

Fig. 2: Outside Rearview Mirror Schematic (Driver)
Courtesy of GENERAL MOTORS CORP.

2007 ACCESSORIES & EQUIPMENT Mirrors - Avalanche, Escalade, Suburban, Tahoe & Yukon



MIRROR COMPONENT VIEWS

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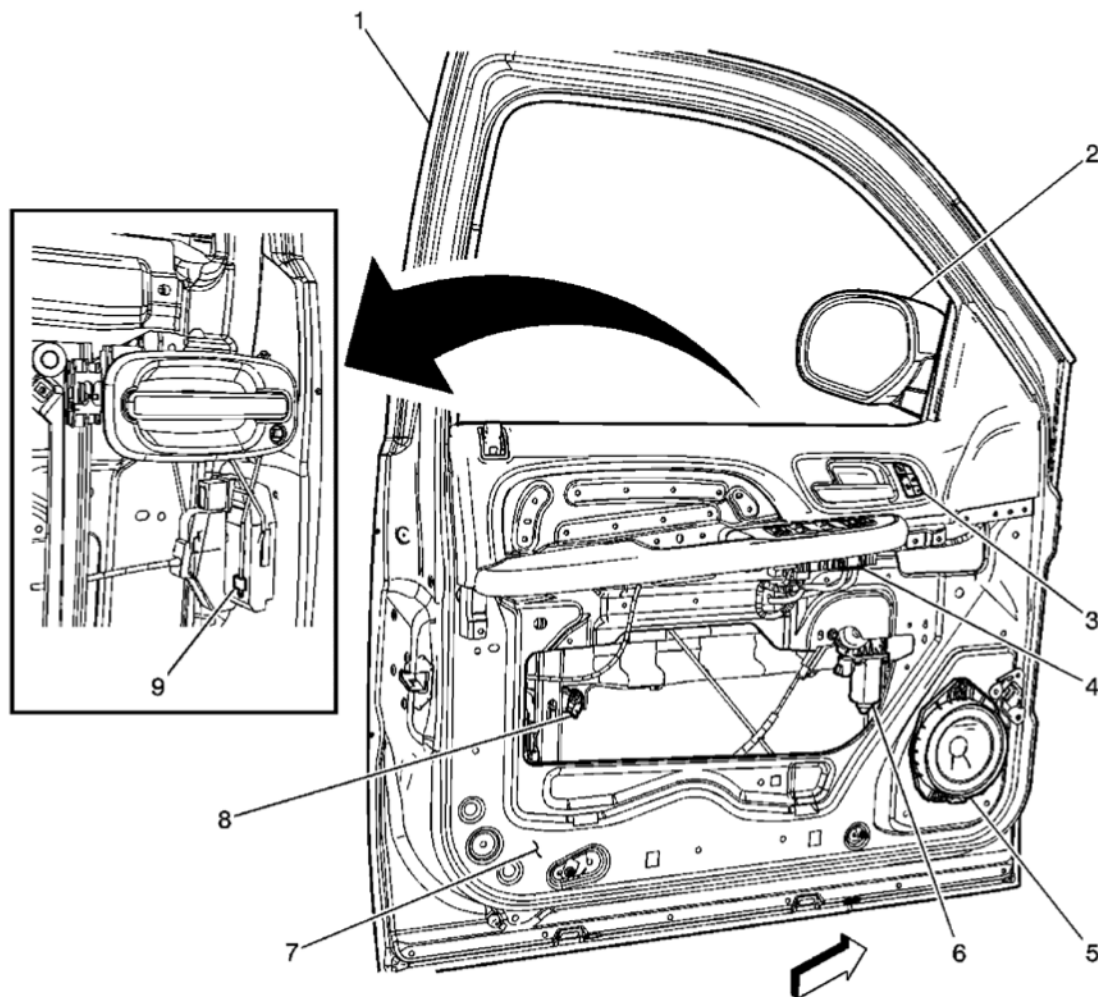


Fig. 4: Driver Door Components

Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 4

Callout	Component Name
1	Door Frame
2	Outside Rearview Mirror - Driver
3	Memory/Heated Seat Switch (AN3 Except KB6) / Memory Seat Switch (KB6)
4	Driver Door Switch (DDS)
5	Speaker - LF Door
6	Window Motor - Driver
7	Inflatable Restraint Side Impact Sensor (SIS) - LF (ASF)
8	Door Latch Assembly - Driver

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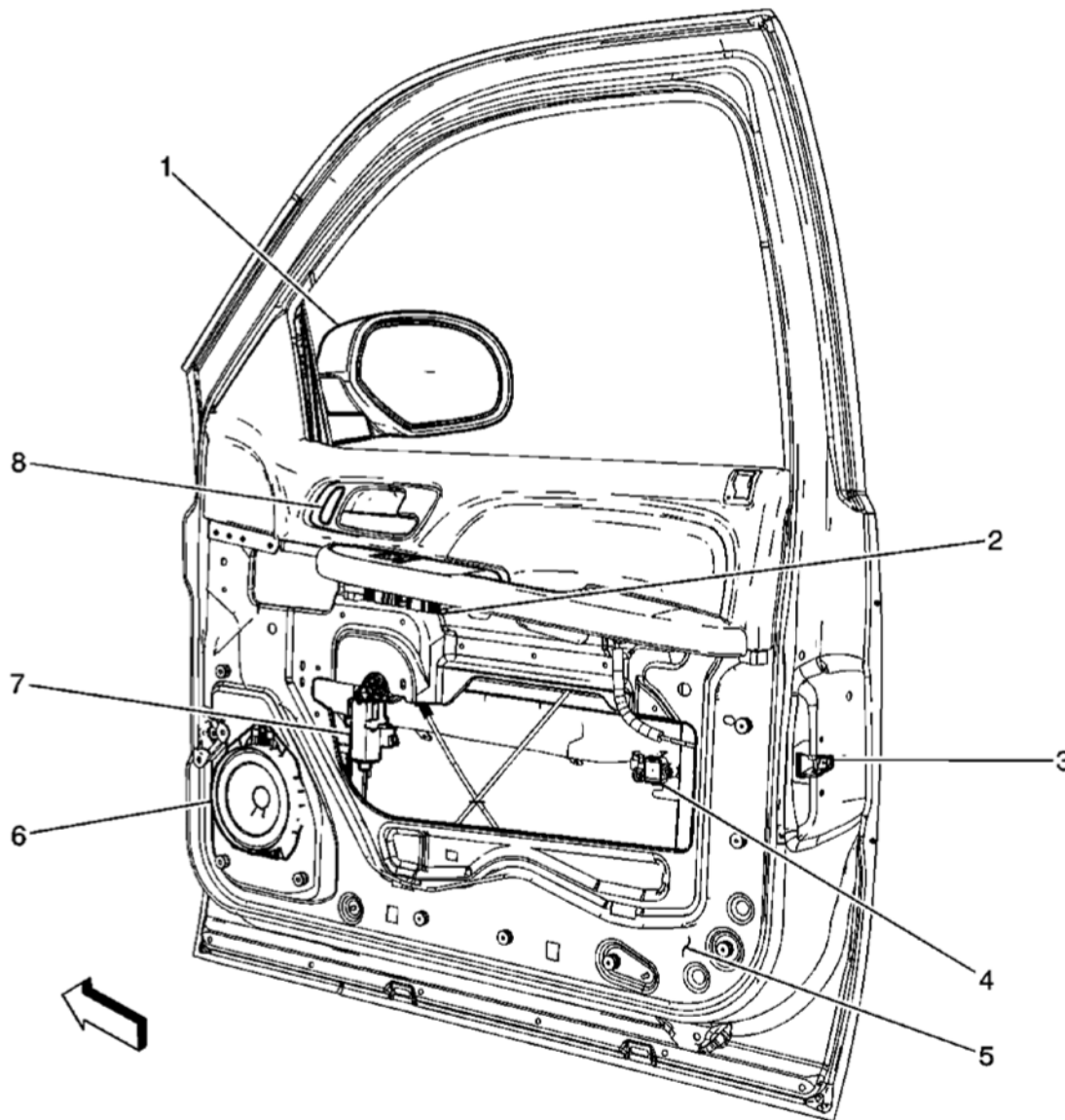


Fig. 5: Passenger Door Components
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 5

Callout	Component Name
1	Outside Rearview Mirror - Passenger
2	Passenger Door Switch (PDS)
3	Door Latch Assembly - Passenger
4	Inflatable Restraint Side Impact Sensor (SIS) - RF (ASF)
5	Speaker - RF Door
6	Window Motor - Passenger

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7 Heated Seat Switch (KA6)

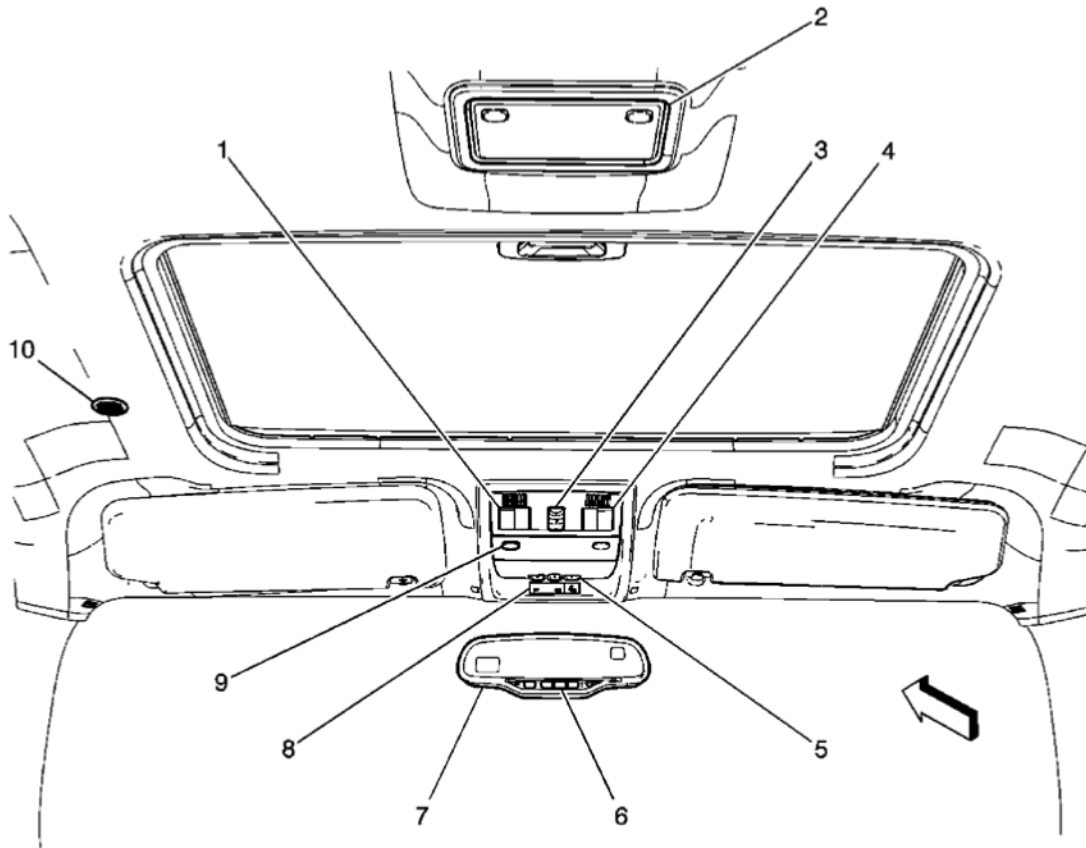


Fig. 6: Top Front of the Passenger Compartment
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 6

Callout	Component Name
1	Sunroof Switch (CF5)
2	Courtesy/Reading Lamps - Second Row
3	Power Liftgate Switch (E61)
4	Folding Seat Switch - Front (ARS)
5	Garage Door Opener (UG1)
6	Onstar Button Assembly (UE1)
7	Inside Rearview Mirror (ISRVM)
8	Inflatable Restraint Passenger Air Bag ON/OFF Indicator
9	Courtesy/Reading Lamp - Front
10	Inside Air Temperature Sensor - Front (CJ2)

VISUAL IDENTIFICATION

MIRROR CONNECTOR END VIEWS

Ambient Air Temperature Sensor - ISRVM

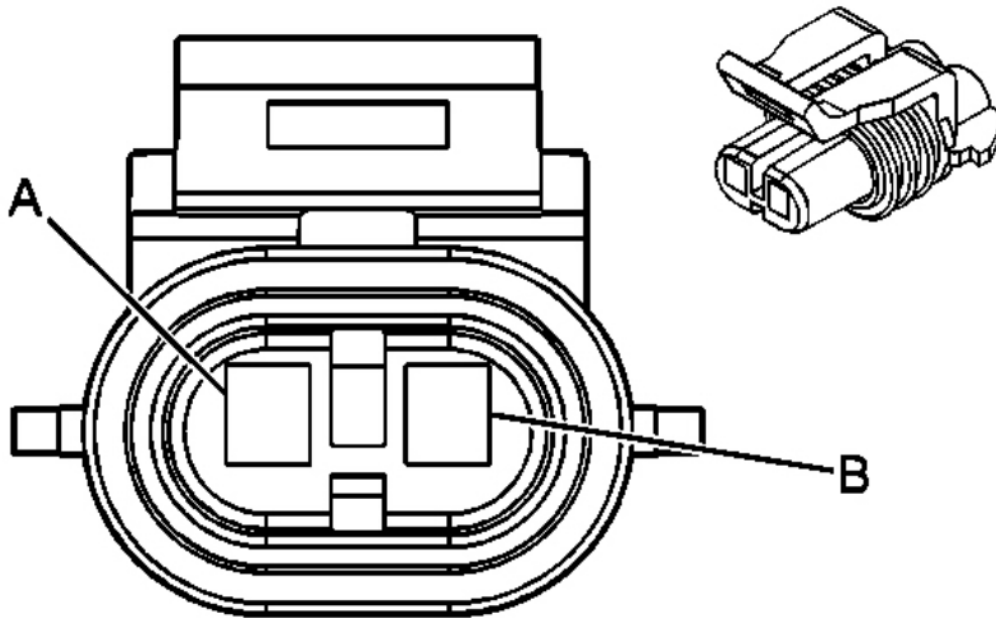


Fig. 7: Ambient Air Temperature Sensor - ISRVM Connector End View
Courtesy of GENERAL MOTORS CORP.

Ambient Air Temperature Sensor - ISRVM Connector Parts Information

Connector Part Information

- OEM: 12052642
- Service: 12101856
- Description: 2-Way F Metri-Pack 150 Series, Sealed (L-GN)

Terminal Part Information

- Terminal/Tray: 12048074/2
- Core/Insulation Crimp: E/1
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Ambient Air Temperature Sensor - ISRVM Connector Terminal Identification

Pin	Wire Color	Circuit No.	Function
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A	D-GN/WH	636	Ambient Air Temperature Sensor Signal
B	YE	61	Low Reference

Inside Rearview Mirror (ISRV)M)

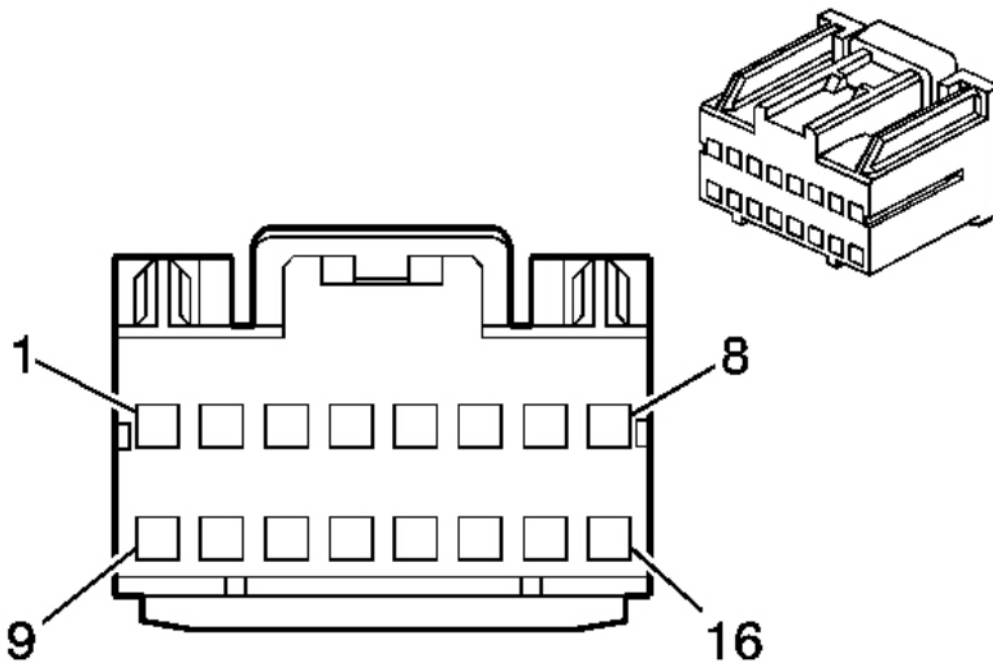


Fig. 8: Inside Rearview Mirror (ISRV)M Connector End View
Courtesy of GENERAL MOTORS CORP.

Inside Rearview Mirror (ISRV)M Connector Parts Information

Connector Part Information

- OEM: 15441350
- Service: 15306351
- Description: 16-Way F 040 II (BK)

Terminal Part Information

- Terminal/Tray: 15445905/23
- Core/Insulation Crimp: J/J
- Release Tool/Test Probe: 12180559/J-35616-6 (BN)

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Inside Rearview Mirror (ISRV) Connector Terminal Identification

Pin	Wire Color	Circuit No.	Function
1	RD/WH	240	Battery Positive Voltage
2	-	-	Not Used
3	D-GN	5060	Low Speed GMLAN Serial Data
4	-	-	Not Used
5	GY	1690	Automatic Day/Night Mirror Signal (DL3/DR4)
6	D-GN/WH	636	Ambient Air Temperature Sensor Signal
7	YE	61	Low Reference
8	BK	1050	Ground
9	D-BU	38	Backup Lamp Relay Control
10	-	-	Not Used
11	D-GN/WH	2514	Keypad Signal (UE1)
12	L-GN/BK	2515	Keypad Supply Voltage (UE1)
13	PK	1639	Ignition 1 Voltage
14	YE/BK	2516	Keypad Green LED Signal (UE1)
15	BN/WH	2517	Keypad Red LED Signal (UE1)
16	PK	1691	Low Reference (DL3/DR4)

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC B1544, B1600, or B1605</u>	Mirror Motors Circuit
<u>DTC B1580 or B1590</u>	Mirror Position Sensor Circuit
<u>DTC B1640 or B1645</u>	Mirror Heater Circuit Short
<u>DTC B1722</u>	Mirror Power Fold Control Circuit

DIAGNOSTIC STARTING POINT - MIRRORS

Begin the system diagnosis with the **Diagnostic System Check - Vehicle** . The Diagnostic System Check will provide the following information:

- The identification of the control modules which command the system.
- The ability of the control modules to communicate through the serial data circuit.
- The identification of any stored diagnostic trouble codes (DTCs) and their status.

The use of the Diagnostic System Check will identify the correct procedure for diagnosing the system and where the procedure is located.

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DTC B1544, B1600, OR B1605

Circuit Description

The driver door switch (DDS) and passenger door switch (PDS) supply battery positive voltage and ground on opposing mirror motor control circuits upon receipt of a mirror switch activation or a GMLAN message commanding mirror control, memory recall or mirror tilt in reverse functions.

DTC Descriptors

This diagnostic procedure supports the following DTCs:

- DTC B1544 Mirror Motors Common Circuit
- DTC B1600 Mirror Motor Vertical Circuit
- DTC B1605 Mirror Motor Horizontal Circuit

Conditions for Running the DTC

- System voltage must be between 9-16 volts.
- The mirror motor control circuits must be active.

Conditions for Setting the DTC

- If the mirror motor control circuits are switched to battery voltage and the mirror motor control circuit is shorted to ground.
- If the mirror motor control circuits are switched to ground and the mirror motor control circuit is shorted to battery voltage.

Action Taken When the DTC Sets

The outside rearview mirror will not operate properly on all axis.

Conditions for Clearing the DTC

When the fault is no longer present, the door module changes the current DTC to a history DTC. The door module will clear the history DTC after 50 fault-free ignition cycles, or in response to a scan tool command.

DTC B1544, B1600, or B1605

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	1. Turn ON the ignition, with the engine OFF. 2. Activate the mirror switch in the up, down, left, and right positions.	Go to <u>Testing for Intermittent</u>	

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	Does the mirror move properly with each activation?	<u>Conditions and Poor Connections</u>	Go to Step 3
3	1. Turn OFF the ignition. 2. Disconnect the mirror connector from the appropriate door switch. 3. Turn ON the ignition, with the engine OFF. 4. Probe each of the mirror motor control circuit pins at the door switch one at a time with a test lamp that is connected to a good ground. Did the test lamp illuminate at any of the test points?	Go to Step 7	Go to Step 4
4	1. Connect a test lamp between the mirror motor down control circuit pin at the door switch and a good ground. 2. Activate the mirror switch to the down position. Does the test lamp illuminate?	Go to Step 5	Go to Step 8
5	1. Connect a test lamp between the mirror motor right control circuit pin at the door switch and a good ground. 2. Activate the mirror switch to the right position. Does the test lamp illuminate?	Go to Step 6	Go to Step 8
6	1. Connect a test lamp between the mirror motor up/left control circuit pin at the door switch and a good ground. 2. Activate the mirror switch to the up and left positions. Does the test lamp illuminate?	Go to Step 7	Go to Step 8
7	Inspect for poor connection at the harness connector of the appropriate door switch. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u>. Did you find and correct the conditions?	Go to Step 10	Go to Step 9
8	Replace the appropriate door switch. Refer to <u>Control Module References</u> for replacement, setup, and programming. Did you complete the replacement?	Go to Step 10	-
9	Replace the mirror. Refer to <u>Mirror Replacement - Power</u>. Did you complete the replacement?	Go to Step 10	-
	1. Use the scan tool in order to clear the DTCs.		

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10	2. Operate the vehicle within the Conditions for Running the DTC, as specified in the supporting text.		
	Does the DTC reset?	Go to Step 2	System OK

DTC B1580 OR B1590

Circuit Description

The driver door switch (DDS) and passenger door switch (PDS) receive mirror position signals from the mirror horizontal and vertical position sensors. These signals are used by the door switches for memory recall functions of the driver and passenger mirrors. The door switches command the mirror memory settings based upon the voltage level received back from the position sensors. Each door switch provides a 5-volt supply, a signal, and ground circuit for each of the position sensors. The horizontal and vertical position sensors are variable resistors that the door switches monitor voltage levels across. When a memory setting is recalled, the door switches command the mirror motors in the appropriate directions until the stored position sensor voltage levels are achieved. The DDS and PDS monitor the signal circuits to determine if the voltage level is out of range. For more detailed information concerning power mirror operation, refer to **Outside Mirror Description and Operation (Heated Mirrors)** or **Outside Mirror Description and Operation (Power Mirrors)**.

DTC Descriptors

This diagnostic procedure supports the following DTCs:

- DTC B1580 Mirror Horizontal Position Sensor Circuit
- DTC B1590 Mirror Vertical Position Sensor Circuit

Conditions for Running the DTC

Battery voltage must be between 9-16 volts.

Conditions for Setting the DTC

- A mirror position sensor signal voltage is below 0.5 volts for 2 seconds.
- A mirror position sensor signal voltage is above 4.5 volts for 2 seconds.

Action Taken When the DTC Sets

- The door switch will ignore the failed position sensor.
- The door switch will ignore memory set or recall for the mirrors.
- Manual mirror movements will be allowed.

Conditions for Clearing the DTC

- When the condition responsible for setting the DTC no longer exists the DDS/PDS clears this current

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DTC and stores the DTC as a history DTC.

- The history DTC will clear after 50 ignition switch cycles without a failure or in response to a scan tool command.

Diagnostic Aids

- If DTC B1580 and B1590 are both set, the low reference circuit may be open, or the 5-volt reference circuit may be open, short to ground or short to voltage.
- Thoroughly inspect the wiring and connectors. An incomplete inspection of the wiring and connectors may result in misdiagnosis causing part replacement with the reappearance of the malfunction. If an intermittent malfunction exists, refer to **Testing for Intermittent Conditions and Poor Connections**.

DTC B1580 or B1590

Step	Action	Value(s)	Yes	No
1	Did you perform the Diagnostic System Check - Vehicle?	-	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	- Install a scan tool. - Turn ON the ignition, with the engine OFF. - With the scan tool, observe the Mirror Horizontal and Vertical Position parameters in the driver door switch (DDS) and passenger door switch (PDS) data lists. - Operate both the left and right mirrors through the full range of movements. Does the scan tool indicate that the left and right Mirror Horizontal and Vertical Position parameters are within the specified range?	0.50-4.75 V	Go to <u>Testing for Intermittent Conditions and Poor Connections</u>	Go to Step 3
3	Is there a horizontal and vertical DTC set on the same mirror?	-	Go to Step 6	Go to Step 4
4	- Turn OFF the ignition. - Disconnect the appropriate mirror. - Turn ON the ignition, with the engine OFF. - With a scan tool, observe the appropriate Mirror Position parameter. Does the scan tool indicate that the Mirror Position parameter is less than the specified value?	0.50 V	Go to Step 5	Go to Step 8

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5	1. Turn OFF the ignition. 2. Connect a 3-amp fused jumper wire between the 5-volt reference circuit and the mirror position signal circuit of the appropriate mirror position sensor at the mirror harness connector. 3. Turn ON the ignition, with the engine OFF. 4. With a scan tool, observe the Mirror Position parameter. Does the scan tool indicate that the Mirror Position parameter is within the specified range?	4.75-5.25 V		Go to Step 12	Go to Step 9
6	1. Turn OFF the ignition. 2. Disconnect the appropriate mirror. 3. Turn ON the ignition, with the engine OFF. 4. Measure the voltage between the 5-volt reference circuit at the mirror harness connector and a good ground. Does the voltage measure within the specified range?	4.75-5.25 V		Go to Step 7	Go to Step 10
7	Measure the voltage between the 5-volt reference circuit and the low reference circuit at the mirror harness connector. Does the voltage measure within the specified range?	4.75-5.25 V		Go to Step 12	Go to Step 11
8	Test for a short to voltage on the mirror position signal circuit. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u>. Did you find and correct the condition?	-		Go to Step 16	Go to Step 13
9	Test the mirror position signal circuit for an open, high resistance, short to ground or battery. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u>. Did you find and correct the condition?	-		Go to Step 16	Go to Step 13
10	Test the 5-volt reference circuit for an open, high resistance, short to ground or battery. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u>. Did you find and correct the condition?	-		Go to Step 16	Go to Step 13
11	Test the low reference circuit for an open, high resistance or short to battery. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u>. Did you find and correct the condition?	-		Go to Step 16	Go to Step 13

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12	Inspect for poor connections at the harness connector of the power mirror. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find and correct the condition?	-	Go to Step 16	Go to Step 14
13	Inspect for poor connections at the harness connector of the DDS/PDS. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find and correct the condition?	-	Go to Step 16	Go to Step 15
14	Replace the power mirror. Refer to <u>Mirror Replacement - Power</u> . Did you complete the replacement?	-	Go to Step 16	-
15	Replace the DDS/PDS. Refer to <u>Control Module References</u> for replacement, setup, and programming. Did you complete the replacement?	-	Go to Step 16	-
16	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	-	Go to Step 2	System OK

DTC B1640 OR B1645

DTC Descriptors

DTC B1640 01

Mirror Heater Circuit Short to Battery

DTC B1640 02

Mirror Heater Circuit Short to Ground

Diagnostic Fault Information

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

Circuit/System Description

The driver door switch (DDS) and passenger door switch (PDS) supply voltage to the outside rearview mirror heater elements upon receipt of a GMLAN message from the body control module (BCM) indicating that the rear defrost system is active. The door switches monitor the heater element control circuits whenever the

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ignition is ON.

Conditions for Running the DTC

Battery voltage must be between 9-16 volts.

Conditions for Setting the DTC

B1640 01

While the heated mirrors are inactive the heater element control circuit is shorted to voltage.

B1640 02

While the heated mirrors are active the heater element control circuit is shorted to ground.

Action Taken When the DTC Sets

The affected heated mirror will not be activated.

Conditions for Clearing the DTC

- The DTC will be current for as long as the fault is present.
- When the fault is no longer present the DTC will be a history status code.

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

Vehicle Access Connector End Views

Electrical Information Reference

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

Scan Tool Reference

Scan Tool Data List

Circuit/System Testing

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1. Disconnect the power mirror connector at the door switch and clear the DTC.
2. Ignition ON, verify that the DTC does not reset when the rear defroster switch is activated.
 - o If the DTC resets, replace the door switch.
3. Disconnect the mirror face electrical terminals and test the mirror heater control circuit for a short to voltage or ground.
4. If the circuits test normal, replace the mirror face.

Repair Procedures

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

- **Mirror Face Replacement**
- **Control Module References** for driver or passenger door lock and side window switch replacement

DTC B1722

Circuit Description

The driver door switch (DDS) and passenger door switch (PDS) control the power folding or power extending functions of the outside rearview mirrors. The fold/extend motors are controlled by the switches through the fold/extend and unfold/retract control circuits. The door switches monitor the control circuits for fault conditions when power folding or power extending functions are requested prior to activating the function and during operation.

DTC Descriptors

This diagnostic procedure supports the following DTCs:

- DTC B1722 01 Mirror Power Fold Control Circuit Short to Battery
- DTC B1722 02 Mirror Power Fold Control Circuit Short to Ground
- DTC B1722 04 Mirror Power Fold Control Circuit Open Circuit

Conditions for Running the DTC

- Battery voltage must be between 9-16 volts.
- The ignition switch is in the ON position.
- A mirror fold/extend or unfold/retract function must be active.

Conditions for Setting the DTC

When the DDS or PDS switch the mirror fold motor control circuits to battery voltage and ground and one of the mirror fold/extend motor control circuits are shorted to ground, shorted to battery or open.

Action Taken When the DTC Sets

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The DDS or PDS will stop supplying battery voltage and ground to the mirror fold motor and the folding/extending mirrors will be inoperative.

Conditions for Clearing the DTC

- When the fault is no longer present, the door switch changes the current DTC to a history DTC.
- The door switch will clear the history DTC after 50 fault-free ignition cycles, or in response to a scan tool command.

DTC B1722

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. Place the mirror select switch in the neutral/fold position. 4. Place the mirror direction switch in both the left/extend and right/retract positions. Does DTC B1722 set as a current DTC?	Go to Step 3	Go to <u>Testing for Intermittent Conditions and Poor Connections</u>
3	1. Connect a test lamp to a good ground. 2. Backprobe both of the mirror fold motor control circuits one at a time with the test lamp. Does the test lamp illuminate at either test point?	Go to Step 6	Go to Step 4
4	1. Connect a test lamp to battery voltage. 2. Backprobe both of the mirror fold motor control circuits one at a time with the test lamp. Does the test lamp illuminate at either test point?	Go to Step 6	Go to Step 5
5	1. Disconnect the power mirror. 2. Test for continuity through the mirror fold motor and the mirror fold motor control circuits. Is there continuity?	Go to Step 7	Go to Step 6
6	Inspect for poor connections at the harness connector of the power mirror. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> . Did you find and correct the condition?	Go to Step 10	Go to Step 8
	Inspect for poor connections at the harness connector of the appropriate door switch. Refer to <u>Testing for</u>		

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7	<u>Intermittent Conditions and Poor Connections</u> . Did you find and correct the condition?	Go to Step 10	Go to Step 9
8	Replace the appropriate power mirror. Refer to <u>Mirror Replacement - Power</u> . Did you complete the replacement?	Go to Step 10	-
9	Replace the appropriate door switch. Refer to <u>Control Module References</u> for replacement, setup, and programming. Did you complete the replacement?	Go to Step 10	-
10	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the Conditions for Running the DTC, as specified in the supporting text. Does the DTC reset?	Go to Step 2	System OK

SYMPTOMS - MIRRORS

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

- 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.
- Review the system operation in order to familiarize yourself with the system functions. Refer to the following system descriptions:
 - Outside Mirror Description and Operation (Heated Mirrors)****Outside Mirror Description and Operation (Power Mirrors)**
 - Automatic Day-Night Mirror 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

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

- **Heated Mirrors Inoperative**
- **Mirrors - Automatic Day-Night Inoperative**
- **Mirrors - Outside Automatic Day-Night Feature Inoperative**
- **Power Mirrors - Folding Inoperative**
- **Power Mirrors Inoperative**
- **Power Mirrors - Memory Functions Inoperative**

HEATED MIRRORS INOPERATIVE

Heated Mirrors Inoperative

Step	Action	Yes	No
Schematic Reference: <u>Outside Rearview Mirror Schematics</u> Connector End View Reference: <u>Vehicle Access Connector End Views</u>			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	Verify that the Heated Mirrors Inoperative complaint is present. Does the Heated Mirrors System operate as described in the Description and Operation?	Go to <u>Testing for Intermittent Conditions and Poor Connections</u>	Go to Step 3
3	Is the rear defogger inoperative also?	Go to <u>Defogger Inoperative - Rear Window</u>	Go to Step 4
4	1. Disconnect the inoperative mirror. 2. Using a test lamp connected to ground, probe the heated mirror element supply voltage circuit. 3. Turn ON the ignition. 4. Place the rear defogger switch to the ON position. Does the test lamp illuminate?	Go to Step 5	Go to Step 6
5	1. Turn OFF the ignition. 2. Using a test lamp, probe between the heated mirror element supply voltage circuit and the heated mirror element ground circuit. 3. Turn ON the ignition. 4. Place the rear defogger switch to the ON position. Does the test lamp illuminate?	Go to Step 8	Go to Step 7

2007 Cadillac Escalade

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6	Repair the poor connection or an open in the heated mirror element supply voltage circuit. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you complete the repair?	Go to Step 9	-
7	Repair the poor connection or an open in the heated mirror ground circuit. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you complete the repair?	Go to Step 9	-
8	Replace the mirror face. Refer to <u>Mirror Face Replacement</u> . Did you complete the repair?	Go to Step 9	-
9	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

MIRRORS - AUTOMATIC DAY-NIGHT INOPERATIVE

Diagnostic Aids

The automatic day-night feature of the inside rearview mirror may not operate properly or become inoperative due to an intermittent short to battery voltage in the backup lighting system.

Mirrors - Automatic Day-Night Inoperative

Step	Action	Value(s)	Yes	No
Schematic Reference: <u>Inside Rearview Mirror Schematics</u> Connector End View Reference: <u>Window Systems Connector End Views</u>				
1	Did you review the operation of the automatic day-night feature of the inside rearview mirror and perform the necessary inspections?	-	Go to Step 2	Go to <u>Symptoms - Mirrors</u>
2	1. Turn ON the ignition, with the engine OFF. 2. Turn ON the automatic day-night feature of the inside rearview mirror. 3. Cover the sensor on the inside rearview mirror back, facing the front window. 4. Shine a bright light into the sensor on the inside rearview mirror face, facing the rear window. Does the inside rearview mirror darken?	-	Go to Diagnostic Aids	Go to Step 3
3	1. Turn OFF the ignition. 2. Disconnect the harness connector of the inside rearview mirror. 3. Measure the resistance between the ground circuit of the inside rearview	3 ohms		

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	mirror and a good ground.			
	Is the resistance less than the specified value?		Go to Step 4	Go to Step 9
4	1. Turn ON the ignition, with the engine OFF. 2. Measure the voltage between the ignition voltage circuit and the ground circuit of the inside rearview mirror.	B+		
	Is the voltage within the specified range?		Go to Step 5	Go to Step 10
5	1. Place the transmission in PARK. 2. Measure the voltage between the backup lamp supply voltage circuit and the ground circuit of the inside rearview mirror.	0.5 V		
	Is the voltage less than the specified value?		Go to Step 6	Go to Backup Lamps Always On
6	1. Place the transmission in REVERSE. 2. Measure the voltage between the backup lamp supply voltage circuit and the ground circuit of the inside rearview mirror.	B+		
	Is the voltage within the specified range?		Go to Step 8	Go to Step 7
7	Test the backup lamp supply voltage circuit of the inside rearview mirror for an open or short to ground. Refer to Circuit Testing and Wiring Repairs. Did you find and correct the condition?	-		Go to Backup Lamps Inoperative
8	Inspect for poor connections at the harness connector of the inside rearview mirror. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs. Did you find and correct the condition?	-		
			Go to Step 12	Go to Step 11
9	Repair an open or high resistance in the ground circuit of the inside rearview mirror. Refer to Wiring Repairs. Did you complete the repair?	-		-
			Go to Step 12	
10	Repair an open or short to ground in the ignition voltage circuit of the inside rearview mirror. Refer to Wiring Repairs. Did you complete the repair?	-		-
			Go to Step 12	
11	Replace the inside rearview mirror. Refer to Control Module References for replacement, setup, and programming. Did you complete the replacement?	-		-
			Go to Step 12	

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2007 ACCESSORIES & EQUIPMENT Mirrors - Avalanche, Escalade, Suburban, Tahoe & Yukon

12	Operate the system in order to verify the repair. Did you correct the condition?	-	System OK	Go to Step 2
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MIRRORS - OUTSIDE AUTOMATIC DAY-NIGHT FEATURE INOPERATIVE

Mirrors - Outside Automatic Day-Night Feature Inoperative

Step	Action	Values	Yes	No
Schematic Reference: <u>Outside Rearview Mirror Schematics</u> Connector End View Reference: <u>Window Systems Connector End Views</u>				
1	Did you review the operation of the automatic day-night feature of the driver outside rearview mirror and perform the necessary inspections?	-	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	1. Turn ON the ignition, with the engine OFF. 2. Turn ON the automatic day-night feature of the inside rearview mirror. 3. Cover the sensor on the mirror back, facing the front window. 4. Shine a bright light into the sensor on the mirror face, facing the rear window. Does the inside rearview mirror darken?	-	Go to Step 3	Go to <u>Mirrors - Automatic Day-Night Inoperative</u>
3	While shining a bright light into the sensor on the face of the inside rearview mirror, observe the driver outside rearview mirror. Does the driver outside rearview mirror darken?	-	Go to <u>Testing for Intermittent Conditions and Poor Connections</u>	Go to Step 4
4	1. Turn OFF the ignition. 2. Disconnect the harness connector C2 of the driver door switch (DDS). 3. Turn ON the ignition, with the engine OFF. 4. Turn ON the automatic day-night feature of the inside rearview mirror. 5. Cover the sensor on the mirror back, facing the front window. 6. Shine a bright light into the sensor on the mirror face, facing the rear window. 7. Measure the voltage between the signal circuit and the low reference circuit of the driver outside rearview mirror element.	0.75-1.5 V		

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	Is the voltage within the specified range?		Go to Step 7	Go to Step 5
5	Is the voltage greater than the specified value?	1.5 V	Go to Step 18	Go to Step 6
6	Measure the voltage between the signal circuit of the driver outside rearview mirror element and a good ground. Is the voltage within the specified range?	0.75-1.5 V	Go to Step 13	Go to Step 12
7	1. Turn OFF the ignition. 2. Connect the harness connector C2 of the DDS. 3. Carefully disconnect the mirror face of the driver outside rearview mirror. Refer to <u>Mirror Face Replacement</u>. 4. Turn ON the ignition, with the engine OFF. 5. Turn ON the automatic day-night feature of the inside rearview mirror. 6. Cover the sensor on the mirror back, facing the front window. 7. Shine a bright light into the sensor on the mirror face, facing the rear window. 8. Measure the voltage between the signal circuit and the low reference circuit of the driver outside rearview mirror element. Is the voltage within the specified range?	0.75-1.5 V	Go to Step 14	Go to Step 8
8	Is the voltage greater than the specified value?	1.5 V	Go to Step 18	Go to Step 9
9	1. Turn OFF the ignition. 2. Disconnect the harness connector C3 of the DDS. 3. Measure the resistance of the signal circuit of the driver outside rearview mirror element between the driver outside rearview mirror face and the DDS. Is the resistance less than the specified value?	3 ohms	Go to Step 10	Go to Step 15
10	Measure the resistance between the signal circuit of the driver outside rearview mirror element to a good ground. Is the resistance within the specified range?	OL	Go to Step 11	Go to Step 15
11	Measure the resistance of the low reference circuit of the driver outside rearview mirror element between the driver outside rearview mirror face and the DDS.	3 ohms		

2007 Cadillac Escalade

2007 ACCESSORIES & EQUIPMENT Mirrors - Avalanche, Escalade, Suburban, Tahoe & Yukon

	Is the resistance less than the specified value?		Go to Step 17	Go to Step 15
12	Test the signal circuit of the driver outside rearview mirror element for an open or short to ground. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you find or correct the condition?	-	Go to Step 23	Go to Step 16
13	Test the low reference circuit of the driver outside rearview mirror element for an open or high resistance. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you find or correct the condition?	-	Go to Step 23	Go to Step 16
14	Inspect for poor connections at the harness connector of the driver outside rearview mirror face. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find or correct the condition?	-	Go to Step 23	Go to Step 19
15	Inspect for poor connections at the harness connector of the driver outside rearview mirror. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find or correct the condition?	-	Go to Step 23	Go to Step 20
16	Inspect for poor connections at the harness connector of the inside rearview mirror. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find or correct the condition?	-	Go to Step 23	Go to Step 21
17	Inspect for poor connections at the harness connector of the DDS. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find or correct the condition?	-	Go to Step 23	Go to Step 22
18	IMPORTANT: A short to voltage in the signal circuit of the driver outside rearview mirror element will cause permanent damage to both the driver outside rearview mirror and the inside rearview mirror element. Repair the short to voltage in the signal circuit of the driver outside rearview mirror element. Refer to <u>Wiring Repairs</u> .Did you complete the repair?	-	Go to Step 23	-
19	Replace the driver outside rearview mirror face. Refer to <u>Mirror Face Replacement</u> .	-		-

2007 Cadillac Escalade

2007 ACCESSORIES & EQUIPMENT Mirrors - Avalanche, Escalade, Suburban, Tahoe & Yukon

	Did you complete the replacement?		Go to Step 23	
20	Replace the driver outside rearview mirror. Refer to <u>Mirror Replacement - Power</u> . Did you complete the replacement?	-	Go to Step 23	-
21	IMPORTANT: Perform the calibration procedure for the inside rearview mirror. Refer to <u>Compass Calibration and Magnetic Variance</u> . Replace the inside rearview mirror. Refer to <u>Rearview Mirror Replacement</u> . Did you complete the replacement?	-	Go to Step 23	-
22	Replace the DDS. Refer to <u>Control Module References</u> for replacement, setup, and programming. Is the replacement complete?	-	Go to Step 23	-
23	Operate the system in order to verify the repair. Did you correct the condition?	-	System OK	Go to Step 2

POWER MIRRORS - FOLDING INOPERATIVE

Power Mirrors - Folding Inoperative

Step	Action	Yes	No
Schematic Reference: <u>Outside Rearview Mirror Schematics</u>			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	1. Turn ON the ignition, with the engine OFF. 2. Place the mirror select switch in the neutral/fold position. 3. Activate the mirror direction switch in the left/extend and right/retract positions. Do the outside rearview mirrors extend and retract with the corresponding switch activation?	Go to <u>Testing for Intermittent Conditions and Poor Connections</u>	Go to Step 3
3	Are both folding mirrors inoperative?	Go to Step 4	Go to Step 5
4	1. Install a scan tool. 2. Monitor the Mirror Select Switch and the Mirror Switch Data parameters. 3. Activate the mirror select switch left, right and neutral/fold positions. 4. Activate the left/extend and right/retract functions from the mirror switch.		

2007 Cadillac Escalade

2007 ACCESSORIES & EQUIPMENT Mirrors - Avalanche, Escalade, Suburban, Tahoe & Yukon

	Do all of the data parameters change with the corresponding switch activations?	Go to Step 5	Go to Step 6
5	1. Install a scan tool. 2. With the scan tool, command the inoperative mirror to retract and extend. Does the mirror move with the corresponding scan tool command?	Go to Step 8	Go to Step 7
6	Inspect for poor connections at the driver door switch (DDS). Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find and correct the condition?	Go to Step 12	Go to Step 9
7	Inspect for poor connections at the power mirror. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find and correct the condition?	Go to Step 12	Go to Step 10
8	Inspect for poor connections at the appropriate door switch. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find and correct the condition?	Go to Step 12	Go to Step 11
9	Replace the DDS. Refer to <u>Control Module References</u> for replacement, setup, and programming. Did you complete the repair?	Go to Step 12	-
10	Replace the power mirror. Refer to <u>Mirror Replacement - Power</u>. Did you complete the repair?	Go to Step 12	-
11	Replace the appropriate door switch. Refer to <u>Control Module References</u> for replacement, setup, and programming. Did you complete the repair?	Go to Step 12	-
12	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

POWER MIRRORS INOPERATIVE

Diagnostic Aids

- If the power mirror system fuse is open and a short to ground in the battery positive voltage circuit is not detected, the fault could be a short to ground in one of the power mirror control circuits. This would open the power mirror system fuse when the mirror switch is pressed.
- If both power mirrors are inoperative on one or more axis, the most probable cause is a power mirror switch failure. However, the fault could be an open circuit on 2 or more of the power mirror control circuits.
- The power mirror assembly is equipped with a pigtail harness and is not serviceable. If an internal open or short is detected in the power mirror assembly, replace the power mirror assembly.

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Test Description

The numbers below refer to the step numbers on the diagnostic table.

6: This step tests the integrity of both the mirror control circuits and the power mirror switch. If both power mirrors are inoperative on one or more axis, begin testing by disconnecting one of the power mirrors, if an open circuit is detected and repaired for that power mirror, repeat step 6 for the other power mirror.

7: This step tests the integrity of the battery positive voltage circuit, not the fuse.

Power Mirrors Inoperative

Step	Action	Yes	No
Schematic Reference: <u>Outside Rearview Mirror Schematics</u> Connector End View Reference: <u>Vehicle Access Connector End Views</u>			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	1. Place the mirror selector switch in the LEFT mirror position. 2. Activate the mirror position switch in the UP, DOWN, LEFT, and RIGHT directions and note the operation. 3. Place the mirror selector switch in the RIGHT mirror position. 4. Activate the mirror position switch in the UP, DOWN, LEFT, and RIGHT directions and note the operation. Do both power mirrors operate properly?	Go to <u>Testing for Intermittent Conditions and Poor Connections</u>	Go to Step 3
3	Are both the left and right power mirrors completely inoperative?	Go to Step 4	Go to Step 6
4	1. Disconnect the power mirror switch. 2. Probe the battery positive voltage circuit of the power mirror switch harness connector with a test lamp that is connected to ground. Does the test lamp illuminate?	Go to Step 5	Go to Step 7
5	Connect a test lamp between the battery positive voltage circuit of the power mirror switch harness connector and the ground circuit of the power mirror switch harness connector. Does the test lamp illuminate?	Go to Step 9	Go to Step 15
	1. Disconnect the inoperative power mirror. 2. Connect a test lamp between the inoperative		

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6	mirror motor control circuits of the power mirror harness connector. 3. Place the mirror selector switch to the mirror to be tested. 4. Activate the power mirror switch in both directions for the functions being tested. Does the test lamp illuminate in both directions?	Go to Step 12	Go to Step 8
7	Repair the battery positive voltage circuit of the power mirror switch for a short to ground or an open. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you complete the repair?	Go to Step 18	Go to Step 9
8	Test the mirror motor control circuits for an open. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you find and correct the condition?	Go to Step 18	Go to Step 9
9	Probe each of the power mirror motor control circuits of the power mirror switch harness connector with a test lamp that is connected to battery positive voltage. Did the test lamp illuminate at any of the power mirror motor control circuits?	Go to Step 13	Go to Step 10
10	Probe each of the power mirror motor control circuits of the power mirror switch harness connector with a test lamp that is connected to ground. Did the test lamp illuminate at any of the power mirror motor control circuits?	Go to Step 14	Go to Step 11
11	Inspect for poor connections at the harness connector of the power mirror switch. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find and correct the condition?	Go to Step 18	Go to Step 16
12	Inspect for poor connections at the harness connector of the inoperative power mirror. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find and correct the condition?	Go to Step 18	Go to Step 17
13	Repair the short to ground in the power mirror motor control circuit. Refer to <u>Wiring Repairs</u> . Did you complete the repair?	Go to Step 18	-
14	Repair the short to battery positive voltage in the power mirror motor control circuit. Refer to <u>Wiring Repairs</u> . Did you complete the repair?	Go to Step 18	-
15	Repair the open in the power mirror switch ground circuit. Refer to <u>Wiring Repairs</u> . Did you complete the repair?	Go to Step 18	-

2007 Cadillac Escalade

2007 ACCESSORIES & EQUIPMENT Mirrors - Avalanche, Escalade, Suburban, Tahoe & Yukon

16	Replace the power mirror switch. Did you complete the replacement?	Go to Step 18	-
17	Replace the power mirror motor. Refer to <u>Motor Replacement - Power Mirror</u> . Did you complete the replacement?	Go to Step 18	-
18	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

POWER MIRRORS - MEMORY FUNCTIONS INOPERATIVE

Power Mirrors - Memory Functions Inoperative

Step	Action	Value(s)	Yes	No
Schematic Reference: <u>Outside Rearview Mirror Schematics</u>				
1	Did you perform the Diagnostic System Check - Vehicle?	-	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	- Place the mirror select switch in the left mirror position. - Activate the mirror position switch in the UP, DOWN, LEFT and RIGHT directions and note the operation. - Place the mirror select switch in the right mirror position. - Activate the mirror position switch in the UP, DOWN, LEFT and RIGHT directions and note the operation. Do both power mirrors operate properly?	-	Go to Step 3	Go to <u>Power Mirrors Inoperative</u>
3	- Install a scan tool. - Turn ON the ignition, with the engine OFF. - Monitor the Memory Switch data parameters. Are any of the Memory Switch data parameters active without a switch activation?	-	Go to Step 5	Go to Step 4
4	- Monitor the Memory Switch data parameters. - Activate the memory 1, memory 2 and Exit switches one at a time. Do all of the Memory Switch data parameters	-		

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	change state with the corresponding switch activation?		Go to Step 7	Go to Step 6
5	Disconnect the memory switch. Does the Memory Switch data parameter change to idle?	-	Go to Step 13	Go to Step 12
6	1. Disconnect the memory switch. 2. Monitor the memory switch data parameter. 3. Connect a 3-amp fused jumper between the memory switch battery positive voltage pin and each of the memory switch signal pins, one at a time, at the driver door switch (DDS). Does the Memory Switch data parameter change state appropriately at each test point?	-	Go to Step 13	Go to Step 12
7	With a scan tool, monitor the Mirror Horizontal and Vertical Position data parameters of the inoperative mirror while commanding the mirror to move with the mirror switch. Do the Mirror Horizontal and Vertical Position data parameters change values with the corresponding mirror movement?	-	Go to Step 10	Go to Step 8
8	1. Disconnect the inoperative mirror. 2. Measure the voltage between the mirror 5-volt reference circuit pin at the door module and a good ground. Does the voltage measure within the specified range?	4.75-5 V	Go to Step 9	Go to Step 12
9	1. With a scan tool, monitor the Mirror Horizontal and Vertical Position data parameters. 2. Connect a 3-amp fused jumper between the mirror 5-volt reference circuit pin and each of the horizontal and vertical position signal circuit pins at the door module one at a time. Do the Mirror Horizontal and Vertical Position data parameters display within the specified range?	4.75-5 V	Go to Step 14	Go to Step 10
	1. Connect the inoperative mirror. 2. Backprobe the mirror 5-volt reference			

2007 Cadillac Escalade

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10	circuit with a DMM connected to a good ground. 3. Monitor the voltage displayed on the DMM while commanding the mirror to the full up, down, left and right positions with the mirror position switch. Does the measured voltage display greater than the specified value?	5 V		Go to Step 14	Go to Step 11
11	1. Command the mirror to move with the mirror switch to the full up and full left position. 2. Press and hold the memory 1 switch until two audible tones are heard. 3. With a scan tool, monitor and record the Mirror Horizontal and Vertical Position data parameter voltage values. 4. Command the mirror to move with the mirror switch to the full down and full right position. 5. Press and release the memory 1 switch. Does the mirror recall to within 0.02 volt of the stored Mirror Horizontal and Vertical Position data parameter voltage values recorded earlier?	Within 0.2 V		Go to <u>Testing for Intermittent Conditions and Poor Connections</u>	Go to Step 12
12	Inspect for poor connections at the appropriate door switch. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u>. Did you find and correct the condition?	-		Go to Step 18	Go to Step 15
13	Inspect for poor connections at the memory switch. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u>. Did you find and correct the condition?	-		Go to Step 18	Go to Step 16
14	Inspect for poor connections at the appropriate mirror. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u>. Did you find and correct the condition?	-		Go to Step 18	Go to Step 17
15	Replace the appropriate door switch. Refer to <u>Control Module References</u> for replacement, setup, and programming. Did you complete the repair?	-		Go to Step 18	-
	Replace the memory switch. Refer to <u>Heated</u>				

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16	<u>Seat Switch Replacement - Front (w/o KB6)</u> . Did you complete the repair?	-	Go to Step 18	-
17	Replace the appropriate mirror. Refer to <u>Motor Replacement - Power Mirror</u> . Did you complete the repair?	-	Go to Step 18	-
18	Operate the system in order to verify the repair. Did you correct the condition?	-	System OK	Go to Step 2

REPAIR INSTRUCTIONS

MIRROR REPLACEMENT - POWER

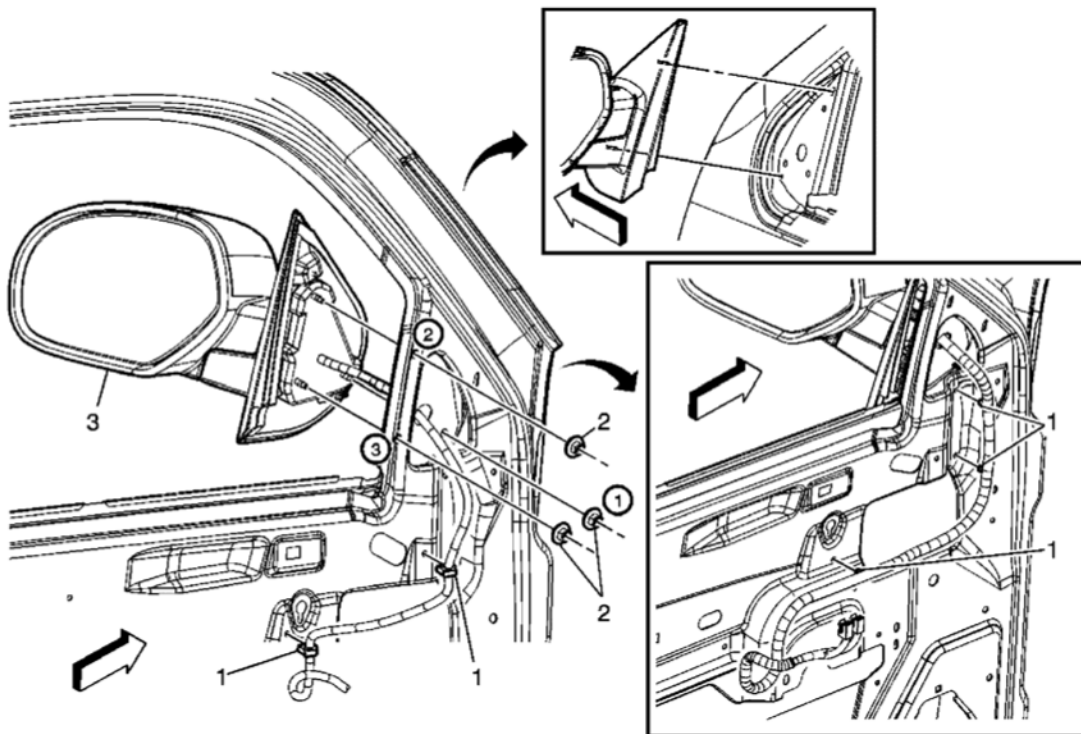


Fig. 9: View Of Outside Power Mirror & Components

Courtesy of GENERAL MOTORS CORP.

Mirror Replacement - Power

Callout	Component Name
Preliminary Procedures: Remove the front door trim panel. Refer to <u>Front Side Door Trim Panel Replacement</u> .	
1	Outside Power Mirror Wiring Retainer Clips (Qty: 3)
	Outside Power Mirror Nuts (Qty: 3)

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NOTE:

Refer to **Fastener Notice** .

2

Tighten: 9 N.m (80 lb in)

Tip: Disconnect the electrical connector.

3

Outside Power Mirror

MOTOR REPLACEMENT - POWER MIRROR

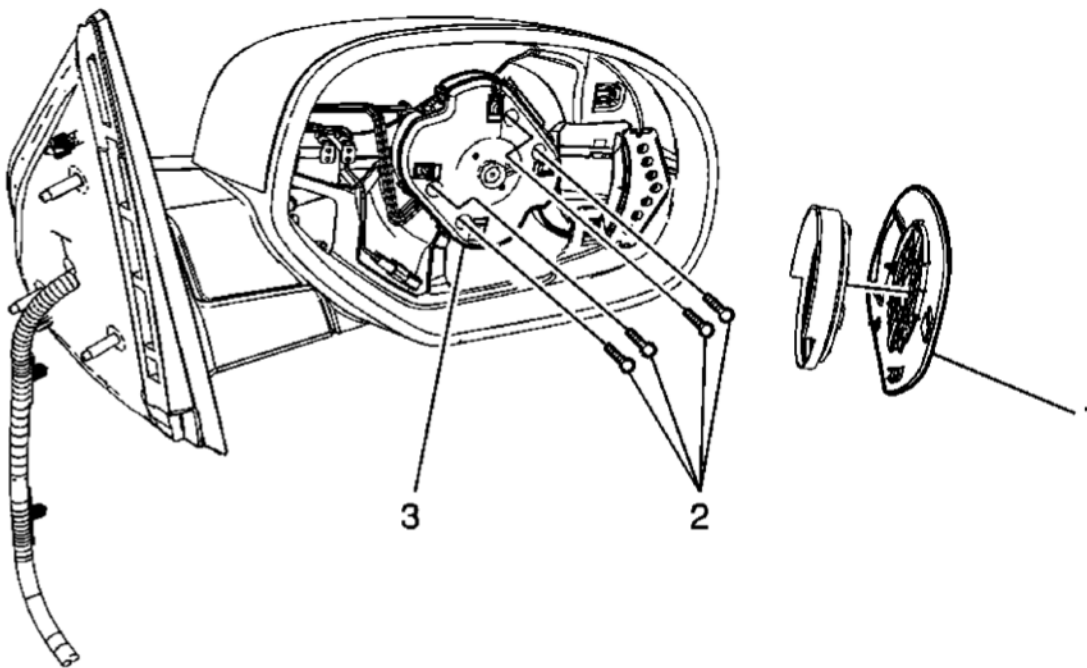


Fig. 10: View Of Outside Rearview Mirror Motor & Components
Courtesy of GENERAL MOTORS CORP.

Motor Replacement - Power Mirror

Callout	Component Name
1	Outside Rearview Mirror Face Tip: 1. Tip the mirror face outward at the bottom. 2. With a twisting motion push upward on the bottom of the mirror face and pull rearward until it releases from the rearview mirror motor. 3. Disconnect the electrical connectors.
	Outside Rearview Mirror Motor Screws (Qty: 4)

2007 Cadillac Escalade

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2	NOTE: Refer to <u>Fastener Notice</u> . Tighten: 2 N.m (18 lb in)
3	Outside Rearview Mirror Motor Tip: Gently press the mirror back into the adjuster mechanism with the palm of the hand on the center of the glass until it locks into place.

MIRROR FACE REPLACEMENT

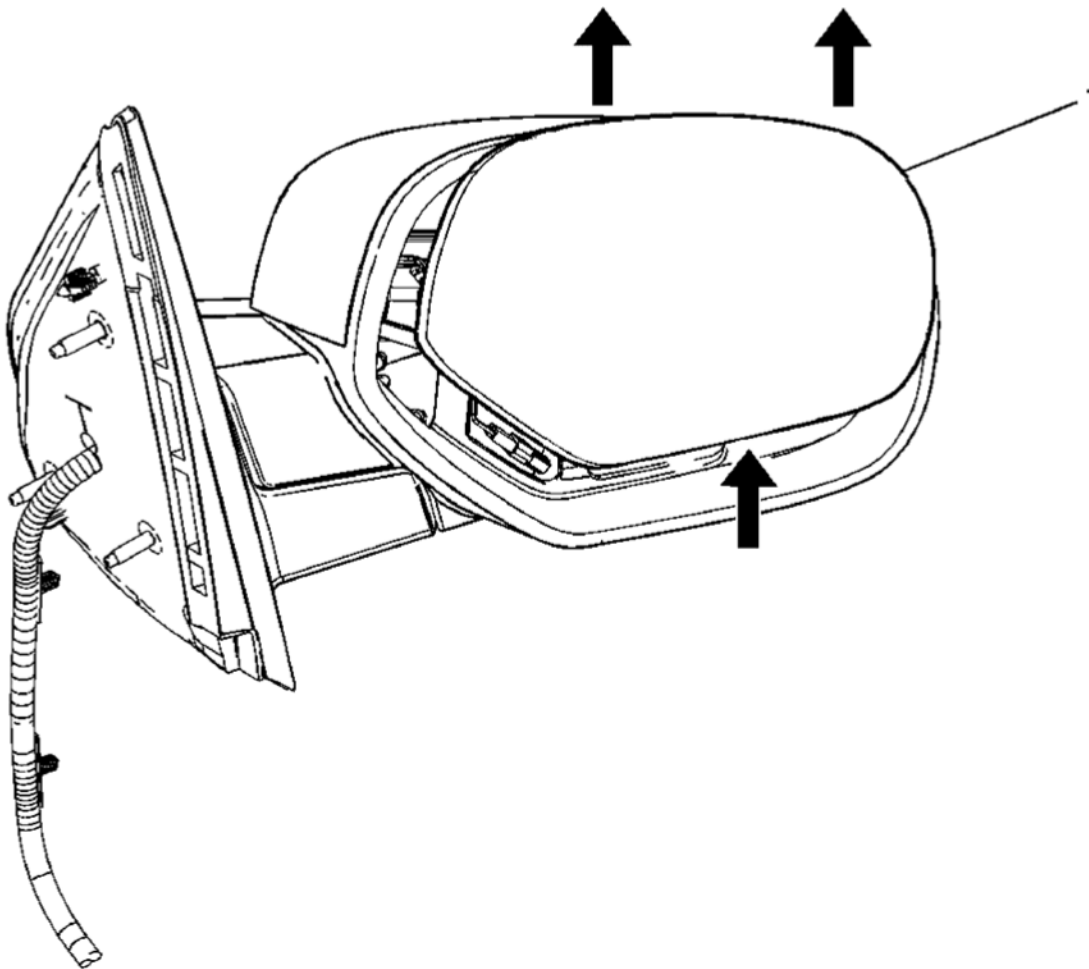


Fig. 11: View Of Outside Rearview Mirror Face
Courtesy of GENERAL MOTORS CORP.

Mirror Face Replacement

Callout	Component Name
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> .	

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Outside Rearview Mirror Face

Tip:

1

1. Tilt the mirror face outward at the bottom.
2. With a twisting motion push upward on the bottom of the mirror face and pull forward until it releases from the rearview mirror motor.
3. Disconnect the electrical connectors.

REARVIEW MIRROR REPLACEMENT

Removal Procedure

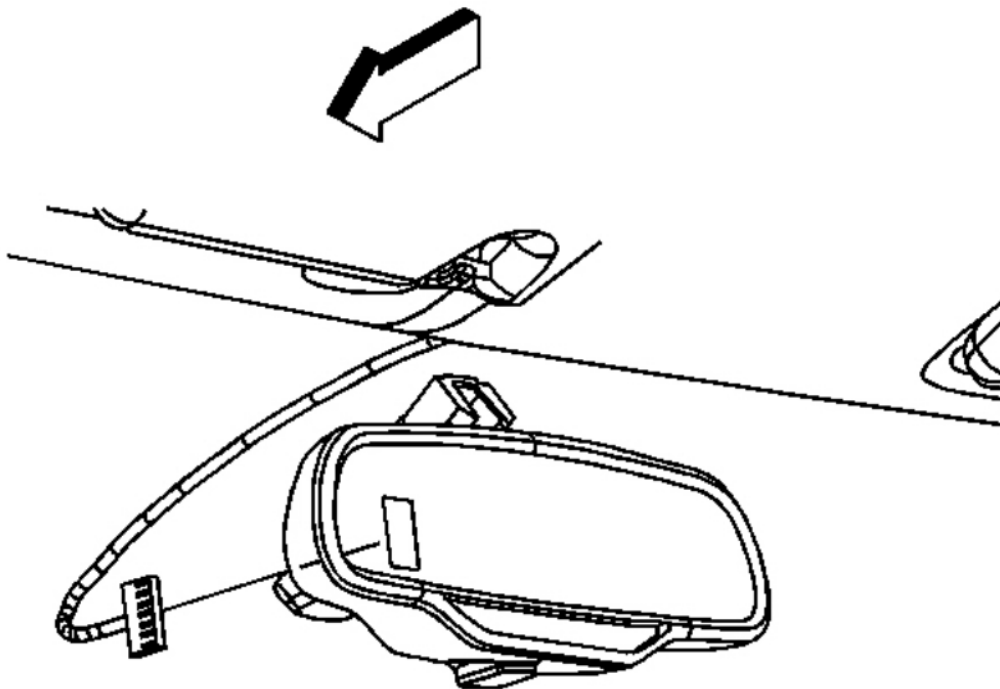


Fig. 12: View Of Rearview Mirror Electrical Connector
Courtesy of GENERAL MOTORS CORP.

1. Disconnect the electrical connector from the back of the mirror.
2. Remove the wire cover.
3. Adjust the mirror to the full upward position.
4. Remove the base trim cover.

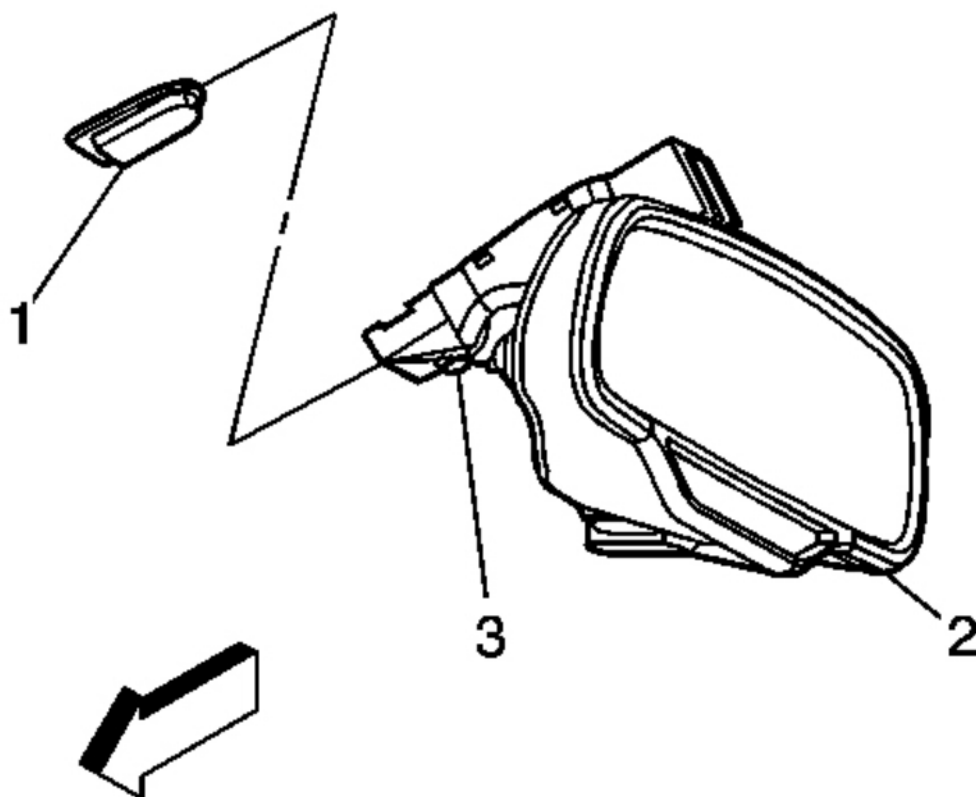


Fig. 13: View Of Rearview Mirror Mounting Components
Courtesy of GENERAL MOTORS CORP.

5. Loosen the screw (3) in order to remove the mirror (2) from the button assembly (1).
6. Slide the mirror assembly in an upward motion in order to remove.

Installation Procedure

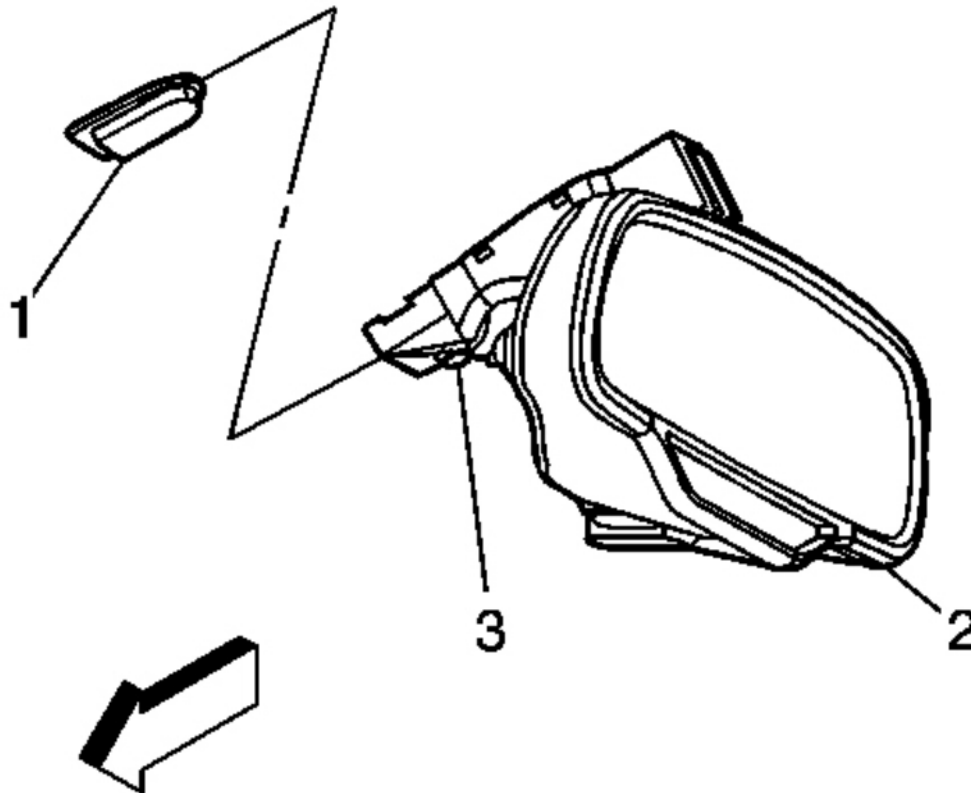


Fig. 14: View Of Rearview Mirror Mounting Components
Courtesy of GENERAL MOTORS CORP.

1. Position the center bottom of the mirror mount against the windshield at the top of the support button (1).
2. Slide the base of the mirror onto the button.

NOTE: Refer to Fastener Notice .

3. Make sure the mirror is firmly seated on the windshield button by pushing down on the base of the mirror.

Tighten: Tighten the screw (3) to 1.8 N.m (16 lb in) in order to secure the mirror base to the button.

4. Install the base trim cover.

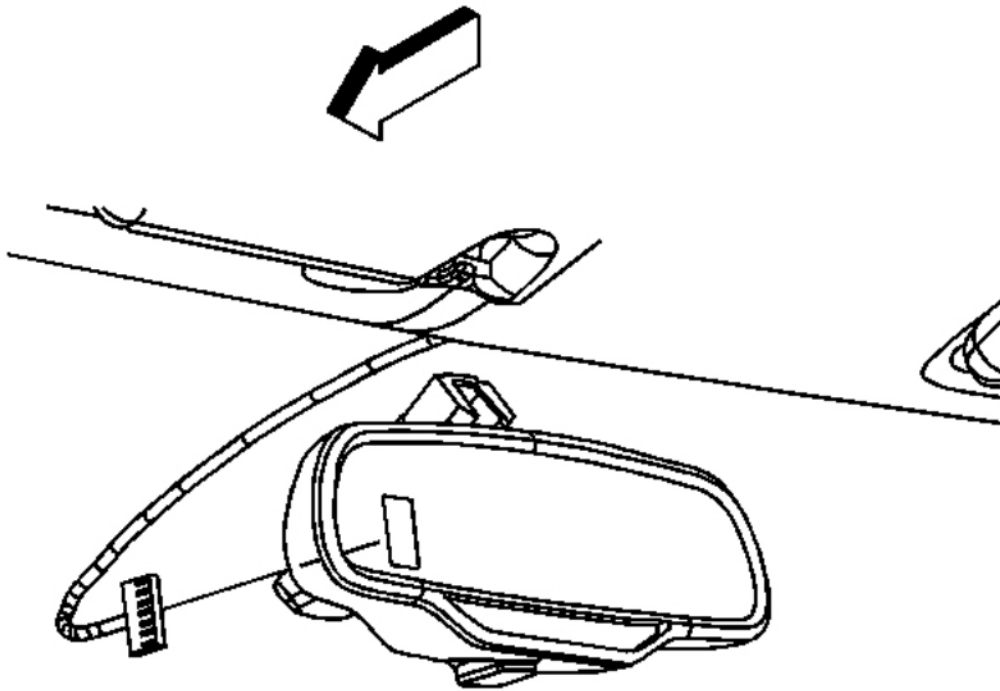


Fig. 15: View Of Rearview Mirror Electrical Connector
Courtesy of GENERAL MOTORS CORP.

5. Connect the electrical connector.
6. Install the wire cover.
7. Reposition the mirror assembly.
8. Refer to **Control Module References** for programming and setup information.

REARVIEW MIRROR SUPPORT INSTALLATION

Tools Required

- Inside Mirror Adhesive Kit GM P/N 1052369 (Canadian P/N 993362), or equivalent
 - Safety Razor or Utility Knife
1. Determine the location of the mirror mounting base by marking the outside of the windshield with a marking pencil where the base was previously located. If it is not clear where the base was mounted, use the following steps to determine where the base should be installed:

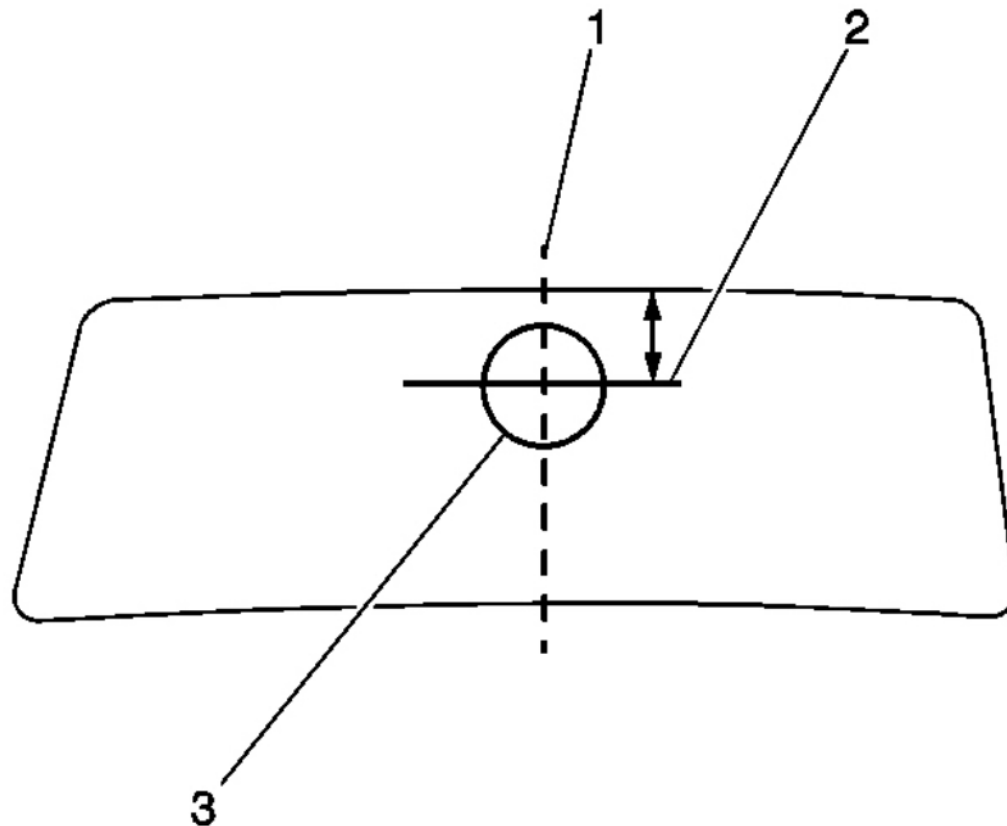


Fig. 16: Identifying Mirror Mounting Base Location
Courtesy of GENERAL MOTORS CORP.

1. Using a measuring tape, measure the distance between the windshield pillars from the base of the shade line .
2. Using a marking pencil, halfway between the windshield pillars, draw a centerline (1) on the windshield from the roof panel to the windshield base.
3. Draw a perpendicular line intersecting the centerline (2) at that location.

The top center of the mirror mounting base will be at the intersection of these lines.

2. Scrape the inside windshield thoroughly with a safety razor or utility knife in order to remove all old adhesive.
3. If reinstalling the original mounting base, place the mirror mounting base in a suitable holding device, such as a vise.
4. Clean the mirror mounting base thoroughly with a safety razor or utility knife in order to remove all old

adhesive.

5. Clean the inside windshield and the mounting surface of the mirror mounting base thoroughly with a clean cloth saturated with naphtha or a 50/50 mixture (by volume) of clean water and isopropyl alcohol.

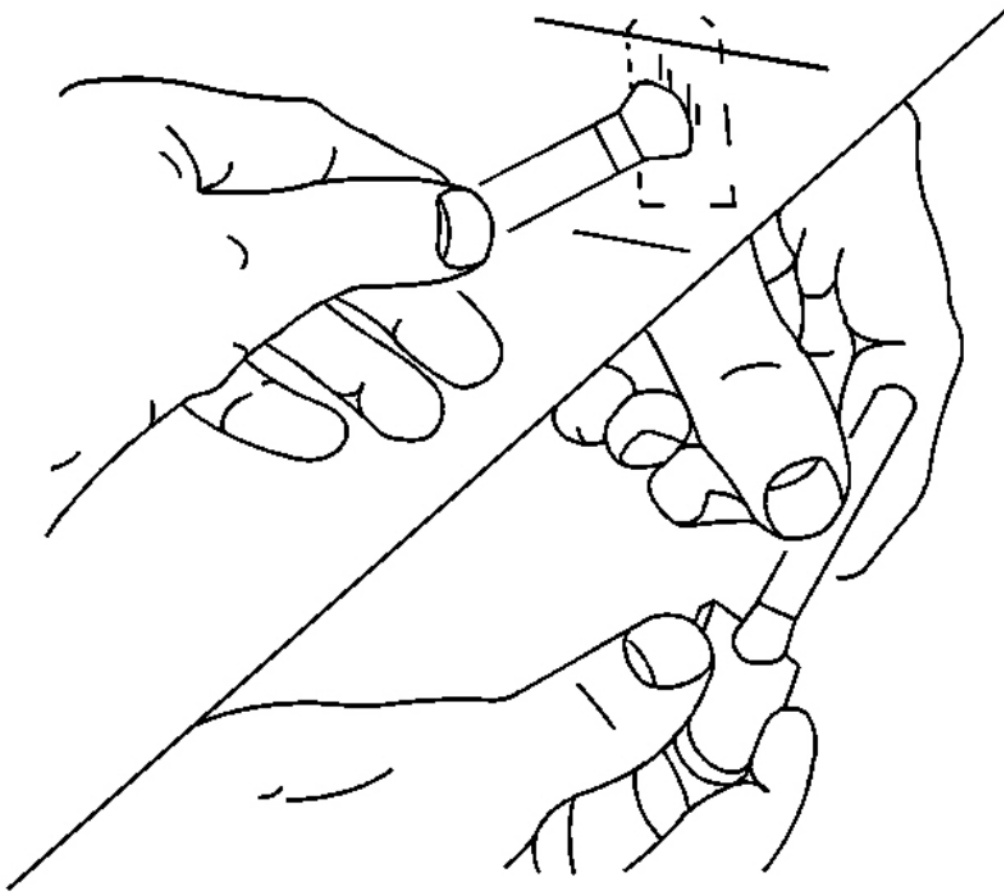


Fig. 17: Applying Adhesive To Mirror Base & Window
Courtesy of GENERAL MOTORS CORP.

6. Use Inside Mirror Adhesive Kit GM P/N 1052369 (Canadian P/N 993362), or equivalent, to apply a small amount of activator to the mounting surface of the mirror mounting base.
7. Apply a small amount of activator to the windshield where the mounting base is to be installed.
8. Allow the activator to dry 5 minutes.

IMPORTANT: Do not touch the mounting surface of the mirror mounting base or the window.

9. Apply 1 drop of adhesive to the center of the mirror mounting base.

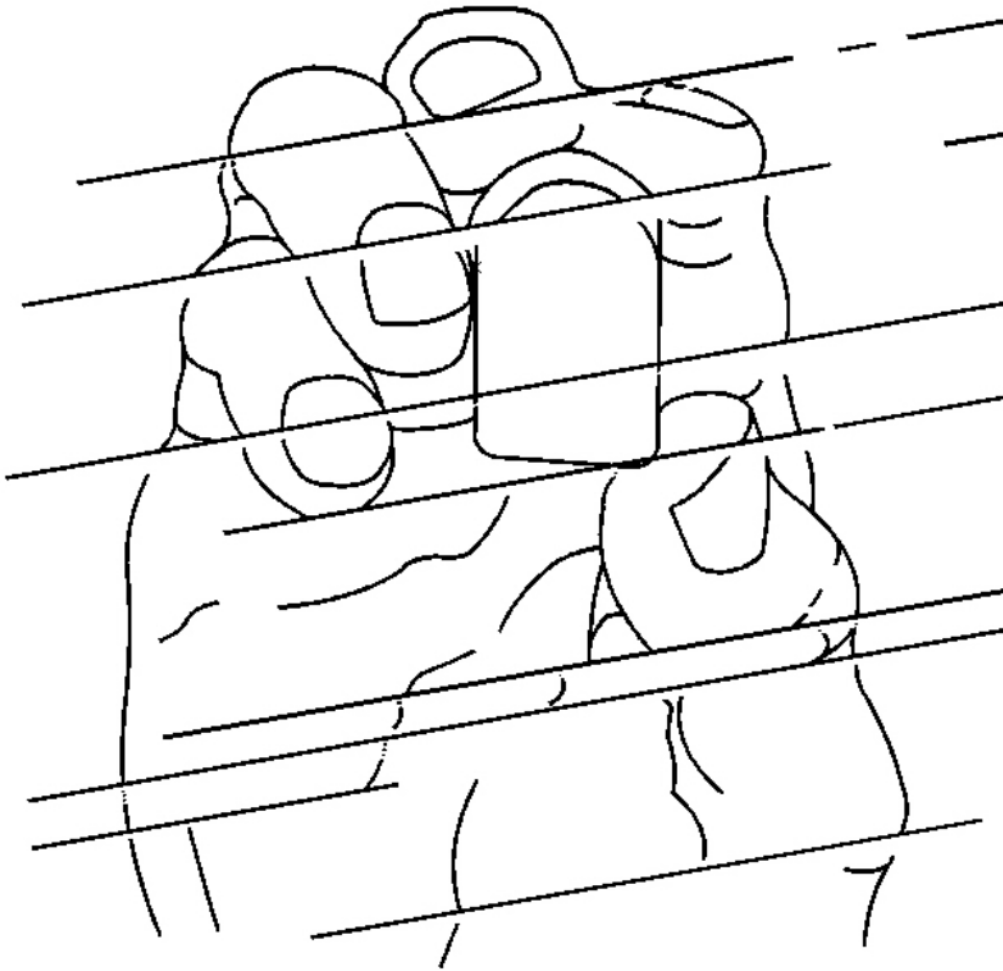


Fig. 18: Installing Mirror Mounting Base
Courtesy of GENERAL MOTORS CORP.

10. Immediately apply the mounting base to the windshield, ensuring that the mounting base aligns correctly to the marks made on the outside of the windshield.
11. Hold the mounting base firmly in place for 1 minute.
12. Allow the adhesive to set for 15 minutes.
13. Install the mirror to the mirror mounting base and fasten, if necessary.
14. Connect the electrical connector and install the wire cover, if equipped.

DESCRIPTION AND OPERATION

OUTSIDE MIRROR DESCRIPTION AND OPERATION (HEATED MIRRORS)

Heated OSRV Mirror

On vehicles equipped with heated outside rearview (OSRV) mirrors, the driver door switch (DDS) and passenger door switch (PDS) controls the activation of the mirror heaters. Upon receiving a LAN message indicating a request for heated mirrors, the driver door switch (DDS), and passenger door switch (PDS) for the passenger side, will activate the mirror heater output. The mirror heaters will remain active until a new message is received indicating rear defogger is to be deactivated, either by driver input or by expiration of a calibrated timer.

OUTSIDE MIRROR DESCRIPTION AND OPERATION (POWER MIRRORS)

Power Mirror System

Power Mirror System Components

The power mirror system consists of the following components:

- Driver Door Switch (DDS)-An electronic control module with integrated switches and requires programming when replaced
- Passenger Door Switch (PDS)-An electronic control module with integrated switches, requires programming when replaced
- Power Mirror Direction Switch-Integrated into DDS and is a 4 position momentary switch that provides a signal input to the DDS for up, down, left/extend and right/retract with a mirror switch activation
- Mirror Select Switch-Integrated into DDS and is a 3 position switch that allows the operator to select the left or right mirror and also a neutral/fold position
- Left Outside Power Mirror-Contains both the vertical and horizontal mirror motors
- Right Outside Power Mirror-Contains both the vertical and horizontal mirror motors
- Body Control Module-An electronic control module that requires programming when replaced, serves as the power mode master and is the main message handler
- Memory Switch, if equipped with memory mirrors-Supplied power by the DDS and provides a voltage signal to the DDS upon a switch activation
- Horizontal and Vertical Position Sensors, if equipped with memory mirrors-Supplied a 5-volt and low reference by the DDS/PDS and provide a variable voltage signal to the DDS/PDS that is proportional to mirror position
- Powertrain Control Module (PCM), if equipped with memory mirrors-An electronic control module that requires programming when replaced and provides the message indicating transmission gear selection
- Driver Information Center (DIC), if equipped with memory mirrors-Part of the instrument cluster which is an electronic control module that requires programming when replaced and is used to personalize the memory recall functions
- Fold Motor, in each of the outside mirrors, if equipped with power fold mirrors-Provides extend and

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retract movements of the mirror and is serviced as a complete mirror assembly

Each of the outside power mirrors contains 2 reversible motors to provide horizontal and vertical movement of the mirror glass. The vertical motor operates the up and down directions and the horizontal motor operates the left and right directions. If equipped with power folding mirrors, each outside power mirror will contain a reversible fold motor to operate the extend and retract functions. Each of the mirror motors are circuit breaker protected.

Power Mirror System Controls

The power mirror switch incorporates a 3-position mirror select switch and a 4-position mirror direction switch. The mirror select switch allows the operator to select the mirror to be moved by selecting the L position for the left power mirror, selecting the R position for the right power mirror or the center which is the neutral/fold position. The mirror direction switch is a 4-position switch that allows the operator to move the selected mirror up, down, left or right. The mirror direction switch also functions as the folding mirror switch. When the selector switch is in the neutral/fold position, activate the mirror direction switch to the left to extend the mirrors and right to retract the mirrors.

Power Mirror System Operation

The power mirror switch is integrated into the DDS. The left and right mirror positions of the select switch and 4 positions of the direction switch, when active, will provide a signal to the DDS. If the selector switch is placed in the L position and the up switch is depressed, 2 signals will be supplied to the DDS. The DDS upon receipt of these signals will provide battery voltage to the mirror motor left/up control circuit and ground to the mirror motor down control circuit and the mirror will move up. The remainder of the driver mirror functions operate in the same manner as described above except the DDS will supply battery voltage and ground to the appropriate control circuits for the direction selected. If the passenger mirror is selected and a direction switch is activated, the DDS sends a LAN message to the PDS indicating that the passenger mirror was selected and the direction to be commanded. The PDS will then supply battery voltage and ground to the appropriate control circuits for the direction selected.

Memory Mirror System

Memory Mirror System Controls

The driver door switch (DDS) and passenger door switch (PDS) are capable of storing mirror positions and controlling the mirrors to these positions to the preferred settings of 2 different drivers. Each driver will be able to personalize the memory system by positioning the mirrors and seats to their preferred settings. Then press and hold the memory 1 or memory 2 button until an audible chime is heard and the current mirror positions will be stored into memory of the DDS and PDS. Seat position will be stored in the driver position module (DPM). Once the mirror and seat positions have been stored into memory, a momentary memory 1 or memory 2 switch activation will supply the DDS a battery voltage signal. The DDS, upon receipt of the memory switch signal, with the transmission in park or neutral, will then drive the driver mirror to the corresponding stored memory position. The DDS will also send a LAN message to the PDS and DSM indicating that a memory switch activation occurred. The PDS will then drive the passenger mirror and the DPM will drive the driver seat to the corresponding stored memory position. The memory system can also be controlled by any of the following if programmed using the driver information center (DIC) to enable/disable the features:

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- Auto exit/entry seat positioning
- Mirror and seat position recall on a keyless entry unlock activation
- Mirror and seat position recall on ignition key insertion

For further information on programming and configuration, refer to Driver Personalization in Personalization.

Memory Mirror System Operation

Mirror position is determined by both horizontal and vertical position sensors in each of the power mirrors. The DDS and PDS supplies a reference voltage and a low reference to these sensors and determines mirror position through the horizontal and vertical position signal circuits.

The memory switch receives power from the DDS through the battery supply voltage circuit and the DDS fuse. The DDS upon receipt of a memory switch signal input or an appropriate LAN message from the BCM, the DDS and PDS will then supply battery voltage and ground to the appropriate power mirror motors through the mirror motor control circuits to move the mirrors to the predetermined positions.

Folding Mirror System

Folding Mirror System Controls

The folding mirror system requires signals from 2 separate switches. The mirror select switch must be in the neutral/fold position and the mirror direction switch must be activated to the left/extend or right/retract positions. Both switches are integrated into the DDS and provide direct signals.

Folding Mirror System Operation

Upon receipt of the required switch inputs the DDS will supply battery voltage and ground to the mirror fold motor control circuits to perform the requested extend or retract function. The DDS will also send a LAN message to the PDS indicating the requested function. The PDS will supply battery voltage and ground to the mirror fold motor control circuits to perform the requested extend or retract function.

AUTOMATIC DAY-NIGHT MIRROR DESCRIPTION AND OPERATION

Inside Rearview Mirror with the Automatic Day-Night Feature System Components

The inside rearview mirror with the automatic day-night feature system consists of the following components:

- Inside rearview mirror
- Ambient air temperature sensor

Inside Rearview Mirror with the Automatic Day-Night Feature System Operation

The inside rearview mirror uses 2 photocell sensors. One sensor is the headlight sensor, located on the face side of the mirror. The headlight sensor is used to determine light conditions present at the mirror face. The other sensor is the ambient light sensor, located on the rear of the mirror or windshield side. The ambient light sensor is used to determine the exterior light conditions. With a low exterior light condition detected, and a high light

2007 Cadillac Escalade

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condition from behind of the car, at the headlight sensor, the inside rearview mirror will automatically darken the face of the mirror.

In the daytime, the mirror is in a normal state because of the high exterior light condition that is indicated by the ambient light sensor. With the gear selector lever in the REVERSE position, backup lamp supply voltage is supplied as an input to the inside rearview mirror. The mirror monitors this input to disable the automatic day-night feature. This allows the driver to see objects in the mirror clearly when backing up, even during the night.

Compass

The mirror uses 2 magnetic field sensors for compass direction. One sensor is for north and south, the other is for east and west. The mirror supplies a signal and low reference to each sensor. As the vehicle travels with or against the earth's magnetic pull, there will be a change in voltage on one or both sensors. As a result of the change in voltage, the mirror changes the heading on the compass display.

Temperature Display

The inside rearview mirror monitors the ambient air temperature sensor. As the outside air temperature gets warmer, the ambient air temperature sensor will lower resistance. The inside rearview mirror monitors this change and will show this as a warmer temperature on the display. Temperatures exceeding 62°C (143°F) will be out of the mirror's temperature range and SC will be shown on the temperature display. In colder outside air temperatures, the ambient air temperature sensor will raise in resistance. The inside rearview mirror will show a colder temperature on the display. Temperatures lower than -40°C (-40°F) will be out of the mirror's temperature range which OC will be shown on the temperature display. In cold temperatures such as 3°C (37°F) or below, the temperature display will show ICE when the ignition is first turned ON. The display will toggle between ICE and the actual outside temperature until the temperature update process is complete.

Temperature Display Update Process

The inside rearview mirror has a temperature program that takes in account the fact that the radiator will heat the ambient air temperature sensor if the radiator is warm and the vehicle is not moving. If the vehicle has been off for more than 2 hours, the mirror temperature program assumes that the radiator has cooled and that the temperature supplied by the ambient air temperature sensor is accurate. Because of this, if the vehicle has been off for more than 2 hours, the mirror displays the temperature as reported by the ambient air temperature sensor. When the ambient air temperature sensor reports a new temperature to the mirror, one of the following cases will apply:

- Ignition is OFF for more than 2 hours, then is turned ON for more than 3 minutes. The outside temperature is greater than the last temperature recorded by the mirror for 2 minutes. The mirror will increase the last temperature reading by one degree every 2 minutes for 8 consecutive times. If the outside temperature is not matched after the 8th update, the mirror will then display the current outside temperature.
- Ignition is off for more than 2 hours, then is turned ON for less than 3 minutes. The mirror will update the temperature display every 2 seconds.
- Ignition is OFF for more than 2 hours, then is turned ON for more than 3 minutes. The outside temperature is less than the last temperature recorded by the mirror. The mirror will then display the current outside temperature.

2007 Cadillac Escalade

2007 ACCESSORIES & EQUIPMENT Mirrors - Avalanche, Escalade, Suburban, Tahoe & Yukon

- Ignition has been OFF for less than 2 hours. The outside temperature is greater than the last temperature recorded by the mirror, but the ignition is cycled from ON to OFF within 2 minutes. The mirror will display the old temperature.
- Ignition has been OFF for less than 2 hours. The outside temperature is less than the last temperature recorded by the mirror. The mirror will then display the current outside temperature.

Switches of the Inside Rearview Mirror with the Automatic Day-Night Feature and Compass without OnStar®

The inside rearview mirror has 2 switches that perform the following functions:

- The MIRROR switch is used to enable or disable the automatic day-night feature of the mirror. With the ignition in the ON position, depress the MIRROR switch to enable the automatic day-night feature of the mirror. A green indicator will illuminate on the mirror when the automatic day-night feature is enabled. To disable the automatic day-night feature of the mirror, depress the MIRROR switch.
- The COMPASS switch is used to turn the compass ON and OFF. With the ignition in the ON position, depress the COMPASS switch to turn the compass ON. Depress the COMPASS switch again to turn the compass OFF. The COMPASS switch is also used to place the compass into a calibration or zone mode. For more information, refer to **Compass Calibration and Magnetic Variance**.

Switches of the Inside Rearview Mirror with the Automatic Day-Night Feature, Compass/Temperature Display without OnStar®

The inside rearview mirror has 2 switches that perform the following functions:

- The TEMP switch is used to turn the compass/temperature display ON or OFF, it is also used to enable or disable the automatic day-night feature of the mirror. With the ignition in the ON position, depress the TEMP switch to enable the compass/temperature display. Depress the TEMP switch again to disable the compass/temperature display. The TEMP switch can be held for 4 seconds in order to change the display from Fahrenheit (°F) to Celsius (°C), or from Celsius (°C) to Fahrenheit (°F). Depress the TEMP switch until the green indicator illuminates on the mirror. This indicates that the automatic day-night feature is enabled. To disable the automatic day-night feature of the mirror, depress the TEMP switch until the green indicator turns OFF.
- The COMP switch is used to turn the compass/temperature display ON or OFF. With the ignition in the ON position, depress the COMP switch to turn the compass/temperature display ON. Depress the COMP switch again to turn the compass/temperature display OFF. The COMP switch is also used to place the compass into a calibration or zone mode. For more information, refer to **Compass Calibration and Magnetic Variance**.

Switches of the Inside Rearview Mirror with the Automatic Day-Night Feature with Compass and OnStar®

The inside rearview mirror has 4 switches that perform the following functions:

- The ON/OFF switch located at the left side of the mirror performs the following functions:
 - To enable or disable the automatic day-night feature of the mirror-With the ignition in the ON position, depress and hold the ON/OFF switch for 4 seconds to enable the automatic day-night feature of the mirror. A green indicator will illuminate on the mirror when the automatic day-night

2007 Cadillac Escalade

2007 ACCESSORIES & EQUIPMENT Mirrors - Avalanche, Escalade, Suburban, Tahoe & Yukon

feature is enabled. To disable the automatic day-night feature of the mirror, depress and hold the ON/OFF switch for 4 seconds.

- To turn the compass ON and OFF-With the ignition in the ON position, depress the ON/OFF switch to turn the compass ON. Depress the ON/OFF switch again to turn the compass OFF. The ON/OFF switch is also used to place the compass into a calibration or zone mode. For more information, refer to **Compass Calibration and Magnetic Variance** .
- The 3 switches on the right side of the mirror are for OnStar® operation. For more information, refer to **OnStar Description and Operation** .

Switches of the Inside Rearview Mirror with the Automatic Day-Night Feature, Compass/Temperature Display with OnStar®

The inside rearview mirror has 4 switches that perform the following functions:

- The ON/OFF switch located at the left side of the mirror performs the following functions:
 - To enable or disable the automatic day-night feature of the mirror-With the ignition in the ON position, depress and hold the ON/OFF switch for 6 seconds to enable the automatic day-night feature of the mirror. A green indicator will illuminate on the mirror when the automatic day-night feature is enabled. To disable the automatic day-night feature of the mirror, depress and hold the ON/OFF switch for 6 seconds.
 - To turn the compass/temperature display ON and OFF-With the ignition in the ON position, depress the ON/OFF switch to turn the compass/temperature display ON. Depress the ON/OFF switch again to turn the compass/temperature display OFF. The ON/OFF switch can be held for 4 seconds in order to change the display from Fahrenheit (°F) to Celsius (°C), or from Celsius (°C) to Fahrenheit (°F). The ON/OFF switch is also used to place the compass into a calibration or zone mode. For more information, refer to **Compass Calibration and Magnetic Variance** .
- The 3 switches on the right side of the mirror are for OnStar® operation. For more information, refer to **OnStar Description and Operation** .