

2018 ACCESSORIES & EQUIPMENT

Power Seats - Traverse

SPECIFICATIONS

FASTENER SPECIFICATIONS

Reusable Threaded Fastener Tightening Specifications

NOTE:

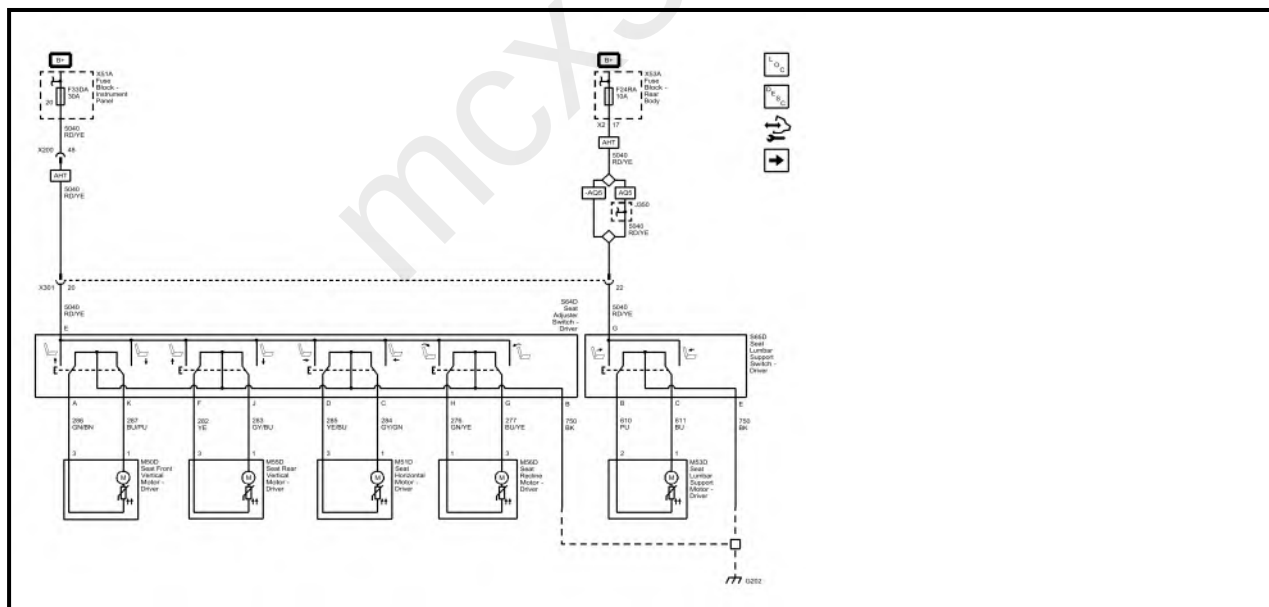
All fasteners listed in this table can be reused after removal.

Application	Specification
	Metric (English)
Driver or Passenger Seat Recliner Actuator Bolt	6 N.m (53 lb in)
Driver Seat Adjuster Memory Module Fastener	2.5 N.m (22 lb in)
Folding 3rd Row Seat Bracket Bolt	10 N.m (89 lb in)
Folding 3rd Row Seat Module Screw	2.5 N.m (22 lb in)
Front Seat Adjuster Memory Module Bracket Fastener	2.5 N.m (22 lb in)
Front Seat Tilt Adjuster Actuator Bolt	8 N.m (71 lb in)
Front Seat Vertical Adjuster Actuator Nut	23 N.m (17 lb ft)

SCHEMATIC WIRING DIAGRAMS

DRIVER SEAT WIRING SCHEMATICS

Seat Adjuster Switch and Motors (Without AAB) and Lumbar Support



Module Power, Ground, Serial Data, and Memory Controls (AAB)

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

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 Wiring 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

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 appropriate 12 V reference circuit terminal listed below and ground while pressing any power seat switch.
 - Front vertical motor - terminal 2
 - Rear vertical motor - terminal 4
 - Horizontal motor - terminal 4
 - Recline motor - terminal 2
 - **If 10.8 V or less**
 1. Ignition OFF, disconnect the X5 harness connector at the K40D Seat Memory Control Module - Driver.
 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.
 - Go to next step: 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 K40D Seat Memory Control Module - Driver.
 - **Go to next step: If greater than 10.8 V**
4. Test for 0.2 - 2 V between the appropriate signal circuit terminal listed below and ground:

- Front vertical motor - terminal 4
- Rear vertical motor - terminal 2
- Horizontal motor - terminal 2
- Recline motor - terminal 4

• **If less than 0.2 V**

1. Ignition OFF, disconnect the X5 harness connector at the K40D Seat Memory Control Module - Driver.
2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: 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 K40D Seat Memory Control Module - Driver.

• **If greater than 2 V**

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 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 K40D Seat Memory Control Module - Driver.

• **Go to next step: 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 \(Power\)](#) [Driver or Passenger Seat Cushion Frame Replacement \(Manual\)](#)
- [Driver or Passenger Seat Recliner Actuator Replacement](#)
- [Control Module References](#) for K40D Seat Memory Control Module - Driver replacement, programming and setup

DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, OR B1820

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

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

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 59, B1740 59, B1745 59, B1750 59, B1755 59, B1760 59, B1815 59, B1820 59	1	-	-
Front Vertical Down Switch Signal	B1735 59, B1740 59, B1745 59, B1750 59, B1755 59, B1760 59, B1815 59, B1820 59	1	-	-
Rear Vertical Up Switch Signal	B1735 59, B1740 59, B1745 59, B1750 59, B1755 59, B1760 59, B1815 59, B1820 59	2	-	-
Rear Vertical Down Switch Signal	B1735 59, B1740 59, B1745 59, B1750 59, B1755 59, B1760 59, B1815 59, B1820 59	2	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Horizontal Forward Switch Signal	B1735 59, B1740 59, B1745 59, B1750 59, B1755 59, B1760 59, B1815 59, B1820 59	3	-	-
Horizontal Rearward Switch Signal	B1735 59, B1740 59, B1745 59, B1750 59, B1755 59, B1760 59, B1815 59, B1820 59	3	-	-
Recline Forward Switch Signal	B1735 59, B1740 59, B1745 59, B1750 59, B1755 59, B1760 59, B1815 59, B1820 59	4	-	-
Recline Rearward Switch Signal	B1735 59, B1740 59, B1745 59, B1750 59, B1755 59, B1760 59, B1815 59, B1820 59	4	-	-
1. The seat front vertical motor is inoperative 2. The seat rear vertical motor is inoperative 3. The seat horizontal motor is inoperative 4. The seat recline motor 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 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 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.

Conditions for Setting the DTC

- If a seat 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 Wiring 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 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
 - **If the parameter does not change**

Refer to Circuit/System Testing.

- **Go to next step: If the parameter changes**

3. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector 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
- Driver Seat Horizontal Switch
- Driver Seat Back Switch
- **If not Inactive**
 1. Ignition OFF, disconnect the X5 harness connector at the K40D Seat Memory Control Module - Driver, ignition ON.
 2. Test for infinite resistance between the appropriate signal circuit terminal listed below and ground:
 - Front vertical up switch terminal A
 - Front vertical down switch terminal K
 - Rear vertical up switch terminal F
 - Rear vertical down switch terminal J
 - Horizontal forward switch terminal D
 - Horizontal rearward switch terminal C
 - Recline forward switch terminal H
 - Recline rearward switch terminal G
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K40D Seat Memory Control Module - Driver.
 - **Go to next step: If Inactive**
- 3. Install a 3 A fused jumper wire between the appropriate signal circuit terminal listed below and the ground circuit terminal E.
 - Front vertical up switch terminal A
 - Front vertical down switch terminal K
 - Rear vertical up switch terminal F
 - Rear vertical down switch terminal J
 - Horizontal forward switch terminal D
 - Horizontal rearward switch terminal C
 - Recline forward switch terminal H
 - Recline rearward switch terminal G
- 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 K40D Seat Memory Control Module - Driver, 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.
 - Go to next step: 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 K40D Seat Memory Control Module - Driver.
 - **Go to next step: 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 harness connector at the S64D Seat Adjuster Switch - Driver.
2. Test for infinite resistance between the ground terminal E and each signal terminal with the switch in the open position.
 - **If less than infinite resistance**

Replace the S64D Seat Adjuster Switch - Driver.

- **Go to next step: If infinite resistance**

3. Test for less than 2 Ω between the ground terminal E and each signal terminal with the appropriate switch in the closed position.

- **If 2 Ω or greater**

Replace the S64D Seat Adjuster Switch - Driver.

- **Go to next step: 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 Replacement](#)
- [Control Module References](#) for K40D Seat Memory Control Module - Driver replacement, programming and setup

DTC B2755 OR B2765

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 Resistance	Short to Voltage	Signal Performance
Memory Seat Switch Signal 1	B2755 02	1	B2755 01	B2755 00 or 59
Memory Seat Switch Set Signal	B2765 02 or 59	2	-	-
Low Reference	-	1, 2	-	-
1. Memory recall is inoperative 2. Memory set 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 s, the module will set this DTC.

Actions Taken When the DTC Sets

- 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 Wiring Schematics

Connector End View 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 Memory Control Module Memory Recall Switches parameter changes between Inactive and Memory 1 when pressing the memory 1 switch.

- **If the parameter does not change**

Refer to Circuit/System Testing.

- **Go to next step: If the parameter changes**

3. Verify the scan tool Seat Memory Control Module 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.

- **Go to next step: If the parameter changes**

4. Verify the scan tool 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.

- **Go to next step: If the parameter changes**

5. Verify the scan tool Memory Recall Switches parameter changes between Inactive and Active when pressing the SET switch.

- **If the parameter does not change**

Refer to Circuit/System Testing.

- **Go to next step: 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 K40D Seat Memory Control Module - Driver.

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**

1. Ignition OFF, disconnect the X6 harness connector at the K40D Seat Memory Control Module - Driver.

2. Test for infinite resistance between the signal circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- Go to next step: 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 K40D Seat Memory Control Module - Driver.

- **Go to next step: If 9 V or greater**

4. Ignition OFF, disconnect the X6 harness connector at the K40D Seat Memory Control Module - Driver, 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.

- **Go to next step: 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 the low reference terminal 1 and each signal terminal listed below and with the switch in the open position.

- Terminal 5
- Terminal 6
- **If less than infinite resistance**

Replace the S47D Seat Memory Switch - Driver.

- **Go to next step: 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.

- **Go to next step: 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.

- **Go to next step: 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.

- **Go to next step: If between 1800 - 2201 Ω**

6. Test for 5.52k - 6.73 k Ω between the signal terminal 6 and the low reference terminal 1 while pressing the Exit button.

- **If not between 5.52k - 6.73 k Ω**

Replace the S47D Seat Memory Switch - Driver.

- **Go to next step: If between 5.52k - 6.73 k Ω**

7. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Front Seat Adjuster Memory Switch Replacement](#)
- [Control Module References](#) for K40D Seat Memory Control Module - Driver replacement, programming, and setup

DTC B3920

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 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
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	2	B3920 01	B3920 00, B3920 0B
Seat Horizontal Motor Rearward Control	B3920 02	2	B3920 01	B3920 00, B3920 0B
Seat Rear Vertical Motor Down Control	B3920 02	3	B3920 01	B3920 00, B3920 0B
Seat Rear Vertical Motor Up Control	B3920 02	3	B3920 01	B3920 00, B3920 0B
Seat Recline Motor Forward Control	B3920 02	4	B3920 01	B3920 00, B3920 0B
Seat Recline Motor Rearward Control	B3920 02	4	B3920 01	B3920 00, B3920 0B
1. The seat front vertical motor is inoperative 2. The seat horizontal motor is inoperative 3. The seat rear vertical motor is inoperative 4. The seat recline motor is inoperative				

Circuit/System Description

The seat memory control module controls the seat 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 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

- 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 Wiring Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Memory Seats Description and Operation

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

B3920 01 or B3920 02

1. Ignition OFF, disconnect the X3 connector at the K40D Seat Memory Control Module - Driver.
2. Test for infinite resistance between each control circuit terminal listed below and ground:

- Front vertical motor up control terminal 3
- Front vertical motor down control terminal 4
- Rear vertical motor up control terminal 5
- Rear vertical motor down control terminal 6
- Horizontal motor forward control terminal 11
- Horizontal motor rearward control terminal 12
- Recline motor forward control terminal 1

- Recline motor rearward control terminal 2
- **If less than infinite resistance**

Repair the short to ground on the circuit.

- **Go to next step: 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
- Front vertical motor down control terminal 4
- Rear vertical motor up control terminal 5
- Rear vertical motor down control terminal 6
- Horizontal motor forward control terminal 11
- Horizontal motor rearward control terminal 12
- Recline motor forward control terminal 1
- Recline motor rearward control terminal 2
- **If 1 V or greater**

Repair the short to voltage on the circuit.

- **Go to next step: If less than 1 V**

5. Replace the K40D Seat Memory Control Module - Driver.

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 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

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 in both directions.

- **If DTC B3920 00 or B3920 0B sets**

1. Ignition OFF, disconnect the X3 harness connector at the K40D Seat Memory Control Module - Driver.

2. Test for infinite resistance between the control circuits.

- If less than infinite resistance, repair the short between the circuits.
- Go to next step: 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 K40D Seat Memory Control Module - Driver.

- **Go to next step: If DTC B3920 00 or B3920 0B does not set**

7. Replace the appropriate 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 \(Power\)](#) [Driver or Passenger Seat Cushion Frame Replacement \(Manual\)](#)
- [Driver or Passenger Seat Recliner Actuator Replacement](#)
- [Control Module References](#) for K40D Seat Memory Control Module - Driver 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.
 - 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](#)
 - [Memory Seats Description and Operation](#)
 - [Power Seats System Description and Operation \(Front Seats\)](#) [Power Seats System Description and Operation \(3rd Row Seats\)](#)

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](#)
- [Memory Seat Feature Malfunction](#)
- [Power Seat Malfunction \(Driver Seat with Memory AAB\)](#) [Power Seat Malfunction \(Driver Seat without Memory AAB\)](#) [Power Seat Malfunction \(Passenger Seat\)](#)
- [Power Folding Seat Malfunction](#)

LUMBAR SUPPORT MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

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

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
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 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 Wiring Schematics](#)
- [Passenger Seat Wiring Schematics](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Lumbar Support Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Circuit/System Testing

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the appropriate S65 Seat Lumbar Support Switch. 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 E 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.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminal G 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.
 - Go to next step: 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 OK and there is voltage at the fuse.
 - **Go to next step: If the test lamp illuminates**
5. Ignition OFF, connect the harness connector at the S65 Seat Lumbar Support Switch and disconnect the harness connector at the M53 Seat Lumbar Support Motor.
6. Connect a test lamp between control circuit terminal 1 and control circuit terminal 2, ignition ON.
7. Verify the test lamp turns ON when commanding the lumbar support Forward and Rearward using the S65 Seat Lumbar Support Switch.
 - **If the test lamp remains OFF during either of the commands**
 1. Ignition OFF, disconnect the harness connector at the S65 Seat Lumbar Support 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.
 - Go to next step: 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 S65 Seat Lumbar Support Switch.
 - **Go to next step: If the test lamp turns ON during each of the commands**
8. Test or replace the M53 Seat Lumbar Support Motor.

Component Testing

Seat Lumbar Support Switch

1. Ignition OFF, disconnect the harness connector at the appropriate S65 Seat Lumbar Support Switch.
2. Test for infinite resistance between the B+ terminal G and each control terminal with the switch in the open position.
 - **If less than infinite resistance**

Replace the S65 Seat Lumbar Support Switch.
 - **Go to next step: If infinite resistance**
3. Test for less than 2 Ω between the B+ terminal G and each control terminal with the appropriate switch in the closed position.
 - **If 2 Ω or greater**

Replace the S65 Seat Lumbar Support Switch.
 - **Go to next step: If less than 2 Ω**
4. Test for less than 2 Ω between the ground terminal E and each control terminal with the switch in the open position.
 - **If 2 Ω or greater**

Replace the S65 Seat Lumbar Support Switch.
 - **Go to next step: 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 1 and 12 V.
3. Momentarily install a jumper wire between control terminal 2 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.
 - **Go to next step: 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.
 - **Go to next step: 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 Lumbar Control Switch Replacement](#)
- [Front Seat Back Lumbar Replacement](#)

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 K40D Seat Memory Control Module - Driver 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

[Driver Seat Wiring 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 that all 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 \(Driver Seat with Memory AAB\)](#)[Power Seat Malfunction \(Driver Seat without Memory AAB\)](#)[Power Seat Malfunction \(Passenger Seat\)](#).
 - **Go to next step: 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 K40D Seat Memory Control Module - Driver.
 2. Test for less than 2 Ω in the low reference circuit end to end
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40D Seat Memory Control Module - Driver.
 - **Go to next step: If less than 30 Ω**
3. Ignition ON, press a power seat switch in order to wake up the K40D Seat Memory Control Module - Driver.
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 K40D Seat Memory Control Module - Driver.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.

- Go to next step: If infinite resistance
3. Test for less than $2\ \Omega$ in the signal circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - If less than $2\ \Omega$, replace the K40D Seat Memory Control Module - Driver.
 - **Go to next step: If 9 V or greater**
 5. Ignition OFF, disconnect the X6 harness connector at the K40D Seat Memory Control Module - Driver, 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.

 - **Go to next step: If less than 1 V**
 7. 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.

 - **Go to next step: If infinite resistance**
3. Test for less than $4\ \Omega$ between the signal terminal 5 and the low reference terminal 1 while pressing the Memory SET button.
 - **If $4\ \Omega$ or greater**

Replace the S47D Seat Memory Switch - Driver.

 - **Go to next step: If less than $4\ \Omega$**
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.

 - **Go to next step: 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.

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

Replace the S47D Seat Memory Switch - Driver.

- Go to next step: 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**
- **Control Module References** for K40D Seat Memory Control Module - Driver replacement, programming and setup

POWER FOLDING SEAT MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
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	-	-
Right 3rd Row Folding Seat Actuator Release Control	3	3	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
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 Wiring 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 (3rd 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 .
 - **Go to next step: 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

- **Go to next step: If both rear folding seats operate**

5. All OK.

Circuit/System Testing

Both 3rd row Folding Seats are Inoperative

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](#).

- **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.
- Go to next step: If infinite resistance

3. Ignition OFF, all vehicle systems OFF, disconnect the X2 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 infinite resistance between each control circuit and ground.

- Terminal 1 X2
- Terminal 2 X2
- Terminal 3 X2
- Terminal 4 X2
- 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.

- **Go to next step: 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.

- **Go to next step: 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.
 - 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.
- **Go to next step: 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 harness connector 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.
 - Go to next step: 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 harness connector at the S144B Folding Seat Control Switch - 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.
 - **Go to next step: 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 folding seat back unlatch motor listed below:
 - M109LR Folding Seat Back Unlatch Motor - 3rd Row Left
 - M109RR Folding Seat Back Unlatch Motor - 3rd Row Right
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
 - Left 3rd row folding seat unlatch motor terminal 5 X2 and terminal 6 X2
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: 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
 - Left 3rd row folding seat unlatch motor terminal 5 X2 and terminal 6 X2
 - If greater than 1 V, repair the short to ground on the circuit.
 - Go to next step: 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.
 - **Go to next step: 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.
 - **Go to next step: 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.
 - **Go to next step: If less than 10 Ω**
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.
 - Go to next step: 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.
 - **Go to next step: 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.
 - Go to next step: 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.
 - **Go to next step: If the test lamp turns ON**
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 Pull Strap Replacement \(Power\)](#) [3rd Row Seat Pull Strap Replacement \(Manual\)](#)
- [Control Module References](#) for K169 Folding Seat Control Module - 3rd Row replacement, programming and setup

POWER SEAT MALFUNCTION (DRIVER SEAT WITH MEMORY AAB)

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, 1	U0208 00, 1	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Seat Memory Control Module B+ Terminal 2 X1	1	1	-	-
Front Vertical Up Switch Signal	B1735 59, B1740 59, B1745 59, B1750 59, B1755 59, B1760 59, B1815 59, B1820 59	2	-	-
Front Vertical Down Switch Signal	B1735 59, B1740 59, B1745 59, B1750 59, B1755 59, B1760 59, B1815 59, B1820 59	2	-	-
Rear Vertical Up Switch Signal	B1735 59, B1740 59, B1745 59, B1750 59, B1755 59, B1760 59, B1815 59, B1820 59	3	-	-
Rear Vertical Down Switch Signal	B1735 59, B1740 59, B1745 59, B1750 59, B1755 59, B1760 59, B1815 59, B1820 59	3	-	-
Horizontal Forward Switch Signal	B1735 59, B1740 59, B1745 59, B1750 59, B1755 59, B1760 59, B1815 59, B1820 59	4	-	-
Horizontal Rearward Switch Signal	B1735 59, B1740 59, B1745 59, B1750 59, B1755 59, B1760 59, B1815 59, B1820 59	4	-	-
Recline Forward Switch Signal	B1735 59, B1740 59, B1745 59, B1750 59, B1755 59, B1760 59, B1815 59, B1820 59	5	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Recline Rearward Switch Signal	B1735 59, B1740 59, B1745 59, B1750 59, B1755 59, B1760 59, B1815 59, B1820 59	5	-	-
Driver Seat Front Vertical Motor Down Control	B3920 02	2	B3920 01	B3920 00, B3920 0B
Driver Seat Front Vertical Motor Up Control	B3920 02	2	B3920 01	B3920 00, B3920 0B
Driver Seat Rear Vertical Motor Down Control	B3920 02	3	B3920 01	B3920 00, B3920 0B
Driver Seat Rear Vertical Motor Up Control	B3920 02	3	B3920 01	B3920 00, B3920 0B
Driver Seat Horizontal Motor Forward Control	B3920 02	4	B3920 01	B3920 00, B3920 0B
Driver Seat Horizontal Motor Rearward Control	B3920 02	4	B3920 01	B3920 00, B3920 0B
Driver Seat Recline Motor Forward Control	B3920 02	5	B3920 01	B3920 00, B3920 0B
Driver Seat Recline Motor Rearward Control	B3920 02	5	B3920 01	B3920 00, B3920 0B
Seat Adjuster Switch Ground	-	1	-	-
Seat Memory Control Module Ground	-	U0208 00, 1	-	-
1. All power seat functions are inoperative 2. The seat front vertical motor is inoperative 3. The seat rear vertical motor is inoperative 4. The seat horizontal motor is inoperative 5. The seat recline motor is inoperative				

Circuit/System Description

Battery voltage is supplied at all times to the seat memory control module through a 20 A fuse located in the rear body 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 30 A fuse 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 Wiring Schematics

Connector End View Reference

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
 - **Go to next step: 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
 - 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.
 - **Go to next step: 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 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 E 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.
 - **Go to next step: If less than 10 Ω**

3. Install a 3 A fused jumper wire between the ground circuit terminal E and the appropriate signal circuit terminal listed below, ignition ON.
 - Front vertical up switch terminal A
 - Front vertical down switch terminal K
 - Rear vertical up switch terminal F
 - Rear vertical down switch terminal J
 - Horizontal forward switch terminal D
 - Horizontal rearward switch terminal C
 - Recline forward switch terminal H
 - Recline rearward switch terminal G
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 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.
 - Go to next step: 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 K40D Seat Memory Control Module - Driver.
 - **Go to next step: 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 X1 harness connector at the K40D Seat Memory Control Module - Driver, ignition ON.
2. 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.
 - If less than 2 Ω , verify the circuit fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open.**
 1. Ignition OFF.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K40D Seat Memory Control Module - Driver.
 - **Go to next step: If the test lamp illuminates.**
 - 3. Ignition OFF, connect the X1 harness connector at the K40D Seat Memory Control Module - Driver 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
 - 4. 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.

5. 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 K40D Seat Memory Control Module - Driver.

2. Test for infinite resistance between each control circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- Go to next step: 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 K40D Seat Memory Control Module - Driver.

- **Go to next step: If the test lamp turns ON during each of the commands**

6. Test or replace the seat motor.

Component Testing

Seat Adjuster Switch Test

1. Ignition OFF, disconnect the harness connector at the S64D Seat Adjuster Switch - Driver.

2. Test for infinite resistance between the ground terminal E and each signal terminal with the switch in the open position.

- **If less than infinite resistance**

Replace the S64D Seat Adjuster Switch - Driver.

- **Go to next step: If infinite resistance**

3. Test for less than 2 Ω between the ground terminal E and each signal terminal with the appropriate switch in the closed position.

- **If 2 Ω or greater**

Replace the S64D Seat Adjuster Switch - Driver.

- **Go to next step: 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.

- **Go to next step: 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.
 - **Go to next step: 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 Replacement](#)
- [Front Seat Tilt Adjuster Actuator Replacement](#)
- [Driver or Passenger Seat Vertical Adjuster Actuator Replacement](#)
- [Driver or Passenger Seat Cushion Frame Replacement \(Power\)](#) [Driver or Passenger Seat Cushion Frame Replacement \(Manual\)](#)
- [Driver or Passenger Seat Recliner Actuator Replacement](#)
- [Control Module References](#) for K40D Seat Memory Control Module - Driver replacement, programming and setup

POWER SEAT MALFUNCTION (DRIVER SEAT WITHOUT MEMORY AAB)

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	2	-	-
Front Vertical Motor Up Control	1	2	-	-
Rear Vertical Motor Down Control	1	3	-	-
Rear Vertical Motor Up Control	1	3	-	-
Horizontal Motor Forward Control	1	4	-	-
Horizontal Motor Rearward Control	1	4	-	-
Recline Motor Forward Control	1	5	-	-
Recline Motor Rearward Control	1	5	-	-
Ground	-	1	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
1. All power seat functions are inoperative 2. The seat front vertical motor is inoperative 3. The seat rear vertical motor is inoperative 4. The seat horizontal motor is inoperative 5. The seat recline motor is inoperative				

Circuit/System Description

The driver seat without memory is completely controlled through their respective seat adjuster switches. 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 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 to run in the opposite direction. All seat motors are powered this way.

Reference Information

Schematic Reference

Driver Seat Wiring 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 (3rd Row Seats)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Circuit/System Verification

1. Verify the appropriate driver seat directional motors listed below operate while operating the seat switches in both directions.
 - M51D Seat Horizontal Motor - Driver
 - M50D Seat Front Vertical Motor - Driver
 - M55D Seat Rear Vertical Motor - Driver
 - M56D Seat Recline Motor - Driver
 - **If all seat motors do not operate**

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

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

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

- **Go to next step: If all seat motors operate**

2. All OK.

Circuit/System Testing

Seat Adjuster Switch Circuit Test

1. Ignition OFF and all vehicle systems OFF, disconnect the 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 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.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminal E 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.
 - Go to next step: 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 OK and there is voltage at the fuse.
 - **Go to next step: If the test lamp illuminates**
5. Test or replace the S64D Seat Adjuster Switch - Driver.

Seat Motor Circuit Test

1. Ignition OFF, disconnect the harness connector at the appropriate seat motor listed below:
 - M51D Seat Horizontal Motor - Driver
 - M50D Seat Front Vertical Motor - Driver
 - M55D Seat Rear Vertical Motor - Driver
 - M56D Seat Recline Motor - Driver
2. Connect a test lamp between control circuit terminal 1 and control circuit terminal 3, ignition ON.
3. Verify the test lamp turns ON when commanding the seat motor Up and Down or Forward and Rearward using the S64D Seat Adjuster Switch - Driver.
 - **If the test lamp does not turn ON during either of the commands**
 1. Ignition OFF, disconnect the harness connector at the S64D Seat Adjuster Switch - Driver.
 2. Test for infinite resistance between each control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - Go to next step: 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 S64D Seat Adjuster Switch - Driver.
 - **Go to next step: If the test lamp turns ON 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 S64D Seat Adjuster Switch - Driver.
2. Test for infinite resistance between the B+ terminal E and each control terminal with the switch in the open position.
 - **If less than infinite resistance**

Replace the S64D Seat Adjuster Switch - Driver.
 - **Go to next step: If infinite resistance**
3. Test for less than 2 Ω between the B+ terminal E and each control terminal with the appropriate switch in the closed position.
 - **If 2 Ω or greater**

Replace the S64D Seat Adjuster Switch - Driver.
 - **Go to next step: If less than 2 Ω**
4. Test for less than 2 Ω between the ground terminal B and each control terminal with the switch in the open position.
 - **If 2 Ω or greater**

Replace the S64D Seat Adjuster Switch - Driver.
 - **Go to next step: If less than 2 Ω**
5. All OK.

Seat Motor

1. Ignition OFF, disconnect the harness connector at the appropriate seat motor listed below:
 - M51D Seat Horizontal Motor - Driver
 - M50D Seat Front Vertical Motor - Driver
 - M55D Seat Rear Vertical 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 motor.
 - **Go to next step: 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.
 - **Go to next step: 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 Replacement](#)

- [Front Seat Tilt Adjuster Actuator Replacement](#)
- [Driver or Passenger Seat Vertical Adjuster Actuator Replacement](#)
- [Driver or Passenger Seat Cushion Frame Replacement \(Power\)](#), [Driver or Passenger Seat Cushion Frame Replacement \(Manual\)](#)
- [Driver or Passenger Seat Recliner Actuator Replacement](#)

POWER SEAT MALFUNCTION (PASSENGER SEAT)

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	-	-
Rear Vertical Motor Down Control	1	2	-	-
Rear Vertical Motor Up Control	1	2	-	-
Horizontal Motor Forward Control	1	3	-	-
Horizontal Motor Rearward Control	1	3	-	-
Recline Motor Forward Control	1	4	-	-
Recline Motor Rearward Control	1	4	-	-
Ground	-	1	-	-
1. All power seat functions are inoperative 2. The seat rear vertical motor is inoperative 3. The seat horizontal motor is inoperative 4. The seat recline motor is 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 30 A fuse 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 to run in the opposite direction. All seat motors are powered this way.

Reference Information

Schematic Reference

[Passenger Seat Wiring Schematics](#)

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Power Seats System Description and Operation (Front Seats)Power Seats System Description and Operation (3rd Row Seats)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Circuit/System Verification

1. Verify the appropriate passenger seat directional motors listed below operate while operating the seat switches in both directions.

- M51P Seat Horizontal Motor - Passenger
- M55P Seat Rear Vertical Motor - Passenger
- M56P Seat Recline Motor - Passenger
- **If all seat motors do not operate**

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

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

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

- **Go to next step: If all seat motors operate**

2. All OK.

Circuit/System Testing

Seat Adjuster Switch Circuit Test

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S64P Seat Adjuster Switch - Passenger. 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 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.

- **Go to next step: If less than 10 Ω**

3. Ignition ON.

4. Verify a test lamp illuminates between the B+ circuit terminal E 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.
- Go to next step: 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 OK and there is voltage at the fuse.

- **Go to next step: If the test lamp illuminates**

5. Test or replace the S64P Seat Adjuster Switch - Passenger.

Seat Motor Circuit Test

1. Ignition OFF, disconnect the harness connector at the appropriate seat motor listed below:
 - M51P Seat Horizontal Motor - Passenger
 - M55P Seat Rear Vertical Motor - Passenger
 - M56P Seat Recline Motor - Passenger
2. Connect a test lamp between control circuit terminal 1 and control circuit terminal 3, ignition ON.
3. Verify the test lamp turns ON when commanding the seat motor Up and Down or Forward and Rearward using the S64P Seat Adjuster Switch - Passenger.
 - **If the test lamp does not turn ON during either of the commands**
 1. Ignition OFF, disconnect the 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.
 - Go to next step: 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.
 - **Go to next step: If the test lamp turns ON 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 S64P Seat Adjuster Switch - Passenger.
2. Test for infinite resistance between the B+ terminal E and each control terminal with the switch in the open position.
 - **If less than infinite resistance**

Replace the S64P Seat Adjuster Switch - Passenger.
 - **Go to next step: If infinite resistance**
3. Test for less than 2 Ω between the B+ terminal E and each control terminal with the appropriate switch in the closed position.
 - **If 2 Ω or greater**

Replace the S64P Seat Adjuster Switch - Passenger.
 - **Go to next step: If less than 2 Ω**
4. Test for less than 2 Ω between the ground terminal B and each control terminal with the switch in the open position.
 - **If 2 Ω or greater**

Replace the S64P Seat Adjuster Switch - Passenger.
 - **Go to next step: If less than 2 Ω**
5. All OK.

Seat Motor

1. Ignition OFF, disconnect the harness connector at the appropriate seat motor listed below:
 - M51P Seat Horizontal Motor - Passenger
 - M55P Seat Rear Vertical Motor - Passenger
 - M56P Seat Recline Motor - Passenger

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 motor.
 - **Go to next step: 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.
 - **Go to next step: 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 Replacement](#)
- [Driver or Passenger Seat Vertical Adjuster Actuator Replacement](#)
- [Driver or Passenger Seat Cushion Frame Replacement \(Power\)](#), [Driver or Passenger Seat Cushion Frame Replacement \(Manual\)](#)
- [Driver or Passenger Seat Recliner Actuator Replacement](#)

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.
- 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:

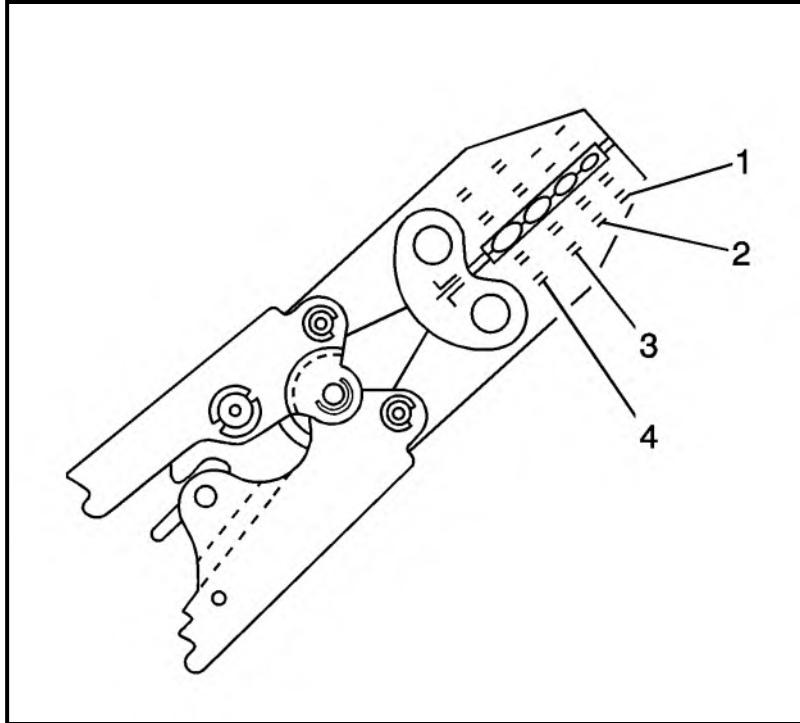
You must perform the following procedures in the listed order. Repeat the procedure if any wire strands are damaged. You must obtain a clean strip with all of the wire strands intact.

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.

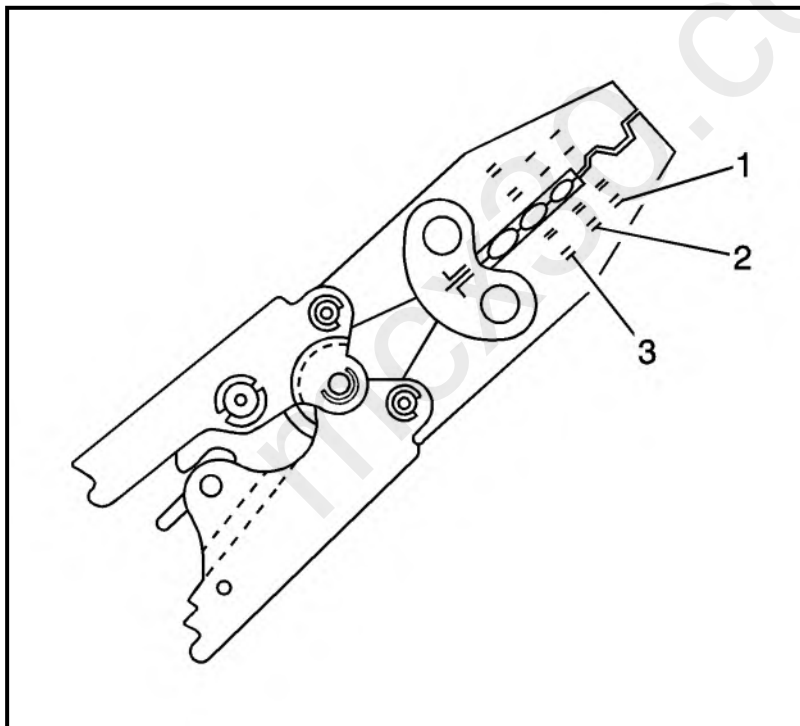
3. Strip the insulation:
 - When adding a length of wire to the existing harness, use the same size wire as the original wire.
 - Perform one of the following items in order to find the correct wire size:
 - Find the wire on the schematic and convert to regional wiring gauge size.
 - If you are unsure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

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.

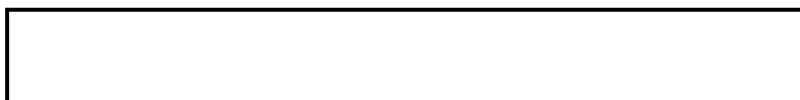
7.

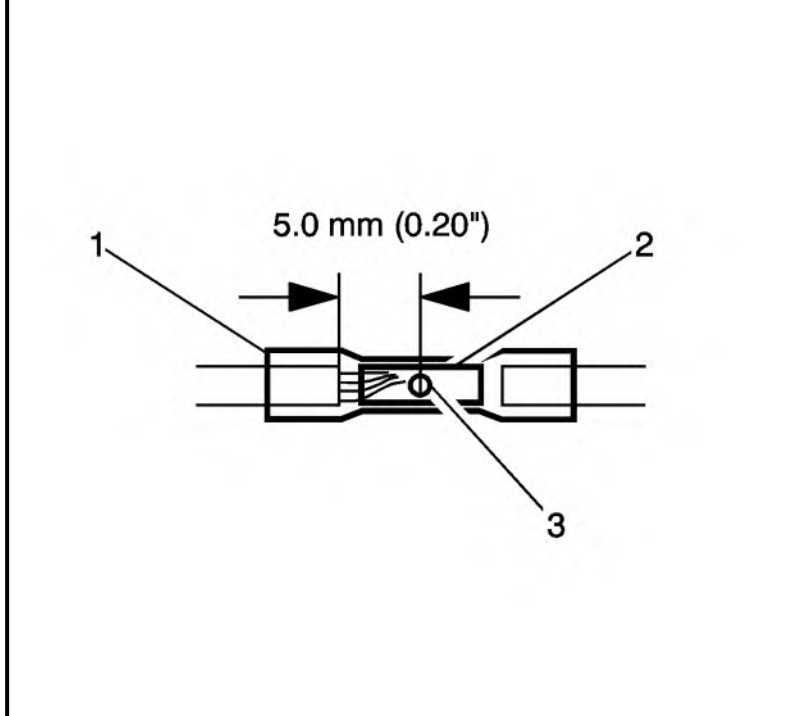


The **J-38125-8** splice sleeve crimping tool has three crimp nests. The largest crimp nest (3) is used for crimping 10 and 12 gauge wires. The second largest crimp nest (2) is used for crimping 14 and 16 gauge wires. The smallest crimp nest (1) is used for crimping 18 to 20 gauge wires. The crimp nests 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 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).

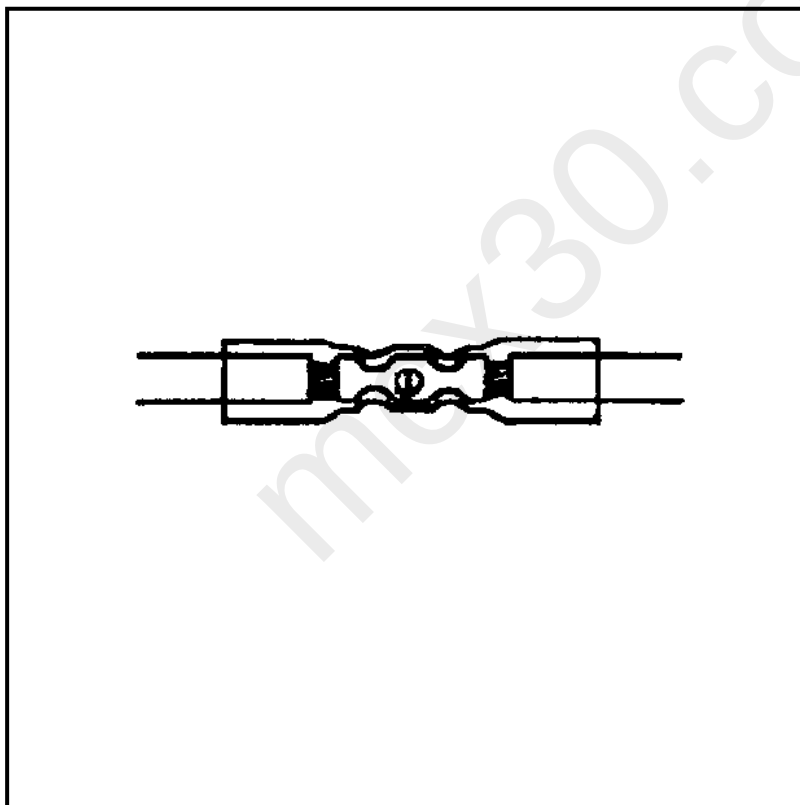
9.





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 firmly hold the DuraSeal splice sleeve in the proper nest.

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.

12.





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

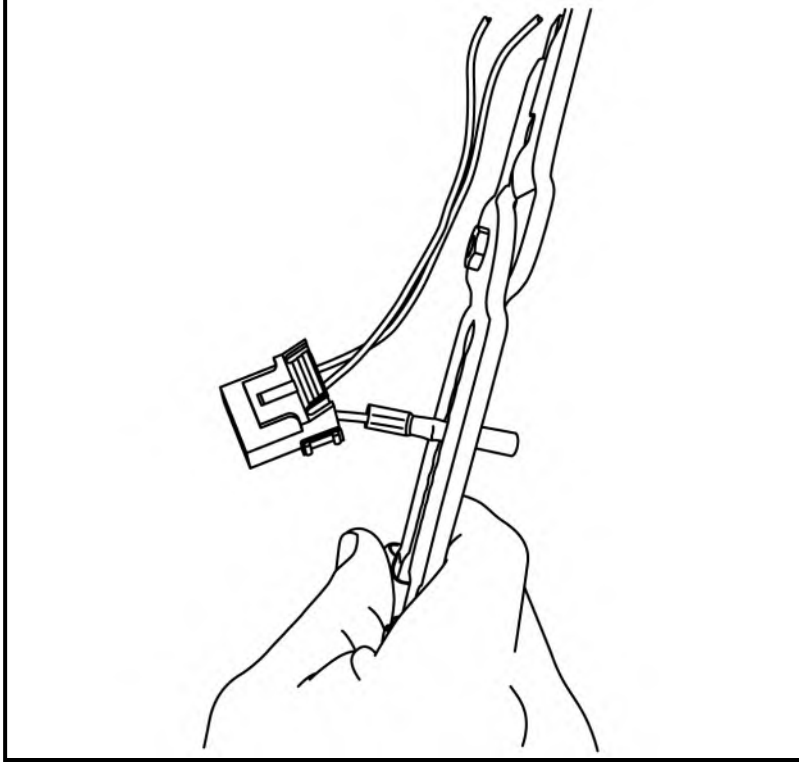
13. Start in the middle and gradually move the heat barrel to the open ends of the tubing:
 - The tubing will shrink completely as the heat is moved along the insulation.
 - A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.

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.

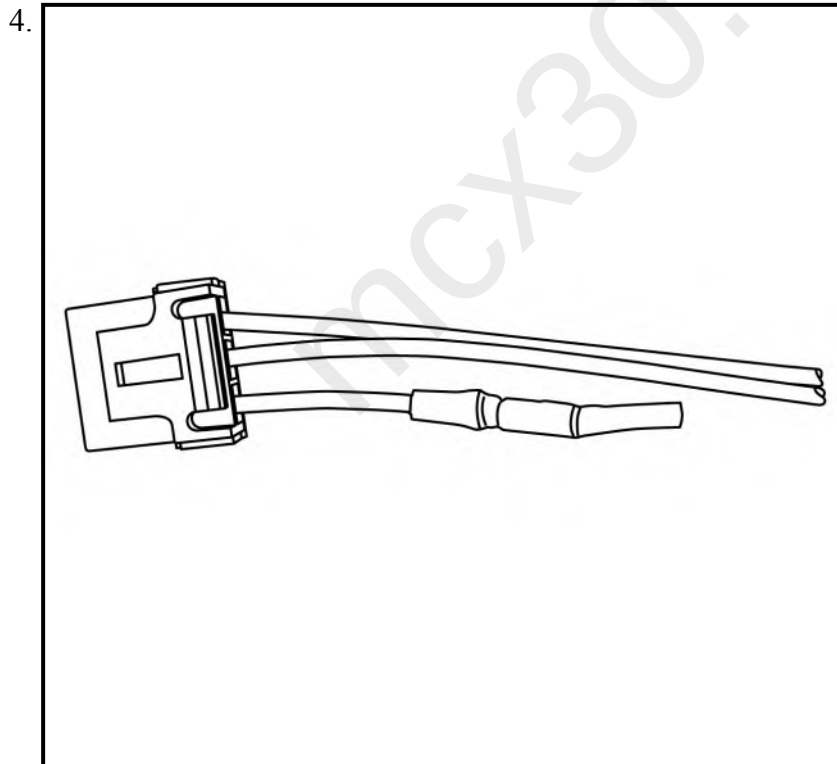




2. Tightly close the handles of the crimp tool until the crimper handles open when released.

The crimper handles will not open until you apply the proper amount of pressure to the DuraSeal splice sleeve. Holding the DuraSEAL with one hand gently tug on the wire to ensure it is crimped in the DuraSeal.

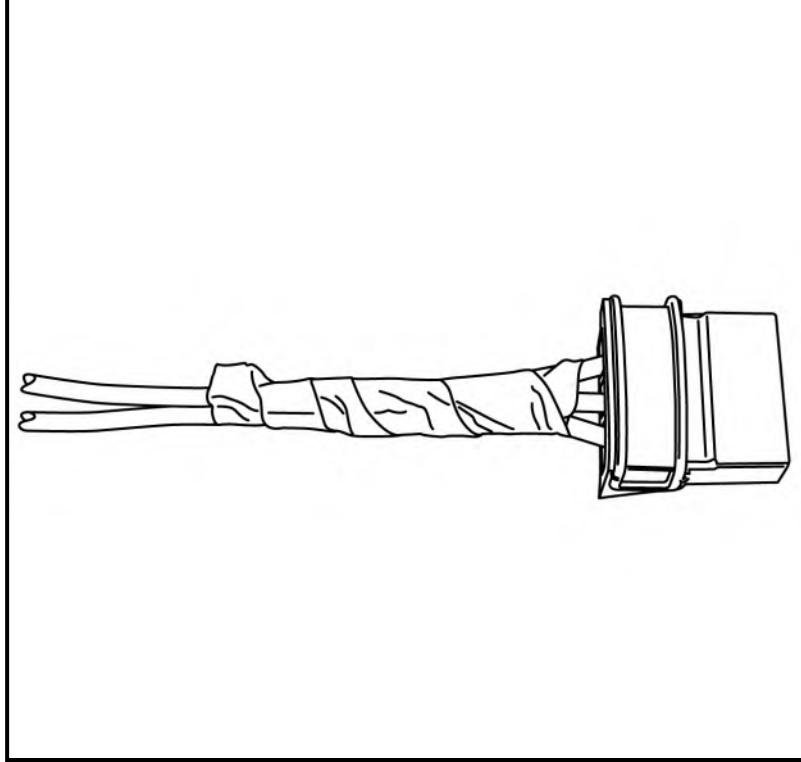
3. Using the heat torch, apply heat to the crimped area of the barrel.



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.





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:

- Loose, corroded, or painted terminal stud/fastener
- 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 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

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 Wiring 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 (screw or stud). 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 Wiring 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](#).
- 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.

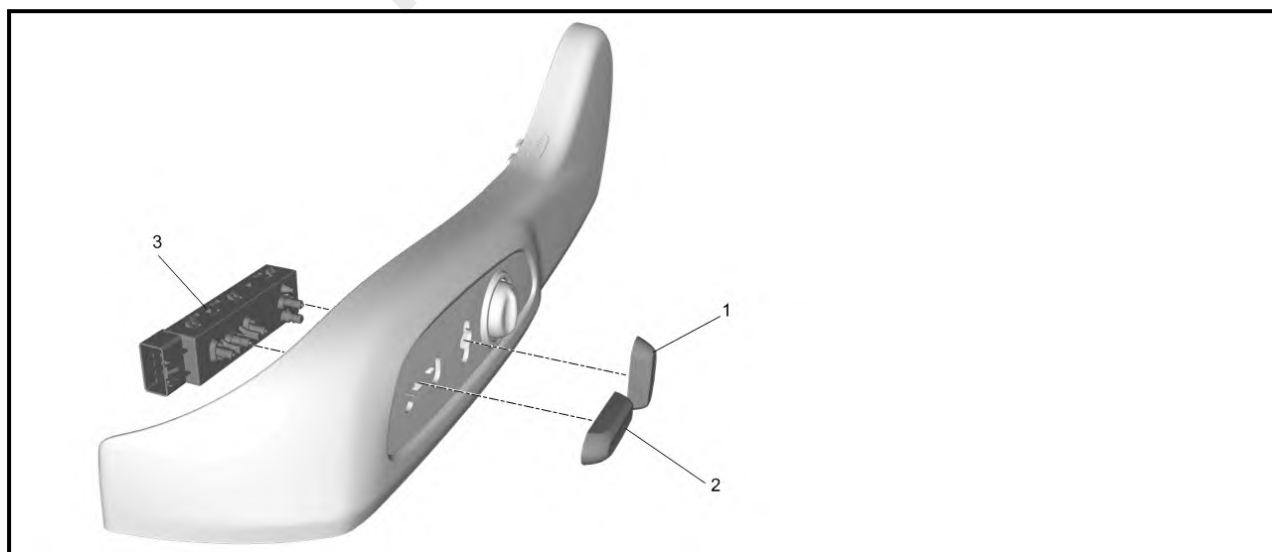
Incorrect Control Module

- 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.

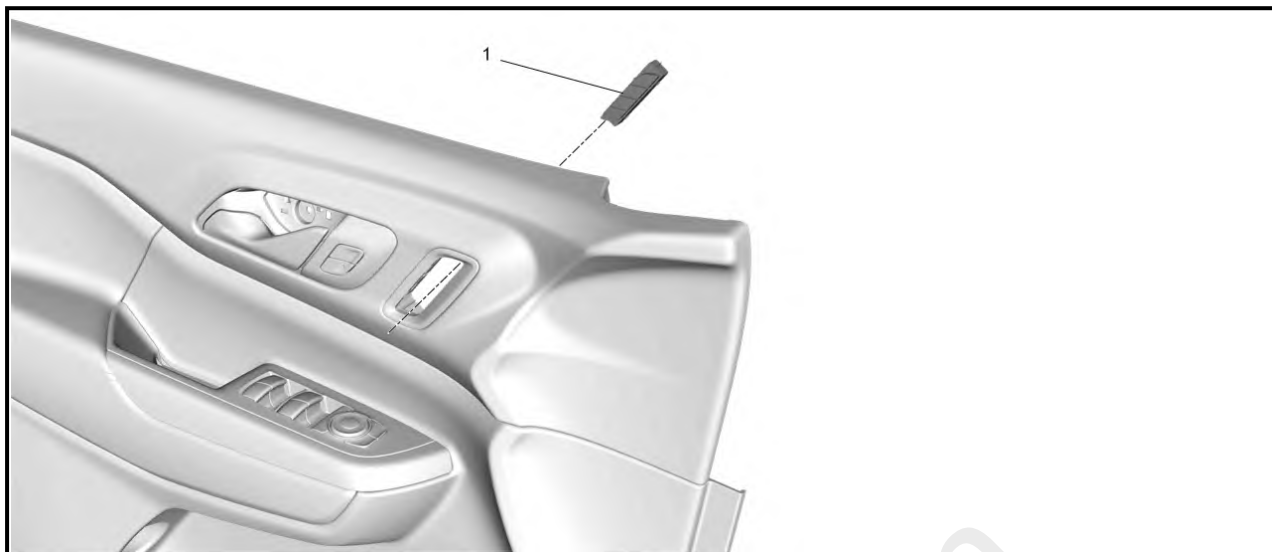
DRIVER OR PASSENGER SEAT ADJUSTER SWITCH REPLACEMENT



Callout	Component Name
Preliminary Procedure	
Front Seat Cushion Outer Finish Cover Replacement (Manual) , Front Seat Cushion Outer Finish Cover Replacement (Power)	

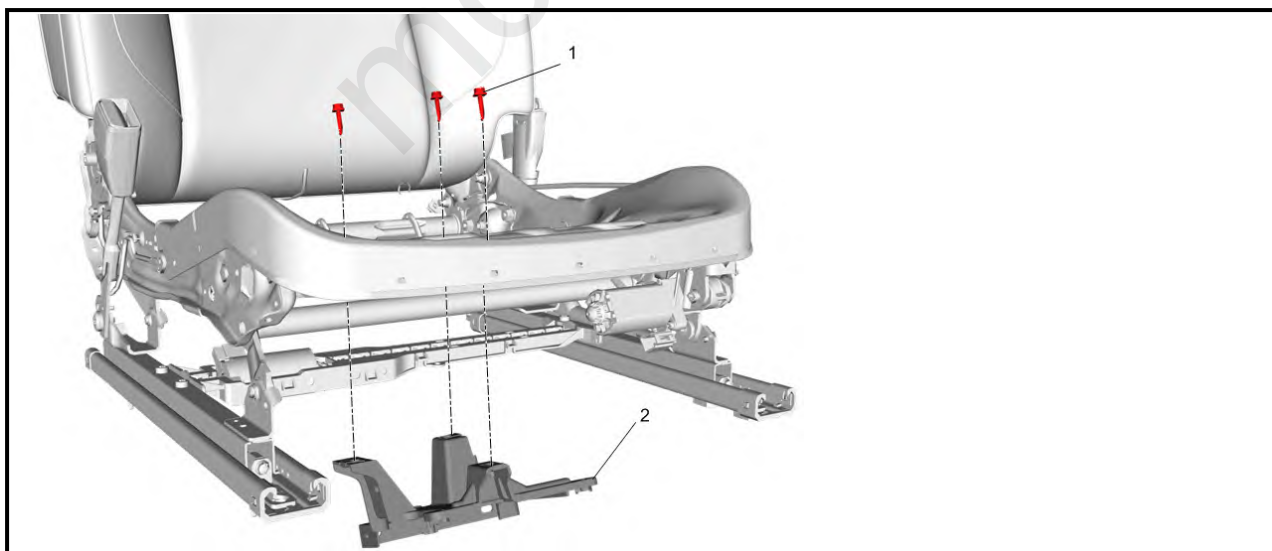
Callout	Component Name
1	Front Seat Recliner Knob
2	Front Seat Adjuster Knob
3	Driver or Passenger Seat Adjuster Switch

FRONT SEAT ADJUSTER MEMORY SWITCH REPLACEMENT



Callout	Component Name
Preliminary Procedure Front Side Door Trim Replacement	
1	Front Seat Adjuster Memory Switch Procedure 1. Use a plastic trim tool to release the switch from the door trim. 2. Disconnect the electrical connector.

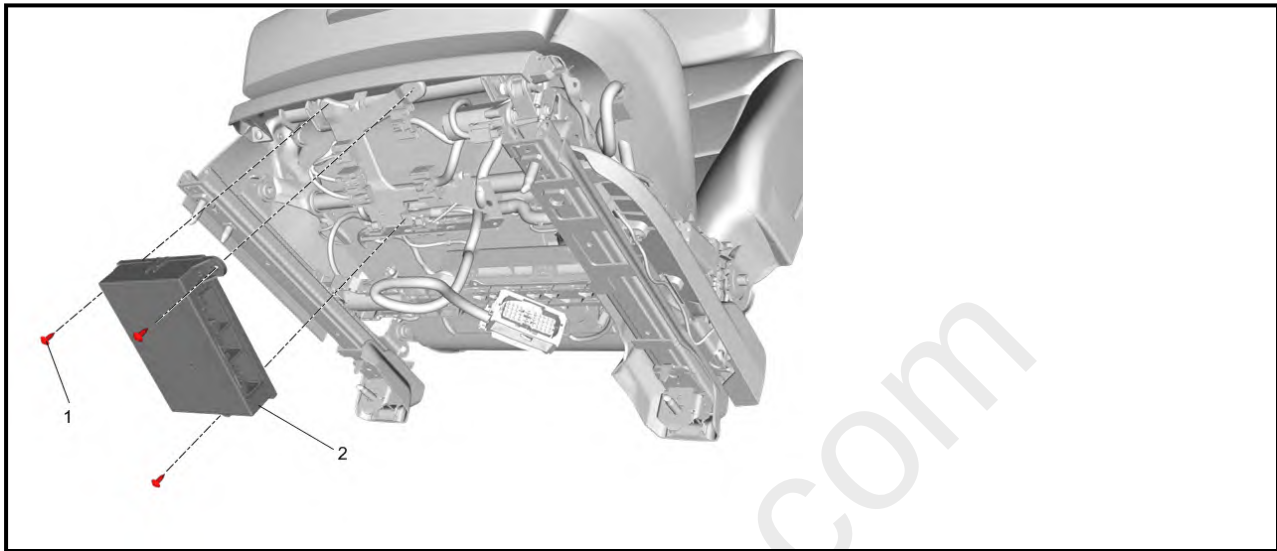
FRONT SEAT ADJUSTER MEMORY MODULE BRACKET REPLACEMENT



Callout	Component Name
Preliminary Procedures 1. Front Seat Cushion Cover and Pad Replacement 2. Driver Seat Adjuster Memory Module Replacement	

Callout	Component Name
1	Front Seat Adjuster Memory Module Bracket Fastener [3x] CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)
2	Front Seat Adjuster Memory Module Bracket

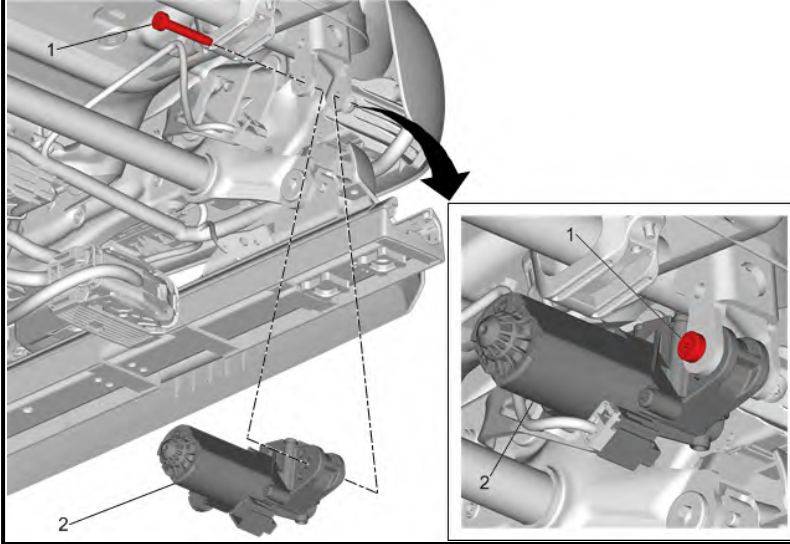
DRIVER SEAT ADJUSTER MEMORY MODULE REPLACEMENT



Callout	Component Name
Preliminary Procedure Driver or Passenger Seat Removal and Installation - Reposition	
1	Driver Seat Adjuster Memory Module Fastener [3x] CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)
2	Driver Seat Adjuster Memory Module Procedure 1. Disconnect the electrical connector. 2. Perform the necessary programming and setup procedure: Control Module References

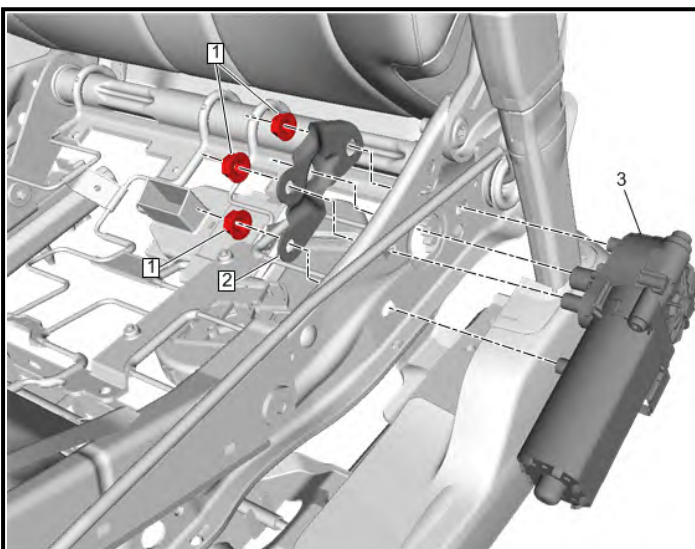
FRONT SEAT TILT ADJUSTER ACTUATOR REPLACEMENT





Callout	Component Name
Preliminary Procedure <u>Driver or Passenger Seat Removal and Installation</u>	
1	Front Seat Tilt Adjuster Actuator Bolt CAUTION: Refer to <u>Fastener Caution</u> . Procedure 1. Set the seat to it's highest position. 2. Remove the securing bolt from the actuator and cushion frame. Tighten 8 N.m (71 lb in)
2	Front Seat Tilt Adjuster Actuator Procedure 1. Disconnect the electrical connector. 2. Remove the tilt adjuster actuator by pulling downward from the cushion frame.

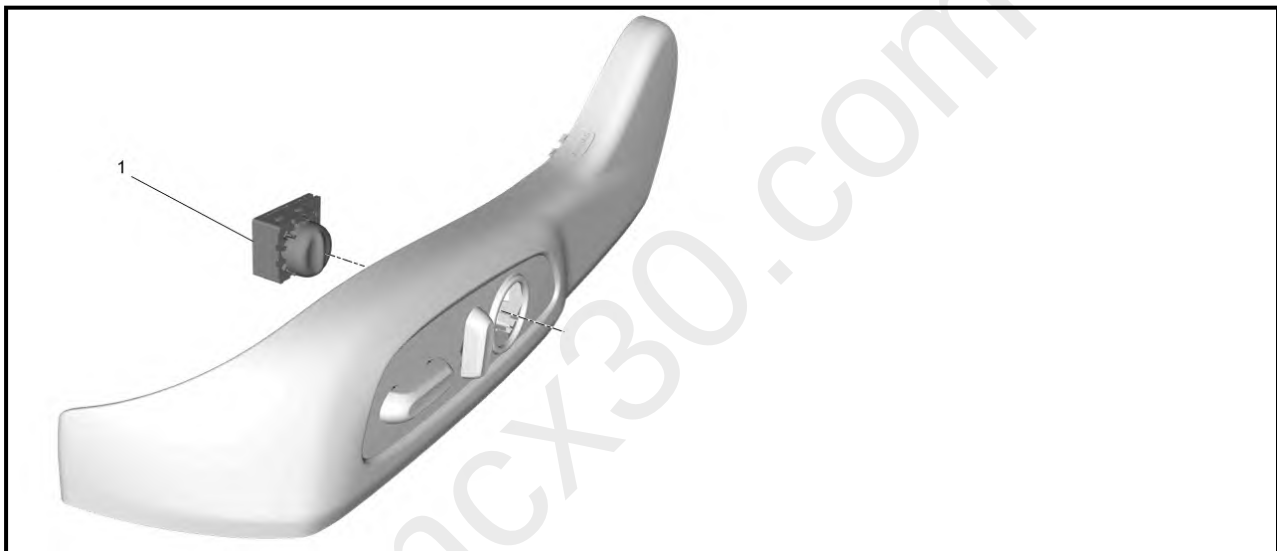
DRIVER OR PASSENGER SEAT VERTICAL ADJUSTER ACTUATOR REPLACEMENT



Callout	Component Name

Callout	Component Name
Preliminary Procedure <u>Front Seat Cushion Cover and Pad Replacement</u>	
1	Front Seat Vertical Adjuster Actuator Nut [3x] CAUTION: Refer to <u>Fastener Caution</u> . Tighten 23 N.m (17 lb ft)
2	Front Seat Adjuster Vertical Actuator Bracket
3	Front Seat Adjuster Vertical Actuator Procedure 1. Disconnect the electrical connector. 2. Carefully disengage the adjuster by pulling outward.

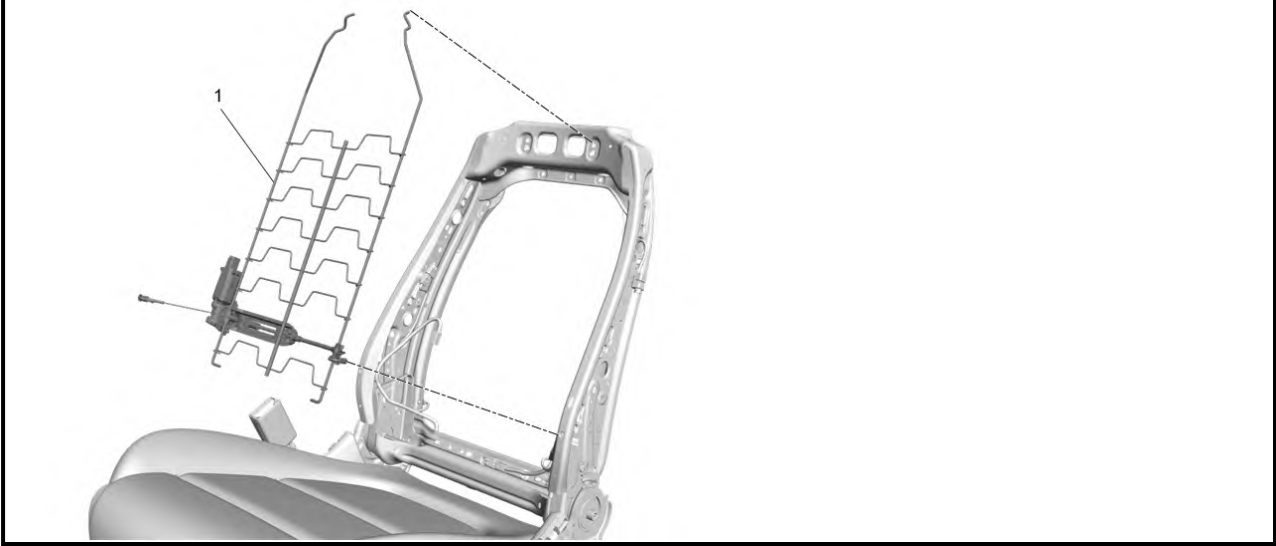
DRIVER OR PASSENGER SEAT LUMBAR CONTROL SWITCH REPLACEMENT



Callout	Component Name
Preliminary Procedure <u>Front Seat Cushion Outer Finish Cover Replacement (Manual). Front Seat Cushion Outer Finish Cover Replacement (Power).</u>	
1	Driver or Passenger Seat Lumbar Control Switch

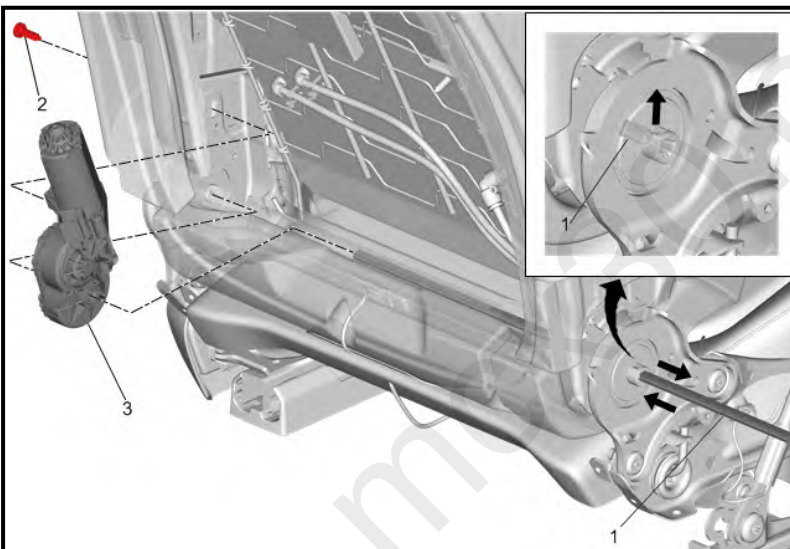
FRONT SEAT BACK LUMBAR REPLACEMENT





Callout	Component Name
Preliminary Procedure <u>Driver or Passenger Seat Back Cover and Pad Replacement</u>	
1	Front Seat Back Lumbar Procedure Disconnect the electrical connector.

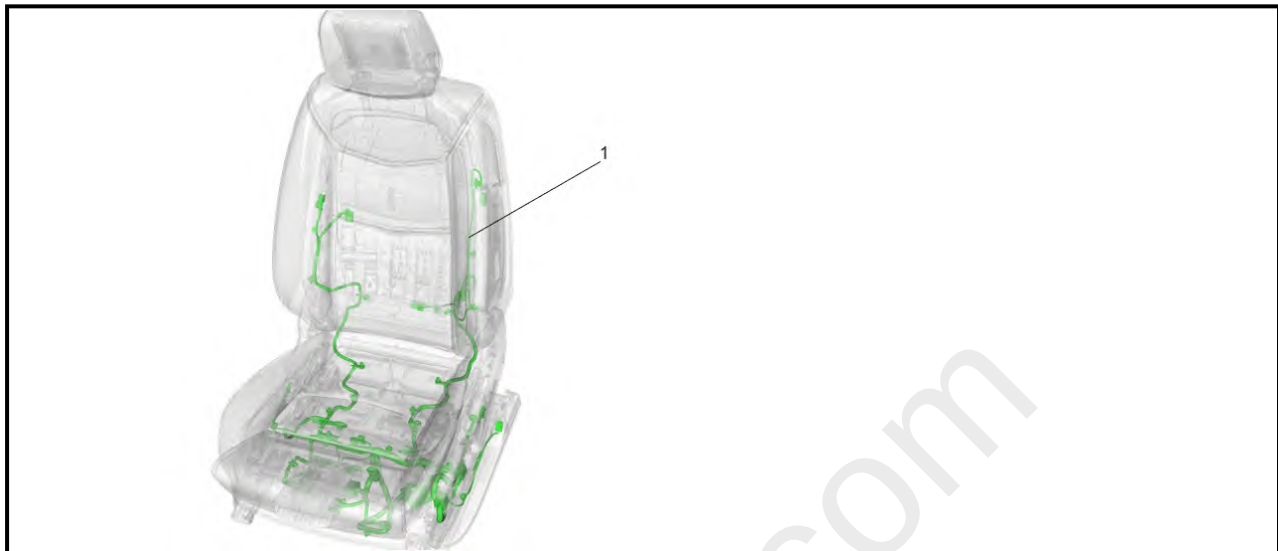
DRIVER OR PASSENGER SEAT RECLINER ACTUATOR REPLACEMENT



Callout	Component Name
Preliminary Procedure <u>Driver or Passenger Seat Back Cover and Pad Replacement</u> - Reposition	
1	Driver or Passenger Seat Recliner Actuator Rod Procedure Use a flat-bladed tool to push upward on the front seat recliner hub tab while gently tapping the recliner rod outward until the rod is free of the recliner motor.
2	Driver or Passenger Seat Recliner Actuator Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten 6 N.m (53 lb in)

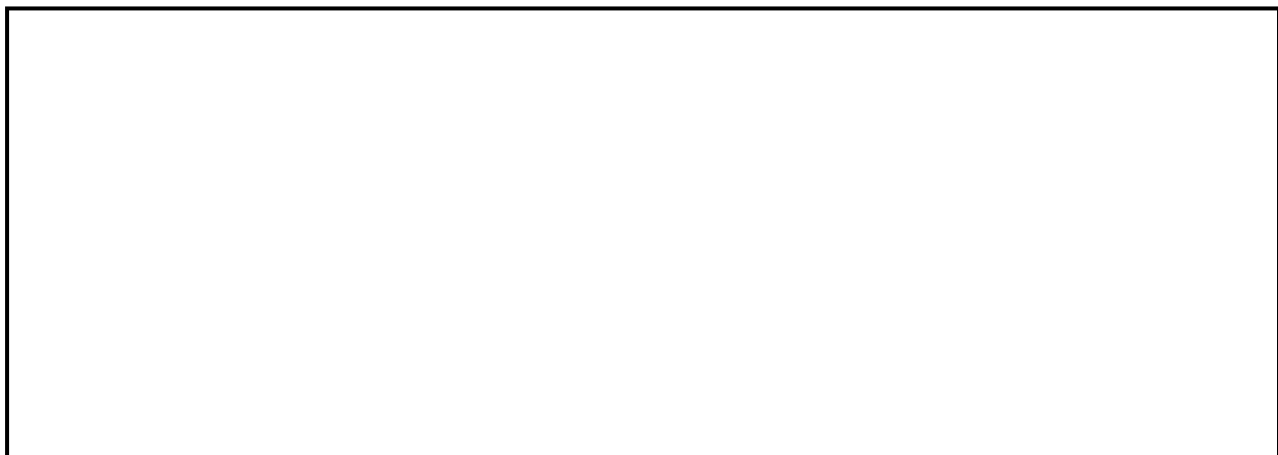
Callout	Component Name
3	Driver or Passenger Seat Recliner Actuator Procedure 1. Disconnect the electrical connector. 2. Pull up on the trim cover to gain access to the seat recliner actuator bolt. 3. Remove the seat recliner actuator.

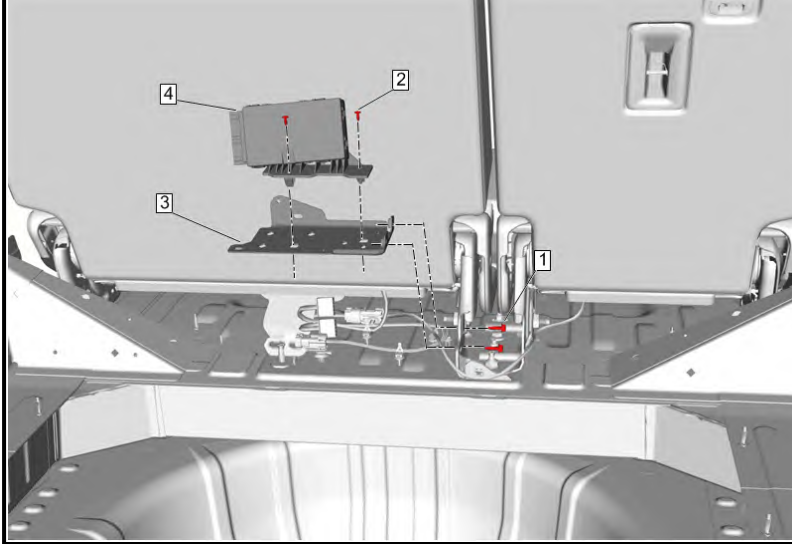
FRONT SEAT WIRING HARNESS REPLACEMENT



Callout	Component Name
WARNING: Refer to SIR Warning . Preliminary Procedures 1. SIR Disabling and Enabling 2. Driver or Passenger Seat Removal and Installation	
1	Front Seat Wiring Harness NOTE: Typical wiring harness shown, individual harness may be different due to option content. Various seat components may need to be removed from the seat to access the harness depending on seat and content options.

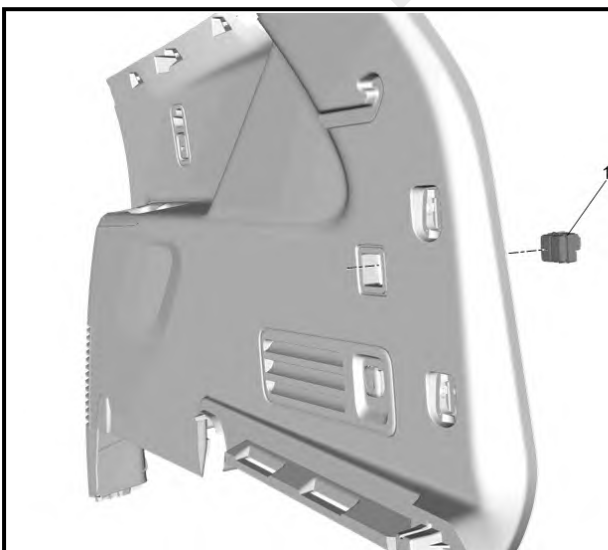
FOLDING 3RD ROW SEAT MODULE REPLACEMENT





Callout	Component Name
1	Folding 3rd Row Seat Bracket Bolt [2x] CAUTION: Refer to Fastener Caution . Tighten 10 N.m (89 lb in)
2	Folding 3rd Row Seat Module Screw [2x] Tighten 2.5 N.m (22 lb in)
3	Folding 3rd Row Seat Bracket
4	Folding 3rd Row Seat Module Procedure 1. Disconnect the electrical connector. 2. Perform the necessary programming and setup procedure: Control Module References

3RD ROW SEAT FOLDING SWITCH REPLACEMENT



Callout	Component Name
Preliminary Procedure Quarter Lower Rear Trim Panel Replacement (Right Side) Quarter Lower Rear Trim Panel Replacement (Left Side)	

Callout	Component Name
1	3rd Row Seat Folding Switch Procedure 1. Use a plastic trim tool to release the switch from the trim panel. 2. Disconnect the electrical connector.

DESCRIPTION AND OPERATION

LUMBAR SUPPORT DESCRIPTION AND OPERATION

Lumbar Support Components

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

- S65 Seat lumbar switch
- M53 Lumbar support motor

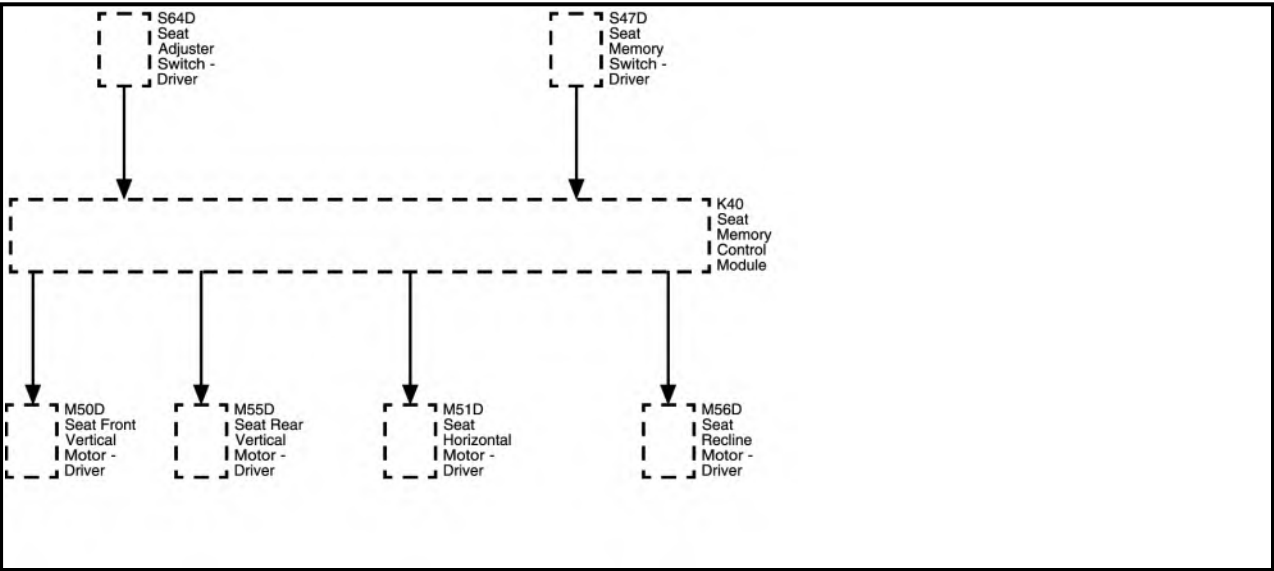
The seat lumbar switch provides both power and ground to the lumbar support motor. The motor contains an electronic circuit breaker (PTC) that will reset only after voltage has been removed from the motor. The motor moves the lumbar support forward and rearward.

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.

MEMORY SEATS DESCRIPTION AND OPERATION

The memory seat system consists of the following components:

- K40 Seat memory control module
- S64 Seat adjuster switch
- S47 Seat memory switch
- M51 Seat horizontal motor
- M50 Seat front vertical motor
- M55 Seat rear vertical motor
- M56 Seat recline motor



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

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 an 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 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:

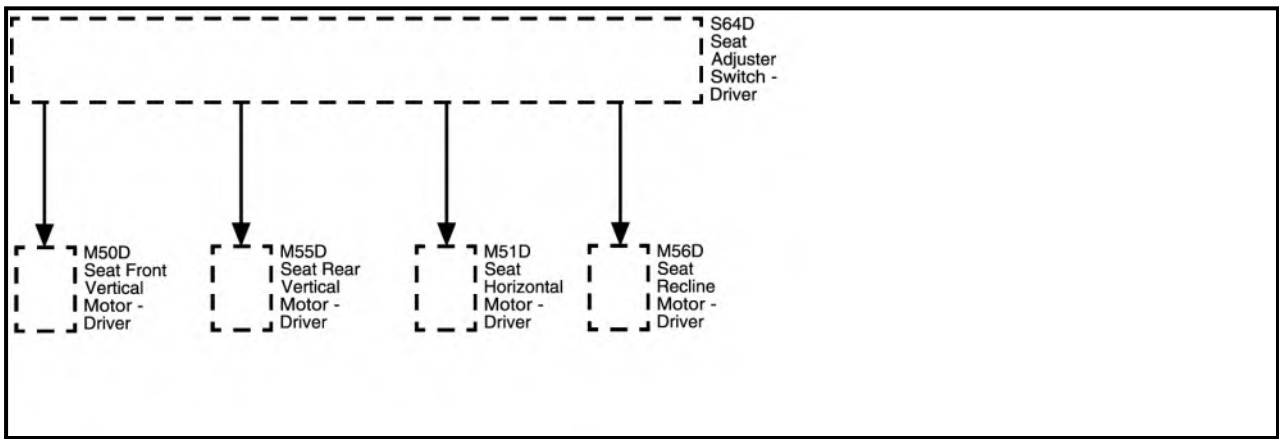
- Auto Memory Recall
- Easy Exit Options

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



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

Callout	Component Name
M51D	M51D Seat Horizontal Motor - Driver
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 (3RD ROW SEATS)

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 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 reached 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 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.
