STANDARD PROCEDURE > MODULE REPLACEMENT GUIDE (RF-HUB, PCM, BCM, ESL)

NOTE:

NOTE: If using 14.01 tool software and replacing the RF-Hub, the 'PROXI Configuration Alignment' procedure may need to be ran before running the 'Program Ignition FOBIKs' procedure in addition to the 'PROXI Configuration Alignment' procedure already documented in the below tables.

MODULE	MODULE REPLACEMENT GUIDE (RF-HUB, PCM, BCM, ESL)						
	Condition 1	Condition 2	Condition 3	Condition 4	Condition 5	Condition 6	Condition 7
RF-HUB (and ELV/ESCL if equipped)	New	Existing	Existing	Existing	Existing	New	New
BCM	Existing	New	Existing	Existing	Existing	New	Existing
FOBiKs	Existing	Existing	New	Existing	Existing	Existing	New
PCM	Existing	Existing	Existing	New	Existing	Existing	Existing
ESL	Existing	Existing	Existing	Existing	New	Existing	Existing
PROGRAMMING ORDER	**ASSOCIATED MODULE MISC. FUNCTION**						
1	RF-HUB Replace	Restore BCM PROXI Configuration	Program Ignition FOBIKs (ignition off)	Flash update PCM (if PCM arrives in a generic state)	Program Ignition FOBIKs (ignition off)	Restore BCM PROXI Configuration	RF-HUB Replace
2	Program Ignition FOBIKs (Ignition Off)	BCM Replaced (in Vehicle Prep)		PCM Replaced (in Vehicle Prep)	PROXI Configuration Alignment	RF-HUB Replace	Program Ignition FOBIKs (ignition off)
3	'PROXI Configuration Alignment			PROXI Configuration Alignment	RF-HUB Replace	Program Ignition FOBIKs (Ignition Off)	PROXI Configuration Alignment
4	Update Front and Rear Axle Nominal Tire Pressure Values			Check PCM VIN and other PCM routines	Update Front and Rear Axle Nominal Tire Pressure Values	'PROXI Configuration Alignment	Update Front and Rear Axle Nominal Tire Pressure Values

5	Program Tire Sensor IDs				Program Tire Sensor IDs	BCM Replaced (in Vehicle Prep)	Program Tire Sensor IDs
6						Update Front and Rear Axle Nominal Tire Pressure Values	
7						Program Tire Sensor IDs	

MODULE	KL MODULE REPLACEMENT GUIDE (RF-HUB, PCM, BCM, ESL)						
	Condition 8	Condition 9	Condition 10	Condition 11	Condition 12	Condition 13	Condition 14
RF-HUB (and ELV/ESCL if equipped)	New	Existing	Existing	Existing	Existing	New	New
BCM	Existing	New	New	Existing	New	Existing	New
FOBiKs	Existing	New	Existing	New	New	New	Existing
PCM	New	Existing	New	New	New	New	New
ESL	Existing	Existing	Existing	Existing	Existing	Existing	Existing
PROGRAMMING ORDER	**ASSOCIATED MODULE MISC. FUNCTION**						
1	RF-HUB Replace	Restore BCM Proxi Configuration	Restore BCM Proxi Configuration	Program Ignition FOBIKs (Ignition Off)	Restore BCM Proxi Configuration	RF-HUB Replace	Restore BCM Proxi Configuration
2	Program Ignition FOBIKs (Ignition Off)	Program Ignition FOBIKs (Ignition Off)	Flash update PCM (if PCM arrives in a generic state)	Flash update PCM (if PCM arrives in a generic state)	Program Ignition FOBIKs (Ignition Off)	Program Ignition FOBIKs (Ignition Off)	RF-HUB Replace
3	Flash update PCM (if PCM arrives in a generic state)	BCM Replaced (in Vehicle Prep)	BCM Replaced (in Vehicle Prep)	PCM Replaced (in Vehicle Prep)	Flash update PCM (if PCM arrives in a generic state)	Flash update PCM (if PCM arrives in a generic state)	Program Ignition FOBIKs (Ignition Off)
4	PCM Replaced (in Vehicle Prep)		PCM Replaced (in Vehicle Prep)	PROXI Configuration Alignment	BCM Replaced (in Vehicle Prep)	PCM Replaced (in Vehicle Prep)	Flash update PCM (if PCM arrives in a generic state)
5	PROXI Configuration Alignment		PROXI Configuration Alignment	Check PCM VIN and other PCM	PCM Replaced (in Vehicle Prep)	PROXI Configuration Alignment	BCM Replaced (in Vehicle Prep)

				routines			
6	Check PCM VIN and other PCM routines		Check PCM VIN and other PCM routines		PROXI Configuration Alignment	Update Front and Rear Axle Nominal Tire Pressure Values	PCM Replaced (in Vehicle Prep)
7	Update Front and Rear Axle Nominal Tire Pressure Values				Check PCM VIN and other PCM routines	Program Tire Sensor IDs	PROXI Configuration Alignment
8	Program Tire Sensor IDs					Check PCM VIN and other PCM routines	Check PCM VIN and other PCM routines
9							Update Front and Rear Axle Nominal Tire Pressure Values
10							Program Tire Sensor IDs

MODULE	KL MODULE REPLACEMENT GUIDE (RF-HUB, PCM, BCM, ESL)						
	Condition 15	Condition 16	Condition 7	Condition 18	Condition 19	Condition 20	Condition 21
RF-HUB (and ELV/ESCL if equipped)	New	New	New	New	New	Existing	Existing
BCM	New	New	New	Existing	Existing	New	New
FOBiKs	New	New	Existing	New	Existing	New	Existing
PCM	Existing	New	Existing	Existing	New	Existing	New
ESL	Existing	Existing	New	New	New	New	New
PROGRAMMING ORDER	**ASSOCIATED MODULE MISC. FUNCTION**						
1	Restore BCM Proxi Configuration	Restore BCM Proxi Configuration	Restore BCM Proxi Configuration	RF-HUB Replace	RF-HUB Replace	Restore BCM Proxi Configuration	Restore BCM Proxi Configuration
2	RF-HUB Replace	RF-HUB Replace	RF-HUB Replace	Program Ignition FOBIKs (Ignition Off)	Program Ignition FOBIKs (Ignition Off)	Program Ignition FOBIKs (Ignition Off)	Flash update PCM (if PCM arrives in a generic state)

3	Program Ignition FOBIKs (Ignition Off)	Program Ignition FOBIKs (Ignition Off)	Program Ignition FOBIKs (Ignition Off)	ESL Replaced (in Vehicle Prep)	Flash update PCM (if PCM arrives in a generic state)	BCM Replaced (in Vehicle Prep)	BCM Replaced (in Vehicle Prep)
4	BCM Replaced (in Vehicle Prep)	Flash update PCM (if PCM arrives in a generic state)	BCM Replaced (in Vehicle Prep)	PROXI Configuration Alignment	PCM Replaced (in Vehicle Prep)	ESL Replace (in Vehicle Prep)	PCM Replaced (in Vehicle Prep)
5	PROXI Configuration Alignment	BCM Replaced (in Vehicle Prep)	ESL Replaced (in Vehicle Prep)	Update Front and Rear Axle Nominal Tire Pressure Values	ESL Replace (in Vehicle Prep)		ESL Replace (in Vehicle Prep)
6	Update Front and Rear Axle Nominal Tire Pressure Values	PCM Replaced (in Vehicle Prep)	PROXI Configuration Alignment	Program Tire Sensor IDs	PROXI Configuration Alignment		PROXI Configuration Alignment
7	Program Tire Sensor IDs	PROXI Configuration Alignment	Update Front and Rear Axle Nominal Tire Pressure Values		Check PCM VIN and other PCM routines		Check PCM VIN and other PCM routines
8		Check PCM VIN and other PCM routines	Program Tire Sensor IDs		Update Front and Rear Axle Nominal Tire Pressure Values		
9		Update Front and Rear Axle Nominal Tire Pressure Values			Program Tire Sensor IDs		
10		Program Tire Sensor IDs					

MODULE	KL MODULE REPLACEMENT GUIDE (RF-HUB, PCM, BCM, ESL)					
	Condition 22	Condition 23	Condition 24	Condition 25	Condition 26	Condition 27
RF-HUB (and ELV/ESCL if equipped)	Existing	Existing	New	New	New	New
BCM	Existing	New	Existing	New	New	New

FOBiKs	New	New	New	Existing	New	New
PCM	New	New	New	New	Existing	New
ESL	New	New	New	New	New	New
PROGRAMMING ORDER	**ASSOCIATED MODULE MISC. FUNCTION**					
1	Program Ignition FOBIKs (Ignition Off)	Restore BCM Proxi Configuration	RF-HUB Replace	Restore BCM Proxi Configuration	Restore BCM Proxi Configuration	Restore BCM Proxi Configuration
2	Flash update PCM (if PCM arrives in a generic state)	Program Ignition FOBIKs (Ignition Off)	Program Ignition FOBIKs (Ignition Off)	RF-HUB Replace	RF-HUB Replace	RF-HUB Replace
3	PCM Replaced (in Vehicle Prep)	Flash update PCM (if PCM arrives in a generic state)	Flash update PCM (if PCM arrives in a generic state)	Program Ignition FOBIKs (Ignition Off)	Program Ignition FOBIKs (Ignition Off)	Program Ignition FOBIKs (Ignition Off)
4	ESL Replace (in Vehicle Prep)	BCM Replaced (in Vehicle Prep)	PCM Replaced (in Vehicle Prep)	Flash update PCM (if PCM arrives in a generic state)	BCM Replaced (in Vehicle Prep)	Flash update PCM (if PCM arrives in a generic state)
5	PROXI Configuration Alignment	PCM Replaced (in Vehicle Prep)	ESL Replace (in Vehicle Prep)	BCM Replaced (in Vehicle Prep)	ESL Replace (in Vehicle Prep)	BCM Replaced (in Vehicle Prep)
6	Check PCM VIN and other PCM routines	ESL Replace (in Vehicle Prep)	PROXI Configuration Alignment	PCM Replaced (in Vehicle Prep)	PROXI Configuration Alignment	PCM Replaced (in Vehicle Prep)
7		PROXI Configuration Alignment	Update Front and Rear Axle Nominal Tire Pressure Values	ESL Replace (in Vehicle Prep)	Update Front and Rear Axle Nominal Tire Pressure Values	ESL Replace (in Vehicle Prep)
8		Check PCM VIN and other PCM routines	Program Tire Sensor IDs	PROXI Configuration Alignment	Program Tire Sensor IDs	PROXI Configuration Alignment
9			Check PCM VIN and other PCM routines	Check PCM VIN and other PCM routines		Check PCM VIN and other PCM routines
10				Update Front and Rear Axle Nominal Tire Pressure Values		Update Front and Rear Axle Nominal Tire Pressure Values
11				Program Tire Sensor IDs		Program Tire Sensor IDs

STANDARD PROCEDURE > MODULE PROXI REQUIREMENTS

NOTE:

When replacing a module, a PROXI Alignment Procedure may need to be completed for that module.

The PROXI Alignment Procedure is needed to learn the PROXI Configuration from the BCM. This PROXI information configures the modules based on the content of the vehicle.

Refer to the table below for the list of which modules do and do not require the PROXI Alignment Procedure.

MODULE	REQUIRES PROXI
ABS	YES
ACC	YES
AMP	YES
BCM	MASTER OF THE PROXI CONFIGURATION DATA
CDM	YES
CSWM	YES
DTCM	YES
ETM (high line RADIO)	YES
EPS	YES
ESL	YES
ESM	YES
FFC	YES
HVAC	YES
IPC	YES
LBSS OR RBSS	YES
ORC	YES
PAM	YES
PCM	YES
RFHM	YES
RRM (low line RADIO)	YES
TCM	YES
TPM	YES
TTM	YES

NOTE:

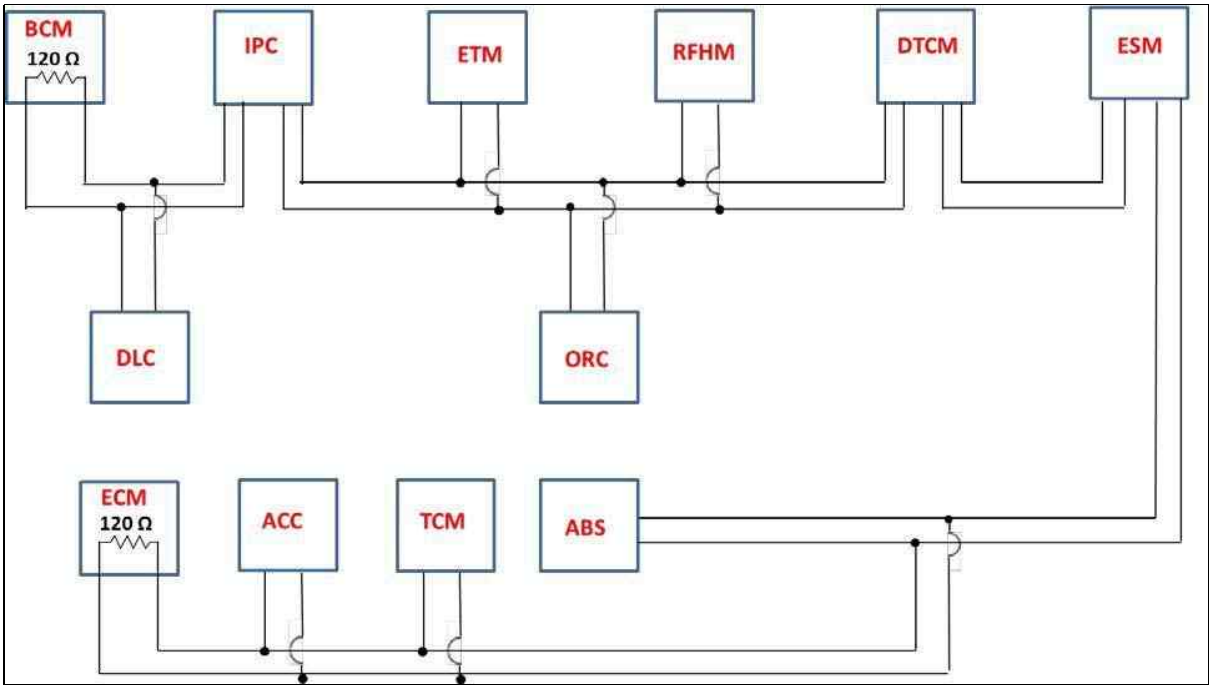
Some modules require several steps to replace the ECU. See the appropriate ECU replacement procedure information for a full list of replacement steps.

COMMUNICATION > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DIGITAL NETWORKS

The vehicle features an electrical/electronic architecture called Next-Generation. Data transmission between the various ECUs in the Next-Generation architecture occurs through the following digital networks:

- CAN-C1 (high-speed 500 kb/s)
- CAN-C2 (high-speed 500 kb/s)
- CAN-BH (medium-speed 125 kb/s)

Fig 1: CAN-C1 Circuit Diagram



Courtesy of CHRYSLER GROUP, LLC

CAN-C1

The ECUs interconnected by the CAN-C1 are:

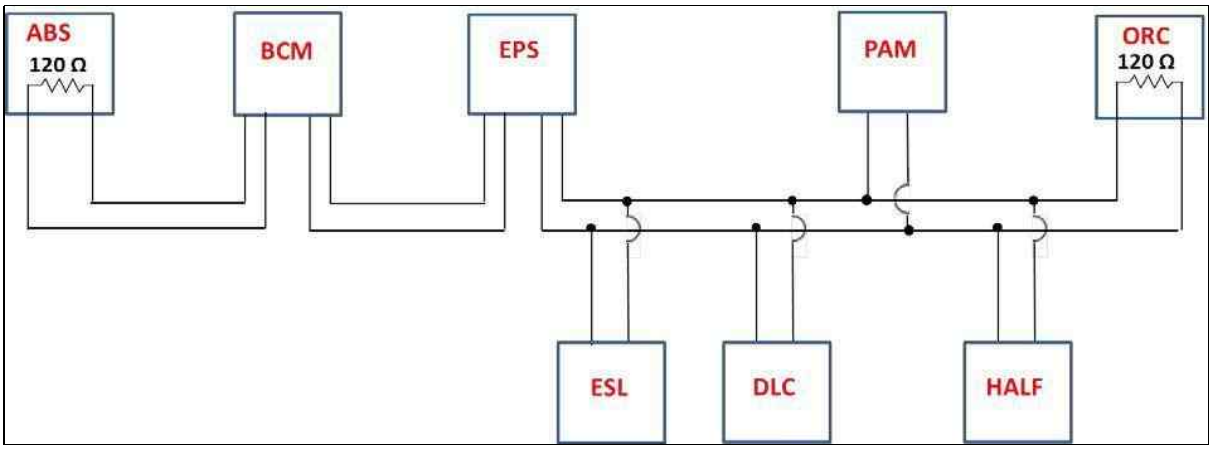
- BCM (Body Control Module)
- IPC (Instrument Panel Cluster)
- ETM (Entertainment Telematic Module - Infotelematic Module VP2 with Nav or VP4)
- ORC (Occupant Restraint Control - Airbag module)

- RFH (Radio Frequency Module)
- DTCM (Drive Train Control Module - Transmission Module)
- ESM (Electronic Shifter Module - Automatic transmission selector lever module)
- ABS (Anti-lock Braking System Module)
- ACC (Adaptive Cruise Control Module)
- TCM (Automatic Transmission Control Module)
- ECM (Engine Control Module)

CAN-C1 reaches the DLC multiple diagnosis connector.

The 120-ohm terminal resistors of the CAN-C1 are located in the BCM and in the ECM.

Fig 2: CAN-C2 Circuit Diagram



Courtesy of CHRYSLER GROUP, LLC

CAN-C2

The CAN-C2 manages the data which is exchanged at high speed between the ECU modules of the vehicle chassis.

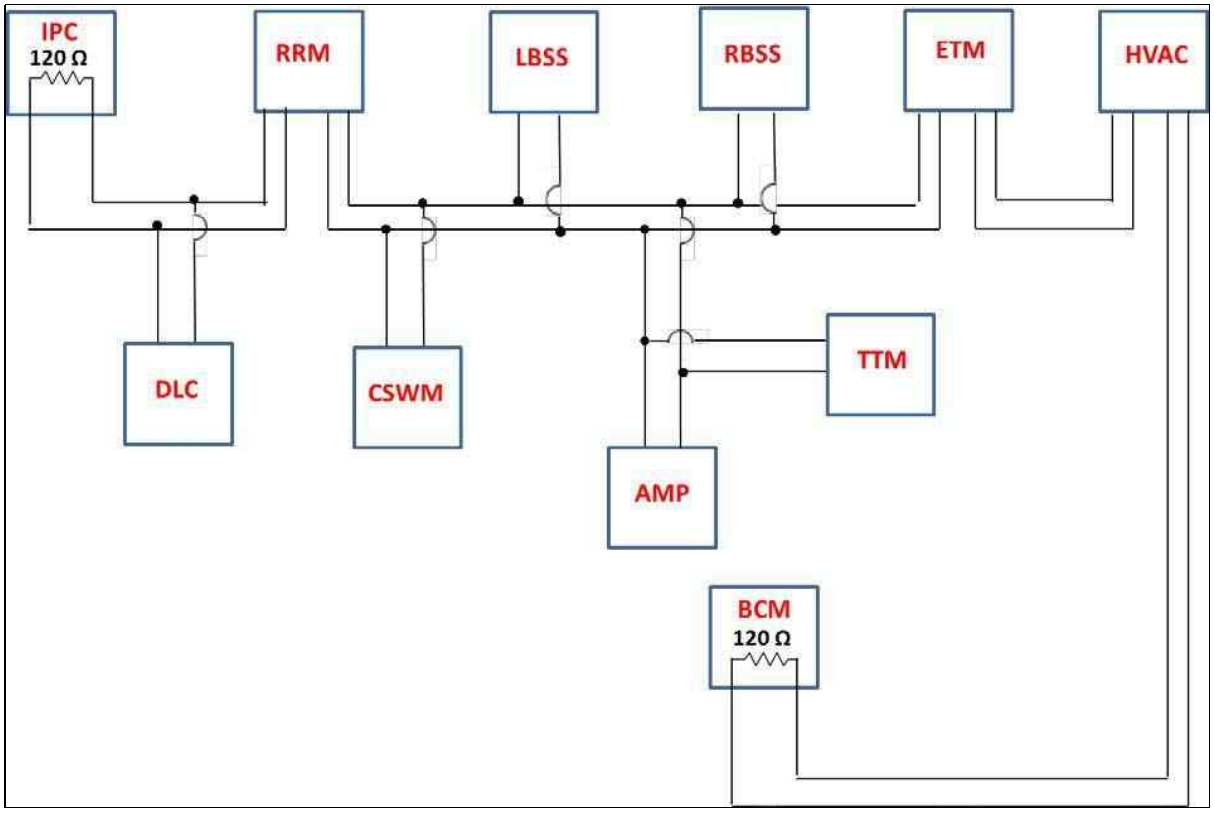
The control units interconnected by the CAN-C2 are:

- ABS (Anti-lock Braking System Module)
- BCM (Body Control Module)
- ESL (Electric Steering Wheel - Steering Lock Module)
- PAM (Parking Aid Module)
- EPS (Electric Power Steering Module.)
- HALF (Haptic Lane Feedback - Lane maintenance assistance module)
- ORC (Occupant Restraint Control)

The CAN-C2 is in the DLC multiple diagnosis connector.

The 120-ohm terminal resistors are in the ABS module and the ORC Airbag module.

Fig 3: CAN-BH Circuit Diagram



Courtesy of CHRYSLER GROUP, LLC

CAN-BH

The CAN-BH manages the data exchanged at medium speed between the electronic modules which manage the passenger compartment comfort on the vehicle.

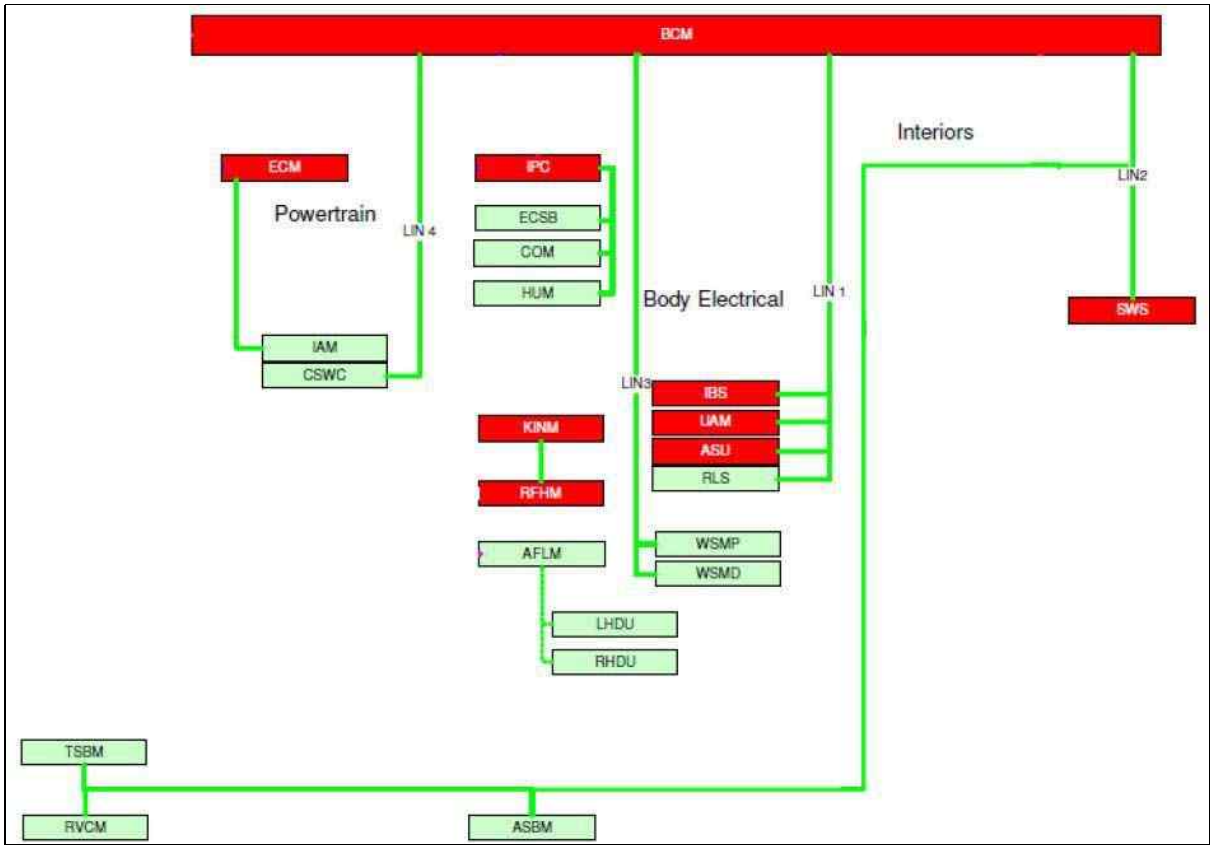
The control units interconnected by the CAN-BH are:

- IPC (Instrument Panel Cluster)
- RRM (Radio Receiver Module)
- CSWM (Comfort Seat Wheel Module - Seat and Steering Wheel Heating Module)
- LBSS (Left Blind Spot Sensor)
- RBSS (Right Blind Spot Sensor)
- AMP (Amplifier - Hi-Fi system amplifier)
- TTM (Trailer Tow Module - Tow Hook Module)
- HVAC (Heating Ventilation and Air Conditioning - Climate control module)
- ETM (Entertainment Telematic Module - Infotelematic Module VP2, VP4)
- BCM (Body Control Module)

The CAN-BH is in the DLC multiple diagnosis connector.

The 120-ohm terminal resistors are in the BCM and the IPC module.

Fig 4: LINs Circuit Diagram



Courtesy of CHRYSLER GROUP, LLC

LINs

Some Modules dialogue with certain vehicle components via LINs. The BCM uses 4 LINs to dialogue with the following components:

LIN 1

- IBS (Intelligent Battery Sensor - negative battery terminal IBS)
- UAM (Ultrasonic Anti-tilt Module)
- ASU (Alarm System Unit)
- RLS (Rain Light Sensor - Rain sensor)

LIN 2

- SWS (Steering Wheel Switch bank)
- ASBM (Auxiliary Switch Bank Module - controls on dashboard)
- TSBM (Terrain Selector Bank Module - Traction mode selector module on tunnel)
- RVCM (Rear View Camera Module)

LIN 3

- WSMP (Window Smart Motor Passenger)

- WSMD (Window Smart Motor Driver)

LIN 4

- CSWC (Cruise control Steering Wheel Commands)

The instrument panel (IPC) communicates via a LIN line with the following components:

- ECSB (Emergency Call Switch Bank)
- COM (Compass Module)
- HUM (Humidity Sensor)

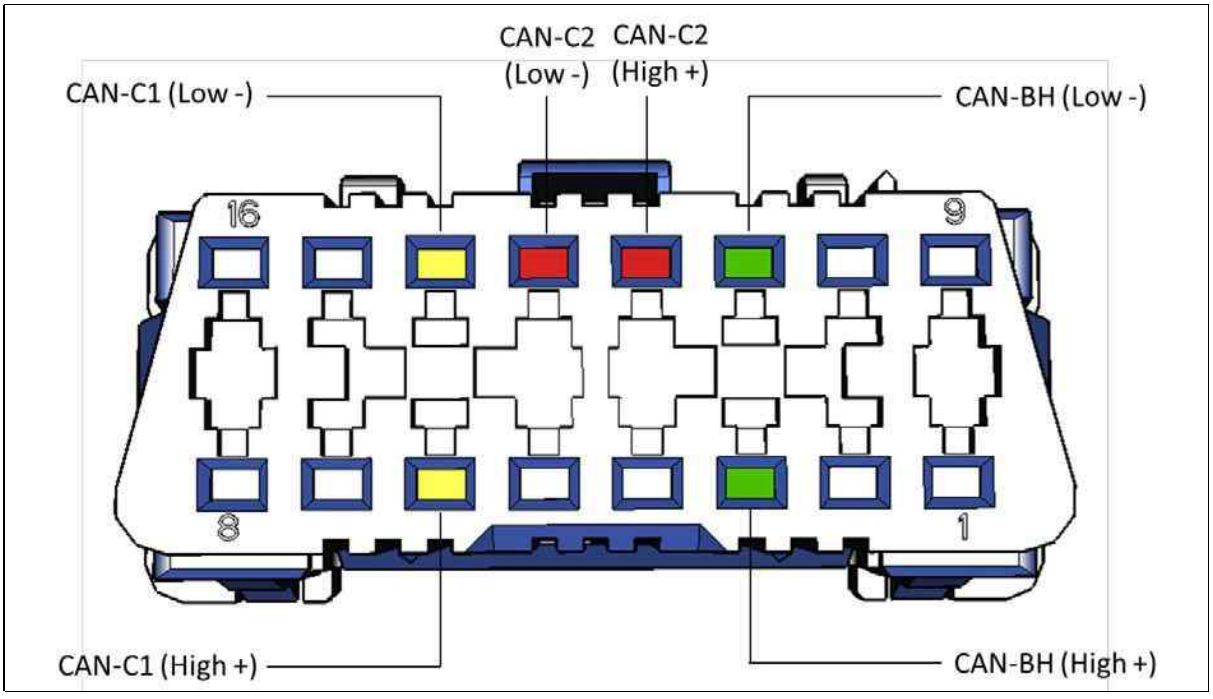
There is also a LIN line that connects the ECM to the voltage regulator of the intelligent alternator.

CONNECTOR, DATA LINK > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DATA LINK CONNECTOR

The vehicle is supplied with numerous electronic control units that perform a self diagnosis function. Connecting to these control units via diagnostic equipment allows you to read the self-diagnosis information (parameters, errors) or carry out available active diagnostics. All the diagnosis lines flow into the EOBD connector (European On Board Diagnosis) which conforms with Directive 98/69/EC - ISO standard J1962 - located under the dashboard near the Body Control Module (BCM). On the same connector it is possible to diagnose all nodes (control units) connected both to the low transmission speed CAN-B for the management of standard body functions and to the high-transmission speed CAN-C for dynamic vehicle controls (bus CAN-H and CAN-L).

The 4x4 control unit also has an additional diagnosis connection, located next to the control unit itself.

Fig 1: DLC Connector Terminal Identification



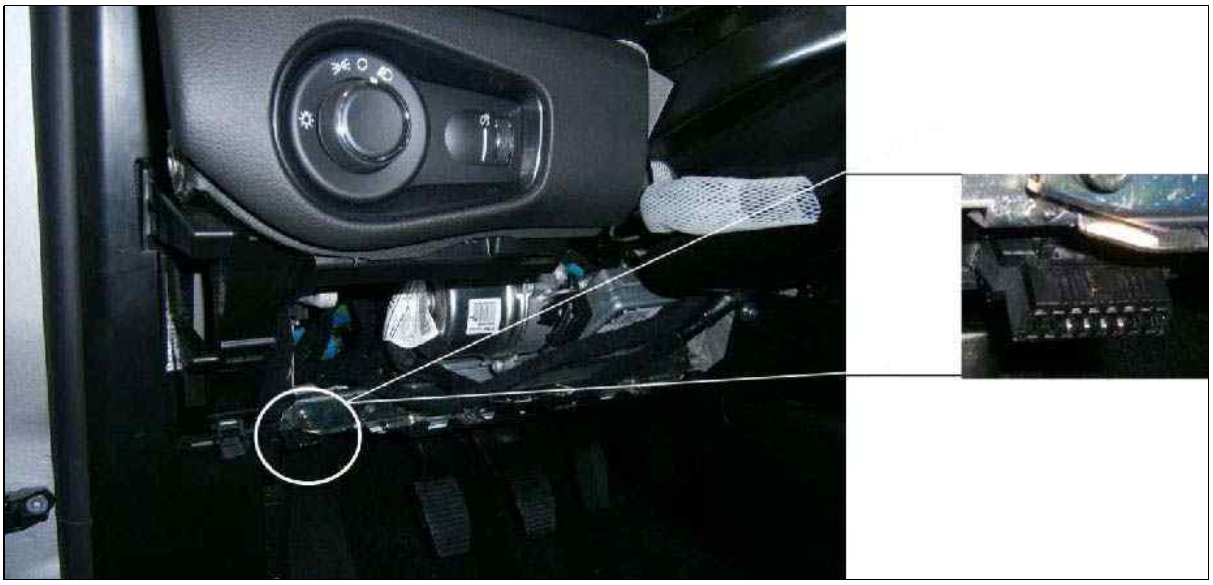
Courtesy of CHRYSLER GROUP, LLC

DLC multiple diagnosis connector

The three networks are positioned in the multiple diagnosis connector in the following pins:

- Pin 3 - CAN-BH High
- Pin 11 - CAN-BH Low
- Pin 12 - CAN-C2 High
- Pin 13 - CAN-C2 Low
- Pin 14 - CAN-C1 Low
- Pin 6 - CAN-C1 High

Fig 2: DLC Location



Courtesy of CHRYSLER GROUP, LLC

DLC multiple diagnosis connector position

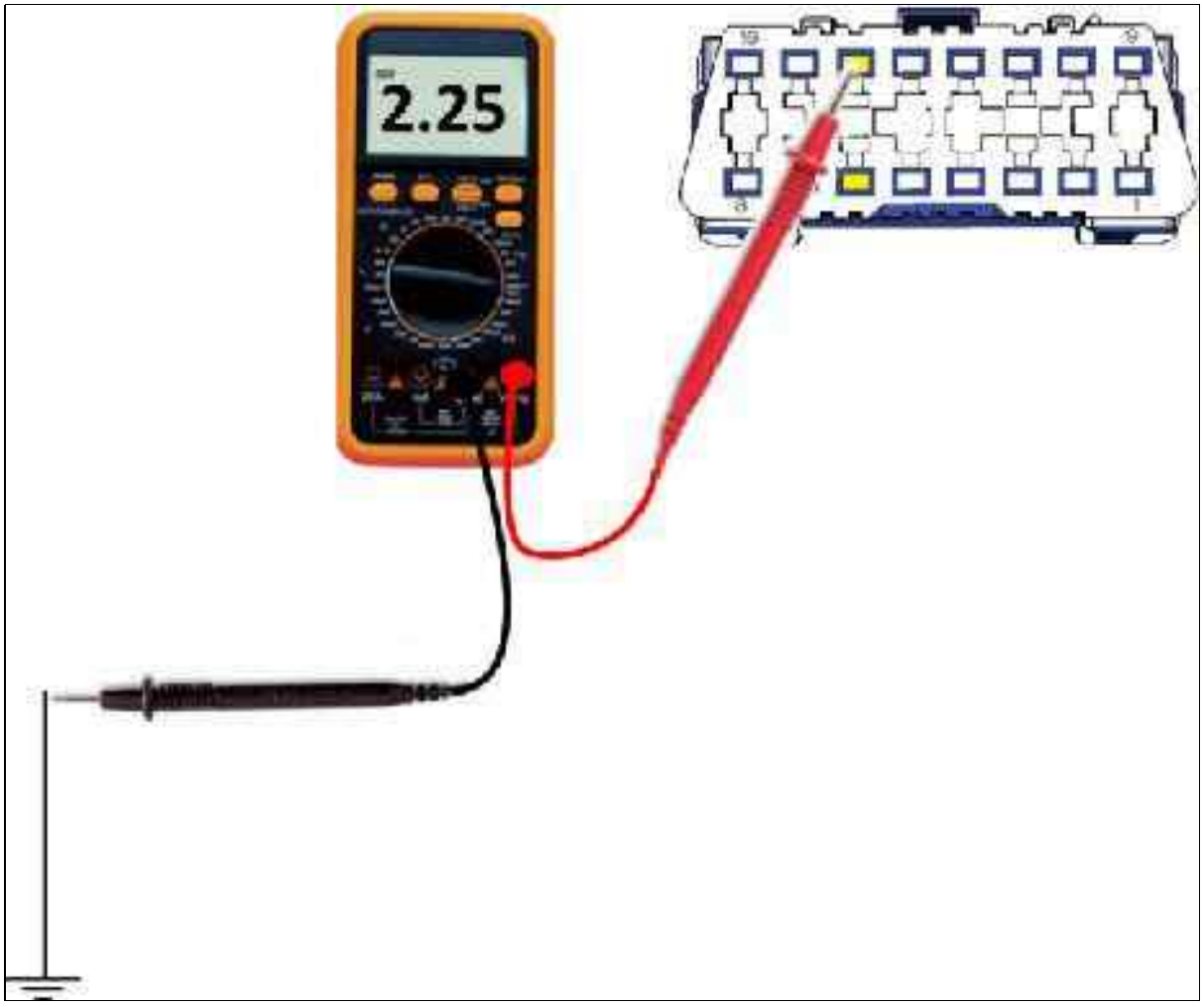
Digital network voltage levels

CAN-C1

Fig 3: Checking Voltage On CAN-C1 (High +)

Courtesy of CHRYSLER GROUP, LLC

Fig 4: Checking Voltage On CAN-C1 (Low -)



Courtesy of CHRYSLER GROUP, LLC

CAN-C2

Fig 5: Checking Voltage On CAN-C2 (High +)

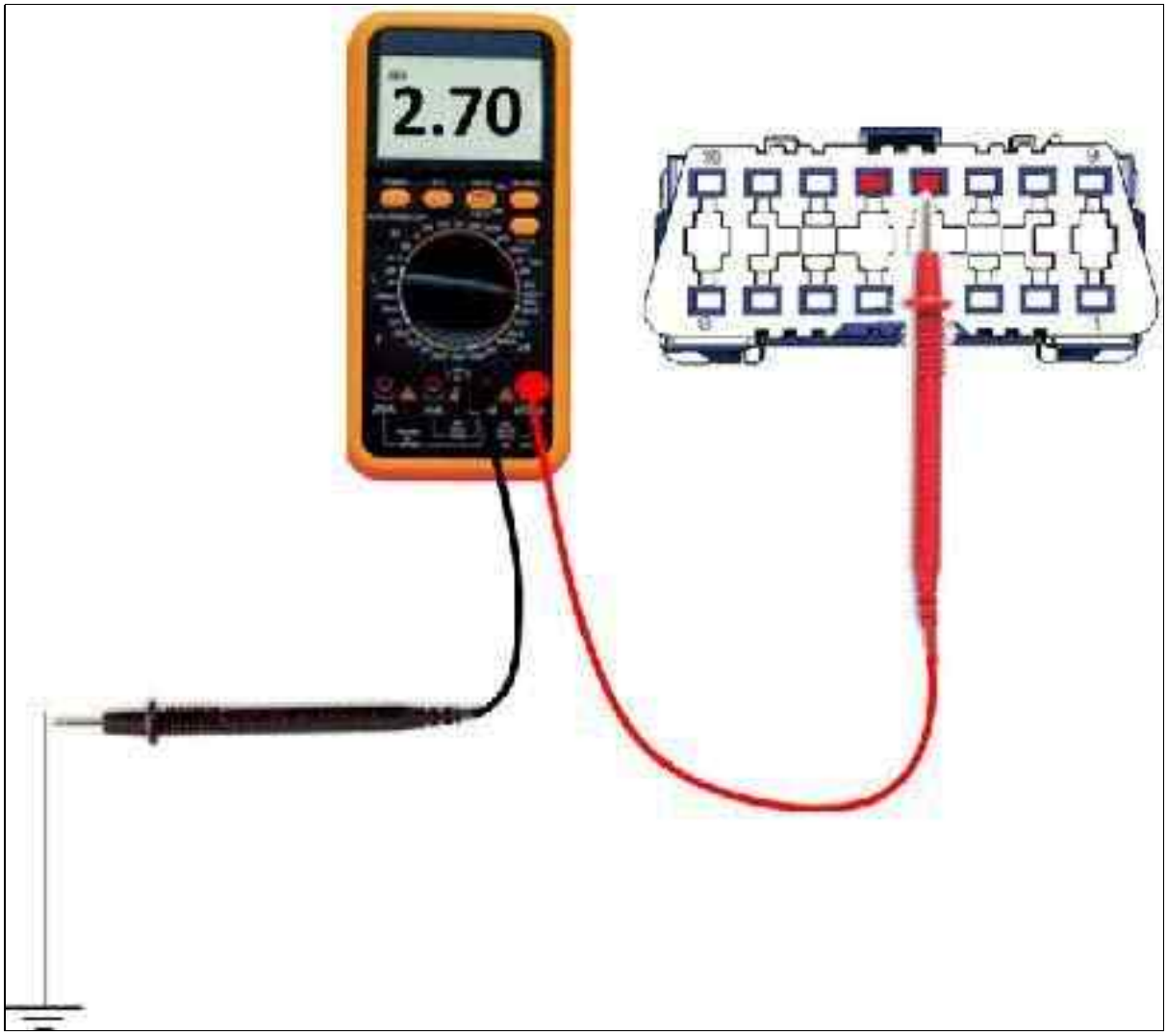


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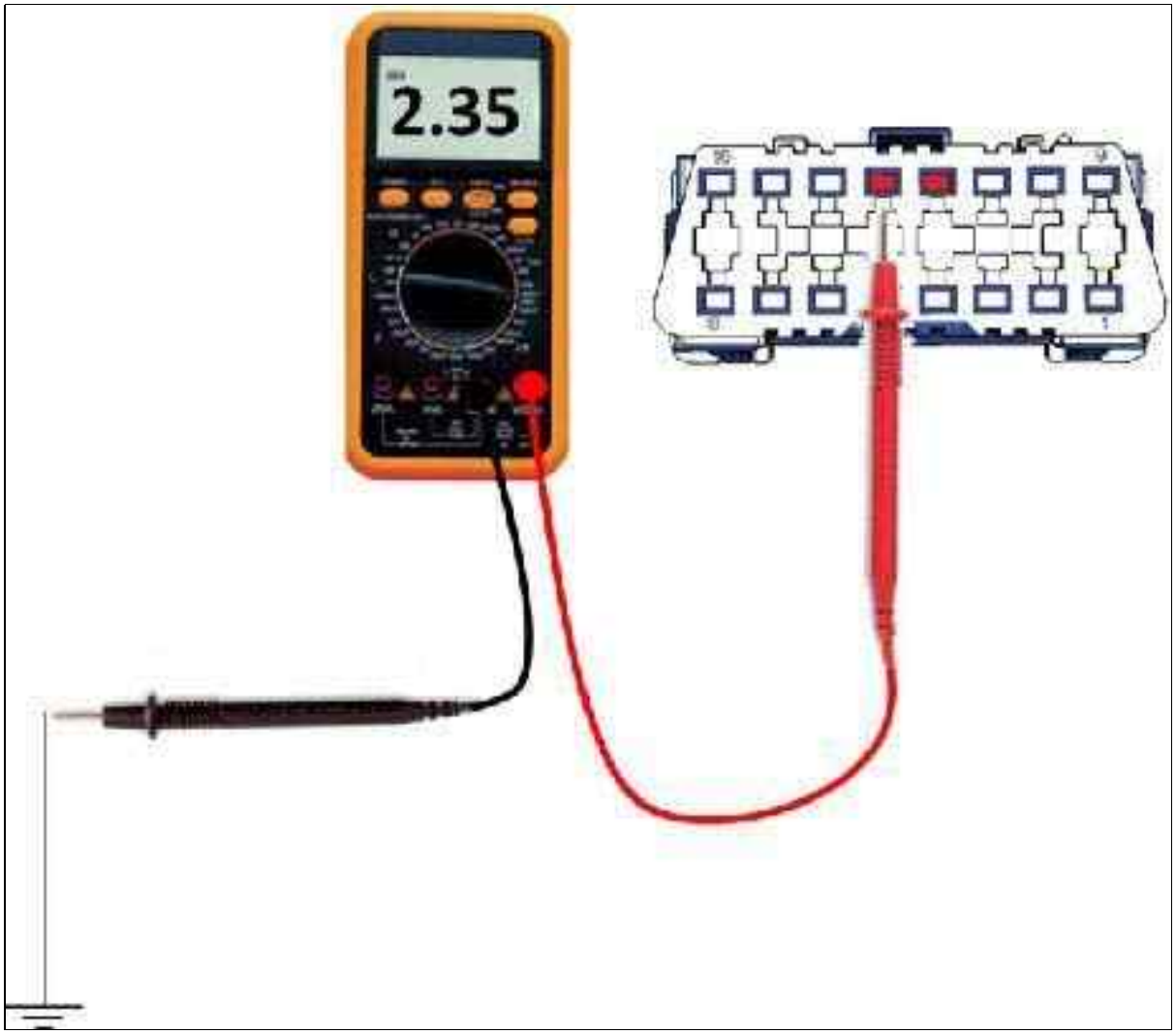
Fig 6: Checking Voltage On CAN-C2 (Low -)



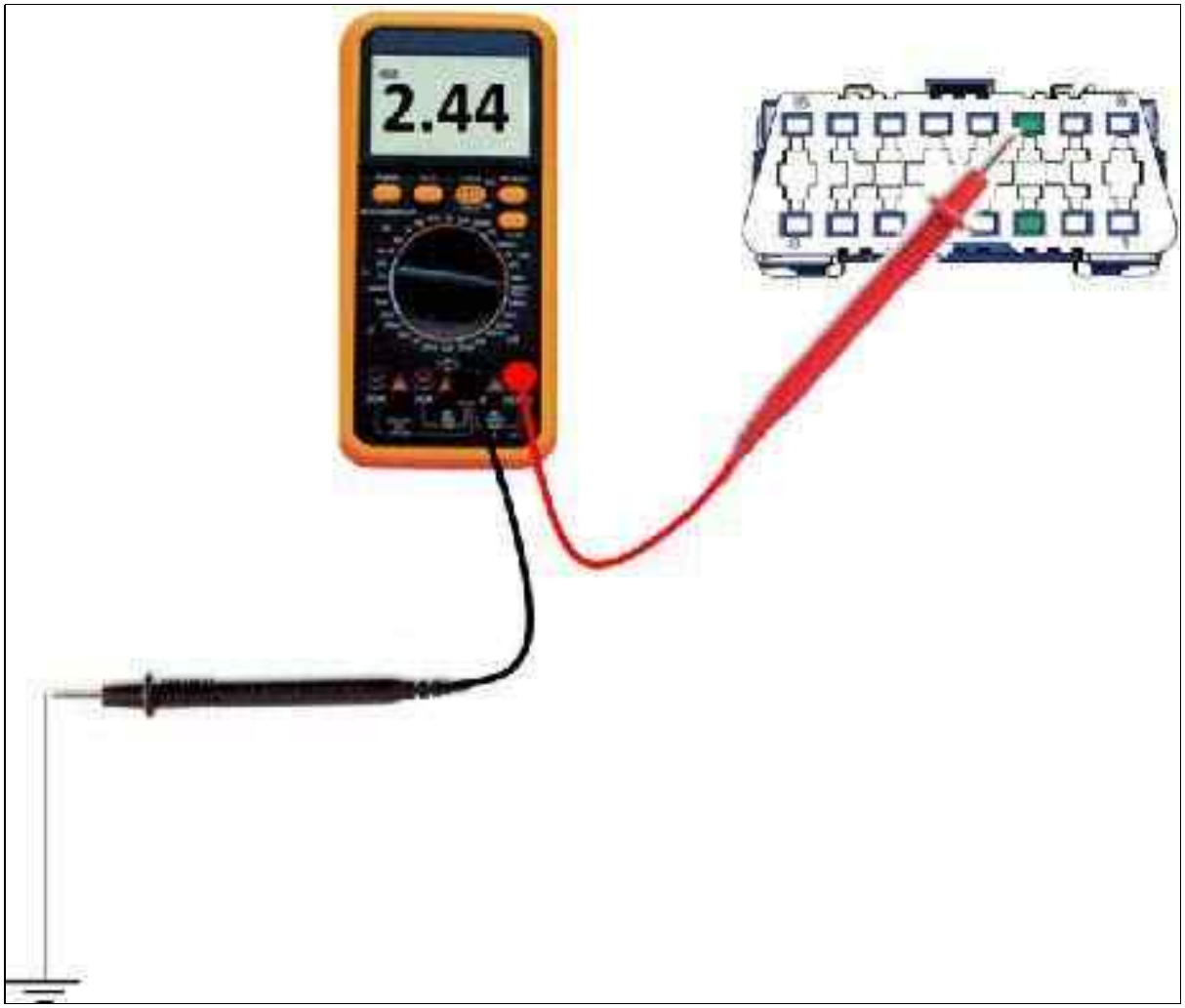
Courtesy of CHRYSLER GROUP, LLC

CAN-BH

Fig 7: Checking Voltage On CAN-BH (High +)

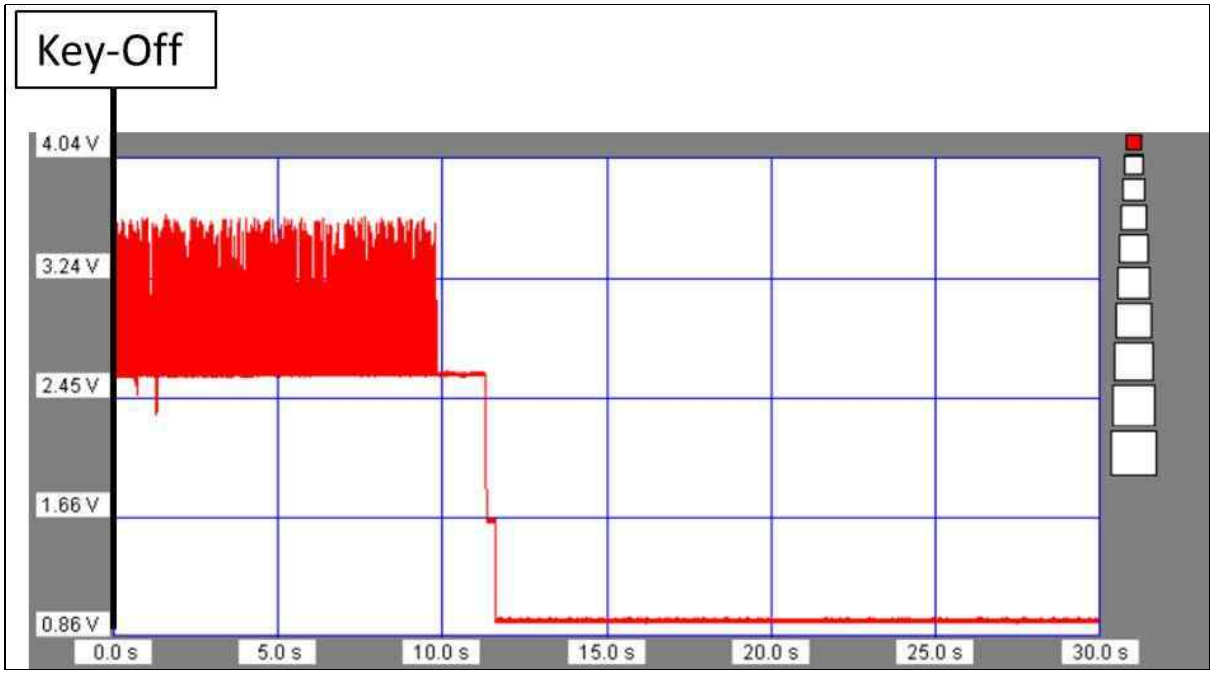
Courtesy of CHRYSLER GROUP, LLC

Fig 8: Checking Voltage On CAN-BH (Low -)



Courtesy of CHRYSLER GROUP, LLC

Fig 9: CAN System Waveform - Key Off



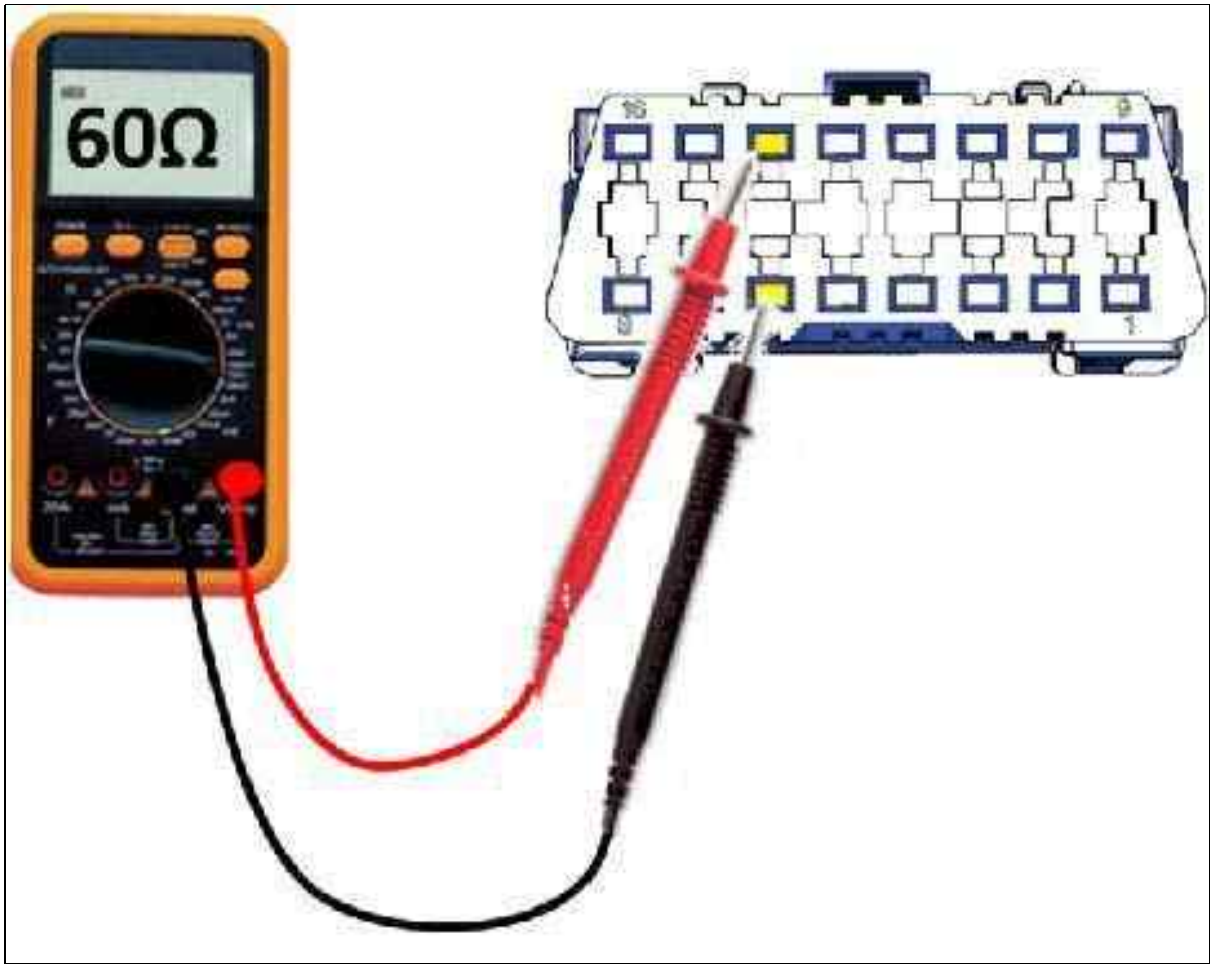
Courtesy of CHRYSLER GROUP, LLC

The CAN-C1, CAN-C2 and CAN-BH enter Sleep mode approximately 10-12 seconds after the key is turned to OFF. The networks "wake up" with the key at OFF when one of the vehicle's doors passes from "Closed" status to "Open" status.

The ACC module is connected to the Half module via a dedicated CAN-C line. The reason behind the dedicated data transmission line between the two modules is the continuous exchange of information between them during operation of the cruise control and of the FCW function.

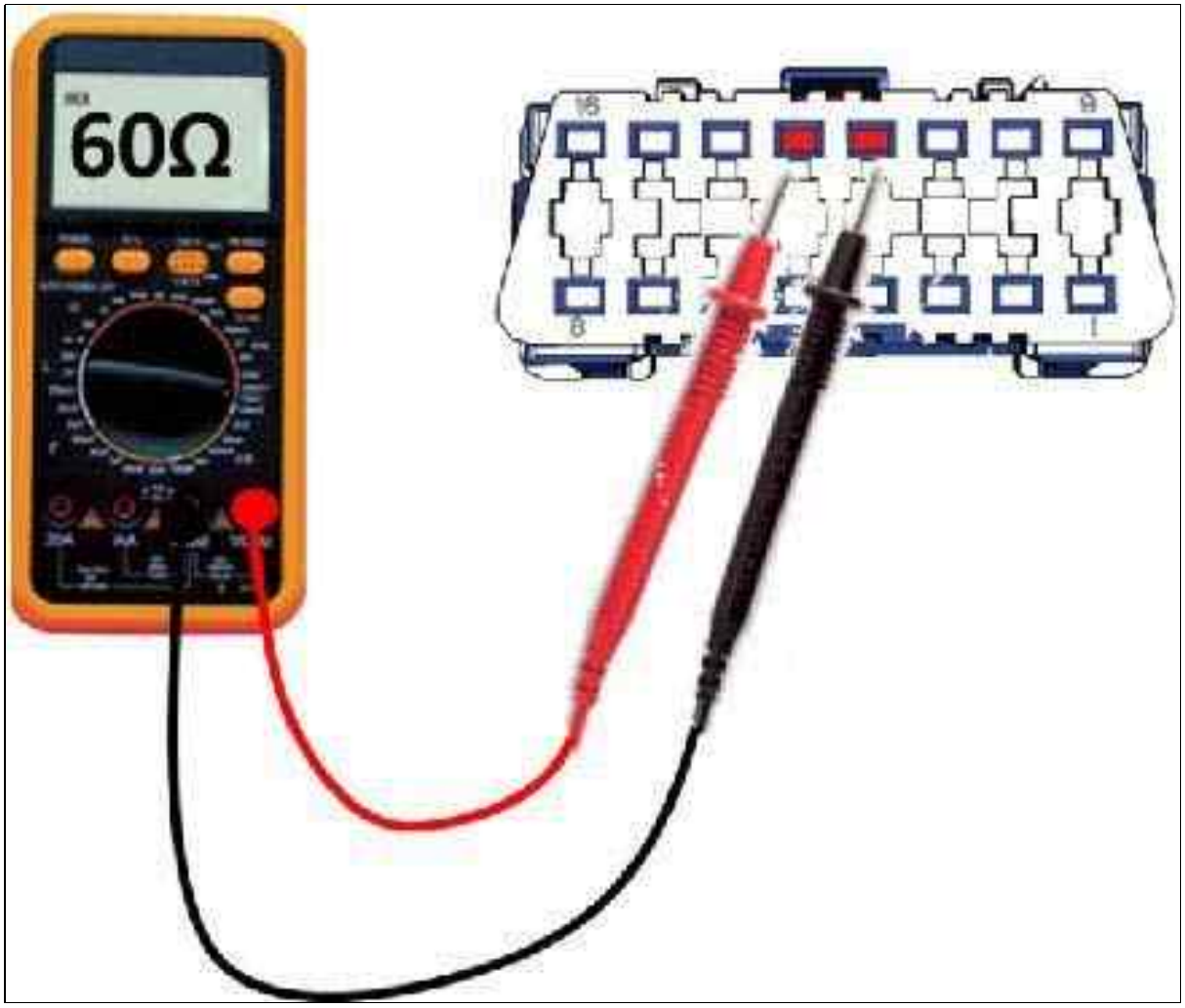
Electrical continuity of the networks

Fig 10: Checking Resistance On CAN-C1 Circuit - (Pin 14 And Pin 6)



Courtesy of CHRYSLER GROUP, LLC

Fig 11: Checking Resistance On CAN-C2 Circuit - (Pin 12 And Pin 13)



Courtesy of CHRYSLER GROUP, LLC

Fig 12: Checking Resistance On CAN-BH Circuit - (Pin 11 And Pin 3)

Courtesy of CHRYSLER GROUP, LLC

The three digital networks CAN-C1, CAN-C2 and CAN-BH have 120-ohm terminal resistors. The electrical continuity of the networks can be checked directly via the diagnosis connector by setting the multimeter to the Ohm function. When the network is electrically continuous, the value that the operator needs to read on the display is approximately 60 ohms for all three networks.

The central diagnostic socket receives a direct battery power supply from the line protected by a fuse located in the BCM. The BCM receives a direct power supply from the battery through the line protected by maxi fuse in the engine compartment junction unit. The BCM receives an ignition-operated power supply (INT). This signal is used, amongst other things, to "wake up the network".

CONNECTOR, DATA LINK > DESCRIPTION AND OPERATION > MICROPOD II

Fig 1: VCI Pod & MICROPOD II

Courtesy of CHRYSLER GROUP, LLC

In order to diagnose the vehicle, the wiTECH must be supported by specific new equipment called Micropod II. Fundamentally, the current VCI Pod is unable to dialogue with the vehicle systems through the three CANs. The current VIC Pod can manage the dialogue via two CANs. For this reason, it is necessary to use the Micropod II which will be distributed to the service network as specific equipment.

Fig 2: MICROPOD II Connection

Courtesy of CHRYSLER GROUP, LLC

The Micropod II is different to the VCI pod. It allows wi-fi connection, and no longer Bluetooth. The wi-fi connection can be made using the current wiTECH access point (router) provided to the Jeep service network. Alternatively, PC and Micropod II can be connected via USB cable.

In order to use the Micropod II, it must be configured for the desired wi-fi network. Below is the configuration procedure.

MICROPOD II Wi-Fi mode configuration

In addition to USB methods, the MICROPOD can be used in Wi-Fi mode. Approximately 15 minutes are required to set up the MICROPOD with Wi-Fi. Make sure that you have the time required and the USB cable provided to hand.

Depending on the complexity of the network, the time taken to connect the MICROPOD to the Wi-Fi network may vary from a few seconds to 5 minutes. In some cases, the support of your IT manager may be required. It is also possible that some configurations of your internal network do not permit correct use of Wi-Fi connection.

NOTE:

Not all networks and not all Wi-Fi configurations are ideal for using the MICROPOD in Wi-Fi mode. In order not to encounter these problems, you can provide yourself with completely open Wi-Fi access

Fig 3: MICROPOD II

Courtesy of CHRYSLER GROUP, LLC

If the name of the Wi-Fi network, the password and the relative ciphering are known, go straight to B1. Otherwise, carry on with A 1.

For support, contact the WITECH PLUS HELP DESK

Fig 4: Check The Name Of Your Wi-Fi Network

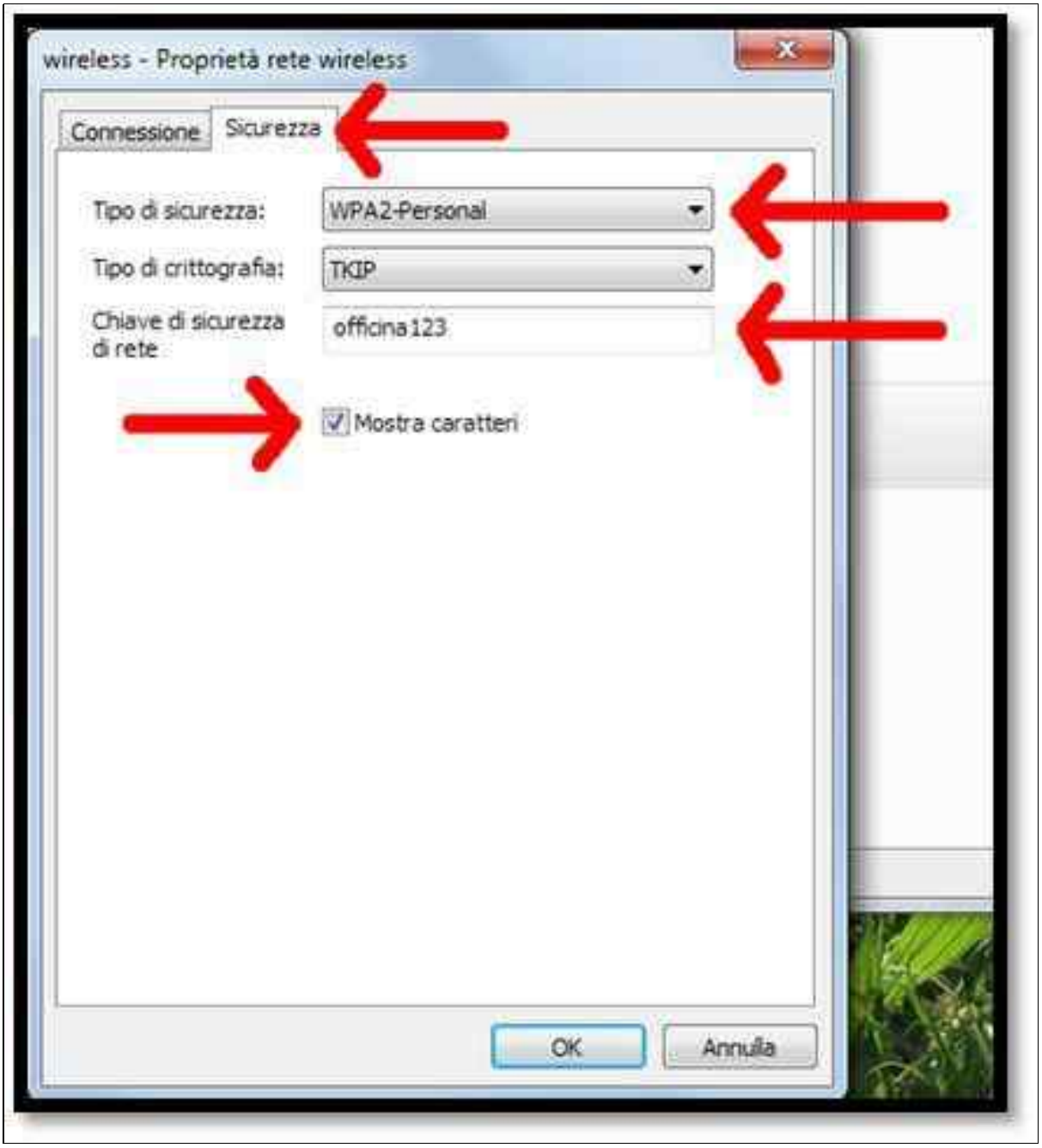
Courtesy of CHRYSLER GROUP, LLC

A. Identifying network name and password

A 1. Check the name of your Wi-Fi network by clicking the dedicated icon near the clock

In the above example, the Wi-Fi network that the PC is connected to is called "wireless". To identify the Password for the Wi-Fi network, right-click on the connected network and then click Properties

Fig 5: Security Tab



Courtesy of CHRYSLER GROUP, LLC

A 2. In the window that appears, click on the Security tab and Show characters

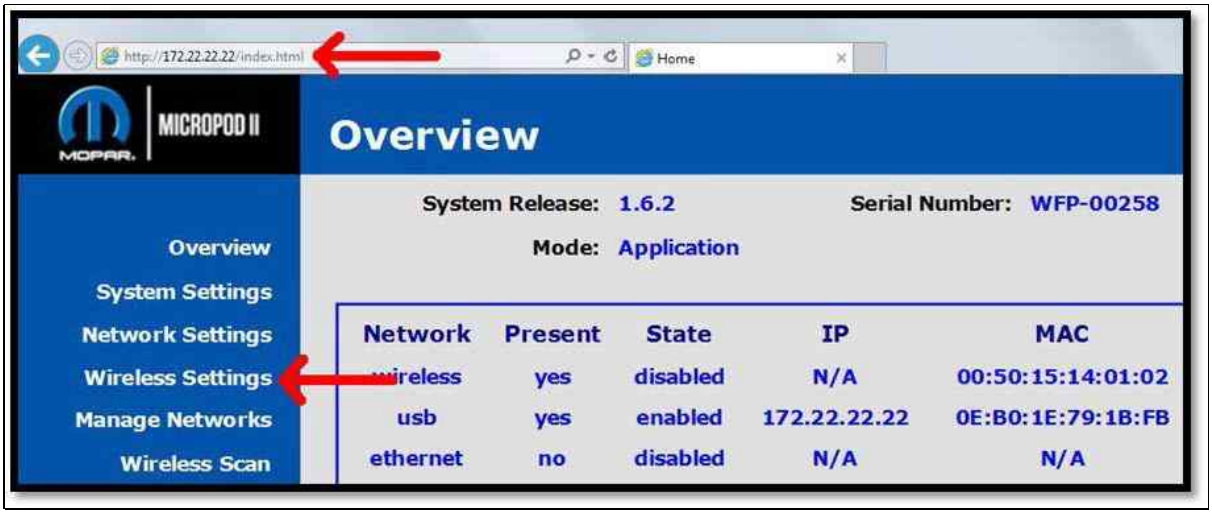
WARNING: the PC administrator password may be requested This window contains the Wi-Fi network details.

In our example, they are:

- SSID "wireless" = Wi-Fi name
- Security "WPA2" = Security type
- Enter Key "officina123" = Security key (password)

A 3. Close all windows and carry on with B 1

Fig 6: Enter Address

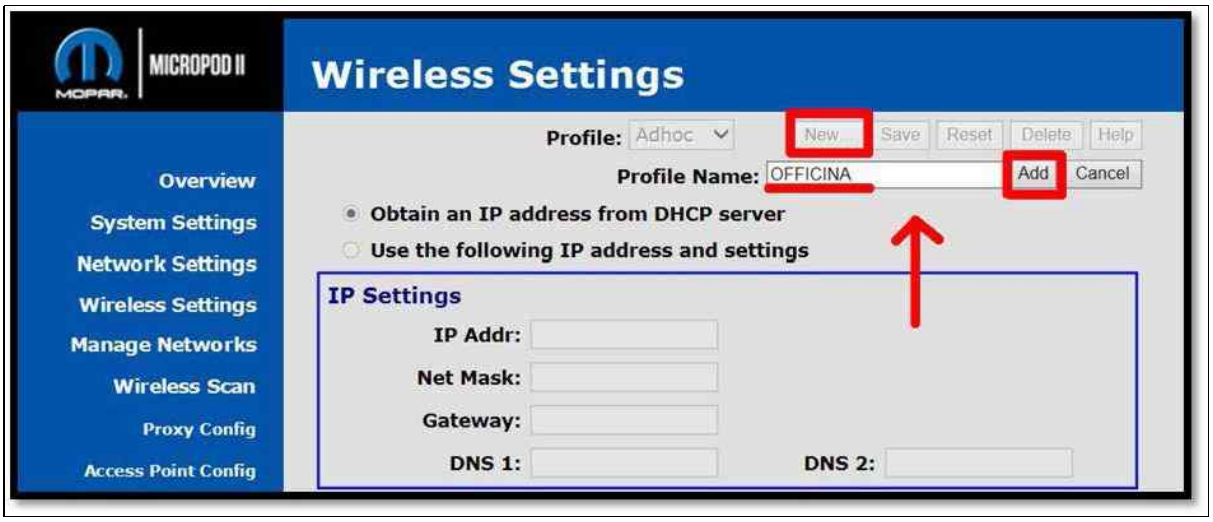


Courtesy of CHRYSLER GROUP, LLC

B. Setting up Wi-Fi on the MICROPOD II

- B 1. Connect the USB cable between PC and MICROPOD
- B 2. Wait for about 40 seconds and open the Internet Explorer browser
- B 3. Enter the address 172.22.22.22 and press enter
- B 4. The page below will be shown; click on Wireless Settings

  Fig 7: Choosing A Name For The Network Profile

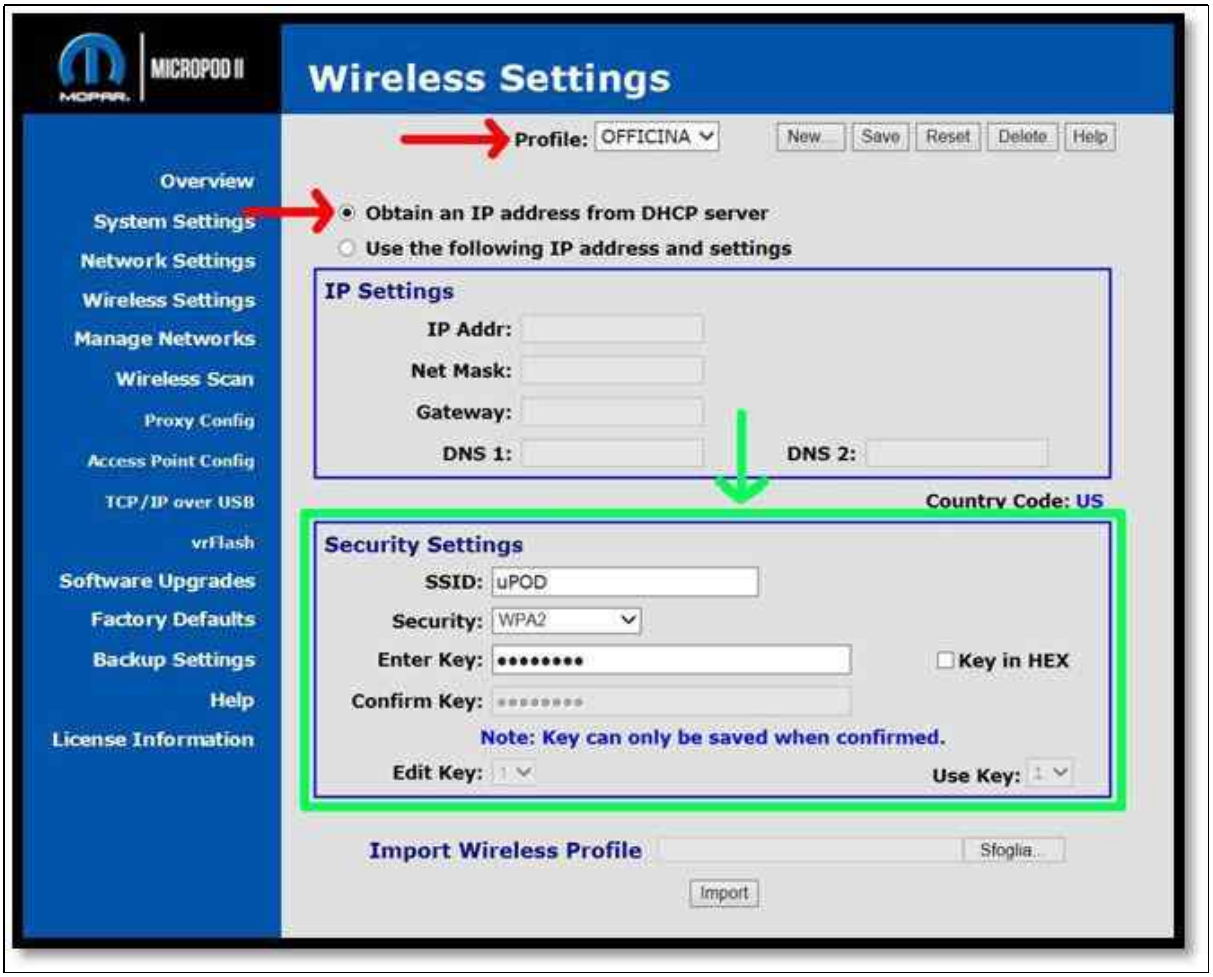


Courtesy of CHRYSLER GROUP, LLC

- B 5. The page below will be shown;
- B 6. click on New
- B 7. Choose a name for the network profile that you're creating (e.g. "WORKSHOP") and click Add
- B 8. Then select the "WORKSHOP" Profile

- B 9. Select the option indicated by the red arrow

Fig 8: Completing Fields



Courtesy of CHRYSLER GROUP, LLC

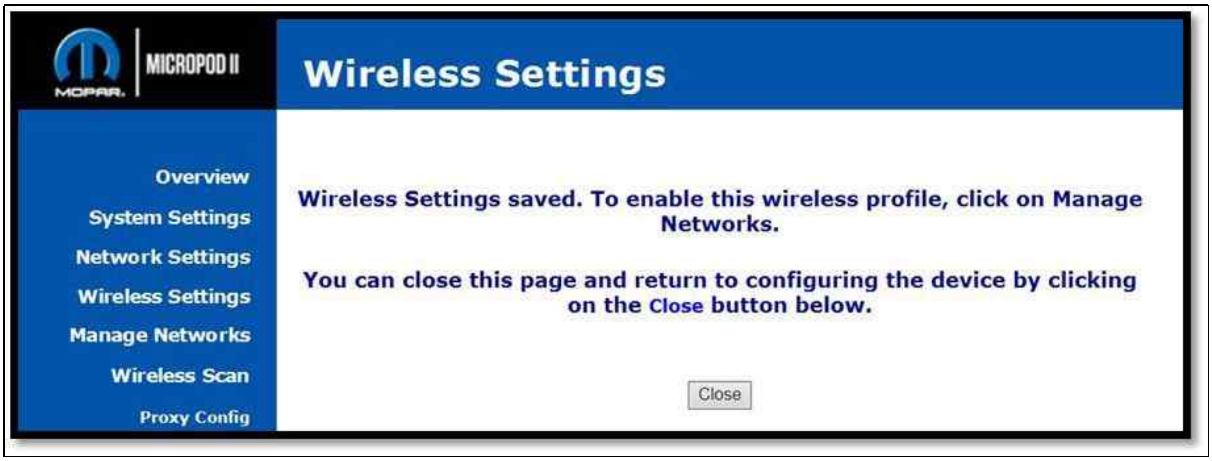
- B 10. Complete the fields indicated by the green box (the same as at A 2)
  - In our example, they are:
  - SSID "wireless" = Wi-Fi name
  - Security "WPA2" = Security type
  - Enter Key "officina123" = Security key
  - Confirm Key "officina123" = Confirm security key

Fig 9: Save Settings

Courtesy of CHRYSLER GROUP, LLC

- B 11. Once completed, click on **Save**

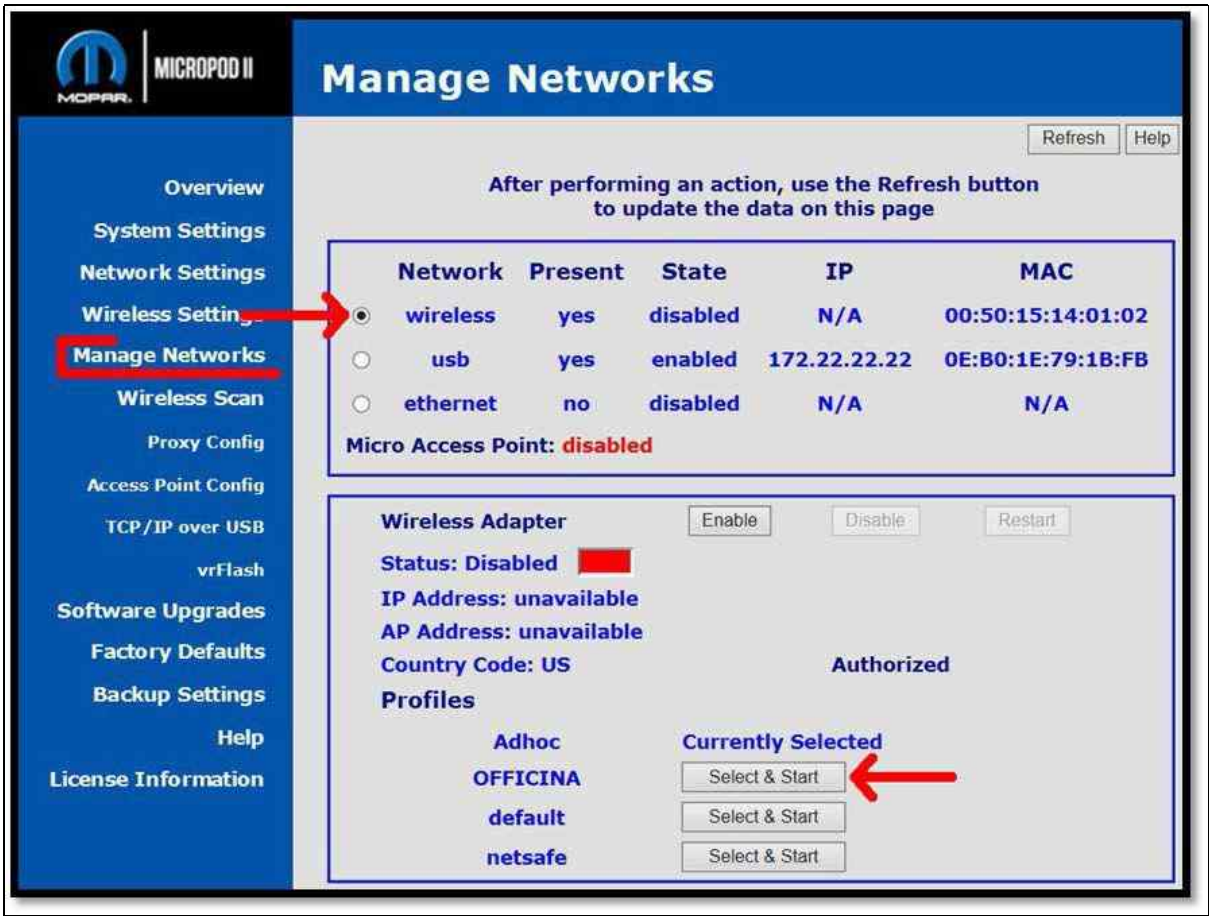
Fig 10: Close Settings



Courtesy of CHRYSLER GROUP, LLC

- B 12. Wait for the next screen and click on **Close**

Fig 11: Managing Networks

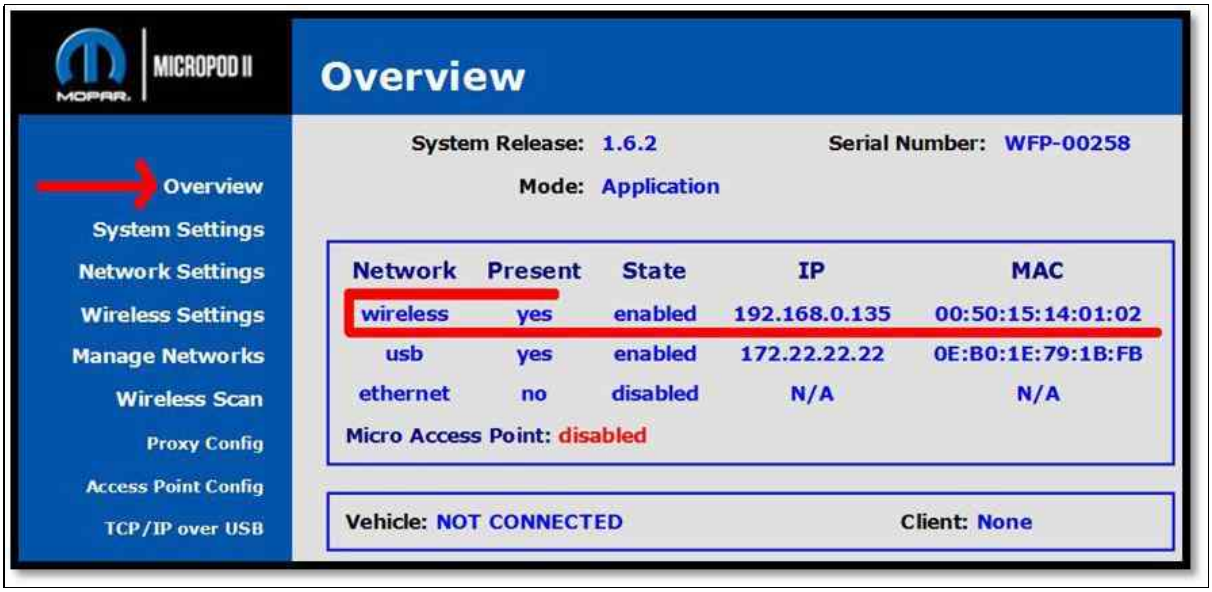


Courtesy of CHRYSLER GROUP, LLC

- B 13. Then select **Manage Networks**
- B 14. Select the option indicated by the red arrow: **wireless**

- B 15. Click the **Select & Start** button next to the profile created previously (in our example "WORKSHOP")

  Fig 12: Overview



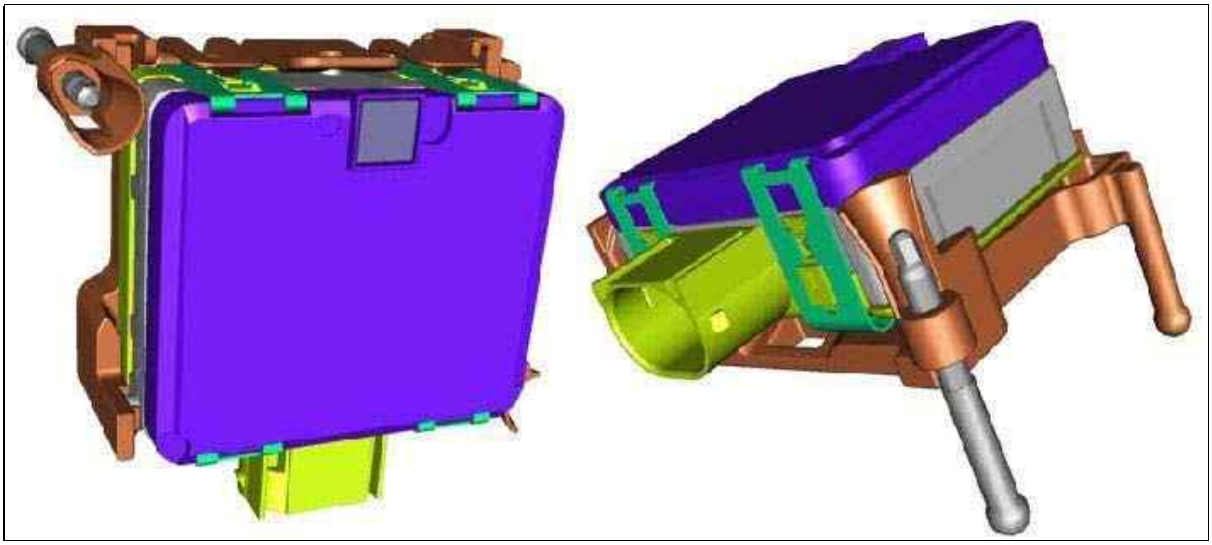
Courtesy of CHRYSLER GROUP, LLC

- B 16. Wait for a minute and select **Overview**

If configuration is successful, the IP address for the Wi-Fi connection will appear, as in the red box above.

MODULE, ADAPTIVE CRUISE CONTROL > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

Fig 1: Adaptive Cruise Control Module

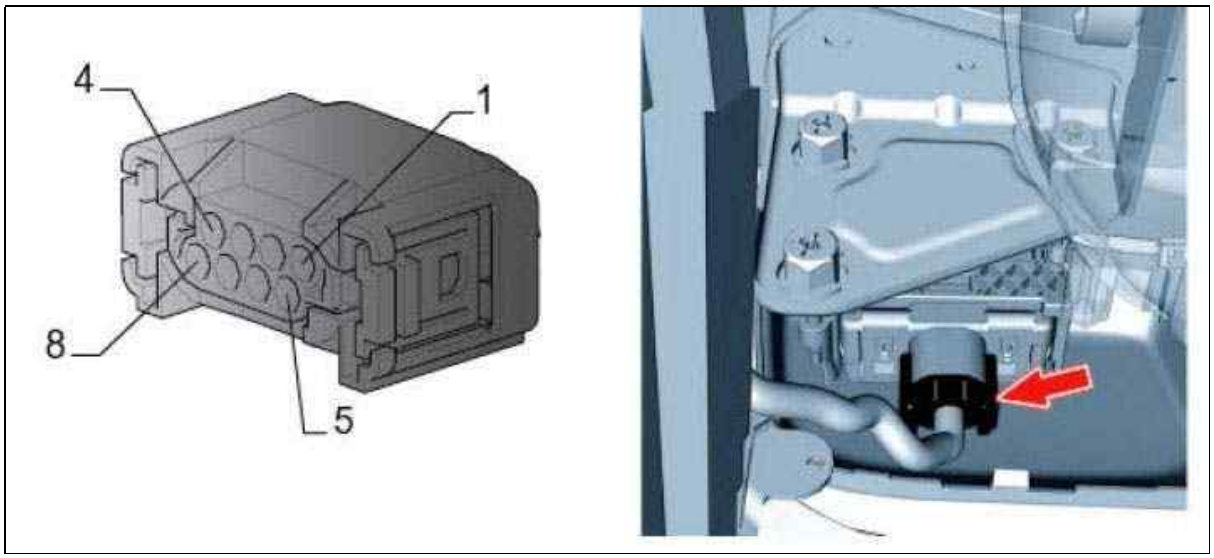


Courtesy of CHRYSLER GROUP, LLC

The ACC sensor contains the software required to operate normal Cruise Control, ACC+, and FCW+. The ACC sensor determines the distance to a target vehicle and the speed at which the target vehicle is approached. If

the ACC sensor determines that intervention is required, the ACC sensor sends a message to other modules over CAN-C to activate audible, visual and haptic warnings. The ACC sensor also sends torque requests to the PCM and brake requests to the ABS module.

Fig 2: Adaptive Cruise Control Module Connector Terminal Identification



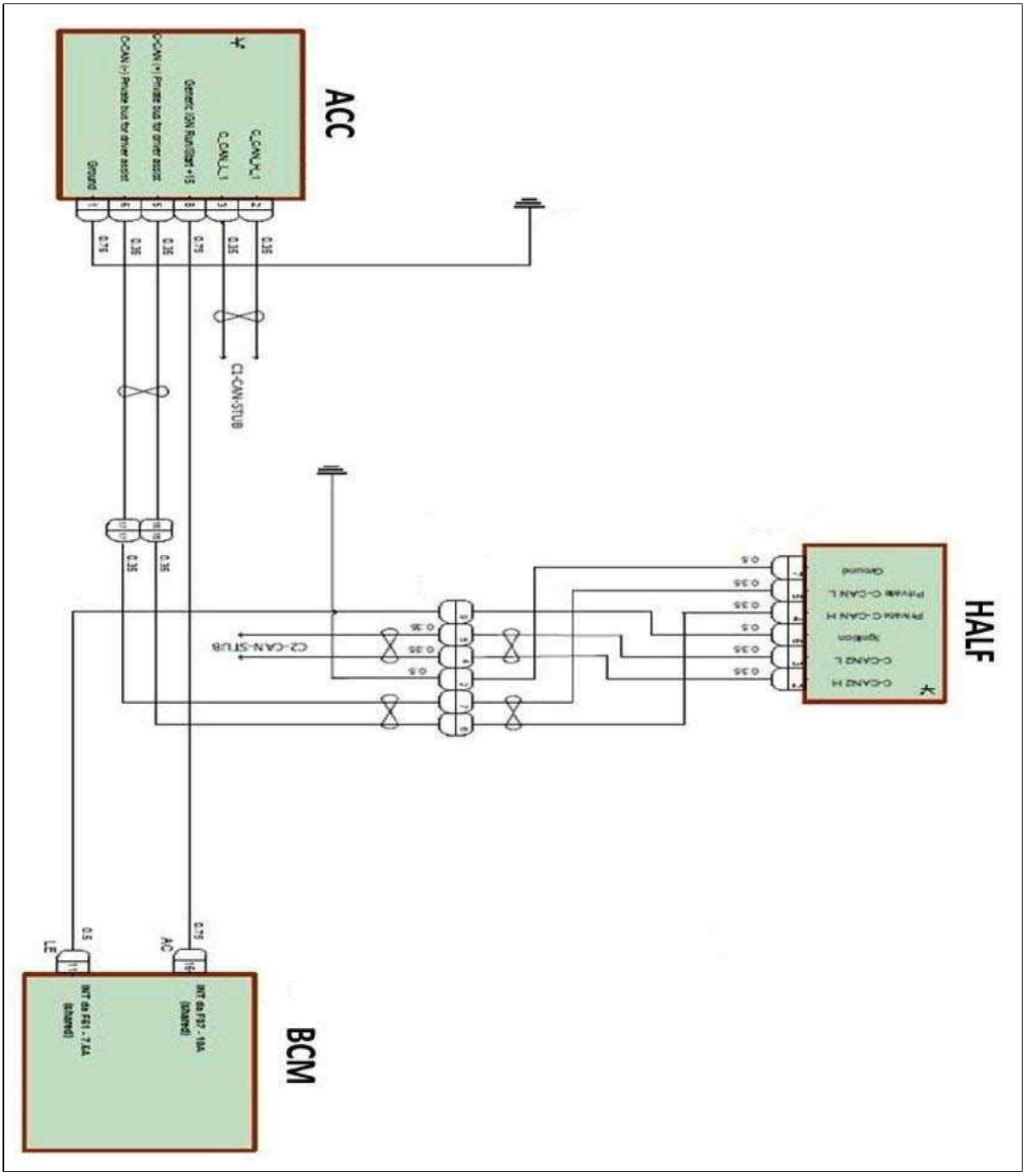
Courtesy of CHRYSLER GROUP, LLC

ACC pinout

1. Ground
2. CAN 1 H
3. CAN 1 L
4. N.C.
5. Private CAN
6. Private CAN
7. N.C.
8. 12V power supply

MODULE, ADAPTIVE CRUISE CONTROL > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

Fig 1: Adaptive Cruise Control Module Circuit Diagram



Courtesy of CHRYSLER GROUP, LLC

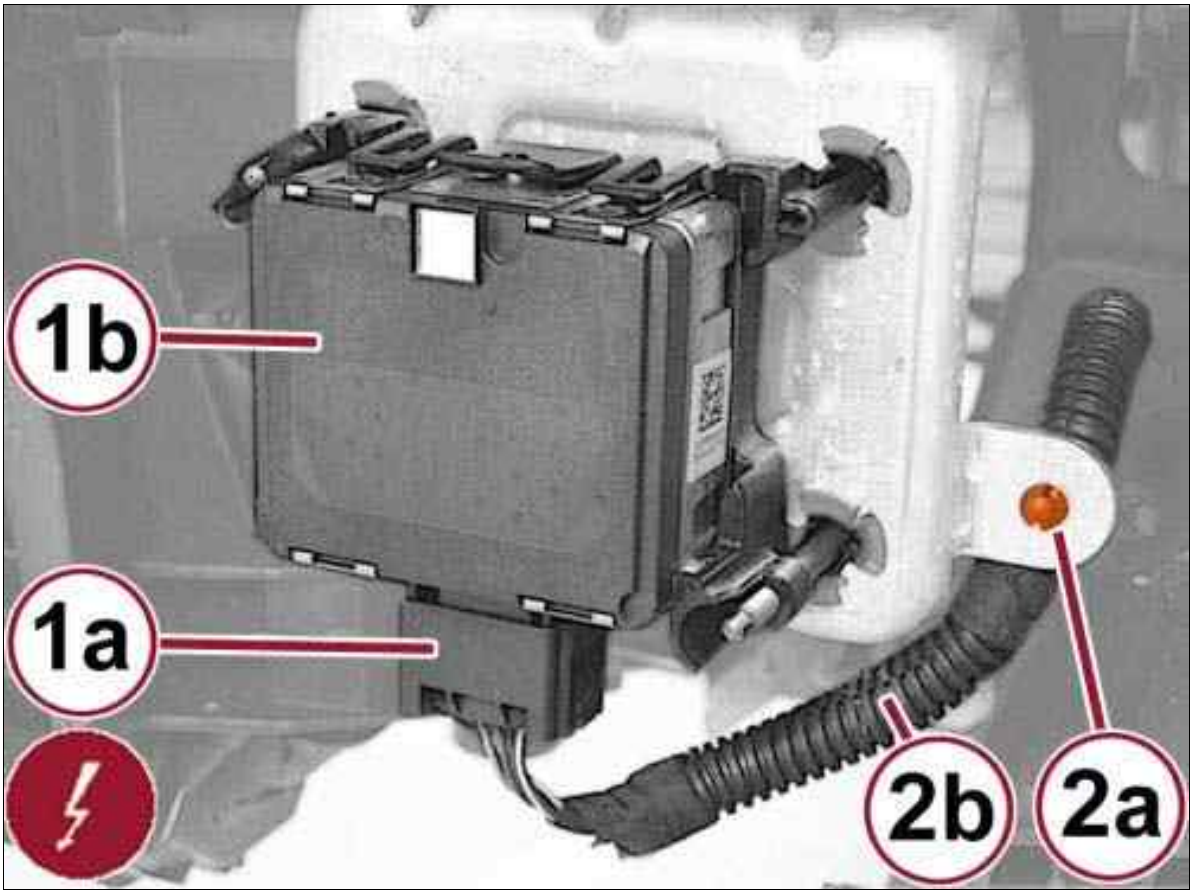
ACC+ / HALF+ system wiring diagram

The hard wired inputs for the ACC module may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the ACC module or the electronic controls or communication between other modules and devices that provide features of the ACC and FCW system features. The most reliable, efficient, and accurate means to diagnose the ACC module or the electronic controls and communication related to ACC or FCW system operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

MODULE, ADAPTIVE CRUISE CONTROL > REMOVAL AND INSTALLATION > ACC SENSOR / MODULE > REMOVAL - SENSOR

1. Disconnect and isolate the negative battery cable.
2. Remove the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .

   Fig 1: Radar Wire Harness Connector & Wire Harness Retainer



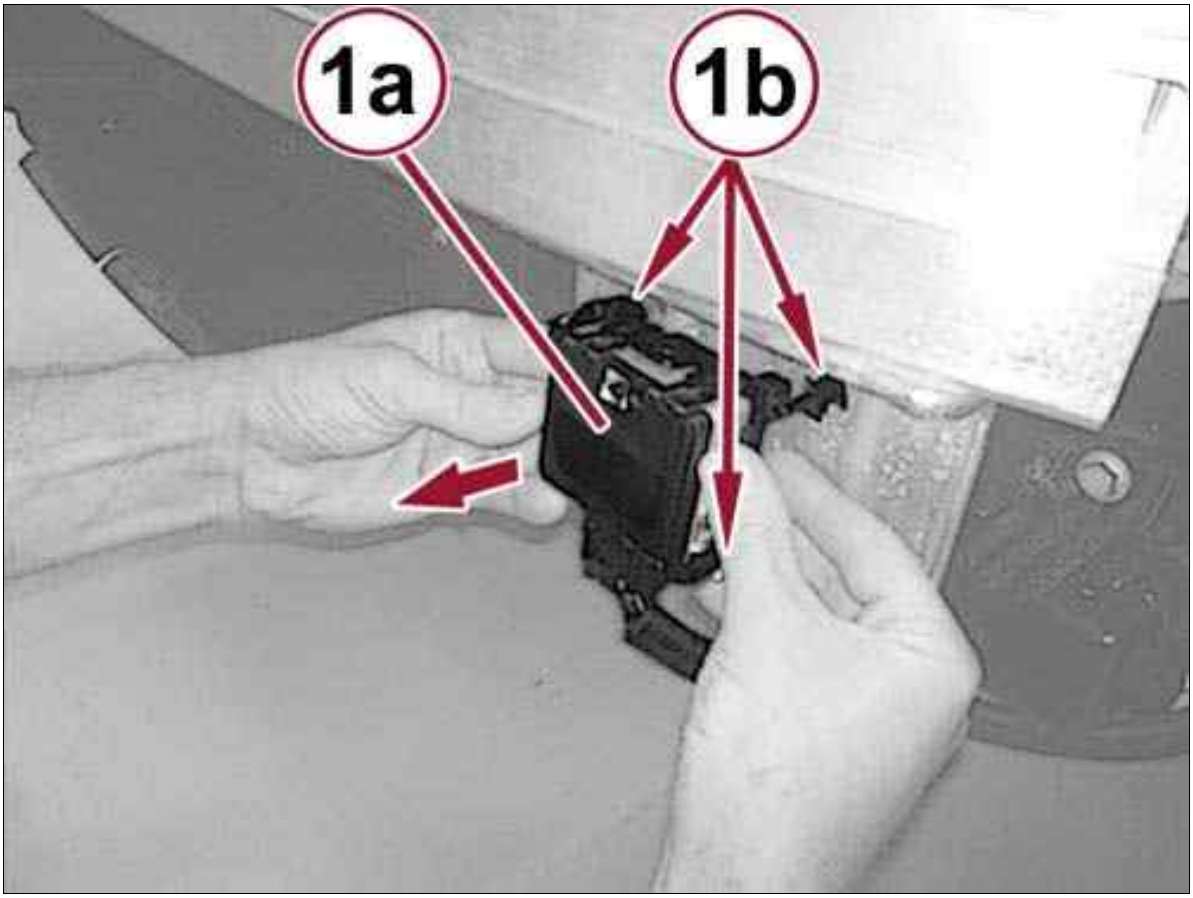
Courtesy of CHRYSLER GROUP, LLC

3. Disconnect the electrical connection (1a) of the radar (1b).

> *NOTE:*
>
> *Avoid pressing the central area of the sensor. Act only on the side edges.*

4. Disengage the retainer (2a) of the wiring (2b).

Fig 2: Radar Sensor & Anchor Pins



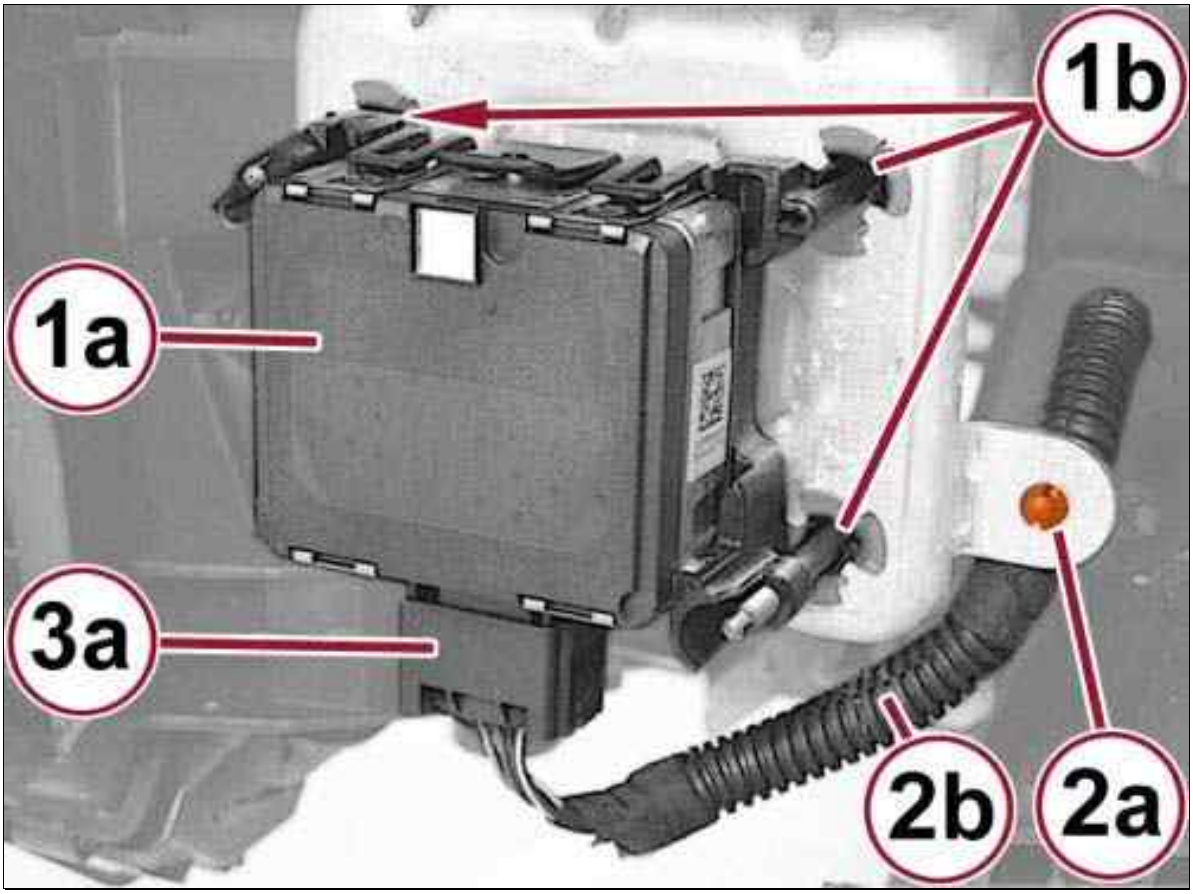
Courtesy of CHRYSLER GROUP, LLC

5. Disconnect the sensor (1a) and then release the three pinned anchors (1b) securing the radar.

MODULE, ADAPTIVE CRUISE CONTROL > REMOVAL AND INSTALLATION > ACC SENSOR / MODULE > INSTALLATION - SENSOR

1. Check that the sensor / radar is not damaged.

Fig 1: Radar Sensor, Wiring, Retainer, Connector & Anchor Pins



Courtesy of CHRYSLER GROUP, LLC

2. Place the sensor (1a) and, acting on the side edges, insert seat the anchor pins (1b) making sure that the fastening is correct.

> *NOTE:*
>
> *During assembly avoid applying pressure on the pins toward the inside of the component, since it may cause a partial detachment of the cover of the component.*

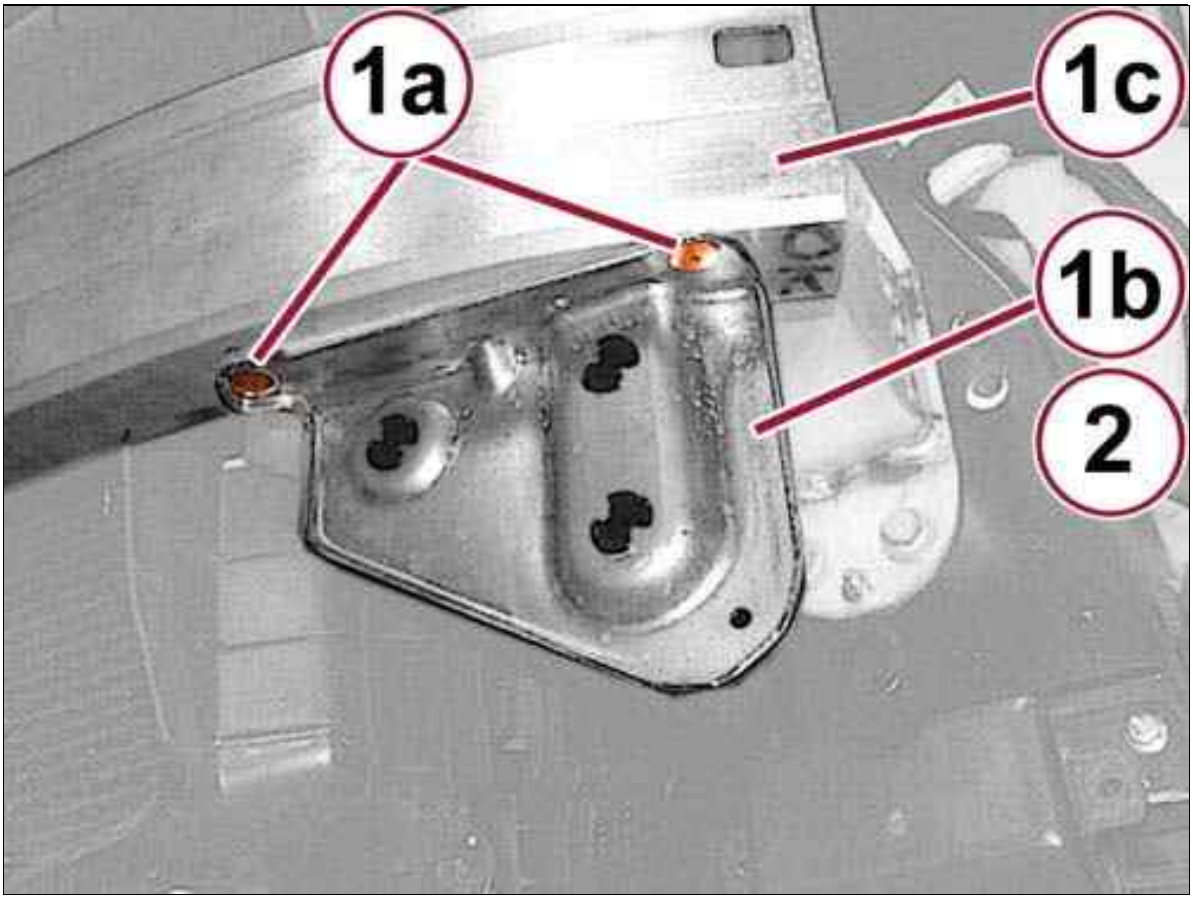
3. Engage the retainer (2a) of the wiring (2b).
4. Connect the electrical connection (3a) of the radar (1a).
5. Install the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .
6. Perform the calibration of the radar. Refer to MODULE, ADAPTIVE CRUISE CONTROL, MODULE PROGRAMMING .

MODULE, ADAPTIVE CRUISE CONTROL > REMOVAL AND INSTALLATION > ACC BRACKET > REMOVAL - BRACKET

1. Disconnect and isolate the negative battery cable.

2. Remove the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .

Fig 1: Bracket & Rivets

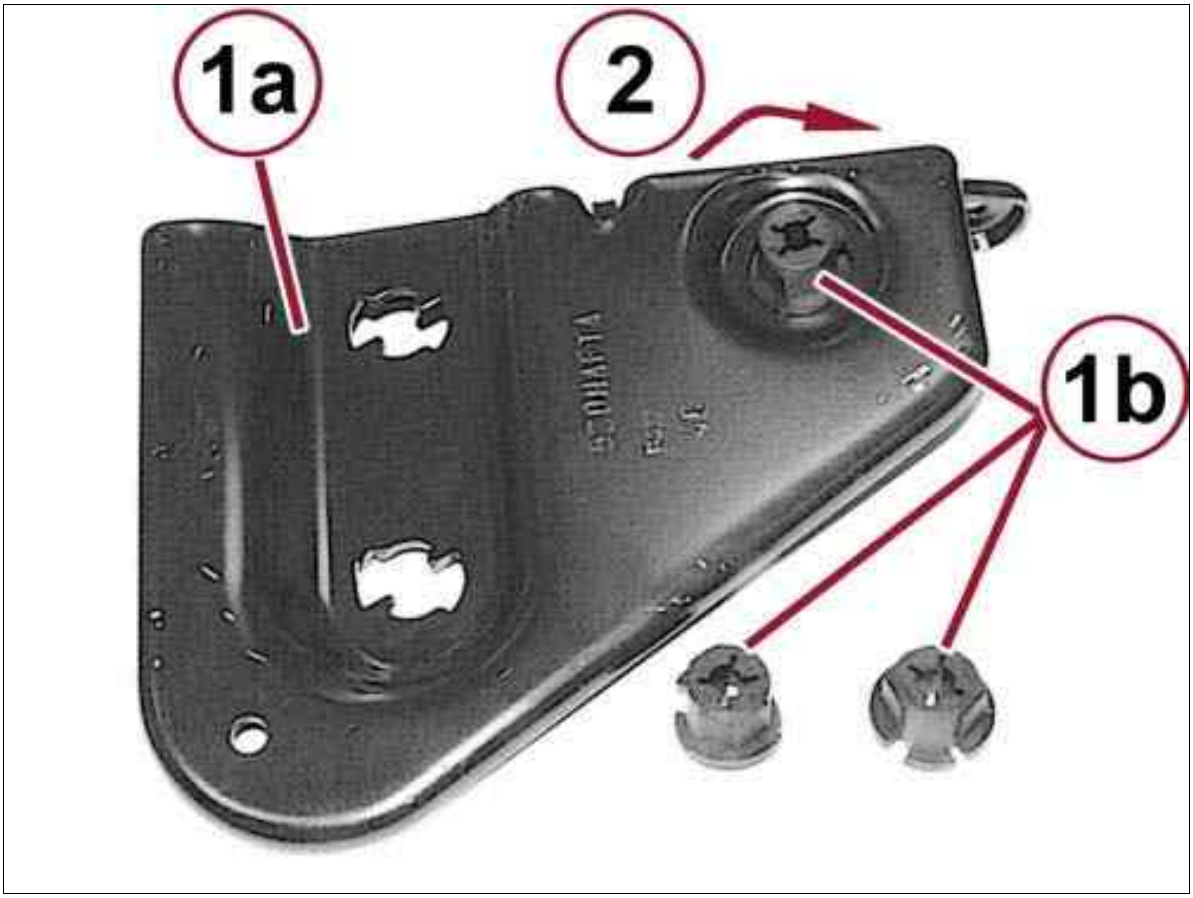


Courtesy of CHRYSLER GROUP, LLC

3. Using a drill, remove the rivets (1a) holding the bracket (1b) to cross (1c).
4. Remove the bracket (1b).

MODULE, ADAPTIVE CRUISE CONTROL > REMOVAL AND INSTALLATION > ACC BRACKET > INSTALLATION - BRACKET

Fig 1: Bracket, Anchor & Bushings



Courtesy of CHRYSLER GROUP, LLC

1. Check that the bracket is not damaged.
2. Place the new bracket (1a) bushings anchor (1b) supplied with the spare.
3. Turn with a key bushings (1b) in their seats about half a turn, until it reaches the stop (approximately 14 daN / m).
4. Position the bracket and fasten with rivets.
5. Install the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .
6. Connect the negative battery cable.

MODULE, ADAPTIVE CRUISE CONTROL > MODULE PROGRAMMING > MODULE ALIGNMENT - EMEA

SPECIAL TOOLS REQUIRED -

- **2021200000** - Reflective Mirror Support
- **2021201000** - Sealing Strip

This procedure must be performed in the following cases:

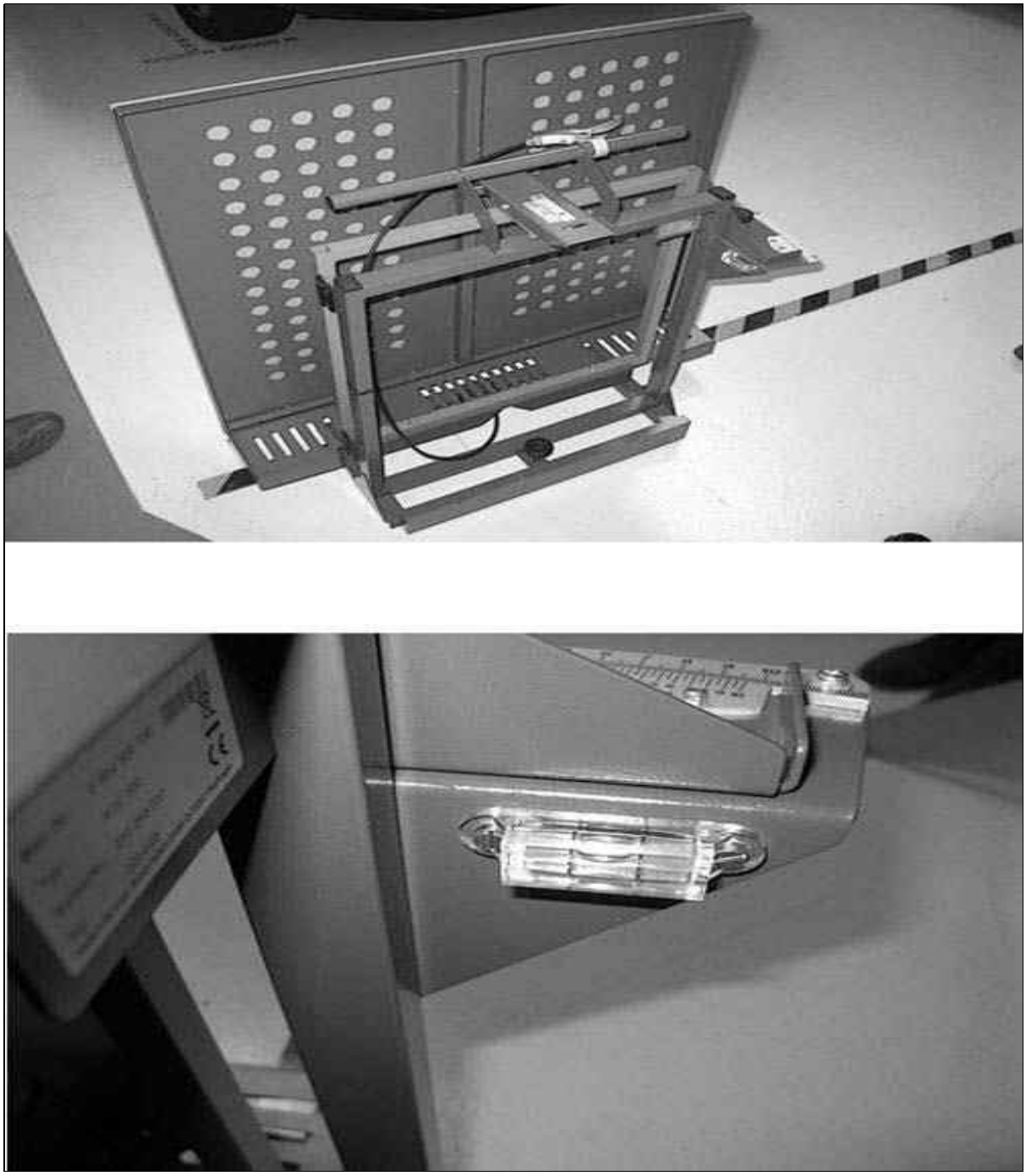
- Removing / installing the radar sensor

- Warning light indicated the failure of the radar sensor proximity
- Rear axle adjustments
- Replacing wheel rims or tires with a larger or smaller diameter component
- Removing / installing the front end.

Fit the strap to the workshop floor:

- It is advisable to place the strip parallel to a perimeter wall of the workshop and at a safe distance to allow the operator to maneuver the equipment.
- The floor can have an angle of maximum inclination of 3° downhill or an uphill maximum inclination of 1°.
- Unevenness maxims:
    - surface adjustment control unit: 1 mm
    - vehicle control surface: 10 mm.

Fig 1: Level Indicator



Courtesy of CHRYSLER GROUP, LLC

1. Fit the tool support mirror on the strip, taking care to respect the vertical position by the level indicated in the illustration.

Fig 2: Center Groove Position

Courtesy of CHRYSLER GROUP, LLC

2. Set the reflecting mirror to the center groove position as shown in illustration.

Determining the axis of travel - For the control and regulation of the sensor / proximity radar the mirror must be adjusted in horizontal and vertical position relative to the axis of travel of the vehicle. Normally, the vehicle is not located in a position exactly perpendicular to the control and also the measuring site may present surface irregularities and / or a slope. This must be done for the left and right side of the vehicle.

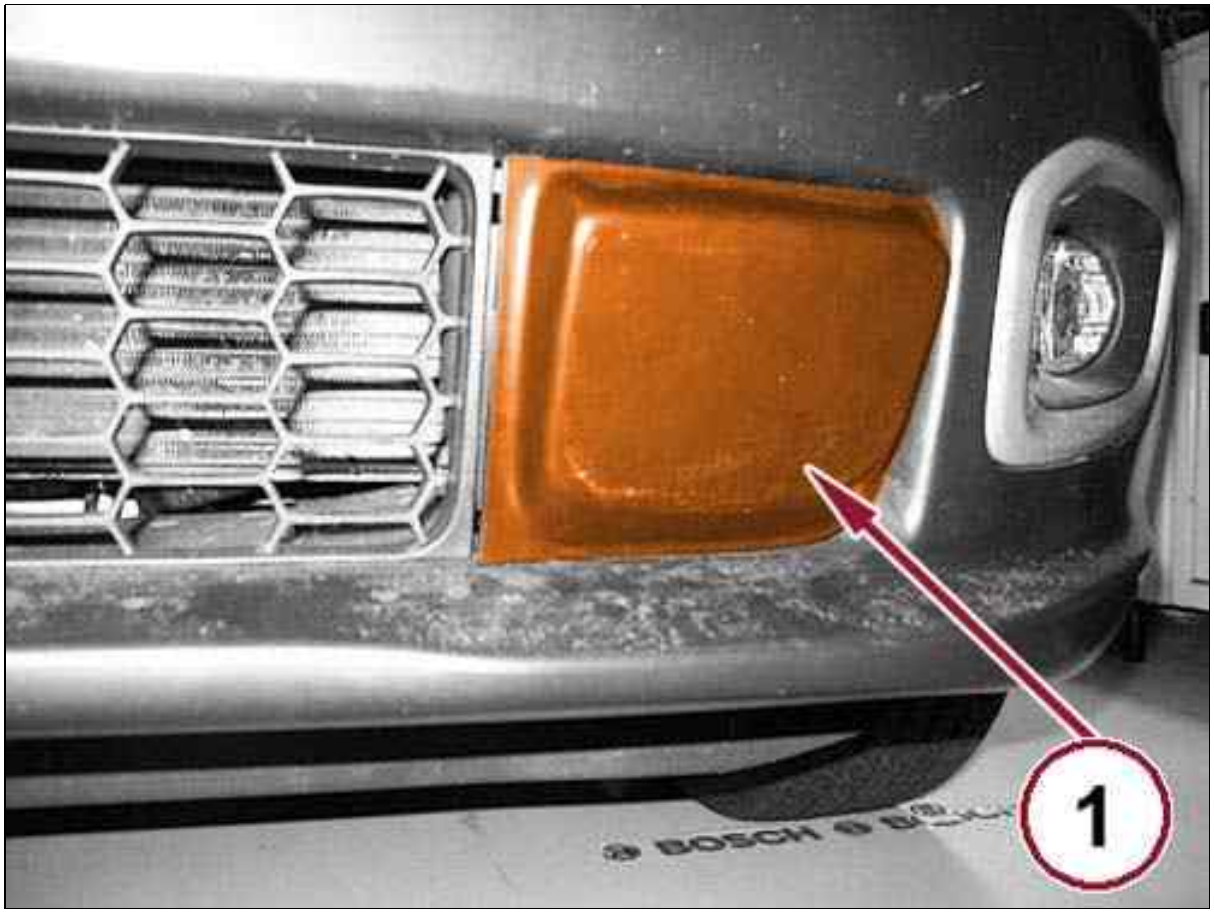
On the basis of the determined values of both sides of the vehicle, the diagnosis system then calculates the adjustments of the mirror for the alignment of the axis of travel.

Preparation Measure -

Before beginning the control and adjustment of the sensor / proximity radar must perform the following steps:

- check the inflation pressure of the tires and, if necessary, correct it
- place the vehicle on the measuring site so that it is possibly orthogonal to the strip on the floor. If the deviation of the axis of travel of the vehicle with respect to the strip is greater than 5°, it is not possible to base alignment
- check that the distance between the sensor / radar proximity and the reflex mirror is 120 cm +/- 5 cm.

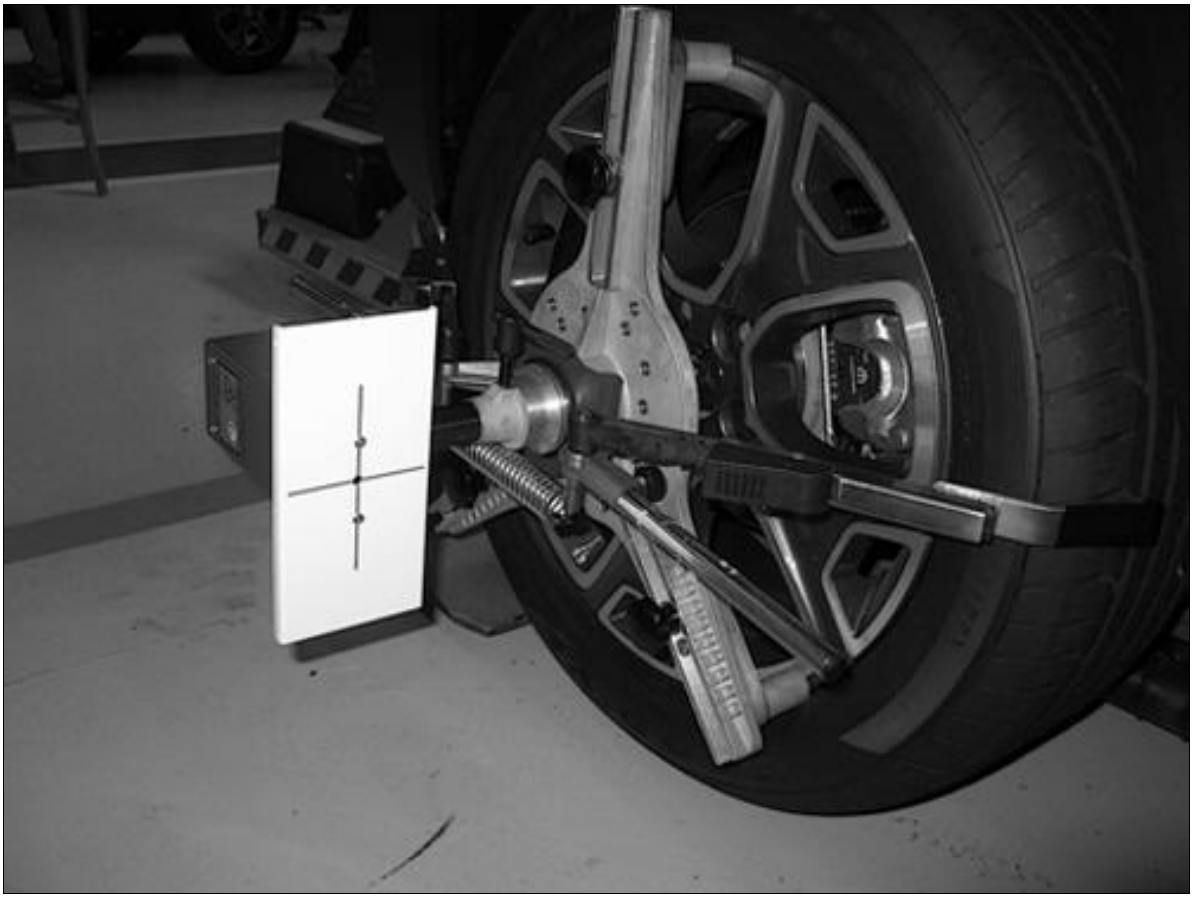
Fig 3: Cover



Courtesy of CHRYSLER GROUP, LLC

1. Disengage and remove the cover (1) for the sensor / proximity radar.

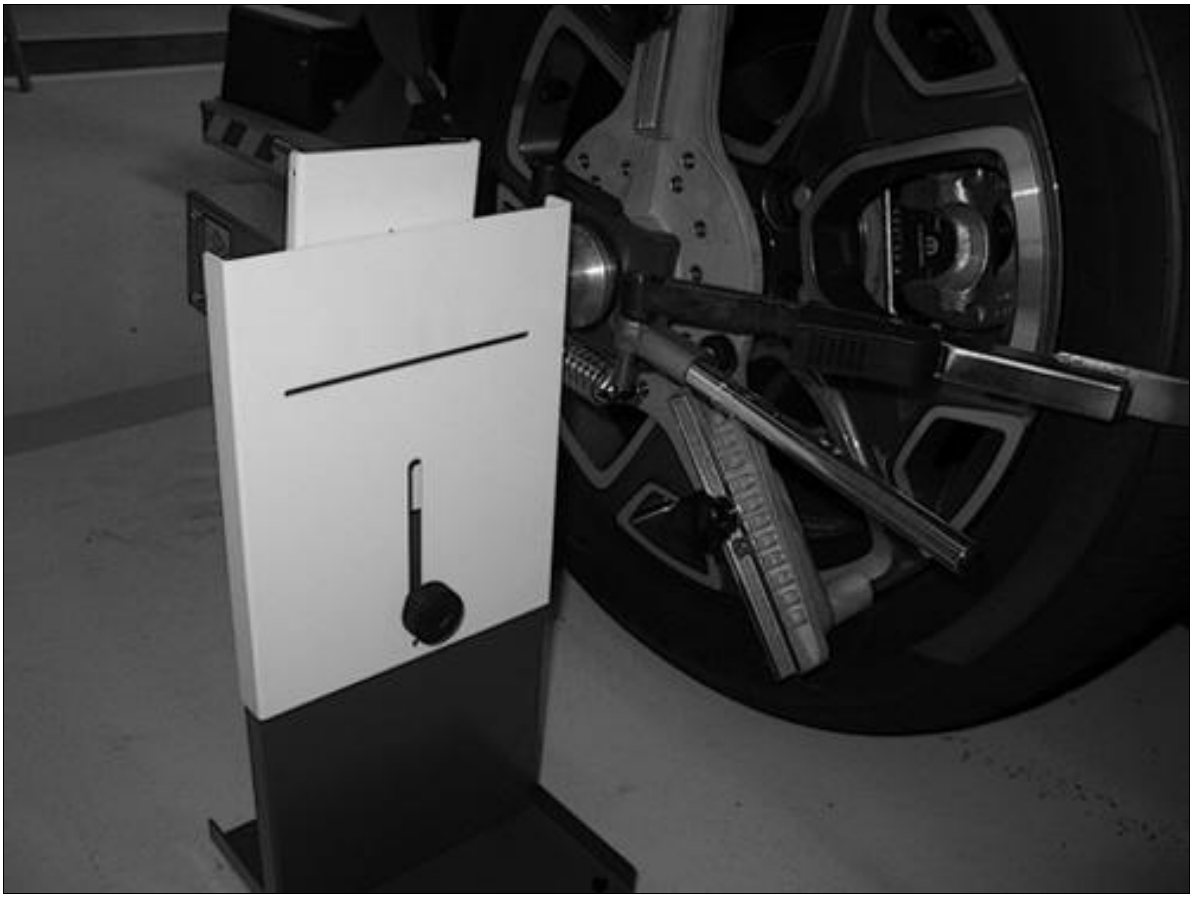
Fig 4: Tool On Right Rear Wheel



Courtesy of CHRYSLER GROUP, LLC

2. Fit the tool on the right rear wheel.

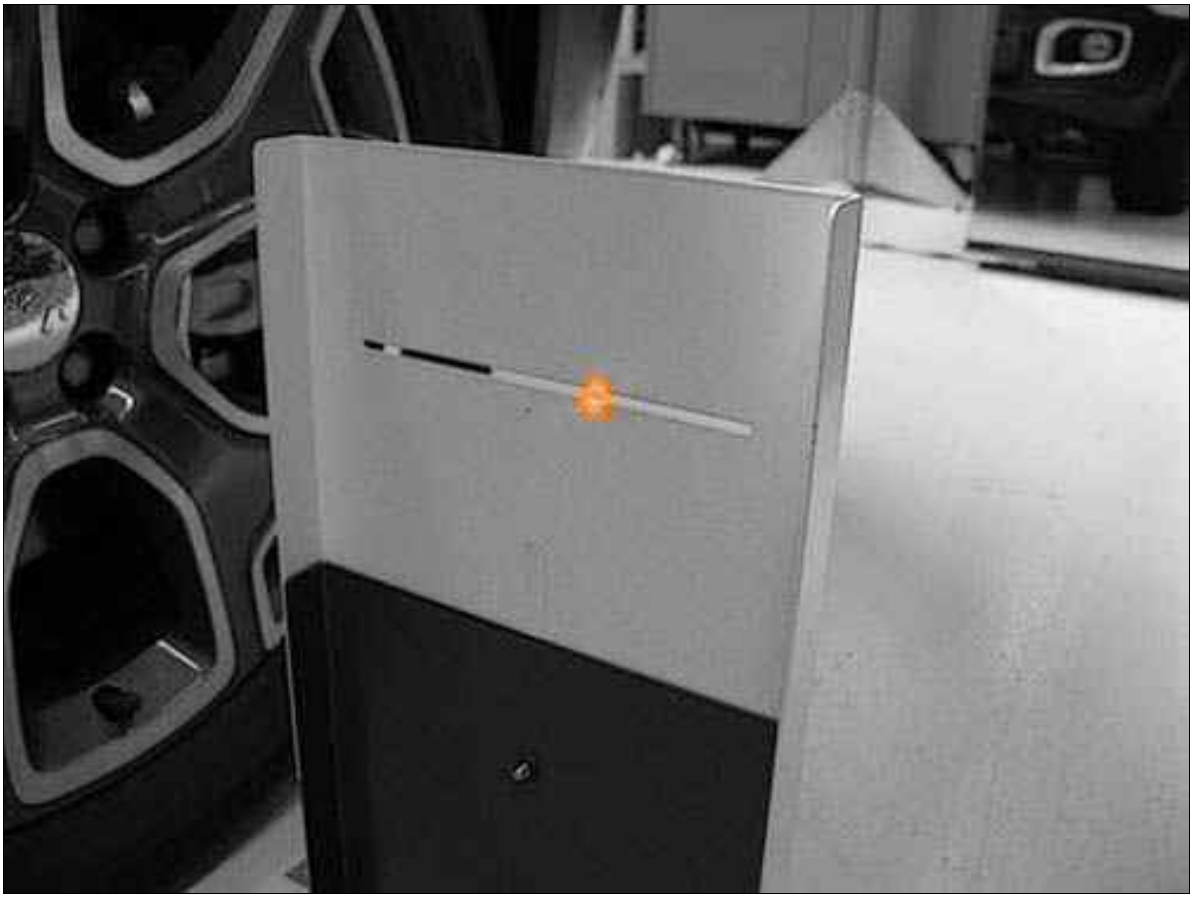
Fig 5: Adjusting Height Of Mask



Courtesy of CHRYSLER GROUP, LLC

3. Place the mask adjustable in the vicinity of the source of the laser beam as shown in illustration.
4. Turn on the laser beam and using the knob to adjust the height of the mask so that the laser beam passes through the slit tighten the knob.

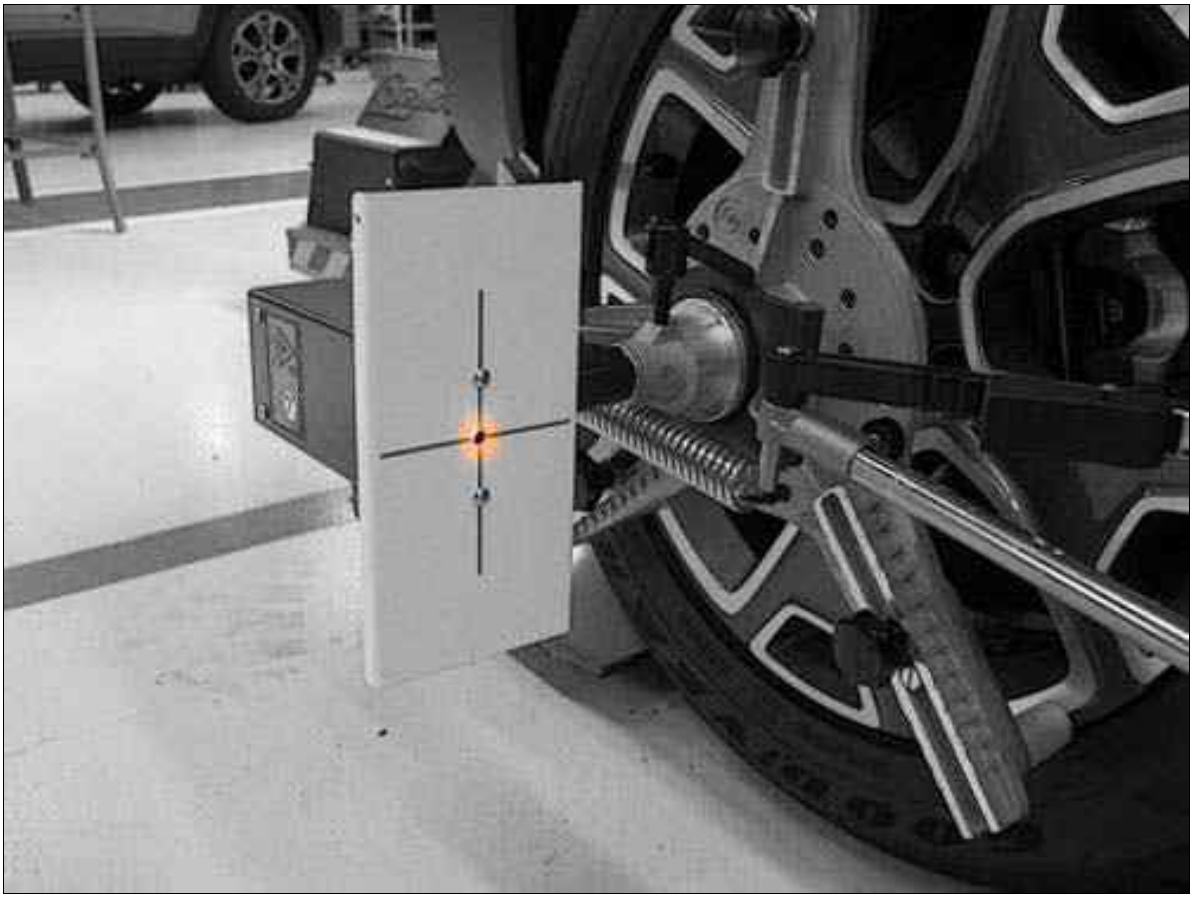
Fig 6: Laser Beam In Slot



Courtesy of CHRYSLER GROUP, LLC

5. Move the mask in the vicinity of the right front wheel as shown in the illustration and direct the laser beam so that it passes through the slot.

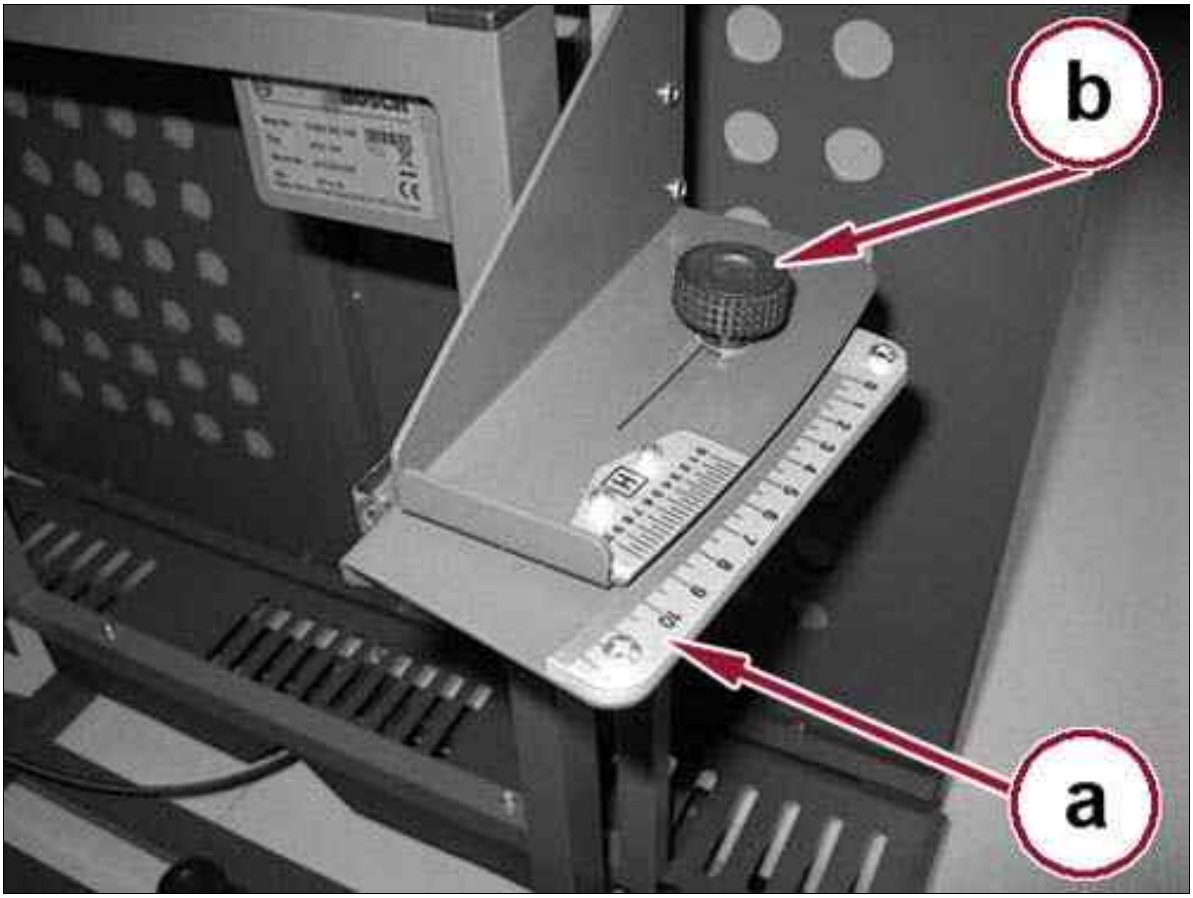
Fig 7: Laser Beam In Bull's-Eye



Courtesy of CHRYSLER GROUP, LLC

6. Remove the mask, so that the laser beam on the mirror aligns with the strip.
7. The laser beam reflection of the mirror has to hit the bull's-eye mounted on the source of the laser beam.

Fig 8: Horizontal Adjustment Knob & Graduated Plate



Courtesy of CHRYSLER GROUP, LLC

8. To achieve this goal you have to adjust the horizontal / vertical position of the reflecting mirror in the following manner.
    1. **Horizontal adjustment:** by moving the graduated plate (a) and locking knob (b).

Fig 9: Vertical Adjustment Thumbscrew

Courtesy of CHRYSLER GROUP, LLC

2. **Vertical adjustment:** through the thumbscrew

Fig 10: Graduated Scales (1 Of 2)

Courtesy of CHRYSLER GROUP, LLC

9. After adjustment of the mirror so that the laser beam is reflected on the target correctly, proceed to the relief portion of the horizontal and vertical through the graduated scales shown below.
    1. Relief horizontal dimension

Fig 11: Graduated Scales (2 Of 2)

Courtesy of CHRYSLER GROUP, LLC

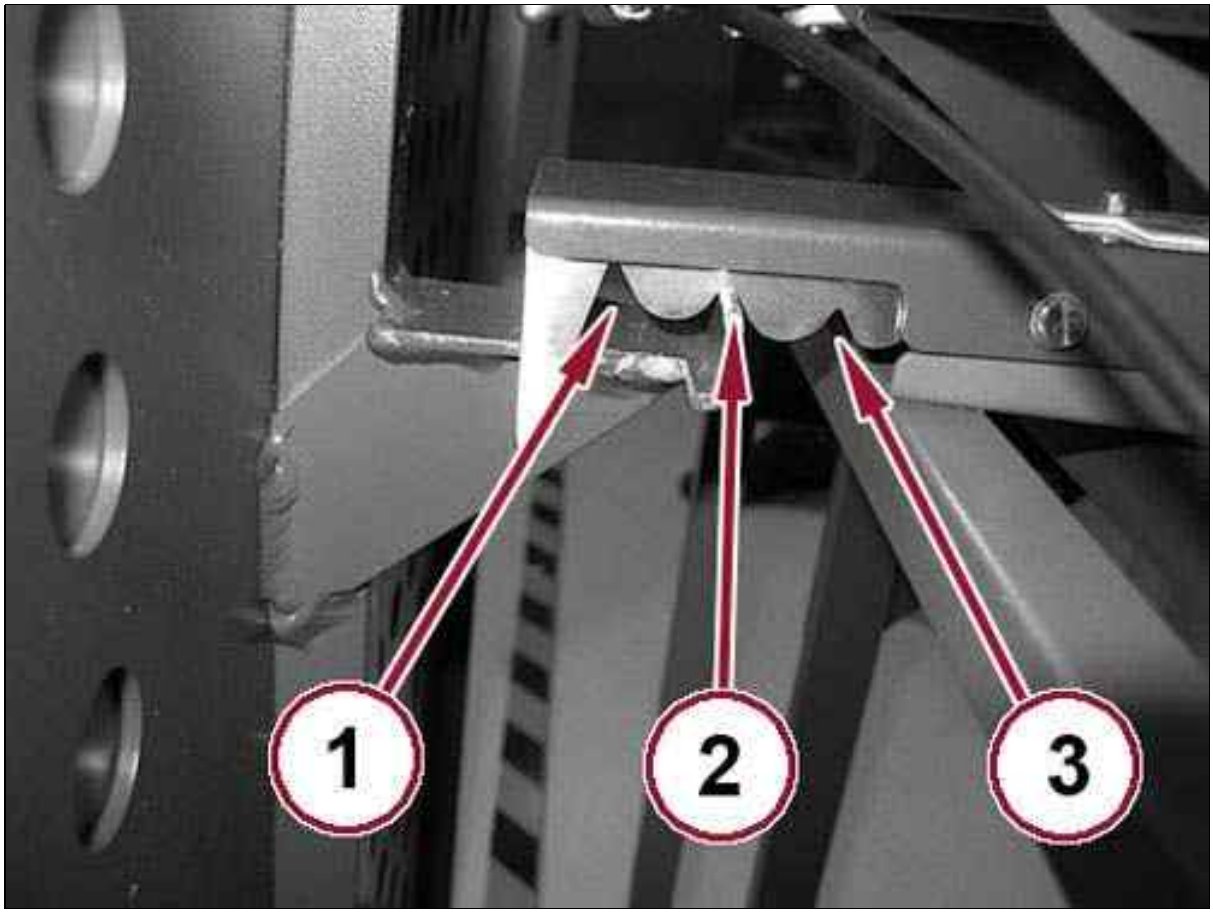
2. Significant vertical dimension

10. Proceed similarly to the right side to make the relief of the horizontal and vertical portion of the left side.

MIRROR ADJUSTMENT - Perform the arithmetic average of the horizontal and vertical dimensions on the detected right and left side during alignment of the tool adjustment.

The mean value obtained from H horizontal dimensions and the value obtained by V vertical dimensions, should be used to set the final position of the reflecting mirror.

Fig 12: Angle Adjustments Of Reflecting Mirror



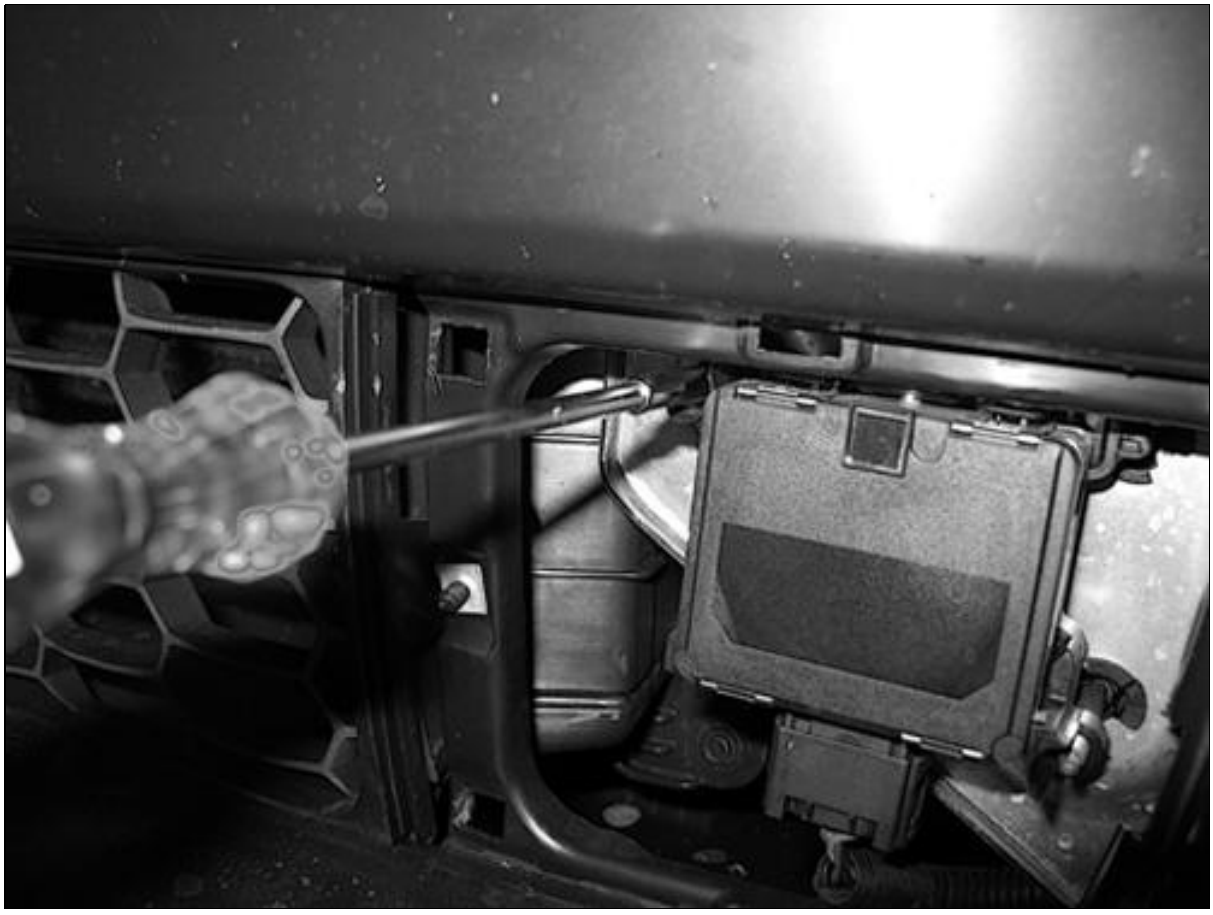
Courtesy of CHRYSLER GROUP, LLC

ADJUSTING THE SENSOR / RADAR PROXIMITY - Connect the diagnostic tool to the control unit integrated in the sensor / proximity radar and launch the procedure "active misalignment calibration radar".

The calibration procedure involves performing three measurements each time changing the angle of the reflecting mirror. Acting on the tilting device of the reflecting mirror you get the required positions.

- POSITION 1: mirror forward
- POSITION 2: mirror in the middle (see illustration)
- POSITION 3: mirror back

Fig 13: Vertical Adjustment



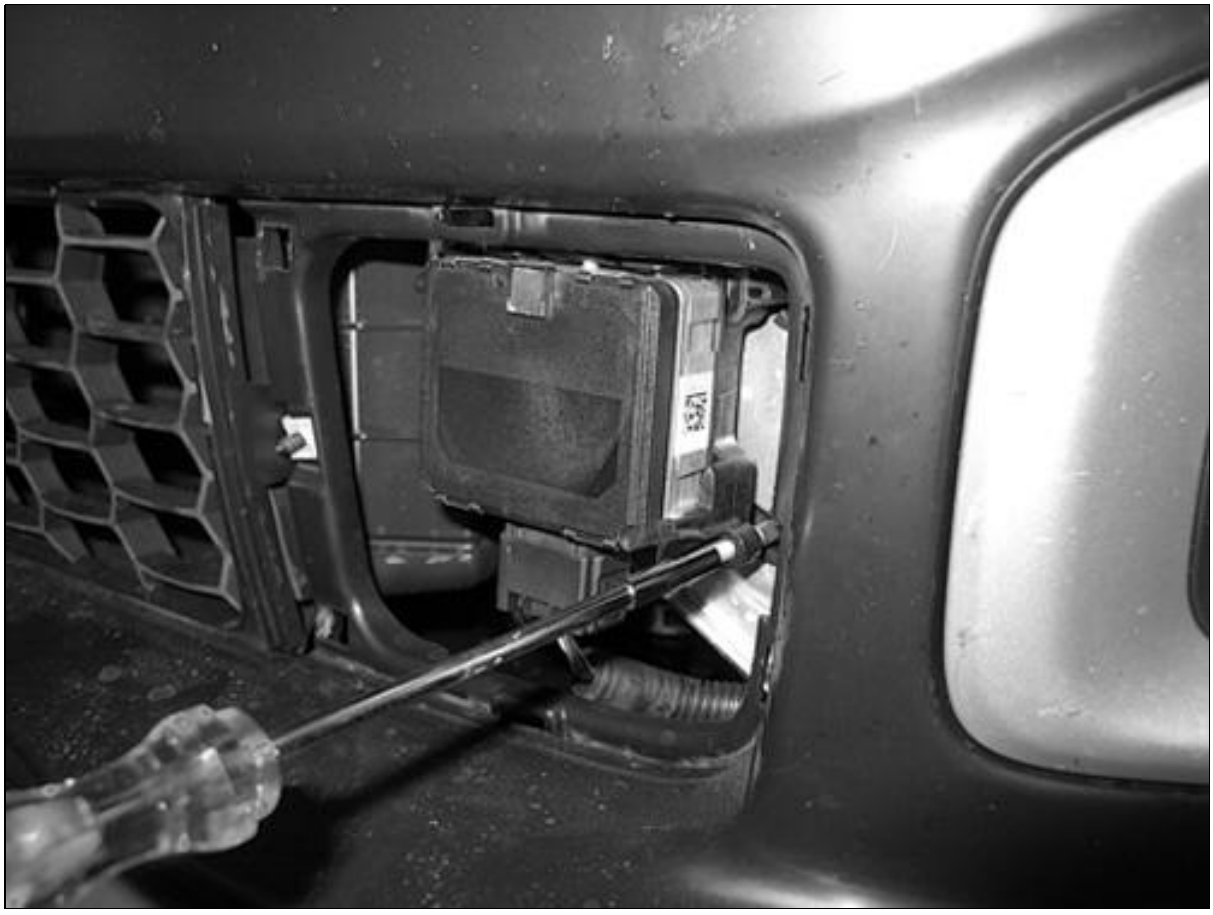
Courtesy of CHRYSLER GROUP, LLC

NOTE:

For vertical and horizontal radar, follow the directions given from the equipment of diagnosis.

SCREW POSITION 1: with a tool acting on the screw shown in the illustration for vertical adjustment.

Fig 14: Horizontal Adjustment



Courtesy of CHRYSLER GROUP, LLC

SCREW POSITION 2: with tool turn screw shown in the illustration for horizontal adjustment.

MODULE, ADAPTIVE CRUISE CONTROL > MODULE PROGRAMMING > MODULE ALIGNMENT - NAFTA

YouTube	A multimedia supplement to the instructions contained in this article is available. To view the multimedia example of the condition described go to; **http://www.youtube.com, search for "Mitchell1Videos" then type, "A00735717.vid1" into the "Search Channel" box.**

NOTE:

Special tool 2014000080 is available through a rental program. For additional details visit the Mopar® Essential Tool website.

This procedure must be performed in the following cases:

- Removing / installing the radar sensor
- Warning light indicated the failure of the radar sensor proximity
- Rear axle adjustments
- Replacing wheel rims or tires with a larger or smaller diameter component
- Removing / installing the front end.

Preparation Measure - The following steps must be performed before beginning the control and adjustment of the sensor / proximity radar:

- Check the inflation pressure of the tires and, if necessary, correct it.
- Make sure the steering wheel is centered.
- Check that there is at least 3 meters (10 feet) in front of the vehicle for space to setup the sensor.
- The floor can have an angle of maximum inclination of 3° downhill or an uphill maximum inclination of 1°.

Fig 1: Unboxing Special Tool

Courtesy of CHRYSLER GROUP, LLC

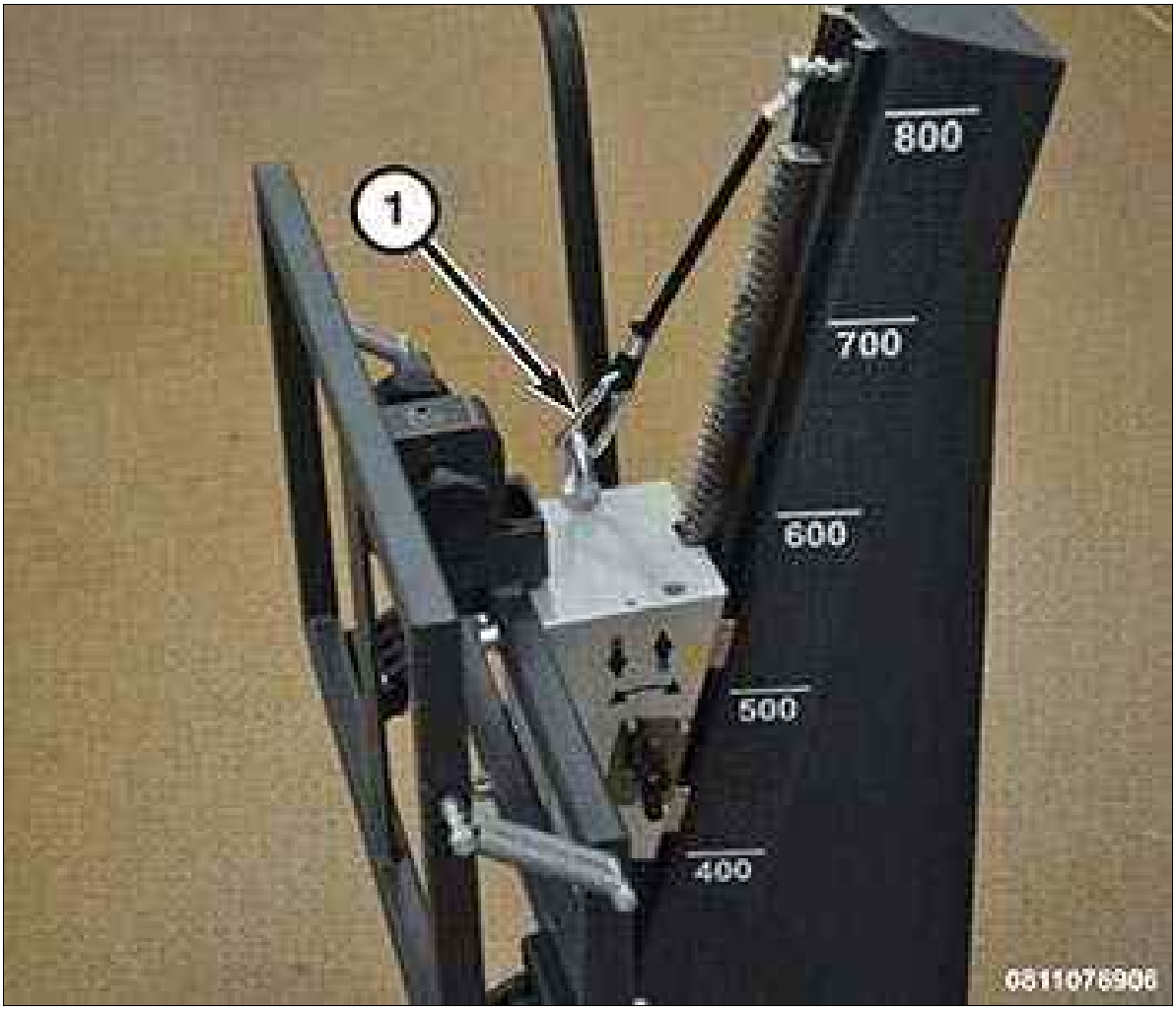
1. Follow the instructions included in the special tool 2014000080 container for proper unboxing.

Fig 2: Plumb Bob, Tape Measure, Snap Line, Chalk Bottle & Laser

Courtesy of CHRYSLER GROUP, LLC

2. Verify the proper tools and components are in the shipping container. The following items are included: plumb bob, tape measure, snap line, chalk bottle, and the laser for the mirror.

Fig 3: Assembling Special Tool



Courtesy of CHRYSLER GROUP, LLC

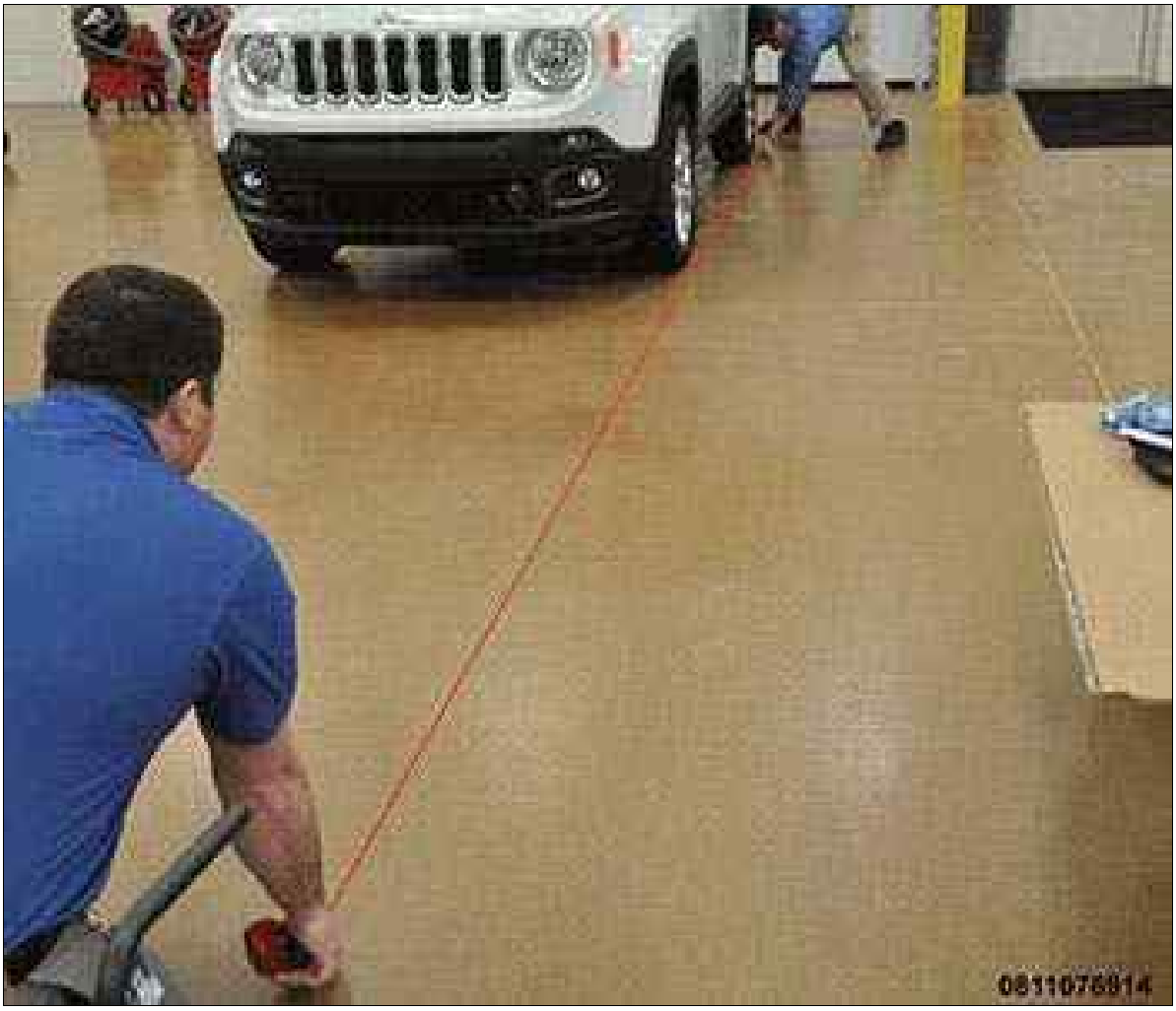
3. Assemble the alignment tool following the instructions included in the shipping container.
4. Once the tool is properly assembled, set it aside while performing the measurement procedure.

Fig 4: Marking Floor

Courtesy of CHRYSLER GROUP, LLC

5. Find the center of each wheel and with the plumb bob mark the floor for each wheel. The plumb bob must be the same distance out from each wheel/tire.

Fig 5: Making Chalk Line



Courtesy of CHRYSLER GROUP, LLC

6. Use the chalk line to snap a line on both the left and right side of the vehicle along the marks made with the plumb bob in the previous step. Extend the line that is snapped at least 3 meters (10 feet) in front of the center of the front wheels. This will allow room to properly position the alignment tool.

Fig 6: Measuring Distance From Front Wheel

Courtesy of CHRYSLER GROUP, LLC

7. Once both side lines are extended, measure out about 3 meters (10 feet) from each front wheel mark along the chalk line and mark the spot on the line.

Fig 7: Making Chalk Line Between Marks

Courtesy of CHRYSLER GROUP, LLC

8. Once both marks have been made, snap a chalk line between the two marks to create the front line where the alignment tool will be placed.

Fig 8: Removing Trim Cover

Courtesy of CHRYSLER GROUP, LLC

9. Remove the trim cover for the alignment sensor.

Fig 9: Marking Floor

Courtesy of CHRYSLER GROUP, LLC

10. Find the horizontal center of the sensor and use the plumb bob to mark the location on the floor.

Fig 10: Measuring Distance From Mark

Courtesy of CHRYSLER GROUP, LLC

11. Measure a side chalk line to the sensor horizontal center mark. This will be the same length that the center of the sensor tool will be placed on the front chalk line.

Fig 11: Positioning Tool

Courtesy of CHRYSLER GROUP, LLC

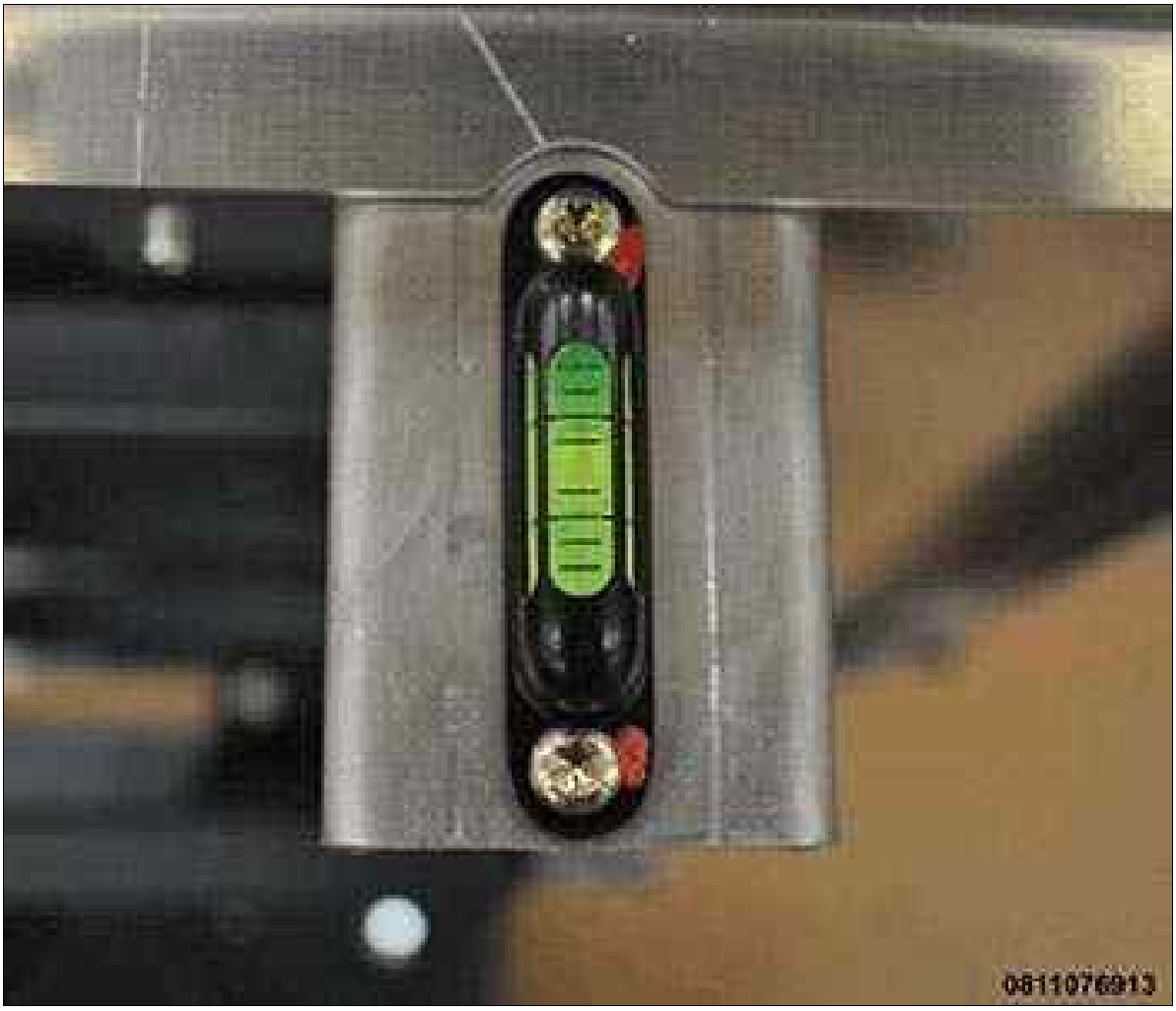
12. Position the sensor tool with the center lined up with the mark on the front line. Install the laser and align the beam with the chalk line.

Fig 12: Leveling Tool

Courtesy of CHRYSLER GROUP, LLC

13. There are adjusters at the front and rear of the base of the sensor to level the tool.

Fig 13: Level



Courtesy of CHRYSLER GROUP, LLC

14. With the tilt cam in the 0 degree position, adjust the tool until the bubble is in the center of the level.
15. Measure from the horizontal mark on the floor to the vertical center of the sensor.

Fig 14: Setting Height Of Mirror

Courtesy of CHRYSLER GROUP, LLC

16. Set the height of the center of the mirror at the same height as the vertical center of the sensor.

Fig 15: Mirror In Position

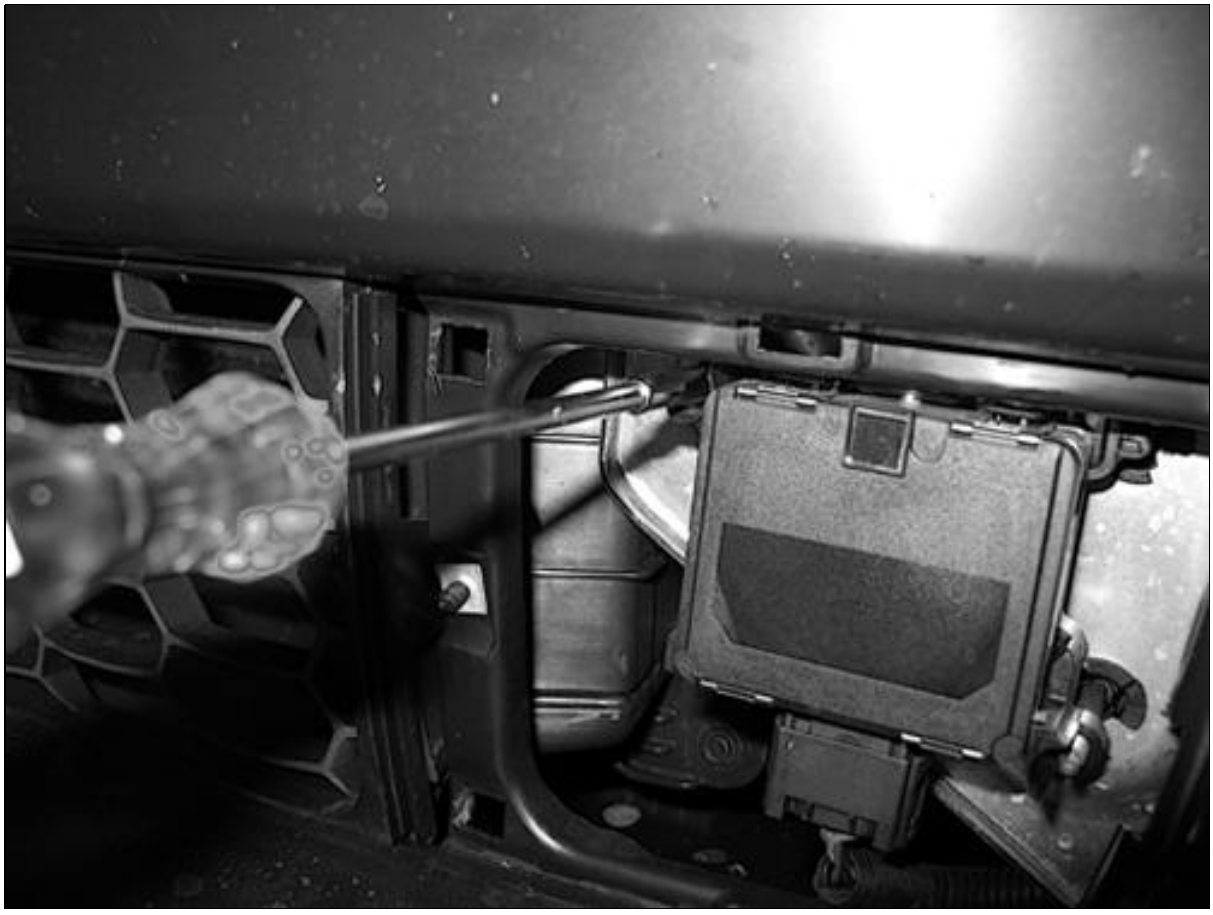
Courtesy of CHRYSLER GROUP, LLC

17. Verify that the laser is still lined up with the front cha k line. Then make sure the bubble is still in the middle of the level with the tilt cam in the 0 degree position.
18. Turn off the laser and remove it from the mirror.
19. Use the scan tool to perform the alignment procedure.

THE SENSOR / RADAR PROXIMITY - The calibration procedure involves performing three measurements, each time changing the angle of the reflecting mirror. To adjust the angle, tilt the mirror forward and then turn the tilt cam to the desired position.

- POSITION 1: mirror forward (2 degrees forward)
- POSITION 2: mirror in the middle (0 degrees)
- POSITION 3: mirror back (2 degrees rearward)

Fig 16: Vertical Adjustment



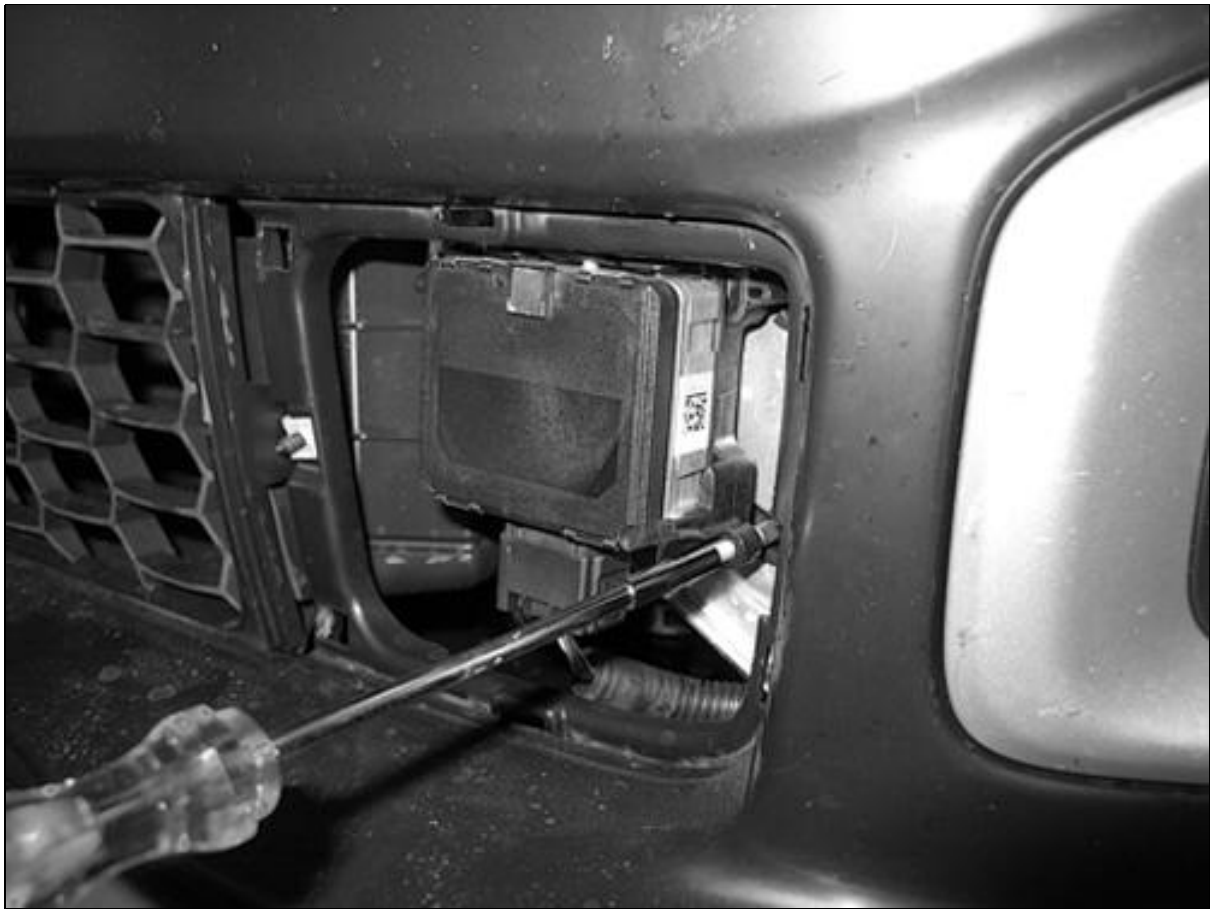
Courtesy of CHRYSLER GROUP, LLC

NOTE:

For vertical and horizontal radar, follow the directions given from the equipment of diagnosis.

SCREW POSITION 1: with a tool acting on the screw shown in the illustration for vertical adjustment.

Fig 17: Horizontal Adjustment



Courtesy of CHRYSLER GROUP, LLC

SCREW POSITION 2: with tool turn screw shown in the illustration for horizontal adjustment.

MODULE, ANTI-LOCK BRAKE SYSTEM > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION

For the removal and installation of the ABS Module, refer to INTEGRATED CONTROL UNIT (ICU), REMOVAL AND INSTALLATION .

MODULE, BODY CONTROL > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

Fig 1: Body Control Module

Courtesy of CHRYSLER GROUP, LLC

The BCM, produced by Delphi, is an electronic control unit that manages and controls the following systems:

- Exterior lighting
- Internal lighting
- Electric windows.
- Door locking and unlocking
- Tailgate locking/unlocking

- Wipers and screen washer system
- Fuel level gauge
- Outside temperature
- Immobilizer function
- Brake fluid level
- brake switch
- Vehicle configuration
- Diesel heater on Filter Relay Control.
- Hazard warning lights control
- Gateway functions between the high-speed (CAN-C1) and medium-speed (CAN-BH) CANs and LIN.

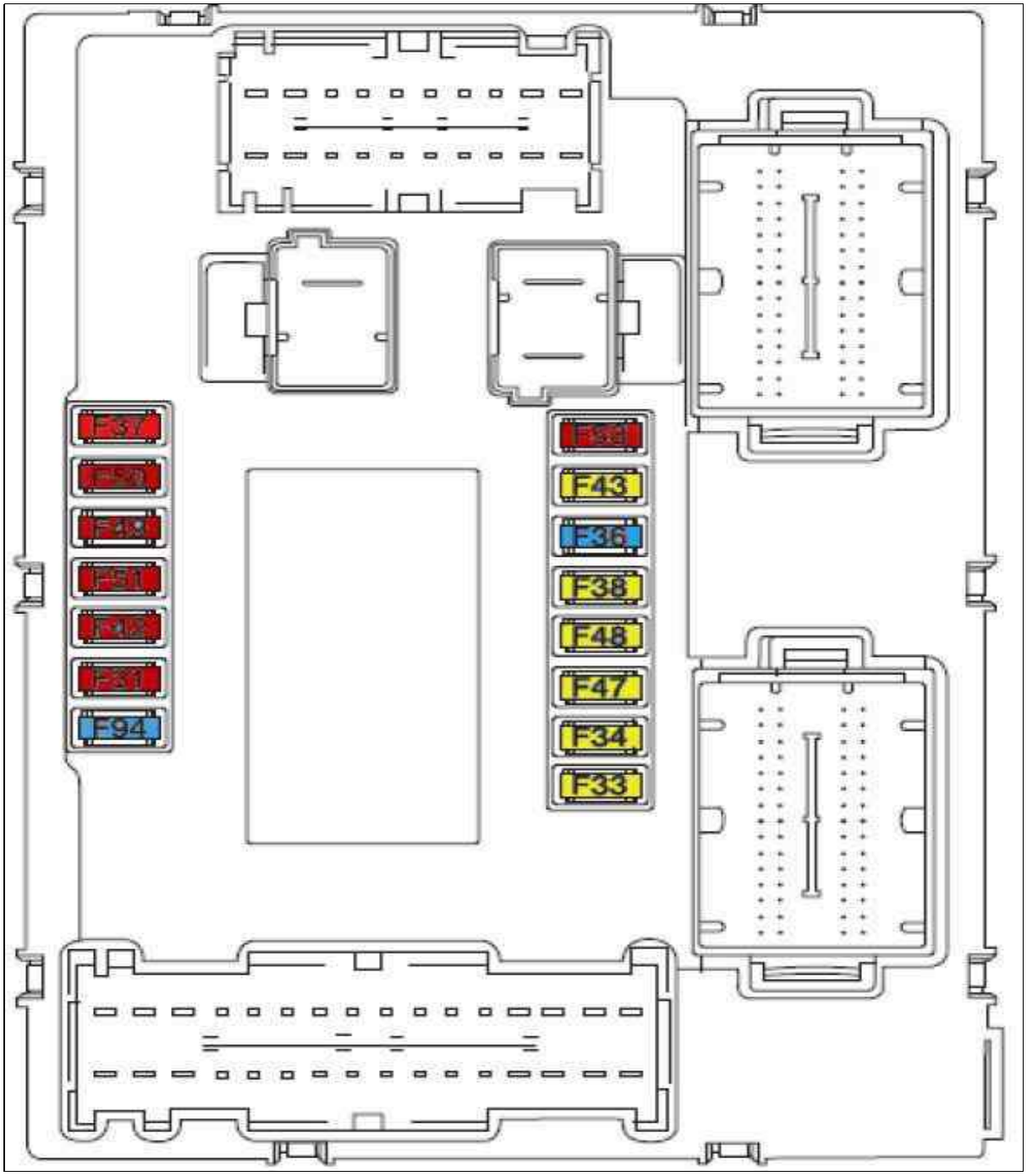
The BCM also constitutes an interconnection unit that ensures a protected supply for many electrical loads via fuses

The BCM comprises two main boards:

- the power board, which contains the fuses, internal relays and power connections;
- the logic board which contains the microprocessor.

The Body Computer is positioned under the dashboard lining to the left of the steering wheel behind a plastic cover which is removable for access to the fuses.

Fig 2: Body Control Module Fuse Identification



Courtesy of CHRYSLER GROUP, LLC

FUSE	COMPONENT
F31	Flashing/Electric front seat movement/Climate control fan
F33	Front electric window (driver side)
F34	Electric front window (passenger side)/Rear electric window control (driver side panel)/Wiper (1st and 2nd speed)
F36	Alarm siren/Volumetric alarm sensor/Climate control/heating system/EMC Folding/RFHM/RRM/CSW/USB port/Voltage stabilizer/EOBD system/ESL

F37	Supply for Forward Collision Warning Plus system/All-wheel drive (AWD)/IPC
F38	Safe Lock device (Driver side door unlocking for versions/markets, where provided)/Door unlocking/Central locking/Electric tailgate unlocking
F43	Windscreen/rear window washer pump
F47	Rear left electric window
F48	Rear right electric window
F49	Supply for PAM/Front roof spot lights/Interior rear view mirror/Electric sun roof motor/Heated front seats/Stop/Start System/ESL/ Battery stabilizer/ESC system
F50	Airbags
F51	Supply for LDW/CDU alarm/Rear roof light/Climate control compressor/Brake pedal switch (NC)/Automatic transmission panel/Compass/Rear camera/Headlight alignment corrector/Climate control.
F53	IPC/Ignition device/Keyless Enter-N-Go system/ Brake switch (NO)
F54	Power socket

MODULE, BODY CONTROL > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

The BCM manages the Logistic mode function. Some electrical loads are deactivated when the function is active.

The Logistic mode can be deactivated using the diagnosis equipment (the command is in the "miscellaneous functions" menu of the BCM). Alternatively, the function can be deactivated through a manual procedure. This procedure is as follows:

- Key to ON

  Fig 1: Headlights Switch Off Position

Courtesy of CHRYSLER GROUP, LLC

- The headlights must not be on: Headlights off.

  Fig 2: Right Direction Indicator Position

Courtesy of CHRYSLER GROUP, LLC

- Activate the right direction indicator.

  Fig 3: Spot Light Position

Courtesy of CHRYSLER GROUP, LLC

- Keep the lever in spot light position for approximately 10 seconds.

The configuration of the vehicle on those with Next-Generation architecture is called PROXY. PROXY consists of a computer file with a maximum of 255 bytes. All modules requiring configuration will store a specific version of the PROXY file. All other modules store only the part of the file pertaining to that module.

The BCM uses the PROXY file to perform a vehicle configuration check when the ignition key is turned to the ON position. The BCM sends a PROXY configuration code to PROXY configured modules on all the networks. PROXY configured modules will reply with their own configuration code. The BCM then compares the codes. If a code mismatch is detected, the BCM will set a diagnostic trouble code (DTC). If the DTC is present for three ignition cycles, the BCM sends a message to the IPC to flash the odometer.

The following diagnosis functions are in the "Miscellaneous Functions" menu of the BCM:

1. Restore Proxy configuration
2. Proxy alignment

Restoring the Proxy configuration allows you to rewrite, via wiTECH connected to the web, the proxy in the BCM.

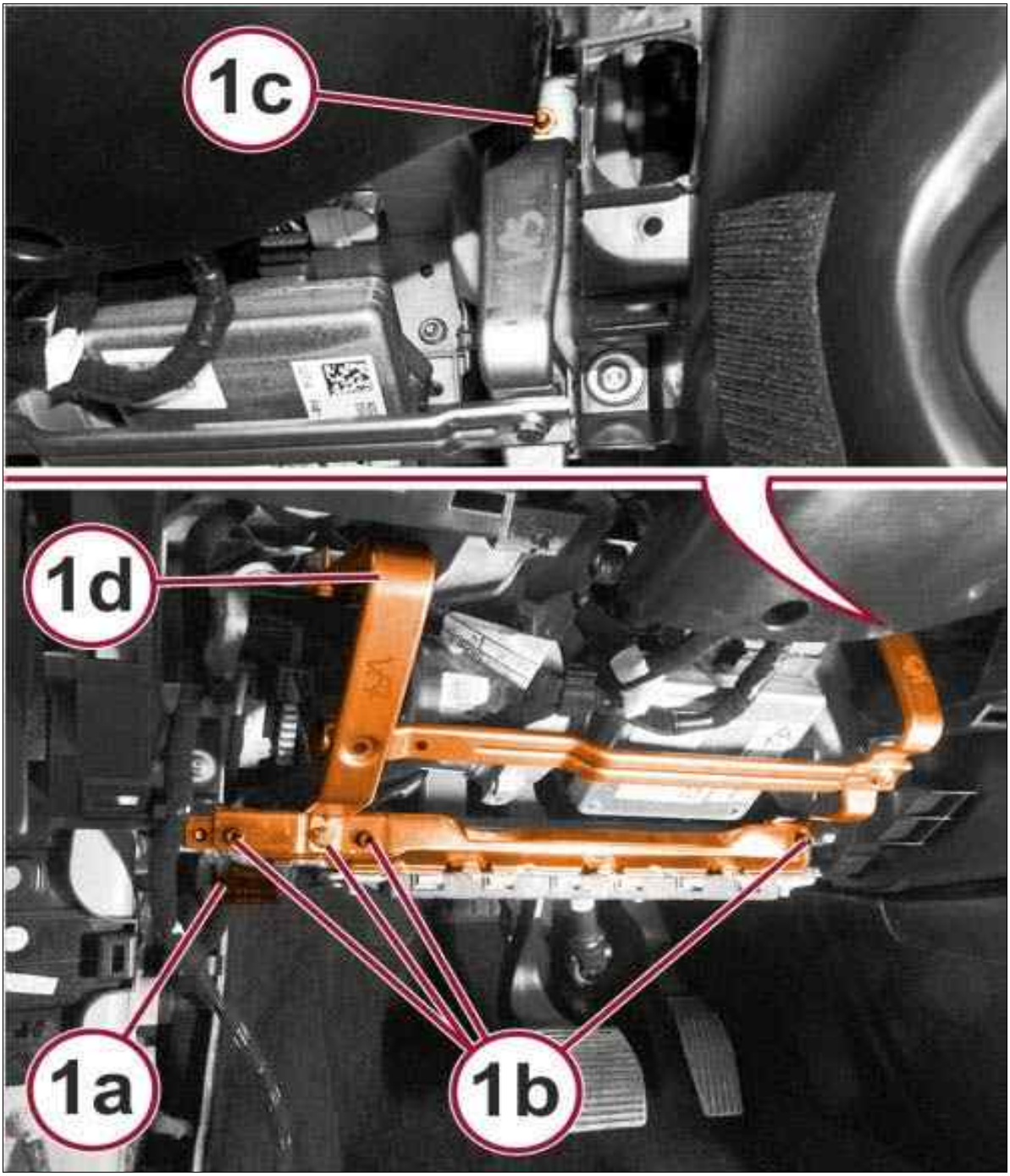
Proxy alignment allows the BCM to send the appropriate part of the Proxy to each individual module. For example if the ORC (airbag) module is replaced during servicing, it needs to receive the airbag Proxy information from the BCM in order to configure itself. The BCM extracts the part relating to the airbag module from the Proxy and sends it to the latter in a file.

The Proxy alignment must always be carried out after running "restore vehicle configuration".

MODULE, BODY CONTROL > REMOVAL AND INSTALLATION > LEFT HAND DRIVE > REMOVAL

1. Disconnect and isolate the negative battery cable.
2. Remove the steering column opening cover. Refer to COVER, STEERING COLUMN OPENING, REMOVAL AND INSTALLATION .

Fig 1: Body Control Module Brackets, Connector, Nut & Screws



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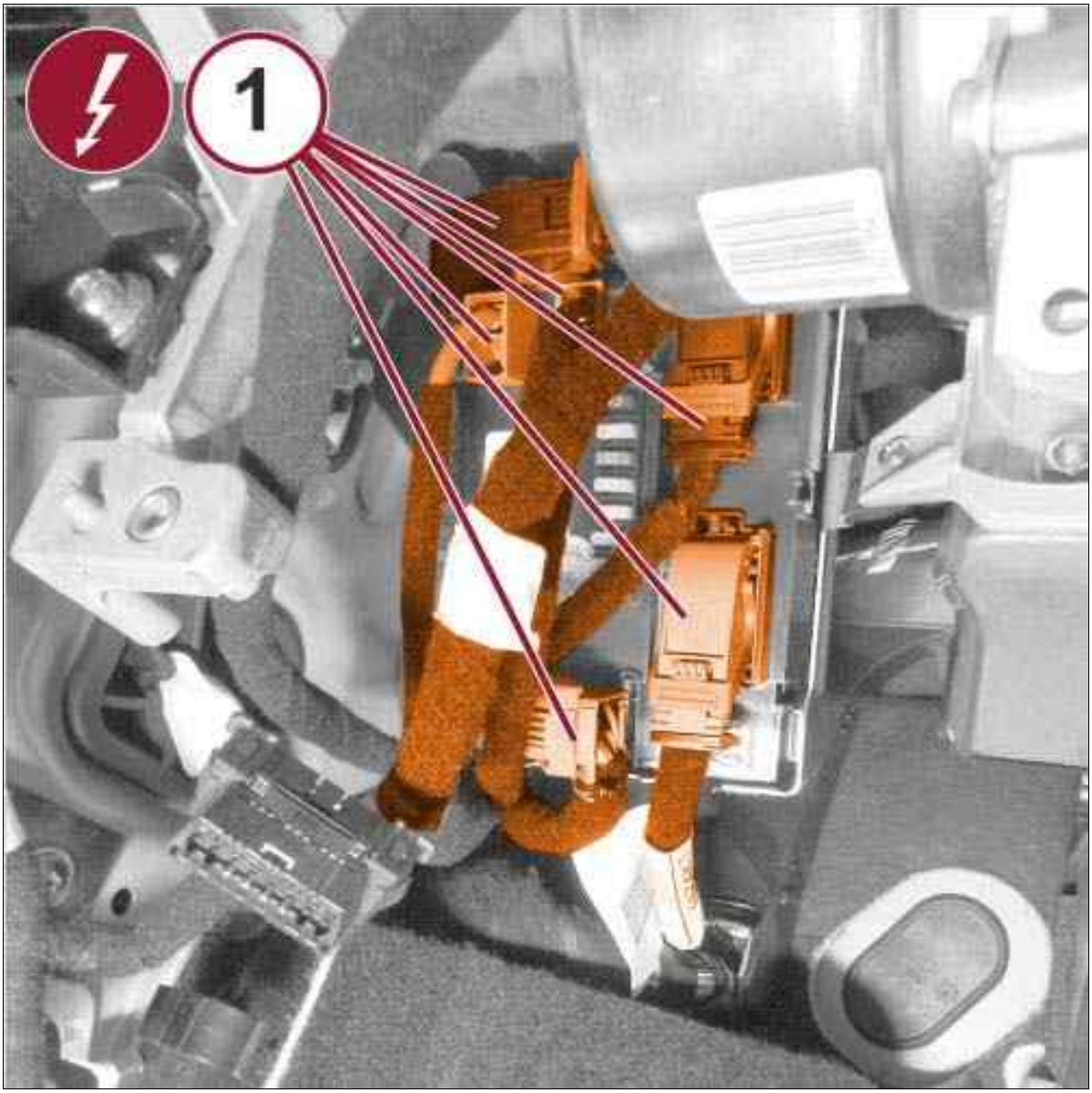
3. Remove the connector (1a), remove the screws (1b), nut (1c) and remove the brackets (1d) from the Body Control Module (BCM).

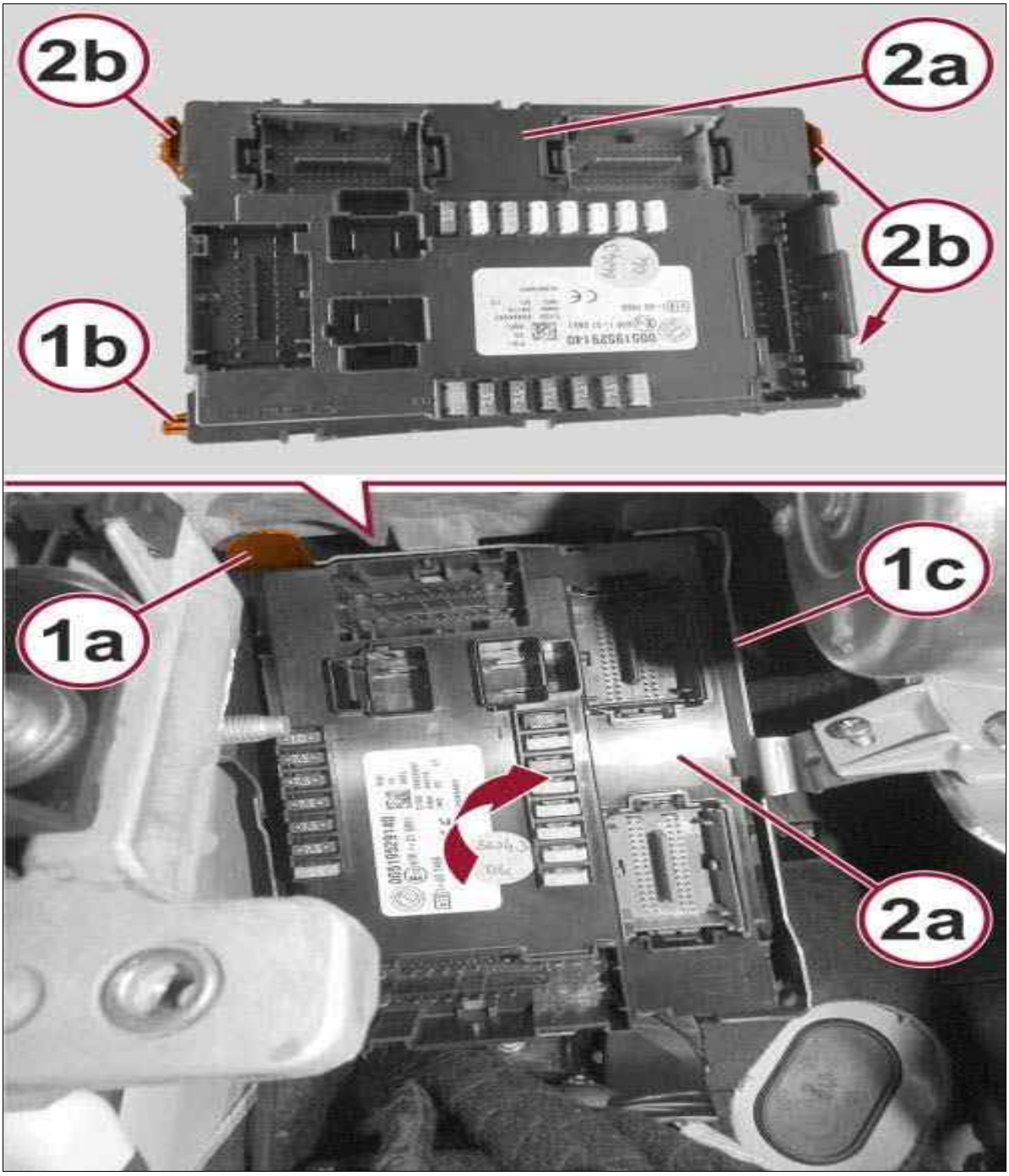
Fig 2: Body Control Module Connectors



Courtesy of CHRYSLER GROUP, LLC

4. Disconnect the electrical connectors (1).

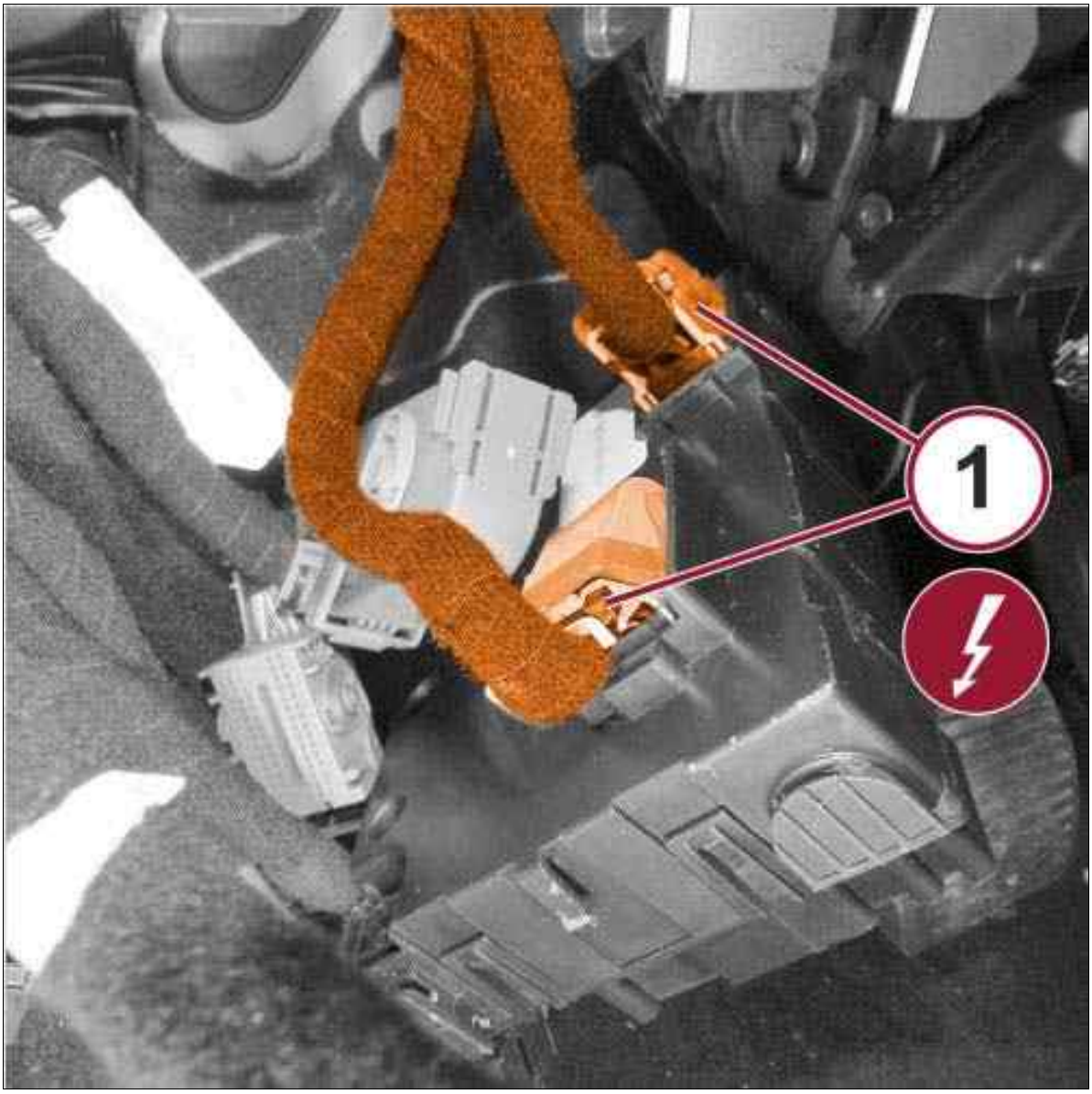
Fig 3: Body Control Module, Bracket, Pin & Retainers



Courtesy of CHRYSLER GROUP, LLC

5. Using a suitable tool, release the retainer (1a) and then release the pin (1b) from the bracket (1).
6. Turn the BCM (2a), release the retainers (2b) and move the body computer.

Fig 4: Back Of Body Control Module Connectors



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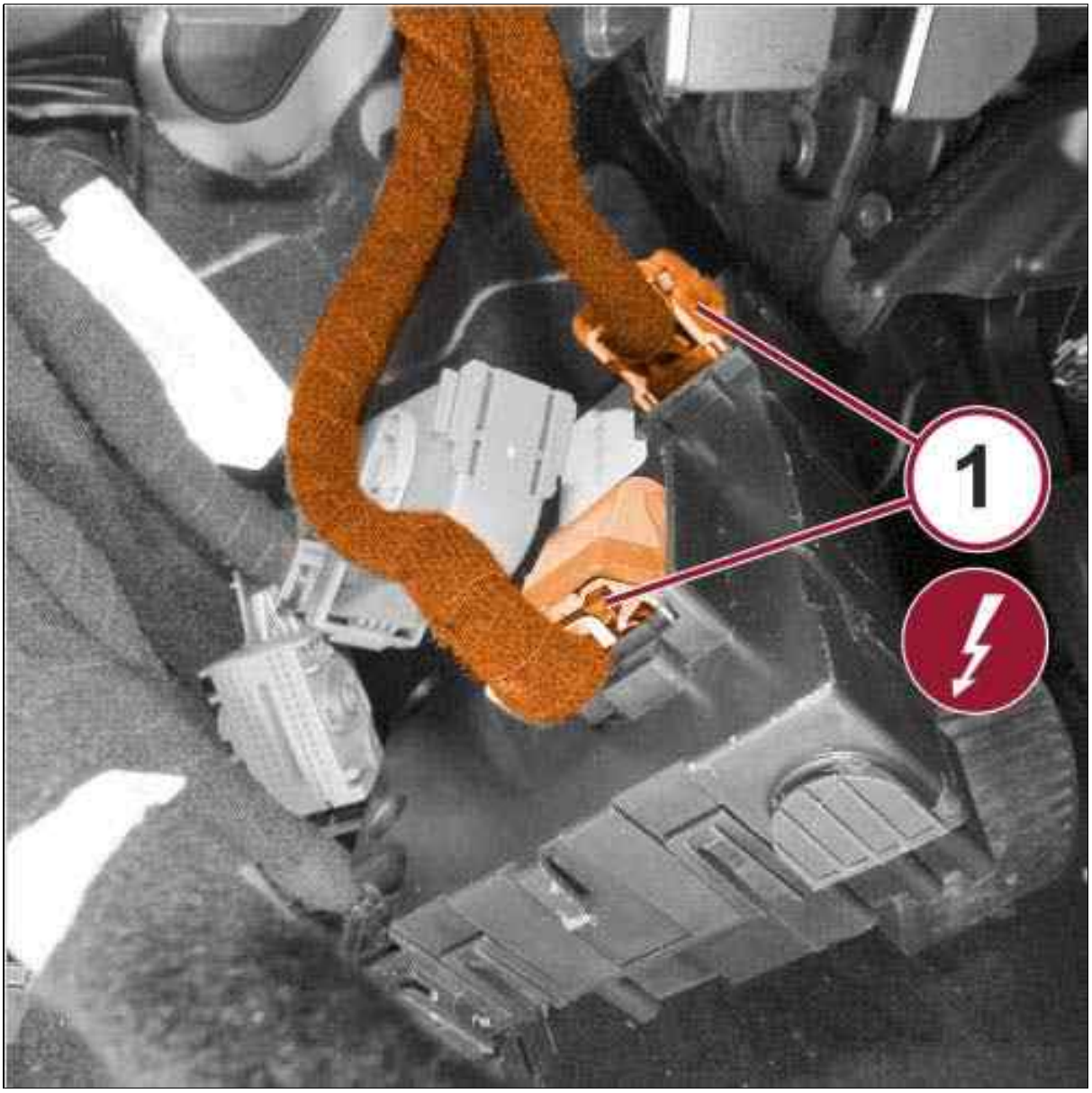
7. Disconnect the electrical connections (1) from the back of the BCM.
8. Remove the BCM from the vehicle.

MODULE, BODY CONTROL > REMOVAL AND INSTALLATION > LEFT HAND DRIVE > INSTALLATION

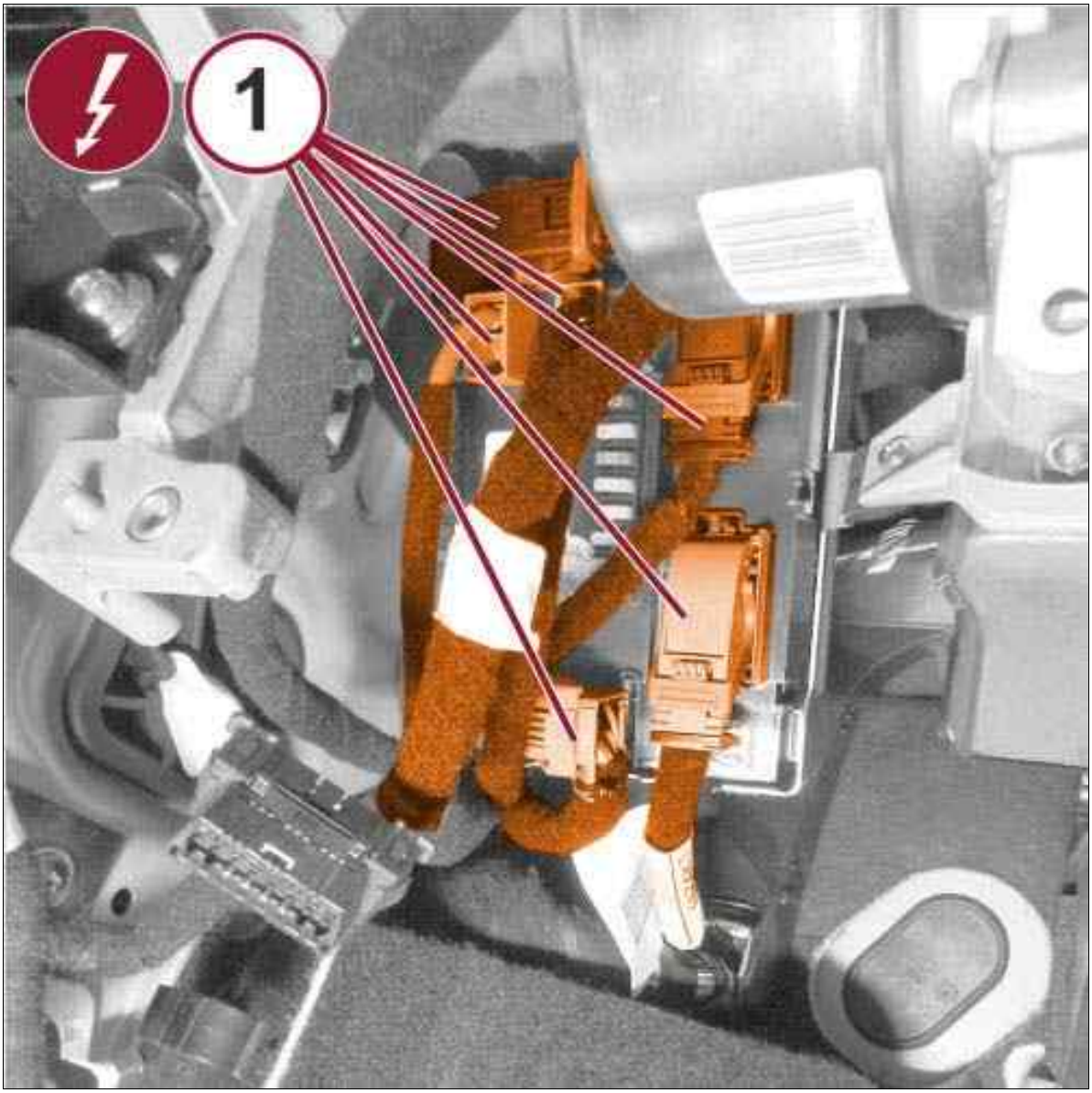
Fig 1: Back Of Body Control Module Connectors



Courtesy of CHRYSLER GROUP, LLC

1. Connect the wire harness connectors to the back of the Body Control Module (BCM).
2. Position and secure the BCM to the BCM mounting bracket.

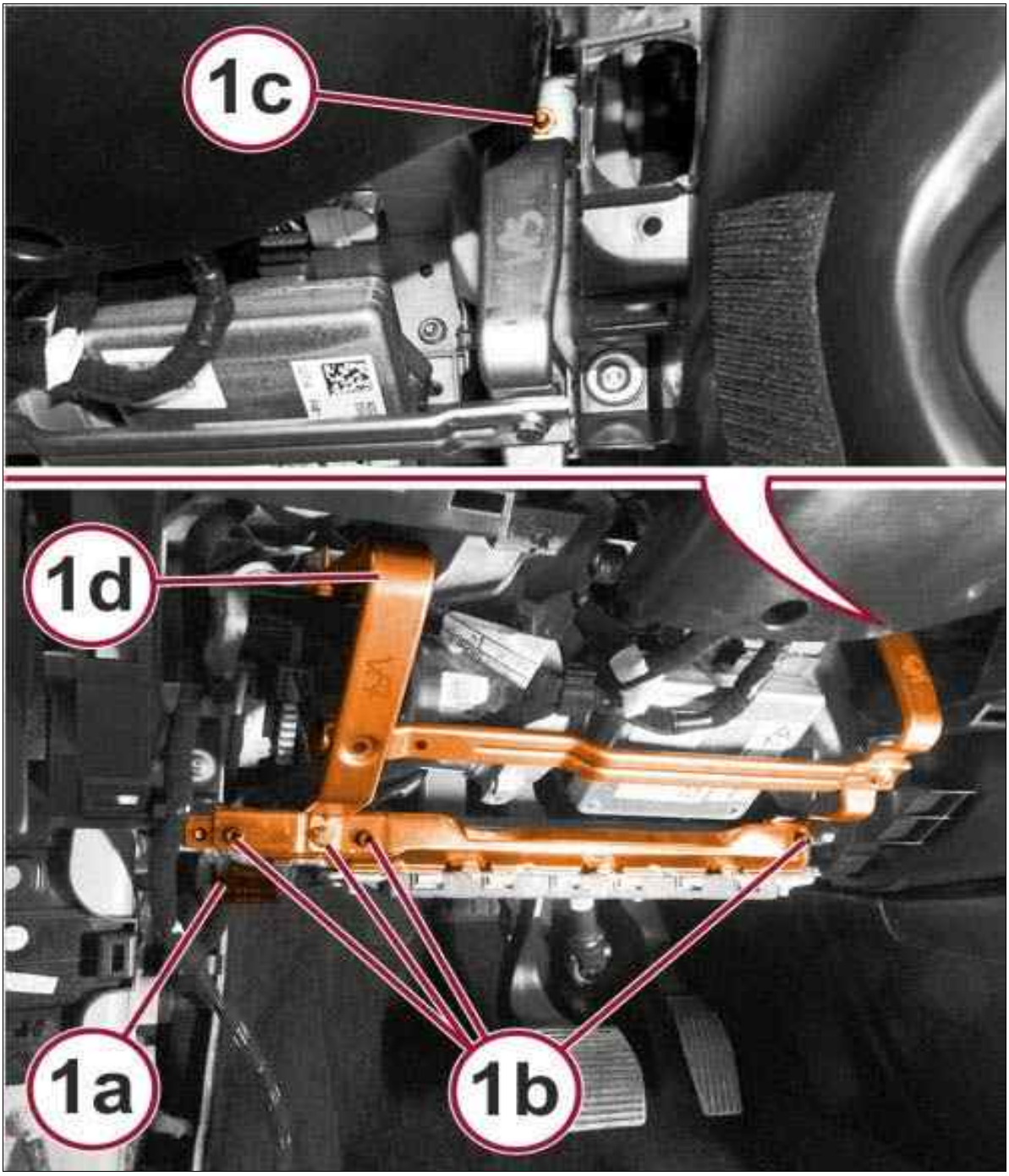
Fig 2: Body Control Module Connectors



Courtesy of CHRYSLER GROUP, LLC

3. Connect the electrical connectors to the front of the BCM.

Fig 3: Body Control Module Brackets, Connector, Nut & Screws



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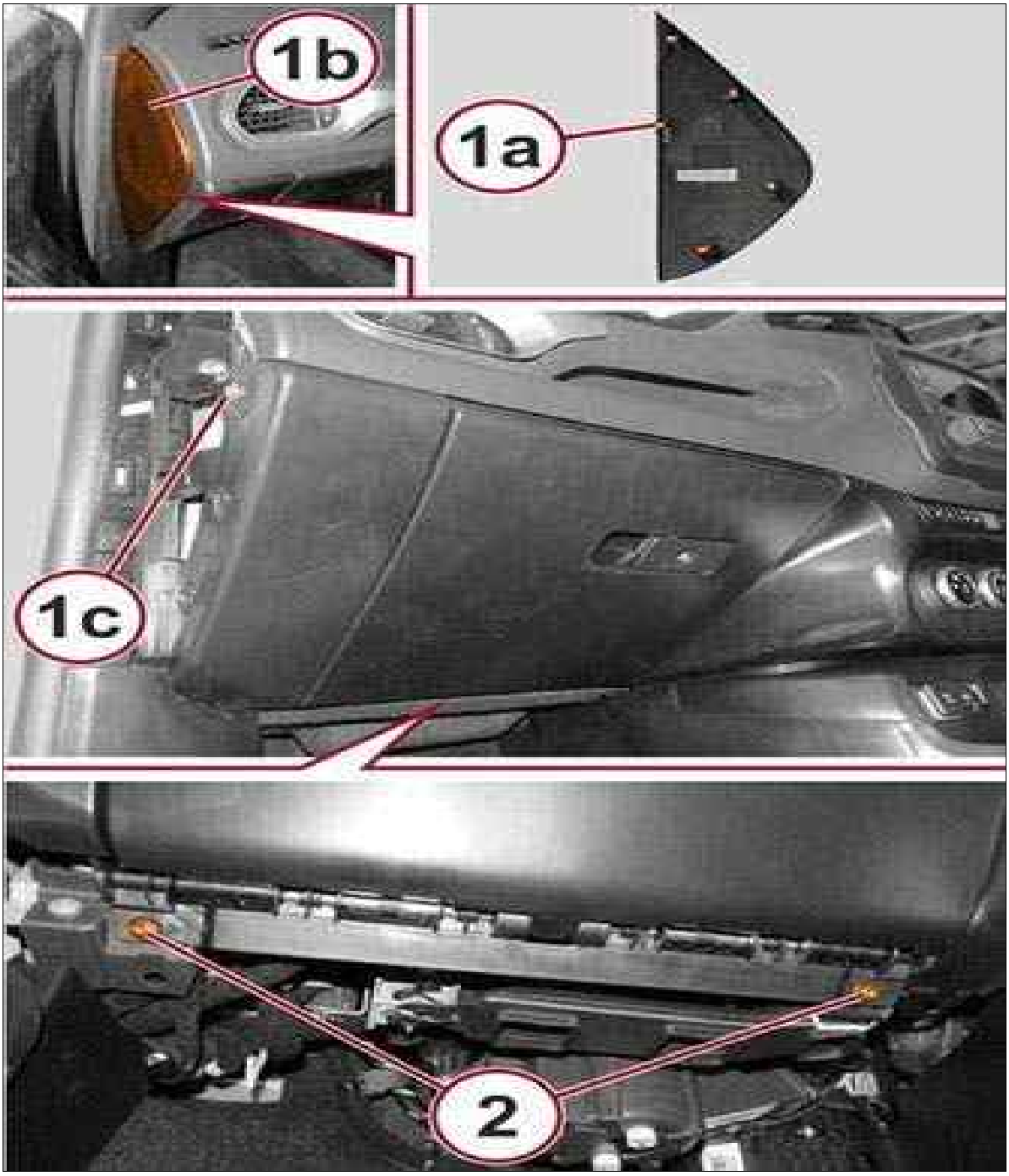
4. Position and secure the BCM brackets.
5. Install the steering column opening cover. Refer to COVER, STEERING COLUMN OPENING, REMOVAL AND INSTALLATION .
6. Connect the negative battery cable.

MODULE, BODY CONTROL > REMOVAL AND INSTALLATION > RIGHT HAND DRIVE >

REMOVAL

1. Disconnect and isolate the negative battery cable.

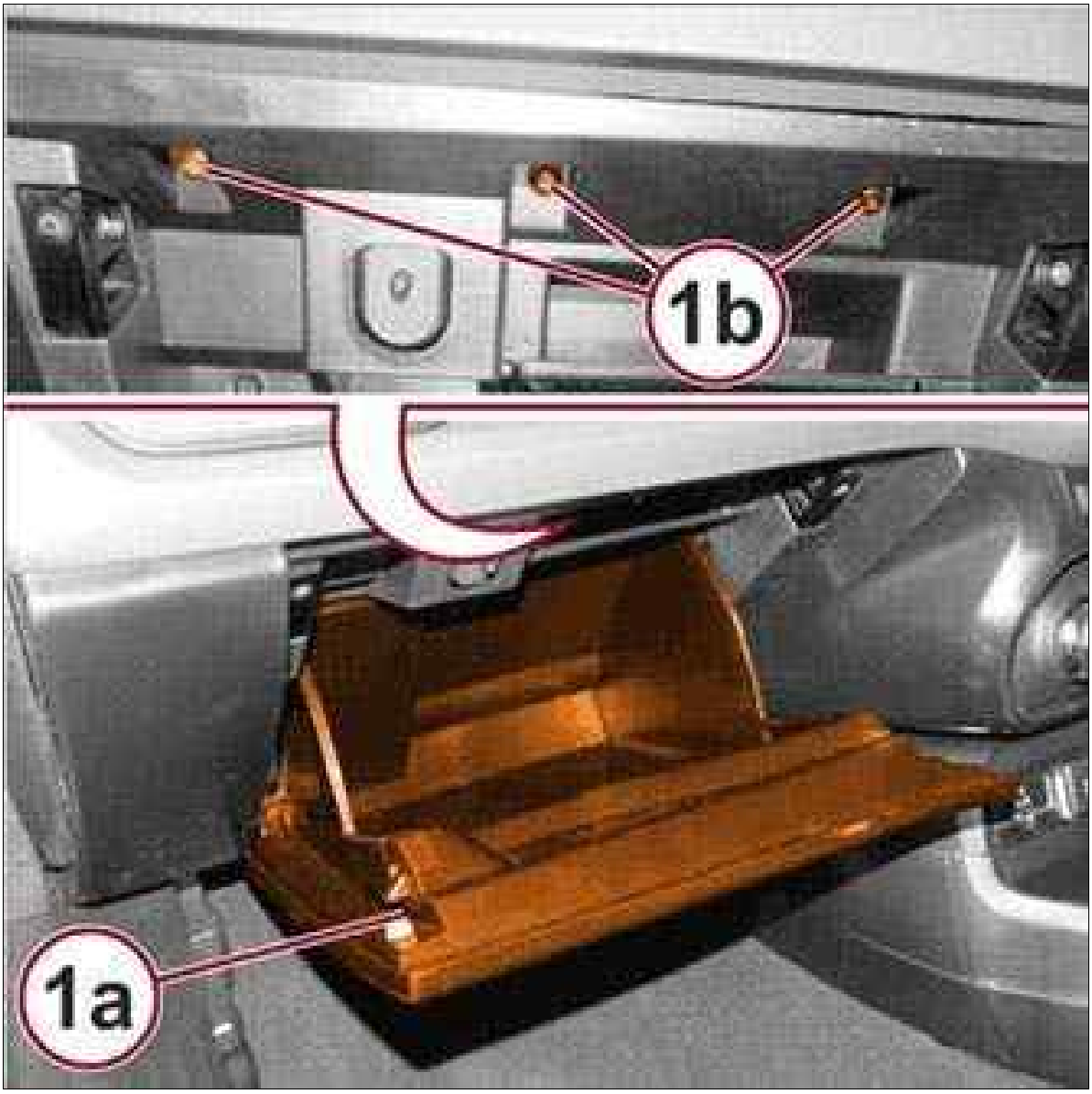
   Fig 1: Side Trim, Retainers & Screws



Courtesy of CHRYSLER GROUP, LLC

2. Pry up the retainers (1a) with a suitable tool, remove the side trim (1b) and remove the screw (1c).
3. Remove the lower screws (2).

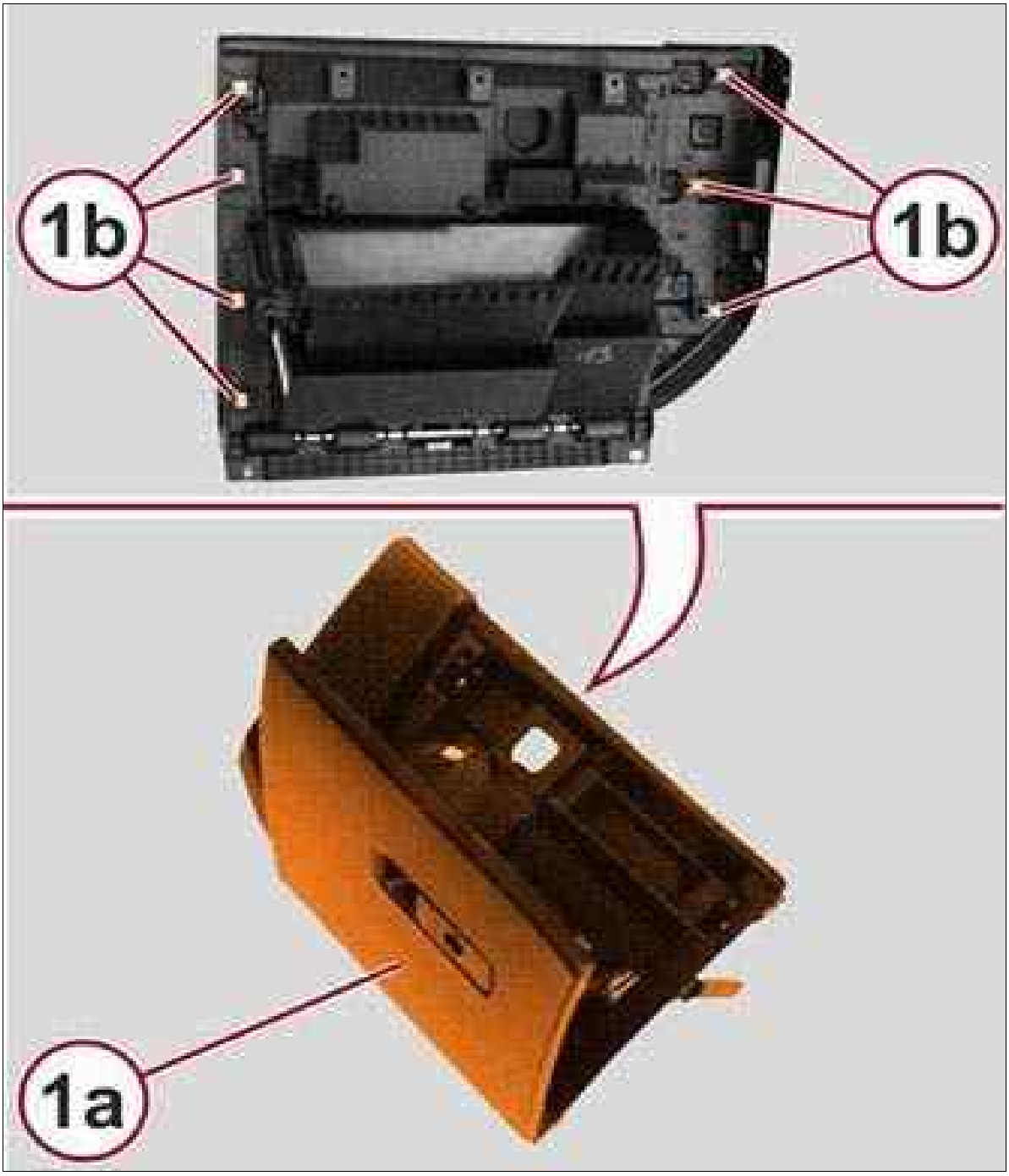
Fig 2: Glove Compartment & Screws



Courtesy of CHRYSLER GROUP, LLC

4. Open the glove compartment (1a) and remove the upper screws (1b).

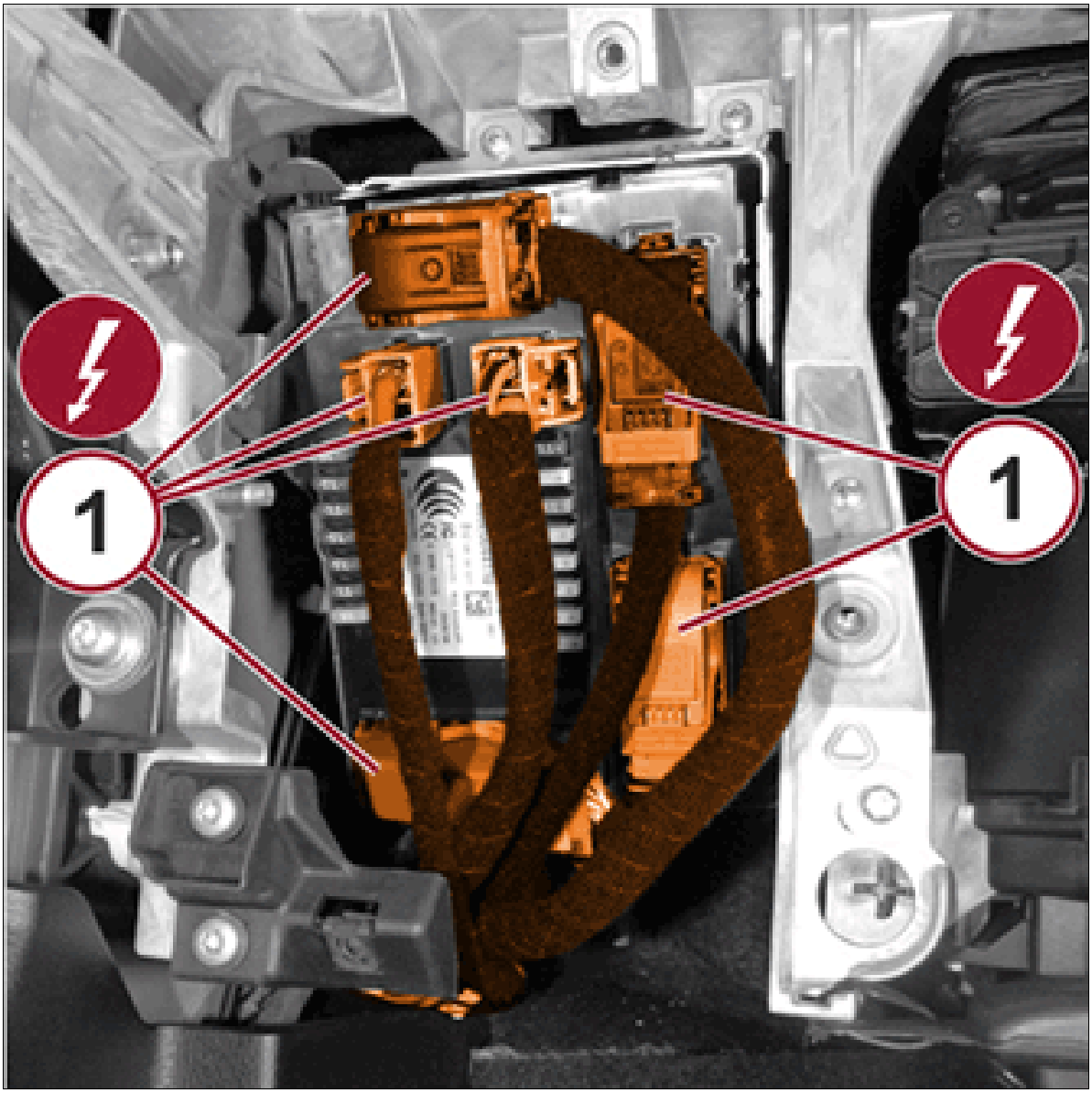
Fig 3: Glove Box Assembly & Retainers



Courtesy of CHRYSLER GROUP, LLC

5. Remove the glove box assembly (1a) from the dashboard by releasing the retainers (1b).

Fig 4: BCM Electrical Connections



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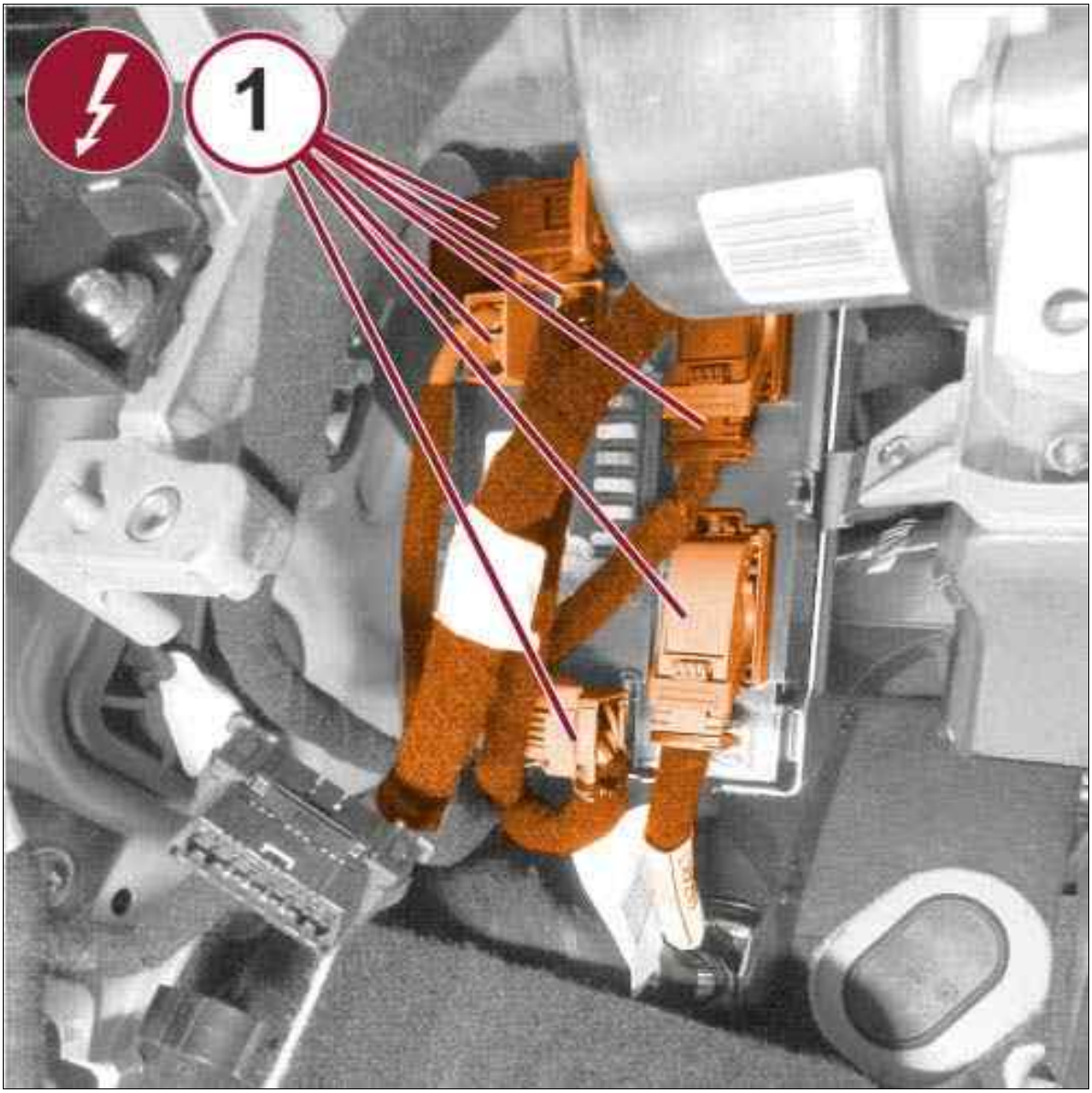
6. Disconnect the BCM electrical connections (1).
7. Remove the connector (1a), remove the screws (1b), nut (1c) and remove the brackets (1d) from the Body Control Module (BCM).

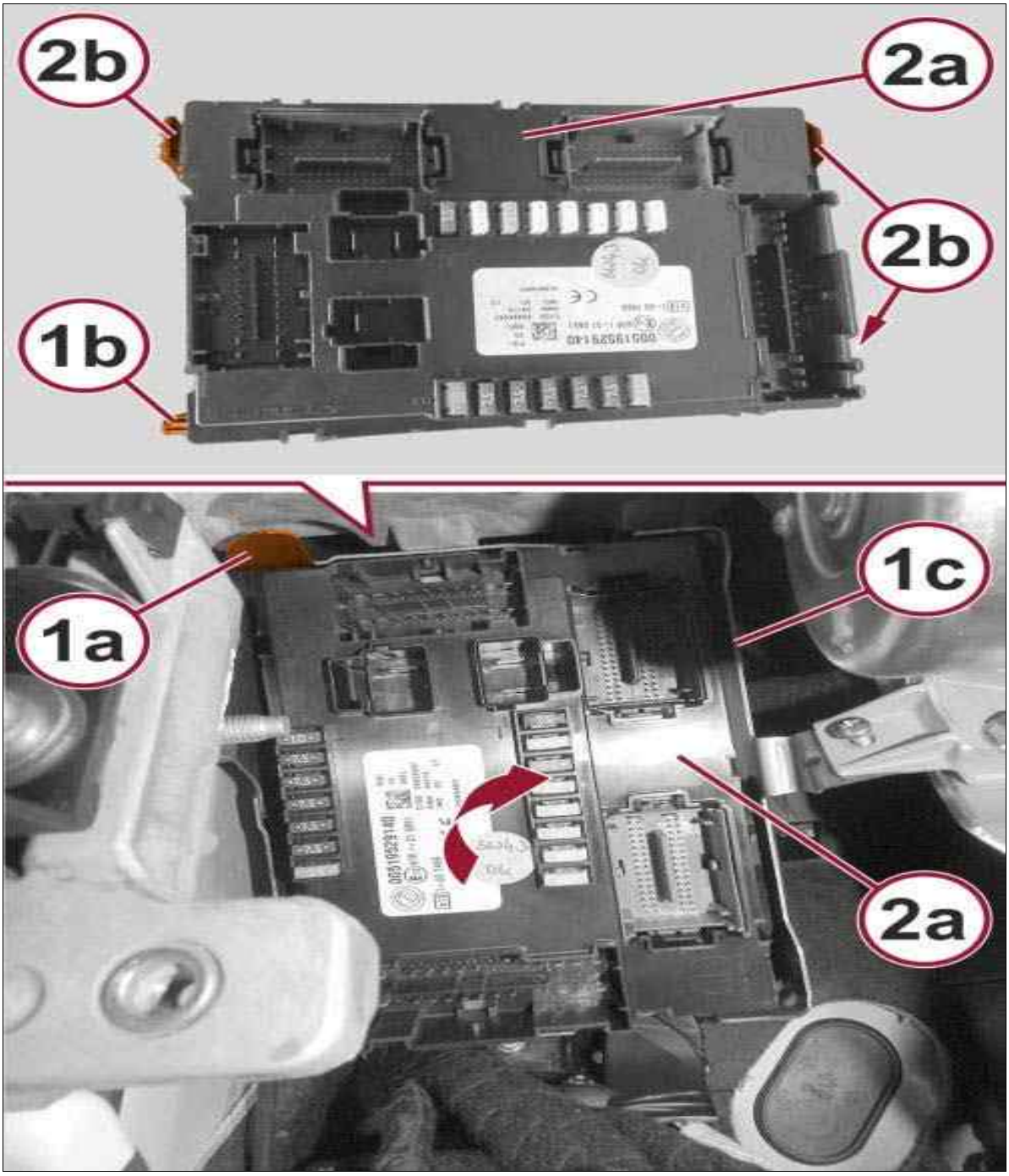
Fig 5: Body Control Module Connectors



Courtesy of CHRYSLER GROUP, LLC

8. Disconnect the electrical connectors (1).

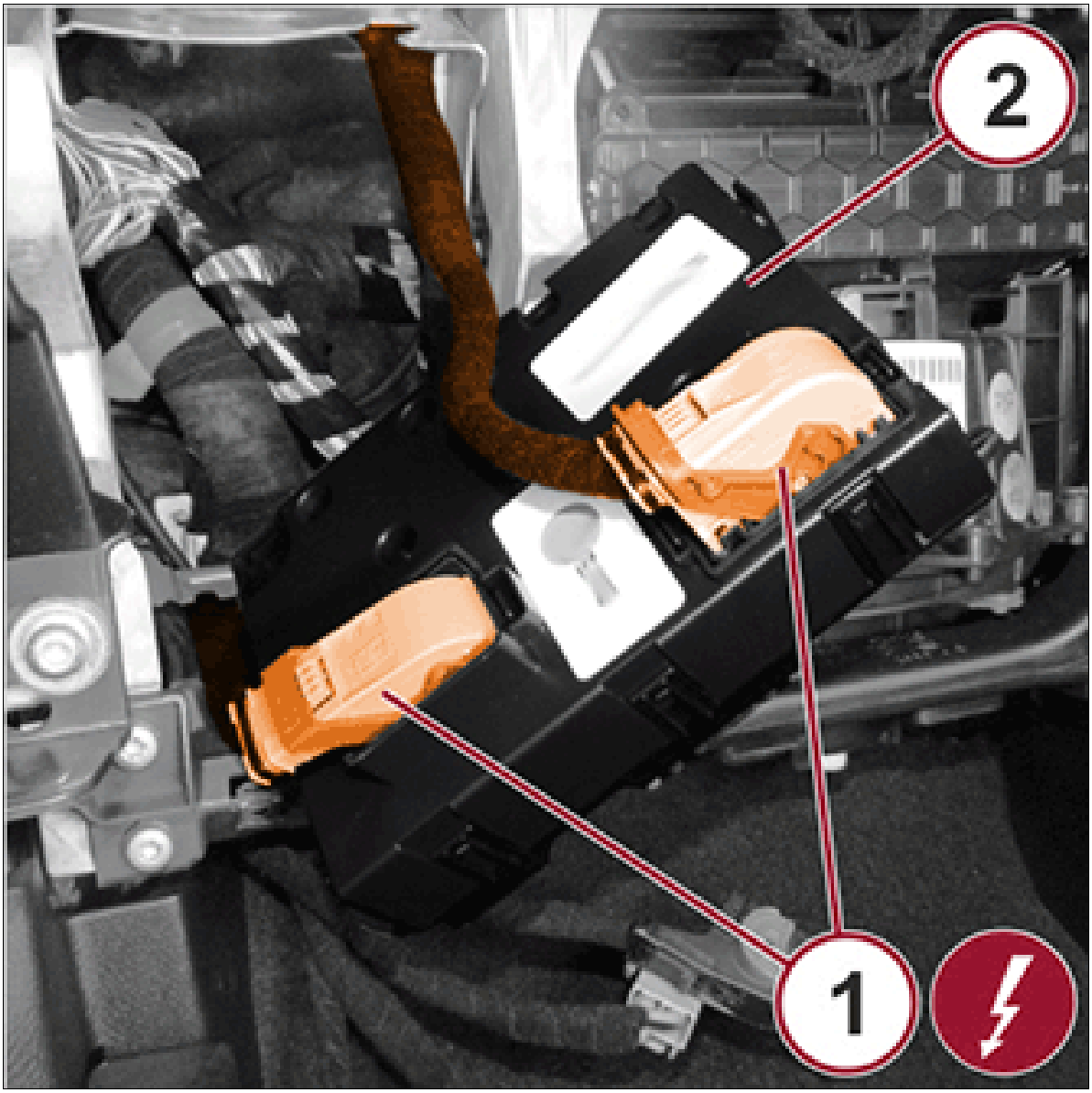
Fig 6: Body Control Module, Bracket, Pin & Retainers



Courtesy of CHRYSLER GROUP, LLC

9. Using a suitable tool, release the retainer (1a) and then release the pin (1b) from the bracket (1c).
10. Turn the BCM (2a), release the retainers (2b) and move the BCM to access the rear connectors.

Fig 7: Back Of Body Control Module Connectors



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11. Disconnect the BCM electrical connections (1) from the back of the BCM (2).
12. Remove the BCM from the vehicle.

MODULE, BODY CONTROL > REMOVAL AND INSTALLATION > RIGHT HAND DRIVE > INSTALLATION

1. Connect the electrical connections on the rear side of the assembly.
2. Place the Body Control Module (BCM) assembly in its housing and secure the retainers to the bracket.
3. Connect the electrical connections on the front side of the assembly.
4. Fit the glovebox in its housing, engaging the retainers.

5. Tighten the glove box compartments internal and lower screws.
6. Tighten the side screw and reposition the trim in its housing, engaging the retainers.
7. Connect the negative battery terminal.
8. Perform BCM programming. Refer to MODULE, BODY CONTROL, MODULE PROGRAMMING .

MODULE, BODY CONTROL > MODULE PROGRAMMING > PROGRAMMING

NOTE:

During the Body Control Module (BCM) replacement procedure the original VIN and electronic code (key code) will be needed.

NOTE:

In some cases the vehicle may exhibit a start and stall condition after the BCM is replaced. If this occurs the key learn procedure may need to be ran and all keys relearned. Make sure that all keys are present if key relearn is required; keys not present will be locked out.

NOTE:

Customer keys that are not present at the dealer after the BCM was replaced may not have RKE functionality until the customer turns the key in the ignition.

When replacing any module not the replacement and programming order. For more information see the **MODULE REPLACEMENT AND PROGRAMMING ORDER GUIDE** . Refer to STANDARD PROCEDURE .

1. Ensure that the ignition is in and remains in the **RUN** position while performing this procedure
2. Select the **BCM module** from the "Vehicle View" screen
3. Select the **Misc. Functions** tab with the "BCM View" menu options
4. Select the **BCM Replaced** routine and click the start button
5. Follow the prompts on the screen to complete the procedure.

MODULE, BODY CONTROL > MODULE PROGRAMMING > PROGRAMMING KEYS TO THE BCM

NOTE:

- *All customer keys, including any previously programmed and replacement keys, must be learned during this procedure.*

- *The Body Control Module (BCM) may be programmed to recognize up to a total of eight key fobs. When replacing or adding a key fob, the replacement/additional key fob must be ordered through your parts department by VIN. The new key will arrive within 24 hours cut to match the door lock cylinder in the vehicle for which it will be used. Once the new key fob arrives, the BCM must be programmed to recognize it as a valid key fob.*
- *If any previously programmed keys are not re-programmed during this procedure, they will be permanently disabled.*
- *The entire key procedure will require the key to be in the OFF position and with the hazard lights turned on.*
- *If the wrong key code is entered three times in a row it will lock out the BCM for a period of 24 hours.*
- *Do NOT at any point during the procedure hit the CLOSE button, always hit CONTINUE until procedure says it is completed successfully and it is now safe to turn off hazards. Hitting the CLOSE button will cause the routine to end without learning the key.*

1. Obtain security pin for the vehicle.
2. Insert a key (already programmed if possible) into the ignition to start the process.
3. Turn the ignition to the run position and connect to the vehicle using the scan tool.
4. Select "BCM" from the topology view and then the "MISC" tab.
5. The hazard lamps must be **on** during programming.
6. Select "Erase and Program Keys", then click "continue".
7. Turn key to off position as instructed in procedure. Follow routine, remove the key from the ignition as instructed to program additional keys, wait 10 seconds between adding keys. Continue following tool prompts to complete.

NOTE:

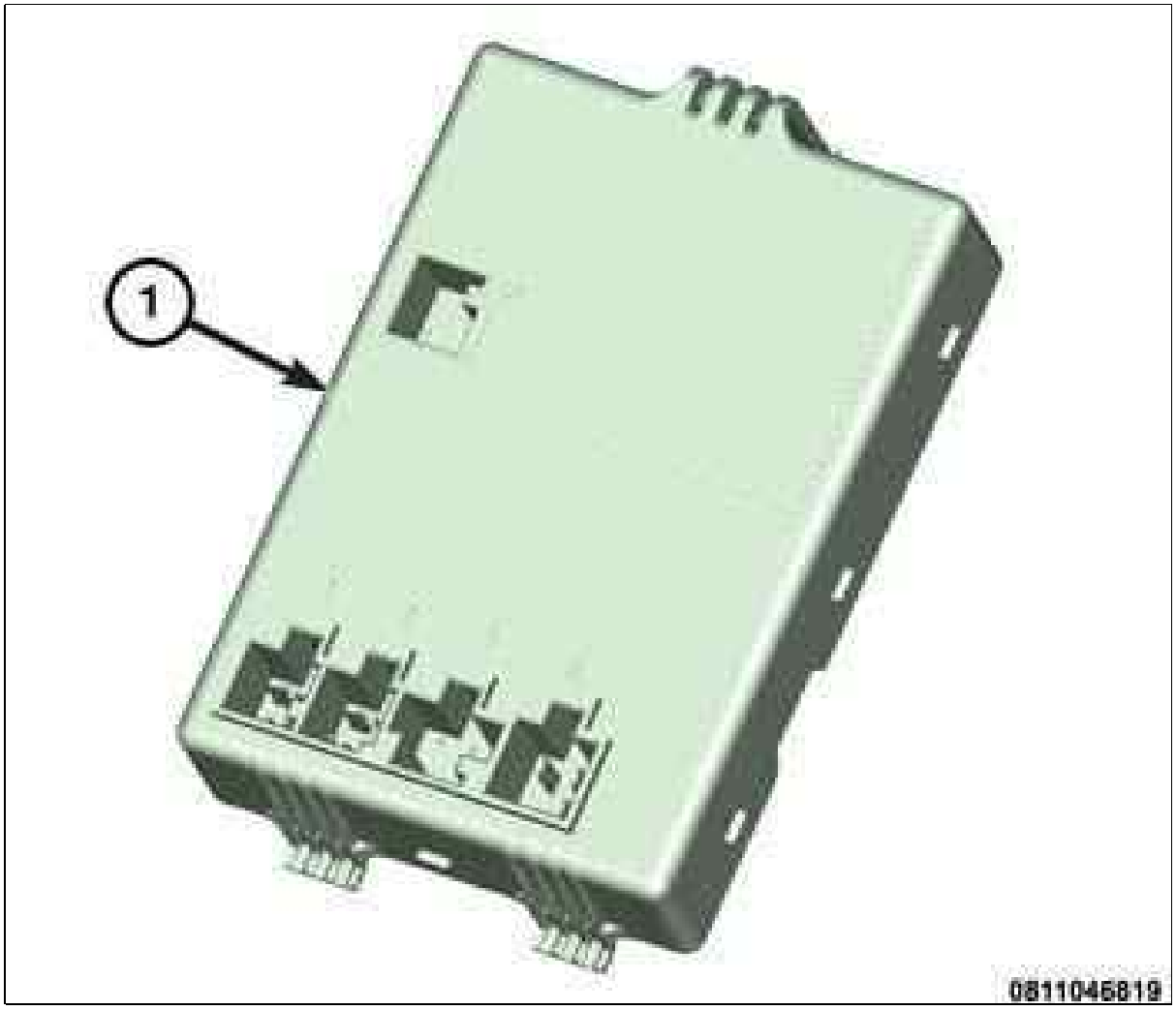
Do NOT at any point during the procedure hit the CLOSE button, always hit CONTINUE until procedure says it is completed successfully and it is now safe to turn off hazards. Hitting the CLOSE button will cause the routine to end without learning the key.

NOTE:

If at any point the customer needs a BCM replacement. The keys should be already programmed to the BCM. If the vehicle exhibits a start and stall situation after the BCM is replaced the keys may need to be reprogrammed using the program ignition keys procedure in the scan tool.

MODULE, COMFORT SEAT AND WHEEL > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

Fig 1: Comfort Seat And Wheel Module



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The Comfort Seat and Wheel Module (CSWM) (also known as the Heated Seat Module) is located under the passenger front seat. It has a minimum of 2 electrical connectors and a maximum of 4 electrical connections. and a push pin style retainer that secures it to the seat pan. The module can be accessed from under the passenger seat with the seat in the full back and up position.

The CSWM is a CAN-IHS bus microcontroller providing outputs to the heated seat pads, heated steering wheel, and ventilating up to two seats. The CSWM receives commands over the CAN IHS BUS from the BCM. The seat thermistor is hard wired to the CSWM.

Heated Seats - The CSWM uses a Pulse Width Modulation (PWM) to provide power to the seat cushion and back heating elements. The temperature sensor thermistor is located in the seat cushion. The thermistor sensor feedbacks from each seat heating element to the CSWM to regulate the heater outputs to prevent any seat temperature to rise above set points. Seat heating has two selectable heat settings which are HI and LO. Depending on thermistor reading, the CSWM will start the heater output by adjusting the PWM heat level according to the calibration table.

Heated Steering Wheel - The CSWM provides power to the steering wheel heating element. The heated steering wheel is standard when the vehicle is equipped with front heated seats. During normal operation, the CSWM will switch on the power for the heated wheel only if the engine is running. The heated steering wheel temperature sensor is hardwired to the EVIC (switch) which sends that information over a LIN Bus through the clockspring/SCCM to the BCM. The thermistor sensor feedbacks from the steering wheel heating element via

the CAN Internal High Speed (IHS) bus to the CSWM regulating the heater output to prevent the wheel temperature to rise above the maximum threshold temperature set point.

MODULE, COMFORT SEAT AND WHEEL > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

The Comfort Seat Wheel Module (CSWM) operates on fused battery current received from the ignition switch. The module is grounded to the body at all times through the electrical connector. Inputs to the module include CAN Internal High Speed (IHS) bus data bus messages and standard hardwired 12 volt power and ground. In response to inputs, the CSWM will control the battery current to the appropriate heated seat elements.

When a heated seat switch IHS data bus signal is received by the CWSM, the module energizes the selected heated seat element. The Low heat set point is about 38° C (100.4° F), and the High heat set point is about 42° C (107.6° F).

The CSWM will automatically transition the output from high to low after a maximum period of 60 minutes has elapsed. The CSWM will automatically transition the output from low to off after a maximum period of 45 minutes has elapsed.

In addition to operating the heated seat elements, the heated seat module sends LED illumination messages to the instrument cluster (IC). The IC then sends the LED illumination message to the Integrated Center Stack (ICS) so that the appropriate LEDs are illuminated for any given heating level. Pressing the switch once will select high-level heating. Pressing the switch a second time will select low-level heating. Pressing the switch a third time will shut the heating elements off.

If the CSWM detects a heated seat element OPEN or SHORT circuit, it will record and store the appropriate Diagnostic Trouble Code (DTC).

Driver Seat Heat Systems

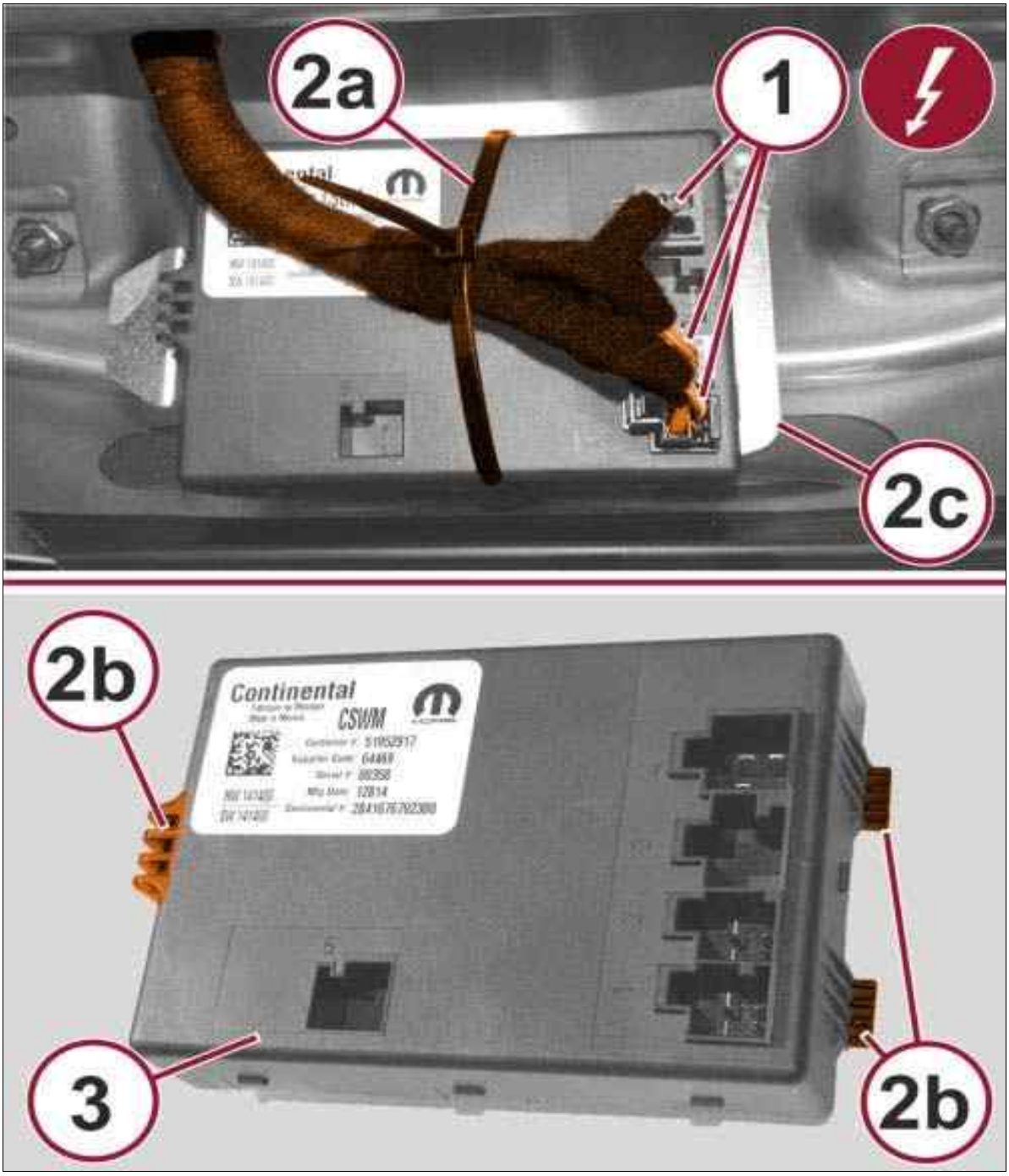
- The element consists of a cushion element connected in parallel with a back element.
- The seat cushion has a thermistor to provide feedback to the CSWM.
- The seat cushion and seat back has a thermostat to automatically open the feed to the heated seat system.
- The heated seat cushion and seat back have a thermostat to automatically open the feed to turn the heated seat system off if the temperature reaches or exceeds the operating parameters programmed to the CSWM.

The CSWM is diagnosed using a scan tool. If the module detects a heated seat element OPEN or SHORT circuit, the system will turn off and it will record and store the appropriate diagnostic trouble code (DTC). Refer to DIAGNOSIS AND TESTING .

MODULE, COMFORT SEAT AND WHEEL > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

1. Disconnect and isolate the negative battery cable.

Fig 1: Comfort Seat And Wheel Module, Tie Strap, Tabs & Connectors



Courtesy of CHRYSLER GROUP, LLC

2. Disconnect the electrical connections (1).
3. Cut the tie (2a) and release the Comfort Seat and Wheel Module (CSWM) from retaining tabs (2b) that secure it to the base of the seat (2c).
4. Remove the CSWM (3).

MODULE, COMFORT SEAT AND WHEEL > REMOVAL AND INSTALLATION > REMOVAL

AND INSTALLATION > INSTALLATION

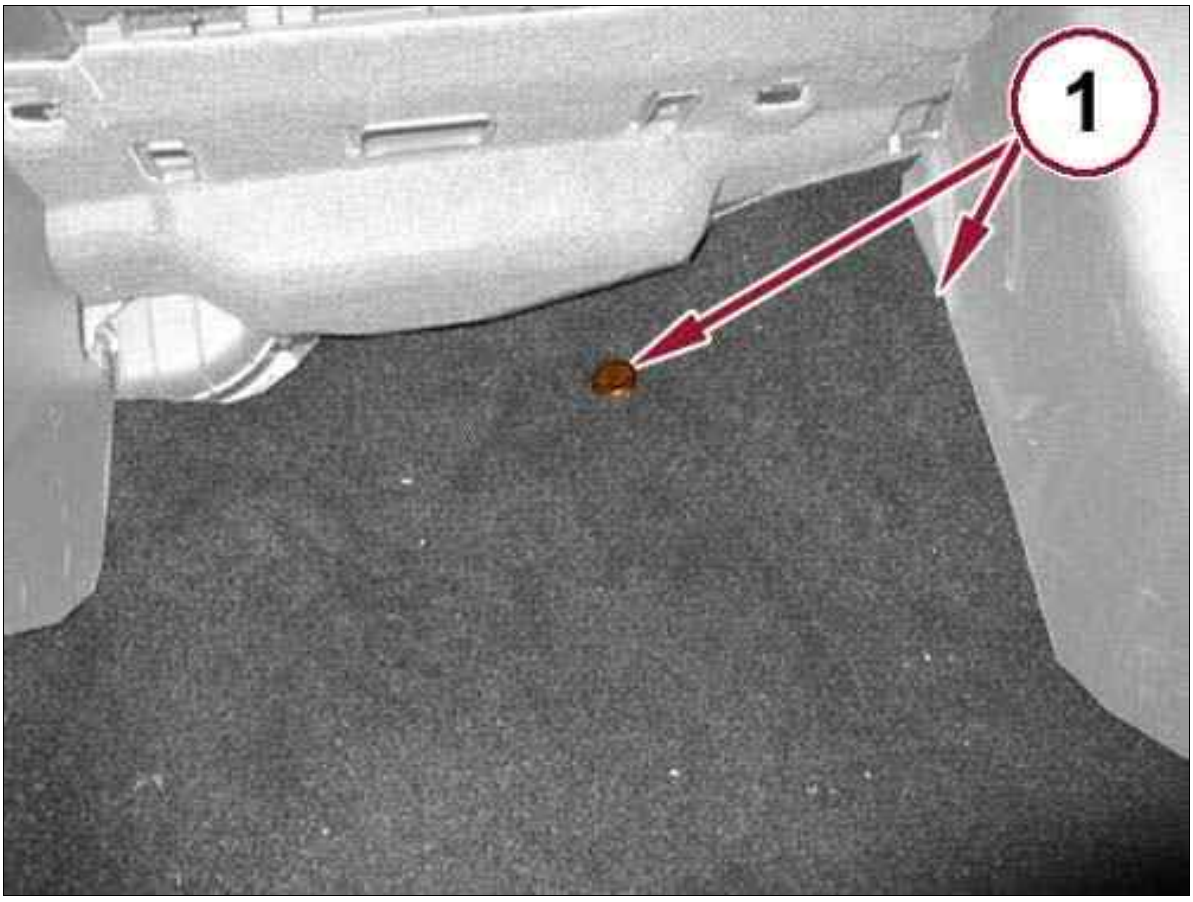
1. Position the CSWM and secure it to the retainers and with a clamp at the base of the seat.
2. Connect the electrical connections.
3. Connect the negative battery terminal.

MODULE, DRIVETRAIN CONTROL > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

> *NOTE:*
>
> *When replacing the DTCM, use the diagnostic scan tool to go to the menu "various functions" and follow the steps for the "replacement unit" routine.*

1. Disconnect and isolate the negative battery cable.
2. Using a trim stick or equivalent, remove the instrument panel side cover.
3. Lower the silencer panel.

Fig 1: Retainer



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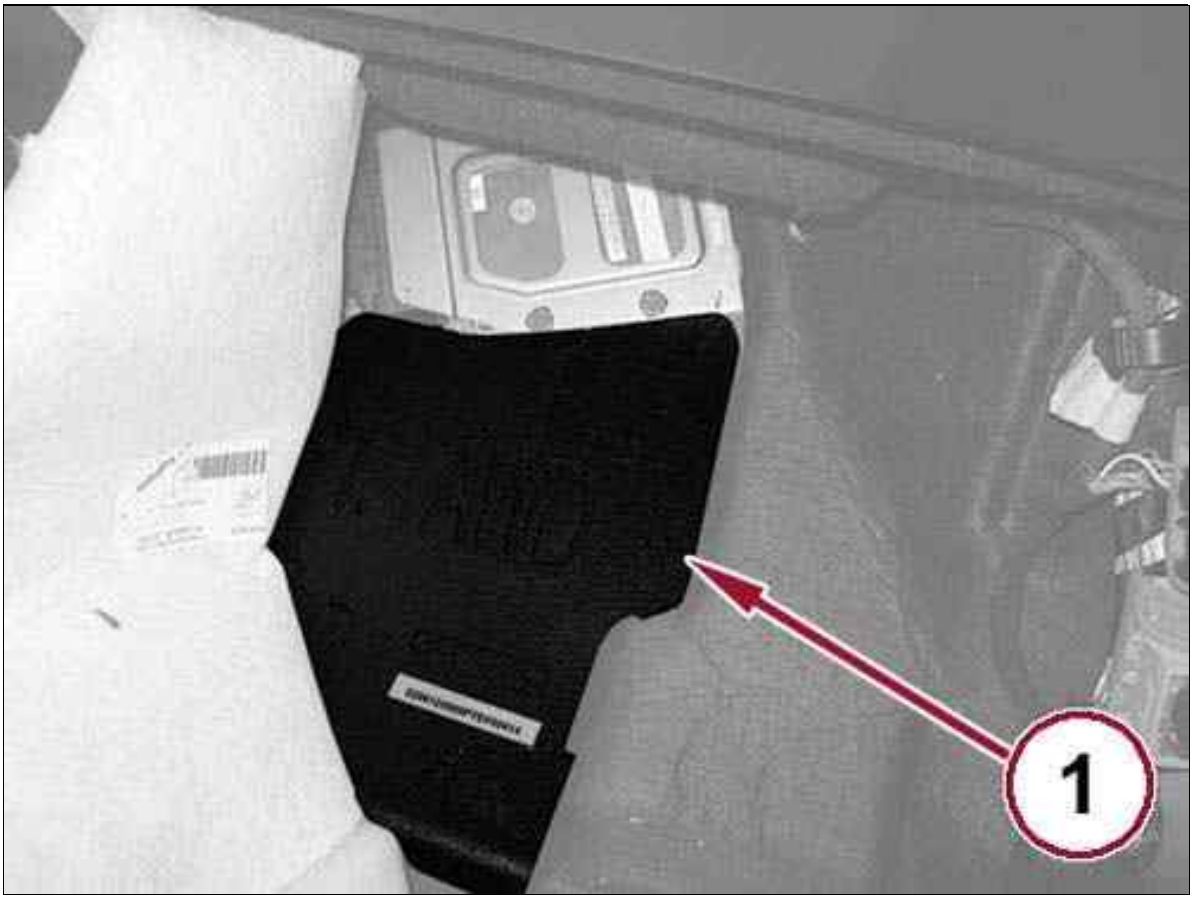
4. Remove the retainer (1) and position the reposition the side floor cover.

Fig 2: Protection Cover



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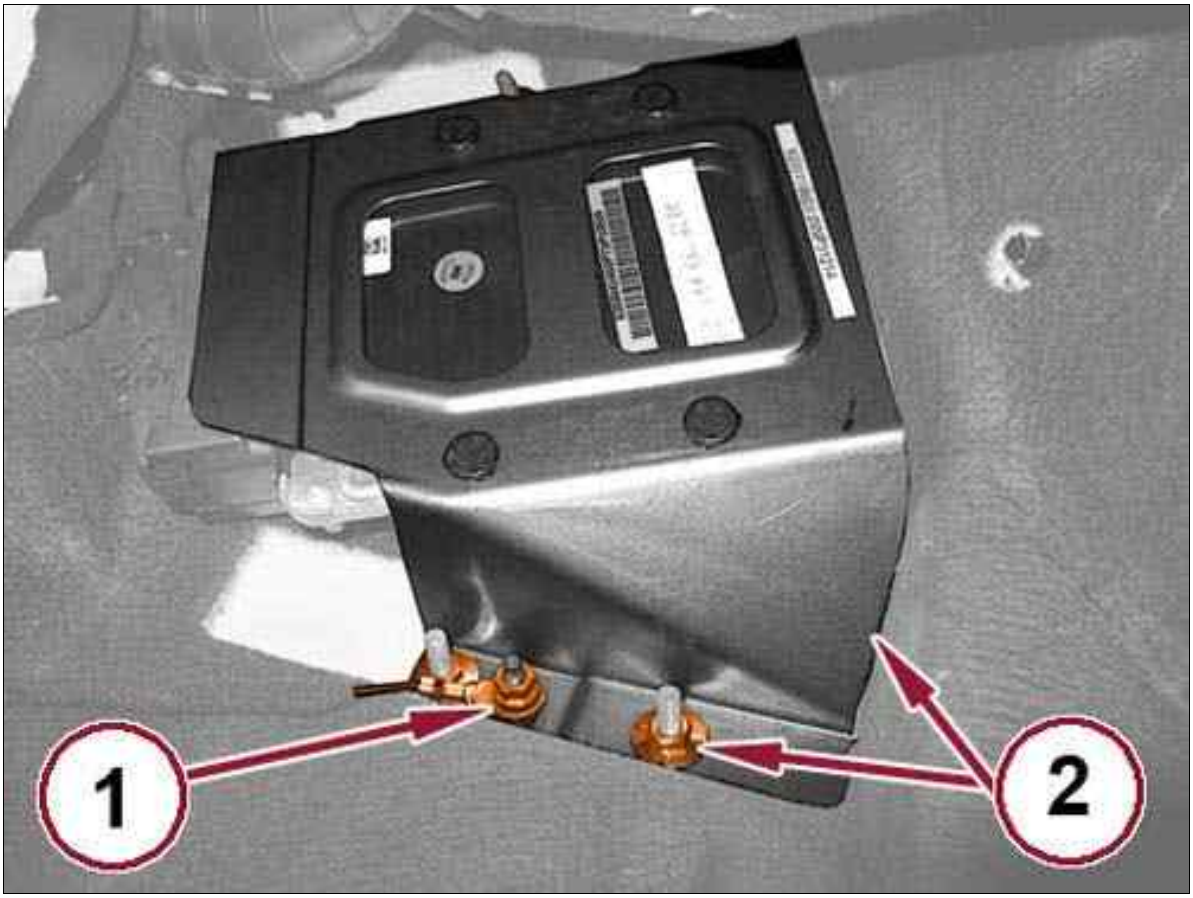
5. Remove the protection cover (1).

Fig 3: Cover, Cable End & Nuts



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6. Remove the nut remove the cable end (1).
7. Remove the nuts and remove the module with cover (2).

MODULE, DRIVETRAIN CONTROL > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

1. Position the module with cover into place and tighten the nuts.
2. Connect the ground cable.
3. Install the protective cover.
4. Reposition and secure the side floor cover into the installed position.
5. Secure the silencer panel.
6. Install the instrument panel side cover.
7. Connect the negative battery cable.
8. Using the diagnostic scan tool, perform the "replacement unit" routine in the misc functions menu of the DTCM.

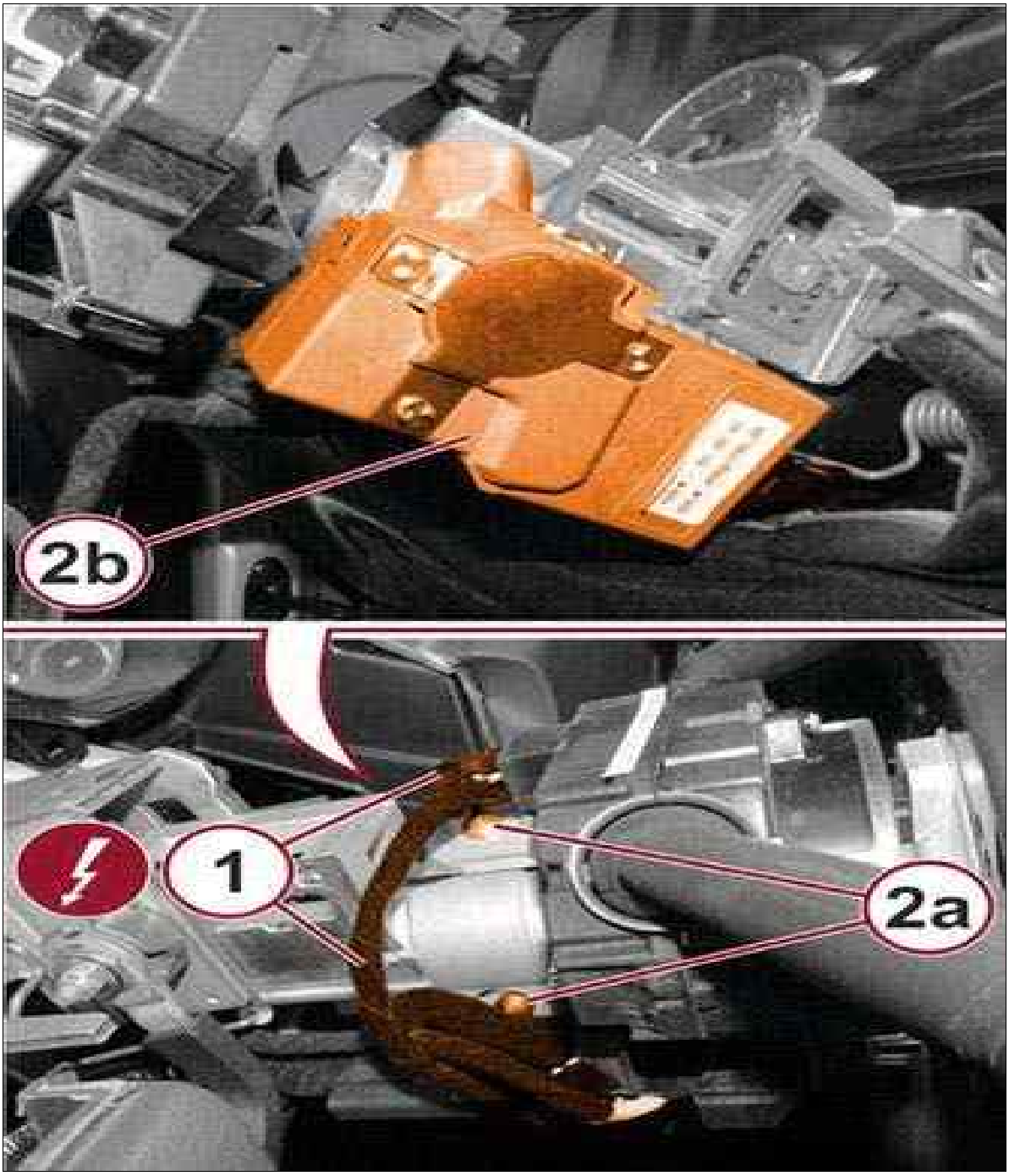
MODULE, ELECTRIC POWER STEERING > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION

For the description and operation of the electric power steering module, refer to COLUMN, DESCRIPTION AND OPERATION .

MODULE, ELECTRONIC STEERING LOCK (ESL) > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

1. Remove the steering column shroud. Refer to SHROUD, STEERING COLUMN, REMOVAL AND INSTALLATION .

Fig 1: Electronic Steering Lock Module, Headless Screws & Connectors



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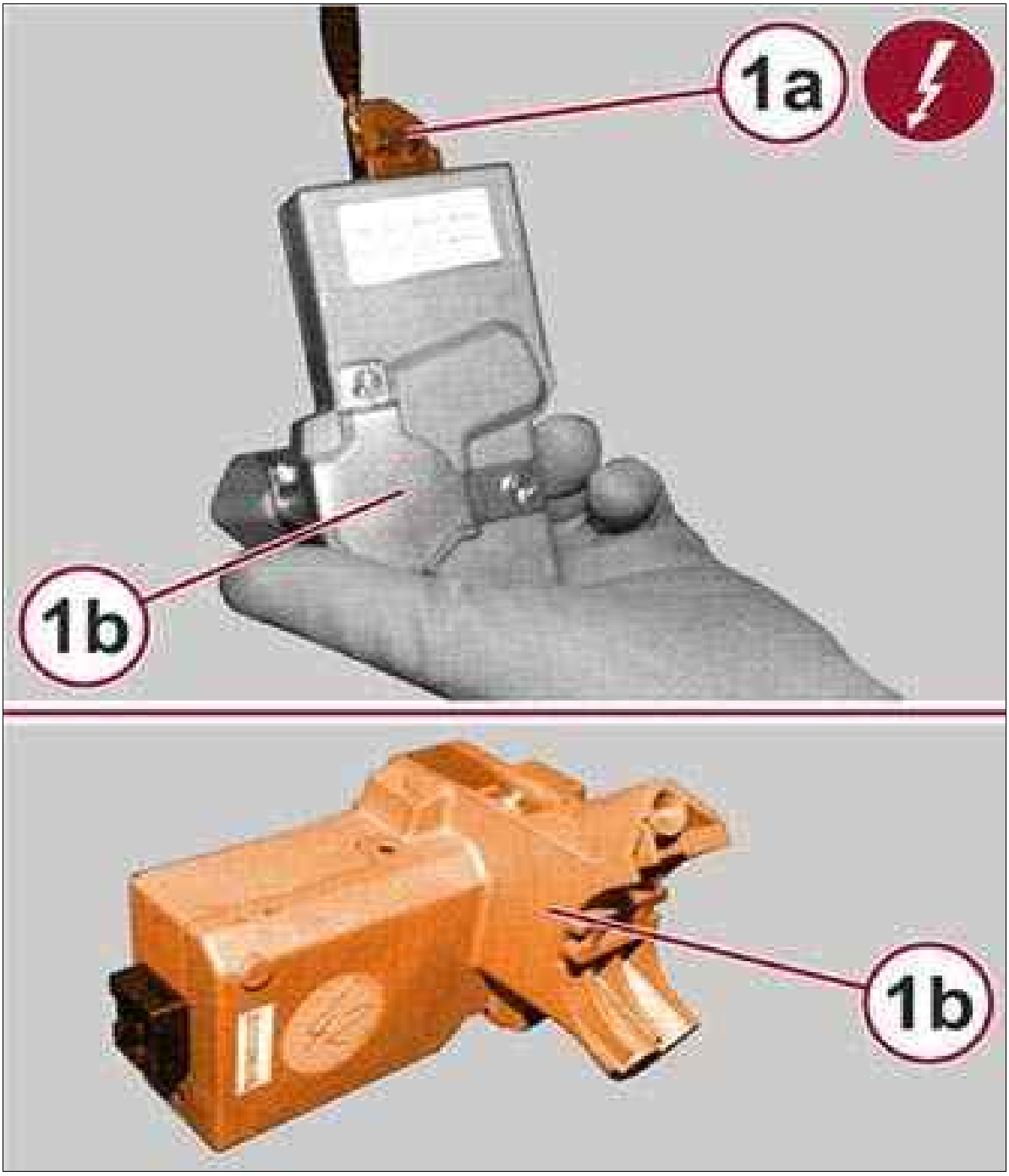
2. Disconnect the steering column stalk electrical connection (1) and move the wiring aside.
3. Use a hammer and chisel to remove the headless screws (2a) and extract the electronic steering lock module (2b) from its housing.

Fig 2: Electronic Steering Lock Module & Connector



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4. Disconnect the electrical connection (1a) and keep the electronic steering lock module (1b).

MODULE, ELECTRONIC STEERING LOCK (ESL) > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

1. Check that the electronic steering lock module is not damaged.
2. Connect the electrical connection.

3. Place the electronic steering lock module in its housing and tighten the new special screws until the head shears off.
4. Connect the steering column stalk electrical connection and reposition the wiring.
5. Install the steering column shroud. Refer to SHROUD, STEERING COLUMN, REMOVAL AND INSTALLATION .
6. Connect the negative battery cable.
7. Perform module programming as needed. For further information, refer to MODULE, ELECTRONIC STEERING LOCK (ESL), MODULE PROGRAMMING .

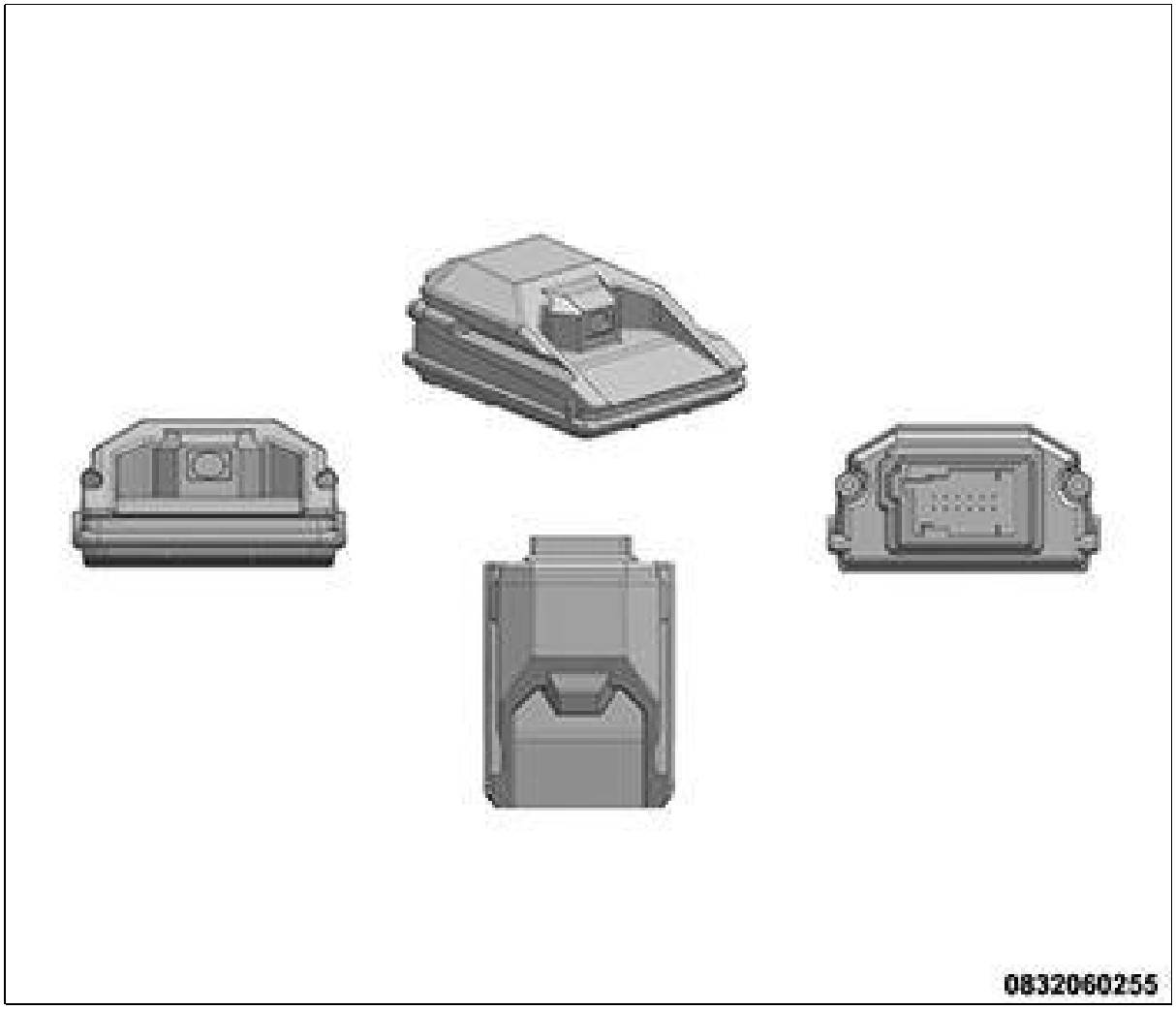
MODULE, ELECTRONIC STEERING LOCK (ESL) > MODULE PROGRAMMING > ESL PROGRAMMING

If the Electronic Steering Lock (ESL) module is replaced:

1. Connect the diagnostic scan tool to the vehicle.
2. Navigate to the Body Control Module (BCM) in the "Misc Functions" menu.
3. Start the "Secret key transfer to ECM/ESL" routine.

MODULE, FORWARD FACING CAMERA > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

Fig 1: Forward Facing Camera



Courtesy of CHRYSLER GROUP, LLC

The Forward Facing Camera (FFC) module is a stand-alone monocular camera mounted to the inside interior of the front windshield, within the Combined Rear View Mirror Module (CRVMM) housing, that captures and processes video images. The camera will perform the following functions on this model:

- **Automatic High Beam Control (AHBC)** - Based on ambient situations, the AHBC feature will control the vehicle high-beam headlights automatically, relieving the driver of the manual operation of the high beam headlights. The AHBC feature automatically turns off the high beams when there is oncoming traffic, preceding traffic, presence of a village, high ambient lighting due to a town or twilight/dusk, when the vehicle driving speed too low, delay and fog.
- **Object detection for supporting data fusion (ACC+)** - The camera provides additional object, lane and environmental conditions for data fusion. The FFC will also perform redundancy checks with the ACC radar to verify accurate detection.
- **Lane Departure Warning (LDW+)** - LDW+ utilizes camera-based machine vision sensor to detect and measure vehicle position within lane boundaries (when enabled). The system can be turned on or off with a single hard button on the Auxiliary Switch Bank Module (ASBM). The driver can configure the torque feedback amount and warning zone start point through the personalization settings in the radio. Three settings for each are provided.
- **Forward Collision Warning Plus (FCW+)** - The FFC in conjunction with the radar sensor is used to detect whether the vehicle is approaching another vehicle or large obstacle in its path too rapidly and will

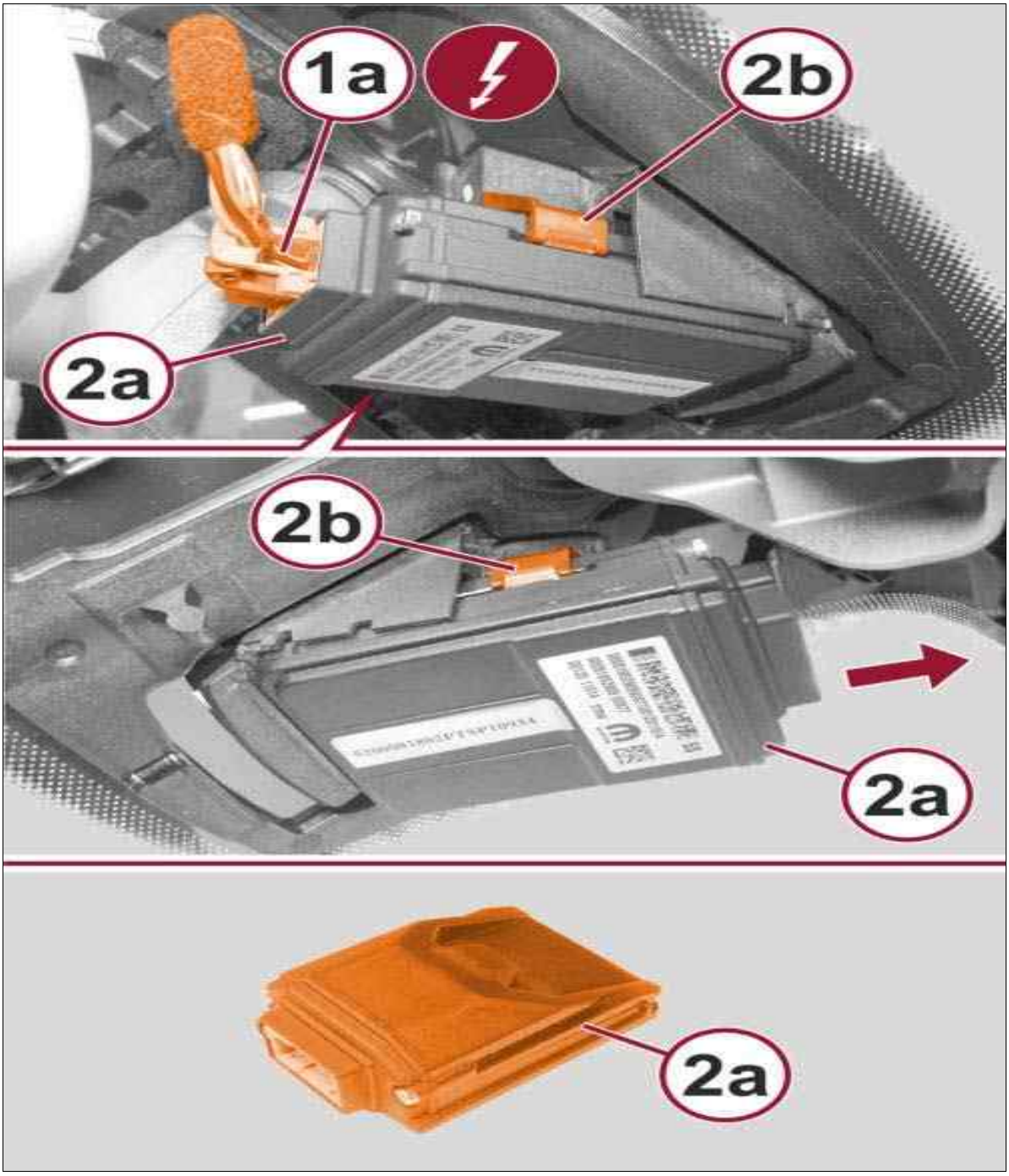
warn/assist the driver in avoiding/mitigating the incident (when enabled). The driver has the ability to adjust the sensitivity and turn brake support on or off in the radio.

The camera and bracket are not adjustable or repairable and must be replaced if inoperable or damaged.

MODULE, FORWARD FACING CAMERA > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.
2. Separate the rear view mirror trim covers to gain access to the Forward Facing Camera (FFC). Refer to MIRROR, REARVIEW, REMOVAL AND INSTALLATION .

Fig 1: Forward Facing Camera & Connector



Courtesy of CHRYSLER GROUP, LLC

3. Disconnect the electrical connector (1a) from the FFC (2a).
4. The FFC is attached to a bracket in a hook and rotate fashion. Rotate the FFC downwards while disengaging the bracket's hooks to release from the bracket. It is easier to remove the FFC from the passenger seat.

MODULE, FORWARD FACING CAMERA > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

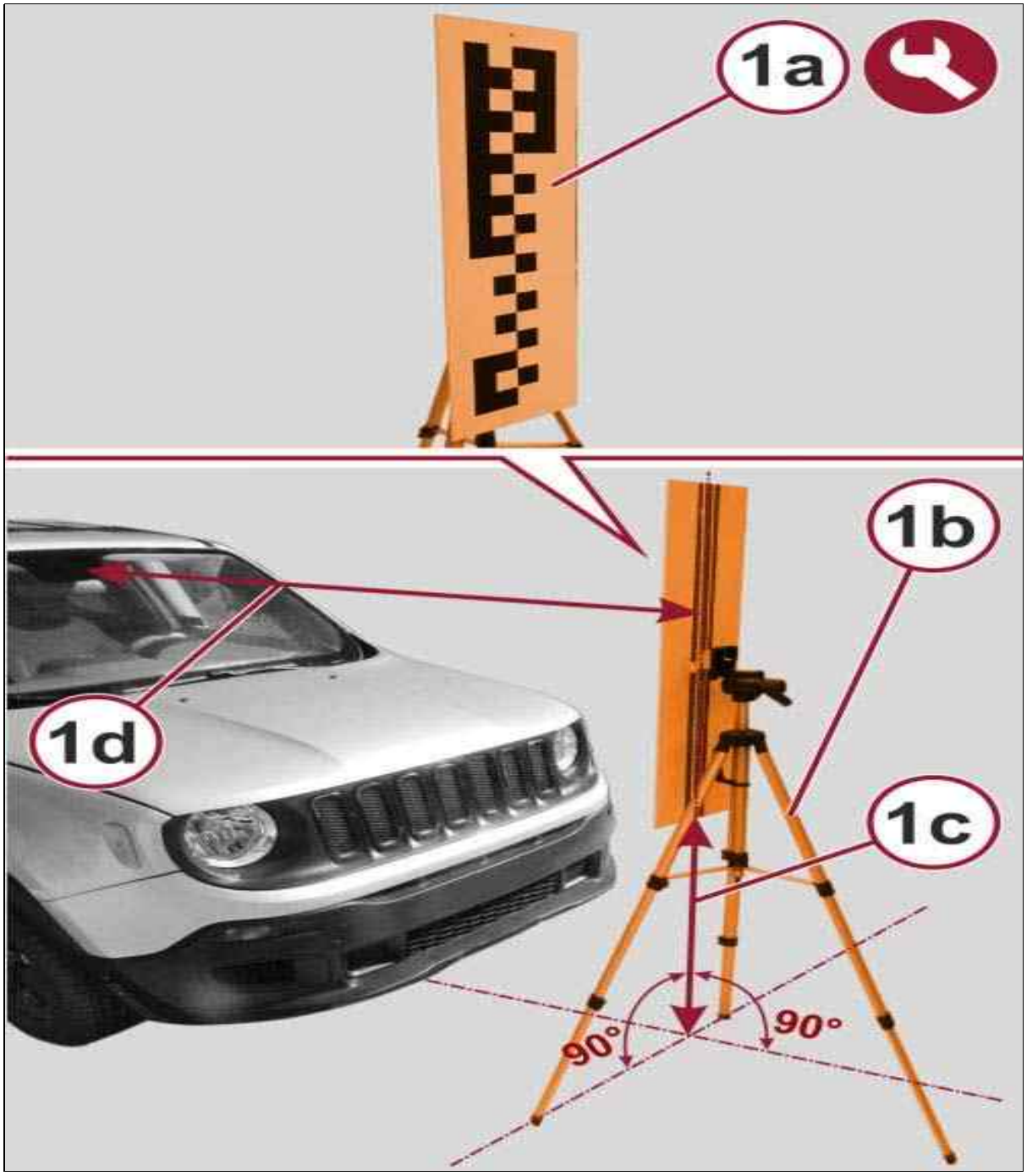
NOTE:

Ensure that both inside and outside of the windshield in the area of the Forward Facing Camera (FFC) is clean of dirt, dust, or finger prints prior to installation.

1. Install the FFC to the bracket on the windshield. Position the FFC to the bracket attachment point making sure that the alignment tabs are proper and set the FFC in place until the bracket locks engage.
2. Connect the electrical connector to the back of the FFC.
3. Assemble the rear view mirror covers into place. Refer to MIRROR, REARVIEW, REMOVAL AND INSTALLATION .
4. Connect the negative battery cable.

MODULE, FORWARD FACING CAMERA > MODULE PROGRAMMING > LDW+ CALIBRATION PROCEDURE

Fig 1: Forward Facing Camera Calibration Procedure



Courtesy of CHRYSLER GROUP, LLC

NOTE:

The following procedure explains how to calibrate the Forward Facing Camera (FFC) when replacing the FFC (a replacement FFC is not factory calibrated). This procedure should also be used when the windshield is replaced.

Perform the following checks and setup prior to performing the calibration procedure:

- Confirm that the vehicle is unloaded (no luggage or extra weight being carried).
- Check and correct the tire pressures as needed.
- Check that the windshield is free of damage, is clean and that there are no impediments to the vision of the FFC.
- Place the vehicle on level ground and in good light.
- Align the wheels to the longitudinal axis of the car.
- Place the tool (1a) on a suitable support (1b), at a height from the ground (1c) of 90 cm and the distance (1d) of 170 cm from the FFC.

> *NOTE:*
>
> *The calibration procedure is performed by placing the equipment to two different distances from the FFC. The diagnostic scan tool will warn when changing its position.*

> *NOTE:*
>
> *The equipment must be positioned perpendicular to the longitudinal axis of the car.*

> *NOTE:*
>
> *Small variations compared to the dimensions will prevent FFC calibration.*

> *NOTE:*
>
> *It is critical to not alter the position of he equipment between the two phases of the calibration procedure. If possible, proceed with the handling of the vehicle itself and not the equipment. If this is not possible, be very careful when moving the equipment to not alter the angle of the panel with respect to the vehicle. Small variations compared to the dimensions will prevent FFC calibration.*

CALIBRATION PROCEDURE

1. Connect the diagnostic scan tool and start the car. The system must not be activated.
2. Start the calibration function through the diagnostic scan tool.
3. At the end of the first phase of the calibration routine, the diagnostic tool will alert you to change the location of the equipment.
4. Position the equipment at a distance of 270 cm from the FFC.
5. Proceed with the second phase of the calibration following the instructions on the diagnostic scan tool.
6. The diagnosis scan tool will display a message indicating the end of the calibration procedure has been reached. In case of calibration failure the diagnostic tool will also indicate the causes.

7. Disconnect the diagnostic scan tool and run a cycle key.

NOTE:

If during operation, the LDW+ system releases alerts inconsistent with the actual driving conditions (eg: car properly between lanes but notice the crossing lane), the system must be calibrated again.

MODULE, HVAC > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

WARNING:

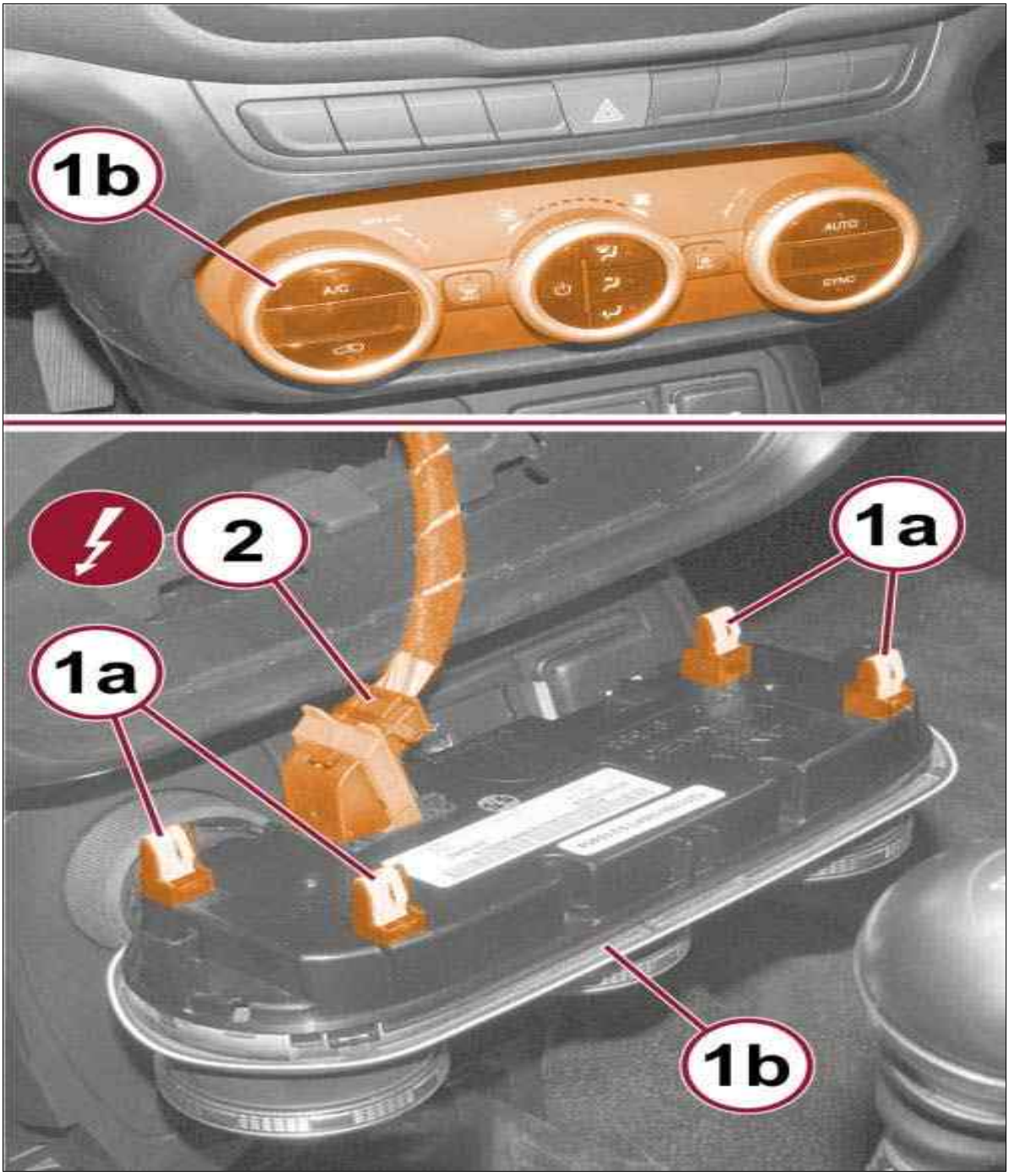
To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbags, airbag curtains, knee blocker, seat belt tensioner, impact sensor or instrument panel component diagnosis or service. Refer to WARNING . Disconnect the IBS/negative battery cable assembly from the negative battery post, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE:

Automatic A/C heater control shown in illustration, manual A/C heater control similar.

1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.
2. Remove the radio. Refer to RADIO, REMOVAL AND INSTALLATION .

Fig 1: A/C Heater Control, Retaining Clips & Connector



Courtesy of CHRYSLER GROUP, LLC

3. Reaching through the radio compartment to access the A/C heater control retaining clips (1a), disengage the four retainers (1a) while pulling the A/C heater control (1b) away from the instrument panel.
4. Disconnect the HVAC wire harness connector (2) from the A/C heater control (1b) and remove the A/C heater control.

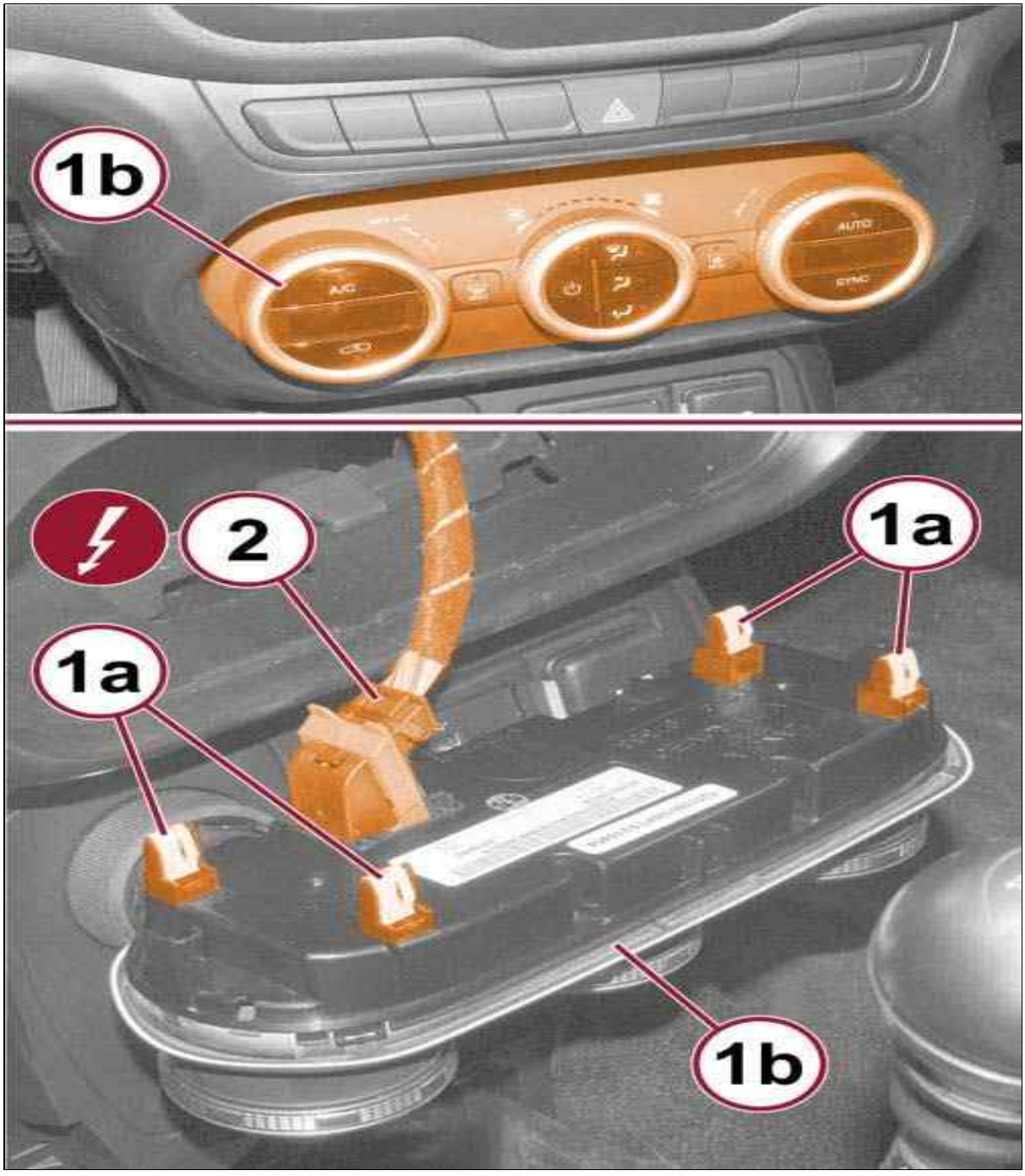
MODULE, HVAC > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION >

INSTALLATION

NOTE:

Automatic A/C heater control shown in illustration, manual A/C heater control similar.

Fig 1: A/C Heater Control, Retaining Clips & Connector



Courtesy of CHRYSLER GROUP, LLC

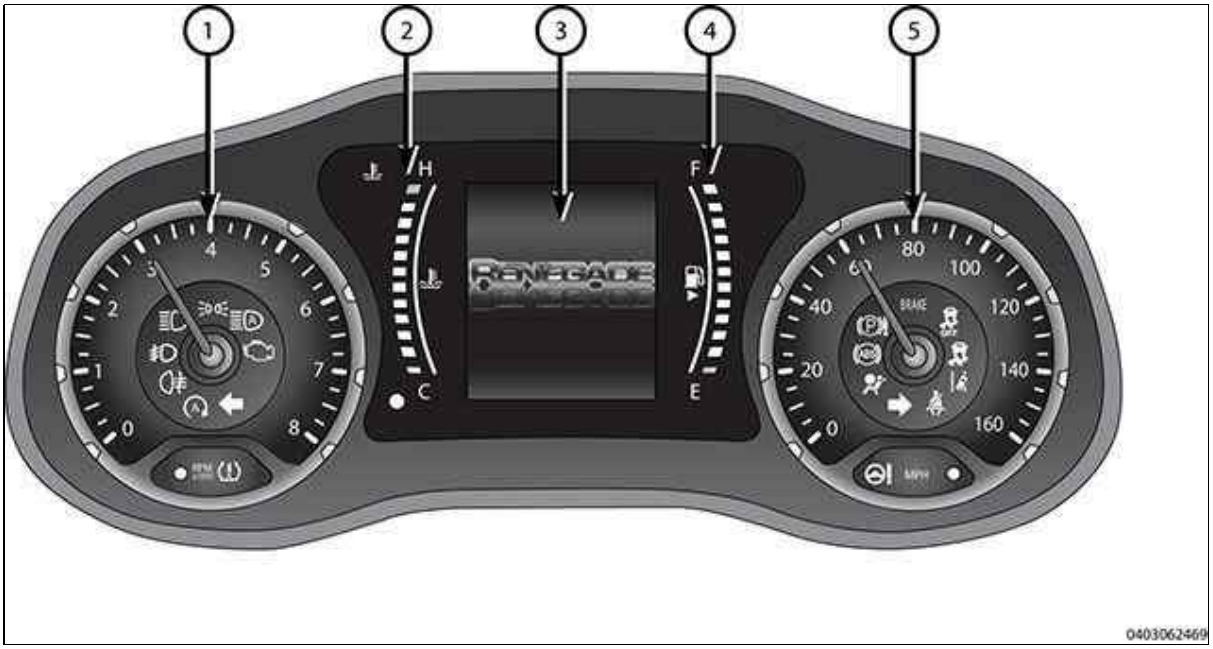
1. Position the A/C heater control (1b) to the instrument panel and connect the HVAC wire harness connector (2).

2. Align the four retainers (1a) of the A/C heater control (1b) with the instrument panel and press into place. Be certain all four retainers (1a) are fully engaged with the instrument panel.
3. Install the radio. Refer to RADIO, REMOVAL AND INSTALLATION .
4. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector.
5. Initiate the Actuator Calibration function using a scan tool. Refer to STANDARD PROCEDURE .

> *NOTE:*
>
> ***If this Electronic Control Unit (ECU) is being replaced with a new unit, a diagnostic scan tool MUST be used to align the PROXI configuration data into the new ECU. Follow the routine outlined in the diagnostic scan tool for PROXI Configuration Alignment under Body Control Module (BCM) Miscellaneous Functions menu.***

MODULE, INSTRUMENT PANEL CLUSTER > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

Fig 1: Instrument Panel Cluster (IPC)



Courtesy of CHRYSLER GROUP, LLC

The Instrument Panel Cluster (IPC) for this vehicle is located in the instrument panel above the steering column opening. The IPC gauges and indicators are visible through an opening in the cluster bezel and are protected by a clear plastic cluster lens that is secured to the cluster housing by integral latch formations.

The molded plastic cluster housing encloses and protects the perimeter of the IPC unit. The cluster housing serves as the carrier for the instrument cluster circuitry, the gauge set, the indicators, an electronic display unit as well as an audible tone transducer. Each of the cluster hard indicators as well as the general cluster illumination is provided by dedicated Light Emitting Diode (LED) units soldered to the cluster electronic circuit board. A molded plastic rear cover includes clearance holes for the connector receptacle and is secured to the

cluster housing by screws. The connector receptacle on the back of the IPC electronic circuit board connects the unit to the electrical system of the vehicle through a dedicated take out and connector of the instrument panel wire harness.

Just behind the cluster lens is the molded plastic cluster mask. The mask serves to separate and define the layout of the various visible areas of the IPC and also trims the cluster overlay. The mask lays over the cluster overlay, which is a laminated plastic unit. The dark, visible, outer surface of the overlay is marked with all of the gauge dial faces and graduations, but this layer is also translucent. The darkness of this outer layer prevents the cluster from appearing cluttered or busy by concealing the hard indicators that are not illuminated, while the translucence of this layer allows those hard indicators that are illuminated to be readily visible. The underlying layer of the overlay is opaque and allows light from the hard indicator LED units to be visible through the outer layer of the overlay through predetermined stencil-like cutouts. The defined areas of the IPC are:

- **Tachometer (1)**

  - This is the analog tachometer scale.

- **Temperature Gauge (2)**

  - This is the analog temperature scale.

- **Electronic Display Unit (3)**

  - This is the electronic display unit. It includes an odometer display, several trip computer functions, a message center, numerous predetermined soft indicators and several reconfigurable display options.

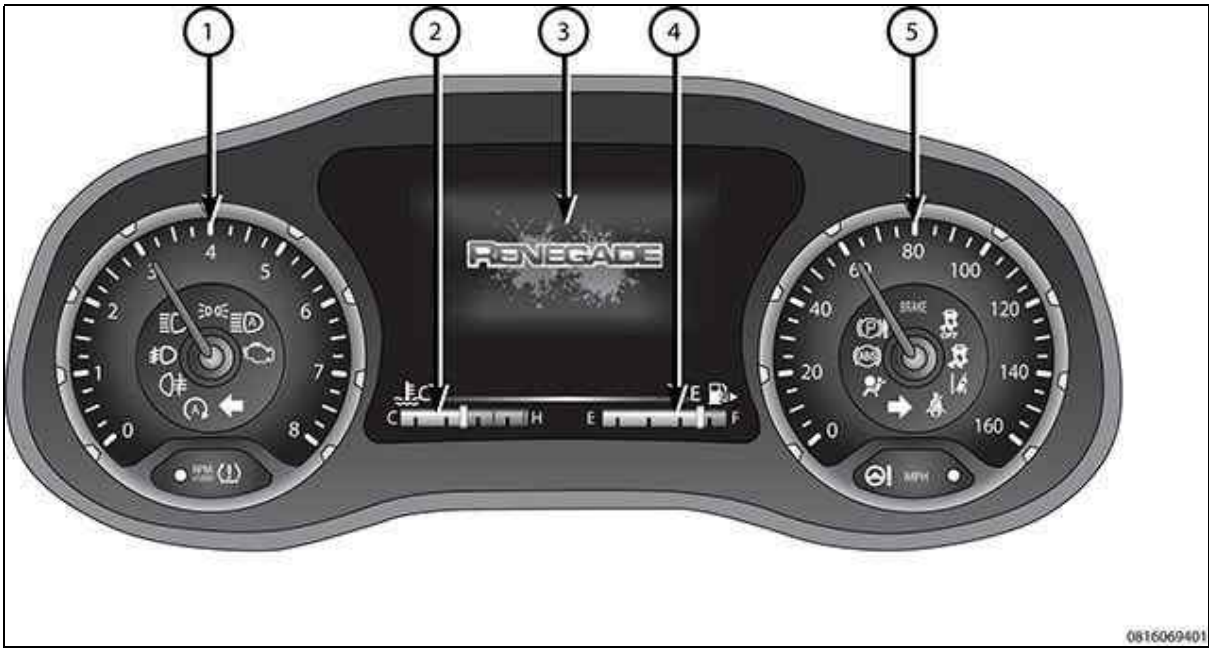
- **Fuel Level Gauge (4)**

  - This is the analog fuel level scale.

- **Speedometer (5)**

  - This is the analog speedometer scale.

Fig 2: Instrument Panel Cluster (IPC)



Courtesy of CHRYSLER GROUP, LLC

Several versions of the IPC are offered on this vehicle. These versions accommodate all of the variations of

optional equipment and regulatory requirements for the various markets in which the vehicle is offered. The microcontroller-based IPC utilizes integrated circuitry and information carried on the Controller Area Network (CAN) data bus along with several hard wired inputs to monitor other sensors and switches in the vehicle. In response to those inputs, the internal circuitry and programming of the IPC allow it to monitor many electronic functions and features of the vehicle.

The IPC is mounted behind the steering wheel, is connected to the CAN and includes four gauges:

- **Tachometer (1)**

  - This is the analog tachometer scale.

- **Temperature Gauge (2)**

  - This is the analog temperature scale.

- **Electronic Display Unit (3)**

  - This is the electronic display unit. It includes an odometer display, several trip computer functions, a message center, numerous predetermined soft indicators and several reconfigurable display options.

- **Fuel Level Gauge (4)**

  - This is the analog fuel level scale.

- **Speedometer (5)**

  - This is the analog speedometer scale.

At the center is a large display (available in two different versions and is reconfigurable), the Electronic Vehicle Information Center (EVIC). In the various information positions are located numerous warning lights, described in the service information of the functions to which they relate.

The IPC receives and manages the messages coming from the compass module and the humidity sensor (if present) via the LIN line.

The BCM directly controls the door closing red flashing LED, located in the instrument panel.

For the versions in which the "SERVICE" menu is present, a dedicated menu for resetting the SERVICE will be available in the IPC module diagnosis. The "SERVICE" resetting procedure must be carried out via diagnosis equipment.

For versions in which the pre-delivery mileage RESET function is present, when the vehicle is new or with less than 200 km (124 miles) the display shows the letter "H" before mileage. As long as mileage is below 200 km (124 miles) and the "H" is displayed this can be reset, since it is considered as pre-delivery movement. Resetting of pre-delivery mileage is carried out through diagnosis equipment in the IPC module diagnosis.

Within the IPC is placed a chime with the ability to manage reports of different intensity, in order to fulfill the many functions (described in the diagrams of the functions to which they relate).

The IPC is a module of the CAN through which it exchanges information with the Body Control Module (BCM) and other electronic control units, in detail:

- - Speedometer: the function is to display on the dashboard of the car speed: this information comes from the Antilock Brake System (ABS) control unit and Powertrain Control Module (PCM), using the BCM

- - Engine RPM: the function is to display on the IPC the rotational speed of the engine by means of the message sent via the CAN by the PCM

- - Odometer: function provides for the display and storage of total and partial information that are processed by the BCM through a counter that is transmitted via the CAN to the IPC

- - Fuel level: the BCM receives the signal from the sensor built into the fuel pump inside the tank and processes it to ensure an appropriate filtering / damping to the indicator of the IPC and also controls the lighting of the "reserve" lamp

The IPC indicator circuit is able to detect any anomaly in the wiring or the sensor and provide an appropriate indication to the IPC:

- - Fuel level: in case of system malfunction, the index is placed at the beginning of scale and the light of the "reserve" flashes.
- - Engine coolant temperature: the function is to display on the IPC the coolant temperature and the indicator light will light of excessive engine temperature by means of messages sent via the CAN by the PCM. The temperature reading is always guaranteed, even in extreme conditions of operation.
- - Low engine oil pressure: the function includes the lighting on the IPC of minimum engine oil pressure warning light through a message sent via CAN by the PCM.
- - Park Brake: the BCM acquires the status of the parking brake from the switch and communicates specific activation to the IPC through the CAN, the function includes the lighting on the IPC of the "brake fluid level too low" warning light; also, if this signal is associated to pass a certain threshold of speed, an acoustic signal is activated.
- - Insufficient brake fluid: the function includes the lighting on the IPC of the "brake fluid level too low" warning light. The signal is sent via the CAN by the BCM.

The IPC gauges, indicators, LED units, control switches as well as the electronic display unit are all integral components of the IPC and its electronic circuit board. If any part of the IPC is damaged or ineffective, the entire IPC assembly must be replaced.

MODULE, INSTRUMENT PANEL CLUSTER > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

The IPC has the hardware and software to simultaneously monitor multiple inputs. The microcontroller-based IPC uses these inputs to control the gauges and indicators visible on the face of the cluster, and to display the appropriate information in the electronic display unit to allow the vehicle operator to monitor the conditions of many of the vehicle components and operating systems. The IPC display provides valuable information about the various standard and optional powertrains, fuel and emissions systems, cooling systems, lighting systems, safety systems and many other convenience items. The IPC is installed in the instrument panel so that all of these monitors can be easily viewed by the vehicle operator when driving, while still allowing relative ease of access for service.

Some of the IPC inputs are hard wired, but most are in the form of electronic messages that are transmitted by other electronic modules over the Controller Area Network (CAN) data bus. The IPC microcontroller smooths the input data using algorithms to provide gauge readings that are accurate, stable and responsive to operating conditions. These algorithms are designed to provide gauge readings during normal operation that are consistent with customer expectations. However, when abnormal conditions exist such as high coolant temperature, the algorithm can provide an extreme output and the microcontroller can sound a chime through the on-board audible tone transducer to provide distinct visual and audible indications of a problem to the vehicle operator. The IPC may also produce audible warnings for other electronic modules in the vehicle based upon electronic **tone request** messages received over the CAN data bus. Each audible warning is intended to provide the vehicle operator with an audible alert to supplement a visual indication.

The Body Control Module (BCM) stores and compares vehicle configuration data with the IPC as well as with other Electronic Control Units (ECU) in the vehicle. This process is referred to as PRogramming Of Configuration of Systems Integrated (PROCSI) (also known as PROXI). If a configuration mismatch is detected, the BCM sets a DTC. A configuration mismatch DTC will require the performance of a Restore BCM

PROXI Configuration routine, or a PROXI Configuration Alignment routine using a diagnostic scan tool.

The IPC circuitry operates on battery current received through a fused B(+) fuse on a non-switched fused B(+) circuit. This arrangement allows the IPC to remain functional regardless of the status of the ignition switch. The IPC circuitry is grounded through a ground circuit and take out of the instrument panel wire harness with an eyelet terminal connector that is secured by a ground screw to a ground location on the instrument panel structural support.

The hard wired circuits between components related to the IPC may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin out information and location views for the various wire harness connectors, splices and grounds.

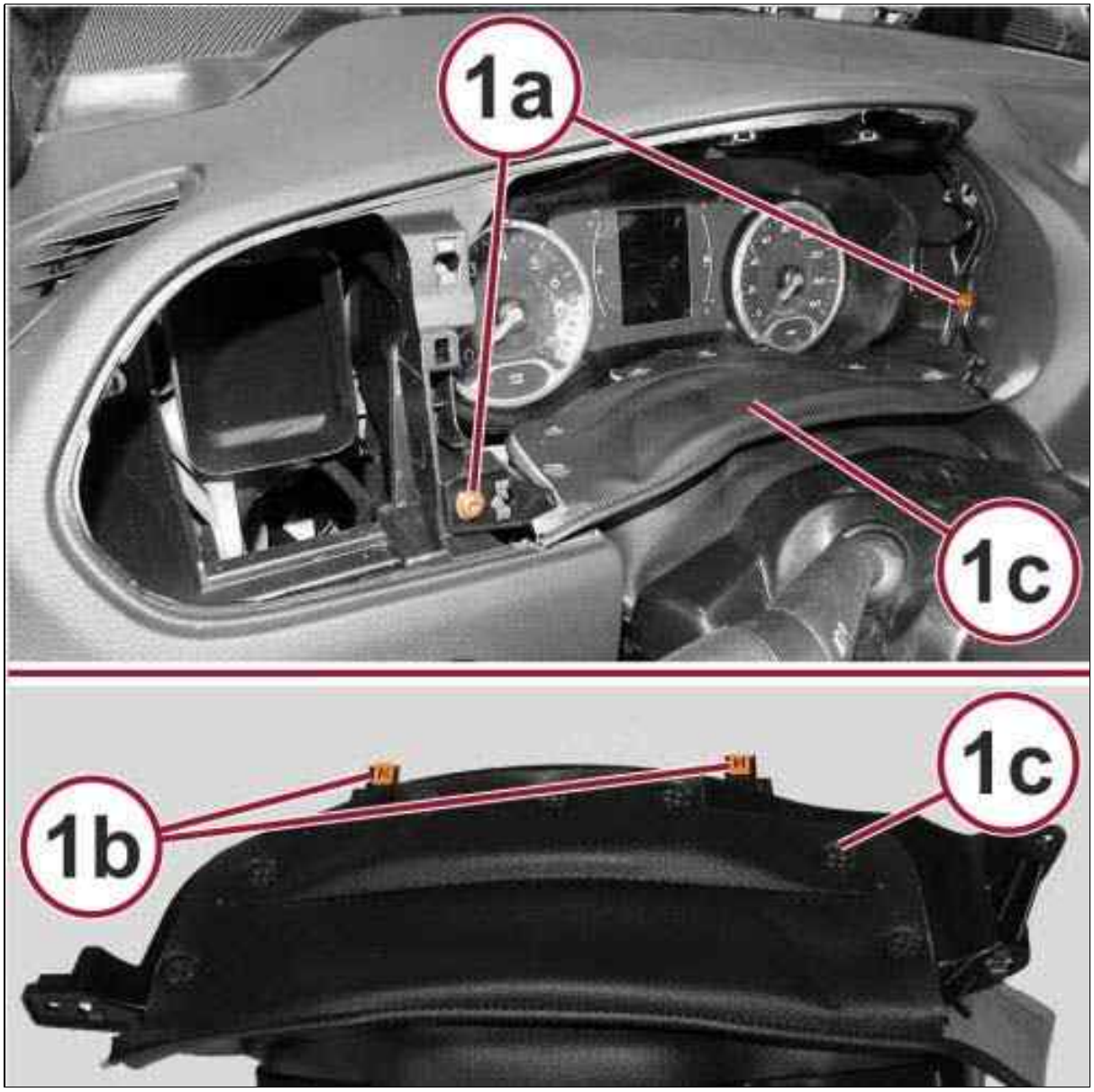
However, conventional diagnostic methods will not prove conclusive in the diagnosis of the IPC or the electronic controls or communication between modules and other devices that provide some features of the IPC. The most reliable, efficient and accurate means to diagnose the IPC or the electronic controls and communication related to IPC operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

MODULE, INSTRUMENT PANEL CLUSTER > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

WARNING:

To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbags, airbag curtains, knee blocker, seat belt tensioner, impact sensor or instrument panel component diagnosis or service. Refer to WARNING . Disconnect the IBS/negative battery cable assembly from the negative battery post, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

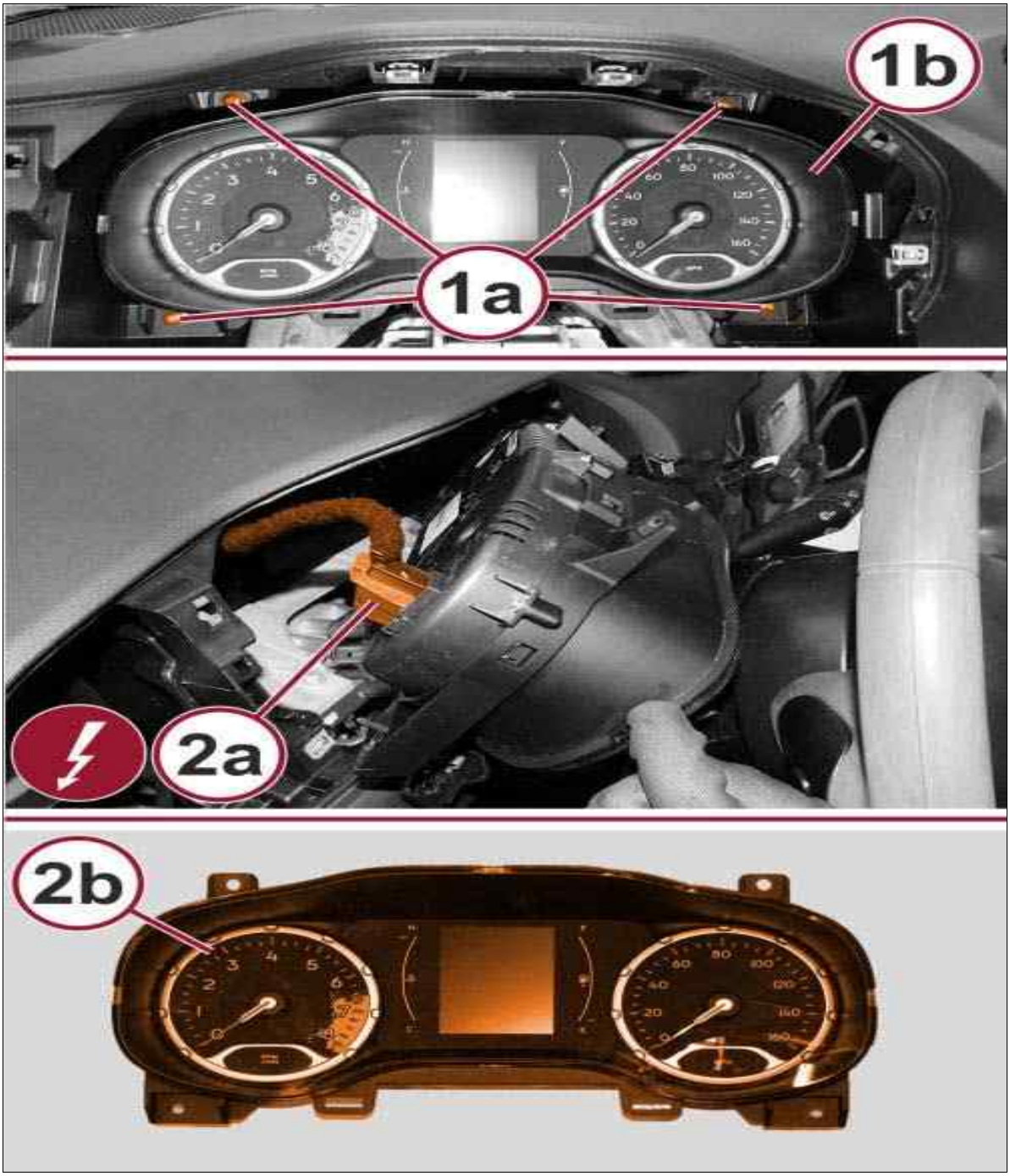
Fig 1: Steering Column Shroud Gap Hider & Fasteners



Courtesy of CHRYSLER GROUP, LLC

1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.
2. Lower the steering column to the downward most position.
3. Telescope the steering column to its extended most position.
4. Remove the instrument cluster bezel from the instrument panel. Refer to BEZEL, INSTRUMENT CLUSTER, REMOVAL AND INSTALLATION .
5. Remove the two fasteners (1a) from the steering column shroud gap hider (1c) and remove the gap hider from the vehicle.

Fig 2: Instrument Panel Cluster, Wiring Harness Connector & Fasteners



Courtesy of CHRYSLER GROUP, LLC

6. Remove the four fasteners (1a) that secure the instrument panel cluster (1b) to the instrument panel.
7. Disconnect the instrument panel wiring harness connector (2a) from the receptacle on the back of the instrument panel cluster (2b).
8. Remove the instrument panel cluster (2b) from the instrument panel.

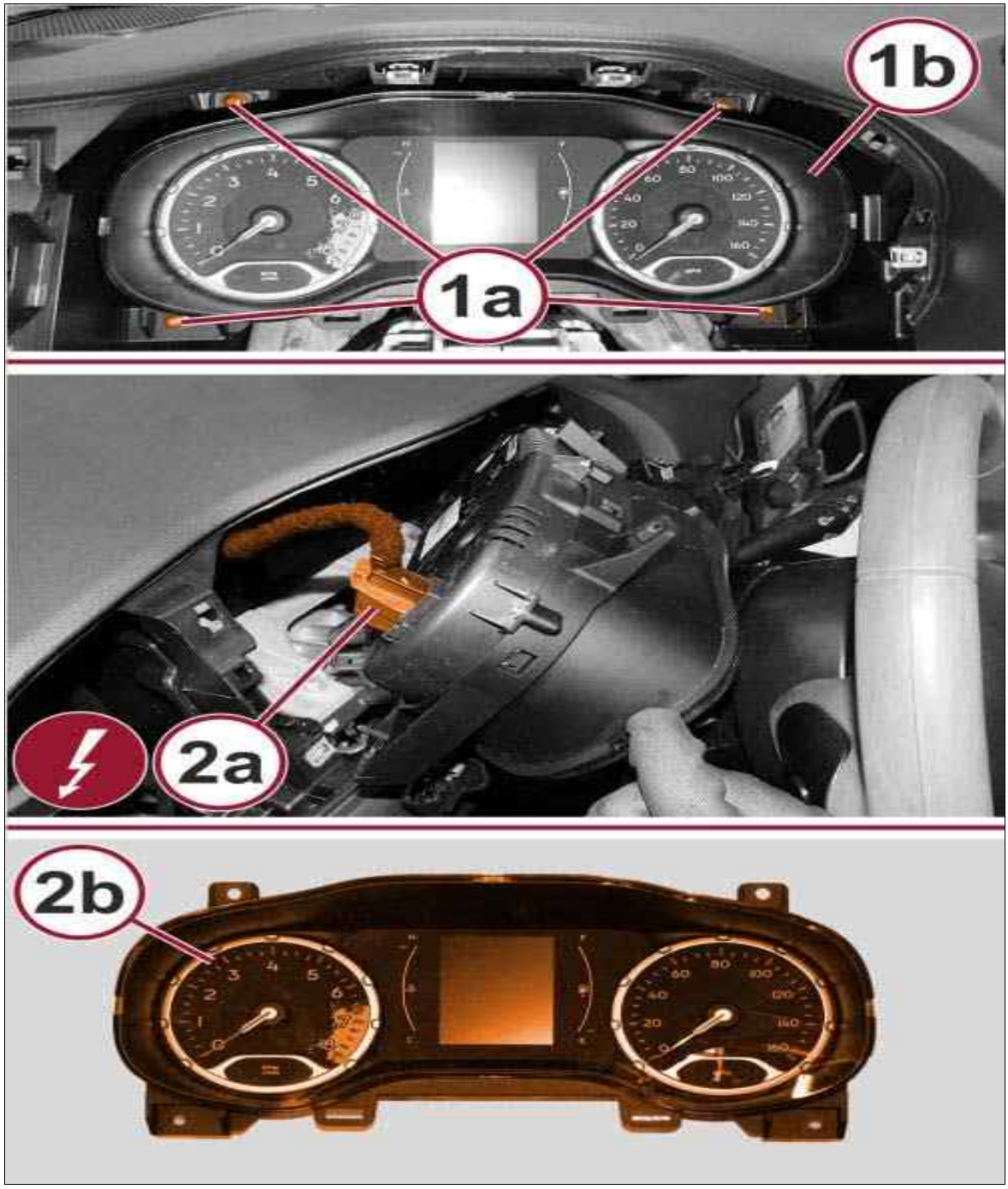
MODULE, INSTRUMENT PANEL CLUSTER > REMOVAL AND INSTALLATION > REMOVAL

WARNING:

To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbags, airbag curtains, knee blocker, seat belt tensioner, impact sensor or instrument panel component diagnosis or service. Refer to WARNING . Disconnect the IBS/negative battery cable assembly from the negative battery post, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE:

Fig 1: Instrument Panel Cluster, Wiring Harness Connector & Fasteners

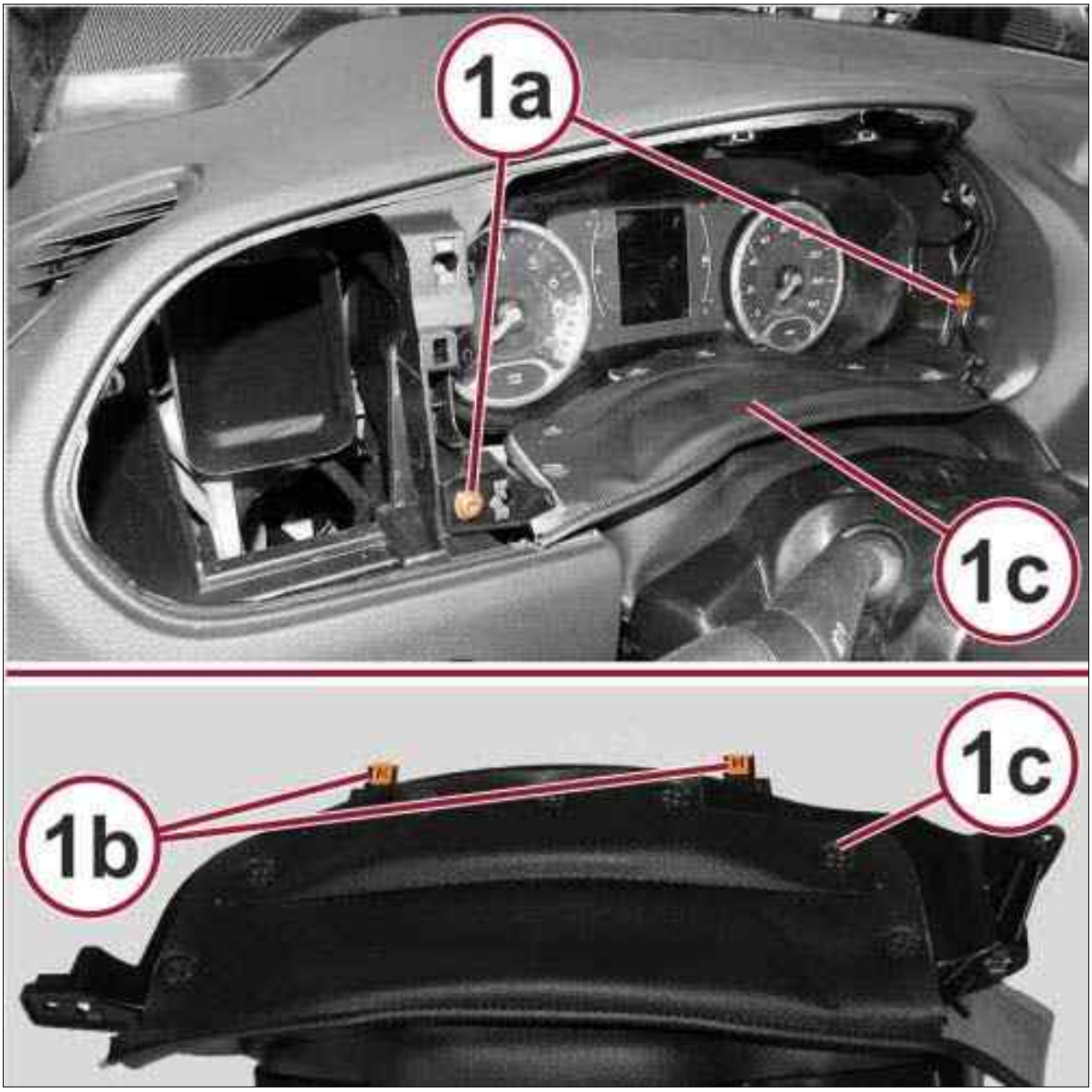


Courtesy of CHRYSLER GROUP, LLC

Make sure that the steering column remains in the lowest position setting.

1. Telescope the steering column to its extended most position.
2. Position the instrument cluster close enough to the instrument panel to access and connect the instrument panel wire harness connector (2a) to the receptacle on the back of the cluster housing.
3. Install and securely tighten the four screws (1a) that secure the instrument panel cluster to the instrument panel.

Fig 2: Steering Column Shroud Gap Hider & Fasteners



Courtesy of CHRYSLER GROUP, LLC

4. Position the steering column shroud gap hider (1c) to the instrument panel and install the two fasteners (1a). Be certain the retaining clips (1b) are fully engaged with the instrument panel.
5. Install the instrument cluster bezel onto the instrument panel. Refer to BEZEL, INSTRUMENT CLUSTER, REMOVAL AND INSTALLATION .
6. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector.

NOTE:

If this Electronic Control Unit (ECU) is being replaced with a new unit, a diagnostic scan tool MUST be used to align the PROXI Configuration data into the new ECU. Follow the routine outlined in the diagnostic scan tool for PROXI Configuration Alignment under Miscellaneous Functions for the ECU menu item. Refer to MODULE, INSTRUMENT PANEL CLUSTER, MODULE PROGRAMMING .

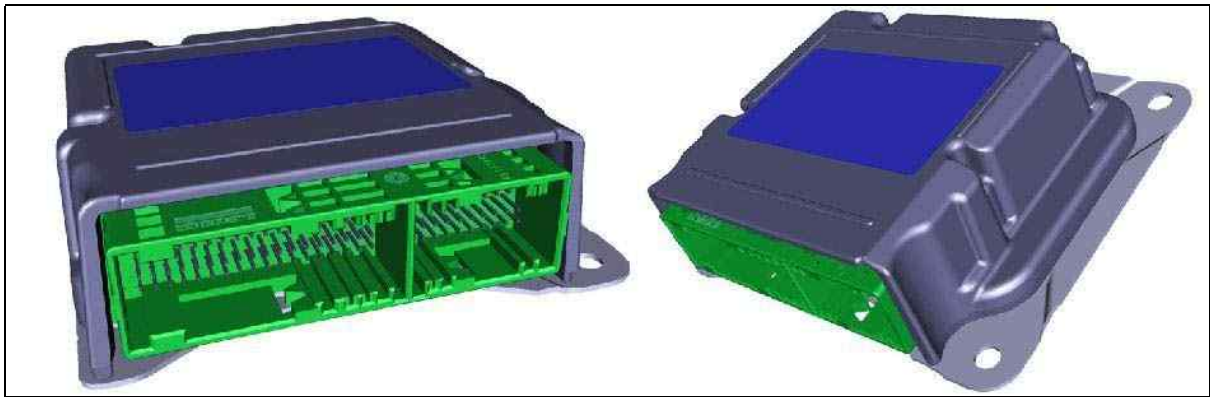
MODULE, INSTRUMENT PANEL CLUSTER > MODULE PROGRAMMING > PROGRAM THE IPC (INSTRUMENT PANEL CLUSTER)

1. Connect the scan tool.
2. Check vehicle for DTC's.
3. Clear all stored DTC's.
4. Turn car OFF then ON and confirm DTC's are gone.
5. From the Vehicle View, Click on the IPC icon >> Misc. Functions >> Proxi Configuration

If required, continue to programming the next module.

MODULE, OCCUPANT RESTRAINT > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

Fig 1: Occupant Restraint Controller Module



Courtesy of CHRYSLER GROUP, LLC

The Occupant Restraint Controller (ORC) module, located on the floor tunnel under the instrument panel center console, monitors the impact and occupant sensors and activates restraint system devices in the event of an impact. The ORC also contains impact sensors that are used to determine the level of deployment and to verify the information received from the remote sensors.

An arrow printed on the ORC label indicates the installation orientation. The arrow must point toward the front of the vehicle. The ORC must be installed correctly for correct restraint system operation.

The ORC module will set a specific DTC which cannot be deleted, not even using the diagnostic tool. This will

happen when you reach:

- 3 activations of the pretensioners, EMEA only
- 2 activations of the pretensioners, NAFTA only
- 3 activations of the side airbags, EMEA only
- 2 activations of the side airbags, NAFTA only
- 1 activation of the pretensioners plus the front airbags; all versions
- Any other combination of the above mentioned cases until one of the limits is reached

When one of the above mentioned limits is reached, the ORC module will have to be replaced.

In EMEA versions the front passenger airbag can be deactivated via the vehicle menu. A dedicated LED indicates its deactivation.

Fig 2: Warning Indicators

Courtesy of CHRYSLER GROUP, LLC

The yaw or lateral acceleration sensor is installed inside the ORC module and is used for the correct operation of the vehicle dynamic stability functions.

The impact sensor and safing sensor internal to the ORC are calibrated for the specific vehicle, and are only serviced as a unit with the ORC. In addition, there are unique versions of the ORC for vehicles with or without certain optional Supplemental Restraint System (SRS) components. The ORC cannot be repaired or adjusted and, if damaged or ineffective, it must be replaced.

MODULE, OCCUPANT RESTRAINT > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

The microcontroller within the ORC contains the SRS logic circuits and controls all of the SRS components. The ORC uses On-Board Diagnostics (OBD) and can communicate with other electronic modules in the vehicle as well as with the diagnostic scan tool using the Controller Area Network (CAN) data bus. This method of communication is used for control of the airbag indicator in the Instrument Panel Cluster (IPC) and for SRS diagnosis and testing through the 16-way data link connector located on the driver side lower edge of the instrument panel.

The ORC microcontroller continuously monitors all of the SRS electrical circuits to determine the system readiness. If the ORC detects a monitored system fault, it sets an active and stored Diagnostic Trouble Code (DTC) and sends electronic messages to the IPC over the CAN data bus to turn On the airbag indicator. An active fault only remains for the duration of the fault, or in some cases for the duration of the current ignition cycle, while a stored fault causes a DTC to be stored in memory by the ORC. For some DTCs, if a fault does not recur for a number of ignition cycles, the ORC will automatically erase the stored DTC. For other internal faults, the stored DTC is latched forever.

The ORC receives battery current through two circuits; a fused ignition output (run) circuit through a fuse in the Body Control Module (BCM) and a fused ignition output (run-start) circuit through a second fuse in the BCM. The ORC receives ground through a ground circuit and take out of the instrument panel wire harness that is secured by a nut to a weld stud on the floor panel transmission tunnel. These connections allow the ORC to be operational whenever the status of the ignition is Start or On.

The ORC also contains an energy-storage capacitor. When the status of the ignition is Start or On this capacitor is continually being charged with enough electrical energy to deploy the SRS components for up to one second following a battery disconnect or failure. The purpose of the capacitor is to provide backup SRS protection in case there is a loss of battery current supply to the ORC during an impact.

Various sensors within the ORC are continuously monitored by the ORC logic. These internal sensors, along with several external impact sensor inputs allow the ORC to determine both the severity of an impact and to verify the necessity for deployment of any SRS components. In vehicles manufactured for Europe-Middle East-Africa (EMEA) markets, a remote front impact sensor (also known as an Early Crash Sensor/ECS) is located on the back of the lower horizontal member of the radiator support near the center. In vehicles manufactured for North America Free Trade Agreement (NAFTA) markets, remote front impact sensors are located on the back of the right and left vertical members of the radiator support inboard of the headlamps. The electronic impact sensors are accelerometers that sense the rate of vehicle deceleration, which provides verification of the direction and severity of an impact.

The ORC also monitors inputs from the seat track position sensors (NAFTA market only), the front seat belt switches, the rear seat belt switches (EMEA markets only), an internal rollover sensor and four additional remote side impact sensors located on the left and right front door hardware module carriers and on the right and left lower B-pillars to control deployment of the side curtain airbag units and, if equipped, the front seat airbags (also known as pelvic and thoracic airbags). The ORC uses the seat belt switch inputs along with inputs from the Occupant Detection Sensor (ODS) in the passenger front seat cushion to support the seat belt alert feature, and will send electronic messages to the IPC to illuminate the seat belt indicator when appropriate.

The impact sensors within the ORC are electronic accelerometer sensors that provide an additional logic input to the ORC microcontroller. These sensors are used to verify the need for a SRS component deployment by

detecting impact energy of a lesser magnitude than that of the primary electronic impact sensors, and must exceed a safing threshold in order for the SRS components to deploy. A separate impact sensor within the ORC provides confirmation to the ORC microcontroller of side impact forces. This separate sensor is a bi-directional unit that detects impact forces from either side of the vehicle.

Pre-programmed decision algorithms in the ORC microcontroller determine when the deceleration rate as signaled by the impact sensors indicate an impact that is severe enough to require SRS protection. In NAFTA market vehicles, based upon the severity of the monitored impact, the ORC also determines the level of front airbag deployment force required for each front seating position. When the programmed conditions are met, the ORC sends the proper electrical signals to deploy the front airbags, the front seat belt tensioners and either side curtain and, if equipped, seat airbag unit.

The BCM stores and compares vehicle configuration data with the ORC as well as with other Electronic Control Units (ECU) in the vehicle. This process is referred to as PRogramming Of Configuration of Systems Integrated (PROCSI) (also known as PROXI). If a configuration mismatch is detected, the BCM sets a DTC. A configuration mismatch DTC will require the performance of a Restore BCM PROXI Configuration routine, or a PROXI Configuration Alignment routine using a diagnostic scan tool.

The hard wired inputs and outputs for the ORC may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the ORC or the electronic controls and communication between other modules and devices that provide some features of the SRS. The most reliable, efficient and accurate means to diagnose the ORC or the electronic controls and communication related to SRS operation requires the use of a diagnostic scan tool and may also require the use of the SRS Load Tool special tool along with the appropriate Load Tool Jumpers and Adapters. Refer to the appropriate diagnostic information.

MODULE, OCCUPANT RESTRAINT > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

WARNING:

To avoid serious or fatal injury on vehicles equipped with side curtain airbags, disable the Supplemental Restraint System (SRS) before attempting any Occupant Restraint Controller (ORC) diagnosis or service. The ORC may contain a rollover sensor, which enables the system to deploy the side SRS components in the event of a vehicle rollover event. If an ORC containing a rollover sensor is accidentally rolled during service while still connected to battery power, the side SRS components will deploy. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment. Refer to WARNING .

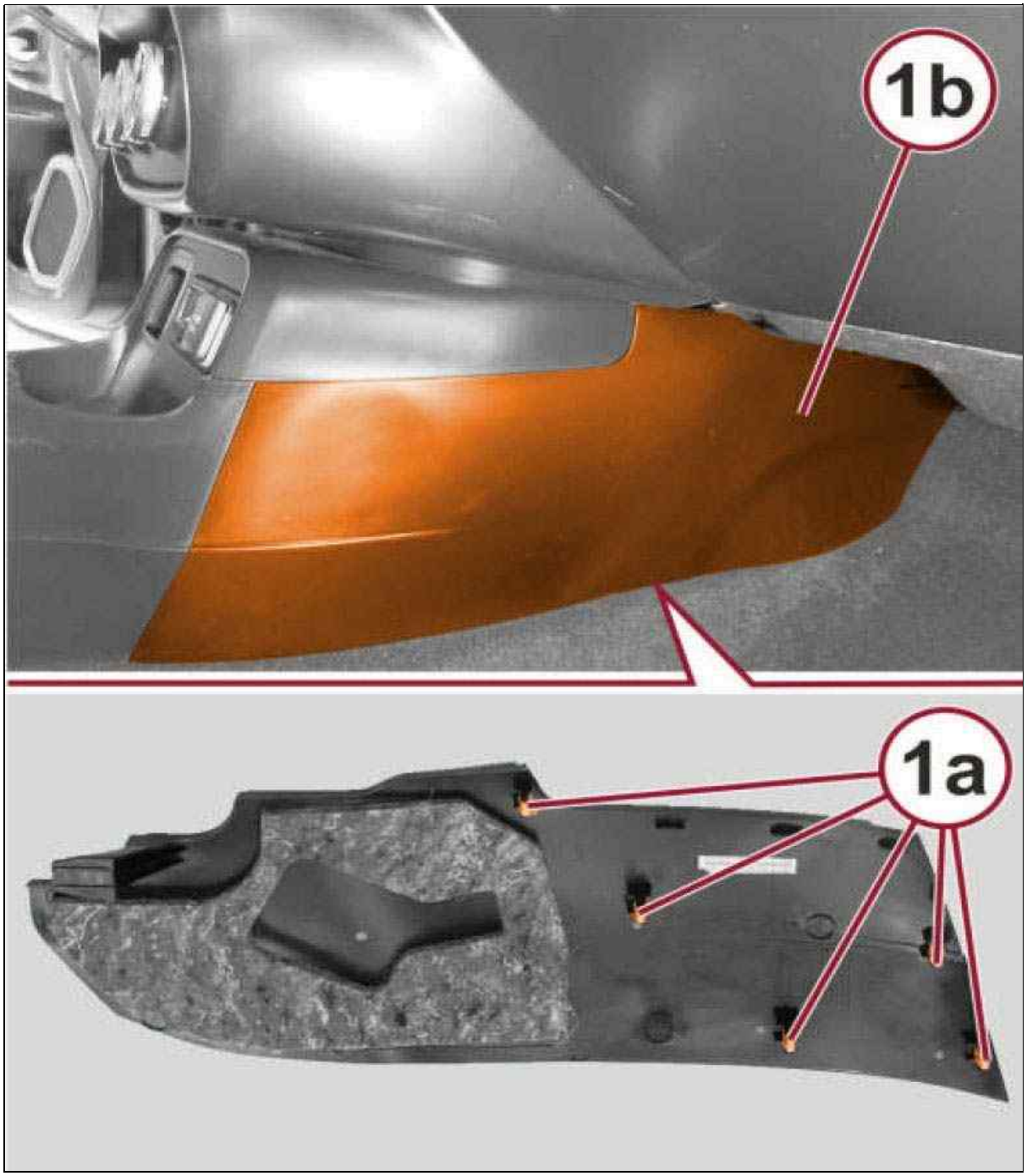
WARNING:

To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbags, airbag curtains, knee blocker, seat belt tensioner, impact sensor or instrument panel component diagnosis or service. Refer to WARNING . Disconnect the IBS/negative battery cable assembly from the negative battery post, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING:

To avoid serious or fatal injury, never strike or drop the Occupant Restraint Controller (ORC), as it can damage the impact sensor or affect its calibration. The ORC contains the impact sensor, which enables the system to deploy the SRS components. If an ORC is accidentally dropped during service, the module must be scrapped and replaced with a new unit. Failure to observe this warning could result in accidental, incomplete, or improper SRS component deployment.

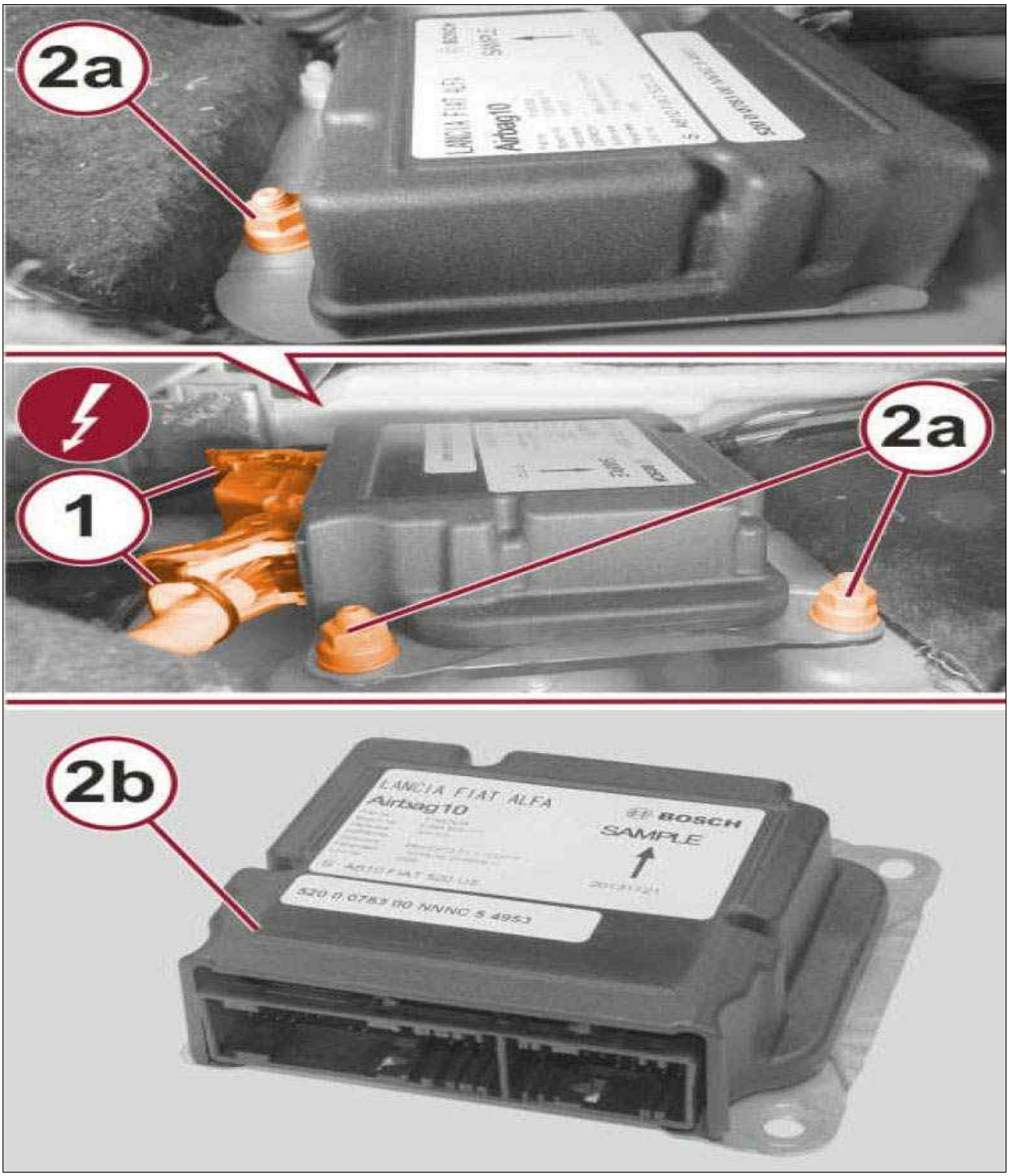
Fig 1: Front Side Panel & Clips



Courtesy of CHRYSLER GROUP, LLC

1. Disconnect and isolate the negative cable from the battery. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector before disconnecting the negative cable from the battery. Wait two minutes for the system capacitor to discharge before further service.
2. Remove the front side panel (1b) from the right side of the center floor console on the floor panel center tunnel. Refer to CONSOLE, FLOOR, REMOVAL AND INSTALLATION .

   Fig 2: Occupant Restraint Controller, Connector & Nuts



Courtesy of CHRYSLER GROUP, LLC

3. Disconnect the wire harness connectors (1) from the rearward-facing end of the Occupant Restraint Controller (ORC) (2b). To disconnect the wire harness connector from the ORC, depress the release tab and lift the lever arm on the connector.
4. Remove the three nuts (2a) that secure the ORC to the weld studs on the floor panel center tunnel.

5. Lift the ORC off of the weld studs and remove it from the vehicle.

MODULE, OCCUPANT RESTRAINT > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

WARNING:

To avoid serious or fatal injury on vehicles equipped with side curtain airbags, disable the Supplemental Restraint System (SRS) before attempting any Occupant Restraint Controller (ORC) diagnosis or service. The ORC may contain a rollover sensor, which enables the system to deploy the side SRS components in the event of a vehicle rollover event. If an ORC containing a rollover sensor is accidentally rolled during service while still connected to battery power, the side SRS components will deploy. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment. Refer to WARNING .

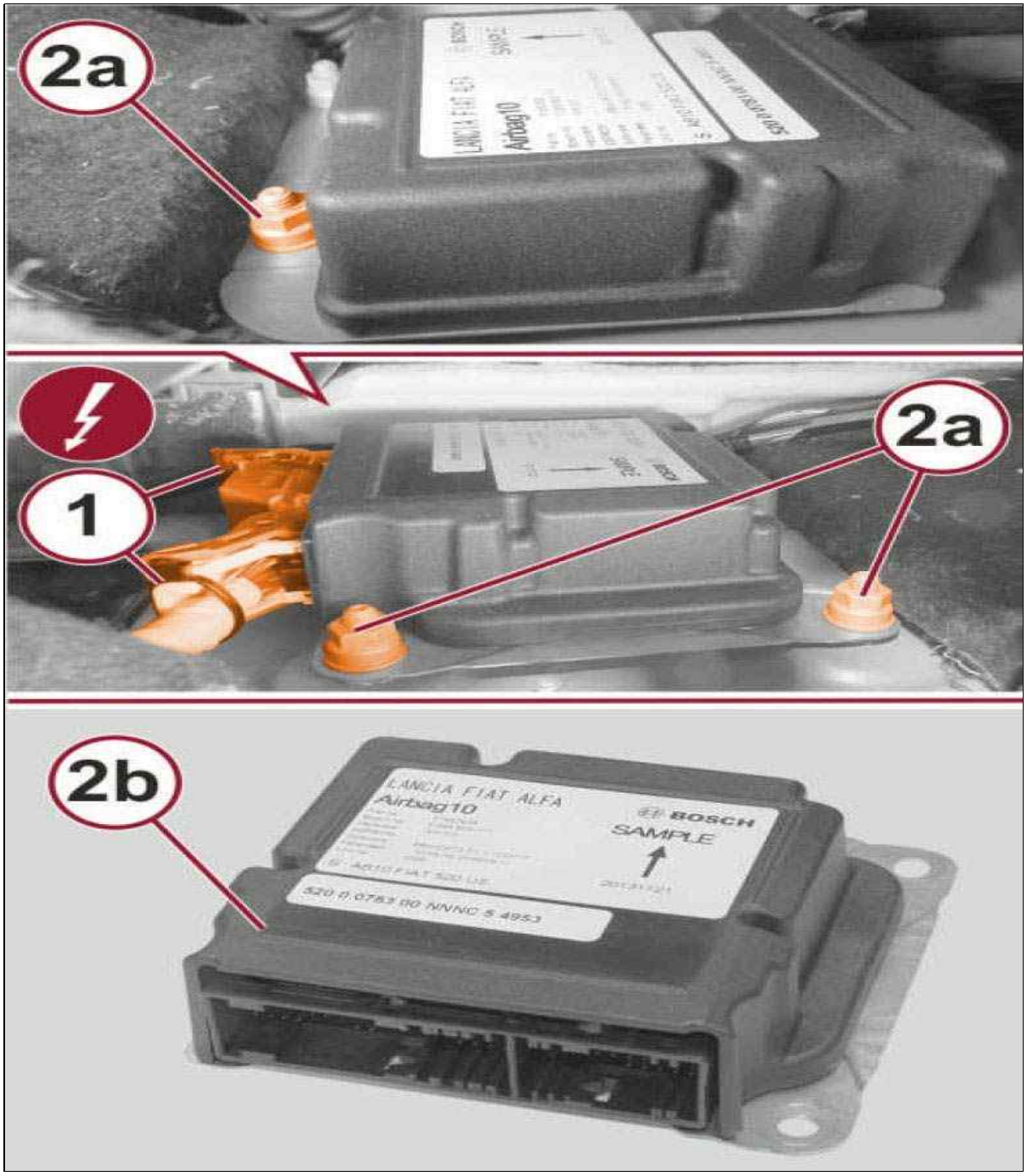
WARNING:

To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbags, airbag curtains, knee blocker, seat belt tensioner, impact sensor or instrument panel component diagnosis or service. Refer to WARNING . Disconnect the IBS/negative battery cable assembly from the negative battery post, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING:

To avoid serious or fatal injury, never strike or drop the Occupant Restraint Controller (ORC), as it can damage the impact sensor or affect its calibration. The ORC contains the impact sensor, which enables the system to deploy the SRS components. If an ORC is accidentally dropped during service, the module must be scrapped and replaced with a new unit. Failure to observe this warning could result in accidental, incomplete, or improper SRS component deployment.

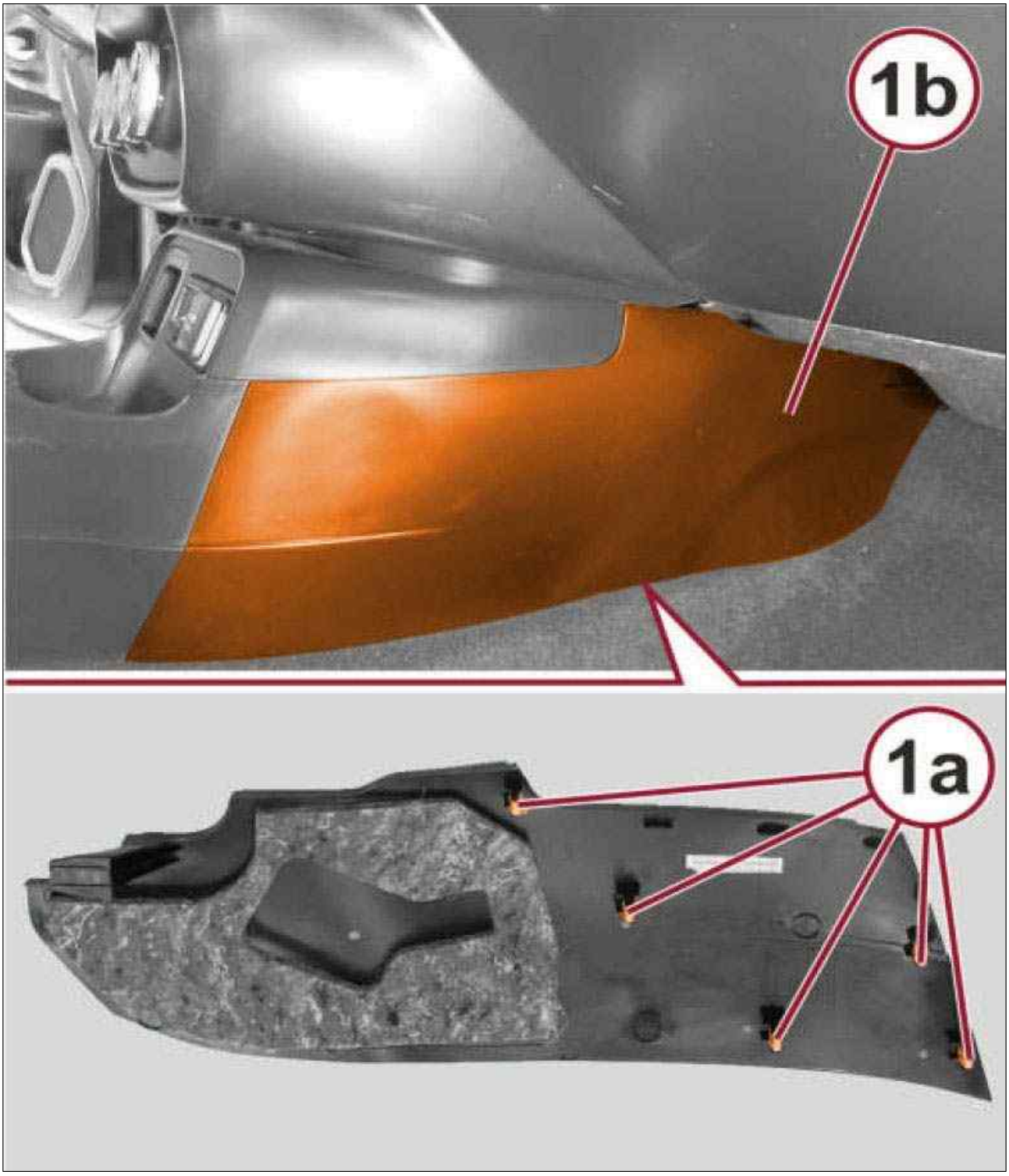
Fig 1: Occupant Restraint Controller, Connector & Nuts



Courtesy of CHRYSLER GROUP, LLC

1. Carefully position the Occupant Restraint Controller (ORC) (2b) onto the weld studs on the top of the floor panel center tunnel. When the ORC is correctly positioned, the bottom of the housing will fit flush with the top of the floor panel center tunnel and the orientation arrow on the label on top of the housing will be pointed forward in the vehicle.
2. Install and tighten the three nuts (2a) that secure the ORC to the weld studs on the top of the floor panel center tunnel. Tighten the nuts securely.
3. Connect both wire harness connectors (1) to the rearward-facing end of the ORC. Be certain that the latch on each connector is fully engaged.

Fig 2: Front Side Panel & Clips



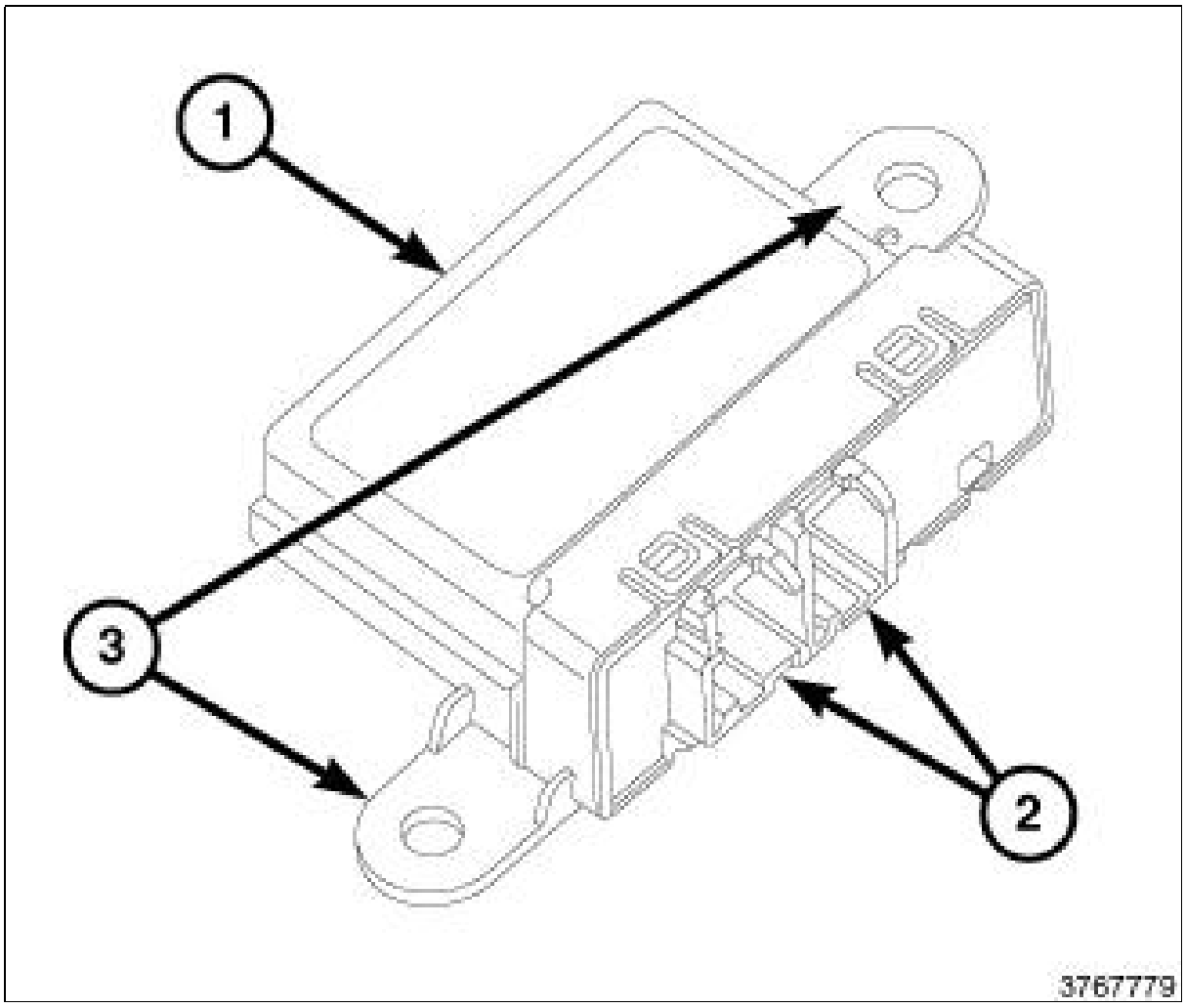
Courtesy of CHRYSLER GROUP, LLC

4. Align the snap clips (1a) of the front side panel with the right side of the center floor console and snap it into place. Refer to CONSOLE, FLOOR, REMOVAL AND INSTALLATION .
5. If this Electronic Control Unit (ECU) is being replaced with a new unit, a diagnostic scan tool MUST be used to align the PROXI configuration data into the new ECU. Follow the routine outlined in the diagnostic scan tool for PROXI Configuration Alignment under Body Control Module (BCM) Miscellaneous Functions menu.
6. If this Electronic Control Unit (ECU) is being replaced with a new unit, the Initialize ORC Miscellaneous Function must be run using a diagnostic scan tool.

7. Do not connect the negative cable to the battery at this time. The Supplemental Restraint System (SRS) Verification Test procedure should be performed following service of any SRS component. Refer to SUPPLEMENTAL RESTRAINT SYSTEM VERIFICATION TEST .

MODULE, PARK ASSIST > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

Fig 1: Park Assist Module, Connector Receptacles & Mounting Tabs



Courtesy of CHRYSLER GROUP, LLC

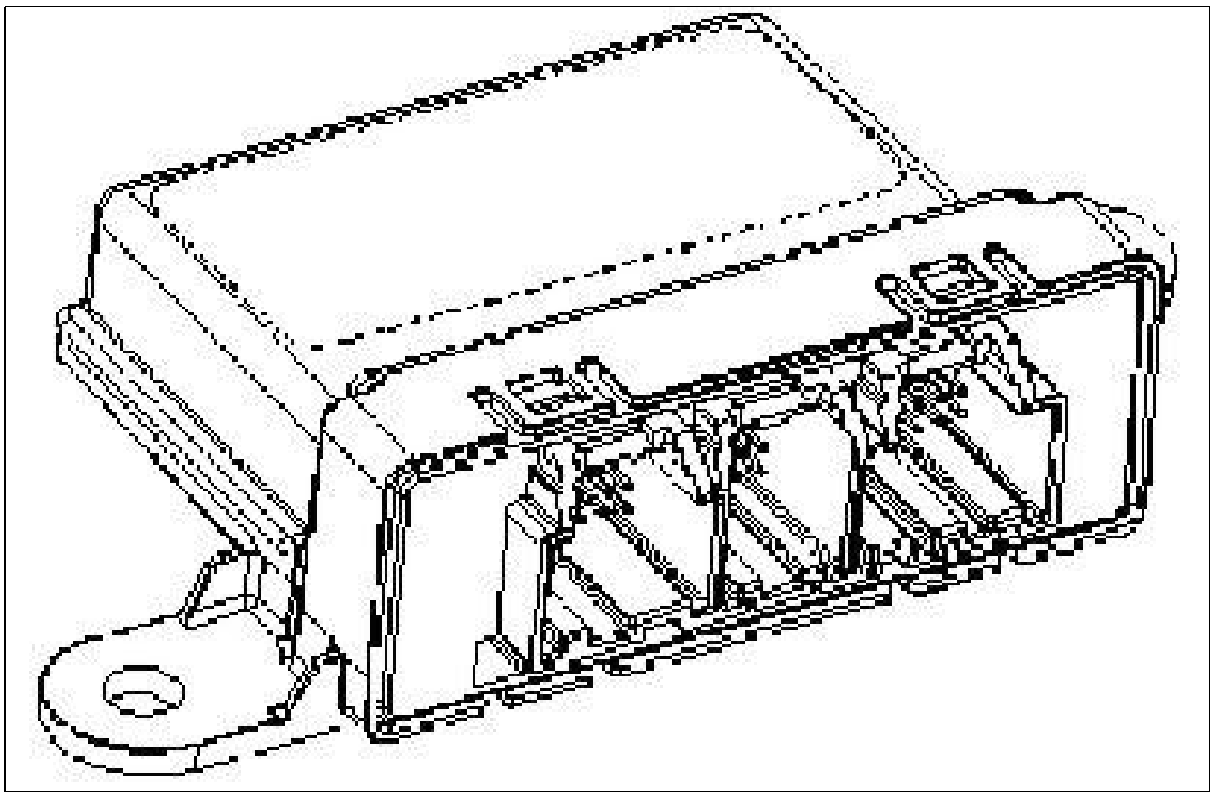
The Parking Assist Module has the following characteristics:

- It receives power supply for its operation.
- It provides power supply to the 4 sensors.
- It receives signals from the 4 ultrasonic sensors.
- It manages the presence of a possible trailer: it is configured to deactivate the rear sensors when a trailer is present.
- It communicates and transmits data over the high-speed CAN-C2 network.

If a fixed tow hook is present, the signal "Trailer presence" informs the PAM control unit to deactivate the rear sensors if a trailer is attached to the car. The signal "Trailer presence" is sent by the Trailer Tow Module (TTM) via CAN-BH.

To ensure the proper operation of the system when the trailer is not attached to the vehicle, the PAM control unit changes the sensor detection area range in order to take into account the space occupied by the tow hook.

Fig 2: Semi-Automatic Parking Control Unit PAM



Courtesy of CHRYSLER GROUP, LLC

Semi-automatic parking control unit PAM

The semi-automatic parking control unit PAM has the following characteristics:

- It receives power supply for its operation.
- It provides power supply to the 12 sensors.
- It receives signals from the 12 ultrasonic sensors.
- It manages the presence of a possible trailer: it is configured to deactivate the rear sensors when a trailer is present.
- It communicates and transmits data over the high speed CAN-C2 network.

The PAM cannot be adjusted or repaired and, if damaged or ineffective, it must be replaced with a new unit. The PAM software is flash programmable.

MODULE, PARK ASSIST > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

The microcontroller in the Park Assist Module (PAM) contains the park assist system logic circuits. The PAM uses On-Board Diagnostics (OBD) and can communicate with other electronic modules in the vehicle as well as with the diagnostic scan tool using the Controller Area Network (CAN) data bus. This method of communication is also used for park assist system diagnosis and testing through the 16-way data link connector located on the driver side lower edge of the instrument panel.

The PAM provides voltage to the four park assist sensors located in the bumper fascia or fascias. The PAM monitors return inputs from each of the sensors on dedicated hard wired data communication circuits. These sensor inputs allow the PAM to determine when an obstacle is in the rear path of the vehicle. When an obstacle is detected the sensor inputs allow the PAM logic to calculate the relative location of the obstacle, and whether the distance to that obstacle is increasing or decreasing.

Pre-programmed decision algorithms and calibrations allow the PAM microcontroller to determine the appropriate park assist system outputs based upon the inputs received from the park assist sensors and electronic messages received from other modules in the vehicle over the CAN data bus. When the programmed conditions are met the PAM sends electronic messages to the Instrument Panel Cluster (IPC) over the CAN data bus to obtain the proper park assist system audible outputs and textual messages in the IPC display. The PAM also broadcasts electronic messages over the CAN data bus to enable the other electronic features of the park assist system.

The PAM microcontroller continuously monitors all of the park assist system electrical circuits and components to determine the system readiness. If the PAM detects a monitored system fault, it sets a Diagnostic Trouble Code (DTC) and sends the appropriate electronic messages to the IPC over the CAN data bus to control operation of certain park assist system audible and textual warnings.

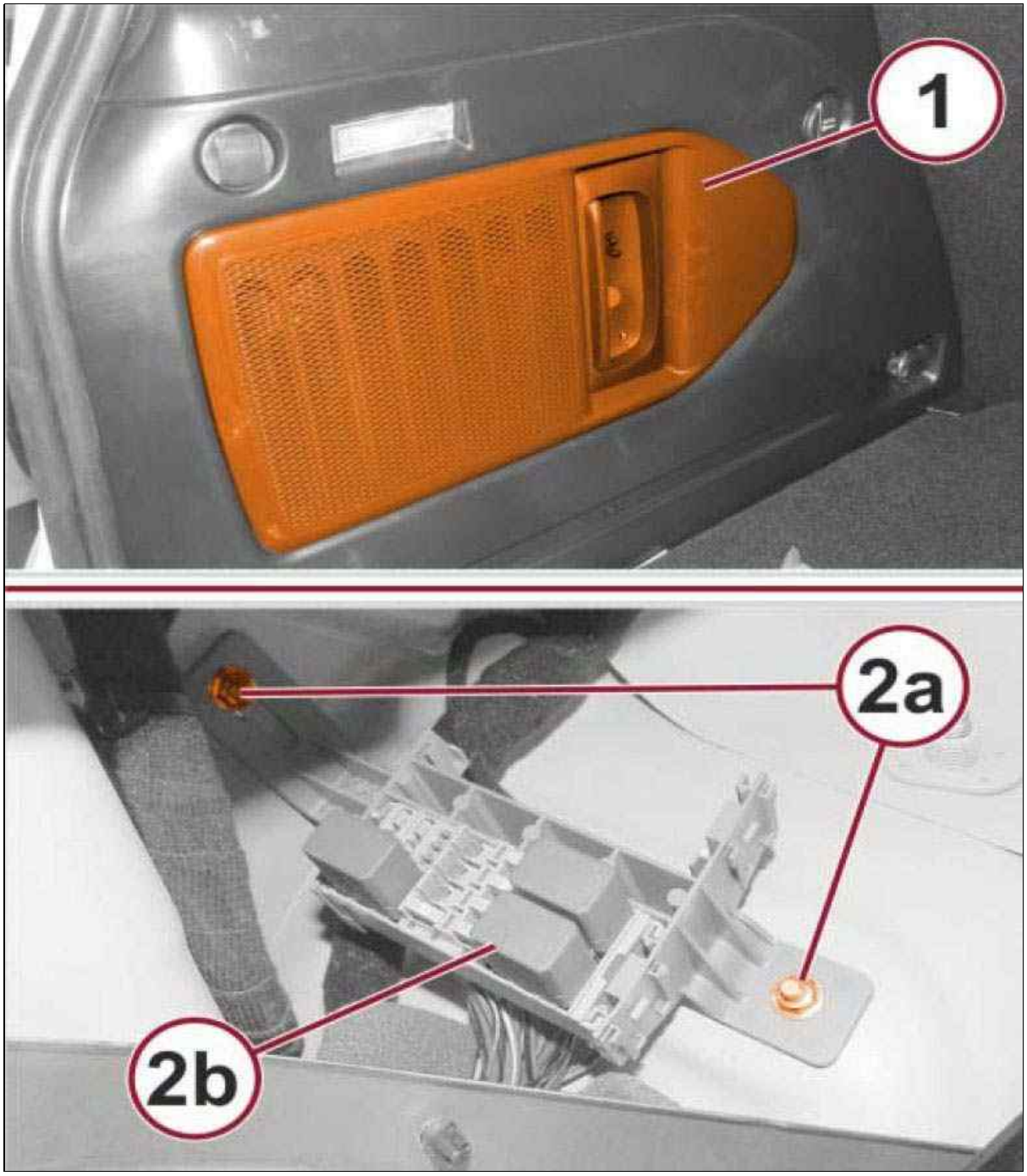
The PAM receives battery current on a fused ignition output (run-start) circuit through a fuse in the Power Distribution Center (PDC). The PAM receives ground through a ground circuit and take out of the body wire harness connected to the body sheet metal. These connections allow the PAM to be operational whenever the status of the ignition is Start or On.

The hard wired circuits between components related to the PAM may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the PAM or the electronic controls and communication between modules and other devices that provide some features of the park assist system. The most reliable, efficient and accurate means to diagnose the PAM or the electronic controls and communication related to park assist system operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

MODULE, PARK ASSIST > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

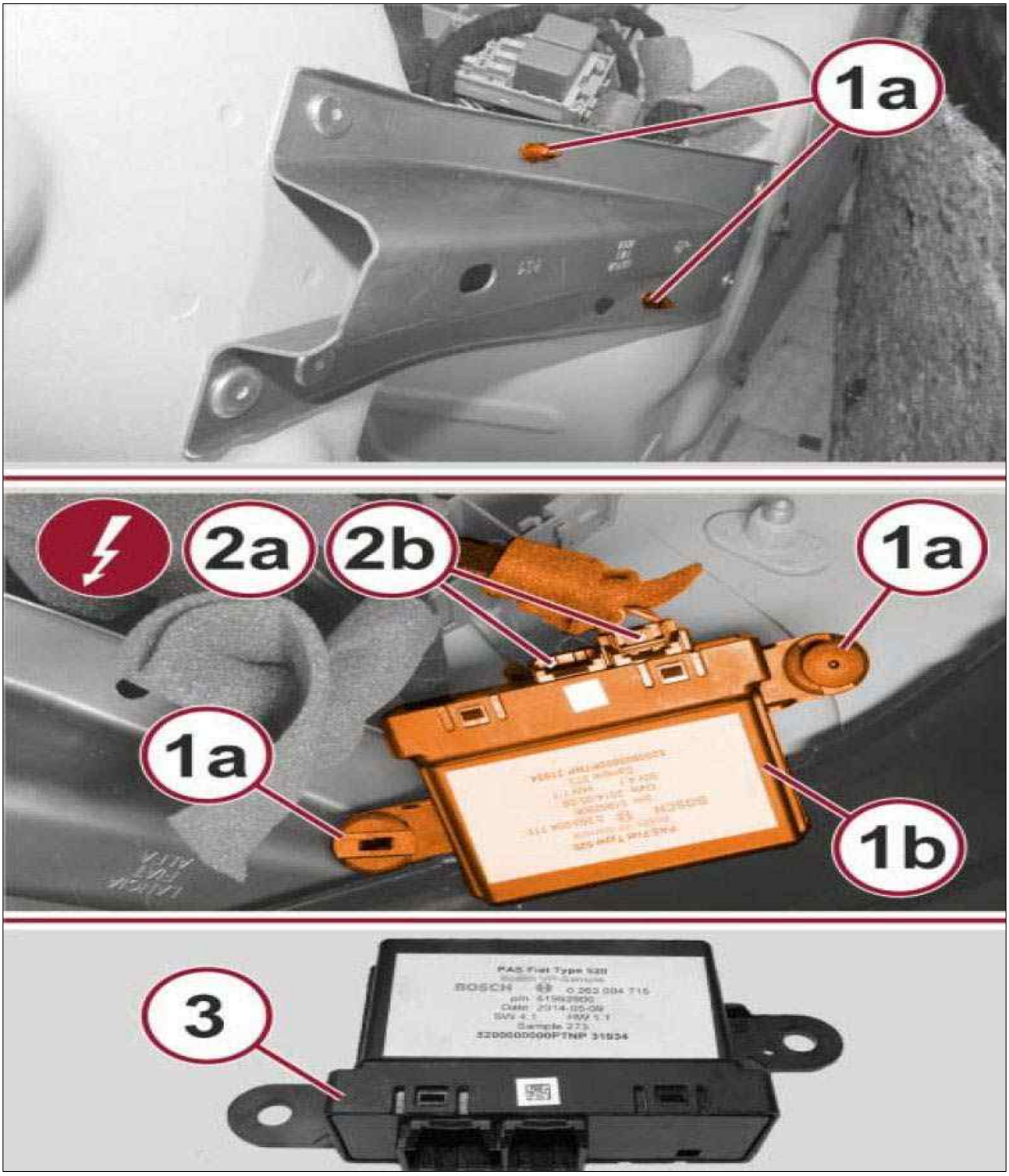
Fig 1: Left Inner Quarter Panel, Supplemental Junction Box & Nuts



Courtesy of CHRYSLER GROUP, LLC

1. Disconnect and isolate the negative cable from the battery. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector before disconnecting the negative cable from the battery.
2. Remove the trim from the left inner quarter panel (1) to access the Park Assist Module (PAM) behind the left rear wheel house. Refer to PANEL, QUARTER TRIM, REMOVAL AND INSTALLATION .
3. Remove the two nuts (2a) that secure the supplemental Junction Box (JB) (2b) and move the JB aside.

Fig 2: Park Assist Module, Push-Pin Retainers & Connectors



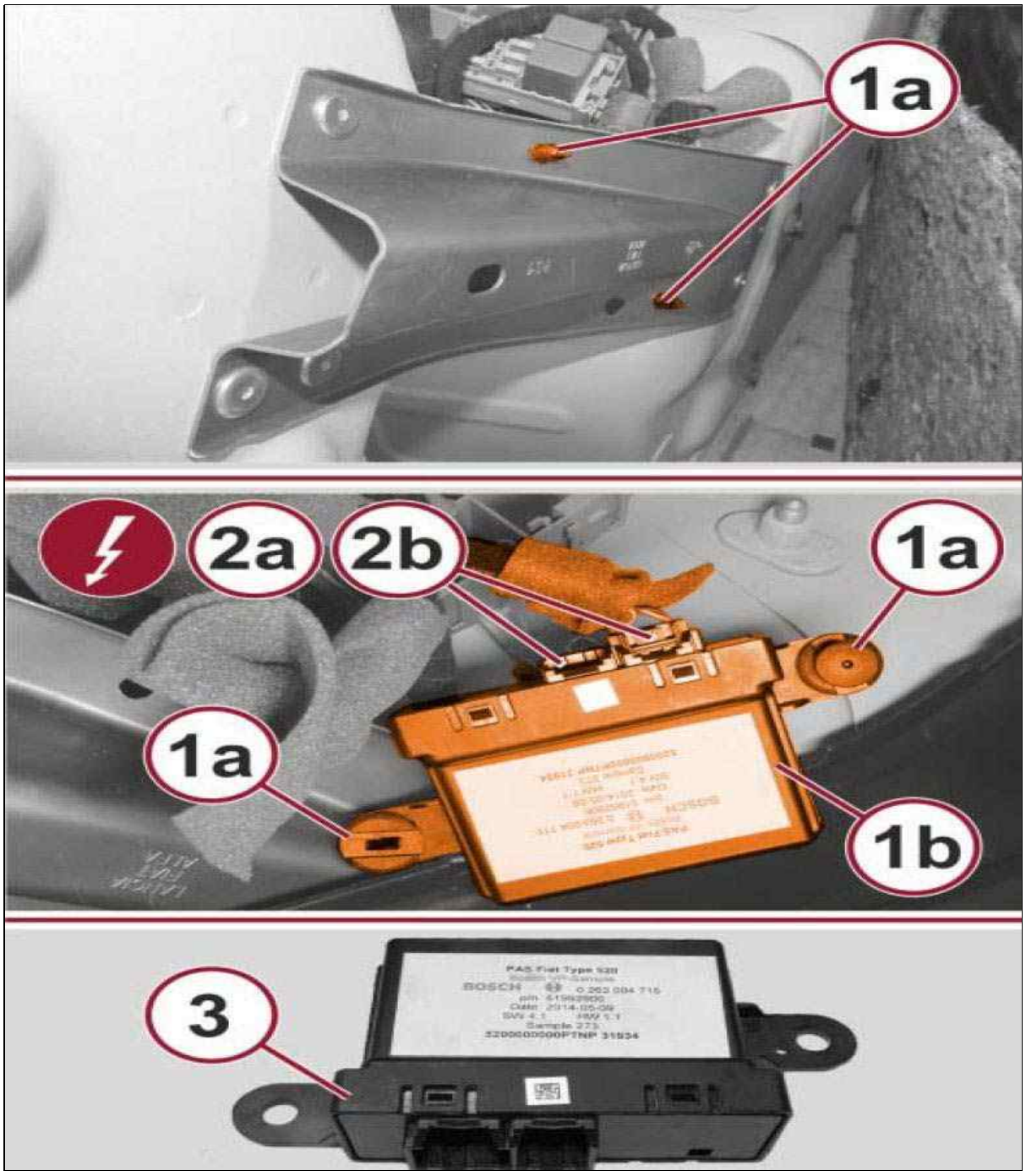
Courtesy of CHRYSLER GROUP, LLC

4. Remove the two plastic push-pin retainers (1a) that secure the PAM (1b).
5. Disconnect the two or three wire harness connectors (2a and 2b) from the PAM connector receptacles.
6. Remove the PAM (3) from the vehicle.

MODULE, PARK ASSIST > REMOVAL AND INSTALLATION > REMOVAL AND

INSTALLATION > INSTALLATION

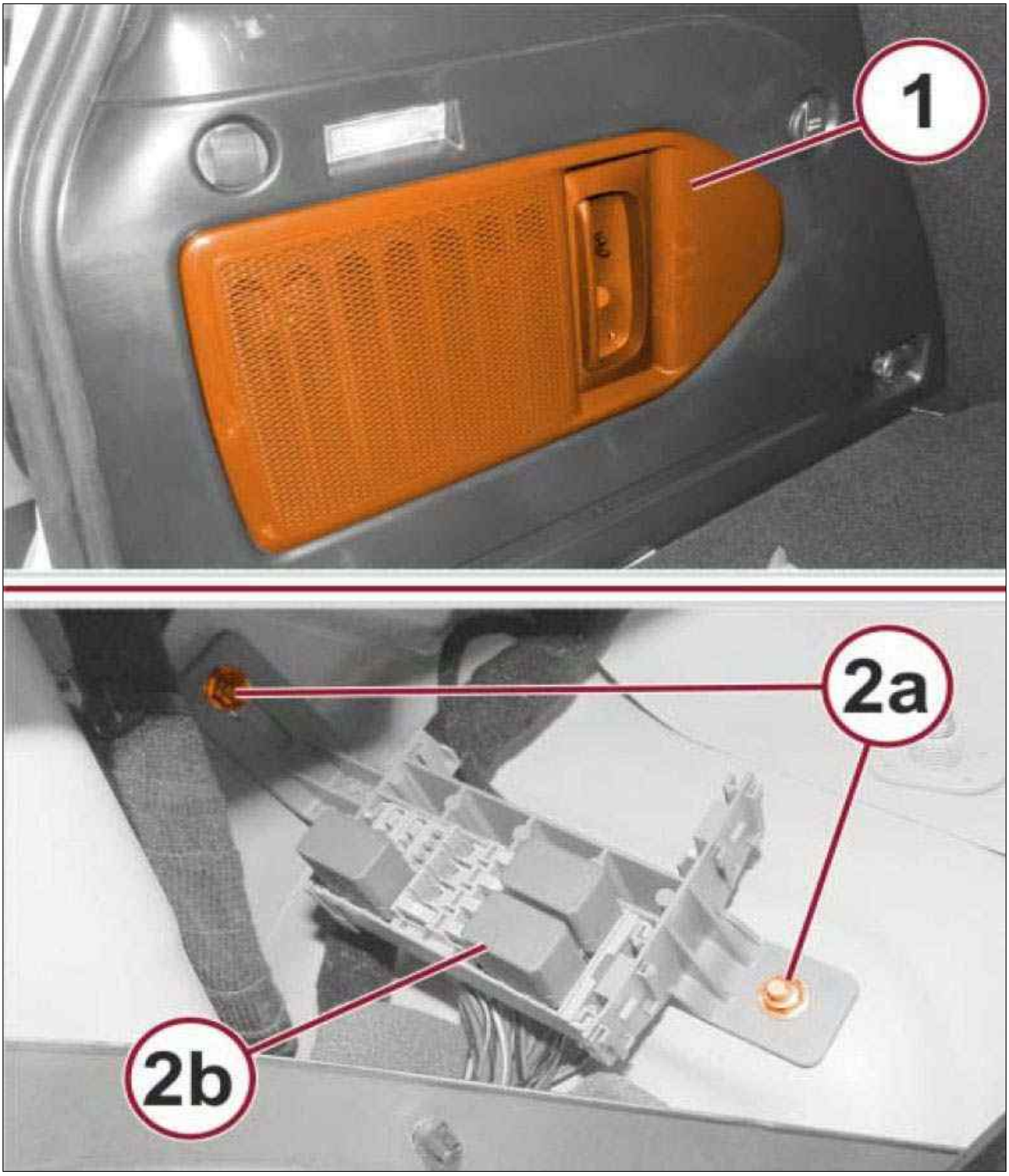
Fig 1: Park Assist Module, Push-Pin Retainers & Connectors



Courtesy of CHRYSLER GROUP, LLC

1. Position the Park Assist Module (PAM) (1b) into the left of the cargo are behind the left rear wheel house.
2. Connect the two or three wire harness connectors (2a and 2b) to the PAM connector receptacles.
3. Position the PAM to its mounting location.
4. Install the two plastic push-pin retainers (1a) that secure the PAM.

Fig 2: Left Inner Quarter Panel, Supplemental Junction Box & Nuts



Courtesy of CHRYSLER GROUP, LLC

5. Position the supplemental Junction Block (JB) (2b) onto the mounting studs.
6. Install and tighten the two nuts (2a) that secure the JB. Tighten the nuts securely.
7. Install the trim onto the left inner rear quarter panel. Refer to PANEL, QUARTER TRIM, REMOVAL AND INSTALLATION .
8. Connect the negative cable to the battery. If equipped with an Intelligent Battery Sensor (IBS), reconnect the IBS connector.

NOTE:

If this Electronic Control Unit (ECU) is being replaced with a new unit, a diagnostic scan tool MUST be used to align the PROXI configuration data into the new ECU. Follow the routine outlined in the diagnostic scan tool for PROXI Configuration Alignment under Body Control Module (BCM) Miscellaneous Functions menu.

MODULE, POWERTRAIN CONTROL > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > PCM

The Powertrain Control Module (PCM) is located next to the engine compartment battery. The PCM is a digital computer containing a microcontroller. The PCM receives input signals from various switches and sensors that are referred to as PCM Inputs. Based on these inputs, the PCM adjusts various engine and vehicle operations through devices that are referred to as PCM Outputs.

The PCM uses the CAN-C bus to perform engine diagnostics and flash operations.

MODULE, POWERTRAIN CONTROL > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

The Powertrain Control Module (PCM) is a pre-programmed, microprocessor digital computer. The PCM operates the fuel system, regulates ignition timing, air-fuel ratio, emission control devices, charging system, certain transmission features, speed control, air conditioning compressor clutch engagement (if equipped) and idle speed. The PCM can adapt its programming to meet changing operating conditions. It also receives input signals from various switches and sensors. Based on these inputs, the PCM regulates various engine and vehicle operations through different system components. These components are referred to as PCM Outputs.

The PCM adjusts ignition timing based upon inputs it receives from sensors that react to: engine RPM, manifold absolute pressure, engine coolant temperature, throttle position, transmission gear selection (automatic transmission), vehicle speed and the brake switch. It also adjusts idle speed based on inputs it receives from sensors that react to: throttle position, vehicle speed, transmission gear selection, engine coolant temperature and from inputs it receives from the air conditioning clutch switch and brake switch. As input signals change, the PCM adjusts its response to the output devices. For example, the PCM must calculate different injector pulse width, ignition timing and camshaft settings for idle as compared to wide open throttle (WOT). It also adjusts the generator charge rate through control of the generator field and provides speed control operation (depending on vehicle build).

The PCM will operate in two different modes, Open Loop and Closed Loop. During Open Loop operation, the PCM still receives all input signals but responds only to a limited amount of inputs based on the algorithms for output control. Inputs from the Oxygen (O2) Sensors and other sensors (depending on the PCM programming) are not monitored during Open Loop operation. During Closed Loop operation, the PCM will monitor all inputs and outputs. The inputs indicate to the PCM whether or not the calculated output settings result in an ideal air-fuel ratio. This ratio is 14.7 parts air to 1 part fuel. By monitoring the exhaust oxygen content through the O2 Sensor and all other inputs, the PCM has the ability to fine tune the air handling, fuel control, ignition timing and spark advance settings. This is done to achieve optimum fuel economy combined with low emission engine performance.

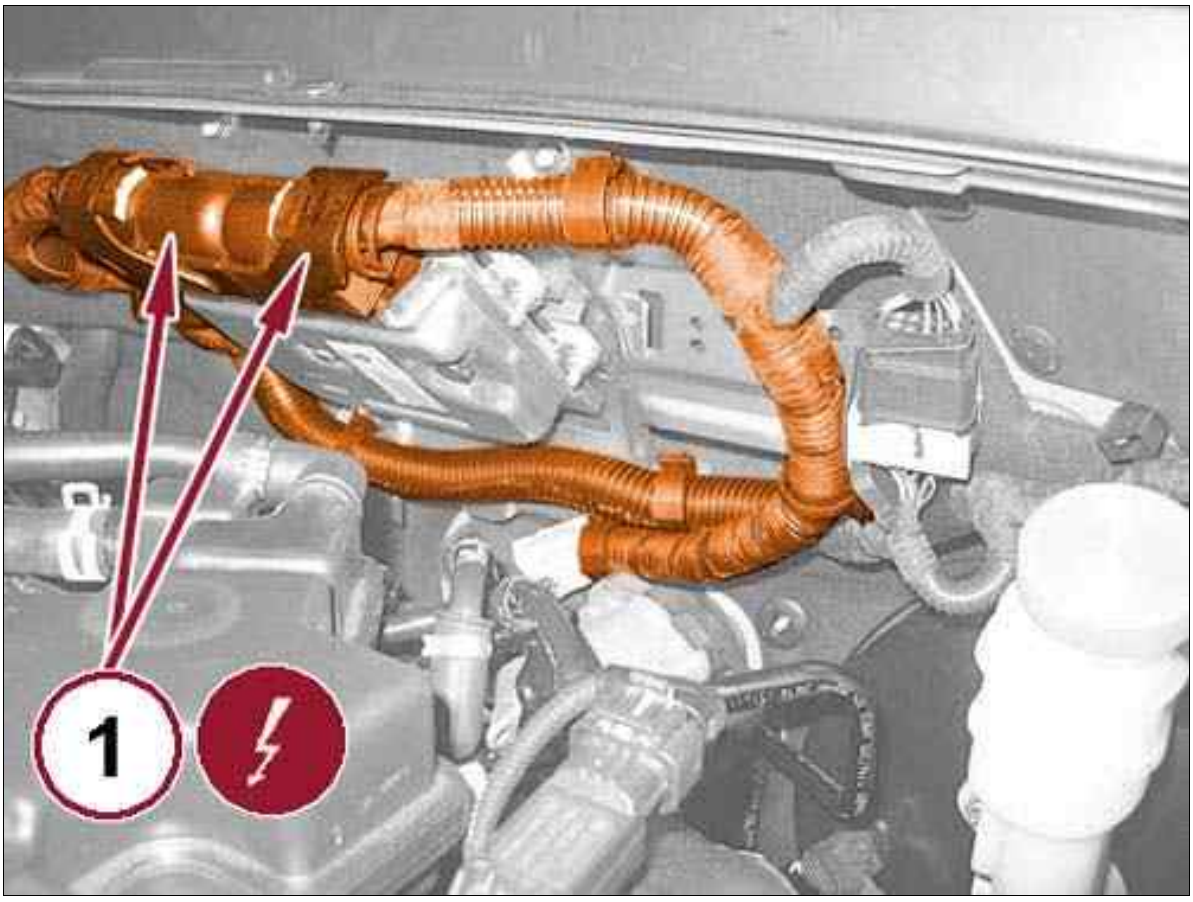
NOTE:

Depending on vehicle build configuration, transmission and engine type, the PCM will be programed with different software to meet the vehicle system needs. It is always important to verify the Vehicle Identification Number (VIN) and software level in the PCM when diagnosing concerns related to the PCM.

MODULE, POWERTRAIN CONTROL > REMOVAL AND INSTALLATION > 1.4L REMOVAL AND INSTALLATION > 1.4L REMOVAL

1. Disconnect and isolate the negative battery cable.
2. Remove the engine beauty cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .

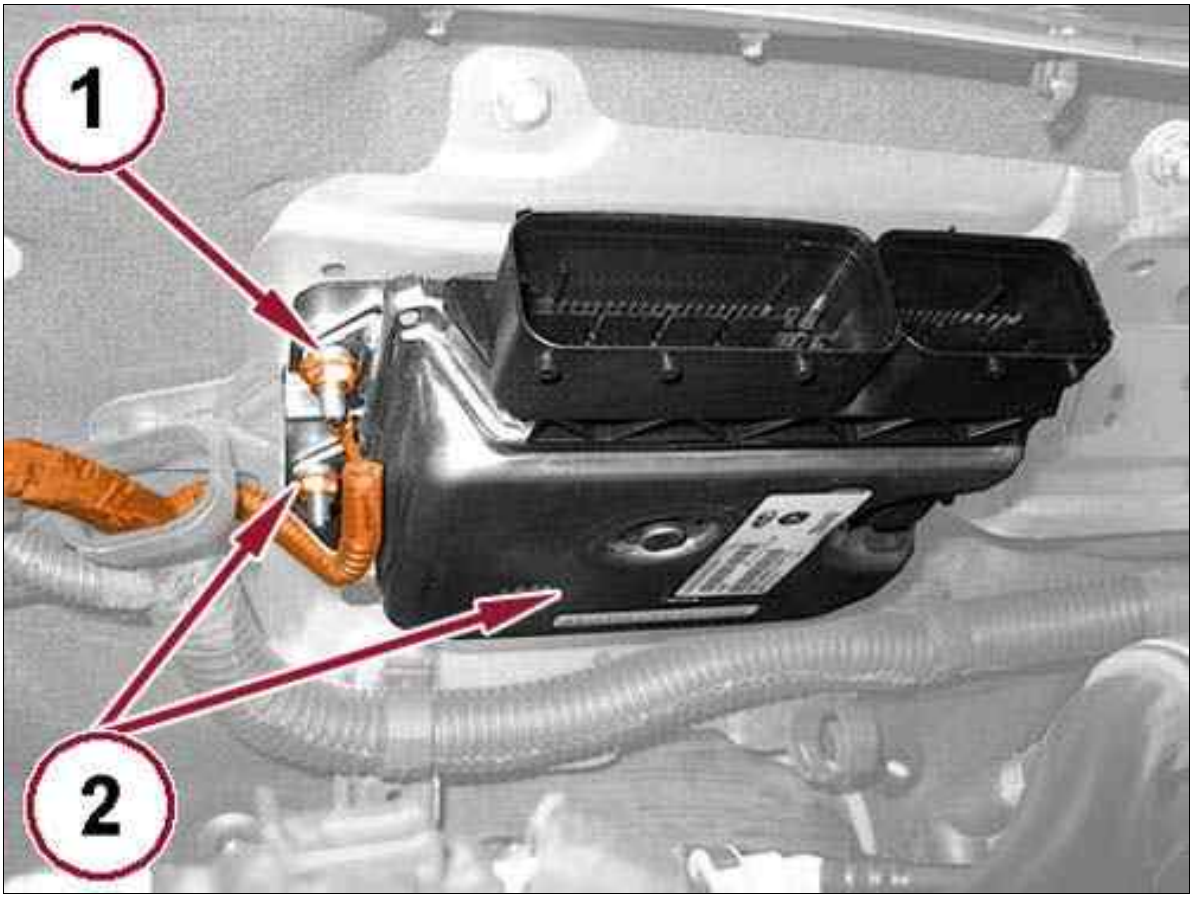
   Fig 1: Powertrain Control Module Connectors - 1.4L



Courtesy of CHRYSLER GROUP, LLC

3. Disconnect the Powertrain Control Module (PCM) electrical connectors.

Fig 2: Powertrain Control Module, Ground Wire & Nuts - 1.4L



Courtesy of CHRYSLER GROUP, LLC

4. Remove the training nut and disconnect the ground wire.
5. Remove the PCM retaining nuts (2) and then remove the PCM from the vehicle.

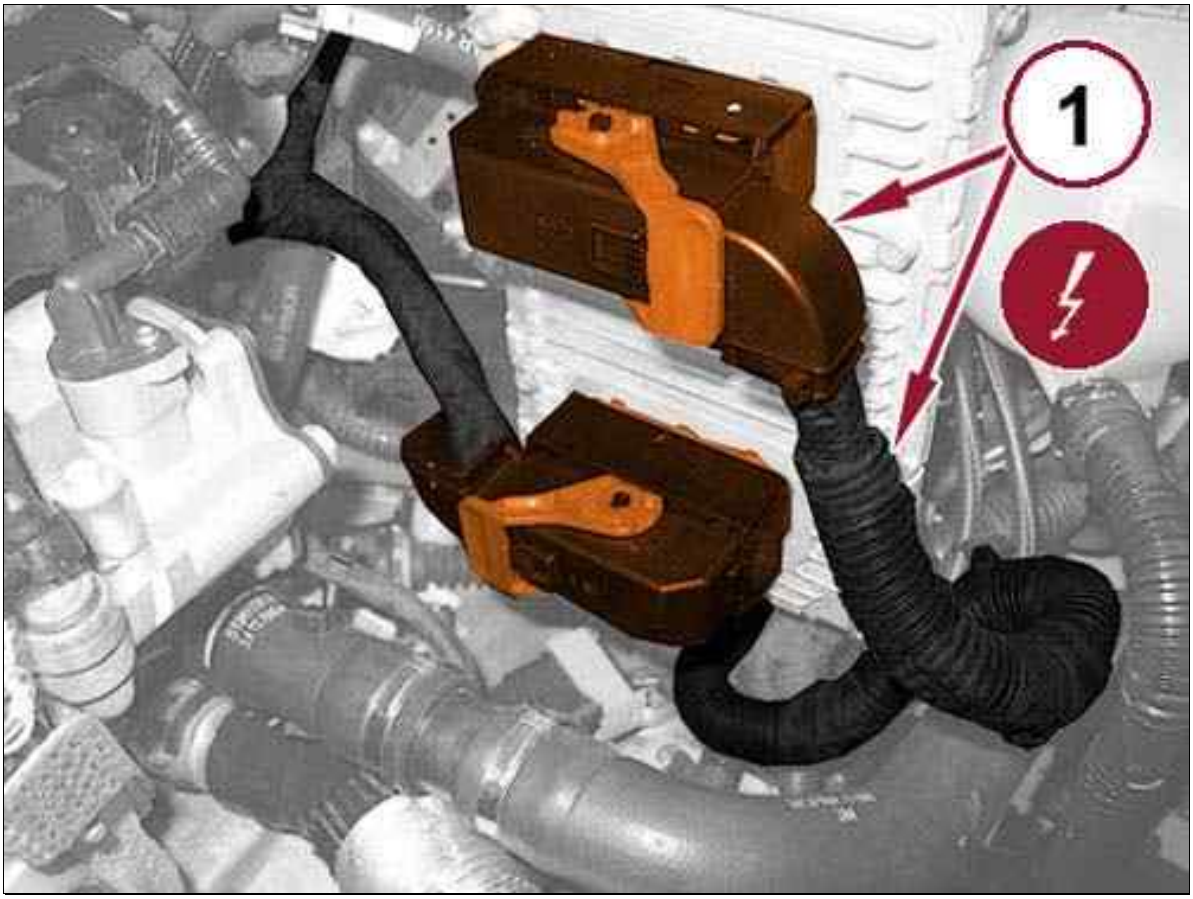
MODULE, POWERTRAIN CONTROL > REMOVAL AND INSTALLATION > 1.4L REMOVAL AND INSTALLATION > 1.4L INSTALLATION

1. Position and install the PCM to the vehicle.
2. Connect the ground wire and wire retaining nut to the PCM.
3. Connect the wiring harness connectors to the PCM.
4. Install the engine beauty cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
5. Connect the negative battery cable.
6. Connect the diagnostic scan tool to the vehicle and select "ECM" in "miscellaneous features". Perform the "replacement unit" routine.
7. With key in the "OFF" position and with the emergency lights turned on, go to "control BCM" in "miscellaneous features" and launch the "transfer secret key" procedure.

MODULE, POWERTRAIN CONTROL > REMOVAL AND INSTALLATION > 2.4L REMOVAL AND INSTALLATION > 2.4L REMOVAL

1. Disconnect and isolate the negative battery cable.
2. Remove the engine beauty cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .

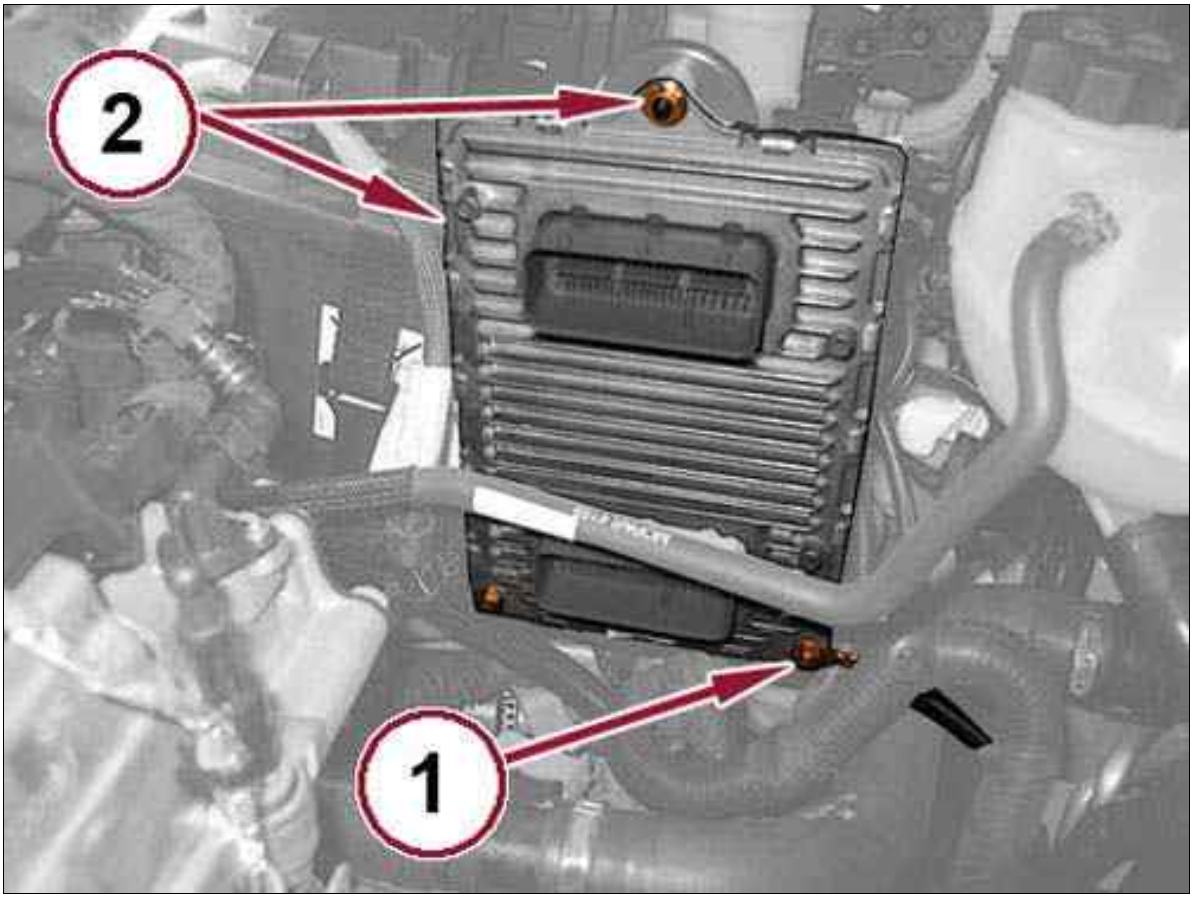
   Fig 1: Powertrain Control Module Connectors - 2.4L



Courtesy of CHRYSLER GROUP, LLC

3. Disconnect the Powertrain Control Module (PCM) electrical connectors.

Fig 2: Powertrain Control Module, Ground Wire & Nuts - 2.4L



Courtesy of CHRYSLER GROUP, LLC

4. Remove the training nut and disconnect the ground wire.
5. Remove the PCM retaining nuts (2) and then remove the PCM from the vehicle.

MODULE, POWERTRAIN CONTROL > REMOVAL AND INSTALLATION > 2.4L REMOVAL AND INSTALLATION > 2.4L INSTALLATION

1. Position and install the PCM to the vehicle.
2. Connect the ground wire and wire retaining nut to the PCM.
3. Connect the wiring harness connectors to the PCM.
4. Install the engine beauty cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
5. Connect the negative battery cable.
6. Connect the diagnostic scan tool to the vehicle and select "ECM" in "miscellaneous features". Perform the "replacement unit" routine.
7. With key in the "OFF" position and with the emergency lights turned on, go to "control BCM" in "miscellaneous features" and launch the "transfer secret key" procedure.

MODULE, POWERTRAIN CONTROL > MODULE PROGRAMMING > PROGRAMMING THE CUSW PCM

This procedure is required when one or more of the following situations are true:

- A Powertrain Control Module (PCM) has been replaced.
- Diagnostic Trouble Code (DTC) P1602 - PCM Not Programmed is set.
- An updated calibration or software release is available for either the PCM or Transmission Control Module (TCM).

This procedure assumes that the scan tool is properly configured to the dealership network with either a wired or wireless connection. For help on how to network the scan tool, use the "Help" tab at the top of the diagnostic application.

Programming Procedure:

1. Connect a battery charger to the vehicle.
2. Connect the scan tool.
3. Ignition key should be in RUN position.
4. When a generic controller is installed, no VIN is in the PCM. There will be a screen from the scan tool indicating that the scan tool cannot read the VIN.
5. Enter the correct VIN in order to flash the PCM.

> *NOTE:*
>
> *No VIN is written into the PCM at this point. It is only used for the diagnostic information.*

6. Next, a screen confirmation displays. Select continue.
7. The Vehicle Connection Wizard screen displays. Disregard and close this screen. The PCM must be flashed before performing any diagnostics.
8. The Vehicle View Screen will indicate that a flash is available (lightning bolt) for the PCM. Reading all DTC's at the bottom of the screen will indicate that "P1602 - PCM Not Programmed" is present and active for the PCM
9. When the PCM is selected, the flash tab should be selected. Select the appropriate part number to flash the controller.
10. Clear DTC's screen after the flash process completes.
11. Perform the **"Proxy Configuration Alignment"** found in the "Vehicle Preparations" menu. This routine will copy the proxi into the PCM and write the PCM VIN.
12. Select PCM view and then select "
13. Select and run the **"Learn ETC"** routine. This routine is necessary to learn the throttle position voltages and the accelerator pedal position.
14. Perform the **"Cruise Control Learn"** routine. Follow the prompts shown on the scan tool.

15. Module programming is complete.

MODULE, RADIO FREQUENCY (RF HUB) > DESCRIPTION AND OPERATION > DESCRIPTION

The RFH module carries out a number of functions which depend on the type of key that comes with the vehicle. It may have two different types of key:

- Fobik key

  Fig 1: Fobik Key

Courtesy of CHRYSLER GROUP, LLC

- Mechanical groove key.

If the vehicle has the first type of key, it can't have the second type and vice versa.

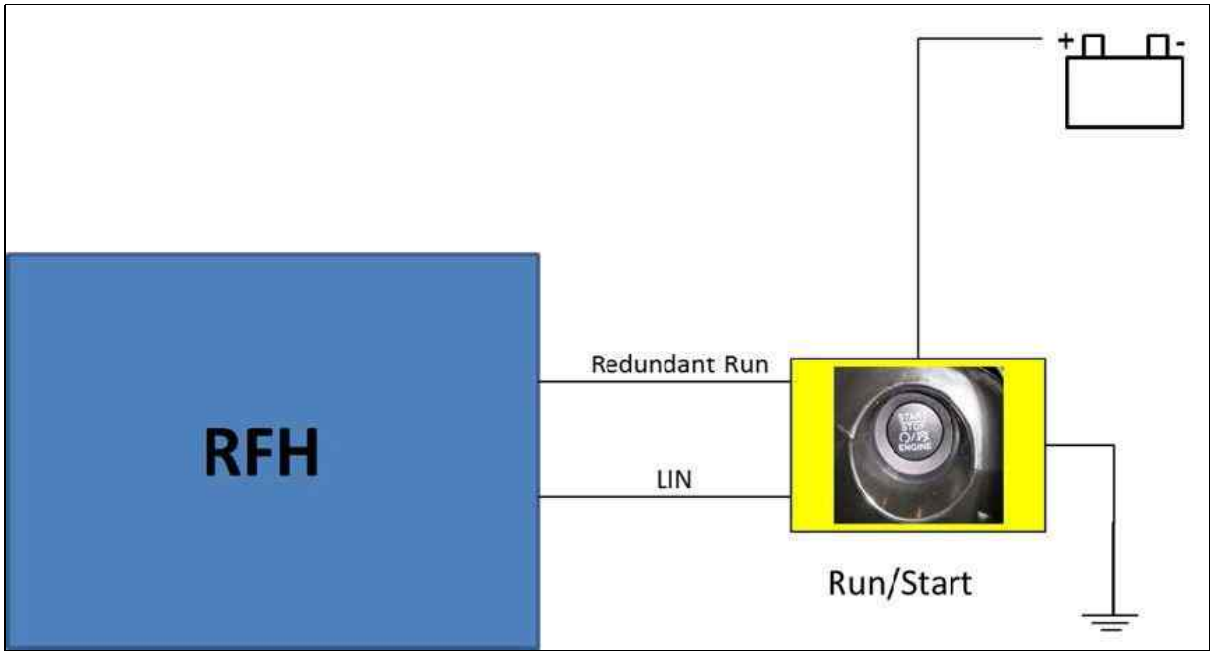
Fig 2: Fobik Key Functions

Courtesy of CHRYSLER GROUP, LLC

Fobik key: RFH functions - When the car has a Fobik key, the RFH module carries out the following functions:

- Passive Entry
- Key recognition (RFH is part of the Immobilizer system)
- TPMS (tire pressure detection) function.

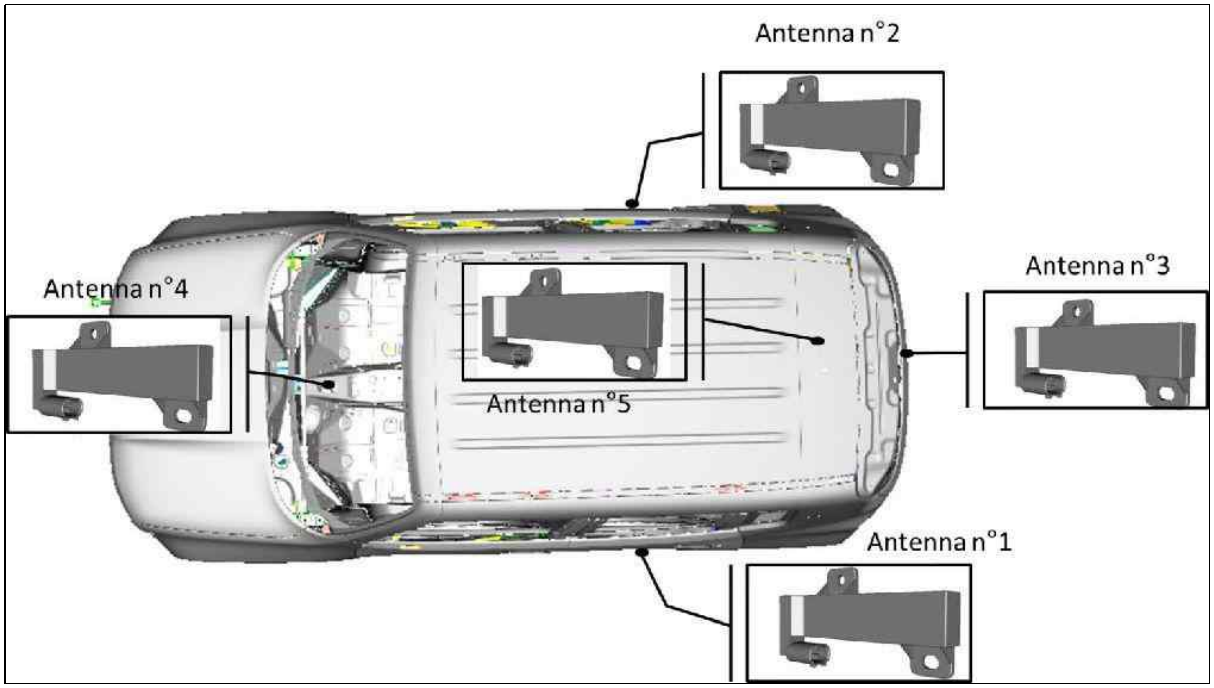
Fig 3: RFH Module & Run/Start Button Circuit Diagram



Courtesy of CHRYSLER GROUP, LLC

Since it has to recognize the keys, their codes are programmed in the RFH module. The ignition switch also comprises a Start/Stop button named KIN module. The button is connected electrically to the RFH module through a LIN line and a connection with an analogue signal called "Redundant Run". This signal permits the RFH to determine whether the Start/Stop button has been pressed if there is a fault on the LIN line.

Fig 4: Antenna Locations

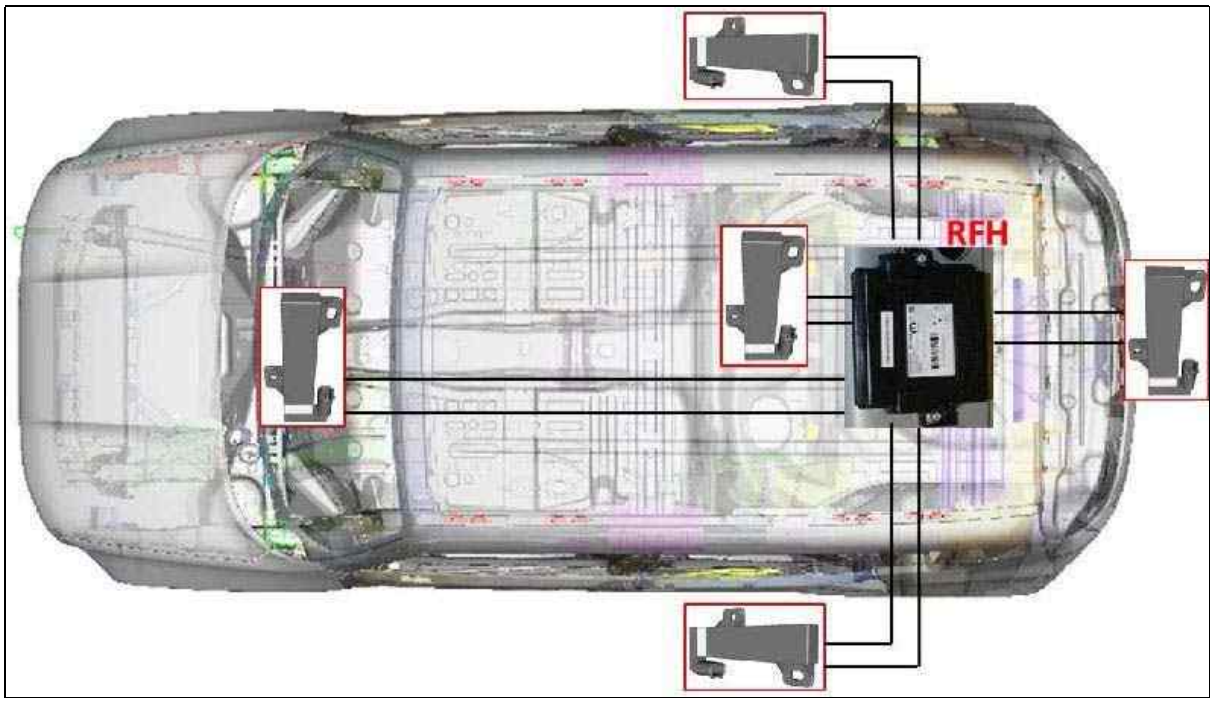


Courtesy of CHRYSLER GROUP, LLC

To carry out the Passive Entry function, the RFH module needs 5 low-frequency peripheral aerials that allow the module to identify and locate the keys.

Aerial Name	Aerial position.
1	Rear left door
2	Rear right door
3	Rear bumper
4	Dashboard
5	Luggage compartment

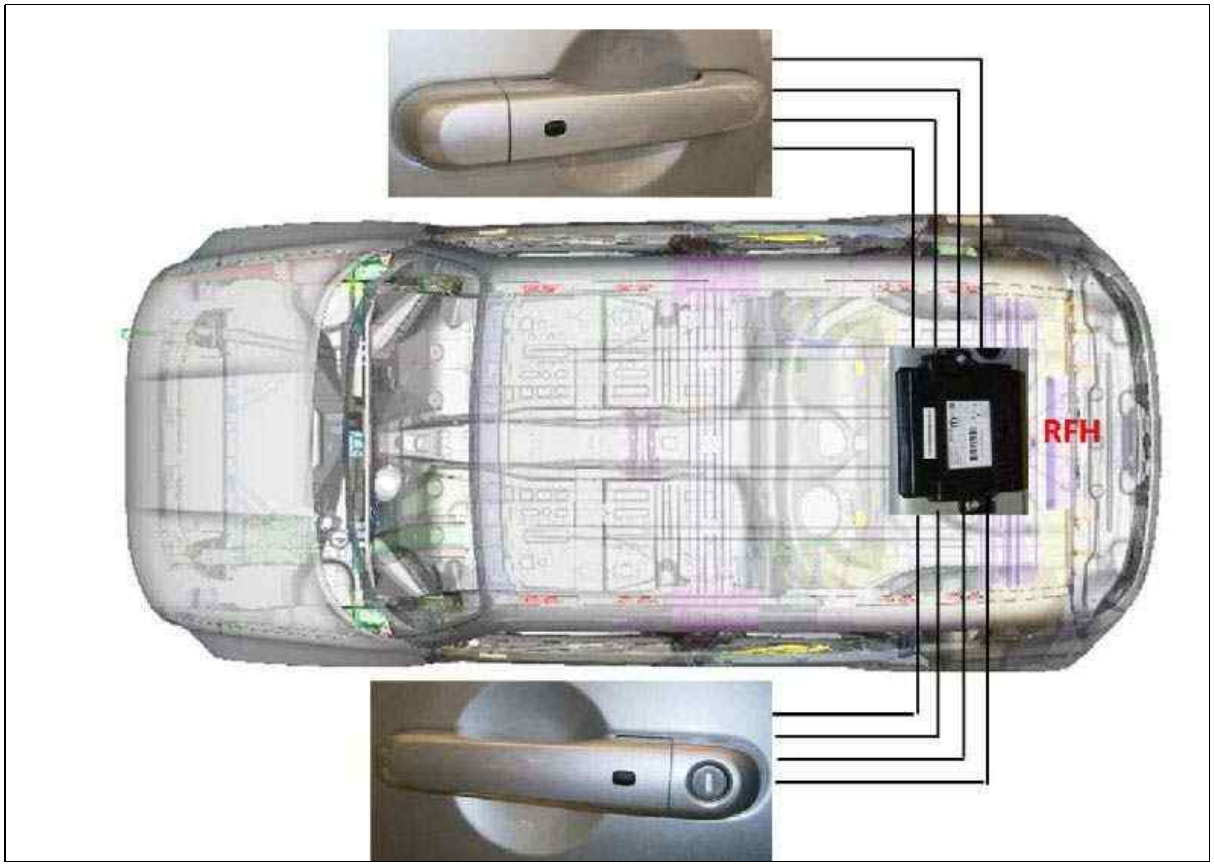
Fig 5: RFH Module & Antenna Circuit Diagram



Courtesy of CHRYSLER GROUP, LLC

The RFHM is located in the rear overhead compartment of the vehicle. The module be adjusted or repaired and, if damaged or ineffective, it must be replaced.

Fig 6: RFH Module & Door Locks Circuit Diagram



Courtesy of CHRYSLER GROUP, LLC

The Passive Entry system also makes use of the two door locking buttons on the front handles, through which car users can request door locking. Inside the handles are capacitive sensors (one per handle) which allow the RFH module to determine whether the user's hand is near the inside of the handle.

The RFH module detects the vicinity of the key to the vehicle through aerials. The key recognition and authentication stage begins when the vehicle user brings their hand towards the inside of the handle. At that moment, the RFH reads the key ID and the secret code stored in it. If the RFH module identifies it as the key encoded in its memory, it sends the request to unlock the doors or the driver door only (depending on the setting in the "my car" menu) to the BCM.

Fig 7: Mechanical Groove Key

Courtesy of CHRYSLER GROUP, LLC

Mechanical groove key: RFH functions - If the vehicle comes with key with mechanical groove, the RFH module carries out only the following function:

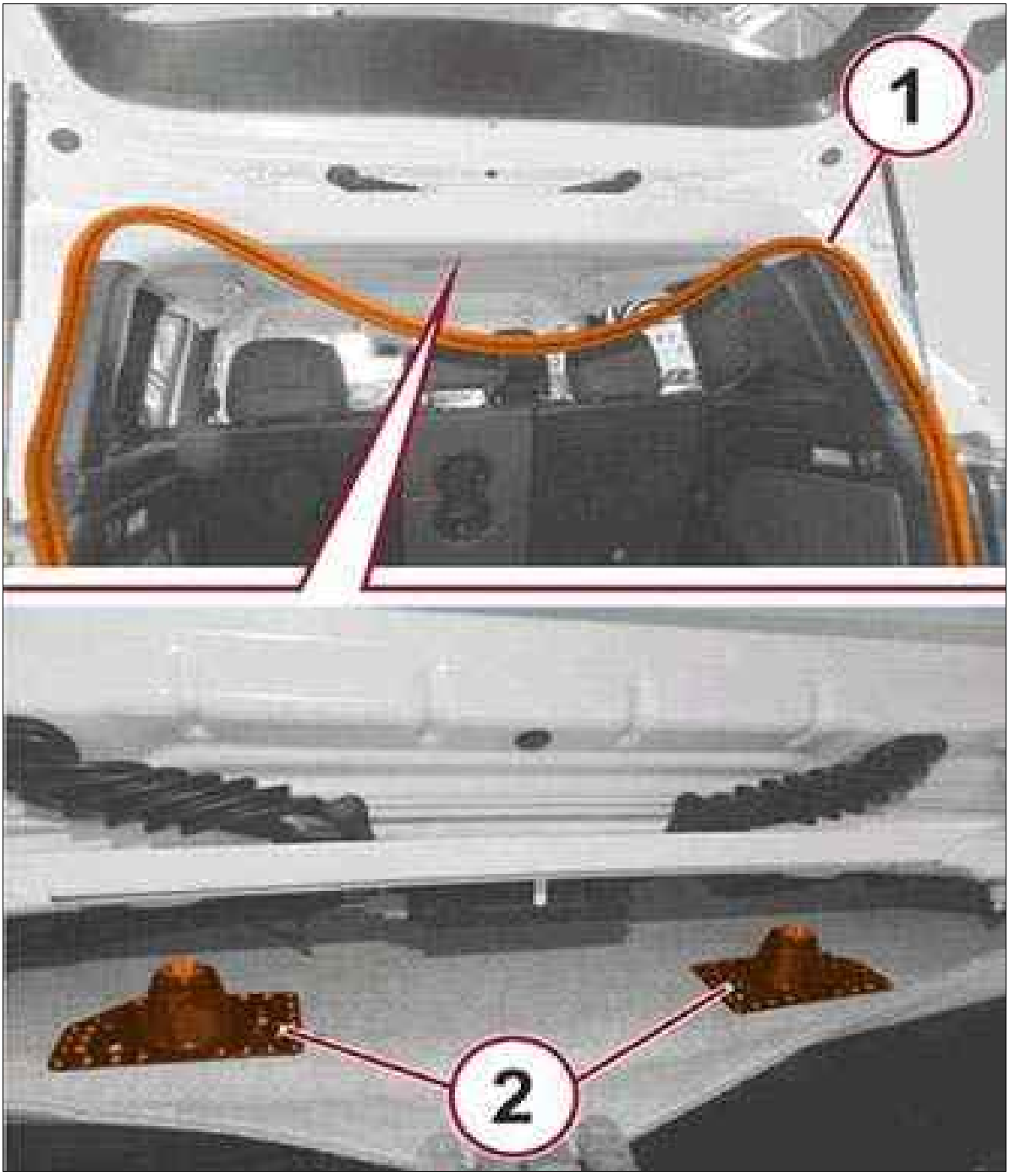
- TPMS (tire pressure detection) function

In this case the RFH module is not a component of the immobilizer function, since the ID codes of the vehicle's keys are stored in the BCM. Consequently, the ignition switch no longer comprises the KIN module (Start/Stop button) but the classic mechanical switch.

MODULE, RADIO FREQUENCY (RF HUB) > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

1. Disconnect and isolate the negative battery cable.
2. Lower the top portion of the liftgate weatherstrip.

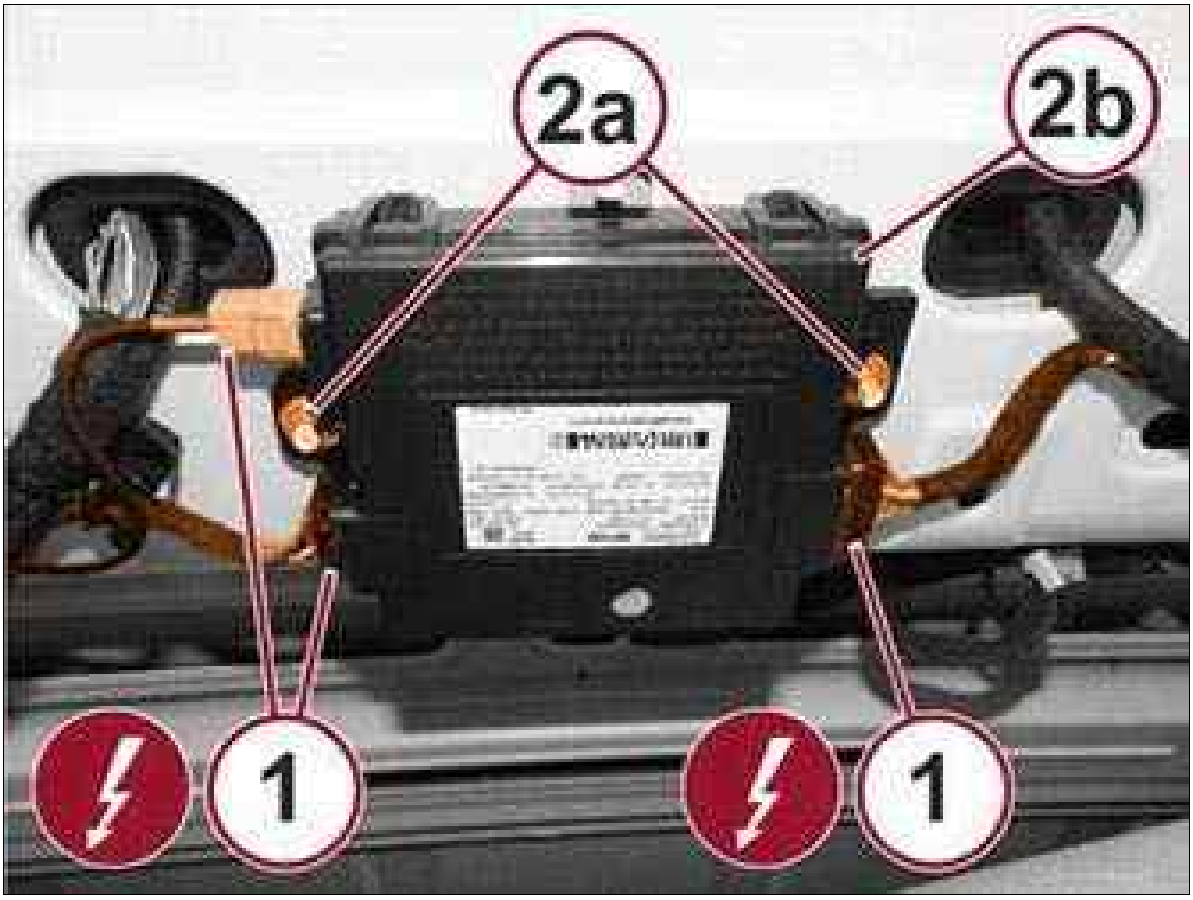
Fig 1: Weatherstrip & Retainers



Courtesy of CHRYSLER GROUP, LLC

3. With the proper tool, remove the retainers (2).

Fig 2: RFH Module, Connectors & Nuts



Courtesy of CHRYSLER GROUP, LLC

4. Slightly lower the rear of the headlining and disconnect the electrical connections of the RFHM.
5. Remove the nuts (2a) and remove the RFHM (2b).

MODULE, RADIO FREQUENCY (RF HUB) > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

1. Check that the RFHM is not damaged.
2. Place the RFHM to the vehicle and tighten the nuts.
3. Connect the electrical connectors to the RFHM.
4. Connect the negative battery cable.
5. Connect the diagnostic scan tool and perform the learning procedure.
6. Secure the headliner back in the installed position.
7. Secure the tailgate weatherstripping.

MODULE, RADIO FREQUENCY (RF HUB) > MODULE PROGRAMMING > PROGRAMMING

THE RF-HUB

If the Remote Frequency Hub Module (RFHM) is replaced on vehicles equipped with the Passive Entry key:

1. Position the ignition to OFF
2. Activate the hazard warning lights
3. Connect the scan tool
4. Navigate to RFH control unit located in "Misc Functions" menu
5. Select and perform the "RFH control unit replacement" routine and follow the prompted instructions
6. Once complete, perform the following routines located in the "Misc Functions" menu:
    1. Write the rated front and rear tire pressure values
    2. Program ID of rear right tire sensor
    3. Program ID of rear left tire sensor
    4. Program ID of front left tire sensor
    5. Program ID of front right tire sensor
    6. Carry out the "TPM sensor roller bench test" procedure.
7. Programming is complete.

MODULE, RADIO RECEIVER > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

There are three Radio Receiver Modules (RRM) available in this vehicle, Uconnect® 3.0, Uconnect® 5.0 and Uconnect® 6.5. Each RRM has a distinct chassis design and is identified by a sales code. The Uconnect® 3.0 RRM (Sales Code RA1) includes the following features:

- AM/FM frequency reception
- dot-matrix, single DIN, monochromatic display
- six-channel presets
- four speakers
- iPod integration
- Auxiliary/Universal Serial Bus (USB) Media Hub
- USB port in the center console (optional)
- vehicle personalization/settings
- speed adjusted volume

The Uconnect® 5.0 RRM (Sales Code RA2) includes the following features:

- AM/FM frequency reception

- 12.7 centimeter (5.0 inch) full color touchscreen display
- iPod integration
- Auxiliary/USB Media Hub
- USB port in the center console (optional)
- vehicle personalization/settings
- speed adjusted volume
- integrated steering wheel controls
- Radio Broadcast Data System (RBDS)
- Bluetooth connectivity
- Bluetooth streaming audio
- hands-free phone
- Voice Recognition (VR) commands
- text message reader
- six speakers (optional)
- integrated Global Positioning System (GPS) navigation (optional)
- ParkView® integrated rear view camera (optional)
- Sirius XM satellite radio (optional)

The Uconnect® 6.5 RRM (Sales Code RA4) includes the following features:

- AM/FM frequency reception
- 16.5 centimeter (6.5 inch) full color touchscreen display
- iPod integration
- Auxiliary/USB Media Hub
- USB port in the center console (optional)
- vehicle personalization/settings
- speed adjusted volume
- integrated steering wheel controls
- Radio Broadcast Data System (RBDS)
- Bluetooth connectivity
- Bluetooth streaming audio
- hands-free phone
- Voice Recognition (VR) commands
- text message reader

- nine speakers (optional)
- Premium integrated 3D Global Positioning System (GPS) navigation (optional)
- ParkView® integrated rear view camera (optional)
- Sirius XM satellite radio (1-year subscription)

Hard wired circuitry connects the RRM to the electrical system of the vehicle. These hard wired circuits are integral to several wire harnesses, which routes throughout the vehicle and retained by many different methods. These circuits may be connected to each other and to the vehicle electrical system through the use of a combination of soldered splices, splice block connectors, and many different types of wire harness terminal connectors and insulators. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin out and location views for the various wire harness connectors, splices and grounds.

The RRM cannot be adjusted or repaired. If the RRM is damaged or ineffective, it must be replaced.

MODULE, RADIO RECEIVER > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

The Radio Receiver Module (RRM) becomes operational when it receives a wake up signal over the Controller Area Network (CAN) - B data bus indicating the status of the ignition switch is On or Accessory. For further information on the operation of the radio or media system in the vehicle, see the heading for the appropriate audio system option in the User Guide or the Owner Manual. See the Uconnect® web site (**http://www.driveuconnect.com/**) for more information, or refer to the **For Owners** link on the vehicle brand web site for copies of those publications.

The RRM uses a roof mounted antenna for AM/FM signal reception and, depending upon vehicle optional equipment, a roof mounted combination antenna that can receive Global Positioning System (GPS) and satellite radio signals.

Depending upon the audio system options, the RRM can play audio from many different media sources. The media can be played by connecting the source to the audio system via a 3.5 millimeter auxiliary (AUX) port, a Universal Serial Bus (USB) port or through wireless Bluetooth audio streaming. Refer to the Uconnect® web site (**http://www.driveuconnect.com/**) for compatibility information.

NOTE:

USB devices (e.g., camera memory USB adaptors, etc. excluding Apple products) must comply with the MSD (Mass Storage Device) standard. This remote USB port can provide power to the inserted device.

MODULE, RADIO RECEIVER > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

NOTE:

For RA4 radios, if possible, the version of the map and Point Of Interest (POI) data should be noted before the original radio is replaced with a new unit. If the version of the map and POI data

found on the new radio is not equal to or newer than the version that is found, updated data will need to be downloaded and installed to the new radio at the expense of the dealer. For the Navigation system restore and update procedures, refer to STANDARD PROCEDURE .

Fig 1: Center Trim Bezel & Tabs

Courtesy of CHRYSLER GROUP, LLC

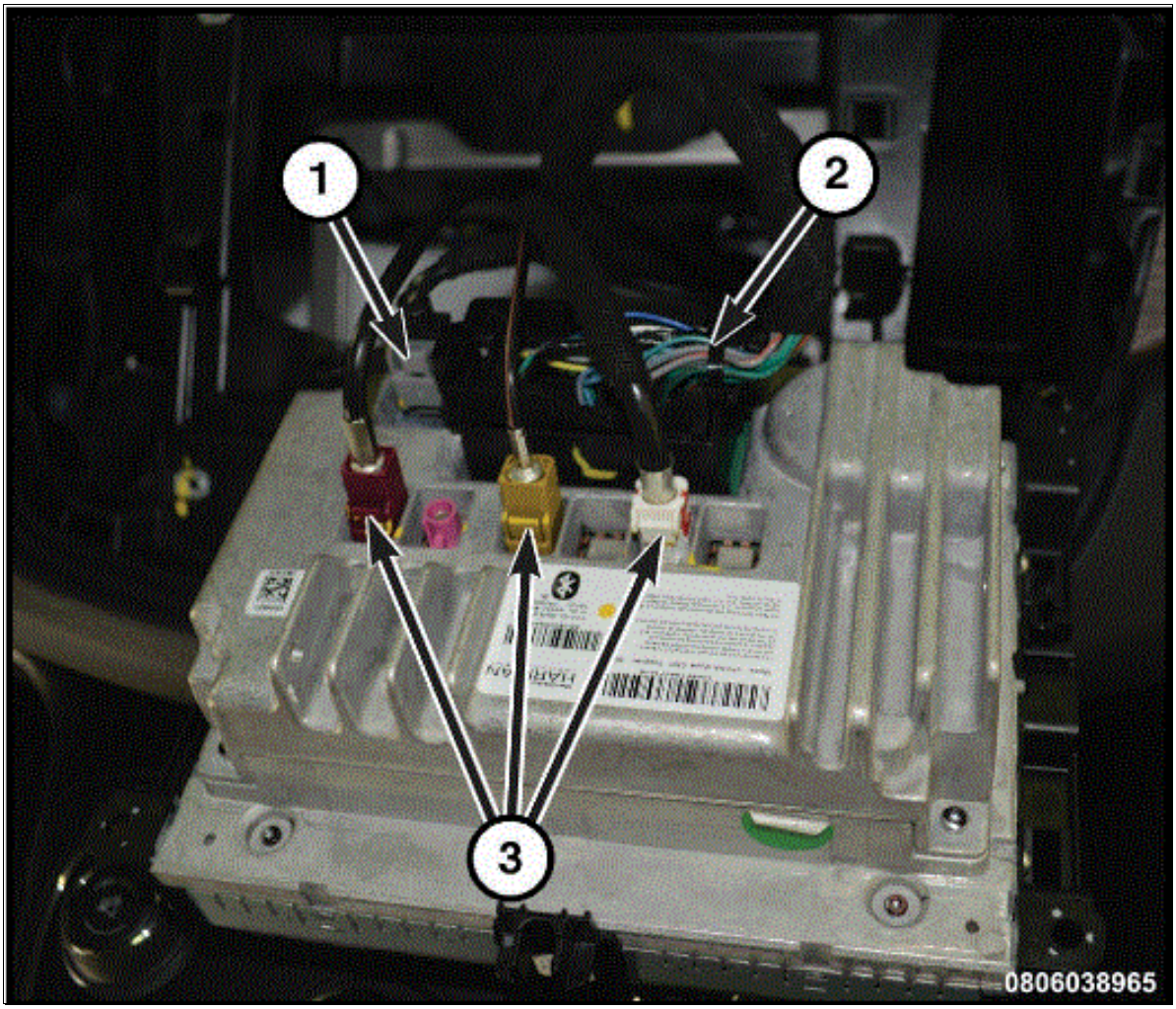
1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.
2. Using trim stick C-4755 or equivalent, remove the center trim bezel (1b) from the instrument panel.

Fig 2: Radio & Screws

Courtesy of CHRYSLER GROUP, LLC

3. Remove the four screws (1a) securing the radio (1b) to the instrument panel.
4. Pull the radio out far enough to access the back of the radio.

Fig 3: Radio Receiver Module Connectors

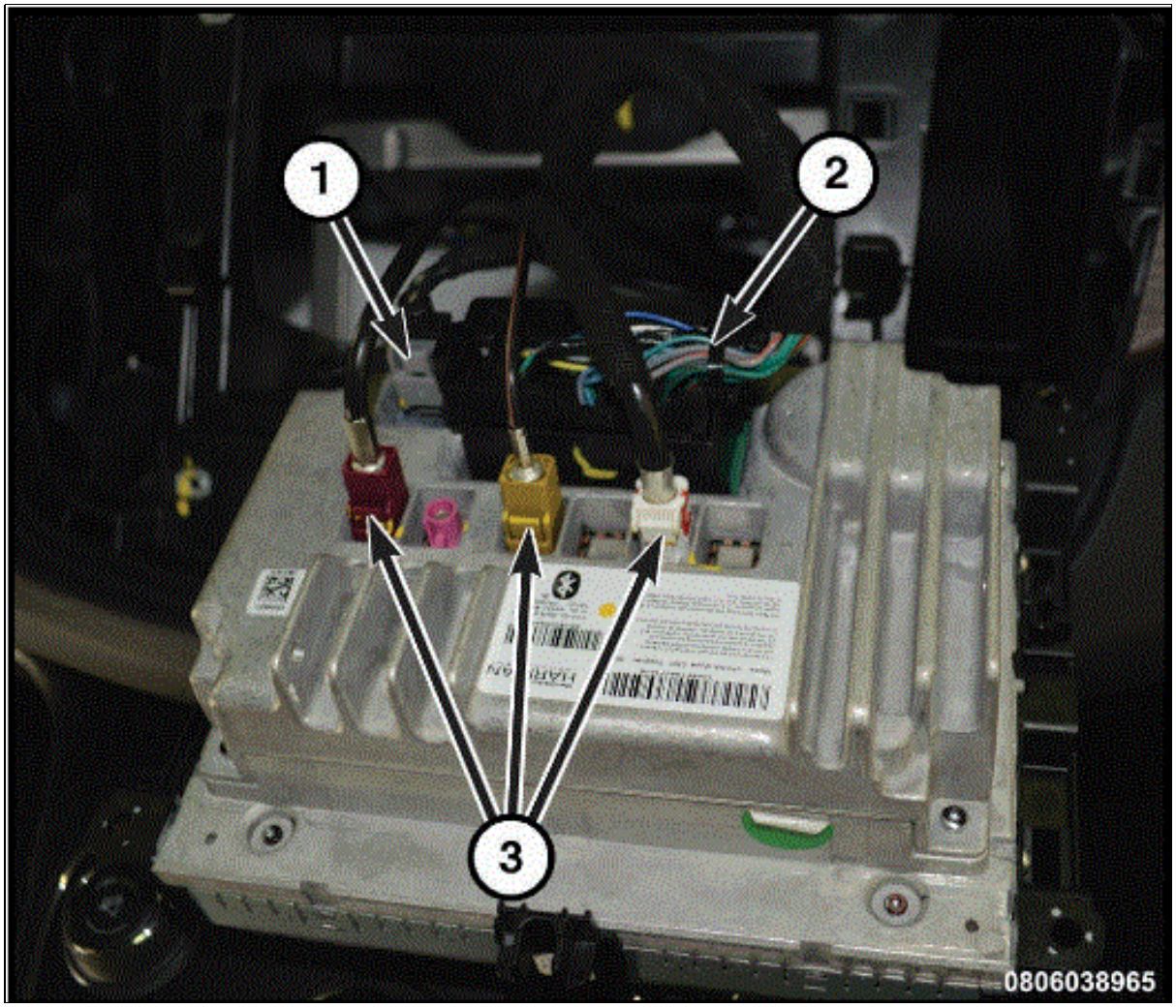


Courtesy of CHRYSLER GROUP, LLC

5. Disconnect the antenna cables (3), and radio wire harness connector (2).
6. If equipped, disconnect the USB connector (1).
7. Remove the radio from the instrument panel.

MODULE, RADIO RECEIVER > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

Fig 1: Radio Receiver Module Connectors



Courtesy of CHRYSLER GROUP, LLC

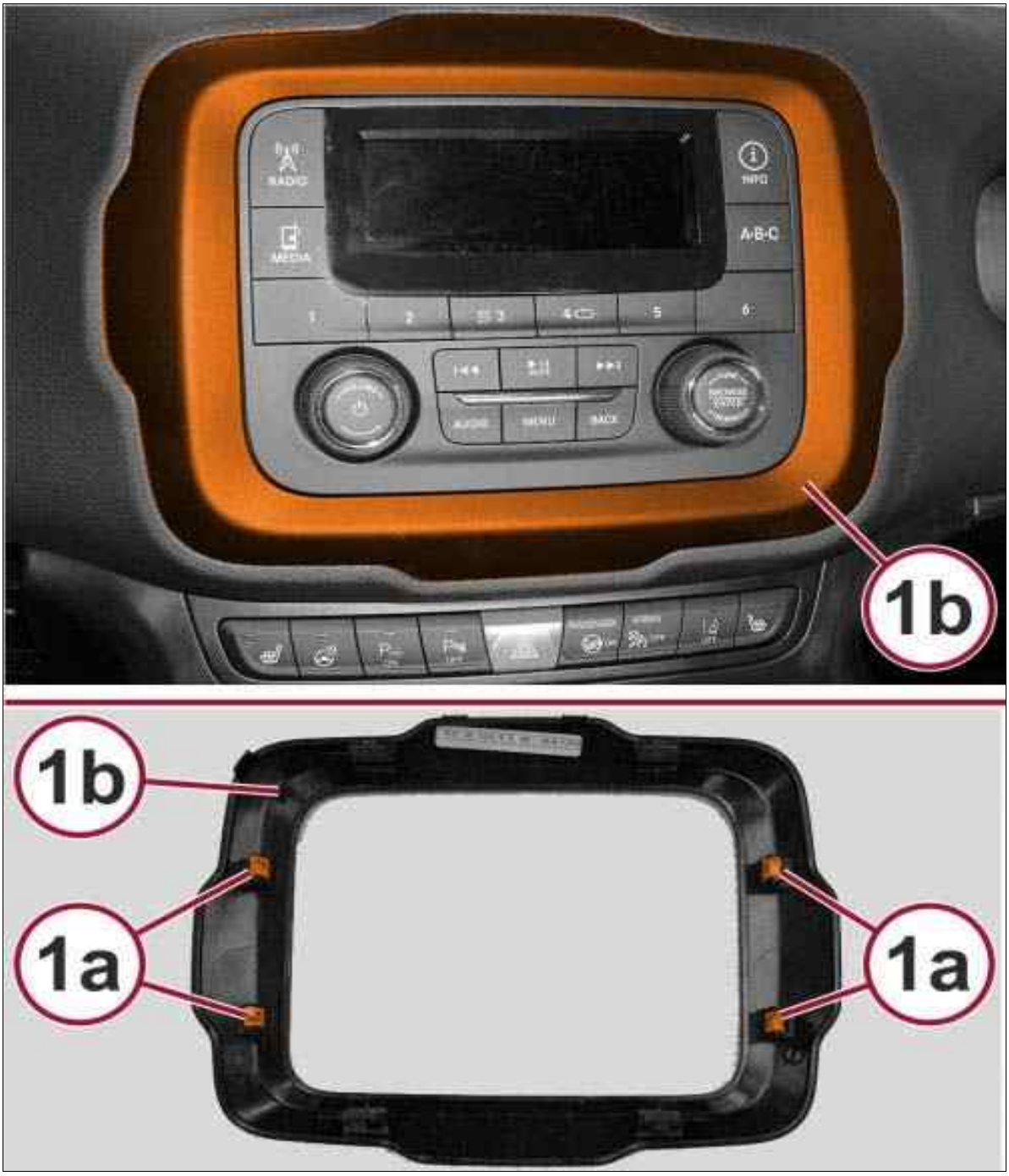
1. Position the radio near the instrument panel.
2. Connect the antenna cables (3) and radio wire harness connector (2).
3. If equipped, connect the USB connectors (1).

Fig 2: Radio & Screws

Courtesy of CHRYSLER GROUP, LLC

4. Position the radio into the instrument panel.
5. Install and securely tighten the four screws (1a) securing the radio (1b) to the instrument panel.

Fig 3: Center Trim Bezel & Tabs



Courtesy of CHRYSLER GROUP, LLC

6. Install the instrument panel center bezel (1b). Be certain the four retaining tabs (1a) are fully engaged to the instrument panel.
7. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector.

> *NOTE:*
>
> *If this Electronic Control Unit (ECU) is being replaced with a new unit, a diagnostic scan tool MUST be used to align the PROXI configuration data into the new ECU. Follow the*

routine outlined in the diagnostic scan tool for PROXI Configuration Alignment under Body Control Module (BCM) Miscellaneous Functions menu.

NOTE:

Uconnect® Access Applications and WiFi hotspot will be automatically updated in the replacement radio through the radio's embedded cellular phone based on the customers present subscription status. This update process may take up to an hour, depending upon the number of apps and adequate cellular services accessibility. The dealer is not expected to perform this process or to oversee it, but may need to explain to the vehicle owner or operator that some features and applications may not be fully restored and overall system response may be slowed until the process has completed.

NOTE:

For RA4 radio only: Any factory replacement radio for the same vehicle will be provided with the Navigation system already activated. For more information, refer to the NAVIGATION/TELECOMMUNICATION - SERVICE INFORMATION article.

MODULE, RADIO RECEIVER > MODULE PROGRAMMING > PROGRAM THE RADIO

1. Connect the scan tool.
2. Check vehicle for DTCs.
3. Clear all stored DTCs.
4. Turn car OFF then ON and confirm DTCs are gone.
5. Go to BCM >> Misc. Functions >> Proxi Alignment.

If required, continue to programming the next module.

MODULE, TIRE PRESSURE MONITORING (TPM) > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION

The Tire Pressure Monitoring (TPM) module is located inside the Radio Frequency Hub (RF hub). The Tire Pressure Monitoring System (TPM) monitors the tire pressure of each tire and alerts the driver, through the instrument panel cluster, when a low pressure tire condition exists or a TPM abnormal condition exists. The TPM consists of the following components:

The tire pressure monitoring system comprises the following components:

- Tire pressure sensor control unit.
- Tire pressure monitoring sensors located in the valve of each wheel.

The Tire Pressure Monitor (TPM) module is able to receive individual tire pressure and temperature information

from the TPM sensors located inside the road wheels. The TPM module has a CAN network interface to connect it to the vehicle network and carry out the following functions:

- Receives and processes the radio frequency data signals from each TPM sensor located inside each wheel.
- Monitors the TPM sensor status.
- Carries out self test.
- Calculates information from TPM sensors to generate low pressure and malfunction warnings.
- Transmits and receives information and status messages to other modules, the instrument panel cluster (IPC) and body control module (BCM), on the CAN network.
- Carries out diagnostic functions.

MODULE, TIRE PRESSURE MONITORING (TPM) > DIAGNOSIS AND TESTING > DIAGNOSIS AND TESTING

Tire Pressure Monitoring (TPM) System Diagnosis

When diagnosing a tire pressure issue, first check the Tire Pressure Monitoring (TPM) warning light in the IPC during starting. From the OFF position, switch ON and check the TPM warning light to observe one of the following:

- If after 10 seconds the warning light is on and constant (not flashing), then one or more of the tires has low pressure or another fault exists.
- If after 10 seconds the warning light flashes for 75 seconds, then remains on constantly, a fault has been detected in the system.

Sensed tire pressure values are also displayed in the Electronic Vehicle Information Center (EVIC).

If the RF-Hub does not receive a signal from a sensor, dashes will be displayed in lieu of a pressure value.

If a low pressure warning is indicated, check the air pressure in all tires with an accurate pressure gauge. If the pressure in the tire is low, diagnose and repair the cause of the low pressure. Reinstall the tire, or tires, on the vehicle and allow approximately two minutes for the message or warning light to turn off. If the message or warning light remains on, another fault is present.

If a system fault exists, check for the following conditions which may cause a system fault:

- Signal interference due to electronic devices or driving next to facilities emitting the same radio frequencies as the TPM sensors.
- Accumulation of snow or ice around the wheels or wheel housings.
- Using snow chains.
- Using wheels not equipped with TPM sensors.
- Incorrectly programmed Sensor ID numbers.

TPM system DTCs are stored in the RF-Hub. Check for DTCs using diagnosis equipment. For the procedure for diagnosing TPM system DTCs, refer to the DTC INDEX article.

If a new sensor is installed, perform one of the following procedures in the TPM diagnosis check test to

program the RF-Hub with the new sensor ID.

- Use the TPM-RKE 9936 analyzer, with the diagnosis equipment, to program the TPM module with the tire pressure sensor ID.
- Once the vehicle has remained stationary for more than 20 minutes, the RF-Hub should automatically learn the sensor ID when the vehicle is driven for a minimum of 10 minutes while maintaining a continuous speed above 24 km/h (15 mph).

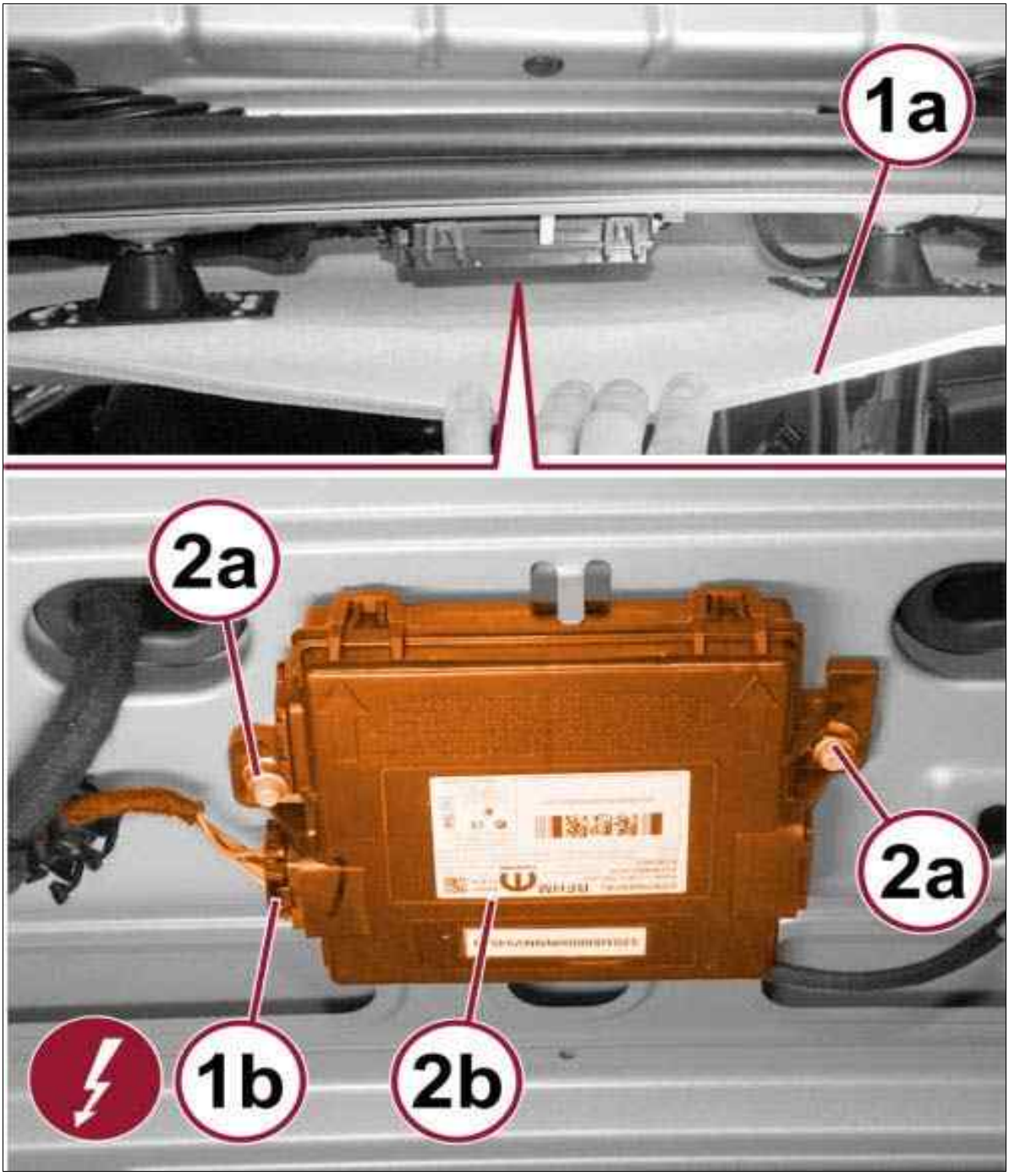
PRESSURE LABEL		PRESSURE THRESHOLD	
psi	**mbar**	**psi**	**mbar**
26	1793	22	1517
27	1862	22	1517
28	1931	23	1586
29	2000	24	1655
30	2069	25	1724
31	2138	25	1724
32	2207	26	1793
33	2276	27	1862
34	2345	28	1931
35	2414	28	1931
36	2483	29	2000
37	2552	30	2069
38	2621	31	2138
39	2690	31	2138
40	2759	32	2207
41	2828	33	2276
42	2897	34	2345
43	2966	35	2414
44	3034	35	2414
45	3103	36	2483
46	3172	37	2552
47	3241	38	2621
48	3310	38	2621
49	3379	39	2690
50	3448	40	2759
51	3517	41	2828
55	3793	44	3034

60	4138	48	3310
65	4483	52	3586
70	4828	56	3862
75	5172	60	4138
80	5517	64	4414

MODULE, TIRE PRESSURE MONITORING (TPM) > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

1. Disconnect and isolate the negative battery cable.

Fig 1: Headliner, Tire Pressure Module, Connector & Nuts



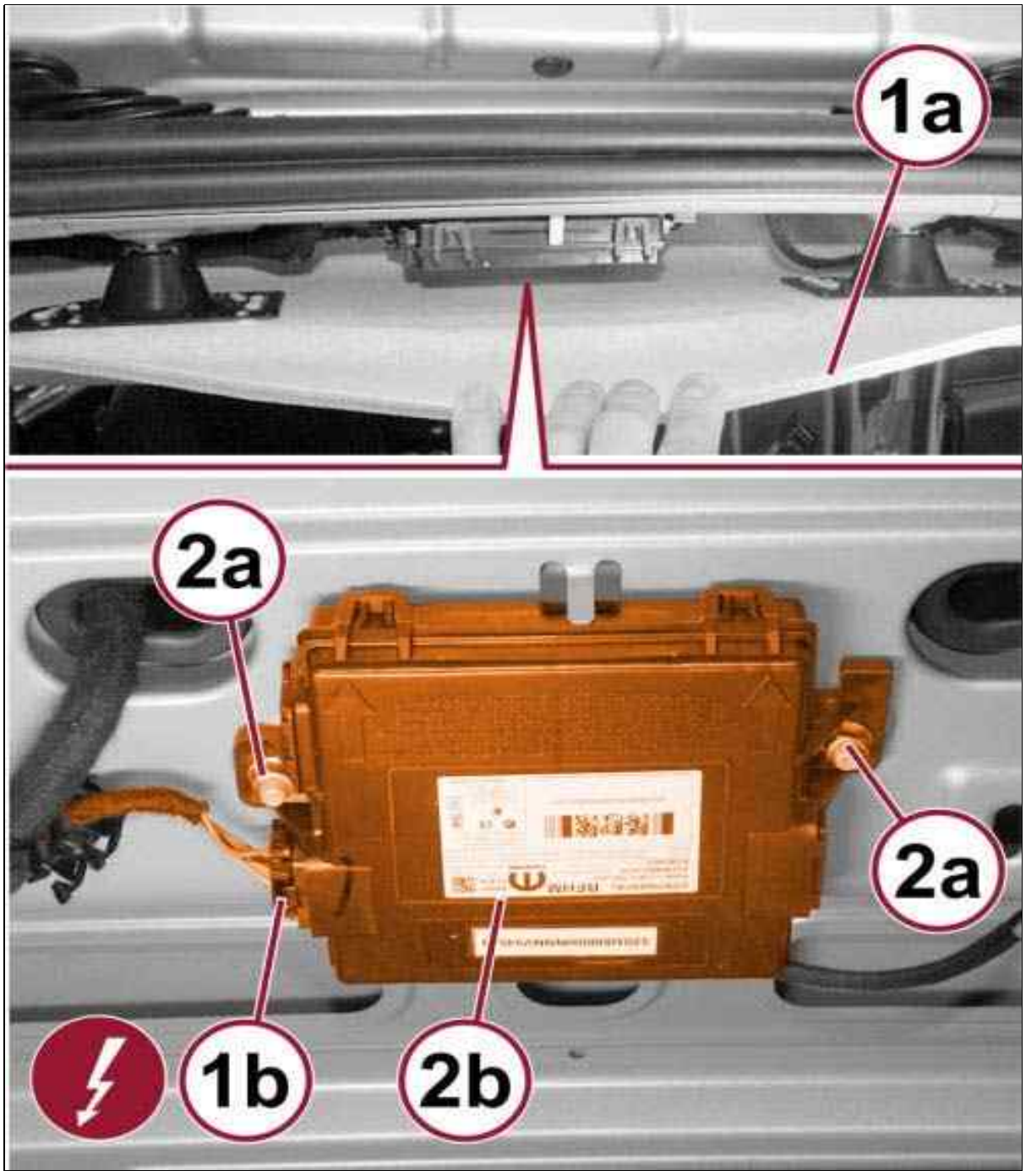
Courtesy of CHRYSLER GROUP, LLC

2. Remove the top portion of the liftgate seal.
3. Slightly lower the rear of the headliner (1a) and disconnect the Tire Pressure Module (TPM) electrical connector (1b).
4. Remove the TPM to body nuts (2a) and remove the TPM (2b).

MODULE, TIRE PRESSURE MONITORING (TPM) > REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION > INSTALLATION

Fig 1: Headliner, Tire Pressure Module, Connector & Nuts



Courtesy of CHRYSLER GROUP, LLC

1. Position the Tire Pressure Module (TPM) (2b) to the body.
2. Install and tighten the TPM to body nuts (2a).
3. Connect the TPM wiring harness connector (1b).
4. Install the partially removed liftgate seal.
5. Connect the negative battery cable.

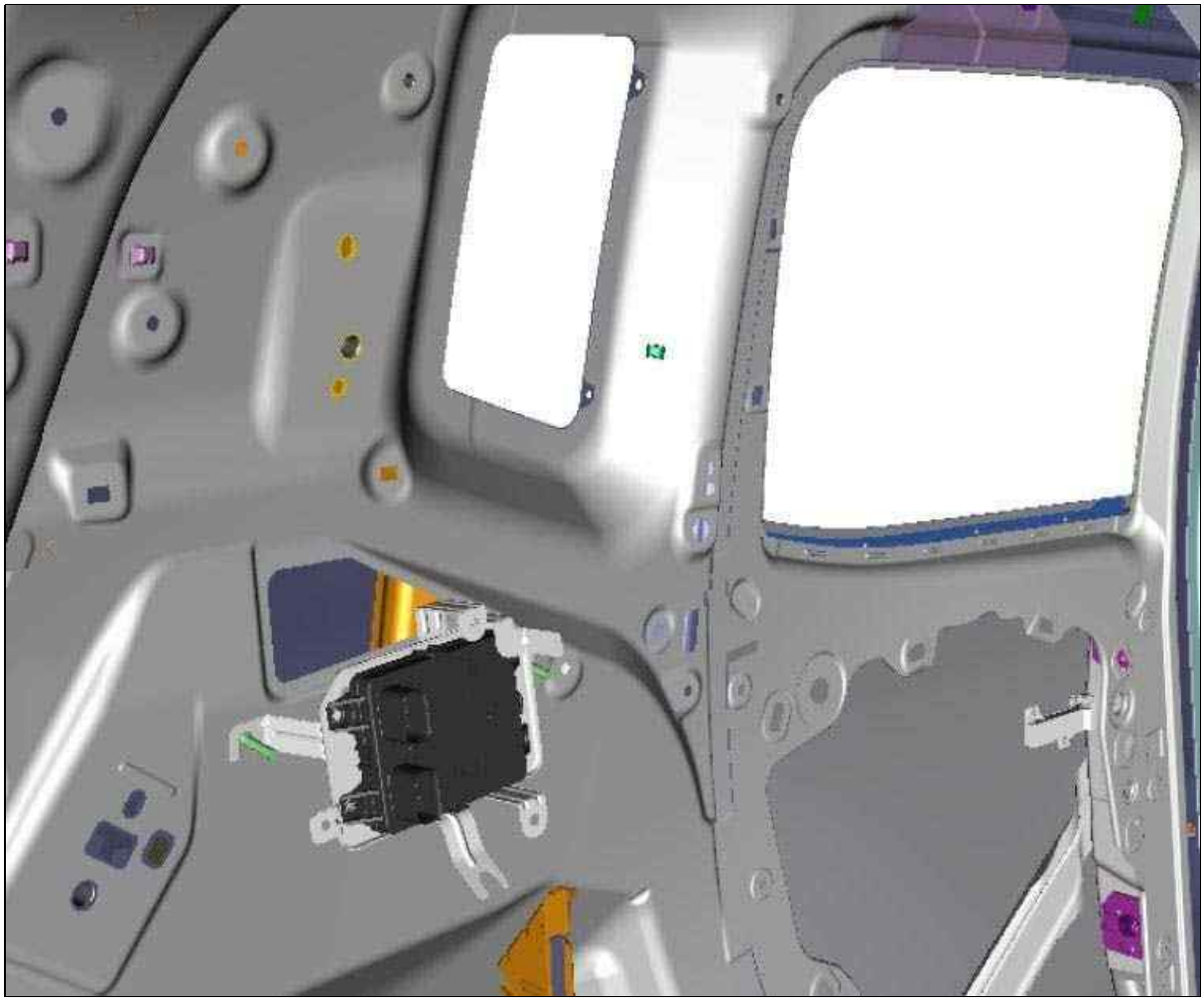
6. Connect the scan tool and perform the learn procedure.

MODULE, TIRE PRESSURE MONITORING (TPM) > MODULE PROGRAMMING > PROGRAMMING

1. With the scan tool, go to "Tire Pressure Module (TPM)", select "Miscellaneous Functions" and perform the Proxy Alignment procedure.
2. With the scan tool, go to "Tire Pressure Module (TPM)", select "Data Display", read "'Tire Placard Pressure - Front" and "'Tire Placard Pressure - Rear" and confirm the values match the Tire Inflation Pressure (Placard) label. Also, go into the Body Control Module (BCM), select Data Display and read "'Tire Placard Pressure - Front" and "'Tire Placard Pressure - Rear" to confirm the values were programmed correctly. If the Placard values are incorrect in the BCM or TPM Module, select the Body Control Module (BCM) then under "Miscellaneous Functions", select "Update Pressure Threshold" and enter the placard pressure value as seen on the Tire Inflation Pressure (Placard) label. Program the Placard Pressure Values into the Tire Pressure Module (TPM).
3. With the scan tool, erase all stored DTCs.
4. Check for DTCs. If DTCs are present, refer to the DTC INDEX article.

MODULE, TRAILER TOW > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

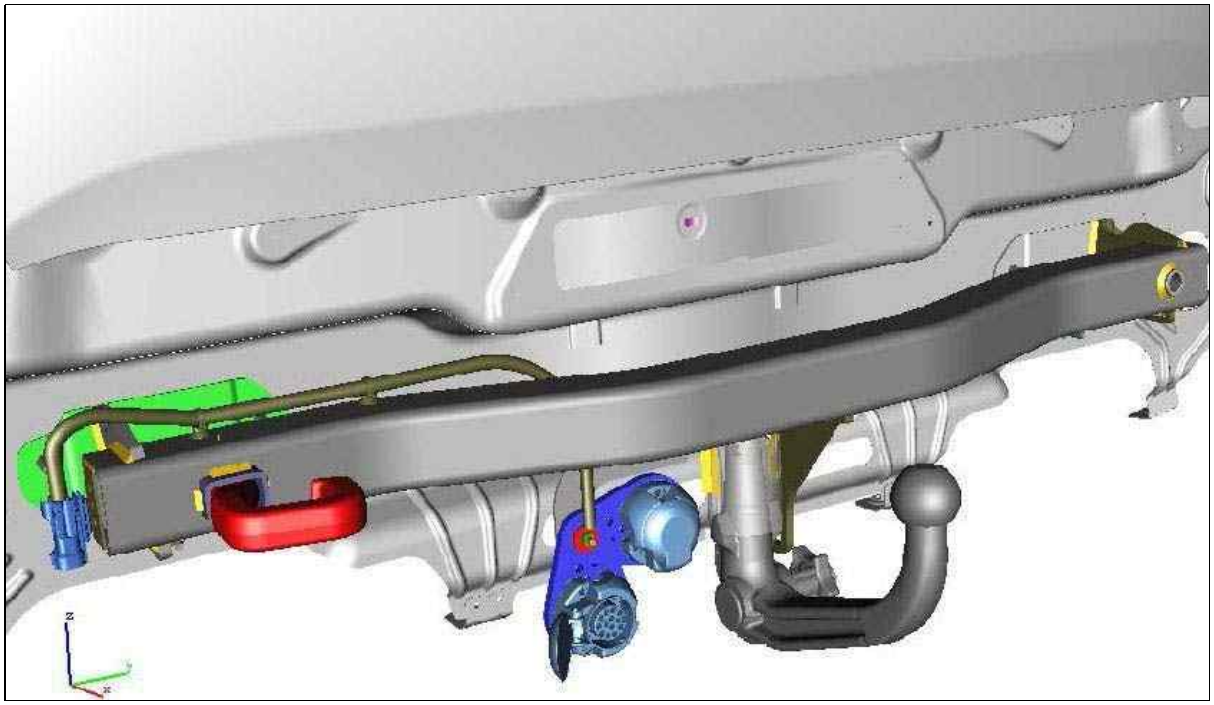
Fig 1: Trailer Tow Module



Courtesy of CHRYSLER GROUP, LLC

The vehicle can be equipped with a fixed tow hook. The external lighting of any trailer receives power supply from the Trailer Tow Module (TTM). The TTM is located on the rear left side of the vehicle, above the wheel arch.

Fig 2: Trailer Tow Module Connector



Courtesy of CHRYSLER GROUP, LLC

The TTM is electrically connected to the wiring of the trailer through a connector near the tow hook.

The TTM module shows all the rear light activation controls from the vehicle on the trailer.

MODULE, TRAILER TOW > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

The Trailer Tow Module (TTM) is used to operate the trailer lamps and lighting system in conjunction with the vehicles various module outputs. The TTM monitors CAN bus networks for lighting requests from the Body Control Module and other inputs. The TTM itself is responsible for its own logic, actuation and sensing. The TTM is also responsible for trailer light indicator activation sent from it over the bus to the Instrument Cluster (IC).

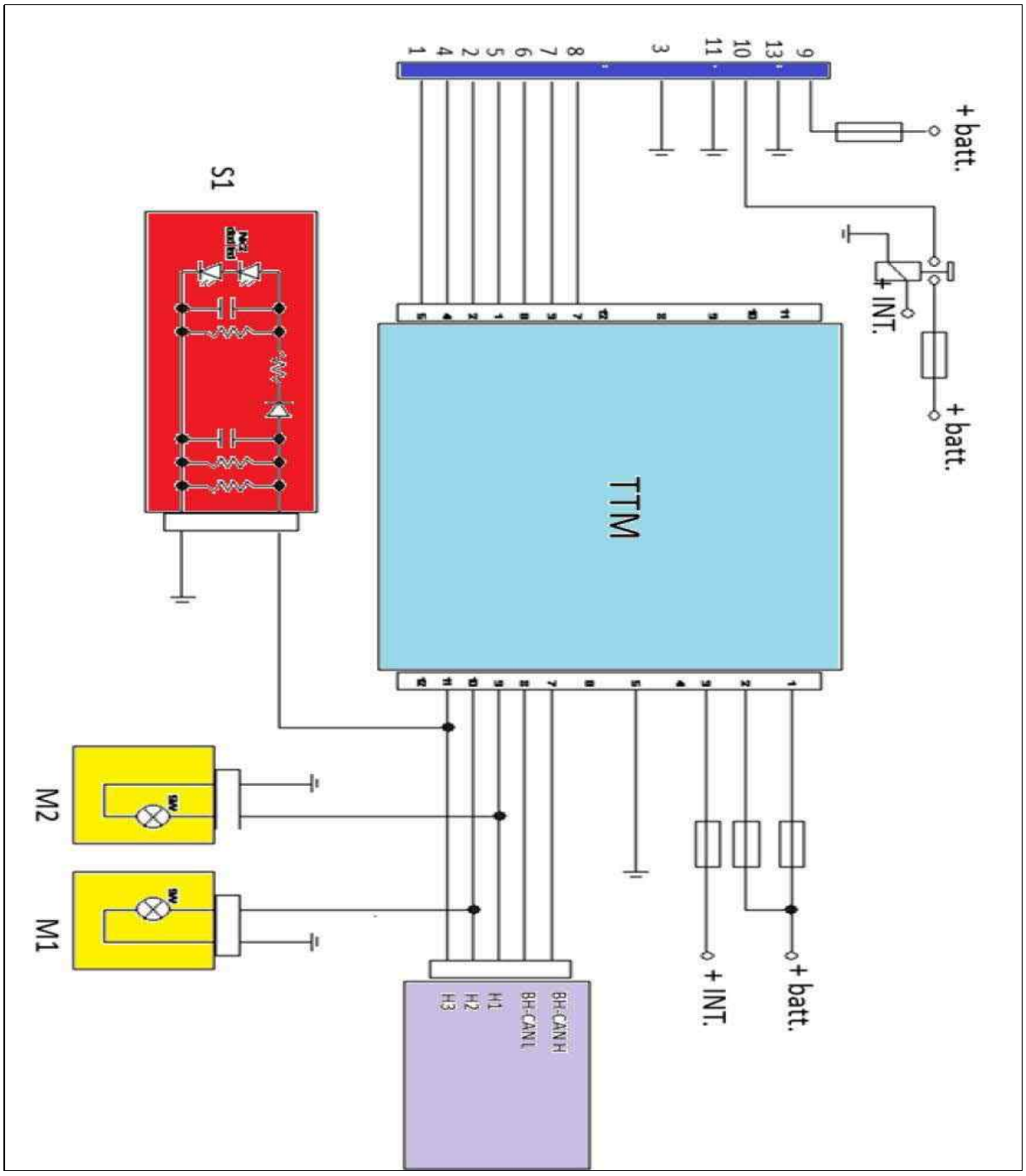
Some of the CAN inputs received by the TTM include the following:

- vehicle speed
- reverse gear
- stop lights OFF and ON requests
- turn and hazard lights OFF and ON requests.
- parking lights
- rear for lighting

The TTM assures that these lighting functions are maintained synchronous with the vehicles lighting requests as read on the CAN bus. The TTM then sends the appropriate output OFF or ON signal to the respective trailer lights. The TTM also sends an output signal failure to the IC indicating if the light operation has failed. The IC

will then display the appropriate indiction.

Fig 1: Trailer Tow Module Circuit Diagram



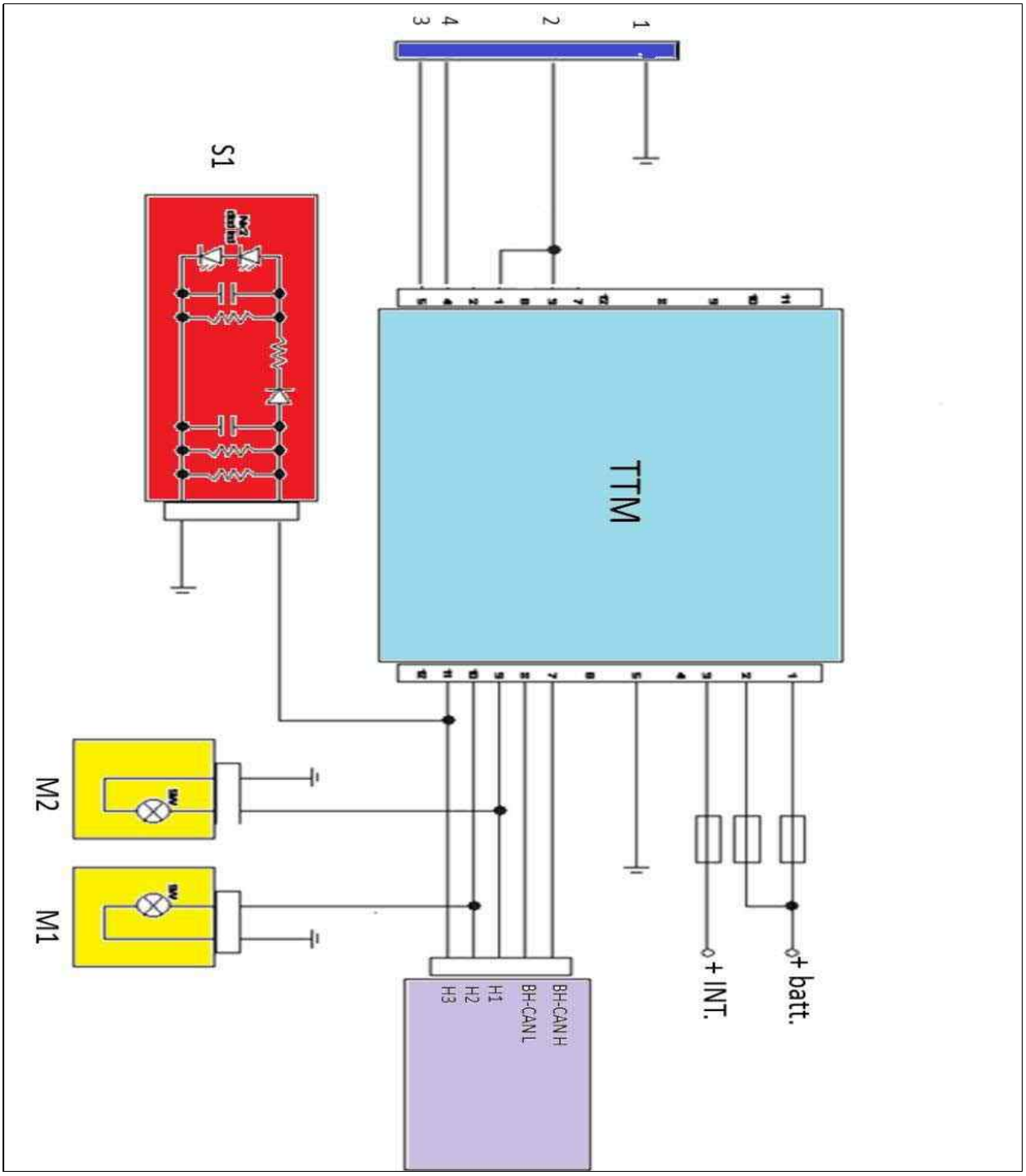
Courtesy of CHRYSLER GROUP, LLC

1. Left side direction indicator (21 W)
2. Rear fog light (2x21 W)
3. Trailer light ground.
4. Right side direction indicator (21 W)
5. Left side light/number plate light (6x5 W)

6. Brake light (4x21 W)
7. Left side light/number plate light (6x5 W)
8. Reversing light (2x21)
9. + Battery power supply
10. Ignition-operated supply
11. Ground for tow hook socket
12. Ground for tow hook socket.

- H1 - Right side direction indicator control (from Body Control Module/BCM)
- H2 - Left side direction indicator control (from BCM)
- H3 - Third brake light control (from BCM)
- M1 - Side direction indicator on left side door mirror.
- M2 - Side direction indicator on right side door mirror.
- S1 - third brake light.

Fig 2: Trailer Tow Module Circuit Diagram (NAFTA Market)



Courtesy of CHRYSLER GROUP, LLC

1. Light ground on trailer
2. Side light/side marker/number plate light (12x5 W)
3. Left side brake light/direction indicator (2x21 W)
4. Right side brake light/direction indicator (2x21 W)

- H1 - Right side direction indicator control (from BCM)
- H2 - Left side direction indicator control (from BCM)

- H3 - Third brake light control (from BCM)
- M1 - Side direction indicator on left side door mirror.
- M2 - Side direction indicator on right side door mirror.
- S1 - Third brake light.

MODULE, TRANSMISSION CONTROL > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

The Transmission Control Module (TCM) is mounted on the outside of the transmission case, over the differential.

The electronic control system consists of various components providing inputs to the TCM. The TCM monitors transmission sensors, shifter assembly, and bus messages to determine transmission shift strategy. After shift strategies are determined, the TCM controls the actuation of transmission solenoids, which controls the routing of hydraulic fluid within the transmission, by moving a sequence of four valves to make a shift occur.

The system performs its functions based on continuous real-time sensor feedback information. In addition the TCM receives information from the rest of the vehicle over the CAN C bus. The CAN C bus is a high-speed communication bus that allows real time control capability between various controllers. Most messages are sent every 20 milliseconds. This means critical information can be shared between the transmission, engine, and ABS controllers. The CAN C bus is a two wire bus with a CAN C Bus (+) circuit and a CAN C Bus (-) circuit. These circuits are twisted pairs in the harness to reduce the potential of radio and noise interference.

The transmission control system automatically adapts to changes in engine performance, vehicle speed, and transmission temperature variations to provide consistent shift quality. The control system ensures that clutch operation during up-shifting and downshifting is more responsive without increased harshness. The TCM activates the solenoid valves and moves valves in the valve body to achieve the necessary gear changes. The required pressure level is calculated from the load condition, engine speed. Vehicle speed (from ABS module) and transmission oil temperature, matched to the torque to be transmitted. Power for the transmission system is supplied through the shifter mechanism (no transmission control relay).

MODULE, TRANSMISSION CONTROL > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

The Transmission Control Module (TCM) regulates the amount of hydraulic pressure used to engage the clutches and the Torque Converter Clutch (TCC), in addition to directing hydraulic pressure to engage or release any given clutch for any given required gear.

The TCM will actuate the valves via solenoids based on the position of the shifter, transmission fluid temperature, engine operating conditions, traction conditions and driver demands.

During a shift, the TCM will actuate the solenoids to match the gear ranges to the optimal torque range of the engine based on the position of the accelerator pedal, shifter and vehicle speed as determined by the PCM based on input from the Vehicle Speed Sensor (VSS) and Anti-lock Brake System (ABS) module.

Due to the complexity of the 948TE transmission control system, always refer to the appropriate transmission electrical/electronic diagnostic information when attempting to diagnose transmission problems.

Some examples of **direct inputs** to the TCM are:

- Battery (B+) voltage

- Ignition Status
- Transmission Range Sensor (TRS)
- Cruise Control Switch
- Throttle Position
- Body Control Module (BCM)
- Shifter Position
- Pressure Switches
- Transmission Temperature Sensor
- Input Shaft Speed Sensor
- Output Shaft Speed Sensor
- Line Pressure Sensor

Some examples of **indirect inputs** to the TCM are:

- Torque Reduction Confirmation
- Engine Coolant Temperature
- Scan Tool Communication

Based on the information received from these various inputs, the TCM determines the appropriate shift schedule and shift points, depending on the present operating conditions and driver demand. This is possible through the control of various direct and indirect outputs.

Some examples of TCM **direct outputs** are:

- Solenoids
- Torque Reduction Request

Some examples of TCM **indirect outputs** are:

- Transmission Temperature
- PRNDL Position

In addition to monitoring inputs and controlling outputs, the TCM has other important responsibilities and functions:

- Storing and Selecting Appropriate Shift Schedules
- System Self-diagnostics
- Diagnostic Capabilities (with scan tool)

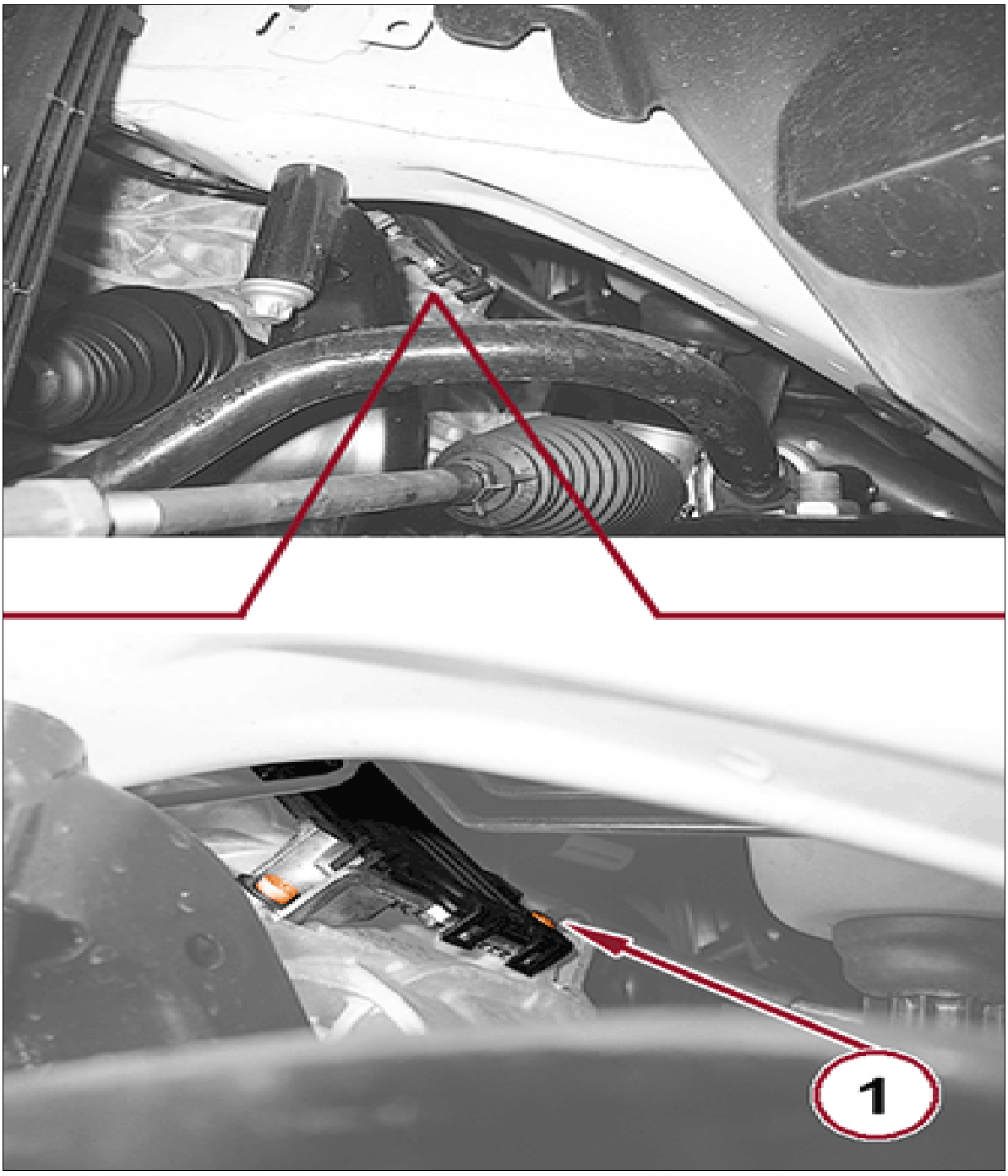
MODULE, TRANSMISSION CONTROL > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

1. Remove the engine cover. For 1.6/2.0L, refer to COVER, ENGINE, REMOVAL AND INSTALLATION . For 1.4L, refer to COVER, ENGINE, REMOVAL AND INSTALLATION . For 2.4L, refer to COVER,

ENGINE, REMOVAL AND INSTALLATION .

2. Remove the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
3. Raise and support the vehicle. Refer to HOISTING, STANDARD PROCEDURE .
4. Remove the left front wheel and tire assembly. Refer to REMOVAL AND INSTALLATION .

Fig 1: Transmission Control Module Lower Mounting Bolts



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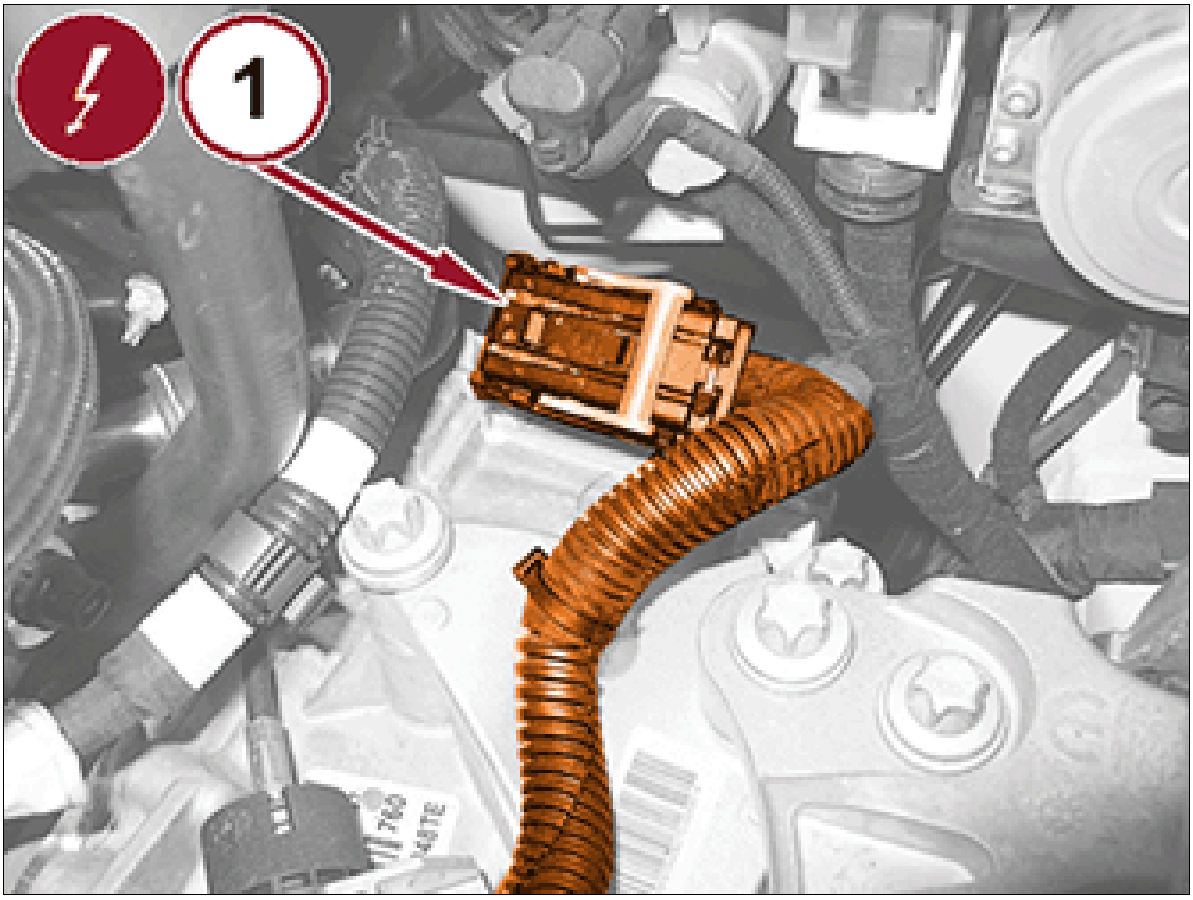
5. Remove the two lower Transmission Control Module (TCM) mounting bolts (1).
6. Lower the vehicle.

Fig 2: Transmission Control Module Connector



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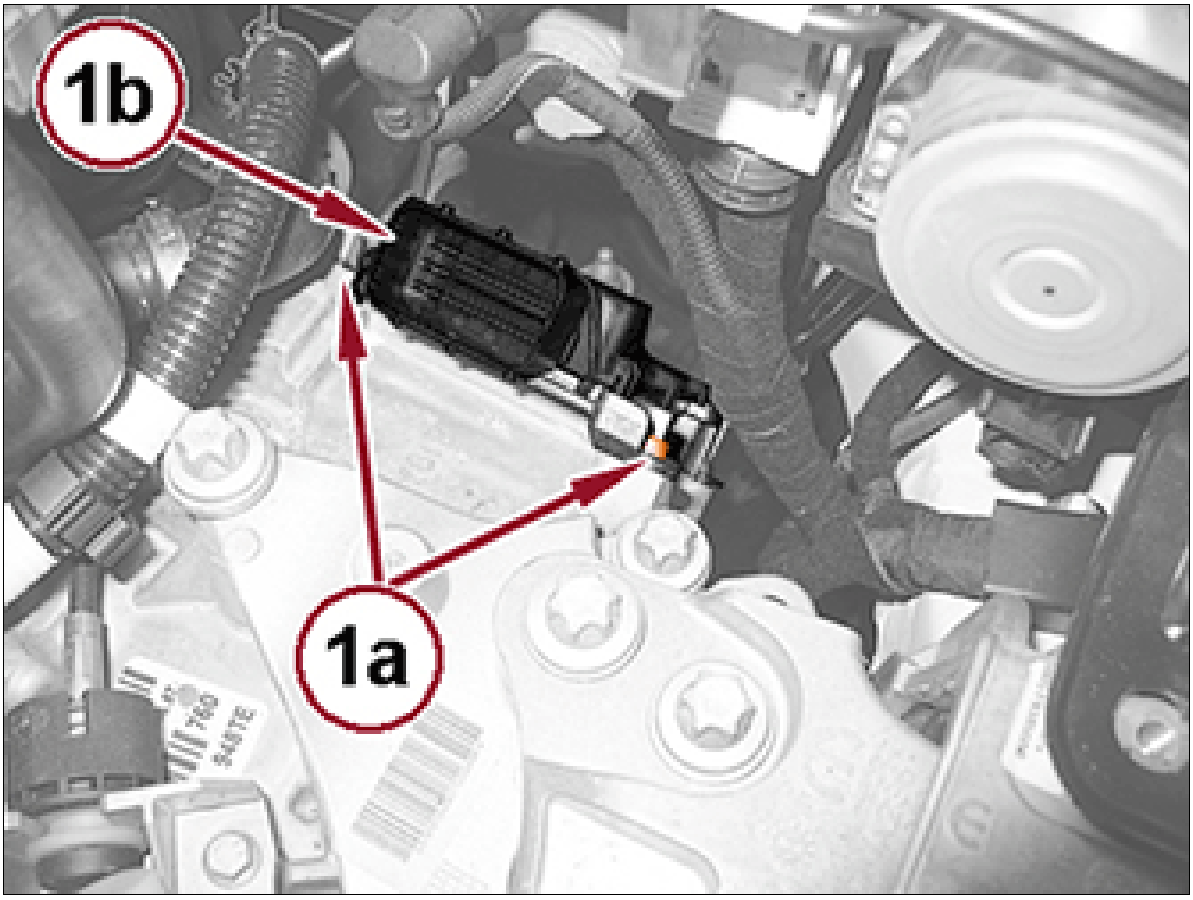
7. Disconnect the TCM wire harness connector (1).

Fig 3: Transmission Control Module Upper Mounting Bolts



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8. Remove the two upper TCM mounting bolts (1a).
9. Remove the TCM (1b) from the vehicle.

MODULE, TRANSMISSION CONTROL > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

NOTE:

When replacing a Transmission Control Module (TCM), the TCM must be programmed. Failure to properly program the TCM may result in the illumination of the Malfunction Indicator Lamp (MIL) and setting DTC(s).

NOTE:

If this Electronic Control Unit (ECU) is being replaced with a new unit, a diagnostics scan tool MUST be used to align the PROXI configuration data into the new ECU. Follow the routine outlined in the diagnostic scan tool for PROXI Configuration Alignment under Body Control Module (BCM) Miscellaneous Functions menu.

NOTE:

The Valve Body Solenoid Learn procedure must be performed when the TCM and/or valve body is replaced. Failure to perform the Valve Body Solenoid Learn procedure will result in reduced shift quality.

1. Place the TCM (2) in position on the transmission.
2. Install the two upper bolts to hold the TCM to the transmission.
3. Connect the wire harness connector into the TCM.
4. Raise the vehicle.
5. Install the two lower TCM mounting bolts and tighten securely.
6. Install the left front tire and wheel assembly. Refer to REMOVAL AND INSTALLATION .
7. Lower the vehicle.
8. Install the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
9. Install the engine cover. For 1.6/2.0L, refer to COVER, ENGINE, REMOVAL AND INSTALLATION . For 1.4L, refer to COVER, ENGINE, REMOVAL AND INSTALLATION . For 2.4L, refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
10. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector to the negative battery cable.
11. Perform TCM programming and verification. Refer to MODULE, TRANSMISSION CONTROL, MODULE PROGRAMMING .

MODULE, TRANSMISSION CONTROL > MODULE PROGRAMMING > TCM PROGRAMMING-948TE

PROGRAMMING THE TRANSMISSION CONTROL MODULE (TCM)

NOTE:

When replacing a Transmission Control Module (TCM), the TCM must be programmed.

NOTE:

Failure to properly program the TCM may result in the illumination of the Malfunction Indicator Lamp (MIL) and setting DTC(s).

NOTE:

While performing the TCM programming procedure, the vehicle battery must be maintained between 10 and 16 volts. Ambient temperature must be between 0° C (32° F) 60° C (140° F). Vehicle must be in Park with brake pedal depressed.

1. Using the scan tool and Dealer Connect, download the appropriate TCM flash file to the scan tool.
2. Turn the Ignition ON, Engine not running.
3. Make sure the gear selector is in the PARK position.
4. Apply and hold the brake pedal for the duration of the programming procedure.
5. Following the menu on the scan tool, program the TCM.

   NOTE:

   If this Electronic Control Unit (ECU) is being replaced with a new unit or if a new transmission has been installed, a diagnostic scan tool MUST be used to align the PROXI configuration data into the new ECU.

   Follow the routine outlined in the diagnostic scan tool for PROXI Configuration Alignment under Body Control Module (BCM) Miscellaneous Functions menu.
6. Using a scan tool, follow the on-screen instructions to perform the VIN Verification procedure. This only needs to be done if a new ECU or a new transmission has been installed.

   NOTE:

   If this Electronic Control Unit (ECU) is being replaced with a new unit, a diagnostic scan tool MUST be used to perform the Valve Body Solenoid Learn procedure. Failure to perform the Valve Body Solenoid Learn procedure will result in reduced shift quality.

   Using a scan tool, follow the on-screen instructions to perform the Valve Body Solenoid Learn procedure.

NOTE:

If this Electronic Control Unit (ECU) is being replaced with a new unit, a diagnostic scan tool MUST be used to perform the TCM Adaptation procedure. Failure to perform the TCM Adaptation procedure will result in reduced shift quality.

Perform the TCM ADAPTATION procedure. Refer to TCM ADAPTATION - 948TE AND 9HP48 .

7. With the scan tool, erase DTCs.
8. With the scan tool, read TCM DTCs.

   Does the scan tool display any DTCs?

   Yes

   1. Perform the appropriate diagnostic procedure(s).

   No

   1. Test Complete
   2. Perform the TRANSMISSION VERIFICATION TEST. Refer to TRANSMISSION VERIFICATION TEST - 948RE 9HP48 .