

2017 ACCESSORIES & EQUIPMENT

Power Seats - Encore, Trax

SPECIFICATIONS

FASTENER SPECIFICATIONS

Reusable Threaded Fastener Tightening Specifications

NOTE:

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

Application	Specification
	Metric (English)
Driver or Passenger Seat Vertical Adjuster Actuator Bolt	20 N.m (15 lb ft)
Driver or Passenger Seat Vertical Adjuster Actuator Fastener	8 N.m (71 lb in)
Front Seat Tilt Adjuster Actuator Fastener	8 N.m (71 lb in)

SCHEMATIC WIRING DIAGRAMS

DRIVER SEAT WIRING SCHEMATICS (BUICK)

Power Seat (Buick without AAG)

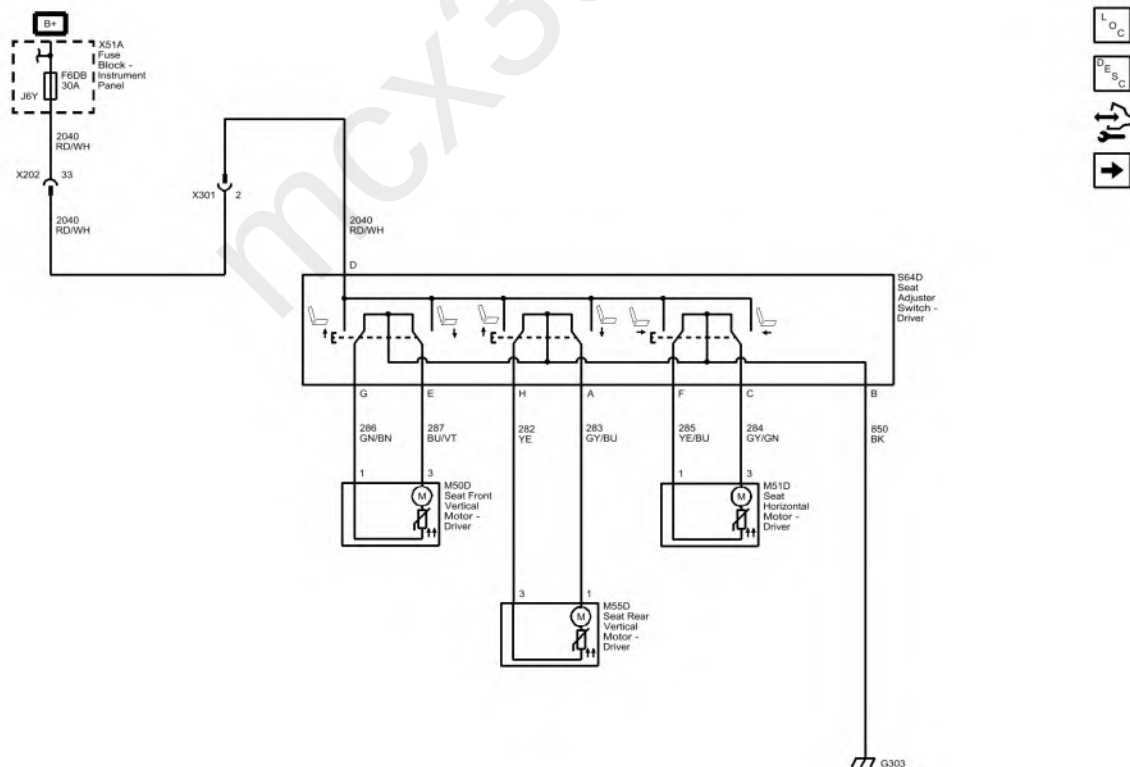


Fig.1: Power Seat (Buick without AAG)

Courtesy of GENERAL MOTORS COMPANY

Power Lumbar (Buick)

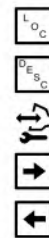
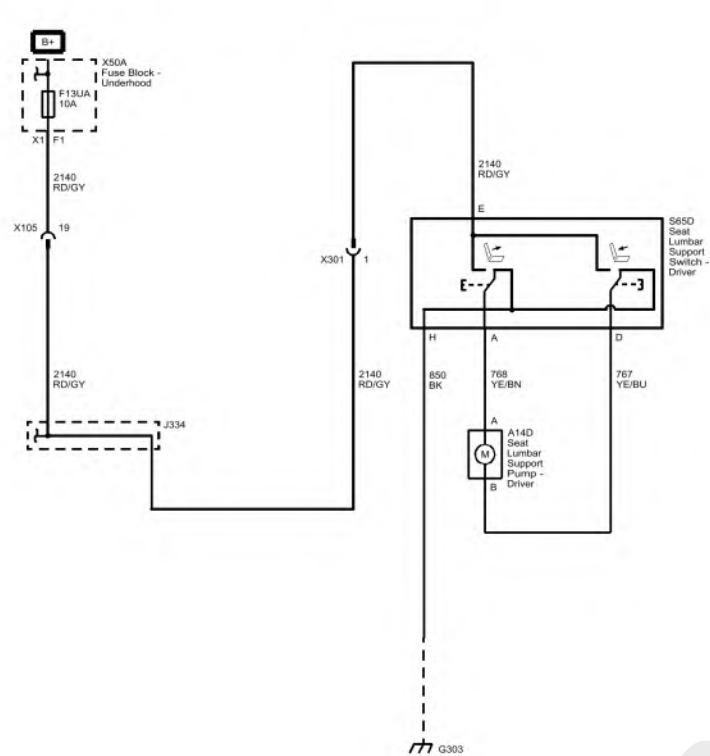


Fig. 2: Power Lumbar (Buick)
Courtesy of GENERAL MOTORS COMPANY

Module Power, Ground, Serial Data, and Memory Controls (Buick with AAG)

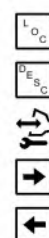
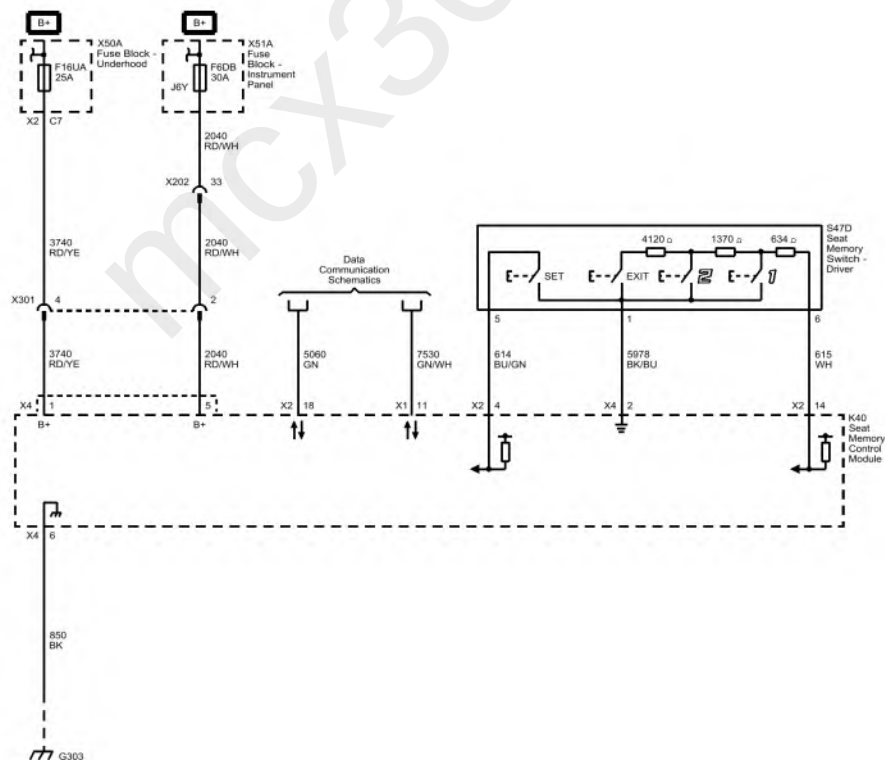


Fig. 3: Module Power, Ground, Serial Data, and Memory Controls (Buick with AAG)
Courtesy of GENERAL MOTORS COMPANY

Seat Adjuster Switch and Position Motors (Buick with AAG)

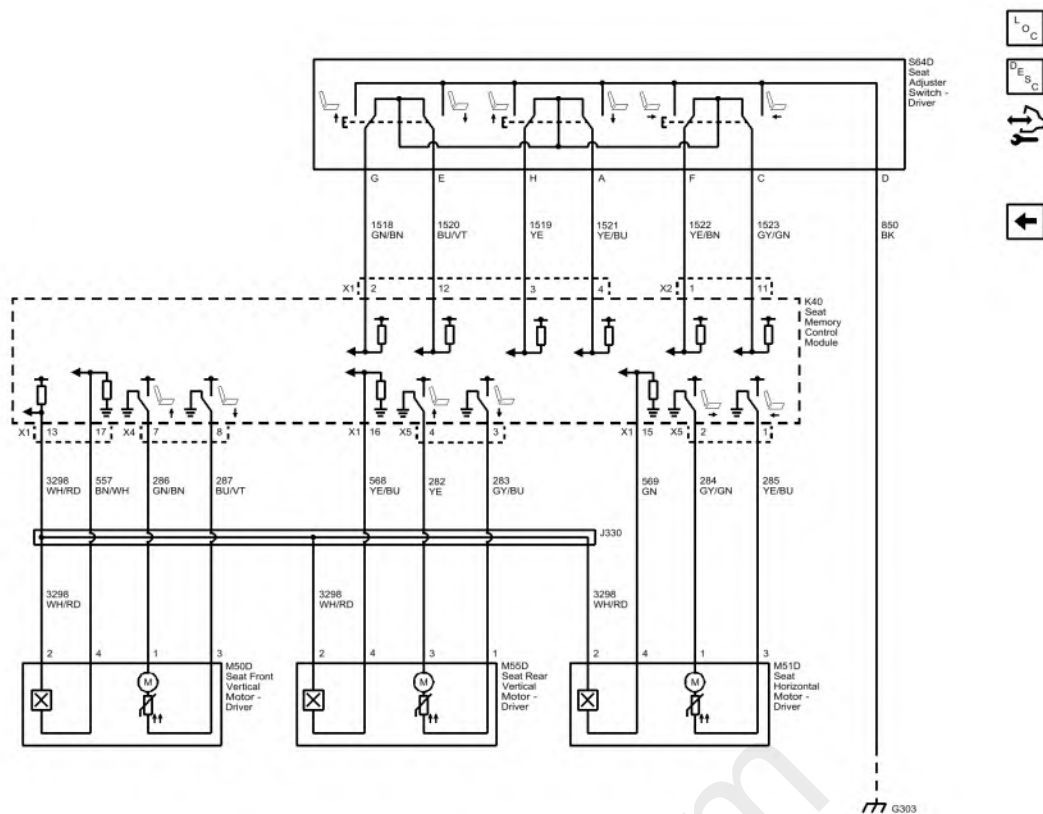


Fig. 4: Seat Adjuster Switch and Position Motors (Buick with AAG)
Courtesy of GENERAL MOTORS COMPANY

DRIVER SEAT WIRING SCHEMATICS (CHEVROLET)

6-Way Power Driver Seat (Chevrolet with AG9)

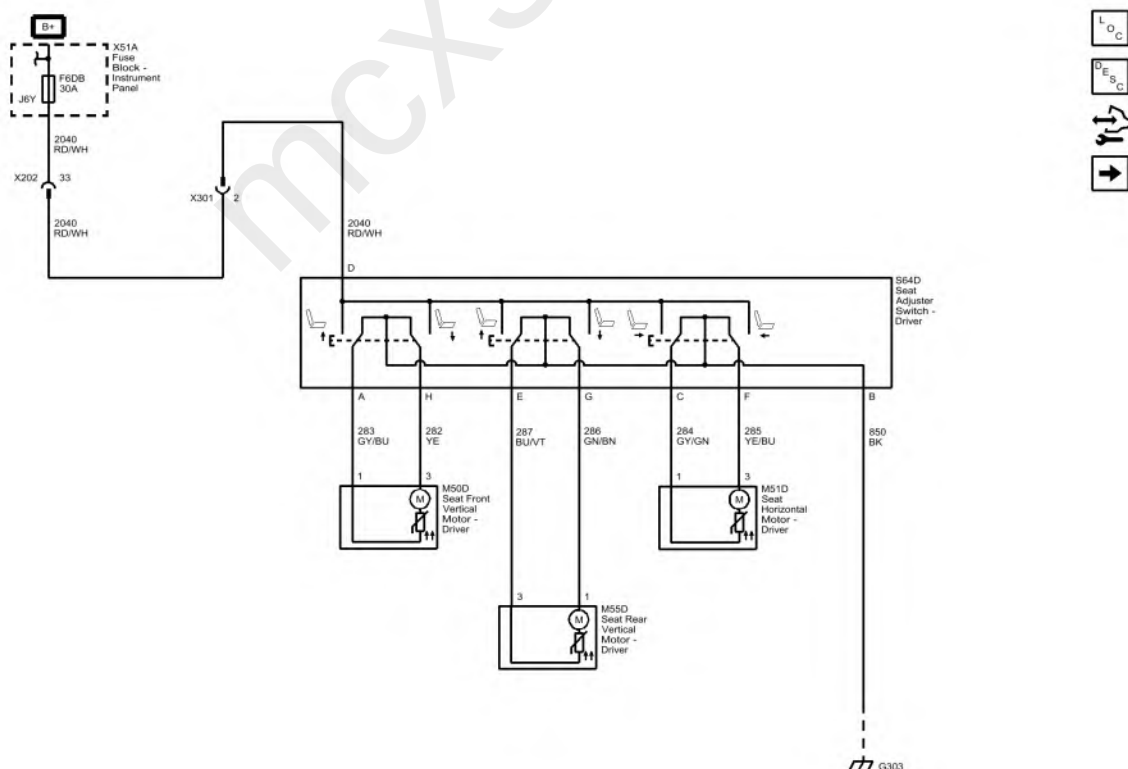


Fig. 5: 6-Way Power Driver Seat (Chevrolet with AG9)
Courtesy of GENERAL MOTORS COMPANY

Power Lumbar Driver Seat (Chevrolet)

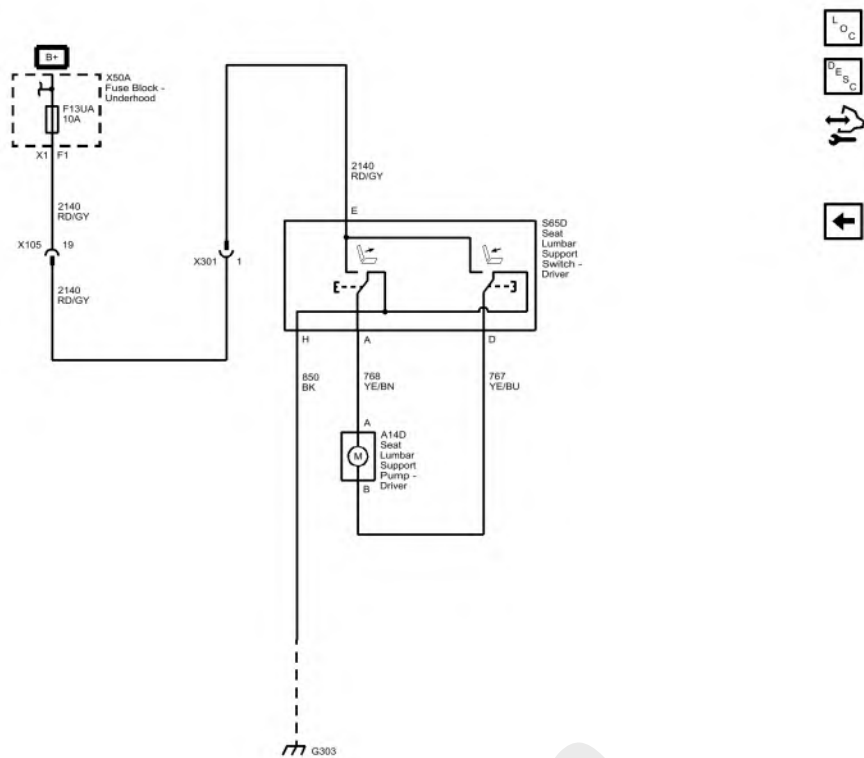


Fig. 6: Power Lumbar Driver Seat (Chevrolet)
Courtesy of GENERAL MOTORS COMPANY

PASSENGER SEAT WIRING SCHEMATICS (BUICK)

Power Seat (Buick with AQ5)

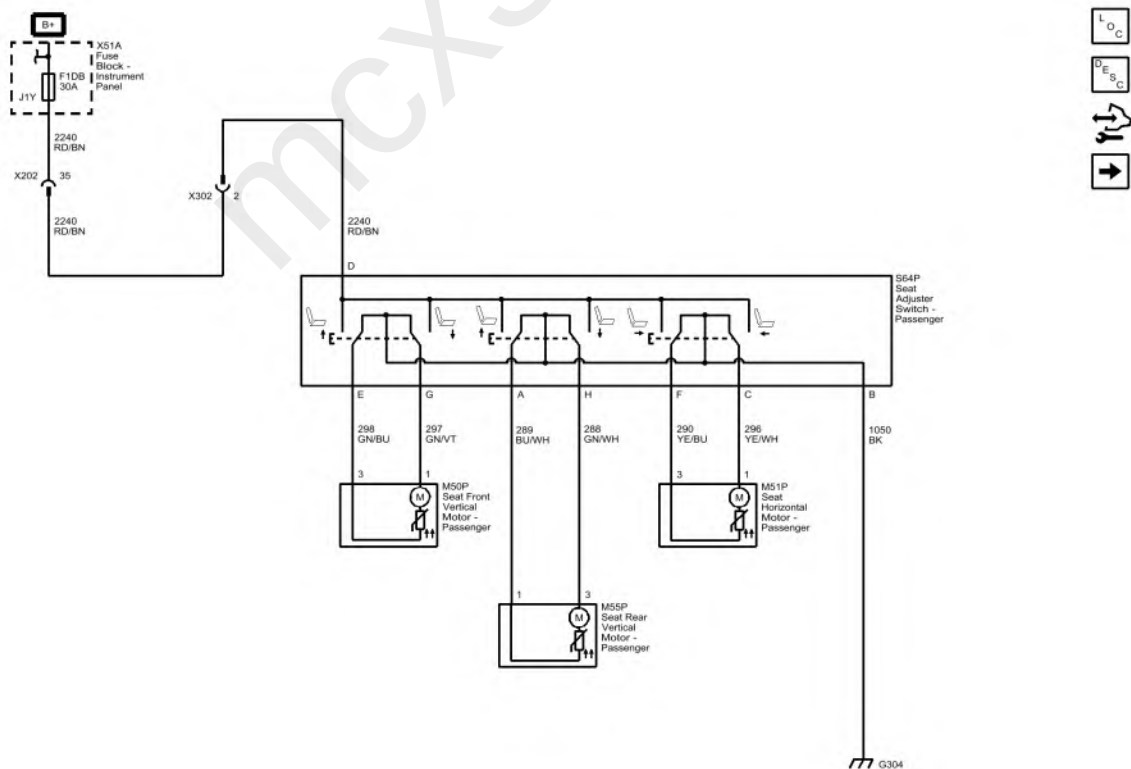


Fig. 7: Power Seat (Buick with AQ5)
Courtesy of GENERAL MOTORS COMPANY

Power Lumbar (Buick with AQ5)

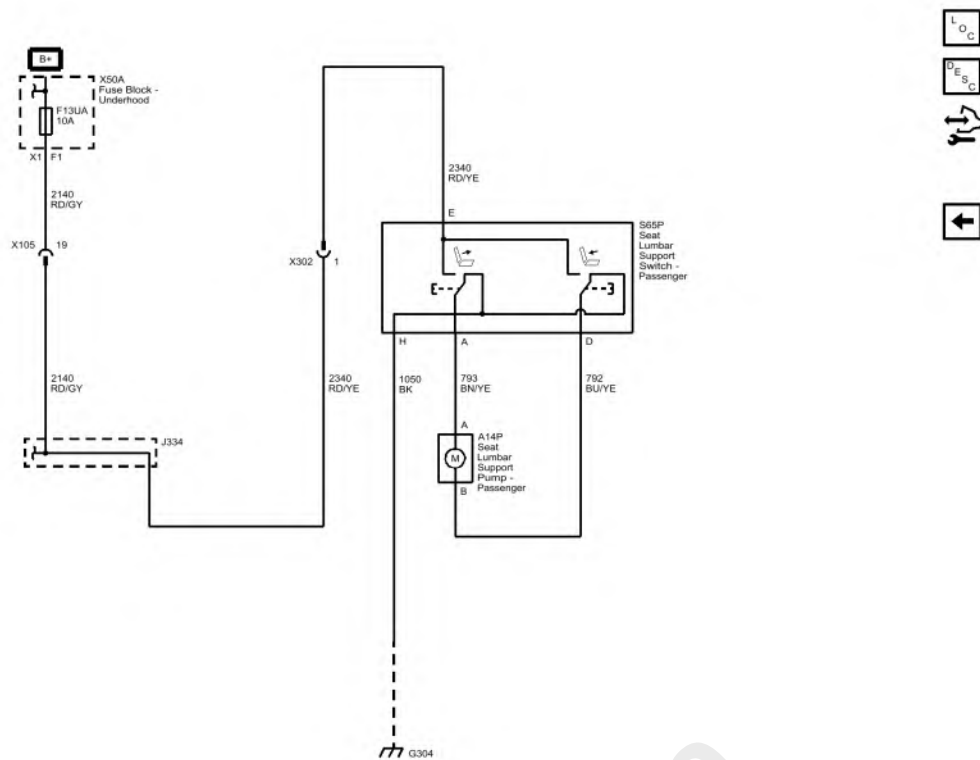


Fig. 8: Power Lumbar (Buick with AQ5)
Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC INFORMATION AND PROCEDURES

DTC B1735, B1740, B1745, B1750, B1755, B1760, B1815, OR B1820: DRIVER SEAT SWITCHES

Diagnostic Instructions

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

DTC Descriptors

DTC B1735 02

Driver Seat Front Up Switch Circuit Short to Ground

DTC B1740 02

Driver Seat Front Down Switch Circuit Short to Ground

DTC B1745 02

Driver Seat Rear Up Switch Circuit Short to Ground

DTC B1750 02

Driver Seat Rear Down Switch Circuit Short to Ground

DTC B1755 02

Driver Seat Assembly Forward Switch Circuit Short to Ground

DTC B1760 02

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Front Vertical Up Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02	1	-	-
Front Vertical Down Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02	1	-	-
Rear Vertical Up Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02	1	-	-
Rear Vertical Down Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02	1	-	-
Horizontal Forward Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02	1	-	-
Horizontal Rearward Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02	1	-	-
1. Power seat inoperative				

Circuit/System Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

- If a seat switch circuit is active in one direction and the switch for the opposite direction is pressed, this DTC will set.

- A short to ground on a switch signal circuit.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Diagnostic Aids

- If one of the switch signal circuits is shorted to ground, multiple 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 (Buick) Driver Seat Schematics (Chevrolet)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX (ENCORE) COMPONENT CONNECTOR END VIEWS - INDEX (TRAX)

Description and Operation

Memory Seats Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

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

Refer to Circuit/System Testing.

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

1. Ignition OFF, disconnect the harness connector at the S64D Seat Adjuster Switch - Driver, Ignition ON.
2. Verify that all scan tool driver seat switch parameters listed below are Inactive:
 - Driver Seat Cushion Front Vertical Switch
 - Driver Seat Cushion Rear Vertical Switch
 - Driver Seat Horizontal Switch
 - **If not Inactive**
 1. Ignition OFF, disconnect the harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between the appropriate signal circuit terminal listed below and ground:
 - Front vertical up switch terminal G
 - Front vertical down switch terminal E
 - Rear vertical up switch terminal H
 - Rear vertical down switch terminal A
 - Horizontal forward switch terminal F
 - Horizontal rearward switch terminal C
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K40 Seat Memory Control Module.
 - **If Inactive**
3. Install a 3 A fused jumper wire between the appropriate signal circuit terminal listed below and the ground circuit terminal D.
 - Front vertical up switch terminal G
 - Front vertical down switch terminal E
 - Rear vertical up switch terminal H
 - Rear vertical down switch terminal A
 - Horizontal forward switch terminal F
 - Horizontal rearward switch terminal C
4. Verify the scan tool seat switch parameter is Forward/Rearward or UP/Down.
 - **If not Forward/Rearward or UP/Down**
 1. Ignition OFF, disconnect the harness connector at the K40 Seat Memory Control Module, ignition ON.
 2. Test for less than 1 V between the signal circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Ignition OFF.
 4. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40 Seat Memory Control Module.
 - **If Forward/Rearward or UP/Down**
5. Test or replace the S64D Seat Adjuster Switch - Driver.

Component Testing

Seat Adjuster Switch Test

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

Replace the Seat Adjuster Switch - Driver.

- **If infinite resistance**

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

- **If 2 Ω or greater**

Replace the Seat Adjuster Switch - Driver.

- **If less than 2 Ω**

4. All OK.

Repair Instructions

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

- [Driver or Passenger Seat Adjuster Switch Replacement](#)
- [Control Module References](#) for K40 Seat Memory Control Module replacement, programming and setup

DTC B1825, B2355, B2365, OR B2375: DRIVER 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 B2355 01

Driver Seat Front Vertical Position Sensor Circuit Short to Battery

DTC B2355 06

Driver Seat Front Vertical Position Sensor Circuit Low Voltage/Open

DTC B2365 01

Driver Seat Rear Vertical Position Sensor Circuit Short to Battery

DTC B2365 06

Driver Seat Rear Vertical Position Sensor Circuit Low Voltage/Open

DTC B2375 01

Driver Seat Assembly Horizontal Position Sensor Circuit Short to Battery

DTC B2375 06

Driver Seat Assembly Horizontal Position Sensor Circuit Low Voltage/Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
12 V Reference	B2355 06, B2365 06, B2375 06	B2355 06, B2365 06, B2375 06	-	-
Driver Seat Front Vertical Position Sensor Signal	B2355 06	B2355 06	B2355 01	-

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

Circuit Description

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

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

B2355 01, B2365 01, or B2375 01

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

B2355 06, B2365 06, or B2375 06

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

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Driver Seat Schematics (Buick)**Driver Seat Schematics (Chevrolet)**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX (ENCORE)**COMPONENT CONNECTOR END VIEWS - INDEX (TRAX)**

Description and Operation

Memory Seats Description and Operation

Electrical Information Reference

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

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate driver seat motor listed below for which the DTC set:
 - M50D Seat Front Vertical Motor - Driver
 - M55D Seat Rear Vertical Motor - Driver
 - M51D Seat Horizontal Motor - Driver
2. Ignition ON.
3. Test for greater than 10.8 V between the 12 V reference circuit terminal 2 and ground.
 - **If 10.8 V or less**
 1. Ignition OFF, disconnect the X1 harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between the 12 V reference circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the 12 V reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40 Seat Memory Control Module.
 - **If greater than 10.8 V**
4. Test for 0.2-2.0 V between the signal circuit terminal 4 and ground.
 - **If less than 0.2 V**
 1. Ignition OFF, disconnect the X1 harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40 Seat Memory Control Module.
 - **If greater than 2.0 V**
 1. Ignition OFF, disconnect the X1 harness connector at the K40 Seat Memory Control Module, ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K40 Seat Memory Control Module.
 - **If between 0.2-2.0 V**
5. Test or replace the seat motor.

Repair Instructions

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

- [Front Seat Tilt Adjuster Actuator Replacement](#)
- [Driver or Passenger Seat Vertical Adjuster Actuator Replacement](#)
- [Front Seat Adjuster Actuator Replacement](#)
- [Control Module References](#) for K40 Seat Memory Control Module replacement, programming and setup

DTC B3920: DRIVER SEAT MOTORS GROUP

Diagnostic Instructions

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

DTC Descriptors

DTC B3920 00

Driver Seat Motors Group 1 Common Circuit Malfunction

DTC B3920 01

Driver Seat Motors Group 1 Common Circuit Short to Battery

DTC B3920 02

Driver Seat Motors Group 1 Common Circuit Short to Ground

DTC B3920 42

Driver Seat Motors Group 1 Common Circuit Calibration Not Programmed

DTC B3920 0B

Driver Seat Motors Group 1 Common Circuit High Current

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Driver Seat Front Vertical Motor Down Control	B3920 02	B3920 0B	1	B3920 01	B3920 42
Driver Seat Front Vertical Motor Up Control	B3920 02	B3920 0B	1	B3920 01	B3920 42
Driver Seat Rear Vertical Motor Down Control	B3920 02	B3920 0B	1	B3920 01	B3920 42
Driver Seat Rear Vertical Motor Up Control	B3920 02	B3920 0B	1	B3920 01	B3920 42
Driver Seat Horizontal Motor Forward Control	B3920 02	B3920 0B	1	B3920 01	B3920 42
Driver Seat Horizontal Motor Rearward Control	B3920 02	B3920 0B	1	B3920 01	B3920 42
1. Power seat motor inoperative					

Circuit/System Description

The seat memory control module controls the seat motors via half bridges that are connected to power rails internal to the module. The seat memory control module connects all of the motor control circuits on each power rail to a common reference point whenever they are not in operation. This reference point is biased to approximately 2.5 V. The seat memory control module checks to see if this reference voltage is shorted to ground or battery before enabling any seat motor.

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

Conditions for Running the DTC

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

Conditions for Setting the DTC

B3920 00

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

B3920 01

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

B3920 02

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

B3920 42

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

B3920 0B

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

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Driver Seat Schematics (Buick) Driver Seat Schematics (Chevrolet)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX (ENCORE) COMPONENT CONNECTOR END VIEWS - INDEX (TRAX)

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 X4 and X5 harness connectors at the K40 Seat Memory Control Module.
2. Test for infinite resistance between the control circuit terminals listed below and ground:
 - Front vertical motor up control terminal 7 X4
 - Front vertical motor down control terminal 8 X4
 - Rear vertical motor up control terminal 4 X5
 - Rear vertical motor down control terminal 3 X5
 - Horizontal motor forward control terminal 2 X5
 - Horizontal motor rearward control terminal 1 X5
 - **If less than infinite resistance**

Repair the short to ground on the circuit.
 - **If infinite resistance**
3. Ignition ON.
4. Test for less than 1 V between the control circuit terminals listed below and ground:
 - Front vertical motor up control terminal 7 X4
 - Front vertical motor down control terminal 8 X4
 - Rear vertical motor up control terminal 4 X5
 - Rear vertical motor down control terminal 3 X5
 - Horizontal motor forward control terminal 2 X5
 - Horizontal motor rearward control terminal 1 X5
 - **If 1 V or greater**

Repair the short to voltage on the circuit.
 - **If less than 1 V**
5. Replace the K40 Seat Memory Control Module.

B3920 00 or B3920 0B

1. Ignition ON.
2. Clear the current and history DTC.
3. Determine which motor set this DTC by operating the driver seat motors listed below one at a time in both directions. Check for the DTC to set between each motor test.
 - M50D Seat Front Vertical Motor - Driver
 - M55D Seat Rear Vertical Motor - Driver
 - M51D Seat Horizontal Motor - Driver

4. Ignition OFF, disconnect the harness connector at the seat motor for which the DTC set, ignition ON.
5. Clear the DTC.
6. Verify that DTC B3920 00 or B3920 0B does not set while operating the seat motor adjuster switch in both directions.
 - **If DTC B3920 00 or B3920 0B sets**
 1. Test for infinite resistance between control circuit terminal 1 and control circuit terminal 3.
 - If less than infinite resistance, repair the short between the circuits.
 - If infinite resistance
 2. Test for less than 2 Ω between each control circuit terminal listed below end to end:
 - Terminal 1
 - Terminal 3
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the seat motor.
 - **If DTC B3920 00 or B3920 0B does not set**
7. Replace the seat motor.

B3920 42

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

Replace the K40 Seat Memory Control Module.
 - **If the DTC is not set**
3. All OK.

Repair Instructions

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

- [Front Seat Tilt Adjuster Actuator Replacement](#)
- [Driver or Passenger Seat Vertical Adjuster Actuator Replacement](#)
- [Front Seat Adjuster Actuator Replacement](#)
- [Control Module References](#) for K40 Seat Memory Control Module replacement, programming and setup

SYMPTOMS - POWER SEATS

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

1. Perform the [Diagnostic System Check - Vehicle](#) before using the Symptom Tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to the following system descriptions:
 - [Lumbar Support Description and Operation](#)
 - [Memory Seats Description and Operation](#)
 - [Power Seats System Description and Operation](#)

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the system. Refer to [Checking Aftermarket Accessories](#).

- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to [Testing for Intermittent Conditions and Poor Connections](#).

Symptom List

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

- [Lumbar Support Malfunction](#)
- [Memory Seat Feature Malfunction](#)
- [Power Seat Malfunction \(Without Memory AAG\)](#)[Power Seat Malfunction \(With Memory AAG\)](#)

LUMBAR SUPPORT MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	1	1	-	-
Seat Lumbar Motor Forward Control Terminal A	1	1	-	-
Seat Lumbar Motor Rearward Control Terminal D	1	1	-	-
Ground	-	1	-	-
1. The seat lumbar support is inoperative				

Circuit/System Description

The seat lumbar support is controlled through the seat lumbar support switch. Battery voltage is supplied at all times to the lumbar switch through a 10 A fuse located in the rear body fuse block. When the lumbar switch is in an inactive state, the switch contacts are closed to the switch ground circuit.

The lumbar motor is reversible. For example, when the lumbar forward switch is pressed to move the lumbar support forward, battery voltage is applied through the switch contacts and the lumbar motor forward control circuit to the motor. 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

- [Driver Seat Schematics \(Buick\)](#)[Driver Seat Schematics \(Chevrolet\)](#)
- [Passenger Seat Schematics \(Buick\)](#)

Connector End View Reference

Description and Operation

Lumbar Support Description and Operation

Electrical Information Reference

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

Circuit/System Testing

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the appropriate seat lumbar support switch listed below. It may take up to 2 min for all vehicle systems to power down.
 - S65D Seat Lumbar Support Switch - Driver
 - S65P Seat Lumbar Support Switch - Passenger
2. Test for less than 10 Ω between the ground circuit terminal H and ground.
 - **If 10 Ω or greater**
 1. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **If less than 10 Ω**
3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminal E and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp illuminates**
5. Ignition OFF, connect the harness connector at the S65 Seat Lumbar Support Switch and disconnect the harness connector at the M53 Seat Lumbar Support Motor.
6. Connect a test lamp between control circuit terminal A and control circuit terminal B, ignition ON.
7. Verify the test lamp turns ON when commanding the lumbar support Forward and Rearward using the S65 Seat Lumbar Support Switch.
 - **If the test lamp remains OFF during either of the commands**
 1. Ignition OFF, disconnect the harness connector at the S65 Seat Lumbar Support Switch.
 2. Test for infinite resistance between each control circuit and ground.
 - If less than Infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in each control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the S65 Seat Lumbar Support Switch.
 - **If the test lamp remains ON during either of the commands**

1. Ignition OFF, disconnect the harness connector at the S65 Seat Lumbar Support Switch, ignition ON.
2. Test for less than 1 V between each control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the S65 Seat Lumbar Support Switch.
- **If the test lamp turns ON during each of the commands**
8. Test or replace the M53 Seat Lumbar Support Motor.

Component Testing

Lumbar Support Switch

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

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

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

Replace the S65 Seat Lumbar Support Switch.
 - **If less than 2 Ω**
5. All OK.

Seat Lumbar Support Motor

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

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

2. Install a 30 A fused jumper wire between control terminal A 12 V.
3. Momentarily install a jumper wire between control terminal B and ground. The M53 Seat Lumbar Support Motor should momentarily perform the lumbar FORWARD function.
 - **If the motor does not perform the lumbar FORWARD function**

Replace the M53 Seat Lumbar Support Motor.
 - **If the motor performs the lumbar FORWARD function**
4. Reverse the polarity of jumper wires; the lumbar motor should perform REARWARD function.
 - **If the motor does not perform the lumbar REARWARD function**

Replace the M53 Seat Lumbar Support Motor.
 - **If the motor performs the lumbar REARWARD function**

5. All OK.

Repair Instructions

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

- [Driver or Passenger Seat Lumbar Control Switch Replacement](#)
- [Front Seat Back Lumbar Replacement](#)

MEMORY SEAT FEATURE MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Memory Set Switch Signal	1	1	-	-
Memory Switch Signal	1	1	1	-
Driver Seat Memory Switch Low Reference	-	1	-	-
1. Memory seat feature inoperative				

Circuit/System Description

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

Diagnostic Aids

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

Reference Information

Schematic Reference

[Driver Seat Schematics \(Buick\)](#)[Driver Seat Schematics \(Chevrolet\)](#)

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX \(ENCORE\)](#) [COMPONENT CONNECTOR END VIEWS - INDEX \(TRAX\)](#)

Description and Operation

[Memory Seats Description and Operation](#)

Electrical Information Reference

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

Control Module References for scan tool information

Circuit/System Verification

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

Refer to **Power Seat Malfunction (Without Memory AAG)****Power Seat Malfunction (With Memory AAG)**.
 - **If all seat functions operate**
3. Verify that the memory recall personalization option is ON. Refer to the owners manual.
 - **If the memory recall personalization option is not ON**

Turn ON the option, refer to the Owners Manual.
 - **If the memory recall personalization option is ON**
4. Refer to Circuit/System Testing.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the S47D Seat Memory Switch - Driver.
2. Test for less than 20 Ω between the low reference circuit terminal 1 and ground.
 - **If 20 Ω or greater**
 1. Ignition OFF, disconnect the X4 harness connector at the K40 Seat Memory Control Module.
 2. Test for less than 2 Ω in the low reference circuit end to end
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40 Seat Memory Control Module.
 - **If less than 20 Ω**
3. Ignition ON, press a power seat switch in order to wake up the K40 Seat Memory Control Module.
4. Test for 9 V or greater between each signal circuit terminal listed below and ground:
 - Memory set switch signal terminal 5
 - Memory switch signal terminal 6
 - **If less than 9 V**
 1. Ignition OFF, disconnect the X2 harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40 Seat Memory Control Module.
 - **If 9 V or greater**
5. Ignition OFF, disconnect the X2 harness connector at the K40 Seat Memory Control Module, ignition ON.
6. Test for less than 1 V between each signal circuit terminal listed below and ground:
 - Memory set switch signal terminal 5
 - Memory switch signal terminal 6
 - **If 1 V or greater**

Repair the short to voltage on the circuit.

- **If less than 1 V**

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

Component Testing

Driver Seat Memory Switch

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

- Terminal 1
- Terminal 6
- **If less than infinite resistance**

Replace the S47D Seat Memory Switch - Driver.

- **If infinite resistance**

3. Test for less than 2 Ω between the signal terminal 1 and the low reference terminal 5 while pressing the memory MEM button.

- **If 2 Ω or greater**

Replace the S47D Seat Memory Switch - Driver.

- **If less than 2 Ω**

4. Test for 570-698 Ω between the signal terminal 6 and the low reference terminal 5 while pressing the memory 1 button.

- **If not between 570-698 Ω**

Replace the S47D Seat Memory Switch - Driver.

- **If between 570-698 Ω**

5. Test for 1800-2209 Ω between the signal terminal 6 and the low reference terminal 5 while pressing the memory 2 button.

- **If not between 1800-2209 Ω**

Replace the S47D Seat Memory Switch - Driver.

- **If between 1800-2209 Ω**

6. All OK.

Repair Instructions

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

- [Driver Seat Adjuster Memory Switch Replacement \(Buick\)](#)
- [Control Module References](#) for K40 Seat Memory Control Module replacement, programming and setup

POWER SEAT MALFUNCTION (WITHOUT MEMORY AAG)

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	1	1	-	-
Front Vertical Motor Down Control	1	1	-	-
Front Vertical Motor Up Control	1	1	-	-
Horizontal Motor Forward Control	1	1	-	-
Horizontal Motor Rearward Control	1	1	-	-
Rear Vertical Motor Down Control	1	1	-	-
Rear Vertical Motor Up Control	1	1	-	-
Ground	-	1	-	-
1. Power seat inoperative				

Circuit/System Description

The seat adjuster switches provide both power and ground to the selected seat motors. When the seat switch is 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, B+ is applied through the switch contacts and the seat horizontal motor forward control circuit to the motor. With the horizontal motor rearward switch contacts closed to the switch ground circuit, the motor runs in order to drive the entire seat forward until the switch is released. Moving the entire seat rearward works similarly to moving the entire seat forward, except that battery voltage and ground are applied on opposite circuits causing the motor to run in the opposite direction. All seat motors are powered this way.

Reference Information

Schematic Reference

- [Driver Seat Schematics \(Buick\)](#)[Driver Seat Schematics \(Chevrolet\)](#)
- [Passenger Seat Schematics \(Buick\)](#)

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX \(ENCORE\)](#) [COMPONENT CONNECTOR END VIEWS - INDEX \(TRAX\)](#)

Description and Operation

Power Seats System Description and Operation

Electrical Information Reference

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

Circuit/System Verification

1. Verify the driver or passenger power seat directional motors listed below operate when operating the seat switches in both directions.
 - M50 Seat Front Vertical Motor
 - M51 Seat Horizontal Motor

- M55 Seat Rear Vertical Motor
- **If all seat motors do not operate**

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

- **If 1 or more seat motors operate**

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

2. All OK.

Circuit/System Testing

Seat Adjuster Switch Circuit Test

1. Ignition OFF, disconnect the harness connector at the appropriate seat adjuster switch listed below:
 - S64D Seat Adjuster Switch - Driver
 - S64P Seat Adjuster Switch - Passenger
2. Test for less than 10 Ω between the ground circuit terminal B and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **If less than 10 Ω**
3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminal D and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the circuit fuse is not open and there is voltage at the fuse.
 - **If the test lamp illuminates**
5. Test or replace the S64 Seat Adjuster Switch.

Seat Motor Circuit Test

1. Ignition OFF, disconnect the harness connector at the appropriate seat motor listed below:
 - M51 Seat Horizontal Motor
 - M50 Seat Front Vertical Motor
 - M55 Seat Rear Vertical Motor
2. Connect a test lamp between control circuit terminal 1 and control circuit terminal 3, ignition ON.
3. Verify the test lamp turns ON when commanding the seat motor Up and Down or Forward and Rearward using the seat adjuster switch.
 - **If the test lamp remains OFF during either of the commands**
 1. Ignition OFF, remove the test lamp, disconnect the harness connector at the S64 Seat Adjuster Switch.
 2. Test for infinite resistance between each control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance

3. Test for less than 2 Ω in each control circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , test or replace the S64 Seat Adjuster Switch

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

4. Test or replace the seat motor.

Component Testing

Seat Adjuster Switch

1. Ignition OFF, disconnect the harness connector at the S64 Seat Adjuster Switch.

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

- **If less than infinite resistance**

Replace the S64 Seat Adjuster Switch.

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

- **If 2 Ω or greater**

Replace the S64 Seat Adjuster Switch.

- **If less than 2 Ω**

4. Test for less than 2 Ω between the ground terminal B and each control terminal listed below with the switch in the open position.

- **If 2 Ω or greater**

Replace the S64 Seat Adjuster Switch.

- **If less than 2 Ω**

5. All OK.

Seat Motor

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

- M51 Seat Horizontal Motor
- M50 Seat Front Vertical Motor
- M55 Seat Rear Vertical Motor

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

2. Install a 30 A fused jumper wire between control terminal 1 and 12 V.

3. Momentarily install a jumper wire between control terminal 3 and ground. The seat motor should momentarily perform the appropriate FORWARD/ REARWARD/ UP/ DOWN function.

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

Replace the motor.

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

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

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

Replace the motor.

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

5. All OK.

Repair Instructions

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

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

POWER SEAT MALFUNCTION (WITH MEMORY AAG)

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Seat Memory Control Module B+ Terminal 1 X4	2	2	-	-
Seat Memory Control Module B+ Terminal 5 X4	B242A 02, B2425 0D, B2430 0D, 1, 6	B242A 02, B2425 0D, B2430 0D, 1, 6	-	-
Front Vertical Up Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02	3	-	-
Front Vertical Down Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02	3	-	-
Horizontal Forward Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02	4	-	-
Horizontal Rearward Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02	4	-	-
Rear Vertical Up Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02	5	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Rear Vertical Down Switch Signal	B1735 02, B1740 02, B1745 02, B1750 02, B1755 02, B1760 02	5	-	-
Driver Seat Front Vertical Motor Down Control	B3920 02	3	B3920 01	B3920 00
Driver Seat Front Vertical Motor Up Control	B3920 02	3	B3920 01	B3920 00
Driver Seat Horizontal Motor Forward Control	B3920 02	4	B3920 01	B3920 00
Driver Seat Horizontal Motor Rearward Control	B3920 02	4	B3920 01	B3920 00
Driver Seat Rear Vertical Motor Down Control	B3920 02	5	B3920 01	B3920 00
Driver Seat Rear Vertical Motor Up Control	B3920 02	5	B3920 01	B3920 00
Ground	-	1, 2	-	-
1. Power seat and memory functions inoperative 2. Scan Tool Does Not Communicate with Low Speed GMLAN Device 3. The seat front vertical motor is inoperative 4. The seat horizontal motor is inoperative 5. The seat rear vertical motor is inoperative 6. Heated seats are inoperative				

Circuit/System Description

Battery voltage is supplied at all times to the seat memory control module through a 25 A fuse located in the underhood fuse block. This voltage is used by the module for logic power. Battery positive voltage is also supplied at all times to the seat memory control module through a 30 A fuse located in the instrument panel fuse block. This voltage is connected to a power rail internal to the seat memory control module and is used to drive the power seat motors and the seat heater elements on vehicles equipped with heated seats. Each seat motor is controlled by the seat memory control module through 2 motor control circuits. The seat memory control module 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 seat memory control module checks to see if the reference voltage is shorted to ground or battery before enabling any of the seat motors.

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

Reference Information

Schematic Reference

Driver Seat Schematics (Buick)**Driver Seat Schematics (Chevrolet)**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX (ENCORE)**COMPONENT CONNECTOR END VIEWS - INDEX (TRAX)**

Memory Seats Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

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

Refer to Circuit/System Testing - Driver Seat Adjuster Switch Circuit Test.
 - **If the parameter changes**
3. Verify the seat directional motors listed below operate while operating the appropriate driver seat switches in both directions.
 - M50D Seat Front Vertical Motor - Driver
 - M51D Seat Horizontal Motor - Driver
 - M55D Seat Rear Vertical Motor - Driver
 - **If any seat motor does not operate**

Refer to Circuit/System Testing - Seat Motor Control Circuit Test.
 - **If all seat motors operate**
4. All OK.

Circuit/System Testing

Driver Seat Adjuster Switch Circuit Test

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S64D Seat Adjuster Switch - Driver. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal D and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **If less than 10 Ω**
3. Verify that all scan tool driver seat switch parameters listed below are Inactive:
 - Driver Seat Cushion Front Vertical Switch
 - Driver Seat Cushion Rear Vertical Switch
 - Driver Seat Horizontal Switch

- **If not Inactive**

1. Ignition OFF, disconnect the harness connector at the K40 Seat Memory Control Module.
2. Test for infinite resistance between the appropriate signal circuit terminal listed below and ground:
 - Front vertical up switch terminal G
 - Front vertical down switch terminal E
 - Rear vertical up switch terminal H
 - Rear vertical down switch terminal A
 - Horizontal forward switch terminal F
 - Horizontal rearward switch terminal C
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K40 Seat Memory Control Module.

- **If Inactive**

4. Install a 3 A fused jumper wire between the appropriate signal circuit terminal listed below and the ground circuit terminal D.
 - Front vertical up switch terminal G
 - Front vertical down switch terminal E
 - Rear vertical up switch terminal H
 - Rear vertical down switch terminal A
 - Horizontal forward switch terminal F
 - Horizontal rearward switch terminal C
5. Verify the scan tool seat switch parameter is Forward/Rearward or UP/Down.
 - **If not Forward/Rearward or UP/Down**
 1. Ignition OFF, disconnect the harness connector at the K40 Seat Memory Control Module, ignition ON.
 2. Test for less than 1 V between the signal circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Ignition OFF.
 4. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40 Seat Memory Control Module.
 - **If Forward/Rearward or UP/Down**
6. Test or replace the S64D Driver Seat Adjuster Switch.

Seat Motor Control Circuit Test

1. Ignition OFF, disconnect the X4 harness connector at the K40 Seat Memory Control Module.
2. Test for less than 10 Ω between the ground circuit terminal 6 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **If less than 10 Ω**
3. Ignition ON.
4. Verify that a test lamp illuminates between the B+ circuit terminal 5 and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF.
 2. Test for infinite resistance between the B+ circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp illuminates**
5. Ignition OFF, connect the X4 harness connector at the K40 Seat Memory Control Module and disconnect the harness connector at the appropriate seat motor listed below:
 - M50D Seat Front Vertical Motor - Driver
 - M51D Seat Horizontal Motor - Driver
 - M55D Seat Rear Vertical Motor - Driver
 6. Connect a test lamp between control circuit terminal 1 and control circuit terminal 3, ignition ON.

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

7. Verify the test lamp illuminates when commanding the seat motor in the Up/Down or Forward/Rearward states with a scan tool.
 - **If the test lamp does not illuminate during either of the commands**
 1. Ignition OFF, disconnect the appropriate X4 or X5 harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between each control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in each control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40 Seat Memory Control Module.
 - **If the test lamp illuminates during each of the commands**
8. Test or replace the seat motor.

Component Testing

Seat Adjuster Switch Test

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

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

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

Seat Motor

1. Ignition OFF, disconnect the harness connector at the appropriate seat motor listed below:
 - M50D Seat Front Vertical Motor - Driver

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

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

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

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.

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

REPAIR INSTRUCTIONS

WIRE TO WIRE REPAIR - SEATS

Special Tools

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

For equivalent regional tools, refer to Special Tools.

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

NOTE: If the wiring harness internal to the transmission is damaged, the wiring harness must be replaced. The use of splice sleeves in an attempt to

repair the internal transmission wires, connectors, or terminals could result in performance issues.

NOTE: Do not splice wires in Door Harness Grommets.

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

- A special heat shrink sleeve environmentally seals the splice. The heat shrink sleeve contains a sealing adhesive inside.
- A cross hatched (knurled) core crimp provides the necessary low resistance contact integrity for these sensitive, low energy circuits.

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

Splice Sleeve Selection

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

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

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

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

3. Strip the insulation:
 - When adding a length of wire to the existing harness, use the same size wire as the original wire.
 - Perform one of the following items in order to find the correct wire size:
 - Find the wire on the schematic and convert to regional wiring gauge size.
 - If you are unsure of the wire size, begin with the largest opening in the wire stripper and work down until achieving a clean strip of the insulation.
 - Strip approximately 5.0 mm (0.20 in) of insulation from each wire to be spliced.
 - Do not nick or cut any of the strands. Inspect the stripped wire for nicks or cut strands.
 - If the wire is damaged, repeat this procedure after removing the damaged section.
4. For high temperature wiring, slide a section of high temperature SCT1 shrink tubing down the length of wire to be spliced. Ensure that the shrink tubing will not interfere with the splice procedure.

5. Select the proper DuraSeal splice sleeve according to the wire size. Refer to the above table at the beginning of the repair procedure for the color coding of the DuraSeal splice sleeves and the crimp tool nests.

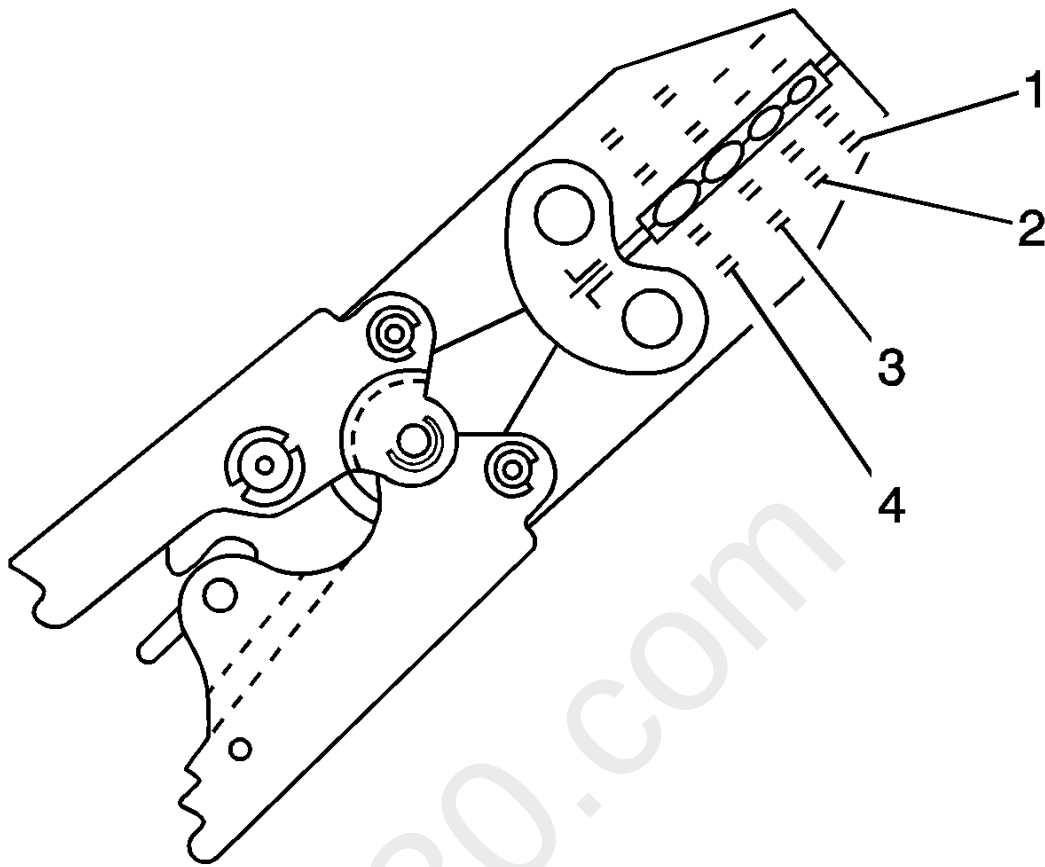


Fig. 9: Splice Sleeve Crimping Tool With 4 Crimp Nests
Courtesy of GENERAL MOTORS COMPANY

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

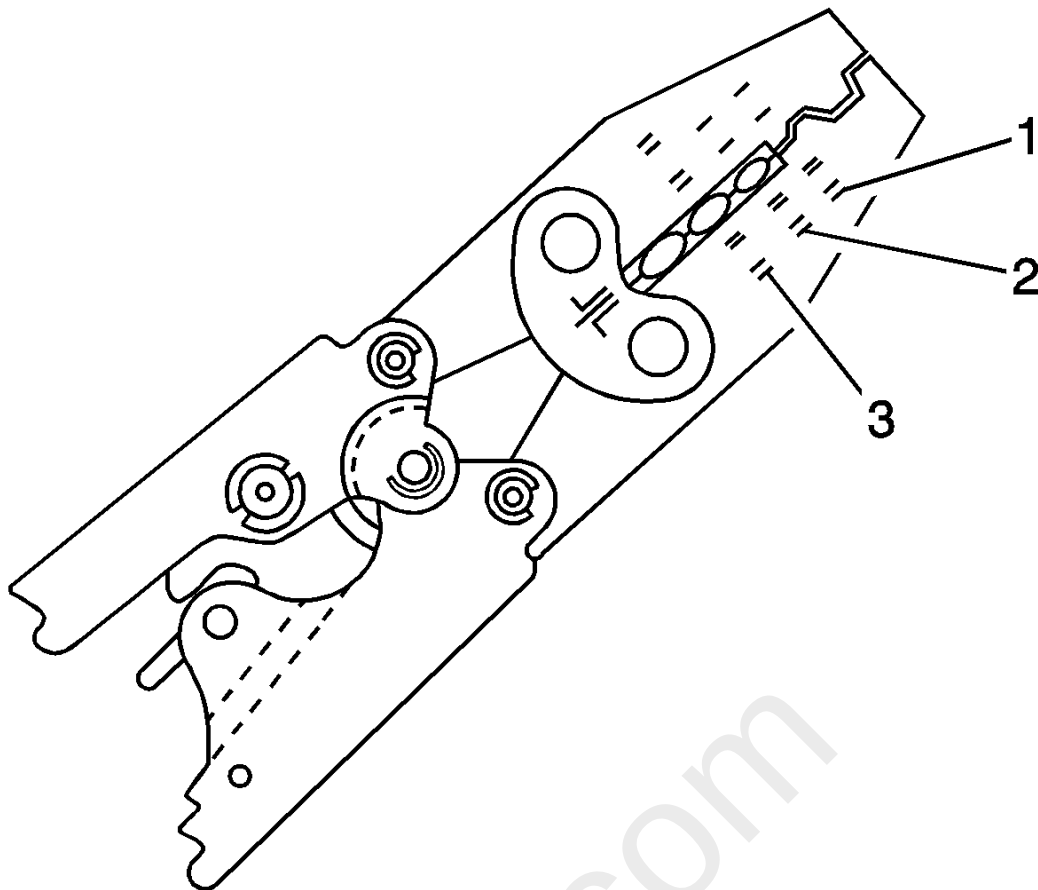


Fig. 10: Splice Sleeve Crimping Tool With 3 Crimp Nests
Courtesy of GENERAL MOTORS COMPANY

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

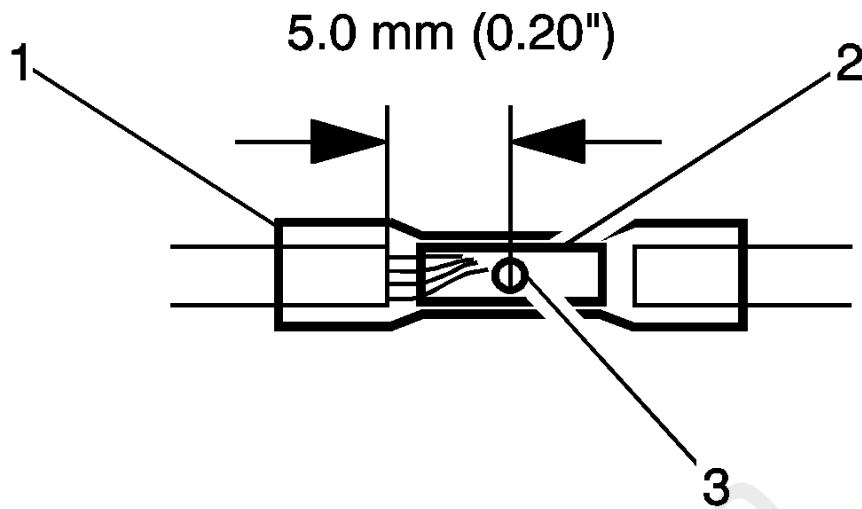


Fig. 11: Identifying Duraseal Splice Sleeve
Courtesy of GENERAL MOTORS COMPANY

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



Fig. 12: Crimped Duraseal Splice Sleeve

Courtesy of GENERAL MOTORS COMPANY

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

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



Fig. 13: Crimped Duraseal Splice Sleeve
Courtesy of GENERAL MOTORS COMPANY

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

Weatherpack™ Wiring Repair

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

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

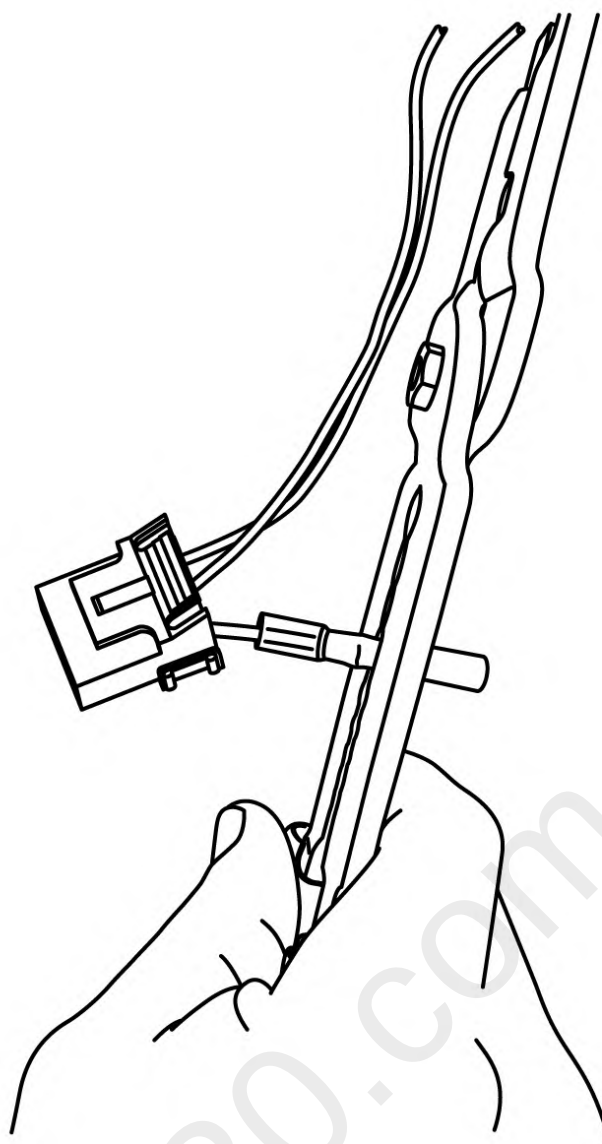


Fig. 14: Tightly Close Handles Of Crimp Tool
Courtesy of GENERAL MOTORS COMPANY

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

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

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

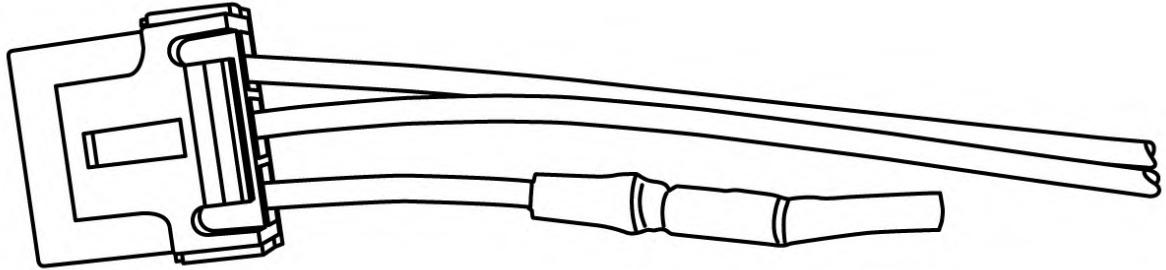


Fig. 15: Heat To Crimped Area Of Barrel

Courtesy of GENERAL MOTORS COMPANY

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

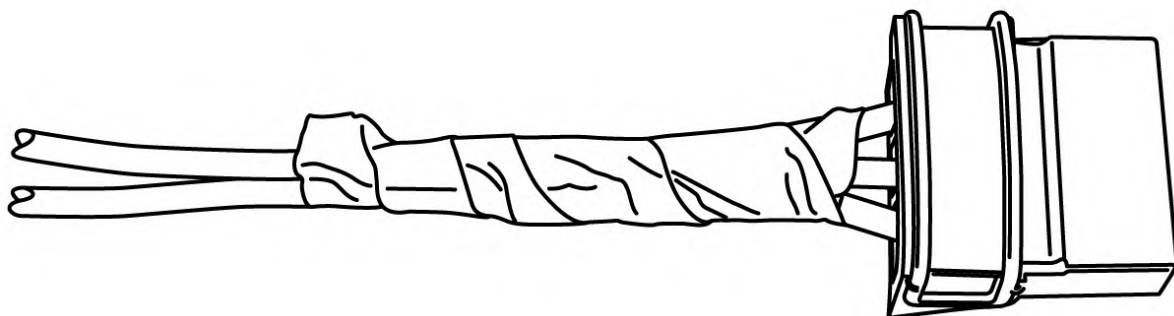


Fig. 16: Taping Extra Terminated Leads Back Into Harness
Courtesy of GENERAL MOTORS COMPANY

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

High Temperature Wiring Repairs

Use the following procedures to perform high temperature wiring repairs:

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

CONNECTOR RECONNECTION - SEATS

Special Tools

EL-35616 Terminal Test Probe Kit

For equivalent regional tools, refer to [Special Tools](#) .

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

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

- Loose, corroded, or painted terminal stud/fastener
- Wiring broken inside the insulation
- Poor connection between the male and female terminal at a connector
- A terminal not seated all the way into the connector body
- Poor terminal to wire connection - Some conditions which fall under this description are poor crimps, poor solder joints, crimping over the wire insulation rather than the wire itself, and corrosion in the wire to terminal contact area, etc.
- Pierced or damaged insulation can allow moisture to enter the wiring causing corrosion. The conductor can corrode inside the insulation, with little visible evidence. Look for swollen and stiff sections of wire in the suspect circuits.
- Wiring which has been pinched, cut, or its insulation rubbed through may cause an intermittent open or short as the bare area touches other wiring or parts of the vehicle.
- Wiring that comes in contact with hot or exhaust components
- Refer to [**Inducing Intermittent Fault Conditions**](#) in order to duplicate the conditions required, in order to verify the customer concern.
- Refer to [**Testing for Electrical Intermittents**](#) for test procedures to detect intermittent open, high resistance, short to ground, and short to voltage conditions.
- Refer to [**Scan Tool Snapshot Procedure**](#) for advanced intermittent diagnosis and Vehicle Data Recorder operation.

Testing for Terminal Fretting

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

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

Testing for Proper Terminal Contact

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

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

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

Testing for Proper Terminal Contact in Bussed Electrical Centers

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

Follow the procedure below in order to test terminal contact:

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

Flat Wire Connectors

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

Follow the procedure below in order to test terminal contact:

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

Control Module/Component Voltage and Grounds

Poor voltage or ground connections can cause widely varying symptoms.

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

Temperature Sensitivity

- An intermittent condition may occur when a component/connection reaches normal operating temperature. The condition may occur only when the component/connection is cold, or only when the component/connection is hot.
- Freeze Frame, Failure Records, Snapshot, or Vehicle Data Recorder data may help with this type of intermittent condition, where applicable.
- If the intermittent is related to heat, review the data for a relationship with the following:
 - High ambient temperatures
 - Underhood/engine generated heat

- Circuit generated heat due to a poor connection, or high electrical load
- Higher than normal load conditions, towing, etc.
- If the intermittent is related to cold, review the data for the following:
 - Low ambient temperatures - In extremely low temperatures, ice may form in a connection or component. Inspect for water intrusion.
 - The condition only occurs on a cold start.
 - The condition goes away when the vehicle warms up.
- Information from the customer may help to determine if the trouble follows a pattern that is temperature related.
- If temperature is suspected of causing an intermittent fault condition, attempt to duplicate the condition. Refer to [Inducing Intermittent Fault Conditions](#) in order to duplicate the conditions required.

Electromagnetic Interference and Electrical Noise

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

- A mis-routed harness that is too close to high voltage/high current devices such as secondary ignition components, motors, generator etc. - These components may induce electrical noise on a circuit that could interfere with normal circuit operation.
- Electrical system interference caused by a malfunctioning relay, or a control module driven solenoid or switch - These conditions can cause a sharp electrical surge. Normally, the condition will occur when the malfunctioning component is operating.
- Installation of non-factory or aftermarket add on accessories such as lights, 2-way radios, amplifiers, electric motors, remote starters, alarm systems, cell phones, etc. - These accessories may create interference in other circuits while operating and the interference would disappear when the accessory is not operating. Refer to [Checking Aftermarket Accessories](#).
- Test for an open diode across the A/C compressor clutch and for other open diodes. Some relays may contain a clamping diode.
- The generator may be allowing AC noise into the electrical system.

Incorrect Control Module

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

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

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

DRIVER OR PASSENGER SEAT ADJUSTER SWITCH REPLACEMENT

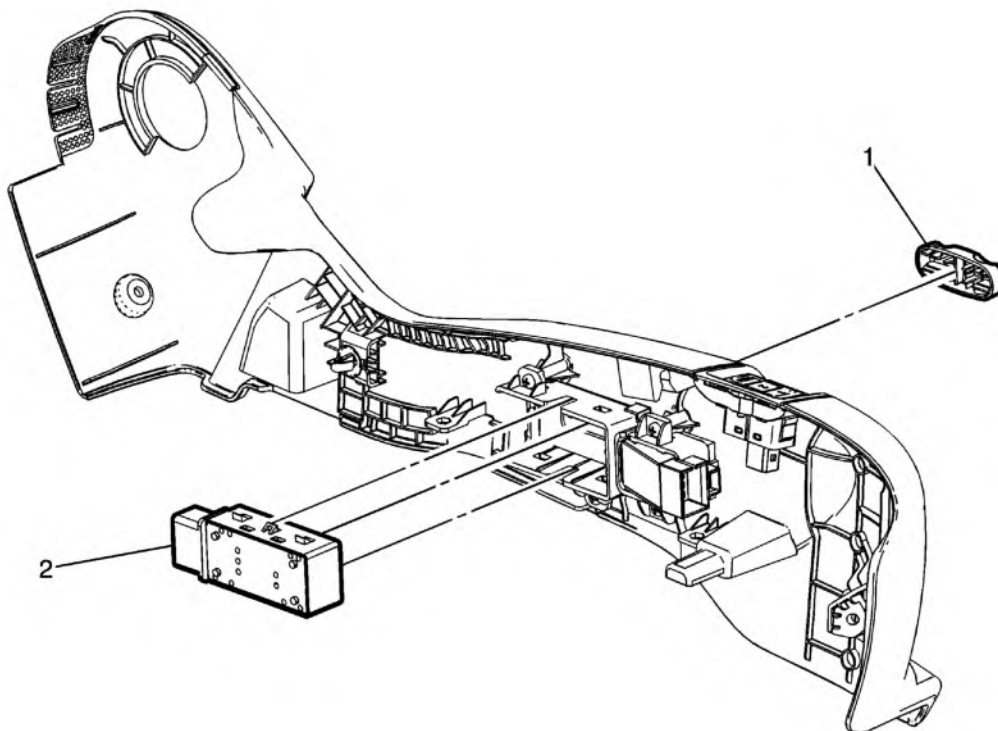


Fig. 17: Driver or Passenger Seat Adjuster Switch

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the driver or passenger seat cushion outer finish panel. Refer to Driver or Passenger Seat Cushion Outer Finish Panel Replacement (Power) Driver or Passenger Seat Cushion Outer Finish Panel Replacement (Manual) .	
1	Driver or Passenger Seat Adjuster Knob
2	Driver or Passenger Seat Adjuster Switch
Procedure Use a flat-bladed tool to release the switch from the finish cover.	

DRIVER SEAT ADJUSTER MEMORY SWITCH REPLACEMENT (BUICK)

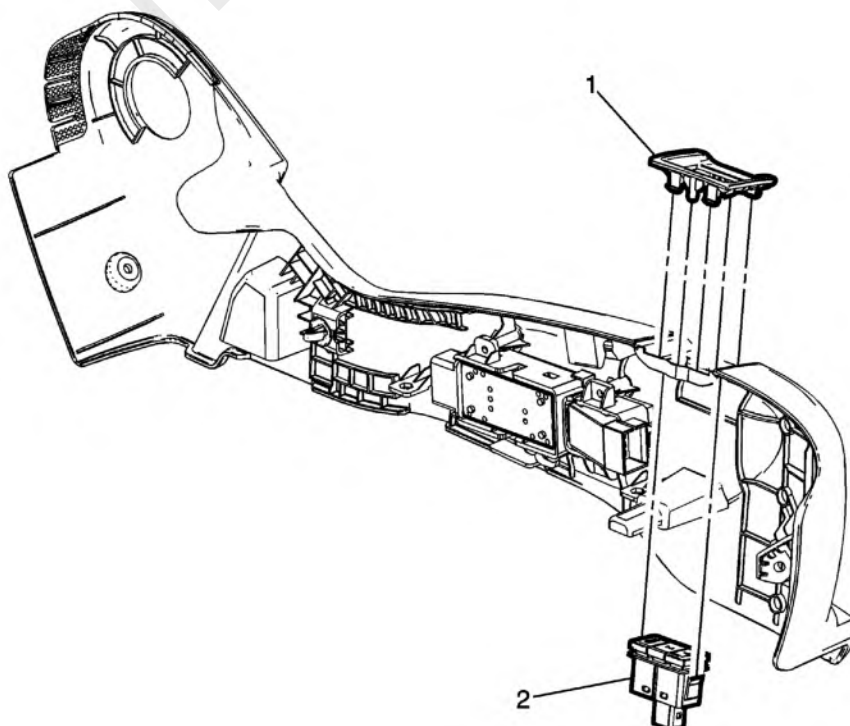


Fig. 18: Driver Seat Adjuster Memory Switch (Encore).
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the driver or passenger seat cushion outer finish panel. Refer to Driver or Passenger Seat Cushion Outer Finish Panel Replacement (Power) , Driver or Passenger Seat Cushion Outer Finish Panel Replacement (Manual) .	
1	Driver Seat Adjuster Memory Switch Bezel Procedure Use a flat-bladed tool to disengage the memory switch bezel from the seat cushion outer finish panel.
2	Driver Seat Adjuster Memory Switch Procedure 1. Disconnect the electrical connection. 2. Disengage the integral tabs and remove the switch from the face of the seat cushion outer finish panel.

DRIVER OR PASSENGER SEAT ADJUSTER MEMORY MODULE REPLACEMENT (BUICK)

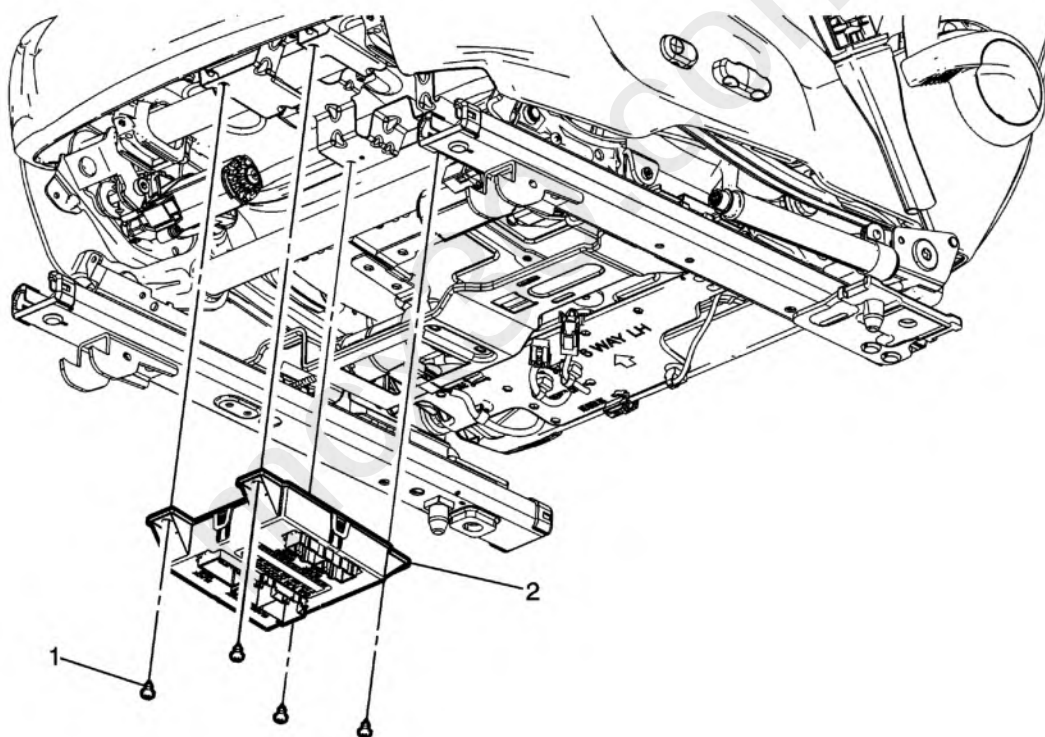


Fig. 19: Driver Or Passenger Seat Adjuster Memory Module (Encore).
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front seat. Refer to Driver or Passenger Seat Removal and Installation .	
1	Driver or Passenger Seat Adjuster Memory Module Fastener (Qty: 4) CAUTION: Refer to Fastener Caution .

Callout	Component Name
2	Driver or Passenger Seat Adjuster Memory Module Procedure 1. Disconnect the electrical connectors. 2. Remove the module from the adjuster memory and wiring harness bracket. 3. Refer to Control Module References for programing and setup information.

FRONT SEAT TILT ADJUSTER ACTUATOR REPLACEMENT

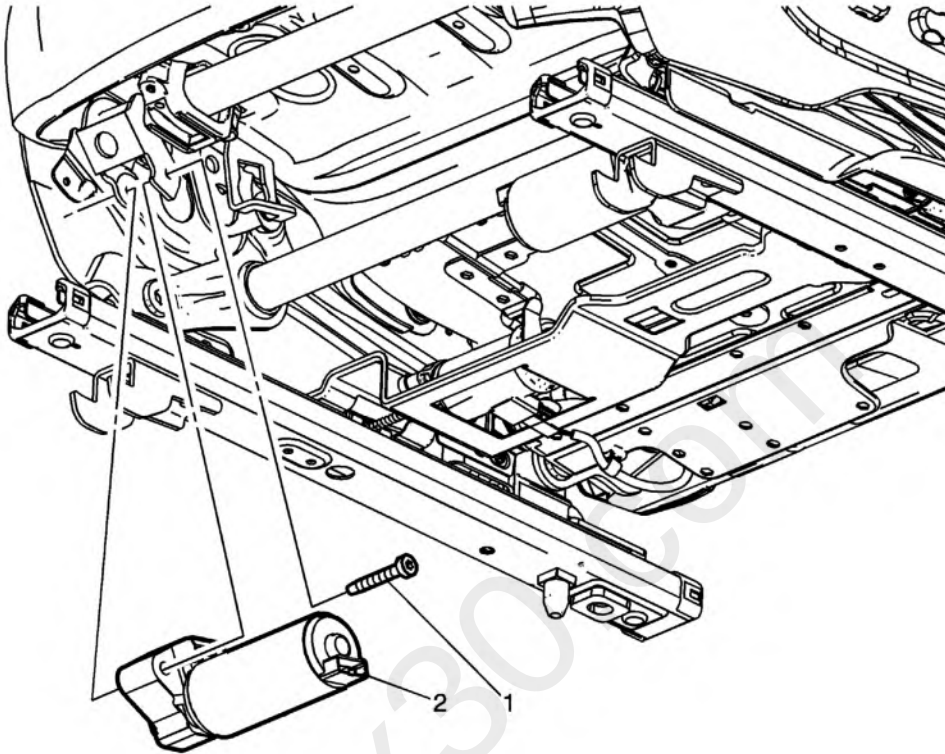


Fig. 20: Front Seat Tilt Adjuster Actuator
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the driver or passenger seat. Refer to Driver or Passenger Seat Removal and Installation	
1	Front Seat Tilt Adjuster Actuator Fastener CAUTION: Refer to Fastener Caution . Tighten 8 N.m (71 lb in)
2	Front Seat Tilt Adjuster Actuator Procedure Disconnect the electrical connector.

DRIVER OR PASSENGER SEAT VERTICAL ADJUSTER ACTUATOR REPLACEMENT

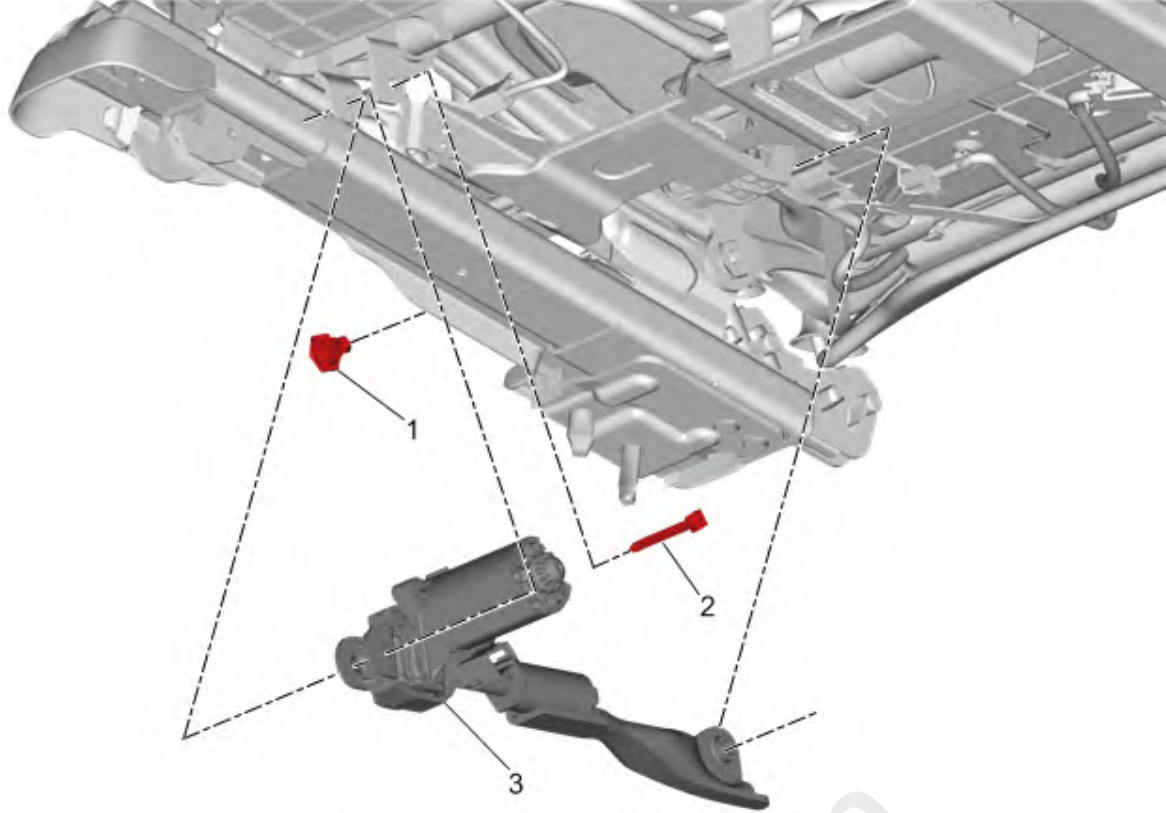


Fig. 21: Driver or Passenger Seat Vertical Adjuster Actuator
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the driver or passenger seat. Refer to Driver or Passenger Seat Removal and Installation	
1	Driver or Passenger Seat Vertical Adjuster Actuator Bolt CAUTION: Refer to Fastener Caution . Tighten 20 N.m (15 lb ft)
2	Driver or Passenger Seat Vertical Adjuster Actuator Fastener Tighten 8 N.m (71 lb in)
3	Driver or Passenger Seat Vertical Adjuster Actuator Procedure Disconnect the electrical connector.

FRONT SEAT ADJUSTER ACTUATOR REPLACEMENT

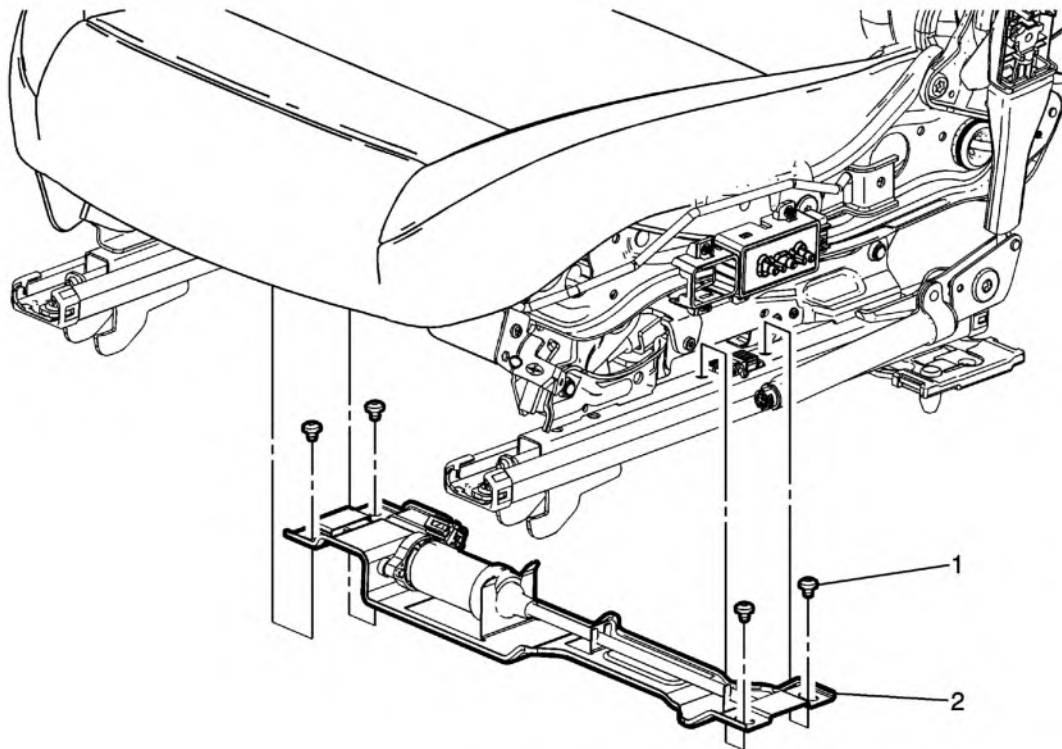


Fig. 22: Front Seat Adjuster Actuator
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Adjust the seat to the full upward position. 2. Remove the front seat anchor plate tensioner cover. Refer to Front Seat Belt Anchor Plate Tensioner Cover Replacement. 3. Remove the driver or passenger seat. Refer to Driver or Passenger Seat Removal and Installation.	
1	Front Seat Adjuster Actuator Fasteners (Qty: 4) CAUTION: Refer to Fastener Caution .
2	Front Seat Adjuster Actuator Procedure 1. Disconnect the electric connector. 2. Remove the seat adjuster motor shaft out of both seat frame side brackets. 3. Remove the seat adjuster and mounting bracket by pulling downward from the cushion frame.

DRIVER OR PASSENGER SEAT LUMBAR CONTROL SWITCH REPLACEMENT

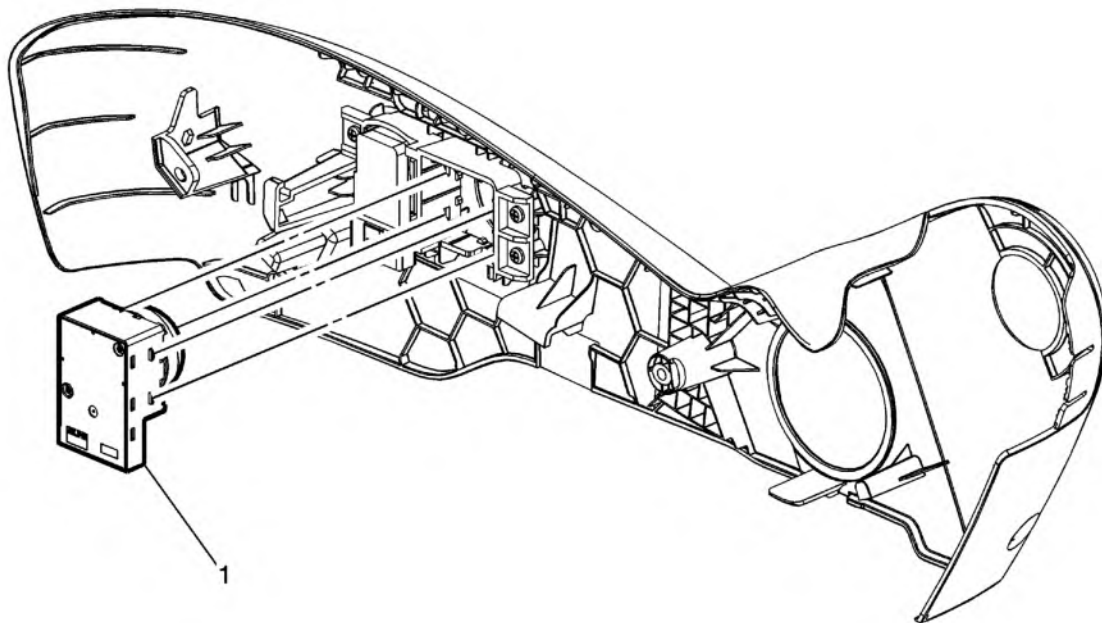


Fig. 23: Driver Or Passenger Seat Lumbar Control Switch

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the driver or passenger seat cushion outer finish panel. Refer to Driver or Passenger Seat Cushion Outer Finish Panel Replacement (Power) Driver or Passenger Seat Cushion Outer Finish Panel Replacement (Manual) .	
1	Driver or Passenger Seat Lumbar Control Switch Procedure Disconnect the electrical connector.

FRONT SEAT BACK LUMBAR REPLACEMENT



Fig. 24: Front Seat Back Lumbar
Courtesy of GENERAL MOTORS COMPANY

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

DESCRIPTION AND OPERATION

LUMBAR SUPPORT DESCRIPTION AND OPERATION

Lumbar Support Components

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

- Seat lumbar support switch
- Lumbar support motor

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

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

MEMORY SEATS DESCRIPTION AND OPERATION

Memory Seat System Components

The memory seat system consists of the following components:

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

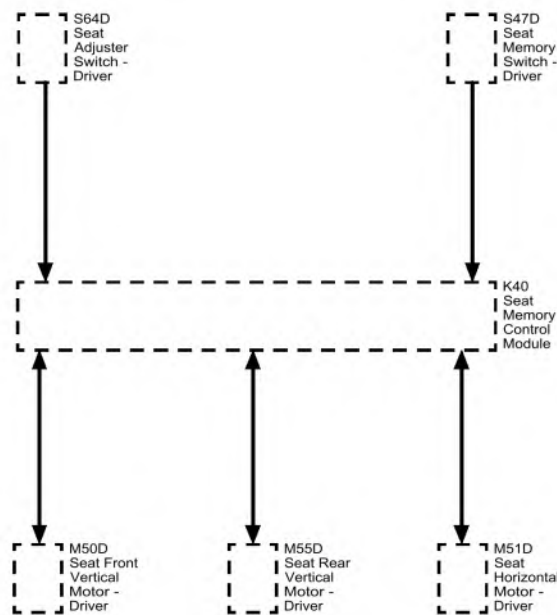


Fig. 25: Memory Seat Block Diagram
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
S64D	S64D Seat Adjuster Switch - Driver
S47D	S47D Seat Memory Switch - Driver
K40	K40 Seat Memory Control Module
M50D	M50D Seat Front Vertical Motor - Driver
M55D	M55D Seat Rear Vertical Motor - Driver
M51D	M51D Seat Horizontal Motor - Driver

Driver Seat Personalization Option

The seat memory control module will not perform remote memory recall and driver seat easy exit functions unless these personalization options are activated in the audio system, refer to Vehicle Personalization in the Owner's Manual. The audio system reports the vehicle personalization option settings to the seat memory control module as well as other receiving modules via GMLAN message each time the ignition switch is cycled to the ON position. The seat memory control module will then store the seat personalization option settings and examine them before making a memory seat adjustment. The seat personalization option settings stored within the seat memory control module will not change until the memory recall option setting in the audio system is changed and the ignition switch is cycled to the ON position.

Driver Seat Adjuster Switch

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

Seat Memory Switch

Memory recalls via the memory switch require the driver to press and hold the memory button until the seat reaches it's memory position.

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

Refer to the Owner's Manual for Storing Memory Positions, Recalling Memory Positions, Recalling RKE Memory Positions, and for the Easy Exit Driver Seat function.

Seat Motors

There are 3 motors that move the position of the seat. These are the seat horizontal motor, front vertical motor, and the rear vertical motor. The horizontal motor moves the entire seat forward and rearward. Both vertical motors run simultaneously when the seat switch is operated in order 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 seat memory control module controls all seat motors via half bridges that are connected to a single power rail internal to the module. The module connects all 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 seat memory control module checks to see if this reference voltage is shorted to ground or battery before enabling any seat motor. All seat motors operate independently of each other. Each motor contains a electronic circuit breaker (PTC), which will reset only after voltage has been removed from the motor.

All seat motors are reversible. For example, when the seat switch is pressed to move the entire seat forward, ground is applied through the switch contacts and seat horizontal forward switch signal circuit to the seat memory control module. In response to this signal, the seat memory control module applies battery voltage through the driver seat horizontal motor forward control circuit and ground through the driver seat horizontal motor rearward control circuit to the motor. The motor runs 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 seat motors are powered this way.

Seat Position Sensors

The seat motors are equipped with 2 wire hall effect type position sensors internal to the motor. The sensors are monitored by the seat memory control module and are used to determine seat positions when storing or recalling memory settings. The seat memory control module supplies the sensors with a common 12 V reference circuit and separate signal circuits. During seat motor operation, the hall effect position sensor provides a determined number of pulse signals for every revolution of the motor shaft. These pulse signals (Counts) range from 0 - 65, 535. High scan tool count values indicate forward or upward seat positions while low count values indicate rearward or downward seat positions.

POWER SEATS SYSTEM DESCRIPTION AND OPERATION

The power seat system consists of the following components:

- Seat adjuster switch
- Seat horizontal motor
- Seat front vertical motor
- Seat rear vertical motor

NOTE: If equipped, the passenger seat block diagram is identical to the driver seat.

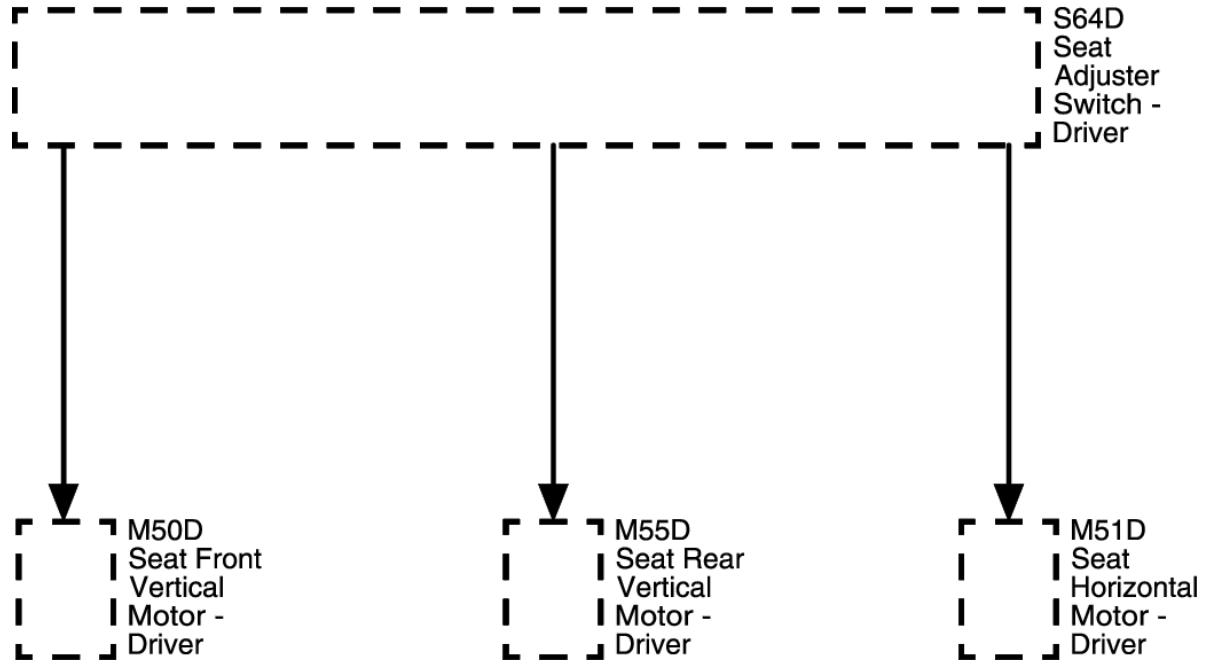


Fig. 26: Power Seat Block Diagram
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
S64D	S64D Seat Adjuster Switch - Driver
M50D	M50D Seat Front Vertical Motor - Driver
M55D	M55D Seat Rear Vertical Motor - Driver
M51D	M51D Seat Horizontal Motor - Driver

Motors

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

Seat Operation

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