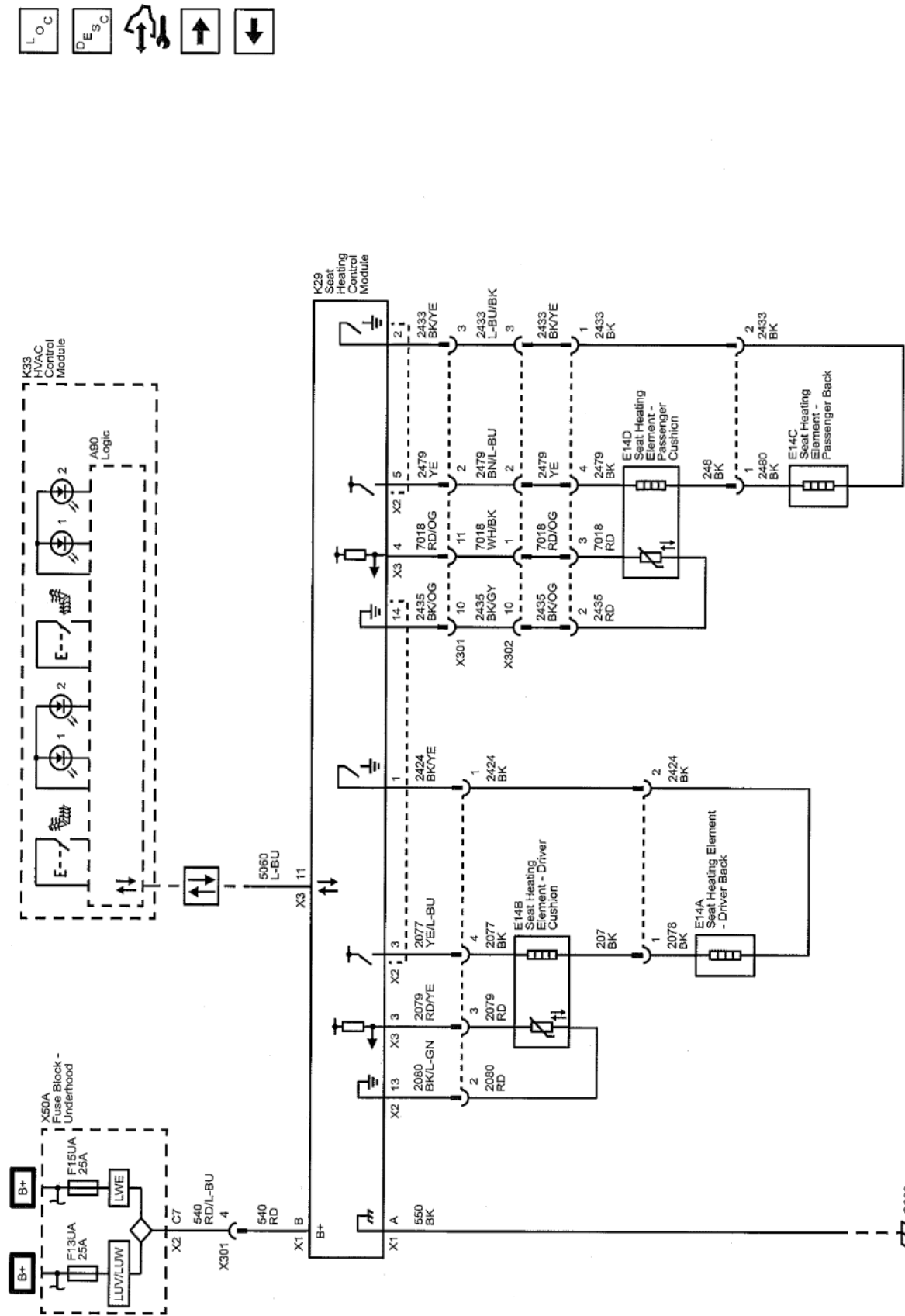


Seat Heating and Cooling

Schematic and Routing Diagrams

Heated/Cooled Seat Schematics (Heated Seats (KA1))



Diagnostic Information and Procedures

DTC B1925 or B2170

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle* on page 6-66 prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis* on page 6-58 for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions* on page 6-59 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 Cushion Temperature Sensor Signal	B1925 02	B1925 05	B1925 05	B2345 13
Driver Heated Seat Cushion Temperature Sensor Low Reference	—	B1925 05	—	B2345 13
Passenger Heated Seat Element Control Terminal 5 X2	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Passenger Heated Seat Element Control Terminal 2 X2	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Passenger Heated Seat Cushion Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	B2345 13
Passenger Heated Seat Cushion Temperature Sensor Low Reference	—	B2170 05	—	B2345 13

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

B1925 02 or B2170 02

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

B1925 05 or B2170 05

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

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics on page 14-35

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Heated Seats Description and Operation on page 14-49

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 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 5 Ω between the low reference circuit terminal 2 and ground.
 - ⇒ **If 5 Ω or greater**
 - 2.1. Ignition OFF, disconnect the X2 harness connector at the K29 seat heating control module.
 - 2.2. Test for less than 2 Ω in the low reference circuit end to end.
 - ⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.
 - ⇒ If less than 2 Ω , replace the K29 seat heating control module.
 - ↓ **If less than 5 Ω**
3. Ignition ON.

4. Test for 4.8–5.2 V between the signal circuit terminal 3 and ground.

⇒ If less than 4.8 V

- 4.1. Ignition OFF, disconnect the X3 harness connector at the K29 seat heating control module.
- 4.2. Test for infinite resistance between the signal circuit and ground.
 - ⇒ If less than infinite resistance, repair the short to ground on the circuit.
 - ↓ If infinite resistance
- 4.3. Test for less than 2 Ω in the signal circuit end to end.
 - ⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.
 - ⇒ If less than 2 Ω , replace the K29 seat heating control module.

⇒ If greater than 5.2 V

- 4.1. Ignition OFF, disconnect the X3 harness connector at the K29 seat heating control module, Ignition ON.
- 4.2. Test for less than 1 V between the signal circuit and ground.
 - ⇒ If 1 V or greater, repair the short to voltage on the circuit.
 - ⇒ If less than 1 V, K29 seat heating control module.

↓ If between 4.8–5.2 V

5. 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 Ω –300 k Ω between the signal circuit terminal 3 and the low reference circuit terminal 2.
 - ⇒ **If not between 500 Ω –300 k Ω**
Replace the E14 seat cushion heating element.
 - ↓ **If between 500 Ω –300 k Ω**
3. All OK.

Repair Instructions

Perform the *Diagnostic Repair Verification* on page 6-92 after completing the repair.

- *Driver or Passenger Seat Cushion Heater Replacement on page 14-48*
- *Control Module References on page 6-3 for seat heating control module replacement, programming and setup*

DTC B2345**Diagnostic Instructions**

- Perform the *Diagnostic System Check - Vehicle* on page 6-66 prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis* on page 6-58 for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions* on page 6-59 provides an overview of each diagnostic category.

DTC Descriptors**DTC B2345 13:** Seat Heater Disable Circuit Low Voltage/High Temperature**Diagnostic Fault Information**

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

Circuit/System Description

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

Conditions for Running the DTC

- Engine must be running.
- 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 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 on page 14-35

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Heated Seats Description and Operation on page 14-49

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the X2 and X3 harness connectors at the K29 seat heating control module.
2. Test for greater than 3 k Ω between the signal and the low reference circuit terminals listed below:
 - Driver seat cushion terminal 3 X3 and terminal 13 X2
 - Passenger seat cushion terminal 4 X3 and terminal 14 X2

⇒ **If less than 3 k Ω**

- 2.1. Ignition OFF, disconnect the harness connector at the appropriate E14B or E14D seat cushion heating element.
- 2.2. Test for Infinite resistance between the signal and low reference circuits.

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

⇒ If infinite resistance, test or replace the E14 seat cushion heating element.

↓ **If greater than 3 k Ω**

3. Replace the K29 seat heating control module.

Component Testing

Seat Cushion Heating Element

1. Ignition OFF, disconnect the harness connector at the appropriate E14B or E14D seat cushion heating element.
2. Test for 500 Ω –300 k Ω between the signal circuit terminal 3 and the low reference circuit terminal 2.

⇒ **If not between 500 Ω –300 k Ω**

Replace the E14 seat cushion heating element.

↓ **If between 500 Ω –300 k Ω**

3. All OK.

Repair Instructions

Perform the *Diagnostic Repair Verification* on page 6-92 after completing the repair.

- *Driver or Passenger Seat Cushion Heater Replacement on page 14-48*
- *Control Module References on page 6-3 for K29 seat heating control module replacement, programming and setup*

DTC B2425 or B2430**Diagnostic Instructions**

- Perform the *Diagnostic System Check - Vehicle* on page 6-66 prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis* on page 6-58 for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions* on page 6-59 provides an overview of each diagnostic category.

DTC Descriptors**DTC B2425 0B:** Driver Seat Cushion Heater Circuit High Current**DTC B2425 0D:** Driver Seat Cushion Heater Circuit High Resistance**DTC B2425 0E:** Driver Seat Cushion Heater Circuit Low Resistance**DTC B2430 0B:** Passenger Seat Cushion Heater Circuit High Current**DTC B2430 0D:** Passenger Seat Cushion Heater Circuit High Resistance**DTC B2430 0E:** Passenger Seat Cushion Heater Circuit Low Resistance**Diagnostic Fault Information**

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

Circuit/System Description

The driver and front passenger heated seats are controlled by the front 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.
- 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 B2430 0D**

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

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

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

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics on page 14-35

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Heated Seats Description and Operation on page 14-49

Electrical Information Reference

- Circuit Testing on page 11-526
- Connector Repairs on page 11-548
- Testing for Intermittent Conditions and Poor Connections on page 11-531
- Wiring Repairs on page 11-537

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

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

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

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

2. Test for 0.5–2 Ω between control circuit terminal 1 and control circuit terminal 2.

⇒ **If not between 0.5–2 Ω**

Replace the E14A driver seat back heating element.

⇓ **If between 0.5–2 Ω**

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

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

4. Test for 1–5 Ω between control circuit terminal 3 and control circuit terminal 1.

⇒ **If less than 1 Ω**

- 4.1. Ignition OFF, disconnect the harness connector at the E14B driver seat cushion heating element.

- 4.2. Test for infinite resistance between the control circuits.

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

⇒ **If infinite resistance**, test or replace the E14B driver seat cushion heating element.

⇒ **If greater than 5 Ω**

- 4.1. Ignition OFF, disconnect the harness connector at the E14B driver seat cushion heating element.

- 4.2. Test for less than 2 Ω between the control circuits end to end.

⇒ **If 2 Ω or greater**, repair the open/high resistance in the circuit.

⇒ **If less than 2 Ω** , test or replace the E14B driver seat cushion heating element.

⇓ **If between 1–5 Ω**

5. Replace the K29 seat heating control module.

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

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

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

2. Test for 0.5–2 Ω between control circuit terminal 1 and control circuit terminal 2.

⇒ **If not between 0.5–2 Ω**

Replace the E14C passenger seat back heating element.

⇓ **If between 0.5–2 Ω**

3. Connect the harness connector at the E14C passenger seat back heating element and disconnect the X2 harness connector at the K29 seat heating control module.

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

4. Test for 1–5 Ω between control circuit terminal 5 and control circuit terminal 2.

⇒ **If less than 1 Ω**

- 4.1. Ignition OFF, disconnect the harness connector at the E14D passenger seat cushion heating element.
- 4.2. Test for infinite resistance between the control circuits.
- ⇒ If less than infinite resistance, repair the short between the circuits.
- ⇒ If infinite resistance, test or replace the E14D passenger seat cushion heating element.

⇒ **If greater than 5 Ω**

- 4.1. Ignition OFF, disconnect the harness connector at the E14D passenger seat cushion heating element.

- 4.2. Test for less than 2 Ω between the control circuits end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω , test or replace the E14D passenger seat cushion heating element.

↓ **If between 1–5 Ω**

5. Replace the K29 seat heating control module.

Repair Instructions

Perform the *Diagnostic Repair Verification* on page 6-92 after completing the repair.

- *Driver or Passenger Seat Back Cushion Heater Replacement on page 14-47*
- *Driver or Passenger Seat Cushion Heater Replacement on page 14-48*
- *Control Module References on page 6-3 for front seat heating control module replacement, programming and setup*

DTC B242A

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle* on page 6-66 prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis* on page 6-58 for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions* on page 6-59 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 0B, B2425 0E
Driver Heated Seat Element Control Terminal 1 X2	B242A 02	B2425 0D	B242A 01	B2425 0B, B2425 0E
Driver Heated Seat Cushion Temperature Sensor Signal	B1925 02	B1925 05	B1925 05	B2345 13
Driver Heated Seat Cushion Temperature Sensor Low Reference	—	B1925 05	—	B2345 13
Passenger Heated Seat Element Control Terminal 5 X2	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Passenger Heated Seat Element Control Terminal 2 X2	B242A 02	B2430 0D	B242A 01	B2430 0B, B2430 0E
Passenger Heated Seat Cushion Temperature Sensor Signal	B2170 02	B2170 05	B2170 05	B2345 13
Passenger Heated Seat Cushion Temperature Sensor Low Reference	—	B2170 05	—	B2345 13

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

B242A 01

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

B242A 02

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

Action Taken When the DTC Sets

The heated seat function for both seats will be disabled.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics on page 14-35

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Heated Seats Description and Operation on page 14-49

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Testing

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

⇒ If less than infinite resistance

Repair the short to ground on the circuit.

⇓ If infinite resistance

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

⇒ If 1 V or greater

Repair the short to voltage on the circuit.

⇓ If less than 1 V

5. Replace the K29 seat heating control module.

Repair Instructions

Perform the *Diagnostic Repair Verification* on page 6-92 after completing the repair.

Control Module References on page 6-3 for seat heating control module replacement, programming and setup

Symptoms - Seat Heating and Cooling

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

1. When diagnosing a heated seat system condition perform the *Diagnostic System Check - Vehicle* on page 6-66, before using the symptom tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The control module(s) can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to *Heated Seats Description and Operation* on page 14-49.

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the power seats. Refer to *Checking Aftermarket Accessories* on page 11-525.
- 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* on page 11-531.

Symptom List

Refer to the *Front Heated Seat Malfunction* on page 14-45 diagnostic procedure in order to diagnose the symptom.

Front Heated Seat Malfunction

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle* on page 6-66 prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis* on page 6-58 for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions* on page 6-59 provides an overview of each diagnostic category.

Diagnostic Fault Information

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

Circuit/System Description

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

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics on page 14-35

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Heated Seats Description and Operation on page 14-49

Electrical Information Reference

- *Circuit Testing* on page 11-526
- *Connector Repairs* on page 11-548

- *Testing for Intermittent Conditions and Poor Connections* on page 11-531
- *Wiring Repairs* on page 11-537

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Verification

1. Ignition ON.
 2. Verify that no heated seat DTCs are set.
- ⇒ **If any heated seat DTC is set**
- Refer to *Diagnostic Trouble Code (DTC) List - Vehicle* on page 6-69.
- ↓ **If no heated seat DTCs are set**
3. Engine ON.
 4. Verify the scan tool Front Seat Heating Control Module Driver Seat Heating/Venting/Cooling Mode parameter changes between Off and Back & Cushion Heat after pressing the driver heated seat switch.
- ⇒ **If the parameter does not change**
- Replace the K33 HVAC control module.
- ↓ **If the parameter changes**

5. Verify the scan tool Passenger Front Seat Heating/Venting/Cooling Mode Switch parameter changes between Off and Back & Cushion Heat after pressing the passenger heated seat switch.

⇒ **If the parameter does not change**

Replace the K33 HVAC control module.

↓ **If the parameter changes**

6. Replace the K29 seat heating control module.

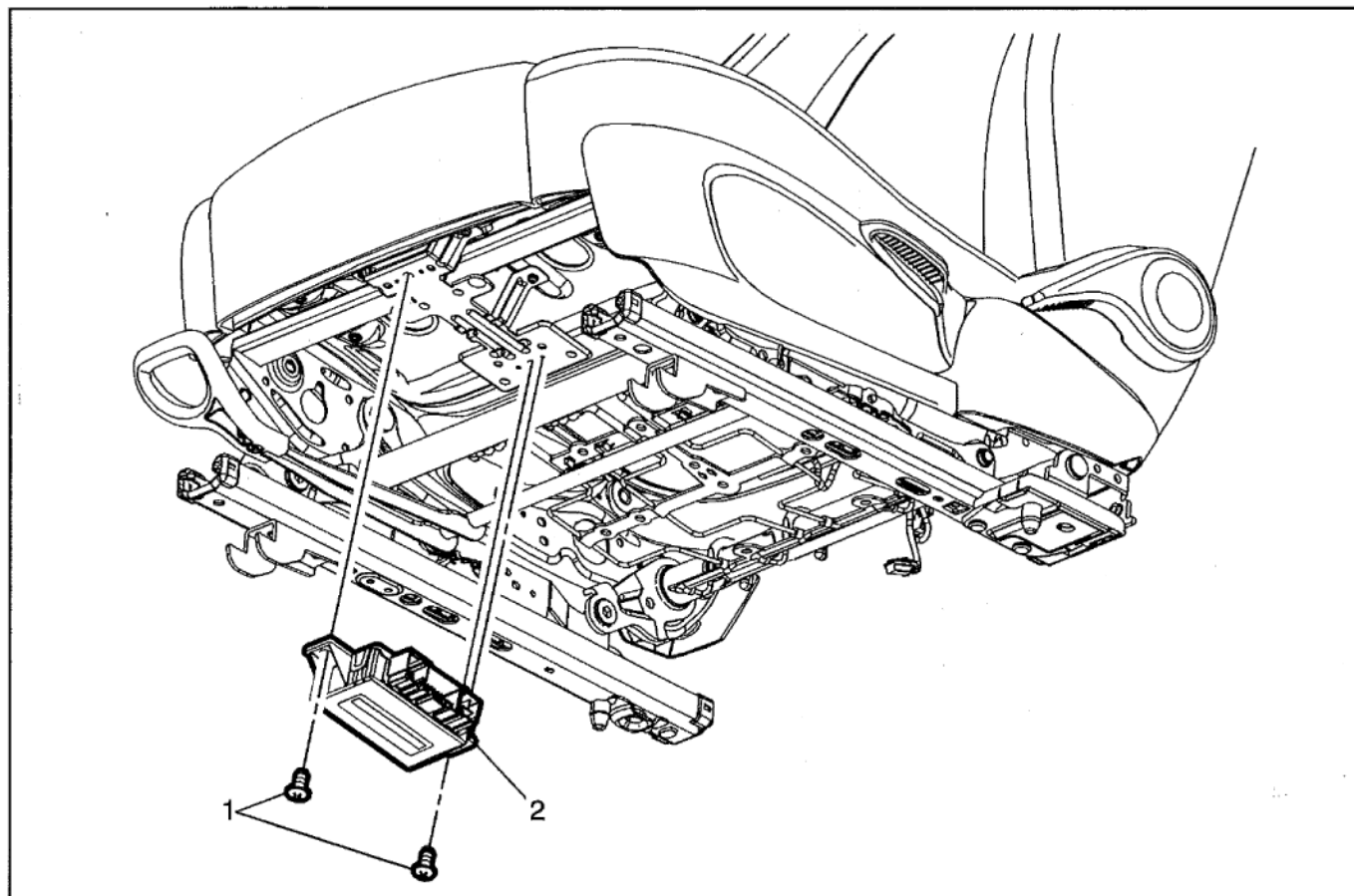
Repair Instructions

Perform the *Diagnostic Repair Verification* on page 6-92 after completing the repair.

- *Heater and Air Conditioning Control Replacement* on page 10-79
- *Control Module References* on page 6-3 for seat heating control module replacement, programming and setup

Repair Instructions

Front Seat Heater Control Module Replacement

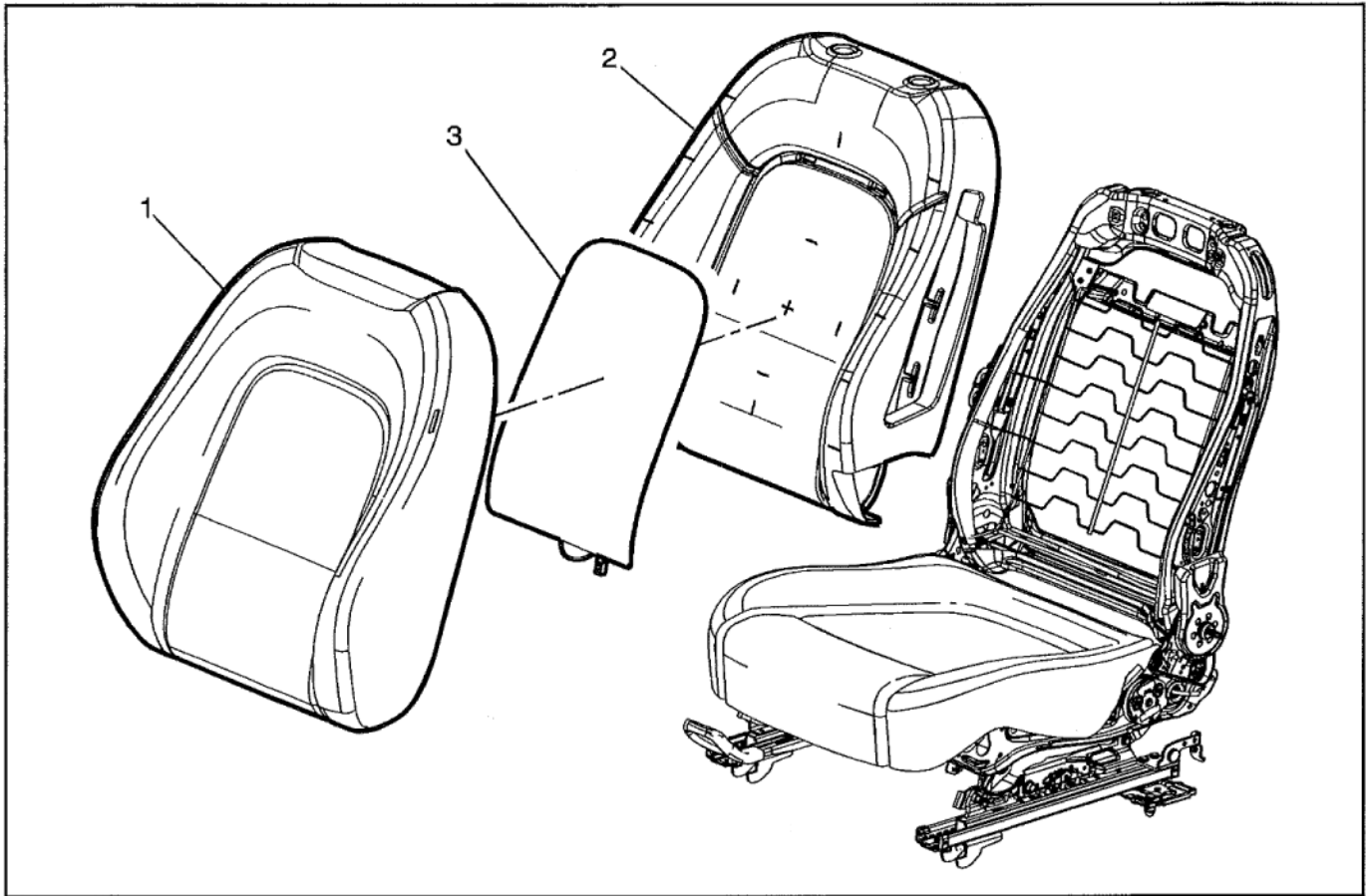


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Front Seat Heater Control Module Replacement

Callout	Component Name
1	Front Seat Heater Control Module Fastener (Qty: 2) Caution: Refer to <i>Fastener Caution</i> on page 0-8.
2	Front Seat Heater Control Module Procedure 1. Disconnect the electrical connectors. 2. Remove the module from the heater control bracket. 3. Refer to <i>Control Module References</i> on page 6-3 for replacement and setup information.

Driver or Passenger Seat Back Cushion Heater Replacement

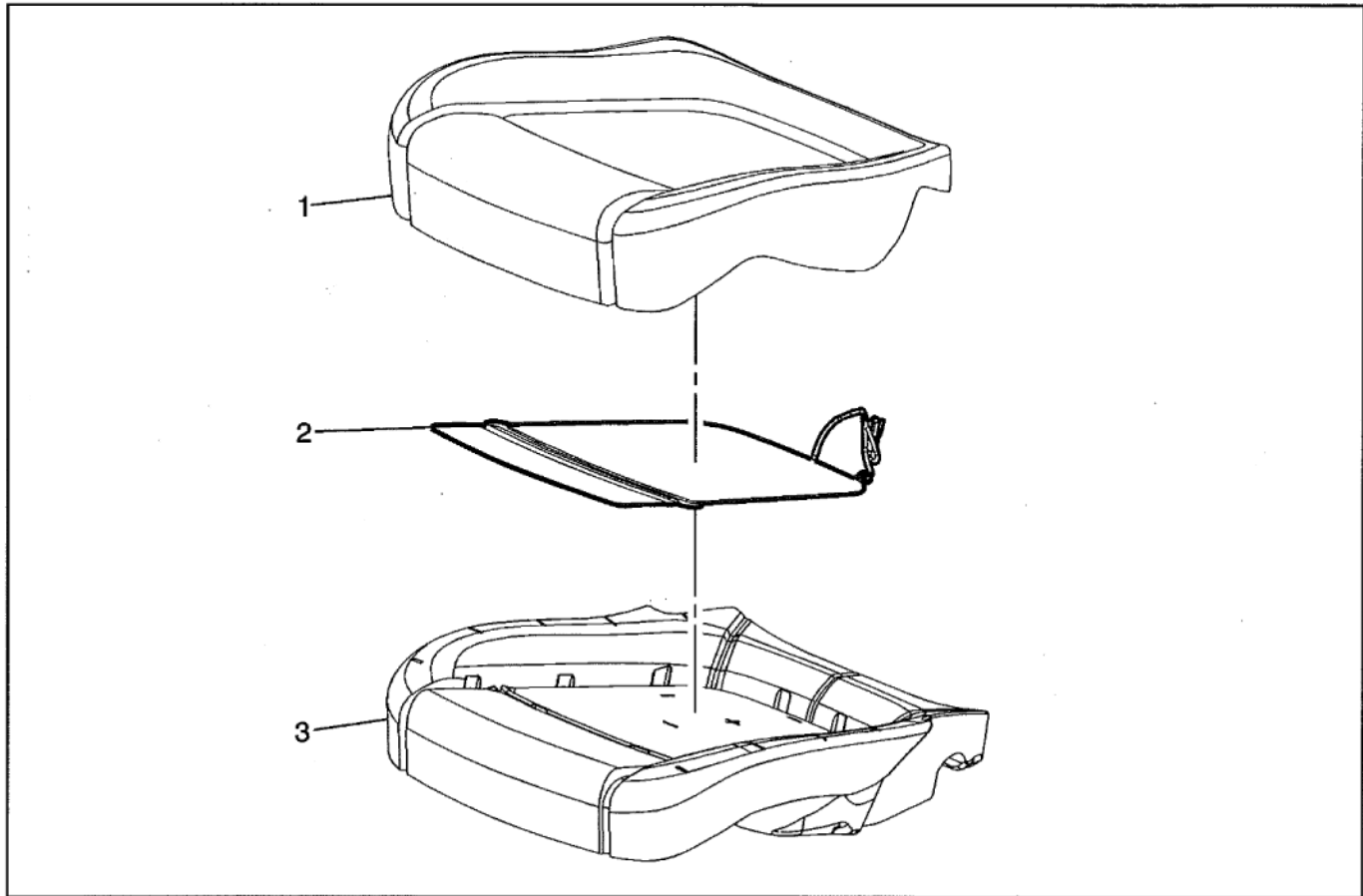


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Driver or Passenger Seat Back Cushion Heater Replacement

Callout	Component Name
Warning: Refer to SIR Warning on page 0-7.	
Preliminary Procedure	
1. Remove the driver or passenger seat. Refer to <i>Driver or Passenger Seat Removal and Installation</i> on page 14-4.	
2. Remove the driver or passenger seat back cushion cover and pad. Refer to <i>Driver or Passenger Seat Back Cover and Pad Replacement</i> on page 14-15.	
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 leaving the old adhesive strips intact on the seat cushion. The new seat heater adhesive strips will be placed over the old adhesive strips.

Driver or Passenger Seat Cushion Heater Replacement



2506114

Driver or Passenger Seat Cushion Heater Replacement

Callout	Component Name
Warning: Refer to SIR Warning on page 0-7.	
Preliminary Procedures 1. Remove the driver or passenger seat. Refer to <i>Driver or Passenger Seat Removal and Installation</i> on page 14-4. 2. Remove the front seat cushion cover and pad. Refer to <i>Front Seat Cushion Cover and Pad Replacement</i> on page 14-14.	
1	Front Seat Cushion Cover Procedure Separate the seat cushion from the seat cushion pad by pulling the cover away from the pad.
2	Front Seat Cushion Heater Procedure The heater is retained to the pad with adhesive, carefully peel the heater from the seat cushion pad to remove.
3	Front Seat Cushion Pad Note: The seat belt presence sensor and heat mat, if equipped are integral parts of the seat cushion pad.

Description and Operation

Heated Seats Description and Operation

Heated Seat Components

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

- Left heated seat switch
- Right heated seat switch
- HVAC control module
- Seat heating control module
- Driver seat cushion heating element
- Driver seat back heating element
- Driver seat cushion temperature sensor
- Passenger seat cushion heating element
- Passenger seat back heating element
- Passenger seat cushion temperature sensor

Power and Ground

Battery positive voltage is supplied at all times to the seat heating control module through a 30 A fuse located in the underhood fuse block. This voltage is used by the module to supply power to the seat heating elements. Ground for the module is provided through the module ground circuit and ground connection.

Heated Seat Operation

The driver and passenger heated seats are controlled by a single seat heating control module that is located under the driver seat cushion. Both heated seats are controlled by separate heated seat switches that are located in the HVAC control. When a heated seat switch is pressed, a serial data message is sent from the HVAC control to the HVAC control module indicating the heated seat command. The HVAC control

module then serves as a gateway to transmit the message to the seat heating control module via the serial data line. In response to this signal, the seat heating control module applies battery positive voltage through the element supply voltage circuit to the appropriate seat heating elements. The seat heating control module then sends a serial data message back to the HVAC control module to gateway the information to the HVAC control to either illuminate or turn off the appropriate temperature indicator.

Temperature Regulation

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

The 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 Shed Management

The electrical power management function is designed to monitor the vehicle electrical load and determine when the battery is potentially in a high discharge condition. The heated seat system is one of the vehicle loads that is subject to reduction during a battery discharge condition. For more information on load management refer to *Electrical Power Management Description and Operation* on page 9-731.