

## 2005-07 ACCESSORIES & EQUIPMENT

### Stationary Windows - Ion

## SPECIFICATIONS

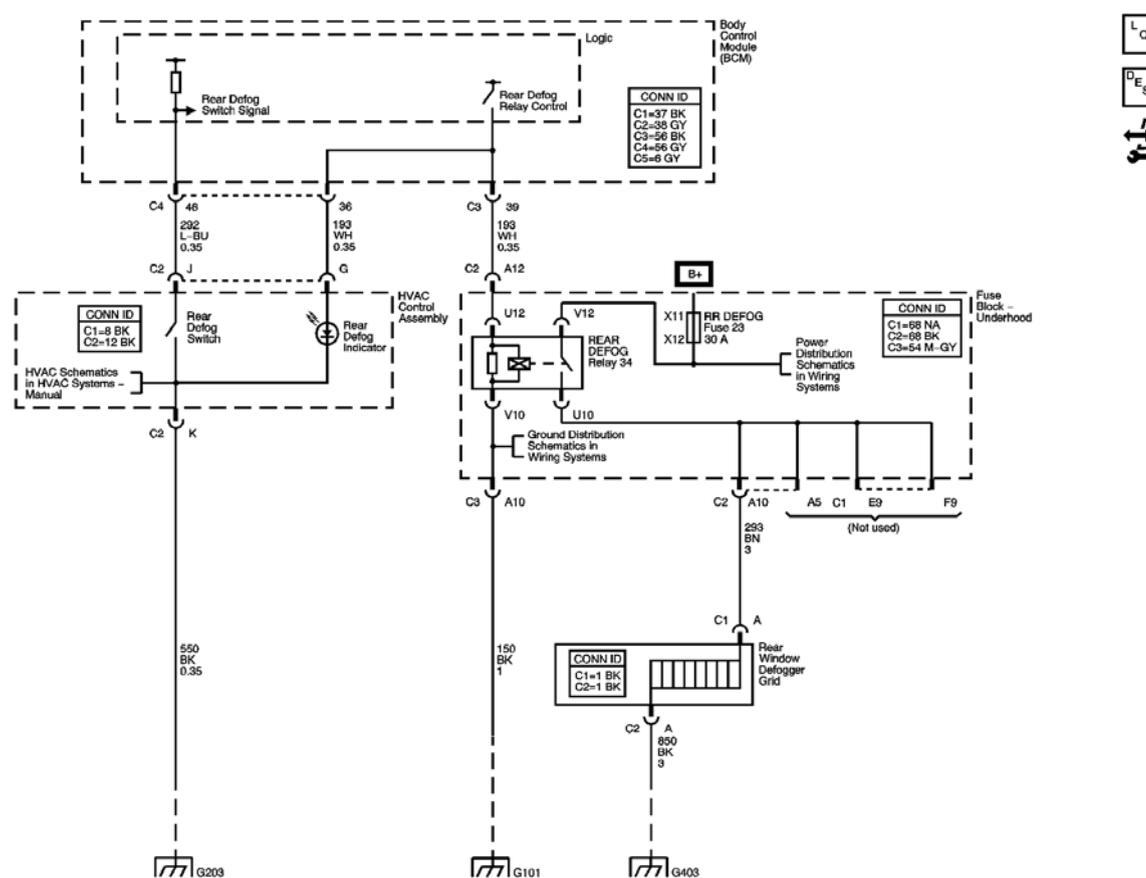
### FASTENER TIGHTENING SPECIFICATIONS

#### Fastener Tightening Specifications

Application	Specification	
	Metric	English
Rearview Mirror Screw	2 N.m	18 lb in

## SCHEMATIC AND ROUTING DIAGRAMS

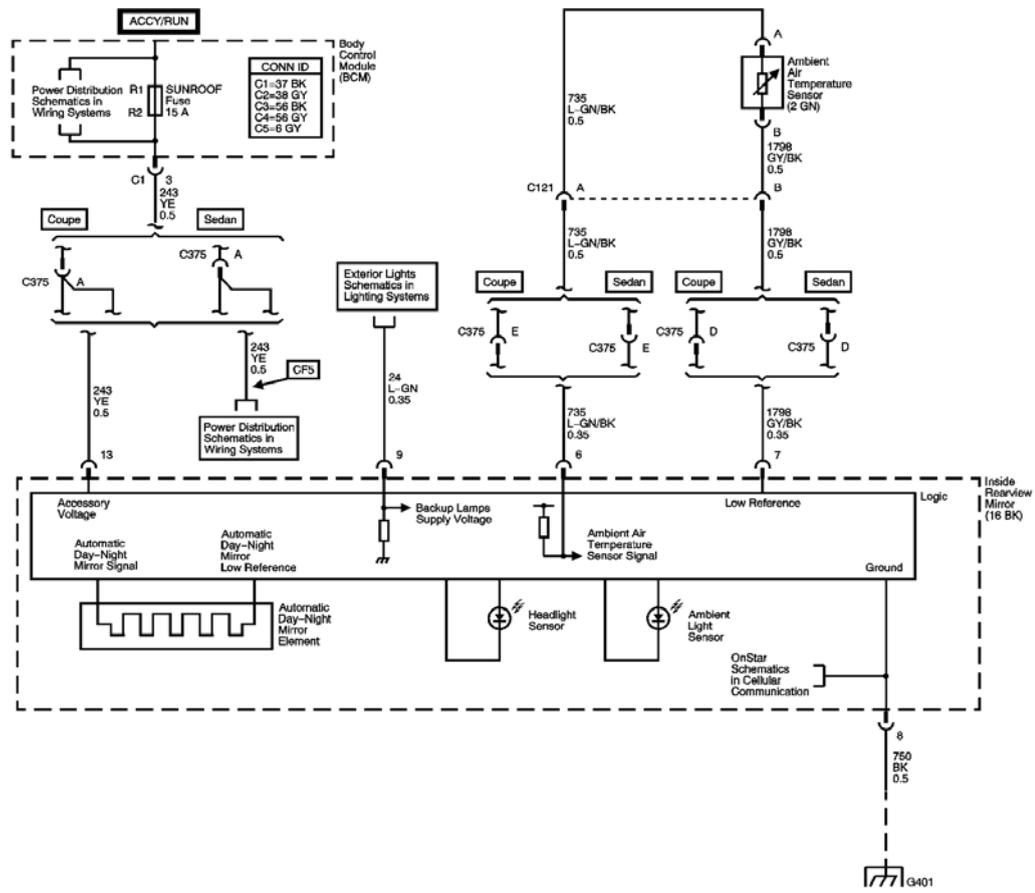
### DEFOGGER SCHEMATICS



**Fig. 1: Defogger Schematics**

Courtesy of GENERAL MOTORS CORP.

### INSIDE REARVIEW MIRROR SCHEMATICS

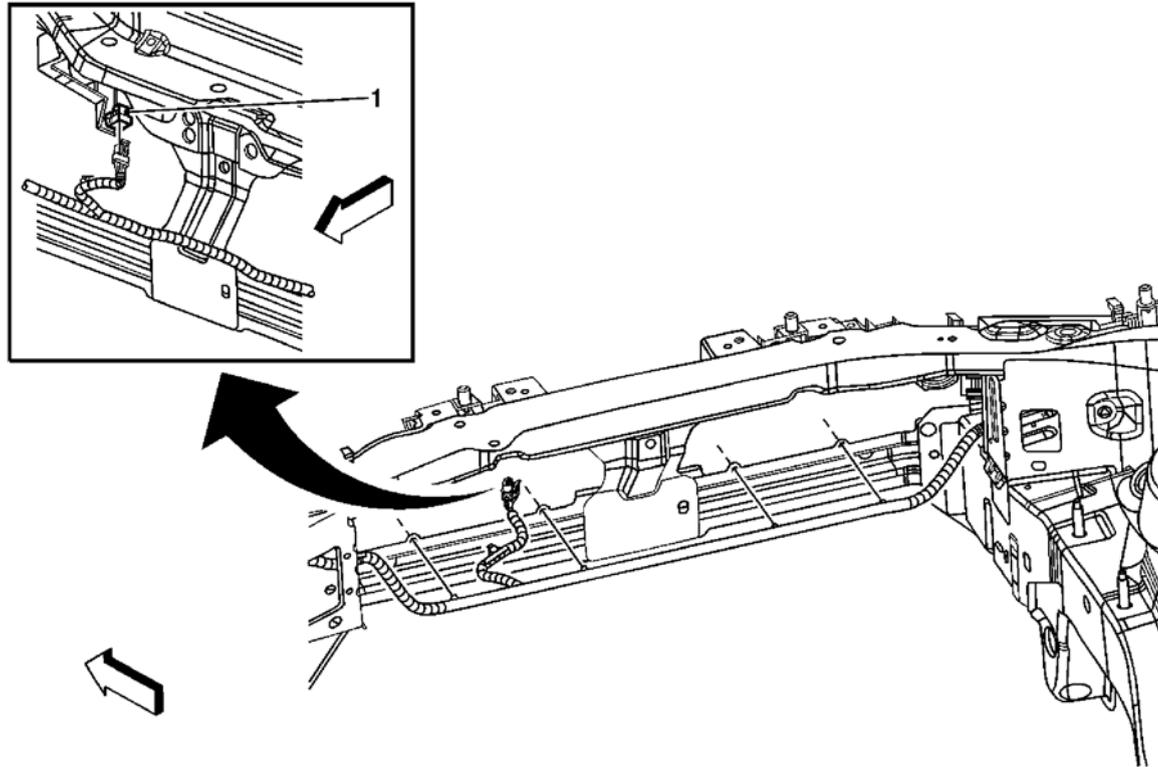


**Fig. 2: Inside Rearview Mirror Schematics**  
 Courtesy of GENERAL MOTORS CORP.

**COMPONENT LOCATOR**

**STATIONARY WINDOWS COMPONENT VIEWS**

Left Front of the Vehicle

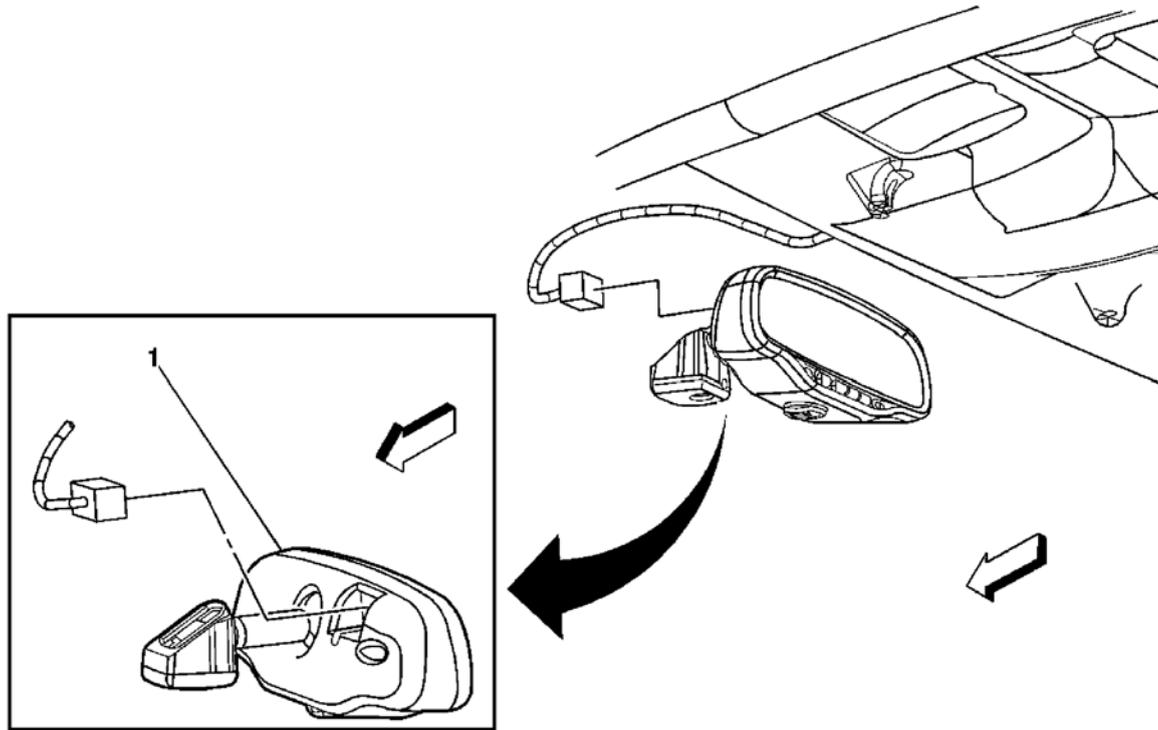


**Fig. 3: Left Front Of Vehicle (DF5) Component View**  
 Courtesy of GENERAL MOTORS CORP.

**Callouts For Fig. 3**

Callout	Component Name
1	Ambient Air Temperature Sensor

**Center Front Roof of the Vehicle**

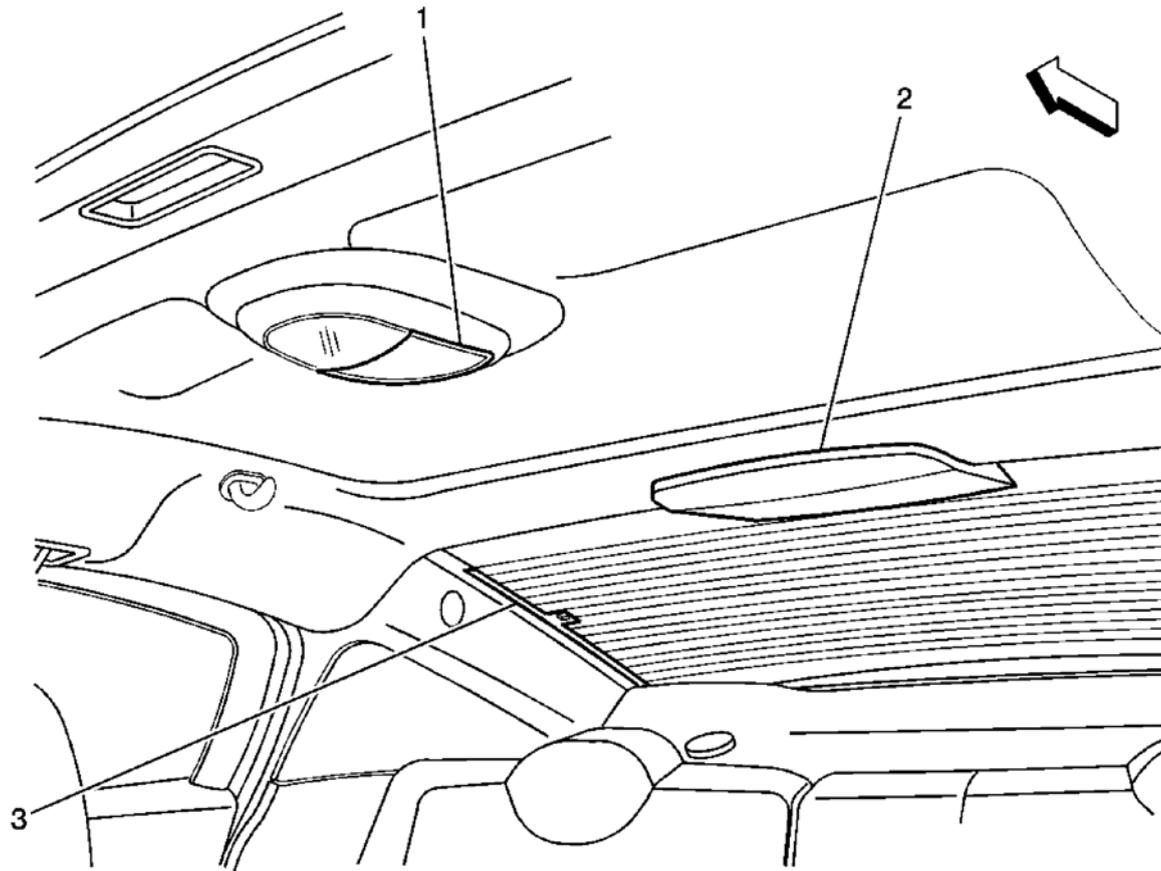


**Fig. 4: Top Center Of Windshield Component View**  
 Courtesy of GENERAL MOTORS CORP.

**Callouts For Fig. 4**

Callout	Component Name
1	Inside Rear View Mirror

Rear of the Passenger Compartment

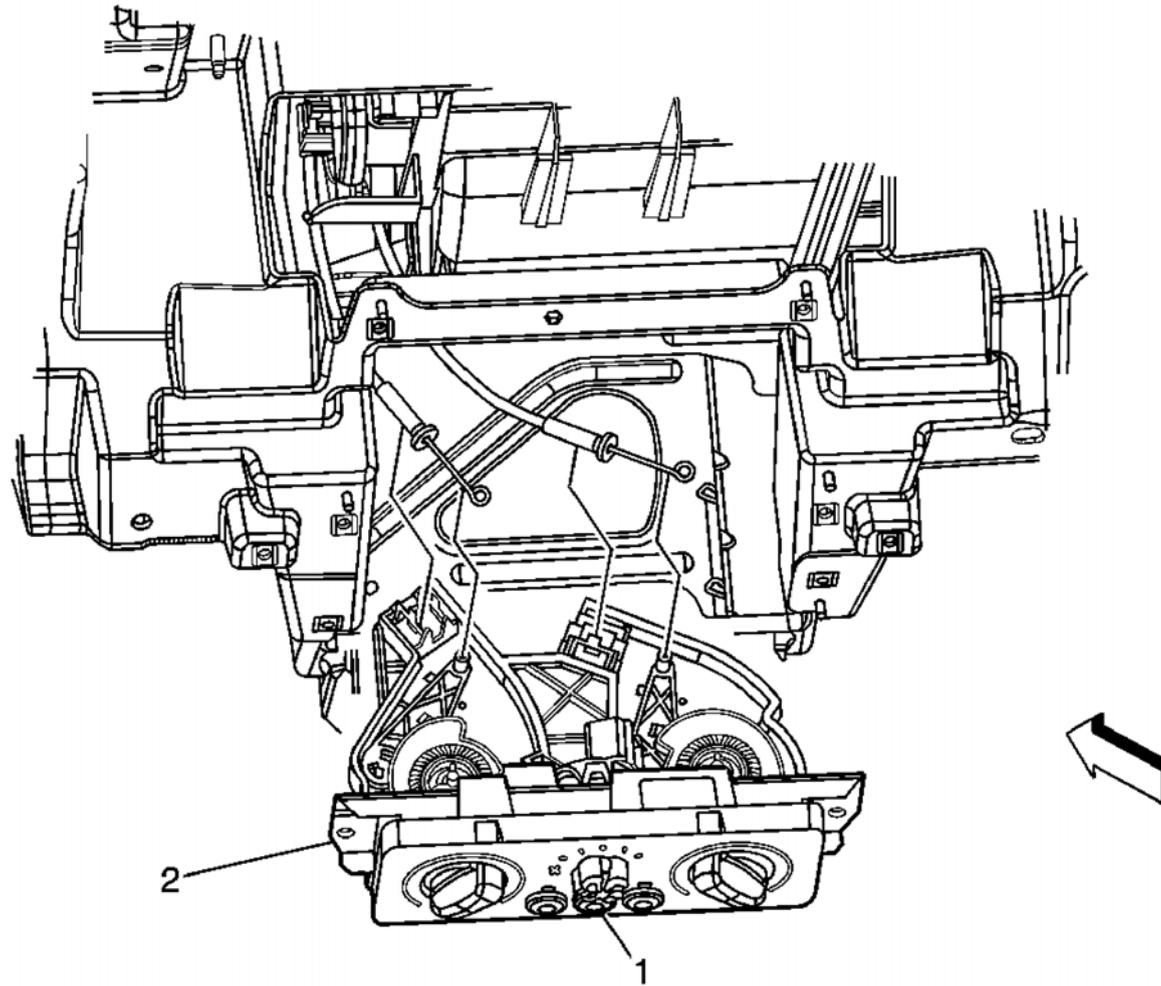


**Fig. 5: Rear Of Passenger Compartment Component View**  
 Courtesy of GENERAL MOTORS CORP.

**Callouts For Fig. 5**

Callout	Component Name
1	Dome Lamp
2	Center High Mounted Stop Lamp (CHMSL)
3	Rear Window Defogger Grid

Center of the I/P



**Fig. 6: Center Of I/P Component View**  
 Courtesy of GENERAL MOTORS CORP.

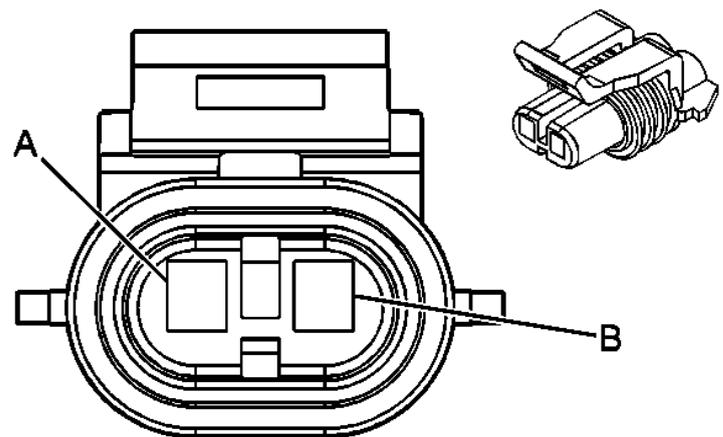
**Callouts For Fig. 6**

Callout	Component Name
1	Rear Window Defogger Switch
2	HVAC Control Assembly

**STATIONARY WINDOWS CONNECTOR END VIEWS**

Ambient Air Temperature Sensor (DF5)

Ambient Air Temperature Sensor (DF5)



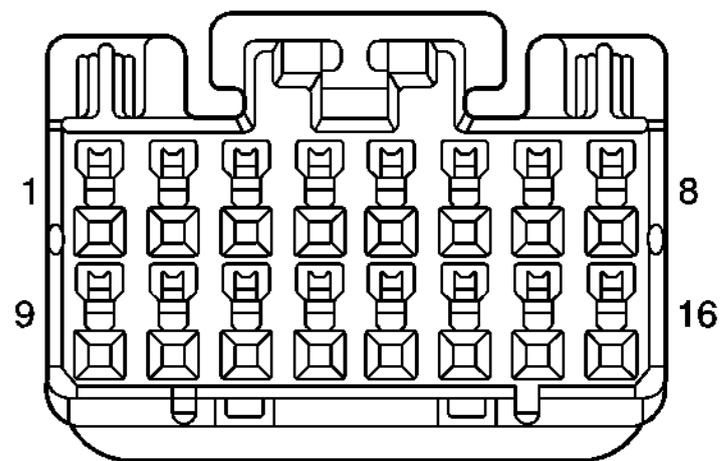
**Connector Part Information**

- 12052642
- 2-Way F Metri-Pack 150 Series Sealed (L-GN)

Pin	Wire Color	Circuit No.	Function
A	L-GN/BK	735	Ambient Air Temperature Sensor Signal
B	GY/BK	1798	Low Reference

**Inside Rearview Mirror (DF5 or UE1)**

**Inside Rearview Mirror (DF5 or UE1)**



**Connector Part Information**

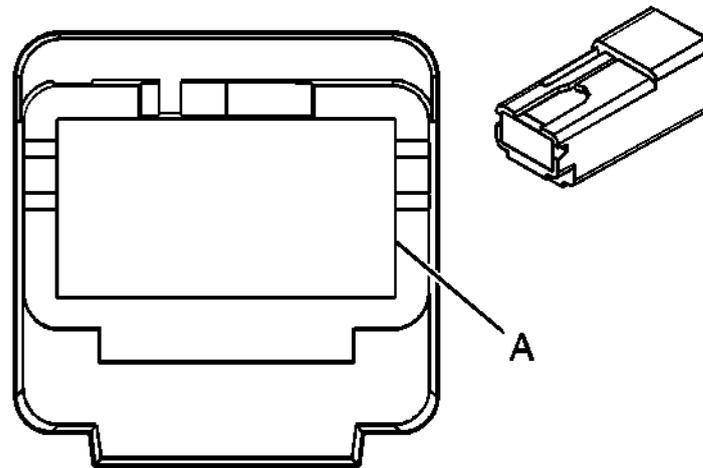
- 917981-2
- 16-Way F Housing/(0.040/0.070 Hybrid I/O) (BK)

Pin	Wire Color	Circuit No.	Function
1	-	-	Not Used

2	BARE	654	Cellular Telephone Microphone Low Reference (UE1)
3-5	-	-	Not Used
6	L-GN/BK	735	Ambient Air Temperature Sensor Signal (DF5)
7	GY/BK	1798	Low Reference (DF5)
8	BK	750	Ground (DF5)
9	L-GN	24	Backup Lamp Supply Voltage (DF5)
10	GY	655	Cellular Microphone Signal (UE1)
11	D-GN/WH	2514	Keypad Signal (UE1)
12	L-GN/BK	2515	Keypad Supply Voltage (UE1)
13	YE	243	Accessory Voltage (DF5)
14	YE/BK	2516	Keypad Green LED Signal (UE1)
15	BN/WH	2517	Keypad Red LED Signal (UE1)
16	-	-	Not Used

### Rear Window Defogger Grid C1

#### Rear Window Defogger Grid C1



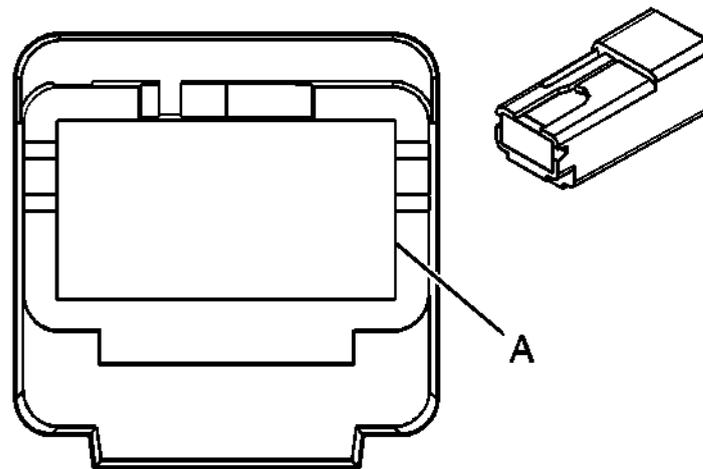
#### Connector Part Information

- 12092133
- 1-Way F Metri-Pack 630 Series Self Lock (BK)

Pin	Wire Color	Circuit No.	Function
A	BN	293	Rear Defog Element Supply Voltage

### Rear Window Defogger Grid C2

#### Rear Window Defogger Grid C2



**Connector Part Information**

- 12092133
- 1-Way F Metri-Pack 630 Series Self Lock (BK)

Pin	Wire Color	Circuit No.	Function
A	BK	850	Ground

## DIAGNOSTIC INFORMATION AND PROCEDURES

### DIAGNOSTIC STARTING POINT - STATIONARY WINDOWS

For the inside rearview mirror with the automatic day-night feature, begin the diagnosis by reviewing the system Description and Operation. Reviewing the Description and Operation information will help you determine the correct symptom diagnostic procedure when a malfunction exists. Reviewing the Description and Operation information will also help you determine if the condition described by the customer is normal operation. Refer to [Diagnostic System Check - Vehicle](#) in Vehicle DTC Information, in order to identify the correct procedure for diagnosing the system and where the procedure is located.

For the rear window defogger, begin the diagnosis with the [Diagnostic System Check - Vehicle](#) in Vehicle DTC Information. 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.

### SCAN TOOL OUTPUT CONTROLS

#### Body Control Module (BCM)

Scan Tool Output Control	Additional Menu Selection(s)	Description
Rear Defogger	Miscellaneous Test	The BCM actuates the Rear Defogger relay when you select ON. The rear window defogger grid should become warm.

### SCAN TOOL DATA LIST

## Body Control Module (BCM)

Scan Tool Parameter	Units Displayed	Typical Data Value
<b>Operating Conditions: Ignition in RUN Position, Engine OFF, All Doors CLOSED, DRLs OFF</b>		
A/C Switch	On/Off	Varies
Battery 1	Volts	Varies
Rear Defog Relay Cmd	On/Off	Off
Rear Defog Switch Input	On/Off	Off

## SCAN TOOL DATA DEFINITIONS

### Body Control Module (BCM)

#### A/C Switch

The scan tool displays On or Off. The BCM displays On when it receives an input from the HVAC control head indicator an A/C request.

#### Battery 1

The scan tool displays the value of the vehicle battery voltage.

#### Rear Defog Relay

The scan tool displays On or Off. When the BCM energizes the Rear Defogger relay, the scan tool will display On. When the BCM de-energizes the Rear Defogger relay, the scan tool will display Off.

#### Rear Defog Switch Input

The scan tool displays On or Off. When you depress the rear window defogger switch, the switch pulls the rear defogger switch signal circuit of the BCM low. The scan tool will display On. When you depress the switch again, the rear defogger switch signal circuit of the BCM will return to its normal state. The scan tool will display Off.

## DTC B0285



## Action Taken When the DTC Sets

The rear window defogger will be disabled until the condition is no longer present.

## Conditions for Clearing the DTC

- This DTC will change from current to history when the fault is no longer present.
- A history DTC will clear after 100 consecutive ignition cycles if the condition for the malfunction is no longer present.

## Test Description

The numbers below refer to the step numbers on the diagnostic table.

**2:** Listen for an audible click when the REAR DEFOG relay operates. Command both the ON and OFF states. Repeat the commands as necessary.

**3:** Verifies that the BCM is providing voltage to the REAR DEFOG relay.

**5:** Tests for a short to ground on the supply voltage circuit of the REAR DEFOG relay coil.

## DTC B0285

Step	Action	Yes	No
<b>Schematic Reference:</b> <a href="#">Defogger Schematics</a> <b>Connector End View Reference:</b> <a href="#">Stationary Windows Connector End Views</a>			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to <b>Step 2</b>	Go to <a href="#">Diagnostic System Check - Vehicle</a> in Vehicle DTC Information
2	<ol style="list-style-type: none"> <li>1. Install a scan tool.</li> <li>2. Turn ON the ignition, with the engine OFF.</li> <li>3. From miscellaneous test menu, select the rear defogger from the body control module (BCM) output controls.</li> <li>4. With a scan tool, command the REAR DEFOG relay ON and OFF.</li> </ol> Do you hear a click when you command the REAR DEFOG relay ON and OFF?	Go to <a href="#">Testing for Intermittent Conditions and Poor Connections</a> in Wiring Systems	Go to <b>Step 3</b>
3	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the REAR DEFOG relay.</li> <li>3. Turn ON the ignition, with the engine OFF.</li> <li>4. Connect a test lamp between the supply voltage circuit of the REAR DEFOG relay coil and a good ground.</li> <li>5. With the scan tool, command the REAR DEFOG relay ON and OFF.</li> </ol> Does the test lamp illuminate?	Go to <b>Step 4</b>	Go to <b>Step 5</b>
4	<ol style="list-style-type: none"> <li>1. Connect a test lamp between the supply voltage circuit of the REAR DEFOG relay coil and the ground circuit of the REAR DEFOG relay coil.</li> <li>2. With the scan tool, command the REAR DEFOG relay ON and OFF.</li> </ol> Does the test lamp turn ON and OFF with each command?	Go to <b>Step 7</b>	Go to <b>Step 9</b>
5	Test the supply voltage circuit of the REAR DEFOG relay for a short to ground. Refer to <a href="#">Circuit Testing</a> and <a href="#">Wiring Repairs</a> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 12</b>	Go to <b>Step 6</b>

Step	Action	Yes	No
6	Test the supply voltage circuit of the rear window defogger indicator for a short to ground. Refer to <a href="#">Circuit Testing</a> and <a href="#">Wiring Repairs</a> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 12</b>	Go to <b>Step 8</b>
7	Inspect for poor connections at the REAR DEFOG relay. Refer to <a href="#">Testing for Intermittent Conditions and Poor Connections</a> and <a href="#">Connector Repairs</a> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 12</b>	Go to <b>Step 10</b>
8	Inspect for poor connections at the harness connector of the BCM. Refer to <a href="#">Testing for Intermittent Conditions and Poor Connections</a> and <a href="#">Connector Repairs</a> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 12</b>	Go to <b>Step 11</b>
9	Repair an open or high resistance in the ground circuit of the REAR DEFOG relay. Refer to <a href="#">Wiring Repairs</a> in Wiring Systems. Did you complete the repair?	Go to <b>Step 12</b>	-
10	Replace the REAR DEFOG relay. Did you complete the replacement?	Go to <b>Step 12</b>	-
11	Replace the BCM. Refer to <a href="#">Control Module References</a> in Computer/Integrating Systems for replacement, setup, and programming. Did you complete the replacement?	Go to <b>Step 12</b>	-
12	<ol style="list-style-type: none"> <li>1. Use the scan tool in order to clear the DTCs.</li> <li>2. Operate the vehicle within the Conditions for Setting the DTC as specified in the supporting text.</li> </ol> Does the DTC reset?	Go to <b>Step 2</b>	System OK

## DTC B0285 OR B0287

### DTC Descriptor

DTC B0285: Electric Rear Defrost Circuit Low

DTC B0287: Electric Rear Defrost Circuit Open

### Diagnostic Fault Information

Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.

### DTC B0285 or B0287 Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Relay Switch B+ Circuit	2	2	--	--
Rear Defog Relay Control	B0285	B0287	B0287	--
Relay Controlled Output Circuit	2	2	3	--
Rear Defog Switch Signal	2	2	2	--
Defog Switch Ground	--	1,2	1,2	--
Rear Window Defogger Grid Ground	--	2	2	--
Relay Coil Ground Circuit	--	2	2	--

1. HVAC Defogger Indicator Inoperative
2. Rear Defogger Inoperative
3. Rear Defogger Always ON

### **Circuit/System Description**

The body control module (BCM) monitors the voltage level on the supply voltage circuit of the REAR DEFOG relay. The voltage level should be low while the REAR DEFOG relay is de-energized. The voltage will be near system voltage when the BCM energizes the REAR DEFOG relay.

### **Conditions for Running the DTC**

Battery voltage must be between 9-16 volts.

### **Conditions for Setting the DTC**

#### **DTC B0285**

This DTC will set when the BCM detects a low voltage level in the supply circuit of the REAR DEFOG relay when the relay is energized.

#### **DTC B0287**

This DTC will set when the BCM detects an open/high resistance in the supply circuit of the REAR DEFOG relay when the relay is energized.

### **Action Taken When the DTC Sets**

- The BCM stores the DTC to memory.
- The rear window defogger will not operate.

### **Conditions for Clearing the DTC**

- This DTC will change from current to history when the fault is no longer present.
- A history DTC will clear after 100 consecutive ignition cycles if the condition for the malfunction is no longer present.
- The technician issues a scan tool CLEAR DTCs command.

### **Reference Information**

#### **Schematic Reference**

#### **Defogger Schematics**

#### **Connector End View Reference**

#### **Stationary Windows Connector End Views**

#### **Description and Operation**

#### **Rear Window Defogger Description and Operation**

#### **Electrical Information Reference**

- **CIRCUIT TESTING**
- **CONNECTOR REPAIRS**

- **TESTING FOR INTERMITTENT CONDITIONS AND POOR CONNECTIONS**
- **WIRING REPAIRS**

#### Scan Tool Reference

- **Scan Tool Data List**
- **Scan Tool Data Definitions**
- **Scan Tool Output Controls**

#### Circuit/System Verification

1. Command the rear window defogger ON and OFF with the scan tool. The rear window defogger and defogger indicator should turn ON and OFF when changing between the commanded states.
  - If the rear window defogger does not turn ON and OFF when changing between the commanded states, refer to **Rear Defogger Malfunction**.
  - If the Defogger Indicator does not illuminate or continuously illuminates, refer to **Rear Defog Indicator Malfunction**.

#### Circuit/System Testing

##### Rear Defogger Malfunction

1. Ignition OFF, disconnect the REAR DEFOG relay.
2. Test for less than 1.0 ohm of resistance between the relay coil ground circuit V10 and ground.
3. Connect a test lamp between the rear defogger relay control circuit U12 and the relay coil ground circuit V10.
4. Ignition ON, command the rear defog relay 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 rear defogger relay control circuit U12 for a short to voltage. If the circuit tests normal, replace the BCM.
  - If the test lamp is always OFF, test the rear defogger relay control circuit U12 for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
5. If all circuits test normal, test or replace the REAR DEFOG relay.

##### Rear Defog Indicator Malfunction

1. Ignition OFF, disconnect the harness connector C2 at the HVAC Control Assembly.
2. Ignition OFF, test for less than 1.0 ohm of resistance between the ground circuit terminal K and ground.
  - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Disconnect the REAR DEFOG relay.
4. Connect a test lamp between the control circuit terminal J and ground.
5. Ignition ON, command the Rear Defog Relay 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 BCM.
  - 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 BCM.
6. If all circuits test normal, test or replace the HVAC Control Assembly.

#### Component Testing

##### Relay Test

1. Ignition OFF, disconnect the REAR DEFOG relay.
2. Test for 60-180 ohms of resistance between terminals 85 and 86.
  - If the resistance is not within the specified range, replace the relay.

3. Test for infinite resistance between the following terminals:

- 30 and 86
- 30 and 87
- 30 and 85
- 85 and 87

- If not the specified value, replace the relay.

4. Install a 25-amp fused jumper wire between relay terminal 85 and 12 volts. Install a jumper wire between relay terminal 86 and ground. Test for less than 2 ohms of resistance between terminals 30 and 87.

- If greater than the specified range, replace the relay.

#### Defog Indicator

1. Ignition OFF, disconnect the harness at the HVAC Control Assembly.

2. Install a 5 amp fused jumper wire between circuit terminal G and 12 volts. Install a jumper wire between the ground circuit terminal K and ground. Verify the Defog Indicator illuminates.

- If the Defog Indicator does not illuminate, replace the HVAC Control Assembly.

#### Repair Instructions

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- [RELAY REPLACEMENT \(WITHIN AN ELECTRICAL CENTER\)](#)
- [RELAY REPLACEMENT \(ATTACHED TO WIRE HARNESS\)](#)
- [CONTROL MODULE REFERENCES](#)

#### SYMPTOMS - STATIONARY WINDOWS

For the inside rearview mirror with the automatic day-night feature, review the system operation in order to familiarize yourself with the system functions.

IMPORTANT: Refer to [Automatic Day-Night Mirror Description and Operation](#).

For the rear window defogger system, the following steps must be performed before using the symptom tables.

1. Perform the [Diagnostic System Check - Vehicle](#) in Vehicle DTC Information, 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 rear window defogger system operation in order to familiarize yourself with the system functions. Refer to [Rear Window Defogger Description and Operation](#).

#### Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the rear window defogger or the automatic day-night feature of the inside rearview mirror. Refer to [Checking Aftermarket Accessories](#) in Wiring Systems.
- 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](#) in Wiring Systems.

#### Symptom List

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

- [Defogger Inoperative - Rear Window](#)
- [Defogger Indicator Always On](#)
- [Defogger Grid Lines Diagnosis](#)
- [Mirrors - Automatic Day-Night Inoperative](#)
- [Mirrors - Temperature Displays SC or OC](#)
- [Mirrors - Compass Display Inoperative or Inaccurate](#)

## REAR WINDOW DEFOGGER MALFUNCTION

### Diagnostic Fault Information

Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.

#### Rear Window Defogger Malfunction Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Relay Switch B+ Circuit	2	2	--	--
Rear Defog Relay Control	B0285	B0287	B0287	--
Relay Controlled Output Circuit	2	2	3	--
Rear Defog Switch Signal	2	2	2	--
Defog Switch Ground	--	1,2	1,2	--
Rear Window Defogger Grid Ground	--	2	2	--
Relay Coil Ground Circuit	--	2	2	--
<ol style="list-style-type: none"> <li>1. HVAC Defogger Indicator Inoperative</li> <li>2. Rear Defogger Inoperative</li> <li>3. Rear Defogger Always ON</li> </ol>				

### Circuit/System Description

Battery positive voltage is supplied through the RR DEFOG fuse, in the underhood fuse block, to the REAR DEFOG relay switched input. Ground for the REAR DEFOG relay is provided by G101. The BCM supplies 12 volts on the rear window defogger switch signal circuit to the HVAC control assembly. When you depress the rear window defogger switch, the rear window defogger switch pulls the signal circuit low. The BCM interprets as a request for the rear window defogger system. The BCM enables the rear window defogger system by supplying voltage to the REAR DEFOG relay coil. The relay coil supply voltage is also spliced off internally in the BCM to the supply voltage circuit of the rear window defogger indicator. The REAR DEFOG relay is energized and the rear window defogger indicator is illuminated. With the relay energized, battery positive voltage is allowed from the relay switched input through the switch contacts and out the relay switched output to the rear window defogger grid. Ground for the rear window defogger grid is provided by G403.

When you start the engine and press the rear window defogger switch for the first time, the defogger cycle lasts for 15 minutes. Further operation results in 7.5 minute defogger cycles. The rear defogger feature will not time out if vehicle speed is above 80 km/h (50 mph). The defogger cycle resets to 15 minutes when you cycle the ignition to the OFF position and then to the ON position.

### Reference Information

#### Schematic Reference

#### [Defogger Schematics](#)

## Connector End View Reference

### Stationary Windows Connector End Views

#### Description and Operation

### Rear Window Defogger Description and Operation

#### Electrical Information Reference

- [CIRCUIT TESTING](#)
- [CONNECTOR REPAIRS](#)
- [TESTING FOR INTERMITTENT CONDITIONS AND POOR CONNECTIONS](#)
- [WIRING REPAIRS](#)

#### Scan Tool Reference

- [Scan Tool Data List](#)
- [Scan Tool Data Definitions](#)
- [Scan Tool Output Controls](#)

#### Circuit/System Verification

1. Ignition ON, observe the scan tool Rear Defog Switch parameter while pressing the Rear Defogger Switch. The reading should change between ON and OFF.
  - If the reading does not change between the commanded states, refer to [HVAC Rear Defog Switch Malfunction](#).
2. Command the rear window defogger ON and OFF with the scan tool. The rear window defogger and defogger indicator should turn ON and OFF when changing between the commanded states.
  - If the rear window defogger does not turn ON and OFF when changing between the commanded states, refer to [Rear Defogger Malfunction](#).
  - If the Defogger Indicator does not illuminate or continuously illuminates, refer to [Rear Defog Indicator Malfunction](#).

#### Circuit/System Testing

##### HVAC Rear Defog Switch Malfunction

1. Ignition OFF, disconnect the harness connector C2 at the HVAC Control Assembly.
2. Test for less than 1.0 ohm of resistance between the ground circuit terminal K and ground.
  - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Manual HVAC Rear Defog SW parameter is OFF.
  - If not the specified value, test the signal circuit terminal J for a short to ground. If the circuit tests normal, replace the BCM
4. Install a 3-A fused jumper wire between the signal circuit terminal J and ground. Verify the scan tool Manual HVAC Rear Defog Sw parameter is ON.
  - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
5. If all circuits test normal, test or replace the HVAC Control Assembly

##### Rear Defog Indicator Malfunction

1. Ignition OFF, disconnect the harness connector C2 at the HVAC Control Assembly.
2. Disconnect the REAR DEFOG relay.
3. Connect a test lamp between the control circuit terminal G and ground.
4. Ignition ON, command the Rear Defog Relay 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 BCM.
  - 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 BCM.
5. If all circuits test normal, test or replace the HVAC Control Assembly

### Rear Defogger Malfunction

1. Ignition OFF, disconnect the REAR DEFOG relay.
2. Test for less than 1.0 ohm of resistance between the relay coil ground circuit V10 and ground.
  - If greater than the specified range, test the relay coil ground circuit for an open/high resistance.
3. Ignition ON, verify that a test lamp does not illuminate between the relay controlled output circuit U10 and ground.
  - If the test lamp illuminates, test the relay controlled output circuit for a short to voltage.
4. Verify that a test lamp illuminates between the relay switch B+ circuit V12 and ground.
  - If the test lamp does not illuminate, test the relay switch B+ circuit V12 for a short to ground or an open/high resistance. If the circuit tests normal and the RR DEFOG fuse is open, test the relay controlled output circuit U10 for a short to ground.
5. Ignition OFF, disconnect the harness connector at the Rear Window Defogger Grid.
6. Test for less than 1.0 ohm of resistance between the Rear Window Defogger Grid ground circuit terminal A and ground
  - If greater than the specified range, test the ground circuit for an open/high resistance.
7. Connect the harness connector at the Rear Window Defogger Grid.
8. Ignition ON, connect a 30 amp fused jumper wire between the relay switch B+ circuit V12 and the relay controlled output circuit U10. Verify the Rear Window Defogger Grid is activated.
  - If the Rear Window Defogger Grid does not activate, test the relay controlled output circuit U10 for an open/high resistance. If the circuit tests normal, test or repair the Rear Window Defogger Grid.
9. Connect a test lamp between the rear defogger control circuit U12 and the relay coil ground circuit V10.
10. Command the REAR DEFOG relay 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 rear defogger control circuit U12 for a short to voltage. If the circuit tests normal, replace the BCM.
  - If the test lamp is always OFF, test the rear defogger control circuit U12 for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
11. If all circuits test normal, test or replace the REAR DEFOG relay.

### Component Testing

#### Rear Defog Switch

1. Ignition OFF, disconnect the harness connector C2 at the HVAC control assembly
2. Test for infinite resistance between the signal terminal J and the ground circuit terminal K with the switch in the open position.
  - If not the specified value, replace the HVAC control assembly.
3. Test for less the 2.0 ohms between the signal terminal J and the ground circuit terminal K with the switch in the closed position.
  - If greater than the specified range, replace the HVAC control assembly

#### Defog Indicator

1. Ignition OFF, disconnect the harness C2 at the HVAC Control Assembly.
2. Install a 5 amp fused jumper wire between circuit terminal G and 12 volts. Install a jumper wire between the ground circuit terminal K and ground. Verify the Defog Indicator illuminates.
  - If the Defog Indicator does not illuminate, replace the HVAC Control Assembly.

## Relay Test

1. Ignition OFF, disconnect the REAR DEFOG relay.
2. Test for 60-180 ohms of resistance between terminals 85 and 86.
  - If the resistance is not within the specified range, replace the relay.
3. Test for infinite resistance between the following terminals:
  - 30 and 86
  - 30 and 87
  - 30 and 85
  - 85 and 87
  - If not the specified value, replace the relay.
4. Install a 25-amp fused jumper wire between relay terminal 85 and 12 volts. Install a jumper wire between relay terminal 86 and ground. Test for less than 2 ohms of resistance between terminals 30 and 87.
  - If greater than the specified range, replace the relay.

## Repair Instructions

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- [HVAC Control Assembly Replacement](#)
- [Control Module References](#) for BCM replacement, setup and programming.
- [RELAY REPLACEMENT \(WITHIN AN ELECTRICAL CENTER\)](#)
- [RELAY REPLACEMENT \(ATTACHED TO WIRE HARNESS\)](#)

## DEFOGGER INOPERATIVE - REAR WINDOW

### Test Description

The number below refers to the step number on the diagnostic table.

**8:** Listen for an audible click when the relay operates. Command both the ON and OFF states of the REAR DEFOG relay. Repeat the commands as necessary.

### Defogger Inoperative - Rear Window

Step	Action	Yes	No
Schematic Reference: <a href="#">Defogger Schematics</a> Connector End View Reference: <a href="#">Stationary Windows Connector End Views</a>			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to <b>Step 2</b>	Go to <a href="#">Diagnostic System Check - Vehicle</a> in Vehicle DTC Information
2	1. Start the engine. 2. Depress the rear window defogger switch. 3. Observe the rear window defogger indicator on the HVAC control assembly.  Does the rear window defogger indicator illuminate?	Go to <b>Step 3</b>	Go to <b>Step 5</b>
3	Connect a test lamp between the rear window defogger grid and a good ground. Does the test lamp illuminate?	Go to <b>Step 4</b>	Go to <b>Step 8</b>

Step	Action	Yes	No
4	Connect a test lamp between the left side of the rear window defogger grid and the right side of the rear window defogger grid. Does the test lamp illuminate?	Go to <a href="#">Testing for Intermittent Conditions and Poor Connections</a> in Wiring Systems	Go to <b>Step 20</b>
5	<ol style="list-style-type: none"> <li>1. Install a scan tool.</li> <li>2. With the scan tool, observe the Rear Defog Switch Input parameter in the body control module (BCM) HVAC data list.</li> <li>3. Depress the rear window defogger switch.</li> </ol> Does the scan tool display On?	Go to <b>Step 7</b>	Go to <b>Step 6</b>
6	<ol style="list-style-type: none"> <li>1. Turn the ignition OFF.</li> <li>2. Disconnect harness connector C4 of the BCM.</li> <li>3. Turn the ignition ON, with the engine OFF.</li> <li>4. Connect a test lamp between battery voltage and the rear defogger switch signal circuit of the HVAC control assembly.</li> <li>5. Depress the rear window defogger switch.</li> </ol> Does the test lamp illuminate?	Go to <b>Step 19</b>	Go to <b>Step 15</b>
7	<ol style="list-style-type: none"> <li>1. Turn the ignition OFF.</li> <li>2. Disconnect harness connector C4 of the BCM.</li> <li>3. Turn the ignition ON, with the engine OFF.</li> <li>4. Connect a 3-ampere fused jumper between battery voltage and the supply voltage circuit of the rear window defogger indicator for the HVAC control assembly.</li> </ol> Does the indicator illuminate?	Go to <b>Step 19</b>	Go to <b>Step 16</b>
8	<ol style="list-style-type: none"> <li>1. Install a scan tool.</li> <li>2. From the miscellaneous test menu, select the rear defogger under from the BCM output controls.</li> <li>3. Command the REAR DEFOG relay ON and OFF.</li> </ol> Do you hear a click when you command the REAR DEFOG relay ON and OFF?	Go to <b>Step 11</b>	Go to <b>Step 9</b>
9	<ol style="list-style-type: none"> <li>1. Turn the ignition OFF.</li> <li>2. Disconnect the REAR DEFOG relay.</li> <li>3. Turn the ignition ON, with the engine OFF.</li> <li>4. Connect a test lamp between the supply voltage circuit and the ground circuit of the REAR DEFOG relay coil.</li> <li>5. From the miscellaneous test menu, select the rear defogger under from the BCM output controls.</li> <li>6. With the scan tool, command the REAR DEFOG relay ON.</li> </ol> Does the test lamp illuminate?	Go to <b>Step 17</b>	Go to <b>Step 10</b>
10	<ol style="list-style-type: none"> <li>1. Install a scan tool.</li> <li>2. Connect a test lamp between the supply voltage circuit of the REAR</li> </ol>	Go to <b>Step 21</b>	Go to <b>Step 13</b>

Step	Action	Yes	No
11	<p>DEFOG relay coil and a good ground.</p> <p>3. With the scan tool, command the REAR DEFOG relay ON.</p> <p>Does the test lamp illuminate?</p> <p>1. Turn the ignition OFF.</p> <p>2. Disconnect the REAR DEFOG relay.</p> <p>3. Turn the ignition ON, with the engine OFF.</p> <p>4. Connect a test lamp between the switched battery voltage circuit input of the REAR DEFOG relay and a good ground.</p> <p>Does the test lamp illuminate?</p>	Go to <b>Step 12</b>	Go to <b>Step 14</b>
12	<p>1. Connect a test lamp between the rear window defogger grid and a good ground.</p> <p>2. Connect a 30-ampere fused jumper between the switched battery voltage circuit input of the REAR DEFOG relay and the switched relay output to the supply voltage circuit of the rear defogger.</p> <p>Does the test lamp illuminate?</p>	Go to <b>Step 17</b>	Go to <b>Step 23</b>
13	<p>Test the supply voltage circuit of the REAR DEFOG relay coil for an open or short to ground. Refer to <a href="#">Circuit Testing</a> and <a href="#">Wiring Repairs</a> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	Go to <b>Step 27</b>	Go to <b>Step 19</b>
14	<p>Test the switched battery voltage circuit input of the REAR DEFOG relay for an open or high resistance. Refer to <a href="#">Circuit Testing</a> and <a href="#">Wiring Repairs</a> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	Go to <b>Step 27</b>	Go to <b>Step 22</b>
15	<p>Test the rear defogger switch signal circuit of the HVAC control assembly for an open or short to voltage. Refer to <a href="#">Circuit Testing</a> and <a href="#">Wiring Repairs</a> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	Go to <b>Step 27</b>	Go to <b>Step 18</b>
16	<p>Test the supply voltage circuit of the rear window defogger indicator for the HVAC control assembly for an open or short to ground. Refer to <a href="#">Circuit Testing</a> and <a href="#">Wiring Repairs</a> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	Go to <b>Step 27</b>	Go to <b>Step 18</b>
17	<p>Inspect for poor connections at the REAR DEFOG relay. Refer to <a href="#">Testing for Intermittent Conditions and Poor Connections</a> and <a href="#">Connector Repairs</a> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	Go to <b>Step 27</b>	Go to <b>Step 24</b>
18	<p>Inspect for poor connections at the harness connector of the HVAC control assembly. Refer to <a href="#">Testing for Intermittent Conditions and Poor Connections</a> and <a href="#">Connector Repairs</a> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	Go to <b>Step 27</b>	Go to <b>Step 25</b>
19	<p>Inspect for poor connections at the harness connector of the BCM. Refer to <a href="#">Testing for Intermittent Conditions and Poor Connections</a> and <a href="#">Connector Repairs</a> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	Go to <b>Step 27</b>	Go to <b>Step 26</b>

Step	Action	Yes	No
20	Repair an open or high resistance in the ground circuit of the rear window defogger. Refer to <a href="#">Wiring Repairs</a> in Wiring Systems. Did you complete the repair?	Go to <b>Step 27</b>	-
21	Repair an open or high resistance in the ground circuit of the REAR DEFOG relay coil. Refer to <a href="#">Wiring Repairs</a> in Wiring Systems. Did you complete the repair?	Go to <b>Step 27</b>	-
22	Repair a short to ground in the supply voltage circuit of the rear window defogger. Refer to <a href="#">Wiring Repairs</a> in Wiring Systems. Did you complete the repair?	Go to <b>Step 27</b>	-
23	Repair an open or high resistance in the supply circuit of the rear window defogger. Refer to <a href="#">Wiring Repairs</a> in Wiring Systems. Did you complete the repair?	Go to <b>Step 27</b>	-
24	Replace the REAR DEFOG relay. Did you complete the replacement?	Go to <b>Step 27</b>	-
25	Replace the HVAC control assembly. Refer to <a href="#">HVAC Control Assembly Replacement</a> in HVAC Systems - Manual. Did you complete the replacement?	Go to <b>Step 27</b>	-
26	Replace the BCM. Refer to <a href="#">Control Module References</a> in Computer/Integrating Systems for replacement, setup, and programming. Did you complete the replacement?	Go to <b>Step 27</b>	-
27	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to <b>Step 2</b>

## DEFOGGER INDICATOR ALWAYS ON

### Test Description

The number below refers to the step number on the diagnostic table.

**3:** Command both the ON and OFF states of the rear window defogger switch. Repeat the command as necessary to verify the Rear Defog Switch Input data parameter does or doesn't change states.

### Defogger Indicator Always On

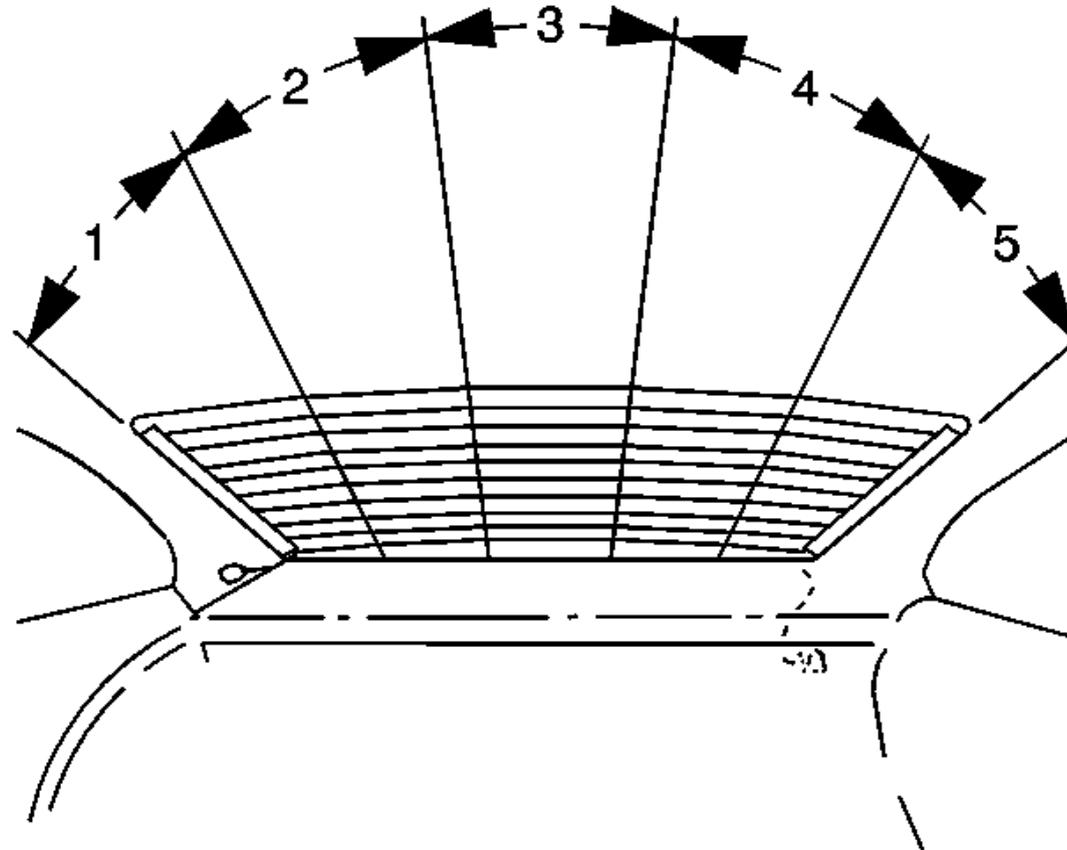
Step	Action	Yes	No
<b>Schematic Reference:</b> <a href="#">Defogger Schematics</a> <b>Connector End View Reference:</b> <a href="#">Stationary Windows Connector End Views</a>			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to <b>Step 2</b>	Go to <a href="#">Diagnostic System Check - Vehicle</a> in Vehicle DTC Information
2	<ol style="list-style-type: none"> <li>Turn ON the ignition, with the engine OFF.</li> <li>Observe the rear window defogger indicator on the HVAC control assembly.</li> <li>Command the rear window defogger indicator ON and OFF, by depressing the rear window defogger switch.</li> </ol> Does the rear window defogger indicator turn ON and OFF with each command?	Go to <a href="#">Testing for Intermittent Conditions and Poor Connections</a> in Wiring Systems	Go to <b>Step 3</b>

Step	Action	Yes	No
3	<ol style="list-style-type: none"> <li>1. Install a scan tool.</li> <li>2. With the scan tool, observe the Rear Defog Switch Input Data parameter in the body control module (BCM) HVAC data list.</li> <li>3. Depress the rear window defogger switch.</li> </ol> <p>Does the Rear Defog Switch Input Data parameter always display On?</p>	Go to <b>Step 4</b>	Go to <b>Step 5</b>
4	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect harness connector C4 of the BCM.</li> <li>3. Turn ON the ignition, with the engine OFF.</li> <li>4. Connect a test lamp from the rear window defogger switch signal circuit to battery voltage.</li> </ol> <p>Does the test lamp illuminate?</p>	Go to <b>Step 6</b>	Go to <b>Step 7</b>
5	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect harness connector C3 of the BCM.</li> <li>3. Turn ON the ignition, with the engine OFF.</li> <li>4. Connect a test lamp from the supply voltage circuit of the REAR DEFOG relay coil to a good ground.</li> </ol> <p>Does the test lamp illuminate?</p>	Go to <b>Step 9</b>	Go to <b>Step 10</b>
6	<p>Test the rear defogger switch signal circuit of the HVAC control assembly for short to ground. Refer to <a href="#">Circuit Testing</a> and <a href="#">Wiring Repairs</a> in Wiring Systems. Did you find and correct the condition?</p>	Go to <b>Step 13</b>	Go to <b>Step 8</b>
7	<p>Inspect for poor connections at the harness connector of the BCM. Refer to <a href="#">Testing for Intermittent Conditions and Poor Connections</a> and <a href="#">Connector Repairs</a> in Wiring Systems. Did you find and correct the condition?</p>	Go to <b>Step 13</b>	Go to <b>Step 11</b>
8	<p>Inspect for poor connections at the harness connector of the HVAC control assembly. Refer to <a href="#">Testing for Intermittent Conditions and Poor Connections</a> and <a href="#">Connector Repairs</a> in Wiring Systems. Did you find and correct the condition?</p>	Go to <b>Step 13</b>	Go to <b>Step 12</b>
9	<p>Repair a short to voltage in the supply voltage circuit of the REAR DEFOG relay coil. Refer to <a href="#">Wiring Repairs</a> in Wiring Systems. Did you complete the repair?</p>	Go to <b>Step 13</b>	-
10	<p>Repair a short to voltage in the supply voltage circuit of the rear window defogger indicator. Refer to <a href="#">Wiring Repairs</a> in Wiring Systems. Did you complete the repair?</p>	Go to <b>Step 13</b>	-
11	<p>Replace the BCM. Refer to <a href="#">Control Module References</a> in Computer/Integrating Systems for replacement, setup, and programming. Did you complete the replacement?</p>	Go to <b>Step 13</b>	-
12	<p>Replace the HVAC control assembly. Refer to <a href="#">HVAC Control Assembly Replacement</a> in HVAC Systems - Manual. Did you complete the replacement?</p>	Go to <b>Step 13</b>	-
13	<p>Operate the system in order to verify the repair. Did you correct the condition?</p>	System OK	Go to <b>Step 2</b>

## DEFOGGER GRID LINES DIAGNOSIS

IMPORTANT: This test is for reference only. A grid line fault requires rear window replacement. Refer to [Rear Window Replacement](#).

1. Start the engine.
2. Activate the rear window defogger system.
3. Connect a test lamp to a good ground.

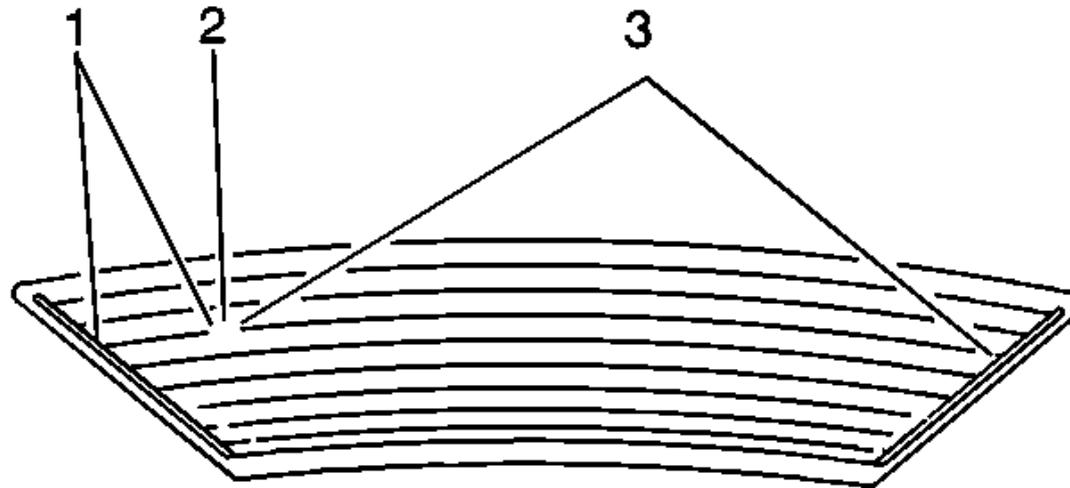


**Fig. 8: Identifying Defogger Grid Line Zones**

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The test lamp brilliance will decrease proportionately to the increased resistance in the grid line as the probe is moved from the battery positive bus wire to the ground bus wire. The test lamp brilliance may vary from one window to another.

4. Move the test lamp probe from zone 5 to zone 1 along each grid line.
  - If the test lamp shows full brilliance at both ends of the grid lines. Inspect for an open or poor connection in the ground circuit of the rear window defogger grid. Refer to [Testing for Intermittent Conditions and Poor Connections](#) and [Connector Repairs](#) in Wiring Systems.



**Fig. 9: Identifying Grid Line Test Locations**  
 Courtesy of GENERAL MOTORS CORP.

- If the test lamp goes out, test the grid line in at least 2 places (1,3) to eliminate the possibility of bridging the open (2) in the grid line.
5. Once the open (2) is located, replace the rear window. Refer to [Rear Window Replacement](#).

**MIRRORS - AUTOMATIC DAY-NIGHT INOPERATIVE**

**Diagnostic Aids**

The automatic day-night feature of the inside rearview mirror may not operate properly or become inoperative due to an intermittent short to battery positive voltage in the backup lighting system.

**Mirrors - Automatic Day-Night Inoperative**

Step	Action	Values	Yes	No
Schematic Reference: <a href="#">Inside Rearview Mirror Schematics</a> Connector End View Reference: <a href="#">Stationary Windows Connector End Views</a>				
1	Did you review the operation of the automatic day-night feature of the inside rearview mirror and perform the necessary inspections?	-	Go to <b>Step 2</b>	Go to <a href="#">Symptoms - Stationary Windows</a>
2	1. Turn the ignition ON, with the engine OFF. 2. Turn ON the automatic day-night feature of the inside rearview mirror. 3. Cover the sensor on the inside rearview mirror back, facing the front window. 4. Shine a bright light into the sensor on the inside rearview mirror face, facing the rear window.	-		
	Does the inside rearview mirror darken?		Go to Diagnostic Aids	Go to <b>Step 3</b>

Step	Action	Values	Yes	No
3	<ol style="list-style-type: none"> <li>1. Turn the ignition OFF.</li> <li>2. Disconnect the harness connector of the inside rearview mirror.</li> <li>3. Measure the resistance between the ground circuit of the inside rearview mirror and a good ground.</li> </ol> <p>Is the resistance less than the specified value?</p>	3 Ω	Go to <b>Step 4</b>	Go to <b>Step 9</b>
4	<ol style="list-style-type: none"> <li>1. Turn the ignition ON, with the engine OFF.</li> <li>2. Measure the voltage between the accessory voltage circuit of the inside rearview mirror and the ground circuit of the inside rearview mirror.</li> </ol> <p>Is the voltage within the specified range?</p>	B+	Go to <b>Step 5</b>	Go to <b>Step 10</b>
5	<ol style="list-style-type: none"> <li>1. Place the transmission in PARK.</li> <li>2. Measure the voltage between the backup lamp supply voltage circuit of the inside rearview mirror and the ground circuit of the inside rearview mirror.</li> </ol> <p>Is the voltage less than the specified value?</p>	0.5 V	Go to <b>Step 6</b>	Go to <b>Backup Lamps Always On</b> in Lighting Systems
6	<ol style="list-style-type: none"> <li>1. Place the transmission in REVERSE.</li> <li>2. Measure the voltage between the backup lamp supply voltage circuit of the inside rearview mirror and the ground circuit of the inside rearview mirror.</li> </ol> <p>Is the voltage within the specified range?</p>	B+	Go to <b>Step 8</b>	Go to <b>Step 7</b>
7	<p>Test the backup lamp supply voltage circuit of the inside rearview mirror for an open or high resistance. Refer to <b>Circuit Testing</b> and <b>Wiring Repairs</b> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	-	Go to <b>Step 12</b>	Go to <b>Backup Lamps Inoperative</b> in Lighting Systems
8	<p>Inspect for poor connections at the harness connector of the inside rearview mirror. Refer to <b>Testing for Intermittent Conditions and Poor Connections</b> and <b>Connector Repairs</b> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	-	Go to <b>Step 12</b>	Go to <b>Step 11</b>
9	<p>Repair an open or high resistance in the ground circuit of the inside rearview mirror. Refer to <b>Wiring Repairs</b> in Wiring Systems.</p> <p>Did you complete the repair?</p>	-	Go to <b>Step 12</b>	-
10	<p>Repair an open or short to ground in the accessory voltage circuit of the inside rearview mirror. Refer to <b>Wiring Repairs</b> in Wiring Systems.</p> <p>Did you complete the repair?</p>	-	Go to <b>Step 12</b>	-
11	<p>IMPORTANT:</p> <p>Perform the <b>Compass Calibration and Variance Procedure</b> for the inside rearview mirror with compass.</p> <p>Replace the inside rearview mirror. Refer to <b>Rearview Mirror Replacement</b>. Did you complete the replacement?</p>	-	Go to <b>Step 12</b>	-

Step	Action	Values	Yes	No
12	Operate the system in order to verify the repair. Did you correct the condition?	-	System OK	Go to <b>Step 2</b>

## MIRRORS - TEMPERATURE DISPLAYS SC OR OC

The following table will be used to measure the resistance of the sensor and compare it with the actual ambient temperature. The mirror's temperature accuracy should be within 5 degrees of the actual temperature. The actual temperature should not be taken from a radio station, a sign displaying the temperature, etc. A temperature measuring tool such as a thermometer should be used. Some temperature measuring tools may be within 5 degrees of the actual temperature. Make sure to consult the manufacturer for the accuracy of the tool. This comparison can make the mirror seem off by 5-10 degrees of the actual temperature when it is not.

### Ambient Air Temperature Sensor Resistance

°C	°F	Minimum Resistance K Ohms	Maximum Resistance K Ohms
-35	-31	234.81	250.59
-30	-22	171.69	182.31
-25	-13	126.82	133.99
-20	-4	94.63	99.49
-15	5	71.30	74.58
-10	14	54.21	56.43
-5	23	41.48	43.17
0	32	32.00	33.31
5	41	24.96	25.83
10	50	19.61	20.19
15	59	15.49	15.94
20	68	12.31	12.67
25	77	9.85	10.12
30	86	7.96	8.15
35	95	6.45	6.61
40	104	5.27	5.39
45	113	4.32	4.42
50	122	3.56	3.64
55	131	2.95	3.02
60	140	2.46	2.52

### Mirrors - Temperature Displays SC or OC

Step	Action	Yes	No
<b>Schematic Reference:</b> <a href="#">Inside Rearview Mirror Schematics</a>			
<b>Connector End View Reference:</b> <a href="#">Stationary Windows Connector End Views</a>			
1	Did you review the temperature display operation of the inside rearview mirror and perform the necessary inspections?	Go to <b>Step 2</b>	Go to <a href="#">Symptoms - Stationary Windows</a>
2	1. Turn ON the ignition, with the engine OFF. 2. Turn ON the temperature display on the inside rearview mirror.  Does the temperature display show a temperature reading?	Go to <b>Step 3</b>	Go to <b>Step 5</b>

Step	Action	Yes	No
3	Does the temperature display show an accurate temperature reading?	Go to <a href="#">Testing for Intermittent Conditions and Poor Connections</a> in Wiring Systems	Go to <b>Step 4</b>
4	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the ambient air temperature sensor.</li> <li>3. Measure the resistance of the ambient air temperature from the sensor signal circuit to the low reference circuit of the sensor.</li> <li>4. Compare the ambient air temperature sensor resistance reading with the chart above.</li> </ol> <p>Is the ambient air temperature sensor resistance within the range specified in the chart above?</p>	Go to <b>Step 12</b>	Go to <b>Step 13</b>
5	Does the temperature display show SC?	Go to <b>Step 6</b>	Go to <b>Step 7</b>
6	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the ambient air temperature sensor.</li> <li>3. Turn ON the ignition, with the engine OFF.</li> </ol> <p>Does the temperature display show SC?</p>	Go to <b>Step 9</b>	Go to <b>Step 13</b>
7	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the ambient air temperature sensor.</li> <li>3. Connect a 3-ampere fused jumper between the signal circuit of the ambient air temperature sensor and a good ground.</li> <li>4. Turn ON the ignition, with the engine OFF.</li> </ol> <p>Does the temperature display show SC?</p>	Go to <b>Step 8</b>	Go to <b>Step 10</b>
8	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Connect a 3-ampere fused jumper between the signal circuit and the low reference circuit of the ambient air temperature sensor.</li> <li>3. Turn ON the ignition, with the engine OFF.</li> </ol> <p>Does the mirror temperature display show SC?</p>	Go to <b>Step 13</b>	Go to <b>Step 11</b>
9	Test the signal circuit of the ambient air temperature sensor for a short to ground. Refer to <a href="#">Circuit Testing</a> and to <a href="#">Wiring Repairs</a> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 17</b>	Go to <b>Step 14</b>
10	Test the signal circuit of the ambient air temperature sensor for an open or for a short to battery positive voltage. Refer to <a href="#">Circuit Testing</a> and to <a href="#">Wiring Repairs</a> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 17</b>	Go to <b>Step 14</b>
11	Test the low reference circuit of the ambient air temperature sensor for an open or for a high resistance. Refer to <a href="#">Circuit Testing</a> and to <a href="#">Wiring Repairs</a> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 17</b>	Go to <b>Step 14</b>
12	Test the signal and low reference circuits of the ambient air temperature sensor for high resistance. Refer to <a href="#">Circuit Testing</a> and to <a href="#">Wiring Repairs</a> in Wiring Systems.	Go to <b>Step 17</b>	Go to <b>Step 14</b>

Step	Action	Yes	No
13	Did you find and correct the condition?	Go to <b>Step 17</b>	Go to <b>Step 15</b>
	Inspect for a poor connection at the harness connector of the ambient air temperature sensor. Refer to <a href="#">Testing for Intermittent Conditions and Poor Connections</a> and to <a href="#">Connector Repairs</a> in Wiring Systems. Did you find and correct the condition?		
14	Inspect for a poor connection at the harness connector of the inside rearview mirror. Refer to <a href="#">Testing for Intermittent Conditions and Poor Connections</a> and to <a href="#">Connector Repairs</a> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 17</b>	Go to <b>Step 16</b>
15	Replace the ambient air temperature sensor. Refer to <a href="#">Ambient Air Temperature Sensor Replacement (Sedan)</a> or <a href="#">Ambient Air Temperature Sensor Replacement (Coupe)</a> . Did you complete the replacement?	Go to <b>Step 17</b>	-
16	IMPORTANT: Perform <a href="#">Compass Calibration and Variance Procedure</a> for the inside rearview mirror with compass.  Replace the inside rearview mirror. Refer to <a href="#">Rearview Mirror Replacement</a> . Did you complete the replacement?	Go to <b>Step 17</b>	-
17	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to <b>Step 3</b>

## MIRRORS - COMPASS DISPLAY INOPERATIVE OR INACCURATE

### Mirrors - Compass Display Inoperative or Inaccurate

Step	Action	Yes	No
Schematic Reference: <a href="#">Inside Rearview Mirror Schematics</a> Connector End View Reference: <a href="#">Stationary Windows Connector End Views</a>			
1	Did you review the compass operation of the inside rearview mirror and perform the necessary inspections?	Go to <b>Step 2</b>	Go to <a href="#">Symptoms - Stationary Windows</a>
2	Does the automatic day-night feature of the inside rearview mirror operate correctly?	Go to <b>Step 3</b>	Go to <a href="#">Mirrors - Automatic Day-Night Inoperative</a>
3	1. Turn ON the ignition, with the engine OFF. 2. Turn ON the compass. 3. Verify that the compass has one of the following conditions: <ul style="list-style-type: none"> <li>• An incorrect reading on the display.</li> <li>• The letter "C" or "CAL" is displayed.</li> <li>• The compass display is blank.</li> </ul>	Go to <b>Step 4</b>	Go to <a href="#">Testing for Intermittent Conditions and Poor Connections</a> in Wiring Systems
	Does the compass have one of the conditions mentioned above?		
4	Is the compass display totally blank?	Go to <b>Step 8</b>	Go to <b>Step 5</b>
5	Is the letter "C" or "CAL" displayed on the mirror?	Go to <b>Step 6</b>	Go to <b>Step 7</b>
6	Perform the compass calibration procedure. Refer to <a href="#">Compass Calibration and Variance Procedure</a> . Is the compass accurate and operating properly?	Go to <b>Step 10</b>	Go to <b>Step 7</b>

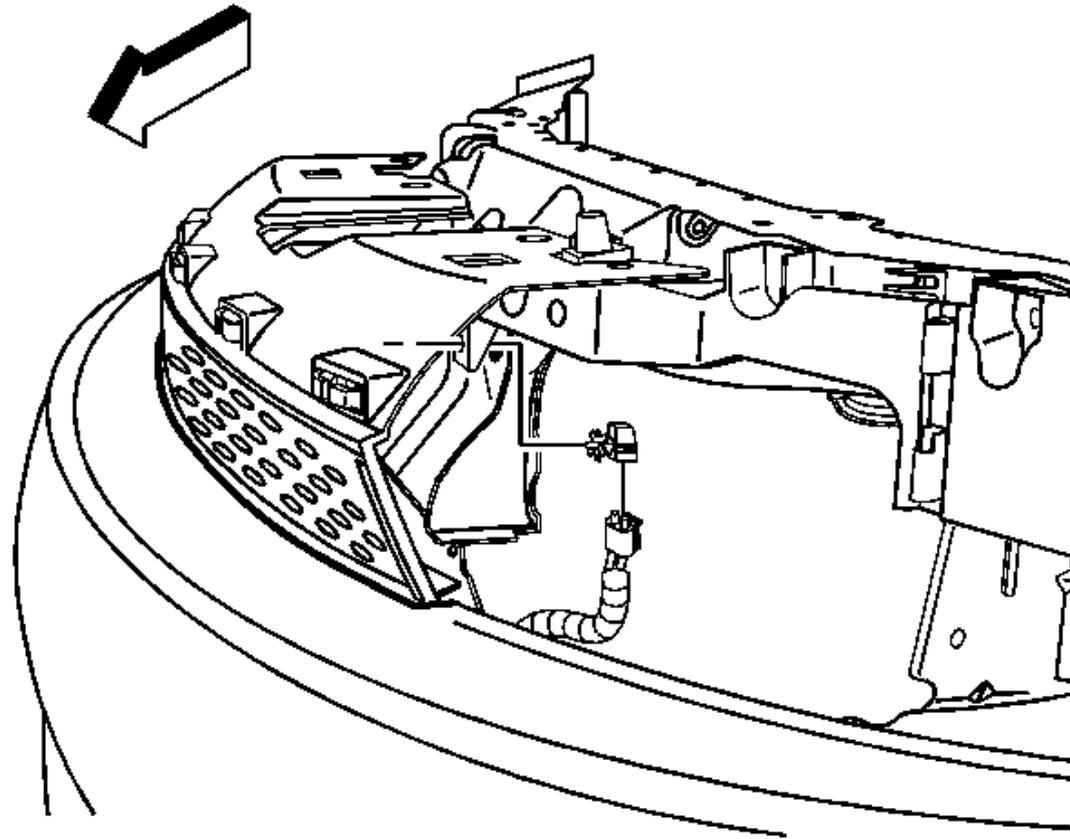
Step	Action	Yes	No
7	Perform the compass magnetic variation adjustment procedure. Refer to <a href="#">Compass Calibration and Variance Procedure</a> . Is the compass accurate and operating properly?	Go to <b>Step 10</b>	Go to <b>Step 8</b>
8	Inspect for a poor connection at the harness connector of the inside rearview mirror. Refer to <a href="#">Testing for Intermittent Conditions and Poor Connections</a> and to <a href="#">Connector Repairs</a> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 10</b>	Go to <b>Step 9</b>
9	IMPORTANT: Perform <a href="#">Compass Calibration and Variance Procedure</a> for the inside rearview mirror with compass.  Replace the inside rearview mirror. Refer to <a href="#">Rearview Mirror Replacement</a> . Did you complete the replacement?	Go to <b>Step 10</b>	-
10	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to <b>Step 3</b>

## REPAIR INSTRUCTIONS

### AMBIENT AIR TEMPERATURE SENSOR REPLACEMENT (SEDAN)

#### Removal Procedure

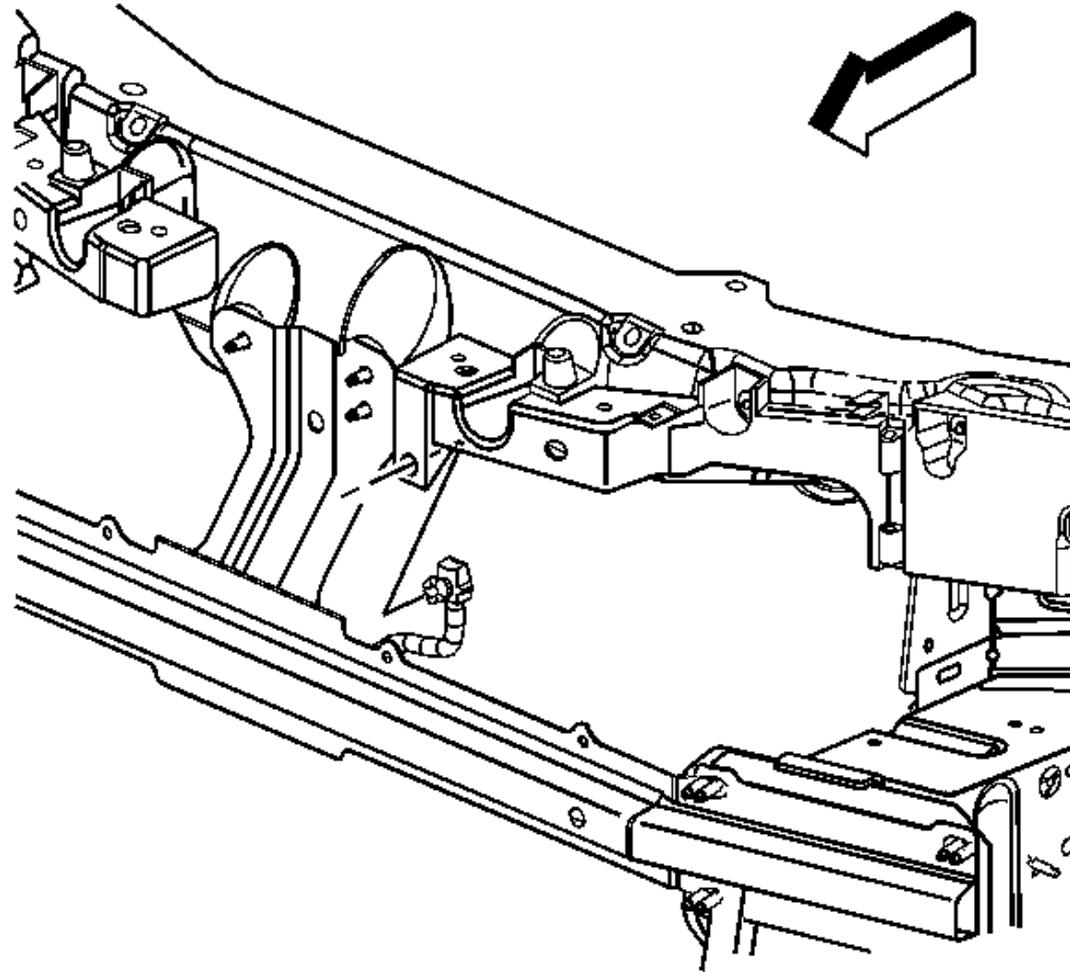
1. Open the hood.
2. Remove the left headlamp. Refer to [Headlamp Assembly or Headlamp Bulb and/or Cornering, Sidemarkers, Park, Turn Signal Bulb Replacement](#) in Lighting Systems.



**Fig. 10: View Of Ambient Air Temperature Sensor Electrical Connector (Sedan)**  
Courtesy of GENERAL MOTORS CORP.

3. Reach behind the grille. Release the ambient air temperature sensor from the headlamp bracket.
4. Disconnect the electrical connector from the ambient air temperature sensor.
5. Remove the sensor from the vehicle.

#### **Installation Procedure**



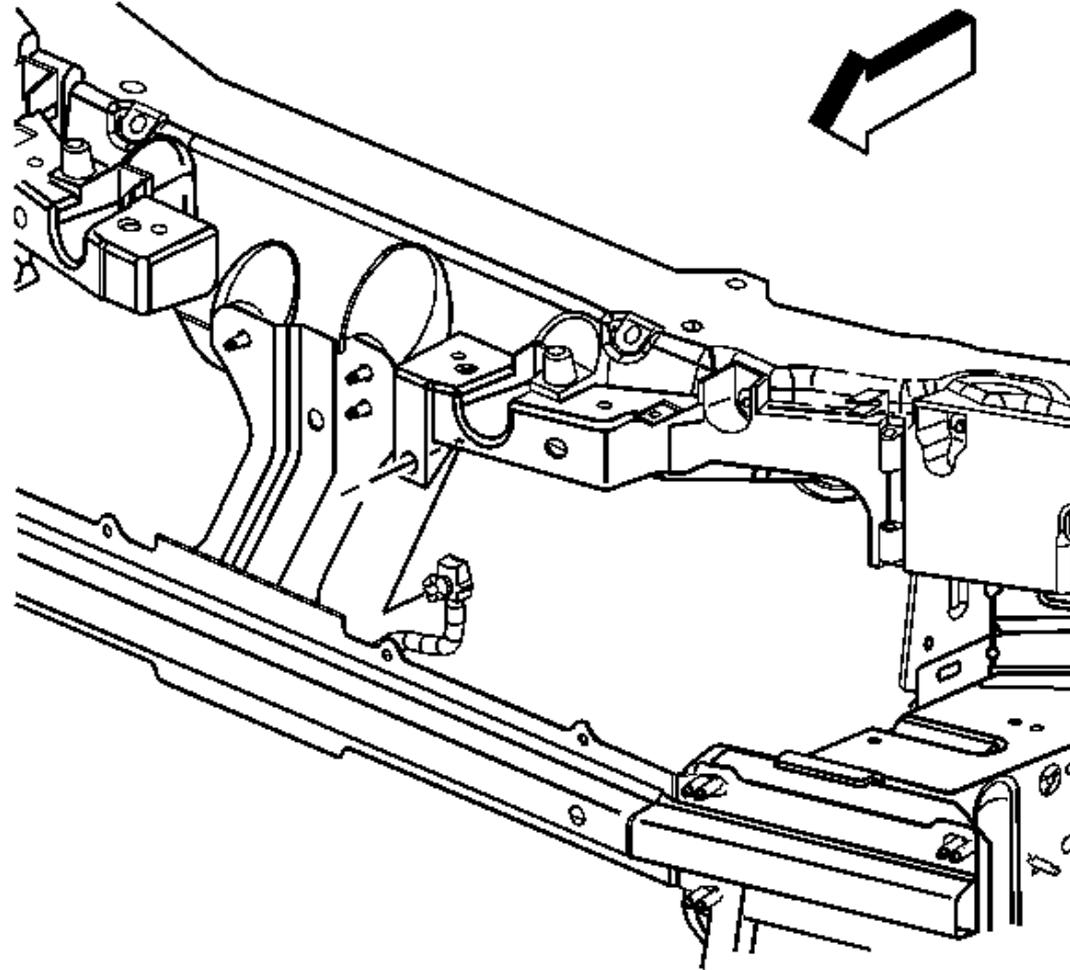
**Fig. 11: View Of Ambient Air Temperature Sensor**  
Courtesy of GENERAL MOTORS CORP.

1. Connect the electrical connector to the ambient air temperature sensor.
2. Push the ambient air temperature sensor through the hole in the headlamp bracket until the sensor is seated.
3. Install the left headlamp. Refer to [Headlamp Assembly or Headlamp Bulb and/or Cornering, Sidemarkers, Park, Turn Signal Bulb Replacement](#) in Lighting Systems.
4. Close the hood.

### **AMBIENT AIR TEMPERATURE SENSOR REPLACEMENT (COUPE)**

#### **Removal Procedure**

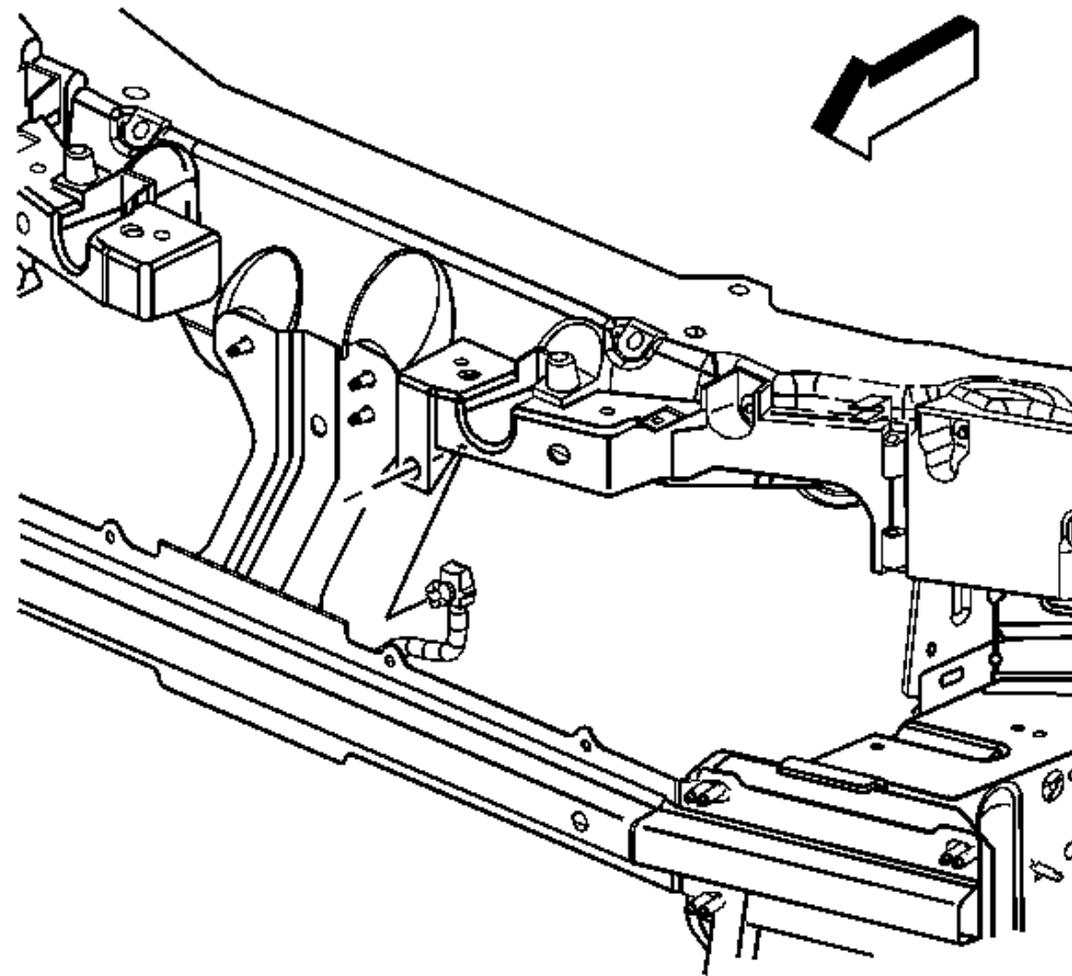
1. Open the hood.



**Fig. 12: View Of Ambient Air Temperature Sensor (Coupe)**  
Courtesy of GENERAL MOTORS CORP.

2. Release the ambient air temperature sensor from the headlamp bracket.
3. Disconnect the electrical connector from the ambient air temperature sensor.
4. Remove the sensor from the vehicle.

#### **Installation Procedure**



**Fig. 13: View Of Ambient Air Temperature Sensor (Coupe)**

Courtesy of GENERAL MOTORS CORP.

1. Connect the electrical connector to the ambient air temperature sensor.
2. Push the ambient air temperature sensor through the hole in the headlamp bracket until the sensor is seated.
3. Close the hood.

### **WINDSHIELD REVEAL MOLDING REPLACEMENT**

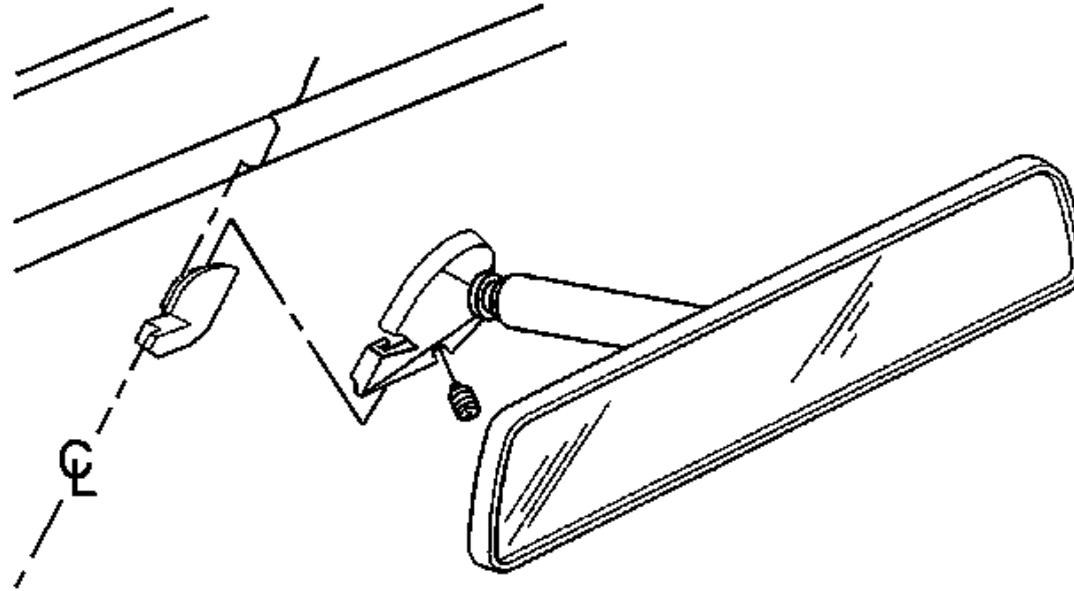
The reveal molding is bonded to the windshield, and is replaced with the windshield as an assembly. Refer to [Urethane Adhesive Installation of Stationary Windows](#).

### **REAR WINDOW REVEAL MOLDING REPLACEMENT**

The rear window reveal molding is bonded to the rear window, and is replaced with the window as an assembly. Refer to [Urethane Adhesive Installation of Stationary Windows](#).

## REARVIEW MIRROR REPLACEMENT

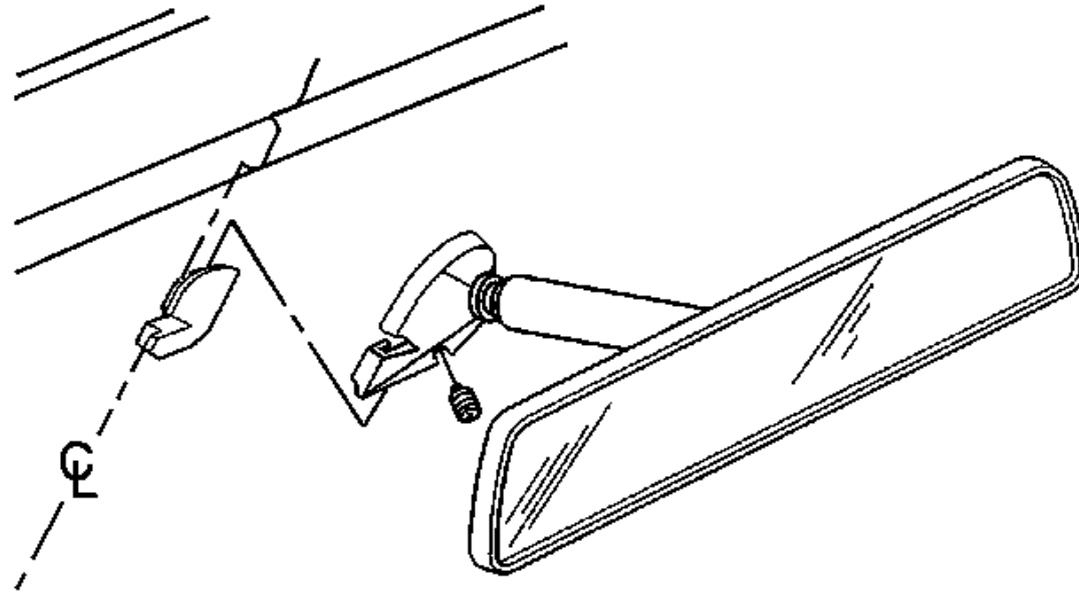
### Removal Procedure



**Fig. 14: View Of Rearview Mirror Mounting Components**  
Courtesy of GENERAL MOTORS CORP.

1. Loosen the set screw in the base of the mirror.
2. Remove the mirror from the mounting pad.
3. Disconnect the rearview mirror wiring harness, if applicable.

### Installation Procedure



**Fig. 15: View Of Rearview Mirror Mounting Components**  
Courtesy of GENERAL MOTORS CORP.

1. Install the mirror to the mounting pad.

**NOTE:** Refer to **FASTENER NOTICE** .

2. Tighten the set screw that retains the mirror base to the mounting pad.

**Tighten:** Tighten the mirror set screw to 2 N.m (18 lb in).

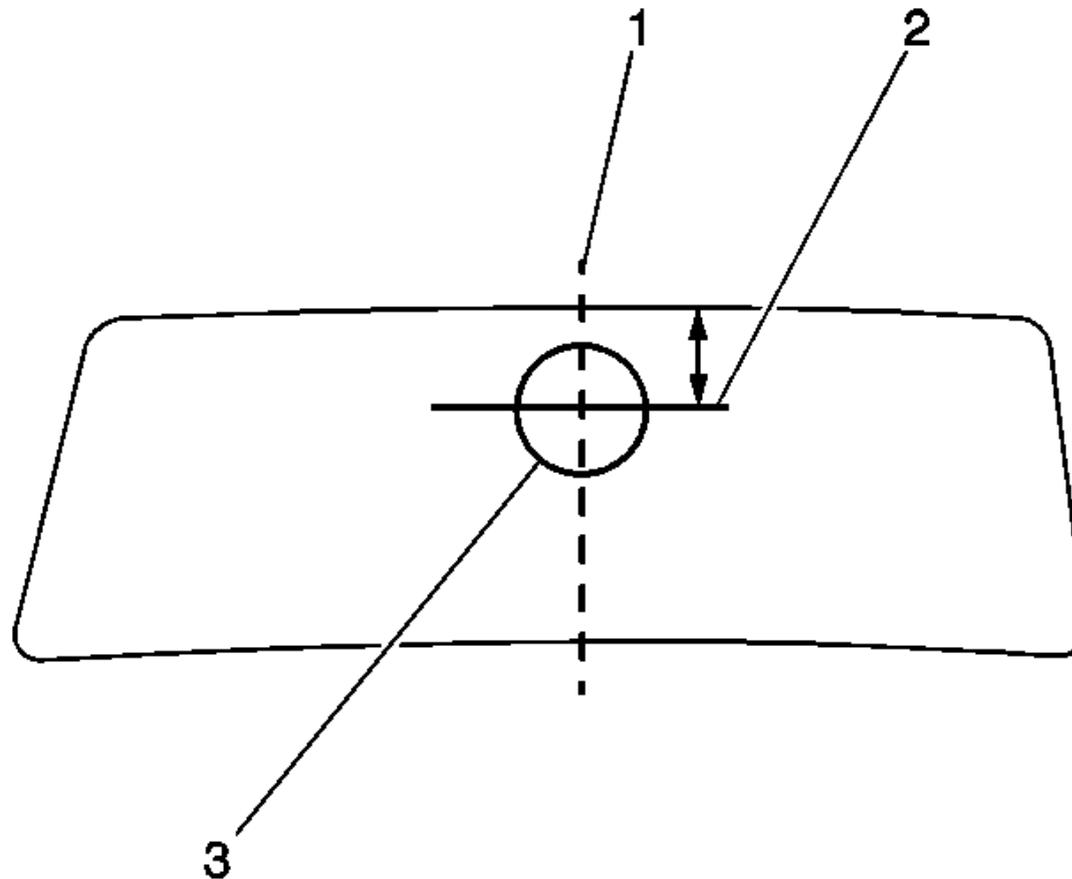
3. Install the rearview mirror wiring harness.

## **REARVIEW MIRROR SUPPORT INSTALLATION**

### **Tools Required**

- Inside Mirror Adhesive Kit GM P/N 1052369 (Canadian P/N 993362) or equivalent
- Safety Razor or Utility Knife

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:

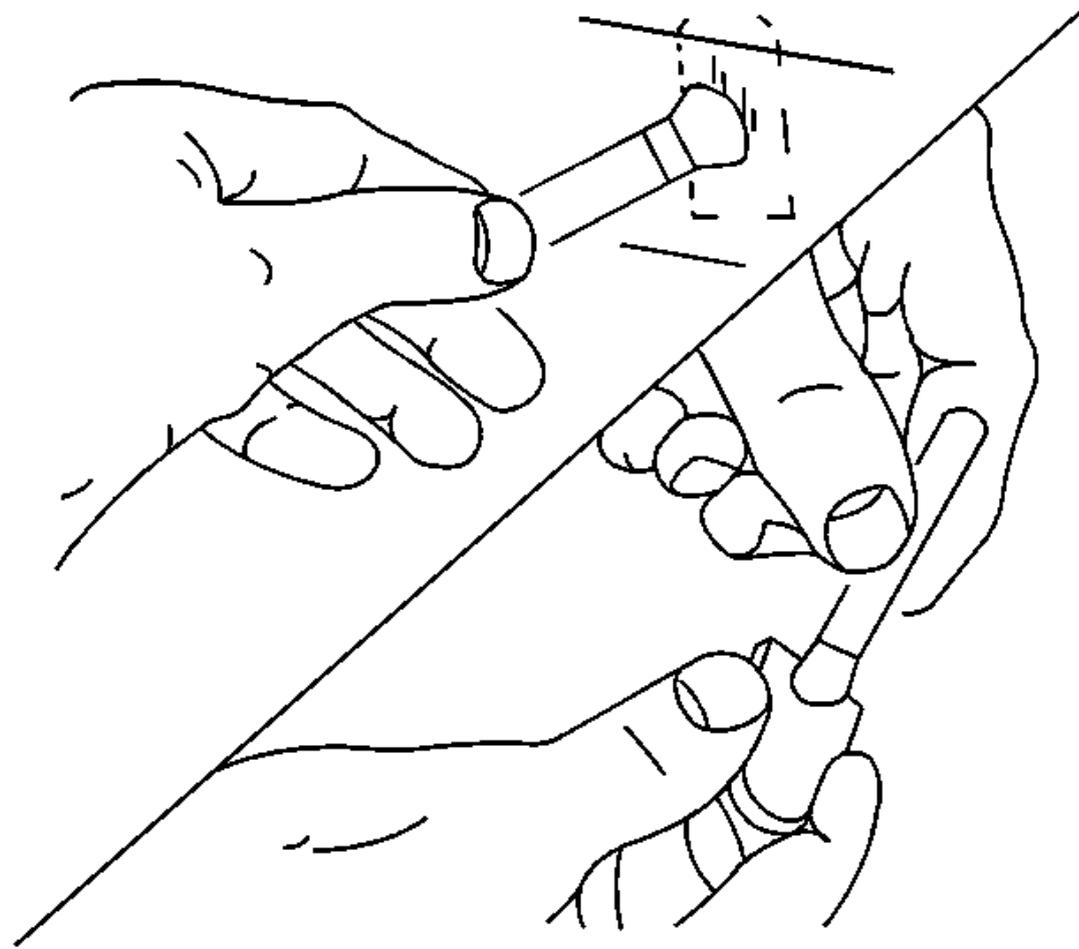


**Fig. 16: Identifying Mirror Mounting Base Location**  
Courtesy of GENERAL MOTORS CORP.

- A. Using a measuring tape, measure the distance between the windshield pillars from the base of the shade line .
- B. Using a marking pencil, halfway between the windshield pillars, draw a centerline (1) on the windshield from the roof panel to the windshield base.
- C. 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 glass 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 vice.
- 4. Scrape the mirror mounting base thoroughly with a safety razor or utility knife in order to remove all old adhesive.
- 5. 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.

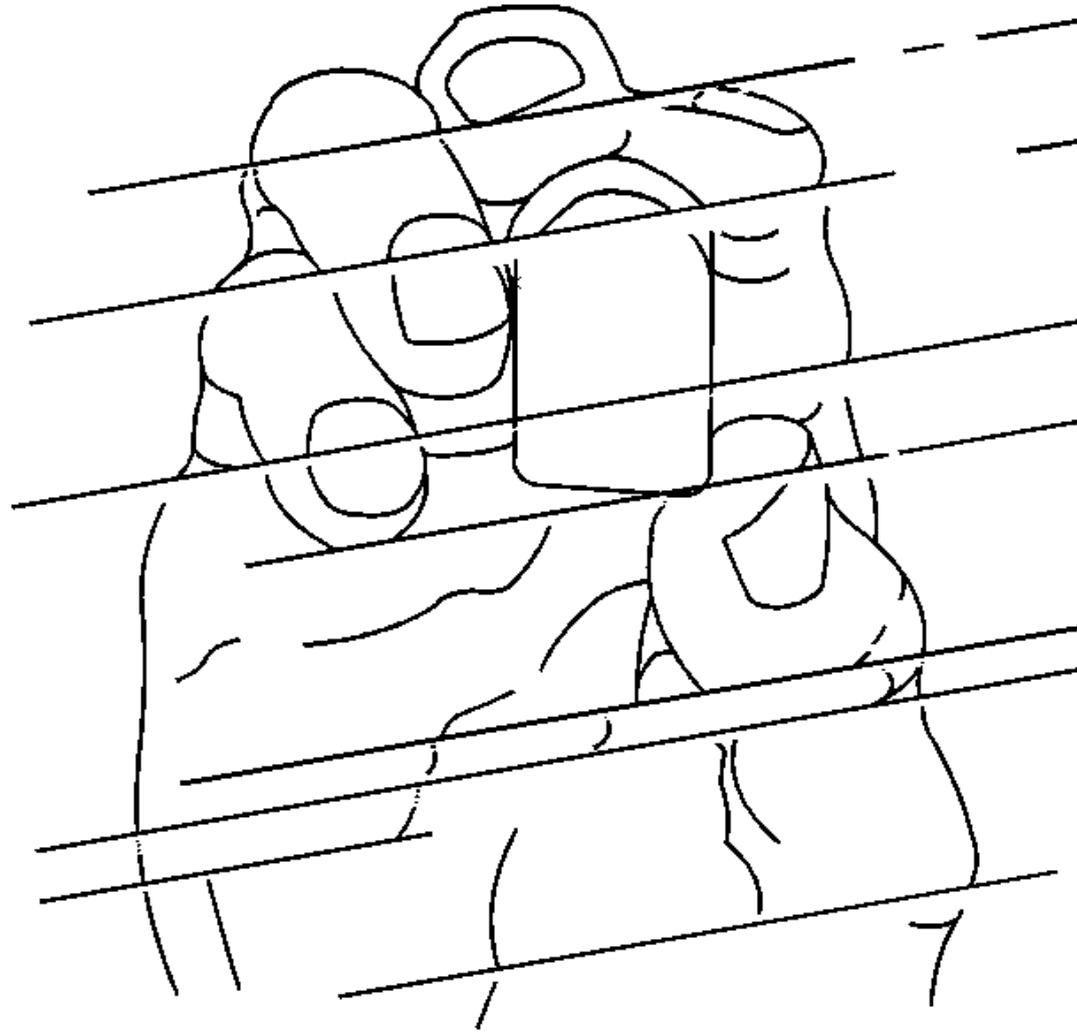


**Fig. 17: Applying Adhesive To Mirror Base & Window**  
Courtesy of GENERAL MOTORS CORP.

6. Use Inside Mirror Adhesive Kit GM P/N 1052369 (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 glass.

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



**Fig. 18: 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.

## **WINDSHIELD REPLACEMENT**

### **Tools Required**

- **J 39032** Stationary Glass Removal Tool. See [Special Tools](#).
- Urethane Adhesive Kit GM P/N 12346392 or Equivalent

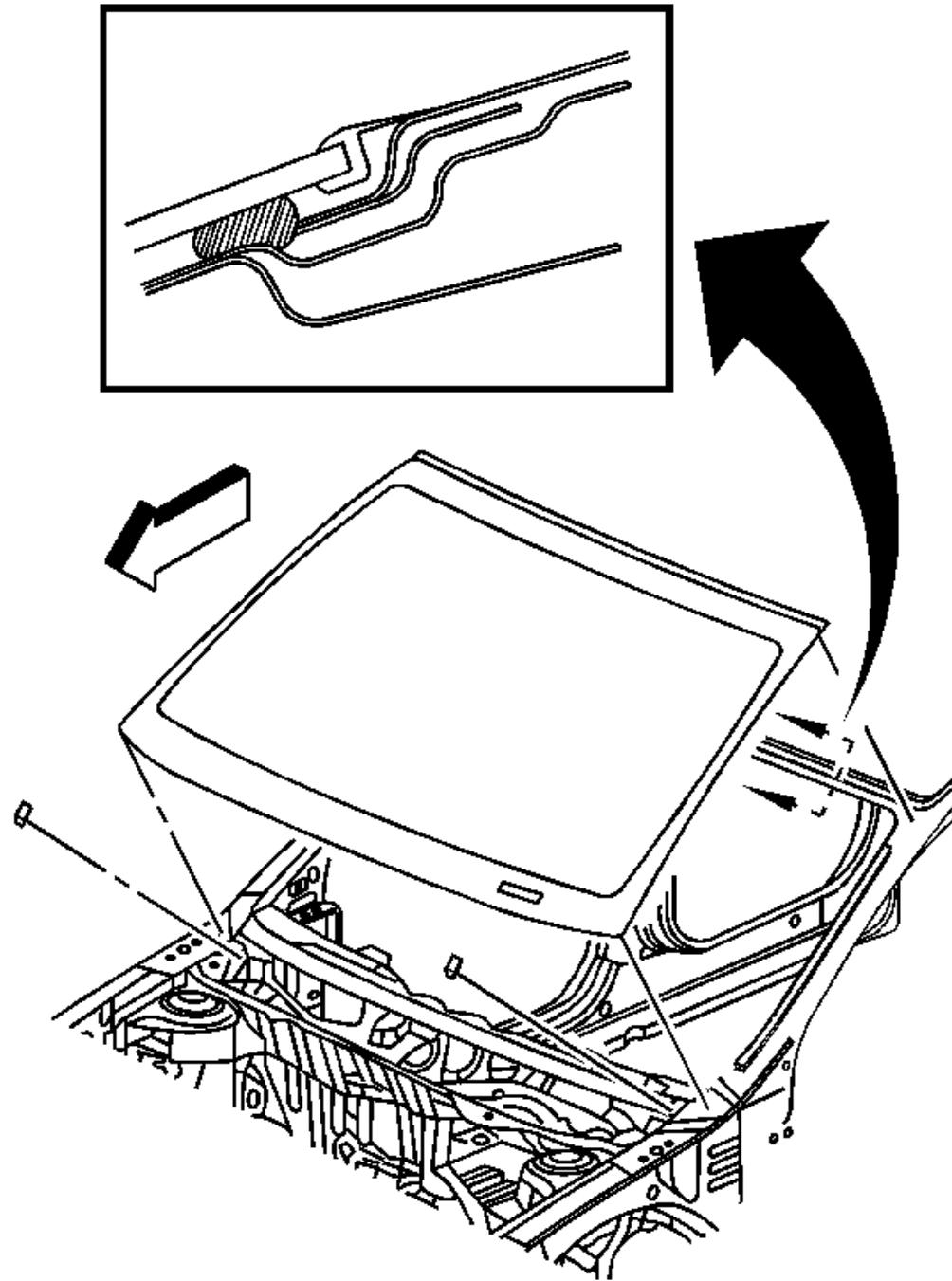
- Isopropyl Alcohol or Equivalent
- Cartridge-type Caulking Gun
- Commercial-type Utility Knife
- Razor Blade Scraper
- Suction Cups
- Plastic Paddle

### Removal Procedure

IMPORTANT: Before cutting out a stationary window, apply a double layer of masking tape around the perimeter of the painted surfaces and the interior trim.

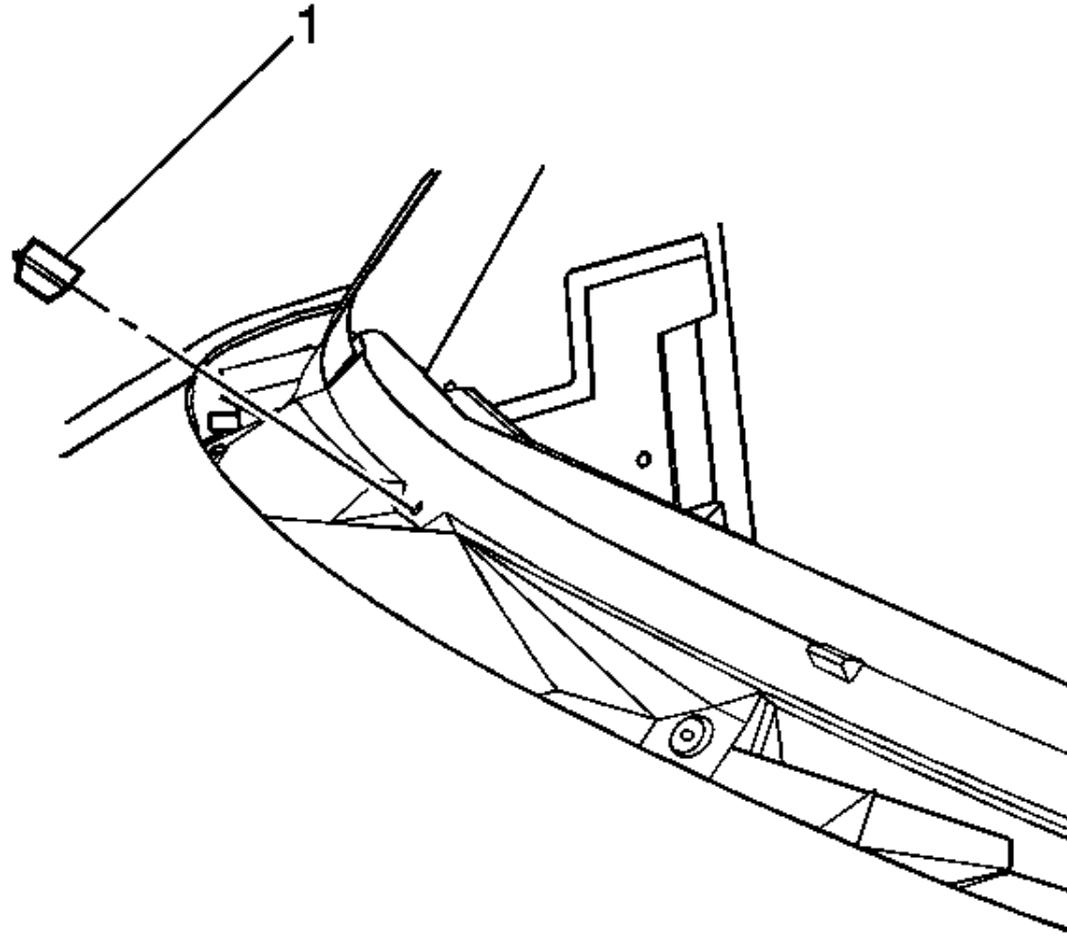
1. Open the hood.
2. Remove the windshield wiper arms and blades. Refer to [Wiper Arm Replacement](#) in Wipers/Washer Systems.
3. Remove the air inlet grille. Refer to [Air Inlet Grille Panel Replacement](#) in Body Front End.
4. Remove the windshield frame appliques. Refer to [Applique Replacement - Windshield Frame](#) .
5. Remove the rearview mirror. Refer to [Rearview Mirror Replacement](#).

**CAUTION:** If broken glass falls into the defroster outlets, it can be blown into the passenger compartment and cause personal injury.



**Fig. 19: Removing/Installing Windshield**  
Courtesy of GENERAL MOTORS CORP.

6. Cover the following parts to protect from broken glass:
- Upper dash pad
  - Defroster outlets and A/C outlets
  - Seats and carpeting

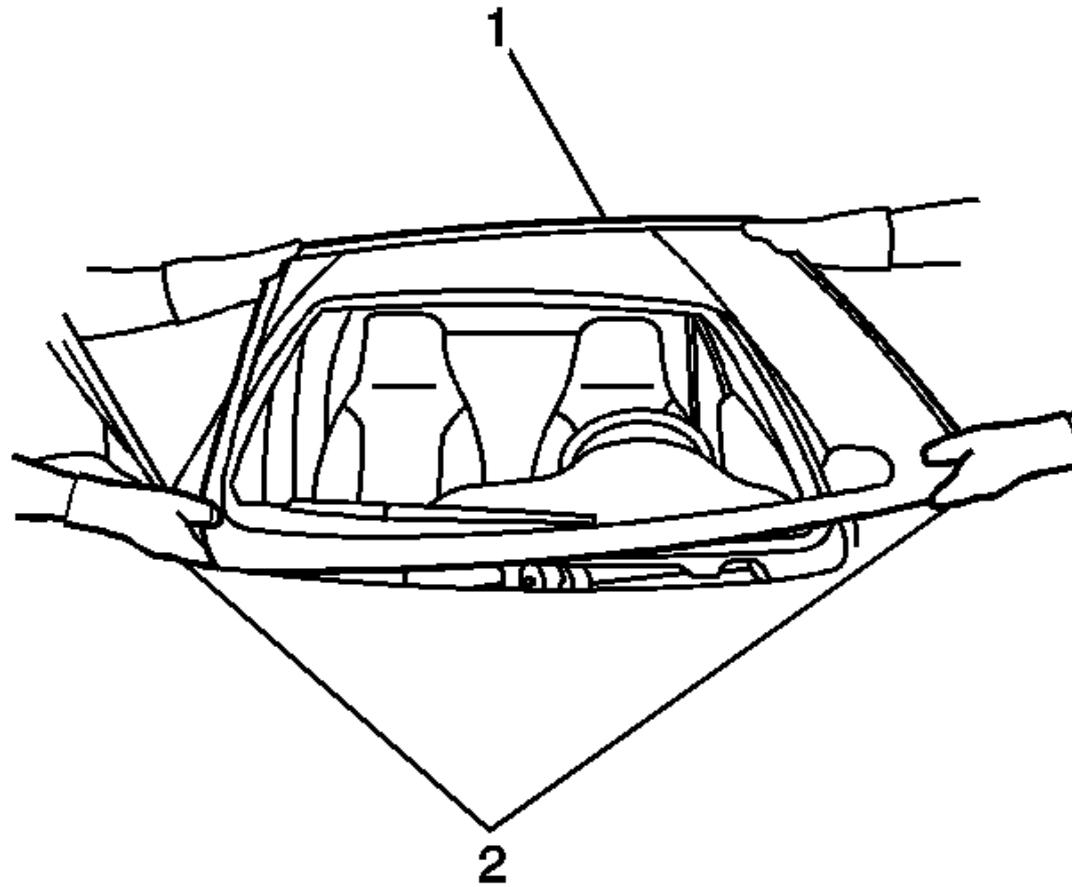


**Fig. 20: Identifying Lower Windshield Supports**

Courtesy of GENERAL MOTORS CORP.

**CAUTION:** 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.

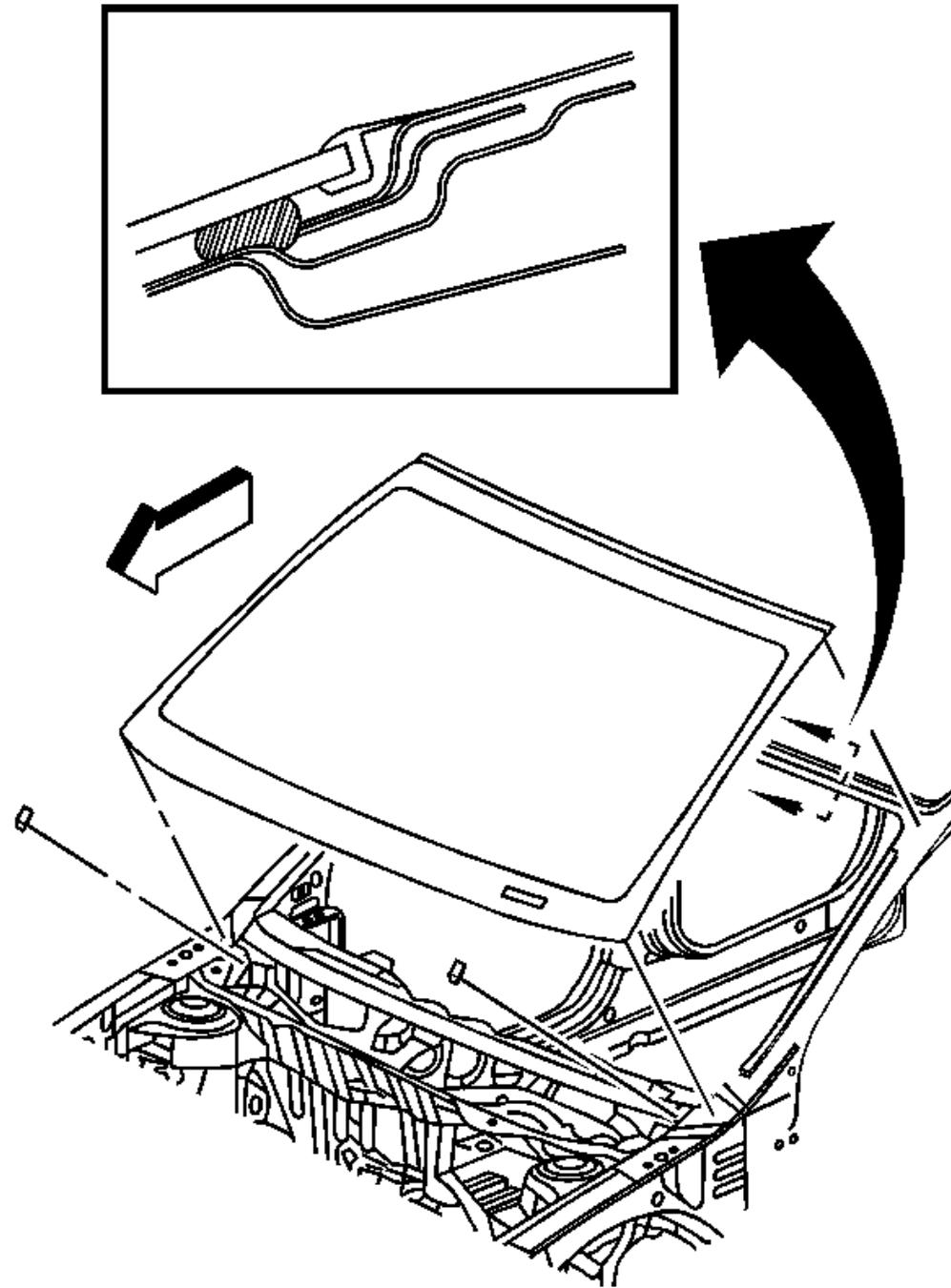
7. Remove the lower windshield supports (1) from the cowl panel, if equipped.
8. Cut the urethane adhesive along the windshield pillars:
  - Leave a base of urethane on the pinchweld flange.
  - The only suitable lubrication is clear water.
  - From the outside of the car, use **J 39032** to cut the urethane along the sides of the window. See [Special Tools](#).
9. From the inside of the car, cut the urethane bead along the top and the bottom of the windshield.



**Fig. 21: Removing/Installing Windshield**  
Courtesy of GENERAL MOTORS CORP.

10. Remove the windshield (1) from the vehicle with the aid of an assistant (2).

### Installation Procedure



**Fig. 22: Removing/Installing Windshield**  
Courtesy of GENERAL MOTORS CORP.

1. Install a stationary window into the opening. Refer to [Urethane Adhesive Installation of Stationary Windows](#).
2. Install the rearview mirror. Refer to [Rearview Mirror Replacement](#).
3. Install the front upper garnish molding. Refer to [Molding Replacement - Roof Weld Joint Reveal - Front \(Coupe\)](#) or [Molding Replacement - Roof Weld Joint](#)

**Reveal - Front (Sedan)** in Exterior Trim.

4. Install the windshield frame appliques. Refer to **Applique Replacement - Windshield Frame** in Exterior Trim.
5. Install the air inlet grille. Refer to **Air Inlet Grille Panel Replacement** in Body Front End.
6. Install the windshield wipers arms and blades. Refer to **Wiper Arm Replacement** in Wipers/Washer Systems.
7. Remove the double layer of masking tape around the perimeter of the painted surfaces and the interior trim.
8. Close the hood.

## **URETHANE ADHESIVE INSTALLATION OF STATIONARY WINDOWS**

**CAUTION:** Refer to **GLASS AND SHEET METAL HANDLING CAUTION** .

**IMPORTANT:** Remove all but approximately 2 mm (3/64 in) of the existing bead of urethane adhesive from the pinch-weld flange.

1. Remove all mounds or loose pieces of urethane adhesive from the pinch-weld area.
2. If the original window is being reused, remove all but a thin film of the existing urethane adhesive from the window surface by using a clean utility knife or razor blade scraper.
3. Inspect the following components for the causes of a broken window:
  - The flange of the window opening
  - The window reveal molding
4. Inspect for any of the following problems in order to help prevent future breakage of the window:
  - High weld
  - Solder spots
  - Hardened sealer
  - Any other obstruction or irregularity in the pinch-weld flange

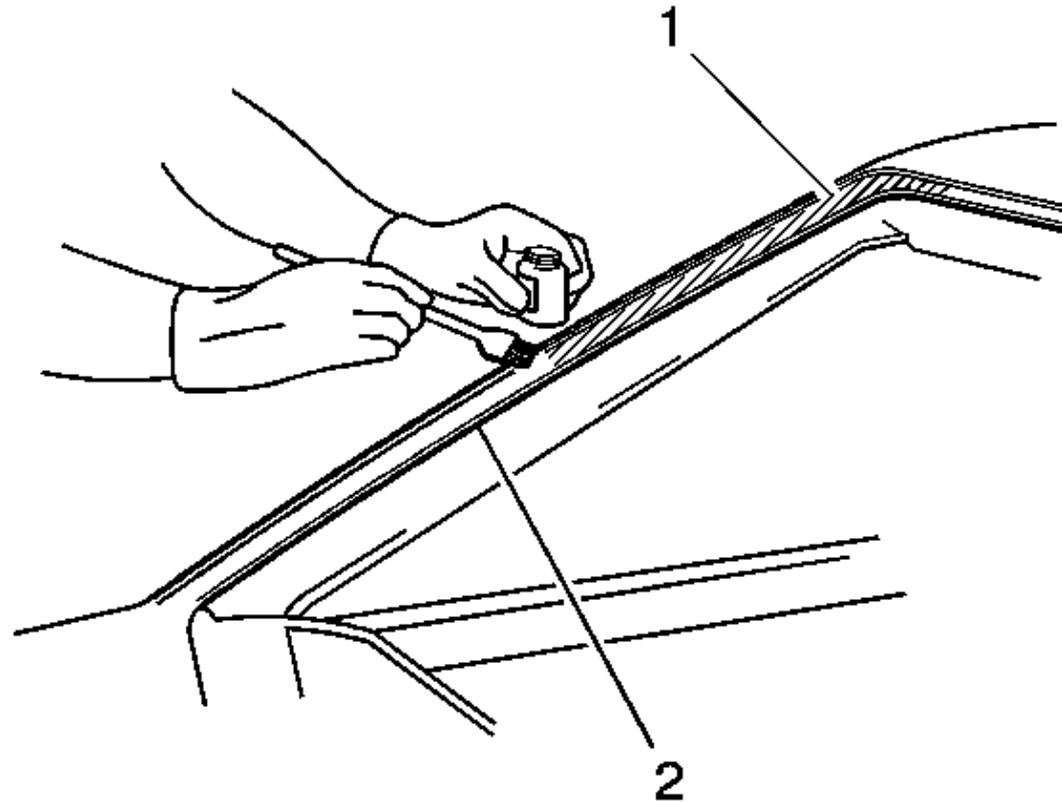
If corrosion of the pinch-weld flange is present or if sheet metal repairs or replacements are required, the pinch-weld flange must be refinished in order to restore the bonding area strength. If paint repairs are required, mask the flange bonding area prior to applying the color coat in order to

**IMPORTANT:** provide a clean primer only surface. Materials such as BASF DE15®, DuPont 2610®, Sherwin-Williams PSE 4600 and NP70® and Martin-Semour 5120 and 5130® PPG DP90LF SPIES/ HECKER 3688/8590 - 3688/5150 - 4070/5090 STANDOX 11158/13320 - 14653/14980 products are approved for this application.

5. After repairing the opening as indicated, perform the following steps:
  1. Remove all traces of broken glass from the outer cowl panel, seats, floor and defroster ducts.
  2. Clean around the edge of the inside surface of the window with a 50/50 mixture of isopropyl alcohol and water by volume on a dampened lint free cloth.

**CAUTION:** Refer to **WINDOW RETENTION CAUTION** .

6. Verify all primers and urethane adhesive are within expiration dates.



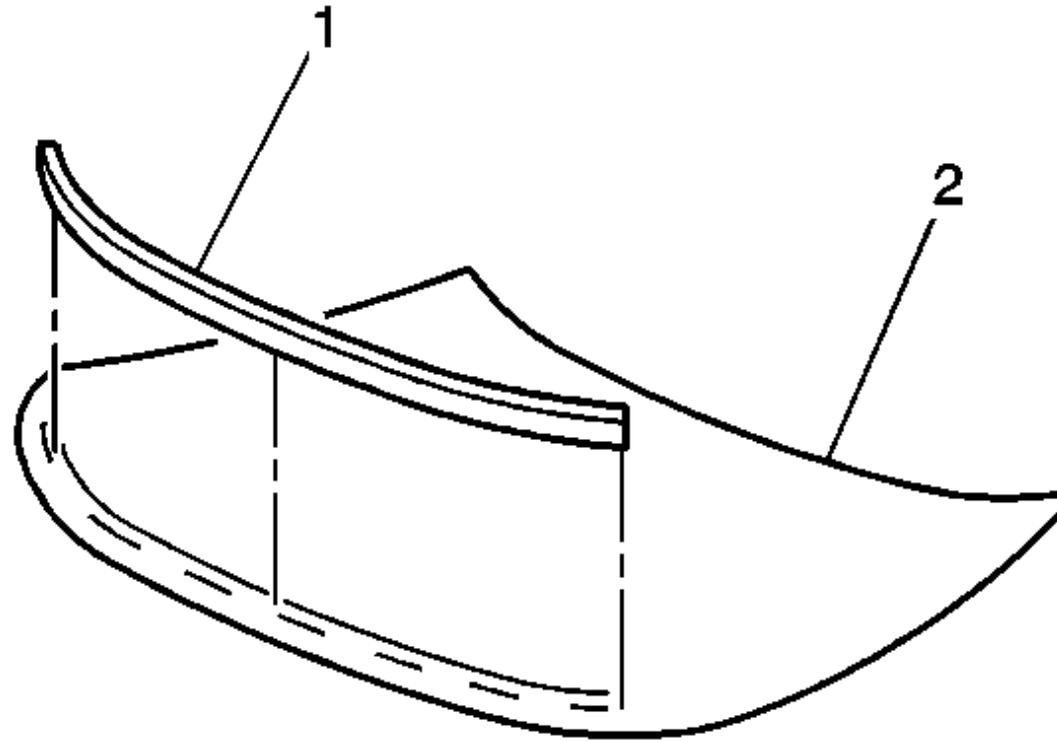
**Fig. 23: Applying Pinch-Weld Primer**

Courtesy of GENERAL MOTORS CORP.

**CAUTION:** Failure to prep the area prior to the application of primer may cause insufficient bonding of urethane adhesive. Insufficient bonding of urethane adhesive may allow unrestrained occupants to be ejected from the vehicle resulting in personal injury.

**IMPORTANT:** Do not apply the black #3 primer to the existing bead (1) of the urethane adhesive on the pinch-weld flange. Apply the primer only to nicks, scratches or the primed surfaces.

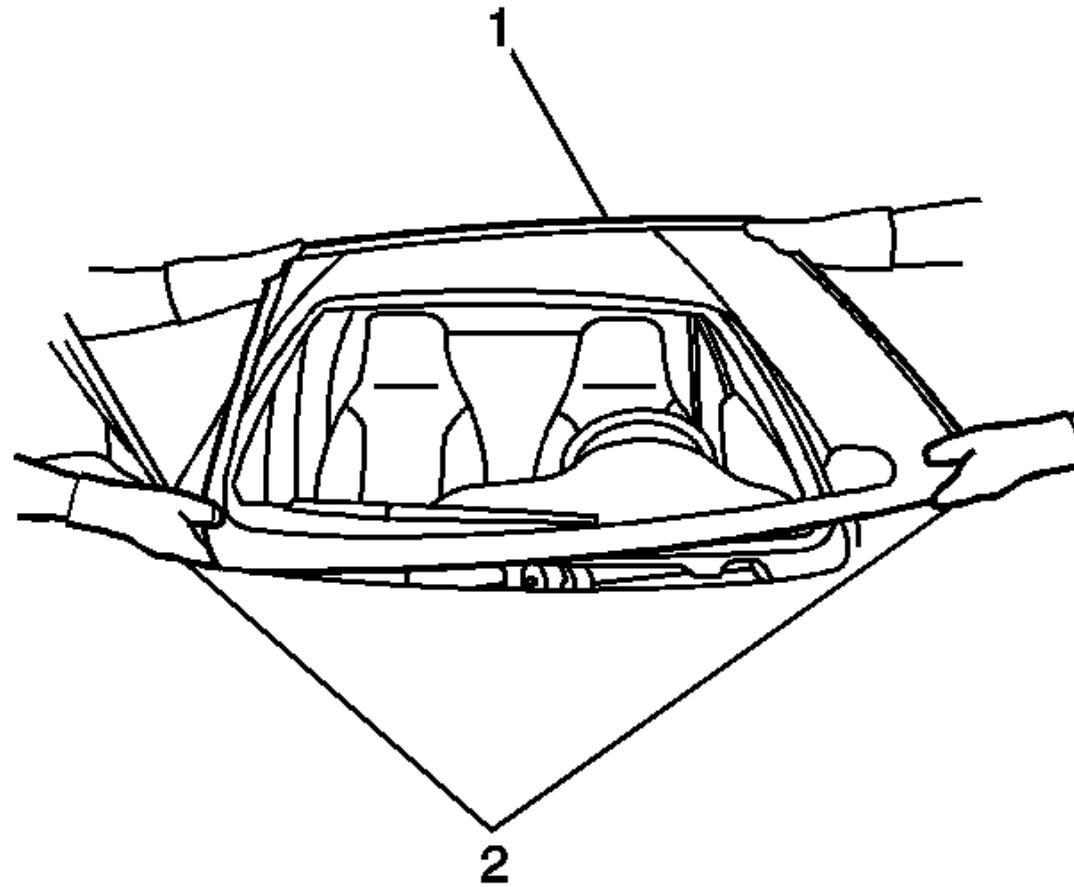
7. Shake the pinch-weld primer black #3 for at least 1 minute.
8. Use a new dauber in order to apply the primer to the surface of the pinch-weld flange (1).
9. Allow the pinch-weld primer to dry for approximately 10 minutes.



**Fig. 24: Identifying Windshield Acoustic Strip**  
Courtesy of GENERAL MOTORS CORP.

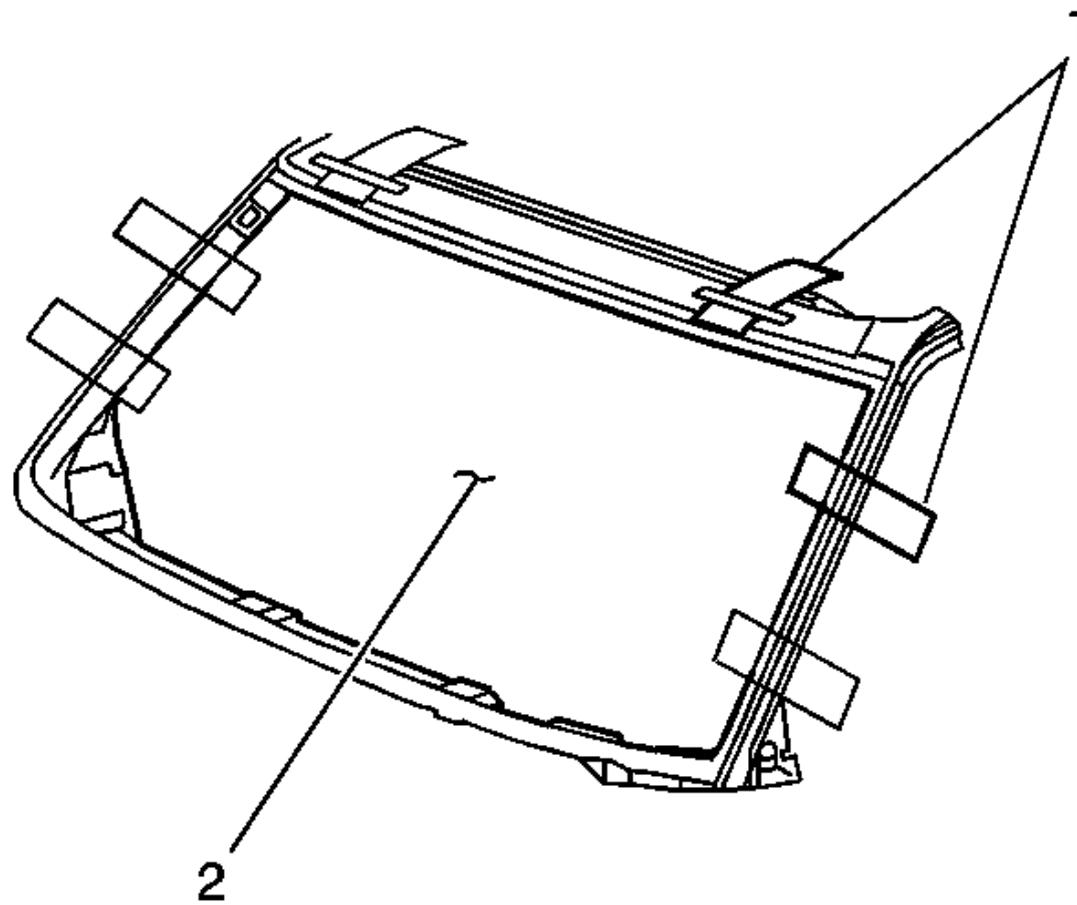
10. Install the new windshield acoustic strip (1) to the windshield (2), if equipped or damaged.

The acoustic strip aids in reducing noise.



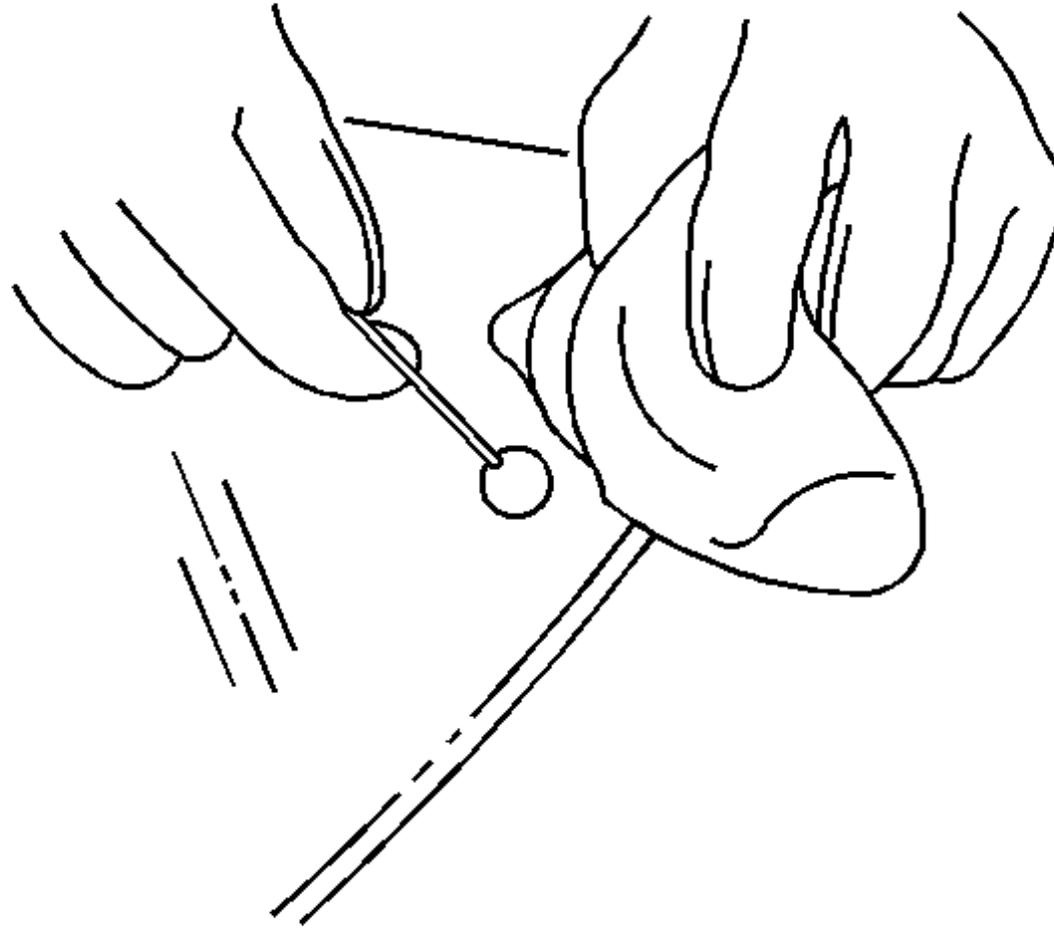
**Fig. 25: Removing/Installing Windshield**  
Courtesy of GENERAL MOTORS CORP.

11. With an assistant dry fit the window (1) to the opening in order to determine the correct position.



**Fig. 26: Aligning Tape Lines On Window To Body**  
Courtesy of GENERAL MOTORS CORP.

12. Using masking tape in order to mark the locations (1) of the window (2) in the opening.
13. Cut the masking in the center and remove the window from the opening.



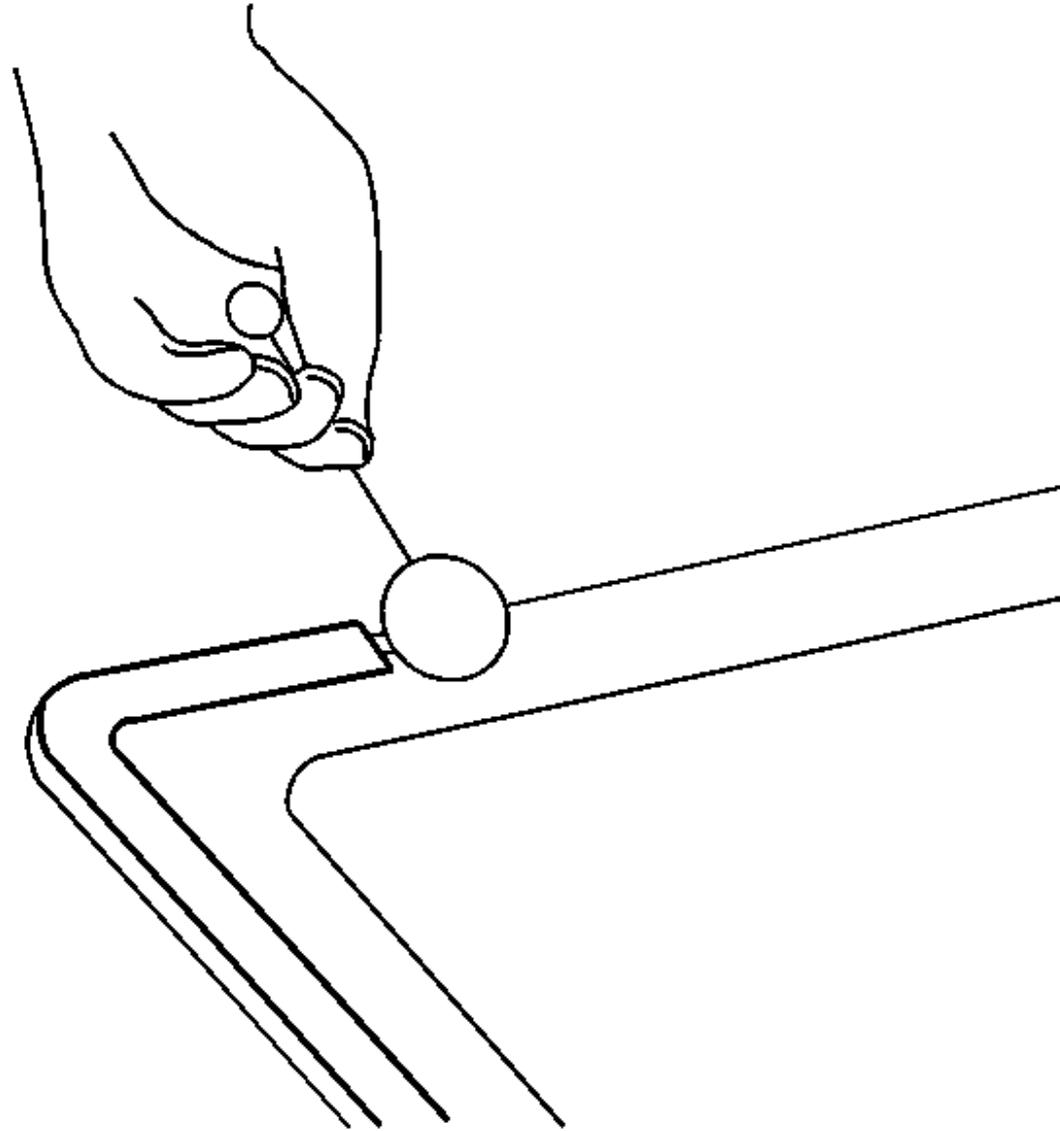
**Fig. 27: Applying Glass Prep**

Courtesy of GENERAL MOTORS CORP.

**IMPORTANT:** Use care when applying glass prep clear #1 on the window. This primer dries almost instantly, and may stain the viewing area of the window if not applied evenly.

14. Use a new dauber in order to apply glass prep clear #1 to the area approximately 10-16 mm (3/8-5/8 in) around the entire perimeter of the window inner surface.

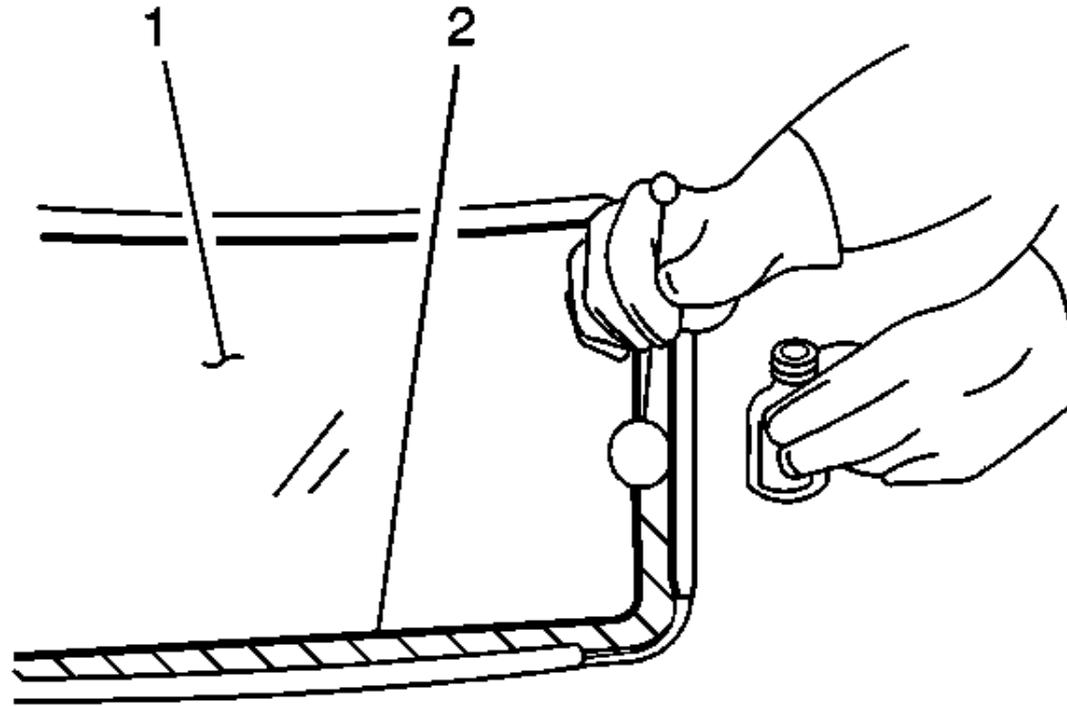
Immediately wipe the glass primed area using a clean, lint-free cloth.



**Fig. 28: Applying Glass Prep**

Courtesy of GENERAL MOTORS CORP.

15. Apply a second coat of the glass prep clear #1 to the same area of the glass.

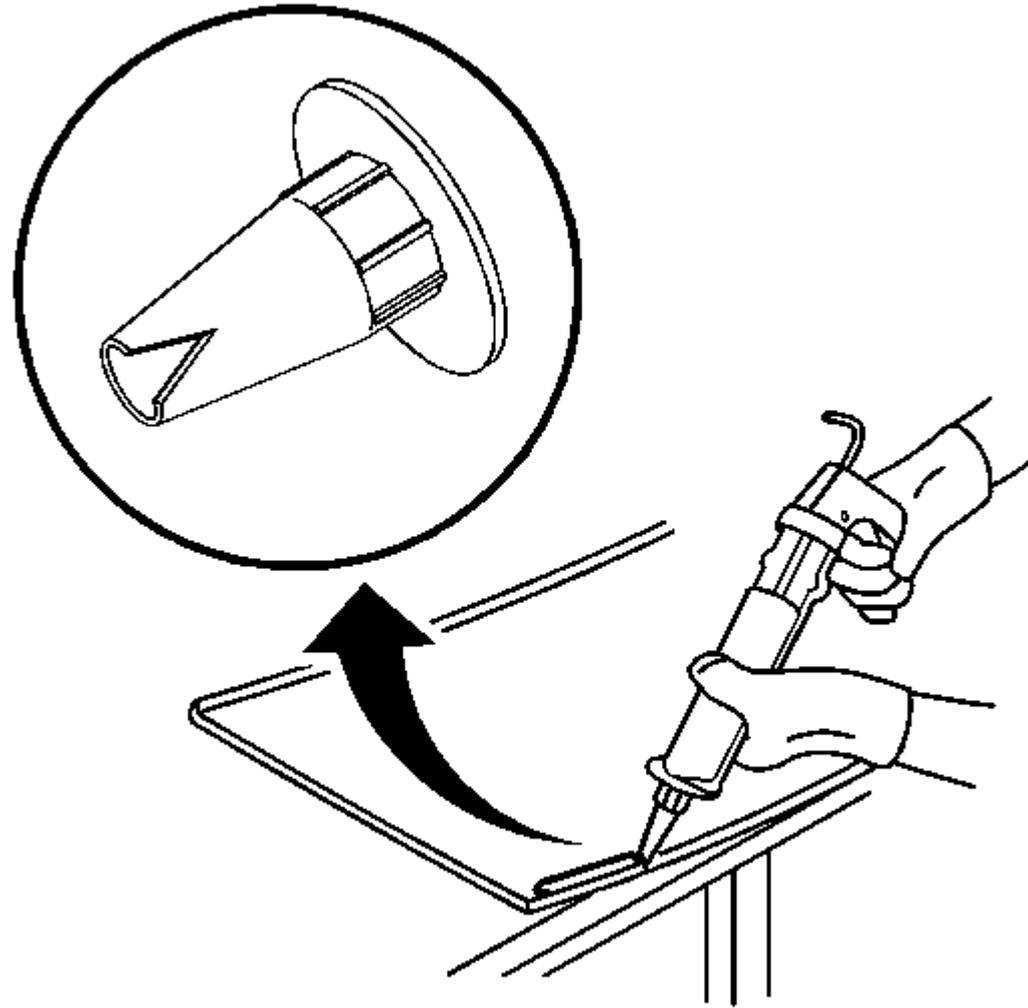


**Fig. 29: Applying Glass Primer**

**Courtesy of GENERAL MOTORS CORP.**

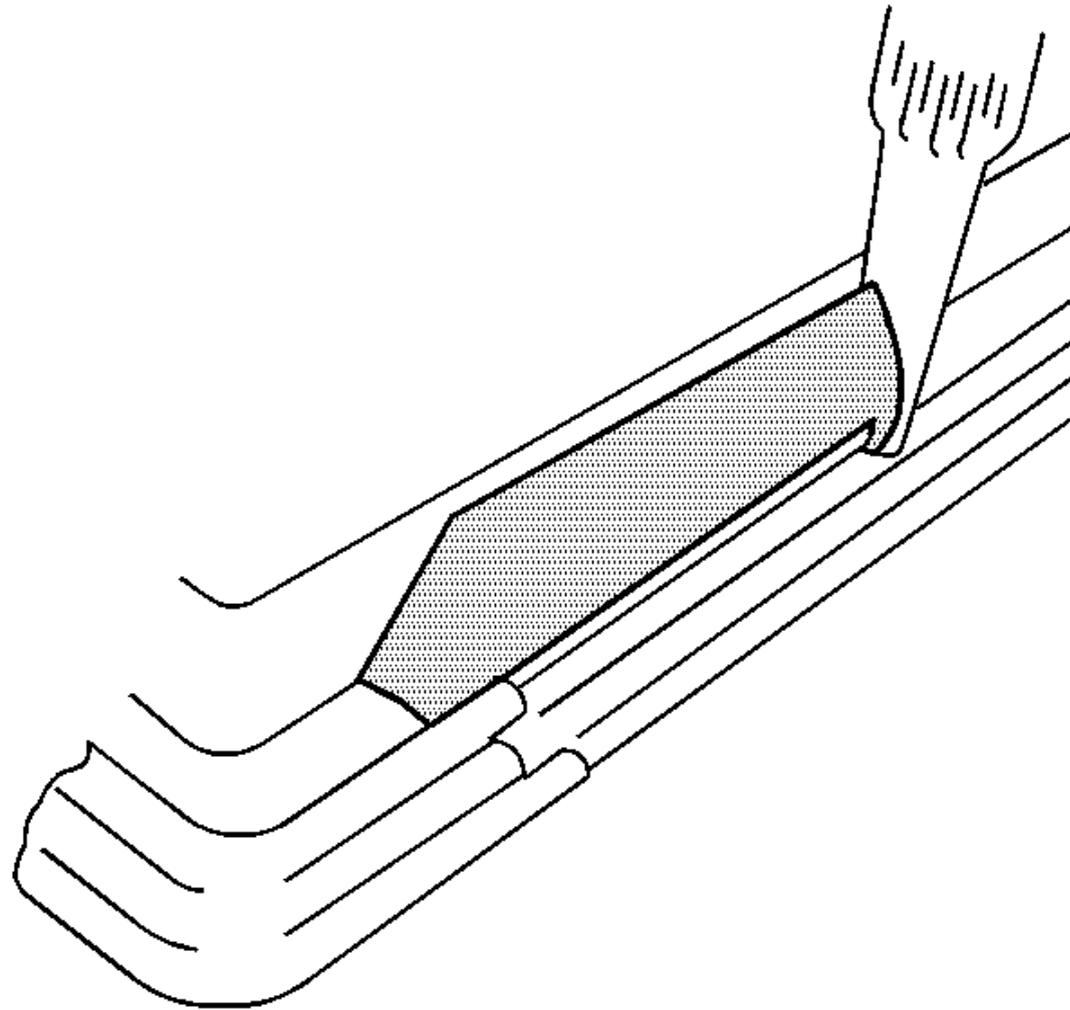
IMPORTANT: The glass primer black #2 is effective up to 8 hours after applying it to the glass. The primed surface of the glass must be kept clean.

16. Shake the glass primer black #2 for at least 1 minute.
17. Use a new dauber in order to apply the glass primer black #2 to the same areas (2) that glass prep clear #1 was applied.
18. Allow the glass primer to dry for approximately 10 minutes.



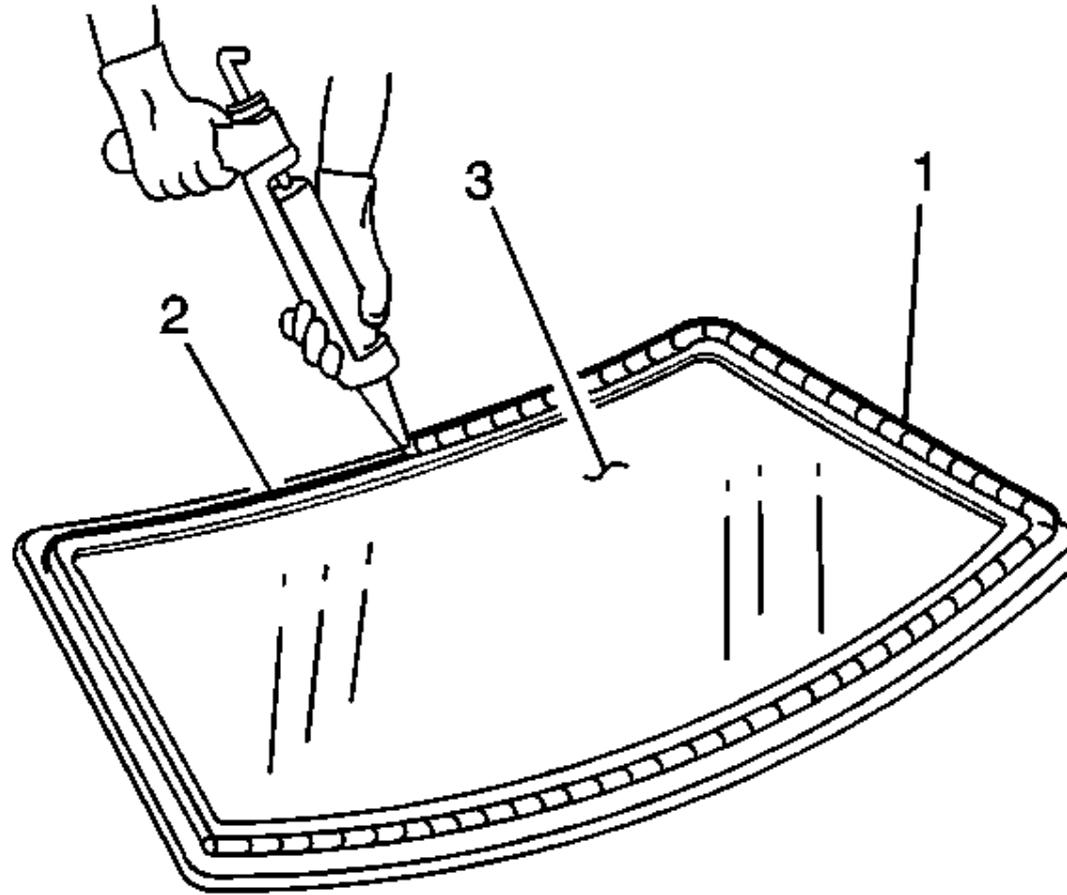
**Fig. 30: View Of Modified Applicator Nozzle**  
Courtesy of GENERAL MOTORS CORP.

19. Cut the applicator nozzle in order to provide a bead of 12.7 mm (1/2 in) wide and 12.7 mm (1/2 in) high.



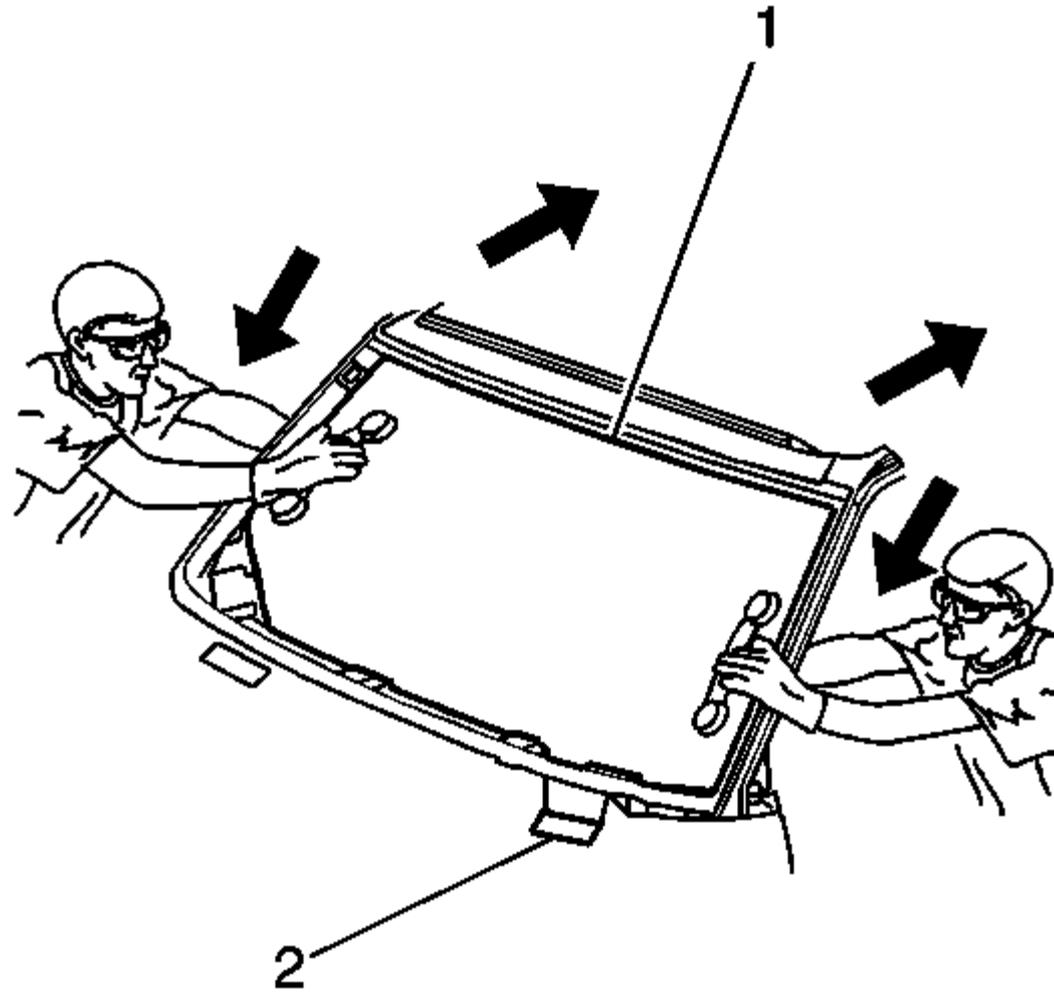
**Fig. 31: Applying Bead Of Urethane Adhesive**  
Courtesy of GENERAL MOTORS CORP.

20. Use a cartridge-type caulking gun in order to apply a smooth, continuous bead of urethane adhesive.



**Fig. 32: Applying Urethane Adhesive To Inner Surface Of Window**  
Courtesy of GENERAL MOTORS CORP.

21. Use the edge of the window or the inside edge of the reveal molding as a guide for the nozzle in order to apply the urethane adhesive (1) to the inner surface of the window (3).

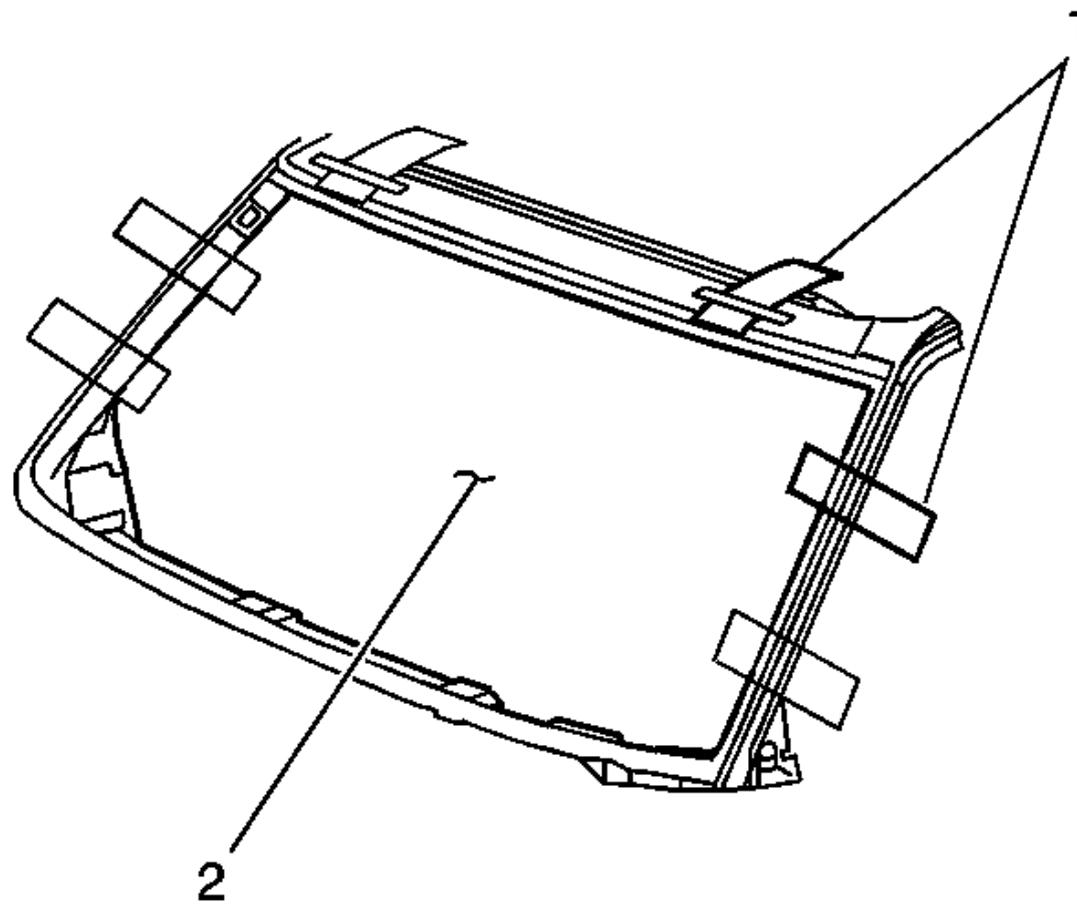


**Fig. 33: Installing Windshield**

Courtesy of GENERAL MOTORS CORP.

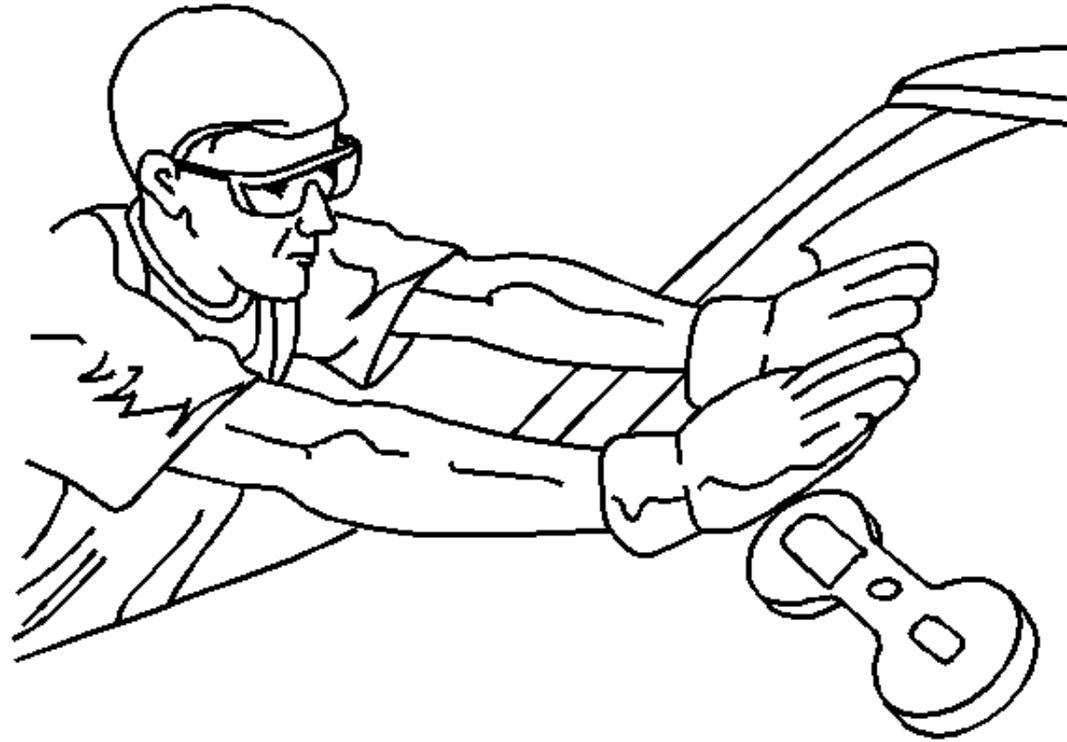
22. With the aid of an assistant, place the window in the opening.

If installing a windshield place the windshield on the lower supports (2), if equipped.



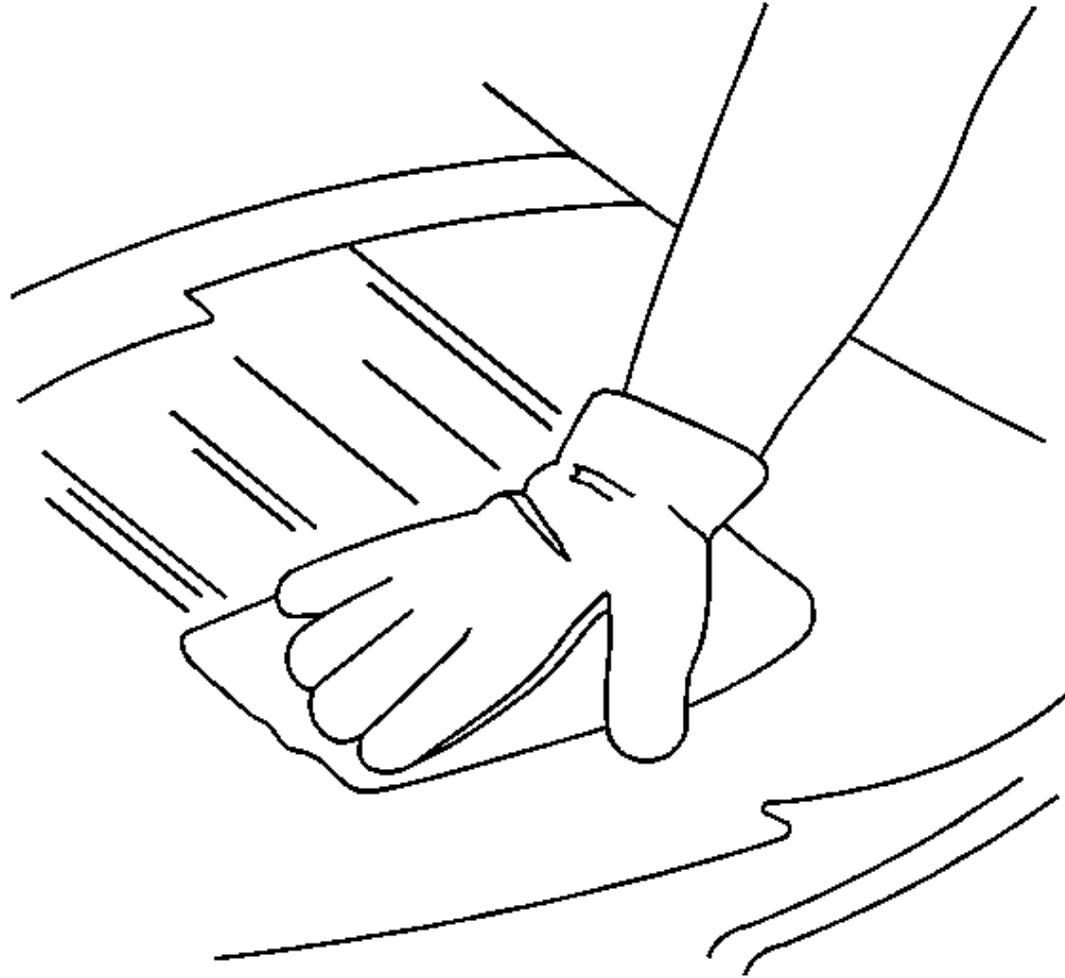
**Fig. 34: Aligning Tape Lines On Window To Body**  
Courtesy of GENERAL MOTORS CORP.

23. Align the masking tape (1) lines on the window (2) and the body.



**Fig. 35: Pressing Window Into Place**  
Courtesy of GENERAL MOTORS CORP.

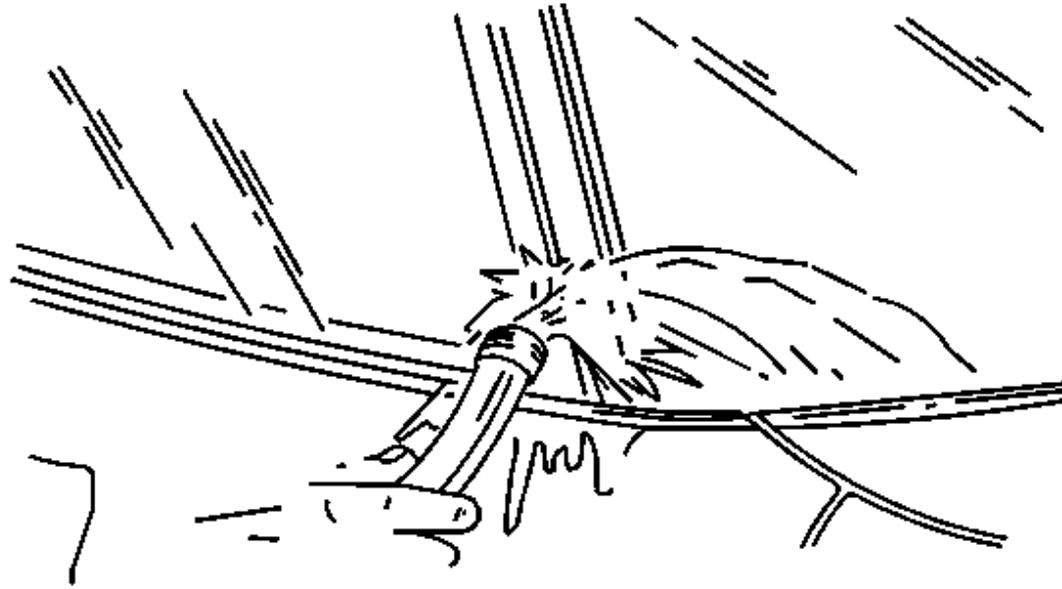
24. Press the window firmly into place.
25. Tape the window to the body in order to minimize movement until the urethane adhesive cures.



**Fig. 36: Cleaning Window**

**Courtesy of GENERAL MOTORS CORP.**

26. Clean any excess urethane adhesive from the body.



**Fig. 37: Performing Water Hose Test**

Courtesy of GENERAL MOTORS CORP.

**IMPORTANT:** Do not direct a hard stream of high pressure water to the freshly applied urethane adhesive.

27. Use a soft spray of warm water in order to immediately water test the window.
28. Inspect the window for leaks.
29. If any leaks are found, use a plastic paddle in order to apply extra urethane adhesive at the leak point.
30. Retest the window for leaks.

**CAUTION:** Insufficient curing of urethane adhesive may allow unrestrained occupants to be ejected from the vehicle resulting in personal injury.

- For the moisture-curing type of urethane adhesive, allow a minimum of 6 hours at 21°C (70°F) or greater and with at least 30 percent relative humidity. Allow at least 24 hours for the complete curing of the urethane adhesive.
- For the chemical-curing type of urethane adhesive, allow a minimum of 1 hour.

**Do NOT physically disturb the repair area until after these minimum times have elapsed.**

31. Maintain the following conditions in order to properly cure the urethane adhesive:
  - Partially lower a door window in order to prevent pressure buildups when closing doors before the urethane adhesive cures.
  - Do not drive the vehicle until the urethane adhesive is cured. Refer to the above curing times.
  - Do not use compressed air in order to dry the urethane adhesive.
32. Complete the window installation.

## REAR WINDOW REPLACEMENT

### Tools Required

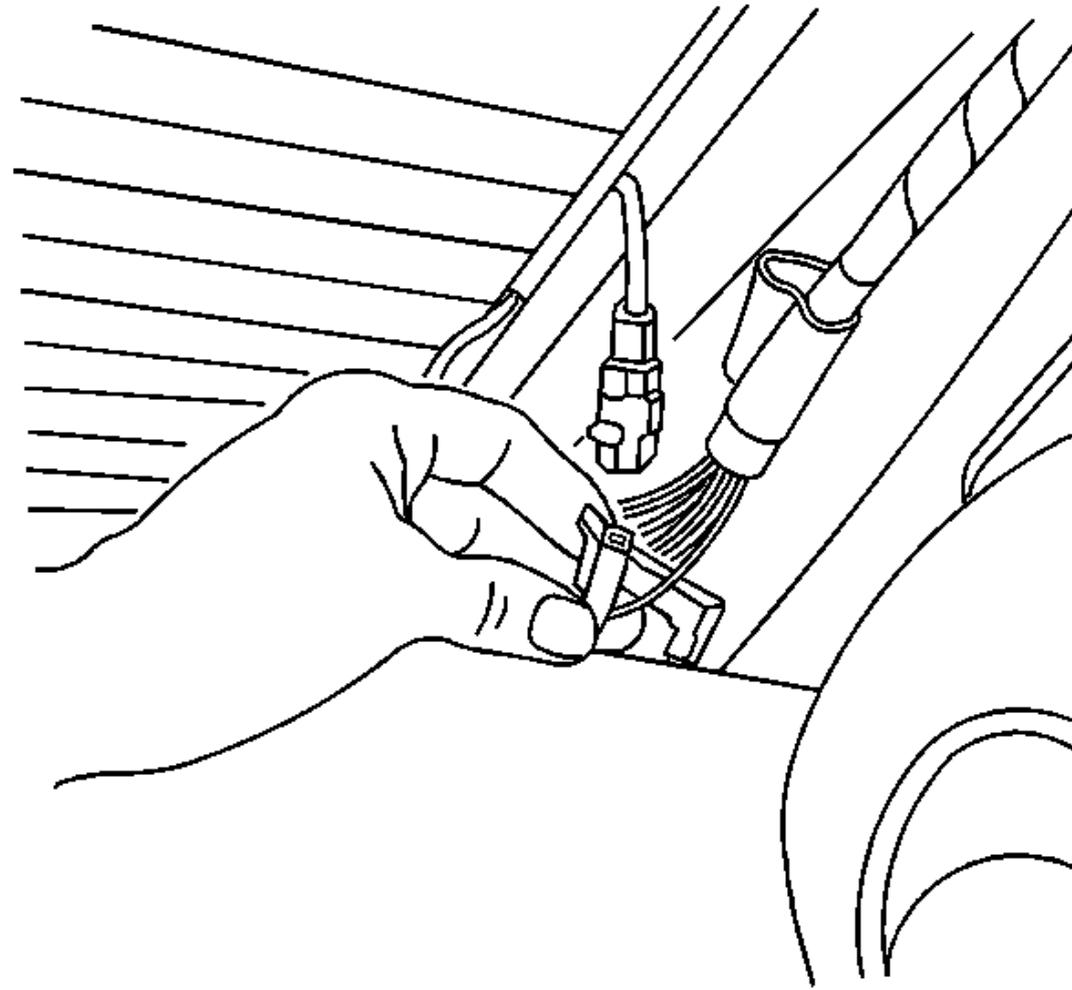
- **J 39032** Stationary Glass Removal Tool. See [Special Tools](#).
- Urethane Adhesive Kit GM P/N 12346392 or Equivalent
- Isopropyl Alcohol or Equivalent
- Cartridge-type Caulking Gun
- Commercial-type Utility Knife
- Razor Blade Scraper
- Suction Cups
- Plastic Paddle

### Removal Procedure

**CAUTION:** If a window is cracked but still intact, crisscross the window with masking tape in order to reduce the risk of damage or personal injury.

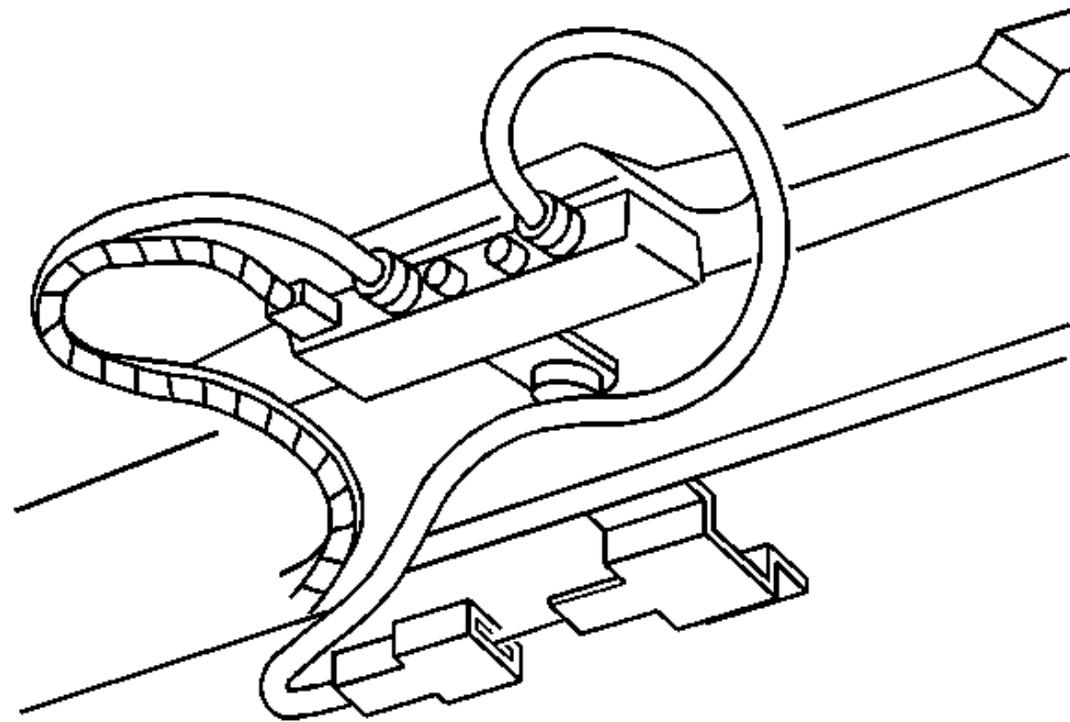
IMPORTANT: Before cutting out a stationary window, apply a double layer of masking tape around the perimeter of the painted surfaces and inner trim.

1. Remove the rear roof rail appliques. Refer to [Molding Replacement - Roof Weld Joint Reveal - Rear \(Coupe\)](#) or [Molding Replacement - Roof Weld Joint Reveal - Rear \(Sedan\)](#) in Exterior Trim.
2. Remove the rear upper garnish moldings. Refer to [Garnish Molding Replacement - Lock Pillar Upper](#) in Interior Trim.



**Fig. 38: Locating Rear Window Defogger Electrical Connector**  
Courtesy of GENERAL MOTORS CORP.

3. Disconnect the rear window defogger electrical connectors.



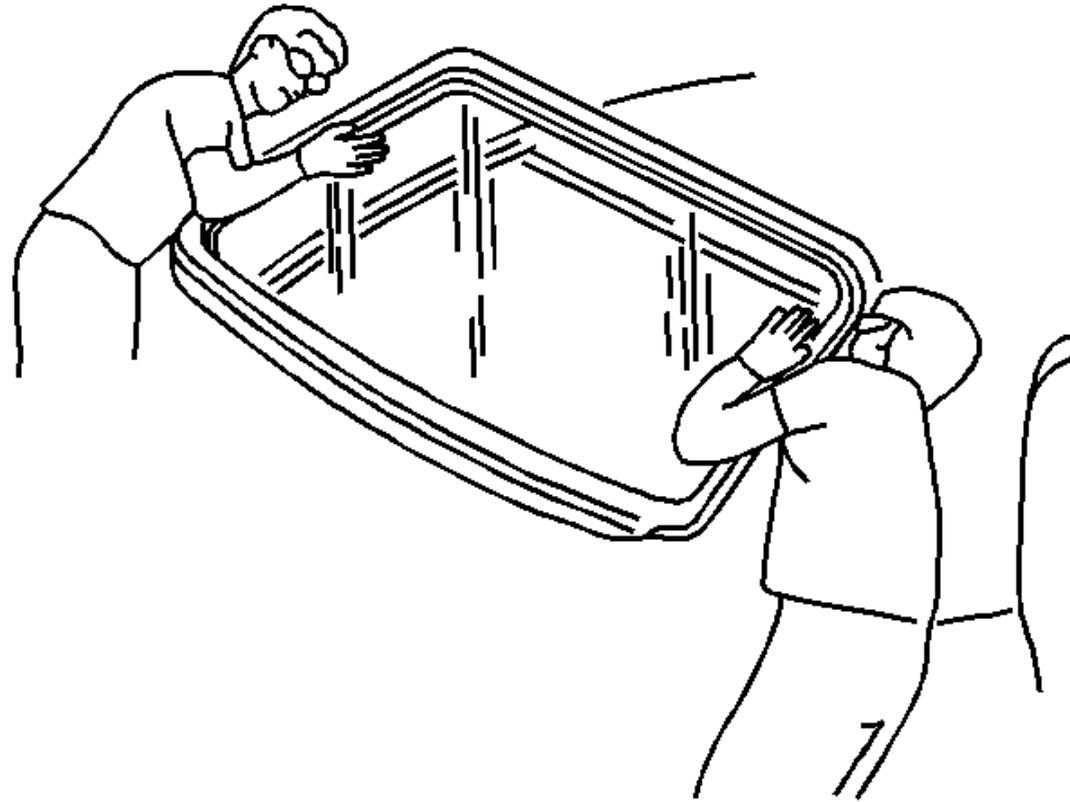
**Fig. 39: Rear Window Radio Antenna Connector**

Courtesy of GENERAL MOTORS CORP.

4. Disconnect the rear window radio antenna connector.
5. Open the rear compartment lid in order to access the reveal molding.

**CAUTION:** 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.

6. Cut the urethane adhesive along the sides of the rear window:
  - Leave a base of urethane on the pinchweld flange.
  - The only suitable lubrication is clear water.
  - From the outside of the car, use **J 39032** to cut the urethane along the sides of the window. See [Special Tools](#).
7. From the inside of the car, cut the urethane bead along the top and the bottom of the rear window.

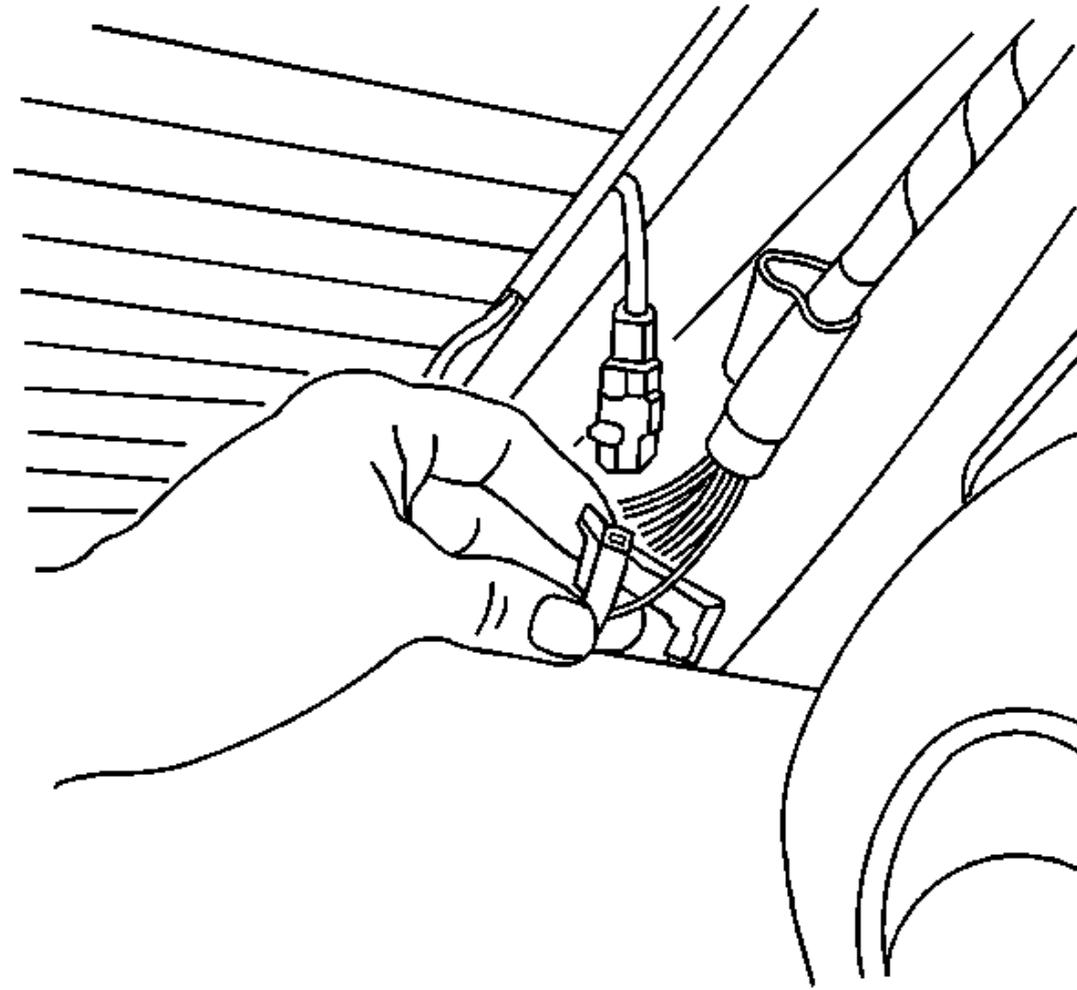


**Fig. 40: Removing/Installing Rear Window**  
Courtesy of GENERAL MOTORS CORP.

8. With the aid of an assistant, lift the rear window from the opening.

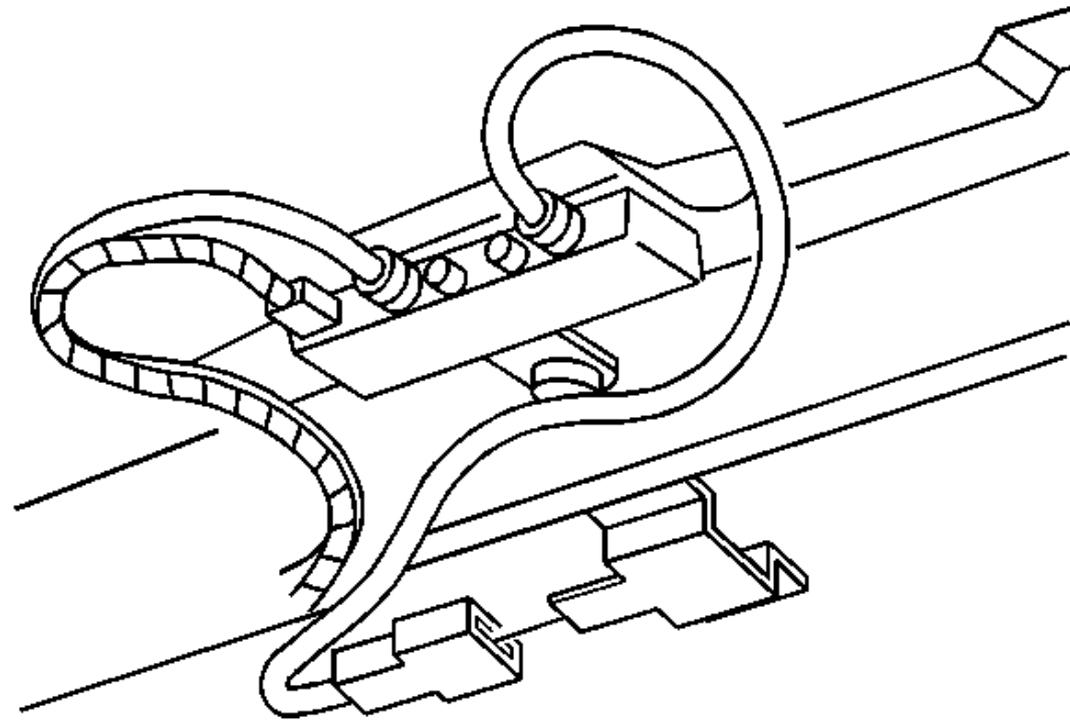
#### **Installation Procedure**

1. Install the rear window into the opening. Refer to [Urethane Adhesive Installation of Stationary Windows](#).



**Fig. 41: Locating Rear Window Defogger Electrical Connector**  
Courtesy of GENERAL MOTORS CORP.

2. Connect the rear window defogger electrical connectors.



**Fig. 42: Rear Window Radio Antenna Connector**  
Courtesy of GENERAL MOTORS CORP.

3. Install the rear window radio antenna connector.
4. Verify the radio has reception.
5. Install the rear upper garnish moldings. Refer to [Garnish Molding Replacement - Lock Pillar Upper](#) in Interior Trim.
6. Install the rear roof rail appliques. Refer to [Molding Replacement - Roof Weld Joint Reveal - Rear \(Coupe\)](#) or [Molding Replacement - Roof Weld Joint Reveal - Rear \(Sedan\)](#) in Exterior Trim.
7. Remove the double layer of masking tape around the perimeter of the painted surfaces and the interior trim.

## **DESCRIPTION AND OPERATION**

### **ADHESIVE SERVICE KIT DESCRIPTION**

The GM of Canada Adhesive Caulking Kit, P/N 10952983, contains the following items:

- Four different primers
- A tube of urethane adhesive with a nozzle
- Four daubers
- Instructions with warnings

Use the urethane adhesive caulking kit for replacement of any urethane adhesive-installed window using the full cut method.

In the United States or Canada, you may use any of the following equivalent urethane adhesive systems which meet GM Specification GM 3651G:

- Dow Automotive - Essex 400HV. One part and requires associated primers.
- Dow Automotive - Essex U216. Two part and requires associated primers.

Call Dow Automotive at 1-800-453-3779 for more information.

- 3M™ "Fast Cure" Auto Glass Urethane. One part and requires associated primers.

Call 3M™ at 1-877-666-2277 for more information.

Use these materials based on specific manufacturer. Do NOT intermix primers or adhesives from one manufacturer to another.

Always follow the system manufacturer's instructions for application, handling, and curing.

### **FULL-CUT METHOD DESCRIPTION**

Use only the full cut method, also know as in the field as Full Strip Method, when installing windows.

This method includes the following:

1. Remove all but approximately 2 mm (3/64 in) of the existing urethane adhesive bead from the pinch-weld flange.
2. Apply pinch-weld primer to any exposed painted areas on the pinch-weld flange.

IMPORTANT:

- If corrosion of the pinch-weld flange is present, or if sheet metal repairs or replacements are required, refinish the pinch-weld flange in order to present a clean, primer-only surface.
- If paint repairs are required, mask the flange bonding area, prior to applying the color coat, in order to provide a clean, primer-only surface.
- Appropriate materials for these primer applications are typically 2 component catalyzed products. Use materials such as BASF DE15®, DuPont 2610®, Sherwin-Williams PSE 4600 and NP70® and Martin-Semour 5120,5130®, PPG DP90LF SPIES/ HECKER 3688/8590 - 3688/5150 - 4070/5090 STANDOX 11158/13320 - 14653/14980 products are approved for this application. Follow the manufacturer's directions for the mix, the application, and the drying times.
- After repairing the opening as indicated, shake the pinch-weld black #3 primer well. Using a new dauber, apply the primer to the primed surface of the flange in the bonding area. Allow the primer to dry for 10 minutes.

### **STATIONARY WINDOW DESCRIPTION**

Most stationary windows, specifically windshields, are retained to the body with urethane adhesive which adheres the window to the body, increasing structural integrity. The reinstallation of the windows with urethane adhesive requires complete replacement of the urethane adhesive bead, and is know as the Full Cut Method.

### **REAR WINDOW DEFOGGER DESCRIPTION AND OPERATION**

#### **Rear Window Defogger System Components**

The rear window defogger system consist of the following components:

- The HVAC control assembly
- The body control module (BCM)
- The REAR DEFOG relay
- The rear window grid

## Rear Window Defogger Operation

Battery positive voltage is supplied through the RR DEFOG fuse, in the underhood fuse block, to the REAR DEFOG relay switched input. Ground for the REAR DEFOG relay is provided by G101. The BCM supplies 12 volts on the rear window defogger switch signal circuit to the HVAC control assembly. When you depress the rear window defogger switch, the rear window defogger switch pulls the signal circuit low. The BCM interprets as a request for the rear window defogger system. The BCM enables the rear window defogger system by supplying voltage to the REAR DEFOG relay coil. The relay coil supply voltage is also spliced off internally in the BCM to the supply voltage circuit of the rear window defogger indicator. The REAR DEFOG relay is energized and the rear window defogger indicator is illuminated. With the relay energized, battery positive voltage is allowed from the relay switched input through the switch contacts and out the relay switched output to the rear window defogger grid. Ground for the rear window defogger grid is provided by G403.

When you start the engine and press the rear window defogger switch for the first time, the defogger cycle lasts for 15 minutes. Further operation results in 7.5 minute defogger cycles. The defogger cycle resets to 15 minutes when you cycle the ignition to the OFF position and then to the ON position.

## 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 consist of the following components:

- Inside rearview mirror
- Ambient air temperature sensor

### Power and Ground of the Inside Rearview Mirror

- With the ignition ON, ignition voltage is supplied to the mirror from the SUNROOF fuse in the I/P fuse block.
- Ground for the mirror is provided by G401.

### 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 rear 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 front of the mirror or windshield side. The ambient light sensor is used to determine light conditions present at the mirror. With automatic day-night feature enabled, the mirror uses ambient light sensor to determine the exterior light condition. With a low light condition detected, and a high light condition from behind 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 light condition that is 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. In night time conditions only, the mirror monitors this input to disable the automatic day-night feature which allows the face to gradually change to a normal state. This allows the driver to see objects in the mirror clearly when backing up.

## Compass

The mirror uses two 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 and 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 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, Compass/Temperature Display without OnStar®

The inside rearview mirror has two 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 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 Variance Procedure](#).

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

The inside rearview mirror has four 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 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 Variance Procedure](#).
- The three switches on the right side of the mirror are for OnStar® operation. For more information, refer to [OnStar Description and Operation](#) in Cellular Communications.

## COMPASS CALIBRATION AND VARIANCE PROCEDURE

### Compass Calibration

Before calibrating the compass, drive the vehicle to an open area that is magnetically clean or free of large metallic objects such as high tension power lines or large steel buildings. Verify there are no magnetized roof antennas, magnets on or hanging from the mirror, or any other magnetized objects on the inside or outside of the vehicle close to the mirror.

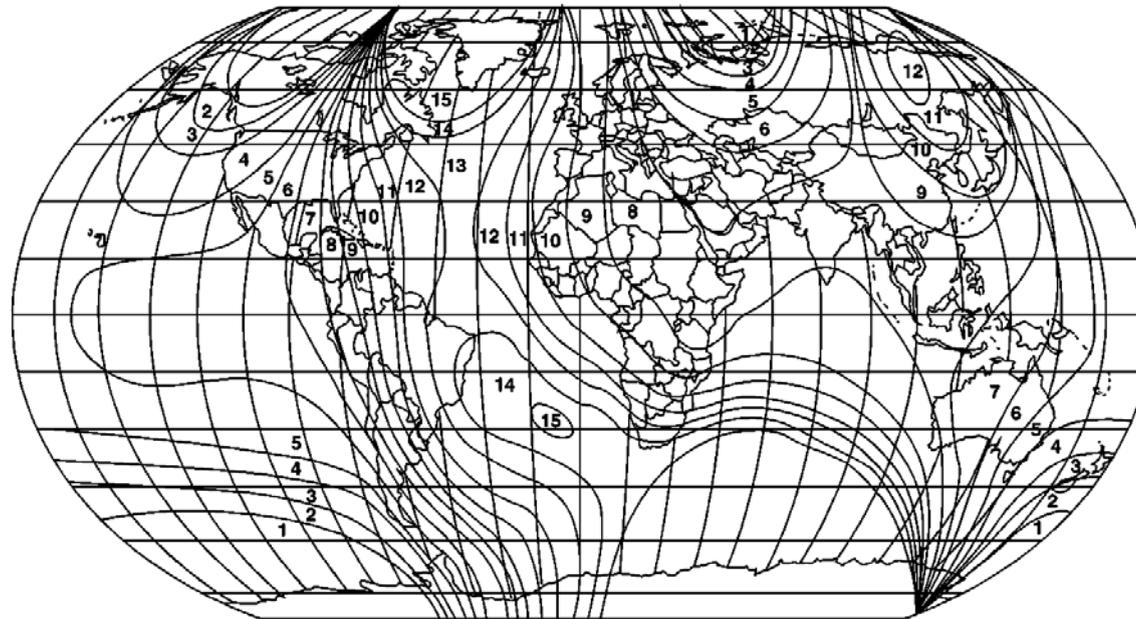
1. Start the engine.

IMPORTANT: Before calibrating the compass, make sure the mirror has the correct zone number. Refer to [Compass Magnetic Variation Adjustment](#).

2. Press and hold the switch for the compass, which may be depicted as COMP, COMPASS, or on/off (w/UE1) depending on the type of mirror on the vehicle, until the letter "C" or "CAL" is displayed.
3. Drive the vehicle in circles at a speed of less than 8 km/h (5 mph) until the "C" or "CAL" is replaced by a proper vehicle heading. The calibration procedure is now complete.

### Compass Magnetic Variation Adjustment

Magnetic variation adjustments are required when the compass displays a constant error in heading. Variation is the difference between magnetic north and true north due to geographical location.



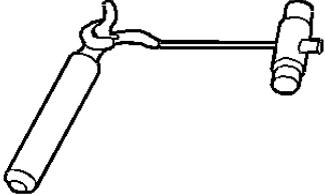
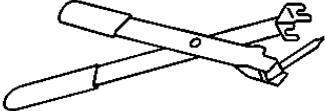
**Fig. 43: World Magnetic Variation Map**  
Courtesy of GENERAL MOTORS CORP.

1. Locate your current geographic location on the World Magnetic Variation Map.
2. Turn ON the ignition, with the engine OFF.
3. Press and hold the switch for the compass, which may be depicted as COMP, COMPASS, or on/off (w/UE1) depending on the type of mirror on the vehicle, until a zone number appears on the compass display.
4. Depress the switch for the compass to select the desired zone number.
5. Wait 5 seconds. The display will return to a compass heading. The variance procedure is now complete.
6. Calibrate the compass. Refer to [Compass Calibration](#).

# SPECIAL TOOLS AND EQUIPMENT

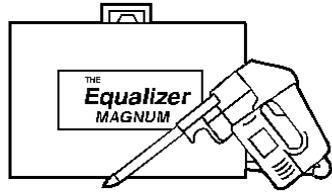
## SPECIAL TOOLS

### Special Tools

Illustration	Tool Number/ Description
	J-9886-01 Door Handle Clip Remover
	J-24402-A Glass Sealant Cold Knife Remover
	J-33431-C Signal Generator and Instrument Panel Tester
	J-34946 Window Pin Remover

**Illustration**

**Tool Number/ Description**



J-39032  
Stationary Glass Removal Tool



J-39040  
Quarter Window Remover