ACCESSORIES & EQUIPMENT

Power Seats - Escalade, Suburban, Tahoe, Yukon

SPECIFICATIONS

FASTENER SPECIFICATIONS

Application	Specification	
	Metric	English
Driver or Passenger Seat Recliner Actuator Motor Fastener	6 N.m	53 lb in
Driver or Passenger Seat Vertical Adjuster Actuator Bolt	8 N.m	70 lb in
Folding 3rd Row Seat Module Screw	2.5 N.m	22 lb in
Front Seat Tilt Adjuster Actuator Bolt	8 N.m	70 lb in
Rear Seat Actuator Screw	6 N.m	53 lb in
Rear Seat Actuator Screw	3 N.m	25 lb in
3rd Row Seat Back Pivot Actuator Motor Bolt	28 N.m	21 lb ft

SCHEMATIC WIRING DIAGRAMS

DRIVER SEAT WIRING SCHEMATICS

Power, Ground, Serial Data and Memory Switch (A45)

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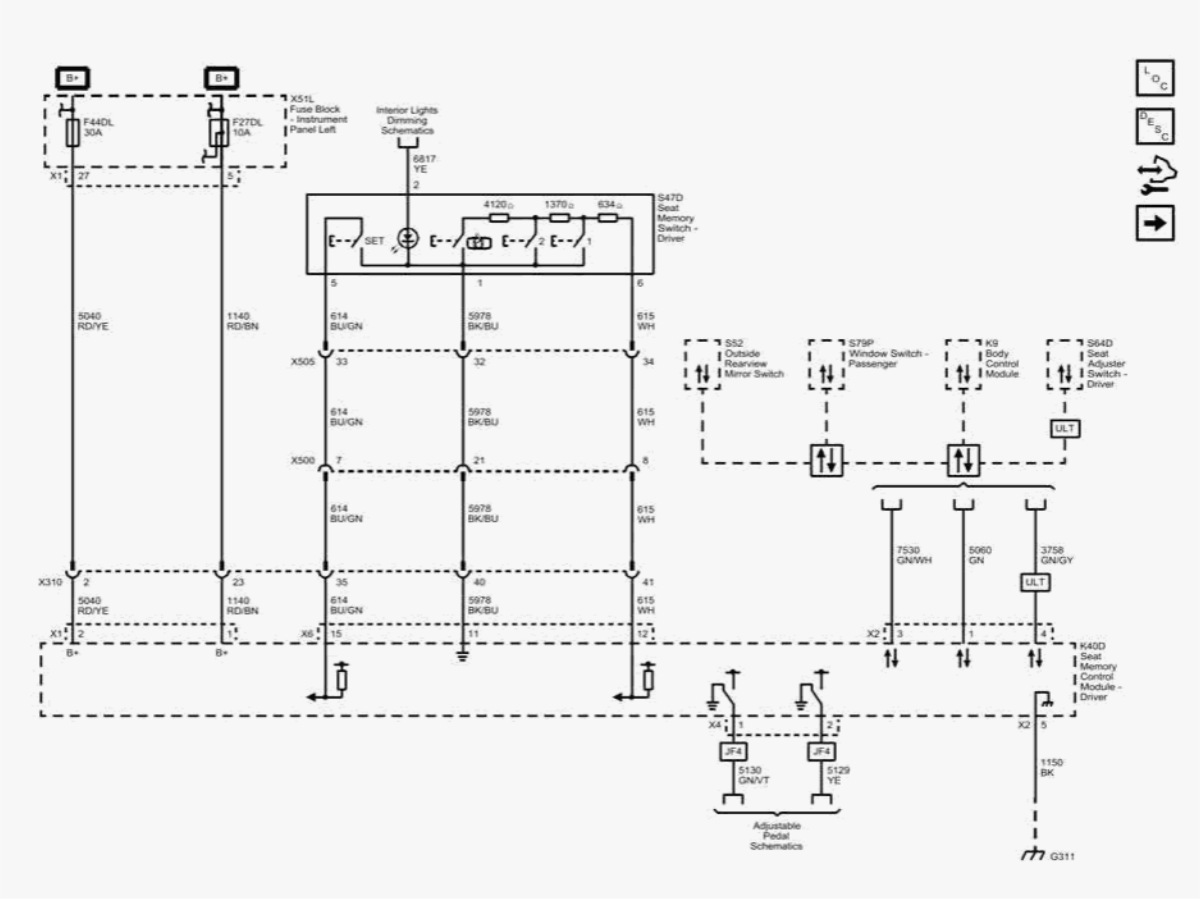


Fig. 1: Power, Ground, Serial Data and Memory Switch (A45)
Courtesy of GENERAL MOTORS COMPANY

Controls and Motors (A45, without Y91 or Z75)

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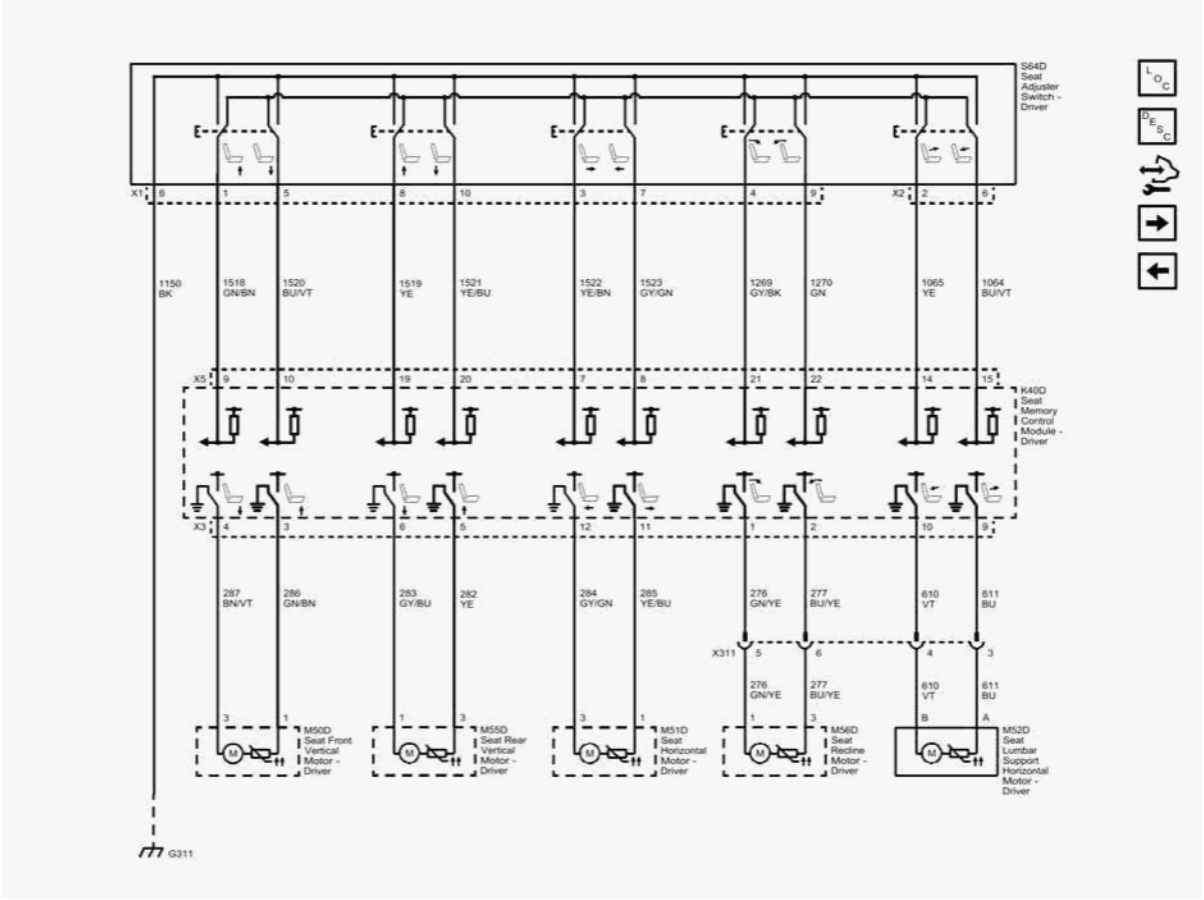


Fig. 2: Controls and Motors (A45, without Y91 or Z75)
Courtesy of GENERAL MOTORS COMPANY

Controls and Motors (A45, with Y91 or Z75 without ULT)

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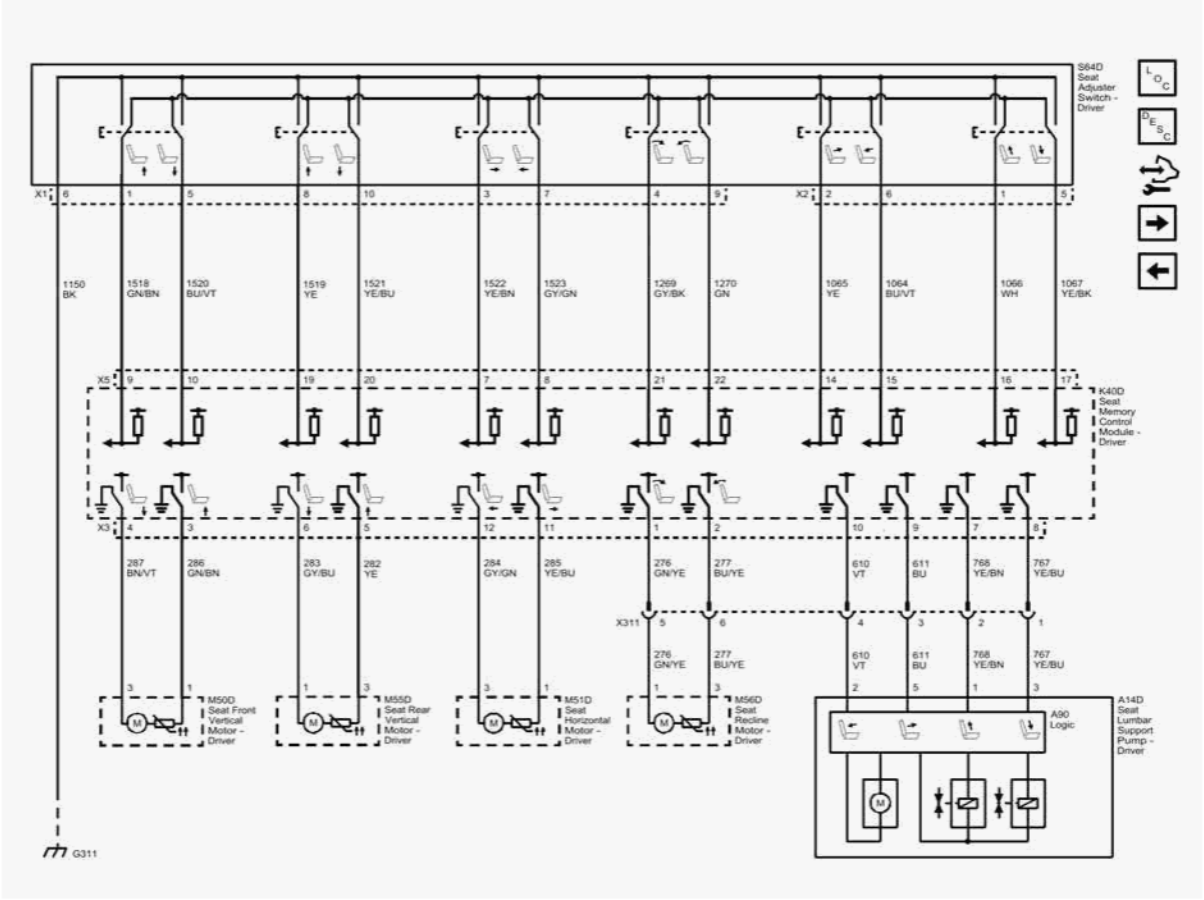


Fig. 3: Controls and Motors (A45, with Y91 or Z75 without ULT)
Courtesy of GENERAL MOTORS COMPANY

Position Sensors (A45)

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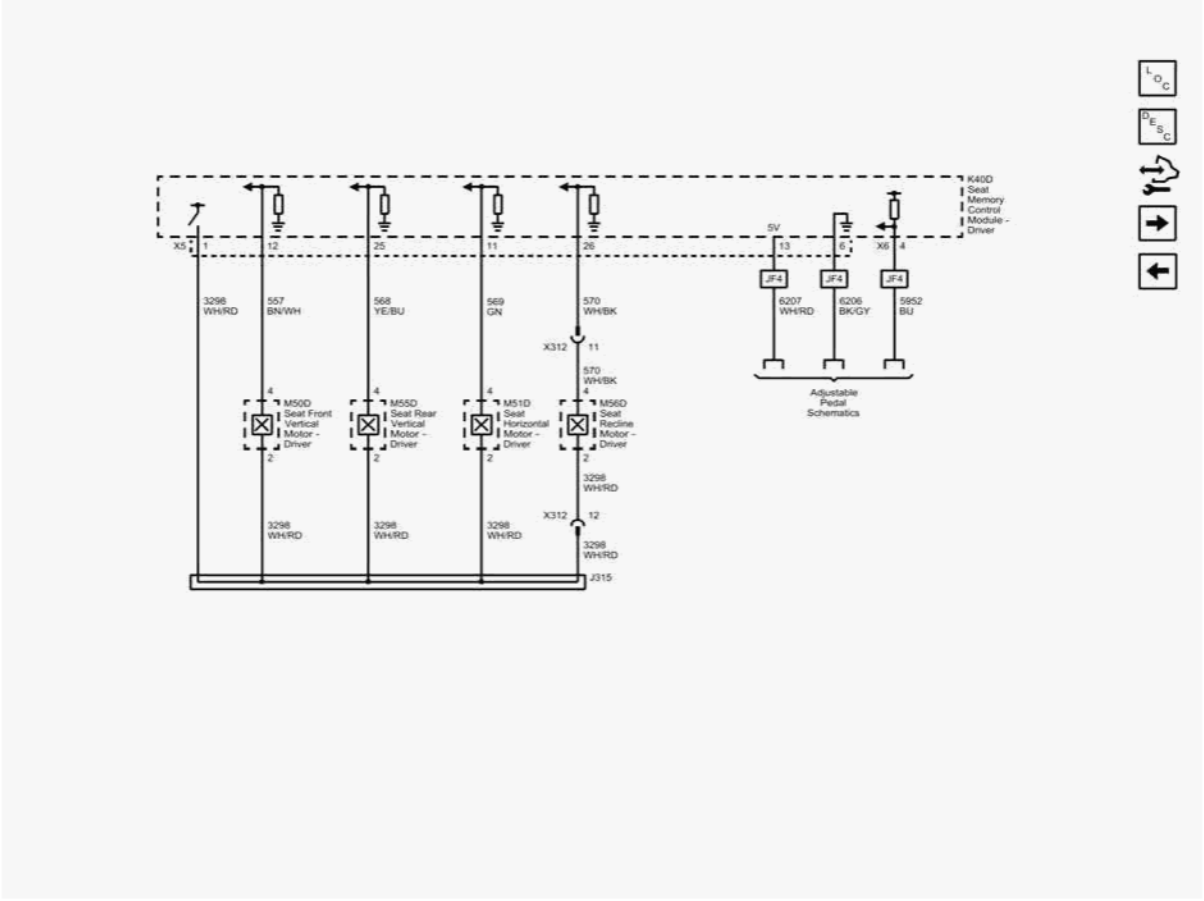


Fig. 4: Position Sensors (A45)
Courtesy of GENERAL MOTORS COMPANY

Power Seat (without A45)

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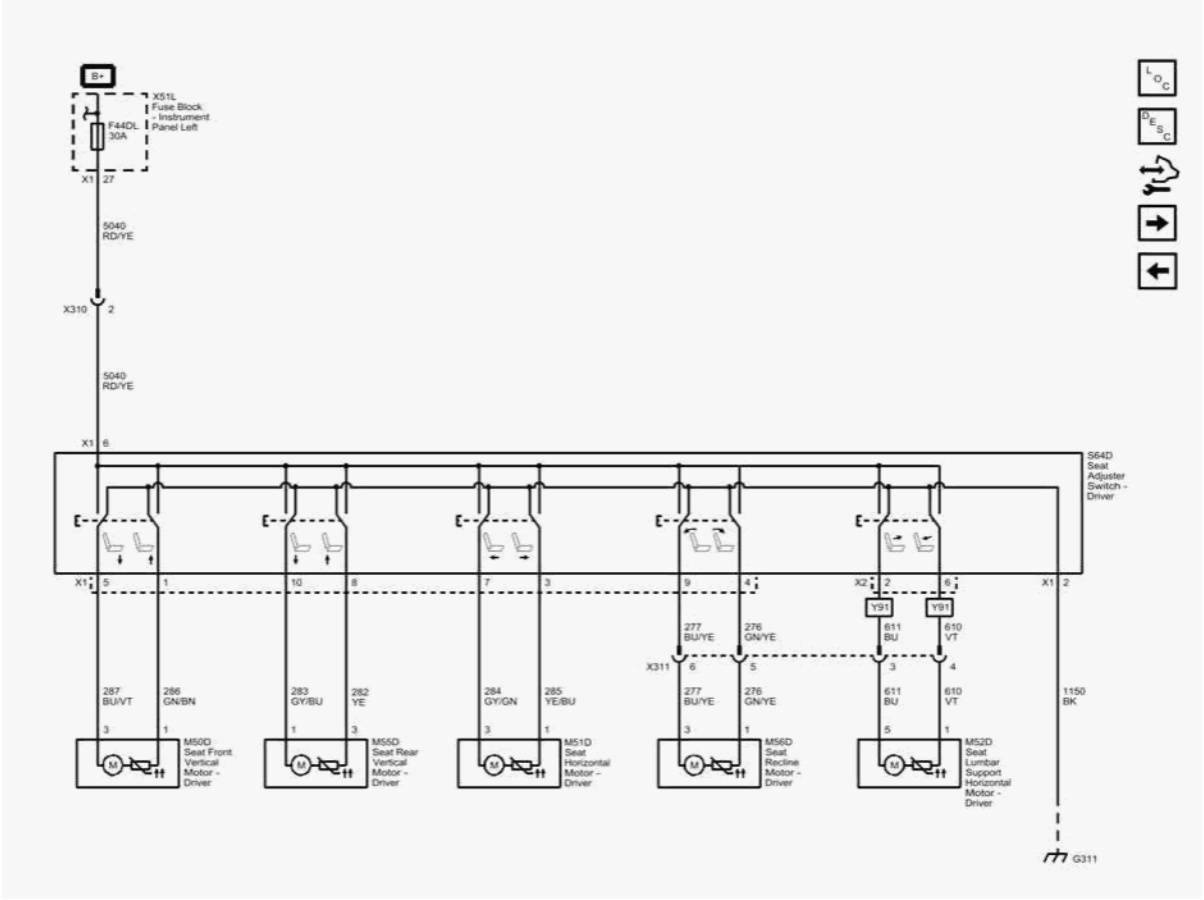


Fig. 5: Power Seat (without A45)

Courtesy of GENERAL MOTORS COMPANY

Controls and Motors (ULT)

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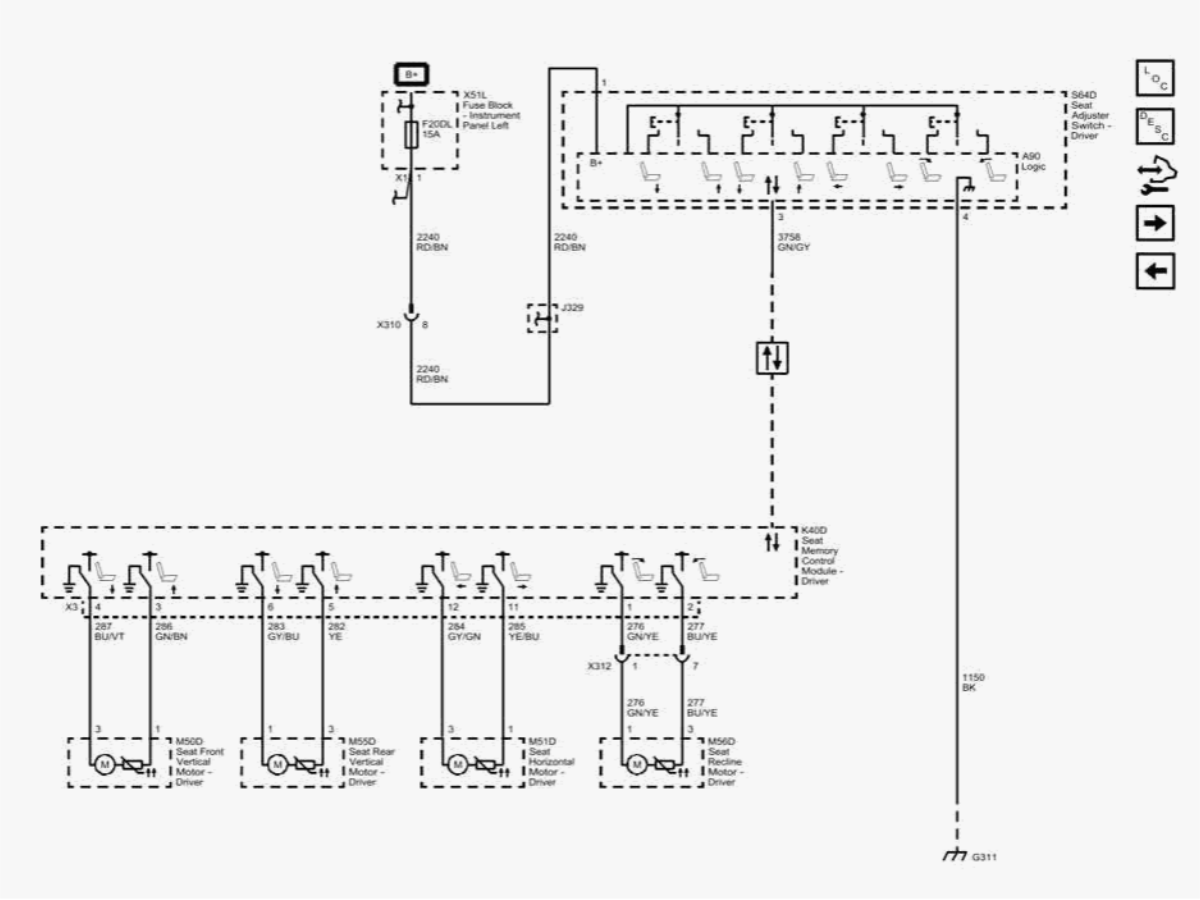


Fig. 6: Controls and Motors (ULT)

Courtesy of GENERAL MOTORS COMPANY

Lumbar and Massage (ULT)

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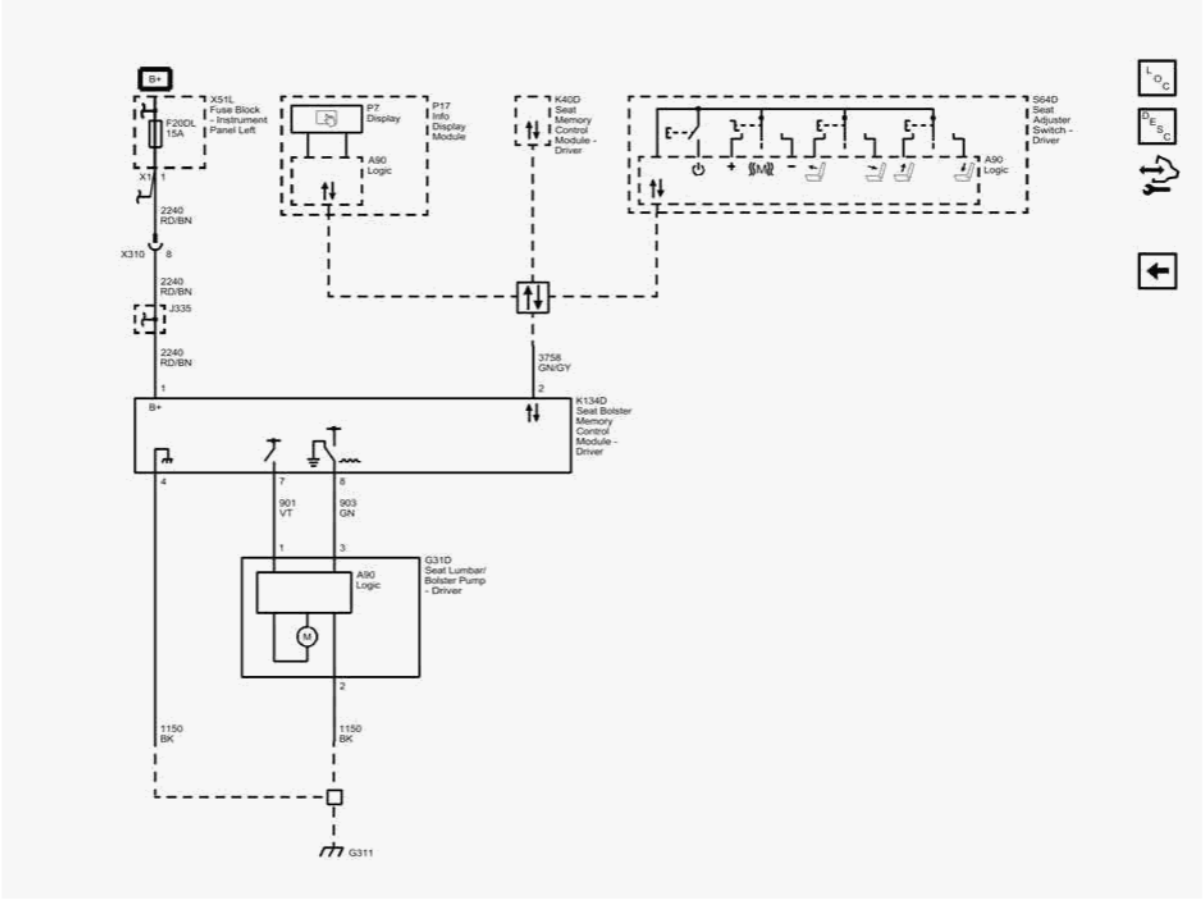


Fig. 7: Lumbar and Massage (ULT)
Courtesy of GENERAL MOTORS COMPANY

PASSENGER SEAT WIRING SCHEMATICS

Power Seat (without Y91 or Z75)

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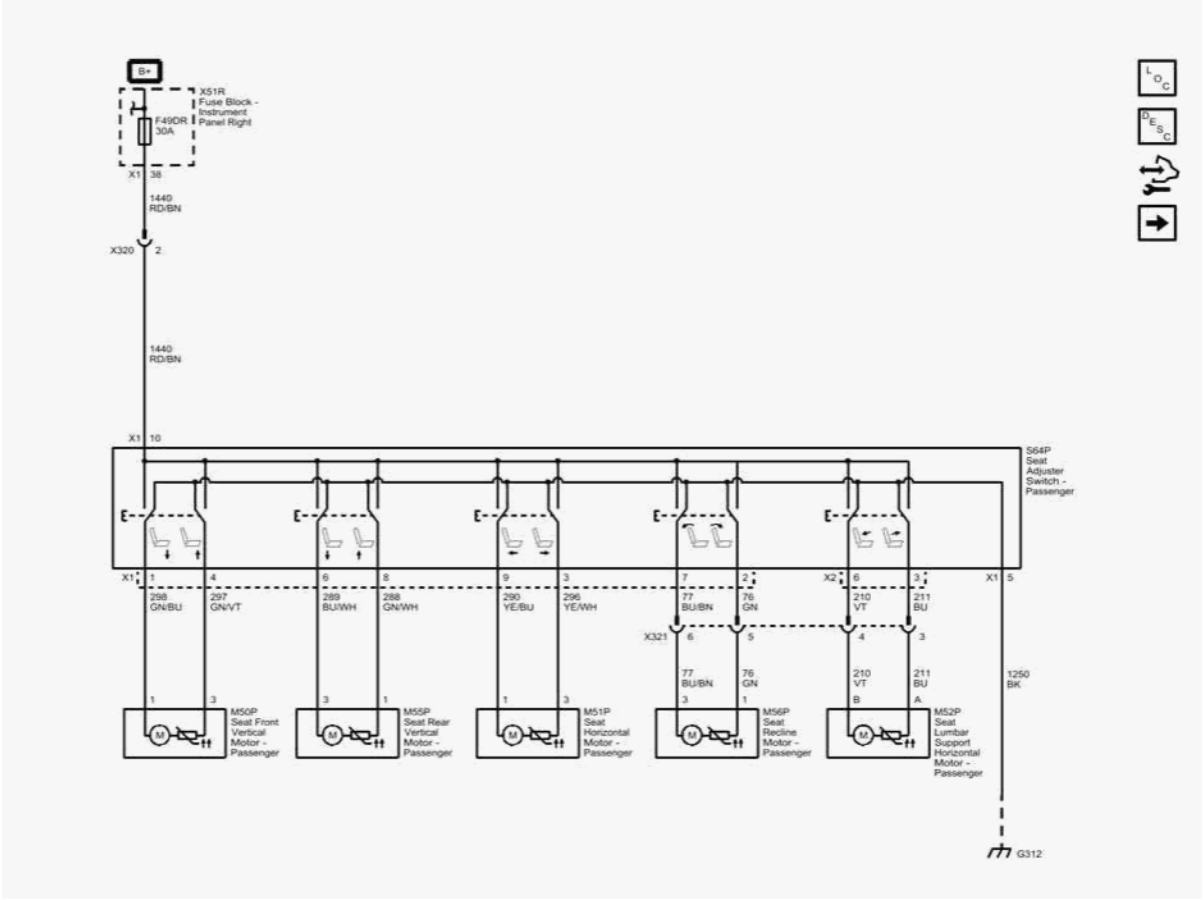


Fig. 8: Power Seat (without Y91 or Z75)
Courtesy of GENERAL MOTORS COMPANY

Power Seat (Y91 or Z75 without ULT)

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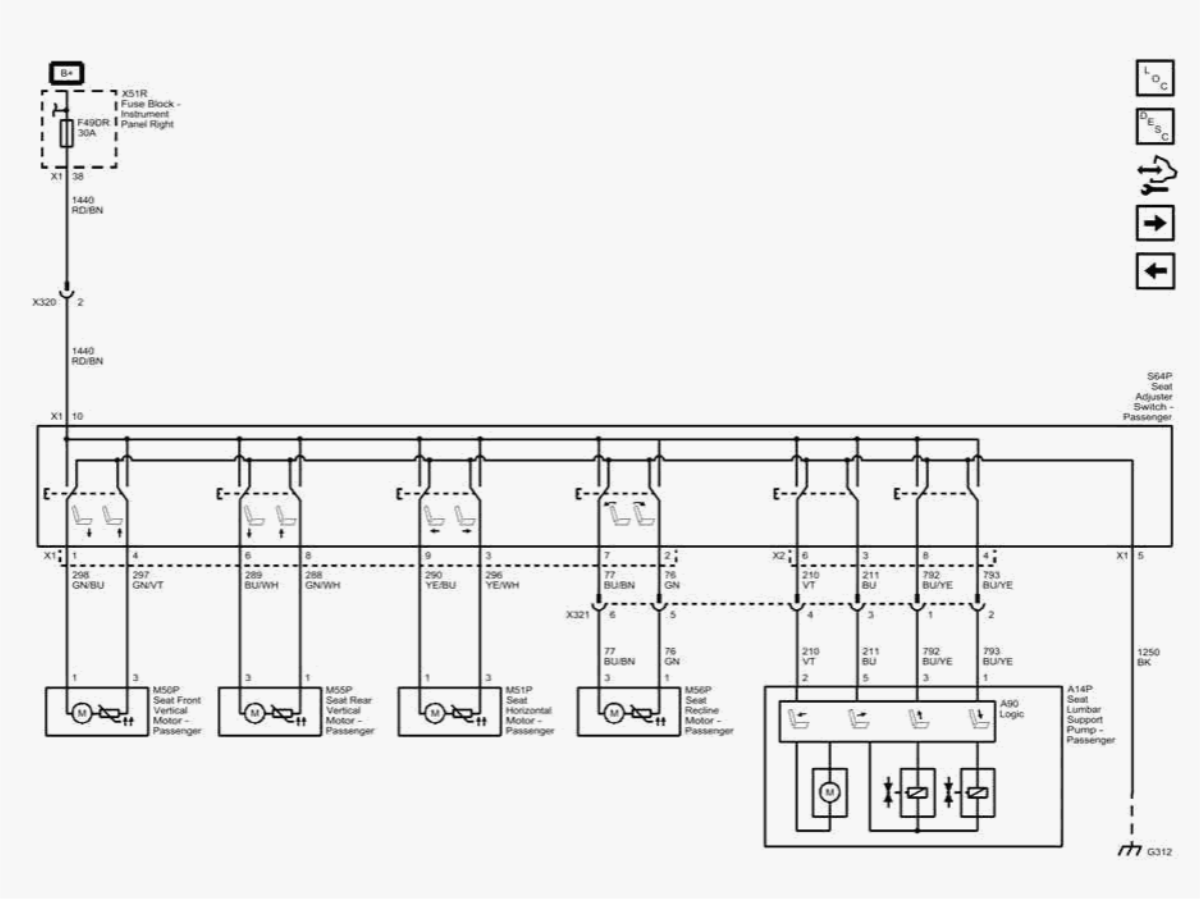


Fig. 9: Power Seat (Y91 or Z75 without ULT)
Courtesy of GENERAL MOTORS COMPANY

Power Seat (ULT)

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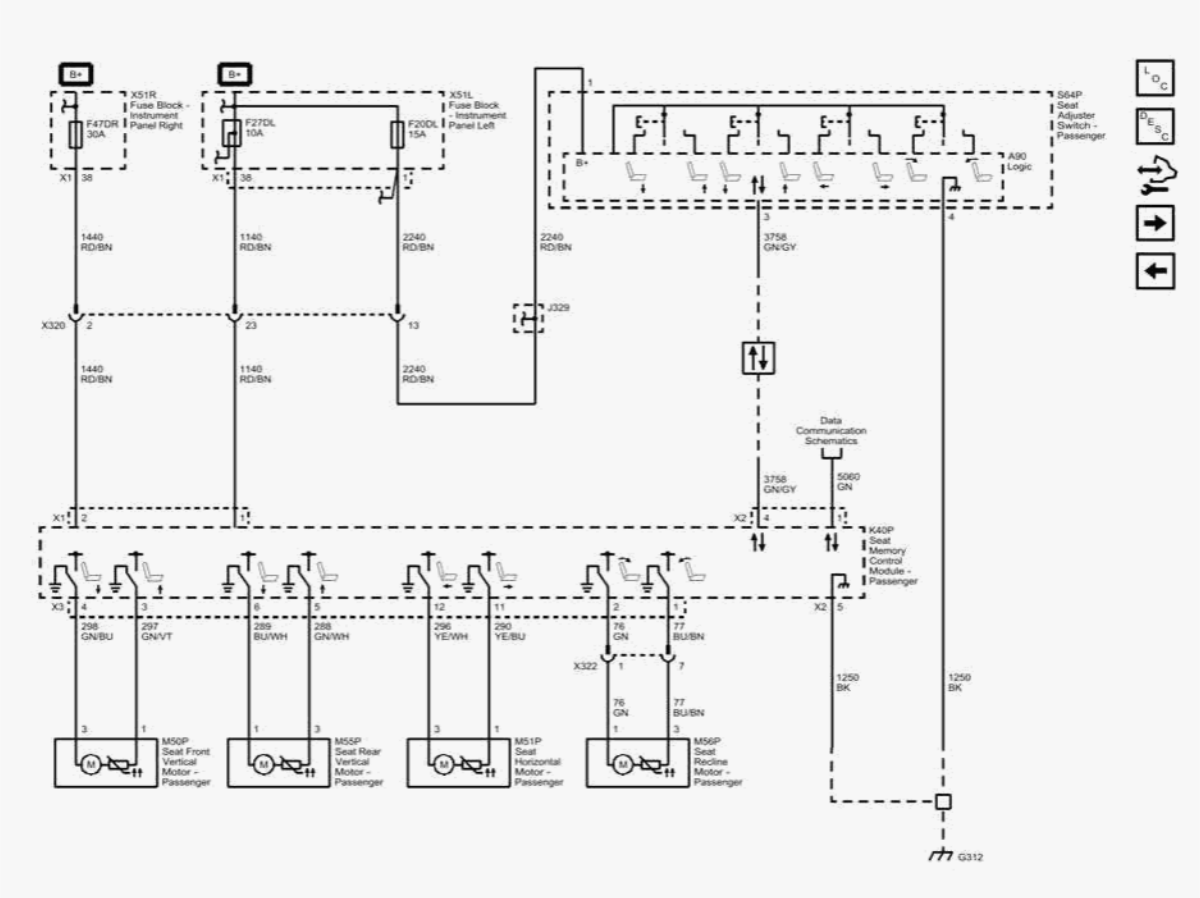


Fig. 10: Power Seat (ULT)
Courtesy of GENERAL MOTORS COMPANY

Lumbar and Massage (ULT)

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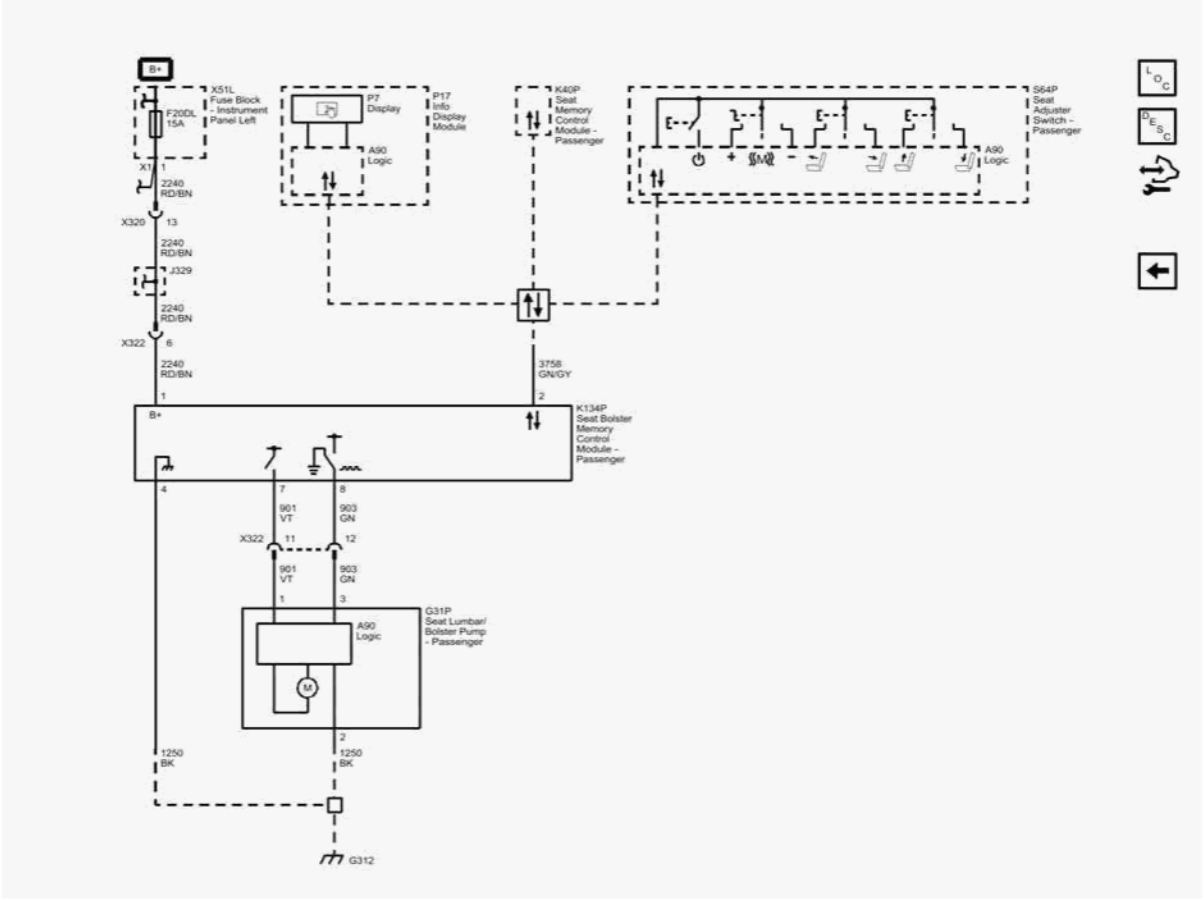


Fig. 11: Lumbar and Massage (ULT)
Courtesy of GENERAL MOTORS COMPANY

REAR SEAT WIRING SCHEMATICS

2nd Row Seats (ATN or ATT)

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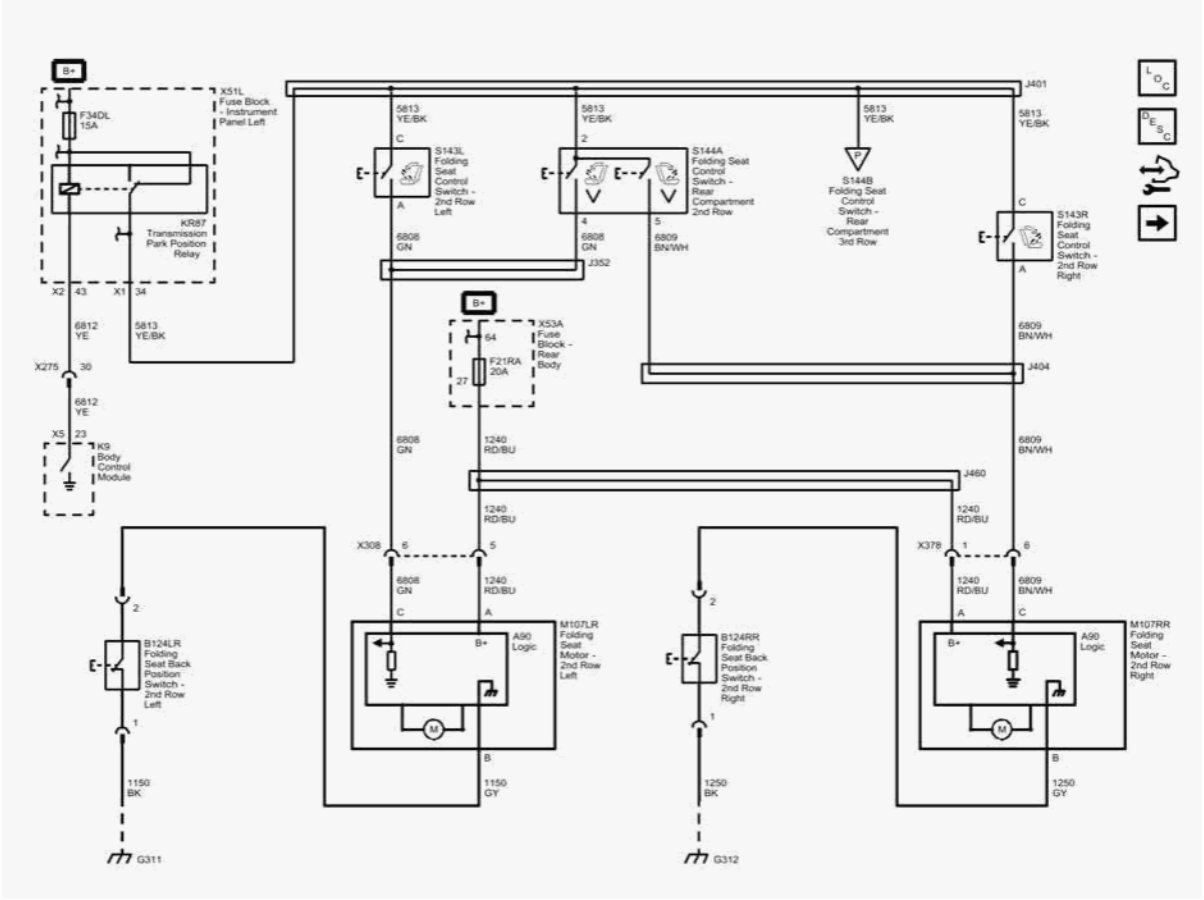


Fig. 12: 2nd Row Seats (ATN or ATT)
Courtesy of GENERAL MOTORS COMPANY

3rd Row Seats (AS8)

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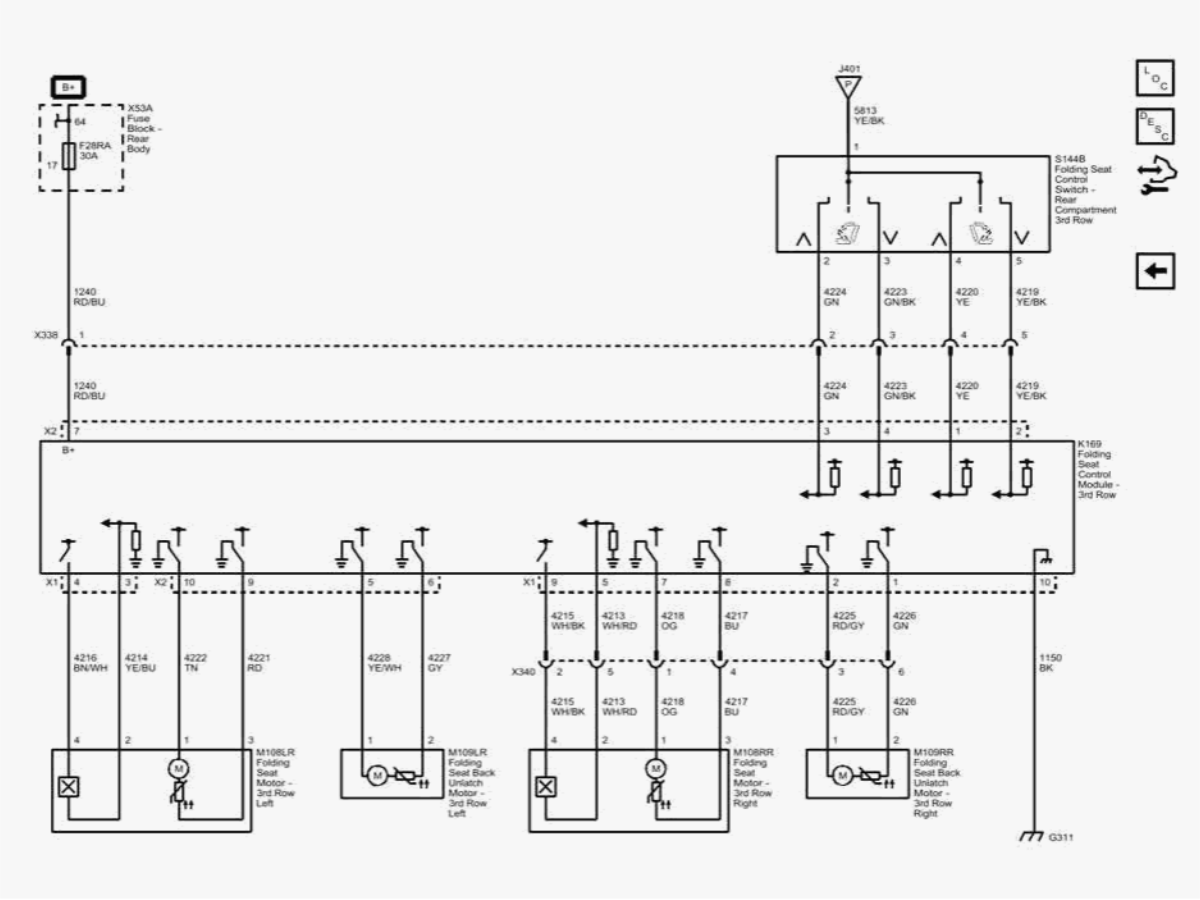


Fig. 13: 3rd Row Seats (AS8)
Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC INFORMATION AND PROCEDURES

DTC B1405, B1825, B2355, B2365, OR B2375: CONTROL MODULE VOLTAGE REFERENCE OUTPUT 2/POSITION SENSOR

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.

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DTC Descriptors

DTC B1405

Control Module Voltage Reference Output 2 Circuit

DTC B1825

Seat Recline Position Sensor Circuit

DTC B2355

Seat Front Vertical Position Sensor Circuit

DTC B2365

Seat Rear Vertical Position Sensor Circuit

DTC B2375

Driver Seat Assembly Horizontal Position Sensor Circuit

For symptom byte information refer to **Symptom Byte List**

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
12 V Reference	B1405 02, B1825 06, B2355 06, B2365 06, B2375 06	B1825 06, B2355 06, B2365 06, B2375 06	-	-
Seat Front Vertical Position Sensor Signal	B2355 06	B2355 06	B1825 01, B2355 01, B2365 01, B2375 01	B2355 5A
Seat Rear Vertical Position Sensor Signal	B2365 06	B2365 06	B1825 01, B2355 01, B2365 01, B2375 01	B2365 5A

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Seat Horizontal Position Sensor Signal	B2375 06	B2375 06	B1825 01, B2355 01, B2365 01, B2375 01	B2375 5A
Seat Recline Position Sensor Signal	B1825 06	B1825 06	B1825 01, B2355 01, B2365 01, B2375 01	B1825 5A

Circuit Description

The seat memory control module monitors the position of the seat motors by using hall effect position sensors which are an internal part of each motor. The module supplies each sensor with a 12 V reference circuit only when any seat motor is active, and a low side signal circuit. During seat motor operation, the hall effect position sensor provides a determined number of pulse signals for every revolution of the motor shaft. The scan tool displays these pulse signals as counts that range from 0-65, 535. The module counts the feedback pulses from each sensor to determine seat position and end of travel limits for each of the seat motors. High scan tool count values indicate forward or upward seat positions while low count values indicate rearward or downward seat positions.

Conditions for Running the DTC

- Any seat motor must be active.
- DTC B1325 must not be present.
- Module battery voltage must be between 9-16 V.

Conditions for Setting the DTC

The seat memory control module does not detect position sensor movement or pulse signals while the adjuster motor is active. The following conditions will set this DTC:

B1405 02

The seat memory control module detects a short to ground or an open on the 12 V reference circuit.

B1825 01, B2355 01, B2365 01, or B2375 01

The seat memory control module detects a voltage greater than 5 V on the sensor signal circuit.

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B1825 06, B2355 06, B2365 06, or B2375 06

The seat memory control module detects a short to ground or an open on the sensor signal circuit.

Action Taken When the DTC Sets

- With a short to ground or an open circuit, the seat memory control module disables the memory recall and easy exit/entry action commands of the motor monitored by the sensor. The motor will respond to manual position commands.
- With a short to battery voltage, the seat memory control module disables the memory recall and easy exit/entry action commands for all four seat motors. The motors will respond to manual position commands.

Conditions for Clearing the DTC

- The current DTC clears when the fault 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

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Memory Seats Description and Operation

Electrical Information Reference

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

Scan Tool Reference

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Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate driver seat motor listed below for which the DTC set:
    - M50D Seat Front Vertical Motor - Driver
    - M55D Seat Rear Vertical Motor - Driver
    - M51D Seat Horizontal Motor - Driver
    - M56D Seat Recline Motor - Driver
2. Ignition ON.
3. Test for greater than 10.8 V between the 12 V reference circuit terminal 2 and ground while pressing any power seat switch.
    - **If 10.8 V or less**
    1. Ignition OFF, disconnect the X5 harness connector at the K40 Seat Memory Control Module.
    2. Test for infinite resistance between the 12 V reference 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 Ω in the 12 V 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 K40 Seat Memory Control Module.
    - **If greater than 10.8 V**
4. Test for 0.2-2 V between the signal circuit terminal 4 and ground.
    - **If less than 0.2 V**
    1. Ignition OFF, disconnect the X5 harness connector at the K40 Seat Memory Control Module.
    2. Test for infinite resistance between the signal circuit and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.
        - If infinite resistance
    3. Test for less than 2 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 K40 Seat Memory Control Module.
    - **If greater than 2 V**

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1. Ignition OFF, disconnect the X5 harness connector at the K40 Seat Memory Control Module, ignition ON.
2. Test for less than 1 V between each signal circuit listed below and ground.
    - Front vertical sensor terminal 12
    - Seat horizontal sensor terminal 11
    - Rear vertical sensor terminal 25
    - Seat recline sensor terminal 26
    - If 1 V or greater, repair the short to voltage on the circuit.
    - If less than 1 V, replace the K40 Seat Memory Control Module.

- **If between 0.2-2 V**

5. Test or replace the seat motor.

Repair Instructions

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

- **Front Seat Tilt Adjuster Actuator Replacement**
- **Driver or Passenger Seat Vertical Adjuster Actuator Replacement**
- **Driver or Passenger Seat Cushion Frame Replacement (Except Passenger Side with 6-way Power)** **Driver or Passenger Seat Cushion Frame Replacement (Passenger Side with 6-way Power)**
- **Driver or Passenger Seat Recliner Actuator Replacement****Driver or Passenger Seat Recliner Actuator Replacement (22-Way Power)**
- **Control Module References** for K40 Seat Memory Control Module replacement, programming and setup

DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, B1820, B1830, B1835, B1840, OR B1845: DRIVER SEAT SWITCH

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 B1735

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Seat Front Up Switch Circuit

DTC B1740

Seat Front Down Switch Circuit

DTC B1745

Seat Rear Up Switch Circuit

DTC B1750

Seat Rear Down Switch Circuit

DTC B1755

Seat Assembly Forward Switch Circuit

DTC B1760

Seat Assembly Rearward Switch Circuit

DTC B1815

Seat Recline Forward Switch Circuit

DTC B1820

Seat Recline Rearward Switch Circuit

DTC B1830

Seat Lumbar Forward Switch Circuit

DTC B1835

Seat Lumbar Rearward Switch Circuit

DTC B1840

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Seat Lumbar Up Switch Circuit

DTC B1845

Seat Lumbar Down Switch Circuit

For symptom byte information refer to **Symptom Byte List**

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Front Vertical Up Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	1	-	-
Front Vertical Down Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	1	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Rear Vertical Up Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	1	-	-
Rear Vertical Down Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	1	-	-
Horizontal Forward Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59,	1	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
	B1835 02 or 59, B1840 02 or 59, B1845 02 or 59			
Horizontal Rearward Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	1	-	-
Recline Forward Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	1	-	-
Recline Rearward Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59,	1	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
	B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59			
Seat Lumbar Up Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	2	-	-
Seat Lumbar Down Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	2	-	-
Seat Lumbar Forward Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59,	2	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
	B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59			
Seat Lumbar Rearward Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	2	-	-
1. Power seat is inoperative 2. Lumbar support is inoperative				

Circuit/System Description

The seat memory control module supplies a reference voltage to each signal circuit of the driver seat adjuster switch. When the power seat or lumbar switches are pressed, the appropriate signal circuit from the seat memory control module is pulled low through the switch contacts indicating the power seat command. The seat memory control module then commands the driver seat or lumbar to move in response to the switch signals.

Conditions for Running the DTC

- DTC B1325 must not be present.
- Module battery voltage must be between 9-16 V.

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Conditions for Setting the DTC

- If a seat or lumbar switch circuit is active in one direction and the switch for the opposite direction is pressed, this DTC will set.
- A short to ground on a switch signal circuit.

Action Taken When the DTC Sets

- A motor output driven in response to a switch considered failed, is deactivated for both directions.
- All memory recall commands are ignored.
- The seat memory control module will respond to any other switch signal that has not set a DTC.

Conditions for Clearing the DTC

- The current DTC will clear and set the DTC to history, when the fault is no longer present 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.

Diagnostic Aids

- If one of the switch signal circuits is shorted to ground, multiple DTCs will set.
- If a switch is stuck in one direction and the switch is pressed in the opposite direction, a single DTC will set.

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Memory Seats 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 Verification

1. Ignition ON.
2. Verify the scan tool seat switch parameters listed below change between Inactive and Forward/Rearward or UP/Down when pressing the appropriate seat directional switch.
    - Driver Seat Cushion Front Vertical Switch
    - Driver Seat Cushion Rear Vertical Switch
    - Driver Seat Horizontal Switch
    - Driver Seat Back Switch
    - Driver Lumbar Support Vertical Switch
    - Driver Lumbar Support Horizontal Switch
    - **If the parameter does not change**

      Refer to Circuit/System Testing.

    - **If the parameter changes**
3. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the X1 and X2 harness connectors at the S64D Seat Adjuster Switch - Driver.
2. Verify that all scan tool driver seat switch parameters listed below are Inactive:
    - Driver Seat Cushion Front Vertical Switch
    - Driver Seat Cushion Rear Vertical Switch

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- Driver Seat Horizontal Switch
- Driver Seat Back Switch
- Driver Lumbar Support Vertical Switch (with 4-way lumbar)
- Driver Lumbar Support Horizontal Switch
- **If not Inactive**

1. Ignition OFF, disconnect the X5 harness connector at the K40 Seat Memory Control Module, ignition ON.
2. Test for infinite resistance between the appropriate signal circuit terminal listed below and ground:
    - Front vertical up switch terminal 1 X1
    - Front vertical down switch terminal 5 X1
    - Rear vertical up switch terminal 8 X1
    - Rear vertical down switch terminal 10 X1
    - Horizontal forward switch terminal 3 X1
    - Horizontal rearward switch terminal 7 X1
    - Recline forward switch terminal 4 X1
    - Recline rearward switch terminal 9 X1
    - Driver seat lumbar up terminal 1 X2 (with 4-way lumbar)
    - Driver seat lumbar down terminal 5 X2 (with 4-way lumbar)
    - Driver seat lumbar forward terminal 2 X2
    - Driver seat lumbar rearward terminal 6 X2
    - If less than infinite resistance, repair the short to ground on the circuit.
    - If infinite resistance, replace the K40 Seat Memory Control Module.

- **If Inactive**

3. Install a 3 A fused jumper wire between the appropriate signal circuit terminal listed below and the ground circuit terminal 6.
    - Front vertical up switch terminal 1 X1
    - Front vertical down switch terminal 5 X1
    - Rear vertical up switch terminal 8 X1
    - Rear vertical down switch terminal 10 X1
    - Horizontal forward switch terminal 3 X1
    - Horizontal rearward switch terminal 7 X1

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- Recline forward switch terminal 4 X1
- Recline rearward switch terminal 9 X1
- Driver seat lumbar up terminal 1 X2 (with 4-way lumbar)
- Driver seat lumbar down terminal 5 X2 (with 4-way lumbar)
- Driver seat lumbar forward terminal 2 X2
- Driver seat lumbar rearward terminal 6 X2

4. Verify the appropriate scan tool seat switch parameter is Forward/Rearward or UP/Down.
   - **If not Forward/Rearward or UP/Down**
   1. Ignition OFF, disconnect the X5 harness connector at the K40 Seat Memory Control Module, ignition ON.
   2. Test for less than 1 V between the signal circuit terminal and ground.
      - If 1 V or greater, repair the short to voltage on the circuit.
      - If less than 1 V
   3. Ignition OFF.
   4. 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 K40 Seat Memory Control Module.
   - **If Forward/Rearward or UP/Down**
5. Test or replace the S64D Seat Adjuster Switch - Driver.

Component Testing

Seat Adjuster Switch Test

1. Ignition OFF, disconnect the X1 and X2 harness connectors at the S64D Seat Adjuster Switch - Driver.
2. Test for infinite resistance between the ground terminal 6 and each signal terminal with the switch in the open position.
   - **If less than infinite resistance**

     Replace the S64D Seat Adjuster Switch - Driver.

   - **If infinite resistance**
3. Test for less than 2 Ω between the ground terminal 6 and each signal terminal with the appropriate switch in the closed position.

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- **If 2 Ω or greater**

  Replace the S64D Seat Adjuster Switch - Driver.

- **If less than 2 Ω**

4. All OK.

Repair Instructions

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

- **Driver or Passenger Seat Adjuster Switch ReplacementDriver or Passenger Seat Adjuster Switch Replacement (22-Way Power)**
- **Control Module References** for K40 Seat Memory Control Module replacement, programming and setup

DTC B244A: SEAT ADJUSTER SWITCH INTERNAL 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.

DTC Descriptors

DTC B244A 39

Seat Adjuster Switch Internal Malfunction

Circuit/System Description

The seat memory control module detects an internal fault with the seat adjuster switch. No external circuits are involved.

Conditions for Running the DTC

Ignition ON.

Conditions for Setting the DTC

The seat memory control module detects an internal fault with the seat adjuster switch.

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Action Taken When the DTC Sets

The seat memory control module ignores all seat adjuster switch inputs.

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

- **Driver Seat Schematics**
- **Passenger Seat Schematics**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Memory Seats Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

DTC B244A

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1. Ignition ON.
2. Verify DTC B244A is not set.
    - **If the DTC is set**

      Replace the appropriate S64 Seat Adjuster Switch.

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

Repair Instructions

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

Driver or Passenger Seat Adjuster Switch ReplacementDriver or Passenger Seat Adjuster Switch Replacement (22-Way Power)

DTC B2755 OR B2765: MEMORY SELECT SWITCH

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 B2755

Memory Select Switch Circuit

DTC B2765

Memory Set Switch Circuit

For symptom byte information refer to **Symptom Byte List**

Diagnostic Fault Information

Circuit	Short to Ground	Open/High	Short to Voltage	Signal Performance

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		Resistance		
Memory 1 Switch Signal	B2755 02	1	B2755 01	B2755 00 or 59
Memory Set Switch Signal	B2765 02 or 59	2	2	-
Low Reference	-	1, 2	-	-
1. The seat memory recall feature is inoperative 2. The seat memory set function is inoperative				

Circuit/System Description

Low reference is supplied to the driver seat memory switch from the seat memory control module. When a memory switch is pressed, the signal circuit from the seat memory control module is pulled low through the switch contacts and series of resistors indicating the memory recall request. In response to this signal, the seat memory control module commands the appropriate seat motors to move to the pre-recorded seat positions stored in memory.

Conditions for Running the DTC

- DTC B1327 must not be present.
- Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

B2755 00 or 59

The seat memory control module detects a stuck Memory 1, Memory 2, or Exit switch for a given amount of time.

B2755 01

If the seat memory control module detects a short to voltage on the memory seat switch signal circuit this DTC will set.

B2755 02

If the seat memory control module detects a short to ground on the memory seat switch signal circuit this DTC will set.

B2765 02 or 59

If the memory set switch signal is active for greater than 30 seconds, the module will set this DTC.

Actions Taken When the DTC Sets

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- Current and history DTCs are set.
- All memory recall commands and are ignored.

Conditions for Clearing the DTCs

- The DTC automatically clears when the switch circuit setting the DTC is no longer active.
- A history DTC will clear once 50 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Memory Seats Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Driver Seat Memory Recall Switches parameter changes between Inactive and Memory 1 when pressing the memory 1 switch.

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- **If the parameter does not change**

  Refer to Circuit/System Testing.

- **If the parameter changes**

3. Verify the scan tool Driver Seat Memory Recall Switches parameter changes between Inactive and Memory 2 when pressing the memory 2 switch.
   - **If the parameter does not change**

     Refer to Circuit/System Testing.

   - **If the parameter changes**
4. Verify the scan tool Driver Seat Memory Recall Switches parameter changes between Inactive and Exit when pressing the EXIT switch.
   - **If the parameter does not change**

     Refer to Circuit/System Testing.

   - **If the parameter changes**
5. Verify the scan tool Driver Memory Set Switch parameter changes between Inactive and Active when pressing the SET switch.
   - **If the parameter does not change**

     Refer to Circuit/System Testing.

   - **If the parameter changes**
6. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the S47D Seat Memory Switch - Driver, ignition ON.
2. Press a power seat switch in order to wake up the K40 Seat Memory Control Module.
3. Test for 9 V or greater between each signal circuit terminal listed below and ground:
   - Memory set switch signal terminal 5
   - Memory switch signal terminal 6
   - **If less than 9 V**

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1. Ignition OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module.
2. Test for infinite resistance between the signal circuit and ground.
    - If less than infinite resistance, repair the short to ground on the circuit.
    - If infinite resistance
3. Test for less than 2 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 K40 Seat Memory Control Module.
- **If 9 V or greater**

4. Ignition OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module, ignition ON.
5. Test for less than 1 V between each signal circuit terminal listed below and ground:
    - Memory set switch signal terminal 5
    - Memory switch signal terminal 6
    - **If 1 V or greater**

      Repair the short to voltage on the circuit.

    - **If less than 1 V**
6. Test or replace the S47D Seat Memory Switch - Driver.

Component Testing

Driver Seat Memory Switch

1. Ignition OFF, disconnect the harness connector at the S47D Seat Memory Switch - Driver.
2. Test for infinite resistance between each signal terminal listed below and the low reference terminal 1 with the switch in the open position.
    - Terminal 5
    - Terminal 6
    - **If less than infinite resistance**

      Replace the S47D Seat Memory Switch - Driver.

    - **If infinite resistance**
3. Test for less than 4 Ω between the signal terminal 5 and the low reference terminal 1 while pressing the memory SET button.

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- **If 4 Ω or greater**

  Replace the S47D Seat Memory Switch - Driver.

- **If less than 4 Ω**

4. Test for 573-701 Ω between the signal terminal 6 and the low reference terminal 1 while pressing the memory 1 button.
   - **If not between 573-701 Ω**

     Replace the S47D Seat Memory Switch - Driver.

   - **If between 573-701 Ω**
5. Test for 1800-2201 Ω between the signal terminal 6 and the low reference terminal 1 while pressing the memory 2 button.
   - **If not between 1800-2201 Ω**

     Replace the S47D Seat Memory Switch - Driver.

   - **If between 1800-2201 Ω**
6. Test for 5.52k-6.73 kΩ between the signal terminal 6 and the low reference terminal 1 while pressing the Exit button.
   - **If not between 5.52k-6.73 kΩ**

     Replace the S47D Seat Memory Switch - Driver.

   - **If between 5.52k-6.73 kΩ**
7. All OK.

Repair Instructions

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

- **Front Seat Adjuster Memory Switch Replacement (Cadillac)Front Seat Adjuster Memory Switch Replacement (Chevrolet / GMC)**
- **Control Module References** for K40 Seat Memory Control Module replacement, programming, and setup

DTC B3920: SEAT MOTORS GROUP 1 COMMON CIRCUIT

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 B3920 00

Seat Motors Group 1 Common Circuit

For symptom byte information refer to **Symptom Byte List**

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Adjustable Pedal Actuator Forward Control	B3920 02	3	B3920 01	B3920 00, B3920 0B
Adjustable Pedal Actuator Forward Control	B3920 02	3	B3920 01	B3920 00, B3920 0B
Seat Front Vertical Motor Down Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Seat Front Vertical Motor Up Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Seat Horizontal Motor Forward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Seat Horizontal Motor Rearward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Seat Rear Vertical Motor Down Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Seat Rear Vertical Motor Up Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Seat Recline Motor Forward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Seat Recline Motor Rearward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Seat Lumbar Motor Forward Control	B3920 02	2	B3920 01	B3920 00, B3920 0B
Seat Lumbar Motor Rearward Control	B3920 02	2	B3920 01	B3920 00, B3920 0B
Seat Lumbar Motor Up Control	B3920 02	2	B3920 01	B3920 00, B3920 0B
Seat Lumbar Motor Down Control	B3920 02	2	B3920 01	B3920 00, B3920 0B
1. Power seat and memory functions are inoperative 2. Lumbar support functions are inoperative 3. Adjustable pedal function is inoperative				

Circuit/System Description

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The seat memory control module controls the seat, lumbar, and adjustable pedal motors via half bridges that are connected to power rails internal to the module. The seat memory control module connects all of the motor control circuits on each power rail to a common reference point whenever they are not in operation. The module monitors all seat motor control circuits for a shorted to ground or voltage before enabling any seat motor.

When a power seat, lumbar, or adjustable pedal switch is pressed or when a memory recall is requested, each seat motor receives battery voltage and ground from the seat memory control module via the motor control circuits. All motors are reversible, so the direction the motor rotates depends on which control circuit voltage is applied and which control circuit ground is applied. When the switch is operated in the opposite direction, the module reverses the polarity and applies voltage and ground to the opposite circuits to move the seat in the opposite direction.

Conditions for Running the DTC

- DTC B1325 must not be present.
- Module battery voltage must be between 9-16 V.

Conditions for Setting the DTC

B3920 00

Current out of the module does not match the current returning to the module from 1.5-5 A.

B3920 01

The voltage on any power rail 1 motor control circuit exceeds 2.78 V for 100 ms.

B3920 02

The voltage on any power rail 1 motor control circuit is below 1.47 V for 100 ms.

B3920 0B

The differential current measured through the high and low side of the power rail is within tolerance of each other, but the absolute current or an over-current has exceeded the maximum value.

Action Taken When the DTC Sets

The seat memory control module will not allow operation of any motor on the power rail for which the DTC was set.

Conditions for Clearing the DTC

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- The current DTC clears when the fault 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

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Memory 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

B3920 01 or B3920 02

1. Ignition OFF, disconnect the X3 and X4 harness connectors at the appropriate driver or passenger K40 Seat Memory Control Module.
2. Test for infinite resistance between each control circuit terminal listed below and ground:
   - Front vertical motor up control terminal 3 X3
   - Front vertical motor down control terminal 4 X3
   - Rear vertical motor up control terminal 5 X3

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- Rear vertical motor down control terminal 6 X3
- Horizontal motor forward control terminal 11 X3
- Horizontal motor rearward control terminal 12 X3
- Recline motor forward control terminal 1 X3
- Recline motor rearward control terminal 2 X3
- Driver power seat lumbar motor up control terminal 7 X3 (with 4-way lumbar)
- Driver power seat lumbar motor down control terminal 8 X3 (with 4-way lumbar)
- Driver power seat lumbar motor forward control terminal 9 X3
- Driver power seat lumbar motor rearward control terminal 10 X3
- Adjustable pedal actuator forward control terminal 1 X4 (with adjustable pedals)
- Adjustable pedal actuator rearward control terminal 2 X4 (with adjustable pedals)
- **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 each control circuit terminal listed below and ground:
   - Front vertical motor up control terminal 3 X3
   - Front vertical motor down control terminal 4 X3
   - Rear vertical motor up control terminal 5 X3
   - Rear vertical motor down control terminal 6 X3
   - Horizontal motor forward control terminal 11 X3
   - Horizontal motor rearward control terminal 12 X3
   - Recline motor forward control terminal 1 X3
   - Recline motor rearward control terminal 2 X3
   - Driver power seat lumbar motor up control terminal 7 X3 (with 4-way lumbar)
   - Driver power seat lumbar motor down control terminal 8 X3 (with 4-way lumbar)
   - Driver power seat lumbar motor forward control terminal 9 X3
   - Driver power seat lumbar motor rearward control terminal 10 X3

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- Adjustable pedal actuator forward control terminal 1 X4 (with adjustable pedals)
- Adjustable pedal actuator rearward control terminal 2 X4 (with adjustable pedals)
- **If 1 V or greater**

  Repair the short to voltage on the circuit.

- **If less than 1 V**

5. Replace the K40 Seat Memory Control Module.

B3920 00 or B3920 0B

1. Ignition ON.
2. Clear the current and history DTC.
3. Determine which motor set this DTC by operating the driver seat, lumbar, and adjustable pedal motors listed below one at a time in both directions. Check for the DTC to set between each motor test.
   - M50D Seat Front Vertical Motor - Driver
   - M55D Seat Rear Vertical Motor - Driver
   - M51D Seat Horizontal Motor - Driver
   - M56D Seat Recline Motor - Driver
   - M52D Seat Lumbar Support Horizontal Motor - Driver
   - A14D Seat Lumbar Support Pump - Driver (with 4-way lumbar)
   - M5 Adjustable Pedal Motor
4. Ignition OFF, disconnect the harness connector at the motor for which the DTC set, ignition ON.
5. Clear the DTC.
6. Verify that DTC B3920 00 or B3920 0B does not set while operating the appropriate seat motor adjuster switch or adjustable pedal switch in both directions.
   - **If DTC B3920 00 or B3920 0B sets**
   1. Ignition OFF, disconnect the appropriate X3 or X4 harness connector at the K40 Seat Memory Control Module.
   2. Test for infinite resistance between the control circuits.
      - If less than infinite resistance, repair the short between the circuits.
      - If infinite resistance

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3. Test for less than 2 Ω in each control circuit end to end.
    - If 2 Ω or greater, repair the open/high resistance in the circuit.
    - If less than 2 Ω, replace the seat, lumbar, or adjustable pedal motor.
- **If DTC B3920 00 or B3920 0B does not set**

7. Replace the appropriate seat, lumbar, or adjustable pedal motor.

Repair Instructions

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

- **Front Seat Tilt Adjuster Actuator Replacement**
- **Driver or Passenger Seat Vertical Adjuster Actuator Replacement**
- **Driver or Passenger Seat Cushion Frame Replacement (Except Passenger Side with 6-way Power)** **Driver or Passenger Seat Cushion Frame Replacement (Passenger Side with 6-way Power)**
- **Front Seat Back Lumbar Replacement (2-Way Power)Front Seat Back Lumbar Replacement (4-Way Pneumatic)**
- **Driver or Passenger Seat Recliner Actuator ReplacementDriver or Passenger Seat Recliner Actuator Replacement (22-Way Power)**
- **Brake and Accelerator Pedal Assembly Replacement**
- **Control Module References** for K40 Seat Memory Control Module replacement, programming and setup

DTC B392B: SEAT LUMBAR/BOLSTER PUMP

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 B392B 00

Seat Lumbar/Bolster Pump

Diagnostic Fault Information

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U1520 00, U1528 00	U1520 00	-	-
Seat Bolster Memory Control Module Ground	-	U1520 00	-	-
Seat Lumbar/Bolster Pump Control Terminal 1	B392B 00	1	-	-
Seat Lumbar/Bolster Pump Control Terminal 3	1	1	1	-
Seat Lumbar/Bolster Pump Ground	-	1	-	-
1. The lumbar/bolster functions are inoperative				

Circuit/System Description

When a seat lumbar, bolster, or massage function is commanded ON, the seat bolster memory control module applies battery voltage and a low side drive pulse width modulated (PWM) signal through their respective control circuits to the seat lumbar/bolster pump. The logic in the pump interprets this signal and pump runs to inflate the lumbar/bolster bladders until the switch is released.

Conditions for Running the DTC

- Ignition ON.
- The voltage control circuit to the lumbar/bolster pump must be active.

Conditions for Setting the DTC

The seat bolster memory control module detects a short to ground on the lumbar/bolster pump voltage control circuit.

Action Taken When the DTC Sets

All lumbar, bolster, and massage functions are inoperative.

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

- **Driver Seat Schematics**

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- **Passenger Seat Schematics**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Lumbar Support Description and Operation (2-Way with Memory A45)Lumbar Support Description and Operation (2-Way without Memory A45)Lumbar Support Description and Operation (4-Way without Memory A45)Lumbar Support Description and Operation (4-Way with Memory A45)Lumbar Support Description and Operation (With Seat Bolster Memory Control Module)

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, all vehicle systems OFF, disconnect the harness connector at the appropriate G31 Seat Lumbar/Bolster Pump.
2. Test for less than 10 Ω between the ground circuit terminal 2 and ground.
    - **If 10 Ω or greater**
    1. Ignition OFF.
    2. Test for less than 2 Ω in the ground circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, repair the open/high resistance in the ground connection.
    - **If less than 10 Ω**
3. Connect a test lamp between the control circuit terminal 1 and ground, ignition ON.

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NOTE: **The test lamp should stay ON for approximately 1 min after releasing the switch.**

4. Verify the test lamp turns ON after pressing and holding the lumbar forward switch for 3 s.
    - **If the test lamp remains OFF**
    1. Ignition OFF, remove the test lamp, disconnect the harness connector at the K134 Seat Bolster Memory 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 Ω in the control circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, replace the K134 Seat Bolster Memory Control Module.
    - **If the test lamp turns ON**
5. Test or replace the G31 Seat Lumbar/Bolster Pump.

Repair Instructions

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

- **Front Seat Lumbar Support Bladder Pump Replacement (22-Way Power)**
- **Control Module References** for K134D Seat Bolster Memory Control Module - Driver and K134P Seat Bolster Memory Control Module - Passenger replacement, programming and setup

DTC B392C: SEAT BOLSTER MEMORY CONTROL MODULE INTERNAL 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.

DTC Descriptors

DTC B392C 39

Seat Bolster Memory Control Module Internal Malfunction

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Circuit/System Description

The seat memory control module detects an internal electronic fault in the seat bolster memory 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.

An internal electronic fault in the seat bolster memory control module will set this DTC.

Action Taken When the DTC Sets

All lumbar/bolster functions will be inoperative.

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

- **Driver Seat Schematics**
- **Passenger Seat Schematics**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Lumbar Support Description and Operation (2-Way with Memory A45)Lumbar Support Description and Operation (2-Way without Memory A45)Lumbar Support Description and Operation (4-Way without Memory A45)Lumbar Support Description and Operation (4-Way with Memory A45)Lumbar Support Description and Operation (With Seat Bolster Memory Control Module)

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Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

DTC B392C

1. Ignition ON.
2. Verify DTC B392C is not set.
   - **If the DTC is set**

     Replace the appropriate K134 Seat Bolster Memory 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 K134D Seat Bolster Memory Control Module - Driver or K134P Seat Bolster Memory Control Module - Passenger replacement, programming and setup

SYMPTOMS - POWER SEATS

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.

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- The control modules can communicate via the serial data link.

2. Review the system operation in order to familiarize yourself with the system functions. Refer to the following system descriptions:
   - **Lumbar Support Description and Operation (2-Way with Memory A45)Lumbar Support Description and Operation (2-Way without Memory A45)Lumbar Support Description and Operation (4-Way without Memory A45)Lumbar Support Description and Operation (4-Way with Memory A45)Lumbar Support Description and Operation (With Seat Bolster Memory Control Module)**
   - **Memory Seats Description and Operation**
   - **Power Seats System Description and Operation (Front Seats)Power Seats System Description and Operation (2nd Row Seats)Power Seats System Description and Operation (3rd Row Seats)Power Seats System Description and Operation (Passenger Seat with Seat Bolster Memory Control Module)**

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the system. Refer to **Checking Aftermarket Accessories** .
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

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:

- **Lumbar Support Malfunction (2-Way without Memory A45)Lumbar Support Malfunction (4-Way with Memory A45)Lumbar Support Malfunction (4-Way without Memory A45)Lumbar Support Malfunction (With Seat Bolster Memory Control Module)Lumbar Support Malfunction (2-Way with Memory A45)**
- **Memory Seat Feature Malfunction**
- **Power Seat Malfunction (Without Memory A45)Power Seat Malfunction (With Memory A45)Power Seat Malfunction (With ULT)**

LUMBAR SUPPORT MALFUNCTION (2-WAY 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.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	1	2	-	-
Driver Power Seat Lumbar Motor Rearward Control	1	2	-	-
Driver Power Seat Lumbar Motor Forward Control	1	2	-	-
Ground	-	2	-	-

1. The power seat and lumbar support are inoperative
2. The lumbar support is inoperative

Circuit/System Description

The seat lumbar switch provides both power and ground to the lumbar support motor. When the lumbar switches are in an inactive state, the switch contacts are closed to the switch ground circuit.

The lumbar support horizontal motor is reversible. For example, when the lumbar forward switch is pressed to move the lumbar support forward, battery voltage is applied through the switch contacts and the lumbar motor forward control circuit to the motor. With the lumbar motor horizontal rearward switch contacts closed to the switch ground circuit, the motor runs in order to drive the lumbar support forward toward the occupants back until the switch is released. Moving the lumbar support rearward works similarly to moving the lumbar support forward, except that battery positive voltage and ground are applied on opposite circuits causing the motor to run in the opposite direction.

Reference Information

Schematic Reference

- **Driver Seat Schematics**
- **Passenger Seat Schematics**

Connector End View Reference

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COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Lumbar Support Description and Operation (2-Way without Memory A45)

Electrical Information Reference

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

Circuit/System Verification

1. Ignition ON.
2. Verify that all power seat functions operate when being controlled by the S64 Seat Adjuster Switch.
    - **If any power seat function does not operate**

      Refer to Power Seat Malfunction (Without Memory A45).

    - **If all power seat functions operate**
3. Refer to Circuit/System Testing.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate M53 Seat Lumbar Support Motor.
2. Connect a test lamp between control circuit terminal A and control circuit terminal B, ignition ON.
3. Verify the test lamp turns ON when commanding the lumbar support Forward and Rearward using the seat lumbar switch.
    - **If the test lamp remains OFF during either of the commands**
    1. Ignition OFF, disconnect the X2 harness connector at the S64 Seat Adjuster Switch.
    2. Test for less than 2 Ω in each control circuit 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 S64 Seat Adjuster Switch

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- **If the test lamp turns ON during each of the commands**

4. Test or replace the M53 Seat Lumbar Support Motor.

Component Testing

Seat Adjuster Switch

1. Ignition OFF, disconnect the X1 and X2 harness connectors at the appropriate S64 Seat Adjuster Switch.
2. Test for infinite resistance between the B+ terminal and each control terminal with the switch in the open position.
   - **If less than infinite resistance**

     Replace the S64 Seat Adjuster Switch.

   - **If infinite resistance**
3. Test for less than 2 Ω between the B+ terminal and each control terminal with the appropriate switch in the closed position.
   - **If 2 Ω or greater**

     Replace the S64 Seat Adjuster Switch.

   - **If less than 2 Ω**
4. Test for less than 2 Ω between the ground terminal and each control terminal with the switch in the open position.
   - **If 2 Ω or greater**

     Replace the S64 Seat Adjuster Switch.

   - **If less than 2 Ω**
5. All OK.

M53 Seat Lumbar Support Motor

1. Ignition OFF, disconnect the harness connector at the M53 Seat Lumbar Support Motor.

   NOTE: When performing the following tests, make sure that the lumbar support is not already in the position the test is attempting to produce.

2. Install a 30 A fused jumper wire between control terminal B and 12 V.

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3. Momentarily install a jumper wire between control terminal A and ground. The M53 Seat Lumbar Support Motor should momentarily perform the lumbar FORWARD function.
    - **If the motor does not perform the lumbar FORWARD function**

      Replace the M53 Seat Lumbar Support Motor.

    - **If the motor performs the lumbar FORWARD function**
4. Reverse the polarity of jumper wires; the lumbar motor should perform REARWARD function.
    - **If the motor does not perform the lumbar REARWARD function**

      Replace the M53 Seat Lumbar Support Motor.

    - **If the motor performs the lumbar REARWARD function**
5. All OK.

Repair Instructions

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

- **Driver or Passenger Seat Adjuster Switch Replacement**
- **Front Seat Back Lumbar Replacement (2-Way Power)**

LUMBAR SUPPORT MALFUNCTION (4-WAY 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
Driver Seat Lumbar Rearward Switch Signal	B1735 02 or 59, B1740 02 or 59,	2	2	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
	B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59			
Driver Seat Lumbar Down Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	2	2	-
Driver Seat Lumbar Forward Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59,	1	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
	B1845 02 or 59			
Driver Seat Lumbar Rearward Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	1	-	-
Driver Power Seat Lumbar Motor Up Control	B3920 02	2	B3920 01	-
Driver Power Seat Lumbar Motor Down Control	B3920 02	2	B3920 01	-
Driver Power Seat Lumbar Motor Forward Control	B3920 02	1	B3920 01	-
Driver Power Seat Lumbar Motor Rearward Control	B3920 02	1	B3920 01	-
1. The driver seat lumbar horizontal support is inoperative 2. The driver seat vertical support is inoperative.				

Circuit/System Description

The seat memory control module supplies a reference voltage to each signal circuit of the driver seat adjuster switch. When the lumbar support switches are pressed, the appropriate signal circuit from the seat memory control module is pulled low through the switch contacts indicating the seat lumbar support command. The control module then applies battery voltage through the control circuit to the seat lumbar support pump. The pump energizes its internal inflate solenoid and the pump runs to inflate the bladder until the switch is released. When the lumbar switch is pressed to deflate the lumbar bladder, the signal circuit from the seat memory control module is pulled low indicating the deflate command. Battery voltage is applied through the deflate control circuit to the seat lumbar support pump. The pump energizes its internal deflate solenoid and air is released from the bladder until the switch is released.

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Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Lumbar Support Description and Operation (4-Way with Memory A45)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

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

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

    - **If no power seat DTCs are set**
3. Verify that all power seat functions operate when being controlled by the S64D Seat Adjuster Switch - Driver.
    - **If any power seat function does not operate**

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Refer to **Power Seat Malfunction (With Memory A45)**.

- **If all power seat functions operate**

4. Verify each scan tool parameter listed below changes between Inactive and Up and Down or Forward and Rearward when pressing the appropriate lumbar switch in both directions.
   - Driver Lumbar Support Horizontal Switch
   - Driver Lumbar Support Vertical Switch
   - **If the parameter does not change**

     Refer to Circuit/System Testing - Lumbar Switch Circuit Test

   - **If the parameter changes**
5. Refer to Circuit/System Testing - Lumbar Support Pump Circuit Test.

Circuit/System Testing

Lumbar Switch Circuit Test

1. Ignition ON.
2. Verify the scan tool lumbar switch parameters listed below are Inactive:
   - Driver Lumbar Support Horizontal Switch
   - Driver Lumbar Support Vertical Switch
   - **If not Inactive**
   1. Ignition OFF, disconnect the X5 harness connector at the K40D Seat Memory Control Module - Driver.
   2. Test for infinite resistance between the appropriate signal circuit terminal listed below and ground:
      - Driver seat lumbar up terminal 16
      - Driver seat lumbar down terminal 17
      - Driver seat lumbar forward terminal 14
      - Driver seat lumbar rearward terminal 15
      - If less than infinite resistance, repair the short to ground on the circuit.
      - If infinite resistance, replace the K40D Seat Memory Control Module - Driver.
   - **If Inactive**

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3. Ignition OFF, disconnect the X1 and X2 harness connectors at the S64D Seat Adjuster Switch - Driver, ignition ON.
4. Install a 3 A fused jumper wire between the ground circuit terminal 6 X1 and the appropriate signal circuit terminal listed below:
    - Driver seat lumbar up terminal 1 X2
    - Driver seat lumbar down terminal 5 X2
    - Driver seat lumbar forward terminal 2 X2
    - Driver seat lumbar rearward terminal 6 X2
5. Verify the appropriate scan tool lumbar switch parameter changes between Inactive and Forward/Rearward, or UP/Down.
    - **If the parameter does not change**
    1. Ignition OFF, disconnect the X5 harness connector at the K40D Seat Memory Control Module - Driver, ignition ON.
    2. Test for less than 1 V between the signal circuit and ground.
        - If 1 V or greater, repair the short to voltage on the circuit.
        - If less than 1 V
    3. Test for less than 2 Ω in the circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, replace the K40D Seat Memory Control Module - Driver.
    - **If the parameter changes**
6. Test or replace the S64D Seat Adjuster Switch - Driver.

Lumbar Support Pump Circuit Test

1. Ignition OFF, disconnect the harness connector at the A14D Seat Lumbar Support Pump - Driver.
2. Connect a test lamp between the appropriate control circuit terminals listed below, ignition ON.
    - Seat lumbar horizontal control terminal 2 and control terminal 5
    - Seat lumbar vertical control terminal 1 and control terminal 3
3. Verify the test lamp turns ON when pressing the appropriate lumbar switch in both directions.
    - **If test lamp remains OFF during either of the commands**
    1. Ignition OFF, remove the test lamp, disconnect the X3 harness connector at the K40D Seat Memory Control Module - Driver, ignition ON.
    2. Test for less than 1 V between each control circuit and ground.
        - If 1 V or greater, repair the short to voltage on the circuit.

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- If less than 1 V

3. Ignition OFF.
4. Test infinite resistance between each control circuit and ground.
    - If less than infinite resistance, repair the short to ground on the circuit.
    - If infinite resistance
5. Test for less than 2 Ω in each control circuit end to end.
    - If 2 Ω or greater, repair the open/high resistance in the circuit.
    - If less than 2 Ω, replace the K40D Seat Memory Control Module - Driver.

- **If the test lamp turns ON during each of the commands**

4. Test or replace the A141D Seat Lumbar Support Pump - Driver.

Component Testing

Lumbar Support Switch

1. Ignition OFF, disconnect the X1 and X2 harness connector at the S64D Seat Adjuster Switch - Driver.
2. Test for infinite resistance between the ground terminal 6 X1 and each lumbar signal terminal with the switch in the open position.
    - **If less than infinite resistance**

      Replace the S64D Seat Adjuster Switch - Driver.

    - **If infinite resistance**
3. Test for less than 2 Ω between the ground terminal 6 X1 and each lumbar signal terminal with the appropriate switch in the closed position.
    - **If 2 Ω or greater**

      Replace the S64D Seat Adjuster Switch - Driver.

    - **If less than 2 Ω**
4. All OK.

Repair Instructions

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

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- **Driver or Passenger Seat Adjuster Switch Replacement**
- **Front Seat Back Lumbar Replacement (4-Way Pneumatic)**
- **Control Module References** for K40D Seat Memory Control Module - Driver replacement, programming and setup

LUMBAR SUPPORT MALFUNCTION (4-WAY 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
B+	1	1	-	-
Passenger Power Seat Lumbar Motor Up Control	1	2	-	-
Passenger Power Seat Lumbar Motor Down Control	1	2	-	-
Passenger Power Seat Lumbar Motor Forward Control	1	2	-	-
Passenger Power Seat Lumbar Motor Rearward Control	1	2	-	-
Ground	-	1	-	-
1. The power seat and the lumbar support functions are inoperative 2. The lumbar support is inoperative				

Circuit/System Description

Battery voltage is supplied at all times to the seat adjuster switch through a 30 A fuse located in the underhood fuse block. When a lumbar horizontal forward switch is pressed to inflate the lumbar support, battery voltage is applied through the switch contacts and the inflate control circuit to the seat lumbar support pump. In response to this signal, the pump energizes its internal inflate solenoid and runs to inflate the lumbar bladder until the switch is released. When the switch is pressed to deflate the lumbar support, battery voltage is applied through the switch contacts and the deflate signal

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circuit to the seat lumbar support pump. The pump energizes its internal deflate solenoid and air is released from the bladder until the switch is released. The lumbar vertical support also operates this way.

Reference Information

Schematic Reference

Passenger Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Lumbar Support Description and Operation (4-Way without Memory A45)

Electrical Information Reference

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

Circuit/System Verification

1. Ignition ON.
2. Verify that all power seat functions operate when being controlled by the S64P Seat Adjuster Switches - Passenger.
    - **If any power seat function does not operate**

      Refer to **Power Seat Malfunction (Without Memory A45)**.

    - **If all power seat functions operate**
3. Verify the lumbar support pump turns ON when the lumbar support switch is pressed in the FORWARD direction. The upper and lower lumbar support bladders should inflate until the bladders are 100% inflated or the switch is released.
    - **If the pump does not turn ON or the bladder does not inflate**

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Refer to Circuit/System Testing

- **If the pump turns ON and the upper bladder inflates**

4. Verify the upper and lower lumbar support bladders deflate when the lumbar REARWARD switch is pressed. The bladders should deflate until the bladders are 100% deflated or the switch is released.
   - **If the bladders do not deflate**

     Refer to Circuit/System Testing

   - **If the bladders deflate**
5. Verify the lumbar support pump turns ON and the upper lumbar support bladder starts to inflate when the lumbar switch is pressed in the UP direction. If the lower bladder is inflated it will deflate while the upper bladder inflates until the upper bladder is 100% inflated or switch is released.
   - **If the pump does not turn ON or the upper bladder does not inflate**

     Refer to Circuit/System Testing

   - **If the pump turns ON and the upper bladder inflates**
6. Verify the upper lumbar bladder starts to deflate while the lower lumbar bladder starts to inflate while the lumbar switch is pressed in the DOWN direction. The upper bladder should deflate until it is 100% deflated and the lower bladder should inflate until it is 100% inflated or the switch is released.
   - **If the upper bladder does not deflate or the lower bladder does not inflate**

     Refer to Circuit/System Testing

   - **If the upper bladder deflates and the lower bladder inflates**
7. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the A14P Seat Lumbar Support Pump - Passenger.
2. Connect a test lamp between the appropriate control circuit terminals listed below, ignition ON.
   - Seat lumbar horizontal control terminal 2 and control terminal 5
   - Seat lumbar vertical control terminal 1 and control terminal 3
3. Verify the test lamp turns ON when pressing the appropriate lumbar switch in both directions.

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- **If the test lamp is always OFF**

1. Ignition OFF, remove the test lamp, disconnect the X2 harness connector at the S64P Seat Adjuster Switch - Passenger.
2. Test for infinite resistance between each 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 Ω in each control circuit 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 S64P Seat Adjuster Switch - Passenger.

- **If the test lamp turns ON during each command**

4. Test or replace the A14P Seat Lumbar Support Pump - Passenger.

Repair Instructions

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

- **Driver or Passenger Seat Adjuster Switch Replacement**
- **Front Seat Back Lumbar Replacement (4-Way Pneumatic)**

LUMBAR SUPPORT MALFUNCTION (WITH SEAT BOLSTER MEMORY CONTROL 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.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U1520 00, U1528 00	U1520 00	-	-
Linear Interconnect Network Bus 13	U1502 00, U1520 00, U1528 00	U1520 00	U1502 00, U1520 00, U1528 00	-
Seat Bolster Memory Control Module Ground	-	U1520 00	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Seat Lumbar/Bolster Pump Control Terminal 7	B392B 00	1	-	-
Seat Lumbar/Bolster Pump Control Terminal 8	1	1	1	-
Seat Lumbar/Bolster Pump Ground	-	1	-	-
1. The lumbar/bolster functions are inoperative				

Circuit/System Description

The seat adjuster switch on vehicles equipped with the seat memory lumbar/bolster feature is a LIN Bus device. When a seat function select switch, lumbar/bolster 4-way switch, or the massage switch is pressed, a serial data message is sent from the seat adjuster switch to the seat memory control module indicating the seat lumbar/bolster request. The seat memory control module then commands the seat bolster memory module, via LIN serial data messages, to perform the required pneumatic movements.

The seat bolster memory control module contains the electronic circuitry for executing the commanded pneumatic seat adjustments, air direction solenoids, pressure sensors for storing air bladder pressures, and outputs which supplies battery power and a low side drive pulse width modulated (PWM) signal to the external seat air pump motor when any of the air bladders require inflating.

Reference Information

Schematic Reference

- **Driver Seat Schematics**
- **Passenger Seat Schematics**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Lumbar Support Description and Operation (With Seat Bolster Memory Control Module)

Electrical Information Reference

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

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

Circuit/System Verification

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

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

   - **If no DTCs are set**
3. Verify the scan tool Seat Function Select Switch parameter changes between Inactive and UP or Down when operating the switch.
   - **If the parameter does not change**

     Test or replace the S64 Seat Adjuster Switch.

   - **If the parameter changes**
4. Verify the scan tool Seat 4-Way Switch parameter changes between Inactive and UP/Down or Forward/Rearward when operating the 4-way switch in the up/down and forward/rearward directions.
   - **If the parameter does not change**

     Test or replace the S64 Seat Adjuster Switch.

   - **If the parameter changes**
5. Verify the scan tool Seat Massage Switch parameter changes between Active and Inactive when pressing the seat massage switch.
   - **If the parameter does not change**

     Test or replace the S64 Seat Adjuster Switch.

   - **If the parameter changes**
6. Verify that all K134 Seat Bolster Memory Control Module functions operate when being controlled by the S64 Seat Adjuster Switch.
   - **If all K134 Seat Bolster Memory Control Module functions are inoperative**

     Refer to Circuit/System Testing.

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- **If any but not all of the K134 Seat Bolster Memory Control Module functions is inoperative**

1. Ignition ON.
2. Test the integrity of the air hoses and bladders for the inoperative lumbar/bolster function.
    - If a fault is found with the air hoses or bladders, repair or replace as needed.
    - If the air hoses and bladders test normal.
3. Replace the K134 Seat Bolster Memory Control Module.

- **If all K134 Seat Bolster Memory Control Module functions operate**

7. All OK.

Circuit/System Testing

1. Ignition OFF, all vehicle systems OFF, disconnect the harness connector at the appropriate K134 Seat Bolster Memory Control Module. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 4 and ground.
    - **If 10 Ω or greater**

    1. Ignition OFF.
    2. Test for less than 2 Ω in the ground circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, repair the open/high resistance in the ground connection.

    - **If less than 10 Ω**

3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminal 1 and ground.
    - **If the test lamp does not illuminate**

    1. Ignition OFF, remove the test lamp.
    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
    3. Test for less than 2 Ω in the B+ circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, verify the fuse is not open and there is voltage at the fuse.

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- **If the test lamp illuminates**

5. Ignition OFF, connect the harness connector at the K134 Seat Bolster Memory Control Module and disconnect the harness connector at the G31 Seat Lumbar/Bolster Pump.
6. Test for less than 10 Ω between the ground circuit terminal 2 and ground.
    - **If 10 Ω or greater**
    1. Ignition OFF.
    2. Test for less than 2 Ω in the ground circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, repair the open/high resistance in the ground connection.
    - **If less than 10 Ω**
7. Connect a test lamp between the control circuit terminal 1 and ground, ignition ON.
8. Verify the test lamp turns ON for approximately 1 min after pressing and holding the lumbar forward switch for 3 s.
    - **If the test lamp remains OFF**
    1. Ignition OFF, remove the test lamp, disconnect the harness connector at the K134 Seat Bolster Memory 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 Ω in the control circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, replace the K134 Seat Bolster Memory Control Module.
    - **If the test lamp turns ON**
9. Test for 6-9 kΩ between the control circuit terminal 3 and ground when pressing and holding the lumbar forward switch.
    - **If less than 6 kΩ**
    1. Ignition OFF, disconnect the harness connector at the K134 Seat Bolster Memory 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 K134 Seat Bolster Memory Control Module.
    - **If greater than 9 kΩ**
    1. Ignition OFF, disconnect the harness connector at the K134 Seat Bolster Memory Control Module, ignition ON.

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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 Ω in the control circuit end to end.
    - If 2 Ω or greater, repair the open/high resistance in the circuit.
    - If less than 2 Ω, replace the K134 Seat Bolster Memory Control Module.

- **If between 6-9 kΩ**

10. Test or replace the G31 Seat Lumbar/Bolster Pump.

Repair Instructions

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

- **Driver or Passenger Seat Adjuster Switch ReplacementDriver or Passenger Seat Adjuster Switch Replacement (22-Way Power)**
- **Front Seat Lumbar Support Bladder Pump Replacement (22-Way Power)**
- **Control Module References** for K134D Seat Bolster Memory Control Module - Driver and K134P Seat Bolster Memory Control Module - Passenger replacement, programming and setup

LUMBAR SUPPORT MALFUNCTION (2-WAY 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
Driver Seat Lumbar Forward Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59,	1	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
	B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59			
Driver Seat Lumbar Rearward Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59	1	-	-
Driver power Seat Lumbar Motor Forward Control	B3920 02	1	B3920 01	-
Driver Power Seat Lumbar Motor Rearward Control	B3920 02	1	B3920 01	-
1. The seat lumbar support is inoperative				

Circuit/System Description

The lumbar support horizontal motor is reversible. For example, when the lumbar switch is operated to move the lumbar support forward, the switch signal circuit from the seat memory control module is pulled low indicating the lumbar forward command. In response to this signal, the seat memory control module applies battery voltage through the lumbar motor forward control circuit and ground through the lumbar motor rearward control circuit to the motor. The motor runs to drive the lumbar support forward towards the occupants back until the switch is released. Moving the lumbar support rearward works similarly to moving the lumbar support forward, except that battery positive voltage and ground are applied on the opposite circuits causing the motor to run in the opposite direction.

Reference Information

Schematic Reference

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Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Lumbar Support Description and Operation (2-Way with Memory A45)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify that all power seat functions operate when being controlled by the S64D Seat Adjuster Switch - Driver.
    - **If any power seat function does not operate**

      Refer to **Power Seat Malfunction (With Memory A45)Power Seat Malfunction (With ULT)**.

    - **If all power seat functions operate**
3. Verify the scan tool Driver Seat Lumbar Horizontal Switch parameter changes between Inactive and Forward/Rearward when pressing the lumbar switch in both directions.
    - **If the parameter does not change**

      Refer to Circuit/System Testing - Lumbar Support Switch Circuit Test.

    - **If the parameter changes**

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4. Refer to Circuit/System Testing - Lumbar Horizontal Motor Circuit Test.

Circuit/System Testing

Lumbar Support Switch Circuit Test

1. Ignition OFF, disconnect the X2 harness connector at the S64D Seat Adjuster Switch - Driver.
2. Verify the scan tool Driver Seat Lumbar Horizontal Switch parameter is Inactive:
    - **If not Inactive**
    1. Ignition OFF, disconnect the X5 harness connector at the K40 Seat Memory Control Module.
    2. Test for Infinite resistance between the appropriate signal circuit terminal listed below and ground.
        - Lumbar forward switch signal terminal 2
        - Lumbar rearward switch signal terminal 6
        - If less than infinite resistance, repair the short to ground on the circuit.
        - If infinite resistance, replace the K40 Seat Memory Control Module.
    - **If Inactive**
3. Install a 3 A fused jumper wire between each signal circuit terminal listed below and ground, one at a time.
    - Lumbar forward switch signal terminal 2
    - Lumbar rearward switch signal terminal 6
4. Verify the scan tool Driver Seat Lumbar Horizontal Switch parameter is Froward or Rearward.
    - **If not Froward or Rearward**
    1. Ignition OFF, disconnect the X5 harness connector at the K40 Seat Memory Control Module, ignition ON.
    2. Test for less than 1 V between the signal circuit and ground.
        - If 1 V or greater, repair the short to voltage on the circuit.
        - If less than 1 V
    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 K40 Seat Memory Control Module.
    - **If Froward or Rearward**
5. Test or replace the S64D Seat Adjuster Switch - Driver.

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Lumbar Horizontal Motor Circuit Test

1. Ignition OFF, disconnect the harness connector at the M52D Seat Lumbar Support Horizontal Motor - Driver.
2. Connect a test lamp between control circuit terminal A and control circuit terminal B, ignition ON.

NOTE: **Once the lumbar motor is commanded On using the scan tool, the lumbar function may not work using the seat adjuster switch until you back out of the scan tool Control Functions menu.**

3. Verify the test lamp turns ON when commanding the Driver Seat Lumbar Support Horizontal Movement Forward and Rearward states with a scan tool.
   - **If the test lamp remains OFF during either of the commands**
   1. Ignition OFF, disconnect the X3 harness connector at the K40 Seat Memory Control Module.
   2. Test for infinite resistance between each 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 Ω in each control circuit end to end.
      - If 2 Ω or greater, repair the open/high resistance in the circuit.
      - If less than 2 Ω, replace the K40 Seat Memory Control Module.
   - **If the test lamp turns ON during each of the commands**
4. Test or replace the M52D Seat Lumbar Support Horizontal Motor - Driver.

Component Testing

Lumbar Support Switch

1. Ignition OFF, disconnect the X1 and X2 harness connector at the S64D Seat Adjuster Switch - Driver.
2. Test for infinite resistance between the ground terminal 6 X1 and each lumbar signal terminal with the switch in the open position.
   - **If less than infinite resistance**

     Replace the S64D Seat Adjuster Switch - Driver.

   - **If infinite resistance**
3. Test for less than 2 Ω between the ground terminal 6 X1 and each lumbar signal terminal with the appropriate switch in the closed position.

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- **If 2 Ω or greater**

  Replace the S64D Seat Adjuster Switch - Driver.

- **If less than 2 Ω**

4. All OK.

Lumbar Horizontal Motor

1. Ignition OFF, disconnect the harness connector at the M52D Seat Lumbar Support Horizontal Motor - Driver.

NOTE: **When performing the following tests, make sure that the lumbar support is not already in the position the test is attempting to produce.**

2. Install a 30 A fused jumper wire between control terminal A and 12 V.
3. Momentarily install a jumper wire between control terminal B and ground. The lumbar motor should momentarily perform the appropriate FORWARD/ REARWARD function.
   - **If the motor does not perform the FORWARD/ REARWARD function**

     Replace the M52D Seat Lumbar Support Horizontal Motor - Driver.

   - **If the motor performs the FORWARD/ REARWARD function**
4. Reverse the jumper wires; the motor should perform FORWARD/ REARWARD function.
   - **If the motor does not perform the FORWARD/ REARWARD function**

     Replace the M52D Seat Lumbar Support Horizontal Motor - Drive.

   - **If the motor performs the FORWARD/ REARWARD function**
5. All OK.

Repair Instructions

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

- **Driver or Passenger Seat Adjuster Switch Replacement**
- **Front Seat Back Lumbar Replacement (2-Way Power)**

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- **Control Module References** for K40 Seat Memory Control Module replacement, programming and setup

MEMORY SEAT FEATURE 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
Memory 1 Switch Signal	B2755 02	1	B2755 01	B2755 00 or 59
Memory Set Switch Signal	B2765 02 or 59	1	-	-
Low Reference	-	1	-	-
1. Memory recall is inoperative				

Circuit/System Description

Low reference is supplied to the driver seat memory switch from the seat memory control module. When a memory switch is pressed, the signal circuit from the seat memory control module is pulled low through the switch contacts and series of resistors indicating the memory recall request. In response to this signal, the seat memory control module commands the appropriate seat motors to move to the pre-recorded seat positions stored in memory.

Diagnostic Aids

The seat memory control module must be awake when measuring voltage from either one of the memory seat switch signal circuits. Voltage readings of 0.0 V or 5 V are possible if the module is not fully awake and result in misdiagnosing the circuit.

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

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COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Memory Seats Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify that all manual power seat functions operate when being controlled by the S64D Seat Adjuster Switch - Driver.
    - **If any manual power seat function does not operate**

      Refer to **Power Seat Malfunction (Without Memory A45)Power Seat Malfunction (With Memory A45)Power Seat Malfunction (With ULT)**

    - **If all manual power seat functions operate**
3. Refer to Circuit/System Testing.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the S47D Seat Memory Switch - Driver.
2. Test for less than 30 Ω between the low reference circuit terminal 1 and ground.
    - **If 30 Ω or greater**
    1. Ignition OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module.
    2. Test for less than 2 Ω in the low reference circuit end to end

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- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω, replace the K40 Seat Memory Control Module.

- **If less than 30 Ω**

3. Ignition ON, press a power seat switch in order to wake up the K40 Seat Memory Control Module.
4. Test for 9 V or greater between each signal circuit terminal listed below and ground:
   - Memory set switch signal terminal 5
   - Memory switch signal terminal 6
   - **If less than 9 V**
   1. Ignition OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module.
   2. Test for infinite resistance between the signal circuit and ground.
      - If less than infinite resistance, repair the short to ground on the circuit.
      - If infinite resistance
   3. Test for less than 2 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 K40 Seat Memory Control Module.
   - **If 9 V or greater**
5. Ignition OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module, ignition ON.
6. Test for less than 1 V between each signal circuit terminal listed below and ground:
   - Memory set switch signal terminal 5
   - Memory switch signal terminal 6
   - **If 1 V or greater**

     Repair the short to voltage on the circuit.

   - **If less than 1 V**
7. Test or replace the S47D Seat Memory Switch - Driver.

Component Testing

Driver Seat Memory Switch

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1. Ignition OFF, disconnect the harness connector at the S47D Seat Memory Switch - Driver.
2. Test for infinite resistance between each signal terminal listed below and the low reference terminal 1 with the switch in the open position.
    - Terminal 5
    - Terminal 6
    - **If less than infinite resistance**

      Replace the S47D Seat Memory Switch - Driver.

    - **If infinite resistance**
3. Test for less than 4 Ω between the signal terminal 5 and the low reference terminal 1 while pressing the memory SET button.
    - **If 4 Ω or greater**

      Replace the S47D Seat Memory Switch - Driver.

    - **If less than 4 Ω**
4. Test for 573-701 Ω between the signal terminal 6 and the low reference terminal 1 while pressing the memory 1 button.
    - **If not between 573-701 Ω**

      Replace the S47D Seat Memory Switch - Driver.

    - **If between 573-701 Ω**
5. Test for 1800-2201 Ω between the signal terminal 6 and the low reference terminal 1 while pressing the memory 2 button.
    - **If not between 1800-2201 Ω**

      Replace the S47D Seat Memory Switch - Driver.

    - **If between 1800-2201 Ω**
6. Test for 5.52k-6.73 kΩ between the signal terminal 6 and the low reference terminal 1 while pressing the Exit button.
    - **If not between 5.52k-6.73 kΩ**

      Replace the S47D Seat Memory Switch - Driver.

    - **If between 5.52k-6.73 kΩ**
7. All OK.

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Repair Instructions

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

- **Front Seat Adjuster Memory Switch Replacement (Cadillac)Front Seat Adjuster Memory Switch Replacement (Chevrolet / GMC)**
- **Control Module References** for K40 Seat Memory Control Module replacement, programming and setup

POWER SEAT ADJUSTER MECHANICAL DIAGNOSIS

Condition	Possible Cause	Correction
Horizontal Operation of Seat Not Smooth but Jerky-Apparent Hard Operation	The adjuster horizontal actuator is damaged.	Replace the adjuster assembly.
Horizontal Chuck or Looseness	• The horizontal actuator is improperly adjusted to the rack. • The top plate subassembly is loose.	• Replace the adjuster assembly. • Replace the adjuster assembly.
One Adjuster Will Not Operate Horizontally	• The horizontal drive cable is disconnected or damaged. • The horizontal actuator is inoperative.	• Inspect the drive cables, they must be stright to be engaged. Replace if damaged. • Replace the adjuster assembly.
One Adjuster Will not Operate Vertically	• The vertical drive cable is disconnected or damaged. • The vertical actuator subassembly is inoperative.	• Inspect the vertical drive cables, replace if damaged. • Replace the adjuster assembly.
Both Adjusters Will Not Operate Horizontally and/or Vertically	• The motor is damaged or inoperative. • The wiring harness is damaged.	• Replace the adjuster assembly • Replace the wiring harness.
Vertical Chuck or Looseness	The vertical actuator is inoperative.	Replace the adjuster assembly.

POWER FOLDING SEAT MALFUNCTION (3RD ROW)

Diagnostic Instructions

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- 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
Folding Seat Control Module - 3rd Row B+	1	1	-	-
Folding Seat Switch - 3rd Row B+	B0005 02, 1	1	-	-
Left 3rd Row Seat Fold Switch Signal	B0005 02, 1	2	-	-
Left 3rd Row Seat Unfold Switch Signal	B0005 02, 1	2	-	-
Left 3rd Row Seat Position Sensor Signal	2	2	-	-
Left 3rd Row Seat Position Sensor Low Reference	-	2	-	-
Left 3rd Row Folding Seat Motor Fold Control	2	2	-	-
Left 3rd Row Folding Seat Motor Unfold Control	2	2	-	-
Left 3rd Row Folding Seat Actuator Retract Control	2	2	-	-
Left 3rd Row Folding Seat Actuator Release Control	2	2	-	-
Right 3rd Row Seat Fold Switch Signal	B0005 02, 1	3	-	-
Right 3rd Row Seat Unfold Switch Signal	B0005 02, 1	3	-	-
Right 3rd Row Seat Position Sensor Signal	3	3	-	-
Right 3rd Row Seat Position Sensor Low Reference	-	3	-	-
Right 3rd Row Folding Seat Motor Fold Control	3	3	-	-
Right 3rd Row Folding Seat Motor Unfold Control	3	3	-	-
Right 3rd Row Folding Seat Actuator Retract Control	3	3	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Right 3rd Row Folding Seat Actuator Release Control	3	3	-	-
Folding Seat Control Module - 3rd Row Ground	-	1	-	-
1. Both 3rd row folding seats are inoperative 2. The left 3rd row folding seat is inoperative 3. The right 3rd row folding seat is inoperative				

Circuit/System Description

The power folding third row seat system consists of folding seat switches, a control module, a seat back release actuator, a hall-effect position sensor, and the folding seat motor.

The third row folding seat switches are located on the D-pillar. Voltage to the switches is supplied through the park enable relay while in a de-energized state. The park enable relay is controlled by the body control module (BCM) through a high side drive control circuit and will be de-energized whenever the ignition is in the accessory or run positions and the transmission is in park. Battery voltage is supplied to the folding seat control module through a 30 A fuse located in the rear body fuse block. When a folding seat switch is pressed, battery voltage is applied through the switch contacts and the signal circuit to the folding seat control module indicating the folding seat request. In response to this signal, the module applies a PWM voltage through the seat back release actuator control circuit energizing the actuator. With the actuator energized and the seat back released, the control module applies battery voltage and ground through the folding seat motor control circuits to the motor. The motor runs to either move the seat back cushion to the folded or unfolded seat position. The control module supplies the hall-effect sensor with a low reference and a signal circuit. The module monitors the voltage from the signal circuit in order to detect a seat stall condition. If the module does not detect seat movement within 400ms, it will cease folding seat operation.

Reference Information

Schematic Reference

Rear Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Power Seats System Description and Operation (Front Seats)Power Seats System Description and Operation (2nd Row Seats)Power Seats

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System Description and Operation (3rd Row Seats)Power Seats System Description and Operation (Passenger Seat with Seat Bolster Memory Control Module)

Electrical Information Reference

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

Circuit/System Verification

1. Ignition ON.
2. Verify that DTC B0005 is not set.
   - **If the DTC is set**

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

   - **If the DTC is not set**
3. Transmission in P.
4. Verify the left and right 3rd row folding seats operate when pressing the appropriate folding seat switch.
   - **If both folding seats are inoperative**

     Refer Circuit/System Testing - Both 3rd row Folding Seats are Inoperative

   - **If one folding seat operates but not both**

     Refer Circuit/System Testing - Folding Seat Motor Circuit Test

   - **If both rear folding seats operate**
5. All OK.

Circuit/System Testing

Both 3rd row Folding Seats are Inoperative

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1. Ignition OFF, transmission in park, disconnect the harness connector at the S144B Folding Seat Control Switch - Rear Compartment 3rd Row, ignition ON.
2. Verify a test lamp illuminates between the B+ circuit terminal 1 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 Ω in the B+ circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, refer to **Power Mode Mismatch (With BTM)** **Power Mode Mismatch (Without BTM)** .
    - **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 B+ circuit and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.
        - If infinite resistance, replace the K169 Folding Seat Control Module - 3rd Row.
    - **If the test lamp illuminates**
3. Ignition OFF, all vehicle systems OFF, disconnect the X1 harness connector at the K169 Folding Seat Control Module - 3rd Row. It may take up to 2 min for all vehicle systems to power down.
4. Test for less than 10 Ω between the ground circuit terminal 10 and ground.
    - **If 10 Ω or greater**
    1. Ignition OFF.
    2. Test for less than 2 Ω in the ground circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, repair the open/high resistance in the ground connection.
    - **If less than 10**
5. Ignition OFF, disconnect the X2 harness connector at the K169 Folding Seat Control Module - 3rd Row, ignition ON.
6. Verify a test lamp illuminates between the B+ circuit terminal 7 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 Ω in the B+ circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.

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- If less than 2 Ω, verify the circuit 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 B+ circuit and ground.
    - If less than infinite resistance, repair the short to ground on the circuit.
    - If infinite resistance, replace the K169 Folding Seat Control Module - 3rd Row.

- **If the test lamp illuminates**

7. Replace the K169 Folding Seat Control Module - 3rd Row.

Folding Seat Motor Circuit Test

1. Ignition OFF, disconnect the X2 harness connector at the K169 Folding Seat Control Module - 3rd Row.
2. Connect a test lamp between each signal circuit terminal listed below and ground, one at a time, ignition ON.
    - Terminal 4 - left seat fold
    - Terminal 3 - left seat unfold
    - Terminal 2 - right seat fold
    - Terminal 1 - right seat unfold
3. Verify the test lamp turns ON and OFF when pressing and releasing the appropriate S144B Folding Seat Control Switch - Rear Compartment 3rd Row.
    - **If the test lamp does not turn ON**

    1. Ignition OFF, remove the test lamp, disconnect the appropriate harness connector listed below at the S144B Folding Seat Control Switch - Rear Compartment 3rd Row.
    2. Test for infinite resistance between the signal circuit and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.
        - If infinite resistance
    3. Test for less than 2 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, test or replace the S144B Folding Seat Control Switch - Rear Compartment 3rd Row.

    - **If the test lamp remains ON**

    1. Ignition OFF, remove the test lamp, disconnect the appropriate harness connector listed below at the S144B Folding Seat Control Switch

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- Rear Compartment 3rd Row, ignition ON.

2. Test for less than 1 V between the signal circuit and ground.
    - If 1 V or greater, repair the short to voltage on the circuit.
    - If less than 1 V, test or replace the S144B Folding Seat Control Switch - Rear Compartment 3rd Row.

- **If the test lamp turns ON and OFF**

4. Ignition OFF, connect the harness connector at the S144B Folding Seat Control Switch - Rear Compartment 3rd Row and disconnect the harness connector at the appropriate M109 Folding Seat Back Unlatch Motor - 3rd Row.
5. Connect a test lamp between control circuit terminal 1 and control circuit terminal 2, ignition ON.
6. Verify the test lamp turns ON when commanding the folding seat UP and Down using the S144B Folding Seat Control Switch - Rear Compartment 3rd Row.
    - **If the test lamp does not turn ON during either of the commands**

1. Ignition OFF, remove the test lamp, disconnect the appropriate harness connector listed below at the K169 Folding Seat Control Module - 3rd Row.
    - X1 - right 3rd row folding seat
    - X2 - left 3rd row folding seat
2. Test for infinite resistance between the appropriate control circuits listed below and ground.
    - Right 3rd row folding seat unlatch motor terminal 1 X1 and terminal 2 X1
    - Right 3rd row folding seat motor terminal 7 X1 and terminal 8 X1
    - Left 3rd row folding seat unlatch motor terminal 5 X2 and terminal 6 X2
    - Left 3rd row folding seat terminal 9 X2 and terminal 10 X2
    - 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 appropriate control circuits listed below and ground.
    - Right 3rd row folding seat unlatch motor terminal 1 X1 and terminal 2 X1
    - Right 3rd row folding seat motor terminal 7 X1 and terminal 8 X1
    - Left 3rd row folding seat unlatch motor terminal 5 X2 and terminal 6 X2
    - Left 3rd row folding seat terminal 9 X2 and terminal 10 X2
    - If greater than 1 V, repair the short to ground on the circuit.

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- If less than 1 V

5. Test for less than 2 Ω in the M109 Folding Seat Back Unlatch Motor control circuit terminals listed below end to end.
   - Terminal 1
   - Terminal 2
   - If 2 Ω or greater, repair the open/high resistance in the circuit.
   - If less than 2 Ω, replace the K169 Folding Seat Control Module - 3rd Row.

- **If the test lamp turns ON during each of the commands**

7. Ignition OFF, connect the harness connector at the M109 Folding Seat Back Unlatch Motor - 3rd Row, ignition ON.
8. Verify the M109 Folding Seat Back Unlatch Motor - 3rd Row activates when commanding the folding seat UP and Down using the S144B Folding Seat Control Switch - Rear Compartment 3rd Row.
   - **If the M109 Folding Seat Back Unlatch Motor - 3rd Row does not activate**

     Test or replace the M109 Folding Seat Back Unlatch Motor - 3rd Row.

   - **If the M109 Folding Seat Back Unlatch Motor - 3rd Row activates**
9. Ignition OFF, disconnect the harness connector at the M108 Folding Seat Motor - 3rd Row.
10. Test for less than 10 Ω between the low reference circuit terminal 4 and ground.
    - **If 10 Ω or greater**
    1. Ignition OFF, disconnect the X1 harness connector at the K169 Folding Seat Control Module - 3rd Row.
    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, K169 Folding Seat Control Module - 3rd Row.
    - **If less than 10**
11. Connect a test lamp between the signal terminal 2 and ground, ignition ON.
12. Verify the test lamp turns ON at a low intensity for approximately 30 s after pressing the S144B Folding Seat Control Switch - Rear Compartment 3rd Row.
    - **If the test lamp remains OFF**
    1. Ignition OFF, remove the test lamp, disconnect the X1 harness connector at the K169 Folding Seat Control Module - 3rd Row.
    2. Test for infinite resistance between the signal circuit and ground.
       - If less than infinite resistance, repair the short to ground on the circuit.

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- If infinite resistance

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 K169 Folding Seat Control Module - 3rd Row.

- **If the test lamp is always ON**

1. Ignition OFF, remove the test lamp, disconnect the X1 harness connector at the K169 Folding Seat Control Module - 3rd Row, ignition ON.
2. Test for less than 1 V between the signal circuit and ground.
    - If 1 V or greater, repair the short to ground on the circuit.
    - If less than 1 V, replace the K169 Folding Seat Control Module - 3rd Row.

- **If the test lamp turns ON and OFF**

13. Connect a test lamp between control circuit terminal 1 and control circuit terminal 3.

NOTE: **When performing this procedure the test lamp may blink once when pressing the switch then two more time after releasing the switch. This is normal circuit operation with the motor disconnected.**

14. Verify the test lamp momentarily turns ON when pressing the S144B Folding Seat Control Switch - Rear Compartment 3rd Row in both directions.

- **If the test lamp remains OFF during either of the commands**

1. Ignition OFF, remove the test lamp, disconnect the appropriate harness connector listed below at the K169 Folding Seat Control Module - 3rd Row.
    - X1 - right 3rd row folding seat
    - X2 - left 3rd row folding seat
2. Test for infinite resistance between each 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 Ω in each control circuit end to end.
    - If 2 Ω or greater, repair the open/high resistance in the circuit.
    - If less than 2 Ω, replace the K169 Folding Seat Control Module - 3rd Row.

- **If the test lamp turns ON**

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15. Test or replace the M108 Folding Seat Motor - 3rd Row.

Repair Instructions

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

- **3rd Row Seat Folding Switch Replacement**
- **3rd Row Seat Back Pivot Actuator Motor Replacement - Back Cushion**
- **Control Module References** for K169 Folding Seat Control Module - 3rd Row replacement, programming and setup

POWER FOLDING SEAT MALFUNCTION (2ND ROW)

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
Folding Seat Switch B+	B0005 02, 1	2, 3	-	-
Left Folding Seat Motor B+	1	2	-	-
Left Rear Seat Fold Tumble Control	1	2	-	-
Left 2nd Row Folding Seat Motor Ground	-	2	-	-
Right Folding Seat Motor B+	1	3	-	-
Right Rear Seat Fold Tumble Control	1	3	-	-
Right 2nd Row Folding Seat Motor Ground	-	3	-	-
1. Both folding seats are inoperative 2. The left 2nd row folding seat is inoperative 3. The right 2nd row folding seat is inoperative				

Circuit/System Description

The folding 2nd row seats are operated from the folding seat switches located on the driver side rear panel and on the trim panel in the rear cargo area. Battery voltage is supplied at all times to the folding seat switches through the park enable relay while in a de-energized state. Battery voltage is

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also supplied at all times to the folding seat motors through a 20 A fuse located in the rear body fuse block. When a folding seat switch is pressed, battery voltage is applied through the switch contacts and the control circuit to the folding seat motor. The motor runs to move the seat back to the folded position.

Reference Information

Schematic Reference

Rear Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Power Seats System Description and Operation (2nd Row Seats)

Electrical Information Reference

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

Circuit/System Verification

1. Ignition ON.
2. Verify that DTC B0005 is not set.
    - **If the DTC is set**

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

    - **If the DTC is not set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

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1. Ignition OFF, transmission in P, disconnect the harness connector at the appropriate folding seat control switch listed below, ignition ON.
    - S144A Folding Seat Control Switch - Rear Compartment 2nd Row
    - S143L Folding Seat Control Switch - 2nd Row Left
    - S143R Folding Seat Control Switch - 2nd Row Right
2. Verify a test lamp illuminates between the appropriate B+ circuit terminal listed below and ground:
    - S144A Folding Seat Control Switch - Rear Compartment 2nd Row terminal 2
    - S143L Folding Seat Control Switch - 2nd Row Left terminal C
    - S143R Folding Seat Control Switch - 2nd Row Right terminal C
    - **If the test lamp does not illuminate**
    1. Ignition OFF, remove the test lamp.
    2. Test for less than 2 Ω in the B+ circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, refer to **Power Mode Mismatch (With BTM)** **Power Mode Mismatch (Without BTM)** .
    - **If the test lamp illuminates**
3. Ignition OFF, all vehicle systems OFF, connect the harness connector at the Folding Seat Control Switch - 2nd Row and disconnect the harness connector at the M107 Folding Seat Motor - 2nd Row. It may take up to 2 min for all vehicle systems to power down.
4. Test for less than 10 Ω between the ground circuit terminal B and ground.
    - **If 10 Ω or greater**
    1. Ignition OFF.
    2. Test for less than 2 Ω in the ground circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, repair the open/high resistance in the ground connection.
    - **If less than 10**
5. Ignition ON.
6. Verify a test lamp illuminates between the B+ circuit terminal A 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 Ω in the B+ circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.

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- If less than 2 Ω, verify the circuit 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 B+ circuit and ground.
    - If less than infinite resistance, repair the short to ground on the circuit.
    - If infinite resistance, test or replace the M107 Folding Seat Motor - 2nd Row.

- **If the test lamp illuminates**

7. Connect a test lamp between the control circuit terminal C and ground, ignition ON.
8. Verify a test lamp turns ON and OFF when pressing and releasing the Folding Seat Control Switch - 2nd Row.

- **If the test lamp is always OFF**

1. Ignition OFF, remove the test lamp, disconnect the harness connector at the Folding Seat Control Switch - 2nd Row.
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 Ω in the control circuit 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 Folding Seat Control Switch - 2nd Row.

- **If the test lamp is always ON**

1. Ignition OFF, remove the test lamp, disconnect the harness connector at the Folding Seat Control Switch - 2nd Row, 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, test or replace the Folding Seat Control Switch - 2nd Row.

- **If the test lamp turns ON and OFF**

9. Test or replace the M107 Folding Seat Motor - 2nd Row.

Repair Instructions

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

- **Rear Seat Recliner Actuator Replacement (with Bucket)Rear Seat Recliner Actuator Replacement (with Split Bench)**

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- **Rear Seat Recliner Switch Replacement**

POWER 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
B+	1	1	-	-
Front Vertical Motor Down Control	1	1	-	-
Front Vertical Motor Up Control	1	1	-	-
Horizontal Motor Forward Control	1	1	-	-
Horizontal Motor Rearward Control	1	1	-	-
Rear Vertical Motor Down Control	1	1	-	-
Rear Vertical Motor Up Control	1	1	-	-
Recline Motor Forward Control	1	1	-	-
Recline Motor Rearward Control	1	1	-	-
Ground	-	1	-	-
1. Power seat inoperative				

Circuit/System Description

The driver seat without memory and the passenger seat are completely controlled through their respective seat adjuster switches. Battery voltage is supplied at all times to the seat adjuster switch through a circuit breaker located in the instrument panel fuse block. When the seat switches are in an inactive state, the switch contacts are closed to the switch ground circuit.

All seat motors are reversible. For example, when the seat horizontal forward switch is pressed to move the entire seat forward, battery voltage is applied through the switch contacts and the seat horizontal motor forward control circuit to the motor. With the horizontal motor rearward switch contacts closed to the switch ground circuit, the motor runs in order to drive the entire seat forward until the switch is released. Moving the entire seat rearward works similarly to moving the entire seat forward, except that battery voltage and ground are applied on opposite circuits causing the motor

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to run in the opposite direction. All seat motors are powered this way.

Reference Information

Schematic Reference

- **Driver Seat Schematics**
- **Passenger Seat Schematics**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Power Seats System Description and Operation (Front Seats)Power Seats System Description and Operation (2nd Row Seats)Power Seats System Description and Operation (3rd Row Seats)Power Seats System Description and Operation (Passenger Seat with Seat Bolster Memory Control Module)

Electrical Information Reference

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

Circuit/System Verification

1. Verify the appropriate driver or passenger seat directional motors listed below operate while operating the seat switches in both directions.
   - M51 Seat Horizontal Motor
   - M50 Seat Front Vertical Motor
   - M55 Seat Rear Vertical Motor
   - M56 Seat Recline Motor
   - **If all seat motors do not operate**

     Refer to Circuit/System Testing - Seat Adjuster Switch Circuit Test.

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- **If 1 or more seat motors operate but not all**

  Refer to Circuit/System Testing - Seat Motor Circuit Test.

- **If all seat motors operate**

2. All OK.

Circuit/System Testing

Seat Adjuster Switch Circuit Test

1. Ignition OFF, disconnect the harness connector at the appropriate S64 Seat Adjuster Switch.
2. Test for less than 10 Ω between the appropriate ground circuit terminal listed below and ground.
   - Driver seat terminal 2
   - Passenger seat terminal 5
   - **If 10 Ω or greater**
   1. Ignition OFF.
   2. Test for less than 2 Ω in the ground circuit end to end.
      - If 2 Ω or greater, repair the open/high resistance in the circuit.
      - If less than 2 Ω, repair the open/high resistance in the ground connection.
   - **If less than 10 Ω**
3. Ignition ON.
4. Verify a test lamp illuminates between the appropriate B+ circuit terminal listed below and ground.
   - Driver seat terminal 6
   - Passenger seat terminal 10
   - **If the test lamp does not illuminate**
   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
   3. Test for less than 2 Ω in the B+ circuit end to end.

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- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω, verify the circuit breaker is not open and there is voltage at the circuit breaker.

- **If the test lamp illuminates**

5. Test or replace the S64 Seat Adjuster Switch.

Seat Motor Circuit Test

1. Ignition OFF, disconnect the harness connector at the appropriate seat motor listed below:
   - M50 Seat Front Vertical Motor
   - M55 Seat Rear Vertical Motor
   - M51 Seat Horizontal Motor
   - M56 Seat Recline Motor
2. Connect a test lamp between control circuit terminal 1 and control circuit terminal 3, ignition ON.
3. Verify the test lamp illuminates when commanding the seat motor Up and Down or Forward and Rearward using the seat adjuster switch.
   - **If the test lamp does not illuminate during either of the commands**
   1. Ignition OFF, disconnect the harness connector at the S64 Seat Adjuster Switch.
   2. Test for infinite resistance between each 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 Ω in each control circuit 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 S64 Seat Adjuster Switch
   - **If the test lamp illuminates during each of the commands**
4. Test or replace the seat motor.

Component Testing

Seat Adjuster Switch Test

1. Ignition OFF, disconnect the harness connector at the S64 Seat Adjuster Switch.
2. Test for infinite resistance between the B+ terminal and each control terminal with the switch in the open position.

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- **If less than infinite resistance**

  Replace the S64 Seat Adjuster Switch.

- **If infinite resistance**

3. Test for less than 2 Ω between the B+ terminal and each control terminal with the appropriate switch in the closed position.
   - **If 2 Ω or greater**

     Replace the S64 Seat Adjuster Switch.

   - **If less than 2 Ω**
4. Test for less than 2 Ω between the ground terminal and each control terminal with the switch in the open position.
   - **If 2 Ω or greater**

     Replace the S64 Seat Adjuster Switch.

   - **If less than 2 Ω**
5. All OK.

Seat Motor

1. Ignition OFF, disconnect the harness connector at the appropriate seat motor listed below:
   - M50 Seat Front Vertical Motor
   - M55 Seat Rear Vertical Motor
   - M51 Seat Horizontal Motor
   - M56 Seat Recline Motor

NOTE: **When performing the following tests, make sure that the seat is not already in the position the test is attempting to produce.**

2. Install a 30 A fused jumper wire between control terminal 1 and 12 V.
3. Momentarily install a jumper wire between control terminal 3 and ground. The seat motor should momentarily perform the appropriate FORWARD/ REARWARD/ UP/ DOWN function.
   - **If the motor does not perform the FORWARD/ REARWARD/ UP/ DOWN function**

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Replace the motor.

- **If the motor performs the FORWARD/ REARWARD/ UP/ DOWN function**

4. Reverse the jumper wires; the motor should perform FORWARD/ REARWARD/ UP/ DOWN function.
   - **If the motor does not perform the FORWARD/ REARWARD/ UP/ DOWN function**

     Replace the motor.

   - **If the motor performs the FORWARD/ REARWARD/ UP/ DOWN function**
5. All OK.

Repair Instructions

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

- **Driver or Passenger Seat Adjuster Switch ReplacementDriver or Passenger Seat Adjuster Switch Replacement (22-Way Power)**
- **Front Seat Tilt Adjuster Actuator Replacement**
- **Driver or Passenger Seat Vertical Adjuster Actuator Replacement**
- **Driver or Passenger Seat Cushion Frame Replacement (Except Passenger Side with 6-way Power)** **Driver or Passenger Seat Cushion Frame Replacement (Passenger Side with 6-way Power)**
- **Driver or Passenger Seat Recliner Actuator ReplacementDriver or Passenger Seat Recliner Actuator Replacement (22-Way Power)**

POWER 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 1 X1	1, 2	1, 2	-	-
Seat Memory Control Module B+ Terminal 2 X1	1, 3	1, 3	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Front Vertical Up Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	1	-	-
Front Vertical Down Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	1	-	-
Rear Vertical Up Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59,	1	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
	B1835 02 or 59, B1840 02 or 59, B1845 02 or 59			
Rear Vertical Down Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	1	-	-
Horizontal Forward Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	1	-	-
Horizontal Rearward Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59,	1	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
	B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59			
Recline Forward Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	1	-	-
Recline Rearward Switch Signal	B1735 02 or 59, B1740 02 or 59, B1745 02 or 59, B1750 02 or 59, B1755 02 or 59, B1760 02 or 59, B1815 02 or 59, B1820 02 or 59, B1830 02 or 59, B1835 02 or 59, B1840 02 or 59, B1845 02 or 59	1	-	-
Driver Seat Front Vertical Motor Down Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Seat Front Vertical Motor Up Control	B3920 02	1	B3920 01	B3920 00, B3920 0B

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Driver Seat Horizontal Motor Forward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Seat Horizontal Motor Rearward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Seat Rear Vertical Motor Down Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Seat Rear Vertical Motor Up Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Seat Recline Motor Forward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Seat Recline Motor Rearward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Ground	-	U0208 00, 2	-	-
1. Power seat and memory functions inoperative 2. Scan Tool Does Not Communicate with Low Speed GMLAN Device 3. Lumbar support is inoperative				

Circuit/System Description

Battery voltage is supplied at all times to the seat memory control module through a fuse located in the underhood fuse block. This voltage is used by the module for logic power. Battery positive voltage is also supplied at all times to the seat memory control module through a circuit breaker located in the instrument panel fuse block. This voltage is connected to a power rail internal to the seat memory control module and is used to drive the power seat motors. Each seat motor is controlled by the seat memory control module by applying power and ground through the control circuits to the motor.

All motors are reversible. For example, when the seat switch is operated to move the entire seat forward, the switch signal circuit from the seat memory control module is pulled low indicating the entire seat forward command. In response to this signal, the seat memory control module applies battery voltage through the driver seat horizontal motor forward control circuit and ground through the driver seat horizontal motor rearward control circuit to the motor. The motor runs to drive the entire seat forward until the switch is released. Moving the entire seat rearward works similarly to moving the entire seat forward, except that battery positive voltage and ground are applied on the opposite circuits causing the motor to run in the opposite direction.

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

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COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Memory Seats Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool seat switch parameters listed below change between Inactive and Forward/Rearward or Up/Down when pressing the appropriate switch.
    - Driver Seat Horizontal Switch
    - Driver Seat Cushion Front Vertical Switch
    - Driver Seat Cushion Rear Vertical Switch
    - Driver Seat Back Switch
    - **If the parameter does not change**

      Refer to Circuit/System Testing - Driver Seat Adjuster Switch Circuit Test

    - **If the parameter changes**
3. Verify the seat directional motors listed below operate while operating the appropriate seat switches in both directions.
    - M50D Seat Front Vertical Motor - Driver
    - M55D Seat Rear Vertical Motor - Driver

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- M51D Seat Horizontal Motor - Driver
- M56D Seat Recline Motor - Driver
- **If any seat motor does not operate**

  Refer to Circuit/System Testing - Seat Motor Control Circuit Test.

- **If all seat motors operate**

4. All OK.

Circuit/System Testing

Driver Seat Adjuster Switch Circuit Test

1. Ignition OFF and all vehicle systems OFF, disconnect the X1 harness connector at the S64D Seat Adjuster Switch - Driver. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 6 and ground.
   - **If 10 Ω or greater**
   1. Ignition Off.
   2. Test for less than 2 Ω in the ground circuit end to end.
      - If 2 Ω or greater, repair the open/high resistance in the circuit.
      - If less than 2 Ω, repair the open/high resistance in the ground connection.
   - **If less than 10 Ω**
3. Install a 3 A fused jumper wire between the ground circuit terminal 6 and the appropriate signal circuit terminal listed below, ignition ON.
   - Front vertical up switch terminal 1
   - Front vertical down switch terminal 5
   - Rear vertical up switch terminal 8
   - Rear vertical down switch terminal 10
   - Horizontal forward switch terminal 3
   - Horizontal rearward switch terminal 7
   - Recline forward switch terminal 4
   - Recline rearward switch terminal 9
4. Verify the appropriate scan tool seat switch parameter is Forward/Rearward or UP/Down.

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- **If not Forward/Rearward or UP/Down**

1. Ignition OFF, disconnect the X5 harness connector at the K40 Seat Memory Control Module, ignition ON.
2. Test for less than 1 V between the signal circuit and ground.
    - If 1 V or greater, repair the short to voltage on the circuit.
    - If less than 1 V
3. Ignition OFF.
4. 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 K40 Seat Memory Control Module.

- **If Forward/Rearward or UP/Down**

5. Test or replace the S64D Seat Adjuster Switch - Driver.

Seat Motor Control Circuit Test

1. Ignition OFF, disconnect the X2 harness connector at the K40 Seat Memory Control Module.
2. Test for less than 10 Ω between ground circuit terminal 5 and ground.
    - **If 10 Ω or greater**

    1. Ignition OFF.
    2. Test for less than 2 Ω in the ground circuit end to end.

    - If 2 Ω or greater, repair the open/high resistance in the circuit.
    - If less than 2 Ω, repair the open/high resistance in the ground connection.
    - **If less than 10 Ω**

3. Ignition OFF, disconnect the X1 harness connector at the K40 Seat Memory Control Module, ignition ON.
4. Verify that a test lamp illuminates between each B+ circuit terminal listed below and ground:
    - Terminal 1
    - Terminal 2
    - **If the test lamp does not illuminate and the circuit fuse is good.**

    1. Ignition OFF.
    2. Test for less than 2 Ω in the B+ circuit end to end.

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

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- If less than 2 Ω, verify the circuit breaker is OK and there is voltage at the circuit breaker.

- **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 K40 Seat Memory Control Module.

- **If the test lamp illuminates.**

5. Ignition OFF, connect the X1 harness connector at the K40 Seat Memory Control Module and disconnect the harness connector at the appropriate seat motor listed below:
    - M50D Seat Front Vertical Motor - Driver
    - M55D Seat Rear Vertical Motor - Driver
    - M51D Seat Horizontal Motor - Driver
    - M56D Seat Recline Motor - Driver
6. Connect a test lamp between control circuit terminal 1 and control circuit terminal 3, ignition ON.

NOTE: **Once a seat motor is commanded On using the scan tool, the seat function may not work using the seat adjuster switch until you back out of the scan tool Control Functions menu.**

7. Verify the test lamp turns ON when commanding the seat motor in the Up/Down or Forward/Rearward states with a scan tool.
    - **If the test lamp remains OFF during either of the commands**

    1. Ignition OFF, disconnect the X3 harness connector at the K40 Seat Memory Control Module.
    2. Test for infinite resistance between each 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 Ω in each control circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, replace the K40 Seat Memory Control Module.

    - **If the test lamp turns ON during each of the commands**

8. Test or replace the seat motor.

Component Testing

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Seat Adjuster Switch Test

1. Ignition OFF, disconnect the X1 and X2 harness connectors at the S64D Seat Adjuster Switch - Driver.
2. Test for infinite resistance between the ground terminal 6 and each signal terminal with the switch in the open position.
   - **If less than infinite resistance**

     Replace the S64D Seat Adjuster Switch - Driver.

   - **If infinite resistance**
3. Test for less than 2 Ω between the ground terminal 6 and each signal terminal with the appropriate switch in the closed position.
   - **If 2 Ω or greater**

     Replace the S64D Seat Adjuster Switch - Driver.

   - **If less than 2 Ω**
4. All OK.

Seat Motor

1. Ignition OFF, disconnect the harness connector at the appropriate seat motor listed below:
   - M50D Seat Front Vertical Motor - Driver
   - M55D Seat Rear Vertical Motor - Driver
   - M51D Seat Horizontal Motor - Driver
   - M56D Seat Recline Motor - Driver

   NOTE: **When performing the following tests, make sure that the seat is not already in the position the test is attempting to produce.**

2. Install a 30 A fused jumper wire between control terminal 1 and 12 V.
3. Momentarily install a jumper wire between control terminal 3 and ground. The seat motor should momentarily perform the appropriate FORWARD/ REARWARD/ UP/ DOWN function.
   - **If the motor does not perform the FORWARD/ REARWARD/ UP/ DOWN function**

     Replace the seat motor.

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- **If the motor performs the FORWARD/ REARWARD/ UP/ DOWN function**

4. Reverse the jumper wires; the motor should perform FORWARD/ REARWARD/ UP/ DOWN function.
   - **If the motor does not perform the FORWARD/ REARWARD/ UP/ DOWN function**

     Replace the seat motor.

   - **If the motor performs the FORWARD/ REARWARD/ UP/ DOWN function**
5. All OK.

Repair Instructions

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

- **Driver or Passenger Seat Adjuster Switch ReplacementDriver or Passenger Seat Adjuster Switch Replacement (22-Way Power)**
- **Front Seat Tilt Adjuster Actuator Replacement**
- **Driver or Passenger Seat Vertical Adjuster Actuator Replacement**
- **Driver or Passenger Seat Cushion Frame Replacement (Except Passenger Side with 6-way Power)** **Driver or Passenger Seat Cushion Frame Replacement (Passenger Side with 6-way Power)**
- **Driver or Passenger Seat Recliner Actuator ReplacementDriver or Passenger Seat Recliner Actuator Replacement (22-Way Power)**
- **Control Module References** for K40 Seat Memory Control Module replacement, programming and setup

POWER SEAT MALFUNCTION (WITH ULT)

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 1 X1	U0208 00, 2	U0208 00, 2	-	-
Seat Memory Control Module B+ Terminal 2 X1	1, 3	1, 3	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Linear Interconnect Network Bus 13	U1502 00, U1520 00, U1528 00	U1520 00	U1502 00, U1520 00, U1528 00	-
Power Seat Front Vertical Motor Down Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Power Seat Front Vertical Motor Up Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Power Seat Horizontal Motor Forward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Power Seat Horizontal Motor Rearward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Power Seat Rear Vertical Motor Down Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Power Seat Rear Vertical Motor Up Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Power Seat Recline Motor Forward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Power Seat Recline Motor Rearward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Ground	-	U0208 00, 2	-	-
1. Power seat and memory functions inoperative 2. Scan Tool Does Not Communicate with Low Speed GMLAN Device 3. Lumbar support is inoperative				

Circuit/System Description

Battery voltage is supplied at all times to the seat memory control module through a fuse located in the underhood fuse block. This voltage is used by the module for logic power. Battery positive voltage is also supplied at all times to the seat memory control module through a circuit breaker located in the instrument panel fuse block. This voltage is connected to a power rail internal to the seat memory control module and is used to drive the power seat motors. Each seat motor is controlled by the seat memory control module by applying power and ground through the control circuits to the motor.

All motors are reversible. For example, when the seat switch is operated to move the entire seat forward, a serial data message is sent from the seat adjuster switch to the seat memory control module indicating the entire seat forward command. In response to this message, the seat memory control module applies battery voltage through the driver seat horizontal motor forward control circuit and ground through the driver seat horizontal motor rearward control circuit to the motor. The motor runs to drive the entire seat forward until the switch is released. Moving the entire seat rearward works similarly to moving the entire seat forward, except that battery positive voltage and ground are applied on the opposite circuits causing the motor to run in the opposite direction.

Reference Information

Schematic Reference

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- **Driver Seat Schematics**
- **Passenger Seat Schematics**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

- **Power Seats System Description and Operation (Front Seats)Power Seats System Description and Operation (2nd Row Seats)Power Seats System Description and Operation (3rd Row Seats)Power Seats System Description and Operation (Passenger Seat with Seat Bolster Memory Control Module)**
- **Memory Seats Description and Operation**

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

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

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

   - **If no DTCs are set**
3. Verify the appropriate scan tool Driver or Passenger seat switch parameters listed below change between Inactive and Forward/Rearward or Up/Down when pressing the appropriate switch.

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- Seat Horizontal Switch
- Seat Cushion Front Vertical Switch
- Seat Cushion Rear Vertical Switch
- Seat Back Switch
- **If the parameter does not change**

  Test or replace the S64 Seat Adjuster Switch.

- **If the parameter changes**

4. Verify the seat directional motors listed below operate while operating the appropriate seat switches in both directions.
   - M50 Seat Front Vertical Motor
   - M55 Seat Rear Vertical Motor
   - M51 Seat Horizontal Motor
   - M56 Seat Recline Motor
   - **If any seat motor does not operate**

     Refer to Circuit/System Testing.

   - **If all seat motors operate**
5. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the X2 harness connector at the appropriate K40 Seat Memory Control Module.
2. Test for less than 10 Ω between ground circuit terminal 5 and ground.
   - **If 10 Ω or greater**
   1. Ignition OFF.
   2. Test for less than 2 Ω in the ground circuit end to end.
   - If 2 Ω or greater, repair the open/high resistance in the circuit.
   - If less than 2 Ω, repair the open/high resistance in the ground connection.
   - **If less than 10 Ω**
3. Ignition OFF, disconnect the X1 harness connector at the K40 Seat Memory Control Module, ignition ON.

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4. Verify that a test lamp illuminates between the B+ circuit terminal 2 and ground.
    - **If the test lamp does not illuminate.**
    1. Ignition OFF.
    2. Test for less than 2 Ω in the B+ circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, verify the circuit breaker is OK and there is voltage at the circuit breaker.
    - **If the test lamp illuminates.**
5. Ignition OFF, connect the X1 harness connector at the K40 Seat Memory Control Module and disconnect the harness connector at the appropriate seat motor listed below:
    - M50 Seat Front Vertical Motor
    - M55 Seat Rear Vertical Motor
    - M51 Seat Horizontal Motor
    - M56 Seat Recline Motor
6. Connect a test lamp between control circuit terminal 1 and control circuit terminal 5, ignition ON.

NOTE: **Once a seat motor is commanded On using the scan tool, the seat function may not work using the seat adjuster switch until you back out of the scan tool Control Functions menu.**

7. Verify the test lamp turns ON when commanding the seat motor in the Up/Down or Forward/Rearward states with a scan tool.
    - **If the test lamp remains OFF during either of the commands**
    1. Ignition OFF, disconnect the X3 harness connector at the K40 Seat Memory Control Module.
    2. Test for infinite resistance between each 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 Ω in each control circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, replace the K40 Seat Memory Control Module.
    - **If the test lamp turns ON during each of the commands**
8. Test or replace the seat motor.

Component Testing

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Seat Motor

1. Ignition OFF, disconnect the harness connector at the appropriate seat motor listed below:
   - M50 Seat Front Vertical Motor
   - M55 Seat Rear Vertical Motor
   - M51 Seat Horizontal Motor
   - M56 Seat Recline Motor

   NOTE: **When performing the following tests, make sure that the seat is not already in the position the test is attempting to produce.**

2. Install a 30 A fused jumper wire between control terminal 1 and 12 V.
3. Momentarily install a jumper wire between control terminal 5 and ground. The seat motor should momentarily perform the appropriate FORWARD/ REARWARD/ UP/ DOWN function.
   - **If the motor does not perform the FORWARD/ REARWARD/ UP/ DOWN function**

     Replace the seat motor.

   - **If the motor performs the FORWARD/ REARWARD/ UP/ DOWN function**
4. Reverse the jumper wires; the motor should perform FORWARD/ REARWARD/ UP/ DOWN function.
   - **If the motor does not perform the FORWARD/ REARWARD/ UP/ DOWN function**

     Replace the seat motor.

   - **If the motor performs the FORWARD/ REARWARD/ UP/ DOWN function**
5. All OK.

Repair Instructions

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

- **Driver or Passenger Seat Adjuster Switch ReplacementDriver or Passenger Seat Adjuster Switch Replacement (22-Way Power)**
- **Front Seat Tilt Adjuster Actuator Replacement**
- **Driver or Passenger Seat Vertical Adjuster Actuator Replacement**

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- Driver or Passenger Seat Cushion Frame Replacement (Except Passenger Side with 6-way Power) Driver or Passenger Seat Cushion Frame Replacement (Passenger Side with 6-way Power)
- Driver or Passenger Seat Recliner Actuator ReplacementDriver or Passenger Seat Recliner Actuator Replacement (22-Way Power)
- Control Module References for K40D Seat Memory Control Module - Driver and K40P Seat Memory Control Module - Passenger replacement, programming and setup

REPAIR INSTRUCTIONS

WIRE TO WIRE REPAIR - SEATS

Special Tools

- **EL-38125-10** Splice Sleeve Crimping Tool (non GMNA)
- **J-38125-5A** Ultra Torch Special Tool
- **J-38125-8** Splice Sleeve Crimping Tool (GMNA)

For equivalent regional tools, refer to Special Tools .

WARNING: **In order to reduce the risk of personal injury, loss of high voltage isolation to ground and higher system impedance, do not attempt to repair any HV wiring, connector, or terminal that is damaged. High voltage coaxial type cables are not repairable. Never attempt to repair a coaxial type cable. The entire cable/harness or component must be replaced. In order to maintain system integrity and personal safety, never attempt to repair any high voltage wiring, cables, or terminals. Performing this procedure on high voltage circuits may result in serious injury or death.**

NOTE: **If the wiring harness internal to the transmission is damaged, the wiring harness must be replaced. The use of splice sleeves in an attempt to repair the internal transmission wires, connectors, or terminals could result in performance issues.**

NOTE: **Do not splice wires in Door Harness Grommets.**

NOTE: **The DuraSeal splice sleeves have the following 2 critical features:**

- **A special heat shrink sleeve environmentally seals the splice. The heat shrink sleeve contains a sealing adhesive inside.**

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- **A cross hatched (knurled) core crimp provides the necessary low resistance contact integrity for these sensitive, low energy circuits.**

Use only DuraSeal splice sleeves to form a one-to-one splice on all types of insulation except high voltage and specialty cables. Use DuraSeal splice sleeves where there are special requirements such as moisture sealing. Follow the instructions below in order to splice copper wire using DuraSeal splice sleeves.

Splice Sleeve Selection

Splice Sleeve Color	Crimp Tool Nest Color		Wire Gauge mm^2 / (AWG)
	3 Crimp Nests	4 Crimp Nests	
Salmon (Yellow-Pink) 19300089	Red (1) or Red/Green (1)	Red (2)	0.22-0.8/(18-26)
Blue 19168447	Blue (2)	Blue (3)	1.0-2.0/(14-16)
Yellow 19168448	Yellow (3)	Yellow (4)	3.0-5.0/(10-12)

NOTE: **You must perform the following procedures in the listed order. Repeat the procedure if any wire strands are damaged. You must obtain a clean strip with all of the wire strands intact.**

1. Open the harness by removing any tape:
   - Use a sewing seam ripper, available from sewing supply stores, in order to cut open the harness in order to avoid wire insulation damage.
   - Use the DuraSeal splice sleeves on all types of insulation except Tefzel and coaxial.
   - Do not use the crimp and DuraSeal splice sleeve to form a splice with more than 2 wires coming together.
2. Cut as little wire off the harness as possible. You may need the extra length of wire in order to change the location of a splice.

   Adjust splice locations so that each splice is at least 40 mm (1.5 in) away from the other splices, harness branches, or connectors.

3. Strip the insulation:
   - When adding a length of wire to the existing harness, use the same size wire as the original wire.
   - Perform one of the following items in order to find the correct wire size:
     - Find the wire on the schematic and convert to regional wiring gauge size.
     - If you are unsure of the wire size, begin with the largest opening in the wire stripper and work down until achieving a clean strip of

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the insulation.

- Strip approximately 5.0 mm (0.20 in) of insulation from each wire to be spliced.
- Do not nick or cut any of the strands. Inspect the stripped wire for nicks or cut strands.
- If the wire is damaged, repeat this procedure after removing the damaged section.

4. For high temperature wiring, slide a section of high temperature SCT1 shrink tubing down the length of wire to be spliced. Ensure that the shrink tubing will not interfere with the splice procedure.
5. Select the proper DuraSeal splice sleeve according to the wire size. Refer to the above table at the beginning of the repair procedure for the color coding of the DuraSeal splice sleeves and the crimp tool nests.

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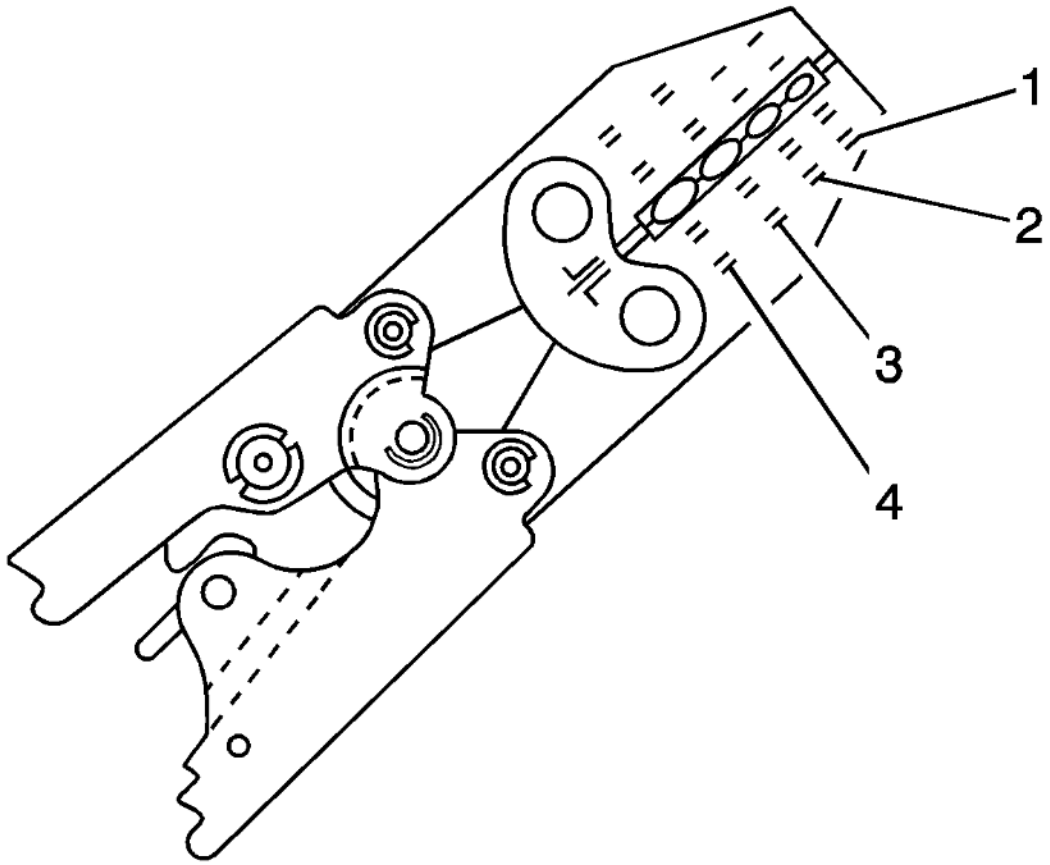


Fig. 14: Splice Sleeve Crimping Tool With 4 Crimp Nests
Courtesy of GENERAL MOTORS COMPANY

6. The **EL-38125-10** splice sleeve crimping tool has four crimp nests. The largest crimp nest (4) is used for crimping 10 and 12 gauge wires. The second largest crimp nest (3) is used for crimping 14 and 16 gauge wires. The third largest crimp nest (2) is used for crimping 18 and 20 gauge wires. The smallest crimp nest (1) is used for crimping 22 to 26 gauge wires. The crimp nests are referenced in the table (farther above) under the crimp tool nest color.

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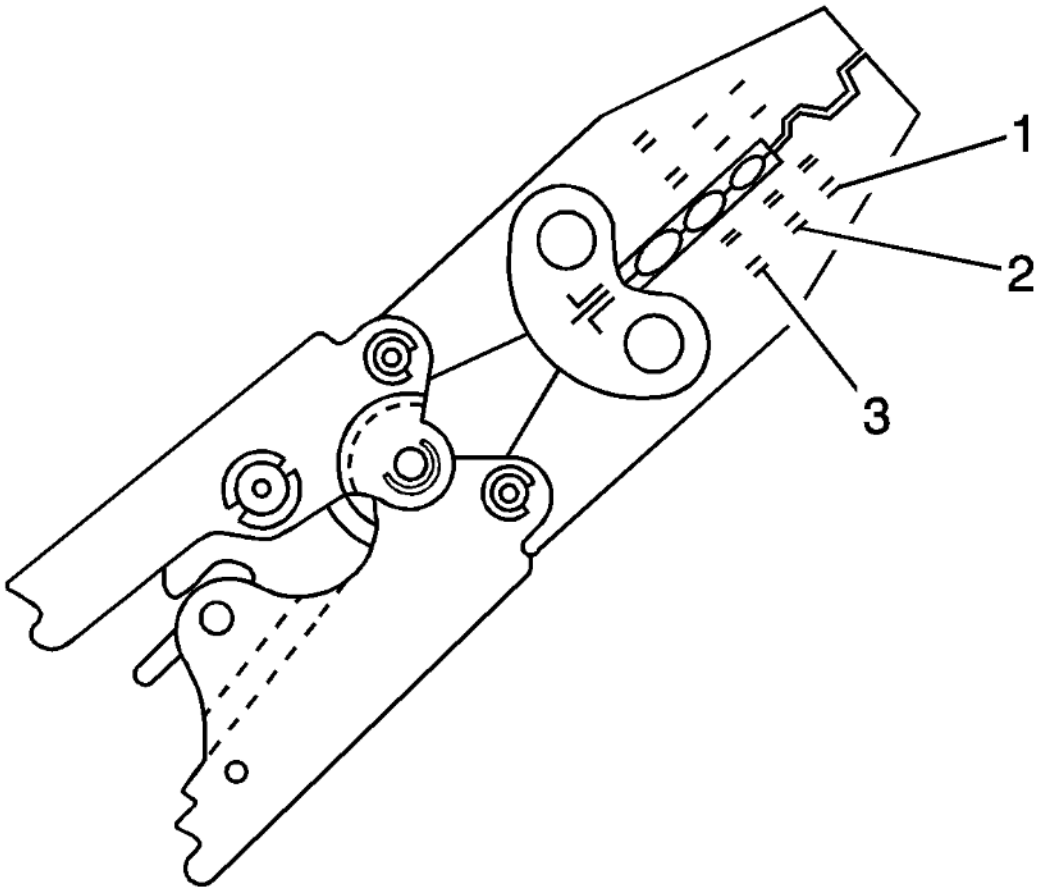


Fig. 15: Splice Sleeve Crimping Tool With 3 Crimp Nests
Courtesy of GENERAL MOTORS COMPANY

7. The **J-38125-8** splice sleeve crimping tool has three crimp nests. The largest crimp nest (3) is used for crimping 10 and 12 gauge wires. The second largest crimp nest (2) is used for crimping 14 and 16 gauge wires. The smallest crimp nest (1) is used for crimping 18 to 20 gauge wires. The crimp nests are referenced in the table (farther above) under the crimp tool nest color.
8. Use the splice sleeve crimp tool in order to position the DuraSeal splice sleeve in the proper color nest of the splice sleeve crimp tool. For the four crimp nest tool, use the three largest crimp nests to crimp the splice sleeves. For the three crimp nest tool, use all three crimp nests to

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crimp the splice sleeves. Use the four and three crimp tool diagrams (above) and the table (farther above) to match the splice sleeve with the correct crimp nest. The crimp tool diagram callout numbers match the numbers in the table (under crimp tool nest color).

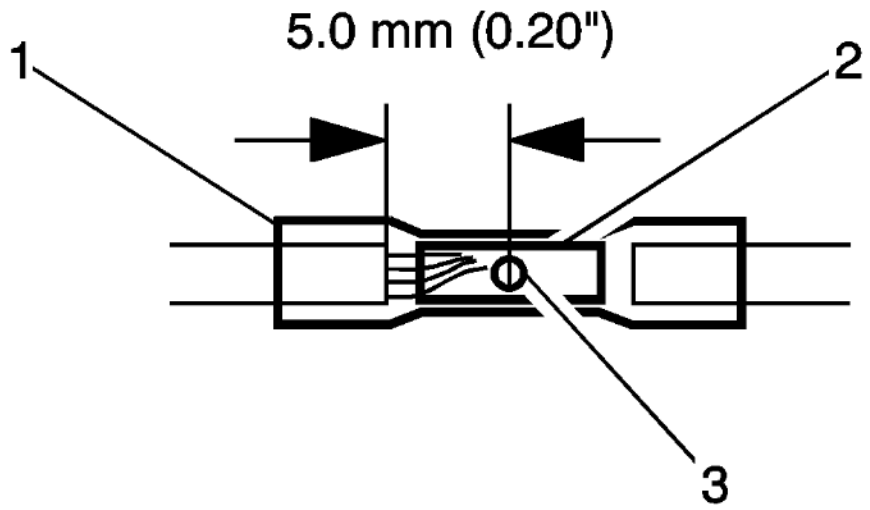


Fig. 16: Duraseal Splice Sleeve
Courtesy of GENERAL MOTORS COMPANY

9. Place the DuraSeal splice sleeve in the nest. Ensure that the crimp falls midway between the end of the barrel and the stop. The sleeve has a stop (3) in the middle of the barrel (2) in order to prevent the wire (1) from going further. Close the hand crimper handles slightly in order to

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firmly hold the DuraSeal splice sleeve in the proper nest.



Fig. 17: Crimped Duraseal Splice Sleeve
Courtesy of GENERAL MOTORS COMPANY

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10. Insert the wire into the splice sleeve barrel until the wire hits the barrel stop. Refer to **Folded-Over Wire Repair** for splicing wires of 0.35 mm or less (22, 24, 26 gauge sizes) and for splicing wires of different gauges.
11. Tightly close the handles of the crimp tool until the crimper handles open when released.

    The crimper handles will not open until you apply the proper amount of pressure to the DuraSeal splice sleeve. Repeat steps 4 and 6 for the opposite end of the splice.

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Fig. 18: Crimped Duraseal Splice Sleeve
Courtesy of GENERAL MOTORS COMPANY

12. Using the heat torch, apply heat to the crimped area of the barrel.
13. Start in the middle and gradually move the heat barrel to the open ends of the tubing:

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- The tubing will shrink completely as the heat is moved along the insulation.
- A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.

Weatherpack™ Wiring Repair

NOTE: **Some replacement pigtail connectors may be delivered without the terminated leads installed into the connector. For Weatherpack™ connectors, all terminated leads included in the package should to be installed into the connector. If the connector end view shows that a terminal is not occupied, the extra terminated lead(s) need to be installed and the end(s) sealed using a DuraSeal splice sleeve and taped back into the harness.**

1. Insert the wire into the splice sleeve barrel until the wire hits the barrel stop. Refer to **Folded-Over Wire Repair** for splicing wires of 0.35 mm or less (22, 24, 26 gauge sizes) and for splicing wires of different gauges.

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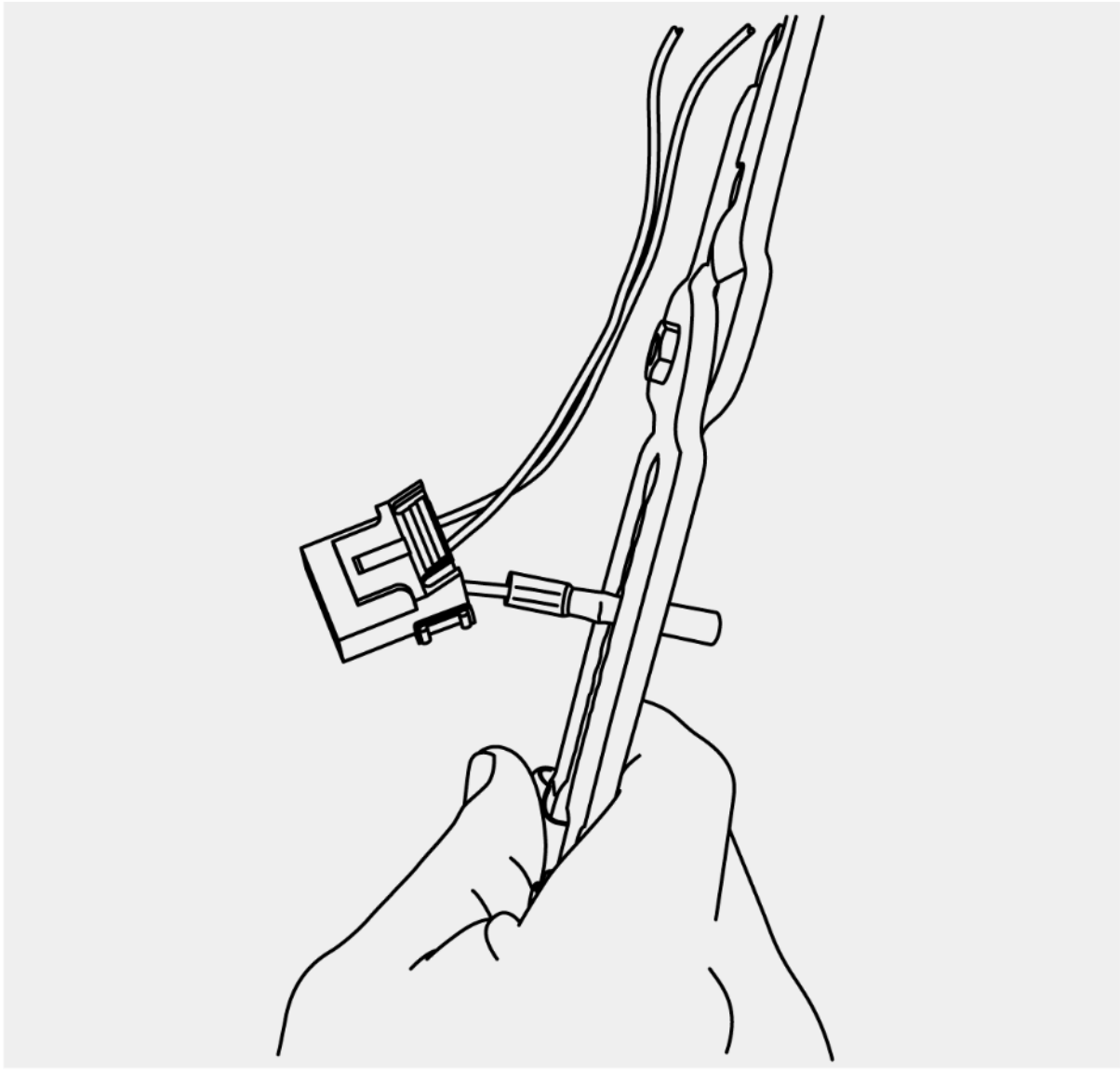


Fig. 19: Tightly Close Handles Of Crimp Tool
Courtesy of GENERAL MOTORS COMPANY

2. Tightly close the handles of the crimp tool until the crimper handles open when released.

   The crimper handles will not open until you apply the proper amount of pressure to the DuraSeal splice sleeve. Holding the DuraSEAL with

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one hand gently tug on the wire to ensure it is crimped in the DuraSeal.

3. Using the heat torch, apply heat to the crimped area of the barrel.

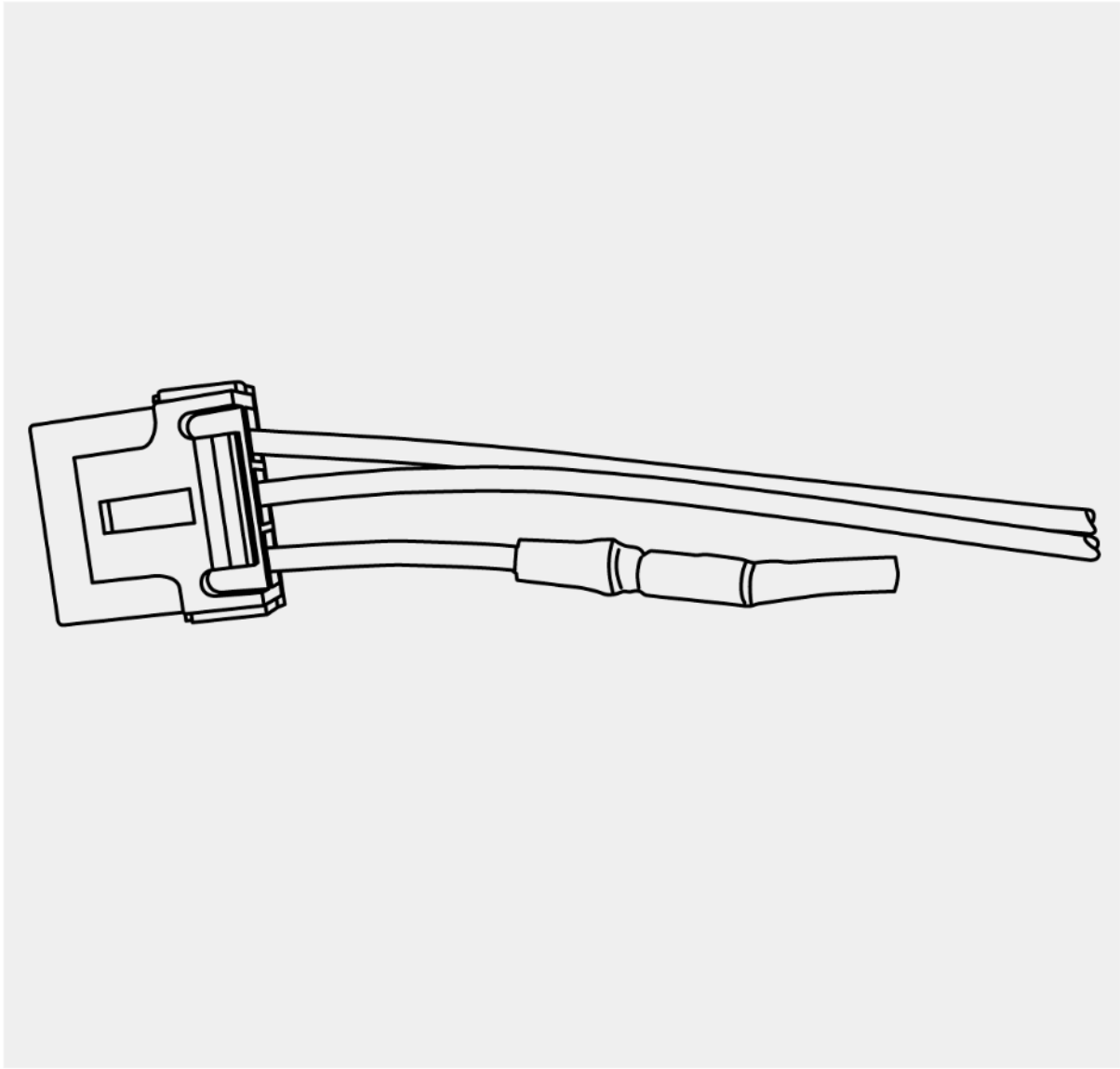


Fig. 20: Applying Heat To Crimped Area Of Barrel
Courtesy of GENERAL MOTORS COMPANY

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4. Start in the middle and gradually move the heat barrel to the open ends of the tubing:
    - The tubing will shrink completely as the heat is moved along the insulation.
    - A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.

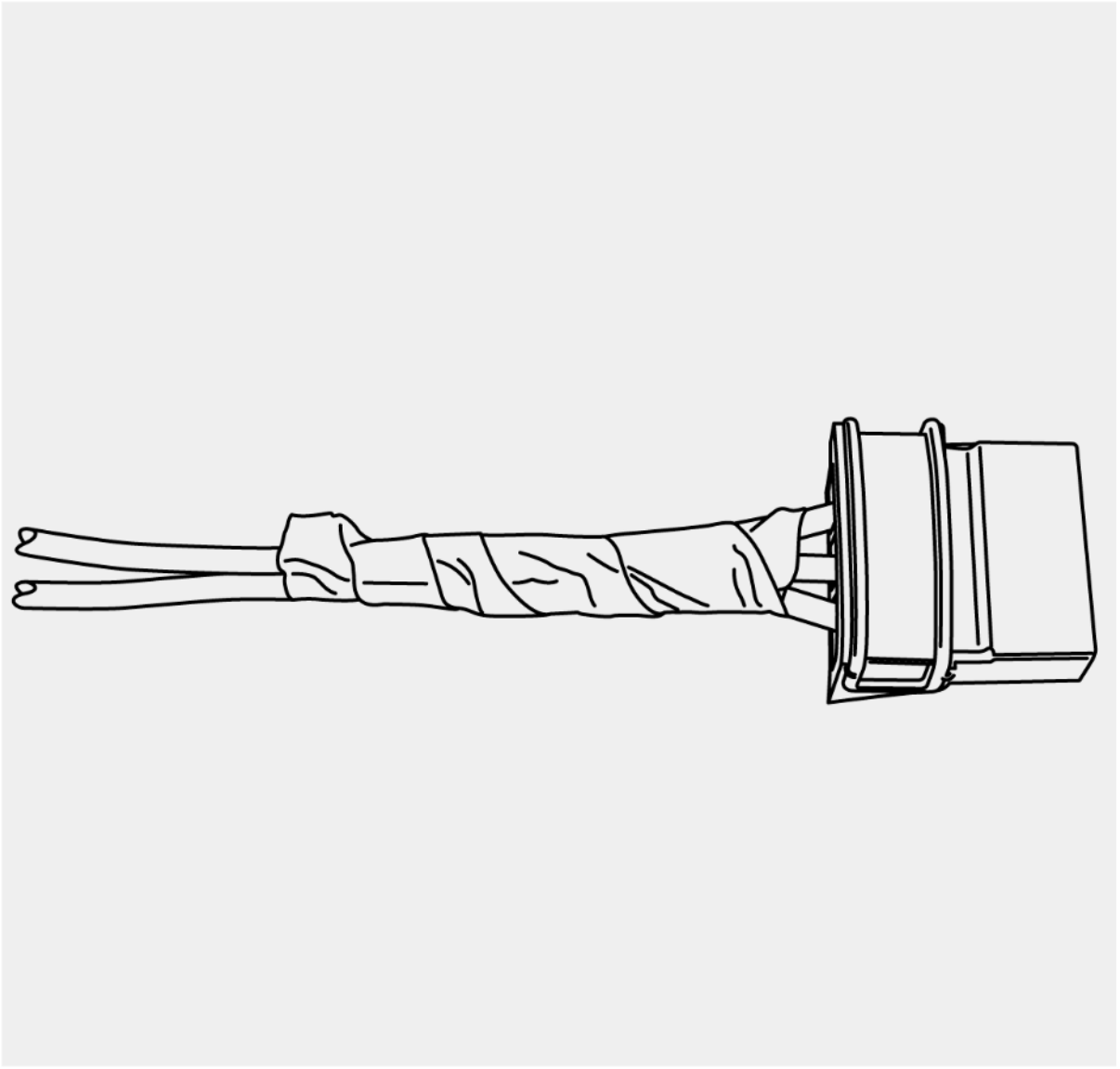


Fig. 21: Taping Extra Terminated Leads Back Into Harness
Courtesy of GENERAL MOTORS COMPANY

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5. Tape the extra terminated lead(s) back into the harness.

High Temperature Wiring Repairs

Use the following procedures to perform high temperature wiring repairs:

1. Center the high temperature SCT1 shrink tube over the DuraSeal splice sleeve.
2. Using the heat torch, apply heat to the high temperature heat shrink tubing.
3. Gradually move the heat from the center to the open end of the tubing:
    - The tubing will shrink completely as the heat is moved along the insulation.
    - A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.
4. Replace any reflective tape and clips that may have been removed during the repair.

CONNECTOR RECONNECTION - SEATS

Special Tools

EL-35616 Terminal Test Probe Kit

For equivalent regional tools, refer to **Special Tools** .

When the condition is not currently present, but is indicated in DTC history, the cause may be intermittent. An intermittent may also be the cause when there is a customer complaint, but the symptom cannot be duplicated. Refer to the Symptom Table of the system that is suspect of causing the condition before trying to locate an intermittent condition.

Most intermittent conditions are caused by faulty electrical connections or wiring. Inspect for the following items:

- Wiring broken inside the insulation
- Poor connection between the male and female terminal at a connector
- A terminal not seated all the way into the connector body
- Poor terminal to wire connection - Some conditions which fall under this description are poor crimps, poor solder joints, crimping over the wire insulation rather than the wire itself, and corrosion in the wire to terminal contact area, etc.
- Pierced or damaged insulation can allow moisture to enter the wiring causing corrosion. The conductor can corrode inside the insulation, with little visible evidence. Look for swollen and stiff sections of wire in the suspect circuits.
- Wiring which has been pinched, cut, or its insulation rubbed through may cause an intermittent open or short as the bare area touches other

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wiring or parts of the vehicle.

- Wiring that comes in contact with hot or exhaust components
- Refer to **Inducing Intermittent Fault Conditions** in order to duplicate the conditions required, in order to verify the customer concern.
- Refer to **Testing for Electrical Intermittents** for test procedures to detect intermittent open, high resistance, short to ground, and short to voltage conditions.
- Refer to **Scan Tool Snapshot Procedure** for advanced intermittent diagnosis and Vehicle Data Recorder operation.

Testing for Terminal Fretting

Some intermittent conditions can be caused by wire terminal fretting corrosion. Fretting corrosion is a build-up of insulating, oxidized wear debris that can form when there is a small motion between electrical contacts. The oxidized wear debris can pile up enough at the electrical contact spots that the electrical resistance across the connection increases. Movement between the contacting surfaces as small as 10 to 100 microns can cause fretting. To put this in perspective, a sheet of paper is about 100 microns thick, so fretting motion is small and hard to see. Vibration and thermal expansion/contraction are the main sources that create fretting motion. Since vehicles vibrate and can experience large temperature swings, they are a good source for fretting motion. Tin, copper, nickel, and iron surfaces are all susceptible to fretting corrosion. Fretting corrosion can be difficult to see but it looks like small, dark smudges on the terminals contact surface.

To correct a fretting condition disconnect the suspect connector and add dielectric grease / lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087) to both sides of the connector terminals. Then reconnect the connector and wipe away any excess lubricant. This will correct the additional terminal contact resistance due to the terminal fretting corrosion.

Testing for Proper Terminal Contact

It is important to test terminal contact at the component and any inline connectors before replacing a suspect component. Mating terminals must be inspected to ensure good terminal contact. A poor connection between the male and female terminal at a connector may be the result of contamination or deformation.

Contamination may be caused by the connector halves being improperly connected. A missing or damaged connector seal, damage to the connector itself, or exposing the terminals to moisture and dirt can also cause contamination. Contamination, usually in the underhood or underbody connectors, leads to terminal corrosion, causing an open circuit or intermittently open circuit.

Deformation is caused by probing the mating side of a connector terminal without the proper adapter. Always use the **EL-35616** kit when probing connectors. Other causes of terminal deformation are improperly joining the connector halves, or repeatedly separating and joining the connector halves. Deformation, usually to the female terminal contact tang, can result in poor terminal contact causing an open or intermittently open circuit.

Testing for Proper Terminal Contact in Bussed Electrical Centers

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It is very important to use the correct test adapter when testing for proper terminal contact of fuses and relays in a bussed electrical center. Use the **EL-35616** kit to test for proper terminal contact. Failure to use the **EL-35616** kit can result in improper diagnosis of the bussed electrical center.

Follow the procedure below in order to test terminal contact:

1. Separate the connector halves.
2. Visually inspect the connector halves for contamination. Contamination may result in a white or green build-up within the connector body or between terminals. This causes high terminal resistance, intermittent contact, or an open circuit. An underhood or underbody connector that shows signs of contamination should be replaced in its entirety: terminals, seals, and connector body.
3. Using an equivalent male terminal/terminated lead, verify that the retention force is significantly different between a known good terminal and the suspect terminal. Replace the female terminal in question.

Flat Wire Connectors

There are no serviceable parts for flat wire connectors on the harness side or the component side.

Follow the procedure below in order to test terminal contact:

1. Remove the component in question.
2. Visually inspect each side of the connector for signs of contamination. Avoid touching either side of the connector as oil from your skin may be a source of contamination as well.
3. Visually inspect the terminal bearing surfaces of the flat wire circuits for splits, cracks, or other imperfections that could cause poor terminal contact. Visually inspect the component side connector to ensure that all of the terminals are uniform and free of damage or deformation.
4. Insert the appropriate adapter into the flat wire harness connector in order to test the circuit in question.

Control Module/Component Voltage and Grounds

Poor voltage or ground connections can cause widely varying symptoms.

- Test all control module voltage supply circuits. Many vehicles have multiple circuits supplying voltage to a control module. Other components in the system may have separate voltage supply circuits that may also need to be tested. Inspect connections at the module/component connectors, fuses, and any intermediate connections between the voltage source and the module/component. A test lamp or a DMM may indicate that voltage is present, but neither tests the ability of the circuit to carry sufficient current. Operate the component to test the ability of the circuit to carry sufficient current. Refer to **Circuit Testing** , and **Power Distribution Schematics** .
- Test all control module ground and system ground circuits. The control module may have multiple ground circuits. Other components in the system may have separate grounds that may also need to be tested. Inspect grounds for clean and tight connections at the grounding point.

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Inspect the connections at the component and in splice packs, where applicable. Operate the component to test the ability of the circuit to carry sufficient current. Refer to **Circuit Testing** , and **Ground Distribution Schematics** .

Temperature Sensitivity

- An intermittent condition may occur when a component/connection reaches normal operating temperature. The condition may occur only when the component/connection is cold, or only when the component/connection is hot.
- Freeze Frame, Failure Records, Snapshot, or Vehicle Data Recorder data may help with this type of intermittent condition, where applicable.
- If the intermittent is related to heat, review the data for a relationship with the following:
  - High ambient temperatures
  - Underhood/engine generated heat
  - Circuit generated heat due to a poor connection, or high electrical load
  - Higher than normal load conditions, towing, etc.
- If the intermittent is related to cold, review the data for the following:
  - Low ambient temperatures - In extremely low temperatures, ice may form in a connection or component. Inspect for water intrusion.
  - The condition only occurs on a cold start.
  - The condition goes away when the vehicle warms up.
- Information from the customer may help to determine if the trouble follows a pattern that is temperature related.
- If temperature is suspected of causing an intermittent fault condition, attempt to duplicate the condition. Refer to **Inducing Intermittent Fault Conditions** in order to duplicate the conditions required.

Electromagnetic Interference and Electrical Noise

Some electrical components/circuits are sensitive to electromagnetic interference or other types of electrical noise. Inspect for the following conditions:

- A mis-routed harness that is too close to high voltage/high current devices such as secondary ignition components, motors, generator etc. - These components may induce electrical noise on a circuit that could interfere with normal circuit operation.
- Electrical system interference caused by a malfunctioning relay, or a control module driven solenoid or switch - These conditions can cause a sharp electrical surge. Normally, the condition will occur when the malfunctioning component is operating.
- Installation of non-factory or aftermarket add on accessories such as lights, 2-way radios, amplifiers, electric motors, remote starters, alarm systems, cell phones, etc. - These accessories may create interference in other circuits while operating and the interference would disappear when the accessory is not operating. Refer to **Checking Aftermarket Accessories** .

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- Test for an open diode across the A/C compressor clutch and for other open diodes. Some relays may contain a clamping diode.
- The generator may be allowing AC noise into the electrical system.

Incorrect Control Module

- There are only a few situations where reprogramming a control module is appropriate:
  - A new service control module is installed.
  - A control module from another vehicle is installed.
  - Revised software/calibration files have been released for this vehicle.

NOTE: **DO NOT re-program the control module with the SAME software/calibration files that are already present in the control module. This is not an effective repair for any type of concern.**

- Verify that the control module contains the correct software/calibration. If incorrect programming is found, reprogram the control module with the most current software/calibration. Refer to **Control Module References** for replacement, setup, and programming.

DRIVER OR PASSENGER SEAT ADJUSTER SWITCH REPLACEMENT

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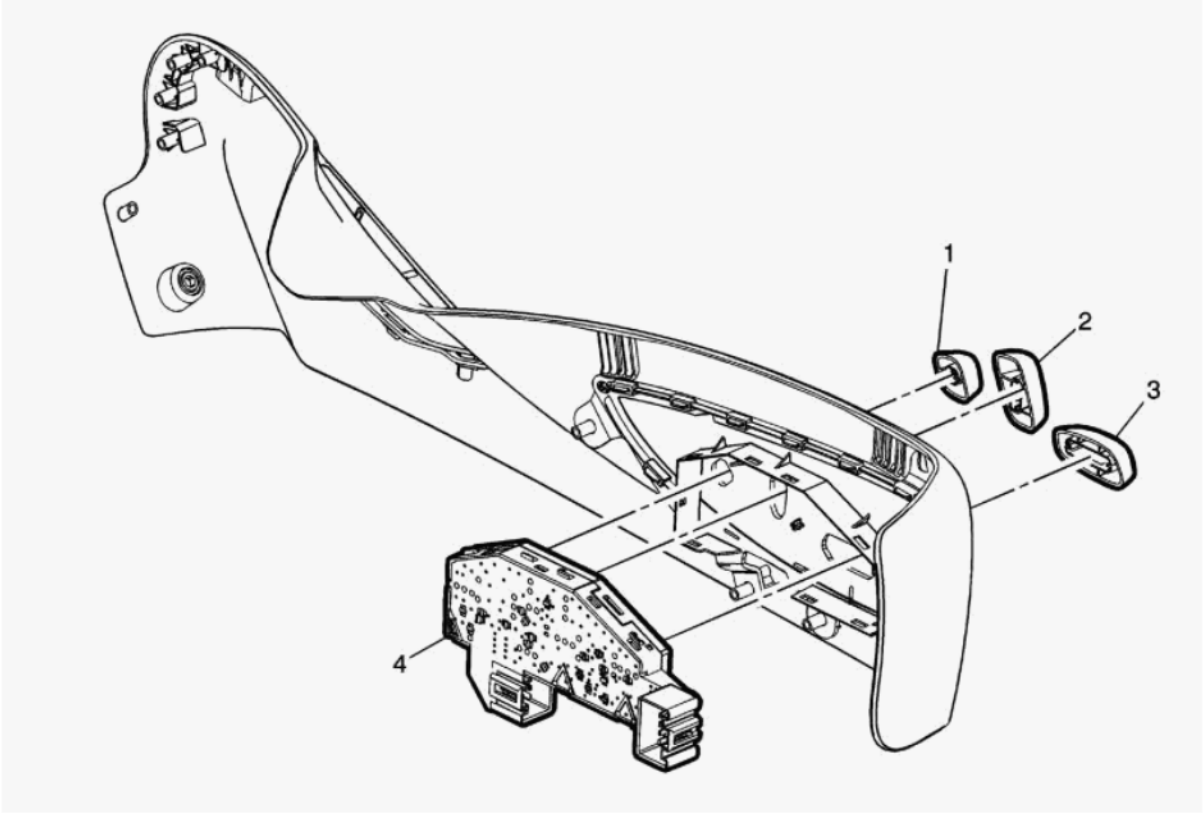


Fig. 22: Driver or Passenger Seat Adjuster Switch
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front seat cushion outer finish cover. Refer to **Front Seat Cushion Outer Finish Cover Replacement (8-Way Power)** **Front Seat Cushion Outer Finish Cover Replacement (2-Way Manual)** **Front Seat Cushion Outer Finish Cover Replacement (22-Way Power)** .	
1	Front Seat Lumbar Support Actuator Knob
2	Front Seat Back Recliner Knob
3	Front Seat Adjuster Knob
4	Driver or Passenger Seat Adjuster Switch **Procedure** Use a flat-bladed tool to release the switch from the finish cover.

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DRIVER OR PASSENGER SEAT ADJUSTER SWITCH REPLACEMENT (22-WAY POWER)

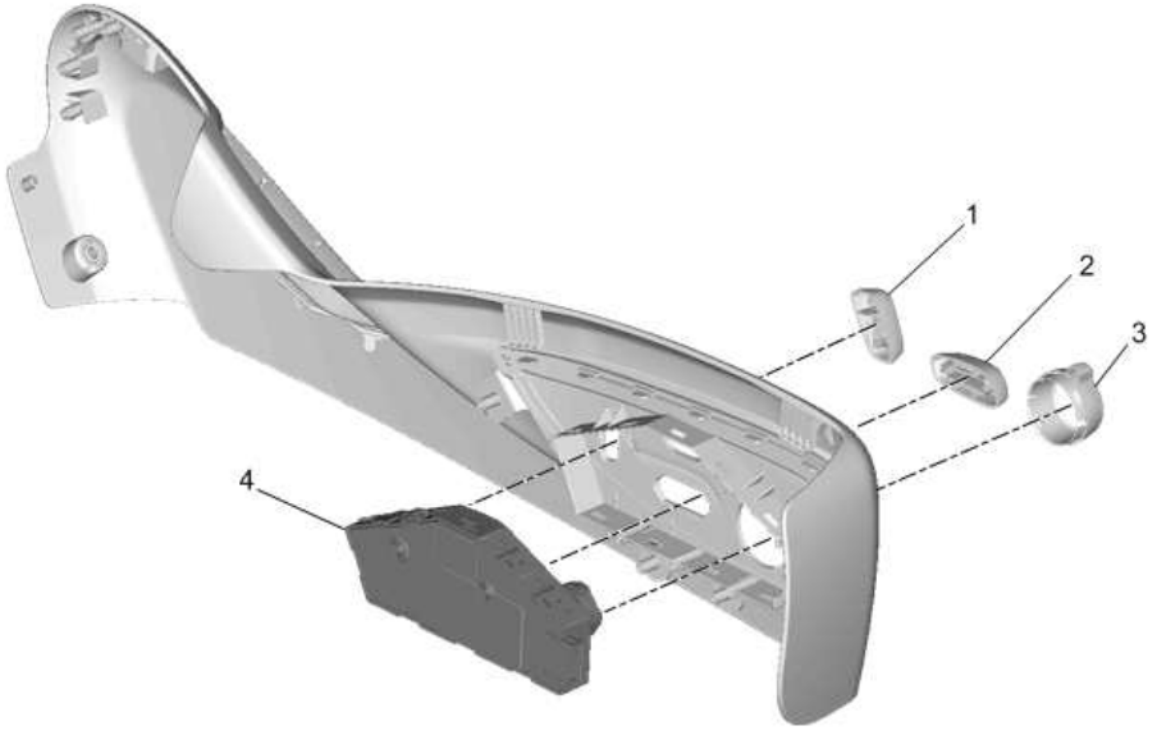


Fig. 23: Driver or Passenger Seat Adjuster Switch (22-Way Power)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure **Front Seat Cushion Outer Finish Cover Replacement (22-Way Power)**	
1	Front Seat Back Recliner Knob
2	Front Seat Adjuster Knob
3	Front Seat Adjuster Knob - Rotary
4	Front Seat Adjuster Switch **Procedure** Use a flat-bladed tool to release the switch from the finish cover.

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FRONT SEAT ADJUSTER MEMORY SWITCH REPLACEMENT (CADILLAC)

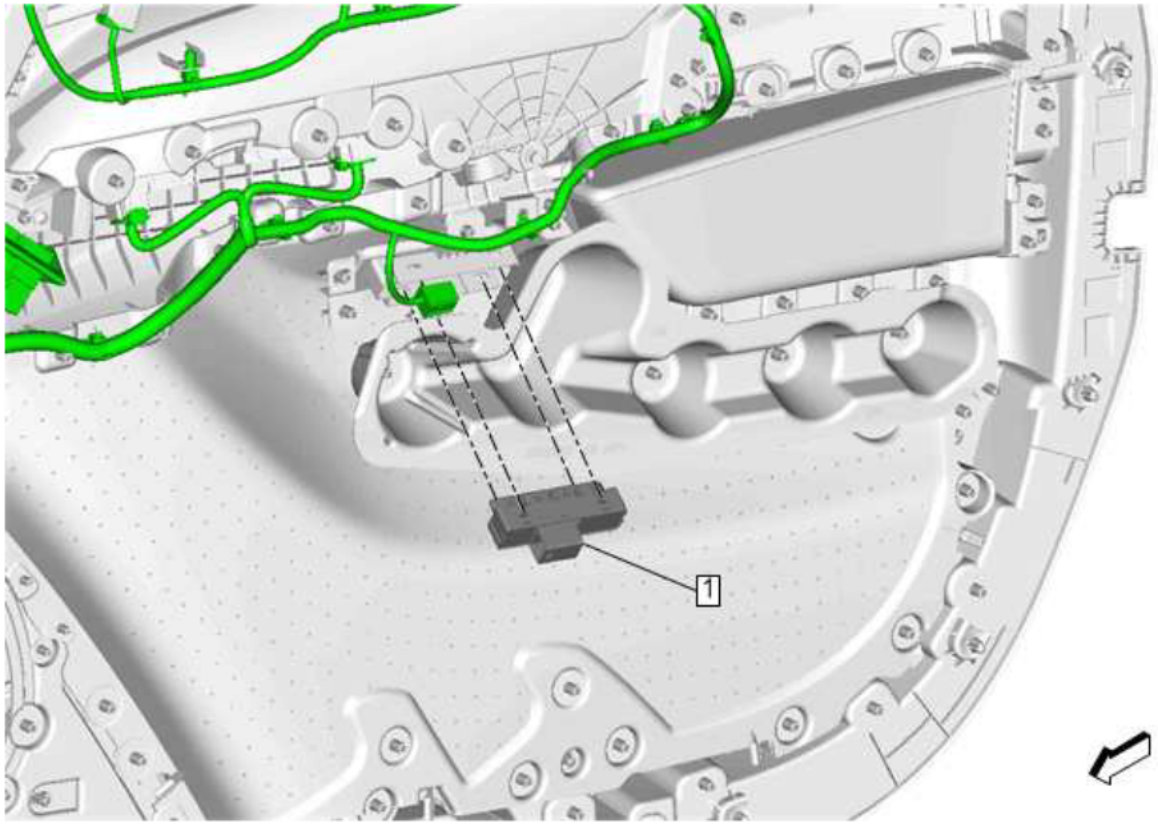


Fig. 24: Front Seat Adjuster Memory Switch (Cadillac)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure **Front Side Door Trim Replacement**	
1	Front Seat Adjuster Memory Switch **Procedure** 1. Disconnect the electrical connector. 2. Use a flat bladed plastic trim tool.

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FRONT SEAT ADJUSTER MEMORY SWITCH REPLACEMENT (CHEVROLET / GMC)

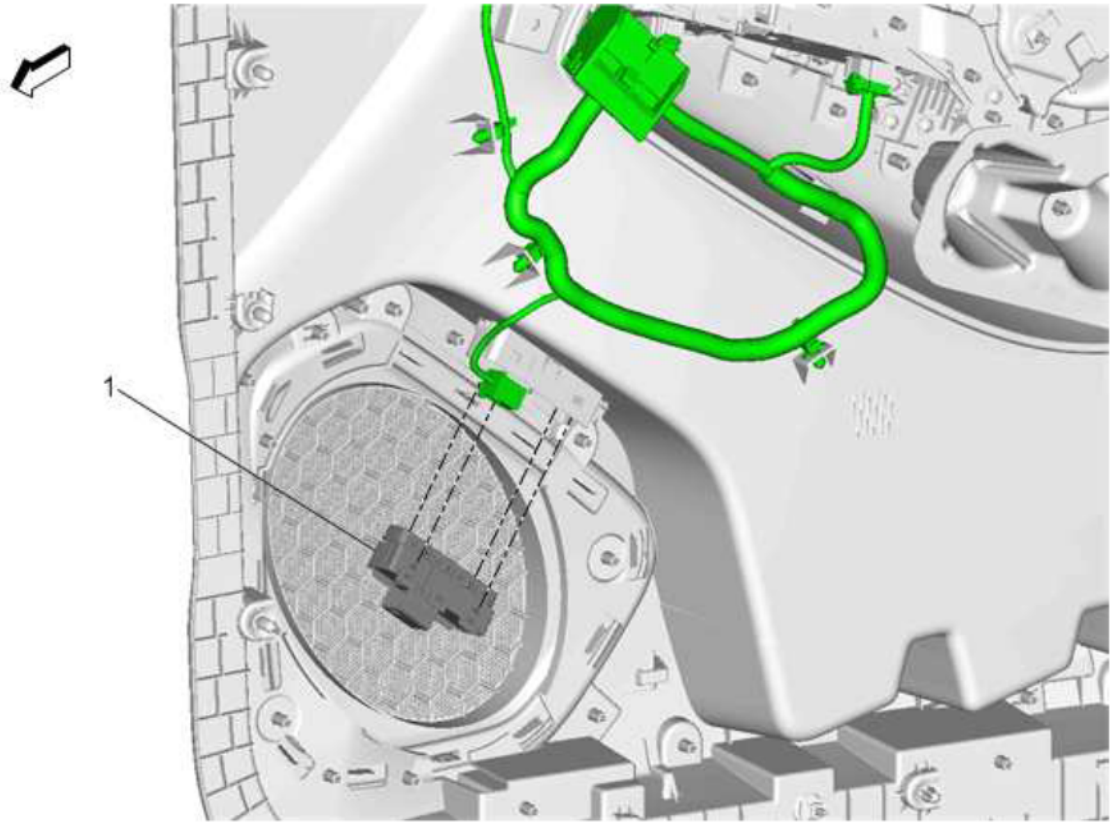


Fig. 25: Front Seat Adjuster Memory Switch (Chevrolet / GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure **Front Side Door Trim Replacement**	
1	Front Seat Adjuster Memory Switch **Procedure** 1. Disconnect the electrical connector. 2. Use a flat bladed plastic trim tool.

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FRONT SEAT ADJUSTER MEMORY MODULE BRACKET REPLACEMENT

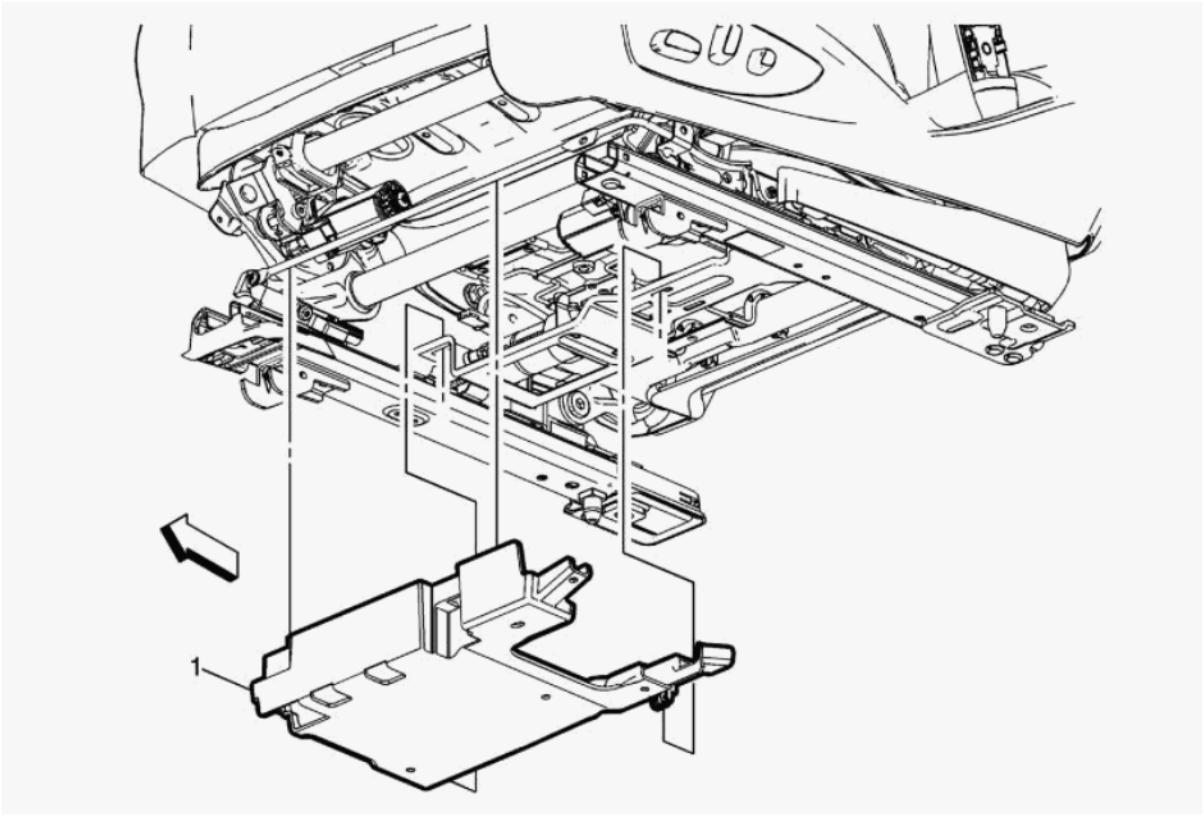


Fig. 26: Front Seat Adjuster Memory Module Bracket
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Front Seat Adjuster Memory Module Bracket Replacement **Procedure** 1. Raise the seat to the highest position to gain access to the module bracket. 2. Disconnect the electrical connection. 3. Gently pull forward on the front of the tray to disconnect it from the electrical tray rod. 4. Gently push up on the rear of the cover to disengage the remaining retainers from the seat adjuster actuator motor

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Callout	Component Name
	mounting bracket.

DRIVER OR PASSENGER SEAT ADJUSTER MEMORY MODULE REPLACEMENT

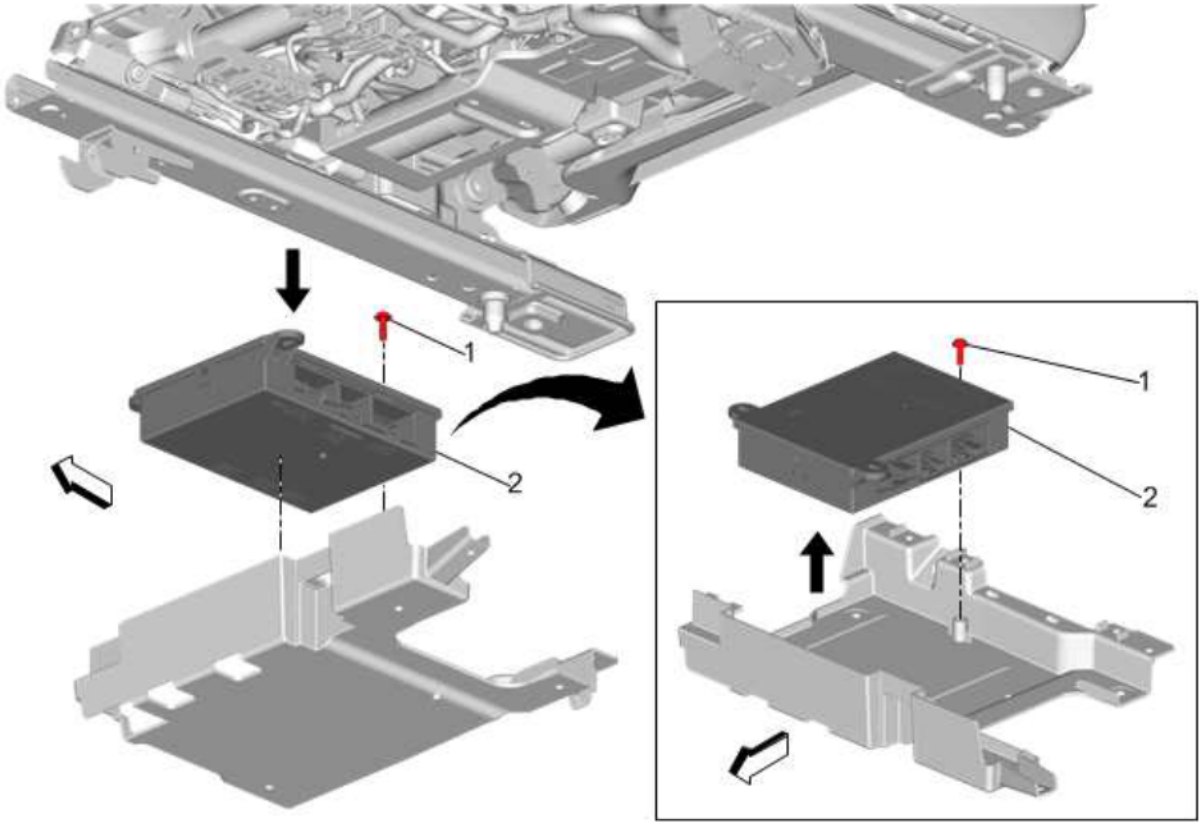


Fig. 27: Driver or Passenger Seat Adjuster Memory Module
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front seat adjuster memory module bracket. Refer to **Front Seat Adjuster Memory Module Bracket Replacement**.	
1	Driver or Passenger Seat Adjuster Memory Module Fastener

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Callout	Component Name
	CAUTION: **Refer to Fastener Caution .** Tighten 2 N.m (18 lb in)
2	Driver or Passenger Seat Adjuster Memory Module **Procedure** 1. Disconnect electrical connectors. 2. Remove the module from the driver seat bracket. 3. Refer to **Control Module References** for programing and setup information.

FRONT SEAT BOLSTER MEMORY MODULE REPLACEMENT (22-WAY POWER)

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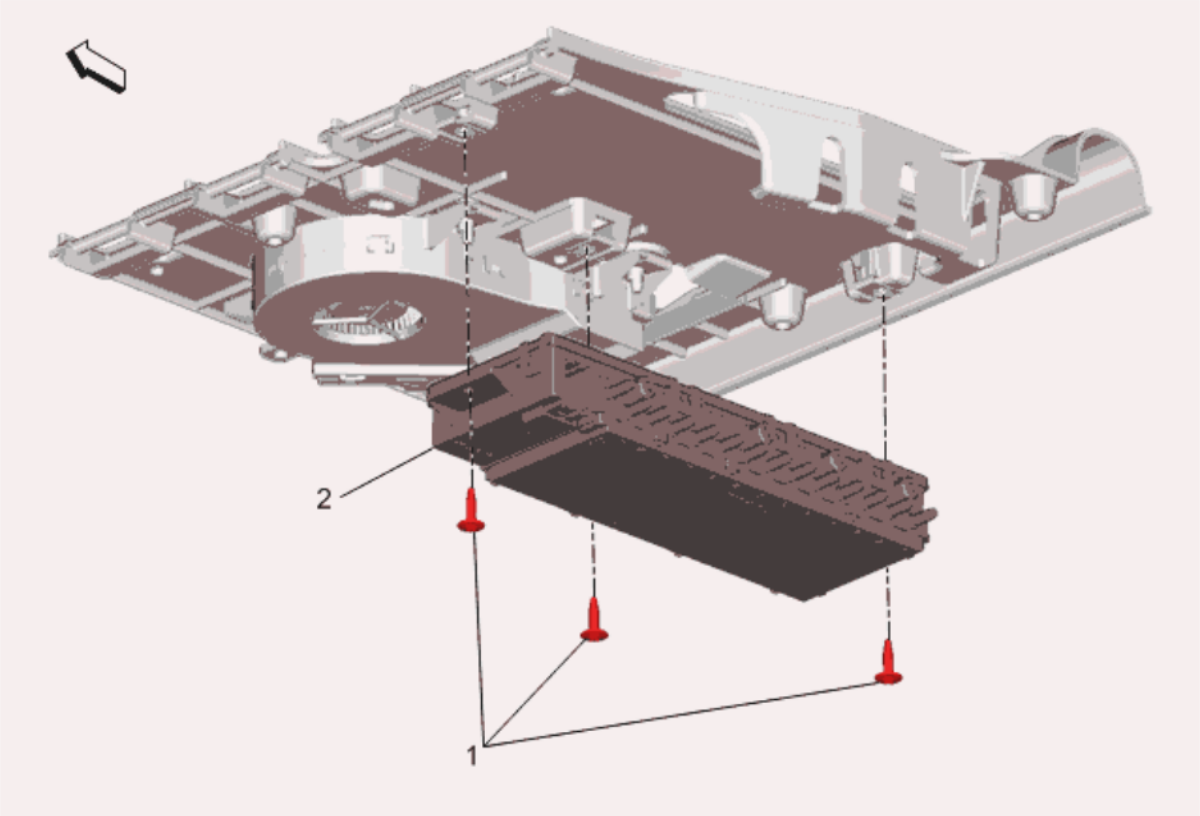


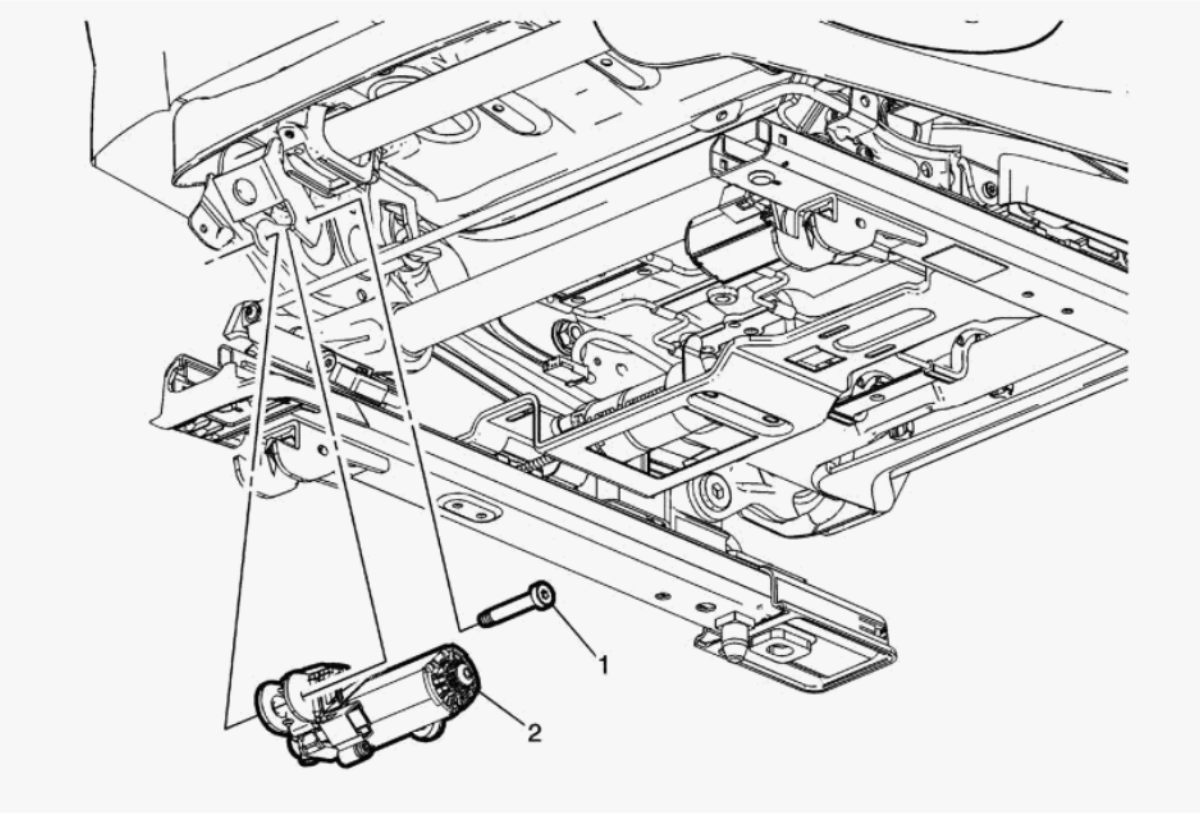
Fig. 28: Front Seat Bolster Memory Module (22-Way Power)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure **Driver or Passenger Seat Removal and Installation**	
1	Front Seat Bolster Memory Module Bolt (Qty: 3) **CAUTION:** **Refer to** **Fastener** **Caution** .

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Callout	Component Name
	Tighten 2.5 N.m (22 lb in)
2	Front Seat Bolster Memory Module **Procedure** 1. Disconnect the electrical connector. 2. Transfer components as necessary. 3. Refer to **Control Module References** for programming and set up information, if required.

FRONT SEAT TILT ADJUSTER ACTUATOR REPLACEMENT



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Fig. 29: Front Seat Tilt Adjuster Actuator
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the driver or passenger seat. Refer to **Driver or Passenger Seat Removal and Installation** . 2. Remove the front seat adjuster module bracket, if equipped. Refer to **Front Seat Adjuster Memory Module Bracket Replacement**.	
1	Front Seat Tilt Adjuster Actuator Fastener **CAUTION:** **Refer to Fastener Caution .** **Procedure** Set the seat to it's highest position. **Tighten** 8 N.m (71 lb in)
2	Front Seat Tilt Adjuster Actuator **Procedure** 1. Disconnect the electrical connector. 2. Remove the adjuster vertical actuator by pulling downward from the cushion frame.

DRIVER OR PASSENGER SEAT VERTICAL ADJUSTER ACTUATOR REPLACEMENT

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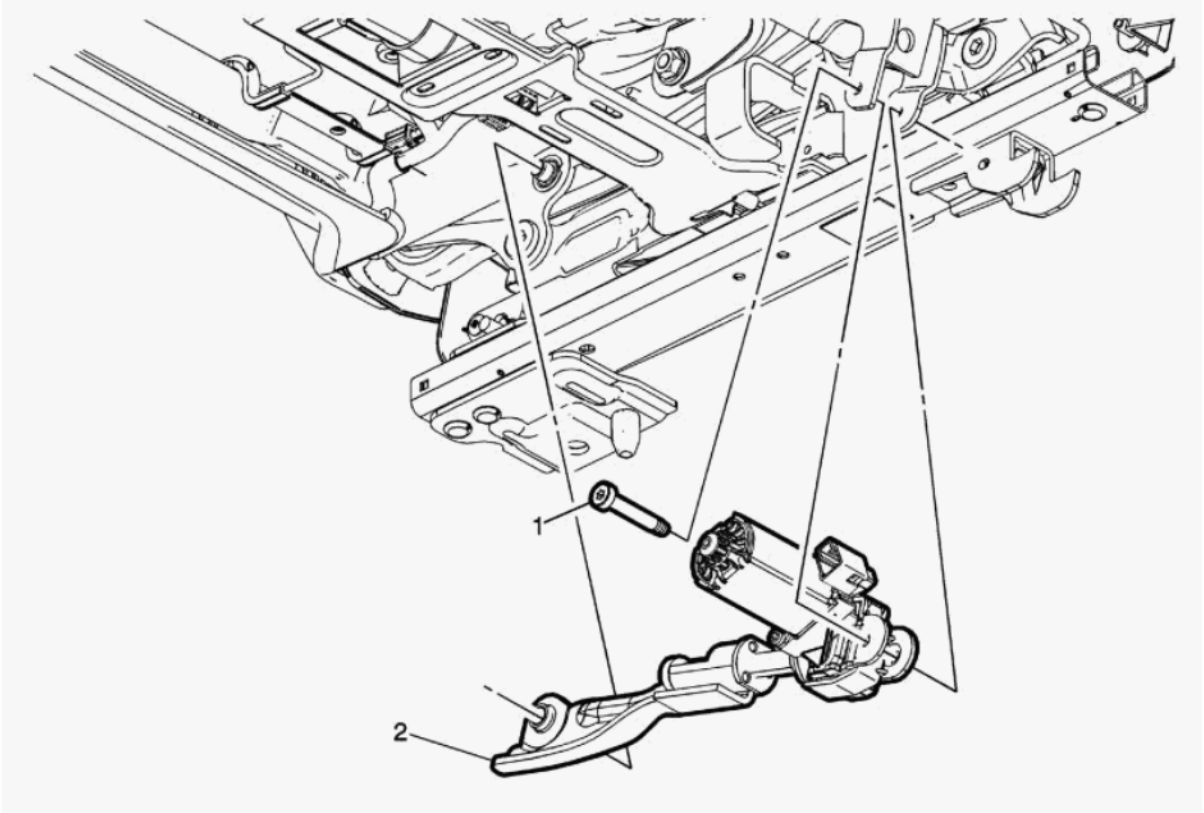


Fig. 30: Driver or Passenger Seat Vertical Adjuster Actuator
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the driver or passenger seat. Refer to **Driver or Passenger Seat Removal and Installation** . 2. Remove the front seat adjuster module bracket, if equipped. Refer to **Front Seat Adjuster Memory Module Bracket Replacement**.	
1	Driver or Passenger Seat Vertical Adjuster Actuator Fastener **CAUTION:** **Refer to** **Fastener**

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Callout	Component Name
	Caution . **Procedure** Set the seat to it's highest position. **Tighten** 8 N.m (71 lb in)
2	Driver or Passenger Seat Vertical Adjuster Actuator **Procedure** 1. Disconnect the electrical connector. 2. Remove the adjuster vertical actuator from the cushion frame.

FRONT SEAT BACK MASSAGE BLADDER REPLACEMENT (22-WAY POWER)

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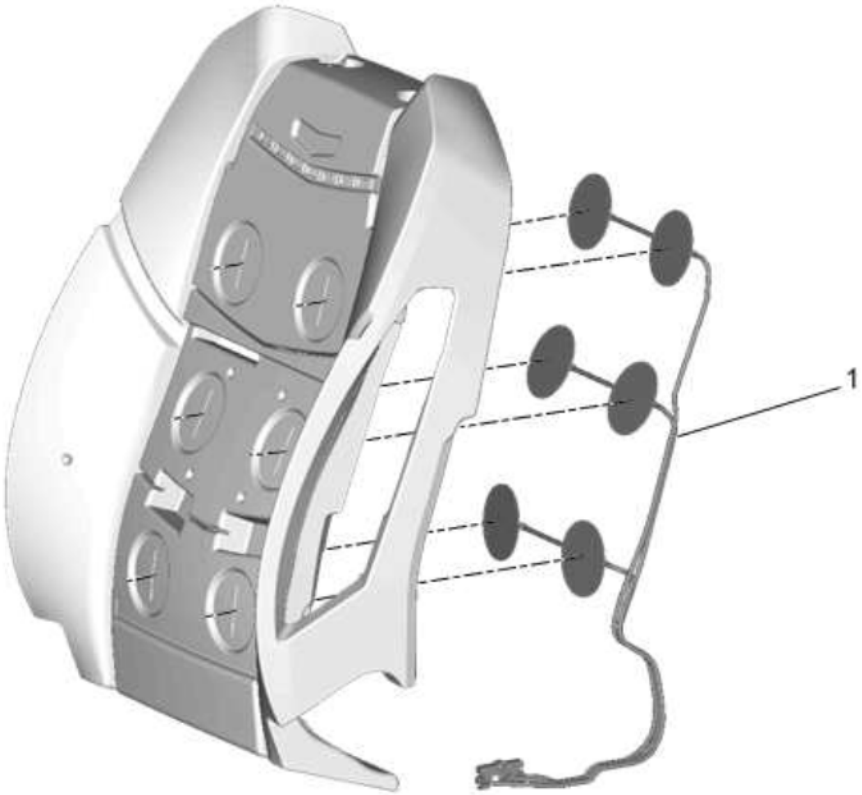


Fig. 31: Front Seat Back Massage Bladder (22-Way Power)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure **Front Seat Back Cushion Vent Fan Mat Replacement (22-Way Power)**	
1	Front Seat Back Massage Bladder **Procedure** Carefully pull the seat back massage nodes through the seat back cushion pad, there are cut holes in the pad to feed the nodes through.

FRONT SEAT CUSHION MASSAGE BLADDER REPLACEMENT (22-WAY POWER)

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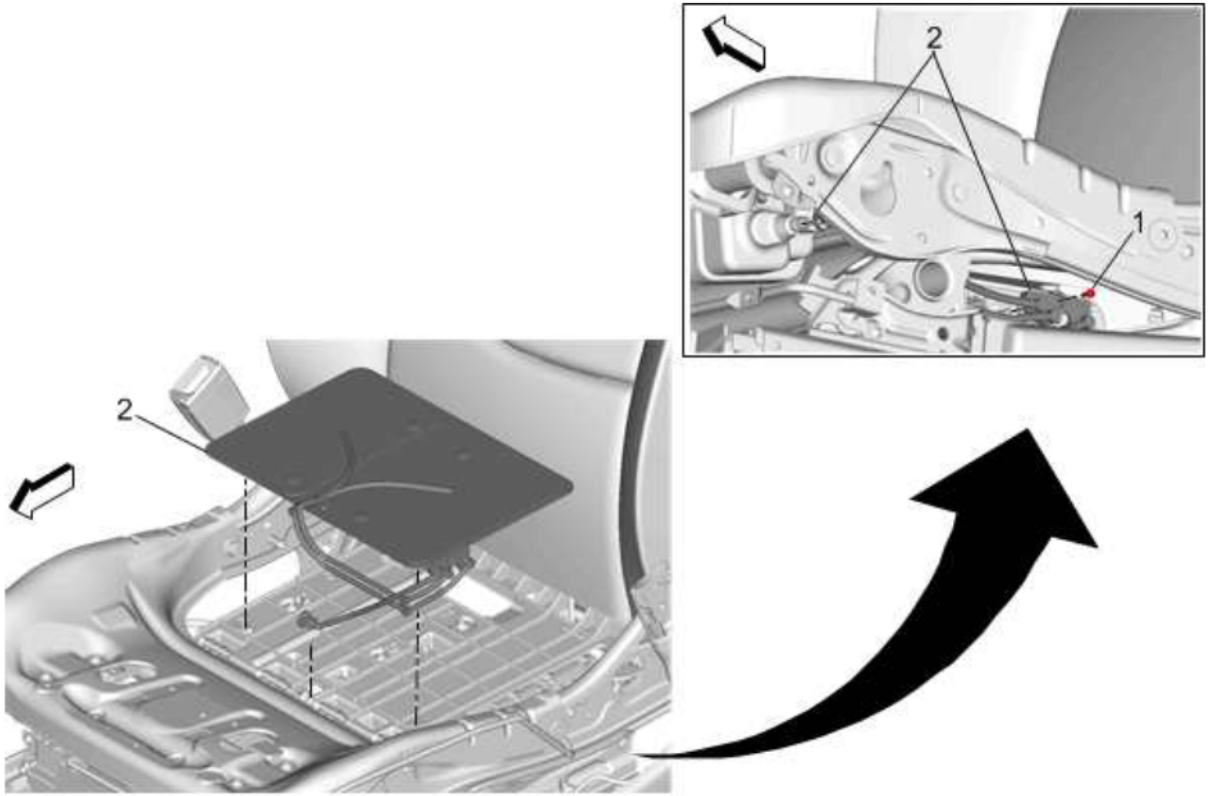


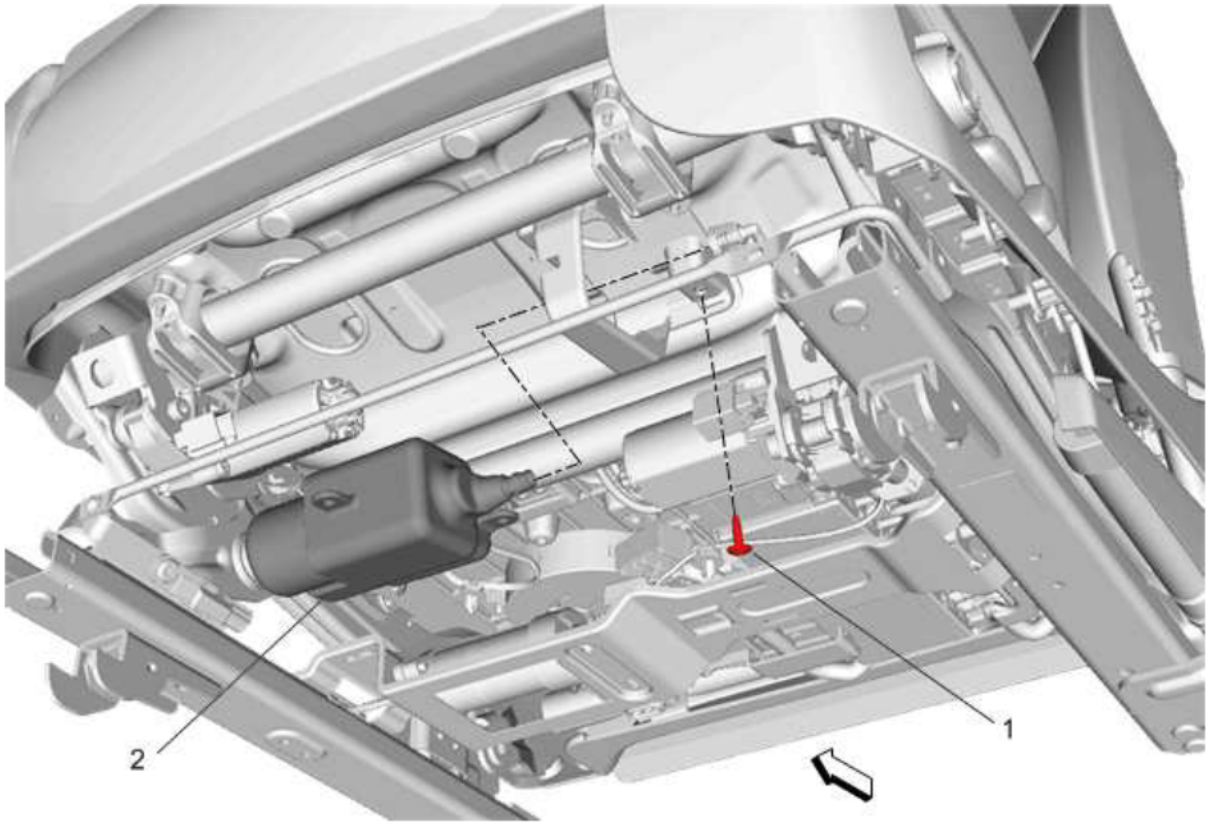
Fig. 32: Front Seat Cushion Massage Bladder (22-Way Power)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: Refer to SIR Warning . **Preliminary Procedures** 1. Driver or Passenger Seat Removal and Installation 2. Front Seat Cushion Cover and Pad Replacement	
1	Front Seat Cushion Massage Bladder Bolt

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Callout	Component Name
	CAUTION: **Refer to Fastener Caution .** Tighten 0.6 N.m (6 lb in)
2	Front Seat Cushion Massage Bladder 1. Disconnect the air supply hose from the pneumatic pump and bolster memory module. 2. Release the retainers securing the bladder to the cushion pad support.

FRONT SEAT LUMBAR SUPPORT BLADDER PUMP REPLACEMENT (22-WAY POWER)



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Fig. 33: Front Seat Lumbar Support Bladder Pump (22-Way Power)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Driver or Passenger Seat Removal and Installation 2. Driver or Passenger Seat Adjuster Memory Module Replacement	
1	Front Seat Lumbar Support Bladder Pump Bolt **CAUTION:** **Refer to Fastener Caution .** **Tighten** 2.5 N.m (22 lb in)
2	Front Seat Lumbar Support Bladder Pump **Procedure** 1. Disconnect the electrical connector. 2. Disconnect the air hose from the pump.

FRONT SEAT BACK LUMBAR BLADDER REPLACEMENT (22-WAY POWER)

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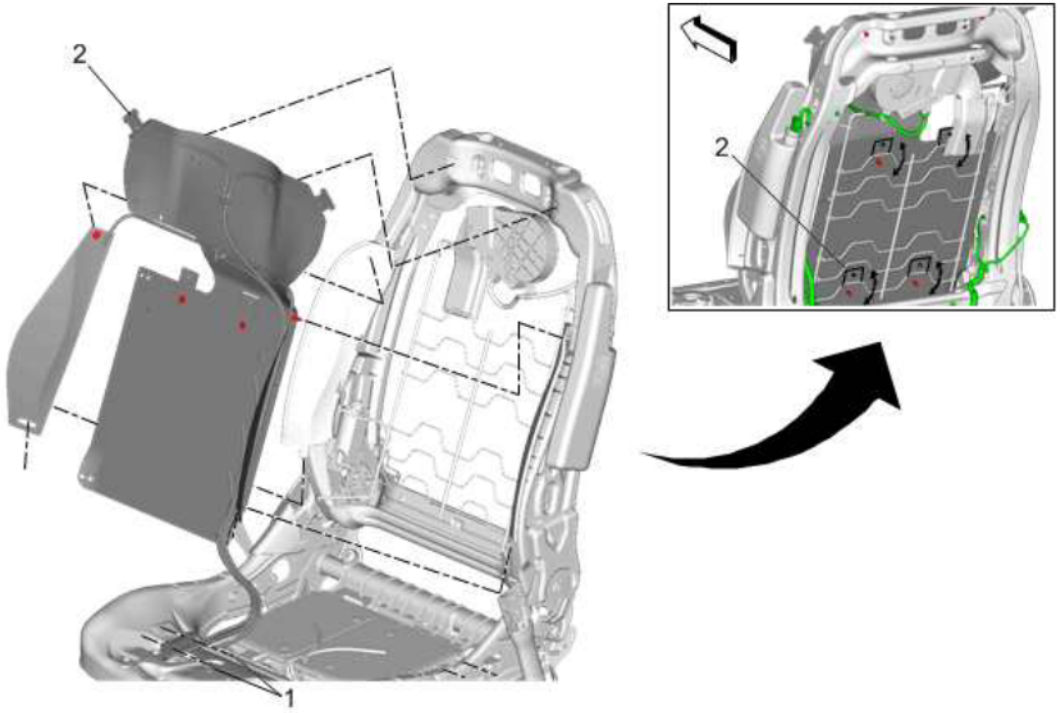


Fig. 34: Front Seat Back Lumbar Bladder (22-Way Power)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: Refer to SIR Warning . **Preliminary Procedure** Driver or Passenger Seat Back Cover and Pad Replacement (22-Way Power)	
1	Front Seat Lumbar Support Bladder Screw (Qty: 2) **CAUTION:** Refer to Fastener Caution .

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Callout	Component Name
	Tighten 0.6 N.m (6 lb in)
2	Front Seat Lumbar Support Bladder **NOTE:** **Not all of the retainers on the Lumbar Bladder need to be removed some only hold the bladder to the felt. These will stay attached.** **Procedure** 1. Disconnect the air supply hose assembly from the seat bolster memory module. 2. Release the 4 tabs that fold over to attach the bladder assembly to the support wire.

FRONT SEAT BACK LUMBAR REPLACEMENT (2-WAY POWER)

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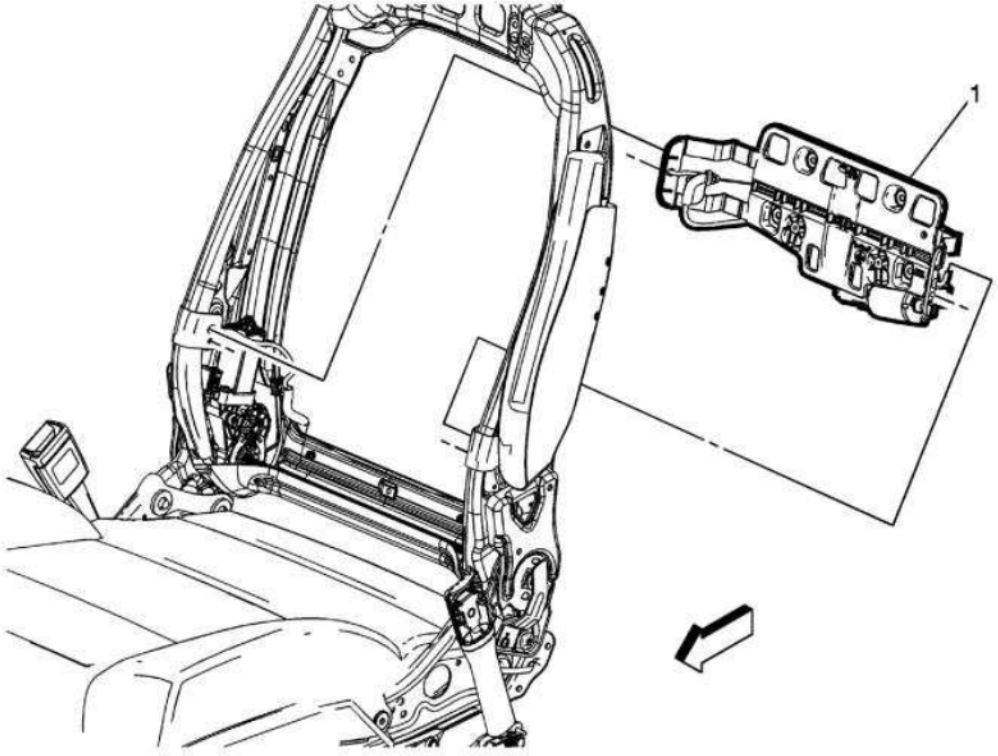


Fig. 35: Front Seat Back Lumbar (2-Way Power)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Remove the driver or passenger seat. Refer to **Driver or Passenger Seat Removal and Installation** . 2. Remove the driver or passenger seat back cushion cover and pad. Refer to **Driver or Passenger Seat Back Cover and Pad Replacement** .	
1	Seat Lumbar Sub System **Procedure** 1. Note the routing of the lumbar cable for installation.

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Callout	Component Name
	2. Push inward on both side of the lumbar system to disengage the locator tabs. 3. Pull the lumbar system up and rearward until the lumbar support disengages from the seat back frame.

FRONT SEAT BACK LUMBAR REPLACEMENT (4-WAY PNEUMATIC)

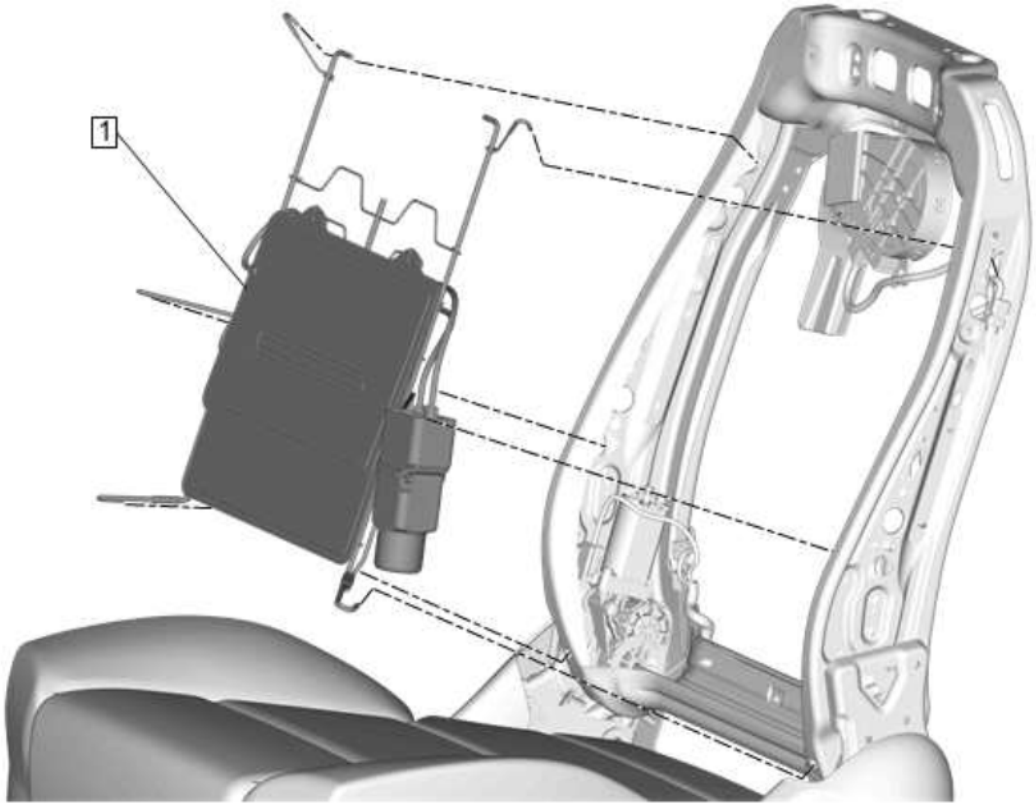


Fig. 36: Front Seat Back Lumbar (4-Way Pneumatic)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: **Refer to SIR Warning .**	

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Callout	Component Name
Preliminary Procedures 1. **SIR Disabling and Enabling** 2. **Driver or Passenger Seat Back Cover and Pad Replacement**	
1	Seat Lumbar Sub System **Procedure** 1. Disconnect all electrical connectors. 2. Pull outward at the bottom of the seat to release the bottom support wires. 3. Pull the bottom of the lumbar forward and up until the lumbar support wires disengage from the seat back frame.

DRIVER OR PASSENGER SEAT RECLINER ACTUATOR REPLACEMENT

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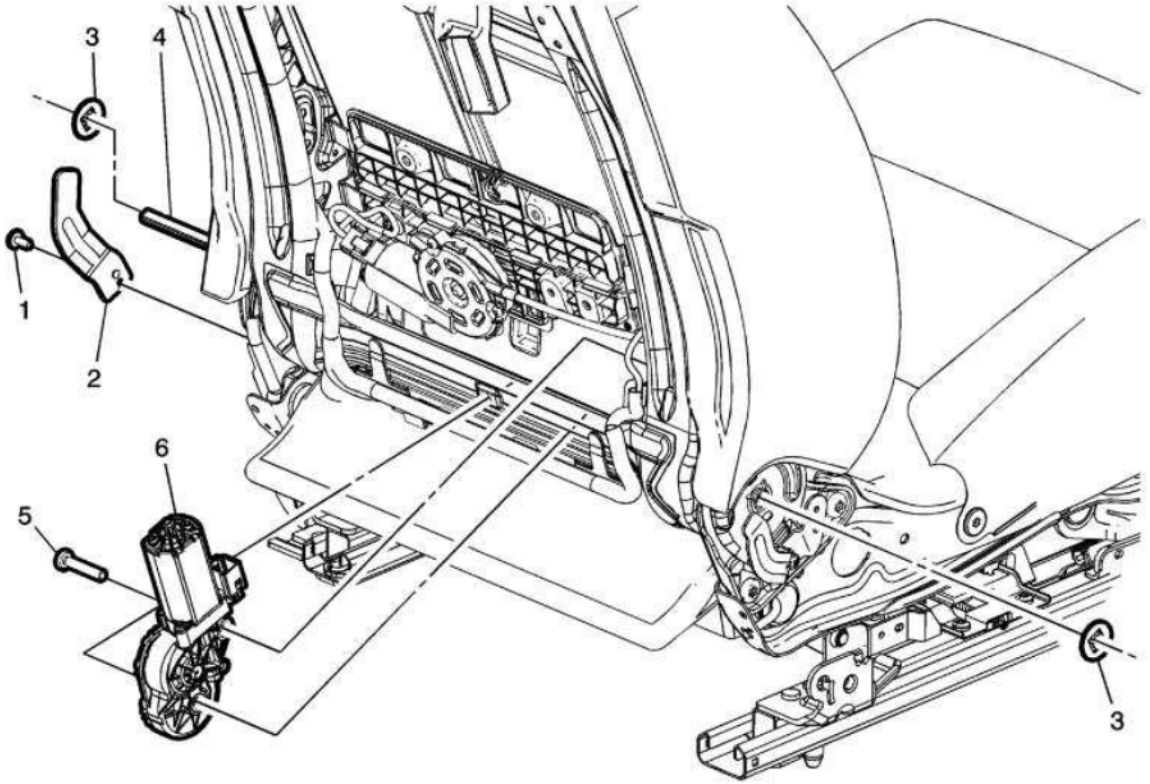


Fig. 37: Driver or Passenger Seat Recliner Actuator
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: **Refer to SIR Warning .** **Preliminary Procedures** 1. Remove the driver or passenger seat. Refer to **Driver or Passenger Seat Removal and Installation** . 2. Remove the driver or passenger seat inner recliner finish cover. Refer to **Driver or Passenger Seat Inner Recliner Finish Cover Replacement** . 3. Remove the front seat cushion outer finish cover. Refer to **Front Seat Cushion Outer Finish Cover Replacement (8-Way Power)**	

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Callout	Component Name
	Front Seat Cushion Outer Finish Cover Replacement (2-Way Manual) Front Seat Cushion Outer Finish Cover Replacement (22-Way Power) . 4. Remove front seat back cushion finish panel. Refer to Front Seat Back Cushion Finish Panel Replacement .
1	Front Seat Recliner Control Bracket Screw
2	Front Seat Recliner Control Bracket
3	Front Seat Recliner Rod Jam Nut **NOTE:** **Replace with new rod jam nut.**
4	Recliner Rod **Procedure** Gently tap the recliner rod outward until the rod is free of the recliner motor.
5	Driver or Passenger Seat Recliner Actuator Motor Fastener **CAUTION:** **Refer to Fastener Caution .** **Procedure** Disconnect the electric connector. **Tighten** 6 N.m (53 lb in)
6	Driver or Passenger Seat Recliner Actuator Motor

DRIVER OR PASSENGER SEAT RECLINER ACTUATOR REPLACEMENT (22-WAY POWER)

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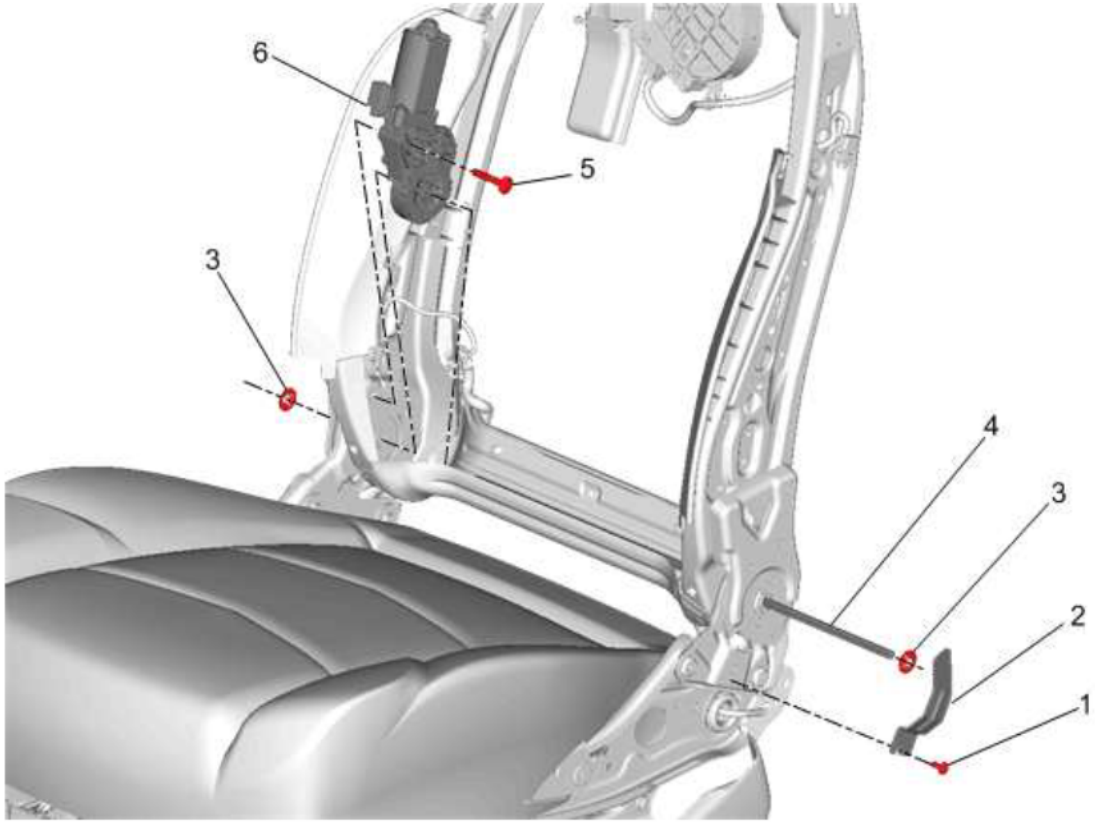


Fig. 38: Driver or Passenger Seat Recliner Actuator (22-Way Power)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: **Refer to SIR Warning .** **Preliminary Procedures** 1. **Driver or Passenger Seat Removal and Installation** 2. **Driver or Passenger Seat Inner Recliner Finish Cover Replacement** 3. **Front Seat Cushion Outer Finish Cover Replacement (22-Way Power)**	

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Callout	Component Name
4. **Driver or Passenger Seat Lumbar Support Replacement (22-Way Power)**	
1	Front Seat Bolt **CAUTION:** **Refer to Fastener Caution .** **Tighten** 2 N.m (18 lb in)
2	Front Seat Outer Recliner Finish Cover Bracket
3	Front Seat Recliner Actuator Shaft Retainer (Qty: 2) **NOTE:** **Replace with new actuator shaft retainer.**
4	Front Seat Recliner Actuator Shaft **Procedure** Gently tap the recliner shaft outward until the shaft is free of the recliner actuator.
5	Front Seat Recliner Actuator Bolt **Tighten** 6 N.m (53 lb in)
6	Front Seat Recliner Actuator **Procedure** Disconnect the electrical connector.

FRONT SEAT BACK WIRING HARNESS REPLACEMENT

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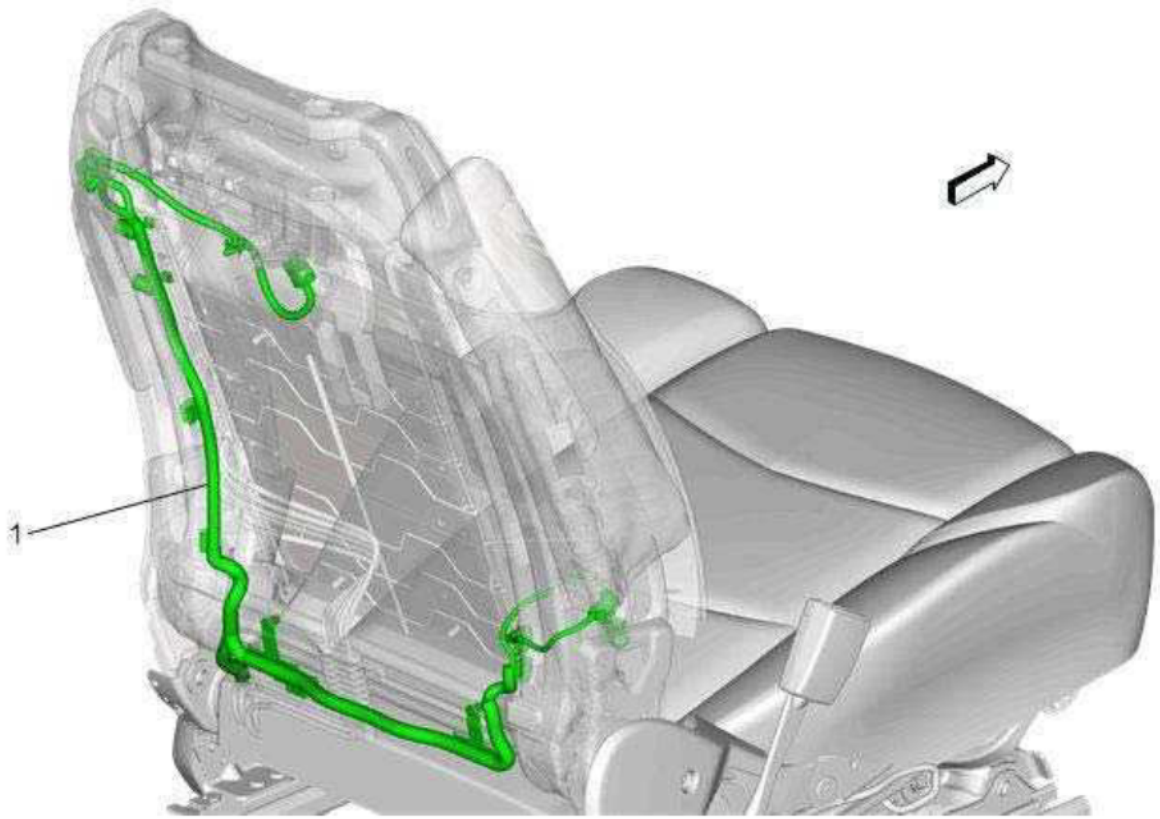


Fig. 39: Front Seat Back Wiring Harness
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: **Refer to SIR Warning .** **Preliminary Procedures** 1. Disable the SIR system. Refer to **SIR Disabling and Enabling** . 2. Remove the driver or passenger seat. Refer to **Driver or Passenger Seat Removal and Installation** . 3. Remove the driver or passenger seat back cushion cover and pad. Refer to **Driver or Passenger Seat Back Cover and Pad Replacement** **Driver or Passenger Seat Back Cover and Pad Replacement (22-Way Power)** .	

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FRONT SEAT CUSHION WIRING HARNESS REPLACEMENT

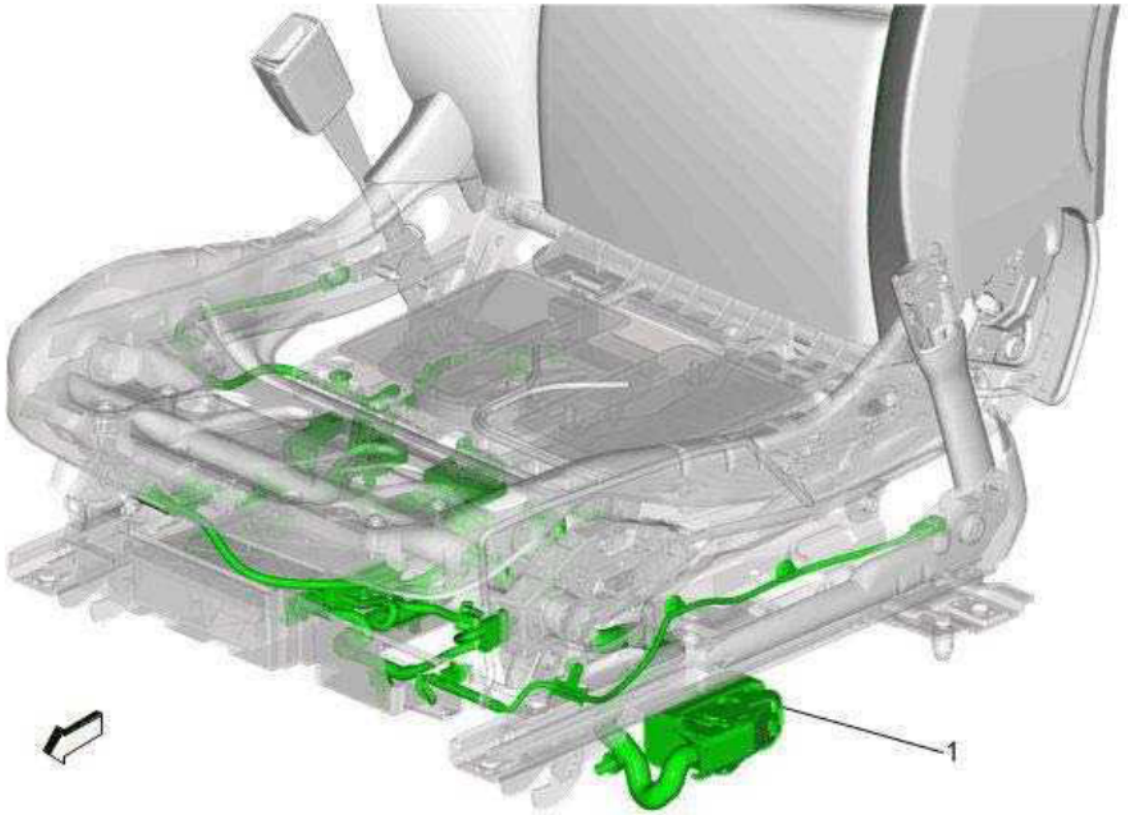


Fig. 40: Front Seat Cushion Wiring Harness
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: **Refer to SIR Warning .** **Preliminary Procedures** 1. Disable the SIR system. Refer to **SIR Disabling and Enabling** . 2. Remove the driver or passenger seat. Refer to **Driver or Passenger Seat Removal and Installation** .	

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Callout	Component Name
3. Remove the front seat cushion cover and pad. Refer to **Front Seat Cushion Cover and Pad Replacement** . 4. Whenever the inflatable restraint passenger presence system or any component of the passenger presence system is removed. Refer to **Control Module References** .	
1	Front Seat Cushion Wiring Harness **NOTE:** **Typical wiring harness shown, individual harness may be different due to option content.**

REAR SEAT WIRING HARNESS REPLACEMENT (BUCKET)

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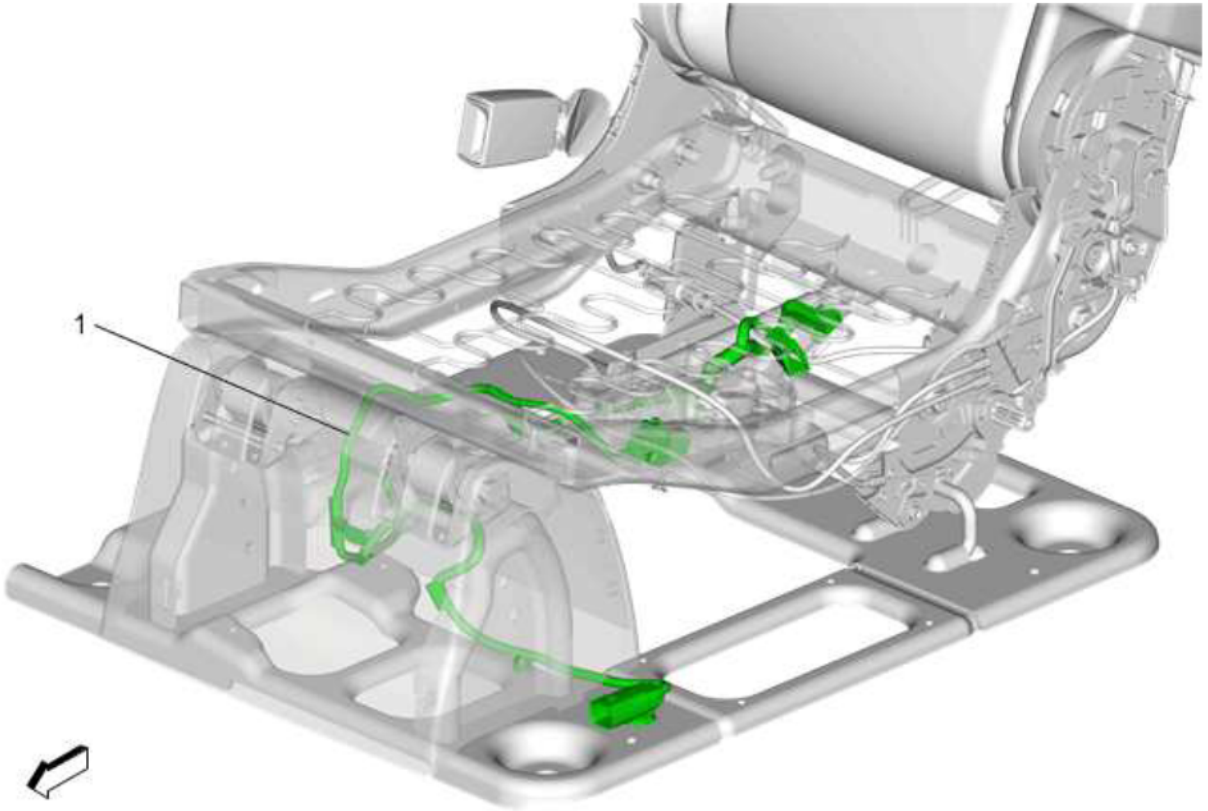


Fig. 41: Rear Seat Wiring Harness (Bucket)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the rear seat. Refer to **Rear Seat Removal and Installation (Bucket)** . 2. Remove the rear seat cushion cover and pad. Refer to **Rear Seat Cushion Cover and Pad Replacement (Bucket)** .	
1	Rear Seat Wiring Harness **NOTE:** **Typical wiring**

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Callout	Component Name
	harness shown, individual harness may be different due to option content.

REAR SEAT WIRING HARNESS REPLACEMENT (SPLIT BENCH)

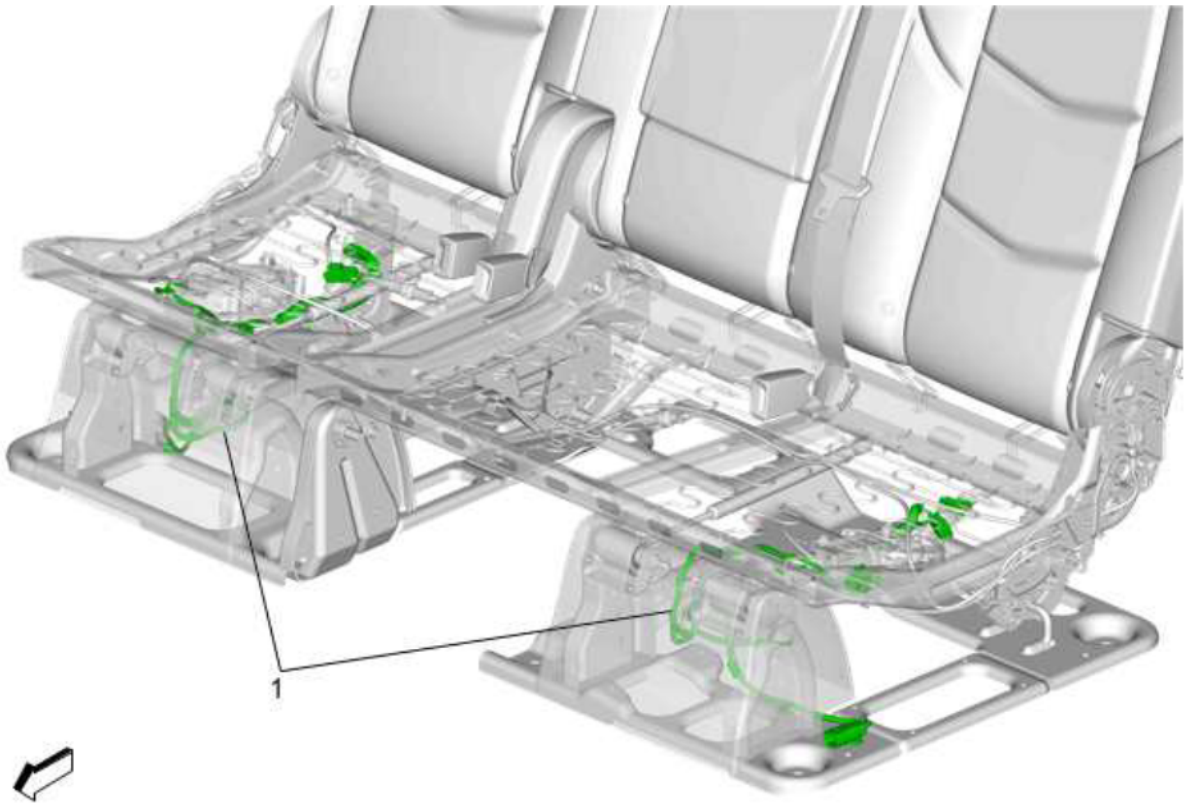


Fig. 42: Rear Seat Wiring Harness (Split Bench)
Courtesy of GENERAL MOTORS COMPANY

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Callout	Component Name
Preliminary Procedures 1. Remove the rear seat. Refer to **Rear Seat Removal and Installation (60/40 Bench)** . 2. Remove the rear seat cushion cover and pad. Refer to **Rear Seat Cushion Cover and Pad Replacement (60/40 Bench)** .	
1	Rear Seat Wiring Harness **NOTE:** **Typical wiring harness shown, individual harness may be different due to option content.**

3RD ROW SEAT ADJUSTER LATCH WIRE REPLACEMENT

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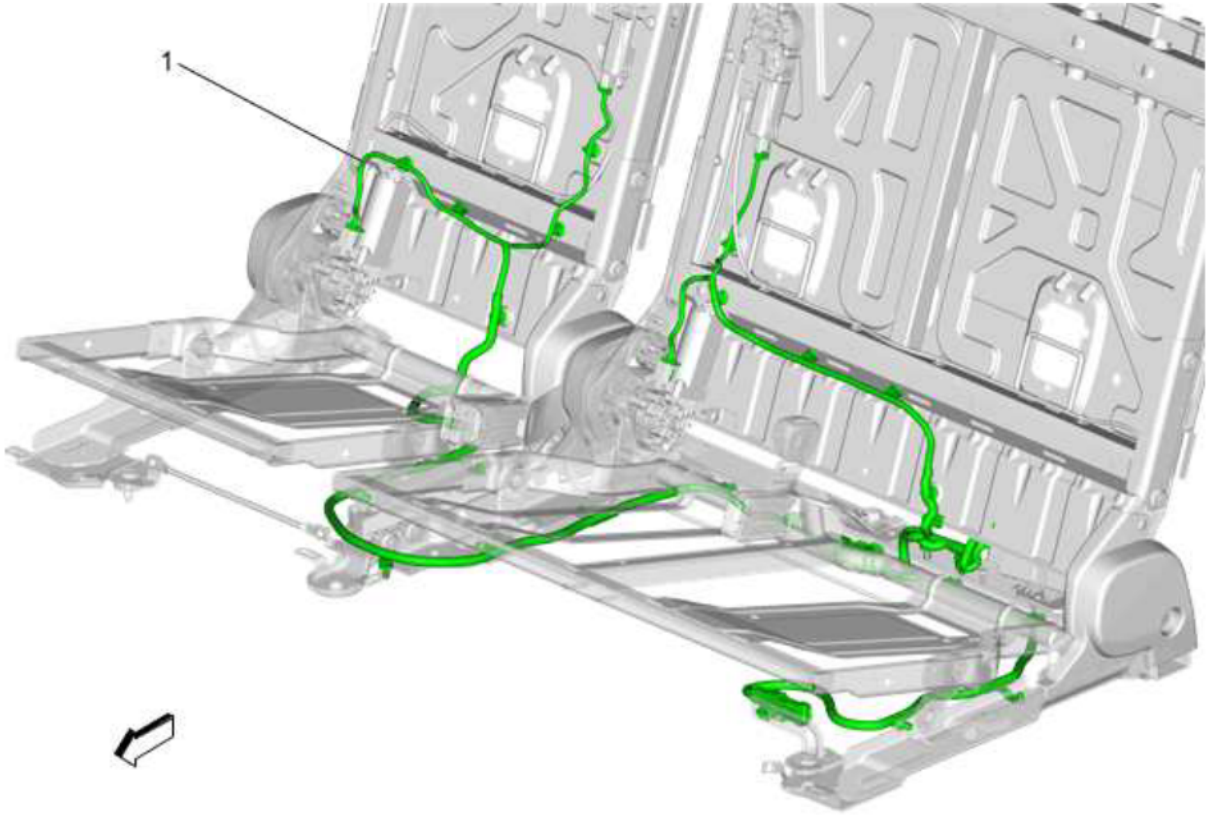


Fig. 43: 3rd Row Seat Adjuster Latch Wire
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: **Refer to SIR Warning .** **Preliminary Procedures** 1. Remove the 3rd row seat. Refer to **3rd Row Seat Removal and Installation** . 2. Remove the 3rd row seat cushion cover and pad. Refer to **3rd Row Seat Cushion Cover and Pad Replacement (60%)** **3rd Row Seat Cushion Cover and Pad Replacement (40%)** . 3. Remove the 3rd row seat back cover and pad. Refer to **3rd Row Seat Back Cover and Pad Replacement (40%)** **3rd Row Seat Back**	

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Callout	Component Name
Cover and Pad Replacement (60%) .	
1	3rd Row Seat Adjuster Latch Wire **NOTE:** **Typical wiring harness shown, individual harness may be different due to option content.**

REAR SEAT RECLINER SWITCH REPLACEMENT

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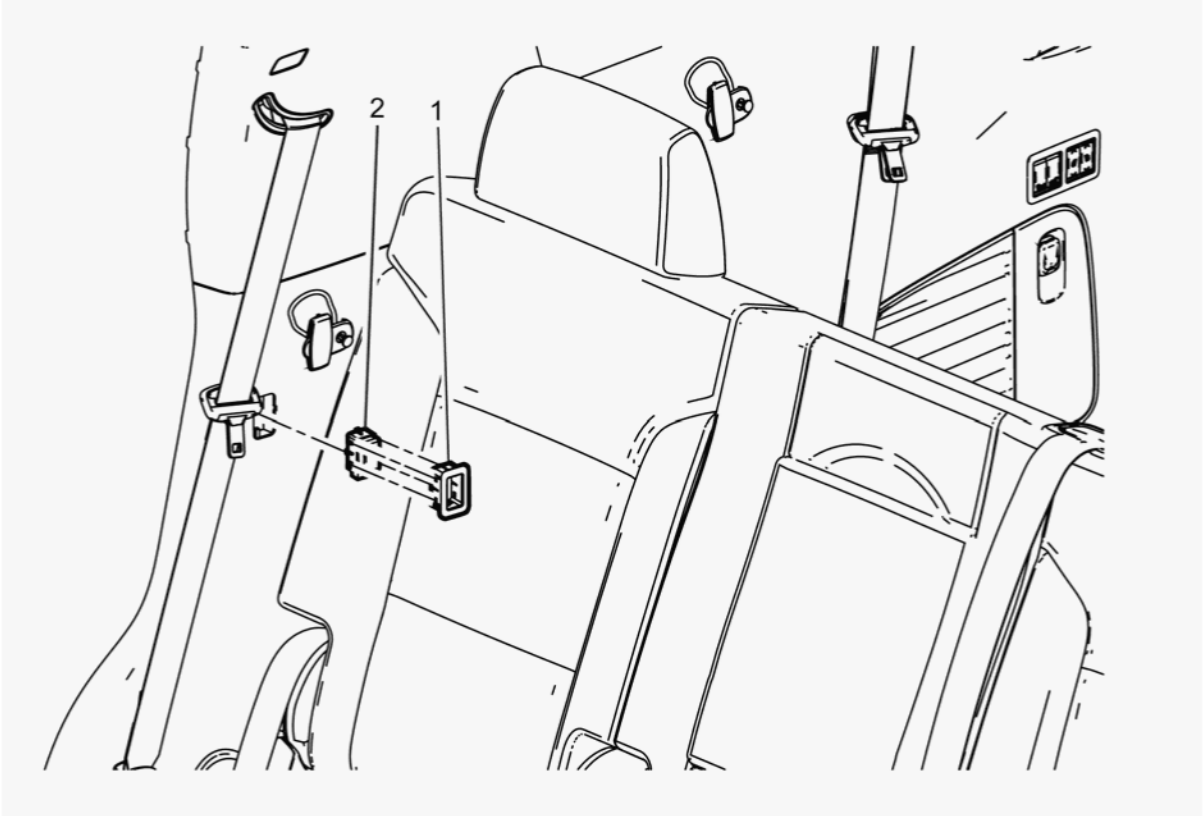


Fig. 44: Rear Seat Recliner Switch
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
1. Remove the body lock pillar upper trim panel. Refer to **Body Lock Pillar Upper Trim Panel Replacement** . 2. Remove the rear side door sill garnish molding. Refer to **Rear Side Door Sill Garnish Molding Replacement** . 3. Release the front of the quarter lower rear trim panel. Refer to **Quarter Lower Rear Trim Panel Replacement (Left Side, Standard Wheelbase)** **Quarter Lower Rear Trim Panel Replacement (Right Side, Standard Wheelbase)** **Quarter Lower Rear Trim Panel Replacement (Left Side, Extended Wheelbase)** **Quarter Lower Rear Trim Panel Replacement (Right Side, Extended Wheelbase)** .	

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Callout	Component Name
1	Rear Seat Recliner Switch Bezel **Procedure** Use a flat-bladed plastic trim tool in order to release the rear seat recliner switch bezel from the quarter lower trim panel
2	Rear Seat Recliner Switch **Procedure** Disconnect the electrical connectors.

REAR SEAT RECLINER ACTUATOR REPLACEMENT (WITH BUCKET)

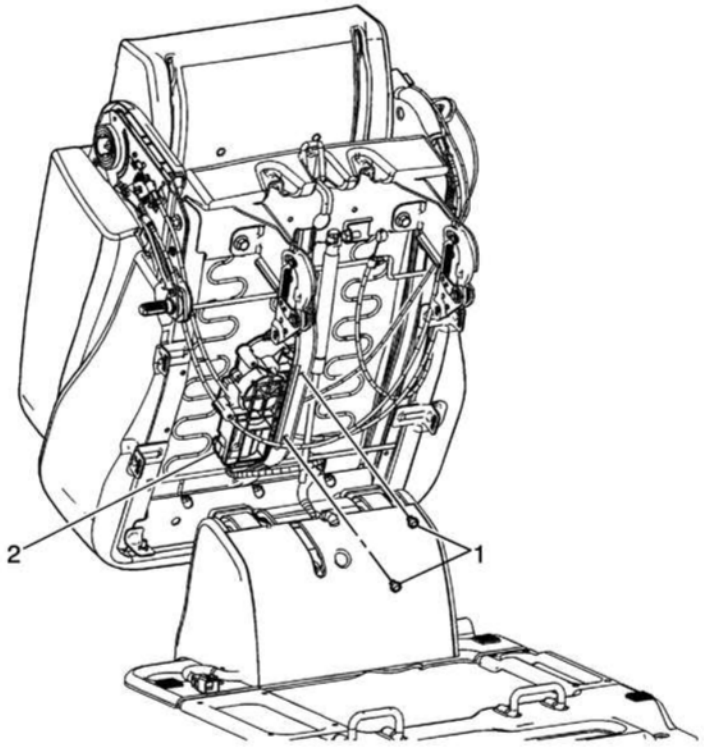


Fig. 45: View Of Rear Seat Recliner Actuator Assembly
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	

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Callout	Component Name
1. Fold the seat forward. 2. Remove the rear seat cushion trim panel. Refer to **Rear Seat Cushion Trim Panel Replacement (Bucket)** .	
1	Rear Seat Recliner Actuator Screw (Qty: 2) **CAUTION:** **Refer to** **Fastener** **Caution** . **Tighten** 3 N.m (27 lb in)
2	Rear Seat Recliner Actuator Assembly **Procedure** 1. Disconnect the electrical connector. 2. Disconnect the actuator cable assembly.

REAR SEAT RECLINER ACTUATOR REPLACEMENT (WITH SPLIT BENCH)

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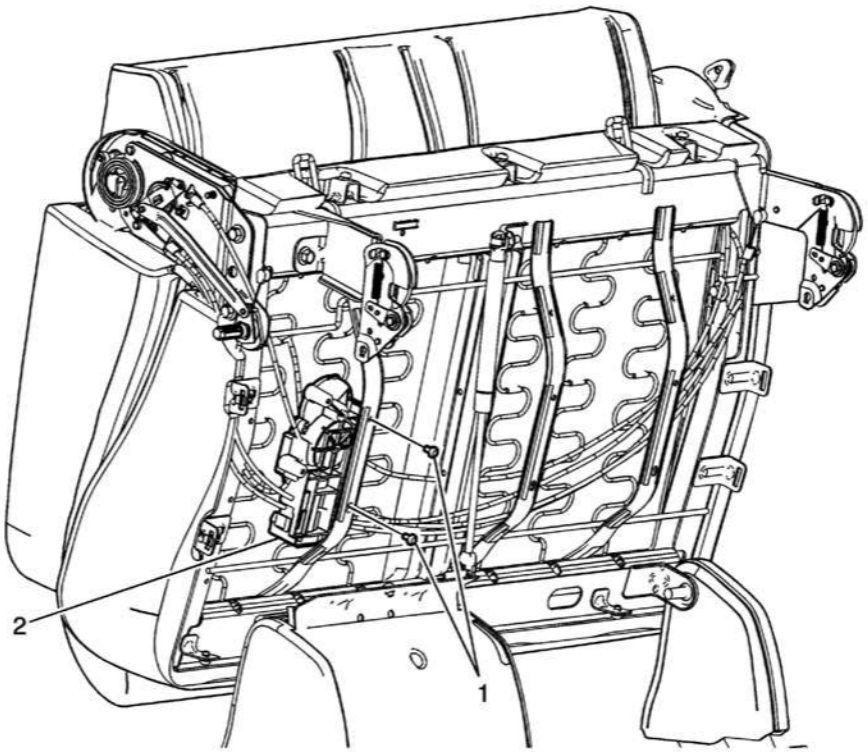


Fig. 46: View Of Rear Seat Recliner Actuator Assembly & Screws
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Fold the seat forward. 2. Remove the rear seat cushion trim panel. Refer to **Rear Seat Cushion Trim Panel Replacement (60/40 Bench)** .	
1	Rear Seat Recliner Actuator Screw (Qty: 2) **CAUTION:** **Refer to** **Fastener** **Caution** .

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Callout	Component Name
	NOTE: **The 60 percent seat is shown, the 40 percent seat is similar.** **Tighten** 3 N.m (27 lb in)
2	Rear Seat Recliner Actuator Assembly 1. Disconnect the electrical connector. 2. Disconnect the actuator cable assembly.

REAR SEAT RECLINER ACTUATOR REPLACEMENT (3RD ROW SEAT)

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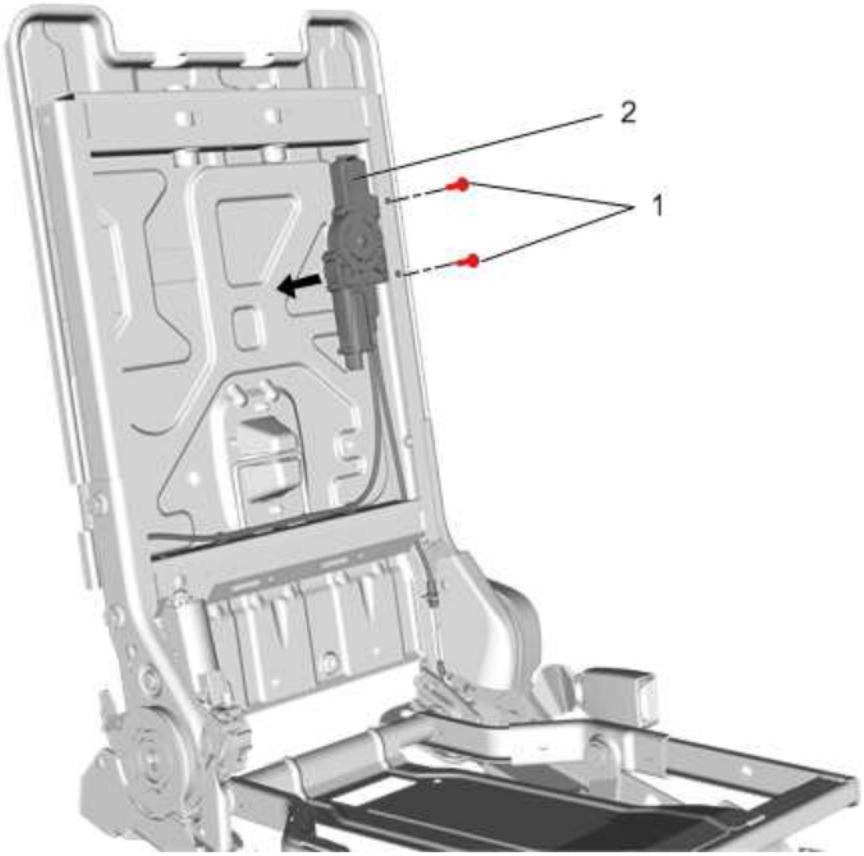


Fig. 47: Rear Seat Recliner Actuator (3rd Row Seat)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures Remove the 3rd row seat back cover and pad. Refer to **3rd Row Seat Back Cover and Pad Replacement (40%)** **3rd Row Seat Back Cover and Pad Replacement (60%)** .	
1	Rear Seat Recliner Actuator Screw (Qty: 2) **CAUTION:** **Refer to** **Fastener** **Caution** .

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Callout	Component Name
	NOTE: **The 40 percent seat is shown, the 60 percent seat is similar.** **Tighten** 6 N.m (53 lb in)
2	Rear Seat Recliner Actuator Assembly 1. Disconnect the electrical connector. 2. Disconnect the actuator cable assembly.

FOLDING 3RD ROW SEAT MODULE REPLACEMENT

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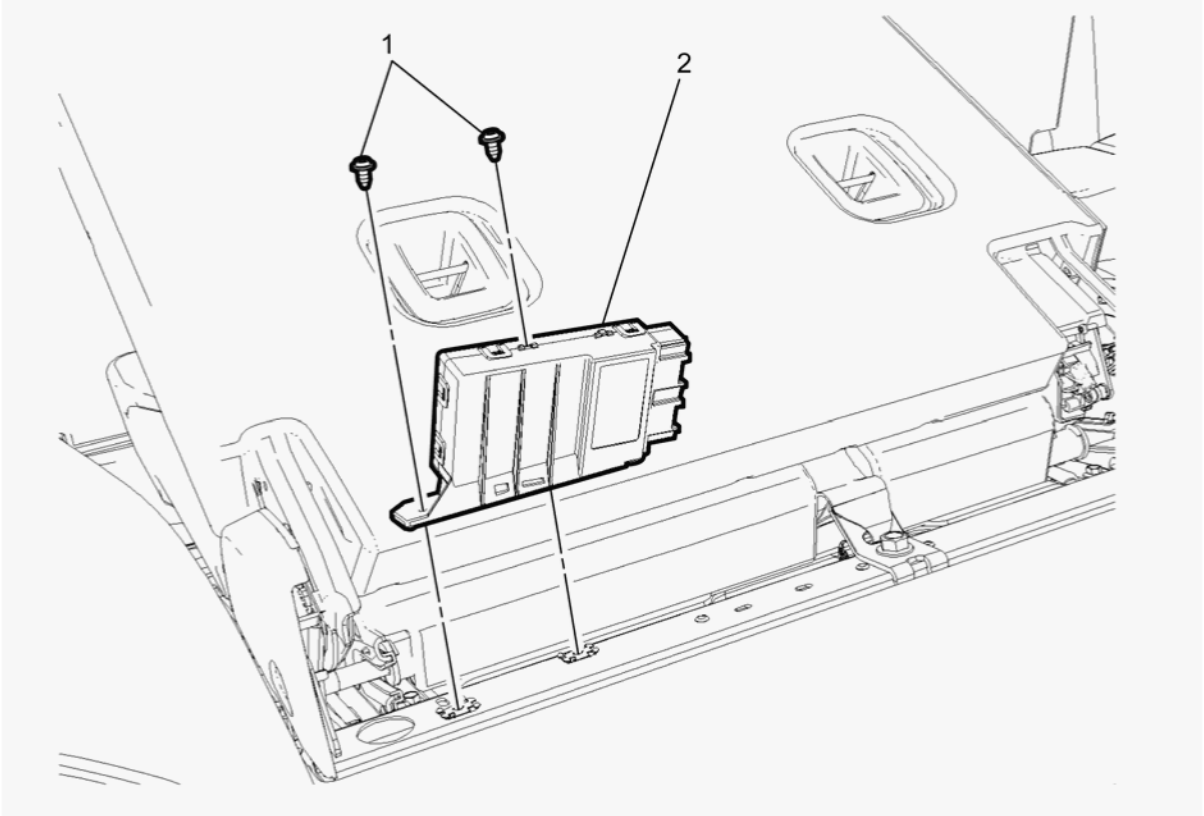


Fig. 48: Folding 3rd Row Seat Module
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Fold the 3rd row 60% seat forward. 2. Remove the rear compartment floor stowage trim compartment. Refer to **Rear Compartment Floor Stowage Trim Compartment Replacement (Standard Wheelbase)** **Rear Compartment Floor Stowage Trim Compartment Replacement (Extended Wheelbase)** .	
1	Folding 3rd Row Seat Module Screw (Qty: 2) **CAUTION:**

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Callout	Component Name
	Refer to Fastener Caution . **Tighten** 2.5 N.m (22 lb in)
2	Folding 3rd Row Seat Module **Procedure** 1. Disconnect the electrical connectors. 2. After the installation is complete, perform the **Diagnostic System Check - Vehicle** .

3RD ROW SEAT FOLDING SWITCH REPLACEMENT

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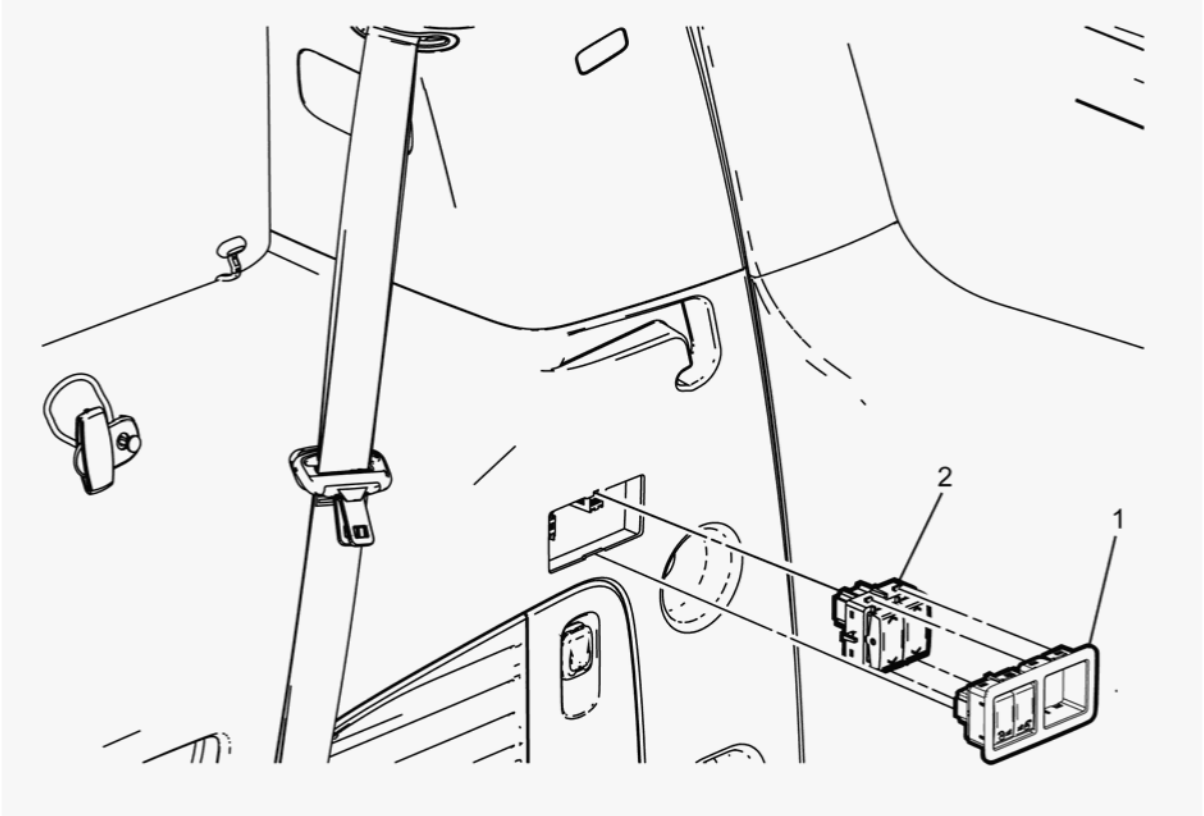


Fig. 49: 3rd Row Seat Folding Switch
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the quarter lower rear trim panel. Refer to **Quarter Lower Rear Trim Panel Replacement (Left Side, Standard Wheelbase)** **Quarter Lower Rear Trim Panel Replacement (Right Side, Standard Wheelbase)** **Quarter Lower Rear Trim Panel Replacement (Left Side, Extended Wheelbase)** **Quarter Lower Rear Trim Panel Replacement (Right Side, Extended Wheelbase)** .	
1	3rd Row Seat Folding Actuator Switch Bezel **Procedure** Use a flat-bladed plastic trim tool in order to release the 3rd row seat folding actuator switch bezel from the quarter lower trim panel
2	3rd Row Seat Folding Actuator Switch **Procedure**

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Callout	Component Name
	Disconnect the electrical connectors.

3RD ROW SEAT BACK PIVOT ACTUATOR MOTOR REPLACEMENT - BACK CUSHION

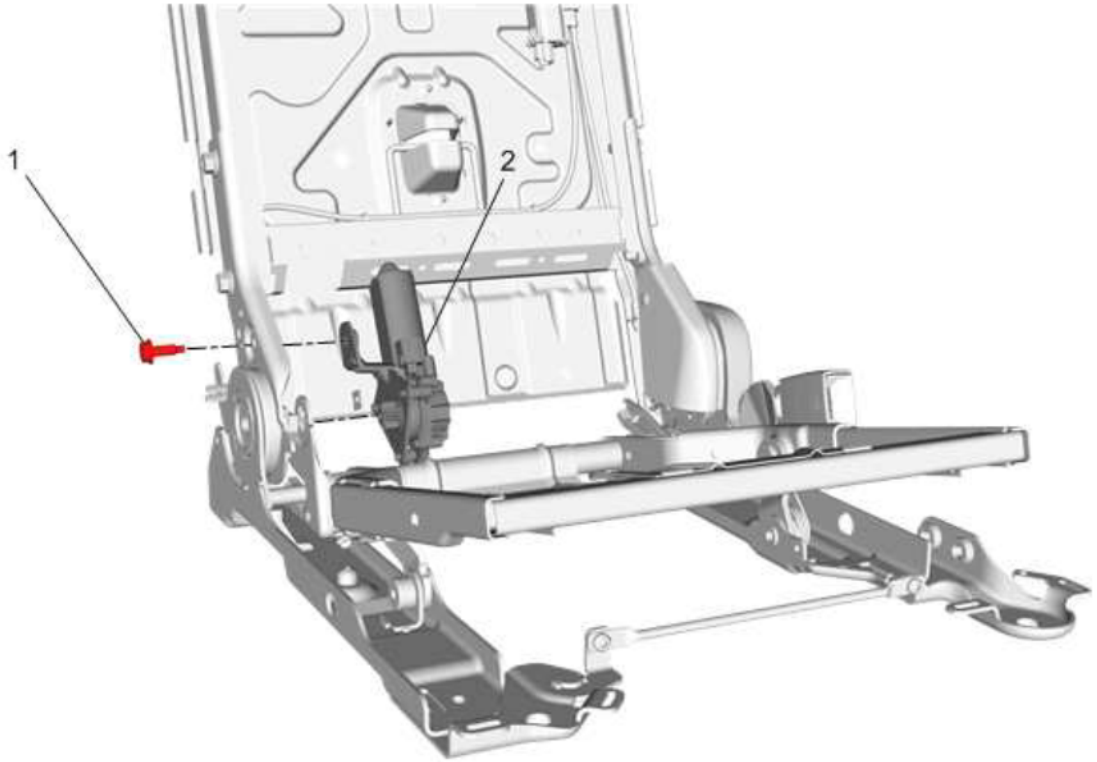


Fig. 50: 3rd Row Seat Back Pivot Actuator Motor - Back Cushion
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	
1. Remove the 3rd row seat back cover and pad. Refer to **3rd Row Seat Back Cover and Pad Replacement (40%)** **3rd Row Seat Back Cover and Pad Replacement (60%)** .	
2. Remove the 3rd row seat back hinge finish cover. Refer to **3rd Row Seat Back Hinge Finish Cover Replacement (40% Inboard**	

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Callout	Component Name
	with AS8) 3rd Row Seat Back Hinge Finish Cover Replacement (40% Outboard with AS8) 3rd Row Seat Back Hinge Finish Cover Replacement (60% Inboard with AS8) 3rd Row Seat Back Hinge Finish Cover Replacement (60% Outboard with AS8) 3rd Row Seat Back Hinge Finish Cover Replacement (60% Inboard with ARN) 3rd Row Seat Back Hinge Finish Cover Replacement (60% Outboard with ARN) 3rd Row Seat Back Hinge Finish Cover Replacement (40% Outboard with ARN) 3rd Row Seat Back Hinge Finish Cover Replacement (40% Inboard with ARN) .
1	3rd Row Seat Back Pivot Actuator Motor Bolt **CAUTION:** **Refer to Fastener Caution .** **Tighten** 28 N.m (21 lb ft) **NOTE:** **The seat back frame is under spring tension. When the motor is removed, the seat frame will suddenly spring into the folded position.**
2	3rd Row Seat Back Pivot Actuator Motor

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Callout	Component Name
	Procedure 1. Disconnect the electrical connector. 2. Slide the motor off of the gear keyed bracket on the frame. 3. Transfer the mounting bracket, if necessary.

DESCRIPTION AND OPERATION

LUMBAR SUPPORT DESCRIPTION AND OPERATION (2-WAY WITH MEMORY A45)

Lumbar Support Components

The driver seat lumbar support system with memory (A45) consists of the following components:

- Seat adjuster switch
- Seat memory control module
- Seat lumbar support horizontal motor

Lumbar Circuit Description

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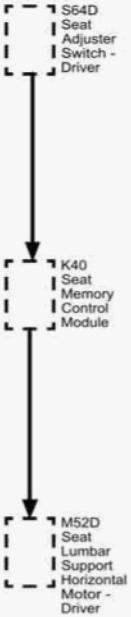


Fig. 51: Lumbar Circuit
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
S64D	S64D Seat Adjuster Switch - Driver
K40	K40 Seat Memory Control Module
M52D	M52D Seat Lumbar Support Horizontal Motor - Driver

Ground is supplied at all times to the driver seat adjuster switch through the switch ground circuit and ground connection. The seat memory control module supplies a low current voltage to each signal circuit of the seat lumbar support switch. When the seat switches are pressed, the appropriate signal circuit from the seat memory control module is pulled low through the switch contacts indicating the lumbar command. In response to this signal, the seat memory control module applies battery voltage through the driver seat lumbar motor forward control circuit and ground through the driver seat lumbar motor rearward control circuit to the motor. The motor runs to drive the lumbar support forward towards the occupants back until the switch is released. Moving the lumbar support rearward works similarly to moving the lumbar support forward, except that battery positive

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voltage and ground are applied on the opposite

LUMBAR SUPPORT DESCRIPTION AND OPERATION (2-WAY WITHOUT MEMORY A45)

Lumbar Support Components

The power seat lumbar support systems consist of the following components:

- Seat lumbar switch
- Lumbar support motor

The seat lumbar switch provides both power and ground to the lumbar support motor. The motor contains an electronic circuit breaker (PTC) that will reset only after voltage has been removed from the motor. The motor moves the lumbar support forward and rearward.

When the lumbar switch is operated to move the lumbar support rearward, battery positive voltage is applied through the lumbar rearward switch contacts and the lumbar motor rearward control circuit to the lumbar support motor. The motor is grounded through the lumbar forward switch contacts and the lumbar motor forward control circuit to the motor. The motor runs to drive the lumbar support rearward away from the occupant's back until the switch is released. Moving the lumbar support forward works similarly to moving the lumbar support rearward, except that battery positive voltage and ground are applied on opposite circuits causing the motor to run in the opposite direction.

LUMBAR SUPPORT DESCRIPTION AND OPERATION (4-WAY WITHOUT MEMORY A45)

Lumbar Support Components

The driver and front passenger pneumatic lumbar support system each consist of the following components:

- Seat Lumbar support switch
- Seat lumbar support valve assembly
- Seat lumbar support pump

Circuit Description

Battery voltage is supplied at all times to the seat adjuster switch through a 30 A fuse located in the instrument panel fuse block. When a lumbar switch is pressed to inflate the lumbar support, battery voltage is applied through the switch contacts and the inflate control circuit to the seat lumbar support valve assembly. In response to this signal, the lumbar support valve assembly energizes its internal inflate solenoid and applies battery voltage through the seat lumbar support pump control circuit to the pump. The pump runs to inflate the appropriate lumbar bladder until the switch is released. When the lumbar rearward switch is pressed to deflate the lumbar support, battery voltage is applied through the switch contacts and the deflate control circuit to the lumbar support valve assembly. The lumbar support valve assembly energizes its internal deflate solenoid and air is

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released from the bladder until the switch is released.

Description of Operation

The following describes the lumbar support operation and how the lumbar support valve assembly responds to each of the lumbar support switch inputs:

- When the lumbar support switch pressed in the FORWARD direction, the lumbar support valve assembly will command the lumbar support pump ON and the upper and lower lumbar support bladders should inflate until the bladders are 100% inflated or the switch is released.
- When pressing the lumbar support switch in the REARWARD direction, the lumbar support valve assembly will slowly deflate the upper and lower lumbar support bladders until the switch is released or both bladders are 100% deflated.
- When the lumbar support switch is pressed in the UP direction, the lumbar support valve assembly will slowly inflate the upper lumbar support bladder until the switch is released or the bladder is 100% inflated.
- When the lumbar support switch is pressed in the DOWN direction, the lumbar support valve assembly will slowly deflate the upper lumbar bladder while it inflates the lower lumbar bladder. The lumbar support valve assembly will continue this operation until the switch is released or the upper lumbar bladder is 100% deflated and the lower lumbar bladder is 100% inflated.

LUMBAR SUPPORT DESCRIPTION AND OPERATION (4-WAY WITH MEMORY A45)

The driver seat lumbar support system consists of the following components:

- Seat adjuster switch
- Seat memory control module
- Seat lumbar support valve assembly
- Seat lumbar pump

This driver seat lumbar support system is a non-memory 4-way pneumatic lumbar system controlled by the seat memory control module.

Circuit Description

Ground is supplied at all times to the driver seat adjuster switch through the switch ground circuit and ground connection. The seat memory control module supplies a low current voltage to each signal circuit of the seat adjuster switch. When the lumbar switch is pressed in the forward direction to inflate the seat lumbar support, the seat horizontal forward signal circuit from the seat memory control module is pulled low through the switch contacts indicating the seat lumbar command. The seat memory control module then applies battery voltage through the lumbar horizontal forward control circuit and ground through the lumbar horizontal rearward control circuit to the seat lumbar support valve assembly. The valve assembly energizes its internal inflate solenoid and applies battery voltage through the seat lumbar support pump control circuit to the pump. The pump runs to

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inflate the appropriate lumbar bladder until the switch is released. When the lumbar switch is pressed in the rearward direction, the lumbar support deflate signal circuit from the seat memory control module is pulled low indicating the lumbar deflate command. The seat memory control module then applies battery voltage through the lumbar horizontal rearward control circuit and ground through the lumbar horizontal forward control circuit to the seat lumbar support valve assembly. The valve assembly energizes its internal deflate solenoid and air is released from the lumbar bladders until the switch is released.

Description of Operation

The following describes the lumbar support operation and how the lumbar adjuster valve assembly responds to each of the lumbar support switch inputs:

- When the lumbar support switch pressed in the FORWARD direction, the lumbar adjuster valve assembly will command the lumbar support pump ON and the upper and lower lumbar support bladders should inflate until the bladders are 100% inflated or the switch is released.
- When pressing the lumbar support switch in the REARWARD direction, the lumbar adjuster valve assembly will slowly deflate the upper and lower lumbar support bladders until the switch is released or both bladders are 100% deflated.
- When the lumbar support switch is pressed in the UP direction, the lumbar adjuster valve assembly will slowly inflate the upper lumbar support bladder until the switch is released or the bladder is 100% inflated.
- When the lumbar support switch is pressed in the DOWN direction, the lumbar adjuster valve assembly will slowly deflate the upper lumbar bladder while it inflates the lower lumbar bladder. The lumbar adjuster valve assembly will continue this operation until the switch is released or the upper lumbar bladder is 100% deflated and the lower lumbar bladder is 100% inflated.

LUMBAR SUPPORT DESCRIPTION AND OPERATION (WITH SEAT BOLSTER MEMORY CONTROL MODULE)

The memory lumbar/bolster system uses air bladders to adjust various aspects of the seat configuration to meet an occupant's preference. It also allows these adjustments to be stored to a memory position along with the seat position data.

Some vehicles may also be equipped with dynamic mode control which gives the chassis subsystem the ability to request an automatic adjustment to the seat's bolster support depending on vehicle driving conditions.

The various seat adjustments and functionality which may be possible include:

- Lumbar support - forward and rearward
- Lumbar support - up and down
- Seat back side bolster
- Upper shoulder support
- Back massage functionality

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The components of the system include:

- LIN based seat switch
- Bolster memory control module
- Radio
- Information display
- Seat memory control module
- Seat air pump motor
- Air bladders

LIN Seat Switch

The seat switch communicates all customer requests for seat movement or adjustment via the LIN serial data bus to the seat memory control module. The seat switch may consist of the following controls:

- Seat adjuster switch similar to the typical discrete seat switch
- Massage On/Off switch, if massage is equipped
- 4-way multi-function switch which can be activated Up/Down/Forward/Rearward
- Feature select rotary ring around the outside of the 4-way multi-function Switch

Manipulating the seat cushion and seat back control bar results in the seat memory control module responding in the same way as it would if the resultant requests were made by discrete signals instead of the LIN messaging this switch employs.

Information Feature Display

Due to the number of pneumatic lumbar/bolster features available, and that the 4-way multi-function switch controls different operations depending on feature selection, the information display is used for the visual feedback of the feature selected as well as which operations of the feature are under the control of the 4-way multi-function switch.

The seat memory control module will track and maintain which lumbar/bolster features are available on the vehicle as well as the current feature selection and its settings. This information is communicated via GMLAN to the radio tuner which in turn communicates it to the information interface for display. The display will show a seat image with the specific selected feature highlighted. In addition, arrows and text will indicate the functions to be adjusted by the 4-way multi-function switch.

If the seat selection menu is not showing on the display, adjusting the lumbar/bolster seat switches will bring this menu up. Only when the display is

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active and the various features are displayed by the infotainment system, then customer can then use the rotary ring to move up or down the feature menu. The display will show a seat image with the specific selected feature highlighted along with arrows and text to indicate the functions to be adjusted by the 4-way multi-function switch.

Lumbar/Bolster Operation

Once the lumbar/bolster feature has been selected, the seat memory control module will command the seat bolster memory control module to perform the required pneumatic movements via LIN serial data messages.

The seat bolster memory control module contains the electronic circuitry for executing the commanded pneumatic seat adjustments, air direction solenoids, pressure sensors for storing air bladder pressures, and an output which supplies battery power to the external seat air pump motor when any of the air bladders require inflating.

Based on the LIN command from the seat memory control module, the seat bolster memory control module controls the appropriate air solenoids and activates or deactivates the external air pump in order to inflate or deflate the air bladders in the correct combination. When an air bladder needs inflating its solenoid opens and the pump motor is activated pumping air into the bladder. When an air bladder needs deflating its solenoid opens the release valve and air is allowed to bleed out of the bladder into the vehicle cabin.

To support memory recall and massage, the seat bolster memory control module uses internal air pressure sensors to track, store and recall the positions of all the air bladders under its control.

The massage On/Off switch on the LIN seat switch allows the customer to turn the massage feature on and off without having to go back into the seat feature menu for set-up.

Refer to Seat Adjustment in the Owner's Manual for the up level seat adjustment features listed above.

MEMORY SEATS DESCRIPTION AND OPERATION

The driver memory seat system consists of the following components:

- Seat adjuster switch
- Seat memory switch
- Seat memory control module
- Seat horizontal motor
- Seat front vertical motor
- Seat rear vertical motor

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- Seat recline motor
- Seat horizontal motor position sensor
- Seat front vertical motor position sensor
- Seat rear vertical motor position sensor
- Seat recline motor position sensor

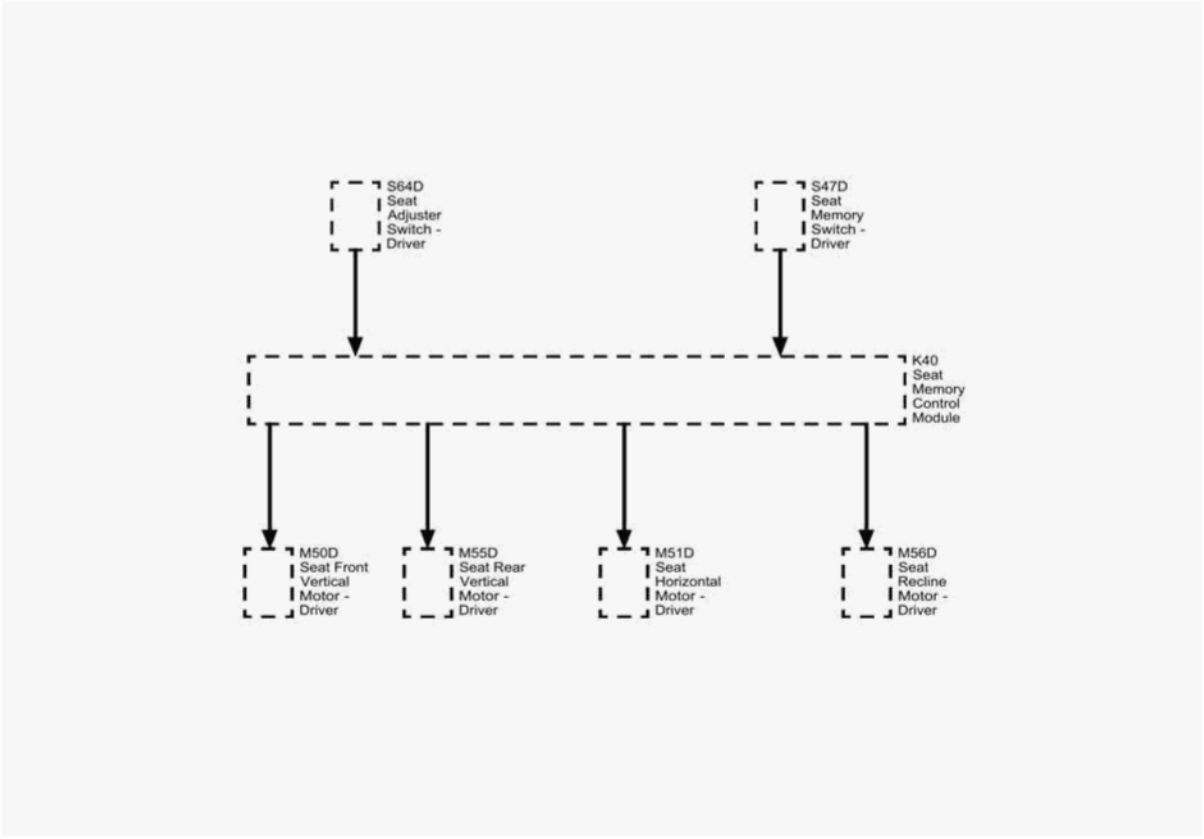


Fig. 52: Memory Seat Block Diagram
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
S64D	S64D Seat Adjuster Switch - Driver
S47D	S47D Seat Memory Switch - Driver
K40	K40 Seat Memory Control Module

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Callout	Component Name
M56D	M56D Seat Recline Motor - Driver
M51D	M51D Seat Horizontal Motor - Driver
M55D	M55D Seat Rear Vertical Motor - Driver
M50D	M50D Seat Front Vertical Motor - Driver

Driver Seat Adjuster Switch

For vehicles equipped with the Seat Bolster Memory Control Module feature (AQJ), refer to **Lumbar Support Description and Operation (2-Way with Memory A45)Lumbar Support Description and Operation (2-Way without Memory A45)Lumbar Support Description and Operation (4-Way without Memory A45)Lumbar Support Description and Operation (4-Way with Memory A45)Lumbar Support Description and Operation (With Seat Bolster Memory Control Module)** for the seat adjuster switch description and operation.

Ground is supplied at all times to the driver seat adjuster switch through the switch ground circuit and ground connection. The seat memory control module supplies a low current voltage to each signal circuit of the seat adjuster switch. When the driver seat adjuster switches are pressed, the appropriate signal circuit from the seat memory control module is pulled low through the switch contacts indicating the power seat command. The seat memory control module then commands the appropriate driver seat motor to move in response to the switch signal.

Seat Memory Control Module Power and Grounds

Battery voltage is supplied at all times to the seat memory control module through two different circuits. One circuit is used by the module to apply power to the driver seat motors and lumbar motors, if equipped, when commanded ON. The second battery voltage circuit is used to power up module and supply a reference voltage to the seat position sensors. Ground is provided to the seat memory control module through a single ground circuit and ground connection.

Seat Motors

There are 4 motors that move the position of the seat. These are the seat horizontal motor, seat front vertical motor, seat rear vertical motor, and the seat back recline motor. The horizontal motor moves the entire seat forward and rearward. The seat front vertical motor moves the front of the seat cushion up or down. The seat rear vertical motor moves the rear of the seat cushion up and down. Due to the seat adjuster switch design the front tilt and the seat height adjuster motor cannot be operated at the same time The recline motor moves the angle of the seat back forward or rearward.

The seat memory control module controls all seat and lumbar motors via half bridges that are connected to a single power rail internal to the module. The module connects all seat and lumbar motor outputs to a common ground whenever they are not in operation. The seat memory control module checks to see if any motor control circuits are shorted to ground or voltage before enabling any seat or lumbar motor. All of the motors operate independently of each other. Each motor contains a electronic circuit breaker (PTC), which will reset only after voltage has been removed from the motor.

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All seat motors are reversible. For example, when a seat switch is pressed to move the entire seat forward, ground is applied through the switch contacts onto the seat horizontal forward switch signal circuit to the seat memory control module. In response to this signal, the module applies battery voltage through the driver seat horizontal motor forward control circuit and ground through the driver seat horizontal motor rearward control circuit to the motor. The motor runs in order to drive the entire seat forward. Moving the entire seat rearward works similarly to moving the entire seat forward, except that battery voltage and ground are applied on the opposite circuits causing the motor to run in the opposite direction. All of the motors are powered this way.

Position Sensors

To monitor seat position, each seat motor has an internal 2-wire hall-effect position sensor. The seat memory control module supplies all the sensors with a common 12 V reference when the seat is moving and a unique signal circuit for each sensor. During seat motor operation, the position sensors provide a specific number of pulse signals for every revolution of the motor shaft.

The seat memory control module determines seat position by keeping a running counter where movement in the forward/upward direction adds counts and movement in the rearward/down direction subtracts counts. The value of the counter will be in the range of 0 - 65, 535

The value of these counters, which represent seat positions, are stored in memory for future seat memory recall operation. During a memory seat position recall, the seat memory control module moves the seat in such a way to return it the stored counter value.

Memory Functions

In all power modes except crank, memory recalls can be initiated by pressing and holding one of the memory position buttons until the seat reaches the stored memory position associated with the activated button. This is called a supervised recall.

The seat memory control module supplies a ground at all times through a low reference circuit to the driver seat memory switch. The module also supplies memory set and memory recall signal circuits to the seat memory switch. When a memory recall switch is pressed, the signal circuit from the seat memory control module is pulled low through the switch contacts and a series of resistors indicating the memory recall request. In response to this signal, the seat memory control module commands the appropriate seat motors to move to the pre-recorded seat positions stored in memory.

Refer to the Owner's Manual for storing memory positions.

Auto Memory Recall and Easy Exit

The seat memory control module will not perform Auto Memory Seat Recall and Easy Exit functions unless these options are enabled in vehicle personalization using the radio/HVAC controls.

Refer to Instruments and Controls/Vehicle Personalization in the Owner's Manual for the following memory personalization options:

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- Auto Memory Recall
- Easy Exit Options

The radio/HVAC controls reports the auto memory recall option settings to the seat memory control module via serial data message. The module will then store the memory recall option setting and examine it before making a memory seat adjustment. The auto memory recall option setting stored within the module will not change until the auto memory recall option setting in vehicle personalization is changed.

POWER SEATS SYSTEM DESCRIPTION AND OPERATION (FRONT SEATS)

The driver and passenger power seat systems each consist of the following components:

- Seat adjuster switch
- Seat horizontal motor
- Seat front vertical motor (If Equipped)
- Seat rear vertical motor
- Seat recline motor

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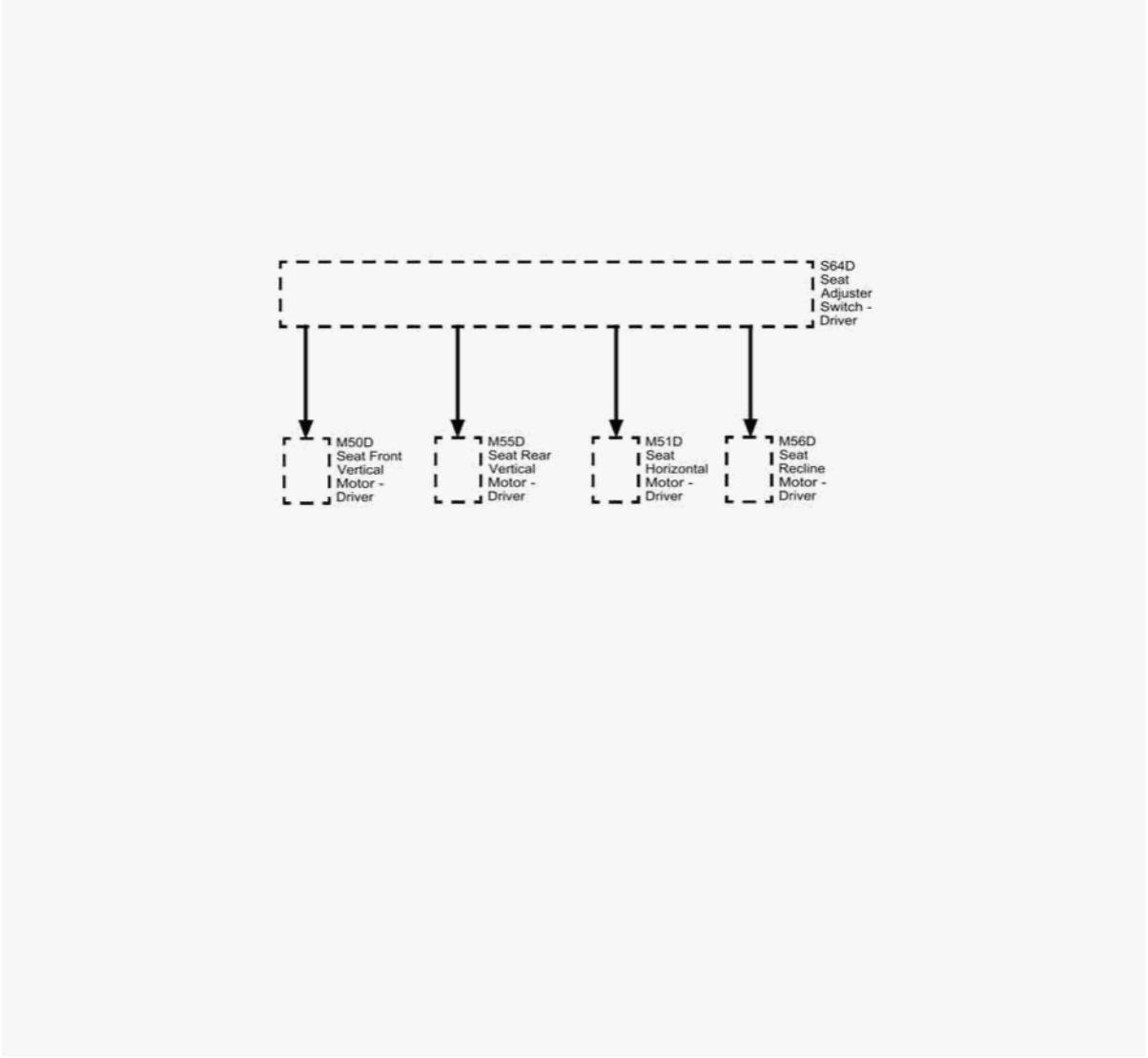


Fig. 53: Power Seat Block Diagram
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
S64D	S64D Seat Adjuster Switch - Driver
M56D	M56D Seat Recline Motor - Driver
M51D	M51D Seat Horizontal Motor - Driver

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Callout	Component Name
M55D	M55D Seat Rear Vertical Motor - Driver
M50D	M50D Seat Front Vertical Motor - Driver

Seat Motors

The seat switches provide both power and ground to the selected seat motors.

All of the seat motors operate independently of each other. Each motor contains an electronic circuit breaker (PTC) that opens in the event of a circuit overload and will reset only after voltage has been removed from the circuit. There are four seat position motors and two lumbar motors. These are the horizontal motor, front vertical motor, rear vertical motor, and the seat back recline motor. The seat horizontal motor moves the entire seat forward and rearward. The seat vertical motors may operate independently to tilt the front or rear of the seat cushion up or down. Both motors can also run simultaneously to move the entire seat up or down. The recline motor moves the angle of the seat back forward or rearward.

Seat Operation

All seat motors are reversible. For example, when the seat horizontal forward switch is pressed to move the entire seat forward, battery voltage is applied through the switch contacts and the seat horizontal motor forward control circuit to the motor. With the horizontal motor rearward switch contacts closed to the switch ground circuit, the motor runs in order to drive the entire seat forward until the switch is released. Moving the entire seat rearward works similarly to moving the entire seat forward, except that battery voltage and ground are applied on opposite circuits causing the motor to run in the opposite direction. All seat motors are powered this way.

POWER SEATS SYSTEM DESCRIPTION AND OPERATION (2ND ROW SEATS)

The left and right 2nd row folding seat systems each consist of the following components:

- Folding seat switch
- Folding seat motor

The folding 2nd row seats are operated from the folding seat switches located on the driver side rear panel and on the trim panel in the rear cargo area. Battery voltage is supplied at all times to the folding seat switches through the park enable relay while in a de-energized state. Battery voltage is also supplied at all times to the folding seat motors through a 20 A fuse located in the rear body fuse block. When a folding seat switch is pressed, battery voltage is applied through the switch contacts and the control circuit to the folding seat motor. The motor runs to move the seat back to the folded position.

POWER SEATS SYSTEM DESCRIPTION AND OPERATION (3RD ROW SEATS)

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The left and right 3rd row folding seat system each consist of the following components:

- Folding seat control module - 3rd row
- Folding seat switch - D-pillar 3rd row
- Folding seat motor - seat back release 3rd row
- Folding seat motor - 3rd row
- Folding seat sensor

Folding Seat Control Module - 3rd Row

The folding seat control module controls both sides of the 60/40 split 3rd row folding seat.

The folding seat control module will be in a low power sleep state until it detects the activation of one of the folding seat switches. It will remain in its normal operating awake mode and not return to its sleep mode until all its outputs have been off for 30 s and it has been determined that no switches are active.

Battery positive voltage is supplied at all times to the folding seat control module through a 30 A fuse located in the rear body fuse block. The module uses this voltage for both logic power and to power the seat motors and seat back release motors. Each folding seat motor and release motor is controlled by a relays internal to the folding seat control module and through two control circuits to each motor and release motor. The control module checks to see if the control circuits are shorted to ground or voltage before enabling folding seat operation.

Folding Seat Switches

The 3rd row folding seat switches are located on the D-pillar of the rear cargo area. Each side of the 60/40 split seat has a pair of fold and unfold normally open, high assertion, momentary switches designed to keep them from being simultaneously pressed.

When the transmission is in the park position, battery voltage is supplied to the folding seat switches through the normally closed contacts of the Park Enable Relay which is controlled by the BCM. When the transmission is not in the park position, the BCM energizes the relay opening the contacts and removing battery voltage from the switches. Thus folding seat operation is only available with the vehicle transmission in the park position.

Each switch contact is connected to an individual discrete input of the folding seat control module which provides a pull down to ground on these signal circuits. When a folding seat switch is pressed battery voltage is applied through the switch contacts and the signal circuit to the folding seat control module. The module then commands the folding seat to move in response to the switch signal.

Folding Seat Motor - Seat Back Release

The folding seat back release motor is a spring loaded device used to latch the seat back into its desired parked position or to unlatch the seat back for

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folding or unfolding seat operation. There are three modes of release motor control; retract, hold, and release. When the folding seat switch is pressed to fold the seat, the folding seat control module applies a PWM voltage, approximately 95% duty cycle, through the seat back release motor control circuit to the motor releasing the seat back. The control module holds the release motor at a reduced voltage, approximately 25% duty cycle, until a stall condition is reached. Once a stall condition is reach the module releases the motor latching the seat back in place. One second after the motor is released, the seat will move in the opposite direction of travel to confirm the seat back is locked in a secure position. This action will continue until a stall condition is detected, refer to Folding Seat Sensor below. After the completion of the latch lock conformation, the module will relieve any bound up tension after the latch lock conformation.

Folding Seat Motor

The folding seat motor is used to physically move the seat back to its desired position. It is a bi-directional motor connected to two H-Bridge relay outputs of the folding seat control module. To fold the seat, one control module output provides power to one side of the motor while the other side is grounded through the other relay output. To unfold the seat, the polarities on the motor are reversed.

While the motor outputs are off, the control module internal diagnostic network applies a bias voltage of 2.5 V to the motor control circuits. If there is a short to voltage or a short to ground on either control circuit, this will cause a shift in the bias voltage on the diagnostic network and the module will not activate a motor under this condition.

Folding Seat Sensor

Internal to the folding seat motor is the folding seat sensor. The sensor is a 2-wire hall-effect sensor which is used strictly to determine the stall status of the folding seat motor. It is not used to provide seat position information.

The folding seat control module supplies a 10 V reference voltage through one circuit while the other circuit is the signal circuit. As the motor runs the sensor provides 4 pulses per revolution which it uses to determine when the motor has reached a stalled condition. A stall condition is caused by the seat back being fully folded, by being unfolded in the upright position, or by an object in the seat's path preventing movement. If the module does not detect a pulse from the sensor for 100 ms it will cease the folding seat operation.

Folding Seat Operation

With the vehicle transmission in the park position, the folding seat will operate in either dual mode or single mode. The normal operating mode is the dual seat mode where both sides of the 60/40 seat can move individually or at the same time.

Single seat mode is entered during a requested operation when the system voltage drops below 10.5 V. It allows only one side of the 60/40 seat to be folded at a time until the requested operation is complete. Once the operation is completed, additional switch inputs will be ignored until the voltage level returns to its normal range. In all cases the 60 seat operation will have priority over the 40 seat operation.

When a switch is activated, battery voltage is applied to the associated input signal to the control module. This wakes the module up out of its low

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power state and begins to execute the requested seat movement.

First, the control module operates the folding seat back release motor in the pull state, refer to Folding Seat Motor - Seat Back Release above, until it considers the seat is unlatched as determined either monitoring motor current for a stall condition or a 1.5 s time-out. Once the seat is considered unlatched the control module maintains the release motor in the hold state to keep the latch pin disengaged from the seat.

Once the release motor is in the hold state, the control module powers the folding seat motor in the appropriate direction to fold or un-fold the seat based on which switch inputs are active. While the seat motor is active the control module monitors the folding seat sensor for a stall condition, switch inputs for a transition from the active to the inactive state, excessive motor current, and the time the motor is active.

The seat will continue to move until the control module determines that either the customer has released the switch, the folding seat sensor indicates that the folding seat motor is in a stall condition, excessive motor current is detected, or the current seat movement is taking an excessive amount of time to execute for the given system voltage and operating temperature. When any of these conditions are detected the control module turns off the seat motor, then releases the motor allowing the motor's spring to drive the latch pin back into the lock position. The control module then executes a seat parking operation.

To execute seat parking, one second after the release motor is released, the seat shall move in the opposite direction of travel to confirm the latch is locked. This seat movement will occur until a stall condition is detected or 400 ms have passed. Then to relieve any tension in the seat structure that may have occurred due to the latch confirmation, the seat will move in the opposite direction for a specified amount of travel or after 100 ms have passed.

The module will power down to its low power state when all the switches appear inactive and all the outputs have been inactive for 30 s.

POWER SEATS SYSTEM DESCRIPTION AND OPERATION (PASSENGER SEAT WITH SEAT BOLSTER MEMORY CONTROL MODULE)

The passenger power seat motors controlled by a seat memory control module consists of the following components:

- Seat adjuster switch
- Seat memory control module
- Seat horizontal motor
- Seat front vertical motor
- Seat rear vertical motor
- Seat recline motor

Passenger Seat Adjuster Switch

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The seat adjuster switch on vehicles equipped with the seat memory lumbar/bolster feature is a LIN Bus device. When a power seat switch is pressed, a serial data message is sent from the seat adjuster switch to the seat memory control module indicating the power seat command. The seat memory control module then commands the appropriate seat motor to move in response to the switch signal.

Seat Memory Control Module Power and Grounds

Battery voltage is supplied at all times to the passenger seat memory control module through a 30 A fuse located in the right instrument panel fuse block. This voltage is used by the module to apply power to the seat motors when commanded ON. Battery voltage is also supplied at all times to the seat memory control module through a 10 A fuse located in the left instrument panel fuse block. This voltage is used to power up module. Ground is provided to the seat memory control module through a single ground circuit and ground connection.

Seat Motors

There are 4 motors that move the position of the seat. These are the seat horizontal motor, seat front vertical motor, seat rear vertical motor, and the seat back recline motor. The horizontal motor moves the entire seat forward and rearward. The seat front vertical motor moves the front of the seat cushion up or down. The seat rear vertical motor moves the rear of the seat cushion up and down. Due to the seat adjuster switch design the front tilt and the seat height adjuster motor cannot be operated at the same time The recline motor moves the angle of the seat back forward or rearward.

The seat memory control module controls all seat motors via half bridges that are connected to a single power rail internal to the module. The module connects all seat motor outputs to a common ground whenever they are not in operation. The seat memory control module checks to see if any motor control circuits are shorted to ground or voltage before enabling any seat motor. All of the motors operate independently of each other. Each motor contains a electronic circuit breaker (PTC), which will reset only after voltage has been removed from the motor.

All seat motors are reversible. For example, when a seat switch is pressed to move the entire seat forward, ground is applied through the switch contacts onto the seat horizontal forward switch signal circuit to the seat memory control module. In response to this signal, the module applies battery voltage through the seat horizontal motor forward control circuit and ground through the seat horizontal motor rearward control circuit to the motor. The motor runs in order to drive the entire seat forward. Moving the entire seat rearward works similarly to moving the entire seat forward, except that battery voltage and ground are applied on the opposite circuits causing the motor to run in the opposite direction. All of the motors are powered this way.

Memory Functions

The passenger power seat system controlled by the seat memory control module does not support seat memory functions. Its purpose is to support the seat bolster memory control module.

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