

2010 ACCESSORIES & EQUIPMENT

Mirrors - Equinox & Terrain

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Inside Rearview Mirror	2 N.m	18 lb in
Outside Rearview Mirror Bolts	10 N.m	89 lb in
Outside Rearview Mirror Motor Screws	5 N.m	44 lb in

ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS

Application	Type of Material	GM Part Number	
		United States	Canada
Inside Mirror Adhesive Kit	Adhesive	89021329	993362

SCHEMATIC AND ROUTING DIAGRAMS

INSIDE REARVIEW MIRROR SCHEMATICS

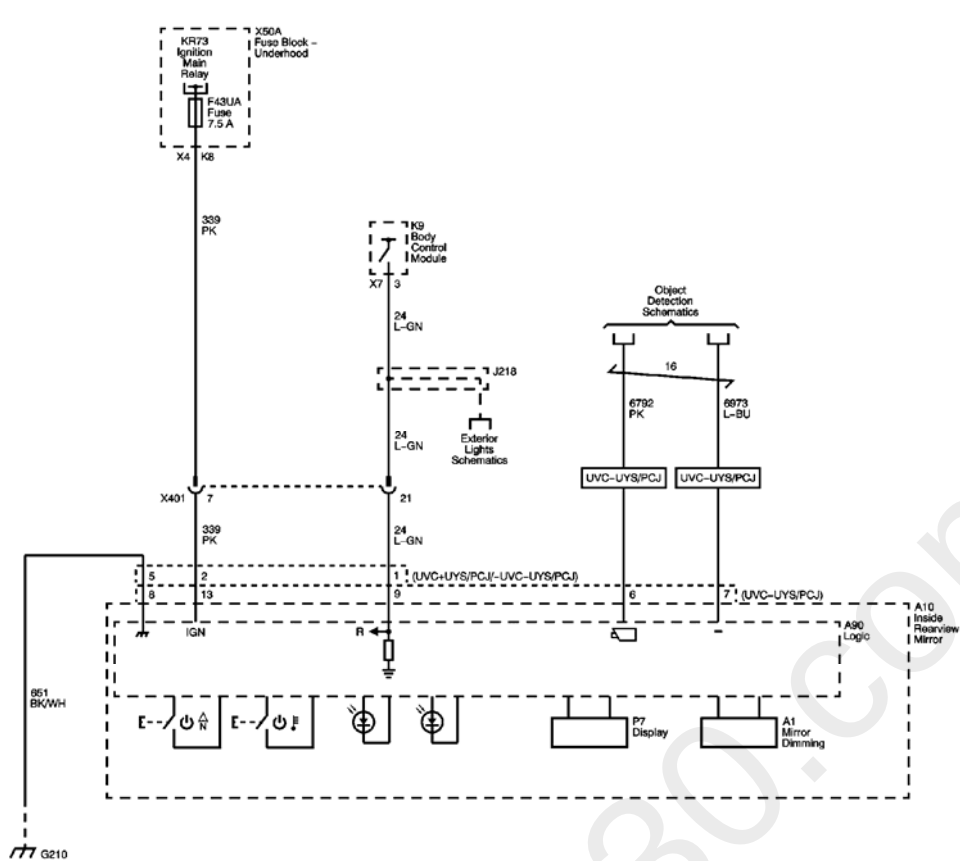


Fig. 1: Inside Rearview Mirror Schematic
 Courtesy of GENERAL MOTORS CORP.

OUTSIDE REARVIEW MIRROR SCHEMATICS

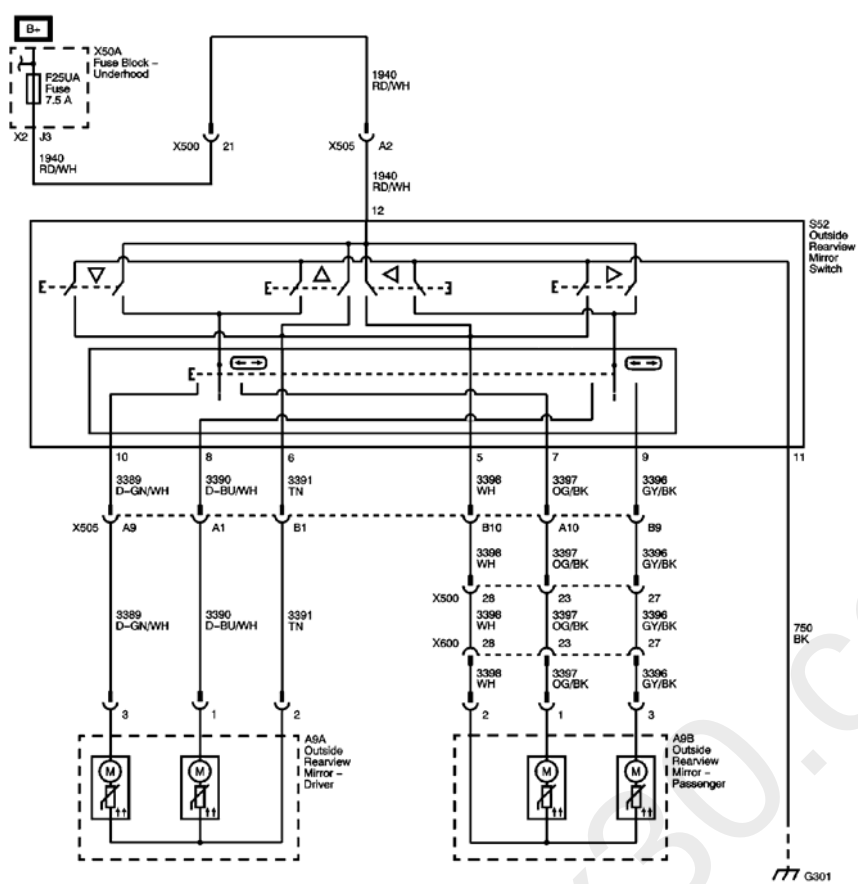


Fig. 2: Outside Mirrors (without LTZ or SLT)
 Courtesy of GENERAL MOTORS CORP.



Courtesy of GENERAL MOTORS CORP.

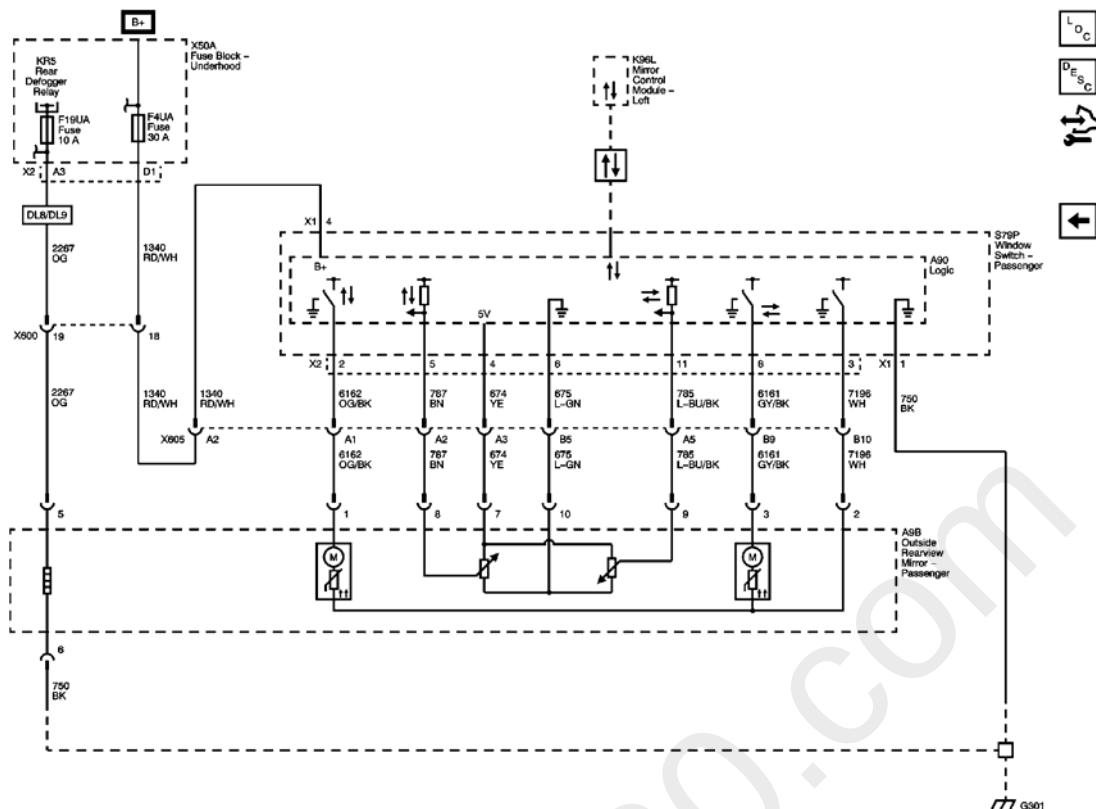


Fig. 4: Outside Mirror - Passenger (LTZ or SLT)
 Courtesy of GENERAL MOTORS CORP.

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC B154A or B154B</u>	B154A 39: Driver Mirror Internal Malfunction B154B 39: Passenger Mirror Internal Malfunction

DTC B154A OR B154B

Diagnostic Instructions

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

DTC Descriptors

DTC B154A 39

Driver Mirror Internal Malfunction

DTC B154B 39

Passenger Mirror Internal Malfunction

Circuit/System Description

The outside rearview mirror switch is a multiplex switch which signals the left mirror control module which outside rearview mirror to move (driver or passenger) and which direction to move it. The left mirror control module and the passenger window switch are on a serial data circuit with the memory seat module as the master. The mirror select and directional control switches are inputs to the left mirror control module. When the memory seat module receives the switch inputs from the left mirror control module, mirror output commands are sent to the appropriate switch through the serial data circuit. The left mirror control module and passenger window switch control the left and right outside rear view mirrors through bi-directional motor control circuits. The motor control circuits are floating while in an inactive state and the switches will apply power and ground to the control circuits as necessary to move the mirror in the commanded direction.

Mirror position is determined by both horizontal and vertical position sensors in each of the power mirrors. The left mirror control module and passenger window switch supply a 5 V reference, low reference, and horizontal and vertical position signal circuits to these sensors. The signal circuits are referenced from 5 V by the switches and the signal circuit voltage levels represent the mirror positions. The mirror positions are sent to the memory seat module through the serial data circuit where they are stored for memory mirror operation. When the memory seat module receives a memory recall command, the memory seat module will send the go to position commands to the left mirror control module and passenger window switch. The switches will then drive the appropriate mirror motors to the commanded position sensor settings.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

B154A 39

The left mirror control module has determined that a hardware or software error has occurred.

B154B 39

The passenger window switch has determined that a hardware or software error has occurred.

Action Taken When the DTC Sets

Power mirror functions are suspended as long as the fault is present.

Conditions for Clearing the DTC

- A current DTC will clear when the fault is no longer present.
- A history DTC will clear after 40 fault free ignition cycles.

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Outside Mirror Description and Operation (without LTZ or SLT) or Outside Mirror Description and Operation (with LTZ or SLT)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

If the DTC is set, replace the appropriate K96L left mirror control module or the S79P passenger window switch.

Repair Procedures

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

Control Module References for left mirror control module or passenger window switch replacement, setup, and programming

SYMPTOMS - MIRRORS

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

1. Perform the Diagnostic System Check - Vehicle before using the Symptom Tables in order to verify that

all of the following are true:

- There are no DTCs set.
 - The control modules can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to the following system descriptions:
- **Outside Mirror Description and Operation (without LTZ or SLT)****Outside Mirror Description and Operation (with LTZ or SLT)**
 - **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

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

- **Heated Mirrors Malfunction (with SLT)**
- **Automatic Day-Night Mirrors Malfunction**
- **Power Mirror Malfunction (with LTZ or SLT)** or **Power Mirror Malfunction (without LTZ or SLT)**

HEATED MIRRORS MALFUNCTION (WITH SLT)

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Heated Mirror Element Control	1	1	2	-
Ground	-	1	-	-

1. Heated Mirror Inoperative

2. Heated Mirror Always On

Circuit/System Description

The R/DEFOG relay supplies voltage to the outside rearview mirror heater elements based on the current state of the rear window defogger. The relay supplies B+ through the driver/passenger mirror heating element control circuit when a request is seen.

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Outside Mirror Description and Operation (without LTZ or SLT) or Outside Mirror Description and Operation (with LTZ or SLT)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Engine running, press the rear window defogger switch. Verify the rear window defogger turns ON and the rear window becomes warm.
 - If the rear window defogger does not turn on, refer to Rear Window Defogger Malfunction .
2. Verify both the left and right outside mirror glass becomes warm.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate A9 outside rearview mirror.
2. Wait 1 minute, test for less than 10 ohms between the ground circuit terminal 6 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.

3. Connect a test lamp between the heater element control circuit terminal 5 and ground.
4. Engine running, operate the rear window defogger ON and OFF with the rear defogger switch. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to voltage.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance.
5. If all circuits test normal, test or replace the E17 outside rearview mirror glass.

Repair Procedures

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

Outside Rearview Mirror Glass Replacement

AUTOMATIC DAY-NIGHT MIRRORS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ignition	1	1	-	-
Backup Lamp Control	1	1	1	-
Ground	-	1	-	-
1. Inside Electrochromic Mirror Malfunction				

Circuit/System Description

The inside rearview mirror uses 2 photocell sensors. One sensor is the rear light sensor, located on the face side of the mirror, facing the rear of the vehicle. The rear light sensor is used to determine light conditions present at the mirror face. The other sensor is the front light sensor, located on the backside of the mirror, facing the front of the vehicle. The front light sensor is used to determine the exterior light conditions at the front of the vehicle. With a low exterior light condition detected by the front light sensor and a high light condition from the rear light sensor, the inside rearview mirror will automatically darken the face of the inside rearview mirror.

With the gear selector lever in the REVERSE position and the vehicle running, backup lamp control 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, regardless of the rear light sensor status.

Diagnostic Aids

If the vehicle has a rear vision camera the button for turning the automatic dimming feature on or off will not be available.

Reference Information

Schematic Reference

Inside Rearview Mirror Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Automatic Day-Night Mirror Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, headlamps ON, vehicle in PARK, automatic dimming enabled, cover the front light sensor with a towel or other suitable item. Shine a flashlight at the rear light sensor while observing the inside rearview mirror face. The inside rearview mirror face should dim.
2. Engine running, place the transmission in REVERSE. The inside rearview mirror face should transition from dim to bright.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the A10 inside rearview mirror.
2. Wait 1 minute, test for less than 10 ohms between the appropriate ground circuit terminal listed below and ground:
 - Terminal 5 with (UVC) and (UYS) or without (UVC) or (UYS)
 - Terminal 8 with (UVC) and without (UYS)
 - If greater than the specified range, test the ground circuit for an open/high resistance.

3. Ignition ON, verify that a test lamp illuminates between the appropriate ignition circuit terminal listed below and ground:
 - Terminal 2 with (UVC) and (UYS) or without (UVC) or (UYS)
 - Terminal 13 with (UVC) and without (UYS)
 - If the test lamp does not illuminate test the ignition circuit for an open/high resistance or short to ground.
4. Engine running, park brake applied, vehicle in REVERSE, verify that a test lamp illuminates between the appropriate backup lamp control circuit terminal listed below and ground:
 - Terminal 1 with (UVC) and (UYS) or without (UVC) or (UYS)
 - Terminal 9 with (UVC) and without (UYS)
 - If the test lamp does not illuminate test the control circuit for an open/high resistance or short to ground. If the circuit tests normal, refer to **Backup Lamps Malfunction** .
5. If all circuits test normal, test or replace the A10 inside rearview mirror.

Repair Procedures

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

Inside Rearview Mirror Replacement

POWER MIRROR MALFUNCTION (WITH LTZ OR SLT)

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Outside Rearview Mirror Switch 5 V Reference	1	1	1	-
Position Sensor 5 V Reference	1	1	1	-
Left/Right Mirror Horizontal Position Sensor Signal	1	1	1	-
Left/Right Mirror Vertical Position Sensor Signal	1	1	1	-
Left/Right Mirror Motor Horizontal Control	1	1	1	-
Left/Right Mirror Motor Common Control	1	1	1	-
Left/Right Mirror Motor Vertical				

Control	1	1	1	-
Low Reference Position Sensors	-	1	-	-
Low Reference Rearview Mirror Switch	-	1	-	-
1. Power Mirror Malfunction				

Circuit/System Description

The outside rearview mirror switch is a multiplex switch which signals the left mirror control module which outside rearview mirror to move (driver or passenger) and which direction to move it. The left mirror control module and the passenger window switch are on a serial data circuit with the memory seat module as the master. The mirror select and directional control switches are inputs to the left mirror control module. When the memory seat module receives the switch inputs from the left mirror control module, mirror output commands are sent to the appropriate module/switch through the serial data circuit. The left mirror control module and passenger window switch control the left and right outside rear view mirrors through bi-directional motor control circuits. The motor control circuits are floating while in an inactive state and the switches will apply power and ground to the control circuits as necessary to move the mirror in the commanded direction.

Mirror position is determined by both horizontal and vertical position sensors in each of the power mirrors. The left mirror control module and passenger window switch supply a 5 V reference, low reference, and horizontal and vertical position signal circuits to these sensors. The signal circuits are referenced from 5 V by the switches and the signal circuit voltage levels represent the mirror positions. The mirror positions are sent to the memory seat module through the serial data circuit where they are stored for memory mirror operation. When the memory seat module receives a memory recall command, the memory seat module will send the go to position commands to the left mirror control module and passenger window switch. The switches will then drive the appropriate mirror motors to the commanded position sensor settings.

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Outside Mirror Description and Operation (without LTZ or SLT) or Outside Mirror Description and Operation (with LTZ or SLT)

Electrical Information Reference

- Circuit Testing
- Connector Repairs

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, observe the scan tool Mirror Select Switch parameter while cycling the mirror select switch between the left and right positions. The parameter should change between None, Right, and Left.
 - If the parameter does not cycle between the specified values, refer to Mirror Switch Circuit Test.
2. Observe the scan tool Mirror Direction Switch parameter while cycling the mirror directional switch between the up, down, left and right positions. The parameter should change between Inactive, Up, Down, Left, and Right.
 - If the parameter does not cycle between the specified values, refer to Mirror Switch Circuit Test.
3. Command the driver and passenger mirrors UP/DOWN and RIGHT/LEFT with a scan tool. Verify the mirrors move in the commanded directions.
 - If a mirror does not move in all the commanded directions, refer to Mirror Motor Circuit Test.
4. Operate the memory 1 and 2 recall switches. The outside rearview mirrors should adjust to the stored memory positions.
 - If a mirror does not adjust to the stored memory position, refer to Mirror Position Sensor Circuit Test-Driver or Mirror Position Sensor Circuit Test-Passenger.

Circuit/System Testing

Mirror Switch Circuit Test

1. Ignition OFF, disconnect the harness connector at the S52 outside rearview mirror switch.
2. Doors closed, wait 1 minute, test for less than 10 ohms between the low reference terminal 11 and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the K96 mirror control module.
3. Ignition ON, test for 4.8-5.2 V between the 5 V reference circuit terminal 5 and ground.
 - If less than the specified range, test the 5 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K96 mirror control module.
 - If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the K96 mirror control module.
4. Ignition ON, test for 4.8-5.2 V between the 5 V reference circuit terminal 12 and ground.
 - If less than the specified range, test the 5 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K96 mirror control module.
 - If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the K96 mirror control module.

5. If all circuits test normal, test or replace the S52 outside rearview mirror switch.

Mirror Motor Circuit Test

1. Ignition OFF, disconnect the harness connector at the appropriate A9A or A9B outside rearview mirror.
2. Connect a test lamp between the control circuit terminal 3 and the control circuit terminal 2.
3. Ignition ON, command the mirror LEFT and RIGHT with a scan tool. The test lamp should turn ON when commanding the LEFT and RIGHT states.
 - If the test lamp remains OFF during either of the commands, test for a short to voltage, short to ground or an open/high resistance on either control circuit. If the circuits test normal, replace the switch/module.
 - K96 mirror control module
 - S79P passenger window switch
4. Connect a test lamp between the control circuit terminal 1 and the control circuit terminal 2.
5. Ignition ON, command the mirror UP and DOWN with a scan tool. The test lamp should turn ON when commanding the UP and DOWN states.
 - If the test lamp remains OFF during either of the commands, test for a short to voltage, short to ground or an open/high resistance on either control circuits. If the circuits test normal, replace the switch/module.
 - K96 mirror control module
 - S79P passenger window switch
6. If all circuits test normal, test or replace the outside rearview mirror inner actuator.

Mirror Position Sensor Circuit Test-Driver

1. Ignition OFF, disconnect the harness connector at the A9A outside rearview mirror.
2. Doors closed, wait 3 minutes, test for less than 10 ohms between the low reference circuit terminal 10 and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the K96 mirror control module.
3. Ignition ON, test for 4.6-5.4 V between the 5 V reference circuit terminal 7 and ground.
 - If less than the specified range, test the 5 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K96 mirror control module.
 - If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the K96 mirror control module.
4. Verify the scan tool Mirror Vertical Position parameter is greater than 4.6 V.
 - If less than the specified range, test the signal circuit terminal 8 for a short to ground. If the circuit tests normal, replace the K96 mirror control module.
5. Verify the scan tool Mirror Horizontal Position parameter is greater than 4.6 V.
 - If less than the specified range, test the signal circuit terminal 9 for a short to ground. If the circuit tests normal, replace the K96 mirror control module.
6. Install a 3 A fused jumper wire between the signal circuit terminal 8 and the low reference circuit

terminal 10. Verify the scan tool Mirror Vertical Position parameter is less than 0.4 V.

- If greater than the specified range, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K96 mirror control module.
7. Install a 3 A fused jumper wire between the signal circuit terminal 9 and the low reference circuit terminal 10. Verify the scan tool Mirror Horizontal Position parameter is less than 0.4 V.
 - If greater than the specified range, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K96 mirror control module.
 8. If all circuits test normal, test or replace the outside rearview mirror inner actuator.

Mirror Position Sensor Circuit Test-Passenger

1. Ignition OFF, disconnect the harness connector at the A9B outside rearview mirror.
2. Doors closed, wait 3 minutes, test for less than 10 ohms between the low reference circuit terminal 10 and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the S79P passenger window switch.
3. Ignition ON, test for 4.6-5.4 V between the 5 V reference circuit terminal 7 and ground.
 - If less than the specified range, test the 5 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the S79P passenger window switch.
 - If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the S79P passenger window switch.
4. Verify the scan tool Mirror Vertical Position parameter is less than 0.4 V.
 - If more than the specified range, test the signal circuit terminal 8 for a short to voltage. If the circuit tests normal, replace the S79P passenger window switch.
5. Verify the scan tool Mirror Horizontal Position parameter is less than 0.4 V.
 - If more than the specified range, test the signal circuit terminal 9 for a short to voltage. If the circuit tests normal, replace the S79P passenger window switch.
6. Install a 3 A fused jumper wire between the signal circuit terminal 8 and the low reference circuit terminal 10. Verify the scan tool Mirror Vertical Position parameter is more than 4.6 V.
 - If less than the specified range, test the signal circuit for a short to ground or open/high resistance. If the circuit tests normal, replace the S79P passenger window switch.
7. Install a 3 A fused jumper wire between the signal circuit terminal 9 and the low reference circuit terminal 10. Verify the scan tool Mirror Horizontal Position parameter is more than 4.6 V.
 - If less than the specified range, test the signal circuit for a short to ground or open/high resistance. If the circuit tests normal, replace the S79P passenger window switch.
8. If all circuits test normal, test or replace the outside rearview mirror inner actuator.

Repair Procedures

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

- **Outside Rearview Mirror Inner Actuator Replacement**
- **Outside Remote Control Rearview Mirror Switch Replacement**

- **Outside Rearview Mirror Folding Control Module Replacement**

POWER MIRROR MALFUNCTION (WITHOUT LTZ OR SLT)

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	1	1	-	-
Left/Right Mirror Horizontal Motor Control	1	1	-	-
Left/Right Mirror Vertical Motor Control	1	1	-	-
Left/Right Mirror Motor Common Control	1	1	-	-
Ground	-	1	-	-
1. Power Mirror Malfunction				

Circuit/System Description

The outside rearview mirror switch controls the outside rearview mirrors based on the position of the mirror selector switch and which movement position is selected. The outside rearview mirror switch has four positions: up, down, left, and right. B+ is applied to the switch from the power mirror fuse and when a movement position switch is selected, voltage is sent to the commanded mirror via a mirror control circuit. The opposite mirror control circuit acts as a ground circuit for the bi-directional mirror motor. Ground is the applied through the switch.

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Outside Mirror Description and Operation (without LTZ or SLT) or Outside Mirror Description and

Operation (with LTZ or SLT)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, with the mirror selector switch in the DRIVER position, command the mirrors UP, DOWN, LEFT, and RIGHT using the mirror directional switch. The driver mirror should move in the commanded direction.
2. With the mirror selector switch in the PASSENGER position, command the mirrors UP, DOWN, LEFT, and RIGHT using the mirror directional switch. The passenger mirror should move in the commanded direction.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the S52 outside rearview mirror switch.
2. Wait 1 minute, test for less than 10 ohms between the ground circuit terminal 11 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal 12 and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
4. Ignition OFF, connect the harness connector at the S52 outside rearview mirror switch.
5. Disconnect the harness connector at the appropriate A9A or A9B outside rearview mirror.
6. Connect a test lamp between the control circuit terminal 2 and the control circuit terminal 1.
7. Operate the vertical switch UP and DOWN. The test lamp should turn ON when commanding the UP and DOWN states.
 - If the test lamp remains OFF during either of the commands, test for a short to voltage, short to ground, or an open/high resistance on the control circuits. If the circuits test normal, replace the S52 outside rearview mirror switch.
8. Connect a test lamp between the control circuit terminal 3 and the control circuit terminal 2.
9. Operate the horizontal switch LEFT and RIGHT. The test lamp should turn ON when commanding the LEFT and RIGHT states.
 - If the test lamp remains OFF during either of the commands, test for a short to voltage, short to ground, or an open/high resistance on the control circuits. If the circuits test normal, replace the S52 outside rearview mirror switch.

10. If all circuits test normal, test or replace the outside rearview mirror motor.

Repair Procedures

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

- **Outside Rearview Mirror Inner Actuator Replacement**
- **Outside Remote Control Rearview Mirror Switch Replacement**

REPAIR INSTRUCTIONS

OUTSIDE REARVIEW MIRROR REPLACEMENT (EQUINOX)

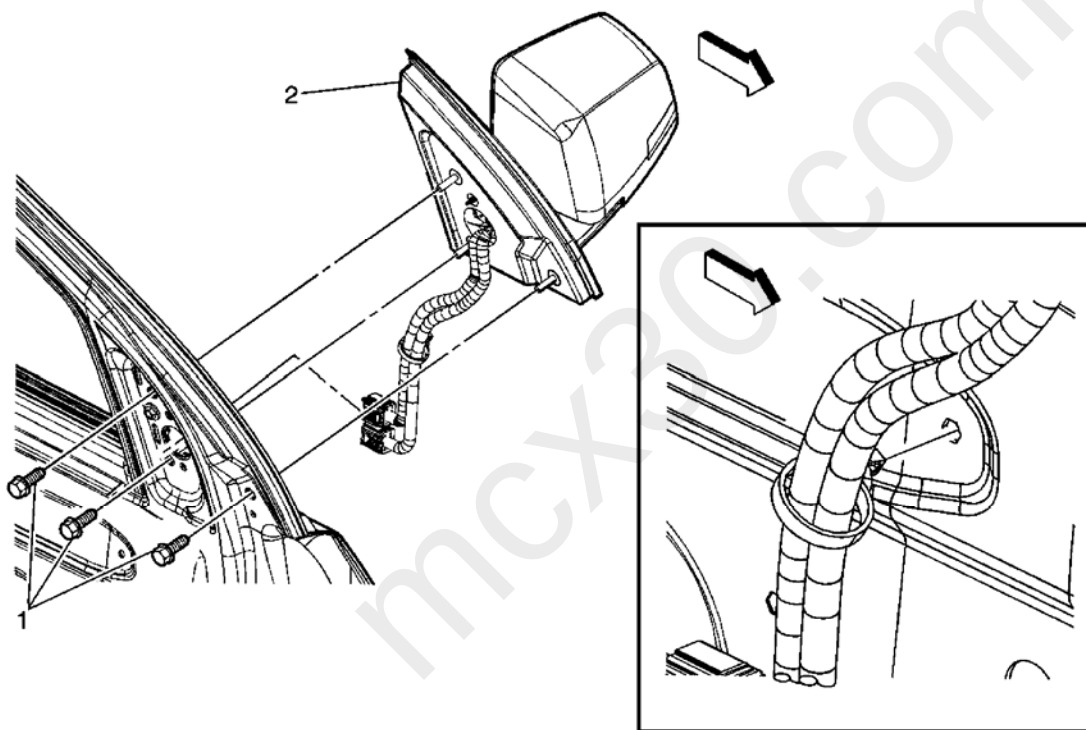


Fig. 5: Outside Rearview Mirror (Equinox)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1.	Place the window in the fully down position.
2.	Remove front door trim panel. Refer to <u>Front Side Door Trim Panel Replacement</u> .
3.	Remove the front side door garnish molding. Refer to <u>Front Side Door Garnish Molding Replacement</u> .

1	Outside Rearview Mirror Bolt (Qty: 3) CAUTION: Refer to <u>Fastener Caution</u> . Procedure: Disconnect the electrical connector. Tighten: 10 N.m (89 lb in).
2	Outside Rearview Mirror Procedure: Inspect the mirror for proper operation before installing the side door garnish molding and door trim panel.

OUTSIDE REARVIEW MIRROR REPLACEMENT (TERRAIN)

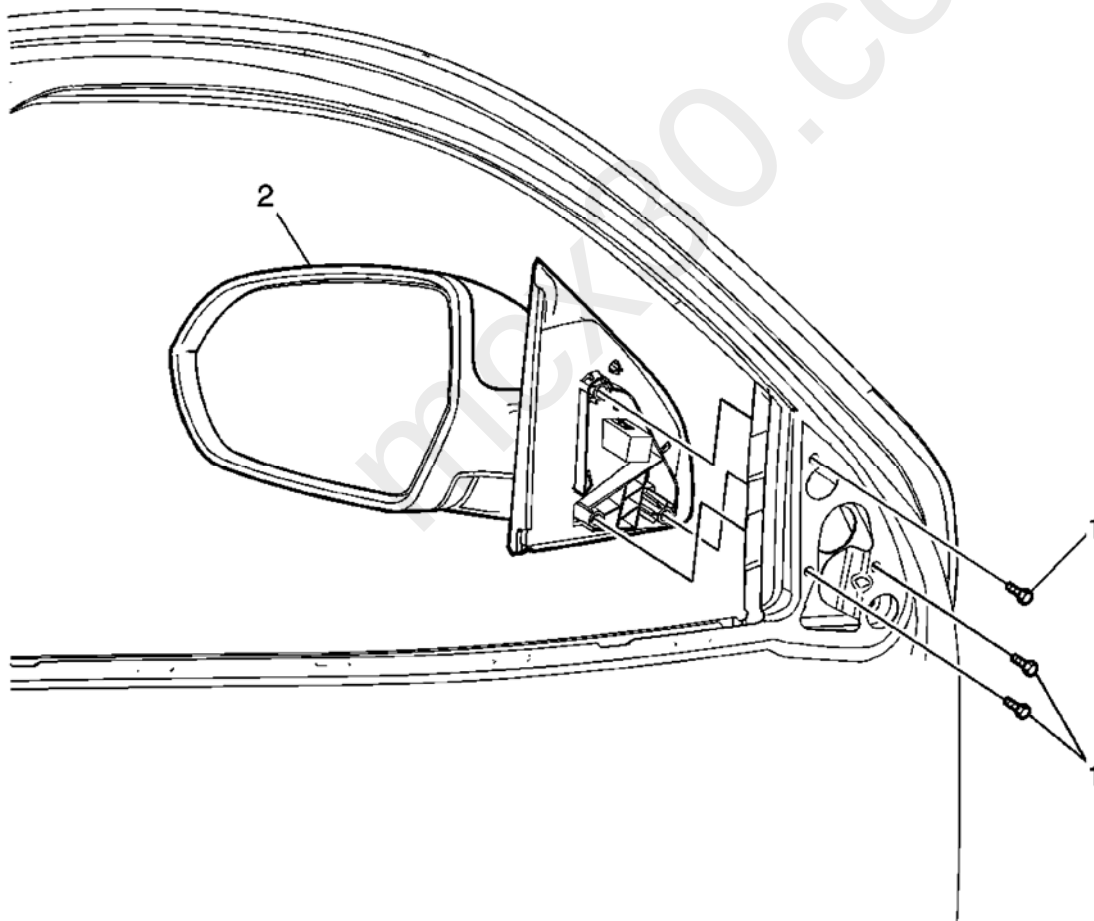


Fig. 6: Outside Rearview Mirror (Terrain)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1. Place the window in the full down position. 2. Remove the front side door garnish molding. Refer to <u>Front Side Door Garnish Molding Replacement</u> .	
1	Outside Rearview Mirror Bolt (Qty: 3) WARNING: Refer to <u>Glass and Sheet Metal Handling Warning</u> . CAUTION: Refer to <u>Fastener Caution</u> . Procedure: Disconnect the electrical connector. Tighten: 10 N.m (89 lb in).
2	Outside Rearview Mirror Procedure: Inspect the mirror for proper operation before installing the door trim panel.

OUTSIDE REMOTE CONTROL REARVIEW MIRROR SWITCH REPLACEMENT

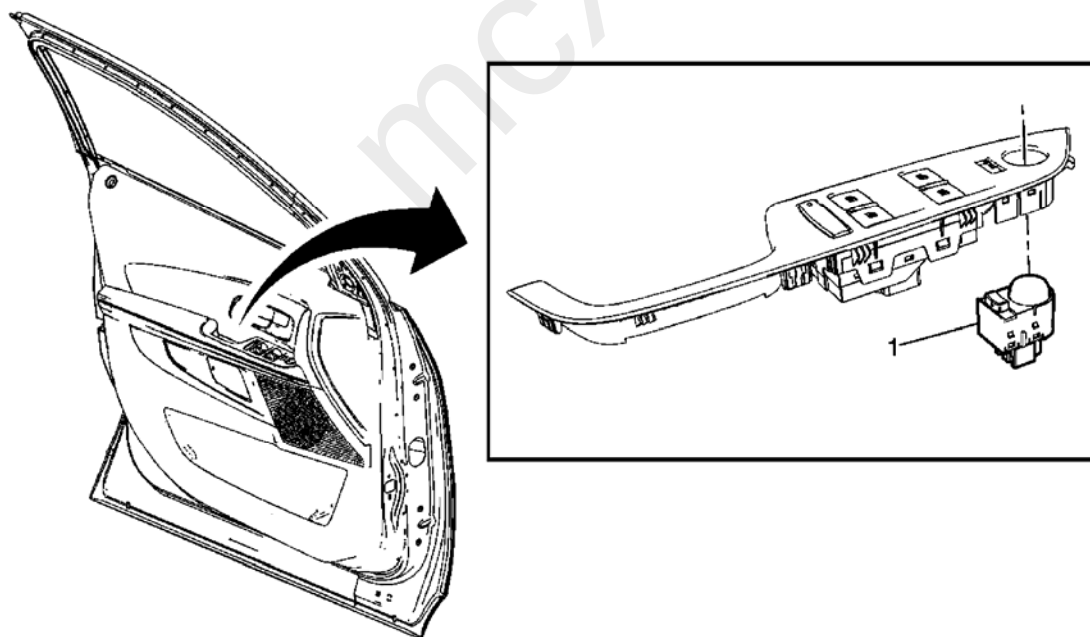


Fig. 7: Outside Remote Control Rearview Mirror Switch

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the front side door accessory switch mount plate. Refer to <u>Front Side Door Accessory Switch Mount Plate Replacement</u> .	
1	Outside Remote Control Rearview Mirror Switch Assembly Procedure 1. Disconnect the electrical connector. 2. Refer to <u>Control Module References</u> for programming and setup information.

OUTSIDE REARVIEW MIRROR FOLDING CONTROL MODULE REPLACEMENT

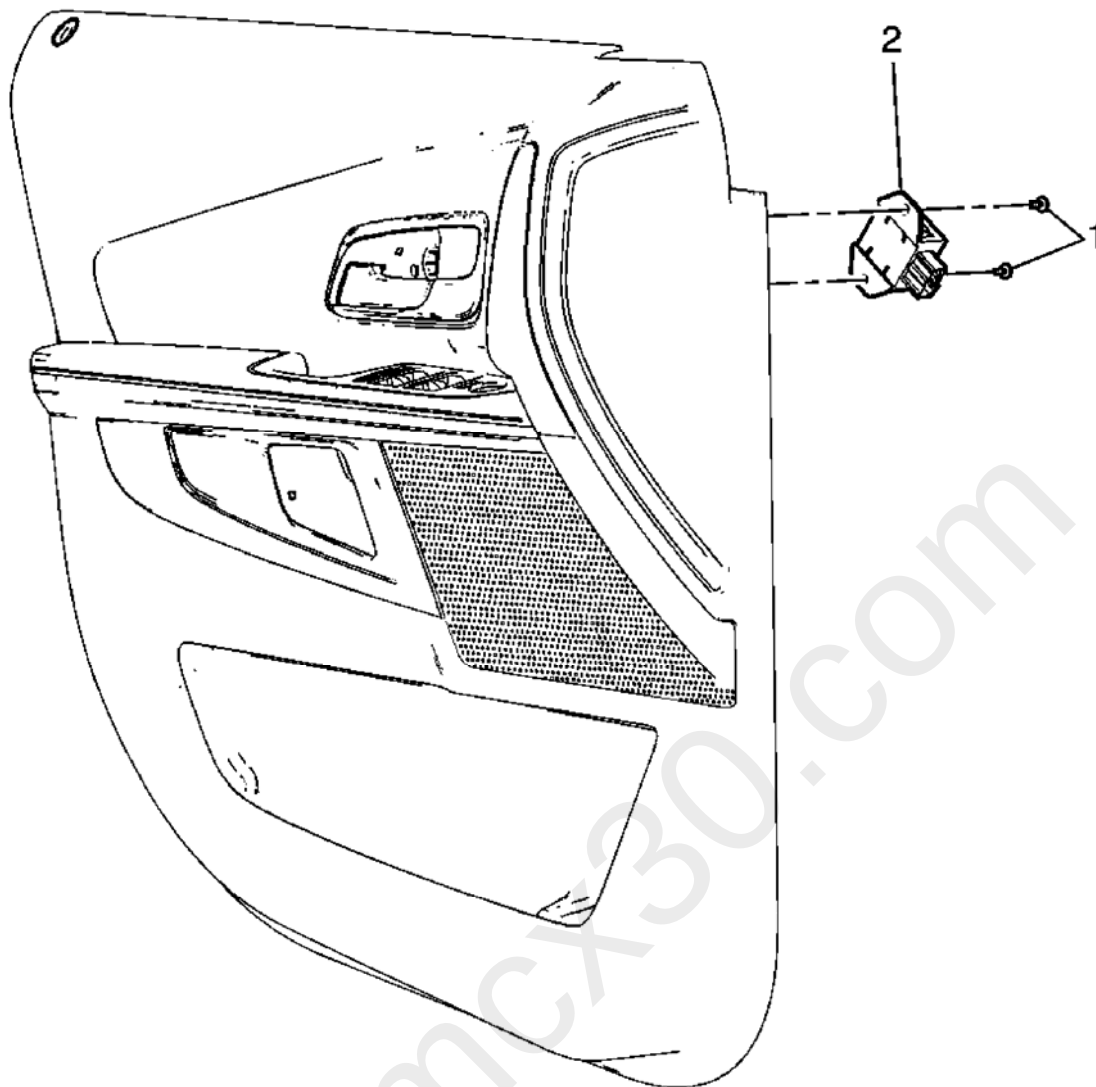


Fig. 8: Outside Rearview Mirror Folding Control Module
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the front side door trim panel. Refer to Front Side Door Trim Panel Replacement .	
1	Outside Rearview Mirror Folding Control Module Bolts (Qty: 2) CAUTION: Refer to Fastener Caution . Tighten: 2.5 N.m (22 lb ft)
2	Outside Rearview Mirror Folding Control Module Procedure:

Disconnect electrical connector.

OUTSIDE REARVIEW MIRROR INNER ACTUATOR REPLACEMENT

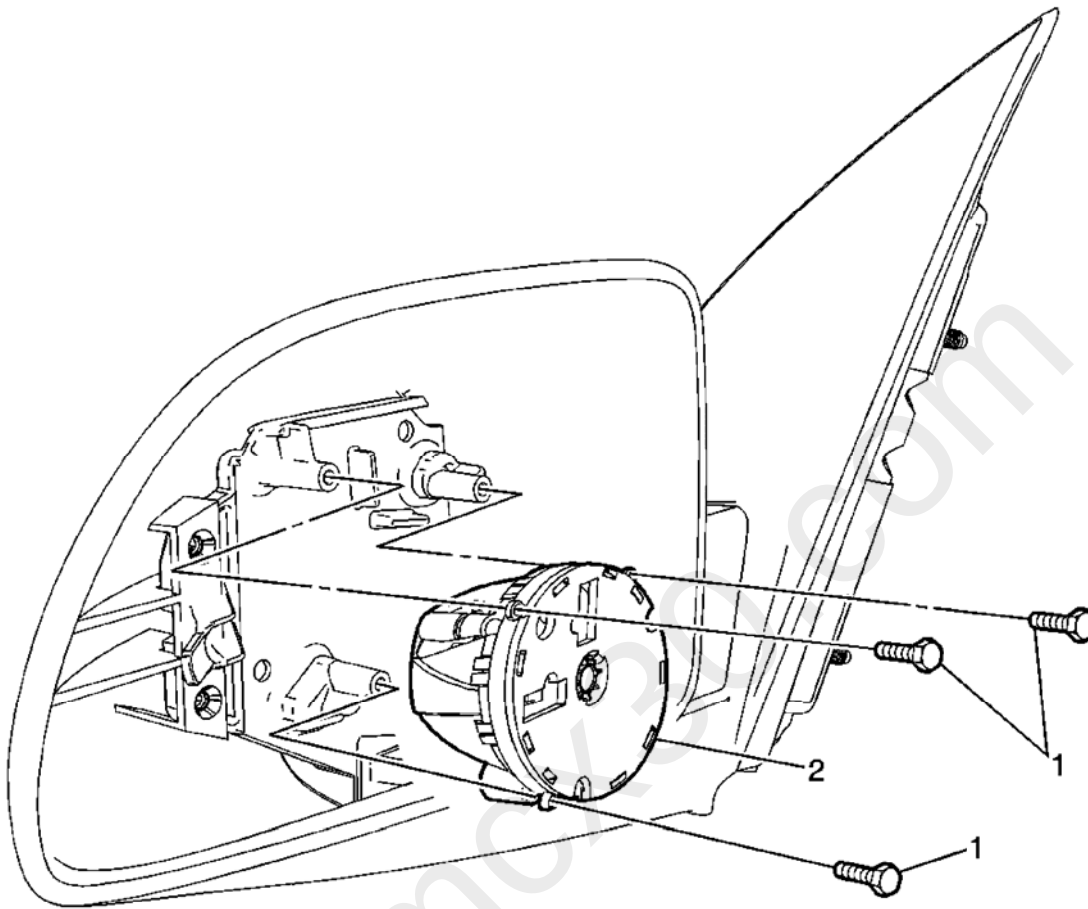


Fig. 9: Outside Rearview Mirror Inner Actuator
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the outside rearview mirror glass. Refer to <u>Outside Rearview Mirror Glass Replacement</u> .	
1	Outside Rearview Mirror Inner Actuator Screws (Qty: 3) WARNING: Refer to <u>Glass and Sheet Metal Handling Warning</u> . CAUTION: Refer to <u>Fastener Caution</u> .

	Procedure: Disconnect the electrical connector. Tighten: 5 N.m (44 lb in)
2	Outside Rearview Mirror Inner Actuator Procedures 1. When installing, align the retainers on the mirror glass with the motor retainers. 2. With the palm of your hand push inward until the glass lock in place. 3. Inspect the mirror actuator for proper operation before installing the outside rearview mirror glass.

OUTSIDE REARVIEW MIRROR GLASS REPLACEMENT

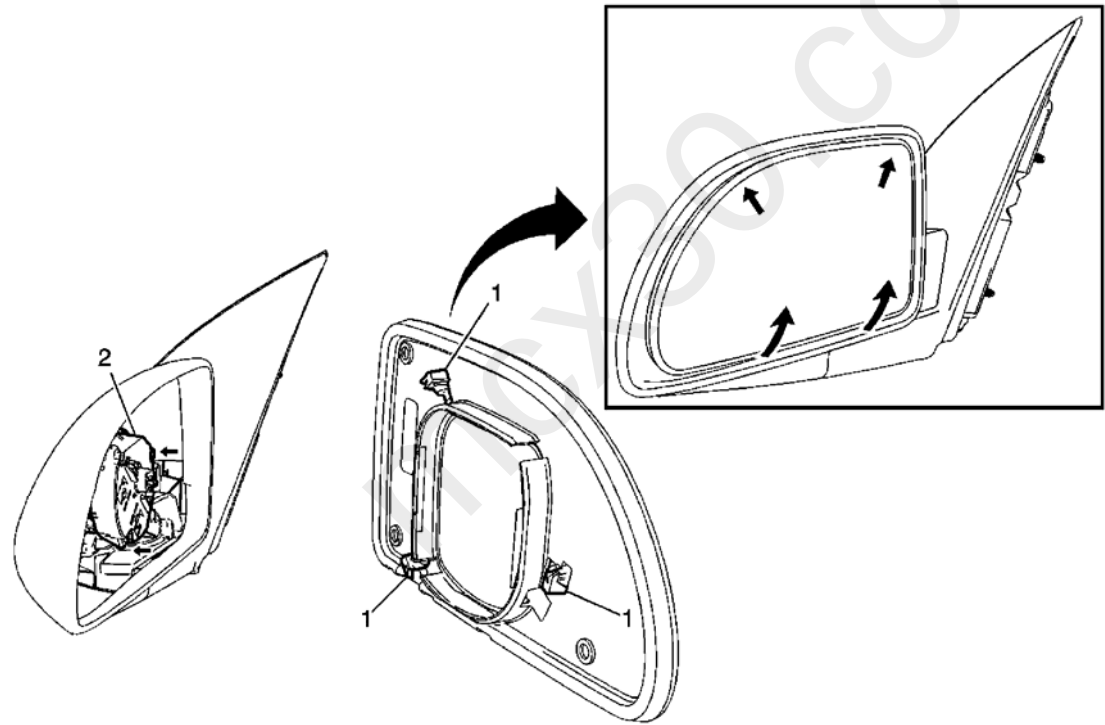


Fig. 10: Outside Rearview Mirror Glass
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
	Outside Rearview Mirror Glass
	WARNING:

Refer to Glass and Sheet Metal Handling Warning .

Procedures

1

1. Push the top center of the mirror inward, grasp the bottom center of mirror pulling rearward until the mirror releases from the motor.
2. Disconnect the electrical connectors from the back of the mirror, if equipped.
3. When installing, align the retainers on the mirror glass with the motor retainers.
4. With the palm of your hand push inward until the glass lock in place.
5. Inspect the mirror for proper operation before installing the door trim panel.

INSIDE REARVIEW MIRROR REPLACEMENT

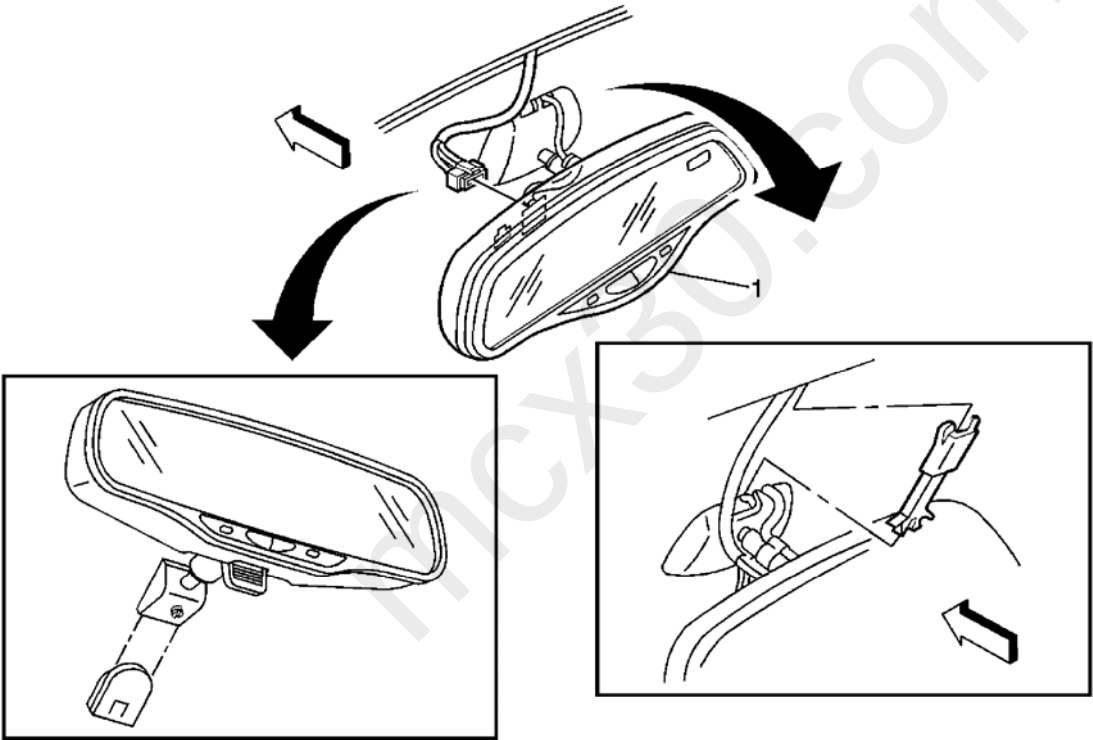


Fig. 11: Inside Rearview Mirror
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
	Inside Rearview Mirror
	CAUTION: Refer to <u>Fastener Caution</u> .

Procedure

1

1. Remove the inside rearview mirror cover, if equipped.
2. Disconnect the electrical connector, if equipped.
3. Adjust the mirror to the full upward position.
4. Loosen the set screw located at the base of the mirror.
5. Slide the mirror upward off of the rearview mirror button.
6. Refer to **Control Module References** for programming and setup information.

Tighten: 1.8 N.m (16 lb in)

INSIDE REARVIEW MIRROR BRACKET INSTALLATION

Special Tools

Safety Razor or Utility Knife

Installation

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:

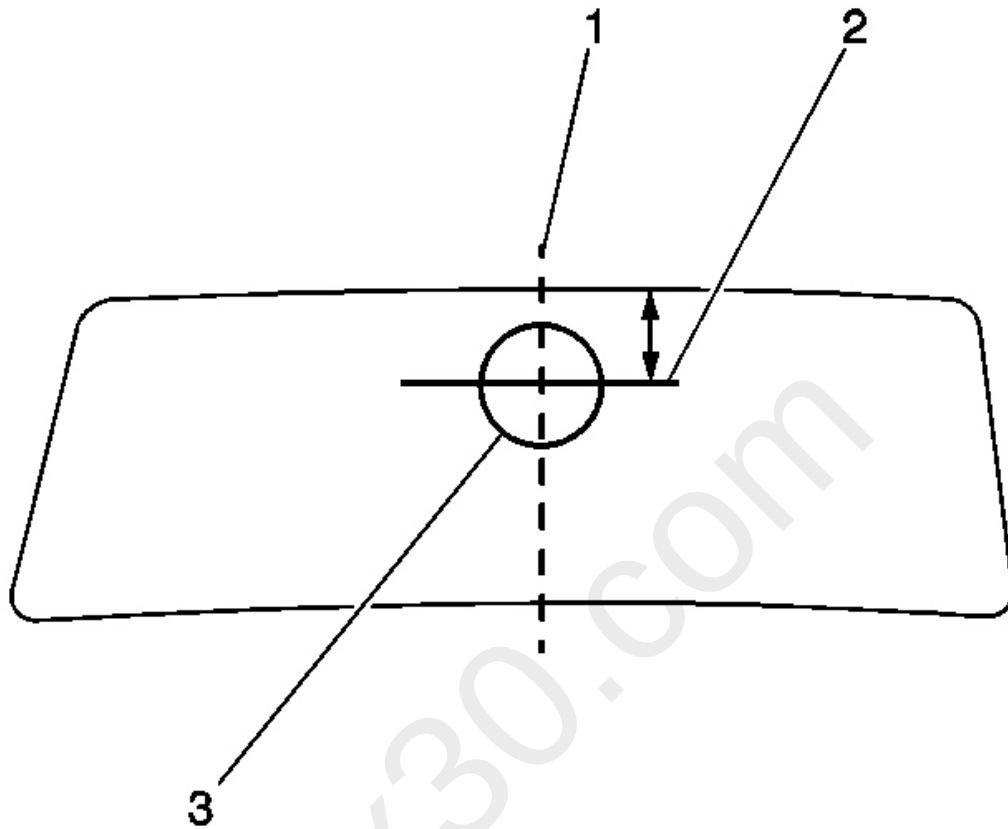


Fig. 12: Identifying Mirror Mounting Base Location
Courtesy of GENERAL MOTORS CORP.

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 glass 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 vice.
4. Scrape the mirror mounting base thoroughly with a safety razor or utility knife in order to remove all old adhesive.

5. Clean the inside windshield glass 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.

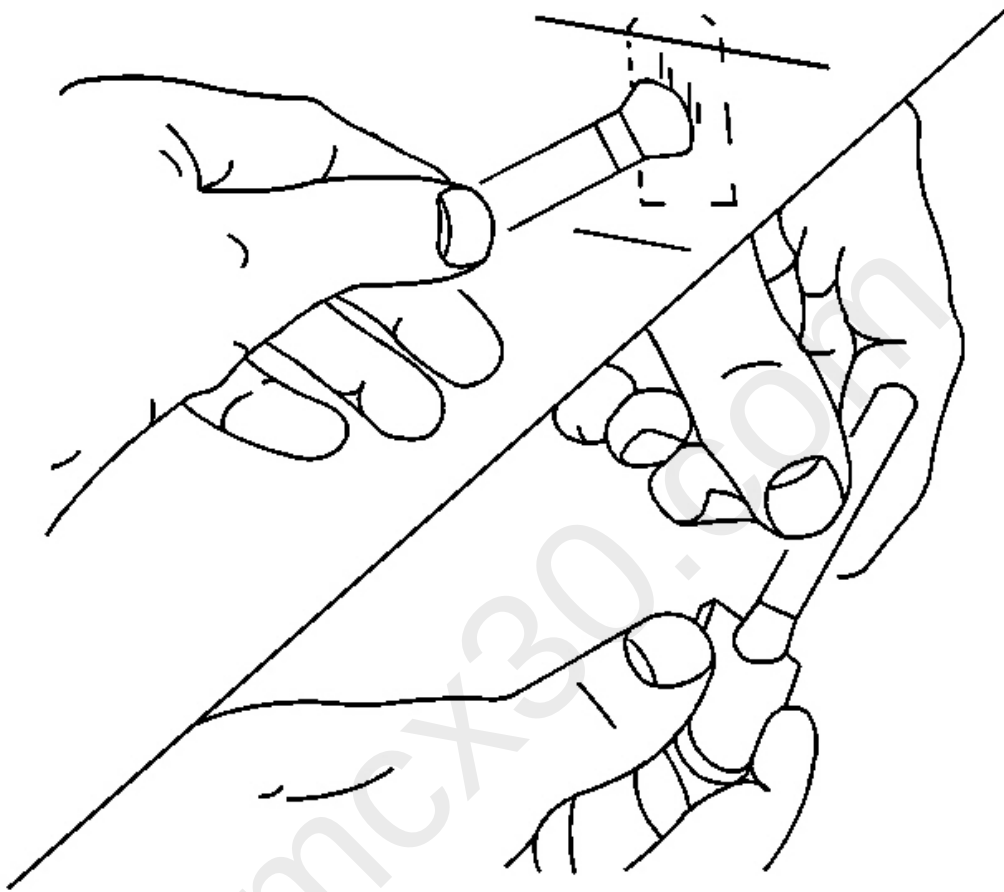


Fig. 13: Applying Adhesive To Mirror Base & Window
Courtesy of GENERAL MOTORS CORP.

6. Using the Inside Mirror Adhesive Kit, or equivalent to apply a small amount of activator to the mounting surface of the mirror mounting base. Refer to **Adhesives, Fluids, Lubricants, and Sealers** for the recommended adhesive.
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.

NOTE: Do not touch the mounting surface of the mirror mounting base or the glass.

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

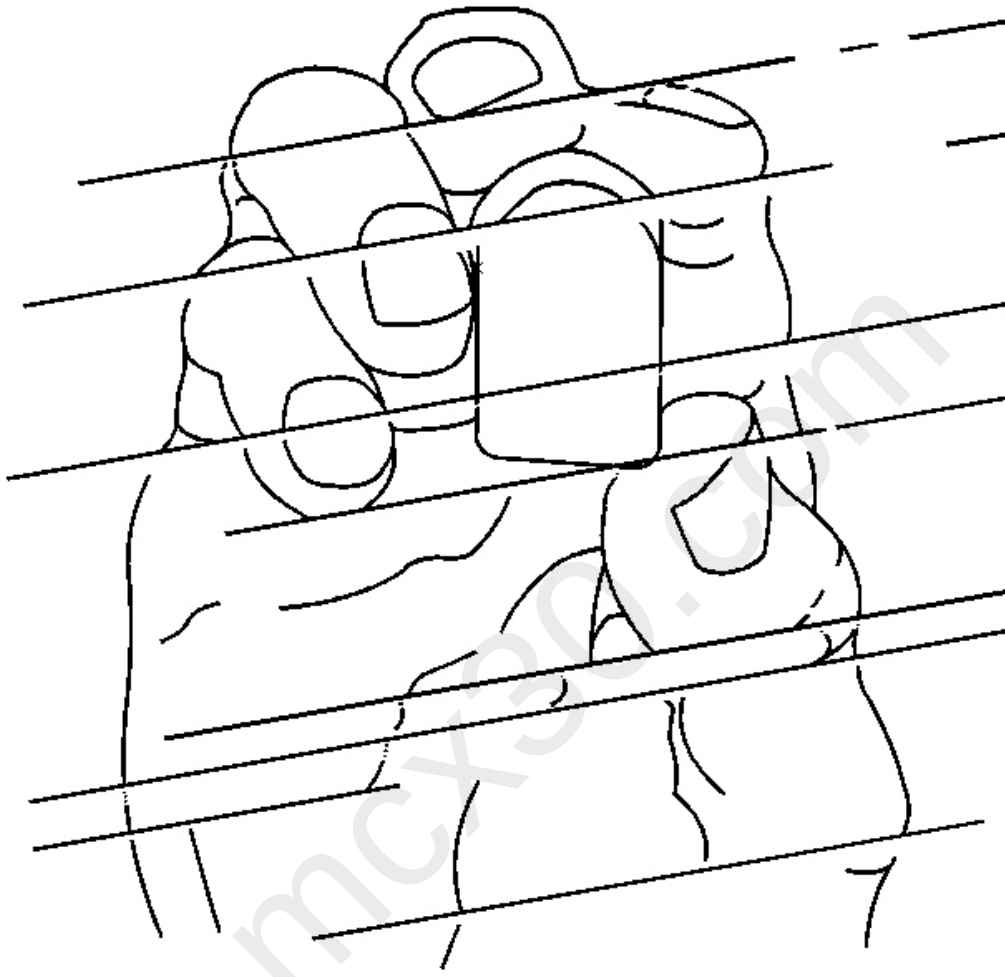


Fig. 14: Installing Mirror Mounting Base
Courtesy of GENERAL MOTORS CORP.

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

AUTOMATIC DAY-NIGHT MIRROR DESCRIPTION AND OPERATION

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 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 and the engine running, 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.

OUTSIDE MIRROR DESCRIPTION AND OPERATION (WITHOUT LTZ OR SLT)

Power Mirror System Components

The power mirror system consists of the following components:

- Mirror direction switch - Controls the left, right, up and down movements of the mirrors
- Mirror select switch - Allows the operator to select the mirror to be moved
- Left outside mirror - Contains both the horizontal and vertical mirror motors
- Right outside mirror - Contains both the horizontal and vertical mirror motors

Each of the outside power mirrors contains 2 motors. The up-down motor operates the vertical directions and the left-right motor operates the horizontal directions. Each of the power mirror motors are internally circuit breaker protected.

Power Mirror System Controls

The outside mirror switch incorporates a mirror select switch and a 4 position mirror direction switch.

The mirror select switch allows the driver to select the mirror to be moved by pressing the switch to L position enabling the left outside mirror or pressing the switch to R position enabling the right outside mirror.

The mirror direction switch is a 4 position switch that allows the operator to move the selected mirror up, down, left or right.

Power Mirror System Operation

The outside mirror switch receives power through the battery positive voltage circuit from the underhood fuse

block. The outside mirror switch also receives a constant ground.

The 4 positions of the direction switch have multiple switch contacts. When not in use, the directional contacts are isolated from any circuit. Each of the contacts are connected to opposing sides of the appropriate mirror motors through the selector switch. The selector switch interrupts or completes these circuits depending on the position of the selector switch, L or R.

If the mirror select switch is placed in the L position and the up switch is pressed, battery voltage will be supplied to the driver outside mirror vertical motor through the driver mirror motor up control circuit and return to the mirror switch through the driver mirror motor left/down control circuit, then to ground and the mirror will move up. If the down switch is pressed, the driver mirror motor left/down control circuit supplies battery voltage and the driver mirror motor up control circuit completes the path to the mirror switch, then to ground and the mirror will move down.

The remainder of the mirror functions operate in the same manner as described above. Placing the mirror control switch in opposing positions, left/right or up/down, will reverse the voltage polarity to the mirror motor, utilizing the same circuits and the mirror will move accordingly.

OUTSIDE MIRROR DESCRIPTION AND OPERATION (WITH LTZ OR SLT)

Power Mirror System Components

The power mirror system consists of the following components:

- Memory Seat Module
- Outside Rearview Mirror Switch
- Left Mirror Control Module
- Passenger Window Switch
- Left Outside Rearview Mirror
- Right Outside Rearview Mirror

Power Mirror System Controls

The outside rearview mirror switch is a multiplex switch which signals the left mirror control module which outside rearview mirror to move (driver or passenger) and which direction to move it. The left mirror control module and the passenger window switch are on a serial data circuit with the memory seat module as the master. The mirror select and directional control switches are inputs to the left mirror control module. When the memory seat module receives the switch inputs from the left mirror control module, mirror output commands are sent to the appropriate module/switch through the serial data circuit. The left mirror control module and passenger window switch control the left and right outside rear view mirrors through bi-directional motor control circuits. The motor control circuits are floating while in an inactive state and the switches will apply power and ground to the control circuits as necessary to move the mirror in the commanded direction.

Mirror position is determined by both horizontal and vertical position sensors in each of the power mirrors. The left mirror control module and passenger window switch supply a 5 V reference, low reference, and horizontal and vertical position signal circuits to these sensors. The signal circuits are referenced from 5 V by the switches and the signal circuit voltage levels represent the mirror positions. The mirror positions are sent to the memory

seat module through the serial data circuit where they are stored for memory mirror operation. When the memory seat module receives a memory recall command, the memory seat module will send the go to position commands to the left mirror control module and passenger window switch. The switches will then drive the appropriate mirror motors to the commanded position sensor settings.

Heated Mirrors

The heated mirrors are controlled through the rear defog relay. Whenever the vehicle is running and the rear window defogger is turned on battery voltage is supplied to the mirror heater elements through the left and right mirror heater element control circuits.

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