Component Procedures: Mirrors

Table of Contents

Component Procedures: Mirrors

Parts and Labor (itype_189)

Labor

Operation	Qualifier Path	Skill	Std Hrs	Wty Hrs
Remove & Replace	Power Mirror > Mirror, R&R > One Side	B	0.6	0.5

Automatic Day-Night Mirror (Article 10433)

Inside Rearview Mirror with the Automatic Day-Night Feature System Operation

The inside rearview mirror uses 2 photocell sensors. One sensor is the headlight sensor, located on the face side of the mirror. The headlight sensor is used to determine light conditions present at the mirror face . The other sensor is the ambient light sensor, located on the rear of the mirror or windshield side. The ambient light sensor is used to determine the exterior light conditions. With a low exterior light condition detected, and a high light condition from behind the car, at the headlight sensor, the inside rearview mirror will automatically darken the face of the mirror.

In the daytime, the mirror is in a normal state because of the high exterior light condition that is indicated by the ambient light sensor. With the gear selector lever in the REVERSE position and the engine running, backup lamp supply voltage is supplied as an input to the inside rearview mirror. The mirror monitors this input to disable the automatic day-night feature. This allows the driver to see objects in the mirror clearly when backing up, even during the night.

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

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

Outside Mirror (Article 10434)

Power Mirror System Components

The power mirror system consists of the following components:

- Outside rearview mirror switch
- Mirror selector switch
- Left outside rearview mirror
- Right outside rearview mirror
- Power mirror fuse

Each of the outside rearview mirror s contains two motors. The vertical motor operates the mirror in the up and down directions, and the horizontal motor operates the mirror in the left and right directions. Each of the outside rearview mirror motor s are circuit breaker protected.

Figure 1: Power Mirrors Without A45 Block Diagram

Power Mirror System Controls

The outside rearview mirror switch is a four position directional switch: Up, Down, Left and Right.

The mirror select switch is a two position switch: left and right.

Power Mirror System Operation

The outside rearview mirror switch receives power through the battery positive voltage circuit from the power mirror fuse. The power mirror switch also receives a constant ground.

The four positions of the direction switch have dual switch contacts. Each of the contacts are connected to opposing sides of the appropriate power mirror motor s through the selector switch. The selector switch completes these circuits depending on the position of the selector switch, left or right.

If the selector switch is placed in the left position and the up switch is depressed, battery positive voltage will be supplied to the left outside rearview mirror vertical motor through the left mirror motor down control circuit and ground through the left mirror motor left control circuit. If the down switch is depressed, battery positive voltage will be supplied to the left outside rearview mirror vertical motor through the left mirror motor left control circuit and ground through the left mirror motor down control circuit.

The remainder of the mirror functions operate in the same manner as described above. Placing the power mirror switch in opposing positions, left/right or up/down, will reverse the polarity to the mirror motor, reversing the direction of movement.

Heated Mirrors (If Equipped)

The heated outside mirrors will operate when the rear window defogger is energized. Vehicle needs to be running for rear window defogger to operate.

Inside Rearview Mirror Schematics (Article 10448)

Figure 1: Inside Rearview Mirror (DD8)
Figure 2: Inside Rearview Mirror (DBX)
Figure 3: Inside Rearview Mirror (DBW)

Outside Rearview Mirror Schematics (Article 10449)

Figure 1: Outside Rearview Mirrors

Mirrors - Electrochromic Mirror Circuit (W/ Light Sensitive Rearview Mirror) (Article 10334)

Mirrors - Electrochromic Mirror Circuit (W/ Light Sensitive Rearview Mirror)
Page 1 of 1

Mirrors - Electrochromic Mirror Circuit (W/O Light Sensitive Rearview Mirror) (Article 10321)

Mirrors - Electrochromic Mirror Circuit (W/O Light Sensitive Rearview Mirror)
Page 1 of 1

Mirrors - Power Mirrors Circuit (Article 10340)

Mirrors - Power Mirrors Circuit
Page 1 of 1

Outside Rearview Mirror Opening Applique Replacement (Article 10444)

Callout Component Name
Preliminary Procedures Remove the front side door trim panel . Refer to Front Side Door Trim Panel Replacement .
Preliminary Procedures
Remove the front side door trim panel . Refer to Front Side Door Trim Panel Replacement .
1 Outside Rearview Mirror Opening Applique Fastener (Qty: 3) Caution: Refer to Fastener Caution . Tip: Remove pad to assess the outside rearview mirror opening applique fasteners. Tighten 2 Nm (18 lb in)
2 Nm (18 lb in)
2 Outside Rearview Mirror Opening Applique

Outside Rearview Mirror Seal Replacement (Article 10447)

Callout Component Name
Preliminary Procedures Place the front door window in the full down position. Remove the outside rearview mirror . Refer to Outside Rearview Mirror Replacement . Remove the front side door window belt reveal molding. Refer to Front Side Door Window Belt Reveal Molding Replacement .
Preliminary Procedures
- Place the front door window in the full down position.
- Remove the outside rearview mirror . Refer to Outside Rearview Mirror Replacement .
- Remove the front side door window belt reveal molding. Refer to Front Side Door Window Belt Reveal Molding Replacement .

1 Outside Rearview Mirror Seal Retainer
2 Outside Rearview Mirror Seal Procedures Insert mirror seal into the channel working it downward. The seal must be fully seated into the door lower frame . Inspect the mirror and window for proper operation before install the trim panel .
Procedures
- Insert mirror seal into the channel working it downward.
- The seal must be fully seated into the door lower frame .
- Inspect the mirror and window for proper operation before install the trim panel .

Outside Rearview Mirror Replacement (Article 10446)

Callout Component Name
Warning: Refer to Glass and Sheet Metal Handling Warning . Preliminary Procedure Remove the front side door trim panel . Refer to Front Side Door Trim Panel Replacement .
Preliminary Procedure
Remove the front side door trim panel . Refer to Front Side Door Trim Panel Replacement .
1 Outside Rearview Mirror Nuts (Qty: 3) Caution: Refer to Fastener Caution . Procedure Remove the outside rearview mirror nuts access cover . Disconnect the electrical connector. Tighten 10 Nm (89 lb in)

Procedure
- Remove the outside rearview mirror nuts access cover .
- Disconnect the electrical connector.
10 Nm (89 lb in)
2 Outside Rearview Mirror

Outside Rearview Mirror Actuator Replacement (Article 10442)

Callout Component Name
Preliminary Procedure Remove the outside rearview mirror lens. Refer to Outside Rearview Mirror Glass Replacement .
Preliminary Procedure
Remove the outside rearview mirror lens. Refer to Outside Rearview Mirror Glass Replacement .
1 Outside Rearview Mirror Inner Actuator/Motor Screws (Qty: 3) Warning: Refer to Glass and Sheet Metal Handling Warning . Caution: Refer to Fastener Caution . Procedure Disconnect the electrical connector. Tighten 10 Nm (89 lb in)
Procedure
Disconnect the electrical connector.
10 Nm (89 lb in)
2 Outside Rearview Mirror Inner Actuator/Motor

Outside Rearview Mirror Glass Replacement (Article 10443)

Callout Component Name
1 Outside Rearview Mirror Glass Retainers (Qty :6) Warning: Refer to Glass and Sheet Metal Handling Warning . Procedure Apply several layers of masking tape to the top of the outside rearview mirror housing in order to protect the painted finish. Push the mirror glass (2) inward at the bottom of the mirror glass until full travel is reached. Insert a suitable tool behind the mirror glass and housing, pry outward until the mirror glass is releases from the retainers. Disconnect electrical connectors from mirror, if equipped.
Procedure
- Apply several layers of masking tape to the top of the outside rearview mirror housing in order to protect the painted finish. Push the mirror glass (2) inward at the bottom of the mirror glass until full travel is reached.
- Insert a suitable tool behind the mirror glass and housing, pry outward until the mirror glass is releases from the retainers.
- Disconnect electrical connectors from mirror, if equipped.
2 Outside Rearview Mirror Glass Procedure Align the mirror glass retainers with the retaining tabs (1) on the actuator. Using a 9 cm (3 in) rubber sanding block placed in the center of the mirror glass, apply pressure until an audible click is heard. Inspect the power mirror for proper operation.
- Align the mirror glass retainers with the retaining tabs (1) on the actuator.
- Using a 9 cm (3 in) rubber sanding block placed in the center of the mirror glass, apply pressure until an audible click is heard.
- Inspect the power mirror for proper operation.

Inside Rearview Mirror Replacement (Article 10440)

Callout Component Name
Preliminary Procedure Remove the inside rearview mirror wiring harness cover. Refer to Inside Rearview Mirror Wiring Harness Cover Replacement .
Preliminary Procedure
Remove the inside rearview mirror wiring harness cover. Refer to Inside Rearview Mirror Wiring Harness Cover Replacement .
1 Inside Rearview Mirror Electrical Connector
2 Inside Rearview Mirror Set Screw Caution: Refer to Fastener Caution . Procedure Adjust the mirror to the full upward position. Loosen the set screw located at the base of the mirror. Slide the mirror upward off of the rearview mirror button. Tighten 2 Nm (18 lb in)
Procedure
- Adjust the mirror to the full upward position.
- Loosen the set screw located at the base of the mirror.
- Slide the mirror upward off of the rearview mirror button.
2 Nm (18 lb in)
3 Inside Rearview Mirror Procedure Clear all diagnostic trouble codes (DTC). Refer to Control Module

References for programming and setup information. Note: Record and then clear all Diagnostic Trouble Codes before performing any diagnostic procedures or mirror replacement.
- Clear all diagnostic trouble codes (DTC).
- Refer to Control Module References for programming and setup information.

Inside Rearview Mirror Wiring Harness Cover Replacement (Article 10441)

Callout Component Name
1 Inside Rearview Mirror Wiring Harness Cover Procedure Slide the cover up and gentle pull down and out from window.
Procedure
Slide the cover up and gentle pull down and out from window.

Mirrors - Adhesives, Fluids, Lubricants, and Sealers (Article 10450)

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

Mirrors - Fastener Specifications (Article 10452)

Application Specification
Metric English
Inside Rearview Mirror Set Screw 2 Nm 18 lb in
Outside Rearview Mirror Nuts 10 Nm 89 lb in
Outside Rearview Mirror Inner Actuator/Motor Screws 10 Nm 89 lb in

All Technical Service Bulletins (itype_100)

Tsbs
- Memory Mirror Positions Lost and/or Reverse Tilt is Inoperative (17-NA-297, 2017/11/17)
- Power Foldaway Mirror Glass Shakes, Flutters at Normal Driving Speeds (16-NA-075, 2017/12/15)
- Body - Power Foldaway Mirror Glass Shakes/Flutters (PI0373B, 2014/06/18)
- Warranty Administration - Warranty Claims Submission - Outside Rear View Mirrors (10-08-64-002D, 2018/01/17)
- Mirrors - Inside Mirror Loose/Bracket Fell Off (PI1290, 2014/08/07)

Repair Tips (itype_110)

Tsbs
- Body - Power Foldaway Mirror Glass Shakes/Flutters (PI0373B, 2014/06/18)
- Mirrors - Inside Mirror Loose/Bracket Fell Off (PI1290, 2014/08/07)

Inside Rearview Mirror Programming and Setup (Article 10742)

The inside rearview mirror comes with pre-loaded software. No programming is required unless directed by engineering due to a software update.

Symptoms - Mirrors (Article 10439)

- 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.
- 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
- OnStar Description and Operation
- Outside Mirror Description and Operation

Visual/Physical Inspection
- Inspect for aftermarket devices which could affect the operation of the system.
- 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
- Heated Mirrors Malfunction
- OnStar Button LED Malfunction
- OnStar Button Malfunction
- Power Mirror Malfunction

Heated Mirrors Malfunction (Article 10437)

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit Short to Ground Open/High Resistance Short to Voltage Signal Performance
Left Heated Mirror Element Control 2 1 3 —
Driver Outside Rearview Mirror Ground — 1 — —
Right Heated Mirror Element Control 2 1 3 —
Passenger Outside Rearview Mirror Ground — 1 — —
1. Single Heated Mirror Inoperative 2. Both Heated Mirrors Inoperative 3. Heated Mirrors Always On

Circuit/System Description

The 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.

Reference Information

Schematic Reference
Outside Rearview Mirror Schematics
Connector End View Reference
Component Connector End Views
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

- Engine running.
- 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
- Verify the E17D Outside Rearview Mirror Glass-Driver and the E17P Outside Rearview Mirror Glass-Passenger become warm when commanding the Rear Defogger On with a scan tool.
- If the E17D Outside Rearview Mirror Glass-Driver and the E17P Outside Rearview Mirror Glass-Passenger do not become warm Refer to Circuit/System Testing.
- If the E17D Outside Rearview Mirror Glass-Driver and the E17P Outside Rearview Mirror Glass-Passenger become warm
- All OK.

Circuit/System Testing

- 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.
- Test for less than 10 Ω between the ground circuit terminal listed below and ground.
- E17D Outside Rearview Mirror Glass-Driver ground circuit terminal 4
- E17P Outside Rearview Mirror Glass-Passenger ground circuit terminal 2
- If 10 Ω or greater
- Ignition OFF.
- 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
- Ignition ON, connect a test lamp between the control circuit terminal and the ground circuit terminal listed below:
- E17D Outside Rearview Mirror Glass-Driver control circuit terminal 3 and ground circuit terminal 4
- E17P Outside Rearview Mirror Glass-Passenger control circuit terminal 1 and ground circuit terminal 2
- Verify the test lamp turns ON and OFF when commanding the Rear Defogger On and Off with a scan tool.
- If the test lamp is always OFF
- Ignition OFF, remove the test lamp, disconnect the harness connector at the X50A Fuse Block-Underhood.
- 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
- Test for less than 2 Ω in the control circuit end to end.
- If less than 2 Ω, replace the E17 Outside Rearview Mirror Glass.
- If the test lamp is always ON
- Ignition OFF, remove the test lamp, disconnect the harness connector at the X50A Fuse Block-Underhood, ignition ON.
- Test for less than 1 V between the control circuit and ground.
- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V, replace the X50A Fuse Block-Underhood
- If the test lamp turns ON and OFF
- Test or replace the E17 Outside Rearview Mirror Glass.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.

Outside Rearview Mirror Glass Replacement

Accessory Wiring Junction Block Replacement

Automatic Day-Night Mirrors Malfunction (DD8 w/ UE1) (Article 10435)

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 B2545 02 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 mirror face to darken the mirror when needed.

With the gear selector lever in the REVERSE position and the engine running, the automatic day-night feature is disabled. This allows the driver to see objects in the mirror clearly when backing up, regardless of the rear light sensor status. The reverse signal is provided to the mirror through serial data.

Reference Information

Schematic Reference

- Inside Rearview Mirror Schematics
- Outside Rearview Mirror Schematics

Connector End View Reference

Component Connector End Views
Description and Operation
Automatic Day-Night Mirror Description and Operation
Electrical Information Reference
- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs
Scan Tool Reference
Control Module References for scan tool information
Circuit/System Verification
- Ignition ON.
- Cover the windshield with a blanket or other suitable item.
- 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
- 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
- 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
- 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
- All OK.
Circuit/System Testing
Inside Review Mirror Dimming Inoperative
- 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.
- Test for less than 10 Ω between the ground circuit terminal 5 and ground.
- If 10 Ω or greater
- Ignition OFF, remove the test lamp.
- 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
- 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
- Test for less than 2 Ω in the ignition circuit end to end.
- 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
- 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
- Test for infinite resistance between the signal circuit and ground.
- If infinite resistance, replace the A10 Inside Rearview Mirror
- If the test lamp illuminates
- Replace the A10 Inside Rearview Mirror.
Day-Night Disable Malfunction
- Ignition OFF, disconnect the harness connector at the A10 Inside Rearview Mirror. Ignition ON
- Connect a test lamp between the control circuit terminal 1 and ground
- 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
- Ignition OFF, remove the test lamp, disconnect the harness connector at the K9 Body Control Module .
- Test for infinite resistance between the control circuit terminal 1 and ground.
- Test for less than 2 Ω in the control circuit end to end.
- If less than 2 Ω, refer to Backup Lamps Malfunction .
- If the test lamp is always ON
- Ignition OFF, remove the test lamp, disconnect the harness connector at the K9 Body Control Module, ignition ON.
- 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
Outside Rearview Mirror Dimming Malfunction
- Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the E17D Outside Rearview Mirror Glass. It may take up to 2 minutes for all vehicle systems to power down.
- Test for less than 10 Ω between the low reference circuit terminal 2 and ground.
- Ignition OFF, disconnect the harness connector at the A10 Inside Rearview Mirror.
- Test for less than 2 Ω in the low reference circuit end to end.
- If less than 2 Ω, replace the A10 Inside Rearview Mirror.
- Test for less than 1 V between the control circuit terminal 1 and ground.
- If 1 V or greater
- Ignition OFF, disconnect the harness connector at the A10 Inside Rearview Mirror, ignition ON.
- If less than 1 V replace the A10 Inside Rearview Mirror.
- If less than 1 V
- Ignition ON, headlamps ON, transmission not in R, cover the front light sensor with a towel or other suitable item. Shine a flashlight at the rear light sensor.
- Test for greater than 1 V between the control circuit terminal 1 and ground.
- If 1 V or less
- Test for infinite resistance between the control circuit and ground.
- If less than 2 Ω, test or replace the A10 Inside Rearview Mirror.
- If greater than 1 V
- Test or replace E17 Outside Rearview Mirror Glass.
Repair Instructions
Perform the Diagnostic Repair Verification after completing the repair.
- Outside Rearview Mirror Glass Replacement
- Control Module References for the inside rearview mirror replacement, programming and setup

Automatic Day-Night Mirrors Malfunction (DD8 w/o UE1) (Article 10436)

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 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
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.

Reference Information

Schematic Reference

- Inside Rearview Mirror Schematics
- Outside Rearview Mirror Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Automatic Day-Night Mirror Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

- Engine running, headlamps ON.
- Cover the windshield with a blanket or other suitable item.
- 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
- Park brake applied, verify the A10 Inside Rearview Mirror face transitions from dim to bright when placing the transmission selector in R (reverse).
- 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
- Vehicle in PARK, shine a flashlight at the rear light sensor while observing the A9A Outside Rearview Mirror-Driver face.
- Verify the A9A Outside Rearview Mirror-Driver face dims.
- 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
- Engine running, park brake applied, place the transmission in REVERSE.
- Verify the A9A Outside Rearview Mirror-Driver face transitions from dim to bright.
- 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
- All OK.

Circuit/System Testing

Inside Review Mirror Dimming Inoperative

- 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.
- Test for less than 10 Ω between the ground circuit terminal 5 and ground.
- If 10 Ω or greater
- Ignition OFF, remove the test lamp.
- 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
- Ignition ON.
- 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
- Test for less than 2 Ω in the ignition circuit end to end.
- 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

- 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
- Test for infinite resistance between the signal circuit and ground.
- If infinite resistance, replace the A10 Inside Rearview Mirror
- If the test lamp illuminates
- Replace the A10 Inside Rearview Mirror.
Day-Night Disable Malfunction
- Ignition OFF, disconnect the harness connector at the A10 Inside Rearview Mirror.
- Connect a test lamp between the signal circuit terminal 1 and ground
- Ignition ON, verify the test lamp turns ON and OFF while commanding the Backup Lamps Active and Inactive with a scan tool.
- If the test lamp is always OFF
- Ignition OFF, remove the test lamp, disconnect the X204 inline harness connector.
- Test for infinite resistance between the signal circuit terminal 1 and ground.
- Test for less than 2 Ω in the control circuit end to end.
- If less than 2 Ω, refer to Backup Lamps Malfunction .
- If the test lamp is always ON
- Ignition OFF, remove the test lamp, disconnect the X204 inline harness connector, ignition ON.
- 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
Outside Rearview Mirror Dimming Malfunction
- 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.
- Test for less than 10 Ω between the low reference circuit terminal 2 and ground.
- Test for less than 2 Ω in the low reference circuit end to end.
- If less than 2 Ω, replace the A10 Inside Rearview Mirror.
- Test for less than 1 V between the control circuit terminal 1 and ground.
- If 1 V or greater
- Ignition OFF, disconnect the harness connector at the A10 Inside Rearview Mirror, ignition ON.
- Test for less than 1 V between the control circuit and ground.
- If less than 1 V replace the A10 Inside Rearview Mirror.
- If less than 1 V
- 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.
- Test for greater than 1 V between the control circuit terminal 1 and ground.
- If 1 V or less
- Test for infinite resistance between the control circuit and ground.
- If less than 2 Ω, test or replace the A10 Inside Rearview Mirror.
- If greater than 1 V
- 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 Malfunction (Article 10438)

Diagnostic Instructions
- Perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.
- Review Strategy Based Diagnosis for an overview of the diagnostic approach.
- Diagnostic Procedure Instructions provides an overview of each diagnostic category.
Diagnostic Fault Information
Circuit Short to Ground Open/High Resistance Short to Voltage Signal Performance
Outside Rearview Mirror Switch B+ 1 1 — —
Driver Left/Right Mirror Horizontal Motor Control 1 2 2 —
Driver Left/Right Mirror Vertical Motor Control 1 2 2 —
Passenger Left/Right Mirror Horizontal Motor Control 1 3 3 —
Passenger Left/Right Mirror Vertical Motor Control 1 3 3 —

Outside Rearview Mirror Switch Ground — 1 — —
1. Both Outside Power Mirrors Inoperative 2. Driver Outside Power Mirror Malfunction 3. Passenger Outside Power Mirror Malfunction

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 .

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Outside Mirror Description and Operation

Electrical Information Reference

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

Circuit/System Verification

- Verify the A9A Outside Rearview Mirror-Driver and the A9B Outside Rearview Mirror-Passenger operates UP, DOWN, LEFT and RIGHT with the S52 Outside Rearview Mirror Switch.
- 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 Mirror s Inoperative.
- 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.
- If both the A9A Outside Rearview Mirror-Driver and the A9B Outside Rearview Mirror-Passenger move UP, DOWN, LEFT and RIGHT
- All OK.

Circuit/System Testing

Both Outside Mirrors Inoperative

- Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S52 Outside Rearview Mirror Switch. It may take up to 2 minutes for all vehicle systems to power down.
- Test for less than 10 Ω between the ground circuit terminal 2 and ground.
- If 10 Ω or greater
- Ignition OFF.
- 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
- 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
- Test for less than 2 Ω in the B+ circuit end to end.
- 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
- Test for infinite resistance between the B+ circuit and ground.
- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance
- Test for infinite resistance between each of the control circuit terminals listed below and ground:
- Terminal 3 control circuit
- Terminal 4 control circuit
- Terminal 5 control circuit
- Terminal 7 control circuit
- Terminal 8 control circuit
- If infinite resistance, test or replace the appropriate M77 Outside Rearview Mirror Motor .
- If the test lamp illuminates
- Test or replace the S52 Outside Rearview Mirror Switch.

Single Outside Mirror Malfunction

- Ignition OFF, disconnect the harness connector at the appropriate A9 Outside Rearview Mirror. Ignition ON
- Connect a test lamp between the control circuit terminal 3 and the control circuit terminal 2.
- Verify the test lamp illuminates when commanding the UP and DOWN functions with the S52 Outside Rearview Mirror Switch.
- If the test lamp does not illuminate during either of the UP and DOWN commands
- Ignition OFF, remove the test lamp, disconnect the harness connector at the S52 Outside Rearview Mirror Switch.
- Test for infinite resistance between each control circuit and ground.
- Test for less than 2 Ω in each control circuit end to end.
- If less than 2 Ω, replace at the S52 Outside Rearview Mirror Switch.
- If the test lamp is always ON
- Ignition OFF, remove the test lamp, disconnect the harness connector at the S52 Outside Rearview Mirror Switch, ignition ON.
- Test for less than 1 V between each control circuit and ground.
- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V, replace the S52 Outside Rearview Mirror Switch
- If the test lamp illuminates during UP and DOWN the commands
- Connect a test lamp between the control circuit terminal 1 and the control circuit terminal 2.
- Verify the test lamp illuminates when commanding the LEFT and RIGHT functions with the S52 Outside Rearview Mirror Switch.
- If the test lamp does not illuminate during either of the LEFT and RIGHT commands
- If the test lamp illuminates during the LEFT and RIGHT commands
- Test or replace the M77 Outside Rearview Mirror Motor.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.
- Outside Rearview Mirror Remote Control Switch Replacement
- Outside Rearview Mirror Actuator Replacement

Erratic Operation (itype_132)

Tsbs
- Memory Mirror Positions Lost and/or Reverse Tilt is Inoperative (17-NA-297, 2017/11/17)

Inoperative (itype_148)

Tsbs
- Memory Mirror Positions Lost and/or Reverse Tilt is Inoperative (17-NA-297, 2017/11/17)

Loose (itype_150)

Tsbs
- Power Foldaway Mirror Glass Shakes, Flutters at Normal Driving Speeds (16-NA-075, 2017/12/15)

Warranty Information (itype_119)

Tsbs
- Warranty Administration - Warranty Claims Submission - Outside Rear View Mirrors (10-08-64-002D, 2018/01/17)