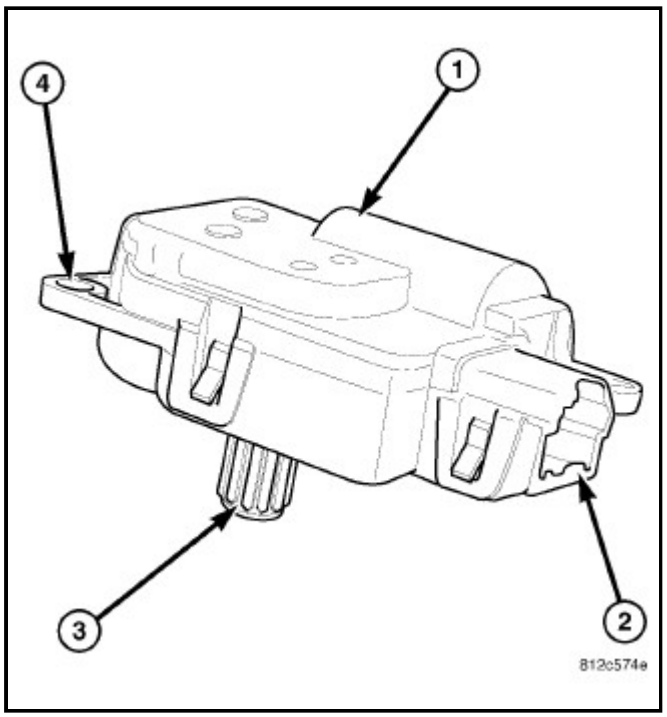
DESCRIPTION

The blend door actuators (1) for the front heating-A/C system are reversible, 12-volt direct current (DC) servo motors. Models with the front single zone heating-A/C system have a single blend-air door, which is controlled by a single blend door actuator. Models with the front dual zone heating-A/C system have dual blend-air doors, which are controlled by two blend door actuators.



The blend door actuator for the single zone heating-A/Csystem is located on the driver side front HVAC air distribution housing. For the dual zone heating-A/C system, the same blend door actuator used for the single zone system becomes the driver side blend door actuator, which is mechanically connected to only the driver side blend-air door. A second separate blend door actuator is also located on the passenger side of the front air distribution housing which is mechanically connected to only the passenger side blend-air door.

The blend door actuators are contained within a black molded plastic housing with an integral wire connector receptacle (2). An output shaft with splines (3) connect the blend door actuators to the blend door linkage. Three integral mounting tabs (4) allow the actuators to be secured to the air distribution housing. The blend door actuators do not require mechanical indexing to the blend door linkage, as they are electronically calibrated by the A/C-heater control.

The A/C-heater control must be recalibrated each time an actuator motor is replaced (Refer to 28 - DTC-Based Diagnostics/HVAC - Standard Procedure) .

The blend door actuators are interchangeable with the actuators for the recirculation and mode-air doors.

OPERATION

The blend door actuators are connected to the A/C-heater control through the vehicle electrical system by a dedicated two-wire lead and connector. The blend door actuator(s) can move the blend-air door(s) in two directions. When the A/C-heater control pulls the voltage on one side of the motor connection high and the other connection low, the blend-air door will move in one direction. When the A/C-heater control reverses the polarity of the voltage to the motor, the blend-air door moves in the opposite direction. When the A/C-heater control makes the voltage to both connections high or both connections low, the blend-air door stops and will not move.

The A/C-heater control uses a pulse-count positioning system to monitor the operation and relative position of the blend door actuator(s) and the blend-air door(s). The A/C-heater control learns the blend-air door stop positions during the calibration procedure and will store a diagnostic trouble code(DTC) for any problems it detects in the blend door actuator circuits.

The blend door actuators are diagnosed using a scan tool (Refer to 28 - DTC-Based Diagnostics/HVAC - Diagnosis and Testing) .

The blend door actuators cannot be adjusted or repaired and must be replaced if inoperative or damaged.

REMOVAL

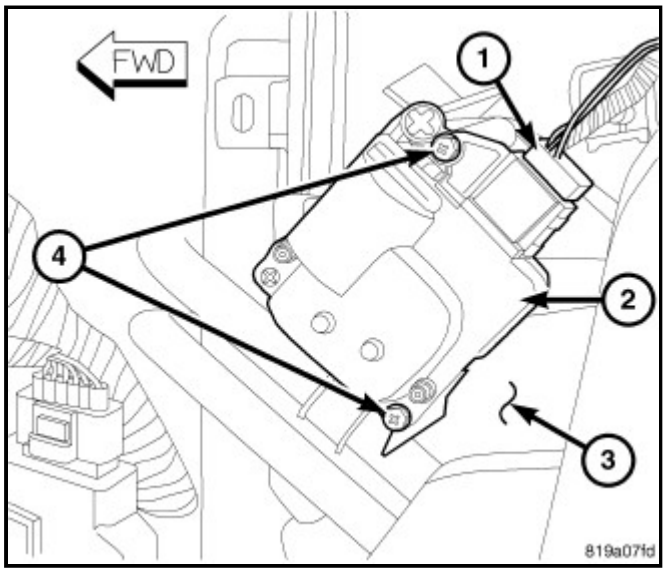
WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions may result in accidental airbag deployment and possible serious or fatal injury.

NOTE: The single zone heating-A/C system is equipped with a single blend door actuator. The dual zone system has two blend door actuators, one for the driver side blend-air door and one for the passenger side blend-air door.

NOTE: LHD model shown in illustrations. RHD model similar.

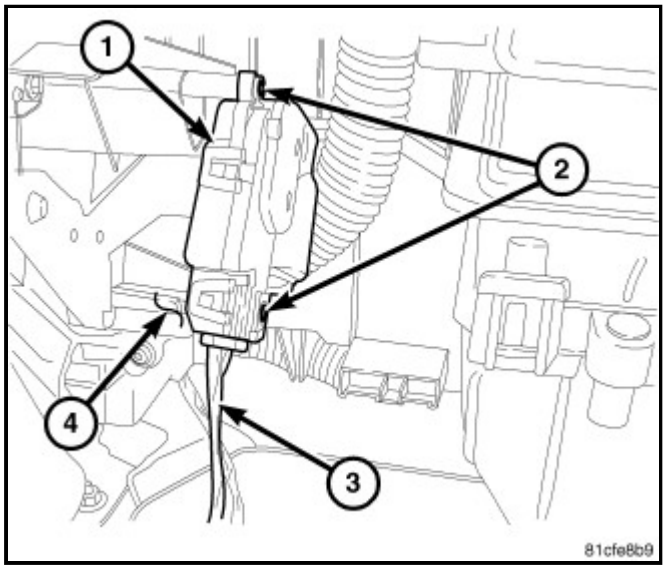
SINGLE ZONE/DUAL ZONE LEFT SIDE

1. Disconnect and isolate the negative battery cable.
2. On RHD models, if equipped, remove the silencer from underneath the passenger side of the instrument panel.
3. On RHD models, remove the glove box bin(Refer to 23 - Body/Instrument Panel/GLOVE BOX, Instrument Panel - Removal) .
4. Disconnect the wire harness connector (1) from the blend door actuator (2) located on the left side of the HVAC air distribution housing (3).
5. Remove the two screws (4) that secure the blend door actuator to the air distribution housing and remove the actuator.



DUAL ZONE RIGHT SIDE

1. Disconnect and isolate the negative battery cable.
2. On LHD models, if equipped, remove the silencer from underneath the passenger side of the instrument panel.
3. On LHD models, remove the glove box bin(Refer to 23 - Body/Instrument Panel/GLOVE BOX, Instrument Panel - Removal) .
4. Remove the front floor distribution duct from the right side of the air distribution housing (Refer to 24 - Heating and Air Conditioning/Distribution/DUCT, Floor Distribution - Installation) .
5. Remove the screws (2) that secure the blend door actuator (1) to the right side of the air distribution housing (4) and remove the actuator from the housing.
6. Disconnect the wire harness connector (3) from the blend door actuator and remove the actuator from the vehicle.



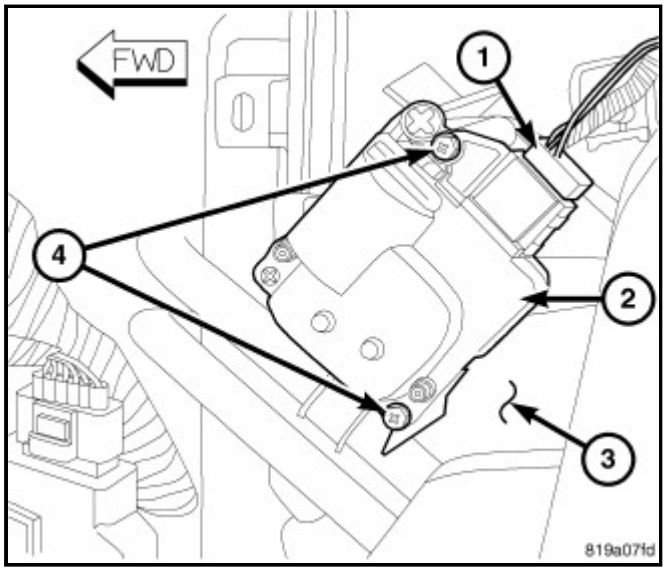
INSTALLATION

NOTE: The single zone heating-A/C system is equipped with a single blend door actuator. The dual zone system has two blend door actuators, one for the driver side blend-air door and one for the passenger side blend-air door.

NOTE: LHD model shown in illustrations. RHD model similar.

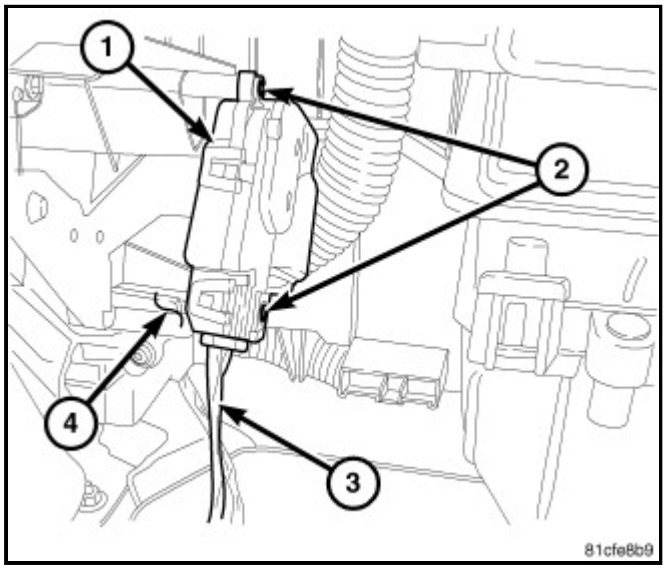
SINGLE ZONE/DUAL ZONE LEFT SIDE

1. Position the blend door actuator (2) onto the left side of the HVAC air distribution housing (3). If necessary, rotate the actuator slightly to align the splines on the actuator output shaft with those in the blend air door linkage.
2. Install the two screws (4) that secure the blend door actuator to the air distribution housing. Tighten the screws to 2 N·m (17 in. lbs.).
3. Connect the wire harness connector (1) to the blend door actuator.
4. On RHD models, install the glove box bin(Refer to 23 - Body/Instrument Panel/GLOVE BOX, Instrument Panel - Installation) .
5. On RHD models, if equipped, install the silencer underneath the instrument panel.
6. Reconnect the negative battery cable.
7. Initiate the Actuator Calibration function using a scan tool (Refer to 28 - DTC-Based Diagnostics/HVAC - Standard Procedure) .



DUAL ZONE RIGHT SIDE

1. Position the blend door actuator (1) to the right side of the HVAC air distribution housing (4) and connect the wire harness connector (3) to the actuator.
2. Install the blend door actuator onto the air distribution housing. If necessary, rotate the actuator slightly to align the splines on the actuator with the blend door linkage.
3. Install the two screws (2) that secure the blend door actuator to the air distribution housing. Tighten the screws to 1.2 N·m (10 in. lbs.).
4. Install the right front floor distribution duct onto the air distribution housing (Refer to 24 - Heating and Air Conditioning/Distribution/DUCT, Floor Distribution - Installation) .
5. On LHD models, install the glove box bin(Refer to 23 - Body/Instrument Panel/GLOVE BOX, Instrument Panel - Installation) .
6. On LHD models, if equipped, install the silencer underneath the instrument panel.
7. Reconnect the negative battery cable.
8. Initiate the Actuator Calibration function using a scan tool (Refer to 28 - DTC-Based Diagnostics/HVAC - Standard Procedure) .



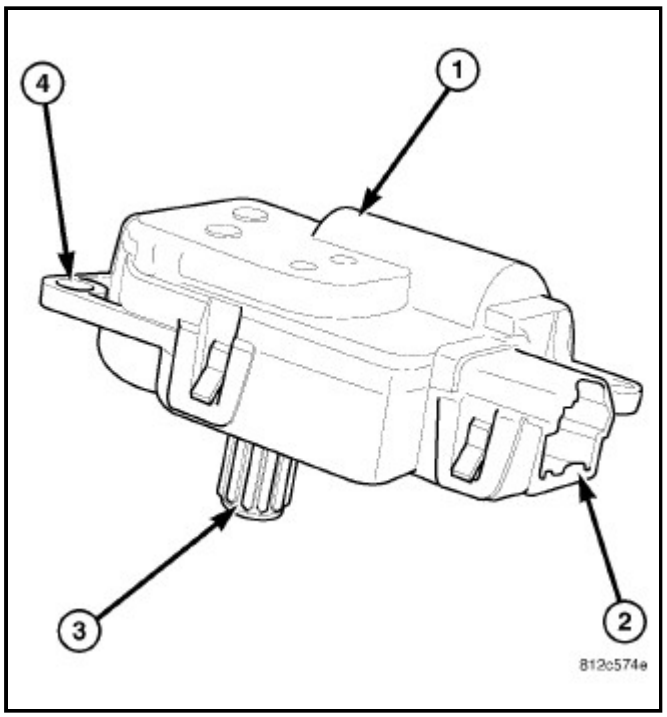
DESCRIPTION

The mode door actuator (1) for the heating-A/C system is a reversible, 12-volt Direct Current (DC) servo motor, which is mechanically connected to the mode-air doors. The mode door actuator is located on the right side of the HVAC air distribution housing.

The mode door actuator is contained within a black molded plastic housing with an integral wire connector receptacle (2). An output shaft with splines (3) connect it to mode door linkage and integral mounting tabs (4) allow the actuator to be secured to the air distribution housing. The mode door actuator does not require mechanical indexing to the mode-air doors, as it is electronically calibrated by the A/C-heater control.

The A/C-heater control must be recalibrated each time an actuator motor is replaced (Refer to 28 - DTC-Based Diagnostics/HVAC - Standard Procedure) .

The mode door actuator is interchangeable with the actuators for the recirculation and blend-air doors.



OPERATION

The mode door actuator is connected to the A/C-heater control through the vehicle electrical system by a dedicated two-wire lead and connector of the instrument panel wire harness. The mode door actuator can move the mode-air door in two directions. When the A/C-heater control pulls the voltage on one side of the motor connection high and the other connection low, the mode-air door will move in one direction. When the A/C-heater control reverses the polarity of the voltage to the motor, the mode-air door moves in the opposite direction. Once the A/C-heater control makes the voltage to both connections high or both connections low, the mode-air door stops and will not move.

The A/C-heater control uses a pulse-count positioning system to monitor the operation and relative position of the mode door actuator and the mode-air door. The A/C-heater control learns the mode-air door stop positions during the calibration procedure and will store a diagnostic trouble code (DTC) for any problems it detects in the mode door actuator circuits (Refer to 28 - DTC-Based Diagnostics/HVAC - Diagnosis and Testing) .

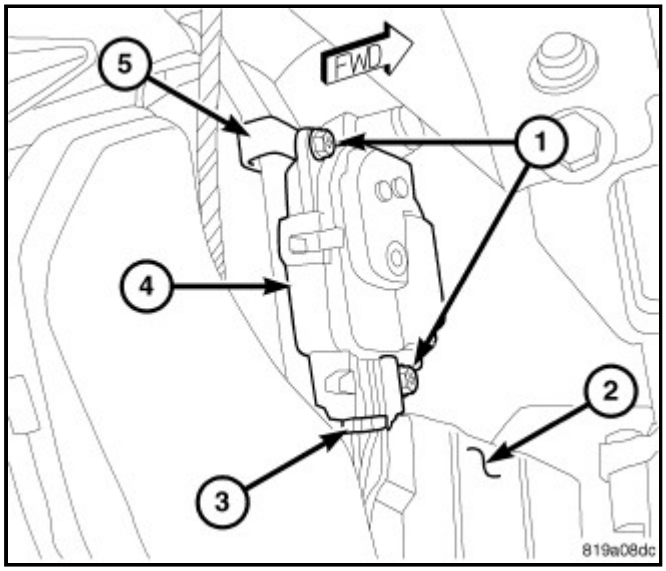
The mode door actuator cannot be adjusted or repaired and it must be replaced if inoperative or damaged.

REMOVAL

WARNING: Disable the airbag system before attempting any steering wheel, steering column or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to follow these instructions may result in accidental airbag deployment and possible serious or fatal injury.

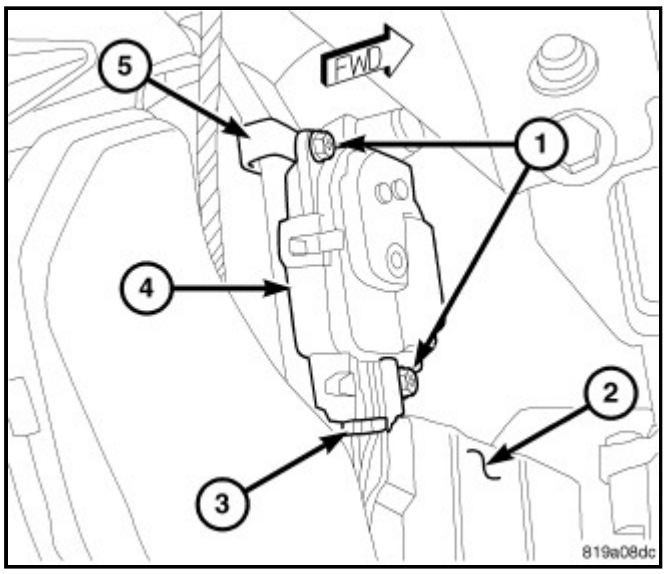
NOTE: LHD model shown. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. Remove the glove box bin(Refer to 23 - Body/Instrument Panel/GLOVE BOX, Instrument Panel - Removal) .
3. Remove the screws (1) that secure the mode door actuator (4) to the bracket (5) located on the right side of the HVAC air distribution housing (2).
4. Disconnect the wire harness connector (3) from the mode door actuator and remove the actuator.



INSTALLATION

1. Position the mode door actuator (4) onto the bracket (5) located on the right side of the HVAC air distribution housing (2). If necessary, rotate the actuator slightly to align the splines on the actuator output shaft with those in the mode air door linkage.
2. Install the screws (1) that secure the mode door actuator to the air distribution housing. Tighten the screws to 2 N·m (17 in. lbs.).
3. Connect the wire harness connector (3) to the mode door actuator.
4. Install the glove box bin(Refer to 23 - Body/Instrument Panel/GLOVE BOX, Instrument Panel - Installation) .
5. Reconnect the negative battery cable.
6. Initiate the Actuator Calibration function using a scan tool (Refer to 28 - DTC-Based Diagnostics/HVAC - Standard Procedure) .



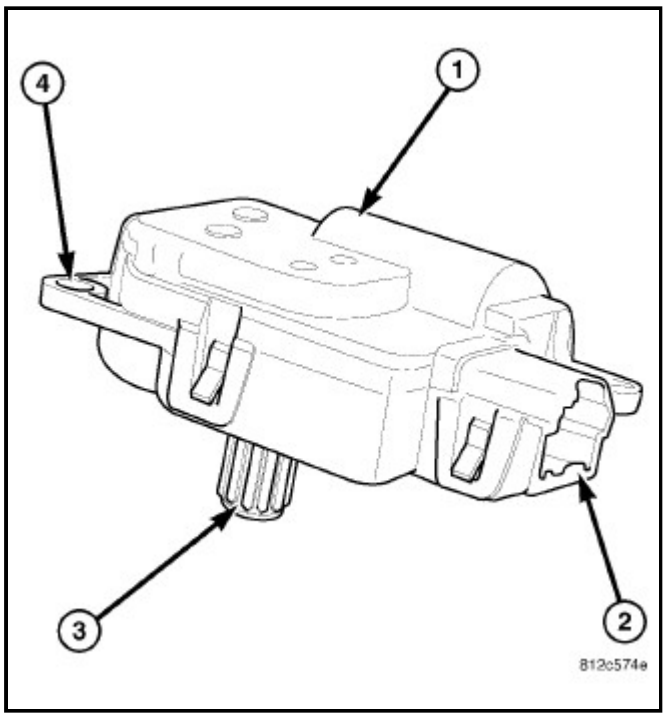
DESCRIPTION

The recirculation door actuator (1) is a reversible, 12 volt direct current (DC) servo motor, which is connected directly to the pivot shaft lever of the recirculation-air door. The recirculation door actuator is located on the right side of the HVAC air inlet housing.

The recirculation door actuator is contained within a black molded plastic housing with an integral wire connector receptacle (2), an output shaft with splines (3) connect it to the recirculation door and three integral mounting tabs (4) allow the actuator to be secured to the air inlet housing. The recirculation door actuator does not require mechanical indexing to the recirculation-air door, as it is electronically calibrated by the A/C-heater control.

The A/C-heater control must be recalibrated each time an actuator motor is replaced (Refer to 28 - DTC-Based Diagnostics/HVAC - Standard Procedure) .

The recirculation door actuator is interchangeable with the actuators for the blend and mode-air doors.



OPERATION

The recirculation door actuator is connected to the A/C-heater control through the vehicle electrical system by a dedicated two-wire lead and connector of the instrument panel wire harness. The recirculation door actuator can move the recirculation-air door in two directions. When the A/C-heater control pulls the voltage on one side of the motor connection high and the other connection low, the recirculation-air door will move in one direction. When the A/C-heater control reverses the polarity of the voltage to the motor, the recirculation-air door moves in the opposite direction. Once the A/C-heater control makes the voltage to both connections high or both connections low, the recirculation-air door stops and will not move.

The A/C-heater control uses a pulse-count positioning system to monitor the operation and relative position of the recirculation door actuator and the recirculation-air door. The A/C-heater control learns the recirculation-air door stop positions during the calibration procedure and will store a diagnostic trouble code (DTC) for any problems it detects in the recirculation door actuator circuits (Refer to 28 - DTC-Based Diagnostics/HVAC - Diagnosis and Testing) .

The recirculation door actuator cannot be adjusted or repaired and it must be replaced if inoperative or damaged.

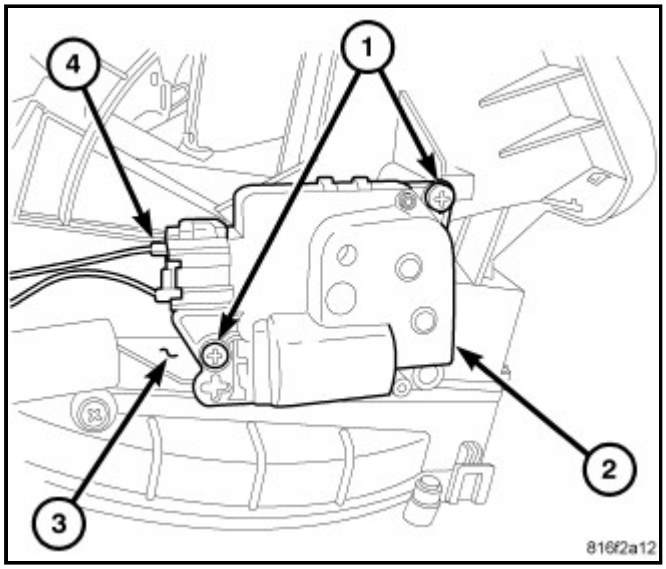
REMOVAL

WARNING: Disable the airbag system before attempting any steering wheel, steering column or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to follow these instructions may result in accidental airbag deployment and possible serious or fatal injury.

NOTE: Illustration shown with instrument panel removed for clarity.

NOTE: LHD model shown. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. Remove the glove box bin (Refer to 23 - Body/Instrument Panel/GLOVE BOX, Instrument Panel - Removal) .
3. Reach through the glove box opening in the instrument panel and remove the screws (1) that secure the recirculation door actuator (2) to the right side of the HVAC air inlet housing (3).
4. Disconnect the wire harness connector (4) from the recirculation door actuator and remove the actuator.

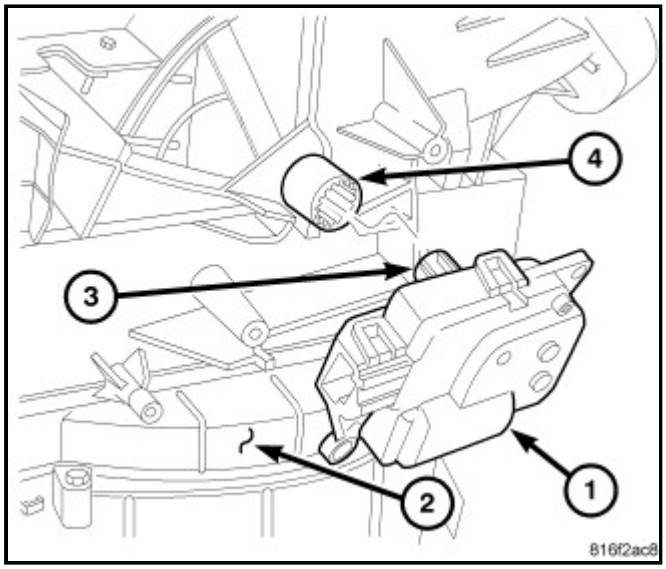


INSTALLATION

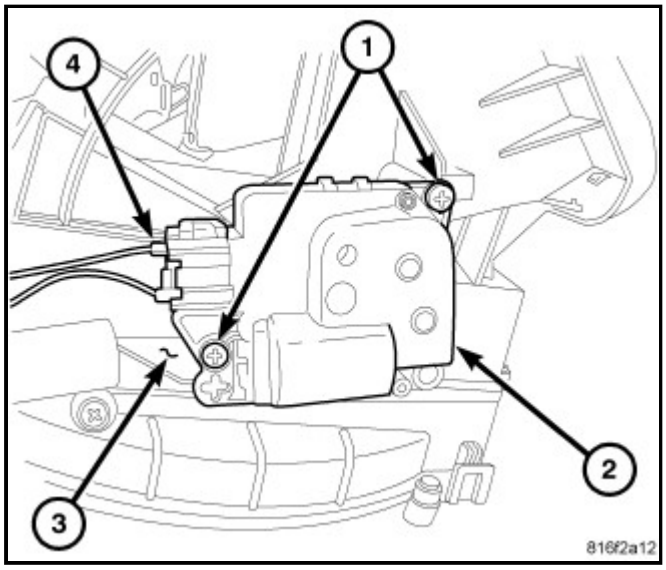
NOTE: Illustrations shown with instrument panel removed for clarity.

NOTE: LHD model shown. RHD model similar.

1. Position the recirculation door actuator (1) to the right side of the HVAC air inlet housing (2).
2. Install the recirculation door actuator onto the air inlet housing. If necessary, rotate the actuator slightly to align the splines on the actuator output shaft (3) with those on the recirculation door pivot shaft adapter (4).



3. Install the screws (1) that secure the recirculation door actuator (2) to the air inlet housing (3). Tighten the screws to 2 N·m (17 in. lbs.).
4. Connect the instrument panel wire harness connector (4) to the recirculation door actuator.
5. Install the glove box bin(Refer to 23 - Body/Instrument Panel/GLOVE BOX, Instrument Panel - Installation) .
6. Reconnect the negative battery cable.
7. Initiate the Actuator Calibration function using a scan tool (Refer to 28 - DTC-Based Diagnostics/HVAC - Standard Procedure) .



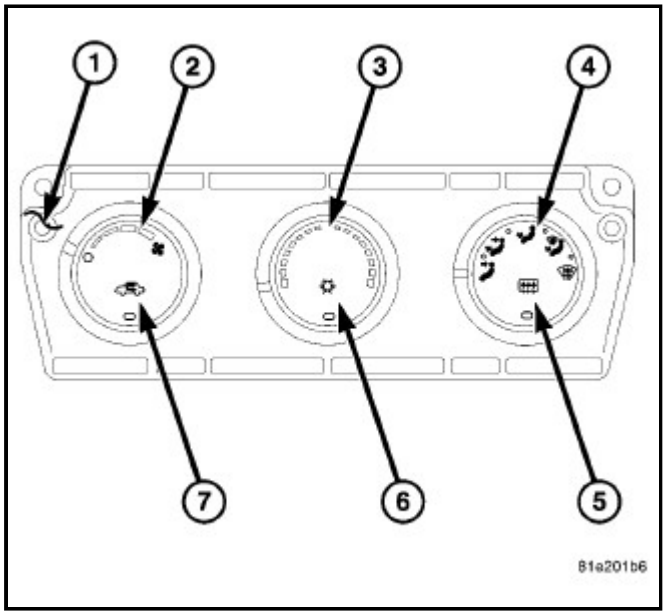
MANUAL TEMPERATURE CONTROL (MTC) SYSTEM

The A/C-heater control for the front only manual temperature control (MTC) single zone system allows one temperature setting for the entire vehicle. All controls are identified by ISO graphic symbols.

The heating-A/C system uses a dedicated miroprocessor to drive the electrically operated door actuators. This control provides the vehicle operator with a number of setting options to help control the climate and comfort within the vehicle.

The A/C-heater control (1) is located in the instrument panel and contains:

- a rotary control for blower motor speed selection and to turn the blower motor off (2).
- a rotary control for temperature control of the discharged air (3).
- a rotary control for mode control of the discharged air (4).
- a push-button control with indicator lamp to turn the rear window defogger system on and off (5).
- a push-button control with indicator lamp to turn the A/C system on and off (6).
- a push-button control with indicator lamp for recirculation control of the discharged air (7).



The A/C-heater control for the MTC heating and A/C system and is diagnosed using a scan tool (Refer to 28 - DTC-Based Diagnostics/HVAC - Diagnosis and Testing) .

Prior to replacing an A/C-heater control, check for any diagnostic trouble codes (DTCs) related to the heating-A/C systems and run the calibration procedure to verify that the concern is not a system issue (Refer to 28 - DTC-Based Diagnostics/HVAC - Standard Procedure)

The A/C-heater control cannot be adjusted or repaired and must be replaced if inoperative or damaged.

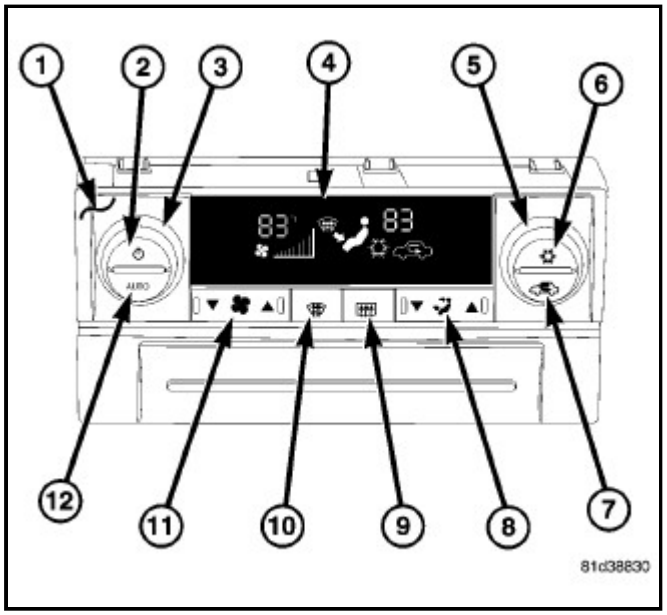
AUTOMATIC TEMPERATURE CONTROL (ATC) DUAL ZONE SYSTEM

The A/C-heater control for the automatic temperature control (ATC) dual zone front heating-A/C system allows both the driver and the front seat passenger the ability to individually regulate air temperature for their side of the vehicle. An infrared sensor located in the overhead console detects thermal radiation emitted by the front seat occupants and their surroundings. Based on the sensor input, the system automatically adjusts the air temperature, airflow volume, airflow distribution and amount of inside air recirculation to maintain front seat occupant comfort, even under changing outside weather conditions. All controls are identified by ISO graphic symbols.

The ATC dual zone heating-A/C system uses a dedicated miroprocessor to automatically drive the electrically operated door actuators. The ATC A/C-heater control obtains vehicle speed, engine speed, engine coolant temperature, ambient temperature and refrigerant system pressure. The ATC A/C-heater control communicates with other electrical modules in the vehicle over the CAN IHC bus.

This ATC system provides the vehicle operator with a number of setting options to help control the climate and comfort within the vehicle and offers several manual override features such as fan speed, airflow distribution, defrost mode and when the outside air contains smoke, odors or high humidity, the interior air can be manually recirculated.

The ATC dual zone A/C-heater control (1) is located in the instrument panel and contains:



- a push button on/off control which allows the heating-A/C system to be completely turned off (2). The vacuum-flourescent (VF) digital display (4) is blank when the heater-A/C system is off.
- two rotary temperature controls to select both driver and front seat passenger comfort temperatures from 15° to 29° C (60° to 85° F) (3 and 5). Comfort temperatures for each zone are shown in the VF digital display. If the set temperatures are 15° C (60° F) and is adjusted lower, the A/C-heater control will attempt to achieve the lowest temperature possible, but the display will show LO. If the set temperatures are 29° C (85° F) and is adjusted up, the A/C-heater control will attempt to achieve the highest temperature possible, but the display will show HIGH. Temperatures can be displayed in either Metric or Fahrenheit.
- a push button A/C on/off control (6). An ISO Snowflake symbol appears in the VF digital display when the A/C system is in operation, whether under manual or Auto mode.
- a push button air recirculation control to set the heating-A/C system to Recirculation mode (7). An ISO Recirculation symbol appears in the VF digital display when Recirculation mode is selected and when the system exceeds 80 percent circulated air under Auto mode (due to high A/C demand).
- a rocker switch mode control that can override the Auto mode (8). An ISO mode symbol appears in the VF digital display to indicate the current mode setting when selected manually or by Auto mode.
- a push button rear window defogger on/off control (9). An indicator lamp illuminates in the control when selected. The indicator lamp illuminates in the control even with the heating-A/C system turned off.
- a push button front window defogger control (10). An indicator lamp illuminates in the control when selected manually and an ISO symbol appears in the VF digital display when selected by Auto mode.
- a rocker switch fan speed control that can override the Auto mode (11). A bar graph is shown in the VF digital display to indicate the selected or determined front fan speed (depending on manual or Auto mode).
- a push button automatic mode control to set the heating-A/C system to Auto mode (12). AUTO appears in the VF digital display when the system is in Auto mode.
- illumination lamps for backlighting of the control.
- computer logic that remembers the settings of the controls when the ignition is turned off and retains those settings after a restart. If the system is off when the ignition is turnedoff it will be off when the engine is restarted, etc.
- computer logic that provides variable air recirculation under high temperature and humidity conditions. Because recirculation is generally accompanied by increased fan noise, the proportion of recirculated to outside air gradually approaches full recirculation over a broad temperature range.

The front A/C-heater control utilizes integrated circuitry and information carried on the controller area network (CAN) IHS bus to monitor many sensors and switch inputs throughout the vehicle. In response to those inputs, the internal circuitry and programming of the A/C-heater control allows it to control the electronic functions and features of the ATC heating-A/C system.

The inputs received by the A/C-heater control of the ATC heating-A/C system are as follows:

- Refrigerant Pressure

- Evaporator Temperature
- Engine Coolant Temperature
- Ambient Air Temperature
- Infrared Temperature Sensor
- Vehicle Speed

The messages broadcasted by the A/C-heater control of the ATC heating-A/C system are as follows:

- A/C Request
- A/C Select
- Rear Window Defogger (EBL) Request

The A/C-heater control for the ATC heating and A/C system is diagnosed using a scan tool(Refer to 28 - DTC-Based Diagnostics/HVAC - Diagnosis and Testing) .

Prior to replacing an A/C-heater control, check for any diagnostic trouble codes (DTCs) related to the heating-A/C systems and run the calibration procedure to verify that the concern is not a system issue (Refer to 28 - DTC-Based Diagnostics/HVAC - Standard Procedure) .

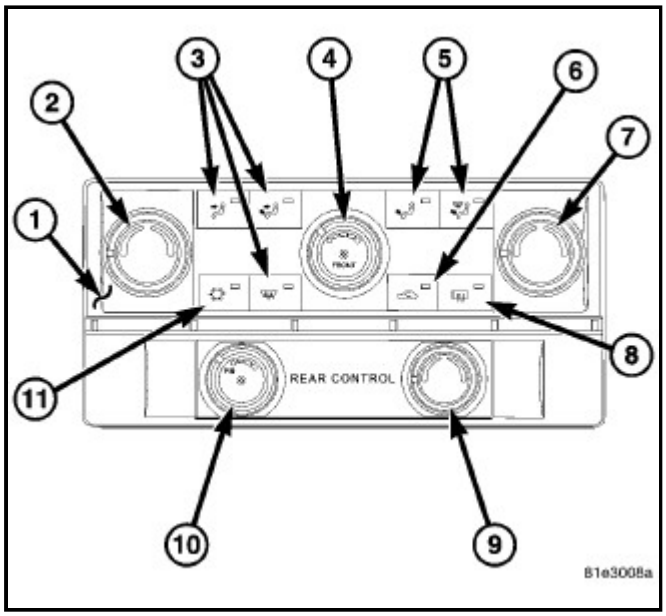
The A/C-heater control cannot be adjusted or repaired and must be replaced if inoperative or damaged. The illumination lamps can be serviced separately.

MANUAL TEMPERATURE CONTROL (MTC) TRI ZONE

The A/C-heater controls for the manual temperature control (MTC) tri-zone heating-A/C system allows the driver and front seat passenger and the intermediate seat passengers the ability to individually regulate air temperature as well as fan speed for their portion of the vehicle. Primary controls for the rear are located on the front A/C-heater control panel. All controls are identified by ISO graphic symbols.

FRONT CONTROL PANEL

The front manual dual zone A/C-heater control and integral computer (1) is located in the instrument panel and contains:



- three rotary temperature controls (2, 7 and 9) to select the separate temperatures for both of the front comfort zones and the rear comfort zone
- five push button mode controls (3 and 5) to select the position of the discharged air for the driver and front passenger comfort zones. An indicator lamp illuminates in each of the controls when selected.
- a rotary control knob for front fan speed selection and turning the heater-A/C system off (4).
- a push button air recirculation control (6). An indicator lamp illuminates in the control when selected.
- a push button rear window defogger on/off control (8). An indicator lamp illuminates in the control when selected. The rear window defogger system operates and the indicator lamp illuminates in the control even when the heating-A/C system is turned off.
- a rotary control knob for rear fan speed selection and turning the rear heater-A/C system off (10). This control has a position for locking out the rear heater-A/C controls, allowing only the driver and front seat passenger control of the rear heating-A/C system.
- a push button A/C on/off control (11). An indicator lamp illuminates in the control when the A/C system is in operation.
- computer logic that remembers the settings of the controls when the ignition is turned off and retains those settings after a restart. If the system is off when the ignition is turned off it will be off when the engine is restarted, etc.

The front A/C-heater control utilizes integrated circuitry and information carried on the controller area network (CAN) IHS bus to monitor many sensors and switch inputs throughout the vehicle. In response to those inputs, the internal circuitry and programming of the A/C-heater control allows it to control the electronic functions and features of the MTC heating-A/C system.

The front A/C-heater control is diagnosed using a scan tool (Refer to 28 - DTC-Based Diagnostics/HVAC - Diagnosis and Testing) .

Prior to replacing an A/C-heater control, check for any diagnostic trouble codes(DTCs) related to the heating-A/C systems and run the calibration procedure to verify that the concern is not a system issue (Refer to 28 - DTC-Based Diagnostics/HVAC - Standard Procedure) .

The front A/C-heater control cannot be repaired and must be replaced if inoperative or damaged.

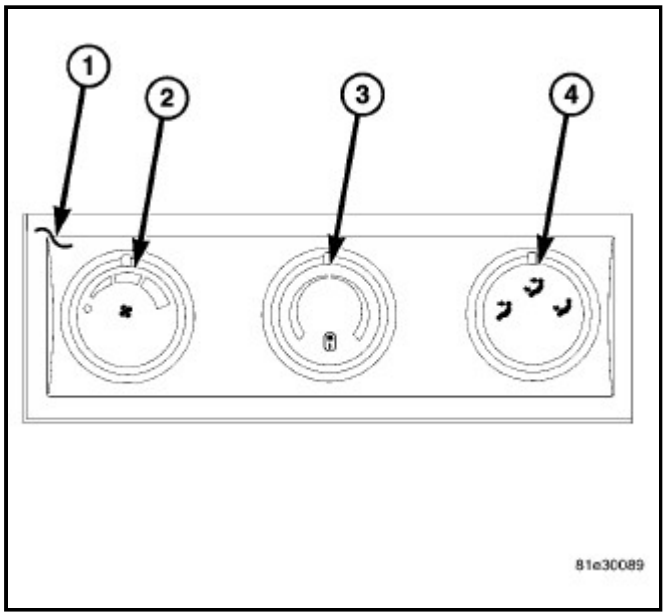
REAR CONTROL PANEL

The rear MTC A/C-heater control is located in the headliner and allows intermediate seat passengers to adjust rear air distribution, temperature and blower motor speed when the rear heating-A/C system primary on/off control in the front A/C-heater control in the instrument panel is set to the on position and the rear heater-A/C controls are NOT locked out by the driver or front seat passenger.

The rear A/C-heater control (1) contains:

- a rotary control knob for fan speed selection and turning the rear heating-A/C system on and off (2).
- a rotary control knob for temperature control of the rear discharged air (3). An indicator lamp illuminates in the control when the rear heater-A/C controls are locked out by the driver or front seat passenger.

- a rotary control knob for mode control of the rear discharged air (4).



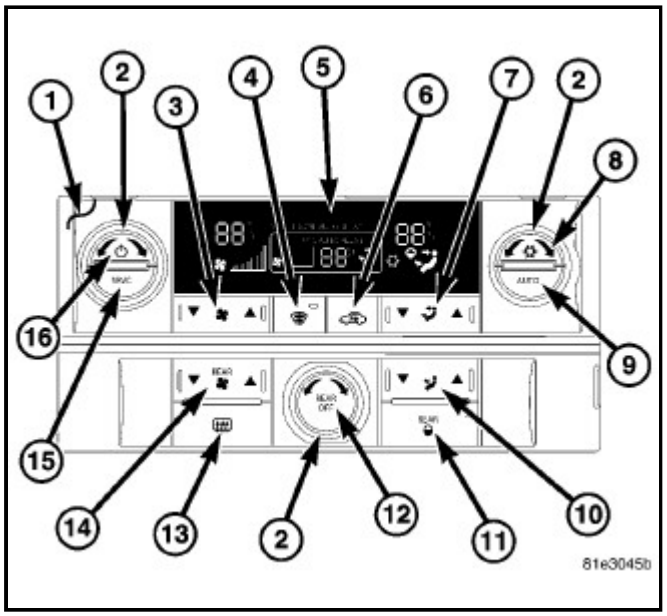
The rear A/C-heater control is a slave potentiometer to the front A/C-heater control and cannot be repaired and must be replaced if inoperative or damaged.

AUTOMATIC TEMPERATURE CONTROL (ATC) TRI ZONE

The A/C-heater controls for the Automatic Temperature Control (ATC) tri-zone heating-A/C system allows the driver, font seat passenger and the intermediate seat passengers the ability to individually regulate the air temperature for their portion of the vehicle automatically. Primary controls for the rear are located on the front A/C-heater control panel. All controls are identified by ISO graphic symbols.

FRONT CONTROL PANEL

The front A/C-heater control (1) and integral computer is located in the instrument panel and contains:



- three rotary temperature controls (2) to select both of the front and the rear comfort temperatures from 15° to 29° C (60° to 85° F). Comfort temperatures for each zone are shown in the Vacuum-Flourescent (VF) digital display (5). If the set temperatures are 15° C (60° F) and is adjusted lower, the A/C-heater control will attempt to achieve the lowest temperature possible, but the display will show LO. If the set temperatures are 29° C (85° F) and is adjusted up, the A/C-heater control will attempt to achieve the highest temperature possible, but the display will show HIGH. Temperatures can be displayed in either Metric or Fahrenheit, which is selected from the overhead console.
- a rocker switch front fan speed control (3) that can override the Auto mode. A bar graph is shown in the VF digital display to indicate the selected or determined front fan speed (depending on manual or Auto mode).
- a push button front window defogger control (4). An indicator lamp illuminates in the control when selected manually and an ISO symbol appears in the VF digital display when selected by Auto mode.
- a push button air recirculation control (6). An indicator lamp illuminates in the control when selected manually and an ISO Recirculation symbol appears in the VF digital display when the system exceeds 80 percent circulated air under Auto mode due to high A/C demand.
- a rocker switch front mode control (7) that can override the Auto mode. An ISO mode symbol appears in the VF digital display to indicate the current mode setting when selected manually or by Auto mode.
- a push button A/C on/off control (8). An ISO Snowflake symbol appears in the VF digital display when the A/C system is in operation, whether under manual or Auto mode.
- a push button automatic mode control (9) to set the heating-A/C system to Auto mode. FRONT AUTO appears in the VF digital display when the system is in Auto mode.
- a rocker switch rear mode control (10) that can override the rear A/C-heater control and the Auto mode. An ISO mode symbol appears in the center portion of the VF display to show the current mode setting when selected manually or by Auto mode.
- a push button control that locks out the rear heater-A/C controls (11), allowing only the driver and front seat passenger control of the rear heating-A/C system. An indicator lamp illuminates in the control when selected.
- a push button on/off control (12) that turns the rear heating-A/C system completely off. The center portion of the VF display is blank when the rear heating-A/C system is off.
- a push button rear window defogger on/off control (13). An indicator lamp illuminates in the control when selected. The indicator lamp illuminates in the control even with the heating-A/C system turned off.
- a rocker switch rear fan speed control (14) that can override the rear A/C-heater control and the Auto mode. A bar graph is shown in the center portion of the VF digital display to indicate the selected or determined rear fan speed (depending on manual or Auto mode).
- a push button synchronize control (15) that synchronizes the temperature of all three of the comfort zones to the drivers selected temperature. SYNC appears in the VF digital display when the system is synchronized, whether under manual or Auto mode.
- a push button on/off control (16) which allows the heating-A/C system to be completely turned off. The display is blank when the heater-A/C system is off.
- illumination lamps for backlighting of the control.
- computer logic that remembers the settings of the controls when the ignition is turned off and retains those settings after a restart. If the system is off when the ignition is turned off it will be off when the engine is restarted, etc.
- computer logic that provides variable air recirculation under high temperature and humidity conditions. Because recirculation is generally accompanied by increased fan noise, the proportion of recirculated to outside air gradually approaches full recirculation over a broad temperature range.

The front A/C-heater control utilizes integrated circuitry and information carried on the Controller Area Network (CAN) IHS bus to monitor many sensors and switch inputs throughout the vehicle. In response to those inputs, the internal circuitry and programming of the A/C-heater control allows it to control the electronic functions and features of the ATC heating-A/C system.

The inputs received by the A/C-heater control of the ATC heating-A/C system are as follows:

- Refrigerant Pressure
- Evaporator Temperature
- Engine Coolant Temperature
- Ambient Air Temperature
- Infrared Temperature Sensor
- Vehicle Speed

The messages broadcast by the A/C-heater control of the ATC heating-A/C system are as follows:

- A/C Request
- A/C Select
- Rear Window Defogger (EBL) Request
- Heated Front Seat Requests

The front A/C-heater control is diagnosed using a scan tool (Refer to 28 - DTC-Based Diagnostics/HVAC - Diagnosis and Testing) .

Prior to replacing an A/C-heater control, check for any Diagnostic Trouble Codes (DTCs) related to the heating-A/C systems and run the calibration procedure to verify that the concern is not an system calibration issue (Refer to 28 - DTC-Based Diagnostics/HVAC - Standard Procedure) .

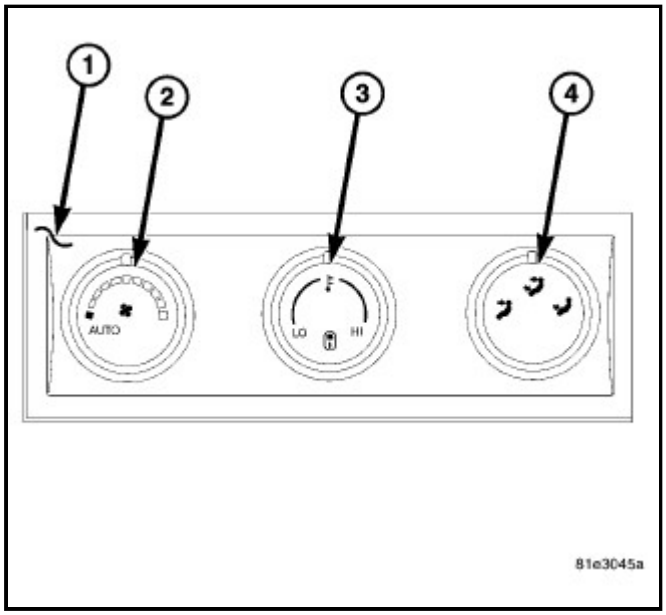
The front A/C-heater control cannot be repaired and must be replaced if inoperative or damaged.

REAR CONTROL PANEL

The rear A/C-heater control is located in the rear overhead console and allows intermediate seat passengers to adjust rear air distribution, temperature and blower motor speed when the rear heating-A/C system primary on/off control in the front A/C-heater control in the instrument panel is set to the on position and the rear heater-A/C controls are NOT locked out by the driver and front seat passenger.

The rear A/C-heater control (1) contains:

- a rotary control knob for fan speed selection and turning the rear heating-A/C system off or to Auto mode (2).
- a rotary control knob for temperature control of the rear discharged air (3). An indicator lamp illuminates in the control when the rear heater-A/C controls are locked out by the driver or front seat passenger.
- a rotary control knob for mode control of the rear discharged air (4).



The rear A/C-heater control is a slave potentiometer to the front A/C-heater control and cannot be repaired and must be replaced if inoperative or damaged.

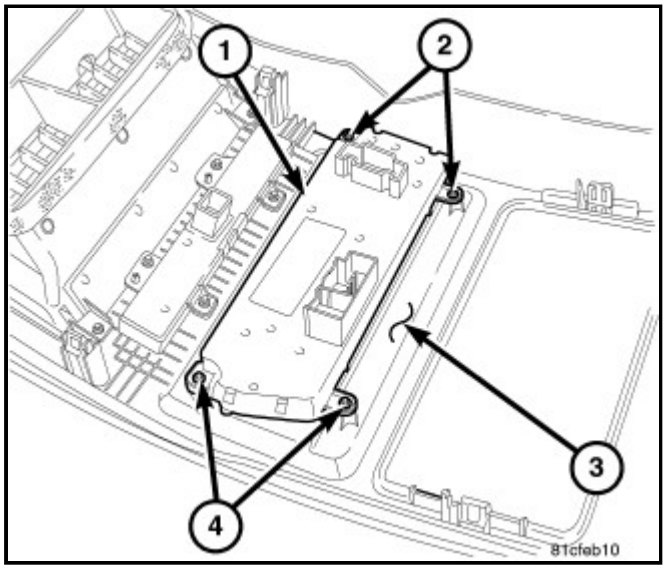
REMOVAL

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions may result in accidental airbag deployment and possible serious or fatal injury.

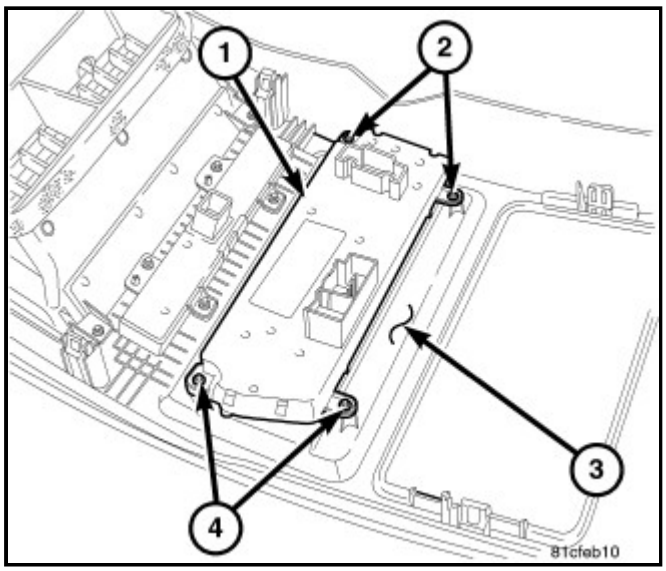
NOTE: Take the proper precautions to protect the front face of the instrument panel center bezel from cosmetic damage during this service procedure.

NOTE: MTC single zone A/C-heater control shown. Other A/C-heater controls similar.

1. Disconnect and isolate the negative battery cable.
2. Remove the center bezel (3) and place it on a workbench (Refer to 23 - Body/Instrument Panel/BEZEL, Instrument Panel - Removal) .
3. Remove the screws (2 and 4) that secure the A/C-heater control (1) to the back of the center bezel and remove the control.



INSTALLATION



NOTE: **MTC single zone A/C-heater control shown. Other A/C-heater controls similar.**

1. Position the A/C-heater control (1) onto the back of the center bezel (3).
2. Install the screws (2 and 4) that secure the A/C-heater control to the center bezel. Tighten the screws to 2 N·m (17 in. lbs.).
3. Install the center bezel (Refer to 23 - Body/Instrument Panel/BEZEL, Instrument Panel - Installation) .
4. Reconnect the negative battery cable.

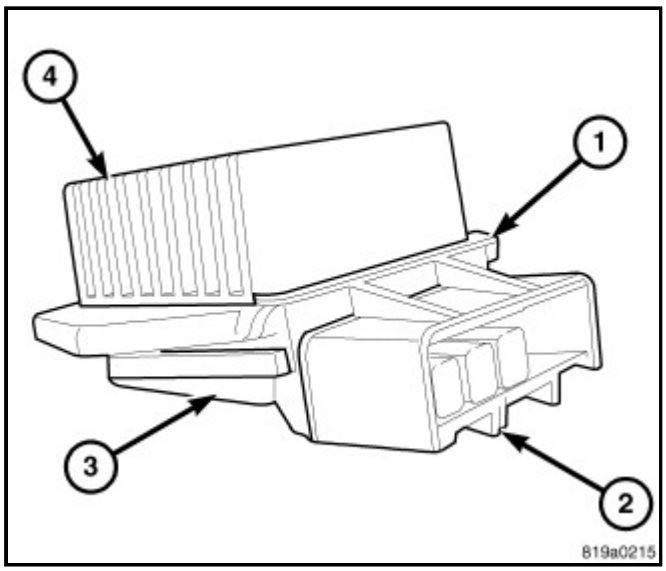
NOTE: **The A/C-heater control will automatically perform the Actuator Calibration function when the ignition is initially turned on when installing a new control or when reinstalling the original control. However, the Actuator Calibration function must be manually initiated using a scan tool if the A/C-heater control has been previously installed in another vehicle.**

5. If required, initiate the Actuator Calibration function using a scan tool (Refer to 28 - DTC-Based Diagnostics/HVAC - Standard Procedure) .

DESCRIPTION

A blower motor power module is used on this model when equipped with the automatic temperature control (ATC) heating-A/C system. Models equipped with the manual temperature control (MTC) heating-A/C system use a blower motor resistor, instead of the blower motor power module (Refer to 24 - Heating and Air Conditioning/Controls/RESISTOR, Blower Motor - Description) .

The blower motor power module is mounted to the bottom of the HVAC housing, on the passenger side of the vehicle. The blower motor power module consists of a molded plastic mounting plate (1) with an integral connector receptacle (2). Concealed behind the mounting plate is the power module electronic circuitry (3) and a finned aluminum heat sink (4). The blower motor power module is accessed for service from under the instrument panel.



OPERATION

The blower motor power module is connected to the vehicle electrical system through a dedicated lead and connector of the instrument panel wire harness. A second lead and connector of the instrument panel wire harness is connected to the blower motor. The blower motor power module allows the microprocessor-based automatic temperature control(ATC) A/C-heater control to calculate and provide infinitely variable blower motor speeds based upon either manual blower switch input or the ATC programming using a pulse width modulated (PWM) circuit strategy.

The PWM voltage is applied to a comparator circuit which compares the PWM signal voltage to the blower motor feedback voltage. The resulting output drives the power module circuitry, which provides a linear output voltage to change or maintain the desired blower speed.

The blower motor power module is diagnosed using a scan tool (Refer to 28 - DTC-Based Diagnostics/HVAC - Diagnosis and Testing) .

The blower motor power module cannot be adjusted or repaired must be replaced if inoperative or damaged.

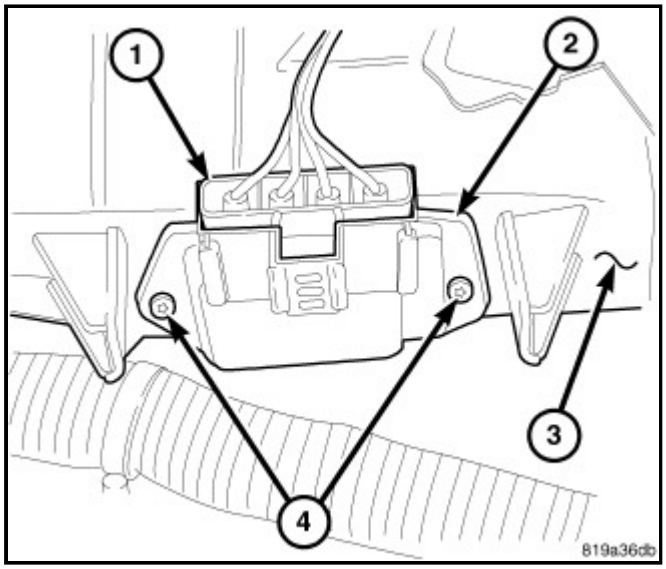
REMOVAL

WARNING: Disable the airbag system before attempting any steering wheel, steering column or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to follow these instructions may result in accidental airbag deployment and possible serious or fatal injury.

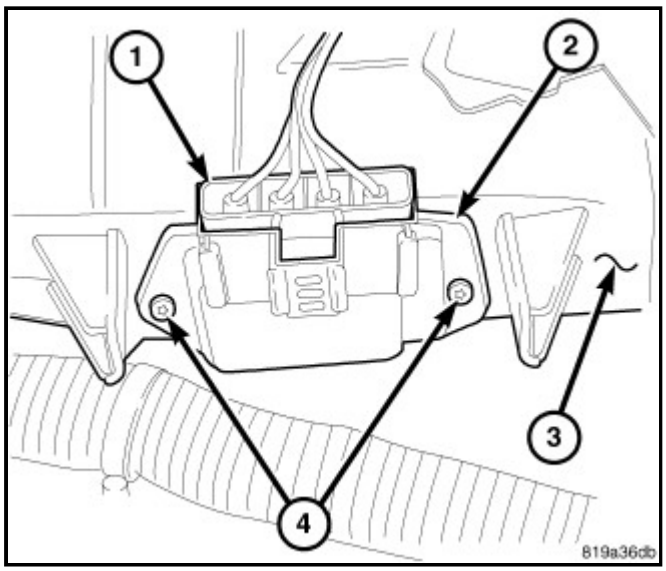
WARNING: The heat sink for the blower motor power module may get very hot during normal operation. If the blower motor was turned on prior to servicing the blower motor power module, wait five minutes to allow the heat sink to cool before performing diagnosis or service. Failure to take this precaution may result in possible serious injury.

NOTE: LHD model shown. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. Disconnect the wire harness connector (1) from the blower motor power module (2) located at the bottom of the HVAC housing (3) on the passenger side of the vehicle.
3. Remove the two screws (4) that secure the blower motor power module to the HVAC housing and remove the power module.



INSTALLATION



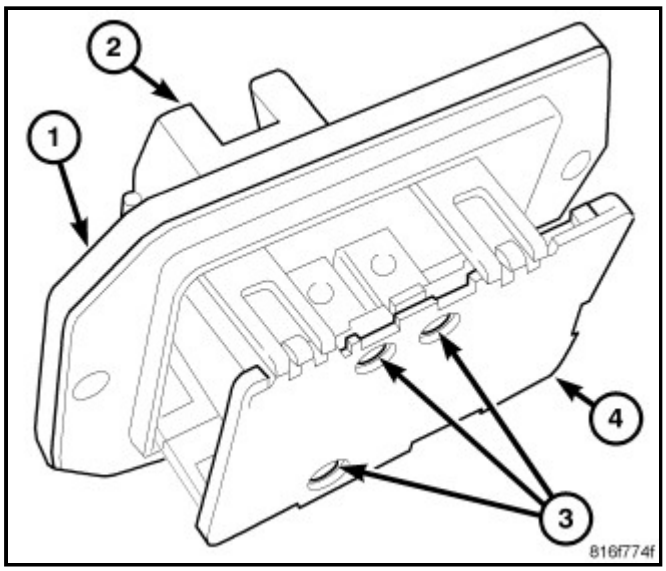
NOTE: LHD model shown. RHD model similar.

1. Position the blower motor power module (2) into the bottom of the HVAC housing (3).
2. Install the two screws (4) that secure the blower motor power module to the HVAC housing. Tighten the screws to 1.2 N·m (10 in. lbs.).
3. Connect the wire harness connector (1) to the blower motor power module.
4. Reconnect the negative battery cable.

DESCRIPTION

A blower motor resistor is used on vehicles equipped with the manual temperature control (MTC) heating-A/C system. Vehicles equipped with the automatic temperature control (ATC) heating-A/C system use a blower motor power module, instead of the blower motor resistor (Refer to 24 - Heating and Air Conditioning/Controls/MODULE, Power - Description) .

The blower motor resistor is mounted to the bottom of the HVAC housing, on the passenger side of the vehicle. The blower motor resistor consists of a molded plastic mounting plate (1) with an integral wire connector receptacle (2). Concealed behind the mounting plate are resistors (3) located between a two-piece stamped steel base (4). The blower motor resistor is accessed for service from under the instrument panel.



OPERATION

The blower motor resistor is connected to the vehicle electrical system through a dedicated take out and connector of the instrument panel wire harness. The blower motor resistor has three resistors, each of which will reduce the current flow through the blower motor to change the blower motor speed.

The blower motor control for the heating-A/C system directs the ground path for the blower motor through the correct resistor to obtain the selected speed. With the blower motor control in the lowest speed position, the ground path for the blower motor is applied through all of the resistors. Each higher speed selected with the blower motor control applies the blower motor ground path through fewer of the resistors, increasing the blower motor speed. When the blower motor control is in the highest speed position, the blower motor resistor is bypassed and the blower motor receives a direct path to ground.

The blower motor resistor cannot be adjusted or repaired and it must be replaced if inoperative or damaged.

BLOWER MOTOR RESISTOR

WARNING: Disable the airbag system before attempting any steering wheel, steering column or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to follow these instructions may result in accidental airbag deployment and possible serious or fatal injury.

NOTE: See Wiring Information for circuit descriptions and diagrams. Wiring Information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

1. Disconnect and isolate the negative battery cable.
2. Disconnect the wire harness connector from the blower motor resistor (Refer to 24 - Heating and Air Conditioning/Controls/RESISTOR, Blower Motor - Removal) .
3. Using an ohmmeter, check for continuity between all of the blower motor resistor terminals. In each case there should be continuity. If OK, repair the wire harness circuits between the blower motor speed control and the blower motor resistor or blower motor as required. If not OK, replace the inoperative blower motor resistor.

REMOVAL

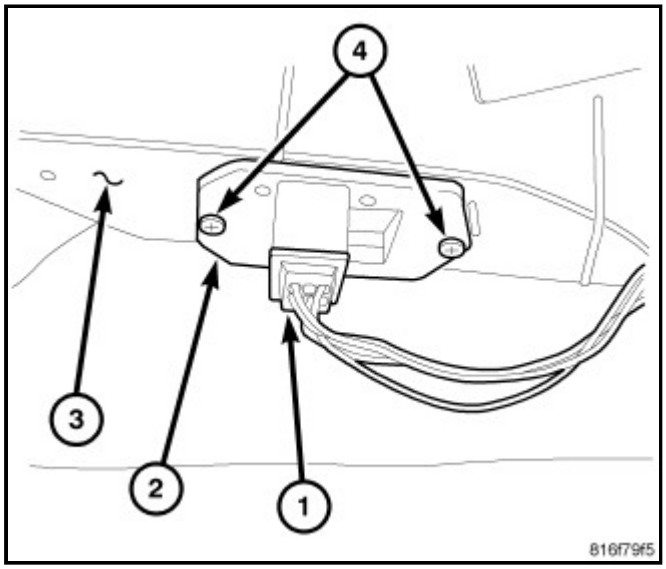
WARNING: Disable the airbag system before attempting any steering wheel, steering column or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to follow these instructions may result in accidental airbag deployment and possible serious or fatal injury.

WARNING: The blower motor resistor may get very hot during normal operation. If the blower motor was turned on prior to servicing the blower motor resistor, wait five minutes to allow the blower motor resistors to cool before performing diagnosis or service. Failure to take this precaution may result in possible injury.

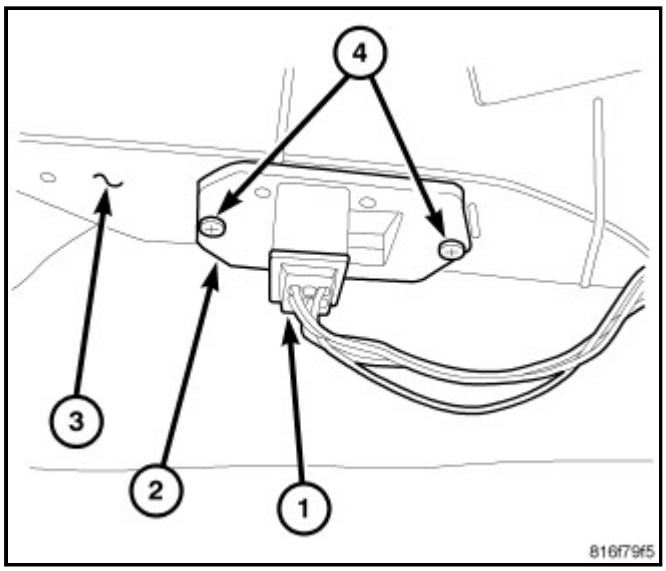
CAUTION: Do not operate the blower motor with the blower motor resistor removed from the circuit. Failure to take this precaution can result in vehicle damage.

NOTE: LHD model shown. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. Disconnect the wire harness connector (1) from the blower motor resistor (2) located at the bottom of the HVAC housing (3) on the passenger side of the vehicle.
3. Remove the two screws (4) that secure the blower motor resistor to the HVAC housing and remove the resistor.



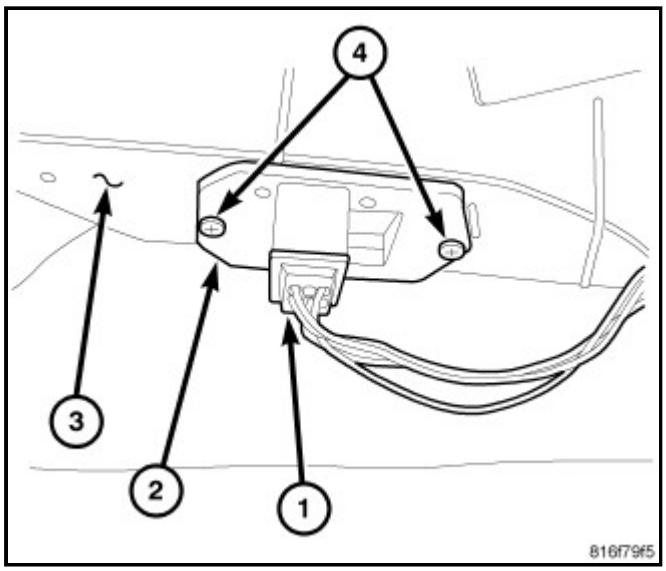
INSTALLATION



NOTE: LHD model shown. RHD model similar.

1. Position the blower motor resistor (2) onto the bottom of the HVAC housing (3).
2. Install the two screws (4) that secure the blower motor resistor to the HVAC housing. Tighten the screws to 1.2 N·m (10 in. lbs.).
3. Connect the wire harness connector (1) to the blower motor resistor.
4. Reconnect the negative battery cable.

INSTALLATION

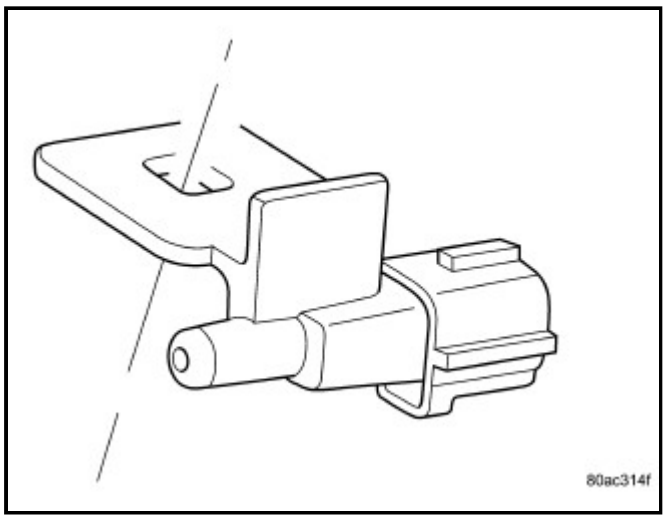


NOTE: LHD model shown. RHD model similar.

1. Position the blower motor resistor (2) onto the bottom of the HVAC housing (3).
2. Install the two screws (4) that secure the blower motor resistor to the HVAC housing. Tighten the screws to 1.2 N·m (10 in. lbs.).
3. Connect the wire harness connector (1) to the blower motor resistor.
4. Reconnect the negative battery cable.

DESCRIPTION

The ambient air temperature sensor is a variable resistor that monitors the air temperature outside of the vehicle. The ATC system uses the sensor data to maintain optimum cabin temperature levels. The ambient air temperature sensor is mounted inside the front fascia.



OPERATION

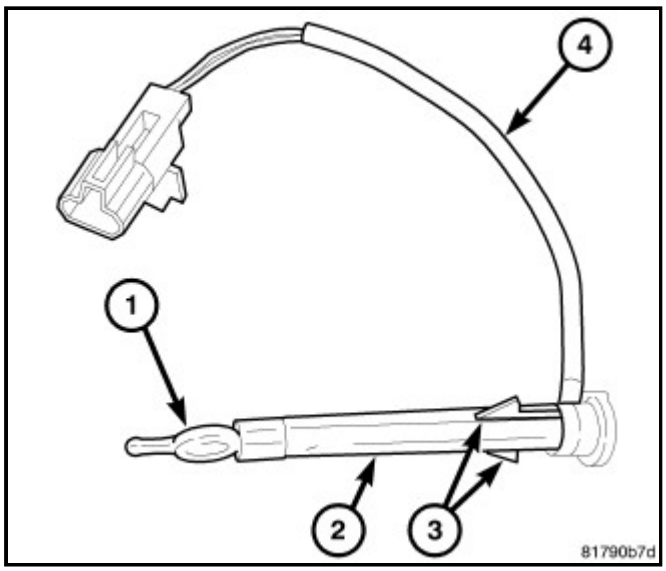
The ambient air temperature sensor is a variable resistor that operates on a 5-volt reference signal sent by the Totally Integrated Power Module (TIPM). The ambient air temperature sensor is connected to the TIPM through a two-wire lead and connector of the vehicle wire harness. The ambient air temperature sensor changes its internal resistance in response to changes in the outside air temperature, which either increases or decreases the reference signal voltage read by the TIPM. The TIPM converts and broadcasts the sensor data over the Controller Area Network (CAN) IHS bus, where it is read by the ATC A/C-heater control, Powertrain Control Module (PCM) and other vehicle control modules.

The ambient air temperature sensor is diagnosed using a scan tool (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Diagnosis and Testing).

The ambient air temperature sensor cannot be adjusted or repaired and must be replaced if inoperative or damaged.

DESCRIPTION

The evaporator temperature sensor measures the temperature of the conditioned air downstream of the A/C evaporator. The evaporator temperature sensor is an electrical thermistor (1) mounted on the end of a molded plastic housing (2) that is inserted into the driver side of the HVAC housing near the coldest point of the A/C evaporator. The evaporator temperature sensor is retained in the HVAC housing by two integral retaining tabs (3) and is connected to the vehicle electrical system by use of a wire lead and connector (4) with two terminals.



OPERATION

The evaporator temperature sensor monitors the surface temperature of A/C evaporator and supplies an input signal to the A/C-heater control. The A/C-heater control uses the evaporator temperature sensor input signal to optimize A/C system performance and to protect the A/C system from evaporator freezing. The evaporator temperature sensor will change its internal resistance in response to the temperatures it monitors and is connected to the A/C-heater control through sensor ground circuit and a 5-volt reference signal circuit. As the temperature of the A/C evaporator decreases, the internal resistance of the evaporator temperature sensor decreases.

The A/C-heater control uses the monitored voltage reading as an indication of evaporator temperature. The A/C-heater control is programmed to respond to this input by requesting the powertrain control module (PCM) or the engine control module (ECM) (depending on engine application) to adjust the compressor swash plate angle as necessary to optimize A/C system performance and to protect the A/C system from evaporator freezing (Refer to 24 - Heating and Air Conditioning/Plumbing/COMPRESSOR, A/C - Operation) .

The evaporator temperature sensor is diagnosed using a scan tool.

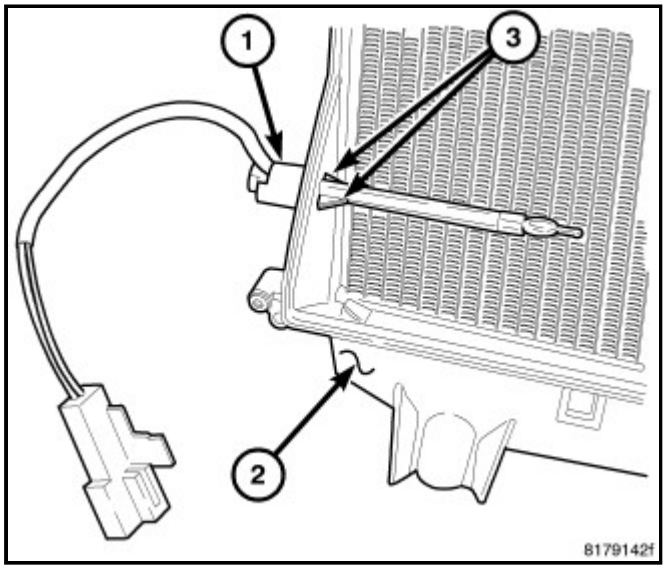
The evaporator temperature sensor cannot be adjusted or repaired and it must be replaced if inoperative or damaged.

REMOVAL

WARNING: Disable the airbag system before attempting any steering wheel, steering column or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to follow these instructions may result in accidental airbag deployment and possible serious or fatal injury.

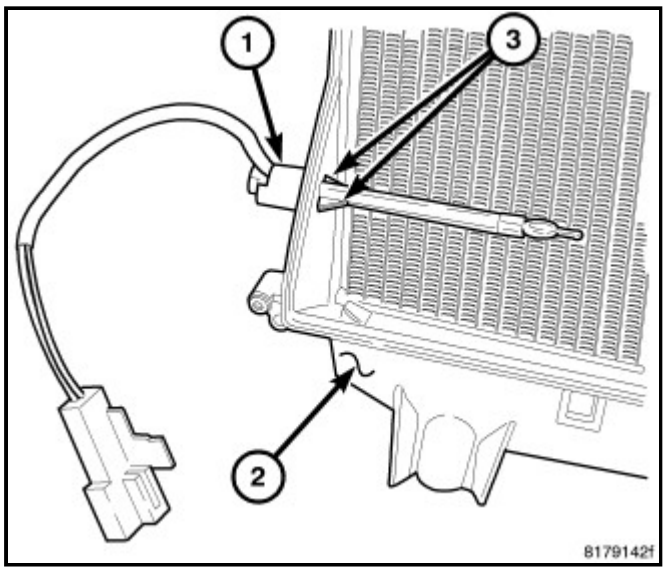
NOTE: Illustration shown with air distribution housing removed for clarity.

NOTE: It is not necessary to remove and disassemble the HVAC housing to service the evaporator temperature sensor. The evaporator temperature sensor can be removed for service from underneath the instrument panel.



1. Disconnect and isolate the negative battery cable.
2. Reach up under the driver side of the instrument panel and disconnect the electrical connector for the evaporator temperature sensor (1) from the instrument panel wire harness.
3. Using needle nose pliers, disengage the two retaining tabs (3) that secure the evaporator temperature sensor to the HVAC housing (2) by carefully pulling the sensor straight out of the side of the HVAC housing.
4. Route the electrical connector and wire lead of the evaporator temperature sensor out from under the heater core tubes and remove the sensor from the vehicle.

INSTALLATION



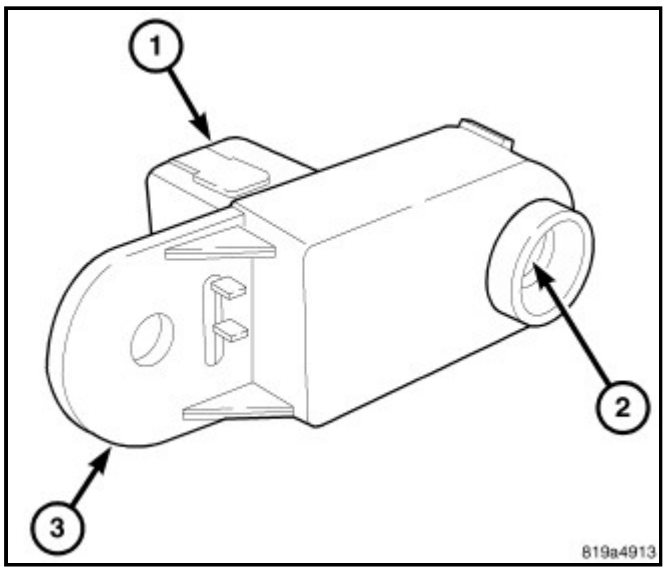
NOTE: Illustration shown with air distribution housing removed for clarity.

1. Route the electrical connector and wire lead of the evaporator temperature sensor (1) under the heater core tubes located on the driver side of the HVAC housing (2).
2. Install the evaporator temperature sensor into the driver side of the HVAC housing. Make sure the retaining tabs (3) are fully engaged to the housing.
3. Connect the electrical connector for the evaporator temperature sensor to the instrument panel wire harness.
4. Reconnect the negative battery cable.

DESCRIPTION

The infrared temperature sensor is located in the overhead console and consists of an infrared transducer concealed behind a clear lens (2) in a molded plastic housing with an integral wire connector receptacle (1) and mounting tab (3).

The infrared sensor is used only on models equipped with the automatic temperature control (ATC) heating-A/C system.



OPERATION

The infrared sensor detects thermal radiation emitted by the driver and front passenger seat occupants and surroundings and converts its data into a linear pulse width modulated (PWM) output signal which is read by the automatic temperature control (ATC) A/C-heater control. The ATC A/C-heater control uses the infrared sensor data as one of the inputs necessary to automatically control the interior cabin temperature levels. By using thermal radiation (surface temperature) measurement, rather than an air temperature measurement, the ATC heating-A/C system is able to adjust itself to the comfort level as perceived by the occupants. This allows the ATC system to compensate for other ambient conditions affecting comfort levels, such as solar heat gain or evaporative heat loss.

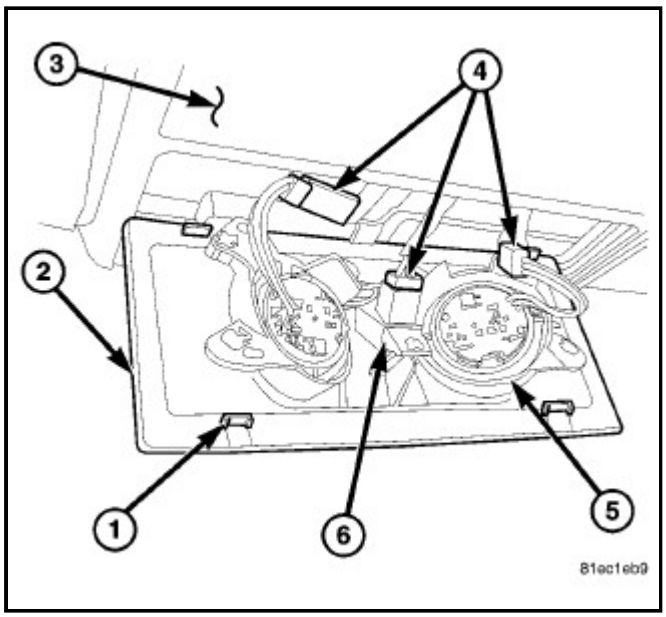
The ATC system logic responds to the infrared sensor message by calculating and adjusting the air flow temperature and air flow rate needed to properly obtain and maintain the selected comfort level temperature of the occupants. The A/C-heater control continually monitors the infrared sensor circuits, and will store diagnostic trouble codes (DTCs) for any problem it detects.

The infrared sensor is diagnosed using a scan tool (Refer to 28 - DTC-Based Diagnostics/HVAC - Diagnosis and Testing) .

The infrared sensor cannot be adjusted or repaired and must be replaced if inoperative or damaged.

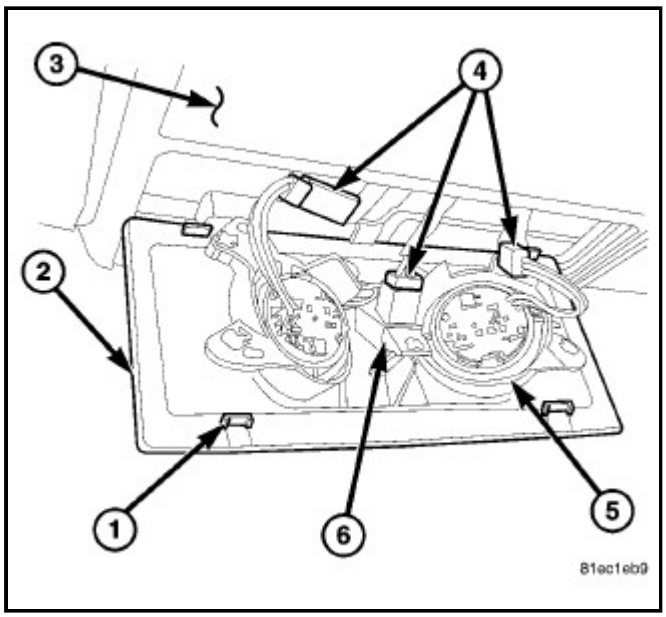
REMOVAL

1. Disconnect and isolate the negative battery cable.
2. Using Trim Stick C-4755 or equivalent, carefully disengage the four retaining tabs (1) that secure the infrared sensor and overhead map/courtesy lamp bezel (2) to the overhead console (3).
3. Disconnect the wire harness connectors (4) from the two overhead map/courtesy lamps (5) and the infrared sensor (6) and remove the sensor, lamp and bezel assembly from the vehicle



INSTALLATION

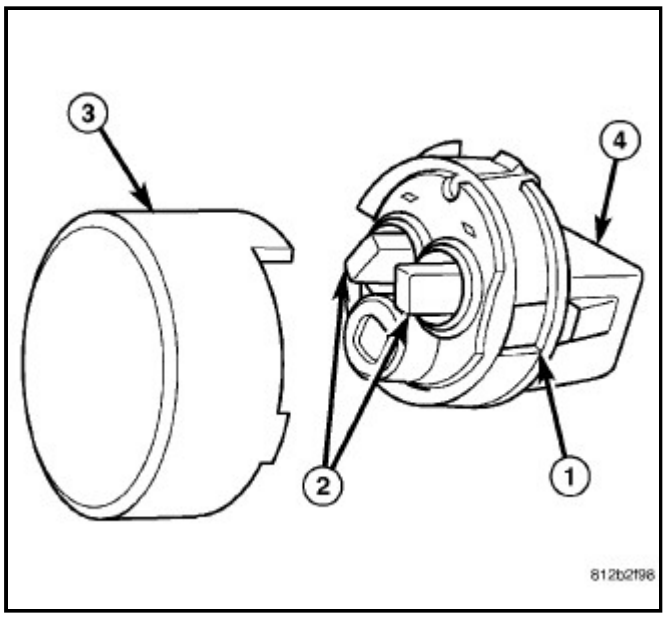
1. Position the infrared sensor and overhead map/courtesy lamp bezel (2) to the overhead console (3).
2. Connect the wire harness connectors (4) to the two overhead map/courtesy lamps (5) and the infrared sensor (6).
3. Engage the four retaining tabs (1) that secure the infrared sensor and overhead map/courtesy lamp bezel to the overhead console. Make sure the retaining tabs are fully engaged.
4. Reconnect the negative battery cable.



DESCRIPTION

NOTE: Typical sun sensor assembly shown.

The automatic temperature control (ATC) heating-A/C system uses a sun sensor assembly (1) to measure sun light intensity. The sun sensor assembly incorporates two sun sensors (2) within a molded plastic case which is mounted to the instrument panel and a clear lens (3) that protrudes through the defroster grille. The wire harness receptacle (4) connects the sun sensors to the vehicle electrical system through a wire lead and connector of the instrument panel wire harness.



OPERATION

The ATC dual-zone heating-A/C system uses two sun sensors to balance the system in response to side-to-side variations in sun light intensity. Passengers in sun and shadow require different functional settings because they experience very different temperatures. The sun sensor assembly provides data to the A/C heater control to help determine proper mode and blend-air door positions and blower motor speeds. The sun sensors are not thermistor type sensors, but rather photo diodes. For this reason the sun sensors responds to sun light intensity rather than temperature. The sun sensor assembly is also used to sense day and night conditions for automatic headlight control, if equipped.

The sun sensor is diagnosed using a scan tool (Refer to 28 - DTC-Based Diagnostics/HVAC - Diagnosis and Testing) .

The sun sensor assembly cannot be adjusted or repaired and must be replaced if inoperative or damaged.

SUN SENSOR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions may result in an accidental airbag deployment and possible serious or fatal injury.

The sun sensor assembly is located so that the sun rays will hit the sensors in the same way that it will hit the driver and the passenger. It is important that the area in front of the sun sensor assembly be unobstructed. Check for the following:

- Windshield wipers are properly adjusted.
- Defroster grille or sun sensor is properly installed. The sun sensor lens should protrude above the defroster grille.
- Any stickers on the windshield are not directly in front of the sun sensor.
- Any items laying on top of the instrument panel are not covering the sun sensor.

If the vehicle exhibits a lack of passenger comfort in sunny weather such as in the early afternoon, inspect the position of the sun sensor assembly. The sun sensor lens should protrude above the defroster grille to insure proper operation. If the sun sensor is not properly positioned, perform the following procedure:

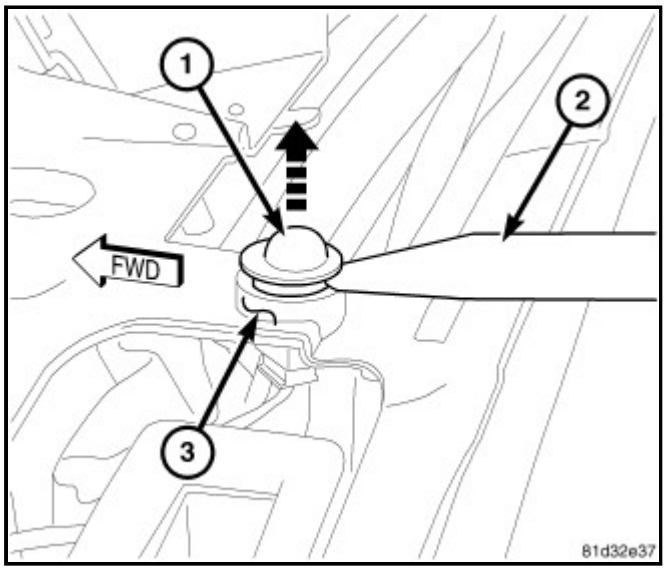
1. Confirm that the defroster grille is properly installed. If not, repair as required.
2. Remove the defroster grille and verify that the sun sensor is properly installed to the instrument panel (Refer to 24 - Heating and Air Conditioning/Controls/SENSOR, Sun - Installation) .
3. Reinstall the defroster grille.

The A/C-heater control continually monitors the sun sensor circuits and will store diagnostic trouble codes (DTCs) for any problem it detects. The sun sensor can be tested in the vehicle with a scan tool (Refer to 28 - DTC-Based Diagnostics/HVAC - Diagnosis and Testing) .

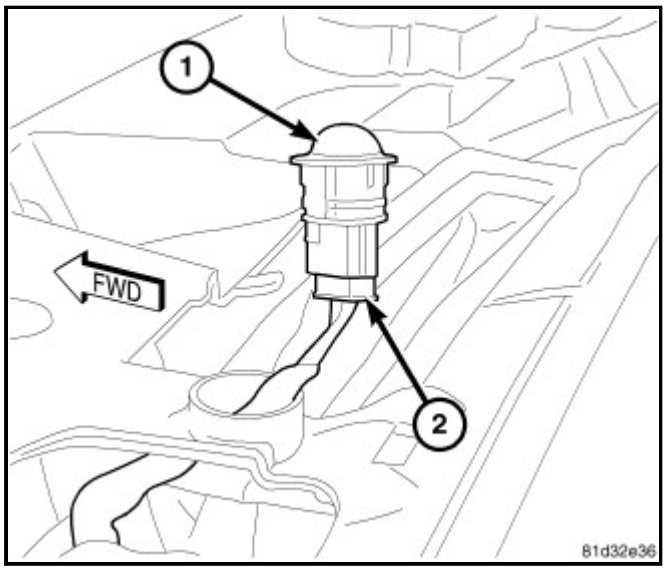
REMOVAL

WARNING: Disable the airbag system before attempting any steering wheel, steering column or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to follow these instructions may result in accidental airbag deployment and possible serious or fatal injury.

1. Disconnect and isolate the negative battery cable.
2. Remove the defroster grille (Refer to 23 - Body/Instrument Panel/GRILLE, Defroster - Removal) .
3. Using Trim Stick C-4755 or equivalent (2), gently pry between both sides of the sun sensor assembly (1) and the instrument panel (3) to release the snap retainers that secure the sun sensor.

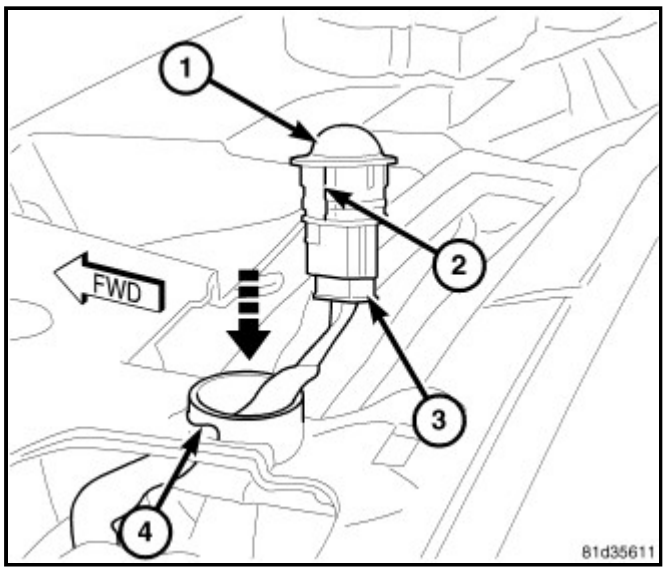


4. Disconnect the wire harness connector (2) from the sun sensor assembly (1) and remove the sensor.



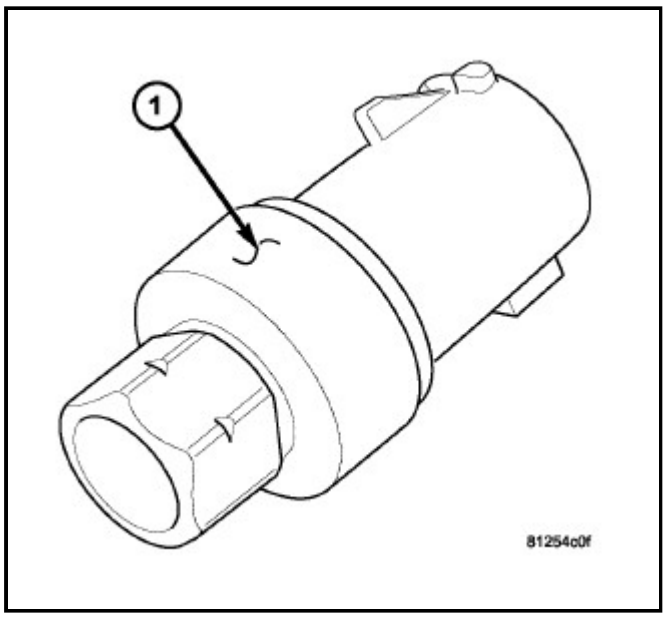
INSTALLATION

1. Position the sun sensor assembly (1) to the top of the instrument panel (4) and connect the wire harness connector (3).
2. Align the tab (2) on the sun sensor assembly with the opening in the instrument panel.
3. Gently push the sun sensor assembly into the instrument panel until the sensor snap retainers are securely engaged.
4. Install the defroster grille (Refer to 23 - Body/Instrument Panel/GRILLE, Defroster - Installation) .
5. Reconnect the negative battery cable.



DESCRIPTION

The A/C pressure transducer (1) is a switch that is installed on a fitting located on the A/C liquid line at the right front corner of the engine compartment. An internally threaded fitting on the A/C pressure transducer connects it to the externally threaded Schrader-type fitting. A rubber O-ring seals the connection between the A/C pressure transducer and the A/C liquid line fitting. The A/C pressure transducer is connected to the vehicle electrical system by a molded plastic connector with three terminals.



OPERATION

The A/C pressure transducer monitors the pressures in the high side of the refrigerant system through its connection to a fitting on the A/C discharge line. The internal resistance of the A/C pressure transducer changes in response to the pressures it monitors.

The Totally Integrated Power Module (TIPM) provides a five volt reference signal and a sensor ground to the A/C pressure transducer. The TIPM then monitors the output voltage of the transducer on a sensor return circuit to determine refrigerant pressure and sends a message to the Powertrain Control Module (PCM) or the Engine Control Module (ECM) (depending on engine application) over the CAN C BUS.

With 2.7L/3.5L 5-Passenger and all 7-Passenger models, the PCM is programmed to respond to this and other sensor inputs by controlling the operation of the swash plate within the A/C compressor and the radiator cooling fan to help optimize A/C system performance and to protect the system components from damage. The PCM adjusts the swash plate to nearly a zero degree angle (low compressor displacement) when high side pressure rises above 3130 kPa (454 psi) and readjusts the swash plate to a greater angle (higher compressor displacement) when high side pressure drops below 1999 kPa (290 psi). The A/C pressure transducer also reduces the swash plate angle if the high side pressure drops below 200 kPa (29 psi) and will increase the swash plate angle when the high side pressure rises above 234 - 262 kPa (34 - 38 psi). When the refrigerant pressure rises above 1655 kPa (240 psi), the PCM will actuate the cooling fan.

With 2.0L/2.4L 5-Passenger models, A/C compressor clutch engagement is controlled by the PCM or ECM, depending on engine application. When the A/C-heater control is set to any A/C position, it sends a request signal on the CAN-IHS bus to the TIPM, which then transfers the request on the CAN-C Bus to the PCM/ECM, which determines if operating conditions are correct for A/C clutch engagement. When all operating conditions have been met, the PCM/ECM sends a signal on a dedicated hard-wired circuit back to the TIPM to energize the internal A/C clutch high side driver. When energized, the A/C clutch high side driver provides battery current to the A/C clutch field coil.

A Schrader-type valve in the A/C discharge line fitting permits the A/C pressure transducer to be removed or installed without disturbing the refrigerant in the A/C system.

The A/C pressure transducer is diagnosed using a scan tool (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Diagnosis and Testing).

The A/C pressure transducer cannot be adjusted or repaired and must be replaced if inoperative or damaged.

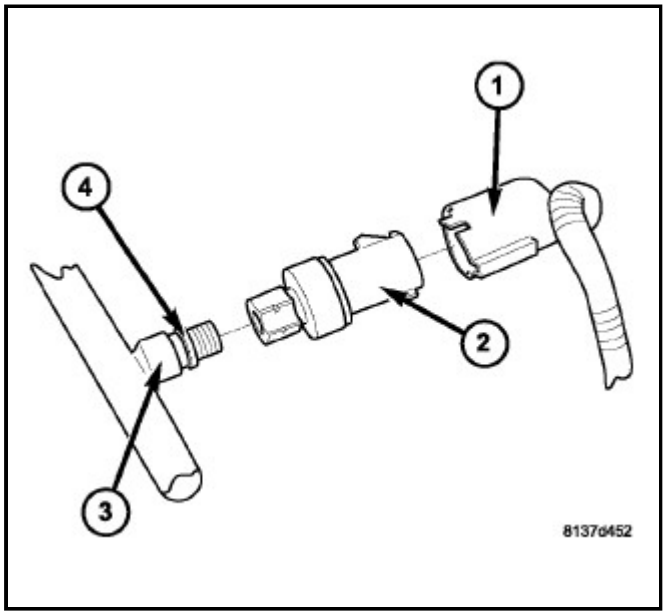
REMOVAL

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation (Refer to 24 - Heating and Air Conditioning/Plumbing - Warning) and (Refer to 24 - Heating and Air Conditioning/Plumbing - Caution) . Failure to follow the warnings and cautions may result in possible serious or fatal injury.

NOTE: It is not necessary to discharge the refrigerant system to replace the A/C pressure transducer.

NOTE: Typical A/C pressure transducer shown.

1. Disconnect and isolate the negative battery cable.
2. Disconnect the wire harness connector (1) from the A/C pressure transducer (2) located on the A/C liquid line (3) at the right front corner of the engine compartment.
3. Remove the A/C pressure transducer from the A/C liquid line and remove and discard the O-ring seal (4).



INSTALLATION

NOTE: Use only the specified O-ring as it is made of special material for R-134a. Use only refrigerant oil of the type required for the A/C compressor.

NOTE: Typical A/C pressure transducer shown.

1. Lubricate a new rubber O-ring seal (4) with clean refrigerant oil and install it onto the A/C liquid line (3).
2. Install the A/C pressure transducer (2) onto the A/C liquid line. Tighten the A/C pressure transducer to 5.6 N·m (50 in. lbs.).
3. Connect the wire harness connector (1) to the A/C pressure transducer.
4. Reconnect the negative battery cable.