

ACCESSORIES & EQUIPMENT

Seat Heating and Cooling - Corvette

SCHEMATIC WIRING DIAGRAMS

HEATED/COOLED SEAT WIRING SCHEMATICS

Heating, Cooling Controls and Seat Heating (KA1) Wiring Schematics

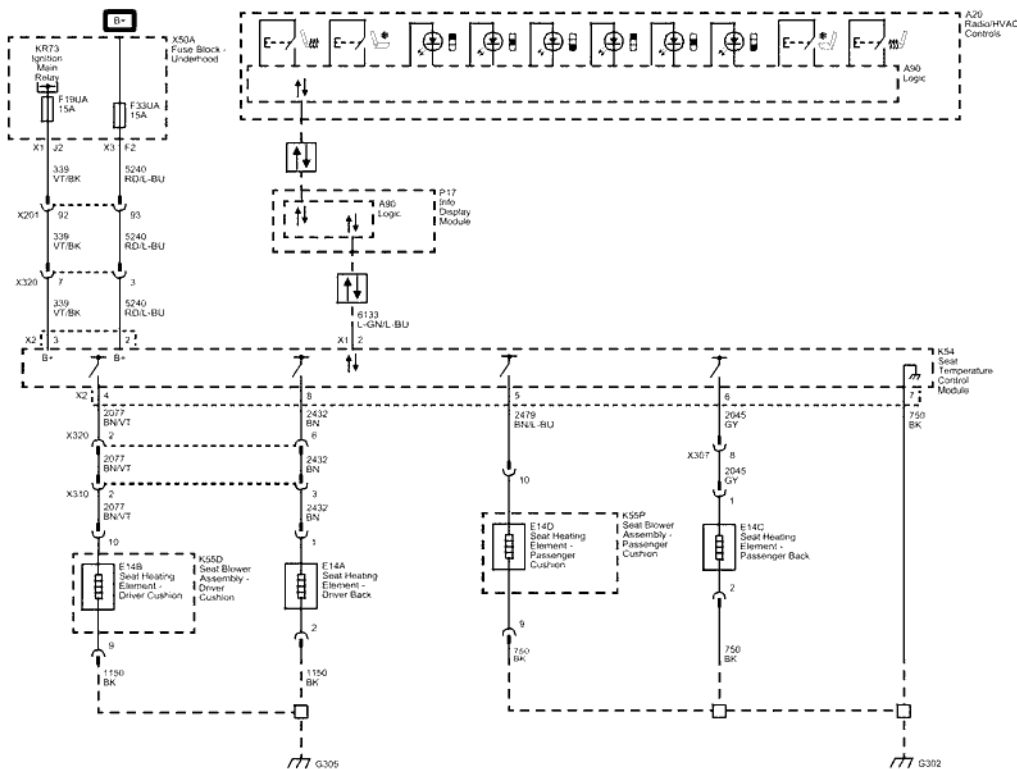


Fig. 1: Heating, Cooling Controls and Seat Heating (KA1) Wiring Schematic
Courtesy of GENERAL MOTORS COMPANY

Driver Seat Blower Motor Controls (KQV) Wiring Schematics

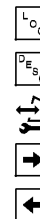
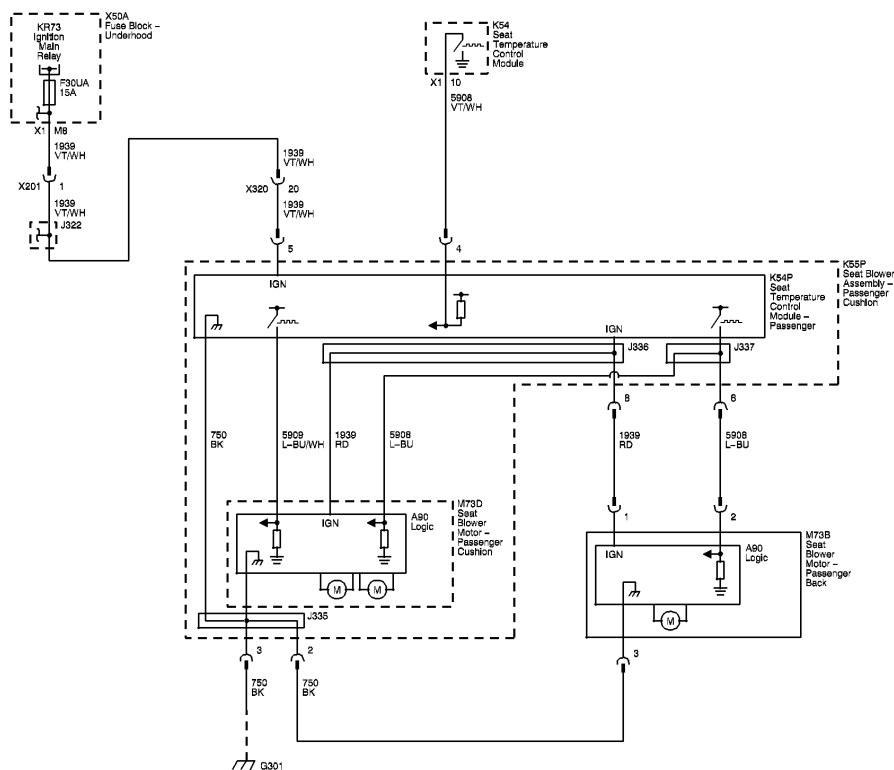


Fig. 3: Passenger Seat Blower Motor Controls (KQV) Wiring Schematic
 Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
DTC B191A	DTC B191A 00 Front Heated Seat Module

DTC B191A: FRONT HEATED SEAT MODULE

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 B191A 00

Front Heated Seat Module

Circuit/System Description

An internal fault is detection inside the control module. No external circuits are involved.

Conditions for Running the DTC

Ignition ON.

Conditions for Setting the DTC

The control module detects an internal fault.

Action Taken When the DTC Sets

The seat heating control module will disable all heated seat functions.

Conditions for Clearing the DTC

- The DTC clears when the diagnostic runs and passes.
- The history DTC will clear after 40 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Heated/Vented Seat Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Circuit/System Verification

1. Ignition ON.
2. Verify DTC B191A is not set.
 - **If the DTC is set**

Replace the K29 Seat Heating Control Module.

- **If the DTC is not set**
3. All OK.

Repair Instructions

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

Control Module References for K29 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. 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 modules can communicate via the serial data link.
2. Refer to the **Heated/Vented Seat Description and Operation** in order to familiarize yourself with the system functions.

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**
- **Vented Seat Malfunction**

FRONT 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
B+ Terminal 2 X2	4, 5	4, 5	-	-
B+ Terminal 3 X2	U1524 00, 1	U1524 00, 1	-	-
Driver Heated Seat Back Element Control	2	2	6	-
Driver Heated Seat Cushion Element Control	3	3	6	-
Passenger Heated Seat Back Element Control	4	4	6	-
Passenger Heated Seat Cushion Element Control	5	5	6	-
Ground	-	1	-	-
1. The driver and front passenger heated seats are inoperative. 2. The driver seat back heat function is inoperative 3. The driver seat cushion heat function is inoperative 4. Front passenger seat back heat function is inoperative 5. Front passenger seat cushion heat function is inoperative 6. Heated seat is always ON.				

Circuit/System Description

When a heated seat switch is pressed, a LIN bus serial data message is sent from the information display module to the body control module (BCM). The BCM serves as the heated seat system master to determine the requested operating mode. The BCM then sends a LIN bus serial data message to the seat heating control module indicating the heated seat command. The BCM also controls the seat temperature and mode indicators, via the serial data line, used to provide the operator with feedback as to the operating status of the system.

When the seat heating control module receives a heated seat command, it applies a high side drive

pulse width modulated (PWM) signals driven at the required duty cycles to generate the appropriate effective voltage to the heating elements to attain the commanded seat temperature.

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

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 Verification

1. Ignition ON.
2. Verify the scan tool Body Control Module Driver Seat Heating Switch parameter changes between Inactive and Active when pressing the heated seat switch.
 - **If the parameter does not change**

Replace the P17 Info Display Module.
 - **If the parameter changes**
3. Verify the scan tool Body Control Module Passenger Seat Heating Switch parameter changes between Inactive and Active when pressing the heated seat switch.
 - **If the parameter does not change**

Replace the P17 Info Display Module.
 - **If the parameter changes**

4. Verify that both the driver and front passenger heated seats operate.
 - **If both the driver and front passenger heated seats are inoperative**
Refer to Circuit/System Testing - Both Heated Seats are Inoperative
 - **If just one of the heated seats is inoperative**
Refer to Circuit/System Testing - One Heated Seat Inoperative
 - **If both heated seats operate**
5. All OK.

Circuit/System Testing

Both Heated Seats are Inoperative

NOTE: **Circuit/System Verification must be performed before proceeding with Circuit/System Testing.**

1. Ignition OFF and all vehicle systems OFF, disconnect the X2 harness connector at the K29 Seat Heating Control Module. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 ohms between the ground circuit terminal 7 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, repair the open/high resistance in the ground connection.
 - **If less than 10 ohms**
3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminals listed below and ground.
 - Terminal 2
 - Terminal 3
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the appropriate B+ circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition OFF.
 2. Test for infinite resistance between the B+ circuit and ground.

- If infinite resistance, replace the K29 Seat Heating Control Module.
 - **If the test lamp illuminates**
5. Replace the K29 Seat Heating Control Module.

One Heated Seat is Inoperative

NOTE: Circuit/System Verification must be performed before proceeding with Circuit/System Testing

1. Ignition OFF, disconnect the X2 harness connector at the K29 Seat Heating Control Module, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the B+ circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition OFF.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K29 Seat Heating Control Module.
 - **If the test lamp illuminates**
 - 3. Ignition OFF and all vehicle systems OFF, connect the X2 harness connector at the K29 Seat Heating Control Module and disconnect the harness connector at the appropriate E14 Seat Heating Element. It may take up to 2 min for all vehicle systems to power down.
 - 4. Test for less than 10 ohms between the appropriate ground circuit terminal listed below and ground:
 - Seat cushion terminal 9
 - Seat back terminal 2
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, repair the open/high resistance in the ground connection.
 - **If less than 10 ohms**
 - 5. Ignition ON, connect a test lamp between the appropriate control circuit terminal listed below and ground.
 - Seat cushion terminal 10

6. Verify the test lamp turns ON and OFF when commanding the appropriate Driver or Passenger Seat Heating element ON and OFF with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the X2 harness connector at the K29 Seat Heating Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in the control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K29 Seat Heating Control Module.
 - **If the test lamp is always ON**
 1. Ignition OFF, disconnect the X2 harness connector at the K29 Seat Heating Control Module, ignition ON.
 2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K29 Seat Heating Control Module.
 - **If the test lamp turns ON and OFF**
7. Test or replace the E14 Seat Heating Element.

Repair Instructions

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

- **Driver or Passenger Seat Back Cushion Heater Replacement**
- **Driver or Passenger Seat Cushion Heater Replacement (Driver), Driver or Passenger Seat Cushion Heater Replacement (Passenger)**
- **Control Module References** for P17 Info Display Module and K29 Seat Heating Control Module replacement, programming and setup

VENTED 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
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Seat Temperature Control Module Ignition	1	1	-	-
Seat Blower Motor Control	1	1	1	-
Seat Temperature Control Module Ground	-	1	-	-
Seat Back Blower Motor Ignition	1	2	1	-
Seat Cushion Blower Motor Ignition	1	3	1	-
Seat Back Blower Motor Control	1	2	-	-
Seat Cushion Blower Motor Control	1	3	-	-
Seat Back Blower Motor Low Reference	-	2	-	-
Seat Cushion Blower Motor Low Reference	-	3	-	-
1. The driver and passenger seat ventilation function is inoperative. 2. Seat back ventilation function is inoperative 3. Seat cushion ventilation function is inoperative				

Circuit/System Description

The driver and front passenger vented seats are controlled by separate vented seat switches located in the information display module. When a vented seat switch is pressed, a serial data message is sent from the information display module to the seat heating control module indicating the vented seat command. In response to this message, the seat heating control module applies a low side pulse width modulation (PWM) signal through the seat vent motor control circuit to the seat temperature control module indicating the vented seat command. In response to this signal, the temperature control module sends a high side pulse width modulation (PWM) signal through the seat blower motor control circuits to the seat back and cushion blower motors indicating the vented seat command. The logic in the blower motors set the blower speed to the switch set point. The seat ventilation blower motors run, drawing cabin air around and away from occupant.

Reference Information

Schematic Reference

Heated/Cooled Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

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 Verification

1. Ignition ON.
2. Verify the heated seat system operates.
 - **If the heated seat system does not operate**

Refer to **Front Heated Seat Malfunction**
 - **If the heated seat system operates**
3. Verify the appropriate scan tool Body Control Module vented seat switch parameter listed below changes between Inactive and Active when pressing the vented seat switch.
 - Driver Seat Ventilation Switch
 - Passenger Seat Ventilation Switch
 - **If the parameter does not change**

Replace the P17 Info Display Module.
 - **If the parameter changes**
4. Verify the seat cushion and seat back blower motors turn ON and OFF.
 - **If either or both the seat cushion and seat back blower motors are inoperative**

Refer to Circuit/System Testing
 - **If the blower motors do not change speed or are always ON**

Refer to Circuit/System Testing
 - **If the seat cushion and seat back blower motors operate**
5. All OK.

Circuit/System Testing

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the appropriate

K54 Seat Temperature Control Module. It may take up to 2 min for all vehicle systems to power down.

2. Test for less than 10 ohms between the ground circuit terminal 3 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, repair the open/high resistance in the ground connection.
 - **If less than 10 ohms**
3. Ignition ON.
4. Verify a test lamp illuminates between the ignition circuit terminal 5 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF, remove the test lamp.
 2. Test for less than 2 ohms in the ignition circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K54 Seat Temperature Control Module.
 - **If the test lamp illuminates**
5. Connect a test lamp between the control circuit terminal 4 and B+, ignition ON.
6. Verify the test lamp turns ON when pressing the vented seat switch through the High, Medium and Low positions and the test lamp turns OFF when the OFF position is reached.
 - **If the test lamp does not turn ON**
 1. Ignition OFF, remove the test lamp, disconnect the harness connector at the K29 Seat Heating Control Module, ignition ON.
 2. Test for less than 1 V between the control circuit and ground
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Test for less than 2 ohms in the control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K29 Seat Heating Control Module.
 - **If the test lamp does not turn OFF**
 1. Ignition OFF, remove the test lamp, disconnect the harness connector at the K29 Seat Heating Control Module.
 2. Test for infinite resistance between the control circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K29 Seat Heating Control Module.
 - **If the test lamp turns ON and OFF**
7. Ignition OFF, connect the harness connector at the K54 Seat Temperature Control Module and disconnect the harness connector at the K53 Seat Blower Assembly - Back.
 8. Test for less than 10 ohms between the low reference circuit terminal 6 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF, disconnect the harness connector at the K54 Seat Temperature Control Module.
 2. Test for less than 2 ohms in the low reference circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K54 Seat Temperature Control Module.
 - **If less than 10 ohms**
 9. Connect a test lamp between the ignition circuit terminal 3 and ground, ignition ON.
 10. Verify the test lamp turns ON when pressing the vented seat switch through the High, Medium and Low blower speed positions then OFF when the OFF position is reached.
 - **If the test lamp is always OFF**
 1. Ignition OFF, remove the test lamp, disconnect the harness connector at the K54 Seat Temperature Control Module.
 2. Test for infinite resistance between the ignition circuit and ground.
 - if less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in the ignition circuit end to end.
 - If 2 ohms or greater, repair the open high/resistance in the ignition circuit.
 - If less than 2 ohms, replace the K54 Seat Temperature Control Module.
 - **If the test lamp is always ON**
 1. Ignition OFF, remove the test lamp, disconnect the harness connector at the K54 Seat Temperature Control Module, ignition ON.
 2. Test for less than 1 V between the ignition circuit and ground.
 - if 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K54 Seat Temperature Control Module.
 - **If the test lamp turns ON and OFF**
 11. Connect a DMM between each control circuit terminal listed below and ground, one at a time, ignition ON.
 - Terminal 4
 - Terminal 5
 12. Test for 2-5 V when pressing the vented seat switch through the High, Medium and Low positions.
 -

1. Ignition OFF, disconnect the harness connector at the K54 Seat Temperature Control Module.
2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 ohms in the control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K54 Seat Temperature Control Module.
 - **If greater than 5 V**
1. Ignition OFF, disconnect the harness connector at the K54 Seat Temperature Control Module, ignition ON.
2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K54 Seat Temperature Control Module.
 - **If between 2-5 V**
13. Replace the K53 Seat Blower Assembly - Back.
14. Connect all system components, ignition ON.
15. Verify both seat cushion and seat back blower motors operate.
 - **If either one or both are inoperative**

Replace the K55 Seat Blower Assembly - Cushion.

 - **If both seat cushion and seat back blower motors operate**
16. All OK.

Repair Instructions

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

- **Front Seat Back Cushion Vent Fan Replacement**
- **Control Module References** for K29 Seat Heating Control Module, P17 Info Display Module and K54 Seat Temperature Control Module replacement, programming and setup

REPAIR INSTRUCTIONS

FRONT SEAT HEATER CONTROL MODULE REPLACEMENT

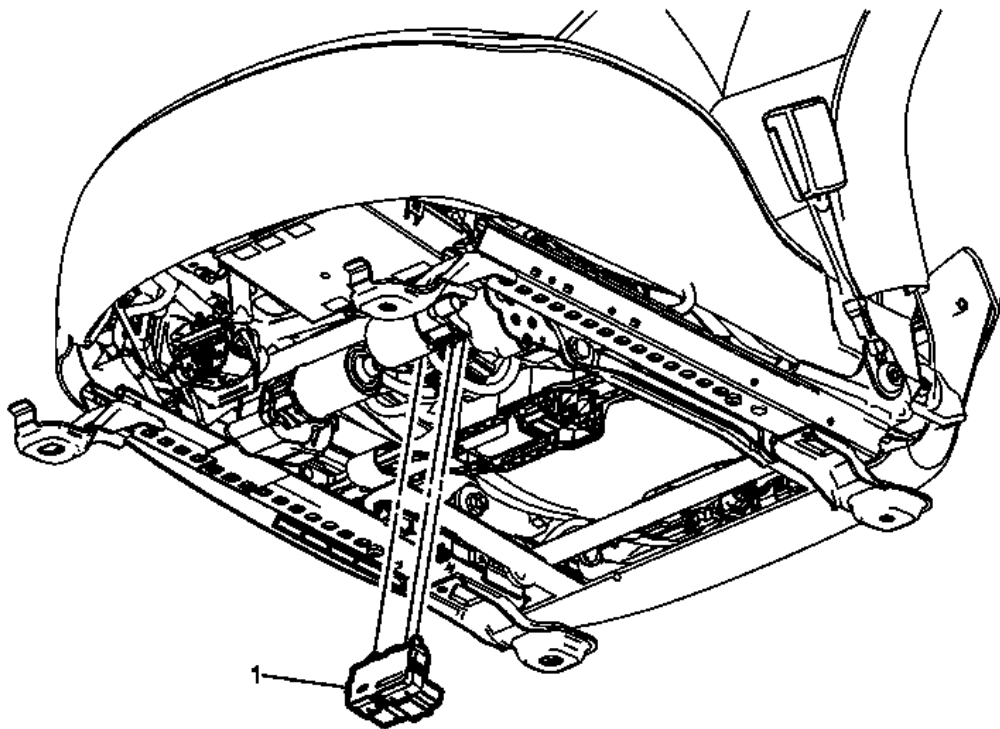


Fig. 4: Front Seat Heater Control Module
Courtesy of GENERAL MOTORS COMPANY

Front Seat Heater Control Module Replacement

Callout	Component Name
Preliminary Procedure Remove the driver or passenger seat. Refer to <u>Driver or Passenger Seat Removal and Installation</u> .	
1	Front Seat Heater Control Module Procedure 1. Disconnect electrical connectors. 2. Refer to <u>Control Module References</u> for programing and setup information.

DRIVER OR PASSENGER SEAT BACK CUSHION HEATER REPLACEMENT

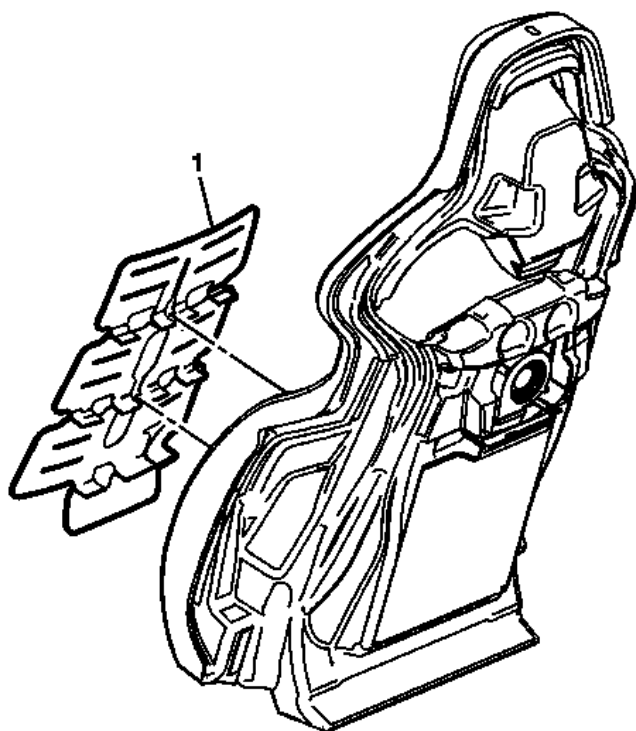


Fig. 5: Driver or Passenger Seat Back Cushion Heater
Courtesy of GENERAL MOTORS COMPANY

Driver or Passenger Seat Back Cushion Heater Replacement

Callout	Component Name
Preliminary Procedure	
1. Remove the driver or passenger seat. Refer to <u>Driver or Passenger Seat Removal and Installation</u> . 2. Remove the driver or passenger seat back cover and pad. Refer to <u>Driver or Passenger Seat Back Cover and Pad Replacement</u> .	
1	Driver or Passenger Seat Back Cushion Heater Procedure 1. Disconnect electrical connector. 2. Remove the heater element by peeling it off the seat back cushion pad. 3. Note the routing of the wiring harness and connector location for installation.

DRIVER OR PASSENGER SEAT CUSHION HEATER REPLACEMENT (DRIVER)

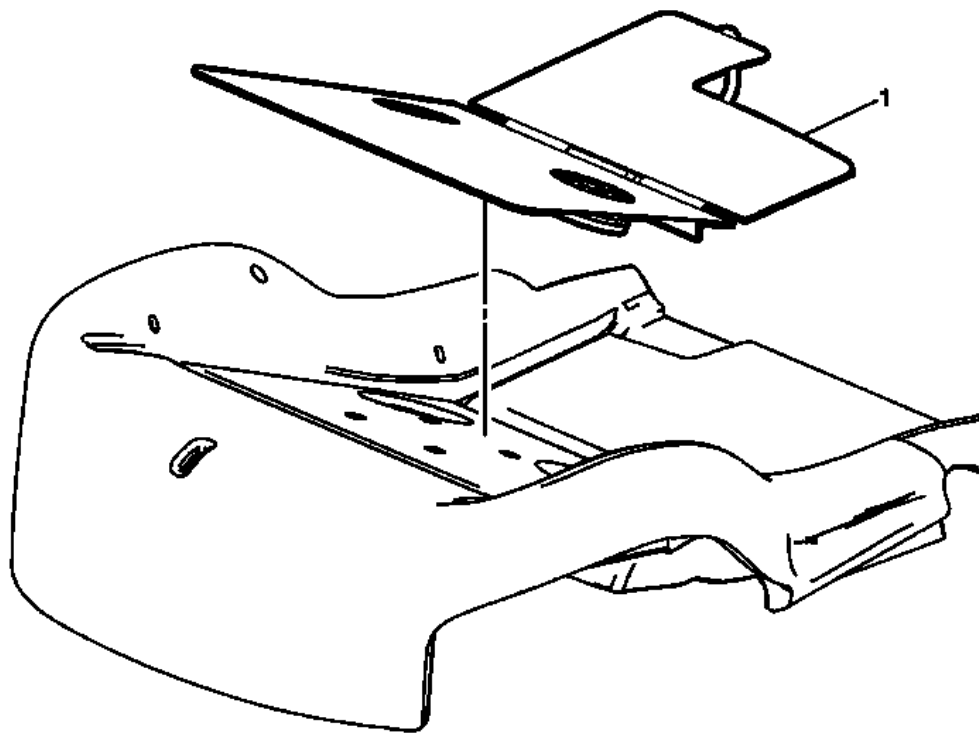


Fig. 6: Driver or Passenger Seat Cushion Heater (Driver)
Courtesy of GENERAL MOTORS COMPANY

Driver or Passenger Seat Cushion Heater Replacement (Driver)

Callout	Component Name
Preliminary Procedure	
1. Remove the driver or passenger seat. Refer to <u>Driver or Passenger Seat Removal and Installation</u> . 2. Remove the front seat cushion cover and pad. Refer to <u>Front Seat Cushion Cover and Pad Replacement</u> .	
1	Driver or Passenger Seat Cushion Heater Procedure 1. Disconnect electrical connector. 2. Remove the heater and vent fan element by peeling it off the seat cushion pad 3. Note the routing of the wiring harness and connector location for installation.

DRIVER OR PASSENGER SEAT CUSHION HEATER REPLACEMENT (PASSENGER)

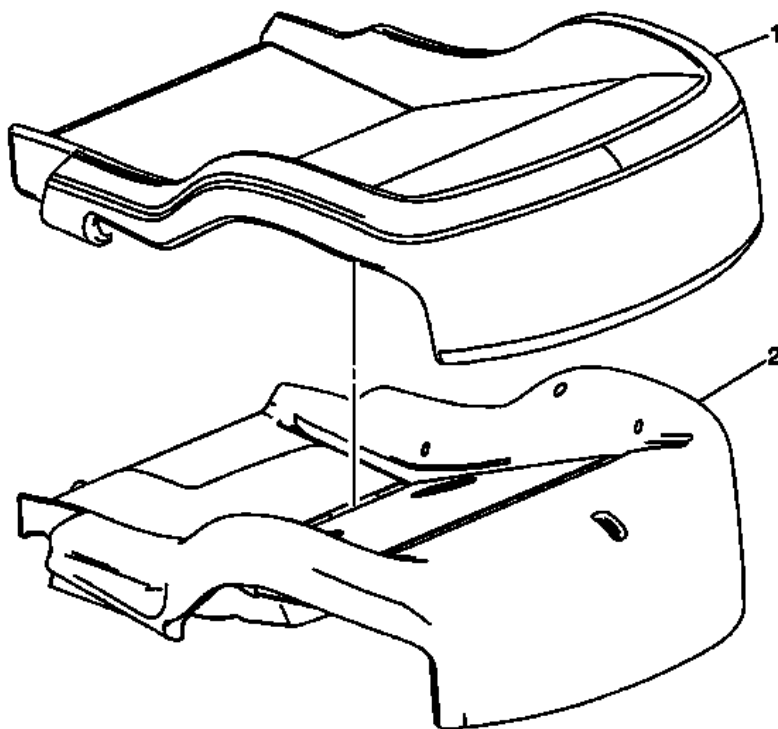


Fig. 7: Driver or Passenger Seat Cushion Heater (Passenger)
 Courtesy of GENERAL MOTORS COMPANY

Driver or Passenger Seat Cushion Heater Replacement (Passenger)

Callout	Component Name
WARNING: Refer to <u>SIR Warning</u> . WARNING: Replace the passenger presence system as a complete assembly to prevent possible injury to the occupant. All the components in the service kit are assembled and calibrated as a unit. Using only some of the components in the service kit will cause the passenger presence system to operate improperly. WARNING: To avoid personal injury, perform a preload test on the passenger presence system whenever you remove or replace the seat cushion trim. Failure to do so may cause the system to malfunction. Preliminary Procedure 1. Disable the SIR system. Refer to. <u>SIR Disabling and Enabling</u> 2. Remove the driver or passenger seat. Refer to. <u>Driver or Passenger Seat Removal and Installation</u> 3. Remove the front seat cushion cover and pad. Refer to <u>Front Seat Cushion Cover and</u>	

1	Driver or Passenger Seat Cushion Cover
	Driver or Passenger Seat Cushion Heater
2	Procedure 1. Disconnect the electrical connectors. 2. The passenger presence system and heater element are both integral parts of the pad on the passenger seat cushion. 3. Note the routing of the wiring harness and connector location for installation. 4. Program the inflatable restraint passenger presence system after replacement. Refer to Control Module References

FRONT SEAT BACK CUSHION VENT FAN REPLACEMENT

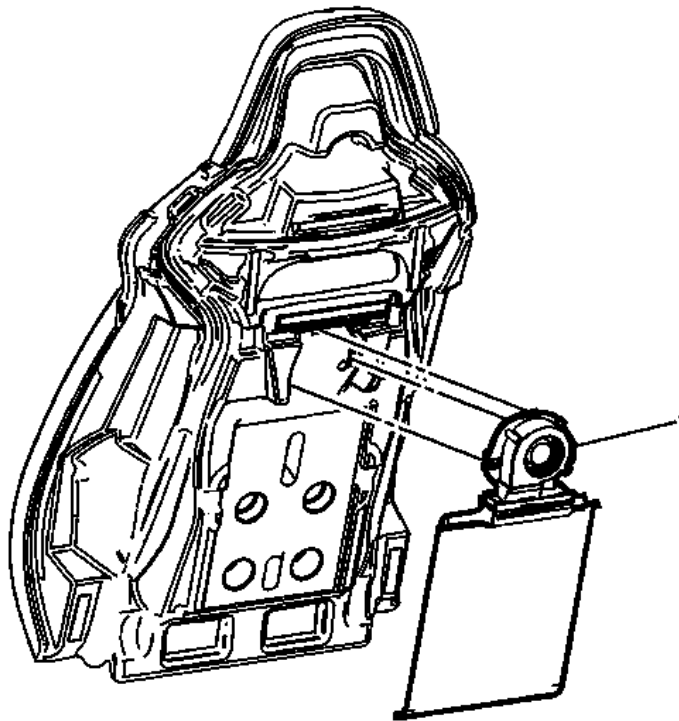


Fig. 8: Front Seat Back Cushion Vent Fan
 Courtesy of GENERAL MOTORS COMPANY

Front Seat Back Cushion Vent Fan Replacement

Callout	Component Name
Preliminary Procedure	
1.	Remove the driver or passenger seat. Refer to Driver or Passenger Seat Removal and Installation .

Seat Back Cover and Pad Replacement .

1	Front Seat Back Cushion Vent Fan Procedure 1. Disconnect electrical connector. 2. Remove the heater element by peeling it off the seat back cushion pad. 3. Note the routing of the wiring harness and connector location for installation.
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DESCRIPTION AND OPERATION

HEATED/VENTED SEAT DESCRIPTION AND OPERATION

Heated Seat Components

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

- Info display module with heated and vented seat switches
- Body control module
- Seat heating control module
- Seat cushion heating element
- Seat back heating element
- Seat temperature control module
- Seat cushion blower motors
- Seat back blower motors

Heated/Vented Seat Switches

The driver and passenger heated seats switches are located in the info display module. The body control module (BCM) monitors each switch activation to determine whether heat or ventilation mode has been requested and to what level. With each press of the switch, the system will cycle through High, Medium, Low and then back to Off again.

When a heated or vented seat switch is pressed, a LIN bus serial data message is sent from the info display module to the body control module. The BCM serves as the heated/vented seat system master to determine the requested operating mode. The BCM then sends a LIN bus serial data message to the seat heating control module indicating the heated/vented seat command. The BCM also controls the seat temperature and mode indicators, via the serial data line, used to provide the operator with feedback as to the operating status of the system.

Heated Seat Operation

When the seat heating control module receives a heated seat command, it applies a high side drive pulse width modulated (PWM) signals driven at the required duty cycles to generate the appropriate

effective voltage to the heating elements to attain the commanded seat temperature.

This heated seat system utilizes a self-regulating heating element system, which is different from the non-regulated heating element systems with seat temperature sensors previously used on GM vehicles. In the self-regulating type of system, temperature feedback to a control module is not required for temperature regulation. The heating element material itself regulates the surface temperature based on the effective voltage applied to the heating element.

Vented Seat Operation

Each vented seat consists of 4 blower motors and a seat temperature control module. There are 2 blower motors packaged with the seat back heating element and 2 blower motors along with the temperature control module packaged with the seat cushion heating element. The vented seat operation is designed to draw cabin air around and away from the occupant through small holes in the seat covers, through channels in the foam pad and then through the blower motor exhausting the waste air under the seat cushion.

With the ignition ON, battery voltage is applied from the ignition run relay and through a 7.5 A fuse to the seat temperature control module. Ground for the blower motors is provided from the ground circuit and the ground connection.

When the seat heating control module receives a ventilation seat command, it sends a low side drive pulse width modulation (PWM) signal through the blower motor control circuit to the seat temperature control module indicating the seat ventilation command. The module interprets this signal then applies ignition voltage to the blower motors and sends a high side drive PWM signal to the seat back and cushion blower motors indicating the vented seat command. The logic in the blower motors then sets the blower speed to the switch set point. All blower motors run drawing cabin air around and away from the occupant.

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** .