

HEATED SYSTEMS

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HEATED MIRRORS

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HEATED MIRRORS

DESCRIPTION - HEATED MIRROR SYSTEM

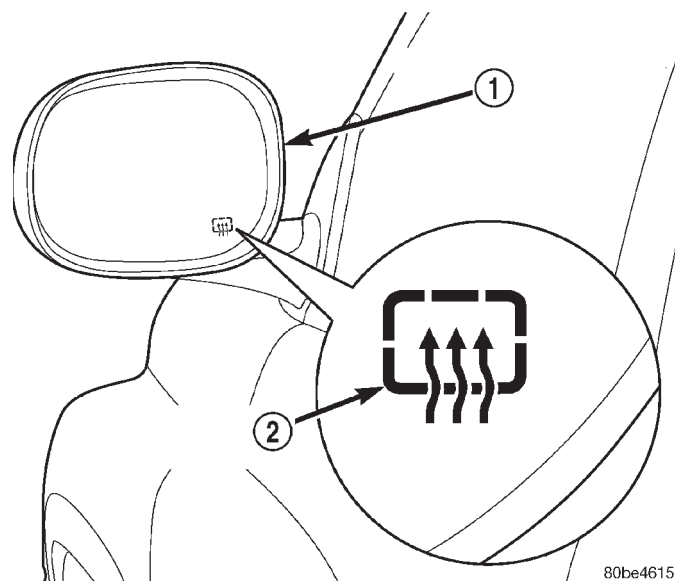


Fig. 1 HEATED MIRROR- TYPICAL

- 1 - POWER HEATED OUTSIDE REAR VIEW MIRROR
2 - REAR WINDOW DEFOGGER ICON

Electrically heated outside rear view mirrors are an additional factory-installed option on models that are equipped with factory-installed dual power mirrors. Vehicles with this option can be visually identified by the International Control and Display Symbol icon for rear window defogger, which appears on the lower inboard corner of each outside mirror glass (Fig. 1); or, by the heated mirror switch that is located in the lower left corner of the a/c heater control unit face plate. The heated mirror system helps the vehicle operator maintain outside rear view mirror visibility during inclement operating conditions by keeping both outside mirror glasses clear of ice, snow, or fog. The heated mirror system for this vehicle includes the following major components:

- The heated mirror switch, including the heated mirror system solid state electronic control logic and timer circuitry, the heated mirror relay and the heated mirror system indicator lamp. All of these components are integral to the a/c heater control unit on the instrument panel.

- The two outside mirror heating grids, which are integral to the power outside mirror units.

Following are general descriptions of the major components in the heated mirror system. See the owner's manual in the vehicle glove box for more information on the features, use and operation of the heated mirror system.

HEATED MIRRORS (Continued)

OPERATION - HEATED MIRROR SYSTEM

The solid state electronic control logic and timer circuitry for the heated mirror system receives battery current from a fuse in the Junction Block (JB) only when the ignition switch is in the On or Start positions. After the heated mirror system is turned On, the electronic control logic and timer circuitry will automatically turn the system off after a programmed time interval of about fifteen minutes. After the initial time interval has expired, if the heated mirror switch is depressed and released a second time during the same ignition cycle, the electronic control logic and timer circuitry will automatically turn the heated mirror system off after a programmed time interval of about five minutes. The heated mirror system will be shut off automatically if the ignition switch is turned to the Off or Accessory positions. After the heated mirror system is turned On, it can also be turned off manually by depressing and releasing the heated mirror switch a second time.

When the heated mirror system is turned On, the heated mirror system control logic and timer circuitry energizes the heated mirror system indicator lamp and the heated mirror relay. When energized, the heated mirror relay supplies fused ignition switch output (run/start) current from a fuse in the JB to the outside mirror heating grids located behind the mirror glass of each of the outside rear view mirrors. When energized, each of the outside mirror heating grids produces enough heat to warm the glass of the outside rear view mirrors.

DIAGNOSIS AND TESTING - HEATED MIRROR SYSTEM

If only one of the outside mirror heating grids is inoperative, perform continuity checks on the circuits and heater grid for that mirror only. If both outside mirror heating grids are inoperative, proceed with the heated mirror system diagnosis as follows. (Refer to Appropriate Wiring Information).

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (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 COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

The operation of the heated mirror system can be confirmed in one of the following manners:

- Turn the ignition switch to the On position. While monitoring the instrument panel voltmeter, momentarily depress and release the heated mirror switch. When the heated mirror system is turned On, a distinct voltmeter needle deflection should be noted.

- Turn the ignition switch to the On position. Momentarily depress and release the heated mirror switch to turn the heated mirror system On. The heated mirror operation can be checked by feeling the outside rear view mirror glass. A distinct difference in temperature between the unheated and heated mirror glass can be detected within three to four minutes of system operation.

The above checks will confirm system operation. Illumination of the heated mirror system indicator lamp means that there is electrical current available at the heated mirror relay, but does not confirm that the electrical current is reaching the outside mirror heating grids.

If the heated mirror system does not operate, the problem should be isolated in the following manner:

- (1) Confirm that the ignition switch is in the On position.

- (2) Check the fuses in the Power Distribution Center (PDC) and in the Junction Block (JB). The fuses must be tight in their receptacles and all electrical connections must be secure.

When the above steps have been completed and both outside mirror heating grids are still inoperative, one or more of the following is faulty:

- Heated mirror switch, electronic control logic and timer circuitry, and heated mirror relay.
- Heated mirror wire harness circuits or connectors.
- Outside mirror heating grid (both mirror grids would have to be faulty).

If turning On the heated mirror system produces a severe voltmeter deflection or fuse failures, check for a shorted circuit between the output of the heated mirror relay and the outside mirror heating grids.

MIRROR SWITCH**DESCRIPTION**

The heated mirror switch, the heated mirror system indicator lamp, the heated mirror system solid state electronic control logic and timer circuitry and the heated mirror relay are all integral to the a/c heater control, which is located between the instrument cluster and the radio near the center of the instrument cluster bezel on the instrument panel. The heated mirror switch and the heated mirror sys-

MIRROR SWITCH (Continued)

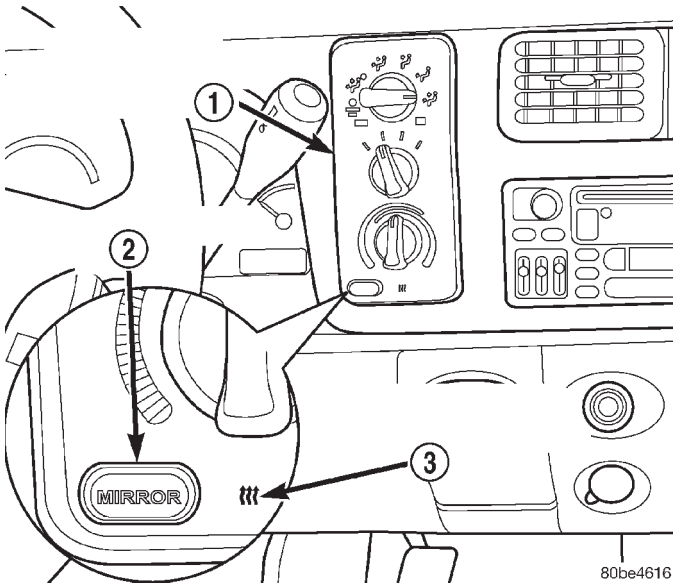


Fig. 2 HEATED MIRROR SWITCH

- 1 - A/C HEATER CONTROL
- 2 - HEATED MIRROR SWITCH
- 3 - HEATED MIRROR SYSTEM INDICATOR LAMP

tem indicator lamp are visible in the lower left corner of the a/c heater control face plate (Fig. 2).

The heated mirror switch, the heated mirror system indicator lamp, the heated mirror system solid state electronic control logic and timer circuitry and the heated mirror relay cannot be repaired. If any of these components is damaged or faulty, the entire a/c heater control must be replaced. (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS/A/C HEATER CONTROL - REMOVAL)

OPERATION

The momentary-type heated mirror switch provides a hard-wired battery current signal to the heated mirror system electronic control logic circuitry each time it is depressed. In response to the heated mirror switch input, the electronic control logic and timer circuitry energizes or de-energizes the amber heated mirror system indicator lamp next to the heated mirror switch to indicate that the heated mirror system is turned On or Off. The electronic control logic and timer circuitry also energizes or de-energizes the heated mirror relay, which controls the feed of electrical current to the outside mirror heating grids.

The heated mirror system electronic control logic and timer circuitry is programmed to turn the heated mirror system Off automatically after about fifteen minutes of operation. If the heated mirror system is turned On a second time following an initial time-out event during the same ignition switch cycle, the heated mirror system electronic control logic and timer circuit is programmed to turn the system Off

automatically after about five minutes. When the electronic control logic and timer circuit detects that a programmed time interval has elapsed, it will automatically de-energize the heated mirror system indicator lamp and the heated mirror relay. The heated mirror system will also be turned Off if the heated mirror switch is depressed while the system is turned On, or if the ignition switch is turned to the Off or Accessory positions.

DIAGNOSIS AND TESTING - HEATED MIRROR SWITCH

The heated mirror switch, the solid state electronic heated mirror system control logic and timer circuitry, the heated mirror system indicator lamp and the heated mirror relay are all integral to the a/c heater control. For circuit descriptions and diagrams (Refer to Appropriate Wiring Information).

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (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 COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

(1) Check the fused ignition switch output (run/start) fuse in the Junction Block (JB). If OK, go to Step 2. If not OK, repair the shorted circuit or component as required and replace the faulty fuse.

(2) Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output (run/start) fuse in the JB. If OK, go to Step 3. If not OK, repair the open circuit to the ignition switch as required.

(3) Disconnect and isolate the battery negative cable. Disconnect the 3-way instrument panel wire harness connector for the heated mirror switch from the heated mirror switch connector receptacle on the back of the a/c heater control. Check for continuity between the ground circuit cavity of the wire harness connector and a good ground. There should be continuity. If OK, go to Step 4. If not OK, repair the open ground circuit to ground as required.

(4) Reconnect the battery negative cable. Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output (run/start) circuit cavity of the 3-way instrument panel wire

MIRROR SWITCH (Continued)

harness connector for the heated mirror switch. If OK, go to Step 5. If not OK, repair the open fused ignition switch output (run/start) circuit to the fuse in the JB as required.

(5) Turn the ignition switch to the Off position. Disconnect and isolate the battery negative cable. Reconnect the 3-way instrument panel wire harness connector for the heated mirror switch to the heated mirror switch connector receptacle on the back of the a/c heater control. Reconnect the battery negative cable. Turn the ignition switch to the On position. Depress and release the heated mirror switch. The amber heated mirror system indicator lamp next to the heated mirror switch button should light. If OK, go to Step 6. If not OK, replace the faulty a/c heater control.

(6) Back probe the fused heated mirror relay output circuit cavity of the 3-way instrument panel wire harness connector for the heated mirror switch on the back of the a/c heater control and check for voltage (battery voltage less the resistance in both outside mirror heating grids). If OK, (Refer to 8 - ELECTRICAL/HEATED MIRRORS/HEATED MIRROR GRID - DIAGNOSIS AND TESTING).

HEATED MIRROR GRID

DESCRIPTION

Vehicles equipped with the optional heated mirror system have an electrically operated heating grid located behind the mirror glass of each power operated outside rear view mirror. The outside mirror heating grid consists of two thin laminations of plastic that approximate the outer dimensions and shape of the mirror glass. A single length of resistor wire weaves in a back and forth pattern between, and is held in place by the two thin laminations of plastic. The two ends of the resistor wire terminate near the inboard edge of the grid, where they are soldered to the ground feed and battery current feed wires contained in the power mirror wire harness. The heating grid is then sandwiched between the back of the molded plastic mirror glass case and the mirror glass, where it remains in direct contact with the back of the mirror glass at all times.

The outside mirror heating grids cannot be repaired and, if faulty or damaged, the entire outside power mirror unit must be replaced. Refer to Power Mirrors for the service procedures.

OPERATION

One end of the outside mirror heating grid resistor wire is connected to a ground feed at all times through a body ground screw located inside the left rear corner of the truck cab. Battery current is directed to the other end of the outside mirror heating grid resistor wire by the energized heated mirror relay when the heated mirror switch is in the On position. As electrical current passes through the heating grid, the resistance of the wire in the heating grid converts some of that electrical current into heat. The heat produced by the heating grid is then conducted through the back of the mirror glass to help keep the glass clear of ice, snow or fog.

DIAGNOSIS AND TESTING - HEATED MIRROR GRID

For circuit descriptions and diagrams (Refer to Appropriate Wiring Information).

(1) Disconnect and isolate the battery negative cable. Disconnect the door wire harness connector from the power mirror wire harness connector at the power mirror with the inoperative heating grid. Check for continuity between the ground circuit cavity in the door wire harness connector for the power mirror and a good ground. If OK, go to Step 2. If not OK, repair the open ground circuit to ground as required.

(2) Reconnect the battery negative cable. Turn the ignition switch to the On position. Turn on the heated mirror system. Check for voltage (battery voltage less the resistance in the outside mirror heating grid that is still connected) at the fused heated mirror relay output circuit cavity in the door wire harness connector for the power mirror. If OK, go to Step 3. If not OK, repair the open fused heated mirror relay output circuit to the heater and air conditioner control unit as required.

(3) Check the outside mirror heating grid by testing for continuity between the ground circuit and the fused heated mirror relay output circuit cavities in the power mirror wire harness connector. There should be continuity. If not OK, replace the faulty power mirror. If OK, check the resistance through the outside mirror heating grid. The correct resistance should be from 10 to 16 ohms when measured at an ambient temperature of 21° C (70° F). If not OK, replace the faulty power mirror.

HEATED SEAT SYSTEM

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HEATED SEAT SYSTEM

DESCRIPTION

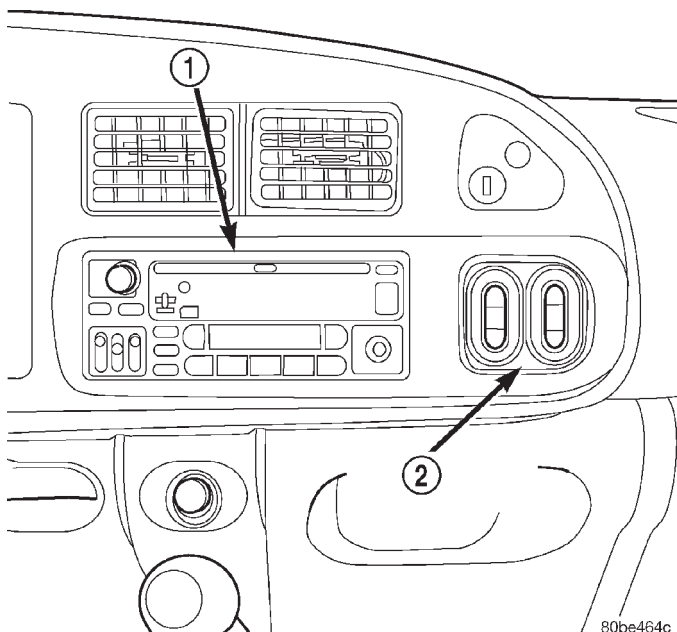


Fig. 1 Heated Seat System Switches

- 1 - Radio Receiver
2 - Heated Seat Switches

Individually controlled electrically heated front seats are available factory-installed optional equipment on the Ram quad cab models that are also equipped with the optional SLT Plus (leather) trim package. Vehicles with this option can be visually identified by the two separate heated seat switches mounted in a bezel located in the lower right corner of the instrument cluster bezel, next to the radio receiver (Fig. 1). The heated seat system allows the front seat driver and passenger to select from two different levels of supplemental electrical seat heating, or no seat heating to suit their individual comfort requirements. The heated seat system for this vehicle includes the following major components, which are described in further detail later in this section:

- **Heated Seat Switches** - Two heated seat switches are used per vehicle, including two Light-Emitting Diode (LED) indicator lamps and an incandescent back lighting bulb for each switch. One switch for the driver and one for the passenger front seats. The switches are mounted in the instrument panel, next to the radio.

- **Heated Seat Module** - also referred to as the Seat Heat Interface Module (SHIM), this module contains the solid state electronic control and diagnostic logic circuitry for the heated seat system. One heated seat module is used per vehicle and is mounted under the center front seat cushion. Refer to the Electronic Control Modules section of the service manual for heated seat module information.

HEATED SEAT SYSTEM (Continued)

- **Heated Seat Elements** - Four heated seat elements are used per vehicle, one for each front seat back and one for each front seat cushion. The elements are integral to the individual front seat and seat back cushions and cannot be removed once installed at the factory. Service replacement seat heating elements are available, without having to replace the entire seat cushion or trim cover. Refer to the procedure in this section.

- **Heated Seat Sensors** - Two heated seat sensors are used per vehicle, one for each front seat. The sensors are integral to the individual front seat heating elements and cannot be removed once installed at the factory. Service replacement seat heating elements with the sensors are available, without having to replace the entire seat cushion or trim cover. Refer to the procedure in this section.

- **Heated Seat Relay** - The heated seat relay controls the battery voltage and current supply to the heated seat module and the rest of the heated seat system. The heated seat relay is mounted in the junction block and is not different than the other relays used throughout the vehicle. Refer to the Power Distribution section of the service manual for more information on standard ISO relays.

Following are general descriptions of the major components in the heated seat system. See the owner's manual in the vehicle glove box for more information on the features, use and operation of the heated seat system. Refer to **Wiring Diagrams** for the location of complete heated seat system wiring diagrams.

OPERATION

The heated seat module receives fused battery current through the energized heated seat relay in the Junction Block (JB) only when the engine is running. The heated seat switches receive battery current through fuse #2 in the Junction Block only when the ignition switch is in the On position. The heated seat module shares a common ground circuit with each of the heated seat elements. The heated seat elements will only operate when the surface temperature of the seat cushion is below the designed temperature set points of the system.

The heated seat system will also be turned off automatically whenever the ignition switch is turned to any position except On or if the engine quits running. If the ignition switch is turned to the Off position or if the engine quits running while a heated seat is turned ON, the heated seat will remain Off after the engine is restarted until a heated seat switch is depressed again.

The heated seat module monitors inputs from the heated seat sensors and the heated seat switches. In response to these inputs the heated seat module uses

its internal programming to control outputs to the heated seat elements in both front seats and to control the heated seat LED indicator lamps located in both of the heated seat switches. The heated seat module is also programmed to provide a self-diagnostic capability. When the module detects certain failures within the heated seat system, it will provide a visual indication of the failure by flashing the indicator lamps in the heated seat switches. The heated seat module will automatically turn off the heated seat elements if it detects a short or open in the heated seat element circuit or a heated seat sensor value that is out of range.

DIAGNOSIS AND TESTING - HEATED SEAT SYSTEM**HEATED SEAT SYSTEM SELF-DIAGNOSIS**

The heated seat system is capable of performing some self-diagnostics. The following table depicts the various monitored failures which will be reported to the vehicle operator or technician by flashing the individual heated seat switch Light Emitting Diode (LED) indicator lamps. Refer to the Heated Seat System Self-Diagnosis table for failure identification. The driver side heated seat switch indicator lamps will flash if a failure occurs in the driver side heated seat, and the passenger side heated seat switch indicator lamps will flash for a passenger side heated seat failure. If a monitored heated seat system failure occurs, the switch indicator lamps will flash at a pulse rate of about one-half second on, followed by about one-half second off for a duration of about one minute after the switch for the faulty heated seat is depressed in either the Low or High direction. This process will repeat every time the faulty heated seat switch is actuated until the problem has been corrected.

Heated Seat System Self-Diagnosis		
Monitored Failure	Switch High Indicator Lamp	Switch Low Indicator Lamp
Heated Seat Element Shorted	Flashing	Flashing
Heated Seat Element Open	Flashing	Off
Heated Seat Sensor Value Out of Range	Off	Flashing

HEATED SEAT SYSTEM (Continued)

If the heated seat system failure is identified by flashing heated seat switch indicator lamps, go to the appropriate diagnosis and testing procedure in this section and confirm the condition, using the step by step procedure. If the monitored failure is confirmed, replace the component. If the monitored failure is not confirmed, replace the heated seat module with a known good unit and retest the system.

HEATED SEAT SYSTEM TESTING

Refer to **Wiring Diagrams** for the location of complete heated seat system wiring diagrams. Before testing the individual components in the heated seat system, perform the following preliminary checks:

WARNING: DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE 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 COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

- If the heated seat switch back lighting and the cluster illumination lamps do not illuminate with the headlamps or park lamps turned On, refer to the **Instrument Cluster** section of the service manual for the location of cluster illumination lamps diagnosis and testing procedures. If the heated seat switch back lighting does not illuminate, but the cluster illumination lamps do illuminate with the headlamps or park lamps turned On, refer to **Diagnosis and Testing the Heated Seat Switch** in this section for the location of the heated seat switch diagnosis and testing procedures.

- If a single indicator lamp for one heated seat switch does not operate and the heated seat elements do heat, refer to **Diagnosis and Testing the Heated Seat Switch** in this section for heated seat switch diagnosis and testing procedures.

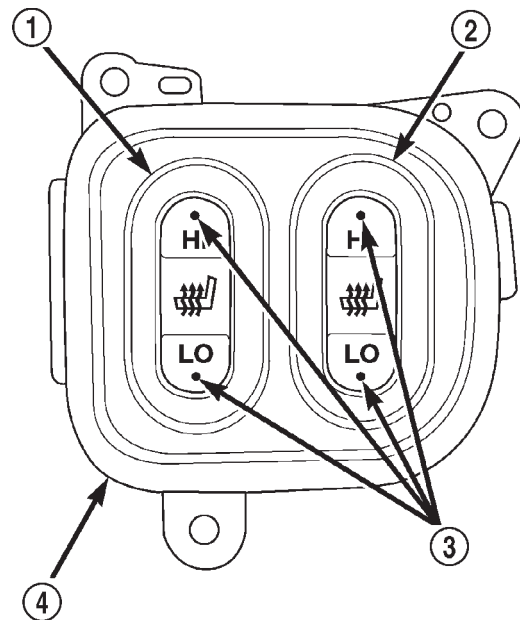
- If both indicator lamps for a heated seat switch operate, but the heated seat elements do not heat, refer to **Diagnosis and Testing the Heated Seat Module** in Electronic Control Modules for heated seat module diagnosis and testing procedures.

- If none of the indicator lamps for both heated seat switches will operate and the heated seat elements for both seats do not heat, refer to **Diagnosis and Testing the Heated Seat Relay** in the Power Distribution section of the service manual for heated seat relay diagnosis and testing procedures.

- If the an indicator lamp on either heated seat switch remains illuminated after the heated seat has been turned Off, refer to **Diagnosis and Testing the Heated Seat Module** in Electronic Control Modules for heated seat module diagnosis and testing procedures. Also refer to the Body Diagnostic Manual for additional diagnosis and testing procedures.

DRIVER SEAT HEATER SWITCH

DESCRIPTION



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Fig. 2 Heated Seat Switches

- 1 - Driver Switch
- 2 - Passenger Switch
- 3 - Indicator Lamps
- 4 - Heated Seat Switch Bezel

The heated seat switches are both mounted in a heated seat switch bezel (Fig. 2), which replaces the standard equipment cubby bin located in the lower right corner of the instrument cluster bezel next to the radio receiver. The two switches are snapped into the mounting holes of the heated seat switch bezel, and the heated seat switch bezel is secured with three screws to the instrument panel. The mounts for the heated seat switch bezel are concealed behind the instrument cluster bezel. The two heated seat switches are identical in appearance and construction, except for the location of a keyway in the single connector receptacle on the back of each switch. The instrument panel wire harness connectors for the heated seat switches are keyed to match the connec-

DRIVER SEAT HEATER SWITCH (Continued)

tor receptacles on the switches so that the two heated seat switches can only be connected to the proper heated seat electrical.

The momentary, bidirectional rocker-type heated seat switch provides a resistor-multiplexed signal to the heated seat module on the mux circuit. Each switch has a center neutral position and momentary Low and High positions so that both the driver and the front seat passenger can select a preferred level of seat heating. Each heated seat switch has two Light-Emitting Diode (LED) indicator lamps, which indicate the selected mode (Low or High) of the seat heater. These indicator lamps also provide diagnostic feedback for the heated seat system. Each switch also has an incandescent bulb, which provides dimmer controlled back lighting of the switch when the headlamps or park lamps are on.

The two LED indicator lamps and the incandescent bulb in each heated seat switch cannot be repaired. If the indicator lamps or back lighting bulb are faulty or damaged, the individual heated seat switch must be replaced.

OPERATION

The heated seat switches receive battery current through a fused ignition switch output (run) circuit when the ignition switch is in the On position. Depressing the heated seat switch rocker to its momentary High or Low position provides a hard-wired resistor multiplexed voltage request signal to the heated seat module to power the heated seat element of the selected seat and maintain the requested temperature setting. If the heated seat switch is depressed to a different position (Low or High) than the currently selected state, the heated seat module will change states to support the new selection. If a heated seat switch is depressed a second time to the same position as the currently selected state, the heated seat module interprets the second input as a request to turn the seat heater off. The heated seat module will then turn the heated seat elements for that seat off.

The indicator lamps in the heated seat switches receive battery current through a fused ignition switch output (run) circuit when the ignition switch is in the On position. The ground side of each indicator lamp is controlled by a separate (high or low/driver or passenger) indicator lamp driver circuit by the heated seat module. The heated seat module control of the switch indicator lamps also allows the module to provide diagnostic feedback to the vehicle operator to indicate monitored heated seat system faults by flashing the indicator lamps on and off. One side of the incandescent back lighting bulb in each heated seat switch is connected to ground at all times. The other side of the incandescent bulb is con-

nected to the fused panel lamps dimmer switch signal circuit. These bulbs are energized when the park lamps or headlamps are turned on, and their illumination intensity is controlled by the panel lamps dimmer switch.

DIAGNOSIS AND TESTING - HEATED SEAT SWITCH

Refer to **Wiring Diagrams** for the location of complete heated seat system wiring diagrams.

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(1) If the problem being diagnosed involves inoperative heated seat switch back lighting and the cluster illumination lamps operate, go to Step 2. If the problem being diagnosed involves inoperative heated seat switch back lighting and the cluster illumination lamps are also inoperative, refer to **Instrument Cluster** in the index of this service manual for the proper cluster illumination lamps diagnosis and testing procedures. If the problem being diagnosed involves inoperative heated seat switch indicator lamps and the heated seat elements do not heat, refer to Step 4. If the problem being diagnosed involves inoperative heated seat switch indicator lamps and the heated seat elements do heat, go to Step 8. If the problem being diagnosed involves a heated seat switch indicator lamp that remains illuminated after the heated seat has been turned Off, refer to **Heated Seat Module** in Electronic Control Modules for the location of the proper heated seat module diagnosis and testing procedures. Also refer to the Body Diagnostic Manual for additional diagnosis and testing procedures.

(2) Disconnect and isolate the battery negative cable. Remove the heated seat switch and bezel unit from the instrument panel. Disconnect the instrument panel wire harness connector from the connector receptacle on the back of the heated seat switch to be tested. Check for continuity between the ground circuit cavity of the instrument panel wire harness connector for the heated seat switch and a good ground. There should be continuity. If OK, go to Step

DRIVER SEAT HEATER SWITCH (Continued)

3. If not OK, repair the open ground circuit to ground as required.

(3) Reconnect the battery negative cable. Turn the park lamps on with the headlamp switch. Rotate the panel lamps dimmer thumbwheel on the headlamp switch upward to just before the interior lamps detent. Check for battery voltage at the fused panel lamps dimmer switch signal circuit cavity of the instrument panel wire harness connector for the heated seat switch. If OK, replace the faulty heated seat switch. If not OK, repair the open fused panel lamps dimmer switch signal circuit to the fuse in the Junction Block (JB) as required.

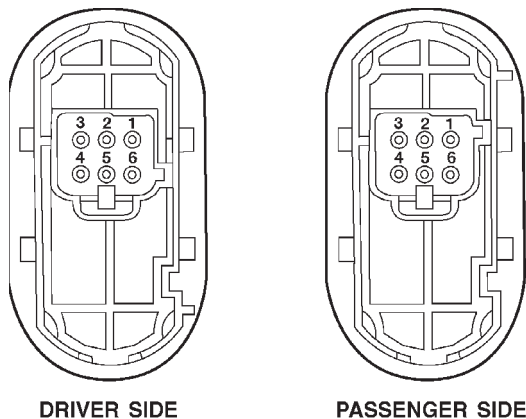
(4) Check the fused ignition switch output (run) fuse in the Junction Block (JB). If OK, go to Step 5. If not OK, repair the shorted circuit or component as required and replace the faulty fuse.

(5) Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output (run) fuse in the JB. If OK, go to Step 6. If not OK, repair the open fused ignition switch output (run) circuit to the ignition switch as required.

(6) Disconnect and isolate the battery negative cable. Remove the heated seat switch and bezel unit from the instrument panel. Disconnect the instrument panel wire harness connector from the connector receptacle on the back of the heated seat switch to be tested. Reconnect the battery negative cable. Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output (run) circuit cavity of the instrument panel wire harness connector for the heated seat switch. If OK, go to Step 7. If not OK, repair the open fused ignition switch output (run) circuit to the JB fuse as required.

(7) Check the continuity and resistance values of the heated seat switch in the Neutral, Low and High positions as shown in the Heated Seat Switch Continuity chart (Fig. 3). If OK, refer to **Heated Seat Module** in Electronic Control Modules for the location of the proper heated seat module diagnosis and testing procedures. Also refer to the Body Diagnostic Manual for additional diagnosis and testing procedures. If not OK, replace the faulty heated seat switch.

NOTE: ANY RESISTANCE VALUES (OHMS Ω) GIVEN IN THE FOLLOWING TEXT ARE SUPPLIED USING THE AUTOMATIC RANGE GENERATED BY A FLUKE® AUTOMOTIVE METER. IF ANOTHER TYPE OF MEASURING DEVICE IS USED THE VALUES GENERATED MAY NOT BE THE SAME AS THE RESULTS SHOWN HERE, OR MAY HAVE TO BE CONVERTED TO THE RANGE USED HERE.



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Fig. 3 Heated Seat Switch

Heated Seat Switch Continuity		
Switch Position	Continuity Between	Resistance
Neutral	4 & 6	2.2 Kilohms
Low	4 & 6	.415 Kilohms
High	4 & 6	33 Ohms

(8) Replace the inoperative heated seat switch with a known good unit and test the operation of the switch indicator lamps. If OK, discard the faulty heated seat switch. If not OK, refer to **Heated Seat Module** in Electronic Control Modules for the location of the proper heated seat module diagnosis and testing procedures. Also refer to the Body Diagnostic Manual for additional diagnosis and testing procedures.

REMOVAL

Both heated seat switches and the heated seat switch bezel are available individually for service replacement.

(1) Disconnect and isolate the battery negative cable.

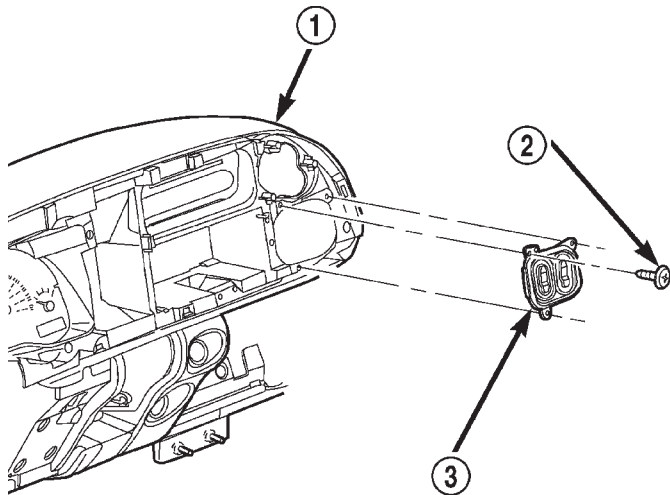
(2) Remove the cluster bezel from the instrument panel. Refer to **Cluster Bezel** in the index of this service manual for the location of the proper cluster bezel removal procedures.

(3) Remove the three screws that secure the heated seat switch bezel to the instrument panel (Fig. 4).

(4) Pull the heated seat switch bezel out from the instrument panel far enough to access and disconnect the two instrument panel wire harness connectors from the connector receptacles on the backs of the heated seat switches.

(5) Remove the heated seat switch bezel and both switches from the instrument panel as a unit.

DRIVER SEAT HEATER SWITCH (Continued)



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Fig. 4 Heated Seat Switch and Bezel Remove/Install

- 1 - INSTRUMENT PANEL
- 2 - SCREW (3)
- 3 - HEATED SEAT SWITCHES AND BEZEL UNIT

(6) From the back of the heated seat switch bezel, gently push the heated seat switch out through the front of the bezel.

INSTALLATION

Both heated seat switches and the heated seat switch bezel are available individually for service replacement.

NOTE: When installing the heated seat switches, be certain they are installed in the proper mounting holes of the heated seat switch bezel. Note that the driver side and passenger side switches are identical in appearance except for the keyway in the connector receptacle on the backs of the switches. The driver side switch has the keyway located near the bottom of the connector receptacle and should be installed in the left mounting hole of the heated seat switch bezel. The passenger side switch has the keyway located near the top of the connector receptacle and should be installed in the right mounting hole of the heated seat switch bezel.

(1) From the front of the heated seat switch bezel, align the back of the heated seat switch with the proper mounting hole in the heated seat switch bezel and gently push the switch into the bezel until it snaps into place.

(2) Position the heated seat switch bezel and both switches to the instrument panel as a unit.

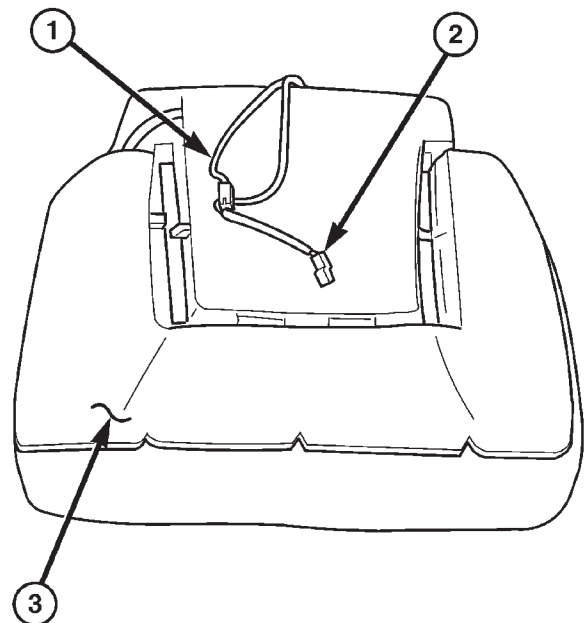
(3) Reconnect the two instrument panel wire harness connectors to the connector receptacles on the backs of the heated seat switches.

(4) Position the heated seat switch bezel and both switches in the instrument panel mounting hole as a unit.

(5) Install and tighten the three screws that secure the heated seat switch bezel to the instrument panel. Tighten the screws to 2.2 N·m (20 in. lbs.).

(6) Install the cluster bezel onto the instrument panel. Refer to **Cluster Bezel** in the index of this service manual for the location of the proper cluster bezel installation procedures.

(7) Reconnect the battery negative cable.

HEATED SEAT ELEMENT**DESCRIPTION**

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Fig. 5 HEATING ELEMENT INSTALLED

- 1 - SEAT BACK WIRE HARNESS
- 2 - HEATED SEAT WIRE HARNESS CONNECTOR
- 3 - HEATED SEAT CUSHION ELEMENT

Vehicles equipped with the optional heated seat system have two sets of electrically operated heating element grids located in each front seat, one set for the seat cushion and the other set for the seat back. Each of the heated seat element grids consists of a single length of resistor wire that is routed in a zig-zag pattern and captured between a covering and the adhesive foam rubber backing. Short pigtail wires with connectors (Fig. 5) are soldered to each end of each resistor wire element grid, which connect all of the element grids for each seating position to each other in series with the heated seat module through the seat wire harness.

HEATED SEAT ELEMENT (Continued)

One temperature sensor is used for each outboard seating position of the front seat, and it is located in the center insert area of the seat cushion cover. The heated seat sensors and their pigtail wires are also captured between a covering and the adhesive foam rubber backing. The heated seat sensors are Negative Thermal Coefficient (NTC) thermistors. The sensors for both front seats receive a voltage feed from a single output of the heated seat module, but the module receives individual sensor inputs from the driver side and passenger side sensors.

The heated seat elements and sensors should not be repaired. If damaged or faulty, the heated seat element assembly must be replaced. (Refer to 8 - ELECTRICAL/HEATED SEATS/HEATED SEAT ELEMENT - REMOVAL).

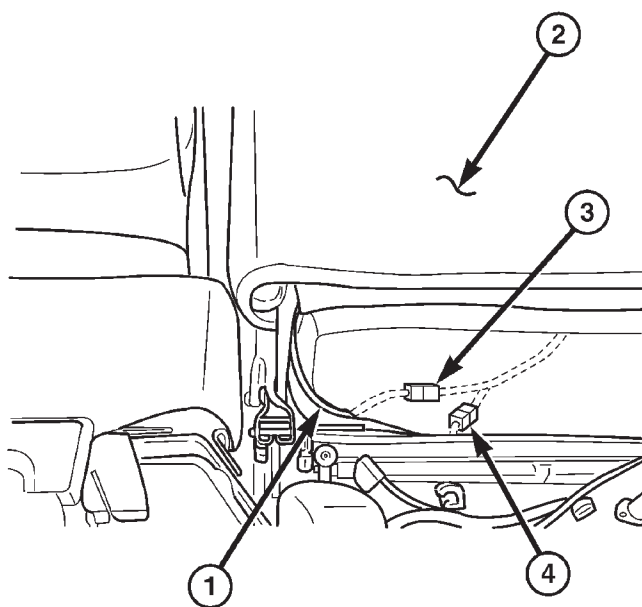
OPERATION

One end of the heated seat element resistor wire is connected to a ground feed at all times through a splice in the heated seat module ground circuit. Battery current is directed to the other end of the heated seat element resistor wire by the energized N-channel Field Effect Transistor (N-FET) located within the heated seat module. The heated seat module will energize the N-FET only when the heated seat switch is in the Low or High position and the heated seat sensor indicates that the seat cushion surface temperature is below the selected (Low or High) temperature set point. As electrical current passes through the heating element grid, the resistance of the wire used in the element disperses some of that electrical current in the form of heat. The heat produced by the heated seat element grid then radiates through the underside of the seat cushion and seat back trim covers, warming the seat cover and its occupant.

The resistance of the heated seat sensor increases and decreases as the surface temperature of the seat cushion cover changes. The heated seat module supplies each sensor with a voltage feed, then detects the sensor resistance by monitoring the voltage of the separate sensor return circuits. The heated seat module compares the heated seat sensor resistance (seat cushion surface temperature) with the heated seat switch resistance (Low or High set point) to determine when the heated seat element grids need to be cycled on or off in order to maintain the selected temperature set point.

DIAGNOSIS AND TESTING - HEATED SEAT ELEMENT AND SENSOR

The heated seat module will self-diagnose shorted or open heated seat element circuits and sensor circuits. Refer to Heated Seat System Diagnosis and Testing in this section for additional diagnosis and testing procedures. To manually check the heated seat element and sensor circuits, proceed as follows. The wire harness connectors for the seat cushion and seat back heating elements and sensor are located under the seat, near the rear edge of the seat cushion frame (Fig. 6) . Refer to **Wiring Diagrams** for the location of complete heated seat system wiring diagrams.



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Fig. 6 PASSENGER SEAT WIRE HARNESS ROUTING

- 1 - SEAT BACK HEATED SEAT WIRE HARNESS
- 2 - PASSENGER SEAT BACK
- 3 - SEAT BACK ELEMENT CONNECTOR
- 4 - SEAT CUSHION ELEMENT CONNECTOR

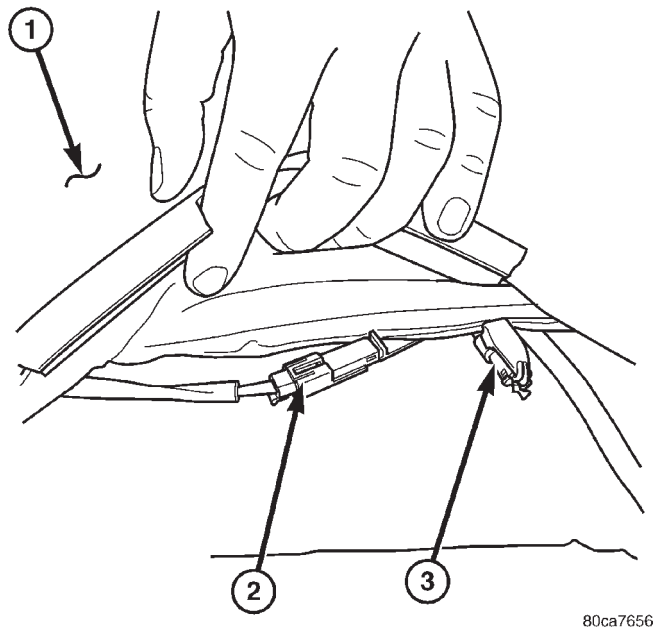
HEATED SEAT ELEMENTS

- (1) Position the appropriate seat in the full forward position.
- (2) Make certain the ignition switch is in the OFF position.

HEATED SEAT ELEMENT (Continued)

(3) Using small channel locks, disengage the seat cushion trim cover J-channel from the lower seat cushion frame (Fig. 7).

(4) Disconnect the 2-way heated seat element connector which requires testing (Fig. 7) or (Fig. 8) Check for continuity between the two heated seat element circuit cavities (Fig. 9). There should be continuity. If OK, the elements within the seat assembly test OK, go to Step 5. If not OK, replace the faulty seat heating element refer to the procedure in this section.



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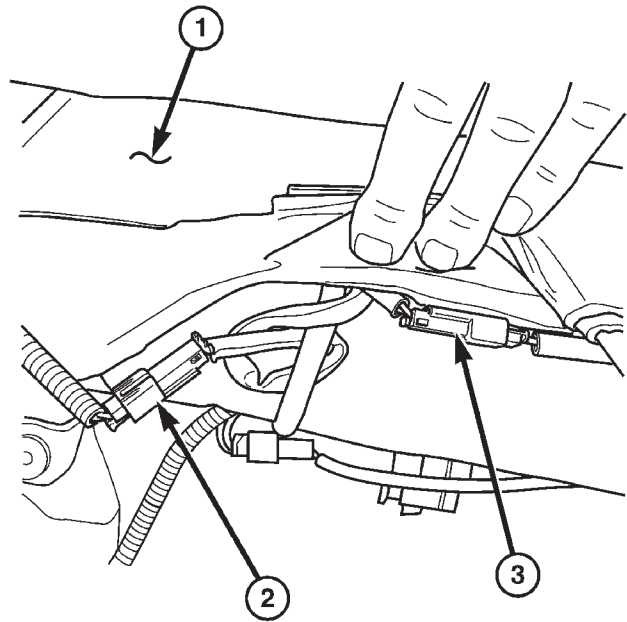
Fig. 7 DRIVERS SEAT CONNECTORS

- 1 - DRIVER SEAT BACK TRIM COVER
- 2 - SEAT BACK ELEMENT CONNECTOR
- 3 - SEAT CUSHION ELEMENT CONNECTOR

(5) Test the seat wire harness between the heated seat module connector and the appropriate 2-way heated seat wire harness connector for shorted or open circuits. If OK, element are OK, proceed with testing the heated seat sensor and module. If not OK, repair the shorted or open seat wire harness as required.

HEATED SEAT SENSOR

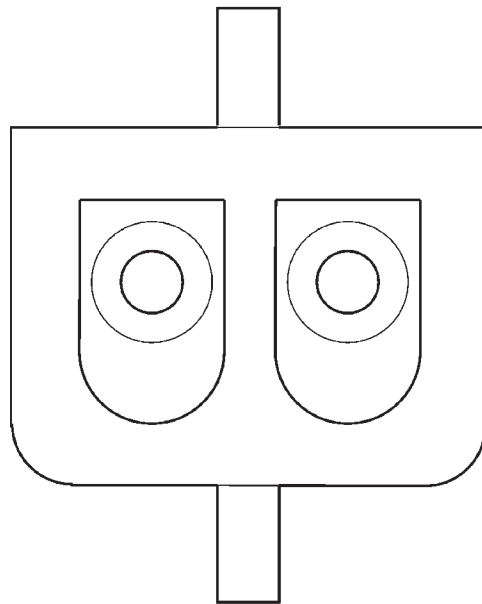
NOTE: ANY RESISTANCE VALUES (OHMS Ω) GIVEN IN THE FOLLOWING TEXT ARE SUPPLIED USING THE AUTOMATIC RANGE GENERATED BY A FLUKE® AUTOMOTIVE METER. IF ANOTHER TYPE OF MEASURING DEVICE IS USED THE VALUES GENERATED MAY NOT BE THE SAME AS THE RESULTS SHOWN HERE, OR MAY HAVE TO BE CONVERTED TO THE RANGE USED HERE.



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Fig. 8 PASSENGER SEAT CONNECTORS

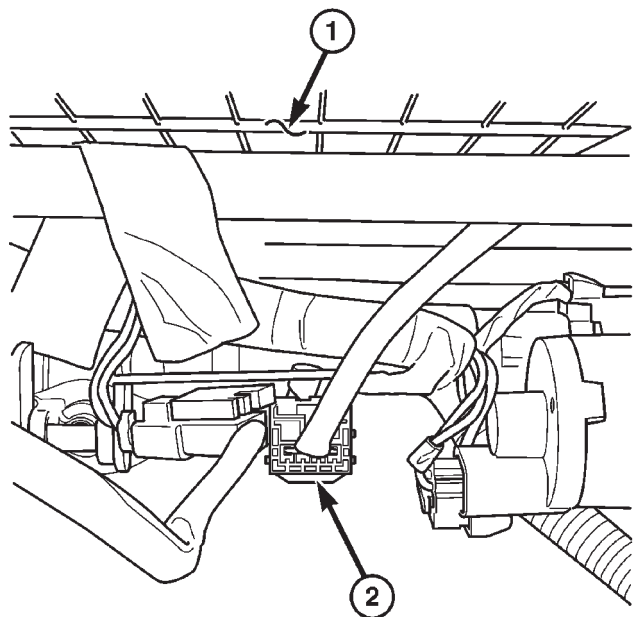
- 1 - PASSENGER SEAT BACK TRIM COVER
- 2 - SEAT BACK ELEMENT CONNECTOR
- 3 - SEAT CUSHION ELEMENT CONNECTOR



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Fig. 9 ELEMENT CONNECTOR

HEATED SEAT ELEMENT (Continued)



80ca768b

Fig. 10 HEATED SEAT CONNECTOR

- 1 - SEAT CUSHION FRAME
2 - HEATED SEAT CONNECTOR

(1) Position the appropriate seat in the full forward position.

(2) Make certain the ignition switch is in the OFF position.

(3) Disconnect the 4-way heated seat wire harness connector from the seat cushion frame (Fig. 10). Using an ohmmeter, check the resistance between the heated seat sensor input circuit cavity and the heated seat sensor feed circuit cavity in the 4-way heated seat wire harness connector. The heated seat sensor resistance should be between 1 kilohm and 100 kilohms. If OK, go to Step 4. If not OK, replace the faulty seat cushion heating element assembly.

(4) Test the seat wire harness between the heated seat module connector and the 4-way heated seat wire harness connector for shorted or open circuits. If OK, refer to **Diagnosis and Testing the Heated Seat Module** in Electronic Control Modules, for the proper heated seat module diagnosis and testing procedures. If not OK, repair the shorted or open heated seat wire harness as required.

REMOVAL

Do not remove the heating element from the seat or seat back cushion. The original element is permanently attached to the seat cushions and cannot be removed without damaging the cushion. The service replacement heating element is designed to be applied directly over the original seat heating element.

(1) Disconnect and isolate the negative battery cable.

(2) Remove the appropriate seat cushion or seat back trim cover. Refer to the Body section of the service manual for the procedures.

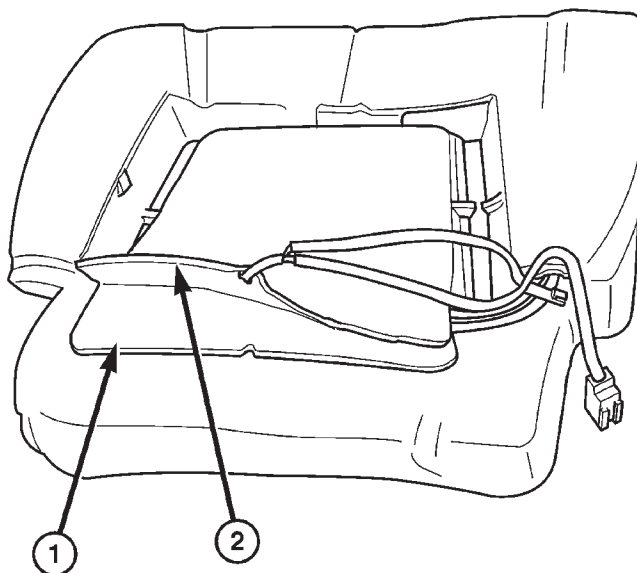
(3) Disconnect the inoperative heated seat cushion or seat back element electrical connectors.

(4) Locate the wires leading from the inoperative heating element and cut them off flush with the edge of the original heating element.

INSTALLATION

(1) Peel off the adhesive backing on the back of the replacement heating element and stick directly over the original heating element (Fig. 11).

CAUTION: During the installation of the replacement heating element, be careful not to fold or crease the element assembly. Folds or creases will cause premature failure.



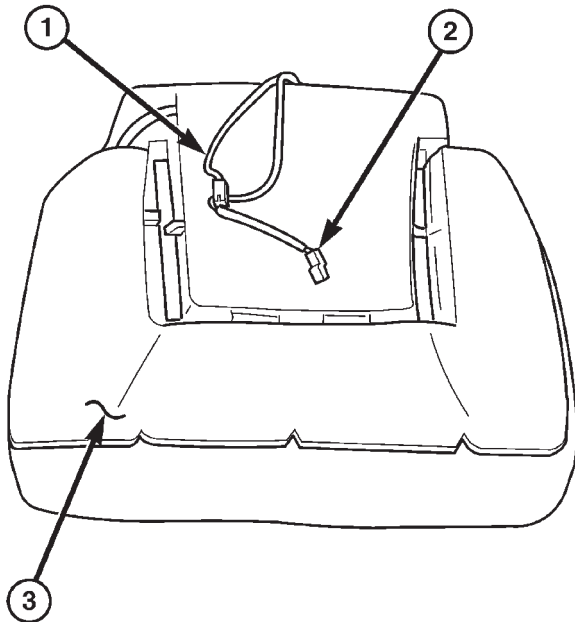
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Fig. 11 HEATING ELEMENT INSTALLATION

- 1 - ORIGINAL (INOPERATIVE) HEATING ELEMENT
2 - REPLACEMENT HEATING ELEMENT

HEATED SEAT ELEMENT (Continued)

(2) Connect the new heating element electrical connectors (Fig. 12) .



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Fig. 12 HEATING ELEMENT INSTALLED

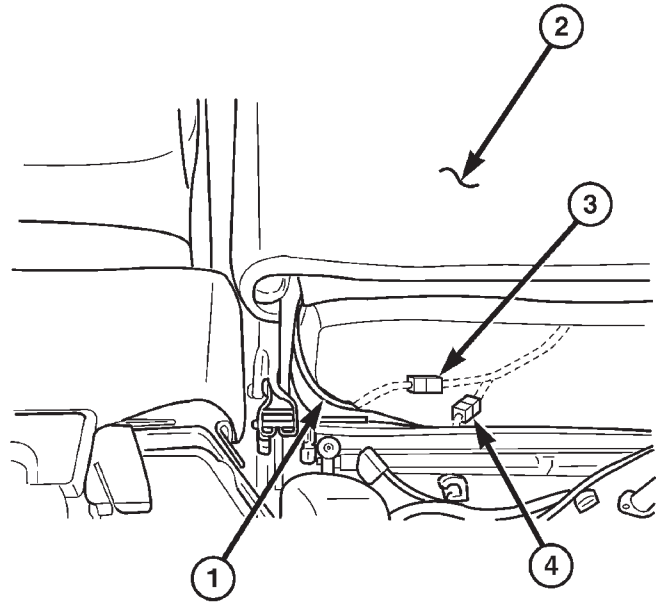
- 1 - SEAT BACK WIRE HARNESS
- 2 - HEATED SEAT WIRE HARNESS CONNECTOR
- 3 - HEATED SEAT CUSHION ELEMENT

(3) Connect the negative battery cable.
 (4) Verify heated seat system operation.
 (5) Install the appropriate seat cushion or seat back trim cover. Make certain the seat wire harness is correctly routed through the seat and seat back. The excess wire between the cushion and back elements should be securely tucked between the rear of the cushion foam and the rear carpet flap of the trim cover. (Fig. 13).

HEATED SEAT RELAY

DESCRIPTION

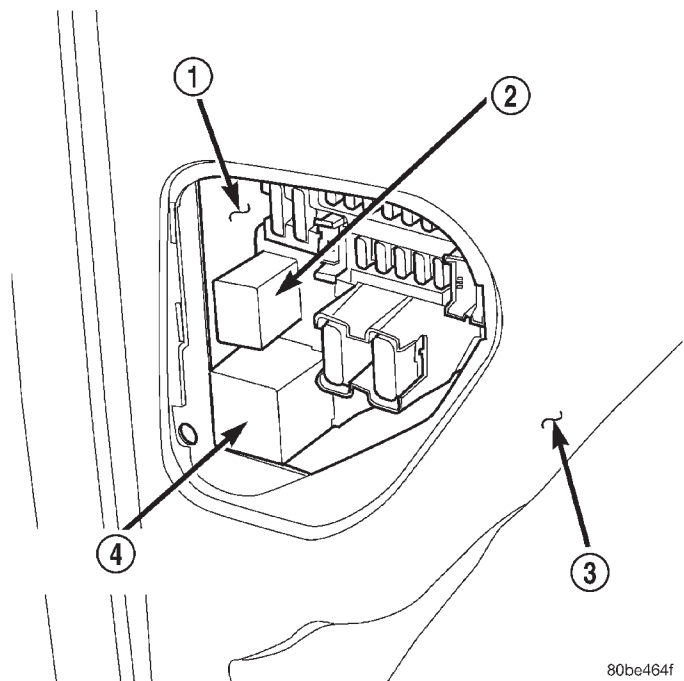
The heated seat relay is an electromechanical device that switches battery current to the heated seat module when the relay control coil is energized. The heated seat relay is located in the Junction Block (JB), on the left end of the instrument panel in the passenger compartment (Fig. 14). The heated seat relay is a International Standards Organization (ISO) micro-relay. Relays conforming to the ISO specifications have common physical dimensions, current capacities, terminal patterns, and terminal functions. The ISO micro-relay terminal functions are the same as a conventional ISO relay. However, the ISO micro-relay terminal pattern (or footprint) is different, the current capacity is lower, and the phys-



80c91d16

Fig. 13 HEATED SEAT WIRE HARNESS ROUTING

- 1 - SEAT BACK HEATED SEAT WIRE HARNESS
- 2 - PASSENGER SEAT BACK
- 3 - SEAT BACK ELEMENT CONNECTOR
- 4 - SEAT CUSHION ELEMENT CONNECTOR



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Fig. 14 Heated Seat Relay

- 1 - JUNCTION BLOCK
- 2 - HEATED SEAT RELAY
- 3 - INSTRUMENT PANEL
- 4 - COMBINATION FLASHER

HEATED SEAT RELAY (Continued)

ical dimensions are smaller than those of the conventional ISO relay.

The heated seat relay cannot be repaired or adjusted and, if faulty or damaged, it must be replaced.

OPERATION

The ISO relay consists of an electromagnetic coil, a resistor or diode, and three (two fixed and one movable) electrical contacts. The movable (common feed) relay contact is held against one of the fixed contacts (normally closed) by spring pressure. When the electromagnetic coil is energized, it draws the movable contact away from the normally closed fixed contact, and holds it against the other (normally open) fixed contact. When the electromagnetic coil is de-energized, spring pressure returns the movable contact to the normally closed position. The resistor or diode is connected in parallel with the electromagnetic coil in the relay, and helps to dissipate voltage spikes that are produced when the coil is de-energized.

The heated seat relay is controlled by the premium version of the Central Timer Module (CTM), which controls the ground feed to the coil ground terminal of the relay to energize and de-energize the electromagnetic coil of the relay. The CTM monitors engine operation through messages it receives from the Powertrain Control Module (PCM) over the Chrysler Collision Detection (CCD) data bus network. The CTM is programmed to energize the relay only when the engine is running, and to de-energize the relay when the engine is not running. Refer to **Central Timer Module** in the index of this service manual for the location of more information on the premium CTM.

DIAGNOSIS AND TESTING - HEATED SEAT RELAY

The heated seat relay (Fig. 15) is located in the Junction Block (JB) on the left end of the instrument panel in the passenger compartment of the vehicle. Refer to **Wiring Diagrams** for the location of complete heated seat system wiring diagrams.

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (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 COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

RELAY TEST

(1) Remove the heated seat relay from the JB. Refer to **Heated Seat Relay** in this section for the location of the proper heated seat relay removal procedures.

(2) A relay in the de-energized position should have continuity between terminals 87A and 30, and no continuity between terminals 87 and 30. If OK, go to Step 3. If not OK, replace the faulty relay.

(3) Resistance between terminals 85 and 86 (electromagnet) should be 75 ± 5 ohms. If OK, go to Step 4. If not OK, replace the faulty relay.

(4) Connect a battery to terminals 85 and 86. There should now be continuity between terminals 30 and 87, and no continuity between terminals 87A and 30. If OK, perform the Relay Circuit Test that follows. If not OK, replace the faulty relay.

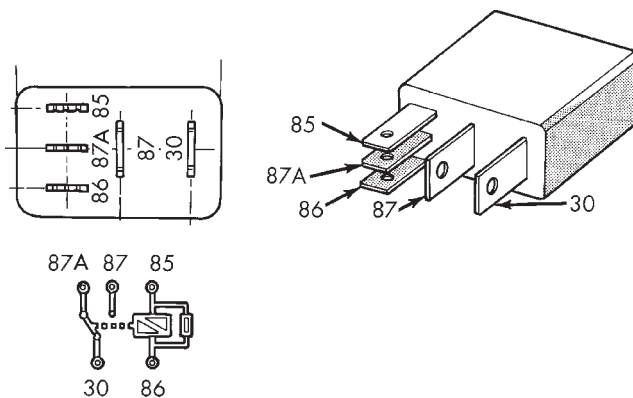


Fig. 15 Heated Seat Relay

TERMINAL LEGEND	
NUMBER	IDENTIFICATION
30	COMMON FEED
85	COIL GROUND
86	COIL BATTERY
87	NORMALLY OPEN
87A	NORMALLY CLOSED

RELAY CIRCUIT TEST

(1) The relay common feed terminal cavity (30) is connected to battery voltage and should be hot at all times. If OK, go to Step 2. If not OK, repair the open circuit to the fused B(+) fuse in the Power Distribution Center (PDC) as required.

(2) The relay normally closed terminal (87A) is connected to terminal 30 in the de-energized position, but is not used for this application. Go to Step 3.

(3) The relay normally open terminal (87) is connected to the common feed terminal (30) in the energized position. This terminal supplies battery voltage to the heated seat module. There should be continuity between the cavity for relay terminal 87 and the B(+) to heated seat module circuit cavity of the heated seat module wire harness connector at all times. If OK, go to Step 4. If not OK, repair the open

HEATED SEAT RELAY (Continued)

B(+) to heated seat module circuit to the heated seat module as required.

(4) The coil battery terminal (86) is connected to the electromagnet in the relay. It is connected to battery voltage and should be hot at all times. Check for battery voltage at the cavity for relay terminal 86. If OK, go to Step 5. If not OK, repair the open circuit to the fused B(+) fuse in the PDC as required.

(5) The coil ground terminal (85) is connected to the electromagnet in the relay. It is grounded by the premium version of the Central Timer Module (CTM) in response to an engine speed message received over the Chrysler Collision Detection (CCD) data bus from the Powertrain Control Module (PCM) when the engine is running. Check for continuity between the cavity for relay terminal 85 and the heated seat relay control circuit cavity of the CTM wire harness connector. There should be continuity at all times. If OK, use a DRBIII® scan tool and the proper diagnostic procedures manual to test the operation of the CTM and CCD data bus. If not OK, repair the open heated seat relay control circuit as required.

REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Remove the fuse access panel by inserting a finger in the finger recess molded into the panel and then pulling the panel sharply away from the left outboard end of the instrument panel.

(3) The heated seat relay is located on the forward side of the Junction Block (JB), just above the combination flasher (Fig. 16).

(4) Grasp the heated seat relay firmly and pull it straight out from the JB.

INSTALLATION

(1) Position the heated seat relay in the proper receptacle in the JB.

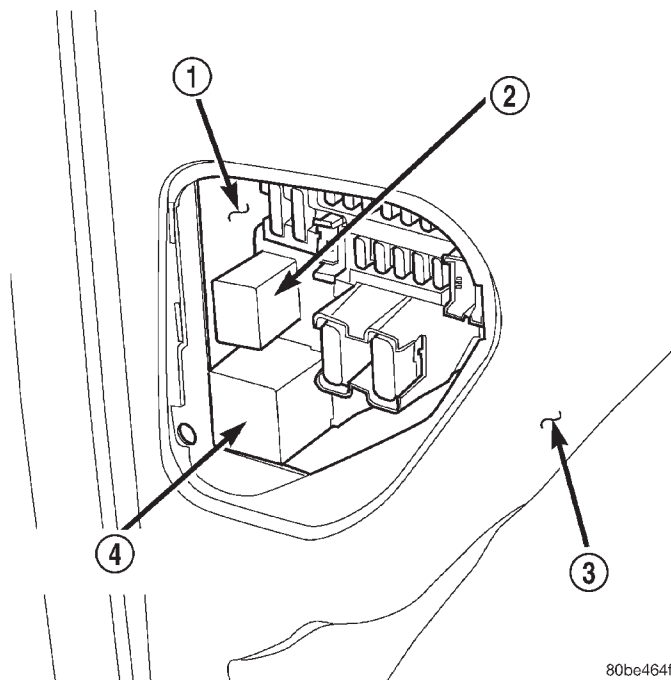
(2) Align the heated seat relay terminals with the terminal cavities in the JB receptacle.

(3) Push in firmly on the heated seat relay until the terminals are fully seated in the terminal cavities in the JB receptacle.

(4) Insert the tabs on the forward edge of the fuse access panel in the notches on the forward edge of the instrument panel fuse access panel opening.

(5) Press the rear edge of the fuse access panel in toward the instrument panel until the panel snaps back into place.

(6) Reconnect the battery negative cable.



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Fig. 16 Heated Seat

- 1 - JUNCTION BLOCK
- 2 - HEATED SEAT RELAY
- 3 - INSTRUMENT PANEL
- 4 - COMBINATION FLASHER

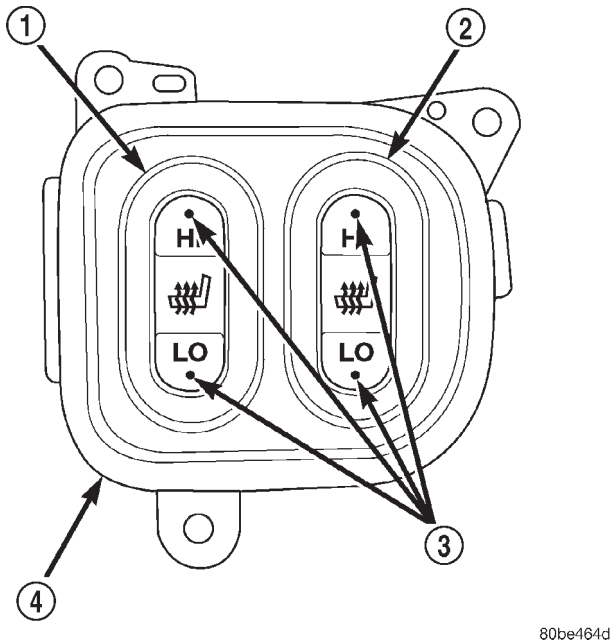
PASSENGER SEAT HEATER SWITCH

DESCRIPTION

The heated seat switches are both mounted in a heated seat switch bezel (Fig. 17), which replaces the standard equipment cubby bin located in the lower right corner of the instrument cluster bezel next to the radio receiver. The two switches are snapped into the mounting holes of the heated seat switch bezel, and the heated seat switch bezel is secured with three screws to the instrument panel. The mounts for the heated seat switch bezel are concealed behind the instrument cluster bezel. The two heated seat switches are identical in appearance and construction, except for the location of a keyway in the single connector receptacle on the back of each switch. The instrument panel wire harness connectors for the heated seat switches are keyed to match the connector receptacles on the switches so that the two heated seat switches can only be connected to the proper heated seat electrical.

The momentary, bidirectional rocker-type heated seat switch provides a resistor-multiplexed signal to the heated seat module on the mux circuit. Each switch has a center neutral position and momentary Low and High positions so that both the driver and

PASSENGER SEAT HEATER SWITCH (Continued)

**Fig. 17 Heated Seat Switches**

- 1 - Driver Switch
- 2 - Passenger Switch
- 3 - Indicator Lamps
- 4 - Heated Seat Switch Bezel

the front seat passenger can select a preferred level of seat heating. Each heated seat switch has two Light-Emitting Diode (LED) indicator lamps, which indicate the selected mode (Low or High) of the seat heater. These indicator lamps also provide diagnostic feedback for the heated seat system. Each switch also has an incandescent bulb, which provides dimmer controlled back lighting of the switch when the headlamps or park lamps are on.

The two LED indicator lamps and the incandescent bulb in each heated seat switch cannot be repaired. If the indicator lamps or back lighting bulb are faulty or damaged, the individual heated seat switch must be replaced.

OPERATION

The heated seat switches receive battery current through a fused ignition switch output (run) circuit when the ignition switch is in the On position. Depressing the heated seat switch rocker to its momentary High or Low position provides a hard-wired resistor multiplexed voltage request signal to the heated seat module to power the heated seat element of the selected seat and maintain the requested temperature setting. If the heated seat switch is depressed to a different position (Low or High) than the currently selected state, the heated seat module will change states to support the new selection. If a heated seat switch is depressed a second time to the

same position as the currently selected state, the heated seat module interprets the second input as a request to turn the seat heater off. The heated seat module will then turn the heated seat elements for that seat off.

The indicator lamps in the heated seat switches receive battery current through a fused ignition switch output (run) circuit when the ignition switch is in the On position. The ground side of each indicator lamp is controlled by a separate (high or low/driver or passenger) indicator lamp driver circuit by the heated seat module. The heated seat module control of the switch indicator lamps also allows the module to provide diagnostic feedback to the vehicle operator to indicate monitored heated seat system faults by flashing the indicator lamps on and off. One side of the incandescent back lighting bulb in each heated seat switch is connected to ground at all times. The other side of the incandescent bulb is connected to the fused panel lamps dimmer switch signal circuit. These bulbs are energized when the park lamps or headlamps are turned on, and their illumination intensity is controlled by the panel lamps dimmer switch.

DIAGNOSIS AND TESTING - HEATED SEAT SWITCH

Refer to **Wiring Diagrams** for the location of complete heated seat system wiring diagrams.

WARNING: DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (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 COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

(1) If the problem being diagnosed involves inoperative heated seat switch back lighting and the cluster illumination lamps operate, go to Step 2. If the problem being diagnosed involves inoperative heated seat switch back lighting and the cluster illumination lamps are also inoperative, refer to **Instrument Cluster** in the index of this service manual for the proper cluster illumination lamps diagnosis and testing procedures. If the problem being diagnosed involves inoperative heated seat switch indicator lamps and the heated seat elements do not heat, refer to Step 4. If the problem being diagnosed

PASSENGER SEAT HEATER SWITCH (Continued)

involves inoperative heated seat switch indicator lamps and the heated seat elements do heat, go to Step 8. If the problem being diagnosed involves a heated seat switch indicator lamp that remains illuminated after the heated seat has been turned Off, refer to **Heated Seat Module** in Electronic Control Modules for the location of the proper heated seat module diagnosis and testing procedures. Also refer to the Body Diagnostic Manual for additional diagnosis and testing procedures.

(2) Disconnect and isolate the battery negative cable. Remove the heated seat switch and bezel unit from the instrument panel. Disconnect the instrument panel wire harness connector from the connector receptacle on the back of the heated seat switch to be tested. Check for continuity between the ground circuit cavity of the instrument panel wire harness connector for the heated seat switch and a good ground. There should be continuity. If OK, go to Step 3. If not OK, repair the open ground circuit to ground as required.

(3) Reconnect the battery negative cable. Turn the park lamps on with the headlamp switch. Rotate the panel lamps dimmer thumbwheel on the headlamp switch upward to just before the interior lamps detent. Check for battery voltage at the fused panel lamps dimmer switch signal circuit cavity of the instrument panel wire harness connector for the heated seat switch. If OK, replace the faulty heated seat switch. If not OK, repair the open fused panel lamps dimmer switch signal circuit to the fuse in the Junction Block (JB) as required.

(4) Check the fused ignition switch output (run) fuse in the Junction Block (JB). If OK, go to Step 5. If not OK, repair the shorted circuit or component as required and replace the faulty fuse.

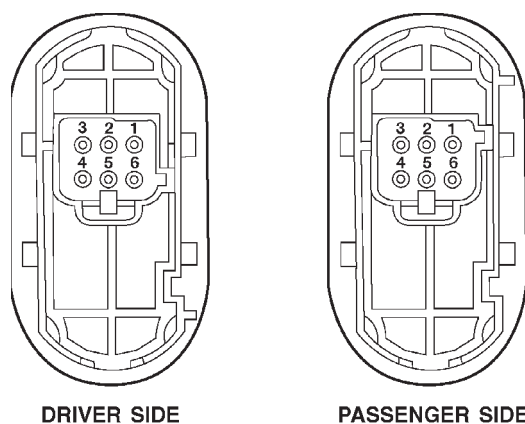
(5) Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output (run) fuse in the JB. If OK, go to Step 6. If not OK, repair the open fused ignition switch output (run) circuit to the ignition switch as required.

(6) Disconnect and isolate the battery negative cable. Remove the heated seat switch and bezel unit from the instrument panel. Disconnect the instrument panel wire harness connector from the connector receptacle on the back of the heated seat switch to be tested. Reconnect the battery negative cable. Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output (run) circuit cavity of the instrument panel wire harness connector for the heated seat switch. If OK, go to Step 7. If not OK, repair the open fused ignition switch output (run) circuit to the JB fuse as required.

(7) Check the continuity and resistance values of the heated seat switch in the Neutral, Low and High positions as shown in the Heated Seat Switch Conti-

nunity chart (Fig. 18). If OK, refer to **Heated Seat Module** in Electronic Control Modules for the location of the proper heated seat module diagnosis and testing procedures. Also refer to the Body Diagnostic Manual for additional diagnosis and testing procedures. If not OK, replace the faulty heated seat switch.

NOTE: ANY RESISTANCE VALUES (OHMS Ω) GIVEN IN THE FOLLOWING TEXT ARE SUPPLIED USING THE AUTOMATIC RANGE GENERATED BY A FLUKE® AUTOMOTIVE METER. IF ANOTHER TYPE OF MEASURING DEVICE IS USED THE VALUES GENERATED MAY NOT BE THE SAME AS THE RESULTS SHOWN HERE, OR MAY HAVE TO BE CONVERTED TO THE RANGE USED HERE.



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Fig. 18 Heated Seat Switch

Heated Seat Switch Continuity		
Switch Position	Continuity Between	Resistance
Neutral	4 & 6	2.2 Kilohms
Low	4 & 6	.415 Kilohms
High	4 & 6	33 Ohms

(8) Replace the inoperative heated seat switch with a known good unit and test the operation of the switch indicator lamps. If OK, discard the faulty heated seat switch. If not OK, refer to **Heated Seat Module** in Electronic Control Modules for the location of the proper heated seat module diagnosis and testing procedures. Also refer to the Body Diagnostic Manual for additional diagnosis and testing procedures.

REMOVAL

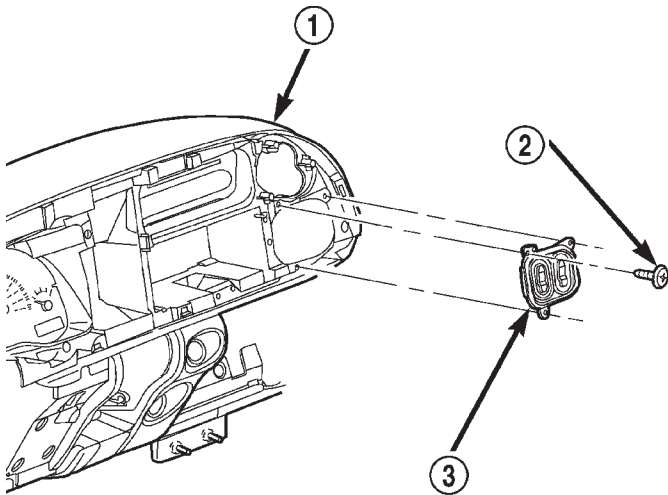
Both heated seat switches and the heated seat switch bezel are available individually for service replacement.

PASSENGER SEAT HEATER SWITCH (Continued)

(1) Disconnect and isolate the battery negative cable.

(2) Remove the cluster bezel from the instrument panel. Refer to **Cluster Bezel** in the index of this service manual for the location of the proper cluster bezel removal procedures.

(3) Remove the three screws that secure the heated seat switch bezel to the instrument panel (Fig. 19).



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Fig. 19 Heated Seat Switch and Bezel Remove/Install

1 - INSTRUMENT PANEL

2 - SCREW (3)

3 - HEATED SEAT SWITCHES AND BEZEL UNIT

(4) Pull the heated seat switch bezel out from the instrument panel far enough to access and disconnect the two instrument panel wire harness connectors from the connector receptacles on the backs of the heated seat switches.

(5) Remove the heated seat switch bezel and both switches from the instrument panel as a unit.

(6) From the back of the heated seat switch bezel, gently push the heated seat switch out through the front of the bezel.

INSTALLATION

Both heated seat switches and the heated seat switch bezel are available individually for service replacement.

NOTE: When installing the heated seat switches, be certain they are installed in the proper mounting holes of the heated seat switch bezel. Note that the driver side and passenger side switches are identical in appearance except for the keyway in the connector receptacle on the backs of the switches. The driver side switch has the keyway located near the bottom of the connector receptacle and should be installed in the left mounting hole of the heated seat switch bezel. The passenger side switch has the keyway located near the top of the connector receptacle and should be installed in the right mounting hole of the heated seat switch bezel.

(1) From the front of the heated seat switch bezel, align the back of the heated seat switch with the proper mounting hole in the heated seat switch bezel and gently push the switch into the bezel until it snaps into place.

(2) Position the heated seat switch bezel and both switches to the instrument panel as a unit.

(3) Reconnect the two instrument panel wire harness connectors to the connector receptacles on the backs of the heated seat switches.

(4) Position the heated seat switch bezel and both switches in the instrument panel mounting hole as a unit.

(5) Install and tighten the three screws that secure the heated seat switch bezel to the instrument panel. Tighten the screws to 2.2 N·m (20 in. lbs.).

(6) Install the cluster bezel onto the instrument panel. Refer to **Cluster Bezel** in the index of this service manual for the location of the proper cluster bezel installation procedures.

(7) Reconnect the battery negative cable.

