

2008 Chevrolet Silverado 1500
2008 ACCESSORIES & EQUIPMENT Mirrors - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

2008 Chevrolet Silverado 1500
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2008 ACCESSORIES & EQUIPMENT

Mirrors - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Inside Rearview Mirror	1.8 N.m	16 lb in
Outside Mirror Motor Screw	2 N.m	18 lb in
Outside Power Mirror Nuts	9 N.m	80 lb in

SCHEMATIC AND ROUTING DIAGRAMS

INSIDE REARVIEW MIRROR SCHEMATICS

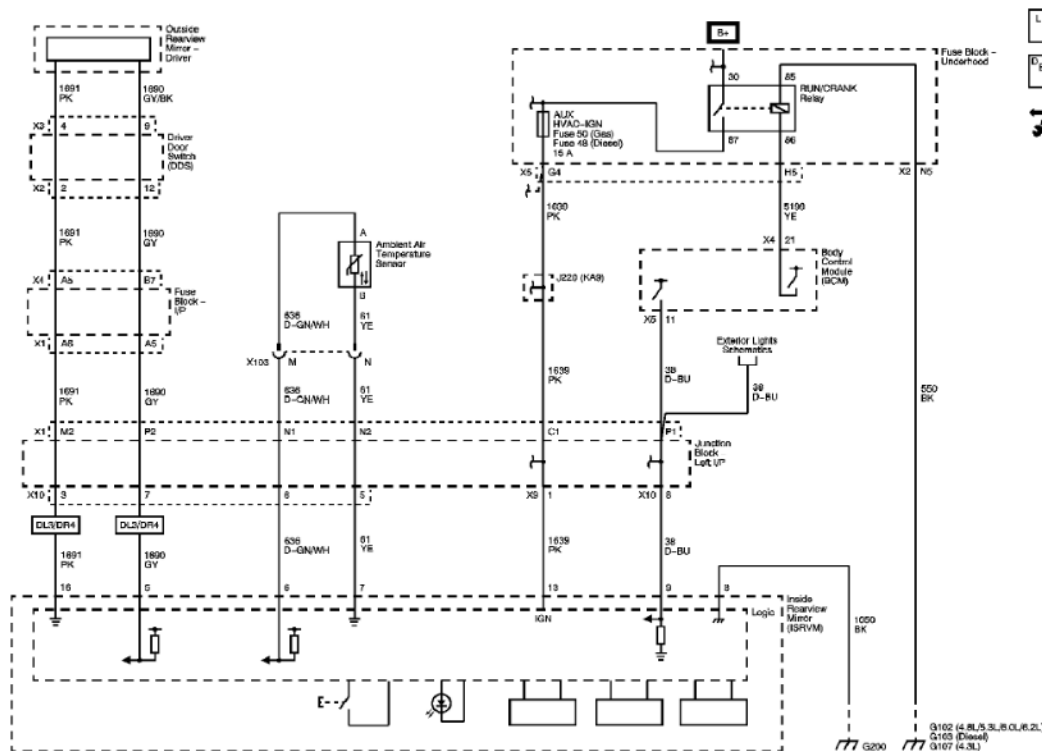


Fig. 1: Inside Rearview Mirror Schematic
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OUTSIDE REARVIEW MIRROR SCHEMATICS

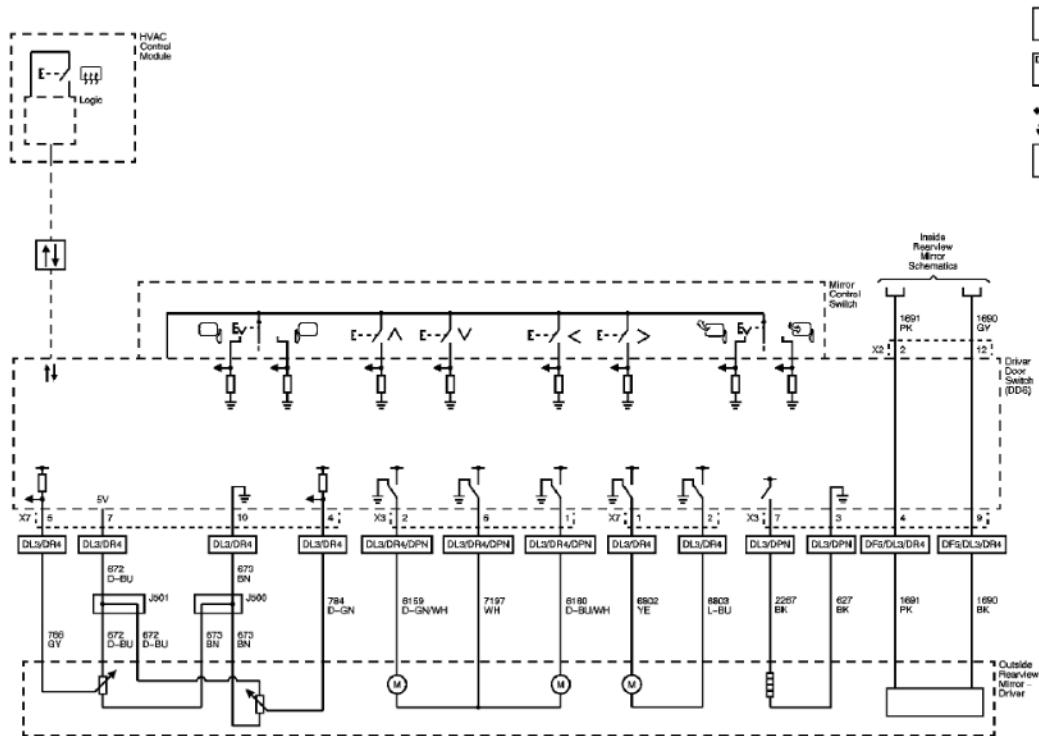


Fig. 2: Driver (AN3/DL3)
Courtesy of GENERAL MOTORS CORP.

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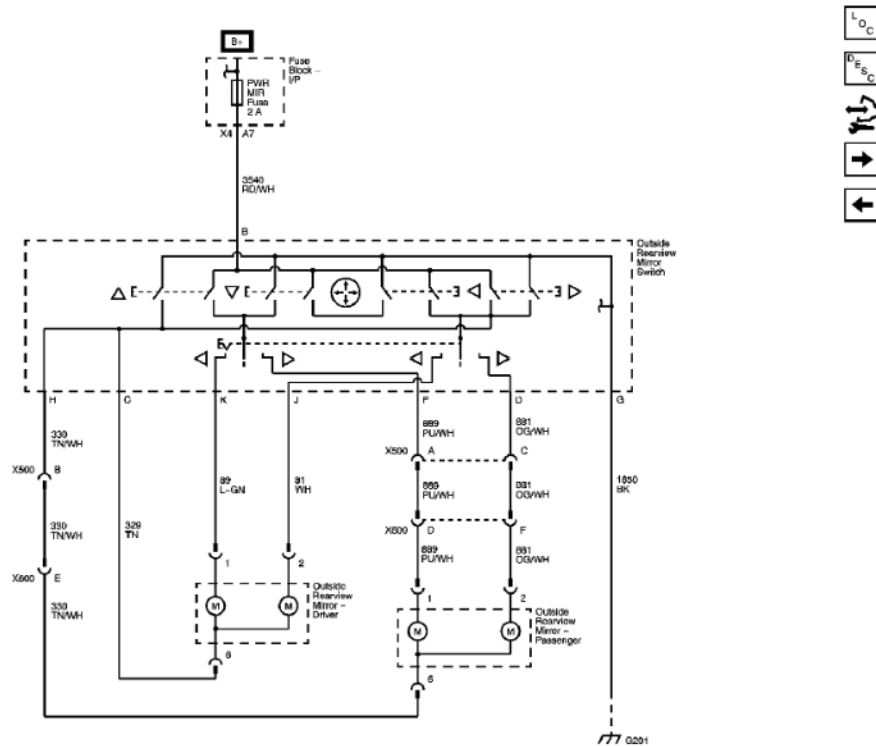


Fig. 4: Position Controls (DL8/DPN -AN3/DL3)
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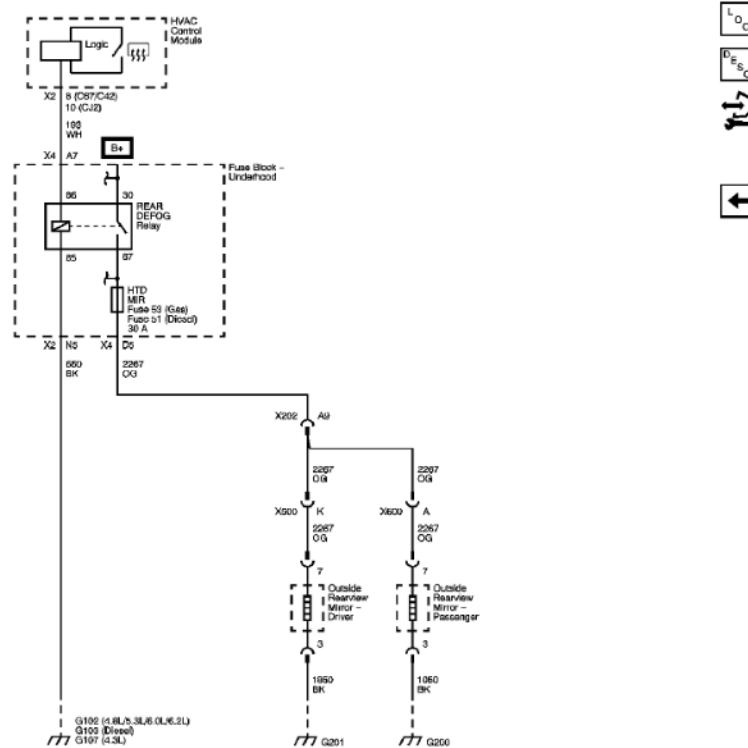


Fig. 5: Heat (DL8/DPN -AN3/DL3)
Courtesy of GENERAL MOTORS CORP.

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC B1544, B1600, or B1605</u>	B1544 01: Mirror Motors Common Circuit Short to Battery B1544 02: Mirror Motors Common Circuit Short to Ground B1544 04: Mirror Motors Common Circuit Open B1600 01: Mirror Motor Vertical Circuit Short to Battery B1600 02: Mirror Motor Vertical Circuit Short to Ground B1600 04: Mirror Motor Vertical Circuit Open B1605 01: Mirror Motor Horizontal Circuit Short to Battery B1605 02: Mirror Motor Horizontal Circuit Short to Ground B1605 04: Mirror Motor Horizontal Circuit Open
<u>DTC B1580 or B1590</u>	B1580: Mirror Horizontal Position Sensor Circuit

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	B1590: Mirror Vertical Position Sensor Circuit
<u>DTC B1640</u>	B1640 01: Mirror Heater Circuit Short to Battery B1640 02: Mirror Heater Circuit Short to Ground
<u>DTC B1722</u>	B1722 01: Mirror Power Fold Circuit Short to Battery B1722 02: Mirror Power Fold Circuit Short to Ground B1722 04: Mirror Power Fold Circuit Open

DIAGNOSTIC STARTING POINT - MIRRORS

Begin the system diagnosis with the **Diagnostic System Check - Vehicle** . The Diagnostic System Check will provide the following information:

- The identification of the control modules which command the system.
- The ability of the control modules to communicate through the serial data circuit.
- The identification of any stored diagnostic trouble codes (DTCs) and their status.

The use of the Diagnostic System Check will identify the correct procedure for diagnosing the system and where the procedure is located.

DTC B1544, B1600, OR B1605

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 B1544 01

Mirror Motors Common Circuit Short to Battery

DTC B1544 02

Mirror Motors Common Circuit Short to Ground

DTC B1544 04

Mirror Motors Common Circuit Open

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DTC B1600 01

Mirror Motor Vertical Circuit Short to Battery

DTC B1600 02

Mirror Motor Vertical Circuit Short to Ground

DTC B1600 04

Mirror Motor Vertical Circuit Open

DTC B1605 01

Mirror Motor Horizontal Circuit Short to Battery

DTC B1605 02

Mirror Motor Horizontal Circuit Short to Ground

DTC B1605 04

Mirror Motor Horizontal Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Driver/Passenger Mirror Motor Right Control	B1605 02	B1605 04	B1605 01	-
Driver/Passenger Mirror Right/Down Motors Common	B1544 02	B1544 04	B1544 01	-
Driver/Passenger Mirror Motor Down Control	B1600 02	B1600 04	B1600 01	-

Circuit/System Description

The Driver Door Switch (DDS) or Passenger Door Switch (PDS) controls the mirror horizontal and vertical motors through the use of bi-directional motor controls. When the mirror is commanded up, voltage is supplied to the mirror vertical motor through the Driver/Passenger Mirror Motor Right/Down Motors Common circuit and ground is supplied through the

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Driver/Passenger Mirror Motor Down Control circuit. When the mirror is commanded down, voltage is supplied to the mirror vertical motor through the Driver/Passenger Mirror Motor Down Control circuit and ground is supplied through the Driver/Passenger Mirror Motor Right/Down Motors Common circuit.

Horizontal controls operate in the same manner with the Driver/Passenger Mirror Motor Right/Down Motors Common circuit supplying voltage and the Driver/Passenger Mirror Motor Right Control circuit supply a ground to the mirror horizontal motor when the mirror is commanded right. When the mirror is commanded left, voltage is supplied to the mirror horizontal motor through the Driver/Passenger Mirror Motor Right Control circuit and ground is supplied through the Driver/Passenger Mirror Motor Right/Down Motors Common circuit.

Conditions for Running the DTC

The power mirror is being commanded left, right, up, or down.

Conditions for Setting the DTC

B1544

An improper voltage level is detected on the Driver/Passenger Mirror Motor Right/Down Motors Common circuit while the mirror is being commanded.

B1600

An improper voltage level is detected on the Driver/Passenger Mirror Motor Down Control circuit while the mirror is being commanded.

B1605

An improper voltage level is detected on the Driver/Passenger Mirror Motor Right Control circuit while the mirror is being commanded.

Action Taken When the DTC Sets

Mirror movement is suspended so long as the fault is present.

Conditions for Clearing the DTC

- A current DTC will clear when the fault is no longer present.
- A history DTC will clear after 40 malfunction-free ignition cycles.

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Outside Mirror Description and Operation (Heated Mirrors) or Outside Mirror Description and Operation (Power Mirrors)

Electrical Information Reference

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

Scan Tool References

Control Module References For Scan Tool Information.

Circuit/System Verification

Command the left and right outside mirror to move up, down, left and right using the mirror directional switch. The mirror should move in the commanded direction.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector X3 at the appropriate door switch.
2. Ignition ON, verify a test lamp does not illuminate between the following control circuit terminals and ground:
 - Control circuit terminal 1
 - Control circuit terminal 2
 - Control circuit terminal 6
 - If the test lamp illuminates, test the appropriate control circuit for a short to voltage.
3. Ignition OFF, test for infinite resistance between the following control circuits and ground:

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- Control circuit terminal 1
 - Control circuit terminal 2
 - Control circuit terminal 6
 - If less the specified value, test the appropriate control circuit for a short to ground.
4. Test for 40-100 ohms of resistance between the control circuit terminal 1 and the control circuit terminal 6.
 - If not within the specified range, test both control circuit for an open/high resistance. If the circuits test normal, test or replace the rearview mirror motor.
 5. Test for 40-100 ohms of resistance between the control circuit terminal 2 and the control circuit terminal 6.
 - If not within the specified range, test both control circuit for an open/high resistance. If the circuits test normal, test or replace the rearview mirror motor.
 6. If all circuits test normal, replace the appropriate door switch.

Repair Procedures

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

- **Outside Rearview Mirror Motor Replacement**
- **Control Module References** for DDS or PDS replacement, setup, and programming

DTC B1580 OR B1590

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 B1580

Mirror Horizontal Position Sensor Circuit

DTC B1590

Mirror Vertical Position Sensor Circuit

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Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
5-Volt Reference	B1580, B1590	B1580, B1590	B1580, B1590	-
Driver/Passenger Mirror Horizontal Position Sensor Signal	B1580	B1580	B1580	-
Driver/Passenger Mirror Vertical Position Sensor Signal	B1590	B1590	B1590	-
Low Reference	B1580, B1590	B1580, B1590	B1580, B1590	-

Circuit/System Description

The Driver Door Switch (DDS) and Passenger Door Switch (PDS) determine the position of the outside rearview mirrors based on inputs from two mirror position sensors, one for vertical position, the other for horizontal position. Five volts are applied to each sensor through a shared 5-volt reference circuit and a shared low reference circuit supplies ground. Each sensor has an individual signal circuit which provides position voltage to the DDS/PDS.

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

B1580

An improper voltage level is seen on the Driver/Passenger Mirror Horizontal Position Sensor Signal circuit.

B1590

An improper voltage level is seen the Driver/Passenger Mirror Vertical Position Sensor Signal circuit.

Action Taken When the DTC Sets

Mirror movement is suspended so long as the fault is present.

Conditions for Clearing the DTC

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- A current DTC will clear when the fault is no longer present.
- A history DTC will clear after 40 malfunction-free ignition cycles.

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Outside Mirror Description and Operation (Heated Mirrors) or Outside Mirror Description and Operation (Power Mirrors)

Electrical Information Reference

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

Scan Tool References

Control Module References For Scan Tool Information.

Circuit/System Verification

Ignition ON, observe the scan tool Mirror Horizontal Position and Mirror Vertical Position parameters. The reading should be between 0.2-4.8 volts and change as the mirror is moved, left, right, up, and down.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector X7 at the appropriate door switch.
2. Ignition ON, verify a test lamp does not illuminate between the following circuit terminals and ground:

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- 5-volt reference circuit terminal 7
 - Signal circuit terminal 4
 - Signal circuit terminal 5
 - Low reference circuit terminal 10
 - If the test lamp illuminates, test the appropriate circuit for a short to voltage.
3. Ignition OFF, test for infinite resistance between the following circuits and ground:
- 5-volt reference circuit terminal 7
 - Signal circuit terminal 4
 - Signal circuit terminal 5
 - Low reference circuit terminal 10
 - If less than the specified value, test the appropriate circuit for a short to ground.
4. Test for 4K-7K ohms of resistance between the 5-volt reference circuit terminal 7 and the low reference circuit terminal 10.
- If not within the specified range, test the 5-volt reference circuit and the low reference circuit for an open/high resistance. If the circuits test normal, test or replace the rearview mirror motor.
5. Test for 1K-7K ohms of resistance between the 5-volt reference circuit terminal 7 and the signal circuit terminal 4.
- If not within the specified range, test the signal circuit for an open/high resistance. If the circuits test normal, test or replace the rearview mirror motor.
6. Test for 1K-7K ohms of resistance between the 5-volt reference circuit terminal 7 and the signal circuit terminal 5.
- If not within the specified range, test the signal circuit for an open/high resistance. If the circuits test normal, test or replace the rearview mirror motor.
7. If all circuits test normal, replace the appropriate door switch.

Repair Procedures

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

- **Outside Rearview Mirror Motor Replacement**
- **Control Module References** for DDS or PDS replacement, setup, and programming

DTC B1640

Diagnostic Instructions

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- 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 B1640 01

Mirror Heater Circuit Short to Battery

DTC B1640 02

Mirror Heater Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Mirror Heating Element Supply Voltage	B1640 02	1	B1640 01	-
Low Reference	-	1	1	-
1. Heated Mirror Malfunction				

Circuit/System Description

The Driver Door Switch (DDS) and Passenger Door Switch (PDS) supply voltage to the outside rearview mirror heater elements upon receipt of a serial data message from the HVAC module indicating that the rear defrost system is active. The door switch supplies B+ through the driver/passenger mirror heating element supply voltage circuit when a request is seen. Ground is applied through the driver/passenger mirror heating low reference circuit.

Conditions for Running the DTC

The heated mirrors or commanded ON.

Conditions for Setting the DTC

B1640 01

A short to voltage is detected on the mirror heating element supply voltage circuit while the heated mirrors.

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B1640 02

A short to ground is detected on the mirror heating element supply voltage circuit while the heated mirrors.

Action Taken When the DTC Sets

The affected heated mirror will not be activated.

Conditions for Clearing the DTC

- A current DTC will clear when the fault is no longer present.
- A history DTC will clear after 40 malfunction-free ignition cycles.

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Outside Mirror Description and Operation (Heated Mirrors) or Outside Mirror Description and Operation (Power Mirrors)

Electrical Information Reference

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

Scan Tool References

Control Module References For Scan Tool Information.

Circuit/System Verification

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Ignition ON, press the rear window defogger switch. The rear window defogger and both heated mirrors should become warm.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector X3 at the appropriate door switch.
2. Ignition ON, verify a test lamp does not illuminate between the supply voltage circuit terminal 7 and ground.
 - If the test lamp illuminates, test the supply voltage circuit for a short to voltage.
3. Ignition OFF, test for infinite resistance between the supply voltage circuit terminal 7 and ground.
 - If less than the specified value, test the supply voltage circuit for a short to ground. If the circuit tests normal, test or replace the applicable rearview mirror face.
4. Test for 5-10 ohms of resistance between the supply voltage circuit terminal 7 and the low reference circuit terminal 3.
 - If not within the specified range, test the supply voltage circuit and the low reference circuit for an open/high resistance. If the circuits test normal, test or replace the appropriate rearview mirror face.
5. If all circuits test normal, test or replace the appropriate door switch.

Repair Procedures

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

- **Outside Rearview Mirror Glass Replacement**
- **Control Module References** for DDS or PDS replacement, setup and programming

DTC B1722

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 B1722 01

Mirror Power Fold Circuit Short to Battery

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DTC B1722 02

Mirror Power Fold Circuit Short to Ground

DTC B1722 04

Mirror Power Fold Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Folding Mirror Motor Retract Control	B1722 02	B1722 04	B1722 01	-
Folding Mirror Motor Extend Control	B1722 02	B1722 04	B1722 01	-

Circuit/System Description

The Driver Door Switch (DDS) and Passenger Door Switch (PDS) control the power folding or power extending functions of the outside rearview mirrors. The folding mirror motors are controlled by using bi-directional motor controls through the folding mirror motor retract control circuit and the folding mirror motor extend control circuit.

Conditions for Running the DTC

Mirror folding is requested.

Conditions for Setting the DTC

An improper voltage level is seen on either the folding mirror motor retract control circuit or the folding mirror motor extend control circuit.

Action Taken When the DTC Sets

Power folding mirror operations are suspended so long as the fault is present.

Conditions for Clearing the DTC

- A current DTC will clear when the fault is no longer present.
- A history DTC will clear after 40 malfunction-free ignition cycles.

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Outside Mirror Description and Operation (Heated Mirrors) or Outside Mirror Description and Operation (Power Mirrors)

Electrical Information Reference

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

Scan Tool References

Control Module References For Scan Tool Information.

Circuit/System Verification

Ignition ON, using the folding mirror switch, the left and right rearview mirrors should extend and retract as commanded.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector X7 at the appropriate door switch.
2. Ignition ON, verify a test lamp does not illuminate between the following circuit terminals and ground:
 - Control circuit terminal 1
 - Control circuit terminal 2
 - If the test lamp illuminates, test the appropriate circuit for a short to voltage.
3. Ignition OFF, test for infinite resistance between the following circuits and ground:
 - Control circuit terminal 1

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- Control circuit terminal 2
 - If less than the specified value, test the appropriate circuit for a short to ground. If the circuits test normal, test or replace the rearview mirror motor.
- 4. Test for 5-15 ohms of resistance between the control circuit terminal 1 and the control circuit terminal 2.
 - If not within the specified range, test both control circuits for an open/high resistance. If the circuits test normal, test or replace the rearview mirror motor.
- 5. If all circuits test normal, replace the appropriate door switch.

Repair Procedures

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

- **Outside Rearview Mirror Motor Replacement**
- **Control Module References** for DDS or PDS replacement, setup, and programming

SYMPTOMS - MIRRORS

IMPORTANT: The following steps must be completed before using the symptom tables.

1. Perform the **Diagnostic System Check - Vehicle** before using the Symptom Tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to the following system descriptions:
 - **Outside Mirror Description and Operation (Heated Mirrors)****Outside Mirror Description and Operation (Power Mirrors)**
 - **Automatic Day-Night Mirror Description and Operation**

Visual/Physical Inspection

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

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Intermittent

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

Symptom List

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

- **Heated Mirrors Inoperative**
- **Automatic Day-Night Mirrors Inoperative (With RPO DL3/DR4)** or **Automatic Day-Night Mirrors Inoperative (Without RPO DL3/DR4)**
- **Power Mirror Folding Inoperative**
- **Power Mirrors Inoperative**

HEATED MIRRORS INOPERATIVE

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
Mirror Heating Element Supply Voltage	B1640 02	1	B1640 01	-
Low Reference	-	1	1	-
1. Heated Mirror Malfunction				

Circuit/System Description

The Driver Door Switch (DDS) and Passenger Door Switch (PDS) supply voltage to the outside rearview mirror heater elements upon receipt of a serial data message from the HVAC module indicating that the rear defrost system is active. The door switch supplies B+ through the driver/passenger mirror heating element supply voltage circuit when a request is seen. Ground is applied through the driver/passenger mirror heating low reference circuit.

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Outside Mirror Description and Operation (Heated Mirrors) or Outside Mirror Description and Operation (Power Mirrors)

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, press the rear window defogger switch. Verify the rear window defogger indicator illuminates.
 - If the rear window defogger indicator does not illuminate, refer to Rear Window Defogger Malfunction .
2. Rear window defogger ON, verify both the left and right outside mirror glass become warm.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector X3 at the appropriate door switch.
2. Ignition ON, verify a test lamp does not illuminate between the supply voltage circuit terminal 7 and ground.
 - If the test lamp illuminates, test the supply voltage circuit for a short to voltage.

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3. Ignition OFF, test for infinite resistance between the supply voltage circuit terminal 7 and ground.
 - If less than the specified value, test the supply voltage circuit for a short to ground. If the circuit tests normal, test or replace the applicable rearview mirror face.
4. Test for 5-10 ohms of resistance between the supply voltage circuit terminal 7 and the low reference circuit terminal 3.
 - If not within the specified range, test the supply voltage circuit and the low reference circuit for an open/high resistance. If the circuits test normal, test or replace the appropriate rearview mirror face.
5. If all circuits test normal, test or replace the appropriate door switch.

Repair Procedures

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

- **Outside Rearview Mirror Glass Replacement**
- **Control Module References** for DDS or PDS replacement, setup and programming

AUTOMATIC DAY-NIGHT MIRRORS INOPERATIVE (WITH RPO DL3/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
Backup Lamp Supply Voltage	1	1	2	-
Automatic Day/Night Mirror Signal	2	2	1	-
Low Reference	-	2	2	-
1. Rearview mirror remains dimmed in reverse 2. Rearview mirror does not dim				

Circuit/System Description

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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 left outside rearview mirror. The inside rearview mirror provides a signal circuit and a low reference circuit to the left mirror face to darken the mirror when needed.

With the gear selector lever in the REVERSE position, 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, 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](#)
- [Wiper/Washer Schematics](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

Control Module References For Scan Tool Information.

Circuit/System Verification

1. Ignition ON, headlamps ON, vehicle in PARK, cover the front light sensor with a towel or other suitable item. Shine a flashlight at the rear light sensor while observing the inside rearview mirror face. The inside rearview mirror face should dim.
 - If the mirror face does not dim, test or replace the inside rearview mirror.
2. Headlamps ON, park brake applied, cover the front light sensor with a towel or other suitable item. Shine a flashlight at the rear light sensor while observing the inside rearview mirror face. Place the transmission in REVERSE. The inside rearview mirror face should transition from dim to bright.
 - If the mirror does not transition from dim to bright, refer to Reverse Input Malfunction below.
3. Headlamps ON, vehicle in PARK, cover the front light sensor with a towel or other suitable item. Shine a flashlight at the rear light sensor while observing the left outside rearview mirror face. The left outside rearview mirror face should dim.
 - If the left outside rearview mirror face does not dim, refer to Outside Rearview Mirror Dimming Malfunction below.
4. Remove the towel from the inside rearview mirror and remove the flashlight. Verify the inside rearview mirror face returns to its normal bright state.
 - If the mirror face does not return to its normal state, test or replace the inside rearview mirror.

Circuit/System Testing**Reverse Input Malfunction**

1. Ignition OFF, disconnect the harness connector at the inside rearview mirror.
2. Ignition ON, park brake applied, vehicle in REVERSE, test for B+ between the supply voltage circuit terminal 9 and ground.
 - If less than the specified value, test the supply voltage circuit for a short to ground or an open/high resistance. If the circuit tests normal, refer to **Backup Lamps Malfunction** .
3. If all circuits test normal, test or replace the inside rearview mirror.

Outside Rearview Mirror Dimming Malfunction

1. Ignition OFF, disconnect the harness connector at the inside rearview mirror.
2. Ignition ON, verify a test lamp does not illuminate between the following circuits and ground:

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2008 ACCESSORIES & EQUIPMENT Mirrors - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

- Signal circuit terminal 5
- Low reference circuit terminal 16
 - If the test lamp illuminates, test the applicable circuit for a short to voltage.
- 3. Ignition OFF, test for infinite resistance between the following circuits and ground:
 - Signal circuit terminal 5
 - Low reference circuit terminal 16
 - If less than the specified range, test the applicable circuit for a short to ground.
- 4. Test for less than 100 ohms of resistance between the signal circuit terminal 5 and the low reference circuit terminal 16.
 - If greater than the specified range, test both circuits for an open/high resistance. If the circuit tests normal, test or replace the driver outside rearview mirror face.
- 5. If all circuits test normal, replace the inside rearview mirror.

Repair Procedures

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

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

AUTOMATIC DAY-NIGHT MIRRORS INOPERATIVE (WITHOUT RPO DL3/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
Backup Lamp Supply Voltage	1	1	2	-
1. Rearview mirror remains dimmed in reverse 2. Rearview mirror does not dim				

Circuit/System Description

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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, 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, 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](#)
- [Wiper/Washer Schematics](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

Control Module References For Scan Tool Information.

Circuit/System Verification

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1. Ignition ON, headlamps ON, vehicle in PARK, cover the front light sensor with a towel or other suitable item. Shine a flashlight at the rear light sensor while observing the inside rearview mirror face. The inside rearview mirror face should dim.
 - If the mirror face does not dim, test or replace the inside rearview mirror.
2. Headlamps ON, park brake applied, cover the front light sensor with a towel or other suitable item. Shine a flashlight at the rear light sensor while observing the inside rearview mirror face. Place the transmission in REVERSE. The inside rearview mirror face should transition from dim to bright.
 - If the mirror does not transition from dim to bright, refer to Reverse Input Malfunction below.
3. Remove the towel from the inside rearview mirror and remove the flashlight. Verify the inside rearview mirror face returns to its normal bright state.
 - If the mirror face does not return to its normal state, test or replace the inside rearview mirror.

Circuit/System Testing

Reverse Input Malfunction

1. Ignition OFF, disconnect the harness connector at the inside rearview mirror.
2. Ignition ON, park brake applied, vehicle in REVERSE, test for B+ between the supply voltage circuit terminal 9 and ground.
 - If less than the specified value, test the supply voltage circuit for a short to ground or an open/high resistance. If the circuit tests normal, refer to **Backup Lamps Malfunction**.
3. If all circuits test normal, test or replace the inside rearview mirror.

Repair Procedures

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

Inside Rearview Mirror Replacement

POWER MIRROR FOLDING INOPERATIVE

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.

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- **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 Retract Control	B1722 02	B1722 04	B1722 01	-
Folding Mirror Motor Extend Control	B1722 02	B1722 04	B1722 01	-

Circuit/System Description

The Driver Door Switch (DDS) and Passenger Door Switch (PDS) control the power folding or power extending functions of the outside rearview mirrors. The folding mirror motors are controlled by using bi-directional motor controls through the folding mirror motor retract control circuit and the folding mirror motor extend control circuit.

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Outside Mirror Description and Operation (Heated Mirrors) or Outside Mirror Description and Operation (Power Mirrors)

Electrical Information Reference

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

Circuit/System Verification

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1. Ignition ON, observe the scan tool Mirror Fold Switch parameter while cycling the mirror fold switch between the extend and retract positions. The parameter should change between Idle, Extend, and Retract.
 - If the parameter does not cycle between the specified values, replace the DDS.
2. Command the power folding mirrors to extend and retract using the mirror fold switch. Both mirrors should extend and retract as commanded.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector X7 at the appropriate door switch.
2. Ignition ON, verify a test lamp does not illuminate between the following circuit terminals and ground:
 - Control circuit terminal 1
 - Control circuit terminal 2
 - If the test lamp illuminates, test the appropriate circuit for a short to voltage.
3. Ignition OFF, test for infinite resistance between the following circuits and ground:
 - Control circuit terminal 1
 - Control circuit terminal 2
 - If less than the specified value, test the appropriate circuit for a short to ground. If the circuits test normal, test or replace the rearview mirror motor.
4. Test for 5-15 ohms of resistance between the control circuit terminal 1 and the control circuit terminal 2.
 - If not within the specified range, test both control circuits for an open/high resistance. If the circuits test normal, test or replace the rearview mirror motor.
5. If all circuits test normal, replace the appropriate door switch.

Repair Procedures

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

- **Outside Rearview Mirror Motor Replacement**
- **Control Module References** for DDS or PDS replacement, setup, and programming

POWER MIRRORS INOPERATIVE

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.

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2008 ACCESSORIES & EQUIPMENT Mirrors - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

- 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
5-Volt Reference	B1580, B1590	B1580, B1590	B1580, B1590	-
Driver/Passenger Mirror Horizontal Position Sensor Signal	B1580	B1580	B1580	-
Driver/Passenger Mirror Vertical Position Sensor Signal	B1590	B1590	B1590	-
Driver/Passenger Mirror Motor Right Control	B1605 02	B1605 04	B1605 01	-
Driver/Passenger Mirror Right/Down Motors Common	B1544 02	B1544 04	B1544 01	-
Driver/Passenger Mirror Motor Down Control	B1600 02	B1600 04	B1600 01	-
Low Reference	B1580, B1590	B1580, B1590	B1580, B1590	-

Circuit/System Description

The Driver Door Switch (DDS) or Passenger Door Switch (PDS) controls the mirror horizontal and vertical motors through the use of bi-directional motor controls. When the mirror is commanded up, voltage is supplied to the mirror vertical motor through the Driver/Passenger Mirror Motor Right/Down Motors Common circuit and ground is supplied through the Driver/Passenger Mirror Motor Down Control circuit. When the mirror is commanded down, voltage is supplied to the mirror vertical motor through the Driver/Passenger Mirror Motor Down Control circuit and ground is supplied through the Driver/Passenger Mirror Motor Right/Down Motors Common circuit.

Horizontal controls operate in the same manner with the Driver/Passenger Mirror Motor Right/Down Motors Common circuit supplying voltage and the Driver/Passenger Mirror Motor Right Control circuit supply a ground to the mirror horizontal motor when the mirror is commanded right. When the mirror is commanded left, voltage is supplied to the mirror horizontal motor through the Driver/Passenger Mirror Motor Right Control circuit and ground is

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supplied through the Driver/Passenger Mirror Motor Right/Down Motors Common circuit.

On vehicles equipped with RPO DL3/DR4, the Driver Door Switch (DDS) and Passenger Door Switch (PDS) determines the position of the outside rearview mirrors based on inputs from two mirror position sensors, one for vertical position, the other for horizontal position. Five volts are applied to each sensor through a shared 5-volt reference circuit and a shared low reference circuit supplies ground. Each sensor has an individual signal circuit which provides position voltage to the DDS/PDS.

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Outside Mirror Description and Operation (Heated Mirrors) or Outside Mirror Description and Operation (Power Mirrors)

Electrical Information Reference

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

Circuit/System Verification

1. Ignition ON, observe the scan tool Mirror Select Switch parameter while cycling the mirror select switch between the left and right positions. The parameter should change between Idle, Left, and Right.
 - If the parameter does not cycle between the specified values, replace the DDS.
2. Observe the scan tool Mirror Motor parameter while cycling the mirror directional switch between the up, down, left and right positions. The parameter should change between Idle, Up, Down, Left, and Right.

- If the parameter does not cycle between the specified values, replace the DDS.
- 3. Verify the vehicle is equipped with RPO DL3/DR4.
 - If the vehicle is not equipped with RPO DL3/DR4, refer to Mirror Motor Circuit Malfunction below.
- 4. Observe the scan tool Mirror Horizontal Position and Mirror Vertical Position parameters. The reading should be between 0.2 volts and 4.8 volts and change as the mirror is moved, left, right, up, and down.
 - If not within the specified range or the parameter does not change as the mirror is moved, refer to Mirror Position Sensor Circuit Malfunction below.
- 5. Command the left and right outside mirror to move up, down, left and right using the mirror directional switch. The mirrors should move in the commanded direction.
 - If either mirror does not move in all commanded directions, refer to Mirror Motor Circuit Malfunction below.

Circuit/System Testing**Mirror Motor Circuit Malfunction**

1. Ignition OFF, disconnect the harness connector X3 at the appropriate door switch.
2. Ignition ON, verify a test lamp does not illuminate between the following control circuit terminals and ground:
 - Control circuit terminal 1
 - Control circuit terminal 2
 - Control circuit terminal 6
 - If the test lamp illuminates, test the appropriate control circuit for a short to voltage.
3. Ignition OFF, test for infinite resistance between the following control circuits and ground:
 - Control circuit terminal 1
 - Control circuit terminal 2
 - Control circuit terminal 6
 - If less the specified value, test the appropriate control circuit for a short to ground.
4. Test for 40-100 ohms of resistance between the control circuit terminal 1 and the control circuit terminal 6.
 - If not within the specified range, test both control circuits for an open/high resistance. If the circuits test normal, test or replace the rearview mirror motor.
5. Test for 40-100 ohms of resistance between the control circuit terminal 2 and the control circuit terminal 6.

- If not within the specified range, test both control circuits for an open/high resistance. If the circuits test normal, test or replace the rearview mirror motor.
- 6. If all circuits test normal, replace the appropriate door switch.

Mirror Position Sensor Circuit Malfunction

1. Ignition OFF, disconnect the harness connector X7 at the appropriate door switch.
2. Ignition ON, verify a test lamp does not illuminate between the following circuit terminals and ground:
 - 5-volt reference circuit terminal 7
 - Signal circuit terminal 4
 - Signal circuit terminal 5
 - Low reference circuit terminal 10
 - If the test lamp illuminates, test the appropriate circuit for a short to voltage.
3. Ignition OFF, test for infinite resistance between the following circuits and ground:
 - 5-volt reference circuit terminal 7
 - Signal circuit terminal 4
 - Signal circuit terminal 5
 - Low reference circuit terminal 10
 - If less than the specified value, test the appropriate circuit for a short to ground.
4. Test for 4K-7K ohms of resistance between the 5-volt reference circuit terminal 7 and the low reference circuit terminal 10.
 - If not within the specified range, test the 5-volt reference circuit and the low reference circuit for an open/high resistance. If the circuits test normal, test or replace the rearview mirror motor.
5. Test for 1K-7K ohms of resistance between the 5-volt reference circuit terminal 7 and the signal circuit terminal 4.
 - If not within the specified range, test the signal circuit for an open/high resistance. If the circuits test normal, test or replace the rearview mirror motor.
6. Test for 1K-7K ohms of resistance between the 5-volt reference circuit terminal 7 and the signal circuit terminal 5.
 - If not within the specified range, test the signal circuit for an open/high resistance. If the circuits test normal, test or replace the rearview mirror motor.
7. If all circuits test normal, replace the appropriate door switch.

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- Outside Rearview Mirror Motor Replacement
- Control Module References for DDS or PDS replacement, setup, and programming

REPAIR INSTRUCTIONS

POWER MIRROR SWITCH REPLACEMENT (WITH DL8 AND WITHOUT SLT)

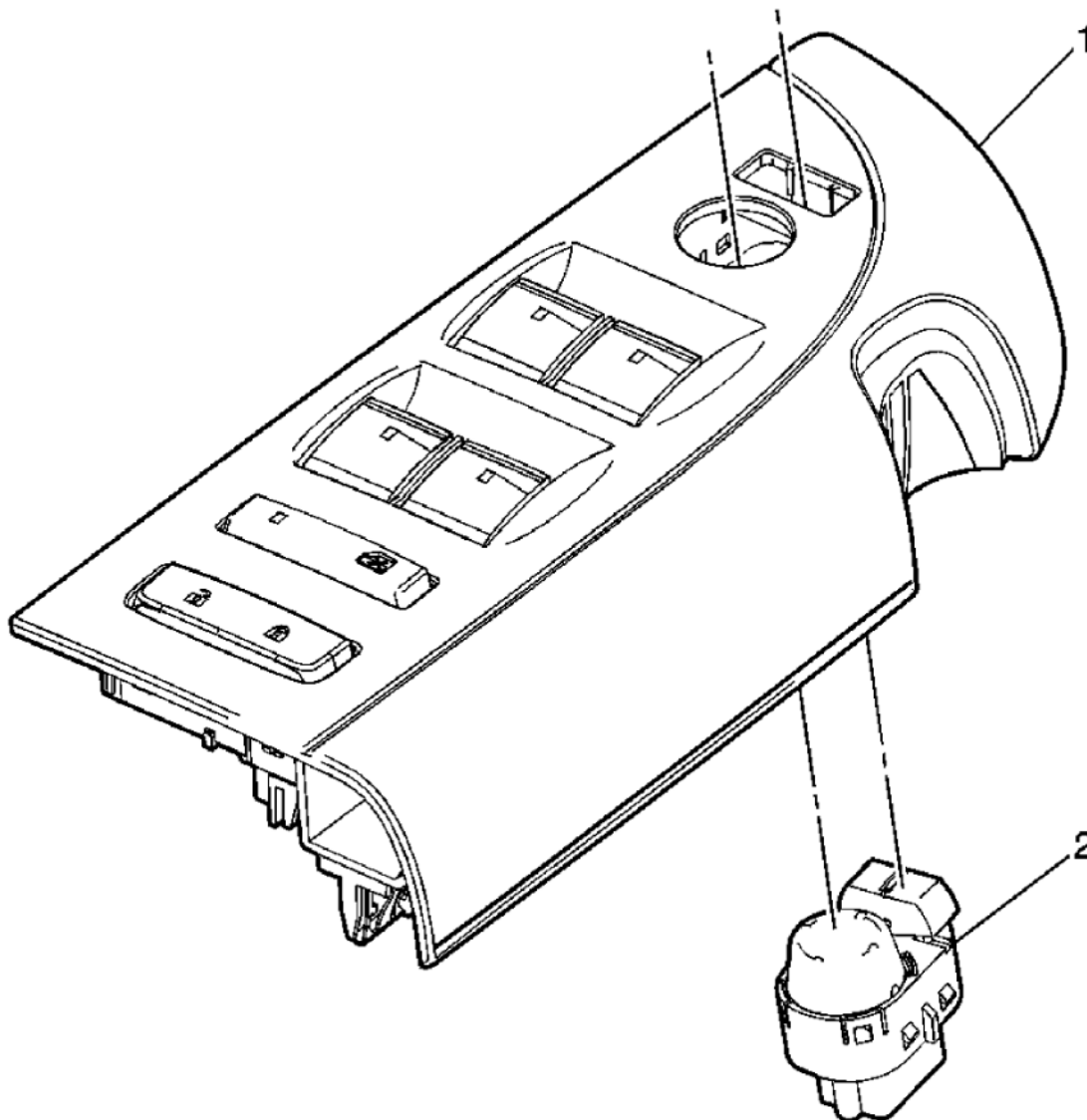


Fig. 6: Power Mirror Switch (with DL8 and without SLT)
Courtesy of GENERAL MOTORS CORP.

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Callout	Component Name
1	Front Side Door Window Switch Bezel Refer to <u>Front Door Switch Bezel Replacement</u> .
2	Outside Rear View Mirror Switch Procedure: Use a small flat bladed tool to aid in the removal of the switch from the bezel.

POWER MIRROR REPLACEMENT

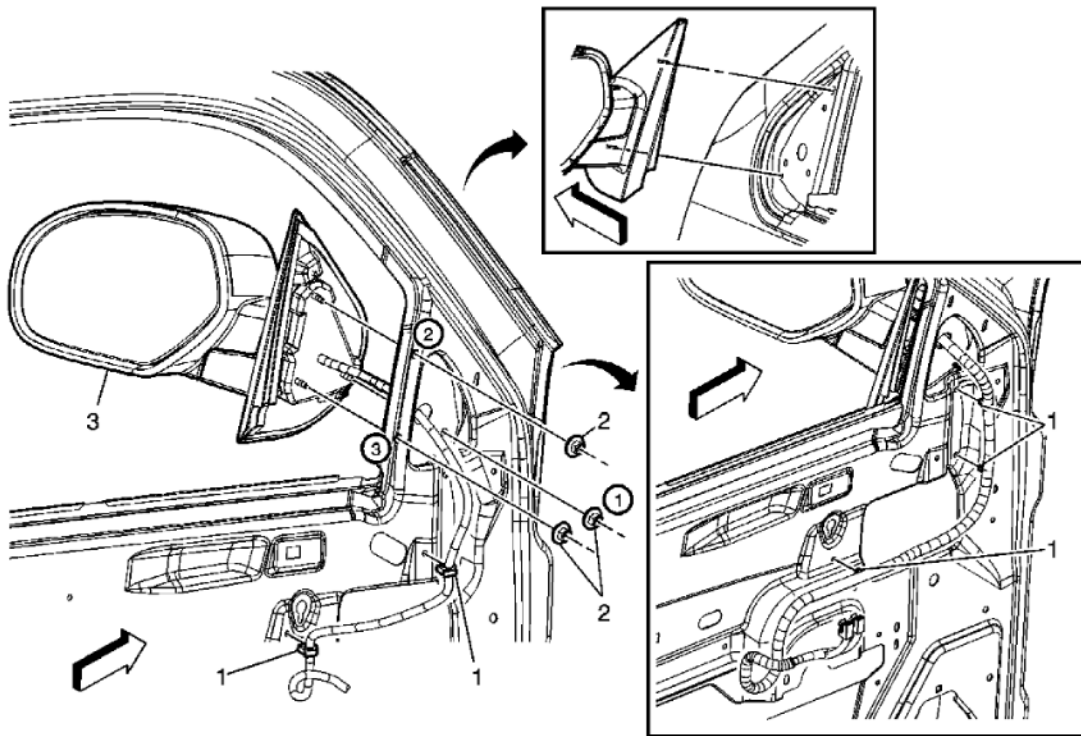


Fig. 7: View Of Outside Power Mirror & Components
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures: Remove the front door trim panel. Refer to <u>Front Side Door Trim Panel Replacement (YE9)</u> or <u>Front Side Door Trim Panel Replacement (SLT)</u> .	
1	Outside Power Mirror Wiring Retainer Clips (Qty: 3)
	Outside Power Mirror Nuts (Qty: 3)
	NOTE:

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2	Refer to <u>Fastener Notice</u> .
	Tighten: 9 N.m (80 lb in)
	Tip: Disconnect the electrical connector.
3	Outside Power Mirror

OUTSIDE REARVIEW MIRROR MOTOR REPLACEMENT

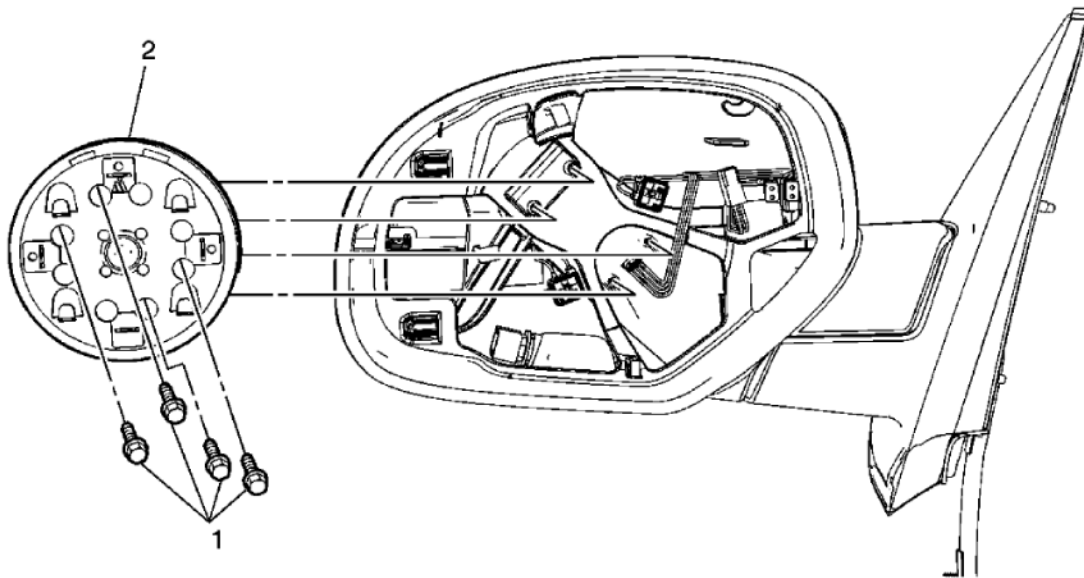


Fig. 8: View Of Outside Rearview Mirror Motor
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the mirror face. Refer to <u>Outside Rearview Mirror Glass Replacement</u> .	
1	Outside Rearview Mirror Motor Screws (Qty: 4) NOTE: Refer to <u>Fastener Notice</u> . Procedure: Disconnect the electrical connector.

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	Tighten: 2 N.m (18 lb in)
2	Outside Rearview Mirror Motor

OUTSIDE REARVIEW MIRROR GLASS REPLACEMENT

Removal Procedure

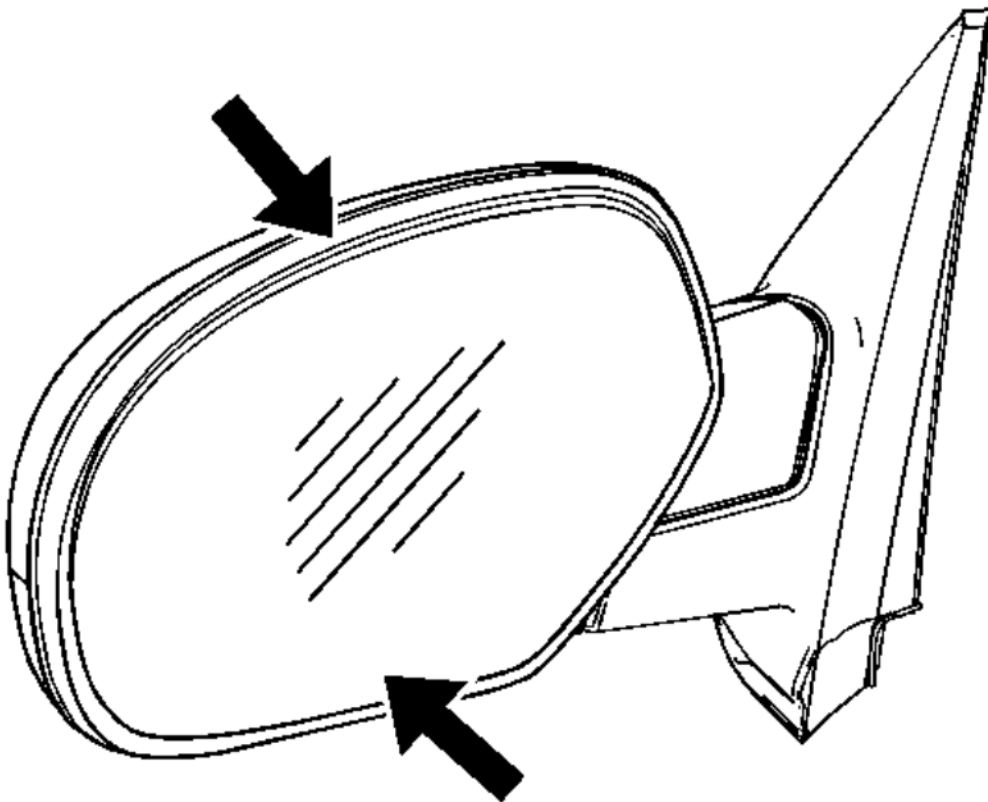


Fig. 9: Identifying Outside Rearview Mirror Glass
Courtesy of GENERAL MOTORS CORP.

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

NOTE: When servicing electrochromic glass that is broken, or if glass breaks during servicing, be cautious not to spill electrochromic fluid onto vehicle. Doing so will cause damage to the vehicle.

1. The top inboard corner is the ideal location for pulling the mirror out of the housing.

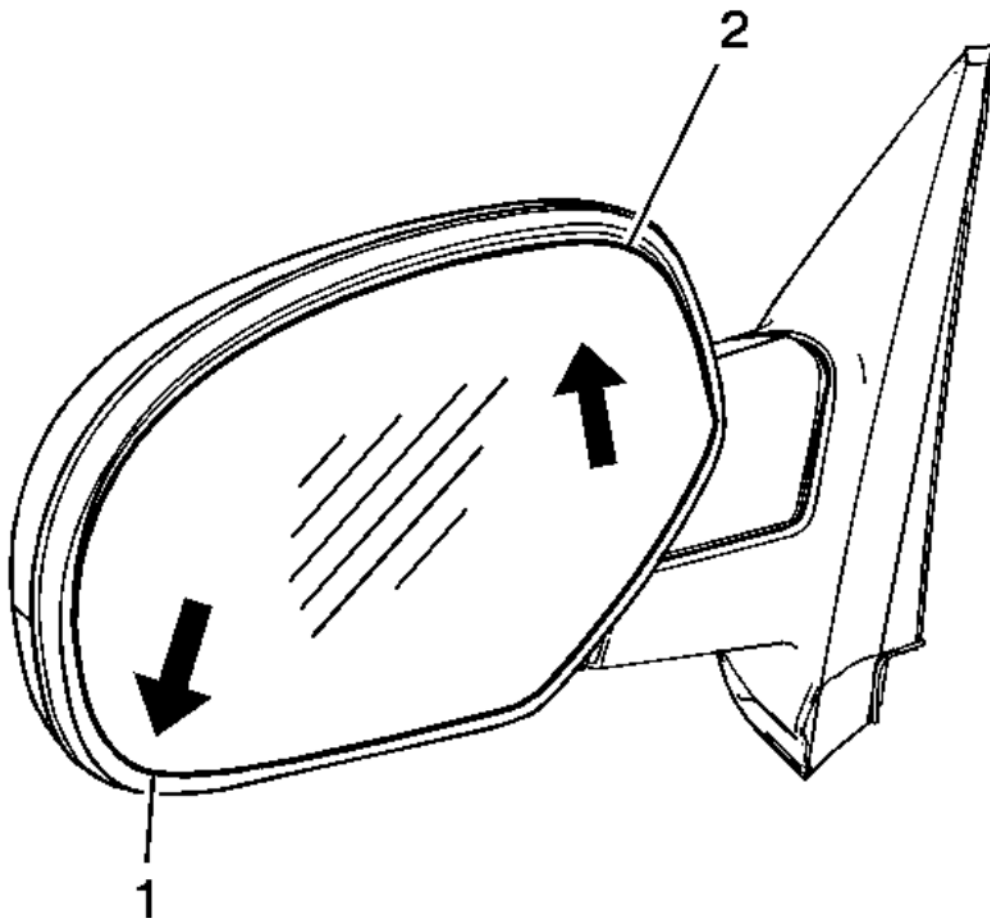


Fig. 10: Identifying Bottom Outboard Corner & Top Inboard Edge Corner
Courtesy of GENERAL MOTORS CORP.

2. Remove the mirror face as follows:

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1. Push mirror glass bottom outboard (1) corner, furthest away from the vehicle door, as far as possible into the mirror housing.
2. Place fingers tips behind the top inboard edge (2) corner, closest to the vehicle door.
3. Pull the mirror glass with light pressure until the glass comes loose.
4. Holding the mirror face, disconnect the electrical connectors from the back of the mirror.

Installation Procedure

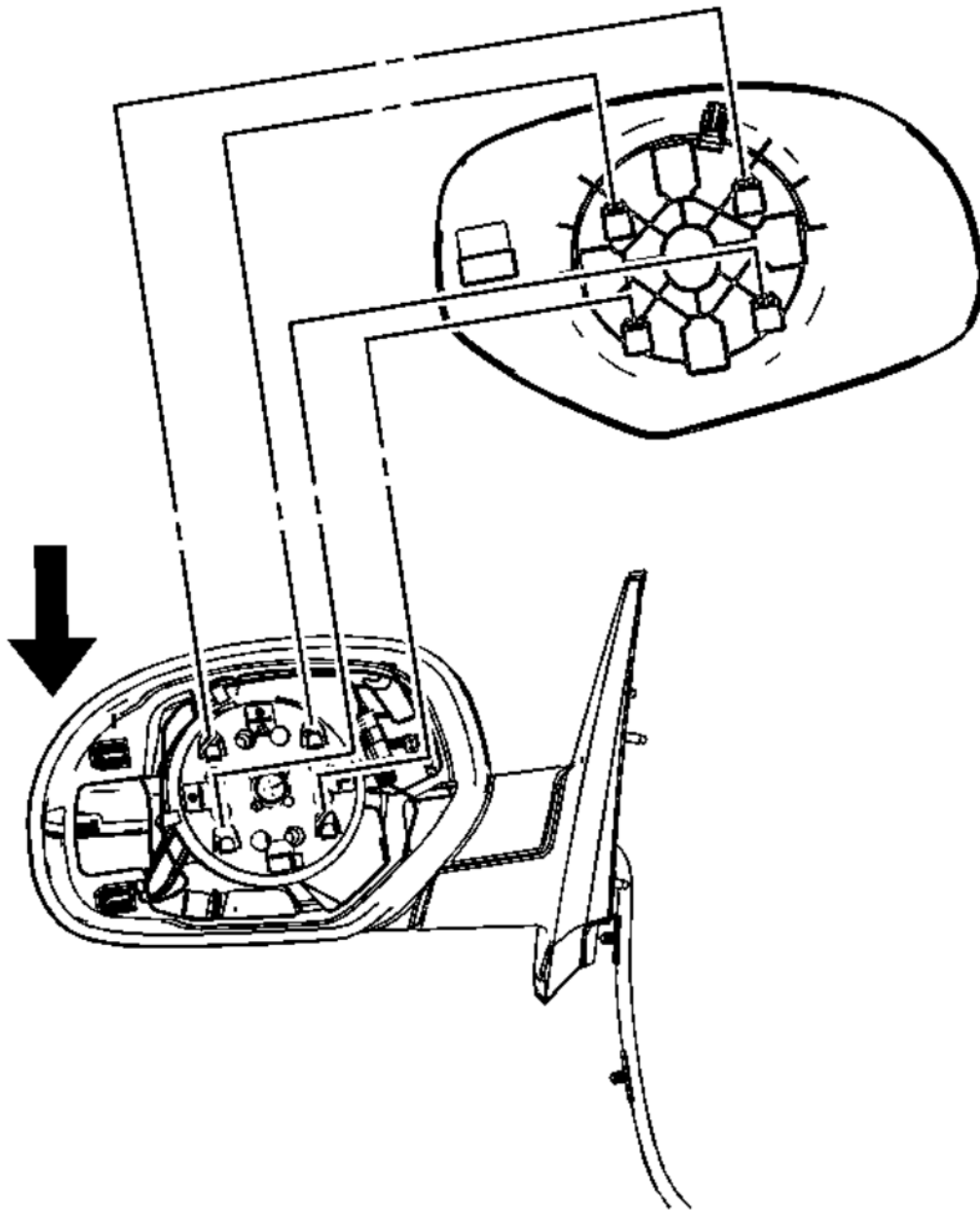


Fig. 11: Positioning Mirror Face On Mirror Housing
Courtesy of GENERAL MOTORS CORP.

1. Position the mirror face on a angle to the mirror housing.

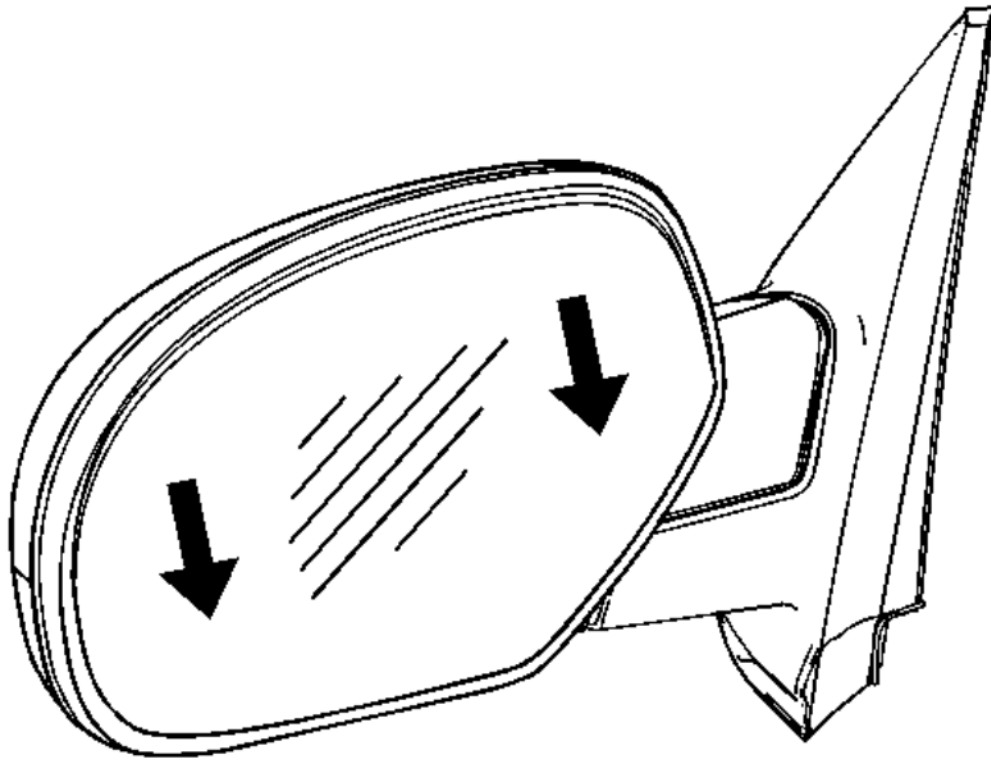


Fig. 12: Pushing Downward & Inward To Lock Glass In Place
Courtesy of GENERAL MOTORS CORP.

2. Install the mirror face as follows:
 1. Holding the mirror face, connect the electrical connectors to the back of the mirror.
 2. Position the mirror face to the motor retainer tabs.
 3. Position the hand in the center of the mirror face.
 4. Apply light pressure to the face.
 5. Push downward and inward to lock in place.
 6. Inspect the mirror face for proper operation.

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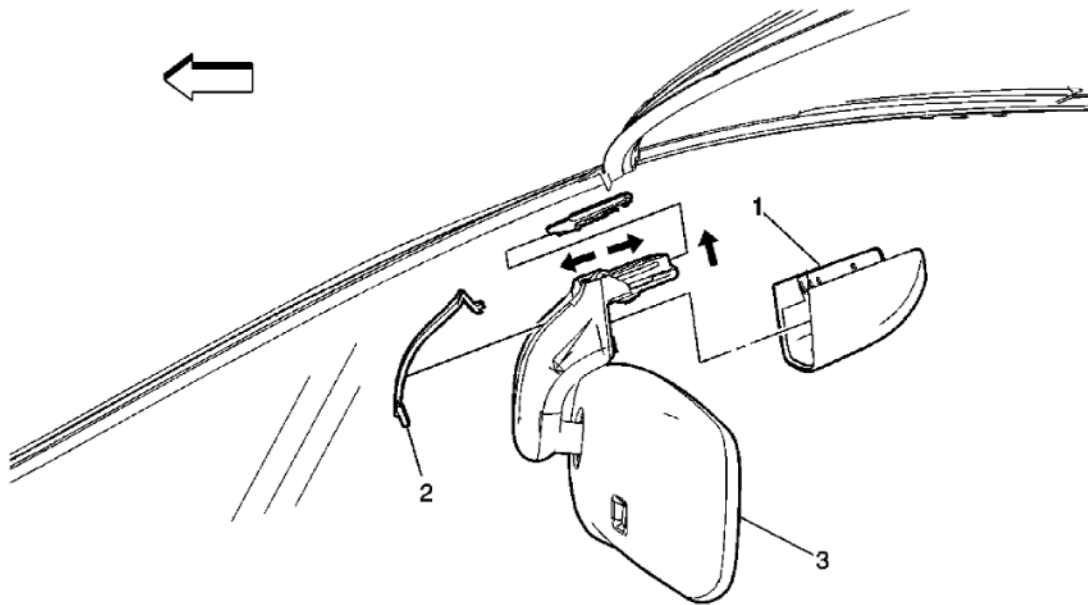


Fig. 13: Identifying Inside Rearview Mirror Components
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Rearview Mirror Support Cover
2	Rearview Mirror Support Wire Cover Procedure: Disconnect the wiring harness from the rearview mirror.
3	Rearview Mirror Procedure: With both hands on the mirror, rock it from side to side while sliding upward, this will assist in the releasing of the mirror from the mounting tab.

REARVIEW MIRROR SUPPORT INSTALLATION

Tools Required

Safety Razor or Utility Knife

Installation

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

installed:

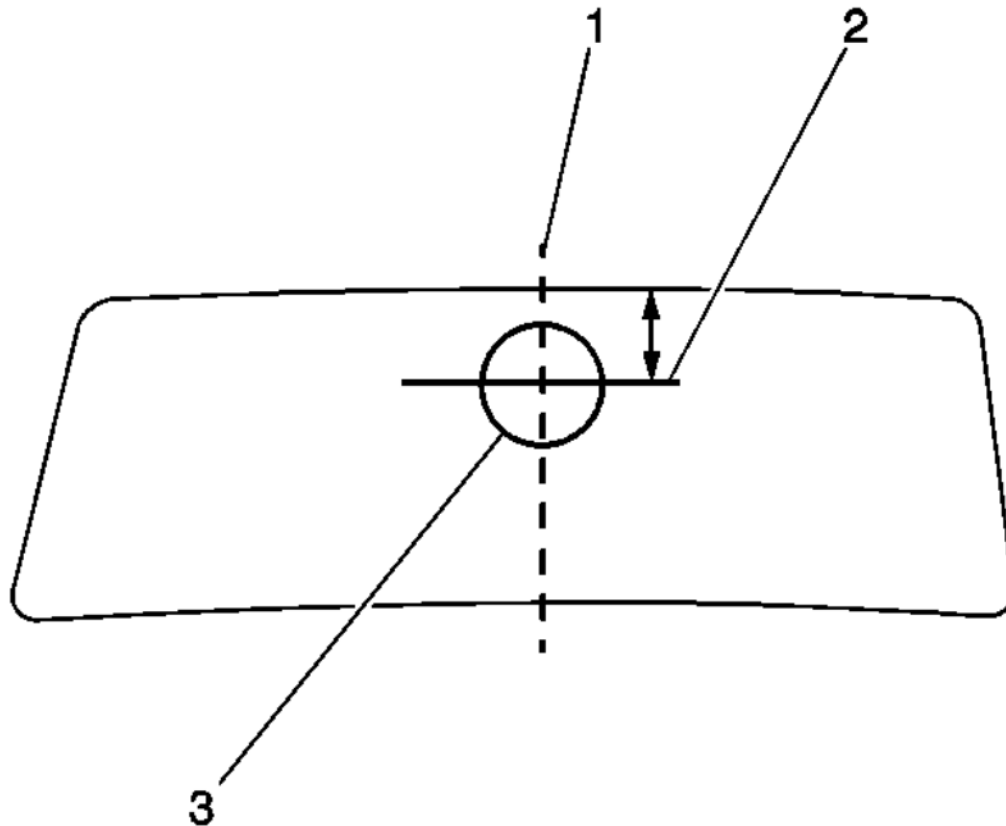


Fig. 14: Identifying Mirror Mounting Base Location
Courtesy of GENERAL MOTORS CORP.

1. Using a measuring tape, measure the distance between the windshield pillars from the base of the shade line .
2. Using a marking pencil, halfway between the windshield pillars, draw a centerline (1) on the windshield from the roof panel to the windshield base.
3. Draw a perpendicular line intersecting the centerline (2) at that location.

The top center of the mirror mounting base will be at the intersection of these lines.

2. Scrape the inside windshield thoroughly with a safety razor or utility knife in order to remove all old adhesive.

3. If reinstalling the original mounting base, place the mirror mounting base in a suitable holding device, such as a vise.
4. Clean the mirror mounting base thoroughly with a safety razor or utility knife in order to remove all old adhesive.
5. Clean the inside windshield and the mounting surface of the mirror mounting base thoroughly with a clean cloth saturated with naphtha or a 50/50 mixture (by volume) of clean water and isopropyl alcohol.

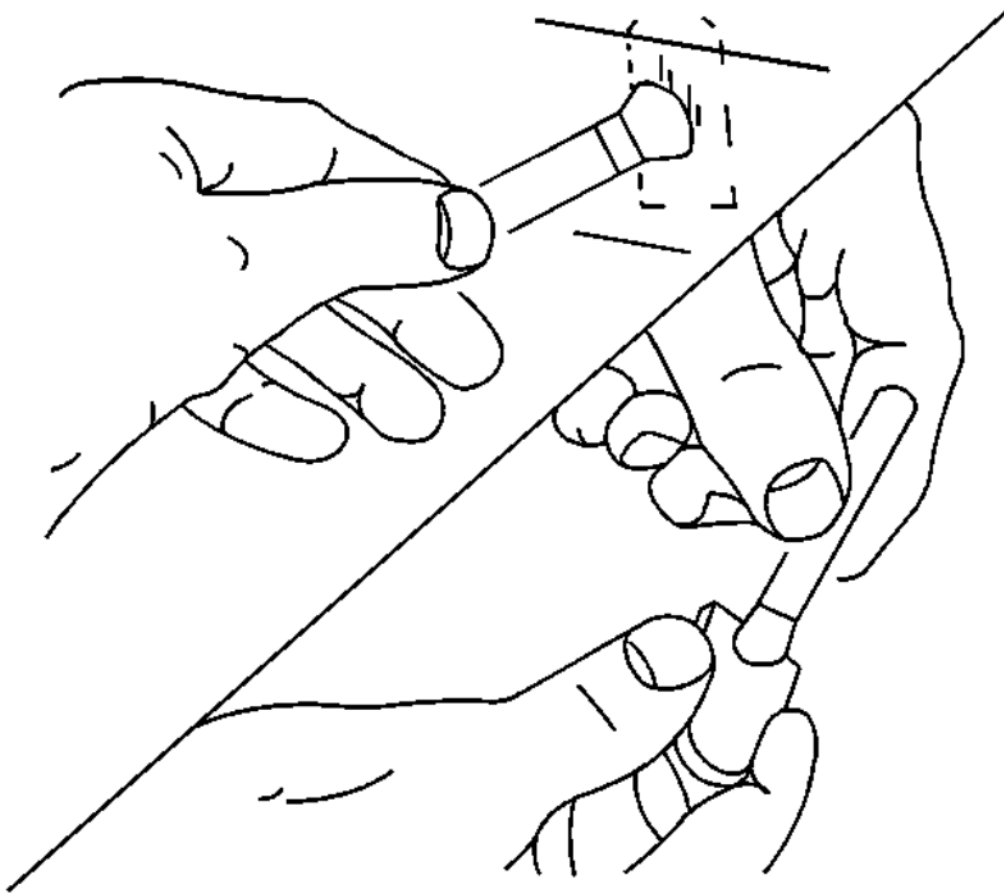


Fig. 15: Applying Adhesive To Mirror Base & Window
Courtesy of GENERAL MOTORS CORP.

6. Use Inside Mirror Adhesive Kit GM P/N 89021329 (Canadian P/N 993362), or equivalent,

to apply a small amount of activator to the mounting surface of the mirror mounting base.

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

IMPORTANT: Do not touch the mounting surface of the mirror mounting base or the window.

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

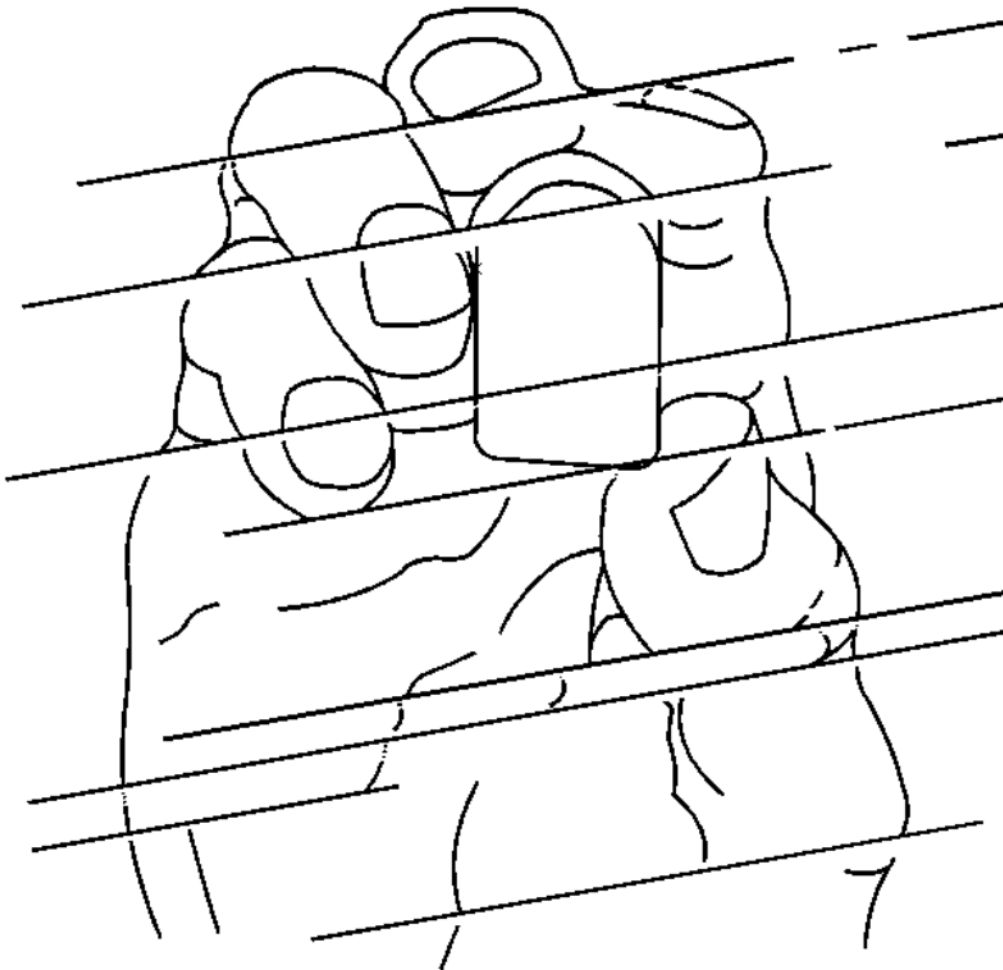


Fig. 16: Installing Mirror Mounting Base

Courtesy of GENERAL MOTORS CORP.

10. Immediately apply the mounting base to the windshield, ensuring that the mounting base aligns correctly to the marks made on the outside of the windshield.
11. Hold the mounting base firmly in place for 1 minute.
12. Allow the adhesive to set for 15 minutes.
13. Install the mirror to the mirror mounting base and fasten, if necessary.
14. Connect the electrical connector and install the wire cover, if equipped.

DESCRIPTION AND OPERATION**OUTSIDE MIRROR DESCRIPTION AND OPERATION (HEATED MIRRORS)****Heated OSRV Mirror**

On vehicles equipped with heated outside rearview (OSRV) mirrors, the driver door switch (DDS) and passenger door switch (PDS) controls the activation of the mirror heaters. Upon receiving a LAN message indicating a request for heated mirrors, the driver door switch (DDS), and passenger door switch (PDS) for the passenger side, will activate the mirror heater output. The mirror heaters will remain active until a new message is received indicating rear defogger is to be deactivated, either by driver input or by expiration of a calibrated timer.

OUTSIDE MIRROR DESCRIPTION AND OPERATION (POWER MIRRORS)**Power Mirror System****Power Mirror System Components**

The power mirror system consists of the following components:

- Driver Door Switch (DDS)-An electronic control module with integrated switches and requires programming when replaced
- Passenger Door Switch (PDS)-An electronic control module with integrated switches, requires programming when replaced
- Power Mirror Direction Switch-Integrated into DDS and is a 4 position momentary switch that provides a signal input to the DDS for up, down, left/extend and right/retract with a mirror switch activation
- Mirror Select Switch-Integrated into DDS and is a 3 position switch that allows the operator to select the left or right mirror and also a neutral/fold position
- Left Outside Power Mirror-Contains both the vertical and horizontal mirror motors

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- Right Outside Power Mirror-Contains both the vertical and horizontal mirror motors
- Body Control Module-An electronic control module that requires programming when replaced, serves as the power mode master and is the main message handler
- Memory Switch, if equipped with memory mirrors-Supplied power by the DDS and provides a voltage signal to the DDS upon a switch activation
- Horizontal and Vertical Position Sensors, if equipped with memory mirrors-Supplied a 5-volt and low reference by the DDS/PDS and provide a variable voltage signal to the DDS/PDS that is proportional to mirror position
- Powertrain Control Module (PCM), if equipped with memory mirrors-An electronic control module that requires programming when replaced and provides the message indicating transmission gear selection
- Driver Information Center (DIC), if equipped with memory mirrors-Part of the instrument cluster which is an electronic control module that requires programming when replaced and is used to personalize the memory recall functions
- Fold Motor, in each of the outside mirrors, if equipped with power fold mirrors-Provides extend and retract movements of the mirror and is serviced as a complete mirror assembly

Each of the outside power mirrors contains 2 reversible motors to provide horizontal and vertical movement of the mirror glass. The vertical motor operates the up and down directions and the horizontal motor operates the left and right directions. If equipped with power folding mirrors, each outside power mirror will contain a reversible fold motor to operate the extend and retract functions. Each of the mirror motors are circuit breaker protected.

Power Mirror System Controls

The power mirror switch incorporates a 3-position mirror select switch and a 4-position mirror direction switch. The mirror select switch allows the operator to select the mirror to be moved by selecting the L position for the left power mirror, selecting the R position for the right power mirror or the center which is the neutral/fold position. The mirror direction switch is a 4-position switch that allows the operator to move the selected mirror up, down, left or right. The mirror direction switch also functions as the folding mirror switch. When the selector switch is in the neutral/fold position, activate the mirror direction switch to the left to extend the mirrors and right to retract the mirrors.

Power Mirror System Operation

The power mirror switch is integrated into the DDS. The left and right mirror positions of the select switch and 4 positions of the direction switch, when active, will provide a signal to the DDS. If the selector switch is placed in the L position and the up switch is depressed, 2 signals

will be supplied to the DDS. The DDS upon receipt of these signals will provide battery voltage to the mirror motor left/up control circuit and ground to the mirror motor down control circuit and the mirror will move up. The remainder of the driver mirror functions operate in the same manner as described above except the DDS will supply battery voltage and ground to the appropriate control circuits for the direction selected. If the passenger mirror is selected and a direction switch is activated, the DDS sends a LAN message to the PDS indicating that the passenger mirror was selected and the direction to be commanded. The PDS will then supply battery voltage and ground to the appropriate control circuits for the direction selected.

Memory Mirror System

Memory Mirror System Controls

The driver door switch (DDS) and passenger door switch (PDS) are capable of storing mirror positions and controlling the mirrors to these positions to the preferred settings of 2 different drivers. Each driver will be able to personalize the memory system by positioning the mirrors and seats to their preferred settings. Then press and hold the memory 1 or memory 2 button until an audible chime is heard and the current mirror positions will be stored into memory of the DDS and PDS. Seat position will be stored in the driver position module (DPM). Once the mirror and seat positions have been stored into memory, a momentary memory 1 or memory 2 switch activation will supply the DDS a battery voltage signal. The DDS, upon receipt of the memory switch signal, with the transmission in park or neutral, will then drive the driver mirror to the corresponding stored memory position. The DDS will also send a LAN message to the PDS and DSM indicating that a memory switch activation occurred. The PDS will then drive the passenger mirror and the DPM will drive the driver seat to the corresponding stored memory position. The memory system can also be controlled by any of the following if programmed using the driver information center (DIC) to enable/disable the features:

- Auto exit/entry seat positioning
- Mirror and seat position recall on a keyless entry unlock activation
- Mirror and seat position recall on ignition key insertion

For further information on programming and configuration, refer to Driver Personalization in Personalization.

Memory Mirror System Operation

Mirror position is determined by both horizontal and vertical position sensors in each of the power mirrors. The DDS and PDS supplies a reference voltage and a low reference to these sensors and determines mirror position through the horizontal and vertical position signal circuits.

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The memory switch receives power from the DDS through the battery supply voltage circuit and the DDS fuse. The DDS upon receipt of a memory switch signal input or an appropriate LAN message from the BCM, the DDS and PDS will then supply battery voltage and ground to the appropriate power mirror motors through the mirror motor control circuits to move the mirrors to the predetermined positions.

Folding Mirror System

Folding Mirror System Controls

The folding mirror system requires signals from 2 separate switches. The mirror select switch must be in the neutral/fold position and the mirror direction switch must be activated to the left/extend or right/retract positions. Both switches are integrated into the DDS and provide direct signals.

Folding Mirror System Operation

Upon receipt of the required switch inputs the DDS will supply battery voltage and ground to the mirror fold motor control circuits to perform the requested extend or retract function. The DDS will also send a LAN message to the PDS indicating the requested function. The PDS will supply battery voltage and ground to the mirror fold motor control circuits to perform the requested extend or retract function.

AUTOMATIC DAY-NIGHT MIRROR DESCRIPTION AND OPERATION

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

The inside rearview mirror with the automatic day-night feature system consists of the following components:

- Inside rearview mirror
- Ambient air temperature sensor

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 of 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

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indicated by the ambient light sensor. With the gear selector lever in the REVERSE position, 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.

Compass

The mirror uses 2 magnetic field sensors for compass direction. One sensor is for north and south, the other is for east and west. The mirror supplies a signal and low reference to each sensor. As the vehicle travels with or against the earth's magnetic pull, there will be a change in voltage on one or both sensors. As a result of the change in voltage, the mirror changes the heading on the compass display.

Temperature Display

The inside rearview mirror monitors the ambient air temperature sensor. As the outside air temperature gets warmer, the ambient air temperature sensor will lower resistance. The inside rearview mirror monitors this change and will show this as a warmer temperature on the display. Temperatures exceeding 62°C (143°F) will be out of the mirror's temperature range and SC will be shown on the temperature display. In colder outside air temperatures, the ambient air temperature sensor will raise in resistance. The inside rearview mirror will show a colder temperature on the display. Temperatures lower than -40°C (-40°F) will be out of the mirror's temperature range which OC will be shown on the temperature display. In cold temperatures such as 3°C (37°F) or below, the temperature display will show ICE when the ignition is first turned ON. The display will toggle between ICE and the actual outside temperature until the temperature update process is complete.

Temperature Display Update Process

The inside rearview mirror has a temperature program that takes in account the fact that the radiator will heat the ambient air temperature sensor if the radiator is warm and the vehicle is not moving. If the vehicle has been off for more than 2 hours, the mirror temperature program assumes that the radiator has cooled and that the temperature supplied by the ambient air temperature sensor is accurate. Because of this, if the vehicle has been off for more than 2 hours, the mirror displays the temperature as reported by the ambient air temperature sensor. When the ambient air temperature sensor reports a new temperature to the mirror, one of the following cases will apply:

- Ignition is OFF for more than 2 hours, then is turned ON for more than 3 minutes. The outside temperature is greater than the last temperature recorded by the mirror for 2 minutes. The mirror will increase the last temperature reading by one degree every 2 minutes for 8 consecutive times. If the outside temperature is not matched after the 8th

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update, the mirror will then display the current outside temperature.

- Ignition is off for more than 2 hours, then is turned ON for less than 3 minutes. The mirror will update the temperature display every 2 seconds.
- Ignition is OFF for more than 2 hours, then is turned ON for more than 3 minutes. The outside temperature is less than the last temperature recorded by the mirror. The mirror will then display the current outside temperature.
- Ignition has been OFF for less than 2 hours. The outside temperature is greater than the last temperature recorded by the mirror, but the ignition is cycled from ON to OFF within 2 minutes. The mirror will display the old temperature.
- Ignition has been OFF for less than 2 hours. The outside temperature is less than the last temperature recorded by the mirror. The mirror will then display the current outside temperature.

Switches of the Inside Rearview Mirror with the Automatic Day-Night Feature and Compass without OnStar®

The inside rearview mirror has 2 switches that perform the following functions:

- The MIRROR switch is used to enable or disable the automatic day-night feature of the mirror. With the ignition in the ON position, depress the MIRROR switch to enable the automatic day-night feature of the mirror. A green indicator will illuminate on the mirror when the automatic day-night feature is enabled. To disable the automatic day-night feature of the mirror, depress the MIRROR switch.
- The COMPASS switch is used to turn the compass ON and OFF. With the ignition in the ON position, depress the COMPASS switch to turn the compass ON. Depress the COMPASS switch again to turn the compass OFF. The COMPASS switch is also used to place the compass into a calibration or zone mode. For more information, refer to **Compass Calibration and Magnetic Variance** .

Switches of the Inside Rearview Mirror with the Automatic Day-Night Feature, Compass/Temperature Display without OnStar®

The inside rearview mirror has 2 switches that perform the following functions:

- The TEMP switch is used to turn the compass/temperature display ON or OFF, it is also used to enable or disable the automatic day-night feature of the mirror. With the ignition in the ON position, depress the TEMP switch to enable the compass/temperature display. Depress the TEMP switch again to disable the compass/temperature display. The TEMP switch can be held for 4 seconds in order to change the display from Fahrenheit (°F) to Celsius (°C), or from Celsius (°C) to Fahrenheit (°F). Depress the TEMP switch until the green indicator illuminates on the mirror. This indicates that the automatic day-night feature

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is enabled. To disable the automatic day-night feature of the mirror, depress the TEMP switch until the green indicator turns OFF.

- The COMP switch is used to turn the compass/temperature display ON or OFF. With the ignition in the ON position, depress the COMP switch to turn the compass/temperature display ON. Depress the COMP switch again to turn the compass/temperature display OFF. The COMP switch is also used to place the compass into a calibration or zone mode. For more information, refer to **Compass Calibration and Magnetic Variance** .

Switches of the Inside Rearview Mirror with the Automatic Day-Night Feature with Compass and OnStar®

The inside rearview mirror has 4 switches that perform the following functions:

- The ON/OFF switch located at the left side of the mirror performs the following functions:
 - To enable or disable the automatic day-night feature of the mirror-With the ignition in the ON position, depress and hold the ON/OFF switch for 4 seconds to enable the automatic day-night feature of the mirror. A green indicator will illuminate on the mirror when the automatic day-night feature is enabled. To disable the automatic day-night feature of the mirror, depress and hold the ON/OFF switch for 4 seconds.
 - To turn the compass ON and OFF-With the ignition in the ON position, depress the ON/OFF switch to turn the compass ON. Depress the ON/OFF switch again to turn the compass OFF. The ON/OFF switch is also used to place the compass into a calibration or zone mode. For more information, refer to **Compass Calibration and Magnetic Variance** .
- The 3 switches on the right side of the mirror are for OnStar® operation. For more information, refer to **OnStar Description and Operation** .

Switches of the Inside Rearview Mirror with the Automatic Day-Night Feature, Compass/Temperature Display with OnStar®

The inside rearview mirror has 4 switches that perform the following functions:

- The ON/OFF switch located at the left side of the mirror performs the following functions:
 - To enable or disable the automatic day-night feature of the mirror-With the ignition in the ON position, depress and hold the ON/OFF switch for 6 seconds to enable the automatic day-night feature of the mirror. A green indicator will illuminate on the mirror when the automatic day-night feature is enabled. To disable the automatic day-night feature of the mirror, depress and hold the ON/OFF switch for 6 seconds.
 - To turn the compass/temperature display ON and OFF-With the ignition in the ON position, depress the ON/OFF switch to turn the compass/temperature display ON. Depress the ON/OFF switch again to turn the compass/temperature display OFF. The

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ON/OFF switch can be held for 4 seconds in order to change the display from Fahrenheit (°F) to Celsius (°C), or from Celsius (°C) to Fahrenheit (°F). The ON/OFF switch is also used to place the compass into a calibration or zone mode. For more information, refer to **Compass Calibration and Magnetic Variance** .

- The 3 switches on the right side of the mirror are for OnStar® operation. For more information, refer to **OnStar Description and Operation** .