

SPECIFICATIONS > FASTENER SPECIFICATIONS

Application	Specification	
	Metric	English
Outside Rearview Mirror Gasket Fastener	3 N.m	27 lb in
Outside Rearview Mirror Inner Actuator Fastener	0.8 N.m	7 lb in
Outside Rearview Mirror Nut	10 N.m	89 lb in

SPECIFICATIONS > ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS

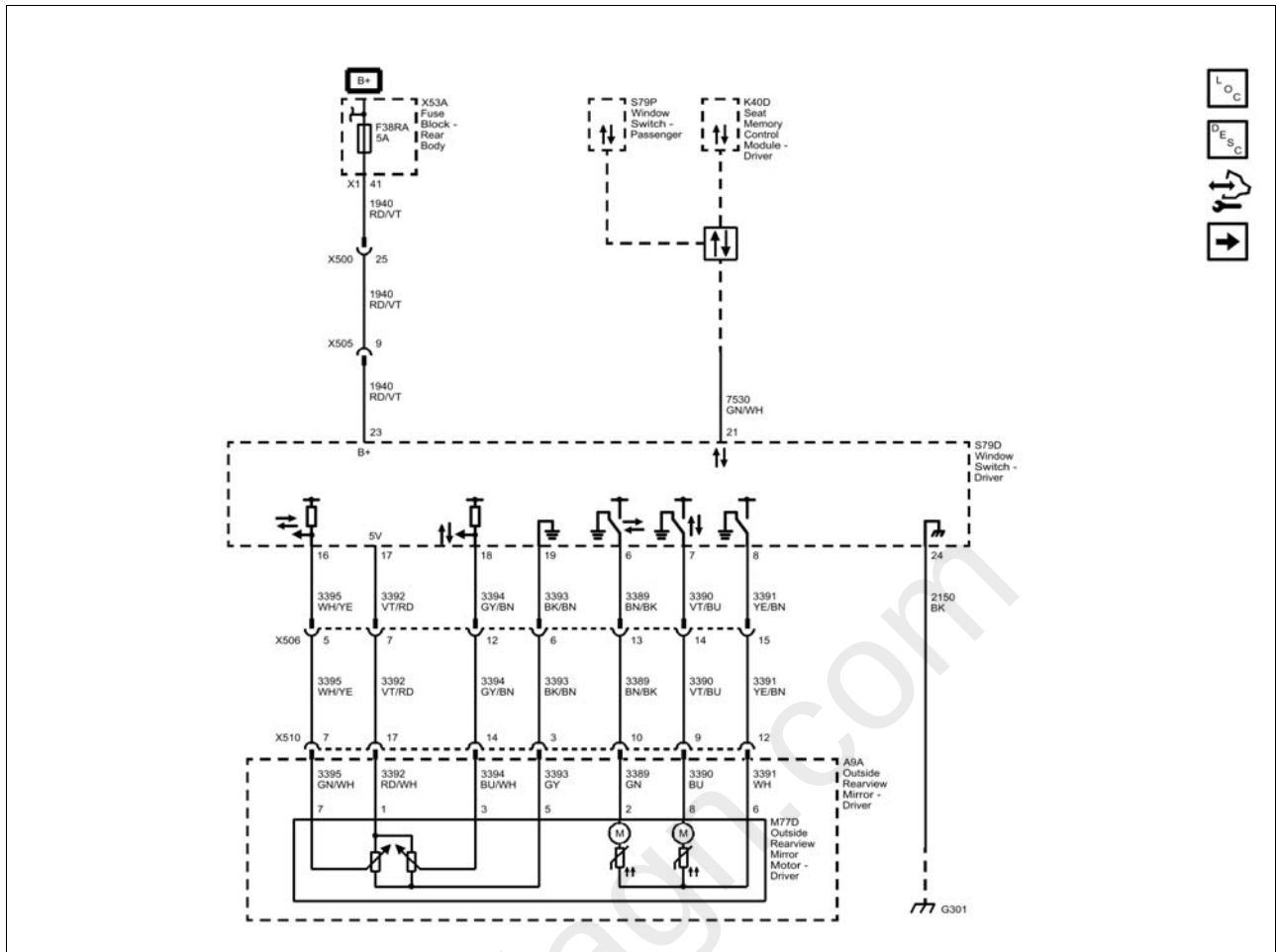
Application	Type of Material	GM Part Number		Brazil
		United States	Canada	
Inside Mirror Adhesive Kit	Adhesive	89021329	89020893	Refer to Owner's Manual.

SCHEMATIC WIRING DIAGRAMS > INSIDE REARVIEW MIRROR WIRING

SCHEMATICS > AUTO-DIMMING MIRROR (DD8)

**SCHEMATIC WIRING DIAGRAMS > OUTSIDE REARVIEW MIRROR WIRING
SCHEMATICS > CONTROLS AND DRIVER POSITION (A45)**

Fig 1: Controls and Driver Position (A45)



Courtesy of GENERAL MOTORS COMPANY

SCHEMATIC WIRING DIAGRAMS > OUTSIDE REARVIEW MIRROR WIRING SCHEMATICS > PASSENGER POSITION (A45)

Legend:

- LOC: Location
- DES: Description
- SW: Switch
- REL: Relay
- DIR: Direction

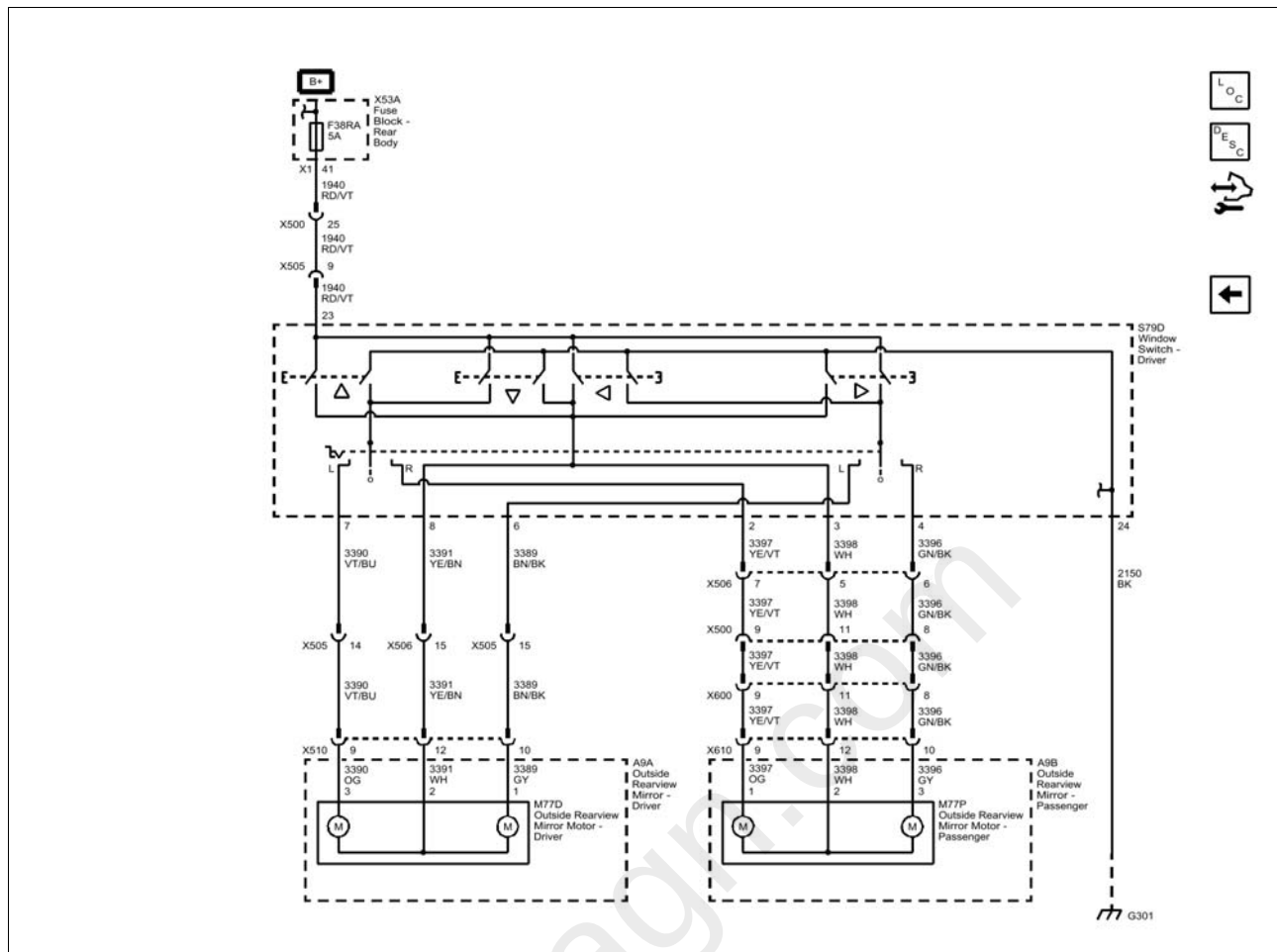
Diagram Details:

- Power Source:** B+ (Battery) connected to X1 15.
- Fuse Block:** F17UA 10A, connected to X1 15 and X600 25.
- Wiring Path:**
 - X600 25 to X606 9 (840 RD/BU).
 - X606 9 to X606 23 (840 RD/BU).
 - X606 23 to B+ (24).
 - B+ (24) to 2250 BK.
- Relays and Switches:**
 - S79D Window Switch - Driver (connected to 7530 GN/WH).
 - K40D Seat Memory Control Module - Driver (connected to 7530 GN/WH).
 - S79P Window Switch - Passenger (connected to 5V).
 - A90 Logic (connected to 5V).
 - A9B Outside Rearview Mirror - Passenger (connected to 3398 WH).
- Motor and Mirror:**
 - M77P Outside Rearview Mirror Motor - Passenger (connected to 3398 WH).
 - M77P Outside Rearview Mirror - Passenger (connected to 3398 WH).
- Wiring Connections:**
 - 3403 VT/WH (X606 6) to 3403 VT/WH (X610 7).
 - 3399 YE/RD (X606 14) to 3399 RD/WH (X610 1).
 - 3401 BU/YE (X606 12) to 3401 BU/WH (X610 3).
 - 3400 BK/GN (X606 5) to 3400 GY (X610 5).
 - 3396 GN/BK (X606 13) to 3396 GN (X610 2).
 - 3397 YE/T (X606 7) to 3397 BU (X610 8).
 - 3398 WH (X606 15) to 3398 WH (X610 6).

SCHEMATIC WIRING DIAGRAMS > OUTSIDE REARVIEW MIRROR WIRING SCHEMATICS > DIMMING AND HEATING (A45)

SCHEMATIC WIRING DIAGRAMS > OUTSIDE REARVIEW MIRROR WIRING SCHEMATICS > DRIVER AND PASSENGER POSITION (WITHOUT A45)

Fig 1: Driver and Passenger Position (without A45)



Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC INFORMATION AND PROCEDURES > DTC B154A OR B154B: MIRROR INTERNAL 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 INFORMATION AND PROCEDURES > DTC B154A OR B154B: MIRROR INTERNAL MALFUNCTION > DTC DESCRIPTORS

DTC B154A 39

Driver Mirror Internal Malfunction

DTC B154B 39

DIAGNOSTIC INFORMATION AND PROCEDURES > DTC B154A OR B154B: MIRROR INTERNAL MALFUNCTION > CIRCUIT/SYSTEM DESCRIPTION

The outside rearview mirror switch 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 outside rearview mirror switch, mirror output commands are sent to the appropriate module/switch through the serial data circuit. The outside rearview 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 rearview 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 rearview mirror switch and passenger window switch. The switches will then drive the appropriate mirror motors to the commanded position sensor settings.

DIAGNOSTIC INFORMATION AND PROCEDURES > DTC B154A OR B154B: MIRROR INTERNAL MALFUNCTION > CONDITIONS FOR RUNNING THE DTC

Battery voltage must be between 9-16 V.

DIAGNOSTIC INFORMATION AND PROCEDURES > DTC B154A OR B154B: MIRROR INTERNAL MALFUNCTION > 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.

DIAGNOSTIC INFORMATION AND PROCEDURES > DTC B154A OR B154B: MIRROR INTERNAL MALFUNCTION > ACTION TAKEN WHEN THE DTC SETS

The affected outside rearview mirror will be inoperative.

DIAGNOSTIC INFORMATION AND PROCEDURES > DTC B154A OR B154B: MIRROR INTERNAL MALFUNCTION > 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.

DIAGNOSTIC INFORMATION AND PROCEDURES > DTC B154A OR B154B: MIRROR INTERNAL MALFUNCTION > 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

DIAGNOSTIC INFORMATION AND PROCEDURES > DTC B154A OR B154B: MIRROR INTERNAL MALFUNCTION > 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.

1. **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.

1. **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.

1. **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.

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

4. All OK.

DIAGNOSTIC INFORMATION AND PROCEDURES > DTC B154A OR B154B: MIRROR INTERNAL MALFUNCTION > REPAIR INSTRUCTIONS

Perform the Diagnostic Repair Verification after completing the repair.

Outside Rearview Mirror Inner Actuator Replacement .

DIAGNOSTIC INFORMATION AND PROCEDURES > 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:
 1. There are no DTCs set.
 2. 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:
 1. Automatic Day-Night Mirror Description and Operation
 2. OnStar Description and Operation
 3. Outside Mirror Description and Operation (With A45) Outside Mirror Description and Operation (Without A45)

DIAGNOSTIC INFORMATION AND PROCEDURES > SYMPTOMS - MIRRORS > 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.

DIAGNOSTIC INFORMATION AND PROCEDURES > SYMPTOMS - MIRRORS > INTERMITTENT

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to Testing for Intermittent Conditions and Poor Connections .

DIAGNOSTIC INFORMATION AND PROCEDURES > SYMPTOMS - MIRRORS > SYMPTOM LIST

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

- Automatic Day-Night Mirrors Malfunction
- Heated Mirrors Malfunction
- OnStar Button LED Malfunction
- OnStar Button Malfunction
- Power Mirror Malfunction (without A45) Power Mirror Malfunction (with A45)

DIAGNOSTIC INFORMATION AND PROCEDURES > 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 INFORMATION AND PROCEDURES > HEATED MIRRORS MALFUNCTION > 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				

DIAGNOSTIC INFORMATION AND PROCEDURES > HEATED MIRRORS MALFUNCTION > CIRCUIT/SYSTEM DESCRIPTION

The RR 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 circuits when a request is seen.

DIAGNOSTIC INFORMATION AND PROCEDURES > HEATED MIRRORS MALFUNCTION > 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

DIAGNOSTIC INFORMATION AND PROCEDURES > HEATED MIRRORS MALFUNCTION > 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.
 1. **If the E18 Rear Defogger Grid does not turn ON or OFF**
Refer to Rear Window Defogger Malfunction .
 1. **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.
 1. **If the E17D Outside Rearview Mirror Glass-Driver or the E17P Outside Rearview Mirror Glass-Passenger do not become warm**
Refer to Circuit/System Testing.
 1. **If the E17D Outside Rearview Mirror Glass-Driver or the E17P Outside Rearview Mirror Glass-Passenger become warm**
4. All OK.

DIAGNOSTIC INFORMATION AND PROCEDURES > HEATED MIRRORS MALFUNCTION > CIRCUIT/SYSTEM TESTING

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector 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 Ω between the ground circuit terminal listed below and ground.
 1. E17D Outside Rearview Mirror Glass-Driver ground circuit terminal 11
 2. E17P Outside Rearview Mirror Glass-Passenger ground circuit terminal 11
 1. **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 1. If 2 Ω or greater, repair the open/high resistance in the circuit.

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

1. If less than 10 Ω

3. Ignition ON, connect a test lamp between the control circuit terminal and the ground circuit terminal listed below:

1. E17D Outside Rearview Mirror Glass-Driver control circuit terminal 8 and ground circuit terminal 11
2. E17P Outside Rearview Mirror Glass-Passenger control circuit terminal 8 and ground circuit terminal 11

4. Verify the test lamp turns ON and OFF when commanding the Rear Defogger On and Off with a scan tool.

1. If the test lamp is always OFF

1. Ignition OFF, remove the test lamp, disconnect the harness connector at the X53A Fuse Block-Rear Body.
2. Test for infinite resistance between the control circuit and ground.
 1. If less than infinite resistance, repair the short to ground on the circuit.
 1. If infinite resistance
3. Test for less than 2 Ω in the control circuit end to end.
 1. If 2 Ω or greater, repair the open/high resistance in the circuit.
 2. If less than 2 Ω , replace the E17 Outside Rearview Mirror Glass.

1. If the test lamp is always ON

1. Ignition OFF, remove the test lamp, disconnect the harness connector at the X53A Fuse Block-Rear Body, ignition ON.
2. Test for less than 1 V between the control circuit and ground.
 1. If 1 V or greater, repair the short to voltage on the circuit.
 2. If less than 1 V, replace the X53A Fuse Block-Rear Body

1. If the test lamp turns ON and OFF

5. Test or replace the appropriate E17 Outside Rearview Mirror Glass.

DIAGNOSTIC INFORMATION AND PROCEDURES > HEATED MIRRORS MALFUNCTION > REPAIR INSTRUCTIONS

Perform the Diagnostic Repair Verification after completing the repair.

- Outside Rearview Mirror Glass Replacement
- Body Wiring Harness Junction Block Replacement

DIAGNOSTIC INFORMATION AND PROCEDURES > 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 INFORMATION AND PROCEDURES > AUTOMATIC DAY-NIGHT MIRRORS MALFUNCTION > 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	B2545 02	3	3	-
Automatic Day/Night Mirror Low Reference	-	2	2	-
Ground	-	1	-	-
1. Inside and Outside Rearview Mirror Automatic Dimming Malfunction 2. Outside Rearview Mirror Automatic Dimming Malfunction 3. Mirror Automatic Day-Night Disable Feature Malfunction				

DIAGNOSTIC INFORMATION AND PROCEDURES > AUTOMATIC DAY-NIGHT MIRRORS 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 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.

DIAGNOSTIC INFORMATION AND PROCEDURES > AUTOMATIC DAY-NIGHT MIRRORS MALFUNCTION > 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

DIAGNOSTIC INFORMATION AND PROCEDURES > AUTOMATIC DAY-NIGHT MIRRORS MALFUNCTION > CIRCUIT/SYSTEM VERIFICATION

1. Engine running, headlamps 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

1. If the A10 Inside Rearview Mirror does not dim

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

1. If the A10 Inside Rearview Mirror dims

4. Park brake applied, verify the A10 Inside Rearview Mirror face transitions from dim to bright when placing the transmission selector in R (reverse).

1. If the A10 Inside Rearview Mirror does not transition between dim and bright.

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

1. **If the A10 Inside Rearview Mirror transitions between bright and dim states**
5. Vehicle in PARK, shine a flashlight at the rear light sensor while observing the A9A Outside Rearview Mirror-Driver face.
6. Verify the A9A Outside Rearview Mirror-Driver face dims.

1. **If the A9A Outside Rearview Mirror-Driver does not dim**

Refer to Outside Rearview Mirror Dimming Malfunction.

1. **If the A9A Outside Rearview Mirror-Driver dims**

7. Engine running, park brake applied, place the transmission in REVERSE.
8. Verify the A9A Outside Rearview Mirror-Driver face transitions from dim to bright.

1. **If the A9A Outside Rearview Mirror-Driver does not transition between bright and dim states**

Refer to Outside Rearview Mirror Dimming Malfunction.

1. **If the A9A Outside Rearview Mirror-Driver transitions between bright and dim states**

9. All OK.

DIAGNOSTIC INFORMATION AND PROCEDURES > AUTOMATIC DAY-NIGHT MIRRORS MALFUNCTION > 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 Ω between the ground circuit terminal 5 and ground.

1. **If 10 Ω or greater**

1. Ignition OFF, remove the test lamp.
2. Test for less than 2 Ω in the ground circuit end to end.
1. If 2 Ω or greater, repair the open/high resistance in the circuit.
2. If less than 2 Ω , repair the open/high resistance in the ground connection.

1. **If less than 10 Ω**

3. Ignition ON.
4. Verify a test lamp illuminates between the ignition circuit terminal 2 and ground.
1. **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 Ω in the ignition circuit end to end.
 1. If 2 Ω or greater, repair the open/high resistance in the circuit.
 2. If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

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

1. 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 signal 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.

1. If the test lamp is always OFF

1. Ignition OFF, remove the test lamp, disconnect the X160 inline harness connector.
2. Test for infinite resistance between the signal circuit terminal 1 and ground.
 1. If less than infinite resistance, repair the short to ground on the circuit.
 1. If infinite resistance
3. Test for less than 2 Ω in the control circuit end to end.
 1. If 2 Ω or greater, repair the open/high resistance in the circuit.
 2. If less than 2 Ω , refer to Backup Lamps Malfunction (Automatic Transmission)Backup Lamps Malfunction (Manual Transmission) .

1. If the test lamp is always ON

1. Ignition OFF, remove the test lamp, disconnect the X160 inline harness connector, ignition ON.
2. Test for less than 1 V between the signal circuit and ground.

1. If 1 V or greater, repair the short to voltage on the circuit.
2. If less than 1 V, refer to Backup Lamps Malfunction (Automatic Transmission)Backup Lamps Malfunction (Manual Transmission)

1. If the test lamp turns ON and OFF

4. Replace the A10 Inside Rearview Mirror.

Outside Rearview Mirror Dimming Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the 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 Ω between the low reference circuit terminal 16 and ground.

1. If 10 Ω or greater

1. Ignition OFF, disconnect the harness connector at the A10 Inside Rearview Mirror.
2. Test for less than 2 Ω in the low reference circuit end to end.
 1. If 2 Ω or greater, repair the open/high resistance in the circuit.
 2. If less than 2 Ω , replace the A10 Inside Rearview Mirror.

1. If less than 10 Ω

3. Ignition ON.
4. Test for less than 1 V between the control circuit terminal 2 and ground.

1. If 1 V or greater

1. Ignition OFF, disconnect the harness connector at the A10 Inside Rearview Mirror, ignition ON.
2. Test for less than 1 V between the control circuit and ground.
 1. If 1 V or greater, repair the short to voltage on the circuit.
 2. If less than 1 V replace the A10 Inside Rearview Mirror.

1. If less than 1 V

5. 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.
6. Test for greater than 1 V between the control circuit terminal 2 and ground.

1. If 1 V or less

1. Ignition OFF, disconnect the harness connector at the A10 Inside Rearview Mirror, ignition ON.
2. Test for infinite resistance between the control circuit and ground.
 1. If less than infinite resistance, repair the short to ground on the circuit.

1. If infinite resistance
3. Test for less than 2 Ω in the control circuit end to end.
 1. If 2 Ω or greater, repair the open/high resistance in the circuit.
 2. If less than 2 Ω , test or replace the A10 Inside Rearview Mirror.

1. If greater than 1 V

7. Test or replace A9A Outside Rearview Mirror-Driver.

DIAGNOSTIC INFORMATION AND PROCEDURES > AUTOMATIC DAY-NIGHT MIRRORS MALFUNCTION > REPAIR INSTRUCTIONS

Perform the Diagnostic Repair Verification after completing the repair.

- Inside Rearview Mirror Replacement
- Outside Rearview Mirror Glass Replacement

DIAGNOSTIC INFORMATION AND PROCEDURES > 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 INFORMATION AND PROCEDURES > POWER MIRROR MALFUNCTION (WITHOUT A45) > DIAGNOSTIC FAULT INFORMATION

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Outside Rearview Mirror Switch B+	1	1	-	-
Driver Left/Right Mirror Horizontal Motor Control	1	2	2	-
Driver Left/Right Mirror Vertical Motor Control	1	2	2	-
Driver Mirror Motor Left/Up Control	1	2	2	-

Passenger Left/Right Mirror Horizontal Motor Control	1	3	3	-
Passenger Left/Right Mirror Vertical Motor Control	1	3	3	-
Passenger Mirror Motor Left/Up Control	1	2	2	-
Outside Rearview Mirror Switch Ground	-	1	-	-
1. Both Outside Power Mirrors Inoperative 2. Driver Outside Power Mirror Malfunction 3. Passenger Outside Power Mirror Malfunction				

DIAGNOSTIC INFORMATION AND PROCEDURES > POWER MIRROR MALFUNCTION (WITHOUT A45) > CIRCUIT/SYSTEM DESCRIPTION

The outside rearview mirror switch controls the functions of 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 and when a movement position switch is selected, B+ is sent to the mirror via a motor control circuit. The opposite motor control circuit acts as a ground circuit for the bi-directional mirror motor.

DIAGNOSTIC INFORMATION AND PROCEDURES > POWER MIRROR MALFUNCTION (WITHOUT A45) > 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

DIAGNOSTIC INFORMATION AND PROCEDURES > POWER MIRROR MALFUNCTION (WITHOUT A45) > CIRCUIT/SYSTEM VERIFICATION

1. Verify the A9A Outside Rearview Mirror-Driver and the A9B Outside Rearview Mirror-Passenger operates UP, DOWN, LEFT and RIGHT with the S79D Window Switch - Driver.

1. **If both the A9A Outside Rearview Mirror-Driver and the A9B Outside Rearview Mirror-Passenger do not move**

Refer to Circuit/System Testing - Both Outside Mirrors Inoperative.

1. **If only the A9A Outside Rearview Mirror-Driver or the A9B Outside Rearview Mirror-Passenger does not move UP, DOWN, LEFT or RIGHT**

Refer to Circuit/System Testing - Single Outside Mirror Malfunction.

1. **If both the A9A Outside Rearview Mirror-Driver and the A9B Outside Rearview Mirror-Passenger move UP, DOWN, LEFT and RIGHT**

2. All OK.

DIAGNOSTIC INFORMATION AND PROCEDURES > POWER MIRROR MALFUNCTION (WITHOUT A45) > CIRCUIT/SYSTEM TESTING

Both Outside Mirrors Inoperative

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S79D Window Switch - Driver. It may take up to 2 minutes for all vehicle systems to power down.

2. Test for less than 10 Ω between the ground circuit terminal 24 and ground.

1. **If 10 Ω or greater**

1. Ignition OFF.

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

1. If 2 Ω or greater, repair the open/high resistance in the circuit.

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

1. **If less than 10 Ω**

3. Verify a test lamp illuminates between the B+ circuit terminal 23 and ground.

1. **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition OFF.

2. Test for less than 2 Ω in the B+ circuit end to end.

1. If 2 Ω or greater, repair the open/high resistance in the circuit.

2. If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

1. 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.
 1. If less than infinite resistance, repair the short to ground on the circuit.
 1. If infinite resistance
3. Test for infinite resistance between each of the control circuit terminals listed below and ground:
 1. Terminal 2 control circuit
 2. Terminal 3 control circuit
 3. Terminal 4 control circuit
 4. Terminal 6 control circuit
 5. Terminal 7 control circuit
 6. Terminal 8 control circuit
 1. If less than infinite resistance, repair the short to ground on the circuit.
 2. If infinite resistance, test or replace the appropriate M77 Outside Rearview Mirror Motor.

1. If the test lamp illuminates

4. Test or replace the S79D Window Switch - Driver.

Single Outside Mirror Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate A9 Outside Rearview Mirror. Ignition ON.
2. Connect a test lamp between the control circuit terminal 9 and the control circuit terminal 12.
3. Verify the test lamp illuminates when commanding the UP and DOWN functions with the S79D Window Switch - Driver.

1. If the test lamp does not illuminate during either of the UP and DOWN commands

1. Ignition OFF, remove the test lamp, disconnect the harness connector at the S79D Window Switch - Driver.
2. Test for infinite resistance between each control circuit and ground.
 1. If less than infinite resistance, repair the short to ground on the circuit.
 1. If infinite resistance
3. Test for less than 2 Ω in each control circuit end to end.
 1. If 2 Ω or greater, repair the open/high resistance in the circuit.

2. If less than 2 Ω , replace at the S79D Window Switch - Driver.

1. If the test lamp is always ON

4. Ignition OFF, remove the test lamp, disconnect the harness connector at the S79D Window Switch - Driver, ignition ON.

5. Test for less than 1 V between each control circuit and ground.

1. If 1 V or greater, repair the short to voltage on the circuit.

2. If less than 1 V, replace the S79D Window Switch - Driver.

1. If the test lamp illuminates during UP and DOWN the commands

4. Connect a test lamp between the control circuit terminal 10 and the control circuit terminal 12.

5. Verify the test lamp illuminates when commanding the LEFT and RIGHT functions with the S79D Window Switch - Driver.

1. If the test lamp does not illuminate during either of the LEFT and RIGHT commands

1. Ignition OFF, remove the test lamp, disconnect the harness connector at the S79D Window Switch - Driver.

2. Test for infinite resistance between each control circuit and ground.

1. If less than infinite resistance, repair the short to ground on the circuit.

1. If infinite resistance

3. Test for less than 2 Ω in each control circuit end to end.

1. If 2 Ω or greater, repair the open/high resistance in the circuit.

2. If less than 2 Ω , replace at the S79D Window Switch - Driver.

1. If the test lamp is always ON

4. Ignition OFF, remove the test lamp, disconnect the harness connector at the S79D Window Switch - Driver, ignition ON.

5. Test for less than 1 V between each control circuit and ground.

1. If 1 V or greater, repair the short to voltage on the circuit.

2. If less than 1 V, replace the S79D Window Switch - Driver.

1. If the test lamp illuminates during the LEFT and RIGHT commands

6. Test or replace the M77 Outside Rearview Mirror Motor.

Perform the Diagnostic Repair Verification after completing the repair.

- Front Side Door Window Control Switch Replacement
- Outside Rearview Mirror Inner Actuator Replacement

DIAGNOSTIC INFORMATION AND PROCEDURES > 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 INFORMATION AND PROCEDURES > POWER MIRROR MALFUNCTION (WITH A45) > DIAGNOSTIC FAULT INFORMATION

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
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	-	1	-	-
1. Power Mirror Malfunction				

DIAGNOSTIC INFORMATION AND PROCEDURES > POWER MIRROR MALFUNCTION (WITH A45) > CIRCUIT/SYSTEM DESCRIPTION

The outside mirror switch (which is part of the driver window 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.

DIAGNOSTIC INFORMATION AND PROCEDURES > POWER MIRROR MALFUNCTION (WITH A45) > REFERENCE INFORMATION

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

INLINE HARNESS 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

DIAGNOSTIC INFORMATION AND PROCEDURES > POWER MIRROR MALFUNCTION (WITH A45) > CIRCUIT/SYSTEM VERIFICATION

1. Ignition ON.

2. Verify the scan tool Mirror Select Switch parameter changes between Left, Right, and None when cycling the S79D Window Switch - Driver between the LEFT, RIGHT, and NONE positions.

1. **If the parameter does not cycle between the specified values**

Replace the S79D Window Switch - Driver.

1. **If the parameter does cycle between the specified values**

3. Verify the scan tool Mirror Direction Command parameter changes between Up, Down, Right and Left while cycling the S79D Window Switch - Driver UP, DOWN, RIGHT and LEFT.

1. **If the parameter does not cycle between the specified values**

Replace the S79D Window Switch - Driver.

1. **If the parameter does cycle between the specified values**

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.

1. **If the A9A Outside Rearview Mirror-Driver does not move RIGHT or LEFT or UP or DOWN**

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

1. **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.

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

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

1. **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.

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

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

1. **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.

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

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

1. **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.

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

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

1. **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.

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

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

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

10. Verify the A9A Outside Rearview Mirror-Driver and A9B Outside Rearview Mirror-Passenger adjust to the stored memory positions when operating the S47D Driver Seat Memory Switch.

1. **If a A9 Outside Rearview Mirror does not adjust to the stored memory position**

- Refer to Memory Seat Feature Malfunction .

1. **If the A9A Outside Rearview Mirror-Driver and A9B Outside Rearview Mirror-Passenger adjust to the stored memory positions**

11. All OK.

DIAGNOSTIC INFORMATION AND PROCEDURES > POWER MIRROR MALFUNCTION (WITH A45) > CIRCUIT/SYSTEM TESTING

Driver Outside Mirror Movement Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S79D Window Switch - Driver. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 24 and ground.

1. **If 10 Ω or greater**

1. Ignition OFF.

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

1. If 2 Ω or greater, repair the open/high resistance in the circuit.

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

1. **If less than 10 Ω**

3. Ignition ON.

4. Verify a test lamp illuminates between the B+ circuit terminal 23 and ground.

1. If the test lamp does not illuminate and the circuit fuse is good

1. Ignition OFF.
2. Test for less than 2 Ω in the B+ circuit end to end.
 1. If 2 Ω or greater, repair the open/high resistance in the circuit.
 2. If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

1. 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.
 1. If less than infinite resistance, repair the short to ground on the circuit.
 1. If infinite resistance
3. Test for infinite resistance between the control circuits listed below and ground:
 1. Control circuit terminal 6
 2. Control circuit terminal 7
 3. Control circuit terminal 8
 1. If less than infinite resistance, repair the short to ground on the circuit.
 2. If infinite resistance, replace the S79D Window Switch - Driver.

1. If the test lamp illuminates

5. Ignition OFF, connect the harness connector at the S79D Window Switch - Driver and disconnect the X510 inline harness connector at the A9A Outside Rearview Mirror-Driver.
Ignition ON

6. Connect a test lamp between the control circuit terminal 12 and control circuit terminal 9.

7. Verify the test lamp turns ON when commanding the Up and Down states with a scan tool.

1. If the test lamp remains OFF during either of the commands

1. Ignition OFF, remove the test lamp, disconnect the harness connector at the S79D Window Switch - Driver.
2. Test for infinite resistance between each control circuit and ground.
 1. If less than infinite resistance, repair the short to ground on the circuit.
 1. If infinite resistance
3. Test for less than 2 Ω in each control circuit end to end.
 1. If 2 Ω or greater, repair the open/high resistance in the circuit.

2. If less than 2 Ω , replace the S79D Window Switch - Driver.

1. If the test lamp is always ON

1. Ignition OFF, remove the test lamp, disconnect the harness connector at the S79D Window Switch - Driver, ignition ON.

2. Test for less than 1 V between each control circuit and ground.

1. If 1 V or greater, repair the short to voltage on the circuit.

2. If less than 1 V, replace the S79D Window Switch - Driver.

1. If the test lamp turns ON during each of the commands

8. Connect a test lamp between the control circuit terminal 12 and control circuit terminal 10.

9. Verify the test lamp turns ON when commanding the Left and Right states with a scan tool.

1. If the test lamp remains OFF during either of the commands

1. Ignition OFF, remove the test lamp, disconnect the harness connector at the S79D Window Switch - Driver.

2. Test for infinite resistance between each control circuit and ground.

1. If less than infinite resistance, repair the short to ground on the circuit.

1. If infinite resistance

3. Test for less than 2 Ω in each control circuit end to end.

1. If 2 Ω or greater, repair the open/high resistance in the circuit.

2. If less than 2 Ω , replace the S79D Window Switch - Driver.

1. If the test lamp is always ON

1. Ignition OFF, remove the test lamp, disconnect the harness connector at the S79D Window Switch - Driver, ignition ON.

2. Test for less than 1 V between each control circuit and ground.

1. If 1 V or greater, repair the short to voltage on the circuit.

2. If less than 1 V, replace the S79D Window Switch - Driver.

1. If the test lamp turns ON during each of the commands

10. 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 Ω between the low reference circuit terminal 3 and ground.

1. If 10 Ω or greater

1. Ignition OFF, disconnect the harness connector at the S79D Window Switch - Driver.
2. Test for less than 2 Ω in the low reference circuit end to end.
 1. If 2 Ω or greater, repair the open/high resistance in the circuit.
 2. If less than 2 Ω , replace the S79D Window Switch - Driver.

1. If less than 10 Ω

3. Ignition ON.
4. Test for 4.8-5.2 V between the 5 V reference circuit terminal 17 and ground.

1. If less than 4.8 V

1. Ignition OFF, disconnect the harness connector at the S79D Window Switch - Driver.
2. Test for infinite resistance between the 5 V reference circuit and ground.
 1. If less than infinite resistance, repair the short to ground on the circuit.
 1. If infinite resistance
3. Test for less than 2 Ω in the 5 V reference circuit end to end.
 1. If 2 Ω or greater, repair the open/high resistance in the circuit.
 2. If less than 2 Ω , replace the S79D Window Switch - Driver.

1. If greater than 5.2 V

1. Ignition OFF, disconnect the harness connector at the S79D Window Switch - Driver, ignition ON.
2. Test for less than 1 V between the 5 V reference circuit and ground.
 1. If 1 V or greater, repair the short to voltage on the circuit.
 2. If less than 1 V, replace the S79D Window Switch - Driver.

1. If between 4.8-5.2 V

5. Verify the scan tool Driver Mirror Vertical Position parameter is less than 4.6 V.

1. If 4.6 V or greater

1. Ignition OFF, disconnect the X1 harness connector at the S79D Window Switch - Driver, ignition ON.
2. Test for less than 1 V between the signal circuit terminal 18 and ground.
 1. If 1 V or greater, repair the short to voltage on the circuit.
 2. If less than 1 V, replace the S79D Window Switch - Driver.

1. If less than 4.6 V

6. Install a 3 A fused jumper wire between the signal circuit terminal 18 and the 5 V reference circuit terminal 17.

7. Verify the scan tool Driver Mirror Vertical Position parameter is greater than 0.6 V.

1. If 0.6 V or less

1. Ignition OFF, remove the jumper wire, disconnect the harness connector at the S79D Window Switch - Driver.

2. Test for infinite resistance between the signal circuit terminal 18 and ground.

1. If less than infinite resistance, repair the short to ground on the circuit.

1. If infinite resistance

3. Test for less than 2 Ω in the signal circuit end to end.

1. If 2 Ω or greater, repair the open/high resistance in the circuit.

2. If less than 2 Ω , replace the S79D Window Switch - Driver.

1. If greater than 0.6 V

8. Verify the scan tool Driver Mirror Horizontal Position parameter is less than 4.6 V.

1. If 4.6 V or greater

1. Ignition OFF, disconnect the harness connector at the S79D Window Switch - Driver, ignition ON.

2. Test for less than 1 V between the signal circuit terminal 16 and ground.

1. If 1 V or greater, repair the short to voltage on the circuit.

2. If less than 1 V, replace the S79D Window Switch - Driver.

1. If less than 4.6 V

9. Install a 3 A fused jumper wire between the signal circuit terminal 16 and the 5 V reference circuit terminal 17.

10. Verify the scan tool Driver Mirror Horizontal Position parameter is greater than 0.6 V.

1. If 0.6 V or less

1. Ignition OFF, remove the jumper wire, disconnect the harness connector at the S79D Window Switch - Driver.

2. Test for infinite resistance between the signal circuit terminal 16 and ground.

1. If less than infinite resistance, repair the short to ground on the circuit.

1. If infinite resistance

3. Test for less than 2 Ω in the signal circuit end to end.

1. If 2 Ω or greater, repair the open/high resistance in the circuit.

2. If less than 2 Ω , replace the S79D Window Switch - Driver.

1. 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 9 and control circuit terminal 12.
3. Verify the test lamp turns ON when commanding the Up and Down states with a scan tool.

1. 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.
 1. If less than infinite resistance, repair the short to ground on the circuit.
 1. If infinite resistance
3. Test for less than 2 Ω in each control circuit end to end.
 1. If 2 Ω or greater, repair the open/high resistance in the circuit.
 2. If less than 2 Ω , replace the S79P Window Switch-Passenger.

1. 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.
 1. If 1 V or greater, repair the short to voltage on the circuit.
 2. If less than 1 V, replace the S79P Window Switch-Passenger

1. If the test lamp turns ON during each of the commands

4. Connect a test lamp between the control circuit terminal 10 and control circuit terminal 12.
5. Verify the test lamp turns ON when commanding the Left and Right states with a scan tool.

1. If the test lamp remains OFF during either of the commands

1. Ignition OFF, remove the test lamp, disconnect the harness connector at the S79P Window Switch-Passenger.
2. Test for infinite resistance between each control circuit and ground.
 1. If less than infinite resistance, repair the short to ground on the circuit.
 1. If infinite resistance

3. Test for less than 2 Ω in each control circuit end to end.

1. If 2 Ω or greater, repair the open/high resistance in the circuit.
2. If less than 2 Ω , replace the S79P Window Switch-Passenger.

1. If the test lamp is always ON

1. Ignition OFF, remove the test lamp, disconnect the harness connector at the S79P Window Switch-Passenger, ignition ON.
2. Test for less than 1 V between each control circuit and ground.
 1. If 1 V or greater, repair the short to voltage on the circuit.
 2. If less than 1 V, replace the S79P Window Switch-Passenger

1. 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 Ω between the low reference circuit terminal 3 and ground.

1. If 10 Ω or greater

1. Ignition OFF, disconnect the harness connector at the S79P Window Switch-Passenger.
2. Test for less than 2 Ω in the low reference circuit end to end.
 1. If 2 Ω or greater, repair the open/high resistance in the circuit.
 2. If less than 2 Ω , replace the S79P Window Switch-Passenger.

1. If less than 10 Ω

3. Ignition ON.
4. Test for 4.8-5.2 V between the 5 V reference circuit terminal 17 and ground.

1. If less than 4.8 V

1. Ignition OFF, disconnect the harness connector at the S79P Window Switch-Passenger.
2. Test for infinite resistance between the 5 V reference circuit and ground.
 1. If less than infinite resistance, repair the short to ground on the circuit.
 1. If infinite resistance
3. Test for less than 2 Ω in the 5 V reference circuit end to end.

1. If 2 Ω or greater, repair the open/high resistance in the circuit.
2. If less than 2 Ω , replace the S79P Window Switch-Passenger.

1. If greater than 5.2 V

1. Ignition OFF, disconnect the 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.
 1. If 1 V or greater, repair the short to voltage on the circuit.
 2. If less than 1 V, replace the S79P Window Switch-Passenger.

1. If between 4.8-5.2 V

5. Verify the scan tool Passenger Mirror Vertical Position parameter is less than 4.6 V.

1. If 4.6 V or greater

1. Ignition OFF, disconnect the harness connector at the S79P Window Switch-Passenger, ignition ON.
2. Test for less than 1 V between the signal circuit terminal 7 and ground.
 1. If 1 V or greater, repair the short to voltage on the circuit.
 2. If less than 1 V, replace the S79P Window Switch-Passenger.

1. If less than 4.6 V

6. Install a 3 A fused jumper wire between the signal circuit terminal 7 and the 5 V reference circuit terminal 6.

7. Verify the scan tool Passenger Mirror Vertical Position parameter is greater than 0.6 V.

1. 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 7 and ground.
 1. If less than infinite resistance, repair the short to ground on the circuit.
 1. If infinite resistance
3. Test for less than 2 Ω in the signal circuit end to end.
 1. If 2 Ω or greater, repair the open/high resistance in the circuit.
 2. If less than 2 Ω , replace the S79P Window Switch-Passenger.

1. If greater than 0.6 V

8. Verify the scan tool Passenger Mirror Horizontal Position parameter is less than 4.6 V.

1. If 4.6 V or greater

1. Ignition OFF, disconnect the harness connector at the S79P Window Switch-Passenger, ignition ON.
2. Test for less than 1 V between the signal circuit terminal 9 and ground.
 1. If 1 V or greater, repair the short to voltage on the circuit.
 2. If less than 1 V, replace the S79P Window Switch-Passenger.

1. If less than 4.6 V

9. Install a 3 A fused jumper wire between the signal circuit terminal 9 and the 5 V reference circuit terminal 6.
10. Verify the scan tool Passenger Mirror Horizontal Position parameter is greater than 0.6 V.

1. If 0.6 V or less

1. Ignition OFF, remove the jumper wire, disconnect the harness connector at the S79P Window Switch-Passenger.
2. Test for infinite resistance between the signal circuit terminal 9 and ground.
 1. If less than infinite resistance, repair the short to ground on the circuit.
 1. If infinite resistance
3. Test for less than 2 Ω in the signal circuit end to end.
 1. If 2 Ω or greater, repair the open/high resistance in the circuit.
 2. If less than 2 Ω , replace the S79P Window Switch-Passenger.

1. If greater than 0.6 V

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

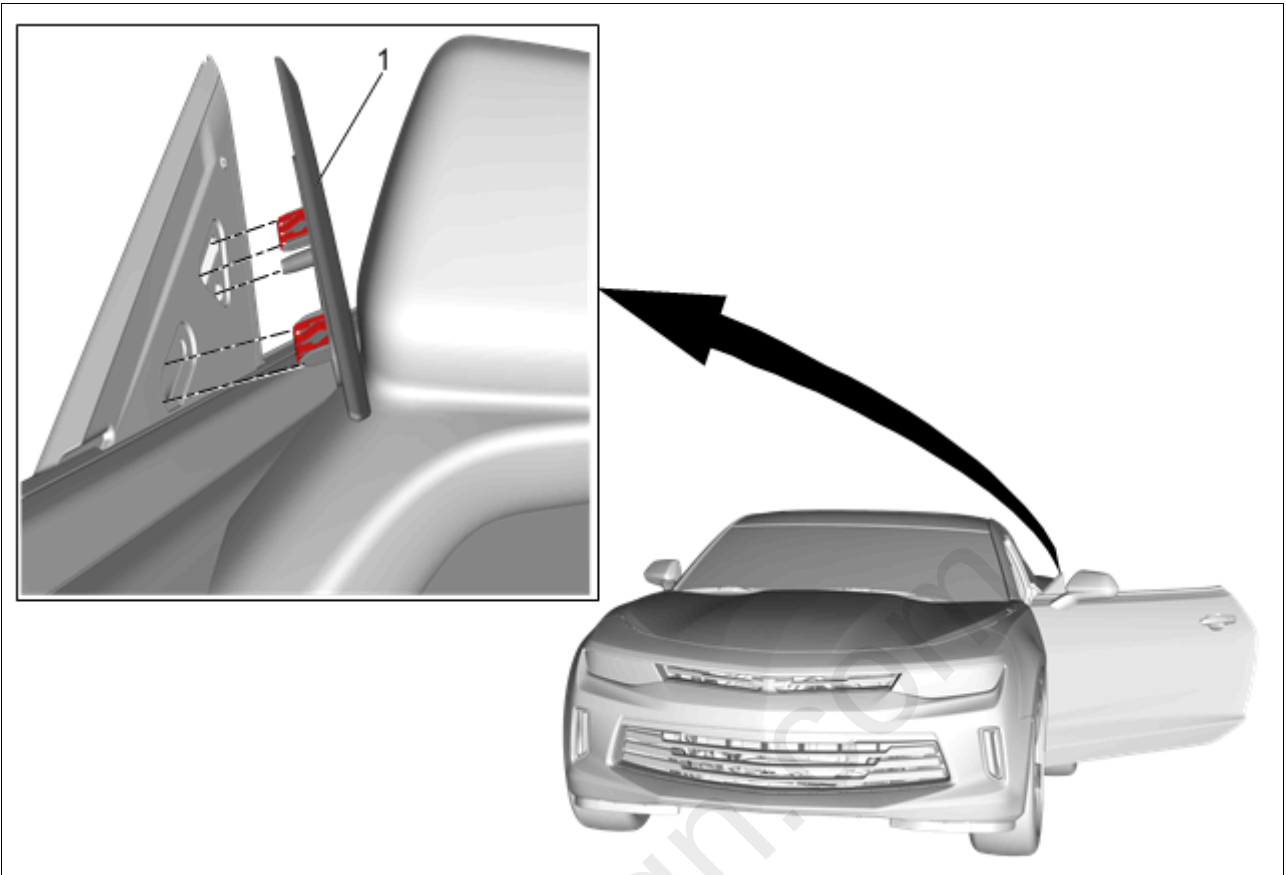
DIAGNOSTIC INFORMATION AND PROCEDURES > POWER MIRROR MALFUNCTION (WITH A45) > REPAIR INSTRUCTIONS

Perform the Diagnostic Repair Verification after completing the repair.

- Front Side Door Window Control Switch Replacement
- Outside Rearview Mirror Inner Actuator Replacement
- Front Side Door Window Switch Replacement - Right Side

REPAIR INSTRUCTIONS > OUTSIDE REARVIEW MIRROR APPLIQUE REPLACEMENT

Fig 1: Outside Rearview Mirror Applique

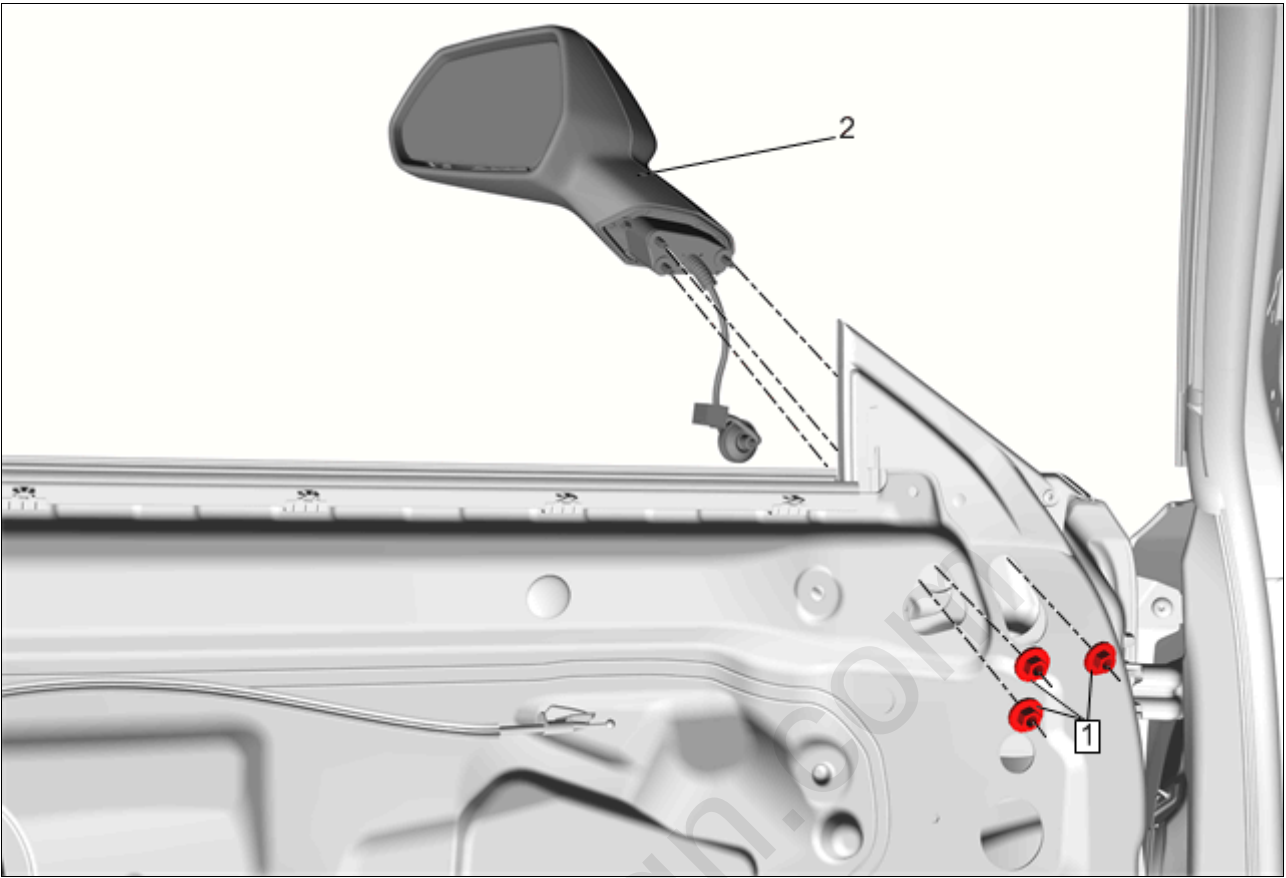


Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Outside Rearview Mirror Applique Procedure Using the appropriate tool, remove the outside rearview mirror applique from the weatherstrip.

REPAIR INSTRUCTIONS > OUTSIDE REARVIEW MIRROR REPLACEMENT

Fig 1: Outside Rearview Mirror



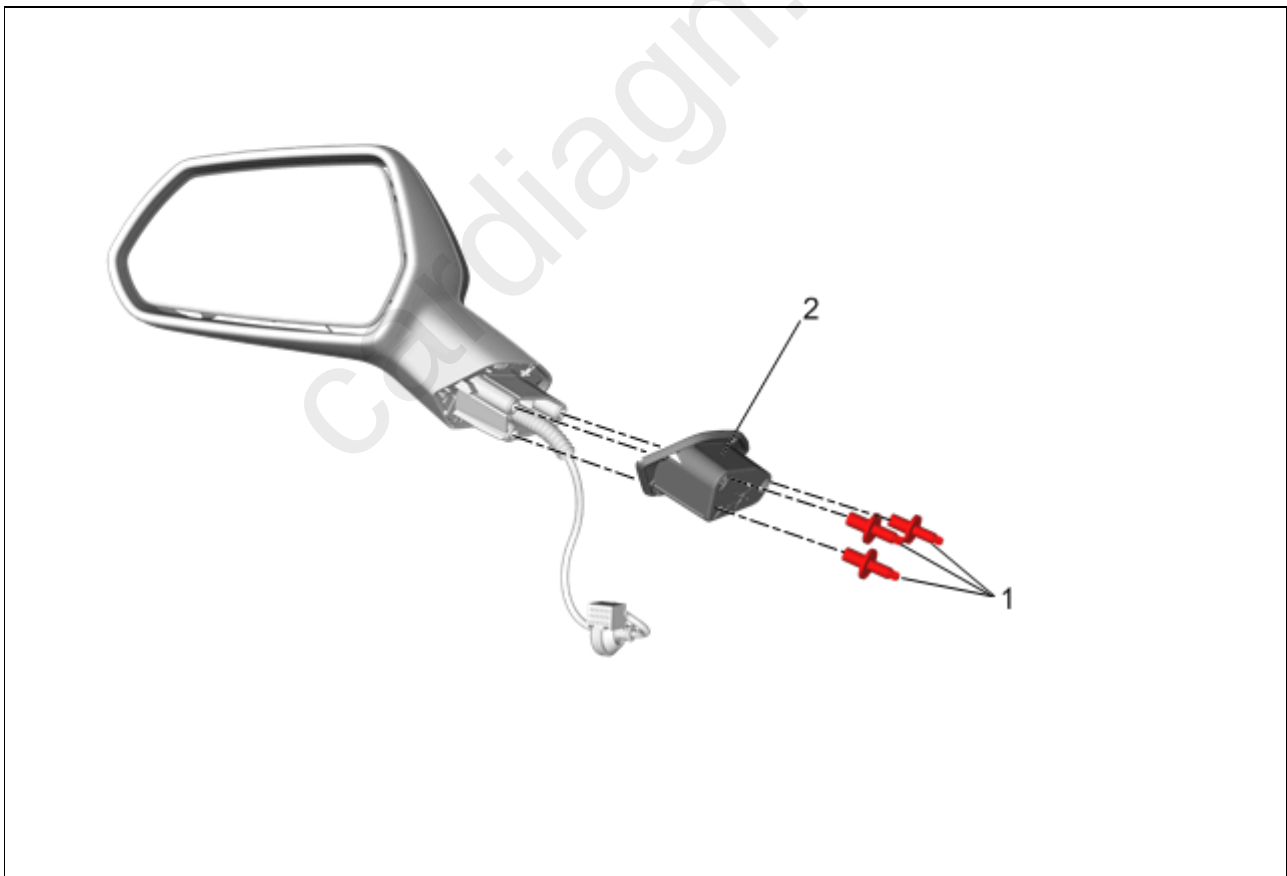
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: <i>Refer to Glass and Sheet Metal Handling Warning .</i>	
Preliminary Procedure Front Side Door Trim Replacement	

	Outside Rearview Mirror Nut <p01> CAUTION: <i>Refer to Fastener Caution .</i>
1	Procedure 1. Remove mirror nut access covers. 2. Disconnect the electrical connector. Tighten 10 N.m (89 lb in)
2	Outside Rearview Mirror

REPAIR INSTRUCTIONS > OUTSIDE REARVIEW MIRROR GASKET REPLACEMENT

Fig 1: Outside Rearview Mirror Gasket

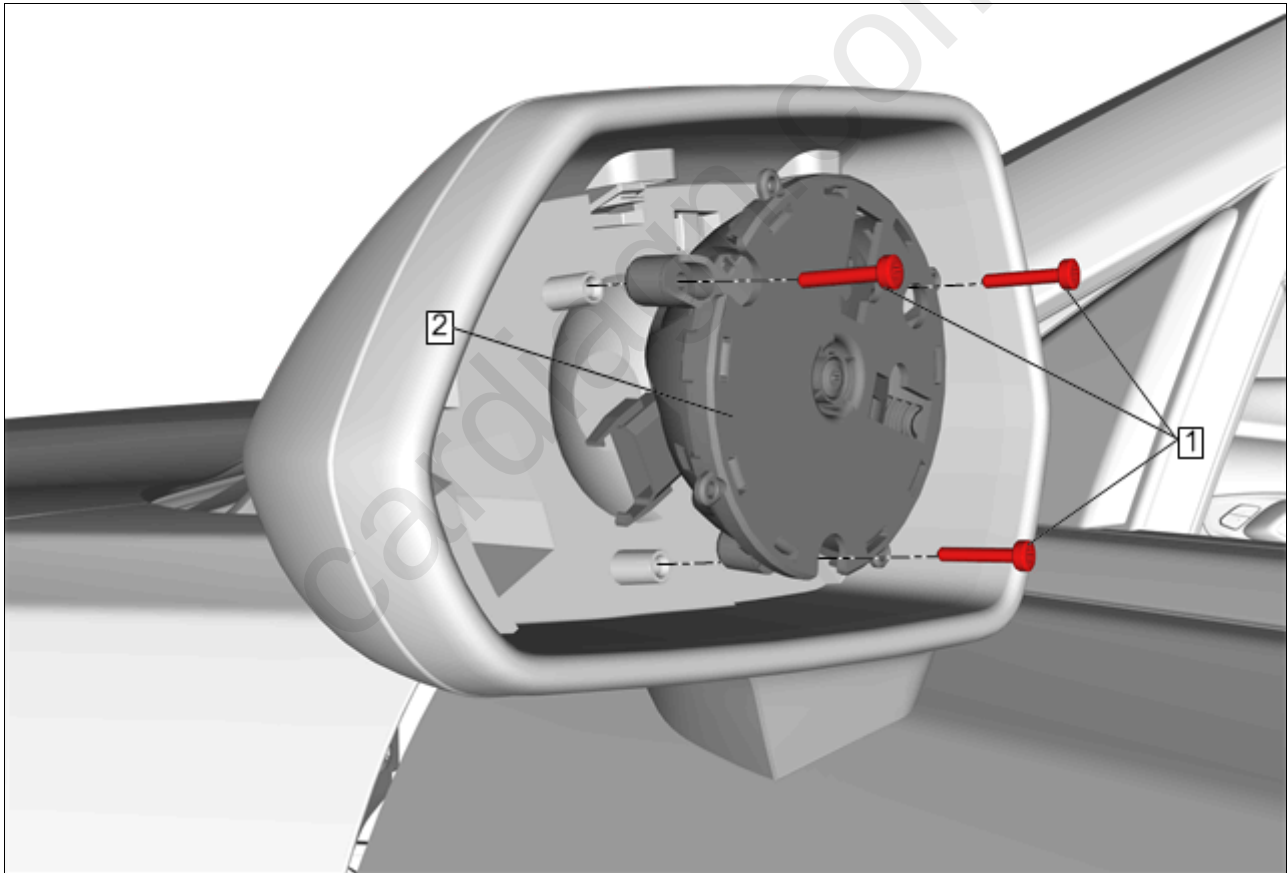


Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Outside Rearview Mirror Replacement	
1	Outside Rearview Mirror Gasket Fastener <p01> Tighten 3 N.m (27 lb in)
2	Outside Rearview Mirror Gasket Procedure Inspect the mirror and window for proper operation before install the trim panel.

REPAIR INSTRUCTIONS > OUTSIDE REARVIEW MIRROR INNER ACTUATOR REPLACEMENT

Fig 1: Outside Rearview Mirror Inner Actuator



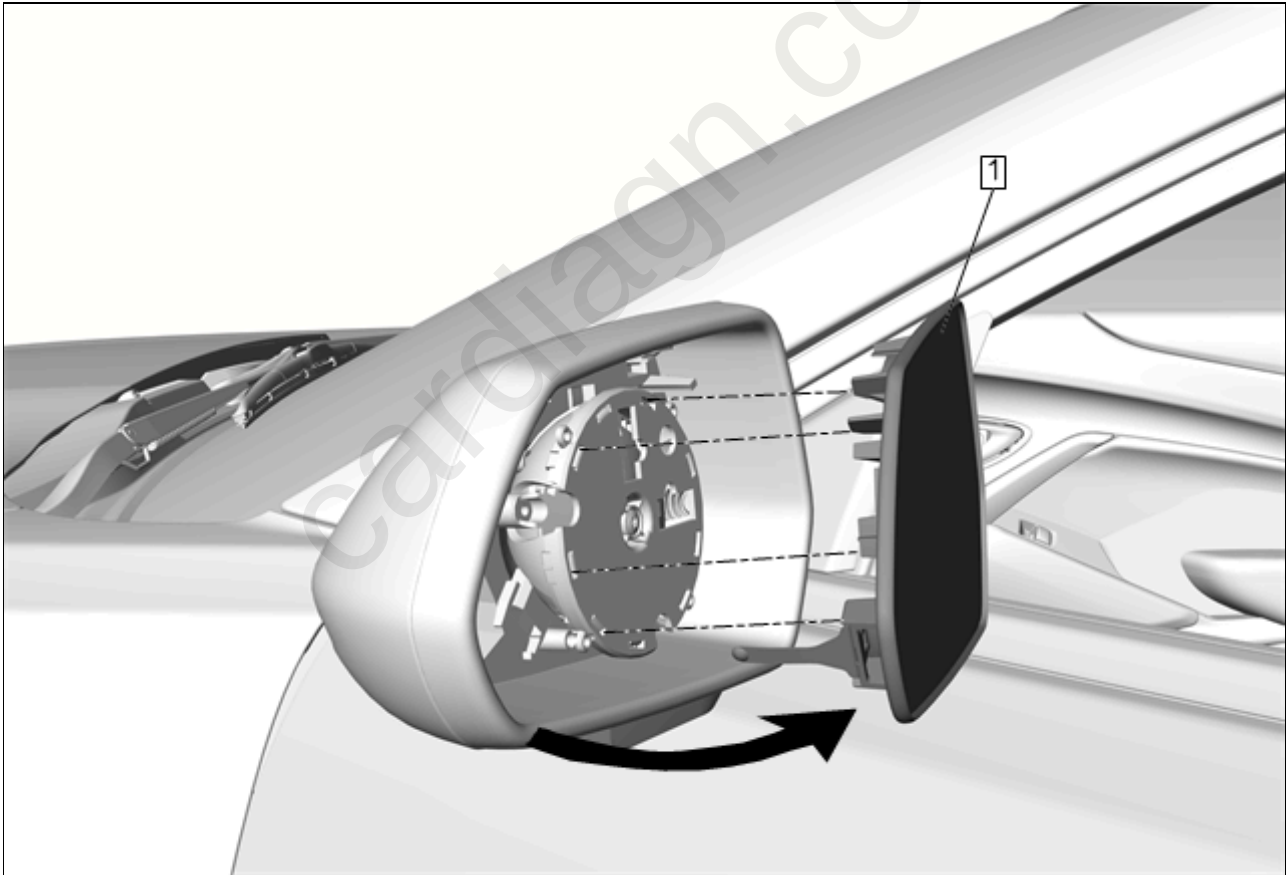
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Outside Rearview Mirror Glass Replacement	

1	Outside Rearview Mirror Inner Actuator Fastener<p01> CAUTION: <i>Refer to Fastener Caution .</i> Procedure Disconnect the electrical connector. Tighten 0.8 N.m (7 lb in)
2	Outside Rearview Mirror Inner Actuator

REPAIR INSTRUCTIONS > OUTSIDE REARVIEW MIRROR GLASS REPLACEMENT

Fig 1: Outside Rearview Mirror Glass



Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Outside Rearview Mirror Glass

WARNING:

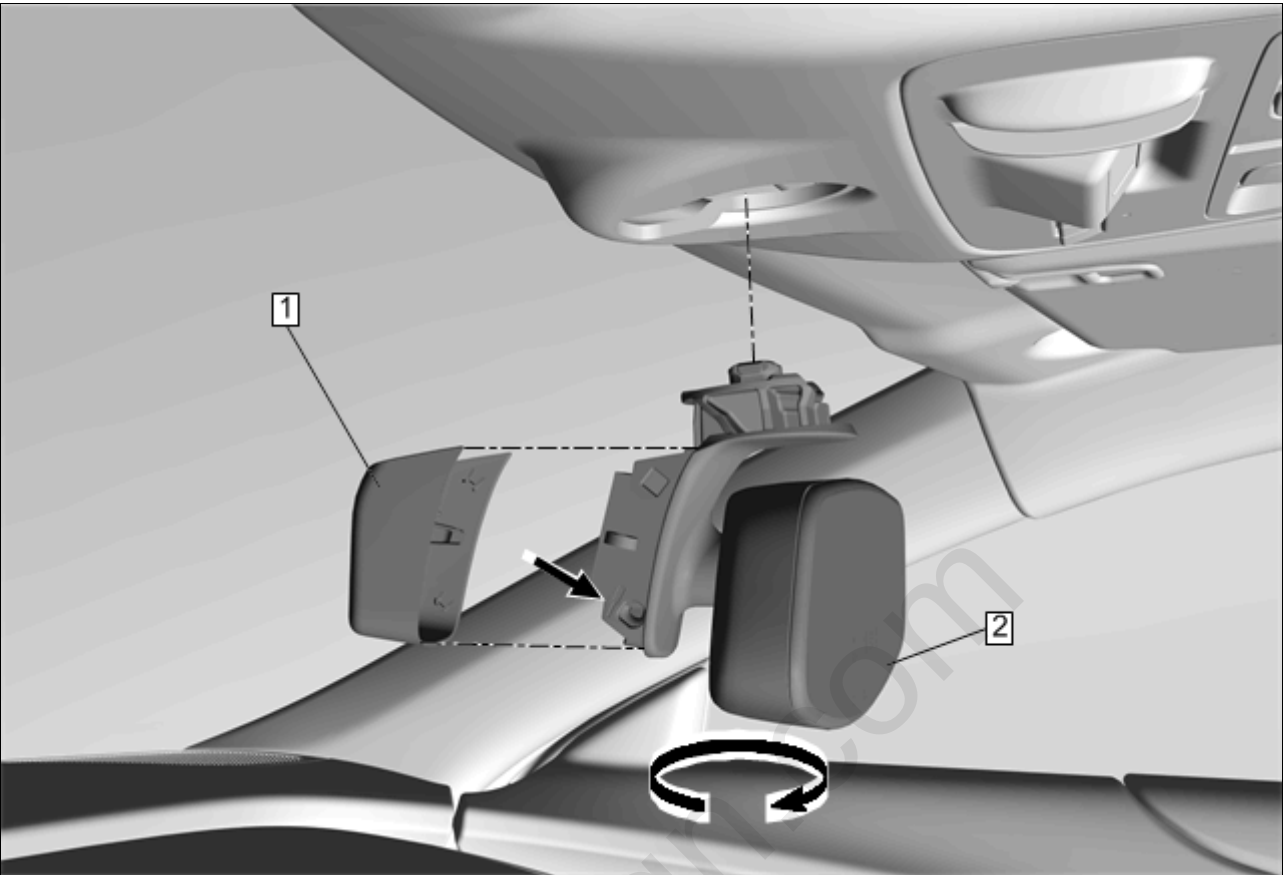
Approved safety glasses and gloves should be worn when performing this procedure to reduce the chance of personal injury.

Procedure

1. Place masking tape over the mirror glass.
2. Carefully push the outside rearview mirror glass upward and into the inside corner of the mirror housing, allowing access to the bottom edge.
3. Grasp the bottom edge of the mirror glass firmly, lift it up and pull rearward until the mirror glass retainers release the actuator motor ring.
4. Disconnect all electrical connectors.
5. Place the mirror glass in line with the inner actuator retainers.
6. Place one hand on the back of the mirror housing, using the flat palm of the other hand press inward locking the mirror glass retainers to the inner actuator ring.
7. Remove the masking tape from the mirror glass.

REPAIR INSTRUCTIONS > INSIDE REARVIEW MIRROR REPLACEMENT

Fig 1: Inside Rearview Mirror



Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Inside Rearview Mirror Cover Procedure Using appropriate tool, release the bottom cover from the mirror.
2	Inside Rearview Mirror Procedure 1. Adjust the mirror to the full upward position. 2. Place a flat-bladed tool through both lower holes on the mirror. 3. Using the flat-bladed tool, rotate the mirror 90 degrees to remove the mirror. 4. Disconnect the electrical connector. 5. Using the flat-bladed tool, install the mirror by rotating the mirror until an audible click is heard. An audible click is heard when the mirror is fully seated.  NOTE: • DO NOT grab the mirror to remove or to install, you will damage the mirror.

- *Ensure screwdriver is through both lower holes of the mirror or you will damage the mirror.*
- *More force is required to remove the mirror than to install the mirror.*

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.

DESCRIPTION AND OPERATION > AUTOMATIC DAY-NIGHT MIRROR DESCRIPTION AND OPERATION > 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.

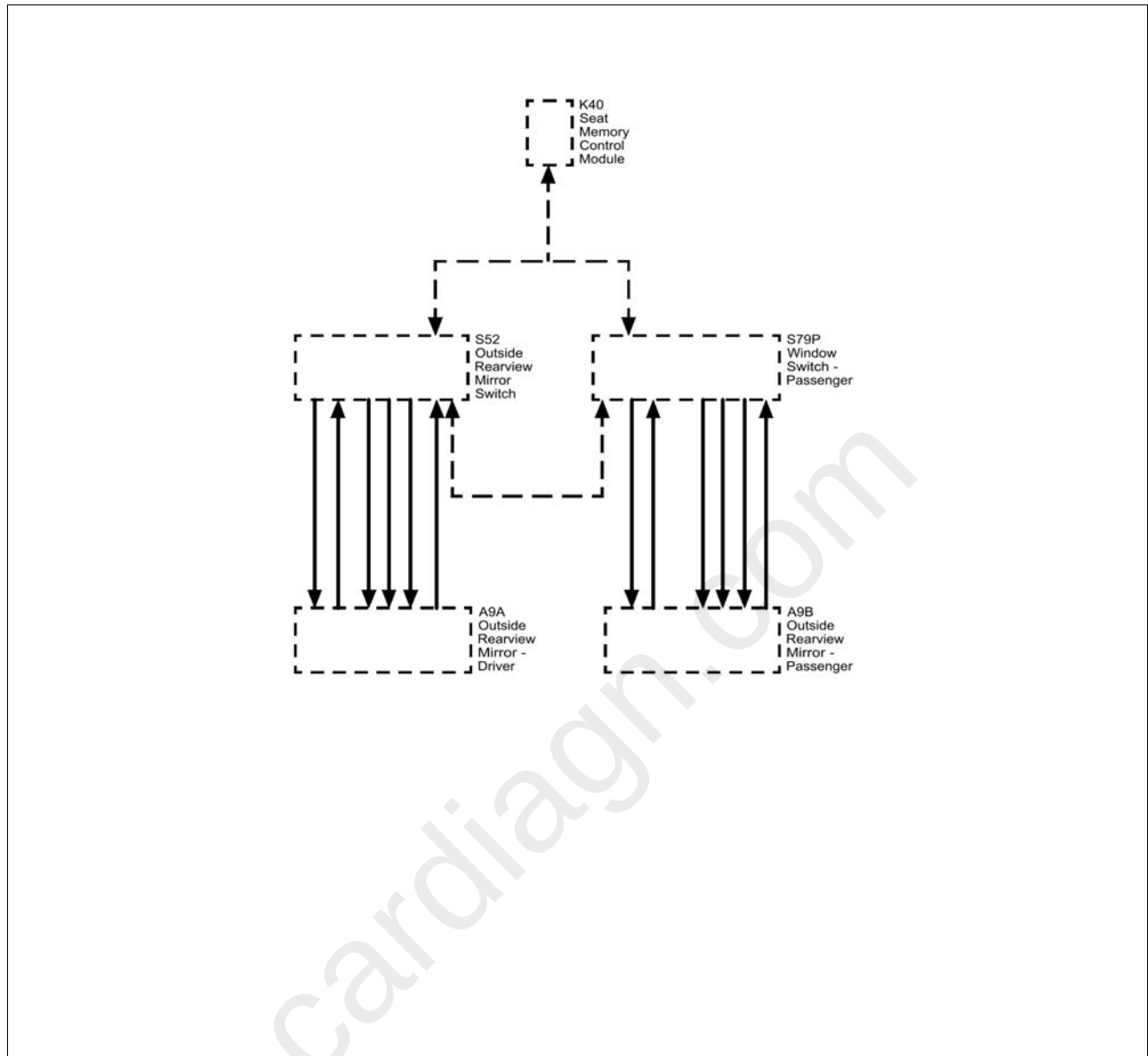
DESCRIPTION AND OPERATION > OUTSIDE MIRROR DESCRIPTION AND OPERATION (WITH A45) > POWER MIRROR SYSTEM COMPONENTS

The power mirror system consists of the following components:

- Memory Seat Control Module
- Outside Rearview Mirror Switch
- Passenger Window Switch
- Driver Outside Rearview Mirror

- Passenger Outside Rearview Mirror

Fig 1: Power Mirror System Diagram (With A45)



Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
K40	K40 Seat Memory Control Module
S52	S52 Outside Rearview Mirror Switch
S79P	S79P Window Switch - Passenger
A9A	A9A Outside Rearview Mirror - Driver
A9B	A9B Outside Rearview Mirror - Passenger

DESCRIPTION AND OPERATION > OUTSIDE MIRROR DESCRIPTION AND OPERATION (WITH A45) > POWER MIRROR SYSTEM CONTROLS

The outside mirror switch and passenger window switch are on a serial data circuit with the memory seat control 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.

DESCRIPTION AND OPERATION > OUTSIDE MIRROR DESCRIPTION AND OPERATION (WITH A45) > 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.

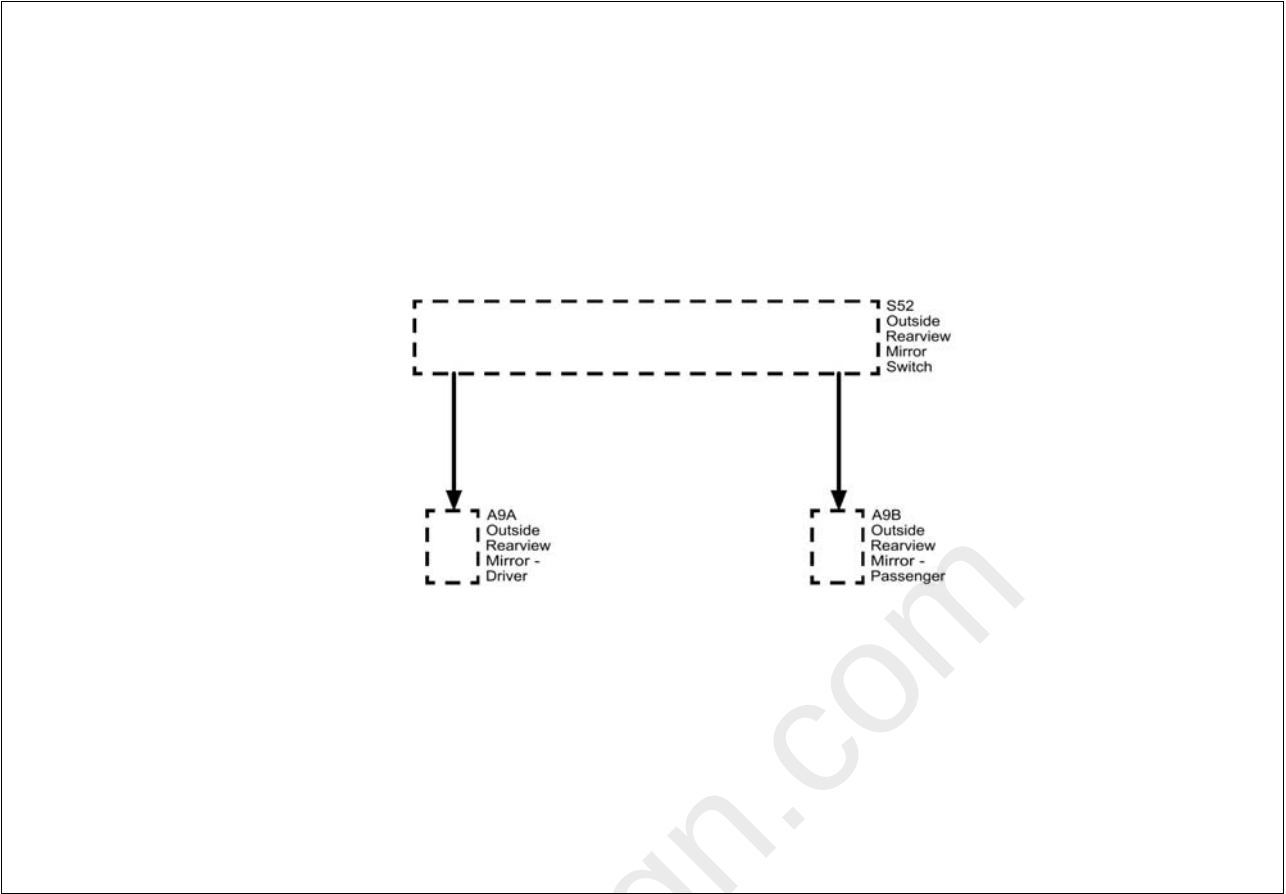
DESCRIPTION AND OPERATION > OUTSIDE MIRROR DESCRIPTION AND OPERATION (WITHOUT A45) > POWER MIRROR SYSTEM COMPONENTS

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.

Fig 1: Power Mirror System Diagram (Without A45)



Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
S52	S52 Outside Rearview Mirror Switch
A9A	A9A Outside Rearview Mirror - Driver
A9B	A9B Outside Rearview Mirror - Passenger

DESCRIPTION AND OPERATION > OUTSIDE MIRROR DESCRIPTION AND OPERATION (WITHOUT A45) > 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.

DESCRIPTION AND OPERATION > OUTSIDE MIRROR DESCRIPTION AND OPERATION (WITHOUT A45) > 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.

DESCRIPTION AND OPERATION > OUTSIDE MIRROR DESCRIPTION AND OPERATION (WITHOUT A45) > 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.