

2013 ACCESSORIES & EQUIPMENT

Mirrors - Malibu

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

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

ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS

Adhesives, Fluids, Lubricants, and Sealers

Application	Type of Material	GM Part Number
Inside Mirror Adhesive Kit	Adhesive	Refer to Electronic Parts Catalog

SCHEMATIC WIRING DIAGRAMS

INSIDE REARVIEW MIRROR WIRING SCHEMATICS

DD8 Wiring Schematics

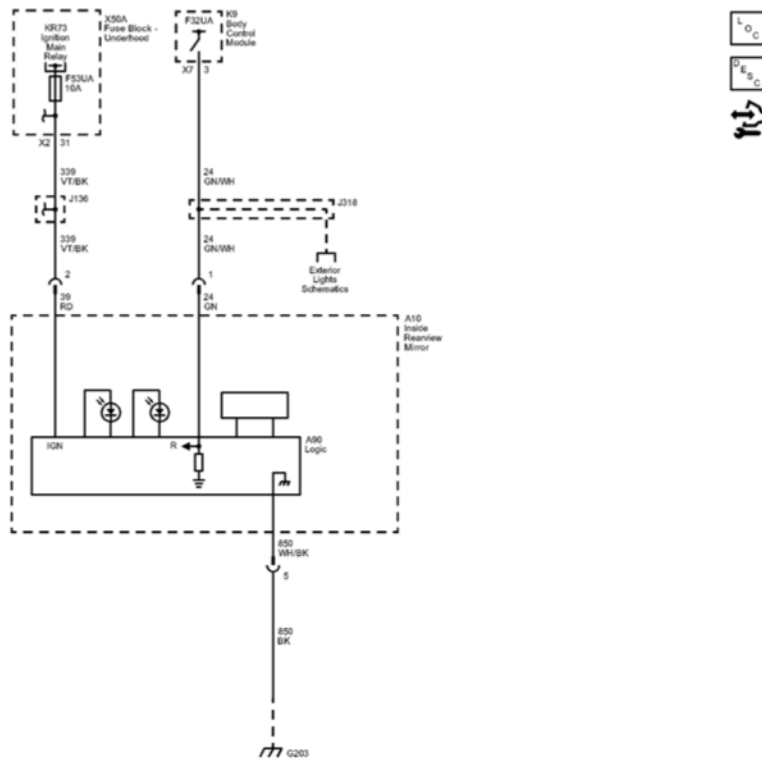


Fig. 1: Inside Rearview Mirror (DD8) Wiring Schematics
 Courtesy of GENERAL MOTORS COMPANY

OUTSIDE REARVIEW MIRROR WIRING SCHEMATICS

Position (without A45) Wiring Schematics

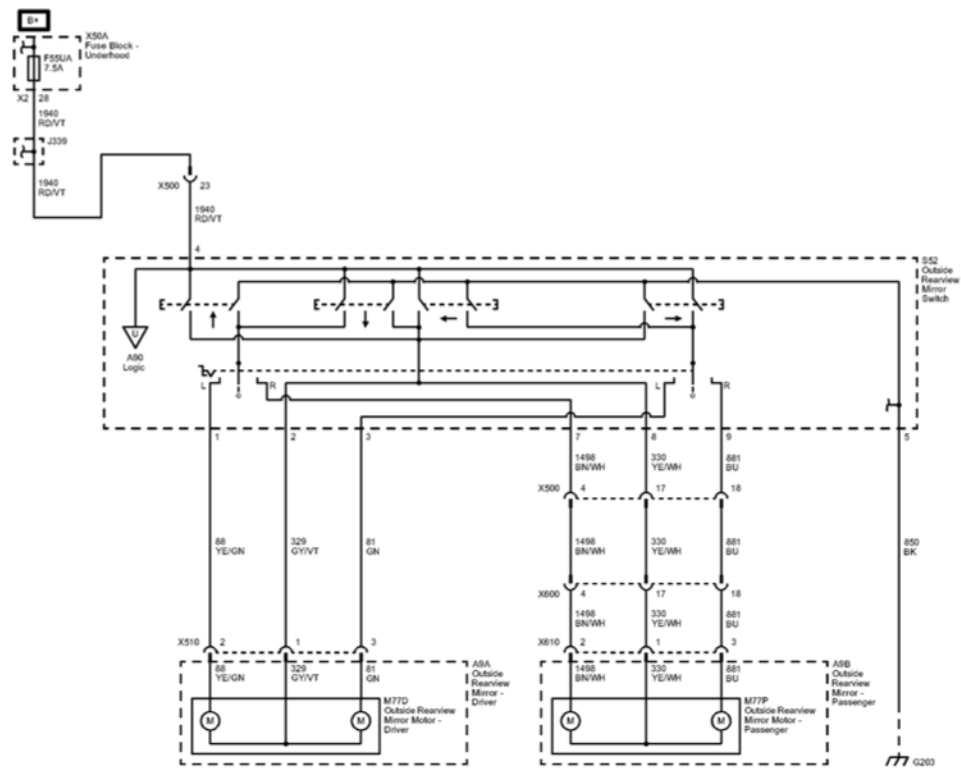


Fig. 2: Position (without A45) Wiring Schematics
 Courtesy of GENERAL MOTORS COMPANY

Driver Position (A45) Wiring Schematics

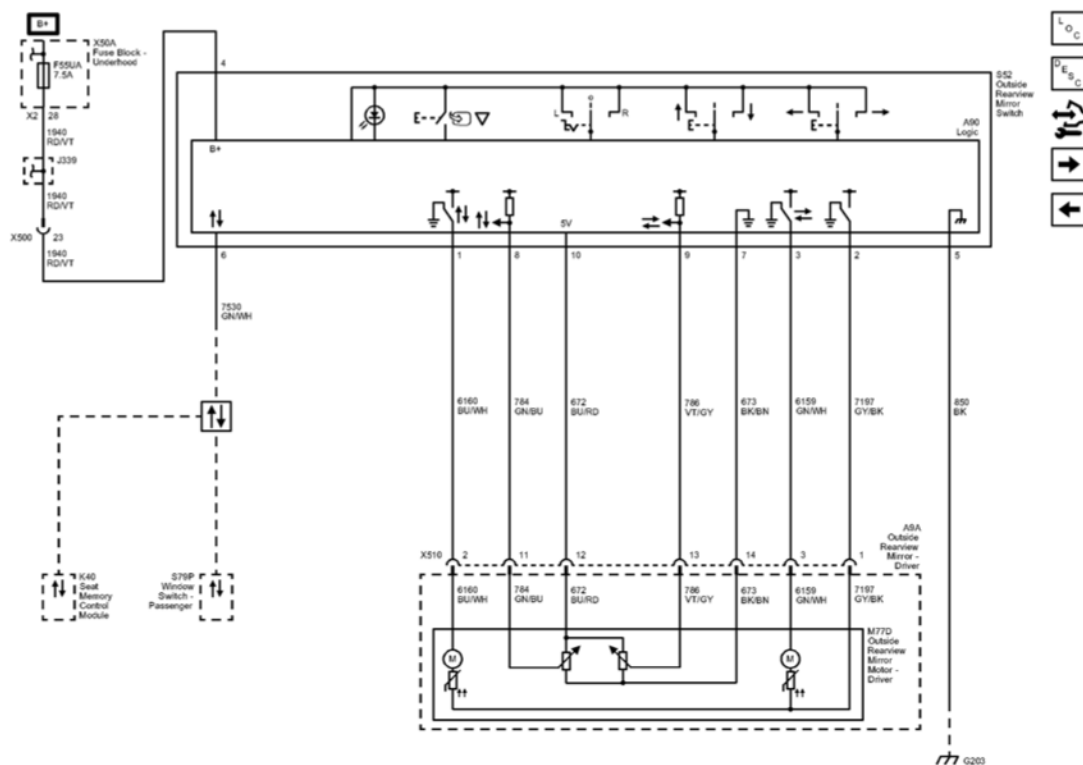


Fig. 3: Driver Position (A45) Wiring Schematics
 Courtesy of GENERAL MOTORS COMPANY

Passenger Position (A45) Wiring Schematics

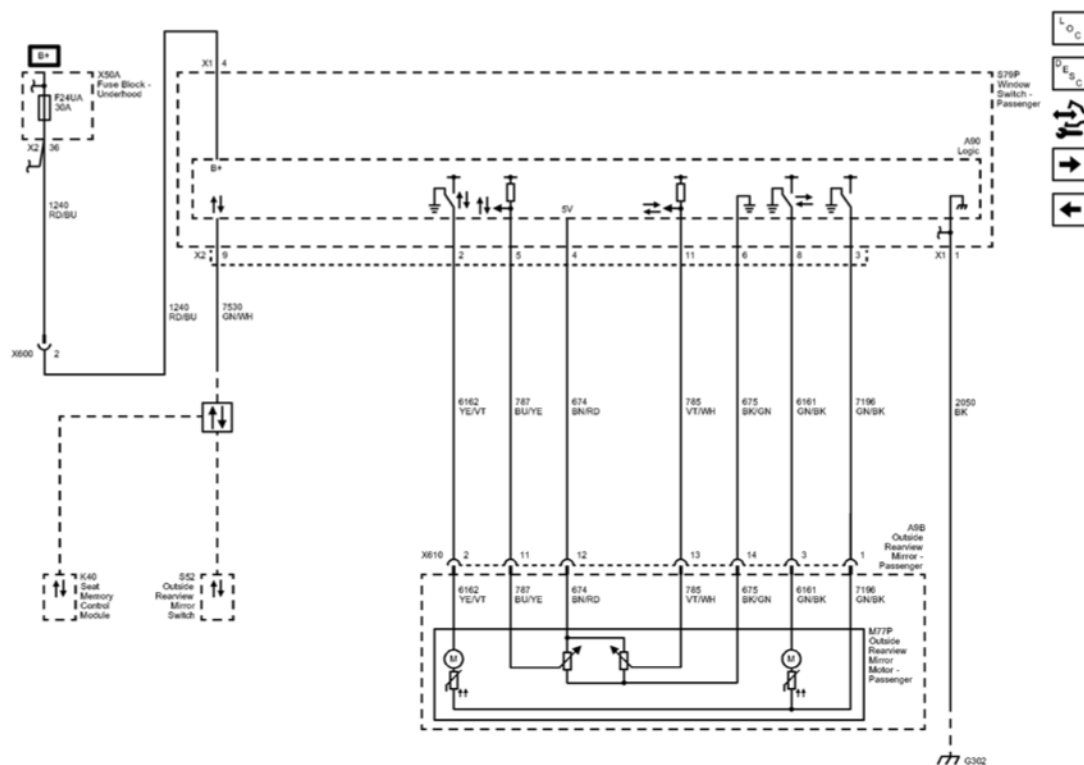


Fig. 4: Passenger Position (A45) Wiring Schematics
 Courtesy of GENERAL MOTORS COMPANY

Heating Wiring Schematics

DTC B154A 39

Driver Mirror Internal Malfunction

DTC B154B 39

Passenger Mirror Internal Malfunction

Circuit/System Description

The outside mirror switch and 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 memory seat module through the serial data circuit. When the memory seat module receives switch inputs from the outside mirror switch, mirror output commands are sent to the appropriate switch through the serial data circuit. The outside mirror switch 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 outside mirror switch 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 outside mirror switch 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

An internal malfunction has been detected by the outside rearview mirror switch while commanding the driver outside rearview mirror UP, DOWN, LEFT or RIGHT.

B154B 39

An internal malfunction has been detected by the passenger window switch while commanding the passenger outside rearview mirror UP, DOWN, LEFT or RIGHT.

Action Taken When the DTC Sets

The affected outside rearview mirror will be inoperative.

Conditions for Clearing the DTC

B154A 39

The driver outside rearview mirror must be replaced before the DTC can be cleared.

B154B 39

The passenger outside rearview mirror must be replaced before the DTC can be cleared.

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Outside Mirror Description and Operation (with A45), Outside Mirror Description and Operation (without A45)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the A9A Outside Rearview Mirror-Driver moves when commanding the Driver Mirror Horizontal Movement Right/Left and Driver Mirror Vertical Movement Up/Down with a scan tool.
 - **If the A9A Outside Rearview Mirror-Driver does not move RIGHT or LEFT or UP or DOWN**

Replace the M77D Outside Rearview Mirror Motor-Driver.

- If the A9A Outside Rearview Mirror-Driver moves RIGHT, LEFT, UP and DOWN
- 3. Verify the A9B Outside Rearview Mirror-Passenger moves when commanding the Passenger Mirror Horizontal Movement Right/Left and Passenger Mirror Vertical Movement Up/Down with a scan tool.
 - If the A9B Outside Rearview Mirror-Passenger does not move RIGHT or LEFT or UP or DOWN

Replace the M77P Outside Rearview Mirror Motor-Passenger.

- If the A9B Outside Rearview Mirror-Passenger moves RIGHT, LEFT, UP and DOWN
- 4. All OK.

Repair Instructions

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

Outside Rearview Mirror Inner Actuator Replacement.

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 (with A45), Outside Mirror Description and Operation (without A45)**
 - **Automatic Day-Night Mirror Description and Operation**
 - **OnStar 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 Malfunction (without A45), Power Mirror Malfunction (With A45)**
- **Power Mirror Tilt Inoperative in Reverse**
- **OnStar Button LED Malfunction**
- **OnStar Button Malfunction**

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
Left Heated Mirror Element Control	2	1	3	-
Driver Outside Rearview Mirror Ground	-	1	-	-
Right Heated Mirror Element Control	2	1	3	-
Passenger Outside Rearview Mirror Ground	-	1	-	-
1. Single Heated Mirror Inoperative 2. Both Heated Mirrors Inoperative 3. Heated Mirrors Always On				

Circuit/System Description

The K5 Rear Defogger 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 received.

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Outside Mirror Description and Operation (with A45), Outside Mirror Description and Operation (without A45)

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.
2. Verify the E18 Rear Defogger Grid turns ON and OFF when commanding the Rear Defogger On and Off with a scan tool.
 - **If the E18 Rear Defogger Grid does not turn ON or OFF**

Refer to **Rear Window Defogger Malfunction** .

- **If the E18 Rear Defogger Grid turns ON and OFF**
3. Verify the E17D Outside Rearview Mirror Glass-Driver and the E17P Outside Rearview Mirror Glass-Passenger become warm when commanding the Rear Defogger On with a scan tool.
 - **If the E17D Outside Rearview Mirror Glass-Driver and the E17P Outside Rearview Mirror Glass-Passenger do not become warm**

Refer to Circuit/System Testing below.

- **If the E17D Outside Rearview Mirror Glass-Driver and the E17P Outside Rearview Mirror Glass-Passenger become warm**
4. All OK.

Circuit/System Testing

1. Ignition OFF and all vehicle systems OFF, disconnect the X1 and X2 harness connectors at the appropriate E17 Outside Rearview Mirror Glass. It may take up to 2 minutes for all vehicle systems to

power down.

2. Test for less than 10 ohms between the ground circuit terminal A X2 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, repair the open/high resistance in the ground connection.
 - **If less than 10 ohms**
3. Engine Running, connect a test lamp between the control circuit terminal A X1 and the ground circuit terminal A X2.
4. Verify the test lamp turns ON and OFF when commanding the Rear Defogger On and Off with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, remove the test lamp, disconnect the harness connector at the X50A Fuse Block-Underhood.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in the control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the E17 Outside Rearview Mirror Glass.
 - **If the test lamp is always ON**
 1. Ignition OFF, remove the test lamp, disconnect the harness connector at the X50A Fuse Block-Underhood, ignition ON.
 2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the X50A Fuse Block-Underhood
 - **If the test lamp turns ON and OFF**
5. Test or replace the E17 Outside Rearview Mirror Glass.

Repair Instructions

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

Outside Rearview Mirror Glass Replacement

Front Compartment Fuse Block 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	B2545 02	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 engine 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 - INDEX

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.
2. Cover the windshield with a blanket or other suitable item.
3. Verify the A10 Inside Rearview Mirror face dims when shining a bright light into the rear light sensor
 - **If the A10 Inside Rearview Mirror does not dim**

Refer to Circuit/System Testing below- Inside Review Mirror Dimming Inoperative

- **If the A10 Inside Rearview Mirror dims**
4. Verify the A10 Inside Rearview Mirror face transitions from dim to bright while commanding the Backup Lamps Active and Inactive with a scan tool.
 - **If the A10 Inside Rearview Mirror does not transition between dim and bright.**

Refer to Circuit/System Testing below- Day-Night Disable Malfunction

- **If the A10 Inside Rearview Mirror transitions between bright and dim states**
5. All OK.

Circuit/System Testing

Inside Review Mirror Dimming Inoperative

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the A10 Inside Rearview Mirror. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 ohms between the ground circuit terminal 5 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, repair the open/high resistance in the ground connection.
 - **If less than 10 ohms**
3. Ignition ON.
4. Verify a test lamp illuminates between the ignition circuit terminal 2 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition OFF.
2. Test for less than 2 ohms in the ignition circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, refer to **Retained Accessory Power Malfunction** .
 - **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition OFF.
2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the A10 Inside Rearview Mirror.

○ **If the test lamp illuminates**

5. Replace the A10 Inside Rearview Mirror.

Day-Night Disable Malfunction

1. Ignition OFF, disconnect the harness connector at the A10 Inside Rearview Mirror.
2. Connect a test lamp between the control circuit terminal 1 and ground
3. Ignition ON, verify the test lamp turns ON and OFF while commanding the Backup Lamps Active and Inactive with a scan tool.

○ **If the test lamp is always OFF**

1. Ignition OFF, remove the test lamp, disconnect the harness connector at the K9 Body Control Module.
2. Test for infinite resistance between the control circuit terminal 1 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 ohms in the control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, refer to **Backup Lamps Malfunction** .

○ **If the test lamp is always ON**

1. Ignition OFF, remove the test lamp, disconnect the harness connector at the K9 Body Control Module, ignition ON.
2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, refer to **Backup Lamps Malfunction**

○ **If the test lamp turns ON and OFF**

4. Replace the A10 Inside Rearview Mirror.

Repair Instructions

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

Inside Rearview Mirror Replacement

POWER MIRROR MALFUNCTION (WITHOUT A45)

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 Motor Horizontal Control	1	1	1	-
Left/Right Mirror Motor Vertical Control	1	1	1	-
Left/Right Mirror Motor Common Control	1	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 - INDEX

Description and Operation

Outside Mirror Description and Operation (with A45), Outside Mirror Description and Operation (without A45)

Electrical Information Reference

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

Circuit/System Verification

1. Verify that both outside rearview mirrors operate while commanding the outside rearview mirrors UP/DOWN and LEFT/RIGHT with the outside mirror directional switch.
 - **If the outside rearview mirrors do not move up/down or left/right**

Refer to Circuit/System Testing below.

- **If the outside rearview mirrors move up/down and left/right**
2. All OK.

Circuit/System Testing

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S52 outside rearview mirror switch. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 ohms between the ground circuit terminal 5 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, repair the open/high resistance in the ground connection.
 - **If less than 10 ohms**
3. Verify a test lamp illuminates between the B+ circuit terminal 4 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the B+ circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition OFF.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for infinite resistance between each of the control circuit terminals listed below and ground:

- Terminal 1 control circuit
- Terminal 2 control circuit
- Terminal 3 control circuit
- Terminal 7 control circuit
- Terminal 8 control circuit
- Terminal 9 control circuit
- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the S52 outside rearview mirror switch.

○ **If the test lamp illuminates**

4. Ignition OFF, connect the harness connector at the S52 outside rearview mirror switch and disconnect the harness connector at the appropriate A9 outside rearview mirror.
5. Connect a test lamp between the control circuit terminal 1 and the control circuit terminal 2.
6. Verify the test lamp illuminates when commanding the UP/DOWN states with the S52 outside rearview mirror switch.

○ **If the test lamp does not illuminate during either of the commands**

1. Ignition OFF, disconnect the harness connector at the S52 outside rearview mirror switch.
2. Test for less than 1 V on each control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
3. Test for infinite resistance between each control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
4. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace at the S52 outside rearview mirror switch.

○ **If the test lamp illuminates during each of the commands**

7. Connect a test lamp between the control circuit terminal 1 and the control circuit terminal 3.
8. Verify the test lamp illuminates when commanding the LEFT/RIGHT states with the S52 outside rearview mirror switch.

○ **If the test lamp does not illuminate during either of the commands**

1. Ignition OFF, disconnect the harness connector at the S52 outside rearview mirror switch.
2. Test for less than 1 V on each control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
3. Test for infinite resistance between each control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
4. Test for less than 2 ohms in each control circuit end to end.

- If 2 ohms or greater, repair the open/high resistance in the circuit.
- If less than 2 ohms, replace at the S52 outside rearview mirror switch.

○ **If the test lamp illuminates during each of the commands**

9. Test or replace the M77 outside rearview mirror motor.

Repair Instructions

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

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

POWER MIRROR MALFUNCTION (WITH A45)

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 B+	U1519 00	U1519 00	-	-
Passenger Window Switch B+	U151B 00	U151B 00	-	-
Position Sensor 5 V Reference	4	4	4	-
Outside Rearview Mirror Switch Left/Right Signal	1	1	1	-
Outside Rearview Mirror Switch Position Signal	1	1	1	-
Left/Right Mirror Horizontal Position Sensor Signal	4	4	4	-
Left/Right Mirror Vertical Position Sensor Signal	4	4	4	-
Left/Right Mirror Motor Horizontal Control	1	1	1	-
Left/Right Mirror Motor Common Control	1	1	1	-
Left/Right Mirror Motor	1	1	1	-

Vertical Control				
Left/Right Mirror Position Low Reference	-	2	-	-
Outside Rearview Mirror Switch Ground	-	U1519 00	-	-
Passenger Window Switch Ground	-	U151B 00	-	-
1. Outside Rearview Mirror Switch Malfunction 2. Driver Outside Power Mirror Malfunction 3. Passenger Outside Power Mirror Malfunction 4. Power Mirror Memory Feature Malfunction				

Circuit/System Description

The outside mirror switch and 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 memory seat module through the serial data circuit. When the memory seat module receives switch inputs from the outside mirror switch, mirror output commands are sent to the appropriate switch through the serial data circuit. The outside mirror switch 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 outside mirror switch 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 outside mirror switch 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 - INDEX

Description and Operation

Outside Mirror Description and Operation (with A45), Outside Mirror Description and Operation (without A45)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Mirror Select Switch parameter changes from None to Left and Right when cycling the S52 Outside Rearview Mirror Switch.
 - **If the parameter does not change**

Refer to Circuit/System Testing below- Outside Rearview Mirror Switch Malfunction.
 - **If the parameter changes**
3. Verify the scan tool Mirror Direction Switch parameter changes from Inactive to Up, Down, Right and Left when cycling the S52 Outside Rearview Mirror Switch.
 - **If the parameter does not change**

Refer to Circuit/System Testing below- Outside Rearview Mirror Switch Malfunction.
 - **If the parameter changes**
4. Verify the A9A Outside Rearview Mirror-Driver moves when commanding the Driver Mirror Horizontal Movement Right/Left and Driver Mirror Vertical Movement Up/Down with a scan tool.
 - **If the A9A Outside Rearview Mirror-Driver does not move RIGHT or LEFT or UP or DOWN**

Refer to Circuit/System Testing below- Driver Outside Mirror Movement Malfunction.
 - **If the A9A Outside Rearview Mirror-Driver moves RIGHT, LEFT, UP and DOWN**
5. Verify the scan tool Driver Mirror Vertical Position parameters are between 0.2-4.8 V and change when commanding the Driver Mirror Vertical Movement Up/Down with a scan tool.
 - **If not between 0.2-4.8 V or does not change**

Refer to Circuit/System Testing below- Driver Mirror Position Sensor Circuit Test.
 - **If between 0.2-4.8 V and changes**
6. Verify the scan tool Driver Mirror Horizontal Position parameters are between 0.2-4.8 V and change

when commanding the Driver Mirror Horizontal Movement Right/Left with a scan tool.

- **If not between 0.2-4.8 V or does not change**

Refer to Circuit/System Testing below- Driver Mirror Position Sensor Circuit Test.

- **If between 0.2-4.8 V and changes**

7. Verify the A9B Outside Rearview Mirror-Passenger moves when commanding the Passenger Mirror Horizontal Movement Right/Left and Passenger Mirror Vertical Movement Up/Down with a scan tool.

- **If the A9B Outside Rearview Mirror-Passenger does not move RIGHT or LEFT or UP or DOWN**

Refer to Circuit/System Testing below- Passenger Outside Mirror Movement Malfunction.

- **If the A9B Outside Rearview Mirror-Passenger moves RIGHT, LEFT, UP and DOWN**

8. Verify the scan tool Passenger Mirror Vertical Position parameters are between 0.2-4.8 V and change while commanding the Passenger Mirror Horizontal Movement Right/Left with a scan tool.

- **If not between 0.2-4.8 V or does not change**

Refer to Circuit/System Testing below- Passenger Mirror Position Sensor Circuit Test.

- **If between 0.2-4.8 V and changes**

9. Verify the scan tool Passenger Mirror Horizontal Position parameters are between 0.2-4.8 V and change while commanding the Passenger Mirror Vertical Movement Up/Down with a scan tool.

- **If not between 0.2-4.8 V or does not change**

Refer to Circuit/System Testing below- Passenger Mirror Position Sensor Circuit Test.

- **If between 0.2-4.8 V and changes**

10. All OK.

Circuit/System Testing

Outside Rearview Mirror Switch Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S52 Outside Rearview Mirror Switch. It may take up to 2 minutes for all vehicle systems to power down.

2. Test for less than 10 ohms between the ground circuit terminal 5 and ground.

- **If 10 ohms or greater**

1. Ignition OFF.

2. Test for less than 2 ohms in the ground circuit end to end.

- If 2 ohms or greater, repair the open/high resistance in the circuit.

- If less than 2 ohms, repair the open/high resistance in the ground connection.

- **If less than 10 ohms**

3. Verify a test lamp illuminates between the B+ circuit terminal 4 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF, remove the test lamp.
 2. Test for less than 2 ohms in the ignition circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the S52 Outside Rearview Mirror Switch
 - **If the test lamp illuminates**
4. Test or replace the S52 Outside Rearview Mirror Switch.

Driver Outside Mirror Movement Malfunction

1. Ignition OFF, disconnect the X510 inline harness connector at the A9A Outside Rearview Mirror-Driver. Ignition ON
2. Connect a test lamp between the control circuit terminal 1 and control circuit terminal 2.
3. Verify the test lamp turns ON when commanding the Up and Down states with a scan tool.
 - **If the test lamp remains OFF during either of the commands**
 1. Ignition OFF, remove the test lamp, disconnect the harness connector at the S52 Outside Rearview Mirror Switch.
 2. Test for infinite resistance between each control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the S52 Outside Rearview Mirror Switch.
 - **If the test lamp is always ON**
 1. Ignition OFF, remove the test lamp, disconnect the harness connector at the S52 Outside Rearview Mirror Switch, ignition ON.
 2. Test for less than 1 V between each control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the S52 Outside Rearview Mirror Switch
 - **If the test lamp turns ON during each of the commands**

4. Connect a test lamp between the control circuit terminal 1 and control circuit terminal 3.
5. Verify the test lamp turns ON when commanding the Left and Right states with a scan tool.
 - **If the test lamp remains OFF during either of the commands**
 1. Ignition OFF, remove the test lamp, disconnect the harness connector at the S52 Outside Rearview Mirror Switch.
 2. Test for infinite resistance between each control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the S52 Outside Rearview Mirror Switch.
 - **If the test lamp is always ON**
 1. Ignition OFF, remove the test lamp, disconnect the harness connector at the S52 Outside Rearview Mirror Switch, ignition ON.
 2. Test for less than 1 V between each control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the S52 Outside Rearview Mirror Switch
 - **If the test lamp turns ON during each of the commands**
6. Test or replace the M77D Outside Rearview Mirror Motor-Driver.

Driver Mirror Position Sensor Circuit Test

1. Ignition OFF and all vehicle systems OFF, disconnect the X510 inline harness connector at the A9A Outside Rearview Mirror-Driver. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 ohms between the low reference circuit terminal 14 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF, disconnect the harness connector at the S52 Outside Rearview Mirror Switch.
 2. Test for less than 2 ohms in the low reference circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the S52 Outside Rearview Mirror Switch.
 - **If less than 10 ohms**
3. Ignition ON.
4. Test for 4.8-5.2 V between the 5 V reference circuit terminal 12 and ground.
 - **If less than 4.8 V**
 1. Ignition OFF, disconnect the harness connector at the S52 Outside Rearview Mirror Switch.
 2. Test for infinite resistance between the 5 V reference circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in the 5 V reference circuit end to end.

- If 2 ohms or greater, repair the open/high resistance in the circuit.
- If less than 2 ohms, replace the S52 Outside Rearview Mirror Switch.
- **If greater than 5.2 V**
- 1. Ignition OFF, disconnect the harness connector at the S52 Outside Rearview Mirror Switch, ignition ON.
- 2. Test for less than 1 V between the 5 V reference circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the S52 Outside Rearview Mirror Switch.
- **If between 4.8-5.2 V**
- 5. Verify the scan tool Driver Mirror Vertical Position parameter is less than 4.6 V.
 - **If 4.6 V or greater**
 - 1. Ignition OFF, disconnect the harness connector at the S52 Outside Rearview Mirror Switch, ignition ON.
 - 2. Test for less than 1 V between the signal circuit terminal 11 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the S52 Outside Rearview Mirror Switch.
 - **If less than 4.6 V**
- 6. Install a 3 A fused jumper wire between the signal circuit terminal 11 and the 5 V reference circuit terminal 12.
- 7. Verify the scan tool Driver Mirror Vertical Position or the parameter is greater than 0.6 V.
 - **If 0.6 V or less**
 - 1. Ignition OFF, remove the jumper wire, disconnect the harness connector at the S52 Outside Rearview Mirror Switch.
 - 2. Test for infinite resistance between the signal circuit terminal 11 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 - 3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the S52 Outside Rearview Mirror Switch.
 - **If greater than 0.6 V**
- 8. Verify the scan tool Driver Mirror Horizontal Position parameter is less than 4.6 V.
 - **If 4.6 V or greater**
 - 1. Ignition OFF, disconnect the harness connector at the S52 Outside Rearview Mirror Switch, ignition ON.
 - 2. Test for less than 1 V between the signal circuit terminal 13 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the S52 Outside Rearview Mirror Switch.
 - **If less than 4.6 V**
- 9. Install a 3 A fused jumper wire between the signal circuit terminal 13 and the 5 V reference circuit

terminal 12.

10. Verify the scan tool Driver Mirror Horizontal Position or the parameter is greater than 0.6 V.
 - **If 0.6 V or less**
 1. Ignition OFF, remove the jumper wire, disconnect the harness connector at the S52 Outside Rearview Mirror Switch.
 2. Test for infinite resistance between the signal circuit terminal 13 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the S52 Outside Rearview Mirror Switch.
 - **If greater than 0.6 V**
11. Test or replace the M77D Outside Rearview Mirror Motor-Driver.

Passenger Outside Mirror Movement Malfunction

1. Ignition OFF, disconnect the X610 inline harness connector at the A9B Outside Rearview Mirror-Passenger. Ignition ON
2. Connect a test lamp between the control circuit terminal 1 and control circuit terminal 2.
3. Verify the test lamp turns ON when commanding the Up and Down states with a scan tool.
 - **If the test lamp remains OFF during either of the commands**
 1. Ignition OFF, remove the test lamp, disconnect the X2 harness connector at the S79P Window Switch-Passenger.
 2. Test for infinite resistance between each control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the S79P Window Switch-Passenger.
 - **If the test lamp is always ON**
 1. Ignition OFF, remove the test lamp, disconnect the X2 harness connector at the S79P Window Switch-Passenger, ignition ON.
 2. Test for less than 1 V between each control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the S79P Window Switch-Passenger
 - **If the test lamp turns ON during each of the commands**
4. Connect a test lamp between the control circuit terminal 1 and control circuit terminal 3.
5. Verify the test lamp turns ON when commanding the Left and Right states with a scan tool.
 - **If the test lamp remains OFF during either of the commands**

1. Ignition OFF, remove the test lamp, disconnect the X2 harness connector at the S79P Window Switch-Passenger.
2. Test for infinite resistance between each control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the S79P Window Switch-Passenger.
 - **If the test lamp is always ON**
1. Ignition OFF, remove the test lamp, disconnect the X2 harness connector at the S79P Window Switch-Passenger, ignition ON.
2. Test for less than 1 V between each control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the S79P Window Switch-Passenger
 - **If the test lamp turns ON during each of the commands**
6. Test or replace the M77P Outside Rearview Mirror Motor-Passenger.

Passenger Mirror Position Sensor Circuit Test

1. Ignition OFF and all vehicle systems OFF, disconnect the X610 inline harness connector at the A9B Outside Rearview Mirror-Passenger. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 ohms between the low reference circuit terminal 14 and ground.
 - **If 10 ohms or greater**
 - 1. Ignition OFF, disconnect the X2 harness connector at the S79P Window Switch-Passenger.
 - 2. Test for less than 2 ohms in the low reference circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the S79P Window Switch-Passenger.
 - **If less than 10 ohms**
3. Ignition ON.
4. Test for 4.8-5.2 V between the 5 V reference circuit terminal 12 and ground.
 - **If less than 4.8 V**
 - 1. Ignition OFF, disconnect the X2 harness connector at the S79P Window Switch-Passenger.
 - 2. Test for infinite resistance between the 5 V reference circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 - 3. Test for less than 2 ohms in the 5 V reference circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the S79P Window Switch-Passenger.
 - **If greater than 5.2 V**

1. Ignition OFF, disconnect the X2 harness connector at the S79P Window Switch-Passenger, ignition ON.
2. Test for less than 1 V between the 5 V reference circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the S79P Window Switch-Passenger.
- **If between 4.8-5.2 V**
5. Verify the scan tool Passenger Mirror Vertical Position parameter is less than 4.6 V.
 - **If 4.6 V or greater**
 - 1. Ignition OFF, disconnect the X2 harness connector at the S79P Window Switch-Passenger, ignition ON.
 - 2. Test for less than 1 V between the signal circuit terminal 11 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the S79P Window Switch-Passenger.
 - **If less than 4.6 V**
6. Install a 3 A fused jumper wire between the signal circuit terminal 11 and the 5 V reference circuit terminal 12.
7. Verify the scan tool Passenger Mirror Vertical Position or the parameter is greater than 0.6 V.
 - **If 0.6 V or less**
 - 1. Ignition OFF, remove the jumper wire, disconnect the X2 harness connector at the S79P Window Switch-Passenger.
 - 2. Test for infinite resistance between the signal circuit terminal 11 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 - 3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the S79P Window Switch-Passenger.
 - **If greater than 0.6 V**
8. Verify the scan tool Passenger Mirror Horizontal Position parameter is less than 4.6 V.
 - **If 4.6 V or greater**
 - 1. Ignition OFF, disconnect the X2 harness connector at the S79P Window Switch-Passenger, ignition ON.
 - 2. Test for less than 1 V between the signal circuit terminal 13 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the S79P Window Switch-Passenger.
 - **If less than 4.6 V**
9. Install a 3 A fused jumper wire between the signal circuit terminal 13 and the 5 V reference circuit terminal 12.
10. Verify the scan tool Passenger Mirror Horizontal Position or the parameter is greater than 0.6 V.
 - **If 0.6 V or less**

1. Ignition OFF, remove the jumper wire, disconnect the X2 harness connector at the S79P Window Switch-Passenger.
2. Test for infinite resistance between the signal circuit terminal 13 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the S79P Window Switch-Passenger.
 - **If greater than 0.6 V**

11. Test or replace the M77P Outside Rearview Mirror Motor-Passenger.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.

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

POWER MIRROR TILT INOPERATIVE IN REVERSE

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.

Circuit/System Description

Mirror position is determined by both horizontal and vertical position sensors in each of the power mirrors. The 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 park tilt mirror in reverse command, the memory seat module will send the tilt down command to the mirror control module and the passenger window switch. The mirror control module and the passenger window switch will then drive the appropriate mirror motors to the commanded position.

Diagnostic Aids

The Park Tilt Mirror in Reverse is a feature in the Personalization Menu of the audio system controls that allows the operator to program the driver and/or passenger outside rearview mirrors to tilt downward when the vehicle is shifted into R (reverse). Verify that this feature has been correctly programmed into the system before performing extensive diagnostics

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Outside Mirror Description and Operation (with A45), Outside Mirror Description and Operation (without A45)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the A9A Outside Rearview Mirror-Driver moves when commanding the Driver Mirror Horizontal Movement Right/Left and Driver Mirror Vertical Movement Up/Down with a scan tool.
 - **If the A9A Outside Rearview Mirror-Driver does not move RIGHT or LEFT or UP or DOWN**

Refer to **Power Mirror Malfunction (without A45), Power Mirror Malfunction (With A45).**

- **If the A9A Outside Rearview Mirror-Driver moves RIGHT, LEFT, UP and DOWN**
3. Verify the A9B Outside Rearview Mirror-Passenger moves when commanding the Passenger Mirror Horizontal Movement Right/Left and Passenger Mirror Vertical Movement Up/Down with a scan tool.
 - **If the A9B Outside Rearview Mirror-Passenger does not move RIGHT or LEFT or UP or DOWN**

Refer to **Power Mirror Malfunction (without A45), Power Mirror Malfunction (With A45).**

- **If the A9B Outside Rearview Mirror-Passenger moves RIGHT, LEFT, UP and DOWN**
4. All OK.

Circuit/System Testing

1. Engine running, shift the vehicle in REVERSE.
2. Verify that the appropriate A9 Outside Rearview Mirror moves DOWN.
 - If the A9 Outside Rearview Mirror does not move DOWN

Replace the K40 Seat Memory Control Module

- If the A9 Outside Rearview Mirror does move DOWN
3. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.

Control Module References for the seat memory control module replacement, programming and setup

REPAIR INSTRUCTIONS

OUTSIDE REARVIEW MIRROR SEAL REPLACEMENT

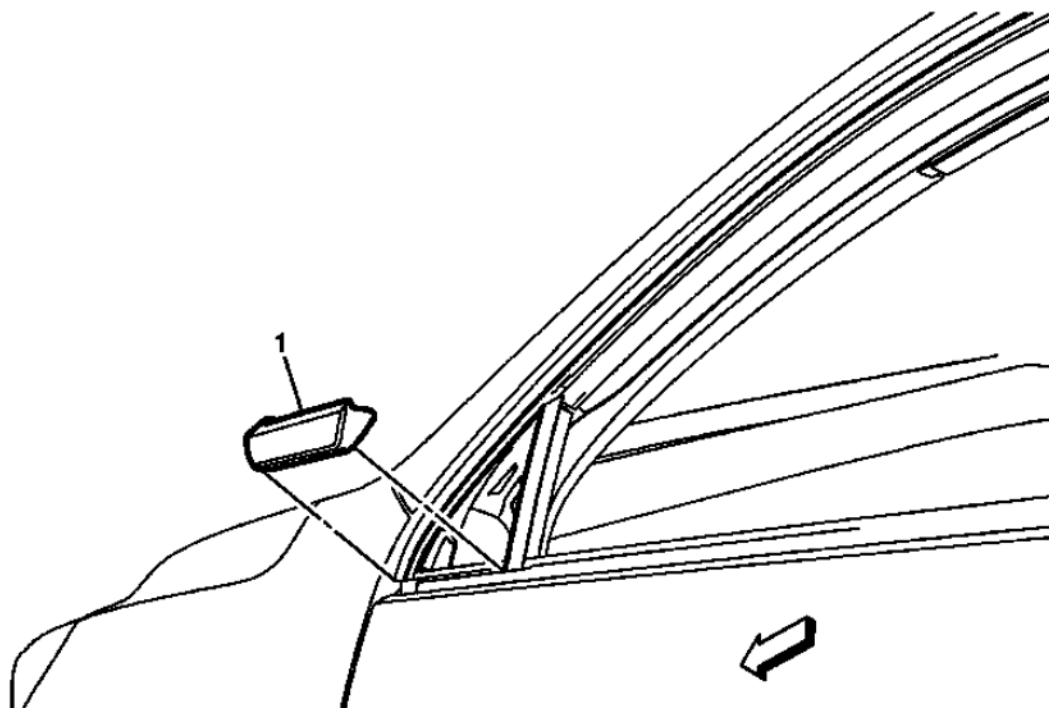


Fig. 6: Outside Rearview Mirror Seal
Courtesy of GENERAL MOTORS COMPANY

Outside Rearview Mirror Seal Replacement

Callout	Component Name
Preliminary Procedure Remove the outside rearview mirror. Refer to <u>Outside Rearview Mirror Replacement</u> .	
1	Outside Rearview Mirror Seal Procedure Inspect the mirror for proper operation before installing the door trim.

OUTSIDE REARVIEW MIRROR REPLACEMENT

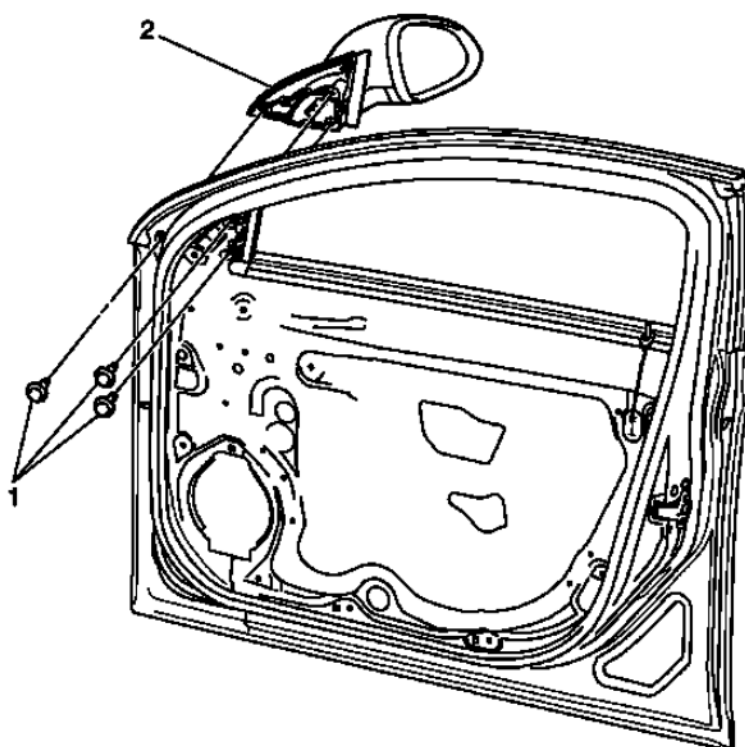


Fig. 7: Outside Rearview Mirror & Fasteners
Courtesy of GENERAL MOTORS COMPANY

Outside Rearview Mirror Replacement

Callout	Component Name
WARNING: Refer to <u>Glass and Sheet Metal Handling Warning</u>	
Preliminary Procedure Remove the front side door garnish molding. Refer to <u>Front Side Door Window Garnish Molding Replacement</u> .	
	Outside Rearview Mirror Fastener (Qty: 3) CAUTION: Refer to <u>Fastener Caution</u> .

1	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.

OUTSIDE REARVIEW MIRROR HOUSING COVER REPLACEMENT

Removal Procedure

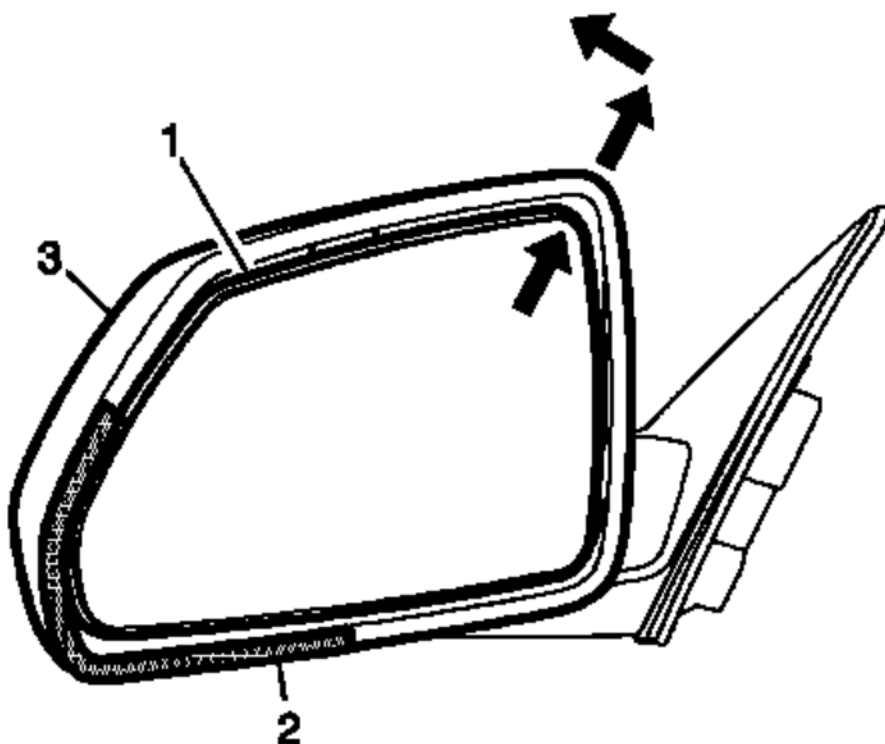


Fig. 8: Mirror Glass

Courtesy of GENERAL MOTORS COMPANY

WARNING: When working with any type of glass or sheet metal with exposed or rough edges, wear approved safety glasses and gloves in order to reduce the chance of personal injury.

1. Apply several layers of masking tape (2) to the bottom and outside edge of the outside rearview mirror housing (3) in order to protect the painted finish.
2. Push the mirror glass (1) inward at the top inner corner until full travel is reached.

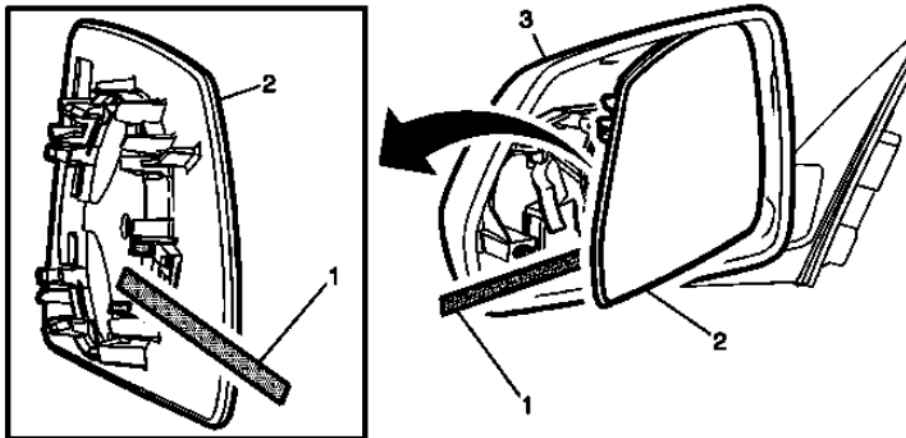


Fig. 9: Mirror Glass

Courtesy of GENERAL MOTORS COMPANY

NOTE: DO Not use the suitable tool (flat plastic) to pry with it Must be used in a twisting motion only to release the mirror glass from the motor.

3. Remove the mirror glass.
 1. Retain pressure on the top inner corner of the mirror glass (1).
 2. Insert a suitable tool (flat plastic) between the two tabs (2) located behind the glass.
 3. Twist the suitable tool (flat plastic) until the mirror glass releases from the motor.
4. Disconnect the electrical connectors.

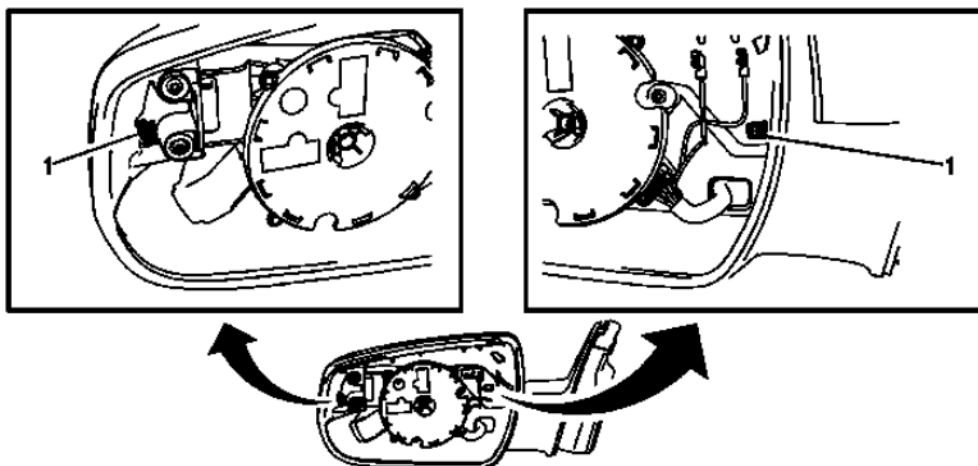


Fig. 10: Retaining Clips

Courtesy of GENERAL MOTORS COMPANY

5. From inside the mirror housing insert a suitable tool in the opening then push rearward releasing the retaining clips (1) from the assembly.

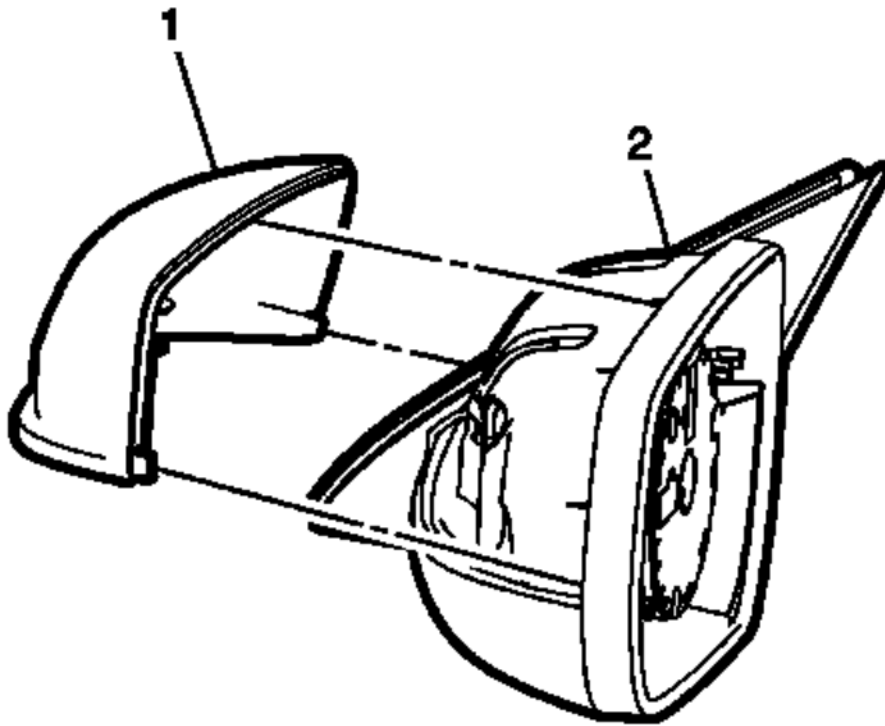


Fig. 11: Mirror Housing Cover

Courtesy of GENERAL MOTORS COMPANY

6. Remove the mirror housing cover (1) from the mirror housing assembly (2).

Installation Procedure

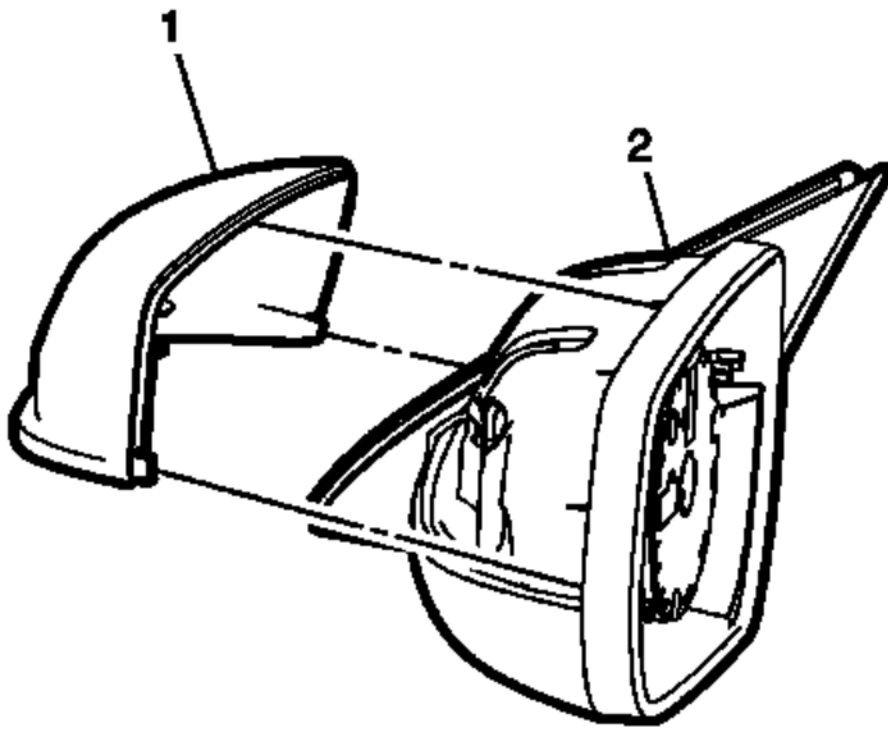


Fig. 12: Mirror Housing Cover

Courtesy of GENERAL MOTORS COMPANY

1. Align the mirror housing cover (1) with the base of the outside mirror housing assembly (2), push forward until the housing cover is fully seated into the outside rearview base.

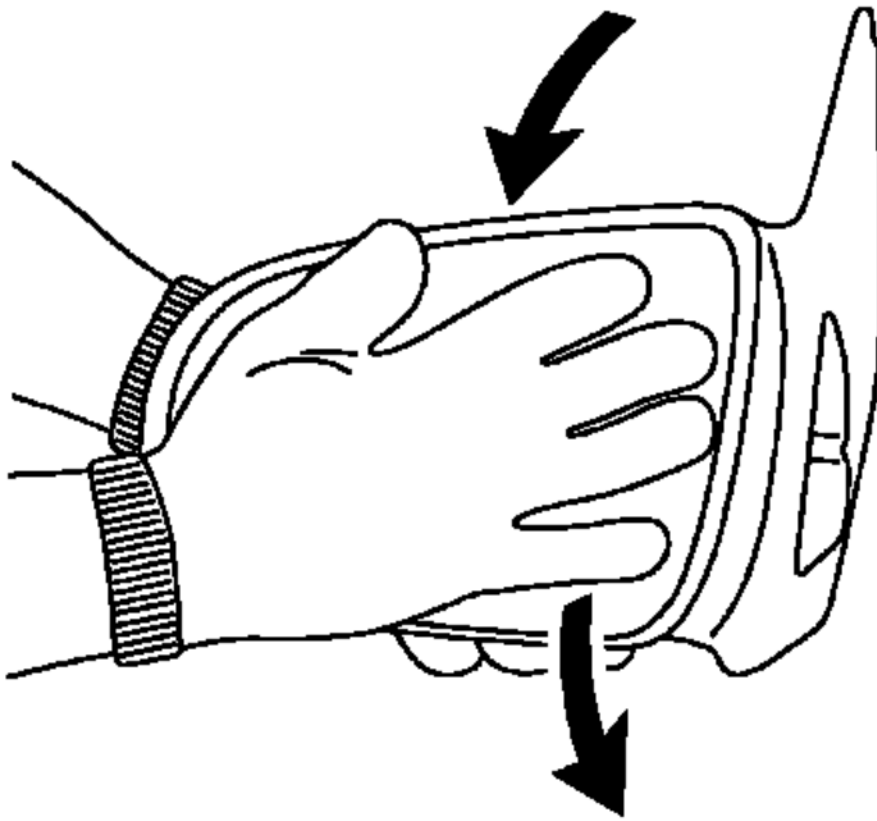


Fig. 13: Placing Hand On Back Of Mirror Housing
Courtesy of GENERAL MOTORS COMPANY

2. Connect the electrical connectors.
3. Align the mirror glass retaining tabs with the motor.
4. Place your hand on the back of the mirror housing.

WARNING: Refer to Glass and Sheet Metal Handling Warning

5. Using the flat part of your hand press inward until the mirror glass fully seats on the motor retaining tabs.
6. Inspect the power mirror for proper operation.
7. Remove the masking tape.
8. Inspect the mirror for proper operation.

OUTSIDE REARVIEW MIRROR REMOTE CONTROL SWITCH REPLACEMENT

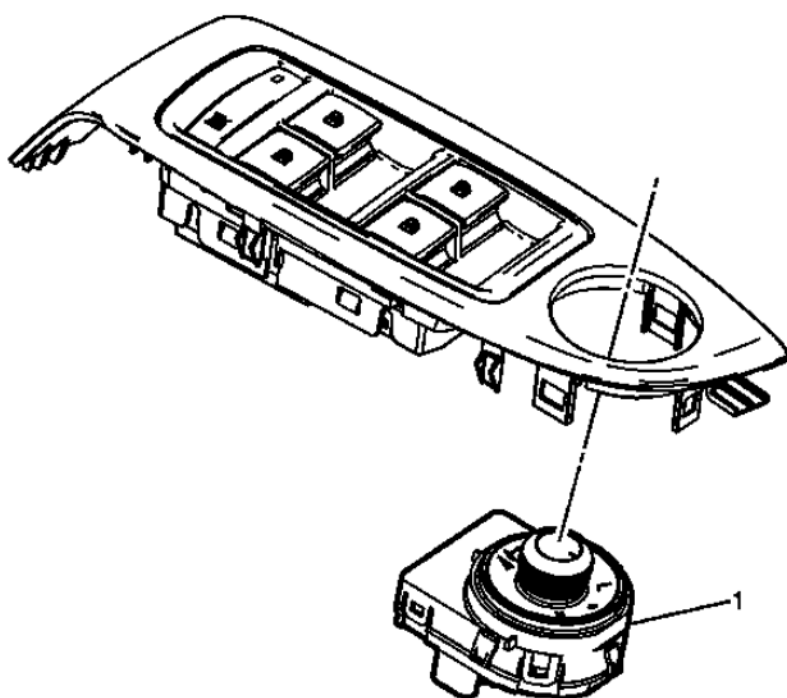


Fig. 14: Outside Rearview Mirror Remote Control Switch
 Courtesy of GENERAL MOTORS COMPANY

Outside Rearview Mirror Remote Control Switch Replacement

Callout	Component Name
Preliminary Procedure Remove the front side door accessory switch mount plate - drivers side door. Refer to <u>Front Side Door Accessory Switch Mount Plate Replacement (Drivers Side Door)</u> , <u>Front Side Door Accessory Switch Mount Plate Replacement (Passenger Side Door)</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 set up procedures.

OUTSIDE REARVIEW MIRROR INNER ACTUATOR REPLACEMENT

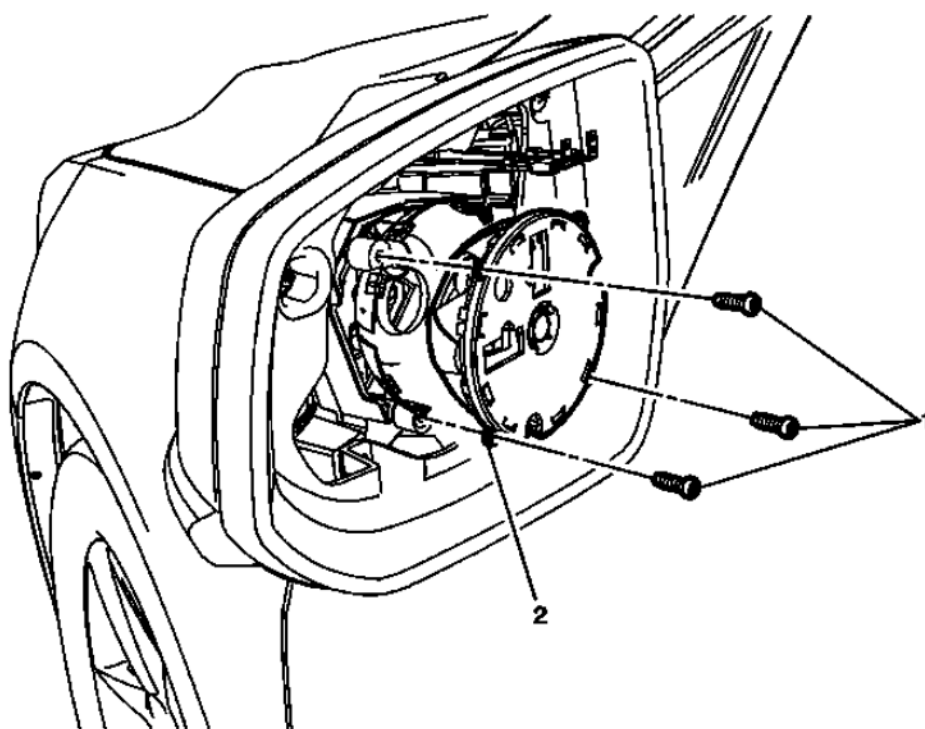


Fig. 15: Outside Rearview Mirror Inner Actuator
 Courtesy of GENERAL MOTORS COMPANY

Outside Rearview Mirror Inner Actuator Replacement

Callout	Component Name
WARNING: Refer to <u>Glass and Sheet Metal Handling Warning</u> .	
Preliminary Procedure Remove the outside rearview mirror lens. Refer to <u>Outside Rearview Mirror Glass Replacement</u> .	
1	Outside Rearview Mirror Inner Actuator/Motor Screws (Qty: 3) 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/Motor Procedure Inspect the mirror for proper operation before installing the inside door trim.

OUTSIDE REARVIEW MIRROR GLASS REPLACEMENT

Removal Procedure

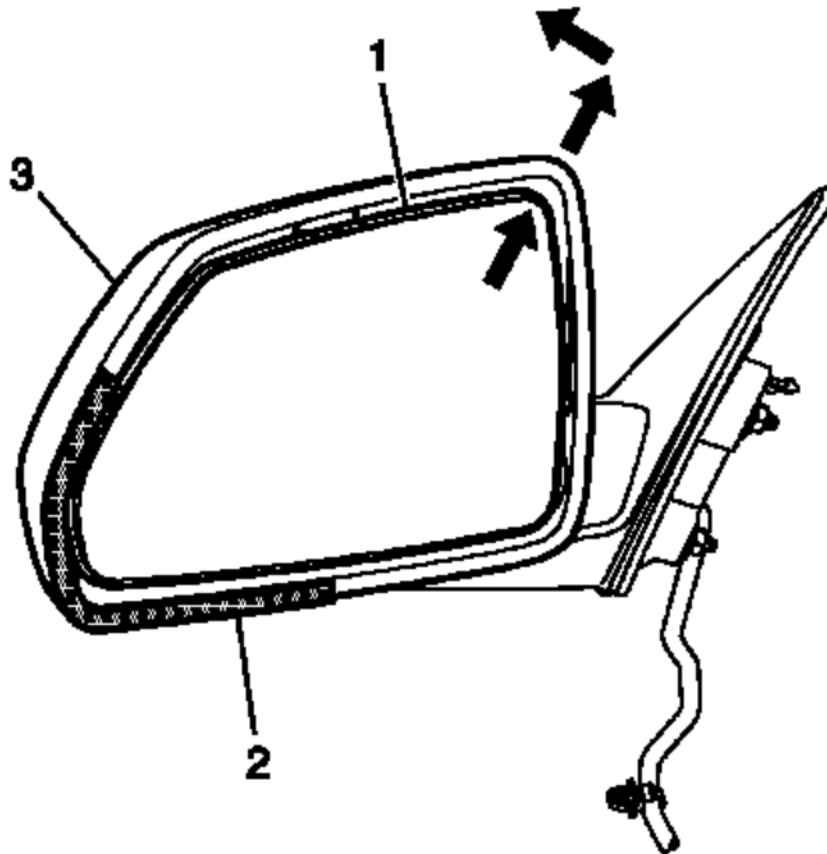


Fig. 16: Outside Rearview Mirror Glass
Courtesy of GENERAL MOTORS COMPANY

WARNING: When working with any type of glass or sheet metal with exposed or rough edges, wear approved safety glasses and gloves in order to reduce the chance of personal injury.

1. Apply several layers of masking tape (2) to the bottom and outside edge of the outside rearview mirror housing (3) in order to protect the painted finish.
2. Push the mirror glass (1) inward at the top inner corner until full travel is reached.

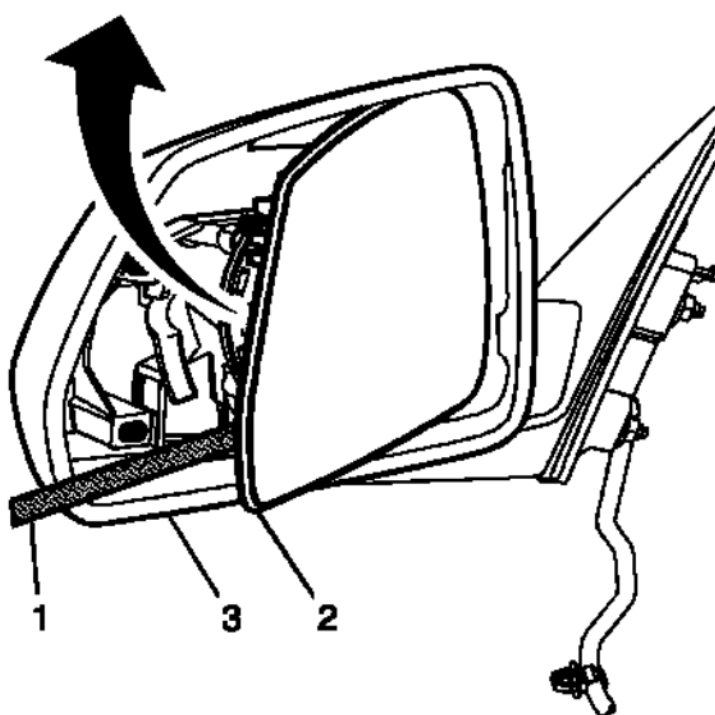
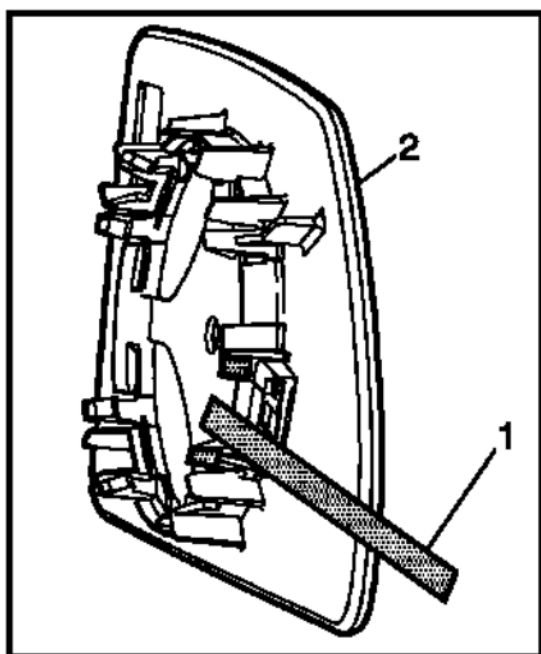


Fig. 17: Identifying Mirror Glass And Flat Plastic
 Courtesy of GENERAL MOTORS COMPANY

NOTE: DO Not use the suitable tool (flat plastic) to pry with it Must be used in a

twisting motion only to release the mirror glass from the motor.

3. Remove the mirror glass.
 1. Retain pressure on the top inner corner of the mirror glass (1).
 2. Insert a suitable tool (flat plastic) between the two tabs (2) located behind the glass.
 3. Twist the suitable tool (flat plastic) until the mirror glass releases from the motor.
4. Disconnect the electrical connectors.

Installation Procedure

1. Connect the electrical connectors.
2. Align the mirror glass retaining tabs with the motor.
3. Place your hand on the back of the mirror housing.

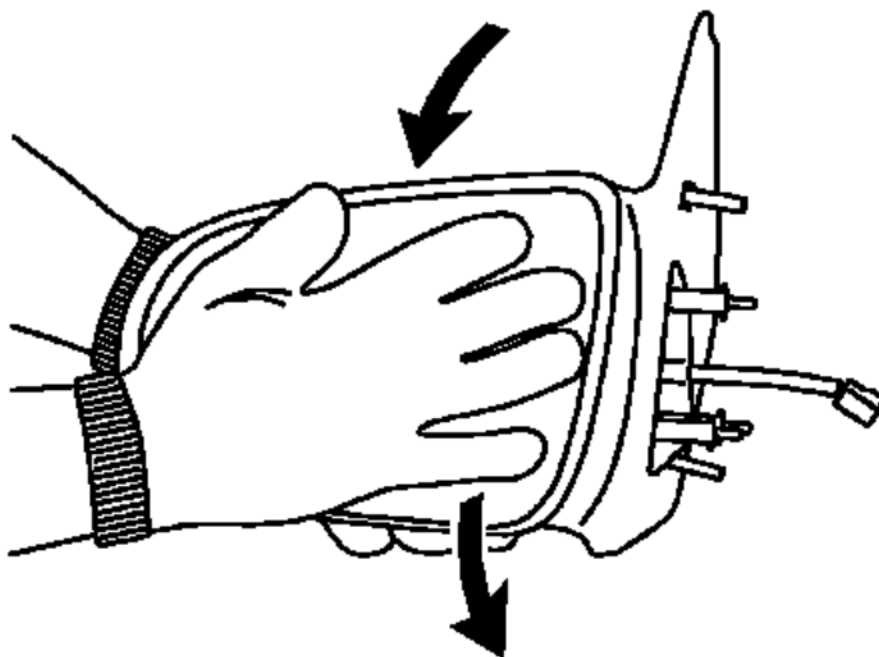


Fig. 18: Mirror Glass & Motor

Courtesy of GENERAL MOTORS COMPANY

WARNING: Refer to Glass and Sheet Metal Handling Warning

4. Using the flat part of your hand press inward until the mirror glass fully seats on the motor retaining tabs.
5. Inspect the power mirror for proper operation.
6. Remove the masking tape.

INSIDE REARVIEW MIRROR REPLACEMENT

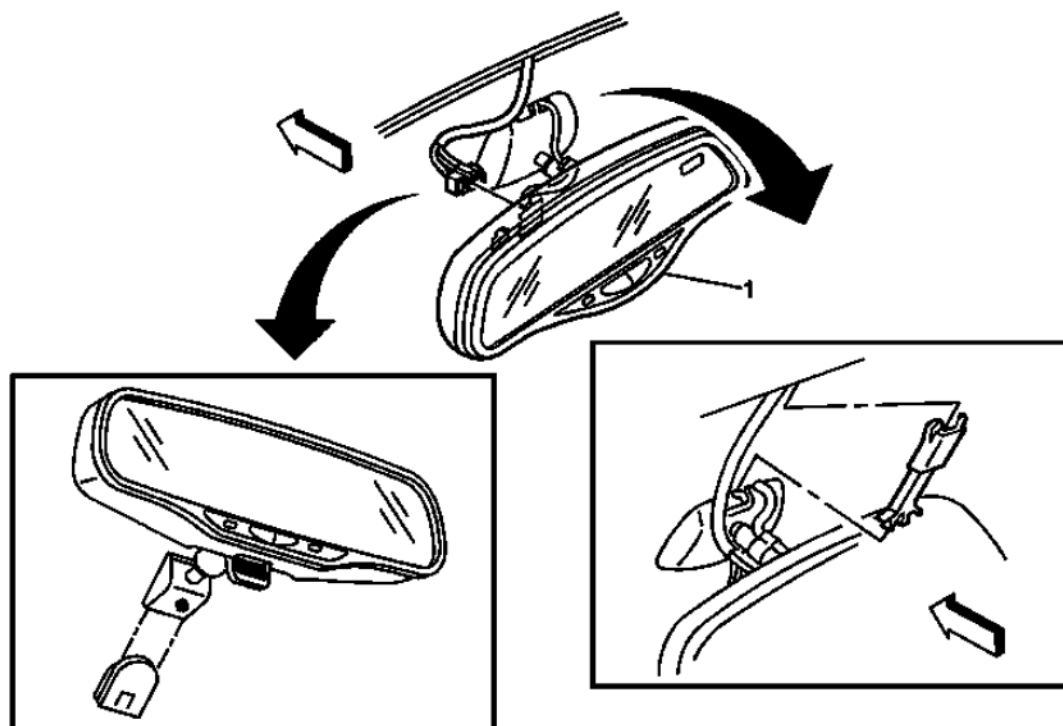


Fig. 19: Identifying Inside Rearview Mirror
Courtesy of GENERAL MOTORS COMPANY

Inside Rearview Mirror Replacement

Callout	Component Name
Preliminary Procedure Remove the inside rearview mirror cover if equipped. Refer to <u>Inside Rearview Mirror Wiring Harness Cover Replacement</u> .	
1	Inside Rearview Mirror CAUTION: Refer to <u>Fastener Caution</u> . Procedure 1. Disconnect the electrical connector, if equipped. 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. Refer to **Control Module References** for programming and setup information.

Tighten
2 N.m (18 lb in)

INSIDE REARVIEW MIRROR BRACKET INSTALLATION

NOTE: If the windshield is equipped with a black out area where the inside rearview mirror is located this procedure does not apply. If the black out area is damaged, replace the windshield.

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:

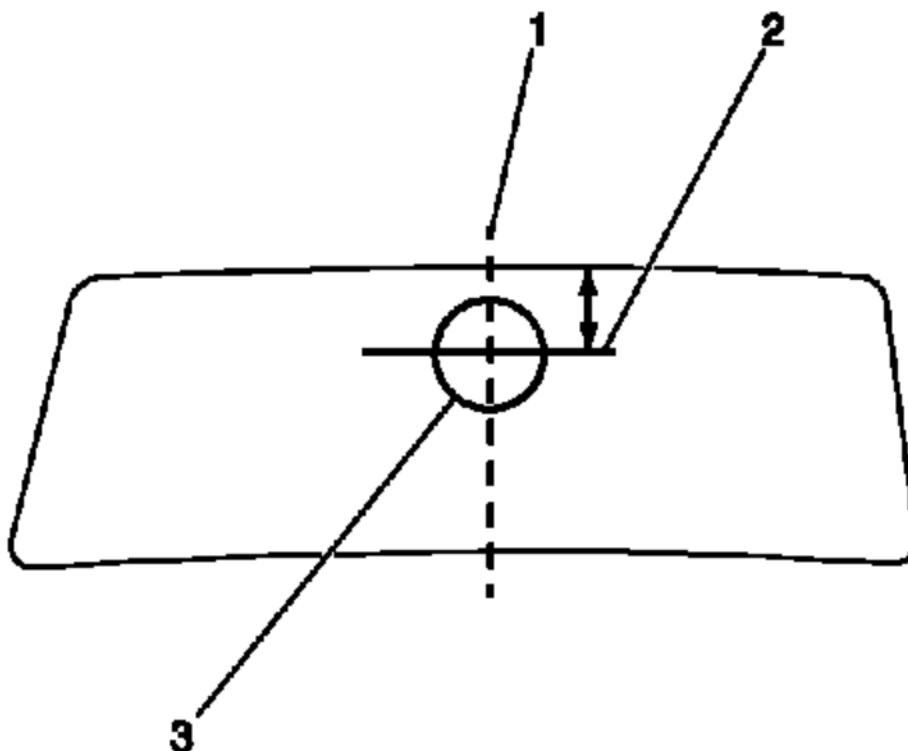


Fig. 20: Identifying Mirror Mounting Base Location
Courtesy of GENERAL MOTORS COMPANY

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.

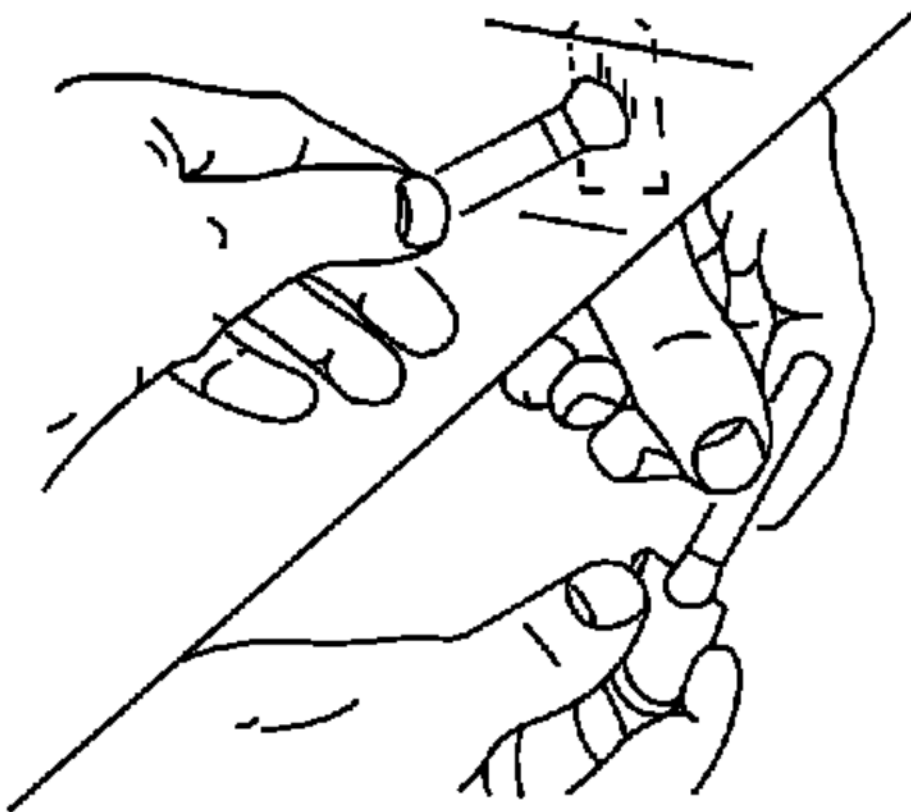


Fig. 21: Applying Adhesive To Mirror Base & Window
Courtesy of GENERAL MOTORS COMPANY

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.
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.

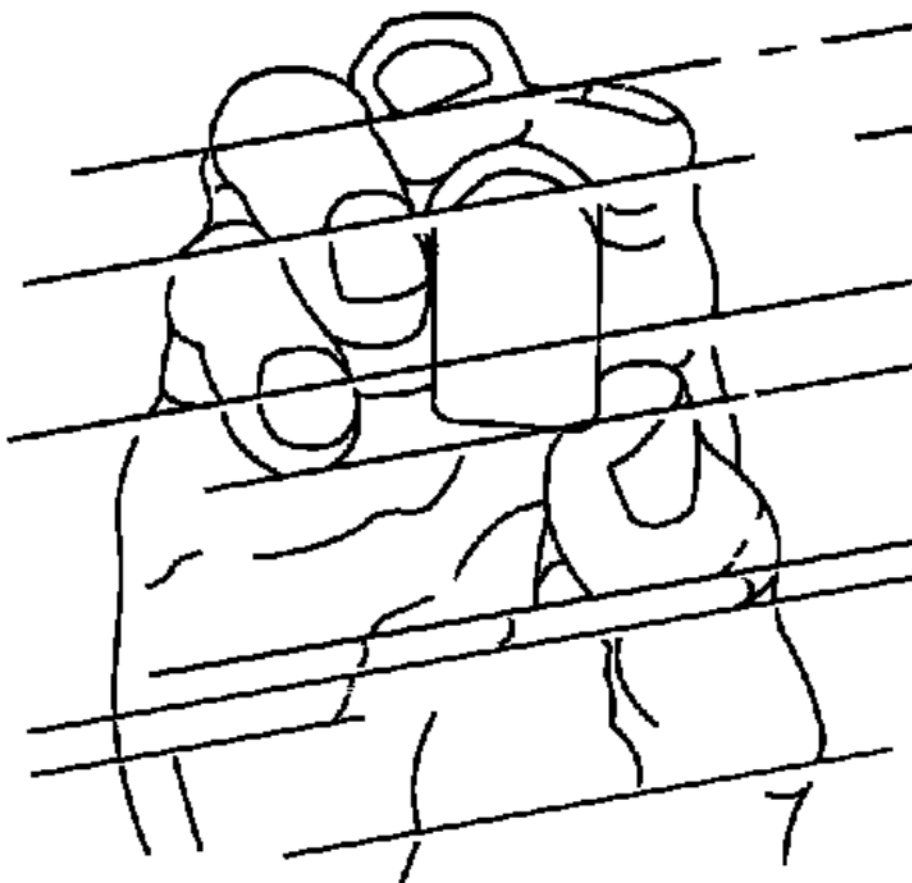


Fig. 22: Installing Mirror Mounting Base
Courtesy of GENERAL MOTORS COMPANY

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.

INSIDE REARVIEW MIRROR WIRING HARNESS COVER REPLACEMENT

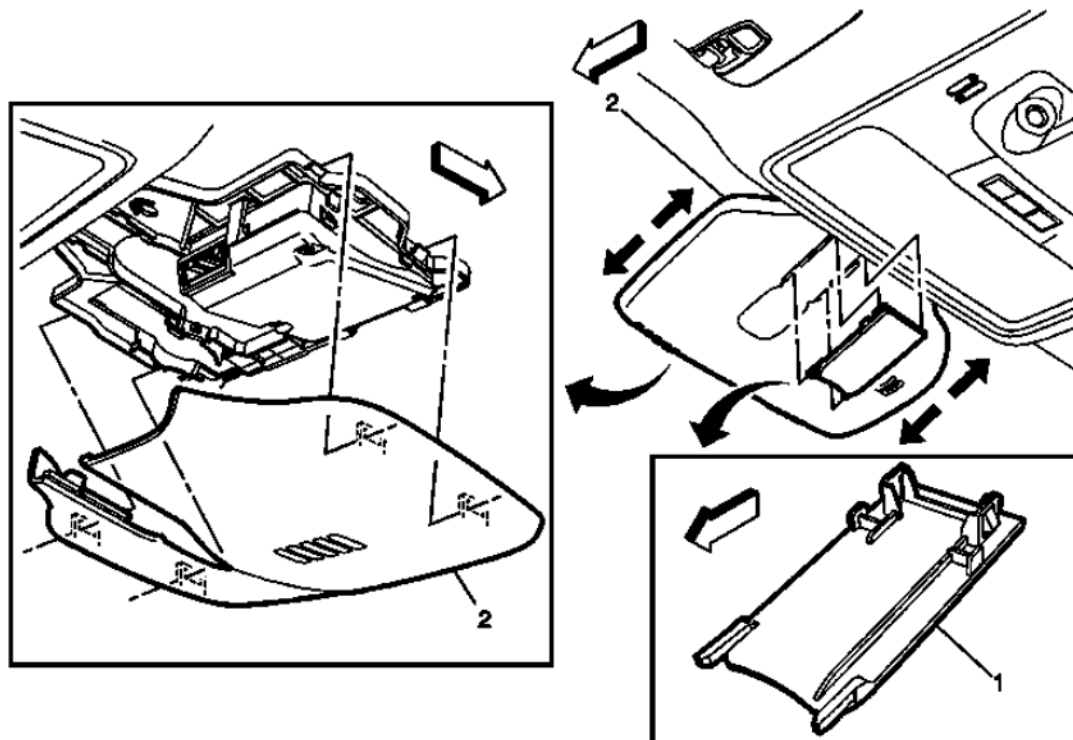


Fig. 23: Inside Rearview Mirror Mount Plate Cover
Courtesy of GENERAL MOTORS COMPANY

Inside Rearview Mirror Wiring Harness Cover Replacement

Callout	Component Name
1	Inside Rearview Mirror Wiring Harness Center Cover
	Procedure 1. Adjust the mirror to the full upward position. 2. Using a suitable plastic tool, insert the tool between the edge of the center cover and cover, turn the tool until the center cover releases. 3. Grasp both sides of the inside rearview mirror wiring harness cover. 4. Pushing upward on the cover, releasing the cover tabs from the windshield retainer.
2	Inside Rearview Mirror Wiring Harness Cover

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 (WITH A45)

Power Mirror System Components

The power mirror system consists of the following components:

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

Power Mirror System Controls

The outside mirror switch and 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 memory seat module through the serial data circuit. When the memory seat module receives switch inputs from the outside mirror switch, mirror output commands are sent to the appropriate switch through the serial data circuit. The outside mirror switch 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 outside mirror switch 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 outside mirror switch 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 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 (WITHOUT A45)

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 turning the switch to L position enabling the left outside mirror or turning 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.

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.