

ACCESSORIES & EQUIPMENT

Power Seats - CTS Sedan

SCHEMATIC WIRING DIAGRAMS

DRIVER SEAT WIRING SCHEMATICS

Power, Ground, Serial Data, and Seat Memory Switch

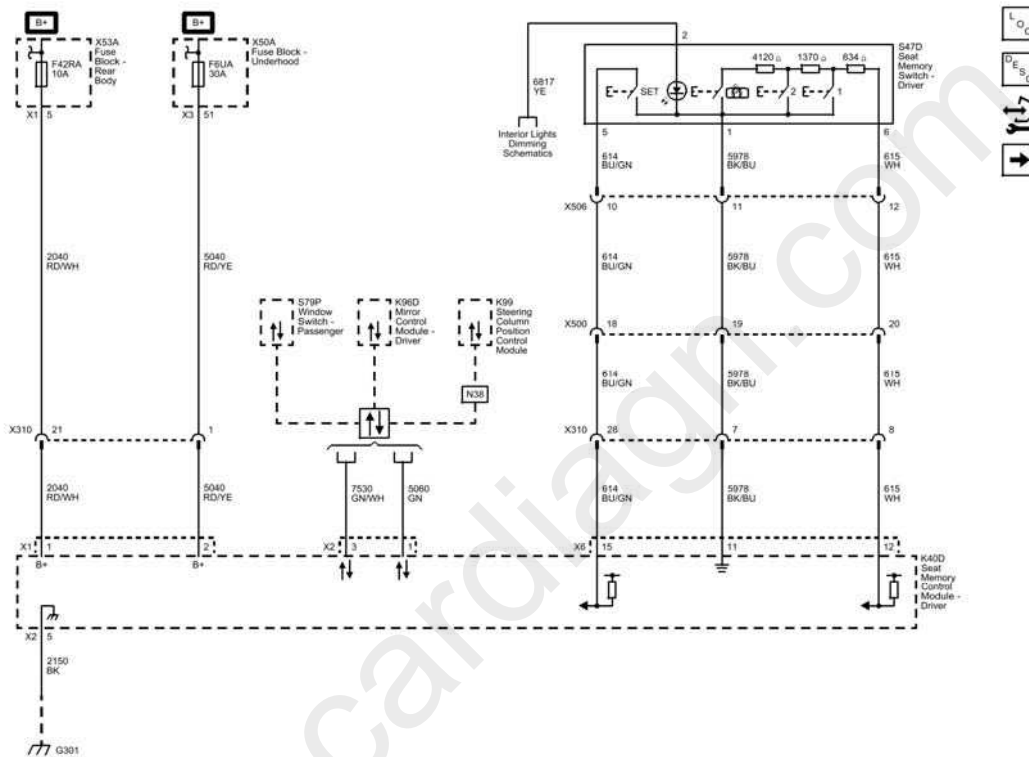


Fig. 1: Power, Ground, Serial Data, and Seat Memory Switch
Courtesy of GENERAL MOTORS COMPANY

Seat Adjuster Switch and Signals

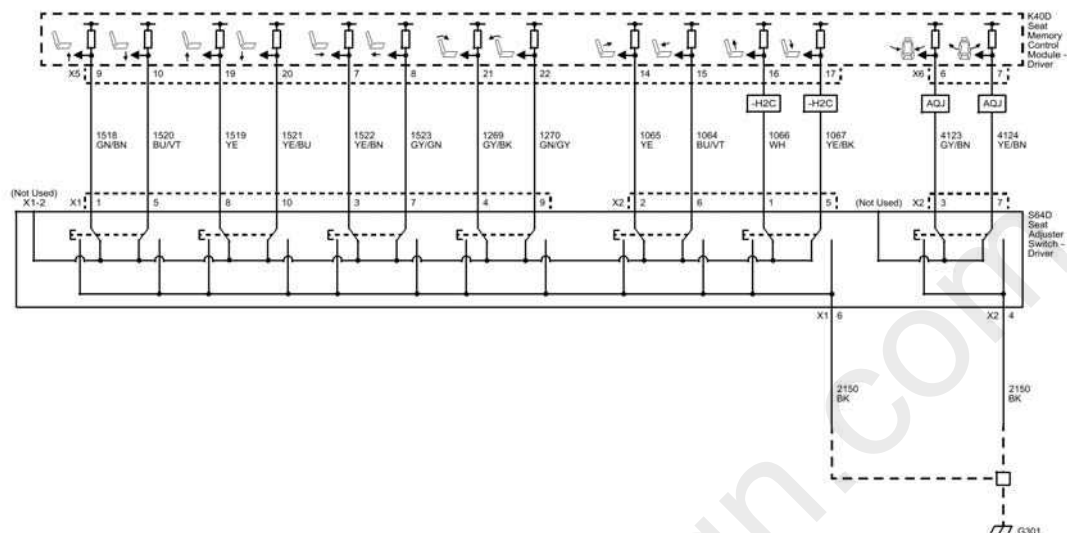
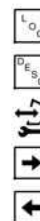


Fig. 2: Seat Adjuster Switch and Signals
Courtesy of GENERAL MOTORS COMPANY

Position

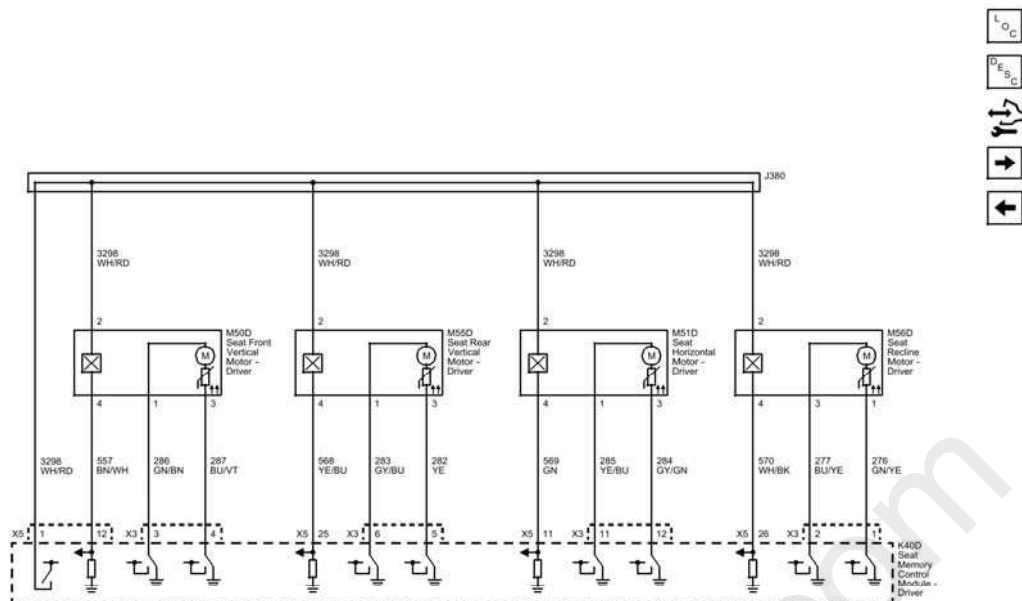


Fig. 3: Position
Courtesy of GENERAL MOTORS COMPANY

Lumbar (H2C)

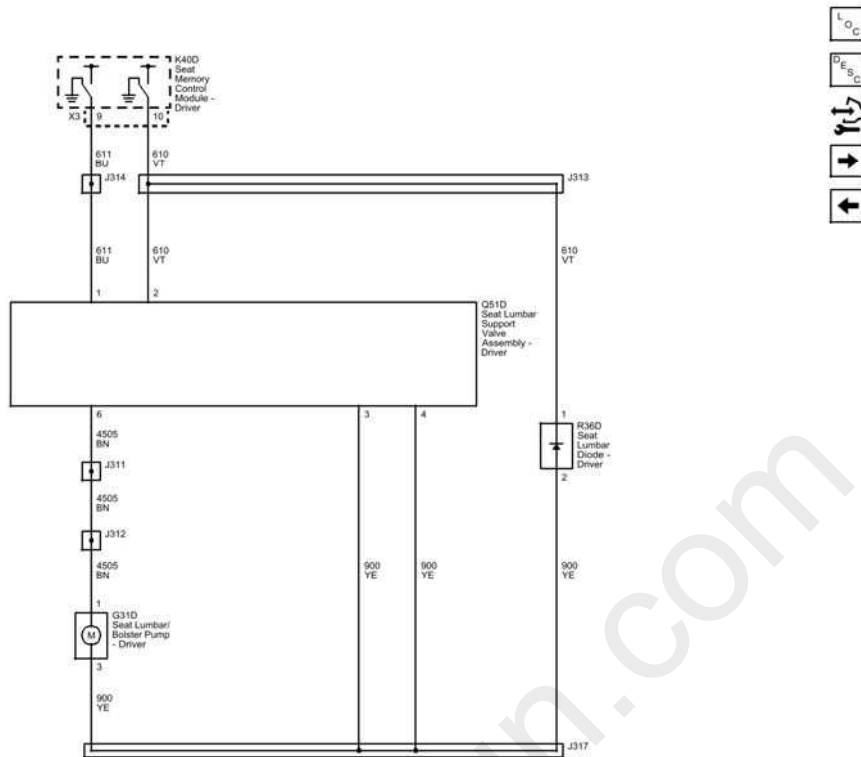
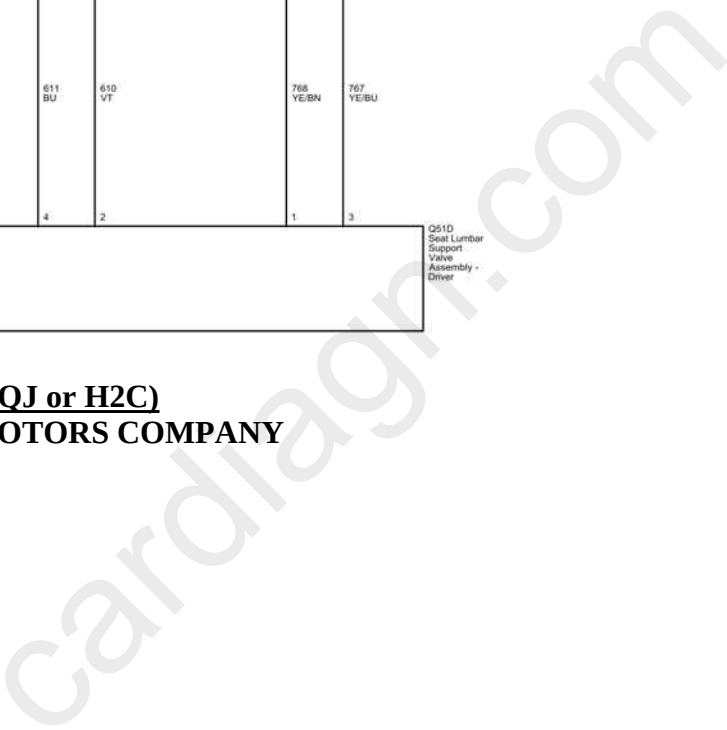


Fig. 4: Lumbar (H2C)

Courtesy of GENERAL MOTORS COMPANY

Lumbar (without AQJ or H2C)



Lumbar and Bolster (AQJ)

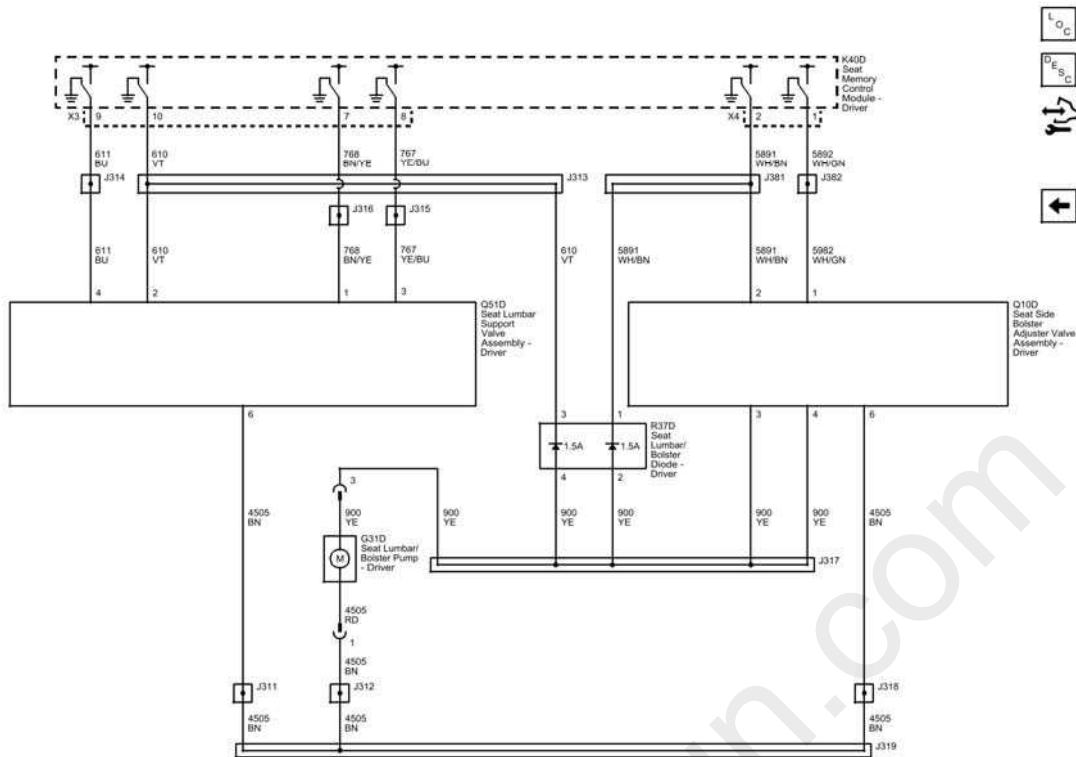


Fig. 6: Lumbar and Bolster (AQJ)
 Courtesy of GENERAL MOTORS COMPANY

PASSENGER SEAT WIRING SCHEMATICS

Position, and Lumbar (H2C)

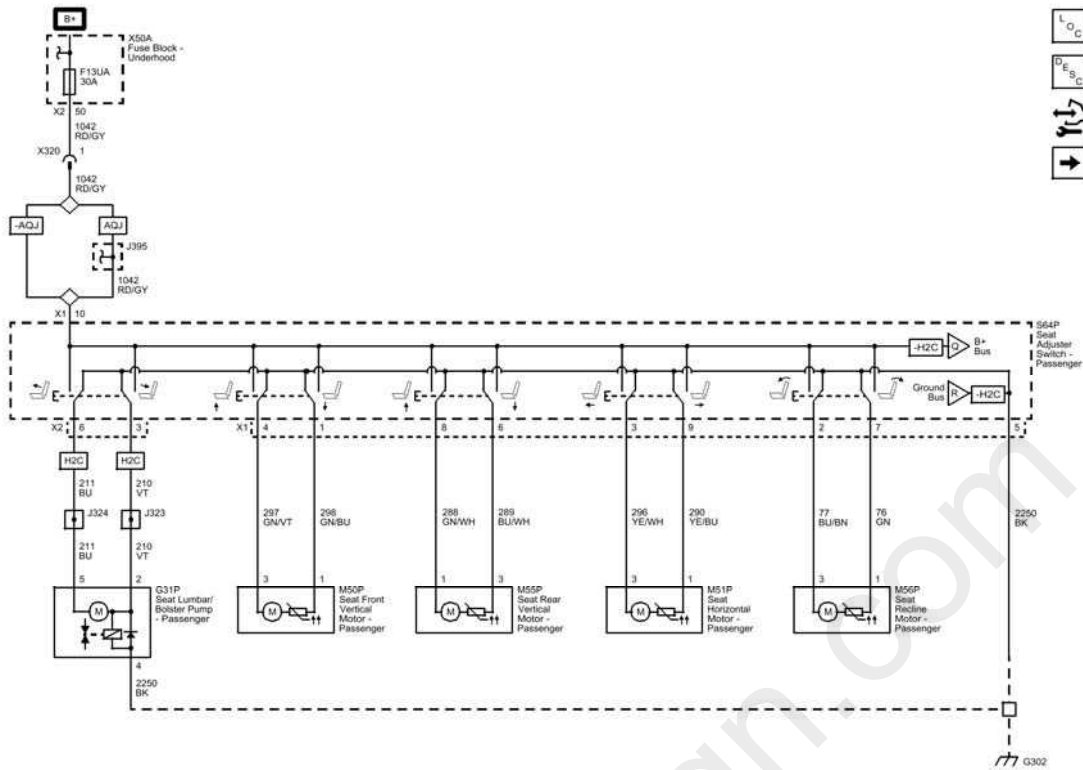


Fig. 7: Position, and Lumbar (H2C)
Courtesy of GENERAL MOTORS COMPANY

Lumbar (without AQJ or H2C)

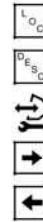
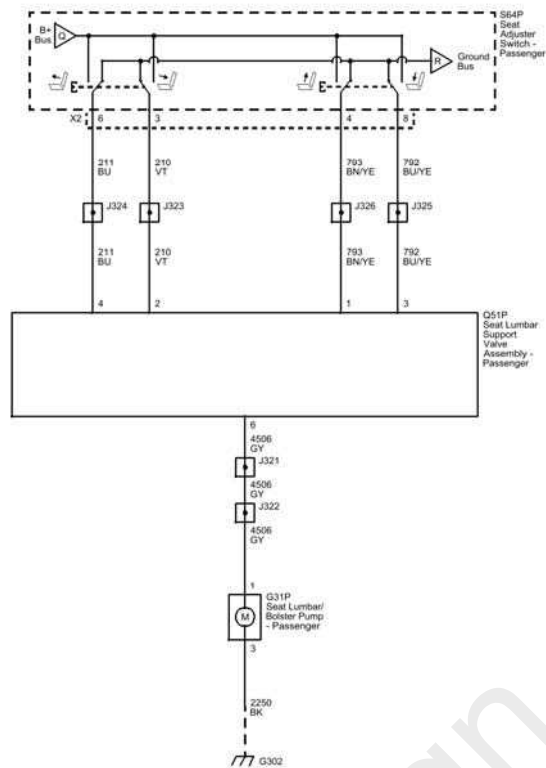


Fig. 8: Lumbar (without AQJ or H2C)
Courtesy of GENERAL MOTORS COMPANY

Lumbar and Bolster (AQJ)

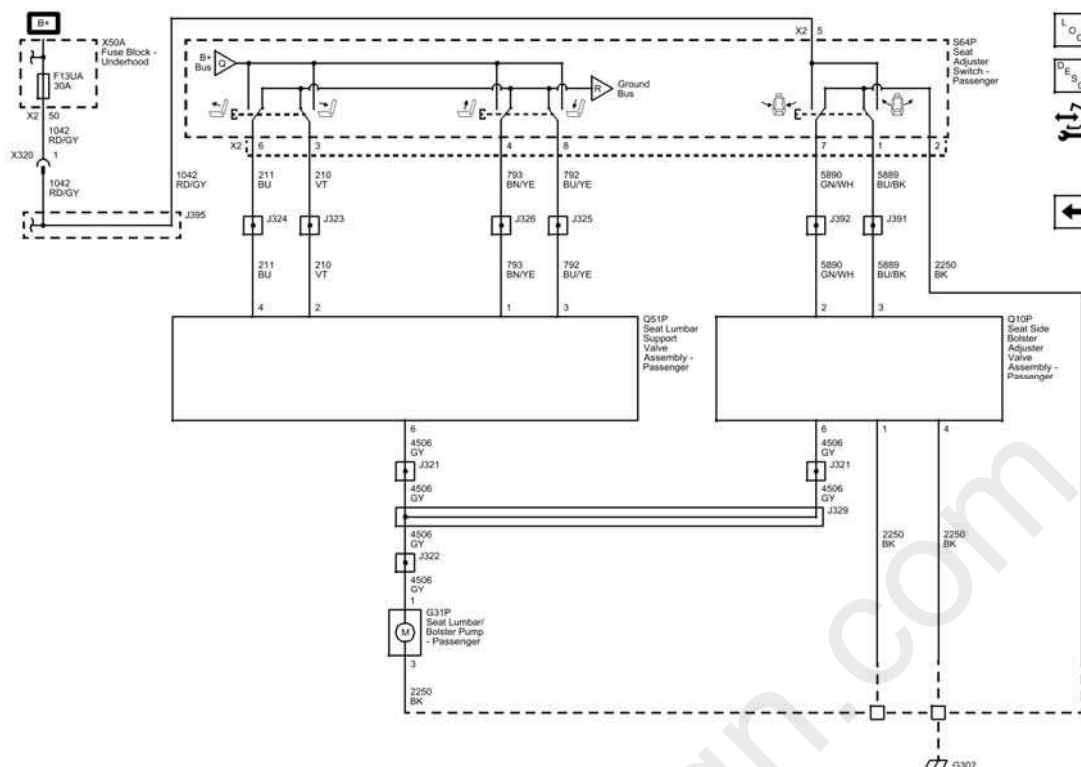


Fig. 9: Lumbar and Bolster (AQJ)

Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC B1405, B1825, B2355, B2365, or B2375</u>	DTC B1405 Control Module Voltage Reference Output 2 Circuit DTC B1825 Driver Seat Recline Position Sensor Circuit DTC B2355 Driver Seat Front Vertical Position Sensor Circuit DTC B2365 Driver Seat Rear Vertical Position Sensor Circuit DTC B2375 Driver Seat Assembly Horizontal Position Sensor Circuit
<u>DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, B1820, B1830, B1835, B1840, or B1845</u>	DTC B1735 02 Driver Seat Front Up Switch Circuit Short to Ground DTC B1740 02 Driver Seat Front Down Switch Circuit Short to Ground DTC B1745 02 Driver Seat Rear Up Switch Circuit Short to Ground DTC B1750 02 Driver Seat Rear Down Switch Circuit Short to Ground DTC B1755 02 Driver Seat Assembly Forward Switch Circuit Short to Ground DTC B1760 02 Driver Seat Assembly Rearward Switch Circuit Short to Ground DTC B1815 02 Driver Seat Recline Forward Switch Circuit Short to

	DTC B1820 02 Driver Seat Recline Rearward Switch Circuit Short to Ground DTC B1830 02 Driver Seat Lumbar Support Forward Switch Circuit Short to Ground DTC B1835 02 Driver Seat Lumbar Support Rearward Switch Circuit Short to Ground DTC B1840 02 Driver Seat Lumbar Support Up Switch Circuit Short to Ground DTC B1845 02 Driver Seat Lumbar Support Down Switch Circuit Short to Ground
<u>DTC B180A or B180B</u>	DTC B180A 02 Driver Seat Back Bolster Inwards Switch Circuit Short to Ground DTC B180B 02 Driver Seat Back Bolster Outwards Switch Circuit Short to Ground
<u>DTC B2755 or B2765</u>	DTC B2755 00 Driver Memory Select Switch Circuit DTC B2755 01 Driver Memory Select Switch Circuit Short to Battery DTC B2755 02 Driver Memory Select Switch Circuit Short to Ground DTC B2765 02 Driver Memory Set Switch Circuit Short to Ground
<u>DTC B3920 (4-Way Lumbar with AQJ)</u>	DTC B3920 00 Driver Seat Motors Group 1 Common Circuit Malfunction DTC B3920 01 Driver Seat Motors Group 1 Common Circuit Short to Battery DTC B3920 02 Driver Seat Motors Group 1 Common Circuit Short to Ground DTC B3920 0B Driver Seat Motors Group 1 Common Circuit High Current
<u>DTC B3920 (2-Way Lumbar H2C)</u>	DTC B3920 00 Driver Seat Motors Group 1 Common Circuit Malfunction DTC B3920 01 Driver Seat Motors Group 1 Common Circuit Short to Battery DTC B3920 02 Driver Seat Motors Group 1 Common Circuit Short to Ground DTC B3920 0B Driver Seat Motors Group 1 Common Circuit High Current
<u>DTC B3920 (4-Way Lumbar without AQJ)</u>	DTC B3920 00 Driver Seat Motors Group 1 Common Circuit Malfunction DTC B3920 01 Driver Seat Motors Group 1 Common Circuit Short to Battery DTC B3920 02 Driver Seat Motors Group 1 Common Circuit Short to Ground DTC B3920 0B Driver Seat Motors Group 1 Common Circuit High Current

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

Diagnostic Instructions

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

DTC Descriptors

DTC B1405

Control Module Voltage Reference Output 2 Circuit

DTC B1825

Driver Seat Recline Position Sensor Circuit

DTC B2355

Driver Seat Front Vertical Position Sensor Circuit

DTC B2365

Driver Seat Rear Vertical Position Sensor Circuit

DTC B2375

Driver Seat Assembly Horizontal Position Sensor Circuit

For symptom byte information refer to [Symptom Byte List](#)

Diagnostic Fault Information

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

Sensor Signal	B1825 06	B1825 06	B2365 01, B2375 01	B1825 5A
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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 Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

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 12 V reference circuit terminal 2 and ground while pressing any power seat switch.
 - **If 10.8 V or less**
 1. Ignition OFF, disconnect the X5 harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between the 12 V reference circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.

- If infinite resistance
- 3. Test for less than 2 ohms in the 12 V reference circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K40 Seat Memory Control Module.
 - **If greater than 10.8 V**
- 4. Test for 0.2-2 V between the signal circuit terminal 4 and ground.
 - **If less than 0.2 V**
 1. Ignition OFF, disconnect the X5 harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K40 Seat Memory Control Module.
 - **If greater than 2 V**
 1. Ignition OFF, disconnect the X5 harness connector at the K40 Seat Memory Control Module, ignition ON.
 2. Test for less than 1 V between each signal circuit listed below and ground.
 - Front vertical sensor terminal 12
 - Seat horizontal sensor terminal 11
 - Rear vertical sensor terminal 25
 - Seat recline sensor terminal 26
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K40 Seat Memory Control Module.
 - **If between 0.2-2 V**
- 5. Test or replace the seat motor.

Repair Instructions

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

- **Front Seat Tilt Adjuster Actuator Replacement**
- **Driver or Passenger Seat Vertical Adjuster Actuator Replacement**
- **Front Seat Adjuster Actuator Replacement**
- **Driver or Passenger Seat Recliner Actuator Replacement**
- **Control Module References** for K40 Seat Memory Control Module replacement, programming and setup

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

Diagnostic Instructions

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

DTC Descriptors

DTC B1735 02

Driver Seat Front Up Switch Circuit Short to Ground

DTC B1740 02

Driver Seat Front Down Switch Circuit Short to Ground

DTC B1745 02

Driver Seat Rear Up Switch Circuit Short to Ground

DTC B1750 02

Driver Seat Rear Down Switch Circuit Short to Ground

DTC B1755 02

Driver Seat Assembly Forward Switch Circuit Short to Ground

DTC B1760 02

Driver Seat Assembly Rearward Switch Circuit Short to Ground

DTC B1815 02

Driver Seat Recline Forward Switch Circuit Short to Ground

DTC B1820 02

Driver Seat Recline Rearward Switch Circuit Short to Ground

DTC B1830 02

Driver Seat Lumbar Support Forward Switch Circuit Short to Ground

DTC B1835 02

Driver Seat Lumbar Support Rearward Switch Circuit Short to Ground

DTC B1840 02

Driver Seat Lumbar Support Up Switch Circuit Short to Ground

DTC B1845 02

Driver Seat Lumbar Support Down Switch Circuit Short to Ground

Diagnostic Fault Information

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

	B1845 02			
Rear Vertical Down Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	1	-	-
Horizontal Forward Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	1	-	-
Horizontal Rearward Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	1	-	-
Recline Forward Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02,	1	-	-

	B1840 02, B1845 02			
Recline Rearward Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	1	-	-
Driver Seat Lumbar Forward Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	2	-	-
Driver Seat Lumbar Rearward Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	2	-	-
Driver Seat Lumbar Up Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02,	2	-	-

	B1835 02, B1840 02, B1845 02			
Driver Seat Lumbar Down Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	2	-	-
1. Power seat is inoperative 2. Lumbar support is inoperative				

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

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

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

- The current DTC will clear and set the DTC to history, when the fault is no longer present and the ignition is cycled OFF then back to ACC or RUN.

- The history DTC will clear after 40 consecutive fault-free ignition cycles have occurred.

Diagnostic Aids

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

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

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
 - Driver Lumbar Support Horizontal Switch
 - Driver Lumbar Support Vertical Switch

- **If the parameter does not change**

Refer to Circuit/System Testing.

- **If the parameter changes**

3. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the X1 and X2 harness connectors at the S64D Seat Adjuster Switch - Driver.
 2. Verify that all scan tool driver seat switch parameters listed below are Inactive:
 - Driver Seat Cushion Front Vertical Switch
 - Driver Seat Cushion Rear Vertical Switch
 - Driver Seat Horizontal Switch
 - Driver Seat Back Switch
 - Driver Lumbar Support Horizontal Switch
 - Driver Lumbar Support Vertical Switch
 - **If not Inactive**
 1. Ignition OFF, disconnect the X5 harness connector at the K40D Seat Memory Control Module - Driver, ignition ON.
 2. Test for infinite resistance between the appropriate signal circuit terminal listed below and ground:
 - Front vertical up switch terminal 1 X1
 - Front vertical down switch terminal 5 X1
 - Rear vertical up switch terminal 8 X1
 - Rear vertical down switch terminal 10 X1
 - Horizontal forward switch terminal 3 X1
 - Horizontal rearward switch terminal 7 X1
 - Recline forward switch terminal 4 X1
 - Recline rearward switch terminal 9 X1
 - Driver seat lumbar up terminal 1 X2
 - Driver seat lumbar down terminal 5 X2
 - Driver seat lumbar forward terminal 2 X2
 - Driver seat lumbar rearward terminal 6 X2
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K40D Seat Memory Control Module - Driver.
 - **If Inactive**
3. Install a 3 A fused jumper wire between the appropriate signal circuit terminal listed below and the ground circuit terminal 6 X1.
 - Front vertical up switch terminal 1 X1
 - Front vertical down switch terminal 5 X1

- Rear vertical up switch terminal 8 X1
 - Rear vertical down switch terminal 10 X1
 - Horizontal forward switch terminal 3 X1
 - Horizontal rearward switch terminal 7 X1
 - Recline forward switch terminal 4 X1
 - Recline rearward switch terminal 9 X1
 - Driver seat lumbar up terminal 1 X2
 - Driver seat lumbar down terminal 5 X2
 - Driver seat lumbar forward terminal 2 X2
 - Driver seat lumbar rearward terminal 6 X2
4. Verify the appropriate scan tool seat switch parameter is Forward/Rearward or UP/Down.
 - **If not Forward/Rearward or UP/Down**
 1. Ignition OFF, disconnect the X5 harness connector at the 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.
 - If less than 1 V
 3. Ignition OFF.
 4. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K40D Seat Memory Control Module - Driver.
 - **If Forward/Rearward or UP/Down**
 5. Test or replace the S64D Seat Adjuster Switch - Driver.

Component Testing

Seat Adjuster Switch Test

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

Replace the S64D Seat Adjuster Switch - Driver.
 - **If infinite resistance**
3. Test for less than 2 ohms between the ground terminal 6 and each signal terminal with the appropriate switch in the closed position.
 - **If 2 ohms or greater**

Replace the S64D Seat Adjuster Switch - Driver.

- If less than 2 ohms

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 B180A OR B180B: DRIVER SEAT BACK BOLSTER

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 B180A 02

Driver Seat Back Bolster Inwards Switch Circuit Short to Ground

DTC B180B 02

Driver Seat Back Bolster Outwards Switch Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Driver Seat Side Bolster Inflate Switch Signal	B180A 02, B180B 02	1	-	-
Driver Seat Side Bolster Deflate Switch Signal	B180A 02, B180B 02	1	-	-
1. The driver seat back side bolster function 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 seat side bolster switches are pressed, the appropriate signal circuit from the seat memory control module is pulled low through the switch contacts indicating the seat side bolster command. The seat memory control module then commands the driver seat side bolsters to inflate or deflate 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 side bolster 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

- The seat side bolster output driven in response to a switch considered failed, is deactivated for both directions.
- The seat memory control module will respond to any other switch signal that has not set a DTC.

Conditions for Clearing the DTC

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

Diagnostic Aids

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

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

Description and Operation

Memory Seats Description and Operation

Electrical Information Reference

- **Circuit Testing**

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Driver Seat Cushion Bolster Switch parameter changes between Inactive and Inflate/Deflate when pressing the seat side bolster switch in both directions.
 - **If the parameter does not change**

Refer to Circuit/System Testing.

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

Circuit/System Testing

1. Ignition OFF, disconnect the X2 harness connector at the S64D Seat Adjuster Switch - Driver.
2. Verify the scan tool Driver Seat Cushion Bolster Switch parameter is Inactive:
 - **If not Inactive**
 1. Ignition OFF, disconnect the X6 harness connector at the K40D Seat Memory Control Module - Driver.
 2. Test for infinite resistance between the appropriate signal circuit terminal listed below and ground:
 - Driver seat side bolster inflate terminal 1 X2
 - Driver seat side bolster deflate terminal 5 X2
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K40D Seat Memory Control Module - Driver.
 - **If Inactive**
3. Install a 3 A fused jumper wire between the ground circuit terminal 4 and the appropriate signal circuit terminal listed below:
 - Driver seat side bolster inflate terminal 1 X2
 - Driver seat side bolster deflate terminal 5 X2
4. Verify the scan tool Driver Seat Cushion Bolster Switch parameter is In or Out.
 - **If not In or Out**
 1. Ignition OFF, disconnect the X6 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.
- If less than 1 V
- 3. Ignition OFF.
- 4. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K40D Seat Memory Control Module - Driver.
- **If not In or Out**
- 5. Test or replace the S64D Seat Adjuster Switch - Driver.

Component Testing

Seat Adjuster Switch Test

1. Ignition OFF, disconnect the X2 harness connector at the S64D Seat Adjuster Switch - Driver.
2. Test for infinite resistance between the ground terminal 4 and each bolster signal terminal with the switch in the open position.
 - **If less than infinite resistance**
 Replace the S64D Seat Adjuster Switch - Driver.
 - **If infinite resistance**
3. Test for less than 2 ohms between the ground terminal 4 and each signal terminal with the appropriate switch in the closed position.
 - **If 2 ohms or greater**
 Replace the S64D Seat Adjuster Switch - Driver.
 - **If less than 2 ohms**
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: DRIVER MEMORY SELECT SWITCH

Diagnostic Instructions

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

- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B2755 00

Driver Memory Select Switch Circuit

DTC B2755 01

Driver Memory Select Switch Circuit Short to Battery

DTC B2755 02

Driver Memory Select Switch Circuit Short to Ground

DTC B2765 02

Driver Memory Set Switch Circuit Short to Ground

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
Memory Seat Switch Set Signal	B2765 02	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.

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

The seat memory control module detects a stuck memory switch for a given amount of time.

B2755 01

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

B2755 02

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

B2765 02

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 Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

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

Refer to Circuit/System Testing.
 - **If the parameter changes**
6. All OK.

Circuit/System Testing

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

- **If less than 9 V**

1. Ignition OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module.
2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K40 Seat Memory Control Module.

- **If 9 V or greater**

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

Repair the short to voltage on the circuit.

- **If less than 1 V**

6. Test or replace the S47D Seat Memory Switch - Driver.

Component Testing

Driver Seat Memory Switch

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

Replace the S47D Seat Memory Switch - Driver.

- **If infinite resistance**

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

Replace the S47D Seat Memory Switch - Driver.

- **If less than 4 ohms**

4. Test for 573-701 ohms between the signal terminal 6 and the low reference terminal 1 while pressing the memory 1 button.

- **If not between 573-701 ohms**

Replace the S47D Seat Memory Switch - Driver.

- **If between 573-701 ohms**

5. Test for 1800-2201 ohms between the signal terminal 6 and the low reference terminal 1 while pressing the memory 2 button.

- **If not between 1800-2201 ohms**

Replace the S47D Seat Memory Switch - Driver.

- **If between 1800-2201 ohms**

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

- **If not between 5.52k-6.73 kohms**

Replace the S47D Seat Memory Switch - Driver.

- **If between 5.52k-6.73 kohms**

7. All OK.

Repair Instructions

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

- **Front Seat Adjuster Memory Switch Replacement**
- **Control Module References** for K40 Seat Memory Control Module replacement, programming, and setup

DTC B3920 (4-WAY LUMBAR WITH AQJ): DRIVER SEAT MOTORS GROUP

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

Driver Seat Motors Group 1 Common Circuit Malfunction

DTC B3920 01

Driver Seat Motors Group 1 Common Circuit Short to Battery

DTC B3920 02

Driver Seat Motors Group 1 Common Circuit Short to Ground

DTC B3920 0B

Driver Seat Motors Group 1 Common Circuit High Current

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Driver Seat Front Vertical Motor Down Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Seat Front Vertical Motor Up Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Seat Horizontal Motor Forward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Seat Horizontal Motor Rearward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Seat Rear Vertical Motor Down Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Seat Rear Vertical Motor Up Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Seat Recline Motor Forward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Seat Recline Motor Rearward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Seat Lumbar Forward Control	B3920 02	2	B3920 01	B3920 00, B3920 0B
Driver Seat Lumbar Rearward Control	B3920 02	2	B3920 01	B3920 00, B3920 0B
Driver Seat Lumbar Up Control	B3920 02	2	B3920 01	B3920 00, B3920 0B
Driver Seat Lumbar Down Control	B3920 02	2	B3920 01	B3920 00, B3920 0B
Driver Seat Side Bolster Deflate Control	B3920 02	3	B3920 01	B3920 00, B3920 0B
Driver Seat Side Bolster Inflate Control	B3920 02	3	B3920 01	B3920 00, B3920 0B
1. Power seat and memory functions inoperative				

- | |
|---|
| <ol style="list-style-type: none">2. Lumbar support functions are inoperative3. Seat side bolsters are inoperative |
|---|

Circuit/System Description

The seat memory control module controls the seat motors, lumbar/bolster pump 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. The module monitors all seat motor control circuits for a shorted to ground or battery 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 Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

Description and Operation

Memory Seats Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

B3920 01 or B3920 02

1. Ignition OFF, disconnect the X3 harness connector at the K40D Seat Memory Control Module - Driver.
2. Test for infinite resistance between each control circuit terminal listed below and ground:
 - Driver seat front vertical motor up control terminal 3
 - Driver seat front vertical motor down control terminal 4
 - Driver seat rear vertical motor up control terminal 5
 - Driver seat rear vertical motor down control terminal 6
 - Driver seat horizontal motor forward control terminal 11
 - Driver seat horizontal motor rearward control terminal 12
 - Driver seat recline motor forward control terminal 1
 - Driver seat recline motor rearward control terminal 2
 - Driver seat lumbar forward control terminal 9

- Driver seat lumbar rearward control terminal 10
- Driver seat lumbar up control terminal 7
- Driver seat lumbar down control terminal 8
- **If less than infinite resistance**

Repair the short to ground on the circuit.

- **If infinite resistance**

3. Ignition ON.

4. Test for less than 1 V between each control circuit terminal listed below and ground:

- Driver seat front vertical motor up control terminal 3
- Driver seat front vertical motor down control terminal 4
- Driver seat rear vertical motor up control terminal 5
- Driver seat rear vertical motor down control terminal 6
- Driver seat horizontal motor forward control terminal 11
- Driver seat horizontal motor rearward control terminal 12
- Driver seat recline motor forward control terminal 1
- Driver seat recline motor rearward control terminal 2
- Driver seat lumbar forward control terminal 9
- Driver seat lumbar rearward control terminal 10
- Driver seat lumbar up control terminal 7
- Driver seat lumbar down control terminal 8
- **If 1 V or greater**

Repair the short to voltage on the circuit.

- **If less than 1 V**

5. Ignition OFF, disconnect the X4 harness connectors at the K40D Seat Memory Control Module - Driver.

6. Test for infinite resistance between each control circuit terminal listed below and ground:

- Driver seat side bolster inflate control terminal 1
- Driver seat side bolster deflate control terminal 2
- **If less than infinite resistance**

Repair the short to ground on the circuit.

- **If infinite resistance**

7. Ignition ON.

8. Test for less than 1 V between each control circuit terminal listed below and ground:

- Driver seat side bolster inflate control terminal 1
- Driver seat side bolster deflate control terminal 2

- **If 1 V or greater**

Repair the short to voltage on the circuit.

- **If less than 1 V**

9. Ignition OFF, disconnect the harness connector at the G31D Seat Lumbar/Bolster Pump - Driver.
10. Test for infinite resistance between each control circuit terminal listed below and ground:

- Terminal 1
- Terminal 3
- **If less than infinite resistance**

Repair the short to ground on the circuit.

- **If infinite resistance**

11. Ignition ON.
12. Test for less than 1 V between each control circuit terminal listed below and ground:

- Terminal 1
- Terminal 3
- **If 1 V or greater**

Repair the short to voltage on the circuit.

- **If less than 1 V**

13. 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, the lumbar support, and the bolster support 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 Back Recline Motor - Driver
 - Q51D Seat Lumbar Support Valve Assembly - Driver
 - Q10D Seat Side Bolster Adjuster Valve Assembly - Driver
 - G31D Seat Lumbar/Bolster Pump - Driver
4. Ignition OFF, disconnect the harness connector at the appropriate seat motor, lumbar valve assembly, bolster valve assembly, or the lumbar/bolster pump 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, lumbar, or bolster switch in both directions.
 - **If DTC B3920 00 or B3920 0B sets**
 1. Test for infinite resistance between the control circuits.
 - If less than infinite resistance, repair the short between the circuits.
 - If infinite resistance
 2. Test for less than 2 ohms in each control circuit end to end:
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, test or replace the seat motor, valve assembly, or pump.
 - **If DTC B3920 00 or B3920 0B does not set**
7. Test or replace the seat motor, valve assembly, or pump.

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**
- **Front Seat Adjuster Actuator Replacement**
- **Driver or Passenger Seat Recliner Actuator Replacement**
- **Driver or Passenger Seat Lumbar Support Replacement**
- **Control Module References** for K40D Seat Memory Control Module - Driver replacement, programming and setup

DTC B3920 (2-WAY LUMBAR H2C): DRIVER SEAT MOTORS GROUP

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

Driver Seat Motors Group 1 Common Circuit Malfunction

DTC B3920 01

Driver Seat Motors Group 1 Common Circuit Short to Battery

DTC B3920 02

Driver Seat Motors Group 1 Common Circuit Short to Ground

DTC B3920 0B

Driver Seat Motors Group 1 Common Circuit High Current

Diagnostic Fault Information

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

Circuit/System Description

The seat memory control module controls the seat motors, lumbar/bolster pump 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. The module monitors all seat motor control circuits for a shorted to ground or battery 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 Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

Description and Operation

Memory Seats Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

B3920 01 or B3920 02

1. Ignition OFF, disconnect the X3 harness connector at the K40D Seat Memory Control Module - Driver.
2. Test for infinite resistance between each control circuit terminal listed below and ground:
 - Driver seat front vertical motor up control terminal 3
 - Driver seat front vertical motor down control terminal 4
 - Driver seat rear vertical motor up control terminal 5
 - Driver seat rear vertical motor down control terminal 6
 - Driver seat horizontal motor forward control terminal 11
 - Driver seat horizontal motor rearward control terminal 12
 - Driver seat recline motor forward control terminal 1
 - Driver seat recline motor rearward control terminal 2
 - Driver seat lumbar forward control terminal 9
 - Driver seat lumbar rearward control terminal 10

- **If less than infinite resistance**

Repair the short to ground on the circuit.

- **If infinite resistance**

3. Ignition ON.
4. Test for less than 1 V between each control circuit terminal listed below and ground:
 - Driver seat front vertical motor up control terminal 3
 - Driver seat front vertical motor down control terminal 4
 - Driver seat rear vertical motor up control terminal 5
 - Driver seat rear vertical motor down control terminal 6

- Driver seat horizontal motor forward control terminal 11
- Driver seat horizontal motor rearward control terminal 12
- Driver seat recline motor forward control terminal 1
- Driver seat recline motor rearward control terminal 2
- Driver seat lumbar forward control terminal 9
- Driver seat lumbar rearward control terminal 10
- **If 1 V or greater**

Repair the short to voltage on the circuit.

- **If less than 1 V**

5. Ignition OFF, disconnect the harness connector at the G31D Seat Lumbar/Bolster Pump - Driver.

6. Test for infinite resistance between each control circuit terminal listed below and ground:

- Terminal 1
- Terminal 3

- **If less than infinite resistance**

Repair the short to ground on the circuit.

- **If infinite resistance**

7. Ignition ON.

8. Test for less than 1 V between each control circuit terminal listed below and ground:

- Terminal 1
- Terminal 3

- **If 1 V or greater**

Repair the short to voltage on the circuit.

- **If less than 1 V**

9. 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, the lumbar support, and bolster support 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 Back Recline Motor - Driver

- Q51D Seat Lumbar Support Valve Assembly - Driver
 - G31D Seat Lumbar/Bolster Pump - Driver
4. Ignition OFF, disconnect the harness connector at the appropriate seat motor, lumbar valve assembly, or lumbar/bolster pump 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 or lumbar switch in both directions.
 - **If DTC B3920 00 or B3920 0B sets**
 1. Test for infinite resistance between the control circuits.
 - If less than infinite resistance, repair the short between the circuits.
 - If infinite resistance
 2. Test for less than 2 ohms in each control circuit end to end:
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, test or replace the seat motor, valve assembly, or pump.
 - **If DTC B3920 00 or B3920 0B does not set**
 7. Test or replace the seat motor, valve assembly, or pump.

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**
- **Front Seat Adjuster Actuator Replacement**
- **Driver or Passenger Seat Recliner Actuator Replacement**
- **Driver or Passenger Seat Lumbar Support Replacement**
- **Control Module References** for K40D Seat Memory Control Module - Driver replacement, programming and setup

DTC B3920 (4-WAY LUMBAR WITHOUT AQJ): DRIVER SEAT MOTORS GROUP

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

Driver Seat Motors Group 1 Common Circuit Malfunction

DTC B3920 01

Driver Seat Motors Group 1 Common Circuit Short to Battery

DTC B3920 02

Driver Seat Motors Group 1 Common Circuit Short to Ground

DTC B3920 0B

Driver Seat Motors Group 1 Common Circuit High Current

Diagnostic Fault Information

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

Circuit/System Description

The seat memory control module controls the seat motors, lumbar/bolster pump 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. The module monitors all seat motor control circuits for a shorted to ground or battery 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 Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

Description and Operation

Memory Seats Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

B3920 01 or B3920 02

1. Ignition OFF, disconnect the X3 harness connector at the K40D Seat Memory Control Module - Driver.
2. Test for infinite resistance between each control circuit terminal listed below and ground:
 - Driver seat front vertical motor up control terminal 3
 - Driver seat front vertical motor down control terminal 4
 - Driver seat rear vertical motor up control terminal 5
 - Driver seat rear vertical motor down control terminal 6
 - Driver seat horizontal motor forward control terminal 11
 - Driver seat horizontal motor rearward control terminal 12
 - Driver seat recline motor forward control terminal 1
 - Driver seat recline motor rearward control terminal 2
 - Driver seat lumbar forward control terminal 9
 - Driver seat lumbar rearward control terminal 10
 - Driver seat lumbar up control terminal 7
 - Driver seat lumbar down control terminal 8
 - **If less than infinite resistance**

Repair the short to ground on the circuit.

- **If infinite resistance**

3. Ignition ON.

4. Test for less than 1 V between each control circuit terminal listed below and ground:

- Driver seat front vertical motor up control terminal 3
- Driver seat front vertical motor down control terminal 4
- Driver seat rear vertical motor up control terminal 5
- Driver seat rear vertical motor down control terminal 6
- Driver seat horizontal motor forward control terminal 11
- Driver seat horizontal motor rearward control terminal 12
- Driver seat recline motor forward control terminal 1
- Driver seat recline motor rearward control terminal 2
- Driver seat lumbar forward control terminal 9
- Driver seat lumbar rearward control terminal 10
- Driver seat lumbar up control terminal 7
- Driver seat lumbar down control terminal 8

- **If 1 V or greater**

Repair the short to voltage on the circuit.

- **If less than 1 V**

5. Ignition OFF, disconnect the harness connector at the G31D Seat Lumbar/Bolster Pump - Driver.

6. Test for infinite resistance between each control circuit terminal listed below and ground:

- Terminal 1
- Terminal 3

- **If less than infinite resistance**

Repair the short to ground on the circuit.

- **If infinite resistance**

7. Ignition ON.

8. Test for less than 1 V between each control circuit terminal listed below and ground:

- Terminal 1
- Terminal 3

- **If 1 V or greater**

Repair the short to voltage on the circuit.

- **If less than 1 V**

9. 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 and the lumbar support 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 Back Recline Motor - Driver
 - Q51D Seat Lumbar Support Valve Assembly - Driver
 - G31D Seat Lumbar/Bolster Pump - Driver
4. Ignition OFF, disconnect the harness connector at the appropriate seat motor, lumbar valve assembly, or the lumbar/bolster pump 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 or lumbar switch in both directions.
 - **If DTC B3920 00 or B3920 0B sets**
 1. Test for infinite resistance between the control circuits.
 - If less than infinite resistance, repair the short between the circuits.
 - If infinite resistance
 2. Test for less than 2 ohms in each control circuit end to end:
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, test or replace the seat motor, valve assembly, or pump.
 - **If DTC B3920 00 or B3920 0B does not set**
7. Test or replace the seat motor, valve assembly, or pump.

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**
- **Front Seat Adjuster Actuator Replacement**
- **Driver or Passenger Seat Recliner Actuator Replacement**
- **Driver or Passenger Seat Lumbar Support 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 (Driver Seat), Lumbar Support Description and Operation (Passenger Seat)**
 - **Memory Seats Description and Operation**
 - **Power Seats System Description and Operation**
 - **Seat Side Bolster Description and Operation (With Memory A45), Seat Side Bolster Description and Operation (Without Memory A45)**

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 (Passenger Seat 4-Way Lumbar with or without AQJ), Lumbar Support Malfunction (Driver Seat with 4-Way Lumbar with or without AQJ), Lumbar Support Malfunction (Driver Seat with 2-Way Lumbar H2C), Lumbar Support Malfunction (Passenger Seat 2-Way Lumbar H2C)**
- **Seat Side Bolster Malfunction (Passenger Seat), Seat Side Bolster Malfunction (Driver Seat)**
- **Memory Seat Feature Malfunction**
- **Power Seat Malfunction (Driver Seat), Power Seat Malfunction (Passenger Seat)**

LUMBAR SUPPORT MALFUNCTION (PASSENGER SEAT 4-WAY LUMBAR WITH OR WITHOUT AQJ)

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 Lumbar Forward Control	1	3	-	-
Seat Lumbar Rearward Control	1	3	-	-
Seat Lumbar Up Control	1	3	-	-
Seat Lumbar Down Control	1	3	-	-
Seat Lumbar/Bolster Pump Control	2	3	4	-
Seat Lumbar/Bolster Pump Ground	-	2	-	-
1. The power seat, lumbar support, and seat side bolster if equipped functions are inoperative 2. The lumbar support and seat side bolster if equipped functions are inoperative 3. The lumbar support is inoperative 4. The lumbar/bolster pump is always ON				

Circuit/System Description

Battery voltage is supplied at all times to the seat adjuster switch through a 30 A fuse located in the underhood fuse block. When the lumbar switch is pressed to inflate the lumbar support, battery voltage is applied through the switch contacts and the inflate control circuit to the seat lumbar support valve assembly. The seat lumbar support valve assembly energizes its internal inflate solenoid and applies battery voltage through the seat lumbar/bolster pump control circuit to the pump. The pump runs to inflate the lumbar support until the switch is released. When the lumbar switch is pressed to deflate the lumbar support, battery voltage is applied through the switch contacts and the deflate control circuit to the seat lumbar support valve assembly. The seat lumbar support valve assembly energizes its internal deflate solenoid and air is released from the bladders until the switch is released.

Reference Information

Schematic Reference

Passenger Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

Description and Operation

Lumbar Support Description and Operation (Driver Seat), Lumbar Support Description and Operation (Passenger Seat)

Electrical Information Reference

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

Circuit/System Verification

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

Refer to **Power Seat Malfunction (Driver Seat)**, **Power Seat Malfunction (Passenger Seat)**.

- **If all power seat functions operate**
3. Verify the lumbar/bolster pump turns ON when the lumbar support switch is pressed in the FORWARD direction. The upper and lower lumbar support bladders should inflate until the bladders are 100% inflated or the switch is released.

- **If the bladders do not inflate**

Refer to Circuit/System Testing

- **If the bladders inflate**

4. Verify the upper and lower lumbar support bladders deflate when the lumbar REARWARD switch is pressed. The bladders should deflate until the bladders are 100% deflated or the switch is released

- **If the bladders do not deflate**

Refer to Circuit/System Testing

- **If the bladders deflate**

5. Verify the upper lumbar support bladder starts to inflate when the lumbar switch is pressed in the UP direction. If the lower bladder is inflated it will deflate while the upper bladder inflates until the upper bladder is 100% inflated or switch is released.

- **If the upper bladder does not inflate**

Refer to Circuit/System Testing

- **If the upper bladder inflates**

6. Verify the upper lumbar bladder starts to deflate while the lower lumbar bladder starts to inflate while the lumbar switch is pressed in the DOWN direction. The upper bladder should deflate until it is 100% deflated and the lower bladder should inflate until it is 100% inflated or the switch is released.

- **If the upper bladder does not deflate and the lower bladder does not inflate**

Refer to Circuit/System Testing

- **If the upper bladder deflates and the lower bladder inflates**

7. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the Q51P Seat Lumbar Support Valve Assembly - Passenger.
2. Connect a test lamp between each control circuit terminal listed below and ground one at a time, ignition ON.
 - Lumbar forward control terminal 4
 - Lumbar rearward control terminal 2
 - Lumbar up control terminal 1
 - Lumbar down control terminal 3
3. Verify the test lamp turns ON and OFF when pressing and releasing the appropriate lumbar switch.
 - **If the test lamp remains OFF during any of the commands**
 1. Ignition OFF, disconnect the X2 harness connector at the S64P Seat Adjuster Switch - Passenger.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in the control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, test or replace the S64P Seat Adjuster Switch - Passenger.
 - **If the test lamp is always ON**
 1. Ignition OFF, disconnect the harness connector at the S64P Seat Adjuster Switch - Passenger, ignition ON.
 2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, test or replace the S64P Seat Adjuster Switch - Passenger.
 - **If the test lamp turns ON and OFF**
4. Ignition OFF, connect the harness connector at the Q51P Seat Lumbar Support Valve Assembly - Passenger and disconnect the harness connector at the G31P Seat Lumbar/Bolster Pump - Passenger.
5. Test for less than 10 ohms between the ground circuit terminal 3 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, repair the open/high resistance in the ground connection.
 - **If less than 10 ohms**

6. Connect a test lamp between the control circuit terminal 1 and ground, ignition ON.
7. Verify the test lamp turns ON and OFF when pressing and releasing the lumbar switch in either UP or FORWARD direction.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the harness connector at the Q51P Seat Lumbar Support Valve Assembly - Passenger.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in the control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, test or replace the Q51P Seat Lumbar Support Valve Assembly - Passenger.
 - **If the test lamp is always ON**

Repair the short to voltage on the circuit.
 - **If the test lamp turns ON and OFF**
8. Test or replace the G31P Seat Lumbar/Bolster Pump - Passenger.

Component Testing

Lumbar Support Switch

1. Ignition OFF, disconnect the X1 and X2 harness connectors at the S64P Seat Adjuster Switch - Passenger.
2. Test for infinite resistance between the B+ terminal 10 X1 and each control terminal with the switch in the open position.
 - **If less than infinite resistance**

Replace the S64P Seat Adjuster Switch - Passenger.
 - **If infinite resistance**
3. Test for less than 2 ohms between the B+ terminal 10 X1 and each control terminal with the appropriate switch in the closed position.
 - **If 2 ohms or greater**

Replace the S64P Seat Adjuster Switch - Passenger.
 - **If less than 2 ohms**
4. Test for less than 2 ohms between the ground terminal 5 X1 and each control terminal with the switch in the open position.
 - **If 2 ohms or greater**

Replace the S64P Seat Adjuster Switch - Passenger.

- If less than 2 ohms

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 Lumbar Support Replacement**

LUMBAR SUPPORT MALFUNCTION (DRIVER SEAT WITH 4-WAY LUMBAR WITH OR WITHOUT AQJ)

Diagnostic Instructions

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

Diagnostic Fault Information

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

	B1835 02, B1840 02, B1845 02			
Driver Seat Lumbar Up Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	1	1	-
Driver Seat Lumbar Down Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	1	1	-
Driver Seat Lumbar Forward Control	B3920 02	1	B3920 01	-
Driver Seat Lumbar Rearward Control	B3920 02	1	B3920 01	-
Driver Seat Lumbar Up Control	B3920 02	1	B3920 01	-
Driver Seat Lumbar Down Control	B3920 02	1	B3920 01	-
1. The driver seat lumbar support is inoperative				

Circuit/System Description

The seat memory control module supplies a low current voltage to each signal circuit of the seat adjuster switch. When the lumbar forward switch is pressed to inflate the seat lumbar support, the seat lumbar forward signal circuit from the seat memory control module is pulled low through the switch contacts indicating the lumbar support inflate command. The seat memory control module then applies battery voltage through the lumbar forward control circuit and ground through the lumbar rearward control circuit to the seat lumbar support valve assembly. The lumbar valve assembly energizes its internal inflate solenoid and applies battery voltage through the seat lumbar/bolster pump control circuit to the pump. The pump runs to inflate the lumbar support bladders until the switch is released. When the lumbar rearward switch is pressed to deflate the lumbar support bladders, the lumbar rearward signal circuit from the seat memory control module is pulled low indicating the lumbar

support deflate command. The seat memory control module then applies battery voltage through the lumbar rearward control circuit and ground through the lumbar forward control circuit to the seat lumbar support valve assembly. The lumbar valve assembly energizes its internal deflate solenoid and air is released from the lumbar bladders until the switch is released.

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

Description and Operation

Lumbar Support Description and Operation (Driver Seat)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

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

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

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

Refer to **Power Seat Malfunction (Driver Seat)**.

- **If all power seat functions operate**

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

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

- **If the parameter changes during each of the commands**

5. Refer to Circuit/System Testing - Seat Lumbar Support Valve Assembly Circuit Test.

Circuit/System Testing

Seat Lumbar Support Switch Circuit Test

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

Seat Lumbar Support Valve Assembly Circuit Test

1. Ignition OFF, disconnect the harness connector at the Q51D Seat Lumbar Support Valve Assembly - Driver.

2. Connect a test lamp between the control circuit terminals listed below and ground one at a time, ignition ON.
 - Seat lumbar horizontal control terminal 4 and terminal 2
 - Seat lumbar vertical control terminal 1 and terminal 3
3. Verify the test lamp turns ON when commanding the lumbar support Forward and Rearward or Up and Down with a scan tool.
 - **If the test lamp is always OFF during either of the commands**
 1. Ignition OFF, remove the test lamp, disconnect the X3 harness connector at the K40D Seat Memory Control Module - Driver.
 2. Test for infinite resistance between each control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K40D Seat Memory Control Module - Driver.
 - **If the test lamp turns ON during each of the commands**
4. Ignition OFF, disconnect the harness connector at the G31D Seat Lumbar/Bolster Pump - Driver.
5. Connect a DMM, set on the diode setting, between the Q51D Seat Lumbar Support Valve Assembly - Driver control circuit terminal 2 and the G31D Seat Lumbar/Bolster Pump - Driver control circuit terminal 3.
6. Record the DMM reading, reverse the DMM leads and record the reading.
7. Verify one of the two recorded readings was between 0.5-0.8 V and the other reading displayed O.L.
 - **If O.L. was not displayed**

Replace the diode in the circuit.
 - **If 0.5-0.8 V was not displayed**
 1. Ignition OFF, disconnect the diode.
 2. Test for less than 2 ohms in each section of the circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the diode.
 - **If both readings were displayed**
8. Ignition OFF, connect the harness connector at the Q51D Seat Lumbar Support Valve Assembly - Driver.
9. Connect a test lamp between the G31D Seat Lumbar/Bolster Pump - Driver control circuit terminal 1 and control circuit terminal 3, ignition ON.
10. Verify the test lamp turns ON when commanding the Driver Seat Lumbar Support Horizontal Movement Forward with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the harness connector at the Q51D Seat Lumbar Support Valve Assembly - 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.
 - If infinite resistance
3. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the Q51D Seat Lumbar Support Valve Assembly - Driver.
 - **If the test lamp turns ON**
11. Test or replace the G31D Seat Lumbar/Bolster Pump - Driver.

Component Testing

Lumbar Support Switch

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

Replace the S64D Seat Adjuster Switch - Driver.
 - **If infinite resistance**
3. Test for less than 2 ohms between the ground terminal 6 X1 and each lumbar signal terminal with the appropriate switch in the closed position.
 - **If 2 ohms or greater**

Replace the S64D Seat Adjuster Switch - Driver.
 - **If less than 2 ohms**
4. All OK.

Repair Instructions

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

- **Driver or Passenger Seat Adjuster Switch Replacement**
- **Driver or Passenger Seat Lumbar Support Replacement**
- **Control Module References** for K40D Seat Memory Control Module - Driver replacement, programming and setup

LUMBAR SUPPORT MALFUNCTION (DRIVER SEAT WITH 2-WAY LUMBAR H2C)

Diagnostic Instructions

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

- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Diagnostic Fault Information

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

Circuit/System Description

The seat memory control module supplies a low current voltage to each signal circuit of the seat adjuster switch. When the lumbar forward switch is pressed to inflate the seat lumbar support, the seat lumbar forward signal circuit from the seat memory control module is pulled low through the switch contacts indicating the lumbar support inflate command. The seat memory control module then applies battery voltage through the lumbar forward control circuit and ground through the lumbar rearward control circuit to the seat lumbar support valve assembly. The lumbar valve assembly energizes its internal inflate solenoid and applies battery voltage through the seat lumbar/bolster pump control circuit to the pump. The pump runs to inflate the lumbar support bladders until the switch is released. When the lumbar rearward switch is pressed to deflate the lumbar support bladders, the lumbar rearward signal circuit from the seat memory control module is pulled low indicating the lumbar support deflate command. The seat memory control module then applies battery voltage through the lumbar rearward control circuit and ground through the lumbar forward control circuit to the seat lumbar support valve assembly. The lumbar valve assembly energizes its internal deflate solenoid and air is released from the lumbar

bladders until the switch is released.

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

Description and Operation

Lumbar Support Description and Operation (Driver Seat)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

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

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

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

Refer to **Power Seat Malfunction (Driver Seat)**.

- **If all power seat functions operate**
4. Verify the scan tool Driver Lumbar Support Horizontal Switch parameter changes between Inactive and Forward and Rearward when pressing the lumbar switch in both directions.

- **If the parameter does not change during either of the commands**

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

- **If the parameter changes during each of the commands**

5. Refer to Circuit/System Testing - Seat Lumbar Support Valve Assembly Circuit Test.

Circuit/System Testing

Seat Lumbar Support Switch Circuit Test

1. Ignition OFF, disconnect the X2 harness connector at the S64D Seat Adjuster Switch - Driver, ignition ON.
2. Install a 3 A fused jumper wire between the appropriate signal circuit terminal listed below and ground.
 - Seat lumbar forward terminal 2
 - Seat lumbar rearward terminal 6
3. Verify the scan tool Driver Lumbar Support Horizontal Switch parameter is Forward or Rearward.
 - **If not Forward or Rearward**
 1. Ignition OFF, remove the jumper wire, disconnect the X5 harness connector at the K40D Seat Memory Control Module - Driver, ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K40D Seat Memory Control Module - Driver.
 - **If Forward or Rearward**
4. Test or replace the S64D Seat Adjuster Switch - Driver.

Seat Lumbar Support Valve Assembly Circuit Test

1. Ignition OFF, disconnect the harness connector at the Q51D Seat Lumbar Support Valve Assembly - Driver.
2. Connect a test lamp between control circuit terminal 1 and control circuit terminal 2, ignition ON.
3. Verify the test lamp turns ON when commanding the lumbar support Forward and Rearward with a scan tool.
 - **If the test lamp is always OFF during either of the commands**
 1. Ignition OFF, remove the test lamp, disconnect the X3 harness connector at the K40D Seat Memory Control Module - Driver.
 2. Test infinite resistance between each control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance

3. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K40D Seat Memory Control Module - Driver.
 - **If the test lamp turns ON during each of the commands**
4. Ignition OFF, disconnect the harness connector at the G31D Seat Lumbar/Bolster Pump - Driver.
5. Connect a DMM, set on the diode setting, between the Q51D Seat Lumbar Support Valve Assembly - Driver control circuit terminal 2 and the G31D Seat Lumbar/Bolster Pump - Driver control circuit terminal 3.
6. Record the DMM reading, reverse the DMM leads and record the reading.
7. Verify one of the two recorded readings was between 0.5-0.8 V and the other reading displayed O.L.
 - **If O.L. was not displayed**

Replace the diode in the circuit.
 - **If 0.5-0.8 V was not displayed**
 1. Ignition OFF, disconnect the diode.
 2. Test for less than 2 ohms in each section of the circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the diode.
 - **If both readings were displayed**
8. Ignition OFF, connect the harness connector at the Q51D Seat Lumbar Support Valve Assembly - Driver.
9. Connect a test lamp between the G31D Seat Lumbar/Bolster Pump - Driver control circuit terminal 1 and control circuit terminal 3, ignition ON.
10. Verify the test lamp turns ON when commanding the Driver Seat Lumbar Support Horizontal Movement Forward with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, disconnect the harness connector at the Q51D Seat Lumbar Support Valve Assembly - 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.
 - If infinite resistance
 3. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, test or replace the Q51D Seat Lumbar Support Valve Assembly - Driver.
 - **If the test lamp turns ON**
11. Test or replace the G31D Seat Lumbar/Bolster Pump - Driver.

Component Testing

Lumbar Support Switch

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

- **If less than infinite resistance**

Replace the S64D Seat Adjuster Switch - Driver.

- **If infinite resistance**

3. Test for less than 2 ohms between the ground terminal 6 X1 and each lumbar signal terminal with the appropriate switch in the closed position.

- **If 2 ohms or greater**

Replace the S64D Seat Adjuster Switch - Driver.

- **If less than 2 ohms**

4. All OK.

Repair Instructions

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

- **Driver or Passenger Seat Adjuster Switch Replacement**
- **Driver or Passenger Seat Lumbar Support Replacement**
- **Control Module References** for K40D Seat Memory Control Module - Driver replacement, programming and setup

LUMBAR SUPPORT MALFUNCTION (PASSENGER SEAT 2-WAY LUMBAR H2C)

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	-	-
Seat Lumbar Deflate signal	1	2	-	-
Seat Lumbar Inflate signal	1	2	-	-
Ground	-	1	-	-
1. The power seat and the lumbar support functions are inoperative 2. The lumbar support is inoperative				

Circuit/System Description

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

Reference Information

Schematic Reference

Passenger Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

Description and Operation

Lumbar Support Description and Operation (Passenger Seat)

Electrical Information Reference

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

Circuit/System Verification

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

Refer to **Power Seat Malfunction (Passenger Seat)**.

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

Refer to Circuit/System Testing

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

4. Verify the lumbar support bladder deflates when the lumbar REARWARD switch is pressed. The bladder should deflate until it is 100% deflated or the switch is released

- **If the bladder does not deflate**

Refer to Circuit/System Testing

- **If the bladder deflates**

5. All OK.

Circuit/System Testing

1. Ignition OFF, all vehicle systems OFF, disconnect the harness connector at the appropriate G31P Seat Lumbar/Bolster Pump - Passenger. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 ohms between the ground circuit terminal 4 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, repair the open/high resistance in the ground connection.
 - **If less than 10 ohms**
3. Test for less than 10 ohms between each control circuit terminal listed below and ground.
 - Lumbar forward switch signal terminal 5
 - Lumbar rearward switch signal terminal 2
 - **If 10 ohms or greater**
 1. Ignition OFF, disconnect the X2 harness connector at the S64P Seat Adjuster Switch - Passenger.
 2. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, test or replace the S64P Seat Adjuster Switch - Passenger.
 - **If less than 10 ohms**
4. Connect a test lamp between each signal circuit terminal listed below and ground one at a time, ignition ON:
 - Lumbar forward switch signal terminal 5
 - Lumbar rearward switch signal terminal 2
5. Verify the test lamp turns ON and OFF when pressing and releasing the appropriate lumbar switch.
 - **If the test lamp remains OFF**
 1. Ignition OFF, disconnect the X2 harness connector at the S64P Seat Adjuster Switch - Passenger.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.

- If infinite resistance, test or replace the S64P Seat Adjuster Switch - Passenger.
- **If the test lamp remains ON**
- 1. Ignition OFF, disconnect the X2 harness connector at the S64P Seat Adjuster Switch - Passenger, 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 S64P Seat Adjuster Switch - Passenger.
- **If the test lamp turns ON and OFF**
- 6. Test or replace the G31P Seat Lumbar/Bolster Pump - Passenger.

Repair Instructions

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

- **Driver or Passenger Seat Adjuster Switch Replacement**
- **Driver or Passenger Seat Lumbar Support Replacement**

SEAT SIDE BOLSTER 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	3	-	-
Seat Side Bolster Inflate Control	1	3	-	-
Seat Side Bolster Deflate Control	1	3	-	-
Seat Lumbar/Bolster Pump Control	2	3	4	-
Seat Adjuster Switch X2 Terminal 2 Ground	-	3	-	-
Seat Side Bolster Valve Assembly Ground	-	3	-	-
Seat Lumbar/Bolster Pump Ground	-	2	-	-
1. The power seat, lumbar support and seat side bolsters functions are inoperative 2. The lumbar support and seat side bolsters functions are inoperative 3. The seat side bolster is inoperative				

4. The lumbar/bolster pump is always ON

Circuit/System Description

Battery voltage is supplied at all times to the seat adjuster switch through a 30 A fuse located in the underhood fuse block. When the bolster switch is pressed to inflate the seat side bolsters, battery voltage is applied through the switch contacts and the inflate control circuit to the seat side bolster valve assembly. The seat side bolster adjuster valve assembly energizes its internal inflate solenoid and applies battery voltage through the seat lumbar/bolster pump control circuit to the pump. The pump runs to inflate the side bolsters until the switch is released. When the bolster switch is pressed to deflate the seat side bolsters, battery voltage is applied through the switch contacts and the deflate control circuit to the seat side bolster valve assembly. The seat side bolster adjuster valve assembly energizes its internal deflate solenoid and air is released from the bladders until the switch is released.

Reference Information

Schematic Reference

Passenger Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

Description and Operation

Lumbar Support Description and Operation (Passenger Seat)

Electrical Information Reference

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

Circuit/System Verification

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

Refer to **Power Seat Malfunction (Passenger Seat)**.

- **If all power seat functions operate**
3. Verify the lumbar/bolster pump turns ON when the bolster switch is pressed to inflate the seat side bolsters. The side bolster bladders should inflate until the bladders are 100% inflated or the switch is

released.

- **If the pump does not turn ON or the bladders do not inflate**

Refer to Circuit/System Testing

- **If the pump turns ON and the bladders inflate**

4. Verify the seat side bolster bladders deflate when the bolster deflate switch is pressed. The bolster bladders should deflate until the bladders are 100% deflated or the switch is released

- **If the bladders do not deflate**

Refer to Circuit/System Testing

- **If the bladders deflate**

5. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the X2 harness connector at the S64P Seat Adjuster Switch - Passenger.

2. Test for less than 10 ohms between the ground circuit terminal 2 and ground.

- **If 10 ohms or greater**

1. Ignition OFF.

2. Test for less than 2 ohms in the ground circuit end to end.

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

- If less than 2 ohms, repair the open/high resistance in the ground connection.

- **If less than 10 ohms**

3. Ignition OFF, disconnect the harness connector at the Q10P Seat Side Bolster Adjuster Valve Assembly - Passenger.

4. Test for less than 10 ohms between each ground circuit terminal listed below and ground.

- Terminal 1

- Terminal 4

- **If 10 ohms or greater**

1. Ignition OFF.

2. Test for less than 2 ohms in the ground circuit end to end.

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

- If less than 2 ohms, repair the open/high resistance in the ground connection.

- **If less than 10 ohms**

5. Connect a test lamp between control circuit terminal 2 and control circuit terminal 3, ignition ON.

6. Verify the test lamp turns ON when pressing the bolster switch in both directions.

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

1. Ignition OFF, remove the test lamp, disconnect the X2 harness connector at the S64P Seat Adjuster Switch - Passenger.

2. Test for infinite resistance between each control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, test or replace the S64P Seat Adjuster Switch - Passenger.
 - **If the test lamp turns ON during each of the commands**
7. Ignition OFF, connect the harness connector at the Q10P Seat Side Bolster Adjuster Valve Assembly - Passenger and disconnect the harness connector at the G31P Seat Lumbar/Bolster Pump - Passenger.
8. Test for less than 10 ohms between the ground circuit terminal 3 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, repair the open/high resistance in the ground connection.
 - **If less than 10 ohms**
 - 9. Connect a test lamp between the control circuit terminal 1 and ground, ignition ON.
10. Verify the test lamp turns ON and OFF when pressing and releasing the bolster inflate switch.
 - **If the test lamp remains OFF**
 1. Ignition OFF, disconnect the harness connector at the Q10P Seat Side Bolster Adjuster Valve Assembly - Passenger.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in the control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, test or replace the Q10P Seat Side Bolster Adjuster Valve Assembly - Passenger.
 - **If the test lamp remains ON**

Repair the short to voltage on the circuit.
 - **If the test lamp turns ON and OFF**
 - 11. Test or replace the G31P Seat Lumbar/Bolster Pump - Passenger.

Component Testing

Seat Side Bolster Switch

1. Ignition OFF, disconnect the X1 and X2 harness connector at the S64P Seat Adjuster Switch - Passenger.

2. Test for infinite resistance between the ground terminal 2 X2 and each bolster control terminal with the switch in the open position.

- **If less than infinite resistance**

Replace the S64P Seat Adjuster Switch - Passenger.

- **If infinite resistance**

3. Test for less than 2 ohms between the ground terminal 2 X2 and each bolster control terminal with the appropriate switch in the closed position.

- **If 2 ohms or greater**

Replace the S64P Seat Adjuster Switch - Passenger.

- **If less than 2 ohms**

4. All OK.

Repair Instructions

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

- **Driver or Passenger Seat Adjuster Switch Replacement**
- **Driver or Passenger Seat Lumbar Support Replacement**

SEAT SIDE BOLSTER MALFUNCTION (DRIVER 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
Seat Side Bolster Deflate Signal	B180A 02	2	-	-
Seat Side Bolster Inflate Signal	B180B 02	2	-	-
Seat Adjuster Switch Ground	-	1	-	-
Seat Side Bolster Inflate Control	B3920 02	2	B3920 01	-
Seat Side Bolster Deflate Control	B3920 02	2	B3920 01	-
Seat Side Bolster Adjuster Valve Assembly Ground Terminal 4	-	2	-	-
Seat Side Bolster Adjuster Valve Assembly Ground Terminal 3	-	2	-	-

Seat Lumbar/Bolster Pump Control	2	2	-	-
Seat Lumbar/Bolster Pump Ground	-	2	-	-
1. The power seat, lumbar support, and side bolster functions are inoperative 2. The seat side bolster is inoperative				

Circuit/System Description

The seat memory control module supplies a low current voltage to each signal circuit of the seat adjuster switch. When the bolster switch is pressed to inflate the seat side bolsters, the seat side bolster inflate signal circuit from the seat memory control module is pulled low through the switch contacts indicating the seat side bolster inflate command. The seat memory control module then applies battery voltage through the bolster inflate control circuit and ground through the bolster deflate control circuit to the seat side bolster adjuster valve assembly. The seat side bolster adjuster valve assembly energizes its internal inflate solenoid and applies battery voltage through the seat lumbar/bolster pump control circuit to the pump. The pump runs to inflate the side bolsters until the switch is released. When the bolster switch is pressed to deflate the seat side bolsters, the seat side bolster deflate signal circuit from the seat memory control module is pulled low indicating the seat side bolster deflate command. The seat memory control module then applies battery voltage through the bolster deflate control circuit and ground through the bolster inflate control circuit to the seat side bolster adjuster valve assembly. The seat side bolster adjuster valve assembly energizes its internal deflate solenoid and air is released from the bladders until the switch is released.

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

Description and Operation

Seat Side Bolster Description and Operation (With Memory A45), Seat Side Bolster Description and Operation (Without Memory A45)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

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

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

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

Refer to **Power Seat Malfunction (Driver Seat)**.

- **If all power seat functions operate**
4. Verify the scan tool Driver Seat Back Side Bolster Switch parameter changes between Inactive and In or Out when pressing the bolster switch in both directions.
 - **If the parameter does not change during either of the commands**

Refer to Circuit/System Testing - Seat Side Bolster Switch Circuit Test.

- **If the parameter changes during each of the commands**
5. Refer to Circuit/System Testing - Seat Side Bolster Adjuster Valve Assembly Circuit Test.

Circuit/System Testing

Seat Side Bolster Switch Circuit Test

1. Ignition OFF and all vehicle systems OFF, disconnect the X2 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 ohms between the ground circuit terminal 4 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, repair the open/high resistance in the ground connection.
 - **If less than 10 ohms**
3. Ignition ON.
4. Verify the scan tool Driver Seat Back Side Bolster Switch parameter is Inactive.
 - **If not Inactive**

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.
 - If infinite resistance, replace the K40D Seat Memory Control Module - Driver.
- **If Inactive**
5. Install a 3 A fused jumper wire between each signal circuit terminal listed below and ground one at a time.
 - Seat side bolster inflate terminal 3
 - Seat side bolster deflate terminal 7
6. Verify the scan tool Driver Seat Back Side Bolster Switch parameter is In and Out.
 - **If not In and Out**
 1. Ignition OFF, remove the jumper wire, disconnect the X6 harness connector at the K40D Seat Memory Control Module - Driver, ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K40D Seat Memory Control Module - Driver.
 - **If In and Out**
7. Test or replace the S64D Seat Adjuster Switch - Driver.

Seat Side Bolster Adjuster Valve Assembly Circuit Test

1. Ignition OFF, disconnect the harness connector at the Q10D Seat Side Bolster Adjuster Valve Assembly - Driver.
2. Connect a test lamp between control circuit terminal 1 and control circuit terminal 2, ignition ON.
3. Verify the test lamp turns ON when pressing the seat side bolster switch in the UP direction.
 - **If the test lamp remains OFF**
 1. Ignition OFF, remove the test lamp, disconnect the X4 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.
 - If infinite resistance
 3. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K40D Seat Memory Control Module - Driver.
 - **If the test lamp turns ON**

4. Ignition OFF.
5. Connect a DMM, set on the diode setting, between control circuit terminal 2 and the control circuit terminal 3.
6. Record the DMM reading, reverse the DMM leads and record the reading.
7. Verify one of the two recorded readings was between 0.5-0.8 V and the other reading displayed O.L.
 - **If O.L. was not displayed**

Replace the diode in the circuit.

- **If 0.5-0.8 V was not displayed**
 1. Ignition OFF, disconnect the diode.
 2. Test for less than 2 ohms in each section of the circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the diode.
 - **If both readings were displayed**
- 8. Ignition OFF, connect the harness connector at the Q10D Seat Side Bolster Adjuster Valve Assembly - Driver and disconnect the harness connector at the G31D Seat Lumbar/Bolster Pump - Driver.
- 9. Connect a test lamp between control circuit terminal 1 and control circuit terminal 3, ignition ON.
- 10. Verify the test lamp turns ON when pressing the seat side bolster inflate switch.
 - **If the test lamp remains OFF**
 1. Ignition OFF, disconnect the harness connector at the Q10D Seat Side Bolster Adjuster Valve Assembly - 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.
 - If infinite resistance
 3. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the Q10D Seat Side Bolster Adjuster Valve Assembly - Driver.
 - **If the test lamp turns ON**
- 11. Test or replace the SG31D Seat Lumbar/Bolster Pump - Driver.

Component Testing

Seat Side Bolster Switch

1. Ignition OFF, disconnect the X1 and X2 harness connector at the S64D Seat Adjuster Switch - Driver.
2. Test for infinite resistance between the ground terminal 4 X2 and each side bolster signal terminal with the switch in the open position.
 - **If less than infinite resistance**

Replace the S64D Seat Adjuster Switch - Driver.

- **If infinite resistance**
- 3. Test for less than 2 ohms between the ground terminal 4 X2 and each side bolster signal terminal with the appropriate switch in the closed position.

- **If 2 ohms or greater**

Replace the S64D Seat Adjuster Switch - Driver.

- **If less than 2 ohms**

- 4. All OK.

Repair Instructions

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

- **Driver or Passenger Seat Adjuster Switch Replacement**
- **Driver or Passenger Seat Lumbar Support Replacement**
- **Control Module References** for K40D Seat Memory Control Module - Driver replacement, programming and setup

MEMORY SEAT FEATURE MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Memory Seat Switch Set Signal	B2765 02	1	B2765 01	B2765 00
Memory Seat Switch Signal (1)	B2755 02	1	1	-
Low Reference	-	1	-	-
1. Memory seat feature is inoperative				

Circuit/System Description

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

Diagnostic Aids

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

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

Description and Operation

Memory Seats Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify that all manual driver power seat functions operate when being controlled by the power seat adjuster switches.
 - **If any seat function does not operate**

Refer to **Power Seat Malfunction (Driver Seat)**, **Power Seat Malfunction (Passenger Seat)**

- **If all seat functions operate**
3. Verify that the memory recall personalization option is ON. Refer to the owners manual.
 - **If the memory recall personalization option is not ON**

Turn ON the option, refer to the Owners Manual.

- **If the memory recall personalization option is ON**

4. 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 ohms between the low reference circuit terminal 1 and ground.
 - **If 30 ohms or greater**
 1. Ignition OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module.
 2. Test for less than 2 ohms in the low reference circuit end to end
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K40 Seat Memory Control Module.
 - **If less than 30 ohms**
3. Ignition ON, press a power seat switch in order to wake up the K40 Seat Memory Control Module.
4. Test for 9 V or greater between each signal circuit terminal listed below and ground:
 - Memory set switch signal terminal 5
 - Memory switch signal terminal 6
 - **If less than 9 V**
 1. Ignition OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K40 Seat Memory Control Module.
 - **If 9 V or greater**
5. Ignition OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module, ignition ON.
6. Test for less than 1 V between each signal circuit terminal listed below and ground:
 - Memory set switch signal terminal 5
 - Memory switch signal terminal 6
 - **If 1 V or greater**

Repair the short to voltage on the circuit.
 - **If less than 1 V**
7. Test or replace the S47D Seat Memory Switch - Driver.

Component Testing

Driver Seat Memory Switch

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

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

Replace the S47D Seat Memory Switch - Driver.

- **If infinite resistance**

3. Test for less than 4 ohms between the signal terminal 5 and the low reference terminal 1 while pressing the memory SET button.

- **If 4 ohms or greater**

Replace the S47D Seat Memory Switch - Driver.

- **If less than 4 ohms**

4. Test for 573-701 ohms between the signal terminal 6 and the low reference terminal 1 while pressing the memory 1 button.

- **If not between 573-701 ohms**

Replace the S47D Seat Memory Switch - Driver.

- **If between 573-701 ohms**

5. Test for 1800-2201 ohms between the signal terminal 6 and the low reference terminal 1 while pressing the memory 2 button.

- **If not between 1800-2201 ohms**

Replace the S47D Seat Memory Switch - Driver.

- **If between 1800-2201 ohms**

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

- **If not between 5.52k-6.73 kohms**

Replace the S47D Seat Memory Switch - Driver.

- **If between 5.52k-6.73 kohms**

7. All OK.

Repair Instructions

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

- **Front Seat Adjuster Memory Switch Replacement**
- **Control Module References** for K40 Seat Memory Control Module replacement, programming and setup

POWER SEAT MALFUNCTION (DRIVER 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
Seat Memory Control Module B+ Terminal 1 X1	U0208 00, 2	U0208 00, 2	-	-
Seat Memory Control Module B+ Terminal 2 X1	1, 3	1, 3	-	-
Power Seat Front Vertical Up Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	1	-	-
Power Seat Front Vertical Down Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	1	-	-
	B1735 02, B1740 02,			

Power Seat Rear Vertical Up Switch Signal	B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	1	-	-
Power Seat Rear Vertical Down Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	1	-	-
Power Seat Horizontal Forward Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	1	-	-
Power Seat Horizontal Rearward Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	1	-	-
	B1735 02,			

Power Seat Recline Forward Switch Signal	B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	1	-	-
Power Seat Recline Rearward Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02, B1815 02, B1820 02, B1830 02, B1835 02, B1840 02, B1845 02	1	-	-
Driver Power Seat Front Vertical Motor Down Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Power Seat Front Vertical Motor Up Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Power Seat Horizontal Motor Forward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Power Seat Horizontal Motor Rearward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Power Seat Rear Vertical Motor Down Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Power Seat Rear Vertical Motor Up Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Power Seat Recline Motor Forward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Driver Power Seat Recline Motor Rearward Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Ground	-	U0208 00, 2	-	-
1. Power seat and memory functions inoperative 2. Scan Tool Does Not Communicate with Low Speed GMLAN Device 3. Lumbar support is inoperative				

Circuit/System Description

Battery voltage is supplied at all times to the seat memory control module through a 10 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 underhood fuse block. This voltage is connected to a power rail internal to the seat memory control module and is used to drive the power seat motors. Each seat motor is controlled by the seat memory control module by applying power and ground through the control circuits to the motor.

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

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

Description and Operation

Memory Seats Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool seat switch parameters listed below change between Inactive and Forward/Rearward or Up/Down when pressing the appropriate switch.
 - Driver Seat Horizontal Switch

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

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

- **If the parameter changes**

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

- M50D Seat Front Vertical Motor - Driver
- M55D Seat Rear Vertical Motor - Driver
- M51D Seat Horizontal Motor - Driver
- M56D Seat Recline Motor - Driver
- **If any seat motor does not operate**

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

- **If all seat motors operate**

4. All OK.

Circuit/System Testing

Driver Seat Adjuster Switch Circuit Test

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

- Horizontal rearward switch terminal 7
 - Recline forward switch terminal 4
 - Recline rearward switch terminal 9
4. Verify the appropriate scan tool seat switch parameter is Forward/Rearward or UP/Down.
 - **If not Forward/Rearward or UP/Down**
 1. Ignition OFF, disconnect the X5 harness connector at the K40 Seat Memory Control Module, ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Ignition OFF.
 4. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K40 Seat Memory Control Module.
 - **If Forward/Rearward or UP/Down**
 5. Test or replace the S64D Seat Adjuster Switch - Driver.

Seat Motor Control Circuit Test

1. Ignition OFF, disconnect the X2 harness connector at the K40 Seat Memory Control Module.
2. Test for less than 10 ohms between ground circuit terminal 5 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, repair the open/high resistance in the ground connection.
 - **If less than 10 ohms**
3. Ignition OFF, disconnect the X1 harness connector at the K40 Seat Memory Control Module, ignition ON.
4. Verify that a test lamp illuminates between the B+ circuit terminal 2 and ground.
 - **If the test lamp does not illuminate.**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the B+ circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, verify the circuit breaker is OK and there is voltage at the circuit breaker.
 - **If the test lamp illuminates.**
5. Ignition OFF, connect the X1 harness connector at the K40 Seat Memory Control Module and disconnect the harness connector at the appropriate seat motor listed below:
 - M50D Seat Front Vertical Motor - Driver

- M55D Seat Rear Vertical Motor - Driver
- M51D Seat Horizontal Motor - Driver
- M56D Seat Recline Motor - Driver

6. Connect a test lamp between control circuit terminal 1 and control circuit terminal 3, ignition ON.

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

7. Verify the test lamp turns ON when commanding the seat motor in the Up/Down or Forward/Rearward states with a scan tool.

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

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

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

8. Test or replace the seat motor.

Component Testing

Seat Adjuster Switch Test

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

- **If less than infinite resistance**

Replace the S64D Seat Adjuster Switch - Driver.

- **If infinite resistance**

3. Test for less than 2 ohms between the ground terminal 6 X1 and each signal terminal with the appropriate switch in the closed position.

- **If 2 ohms or greater**

Replace the S64D Seat Adjuster Switch - Driver.

- **If less than 2 ohms**

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.

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

4. Reverse the jumper wires; the motor should perform FORWARD/ REARWARD/ UP/ DOWN function.

- **If the motor does not perform the FORWARD/ REARWARD/ UP/ DOWN function**

Replace the seat motor.

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

5. All OK.

Repair Instructions

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

- **Driver or Passenger Seat Adjuster Switch Replacement**
- **Front Seat Tilt Adjuster Actuator Replacement**
- **Driver or Passenger Seat Vertical Adjuster Actuator Replacement**
- **Front Seat Adjuster Actuator Replacement**
- **Driver or Passenger Seat Recliner Actuator Replacement**
- **Control Module References** for K40 Seat Memory Control Module replacement, programming and setup

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

Circuit/System Description

The passenger power seat is completely controlled through the seat adjuster switch. Battery voltage is supplied at all times to the seat adjuster switch through a 30 A circuit breaker located in the underhood fuse block. When the seat switches are in an inactive state, the switch contacts are closed to the switch ground circuit and ground connection.

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 Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

Description and Operation

Power Seats System Description and Operation

Electrical Information Reference

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

Circuit/System Verification

1. Verify the passenger seat directional motors listed below operate while operating the seat switches in both directions.
 - M51P Seat Horizontal Motor - Passenger
 - M50P Seat Front Vertical 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.
 - **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 ohms between the ground circuit terminal 5 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.

- If 2 ohms or greater, repair the open/high resistance in the circuit.
- If less than 2 ohms, repair the open/high resistance in the ground connection.
- **If less than 10 ohms**
- 3. Ignition ON.
- 4. Verify a test lamp illuminates between the B+ circuit terminal 10 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF
 2. Test for less than 2 ohms in the B+ circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, verify the circuit breaker is not open and there is voltage at the circuit breaker.
 - **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
 - M50P Seat Front Vertical 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 seat adjuster switch.
 - **If the test lamp remains OFF 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.
 - If infinite resistance
 3. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, test or replace the S64P Seat Adjuster Switch - Passenger.
 - **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 X1 and X2 harness connectors at the S64P Seat Adjuster Switch -

Passenger.

2. Test for infinite resistance between the B+ terminal 10 X1 and each control terminal with the switch in the open position.

- **If less than infinite resistance**

Replace the S64P Seat Adjuster Switch - Passenger.

- **If infinite resistance**

3. Test for less than 2 ohms between the B+ terminal 10 X1 and each control terminal with the appropriate switch in the closed position.

- **If 2 ohms or greater**

Replace the S64P Seat Adjuster Switch - Passenger.

- **If less than 2 ohms**

4. Test for less than 2 ohms between the ground terminal 5 X1 and each control terminal with the switch in the open position.

- **If 2 ohms or greater**

Replace the S64P Seat Adjuster Switch - Passenger.

- **If less than 2 ohms**

5. All OK.

Seat Motor

1. Ignition OFF, disconnect the harness connector at the appropriate seat motor listed below:

- M51P Seat Horizontal Motor - Passenger
- M50P Seat Front Vertical 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.

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

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

Replace the motor.

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

5. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.

- Driver or Passenger Seat Adjuster Switch Replacement
- Front Seat Tilt Adjuster Actuator Replacement
- Driver or Passenger Seat Vertical Adjuster Actuator Replacement
- Front Seat Adjuster Actuator Replacement
- Driver or Passenger Seat Recliner Actuator Replacement

REPAIR INSTRUCTIONS

DRIVER OR PASSENGER SEAT ADJUSTER SWITCH REPLACEMENT

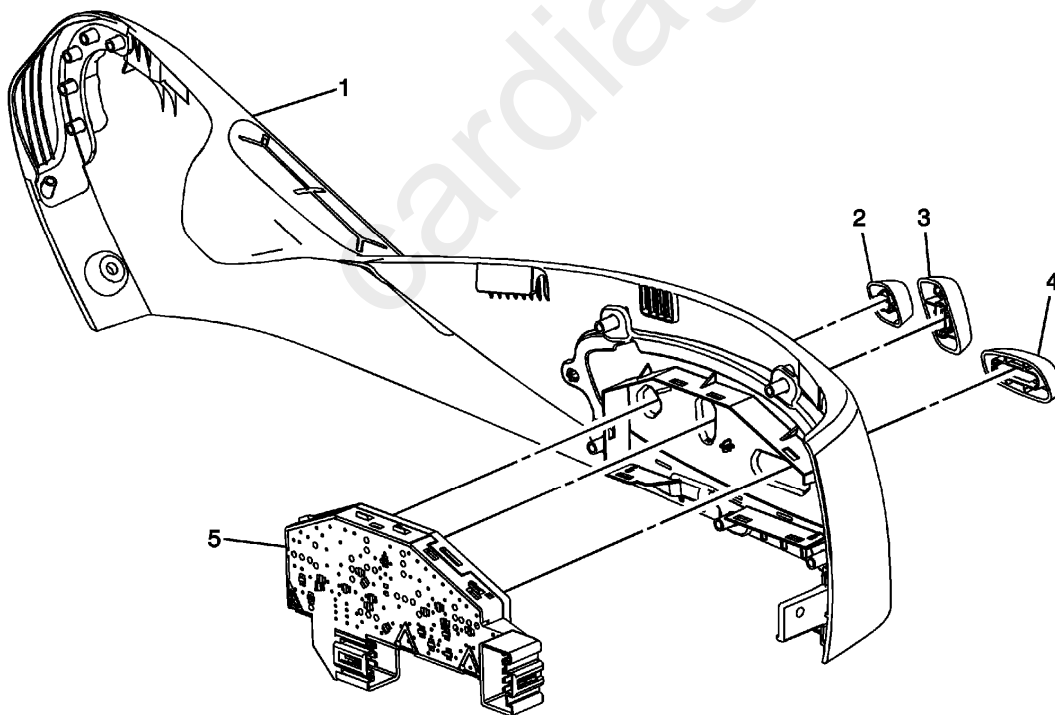


Fig. 10: Driver or Passenger Seat Adjuster & Recliner Switch Components
Courtesy of GENERAL MOTORS COMPANY

Driver or Passenger Seat Adjuster Switch Replacement

Callout	Component Name
Preliminary Procedure Remove the front seat cushion outer finish panel. Refer to <u>Driver or Passenger Seat Cushion Outer Finish Panel Replacement</u> .	
1	Driver or Passenger Seat Cushion Outer Finish Panel
2	Driver or Passenger Seat Lumbar Support Actuator Knob
3	Front Seat Recliner Knob
4	Front Seat Adjuster Knob
5	Driver or Passenger Seat Adjuster Switch
Procedure Use a flat-bladed tool to release the switch from the finish cover.	

FRONT SEAT ADJUSTER MEMORY SWITCH REPLACEMENT

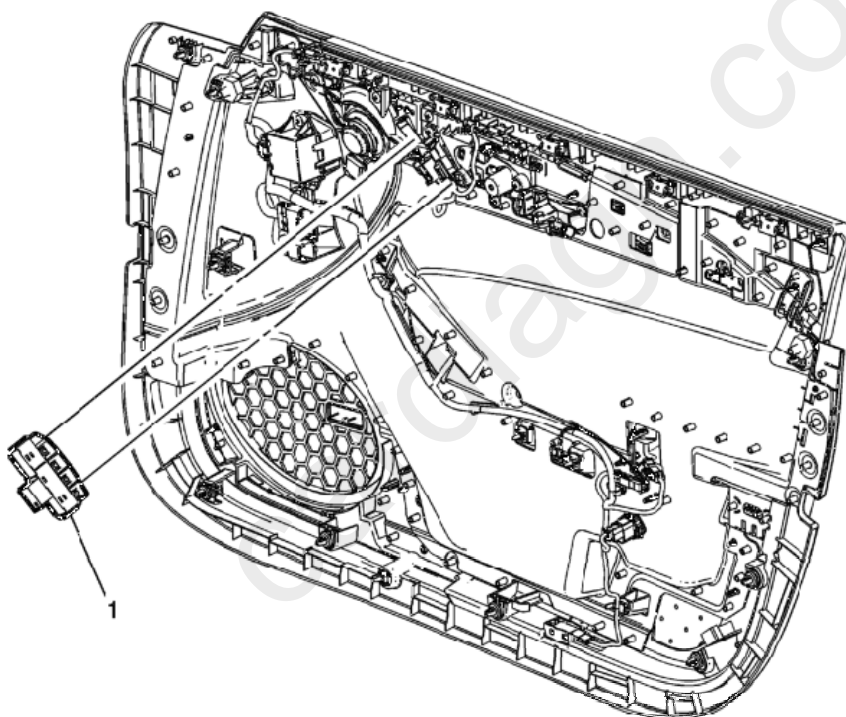


Fig. 11: Front Seat Adjuster Memory Switch
Courtesy of GENERAL MOTORS COMPANY

Front Seat Adjuster Memory Switch Replacement

Callout	Component Name
Preliminary Procedures 1. Remove the front side door trim. Refer to <u>Front Side Door Trim Replacement</u> .	
	Front Seat Adjuster Memory Switch

NOTE:

Reposition the front side door trim panel insulator as necessary.

1

Procedure

1. Disconnect the electrical connector.
2. Using a plastic trim tool, gently pry on the sides of the switch to release it from the panel.

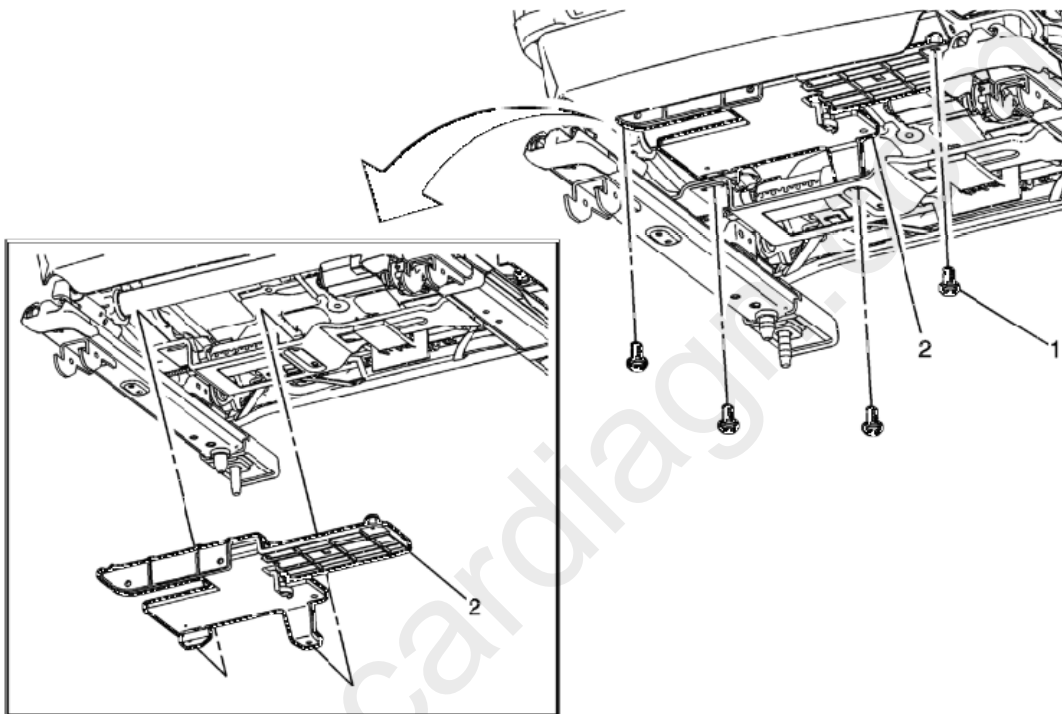
FRONT SEAT ADJUSTER MEMORY MODULE BRACKET REPLACEMENT

Fig. 12: Front Seat Adjuster Memory Module Bracket

Courtesy of GENERAL MOTORS COMPANY

Front Seat Adjuster Memory Module Bracket Replacement

Callout	Component Name
Preliminary Procedures	
1. Remove the driver or passenger seat. Refer to <u>Driver or Passenger Seat Removal and Installation</u> . 2. Remove the driver or passenger seat adjuster memory module, if equipped. Refer to <u>Driver or Passenger Seat Adjuster Memory Module Replacement</u>.	
	Front Seat Adjuster Memory Module Bracket Fastener (Qty: 4)

1	CAUTION: Refer to <u>Fastener Caution</u> .
2	Front Seat Adjuster Memory Module Bracket Procedure Unclip the electrical harness from the bracket.

DRIVER OR PASSENGER SEAT ADJUSTER MEMORY MODULE REPLACEMENT

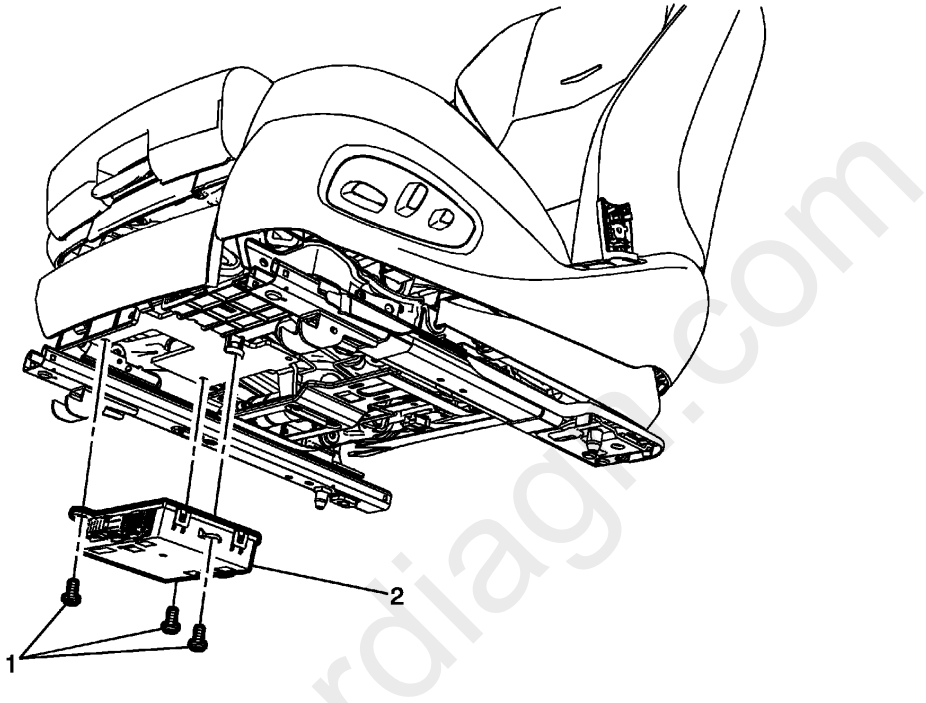


Fig. 13: Driver or Passenger Seat Adjuster Memory Module
Courtesy of GENERAL MOTORS COMPANY

Driver or Passenger Seat Adjuster Memory Module Replacement

Callout	Component Name
Preliminary Procedure Remove the front seat . Refer to <u>Driver or Passenger Seat Removal and Installation</u> .	
1	Driver or Passenger Seat Adjuster Memory Module Fastener (Qty: 3) CAUTION: Refer to <u>Fastener Caution</u> .
2	Driver or Passenger Seat Adjuster Memory Module Procedure 1. Disconnect the electrical connectors.

2. Remove the module from the adjuster memory and wiring harness bracket.
3. Refer to **Control Module References** for programing and setup information.

FRONT SEAT TILT ADJUSTER ACTUATOR REPLACEMENT

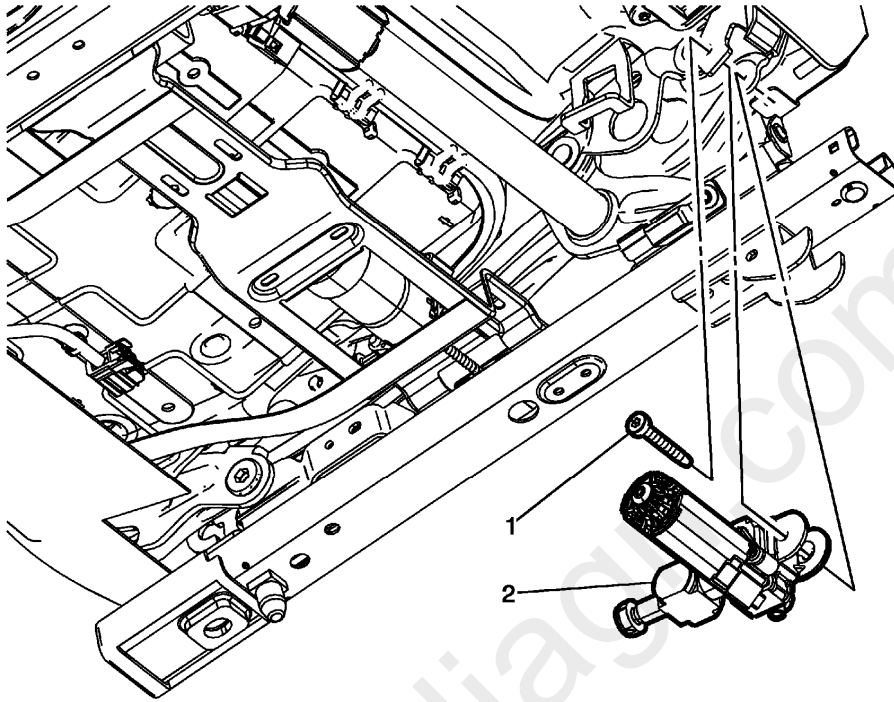


Fig. 14: Front Seat Tilt Adjuster Actuator
Courtesy of GENERAL MOTORS COMPANY

Front Seat Tilt Adjuster Actuator Replacement

Callout	Component Name
Preliminary Procedures	
1. Remove the driver or passenger seat. Refer to <u>Driver or Passenger Seat Removal and Installation</u> . 2. Remove the front seat adjuster memory module bracket. Refer to <u>Front Seat Adjuster Memory Module Bracket Replacement</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 bolt from the actuator and cushion frame.
2	Front Seat Tilt Adjuster Actuator Procedure 1. Disconnect the electrical connector. 2. Rotate the actuator downward and slide the actuator ball nut out of the bracket.

FRONT SEAT RECLINER ACTUATOR SHAFT REPLACEMENT

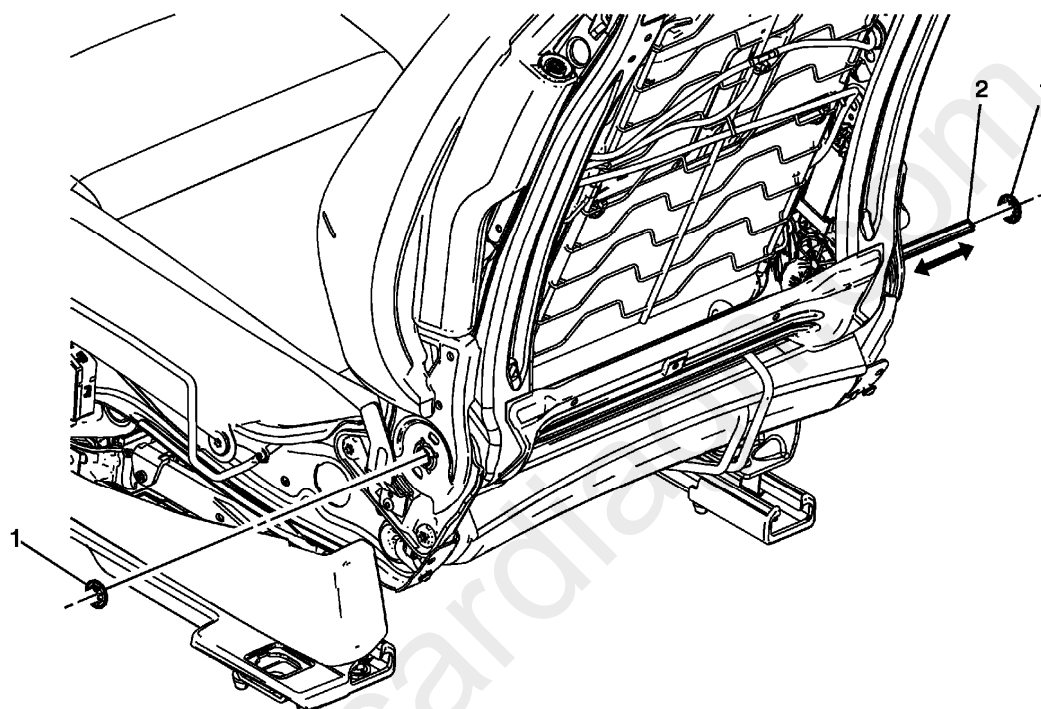


Fig. 15: Front Seat Recliner Actuator Shaft
Courtesy of GENERAL MOTORS COMPANY

Front Seat Recliner Actuator Shaft Replacement

Callout	Component Name
Preliminary Procedure	
1.	Remove the driver or passenger seat. Refer to <u>Driver or Passenger Seat Removal and Installation</u> .
2.	Remove the driver or passenger seat inner recliner finish cover. Refer to <u>Driver or Passenger Seat Inner Recliner Finish Cover Replacement</u> .
3.	Remove the front seat cushion outer finish panel. Refer to <u>Driver or Passenger Seat Cushion Outer Finish Panel Replacement</u> .
4.	Remove the front seat back cushion finish panel. Refer to <u>Front Seat Back Cushion Finish Panel</u>

<u>Replacement .</u>	
1	Front Seat Recliner Actuator Shaft Jam Fastener NOTE: Loosen and reposition the front seat outer recliner finish cover bracket to remove the shaft jam nut and shaft. Procedure After removal of the old jam nut replace with new.
2	Front Seat Recliner Actuator Shaft

DRIVER OR PASSENGER SEAT VERTICAL ADJUSTER ACTUATOR REPLACEMENT

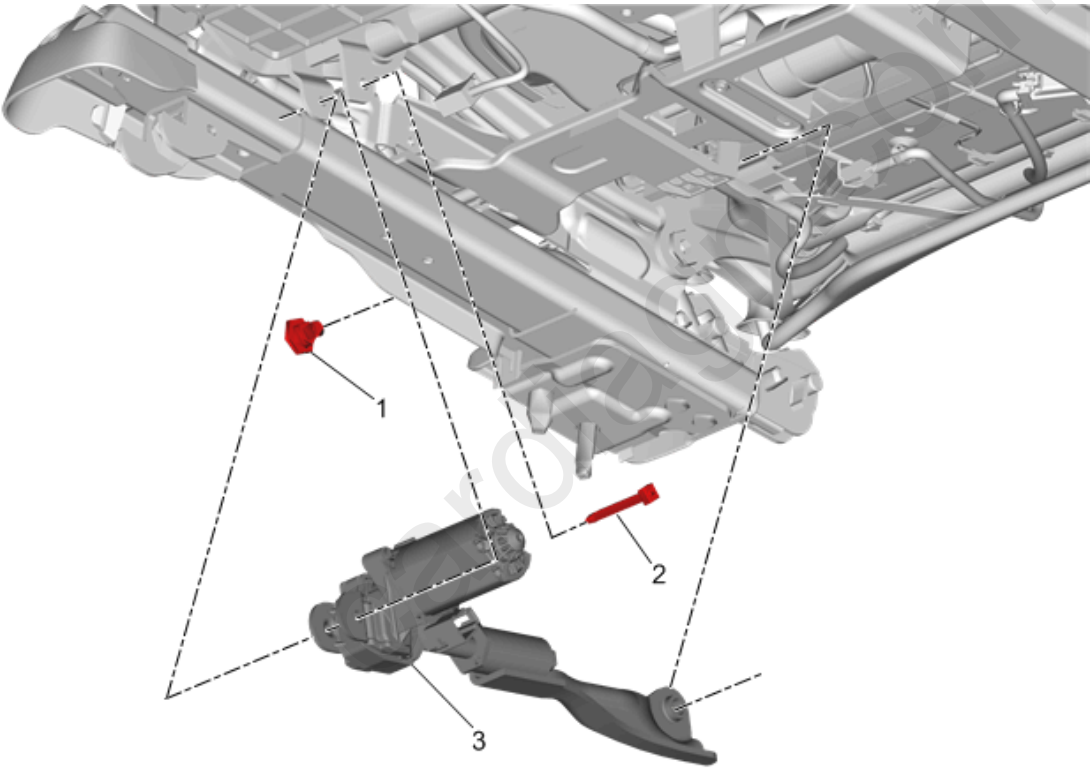


Fig. 16: Driver or Passenger Seat Vertical Adjuster Actuator
Courtesy of GENERAL MOTORS COMPANY

Driver or Passenger Seat Vertical Adjuster Actuator Replacement

Callout	Component Name
Preliminary Procedures	
1.	Remove the driver or passenger seat. Refer to <u>Driver or Passenger Seat Removal and Installation .</u>
2.	Remove the driver or passenger seat cushion outer finish panel. Refer to <u>Driver or Passenger Seat</u>

Cushion Outer Finish Panel Replacement .

3. Remove the front seat cushion sidefinish panel. Refer to **Front Seat Cushion Side Finish Panel Replacement** .

1	Driver or Passenger Seat Vertical Adjuster Actuator Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten 20 N.m (15 lb ft)
2	Driver or Passenger Seat Vertical Adjuster Actuator Fastener Tighten 42 N.m (31 lb ft)
3	Driver or Passenger Seat Vertical Adjuster Actuator Procedure 1. Disconnect the electrical connector. 2. Remove the adjuster vertical actuator from the cushion frame.

FRONT SEAT ADJUSTER ACTUATOR REPLACEMENT

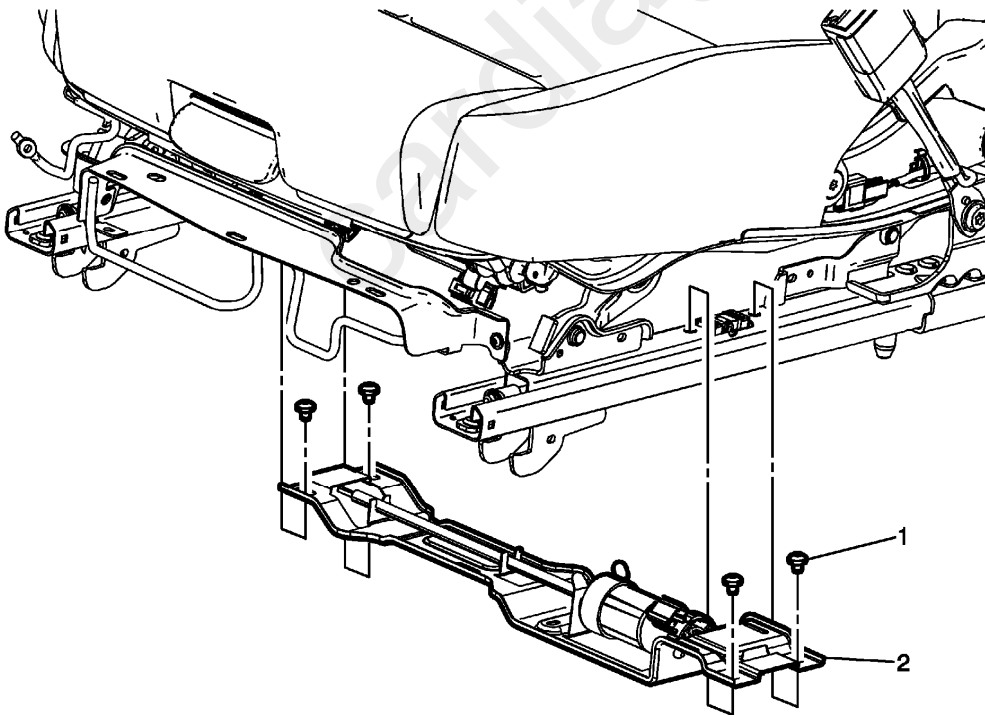


Fig. 17: Front Seat Adjuster Actuator

Courtesy of GENERAL MOTORS COMPANY

Front Seat Adjuster Actuator Replacement

Callout	Component Name
Preliminary Procedures 1. Remove the driver or passenger seat. Refer to <u>Driver or Passenger Seat Removal and Installation</u> . 2. Remove the front seat adjuster memory module bracket. Refer to <u>Front Seat Adjuster Memory Module Bracket Replacement</u>. 3. Remove the retaining screws and reposition the front seat adjuster memory module bracket. Refer to <u>Driver or Passenger Seat Cushion Outer Finish Panel Replacement</u>	
1	Front Seat Adjuster Actuator Fasteners (Qty: 4) CAUTION: Refer to <u>Fastener Caution</u> .
2	Front Seat Adjuster Actuator Procedure 1. Disconnect the electric connector from the actuator and rear floor lamp, if equipped. 2. Remove the driver seat adjuster bracket. 3. Remove the seat adjuster motor shaft out of both seat frame side brackets. 4. Remove the seat adjuster and mounting bracket from the cushion frame.

DRIVER OR PASSENGER SEAT RECLINER ACTUATOR REPLACEMENT

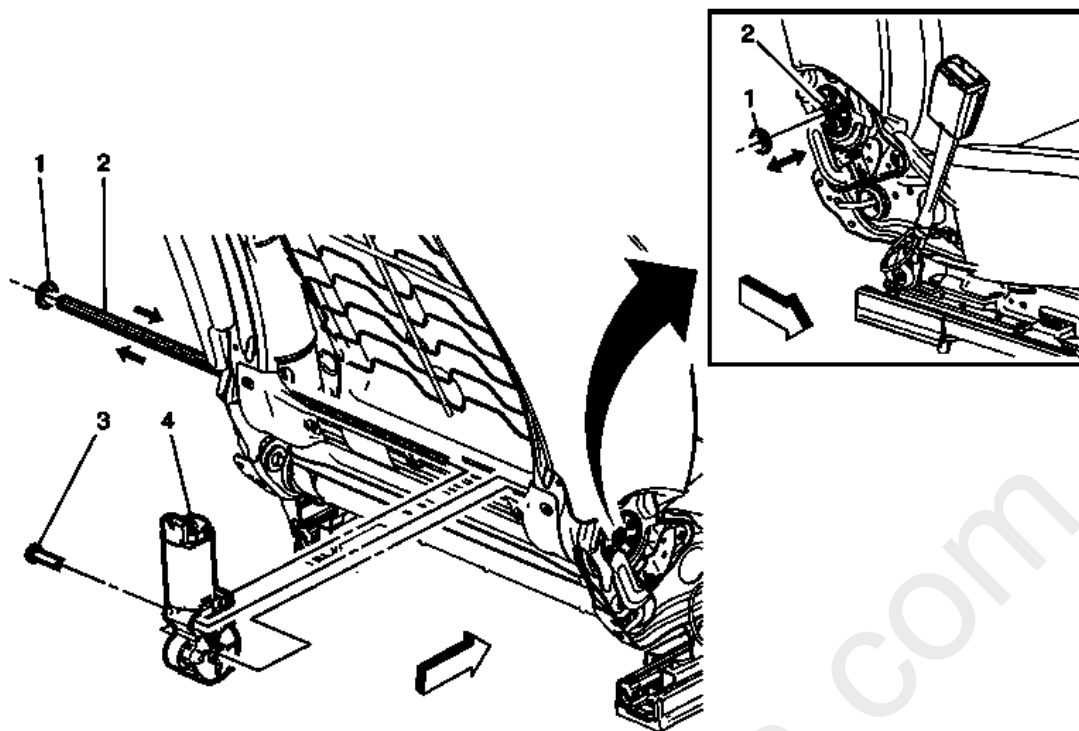


Fig. 18: Driver or Passenger Seat Recliner Actuator
 Courtesy of GENERAL MOTORS COMPANY

Driver or Passenger Seat Recliner Actuator Replacement

Callout	Component Name
WARNING: Refer to <u>SIR Warning</u> .	
Preliminary Procedure	
1. Remove the driver or passenger seat. Refer to <u>Driver or Passenger Seat Removal and Installation</u> .	
2. Remove seat inner recliner finish cover. Refer to <u>Driver or Passenger Seat Inner Recliner Finish Cover Replacement</u> .	
3. Remove front seat cushion outer finish panel. Refer to <u>Driver or Passenger Seat Cushion Outer Finish Panel Replacement</u> .	
4. Remove seat back cushion finish panel. Refer to <u>Front Seat Back Cushion Finish Panel Replacement</u> .	
5. Remove the front seat outer recliner finish cover bracket.	
1	Front Seat Recliner Rod Jam Nut TIP: Replace with new rod jam nut.
2	Recliner Rod Procedure Gently tap the recliner rod outward until the rod is free of the recliner motor.

3	Front Seat Recliner Actuator Motor Fastener CAUTION: Refer to <u>Fastener Caution</u> . Procedure Disconnect the electric connector. Tighten 6 N.m (53 lb in)
4	Front Seat Recliner Actuator Motor

DESCRIPTION AND OPERATION

LUMBAR SUPPORT DESCRIPTION AND OPERATION (DRIVER SEAT)

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

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

2-Way Lumbar Circuit Description

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

4-Way Lumbar Circuit Description

Lumbar Block Diagram

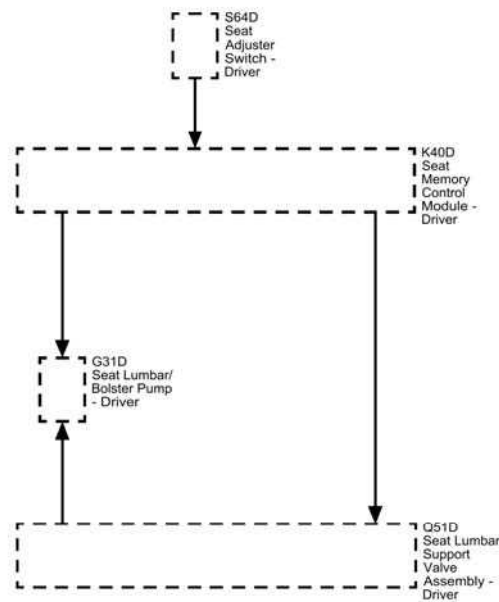


Fig. 19: Lumbar Block Diagram

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
S64D	S64D Seat Adjuster Switch - Driver
K40D	K40D Seat Memory Control Module - Driver
G31D	G31D Seat Lumbar/Bolster Pump - Driver
Q51D	Q51D Seat Lumbar Support Valve Assembly - Driver

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

the lumbar deflate control circuit and ground through the lumbar inflate control circuit to the lumbar support valve assembly. The lumbar valve assembly energizes its internal deflate solenoid and air is released from the lumbar bladder until the switch is released.

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

Description of Operation

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

LUMBAR SUPPORT DESCRIPTION AND OPERATION (PASSENGER SEAT)

The front passenger pneumatic lumbar support system consists of the following components:

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

2-Way Lumbar Circuit Description

Lumbar Block Diagram

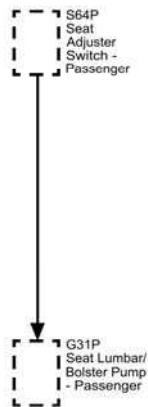


Fig. 20: Lumbar Block Diagram
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
HW	Hard-Wired
S64P	S64P Seat Adjuster Switch - Passenger
G31P	G31P Seat Lumbar/Bolster Pump - Passenger

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

4-Way Lumbar Circuit Description

Lumbar Block Diagram

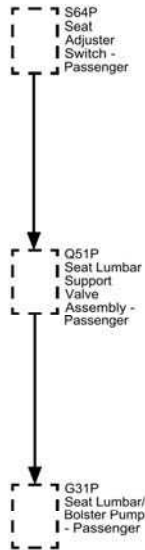


Fig. 21: Lumbar Block Diagram
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
HW	Hard-Wired
HW	Hard-Wired
S64P	S64P Seat Adjuster Switch - Passenger
Q51P	Q51P Seat Lumbar Support Valve Assembly - Passenger
G31P	G31P Seat Lumbar/Bolster Pump - Passenger

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

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

Description of Operation

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

MEMORY SEATS DESCRIPTION AND OPERATION

The memory seat system consists of the following components:

- Driver seat adjuster switch
- Driver seat memory switch
- Seat memory control module
- Driver seat horizontal motor
- Driver seat front vertical motor
- Driver seat rear vertical motor
- Driver seat recline motor
- Driver seat horizontal motor position sensor
- Driver seat front vertical motor position sensor
- Driver seat rear vertical motor position sensor
- Driver seat recline motor position sensor

Memory Seat Block Diagram

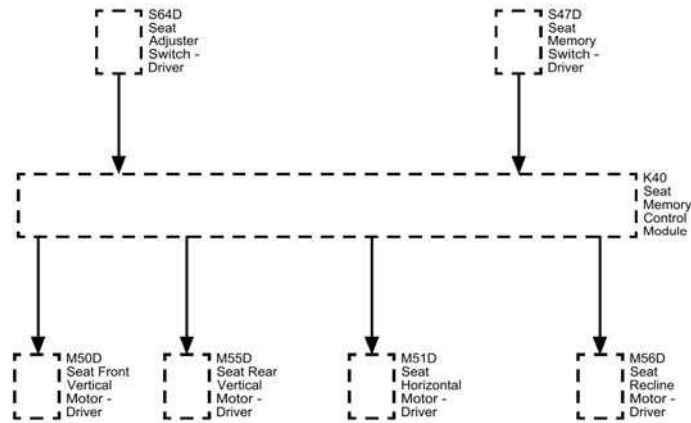


Fig. 22: Memory Seat Block Diagram
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
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

Ground is supplied at all times to the driver seat adjuster switch through the switch ground circuit and ground connection. The seat memory control module supplies a low current voltage to each signal circuit of the seat adjuster switch. When the driver seat adjuster switches are pressed, the appropriate signal circuit from the seat

memory control module is pulled low through the switch contacts indicating the power seat command. The seat memory control module then commands the appropriate driver seat motor to move in response to the switch signal.

Memory Recall Option

The seat memory control module cannot perform Memory Seat Recall and Easy Exit functions unless these options are activated in the radio/HVAC controls, refer to Memory Recall Personalization below or the Owner's Manual. The radio/HVAC controls reports the memory recall option setting to the seat memory control module as well as other receiving modules via serial data message. The module will then store the memory recall option setting and examine it before making a memory seat adjustment. The memory recall option setting stored within the module will not change until the memory recall option setting in the radio/HVAC controls is changed.

Seat Memory Control Module Power and Grounds

Battery positive voltage is supplied at all times to the seat memory control module through a 30 A fuse located in the underhood fuse block. This voltage is used by the module to apply power to the driver seat and lumbar motor when commanded ON. Battery positive voltage is also applied at all times to the seat memory control module through a 10 A fuse located in the rear body fuse block. This voltage is used to power up the module, seat adjuster switch signal circuits, and the seat position sensors. Ground is provided to the seat memory control module through the module ground circuit and ground connection.

Seat Motors

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

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

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.

Un-supervised recalls, a momentary push of memory recall switch, are available when the ignition is ON and the vehicle transmission is the park position.

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.

Easy Exit

If the EASY EXIT SEAT function is activated in the radio/HVAC controls as mentioned above, the vehicle is in the OFF power mode, and the seat memory control module sees the driver door is ajar, the driver seat will automatically move to the saved memory exit position.

Memory Recall Personalization

Refer to the Owner's Manual: Instruments and Controls, Vehicle Personalization, and Comfort and Convenience for the following memory personalization options:

- Auto Memory Recall
- Easy Exit Options

POWER SEATS SYSTEM DESCRIPTION AND OPERATION

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

Power Seat Block Diagram

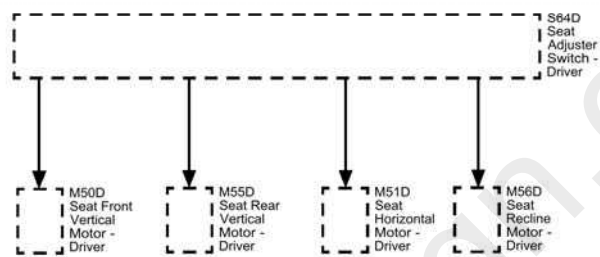


Fig. 23: Power Seat Block Diagram
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired

S64D	S64D Seat Adjuster Switch - Driver
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

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.

SEAT SIDE BOLSTER DESCRIPTION AND OPERATION (WITH MEMORY A45)

The driver seat side bolsters system consists of the following components:

- Driver seat adjuster switch
- Seat memory control module
- Seat side bolster adjuster valve assembly
- Seat lumbar/bolster pump

Lumbar Block Diagram

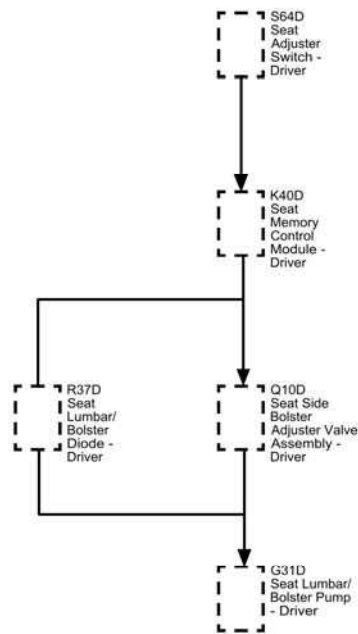


Fig. 24: Lumbar Block Diagram

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
S64D	S64D Seat Adjuster Switch - Driver
K40D	K40D Seat Memory Control Module - Driver
Q10D	Q10D Seat Side Bolster Adjuster Valve Assembly - Driver
G31D	G31D Seat Lumbar/Bolster Pump - Driver
R37D	Seat Lumbar/Bolster Diode - Driver

Ground is supplied at all times to the driver seat adjuster switch through the switch ground circuit and ground connection. The seat memory control module supplies a low current voltage to each signal circuit of the seat adjuster switch. When the bolster switch is pressed to inflate the seat side bolsters, the seat side bolster inflate signal circuit from the seat memory control module is pulled low through the switch contacts indicating the seat side bolster inflate command. The seat memory control module then applies battery voltage through the bolster inflate control circuit and ground through the bolster deflate control circuit to the seat side bolster adjuster valve assembly. The seat side bolster adjuster valve assembly energizes its internal inflate solenoid and applies battery voltage through the seat lumbar/bolster pump control circuit to the pump. The pump runs to inflate the side bolsters until the switch is released. When the bolster switch is pressed to deflate the seat side bolsters, the seat side bolster deflate signal circuit from the seat memory control module is pulled low indicating the seat side bolster deflate command. The seat memory control module then applies battery voltage through the bolster

deflate control circuit and ground through the bolster inflate control circuit to the seat side bolster adjuster valve assembly. The seat side bolster adjuster valve assembly energizes its internal deflate solenoid and air is released from the bladders until the switch is released.

SEAT SIDE BOLSTER DESCRIPTION AND OPERATION (WITHOUT MEMORY A45)

The driver seat side bolsters system consists of the following components:

- Driver seat adjuster switch
- Seat side bolster adjuster valve assembly
- Seat lumbar/bolster pump

Lumbar Block Diagram

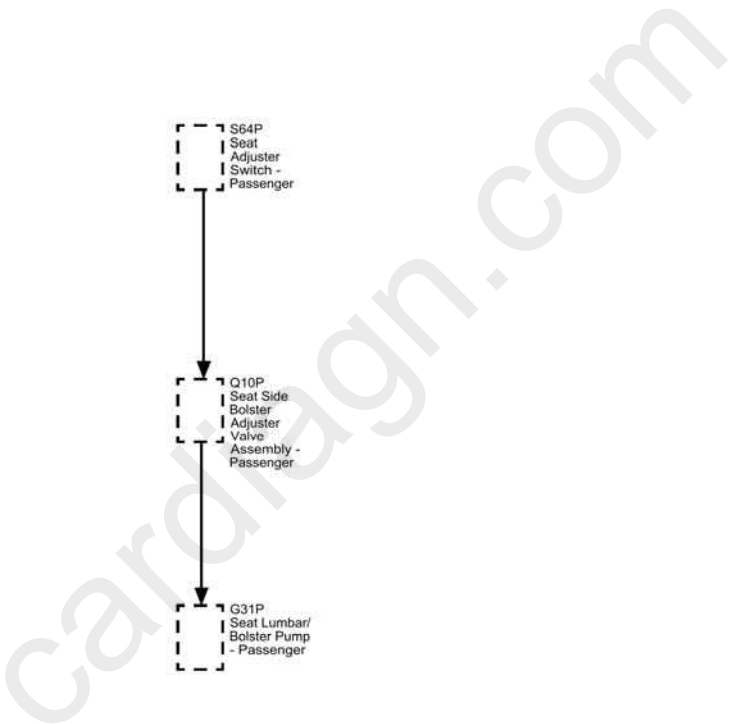


Fig. 25: Lumbar Block Diagram
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
HW	Hard-Wired
HW	Hard-Wired
S64P	S64P Seat Adjuster Switch - Passenger
Q10P	Q10P Seat Side Bolster Adjuster Valve Assembly - Passenger
G31P	G31P Seat Lumbar/Bolster Pump - Passenger

Battery voltage is supplied at all times to the passenger seat adjuster switch through a 30 A fuse located in the underhood fuse block. When the bolster switch is pressed to inflate the seat side bolsters, battery voltage is applied through the switch contacts and the inflate control circuit while ground is applied through the deflate control circuit to the seat side bolster adjuster valve assembly. In response to this command, the seat side bolster adjuster valve assembly energizes its internal inflate solenoid and applies battery voltage through the seat lumbar/bolster pump control circuit to the pump. The pump runs to inflate the seat side bolster bladders until the switch is released. When the switch is pressed to deflate the seat side bolsters, battery voltage is applied through the switch contacts and the deflate control circuit while ground is applied through the inflate control circuit to the seat side bolster adjuster valve assembly. The valve assembly energizes its internal deflate solenoid and air is released from the side bolster bladders until the switch is released.

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