

2017 ACCESSORIES & EQUIPMENT**Mirrors - CT6****SPECIFICATIONS****FASTENER SPECIFICATIONS****Reusable Threaded Fastener Tightening Specifications****NOTE:**

All fasteners listed in this table can be reused after removal.

Application	Specification
	Metric (English)
Inside Rearview Mirror Set Bolt	1.8 N.m (16 lb in)
Outside Rearview Mirror Fastener	10 N.m (89 lb in)
Outside Rearview Mirror Folding Control Module Screw	1 N.m (9 lb in)
Outside Rearview Mirror Housing Bezel Screw	0.8 N.m (7 lb in)
Outside Rearview Mirror Inner Actuator Fastener	0.8 N.m (7 lb in)
Outside Rearview Mirror Upper Housing Cover Bolt	1.8 N.m (16 lb in)

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****Inside Rearview Mirror**

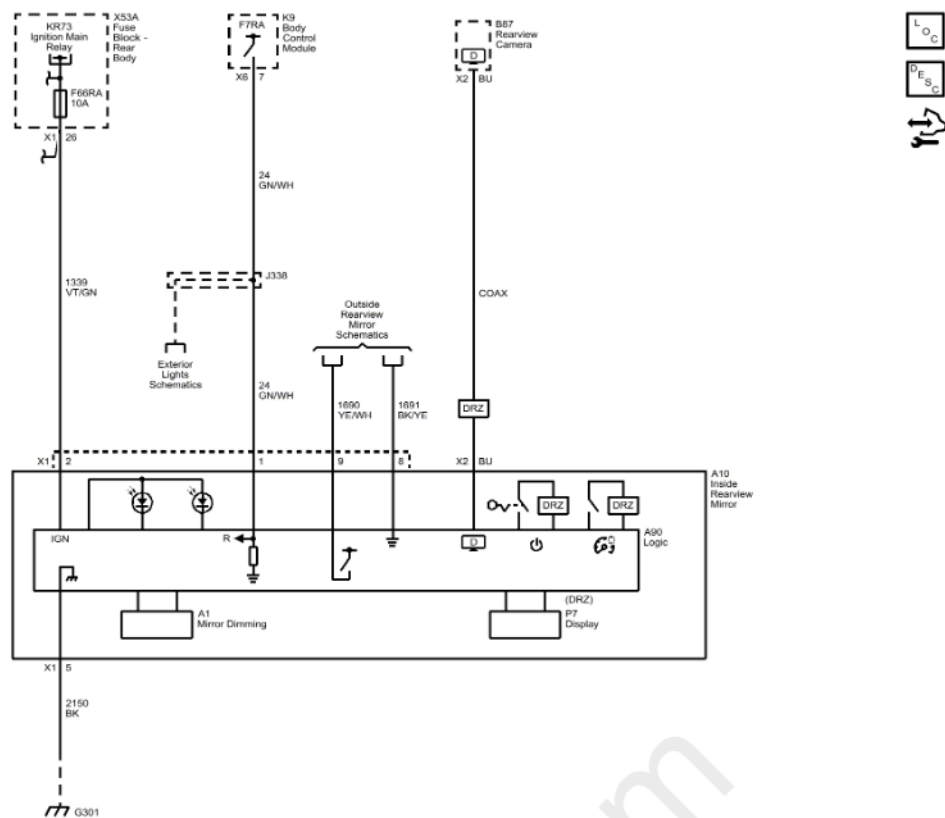


Fig. 1: Inside Rearview Mirror

Courtesy of GENERAL MOTORS COMPANY

OUTSIDE REARVIEW MIRROR SCHEMATICS

Controls, Driver Position and Folding

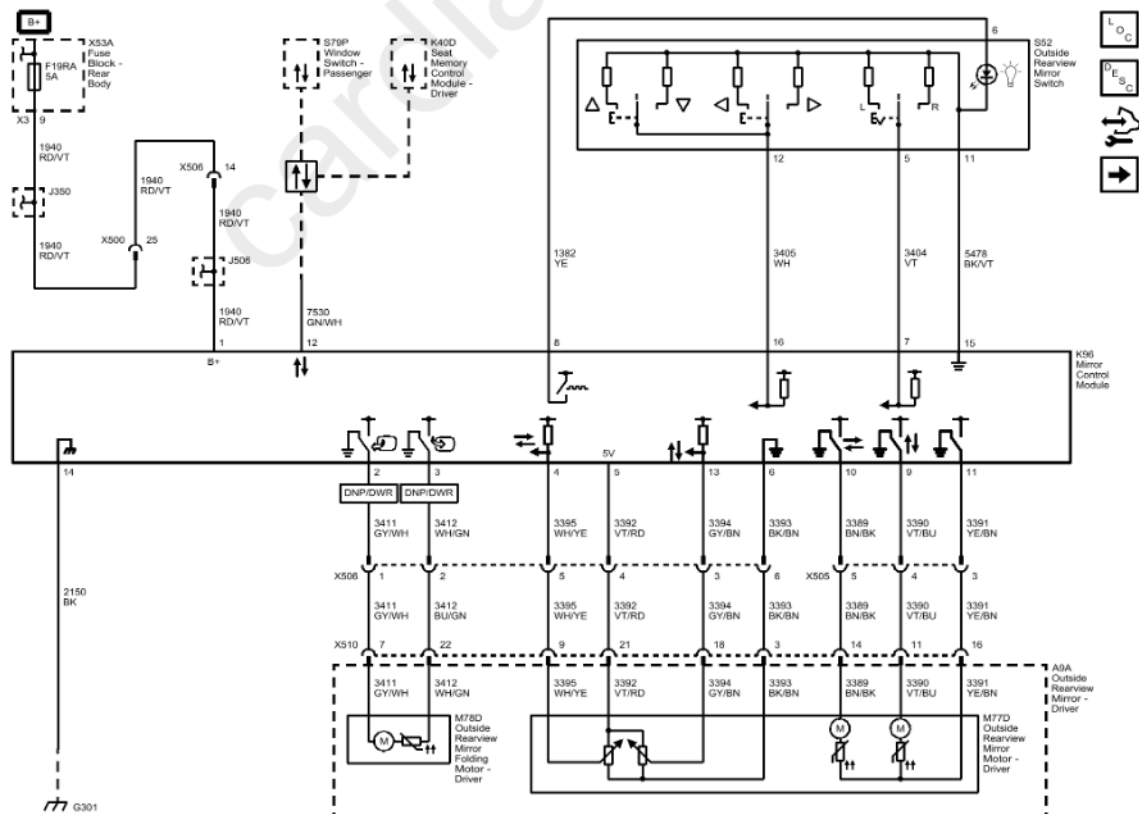


Fig. 2: Controls, Driver Position and Folding

Courtesy of GENERAL MOTORS COMPANY

Passenger Position and Folding

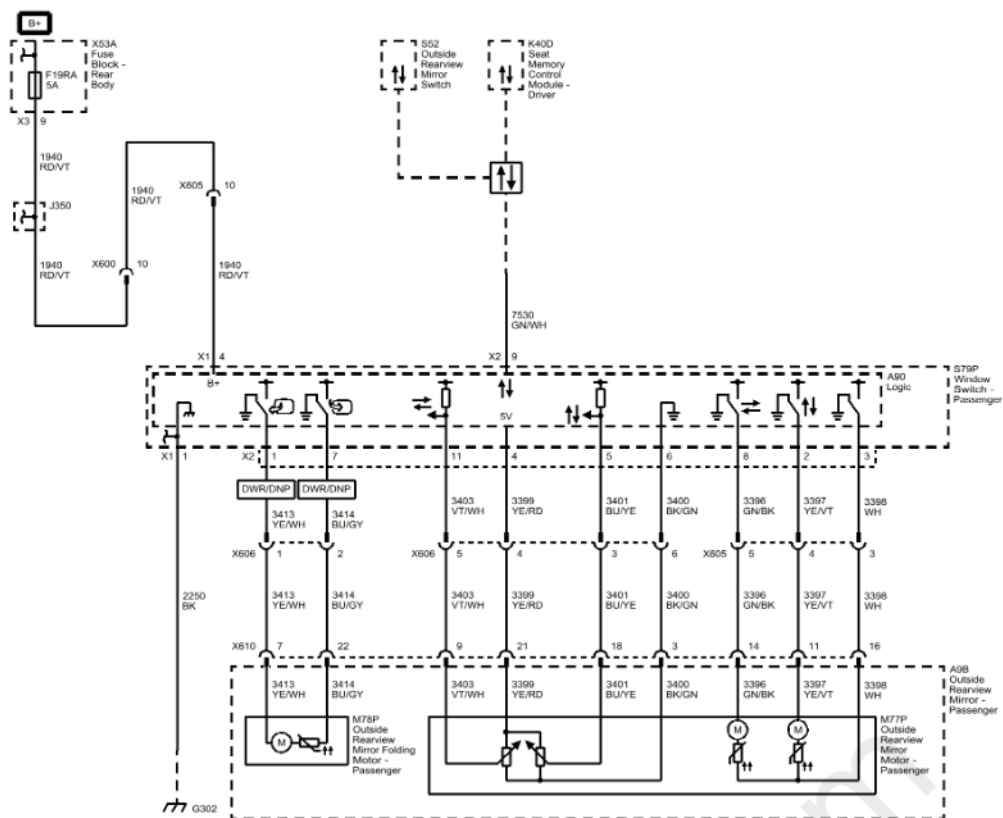


Fig. 3: Passenger Position and Folding
Courtesy of GENERAL MOTORS COMPANY

Dimming and Heating

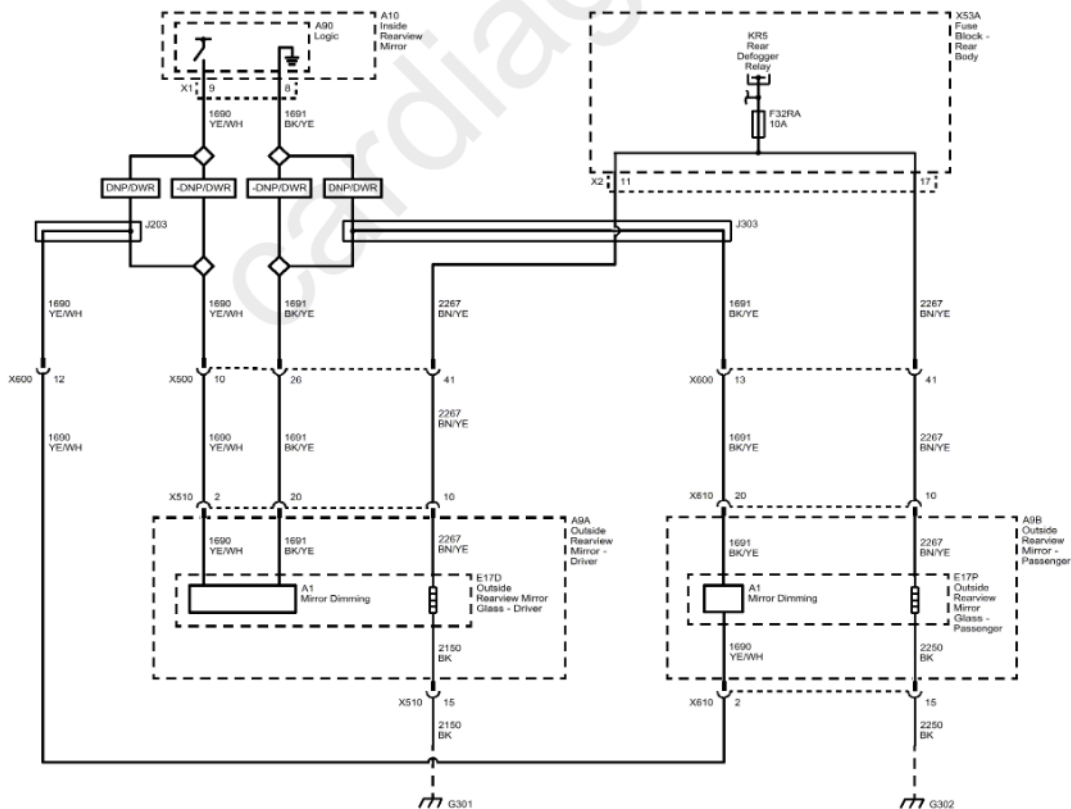


Fig. 4: Dimming and Heating
Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC INFORMATION AND PROCEDURES

DTC B154A OR B154B: DRIVER/PASSENGER 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.

DTC Descriptors

DTC B154A 39

Driver Mirror Internal Malfunction

DTC B154B 39

Passenger Mirror Internal Malfunction

Circuit/System Description

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

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

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 mirror control module 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

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/Vehicle in Service Mode.
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:
 - **Automatic Day-Night Mirror Description and Operation**
 - **Outside Mirror Description and Operation**

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the system. Refer to **Checking Aftermarket Accessories**.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Intermittent

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

Symptom List

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

- **Automatic Day-Night Mirrors Malfunction (with DR5)****Automatic Day-Night Mirrors Malfunction (with DR2 or DR4)**
- **Heated Mirrors Malfunction**
- **Power Mirror Folding Malfunction**
- **Power Mirror Malfunction**
- **Power Mirror Tilt Inoperative in Reverse**

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

When the HVAC control module receives a rear window defog request from the radio/HVAC controls, the HVAC control module will provide B+ voltage to the coil side of the rear defogger relay. This will energize the relay causing the contacts within the relay to close and provide B+ voltage to the rear window defogger grid, the driver outside review mirror and passenger outside rearview mirror heating elements.

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

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 or E17P Outside Rearview Mirror Glass-Passenger do not become warm**
Refer to Circuit/System Testing - Single Outside Mirror Defogger Inoperative.
 - **If both E17D Outside Rearview Mirror Glass-Driver and E17P Outside Rearview Mirror Glass-Passenger never become warm or are always warm**
Refer to Circuit/System Testing - Both Outside Mirrors Defogger Malfunction.
 - **If both the E17D Outside Rearview Mirror Glass-Driver and the E17P Outside Rearview Mirror Glass-Passenger become warm**
4. All OK.

Circuit/System Testing

Single Outside Mirror Defogger Inoperative

1. Ignition OFF and all vehicle systems OFF, disconnect the appropriate X510 or X610 inline harness connector at the A9 Outside 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 15 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **If less than 10 Ω**
3. Engine running, connect a test lamp between the control circuit terminal 10 and the ground circuit terminal 15.
4. Verify the test lamp turns ON when commanding the Rear Defogger On with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, remove the test lamp, disconnect the X2 harness connector at the X53A Fuse Block - Rear Body.
 2. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the E17 Outside Rearview Mirror Glass.
 - **If the test lamp turns ON**
5. Test or replace the E17 Outside Rearview Mirror Glass.

Both Outside Mirror Defogger Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the appropriate X510 or X610 inline harness connector at the appropriate A9 Outside Rearview Mirror. It may take up to 2 minutes for all vehicle systems to power down.
2. Connect a test lamp between the control circuit terminal 10 and ground.
3. Verify the test lamp turns ON and OFF when commanding the Rear Defogger On and Off with a scan tool.
 - **If the lamp is always ON**
 1. Ignition OFF, remove the test lamp, disconnect the X2 harness connector at X53A Fuse Block - Rear Body, 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 [Rear Window Defogger Malfunction](#) .
 - **If the lamp is always OFF**
 1. Ignition OFF, remove the test lamp, disconnect the X2 harness connector at X53A Fuse Block - Rear Body, ignition ON.
 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, refer to [Rear Window Defogger Malfunction](#)
 - **If the lamp turns on and off**
4. Replace the E17 Outside Rearview Mirror Glass.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Outside Rearview Mirror Glass Replacement](#)
- [Body Wiring Harness Junction Block Replacement](#)

AUTOMATIC DAY-NIGHT MIRRORS MALFUNCTION (WITH DR5)

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	U152D 00	1	1	-
Ground	-	1	-	-
1. Inside Mirror Automatic Dimming Inoperative				

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

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/Vehicle in Service Mode.
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 - 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 - 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/Vehicle 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.

- **If 10 Ω or greater**

1. Ignition OFF/Vehicle OFF, remove the test lamp.

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

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

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

- **If less than 10 Ω**

3. Ignition ON/Vehicle in Service Mode.

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/Vehicle OFF, remove the test lamp.

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

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

- If less than 2 Ω , 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/Vehicle OFF, remove the test lamp.

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

3. 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/Vehicle 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/Vehicle in Service Mode, 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/Vehicle 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 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , refer to [Backup Lamps Malfunction](#).
 - **If the test lamp is always ON**
 1. Ignition OFF/Vehicle 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

AUTOMATIC DAY-NIGHT MIRRORS MALFUNCTION (WITH DR2 OR DR4)

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ignition	1	1	-	-
Automatic Day/Night Mirror Signal	2	2	2	-
Backup Lamp Control	U152D 00	1	1	-
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				

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 outside rearview mirror 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 mirrors clearly when backing up, regardless of the rear light sensor status.

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/Vehicle in Service Mode.
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 - 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 - Day-Night Disable Malfunction
 - **If the A10 Inside Rearview Mirror transitions between bright and dim states**
5. Verify the A9A Outside Rearview Mirror-Driver face dims when shining a bright light into the rear light sensor.
 - **If the A9A Outside Rearview Mirror-Driver does not dim**
Refer to Outside Rearview Mirror Dimming Malfunction.
 - **If the A9A Outside Rearview Mirror-Driver dims**
6. Verify the A9A Outside Rearview Mirror-Driver face transitions from dim to bright while commanding the Backup Lamps Active and Inactive with a scan tool.
 - **If the A9A Outside Rearview Mirror-Driver does not transition between bright and dim states**
Refer to Outside Rearview Mirror Dimming Malfunction.
 - **If the A9A Outside Rearview Mirror-Driver transitions between bright and dim states**
7. All OK.

Inside Review Mirror Dimming Inoperative

1. Ignition OFF/Vehicle 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.
 - **If 10 Ω or greater**
 1. Ignition OFF/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **If less than 10 Ω**
3. Ignition ON/Vehicle in Service Mode.
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/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , 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/Vehicle OFF, remove the test lamp.
 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
 3. 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/Vehicle 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/Vehicle in Service Mode, 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/Vehicle OFF, remove the test lamp, disconnect the X337 inline harness connector.
 2. Test for infinite resistance between the signal 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 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , refer to [**Backup Lamps Malfunction**](#) .
 - **If the test lamp is always ON**
 1. Ignition OFF/Vehicle OFF, remove the test lamp, disconnect the X337 inline harness connector, ignition ON.
 2. Test for less than 1 V between the signal 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.

1. Ignition OFF/Vehicle 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 20 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF/Vehicle 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.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the A10 Inside Rearview Mirror.
 - **If less than 10 Ω**
3. Ignition ON/Vehicle in Service Mode.
4. Test for less than 1 V between the control circuit terminal 2 and ground.
 - **If 1 V or greater**
 1. Ignition OFF/Vehicle 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.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V replace the A10 Inside Rearview Mirror.
 - **If less than 1 V**
5. Ignition ON/Vehicle in Service Mode, 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.
 - **If 1 V or less**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the A10 Inside Rearview Mirror, ignition ON.
 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 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , test or replace the A10 Inside Rearview Mirror.
 - **If greater than 1 V**
7. Test or replace A9A Outside Rearview Mirror-Driver.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Inside Rearview Mirror Replacement](#)
- [Outside Rearview Mirror Glass Replacement](#)

POWER MIRROR FOLDING 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
Folding Mirror Motor Fold Control	1	1	-	-
Folding Mirror Motor Unfold Control	1	1	-	-
1. Power Folding Mirror Inoperative				

Circuit/System Description

The outside rearview mirror switch contains resistors which will reduce the signal voltage from the mirror control module, the mirror memory control module is programmed to move the driver outside mirror in a direction depending upon the voltage received from the outside rearview mirror switch. The outside rearview mirror switch has a 3 position rocker switch which corresponds to the driver outside rearview mirror select, no mirror select and passenger outside mirror selected. When the switch is in the no mirror select position and the mirror position switch is held in the DOWN position, mirror control module will command the driver outside mirror to fold or extend and send a serial data message to the memory seat control module to send a fold or extend command to the passenger window switch which will command the passenger outside rearview mirror to fold or extend. The mirror control module and passenger window switch control the fold/extend motors through bi-directional control circuits.

Diagnostic Aids

Power folding mirrors only operate when the mirror selector switch is in the no mirror select position.

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

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/Vehicle in Service Mode.
2. Verify DTC U151B, U1519 are not set.
 - If DTC U151B, U1519 are set
Refer to [DTC U1500-U15FF](#).
 - If DTC U151B, U1519 are not set
3. Verify the scan tool Mirror Direction Switch parameter changes from Inactive to Up, Down, Right, Left, Folding and Extending when cycling the S52 Outside Rearview Mirror Switch.
 - If the parameter does not change

Refer to [Power Mirror Malfunction](#).

- **If the parameter changes**

4. Verify the A9A Outside Rearview Mirror-Driver and the A9B Outside Rearview Mirror-Passenger FOLD and EXTEND when cycling the S52 Outside Rearview Mirror Switch.

- **If the A9A Outside Rearview Mirror-Driver does not FOLD and EXTEND**

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

- **If the A9B Outside Rearview Mirror-Passenger does not FOLD and EXTEND**

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

- **If the A9A Outside Rearview Mirror-Driver and A9B Outside Rearview Mirror-Passenger does FOLD and EXTEND**

5. All OK.

Circuit/System Testing

Driver Outside Mirror Folding Command Malfunction

1. Ignition OFF/Vehicle 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 control circuit terminal 16 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K96 Mirror Control Module.
 2. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K96 Mirror Control Module.
 - **If less than 10 Ω**
3. Test for less than 10 Ω between the control circuit terminal 14 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K96 Mirror Control Module.
 2. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K96 Mirror Control Module.
 - **If less than 10 Ω**
4. Connect a test lamp between control circuit terminal 11 and control circuit terminal 14, ignition ON.
5. Verify the test lamp turns ON when commanding the FOLD and EXTEND when cycling the S52 Outside Rearview Mirror Switch.
 - **If the test lamp remains OFF during either of the commands**
 1. Ignition OFF/Vehicle OFF, remove the test lamp, disconnect the harness connector at the K96 Mirror Control Module.
 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, replace the K96 Mirror Control Module.
 - **If the test lamp turns ON during each of the commands**
6. Test or replace the A9A Outside Rearview Mirror-Driver.

Passenger Outside Mirror Folding Command Malfunction

1. Ignition OFF/Vehicle OFF and all vehicle systems OFF, disconnect the 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 control circuit terminal 16 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF/Vehicle OFF, disconnect the X2 harness connector at the S79P Window Switch-Passenger.
 2. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the S79P Window Switch-Passenger.
 - **If less than 10 Ω**
3. Test for less than 10 Ω between the control circuit terminal 14 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF/Vehicle OFF, disconnect the X2 harness connector at the S79P Window Switch-Passenger.
 2. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the S79P Window Switch-Passenger.
 - **If less than 10 Ω**
4. Connect a test lamp between control circuit terminal 11 and control circuit terminal 14, ignition ON.
5. Verify the test lamp turns ON when commanding the FOLD and EXTEND when cycling the S52 Outside Rearview Mirror Switch.
 - **If the test lamp remains OFF during either of the commands**
 1. Ignition OFF/Vehicle 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, replace the S79P Window Switch-Passenger.
 - **If the test lamp turns ON during each of the commands**
6. Test or replace the A9B Outside Rearview Mirror-Passenger.

Component Testing

Outside Rearview Mirror

1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the appropriate A9 Outside Rearview Mirror.
2. Install a 10 A fused jumper wire between one of the control terminals and 12 V. Momentarily install a jumper wire between the other control terminal and ground. Reverse the jumper wires at least two times, the A9 Outside Rearview Mirror should perform the FOLD and UNFOLD functions.
 - **If the function does not perform the FOLD and UNFOLD functions**

Replace the A9 Outside Rearview Mirror.
 - **If the function performs the FOLD and UNFOLD functions**
3. All OK

Repair Instructions

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

- **Outside Rearview Mirror Replacement**
- **Control Module References** for the left mirror control module replacement, programming and setup.

POWER MIRROR 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
Driver Mirror Control Module B+	U1519 00	U1519 00	-	-
Passenger Window Switch B+	U151B 00	U151B 00	-	-
Position Sensor 5 V Reference	3	3	3	-
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	3	3	3	-
Left/Right Mirror Vertical Position Sensor Signal	3	3	3	-
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	-
Left/Right Mirror Position Low Reference	-	2	-	-
Outside Rearview Mirror Switch Low Reference	-	1	-	-
Driver Mirror Control Module Ground	-	U1519 00	-	-
Passenger Window Switch Ground	-	U151B 00	-	-
1. Outside Rearview Mirror Switch Malfunction 2. Outside Power Mirror Malfunction 3. Power Mirror Memory Feature Malfunction				

Circuit/System Description

The outside rearview mirror switch is a multiplex switch which signals the left mirror control module which outside rearview mirror to move (driver or passenger) and which direction to move it. The left mirror control module and the passenger window switch are on a serial data circuit with the memory seat module as the master. The mirror select and directional control switches are inputs to the left mirror control module. When the memory seat module receives the switch inputs from the left mirror control module, mirror output commands are sent to the appropriate module/switch through the serial data circuit. The left mirror control module and passenger window switch control the left and right outside

rear view mirrors through bi-directional motor control circuits. The motor control circuits are floating while in an inactive state and the switches will apply power and ground to the control circuits as necessary to move the mirror in the commanded direction.

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

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Outside 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/Vehicle in Service Mode.
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 - 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 - 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 - 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 - 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 - 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 - 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 - 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 - Passenger Mirror Position Sensor Circuit Test.

- **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.

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

Refer to [Memory Seat Feature Malfunction](#) .

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

11. All OK.

Circuit/System Testing

Outside Rearview Mirror Switch Malfunction

1. Ignition OFF/Vehicle OFF and all vehicle systems OFF, disconnect the harness connector at the K96 Mirror Control Module. 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 14 and ground.

- **If 10 Ω or greater**

1. Ignition OFF/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
- **If less than 10 Ω**
3. Ignition ON/Vehicle in Service Mode.
4. Verify a test lamp illuminates between the B+ circuit terminal 1 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF/Vehicle OFF.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , 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/Vehicle 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 the test lamp illuminates**
5. Ignition OFF/Vehicle OFF, connect the harness connector at the K96 Mirror Control Module and 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.
6. Test for less than 10 Ω between the low reference circuit terminal 11 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF/Vehicle OFF.
 2. Test for less than 2 Ω in the low reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K96 Mirror Control Module.
 - **If less than 10 Ω**
7. Ignition ON/Vehicle in Service Mode.
8. Test for 4.8-5.2 V between the signal circuit terminal 5 and ground.
 - **If less than 4.8 V**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K96 Mirror Control Module.
 2. 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
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K96 Mirror Control Module.
 - **If greater than 5.2 V**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K96 Mirror Control Module, ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K96 Mirror Control Module.
 - **If between 4.8-5.2 V**
9. Test for 4.8-5.2 V between the signal circuit terminal 12 and ground.
 - **If less than 4.8 V**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K96 Mirror Control Module.
 2. 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
3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K96 Mirror Control Module.
 - **If greater than 5.2 V**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K96 Mirror Control Module, ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K96 Mirror Control Module.
 - **If between 4.8-5.2 V**
10. Test or replace the S52 Outside Rearview Mirror Switch.

Driver Outside Mirror Movement Malfunction

1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the A9A Outside Rearview Mirror-Driver. Ignition ON/Vehicle in Service Mode.
2. Connect a test lamp between the control circuit terminal 11 and control circuit terminal 16.
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/Vehicle OFF, remove the test lamp, disconnect the harness connector at the K96 Mirror Control Module.
 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 Ω in each control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K96 Mirror Control Module.
 - **If the test lamp is always ON**
 1. Ignition OFF/Vehicle OFF, remove the test lamp, disconnect the harness connector at the K96 Mirror Control Module, 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 K96 Mirror Control Module
 - **If the test lamp turns ON during each of the commands**
4. Connect a test lamp between the control circuit terminal 14 and control circuit terminal 16.
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/Vehicle OFF, remove the test lamp, disconnect the harness connector at the K96 Mirror Control Module.
 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 Ω in each control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K96 Mirror Control Module.
 - **If the test lamp is always ON**
 1. Ignition OFF/Vehicle OFF, remove the test lamp, disconnect the harness connector at the K96 Mirror Control Module, 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 K96 Mirror Control Module
 - **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/Vehicle 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 3 and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K96 Mirror Control Module.
 2. Test for less than 2 Ω in the low reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K96 Mirror Control Module.
 - **If less than 10 Ω**
3. Ignition ON/Vehicle in Service Mode.
4. Test for 4.8-5.2 V between the 5 V reference circuit terminal 21 and ground.
 - **If less than 4.8 V**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K96 Mirror Control Module.
 2. Test for infinite resistance between the 5 V reference circuit terminal 21 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the 5 V reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K96 Mirror Control Module.
 - **If greater than 5.2 V**
 1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the K96 Mirror Control Module, 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 K96 Mirror Control Module.
 - **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/Vehicle OFF, disconnect the harness connector at the K96 Mirror Control Module, 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 K96 Mirror Control Module.
 - **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 21.
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/Vehicle OFF, remove the jumper wire, disconnect the harness connector at the K96 Mirror Control Module.
 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 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K96 Mirror Control Module.
 - **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/Vehicle OFF, disconnect the harness connector at the K96 Mirror Control Module, ignition ON.
 2. Test for less than 1 V between the signal circuit terminal 4 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K96 Mirror Control Module.
 - **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 21.
 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/Vehicle OFF, remove the jumper wire, disconnect the harness connector at the K96 Mirror Control Module.
 2. Test for infinite resistance between the signal circuit terminal 4 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K96 Mirror Control Module.
 - **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/Vehicle OFF, disconnect the harness connector at the A9B Outside Rearview Mirror-Passenger. Ignition ON/Vehicle in Service Mode
2. Connect a test lamp between the control circuit terminal 11 and control circuit terminal 16.
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/Vehicle 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 Ω in each control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the S79P Window Switch-Passenger.
 - **If the test lamp is always ON**
 1. Ignition OFF/Vehicle 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 14 and control circuit terminal 16.

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/Vehicle 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 Ω in each control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the S79P Window Switch-Passenger.

- **If the test lamp is always ON**

1. Ignition OFF/Vehicle 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/Vehicle OFF and all vehicle systems OFF, disconnect the 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.

- **If 10 Ω or greater**

1. Ignition OFF/Vehicle OFF, disconnect the X2 harness connector at the S79P Window Switch-Passenger.
2. Test for less than 2 Ω in the low reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the S79P Window Switch-Passenger.

- **If less than 10 Ω**

3. Ignition ON/Vehicle in Service Mode.

4. Test for 4.8-5.2 V between the 5 V reference circuit terminal 21 and ground.

- **If less than 4.8 V**

1. Ignition OFF/Vehicle OFF, disconnect the X2 harness connector at the S79P Window Switch-Passenger.
2. Test for infinite resistance between the 5 V reference circuit terminal 4 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 Ω in the 5 V reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the S79P Window Switch-Passenger.

- **If greater than 5.2 V**

1. Ignition OFF/Vehicle 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/Vehicle 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 5 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 18 and the 5 V reference circuit terminal 21.
- 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/Vehicle 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 5 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , 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/Vehicle 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**
- 9. Install a 3 A fused jumper wire between the signal circuit terminal 9 and the 5 V reference circuit terminal 21.
- 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/Vehicle 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 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the S79P Window Switch-Passenger.
 - **If greater than 0.6 V**
- 11. Test or replace the M77P Outside Rearview Mirror Motor-Passenger.

Component Testing

1. Ignition OFF/Vehicle OFF, disconnect the harness connector at the S52 Outside Rearview Mirror Switch.
2. Test for infinite resistance between the signal terminal 12 and the low reference terminal 11 with the mirror direction switch in the open position.
 - **If less than infinite resistance**

Replace the S52 Outside Rearview Mirror Switch.

- **If infinite resistance**

3. Test for 330-350 Ω between the signal terminal 12 and the low reference terminal 11 with the mirror direction switch in the Left position.

- **If less than 329 Ω or greater than 351 Ω**

Replace the S52 Outside Rearview Mirror Switch.

- **If between 330-350 Ω**

4. Test for 0.65K-0.75K Ω between the signal terminal 12 and the low reference terminal 11 with the mirror direction switch in the Right position.

- **If less than 0.64K Ω or greater than 0.76K Ω**

Replace the S52 Outside Rearview Mirror Switch.

- **If between 0.65K-0.75K Ω**

5. Test for 1.3K-1.5K Ω between the signal terminal 12 and the low reference terminal 11 with the mirror direction switch in the Up position.

- **If less than 1.29K Ω or greater than 1.55K Ω**

Replace the S52 Outside Rearview Mirror Switch.

- **If between 1.3K-1.5K Ω**

6. Test for 3.2K-3.4K Ω between the signal terminal 12 and the low reference terminal 11 with the mirror direction switch in the Down position.

- **If less than 3.1K Ω or greater than 3.5K Ω**

Replace the S52 Outside Rearview Mirror Switch.

- **If between 3.2K-3.4K Ω**

7. Test for 1K-0.9K Ω between the signal terminal 5 and the low reference terminal 11 with the mirror selector switch in the Passenger position.

- **If less than 1K Ω or greater than 0.8K Ω**

Replace the S52 Outside Rearview Mirror Switch.

- **If between 1K-0.9K Ω**

8. Test for 305-312 Ω between the signal terminal 5 and the low reference terminal 11 with the mirror selector switch in the Driver position.

- **If less than 304 Ω or greater than 313 Ω**

Replace the S52 Outside Rearview Mirror Switch.

- **If between 305-312 Ω**

9. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Outside Rearview Mirror Inner Actuator Replacement](#)
- [Outside Rearview Mirror Remote Control Switch Replacement](#)
- [Front Side Door Window Switch Replacement - Right Side](#)
- [Control Module References](#) for the left mirror control module replacement, programming and setup.

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

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/Vehicle in Service Mode.
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](#).
 - **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](#).

- 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.

REARVIEW CAMERA FULL DISPLAY MIRROR 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

Circuit/System Description

If equipped, full display mirror (FDM) provides a wider field of view than normally seen from the inside rearview mirror to assist when driving and changing lanes. When the tab under the inside rearview mirror is pulled rearward, a view of the area behind the vehicle displays on the mirror.

Reference Information

Schematic Reference

[Inside 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. Verify there is no debris on the B87 Rearview Camera lens and the lens is not damaged or the rearview camera is not out of alignment.
 - **If debris is found on the lens or the lens is damaged or the rearview camera is out of alignment**

Clean the lens. If the lens, replace as necessary or adjust the mirror.
 - **If there is no debris on the lens or the lens is not damaged or the rearview camera is not out of alignment**
2. All OK.

Circuit/System Testing

1. Ignition OFF/vehicle OFF, disconnect the coax cable connector at the B87 Rearview Camera and wait for 5 sec before checking the voltage.
2. Ignition On/Vehicle in Service Mode, test for 7 - 10 V between the center conductor of the coax cable and the coax cable ground shield wires.
 - **If the value within the range of 7-10 V**

Replace the B87 Rearview Camera.
 - **If the value outside range of 7-10 V**
3. Ignition OFF/vehicle OFF, disconnect the coax cable connector at the A10 Inside Rearview Mirror and check for the supply voltage at the mirror.
4. Ignition On/Vehicle in Service Mode, test for 9-16 V at the A10 Inside Rearview Mirror.
 - **If the value within the range of 9-16 V**

Test or replace the Replace the coax cable.
 - **If the value outside range of 9-16 V**
5. Replace the A10 Inside Rearview Mirror.

Component Testing

CAUTION: Refer to [Test Probe Caution](#)

NOTE:

- Before testing the coax cable, check the cable exterior for being pinched, cut, damaged or having loose connections at the components, which can cause reception issues.
- To prevent false readings when testing the center coax terminals, use care not to ground the test probe on the outer housing/shield.

Coax Cable Test

1. Test for less than 5 Ω between the coax cable center terminal end to end.
 - **If 5 Ω or greater**

Replace the coax cable.
 - **If less than 5 Ω**
2. Test for greater than 5 Ω between the coax cable outer shield end to end.
 - **If 5 Ω or greater**

Replace the coax cable.
 - **If less than 5 Ω**

3. Test for infinite resistance between the coax cable center terminal and the coax cable outer shield.

- **If less than infinite resistance**

Replace the coax cable.

- **If infinite resistance**

4. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair procedure.

- [Rearview Driver Information Camera Replacement \(Without UVH\)](#) [Rearview Driver Information Camera Replacement \(With UVH\)](#) [Rearview Driver Information Camera Replacement \(With DRZ\)](#)
- [Inside Rearview Mirror Replacement](#)
- [Control Module References](#) for human machine interface control module replacement, programming and setup.

REPAIR INSTRUCTIONS

OUTSIDE REARVIEW MIRROR REPLACEMENT

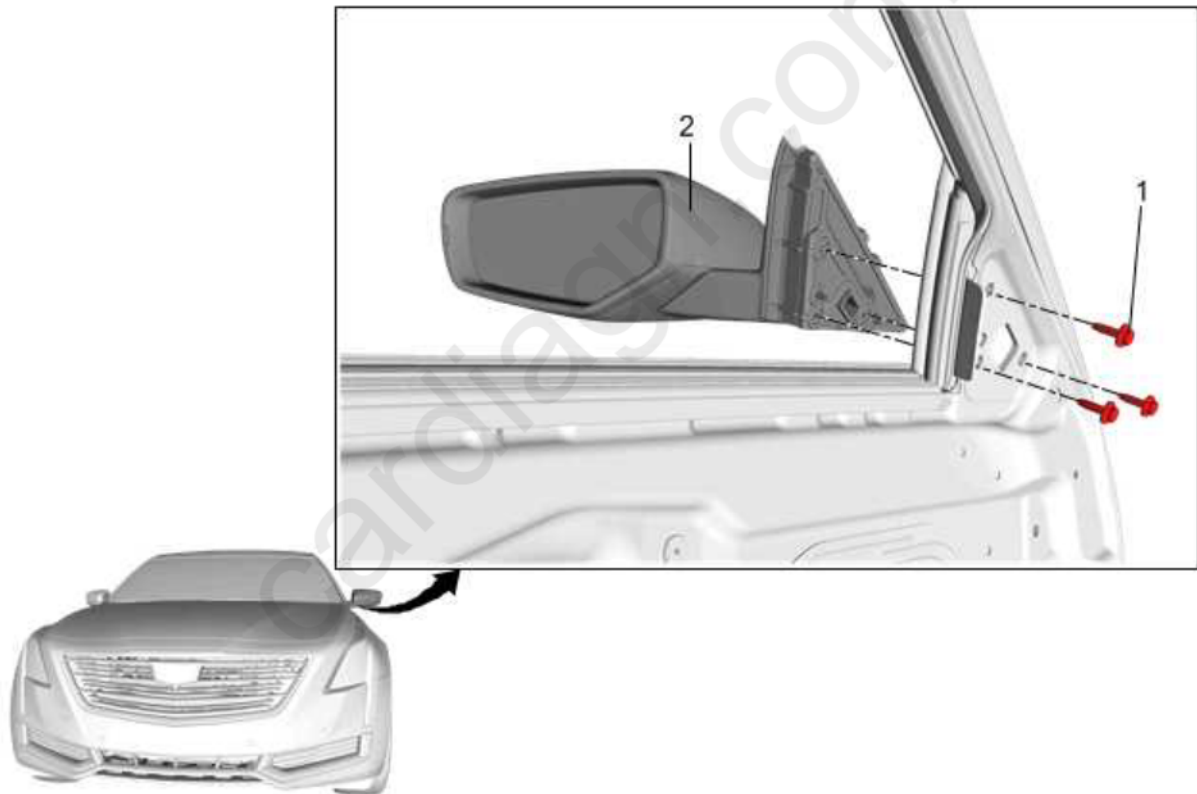


Fig. 5: Outside Rearview Mirror

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: Refer to Glass and Sheet Metal Handling Warning	
Preliminary Procedures	
1. Front Side Door Window Garnish Molding Replacement	
2. Disconnect the electrical connector.	

Callout	Component Name
1	Outside Rearview Mirror Fastener [3x] CAUTION: Refer to Fastener Caution . Tighten 10 N.m (89 lb in)
2	Outside Rearview Mirror NOTE: Inspect the mirror for proper operation before installing the door trim.

OUTSIDE REARVIEW MIRROR GASKET REPLACEMENT



Fig. 6: Outside Rearview Mirror Gasket

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Outside Rearview Mirror Replacement	
1	Outside Rearview Mirror Gasket NOTE: Inspect the mirror for proper operation before installing the door trim.

OUTSIDE REARVIEW MIRROR HOUSING COVER MOLDING REPLACEMENT

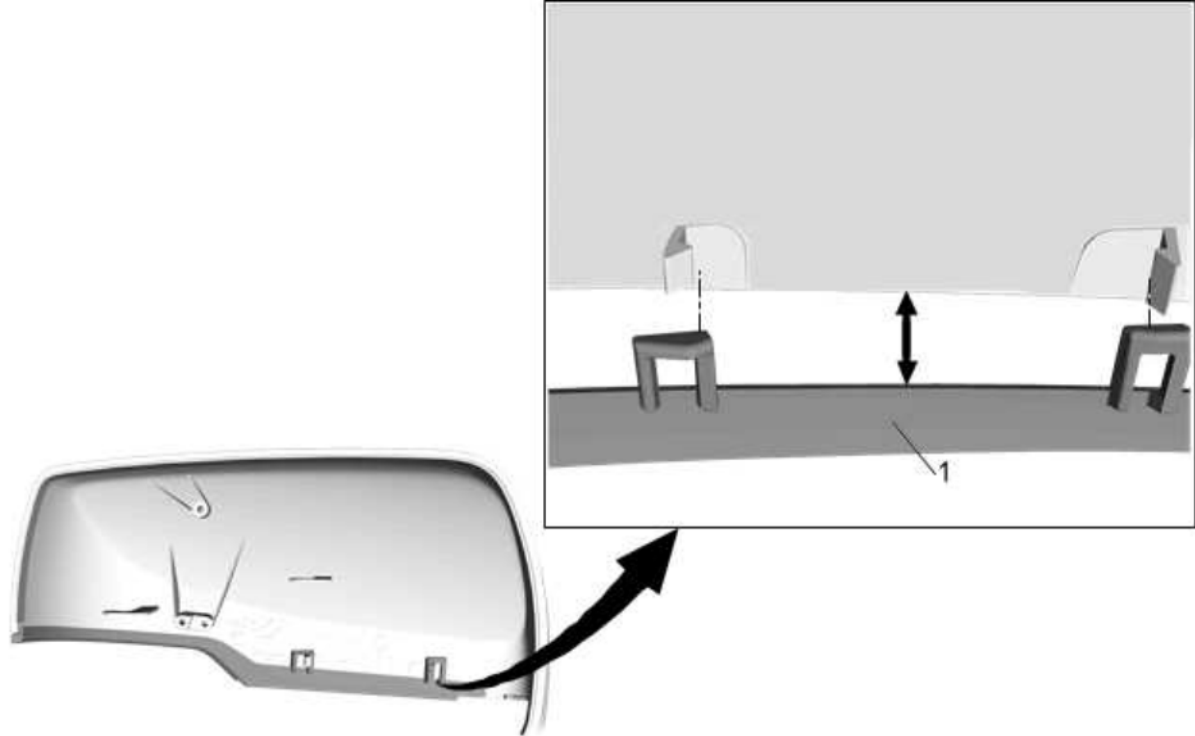


Fig. 7: Outside Rearview Mirror Housing Cover Molding
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
<u>Outside Rearview Mirror Turn Signal Lamp Replacement</u>	
1	Outside Rearview Mirror Housing Cover Molding Procedure Using the appropriate tool, release both retaining clips.

OUTSIDE REARVIEW MIRROR HOUSING UPPER COVER REPLACEMENT

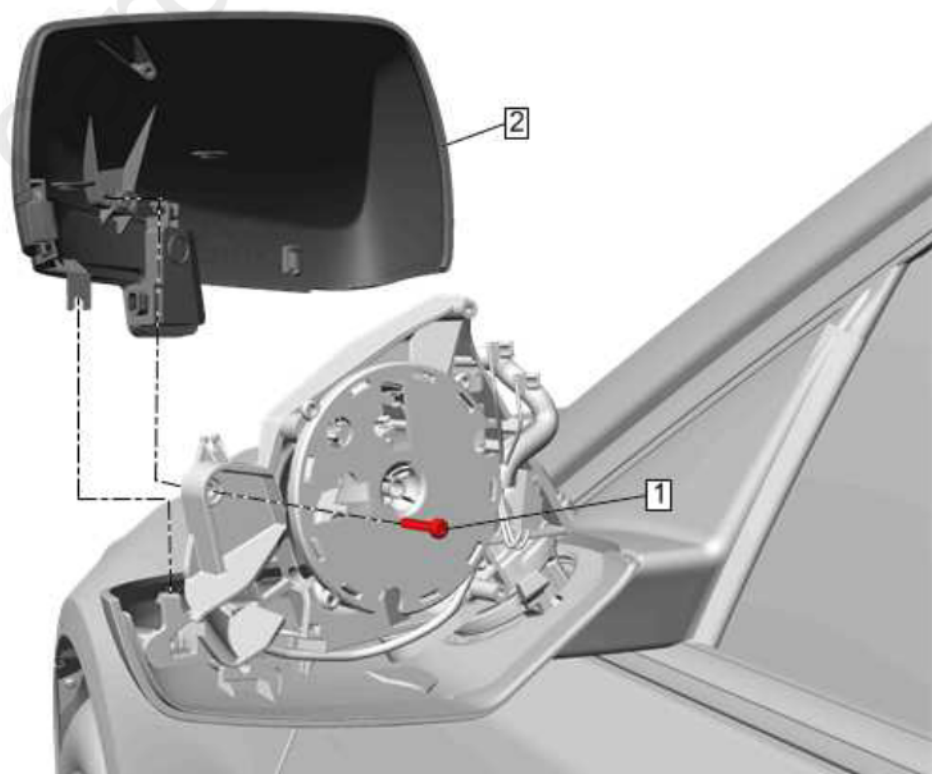


Fig. 8: Outside Rearview Mirror Housing Upper Cover
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Outside Rearview Mirror Housing Bezel Replacement	
1	Outside Rearview Mirror Upper Housing Cover CAUTION: Refer to Fastener Caution . Tighten 1.8 N.m (16 lb in)
2	Outside Rearview Mirror Upper Housing Cover 1. Disconnect the electrical connector. 2. Transfer components as necessary.

OUTSIDE REARVIEW MIRROR HOUSING BEZEL REPLACEMENT

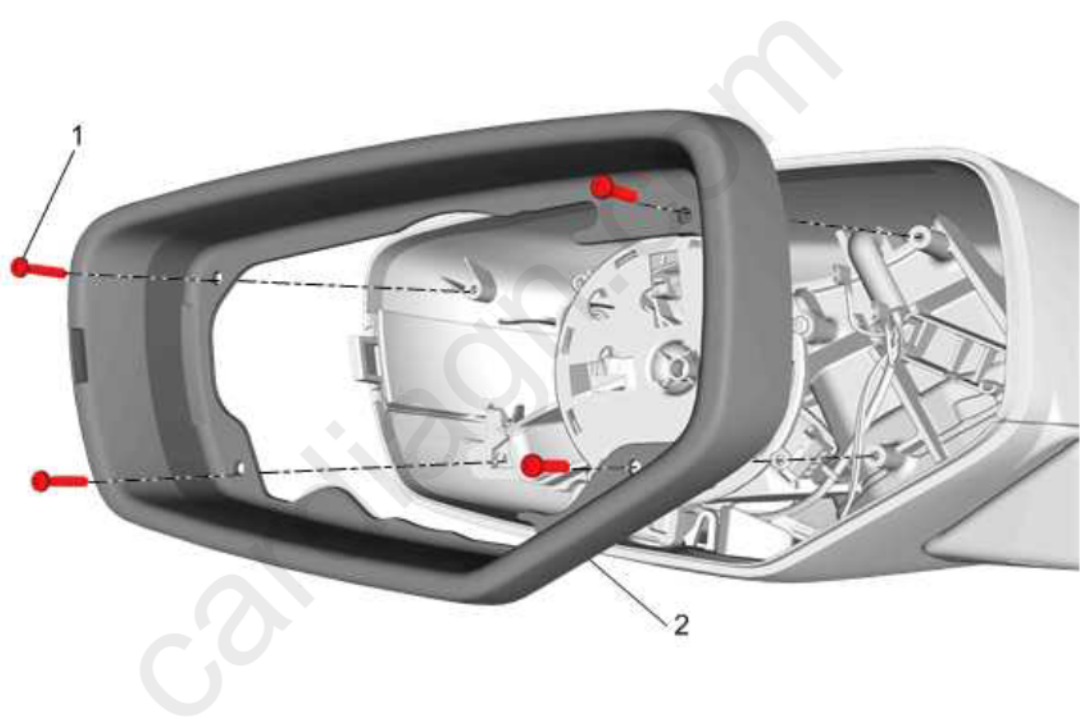


Fig. 9: Outside Rearview Mirror Housing Bezel
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Outside Rearview Mirror Glass Replacement	
1	Outside Rearview Mirror Housing Bezel Screw [4x] CAUTION: Refer to Fastener Caution . Tighten 0.8 N.m (7 lb in)

Callout	Component Name
2	Outside Rearview Mirror Housing Bezel NOTE: Inspect the outside rearview mirror for proper operation.

OUTSIDE REARVIEW MIRROR REMOTE CONTROL SWITCH REPLACEMENT

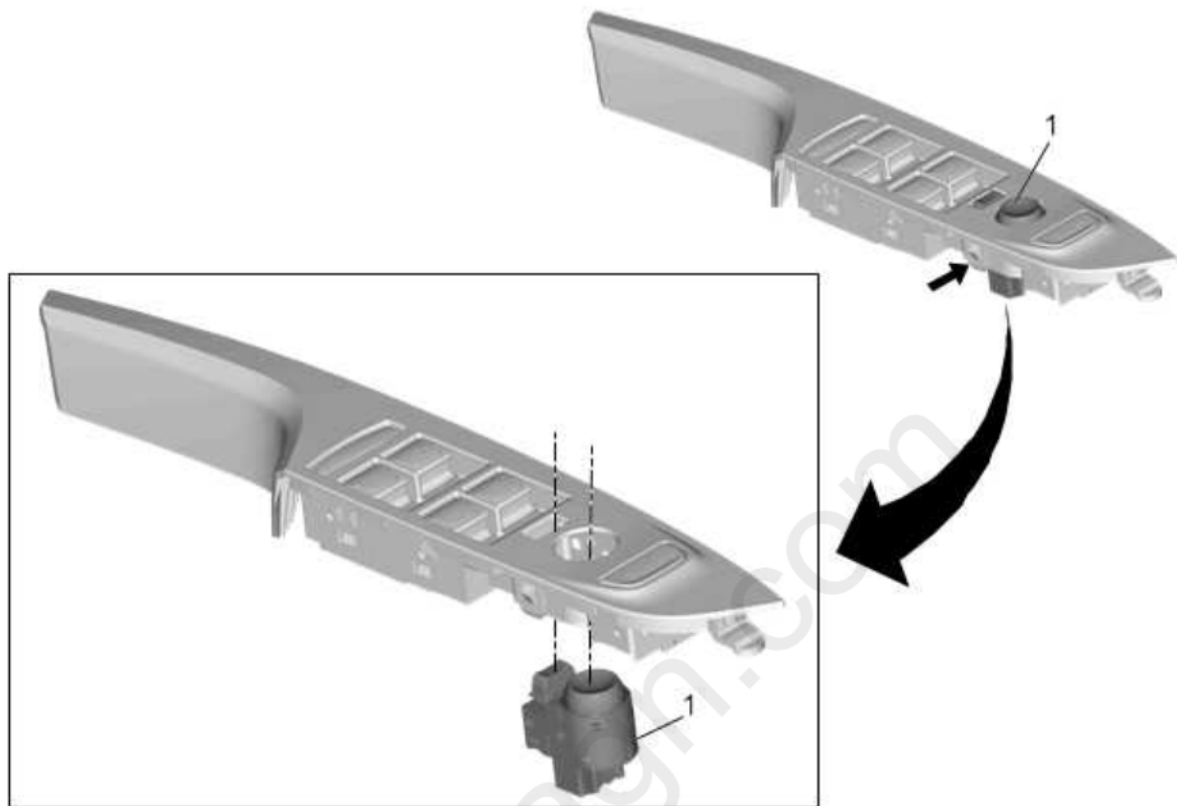


Fig. 10: Outside Rearview Mirror Remote Control Switch

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Front Side Door Armrest Switch Mount Plate Replacement (Drivers Side)</u> <u>Front Side Door Armrest Switch Mount Plate Replacement (Passenger Side)</u>	
1	Outside Rearview Mirror Remote Control Switch Procedure 1. Release the switch assembly from the switch mount plate by depressing the tabs along each side of the switch. 2. <u>Control Module References</u> for programming and setup information, if required.

OUTSIDE REARVIEW MIRROR FOLDING CONTROL MODULE REPLACEMENT

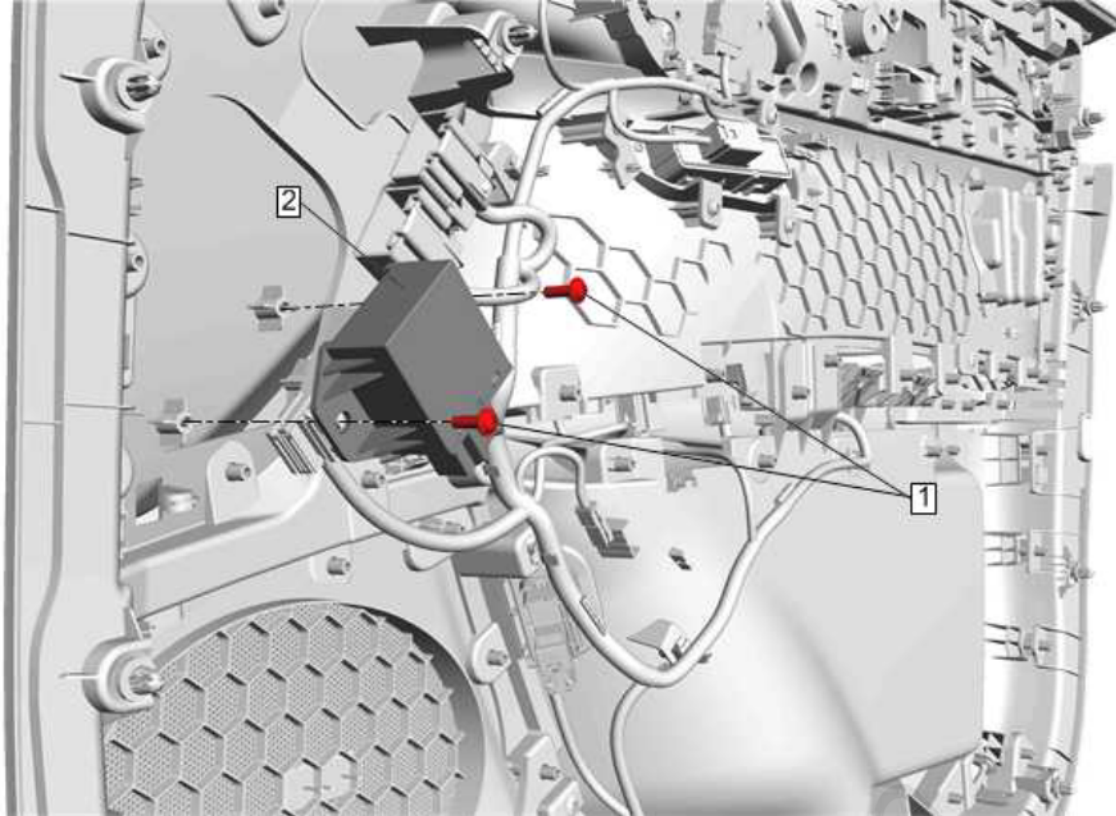


Fig. 11: Outside Rearview Mirror Folding Control Module

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Front Side Door Trim Replacement</u>	
1	Outside Rearview Mirror Folding Control Module Screw [2x] CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 1 N.m (9 lb in)
2	Outside Rearview Mirror Folding Control Module Procedure Disconnect electrical connector.

OUTSIDE REARVIEW MIRROR INNER ACTUATOR REPLACEMENT

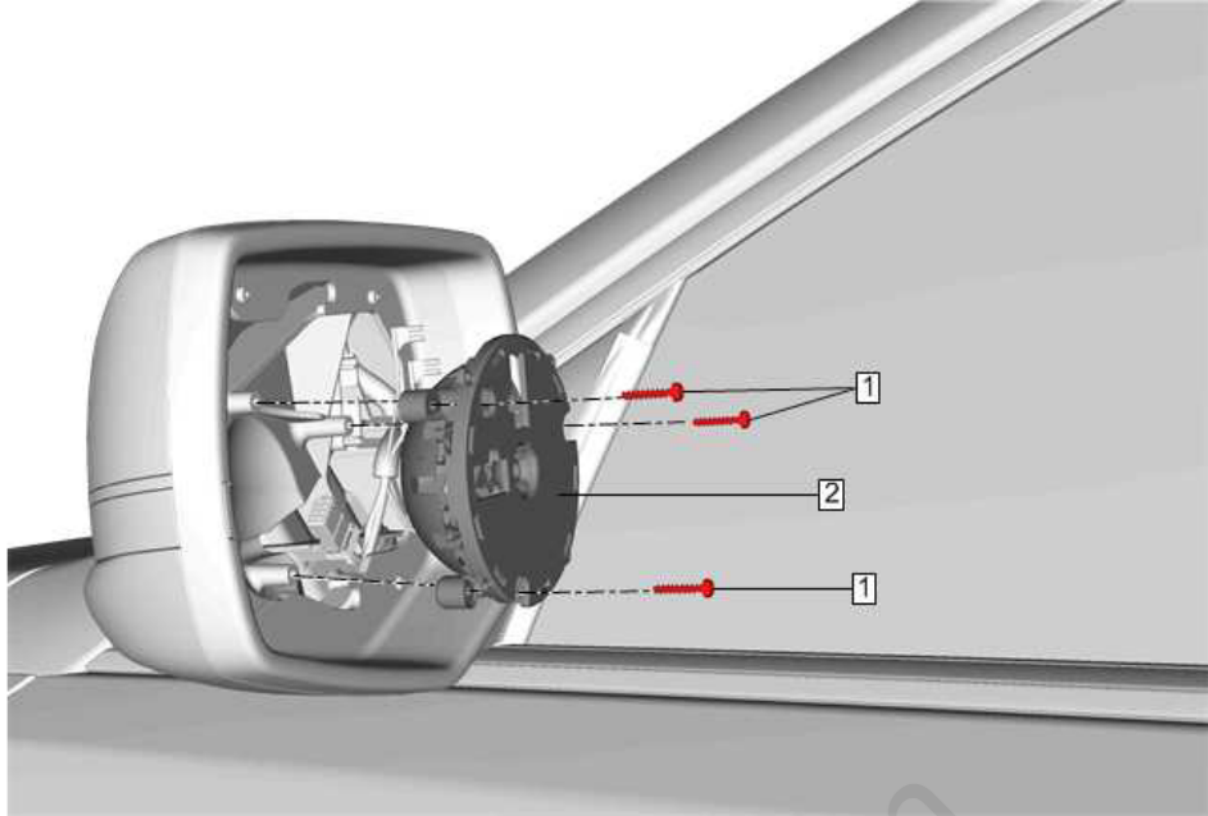


Fig. 12: Outside Rearview Mirror Inner Actuator
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Outside Rearview Mirror Glass Replacement	
1	Outside Rearview Mirror Inner Actuator Fastener [3x] CAUTION: Refer to Fastener Caution . Tighten 0.8 N.m (7 lb in)
2	Outside Rearview Mirror Inner Actuator Procedure Disconnect the electrical connector.

OUTSIDE REARVIEW MIRROR GLASS REPLACEMENT

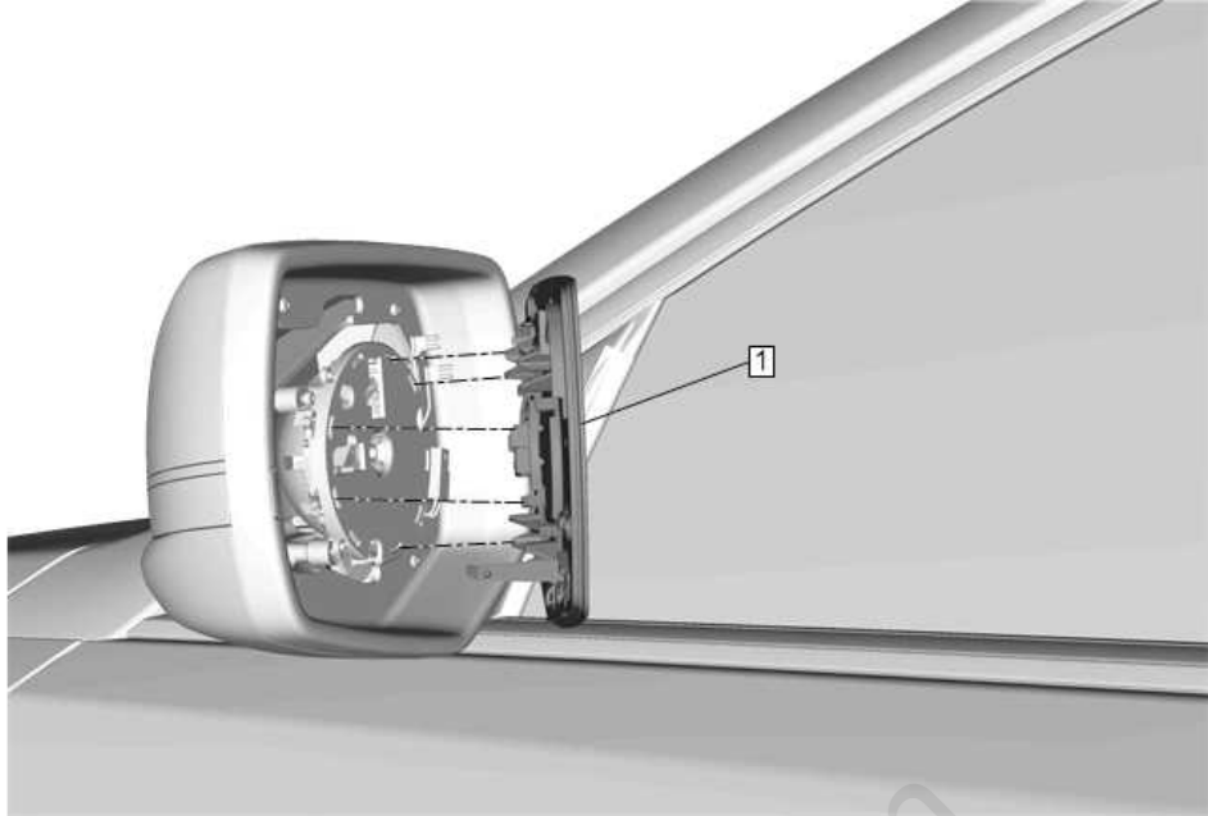


Fig. 13: Outside Rearview Mirror Glass
Courtesy of GENERAL MOTORS COMPANY

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. CAUTION: Refer to Paint Damage Caution . 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.

INSIDE REARVIEW MIRROR REPLACEMENT

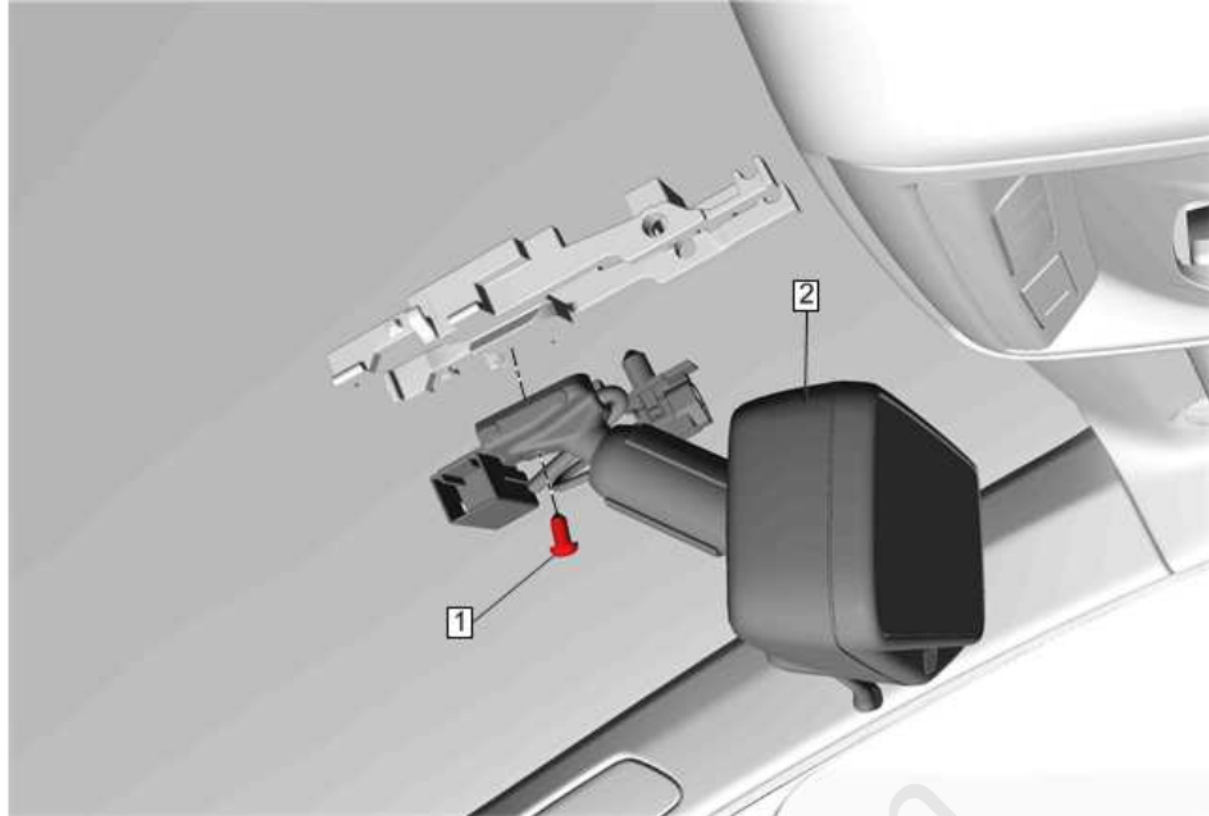


Fig. 14: Inside Rearview Mirror

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Windshield Multifunction Sensor Mount Bracket Cover Replacement (without UEU)</u> <u>Windshield Multifunction Sensor Mount Bracket Cover Replacement (with UEU)</u>	
1	Inside Rearview Mirror Set Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten 1.8 N.m (16 lb in)
2	Inside Rearview Mirror Procedure 1. Loosen the set screw located at the base of the mirror. 2. Slide the mirror off the rearview mirror button. 3. Disconnect the electrical connector.

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.

Inside Rearview Camera Full Display Mirror System Operation

The inside rearview camera full display mirror is connected to the outside rearview camera via a shielded coaxial cable. When the tab under the inside rearview mirror is pulled rearward, a view of the area behind the vehicle displays on the mirror. Adjust the rearview mirror for a clear view of the area behind the vehicle before turning on full display mirror. Use the button on the back of the mirror to adjust the brightness of the display. Make sure the light sensor is not covered when adjusting the brightness.

The inside rearview camera full display mirror may not work properly or display a clear image if:

- It is dark.
- The sun or the beam of headlamps are shining directly into the camera lens.
- Ice, snow, mud or anything else builds up on the camera lens. Clean the lens, rinse it with water and wipe it with a soft cloth.

When the mirror detects that the camera is not sending a valid video signal, it "blue screens" with a "no video" decal for 3 seconds, then reverts back to the mirror. Meanwhile, if a blue screen keeps on displaying instead of the camera view, take the vehicle to your dealer for service.

Rearview Camera Full Display Mirror Block Diagram



Fig. 15: Rearview Camera Full Display Mirror Block Diagram
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
A10	A10 Inside Rearview Mirror
B87	B87 Rearview Camera

OUTSIDE MIRROR DESCRIPTION AND OPERATION

Power Mirror System Components

The power mirror system consists of the following components:

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

Power Mirrors With A45 Block Diagram

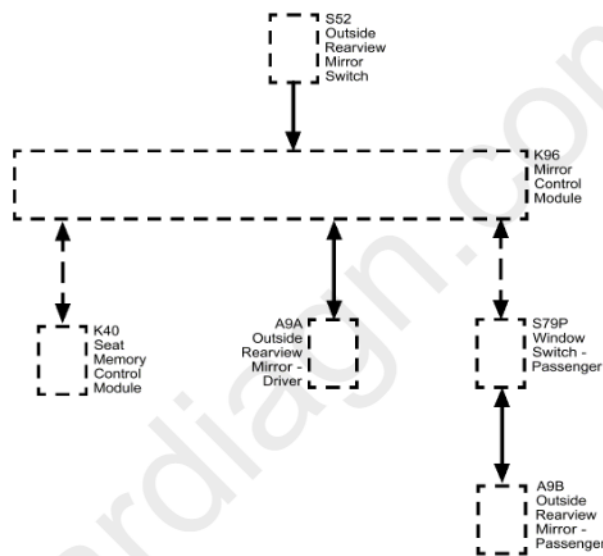


Fig. 16: Power Mirrors With A45 Block Diagram

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
S52	S52 Outside Rearview Mirror Switch
K96	K96 Mirror Control Module
A9A	A9A Outside Rearview Mirror - Driver
S79P	S79P Window Switch - Passenger
A9B	A9B Outside Rearview Mirror - Passenger
K40	K40 Seat Memory Control Module

Power Mirror System Controls

The outside rearview mirror switch is a multiplex switch which signals the mirror control module which outside rearview mirror to move (driver or passenger) and which direction to move it. The mirror control module and the passenger window switch are on a serial data circuit with the memory seat module as the master. The mirror select and directional control switches are inputs to the mirror control module. When

the memory seat module receives the switch inputs from the mirror control module, mirror output commands are sent to the appropriate module/switch through the serial data circuit. The mirror control module and passenger window switch control the left and right outside rear view mirrors through bi-directional motor control circuits. The motor control circuits are floating while in an inactive state and the switches will apply power and ground to the control circuits as necessary to move the mirror in the commanded direction.

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

Folding Mirrors

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

Heated Mirrors

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