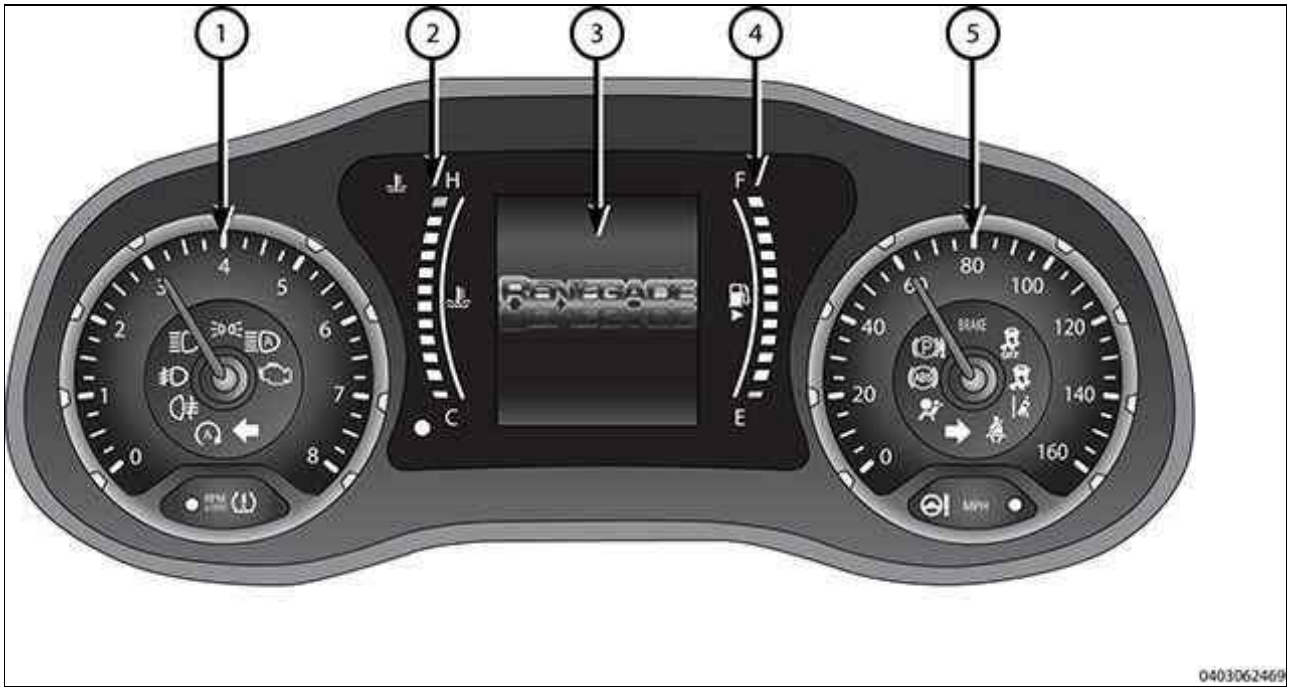
DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

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.

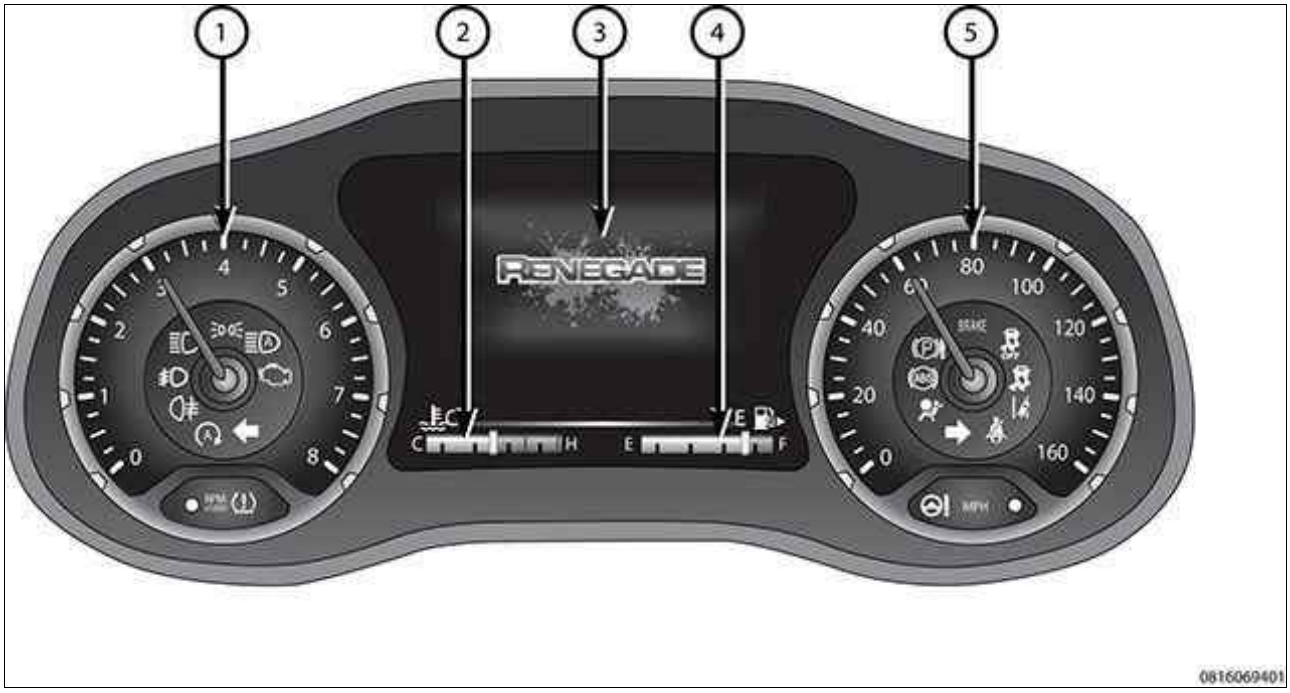
- **Fuel Level Gauge (4)**

  - 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.

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 powertrain, 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 SYSTEM WIRING DIAGRAMS article. 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 & Testing article.

DIAGNOSIS AND TESTING > DIAGNOSIS AND TESTING - INSTRUMENT CLUSTER

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. 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.

If all of the Instrument Panel Cluster (IPC) gauges and indicators are ineffective, be certain to check the IPC fused B(+) fuse and the IPC fused B(+) circuit and ground circuit for shorts or opens. The hard wired circuits between components related to the IPC may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate SYSTEM WIRING DIAGRAMS article. 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 & Testing article.

DIAGNOSIS AND TESTING > ABS WARNING LIGHT ON

The Anti-Lock Brake Module (ABM) sends a message to the Body Control Module (BCM) via the CAN-C network and is then made available to Instrument Panel Cluster via the CAN-B network from the BCM gateway.

0	PRELIMINARY CHECKS	Result OK	Result Not OK	Action
	Connect a diagnostic scan tool and verify on INFORMATION NETWORK CAN: • Absence of control units inactive • Absence of control units in error • Correct insertion of the connector of the ABS control module	Continue to Step 1	1. The presence of anomalies on CAN network 2. ABS control module connector is not properly connected	1. Proceed as indicated by the diagnostic tool 2. Correctly insert ABS control module connector
1	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	With the diagnostic scan tool still connected, check on CAN network information: absence of system / component anomalies absence of CAN network anomalies	Continue to Step 2	1. system / component fault 2. Presence of a fault on the CAN-C network	1. Proceed as indicated by the diagnostic tool 2. Proceed as indicated by the diagnostic tool
2	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	With the diagnostic scan tool still connected to the DLC, verify the absence of anomalies on the instrument panel cluster and the presence of parameters.	Continue to Step 3	Presence of errors	Proceed as indicated by the diagnostic tool
3	CHECK WITH ACTIVE DIAGNOSIS	Result OK	Result Not OK	Action
	With the diagnostic scan tool still connected to the DLC, check the	Diagnostic complete	The ABS warning light flashes	Replace instrument panel cluster

	functionality of the ABS light by activating it with the scan tool.			

DIAGNOSIS AND TESTING > AIRBAG INDICATOR OFF (DOES NOT CARRY OUT INITIAL TEST)

When the ignition key is turned on, the Air Bag indicator lights should come on for a few seconds to indicate the performance of the initial test of the control unit and then go off. The warning lights are integrated LEDs in the electronic circuit of the instrument panel cluster and therefore are NOT replaceable. If the LEDs are at fault, the instrument panel cluster must be replaced.

1	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	Connect a diagnostic scan tool. Make sure that you establish a regular communication with the Air Bag Module and in particular: • no abnormalities in Air Bag control unit • plausibility of all parameters	Continue to Step 2	1. Failure to communicate with the Air Bag Module 2. An error in the Air Bag Module	1. Restore: • Connection between the Air Bag Module and the DLC • power to the Air Bag Module 2. Proceed as indicated by the diagnostic tool
2	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	With the diagnostic scan tool still connected to the DLC, test the functionality of the Air Bag warning light through active diagnosis	Continue to Step 3	Lamp does not flash	Replace instrument panel cluster
3	CHECK PROPER OPERATION	Result OK	Result Not OK	Action
	Verify correct operation of the air bag module.	Diagnostic complete	Air bag module not working	Replace the Air Bag Module

DIAGNOSIS AND TESTING > AMBIENT TEMPERATURE DOES NOT DISPLAY

The ambient temperature does not display in the Electronic Vehicle Information Center (EVIC).

1	CHECKING ELECTRICAL CIRCUIT	Result OK	Result Not OK	Action
	Verify the correct communication between the ambient temperature sensor and Body Control Module. Verify proper operation of the ambient temperature sensor	Continue to Step 2	1. Communication error 2. Ambient temperature sensor fault	1. Restore the correct connections; if necessary replace the wiring. 2. Replace the ambient temperature sensor
2	CHECK DISPLAY OPERATION	Result OK	Result Not OK	Action
	Check the correct operation of the display	Diagnostic complete	Display malfunction	Replace instrument panel cluster

DIAGNOSIS AND TESTING > CLOCK DOES NOT WORK

When the ignition key is turned to the on position, the clock does not display or displays incorrectly.

1	CHECK INSTRUMENT PANEL FEATURES	Result OK	Result Not OK	Action
	Verify: The display shows the correct time You can adjust the time The clock time advances	Diagnostic complete	1. The time displayed is not correct 2. You can not adjust the time 3. The clock time does not advance	1. Set the time correctly 2. Continue to Step 2 3. Continue to Step 3
2	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	Connect the diagnostic scan tool to the DLC. Verify the absence of anomalies on the instrument panel cluster.	Continue to Step 3	Presence of errors	Proceed as indicated by the diagnostic tool
3	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	With the diagnostic scan tool still connected to the DLC, verify the functionality of the display via active diagnosis.	Diagnostic complete	display faulty	Replace the instrument panel cluster

DIAGNOSIS AND TESTING > DOOR OPEN INDICATOR ALWAYS ON

After performing the initial test, the doors open indicator, located on the Instrument Panel Cluster, is always on.

0	PRELIMINARY CHECKS	Result OK	Result Not OK	Action
	Check the correct closure of the four doors	Continue to Step 1	Doors not properly closed	Ensure the doors close properly
1	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	With the diagnostic scan tool, check in the Instrument Panel Cluster the absence of errors and the presence of the parameters	Continue to Step 2	1. the scan tool cannot connect to the instrument panel cluster 2. presence of errors	1. Continue to Step 2 2. Proceed as indicated by the diagnostic tool
2	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	With the diagnostic scan tool, check in the Body Control Module (BCM) for the absence of errors and the variation of the parameter for the state of the doors	Continue to Step 4	The parameter values do not change	Continue to Step 3
3	CHECK ELECTRICAL CONNECTIONS	Result OK	Result Not OK	Action
	Check the operation of the switches on the door motors Check the ground insulation of the connection between the switches and door inputs to the BCM	Continue to Step 4	1. Switch defective 2. Wiring with imperfect ground insulation	1. Replace switch 2. Restore the wiring insulation
4	CHECK WITH ACTIVE DIAGNOSIS	Result OK	Result Not OK	Action
	With the diagnostic scan tool under Instrument Panel Cluster, check in "Active Diagnosis" the correct activation, check the open doors light	Continue to Step 5	The light check doors open is not activated	Replace instrument panel cluster
5	CHECK PROPER OPERATION	Result OK	Result Not OK	Action

	Verify that the fault is no longer present	Diagnostic complete	Anomaly persists	Replace the Body Control Module

DIAGNOSIS AND TESTING > ENGINE COOLANT TEMPERATURE LIGHT DOES NOT WORK

With the ignition key on, the engine coolant temperature warning light on the instrument panel does not work.

NOTE:

The message comes from the engine coolant temperature sensor signal to the Powertrain Control Module (PCM) on the CAN-C network and made available to the Instrument Panel Cluster (IPC) through the Body Control Module (BCM) via the CAN-B network.

1	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	Connect a diagnostic scan tool. Verify the absence of anomalies on the PCM.	Continue to Step 2	Presence of errors	Proceed as indicated by the diagnostic tool
2	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	With the diagnostic scan tool still connected to the DLC, test the functionality of the light in the IPC through active diagnosis	Continue to Step 3	The lamp does not flash.	Replace instrument panel cluster
3	CHECK ELECTRICAL CIRCUIT	Result OK	Result Not OK	Action
	Check continuity / insulation of the wiring between the engine coolant temperature sensor and the PCM.	Continue to Step 4	Circuit fault / not insulated	Restore circuit continuity / insulation
4	CHECK ENGINE TEMPERATURE SENSOR	Result OK	Result Not OK	Action
	Check the correct operation of the engine coolant temperature sensor	Diagnostic complete	faulty sensor	Replace the engine coolant temperature sensor

DIAGNOSIS AND TESTING > EVIC NEVER DISPLAYS DANGER ICE WITH LOW EXTERNAL TEMPERATURE

The Instrument Panel Cluster receives external temperature information from the Body Control Module (BCM), which in turn receives the value from the ambient temperature sensor in the passenger side outside mirror.

0	PRELIMINARY CHECKS	Result OK	Result Not OK	Action
	Check that the temperature shown on the instrument panel cluster display is plausible. Also check if by power cycling the instrument panel cluster the temperature returns plausible	Continue to Step 3	1. implausible value error 2. The value returned correctly with the new key cycle	1. Continue to Step 1 2. Continue to Step 3
1	CHECK WITH ACTIVE DIAGNOSIS	Result OK	Result Not OK	Action
	Connect the diagnostic scan tool to read data from the BCM. With the diagnostic tool test environment in active diagnosis, activate the self-test function for the instrument panel cluster	Continue to Step 2	The function in question is not changed by active diagnosis	Replace the instrument panel cluster
2	CHECK FOR ERRORS	Result OK	Result Not OK	Action
	With the diagnostic scan tool still connected to the DLC, go to the environment BCM and verify the absence of any error on the ambient temperature sensor	Continue to Step 3	1. Ambient temperature sensor defective / incorrectly calibrated 2. Faulty wiring	1. Replace the ambient temperature sensor 2. Restore the correct wiring *NOTE:* *The ambient temperature sensor is an integral part of the passenger outside mirror and is replaced with the mirror.*

3	VERIFY PROPER OPERATION	Result OK	Result Not OK	Action
	Verify that the fault is no longer present	Diagnostic complete		

DIAGNOSIS AND TESTING > EVIC SIGNALS DANGER ICE WITH ELEVATED EXTERNAL TEMPERATURE

The Instrument Panel Cluster receives external temperature information from the Body Control Module (BCM), which in turn receives the value from the ambient temperature sensor in the passenger side outside mirror.

0	PRELIMINARY CHECKS	Result OK	Result Not OK	Action
	Check that the temperature shown on the instrument panel cluster display is plausible. Also check if by power cycling the instrument panel cluster the temperature returns plausible	Continue to Step 3	1. implausible value error 2. The value returned correctly with the new key cycle	1. Continue to Step 1 2. Continue to Step 3
1	CHECK WITH ACTIVE DIAGNOSIS	Result OK	Result Not OK	Action
	Connect the diagnostic scan tool to read data from the BCM. With the diagnostic tool test environment in active diagnosis, activate the self-test function for the instrument panel cluster	Continue to Step 2	The function in question is not changed by active diagnosis	Replace the instrument panel cluster
2	CHECK FOR ERRORS	Result OK	Result Not OK	Action
	With the diagnostic scan tool still connected to the DLC, go to the environment BCM and verify the absence of any error on the ambient temperature sensor	Continue to Step 3	1. Ambient temperature sensor defective / incorrectly calibrated 2. Faulty wiring	1. Replace the ambient temperature sensor 2. Restore the correct wiring *NOTE:* *The ambient temperature sensor is*

				an integral part of the passenger outside mirror and is replaced with the mirror.
3	VERIFY PROPER OPERATION	Result OK	Result Not OK	Action
	Verify that the fault is no longer present	Diagnostic complete	The anomaly persists	Contact Technical Support for more information on the problem

DIAGNOSIS AND TESTING > FUEL WARNING LIGHT DOES NOT WORK

With the ignition key on, the fuel reserve warning light does not come on when the tank enters the reserve level.

NOTE:

The message comes from the fuel level signal to the Body Control Module (BCM) and made available to the Instrument Panel Cluster (IPC) through the CAN-B network.

The BCM also sends a fuel level sensor error message.

1	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	Connect the diagnostic scan tool to the DLC. Verify the absence of anomalies in the BCM.	Continue to Step 2	Sensor with open circuit, sensor DC, value incongruent / implausible with actual fuel level	Proceed as indicated by the diagnostic tool
2	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	With the diagnostic scan tool, test the functionality of the fuel reserve light through active diagnosis.	Continue to Step 3	The light does not come on.	Replace instrument panel cluster
3	CHECK FUEL LEVEL SENSOR	Result OK	Result Not OK	Action
	Check the operation of the fuel level sensor	Continue to Step 4	Sensor not working.	Replace the fuel pump assembly

4	CHECK ELECTRICAL CIRCUIT	Result OK	Result Not OK	Action
	Check continuity / insulation of the circuits between the fuel level sensor and BCM.	Continue to Step 5	Circuit fault / not insulated.	Restore circuit continuity / insulation
5	CHECK PROPER OPERATION	Result OK	Result Not OK	Action
	Verify that the fault is no longer present	Diagnostic complete	Anomaly persists	Replace the Body Control Module

DIAGNOSIS AND TESTING > GENERATOR LIGHT DOES NOT WORK

Turning the ignition key to run, the generator warning light does not come on.

1	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	Connect a diagnostic scan tool. Test the functionality of the light in the instrument panel cluster through active diagnosis.	Continue to Step 2	The light doesn't work.	Replace instrument panel cluster
2	CHECK ELECTRICAL SYSTEM	Result OK	Result Not OK	Action
	Verify the Body Control Module (BCM) power supplies are correct and in particular the signal "D +".	Continue to Step 3	1. Power to the BCM incorrect 2. Signal D + between alternator and BCM interrupted or faulty wiring 3. Faulty alternator	1. Restore correct power to the BCM 2. Restore proper wiring 3. Replace alternator
3	CHECK PROPER OPERATION	Result OK	Result Not OK	Action
	Verify that the fault is no longer present	Diagnostic complete		

DIAGNOSIS AND TESTING > LOW OIL PRESSURE LIGHT DOES NOT WORK

With the ignition key on, the engine low oil pressure warning light on the instrument panel does not work.

NOTE:

The message comes from the engine oil pressure sensor signal to the Powertrain Control Module (PCM) on the CAN-C network and made available to the Instrument Panel Cluster (IPC) through the Body Control Module (BCM) via the CAN-B network.

1	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	Connect a diagnostic scan tool. Verify the absence of anomalies on the PCM and the IPC.	Continue to Step 2	Presence of anomalies in the IPC or PCM	Proceed as indicated by the diagnostic tool
2	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	With the diagnostic scan tool still connected to the DLC, test the functionality of the light in the IPC through active diagnosis	Continue to Step 3	1. The light doesn't work. 2. The light works - pressure sensor defective 3. 3. Engine oil pressure sensor wiring fault / not insulated	1. Replace instrument panel cluster 2. Replace engine oil pressure sensor 3. Restore wiring
3	CHECK PROPER OPERATION	Result OK	Result Not OK	Action
	Verify that the fault is no longer present	Diagnostic complete	anomaly persists	Replace the Body Control Module and continue to Step 4
4	CHECK PROPER OPERATION	Result OK	Result Not OK	Action
	Verify that the fault is no longer present	Diagnostic complete	anomaly persists	Replace the Powertrain Control Module

DIAGNOSIS AND TESTING > MIL WARNING LIGHT FLASHES

The light flashes engine failure with the engine running.

NOTE:

The light may blink in two different modes: when vehicle starts and stops, or when the vehicle is placed in gear.

1	CHECK FUEL WARNING LIGHT	Result OK	Result Not OK	Action
	Check that the low fuel light is off.	Continue to Step 2	Low fuel warning light lit.	Return the fuel level above the reserve area and continue to Step 4
2	CHECK FUEL LEVEL	Result OK	Result Not OK	Action
	Verify the correct operation of the fuel level indicator.	Continue to Step 3	Fuel gauge does not work	Proceed as indicated in FUEL LEVEL INDICATOR DOES NOT WORK
3	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	Connect a diagnostic scan tool to the DLC. Verify the absence of the error "Ignition failure"	Diagnostic complete	Error Ignition Misfiring is present	Proceed as indicated by the diagnostic tool
4	CANCELLATION AND ERROR CHECKING	Result OK	Result Not OK	Action
	Clear the codes in the powertrain control unit using the diagnostic tool. Perform a road test and verify that the error does not recur.	Continue to Step 5	Error Ignition Misfiring is present	Proceed as indicated by the diagnostic tool
5	CHECK PROPER OPERATION	Result OK	Result Not OK	Action
	Verify that the fault is no longer present	Diagnostic complete		

DIAGNOSIS AND TESTING > ODOMETER DOES NOT WORK

While moving, the odometer does not work, or operates erratically. The speed signal comes from the Anti-Lock Brake Module to the Body Control Module via the CAN-C network and is then made available to Instrument Panel Cluster via the CAN-B network from the BCM gateway.

0	PRELIMINARY CHECKS	Result OK	Result Not OK	Action
	Connect a diagnostic scan tool. Check that the engine is running and is not displayed any error message	Continue to Step 2	Presence of errors	Continue to Step 1

1	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	Connect the diagnostic scan tool to read data from the BCM. Check on CAN network information: absence of non-active units absence of control in error; absence of control unit CAN communication error	Continue to Step 2	1. The presence of anomalies on CAN network 2. The presence of errors on instrument panel cluster	1. Proceed as indicated by the diagnostic tool 2. Continue to Step 2
2	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	With the diagnostic scan tool still connected to the DLC, verify the absence of anomalies on the instrument panel cluster.	Continue to Step 3	Errors or failure to communicate with the diagnostic scan tool	Proceed as indicated by the diagnostic tool
3	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	With the diagnostic scan tool still connected to the DLC, check the functionality of the display by activating it with the scan tool.	Diagnostic complete	Odometer does not work	Replace instrument panel cluster

DIAGNOSIS AND TESTING > SPEEDOMETER DOES NOT WORK

While moving, the speedometer does not work, or operates erratically. The speed signal comes from the Anti-Lock Brake Module to the Body Control Module via the CAN-C network and is then made available to Instrument Panel Cluster via the CAN-B network from the BCM gateway.

0	PRELIMINARY CHECKS	Result OK	Result Not OK	Action
	Connect a diagnostic scan tool. Check that the engine is running and is not displayed any error message	Continue to Step 2	Presence of errors	Continue to Step 1

1	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	Connect the diagnostic scan tool to read data from the BCM. Check on CAN network information: absence of non-active units absence of control in error; absence of control unit CAN communication error	Continue to Step 2	1. The presence of anomalies on CAN network 2. The presence of errors on instrument panel cluster	1. Proceed as indicated by the diagnostic tool 2. Continue to Step 2
2	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	With the diagnostic scan tool still connected to the DLC, verify the absence of anomalies on the instrument panel cluster.	Continue to Step 3	Errors or failure to communicate with the diagnostic scan tool	Proceed as indicated by the diagnostic tool
3	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	With the diagnostic scan tool still connected to the DLC, check the functionality of the speedometer pointer by activating it with the scan tool.	Diagnostic complete	Speedometer does not work	Replace instrument panel cluster

DIAGNOSIS AND TESTING > TACHOMETER DOES NOT WORK

The engine tachometer does not work, or works erratically.

1	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	Connect a diagnostic scan tool. Verify the absence of anomalies on the instrument panel.	Continue to Step 2	Presence of errors	Proceed as indicated by the diagnostic tool
2	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action

	With the diagnostic scan tool still connected to the DLC, test the functionality of the pointer through active diagnosis	Continue to Step 3	Tachometer doesn't work for stepper motor malfunction	Replace instrument panel cluster
3	CHECK WITH DIAGNOSTIC TOOL	Result OK	Result Not OK	Action
	With the diagnostic scan tool still connected to the DLC, verify the absence of anomalies on the powertrain control module.	Diagnostic complete	Presence of errors	Proceed as indicated by the diagnostic tool

STANDARD PROCEDURE > STANDARD PROCEDURE - ENHANCED SEATBELT REMINDER PROGRAMMING

The seatbelt indicator also includes a programmable enhanced seatbelt reminder or BELTMINDER feature that is enabled when the vehicle is shipped from the factory. This BELTMINDER feature provides extended and modified visual seatbelt indicator and audible chime warning responses to an unbuckled driver side front seat belt. The BELTMINDER feature may be disabled or enabled by the customer using the programming sequence that follows, or by the dealer using a diagnostic scan tool.

STANDARD PROCEDURE > STANDARD PROCEDURE - ENHANCED SEATBELT REMINDER PROGRAMMING > CUSTOMER PROGRAMMING SEQUENCE

NOTE:

The following sequence of events must occur within 60 seconds of the ignition switch being placed in the ON position in order for the programming to be completed successfully.

1. With all doors closed and the ignition switch in any position except ON or START, buckle the driver side front seat belt.
2. Turn the ignition switch to the ON position and wait for the seatbelt indicator reminder function to conclude (about six seconds).
3. Unbuckle and buckle the driver side front seat belt three or more times, ending with the belt buckled.
4. Turn the ignition switch to any position except ON or START to toggle the BELTMINDER feature from its current setting (from active to inactive, or from inactive to active). A single chime tone will provide an audible confirmation that the programming sequence has been

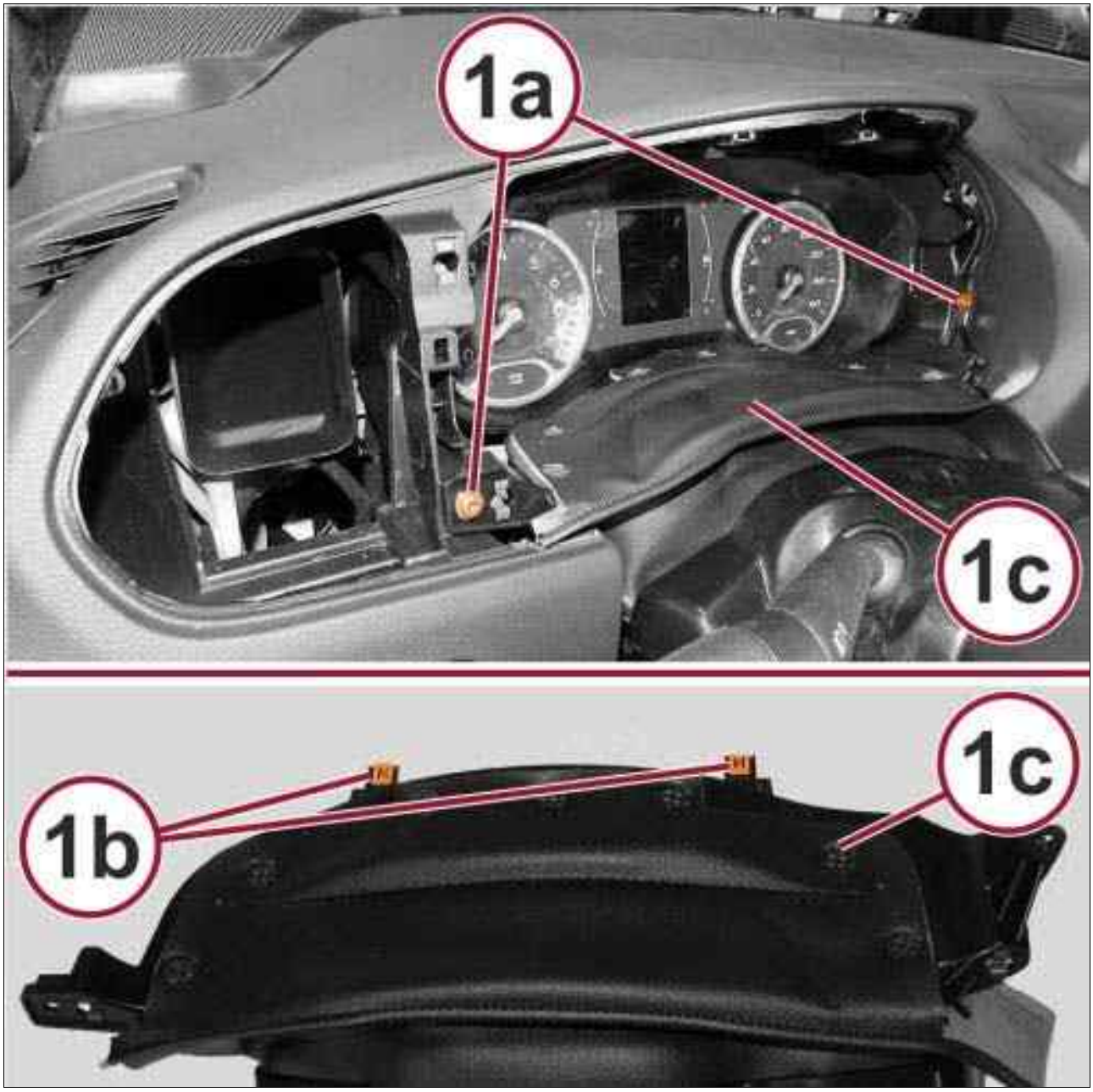
successfully completed.

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. 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.

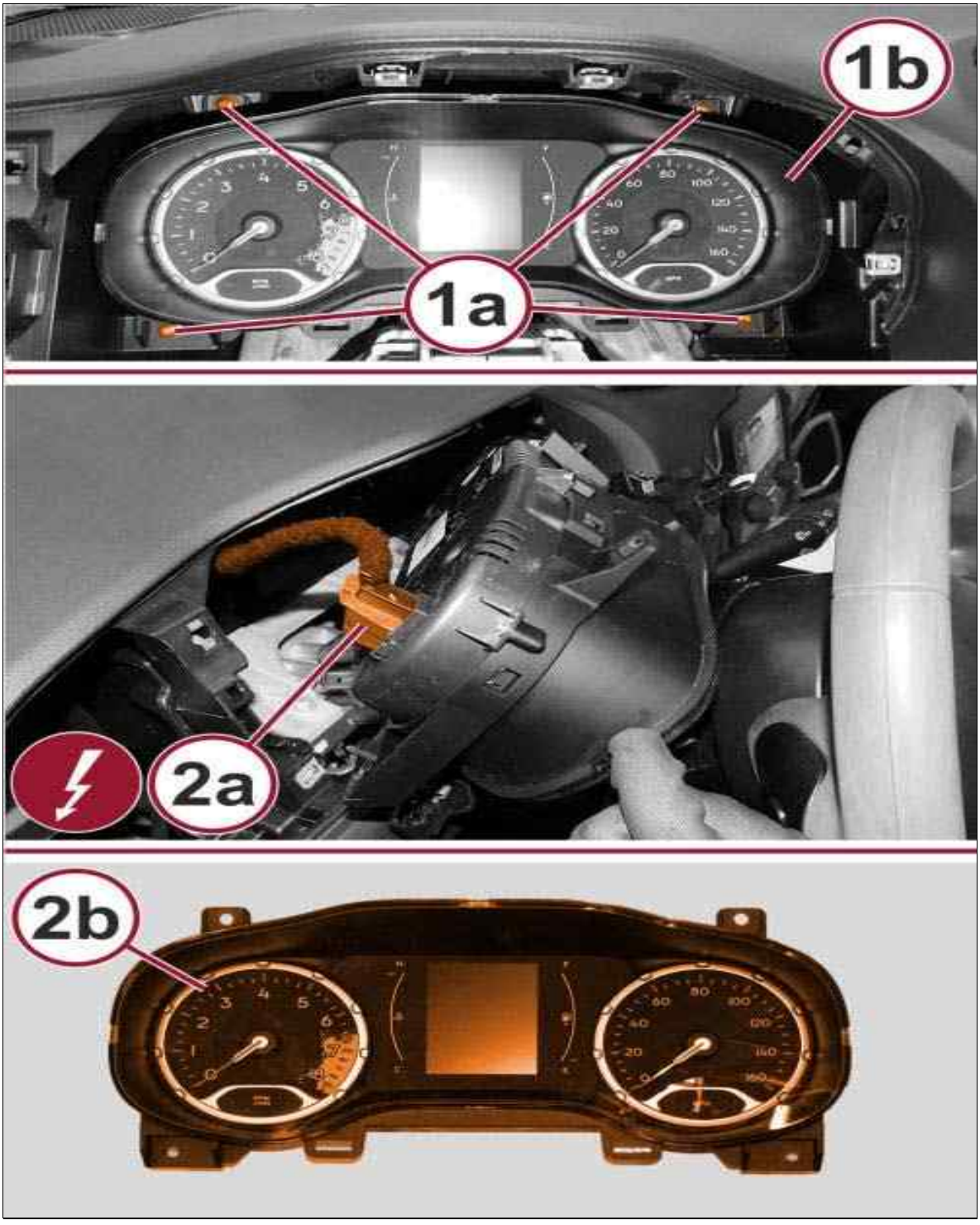
Fig 1: Steering Column Shroud Gap Hider & Fasteners



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.

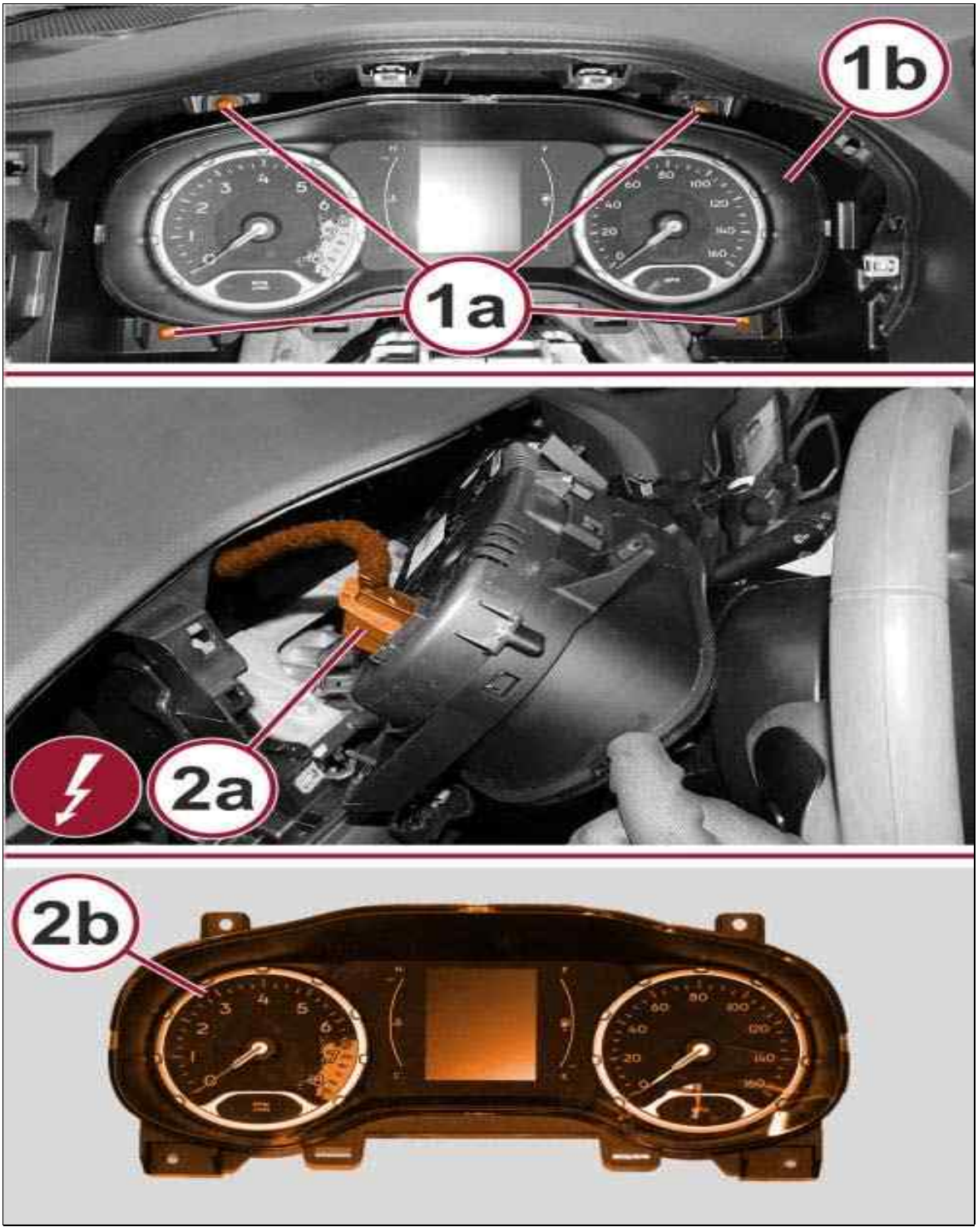
REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

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. 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

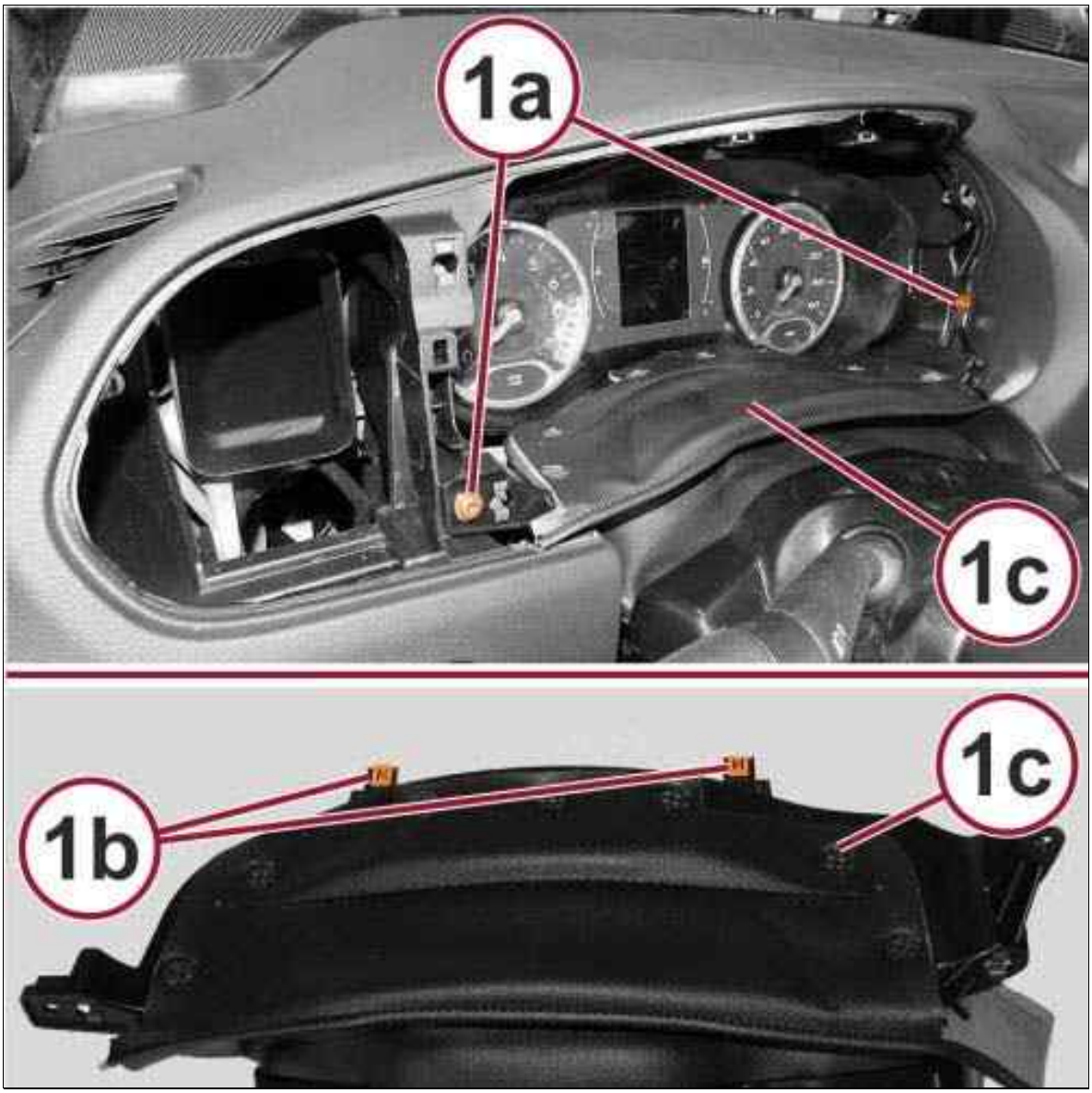
Make sure that the steering column remains in the lowest position setting.

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.

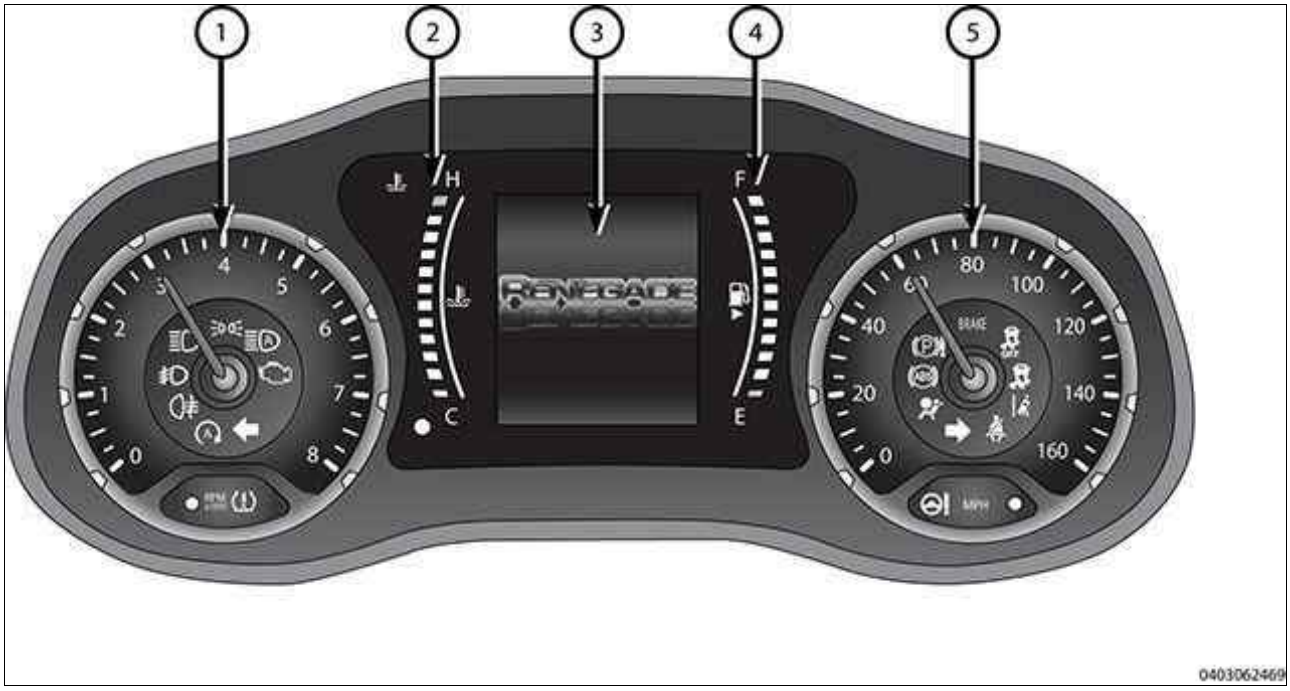
> *NOTE:*

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 .

GAUGE PACK, INSTRUMENT CLUSTER > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

Fig 1: Instrument Panel Cluster (IPC)



Courtesy of CHRYSLER GROUP, LLC

The Instrument Panel Cluster (IPC) houses four analog gauges that are standard on all models. The analog gauges are the speedometer (5), tachometer (1), engine temperature gauge (2) and the fuel gauge (4). Gauge illumination is provided by dimmer controlled Light Emitting Diode (LED) units soldered onto the IPC electronic circuit board.

The IPC gauges, indicators, LED units and control switches as well as the electronic display unit (3) 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.

GAUGE PACK, INSTRUMENT CLUSTER > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

All analog gauges in the Instrument Panel Cluster (IPC) receive battery current on the IPC printed circuit board only when the status of the ignition switch is ON. When status of the ignition switch is OFF,

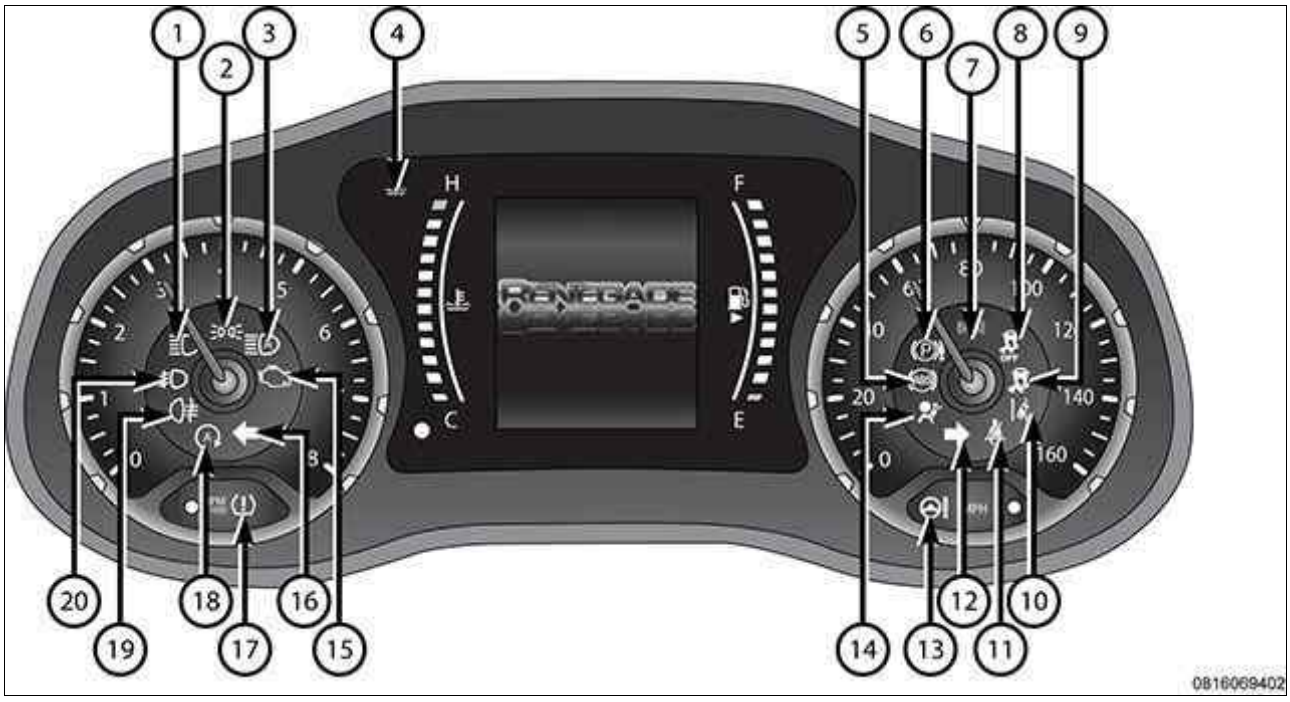
battery current is not supplied to any gauges and the IPC is programmed to move all of the gauge needles back to the low end of their respective scales. Therefore, the gauges do not accurately indicate any vehicle condition unless the status of the ignition switch is ON.

Each of the analog IPC gauges contains an electronically controlled stepper motor unit. The IPC circuitry completely controls the activation and deactivation of these stepper motors to position each gauge needle in the appropriate position based upon IPC programming and electronic messages received from other electronic modules in the vehicle over the Controller Area Network (CAN) data bus.

The analog gauges are diagnosed using the self-diagnostic IPC actuator test when the ignition is turned to ON. Proper testing of the CAN data bus and the electronic message inputs that the IPC uses to control each gauge requires the use of a diagnostic scan tool. Refer to DIAGNOSIS AND TESTING .

INDICATORS, INSTRUMENT CLUSTER > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

Fig 1: Instrument Panel Cluster (IPC) Indicators



Courtesy of CHRYSLER GROUP, LLC

The Instrument Panel Cluster (IPC) features a number of soft indicators, which are located within the electronic display unit in the center of the cluster. The soft indicators are discussed in further detail within the message center service information. Refer to CENTER, ELECTRONIC VEHICLE INFORMATION, DESCRIPTION AND OPERATION . Some of the indicators are automatically configured when the IPC is connected to the electrical system of the vehicle for compatibility with certain optional equipment or equipment required for regulatory purposes in certain markets. While each IPC may have provisions for indicators to support every available option, the configurable indicators will not function in vehicles that do not have the equipment that an indicator supports.

Below are brief explanations of the indicators available on this vehicle. More detailed information may be available elsewhere in this article, located within the service information covering the system or

component that controls or influences the illumination of that indicator.

The IPC includes provisions for the following indicators:

- **High Beam Indicator (1)**
- **Park/Headlight ON Indicator (2)** - if equipped
- **Automatic High Beam Indicator (3)**
- **Engine Coolant Temperature Warning Indicator (4)**
- **Anti-Lock Brake Indicator (5)**
- **Electronic Park Brake Warning Indicator (6)** - if equipped
- **Brake Warning Indicator (7)**
- **Electronic Stability Control (ESC) OFF Indicator (8)** - if equipped
- **Electronic Stability Control (ESC) Activation/Malfunction Indicator (9)** - if equipped
- **Lane Sense Indicator (10)** - if equipped
- **Seat Belt Reminder Indicator (11)**
- **Turn Signal (Right and Left) Indicators (12) and (16)**
- **Electronic Power Steering Warning Indicator (13)**
- **Airbag Warning Indicator (14)**
- **Malfunction Indicator Lamp (15)** - Malfunction Indicator Lamp (MIL)
- **Tire Pressure Monitor Indicator (17)** - Tire Pressure Monitor (TPM)
- **Stop / Start Indicator (18)** - if equipped
- **Rear Fog Lamp Indicator (19)** - if equipped
- **Front Fog Lamp Indicator (20)** - with optional front fog lamps only

The simultaneous firing of BRAKE light (Red) and the ABS light (Amber) with the engine running indicates a failure of the Electronic Breakforce Distribution (EBD) system or that the system is not available.

These indicators and LED units are serviced only as a unit with the IPC. If damaged or ineffective, the entire IPC assembly must be replaced.

INDICATORS, INSTRUMENT CLUSTER > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

Indicators are located in various locations within the Instrument Panel Cluster (IPC) and are all connected to the electronic circuit board. All of the indicators are completely controlled by the IPC. The various indicators are controlled by different strategies; some receive fused ignition output from the IPC circuitry and have a switched ground, while others are grounded through the IPC circuitry and have a switched battery feed. However, most are controlled by Control Area Network (CAN) or Local Interface

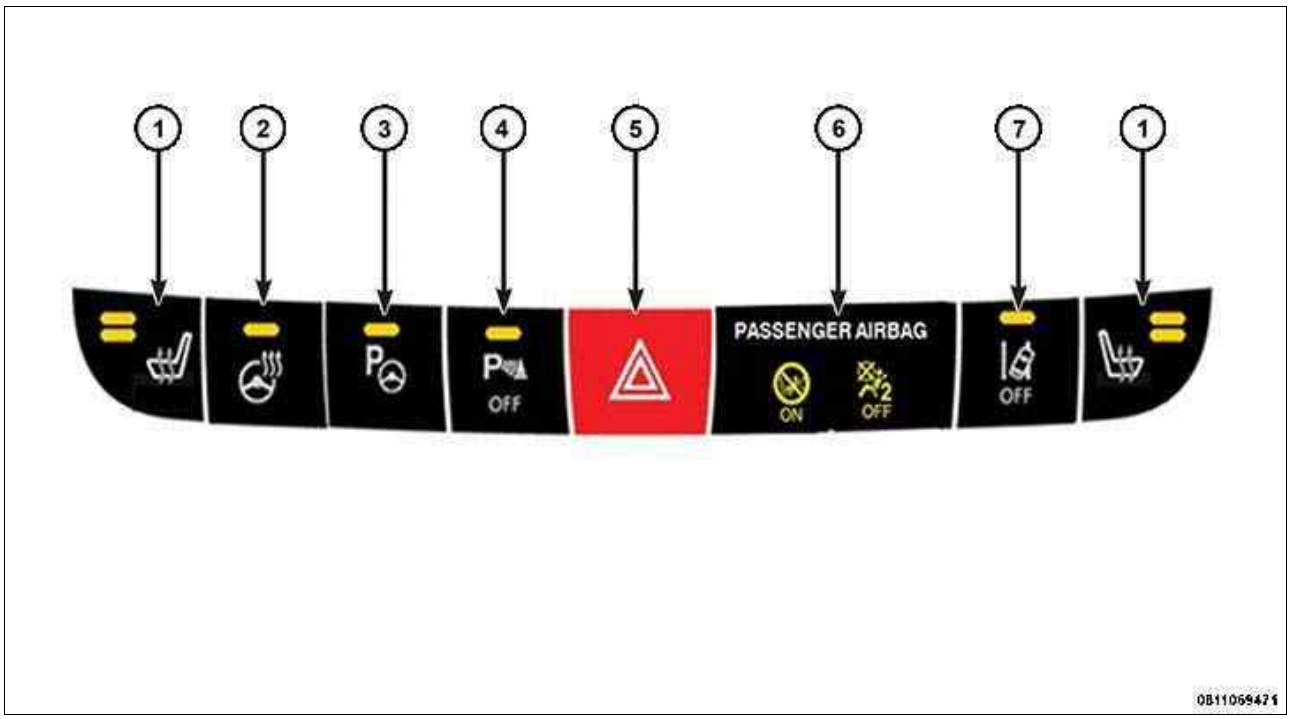
Network (LIN) data bus messages from other electronic modules in the vehicle while others are controlled by a combination of hard wired inputs, electronic messaging and IPC programming. If the IPC loses CAN data bus communication, the IPC circuitry will automatically turn ON the Malfunction Indicator Lamp (MIL) until CAN data bus communication is restored.

In addition, certain indicators in this IPC are automatically or self-configured. This feature allows the configurable indicators to be enabled by the IPC circuitry for compatibility with certain optional equipment. These indicators are enabled or disabled by an electronic **configuration** message sent to the IPC by the Body Control Module (BCM). The BCM default for the Anti-lock Brake System (ABS) and the airbag indicators is enabled. The automatically or self-configured indicators remain latent in the IPC at all times and will be active only when the IPC receives the appropriate CAN or LIN bus message inputs for that optional system or equipment.

The hard wired indicator inputs may be diagnosed using conventional diagnostic tools and procedures. However, the IPC circuitry and electronic CAN or LIN data bus message controlled indicators are diagnosed using a diagnostic scan tool. Proper testing of the CAN or LIN data bus and the electronic data bus message inputs to the IPC that control each indicator requires the use of a diagnostic scan tool. Refer to the appropriate Diagnostic & Testing article. Refer to DIAGNOSIS AND TESTING .

POD, SWITCH > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > DESCRIPTION

Fig 1: Instrument Panel Switch Pod



Courtesy of CHRYSLER GROUP, LLC

The instrument panel switch pod is located just between the Radio Receiver Module (RRM) and air conditioner controls in the center stack area of the instrument panel. This switch is available in multiple configurations, which vary depending upon the equipment in the vehicle. However, every available configuration includes the hazard warning push button switch. The switch pod may include the following switches:

- **Heated Seat Switches (1)** - Driver and Passenger
- **Heated Steering Wheel Switch (2)**
- **Parallel and Perpendicular Park Assist Activation Switch (3)** - EMEA only
- **ParkSense® Rear Park Assist ON/OFF Switch (4)**
- **Hazard Lamp Switch (5)**
- **Passenger Air Bag Status Indicator (6)** - EMEA only
- **Lane Departure Warning + ON/OFF Switch (7)**

The switch housing and the push buttons are constructed of molded plastic. Each push button has a smooth finish and is clearly identified with the appropriate text and International Control and Display Symbol icons. Refer to INTERNATIONAL VEHICLE CONTROL AND DISPLAY SYMBOLS, DESCRIPTION . Several of the push buttons feature Light Emitting Diode (LED) units to give the vehicle operator an indication when the function of that switch is currently active. Only the hazard warning switch push button latches, the remaining switches feature momentary operation.

Six retaining clips secure the switch to the back of the instrument panel through integral mounting tabs that are molded onto the switch housing. The back of the switch housing has an integral connector receptacle containing terminal pins that connect the switch to the vehicle electrical system through a dedicated take out and connector of the instrument panel wire harness.

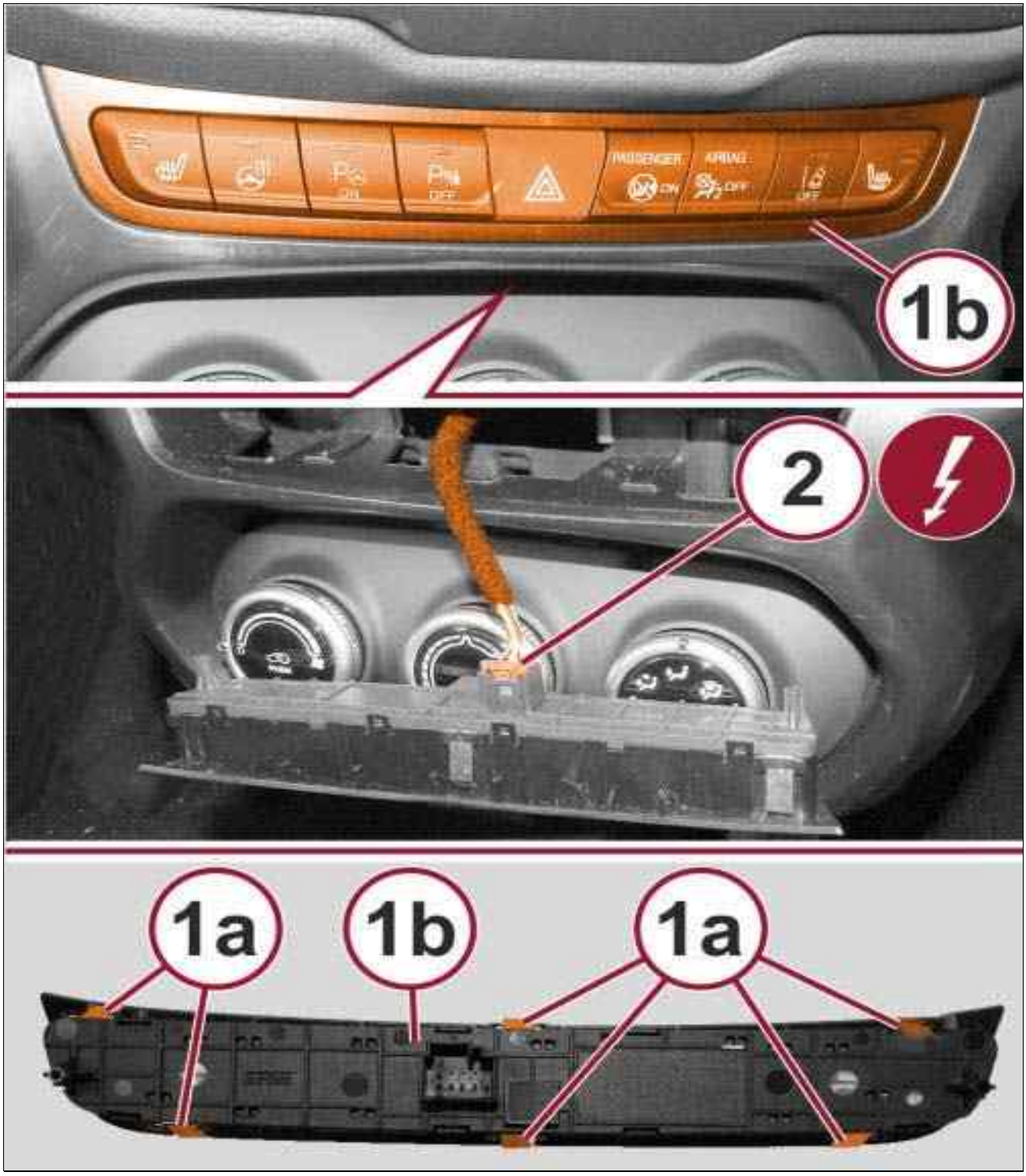
Panel lamps dimmer controlled illumination lamps integral to the circuit board within the switch provide back lighting for visibility at night, but these lamps are not serviceable. The individual switches in the upper instrument panel switch pod cannot be repaired and are not serviced individually. If any component within the switch pod is ineffective or damaged, the entire switch pod must be replaced.

POD, SWITCH > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION > OPERATION

For information covering details of operation for the individual switches and circuits contained within the instrument panel switch pod, refer to the specific service information covering the system to which that switch belongs.

POD, SWITCH > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

Fig 1: Switch Pod, Wire Harness Connector & Retaining Tabs



Courtesy of CHRYSLER GROUP, LLC

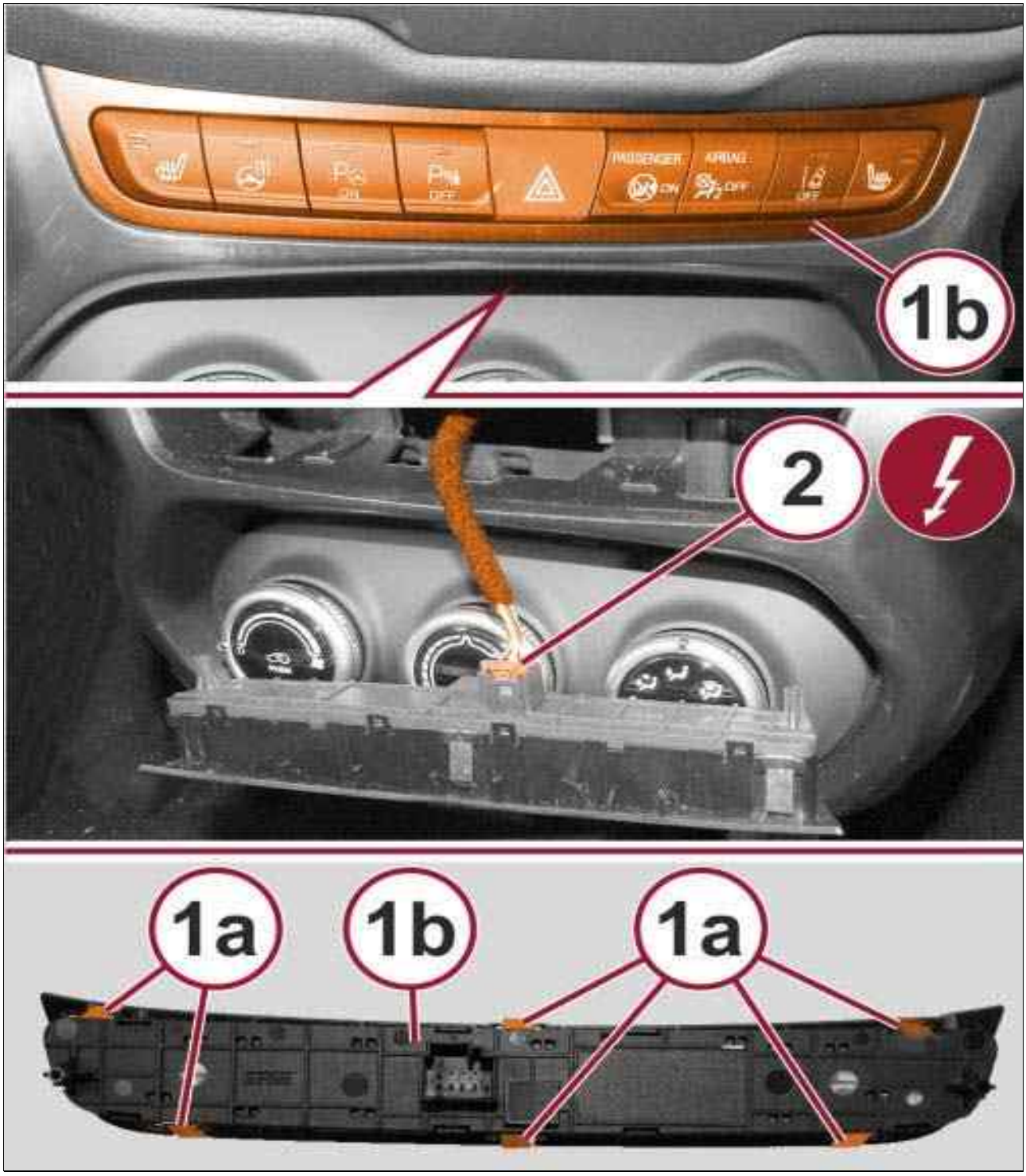
1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.

2. Remove the radio from the instrument panel to gain access to the switch pod retaining tabs (1a). Refer to RADIO, REMOVAL AND INSTALLATION .

3. Using a trim stick C-4755 or equivalent, remove the switch pod (1b) from the instrument panel while compressing the retaining tabs (1a).
4. Disconnect the switch pod wire harness connector (2) from the switch pod (1b).
5. Remove the switch pod (1b) from the vehicle.

POD, SWITCH > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

Fig 1: Switch Pod, Wire Harness Connector & Retaining Tabs



Courtesy of CHRYSLER GROUP, LLC

1. Position the switch pod (1b) to the instrument panel and connect the wire harness (2) to the switch pod (1b).
2. Install the switch pod (1b) into the instrument panel. Be certain the switch pod retaining tabs (1a) fully engage 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.