

2010 Cadillac SRX**2010 ACCESSORIES & EQUIPMENT Mirrors - SRX****2010 ACCESSORIES & EQUIPMENT****Mirrors - SRX****SPECIFICATIONS****FASTENER TIGHTENING SPECIFICATIONS**

Application	Specification	
	Metric	English
Inside Rearview Mirror Set Screw	2 N.m	18 lb in
Outside Rearview Mirror Folding Control Module Bolts	2.5 N.m	22 lb in
Outside Rearview Mirror Motor Screws	2 N.m	18 lb in
Outside Rearview Mirror Bolts	10 N.m	89 lb in

ADHESIVES, FLUIDS, LUBRICANTS AND SEALERS

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

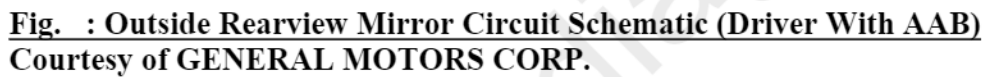
SCHEMATIC AND ROUTING DIAGRAMS**INSIDE REARVIEW MIRROR SCHEMATICS**

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OUTSIDE REARVIEW MIRROR SCHEMATICS

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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.

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- 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 AAB) or Outside Mirror Description and Operation (With AAB)

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

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- 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 AAB)****Outside Mirror Description and Operation (With AAB)**
 - **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**
- **Automatic Day-Night Mirrors Malfunction**
- **Power Mirror Folding Malfunction (without AAB)** or **Power Mirror Folding Malfunction (with AAB)**
- **Power Mirror Malfunction (with AAB)** or **Power Mirror Malfunction (without AAB)**

HEATED 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
Heated Mirror Element Control	1	1	2	-
Ground	-	1	-	-

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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 AAB) or Outside Mirror Description and Operation (With AAB)

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.
 - o 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 become warm.

Circuit/System Testing

1. Ignition OFF, disconnect the X1 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.

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- 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 7 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	-	-
Automatic Day/Night Mirror Signal	2	2	2	-
Backup Lamp Control	1, 2	1, 2	1, 2	-
Automatic Day/Night Mirror Low Reference	-	2	2	-
Ground	-	1	-	-
1. Inside Electrochromic Mirror Malfunction 2. Outside Rearview Mirror Automatic Dimming 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 and the driver outside rearview mirror. The inside rearview mirror provides a signal circuit and a low reference circuit

to the driver mirror face to darken the mirror when needed.

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.

Reference Information

Schematic Reference

- **Inside Rearview Mirror Schematics**
- **Outside 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, 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.
 - If the mirror does not transition between the bright and dim states, refer to **Inside Rearview Mirror Dimming Malfunction**.
3. Vehicle in PARK, shine a flashlight at the rear light sensor while observing the driver outside rearview mirror face. The outside rearview mirror face should dim.
4. Engine running, place the transmission in REVERSE. The driver outside rearview mirror face should transition from dim to bright.

- If the mirror does not transition between the bright and dim states, refer to **Outside Rearview Mirror Dimming Malfunction**.

Circuit/System Testing**Inside Rearview Mirror Dimming Malfunction**

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 ground circuit terminal 5 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 ignition circuit terminal 2 and ground.
 - 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 backup lamp control circuit terminal 1 and ground.
 - 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.

Outside Rearview Mirror Dimming Malfunction

1. Ignition OFF, disconnect the X1 harness connector at the A9A driver outside rearview mirror.
2. Wait 1 minute, test for less than 10 ohms between the low reference circuit terminal 5 and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, test or replace the A10 inside rearview mirror.
3. Ignition ON, test for less than 1 V between the signal circuit terminal 4 and ground.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, test or replace the A10 inside rearview mirror.
4. Headlamps ON, vehicle in PARK, cover the front light sensor with a towel or other suitable item. Shine a flashlight at the rear light sensor. Test for greater than 1 V between the signal circuit terminal 4 and ground.
 - If less than the specified range, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, test or replace the A10 inside rearview mirror.
5. If all circuits test normal, test or replace the E17D driver outside rearview mirror glass.

Repair Procedures

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

- **Inside Rearview Mirror Replacement**
- **Outside Rearview Mirror Glass Replacement**

POWER MIRROR FOLDING MALFUNCTION (WITHOUT AAB)

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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
Folding Mirror Motor Fold Control	1	1	-	-
Folding Mirror Motor Unfold Control	1	1	-	-
1. Power Folding Mirror Inoperative				

Circuit/System Description

The outside mirror switch controls the power fold/unfold functions of the outside rearview mirrors. The folding mirror motors are controlled by using bi-directional motor controls through the folding mirror motor fold control circuit and the folding mirror motor unfold control circuit.

Diagnostic Aids

- Power folding mirror feature only available with RPO DR4 mirrors.
- Power folding mirrors can only operate when the mirror selector switch is in the middle position.

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 AAB) or Outside Mirror Description and Operation (With AAB)

Electrical Information Reference

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

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Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, operate the mirror switch fold/unfold functions. The outside mirrors should fold and unfold.

Circuit/System Testing

1. Ignition OFF, disconnect the X2 harness connector at the appropriate A9 outside rearview mirror.
2. Connect a test lamp between the control circuit terminal 9 and the control circuit terminal 10.
3. Operate the outside mirror switch fold/unfold functions. The test lamp should turn ON when commanding the fold and unfold states.
 - o If the test lamp remains OFF during either of the commands, test for a short to ground or an open/high resistance on either control circuit. If the circuits test normal, replace the S52 outside rearview mirror switch.
4. If all circuits test normal, test or replace the A9 outside rearview mirror.

Repair Procedures

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

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

POWER MIRROR FOLDING MALFUNCTION (WITH AAB)

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
Folding Mirror Motor Fold Control	1	1	-	-
Folding Mirror Motor Unfold Control	1	1	-	-
1. Power Folding Mirror Inoperative				

Circuit/System Description

The mirror select and fold/unfold switches are inputs to the mirror control module which communicates with

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the memory seat module through a serial data circuit. When the memory seat module receives a fold/unfold signal from the mirror control module, the memory seat control module will send a fold or unfold command back to the left mirror control module and passenger window switch. The mirror control module and passenger window switch control the fold/unfold motors through bi-directional control circuits.

Diagnostic Aids

- Power folding mirror feature only available with RPO DR4 mirrors.
- Power folding mirrors can only operate when the mirror selector switch is in the middle position.

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 AAB) or Outside Mirror Description and Operation (With AAB)

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. Observe the scan tool Mirror Select Switch parameter while operating the switch between left, right, and none/fold. The reading should change between Left, Right, and None/Fold.
 - If the reading does not change between the specified values replace the S52 outside rearview mirror switch.
2. Command the driver and passenger mirrors to Fold and Unfold with a scan tool. Both mirrors should move in the commanded direction.

Circuit/System Testing

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1. Ignition OFF, disconnect the X2 harness connector at the appropriate A9 outside rearview mirror.
2. Connect a test lamp between control circuit terminal 5 and control circuit terminal 6.
3. Command the driver and passenger mirrors to Fold and Unfold with a scan tool. The test lamp should turn ON when commanding the fold and unfold states.
 - If the test lamp remains OFF during either of the commands, test for a short to ground or an open/high resistance on either control circuit. If the circuits test normal, replace the appropriate switch.
 - K96 mirror control module
 - S79P passenger window switch
4. If all circuits test normal, test or replace the A9 outside rearview mirror.

Repair Procedures

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

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

POWER MIRROR MALFUNCTION (WITH AAB)

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	-	-

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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 AAB) or Outside Mirror Description and Operation (With AAB)

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.
 - o 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.
 - o 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.
 - o 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.
 - o 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.
 - o If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the K96L left mirror control module.
3. Ignition ON, test for 4.8-5.2 V between the 5 V reference circuit terminal 5 and ground.
 - o 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 K96L left mirror control module.
 - o If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the K96L left mirror control module.
4. Ignition ON, test for 4.8-5.2 V between the 5 V reference circuit terminal 12 and ground.
 - o 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 K96L left mirror control module.
 - o If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the K96L left mirror control module.
5. Ignition ON, test for 4.8-5.2 V between the 5 V reference circuit terminal 6 and ground.
 - o 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 K96L left mirror control module.

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- If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the K96L left mirror control module.
- 6. If all circuits test normal, test or replace the S52 outside rearview mirror switch.

Mirror Motor Circuit Test

1. Ignition OFF, disconnect the X2 harness connector at the appropriate A9 outside rearview mirror.
2. Connect a test lamp between the control circuit terminal 3 and the control circuit terminal 1.
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 motor.

Mirror Position Sensor Circuit Test-Driver

1. Ignition OFF, disconnect the X2 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 3 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 1 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 4 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 for a short to ground. If the circuit tests

normal, replace the 96 mirror control module.

6. Install a 3 A fused jumper wire between the signal circuit terminal and the low reference circuit terminal 3. Verify the scan tool Mirror Vertical Position parameter is less than
 - o 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 96 mirror control module.
7. Install a 3 A fused jumper wire between the signal circuit terminal 2 and the low reference circuit terminal 3. Verify the scan tool Mirror Horizontal Position parameter is less than
 - o 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 96 mirror control module.
8. If all circuits test normal, test or replace the outside rearview mirror motor.

Mirror Position Sensor Circuit Test Passenger

1. Ignition OFF, disconnect the 2 harness connector at the A9B outside rearview mirror.
2. Doors closed, wait 3 minutes, test for less than 1 ohms between the low reference circuit terminal 3 and ground.
 - o 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 .6 5. between the 5 reference circuit terminal 1 and ground.
 - o If less than the specified range, test the 5 reference circuit for a short to ground or an open high resistance. If the circuit tests normal, replace the S79P passenger window switch.
 - o If greater than the specified range, test the 5 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
 - o If more than the specified range, test the signal circuit terminal 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
 - o If more than the specified range, test the signal circuit terminal 2 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 and the low reference circuit terminal 3. Verify the scan tool Mirror Vertical Position parameter is more than .6
 - o 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 2 and the low reference circuit terminal 3. Verify the scan tool Mirror Horizontal Position parameter is more than .6
 - o 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 motor.

Repair Procedures

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

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- Outside Rearview Mirror Motor Replacement
- Outside Remote Control Rearview Mirror Switch Replacement
- Outside Rearview Mirror Folding Control Module Replacement
- Front Side Door Window Switch Replacement

POWER MIRROR MALFUNCTION WITHOUT AA

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 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 AA or Outside Mirror Description and Operation With AA

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 1 ohms between the ground circuit terminal 11 and ground.
 - o 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.
 - o 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 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.
 - o 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 1.
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.

1 . 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 Motor Replacement**
- **Outside Remote Control Rearview Mirror Switch Replacement**

REPAIR INSTRUCTIONS

OUTSIDE REARVIEW MIRROR REPLACEMENT

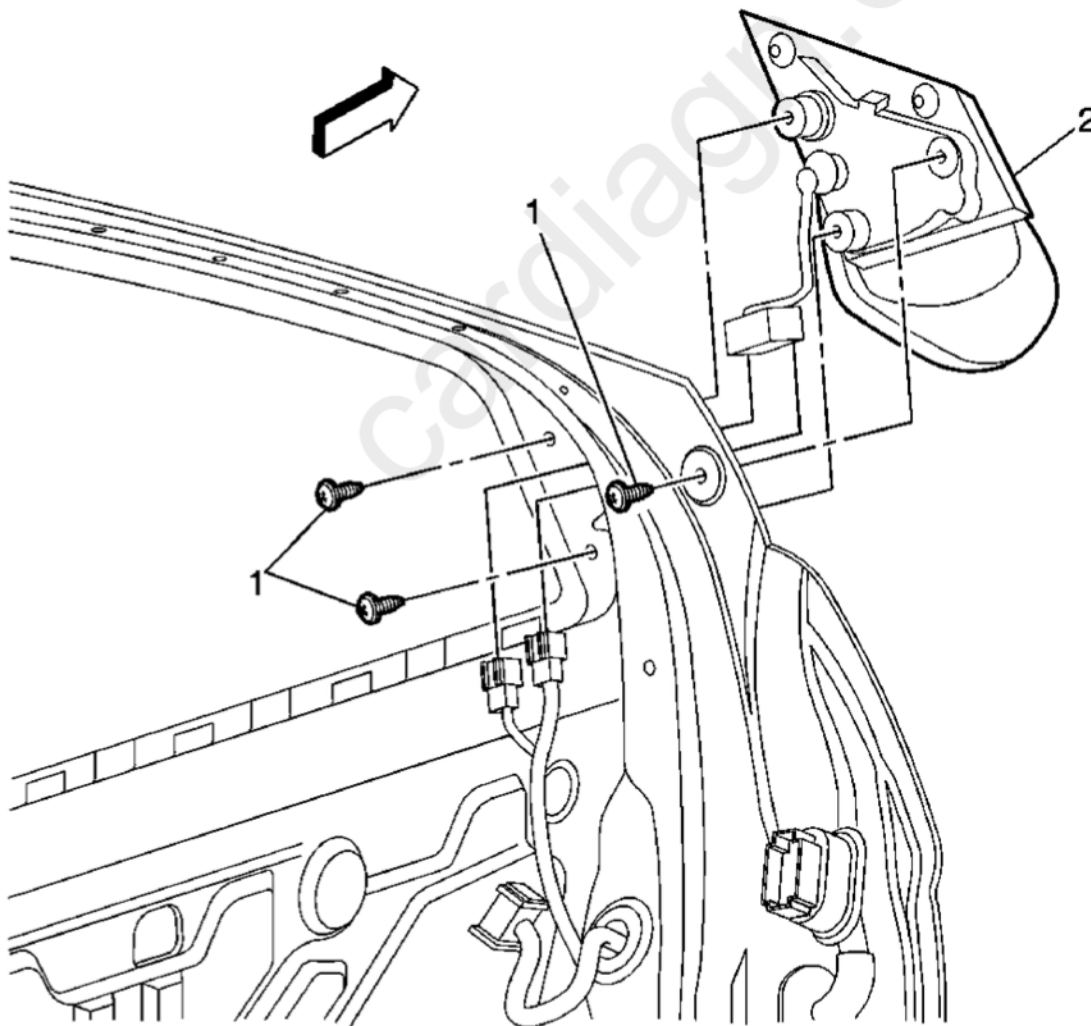


Fig. : Identifying Outside Rearview Mirror
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
ARNIN : Refer to <u>lass and Sheet Metal andling arning</u> .	
Preliminary Procedure: Remove the front side door trim panel. Refer to <u>Front Side Door Trim Replacement</u> .	
1	Outside Rearview Mirror Bolts (Qty: 3) CAUTION: Refer to <u>Fastener Caution</u> . Procedure: Disconnect the electrical connector. Tighten: 1 N.m (89 lb in)
2	Outside Rearview Mirror

OUTSIDE REMOTE CONTROL REARVIEW MIRROR SWITCH REPLACEMENT

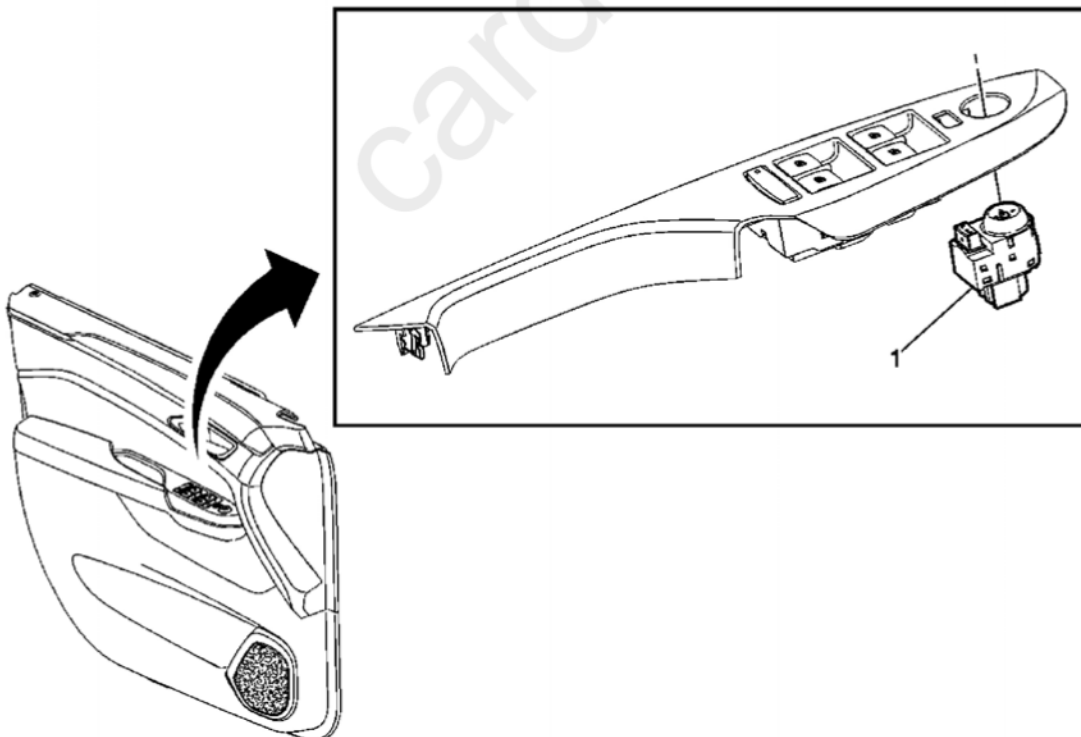


Fig. 7: Identifying Outside Remote Control Rearview Mirror Switch
Courtesy of GENERAL MOTORS CORP.

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> .

OUTSIDE REARVIEW MIRROR FOLDING CONTROL MODULE REPLACEMENT

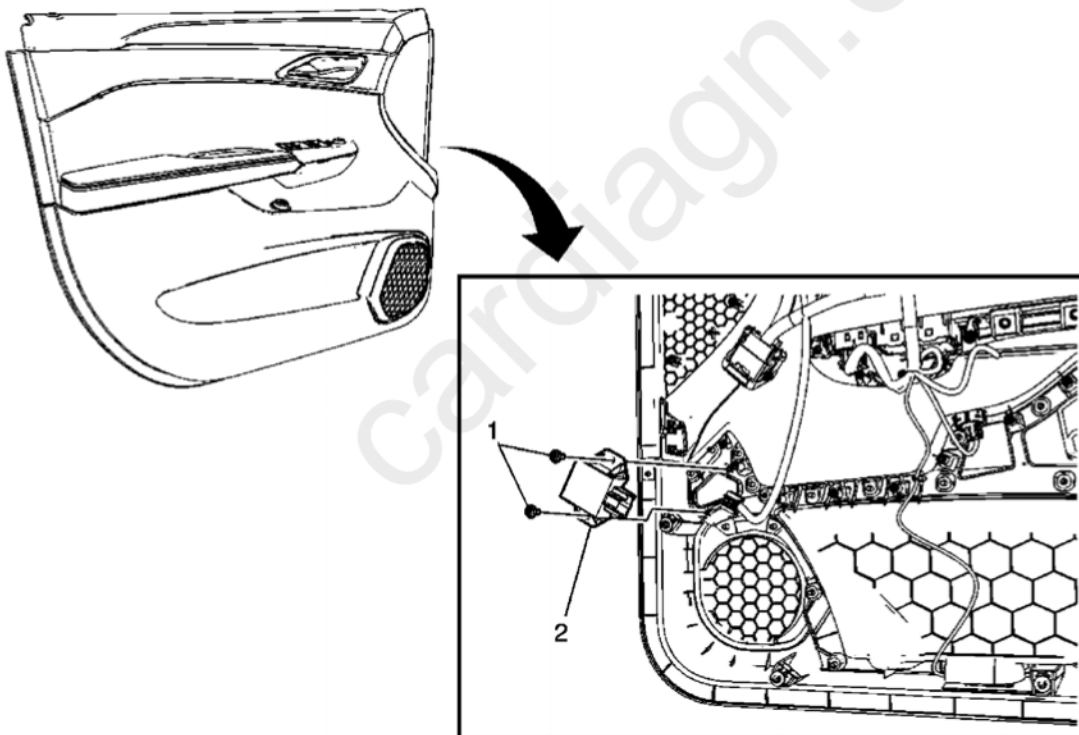


Fig. 8: Identifying Outside Rearview Mirror Folding Control Module
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the front side door trim panel. Refer to <u>Front Side Door Trim Replacement</u> .	
	Outside Rearview Mirror Folding Control Module Bolts (Qty: 2)

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1	CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 2.5 N.m (22 lb ft)
2	Outside Rearview Mirror Folding Control Module Procedure: Disconnect electrical connector.

OUTSIDE REARVIEW MIRROR MOTOR REPLACEMENT

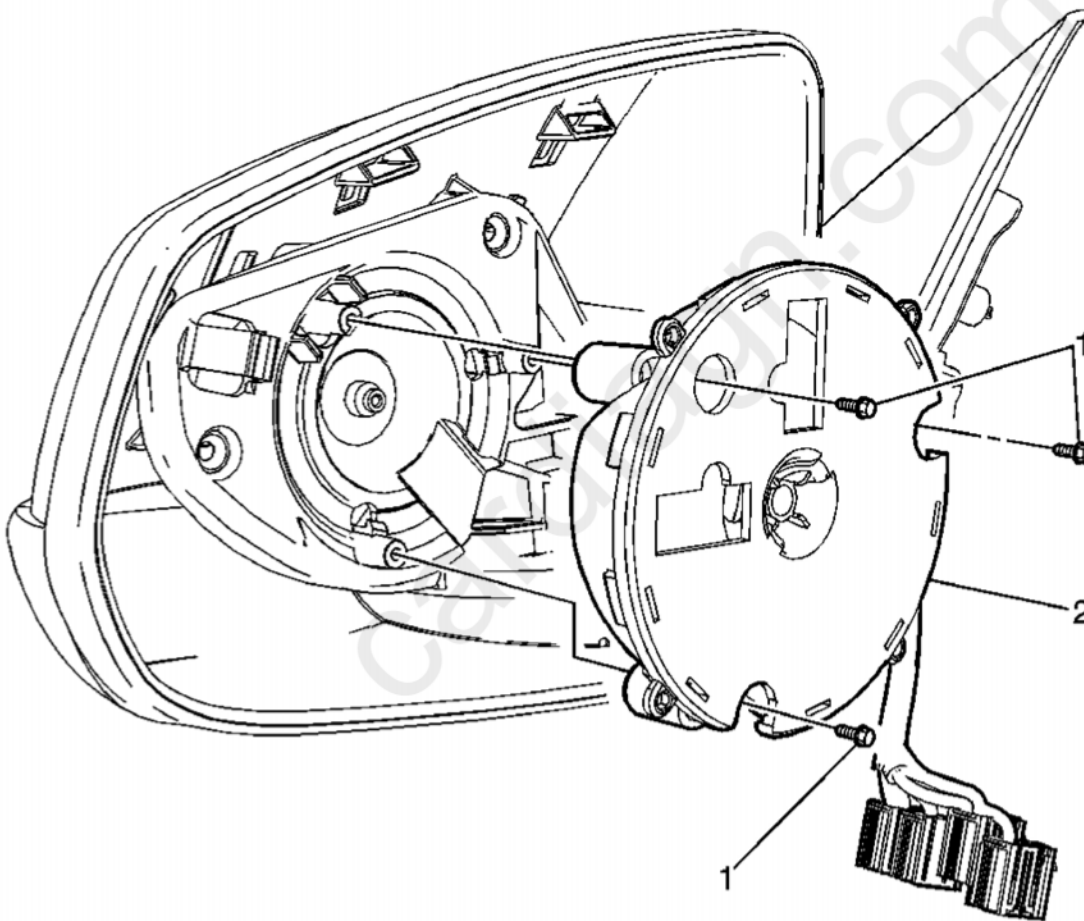


Fig. 9: Identifying Outside Rearview Mirror Motor
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the outside rearview mirror glass. Refer to <u>Outside Rearview Mirror Glass Replacement</u> .	
	Outside Rearview Mirror Motor Screws (Qty: 3)

1	ARNIN : Refer to <u>Glass and Sheet Metal Handling Warning</u> .
	CAUTION: Refer to <u>Fastener Caution</u> .
	Procedure: Disconnect the electrical connector.
2	Tighten: 2 N.m (18 lb in) Outside Rearview Mirror Motor

OUTSIDE REARVIEW MIRROR GLASS REPLACEMENT

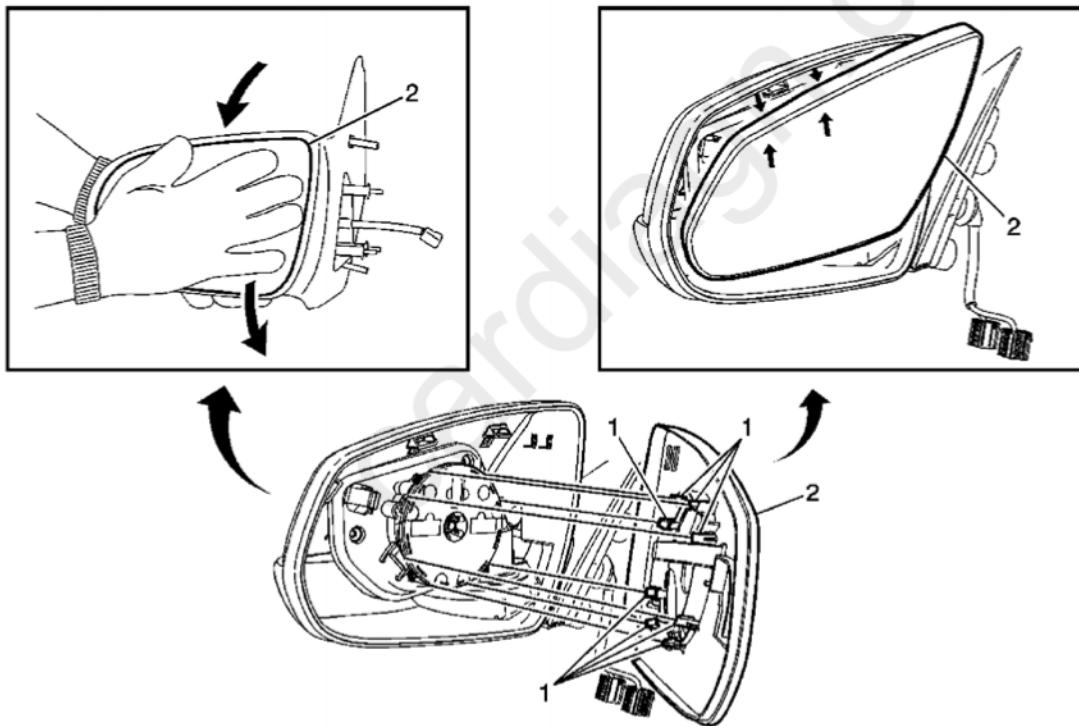


Fig. 10: Identifying Outside Rearview Mirror Glass
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
	Outside Rearview Mirror Glass Retainers (Qty :7) ARNIN : Refer to <u>Glass and Sheet Metal Handling Warning</u> .

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1	Procedure 1. Apply several layers of masking tape to the top of the outside rearview mirror housing in order to protect the painted finish. Push the mirror glass (2) inward at the top of the mirror glass until full travel is reached. 2. Grasp the bottom of the mirror face back and firmly pull it rearward away from the mirror motor and housing. It will be necessary to use a sharp jerking motion to release it from the motor. 3. Disconnect electrical connectors from mirror, if equipped.
2	Outside Rearview Mirror Glass Procedure 1. Align the mirror glass retainers with the retaining tabs (1) on the actuator. 2. Using a 9 cm (3 in) rubber sanding block placed in the center of the mirror glass, apply pressure until an audible click is heard. 3. Inspect the power mirror for proper operation.

OUTSIDE REARVIEW MIRROR HOUSING REPLACEMENT

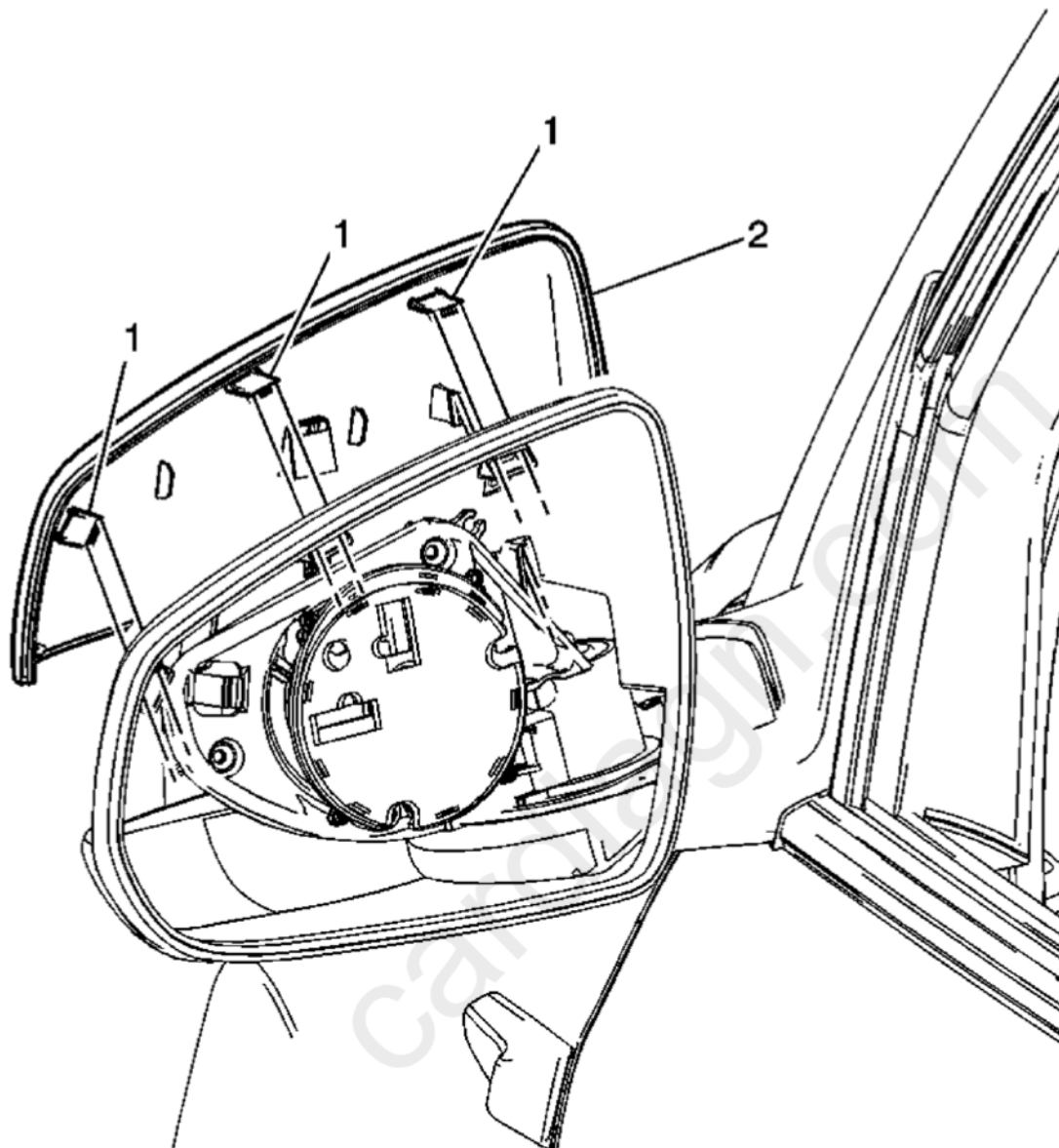


Fig. 11: View Of Outside Rearview Mirror Housing
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures: Remove the outside rearview mirror glass. Refer to Outside Rearview Mirror Glass Replacement .	
1	Outside Rearview Mirror Housing Retainers (Qty: 6) Tip: Push the housing tabs upward releasing the housing cover from the mirror.
2	Outside Rearview Mirror Housing

INSIDE REARVIEW MIRROR REPLACEMENT

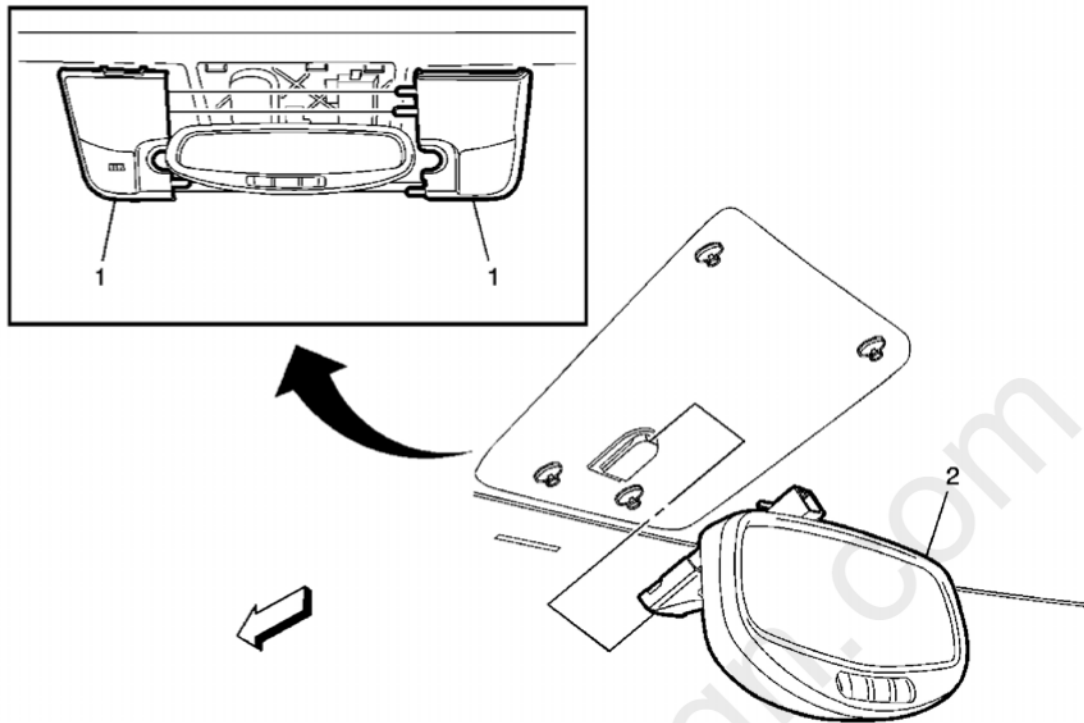


Fig. 12: View Of Inside Rearview Mirror
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Inside Rearview Mirror Cover Tip: Slide the mirror cover apart to expose the electrical connector.
2	Inside Rearview Mirror CAUTION: Refer to <u>Fastener Caution</u> . Procedure 1. Disconnect the electrical connector. 2. Adjust the mirror to the full upward position. 3. Loosen the set screw located at the base of the mirror. 4. Slide the mirror upward off of the rearview mirror button. 5. Remove the windshield outside moisture sensor, if equipped. 6. Refer to <u>Control Module References</u> for programming and setup information, if equipped. Tighten: 2 N.m (18 lb in)

INSIDE REARVIEW MIRROR BRACKET INSTALLATION

NOTE: If the windshield is equipped with a blackout area around the mirror base bracket Care Must be used not to cut or scrape the blackout.

1. Determine the location of the mirror mounting base by marking the outside/inside of the windshield with a wax pencil where the base was previously located. If it is not clear where the base was located, use the following steps to determine where the base should be installed:

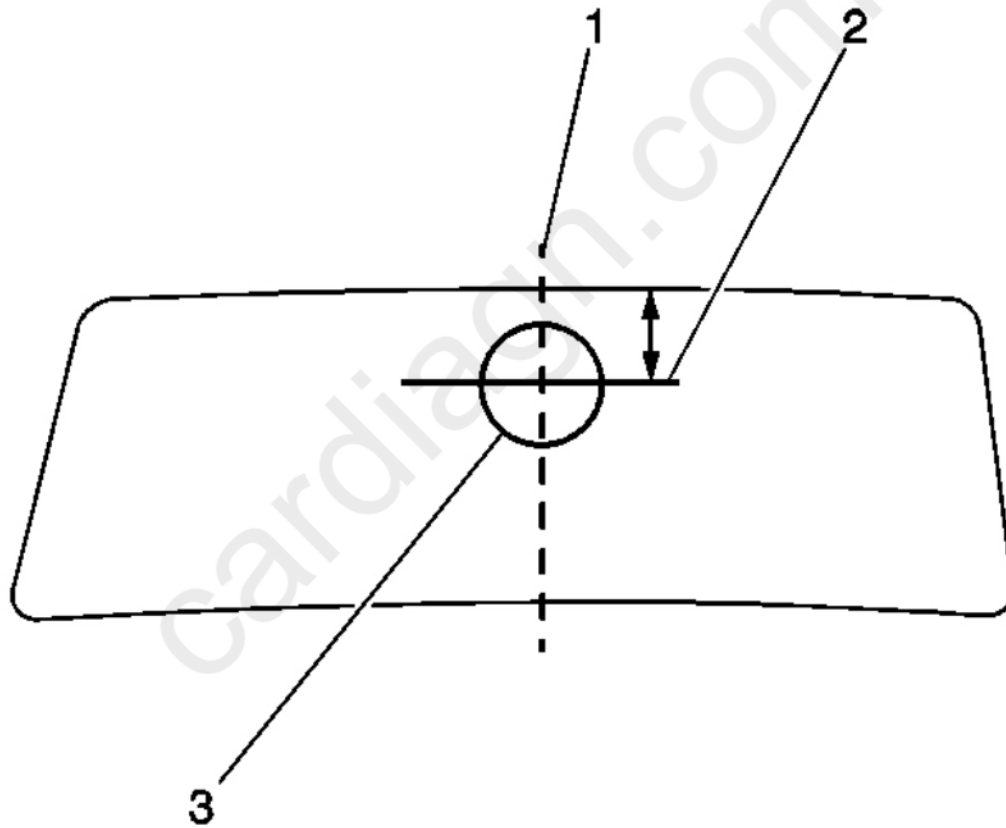


Fig. 13: Identifying Mirror Mounting Base Location
Courtesy of GENERAL MOTORS CORP.

1. Using a measuring tape, measure the distance between the windshield pillars at the windshield blackout 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 bottom center of the mirror mounting base will be at the intersection of these lines.

NOTE: 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.

2. Clean the inside windshield glass thoroughly to remove all old adhesive.

NOTE: If reinstalling the original mounting base, place the mirror mounting base in a suitable holding device, such as a vice.

3. Clean mirror mounting base thoroughly to remove all of the old adhesive.

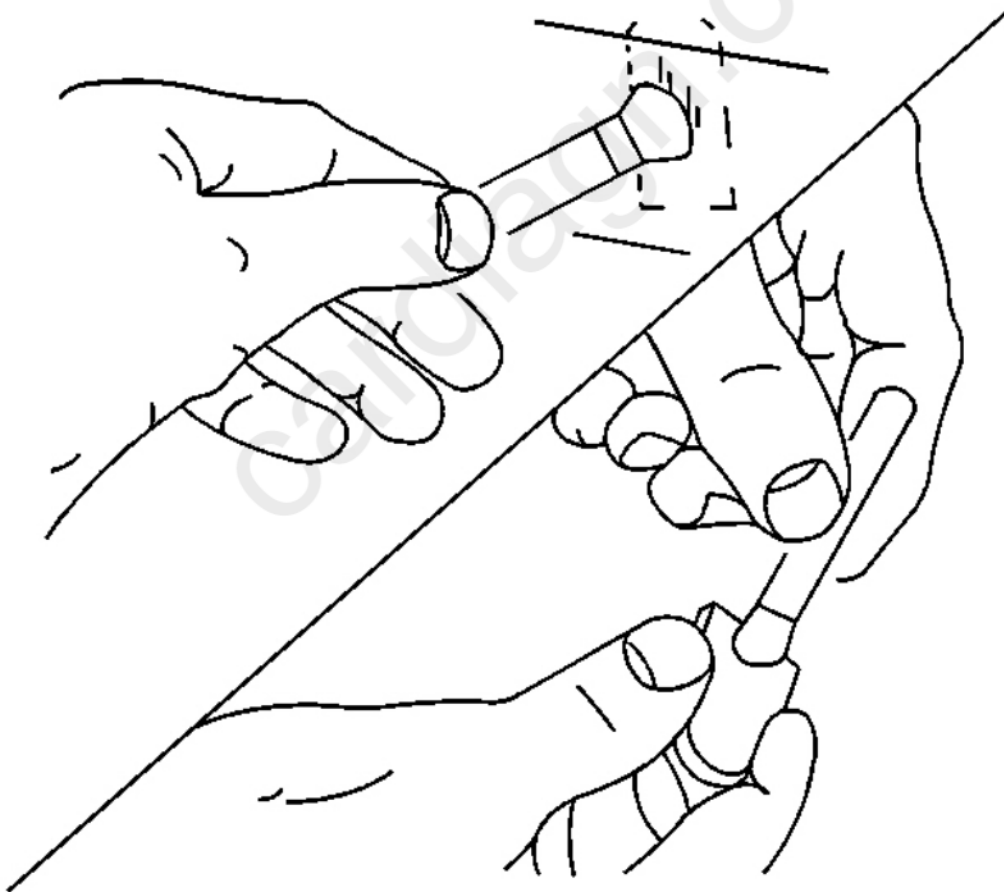


Fig. 14: Applying Adhesive To Mirror Base & Window
Courtesy of GENERAL MOTORS CORP.

4. 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**.
5. Apply a small amount of activator to the windshield where the mounting base is to be installed.
6. Allow the activator to dry 5 minutes.

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

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

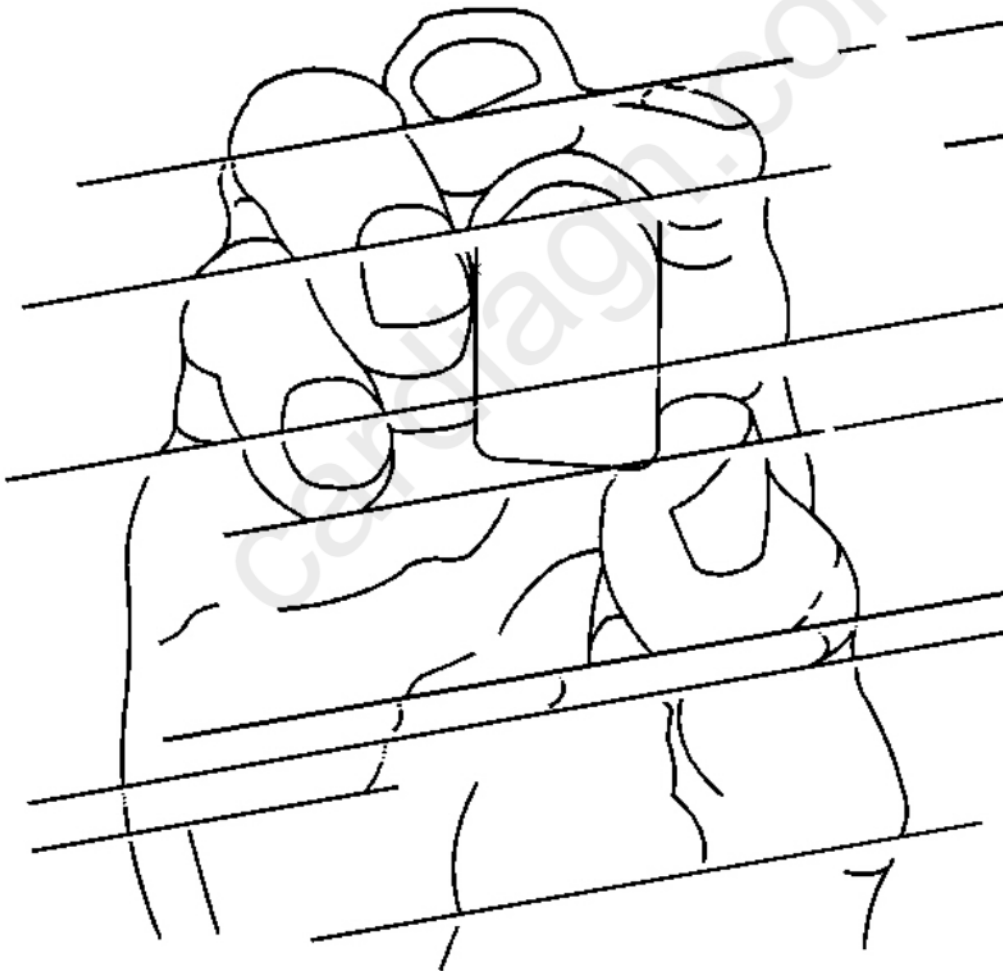


Fig. 15: Identifying Mirror Mounting Base
Courtesy of GENERAL MOTORS CORP.

8. 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.
9. Hold the mounting base firmly in place for 1 minute.
10. Allow the adhesive to set for 15 minutes before installing the rearview mirror.
11. Clean the wax pencil lines from the exterior surface of the glass.
12. Install the mirror to the mirror mounting base. Refer to **Inside Rearview Mirror Replacement**.

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 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.

Driver Outside Rearview Mirror with Automatic Day-Night System Operation (If Equipped)

The automatic day-night feature of the driver outside rearview mirror is controlled by the inside rearview mirror. The inside rearview mirror supplies control and low reference to the driver outside rearview mirror. At night, with the automatic day-night feature enabled, the driver outside rearview mirror will automatically darken with the inside rearview mirror to reduce glare from headlamps behind the vehicle.

OUTSIDE MIRROR DESCRIPTION AND OPERATION (WITHOUT AAB)

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

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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.

Folding Mirrors (If Equipped)

The folding mirror system is controlled through an electronic switch that can be activated when the mirror select switch is in the neutral position. When the mirror select switch is in the neutral position, the fold/unfold function is activated by pressing the down arrow. The fold/unfold switch will fold or unfold the mirrors depending on their current state. When a power fold or unfold function is activated, battery voltage is supplied to the fold motor by the appropriate fold or unfold control circuit and the motor will be grounded by the opposite control circuit.

Heated Mirrors

The heated mirrors are controlled through the rear defog relay. Whenever 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.

OUTSIDE MIRROR DESCRIPTION AND OPERATION (WITH AAB)

Power Mirror System Components

The power mirror system consists of the following components

- Left Mirror Control Module
- Memory Seat Control Module
- Outside Mirror Switch
- 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 control 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 control 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.

Folding Mirrors

The outside rearview mirror switch sends the mirror select and mirror fold/unfold inputs to the left mirror control module which communicates the inputs to the memory seat control module through serial data. When the memory seat control module receives a fold/unfold signal it will send a fold/unfold command to the left mirror control module and the passenger window switch. The outside mirrors will fold or unfold depending on their current state. The left mirror control module and the passenger window switch control the fold/unfold motors through bi-directional control circuits.

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

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mirror heater element control circuits.

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