

2010 ACCESSORIES & EQUIPMENT

Seat Heating and Cooling - SRX

SECTIONS

FASTER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Rear Seat Heater Control Module	5 N.m	44 lb ft

SECTION ROADS

HEATED/COOLED SEAT SCHEMATICS

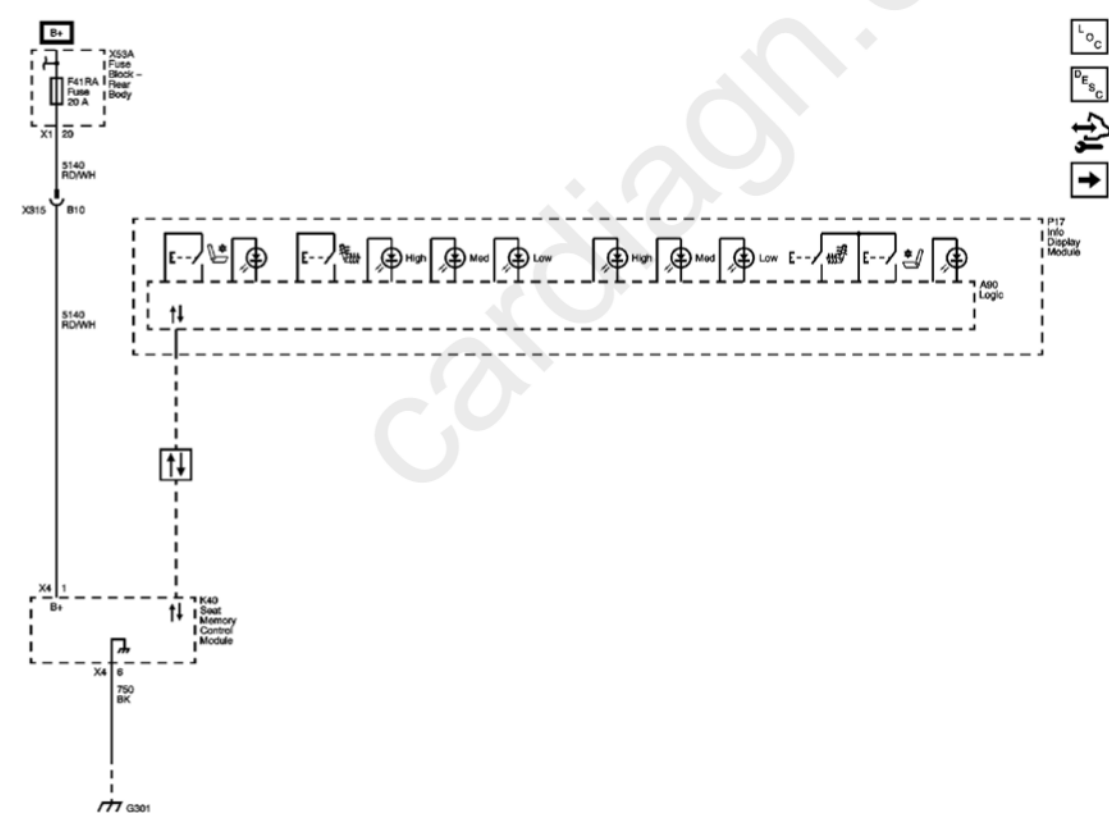


Fig 1 Power Ground Serial data Controls Circuit Schematic
 Courtesy of GE ERA MOTORS CORP

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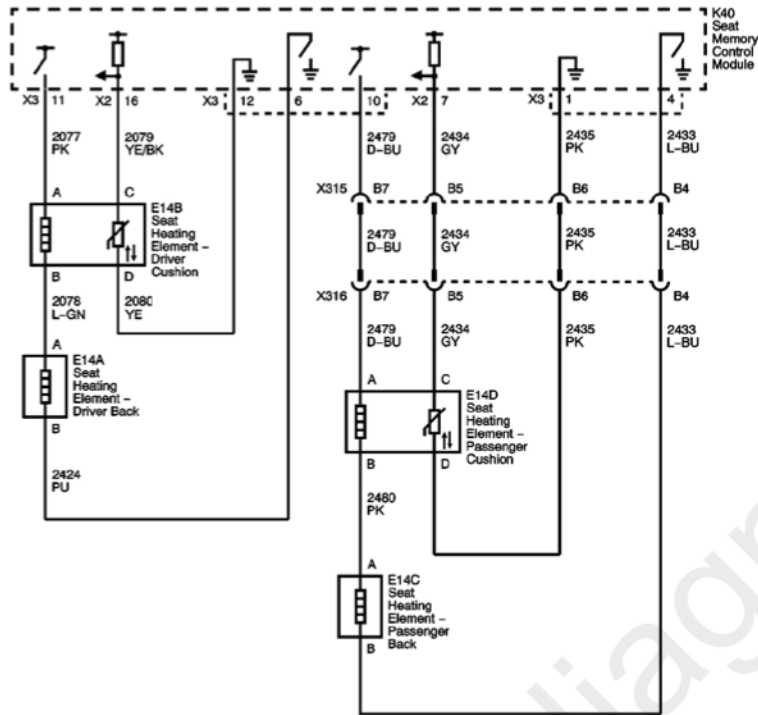


Fig 2 Heated Seats Front Circuit Schematic (KA1)
 Courtesy of GE ERA MOTORS CORP

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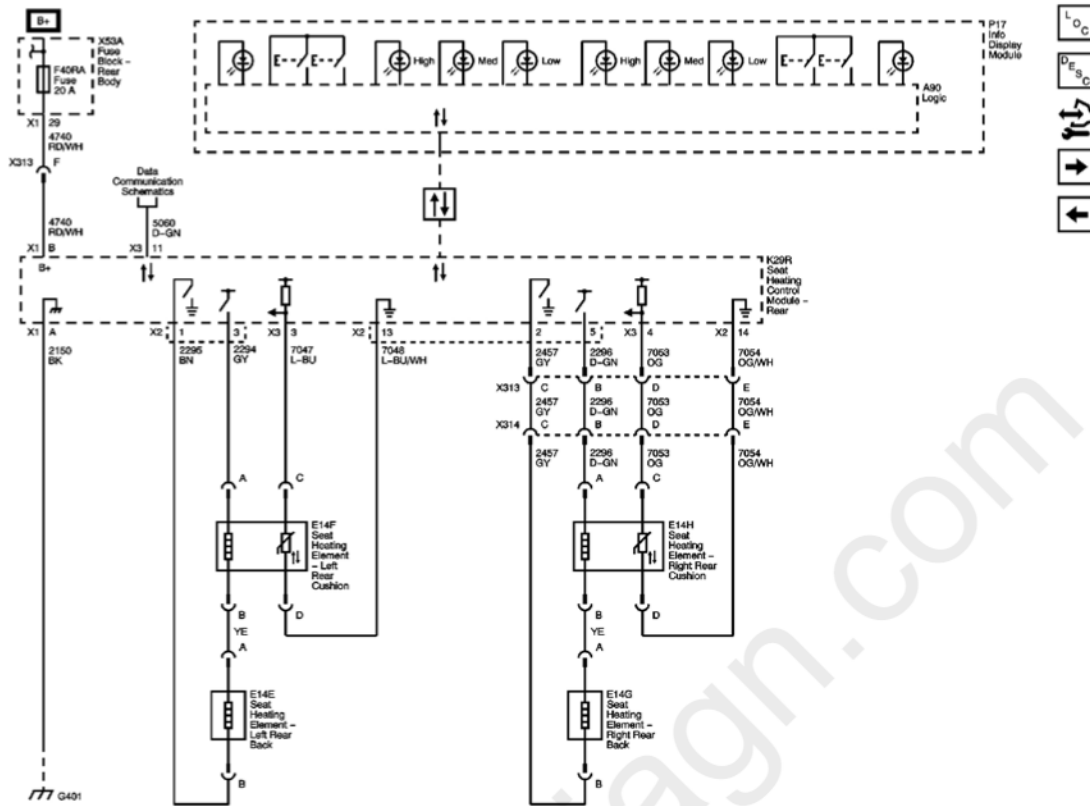


Fig 3 Heated Seats Rear Circuit Schematic (KA6)

Courtesy of GE ERA MOTORS CORP

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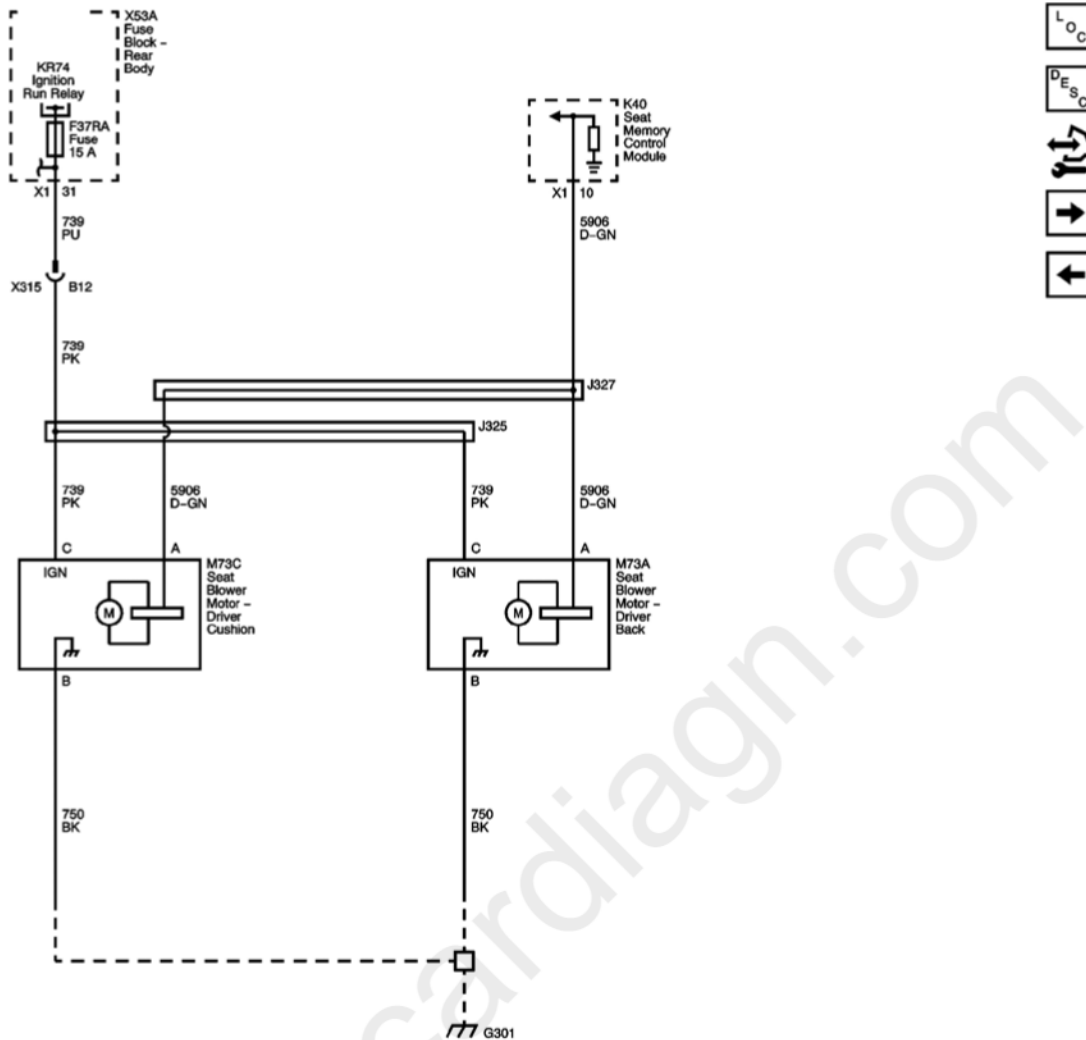


Fig 4 Seat Ventilation Driver Circuit Schematic (KU1)
Courtesy of GE ERA MOTORS CORP

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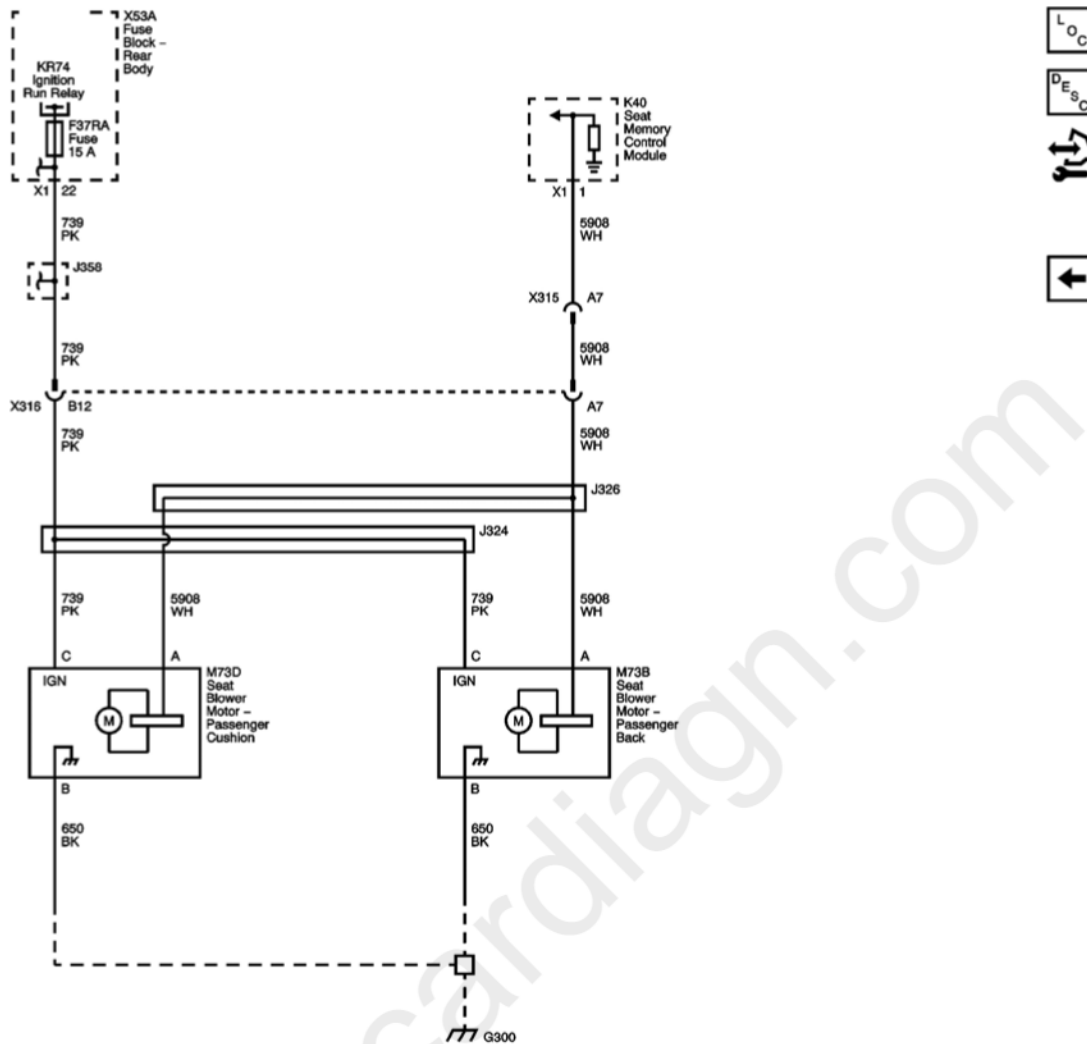


Fig 5 Seat Ventilation Passenger Circuit Schematic (KU3)
 Courtesy of GE ERA MOTORS CORP

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

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<u>DTC B1925 or B2170 (With Memory A45)</u>	B1925 02 Driver Seat Cushion Heater Sensor Circuit Short to Ground B1925 05 Driver Seat Cushion Heater Sensor Circuit High Voltage/Open B2170 02 Passenger Seat Cushion Heater Sensor Circuit Short to Ground B2170 05 Passenger Seat Cushion Heater Sensor Circuit High Voltage/Open
<u>DTC B1925 or B2170 (With KA6)</u>	B1925 02 Left Seat Cushion Heater Sensor Circuit Short to Ground B1925 05 Left Seat Cushion Heater Sensor Circuit High Voltage/Open B2170 02 Right Seat Cushion Heater Sensor Circuit Short to Ground B2170 05 Right Seat Cushion Heater Sensor Circuit High Voltage/Open
<u>DTC B2345 (Without Memory A45)</u>	B2345 13 Seat Heater Disable Circuit Low Voltage High/Temperature
<u>DTC B2345 (With Memory A45)</u>	B2345 13 Seat Heater Disable Circuit Low Voltage High/Temperature
<u>DTC B2345 (With KA6)</u>	B2345 13 Seat Heater Disable Circuit Low Voltage High/Temperature
<u>DTC B2425 or B2430 (Without Memory A45)</u>	B2425 0B Driver Seat Cushion Heater Circuit High Current B2425 0D Driver Seat Cushion Heater Circuit High Resistance B2425 0E Driver Seat Cushion Heater Circuit Low Resistance B2430 0B Passenger Seat Cushion Heater Circuit High Current B2430 0D Passenger Seat Cushion Heater Circuit High Resistance B2430 0E Passenger Seat Cushion Heater Circuit Low Resistance
<u>DTC B2425 or B2430 (With Memory A45)</u>	B2425 0B Driver Seat Cushion Heater Circuit High Current B2425 0D Driver Seat Cushion Heater Circuit High Resistance B2425 0E Driver Seat Cushion Heater Circuit Low Resistance B2430 0B Passenger Seat Cushion Heater Circuit High Current B2430 0D Passenger Seat Cushion Heater Circuit High Resistance B2430 0E Passenger Seat Cushion Heater Circuit Low Resistance
<u>DTC B2425 or B2430 (With KA6)</u>	B2425 0B Left Seat Cushion Heater Circuit High Current B2425 0D Left Seat Cushion Heater Circuit High Resistance B2425 0E Left Seat Cushion Heater Circuit Low Resistance B2430 0B Right Seat Cushion Heater Circuit High Current B2430 0D Right Seat Cushion Heater Circuit High Resistance B2430 0E Right Seat Cushion Heater Circuit Low Resistance
<u>DTC B242A (Without Memory A45)</u>	B242A 01 Seat Heaters Common Circuit Short to Battery B242A 02 Seat Heaters Common Circuit Short to Ground
<u>DTC B242A (With Memory A45)</u>	B242A 01 Seat Heaters Common Circuit Short to Battery B242A 02 Seat Heaters Common Circuit Short to Ground
<u>DTC B242A (With KA6)</u>	B242A 01 Seat Heaters Common Circuit Short to Battery B242A 02 Seat Heaters Common Circuit Short to Ground

DTC B1925 OR B2170 (WITHOUT MEMORY A45)**Diagnostic Instructions**

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

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- 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 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	B2345 13
Driver Heated Seat 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 Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	B2345 13
Passenger Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	B2345 13

Circuit/System Description

The heated seat temperature sensor that set this diagnostic trouble code (DTC) 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

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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. 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

Component Connector End Views

Description and Operation

Heated/Vented Seat Description and Operation

Electrical Information Reference

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- 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 harness connector at the appropriate E14B or E14D seat cushion heating element.
2. Test for less than 10 ohms between the low reference circuit terminal D and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit test normal, replace the K29 seat heating control module.
3. Ignition ON, test for 4. - 5.2 V between the signal circuit terminal C and ground.
 - If less than the specified range, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K29 seat heating control module.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the K29 seat heating control module.
4. If all circuits test normal, test or replace the E14 seat cushion heating element.

Component Testing

E14B or E14D 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 C and the low reference circuit terminal D.
 - If not within the specified range, replace the E14 seat cushion heating element.

Repair Procedures

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

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

DTC B1925 OR B2170 (WITH MEMORY A45)

Diagnostic Instructions

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

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- 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 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 X3	B242A 02	B2425 0D	B242A 01	B2425 0B, 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 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	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 heated seat temperature sensor that set this diagnostic trouble code (DTC) 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. 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****Component Connector End Views**

Description and Operation

Heated/Vented Seat 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 harness connector at the appropriate E14B or E14D seat cushion heating element.
2. Test for less than 10 ohms between the low reference circuit terminal D and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit test normal, replace the K40 seat memory control module.
3. Ignition ON, press a power seat switch in order to wake up the module. Test for 4. - 5.2 V between the signal circuit terminal C and ground.
 - If less than the specified range, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K40 seat memory control module.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the K40 seat memory control module.
4. If all circuits test normal, test or replace the E14 seat cushion heating element.

Component Testing

E14B or E14D 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 C and the low reference circuit terminal D.
 - If not within the specified range, replace the E14 seat cushion heating element.

Repair Procedures

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- Driver or Passenger Seat Cushion Heater Replacement

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

DTC B1925 OR B2170 (WITH KA6)

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

Left Seat Cushion Heater Sensor Circuit Short to Ground

DTC B1925 05

Left Seat Cushion Heater Sensor Circuit High Voltage/Open

DTC B2170 02

Right Seat Cushion Heater Sensor Circuit Short to Ground

DTC B2170 05

Right Seat Cushion Heater Sensor Circuit High Voltage/Open

Diagnostic Fault Information

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

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Right Rear Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	B2345 13
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Circuit/System Description

The heated seat temperature sensor that set this diagnostic trouble code (DTC) is located in the seat cushion just under the seat cover with the seat heating element. The rear 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 rear seat heating control module must be powered.

Conditions for Setting the DTC

B1925 02 or B2170 02

The temperature sensor voltage drops below 0. 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

Component Connector End Views

Description and Operation

Heated/Vented Seat 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 harness connector at the appropriate E14F or E14H rear seat cushion heating element.
2. Test for less than 10 ohms between the low reference circuit terminal D and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit test normal, replace the K29R rear seat heating control module.
3. Ignition ON, test for 4. - 5.2 V between the signal circuit terminal C and ground.
 - If less than the specified range, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K29R rear seat heating control module.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the K29R rear seat heating control module.
4. If all circuits test normal, test or replace the E14 rear seat cushion heating element.

Component Testing

E14F or E14H Seat Cushion Heating Element

1. Ignition OFF, disconnect the harness connector at the appropriate E14F or E14H rear seat cushion heating element.
2. Test for 500 ohms - 300 kohms between the signal circuit terminal C and the low reference circuit terminal D.
 - If not within the specified range, replace the E14 rear seat cushion heating element.

Repair Procedures

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- Rear Seat Cushion Heater Replacement (40 Percent Seat) or Rear Seat Cushion Heater Replacement (60 Percent Seat)

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

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 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	B2345 13
Driver Heated Seat Temperature Sensor Low Reference	-	B1925 05	-	B2345 13
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	B2345 13
Passenger Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	B2345 13

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.

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Conditions for Running the DTC

The seat heating 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

Component Connector End Views

Description and Operation

Heated/Vented Seat 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

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1. Ignition OFF, disconnect the X2, 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 circuits listed below:
 - E14B driver seat cushion terminal 3 X3 and terminal 13 X2
 - E14D passenger seat cushion terminal 4 X3 and terminal 14 X2
 - If less than the specified value, test for a short between the signal and low reference circuits. If the circuits test normal, replace the appropriate E14 seat cushion heating element.
3. If all circuits test normal, replace the K29 seat heating control module.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

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

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

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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**Component Connector End Views****Description and Operation****Heated/Vented Seat 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, 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 the specified value, test for a short between the signal and low reference circuits. If the circuits test normal, replace the appropriate E14 seat cushion heating element.
3. If all circuits test normal, replace the K40 seat memory control module.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

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

DTC B2345 (WITH KA6)**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

2010 Cadillac SRX**2010 ACCESSORIES & EQUIPMENT Seat Heating and Cooling - SRX****DTC B2 45 1**

Seat Heater Disable Circuit Low Voltage High/Temperature

Diagnostic Fault Information

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

Circuit/System Description

The rear seat heating control module controls seat heating operation for both left and right rear 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 rear 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 rear seat heating control module must be powered.

Conditions for Setting the DTC**B2 45 1**

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

Action Taken When the DTC Sets

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The heated seat function for both rear 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

Component Connector End Views

Description and Operation

Rear 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, X3 harness connectors at the K29R rear seat heating control module.
2. Test for greater than 3.0 kohms between the signal and the low reference circuits listed below:
 - E14F left rear seat cushion terminal 3 X3 and terminal 13 X2
 - E14H right rear seat cushion terminal 4 X3 and terminal 14 X2
 - If less than the specified value, test for a short between the signal and low reference circuits. If the circuits test normal, replace the appropriate E14 seat cushion heating element.
3. If all circuits test normal, replace the K29R rear seat heating control module.

Repair Procedures

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Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Rear Seat Cushion Heater Replacement (40 Percent Seat)** or **Rear Seat Cushion Heater Replacement (0 Percent Seat)**
- **Control Module References** for rear seat heating control module replacement, setup and programming

DTC B2425 OR B24 0 (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 B24 0 0B

Passenger Seat Cushion Heater Circuit High Current

DTC B24 0 0D

Passenger Seat Cushion Heater Circuit High Resistance

DTC B24 0 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

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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	B2345 13
Driver Heated Seat 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 Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	B2345 13
Passenger Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	B2345 13

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 running.
- The seat heating control module must be powered and the heated seat must be enabled.

Conditions for Setting the DTC**B2425 0D or B24 0 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 B24 0 0B or B24 0 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

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- 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

Description and Operation

Heated/Vented Seat 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 - 5 ohms between terminal A and terminal B.
 - If not within the specified range, replace the E14A seat back heating element.
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

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conditions are simulated. First with the seat unoccupied, then with the seat occupied.

4. Test for 1 - 7 ohms between control circuit terminal 3 and control circuit terminal 1.
 - If less than the specified range, test for a short between the control circuits. If the circuits test normal, replace the E14B seat cushion heating element.
 - If greater than the specified range, test the control circuits for an open/high resistance. If the circuits test normal, replace the E14B seat cushion heating element.
5. If all circuits test normal, replace the K29 seat heating control module.

B24 0 0B B24 0 0D or B24 0 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 - 5 ohms between terminal A and terminal B.
 - If not within the specified range, replace the E14C seat back heating element.
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 - 7 ohms between control circuit terminal 5 and control circuit terminal 2.
 - If less than the specified range, test for a short between the control circuits. If the circuits test normal, replace the E14D seat cushion heating element.
 - If greater than the specified range, test the control circuits for an open/high resistance. If the circuits test normal, replace the E14D seat cushion heating element.
5. If all circuits test normal, replace the K29 seat heating control module.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

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

DTC B2425 OR B24 0 (WITH MEMORY A45)

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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 B24 0 0B

Passenger Seat Cushion Heater Circuit High Current

DTC B24 0 0D

Passenger Seat Cushion Heater Circuit High Resistance

DTC B24 0 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	B2345 13
Driver Heated Seat Temperature	-	B1925 05	-	B2345 13

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Sensor Low Reference				
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	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 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 running.
- The seat memory control module must be powered and the heated seat must be enabled.

Conditions for Setting the DTC**B2425 0D or B24 0 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 B24 0 0B or B24 0 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.

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- 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

Description and Operation

Heated/Vented Seat 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 X4 harness connector at the K40 seat memory control module.
2. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal 5 and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
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 - 5 ohms between terminal A and terminal B.
 - If not within the specified range, replace the E14A seat back heating element.
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.

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.

6. Test for 1 - 7 ohms between control circuit terminal 11 and control circuit terminal 6.
 - o If less than the specified range, test for a short between the control circuits. If the circuits test normal, replace the E14B seat cushion heating element.
 - o If greater than the specified range, test the control circuits for an open/high resistance. If the circuits test normal, replace the E14B seat cushion heating element.
7. If all circuits test normal, replace the K40 seat memory control module.

B24 0 0B B24 0 0D or B24 0 0E

1. Ignition OFF, disconnect the X4 harness connector at the K40 seat memory control module.
2. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal 5 and ground.
 - o If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
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 - 5 ohms between terminal A and terminal B.
 - o If not within the specified range, replace the E14C seat back heating element.
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.

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.

6. Test for 1 - 7 ohms between control circuit terminal 10 and control circuit terminal 4.
 - o If less than the specified range, test for a short between the control circuits. If the circuits test normal, replace the E14D seat cushion heating element.
 - o If greater than the specified range, test the control circuits for an open/high resistance. If the circuits test normal, replace the E14D seat cushion heating element.
7. If all circuits test normal, replace the K40 seat memory control module.

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Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

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

DTC B2425 OR B2400 (WITH A)

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

Left Seat Cushion Heater Circuit High Current

DTC B2425 0D

Left Seat Cushion Heater Circuit High Resistance

DTC B2425 0E

Left Seat Cushion Heater Circuit Low Resistance

DTC B2400 0B

Right Seat Cushion Heater Circuit High Current

DTC B2400 0D

Right Seat Cushion Heater Circuit High Resistance

DTC B2400 0E

Right Seat Cushion Heater Circuit Low Resistance

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Rear Heated Seat Element Control Terminal 3 X2	B242A 02	B2425 0D	B242A 01	B2425 0B, B2425 0E

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Left Rear Heated Seat Element Control Terminal 1 X2	B242A 02	B2425 0D	B242A 01	B2425 0B, B2425 0E
Left Rear Heated Seat Temperature Sensor Signal	B1925 02	B1925 05	B1925 05	B2345 13
Left Rear Heated Seat Temperature Sensor Low Reference	-	B1925 05	-	B2345 13
Right Rear Heated Seat Element Control Terminal 5 X2	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Right Rear Heated Seat Element Control Terminal 2 X2	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Right Rear Heated Seat Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	B2345 13
Right Rear Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	B2345 13

Circuit/System Description

The left and right rear heated seats are controlled by the rear seat heating control module that is located behind the rear seat back cushion. When a rear 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 running.
- The rear seat heating control module must be powered and the heated seat must be enabled.

Conditions for Setting the DTC**B2425 0D or B24 0 0D**

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

B2425 0B B2425 0E B24 0 0B or B24 0 0E

By measuring current and voltage output to the seat heating elements every 10 seconds, the rear 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

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- 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

Description and Operation

Rear 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 E14E 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 - 5 ohms between terminal A and terminal B.
 - If not within the specified range, replace the E14E seat back heating element.
3. Connect the harness connector at the E14E seat back heating element and disconnect the X2 harness connector at the K29R rear seat heating control module.

NOTE: Element resistance must be measured twice to ensure that all failure

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conditions are simulated. First with the seat unoccupied, then with the seat occupied.

4. Test for 1 - 7 ohms between control circuit terminal 3 and control circuit terminal 1.
 - If less than the specified range, test for a short between the control circuits. If the circuits test normal, replace the E14F seat cushion heating element.
 - If greater than the specified range, test the control circuits for an open/high resistance. If the circuits test normal, replace the E14F seat cushion heating element.
5. If all circuits test normal, replace the K29R rear seat heating control module.

B24 0 0B B24 0 0D or B24 0 0E

1. Ignition OFF, disconnect the harness connector at the E14G 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 - 5 ohms between terminal A and terminal B.
 - If not within the specified range, replace the E14G seat back heating element.
3. Connect the harness connector at the E14G seat back heating element and disconnect the X2 harness connector at the K29R rear 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 - 7 ohms between control circuit terminal 5 and control circuit terminal 2.
 - If less than the specified range, test for a short between the control circuits. If the circuits test normal, replace the E14H seat cushion heating element.
 - If greater than the specified range, test the control circuits for an open/high resistance. If the circuits test normal, replace the E14H seat cushion heating element.
5. If all circuits test normal, replace the K29R rear seat heating control module.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Rear Seat Back Cushion Heater Replacement**
- **Rear Seat Cushion Heater Replacement (40 Percent Seat)** or **Rear Seat Cushion Heater Replacement (0 Percent Seat)**
- **Control Module References** for rear seat heating control module replacement, setup, and programming

DTC B242A (WITHOUT MEMORY A45)

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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	B2345 13
Driver Heated Seat Temperature Sensor Low Reference	-	B1925 05	-	B2345 13
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	B2345 13
Passenger Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	B2345 13

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.

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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

Description and Operation

Heated/Vented Seat 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 terminal 3 and ground.
 - If not the specified value, test the control circuit for a short to ground.
3. Test for infinite resistance between the control circuit terminal 5 and ground.
 - If not the specified value, test the control circuit for a short to ground.
4. Ignition ON, verify that a test lamp does not illuminate between the control circuit terminal 3 and ground.
 - If the test lamp illuminates, test the control circuit for a short to voltage.
5. Verify that a test lamp does not illuminate between the control circuit terminal 5 and ground.
 - If the test lamp illuminates, test the control circuit for a short to voltage.
6. If all circuits test normal, replace the K29 seat heating control module.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

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

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+	B242A 02,	B242A 02,		

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Terminal 5 X4	B2425 0D, B2430 0D, 1, 2	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

- 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.

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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

Description and Operation

Heated/Vented Seat 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.
2. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal 5 and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
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 terminal 11 and ground.
 - If not the specified value, test the control circuit for a short to ground.

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5. Test for infinite resistance between the control circuit terminal 10 and ground.
 - If not the specified value, test the control circuit for a short to ground.
6. Ignition ON, verify that a test lamp does not illuminate between the control circuit terminal 11 and ground.
 - If the test lamp illuminates, test the control circuit for a short to voltage.
7. Verify that a test lamp does not illuminate between the control circuit terminal 10 and ground.
 - If the test lamp illuminates, test the control circuit for a short to voltage.
- . If all circuits test normal, replace the K40 seat memory control module.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

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

DTC B242A (WITH KA6)

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
Left Rear Heated Seat Element Control Terminal 3 X2	B242A 02	B2425 0D	B242A 01	B2425 0E
Left Rear Heated Seat Element Control Terminal 1 X2	B242A 02	B2425 0D	B242A 01	B2425 0E
Left Rear Heated Seat Temperature Sensor Signal	B1925 02	B1925 05	B1925 05	B2345 13
Left Rear Heated Seat Temperature Sensor Low Reference	-	B1925 05	-	B2345 13

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Right Rear Heated Seat Element Control Terminal 5 X2	B242A 02	B2430 0D	B242A 01	B2430 0E
Right Rear Heated Seat Element Control Terminal 2 X2	B242A 02	B2430 0D	B242A 01	B2430 0E
Right Rear Heated Seat Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	B2345 13
Right Rear Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	B2345 13

Circuit/System Description

The rear seat heating control module controls seat heating operation for both left and right rear 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 rear 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 rear seat heating control module must be powered.

Conditions for Setting the DTC**B242A 01**

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

B242A 02

The rear 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 rear 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****Description and Operation****Rear 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 K29R rear seat heating control module.
2. Test for infinite resistance between the control circuit terminal 3 and ground.
 - If not the specified value, test the control circuit for a short to ground.
3. Test for infinite resistance between the control circuit terminal 5 and ground.
 - If not the specified value, test the control circuit for a short to ground.
4. Ignition ON, verify that a test lamp does not illuminate between the control circuit terminal 3 and ground.
 - If the test lamp illuminates, test the control circuit for a short to voltage.
5. Verify that a test lamp does not illuminate between the control circuit terminal 5 and ground.
 - If the test lamp illuminates, test the control circuit for a short to voltage.
6. If all circuits test normal, replace the K29R rear seat heating control module.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

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

SYMPTOMS - SEAT HEATING AND COOLING

I **PORTANT:** T e follo ing te t e co lated efore ing t e to ta le .

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1. 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. Refer to the system description and operation from the following list in order to familiarize yourself with the system functions:
 - **Rear Heated Seats Description and Operation**
 - **Heated/Vented Seat 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 a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- **Front Heated Seat Malfunction (Without Memory A45)** or **Front Heated Seat Malfunction (With Memory A45)**
- **Rear Heated Seat Malfunction**
- **Vented Seat Malfunction (Without Memory A45)** or **Vented Seat Malfunction (With Memory A45)**

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

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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	B2345 13
Driver Heated Seat 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 Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	B2345 13
Passenger Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	B2345 13

Circuit/System Description

The driver and front passenger heated seats are controlled by separate heated seat switches that are located in the radio/HVAC controls. When a heated seat switch is pressed, a serial data message is sent from the radio/HVAC controls to the HVAC control module indicating the heated seat command. The HVAC control module serves as a gateway to transmit the message to the seat heating control module via the serial data line. In response to this message, the seat heating control module applies battery 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 radio/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****Description and Operation****Heated/Vented Seat Description and Operation****Electrical Information Reference**

- **Circuit Testing**
- **Connector Repairs**

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- 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, observe the scan tool Driver Seat Heating/Venting/Cooling Mode parameter while pressing the driver HEATED seat switch. The reading should change between Off and Back & Cushion.
 - If not the specified value, replace the A20 radio/HVAC control.
2. Observe the scan tool Passenger Seat Heating/Venting/Cooling Mode parameter while pressing the passenger HEATED seat switch. The reading should change between Off and Back & Cushion.
 - If not the specified value, replace the A20 radio/HVAC control.
3. If all scan tool parameter readings test normal, there are no DTCs set, and the driver and/or passenger heated seat is inoperative, replace the K29 seat heating control module.

Repair Procedures

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- Radio Control Assembly Replacement
- Control Module References for seat memory control module replacement, setup, and programming

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				

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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 3	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Passenger Heated Seat Element Control Terminal 4 3	B242A 02	B2430 0D	B242A 01	B2430 0B, 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 driver and front passenger heated seats are controlled by separate heated seat switches that are located in the radio/HVAC controls. When a heated seat switch is pressed, a serial data message is sent from the radio/HVAC controls to the HVAC control module indicating the heated seat command. The HVAC control module 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 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 radio/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

Description and Operation

Heated/Vented Seat Description and Operation

Electrical Information Reference

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

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Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the 4 harness connector at the K40 seat memory control module.
2. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal 5 and ground.
 - o If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
3. Ignition OFF, connect the 4 harness connector at the K40 seat memory control module.
4. Ignition ON, observe the scan tool Driver Seat Heating/Venting/Cooling Mode parameter while pressing the driver HEATED seat switch. The reading should change between Off and Back Cushion.
 - o If not the specified value, replace the A20 radio/HVAC control.
5. Observe the scan tool Passenger Seat Heating/Venting/Cooling Mode parameter while pressing the passenger HEATED seat switch. The reading should change between Off and Back Cushion.
 - o If not the specified value, replace the A20 radio/HVAC control.
6. If the scan tool parameter readings test normal, there are no DTCs set, and the driver and/or passenger heated seat is inoperative, replace the K40 seat memory control module.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Radio Control Assembly Replacement**
- **Control Module References** for seat memory control module replacement, setup, and programming

REAR HEATED SEAT MALFUNCTION

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
Left Rear Heated Seat Element Control Terminal 3 2	B242A 02	B2425 0D	B242A 01	B2425 0B, B2425 0E
Left Rear Heated Seat Element Control Terminal 1 2	B242A 02	B2425 0D	B242A 01	B2425 0B, B2425 0E
Left Rear Heated Seat Temperature	B1925 02	B1925 05	B1925 05	B2345 13

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Sensor Signal				
Left Rear Heated Seat Temperature Sensor Low Reference	-	B1925 05	-	B2345 13
Right Rear Heated Seat Element Control Terminal 5 2	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Right Rear Heated Seat Element Control Terminal 2 2	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Right Rear Heated Seat Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	B2345 13
Right Rear Heated Seat Temperature Sensor Low Reference	-	B2170 05	-	B2345 13

Circuit/System Description

The left and right rear heated seats are controlled by separate heated seat switches located in the auxiliary radio/HVAC controls. When a heated seat switch is pressed, a serial data message is sent to the rear seat control module indicating the heated seat command. In response to this message, the rear seat heating control module applies battery positive voltage through the element control circuit to the appropriate seat heating elements. The rear seat heating control module then sends a serial data message back to the auxiliary radio/HVAC controls to either illuminate or turn off the heated seat indicator.

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Rear 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

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Circuit/System Verification

1. Engine ON, observe the scan tool Left Rear Seat Heating/Venting/Cooling Mode parameter while pressing the left rear HEATED seat switch. The reading should change between Off and Back Cushion Heat.
 - If not the specified value, replace the A21 auxiliary radio/HVAC controls.
2. Observe the scan tool Right Rear Seat Heating/Venting/Cooling Mode parameter while pressing the right rear HEATED seat switch. The reading should change between Off and Back Cushion Heat.
 - If not the specified value, replace the A21 auxiliary radio/HVAC controls.
3. If all scan tool parameter readings test normal, there are no DTCs set, and the left and/or right rear heated seat is inoperative, replace the K29R rear seat heating control module.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

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

VENTED 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
Ignition Voltage	1, 4	1, 4	-	-
Driver Seat Back Blower Motor Ignition Voltage	1, 4	2	-	-
Driver Seat Cushion Blower Motor Ignition Voltage	1, 4	3	-	-
Driver Vented Seat Signal	1	1	1	-
Driver Seat Back Blower Motor Ground	-	2	-	-
Driver Seat Cushion Blower Motor Ground	-	3	-	-
Passenger Seat Back Blower Motor Ignition Voltage	1, 4	5	-	-
Passenger Seat Cushion Blower Motor				

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Ignition Voltage	1, 4	6	-	-
Passenger Vented Seat Signal	4	4	4	-
Passenger Seat Back Blower Motor Ground	-	5	-	-
Passenger Seat Cushion Blower Motor Ground	-	6	-	-
1. Driver vented seat is inoperative 2. Driver vented seat back is inoperative 3. Driver vented seat cushion is inoperative 4. Passenger vented seat is inoperative 5. Passenger vented seat back is inoperative 6. Passenger vented seat cushion is inoperative				

Circuit/System Description

The driver and passenger vented seats are controlled by separate vented seat switches located in the radio/HVAC controls. Ignition voltage is supplied to the driver and passenger seat blower motors through a 15 A fuse located in the rear fuse block. When a vented seat switch is pressed, a serial data message is sent from the radio/HVAC controls to the HVAC control module indicating the vented seat command. The HVAC control module serves as a gateway to transmit the message to the seat heating control module via the serial data line. In response to this message, the seat heating control module applies a low side pulse width modulation (PWM) signal through the blower motor control circuits to the seat cushion and seat back blower motors indicating the vented seat command. The logic in the blower motors then sets the blower speed to the switch set point. Both blower motors run drawing cabin air around and away from occupant. The seat heating control module then sends a serial data message back to the HVAC control module to gateway the information back to the radio/HVAC controls to either illuminate or turn off the appropriate switch indicator.

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Heated/Vented Seat Description and Operation

Electrical Information Reference

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

- **iring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit System Verification

1. Engine ON, observe the scan tool Driver Seat Heating/Venting/Cooling Mode parameter while pressing the driver VENTED seat switch. The reading should change between Off and Vent/Cool.
 - If not the specified value, replace the A20 radio/HVAC controls.
2. Observe the scan tool Passenger Seat Heating/Venting/Cooling Mode parameter while pressing the passenger VENTED seat switch. The reading should change between Off and Vent/Cool.
 - If not the specified value, replace the A20 radio/HVAC controls.
3. If all scan tool parameter readings test normal and the driver and/or passenger vented seat is inoperative, refer to **Circuit System Testing**.

Circuit System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate blower motor listed below:
 - M73A seat blower motor - driver back
 - M73C seat blower motor - driver cushion
 - M73B seat blower motor - passenger back
 - M73D seat blower motor - passenger cushion
2. Test for less than 10 ohms between the ground circuit terminal B and ground.
 - If greater than the specified value, test the ground circuit for an open/high resistance.
3. Ignition ON, verify that a test lamp illuminates between the ignition circuit terminal C and ground.
 - If the test lamp does not illuminate, test the ignition circuit for a short to ground or an open/high resistance.
4. Connect a test lamp between the control circuit terminal A and B+.
5. Ignition ON, press the VENTED seat switch through the high, medium, and low positions to OFF. The test lamp should illuminate until the OFF position is reached.
 - If the test lamp does not illuminate, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K29 seat heating control module.
 - If the test lamp remains ON with the switch in the OFF position, test the control circuit for a short to ground. If the circuit tests normal, replace the K29 seat heating control module.
6. If all circuits test normal, test or replace the M73 blower motor.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Radio Control Assem ly Replacement**

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

VENTED SEAT MALFUNCTION (ITH MEMOR A4)

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
Ignition Voltage	1, 4	1, 4	-	-
Driver Seat Back Blower Motor Ignition Voltage	1, 4	2	-	-
Driver Seat Cushion Blower Motor Ignition Voltage	1, 4	3	-	-
Driver Vented Seat Control	1	1	1	-
Driver Seat Back Blower Motor Ground	-	2	-	-
Driver Seat Cushion Blower Motor Ground	-	3	-	-
Passenger Seat Back Blower Motor Ignition Voltage	1, 4	5	-	-
Passenger Seat Cushion Blower Motor Ignition Voltage	1, 4	6	-	-
Passenger Vented Seat Control	4	4	4	-
Passenger Seat Back Blower Motor Ground	-	5	-	-
Passenger Seat Cushion Blower Motor Ground	-	6	-	-
1. Driver vented seat is inoperative 2. Driver vented seat back is inoperative 3. Driver vented seat cushion is inoperative 4. Passenger vented seat is inoperative 5. Passenger vented seat back is inoperative 6. Passenger vented seat cushion is inoperative				

Circuit System Description

The driver and passenger vented seats are controlled by separate vented seat switches located in the radio/HVAC controls. Ignition voltage is supplied to the driver and passenger seat blower motors through a 15 A fuse located in the rear fuse block. When a vented seat switch is pressed, a serial data message is sent from

the radio/HVAC controls to the HVAC control module indicating the vented seat command. The HVAC control module 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 a low side pulse width modulation (PWM) signal through the blower motor control circuits to the seat cushion and seat back blower motors indicating the vented seat command. The logic in the blower motors then sets the blower speed to the switch set point. Both blower motors run drawing cabin air around and away from occupant. The seat memory control module then sends a serial data message back to the HVAC controls module to gateway the information back to the radio/HVAC controls to either illuminate or turn off the appropriate switch indicator.

Reference Information

Schematic Reference

Heated Cooled Seat Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Heated Vented Seat Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit System Verification

1. Ignition ON, observe the scan tool Driver Seat Heating/Venting/Cooling Mode parameter while pressing the left front VENTED seat switch. The reading should change between Off and Vent/Cool.
 - If not the specified value, replace the A20 radio/HVAC controls.
2. Observe the scan tool Passenger Seat Heating/Venting/Cooling Mode parameter while pressing the right front VENTED seat switch. The reading should change between Off and Vent/Cool.
 - If not the specified value, replace the A20 radio/HVAC controls.
3. If all scan tool readings test normal and the driver and/or passenger vented seat is inoperative, refer to **Circuit System Testing**.

Circuit System Testing

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1. Ignition OFF, disconnect the harness connector at the appropriate blower motor listed below:
 - M73A seat blower motor - driver back
 - M73C seat blower motor - driver cushion
 - M73B seat blower motor - passenger back
 - M73D seat blower motor - passenger cushion
2. Test for less than 10 ohms between the ground circuit terminal B and ground.
 - If greater than the specified value, test the ground circuit for an open/high resistance.
3. Ignition ON, verify that a test lamp illuminates between the ignition circuit terminal C and ground.
 - If the test lamp does not illuminate, test the ignition circuit for a short to ground or an open/high resistance.
4. Connect a test lamp between the control circuit terminal A and B+.
5. Ignition ON, press the VENTED seat switch through the high, medium, and low positions to OFF. The test lamp should illuminate until the OFF position is reached.
 - If the test lamp does not illuminate, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K40 seat memory control module.
 - If the test lamp remains ON with the switch in the OFF position, test the control circuit for a short to ground. If the circuit tests normal, replace the K40 seat memory control module.
6. If all circuits test normal, test or replace the M73 blower motor.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Radio Control Assembly Replacement**
- **Control Module References** for seat memory control module replacement, setup, and programming

REPAIR INSTRUCTIONS

DRIVER OR PASSENGER SEAT BACK CUSHION HEATER REPLACEMENT

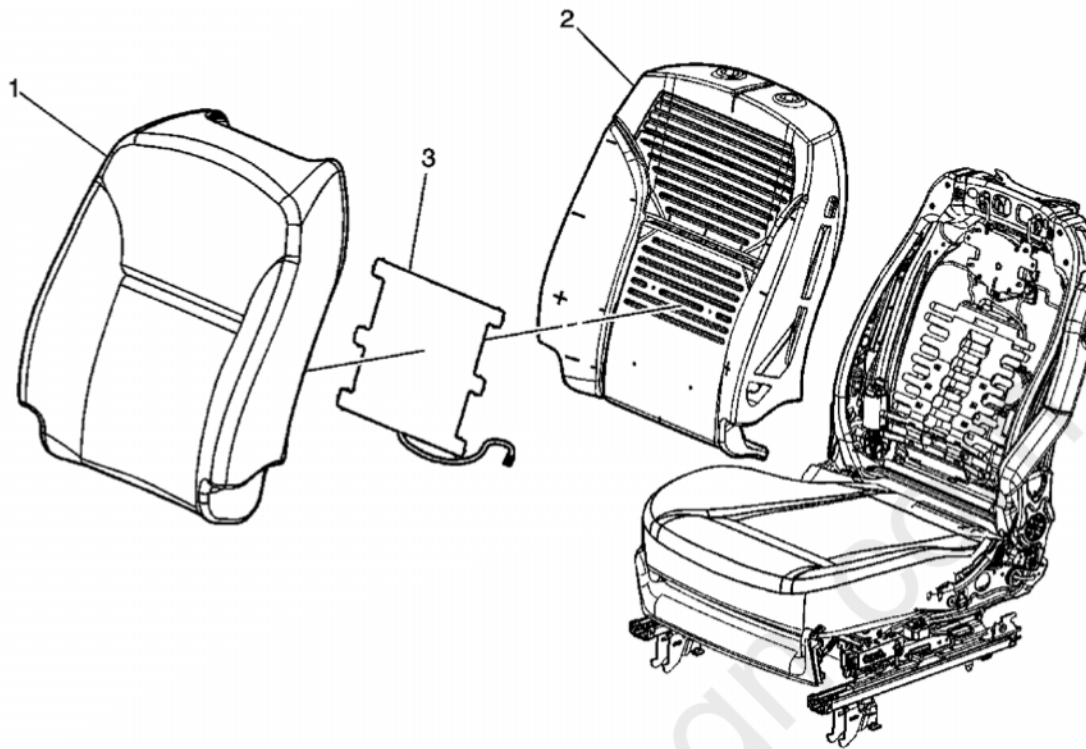


Fig. 6: View Of Driver or Passenger Seat Back Cushion Heater
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
WARNING: Refer to <u>SIR Warning</u> .	
Preliminary Procedure	
1. Remove the driver or passenger seat. Refer to <u>Driver or Passenger Seat Replacement</u> . 2. Remove the driver or passenger seat back cushion cover and pad. Refer to <u>Driver or Passenger Seat Back Cushion Cover and Pad Replacement</u> .	
1	Driver or Passenger Seat Back Cushion Cover Procedure: Separate the seat cushion from the seat cushion 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 by cutting the plastic tag pin attachments. Apply service heater by removing the adhesive backing and attach to the gray strips of fabric inside

the cushion trim. Align the notches in the fabric strips to those in the service heater. Place heater so that copper colored wires face the trim cover.

3. If this is the second time for servicing, then remove the heater leaving the old adhesive strips intact on the seat cushion trim. The new seat heater adhesive strips will be placed over the old adhesive strips.
- . Reassemble the trim to the cushion using hog ring tool.

DRIVER OR PASSENGER SEAT CUSHION HEATER REPLACEMENT

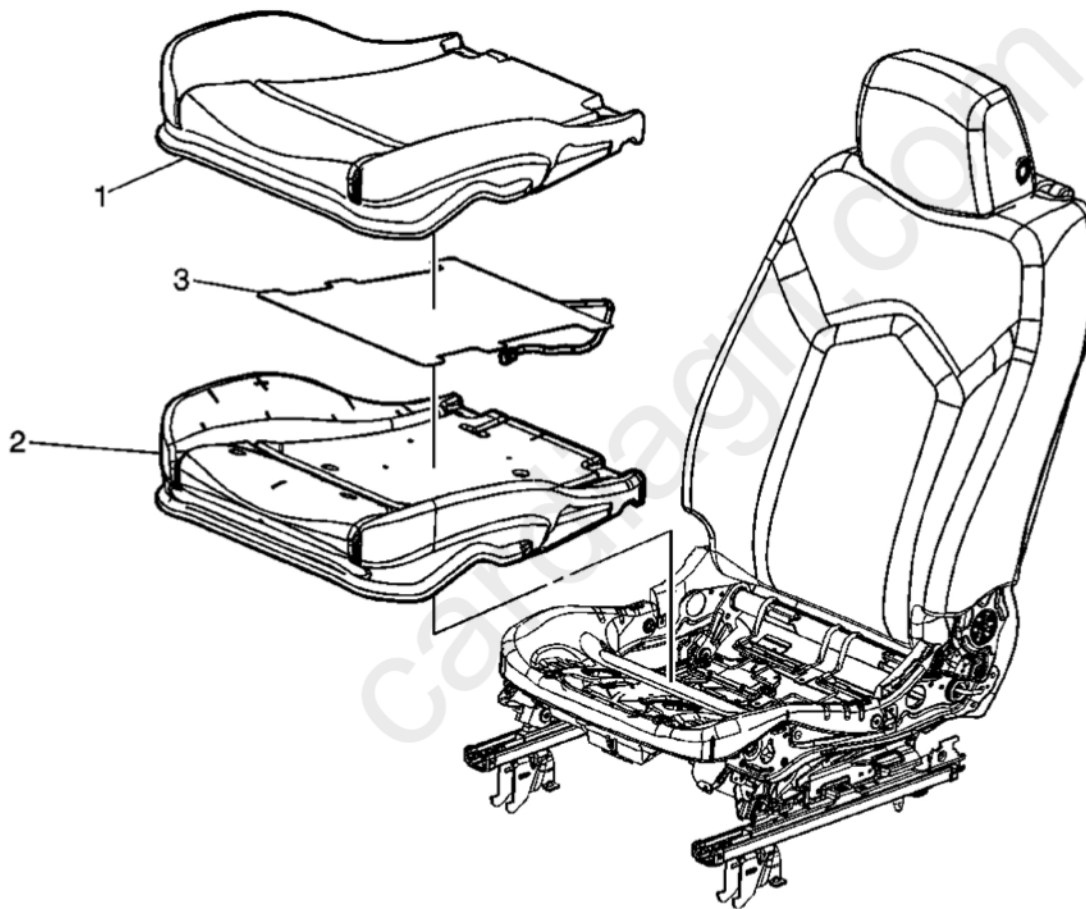


Fig. 7: Identifying Seat Cushion Heater
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure	
1.	Remove the driver or passenger seat. Refer to <u>Driver or Passenger Seat Replacement</u> .
2.	Remove the front seat cushion cover and pad. Refer to <u>Front Seat Cushion Cover and Pad Replacement</u> .

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1	Driver or Passenger Seat Cushion Cover Procedure: Separate the seat cushion from the seat cushion pad.
2	Driver or Passenger Seat Cushion Pad
3	Driver or Passenger Seat Cushion Heater Procedure 1. Disconnect the electrical connector. 2. Remove the heater element by cutting the plastic tag pin attachments. Apply service heater by removing the adhesive backing and attach to the gray strips of fabric inside the cushion trim. Align the notches in the fabric strips to those in the service heater. Place heater so that copper colored wires face the trim cover. 3. If this is the second time for servicing, then remove the heater leaving the old adhesive strips intact on the seat cushion trim. The new seat heater adhesive strips will be placed over the old adhesive strips. • Reassemble the trim to the cushion using hog ring tool. • If this is the passenger seat for the North American market, then the airbag occupant sensor must be checked for preload.

REAR SEAT HEATER CONTROL MODULE REPLACEMENT

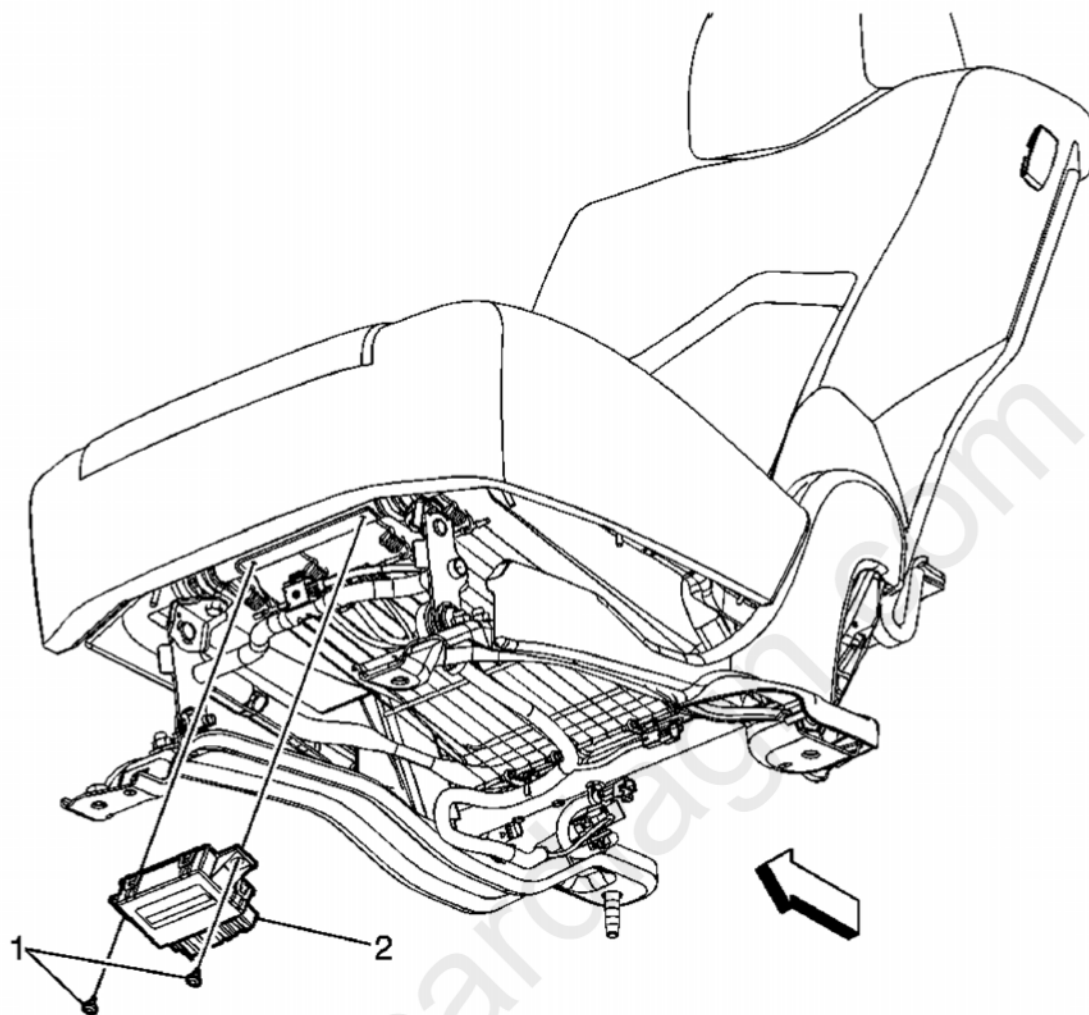


Fig. 8: Identifying Rear Seat Heater Control Module
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Rear Seat Heater Control Module Fastener ty 2
2	Rear Seat Heater Control Module Procedure 1. ocated under the seat side, disconnect the electrical connector. 2. Refer to Control Module References for programming and setup information.

REAR SEAT BACK CUSHION HEATER REPLACEMENT

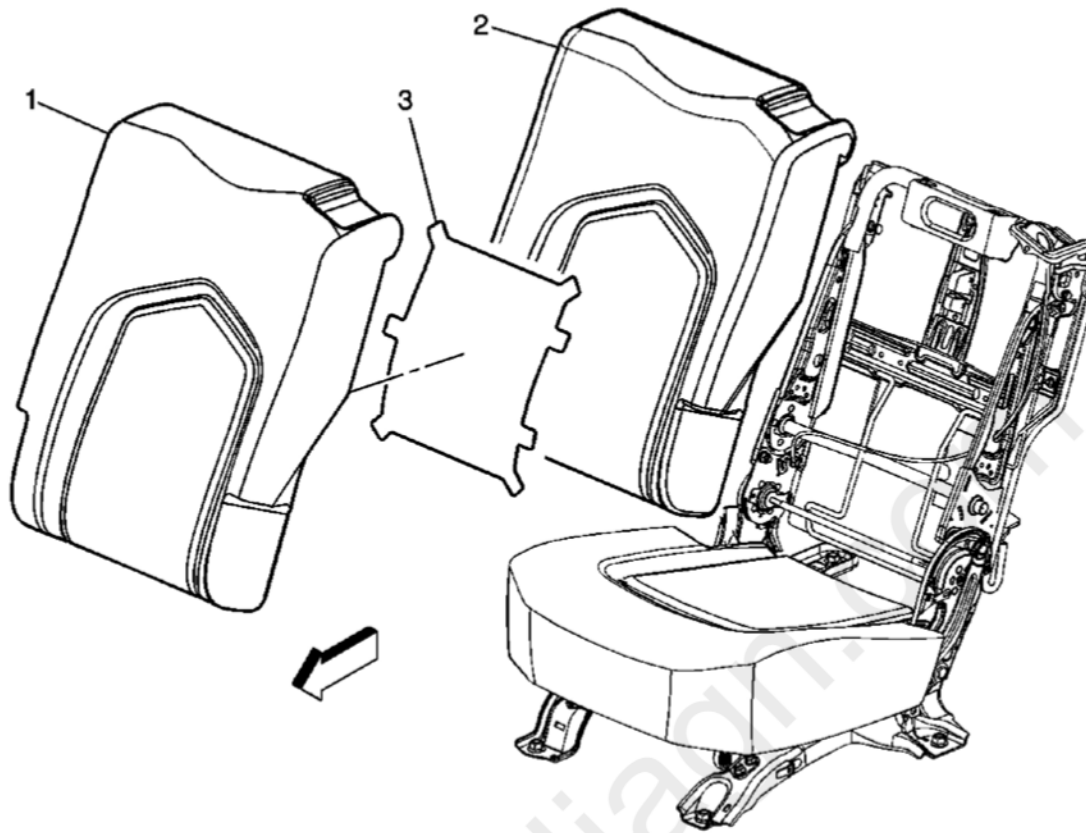
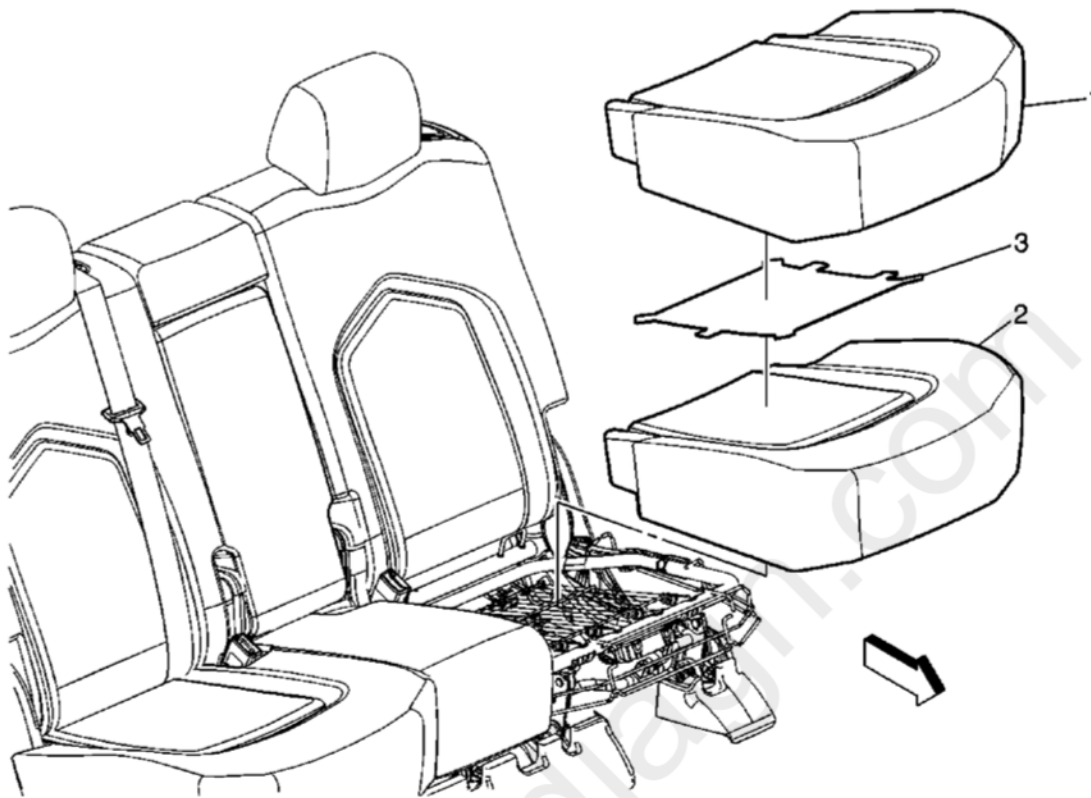


Fig. 9: View Of Rear Seat Back Cushion Heater
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure	
1. Remove the rear seat. Refer to <u>Rear Seat Replacement</u> . 2. Remove the rear seat cushion cover and pad. Refer to <u>Rear Seat Cushion Cover and Pad Replacement (60 Percent Seat)</u> or <u>Rear Seat Cushion Cover and Pad Replacement (40 Percent Seat)</u> .	
1	Rear Seat Back Cushion Cover Procedure: Separate the seat cushion cover from the seat cushion pad.
2	Rear Seat Back Cushion Pad
3	Rear 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 trim. The new seat heater adhesive strips will be placed over the old adhesive strips.

REAR SEAT CUSHION HEATER REPLACEMENT (40 PERCENT SEAT)**Fig. 10: Identifying Rear Seat Cushion Heater (40 Percent Seat)**

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure	
1. Remove the rear seat. Refer to <u>Rear Seat Replacement</u> . 2. Remove the rear seat cushion cover and pad. Refer to <u>Rear Seat Cushion Cover and Pad Replacement (60 Percent Seat)</u> or <u>Rear Seat Cushion Cover and Pad Replacement (40 Percent Seat)</u> .	
1	Rear Seat Cushion Cover Procedure: Separate the seat cushion cover from the seat cushion pad.
2	Rear Seat Cushion Pad
3	Rear Seat Cushion Heater Procedure 1. Disconnect the electrical connector. 2. Remove the heater element leaving the old adhesive strips intact on the seat cushion

cover trim. The new seat heater and strips will be placed over the old adhesive strips.

REAR SEAT CUSHION HEATER REPLACEMENT 6 PERCENT SEAT

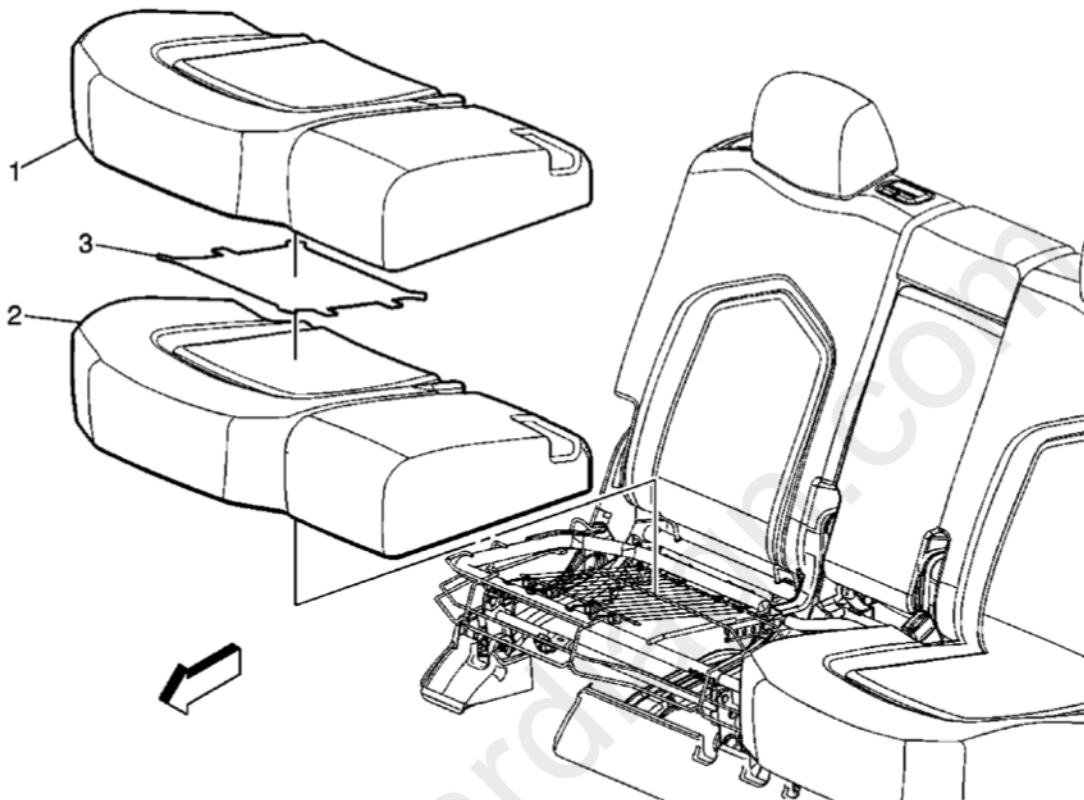


Fig. 11: Identifying Rear Seat Cushion Heater 6 Percent Seat
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure	
1. Remove the rear seat. Refer to <u>Rear Seat Replacement</u> . 2. Remove the rear seat cushion cover and pad. Refer to <u>Rear Seat Cushion Cover and Pad Replacement 6 Percent Seat</u> or <u>Rear Seat Cushion Cover and Pad Replacement Percent Seat</u> .	
1	Rear Seat Cushion Cover Procedure: Separate the seat cushion cover from the seat cushion pad.
2	Rear Seat Cushion Pad
	Rear Seat Cushion Heater Procedure

3

1. Disconnect the electrical connector.
2. Remove the heater element leaving the old adhesive strips intact on the seat cushion cover trim. The new seat heater and strips will be placed over the old adhesive strips.

FRONT SEAT VENT FAN REPLACEMENT

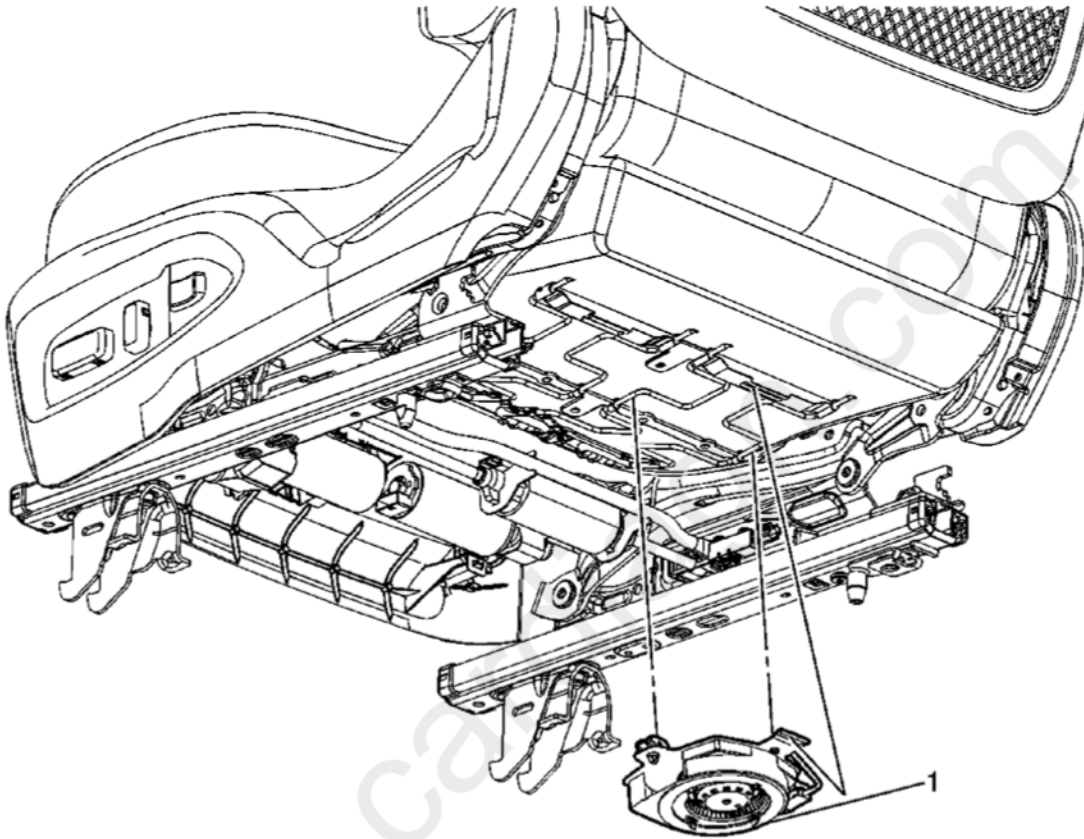


Fig. 1 : Locating Front Seat Vent Fan
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the driver or passenger seat. Refer to Driver or Passenger Seat Replacement .	
1	Front Seat Vent Fan Procedure 1. Disengage the ventilation heating and cooling module duct. 2. Disconnect the electrical connector. 3. Disconnect the retainers from the flex mat.

DRIVER OR PASSENGER SEAT AC VENTILATION HEATING AND COOLING MODULE REPLACEMENT

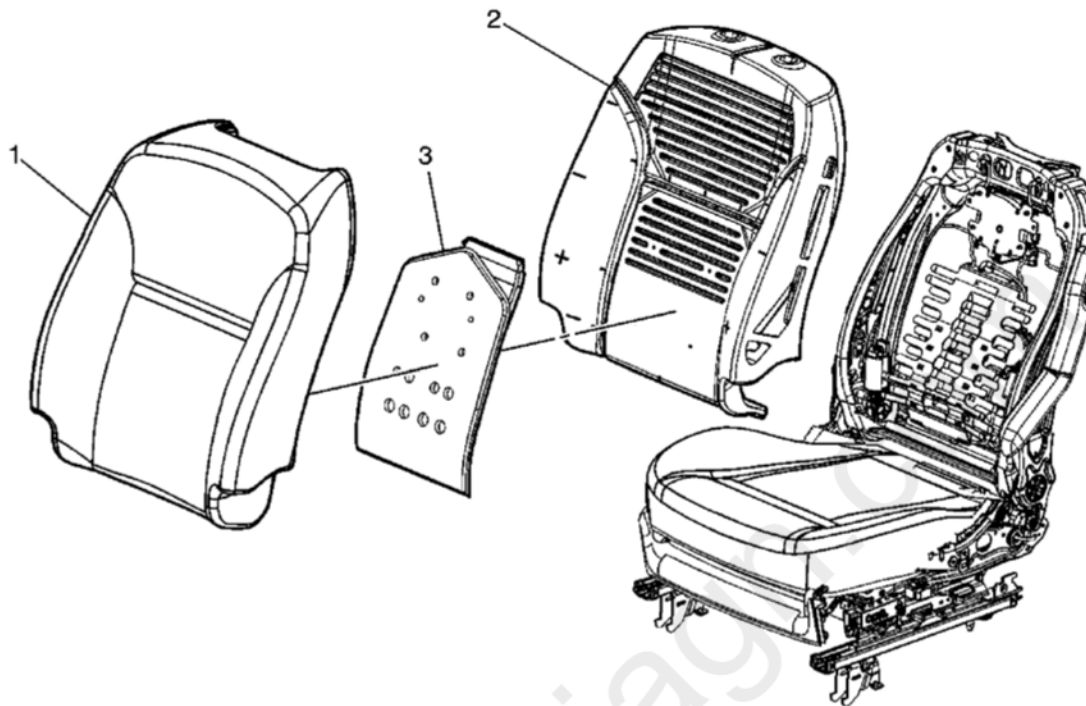


Fig. 1 : Identifying Driver or Passenger Seat ac Ventilation Heating and Cooling Module
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
WARNING: Refer to <u>SIR Warning</u> .	
Preliminary Procedure	
1. Remove the driver or passenger seat. Refer to <u>Driver or Passenger Seat Replacement</u> . 2. Remove the driver or passenger seat back cushion cover and pad. Refer to <u>Driver or Passenger Seat ac Cushion Cover and Pad Replacement</u> .	
1	Driver or Passenger Seat Back Cushion Cover Procedure: Separate the seat cushion from the seat cushion pad.
2	Driver or Passenger Seat Back Cushion Pad
3	Driver or Passenger Seat Back Ventilation Heating and Cooling Module Procedure 1. Remove the cooling module from the pad by separating the glue strips.

2. Disconnect the ventilation heating and cooling module and duct from the fan assembly.

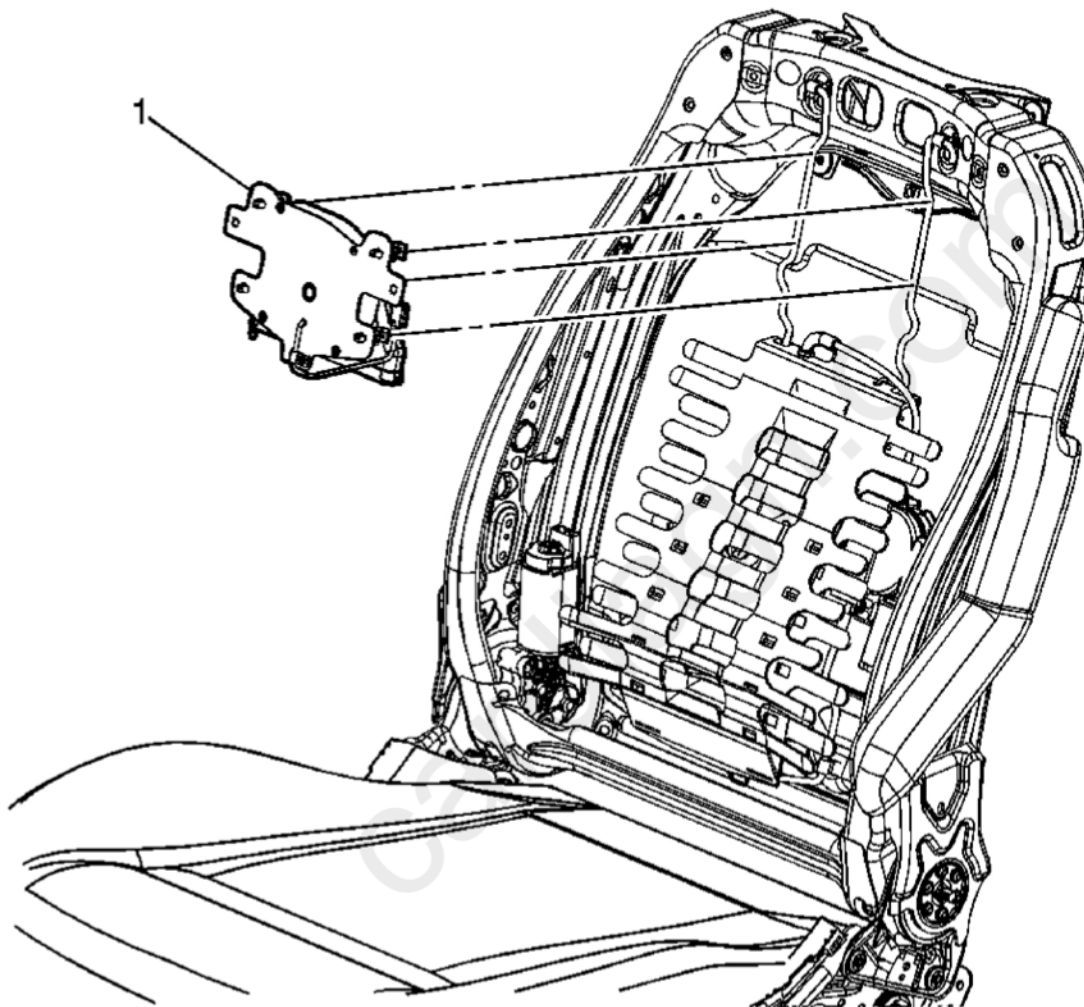
FRONT SEAT AC CUSHION VENT FAN REPLACEMENT

Fig. 1 : Identifying Front Seat ac Cushion Vent Fan
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure	
1. Remove the video display, if equipped. Refer to <u>Video Display Replacement</u> .	
2. Remove the driver or passenger seat back cushion finish panel. Refer to <u>Driver or Passenger Seat ac Cushion Finish Panel Replacement without U G</u> or <u>Driver or Passenger Seat ac Cushion Finish Panel Replacement with U G</u> .	
	Front Seat Back Cushion Ventilation Fan

Procedure

1

1. Disconnect the ventilation heating and cooling module duct, if equipped.
2. Disconnect electrical connector.
3. Disconnect the fan retainers from the lumbar sub system wires.

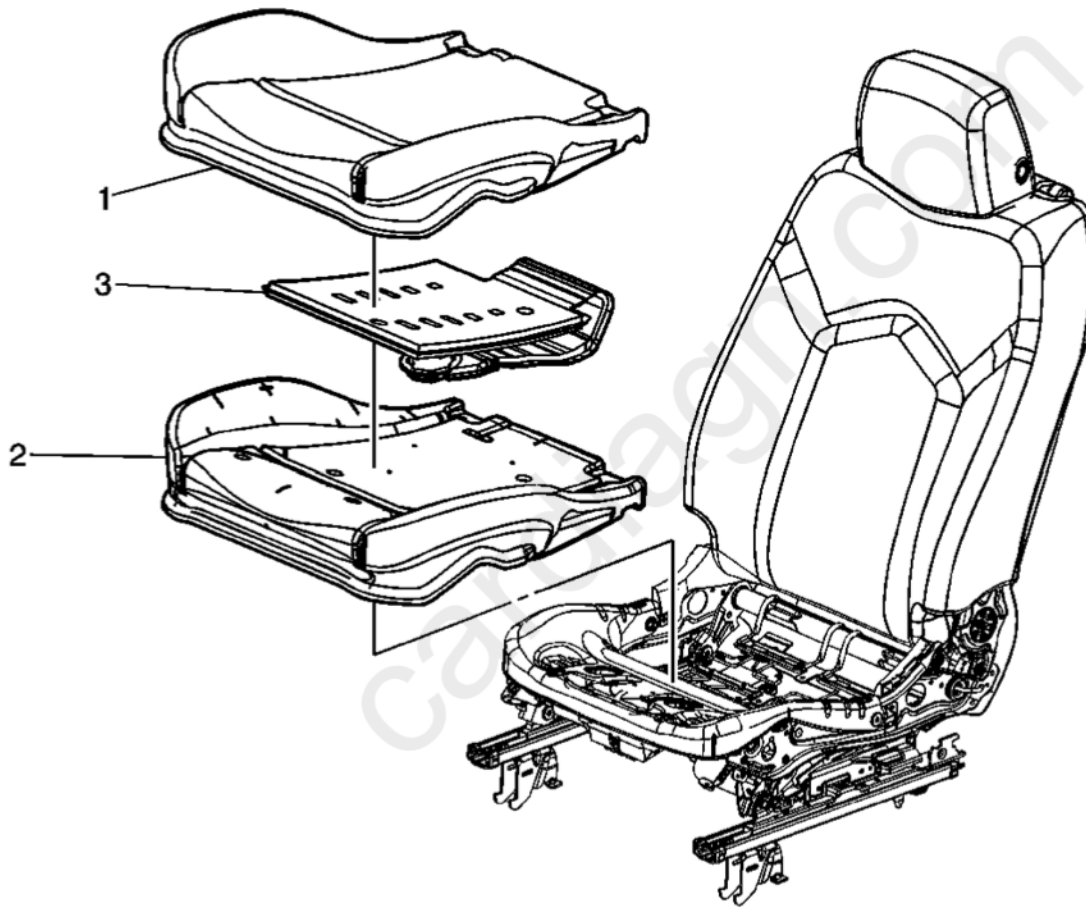
DRIVER SEAT CUSHION VENTILATION HEATING AND COOLING MODULE REPLACEMENT

Fig. 1 : View Of Driver Seat Cushion Ventilation Heating & Cooling Module
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure	
1. Remove the driver or passenger seat. Refer to <u>Driver or Passenger Seat Replacement</u> . 2. Remove the front seat cushion cover and pad. Refer to <u>Front Seat Cushion Cover and Pad Replacement</u> .	
	Driver Seat Cushion Cover

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1	Procedure: Separate the seat cushion cover from the seat cushion pad.
2	Driver Seat Cushion Pad
3	Driver Seat Cushion Ventilation Heating and Cooling Module Procedure 1. Remove the cooling module from the pad by separating the glue strips. 2. Disconnect the ventilation heating and cooling module and duct from the fan assembly.

PASSENGER SEAT CUSHION VENTILATION HEATING AND COOLING MODULE REPLACEMENT

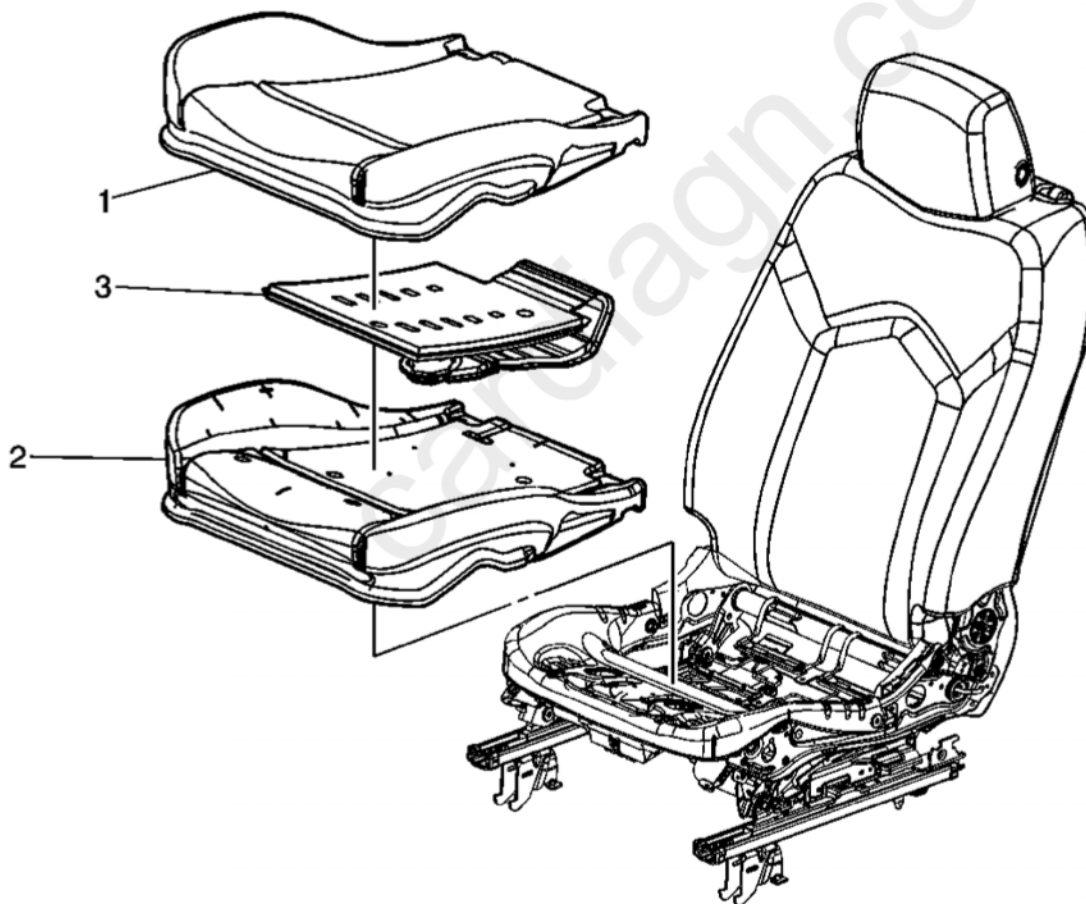


Fig. 16: Identifying Passenger Seat Cushion Ventilation Heating & Cooling Module
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure	

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1. Remove the driver or passenger seat. Refer to **Driver or Passenger Seat Replacement**.
2. Remove the front seat cushion cover and pad. Refer to **Front Seat Cushion Cover and Pad Replacement**.

1	Passenger Seat Cushion Cover Procedure: Separate the seat cushion cover from the seat cushion pad.
2	Passenger Seat Cushion Pad Procedure: When replacing the front passenger seat cushion, you must also replace the inflatable restraint passenger presence system. Refer to <u>Inflatable Restraint Front Passenger Presence Sensor Replacement</u>
3	Passenger Seat Cushion Ventilation Heating and Cooling Module Procedure 1. Remove the cooling module from the pad by separating the glue strips. 2. Disconnect the ventilation heating and cooling module and duct from the fan assembly.

ESCR T O N N O E R T O N

HEATED/VENTED SEAT DESCRIPTION AND OPERATION

Heated Seat Components

The heated/vented seat system consists of the following components:

- Heated seat switch
- Vented seat switch
- Radio/HVAC controls
- Seat memory control module or seat heating control module
- Seat cushion heating element
- Seat back heating element
- Seat cushion temperature sensor
- Seat cushion blower motor
- Seat back blower motor

Heated Seat Operation

The driver and passenger heated seats are controlled by separate heated seat switches that are located with the radio/HVAC controls. When a heated seat switch is pressed, a serial data message is sent from the radio/HVAC controls to the HVAC control module indicating the heated seat command. The HVAC control module serves as a gateway to transmit the message to the seat memory control module/seat heating control module via serial

data line. In response to this message, the seat memory control module/seat heating control module applies battery voltage through the element supply voltage circuit of the seat heating elements. The seat memory control module/seat heating control module sends a serial data message back to the HVAC control module to gateway the information to the radio/HVAC controls to either illuminate or turn off the appropriate temperature indicator.

Temperature Regulation

The seat memory control module monitors the seat temperature through the temperature sensor signal circuit and the temperature sensor (thermistor) that is located in the seat cushion with the heater element. The temperature sensor is a variable resistor, its resistance varies as the temperature of the seat changes. When the temperature sensor resistance indicates to the seat memory 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.

Vented Seat Operation

The vented seat operation is designed to draw cabin air around and away from the occupant through small holes in the seat cushion and seat back covers, through channels in the foam pad, and then through the blower motor exhausting the waste air under the seat cushion.

The driver and passenger vented seats are controlled by separate vented seat switches located in the with the radio/HVAC controls. With the ignition ON, ignition voltage is supplied to the driver and passenger seat blower motors through a 10 A fuse that is located in the underhood fuse block. Ground from G305 is provided to the driver seat blower motors while ground from G302 is provided to the passenger seat blower motors. When a vented seat switch is pressed, a serial data message is sent from the radio/HVAC controls to the HVAC control module indicating the vented seat command. The HVAC control module 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 message, the seat memory control module/seat heating control module applies a low side pulse width modulation (PWM) signal through the blower motor control circuits to the seat cushion and seat back blower motors indicating the vented seat command. The logic in the blower motors then sets the blower speed to the switch set point. Both blower motors run drawing cabin air around and away from occupant. 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 back to the radio/HVAC controls to either illuminate or turn off the appropriate switch indicator.

Remote Start Seat Heating and Ventilation

Some vehicles allow the customer to configure their heated and/or ventilated seats to come on after a remote start is commanded. The heated seats will only come on if the outside air temperature is below 50°F as measured by the outside air temperature sensor. Seat ventilation will only come on if the outside air temperature is measured above 80°F. When seat heating is commanded, the heating level will be on the "High" setting. On some vehicles, the LED display for the heating or ventilation temperature level may not illuminate during remote start operation. When the vehicle operator inserts the key in the ignition and turns it to the "On" position, the heated seats will automatically turn off. Be aware that during remote start heated seat operation, since there is no occupant in the seat, the customer may comment that they feel little or no difference in the temperature of the seat. This is due to little heat transfer to the seat cover occurring since there is no weight on the cushion.

Once the seat is occupied and the seat cover is pressed against the heater element, heat will begin to transfer more rapidly to the seat cover.

Load 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.

REAR HEATED SEATS DESCRIPTION AND OPERATION

Heated Seat Components

The rear heated seat system has one control module that controls heat operation for both the left and right rear seat. The rear heated seat system consists of the following components:

- Rear seat heating control module
- Left rear heated seat switch
- Right rear heated seat switch
- Left seat cushion heating element
- Left seat back heating element
- Left seat cushion temperature sensor
- Right seat cushion heating element
- Right seat back heating element
- Right seat cushion temperature sensor
- 20 A Fuse

Power and Grounds

Battery positive voltage is supplied to the rear seat heating control module through a 20 A fuse that is located in the rear fuse block. This voltage is used to power up the rear seat heating control module and to supply power to the seat heater elements. Ground for the rear seat heating control module is provided at G301.

Heated Seat Operation

The left and right rear heated seats are controlled by separate heated seat switches located in the rear seat audio module. The rear seat heating control module controls the heated seat operation for both rear seats.

The left and right rear heated seats are controlled by a single seat heating control module that is located behind the rear seat back cushion. Both heated seats are controlled by separate heated seat switches that are located in the rear seat audio module. When a heated seat switch is pressed, a GMLAN message is sent from the rear seat audio module to the rear seat heating control module indicating the heated seat command. In response to this signal, the rear seat heating control module then applies battery positive voltage through the element supply voltage circuit to the seat heating elements. The seat heating control module then sends a serial data message back to the rear seat audio module to either illuminate or turn off the appropriate temperature indicator.

Temperature Regulation

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

The rear 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 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 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/cooled 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** .

