

ACCESSORIES & EQUIPMENT

Power Seats - Coupe & Wagon

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Driver Seat Adjuster Memory Switch Screw	2 N.m	18 lb in
Front Seat Adjuster Track Nut	9 N.m	80 lb in
Front Seat Lumbar Subsystem Bolt	9 N.m	80 lb in
Front Seat Outer Adjuster Rear Vertical Actuator Nut	9 N.m	80 lb in
Front Seat Tilt Adjuster Actuator Nut	9 N.m	80 lb in

SCHEMATIC WIRING DIAGRAMS

DRIVER SEAT WIRING SCHEMATICS

Module Ground, and Horizontal, Lumbar, Recline, and Vertical Motors (A45)

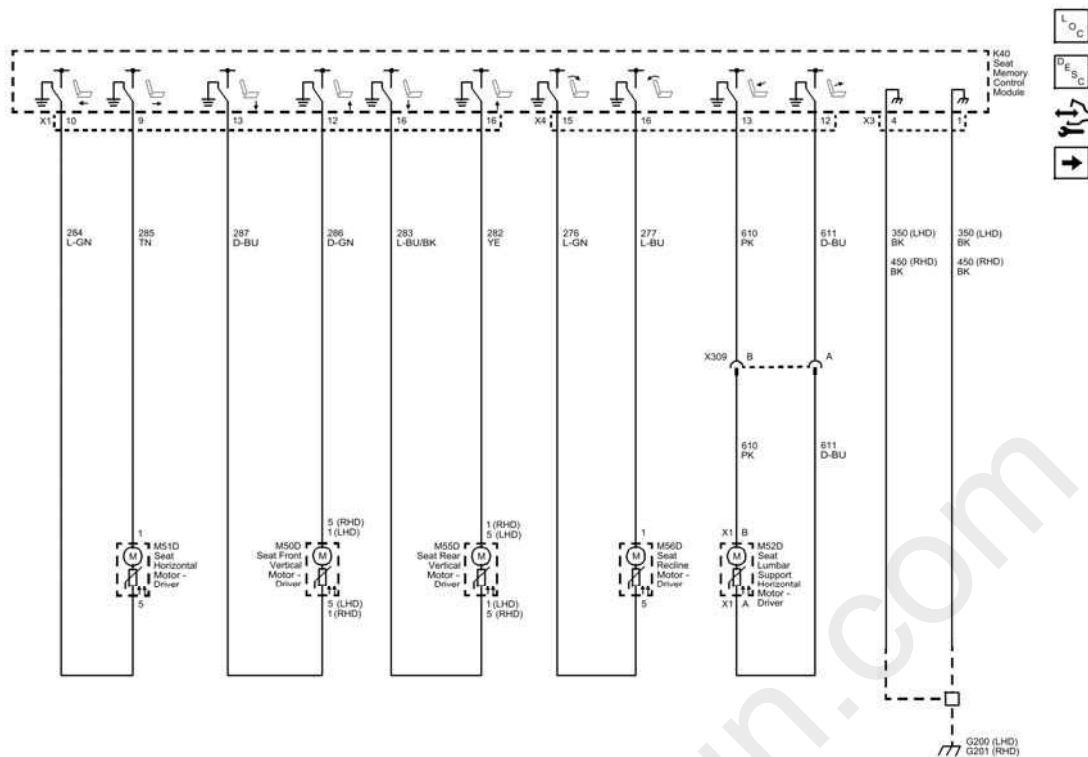
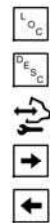


Fig. 1: Module Ground, and Horizontal, Lumbar, Recline, and Vertical Motors (A45)
Courtesy of GENERAL MOTORS COMPANY

Motor Position Sensors (A45)



Seat Switches (A45)

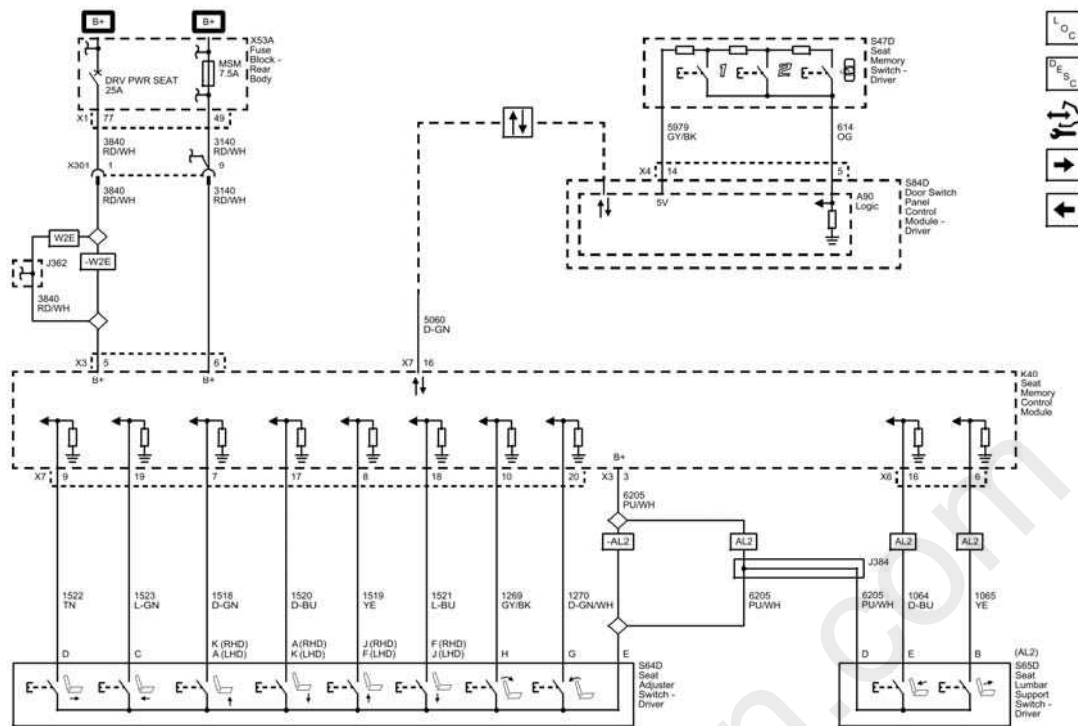


Fig. 3: Seat Switches (A45)

Courtesy of GENERAL MOTORS COMPANY

Seat Switches (W2E)

Seat Switches (without A45 or W2E)

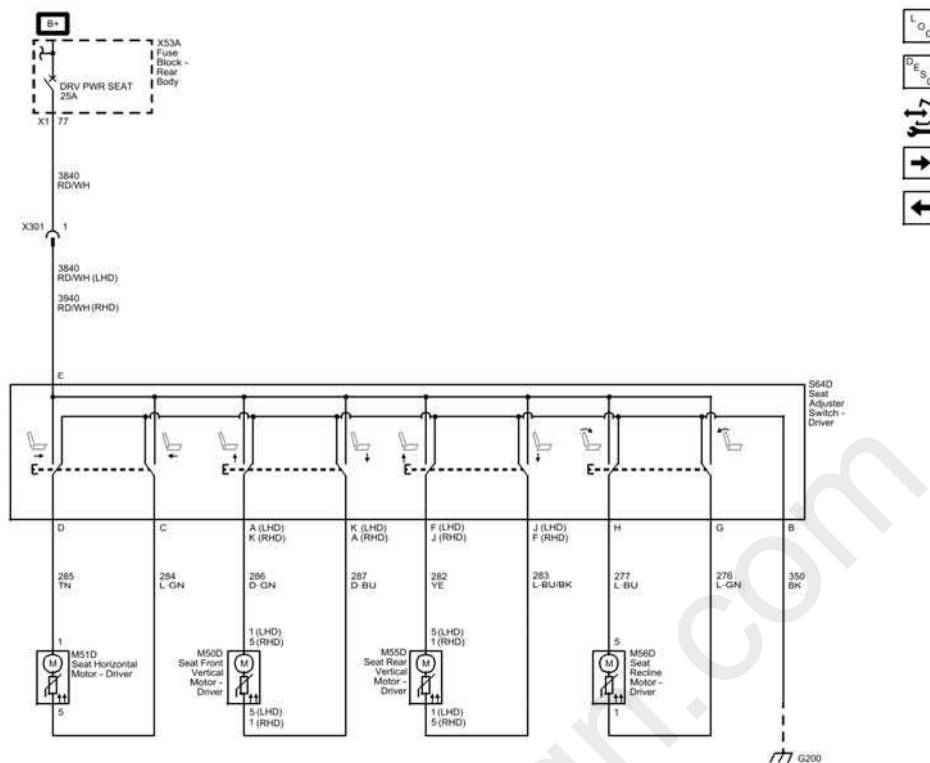


Fig. 5: Seat Switches (without A45 or W2E)
Courtesy of GENERAL MOTORS COMPANY

Easy Entry Seat (Coupe)

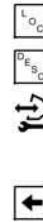
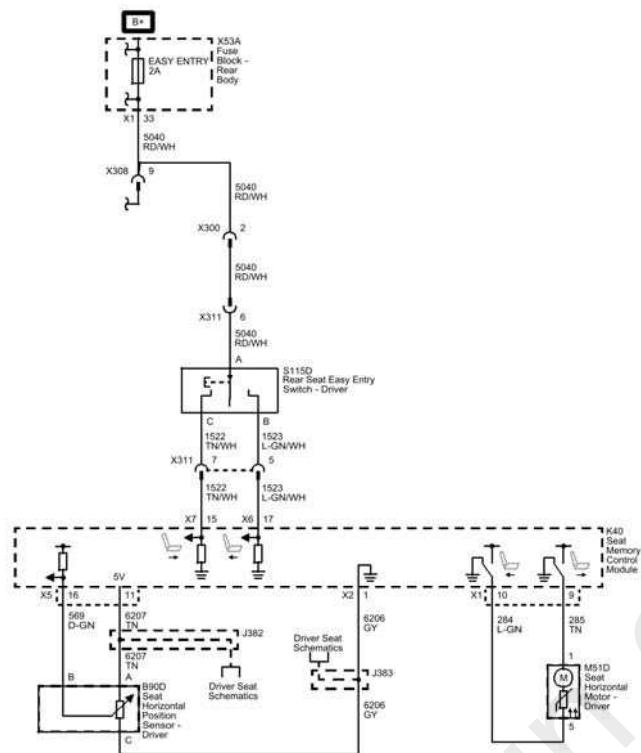


Fig. 6: Easy Entry Seat (Coupe)

Courtesy of GENERAL MOTORS COMPANY

PASSENGER SEAT WIRING SCHEMATICS

Seat Switches (AH8 or AL2)

Seat Switches (W2E)

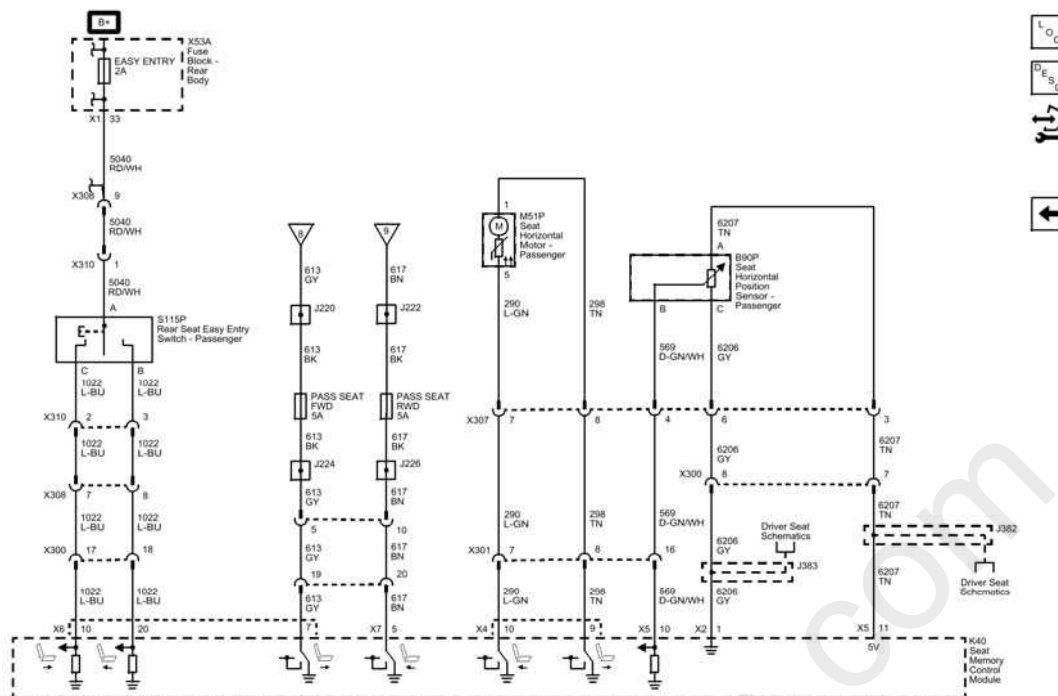


Fig. 9: Easy Entry Seat (Coupe)

Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC B1335</u>	DTC B1335 0B Device Power 3 Circuit Current Above Threshold DTC B1335 42 Device Power 3 Circuit Calibration Data Set Not Programmed DTC B1335 4B Device Power 3 Circuit Calibration Not Learned
<u>DTC B1340</u>	DTC B1340 0B Device Power 4 Circuit Current Above Threshold DTC B1340 42 Device Power 4 Circuit Calibration Data Set Not Programmed DTC B1340 4B Device Power 4 Circuit Calibration Not Learned
<u>DTC B1395 (Coupe)</u>	DTC B1395 02 Device Voltage Reference Output Circuit Short to Ground DTC B1395 05 Device Voltage Reference Output Circuit Short to Battery or Open
<u>DTC B1395 (Sedan, Wagon)</u>	DTC B1395 02 Device Voltage Reference Output Circuit Short to Ground DTC B1395 05 Device Voltage Reference Output Circuit Short to Battery or Open
<u>DTC B1735, B1740, B1745, B1750, B1755,</u>	DTC B1735 01 Seat Front Up Switch Circuit Short to Battery DTC B1740 01 Seat Front Down Switch Circuit Short to Battery

<u>B1760, B1815, or B1820 (Coupe)</u>	DTC B1745 01 Seat Rear Up Switch Circuit Short to Battery DTC B1750 01 Seat Rear Down Switch Circuit Short to Battery DTC B1755 01 Seat Assembly Forward Switch Circuit Short to Battery DTC B1760 01 Seat Assembly Rearward Switch Circuit Short to Battery DTC B1815 01 Seat Recline Forward Switch Circuit Short to Battery DTC B1820 01 Seat Recline Rearward Switch Circuit Short to Battery
<u>DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, or B1820 (Sedan, Wagon)</u>	DTC B1735 01 Seat Front Up Switch Circuit Short to Battery DTC B1740 01 Seat Front Down Switch Circuit Short to Battery DTC B1745 01 Seat Rear Up Switch Circuit Short to Battery DTC B1750 01 Seat Rear Down Switch Circuit Short to Battery DTC B1755 01 Seat Assembly Forward Switch Circuit Short to Battery DTC B1760 01 Seat Assembly Rearward Switch Circuit Short to Battery DTC B1815 01 Seat Recline Forward Switch Circuit Short to Battery DTC B1820 01 Seat Recline Rearward Switch Circuit Short to Battery
<u>DTC B1825, B1850, B1860, B2355, B2365, B2375, or B2405</u>	DTC B1825 01 Seat Recline Position Sensor Circuit Short to Battery DTC B1825 06 Seat Recline Position Sensor Circuit Short to Ground or Open DTC B1825 5A Seat Recline Position Sensor Circuit Plausibility Failure DTC B1850 01 Left Front Seat Lumbar Horizontal Position Sensor Circuit Short to Battery DTC B1850 06 Left Front Seat Lumbar Horizontal Position Sensor Circuit Short to Ground or Open DTC B1850 5A Left Front Seat Lumbar Horizontal Position Sensor Circuit Plausibility Failure DTC B2355 01 Left Seat Front Vertical Position Sensor Circuit Short to Battery DTC B2355 06 Left Seat Front Vertical Position Sensor Circuit Short to Ground or Open DTC B2355 5A Left Seat Front Vertical Position Sensor Circuit Plausibility Failure DTC B2365 01 Left Seat Rear Vertical Position Sensor Circuit Short to Battery DTC B2365 06 Left Seat Rear Vertical Position Sensor Circuit Short to Ground or Open DTC B2365 5A Left Seat Rear Vertical Position Sensor Circuit Plausibility Failure DTC B2375 01 Left Seat Assembly Horizontal Position Sensor Circuit Short to Battery DTC B2375 06 Left Seat Assembly Horizontal Position Sensor Circuit Short to Ground or Open DTC B2375 5A Left Seat Assembly Horizontal Position Sensor Circuit Plausibility Failure DTC B2405 01 Right Seat Assembly Horizontal Position Sensor Circuit Short to Ground or Open DTC B2405 06 Right Seat Assembly Horizontal Position Sensor Circuit Short to Battery
<u>DTC B1830 or B1835</u>	DTC B1830 01 Left Front Seat Lumbar Forward Switch Circuit Short to Battery DTC B1835 01 Left Front Seat Lumbar Rearward Switch Circuit Short to Battery
<u>DTC B2000 or B2005</u>	DTC B2000 01 Right Seat Assembly Horizontal Motor Forward Control Circuit

	DTC B2005 01 Right Seat Assembly Horizontal Motor Rearward Control Circuit Short to Battery
<u>DTC B3603 or B360C-B360E</u>	DTC B3603 01 Driver Seat Easy Entry Switch Forward Circuit DTC B360C 01 Driver Seat Easy Entry Switch Rearward Circuit DTC B360D 01 Passenger Seat Easy Entry Switch Forward Circuit DTC B360E 01 Passenger Seat Easy Entry Switch Rearward Circuit
<u>DTC B3920 or B3921 (Coupe)</u>	DTC B3920 01 Group 1 Seat Motors Common Circuit Short to Battery DTC B3920 02 Group 1 Seat Motors Common Circuit Short to Ground DTC B3921 01 Group 2 Seat Motors Common Circuit Short to Battery DTC B3921 02 Group 2 Seat Motors Common Circuit Short to Ground
<u>DTC B3920 or B3921 (Sedan, Wagon)</u>	DTC B3920 01 Group 1 Seat Motors Common Circuit Short to Battery DTC B3920 02 Group 1 Seat Motors Common Circuit Short to Ground DTC B3921 01 Group 2 Seat Motors Common Circuit Short to Battery DTC B3921 02 Group 2 Seat Motors Common Circuit Short to Ground

DTC B1335: DEVICE POWER 3 CIRCUIT

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 B1335 0B

Device Power 3 Circuit Current Above Threshold

DTC B1335 42

Device Power 3 Circuit Calibration Data Set Not Programmed

DTC B1335 4B

Device Power 3 Circuit Calibration Not Learned

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Driver Seat Front Vertical Motor Down Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2355 5A
Driver Seat Front Vertical Motor Up Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2355 5A

Driver Seat Rear Vertical Motor Down Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2365 5A
Driver Seat Rear Vertical Motor Up Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2365 5A
Driver Seat Horizontal Motor Forward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2375 5A
Driver Seat Horizontal Motor Rearward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2375 5A
Driver Seat Recline Motor Forward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B1825 5A
Driver Seat Lumbar Motor Forward Control	B3920 02	B1335 0B	2	B3920 01	B1335 42, B1335 4B, B1850 5A
Driver Seat Lumbar Motor Rearward Control	B3920 02	B1335 0B	2	B3920 01	B1335 42, B1335 4B, B1850 5A
Passenger Seat Horizontal Motor Forward Control (Coupe)	B3920 02	B1335 0B	3	B3920 01	B1335 42, B1335 4B
Passenger Seat Horizontal Motor Rearward Control (Coupe)	B3920 02	B1335 0B	3	B3920 01	B1335 42, B1335 4B
1. Power seat motor inoperative 2. Lumbar motor inoperative 3. Passenger seat motor inoperative (Coupe)					

Circuit/System Description

The memory seat module (MSM) monitors the current supplied to the driver seat adjuster motors, recline motor, the lumbar motor, and the passenger seat horizontal motor (Coupe). It can detect both absolute and differential current levels from the seat motors. Absolute current is the maximum allowable current the module will supply to the motors. A differential current mismatch occurs when the current supplied to the seat motors does not match the current returning from the motors.

Conditions for Running the DTC

The seat adjuster motors, recline motor or the lumbar motor must be active.

Conditions for Setting the DTC

B1335 0B

The absolute current or an over-current has exceeded the maximum value allowed.

B1335 42

This DTC will set if the module calibration is not programmed.

B1335 4B

This DTC will set if the module calibration is out of range.

Action Taken When the DTC Sets

All movement related to the seat cushion motors, recline and driver seat lumbar motors is aborted.

Conditions for Clearing the DTC

- The current DTC will clear and set the code to history, 3 seconds after no motor movement is requested or the current is no longer mismatched, and the ignition is cycled OFF then back to ACC or RUN.
- The history DTC will clear after 50 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

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

B1335 0B

1. Ignition ON, use a scan tool to clear the current and history diagnostic trouble code.
2. Determine which motor set this DTC by operating the motors listed below one at a time in both directions. Check for the DTC to set between each motor test.

- Driver seat front vertical motor
 - Driver seat rear vertical motor
 - Driver seat horizontal motor
 - Driver seat recline motor
 - Driver seat lumbar horizontal motor
 - Passenger seat horizontal motor (Coupe)
3. Clear the diagnostic trouble codes.
 4. Ignition OFF, disconnect the harness connector at the appropriate seat or lumbar motor for which the DTC set.
 5. Ignition ON, operate the motor adjuster switch in both directions. DTC B1335 0B should not set.
 - If the DTC sets, test for a short between the appropriate control circuits listed below. If the circuits test normal, replace the MSM.
 - Driver seat front vertical motor terminal 1 and terminal 5
 - Driver seat rear vertical motor terminal 1 and terminal 5
 - Driver seat horizontal motor terminal 1 and terminal 5
 - Driver seat recline motor terminal 1 and terminal 5
 - Driver seat lumbar horizontal motor terminal A and terminal B
 - Passenger seat horizontal motor terminal 1 and terminal 5 (Coupe)
 6. Test the appropriate control circuits listed below for a high resistance. If the circuits test normal, test or replace the seat or lumbar motor.
 - Driver seat front vertical motor terminal 1 and terminal 5
 - Driver seat rear vertical motor terminal 1 and terminal 5
 - Driver seat horizontal motor terminal 1 and terminal 5
 - Driver seat recline motor terminal 1 and terminal 5
 - Driver seat lumbar horizontal motor terminal A and terminal B
 - Passenger seat horizontal motor terminal 1 and terminal 5 (Coupe)
 7. If all circuits test normal, test or replace the MSM.

B1335 42 or B1335 4B

If either DTC is set, replace the MSM.

Component Testing

Seat Motor

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

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

2. Install a 30 A fused jumper wire between the control terminal 1 and 12 volts. Momentarily install a jumper wire between the control terminal 5 and ground. The seat motor should momentarily perform the appropriate FORWARD/REARWARD/UP/DOWN function.
 - If the function does not perform as specified, replace the seat motor.
3. Reverse the polarity of jumper wires. The a seat motor should perform in the opposite direction.
 - If the function does not perform as specified, replace the seat motor.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Front Seat Tilt Adjuster Actuator Replacement**
- **Front Seat Adjuster Actuator Replacement**
- **Driver Seat Outer Adjuster Rear Vertical Actuator Replacement**
- **Seat Lumbar Sub System Replacement (AQ9), Seat Lumbar Sub System Replacement (W2E)**
- **Front Seat Recliner Actuator Motor Replacement**
- **Control Module References** for MSM replacement, setup, and programming

DTC B1340: DEVICE POWER 4 CIRCUIT

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 B1340 0B

Device Power 4 Circuit Current Above Threshold

DTC B1340 42

Device Power 4 Circuit Calibration Data Set Not Programmed

DTC B1340 4B

Device Power 4 Circuit Calibration Not Learned

Diagnostic Fault Information

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

Steering Column Telescope Motor Forward Control	B3921 02	B1340 0B	1	B3921 01	B1340 42, B1340 4B, B2860 5A
Steering Column Telescope Motor Rearward Control	B3921 02	B1340 0B	1	B3921 01	B1340 42, B1340 4B, B2860 5A
Steering Column Tilt Motor Down Control	B3921 02	B1340 0B	2	B3921 01	B1340 42, B1340 4B, B2880 5A
Steering Column Tilt Motor Up Control	B3921 02	B1340 0B	2	B3921 01	B1340 42, B1340 4B, B2880 5A
1. Steering column does not telescope in/out 2. Steering column does not tilt up/down					

Circuit/System Description

The memory seat module (MSM) monitors the current supplied to both steering column motors. The MSM can detect both absolute and differential current levels from these motors. Absolute current is the maximum allowable current the module will supply to the motors. A differential current mismatch occurs when the current supplied to the motors does not match the current returning from the motors.

Conditions for Running the DTC

The steering column motors must be active.

Conditions for Setting the DTC

B1340 0B

The absolute current has exceeded the maximum value allowed.

B1340 42

This DTC will set if the module calibration is not programmed.

B1340 4B

This DTC will set if the module calibration is not learned.

Action Taken When the DTC Sets

All movement related to the steering column motors are aborted.

Conditions for Clearing the DTC

- The current DTC will clear and set the code to history, 3 seconds after no motor movement is requested or the current is no longer mismatched, and the power mode changes to OFF then back to ACC or RUN.
- The history DTC will clear after 50 consecutive fault-free ignition cycles have occurred.

Diagnostic Aids

The scan tool may reference the Memory Seat Module (MSM) as the Driver Position Module.

Reference Information

Schematic Reference

- **Driver Seat Schematics**
- **Tilt/Telescoping Steering Column Schematics**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

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

B1340 0B

1. Ignition ON, use a scan tool to clear the current and history diagnostic trouble code.
2. Determine which motor set this DTC by operating the motors listed below one at a time in both directions. Check for the DTC to set between each motor test.
 - Steering Column Tilt motor
 - Steering Column Telescope motor
3. Clear the diagnostic trouble codes.
4. Ignition OFF, disconnect the harness connector at the appropriate steering column motor for which the DTC set.
5. Ignition ON, operate the motor adjuster switch in both directions. DTC B1340 0B should not set.
 - If the DTC sets, test for a short between the appropriate motor control circuits listed below. If the circuits test normal, replace the MSM.
 - Steering column telescope motor terminal C and terminal D

- Steering column tilt motor terminal A and terminal B
- 6. Test the appropriate control circuits listed below for a high resistance. If the circuits test normal, test or replace the steering column.
 - Steering column telescope motor terminal C and terminal D
 - Steering column tilt motor terminal A and terminal B

B1340 42 or B1340 4B

If either DTC is set, replace the MSM.

Component Testing

Seat Motor

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

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

2. Install a 30 A fused jumper wire between the control terminal 1 and 12 V. Momentarily install a jumper wire between the control terminal 5 and ground. The seat motor should momentarily perform the appropriate FORWARD/REARWARD/UP/DOWN function.
 - If the function does not perform as specified, replace the seat motor.
3. Reverse the polarity of jumper wires. The a seat motor should perform in the opposite direction.
 - If the function does not perform as specified, replace the seat motor.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Steering Column Replacement**
- **Control Module References** for MSM replacement, programming and setup

DTC B1395 (COUPE): DEVICE VOLTAGE REFERENCE OUTPUT CIRCUIT

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 B1395 02

Device Voltage Reference Output Circuit Short to Ground

DTC B1395 05

Device Voltage Reference Output Circuit Short to Battery or Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
5 V Reference	B1395 02, B1825 06, B1850 06, B1860 06, B2355 06, B2365 06, B2375 06, B2860 06, B2880 06	B1825 06, B1850 06, B1860 06, B2355 06, B2365 06, B2375 06, B2860 06, B2880 06	B1395 05, B1825 01, B1850 01, B1860 01, B2355 01, B2365 01, B2375 01, B2860 01, B2880 01	B1825 5A, B1850 5A, B1860 5A, B2355 5A, B2365 5A, B2375 5A, B2860 5A, B2880 5A
Driver Seat Front Vertical Position Sensor Signal	B2355 06	B2355 06	B2355 01	-
Driver Seat Rear Vertical Position Sensor Signal	B2365 06	B2365 06	B2365 01	-
Driver Seat Horizontal Position Sensor Signal	B2375 06	B2375 06	B2375 01	-
Driver Seat Lumbar Horizontal Position Sensor Signal	B1850 06	B1850 06	B1850 01	-
Driver Seat Recline Position Sensor Signal	B1825 06	B1825 06	B1825 01	-
Passenger Seat Horizontal Position Sensor Signal	-	-	-	-
Memory Seat/Mirror Sensor Low Reference	-	B1825 01, B1850 01, B1860 01, B2355 01, B2365 01, B2375 01, B2860 01, B2880 01	-	B1825 5A, B1850 5A, B1860 5A, B2355 5A, B2365 5A, B2375 5A, B2860 5A, B2880 5A

Circuit/System Description

The memory seat module (MSM) supplies a 5 V reference to the driver seat and lumbar position sensors, the passenger seat horizontal position sensor, and the tilt/telescoping steering column position sensors. The MSM monitors this reference voltage to ensure the accuracy of the voltages being returned from the sensors. If the voltage exceeds the normal operating range, errors will occur in memory recall operations.

Conditions for Running the DTC

The MSM must be powered.

Conditions for Setting the DTC

B1395 02

The MSM detects a voltage less than 4.8 V for 300 mS on the 5 V reference circuit.

B1395 05

The MSM detects a voltage greater than 5.2 V for 300 mS on the 5 V reference circuit.

Action Taken When the DTC Sets

All memory recall functions will be disabled.

Conditions for Clearing the DTC

- The current DTC will clear and set the code to history, 3 seconds after the reference voltage returns to the normal operating range and the ignition is cycled OFF then back to ACC or RUN.
- The history DTC will clear after 50 consecutive fault-free ignition cycles have occurred.

Diagnostic Aids

- All position sensors use common ground and 5 V reference circuits.
- If the 5 V reference circuit is shorted to voltage multiple position sensor codes will set.
- If the 5 V reference circuit is shorted to ground multiple position sensor codes will set.
- A short to voltage on one of the position sensor signal circuits may set this DTC.
- An internal short to ground in one of the position sensors may set this DTC.

Reference Information

Schematic Reference

- **Driver Seat Schematics**
- **Tilt/Telescoping Steering Column Schematics**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

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 for all position sensors connected to the 5 V reference circuit.
2. Ignition ON, observe all scan tool sensor parameters for Seat 1 Info. and Column Info. The readings should be 0.0 V.
 - If greater than the specified value, test the appropriate signal circuit listed below for a short to voltage. If the circuit tests normal, replace the MSM.
 - Seat horizontal position sensor terminal B X2
 - Seat front vertical position sensor terminal B X2
 - Seat rear vertical position sensor terminal B X2
 - Recline position sensor terminal 2
 - Lumbar horizontal position sensor terminal E
 - Steering column telescope position sensor terminal D X2
 - Steering column tilt position sensor terminal A X2
3. Ignition ON, at any one of the position sensors, test for 4.8 - 5.2 V between the 5 V reference circuit and ground.
 - If less than the specified value, test the 5 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the MSM.
 - If greater than the specified value, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the MSM.
4. Connect each position sensor one at a time and verify that the DTC does not set as current.
 - If the DTC sets as current, replace the appropriate position sensor.
5. If all circuits test normal, replace the MSM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Front Seat Tilt Adjuster Actuator Replacement**
- **Front Seat Adjuster Actuator Replacement**

- **Driver Seat Outer Adjuster Rear Vertical Actuator Replacement**
- **Seat Lumbar Sub System Replacement (AQ9), Seat Lumbar Sub System Replacement (W2E)**
- **Front Seat Recliner Actuator Motor Replacement**
- **Steering Column Tilt Wheel Position Sensor Replacement**
- **Control Module References** for MSM replacement, setup, and programming

DTC B1395 (WAGON): DEVICE VOLTAGE REFERENCE OUTPUT CIRCUIT

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 B1395 02

Device Voltage Reference Output Circuit Short to Ground

DTC B1395 05

Device Voltage Reference Output Circuit Short to Battery or Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
5-Volt Reference	B1395 02, B1825 06, B1850 06, B1860 06, B2355 06, B2365 06, B2375 06, B2860 06, B2880 06	B1825 06, B1850 06, B1860 06, B2355 06, B2365 06, B2375 06, B2860 06, B2880 06	B1395 05, B1825 01, B1850 01, B1860 01, B2355 01, B2365 01, B2375 01, B2860 01, B2880 01	B1825 5A, B1850 5A, B1860 5A, B2355 5A, B2365 5A, B2375 5A, B2860 5A, B2880 5A
Driver Seat Front Vertical Position Sensor Signal	B2355 06	B2355 06	B2355 01	-
Driver Seat Rear Vertical Position Sensor Signal	B2365 06	B2365 06	B2365 01	-
Driver Seat Horizontal Position Sensor Signal	B2375 06	B2375 06	B2375 01	-
Driver Seat Lumbar Horizontal Position Sensor Signal	B1850 06	B1850 06	B1850 01	-

Driver Seat Recline Position Sensor Signal	B1825 06	B1825 06	B1825 01	-
Memory Seat/Mirror Sensor Low Reference	-	B1825 01, B1850 01, B1860 01, B2355 01, B2365 01, B2375 01, B2860 01, B2880 01	-	B1825 5A, B1850 5A, B1860 5A, B2355 5A, B2365 5A, B2375 5A, B2860 5A, B2880 5A

Circuit/System Description

The memory seat module (MSM) supplies a 5-volt reference voltage to the driver seat, lumbar, and tilt/telescoping steering column position sensors. The MSM monitors this reference voltage to ensure the accuracy of the voltages being returned from the sensors. If the voltage exceeds the normal operating range, errors will occur in the memory recall operations of the seat and tilt/telescoping steering.

Conditions for Running the DTC

The MSM must be powered.

Conditions for Setting the DTC

B1395 02

The reference voltage drops below 4.8 volts for more than 300 mS.

B1395 05

The reference voltage exceeds 5.2 volts for more than 300 mS.

Action Taken When the DTC Sets

All memory recall functions will be disabled.

Conditions for Clearing the DTC

- The current DTC will clear and set the code to history, 3 seconds after the reference voltage returns to the normal operating range and the ignition is cycled OFF then back to ACC or RUN.
- The history DTC will clear after 50 consecutive fault-free ignition cycles have occurred.

Diagnostic Aids

- All position sensors use common ground and 5-volt reference circuits.
- If the 5-volt reference circuit is shorted to voltage multiple position sensor codes will set.
- If the 5-volt reference circuit is shorted to ground multiple position sensor codes will set.

- A short to voltage on one of the position sensor signal circuits may set this DTC.
- An internal short to ground in one of the position sensors may set this DTC.

Reference Information

Schematic Reference

- **Driver Seat Schematics**
- **Tilt/Telescoping Steering Column Schematics**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

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 for all position sensors connected to the 5-volt reference circuit.
2. Ignition ON, observe all scan tool sensor parameters for Seat 1 and Column Info. The readings should be 0.0 volts.
 - If greater than the specified value, test the appropriate signal circuit listed below for a short to voltage. If the circuit tests normal, replace the MSM.
 - Seat horizontal position sensor terminal B X2
 - Seat front vertical position sensor terminal B X2
 - Seat rear vertical position sensor terminal B X2
 - Recline position sensor terminal 2
 - Lumbar horizontal position sensor terminal E
 - Steering column telescope position sensor terminal D X2
 - Steering column tilt position sensor terminal A X2

3. Ignition ON, test for 4.8-5.2 volts between the 5-volt reference circuit at any one of the position sensors and ground.
 - If less than the specified value, test the 5-volt reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the MSM.
 - If greater than the specified value, test the 5-volt reference circuit for a short to voltage. If the circuit tests normal, replace the MSM.
4. Connect each position sensor one at a time and verify that the DTC does not set as current.
 - If the DTC sets as current, replace the appropriate position sensor.
5. If all circuits test normal, replace the MSM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Front Seat Tilt Adjuster Actuator Replacement**
- **Front Seat Adjuster Actuator Replacement**
- **Driver Seat Outer Adjuster Rear Vertical Actuator Replacement**
- **Seat Lumbar Sub System Replacement (AQ9), Seat Lumbar Sub System Replacement (W2E)**
- **Front Seat Recliner Actuator Motor Replacement**
- **Steering Column Tilt Wheel Position Sensor Replacement**
- **Control Module References** for MSM replacement, setup, and programming

DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, OR B1820 (COUPE): 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 01

Seat Front Up Switch Circuit Short to Battery

DTC B1740 01

Seat Front Down Switch Circuit Short to Battery

DTC B1745 01

Seat Rear Up Switch Circuit Short to Battery

DTC B1750 01

Seat Rear Down Switch Circuit Short to Battery

DTC B1755 01

Seat Assembly Forward Switch Circuit Short to Battery

DTC B1760 01

Seat Assembly Rearward Switch Circuit Short to Battery

DTC B1815 01

Seat Recline Forward Switch Circuit Short to Battery

DTC B1820 01

Seat Recline Rearward Switch Circuit Short to Battery

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Driver Seat Front Vertical Up Switch Signal	2	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Driver Seat Front Vertical Down Switch Signal	2	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Driver Seat Rear Vertical Up Switch Signal	2	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Driver Seat Rear Vertical Down Switch Signal	2	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-

			01	
Driver Rear Seat Easy Entry Forward Switch Signal	3	3	B1755 01	-
Driver Rear Seat Easy Entry Rearward Switch Signal	3	3	B1760 01	-
Driver Seat Horizontal Forward Switch Signal	2	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01,	-
Driver Seat Horizontal Rearward Switch Signal	2	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Driver Seat Recline Forward Switch Signal	2	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Driver Seat Recline Rearward Switch Signal	2	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
1. Driver power seat inoperative 2. Scan tool does not communicate with low speed GMLAN device 3. Driver rear seat easy entry feature inoperative				

Circuit/System Description

When the driver seat adjuster switch is pressed, battery voltage is applied through the switch signal circuit to the memory seat module (MSM). The MSM then commands the appropriate driver seat motor to move in response to the switch signal. When a driver rear seat easy entry switch is pressed, battery voltage is applied through the switch signal circuit to the MSM. The MSM then commands the driver seat horizontal motor to move in response to the switch signal.

Conditions for Running the DTC

The MSM must be powered.

Conditions for Setting the DTC

B1755 01

- If the driver rear seat easy entry forward switch is stuck or the circuit is shorted to voltage, and the driver seat horizontal forward or rearward switch is pressed, this DTC will set.
- If the driver seat horizontal forward switch is stuck or the circuit is shorted to voltage, and the driver seat horizontal rearward switch is pressed, or, the driver rear seat easy entry forward or rearward switch is pressed, this DTC will set.

B1760 01

- If the driver rear seat easy entry rearward switch is stuck or the circuit is shorted to voltage, and the driver seat horizontal forward or rearward switch is pressed, this DTC will set.
- If the driver seat horizontal rearward switch is stuck or the circuit is shorted to voltage, and the driver seat horizontal forward switch is pressed, or, the driver rear seat easy entry forward or rearward switch is pressed, this DTC will set.

DTC B1735 01, B1740 01, B1745 01, B1750 01, B1815 01, or B1820 01

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

Action Taken When the DTC Sets

B1755 01

- The rear seat easy entry forward switch input commands for the driver front seat are ignored.
- The MSM will respond to any other switch signal that has not set a DTC.

B1760 01

- The rear seat easy entry rearward switch input commands for the driver front seat are ignored.
- The MSM will respond to any other switch signal that has not set a DTC.

DTC B1735 01, B1740 01, B1745 01, B1750 01, B1815 01, or B1820 01

- A motor output driven in response to a switch considered failed, is deactivated for both directions.
- All memory recall commands are ignored for that motor.
- The MSM 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 code to history, 3 seconds after the fault is no longer present and the ignition is cycled OFF then back to ACC or RUN.
- The history DTC will clear after 50 consecutive fault-free ignition cycles have occurred.

Diagnostic Aids

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

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

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, observe all scan tool Seat 1 Inputs seat switch parameters while pressing and releasing the appropriate driver seat directional switch. The readings should change between Active and Inactive.
2. Observe the scan tool Seat 1 Inputs seat switch parameters listed below while pressing and releasing the appropriate driver rear seat easy entry forward and rearward switch. The readings should change between Active and Inactive.
 - Horizontal/Easy Entry Forward Sw
 - Horizontal/Easy Entry Rearward Sw

Circuit/System Testing

DTC B1755 01

1. Ignition ON, observe the scan tool Seat 1 Inputs Horizontal/Easy Entry Forward Sw parameter while

pressing the driver rear seat easy entry FORWARD switch. The reading should be Active.

- If not the specified value, test the signal circuit terminal C for a short to voltage or an open/high resistance. If the circuit tests normal, test or replace the rear seat easy entry switch.
- 2. Ignition ON, observe the scan tool Horizontal/Easy Entry Forward Sw parameter while pressing the driver seat adjuster switch in the FORWARD direction. The reading should be Active.
 - If not the specified value, test the signal circuit terminal D for a short to voltage or an open/high resistance. If the circuit tests normal, test or replace the driver seat adjuster switch.
- 3. If all circuits test normal, replace the memory seat module.

DTC B1760 01

- 1. Ignition ON, observe the scan tool Seat 1 Inputs Horizontal/Easy Entry Rearward Sw parameter while pressing the driver rear seat easy entry REARWARD switch. The reading should be Active.
 - If not the specified value, test the signal circuit terminal B for a short to voltage or an open/high resistance. If the circuit tests normal, test or replace the rear seat easy entry switch.
- 2. Ignition ON, observe the scan tool Horizontal/Easy Entry Rearward Sw parameter while pressing the driver seat adjuster switch in the REARWARD direction. The reading should be Active.
 - If not the specified value, test the signal circuit terminal C for a short to voltage or an open/high resistance. If the circuit tests normal, test or replace the driver seat adjuster switch.
- 3. If all circuits test normal, replace the memory seat module.

DTC B1735 01, B1740 01, B1745 01, B1750 01, B1815 01, or B1820 01

- 1. Ignition OFF, disconnect the harness connector at the seat adjuster switch.
- 2. Verify all scan tool Seat 1 Inputs seat switch parameters listed below are Inactive.
 - Front Vertical Upward Switch
 - Front Vertical Downward Switch
 - Rear Vertical Upward Switch
 - Rear Vertical Downward Switch
 - Recline Forward Switch
 - Recline Rearward Switch
 - If not the specified value, test the appropriate signal circuit listed below for a short to voltage. If the circuit tests normal, replace the MSM.
 - Front vertical upward switch terminal A (LHD)
 - Front vertical upward switch terminal K (RHD)
 - Front vertical downward switch terminal K (LHD)
 - Front vertical downward switch terminal A (RHD)
 - Rear vertical upward switch terminal F (LHD)
 - Rear vertical upward switch terminal J (RHD)
 - Rear vertical downward switch terminal J (LHD)
 - Rear vertical downward switch terminal F (RHD)

- Recline forward switch terminal H
 - Recline rearward switch terminal G
3. If all circuits test normal, test or replace the seat adjuster switch.

Component Testing

Rear Seat Easy Entry Switch

1. Ignition OFF, disconnect the harness connector at the rear seat easy entry switch.
2. Test for infinite resistance between the B+ terminal A and each seat direction signal terminal with the switch in the open position.
 - If not the specified value, replace the rear seat easy entry switch.
3. Test for less than 1 ohms between the B+ terminal A and each seat direction signal terminal with the appropriate switch in the closed position.
 - If greater than the specified value, replace the rear seat easy entry switch.

Driver Seat Adjuster Switch

1. Ignition OFF, disconnect the harness connector at the driver seat adjuster switch.
2. Test for infinite resistance between the B+ terminal E and each seat direction signal terminal with the switch in the open position.
 - If not the specified value, replace the driver seat adjuster switch.
3. Test for less than 1 ohms between the B+ terminal E and each seat direction signal terminal with the appropriate switch in the closed position.
 - If greater than the specified value, replace the driver seat adjuster switch.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Front Seat Adjuster Switch Replacement - Driver Side (AQ9), Front Seat Adjuster Switch Replacement - Driver Side (W2E)**
- **Driver or Passenger Seat Back Cushion Latch Release Handle Replacement (Coupe)**
- **Control Module References** for MSM replacement, setup, and programming

DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, OR B1820 (WAGON): 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 01

Seat Front Up Switch Circuit Short to Battery

DTC B1740 01

Seat Front Down Switch Circuit Short to Battery

DTC B1745 01

Seat Rear Up Switch Circuit Short to Battery

DTC B1750 01

Seat Rear Down Switch Circuit Short to Battery

DTC B1755 01

Seat Assembly Forward Switch Circuit Short to Battery

DTC B1760 01

Seat Assembly Rearward Switch Circuit Short to Battery

DTC B1815 01

Seat Recline Forward Switch Circuit Short to Battery

DTC B1820 01

Seat Recline Rearward Switch Circuit Short to Battery

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Front Vertical Up Switch Signal	2	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Front Vertical Down Switch Signal	2	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820	-

			01	
Rear Vertical Up Switch Signal	2	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Rear Vertical Down Switch Signal	2	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Horizontal Forward Switch Signal	2	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Horizontal Rearward Switch Signal	2	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Recline Forward Switch Signal	2	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Recline Rearward Switch Signal	2	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
1. Power seat inoperative 2. Scan Tool Does Not Communicate with Low Speed GMLAN Device				

Circuit/System Description

When the power seat switches are pressed, they send a 12 V signal through the switch signal circuits to the memory seat module (MSM). The MSM then commands the driver seat and lumbar motors to move in response to the switch signals.

Conditions for Running the DTC

The MSM must be powered.

Conditions for Setting the DTC

- If a seat switch circuit is active in one direction and the switch for the opposite direction is pressed, this DTC will set.
- A short to voltage 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 MSM 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 code to history, 3 seconds after the fault is no longer present and the ignition is cycled OFF then back to ACC or RUN.
- The history DTC will clear after 50 consecutive fault-free ignition cycles have occurred.

Diagnostic Aids

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

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

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

Ignition ON, observe all scan tool Memory Seat Module seat switch parameters while pressing and releasing each seat directional switch. The readings should change between Inactive and Active.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the seat adjuster switch.
2. Verify all scan tool seat switch parameters listed below are Inactive.
 - Front Vertical Upward Switch
 - Front Vertical Downward Switch
 - Rear Vertical Upward Switch
 - Rear Vertical Downward Switch
 - Horizontal Forward Switch
 - Horizontal Rearward Switch
 - Recline Forward Switch
 - Recline Rearward Switch
 - If not the specified value, test the appropriate signal circuit listed below for a short to voltage. If the circuit tests normal, replace the MSM.
 - Front vertical upward switch terminal A (LHD)
 - Front vertical upward switch terminal K (RHD)
 - Front vertical downward switch terminal K (LHD)
 - Front vertical downward switch terminal A (RHD)
 - Rear vertical upward switch terminal F (LHD)
 - Rear vertical upward switch terminal J (RHD)
 - Rear vertical downward switch terminal J (LHD)
 - Rear vertical downward switch terminal F (RHD)
 - Horizontal forward switch terminal D
 - Horizontal rearward switch terminal C
 - Recline forward switch terminal H
 - Recline rearward switch terminal G
3. If all circuits test normal, test or replace the seat adjuster switch.

Component Testing

1. Ignition OFF, disconnect the harness connector at the seat adjuster switch.
2. Test for infinite resistance between the B+ terminal E and each seat direction signal terminal with the

switch in the open position.

- If not the specified value, replace the seat adjuster switch.
- 3. Test for less than 1 ohms between the B+ terminal E and each seat direction signal terminal with the appropriate switch in the closed position.
 - If greater than the specified value, replace the seat adjuster switch.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Front Seat Adjuster Switch Replacement - Driver Side (AQ9), Front Seat Adjuster Switch Replacement - Driver Side (W2E)**
- **Control Module References** for MSM replacement, setup, and programming

DTC B1825, B1850, B1860, B2355, B2365, B2375, OR B2405: 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 B1825 01

Seat Recline Position Sensor Circuit Short to Battery

DTC B1825 06

Seat Recline Position Sensor Circuit Short to Ground or Open

DTC B1825 5A

Seat Recline Position Sensor Circuit Plausibility Failure

DTC B1850 01

Left Front Seat Lumbar Horizontal Position Sensor Circuit Short to Battery

DTC B1850 06

Left Front Seat Lumbar Horizontal Position Sensor Circuit Short to Ground or Open

DTC B1850 5A

Left Front Seat Lumbar Horizontal Position Sensor Circuit Plausibility Failure

DTC B2355 01

Left Seat Front Vertical Position Sensor Circuit Short to Battery

DTC B2355 06

Left Seat Front Vertical Position Sensor Circuit Short to Ground or Open

DTC B2355 5A

Left Seat Front Vertical Position Sensor Circuit Plausibility Failure

DTC B2365 01

Left Seat Rear Vertical Position Sensor Circuit Short to Battery

DTC B2365 06

Left Seat Rear Vertical Position Sensor Circuit Short to Ground or Open

DTC B2365 5A

Left Seat Rear Vertical Position Sensor Circuit Plausibility Failure

DTC B2375 01

Left Seat Assembly Horizontal Position Sensor Circuit Short to Battery

DTC B2375 06

Left Seat Assembly Horizontal Position Sensor Circuit Short to Ground or Open

DTC B2375 5A

Left Seat Assembly Horizontal Position Sensor Circuit Plausibility Failure

DTC B2405 01

Right Seat Assembly Horizontal Position Sensor Circuit Short to Ground or Open

DTC B2405 06

Right Seat Assembly Horizontal Position Sensor Circuit Short to Battery

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
5 V Reference	B1395 02, B1825 06, B1850 06, B2355 06, B2365 06, B2375 06, B2405 06, B2860 06, B2880 06	B1395 02, B1825 06, B1850 06, B2355 06, B2365 06, B2375 06, B2405 06, B2860 06, B2880 06	B1395 05, B1825 01, B1850 01, B2355 01, B2365 01, B2375 01, B2405 01, B2860 01, B2880 01	B1825 5A, B1850 5A, B2355 5A, B2365 5A, B2375 5A, B2860 5A, B2880 5A
Driver Seat Front Vertical Position Sensor Signal	B2355 06	B2355 06	B2355 01	-
Driver Seat Rear Vertical Position Sensor Signal	B2365 06	B2365 06	B2365 01	-
Driver Seat Horizontal Position Sensor Signal	B2375 06	B2375 06	B2375 01	-
Driver Seat Lumbar Horizontal Position Sensor Signal	B1850 06	B1850 06	B1850 01	-
Driver Seat Recline Position Sensor Signal	B1825 06	B1825 06	B1825 01	-
Passenger Seat Horizontal Position Sensor Signal	B2405 06	B2405 06	B2405 01	-
Memory Seat/Mirror Sensor Low Reference	-	B1825 01, B1850 01, B2355 01, B2365 01, B2375 01, B2405 01, B2860 01, B2880 01	-	B1825 5A, B1850 5A, B2355 5A, B2365 5A, B2375 5A, B2860 5A, B2880 5A

Circuit/System Description

The position sensor that set this diagnostic trouble code (DTC) is either attached to the seat directional motor drive cable or directly to the motor it monitors. It receives a 5 V reference and low reference from the memory seat module (MSM). The sensor sends a voltage signal that varies with the movement of the seat through the signal circuit to the MSM. Then based on this voltage signal, the MSM determines the seat position.

Conditions for Running the DTC

The MSM must be powered.

Conditions for Setting the DTC

B1825 01, B1850 01, B2355 01, B2365 01, B2375 01, or B2405 01

If the MSM sees the analog input from this sensor is greater than 4.75 V, the sensor will be considered out of range and the MSM will set this DTC.

B1825 06, B1850 06, B2355 06, B2365 06, B2375 06, or B2405 06

If the MSM sees the analog input from this sensor is less than 0.22 V, the sensor will be considered out of range and the MSM will set this DTC.

B1825 5A, B1850 5A, B2355 5A, B2365 5A, or B2375 5A

This DTC will set, if the MSM is controlling a motor in one direction and its position sensor is tracking the motor in the opposite direction. The sensor is either mounted or wired incorrectly, or the polarity of the motor control circuits are reversed.

Action Taken When the DTC Sets

The MSM disables the memory recall and easy exit/entry action commands of the motor monitored by the sensor. The motor will respond to manual positioning commands.

Conditions for Clearing the DTC

- The current DTC will clear and set to history, when the MSM sees the analog input from the sensor as between 0.22 V and 4.75 V and the ignition is cycled OFF then back to ACC or RUN.
- The history DTC will clear after 50 consecutive fault-free ignition cycles have occurred.

Diagnostic Aids

- All position sensors use common ground and 5 V reference circuits.
- If the 5 V reference circuit is shorted to voltage multiple position sensor codes will set.
- If the 5 V reference circuit is shorted to ground multiple position sensor codes will set.
- If the sensor ground circuit is open multiple codes will set.
- DTC failure type 5A will set if the sensor setting this DTC is either mounted or wired incorrectly, or the polarity of the motor control circuits are reversed.

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

- **Memory Seats Description and Operation**
- **Lumbar Support Description and Operation (With Memory-A45), Lumbar Support 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, observe the scan tool driver seat and lumbar sensor parameters. The readings should be between 0.22 V and 4.75 V and change while adjusting seat and lumbar positions.
2. Observe the scan tool Passenger Seat Horizontal Sensor parameter. The reading should be between 0.22 V and 4.75 V and change while adjusting passenger seat horizontal position.

Circuit/System Testing

B1825 01 or B1825 06

1. Ignition OFF, disconnect the X2 harness connector at the seat recline motor.
2. Test for less than 2 ohms between the appropriate low reference circuit terminal listed below and ground:
 - Terminal 1 (LHD)
 - Terminal 3 (RHD)
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the MSM.
3. Ignition ON, test for 4.8 - 5.2 V between the appropriate 5 V reference circuit terminal listed below and ground:
 - Terminal 3 (LHD)
 - Terminal 1 (RHD)
 - If less than the specified range, test the 5 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the MSM.
 - If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the MSM.
4. Verify the scan tool Driver Seat Recline Sensor parameter is less than 1.0 V.
 - If greater than the specified range, test the signal circuit terminal 2 for a short to voltage. If the circuit tests normal, replace the MSM.

5. Install a 3 A fused jumper wire between the signal circuit terminal 2 and the appropriate 5 V reference circuit terminal listed below. Verify the scan tool Driver Seat Recline Sensor parameter is greater than 4.75 V.
 - Terminal 3 (LHD)
 - Terminal 1 (RHD)
 - If less than the specified range, test the signal circuit for short to ground or an open/high resistance. If the circuit tests normal, replace the MSM.
6. If all circuits test normal, test or replace the seat recline position sensor.

B2355 01, B2355 06, B2365 01, B2365 06, B2375 01 or B2375 06

1. Ignition OFF, disconnect the X2 harness connector at the appropriate seat adjuster motor.
2. Test for less than 2 ohms between the appropriate low reference circuit listed below and ground.
 - Seat horizontal motor sensor terminal C
 - Seat front vertical motor sensor terminal C LHD)
 - Seat front vertical motor sensor terminal A RHD)
 - Seat rear vertical motor sensor terminal A (LHD)
 - Seat rear vertical motor sensor terminal C (RHD)
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the MSM.
3. Ignition ON, test for 4.8 - 5.2 V between the appropriate 5 V reference circuit terminal listed below and ground.
 - Seat horizontal motor sensor terminal A
 - Seat front vertical motor sensor terminal A (LHD)
 - Seat front vertical motor sensor terminal C (RHD)
 - Seat rear vertical motor sensor terminal C (LHD)
 - Seat rear vertical motor sensor terminal A (RHD)
 - If less than the specified range, test the 5 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the MSM.
 - If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the MSM.
4. Verify the appropriate scan tool driver seat position sensor parameter is less than 1.0 V.
 - If greater than the specified range, test the signal circuit terminal B for a short to voltage. If the circuit tests normal, replace the MSM.
5. Install a 3 A fused jumper wire between the signal circuit terminal B and the appropriate 5 V reference circuit terminal listed below. Verify the appropriate scan tool driver seat position sensor parameter is greater than 4.75 V.
 - Seat horizontal position sensor terminal A
 - Seat front vertical position sensor terminal A (LHD)
 - Seat front vertical position sensor terminal C (RHD)
 - Seat rear vertical position sensor terminal C (LHD)

- Seat rear vertical position sensor t terminal A (RHD)
 - If less than the specified range, test the signal circuit for short to ground or an open/high resistance. If the circuit tests normal, replace the MSM.
- 6. If all circuits test normal, test or replace the appropriate seat position sensor.

B1850 01 or B1850 06

1. Ignition OFF, disconnect the X2 harness connector at the lumbar horizontal motor.
2. Test for less than 2 ohms between the appropriate low reference circuit terminal listed below and ground:
 - Terminal 1 (LHD)
 - Terminal 3 (RHD)
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the MSM.
3. Ignition ON, test for 4.8 - 5.2 V between the appropriate 5 V reference circuit terminal listed below and ground:
 - Terminal 3 (LHD)
 - Terminal 1 (RHD)
 - If less than the specified range, test the 5 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the MSM.
 - If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the MSM.
4. Verify the scan tool Lumbar Sensor parameter is less than 1.0 V.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the MSM.
5. Install a 3 A fused jumper wire between the signal circuit terminal 2 and the appropriate 5 V reference circuit terminal listed below. Verify the scan tool Lumbar Sensor parameter is greater than 4.75 V.
 - Terminal 3 (LHD)
 - Terminal 1 (RHD)
 - If less than the specified range, test the signal circuit for short to ground or an open/high resistance. If the circuit tests normal, replace the MSM.
6. If all circuits test normal, test or replace the lumbar position sensor.

B2405 01 or B2405 06

1. Ignition OFF, disconnect the X2 harness connector at the passenger seat horizontal motor.
2. Test for less than 2 ohms between the low reference circuit terminal C and ground:
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the MSM.
3. Ignition ON, test for 4.8 - 5.2 V between the 5 V reference circuit terminal A and ground:
 - If less than the specified range, test the 5 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the MSM.

- If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the MSM.
- 4. Verify the scan tool Passenger Seat Horizontal Sensor parameter is less than 1.0 V.
 - If greater than the specified range, test the signal circuit terminal B for a short to voltage. If the circuit tests normal, replace the MSM.
- 5. Install a 3 A fused jumper wire between the signal circuit terminal B and the 5 V reference circuit terminal A. Verify the scan tool Passenger Seat Horizontal Sensor parameter is greater than 4.75 V.
 - If less than the specified range, test the signal circuit for short to ground or an open/high resistance. If the circuit tests normal, replace the MSM.
- 6. If all circuits test normal, test or replace the passenger seat horizontal position sensor.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Front Seat Tilt Adjuster Actuator Replacement**
- **Front Seat Adjuster Actuator Replacement**
- **Driver Seat Outer Adjuster Rear Vertical Actuator Replacement**
- **Front Seat Recliner Actuator Motor Replacement**
- **Seat Lumbar Sub System Replacement (AQ9), Seat Lumbar Sub System Replacement (W2E)**
- **Front Seat Adjuster Switch Replacement - Passenger Side (AQ9), Front Seat Adjuster Switch Replacement - Passenger Side (W2E)**
- **Control Module References** for MSM replacement, setup, and programming

DTC B1830 OR B1835: LEFT FRONT SEAT LUMBAR 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 B1830 01

Left Front Seat Lumbar Forward Switch Circuit Short to Battery

DTC B1835 01

Left Front Seat Lumbar Rearward Switch Circuit Short to Battery

Diagnostic Fault Information

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Lumbar Forward Switch Signal	2	1	B1830 00	-
Lumbar Rearward Switch Signal	2	1	B1835 00	-
1. Lumbar support inoperative 2. Scan Tool Does Not Communicate with Low Speed GMLAN Device				

Circuit/System Description

When the lumbar switches are pressed, battery voltage is applied through the switch signal circuit to the memory seat module (MSM). The MSM interprets the signal and commands the lumbar motor to move in response to the switch signals.

Conditions for Running the DTC

The MSM must be powered.

Conditions for Setting the DTC

- If a lumbar switch circuit is active in one direction and the switch for the opposite direction is pressed, this DTC will set.
- A short to voltage 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 MSM 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 code to history, 3 seconds after the fault is no longer present and the ignition is cycled OFF then back to ACC or RUN.
- The history DTC will clear after 50 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

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**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, observe the scan tool Memory Seat Module lumbar switch parameters while pressing and releasing the lumbar switch in both directions. The reading should change between Inactive and Active

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the lumbar adjuster switch.
2. Ignition ON, verify the scan tool lumbar switch parameters listed below are Inactive.
 - Lumbar Forward Switch
 - Lumbar Rearward Switch
 - If not the specified value, test the appropriate signal circuit listed below for a short to voltage. If the circuit tests normal, replace the MSM.
 - Lumbar forward switch terminal B
 - Lumbar rearward switch terminal E
3. If all circuits test normal, test or replace the lumbar adjuster switch.

Component Testing

1. Ignition OFF, disconnect the harness connector at the lumbar adjuster switch.
2. Test for infinite resistance between the B+ terminal D and each lumbar direction signal terminal listed below and the with the switch in the open position.
 - Lumbar horizontal forward switch terminal B
 - Lumbar horizontal rearward switch terminal E
 - If not the specified value, replace the lumbar adjuster switch.
3. Test for less than 1 ohms between the B+ terminal D and each lumbar direction signal terminal listed below and the with the switch in the closed position.
 - Lumbar horizontal forward switch terminal B

- Lumbar horizontal rearward switch terminal E
 - If greater than the specified range, replace the lumbar adjuster switch.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Driver Seat Lumbar Control Switch Replacement (AQ9), Driver Seat Lumbar Control Switch Replacement (W2E)**
- **Passenger Seat Lumbar Control Switch Replacement (W2E), Passenger Seat Lumbar Control Switch Replacement (AQ9)**
- **Control Module References** for MSM replacement, programming and setup

DTC B2000 OR B2005: RIGHT SEAT ASSEMBLY MOTOR

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 B2000 01

Right Seat Assembly Horizontal Motor Forward Control Circuit Short to Battery

DTC B2005 01

Right Seat Assembly Horizontal Motor Rearward Control Circuit Short to Battery

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Passenger Rear Seat Easy Entry Forward Switch Signal	1	1	B2000 01	-
Passenger Rear Seat Easy Entry Rearward Switch Signal	1	1	B2005 01	-
Passenger Seat Horizontal Forward Switch Signal	2	2	B2000 01	-
Passenger Seat Horizontal Forward Switch Signal	2	2	B2005 01	-
1. Passenger rear seat easy entry feature inoperative 2. Passenger seat horizontal motor inoperative from the seat adjuster switch				

Circuit/System Description

When a passenger rear seat easy entry switch is pressed, battery voltage is applied through the switch signal circuit to the memory seat module (MSM). The MSM then commands the passenger seat horizontal motor to move in response to the switch signal. When the passenger seat horizontal switch is pressed, battery voltage is applied through the switch signal circuit to the MSM. The MSM then commands the passenger seat horizontal motor to move in response to the switch signal.

Conditions for Running the DTC

The MSM must be powered.

Conditions for Setting the DTC

B2000 01

- If the passenger rear seat easy entry forward switch is stuck or the circuit is shorted to voltage, and the passenger seat horizontal forward or rearward switch is pressed, this DTC will set.
- If the passenger seat horizontal forward switch is stuck and the passenger rear seat easy entry forward or rearward switch is pressed, this DTC will set.

B2005 01

- If the passenger rear seat easy entry rearward switch is stuck or the circuit is shorted to voltage, and the passenger seat horizontal forward or rearward switch is pressed, this DTC will set.
- If the passenger seat horizontal rearward switch is stuck and the passenger rear seat easy entry forward or rearward switch is pressed, this DTC will set.

Action Taken When the DTC Sets

B2000 01

- The rear seat easy entry forward switch input commands for the passenger front seat are ignored.
- The MSM will respond to any other switch signal that has not set a DTC.

B2005 01

- The rear seat easy entry rearward switch input commands for the passenger front seat are ignored.
- The MSM 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 code to history, 3 seconds after the fault is no longer present and the ignition is cycled OFF then back to ACC or RUN.
- The history DTC will clear after 50 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

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, observe the scan tool Seat 2 Inputs seat switch parameters listed below while pressing and releasing the appropriate passenger rear seat easy entry switch. The readings should change between Active and Inactive.
 - Horizontal/Easy Entry Forward Sw
 - Horizontal/Easy Entry Rearward Sw
2. Observe the scan tool seat switch parameters listed below while pressing the passenger seat adjuster switch in the FORWARD and REARWARD directions. The appropriate reading should change between Active and Inactive.
 - Horizontal/Easy Entry Forward Sw
 - Horizontal/Easy Entry Rearward Sw

Circuit/System Testing

DTC B2000 01

1. Ignition ON, observe the scan tool Seat 2 Inputs Horizontal/Easy Entry Forward Sw parameter while pressing the passenger rear seat easy entry FORWARD switch. The reading should be Active.
 - If not the specified value, test the signal circuit terminal C for a short to battery voltage or an open/high resistance. If the circuit tests normal, test or replace the rear seat easy entry switch.
2. Ignition ON, observe the scan tool Horizontal/Easy Entry Forward Sw parameter while pressing the

passenger seat adjuster switch in the FORWARD direction. The reading should be Active.

- If not the specified value, test the signal circuit terminal D for a short to battery voltage or an open/high resistance. If the circuit tests normal, test or replace the passenger seat adjuster switch.
3. If all circuits test normal, replace the memory seat module.

DTC B2005 01

1. Ignition ON, observe the scan tool Seat 2 Inputs Horizontal/Easy Entry Rearward Sw parameter while pressing the passenger rear seat easy entry REARWARD switch. The reading should be Active.
 - If not the specified value, test the signal circuit terminal B for a short to battery voltage or an open/high resistance. If the circuit tests normal, test or replace the rear seat easy entry switch.
2. Ignition ON, observe the scan tool Horizontal/Easy Entry Rearward Sw parameter while pressing the passenger seat adjuster switch in the REARWARD direction. The reading should be Active.
 - If not the specified value, test the signal circuit terminal D for a short to battery voltage or an open/high resistance. If the circuit tests normal, test or replace the passenger seat adjuster switch.
3. If all circuits test normal, replace the memory seat module.

Component Testing

Rear Seat Easy Entry Switch

1. Ignition OFF, disconnect the harness connector at the rear seat easy entry switch.
2. Test for infinite resistance between the B+ terminal A and each seat direction signal terminal with the switch in the open position.
 - If not the specified value, replace the rear seat easy entry switch.
3. Test for less than 1 ohms between the B+ terminal A and each seat direction signal terminal with the appropriate switch in the closed position.
 - If greater than the specified value, replace the rear seat easy entry switch.

Seat Adjuster Switch

1. Ignition OFF, disconnect the harness connector at the passenger seat adjuster switch.
2. Test for infinite resistance between the B+ terminal E and each seat direction signal terminal with the switch in the open position.
 - If not the specified value, replace the passenger seat adjuster switch.
3. Test for less than 1 ohms between the B+ terminal E and each seat direction signal terminal with the appropriate switch in the closed position.
 - If greater than the specified value, replace the passenger seat adjuster switch.
4. Test for less than 1 ohms between the ground terminal B and each control terminal with the switch in the open position.
 - If greater than the specified value, replace the passenger seat adjuster switch.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Front Seat Adjuster Switch Replacement - Driver Side (AQ9), Front Seat Adjuster Switch Replacement - Driver Side (W2E)**
- **Driver or Passenger Seat Back Cushion Latch Release Handle Replacement (Coupe)**
- **Control Module References** for MSM replacement, setup, and programming

DTC B3603 OR B360C-B360E: SEAT EASY ENTRY 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 B3603 01

Driver Seat Easy Entry Switch Forward Circuit

DTC B360C 01

Driver Seat Easy Entry Switch Rearward Circuit

DTC B360D 01

Passenger Seat Easy Entry Switch Forward Circuit

DTC B360E 01

Passenger Seat Easy Entry Switch Rearward Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Driver Seat Easy Entry Forward Switch Signal	1	1	B1755 01, B360D 01	-
Driver Seat Easy Entry Rearward Switch Signal	1	1	B1760 01, B360E 01	-
Passenger Seat Easy Entry Forward Switch Signal	2	2	B2000 01, B360D 01	-
Passenger Seat Easy Entry Rearward Switch Signal	2	2	B2005 01, B360E 01	-

1. Driver seat easy entry feature inoperative

2. Passenger seat easy entry feature inoperative

Circuit/System Description

When a passenger rear seat easy entry switch is pressed, battery voltage is applied through the switch signal circuit to the memory seat module (MSM). The MSM then commands the passenger seat horizontal motor to move in response to the switch signal. When the passenger seat horizontal switch is pressed, battery voltage is applied through the switch signal circuit to the MSM. The MSM then commands the passenger seat horizontal motor to move in response to the switch signal.

Conditions for Running the DTC

The MSM must be powered.

Conditions for Setting the DTC

B3603 01 or B360C 01

- If the transmission is out of the park position and the driver rear seat easy entry forward switch is stuck or the circuit is shorted to voltage, this DTC will set.
- If the transmission is out of the park position and the driver rear seat easy entry rearward switch is stuck or the circuit is shorted to voltage, this DTC will set.

B360D 01 or B360E 01

- If the transmission is out of the park position and the passenger rear seat easy entry forward switch is stuck or the circuit is shorted to voltage, this DTC will set.
- If the transmission is out of the park position and the passenger rear seat easy entry rearward switch is stuck or the circuit is shorted to voltage, this DTC will set.

Action Taken When the DTC Sets

B3603 01 or B360C 01

- The rear seat easy entry switch input commands for the driver seat are ignored.
- The MSM will respond to any other switch signal that has not set a DTC.

B360D 01 or B360E 01

- The rear seat easy entry switch input commands for the passenger front seat are ignored.
- The MSM 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 code to history, 3 seconds after the fault is no longer present and the ignition is cycled OFF then back to ACC or RUN.

- The history DTC will clear after 50 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

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 DTC B1755, B1760, B2000 or B2005 is not set.
 - **If any of the DTCs are set**

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

- **If none of the DTCs are set**

3. Verify the scan tool Seat 1 Inputs parameters listed below change between Active and Inactive when pressing and releasing the driver rear seat easy entry switch in both directions.
 - Horizontal/Easy Entry Forward Sw.
 - Horizontal/Easy Entry Rearward Sw.
 - **If the parameter does not change**

Refer to DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, or B1820 (Wagon), DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, or B1820 (Coupe).

- **If the parameter changes**
- 4. Verify the scan tool Seat 2 Inputs parameters listed below change between Active and Inactive when pressing and releasing the passenger rear seat easy entry switch in both directions.
 - Horizontal/Easy Entry Forward Sw.
 - Horizontal/Easy Entry Rearward Sw.
- **If the parameter does not change**

Refer to **DTC B2000 or B2005**.

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

DTC B3920 OR B3921 (COUPE): GROUP 1 SEAT MOTORS

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 01

Group 1 Seat Motors Common Circuit Short to Battery

DTC B3920 02

Group 1 Seat Motors Common Circuit Short to Ground

DTC B3921 01

Group 2 Seat Motors Common Circuit Short to Battery

DTC B3921 02

Group 2 Seat Motors Common Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Driver Seat Front Vertical Motor Down Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2355 5A
Driver Seat Front Vertical					B1335 42, B1335

Motor Up Control	B3920 02	B1335 0B	1	B3920 01	4B, B2355 5A
Driver Seat Rear Vertical Motor Down Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2365 5A
Driver Seat Rear Vertical Motor Up Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2365 5A
Driver Seat Horizontal Motor Forward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2375 5A
Driver Seat Horizontal Motor Rearward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2375 5A
Driver Seat Recline Motor Forward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B1825 5A
Driver Seat Recline Motor Rearward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B1825 5A
Driver Seat Lumbar Motor Forward Control	B3920 02	B1335 0B	2	B3920 01	B1335 42, B1335 4B, B1850 5A
Driver Seat Lumbar Motor Rearward Control	B3920 02	B1335 0B	2	B3920 01	B1335 42, B1335 4B, B1850 5A
Passenger Seat Horizontal Motor Forward Control	B3920 02	B1335 0B	4	B3920 01	B1335 42, B1335 4B
Passenger Seat Horizontal Motor Rearward Control	B3920 02	B1335 0B	4	B3920 01	B1335 42, B1335 4B
Steering Column Telescope Motor Forward Control	B3921 02	B1340 0B	3	B3921 01	B1340 42, B1340 4B, B2860 5A
Steering Column Telescope Motor Rearward Control	B3921 02	B1340 0B	3	B3921 01	B1340 42, B1340 4B, B2860 5A
Steering Column Tilt Motor Down Control	B3921 02	B1340 0B	3	B3921 01	B1340 42, B1340 4B, B2880 5A
Steering Column Tilt Motor Up Control	B3921 02	B1340 0B	3	B3921 01	B1340 42, B1340 4B, B2880 5A
1. Driver power seat motor is inoperative 2. Driver seat lumbar motor is inoperative 3. Tilt or telescope steering column motor is inoperative 4. Passenger seat horizontal motor is inoperative					

Circuit/System Description

The memory seat module (MSM) controls the driver seat, recline, lumbar motors, the passenger seat horizontal motor, and the steering column motors via half bridges that are divided into 2 groups. Each group is connected to separate power rail internal to the module. The MSM connects all of the motor control circuits on each power rail to a common reference point whenever they are not in operation. This reference point is biased to approximately 2.5 V. The MSM checks to see if this reference voltage is shorted to ground or battery before enabling any seat, lumbar, or steering column motor.

Conditions for Running the DTC

The MSM must be powered.

Conditions for Setting the DTC

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.

B3921 01

The voltage on any power rail 2 motor control circuit exceeds 2.78 V for 100 ms.

B3921 02

The voltage on any power rail 2 motor control circuit is below 1.47 V for 100 ms.

Action Taken When the DTC Sets

The MSM 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 malfunction is no longer present and the power mode changes to OFF then back to ACC or RUN.
- The history DTC will clear after 50 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

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

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

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 X1 harness connector at the MSM.
2. Ignition ON, verify that a test lamp does not illuminate between the control circuits listed below and ground:
 - Driver seat front vertical motor terminal 12
 - Driver seat front vertical motor terminal 13
 - Driver sea rear vertical motor terminal 15
 - Driver seat rear vertical motor terminal 16
 - Driver seat horizontal motor terminal 9
 - Driver seat horizontal motor terminal 10
 - If the test lamp illuminates, test the control circuit for a short to voltage.
3. Test for infinite resistance between the control circuits listed below and ground:
 - Driver seat front vertical motor terminal 12
 - Driver seat front vertical motor terminal 13
 - Driver sea rear vertical motor terminal 15
 - Driver seat rear vertical motor terminal 16
 - Driver seat horizontal motor terminal 9
 - Driver seat horizontal motor terminal 10
 - If not the specified value, test the control circuit for a short to ground.
4. Ignition OFF, disconnect the X4 harness connector at the MSM.
5. Ignition ON, verify that a test lamp does not illuminate between the control circuits listed below and ground:
 - Driver seat lumbar horizontal motor terminal 12
 - Driver seat lumbar horizontal motor terminal 13
 - Driver seat recline motor terminal 15
 - Driver seat recline motor terminal 16
 - Passenger seat horizontal motor terminal 9
 - Passenger seat horizontal motor terminal 10

- If the test lamp illuminates, test the control circuit for a short to voltage.
- 6. Test for infinite resistance between the control circuits listed below and ground:
 - Driver seat lumbar horizontal motor terminal 12
 - Driver seat lumbar horizontal motor terminal 13
 - Driver seat recline motor terminal 15
 - Driver seat recline motor terminal 16
 - Passenger seat horizontal motor terminal 9
 - Passenger seat horizontal motor terminal 10
 - If not the specified value, test the control circuit for a short to ground.
- 7. If all circuits test normal, replace the MSM.

B3921 01 or B3921 02

1. Ignition OFF, disconnect the X1 harness connector at the MSM.
2. Ignition ON, verify that a test lamp does not illuminate between the control circuits listed below and ground:
 - Steering column telescope motor terminal 7
 - Steering column telescope motor terminal 8
 - If the test lamp illuminates, test the control circuit for a short to voltage.
3. Test for infinite resistance between the control circuits listed below and ground:
 - Steering column telescope motor terminal 7
 - Steering column telescope motor terminal 8
 - If not the specified value, test the control circuit for a short to ground.
4. Ignition OFF, disconnect the X4 harness connector at the MSM.
5. Ignition ON, verify that a test lamp does not illuminate between the control circuits listed below and ground:
 - Steering column tilt motor terminal 7
 - Steering column tilt motor terminal 8
 - If the test lamp illuminates, test the control circuit for a short to voltage.
6. Test for infinite resistance between the control circuits listed below and ground:
 - Steering column tilt motor terminal 7
 - Steering column tilt motor terminal 8
 - If not the specified value, test the control circuit for a short to ground.
7. If all circuits test normal, replace the MSM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Front Seat Tilt Adjuster Actuator Replacement**

- Front Seat Adjuster Actuator Replacement
- Driver Seat Outer Adjuster Rear Vertical Actuator Replacement
- Seat Lumbar Sub System Replacement (AQ9), Seat Lumbar Sub System Replacement (W2E)
- Front Seat Recliner Actuator Motor Replacement
- Steering Column Replacement
- Control Module References for MSM replacement, setup, and programming

DTC B3920 OR B3921 (WAGON): GROUP 1/2 SEAT MOTORS COMMON CIRCUIT SHORT

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 01

Group 1 Seat Motors Common Circuit Short to Battery

DTC B3920 02

Group 1 Seat Motors Common Circuit Short to Ground

DTC B3921 01

Group 2 Seat Motors Common Circuit Short to Battery

DTC B3921 02

Group 2 Seat Motors Common Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Driver Seat Front Vertical Motor Down Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2355 5A
Driver Seat Front Vertical Motor Up Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2355 5A
Driver Seat Rear Vertical Motor Down Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2365 5A
Driver Seat Rear Vertical Motor Up Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2365 5A

Driver Seat Horizontal Motor Forward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2375 5A
Driver Seat Horizontal Motor Rearward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2375 5A
Driver Seat Recline Motor Forward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B1825 5A
Driver Seat Recline Motor Rearward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B1825 5A
Driver Seat Lumbar Motor Forward Control	B3920 02	B1335 0B	2	B3920 01	B1335 42, B1335 4B, B1850 5A
Driver Seat Lumbar Motor Rearward Control	B3920 02	B1335 0B	2	B3920 01	B1335 42, B1335 4B, B1850 5A
Steering Column Telescope Motor Forward Control	B3921 02	B1340 0B	3	B3921 01	B1340 42, B1340 4B, B2860 5A
Steering Column Telescope Motor Rearward Control	B3921 02	B1340 0B	3	B3921 01	B1340 42, B1340 4B, B2860 5A
Steering Column Tilt Motor Down Control	B3921 02	B1340 0B	3	B3921 01	B1340 42, B1340 4B, B2880 5A
Steering Column Tilt Motor Up Control	B3921 02	B1340 0B	3	B3921 01	B1340 42, B1340 4B, B2880 5A
1. Driver power seat motor is inoperative 2. Driver seat lumbar motor is inoperative 3. Tilt or telescope steering column motor is inoperative					

Circuit/System Description

The memory seat module (MSM) controls the seat, recline, lumbar, and steering column motors via half bridges that are divided into 2 groups that are connected to separate power rails internal to the module. The MSM connects all of the motor control circuits on each power rail to a common reference point whenever they are not in operation. This reference point is biased to approximately 2.5 V. The MSM checks to see if this reference voltage is shorted to ground or battery before enabling any seat, lumbar, or steering column motor.

Conditions for Running the DTC

The MSM must be powered.

Conditions for Setting the DTC

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.

B3921 01

The voltage on any power rail 2 motor control circuit exceeds 2.78 V for 100 ms.

B3921 02

The voltage on any power rail 2 motor control circuit is below 1.47 V for 100 ms.

Action Taken When the DTC Sets

The MSM 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 malfunction is no longer present and the power mode changes to OFF then back to ACC or RUN.
- The history DTC will clear after 50 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

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

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

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 X1 harness connector at the MSM.
2. Ignition ON, verify that a test lamp does not illuminate between the control circuits listed below and ground:
 - Front vertical motor terminal 12
 - Front vertical motor terminal 13
 - Rear vertical motor terminal 15
 - Rear vertical motor terminal 16
 - Seat horizontal motor terminal 9
 - Seat horizontal motor terminal 10
 - If the test lamp illuminates, test the control circuit for a short to voltage.
3. Test for infinite resistance between the control circuits listed below and ground:
 - Front vertical motor terminal 12
 - Front vertical motor terminal 13
 - Rear vertical motor terminal 15
 - Rear vertical motor terminal 16
 - Seat horizontal motor terminal 9
 - Seat horizontal motor terminal 10
 - If not the specified value, test the control circuit for a short to ground.
4. Ignition OFF, disconnect the X4 harness connector at the MSM.
5. Ignition ON, verify that a test lamp does not illuminate between the control circuits listed below and ground:
 - Lumbar horizontal motor terminal 12
 - Lumbar horizontal motor terminal 13
 - Seat recline motor terminal 15
 - Seat recline motor terminal 16
 - If the test lamp illuminates, test the control circuit for a short to voltage.
6. Test for infinite resistance between the control circuits listed below and ground:
 - Lumbar horizontal motor terminal 12
 - Lumbar horizontal motor terminal 13
 - Seat recline motor terminal 15
 - Seat recline motor terminal 16
 - If not the specified value, test the control circuit for a short to ground.
7. If all circuits test normal, replace the MSM.

B3921 01 or B3921 02

1. Ignition OFF, disconnect the X1 harness connector at the MSM.

2. Ignition ON, verify that a test lamp does not illuminate between the control circuits listed below and ground:
 - Steering column telescope motor terminal 7
 - Steering column telescope motor terminal 8
 - If the test lamp illuminates, test the control circuit for a short to voltage.
3. Test for infinite resistance between the control circuits listed below and ground:
 - Steering column telescope motor terminal 7
 - Steering column telescope motor terminal 8
 - If not the specified value, test the control circuit for a short to ground.
4. Ignition OFF, disconnect the X4 harness connector at the MSM.
5. Ignition ON, verify that a test lamp does not illuminate between the control circuits listed below and ground:
 - Steering column tilt motor terminal 7
 - Steering column tilt motor terminal 8
 - If the test lamp illuminates, test the control circuit for a short to voltage.
6. Test for infinite resistance between the control circuits listed below and ground:
 - Steering column tilt motor terminal 7
 - Steering column tilt motor terminal 8
 - If not the specified value, test the control circuit for a short to ground.
7. If all circuits test normal, replace the MSM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Front Seat Tilt Adjuster Actuator Replacement**
- **Front Seat Adjuster Actuator Replacement**
- **Driver Seat Outer Adjuster Rear Vertical Actuator Replacement**
- **Seat Lumbar Sub System Replacement (AQ9), Seat Lumbar Sub System Replacement (W2E)**
- **Front Seat Recliner Actuator Motor Replacement**
- **Steering Column Replacement**
- **Control Module References** for MSM replacement, setup, and programming

SYMPTOMS - POWER SEATS

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

1. Perform the **Diagnostic System Check - Vehicle** before using the symptom tables in order to verify that all of the following are true:
 - There are no DTCs set.

- The control modules can communicate via the serial data link.
2. Refer to the system description and operation from the following list in order to familiarize yourself with the system functions:
- **Power Seats System Description and Operation**
 - **Lumbar Support Description and Operation (With Memory-A45), Lumbar Support Description and Operation (Without Memory-A45)**
 - **Memory Seats Description and Operation**

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the power seats. Refer to **Checking Aftermarket Accessories** .
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.
- Inspect the seat adjuster track for conditions which may cause binding or objects within the seat adjustment range which obstruct movement or interfere with wiring.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to **Testing for Intermittent Conditions and Poor Connections** .

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- **Lumbar Support Inoperative (With Memory A45), Lumbar Support Inoperative (Without Memory A45), Lumbar Support Inoperative (With W2E)**
- **Memory Seat Feature Inoperative**
- **Easy Entry Seat Malfunction**
- **Power Seat Inoperative (Coupe with Memory A45), Power Seat Inoperative (Wagon with Memory A45), Power Seat Inoperative (Without Memory A45)**

LUMBAR SUPPORT INOPERATIVE (WITHOUT MEMORY A45)

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
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Lumbar Adjuster Switch B+	1, 2	2	-	-
Lumbar Motor Up Control	2	2	-	-
Lumbar Motor Down Control	2	2	-	-
Lumbar Motor Rearward Control	2	2	-	-
Lumbar Motor Forward Control	2	2	-	-
Lumbar Adjuster Switch Ground	-	2	-	-
1. Power Seats Inoperative 2. Lumbar Support Inoperative				

Circuit/System Description

Power seat lumbar support without memory is completely controlled through the seat lumbar adjuster switch. Battery voltage is supplied at all times to the seat lumbar adjuster switch from the RT/FRT/PWR/SEAT 25 A circuit breaker that is located in the rear fuse block. When the seat lumbar adjuster switches are in an inactive state, the switch contacts are closed to the switch ground circuit.

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

Reference Information

Schematic Reference

Passenger Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Lumbar Support Description and Operation (With Memory-A45), Lumbar Support Description and Operation (Without Memory-A45)

Electrical Information Reference

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

Circuit/System Testing

1. Disconnect the harness connector at the lumbar adjuster switch.
2. Test for less than 1 ohms between the ground circuit terminals listed below and ground:
 - Terminal A
 - Terminal C
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Verify that a test lamp illuminates between the B+ circuit terminal D and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
4. Connect the harness connector at the lumbar adjuster switch and disconnect the harness connector at the lumbar motor.
5. Ignition ON, verify that a test lamp illuminates between control circuit terminal 1 and control circuit terminal 2 while pressing the lumbar switch in both directions.
 - If the test lamp does not illuminate for either direction, test the control circuits for a short to ground or an open/high resistance. If the circuits test normal replace the lumbar adjuster switch.
6. If the circuits test normal replace the lumbar motor.

Component Testing

Lumbar Adjuster Switch

1. Ignition OFF, disconnect the harness connector at the lumbar adjuster switch.
2. Test for infinite resistance between each control terminal listed below and the B+ terminal D with the switch in the open position.
 - Lumbar horizontal forward switch terminal B
 - Lumbar horizontal rearward switch terminal E
 - If not the specified value, replace the lumbar adjuster switch.
3. Test for less than 1 ohm between each control terminal listed below and the B+ terminal D with the switch in the closed position.
 - Lumbar horizontal forward switch terminal B
 - Lumbar horizontal rearward switch terminal E
 - If greater than the specified range, replace the lumbar adjuster switch.
4. Test for less than 1 ohms between each control terminal and the ground terminal listed below with the switch in the open position.
 - Lumbar horizontal forward switch terminal B and terminal C
 - Lumbar horizontal rearward switch terminal E and terminal A
 - If greater than the specified range, replace the lumbar adjuster switch.

Lumbar Motor

1. Ignition OFF, disconnect the harness connector at the lumbar motor.

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

2. Install a 30 A fused jumper wire between the control terminal 1 and 12 V. Momentarily install a jumper wire between the control terminal 2 and ground. The lumbar motor should momentarily perform the FORWARD function.
 - If the function does not perform as specified, replace the lumbar motor.
3. Reverse the polarity of jumper wires; the a lumbar motor should perform REARWARD function.
 - If the function does not perform as specified, replace the lumbar motor.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Driver Seat Lumbar Control Switch Replacement (AQ9), Driver Seat Lumbar Control Switch Replacement (W2E)**
- **Passenger Seat Lumbar Control Switch Replacement (W2E), Passenger Seat Lumbar Control Switch Replacement (AQ9)**
- **Seat Lumbar Sub System Replacement (AQ9), Seat Lumbar Sub System Replacement (W2E)**

LUMBAR SUPPORT INOPERATIVE (WITH MEMORY A45)

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Lumbar Adjuster Switch B+	2	1	1	-	-
Lumbar Forward Switch Signal	2	1	1	-	-
Lumbar Rearward Switch Signal	2	1	1	-	-
Driver Seat Lumbar Motor Forward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B1850 5A
Driver Seat Lumbar Motor Rearward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B1850 5A
1. Lumbar Inoperative					
2. Scan Tool Does Not Communicate with Low Speed GMLAN Device					

Circuit/System Description

Battery voltage is supplied at all times to the memory seat module (MSM) through the 10 A MSM fuse located in the rear fuse block. This voltage is used by the MSM for logic power and to supply battery reference voltage to the seat and lumbar adjuster switches. Battery positive voltage is also supplied at all times to the MSM through the LF/FRT/PWR/SEAT 25 A circuit breaker located in the rear fuse block. This voltage is connected to a power rail internal to the MSM and is used to drive the power seat motors, lumbar motor, and the seat heater elements on vehicles equipped with heated seats. Each seat and lumbar adjuster motor is controlled by the MSM through 2 motor control circuits. The MSM connects all motor control circuits on the power rail to a common reference point whenever they are not in operation. This reference point is biased to approximately 2.5 volts. The MSM checks to see if the reference voltage is shorted to ground or battery before enabling any of the seat or lumbar motors.

The lumbar motor is reversible. For example, when the lumbar switch is operated to move the lumbar support forward, battery positive voltage is applied through the switch contacts and the lumbar horizontal forward switch signal circuit to the MSM. In response to this signal, the MSM applies battery voltage through the lumbar motor forward control circuit and ground through the lumbar motor rearward control circuit to the motor. The motor runs to drive the lumbar support forward toward the occupants back until the switch is released. Moving the lumbar support rearward works similarly to moving the lumbar support forward, except that battery positive voltage and ground are applied on 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 - COUPE AND WAGON

Description and Operation

Lumbar Support Description and Operation (With Memory-A45), Lumbar Support 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, verify that all manual power seat functions operate when being controlled by the seat adjuster switches.
 - If all seat functions do not operate, refer to **Power Seat Inoperative (Coupe with Memory A45), Power Seat Inoperative (Wagon with Memory A45), Power Seat Inoperative (Without Memory A45).**
2. Ignition ON, observe the scan tool Memory Seat Module lumbar switch parameters while pressing the lumbar switch. The reading should change between Inactive and Active.
 - If the reading does not change between the specified values, refer to the Lumbar Switch Circuit Test.
3. If all lumbar switch inputs to the MSM function normal, refer to the Lumbar Motor Control Circuit Test.

Circuit/System Testing

Lumbar Adjuster Switch Circuit Test

1. Ignition OFF, disconnect the harness connector at the lumbar adjuster switch.
2. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal D and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the MSM.
3. Verify that the scan tool lumbar switch parameters are Inactive.
 - If not the specified value, test the appropriate signal circuit listed below for a short to voltage. If the circuit tests normal, replace the MSM.
 - Lumbar forward terminal B
 - Lumbar rearward terminal E
4. Install a 3 A fused jumper wire between the appropriate signal circuit listed below and the B+ circuit terminal D. Verify the scan tool lumbar switch parameter is Active.
 - Lumbar forward terminal B
 - Lumbar rearward terminal E
 - If not specified value, test the signal circuit for an open/high resistance. If the circuit tests normal, replace the MSM.
5. If all circuits test normal, test or replace the lumbar adjuster switch.

Lumbar Motor Control Circuit Test

1. Ignition OFF, disconnect the X1 harness connector at the driver seat lumbar horizontal motor.
2. Connect a test lamp between control circuit terminal A and control circuit terminal B.
3. Ignition ON, command the lumbar motor in the forward and rearward directions with a scan tool. The test lamp should turn ON when commanding the forward and rearward states.
 - If the test lamp remains OFF during either of the commands, test the motor control circuits for an open/high resistance. If the circuits test normal replace the MSM.
4. If all circuits test normal, test or replace the lumbar motor.

Component Testing

Lumbar Switch

1. Ignition OFF, disconnect the harness connector at the lumbar switch.
2. Test for infinite resistance between each signal terminal listed below and the B+ terminal D with the switch in the open position.
 - Lumbar horizontal forward switch terminal B
 - Lumbar horizontal rearward switch terminal E
 - If not the specified value, replace the lumbar switch.
3. Test for less than 1 ohms between each signal terminal listed below and the B+ terminal D with the switch in the closed position.
 - Lumbar horizontal forward switch terminal B
 - Lumbar horizontal rearward switch terminal E
 - If greater than the specified range, replace the lumbar switch.

Lumbar Motor

1. Ignition OFF, disconnect the harness connector at the a lumbar horizontal motor.

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

2. Install a 30 A fused jumper wire between the control terminal A and 12 V. Momentarily install a jumper wire between the control terminal B and ground. The lumbar motor should momentarily perform the FORWARD function.
 - If the function does not perform as specified, replace the lumbar motor.
3. Reverse the polarity of jumper wires; the a lumbar motor should perform REARWARD function.
 - If the function does not perform as specified, replace the lumbar motor.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Driver Seat Lumbar Control Switch Replacement (AQ9), Driver Seat Lumbar Control Switch Replacement (W2E)**
- **Seat Lumbar Sub System Replacement (AQ9), Seat Lumbar Sub System Replacement (W2E)**
- **Control Module References** for MSM replacement, setup, and programming

LUMBAR SUPPORT INOPERATIVE (WITH W2E)

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 Adjuster Switch B+	1	1	-	-
Seat Lumbar Deflate signal	1	2, 3	5	-
Seat Lower Lumbar Inflate signal	1	2	4	-
Seat Upper Lumbar Deflate signal	1	3	5	-
Seat Upper Lumbar Inflate signal	1	3	4	-
Seat Lumbar/Bolster Pump Control	1	1	4	-
Lumbar Adjuster Valve Ground	-	1	-	-
Seat Lumbar/Bolster Pump Ground	-	1	-	-
1. The seat lumbar support and the seat cushion/back bolsters are inoperative 2. Lower lumbar support is inoperative 3. Upper lumbar support is inoperative 4. Pump motor is always ON 5. The lumbar bladder will not deflate				

Circuit/System Description

Battery voltage is supplied at all times to the driver and passenger seat lumbar adjuster switches through 25 A circuit breakers located in the rear fuse block. When a lumbar switch is pressed to inflate the lumbar support, battery voltage is applied through the switch contacts and the inflate signal circuit to the seat lumbar adjuster valve. In response to this signal, the lumbar adjuster valve 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 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 adjuster valve. The valve energizes its internal deflate solenoid and air is released from the bladder until the switch is released. Ground for the lumbar adjuster valve and the seat lumbar/bolster pump is supplied at G200 for the driver seat and G201 for the passenger seat.

Reference Information

Schematic Reference

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

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Lumbar Support Description and Operation (With Memory-A45), Lumbar Support Description and Operation (Without Memory-A45)

Electrical Information Reference

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

Circuit/System Verification

1. Ignition ON, press and hold the appropriate seat lumbar adjuster switch in the FORWARD direction. The lumbar/bolster pump should run and the lower lumbar bladder should start to inflate. After the lower lumbar inflates to approximately 50%, the upper lumbar bladder should start to inflate until both bladders are 100% inflated. The lower lumbar will reach 100% first.
2. Press the lumbar adjuster switch in the REARWARD direction. The upper and lower lumbar support bladders should deflate until the switch is released.
3. Press the lumbar adjuster switch in the UP direction. The lumbar/bolster pump should run and the upper lumbar support bladder should inflate and stay inflated until the deflate switch is pressed.
4. Press and hold the lumbar adjuster switch in the DOWN direction. The upper lumbar bladder should start to deflate while the lower lumbar bladder inflates until the upper lumbar is 100% deflated and the lower lumbar is 100% inflated.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate seat lumbar adjuster switch.
2. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal G and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
3. Ignition OFF, connect the harness connector at the lumbar adjuster switch and disconnect the harness connector at the lumbar adjuster valve.
4. Test for less than 5 ohms between the ground circuit terminal 5 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
5. Connect a test lamp between the signal circuit terminals listed below and ground:
 - Lumbar up switch signal terminal 1
 - Lumbar rearward switch signal terminal 2
 - Lumbar down switch signal terminal 3
 - Lumbar forward switch signal terminal 4
6. Ignition ON, press and release the appropriate lumbar switch. The test lamp should turn ON and OFF when changing between the commanded states.

- If the test lamp is always ON, test the signal circuit for a short to voltage. If the circuit tests normal, test or replace the lumbar adjuster switch.
- If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, test or replace the lumbar adjuster switch.
- 7. Ignition OFF, connect the harness connector at the lumbar adjuster valve and disconnect the harness connector at the seat lumbar/bolster pump.
- 8. Test for less than 5 ohms between the ground circuit terminal 3 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
- 9. Connect a test lamp between the control circuit terminal 1 and ground.
- 10. Ignition ON, command the lumbar/bolster pump ON and OFF using either one of the lumbar inflate switches. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, test or replace the lumbar adjuster valve.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, test or replace the lumbar adjuster valve.
- 11. If all circuits test normal, test or replace the seat lumbar/bolster pump.

Component Testing

Lumbar Adjuster Switch

1. Ignition OFF, disconnect the harness connector at the appropriate seat lumbar adjuster switch.
2. Test for infinite resistance between the B+ terminal G and each signal terminal with the switch in the open position.
 - If not the specified value, replace the lumbar adjuster switch.
3. Test for less than 1 ohms between the B+ terminal G and each signal terminal with the appropriate switch in the closed position.
 - If greater than the specified range, replace the lumbar adjuster switch.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Driver Seat Lumbar Control Switch Replacement (AQ9), Driver Seat Lumbar Control Switch Replacement (W2E)**
- **Passenger Seat Lumbar Control Switch Replacement (W2E), Passenger Seat Lumbar Control Switch Replacement (AQ9)**
- **Front Seat Lumbar Support Bladder Replacement (W2E)**
- **Driver or Passenger Seat Cushion Air Pump Replacement (W2E)**

SEAT SIDE BOLSTER 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
Seat Back Bolster Adjuster Switch B+	1	2	-	-
Seat Cushion Bolster Adjuster Switch B+	1	4	-	-
Seat Back Bolster Deflate Signal	1	3	3, 6	-
Seat Back Bolster Inflate Signal	1	3	3, 5	-
Seat Cushion Bolster Deflate Signal	1	4	4, 6	-
Seat Cushion Bolster Inflate Signal	1	4	4, 5	-
Seat Lumbar/Bolster Pump Control	1	1	5	-
Seat Bolster Adjuster Valve Ground	-	2	-	-
Seat Lumbar/Bolster Pump Ground	-	1	-	-
1. The seat cushion/seat back bolsters and the lumbar support are inoperative 2. Seat back and cushion bolsters inoperative 3. Seat back bolster malfunction 4. Seat cushion bolster malfunction 5. Pump motor is always ON 6. The seat cushion or seat back bolster will not inflate				

Circuit/System Description

Battery voltage is supplied at all times to the driver and passenger seat bolster adjuster switches through 15 A fuses located in the rear fuse block. When either bolster switch is pressed to inflate the seat cushion or seat back bolsters, battery voltage is applied through the switch contacts and the inflate signal circuit to the bolster adjuster valve. In response to this signal, the bolster adjuster valve 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 appropriate support bladder until the switch is released. When the switch is pressed to deflate the bolster, battery voltage is applied through the switch contacts and the deflate signal circuit to the bolster adjuster valve. The bolster adjuster valve energizes its internal deflate solenoid and air is released from the bladder until the switch is released. Ground for the seat bolster adjuster valve and the seat lumbar/bolster pump is supplied at G200 for the driver seat and G201 for the passenger seat.

Reference Information

Schematic Reference

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

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Lumbar Support Description and Operation (With Memory-A45), Lumbar Support Description and Operation (Without Memory-A45)

Electrical Information Reference

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

Circuit/System Verification

1. Ignition ON, press and hold the appropriate seat back bolster adjuster switch in the UP direction. The lumbar/bolster pump should run and the seat back bolsters should inflate until the switch is released or the bladders are 100% inflated.
2. Press and hold the seat back bolster adjuster switch in the DOWN direction. The seat back bolster bladders should deflate until the switch is released.
3. Press and hold the seat cushion bolster adjuster switch in the UP direction. The lumbar/bolster pump should run and the seat cushion bolsters should inflate until the switch is released or the bladders are 100% inflated.
4. Press and hold the seat cushion bolster adjuster switch in the DOWN direction. The seat cushion bolster bladders should deflate until the switch is released.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate bolster adjuster switch.
2. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal D and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
3. Ignition OFF, connect the harness connector at the bolster adjuster switch and disconnect the harness connector at the seat bolster adjuster valve.
4. Test for less than 5 ohms between the ground circuit terminal 1 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.

5. Connect a test lamp between the signal circuit terminals listed below and ground:
 - Seat back inflate signal terminal 2
 - Seat back deflate signal terminal 3
 - Seat cushion inflate signal terminal 4
 - Seat cushion deflate signal terminal 5
6. Ignition ON, press and release the appropriate bolster adjuster switch. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the signal circuit for a short to voltage. If the circuit tests normal, test or replace the bolster adjuster switch.
 - If the test lamp is always OFF, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, test or replace the bolster adjuster switch.
7. Ignition OFF, connect the harness connector at the seat bolster adjuster valve and disconnect the harness connector at the seat lumbar/bolster pump.
8. Test for less than 5 ohms between the ground circuit terminal 3 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
9. Connect a test lamp between the control circuit terminal 1 and ground.
10. Ignition ON, command the pump motor ON and OFF using either one of the bolster inflate switches. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, test or replace the seat bolster adjuster valve.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, test or replace the seat bolster adjuster valve.
11. If all circuits test normal, test or replace the seat lumbar/bolster pump.

Component Testing

Seat Back or Cushion Bolster Adjuster Switch

1. Ignition OFF, disconnect the harness connector at the appropriate bolster adjuster switch.
2. Test for infinite resistance between the B+ terminal D and each signal terminal with the switch in the open position.
 - If not the specified value, replace the bolster adjuster switch.
3. Test for less than 1 ohms between the B+ terminal D and each signal terminal with the appropriate switch in the closed position.
 - If greater than the specified range, replace the bolster adjuster switch.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Driver Seat Lumbar Control Switch Replacement (AQ9), Driver Seat Lumbar Control Switch Replacement (W2E)**

- **Passenger Seat Lumbar Control Switch Replacement (W2E), Passenger Seat Lumbar Control Switch Replacement (AQ9)**
- **Front Seat Lumbar Support Bladder Replacement (W2E)**
- **Driver or Passenger Seat Cushion Air Pump Replacement (W2E)**

MEMORY SEAT FEATURE INOPERATIVE

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 Switch Reference Voltage	1	1	-	-
Memory Switch Signal	1	1	1	-
1. Memory Seat Feature Inoperative				

Circuit/System Description

Reference voltage is supplied to the memory switch from the driver door module (DDM). When a memory switch is pressed, battery voltage is applied through the switch contacts, a series of resistors and through the memory switch signal circuit to the DDM. The door module then sends a serial data message to the memory seat module (MSM) indicating the memory recall request. The MSM then commands the appropriate seat motors to move to the pre-recorded seat positions stored in memory in response to the switch input.

Diagnostic Aids

The DDM is referenced in Tech 2 as the Driver Door Switch.

Reference Information

Schematic Reference

Driver Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

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. Verify that all manual power seat and lumbar functions operate as described in the description and operation. Refer to **Power Seat Inoperative (Coupe with Memory A45)**, **Power Seat Inoperative (Wagon with Memory A45)**, **Power Seat Inoperative (Without Memory A45)**, or **Lumbar Support Inoperative (With Memory A45)**, **Lumbar Support Inoperative (Without Memory A45)**, **Lumbar Support Inoperative (With W2E)**.
2. The memory seat module (MSM) cannot perform Memory Seat Recall, Easy Exit Setup, or Easy Exit Recall functions unless these options are activated in the driver information center (DIC). Refer to the Owners Manual to verify that these memory recall personalization options are ON.
3. Verify that memory positions for driver 1 and driver 2 have been recorded to memory by observing the scan tool Driver Position Module, Memory Data 1 and Memory Data 2 parameters.

Circuit/System Testing

1. Ignition ON, verify the scan tool Driver Door Switch Memory Recall Switches parameter is approximately 2.75 volts while pressing the memory 1 switch.
 - If not the specified value, perform the Memory Switch component test. If the switch tests normal, replace the driver door module.
2. Verify the scan tool Memory Recall Switches parameter is approximately 1.75 volts while pressing the memory 2 switch.
 - If not the specified value, replace the memory seat adjuster switch.
3. Verify the scan tool Memory Recall Switch parameter is approximately 1.0 volt while pressing the EXIT switch.
 - If not the specified value, replace the memory seat adjuster switch.
4. If all circuits test normal, replace the MSM.

Component Testing

Memory Switch

1. Disconnect the X4 harness connector at the DDM.
2. Test for infinite resistance between the memory switch signal circuit terminal 5 and the switch supply voltage circuit terminal 14.

- If not infinite, replace the memory seat adjuster switch.
- 3. Test the resistance between terminal 5 and terminal 14 while pressing the memory 1, memory 2, and EXIT buttons. Compare the resistance readings to the values in the Memory Switch Values table below.
 - If the resistance is not within the specified range, replace the memory seat adjuster switch.

Memory Switch Values

Switch Position	Resistance
Idle	Infinite
Memory 1	2.03K-2.49K ohms
Memory 2	3.83K-4.69K ohms
EXIT	8.33K-10.18K ohms

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Driver Seat Adjuster Memory Switch Replacement**
- **Control Module References** for MSM and DDM replacement, setup, and programming

EASY ENTRY SEAT MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Rear Seat Easy Entry Switch B+	2, 3	2, 3	-	-
Driver Seat Easy Entry Forward Switch Signal	2, 3	2	B1755 01	-
Driver Seat Easy Entry Rearward Switch Signal	2, 3	2	B1760 01	-
Driver Seat Horizontal Motor Forward Control	B3920 02	B1335 0B	B3920 01	B1335 42, B1335 4B, B2375 5A
Driver Seat Horizontal Motor Rearward Control	B3920 02	B1335 0B	B3920 01	B1335 42, B1335 4B, B2375 5A
Passenger Seat Assembly Forward Switch Signal	2, 3	2	B2000 01	-
Passenger Seat Assembly Rearward Switch Signal	2, 3	2	B2005 01	-

Passenger Seat Easy Entry Forward Switch Signal	2, 3	3	B2000 01	-
Passenger Seat Easy Entry Rearward Switch Signal	2, 3	3	B2005 01	-
Passenger Seat Horizontal Motor Forward Control	1	1	-	-
Passenger Seat Horizontal Motor Rearward Control	1	1	-	-
1. Passenger seat horizontal motor inoperative 2. Driver seat easy entry function inoperative 3. Passenger seat easy entry function inoperative				

Circuit/System Description

Battery voltage is supplied at all times to the driver and passenger rear seat easy entry switches through a 2 A fuse located in the rear fuse block. Battery positive voltage is also supplied at all times to the MSM through a 25 A circuit breaker. This voltage is connected to a power rail internal to the MSM and is used to drive the power seat motors, lumbar motor, and seat heater elements on vehicles equipped with heated seats. Each seat horizontal adjuster motor is controlled by the MSM through 2 motor control circuits. The MSM connects all motor control circuits on the power rail to a common reference point whenever they are not in operation. This reference point is biased to approximately 2.5 V. The MSM checks to see if the reference voltage is shorted to ground or battery before enabling any of the seat or lumbar motors.

The seat horizontal motor is reversible. For example, when the driver rear seat easy entry switch is operated to move the entire seat forward, battery positive voltage is applied through the switch contacts and the easy entry forward switch signal circuit to the MSM. In response to this signal, the MSM 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. The passenger rear seat easy entry system also operates this way.

Reference Information

Schematic Reference

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

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

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, command the driver seat horizontal motor in the FORWARD and REARWARD directions using the seat adjuster switch. The seat should move in the commanded directions.
 - If the driver seat does not move FORWARD or REARWARD, refer to **Power Seat Inoperative (Coupe with Memory A45), Power Seat Inoperative (Wagon with Memory A45), Power Seat Inoperative (Without Memory A45)** Coupe with Memory A45.
2. Ignition ON, observe the scan tool Seat 1 Inputs seat switch parameters listed below while pressing the appropriate driver rear seat easy entry switch. The reading should change between Active and Inactive.
 - Horizontal/Easy Entry Forward Sw
 - Horizontal/Easy Entry Rearward Sw
 - If the reading does not change between the specified values, refer to the Seat Easy Entry Switch Circuit Test.
3. Ignition ON, command the passenger seat horizontal motor in the FORWARD and REARWARD directions using the seat adjuster switch. The seat should move forward and rearward.
 - If the seat does not move forward and rearward, refer to **Power Seat Inoperative (Coupe with Memory A45), Power Seat Inoperative (Wagon with Memory A45), Power Seat Inoperative (Without Memory A45)** Coupe with Memory A45.
4. Ignition ON, observe the scan tool Seat 2 Inputs seat switch parameters listed below while pressing the appropriate passenger rear seat easy entry switch. The reading should change between Active and Inactive.
 - Horizontal/Easy Entry Forward Sw
 - Horizontal/Easy Entry Rearward Sw
 - If the reading does not change between the specified values, refer to the Seat Easy Entry Switch Circuit Test.

Circuit/System Testing

Seat Easy Entry Switch Circuit Test

1. Ignition OFF, disconnect the harness connector at the appropriate rear seat easy entry switch.
2. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal A and ground.

- If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
- 3. Install a 3 A fused jumper wire between the B+ circuit terminal A and the signal circuit terminal C. Verify the scan tool Horizontal/Easy Entry Forward Sw parameter is Active.
 - If not the specified value, test the signal circuit for an open/high resistance. If the circuit tests normal, replace the MSM.
- 4. Install a 3 A fused jumper wire between the B+ circuit terminal A and the signal circuit terminal B. Verify the scan tool Horizontal/Easy Entry Rearward Sw parameter is Active.
 - If not the specified value, test the signal circuit for an open/high resistance. If the circuit tests normal, replace the MSM.
- 5. If all circuits test normal, test or replace the rear seat easy entry switch.

Component Testing

Rear Seat Easy Entry Switch

1. Ignition OFF, disconnect the harness connector at the appropriate rear seat easy entry switch.
2. Test for infinite resistance between the B+ terminal A and each seat horizontal direction signal terminal with the switch in the open position.
 - If not the specified value, replace the rear seat easy entry switch.
3. Test for less than 1 ohms between the B+ terminal A and each seat horizontal signal terminal with the appropriate switch in the closed position.
 - If greater than the specified range, replace the rear seat easy entry switch.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Front Seat Adjuster Switch Replacement - Driver Side (AQ9), Front Seat Adjuster Switch Replacement - Driver Side (W2E)**
- **Driver or Passenger Seat Back Cushion Latch Release Handle Replacement (Coupe)**
- **Front Seat Adjuster Actuator Replacement**
- **Control Module References** for MSM replacement, setup, and programming

POWER SEAT INOPERATIVE (WITHOUT MEMORY A45)

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Seat Adjuster Switch 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	-	-
Seat Adjuster Switch Ground	-	1	-	-
1. Power seat inoperative				

Circuit/System Description

Power seat without memory is completely controlled through the seat adjuster switch. Battery voltage is supplied at all times to the driver seat adjuster switch from the LF/FRT/PWR/SEAT circuit breaker and the passenger seat adjuster switch from the RT/FRT/PWR/SEAT circuit breaker that are located in the rear fuse block. When the seat adjuster switches are in an inactive state, the switch contacts are closed to the switch ground circuit.

All seat motors are reversible. For example, when the seat horizontal forward switch is pressed to move the entire seat forward, battery voltage is applied through the switch contacts and the seat horizontal motor forward control circuit to the motor. The motor is grounded through the horizontal motor rearward switch contacts and the horizontal motor rearward control circuit to the motor. 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 positive voltage and ground are applied on opposite circuits causing the motor to run in the opposite direction. All seat motors are powered this way.

Reference Information

Schematic Reference

- Driver Seat Schematics
- Passenger Seat Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

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

Operate the seat adjuster switches for the seat directional motors listed below in both directions. The seat should move in the commanded directions.

- Horizontal Motor
 - Front Vertical Motor
 - Rear Vertical Motor
 - Recline Motor
- If the power seat is inoperative in all directions, refer to the Seat Adjuster Switch Circuit Test.
 - Coupe only, if just the passenger seat horizontal motor is inoperative, refer to **Power Seat Inoperative (Coupe with Memory A45), Power Seat Inoperative (Wagon with Memory A45), Power Seat Inoperative (Without Memory A45)** Coupe with Memory A45.
 - If 1 or more of the seat adjuster motors operate, refer to the Seat Adjuster Motor Circuit Test.

Circuit/System Testing

Seat Adjuster Switch Circuit Test

1. Ignition OFF, disconnect the harness connector at the seat adjuster switch.
2. Test for less than 5 ohms between the ground circuit terminal B and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal E and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
4. If all circuits test normal, test or replace the seat adjuster switch.

Seat Adjuster Motor Circuit Test

1. Ignition OFF, disconnect the harness connector at the appropriate seat adjuster motor.
2. Connect a test lamp between control circuit terminal 1 and control circuit terminal 5.
3. Ignition ON, verify that the test lamp illuminates while pressing the appropriate seat switch in both directions.
 - If the test lamp does not illuminate for both directions, test the control circuits for a short to ground or an open/high resistance. If the circuits test normal replace the seat adjuster switch.

4. If all circuits test normal, replace the seat adjuster motor.

Component Testing

Seat Adjuster Switch

1. Ignition OFF, disconnect the harness connector at the seat adjuster switch.
2. Test for infinite resistance between the B+ terminal E and each control terminal with the switch in the open position.
 - If not the specified value, replace the seat adjuster switch.
3. Test for less than 1 ohms between the B+ terminal E and each control terminal with the appropriate switch in the closed position.
 - If greater than the specified range, replace the adjuster switch switch.
4. Test for less than 1 ohms between the ground terminal B and each control terminal with the switch in the open position.
 - If greater than the specified range, replace the seat adjuster switch.

Seat Motor

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

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

2. Install a 30 A fused jumper wire between the control terminal 1 and 12 V. Momentarily install a jumper wire between the control terminal 5 and ground. The seat motor should momentarily perform the appropriate FORWARD/REARWARD/UP/DOWN function.
 - If the function does not perform as specified, replace the seat motor.
3. Reverse the polarity of jumper wires; the a seat motor should perform in the opposite direction.
 - If the function does not perform as specified, replace the seat motor.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Front Seat Adjuster Switch Replacement - Driver Side (AQ9), Front Seat Adjuster Switch Replacement - Driver Side (W2E)**
- **Front Seat Adjuster Switch Replacement - Passenger Side (AQ9), Front Seat Adjuster Switch Replacement - Passenger Side (W2E)**
- **Front Seat Tilt Adjuster Actuator Replacement**
- **Front Seat Adjuster Actuator Replacement**
- **Driver Seat Outer Adjuster Rear Vertical Actuator Replacement**
- **Front Seat Recliner Actuator Motor Replacement**

POWER SEAT INOPERATIVE (COUPE WITH MEMORY A45)

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
MSM B+ Terminal 5 X3	B2425 0D, B2430 0D, 1	B2425 0D, B2430 0D, 1	B242 0D, B243 0D, 1	-	-
MSM B+ Terminal 6 X3	2	2	2	-	-
Seat Adjuster Switch B+	2	1	1	-	-
Driver Seat Front Vertical Up Switch Signal	2	1	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Driver Seat Front Vertical Down Switch Signal	2	1	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Driver Seat Horizontal Forward Switch Signal	2	1	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Driver Seat Horizontal Rearward Switch Signal	2	1	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01,	-

				B1760 01, B1815 01, B1820 01	
Driver Seat Rear Vertical Up Switch Signal	2	1	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Driver Seat Rear Vertical Down Switch Signal	2	1	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Driver Seat Recline Forward Switch Signal	2	1	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Driver Seat Recline Rearward Switch Signal	2	1	-	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Driver Seat Front Vertical Motor Down Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2355 5A
Driver Seat Front Vertical Motor Up Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2355 5A
Driver Seat Horizontal Motor Forward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2375 5A
Driver Seat Horizontal Motor Rearward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2375 5A

Driver Seat Rear Vertical Motor Down Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2365 5A
Driver Seat Rear Vertical Motor Up Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2365 5A
Driver Seat Recline Motor Forward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B1825 5A
Driver Seat Recline Motor Rearward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B1825 5A
Passenger Seat Horizontal Forward Switch Signal	3	3	3	B2000 01	-
Passenger Seat Horizontal Rearward Switch Signal	3	3	3	B2005 01	-
Passenger Seat Horizontal Motor Forward Control	B3920 02	B1335 0B	3	B3920 01	B1335 42, B1335 4B
Passenger Seat Horizontal Motor Rearward Control	B3920 02	B1335 0B	3	B3920 01	B1335 42, B1335 4B
MSM Ground Terminal 1 X3	-	-	-	-	-
MSM Ground Terminal 4 X3	-	-	-	-	-
Ground - Inline Connector X300 Terminal 14	-	2	2	-	-
1. Driver power seat and memory functions inoperative 2. Scan tool does not communicate with low speed GMLAN device 3. Passenger seat horizontal motor inoperative from the seat adjuster switch					

Circuit/System Description

Battery voltage is supplied at all times to the memory seat module (MSM) through a 10 A MSM fuse located in the rear fuse block. This voltage is used by the MSM for logic power and to supply reference voltage to the seat and lumbar adjuster switches. Battery positive voltage is also supplied at all times to the MSM through the a 25 A circuit breaker located in the rear fuse block. This voltage is connected to a power rail internal to the MSM and is used to drive the driver power seat motors, lumbar motor, the passenger seat horizontal motor, and the seat heater elements on vehicles equipped with heated seats. Each seat and lumbar motor is controlled by the MSM through 2 motor control circuits. The MSM connects all motor control circuits on the power rail to a common reference point whenever they are not in operation. This reference point is biased to approximately 2.5 V. The MSM checks to see if the reference voltage is shorted to ground or battery before enabling any of the seat or lumbar motors.

All motors are reversible. For example, when the seat switch is operated to move the entire seat forward, battery positive voltage is applied through the switch contacts and the seat horizontal forward switch signal circuit to the MSM. In response to this signal, the MSM 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 - COUPE AND WAGON

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, observe the scan tool Seat 1 Inputs seat switch parameters while pressing the appropriate driver seat switch. The reading should change between Active and Inactive.
 - If the reading does not change between the specified values, refer to the Driver Seat Adjuster Switch Circuit Test.
2. Command the appropriate driver seat motor in the Up/Down or Forward/Rearward directions with a scan tool. The seat should move up and down or forward and rearward as commanded.
 - If the seat does not move up and down or forward and rearward, refer to the Driver Seat Motor Circuit Test.
3. Operate the passenger seat adjuster switches for the seat directional motors listed below in both directions. The seat should move in the commanded directions.
 - Horizontal Motor
 - Front Vertical Motor
 - Rear Vertical Motor
 - Recline Motor

- If the passenger power seat is inoperative in all directions, refer to **Power Seat Inoperative (Coupe with Memory A45), Power Seat Inoperative (Wagon with Memory A45), Power Seat Inoperative (Without Memory A45)**. Without Memory A45
- 4. Ignition ON, observe the scan tool Seat 2 Inputs Horizontal/Easy Entry Forward and Rearward Sw parameters while pressing the passenger seat horizontal switch in the forward and rearward directions. The readings should change between Active and Inactive.
 - If the reading does not change between the specified values, refer to the Passenger Seat Adjuster Switch Circuit Test.
- 5. Command the passenger Seat Forward/Backward with a scan tool. The passenger seat should move horizontally forward and rearward as commanded.
 - If the seat does not move forward and rearward, refer to the Passenger Seat Horizontal Motor Circuit Test.

Circuit/System Testing

Driver Seat Adjuster Switch Circuit Test

1. Ignition OFF, disconnect the harness connector at the seat adjuster switch.
2. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal E and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the MSM.
3. Install a 3 A fused jumper wire between the B+ circuit terminal E and the appropriate signal circuit listed below. Verify the appropriate scan tool seat switch parameter is Active.
 - Front vertical upward switch terminal A (LHD)
 - Front vertical upward switch terminal K (RHD)
 - Front vertical downward switch terminal K (LHD)
 - Front vertical downward switch terminal A (RHD)
 - Rear vertical upward switch terminal F (LHD)
 - Rear vertical upward switch terminal J (RHD)
 - Rear vertical downward switch terminal J (LHD)
 - Rear vertical downward switch terminal F (RHD)
 - Horizontal forward switch terminal D
 - Horizontal rearward switch terminal C
 - Recline forward switch terminal H
 - Recline rearward switch terminal G
 - If not the specified value, test the signal circuit for an open/high resistance. If the circuit tests normal, replace the MSM.
4. If all circuits test normal, test or replace the seat adjuster switch.

Driver Seat Motor Circuit Test

1. Ignition OFF, disconnect the X3 harness connector at the MSM.

2. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal 5 and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
3. Ignition OFF, connect the X3 harness connector at the memory seat module and disconnect the X1 harness connector at the appropriate seat adjuster motor.
4. Connect a test lamp between control circuit terminal 1 and control circuit terminal 5.
5. Ignition ON, command the appropriate seat motor in the Up/Down or Forward/Rearward directions with a scan tool. The test lamp should turn ON when commanding the up and down or forward and rearward states.
 - If the test lamp remains OFF during either of the commands, test the control circuits for an open/high resistance. If the circuits test normal replace the MSM.
6. If all circuits test normal, test or replace the seat adjuster motor.

Passenger Seat Adjuster Switch Circuit Test

1. Ignition OFF, disconnect the harness connector at the passenger seat adjuster switch.
2. Install a 3 A fused jumper wire between the B+ circuit terminal E and the appropriate signal circuit listed below. Verify the appropriate scan tool Horizontal/Easy Entry Forward or Rearward Sw parameter is Active.
 - Horizontal forward switch terminal D
 - Horizontal rearward switch terminal C
 - If not the specified value, test the signal circuit for an open/high resistance. If the circuit tests normal, replace the MSM.
3. If all circuits test normal, test or replace the seat adjuster switch.

Passenger Seat Horizontal Motor Circuit Test

1. Ignition OFF, disconnect the harness connector at the passenger seat horizontal motor.
2. Connect a test lamp between control circuit terminal 1 and control circuit terminal 5.
3. Ignition ON, command the passenger Seat Forward/Backward with a scan tool. The test lamp should turn ON when commanding the forward and backward states.
 - If the test lamp remains OFF during either of the commands, test the control circuits for an open/high resistance. If the circuits test normal replace the MSM.
4. If all circuits test normal, test or replace the seat horizontal motor.

Component Testing

Seat Adjuster Switch

1. Ignition OFF, disconnect the harness connector at the seat adjuster switch.
2. Test for infinite resistance between the B+ terminal E and each seat direction signal terminal with the switch in the open position.
 - If not the specified value, replace the seat adjuster switch.

3. Test for less than 1 ohms between the B+ terminal E and each seat direction signal terminal with the appropriate switch in the closed position.
 - If greater than the specified range, replace the adjuster switch switch.

Seat Motor

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

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

2. Install a 30 A fused jumper wire between the control terminal 1 and 12 V. Momentarily install a jumper wire between the control terminal 5 and ground. The seat motor should momentarily perform the appropriate FORWARD/REARWARD/UP/DOWN function.
 - If the function does not perform as specified, replace the seat motor.
3. Reverse the polarity of jumper wires; the a seat motor should perform in the opposite direction.
 - If the function does not perform as specified, replace the seat motor.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Front Seat Adjuster Switch Replacement - Driver Side (AQ9), Front Seat Adjuster Switch Replacement - Driver Side (W2E)**
- **Front Seat Tilt Adjuster Actuator Replacement**
- **Front Seat Adjuster Actuator Replacement**
- **Driver Seat Outer Adjuster Rear Vertical Actuator Replacement**
- **Front Seat Recliner Actuator Motor Replacement**
- **Control Module References** for MSM replacement, setup, and programming

POWER SEAT INOPERATIVE (WAGON WITH MEMORY A45)

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
MSM B+ Terminal 5 X3	B2425 0D,	B2425 0D,	B2425 0D, B2430 0D,	-	-

	B2430 0D, 1	B2430 0D, 1	1		
MSM B+ Terminal 6 X3	2	2	2	-	-
Seat Adjuster Switch B+	2	1	1	-	-
Front Vertical Up Switch Signal	2	1	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Front Vertical Down Switch Signal	2	1	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Horizontal Forward Switch Signal	2	1	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Horizontal Rearward Switch Signal	2	1	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Rear Vertical Up Switch Signal	2	1	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Rear Vertical Down Switch				B1735 01, B1740 01, B1745 01, B1750 01,	

Signal	2	1	1	B1755 01, B1760 01, B1815 01, B1820 01	-
Recline Forward Switch Signal	2	1	1	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Recline Rearward Switch Signal	2	1	-	B1735 01, B1740 01, B1745 01, B1750 01, B1755 01, B1760 01, B1815 01, B1820 01	-
Driver Seat Front Vertical Motor Down Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2355 5A
Driver Seat Front Vertical Motor Up Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2355 5A
Driver Seat Horizontal Motor Forward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2375 5A
Driver Seat Horizontal Motor Rearward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2375 5A
Driver Seat Rear Vertical Motor Down Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2365 5A
Driver Seat Rear Vertical Motor Up Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B2365 5A
Driver Seat Recline Motor Forward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B1825 5A
Driver Seat Recline Motor Rearward Control	B3920 02	B1335 0B	1	B3920 01	B1335 42, B1335 4B, B1825 5A
MSM Ground Terminal 1 X3	-	-	-	-	-
MSM Ground Terminal 4 X3	-	-	-	-	-

Ground - Inline Connector X300 Terminal 14	-	2	2	-	-
1. Power seat and memory functions inoperative 2. Scan Tool Does Not Communicate with Low Speed GMLAN Device					

Circuit/System Description

Battery voltage is supplied at all times to the memory seat module (MSM) from the 10 A MSM fuse. This voltage is used by the MSM for logic power and to supply reference voltage to the seat and lumbar adjuster switches. Battery positive voltage is also supplied at all times to the MSM from the LF/FRT/PWR/SEAT 25 A circuit breaker. This voltage is connected to a power rail internal to the MSM and is used to drive the power seat motors, lumbar motor, and seat heater elements on vehicles equipped with heated seats. Each seat and lumbar adjuster motor is controlled by the MSM through 2 motor control circuits. The MSM connects all motor control circuits on the power rail to a common reference point whenever they are not in operation. This reference point is biased to approximately 2.5 V. The MSM checks to see if the reference voltage is shorted to ground or battery before enabling any of the seat or lumbar motors.

All motors are reversible. For example, when the seat switch is operated to move the entire seat forward, battery positive voltage is applied through the switch contacts and the power seat horizontal forward switch signal circuit to the MSM. In response to this signal, the MSM 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 - COUPE AND WAGON

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

Ignition ON, observe the scan tool Memory Seat Module seat switch parameters while pressing the appropriate seat switch. The reading should change between Inactive and Active.

- If the reading does not change between the specified values, refer to the Seat Adjuster Switch Circuit Test.
- If all switch inputs to the MSM function normal, refer to the Seat Adjuster Motor Circuit Test.

Circuit/System Testing

Seat Adjuster Switch Circuit Test

1. Ignition OFF, disconnect the harness connector at the seat adjuster switch.
2. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal E and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the MSM.
3. Install a 3 A fused jumper wire between the appropriate signal circuit listed below and the B+ circuit terminal E. Verify the appropriate scan tool seat switch parameter is Active.
 - Front vertical upward switch terminal A (LHD)
 - Front vertical upward switch terminal K (RHD)
 - Front vertical downward switch terminal K (LHD)
 - Front vertical downward switch terminal A (RHD)
 - Rear vertical upward switch terminal F (LHD)
 - Rear vertical upward switch terminal J (RHD)
 - Rear vertical downward switch terminal J (LHD)
 - Rear vertical downward switch terminal F (RHD)
 - Horizontal forward switch terminal D
 - Horizontal rearward switch terminal C
 - Recline forward switch terminal H
 - Recline rearward switch terminal G
 - If not the specified value, test the signal circuit for an open/high resistance. If the circuit tests normal, replace the MSM.
4. If all circuits test normal, test or replace the seat adjuster switch.

Seat Adjuster Motor Test

1. Ignition OFF, disconnect the X3 harness connector at the MSM.
2. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal 5 and ground.

- If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
- 3. Ignition OFF, connect the X3 harness connector at the memory seat module and disconnect the X1 harness connector at the appropriate seat adjuster motor.
- 4. Connect a test lamp between control circuit terminal 1 and control circuit terminal 5.
- 5. Ignition ON, command the appropriate seat motor in the Up/Down or Forward/Rearward directions with a scan tool. The test lamp should turn ON when commanding the up and down or forward and rearward states.
 - If the test lamp remains OFF during either of the commands, test the control circuits for an open/high resistance. If the circuits test normal replace the MSM.
- 6. If all circuits test normal, test or replace the seat adjuster motor.

Component Testing

Seat Adjuster Switch

1. Ignition OFF, disconnect the harness connector at the seat adjuster switch.
2. Test for infinite resistance between the B+ terminal E and each seat direction signal terminal with the switch in the open position.
 - If not the specified value, replace the seat adjuster switch.
3. Test for less than 1 ohms between the B+ terminal E and each seat direction signal terminal with the appropriate switch in the closed position.
 - If greater than the specified range, replace the adjuster switch switch.

Seat Motor

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

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

2. Install a 30 A fused jumper wire between the control terminal 1 and 12 V. Momentarily install a jumper wire between the control terminal 5 and ground. The seat motor should momentarily perform the appropriate FORWARD/REARWARD/UP/DOWN function.
 - If the function does not perform as specified, replace the seat motor.
3. Reverse the polarity of jumper wires; the a seat motor should perform in the opposite direction.
 - If the function does not perform as specified, replace the seat motor.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Front Seat Adjuster Switch Replacement - Driver Side (AQ9), Front Seat Adjuster Switch Replacement - Driver Side (W2E)**

- Front Seat Tilt Adjuster Actuator Replacement
- Front Seat Adjuster Actuator Replacement
- Driver Seat Outer Adjuster Rear Vertical Actuator Replacement
- Front Seat Recliner Actuator Motor Replacement
- Control Module References for MSM replacement, setup, and programming

REPAIR INSTRUCTIONS

FRONT SEAT ADJUSTER SWITCH REPLACEMENT - DRIVER SIDE (AQ9)

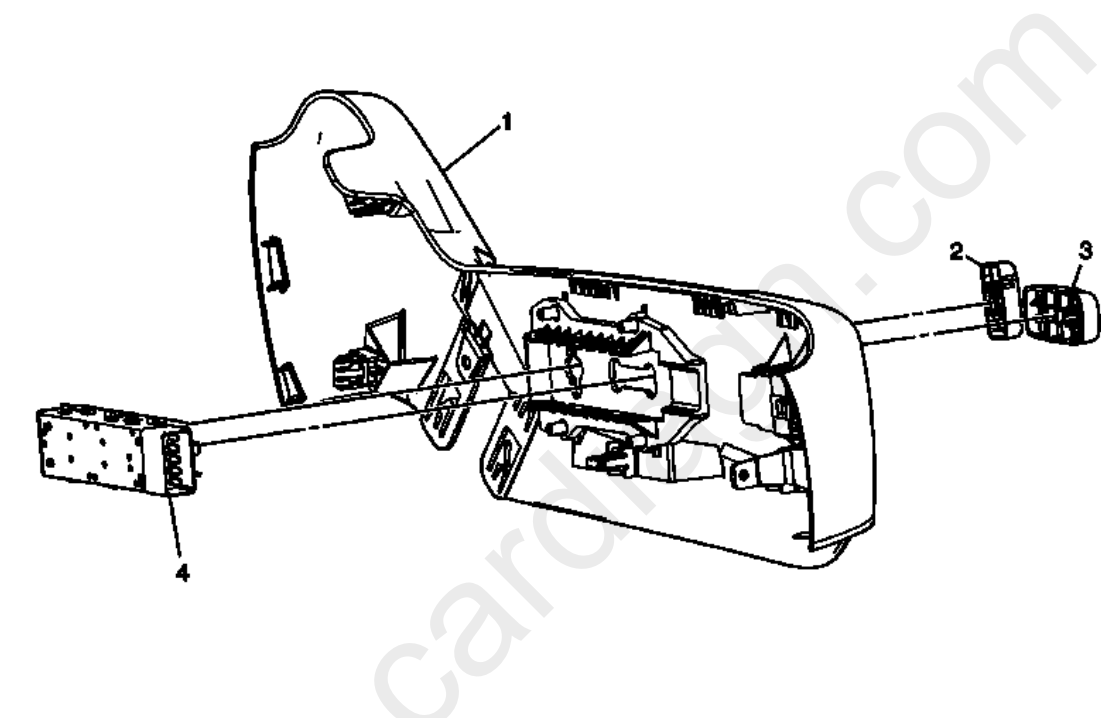


Fig. 10: Driver Seat Adjuster and Recliner Switch Replacement
 Courtesy of GENERAL MOTORS COMPANY

Front Seat Adjuster Switch Replacement - Driver Side (AQ9)

Callout	Component Name
1	Front Seat Adjuster Switch Bezel Refer to <u>Driver or Passenger Seat Adjuster Switch Bezel Replacement (AQ9)</u> .
2	Front Seat Adjuster Switch Knob
3	Front Seat Recliner Switch Knob
4	Front Seat Adjuster Switch TIP: Use a flat-bladed tool to release the switch from the switch bezel.

FRONT SEAT ADJUSTER SWITCH REPLACEMENT - DRIVER SIDE (W2E)

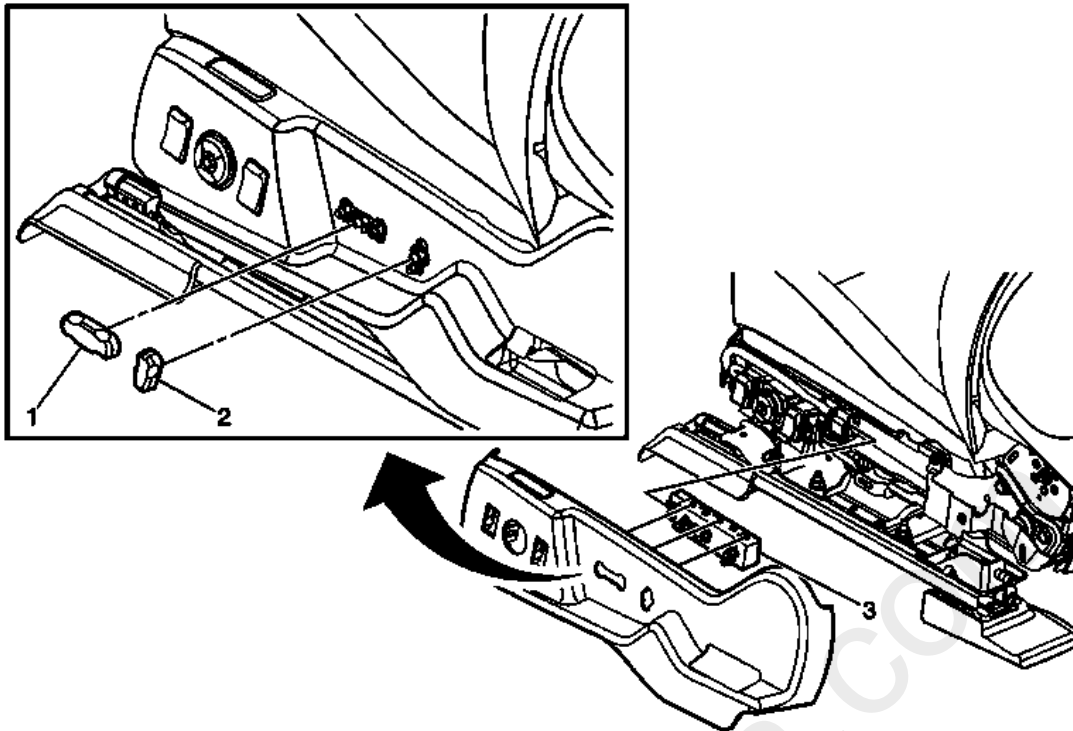


Fig. 11: Identifying Driver Seat Adjuster & Recliner Switch (W2E)
 Courtesy of GENERAL MOTORS COMPANY

Front Seat Adjuster Switch Replacement - Driver Side (W2E)

Callout	Component Name
Preliminary Procedure	
Remove the front seat adjuster switch bezel. Refer to <u>Driver or Passenger Seat Adjuster Switch Bezel Replacement (W2E)</u> .	
1	Front Seat Recliner Switch Knob
2	Front Seat Adjuster Switch Knob
3	Front Seat Adjuster Switch TIP: Use a flat-bladed tool to release the switch from the switch bezel.

FRONT SEAT ADJUSTER SWITCH REPLACEMENT - PASSENGER SIDE (AQ9)

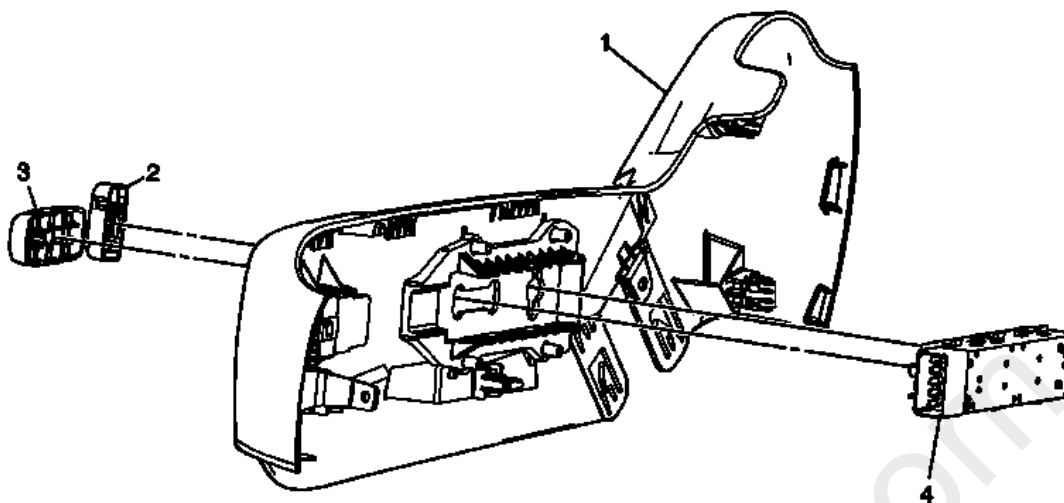


Fig. 12: Front Seat Adjuster Switch Components - Passenger Side (AQ9)
Courtesy of GENERAL MOTORS COMPANY

Front Seat Adjuster Switch Replacement - Passenger Side (AQ9)

Callout	Component Name
1	Front Seat Adjuster Switch Bezel Refer to <u>Driver or Passenger Seat Adjuster Switch Bezel Replacement (AQ9)</u> .
2	Front Seat Adjuster Switch Knob
3	Front Seat Recliner Switch Knob
4	Front Seat Adjuster Switch TIP: Use a flat-bladed tool to release the switch from the switch bezel.

FRONT SEAT ADJUSTER SWITCH REPLACEMENT - PASSENGER SIDE (W2E)

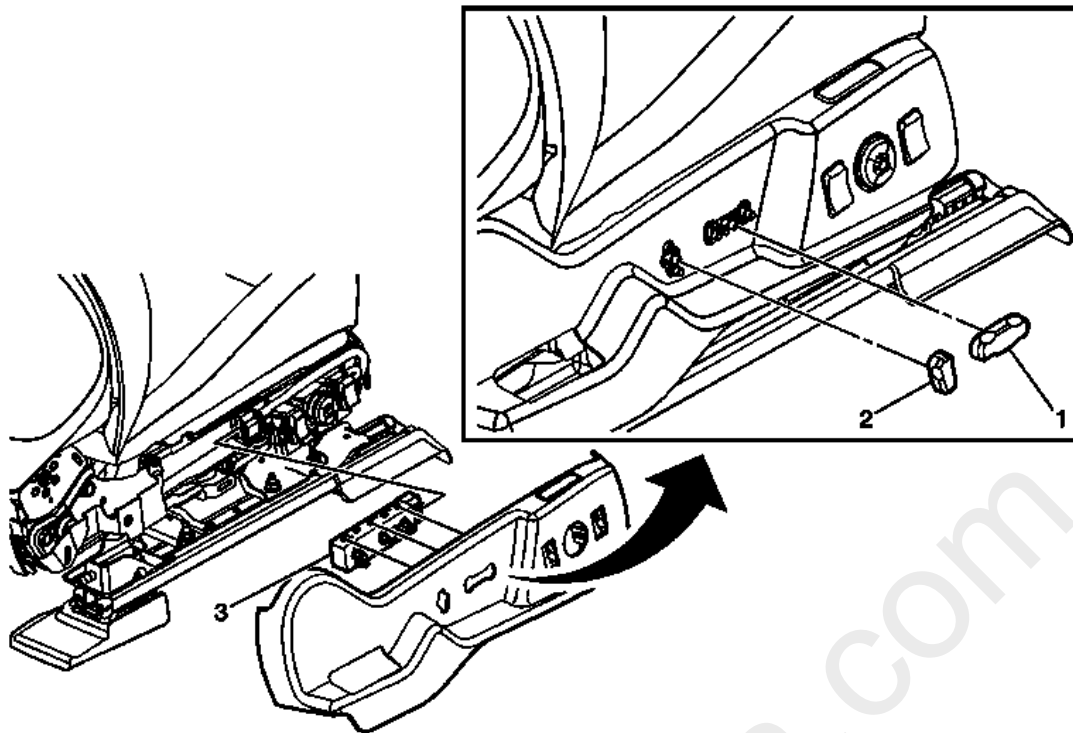


Fig. 13: Front Seat Adjuster Switch Components - Passenger Side (W2E)
Courtesy of GENERAL MOTORS COMPANY

Front Seat Adjuster Switch Replacement - Passenger Side (W2E)

Callout	Component Name
Preliminary Procedure	
Remove the front seat adjuster switch bezel. Refer to <u>Driver or Passenger Seat Adjuster Switch Bezel Replacement (W2E)</u> .	
1	Front Seat Recliner Switch Knob
2	Front Seat Adjuster Switch Knob
3	Front Seat Adjuster Switch TIP: Use a flat-bladed tool to release the switch from the switch bezel.

DRIVER SEAT ADJUSTER MEMORY SWITCH REPLACEMENT

Removal Procedure

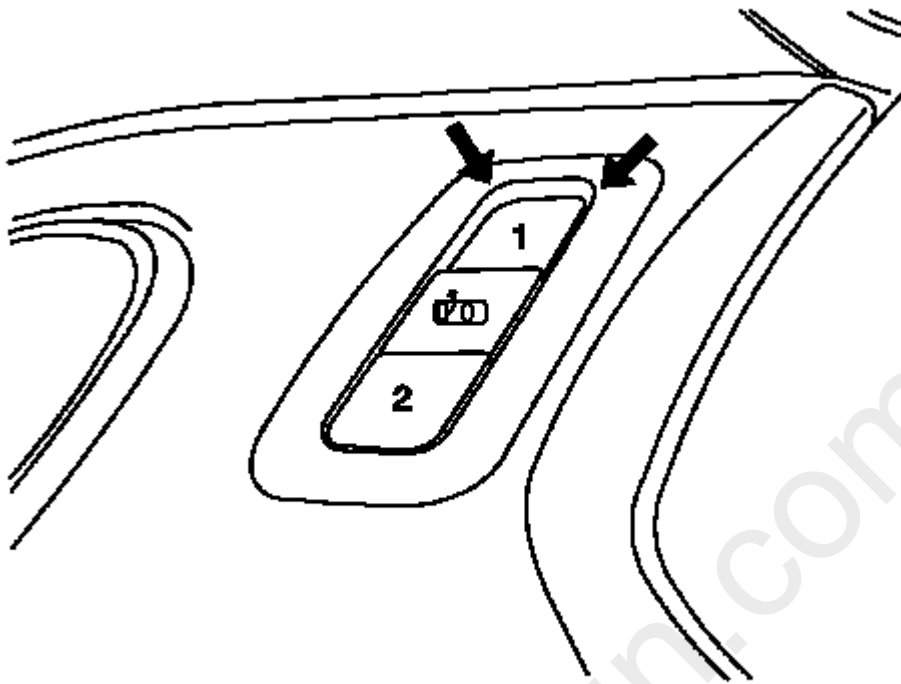


Fig. 14: Driver Seat Adjuster Memory Switch Escutcheon
Courtesy of GENERAL MOTORS COMPANY

1. Remove the driver door panel trim. Refer to **Front Side Door Trim Panel Replacement (Coupe)** , **Front Side Door Trim Panel Replacement (Wagon)** .
2. Remove the 2 screws that secure the memory switch to the escutcheon.

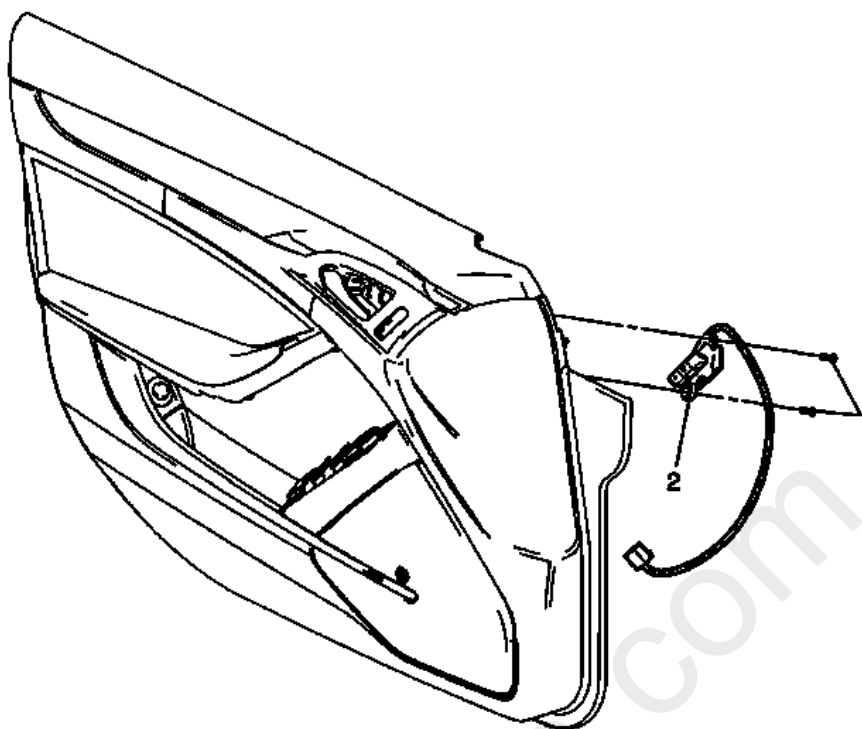


Fig. 15: Driver Seat Adjuster Memory Switch Replacement
Courtesy of GENERAL MOTORS COMPANY

3. Remove the 2 screws (1) that secure the escutcheon to the trim panel.
4. Disconnect the electrical connection.

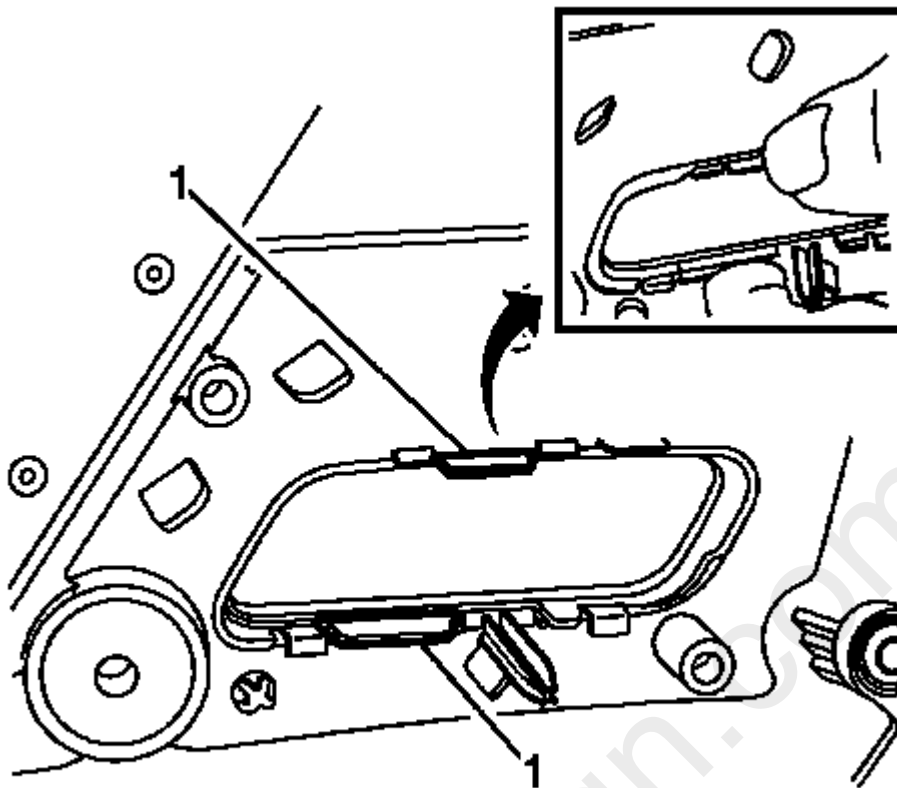


Fig. 16: Driver Seat Adjuster Memory Switch Bezel Side Tabs
Courtesy of GENERAL MOTORS COMPANY

5. Using your finger and thumb, compress the side tabs (1) and push the bezel out through the opening of the trim panel. This will also release the escutcheon from the trim panel.

Installation Procedure

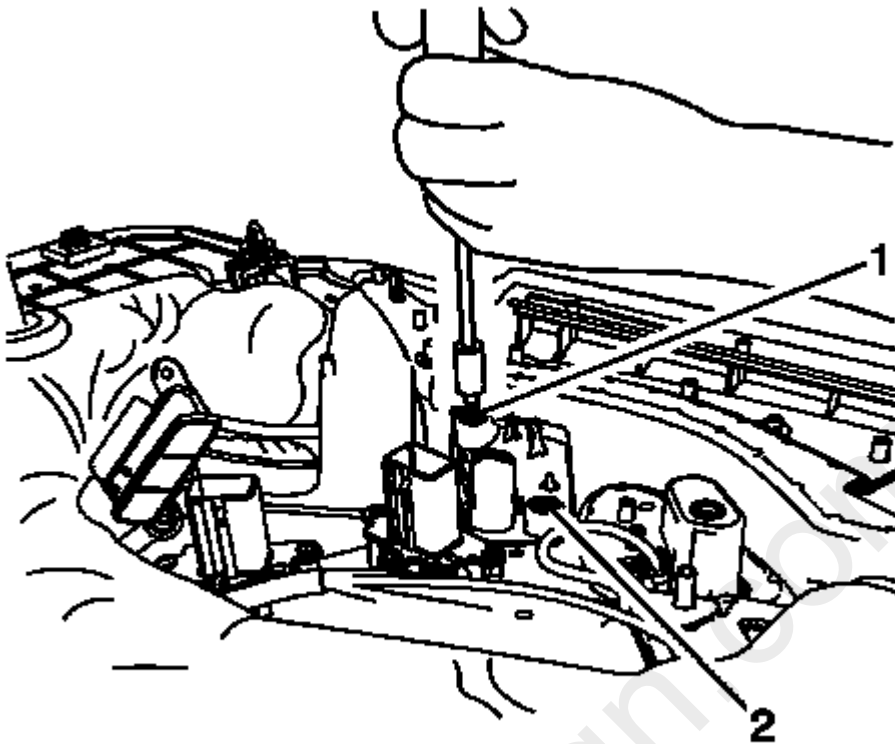


Fig. 17: Driver Seat Adjuster Memory Switch Escutcheon Screws
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

1. Position the new escutcheon to the trim panel and install the screws (1,2). Tighten the screws to 2 (18 lb in).

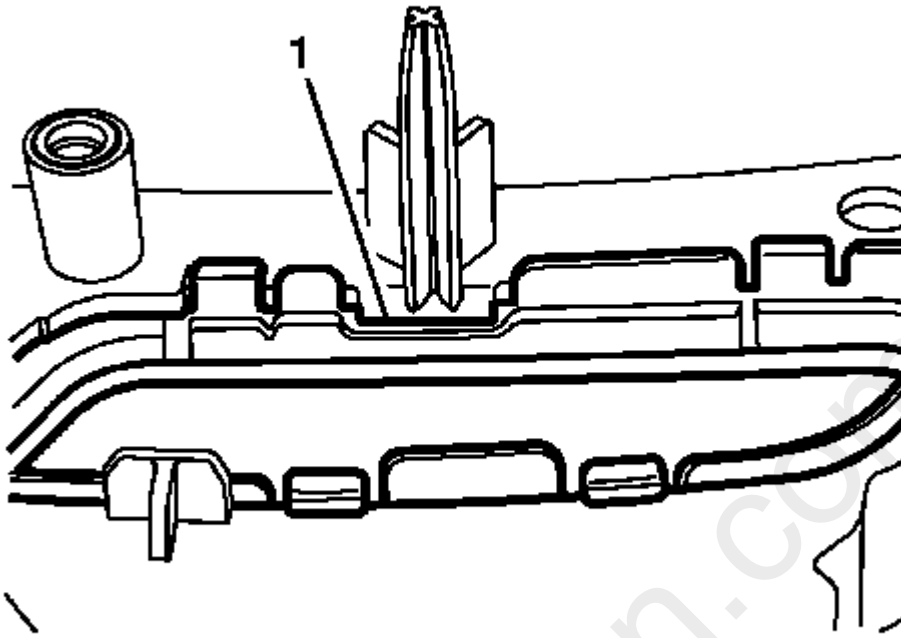


Fig. 18: One-Way Locating Feature
Courtesy of GENERAL MOTORS COMPANY

2. Ensure the switch bezel is installed with the one-way locating feature (1) positioned as shown.

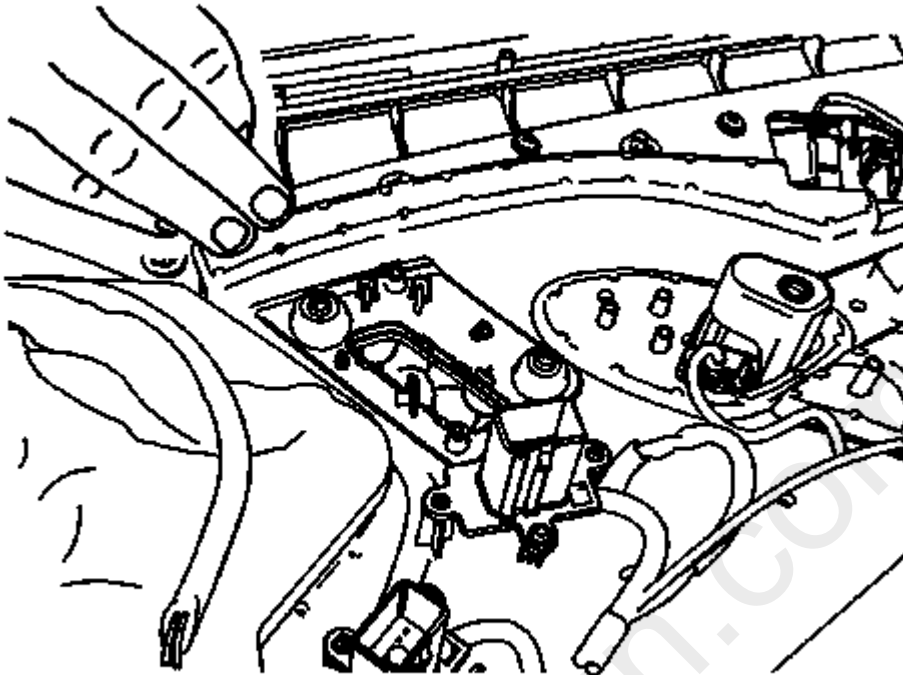


Fig. 19: Bezel

Courtesy of GENERAL MOTORS COMPANY

3. Install bezel by pushing it onto the escutcheon from the front side of the trim panel.

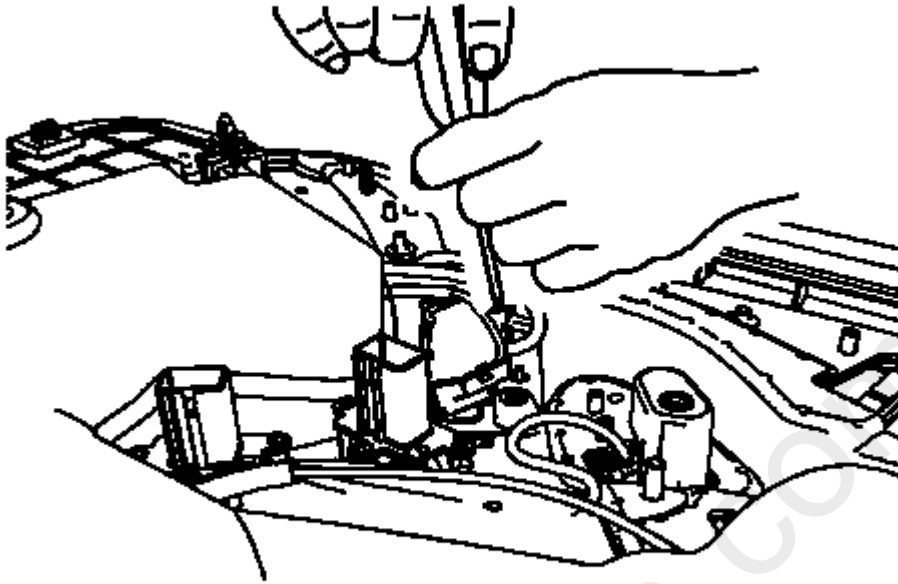


Fig. 20: Testing Push/Return Action
Courtesy of GENERAL MOTORS COMPANY

4. Ensure that the switch is centered in the opening of the bezel, and test the push/return action of the buttons prior to installing the trim panel.

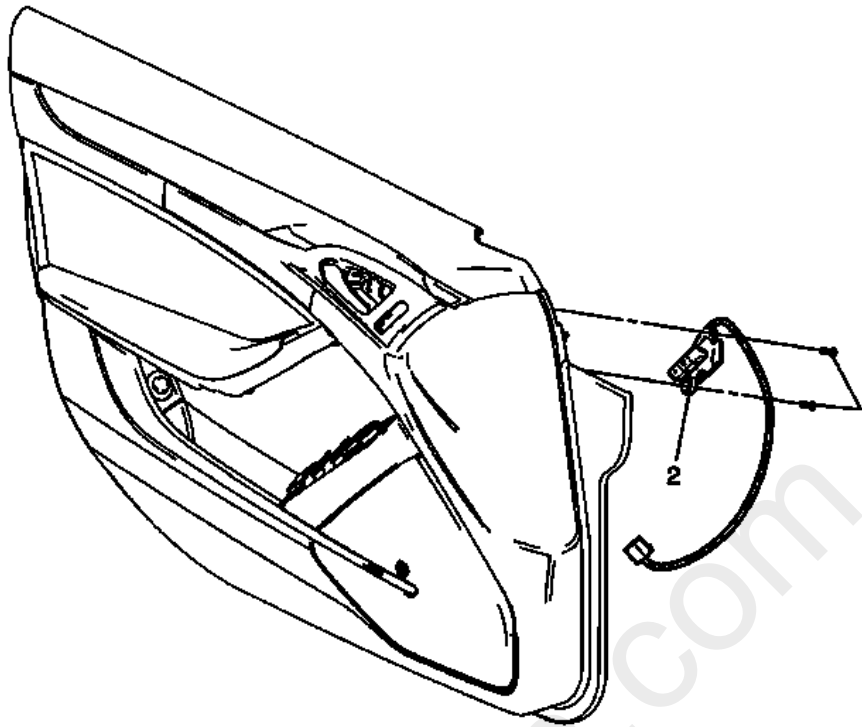


Fig. 21: Driver Seat Adjuster Memory Switch
Courtesy of GENERAL MOTORS COMPANY

5. Install the memory switch and 2 screws (1) that secure the memory switch to the escutcheon. Tighten the screws to 2 (18 lb in).
6. Install the driver door panel trim. Refer to **Front Side Door Trim Panel Replacement (Coupe)** , **Front Side Door Trim Panel Replacement (Wagon)** .

DRIVER OR PASSENGER SEAT ADJUSTER MEMORY MODULE REPLACEMENT

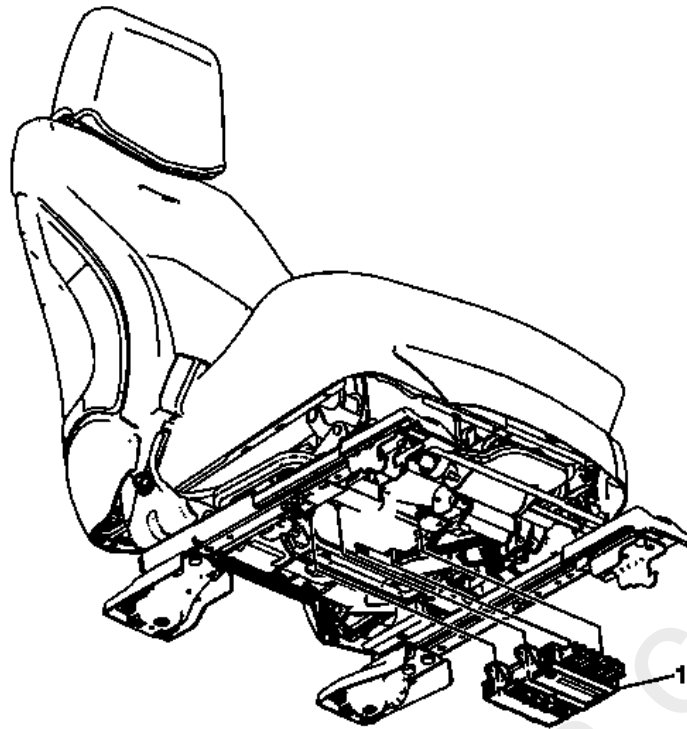


Fig. 22: Front Seat Adjuster Memory Module
 Courtesy of GENERAL MOTORS COMPANY

Driver or Passenger Seat Adjuster Memory Module Replacement

Callout	Component Name
Preliminary Procedure Remove the front seat. Refer to Front Seat Removal and Installation - Bucket (W2E) , Front Seat Removal and Installation - Bucket (AQ9) .	
1	Front Seat Adjuster Memory Module Procedure 1. Disconnect the electrical connector. 2. Unclip the module from the bracket and slide out through the bottom of the seat. 3. Refer to Control Module References for programing and setup information.

FRONT SEAT TILT ADJUSTER ACTUATOR REPLACEMENT

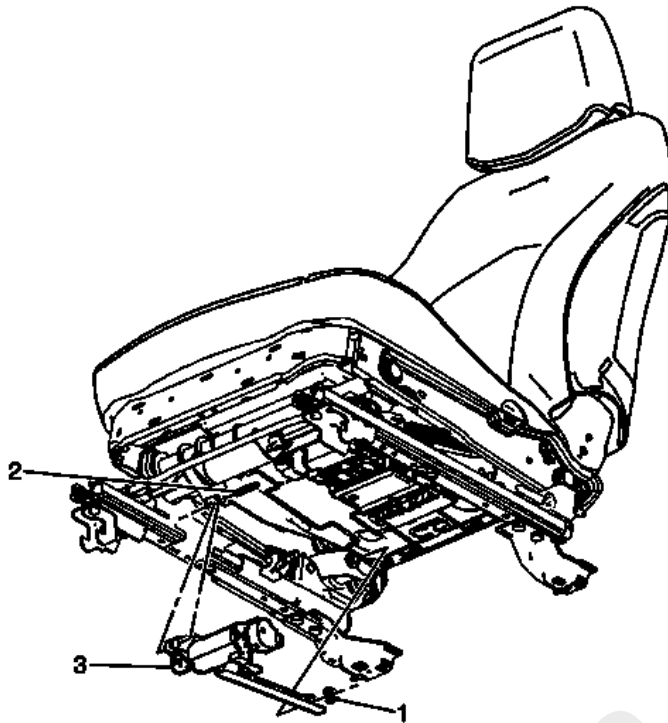


Fig. 23: Front Seat Tilt Adjuster Actuator
 Courtesy of GENERAL MOTORS COMPANY

Front Seat Tilt Adjuster Actuator Replacement

Callout	Component Name
Preliminary Procedure Remove the front seat. Refer to <u>Front Seat Removal and Installation - Bucket (W2E)</u> , <u>Front Seat Removal and Installation - Bucket (AQ9)</u> .	
1	Front Seat Tilt Adjuster Actuator Nut CAUTION: Refer to <u>Fastener Caution</u> . Tighten 9 N.m (80 lb in)
2	Roll Pin TIP: Use a hammer and small round tool to tap the roll pin out.
3	Front Seat Tilt Adjuster Actuator Procedure 1. Disconnect the electrical connector. 2. Refer to <u>Control Module References</u> for programing and setup information.

FRONT SEAT ADJUSTER ACTUATOR REPLACEMENT

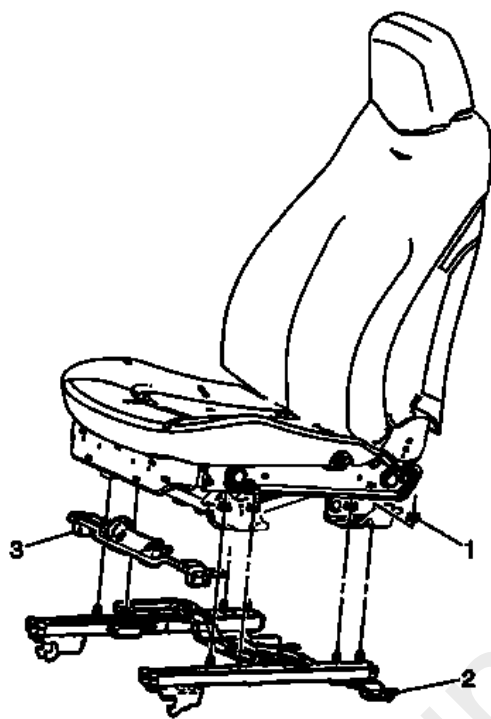


Fig. 24: Front Seat Adjuster Actuator
Courtesy of GENERAL MOTORS COMPANY

Front Seat Adjuster Actuator Replacement

Callout	Component Name
Preliminary Procedure Remove the front seat. Refer to Front Seat Removal and Installation - Bucket (W2E) , Front Seat Removal and Installation - Bucket (AQ9) .	
1	Front Seat Adjuster Track Nut (Qty: 8) CAUTION: Refer to Fastener Caution . Tighten 9 N.m (80 lb in)
2	Front Seat Adjuster Track Assembly
3	Front Seat Adjuster Actuator Procedure 1. Disconnect the electrical connector. 2. Remove the stops on the front of the seat tracks and slide the actuator assembly

forward to remove.

3. Refer to **Control Module References** for programing and setup information.

DRIVER SEAT OUTER ADJUSTER REAR VERTICAL ACTUATOR REPLACEMENT

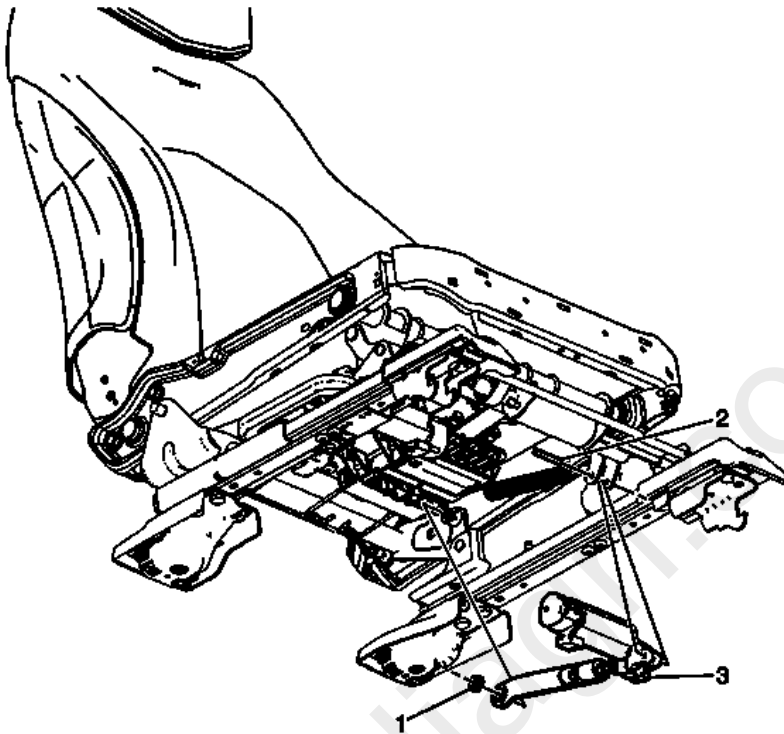


Fig. 25: Driver Seat Outer Adjuster Rear Vertical Actuator

Courtesy of GENERAL MOTORS COMPANY

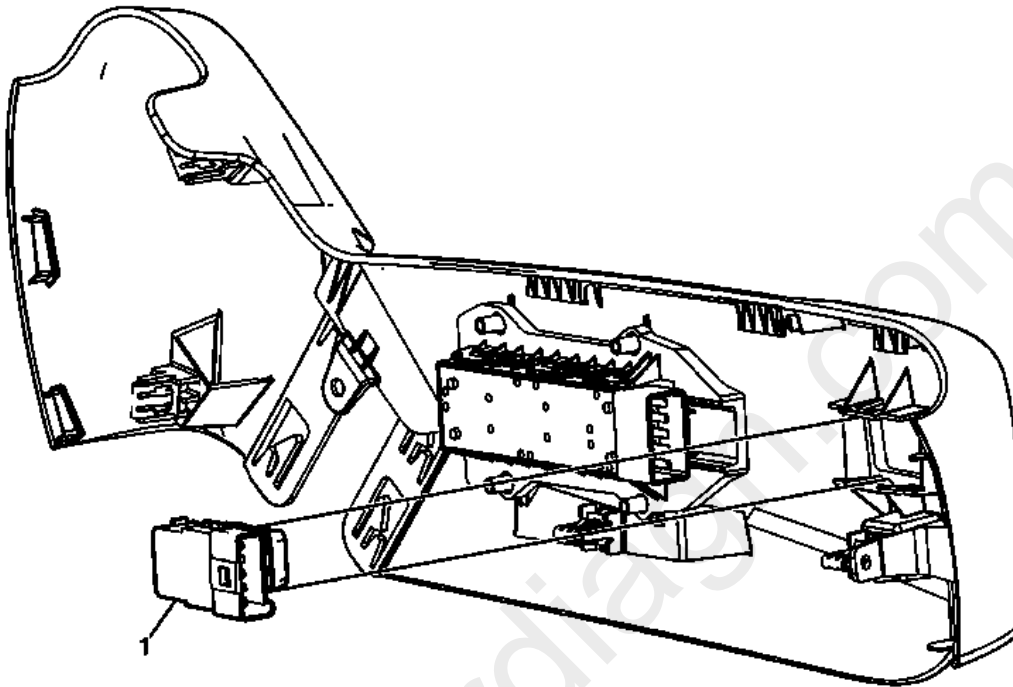
Driver Seat Outer Adjuster Rear Vertical Actuator Replacement

Callout	Component Name
Preliminary Procedure Remove the front seat. Refer to Front Seat Removal and Installation - Bucket (W2E) , Front Seat Removal and Installation - Bucket (AQ9) .	
1	Front Seat Outer Adjuster Rear Vertical Actuator Nut CAUTION: Refer to <u>Fastener Caution</u> . Tighten 9 N.m (80 lb in)
2	Roll Pin TIP: Use a hammer and small round tool to tap the roll pin out.
	Front Seat Outer Adjuster Rear Vertical Actuator

3

Procedure

1. Disconnect the electrical connector.
2. Refer to **Control Module References** for programing and setup information.

DRIVER SEAT LUMBAR CONTROL SWITCH REPLACEMENT (AQ9)**Fig. 26: Front Seat Lumbar Control Switch (AQ9)**

Courtesy of GENERAL MOTORS COMPANY

Driver Seat Lumbar Control Switch Replacement (AQ9)

Callout	Component Name
Preliminary Procedure Remove the front seat adjuster switch bezel. Refer to <u>Driver or Passenger Seat Adjuster Switch Bezel Replacement (AQ9)</u> .	
1	Driver Seat Lumbar Control Switch TIP: Use a flat-bladed tool to release the switch from the switch bezel.

DRIVER SEAT LUMBAR CONTROL SWITCH REPLACEMENT (W2E)

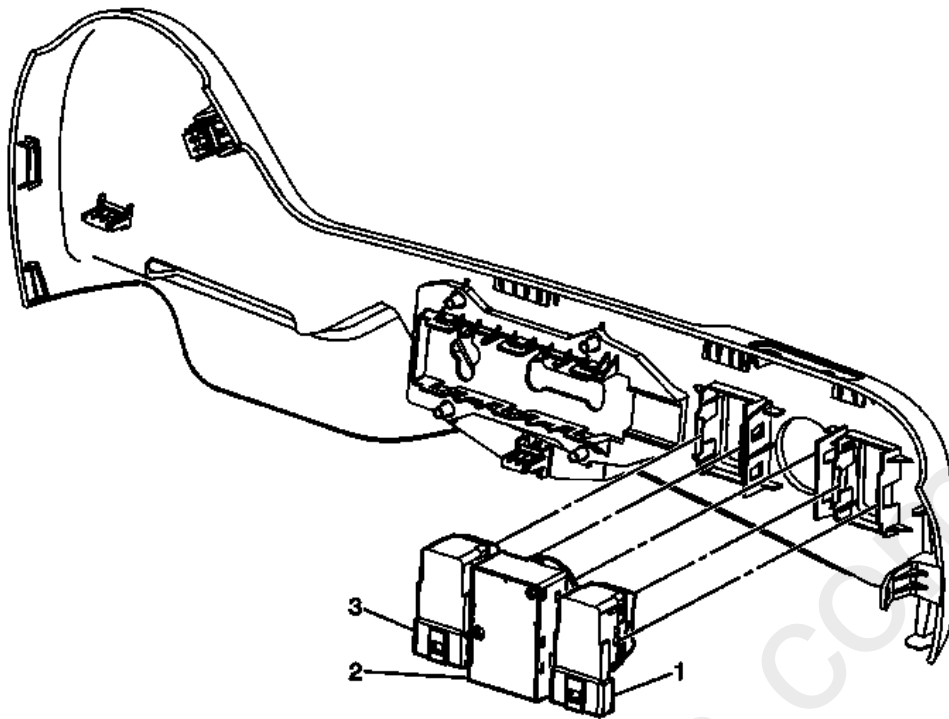


Fig. 27: Driver Seat Lumbar Control Switch (W2E)

Courtesy of GENERAL MOTORS COMPANY

Driver Seat Lumbar Control Switch Replacement (W2E)

Callout	Component Name
Preliminary Procedures	
1.	Remove the front seat adjuster switch bezel. Refer to <u>Driver or Passenger Seat Adjuster Switch Bezel Replacement (W2E)</u> .
2.	Remove the front seat adjuster and recliner switch knobs. Refer to <u>Front Seat Adjuster Switch Replacement - Driver Side (W2E)</u> .
1	Front Seat Cushion Lumbar Control Switch TIP: Use a flat-bladed tool to release the switch from the switch bezel.
2	Front Seat Lumbar Control Switch TIP: Use a flat-bladed tool to release the switch from the switch bezel.
3	Front Seat Back Cushion Lumbar Control Switch TIP: Use a flat-bladed tool to release the switch from the switch bezel.

PASSENGER SEAT LUMBAR CONTROL SWITCH REPLACEMENT (AQ9)

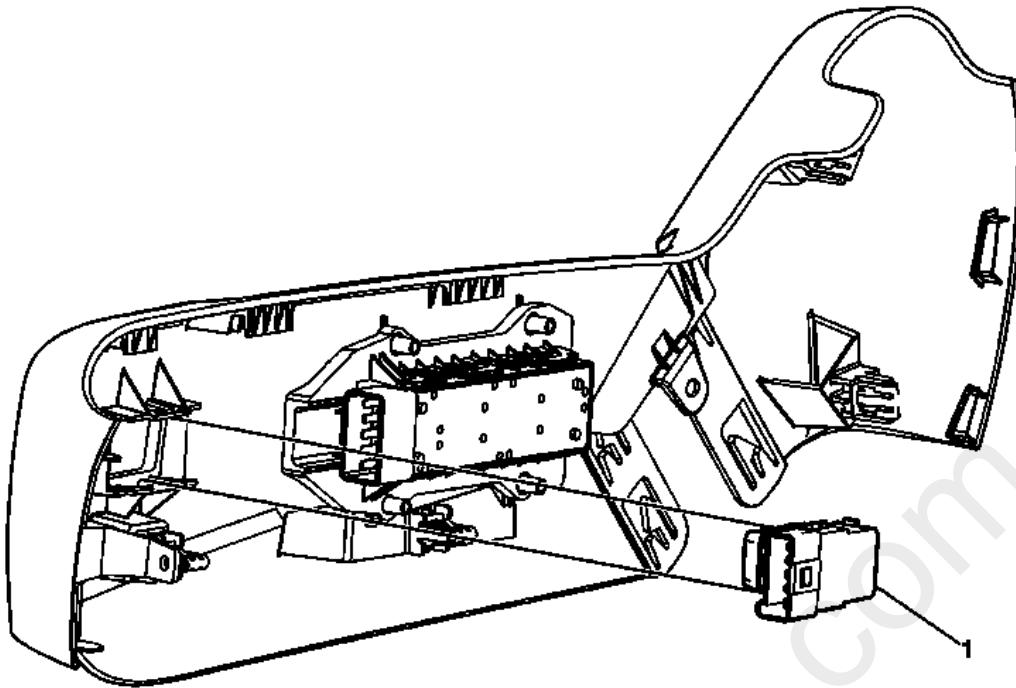


Fig. 28: Passenger Seat Lumbar Control Switch (AQ9)

Courtesy of GENERAL MOTORS COMPANY

Passenger Seat Lumbar Control Switch Replacement (AQ9)

Callout	Component Name
Preliminary Procedure	
Remove the front seat adjuster switch bezel. Refer to <u>Driver or Passenger Seat Adjuster Switch Bezel Replacement (AQ9)</u> .	
1	Driver Seat Lumbar Control Switch TIP: Use a flat-bladed tool to release the switch from the switch bezel.

PASSENGER SEAT LUMBAR CONTROL SWITCH REPLACEMENT (W2E)

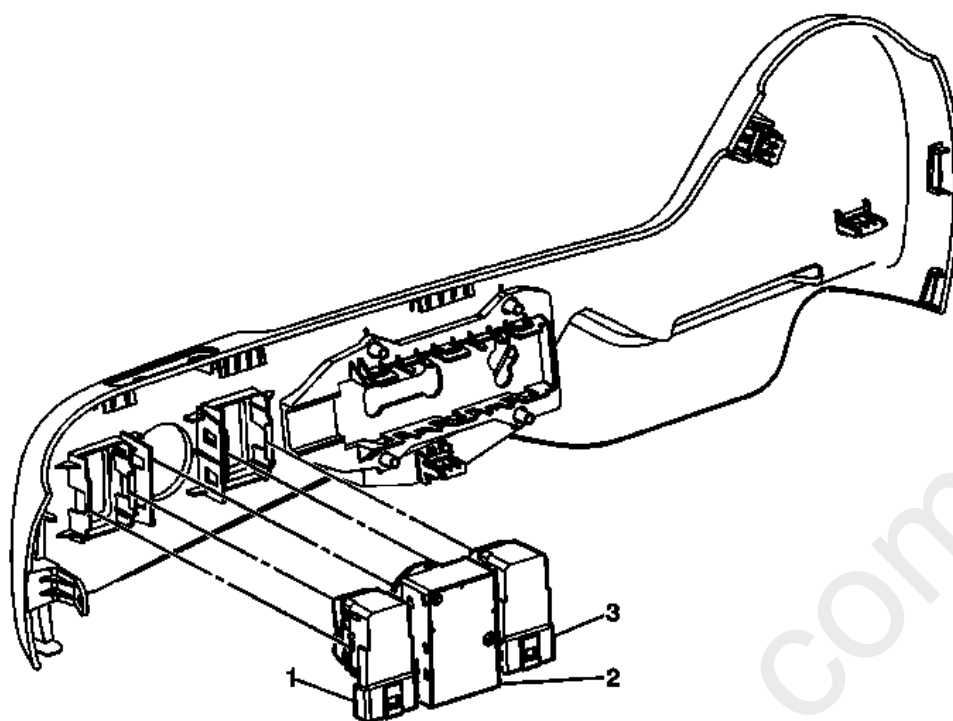


Fig. 29: Passenger Seat Lumbar Control Switch (W2E)

Courtesy of GENERAL MOTORS COMPANY

Passenger Seat Lumbar Control Switch Replacement (W2E)

Callout	Component Name
Preliminary Procedure	
1.	Remove the front seat adjuster switch bezel. Refer to <u>Driver or Passenger Seat Adjuster Switch Bezel Replacement (W2E)</u> .
2.	Remove the front seat adjuster and recliner switch knobs. Refer to <u>Front Seat Adjuster Switch Replacement - Passenger Side (W2E)</u> .
1	Front Seat Cushion Lumbar Control Switch TIP: Use a flat-bladed tool to release the switch from the switch bezel.
2	Front Seat Lumbar Control Switch TIP: Use a flat-bladed tool to release the switch from the switch bezel.
3	Front Seat Back Cushion Lumbar Control Switch TIP: Use a flat-bladed tool to release the switch from the switch bezel.

FRONT SEAT LUMBAR SUPPORT BLADDER REPLACEMENT (W2E)

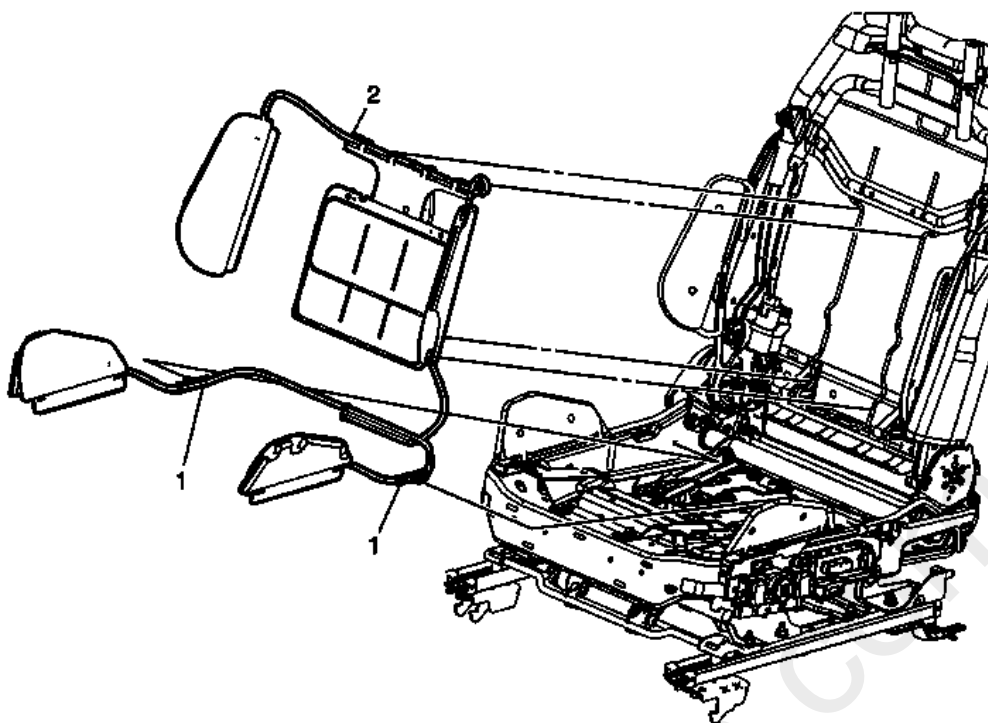


Fig. 30: Identifying Front Seat Lumbar Support Bladder (W2E)

Courtesy of GENERAL MOTORS COMPANY

Front Seat Lumbar Support Bladder Replacement (W2E)

Callout	Component Name
Preliminary Procedure 1. Remove the front seat. Refer to <u>Front Seat Removal and Installation - Bucket (W2E)</u> 2. Remove the front seat cushion cover. Refer to <u>Front Seat Cushion Cover and Pad Replacement (W2E)</u> 3. Disable the SIR system. Refer to <u>SIR Disabling and Enabling</u> 4. Remove the front seat back cushion cover. Refer to <u>Front Seat Back Cushion Cover and Cushion Pad Replacement (W2E)</u>	
1	Front Seat Lumbar Support Bladder Retainer (Qty: 2) Procedure Disengage the seat lumbar bladder push pin retainers from the seat cushion frame.
2	Front Seat Lumbar Support Bladder Procedure 1. Disconnect the front seat electrical connector, and passenger presence system connector, if equipped. 2. Note location and routing of the air hose prior to removal in order to ensure proper reinstallation

3. Disconnect the fan assemblies from the seat back cushion pad.

DRIVER OR PASSENGER SEAT CUSHION AIR PUMP REPLACEMENT (W2E)

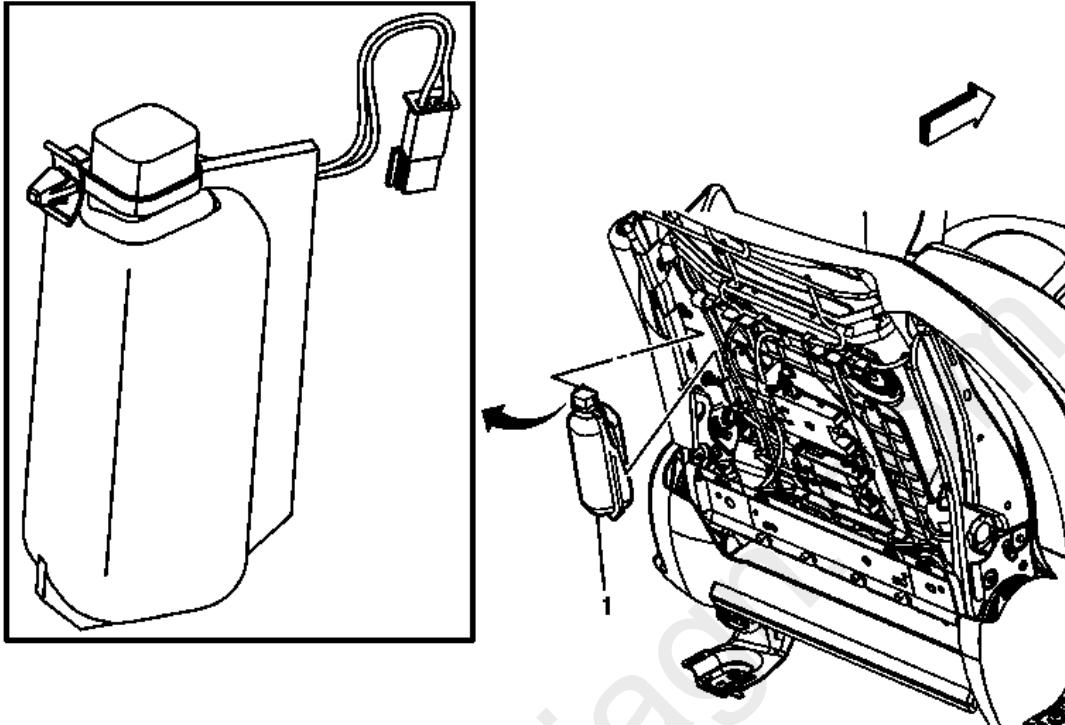


Fig. 31: Identifying Driver Or Passenger Seat Cushion Air Pump (W2E)

Courtesy of GENERAL MOTORS COMPANY

Driver or Passenger Seat Cushion Air Pump Replacement (W2E)

Callout	Component Name
Preliminary Procedure Remove the front seat back cushion finish panel. Refer to Front Seat Back Cushion Finish Panel Replacement (W2E) .	
1	Driver Seat and Passenger Seat Cushion Air Pump Procedure 1. Disconnect electrical connectors as needed. 2. Disconnect air pump hose from lumbar support bladder control valve. 3. Remove the seat cushion air pump.

SEAT LUMBAR SUB SYSTEM REPLACEMENT (AQ9)

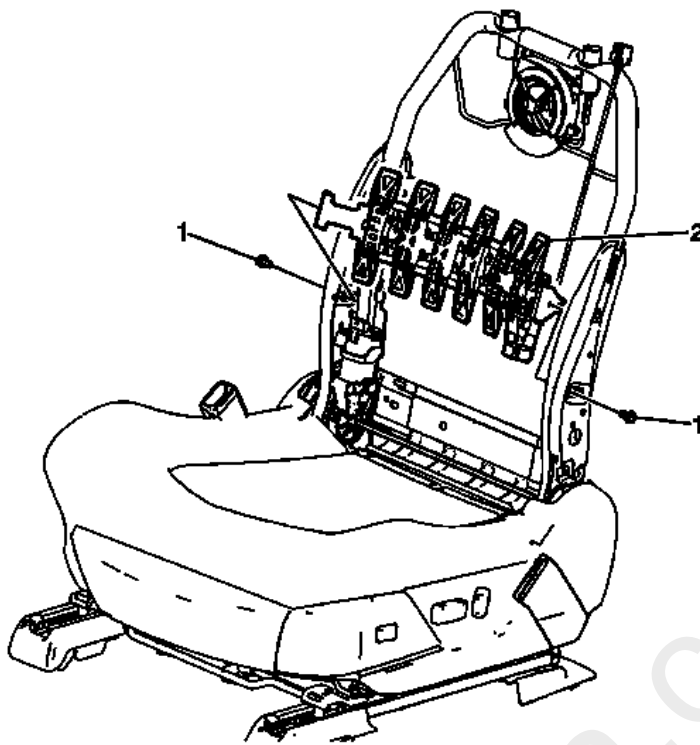


Fig. 32: Seat Lumbar Sub System Replacement
Courtesy of GENERAL MOTORS COMPANY

Seat Lumbar Sub System Replacement (AQ9)

Callout	Component Name
Preliminary Procedure 1. Remove the front seat. Refer to <u>Front Seat Removal and Installation - Bucket (AQ9)</u> . 2. Remove the front seat back cushion latch release handle, if equipped. Refer to <u>Driver or Passenger Seat Back Cushion Latch Release Handle Replacement (Coupe)</u> . 3. Remove the front seat back cushion cover and pad. Refer to <u>Front Seat Back Cushion Cover and Cushion Pad Replacement (AQ9)</u> . 4. Remove the inflatable restraint side impact module. Refer to <u>Front Seat Outboard Seat Back Airbag Replacement (AQ9)</u> .	
1	Front Seat Lumbar Subsystem Bolt (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 9 N.m (80 lb in)
	Front Seat Lumbar Subsystem

2	Procedure 1. Disconnect the electrical connector. 2. Note the routing of the electrical harness for installation.
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SEAT LUMBAR SUB SYSTEM REPLACEMENT (W2E)

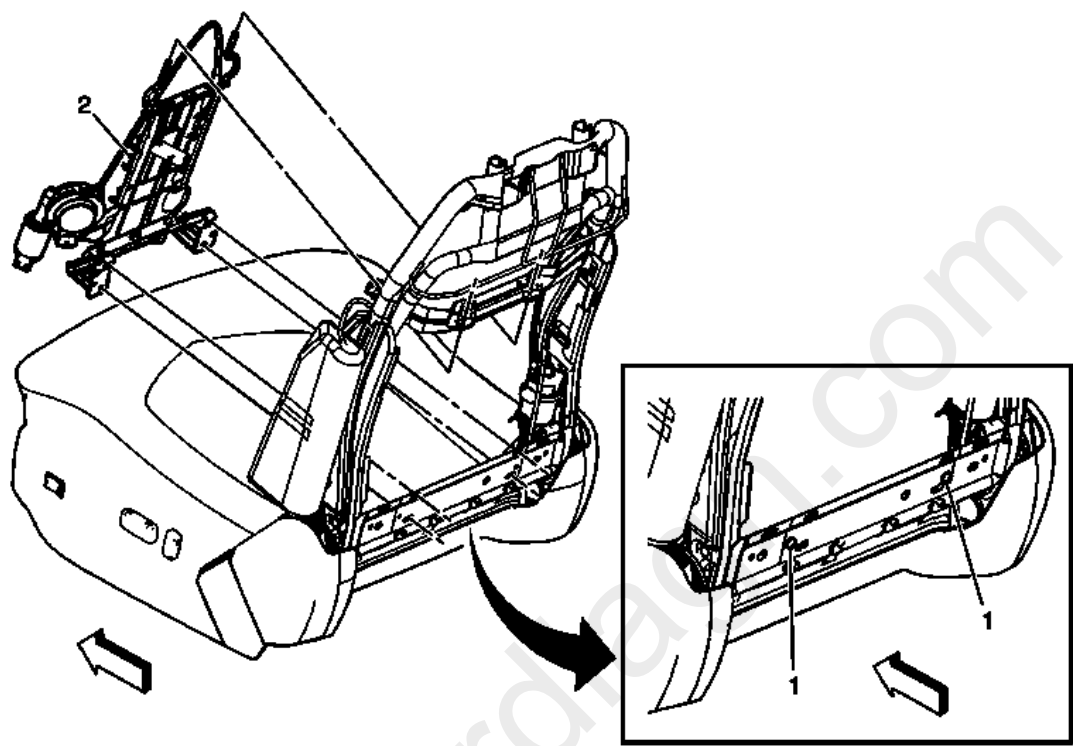


Fig. 33: Identifying Seat Lumbar Sub System (With Active Headrest)
 Courtesy of GENERAL MOTORS COMPANY

Seat Lumbar Sub System Replacement (W2E)

Callout	Component Name
Preliminary Procedure 1. Remove the front seat back cushion latch release handle, if equipped. Refer to <u>Driver or Passenger Seat Back Cushion Latch Release Handle Replacement (Coupe)</u> . 2. Remove the front seat back cushion cover and pad. Refer to <u>Front Seat Back Cushion Cover and Cushion Pad Replacement (W2E)</u> .	
1	Front Seat Lumbar Sub System Rivet (Qty: 2) WARNING: Use the proper eye protection when drilling to prevent metal chips from causing physical injury.

	Procedure Drill out both guide rivets before removing.
2	Front Seat Lumbar Sub System Procedure 1. Disconnect the electrical connector. 2. Note the routing of the electrical harness for installation. 3. Transfer components as necessary. 4. The new lumbar wires would have to be inserted into the guides and then the guides re-riveted at the bottom.

FRONT SEAT RECLINER ACTUATOR MOTOR REPLACEMENT

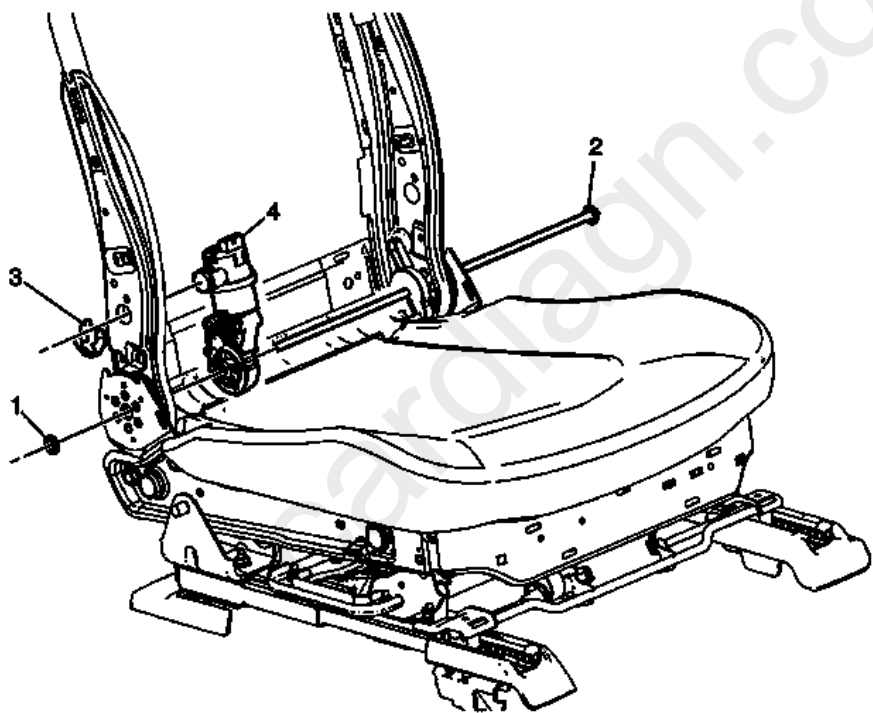


Fig. 34: Front Seat Recliner Actuator Motor
Courtesy of GENERAL MOTORS COMPANY

Front Seat Recliner Actuator Motor Replacement

Callout	Component Name
Preliminary Procedure	
1.	Remove the front seat. Refer to <u>Front Seat Removal and Installation - Bucket (W2E)</u> , <u>Front Seat Removal and Installation - Bucket (AQ9)</u> .

2. Remove the front seat back cushion cover and pad. Refer to <u>Front Seat Back Cushion Cover and Cushion Pad Replacement (AQ9)</u> , <u>Front Seat Back Cushion Cover and Cushion Pad Replacement (W2E)</u> .	
1	Push on Nut TIP: Cut off to remove and replace with new nut.
2	Front Seat Back Cushion Frame Cross Bar Procedure 1. Clamp the lower seat back frame so that the seat back does not move while replacing the recliner actuator. 2. Using a hammer and brass punch tap the bar out far enough to release from the recliner actuator motor.
3	Front Seat Recliner Actuator Retainer Clip
4	Front Seat Recliner Actuator Procedure Disconnect the electrical connector.

DESCRIPTION AND OPERATION

LUMBAR SUPPORT DESCRIPTION AND OPERATION (WITHOUT MEMORY-A45)

Lumbar Support Components

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

- Lumbar switch
- Lumbar horizontal motor
- MSM/RT FRT PWR SEAT Circuit Breaker 25 A

Lumbar Switch

The lumbar switch provides both power and ground to the lumbar motor. Battery positive voltage is supplied at all times to the lumbar adjuster switch from the MSM/RT FRT PWR SEAT Circuit Breaker located in the rear fuse block. Ground for the lumbar adjuster switch is supplied from the G300 ground stake.

Lumbar Horizontal Motor

The lumbar support system consists of a lumbar horizontal motor. The motor contains an electronic circuit breaker (PTC) that will reset only after voltage has been removed from the motor. The lumbar horizontal motor moves the lumbar support forward and rearward.

When the lumbar switch is operated to move the lumbar support rearward, battery positive voltage is applied through the lumbar rearward switch contacts and the lumbar motor rearward control circuit to the lumbar horizontal motor. The motor is grounded through the lumbar forward switch contacts and the lumbar motor forward control circuit to the horizontal motor. The motor runs to drive the lumbar support rearward away from

the occupant's back until the switch is released. Moving the lumbar support forward works similarly to moving the lumbar support rearward, except that battery positive voltage and ground are applied on opposite circuits causing the motor to run in the opposite direction.

LUMBAR SUPPORT DESCRIPTION AND OPERATION (WITH MEMORY-A45)

Lumbar Support Components

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

- Lumbar switch
- Memory seat module (MSM)
- Lumbar horizontal motor
- Lumbar horizontal position sensor
- MSM LOGIC/RF MASSAGE Fuse 10 A

Lumbar Switch

Battery positive voltage is supplied at all times to the driver seat lumbar switch from the memory seat module and the MSM LOGIC/RF MASSAGE Fuse located in the rear fuse block. When the lumbar switches are pressed they send a 12-volt signal to the memory seat module (MSM). The MSM then commands the lumbar motor to move in response to the switch signals.

Motors

The lumbar support system consists of the lumbar horizontal motor. The motor contains a electronic circuit breaker (PTC), which will reset only after voltage has been removed from the motor. The lumbar horizontal motor moves the lumbar support in the forward or rearward directions. The MSM controls the lumbar motor via a half bridge that is connected to a single power rail internal to the module. The MSM connects both lumbar motor outputs on the power rail to a common reference point whenever they are not in operation. This reference point is biased to approximately 2.5 volts. The MSM checks to see if this reference voltage is shorted to ground or battery before enabling any seat or lumbar motor.

Soft stop functions are not used for driver seat motors that are controlled by either a memory or non-memory MSM.

Lumbar Horizontal Movement

When the lumbar switch is operated to move the lumbar support forward, battery positive voltage is applied through the switch contacts and the driver seat lumbar forward switch signal circuit to the memory seat module (MSM). In response to this signal, the MSM applies battery positive voltage through the lumbar motor forward control circuit and ground through the lumbar motor rearward control circuit to the motor. The motor runs to drive the lumbar support forward toward the occupant's back until the switch is released. Moving the lumbar support rearward works similarly to moving the lumbar support forward, except that battery positive voltage and ground are applied on the opposite circuits causing the motor to run in the opposite direction. The MSM also controls the lumbar horizontal motor during memory recall functions.

Lumbar Position Sensors

The lumbar position sensor is a potentiometer which is an internal part of the lumbar motor. The memory seat module (MSM) supplies a 5-volt reference voltage through the 5-volt reference circuit and ground through the low reference circuit to the lumbar position sensor. When the lumbar motor rotates, the resistance of the potentiometer varies changing the feedback voltage of the position sensor signal circuit. This voltage varies from 0.27-4.65 volts. The MSM monitors this voltage signal to determine the lumbar position.

When a memory set command is received, the MSM records the lumbar position by storing the feedback voltage from the position sensor. Then when a memory recall command is received, the MSM moves the motor until the position sensor feedback voltage equals the feedback voltage stored in memory. The lumbar support is not involved in the easy exit function.

Memory Functions

Refer to **Memory Seats Description and Operation**.

MEMORY SEATS DESCRIPTION AND OPERATION

The memory seat system consists of the following components:

- Memory seat module
- Driver door lock/window switch
- Driver seat adjuster switch
- Driver seat lumbar adjuster switch
- Driver memory seat adjuster switch
- Driver rear seat easy entry switch (Coupe)
- Driver seat horizontal motor
- Driver seat front vertical motor
- Driver seat rear vertical motor
- Driver seat recline motor
- Driver seat lumbar horizontal 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
- Driver seat lumbar horizontal motor position sensor
- Passenger rear seat easy entry switch (Coupe)
- Passenger seat horizontal motor (Coupe)
- Passenger seat horizontal motor position sensor (Coupe)

Memory Recall Option

The memory seat module (MSM) cannot perform Memory Seat Recall and Easy Exit functions unless these options are activated in the driver information center (DIC), refer to the Owner's Manual. The DIC reports the memory recall option setting to the MSM, as well as other receiving modules, via GMLAN message each time the ignition switch is cycled to the ON position. The MSM 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 MSM will not change until the memory recall option setting in the DIC is changed and the ignition switch is cycled to the ON position.

Power Seat and Lumbar Switches

Battery positive voltage is supplied at all times to the driver seat adjuster switch and lumbar adjuster switch from the MSM and a 10 A fuse located in the rear fuse block. When the driver seat or lumbar adjuster switches are pressed, battery voltage is applied through the switch signal circuit to the MSM. The MSM then commands the appropriate driver seat motor to move in response to the switch signal.

MSM Power and Grounds

Battery positive voltage is supplied at all times to the MSM through a 25 A circuit breaker located in the rear fuse block. This voltage is used by the MSM to apply power to the driver seat, lumbar, and steering wheel and column motors when commanded ON. Battery positive voltage is also applied at all times to the MSM through a 10 A fuse also located in the rear fuse block. This voltage is used to power up MSM and to supply voltage to the seat and lumbar adjuster switches. Ground is provided to the MSM through two separate ground circuits that are connected to a common ground.

MSM Controlled Motors

The MSM controls all seat, lumbar, and steering wheel and column motors via half bridges that are connected to a single power rail internal to the module. The MSM connects all motor outputs on the power rail to a common reference point whenever they are not in operation. This reference point is biased to approximately 2.5 V. The MSM checks to see if this reference voltage is shorted to ground or voltage before enabling any seat, lumbar, or steering wheel and column 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 MSM controlled motors are reversible. For example, when a seat switch is pressed to move the entire seat forward, battery voltage is applied through the switch contacts and seat horizontal forward switch signal circuit to the MSM. In response to this signal, the MSM 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

The position sensors are potentiometers which are either attached directly to the motor transmission cable or are an internal part of the motor. The MSM supplies a 5 V reference through the 5 V reference circuit and ground through the sensor low reference circuit to the respective seat, lumbar, and steering and column position sensors. For more information regarding the steering wheel and column, refer to **Steering Wheel and Column Description and Operation** . When the motor or cable rotates, the resistance of the potentiometer varies

changing the feedback voltage of the position sensor signal circuit. The voltage varies from 0.22 - 4.75 V. The MSM monitors this voltage signal to determine the position of the seat. When a memory set command is received, the MSM records the seat position by storing the feedback voltage from each position sensor. Then when a memory recall command is received, the MSM moves the motors until the position sensor feedback voltages equals the feedback voltages stored in memory.

Memory Functions

Battery voltage is supplied at all times to the driver memory seat adjuster switch from the driver door lock/window switch that is located on the driver door panel. When a memory button is pressed, battery voltage is applied through the switch contacts, a series of resistors, and the memory recall switch signal circuit to the driver door lock/window switch. In response to this signal, the driver door lock/window switch sends a serial data message to the MSM indicating the memory request.

Memory positions may be recorded for 2 different drivers. To record a position, adjust the driver's seat, lumbar support, and steering wheel and column to the desired position. Press and hold the memory 1 button until two beeps sound indicating that the position has been stored to memory. A second memory position may be programmed by repeating the above steps and pressing button 2, for driver 2. When the MSM receives a memory set message, it records the feedback voltages from the seat, lumbar, and adjustable pedals position sensors for the appropriate driver.

When a memory recall button is pressed, a single beep will sound to acknowledge the command has been received. The MSM will then move the appropriate seat, lumbar, and steering wheel and column until the position sensor feedback voltages equal the feedback voltages stored in memory for the identified driver.

Memory recall operation is disabled if the shift lever is out of NEUTRAL (N) or PARK (P). The memory seat module receives the transmission selector position data via the GMLAN Serial Data circuit.

Easy Exit

If the EASY EXIT SEAT function is activated in the DIC as mentioned above, the driver seat will automatically move rearward approximately 3 inches when the key is removed from the ignition. If desired, the seat may be moved further by pressing the EXIT button. The seat will move approximately 3 inches each time the EXIT button is pressed until it reaches its end of travel. When the EXIT button is pressed, a single beep will sound to acknowledge the command. The Easy Exit incremental movement distance cannot be adjusted; it is pre-programmed at the factory.

Easy Entry Seat - Coupe Only

NOTE: The passenger seat block diagram is identical to the driver seat.

Rear Seat Easy Entry Block Diagram

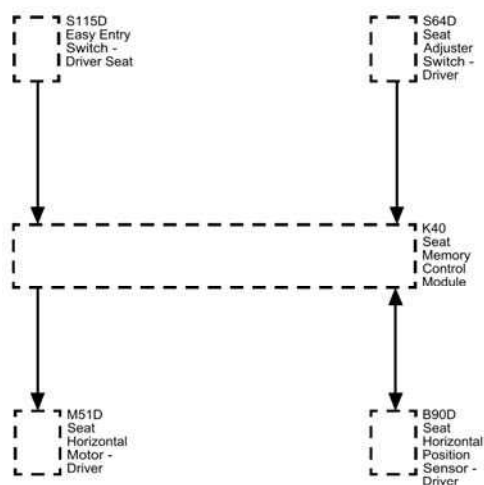


Fig. 35: Rear Seat Easy Entry Block Diagram
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
S115D	Easy Entry Switch - Driver Seat
S64D	S64D Seat Adjuster Switch - Driver
K40	K40 Seat Memory Control Module
M51D	M51D Seat Horizontal Motor - Driver
B90D	B90D Seat Horizontal Position Sensor - Driver

The easy entry seat system is available on the coupe only. The system consists of driver and passenger rear seat easy entry switches, seat horizontal motor, and the memory seat module (MSM). The rear seat easy entry switches are located in the bezel of the seat back cushion release handle. Battery voltage is supplied at all times to the easy entry switches through a 2 A fuse located in the rear fuse block.

The rear seat easy entry switch signal circuits are discrete inputs to the MSM. Using the driver rear seat easy entry switch to move the entire seat forward and rearward functions the same as using the driver seat adjuster switch. For the circuit description of the seat horizontal operation, refer to MSM Controlled Motors above.

The front passenger seat is a non-memory seat, however with the rear seat easy entry system the seat horizontal

motor is controlled by the MSM. The seat can be moved forward or rearward using either the passenger rear seat easy entry switch or the seat adjuster switch. For the circuit description of the seat horizontal operation, refer to MSM Controlled Motors above.

Recall Personalization

Refer to the owners manual for the following memory personalization options:

- Recall upon receipt of the RKE message
- Recall upon receipt of the remote start feature
- Easy exit
- Factory settings

Memory Inhibit/Enable

The MSM receives the ignition switch signal and the gear selector position via GMLAN messages. When the ignition switch is in the OFF position, memory record, memory recall, personalization recall, and exit recall functions are all allowed. When the ignition switch is in the ON position and the gear selector is in the PARK position, only the recall personalization function is deactivated and all other memory functions are allowed. When the ignition switch is in the ON position and the gear selector is out of the PARK position, only memory record is allowed, all other memory seat functions are not allowed.

POWER SEATS SYSTEM DESCRIPTION AND OPERATION

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

- Seat Adjuster Switch
- Seat Horizontal Motor
- Seat Front Vertical Motor
- Seat Rear Vertical Motor
- Seat Recline Motor
- MSM/LT FRT PWR SEAT Circuit Breaker 25 A
- MSM/RT FRT PWR SEAT Circuit Breaker 25 A

Seat Adjuster Switch

Battery positive voltage is supplied at all times to the driver and front passenger seat adjuster switches from their respective Circuit Breakers that are located in the rear fuse block. Both seat adjuster switches are grounded through the switch ground circuit and G 300. The seat adjuster switches provide both power and ground to the selected seat motors.

Motors

All of the seat motors operate independently of each other. Each motor contains an electronic circuit breaker (PTC) that will reset only after voltage has been removed from the motor. There are four seat position motors. These are the horizontal motor, front vertical motor, rear vertical motor, and the seat back recline motor. The

horizontal motor moves the entire seat forward and rearward. Both vertical motors run simultaneously when the seat switch is operated to move the entire seat up and down. Or they can be selected independently to vertically tilt the front or rear of the seat up and down. The recline motor moves the angle seat back forward and rearward.

Horizontal

When the seat switch is operated to move the entire seat forward, battery positive voltage is applied through the horizontal motor forward switch contacts and the horizontal motor forward control circuit to the motor. The motor is grounded through the horizontal motor rearward switch contacts and the horizontal motor rearward control circuit to the motor. 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 positive voltage and ground are applied on opposite circuits causing the motor to run in the opposite direction.

Rear Vertical

When the seat switch is operated to tilt the rear of the seat up, battery positive voltage is applied through the rear vertical motor up switch contacts and the rear vertical motor up control circuit to the rear vertical motor. The motor is grounded through the rear vertical motor down switch contacts and the rear vertical motor down control circuit to the rear vertical motor. The motor runs in order to drive the rear of the seat up until the switch is released. Tilting the rear of the seat down works similarly to tilting the rear of the seat up, except that battery positive voltage and ground are applied on opposite circuits causing the motor to run in the opposite direction.

Front Vertical

When the seat switch is operated to tilt the front of the seat up, battery positive voltage is applied through the front vertical motor up switch contacts and the front vertical motor up control circuit to the front vertical motor. The motor is grounded through the front vertical motor down switch contacts and the front vertical motor down control circuit to the front vertical motor. The motor runs in order to drive the front of the seat up until the switch is released. Tilting the front of the seat down works similarly to tilting the front of the seat up, except that battery positive voltage and ground are applied on opposite circuits causing the motor to run in the opposite direction.

Entire Seat Up or Down

When the seat switch is operated in order to move the entire seat to the up position, battery positive voltage is simultaneously applied through the front and rear vertical motor up switch contacts and the front and rear vertical motor up control circuits to both vertical motors. The motors are grounded through the front and rear vertical motor down switch contacts and the front and rear vertical motor down control circuits to both vertical motors. Both motors run simultaneously in order to drive the entire seat up until the switch is released. Moving the entire seat down works similarly to moving the entire seat up, except that battery positive voltage and ground are applied on the opposite circuits causing the motors to run in the opposite direction.

Recline

When the seat recline switch is operated to move the seat back forward, battery positive voltage is applied through the recline motor forward switch contacts and the recline motor forward control circuit to the recline motor. The motor is grounded through the recline motor rearward switch contacts and the recline motor rearward control circuit to the recline motor. The motor runs in order to move the seat back forward until the

switch is released. Moving the seat back rearward works similarly to moving the seat back forward, except that battery positive voltage and ground are applied on the opposite circuits causing the motor to run in the opposite direction.

SEAT SIDE BOLSTER DESCRIPTION AND OPERATION

Seat Side Bolster Components

The driver and front passenger seat side bolster support system each consist of the following components:

- Seat back side bolster adjuster switch
- Seat cushion side bolster adjuster switch
- Seat side bolster adjuster valve assembly
- Seat lumbar/bolster pump

NOTE: **The passenger seat block diagram is identical to the driver seat.**

Lumbar Block Diagram

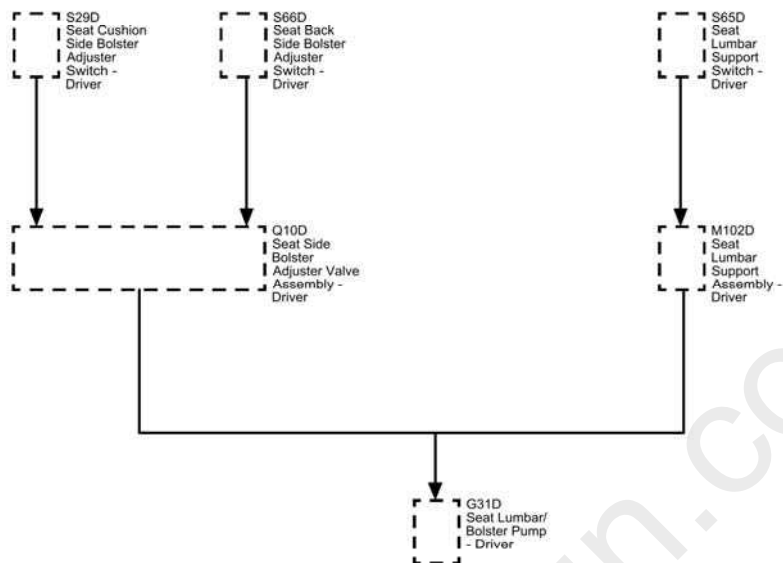


Fig. 36: Lumbar Block Diagram
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
S29D	S29D Seat Cushion Side Bolster Adjuster Switch - Driver
S66D	S66D Seat Back Side Bolster Adjuster Switch - Driver
S65D	S65D Seat Lumbar Support Switch - Driver
Q10D	Q10D Seat Side Bolster Adjuster Valve Assembly - Driver
M102D	Seat Lumbar Support Assembly - Driver
G31D	G31D Seat Lumbar/Bolster Pump - Driver

Battery voltage is supplied at all times to the driver and passenger seat lumbar adjuster switches through 25 A

circuit breakers located in the rear body fuse block. When a lumbar switch is pressed to inflate the seat cushion or seat back side bolsters, battery voltage is applied through the switch contacts and the inflate signal circuit to the seat bolster control valve. In response to this signal, the bolster control valve 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 appropriate bolster bladders until the switch is released. When the switch is pressed to deflate the side bolsters, battery voltage is applied through the switch contacts and the deflate signal circuit to the bolster control valve. The valve energizes its internal deflate solenoid and air is released from the bladder until the switch is released. Ground for the bolster valve and the seat lumbar/bolster pump is supplied at G200 for the driver seat and G201 for the passenger seat.

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