

ACCESSORIES & EQUIPMENT

Mirrors - Coupe And Wagon

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Inside Rearview Mirror Nuts	1.8 N.m	16 lb in
Outside Power Mirror Motor Nuts	1 N.m	9 lb in
Outside Rearview Mirror Nuts	9 N.m	80 lb in

ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS

Adhesives, Fluids, Lubricants, and Sealers

Application	Type of Material	GM Part Number	
		United States	Canada
Inside Mirror Adhesive Kit	Adhesive	89021329	89020893

SCHEMATIC WIRING DIAGRAMS

INSIDE REARVIEW MIRROR WIRING SCHEMATICS

U2R, U2S, or U2T

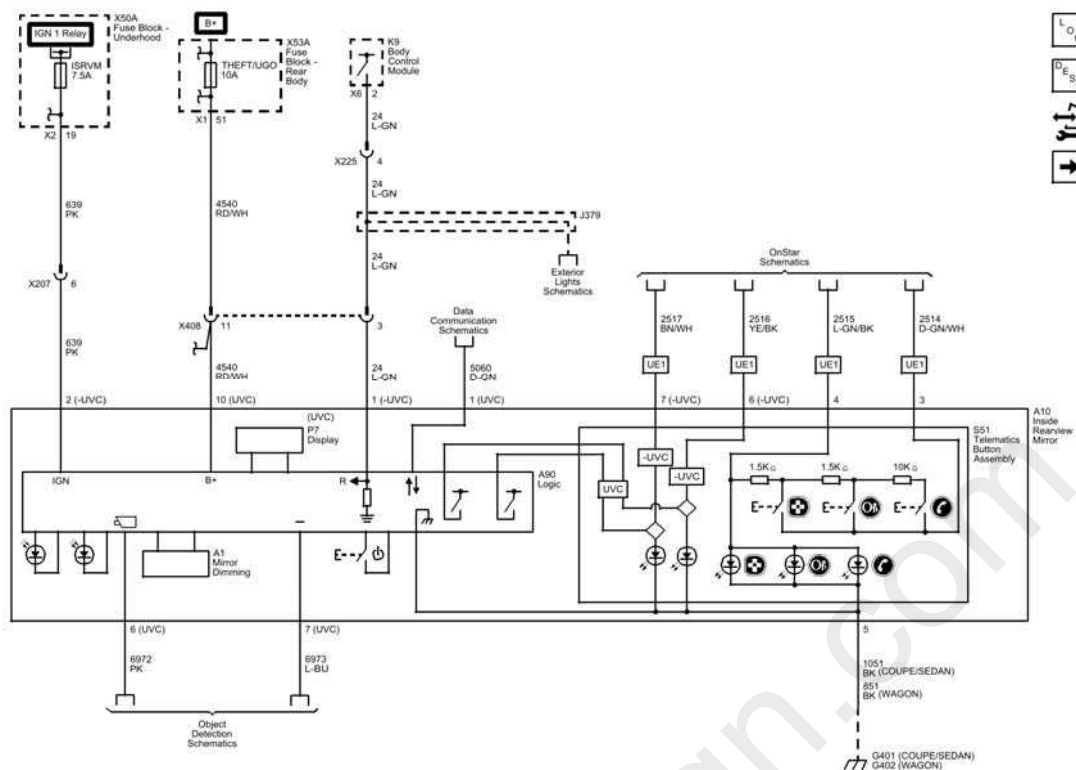
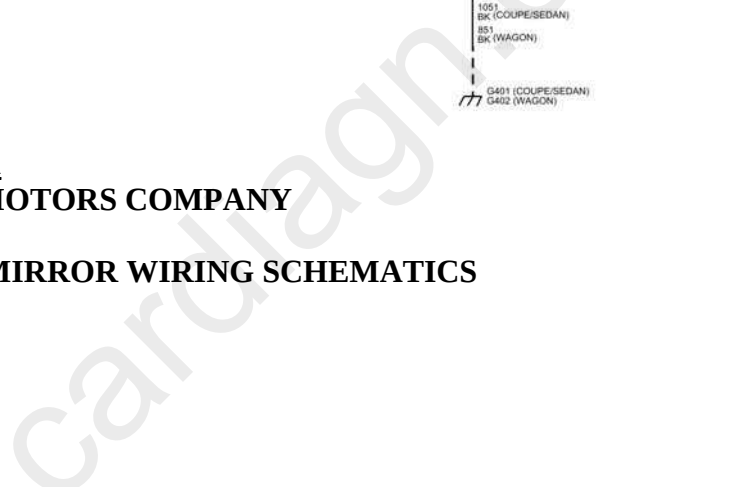


Fig. 1: U2R, U2S, or U2T

Courtesy of GENERAL MOTORS COMPANY

UAV, U2Y, or U2X



Courtesy of GENERAL MOTORS COMPANY

Driver

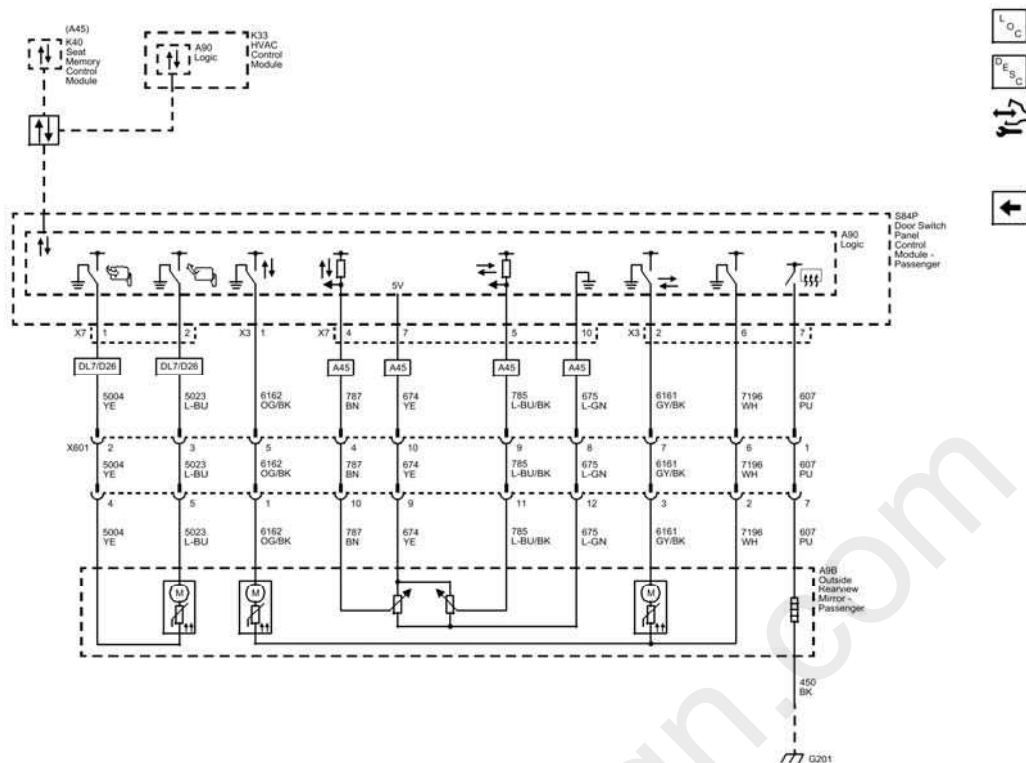


Fig. 4: Passenger

Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC B1544, B1600, or B1605</u>	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 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
<u>DTC B1580 or B1590</u>	DTC B1580 Mirror Horizontal Position Sensor Circuit DTC B1590 Mirror Vertical Position Sensor Circuit
<u>DTC B1640</u>	DTC B1640 01 Mirror Heater Circuit Short to Battery DTC B1640 02 Mirror Heater Circuit Short to Ground
<u>DTC B1722</u>	DTC B1722 01 Mirror Power Fold Control Circuit Short to Battery

	DTC B1722 02 Mirror Power Fold Control Circuit Short to Ground DTC B1722 04 Mirror Power Fold Control Circuit Open
--	---

DTC B1544, B1600, OR B1605: MIRROR MOTORS CIRCUIT

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

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 Horizontal Control	B1605 02	B1605 04	B1605 01	-
Driver/Passenger Mirror Motor Common Control	B1544 02	B1544 04, B1600 04, B1605 04	B1544 01	-
Driver/Passenger Mirror Motor Vertical Control	B1600 02	B1600 04	B1600 01	-

Circuit/System Description

The driver door lock/window switch or passenger door lock/window switch controls the mirror horizontal and vertical motors through the use of bi-directional motor controls. When the mirror is commanded up and down, voltage or ground is supplied to the mirror vertical motor through the mirror motor up/down control circuit and voltage or ground is supplied through the mirror motor common circuit.

Horizontal controls operate in the same manner with the mirror motor left/right control circuit supplying voltage or ground and the mirror motor common circuit supplying voltage or ground to the mirror horizontal motor when the mirror is commanded right and left.

Conditions for Running the DTC

Battery voltage must be between 9-16 volts.

Conditions for Setting the DTC

B1544 01, B1600 01 or B1605 01

The door lock/window switch has detected a short to voltage in the mirror control circuit while commanding the outside rearview mirror.

B1544 02, B1600 02 or B1605 02

The door lock/window switch has detected a short to ground in the mirror control circuit while commanding the outside rearview mirror.

B1544 04, B1600 04 or B1605 04

The door lock/window switch has detected an open/high resistance in the mirror control circuit while commanding the outside rearview mirror.

Action Taken When the DTC Sets

Mirror movement is suspended as 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 - INDEX - COUPE AND WAGON

Description and Operation

Outside Mirror Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the Outside Rearview Mirror-Driver moves when commanding the Mirror Right/Left and Mirror Up/Down with a scan tool.

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

Refer to Circuit/System Testing

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

3. Verify the Outside Rearview Mirror-Passenger when commanding the Mirror Right/Left and Mirror Up/Down with a scan tool.

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

Refer to Circuit/System Testing

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

4. All OK.

Circuit/System Testing

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

2. Test for less than 1 V between each control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the Door Lock/Window Switch
 - **If the test lamp turns ON during each of the commands**
6. Test or replace the Outside Rearview Mirror.

Repair Instructions

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

- **Outside Rearview Mirror Motor Replacement**
- **Control Module References** for driver door lock/window switch or passenger door lock/window switch replacement, setup, and programming

DTC B1580 OR B1590: MIRROR POSITION SENSOR

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
5 V 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	-	-

Circuit/System Description

The driver door module (DDM) and passenger door module (PDM) 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. 5 V is applied to each sensor through a shared 5 V reference circuit and a shared low reference circuit supplies ground. Each sensor has an individual signal circuit which is referenced from ground and provides position voltage to the DDM/PDM.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

B1580

An improper voltage level is seen on the horizontal position sensor signal circuit.

B1590

An improper voltage level is seen the vertical position sensor signal circuit.

Action Taken When the DTC Sets

Memory mirror recall functions are suspended as 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 - INDEX - COUPE AND WAGON

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

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

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate outside rearview mirror.
2. Ignition OFF, wait 1 minute, test for less than 30 ohms between the low reference circuit terminal 12 and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the appropriate door module.
3. Ignition ON, test for 4.8-5.2 V between the 5 V reference circuit terminal 9 and ground while depressing the mirror directional switch up or down.
 - If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the door module.
 - If less than the specified range, test the 5 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the door module.
4. Install a 3 A fused jumper wire between the signal circuit terminal 10 and the 5 V reference circuit terminal 9. Verify the scan tool Mirror Vertical Position parameter is greater than 4.8 V while depressing the mirror directional switch up or down.
 - If less than the specified range, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the door module.
5. Install a 3 A fused jumper wire between the signal circuit terminal 11 and the 5 V reference circuit terminal 9. Verify the scan tool Mirror Horizontal Position parameter is greater than 4.8 V while depressing the mirror directional switch up or down.
 - If less than the specified range, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the door module.
6. Install a 3 A fused jumper wire between the signal circuit terminal 10 and the low reference circuit terminal 12. Verify the scan tool Mirror Vertical Position parameter is less than 0.2 V.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the door module.
7. Install a 3 A fused jumper wire between the signal circuit terminal 11 and the low reference circuit terminal 12. Verify the scan tool Mirror Horizontal Position parameter is less than 0.2 V.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the door module.
8. If all circuits test normal, test or replace the outside rearview mirror motor.

Repair Instructions

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

- **Outside Rearview Mirror Motor Replacement**
- **Control Module References** for DDM and PDM replacement, setup, and programming

DTC B1640: MIRROR HEATER CIRCUIT SHORT

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 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 Control	B1640 02	1	B1640 01	-
Ground	-	1	-	-
1. Heated Mirror Malfunction				

Circuit/System Description

The driver door module (DDM) and passenger door module (PDM) 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 mirror heating element control circuit when a request is seen. Ground is applied through the mirror heating low reference circuit.

Conditions for Running the DTC

Battery voltage must be between 9-16 volts.

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 are inactive.

B1640 02

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

Action Taken When the DTC Sets

The heated mirror will be disabled.

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 - INDEX - COUPE AND WAGON

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

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 at the appropriate outside rearview mirror.
2. Test for less than 10 ohms between the ground circuit terminal 6 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance. If the circuit tests normal, replace the door module.
3. Connect a test lamp between the control circuit terminal 7 and ground.
4. Ignition ON, command the mirror heater ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the door module.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the door module.
5. If all circuits test normal, test or replace the outside rearview mirror glass.

Repair Instructions

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

- **Outside Rearview Mirror Glass Replacement**
- **Control Module References** for DDM and PDM replacement, setup and programming

DTC B1722: MIRROR POWER FOLD CONTROL CIRCUIT

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 Control Circuit Short to Battery

DTC B1722 02

Mirror Power Fold Control Circuit Short to Ground

DTC B1722 04

Mirror Power Fold Control 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 module (DDM) and passenger door module (PDM) 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

Battery voltage must be between 9-16 volts.

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 as 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 - INDEX - COUPE AND WAGON

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 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 at the appropriate outside rearview mirror.
2. Connect a test lamp between control circuit terminal 4 and control circuit terminal 5.
3. Command the mirror fold to Retract and Extend with a scan tool. The test lamp should turn ON when commanding the retract and extend states.
 - If the test lamp remains OFF during either of the commands, test for a short to voltage, short to ground, or an open/high resistance on either control circuit. If the circuits test normal, replace the door module.
4. If all circuits test normal, test or replace the outside rearview mirror.

Repair Instructions

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

- **Power Mirror Replacement (Wagon), Power Mirror Replacement (Coupe)**
- **Control Module References** for DDM and PDM replacement, setup, and programming

SYMPTOMS - MIRRORS

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

1. Perform the **Diagnostic System Check - Vehicle** before using the Symptom Tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to the following system descriptions:

- **Automatic Day-Night Mirror Description and Operation**
- **OnStar Description and Operation**
- **Outside Mirror Description and Operation**

Visual/Physical Inspection

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

Intermittent

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

Symptom List

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

- **Automatic Day-Night Mirrors Malfunction**
- **Heated Mirrors Malfunction**
- **OnStar Button LED Malfunction (without DRC or DRG) , OnStar Button LED Malfunction (with DRC or DRG)**
- **OnStar Button Malfunction**
- **Power Mirror Folding Malfunction**
- **Power Mirror Malfunction**

HEATED MIRRORS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

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

Circuit/System Description

The driver door module (DDM) and passenger door module (PDM) supply voltage to the outside rearview mirror heater elements upon receipt of a serial data message from the HVAC control module indicating that the rear defrost system is active. The door module supplies B+ through the driver/passenger mirror heating element control circuit when a request is seen. Ground is applied through the driver/passenger mirror heating element ground circuit.

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

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

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** .

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate outside rearview mirror.
2. Test for less than 10 ohms between the ground circuit terminal 6 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance. If the circuit tests normal, replace the door module.

3. Connect a test lamp between the control circuit terminal 7 and ground.
4. Ignition ON, command the mirror heater ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the door module.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the door module.
5. If all circuits test normal, test or replace the outside rearview mirror glass.

Repair Instructions

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

- **Outside Rearview Mirror Glass Replacement**
- **Control Module References** for DDM and PDM replacement, setup, and programming

AUTOMATIC DAY-NIGHT MIRRORS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ignition	1	1	-	-
Backup Lamp Control	1	1	1	-
Ground	-	1	-	-
1. Inside Electrochromic Mirror Malfunction				

Circuit/System Description

The inside rearview mirror uses 2 photocell sensors. One sensor is the rear light sensor, located on the face side of the mirror, facing the rear of the vehicle. The rear light sensor is used to determine light conditions present at the mirror face. The other sensor is the front light sensor, located on the backside of the mirror, facing the front of the vehicle. The front light sensor is used to determine the exterior light conditions at the front of the vehicle. With a low exterior light condition detected by the front light sensor and a high light condition from the rear light sensor, the inside rearview mirror will automatically darken the face of the inside rearview mirror 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 control voltage is supplied as an input to

the inside rearview mirror. The mirror monitors this input to disable the automatic day-night feature. This allows the driver to see objects in the mirror clearly when backing up, regardless of the rear light sensor status.

Reference Information

Schematic Reference

Inside Rearview Mirror Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Automatic Day-Night Mirror Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, 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.
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. With engine running, place the transmission in REVERSE. The inside rearview mirror face should transition from dim to bright.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the inside rearview mirror.
2. Test for less than 10 ohms between the ground circuit terminal 5 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify that a test lamp illuminates between the ignition circuit terminal 2 and ground.
 - If the test lamp does not illuminate test the ignition circuit for an open/high resistance or short to ground.

4. Park brake applied, vehicle in REVERSE, verify that a test lamp illuminates between the backup lamp control circuit terminal 1 and ground.
 - If the test lamp does not illuminate test the control circuit for an open/high resistance or short to ground. If the circuit tests normal, refer to **Backup Lamps Malfunction** .
5. If all circuits test normal, test or replace the inside rearview mirror.

Repair Instructions

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

Inside Rearview Mirror Replacement

POWER MIRROR FOLDING MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Folding Mirror Motor 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 module (DDM) and passenger door module (PDM) 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 - INDEX - COUPE AND WAGON

Description and Operation

Outside Mirror Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, 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 DDM.
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 at the appropriate outside rearview mirror.
2. Connect a test lamp between control circuit terminal 4 and control circuit terminal 5.
3. Command the mirror fold to Retract and Extend with a scan tool. The test lamp should turn ON when commanding the retract and extend states.
 - If the test lamp remains OFF during either of the commands, test for a short to voltage, short to ground, or an open/high resistance on either control circuit. If the circuits test normal, replace the door module.
4. If all circuits test normal, test or replace the outside rearview mirror.

Repair Instructions

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

- **Outside Rearview Mirror Motor Replacement**
- **Control Module References** for DDM and PDM replacement, setup, and programming

POWER MIRROR MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Position Sensor 5 V 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	-
Left/Right Mirror Motor Horizontal Control	B1544 04 B1605 02	B1544 04 B1605 04	B1605 02	-
Left/Right Mirror Motor Common Control	B1544 02 B1544 04 B1600 04 B1605 04	B1544 04 B1600 04 B1605 04	B1544 02	-
Left/Right Mirror Motor Vertical Control	B1544 04 B1600 02	B1544 04 B1600 04	B1600 02	-
Low Reference	-	B1580, B1590	-	-

Circuit/System Description

The driver door module (DDM) or passenger door module (PDM) controls the mirror horizontal and vertical motors through the use of bi-directional motor controls. When the mirror is commanded up and down, voltage or ground is supplied to the mirror vertical motor through the mirror motor up/down control circuit and voltage or ground is supplied through the mirror motor common control circuit.

Horizontal controls operate in the same manner with the mirror motor left/right control circuit supplying voltage or ground and the mirror motor common control circuit supplying voltage or ground to the mirror horizontal motor when the mirror is commanded right and left.

The DDM and PDM 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. 5 V is applied to each sensor through a shared 5 V reference circuit and a shared low reference circuit supplies ground. Each sensor has an individual signal circuit which is referenced from ground and provides position voltage to the DDM/PDM.

Reference Information

Schematic Reference

Outside Rearview Mirror Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Outside Mirror Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, 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, Right, and Left.
 - If the parameter does not cycle between the specified values, replace the DDM.
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 DDM.
3. Using the mirror directional switch operate the left and right outside mirrors to move up, down, left and right. The mirrors should move in the commanded directions.
 - If a mirror does not move in all the commanded directions refer to, Mirror Motor Circuit Test.
4. Operate the memory 1 and 2 recall switches. The outside rearview mirrors should adjust to the stored memory settings.
 - If a mirror does not adjust to the stored memory setting, refer to Mirror Position Sensor Circuit Test.

Circuit/System Testing

Mirror Motor Circuit Test

1. Ignition OFF, disconnect the harness connector at the appropriate outside rearview mirror.
2. Connect a test lamp between the control circuit terminal 3 and the control circuit terminal 2.
3. Ignition ON, command the mirror LEFT and RIGHT with a scan tool. The test lamp should turn ON when commanding the LEFT and RIGHT states.
 - If the test lamp remains OFF during either of the commands, test for a short to ground or an open/high resistance on either control circuits. If the circuits test normal, replace the appropriate door module.

4. Connect a test lamp between the control circuit terminal 1 and the control circuit terminal 2.
5. Ignition ON, command the mirror UP and DOWN with a scan tool. The test lamp should turn ON when commanding the UP and DOWN states.
 - If the test lamp remains OFF during either of the commands, test for a short to ground or an open/high resistance on either control circuits. If the circuits test normal, replace the door module.
6. If all circuits test normal, test or replace the outside rearview mirror motor.

Mirror Position Sensor Circuit Test

1. Ignition OFF, disconnect the harness connector at the appropriate outside rearview mirror.
2. Ignition OFF, wait 1 minute, test for less than 1.0 ohms between the low reference circuit terminal 12 and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the appropriate door module.
3. Ignition ON, test for 4.8-5.2 V between the 5 V reference circuit terminal 9 and ground while depressing the mirror directional switch up or down.
 - If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the door module.
 - If less than the specified range, test the 5 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the door module.
4. Install a 3 A fused jumper wire between the signal circuit terminal 10 and the 5 V reference circuit terminal 9. Verify the scan tool Mirror Vertical Position parameter is greater than 4.8 V while depressing the mirror directional switch up or down.
 - If less than the specified range, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the door module.
5. Install a 3 A fused jumper wire between the signal circuit terminal 11 and the 5 V reference circuit terminal 9. Verify the scan tool Mirror Horizontal Position parameter is greater than 4.8 V while depressing the mirror directional switch up or down.
 - If less than the specified range, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the door module.
6. Install a 3 A fused jumper wire between the signal circuit terminal 10 and the low reference circuit terminal 12. Verify the scan tool Mirror Vertical Position parameter is less than 0.2 V.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the door module.
7. Install a 3 A fused jumper wire between the signal circuit terminal 11 and the low reference circuit terminal 12. Verify the scan tool Mirror Horizontal Position parameter is less than 0.2 V.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the door module.
 - If all circuits test normal, test or replace the outside rearview mirror motor.

Repair Instructions

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

- Outside Rearview Mirror Motor Replacement
- Control Module References for DDM and PDM replacement, programming and setup

REPAIR INSTRUCTIONS

OUTSIDE REARVIEW MIRROR SEAL REPLACEMENT (COUPE)

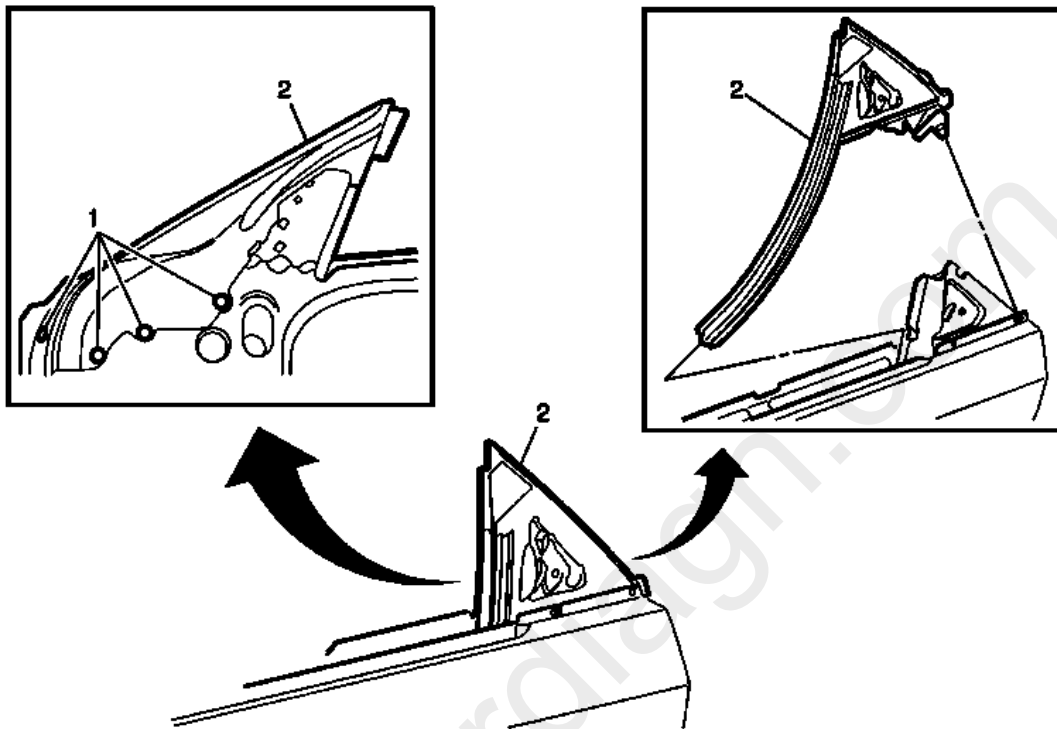


Fig. 5: Outside Rearview Mirror Seal & Retainers (Coupe)
Courtesy of GENERAL MOTORS COMPANY

Outside Rearview Mirror Seal Replacement (Coupe)

Callout	Component Name
Preliminary Procedures	
1. Place the front door window in the full down position. 2. Remove the outside rearview mirror. Refer to <u>Power Mirror Replacement (Coupe)</u>. 3. Remove the front side door window belt reveal molding. Refer to <u>Front Side Door Window Belt Reveal Molding Replacement (Coupe)</u>.	
1	Outside Rearview Mirror Seal Retainer (Qty: 4)
	Outside Rearview Mirror Seal
Procedures	
1. Apply a suitable lubricant (glass cleaner) to the mirror seal, window and window	

2	channel to assist in the installing. 2. Insert mirror seal into the window channel, work the mirror seal downward until fully seated. 3. The mirror seal must be fully seated to the window and window channel before rolling up the window. 4. Inspect the rearview mirror and window for proper operation before install the trim panel.
---	---

POWER MIRROR REPLACEMENT (WAGON)

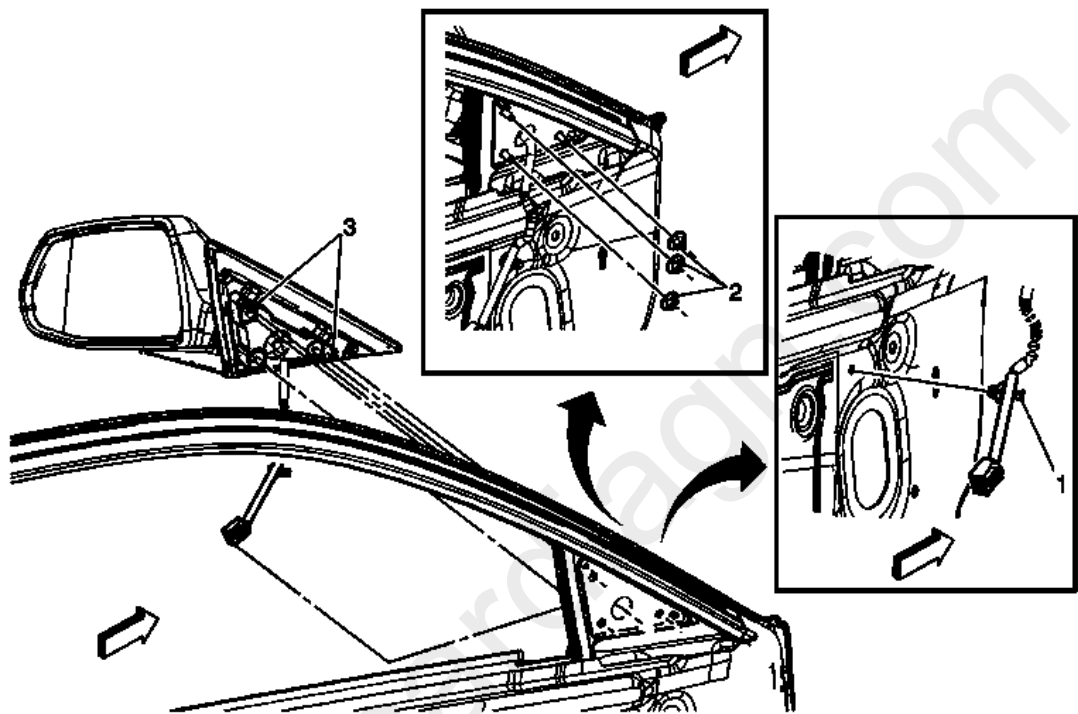


Fig. 6: Power Mirror Replacement (Wagon)
 Courtesy of GENERAL MOTORS COMPANY

Power Mirror Replacement (Wagon)

Callout	Component Name
Preliminary Procedures	
1.	Remove the door trim panel. Refer to <u>Front Side Door Trim Panel Replacement (Wagon)</u> .
2.	Remove the front door upper trim. Refer to <u>Front Side Door Garnish Molding Replacement (Wagon)</u> .
1	Outside Rearview Power Mirror Harness Retainer
	Outside Rearview Power Mirror Nut (Qty: 3)
	CAUTION:

	Refer to <u>Fastener Caution</u> . Procedure 1. Lower the window to the full down position. 2. Disconnect the power mirror wire harness electrical connector. Tighten 9 N.m (80 lb in)
2	
3	Outside Rearview Power Mirror TIP: Pull the wiring harness through the hole in the mirror patch.

POWER MIRROR REPLACEMENT (COUPE)

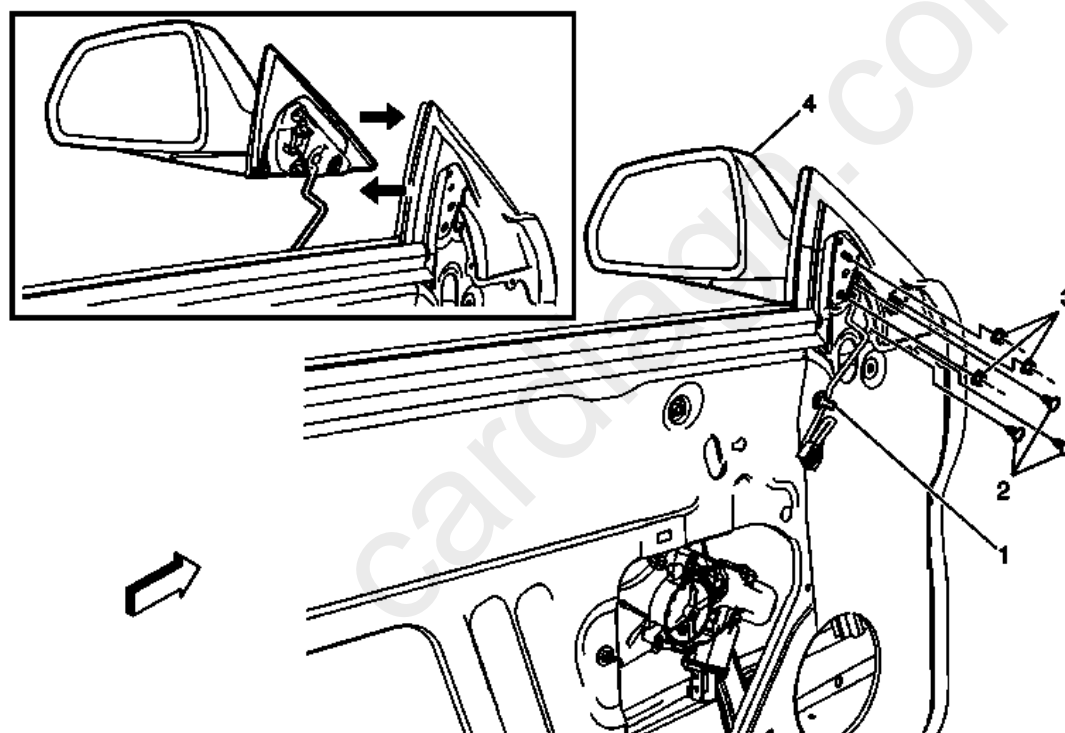


Fig. 7: Power Mirror

Courtesy of GENERAL MOTORS COMPANY

Power Mirror Replacement (Coupe)

Callout	Component Name
WARNING: Refer to <u>Glass and Sheet Metal Handling Warning</u> . Preliminary Procedure	

1. Remove the front side door trim panel. Refer to <u>Front Side Door Trim Panel Replacement (Coupe)</u> . 2. Remove the front side door garnish molding coupe. Refer to <u>Front Side Door Garnish Molding Replacement (Coupe)</u> .	
1	Outside Rearview Power Mirror Harness Retainer
2	Outside Rearview Mirror Sealing Retainers (Qty: 3)
3	Outside Rearview Power Mirror Fastener (Qty: 3) CAUTION: Refer to <u>Fastener Caution</u> . Procedure 1. Lower the window to the full down position. 2. Disconnect the power mirror wire harness electrical connector. 3. Pull up on the inside lower edge of the mirror seal to expose the lower fastener. Tighten 9 N.m (80 lb in)
4	Outside Rearview Power Mirror TIP: Pull the wiring harness through the hole in the mirror patch.

OUTSIDE REARVIEW MIRROR MOTOR REPLACEMENT

Removal Procedure

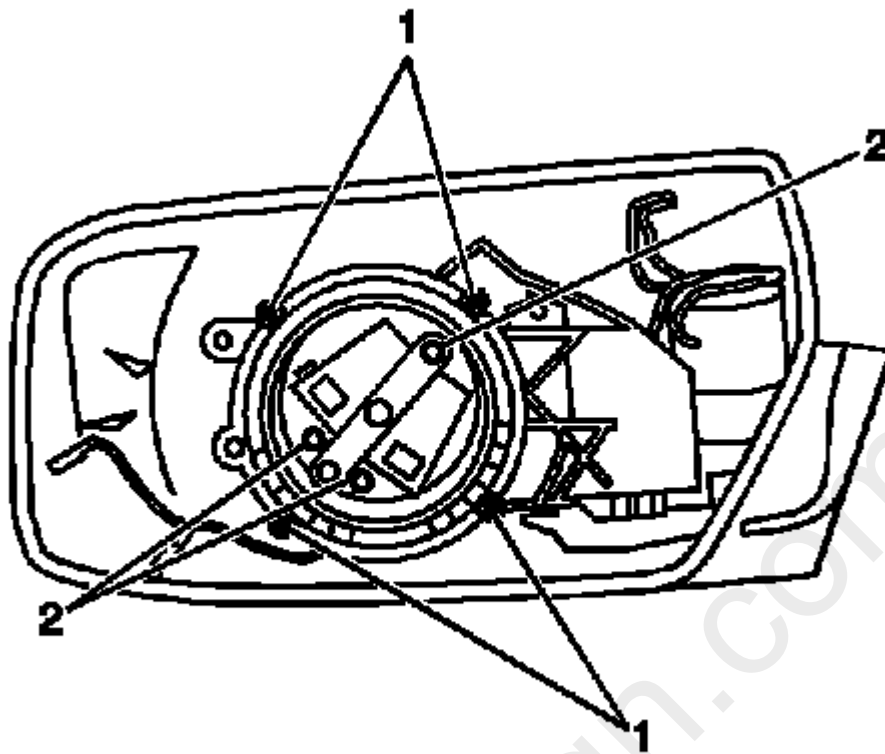


Fig. 8: Aligning Latches & Installing Insulator
Courtesy of GENERAL MOTORS COMPANY

1. Remove the mirror face. Refer to **Outside Rearview Mirror Glass Replacement**.
2. Remove the screws (2).
3. Disconnect the electrical connector.

Installation Procedure

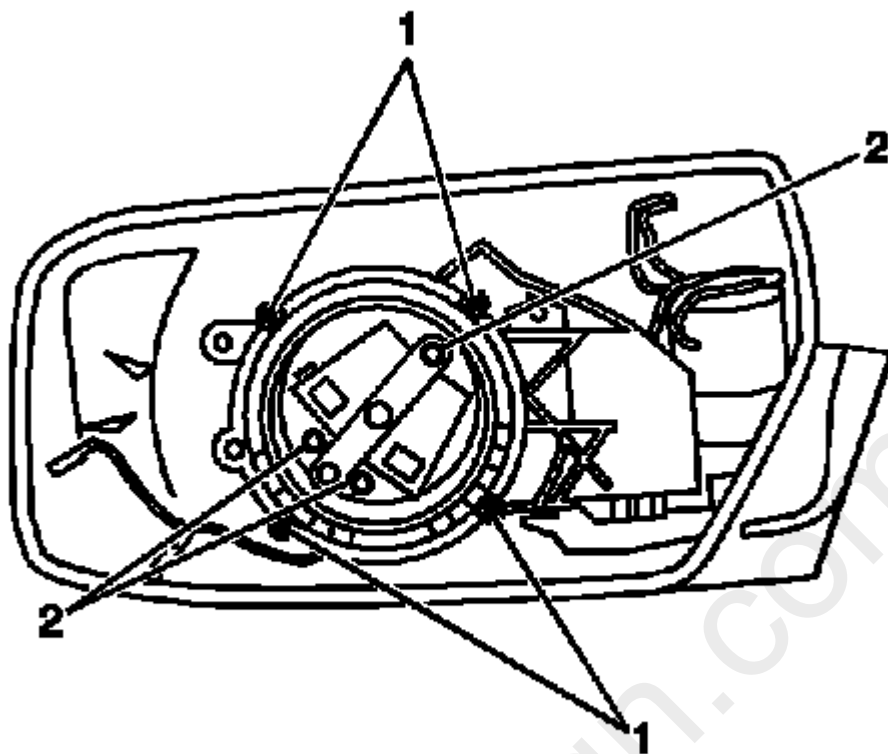


Fig. 9: Aligning Latches & Installing Insulator
Courtesy of GENERAL MOTORS COMPANY

1. Connect the electrical connector.
2. Align the motor to the mirror assembly.

CAUTION: Refer to Fastener Caution .

3. Install the screws (2) and tighten to 1 N.m (9 lb in).
4. Install the mirror face. Refer to **Outside Rearview Mirror Glass Replacement**.

OUTSIDE REARVIEW MIRROR GLASS REPLACEMENT

Removal Procedure

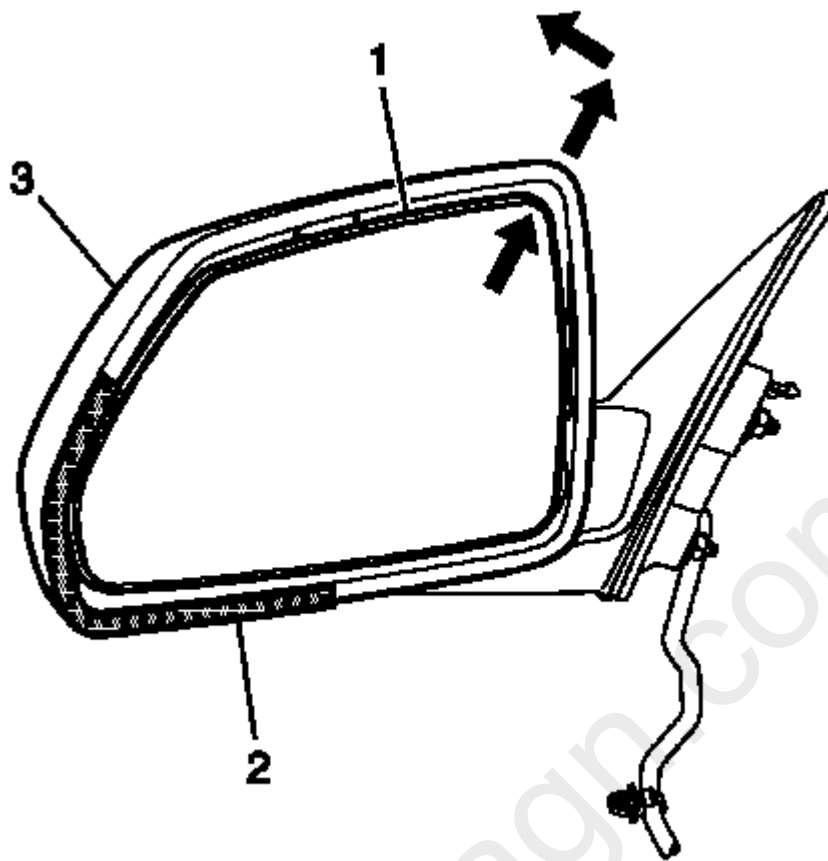


Fig. 10: Outside Rearview Mirror Glass, Masking Tape & Mirror Housing
Courtesy of GENERAL MOTORS COMPANY

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

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

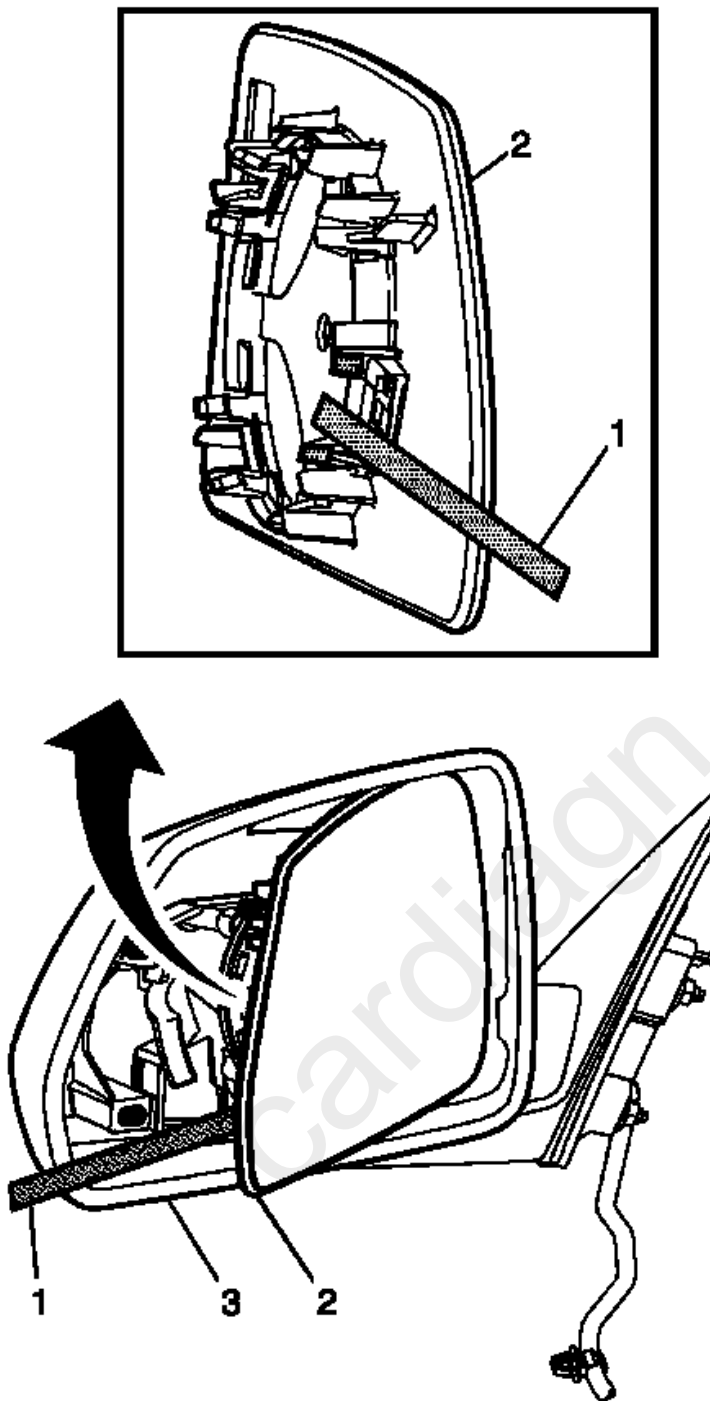


Fig. 11: Identifying Mirror Glass And Flat Plastic
Courtesy of GENERAL MOTORS COMPANY

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

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

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

Installation Procedure

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

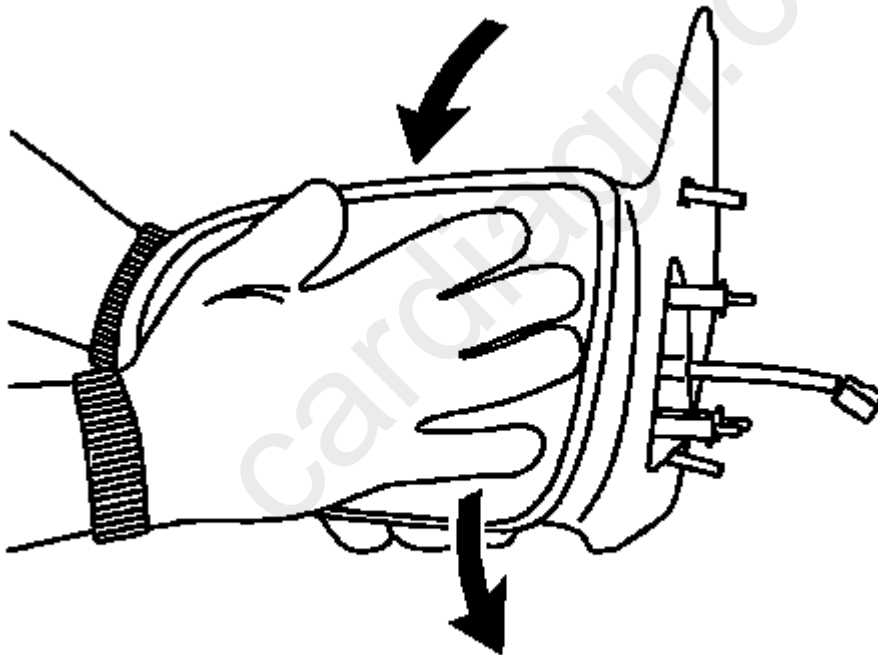


Fig. 12: Mirror Glass & Motor

Courtesy of GENERAL MOTORS COMPANY

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

6. Remove the masking tape.

INSIDE REARVIEW MIRROR REPLACEMENT

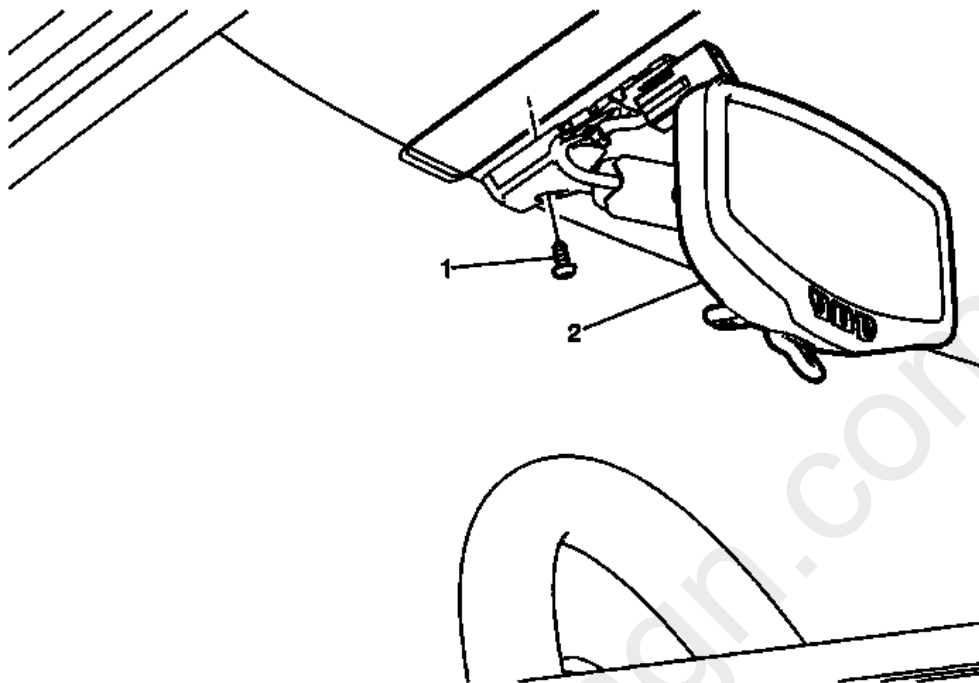


Fig. 13: Inside Rearview Mirror
 Courtesy of GENERAL MOTORS COMPANY

Inside Rearview Mirror Replacement

Callout	Component Name
1	Inside Rearview Mirror Screw CAUTION: Refer to <u>Fastener Caution</u> . Procedure Remove the inside rearview mirror cover, if equipped. Tighten 2 N.m (18 lb in)
2	Inside Rearview Mirror Procedures 1. Disconnect the electrical connector, if equipped. 2. Adjust the mirror to the full upward position.

3. Slide the mirror upward off of the rearview mirror button.
4. Refer to **Control Module References** for programming and setup information.

INSIDE REARVIEW MIRROR BRACKET INSTALLATION

NOTE: If the windshield is equipped with a blackout area around the mirror base bracket Care Must be used not to cut or scrape the blackout .

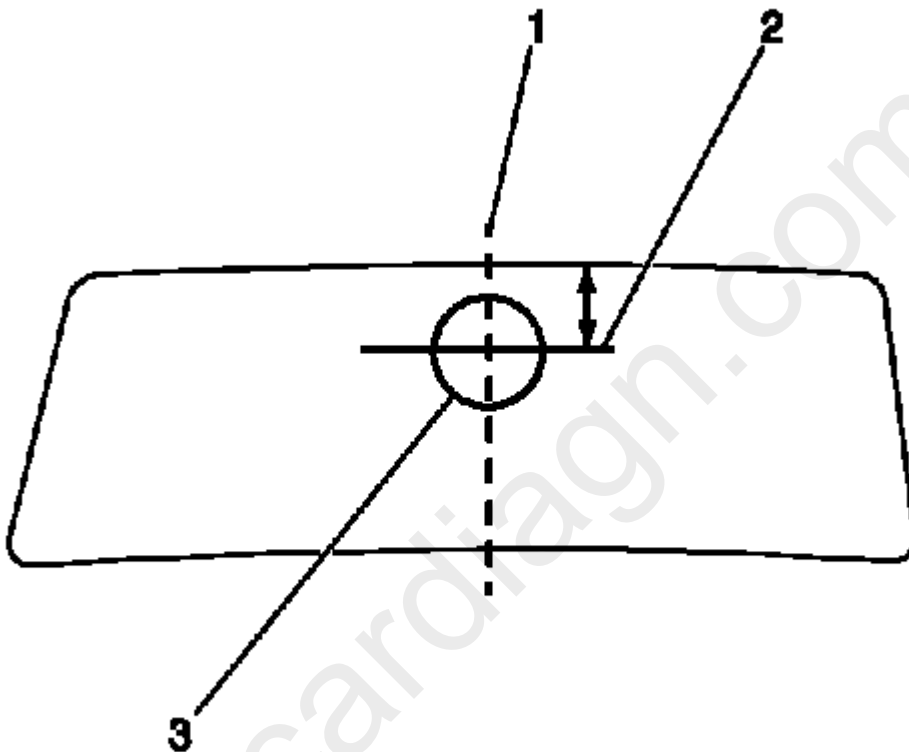


Fig. 14: Identifying Mirror Mounting Base Location
Courtesy of GENERAL MOTORS COMPANY

1. Determine the location of the mirror mounting base by marking the outside/inside of the windshield with a wax pencil where the base was previously located. If it is not clear where the base was located, use the following steps to determine where the base should be installed:
 1. Using a measuring tape, measure the distance between the windshield pillars at the windshield blackout 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 bottom center of the mirror mounting base will be at the intersection of these lines.

NOTE: Clean the inside windshield glass and the mounting surface of the mirror mounting base thoroughly with a clean cloth saturated with naphtha or a 50/50 mixture by volume of clean water and isopropyl alcohol.

2. Clean the inside windshield glass thoroughly to remove all old adhesive.

NOTE: If reinstalling the original mounting base, place the mirror mounting base in a suitable holding device, such as a vice.

3. Clean mirror mounting base thoroughly to remove all of the old adhesive.

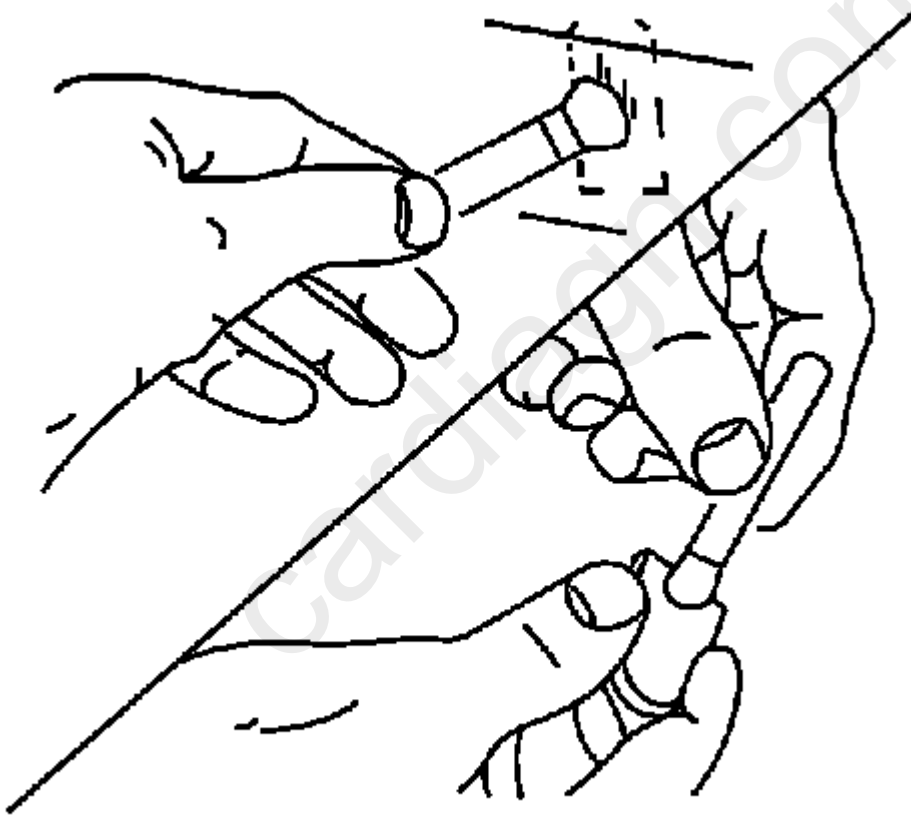


Fig. 15: Applying Adhesive To Mirror Base & Window
Courtesy of GENERAL MOTORS COMPANY

4. Using the Inside Mirror Adhesive Kit , or equivalent to apply a small amount of activator to the mounting surface of the mirror mounting base. Refer to **Adhesives, Fluids, Lubricants, and Sealers.**
5. Apply a small amount of activator to the windshield where the mounting base is to be installed.

6. Allow the activator to dry 5 minutes.

NOTE: Do not touch the mounting surface of the mirror mounting base or the glass.

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

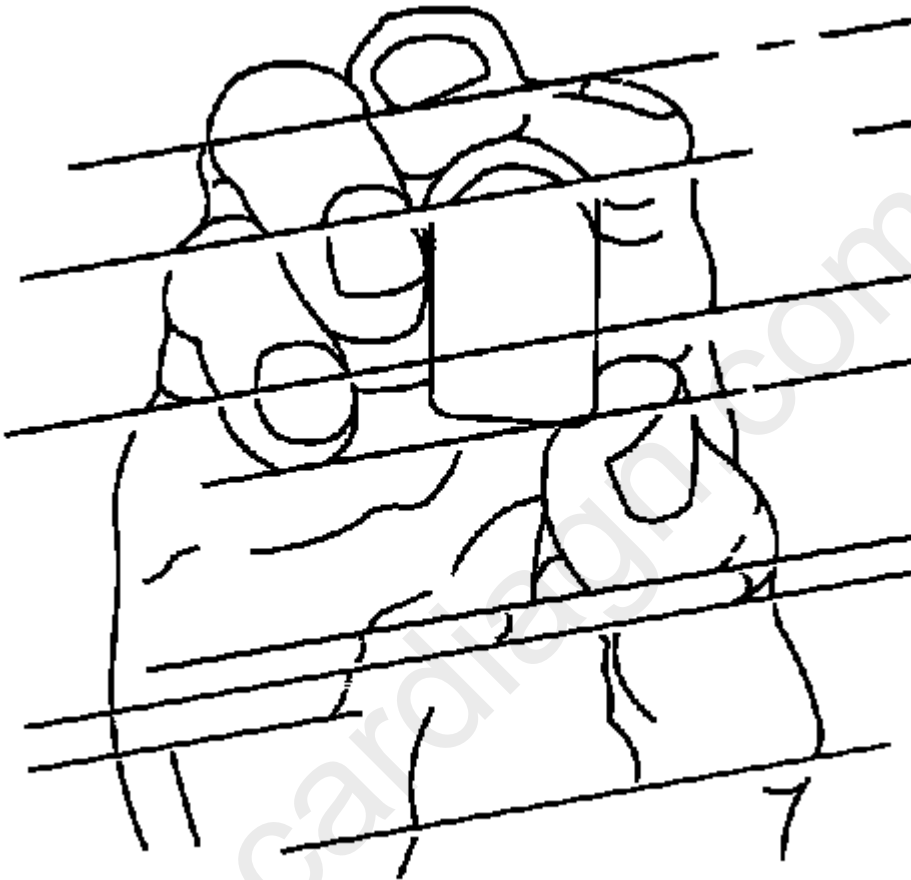


Fig. 16: Installing Mirror Mounting Base
Courtesy of GENERAL MOTORS COMPANY

8. 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.
9. Hold the mounting base firmly in place for 1 minute.
10. Allow the adhesive to set for 15 minutes before installing the rearview mirror.
11. Clean the wax pencil lines from the exterior surface of the glass.
12. Install the mirror to the mirror mounting base. Refer to **Inside Rearview Mirror Replacement**.

DESCRIPTION AND OPERATION

AUTOMATIC DAY-NIGHT MIRROR DESCRIPTION AND OPERATION

Inside Rearview Mirror with Automatic Day-Night System Operation

The inside rearview mirror consist of 2 photocell sensors. The headlight sensor, located on the front of the mirror is used to determine light conditions present at the mirror face from sources behind the vehicle. The ambient light sensor, located on the rear of the mirror is used to determine exterior light conditions present at the mirror. At night the inside rearview mirror will automatically darken to reduce glare from headlamps behind the vehicle.

In daytime conditions, the mirror operates at a normal, clear state due to the high exterior light conditions that are indicated by the ambient light sensor. When the vehicles gear selector is placed in the REVERSE position the automatic day-night feature is disabled. This allows the inside rearview mirror face to gradually change to a normal, clear state and allow the driver to see objects in the mirror clearly when backing up.

Inside Rearview Mirror with OnStar® Switch Operation

The 3 switches on the mirror are for OnStar® operation. For more detailed information, refer to the vehicles owners manual.

OUTSIDE MIRROR DESCRIPTION AND OPERATION

Outside Mirror System Components

The power outside rearview mirror system consists of the following components:

- Driver door switch assembly (DDSA)
- Driver door module (DDM)
- Passenger front door module (PDM)
- Driver outside mirror
- Passenger outside mirror
- Serial data

Outside Rearview Mirror Operation

The outside rearview mirrors are controlled by the driver door switch assembly (DDSA) which contains the mirror control switches, the driver door module (DDM), and the front passenger door module (PDM). The DDSA decodes mirror control switch activations while the door modules apply battery voltage and ground to their respective mirror motors to move the mirrors to the desired positions.

Outside Rearview Mirror Switches

For outside rearview mirror adjustments, the driver door switch assembly (DDSA) contains two built-in switches, the Mirror Select Switch and the Mirror Position Switch. The Mirror Select Switch is used to select which mirror, left or right, is to be adjusted. The Mirror Position Switch is used to move the mirror that has been selected for adjustment to the desired position. The DDSA reports the activity of these switches to the driver door module (DDM) and the front passenger door module (PDM) via the serial data circuit.

The Mirror Select Switch contacts, which are normally open, receive voltage and ground from the DDSA. When, either the left or right mirror has been selected for adjustment, the contacts indicating that selection are closed to ground and the voltage is pulled low. The DDSA processes this voltage information to determine which mirror will be adjusted.

The Mirror Position Switch has four sets of contacts, one set in each corner of the switch. The DDSA supplies voltage to one side of each set of contacts, and ground to the other side of each set of contacts. When the contacts close, voltage flows through them to ground and the DDSA interprets this as a specific mirror direction request signal. The DDSA then sends the request to the appropriate door module via the serial data circuit.

On vehicles that have the memory mirrors feature, the DDSA is also wired to, and receives direct signal inputs from, the memory function switch. For more information concerning the memory function switch refer to **Memory Seats Description and Operation**.

Mirror Motors

Each mirror has two reversible motors for position adjustment; the vertical motor and the horizontal motor. Each reversible mirror motor is wired to its associated door module through two motor control circuits. The door modules control the reversible motors by applying battery voltage and ground to these two motor control circuits. The door module reverses the polarity of the voltage and ground it applies to these two circuits in order to run the mirror motor in opposite directions. For example, to run the mirror in the Up direction, the door module applies voltage to the mirror motor up control circuit, and ground to the mirror motor down control circuit. To run the mirror in the opposite Down direction, the module reverses the polarity, supplying voltage to the down control circuit, and ground to the up control circuit.

Personalization - Driver Information Center (DIC)

The vehicle may be equipped with the memory mirrors feature. However, Personalization in the Setup menu of the driver information center (DIC) must be in the active state for memory mirrors to operate. A check mark appearing after the word Personalization on the display screen indicates that the feature is active. For more detailed information, refer to the vehicles owners manual.

Personalization Option - Dash Integration Module (DIM)

Front door modules also cannot perform memory mirror functions unless the Personalization Option in the dash integration module (DIM) is activated. The DIM stores the Personalization Option setting provided at the assembly plant and reports the setting to both front door modules, as well as other receiving modules, each time the ignition switch is cycled to RUN. The front door modules store the Personalization Option setting provided by the DIM and examine it before making a memory mirrors adjustment.

The Personalization Option setting stored within the front door modules will not change until the Personalization Option setting within the DIM is changed and the ignition switch then cycled to RUN.

If the Personalization Option is activated on a vehicle that is not equipped with memory, the door modules will erroneously set DTCs B1586 and B1591.

Memory Mirrors Operation

The memory mirrors are controlled by the mirror position sensors, the driver door switch assembly (DDSA), and the front door modules. The DDSA decodes memory switch activations while the mirror position sensors provide mirror position information to the front door modules. The front door modules supply voltage and ground to the mirror position sensors, store mirror position information, and apply voltage and ground to run the mirror motors.

For memory operations, each outside rearview mirror has four additional circuits and contains a vertical position sensor and a horizontal position sensor. The position sensors, which are potentiometer type sensors, are attached to the corresponding position motor of each mirror, and provide constant information, in the form of feedback voltage to the associated door module to indicate the vertical and horizontal position of the mirror.

When mirror positions are programmed into the personalization package, the front door modules store the positions indicated by the feedback voltages of the position sensors. When a memory recall is requested, the door modules compare the feedback voltages indicated by the current mirror positions to the stored feedback voltages. The door modules then move the mirrors until the current feedback voltages match the stored feedback voltage levels.

Heated Mirrors

The mirrors heat during the defrost/defog cycles for the rear window. The heated mirrors are connected to the driver door module (DDM) and the front passenger door module (PDM). The DDM and the PDM receive a message from the instrument panel cluster (IPC) via the rear integration module (RIM) commanding the heated mirrors ON. The DDM and PDM first examine information from the dash integration module (DIM) to determine if vehicle conditions are correct for the heated mirrors function to be permitted. If conditions are correct, the DDM then commands the driver side mirror heater ON, and the PDM commands the passenger side mirror heater ON.

Power Folding Mirrors

Export vehicles may also have the power folding mirrors feature. The operator may simultaneously retract both mirrors to a fully folded position, in which they are closely tucked in and parallel to, the front door windows, or simultaneously extend both mirrors to the fully unfolded position for normal everyday use.

For this feature, the driver door switch assembly (DDSA) has an additional power folding mirrors switch built into it and, each mirror contains an additional power folding mirror motor. When the switch is activated to fold the mirrors, the switch contacts close, the DDSA interprets the signal input, and sends the command on to the driver door module (DDM) and the front passenger door module (PDM). The DDM and the PDM then each apply battery voltage and ground to the appropriate circuits of their respective power folding motors in order to retract both mirrors. When the switch is activated to unfold the mirrors, the door modules reverse the polarity of the voltage and ground applied to the reversible folding motors in order to move both mirrors to the fully extended position.

The power folding mirrors switch is activated by momentarily pressing the switch button. Each subsequent press will activate the mirrors to the opposite function of the preceding press, i.e. if the mirrors are currently folded, the next press of the switch button will cause them to unfold and vice-versa.