

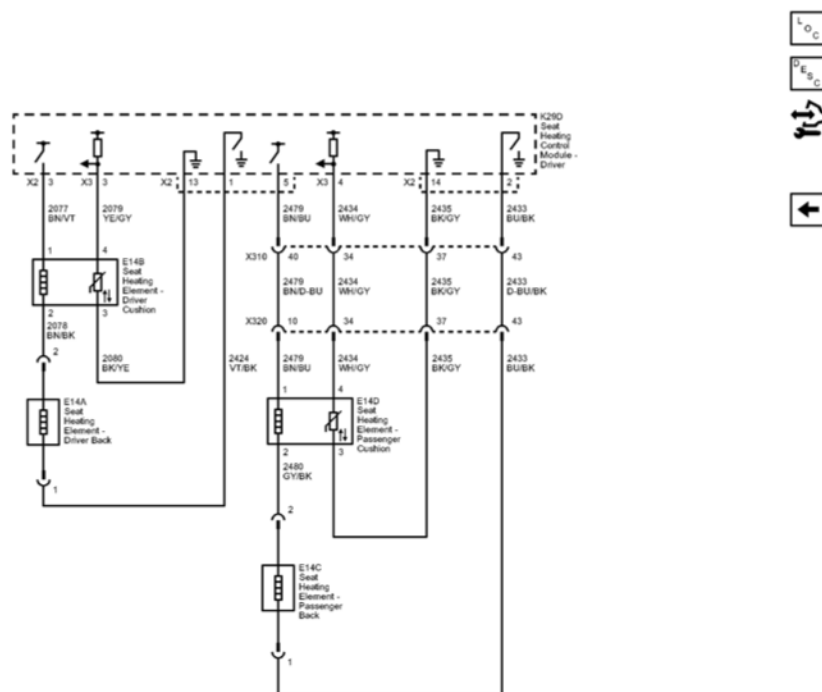


Fig. 3: Seat Heating (KA1 without A45) Wiring Schematics
 Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC B1925 or B2170 (With Memory A45)</u>	DTC B1925 02 Driver Seat Cushion Heater Sensor Circuit Short to Ground
	DTC B1925 05 Driver Seat Cushion Heater Sensor Circuit High Voltage/Open
	DTC B2170 02 Passenger Seat Cushion Heater Sensor Circuit Short to Ground
	DTC B2170 05 Passenger Seat Cushion Heater Sensor Circuit High Voltage/Open
<u>DTC B1925 or B2170 (Without Memory A45)</u>	DTC B1925 02 Driver Seat Cushion Heater Sensor Circuit Short to Ground
	DTC B1925 05 Driver Seat Cushion Heater Sensor Circuit High Voltage/Open
	DTC B2170 02 Passenger Seat Cushion Heater Sensor Circuit Short to Ground

	DTC B2170 05 Passenger Seat Cushion Heater Sensor Circuit High Voltage/Open
<u>DTC B2345 (With Memory A45)</u>	DTC B2345 13 Seat Heater Disable Circuit Low Voltage High/Temperature
<u>DTC B2345 (Without Memory A45)</u>	DTC B2345 13 Seat Heater Disable Circuit Low Voltage/High Temperature
<u>DTC B2425 or B2430 (With Memory A45)</u>	DTC B2425 0B Driver Seat Cushion Heater Circuit High Current DTC B2425 0D Driver Seat Cushion Heater Circuit High Resistance DTC B2425 0E Driver Seat Cushion Heater Circuit Low Resistance DTC B2430 0B Passenger Seat Cushion Heater Circuit High Current DTC B2430 0D Passenger Seat Cushion Heater Circuit High Resistance DTC B2430 0E Passenger Seat Cushion Heater Circuit Low Resistance
<u>DTC B2425 or B2430 (Without Memory A45)</u>	DTC B2425 0B Driver Seat Cushion Heater Circuit High Current DTC B2425 0D Driver Seat Cushion Heater Circuit High Resistance DTC B2425 0E Driver Seat Cushion Heater Circuit Low Resistance DTC B2430 0B Passenger Seat Cushion Heater Circuit High Current DTC B2430 0D Passenger Seat Cushion Heater Circuit High Resistance DTC B2430 0E Passenger Seat Cushion Heater Circuit Low Resistance
<u>DTC B242A (With Memory A45)</u>	DTC B242A 01 Seat Heaters Common Circuit Short to Battery DTC B242A 02 Seat Heaters Common Circuit Short to Ground
<u>DTC B242A (Without Memory A45)</u>	DTC B242A 01 Seat Heaters Common Circuit Short to Battery DTC B242A 02 Seat Heaters Common Circuit Short to Ground

DTC B1925 OR B2170 (WITH MEMORY A45)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B1925 02

Driver Seat Cushion Heater Sensor Circuit Short to Ground

DTC B1925 05

Driver Seat Cushion Heater Sensor Circuit High Voltage/Open

DTC B2170 02

Passenger Seat Cushion Heater Sensor Circuit Short to Ground

DTC B2170 05

Passenger Seat Cushion Heater Sensor Circuit High Voltage/Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Seat Memory Control Module B+ Terminal 5	B242A 02, B2425 0D, B2430 0D, 1, 2	B242A 02, B2425 0D, B2430 0D, 1, 2	-	-
Driver Heated Seat Element Control Terminal 11 X3	B242A 02	B2425 0D	B242A 01	B2425 0E
Driver Heated Seat Element Control Terminal 6 X3	B242A 02	B2425 0D	B242A 01	B2425 0E
Driver Heated Seat Temperature Sensor Signal	B1925 02	B1925 05	B1925 05	-
Driver Heated Seat Temperature Sensor Low Reference	-	B1925 05	-	-
Passenger Heated Seat Element Control Terminal 10 X3	B242A 02	B2430 0D	B242A 01	B2430 0E
Passenger Heated Seat Element Control Terminal 4 X3	B242A 02	B2430 0D	B242A 01	B2430 0E
Passenger Heated Seat Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	-
Passenger Heated Seat				

Temperature Sensor Low Reference	-	B2170 05	-	-
1. Power seats inoperative 2. Heated seats inoperative				

Circuit/System Description

The heated seat temperature sensor is located in the seat cushion just under the seat cover with the seat heating element. The seat memory control module supplies a 5 V reference voltage through the temperature sensor signal circuit and a ground through the low reference circuit to the sensor. The module monitors the voltage of the sensor signal circuit to determine the temperature of the seat. The temperature sensor varies in resistance based on the temperature of the heating element causing the signal voltage to change. Once the seat reaches the set temperature, the module will then cycle the control circuit of the heating elements ON and OFF in order to maintain the desired seat temperature based on the feedback voltage from the sensor.

Conditions for Running the DTC

- DTC B1325 must not be present.
- The seat memory control module must be powered.

Conditions for Setting the DTC

B1925 02 or B2170 02

The temperature sensor voltage drops below 0.6 V for more than 1 second.

B1925 05 or B2170 05

The temperature sensor voltage is greater than 5 V for more than 1 second.

Action Taken When the DTC Sets

The heated seat function for the affected seat will be disabled.

Conditions for Clearing the DTC

- The current DTC will clear and set the code to history 3 seconds after the reference voltage returns to normal operating range and the ignition is cycled OFF then back to ACC or RUN.
- The history DTC will clear after 40 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics

Connector End View Reference

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Heated Seats Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the appropriate E14B or E14D seat cushion heating element. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 ohms between the low reference circuit terminal 3 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF, disconnect the X3 harness connector at the K40 seat memory control module.
 2. Test for less than 2 ohms in the low reference circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K40 seat memory control module.
 - **If less than 10 ohms**
3. Ignition ON.
4. Test for 4.8-5.2 V between the signal circuit terminal 4 and ground.
 - **If less than 4.8 V**
 1. Ignition OFF, disconnect the X2 harness connector at the K40 seat memory control module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K40 seat memory control module.
 - **If greater than 5.2 V**
 1. Ignition OFF, disconnect the X2 harness connector at the K29 seat heating control module, ignition ON.

2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K40 seat memory control module.
 - **If between 4.8-5.2 V**

5. Test or replace the E14 seat cushion heating element.

Component Testing

Seat Cushion Heating Element

1. Ignition OFF, disconnect the harness connector at the appropriate E14B or E14D seat cushion heating element.
2. Test for 500 ohms-300 kohms between the signal circuit terminal 4 and the low reference circuit terminal 3.
 - **If not between 500 ohms-300 kohms**

Replace the E14 seat cushion heating element.
 - **If between 500 ohms-300 kohms**
3. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Driver or Passenger Seat Back Cushion Heater Replacement**
- **Driver or Passenger Seat Cushion Heater Replacement**
- **Control Module References** for seat memory control module replacement, programming and setup

DTC B1925 OR B2170 (WITHOUT MEMORY A45)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B1925 02

Driver Seat Cushion Heater Sensor Circuit Short to Ground

DTC B1925 05

Driver Seat Cushion Heater Sensor Circuit High Voltage/Open

DTC B2170 02

Passenger Seat Cushion Heater Sensor Circuit Short to Ground

DTC B2170 05

Passenger Seat Cushion Heater Sensor Circuit High Voltage/Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Driver Heated Seat Element Control Terminal 3 X2	B242A 02	B2425 0D	B242A 01	B2425 0E
Driver Heated Seat Element Control Terminal 1 X2	B242A 02	B2425 0D	B242A 01	B2425 0E
Driver Heated Seat Temperature Sensor Signal	B1925 02	B1925 05	B1925 05	-
Driver Heated Seat Temperature Sensor Low Reference	-	B1925 05	-	-
Passenger Heated Seat Element Control Terminal 5 X2	B242A 02	B2430 0D	B242A 01	B2430 0E
Passenger Heated Seat Element Control Terminal 2 X2	B242A 02	B2430 0D	B242A 01	B2430 0E
Passenger Heated Seat Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	-
Passenger Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	-

Circuit/System Description

The heated seat temperature sensor is located in the seat cushion just under the seat cover with the seat heating element. The seat heating control module supplies a 5 V reference voltage through the temperature sensor signal circuit and a ground through the low reference circuit to the sensor. The module monitors the voltage of the sensor signal circuit to determine the temperature of the seat. The temperature sensor varies in resistance based on the temperature of the heating element causing the signal voltage to change. Once the seat reaches the set temperature, the module will then cycle the control circuit of the heating elements ON and OFF in order to maintain the desired seat temperature based on the feedback voltage from the sensor.

Conditions for Running the DTC

- DTC B1325 must not be present.
- The seat heating control module must be powered.

Conditions for Setting the DTC

B1925 02 or B2170 02

The temperature sensor voltage drops below 0.6 V for more than 1 second.

B1925 05 or B2170 05

The temperature sensor voltage is greater than 5 V for more than 1 second.

Action Taken When the DTC Sets

The heated seat function for the affected seat will be disabled.

Conditions for Clearing the DTC

- The current DTC will clear and set the code to history 3 seconds after the reference voltage returns to normal operating range and the ignition is cycled OFF then back to ACC or RUN.
- The history DTC will clear after 40 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics

Connector End View Reference

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Description and Operation

Heated Seats Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the appropriate E14B or E14D seat cushion heating element. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 ohms between the low reference circuit terminal 3 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF, disconnect the X2 harness connector at the K29 seat heating control module.
 2. Test for less than 2 ohms in the low reference circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K29 seat heating control module.
 - **If less than 10 ohms**
3. Ignition ON.
4. Test for 4.8-5.2 V between the signal circuit terminal 4 and ground.
 - **If less than 4.8 V**
 1. Ignition OFF, disconnect the X3 harness connector at the K29 seat heating control module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K29 seat heating control module.
 - **If greater than 5.2 V**
 1. Ignition OFF, disconnect the X3 harness connector at the K29 seat heating control module, ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K29 seat heating control module.
 - **If between 4.8-5.2 V**
5. Test or replace the E14 seat cushion heating element.

Component Testing

Seat Cushion Heating Element

1. Ignition OFF, disconnect the harness connector at the appropriate E14B or E14D seat cushion heating element.
2. Test for 500 ohms-300 kohms between the signal circuit terminal 4 and the low reference circuit terminal 3.
 - **If not between 500 ohms-300 kohms**

Replace the E14 seat cushion heating element.
 - **If between 500 ohms-300 kohms**

3. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Driver or Passenger Seat Back Cushion Heater Replacement**
- **Driver or Passenger Seat Cushion Heater Replacement**
- **Control Module References** for seat heating control module replacement, programming and setup

DTC B2345 (WITH MEMORY A45)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B2345 13

Seat Heater Disable Circuit Low Voltage High/Temperature

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Seat Memory Control Module B+ Terminal 5 X4	B242A 02, B2425 0D, B2430 0D, 1, 2	B242A 02, B2425 0D, B2430 0D, 1, 2	-	-
Driver Heated Seat Element Control Terminal 11 X3	B242A 02	B2425 0D	B242A 01	B2425 0E
Driver Heated Seat Element Control Terminal 6 X3	B242A 02	B2425 0D	B242A 01	B2425 0E
Driver Heated Seat Temperature Sensor Signal	B1925 02	B1925 05	B1925 05	B2345 13
Driver Heated Seat Temperature Sensor Low Reference	-	B1925 05	-	B2345 13
Passenger Heated Seat Element Control Terminal 10 X3	B242A 02	B2430 0D	B242A 01	B2430 0E
Passenger Heated Seat Element Control Terminal 4 X3	B242A 02	B2430 0D	B242A 01	B2430 0E
Passenger Heated Seat Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	B2345 13

Passenger Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	B2345 13
1. Power seats inoperative 2. Heated seats inoperative				

Circuit/System Description

The seat memory control module controls seat heating operation for both the driver and front passenger seats. The heating elements are controlled through individual high side and low side control circuits. The low side control circuits for both seats are connected to a common reference point internal to the module. This reference point is biased to approximately 2.5 V. Before the seat memory control module will allow heated seat operation, it checks to see if this biased voltage is shorted to ground or voltage. Once the module verifies that it is not closing to a shorted heating element, it allows for heated seat operation. The module will then continue to monitor the heating elements for a shorted circuit.

Conditions for Running the DTC

The seat memory control module must be powered.

Conditions for Setting the DTC

B2345 13

Any temperature sensor input that remains below 1.5 V for more than 1 second.

Action Taken When the DTC Sets

The heated seat function for both front seats will be disabled.

Conditions for Clearing the DTC

- The current DTC will clear and set the code to history 3 seconds after the reference voltage returns to the normal operating range and the ignition is cycled OFF then back to ACC or RUN.
- The history DTC will clear after 40 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics

Connector End View Reference

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Description and Operation

Heated Seats Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the X2 and X3 harness connectors at the K40 seat memory control module.
2. Test for greater than 3.0 kohms between the signal and the low reference circuits listed below:
 - E14B driver seat cushion terminal 16 X2 and terminal 12 X3
 - E14D passenger seat cushion terminal 7 X2 and terminal 1 X3
 - **If less than 3.0 kohms**
 1. Ignition OFF, disconnect the harness connector at the appropriate E14B or E14D seat cushion heating element.
 2. Test for Infinite resistance between the signal and low reference circuits.
 - If less than infinite resistance, repair the short between the circuits.
 - If infinite resistance, test or replace the E14 seat cushion heating element.
 - **If greater than 3.0 kohms**
3. Replace the K40 seat memory control module.

Component Testing

Seat Cushion Heating Element

1. Ignition OFF, disconnect the harness connector at the appropriate E14B or E14D seat cushion heating element.
2. Test for 500 ohms-300 kohms between the signal circuit terminal 4 and the low reference circuit terminal 3.
 - **If not between 500 ohms-300 kohms**

Replace the E14 seat cushion heating element.
 - **If between 500 ohms-300 kohms**
3. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Driver or Passenger Seat Cushion Heater Replacement**
- **Control Module References** for seat memory control module replacement, programming and setup

DTC B2345 (WITHOUT MEMORY A45)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B2345 13

Seat Heater Disable Circuit Low Voltage/High Temperature

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Driver Heated Seat Element Control Terminal 3 X2	B242A 02	B2425 0D	B242A 01	B2425 0B, B2425 0E
Driver Heated Seat Element Control Terminal 1 X2	B242A 02	B2425 0D	B242A 01	B2425 0B, B2425 0E
Driver Heated Seat Cushion Temperature Sensor Signal	B1925 02	B1925 05	B1925 05	B2345 13
Driver Heated Seat Cushion Temperature Sensor Low Reference	-	B1925 05	-	B2345 13
Passenger Heated Seat Element Control Terminal 5 X2	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Passenger Heated Seat Element Control Terminal 2 X2	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Passenger Heated Seat Cushion Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	B2345 13

Passenger Heated Seat Cushion Temperature Sensor Low Reference	-	B2170 05	-	B2345 13
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Circuit/System Description

The seat heating control module controls seat heating operation for the driver and front passenger seats. The heating elements are controlled through individual high side and low side control circuits. The low side control circuits for both seats are connected to a common reference point internal to the module. This reference point is biased to approximately 2.5 V. Before the seat heating control module will allow heated seat operation, it checks to see if this biased voltage is shorted to ground or voltage. Once the module verifies that it is not closing to a shorted heating element, it allows for heated seat operation. The module will then continue to monitor the heating elements for a shorted circuit.

Conditions for Running the DTC

- The ignition must be ON.
- The seat heating control module must be powered.

Conditions for Setting the DTC

Any temperature sensor input that remains below 1.5 V for more than 1 second.

Action Taken When the DTC Sets

The heated seat function for both seats will be disabled.

Conditions for Clearing the DTC

- The current DTC will clear and set the code to history 3 seconds after the reference voltage returns to the normal operating range and the ignition is cycled OFF then back to ACC or RUN.
- The history DTC will clear after 40 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics

Connector End View Reference

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- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the X2 and X3 harness connectors at the K29 seat heating control module.
2. Test for greater than 3.0 kohms between the signal and the low reference circuit terminals listed below:
 - Driver seat cushion terminal 3 X3 and terminal 13 X2
 - Passenger seat cushion terminal 4 X3 and terminal 14 X2
 - **If less than 3.0 kohms**
 1. Ignition OFF, disconnect the harness connector at the appropriate E14B or E14D seat cushion heating element.
 2. Test for Infinite resistance between the signal and low reference circuits.
 - If less than infinite resistance, repair the short between the circuits.
 - If infinite resistance, test or replace the E14 seat cushion heating element.
 - **If greater than 3.0 kohms**
3. Replace the K29 seat heating control module.

Component Testing

Seat Cushion Heating Element

1. Ignition OFF, disconnect the harness connector at the appropriate E14B or E14D seat cushion heating element.
2. Test for 500 ohms-300 kohms between the signal circuit terminal 4 and the low reference circuit terminal 3.
 - **If not between 500 ohms-300 kohms**

Replace the E14 seat cushion heating element.
 - **If between 500 ohms-300 kohms**
3. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Driver or Passenger Seat Cushion Heater Replacement**
- **Control Module References** for seat heating control module replacement, programming and setup

DTC B2425 OR B2430 (WITH MEMORY A45)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B2425 0B

Driver Seat Cushion Heater Circuit High Current

DTC B2425 0D

Driver Seat Cushion Heater Circuit High Resistance

DTC B2425 0E

Driver Seat Cushion Heater Circuit Low Resistance

DTC B2430 0B

Passenger Seat Cushion Heater Circuit High Current

DTC B2430 0D

Passenger Seat Cushion Heater Circuit High Resistance

DTC B2430 0E

Passenger Seat Cushion Heater Circuit Low Resistance

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Seat Memory Control Module B+ Terminal 5 X4	B242A 02, B2425 0D, B2430 0D, 1, 2	B242A 02, B2425 0D, B2430 0D, 1, 2	-	-

Driver Heated Seat Element Control Terminal 11 X3	B242A 02	B2425 0D	B242A 01	B2425 0B, B2425 0E
Driver Heated Seat Element Control Terminal 6 X3	B242A 02	B2425 0D	B242A 01	B2425 0B, B2425 0E
Driver Heated Seat Temperature Sensor Signal	B1925 02	B1925 05	B1925 05	-
Driver Heated Seat Temperature Sensor Low Reference	-	B1925 05	-	-
Passenger Heated Seat Element Control Terminal 10 X3	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Passenger Heated Seat Element Control Terminal 4 X3	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Passenger Heated Seat Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	-
Passenger Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	-
1. Power seats inoperative 2. Heated seats inoperative				

Circuit/System Description

The driver and front passenger heated seats are controlled by the seat memory control module that is located under the driver seat cushion. When the heated seat is active, the module applies power through a common voltage supply circuit to the seat heater elements. The module controls the seat temperature by providing a pulse width modulation (PWM) ground through the seat heater element control circuit to the heater elements. The module then monitors the current flow through the heating elements and the rate of change of the temperature sensor to verify correct heated seat operation.

Conditions for Running the DTC

- DTC B1325 must not be present.
- The engine must be ON.
- The seat memory control module must be powered and the heated seat must be enabled.

Conditions for Setting the DTC

B2425 0D or B2430 0D

By measuring current and voltage output to the seat heating elements every 10 seconds, the seat memory control module calculates that the heating element resistance is above the maximum resistance.

B2425 0B, B2425 0E, B2430 0B, or B2430 0E

By measuring current and voltage output to the seat heating elements every 10 seconds, the seat memory control module calculates that the heating element resistance is below the minimum resistance.

Action Taken When the DTC Sets

The heated seat function for the affected seat will be disabled.

Conditions for Clearing the DTC

- The current DTC clears when the malfunction is no longer present, and the power mode changes to OFF then back to ACC or RUN.
- The history DTC will clear after 40 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics

Connector End View Reference

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Description and Operation

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Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

B2425 0B, B2425 0D, or B2425 0E

1. Ignition OFF, disconnect the X4 harness connector at the K40 seat memory control module, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 5 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the B+ circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.

- If less than 2 ohms, verify the fuse is not open and there is voltage at the circuit breaker.
- **If the test lamp illuminates**
- 3. Ignition OFF, connect the X4 harness connector at the K40 seat memory control module and disconnect the harness connector at the E14A seat back heating element.

NOTE: **Element resistance must be measured twice to ensure that all failure conditions are simulated. First with the seat unoccupied, then with the seat occupied.**

- 4. Test for 0.5-2 ohms between control circuit terminal 2 and control circuit terminal 3.

- **If not between 0.5-2 ohms**

Replace the E14A seat back heating element.

- **If between 0.5-2 ohms**

- 5. Connect the harness connector at the E14A seat back heating element and disconnect the X3 harness connector at the K40 seat memory control module.
- 6. Test for 1-5 ohms between control circuit terminal 11 and control circuit terminal 6.

- **If less than 1 ohms**

- 1. Ignition OFF, disconnect the harness connector at the E14B seat cushion heating element.
- 2. Test for infinite resistance between the control circuits.
 - If less than infinite resistance, repair the short between the circuits.
 - If infinite resistance, test or replace the E14B seat cushion heating element

- **If greater than 5 ohms**

- 1. Ignition OFF, disconnect the harness connector at the E14B seat cushion heating element.
- 2. Test for less than 2 ohms in the control circuits end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, test or replace the E14B seat cushion heating element.

- **If between 1-5 ohms**

- 7. Replace the K40 seat memory control module.

B2430 0B, B2430 0D, or B2430 0E

- 1. Ignition OFF, disconnect the X4 harness connector at the K40 seat memory control module, ignition ON.
- 2. Verify a test lamp illuminates between the B+ circuit terminal 5 and ground.
 - **If the test lamp does not illuminate**
 - 1. Ignition OFF.
 - 2. Test for less than 2 ohms in the B+ circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, verify the fuse is not open and there is voltage at the circuit breaker.
 - **If the test lamp illuminates**

3. Ignition OFF, connect the X4 harness connector at the K40 seat memory control module and disconnect the harness connector at the E14C seat back heating element.

NOTE: Element resistance must be measured twice to ensure that all failure conditions are simulated. First with the seat unoccupied, then with the seat occupied.

4. Test for 0.5-2 ohms between control circuit terminal 2 and control circuit terminal 3.

- **If not between 0.5-2 ohms**

Replace the E14C seat back heating element.

- **If between 0.5-2 ohms**

5. Connect the harness connector at the E14C seat back heating element and disconnect the X3 harness connector at the K40 seat memory control module.

6. Test for 1-5 ohms between control circuit terminal 10 and control circuit terminal 4.

- **If less than 1 ohms**

1. Ignition OFF, disconnect the harness connector at the E14D seat cushion heating element.

2. Test for infinite resistance between the control circuits.

- If less than infinite resistance, repair the short between the circuits.

- If infinite resistance, test or replace the E14D seat cushion heating element.

- **If greater than 5 ohms**

1. Ignition OFF, disconnect the harness connector at the E14D seat cushion heating element.

2. Test for less than 2 ohms in the control circuits end to end.

- If 2 ohms or greater, repair the open/high resistance in the circuit.

- If less than 2 ohms, test or replace the E14D seat cushion heating element.

- **If between 1-5 ohms**

7. Replace the K40 seat memory control module.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Driver or Passenger Seat Back Cushion Heater Replacement**
- **Driver or Passenger Seat Cushion Heater Replacement**
- **Control Module References** for seat memory control module replacement, programming and setup

DTC B2425 OR B2430 (WITHOUT MEMORY A45)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.

- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B2425 0B

Driver Seat Cushion Heater Circuit High Current

DTC B2425 0D

Driver Seat Cushion Heater Circuit High Resistance

DTC B2425 0E

Driver Seat Cushion Heater Circuit Low Resistance

DTC B2430 0B

Passenger Seat Cushion Heater Circuit High Current

DTC B2430 0D

Passenger Seat Cushion Heater Circuit High Resistance

DTC B2430 0E

Passenger Seat Cushion Heater Circuit Low Resistance

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Driver Heated Seat Element Control Terminal 3 X2	B242A 02	B2425 0D	B242A 01	B2425 0B, B2425 0E
Driver Heated Seat Element Control Terminal 1 X2	B242A 02	B2425 0D	B242A 01	B2425 0B, B2425 0E
Driver Heated Seat Temperature Sensor Signal	B1925 02	B1925 05	B1925 05	-
Driver Heated Seat Temperature Sensor Low Reference	-	B1925 05	-	-
Passenger Heated Seat Element Control Terminal 5 X2	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Passenger Heated Seat Element Control Terminal 2 X2	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Passenger Heated Seat Temperature				

Sensor Signal	B2170 02	B2170 05	B2170 05	-
Passenger Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	-

Circuit/System Description

The driver and front passenger heated seats are controlled by the seat heating control module that is located under the driver seat cushion. When the heated seat is active, the module applies power through a common voltage supply circuit to the seat heater elements. The module controls the seat temperature by providing a pulse width modulation (PWM) ground through the seat heater element control circuit to the heater elements. The module then monitors the current flow through the heating elements and the rate of change of the temperature sensor to verify correct heated seat operation.

Conditions for Running the DTC

- DTC B1325 must not be present.
- The engine must be ON
- The seat heating control module must be powered and the heated seat must be enabled.

Conditions for Setting the DTC

B2425 0D or B2430 0D

By measuring current and voltage output to the seat heating elements every 10 seconds, the seat heating control module calculates that the heating element resistance is above the maximum resistance.

B2425 0B, B2425 0E, B2430 0B, or B2430 0E

By measuring current and voltage output to the seat heating elements every 10 seconds, the seat heating control module calculates that the heating element resistance is below the minimum resistance.

Action Taken When the DTC Sets

The heated seat function for the affected seat will be disabled.

Conditions for Clearing the DTC

- The current DTC clears when the malfunction is no longer present, and the power mode changes to OFF then back to ACC or RUN.
- The history DTC will clear after 40 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Heated Seats Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

B2425 0B, B2425 0D, or B2425 0E

1. Ignition OFF, disconnect the harness connector at the E14A seat back heating element.

NOTE: **Element resistance must be measured twice to ensure that all failure conditions are simulated. First with the seat unoccupied, then with the seat occupied.**

2. Test for 0.5-2 ohms between control circuit terminal 2 and control circuit terminal 3.
 - **If not between 0.5-2 ohms**

Replace the E14A seat back heating element.

- **If between 0.5-2 ohms**

3. Connect the harness connector at the E14A seat back heating element and disconnect the X2 harness connector at the K29 seat heating control module.

NOTE: **Element resistance must be measured twice to ensure that all failure conditions are simulated. First with the seat unoccupied, then with the seat occupied.**

4. Test for 1-5 ohms between control circuit terminal 3 and control circuit terminal 1.
 - **If less than 1 ohms**

1. Ignition OFF, disconnect the harness connector at the E14B seat cushion heating element.

2. Test for infinite resistance between the control circuits.
 - If less than infinite resistance, repair the short between the circuits.
 - If infinite resistance, test or replace the E14B seat cushion heating element.
 - **If greater than 5 ohms**
1. Ignition OFF, disconnect the harness connector at the E14B seat cushion heating element.
2. Test for less than 2 ohms between the control circuits end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, test or replace the E14B seat cushion heating element.
 - **If between 1-5 ohms**
5. Replace the K29 seat heating control module.

B2430 0B, B2430 0D, or B2430 0E

1. Ignition OFF, disconnect the harness connector at the E14C seat back heating element.

NOTE: **Element resistance must be measured twice to ensure that all failure conditions are simulated. First with the seat unoccupied, then with the seat occupied.**

2. Test for 0.5-2 ohms between control circuit terminal 2 and control circuit terminal 3.
 - **If not between 0.5-2 ohms**

Replace the E14C seat back heating element.

- **If between 0.5-2 ohms**
3. Connect the harness connector at the E14C seat back heating element and disconnect the X2 harness connector at the K29 seat heating control module.

NOTE: **Element resistance must be measured twice to ensure that all failure conditions are simulated. First with the seat unoccupied, then with the seat occupied.**

4. Test for 1-5 ohms between control circuit terminal 5 and control circuit terminal 2.
 - **If less than 1 ohms**
1. Ignition OFF, disconnect the harness connector at the E14D seat cushion heating element.
2. Test for infinite resistance between the control circuits.
 - If less than infinite resistance, repair the short between the circuits.
 - If infinite resistance, test or replace the E14D seat cushion heating element.
 - **If greater than 5 ohms**
1. Ignition OFF, disconnect the harness connector at the E14D seat cushion heating element.
2. Test for less than 2 ohms between the control circuits end to end.

- If 2 ohms or greater, repair the open/high resistance in the circuit.
- If less than 2 ohms, test or replace the E14D seat cushion heating element.

○ **If between 1-5 ohms**

5. Replace the K29 seat heating control module.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Driver or Passenger Seat Back Cushion Heater Replacement**
- **Driver or Passenger Seat Cushion Heater Replacement**
- **Control Module References** for seat heating control module replacement, programming and setup

DTC B242A (WITH MEMORY A45)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B242A 01

Seat Heaters Common Circuit Short to Battery

DTC B242A 02

Seat Heaters Common Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Seat Memory Control Module B+ Terminal 5 X4	B242A 02, B2425 0D, B2430 0D, 1, 2	B242A 02, B2425 0D, B2430 0D, 1, 2	-	-
Driver Heated Seat Element Control Terminal 11 X3	B242A 02	B2425 0D	B242A 01	B2425 0E
Driver Heated Seat Element Control Terminal 6 X3	B242A 02	B2425 0D	B242A 01	B2425 0E
Driver Heated Seat Temperature Sensor Signal	B1925 02	B1925 05	B1925 05	-
Driver Heated Seat Temperature				

Sensor Low Reference	-	B1925 05	-	-
Passenger Heated Seat Element Control Terminal 10 X3	B242A 02	B2430 0D	B242A 01	B2430 0E
Passenger Heated Seat Element Control Terminal 4 X3	B242A 02	B2430 0D	B242A 01	B2430 0E
Passenger Heated Seat Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	-
Passenger Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	-
1. Power seats inoperative 2. Heated seats inoperative				

Circuit/System Description

The seat memory control module controls seat heating operation for both the driver and front passenger seats. The heating elements are controlled through individual high side and low side control circuits. The low side control circuits for both seats are connected to a common reference point internal to the module. This reference point is biased to approximately 2.5 V. Before the seat heating control module will allow heated seat operation, it checks to see if this biased voltage is shorted to ground or voltage. Once the module verifies that it is not closing to a shorted heating element, it allows for heated seat operation. The module will then continue to monitor the heating elements for a shorted circuit.

Conditions for Running the DTC

- DTC B1325 must not be present.
- The seat memory control module must be powered.

Conditions for Setting the DTC

B242A 01

The seat memory control module detects a short to voltage on the heater element control circuits.

B242A 02

The seat memory control module detects a short to ground on the heater element control circuits.

Action Taken When the DTC Sets

The heated seat function for both seats will be disabled.

Conditions for Clearing the DTC

- The current DTC will clear and set a history code 3 seconds after the reference voltage returns to normal operating range and the ignition is cycled OFF then back to ACC or RUN.
- The history DTC will clear after 40 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Heated Seats Description and Operation

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the X4 harness connector at the K40 seat memory control module, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 5 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the B+ circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, verify the fuse is not open and there is voltage at the circuit breaker.
 - **If the test lamp illuminates**
3. Ignition OFF, connect the X4 harness connector at the K40 seat memory control module and disconnect the X3 harness connector at the K40 seat memory control module.
4. Test for infinite resistance between the control circuit terminals listed below and ground:
 - Terminal 11
 - Terminal 10
 - **If less than infinite resistance**

Repair the short to ground on the circuit.

- **If infinite resistance**

5. Ignition ON.

6. Test for less than 1 V between the control circuit terminals listed below and ground:

- Terminal 11
- Terminal 10

- **If 1 V or greater**

Repair the short to voltage on the circuit.

- **If less than 1 V**

7. Replace the K40 seat memory control module.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

Control Module References for seat memory control module replacement, programming and setup

DTC B242A (WITHOUT MEMORY A45)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B242A 01

Seat Heaters Common Circuit Short to Battery

DTC B242A 02

Seat Heaters Common Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Driver Heated Seat Element Control Terminal 3 X2	B242A 02	B2425 0D	B242A 01	B2425 0E
Driver Heated Seat Element Control Terminal 1 X2	B242A 02	B2425 0D	B242A 01	B2425 0E
Driver Heated Seat Temperature				

Sensor Signal	B1925 02	B1925 05	B1925 05	-
Driver Heated Seat Temperature Sensor Low Reference	-	B1925 05	-	-
Passenger Heated Seat Element Control Terminal 5 X2	B242A 02	B2430 0D	B242A 01	B2430 0E
Passenger Heated Seat Element Control Terminal 2 X2	B242A 02	B2430 0D	B242A 01	B2430 0E
Passenger Heated Seat Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	-
Passenger Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	-

Circuit/System Description

The seat heating control module controls seat heating operation for both the driver and front passenger seats. The heating elements are controlled through individual high side and low side control circuits. The low side control circuits for both seats are connected to a common reference point internal to the module. This reference point is biased to approximately 2.5 V. Before the seat heating control module will allow heated seat operation, it checks to see if this biased voltage is shorted to ground or voltage. Once the module verifies that it is not closing to a shorted heating element, it allows for heated seat operation. The module will then continue to monitor the heating elements for a shorted circuit.

Conditions for Running the DTC

- DTC B1325 must not be present.
- The seat heating control module must be powered.

Conditions for Setting the DTC

B242A 01

The seat heating control module detects a short to voltage on the heater element control circuits.

B242A 02

The seat heating control module detects a short to ground on the heater element control circuits.

Action Taken When the DTC Sets

The heated seat function for both seats will be disabled.

Conditions for Clearing the DTC

- The current DTC will clear and set a history code 3 seconds after the reference voltage returns to normal operating range and the ignition is cycled OFF then back to ACC or RUN.
- The history DTC will clear after 40 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Heated Seats Description and Operation

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the X2 harness connector at the K29 seat heating control module.
2. Test for infinite resistance between the control circuit terminals listed below and ground:
 - Terminal 3
 - Terminal 5
 - **If less than infinite resistance**

Repair the short to ground on the circuit.

- **If infinite resistance**

3. Ignition ON.
4. Test for less than 1 V between the control circuit terminals listed below and ground:
 - Terminal 3
 - Terminal 5
 - **If 1 V or greater**

Repair the short to voltage on the circuit.

- If less than 1 V

5. Replace the K29 seat heating control module.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

Control Module References for seat heating control module replacement, programming and setup

SYMPTOMS - SEAT HEATING AND COOLING

NOTE: The following steps must be completed before using the symptom tables.

1. When diagnosing a heated seat system condition perform the **Diagnostic System Check - Vehicle** , before using the symptom tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The control module(s) can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to **Heated Seats Description and Operation**.

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the power seats. Refer to **Checking Aftermarket Accessories** .
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.
- Inspect the seat adjuster track for conditions which may cause binding or objects within the seat adjustment range which obstruct movement or interfere with wiring.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to **Testing for Intermittent Conditions and Poor Connections** .

Symptom List

Refer to the **Front Heated Seat Malfunction (Without Memory A45)**, **Front Heated Seat Malfunction (With Memory A45)** diagnostic procedure in order to diagnose the symptom.

FRONT HEATED SEAT MALFUNCTION (WITHOUT MEMORY A45)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.

- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Driver Heated Seat Element Control Terminal 3 X2	B242A 02	B2425 0D	B242A 01	B2425 0B, B2425 0E
Driver Heated Seat Element Control Terminal 1 X2	B242A 02	B2425 0D	B242A 01	B2425 0B, B2425 0E
Driver Heated Seat Temperature Sensor Signal	B1925 02	B1925 05	B1925 05	-
Driver Heated Seat Temperature Sensor Low Reference	-	B1925 05	-	-
Passenger Heated Seat Element Control Terminal 5 X2	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Passenger Heated Seat Element Control Terminal 2 X2	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Passenger Heated Seat Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	-
Passenger Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	-

Circuit/System Description

The driver and front passenger heated seats are controlled by separate heated seat switches that are located in the HVAC controls. When a heated seat switch is pressed; a serial data message is sent from the HVAC controls to the HVAC control module indicating the heated seat command. The HVAC control module then serves as a gateway to transmit the message to seat heating control module via the serial data line. In response to this message, the seat heating control module applies battery positive voltage through the element supply voltage circuit to the appropriate seat heating elements. The seat heating control module then sends a serial data message back to the HVAC control module to gateway the information to the HVAC controls to either illuminate or turn off the appropriate temperature indicator.

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Heated Seats Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify that no heated seat DTCs are set.
 - **If any heated seat DTC is set**

Refer to **Diagnostic Trouble Code (DTC) List - Vehicle**
 - **If no heated seat DTCs are set**
3. Verify the scan tool Front Seat Heating Control Module Driver Seat Heating/Venting/Cooling Mode parameter changes between Off and Back & Cushion Heat after pressing the driver heated seat switch.
 - **If the parameter does not change**

Replace the A26 HVAC controls.
 - **If the parameter changes**
4. Verify the scan tool Passenger Front Seat Heating/Venting/Cooling Mode Switch parameter changes between Off and Back & Cushion Heat after pressing the passenger heated seat switch.
 - **If the parameter does not change**

Replace the A26 HVAC controls.
 - **If the parameter changes**
5. Replace the K29 seat heating control module.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Heater and Air Conditioning Control Replacement**
- **Control Module References** for seat heating control module replacement, programming and setup

FRONT HEATED SEAT MALFUNCTION (WITH MEMORY A45)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Seat Memory Control Module B+ Terminal 5 X4	B242A 02, B2425 0D, B2430 0D, 1, 2	B242A 02, B2425 0D, B2430 0D, 1, 2	-	-
Driver Heated Seat Element Control Terminal 11 X3	B242A 02	B2425 0D	B242A 01	B2425 0B, B2425 0E
Driver Heated Seat Element Control Terminal 6 X3	B242A 02	B2425 0D	B242A 01	B2425 0B, B2425 0E
Driver Heated Seat Temperature Sensor Signal	B1925 02	B1925 05	B1925 05	-
Driver Heated Seat Temperature Sensor Low Reference	-	B1925 05	-	-
Passenger Heated Seat Element Control Terminal 10 X3	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Passenger Heated Seat Element Control Terminal 4 X3	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Passenger Heated Seat Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	-
Passenger Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	-
1. Power seats inoperative 2. Heated seats inoperative				

Circuit/System Description

The driver and front passenger heated seats are controlled by separate heated seat switches that are located in the HVAC controls. When a heated seat switch is pressed, a serial message is sent from the HVAC controls to the HVAC control module indicating the heated seat command. The HVAC control module then serves as a gateway to transmit the message to the seat memory control module via the serial data line. In response to this message, the seat memory control module applies battery positive voltage through the element supply voltage circuit to the appropriate seat heating elements. The seat memory control module then sends a serial data message back to the HVAC control module to gateway the information to the HVAC controls to either illuminate or turn off the appropriate temperature indicator.

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Heated Seats Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify that no heated seat DTCs are set.
 - **If any heated seat DTC is set**

Refer to **Diagnostic Trouble Code (DTC) List - Vehicle**

- **If no heated seat DTCs are set**
3. Refer to Circuit/System Testing below.

Circuit/System Testing

1. Ignition OFF, disconnect the X4 harness connector at the K40 seat memory control module, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 5 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the B+ circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp illuminates**

3. Ignition OFF, connect the X4 harness connector at the K40 seat memory control module, ignition ON,
4. Ignition ON.
5. Verify the scan tool Seat Memory Control Module Driver Seat Heating/Venting/Cooling Mode parameter changes between Off and Back & Cushion Heat after pressing the driver heated seat switch.
 - **If the parameter does not change**
Replace the A26 HVAC controls.
 - **If the parameter changes**
6. Verify the scan tool Passenger Front Seat Heating/Venting/Cooling Mode parameter changes between Off and Back & Cushion Heat after pressing the passenger heated seat switch.
 - **If the parameter does not change**
Replace the A26 HVAC controls.
 - **If the parameter changes**
7. Replace the K40 seat memory control module.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Heater and Air Conditioning Control Replacement**
- **Control Module References** for seat memory control module replacement, programming and setup

REPAIR INSTRUCTIONS

FRONT SEAT HEATER CONTROL MODULE REPLACEMENT

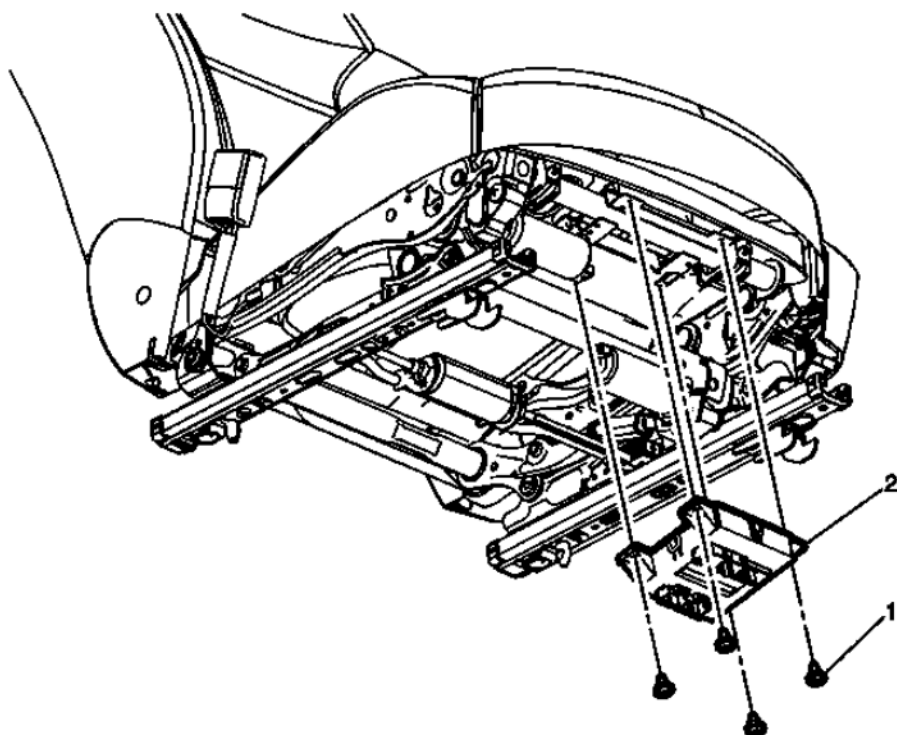


Fig. 4: Front Seat Heater Control Module
 Courtesy of GENERAL MOTORS COMPANY

Front Seat Heater Control Module Replacement

Callout	Component Name
1	Front Seat Heater Control Module Fastener (Qty: 4) CAUTION: Refer to <u>Fastener Caution</u> .
2	Front Seat Heater Control Module Procedure 1. Disconnect the electrical connector. 2. Disconnect the module from the bracket, then pull downward away from the bottom of the seat. 3. Refer to <u>Control Module References</u> for programming and setup information.

DRIVER OR PASSENGER SEAT BACK CUSHION HEATER REPLACEMENT

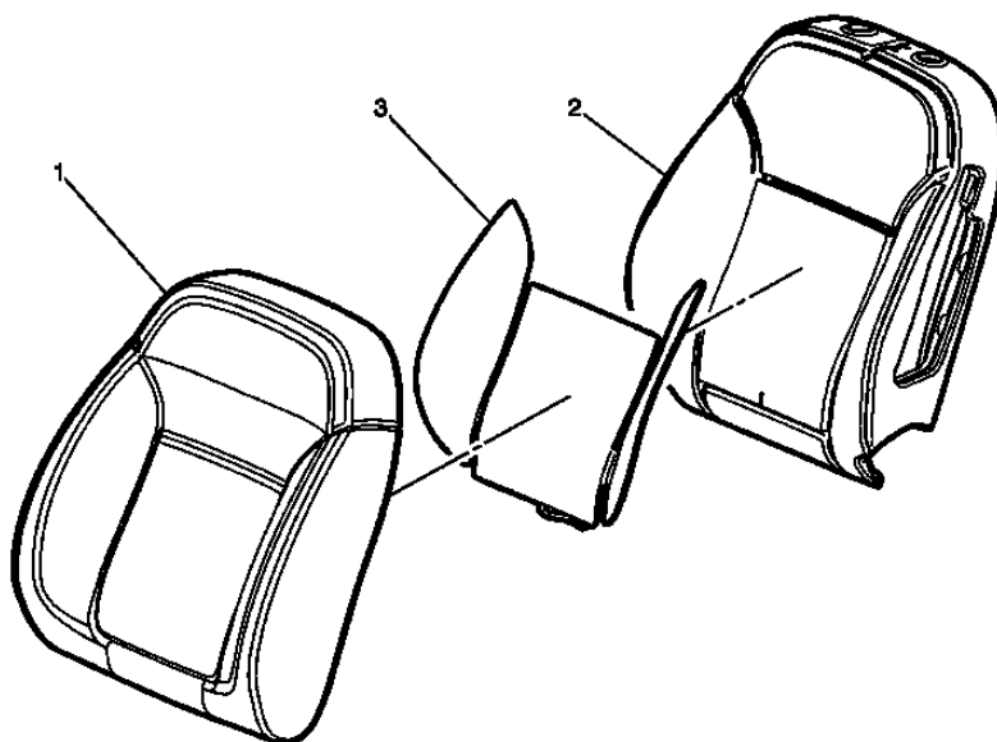


Fig. 5: Driver or Passenger Seat Back Cushion Heater
 Courtesy of GENERAL MOTORS COMPANY

Driver or Passenger Seat Back Cushion Heater Replacement

Callout	Component Name
WARNING: Refer to SIR Warning .	
Preliminary Procedure	
1. Remove the driver or passenger seat. Refer to Driver or Passenger Seat Removal and Installation . 2. Remove the front seat back cushion pad. Refer to Front Seat Back Pad Replacement .	
1	Driver or Passenger Seat Back Cushion Cover Procedure Separate the seat cushion from the seat cushion pad by pulling the cover away from the pad.
2	Driver or Passenger Seat Back Cushion Pad
3	Driver or Passenger Seat Back Cushion Heater Procedure 1. Disconnect the electrical connector. 2. Remove the heater element leaving the old adhesive strips intact

on the seat cushion. The new seat heater adhesive strips will be placed over the old adhesive strips.

DRIVER OR PASSENGER SEAT CUSHION HEATER REPLACEMENT

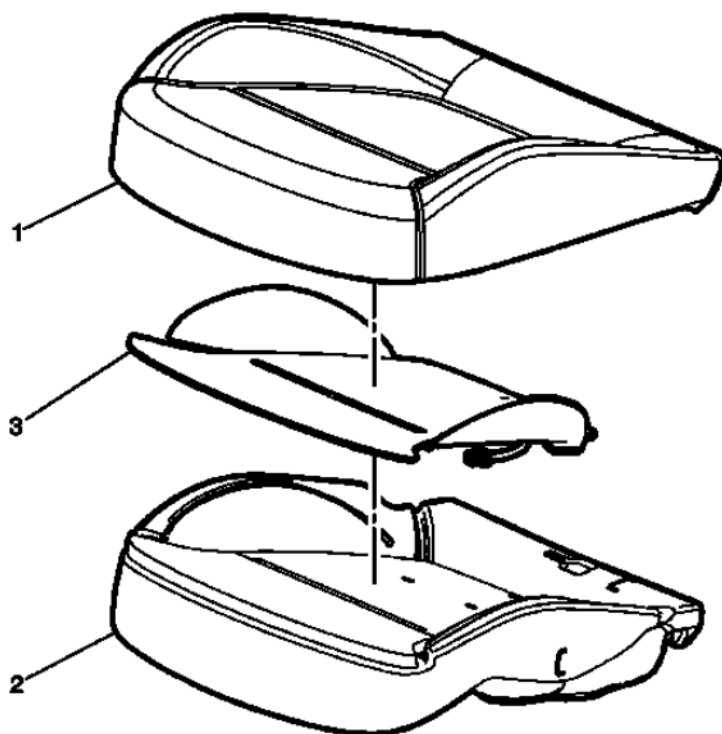


Fig. 6: Driver or Passenger Seat Cushion Heater
Courtesy of GENERAL MOTORS COMPANY

Driver or Passenger Seat Cushion Heater Replacement

Callout	Component Name
WARNING: Refer to SIR Warning .	
Preliminary Procedures	
1. Remove the driver or passenger seat. Refer to Driver or Passenger Seat Removal and Installation . 2. Remove the front seat cushion cover and pad. Refer to Front Seat Cushion Cover and Pad Replacement .	
1	Front Seat Cushion Cover Procedure Separate the seat cushion from the seat cushion pad by pulling the cover away from the pad.
2	Front Seat Cushion Pad

3	Front Seat Cushion Heater
	Procedure 1. Align the tick marks on the heater mat with the tick marks on the seat cushion foam pad, 2. The heater is retained to the pad with adhesive, carefully peel the heater from the seat cushion pad to remove.

REAR SEAT HEATER SWITCH REPLACEMENT

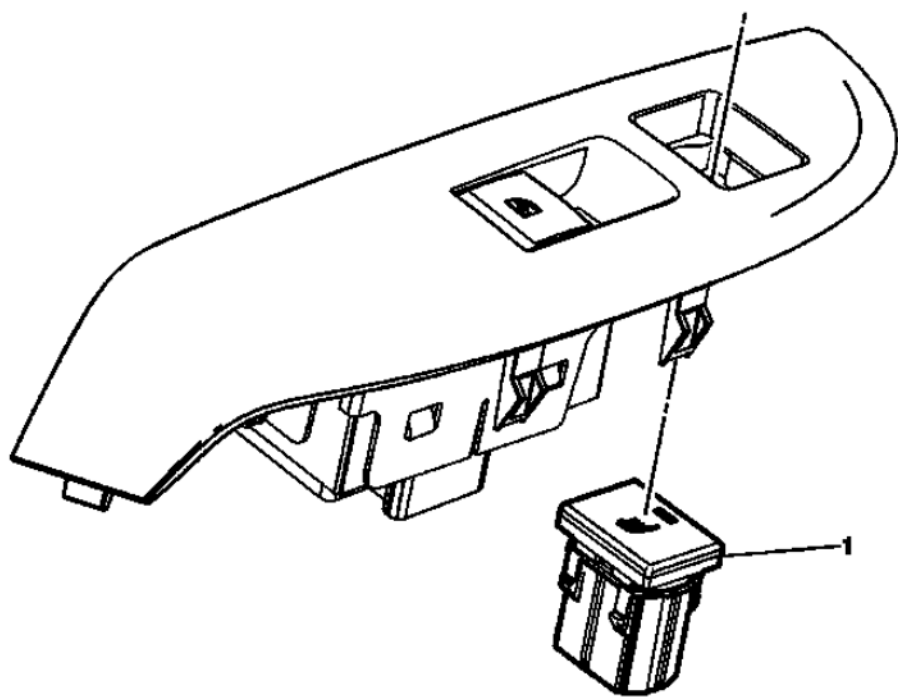


Fig. 7: Rear Seat Heater Switch
 Courtesy of GENERAL MOTORS COMPANY

Rear Seat Heater Switch Replacement

Callout	Component Name
Preliminary Procedure Remove rear side door accessory switch mount plate. Refer to <u>Rear Side Door Accessory Switch Mount Plate Replacement</u> .	
1	Rear Seat Heater Switch
	Procedure 1. Use a flat-bladed tool to release the switch from the mount plate. 2. Disconnect the electrical connector from the switch assembly.

REAR SEAT HEATER CONTROL MODULE REPLACEMENT

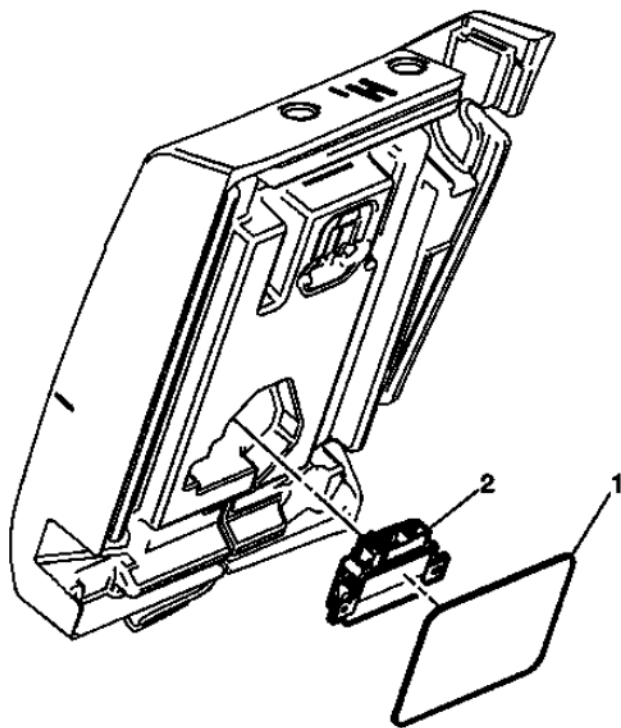


Fig. 8: Rear Seat Heater Control Module
 Courtesy of GENERAL MOTORS COMPANY

Rear Seat Heater Control Module Replacement

Callout	Component Name
Preliminary Procedure Remove the rear seat back cushion cover and pad. Refer to <u>Rear Seat Back Cushion Cover and Pad Replacement (40% w/Splt Back)</u> , <u>Rear Seat Back Cushion Cover and Pad Replacement (60% w/Split Back)</u> .	
1	Rear Seat Heater Control Module Tape
2	Rear Seat Heater Control Module Procedure 1. Disconnect the electrical connector. 2. Refer to <u>Control Module References</u> for programming and setup information.

REAR SEAT BACK CUSHION HEATER REPLACEMENT (40% W/SPLIT BACK)

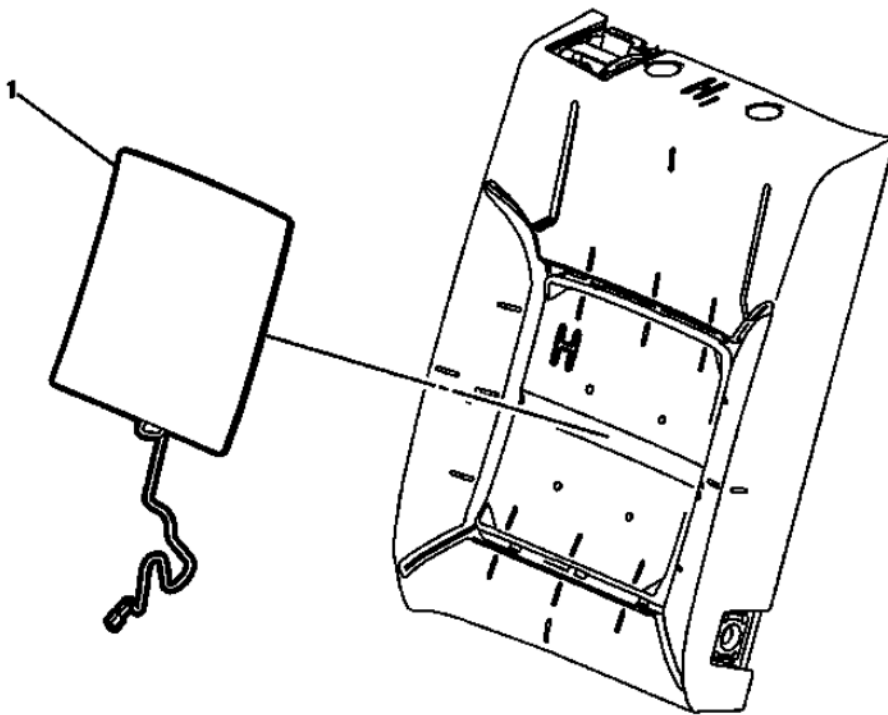


Fig. 9: Rear Seat Back Cushion Heater (40% w/Split Back)

Courtesy of GENERAL MOTORS COMPANY

Rear Seat Back Cushion Heater Replacement (40% w/Split Back)

Callout	Component Name
Preliminary Procedure	
1. Remove the rear seat back cushion. Refer to <u>Rear Seat Back Cushion Removal and Installation (40% w/Split Back)</u> .	
2. Remove the rear seat back cushion cover and pad. Refer to <u>Rear Seat Back Cushion Cover and Pad Replacement (40% w/Split Back)</u> .	
3. Remove the rear seat back cushion bolster. Refer to <u>Rear Seat Back Bolster Replacement</u> .	
1	Rear Seat Back Cushion Heater

REAR SEAT BACK CUSHION HEATER REPLACEMENT (60% W/SPLIT BACK)

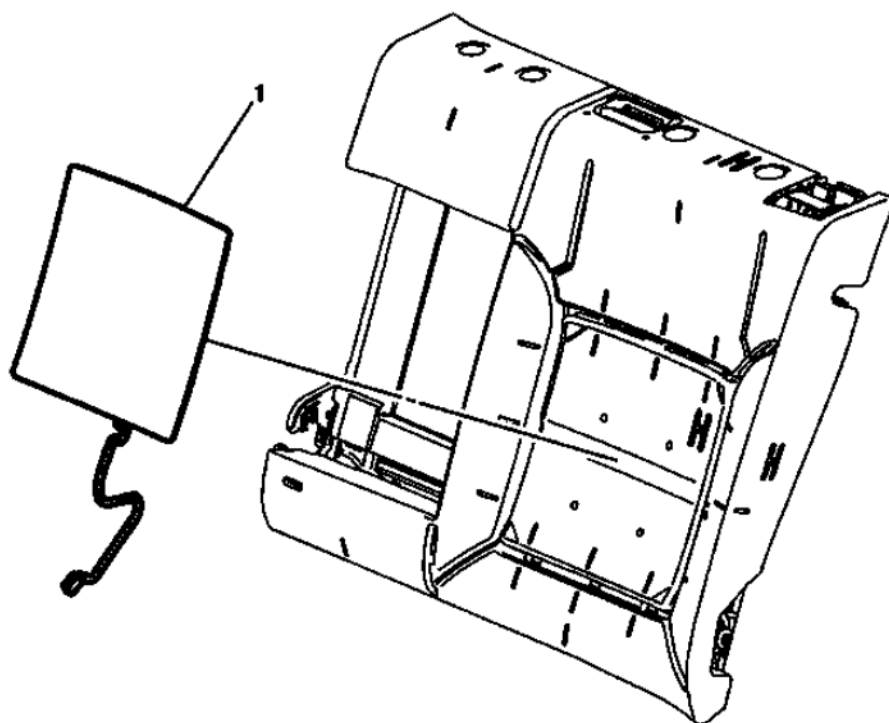


Fig. 10: Rear Seat Back Cushion Heater (60% w/Split Back)

Courtesy of GENERAL MOTORS COMPANY

Rear Seat Back Cushion Heater Replacement (60% w/Split Back)

Callout	Component Name
Preliminary Procedure	
1. Remove the rear seat back cushion. Refer to <u>Rear Seat Back Cushion Removal and Installation (60% w/Split Back)</u> .	
2. Remove the rear seat back cushion cover and pad. Refer to <u>Rear Seat Back Cushion Cover and Pad Replacement (60% w/Split Back)</u> .	
3. Remove the rear seat back cushion Bolster. Refer to <u>Rear Seat Back Bolster Replacement</u> .	
1	Rear Seat Back Cushion Heater

REAR SEAT CUSHION HEATER REPLACEMENT

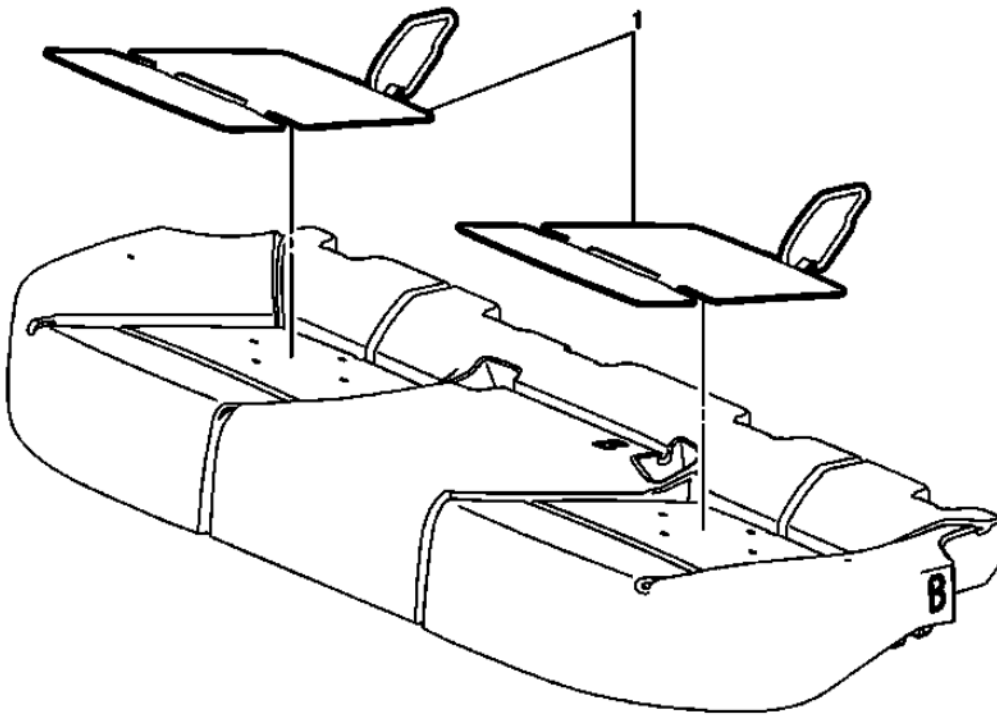


Fig. 11: Rear Seat Cushion Heater
 Courtesy of GENERAL MOTORS COMPANY

Rear Seat Cushion Heater Replacement

Callout	Component Name
Preliminary Procedure	
1. Remove the rear seat cushion. Refer to <u>Rear Seat Cushion Removal and Installation</u> . 2. Remove the rear seat cushion cover and pad. Refer to <u>Rear Seat Cushion Cover and Pad Replacement</u> .	
1	Rear Seat Cushion Heater

DESCRIPTION AND OPERATION

HEATED SEATS DESCRIPTION AND OPERATION

Heated Seat Components

The driver and passenger heated seats consist of the following components:

- Left heated seat switch
- Right heated seat switch
- HVAC control
- Seat memory control module/seat heating control module

- Driver seat cushion heating element
- Driver seat back heating element
- Driver seat cushion temperature sensor
- Passenger seat cushion heating element
- Passenger seat back heating element
- Passenger seat cushion temperature sensor

Heated Seat Operation

The driver and passenger heated seats are controlled by the seat memory control module/seat heating control module that is located under the driver seat cushion. Both heated seats are controlled by separate heated seat switches that are located in the HVAC control. When a heated seat switch is pressed, a serial data message is sent from the HVAC controls to the HVAC control module indicating the heated seat command. The HVAC control module then serves as a gateway to transmit the message to the seat memory control module/seat heating control module via the serial data line. In response to this signal, the module applies battery positive voltage through the element supply voltage circuit to the appropriate seat heating elements. The seat memory control module/seat heating control module then sends a serial data message back to the HVAC control module to gateway the information to the HVAC controls to either illuminate or turn off the appropriate temperature indicator.

Temperature Regulation

When the engine ON, the heated seats will initialize in the OFF state. With each activation of the heated seat switch, the seat memory control module/seat heating control module will cycle the temperature setting in the following manner: HIGH, MEDIUM, LOW, and OFF.

The seat memory control module/seat heating control module monitors the seat temperature through the temperature sensor signal circuit and the temperature sensor (thermistor) that is located in the seat cushion. The temperature sensor is a variable resistor, its resistance changes as the temperature of the seat changes. When the temperature sensor resistance indicates to the seat memory control module/seat heating control module that the seat has reached the desired temperature, the module opens the ground path of the seat heating elements through the heated seat element control circuit. The module will then cycle the element control circuit open and closed in order to maintain the desired temperature.

Load Shed Management

The electrical power management function is designed to monitor the vehicle electrical load and determine when the battery is potentially in a high discharge condition. The heated seat system is one of the vehicle loads that is subject to reduction during a battery discharge condition. For more information on load management refer to **Electrical Power Management Description and Operation** .