

MEMORY SYSTEM

1998 ACCESSORIES & EQUIPMENT General Motors Corp. - Memory Systems

DESCRIPTION

NOTE: For additional information about power seats, see **POWER SEATS** article. For additional information about power mirrors, see **POWER MIRRORS** article.

The memory system includes driver's memory seat, outside mirrors, climate control and stereo functions. When a memory function recall is requested, Seat Control Module (SCM) and Door Control Modules (DCM) will apply voltages to appropriate seat position and mirror position motors until position sensor voltage matches the stored values. The seat control module controls movement of 3 driver's seat position motors. Left and right door control modules control 2 left mirror motors and 2 right mirror motors. All motors have a position sensor, and work independently of each other. Seatback recline and lumbar control is not part of memory functions.

OPERATION

POWER MOTORS

Each memory seat function is controlled by a permanent magnet motor. Power seat uses 3 reversible motors that control seat position. Front and back parts of seat are operated by different motors, and can be raised and lowered independently. Third motor controls forward/backward movement. If seat switch is operated to move entire seat up and down, both height motors run simultaneously. Each power mirror uses 2 motors for horizontal and vertical directions. All motors are reversible, allowing motors to operate movement in each direction.

POSITION SENSORS

Position sensors are used by memory seat/mirror modules to store motor positions in memory and return motors to stored memory positions. Each sensor is a potentiometer, and is mounted to each motor's transmission cable. When cable rotates, resistance of potentiometer varies, and feedback voltage is monitored by memory seat/mirror module to determine motor position. The memory seat/mirror module stores motor positions by recording each position sensor feedback voltage. When a memorized position is requested, each motor is moved until the position sensor feedback voltage equals feedback voltage stored in memory.

COMPONENT LOCATIONS

COMPONENT LOCATIONS

Component	Location
Door Control Module (DCM)	Bottom Center Of Respective Door
Instrument Panel Electrical Center	Top of Passenger Footwell, Behind Carpet
Seat Lower & Upper Motors	Under Respective Front Seat
Seat Control Module (SCM)	Under Driver's Seat
Seat Relay Center	Under Respective Front Seat

PROGRAMMING

MEMORY SET

Memory recall can be set for up to 3 drivers. To program memory settings, move seat to most comfortable position. Move set mirrors to desired position. Depress and hold the No. 1 memory button, located on left door armrest, until the indicator light above the memory button glows steady. Continue to hold button down. When the position has been stored, indicator light should glow steady for one second, then will flash once. To record the second setting, repeat function and depress the No. 2 button. For the third setting, depress No. 1 and 2 buttons simultaneously.

MEMORY RECALL

To recall a position, depress memory button that corresponds with setting for appropriate driver. Seat Control Module (SCM) and Left Door Control Module (LDCM) receives memory request, then supplies battery voltage to seat and mirror motors until all seat and mirror position sensor feedback voltages equal voltages stored in memory for appropriate driver. LDCM will also send a message over serial data line to other systems responsible for memory recall functions (climate control and radio). Indicator light will flash until programmed position is achieved. Memory recall will not work if the vehicle is moving, the key is out of the ignition switch or if a seat or memory switch is being used.

TROUBLE SHOOTING

PRELIMINARY CHECKS

1. If PWR ST/DRV circuit breakers No. 35 (20-amp) and PWR ST/PAS No. 36 (20-amp), located in instrument panel electrical center, opens whenever power seat switch is operated, check circuits for a short to ground. Check fuses No. 4 (10-amp), No. 30 (10-amp), No. 31 (25-amp), No. 33 (10-amp) and No. 34 (25-amp) located in instrument panel electrical center. Check for good, clean ground connections. See **WIRING DIAGRAMS** . Check for proper installation of aftermarket electronic equipment.
2. Check for broken or partially broken wire inside of insulation, which could cause system malfunction but prove good in a continuity/voltage check with system disconnected. These circuits may be intermittent or resistive when loaded. Check by monitoring for voltage drop with system under load.

SELF-DIAGNOSTICS

DIAGNOSTIC PROCEDURE

Check for Diagnostic Trouble Codes (DTCs). See procedures in RETRIEVING DIAGNOSTIC TROUBLE CODES. If any DTCs exist, perform proper test under DIAGNOSTIC TESTS. If no DTCs exist, see **POWER SEATS** or POWER MIRRORS article. After repair is complete, recheck system operation.

RETRIEVING DIAGNOSTIC TROUBLE CODES

Using On-Board Diagnostics

If any warning messages exist, DTCs can be retrieved by depressing RESET button on Driver Information Center (DIC) control panel. Depress and hold OPTIONS button and press FUEL button 4 times within 5 seconds of depressing OPTIONS button. Select appropriate module number and module name will appear on Driver's Information Center (DIC) display. See **MODULE IDENTIFICATION** table. After module is displayed, individual DTCs will be displayed.

To begin manual control of DTC viewing, depress FUEL, TRIP, GAUGES, OPTIONS or RESET button. Depress TRIP button to view previous module. Depress OPTIONS button to view next module. Depress FUEL button to view previous DTC in selected module. Depress GAUGES button to view next DTC in selected module. After retrieving and recording current and history DTCs, proceed to appropriate DTC test under DIAGNOSTIC TESTS and follow diagnostic and repair procedures. Depress the E/M button to exit self-diagnostics.

Using Scan Tool

Diagnostic Trouble Codes (DTCs) can also be retrieved using scan tool. Connect scan tool to Data Link Connector (DLC) located under driver's side of instrument panel. Turn ignition switch to ON position. Select appropriate module on scan tool display to retrieve current and history DTCs. Record DTCs and proceed to appropriate DTC test under DIAGNOSTIC TESTS and follow diagnostic and repair procedures.

MODULE IDENTIFICATION

Description	Module No.
Left Door Control Module (LDCM)	A0
Right Door Control Module (RDCM)	A1
Seat Control Module (SCM)	A6

CLEARING DIAGNOSTIC TROUBLE CODES (DTCS)

Seat Control Module (SCM) and Door Control Module (DCM) DTCs can be cleared by using Instrument Panel Cluster (IPC) clearing feature, using a scan tool or will automatically clear if malfunction has not reoccurred within 50 ignition cycles.

Using On-Board Diagnostics

Use manual control functions to select and view DTCs. See **RETRIEVING DIAGNOSTIC TROUBLE CODES** . Depress the RESET button for 2 seconds to clear the selected DTC from selected module.

Using Scan Tool

Select CLEAR DTCs function on scan tool. Clear current and history DTCs. Operate vehicle and recheck for DTCs.

DTC DEFINITIONS

POWER SEAT/MIRROR DIAGNOSTIC TROUBLE CODES

DTC	Application

B0851	Battery 1 Out Of Range
B0846	Battery 2 Out Of Range
B2242	Memory No. 1 Switch Fault (LDCM)
B2244	Memory No. 2 Switch Fault (LDCM)
B2262	Mirror Horizontal Position Sensor Fault (LDCM)
B2263	Mirror Horizontal Position Sensor Fault (RDCM)
B2264	Mirror Vertical Position Sensor Fault (LDCM)
B2265	Mirror Vertical Position Sensor Fault (RDCM)
B2605	Seat Front Vertical Position Sensor Failure
B2606	Seat Rear Vertical Position Sensor Failure
B2607	Seat Horizontal Position Sensor Failure

DIAGNOSTIC TESTS

CAUTION: To prevent damage to terminals, Connector Test Adaptor Kit (J-35616-A) must be used whenever a diagnostic procedure requires checking or probing terminals. To locate and identify terminals, see WIRING DIAGRAMS .

DTC B0846: BATTERY 2 OUT OF RANGE

Circuit Description

Left Seat Control Module (SCM) has 2 main power feeds (high and low), and one main ground. Low power feed (battery 1) is used to provide power for SCM logic and internal driver operation. High power feed (battery 2) is used to provide power for systems that draw higher amounts of current (motor, lights etc.). For most functions, SCM will operate properly when vehicle system voltage is 9.0-16.0 volts. SCM also monitors voltage level at battery 1 and battery 2 circuits, and can determine if voltage level received is out of range.

DTC B0846 will set if voltage level is out of range, SCM detects battery 2 voltage range less 8.5 volts or more than 16.3 volts for more than 2 seconds. DTC B0846 will store as a history code in SCM memory. No driver warning will be displayed.

Under all fault conditions, DTC B0846 will clear automatically when battery 2 voltage range is 8.5-16.3 volts for more than 2 seconds. Current and history DTCs can be cleared using scan tool or Instrument Panel Cluster (IPC) clearing DTCs feature.

Testing

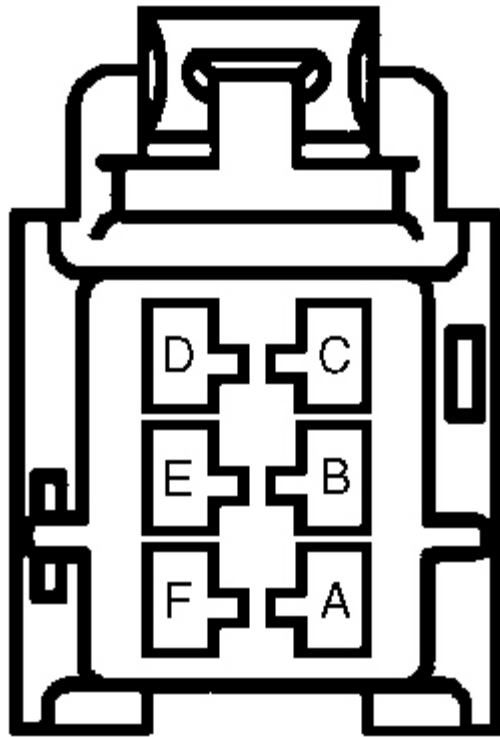
1. Disconnect SCM Black, 6-pin connector C3. Using DVOM, check voltage between SCM harness connector C3, terminal "A" (Orange wire) and ground. See **Fig. 1** . If 10-14 volts exists, go to next step. If 10-14 volts does not exist, go to step 3).
2. Replace SCM. Recheck system operation.
3. Disconnect left seat harness connector C301, located under left seat. Check voltage between connector

C301, terminal "C" (Orange wire) and ground. If 10-14 volts exists, go to next step. If 10-14 volts does not exist, go to step 5).

4. Repair open in Orange wire between connector C301 and SCM connector C3. Recheck system operation.
5. Disconnect instrument panel electrical center connector C2. Using DVOM, check voltage between instrument panel electrical center connector C2 (component-side), terminal F8 (Orange wire) and ground. If 10-14 volts exists, go to next step. If 10-14 volts does not exist, go to step 7).
6. Repair open in Orange wire between connector C301 and instrument panel electrical center connector C2. Recheck system operation.
7. Replace instrument panel electrical center. Recheck system operation.

Diagnostic Aids

1. If DTC does not reset after code is cleared, problem may be intermittent. While performing tests, move wires and connectors. Following conditions may also cause an intermittent malfunction:
 - Intermittent open or short to ground in Orange wire circuit between instrument panel electrical center and SCM.
 - Battery voltage not within range (8.5-16.3).
 - Charging system malfunction.
2. Using scan tool, select SCM data display and monitor battery 2 voltage while test driving vehicle and operating different devices (windows, door locks, power mirrors). This will determine if battery 2 voltage is affected by these devices and can help duplicate malfunction.



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Fig. 1: Identifying Seat Control Module Connector C3
Courtesy of GENERAL MOTORS CORP.

DTC B0851: BATTERY 1 OUT OF RANGE

Circuit Description

Left Seat Control Module (SCM) has 2 main power feeds (high and low), and one main ground. Low power feed (battery 1) is used to provide power for SCM logic and internal driver operation. High power feed (battery 2) is used to provide power for systems that draw higher amounts of current (motor, lights etc.). For most functions, SCM will operate properly when vehicle system voltage is 9.0-16.0 volts. SCM also monitors voltage level at battery 1 and battery 2 circuits and can determine if voltage level received is out of range.

DTC B0851 will set if voltage level is out of range. SCM detects battery 1 voltage range less than 8.5 volts or more than 16.3 volts for more than 2 seconds. DTC B0851 will store as a history code in SCM memory. No driver warning will be displayed.

Under all fault conditions, DTC B0851 will clear automatically when battery 1 voltage range is between 8.5-16.3 volts for more than 2 seconds. Current and history DTCs can be cleared using scan tool or Instrument Panel Cluster (IPC) clearing DTCs feature.

Testing

1. Disconnect SCM connector. Using DVOM, check voltage between SCM harness 26-pin connector C1, terminal No. 3 (Orange wire) and ground. If 10-14 volts exists, go to next step. If 10-14 volts does not exist, go to step 3).
2. Replace SCM. Recheck system operation.
3. Disconnect left seat harness connector C301, located under left seat. Check voltage between connector C301, terminal "E" (Orange wire) and ground. If 10-14 volts exists, go to next step. If 10-14 volts does not exist, go to step 5).
4. Repair open in Orange wire between connector C301 and SCM connector C1. Recheck system operation.
5. Disconnect instrument panel electrical center connector C1. Using DVOM, check voltage between instrument panel electrical center connector C1 (component-side), terminal C12 (Orange wire) and ground. If 10-14 volts exists, go to next step. If 10-14 volts does not exist, go to step 7).
6. Repair open in Orange wire between connector C301 and instrument panel electrical center connector C1. Recheck system operation.
7. Replace instrument panel electrical center. Recheck system operation.

Diagnostic Aids

1. If DTC does not reset after code is cleared, problem may be intermittent. While performing tests, move wires and connectors. Following conditions may also cause an intermittent malfunction:
 - Intermittent open or short to ground in Orange wire circuit between instrument panel electrical center and SCM.
 - Battery voltage not within range (8.5-16.3).
 - Charging system malfunction.
2. Using scan tool, select SCM data display and monitor battery 1 voltage while test driving vehicle and operating different devices (windows, door locks, power mirrors). This will determine if battery 1 voltage is affected by these devices and can help duplicate the malfunction.

DTC: B2242 MEMORY NO. 1 SWITCH FAULT (LDCM)

Circuit Description

Left door switch circuit provides input to Left Door Control Module (LDCM). When MEMORY buttons No. 1 or No. 2 are depressed independently, or if both are depressed simultaneously, LDCM recognizes input as a memory recall request. LDCM provides power and ground to both memory switches. Ground is supplied through activated memory switch to LDCM memory select switch input. LDCM detects low voltage at memory select switch input, LDCM activates appropriate memory functions and sends a message over serial data line to other systems responsible for memory recall functions (RDCM, radio, seats etc.). LDCM monitors both memory select switch input circuits and determines how long a ground has been applied.

DTC B2242 will set if ground is applied for more than 20 seconds. DTC B2242 will store as a history code in LDCM memory. No driver warning will be displayed.

Under all fault conditions, DTC B2242 will clear automatically LDCM no longer detect a short to ground at MEMORY No. 1 switch for more than 20 seconds. Current and history DTCs can be cleared using scan tool or IPC clearing DTCs feature.

Testing

1. Using scan tool, select LDCM input display and monitor MEMORY No. 1 select switch status. If scan tool displays MEMORY No. 1 select switch as ACTIVE, go to next step. If scan tool does not display MEMORY No. 1 select switch as ACTIVE, go to step 6).
2. Disconnect MEMORY No. 1 switch connector. Using scan tool, select LDCM input display and monitor MEMORY No. 1 switch status. If scan tool displays MEMORY No. 1 switch as ACTIVE, go to next step. If scan tool display does not display MEMORY No. 1 switch as ACTIVE, go to step 4).
3. Check for short to ground in White wire between MEMORY No. 1 switch and LDCM. Repair as necessary, then go to step 8). If circuit is okay, go to step 5).
4. Replace left door switch assembly. After repair, go to step 8).
5. Replace LDCM. After repair go to step 8).
6. Check MEMORY No. 1 switch circuit for intermittent malfunction. See DIAGNOSTIC AIDS. If problem was found and repaired, go to step 8). If problem was not found, go to next step.
7. Turn ignition switch to OFF position. Connect or install any connectors or components disconnected or removed. Turn ignition switch to RUN position. Clear any DTCs. Wait for 20 seconds. If DTC B2242 sets, go to step 5). If DTC B2242 does not set, system is okay.
8. Turn ignition switch to OFF position. Connect or install any connectors or components disconnected or removed. Turn ignition switch to RUN position. Clear any DTCs. Recheck system operation.

Diagnostic Aids

1. If DTC does not reset after code is cleared, problem may be intermittent. While performing tests, move wires and connectors. Following conditions may also cause an intermittent malfunction:
 - Intermittent open or short to ground in White wire circuit between MEMORY No. 1 switch and LDCM.
 - MEMORY No. 1 switch is shorted to ground internally or is sticking.
 - MEMORY No. 1 switch was depressed for longer than 20 seconds.
2. If White wire is shorted to ground or MEMORY No. 1 switch is stuck closed, MEMORY No. 1 selected features will operate but MEMORY No. 2 functions will be inoperative.
3. Using scan tool, select LDCM inputs and monitor MEMORY No. 1 select switch status. If scan tool displays ACTIVE, disconnect MEMORY No. 1 switch. If select switch changes to INACTIVE, replace MEMORY No. 1 select switch. If switch status does not change, check White wire for short to ground.

DTC: B2244 MEMORY NO. 2 SWITCH FAULT (LDCM)

Circuit Description

Left door switch circuit provides input to Left Door Control Module (LDCM). When MEMORY No. 1 or No. 2 button is depressed, LDCM recognizes input as a memory recall request. LDCM provides power and ground to both memory switches. Ground is supplied through activated memory switch to LDCM memory select switch input. LDCM detects low voltage at memory select switch input, LDCM activates appropriate memory functions and send a message over serial data line to other systems responsible for memory recall functions (RDCM, radio, seats etc.). LDCM monitors both memory select switch input circuits and determines how long a ground has been applied.

DTC B2244 will set if ground is applied for more than 20 seconds. DTC B2244 will store as a history code in LDCM memory. No driver warning will be displayed.

Under all fault conditions, DTC B2244 will clear automatically if LDCM no longer detects a short to ground at MEMORY No. 2 switch for more than 20 seconds. Current and history DTCs can be cleared using scan tool or Instrument Panel Cluster (IPC) clearing DTCs feature.

Testing

1. Using scan tool, select LDCM input display and monitor MEMORY 2 select switch status. If scan tool displays MEMORY No. 2 select switch as ACTIVE, go to next step. If scan tool does not display MEMORY No. 2 select switch as ACTIVE, go to step 6).
2. Disconnect MEMORY No. 2 switch connector. Using scan tool select LDCM input display and monitor MEMORY No. 2 switch status. If scan tool displays MEMORY No. 2 switch as ACTIVE, go to next step. If scan tool does not display MEMORY No. 2 switch as ACTIVE, go to step 4).
3. Check for short to ground in Purple wire between MEMORY No. 2 switch and LDCM. Repair as necessary, then go to step 8). If circuit is okay, go to step 5).
4. Replace left door switch assembly. After repair, go to step 8).
5. Replace LDCM. After repair go to step 8).
6. Check MEMORY No. 2 switch circuit for intermittent malfunction. See DIAGNOSTIC AIDS. If problem was found and repaired, go to step 8). If problem was not found, go to next step.
7. Turn ignition switch to OFF position. Connect or install any connectors or components disconnected or removed. Turn ignition switch to RUN position. Clear any DTCs. Wait for 20 seconds. If DTC B2244 sets as history, go to step 5). If DTC B2244 does not set, system is okay.
8. Turn ignition switch to OFF position. Connect or install any connectors or components disconnected or removed. Turn ignition switch to RUN position. Clear any DTCs. Recheck system operation.

Diagnostic Aids

1. If DTC does not reset after code is cleared, problem may be intermittent. While performing tests, move wires and connectors. Following conditions may also cause an intermittent malfunction:
 - Intermittent open or short to ground in Purple wire circuit between MEMORY No. 2 switch and LDCM.
 - MEMORY No. 2 switch is shorted to ground internally or is sticking.
 - MEMORY No. 2 switch was depressed for longer than 20 seconds.
2. If Purple wire is shorted to ground or MEMORY No. 2 switch is stuck closed, MEMORY No. 2 selected

features will operate but MEMORY No. 1 functions will be inoperative.

3. Using scan tool, select LDCM inputs and monitor MEMORY No. 2 select switch status. If scan tool displays ACTIVE, disconnect MEMORY No. 2 switch. If select switch changes to INACTIVE, replace MEMORY No. 2 select switch. If select switch does not change status, check purple wire for short to ground.

DTC: B2262 MIRROR HORIZONTAL POSITION SENSOR FAULT (LDCM)

Circuit Description

Left Door Control Module (LDCM) determines horizontal position of left mirror from a signal received from horizontal position sensor. LDCM commands mirror memory recall settings based on voltage level LDCM receives back from horizontal sensor. LDCM provides a 5-volt supply, a left-side horizontal position signal and a ground to horizontal position sensor. When a memory setting is recalled, LDCM will command left mirror motor to move to a stored position sensor voltage previously set. LDCM monitors left mirror horizontal position signal circuit and can determine if voltage level received is out of range.

DTC B2262 will set if LDCM detects left mirror horizontal position sensor signal voltage range less than 0.1 volt or more than 4.78 volts for more than 2 seconds. DTC B2262 will store as a history code in LDCM memory. No driver warning will be displayed.

Under all fault conditions, DTC B2262 will clear automatically if LDCM no longer detects left mirror horizontal position sensor signal voltage range less than 0.1 volt or more than 4.78 volts for more than 2 seconds. Current and history DTCs can be cleared using scan tool or Instrument Panel Cluster (IPC) clearing DTCs feature.

Testing

1. Using scan tool, select LDCM DTC display and check for DTC B2262. If DTC B2262 is stored as a history code, go to next step. If DTC B2262 is not stored as a history code, go to step 5).
2. Using scan tool, select LDCM data display and monitor left mirror horizontal position sensor data while operating left mirror. If horizontal position sensor voltage is 0.1-4.78 volts, go to step 11). If horizontal position sensor voltage is not 0.1-4.78 volts, go to next step.
3. Turn ignition switch to OFF position. Disconnect left mirror 4-pin connector C2. Turn ignition switch to RUN position. Using DVOM, check voltage between left mirror harness connector C2, terminal "A" (Gray wire) and ground while operating left mirror. If 4.0-5.5 volts exists, go to next step. If 4.0-5.5 volts does not exist, go to step 6).
4. Check voltage between left mirror harness connector C2, terminals "A" (Gray wire) and "C" (Black/White wire) while operating left mirror. If 4.0-5.5 volts exists, go to step 9). If 4.0-5.5 volts does not exist, go to step, 7).
5. Turn ignition switch to OFF position. Disconnect left mirror 4-pin connector C2. Turn ignition switch to RUN position. Using DVOM, check voltage between left mirror harness connector C2, terminal "D" (Gray wire) and ground while operating left mirror. If 3.5-5.5 volts exists, go to step 9). If 3.5-5.5 volts does not exist, go to step 8).
6. Check for an open circuit, short to ground or voltage in Gray wire between left outside mirror and LDCM. If problem exists, repair as necessary. After repair, go to step 13). If circuit is okay, go to step

- 10).
7. Check Black/White wire between left mirror and LDCM. If problem is found, repair as necessary. After repair, go to step 13). If circuit is okay, go to step 10).
 8. Check Gray wire for short to ground or voltage between left mirror and LDCM. If problem exists, repair as necessary. After repair, go to step 13). If circuit is okay, go to step 10).
 9. Replace left mirror assembly. Go to step 13).
 10. Replace LDCM. Go to step 13).
 11. Check left mirror horizontal position sensor circuit for an intermittent malfunction. Go to DIAGNOSTIC AIDS. If problem exists, repair as necessary. After repair, go to step 13). If no problem exists, go to next step.
 12. Turn ignition switch to OFF position. Connect or install any connectors or components that were disconnected or removed. Clear any DTCs. See **CLEARING DIAGNOSTIC TROUBLE CODES** under SELF-DIAGNOSTICS. Wait 2 seconds. Check for DTCs. If DTC B2262 sets as history again, go to step 11). If DTC B2262 does not reset, system is okay.
 13. Turn ignition switch to OFF position. Connect or install any connectors or components that were disconnected or removed. Turn ignition switch to RUN position. Clear any DTCs. See procedures in **CLEARING DIAGNOSTIC TROUBLE CODES** under SELF-DIAGNOSTICS. Recheck system operation.

Diagnostic Aids

1. If DTC does not reset after code is cleared, problem may be intermittent. While performing tests, move wires and connectors. Following conditions may also cause an intermittent malfunction:
 - Intermittent open or short to ground in Black/White wire circuit between left outside rear view mirror switch and LDCM.
 - Left mirror horizontal position sensor is open or shorted internally.
2. If LDCM is unable to determine the correct horizontal position, manual power functions will still operate but LDCM will not be able to recall correct memory settings.
3. Using scan tool, select LDCM data display and monitor mirror horizontal display. Move left mirror horizontally in both directions while monitoring horizontal position sensor data. Voltage range should vary and stay between 0.1-4.78 volts depending on direction of mirror. This will determine if horizontal position sensor is shorted in different positions.

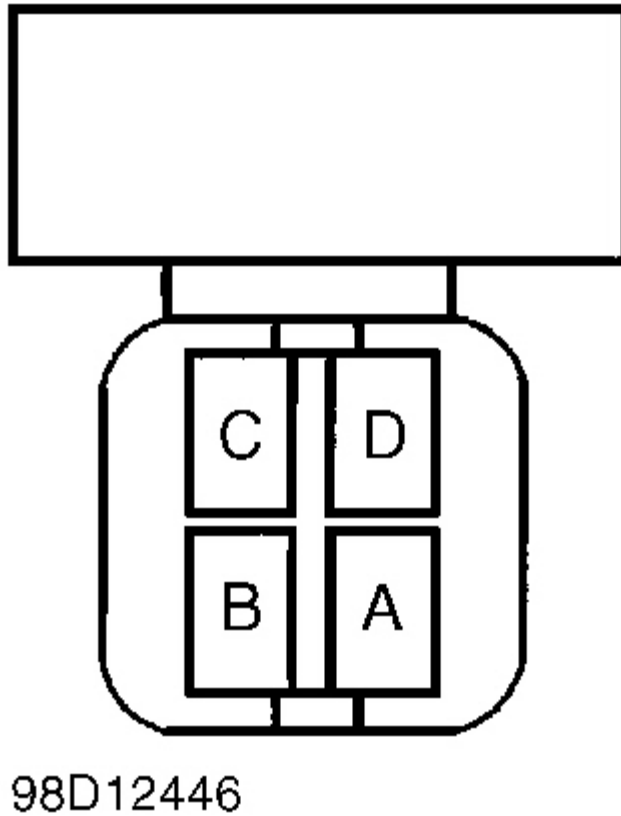


Fig. 2: Identifying Mirror Harness Connector C2
Courtesy of GENERAL MOTORS CORP.

DTC B2263: MIRROR HORIZONTAL POSITION SENSOR FAULT (RDCM)

Circuit Description

Right Door Control Module (RDCM) determines horizontal position of right mirror from a signal received from horizontal position sensor. RDCM commands mirror memory settings based on voltage level RDCM receives back from horizontal sensor. RDCM provides a 5-volt supply, a right-side mirror horizontal position signal and a ground to horizontal position sensor. When a memory setting is recalled, RDCM will command right mirror motor to move to a stored position sensor voltage previously set. RDCM monitors right mirror horizontal position signal circuit and can determine if voltage level received is out of range.

DTC B2263 will set if LDCM detects left mirror horizontal position sensor signal voltage range less than 0.1 volt or more than 4.78 volts for more than 2 seconds. DTC B2263 will store as a history code in RDCM

memory. No driver warning will be displayed.

Under all fault conditions, DTC B2263 will clear automatically if RDCM no longer detects right mirror horizontal position sensor signal voltage range less than 0.1 volt or more 4.78 volts for more than 2 seconds. Current and history DTCs can be cleared using scan tool or Instrument Panel Cluster (IPC) clearing DTCs feature.

Testing

1. Using scan tool, select RDCM DTC display and check for DTC B2263. If DTC B2263 is stored as history, go to next step. If DTC B2263 is not stored in history, go to step 5).
2. Using scan tool, select RDCM data display and monitor right mirror horizontal position sensor data while operating right mirror. If horizontal position sensor voltage is 0.1-4.78 volts, go to step 11). If horizontal position sensor voltage is not 0.1-4.78 volts, go to next step.
3. Turn ignition switch to OFF position. Disconnect right mirror 4-pin connector C2. Turn ignition switch to RUN position. Using DVOM, check voltage between right mirror harness connector C2, terminal "A" (Gray wire) and ground while operating right mirror. If 4.0-5.5 volts exists, go to next step. If 4.0-5.5 volts does not exist, go to step 6).
4. Check voltage between right mirror harness connector C2, terminals "A" (Gray wire) and "C" (Black/White wire) while operating right mirror. If 4.0-5.5 volts exists, go to step 9). If 4.0-5.5 volts does not exist, go to step, 7).
5. Turn ignition switch to OFF position. Disconnect right mirror 4-pin connector C2. Turn ignition switch to RUN position. Using DVOM, check voltage between right mirror harness connector C2, terminal "D" (Light Blue/Black wire) and ground while operating right mirror. If 3.5-5.5 volts exists, go to step 9). If 3.5-5.5 volts does not exist, go to step 8).
6. Check for an open circuit, short to ground or voltage in Gray wire between right outside mirror and RDCM. If problem exists, repair as necessary. After repair, go to step 13). If circuit is okay, go to step 10).
7. Check Black/White wire between right mirror and RDCM. If problem is found, repair as necessary. After repair, go to step 13). If circuit is okay, go to step 10).
8. Check Light Blue/Black wire for short to ground or voltage between right mirror and RDCM. If problem exists, repair as necessary. After repair, go to step 13). If circuit is okay, go to step 10).
9. Replace right mirror assembly. Go to step 13).
10. Replace RDCM. Go to step 13).
11. Check right mirror horizontal position sensor circuit for an intermittent malfunction. Go to DIAGNOSTIC AIDS. If problem exists, repair as necessary. After repair, go to step 13). If no problem exists, go to next step.
12. Turn ignition switch to OFF position. Connect or install any connectors or components that were disconnected or removed. Clear any DTCs. See **CLEARING DIAGNOSTIC TROUBLE CODES** under SELF-DIAGNOSTICS. Wait 2 seconds. Check for DTCs. If DTC B2263 sets as history again, go to step 11). If DTC B2263 does not reset, system is okay.
13. Turn ignition switch to OFF position. Connect or install any connectors or components that were disconnected or removed. Turn ignition switch to RUN position. Clear any DTCs. See procedures in **CLEARING DIAGNOSTIC TROUBLE CODES** under SELF-DIAGNOSTICS. Recheck system

operation.

Diagnostic Aids

1. If DTC does not reset after code is cleared, problem may be intermittent. While performing tests, move wires and connectors. Following conditions may also cause an intermittent malfunction:
 - Intermittent open or short to ground in Black/White wire circuit between right outside rear view mirror switch and RDCM.
 - Right mirror horizontal position sensor is open or shorted internally.
2. If RDCM is unable to determine correct horizontal position, manual power functions will still operate but RDCM will not be able to recall correct memory settings.
3. Using scan tool, select LDCM data display and monitor mirror horizontal display. Move left mirror horizontally in both directions while monitoring horizontal position sensor data. Voltage range should vary and stay between 0.1-4.78 volts depending on direction of mirror. This will determine if horizontal position sensor is shorted in different positions.

DTC B2264: MIRROR VERTICAL POSITION SENSOR FAULT (LDCM)

Circuit Description

Left Door Control Module (LDCM) determines vertical position of left mirror from a signal sent by vertical position sensor. LDCM commands mirror memory recall settings based on voltage level LDCM receives back from vertical sensor. LDCM provides a 5-volt supply, a left-side mirror vertical sensor signal and a ground to vertical position sensor. When a memory setting is recalled, LDCM will command left mirror motor to move to a stored position sensor voltage previously set. LDCM monitors left mirror vertical position signal circuit and can determine if voltage level received is out of range.

DTC B2264 will set if LDCM detects left mirror vertical position sensor signal voltage range less than 0.1 volt or more than 4.78 volts for more than 2 seconds. DTC B2264 will store as a history code in LDCM memory. No driver warning will be displayed.

Under all fault conditions, DTC B2264 will clear automatically if LDCM no longer detects left mirror vertical position sensor signal voltage range less than 0.1 volt or more than 4.78 volts for more than 2 seconds. Current and history DTCs can be cleared using scan tool or Instrument Panel Cluster (IPC) clearing DTCs feature.

Testing

1. Using scan tool, select LDCM DTC display and check for DTC B2264. If DTC B2264 is stored as history, go to next step. If DTC B2264 is not stored in history, go to step 5).
2. Using scan tool, select LDCM data display and monitor left mirror vertical position sensor data while operating left mirror. If vertical position sensor voltage is 0.1-4.78 volts, go to step 11). If vertical position sensor voltage is not 0.1-4.78 volts, go to next step.
3. Turn ignition switch to OFF position. Disconnect left mirror 4-pin connector C2. Turn ignition switch to RUN position. Using DVOM, check voltage between left mirror harness connector C2, terminal "A" (Gray wire) and ground while operating left mirror. If 4.0-5.5 volts exists, go to next step. If 4.0-5.5 volts does not exist, go to step 6).

4. Check voltage between left mirror harness connector C2, terminals "A" (Gray wire) and "C" (Black/White wire) while operating left mirror. If 4.0-5.5 volts exists, go to step 9). If 4.0-5.5 volts does not exist, go to step, 7).
5. Turn ignition switch to OFF position. Disconnect left mirror 4-pin connector C2. Turn ignition switch to RUN position. Using DVOM, check voltage between left mirror harness connector C2, terminal "A" (Gray wire) and ground while operating left mirror. If 3.5-5.5 volts exists, go to step 9). If 3.5-5.5 volts does not exist, go to step 8).
6. Check for an open circuit, short to ground or voltage in Gray wire between left outside mirror and LDCM. If problem exists, repair as necessary. After repair, go to step 13). If circuit is okay, go to step 10).
7. Check Black/White wire between left mirror and LDCM. If problem is found, repair as necessary. After repair, go to step 13). If circuit is okay, go to step 10).
8. Check Dark Green wire for short to ground or voltage between left mirror and LDCM. If problem exists, repair as necessary. After repair, go to step 13). If circuit is okay, go to step 10).
9. Replace left mirror assembly. Go to step 13).
10. Replace LDCM. Go to step 13).
11. Check left mirror vertical position sensor circuit for an intermittent malfunction. Go to DIAGNOSTIC AIDS. If problem exists, repair as necessary. After repair, go to step 13). If no problem exists, go to next step.
12. Turn ignition switch to OFF position. Connect or install any connectors or components that were disconnected or removed. Clear any DTCs. See **CLEARING DIAGNOSTIC TROUBLE CODES (DTCs)** under SELF-DIAGNOSTICS. Wait 2 seconds. Check for DTCs. If DTC B2264 sets as history again, go to step 11). If DTC B2264 does not reset, system is okay.
13. Turn ignition switch to OFF position. Connect or install any connectors or components that were disconnected or removed. Turn ignition switch to RUN position. Clear any DTCs. See procedures in **CLEARING DIAGNOSTIC TROUBLE CODES** under SELF-DIAGNOSTICS. Recheck system operation.

Diagnostic Aids

1. If DTC does not reset after code is cleared, problem may be intermittent. While performing tests, move wires and connectors. Following conditions may also cause an intermittent malfunction:
 - Intermittent open or short to ground in Black/White, Dark Green or Gray wire circuit between left outside rear view mirror switch and LDCM.
 - Left mirror vertical position sensor is open or shorted internally.
2. If LDCM is unable to determine correct vertical position, manual power functions will still operate but LDCM will not be able to recall correct memory settings.
3. Using scan tool, select LDCM data display and monitor mirror vertical display. Move left mirror vertically in both directions while monitoring vertical position sensor data. Voltage range should vary and stay between 0.1-4.78 volts depending on direction of mirror. This will determine if vertical position sensor is shorted in different positions.

DTC B2265: MIRROR VERTICAL POSITION SENSOR FAULT (RDCM)

Circuit Description

Right Door Control Module (RDCM) determines vertical position of right mirror from a signal sent by vertical position sensor. RDCM commands mirror memory recall settings based on voltage level RDCM receives back from vertical sensor. RDCM provides a 5-volt supply, a right-side mirror vertical position signal and a ground to vertical position sensor. When a memory setting is recalled, RDCM will command right mirror motor to move to a stored position sensor voltage previously set. RDCM monitors right mirror vertical position signal circuit and can determine if voltage level received is out of range.

DTC B2265 will set if RDCM detects right mirror vertical position sensor signal voltage range less than 0.1 volt or more than 4.78 volts for more than 2 seconds. DTC B2265 will store as a history code in RDCM memory. No driver warning will be displayed.

Under all fault conditions, DTC B2265 will clear automatically if RDCM no longer detects left mirror vertical position sensor signal voltage range less than 0.1 volt or more than 4.78 volts for more than 2 seconds. Current and history DTCs can be cleared using scan tool or IPC clearing DTCs feature.

Testing

1. Using scan tool, select RDCM DTC display and check for DTC B2265. If DTC B2265 is stored as history, go to next step. If DTC B2265 is not stored in history, go to step 5).
2. Using scan tool, select RDCM data display and monitor left mirror vertical position sensor data while operating left mirror. If vertical position sensor voltage is between 0.1-4.78 volts, go to step 11). If vertical position sensor voltage is not between 0.1-4.78 volts, go to next step.
3. Turn ignition switch to OFF position. Disconnect right mirror 4-pin connector C2. Turn ignition switch to RUN position. Using DVOM, check voltage between right mirror harness connector C2, terminal "A" (Gray wire) and ground while operating right mirror. See **Fig. 2** . If 4.0-5.5 volts exists, go to next step. If 4.0-5.5 volts does not exist, go to step 6).
4. Check voltage between right mirror harness connector C2, terminals "A" (Gray wire) and "C" (Black/White wire) while operating right mirror. If 4.0-5.5 volts exists, go to step 9). If 4.0-5.5 volts does not exist, go to step, 7).
5. Turn ignition switch to OFF position. Disconnect right mirror 4-pin connector C2. Turn ignition switch to RUN position. Using DVOM, check voltage between right mirror harness connector C2, terminal "A" (Gray wire) and ground while operating right mirror. If 3.5-5.5 volts exists, go to step 9). If 3.5-5.5 volts does not exist, go to step 8).
6. Check for an open circuit, short to ground or voltage in Gray wire between right outside mirror and RDCM. If problem exists, repair as necessary. After repair, go to step 13). If circuit is okay, go to step 10).
7. Check Black/White wire between right mirror and RDCM. If problem is found, repair as necessary. After repair, go to step 13). If circuit is okay, go to step 10).
8. Check Brown wire for short to ground or voltage between right mirror and RDCM. If problem exists, repair as necessary. After repair, go to step 13). If circuit is okay, go to step 10).
9. Replace right mirror assembly. Go to step 13).
10. Replace RDCM. Go to step 13).
11. Check right mirror vertical position sensor circuit for an intermittent malfunction. Go to DIAGNOSTIC

AIDS. If problem exists, repair as necessary. After repair, go to step 13). If no problem exists, go to next step.

12. Turn ignition switch to OFF position. Connect or install any connectors or components that were disconnected or removed. Clear any DTCs. See **CLEARING DIAGNOSTIC TROUBLE CODES** (DTCs) under SELF-DIAGNOSTICS. Wait 2 seconds. Check for DTCs. If DTC B2265 sets as history again, go to step 11). If DTC B2265 does not reset, system is okay.
13. Turn ignition switch to OFF position. Connect or install any connectors or components that were disconnected or removed. Turn ignition switch to RUN position. Clear any DTCs. See procedures in **CLEARING DIAGNOSTIC TROUBLE CODES** under SELF-DIAGNOSTICS. Recheck system operation.

Diagnostic Aids

1. If DTC does not reset after code is cleared, problem may be intermittent. While performing tests, move wires and connectors. Following conditions may also cause an intermittent malfunction:
 - Intermittent open or short to ground in Black/White, Brown or Gray wire circuit between right outside rear view mirror switch and RDCM.
 - Right mirror vertical position sensor is open or shorted internally.
2. If RDCM is unable to determine correct vertical position, manual power functions will still operate but RDCM will not be able to recall correct memory settings.
3. Using scan tool, select RDCM data display and monitor mirror vertical display. Move right mirror vertically in both directions while monitoring vertical position sensor data. Voltage range should vary and stay between 0.1-4.78 volts depending on direction of mirror. This will determine if vertical position sensor is shorted in different positions.

DTC B2605: SEAT FRONT VERTICAL POSITION SENSOR FAILURE

Circuit Description

Memory seat functions are operated when voltages from left seat switch are first applied to left Seat Control Module (SCM). SCM then stores voltage of front vertical position sensor when either memory button is depressed. SCM provides a steady 5-volt supply (Purple wire) and ground (Black wire) to front vertical position sensor. Front vertical position sensor provides a return voltage on signal wire (Brown/White wire) to SCM. Depending on seat location, voltage on signal wire varies for 0.1-4.78 volts. When on memory recall is requested, SCM applies voltage to motor until position sensor voltage equals stored value, moving seat to preset position.

DTC B2605 will set if front vertical position sensor input to SCM is less than 0.1 volt or more than 4.78 volts for 2 seconds or more. DTC B2605 will store as a history code in SCM memory. No driver warning will be displayed. Memory function and operation of faulted position sensor will be disabled.

Under all fault conditions, DTC B2605 will clear automatically when front vertical position sensor to SCM is within operating range of 0.1-4.78 volts for 2 seconds or more. Current and history DTCs can be cleared using scan tool or Instrument Panel Cluster (IPC) clearing DTCs feature.

Testing

1. If DTC B2606 or B2607 is also set, go to next step. If DTC B2606 or B2607 is not set, go to step 6).
2. Disconnect left seat lower motor connector C2. Using DVOM, check voltage between left seat lower motor harness connector C2, terminal "A" (Purple wire) and ground. See **Fig. 3** . If 4.5-5.5 volts exists, go to next step. If 4.5-5.5 volts does not exist, go to step 5).
3. Check voltage between left seat lower motor harness connector C2, terminals "A" (Purple wire) and "C" (Black wire). If 4.5-5.5 volts exists, go to next step. If 4.5-5.5 volts does not exist, go to step 9).
4. Replace left seat lower motor. Recheck system operation.
5. Check for open or short to ground in Purple wire between left seat lower motor connector C2 and SCM connector C1. Repair as necessary. If circuit is okay, replace SCM. Recheck system operation.
6. Disconnect left seat lower motor connector C3. Using DVOM, check voltage between left seat motor harness connector C3, terminal "B" (Brown/White wire) and ground. If 3.5-5.5 volts exists, go to next step. If 3.5-5.5 volts does not exist, go to step 8).
7. Replace left seat lower motor. Recheck system operation.
8. Check for open circuit, short to ground or short to voltage in Brown/White wire between left seat lower motor connector C3 and SCM connector C1. Repair as necessary. If circuit is okay, replace SCM. Recheck system operation.
9. Check for open circuit or short to voltage in Black wire between left seat lower motor connector C2 and SCM connector C1. Repair as necessary. If circuit is okay, replace SCM. Recheck system operation.

Diagnostic Aids

1. If DTC does not reset after code is cleared, problem may be intermittent. While performing tests, move wires and connectors. Following conditions may also cause an intermittent malfunction:
 - Intermittent open or short to ground in Brown/White or Purple wire circuits between left seat lower motor and SCM.
 - An intermittent open or short to voltage in ground wire circuit (Black wire).
 - Front vertical position sensor is open or shorted internally.
2. If SCM is unable to determine the correct vertical position, manual power seat functions will still operate, but SCM will not be able to recall correct seat memory seat settings.
3. Using scan tool, select SCM data display and monitor front vertical position data. Move power seat vertically in both directions while voltage range should vary and stay between 0.1-4.78 volts depending on position of seat. This will check if front vertical position sensor is shorted in different positions.

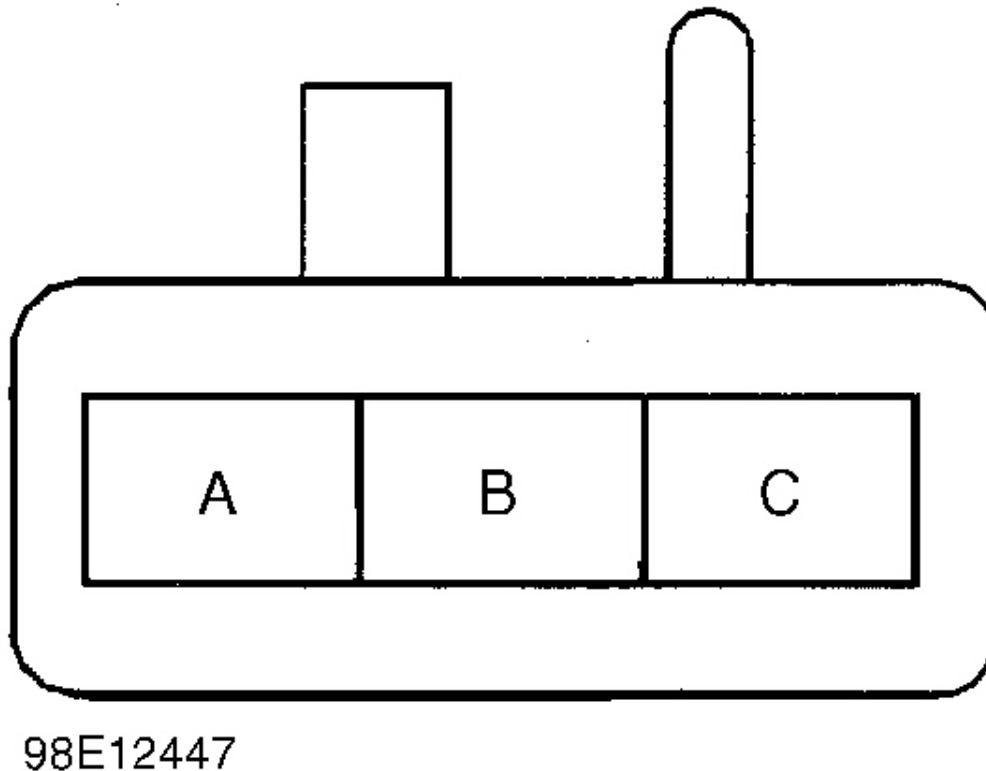


Fig. 3: Identifying Left Seat Lower Motor Harness Connector C2
Courtesy of GENERAL MOTORS CORP.

DTC B2606: SEAT REAR VERTICAL POSITION SENSOR FAILURE

Circuit Description

Memory seat functions are operated when voltages from left seat switch are first applied to left Seat Control Module (SCM). SCM then stores voltage of rear vertical position sensor when either memory button is depressed. SCM provides a steady 5-volt supply (Purple wire) and ground (Black wire) to rear vertical position sensor. Rear vertical position sensor provides a return voltage on signal wire (Tan wire) to SCM. Depending on seat location, voltage on signal wire varies for 0.1-4.78 volts. When on memory recall is requested, SCM applies voltage to motor until position sensor voltage equals stored value, moving seat to preset position.

DTC B2606 will set if rear vertical position sensor input to SCM is less than 0.1 volt or more than 4.78 volts for 2 seconds or more. DTC B2606 will store as a history code in SCM memory. No driver warning will be displayed. Memory function and operation of faulted position sensor will be disabled.

Under all fault conditions, DTC B2606 will clear automatically when rear vertical position sensor to SCM is within operating range of 0.1-4.78 volts for 2 seconds or more. Current and history DTCs can be cleared using scan tool or Instrument Panel Cluster (IPC) clearing DTCs feature.

Testing

1. If DTC B2605 or B2607 is also set, go to next step. If DTC B2605 or B2607 is not set, go to step 6).
2. Disconnect left seat lower motor connector C2. Using DVOM, check voltage between left seat motor harness connector C2, terminal "A" (Purple wire) and ground. See **Fig. 3** . If 4.5-5.5 volts exists, go to next step. If 4.5-5.5 volts does not exist, go to step 5).
3. Check voltage between left seat lower motor harness connector C2, terminals "A" (Purple wire) and "C" (Black wire). If 4.5-5.5 volts exists, go to next step. If 4.5-5.5 volts does not exist, go to step 9).
4. Replace left seat lower motor. Recheck system operation.
5. Check for open or short to ground in Purple wire between left seat lower motor connector C2 and SCM connector C1. Repair as necessary. If circuit is okay, replace SCM. Recheck system operation.
6. Disconnect left seat lower motor Black, 3-pin connector C4. Using DVOM, check voltage between left seat motor harness connector C4, terminal "B" (Tan wire) and ground. If 3.5-5.5 volts exists, go to next step. If 3.5-5.5 volts does not exist, go to step 8).
7. Replace left seat lower motor. Recheck system operation.
8. Check for open circuit, short to ground or short to voltage in Tan wire between left seat lower motor connector C4 and SCM connector C1. Repair as necessary. If circuit is okay, replace SCM. Recheck system operation.
9. Check for open or short to voltage in Black wire between left seat lower motor connector C2 and SCM connector C1. Repair as necessary. If circuit is okay, replace SCM. Recheck system operation.

Diagnostic Aids

1. If DTC does not reset after code is cleared, problem may be intermittent. While performing tests, move wires and connectors. Following conditions may also cause an intermittent malfunction:
 - Intermittent open or short to ground in Tan or Purple wire circuits between left seat lower motor and SCM.
 - An intermittent open or short to voltage in ground wire circuit (Black wire).
 - Rear vertical position sensor is open or shorted internally.
2. If SCM is unable to determine the correct vertical position, manual power seat functions will still operate, but SCM will not be able to recall correct seat memory seat settings.
3. Using scan tool, select SCM data display and monitor rear vertical position data. Move power seat vertically in both directions while voltage range should vary and stay between 0.1-4.78 volts depending on position of seat. This will check if rear vertical position sensor is shorted in different positions.

DTC B2607: SEAT REAR HORIZONTAL POSITION SENSOR FAILURE

Circuit Description

Memory seat functions are operated when voltages from left seat switch are first applied to left Seat Control

Module (SCM). SCM then stores voltage of horizontal position sensor when either memory button is depressed. SCM provides a steady 5-volt supply (Purple wire) and ground (Black wire) to horizontal position sensor. Horizontal position sensor provides a return voltage on signal wire (Dark Green wire) to SCM. Depending on seat location, voltage on signal wire varies for 0.1-4.78 volts. When memory recall is requested, SCM applies voltage to motor until position sensor voltage equals stored value, moving seat to preset position.

DTC B2607 will set if horizontal position sensor input to SCM is less than 0.1 volt or more than 4.78 volts for 2 seconds or more. DTC B2607 will store as a history code in SCM memory. No driver warning will be displayed. Memory function and operation of faulted position sensor will be disabled.

Under all fault conditions, DTC B2607 will clear automatically when horizontal position sensor to SCM is within operating range of 0.1-4.78 volts for 2 seconds or more. Current and history DTCs can be cleared using scan tool or IPC clearing DTC's feature.

Testing

1. If DTC B2605 or B2606 is also set, go to next step. If DTC B2605 or B2606 is not set, go to step 6).
2. Disconnect left seat lower motor Black, 3-pin connector C2. Using DVOM, check voltage between left seat lower motor harness connector C2, terminal "A" (Purple wire) and ground. See **Fig. 3** . If 4.5-5.5 volts exists, go to next step. If 4.5-5.5 volts does not exist, go to step 5).
3. Check voltage between left seat lower motor harness connector C2, terminals "A" (Purple wire) and "C" (Black wire). If 4.5-5.5 volts exists, go to next step. If 4.5-5.5 volts does not exist, go to step 9).
4. Replace left seat lower motor. Recheck system operation.
5. Check for open or short to ground in Purple wire between left seat lower motor connector C2 and SCM connector C1. Repair as necessary. If circuit is okay, replace SCM. Recheck system operation.
6. Disconnect left seat lower motor connector C2. Using DVOM, check voltage between left seat lower motor harness connector C2, terminal "B" (Dark Green wire) and ground. If 3.5-5.5 volts exist, go to next step. If 3.5-5.5 volts does not exist, go to step 8).
7. Replace left seat lower motor. Recheck system operation.
8. Check for open circuit, short to ground or short to voltage in Dark Green wire between left seat lower motor connector C2 and SCM connector C1. Repair as necessary. If circuit is okay, replace SCM. Recheck system operation.
9. Check for open or short to voltage in Black wire between left seat lower motor connector C2 and SCM connector C1. Repair as necessary. If circuit is okay, replace SCM. Recheck system operation.

Diagnostic Aids

1. If DTC does not reset after code is cleared, problem may be intermittent. While performing tests, move wires and connectors. Following conditions may also cause an intermittent malfunction:
 - Intermittent open or short to ground in Dark Green or Purple wire circuits between left seat lower motor and SCM.
 - An intermittent open or short to voltage in ground wire circuit (Black wire).
 - Horizontal position sensor is open or shorted internally.
2. If SCM is unable to determine correct horizontal position, manual power seat functions will still operate,

but SCM will not be able to recall correct seat memory seat settings.

3. Using scan tool, select SCM data display and monitor horizontal position data. Move power seat horizontally in both directions while voltage range should vary and stay between 0.1-4.78 volts depending on position of seat. This will check if horizontal position sensor is shorted in different positions.

REMOVAL & INSTALLATION

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION section before disconnecting battery.

NOTE: For removal and installation procedures, see POWER SEATS or POWER MIRRORS article.

WIRING DIAGRAMS

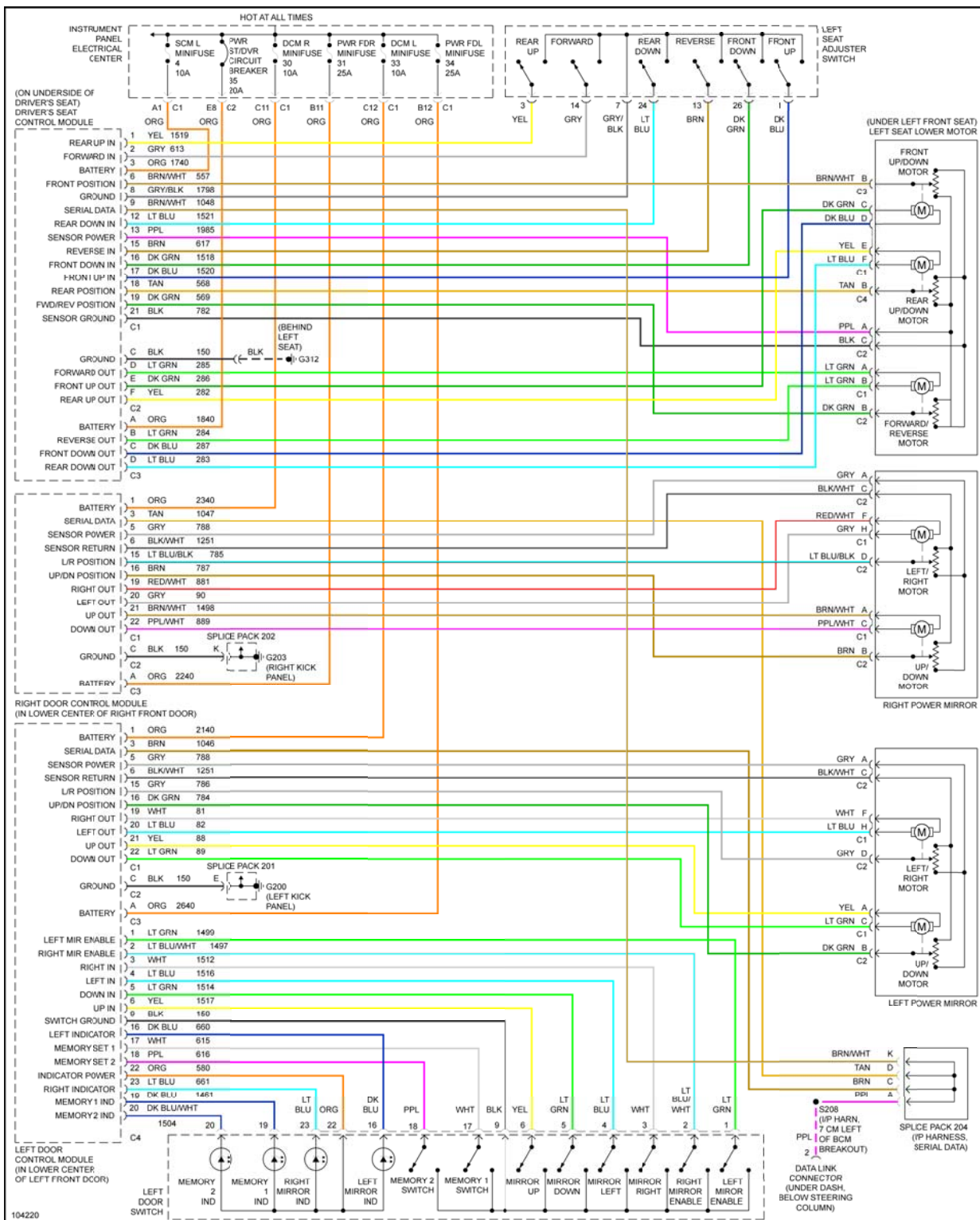


Fig. 4: Memory Power Seats/Power Mirrors Wiring Diagram

