

2009 ACCESSORIES AND EQUIPMENT

Electronic Control Modules - Service Information - Journey

STANDARD PROCEDURE

MODULE/PROGRAMMING ORDER REPLACEMENT GUIDE

MODULE/PROGRAMMING ORDER REPLACEMENT GUIDE

MODULE	MODULE REPLACEMENT GUIDE						
	Condition 1	Condition 2	Condition 3	Condition 4	Condition 5	Condition 6	Condition 7
PCM	Existing Part	Existing Part	New Part	Existing Part	New Part	New Part	New Part
WCM/WIN	Existing Part	New Part	New Part	New Part	Existing Part	Existing Part	New Part
"Ignition Keys / FOBs"	New Part	New Part	New Part	Existing Part	Existing Part	New Part	Existing Part
PROGRAMMING ORDER	SCANTOOL MISC. FUNCTION						
1	Program Ignition Keys or Key FOBs	WIN Replaced	Check PCM VIN	WIN Replaced	PCM Replaced	PCM Replaced	Attempt to avoid this situation. If possible, try to execute condition 4 or 5. Otherwise, keys must be replaced also (condition 3)
2	----	Program Ignition Keys or Key FOBs	WIN Replaced	Program Ignition Keys or Key FOBs	----	Program Ignition Keys or Key FOBs	
3	----	----	Program Ignition Keys or Key FOBs	----	----	----	

MODULE PROGRAMMING

The Wireless Ignition Node (WIN) controls the Vehicle Theft Security System (VTSS), Remote Keyless Entry (RKE). When a Powertrain Control Module (PCM) is in need of replacement, perform the following steps in order:

NOTE: The PCM and the WIN should never be replaced at the same time. They should be replaced independently of each other.

1. If applicable, first replace the PCM with the original WIN still connected to the vehicle.

2. Using a scan tool program the new PCM. (This will ensure the transfer of the Secret Key data from the original WIN into the new PCM).
3. Replace the WIN, using the scan tool program the new WIN module. This will transfer the Secret Key data from the PCM into the new WIN.
4. With the scan tool reprogram the key FOB/K to the new WIN.
5. Ensure all the customer's keys have been programmed to the new module.

NOTE: If the original keys do not successfully program to the new WIN after the proper procedures are followed correctly, programming new keys will be necessary.

NOTE: Programming the PCM or WIN is done using a diagnostic scan tool and a PIN to enter secure access mode. If three attempts are made to enter secure access mode using an incorrect PIN, secure access mode will be locked out for one hour. To exit this lockout mode, turn the ignition to the RUN position for one hour and then enter the correct PIN. Be certain that all accessories are turned OFF. Also, monitor the battery state and connect a battery charger if necessary.

CAUTION: Read all notes and cautions for programming procedures.

NOTE: Have a unique vehicle PIN readily available before running the routine

CAUTION: If the PCM and WIN are replaced at the same time, the PCM MUST be programmed before the WIN.

NOTE: If the PCM and the WIN are replaced at the same time, all vehicle keys will need to be replaced and programmed to the new WIN.

CAUTION: Read all notes and cautions for programming procedures.

NOTE: If the original keys do not successfully program to the new WIN after the proper procedures are followed correctly, programming new keys will be necessary.

NOTE: A maximum of eight keys can be learned by the WIN. Once a key is learned by a WIN, that key has acquired the Secret Key for that WIN and cannot be transferred to any other WIN or vehicle.

CAUTION: Read all notes and cautions for programming procedures.

CAUTION: If the PCM and WIN are replaced at the same time, the PCM **MUST** be programmed before the WIN.

PROGRAMMING THE SECRET KEY TO THE WIN

The secret key is an ID code that is unique to each WIN. This code is programmed and stored in the WIN, the PCM, and each ignition key transponder chip. When the PCM or WIN is replaced, it is necessary to program the Secret Key Code into the new module using a diagnostic scan tool. Follow the programming steps outlined in the diagnostic scan tool for **PCM REPLACED**, **WIN REPLACED**, or **TIPM REPLACED** under **MISCELLANEOUS FUNCTIONS** for the **WIRELESS CONTROL MODULE** menu item as appropriate.

NOTE: Programming the PCM or WIN is done using a diagnostic scan tool and a PIN to enter secure access mode. If three attempts are made to enter secure access mode using an incorrect PIN, secure access mode will be locked out for one hour. To exit this lockout mode, turn the ignition to the RUN position for one hour and then enter the correct PIN. Be certain that all accessories are turned OFF. Also, monitor the battery state and connect a battery charger if necessary.

PCM/WIN PROGRAMMING

When an PCM and the WIN are replaced at the same time, perform the following steps in order:

1. Program the new WIN.
2. Replace all ignition keys and program them to the new WIN.

PROGRAMMING THE WIN

CAUTION: Read all notes and cautions for programming procedures.

1. Connect a battery charger to the vehicle.
2. Connect the scan tool.

NOTE: Have a unique vehicle PIN readily available before running the routine

CAUTION: If the PCM and WIN are replaced at the same time, the PCM **MUST** be programmed before the WIN.

3. Select "ECU View."
4. Select "WIN".

5. Select "Miscellaneous Functions."
6. Select "WIN Replaced".
7. Enter the PIN when prompted.
8. Cycle ignition key after the successful routine completion.

NOTE: If the PCM and the WIN are replaced at the same time, all vehicle keys will need to be replaced and programmed to the new WIN.

PROGRAMMING IGNITION KEYS TO THE WIN

Each FOB/K has a unique ID code that is assigned at the time the key is manufactured. When a key is programmed into the WIN, the module learns the transponder ID code and the transponder acquires the unique Secret Key ID code from the WIN.

CAUTION: Read all notes and cautions for programming procedures.

1. Connect a battery charger to the vehicle.
2. Connect the scan tool.
3. Have a unique vehicle PIN readily available before running the routine.
4. Ignition key should be in RUN position.
5. Select "ECU View".
6. Select "WIN Wireless Control".
7. Select "Miscellaneous Functions."
8. Select "Program Ignition Keys or Key FOBs", Start
9. Enter the PIN when prompted.
10. Verify the correct information.
11. Cycle ignition key after the successful routine completion.

NOTE: If the original keys do not successfully program to the new WIN after the proper procedures are followed correctly, programming new keys will be necessary.

NOTE: A maximum of eight keys can be learned by the WIN. Once a key is learned by a WIN, that key has acquired the Secret Key for that WIN and cannot be transferred to any other WIN or vehicle.

PROGRAMMING THE PCM

CAUTION: Read all notes and cautions for programming procedures.

1. Connect a battery charger to the vehicle.
2. Connect the scan tool.
3. Have a unique vehicle PIN readily available before running the routine.
4. Ignition key should be in RUN position.

CAUTION: If the PCM and WIN are replaced at the same time, the PCM MUST be programmed before the WIN.

5. Select "ECU View".
6. Select "WIN Wireless Control".
7. Select "Miscellaneous Functions."
8. Select "PCM Replaced".
9. Enter the PIN when prompted.
10. Verify the correct information.
11. Cycle ignition key after the successful routine completion.

COMMUNICATION

DESCRIPTION

DESCRIPTION

The primary on-board communication network between microprocessor-based electronic control modules in this vehicle is the Controller Area Network (CAN) data bus system. A data bus network minimizes redundant wiring connections; and, at the same time, reduces wire harness complexity, sensor current loads and controller hardware by allowing each sensing device to be connected to only one module (also referred to as a node). Each node reads, then broadcasts its sensor data over the bus for use by all other nodes requiring that data. Each node ignores the messages on the bus that it cannot use.

The CAN bus is a two-wire multiplex system. Multiplexing is any system that enables the transmission of multiple messages over a single channel or circuit. The CAN bus is used for communication between most vehicle nodes. However, in addition to the CAN bus network, certain nodes may also be equipped with a Local Interface Network (LIN) data bus. The LIN data bus is a single wire low-speed (9.6 Kbps) serial link bus used to provide direct communication between a LIN master module and certain switch or sensor inputs.

There are actually three separate CAN bus systems used in the vehicle. They are designated: the CAN-Interior (also known as CAN Interior High Speed/IHS), the CAN-C and the Diagnostic CAN-C. The CAN-Interior and CAN-C systems provide on-board communication between all nodes in the vehicle. The CAN-C is the faster of the two systems providing near real-time communication (500 Kbps). The CAN-C is used typically for communications between more critical nodes, while the slower (125 Kbps) CAN-Interior system is used for communications between less critical nodes.

The added speed of the CAN data bus is many times faster than previous data bus systems. This added speed facilitates the addition of more electronic control modules or nodes and the incorporation of many new

electrical and electronic features in the vehicle.

The Diagnostic CAN-C bus is also capable of 500 Kbps communication, and is sometimes informally referred to as the CAN-D system to differentiate it from the other high speed CAN-C bus. The Diagnostic CAN-C is used exclusively for the transmission of diagnostic information between the Totally Integrated Power Module/Central GateWay (TIPM or TIPMCGW) and a diagnostic scan tool connected to the industry-standard 16-way Data Link Connector (DLC) located beneath the instrument panel on the driver side of the vehicle.

The TIPM is located in the engine compartment near the battery. The central CAN gateway or hub module integral to the TIPM is connected to all three CAN buses. This gateway physically and electrically isolates the CAN buses from each other and coordinates the bi-directional transfer of messages between them.

OPERATION

OPERATION

The Controller Area Network (CAN) data bus allows all electronic modules or nodes connected to the bus to share information with each other. Regardless of whether a message originates from a module on the lower speed CAN-Interior (also known as CAN Interior High Speed/IHS) bus or on the higher speed CAN-C or CAN-D bus, the message structure and layout is similar, which allows the Totally Integrated Power Module/Central GateWay (TIPM or TIPMCGW) to process and transfer messages between the CAN buses. The TIPM also stores a Diagnostic Trouble Code (DTC) for certain bus network faults.

All modules (also referred to as nodes) transmit and receive messages over one of these buses. Data exchange between nodes is achieved by serial transmission of encoded data messages. Each node can both send and receive serial data simultaneously. Each digital bit of a CAN bus message is carried over the bus as a voltage differential between the two bus circuits which, when strung together, form a message. Each node uses arbitration to sort the message priority if two competing messages are attempting to be broadcast at the same time.

The ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) is the Local Interface Network (LIN) master module in this vehicle and it gathers information from the compass module, the instrument panel switch bank, the Steering Control Module (SCM), and the Heated Seat Module (HSM) through the LIN data bus. There is also LIN bus communication between the individual Tire Pressure Monitor (TPM) transponders and the Wireless Ignition Node (WIN). Both the EMIC and the WIN either act directly upon the information received through the LIN data bus, relay the information to other nodes in the vehicle using electronic messages placed on the CAN bus, or both.

The voltage network used to transmit messages requires biasing and termination. Each module on the CAN bus network provides its own biasing and termination. There are two types of nodes used in the CAN bus network. On the CAN-C or the IHS bus, a dominant node has a 120 ohm termination resistance while a non-dominant (or recessive) node has about a 2500 to 3000 ohm (2.5 to 3.0 kilohm) termination resistance. The dominant nodes on the CAN-C bus are the WIN and the Powertrain Control Module (PCM). The dominant nodes on the IHS bus are the EMIC and the TIPM.

The termination resistance of two dominant nodes is combined in parallel to provide a total of about 60 ohms. This resistance value may vary somewhat by application, depending upon the number of non-dominant nodes

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on the bus. On the CAN-D bus (or Diagnostic CAN-C) all of the 60 ohm termination resistance is present in the Central GateWay (TIPMCGW).

NOTE: All measurement of termination resistance is done with the vehicle battery disconnected.

The communication protocol being used for the CAN data bus is a non-proprietary, open standard adopted from the Bosch CAN Specification 2.0b. The CAN-C is the faster of the two primary buses in the CAN bus system, providing near real-time communication (500 Kbps).

The CAN bus nodes are connected in parallel to the two-wire bus using a twisted pair, where the wires are wrapped around each other to provide shielding from unwanted electromagnetic induction, thus preventing interference with the relatively low voltage signals being carried through them. The twisted pairs have between 33 and 50 twists per meter (yard). While the CAN bus is operating (active), one of the bus wires will carry a higher voltage and is referred to as the CAN High or CAN bus (+) wire, while the other bus wire will carry a lower voltage and is referred to as the CAN Low or CAN bus (-) wire. Refer to the CAN BUS VOLTAGES chart.

CAN Bus Voltages (Normal Operation)								
CAN-C Bus Circuits	Sleep	Recessive (Bus Idle)	Dominant (Bus Active)	CAN-L Short to Ground	CAN-H Short to Ground	CAN-L Short to Battery	CAN-H Short to Battery	CAN-H Short to CAN-L
CAN-L (-)	0 V	2.4 - 2.5 V	1.3 - 2.3 V	0 V	0.3 - 0.5V	Battery Voltage	Battery Voltage Less 0.75 V	2.45 V
CAN-H (+)	0 V	2.4 - 2.5 V	2.6 - 3.5 V	0.02 V	0 V	Battery Voltage Less 0.75 V	Battery Voltage	2.45 V
CAN-Interior Bus Circuits	Key-Off (Bus Asleep)		Key-On (Bus Active)	CAN-L Short to Ground	CAN-H Short to Ground	CAN-L Short to Battery	CAN-H Short to Battery	CAN-H Short to CAN-L
CAN-L (-)	0.0 V		1.3 - 2.3 V	0 V	0.3 - 0.5 V	Battery Voltage	Battery Voltage Less 0.75 V	2.45 V
CAN-H (+)	0.0 V		2.6 - 3.5 V	0.02 V	0 V	Battery Voltage Less 0.75 V	Battery Voltage	2.45 V
Notes								
All measurements taken between node ground and CAN terminal with a standard DVOM. DVOM will display average network voltage.								
Total resistance of CAN-C network can also be measured (60 ohms). Total resistance of CAN-Interior								

network varies, depending upon the number of optional non-dominant nodes on the bus. CAN-Interior total resistance should range between about 60 ohms with the minimal number of nodes, to about 42 ohms with the maximum number of nodes.

In order to minimize the potential effects of Ignition-OFF Draw (IOD), the CAN-Interior network employs a sleep strategy. However, a network sleep strategy should not be confused with the sleep strategy of the individual nodes on that network, as they may differ. For example: The CAN-C bus network is awake only when the ignition switch is in the ON or START positions; however, the TIPM, which is on the CAN-C bus, may still be awake with the ignition switch in the ACCESSORY or UNLOCK positions. The integrated circuitry of an individual node may be capable of processing certain sensor inputs and outputs without the need to utilize network resources.

The CAN-Interior bus network remains active until all nodes on that network are ready for sleep. This is determined by the network using tokens in a manner similar to polling. When the last node that is active on the network is ready for sleep, and it has already received a token indicating that all other nodes on the bus are ready for sleep, it broadcasts a **bus sleep acknowledgment** message that causes the network to sleep. Once the CAN-Interior bus network is asleep, any node on the bus can awaken it by transmitting a message on the network. The TIPM will keep either the CAN-Interior or the CAN-C bus awake for a timed interval after it receives a diagnostic message for that bus over the Diagnostic CAN-C bus.

In the CAN system, available options are configured into the TIPM at the assembly plant, but additional options can be added in the field using the diagnostic scan tool. The configuration settings are stored in non-volatile memory. The TIPM also has two 64-bit registers, which track each of the **as-built** and **currently responding** nodes on the CAN-Interior and CAN-C buses. The TIPM stores a Diagnostic Trouble Code (DTC) in one of two caches for any detected active or stored faults in the order in which they occur. One cache stores powertrain (P-Code), chassis (C-Code) and body (B-Code) DTCs, while the second cache is dedicated to storing network (U-Code) DTCs.

If there are intermittent or active faults in the CAN network, a diagnostic scan tool connected to the Diagnostic CAN-C bus through the 16-way Data Link Connector (DLC) may only be able to communicate with the TIPM. To aid in CAN network diagnosis, the TIPM will provide CAN-Interior and CAN-C network status information to the scan tool using certain diagnostic signals. In addition, the transceiver in each node on the CAN-C bus will identify a **bus off hardware failure**, while the transceiver in each node on the CAN-Interior bus will identify a **general bus hardware failure**. The transceivers for some CAN-Interior nodes will also identify certain failures for both CAN-Interior bus signal wires.

CONNECTOR, DATA LINK

DESCRIPTION

DESCRIPTION

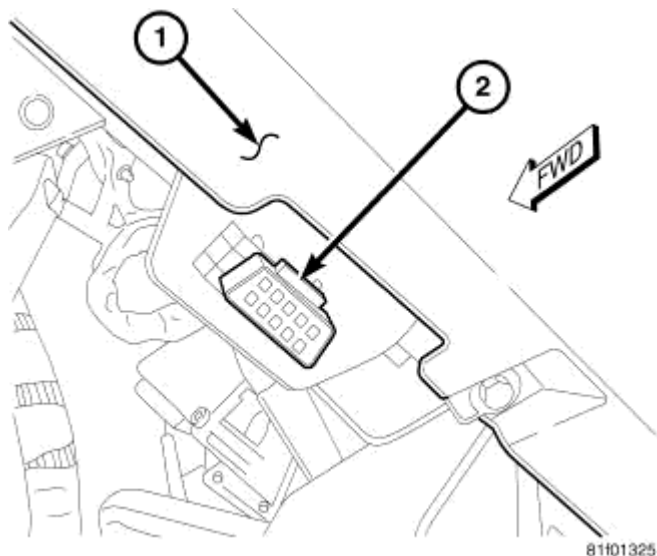


Fig. 1: Data Link Connector
Courtesy of CHRYSLER LLC

The Data Link Connector (DLC) (2) is a 16-way molded plastic connector insulator on a dedicated take out of the instrument panel wire harness. This connector is located at the lower edge of the instrument panel, outboard of the steering column. The connector insulator is retained by integral snap features within a rectangular cutout in the lower instrument panel reinforcement, just forward of the instrument panel steering column opening cover (1).

OPERATION

OPERATION

The Data Link Connector (DLC) is an industry-standard 16-way connector that permits the connection of a diagnostic scan tool to the Controller Area Network (CAN) data bus for interfacing with, configuring and retrieving Diagnostic Trouble Code (DTC) data from the electronic modules that reside on the data bus network of the vehicle.

MODULE, ANTI-LOCK BRAKE SYSTEM

DESCRIPTION

DESCRIPTION

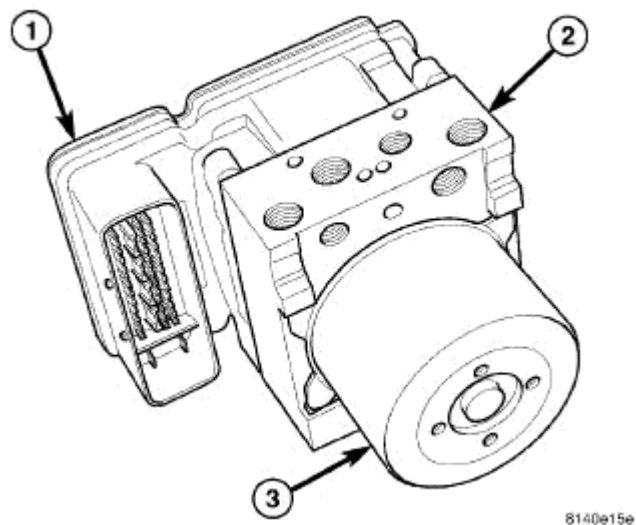


Fig. 2: Antilock Brake Module
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - ANTILOCK BRAKE MODULE (ABM)
2 - HYDRAULIC CONTROL UNIT (HCU)
3 - PUMP/MOTOR |
|---|

The Antilock Brake Module (ABM) is a microprocessor-based device which monitors the antilock brake system (ABS) during normal braking and controls it when the vehicle is in an ABS stop or when in a traction control situation. The ABM utilizes a 47-way electrical connector on the vehicle wiring harness. The power source for the ABM is through the ignition switch in the RUN or ON position.

NOTE: The ABM is only separately serviceable for non-HSA (Hill Start Assist) equipped vehicles. Do not remove the ABM for vehicles equipped with HSA.

The ABM (1) is mounted to the HCU (2) as part of the Integrated Control Unit (ICU). The ICU is located in the engine compartment below the master cylinder on the front suspension cradle/crossmember. For information on the ICU. Refer to **Brakes/Hydraulic/Mechanical/INTEGRATED CONTROL UNIT (ICU) - Description**).

OPERATION

OPERATION

The primary functions of the Antilock Brake Module (ABM) are to:

- Monitor the antilock brake system for proper operation.
- Detect wheel locking or wheel slipping tendencies by monitoring the speed of all four wheels of the vehicle.
- Control fluid modulation to the wheel brakes while the system is in an ABS mode.

- Store diagnostic information.
- Provide communication to the scan tool while in diagnostic mode.
- Illuminate the amber ABS warning indicator lamp.
- Illuminate the ESP function lamp in the message center on the instrument panel when a traction control event occurs.
- Illuminate the ESP function lamp when the amber ABS warning indicator lamp illuminates.

The ABM constantly monitors the antilock brake system for proper operation. If the ABM detects a fault, it will turn on the amber ABS warning indicator lamp and disable the antilock braking system. The normal base braking system will remain operational.

NOTE: If the vehicle is equipped with traction control, the ESP function lamp will illuminate anytime the amber ABS warning indicator lamp illuminates.

The ABM continuously monitors the speed of each wheel through the signals generated by the wheel speed sensors to determine if any wheel is beginning to lock. When a wheel locking tendency is detected, the ABM commands the ABM command coils to actuate. The coils then open and close the valves in the HCU that modulate brake fluid pressure in some or all of the hydraulic circuits. The ABM continues to control pressure in individual hydraulic circuits until a locking tendency is no longer present.

The ABM contains a self-diagnostic program that monitors the antilock brake system for system faults. When a fault is detected, the amber ABS warning indicator lamp is turned on and the fault diagnostic trouble code (DTC) is then stored in a diagnostic program memory. A latched fault will disable certain system functionality for the current ignition cycle. An unlatched fault will disable certain system functionality until the fault condition disappears. These DTC's will remain in the ABM memory even after the ignition has been turned off. The DTC's can be read and cleared from the ABM memory by a technician using a scan tool. If not cleared with a scan tool, the fault occurrence and DTC will be automatically cleared from the ABM memory after the identical fault has not been seen during the next 3,500 miles. Drive-off may be required for the amber ABS warning indicator lamp to go out on the next ignition cycle.

ABM INPUTS

- Wheel speed sensors (four)
- Brake lamp switch
- Ignition switch
- System and pump voltage
- Ground
- ESP/BAS warning indicator lamp
- Diagnostic communication

ABM OUTPUTS

- Amber ABS warning indicator lamp actuation (via BUS)
- Red BRAKE warning indicator lamp actuation (via BUS)

- Instrument cluster (MIC) communication
- ESP/BAS warning indicator lamp
- Diagnostic communication

REMOVAL

LEFT-HAND DRIVE

NOTE: The ABM is only separately serviceable for non-HSA (Hill Start Assist) equipped vehicles. Do not remove the ABM for vehicles equipped with HSA.

1. Disconnect the negative (ground) cable from the battery and isolate it.
2. Remove the engine appearance cover.

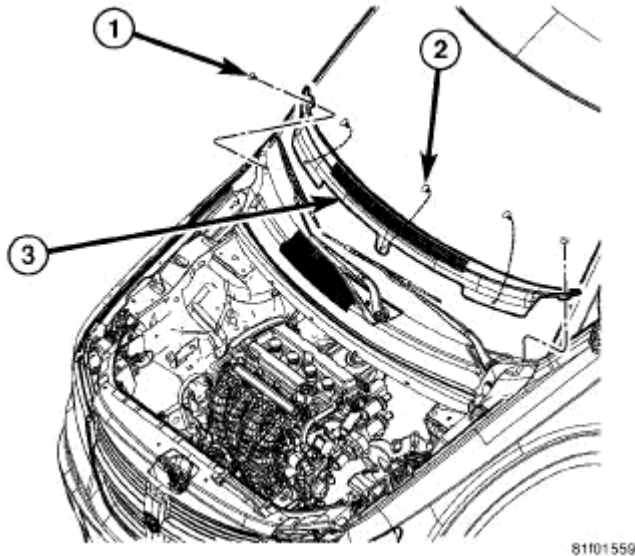


Fig. 3: Cowl Top Screen
Courtesy of CHRYSLER LLC

3. Remove the two push-pins (1) securing the cowl top screen at the ends. Remove the remaining push-pins (2). Remove the cowl top screen (3).
4. Remove the wiper arms. Refer to **Electrical - Wipers/Washers/Wipers/Washers/ARM, Wiper - Removal**

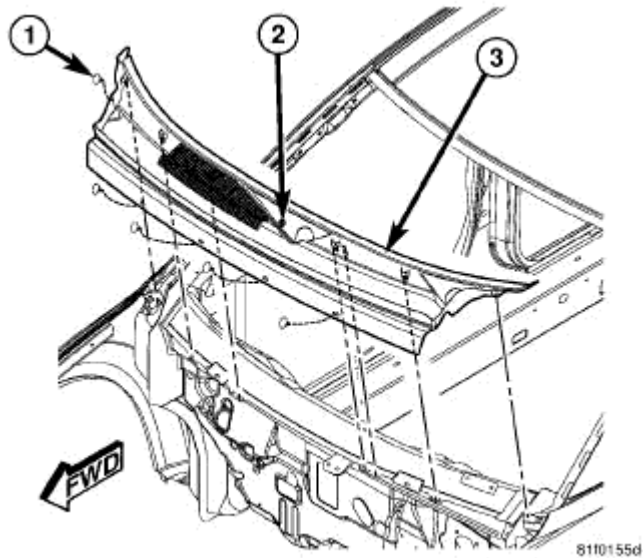


Fig. 4: Cowl Screen

Courtesy of CHRYSLER LLC

5. Remove the push-pins (1) securing the cowl screen to the wheelhouse brace and cowl. Rotate the screw (2) in the center of the cowl screen 90° clockwise to release the screen. Remove the cowl screen (3).

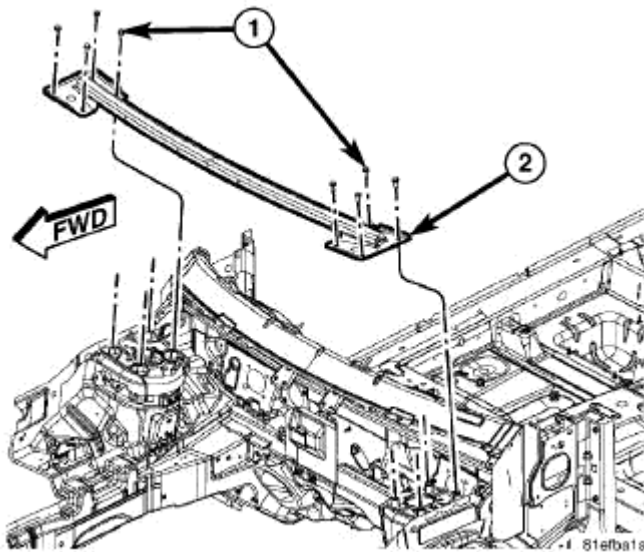


Fig. 5: Wheelhouse Brace

Courtesy of CHRYSLER LLC

6. Remove the eight mounting bolts (four each side) (1) securing the wheel house brace to the strut towers.
7. Remove the wheelhouse brace (2).
8. Remove two screws, then remove the fresh air plenum.
9. Raise and support the vehicle. Refer to **Vehicle Quick Reference/Hoisting - Standard Procedure**

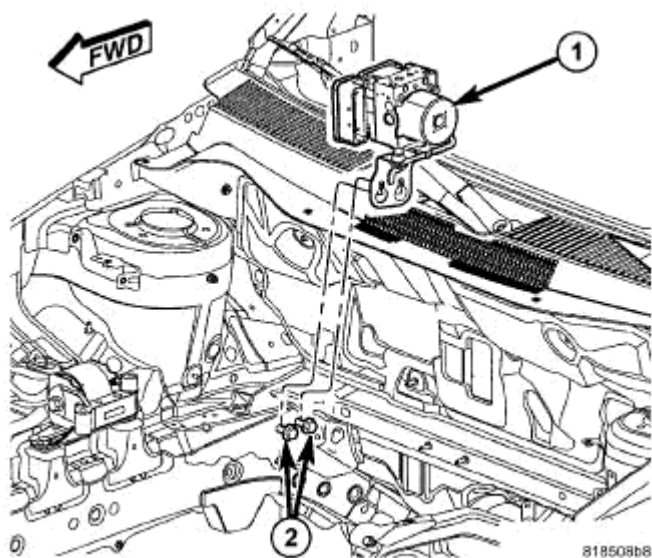


Fig. 6: Locating Integrated Control Unit (ICU)

Courtesy of CHRYSLER LLC

10. Loosen, but do not remove, the two mounting screws (2) attaching the ICU (1) mounting bracket to the body.
11. Lift the ICU and mounting bracket (1) upward to near the top of the slots in the bracket, then snug one or both of the mounting screws (2) to hold the ICU in this position.
12. Lower the vehicle.

CAUTION: Before disassembling the ICU, the ICU must be thoroughly cleaned. This must be done to prevent dirt particles and debris from entering into vital areas of the ICU.

13. Thoroughly clean all surfaces of the ICU and brake tubes. Use only a solvent such as Mopar® Brake Parts Cleaner or equivalent.

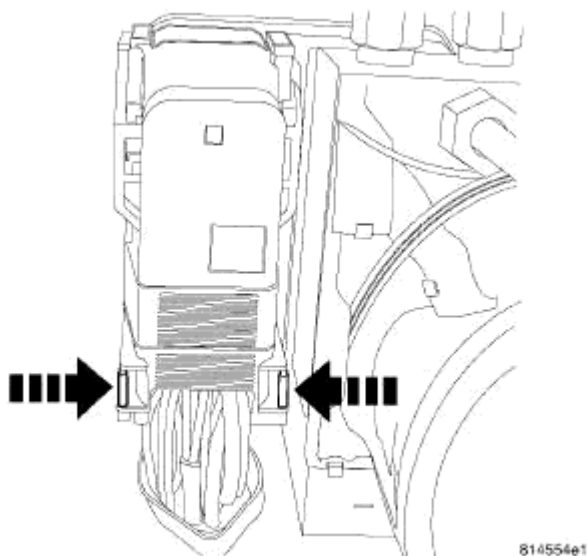


Fig. 7: ABM Connector Release Tabs

Courtesy of CHRYSLER LLC

NOTE: Use this figure in the following step to release the ABM harness connector cover. It shows the location of the release tabs.

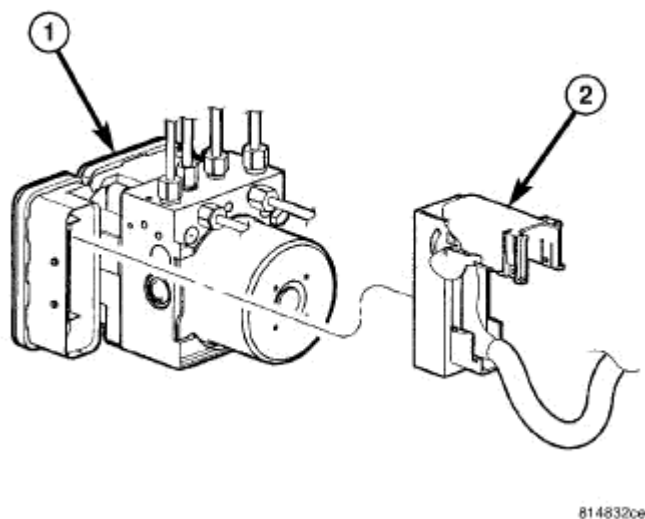


Fig. 8: Wiring Harness Connector At ABM

Courtesy of CHRYSLER LLC

- | |
|--|
| <p>1 - ABM (PART OF ICU)</p> <p>2 - WIRING HARNESS CONNECTOR</p> |
|--|

14 Disconnect the ABM harness connector from the Antilock Brake Module (ABM). To do so:

- a. Depress the tabs on each side of the connector cover, then
- b. Pull outward and upward on the lower half of the cover until it locks into position pointing straight outward (2). The connector can then be pulled straight outward off the ABM (1).

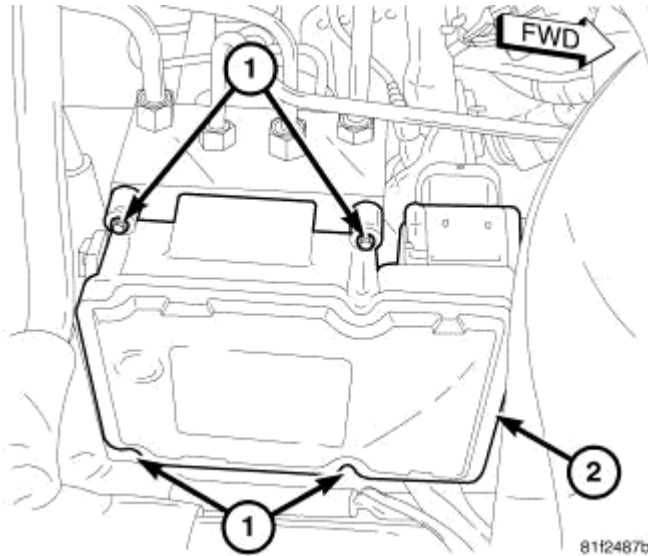


Fig. 9: ABM Mounting
Courtesy of CHRYSLER LLC

15. Remove the four screws (1) attaching the ABM (2) to the HCU. A Torx T20 bit approximately 2 inches long works well.

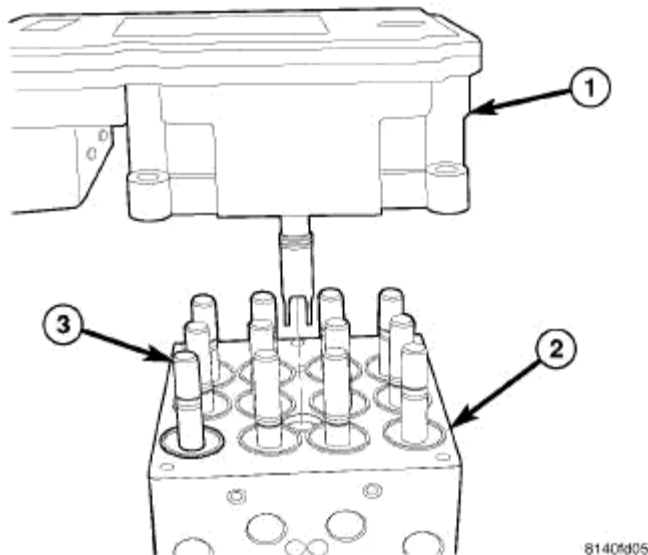


Fig. 10: Identifying ABM, HCU, & Solenoid Valve Stem
Courtesy of CHRYSLER LLC

1 - ABM

2 - HCU

3 - SOLENOID VALVE STEM

CAUTION: When removing the ABM from the HCU, be sure to completely separate the two components (approximately 38 mm (1.5 inches)) before removing the ABM. Otherwise, damage to the pressure sensor or pump motor connection may result, requiring HCU replacement. Do not touch the sensor terminals on the HCU side or the contact pads on the ABM side as this may result in contamination and issues in the future.

16. Separate the ABM (1) from the HCU (2).

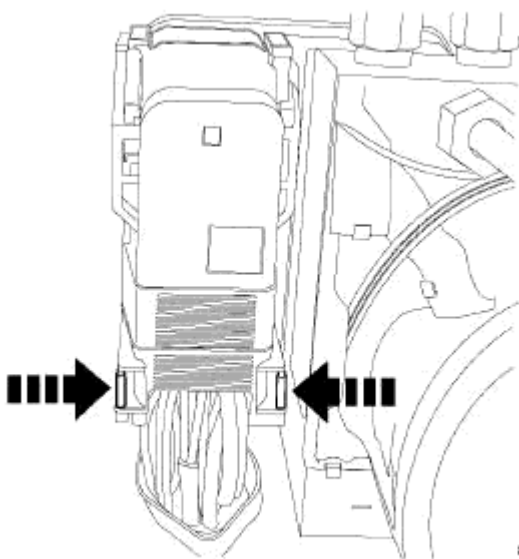
RIGHT-HAND DRIVE

NOTE: The ABM is only separately serviceable for non-HSA (Hill Start Assist) equipped vehicles. Do not remove the ABM for vehicles equipped with HSA.

1. Disconnect the negative (ground) cable from the battery and isolate it.
2. Remove air inlet hose (1) between air cleaner housing and engine.

CAUTION: Before disassembling the ICU, the ICU must be thoroughly cleaned. This must be done to prevent dirt particles and debris from entering into vital areas of the ICU.

3. Thoroughly clean all surfaces of the ICU and brake tubes. Use only a solvent such as Mopar® Brake Parts Cleaner or equivalent.

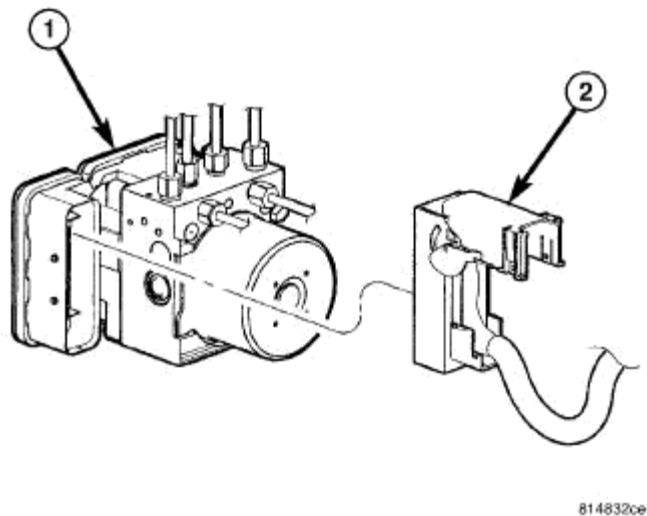


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Fig. 11: ABM Connector Release Tabs

Courtesy of CHRYSLER LLC

NOTE: Use this figure in the following step to release the ABM harness connector cover. It shows the location of the release tabs.

**Fig. 12: Wiring Harness Connector At ABM**

Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - ABM (PART OF ICU)
2 - WIRING HARNESS CONNECTOR |
|---|

4. Disconnect the ABM harness connector from the Antilock Brake Module (ABM). To do so:
 - a. Depress the tabs on each side of the connector cover, then
 - b. Pull outward and upward on the lower half of the cover until it locks into position pointing straight outward (2). The connector can then be pulled straight outward off the ABM (1).

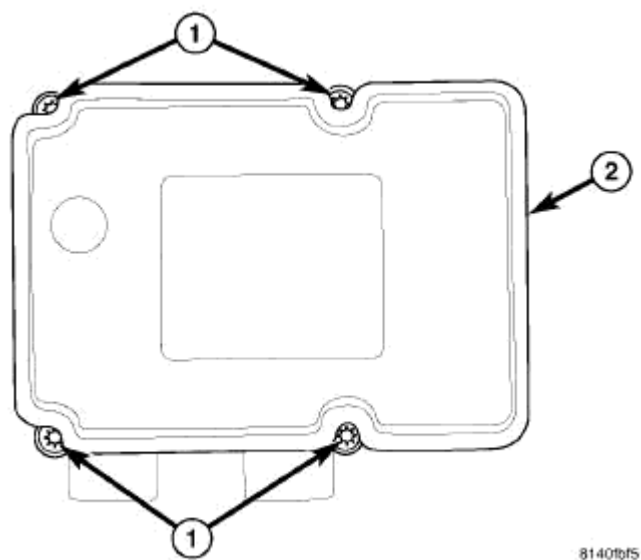


Fig. 13: ABM Mounting Screws
Courtesy of CHRYSLER LLC

1 - MOUNTING SCREWS
2 - ABM

5. Remove the four screws (1) attaching the ABM (2) to the HCU.

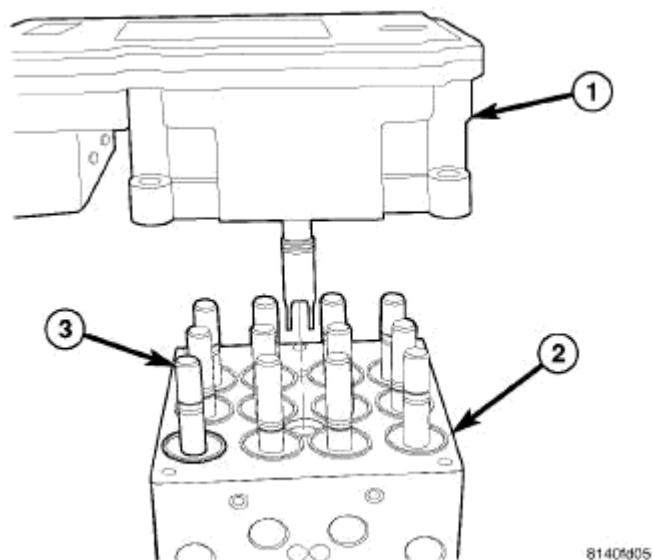


Fig. 14: ABM Assembly To HCU
Courtesy of CHRYSLER LLC

1 - ABM

- 2 - HCU
- 3 - SOLENOID VALVE STEM

CAUTION: When removing the ABM from the HCU, be sure to completely separate the two components (approximately 38 mm (1.5 inches)) before removing the ABM. Otherwise, damage to the pressure sensor or pump motor connection may result, requiring HCU replacement. Do not touch the sensor terminals on the HCU side or the contact pads on the ABM side as this may result in contamination and issues in the future.

6. Separate the ABM (1) from the HCU (2).

INSTALLATION

LEFT-HAND DRIVE

1. Clean any debris off the mating surfaces of the HCU and ABM.

CAUTION: When installing new O-rings or solenoid valve stem seals, do not use any type of lubricant.

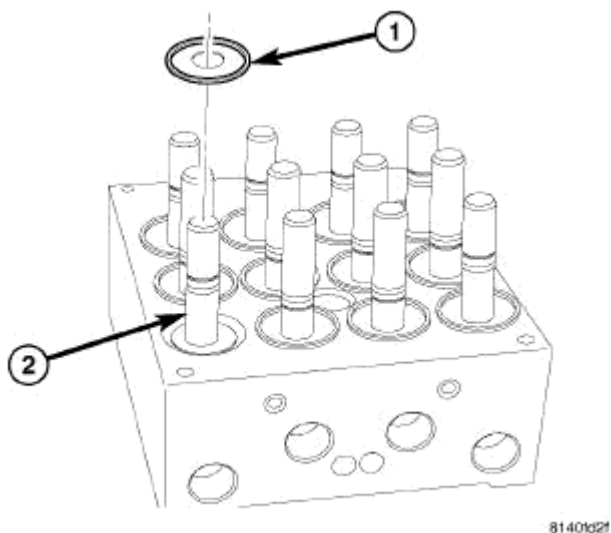


Fig. 15: Solenoid Valve Seal
Courtesy of CHRYSLER LLC

- 1 - SEAL
- 2 - SOLENOID VALVE STEM

2. If the seals (1) on the solenoid valve stems (2) are not new, replace them all. Each of the solenoid valve stem seals must be new to keep out moisture and debris;**do not reuse solenoid valve stem seals.**

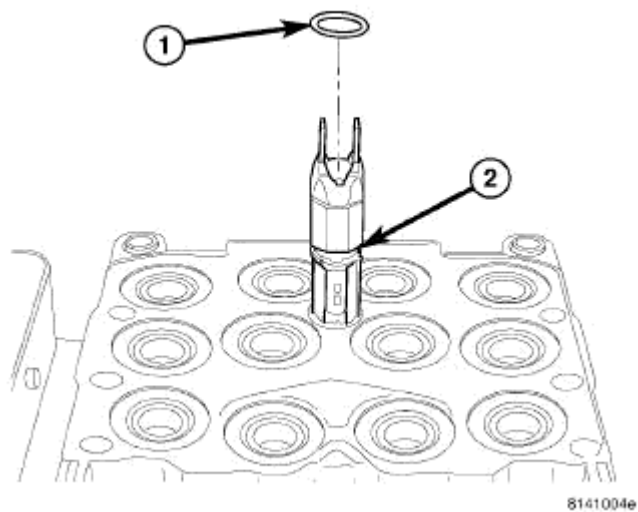


Fig. 16: Internal Pump Connector O-Ring
Courtesy of CHRYSLER LLC

- | |
|----------------------------|
| 1 - O-RING |
| 2 - O-RING MOUNTING GROOVE |

3. Replace the pump/motor connector O-ring (1) if it is not new. Be sure the O-ring is properly seated in the mounting groove (2).

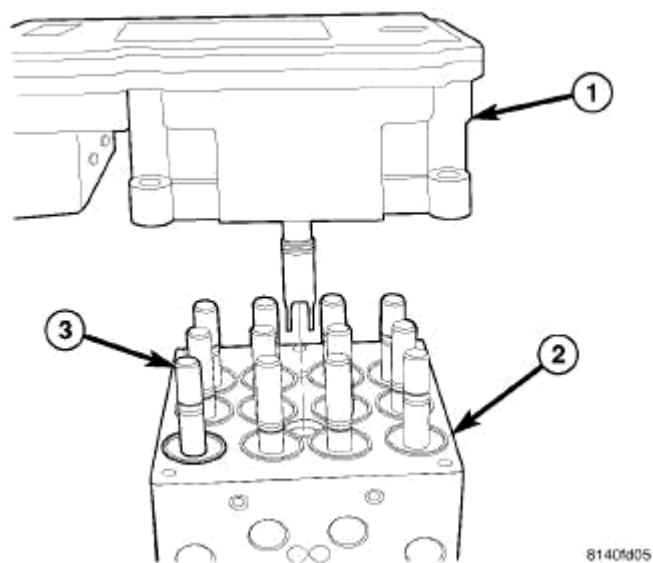


Fig. 17: Identifying ABM, HCU, & Solenoid Valve Stem

Courtesy of CHRYSLER LLC

- 1 - ABM
- 2 - HCU
- 3 - SOLENOID VALVE STEM

4. Align components and install the ABM (1) on the HCU (2).

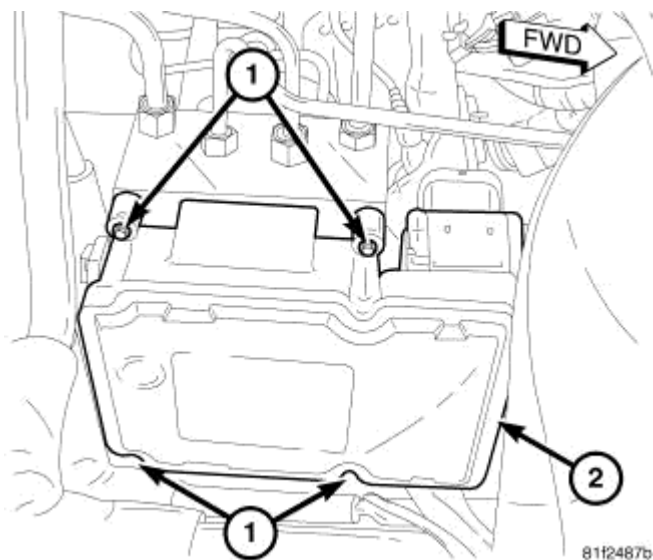


Fig. 18: ABM Mounting

Courtesy of CHRYSLER LLC

5. Install the four screws (1) attaching the ABM (2) to the HCU. Tighten the mounting screws to 2 N.m (17 in. lbs.).

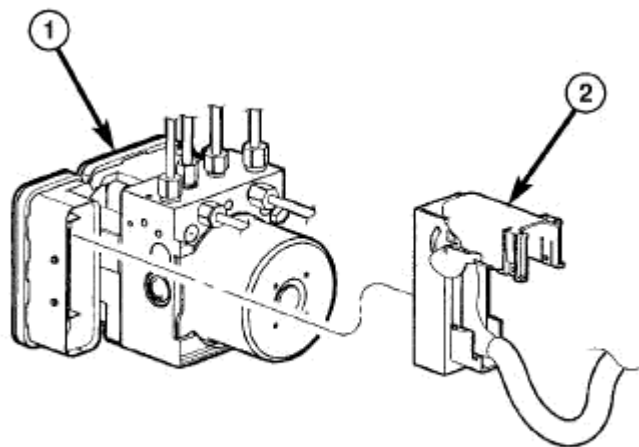


Fig. 19: Wiring Harness Connector At ABM
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - ABM (PART OF ICU)
2 - WIRING HARNESS CONNECTOR |
|---|

CAUTION: Before installing the ABM harness connector on the ABM, be sure the seal is properly installed in the connector.

6. Insert the ABM wiring harness connector (2) into the socket of the ABM (1) and close the cover, locking the connector in place.
7. Raise and support the vehicle. Refer to **Vehicle Quick Reference/Hoisting - Standard Procedure**

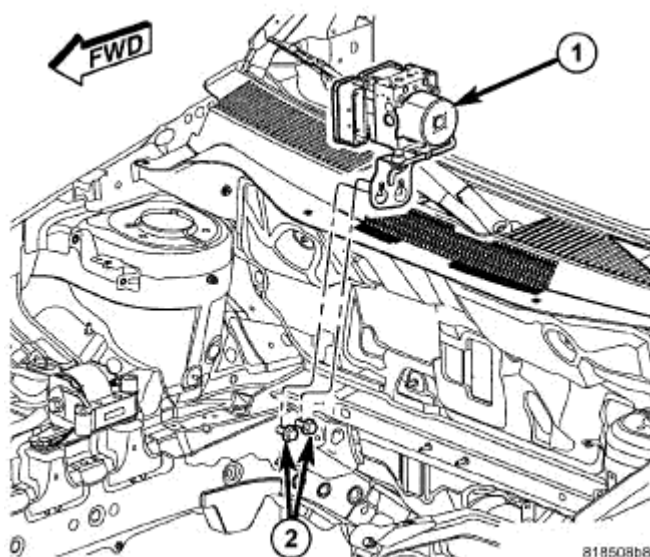


Fig. 20: Locating Integrated Control Unit (ICU)
Courtesy of CHRYSLER LLC

8. Loosen the two mounting screws (2) as necessary and allow the ICU (1) mounting bracket to slide down over the mounting screws and hang the assembly in place. Tighten the two mounting screws (2) to 23 N.m (17 ft. lbs.).
9. Lower the vehicle.
10. Position the fresh air plenum and install the two mounting screws.

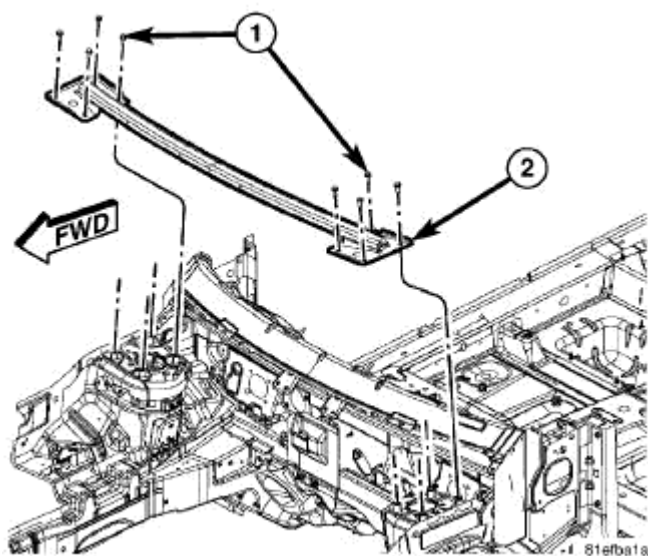


Fig. 21: Wheelhouse Brace
Courtesy of CHRYSLER LLC

11. Install the wheelhouse brace (2). Install and tighten the eight mounting bolts (four each side) (1) to 48 N.m (35 ft. lbs.).

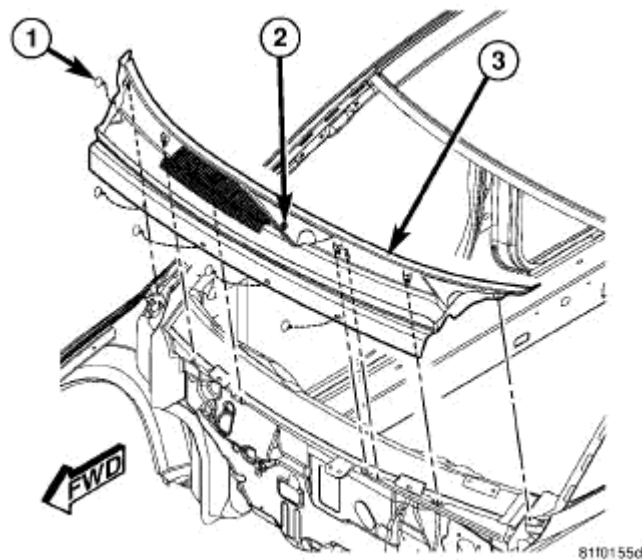
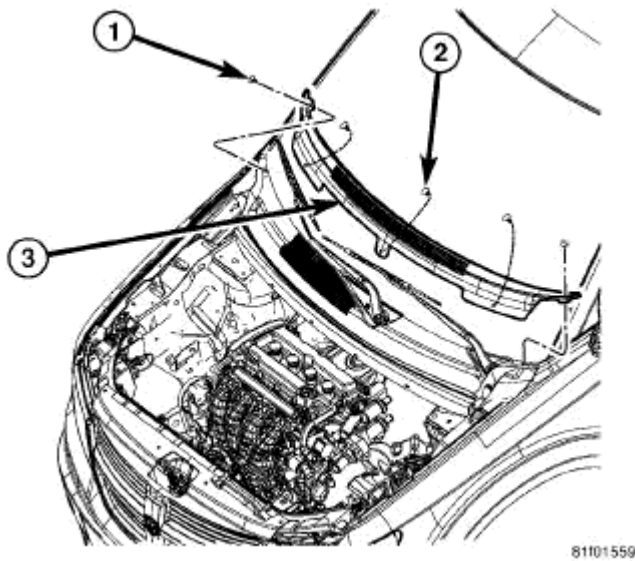


Fig. 22: Cowl Screen
Courtesy of CHRYSLER LLC

12. Install the cowl screen. Install the push-pins (1) securing the cowl screen to the wheelhouse brace and cowl. Rotate the screw (2) in the center of the cowl screen 90° counterclockwise to lock the screen in place.
13. Install the wiper arms. Refer to **Electrical - Wipers/Washers/Wipers/Washers/ARM, Wiper -**

Installation**Fig. 23: Cowl Top Screen****Courtesy of CHRYSLER LLC**

14. Install the cowl top screen (3). Install the two push-pins (1) securing the cowl top screen at the ends. Install the remaining push-pins (2).
15. Install the engine appearance cover.
16. Connect the negative cable on the battery negative post.
17. Hook up the scan tool to initialize the ABM and perform the following:
 - a. Clear any faults.
 - b. Perform the ABS Verification Test and road test the vehicle. Refer to **DTC-Based Diagnostics/MODULE, Antilock Brake (ABS) - Standard Procedure**

RIGHT-HAND DRIVE

1. Clean any debris off the mating surfaces of the HCU and ABM.

CAUTION: When installing new O-rings or solenoid valve stem seals, do not use any type of lubricant.

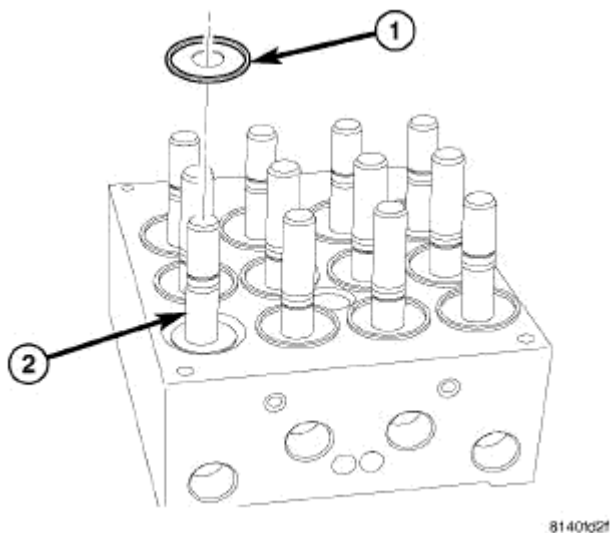


Fig. 24: Solenoid Valve Seal
Courtesy of CHRYSLER LLC

- | |
|-------------------------|
| 1 - SEAL |
| 2 - SOLENOID VALVE STEM |

- If the seals (1) on the solenoid valve stems (2) are not new, replace them all. Each of the solenoid valve stem seals must be new to keep out moisture and debris;**do not reuse solenoid valve stem seals.**

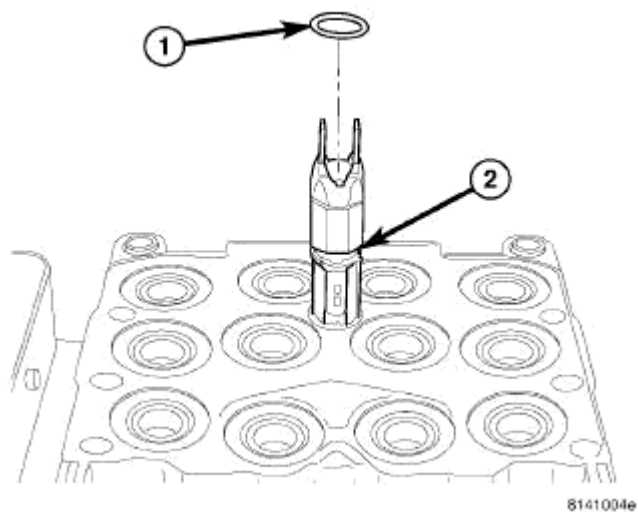


Fig. 25: Internal Pump Connector O-Ring
Courtesy of CHRYSLER LLC

- | |
|------------|
| 1 - O-RING |
|------------|

2 - O-RING MOUNTING GROOVE

3. Replace the pump/motor connector O-ring (1) if it is not new. Be sure the O-ring is properly seated in the mounting groove (2).

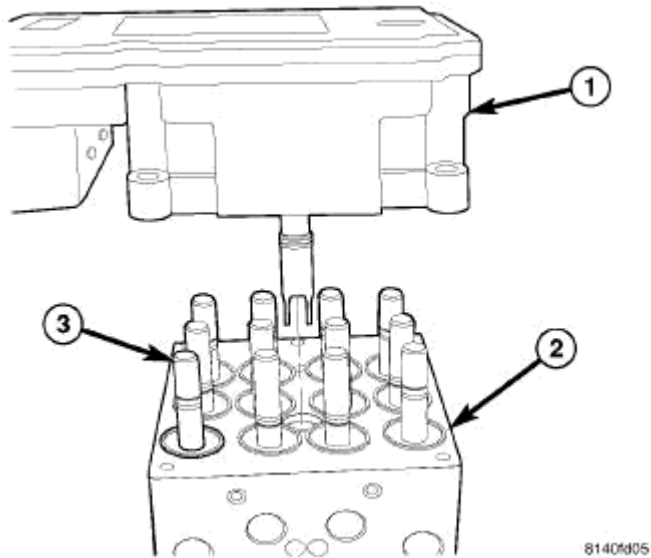


Fig. 26: ABM Assembly To HCU
Courtesy of CHRYSLER LLC

1 - ABM
2 - HCU
3 - SOLENOID VALVE STEM

4. Align components and install the ABM (1) on the HCU (2).

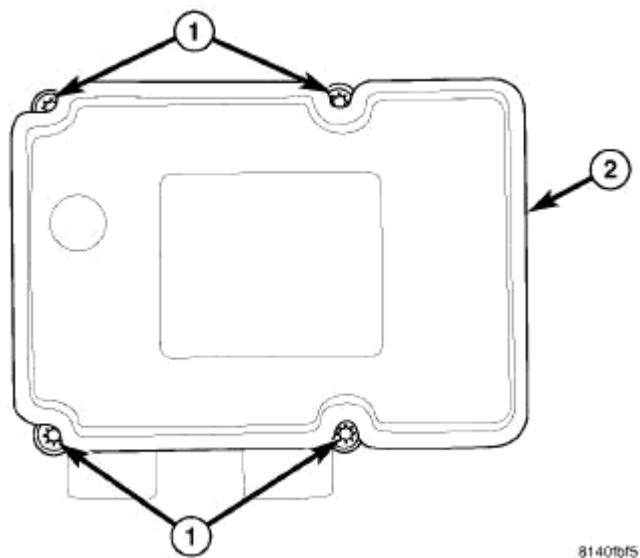


Fig. 27: ABM Mounting Screws
Courtesy of CHRYSLER LLC

1 - MOUNTING SCREWS
2 - ABM

5. Install the four screws (1) attaching the ABM (2) to the HCU. Tighten the mounting screws to 2 N.m (17 in. lbs.).

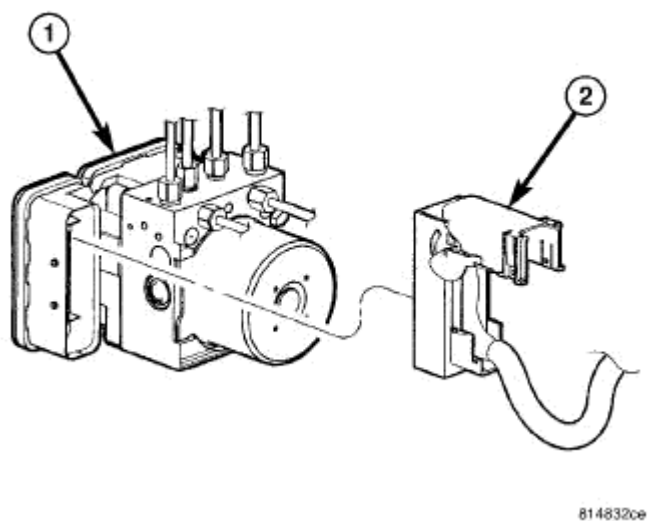


Fig. 28: Wiring Harness Connector At ABM
Courtesy of CHRYSLER LLC

1 - ABM (PART OF ICU)

2 - WIRING HARNESS CONNECTOR

CAUTION: Before installing the ABM harness connector on the ABM, be sure the seal is properly installed in the connector.

6. Insert the ABM wiring harness connector (2) into the socket of the ABM (1) and close the cover, locking the connector in place.
7. Install the air inlet hose (1) between the air cleaner housing and engine.
8. Connect the negative cable on the battery negative post.
9. Hook up the scan tool to initialize the ABM and perform the following:
 - a. Clear any faults.
 - b. Perform the ABS Verification Test and road test the vehicle. Refer to **DTC-Based Diagnostics/MODULE, Antilock Brake (ABS) - Standard Procedure**

MODULE, DOOR

REMOVAL

REMOVAL

1. Disconnect and isolate the battery negative cable.
2. Remove the door trim panel as necessary to gain access to the door control module. Refer to **Body/Door - Front/PANEL, Door Trim - Removal**.
3. Disconnect the electrical connectors.
4. Remove the door control module mounting fasteners and remove the module from the vehicle.

INSTALLATION

INSTALLATION

1. Place the door control module into position and install the mounting fasteners.
2. Connect the electrical connectors.
3. Install the door trim panel. Refer to **Body/Door - Front/PANEL, Door Trim - Installation**.
4. Install the battery negative cable.

MODULE, ENGINE CONTROL

DESCRIPTION

DESCRIPTION

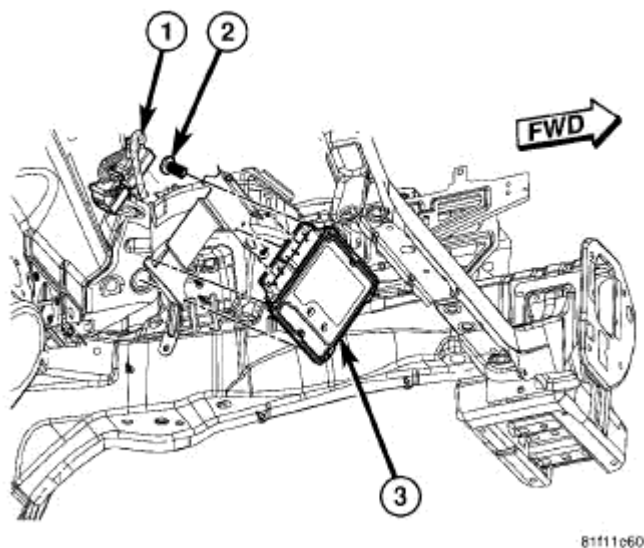


Fig. 29: Removing/Installing ECM - 2.0L Diesel
Courtesy of CHRYSLER LLC

The ECM (3) is located in the left side of engine compartment attached to the left inner fender below the air filter housing.

OPERATION

OPERATION

The ECM has been programmed to monitor different circuits of the diesel fuel injection system. This monitoring is called on-board diagnostics. Certain criteria must be met for a diagnostic trouble code to be entered into the ECM memory. The criteria may be a range of: engine rpm, engine temperature, time or other input signals to the ECM. If all of the criteria for monitoring a system or circuit are met, and a problem is sensed, then a DTC will be stored in the ECM memory. It is possible that a DTC for a monitored circuit may not be entered into the ECM memory, even though a malfunction has occurred. This may happen when the monitoring criteria have not been met. The ECM compares input signal voltages from each input device with specifications (the established high and low limits of the input range) that are programmed into it for that device. If the input voltage is not within the specifications and other trouble code criteria are met, a DTC will be stored in the ECM memory.

ECM OPERATING MODES

As input signals to the ECM change, the ECM adjusts its response to the output devices. For example, the ECM must calculate a different fuel quantity and fuel timing for engine idle condition than it would for a wide open throttle condition. There are several different modes of operation that determine how the ECM responds to the various input signals.

Ignition Switch On (Engine Off)

When the ignition is turned on, the ECM activates the glow plug relay for a time period that is determined by

engine coolant temperature, atmospheric temperature and battery voltage.

Engine Start-Up Mode

The ECM uses the engine temperature sensor and the crankshaft position sensor (engine speed) inputs to determine fuel injection quantity.

Normal Driving Modes

Engine idle, warm-up, acceleration, deceleration and wide open throttle modes are controlled based on all of the sensor inputs to the ECM. The ECM uses these sensor inputs to adjust fuel quantity and fuel injector timing.

Limp-In Mode

If there is a fault detected with the accelerator pedal position sensor, the ECM will set the engine speed at 1100 RPM.

Overspeed Detection Mode

If the ECM detects engine RPM that exceeds 5200 RPM, the ECM will set a DTC in memory and illuminate the MIL until the DTC is cleared.

After-Run Mode

The ECM transfers RAM information to ROM and performs an Input/Output state check.

MONITORED CIRCUITS

The ECM is able to monitor and identify most driveability related trouble conditions. Some circuits are directly monitored through ECM feedback circuitry. In addition, the ECM monitors the voltage state of some circuits and compares those states with expected values. Other systems are monitored indirectly when the ECM conducts a rationality test to identify problems. Although most subsystems of the engine control module are either directly or indirectly monitored, there may be occasions when diagnostic trouble codes are not immediately identified. For a trouble code to set, a specific set of conditions must occur and unless these conditions occur, a DTC will not set.

DIAGNOSTIC TROUBLE CODES

Each diagnostic trouble code (DTC) is diagnosed by following a specific procedure. The diagnostic test procedure contains step-by-step instruction for determining the cause of the DTC as well as no trouble code problems. Refer to the appropriate Diesel Powertrain Diagnostic service information for more information.

HARD CODE

A DTC that comes back within one cycle of the ignition key is a hard code. This means that the problem is current every time the ECM/SKIM checks that circuit or function. Procedures in this service information verify if the DTC is a hard code at the beginning of each test. When the fault is not a hard code, an intermittent test must be performed. NOTE: If the scantool displays faults for multiple components (i.e. ECT, VSS, IAT

sensors) identify and check the shared circuits for possible problems before continuing (i.e. sensor grounds or 5-volt supply circuits). Refer to the appropriate schematic diagram to identify shared circuits. Refer to the appropriate Diesel Powertrain Diagnostic service information for more information.

INTERMITTENT CODE

A DTC that is not current every time the ECM/SKIM checks the circuit or function is an intermittent code. Most intermittent DTCs are caused by wiring or connector problems. Problems that come and go like this are the most difficult to diagnose; they must be looked for under specific conditions that cause them. **NOTE: Electromagnetic (radio) interference can cause an intermittent system malfunction.** This interference can interrupt communication between the ignition key transponder and the SKIM.

The following checks may assist you in identifying a possible intermittent problem:

- Visually inspect the related wire harness connectors. Look for broken, bent, pushed out or corroded terminals.
- Visually inspect the related wire harness. Look for chafed, pierced or partially broken wire.
- Refer to hotlines or technical service bulletins that may apply.

Refer to the appropriate Diesel Powertrain Diagnostic service information for more information.

ECM DIAGNOSTIC TROUBLE CODES

NOTE: Before replacing the ECM for a failed driver, control circuit or ground circuit, be sure to check the related component/circuit integrity for failures not detected due to a double fault in the circuit. Most ECM driver/control circuit failures are caused by internal failures to components (i.e. relays and solenoids) and shorted circuits (i.e. sensor pull-ups, drivers and ground circuits). These faults are difficult to detect when a double fault has occurred and only one DTC has set. If the scan tool displays faults for multiple components (i.e. VSS, ECT, Batt Temp, etc.) identify and check the shared circuits for possible problems before continuing (i.e. sensor grounds or 5-volt supply circuits). Refer to SYSTEM WIRING DIAGRAMS to identify shared circuits. Refer to the appropriate Diesel Powertrain Diagnostic service information for more information.

STANDARD PROCEDURE

PCM/ECM REPROGRAMMING

Follow the instructions in order, refer to RECEIVER, Wireless Ignition Node .

REMOVAL

REMOVAL

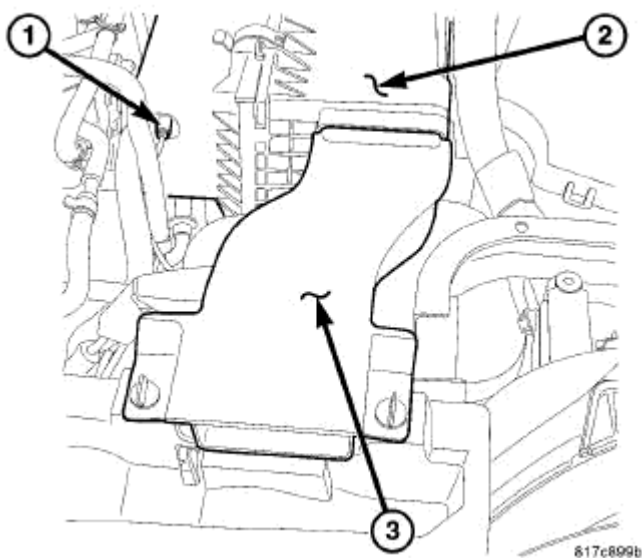


Fig. 30: Air Inlet Duct

Courtesy of CHRYSLER LLC

1. Remove air inlet duct (3).
2. Disconnect negative battery cable.
3. Disconnect vacuum hose (1).
4. Remove air filter housing assembly (2). Refer to Engine/Air Intake System/BODY, Air Cleaner - Removal .

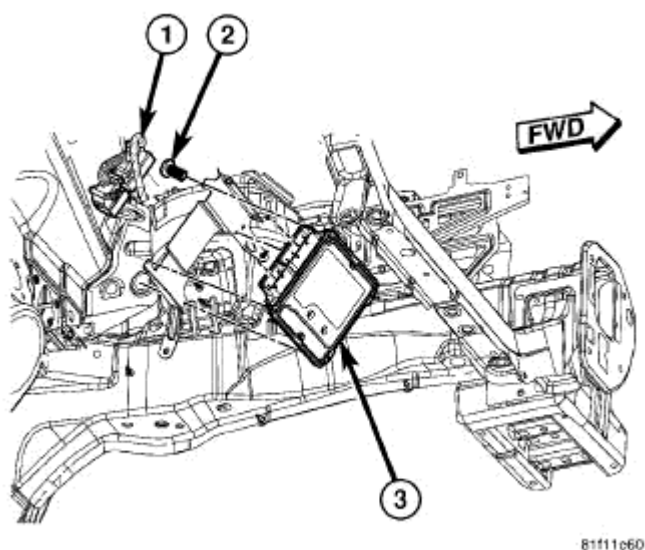


Fig. 31: Removing/Installing ECM - 2.0L Diesel

Courtesy of CHRYSLER LLC

5. Disconnect both ECM (1) electrical connectors.

6. Remove ECM bracket retaining bolts (2) and remove ECM (3).

INSTALLATION

INSTALLATION

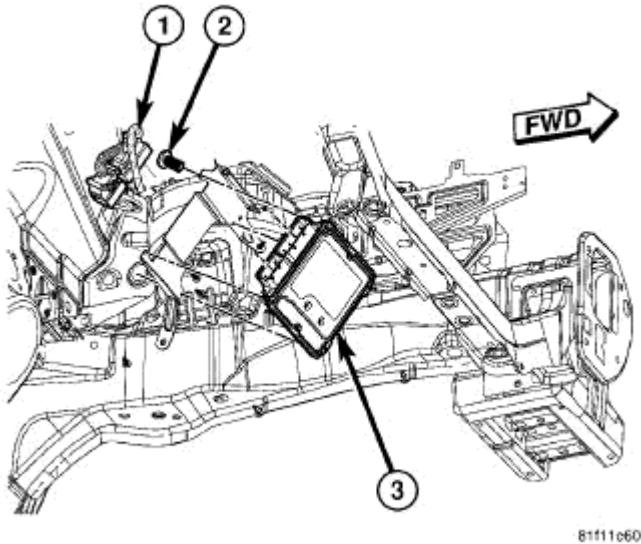


Fig. 32: Removing/Installing ECM - 2.0L Diesel
Courtesy of CHRYSLER LLC

1. Install ECM (3) on mounting bracket. Torque fastener to 10.7N.m (95 lbs. in.).
2. Connect both ECM electrical connectors (1).

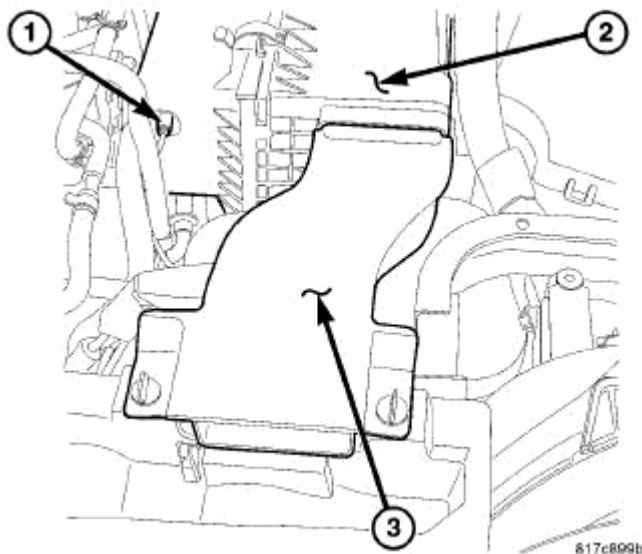


Fig. 33: Air Inlet Duct

Courtesy of CHRYSLER LLC

3. Install air filter housing assembly (2). Refer to Engine/Air Intake System/BODY, Air Cleaner - Installation .
4. Connect vacuum hose (1).
5. Connect negative battery cable.
6. Install air inlet tube (3).
7. Reprogram ECM. See Standard Procedure .

MODULE, FINAL DRIVE CONTROL

DESCRIPTION

DESCRIPTION

The AWD ECM (electronic control module) mounts on the driver side cowl side panel, where it is concealed by the instrument panel. It communicates with other systems over the high-speed CAN-C bus.

OPERATION

OPERATION

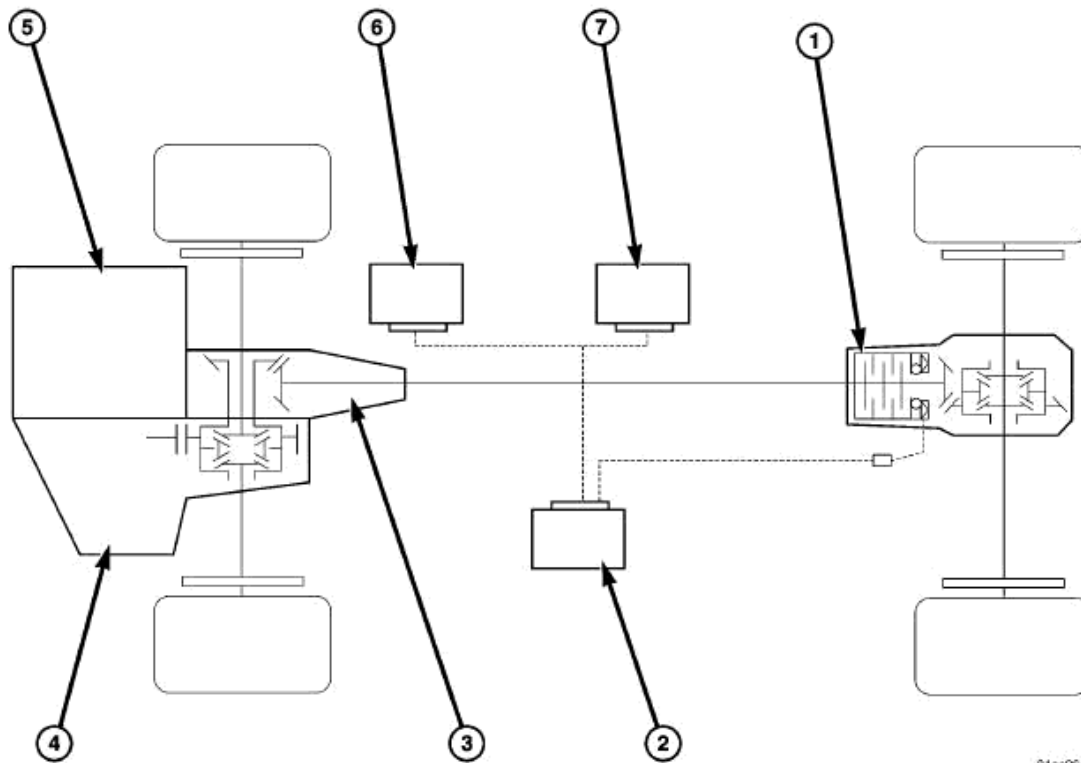


Fig. 34: AWD Outline
Courtesy of CHRYSLER LLC

2009 Dodge Journey R/T

2009 ACCESSORIES AND EQUIPMENT Electronic Control Modules - Service Information - Journey

1 - ECC	5 - ENGINE
2 - AWD ECU	6 - NGC
3 - PTU	7 - ABS CONTROLLER
4 - TRANSMISSION	-

The all-wheel-drive system requires no driver input or control. Under most driving conditions, it is passive and power is transmitted to the front wheels alone. The system functions to optimize traction and handling under the following conditions:

Anticipates slip by responding to pedal position unlike all-wheel drive systems that rely on pumps or viscous fluids to transfer torque, the system requires no front-to-rear slippage for activation. This allows the system to transfer torque in response to accelerator pedal position. If the driver is asking for a lot of power, the system immediately starts clamping the Electronically Controlled Coupling (ECC), transferring a high percentage of power to the rear wheels. This avoids front wheel slippage, as power to propel the car is transmitted through all four tires. This mode of operation is called open-loop operation in that there is no feedback to affect the torque transfer.

Modulates torque to optimize traction on slippery surfaces a second, closed loop, operating mode uses feedback from the wheel-speed sensors to determine the appropriate torque transfer. When the front wheels slip, the all-wheel-drive electronic control module tells the ECC to start clamping, sending power to the rear wheels. Attempting the same aggressive launch described above with the front wheels on ice and the rear wheels on dry pavement, the ECC sends even more torque to the rear wheels to minimize slippage and launch the vehicle. Both modes are always active and the maximum of the two is chosen. Power to the rear wheels is modulated during lost of traction while traveling at freeway speeds; for example, hydroplaning on a puddle of water, will send very little power to the rear wheels because the controller knows at those speeds a lot of power is not needed at the rear wheels.

Prevents binding during low-speed turns a third condition, which is independent of the others, uses the ESP steering angle sensor to determine when the vehicle is turning in a tight circle. This condition causes the electronic control module to reduce torque to the rear wheels to prevent binding in the driveline. The electronic control module is always checking for this condition as well.

Influences handling at moderate speeds. The AWD system is used to influence vehicle dynamics. Other manufacturers limit AWD to aiding traction or providing off-road capability. They concentrate on launching the vehicle or going off road at speeds up to about 25 mph (40 km/hr). Above that speed range, they use it to limit wheel slip for traction. Additional ECM calibration controls torque to the rear wheels for improved handling in the 25-65 mph (40-105 km/hr) range. In this speed range, the system utilizes torque to the rear wheels during cornering with the throttle open to make the car turn more easily - make the handling more neutral. This is more readily accomplished with an electronically controlled system, than with viscous-coupling or gerotor systems that require some degree of front-to-rear slip to transfer torque to the rear wheels. Above 53 mph (113 km/hr), the control strategy provides minimal torque to the rear wheels under normal driving conditions to aid fuel economy.

Works with ESP and Traction Control the electronic control module also interfaces with the ESP and traction control systems. The interface allows the ESP system to use the ECC to help gain control of the vehicle. For this purpose, torque transmitted to the rear wheels by the ECC can be reduced. The AWD system is not traction

control. It only works on situations where front-to-rear traction varies, for instance, front wheels on ice, rear wheels on dry pavement or climbing steep grades. AWD does not aid side-to-side traction. ESP does that through brake intervention.

REMOVAL

REMOVAL

1. Remove the left front trim panel.
2. Remove the electrical connector.
3. Remove the mounting nuts.
4. Remove the ECC module.

INSTALLATION

INSTALLATION

1. Install ECC module into mounting studs.
2. Install mounting nuts and tighten to 8N.m (71 in. lbs.) torque.
3. Install the electrical connector.
4. Install the left front trim panel.

MODULE, HEATED SEAT

DESCRIPTION

DESCRIPTION

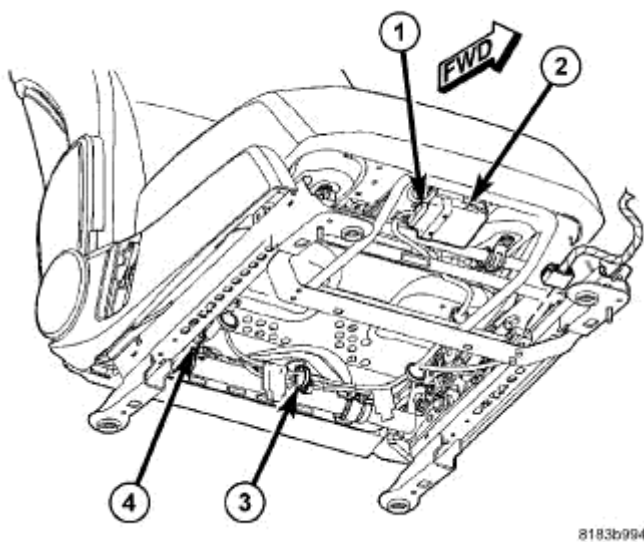


Fig. 35: Locating Heated Seat Module

Courtesy of CHRYSLER LLC

The heated seat module (2) is located under the driver front seat. It has a single electrical connector (1) and a push pin style retainer that secures it to the seat pan (4). The module can be accessed from under the Driver seat with the seat in the full back and up position.

The heated seat module is a microprocessor designed to use the Local Interface Network (LIN) data bus messages from the instrument cluster, sometimes referred to as the Cab Compartment Node (CCN). The CCN receives inputs from the heated seat switches and in turn signals the heated seat module to operate the heated seat elements for both front seats.

OPERATION**OPERATION**

The heated seat module 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 Local Interface Network (LIN) data bus messages and standard hardwired 12 volt power and ground. In response to the LIN inputs the heated seat module will control the battery current to the appropriate heated seat elements.

When a heated seat switch LIN data bus signal is received by the heated seat module, 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).

In addition to operating the heated seat elements, the heated seat module sends LED illumination messages to the instrument cluster, sometimes referred to as the Cab Compartment Node (CCN) via the LIN data bus. The CCN then sends the LED illumination message to the accessory switch bank 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 heated seat module detects a heated seat element OPEN or SHORT circuit, it will record and store the appropriate Diagnostic Trouble Code (DTC).

DIAGNOSIS AND TESTING**HEATED SEAT MODULE**

In order to obtain conclusive testing, the heated seat system and the Local Interface Network (LIN) data bus circuit must be checked. **Any diagnosis of the heated seat system should begin with, the use of a scan tool and the appropriate diagnostic service information.**

Refer to **SYSTEM WIRING DIAGRAMS** for complete circuit schematic or connector pin-out information.

NOTE: Vehicles equipped with the heated seat option utilize a low voltage cut-off feature. This feature turns off power to the heated seat system anytime vehicle

voltage is below 11.7v or above 15.5v. Be certain to check the vehicle electrical system for proper voltage anytime the power seat system appears inoperative.

Before any testing of the heated seat system is attempted, the battery should be fully-charged.

REMOVAL

REMOVAL

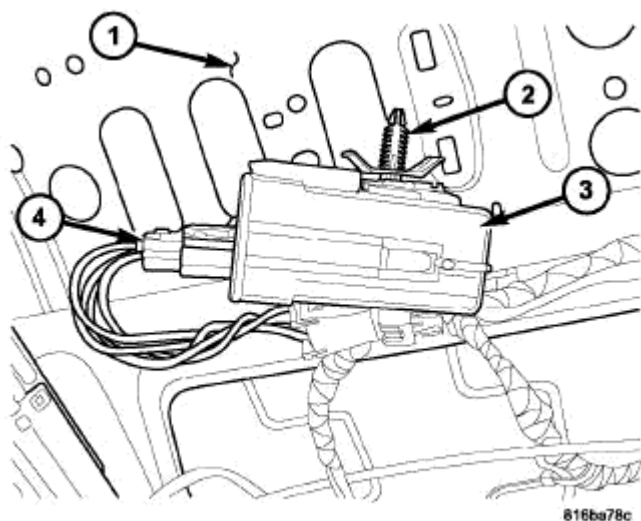


Fig. 36: Locating Heated Seat Module

Courtesy of CHRYSLER LLC

CAUTION: The Heated Seat Module mounting tab can be damaged during module removal and installation. Use care to properly align tab to prevent binding that could result in tab breakage.

1. Position the driver front seat to the full rearward position.
2. Disconnect and isolate the battery negative cable.
3. Disconnect the wire harness connector (4) from the heated seat module (3).
4. Unsnap the heated seat module retaining tab (2) from the seat pan (1).
5. Remove the heated seat module (3) from the vehicle.

INSTALLATION

INSTALLATION

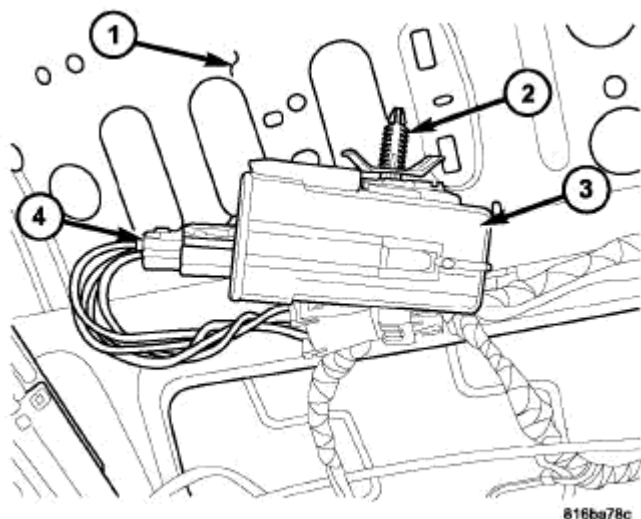


Fig. 37: Locating Heated Seat Module

Courtesy of CHRYSLER LLC

CAUTION: The Heated Seat Module mounting tab can be damaged during module removal and installation. Use care to properly align tab to prevent binding that could result in tab breakage.

1. Install the heated seat module (3) into the vehicle.
2. Position the retaining tab (2) with the mounting hole in the seat pan (1). Firmly apply even pressure to the module (3) until the mounting tab is fully seated.
3. Connect the wire harness connector (4) to the heated seat module (3).
4. Connect the battery negative cable.
5. Check for proper heated seat system operation.

MODULE, POWERTRAIN CONTROL

DESCRIPTION

POWERTRAIN CONTROL MODULE (PCM)

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

NOTE: **PCM Inputs:**

- Air Conditioning Pressure Transducer

- ASD/Main Relay
- Battery Voltage
- Brake Switch
- Camshaft Position Sensor
- Crankshaft Position Sensor
- Distance Sensor (from transmission control module)
- EGR Position Feedback (if equipped)
- Engine Coolant Temperature Sensor
- Heated Oxygen Sensors
- Ignition sense
- Inlet Air Temperature Sensor
- Knock Sensor
- Manifold Absolute Pressure (MAP) Sensor
- Park/Neutral (from trans range sensor)
- Power Steering Pressure Switch
- Proportional Purge Sense
- CAN C Bus
- Speed Control
- Transmission Control Relay (Switched B+)
- Transmission Pressure Switches
- Transmission Temperature Sensor
- Transmission Input Shaft Speed Sensor
- Transmission Output Shaft Speed Sensor
- Vehicle Speed

NOTE: PCM Outputs:

- Air Conditioning Clutch Relay
- Data Link Connector (CAN C Bus)
- Double Start Override
- EGR Solenoid (if equipped)
- Fuel Injectors
- Generator Field
- High Speed Fan Relay
- Ignition Coils
- Natural Vacuum Leak Detection
- Low Speed Fan Relay
- MTV Actuator

- Proportional Purge Solenoid
- SRV Valve
- Speed Control Relay
- Speed Control Vent Relay
- Speed Control Vacuum Relay
- Torque Reduction Request
- Transmission Control Relay
- Transmission Solenoids
- 5 Volt Output

Based on inputs it receives, the powertrain control module (PCM) adjusts fuel injector pulse width, idle speed, ignition timing, and canister purge operation and EGR if equipped. The PCM regulates the cooling fans, air conditioning and speed control systems. The PCM changes generator charge rate by adjusting the generator field.

The PCM adjusts injector pulse width (air-fuel ratio) based on the following inputs.

- Manifold Absolute Pressure
- Engine Speed (crankshaft position sensor)
- Battery Voltage
- Inlet Air Temperature Sensor
- Engine Coolant Temperature
- Exhaust Gas Oxygen Content (heated oxygen sensors)
- Throttle Position

The PCM adjusts engine idle speed through the idle air control motor based on the following inputs.

- Brake Switch
- Engine Coolant Temperature
- Engine Speed (crankshaft position sensor)
- Park/Neutral
- Transaxle Gear Engagement
- Throttle Position
- Vehicle Speed (from Transmission Control Module)

The PCM adjusts ignition timing based on the following inputs.

- Inlet Air Temperature
- Engine Coolant Temperature
- Engine Speed (crankshaft position sensor)
- Knock Sensor

- Manifold Absolute Pressure
- Park/Neutral (from trans range sensor)
- Transaxle Gear Engagement
- Throttle Position

The camshaft and crankshaft signals are sent to the Powertrain Control Module (PCM). If the PCM does not receive both signals within approximately one second of engine cranking, it deactivates the fuel pump. When deactivated, power is shut off to the fuel injectors, ignition coils, fuel pump and the heating element in each oxygen sensor.

The PCM contains a voltage converter that changes battery voltage to a regulated 5.0 volts. The 5.0 volts power the camshaft position sensor, and crankshaft position sensor. The PCM also provides a regulated 5.0 volts supply for the, manifold absolute pressure sensor, throttle position sensor and EGR (if equipped).

The PCM engine control strategy prevents reduced idle speeds until after the engine operates for 320 km (200 miles). If the PCM is replaced after 320 km (200 miles) of usage, update the mileage in new PCM. Use the scan tool to change the mileage in the PCM. Refer to the appropriate Powertrain Diagnostic Service Information and the scan tool. If equipped with SKREEM, must use SKREEM function to program VIN number in new PCM.

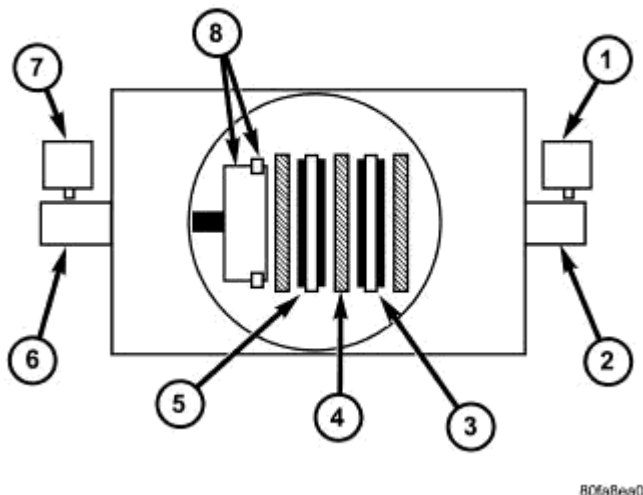
TRANSMISSION CONTROL

CVI CALCULATION

An important function of the PCM is to monitor Clutch Volume Index (CVI). CVIs represent the volume of fluid needed to compress a clutch pack.

The PCM monitors gear ratio changes by monitoring the Input and Output Speed Sensors. The Input, or Turbine Speed Sensor sends an electrical signal to the PCM that represents input shaft rpm. The Output Speed Sensor provides the PCM with output shaft speed information.

By comparing the two inputs, the PCM can determine transaxle gear ratio. This is important to the CVI calculation because the PCM determines CVIs by monitoring how long it takes for a gear change to occur .



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Fig. 38: Example of CVI Calculation
 Courtesy of CHRYSLER LLC

- 1 - OUTPUT SPEED SENSOR
- 2 - OUTPUT SHAFT
- 3 - CLUTCH PACK
- 4 - SEPARATOR PLATE
- 5 - FRICTION DISCS
- 6 - INPUT SHAFT
- 7 - INPUT SPEED SENSOR
- 8 - PISTON AND SEAL

Gear ratios can be determined by using the scan tool and reading the Input/Output Speed Sensor values in the "Monitors" display. Gear ratio can be obtained by dividing the Input Speed Sensor value by the Output Speed Sensor value.

For example, if the input shaft is rotating at 1000 rpm and the output shaft is rotating at 500 rpm, then the PCM can determine that the gear ratio is 2:1. In direct drive (3rd gear), the gear ratio changes to 1:1. The gear ratio changes as clutches are applied and released. By monitoring the length of time it takes for the gear ratio to change following a shift request, the PCM can determine the volume of fluid used to apply or release a friction element.

The volume of transmission fluid needed to apply the friction elements are continuously updated for adaptive controls. As friction material wears, the volume of fluid need to apply the element increases.

Certain mechanical problems within the clutch assemblies (broken return springs, out of position snap rings, excessive clutch pack clearance, improper assembly, etc.) can cause inadequate or out-of-range clutch volumes. Also, defective Input/Output Speed Sensors and wiring can cause these conditions. The following chart identifies the appropriate clutch volumes and when they are monitored/updated:

2009 Dodge Journey R/T

2009 ACCESSORIES AND EQUIPMENT Electronic Control Modules - Service Information - Journey

CLUTCH VOLUMES

Clutch	When Updated			Proper Clutch Volume
	Shift Sequence	Oil Temperature	Throttle Angle	
L/R	2-1 or 3-1 coast downshift	>21° C (70° F)	< 5°	35 to 83
2/4	1-2 shift	> 43° C (110° F)	5 - 54°	20 to 77
OD	2-3 shift			48 to 150
UD	4-3 or 4-2 shift		> 5°	24 to 70

SHIFT SCHEDULES

The PCM has programming that allows it to select a variety of shift schedules. Shift schedule selection is dependent on the following:

- Shift lever position
- Throttle position
- Engine load
- Fluid temperature
- Software level

As driving conditions change, the PCM appropriately adjusts the shift schedule. Refer to the following chart to determine the appropriate operation expected, depending on driving conditions.

Schedule	Condition	Expected Operation	
Extreme Cold	Oil temperature at start-up below -27° C (16° F)	Park, Reverse, Neutral and 2nd gear only (prevents shifting which may fail a clutch with frequent shifts)	-
Cold	Oil temperature at start-up above -24° C (-12° F) and below 2° C (36° F)	- Delayed 2-3 upshift (approximately 35-50 kmh (22-31 mph)	-
		- Delayed 3-4 upshift 72.5-85 kmh (45-53 mph) - Early 4-3 coastdown shift (approximately 30 mph) - Early 3-2	

2009 Dodge Journey R/T

2009 ACCESSORIES AND EQUIPMENT Electronic Control Modules - Service Information - Journey

		coastdown shift (approximately 27 kmh (17 mph)) - High speed 4-2, 3-2, 2-1 kickdown shifts are prevented - No EMCC	
Warm	Oil temperature at start-up above 2° C (36° F) and below 27° C (80° F)	- Normal operation (upshift, kickdowns, and coastdowns) - No EMCC	-
Hot	Oil temperature at start-up above 27° C (80° F)	- Normal operation (upshift, kickdowns, and coastdowns) - Full EMCC, no PEMCC except to engage FEMCC (except at closed throttle at speeds above 112.5-133.5 kmh (70-83 mph))	-
Overheat	Oil temperature above 115° C (240° F) or engine coolant temperature above 118° C (244° F)	- Delayed 2-3 upshift 40-51.5 kmh (25-32 mph) - Delayed 3-4 upshift 66-77 kmh (41-48 mph) - 3rd gear FEMCC from 48-77 kmh (30-48 mph) - 3rd gear PEMCC from 43.5-50 kmh (27-31 mph)	
Super Overheat	Oil temperature above 127° C (260° F)	- All "Overheat" shift schedule features apply - 2nd gear PEMCC above 35 kmh (22 mph) - Above 35 kmh (22 mph) the torque converter will not unlock unless the throttle is closed or if a wide open throttle 2nd	

2009 Dodge Journey R/T

2009 ACCESSORIES AND EQUIPMENT Electronic Control Modules - Service Information - Journey

	PEMCC to 1 kickdown is made	
--	--------------------------------	--

SENSOR RETURN - PCM INPUT

The sensor return circuit provides a low electrical noise ground reference for all of the systems sensors. The sensor return circuit connects to internal ground circuits within the Powertrain Control Module (PCM).

PCM REPLACEMENT

DESCRIPTION

Use the scan tool to reprogram the new pcm with the vehicle's original identification number (vin) and the vehicle's original mileage. If this step is not done a Diagnostic Trouble Code (DTC) may be set.

PCM GROUND

Ground is provided through multiple pins of the PCM connector. Depending on the vehicle there may be as many as two different ground pins. There are power grounds and sensor grounds.

The power grounds are used to control the ground side of relays, solenoids, ignition coil or injectors. The signal ground is used for any input that uses sensor return for ground, and the ground side of any internal processing component.

The PCM case is shielded to prevent RFI and EMI. The PCM case is grounded and must be firmly attached to a good, clean body ground.

Internally all grounds are connected together, however there is noise suppression on the sensor ground. For EMI and RFI protection the housing and cover are also grounded via the mounting screws AND bracket to the chassis, separately from the ground pins.

OPERATION

OPERATION

The PCM supplies two regulated 5 volts supplies - a 5V primary and a 5V secondary (auxiliary) to the following sensors:

- Camshaft Position Sensor (5V secondary)
- Crankshaft Position Sensor (5V primary)
- EGR Position feedback sensor (5V secondary) (if equipped)
- Engine coolant temperature sensor (connected to 5V internal via a pullup resistor)
- Inlet Air Temperature Sensor (connected to 5V internal via a pullup resistor)
- Knock sensor (connected to 5V internal via a pullup resistor)
- Manifold absolute pressure sensor (5V secondary)

- Oil Pressure Switch (connected to 5V internal via pullup resistor)
- Pedal Value Sensor #1 (5V Primary)
- Pedal Value Sensor #2 (5V Secondary)
- SRV Position Feedback Sensor (5V Secondary)
- Throttle Position Sensors (5V Primary)
- Variable Line Pressure Sensor (5V Secondary)

STANDARD PROCEDURE

PCM/ECM REPROGRAMMING - GAS

Follow the instructions in order. See **Standard Procedure**.

OBTAINING DIAGNOSTIC TROUBLE CODES

BULB CHECK

Key on: Bulb illuminated until vehicle starts, as long as all once per trip (readiness) monitors completed. If monitors have **not** been completed, then: Key on: bulb check for about 5 to 8 seconds, lamp then flashes if once per trip (readiness) monitors have **not** been completed until vehicle is started, then MIL is extinguished.

OBTAINING DTC'S USING SCAN TOOL

1. Connect the scan tool to the data link (diagnostic) connector. This connector is located in the passenger compartment; at the lower edge of instrument panel; near the steering column.
2. Turn the ignition switch on and access the "Read Fault" screen.
3. Record all the DTC's and "freeze frame" information shown on the scan tool.
4. To erase DTC's, use the "Erase Trouble Code" data screen on the scan tool. **Do not erase any DTC's until problems have been investigated and repairs have been performed.**

PINION FACTOR SETTING

NOTE: This procedure must be performed if the PCM has been replaced with a NEW or replacement unit. Failure to perform this procedure will result in an inoperative or improperly calibrated speedometer.

The vehicle speed readings for the speedometer are taken from the output speed sensor. The PCM must be calibrated to the different combinations of equipment (final drive and tires) available. Pinion Factor allows the technician to set the Powertrain Control Module initial setting so that the speedometer readings will be correct. To properly read and/or reset the Pinion Factor, it is necessary to use a scan tool.

1. Plug the scan tool into the diagnostic connector located under the instrument panel.
2. Select the Transmission menu.
3. Select the Miscellaneous menu.

4. Select Pinion Factor. Then follow the instructions on the scan tool screen.

QUICK LEARN PROCEDURE

The quick learn procedure requires the use of the scan tool. This program allows the electronic transaxle system to recalibrate itself. This will provide the best possible transaxle operation.

NOTE: **The quick learn procedure should be performed if any of the following procedures are performed:**

- Transaxle Assembly Replacement
- Powertrain Control Module Replacement
- Solenoid/Pressure Switch Assembly Replacement
- Clutch Plate and/or Seal Replacement
- Valve Body Replacement or Recondition

To perform the Quick Learn Procedure, the following conditions must be met:

- The brakes must be applied
 - The engine speed must be above 500 rpm
 - The throttle angle (TPS) must be less than 3 degrees
 - The shift lever position must stay until prompted to shift to overdrive
 - The shift lever position must stay in overdrive after the Shift to Overdrive prompt until the scan tool indicates the procedure is complete
 - The calculated oil temperature must be above 15.5° C (60° F) and below 93° C (200° F)
1. Plug the scan tool into the diagnostic connector. The connector is located under the instrument panel.
 2. Go to the Transmission screen.
 3. Go to the Miscellaneous screen.
 4. Select Quick Learn Procedure. Follow the instructions of the scan tool to perform the Quick Learn Procedure.

REMOVAL**REMOVAL - NGC CONTROLLER**

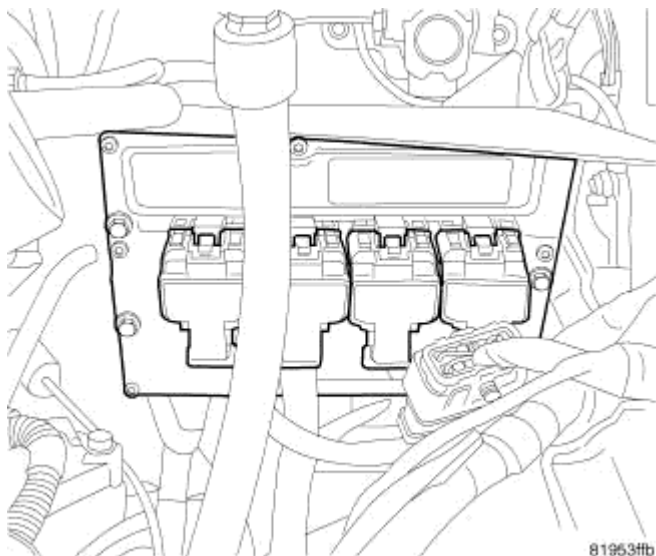


Fig. 39: Remove/Install PCM
Courtesy of CHRYSLER LLC

NOTE: USE THE SCAN TOOL TO REPROGRAM THE NEW POWERTRAIN CONTROL MODULE (PCM) WITH THE VEHICLES ORIGINAL IDENTIFICATION NUMBER (VIN) AND THE VEHICLES ORIGINAL MILEAGE. IF THIS STEP IS NOT DONE, A DIAGNOSTIC TROUBLE CODE (DTC) MAY BE SET.

To avoid possible voltage spike damage to PCM, ignition key must be off, and the negative battery cable must be disconnected before unplugging the PCM connectors.

1. Disconnect and isolate the negative battery cable.
2. Unlock and disconnect the 4 electrical connectors at the PCM.

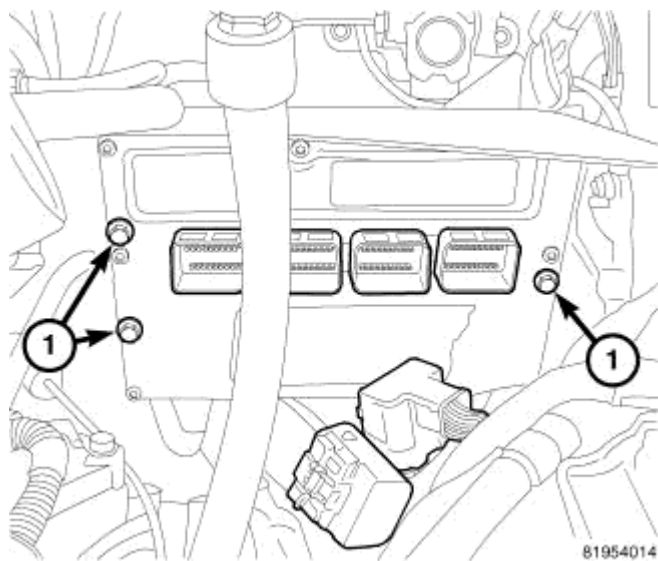


Fig. 40: Mounting Screws/Electrical Connectors

Courtesy of CHRYSLER LLC

3. Remove the 3 fasteners (1) holding the PCM to the bracket.

REMOVAL - GPEC CONTROLLER (2.4L)

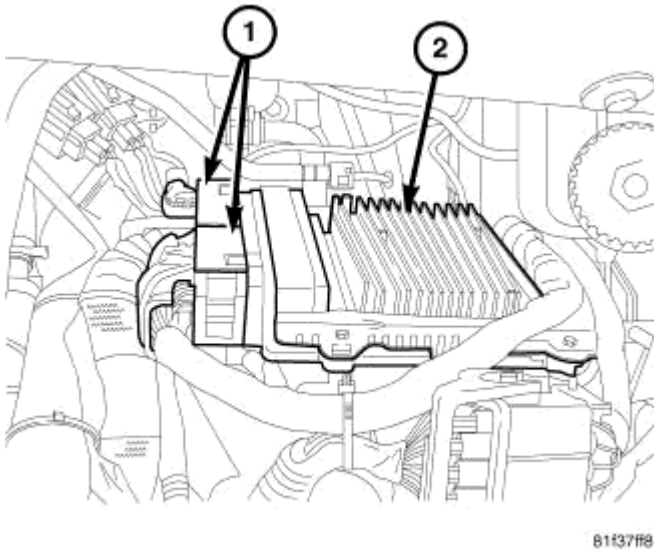


Fig. 41: GPEC Controller

Courtesy of CHRYSLER LLC

1 - Connectors

2 - PCM

NOTE: USE THE SCAN TOOL TO REPROGRAM THE NEW POWERTRAIN CONTROL MODULE (PCM) WITH THE VEHICLES ORIGINAL IDENTIFICATION NUMBER (VIN) AND THE VEHICLES ORIGINAL MILEAGE. IF THIS STEP IS NOT DONE, A DIAGNOSTIC TROUBLE CODE (DTC) MAY BE SET.

To avoid possible voltage spike damage to PCM, ignition key must be off, and the negative battery cable must be disconnected before unplugging the PCM connectors.

1. Disconnect and isolate the negative battery cable.
2. Unlock and disconnect the 2 electrical connectors (1) at the PCM (2).

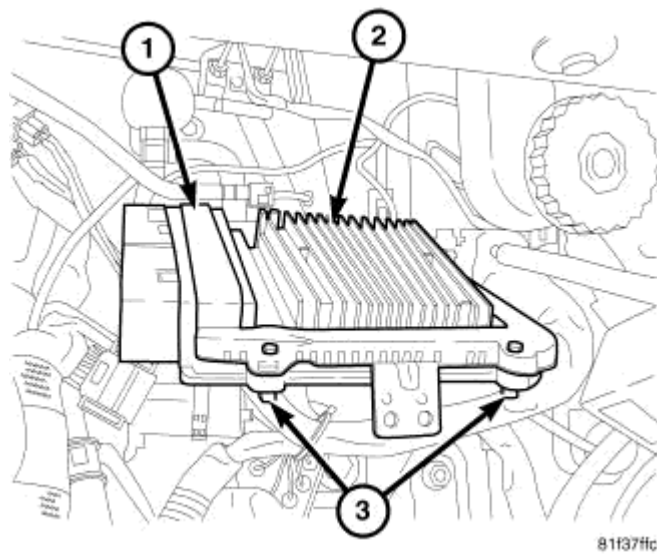


Fig. 42: GPEC Controller Mounting
Courtesy of CHRYSLER LLC

1 - Bracket
2 - PCM
3 - Bolts

3. Remove the 4 bolts (3) holding the PCM (2) to the bracket (1) and remove the PCM (2) from the vehicle.

INSTALLATION

INSTALLATION - NGC CONTROLLER

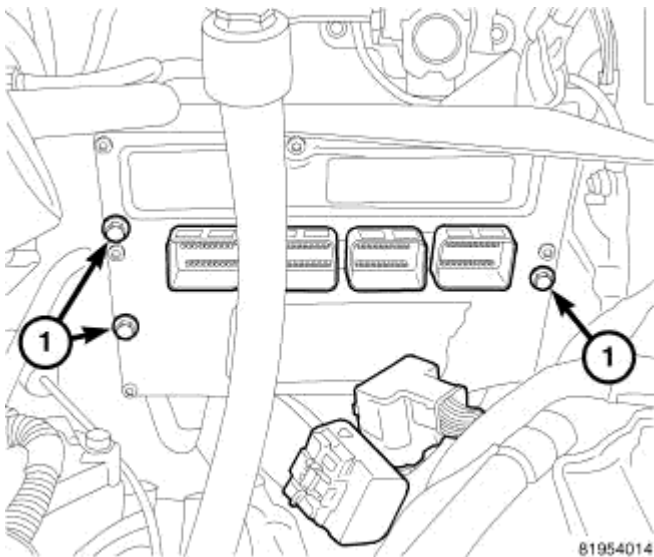


Fig. 43: Mounting Screws/Electrical Connectors
Courtesy of CHRYSLER LLC

NOTE: USE THE SCAN TOOL TO REPROGRAM THE NEW POWERTRAIN CONTROL MODULE (PCM) WITH THE VEHICLES ORIGINAL IDENTIFICATION NUMBER (VIN) AND THE VEHICLES ORIGINAL MILEAGE. IF THIS STEP IS NOT DONE, A DIAGNOSTIC TROUBLE CODE (DTC) MAY BE SET.

1. Install PCM to bracket with 3 fasteners (1).

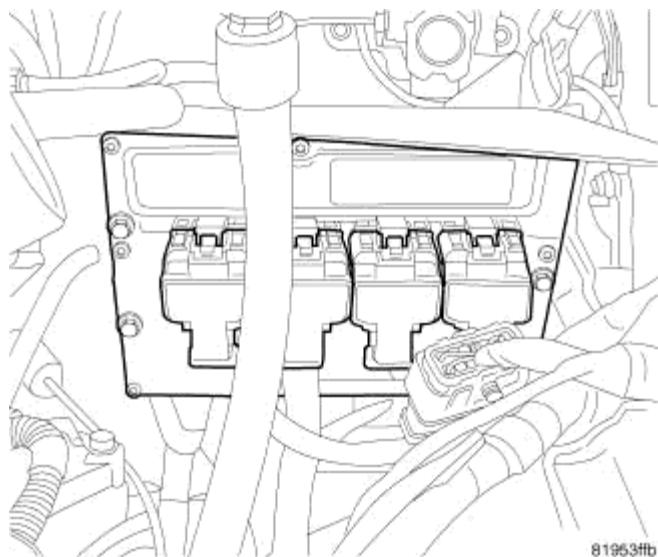


Fig. 44: Remove/Install PCM
Courtesy of CHRYSLER LLC

2. Install and lock the 4 electrical connectors to the PCM.
3. Connect negative battery cable, tighten nut to 5 N.m (45 in. lbs.).
4. Use the scan tool to reprogram new PCM with vehicles original Identification Number (VIN) and original vehicle mileage.

INSTALLATION - GPEC CONTROLLER (2.4L)

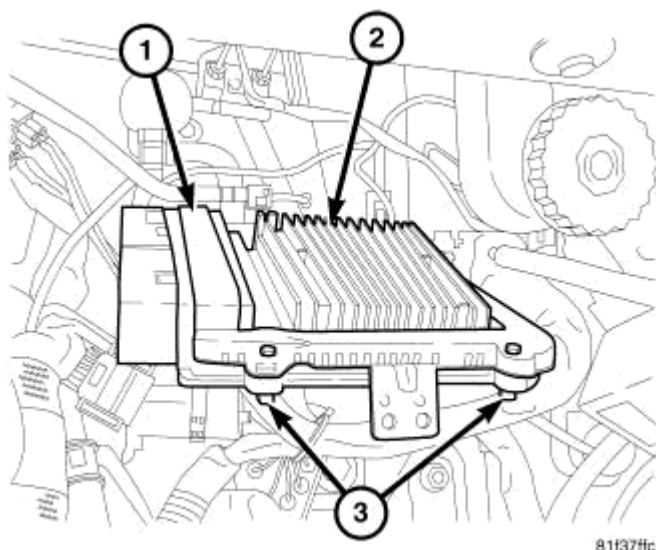


Fig. 45: GPEC Controller Mounting
Courtesy of CHRYSLER LLC

- | |
|-------------|
| 1 - Bracket |
| 2 - PCM |
| 3 - Bolts |

NOTE: USE THE SCAN TOOL TO REPROGRAM THE NEW POWERTRAIN CONTROL MODULE (PCM) WITH THE VEHICLE'S ORIGINAL IDENTIFICATION NUMBER (VIN) AND THE VEHICLE'S ORIGINAL MILEAGE. IF THIS STEP IS NOT DONE, A DIAGNOSTIC TROUBLE CODE (DTC) MAY BE SET.

1. Install PCM (2) to bracket (1) with 4 bolts (3).

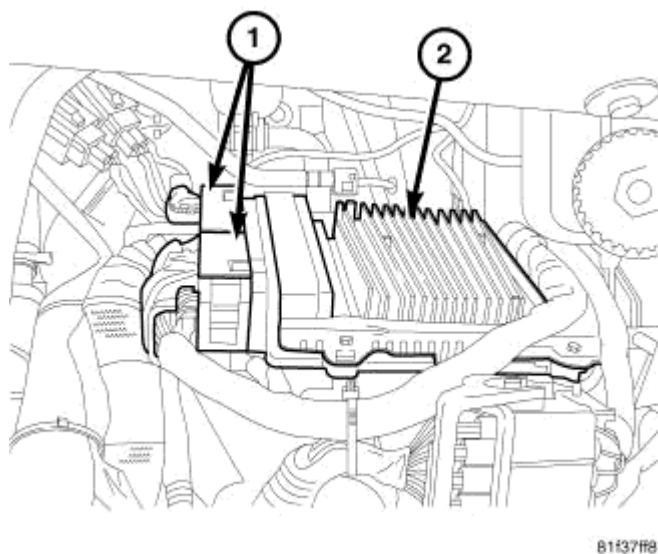


Fig. 46: GPEC Controller

Courtesy of CHRYSLER LLC

- | |
|----------------|
| 1 - Connectors |
| 2 - PCM |

2. Install and lock the 2 electrical connectors (1) to the PCM (2).
3. Connect negative battery cable, tighten nut to 5 N.m (45 in. lbs.).
4. Use the scan tool to reprogram new PCM with vehicles original Identification Number (VIN) and original vehicle mileage.

MODULE, STEERING COLUMN

DESCRIPTION

DESCRIPTION

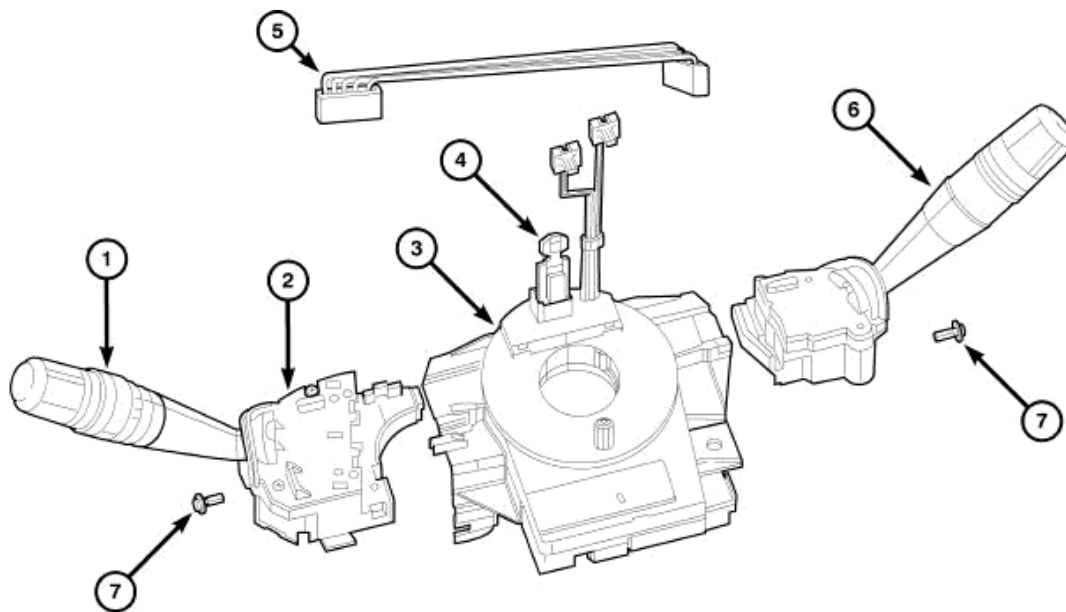


Fig. 47: Steering Control Module

Courtesy of CHRYSLER LLC

This vehicle is equipped with a Steering Control Module (SCM) that is internal to the left multi-function switch housing (2). The left (lighting) multi-function switch is located on the left side of the steering column, just below the steering wheel. This switch is the primary control for the interior and exterior lighting systems. The only visible components of the switch are the control stalk (1), control knob and control sleeve that extend through the steering column shrouds on the left side of the column. The remainder of the switch including its mounting provisions and electrical connections are concealed beneath the shrouds.

The switch housing and controls are constructed of molded black plastic. A single screw (7) through a mounting tab integral to the back of the switch housing, and a slide tab integral to the bottom of the switch housing secure

the switch to the mounting bracket integral to the clockspring (3). A connector receptacle containing seven terminal pins is integral to the inboard end of the switch housing and connects the SCM through a jumper wire harness (5) directly to the right (wiper) multi-function switch (6). A second connector receptacle containing four terminal pins is integral to the back of the switch housing and connects the SCM to the vehicle electrical system through a dedicated takeout and connector of the instrument panel wire harness.

The SCM cannot be adjusted or repaired. If ineffective or damaged the entire left multi-function switch must be replaced. Refer to **Electrical - Lamps and Lighting/Lamps/Lighting - Exterior/SWITCH, Multifunction - Removal** . The clockspring (with the multi-function switch mounting bracket), the left multi-function switch (with the SCM), the right multi-function switch and the jumper wire harness are each available for separate service replacement.

OPERATION

OPERATION

The Steering Control Module (SCM) communicates over the Local Interconnect Network (LIN) data bus with other electronic modules in the vehicle and/or a diagnostic scan tool. The horn switch circuits pass through the clockspring to the Cab Compartment Node (CCN) and the CCN sends a CAN message to the Totally Integrated Power Module (TIPM) to control the horn. The CCN stores Diagnostic Trouble Codes (DTC's) for the SCM. The right (wiper) multi-function switch has several inputs to the CCN.

The SCM is connected to a fused B(+) circuit and receives a path to ground at all times. These connections allow it to remain functional regardless of the ignition switch position. The driver airbag squib circuits of the clockspring, the horn, and the speed control switch circuits pass through the SCM, but the SCM does not monitor, and has no control outputs related to these circuits. Any other input to the SCM that would cause a vehicle system to function but does not require that the ignition switch be in the On position, such as turning on the lights or sounding the horn, prompts the SCM to wake up and transmit on the CAN data bus.

The most reliable, efficient, and accurate means to diagnose the SCM, the CAN data bus, the hard wired inputs or the electronic communication related to SCM operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic service information.

The integral SCM is not available for separate service replacement. If found inoperative or defective, the entire left (lighting) multi-function switch must be replaced. Refer to **Electrical - Lamps and Lighting/Lamps/Lighting - Exterior/SWITCH, Multifunction - Removal** .

DIAGNOSIS AND TESTING

STEERING CONTROL MODULE

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, airbag, seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. 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.

The hard wired circuits between components related to the Steering Control Module (SCM) may be diagnosed using conventional diagnostic tools and procedures. Refer to **SYSTEM WIRING DIAGRAMS** . 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 SCM or the electronic controls or communication between modules and other devices that provide some features of the SCM. The most reliable, efficient, and accurate means to diagnose the SCM or the electronic controls and communication related to SCM operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic service information.

RECEIVER, WIRELESS IGNITION NODE

DESCRIPTION

DESCRIPTION

This vehicle is equipped with a Wireless Ignition Node (WIN) (1). The WIN and the FOB with Integrated Key (FOBIK) are the primary components of the keyless ignition system. The only visible component of the WIN is the ignition switch (5) located on the face of the instrument panel just to the inboard side of the steering column.

The WIN housing is constructed of molded black plastic and it includes four integral mounting bosses (4), which are secured to the instrument panel structure with screws. Two connector receptacles are integral to the back of the switch housing. One (3) connects the WIN to the vehicle electrical system through a dedicated takeout and connector of the instrument panel wire harness. The other (2) is a dedicated connector for the coaxial cable input from the optional remote start system external antenna module.

The WIN is an integrated electronic receiver that replaces the ignition switch. It communicates with other electronic modules in the vehicle over the Controller Area Network (CAN) data bus.

The WIN interfaces with the Remote Keyless Entry (RKE) FOBIK and the Tire Pressure Monitor (TPM) sensors (if equipped) using Radio Frequency (RF) communication, with the Sentry Key Immobilizer System (SKIS) transponder within the FOBIK using Low Frequency (LF) communication. It also communicates with the TPM trigger transponders (if equipped) and steering column lock module (if equipped) using a Local Interface Network (LIN) data bus connection.

The WIN provides a switched 12-volt source through an isolated switch for the steering column lock module required for certain export market vehicles. It also contains a key removal inhibit solenoid, an electronic Brake Transmission Shift Interlock (BTSI) solenoid, a key-in warning contact and it serves as the real time vehicle clock by transmitting the clock information to other electronic modules over the CAN data bus.

The WIN cannot be adjusted or repaired, but is flash update capable. If ineffective or damaged, the entire WIN must be replaced. When replacing the WIN, you must also replace the steering column lock module (if

equipped).

OPERATION

OPERATION

Following are brief descriptions of the systems that the WIN controls.

IGNITION SWITCH

The Wireless Ignition Node (WIN) incorporates an integral ignition switch that consists of four rotary positions with three detent positions and one spring-loaded position. The one extreme clockwise position is a spring-loaded momentary contact "**START**" position. When released from the "**START**" position, the switch will automatically return to the detent "**ON**" position. The other position includes a detent "**ACCESSORY**" position and a detent "**LOCK**" position.

The WIN reads the position of the ignition switch and transmits the data via the CAN data bus. These positions include "**LOCK**" with ignition key-out, "**LOCK**" with ignition key-in, "**ACCESSORY**," "**RUN**," and "**START**."

SENTRY KEY IMMOBILIZER SYSTEM (SKIS)

Upon failure of proper Sentry Key Immobilizer (SKIS) communication to the Powertrain Control Module, (PCM), the PCM will not allow the vehicle to crank. The engine will not re-crank on the key cycle that the failure occurred, a full key down sequence must be performed for the engine to crank again. Refer to **Electrical - Vehicle Theft Security/Vehicle Theft Security - Operation** .

REMOTE KEYLESS ENTRY (RKE)

The Remote Keyless Entry (RKE), transmitter uses Radio Frequency (RF) signals to communicate with the WIN, and the WIN relays the RKE requests to other modules in the vehicle over the CAN data bus. Refer to **Electrical - Power Systems/Power Locks - Operation**

TIRE PRESSURE MONITORING (TPM)

The Tire Pressure Monitoring (TPM) system uses radio and sensor technology to monitor tire air pressure levels. Refer to **Tires and Wheels/Tire Pressure Monitoring - Operation** .

REMOTE START WITH/EXTENDED RANGE ANTENNA

Further information concerning the Remote Start System can be located in , Starting System. Refer to **Electrical - Engine Systems/Starting - Operation**

BRAKE TRANSMISSION SHIFTER INTERLOCK (BTSI)

The Brake Transmission Shifter/Ignition Interlock (BTSI) is controlled by the WIN. The BTSI prevents the transmission gear shifter from being moved out of PARK without a driver in place.

PARK SHIFT INTERLOCK

The key removal inhibit solenoid internal to the WIN prevents the FOB with Integrated KEY (FOBIK) from being rotated in the ignition switch to the LOCK position for all vehicles with an automatic transmission unless the transmission shift lever is in the PARK position. The WIN module monitors a hard wired input from a switch integral to the automatic transmission shifter module to control this feature. The key removal inhibit solenoid is electronically disabled internally by the WIN on vehicles with a manual transmission.

DIAGNOSIS AND TESTING

FOBIK TRAPPED IN WIN

For more information, Refer to **Electrical/Power Locks/TRANSMITTER, Integrated Key FOB - Diagnosis and Testing** .

REMOVAL

REMOVAL

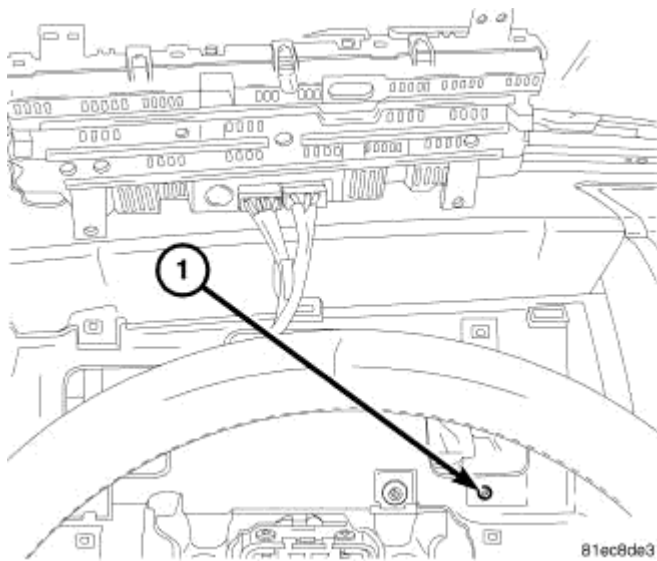


Fig. 48: Lower Instrument Panel Knee Blocker
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the lower instrument panel knee blocker. Refer to **Body/Instrument Panel/KNEEBLOCKER - Removal** .
3. Remove upper steering column shroud. Refer to **Steering/Column/SHROUD, Steering Column - Removal** .
4. Remove the instrument cluster bezel, reposition the instrument, and remove the upper WIN bracket attaching screw (1). Refer to **Electrical - Instrument Cluster/Instrument Cluster - Removal** .

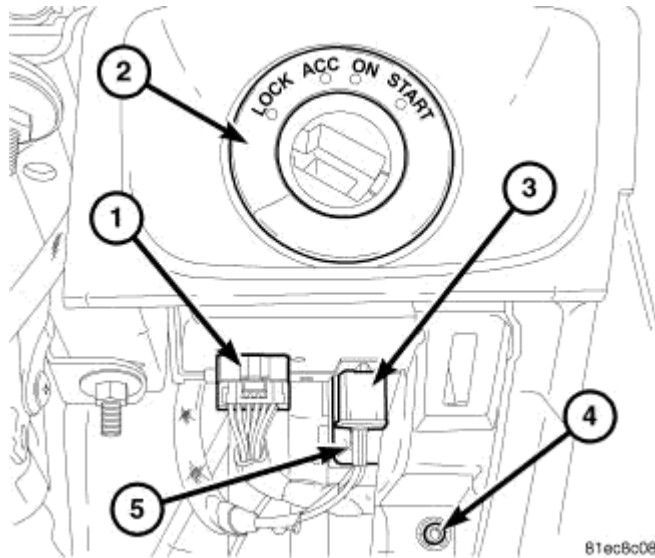


Fig. 49: WIN Electrical Connector And Antenna Connector
Courtesy of CHRYSLER LLC

5. Disconnect the WIN electrical connector (1) and the antenna connector (3) from the WIN.
6. Utilize a trim stick or equivalent and gently pry WIN trim ring (2) away from the instrument panel.
7. Remove the lower WIN attaching screw (5).
8. Remove the lower WIN bracket attaching screw (4).

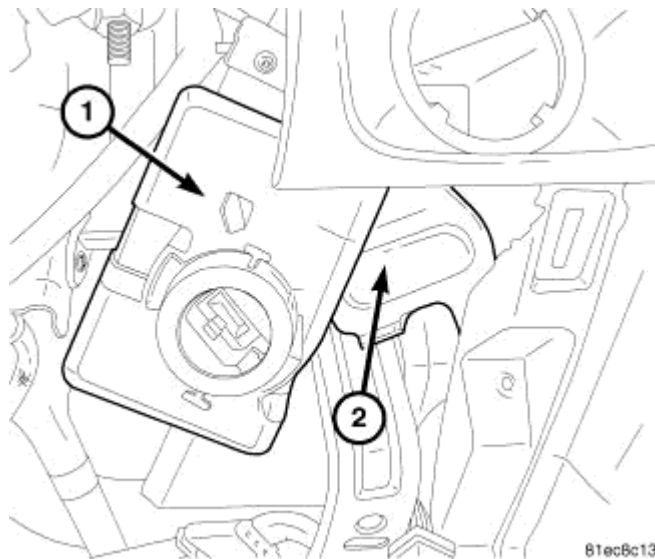


Fig. 50: Bracket-Wireless Ignition Node
Courtesy of CHRYSLER LLC

9. Rotate the WIN (1) and (2) bracket to assist in removal from the instrument panel.
10. Remove the WIN from the instrument panel opening.

INSTALLATION

INSTALLATION

NOTE: The WIN initialization procedure is required whenever the WIN or shaft lock module is replaced on vehicles equipped with the shaft lock module. Refer to Electrical - Vehicle Theft Security/Vehicle Theft Security - Standard Procedure.

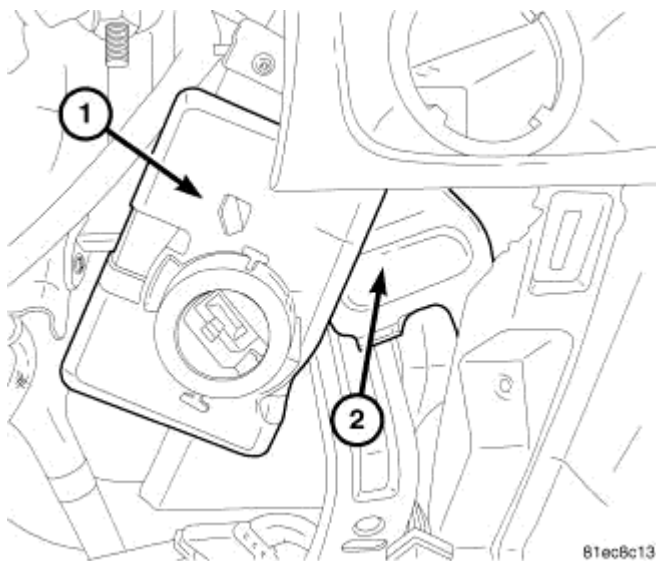


Fig. 51: Bracket-Wireless Ignition Node
Courtesy of CHRYSLER LLC

1. Rotate and position the WIN (1) and bracket (2) into the to instrument panel opening.

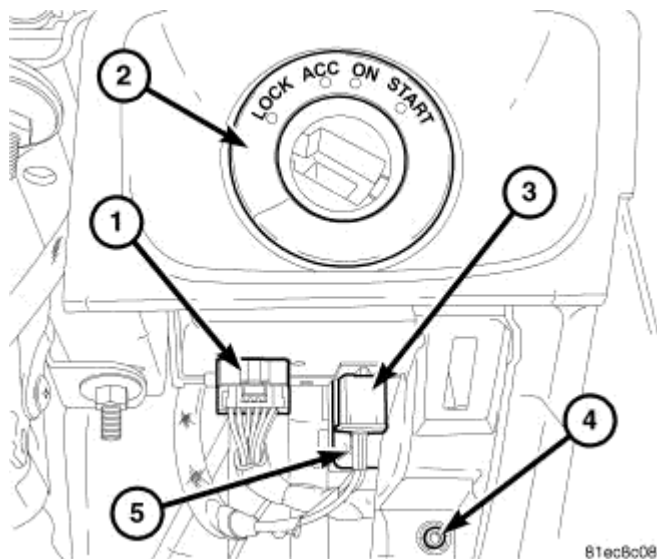


Fig. 52: WIN Electrical Connector And Antenna Connector
Courtesy of CHRYSLER LLC

2. Install the lower WIN bracket attaching screw (4).

3. Install the lower WIN attaching screw (5).
4. Connect the WIN electrical connector (1) and antenna connector (3) to the WIN.
5. Install the WIN trim ring (2).

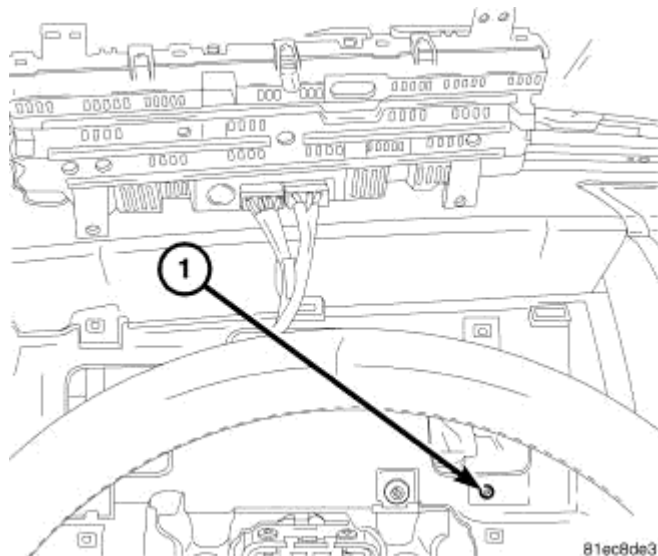


Fig. 53: Lower Instrument Panel Knee Blocker
 Courtesy of CHRYSLER LLC

6. Install the upper WIN bracket attaching screw (1) and reposition the instrument cluster into the instrument panel and install the instrument cluster bezel. Refer to **Electrical - Instrument Cluster/Instrument Cluster - Installation** .
7. Install upper steering column shroud. Refer to **Steering/Column/SHROUD, Steering Column - Installation** .
8. Install knee blocker. Refer to **Body/Instrument Panel/KNEEBLOCKER - Installation** .
9. Connect negative battery cable.
10. If necessary, program the WIN. See **Standard Procedure** .