

ACCESSORIES & EQUIPMENT Fixed and

Moveable Windows - CTS Sedan

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

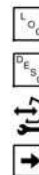
Fastener Tightening Specifications

Application	Specification	
	Metric	English
Front Side Door Window Belt Reveal Molding Screw	2.5 N.m	22 lb in
Front Side Door Window Rear Channel Bolts	11.5 N.m	102 lb in
Front Side Door Window Regulator Guide Bolts	10.5 N.m	93 lb in
Front Side Door Window Regulator Motor Bolts	10.5 N.m	93 lb in
Front Side Door Window Regulator Nuts	11.5 N.m	102 lb in
Rear Side Door Stationary Window Divider Channel Lower Support Bolts	11.5 N.m	102 lb in
Rear Side Door Window Regulator Guide Bolts	10.5 N.m	93 lb in
Rear Side Door Window Regulator Motor Bolts	10.5 N.m	93 lb in
Rear Side Door Window Regulator Nuts	11.5 N.m	102 lb in

SCHEMATIC WIRING DIAGRAMS

MOVEABLE WINDOW WIRING SCHEMATICS

Driver Window



Courtesy of GENERAL MOTORS COMPANY

Passenger Window

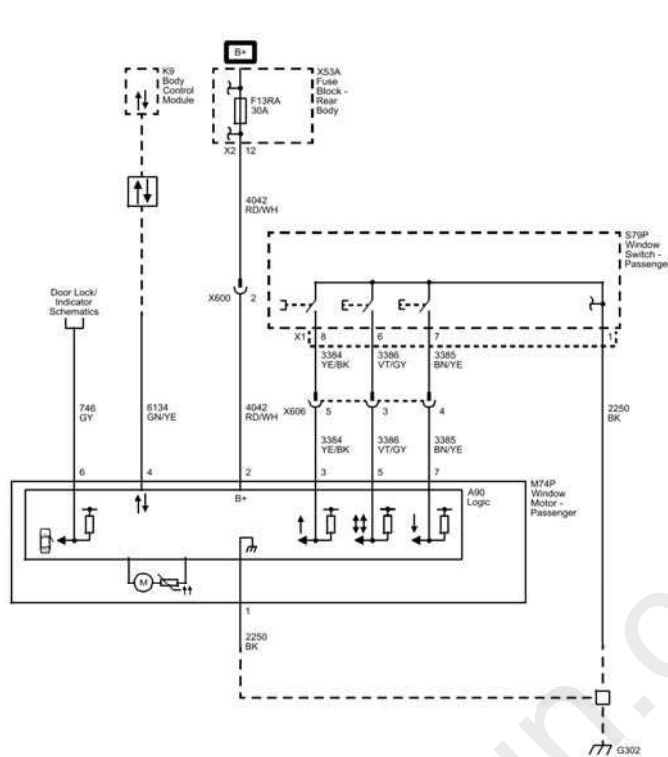


Fig. 2: Passenger Window
 Courtesy of GENERAL MOTORS COMPANY

Rear Window

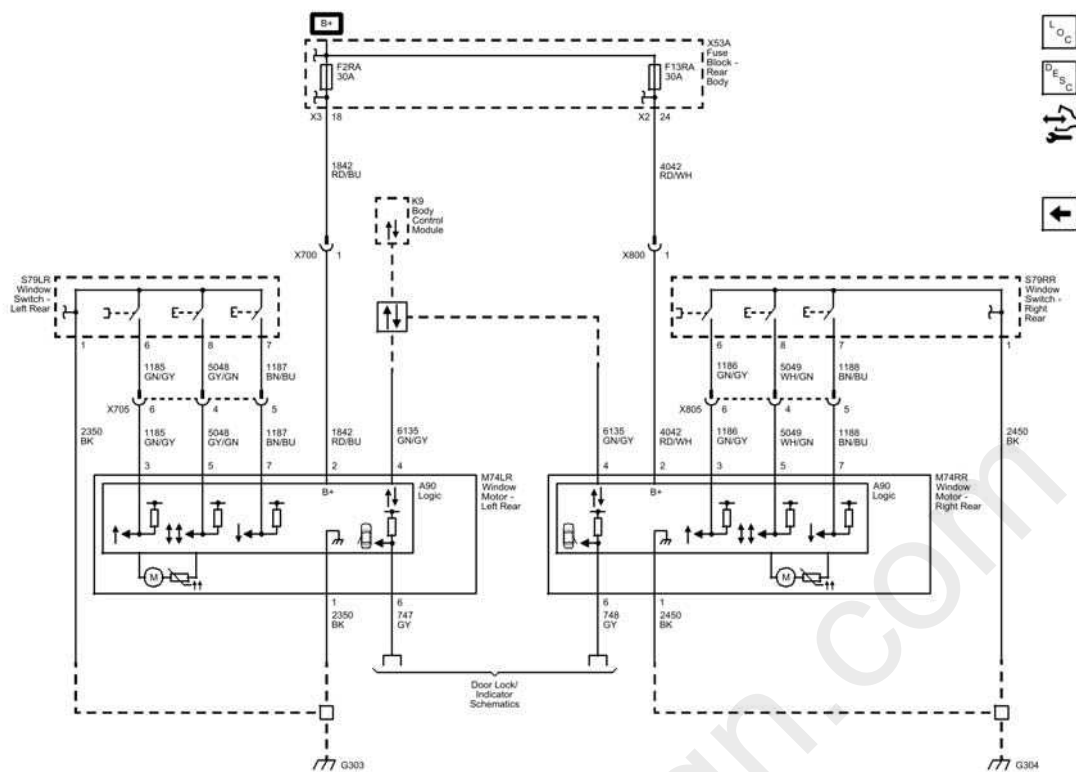


Fig. 3: Rear Window
Courtesy of GENERAL MOTORS COMPANY

DEFOGGER WIRING SCHEMATICS

Defogger System



Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC B0283</u>	DTC B0283 02 v To Ground DTC B0283 05 Rear Defrost Circuit Short To Battery or Open
<u>DTC B316B, B317A, B318A, or B319A</u>	DTC B316B Driver Window Switch DTC B317A Passenger Window Switch DTC B318A Left Rear Window Switch DTC B319A Right Rear Window Switch
<u>DTC B3205, B3210, B3215, or B3220</u>	DTC B3205 Driver Window Motor DTC B3210 Passenger Window Motor DTC B3215 Left Rear Window Motor DTC B3220 Right Rear Window Motor

Diagnostic Instructions

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

DTC Descriptors

DTC B0283 02

Rear Defrost Circuit Short To Ground

DTC B0283 05

Rear Defrost Circuit Short To Battery or Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Control	B0283 02	B0283 05	B0283 05	-
Ground	-	B0283 05	-	-

Circuit/System Description

When the HVAC Control Module receives a rear window defog request from the HVAC face plate, the HVAC Control Module control the coil side of the Rear Defogger Relay. This will energize the relay causing the contacts within the relay to close and provide B+ voltage to the rear window defogger grid.

Conditions for Running the DTC

When the relay is being actively commanded by the HVAC Control Module

Conditions for Setting the DTC

B0283 02

The HVAC Control Module detects a short to ground in the relay coil control circuit.

B0283 05

The HVAC Control Module detects a short to voltage or an open/high resistance in the relay coil control circuit or an open/high resistance in the relay coil ground circuit

Action Taken When the DTC Sets

B0283 02

The rear window defogger will be inoperative.

B0283 05

The rear window defogger will be inoperative or continuously active depending upon the fault.

Conditions for Clearing the DTC

- The DTC will be current for as long as the fault is present.
- When the fault is no longer present, the DTC will be a history DTC.
- A history DTC will clear after 50 ignition cycles.

Reference Information

Schematic Reference

Defogger Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

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

Control Module References for scan tool information

Circuit/System Verification

1. Engine Running.
2. Verify the E18 Rear Defogger Grid turns ON and OFF when commanding the Rear Defogger On and Off with a scan tool.
 - **If the E18 Rear Defogger Grid does not turn ON or OFF**

Refer to Circuit/System Testing

- **If the E18 Rear Defogger Grid turns ON and OFF**

3. All OK.

Circuit/System Testing

1. Ignition OFF and all vehicle systems OFF, disconnect the KR5 Rear Defogger Relay. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 ohms between the ground circuit terminal 85 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, repair the open/high resistance in the ground connection.
 - **If less than 10 ohms**
3. Connect a test lamp between the control circuit terminal 86 and the ground circuit terminal 85, Engine Running.
4. Verify the test lamp turns ON and OFF when commanding the Rear Defogger On and Off with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, remove the test lamp. disconnect the harness connector at the K33 HVAC Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in the control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K33 HVAC Control Module.
 - **If the test lamp is always ON**
 1. Ignition OFF, remove the test lamp, disconnect the harness connector at the K33 HVAC Control Module, Engine Running.
 2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K33 HVAC Control Module.
 - **If the test lamp turns ON and OFF**
5. Test or replace the KR5 Rear Defogger Relay.

Component Testing

Relay Test

1. Ignition OFF, disconnect the KR5 Rear Defogger Relay.

2. Test for 60-180 ohms between terminals 86 and 85.
 - **If less than 60 ohms or greater than 180 ohms**

Replace the KR5 Rear Defogger Relay.

- **If between 60-180 ohms**

3. Test for infinite resistance between the terminals listed below:

- 86 and 30
- 86 and 87
- 85 and 30
- 85 and 87
- **If less than infinite resistance**

Replace the KR5 Rear Defogger Relay.

- **If infinite resistance**

4. Install a 3 A fused jumper wire between relay terminal 86 and 12 V. Install a jumper wire between relay terminal 85 and ground.
5. Test for less than 2 ohms between terminals 30 and 87.
 - **If 2 ohms or greater**

Replace the KR5 Rear Defogger Relay.

- **If less than 2 ohms**

6. All OK

Repair Instructions

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

- **Relay Replacement (Within an Electrical Center)** , **Relay Replacement (Attached to Wire Harness)**
- **Control Module References** for HVAC Control Module replacement, programming and setup

DTC B316B, B317A, B318A, OR B319A: WINDOW SWITCH

Diagnostic Instructions

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

DTC Descriptors

DTC B316B

Driver Window Switch

DTC B317A

Passenger Window Switch

DTC B318A

Left Rear Window Switch

DTC B319A

Right Rear Window Switch

For symptom byte information refer to: **Symptom Byte List**

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Driver Window Motor Control	B316B 02	1	1	-
Left Rear Window Motor Control	B318A 02	3	3	-
Right Rear Window Motor Control	B319A 02	4	4	-
Passenger Window Motor Control	B317A 02	2	2	-
1. Driver Window Malfunction 2. Passenger Window Malfunction 3. Left Rear Window Malfunction 4. Right Rear Window Malfunction				

Circuit/System Description

The window motors supply 12V signal circuits to their respective window switches, when a window switch has been activated, a switch closes providing a ground to the appropriate signal circuit causing the voltage to drop to 0V. The window motor will detect the voltage drop in the signal circuit and will command the window to move in the desired direction.

The driver window master control switch also contains control switches for the passenger, left rear and right rear window functions. When a window switch is pressed, a serial data message is sent to the body control module (BCM). The BCM examines the request and checks for messages from other power window motors that may prohibit window movement. If no prohibitive messages have been received, the BCM will send a serial data message to the passenger window motor or to the appropriate rear window motor which will perform the command as requested.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

B316B 00

The BCM has detected a control switch on the driver window master switch has been active for greater than 60 seconds.

B316B 02

The driver window motor has detected the driver window master switch is active for greater than 60 seconds.

B317A 02

The passenger window motor has detected the passenger window switch is active for greater than 60 seconds.

B318A 02

The left rear window motor has detected the left rear window switch is active for greater than 60 seconds

B319A 02

The right rear window motor has detected the right rear window switch is active for greater than 60 seconds

B316B 39, B317A 39, B318A 39, B319A 39

The window motor has detected an internal failure within the affected door switch

Action Taken When the DTC Sets

The affected power window will malfunction.

Conditions for Clearing the DTC

B316B 00, B316B 02, B317A 02, B318A 02, B319A 02

- The DTC will be current for as long as the fault is present.
- The 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.

B316B 39, B317A 39, B318A 39, B319A 39

If the DTC is current, the affected window switch must be replaced before the DTC can be cleared.

Reference Information

Schematic Reference

Moveable Window Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

Description and Operation

Power Windows Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool parameters listed below change when pressing and pulling the switches for the passenger, left rear and right rear window on the driver window master control;
 - Left Rear Main Control Down Switch - Inactive and Active
 - Left Rear Main Control Express Switch - Inactive and Active
 - Left Rear Main Control Up Switch - Inactive and Active
 - Right Rear Main Control Down Switch - Inactive and Active
 - Right Rear Main Control Express Switch - Inactive and Active
 - Right Rear Main Control Up Switch - Inactive and Active
 - Front Passenger Main Control Down Switch - Inactive and Active
 - Front Passenger Main Control Express Switch - Inactive and Active
 - Front Passenger Main Control Up Switch - Inactive and Active
 - **If any parameter does not change**

Replace the S79D Window Switch-Driver.
 - **If the parameters change**
3. Verify the scan tool parameters listed below change when pressing and pulling the driver window control

switch on the driver window master control:

- Driver Window Main Control Down Switch - Inactive and Active
- Driver Window Main Control Up Switch - Inactive and Active
- Driver Window Main Control Express Down Switch - Inactive and Active
- Driver Window Main Control Express Up Switch - Inactive and Active
- **If any parameter does not change**

Refer to Circuit/System Testing - Driver Window Switch Malfunction.

- **If all the parameters change**

4. Verify the scan tool parameters listed below change when pressing and pulling the S79P Window Switch-Passenger, the S79LR Window Switch-Left Rear and the S79RR Window Switch-Right Rear.
 - Passenger Window Switch at Door - Inactive, Up, Express Up, Down, Express Down
 - Left Rear Window Switch at Door - Inactive, Up, Express Up, Down, Express Down
 - Right Rear Window Switch at Door - Inactive, Up, Express Up, Down, Express Down
 - **If any parameter does not change**

Refer to Circuit/System Testing - Passenger/Rear Window Switch Malfunction.

- **If all the parameters change**

5. All OK.

Circuit/System Testing

Driver Window Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the S79D Window Switch-Driver, ignition ON
2. Verify the scan tool Driver Window Main Control Down Switch parameter is Inactive.
 - **If not Inactive**
 1. Ignition OFF, disconnect the harness connector at the M74D Window Motor-Driver.
 2. Test for infinite resistance between the signal circuit terminal 3 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the M74D Window Motor-Driver.
 - **If Inactive**
3. Install a 3 A fused jumper wire between the signal circuit terminal 3 and ground.
4. Verify the scan tool Driver Window Main Control Down Switch parameter is Active
 - **If not Active**
 1. Ignition OFF, remove the 3 A fused jumper wire, disconnect the harness connector at the M74D Window Motor-Driver, ignition ON.
 2. Test for less than 1 V between the signal circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.

- If less than 1 V
- 3. Ignition OFF, test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the M74D Window Motor-Driver.
- **If Active**
- 5. Verify the scan tool Driver Window Main Control Up Switch parameter is Inactive.
 - **If not Inactive**
 - 1. Ignition OFF, disconnect the harness connector at the M74D Window Motor-Driver.
 - 2. Test for infinite resistance between the signal circuit terminal 6 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the M74D Window Motor-Driver.
 - **If Inactive**
- 6. Install a 3 A fused jumper wire between the signal circuit terminal 6 and ground.
- 7. Verify the scan tool Driver Window Main Control Up Switch parameter is Active
 - **If not Active**
 - 1. Ignition OFF, remove the 3 A fused jumper wire, disconnect the harness connector at the M74D Window Motor-Driver, ignition ON.
 - 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 - 3. Ignition OFF, test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the M74D Window Motor-Driver.
 - **If Active**
- 8. Verify the scan tool Driver Window Main Control Express Switch parameter is Inactive.
 - **If not Inactive**
 - 1. Ignition OFF, disconnect the harness connector at the M74D Window Motor-Driver.
 - 2. Test for infinite resistance between the signal circuit terminal 2 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the M74D Window Motor-Driver.
 - **If Inactive**
- 9. Install a 3 A fused jumper wire between the signal circuit terminal 2 and ground.
- 10. Verify the scan tool Driver Window Main Control Express Switch parameter is Active
 - **If not Active**
 - 1. Ignition OFF, remove the 3 A fused jumper wire, disconnect the harness connector at the M74D Window Motor-Driver, ignition ON.
 - 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.

- If less than 1 V
- 3. Ignition OFF, test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the M74D Window Motor-Driver.
- **If Active**
- 11. Test or replace the S79D Window Switch-Driver.

Passenger/Rear Window Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate passenger or rear S79 Window Switch, ignition ON
2. Verify the appropriate scan tool Window Switch at Door parameter is Inactive.
 - **If not Inactive**
 1. Ignition OFF, disconnect the harness connector at the M74 Window Motor.
 2. Test for infinite resistance between the signal circuit terminal listed below and ground:
 - S79P Window Switch-Passenger - signal circuit terminal 7
 - S79P Window Switch-Passenger - signal circuit terminal 8
 - S79LR Window Switch-Left Rear - signal circuit terminal 6
 - S79LR Window Switch-Left Rear - signal circuit terminal 7
 - S79RR Window Switch-Right Rear - signal circuit terminal 6
 - S79RR Window Switch-Right Rear - signal circuit terminal 7
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the M74 Window Motor.
 - **If Inactive**
3. Install a 3 A fused jumper wire between the circuit terminal listed below and ground:
 - S79P Window Switch-Passenger - signal circuit terminal 8
 - S79LR Window Switch-Left Rear - signal circuit terminal 6
 - S79RR Window Switch-Right Rear - signal circuit terminal 6
4. Verify the scan tool Window Switch at Door parameter is Up
 - **If Inactive**
 1. Ignition OFF, remove the 3 A fused jumper wire, disconnect the harness connector at the M74 Window Motor, ignition ON.
 2. Test for less than 1 V between the circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Ignition OFF, test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the M74 Window Motor.
 - **If Up**

5. Install a 3 A fused jumper wire between the signal circuit terminal 7 and ground.
6. Verify the scan tool Window Switch at Door parameter is Down
 - **If Inactive**
 1. Ignition OFF, remove the 3 A fused jumper wire, disconnect the harness connector at the M74 Window Motor, ignition ON.
 2. Test for less than 1 V between the signal circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Ignition OFF, test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the M74 Window Motor.
 - **If Down**
7. Test for greater than 10 V between the signal circuit terminal listed below and ground:
 - S79P Window Switch-Passenger - signal circuit terminal 6
 - S79LR Window Switch-Left Rear - signal circuit terminal 8
 - S79RR Window Switch-Right Rear - signal circuit terminal 8
 - **If less than 10 V**
 1. Ignition OFF, disconnect the harness connector at the M74 Window Motor.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance on the circuit.
 - If less than 2 ohms, replace the M74 Window Motor.
 - **If greater than 10 V**
8. Test or replace the passenger or rear S79 Window Switch.

Component Testing

Passenger/Rear Window Switch

1. Ignition OFF, disconnect the harness connector at the appropriate passenger or rear S79 Window Switch.
2. Test for infinite resistance between the terminals listed below with the switch in the open position:
 - Ground terminal 1 and control terminal 6
 - Ground terminal 1 and control terminal 7
 - Ground terminal 1 and control terminal 8
 - **If less than infinite resistance**

Replace the passenger or rear S79 Window Switch.

- **If infinite resistance**

3. Test for less than 3 ohms between the ground terminal 1 and the control terminal 8 with the switch in the Up position.

- **If 3 ohms or greater**

Replace the passenger or rear S79 Window Switch.

- **If less than 3 ohms**

4. Test for less than 3 ohms between the ground terminal 1 and the control terminal 7 with the switch in the Down position.

- **If 3 ohms or greater**

Replace the passenger or rear S79 Window Switch.

- **If less than 3 ohms**

5. All OK

Repair Instructions

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

- **Front Side Door Window Control Switch Replacement (Left Side)**
- **Front Side Door Window Switch Replacement - Right Side**
- **Rear Side Door Window Switch Replacement**
- **Front Side Door Window Regulator Motor Replacement**
- **Rear Side Door Window Regulator Motor Replacement**

DTC B3205, B3210, B3215, OR B3220: WINDOW MOTOR

Diagnostic Instructions

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

DTC Descriptors

DTC B3205

Driver Window Motor

DTC B3210

Passenger Window Motor

DTC B3215

Left Rear Window Motor

DTC B3220

Right Rear Window Motor

For symptom byte information, refer to **Symptom Byte List** .

Circuit/System Description

The body control module (BCM) monitors, receives and transmits serial data to each of the doors switches and window motors. When a window switch has been activated on the driver window switch, a signal is sent to the BCM which sends a signal to the appropriate window motor and the window motor will move in the direction commanded.

Conditions for Running the DTC

- The ignition switch is in the ON position.
- Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

B3205 00, B3210 00, B3215 00, B3220 00

The BCM has detected that the compatibility code stored in the affected window motor does not match the compatibility code stored in the BCM.

B3205 39, B3210 39, B3215 39, B3220 39

An internal malfunction has been detected by the BCM in the power window motor while commanding the window UP or DOWN.

B3205 42, B3210 42, B3215 42, B3220 42

The BCM will automatically attempt to download the calibration program into the appropriate window motor (As will occur when the window motor has been replaced), if the first calibration program fails to load, the BCM will attempt to download the calibration program a second time. If this download fails, the BCM will set appropriate DTC.

B3205 4B, B3210 4B, B3215 4B, B3220 4B

The BCM detects that a window motor is "not normalized" which will occur under the following conditions:

- When the battery has been disconnected
- When the battery has been replaced

- When the door wiring harness has been disconnected
- When the window motor has been disconnected.

Action Taken When the DTC Sets

B3205 00, B3205 39, B3205 42, B3210 00, B3210 39, B3210 42, B3215 39, B3220 39

The affected motor will be inoperative.

B3205 4B, B3210 4B, B3215 4B, B3220 4B

The affected motor will not perform the express up or express down functions and the driver information center will display Open, then Close Driver Window or will display Open, then Close Passenger Window.

Conditions for Clearing the DTC

B3205 00, B3210 00, B3215 00, B3220 00

Installing a compatible window motor for that specific make and model vehicle.

B3205 39, B3210 39, B3215 39, B3220 39

The appropriate window motor must be replaced before the DTC can be cleared.

B3205 42, B3210 42, B3215 42, B3220 42

The appropriate window motor must be replaced before the DTC can be cleared.

B3205 4B, B3210 4B, B3215 4B, B3220 4B

The appropriate window motor must be normalized before the DTC can be cleared.

Reference Information

Schematic Reference

Moveable Window Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

Description and Operation

Power Windows Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the driver, passenger, left rear and right rear window functions while commanding the Driver Window Motor, Passenger Window Motor, Left Rear Window Motor and Right Rear Window Motor Up and Down with a scan tool.
 - **If the Up and Down does not work**

Replace the appropriate M74 Window Motor .
 - **If the Up and Down works**
3. Verify the driver, passenger, left rear and right rear window performs the Express Up and Express Down functions with the driver window switch.
 - **If a window does not Express Up and Express Down**

Normalize the window motor, refer to **Window Motor Programming - Express Function**.
 - **If the window performs the Express Up and Express Down functions**
4. All OK.

Repair Instructions

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

- **Front Side Door Window Regulator Motor Replacement**
- **Rear Side Door Window Regulator Motor Replacement**

SYMPTOMS - FIXED AND MOVEABLE WINDOWS

Important Preliminary Checks Before Starting:

1. Perform the **Diagnostic System Check - Vehicle** before using the symptom tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.

2. Review the power window system operation or rear window defogger system operation in order to familiarize yourself with the system functions. Refer to the following:

- **Rear Window Defogger Description and Operation**
- **Power Windows Description and Operation**

Visual/Physical Inspection

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

Intermittent

NOTE:

- **Inspect for proper installation of electrical components if an intermittent condition exists. Inspect for aftermarket theft deterrent devices, lights, and cellular phones. Ensure that no aftermarket equipment is connected to the class 2 circuit. If you can not locate an intermittent condition, a cellular phone signal may cause the condition. Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to Testing for Intermittent Conditions and Poor Connections .**
- **The problem may or may not turn ON the SERVICE VEHICLE SOON indicator or store a DTC. Do not use the symptom tables to diagnose intermittent conditions. The malfunction must be present in order to locate the problem.**

Poor electrical connections or wiring cause most intermittent conditions. Perform a careful visual/physical check for the following conditions:

- Poor mating of the connector halves or a terminal not fully seated in the connector body
- An improperly formed or damaged terminal
- Reform or replace connector terminals in the problem circuit in order to ensure proper contact tension.
- Poor terminal to wire connection requires removing the terminal from the connector body in order to perform the check.

Use a scan tool in order to help detect intermittent conditions. The scan tool has several features that can be used to locate an intermittent condition. The snapshot feature can capture and store data parameters within the scan tool when the malfunction occurs. This information can then be reviewed in order to see what caused the malfunction.

Symptom List

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

- **Rear Window Defogger Malfunction**

- **Power Windows Malfunction**

REAR WINDOW DEFOGGER MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Relay B+	1	1	-	-
Relay Control	B0283 02	B0283 05	B0283 05	-
Relay Ground	-	B0283 05	-	-
Rear Defogger Grid Control	1	1	2	-
Rear Defogger Grid Ground	-	1	-	-
1. Rear Defogger Inoperative 2. Rear Defogger Always ON				

Circuit/System Description

When the HVAC control module receives a rear window defog request from the radio/HVAC controls, the HVAC control module will supply 12 V to the coil side of the rear defogger relay. This will energize the relay causing the contacts within the relay to close and provide B+ voltage to the rear window defogger grid.

Reference Information

Schematic Reference

Defogger Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

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

Control Module References for scan tool information

Circuit/System Verification

1. Engine running.
2. Verify the scan tool Rear Defogger Switch parameter changes between On and Off when pressing the rear window defogger switch.
 - **If the parameter does not change between On and Off**
Replace the A20 Radio/HVAC Controls.
 - **If the parameter changes between On and Off**
3. Verify the rear window defog indicator turns ON and OFF when commanding the Illuminate All Indicators On and Off with a scan tool.
 - **If the rear window defog indicator does not turn ON and OFF**
Replace the A20 Radio/HVAC Controls.
 - **If the rear window defog indicator turns ON and OFF**
4. Verify the E18 Rear Defogger Grid turns ON and OFF when commanding the Rear Defogger On and Off with a scan tool.
 - **If the E18 Rear Defogger Grid does not turn ON and OFF**
Refer to Circuit/System Testing
 - **If the E18 Rear Defogger Grid turns ON and OFF**
5. All OK.

Circuit/System Testing

1. Ignition OFF and all vehicle systems OFF, disconnect the KR5 Rear Defogger Relay. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 ohms between the ground circuit terminal 85 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.

- If less than 2 ohms, repair the open/high resistance in the ground connection.
- **If less than 10 ohms**
- 3. Ignition ON.
- 4. Verify a test lamp illuminates between the B+ circuit terminal 30 and ground.
 - **If the test lamp does not illuminate**
 - Replace the X53A Fuse Block-Rear Body
 - **If the test lamp illuminates**
- 5. Connect a test lamp between the control circuit terminal 86 and the ground circuit terminal 85.
- 6. Verify the test lamp turns ON and OFF when commanding the Rear Defogger On and Off with a scan tool.
 - **If the test lamp is always OFF**
 1. Ignition OFF, remove the test lamp, disconnect the harness connector at the K33 HVAC Control Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in the control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K33 HVAC Control Module.
 - **If the test lamp is always ON**
 1. Ignition OFF, remove the test lamp, disconnect the harness connector at the K33 HVAC Control Module, ignition ON.
 2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K33 HVAC Control Module.
 - **If the test lamp turns ON and OFF**
- 7. Verify that a test lamp does not illuminate between the control circuit terminal 87 and ground.
 - **If the test lamp illuminates**

Repair the short to voltage on the control circuit
 - **If the test lamp does not illuminate**
- 8. Ignition OFF and all vehicle systems OFF, disconnect the X2 harness connector at the E18 Rear Defogger Grid. It may take up to 2 minutes for all vehicle systems to power down.
- 9. Test for less than 10 ohms between the ground circuit terminal 1 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.

- If less than 2 ohms, repair the open/high resistance in the ground connection.
- **If less than 10 ohms**
- 10. Connect the X2 harness connector at the E18 Rear Defogger Grid.
- 11. Ignition ON, connect a 40 A fused jumper wire between the B+ circuit terminal 30 and the control circuit terminal 87.
- 12. Verify the E18 Rear Defogger Grid is activated.
 - **If the E18 Rear Defogger Grid does not activate**
 1. Ignition OFF, remove the jumper wire, disconnect the X1 harness connector at the E18 Rear Defogger Grid.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in the control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the E18 Rear Defogger Grid.
 - **If the E18 Rear Defogger Grid activates**
- 13. Test or replace the KR5 Rear Defogger Relay.

Component Testing

Relay Test

1. Ignition OFF, disconnect the KR5 Rear Defogger Relay.
2. Test for 60-180 ohms between terminals 86 and 85.
 - **If less than 60 ohms or greater than 180 ohms**

Replace the KR5 Rear Defogger Relay.

- **If between 60-180 ohms**

3. Test for infinite resistance between the terminals listed below:
 - 86 and 30
 - 86 and 87
 - 85 and 30
 - 85 and 87
 - **If less than infinite resistance**

Replace the KR5 Rear Defogger Relay.

- **If infinite resistance**

4. Install a 3 A fused jumper wire between relay terminal 86 and 12 V. Install a jumper wire between relay terminal 85 and ground.

5. Test for less than 2 ohms between terminals 30 and 87.

- **If 2 ohms or greater**

Replace the KR5 Rear Defogger Relay.

- **If less than 2 ohms**

6. All OK

Rear Defogger Grid Test

NOTE: Lightly touch the grid lines when testing with the test lamp. If the test lamp point is scraped through the grid line it can cause an open in the circuit

1. Engine running, command the Rear Defogger ON with a scan tool.
2. Verify that a test lamp illuminates between each rear window defogger grid line and ground. The test lamp should be off when testing at the ground side of the grid and get brighter as the test lamp moves closer to the voltage supply side of the grid. The test lamp should be dim when testing each grid line in the middle

- **If the test lamp remains bright at the middle of the grid line.**

The grid line is open between the test point and the ground side of the grid.

Replace the rear window

- **If the test lamp remains off at the middle of the grid line.**

The grid line is open between the test point and the voltage supply side of the grid.

Replace the rear window

- **If the test lamp remains dim at the middle of each grid line.**

3. All OK

Repair Instructions

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

- **Rear Window Replacement**
- **Relay Replacement (Within an Electrical Center)** , **Relay Replacement (Attached to Wire Harness)**
- **Rear Body Fuse Block Replacement**
- **Control Module References** for HVAC control module or radio/HVAC controls replacement, programming and setup

POWER WINDOWS MALFUNCTION

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Driver Window Motor B+	U1530 00, U1534 00	U1530 00	-	-
Driver Window Motor Serial Data	U1530 00, U1534 00	U1534 00	U1534 00	-
Driver Window Motor Down Signal	B316B 02	1	1	-
Driver Window Motor Express Signal	B316B 02	1	1	-
Driver Window Motor Up Signal	B316B 02	1	1	-
Driver Window Motor Ground	-	U1534 00	-	-
Driver Window Switch Ground	-	1, 2, 3, 4	-	-
Left Rear Window Motor B+	U1530 00, U1534 00	U1534 00	-	-
Left Rear Window Motor Serial Data	U1530 00, U1534 00	U1534 00	U1534 00	-
Left Rear Window Motor Down Signal	B318A 02	3	3	-
Left Rear Window Motor Express Signal	B318A 02	3	3	-
Left Rear Window Motor Up Signal	B318A 02	3	3	-
Left Rear Window Motor Ground	-	U1530 00	-	-
Left Rear Window Switch Ground	-	3	-	-
Right Rear Window Motor B+	U1530 00, U1534 00	U1534 00	-	-
Right Rear Window Motor Serial Data	U1530 00, U1534 00	U1534 00	U1534 00	-
Right Rear Window Motor Down Signal	B319A 02	4	4	-
Right Rear Window Motor Express Signal	B319A 02	4	4	-

Right Rear Window Motor Up Signal	B319A 02	4	4	-
Right Rear Window Motor Ground	-	U1530 00	-	-
Right Rear Window Switch Ground	-	4	-	-
Passenger Window Motor B+	U1530 00, U1534 00	U1530 00	-	-
Passenger Window Motor Serial Data	U1530 00, U1534 00	U1534 00	U1534 00	-
Passenger Window Motor Down Signal	B317A 02	2	1	-
Passenger Window Motor Express Signal	B317A 02	2	1	-
Passenger Window Motor Up Signal	B317A 02	2	1	-
Passenger Window Motor Ground	-	U1534 00	-	-
Passenger Window Switch Ground	-	2	-	-
1. Driver Window Malfunction 2. Passenger Window Malfunction 3. Left Rear Window Malfunction 4. Right Rear Window Malfunction				

Circuit/System Description

The window motors supply 12V signal circuits to their respective window switches, when a window switch has been activated, a switch closes providing a ground to the appropriate signal circuit causing the voltage to drop to 0V. The window motor will detect the voltage drop in the signal circuit and will command the window to move in the desired direction.

The driver window master control switch also contains control switches for the passenger, left rear and right rear window functions. When a window switch is pressed, a serial data message is sent to the body control module. The body control module examines the request and checks for messages from other power window motors that may prohibit window movement. If no prohibitive messages have been received, the body control module will send a serial data message to the passenger window motor or to the appropriate rear window motor which will perform the command as requested.

Diagnostic Aids

The loss of the express up and express down functions for the driver, passenger and rear windows may have occurred for the following reasons:

- The battery was disconnected
- The battery was replaced

- A door wiring harness was disconnected
- A window motor was disconnected

The window motors will need to be normalized in order to restore the express functions, refer to **Window Motor Programming - Express Function** for the proper procedure.

Reference Information

Schematic Reference

Moveable Window Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - SEDAN

Description and Operation

Power Windows Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the driver window functions while commanding the Driver Window Motor Up and Down with a scan tool.
 - **If the driver window does not move Up and Down as commanded**

Refer to Circuit/System Testing - Window Motor Malfunction.
 - **If the driver window moves Up and Down as commanded**
3. Verify the driver window moves while commanding the window UP, express UP, DOWN and express DOWN with the S79D Window Switch-Driver.
 - **If the driver window does not move UP or DOWN as commanded**

Refer to Circuit/System Testing - Driver Window Switch Malfunction.

- **If the driver window does not express UP or express DOWN**

Normalize the driver window motor, refer to **Window Motor Programming - Express Function.**

- **If after normalization, the driver window does not express UP or express DOWN**

Refer to Circuit/System Testing - Driver Window Switch Malfunction.

- **If the driver window moves UP, express UP, DOWN and express DOWN as commanded**

4. Verify the scan tool parameters listed below change when pressing and pulling the switches for the passenger, left rear and right rear window on the driver window master control;

- Left Rear Main Control Down Switch - Inactive and Active
- Left Rear Main Control Express Switch - Inactive and Active
- Left Rear Main Control Up Switch - Inactive and Active
- Right Rear Main Control Down Switch - Inactive and Active
- Right Rear Main Control Express Switch - Inactive and Active
- Right Rear Main Control Up Switch - Inactive and Active
- Front Passenger Main Control Down Switch - Inactive and Active
- Front Passenger Main Control Express Switch - Inactive and Active
- Front Passenger Main Control Up Switch - Inactive and Active
- **If any parameter does not change**

Replace the S79D Window Switch-Driver.

- **If the parameters change**

5. Verify the scan tool Child Security Lockout Switch parameter changes between Inactive and Active when pressing the window lockout switch.

- **If the parameters do not change**

Refer to **Power Door Child Lock Malfunction**

- **If the parameters changes**

6. Verify the lockout indicator turns ON and OFF when commanding the Child Security Lock Indicator ON and OFF with a scan tool.

- **If the indicator does not turn ON and OFF**

Replace the S79D Window Switch-Driver.

- **If the indicator turns ON and OFF**

7. Verify the passenger, left rear and right rear window move while commanding the Passenger Window Motor, Left Rear Window Motor, and Right Rear Window Motor Up and Down with a scan tool.

- **If a passenger or rear window does not move Up and Down as commanded**

Refer to Circuit/System Testing - Window Motor Malfunction.

- **If the passenger and rear window moves Up and Down as commanded**

8. Verify the passenger and rear window moves while commanding the window UP, express UP, DOWN and express DOWN with the appropriate passenger or rear S79 Window Switch.

- **If a passenger or rear window does not move UP or DOWN as commanded**

Refer to Circuit/System Testing - Passenger/Rear Window Switch Malfunction.

- **If a passenger or rear window does not express UP or express DOWN**

Normalize the appropriate window motor, refer to **Window Motor Programming - Express Function**.

- **If after normalization, a passenger or rear window does not express UP or express DOWN**

Refer to Circuit/System Testing - Passenger/Rear Window Switch Malfunction.

- **If the passenger and rear window moves UP, express UP, DOWN and express DOWN as commanded**

9. Command the rear window lockout by pressing the window lockout switch on the S79D Window Switch-Driver.

10. Verify the left rear and right rear window does not move while commanding the window UP and DOWN with the S79LR Window Switch-Left Rear and S79RR Window Switch-Right Rear.

- **If a rear window moves UP and DOWN as commanded**

Refer to **Power Door Child Lock Malfunction** .

- **If the rear windows do not move UP and DOWN**

11. All OK.

Circuit/System Testing

Window Motor Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the appropriate M74 Window Motor. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 ohms between the ground circuit terminal 1 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.

- If less than 2 ohms, repair the open/high resistance in the ground connection.
 - **If less than 10 ohms**
- 3. Ignition ON.
- 4. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 - 1. Ignition OFF.
 - 2. Test for less than 2 ohms in the B+ circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 - 1. Ignition OFF.
 - 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the M74 window motor.
 - **If the test lamp illuminates**
- 5. Test or replace the M74 Window Motor.

Driver Window Switch Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S79D Window Switch-Driver. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 ohms between the ground circuit terminal 1 and ground.
 - **If 10 ohms or greater**
 - 1. Ignition OFF.
 - 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, repair the open/high resistance in the ground connection.
 - **If less than 10 ohms**
3. Ignition ON.
4. Verify a test lamp illuminates between the B+ circuit terminal 4 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 - 1. Ignition OFF.
 - 2. Test for less than 2 ohms in the B+ circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 - 1. Ignition OFF.
 - 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.

- If infinite resistance, replace the S79D Window Switch-Driver.
- **If the test lamp illuminates**
- 5. Verify the scan tool Driver Window Main Control Down Switch parameter is Inactive.
 - **If not Inactive**
 1. Ignition OFF, disconnect the harness connector at the M74D Window Motor-Driver.
 2. Test for infinite resistance between the S79D Window Switch-Driver signal circuit terminal 3 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the M74D Window Motor-Driver.
 - **If Inactive**
- 6. Install a 3 A fused jumper wire between the signal circuit terminal 3 and the ground circuit terminal 1.
- 7. Verify the scan tool Driver Window Main Control Down Switch parameter is Active
 - **If not Active**
 1. Ignition OFF, remove the 3 A fused jumper wire, disconnect the harness connector at the M74D Window Motor-Driver, ignition ON.
 2. Test for less than 1 V between the S79D Window Switch-Driver signal circuit terminal 3 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the M74D Window Motor-Driver.
 - **If Active**
- 8. Verify the scan tool Driver Window Main Control Up Switch parameter is Inactive.
 - **If not Inactive**
 1. Ignition OFF, disconnect the harness connector at the M74D Window Motor-Driver.
 2. Test for infinite resistance between the S79D Window Switch-Driver signal circuit terminal 6 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the M74D Window Motor-Driver.
 - **If Inactive**
- 9. Install a 3 A fused jumper wire between the signal circuit terminal 6 and the ground circuit terminal 1.
- 10. Verify the scan tool Driver Window Main Control Up Switch parameter is Active
 - **If not Active**
 1. Ignition OFF, remove the 3 A fused jumper wire, disconnect the harness connector at the M74D Window Motor-Driver, ignition ON.
 2. Test for less than 1 V between the S79D Window Switch-Driver signal circuit 6 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V

3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the M74D Window Motor-Driver.
 - **If Active**
11. Verify the scan tool Driver Window Main Control Express Switch parameter is Inactive.
 - **If not Inactive**
 1. Ignition OFF, disconnect the harness connector at the M74D Window Motor-Driver.
 2. Test for infinite resistance between the S79D Window Switch-Driver signal circuit terminal 2 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the M74D Window Motor-Driver.
 - **If Inactive**
12. Install a 3 A fused jumper wire between the signal circuit terminal 2 and the ground circuit terminal 1.
13. Verify the scan tool Driver Window Main Control Express Switch parameter is Active
 - **If not Active**
 1. Ignition OFF, remove the 3 A fused jumper wire, disconnect the harness connector at the M74D Window Motor-Driver, ignition ON.
 2. Test for less than 1 V between the S79D Window Switch-Driver signal circuit 2 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the M74D Window Motor-Driver.
 - **If Active**
14. Test or replace the S79D Window Switch-Driver.

Passenger/Rear Window Switch Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the appropriate passenger or rear S79 Window Switch. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 ohms between the ground circuit terminal 1 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, repair the open/high resistance in the ground connection.
 - **If less than 10 ohms**
3. Ignition ON.
4. Verify the appropriate scan tool Window Switch at Door parameter is Inactive.

- **If not Inactive**

1. Ignition OFF, disconnect the harness connector at the M74 Window Motor.
2. Test for infinite resistance between the signal circuit terminal listed below and ground:
 - S79P Window Switch-Passenger - signal circuit terminal 7
 - S79P Window Switch-Passenger - signal circuit terminal 8
 - S79LR Window Switch-Left Rear - signal circuit terminal 6
 - S79LR Window Switch-Left Rear - signal circuit terminal 7
 - S79RR Window Switch-Right Rear - signal circuit terminal 6
 - S79RR Window Switch-Right Rear - signal circuit terminal 7
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the M74 Window Motor.

- **If Inactive**

5. Install a 3 A fused jumper wire between the circuit terminal listed below and ground:
 - S79P Window Switch-Passenger - signal circuit terminal 8
 - S79LR Window Switch-Left Rear - signal circuit terminal 6
 - S79RR Window Switch-Right Rear - signal circuit terminal 6
6. Verify the scan tool Window Switch at Door parameter is Up
 - **If not Up**
 1. Ignition OFF, remove the 3 A fused jumper wire, disconnect the harness connector at the M74 Window Motor, ignition ON.
 2. Test for less than 1 V between the circuit terminal and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Ignition OFF, test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the M74 Window Motor.
 - **If Up**
7. Install a 3 A fused jumper wire between the signal circuit terminal 7 and ground.
8. Verify the scan tool Window Switch at Door parameter is Down
 - **If not Down**
 1. Ignition OFF, remove the 3 A fused jumper wire, disconnect the harness connector at the M74 Window Motor, ignition ON.
 2. Test for less than 1 V between the S79 Window Switch signal circuit terminal 7 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
 3. Ignition OFF, test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the M74 Window Motor.

- **If Down**

9. Test for greater than 10 V between the signal circuit terminal listed below and ground:

- S79P Window Switch-Passenger - signal circuit terminal 6
- S79LR Window Switch-Left Rear - signal circuit terminal 8
- S79RR Window Switch-Right Rear - signal circuit terminal 8

- **If less than 10 V**

1. Ignition OFF, disconnect the harness connector at the M74 Window Motor.
2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance on the circuit.
 - If less than 2 ohms, replace the M74 Window Motor.

- **If greater than 10 V**

10. Test or replace the passenger or rear S79 Window Switch.

Repair Instructions

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

- **Front Side Door Window Control Switch Replacement (Left Side)**
- **Front Side Door Window Switch Replacement - Right Side**
- **Rear Side Door Window Switch Replacement**
- **Front Side Door Window Regulator Motor Replacement**
- **Rear Side Door Window Regulator Motor Replacement**

SIDE DOOR WINDOW MECHANICAL DIAGNOSIS

Side Door Window Mechanical Diagnosis

Cause	Correction
DEFINITION: A mechanical condition that requires a correction for proper operation of the side door window. Refer to <u>Symptoms - Fixed and Moveable Windows</u> prior to beginning this table.	
Intermittent Operation	Check proper glass alignment/attachment and door seal installation.
	Check switch and switch bezel to see if sticking.
	Check wire harness for pinched/shorted wire.
	THIS STEP APPLIES TO ALL TWO PIN MOTOR CONNECTORS ONLY. Perform electrical diagnostics, by first applying 12 volt power supply to the regulator motor to verify motor function.
Glass Binds	Check proper glass alignment/attachment.
	Check for defective seal and/or proper seal installation.

	Check for debris in glass run channel.
	Check for glass run channel position.
Regulator/Glass Rattles	Check for loose fasteners and retorque if required.
	Check that the glass is in the channel and reinstall if not positioned correctly.
Noisy Operation	Check for other components in the glass path such as wire harness, impact foam, lock rods, or cables.
	Check for proper glass alignment/attachment and door seal installation.
Windnoise	Check seals, mirror patch, and glass alignment.
False glass reversal, the glass goes down unexpectedly.	Check seals, reinitialize the glass and/or realign the glass.
	Check for debris in the glass run channel.

REPAIR INSTRUCTIONS

WINDSHIELD REPLACEMENT

Special Tools

- **BO-39032** Stationary Glass Removal Tool
- Use an adhesive that is approved by GM

For equivalent regional tools, refer to **Special Tools**.

Removal Procedure

1. Open the hood.
2. Remove the windshield wiper arms. Refer to **Windshield Wiper Arm Replacement** .
3. Remove the windshield side reveal molding. Refer to **Windshield Side Reveal Molding Replacement**.
4. Remove the air inlet grille. Refer to **Air Inlet Grille Panel Replacement** .
5. Remove the windshield garnish moldings. Refer to **Windshield Garnish Molding Replacement** .
6. Lower the front section of the headliner only to access the urethane adhesive bead. Refer to **Headlining Trim Panel Replacement (With Sunroof)** , **Headlining Trim Panel Replacement (Without Sunroof)** .

NOTE: If the windshield is equipped with a blackout area around the mirror base bracket, Care Must be used not to cut or scrape the blackout. If the mount bracket comes off the windshield, it can Not be reinstalled and the windshield must be replaced. If the bracket is bonded to the windshield, it is Not reusable. Remove all sensors, cover, electrical devices, and bracket from the pins. If the bracket is bonded to the windshield, it is Not reusable.

7. Remove the inside rearview mirror. Refer to **Inside Rearview Mirror Replacement** .
8. Remove the camera. Refer to **Front View Camera Replacement (With UGN)** , **Front View Camera Replacement (With UFL)** .

9. Remove the outside moisture sensor. Refer to **Windshield Outside Moisture/Ambient Light and Humidity Sensor Replacement** .

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

10. Cover to protect the following parts from broken glass:

- Upper dash pad
- Defroster outlets and A/C outlets
- Seats and carpeting

WARNING: Refer to **Glass and Sheet Metal Handling Warning** .

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

11. Using the appropriate tool, carefully cut the windshield lace molding from around the window in order to access the urethane adhesive bead.

NOTE: Keep the cutting edge of the tool against the window. There are window locating pins, one in each corner of the window. Use care Not to remove or cut them off when removing the window. If the window locator pins are cut, it will be necessary to tape the window in place.

12. Do the following steps when separating the window from the urethane adhesive:

- Leave a base of urethane adhesive on the pinchweld flange.
- The only suitable lubrication is clean water, no oils, lubes or soaps.
- **BO-39032** Stationary Glass Removal Tool , or equivalent in order to remove the window.

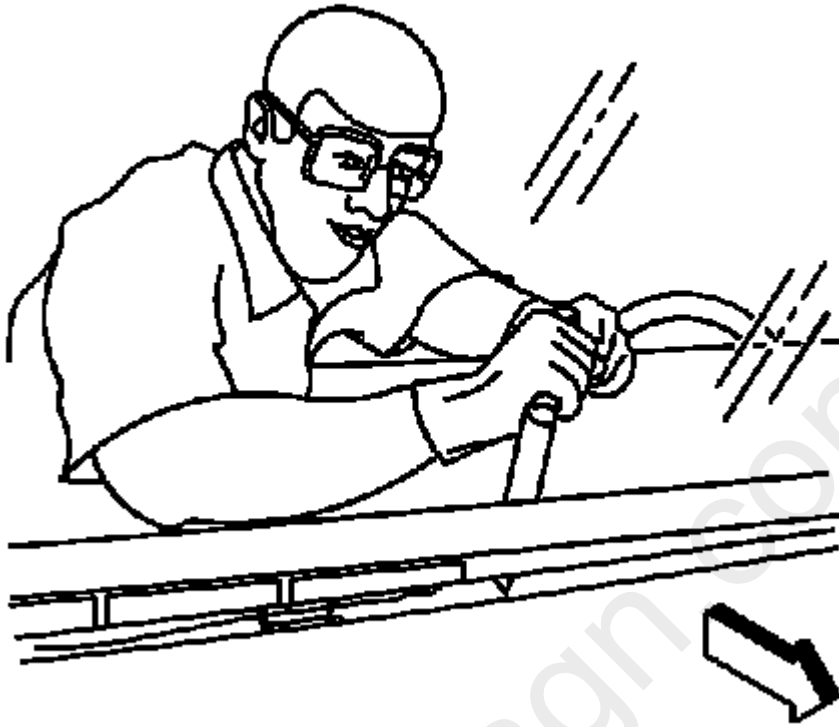


Fig. 5: Separating Bottom Of Window
Courtesy of GENERAL MOTORS COMPANY

13. Using the appropriate tool, cut along the bottom of the window separating the window from urethane adhesive. Keep the cutting edge of the tool against the window. Do this from inside the vehicle. While cutting from inside the vehicle, reposition the tool to cut the urethane adhesive along the top and both sides to release the window completely.

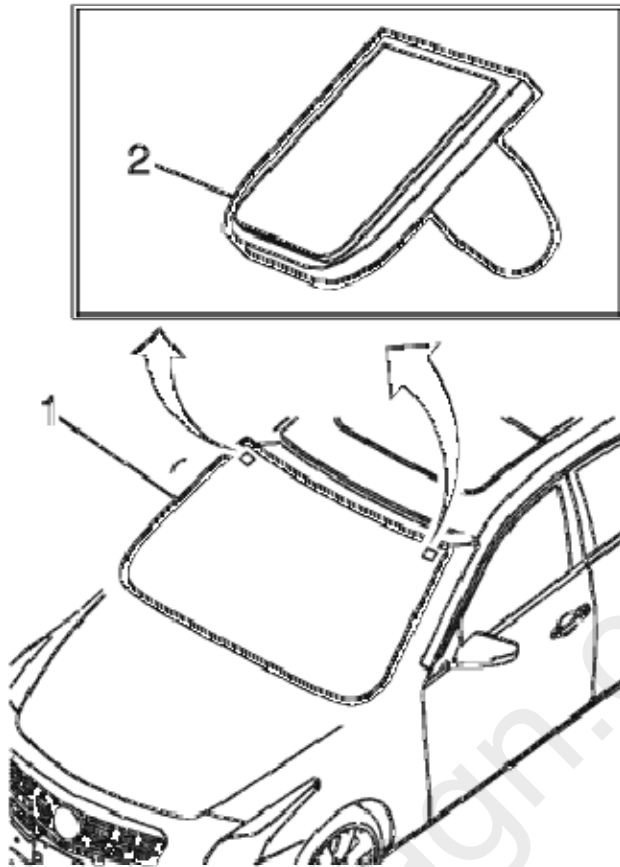


Fig. 6: Windshield And Locator Pins
Courtesy of GENERAL MOTORS COMPANY

14. With an assistant, remove the windshield (1) and locator pins (2) from the vehicle.

Installation Procedure

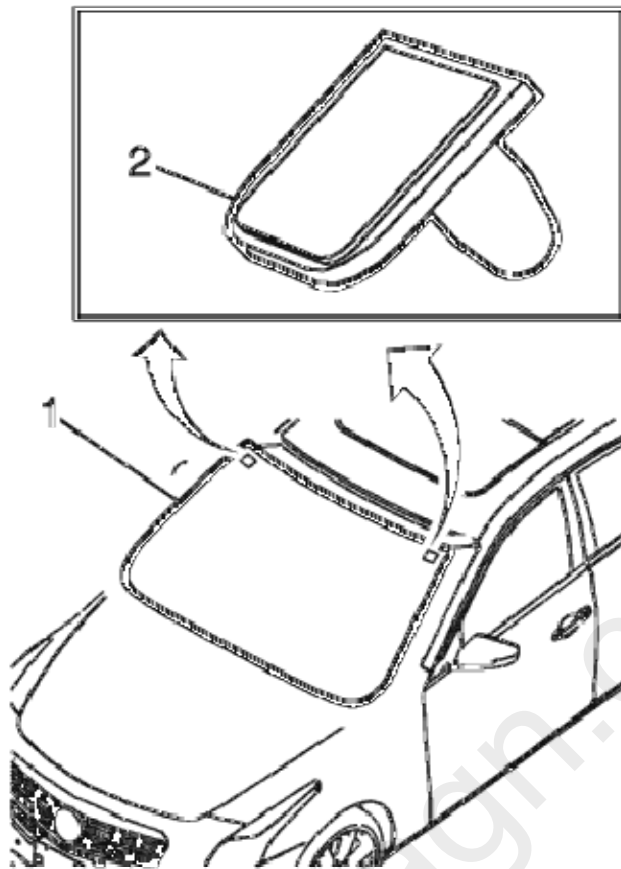


Fig. 7: Windshield And Locator Pins
Courtesy of GENERAL MOTORS COMPANY

1. With an assistant, install the windshield (1) and locator pins (2) into the opening. Refer to **Adhesive Installation of Windshields**.
2. Install the outside moisture sensor. Refer to **Windshield Outside Moisture/Ambient Light and Humidity Sensor Replacement**.
3. Install the camera. Refer to **Front View Camera Replacement (With UGN)**, **Front View Camera Replacement (With UFL)**.
4. Install the inside rearview mirror. Refer to **Inside Rearview Mirror Replacement**.
5. Install the front section of the headliner. Refer to **Headlining Trim Panel Replacement (With Sunroof)**, **Headlining Trim Panel Replacement (Without Sunroof)**.
6. Install the windshield garnish moldings. Refer to **Windshield Garnish Molding Replacement**.
7. Install the air inlet grille. Refer to **Air Inlet Grille Panel Replacement**.
8. Install the windshield side reveal molding. Refer to **Windshield Side Reveal Molding Replacement**.
9. Install the windshield wipers arms. Refer to **Windshield Wiper Arm Replacement**.
10. Remove the double layer of masking tape around the perimeter of the painted surfaces and the interior trim.
11. Close the hood.

WINDSHIELD SIDE REVEAL MOLDING REPLACEMENT

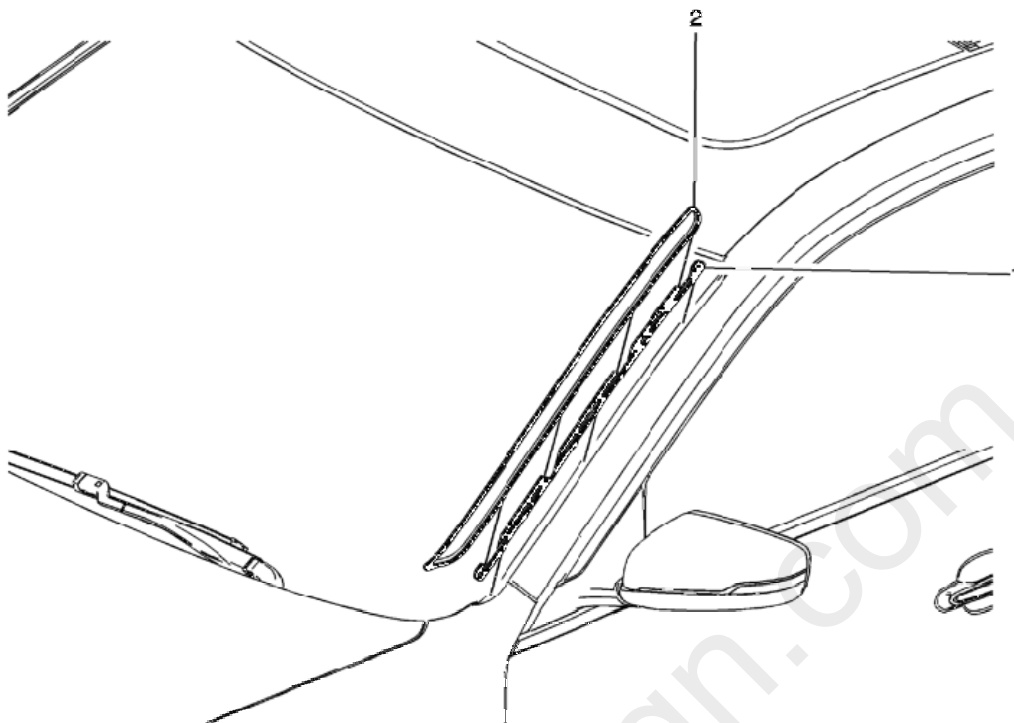


Fig. 8: Windshield Side Reveal Molding
Courtesy of GENERAL MOTORS COMPANY

Windshield Side Reveal Molding Replacement

Callout	Component Name
1	Windshield Side Reveal Molding Retainer
2	Windshield Side Reveal Molding

FRONT SIDE DOOR WINDOW REPLACEMENT

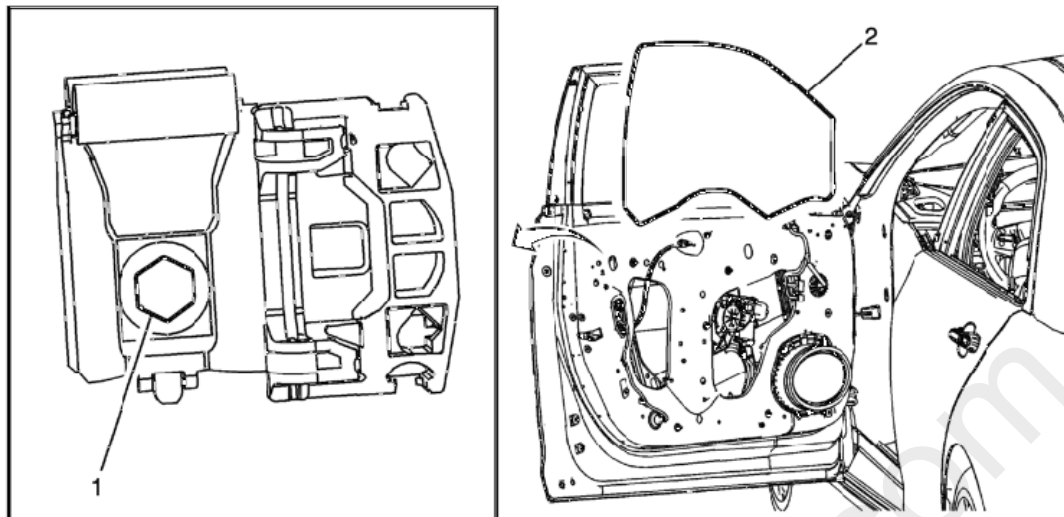


Fig. 9: Front Side Door Window
 Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Replacement

Callout	Component Name
WARNING: Refer to <u>Glass and Sheet Metal Handling Warning</u> .	
WARNING: Disconnect the power window switch when working inside the door. When operated, the Express Up/Down Feature allows the door window to move very quickly, without stopping, which could cause personal injury.	
Preliminary Procedures	
1. Remove the front side door window garnish molding. Refer to <u>Front Side Door Window Garnish Molding Replacement</u> .	
2. Remove the front side door inner sealing strip. Refer to <u>Front Side Door Window Inner Sealing Strip Replacement</u> .	
3. Remove the front door water deflector.	
	Front Side Door Window Regulator Guide Bolt (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> .

1	Procedure 1. Apply masking tape to the applique, reveal belt molding and door frame. 2. Position the window approximately half way down in the door. 3. Loosen the bolts that attach the window to the window regulator guides. 4. Tilt the window downward in the front, pull up on the back of the window and pull it out from the frame. Tighten 10.5 N.m (93 lb in)
2	Front Side Door Window Procedure Place the window into the door frame, slide the window downward locking the retainers into the window retaining holes. NOTE: Inspect the window for proper operation before installing the trim panel.

REAR SIDE DOOR WINDOW REPLACEMENT

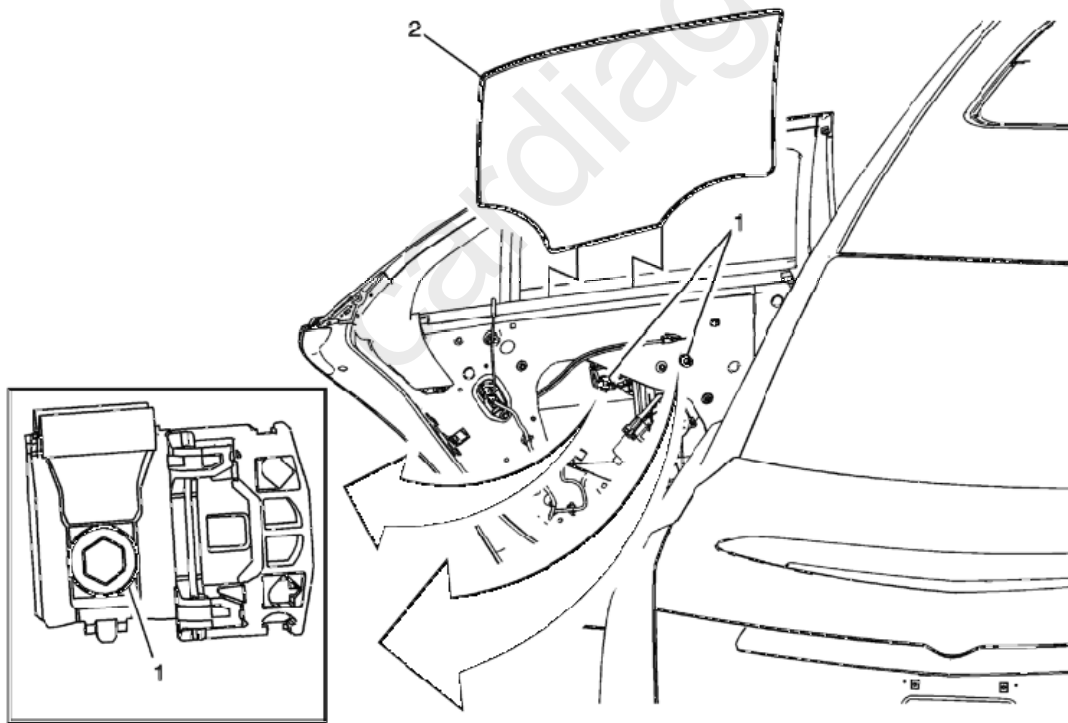


Fig. 10: Rear Side Door Window
Courtesy of GENERAL MOTORS COMPANY

Rear Side Door Window Replacement

Callout	Component Name
WARNING: Refer to <u>Glass and Sheet Metal Handling Warning</u> .	
WARNING: Disconnect the power window switch when working inside the door. When operated, the Express Up/Down Feature allows the door window to move very quickly, without stopping, which could cause personal injury.	
Preliminary Procedures 1. Remove the rear side door garnish molding. Refer to <u>Rear Side Door Window Garnish Molding Replacement</u> . 2. Remove the rear side door inner sealing strip. Refer to <u>Rear Side Door Window Inner Sealing Strip Replacement</u>. 3. Remove the rear side door water deflector.	
1	Rear Side Door Window Regulator Guide Bolt (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Procedure 1. Apply masking tape to the applique, reveal belt molding and door frame. 2. Position the window approximately half way down in the door. 3. Loosen the bolts that attach the window to the window regulator guides. 4. Tilt the window downward in the front, pull up on the back of the window and pull it out from the frame. Tighten 10.5 N.m (93 lb in)
2	Rear Side Door Window Procedure Place the window into the door frame, slide the window downward locking the retainers into the window retaining holes. NOTE: Inspect the window for proper operation before installing the trim.

REAR WINDOW REPLACEMENT

Special Tools

- **BO-39032** Stationary Glass Removal Tool
- Use an adhesive that is approved by GM

For equivalent regional tools, refer to **Special Tools**.

Removal Procedure

WARNING: 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.

NOTE: 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 rear compartment lid in order to access the reveal molding.
2. Remove the body side rear window garnish molding. Refer to **Body Side Rear Window Garnish Molding Replacement** .
3. Disconnect the rear window defogger electrical connectors.
4. Disconnect the rear window radio antenna. Refer to **Radio, Mobile Telephone, and Vehicle Location Antenna Cable Replacement** .
5. Disconnect the radio antenna coil from the rear window. Refer to **Radio Antenna Coil Replacement** .
6. Disconnect the radio antenna ground coil from the rear window. Refer to **Radio Antenna Ground Coil Replacement** .
7. Disconnect the radio antenna amplifier from the rear window. Refer to **Radio Antenna Amplifier Replacement** .

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

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

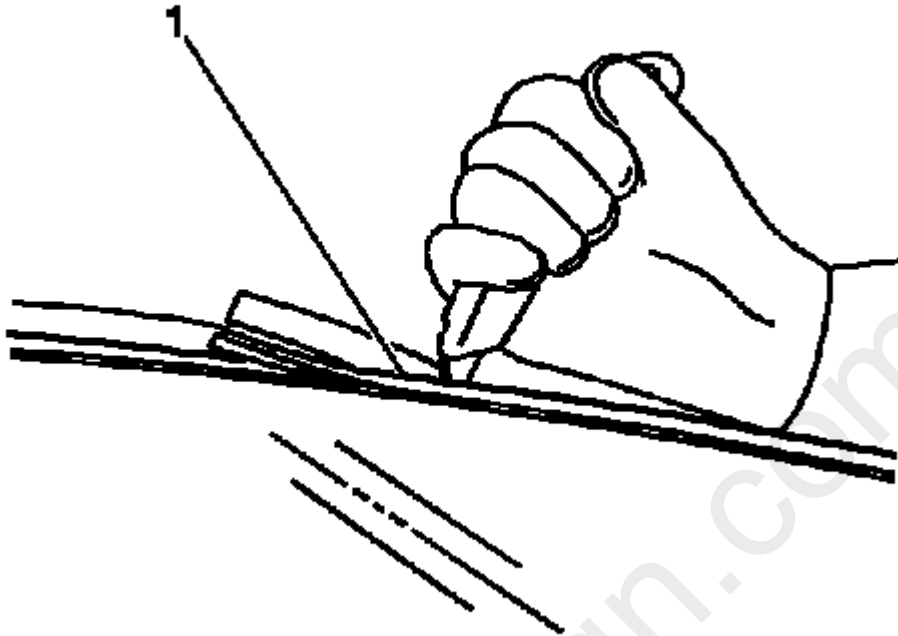


Fig. 11: Using Utility Knife To Remove Reveal Molding
Courtesy of GENERAL MOTORS COMPANY

WARNING: Refer to Glass and Sheet Metal Handling Warning .

9. Using a utility knife, carefully cut the rear window lace molding (1) in order to access the urethane adhesive bead.

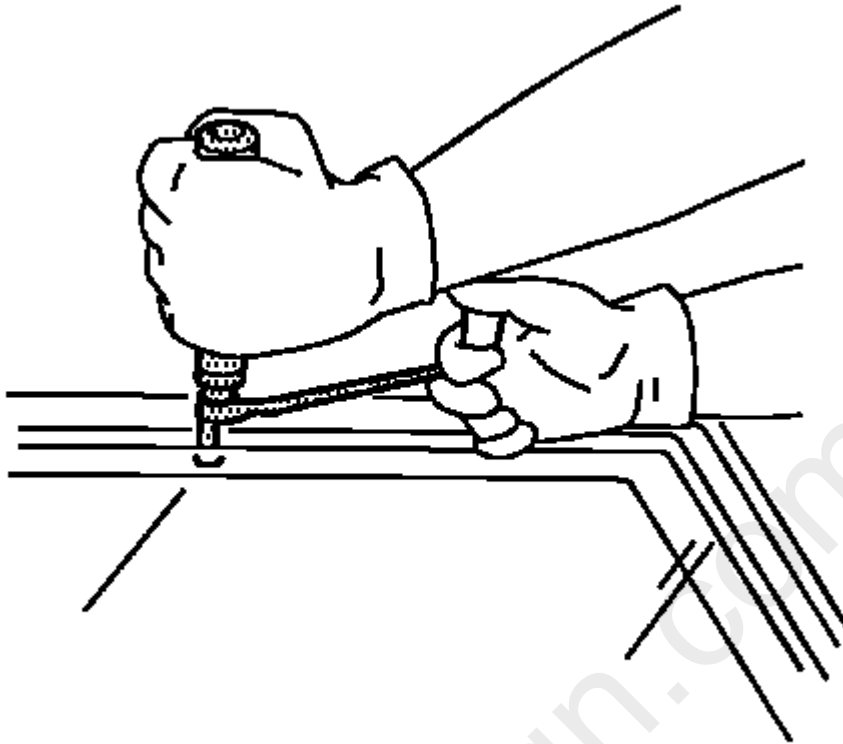


Fig. 12: Separating Urethane Adhesive From Window
Courtesy of GENERAL MOTORS COMPANY

NOTE: Keep the cutting edge of the tool against the window. There are window locating pins, one in each corner of the window. Use care Not to remove or cut them off when removing the window. If the window locator pins are cut, it will be necessary to tape the window in place.

10. This will allow the urethane adhesive to be separated from the window.
 - Leave a base of urethane on the pinchweld flange.
 - The only suitable lubrication is clean water.
 - **BO-39032** Stationary Glass Removal Tool , or equivalent in order to remove the window.

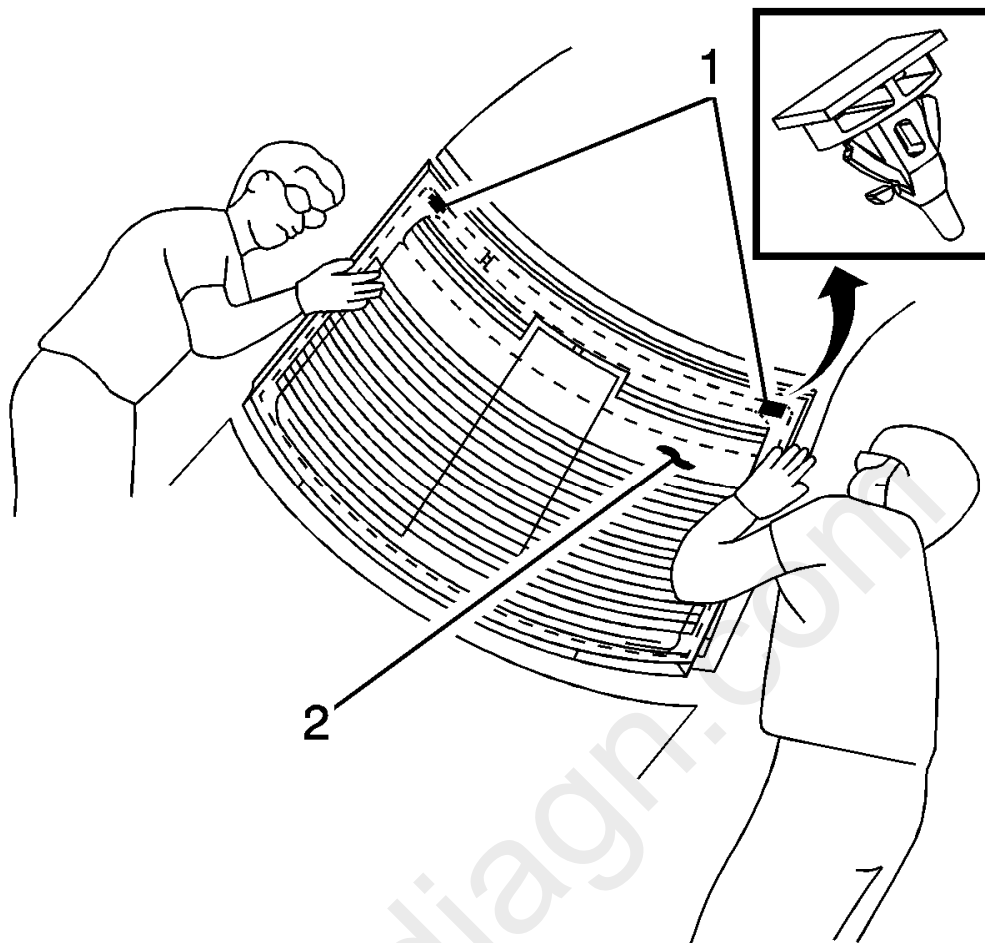


Fig. 13: Installing Rear Window
 Courtesy of GENERAL MOTORS COMPANY

11. With an assistant, remove the locator pins (1) and rear window (2) from the vehicle.

Installation Procedure

1. Install the rear window into the opening. Refer to **Adhesive Installation of Rear Windows**.
2. Connect the rear window defogger electrical connectors.
3. Disconnect the radio antenna amplifier from the rear window. Refer to **Radio Antenna Amplifier Replacement**.
4. Disconnect the radio antenna ground coil from the rear window. Refer to **Radio Antenna Ground Coil Replacement**.
5. Disconnect the radio antenna coil from the rear window. Refer to **Radio Antenna Coil Replacement**.
6. Connect the rear window radio antenna. Refer to **Radio, Mobile Telephone, and Vehicle Location Antenna Cable Replacement**.
7. Check the radio and OnStar® system to verify reception.

8. Install the body side rear window garnish molding. Refer to **Body Side Rear Window Garnish Molding Replacement** .
9. Close the rear compartment lid.
10. Remove the double layer of masking tape around the perimeter of the painted surfaces and the interior trim.

REAR SIDE DOOR WINDOW REAR CHANNEL REPLACEMENT

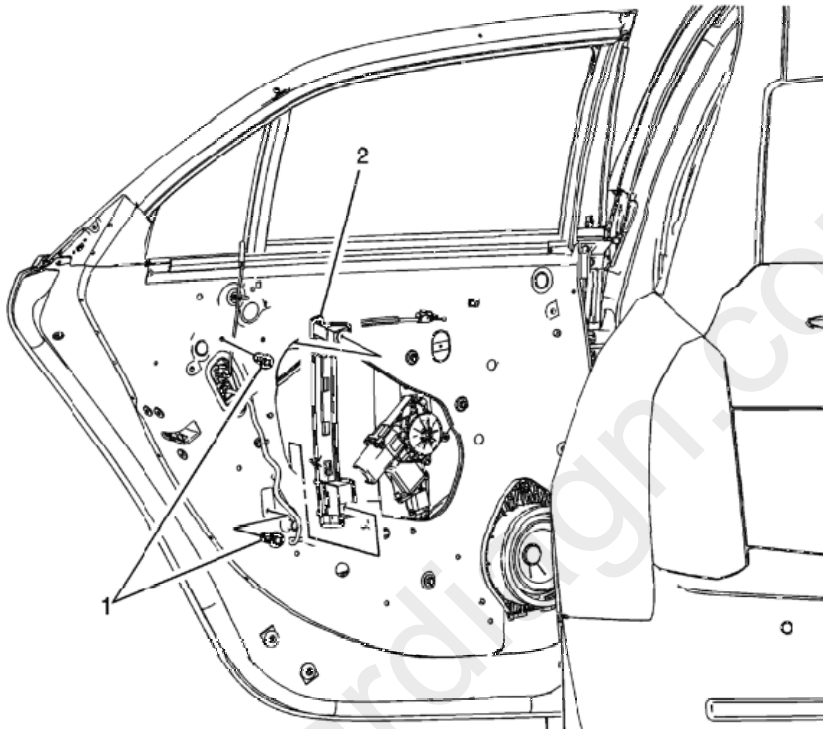


Fig. 14: Rear Side Door Window Rear Channel
Courtesy of GENERAL MOTORS COMPANY

Rear Side Door Window Rear Channel Replacement

Callout	Component Name
Preliminary Procedures	
1. Remove the rear side door trim. Refer to <u>Rear Side Door Trim Replacement</u> . 2. Remove the rear side door armrest plate bolts and plate from the inner door panel. 3. Remove the rear door water deflector.	
	Rear Side Door Stationary Window Divider Channel Lower Support Bolt (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Procedure

1	1. Place the window in the full up position. 2. Pull the rear side door window rear channel downward and away from the stationary window. Tighten 11.5 N.m (102 lb in)
2	Rear Side Door Window Rear Channel Procedure When installing the rear side door window rear channel, ensure that it is in line with the stationary window so that the window will roll properly. NOTE: Inspect the window for proper operation before installing the door trim.

FRONT SIDE DOOR WINDOW CONTROL SWITCH REPLACEMENT (LEFT SIDE)

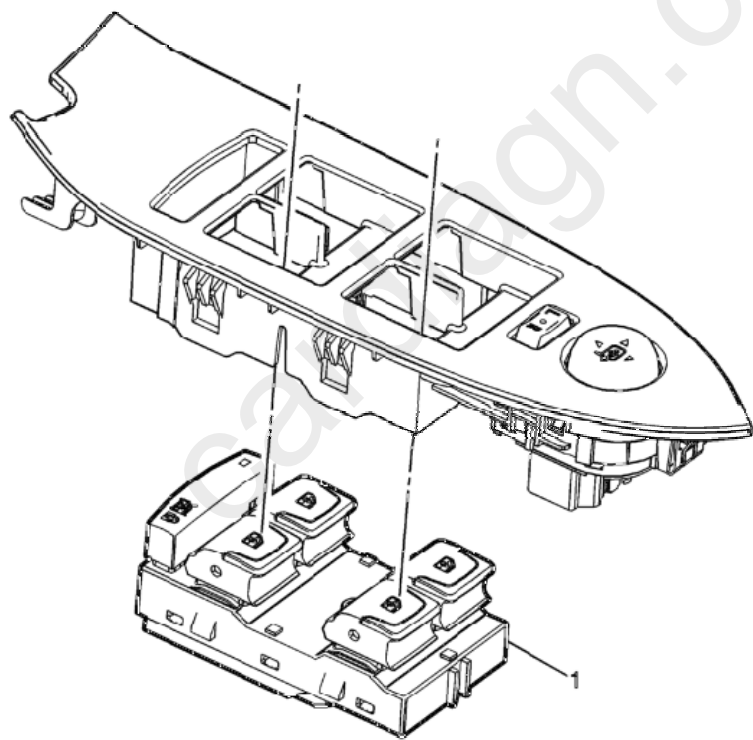


Fig. 15: Front Side Door Window Control Switch (Left Side)
Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Control Switch Replacement (Left Side)

Callout	Component Name
Preliminary Procedure Remove the front side door armrest switch mount plate - driver side door. Refer to Front Side Door	

Armrest Switch Mount Plate Replacement (Driver Side Door) , Front Side Door Armrest Switch Mount Plate Replacement (Passenger Side Door) .

1	Front Side Door Window Control Switch Assembly - Left Side
	Procedure
	1. Release tabs on switch to remove from the front side door armrest switch mount plate. 2. Refer to <u>Control Module References</u> for programming and set up procedures.

FRONT SIDE DOOR WINDOW SWITCH REPLACEMENT - RIGHT SIDE

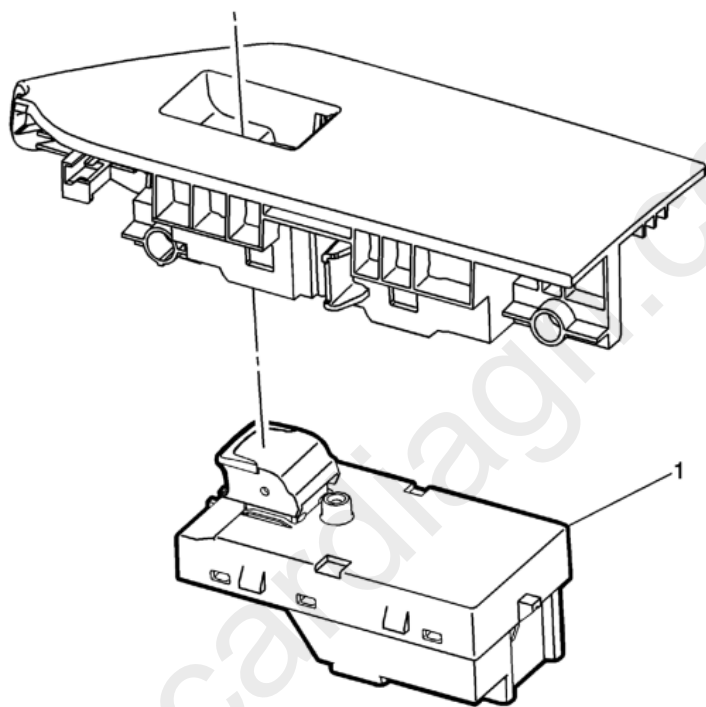


Fig. 16: Front Side Door Window Switch - Right Side
Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Switch Replacement - Right Side

Callout	Component Name
Preliminary Procedure Remove the front side door armrest switch mount plate. Refer to <u>Front Side Door Armrest Switch Mount Plate Replacement (Driver Side Door) , Front Side Door Armrest Switch Mount Plate Replacement (Passenger Side Door) .</u>	
1	Front Side Door Window Switch Assembly - Right Side
	Procedure
	1. Release tabs on switch to remove from front side door armrest switch mount plate.

2. Refer to **Control Module References** for programming and set up procedures.

REAR SIDE DOOR WINDOW SWITCH REPLACEMENT

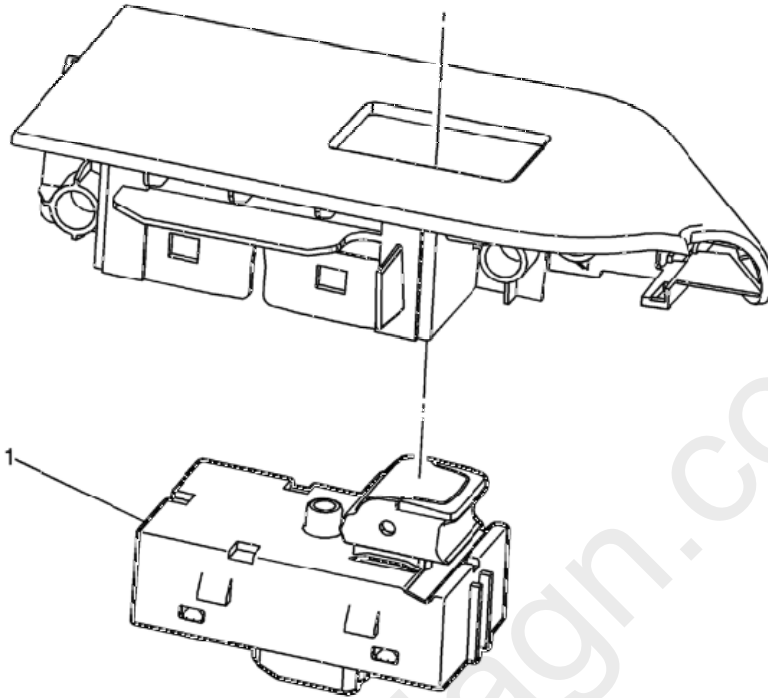


Fig. 17: Rear Side Door Window Switch
Courtesy of GENERAL MOTORS COMPANY

Rear Side Door Window Switch Replacement

Callout	Component Name
Preliminary Procedure Remove the rear side door armrest switch mount plate. Refer to <u>Rear Side Door Armrest Switch Mount Plate Replacement</u> .	
1	Rear Side Door Window Switch Assembly Procedure 1. Release the tabs on switch to remove from the rear side door accessory switch mount plate. 2. Refer to <u>Control Module References</u> for programming and set up procedures.

FRONT SIDE DOOR WINDOW REGULATOR REPLACEMENT

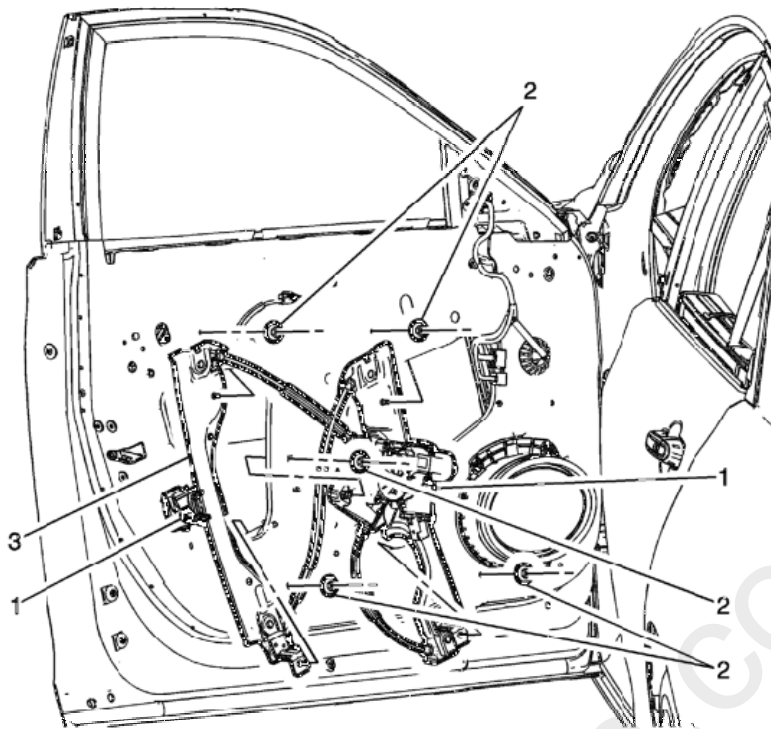


Fig. 18: Front Side Door Window Regulator
Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Regulator Replacement

Callout	Component Name
WARNING: Refer to <u>Glass and Sheet Metal Handling Warning</u> .	
WARNING: Disconnect the power window switch when working inside the door. When operated, the Express Up/Down Feature allows the door window to move very quickly, without stopping, which could cause personal injury.	
Preliminary Procedures	
1. Remove the front side door trim. Refer to <u>Front Side Door Trim Replacement</u> . 2. Remove the water deflector.	
1	Front Side Door Window Regulator Guide Bolt (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Procedure

	1. Position the window to access the window regulator guide bolts. 2. Place the window in the full up position and tape in place. Tighten 10.5 (93 lb in)
2	Front Side Door Window Regulator Nut (Qty: 5) Procedure Disconnect the electrical connector. Tighten 11.5 (102 lb in)
3	Front Side Door Window Regulator Procedure Transfer the window regulator motor. Refer to <u>Front Side Door Window Regulator Motor Replacement.</u> NOTE: Inspect the door window for proper operation before installing the door trim.

WINDOW MOTOR PROGRAMMING - EXPRESS FUNCTION

Window Motor Normalized Procedure

A window motor that has not been normalized will no longer perform the express up and express down functions, this may occur during the following conditions:

- When a window motor has been disconnected or replaced
- When a door harness has been disconnected
- When the battery has been disconnected or replaced

NOTE: When DTC B3205 4B & 3210 4B are set, the following warnings will be displayed on the driver information center:

Open, then Close Driver Window

Open, then Close Passenger Window

These warnings will clear once the windows have been "Normalized" and the respective DTC will clear.

To normalize the window motor, follow these steps:

NOTE: The doors must be completely closed prior to normalizing the windows, a door that is open or ajar may cause the power window to function abnormally or to become inoperative while performing the normalizing

procedure. If this occurs, verify that the door is completely closed then repeat the normalizing procedure.

NOTE: For vehicles equipped with a folding convertible top, the top must be closed and firmly latched prior to normalizing the windows.

1. Ignition ON.
2. Starting with the window completely UP, press and hold the power window switch until the window is fully open and continue holding the switch down for approximately 5 seconds after the window is completely open.
3. Pull the power window switch up until the window is fully closed and continue holding the switch up for approximately 5 seconds after the window is completely closed.

The window should now be normalized and the window should perform the express up and express down functions.

Window Motor Relearn Procedure

A relearn procedure may need to be performed for any Local Interconnect Network (LIN) window motor for the following conditions:

- When the window glass is out of alignment
- When the window glass has been replaced
- When the door has been replaced
- When the window regulator has been replaced

NOTE: Prior to performing the relearn procedure the vehicle must have all 4 wheels properly inflated and mounted, the vehicle must be sitting on a level surface and all doors must be completely closed and for vehicles equipped with a folding convertible top, the top must be closed and firmly latched..

To relearn the window motor, follow these steps:

1. Ignition ON.
2. With a scan tool, select Module Diagnosis, Body Control Module, Configuration/Reset Functions and then select the appropriate Clear Window Learn Values for the window motor requiring the relearn procedure.
3. After the learn procedure, exit the scan tool learn procedure completely, the power window cannot be normalized and will not function until you exit the program.
4. Starting with the window completely UP, press and hold the power window switch until the window is fully open and continue holding the switch down for approximately 5 seconds after the window is completely open.
5. Pull the power window switch up until the window is fully closed and continue holding the switch up for approximately 5 seconds after the window is completely closed.

The window is now reprogrammed.

FRONT SIDE DOOR WINDOW REGULATOR MOTOR REPLACEMENT

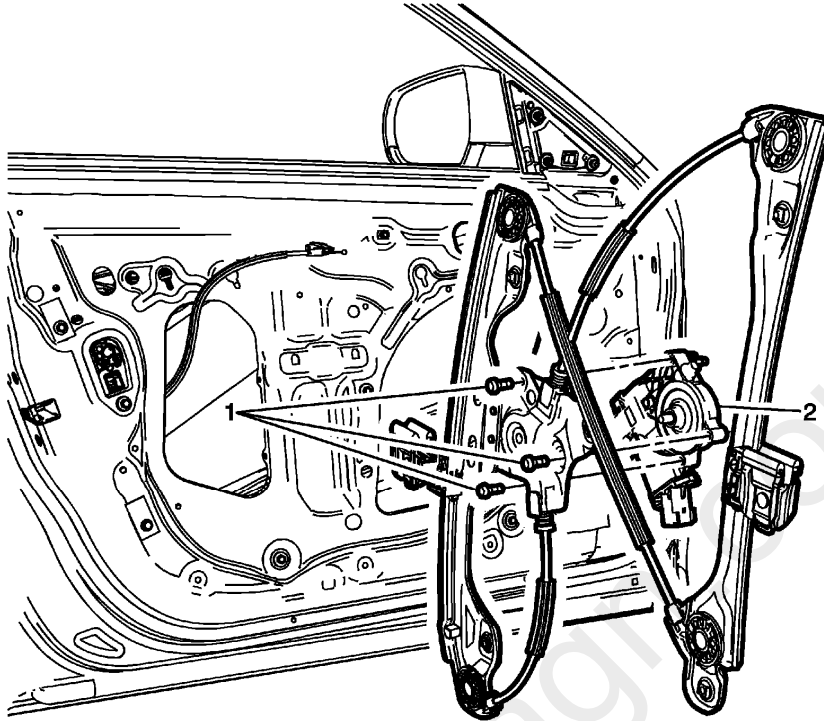


Fig. 19: Front Side Door Window Regulator Motor
Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Regulator Motor Replacement

Callout	Component Name
Preliminary Procedure Remove the front side door window regulator. Refer to <u>Front Side Door Window Regulator Replacement</u> .	
1	Front Side Door Window Regulator Motor Bolt (Qty: 3) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 10.5 N.m (93 lb in)
2	Front Side Door Window Regulator Motor Procedure Program the window motor express function. Refer to <u>Window Motor Programming - Express Function</u>

NOTE:

Inspect the door window for proper operation before installing the door trim.

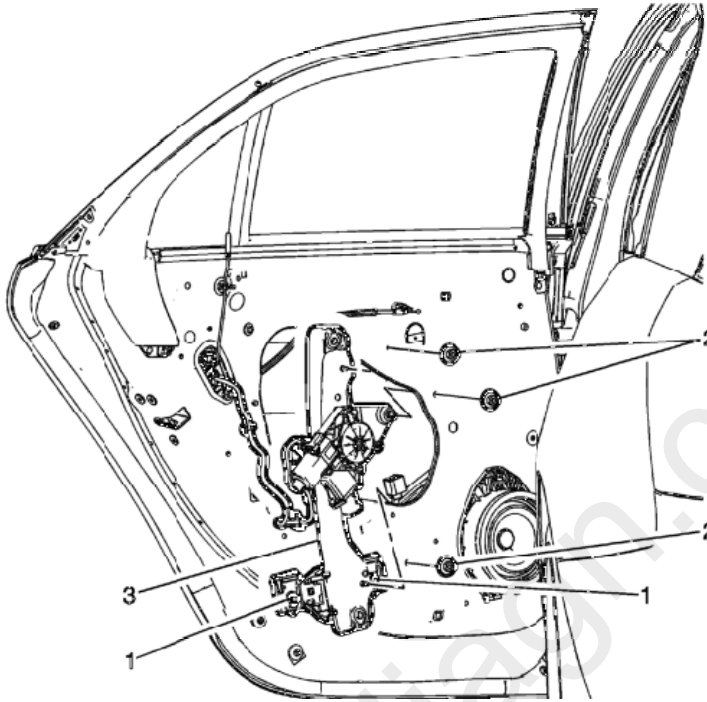
REAR SIDE DOOR WINDOW REGULATOR REPLACEMENT

Fig. 20: Rear Side Door Window Regulator
Courtesy of GENERAL MOTORS COMPANY

Rear Side Door Window Regulator Replacement

Callout	Component Name
WARNING: Refer to <u>Glass and Sheet Metal Handling Warning</u> .	
WARNING: Disconnect the power window switch when working inside the door. When operated, the Express Up/Down Feature allows the door window to move very quickly, without stopping, which could cause personal injury.	
Preliminary Procedures	
1. Remove the rear side door trim. Refer to <u>Rear Side Door Trim Replacement</u> .	
2. Remove the rear side door arm rest plate bolts and plate from the inner door panel.	
3. Remove the water deflector.	
	Rear Side Door Window Regulator Guide Bolt (Qty: 2)

1	CAUTION: Refer to <u>Fastener Caution</u> . Procedure 1. Position the window to access the window regulator guide bolts. 2. Place the window in the full up position and tape in place. Tighten 10.5 (93 lb in)
2	Rear Side Door Window Regulator Nut (Qty: 3) Procedure Disconnect the electrical connector. Tighten 11.5 (102 lb in)
3	Rear Side Door Window Regulator Procedure Transfer the window regulator motor. Refer to <u>Rear Side Door Window Regulator Motor Replacement</u>. NOTE: Inspect the door window for proper operation before installing the door trim.

REAR SIDE DOOR WINDOW REGULATOR MOTOR REPLACEMENT

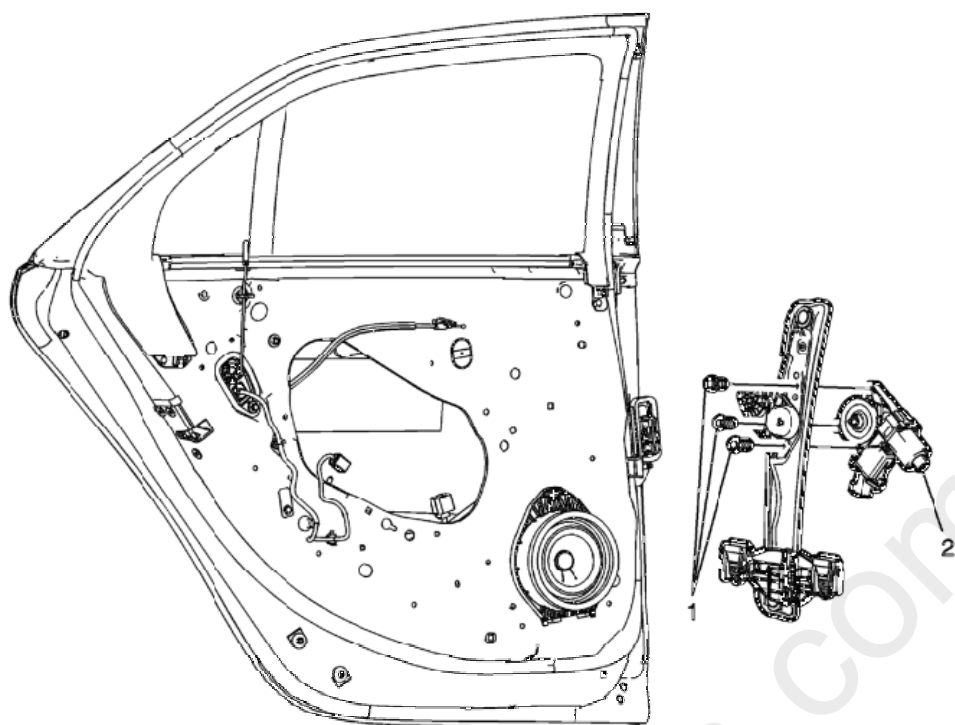


Fig. 21: Rear Side Door Window Regulator Motor
 Courtesy of GENERAL MOTORS COMPANY

Rear Side Door Window Regulator Motor Replacement

Callout	Component Name
Preliminary Procedure Remove the rear side door window regulator. Refer to <u>Rear Side Door Window Regulator Replacement</u> .	
1	Rear Side Door Window Regulator Motor Bolt (Qty: 3) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 10.5 N.m (93 lb in).
2	Rear Side Door Window Regulator Motor NOTE: Inspect the door window for proper operation before installing the door trim.

FRONT SIDE DOOR WINDOW INNER SEALING STRIP REPLACEMENT

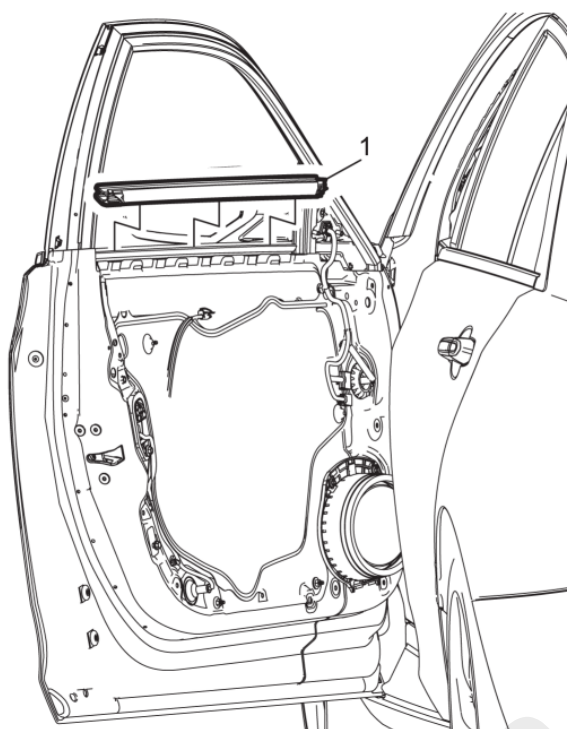


Fig. 22: Front Side Door Window Inner Sealing Strip
 Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Inner Sealing Strip Replacement

Callout	Component Name
Preliminary Procedure Remove the front side door trim. Refer to <u>Front Side Door Trim Replacement</u> .	
1	Front Side Door Window Inner Sealing Strip Procedure 1. Grasp one end of the sealing strip lift upward to release it from the pinchweld flange. 2. Start at one end fully seating the sealing strip on the pinchweld flange of the door.

REAR SIDE DOOR WINDOW BELT REVEAL MOLDING REPLACEMENT

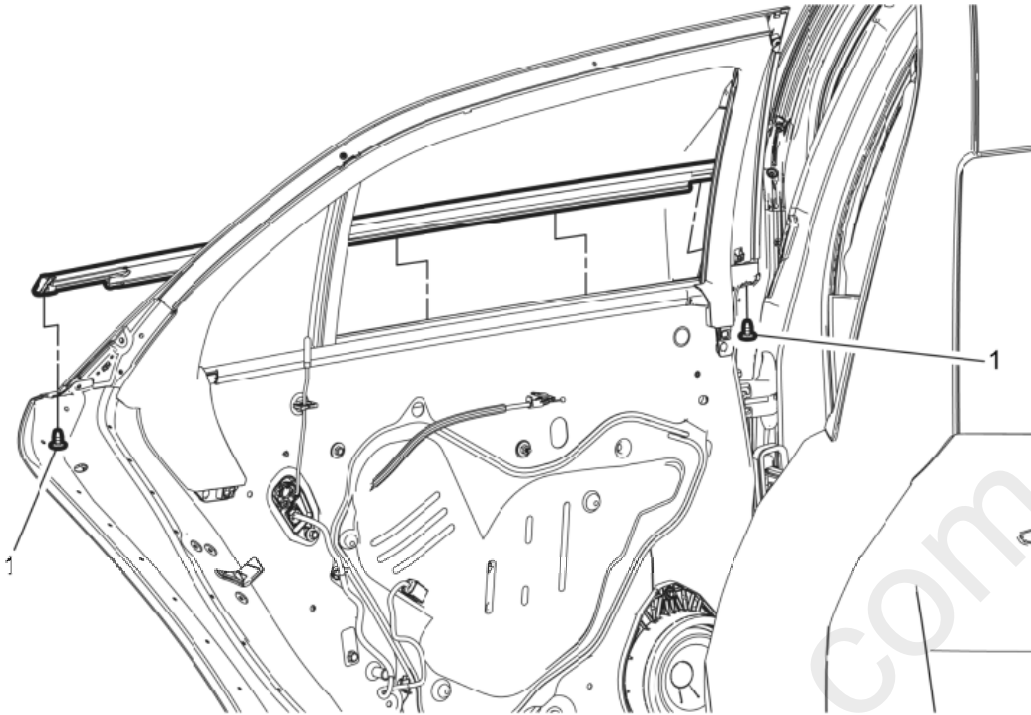


Fig. 23: Rear Side Door Window Belt Reveal Molding
 Courtesy of GENERAL MOTORS COMPANY

Rear Side Door Window Belt Reveal Molding Replacement

Callout	Component Name
Preliminary Procedures 1. Place the rear side door in the full open position. 2. Reposition the rear side door weatherstrip-door side to access the rear side door window belt reveal rear molding screw. Refer to <u>Rear Side Door Weatherstrip Replacement - Door Side</u> . 3. Reposition the rear side door lower auxiliary weatherstrip to access the rear side door window belt reveal front molding screw. Refer to <u>Rear Side Door Lower Auxiliary Weatherstrip Replacement</u> .	
1	Rear Side Door Window Belt Reveal Molding Screw (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> Tighten 2.5 (22 lb in)
	Rear Side Door Window Belt Reveal Molding Procedure

- | | |
|---|--|
| 2 | <ol style="list-style-type: none"> 1. Lower the front side door window to the full down position. 2. Tape off the lower window frame to prevent damage to the door. 3. Using a suitable tool, lift upward at the rear end of the reveal molding. Work the reveal molding down the door flange until it fully releases. 4. Push downward on the molding until fully seated. |
|---|--|

NOTE:

Inspect the door window for proper operation.

FRONT SIDE DOOR WINDOW BELT REVEAL MOLDING REPLACEMENT

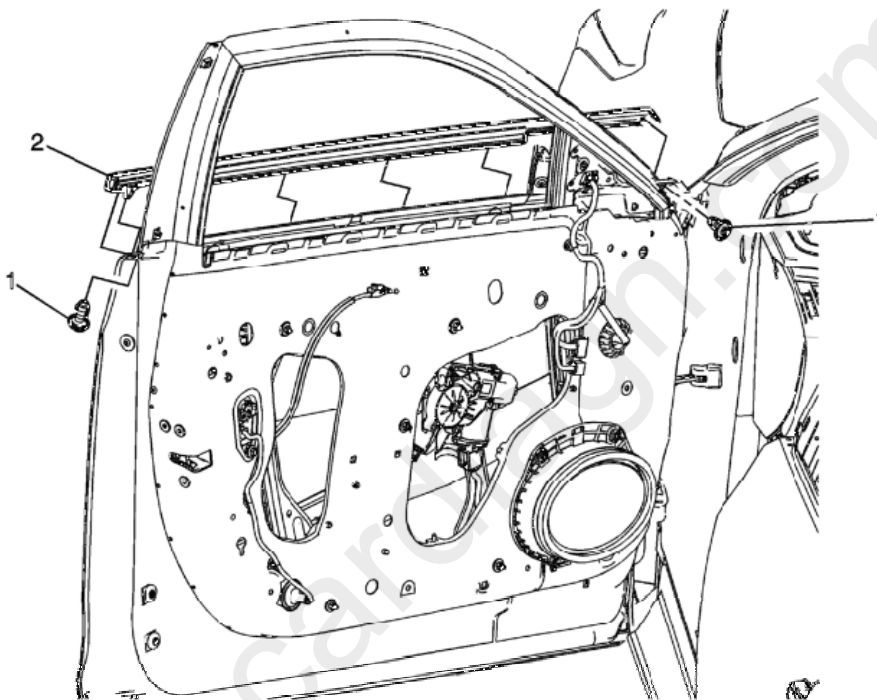


Fig. 24: Front Side Door Window Belt Reveal Molding
Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Belt Reveal Molding Replacement

Callout	Component Name
Preliminary Procedure Remove the outside rearview mirror. Refer to <u>Outside Rearview Mirror Replacement (North America)</u> , <u>Outside Rearview Mirror Replacement (Except North America)</u> .	
1	Front Side Door Window Belt Reveal Molding Screw (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> .

	Tighten 2.5 N.m (22 lb in)
2	Front Side Door Window Belt Reveal Molding Procedure 1. Align the sealing strip to the door. 2. Ensure that the end cap is flush to the door cutline. 3. Rotate the sealing strip downward. 4. Align the sealing strip to the door pinch-weld flange. 5. Push the sealing strip downward to fully seat and secure the strip to the door. NOTE: Inspect the window for proper operation before installing the door trim.

REAR SIDE DOOR WINDOW INNER SEALING STRIP REPLACEMENT

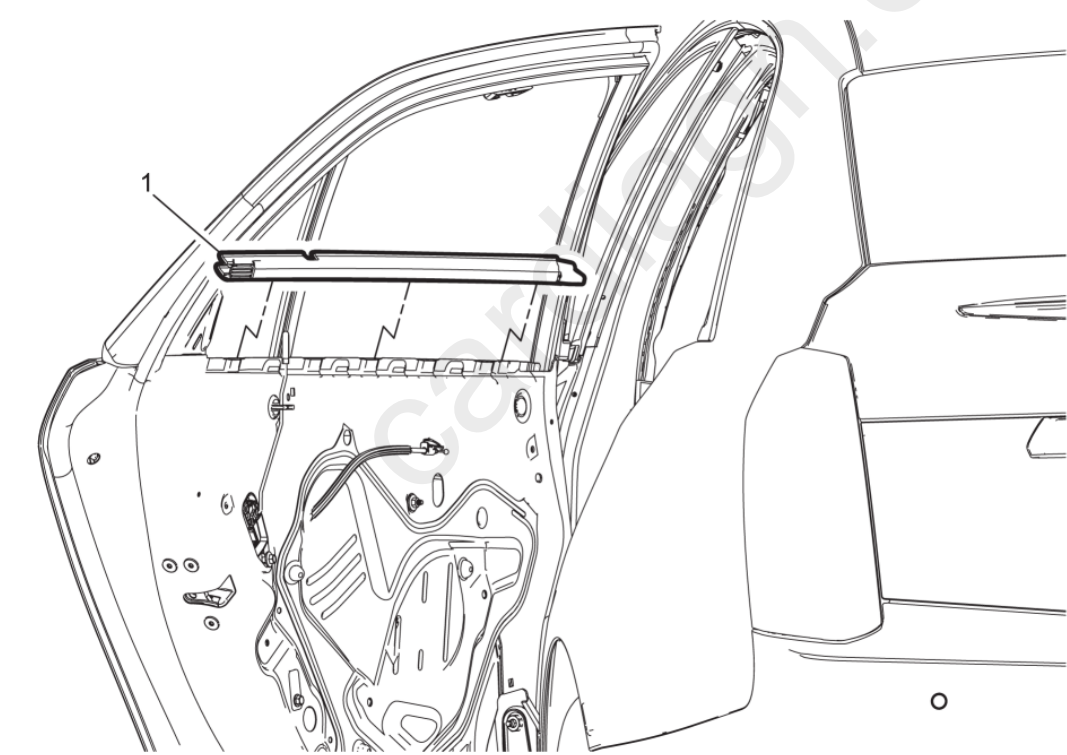


Fig. 25: Rear Side Door Window Inner Sealing Strip
 Courtesy of GENERAL MOTORS COMPANY

Rear Side Door Window Inner Sealing Strip Replacement

Callout	Component Name
Preliminary Procedure	

1. Remove the rear side door trim. Refer to **Rear Side Door Trim Replacement** .
2. Remove the rear side door window inside sunshade. Refer to **Rear Side Door Window Inside Sunshade Replacement** .

1	Rear Side Door Window Inner Sealing Strip Procedure 1. Grasp one end of the sealing strip lift upward to release it from the pinchweld flange. 2. Start at one end fully seating the sealing strip on the pinchweld flange of the door.
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FRONT SIDE DOOR WINDOW WEATHERSTRIP REPLACEMENT

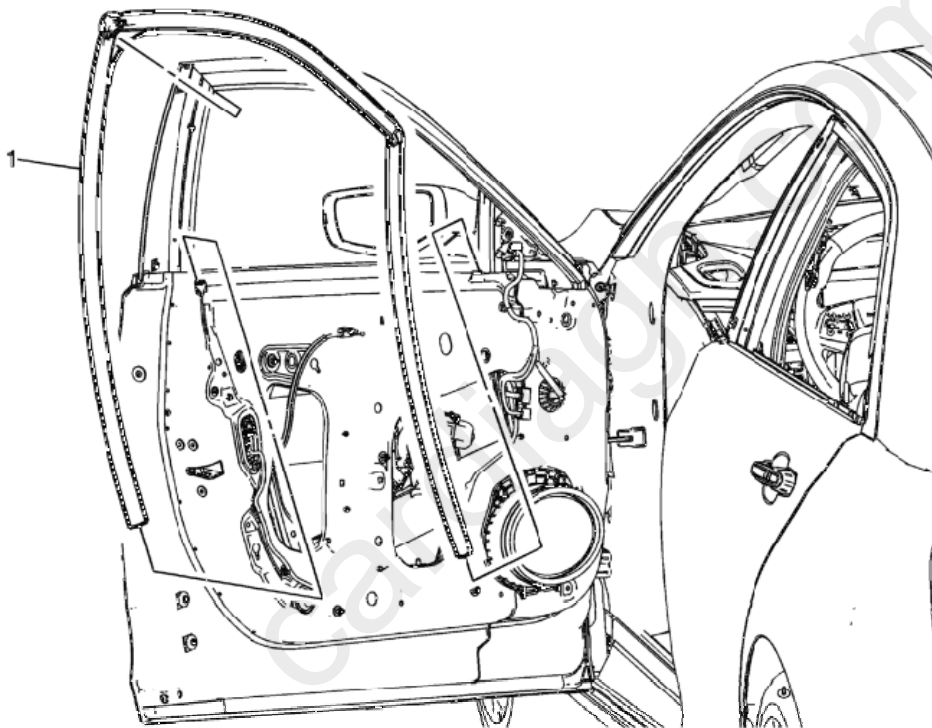


Fig. 26: Front Side Door Window Weatherstrip
 Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Weatherstrip Replacement

Callout	Component Name
Preliminary Procedures 1. Remove the front side door window. Refer to <u>Front Side Door Window Replacement</u>. 2. Position the front side door window regulator rear rail out of the way to access the rear portion of the weatherstrip. Refer to <u>Front Side Door Window Regulator Replacement</u>. 3. Remove the outside rearview mirror. Refer to <u>Outside Rearview Mirror Replacement (North</u>	

America) , Outside Rearview Mirror Replacement (Except North America) .

1	Front Side Door Window Weatherstrip Procedure 1. Pull the window weatherstrip out of the door header. 2. Removing the weatherstrip starting at the rear lower end, pull the inner window weatherstrip away from the door header. 3. Install the weatherstrip at the upper, rear corner, install the inner window weatherstrip to the door pinchweld flange. NOTE: Inspect the window for proper operation before installing the door trim.
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REAR SIDE DOOR WINDOW WEATHERSTRIP REPLACEMENT

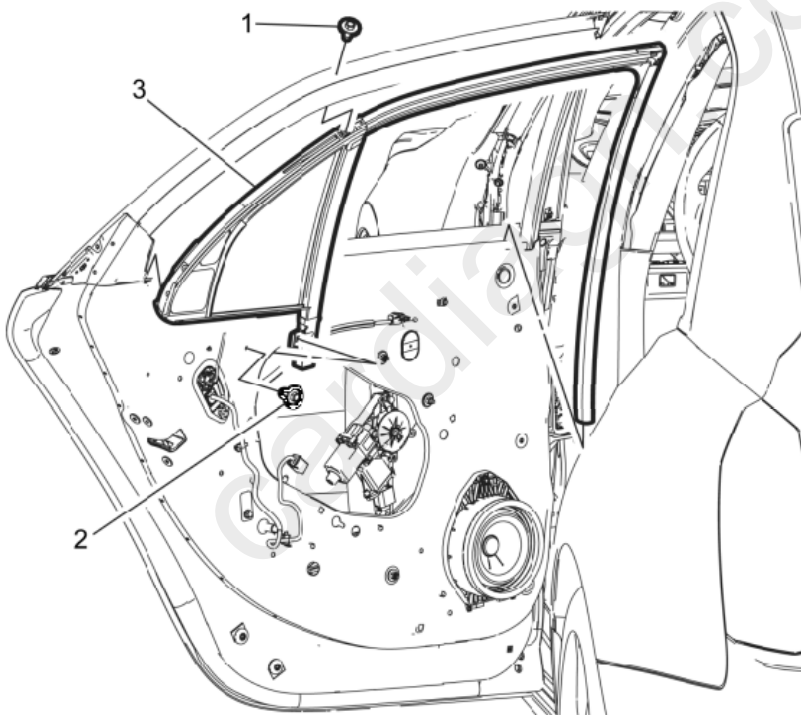


Fig. 27: Rear Side Door Window Weatherstrip
Courtesy of GENERAL MOTORS COMPANY

Rear Side Door Window Weatherstrip Replacement

Callout	Component Name
Preliminary Procedures 1. Remove the rear side door window garnish molding. Refer to <u>Rear Side Door Window Garnish</u>	

Molding Replacement .

2. Remove the rear side door window inner strip. Refer to **Rear Side Door Window Inner Sealing Strip Replacement.**
3. Remove the rear side door window reveal molding. Refer to **Rear Side Door Window Belt Reveal Molding Replacement.**
4. Remove the rear side door window inside sunshade. Refer to **Rear Side Door Window Inside Sunshade Replacement .**

1	Rear Side Door Window Weatherstrip Screw CAUTION: Refer to <u>Fastener Caution .</u> Tighten 2.5 N.m (22 lb in)
2	Rear Side Door Stationary Window Divider Channel Lower Support Bolt Procedure 1. Apply masking tape to the applique, outer belt reveal molding and door frame. 2. Position the window all the way down in the door. Tighten 11.5 N.m (102 lb in)
3	Rear Side Door Window Weatherstrip Procedure 1. Start in the top upper rear corner of the door frame, pull the weatherstrip out of the door frame and rear window channel. 2. Install the window weatherstrip to the top upper rear corner of the door frame, work the weatherstrip around the upper door frame and then down both front lower channels. 3. Ensure that the weatherstrip is fully seated into the upper door frame and down both front lower channels. NOTE: Inspect the door window for proper operation before installing the door trim.

ADHESIVE INSTALLATION OF WINDSHIELDS

WARNING: Refer to **Glass and Sheet Metal Handling Warning .**

1. Use a urethane adhesive systems which meet GM Specification GMW 15672.
2. Make sure to observe the auto-adhesive curing time before releasing the vehicle per urethane adhesive instructions by the manufacturers.

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

3. Remove all mounds or loose pieces of urethane adhesive from the pinch-weld area.
4. 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.
5. 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

NOTE: 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 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.

6. 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.

WARNING: Refer to Window Retention Warning .

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

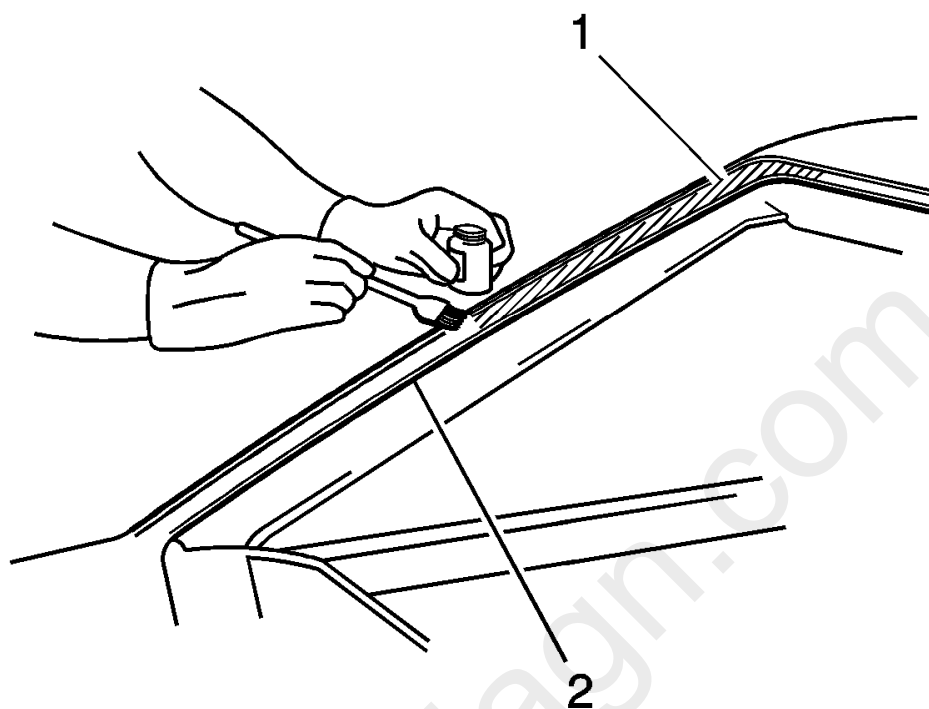


Fig. 28: Applying Pinch-Weld Primer
Courtesy of GENERAL MOTORS COMPANY

WARNING: 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.

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

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

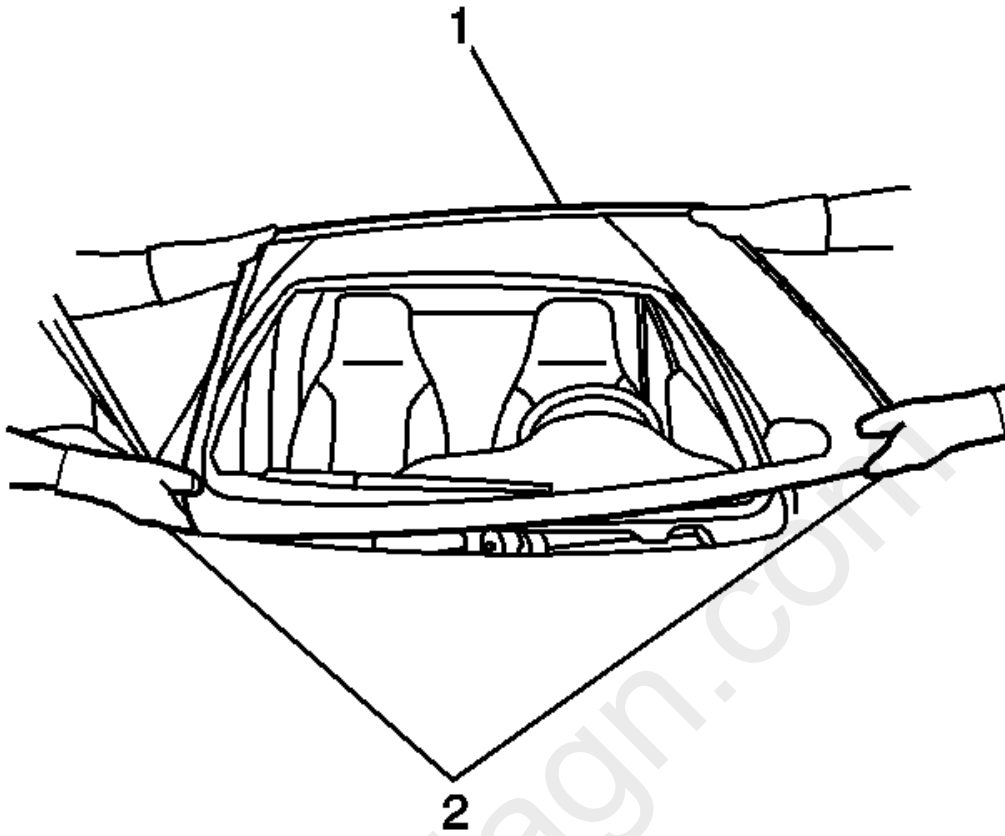


Fig. 29: Removing/Installing Windshield
Courtesy of GENERAL MOTORS COMPANY

11. With an assistant, align the locator pins to the pinch-weld flange, dry fit the window (1) to the opening in order to determine the correct position.

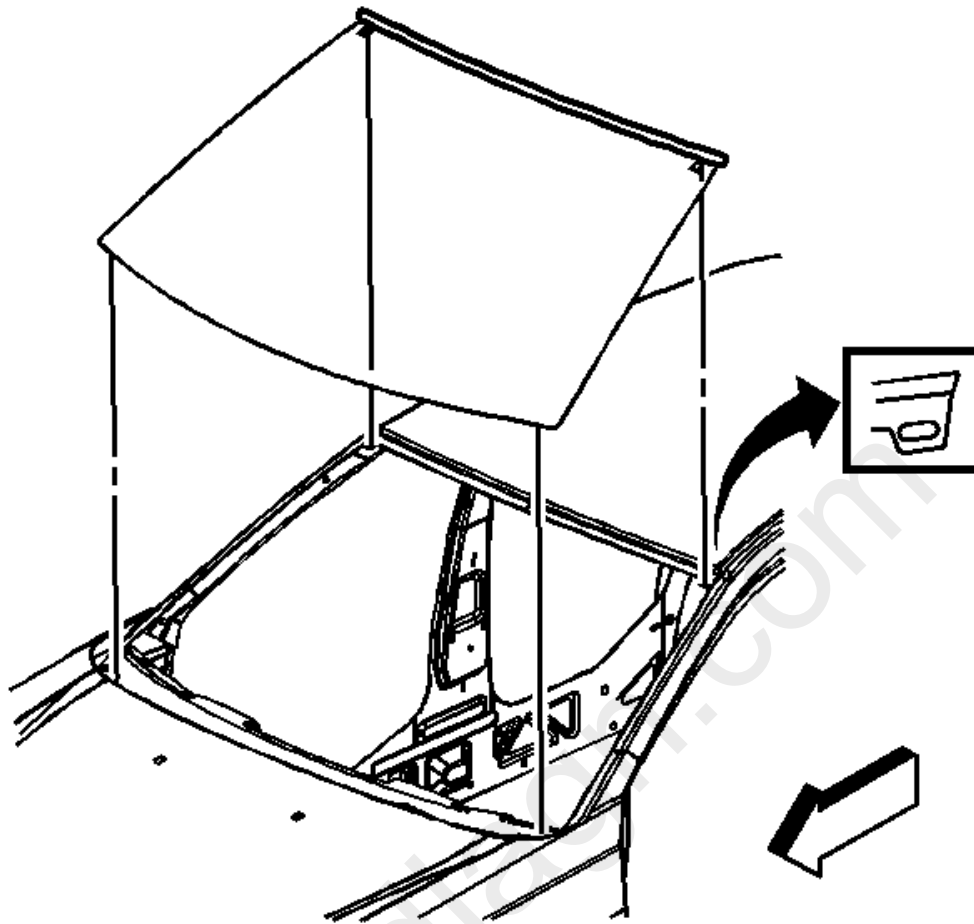


Fig. 30: Identifying Locator Slots On Upper Pinch-Weld Flange
Courtesy of GENERAL MOTORS COMPANY

12. If equipped, ensure that the windshield locator pins are positioned into the locator slots on the upper pinch-weld flange.

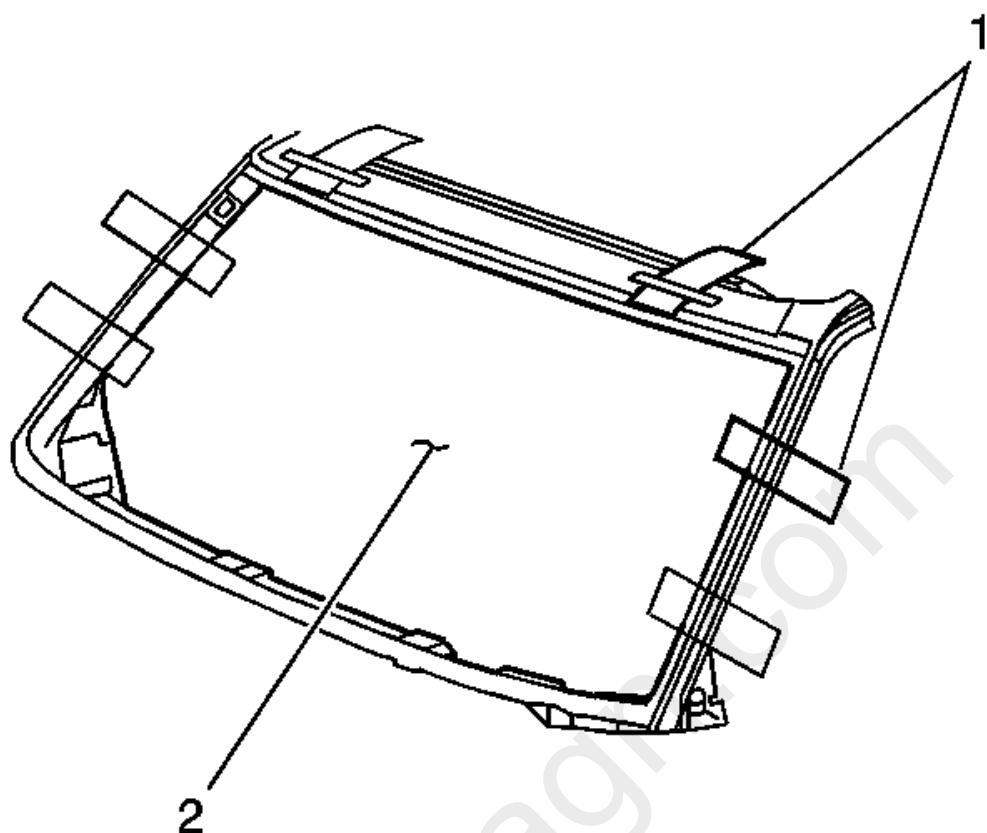


Fig. 31: Aligning Tape Lines On Window To Body
Courtesy of GENERAL MOTORS COMPANY

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

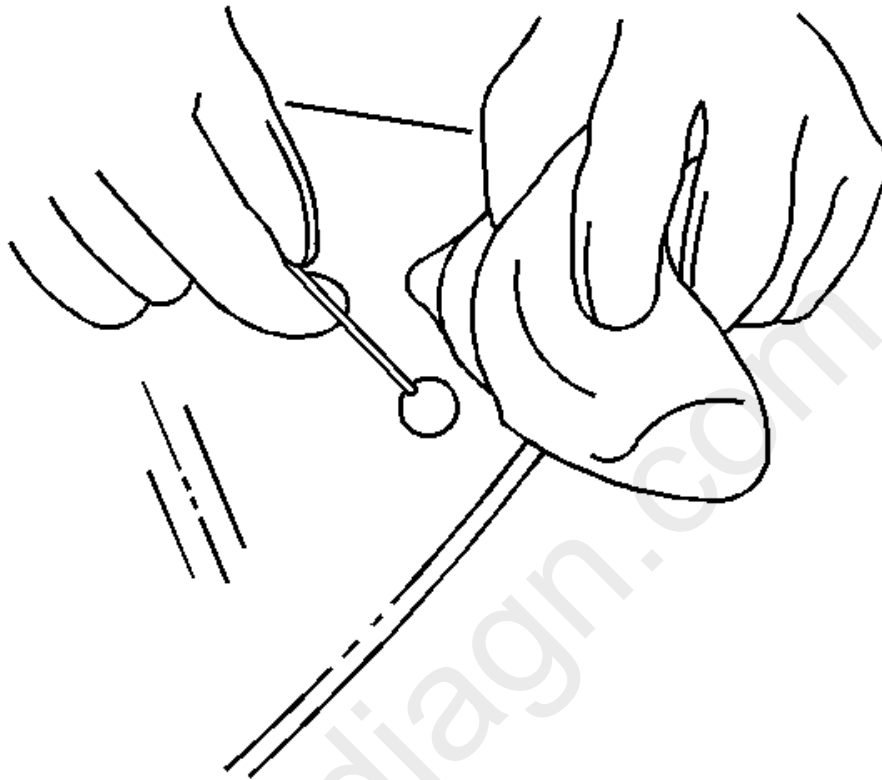


Fig. 32: Applying Glass Prep

Courtesy of GENERAL MOTORS COMPANY

NOTE: Use the existing window as a guide for position of the urethane primers.

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

15. Use a new dauber in order to apply glass prep clear to the area approximately 18 mm (0.71 in) around the entire perimeter of the window inner surface.

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

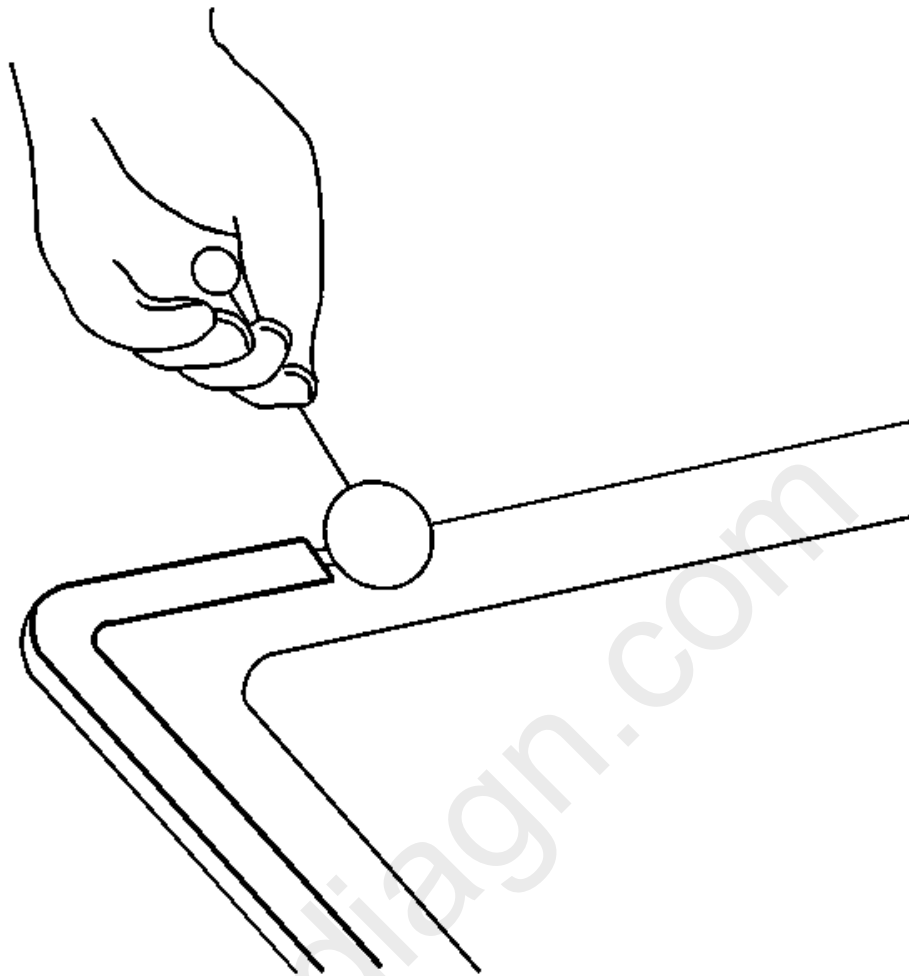


Fig. 33: Applying Glass Prep
Courtesy of GENERAL MOTORS COMPANY

16. Apply a second coat of the glass prep clear to the same area of the glass.

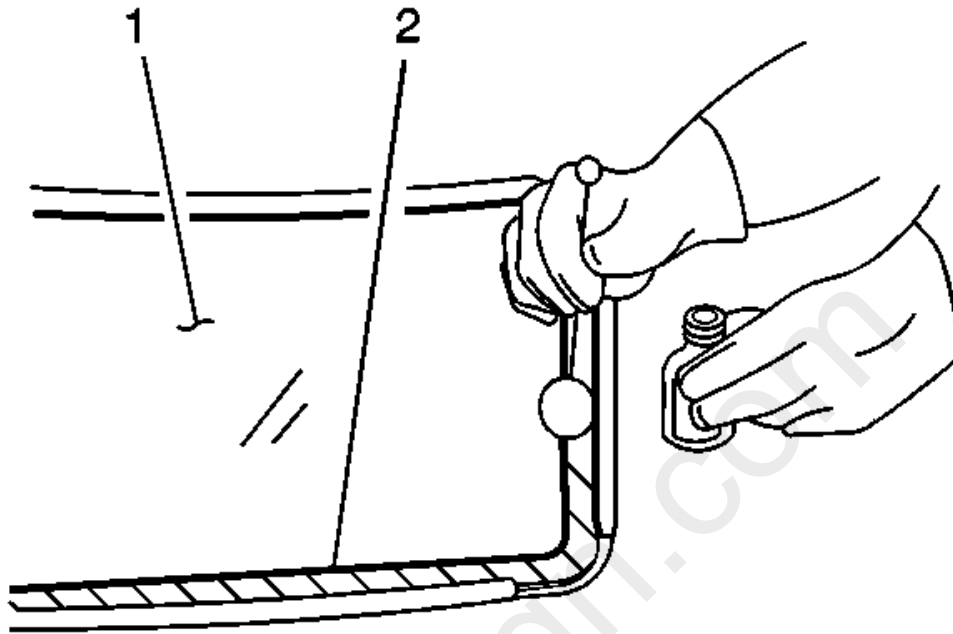


Fig. 34: Applying Glass Primer
Courtesy of GENERAL MOTORS COMPANY

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

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

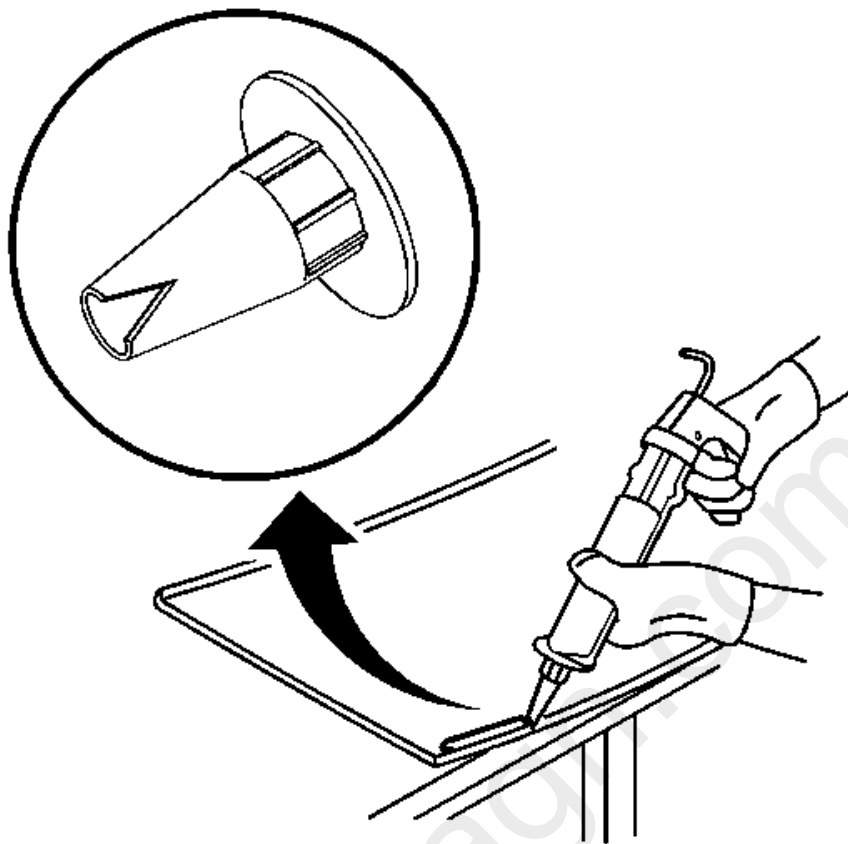


Fig. 35: View Of Modified Applicator Nozzle
Courtesy of GENERAL MOTORS COMPANY

20. Cut the applicator nozzle in order to provide V cut of minimum urethane bead of 8 mm (0.316 in) wide and 12.7 mm (1/2 in) high.

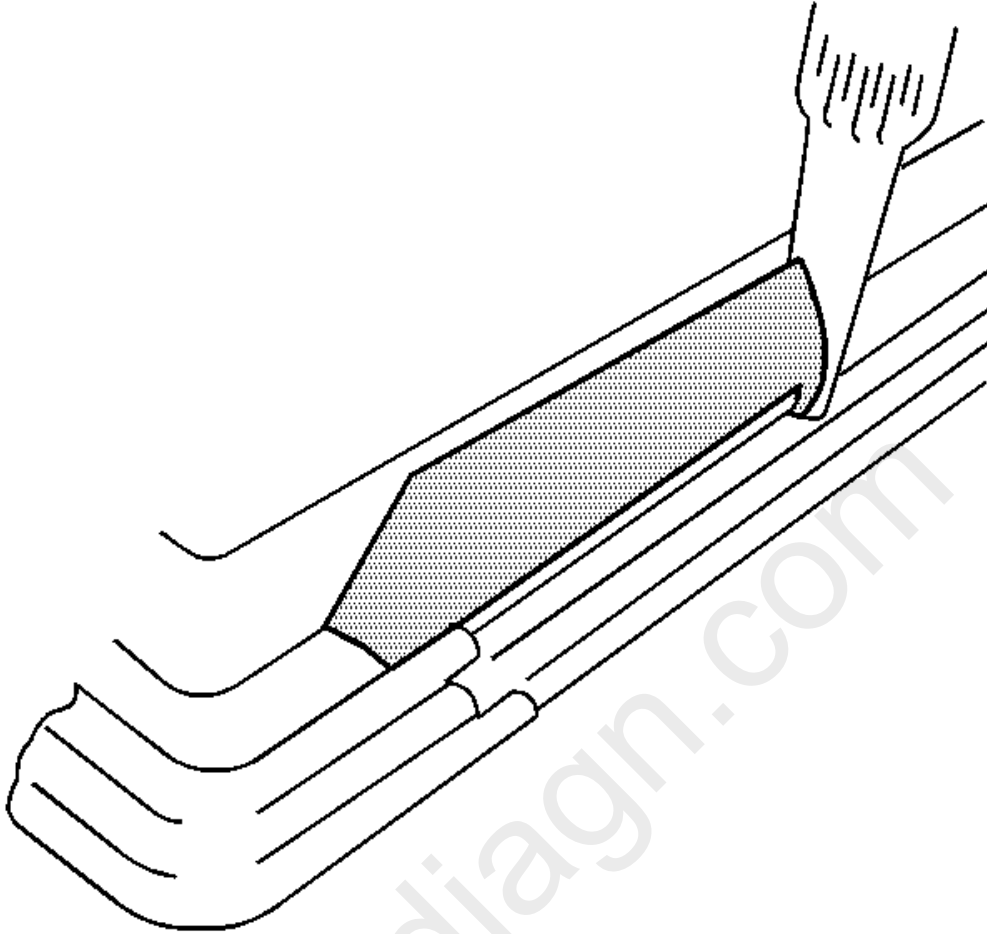


Fig. 36: Applying Continuous Bead Of Urethane Adhesive
Courtesy of GENERAL MOTORS COMPANY

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

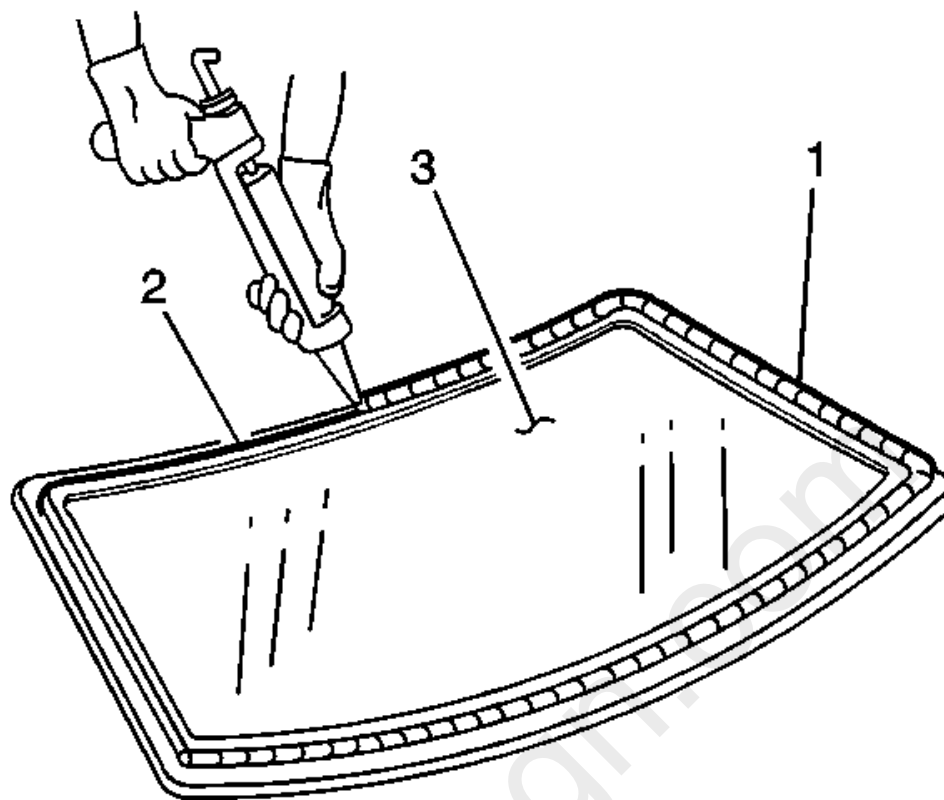


Fig. 37: Applying Urethane Adhesive To Inner Surface Of Window
Courtesy of GENERAL MOTORS COMPANY

22. Use the edge of the window as a guide for the nozzle in order to apply the urethane adhesive (1) to the inner surface of the window (3).

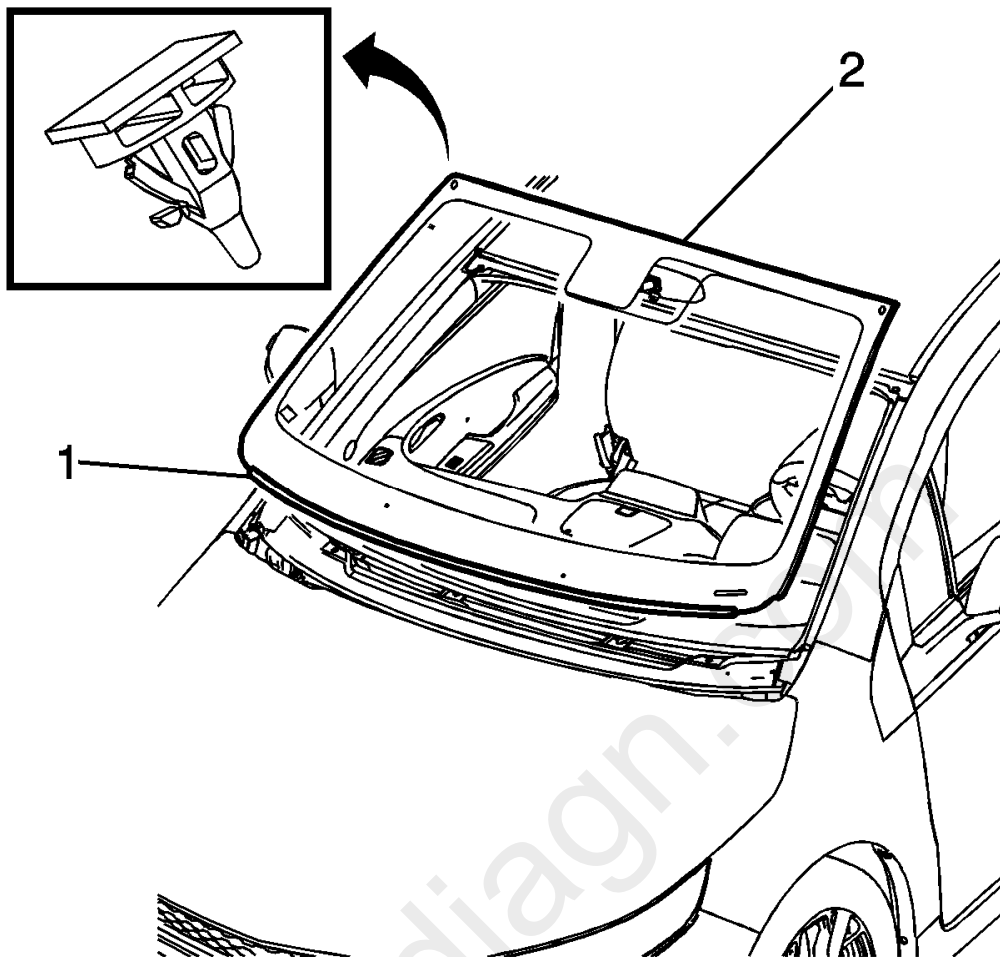


Fig. 38: Ensuring Proper Windshield Fit
Courtesy of GENERAL MOTORS COMPANY

NOTE: If the locators pins were cut off the window when removing tape the window in place, do step 23.

23. With an assistant, position the locators and window (2) to the slots in the pinchweld flange, set the window in place.

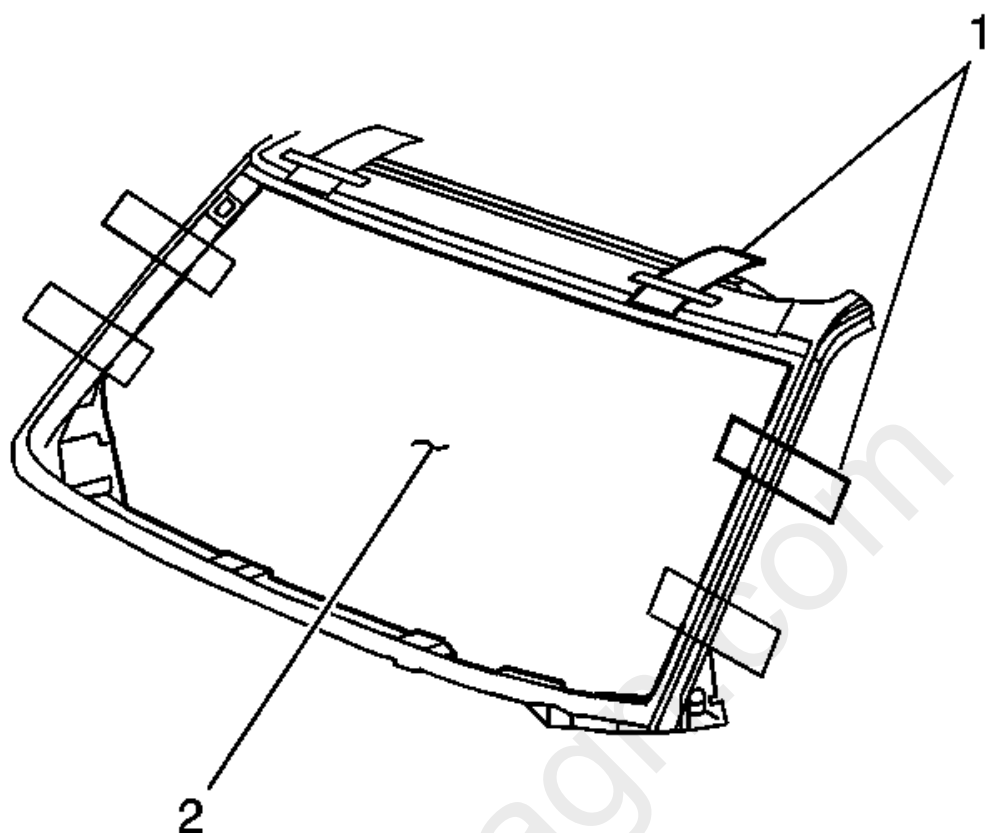


Fig. 39: Aligning Tape Lines On Window To Body
Courtesy of GENERAL MOTORS COMPANY

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

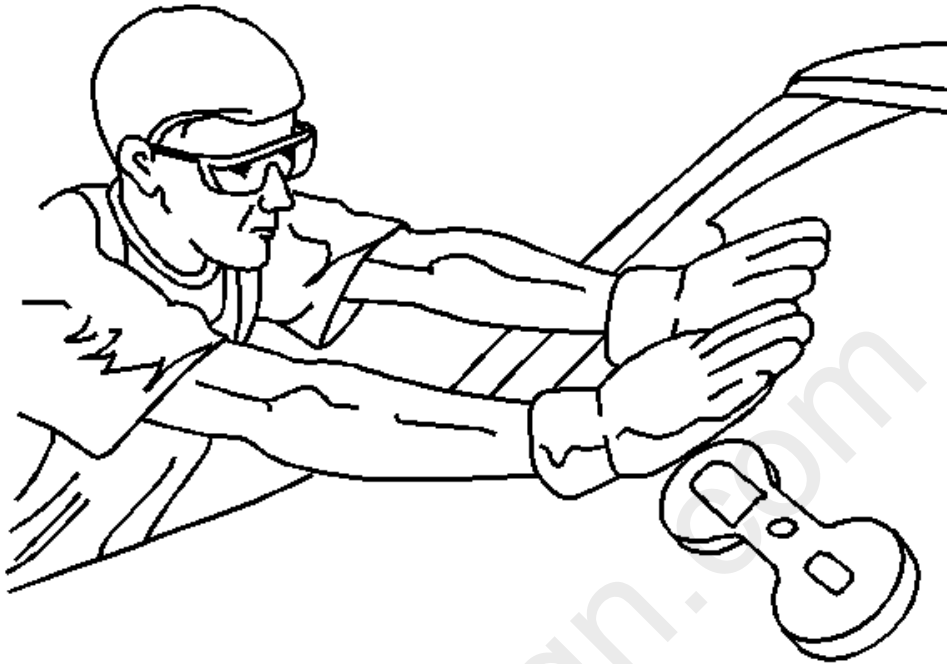


Fig. 40: Pressing Window Into Place
Courtesy of GENERAL MOTORS COMPANY

NOTE: To prevent damage to the window due to objects impacting an exposed edge, upon installation, the window must rest 1 mm (0.04 in) below the surface of the sheet metal.

25. Press firmly around the entire periphery of the windshield in order to wet-out the urethane bead.
26. Tape the window to the body in order to minimize movement until the urethane adhesive cures.
27. Make sure to observe the auto-adhesive curing time before releasing the vehicle per auto-adhesive instructions by the manufacturers.

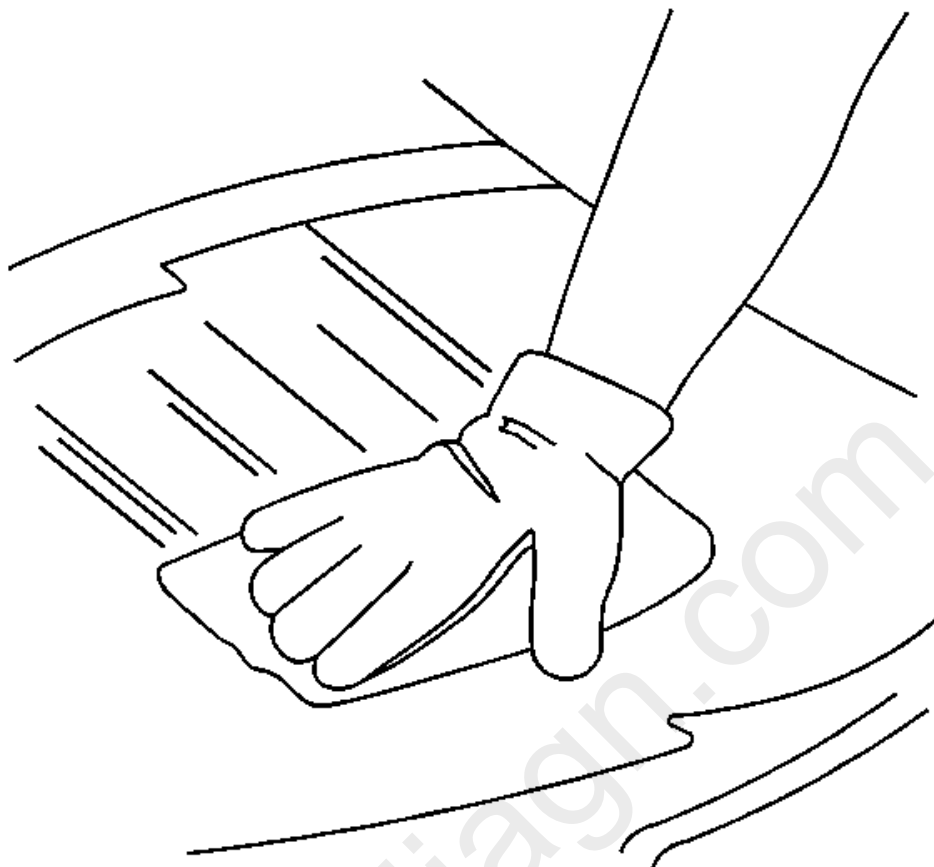


Fig. 41: Cleaning Excess Urethane Adhesive From Body
Courtesy of GENERAL MOTORS COMPANY

28. Clean any excess urethane adhesive from the body.

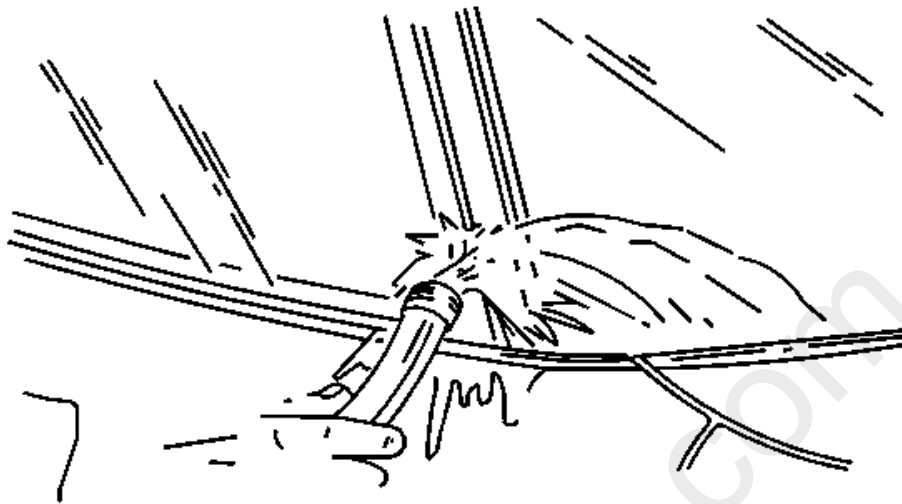


Fig. 42: Performing Water Hose Test
Courtesy of GENERAL MOTORS COMPANY

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

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

WARNING: 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.

33. 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.
34. Complete the window installation.

ADHESIVE INSTALLATION OF REAR WINDOWS

WARNING: Refer to Glass and Sheet Metal Handling Warning .

1. Use a urethane adhesive systems which meet GM Specification GMW-15672.
2. Make sure to observe the auto-adhesive curing time before releasing the vehicle per urethane adhesive instructions by the manufacturers.

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

3. Remove all mounds or loose pieces of urethane adhesive from the pinch-weld area.
4. 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.
5. 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

NOTE: 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 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.

6. 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.

WARNING: Refer to Window Retention Warning .

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

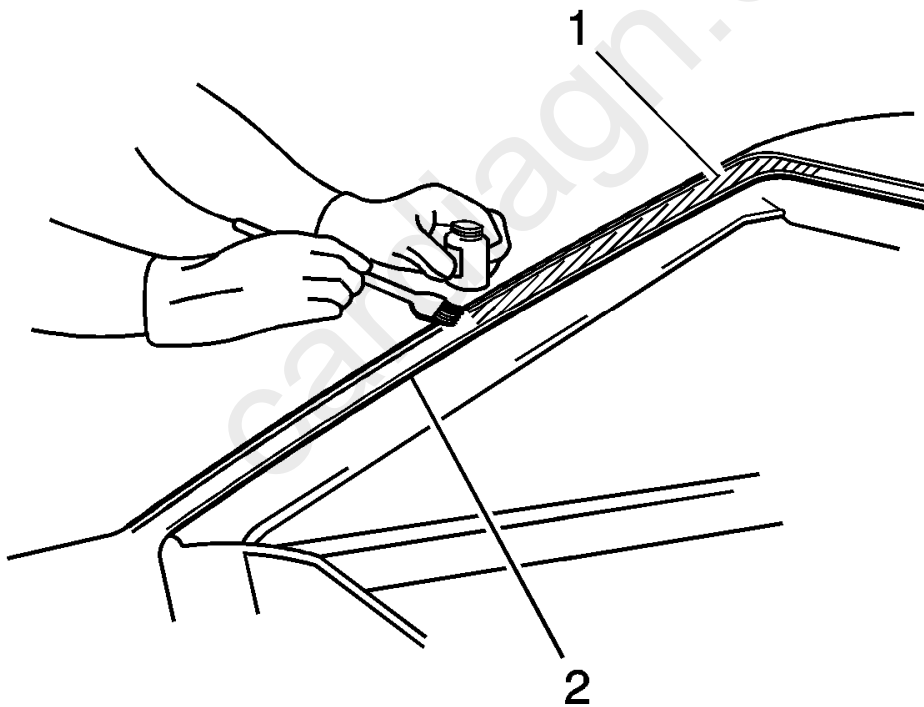


Fig. 43: Applying Pinch-Weld Primer
Courtesy of GENERAL MOTORS COMPANY

WARNING: 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.

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

8. Shake the glass primer black for at least 1 minute.
9. Use a new dauber in order to apply the glass primer black to the surface of the pinch-weld flange (2) that glass prep clear was applied.
10. Allow the glass primer to dry for approximately 10 minutes.

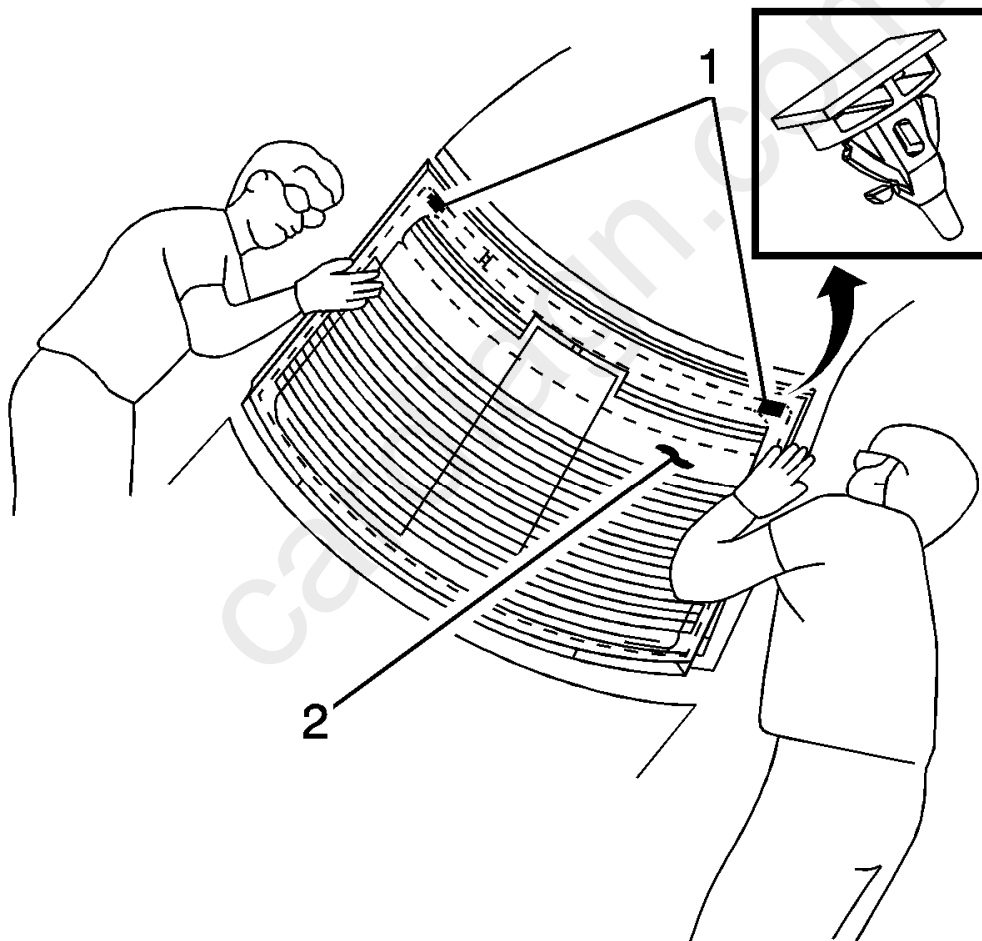


Fig. 44: Installing Rear Window
Courtesy of GENERAL MOTORS COMPANY

11. With an assistant, dry fit the window (2) to the opening in order to determine the correct position.
12. Ensure that the locator pins (1) are positioned into the locator slots on the upper pinch-weld flange.

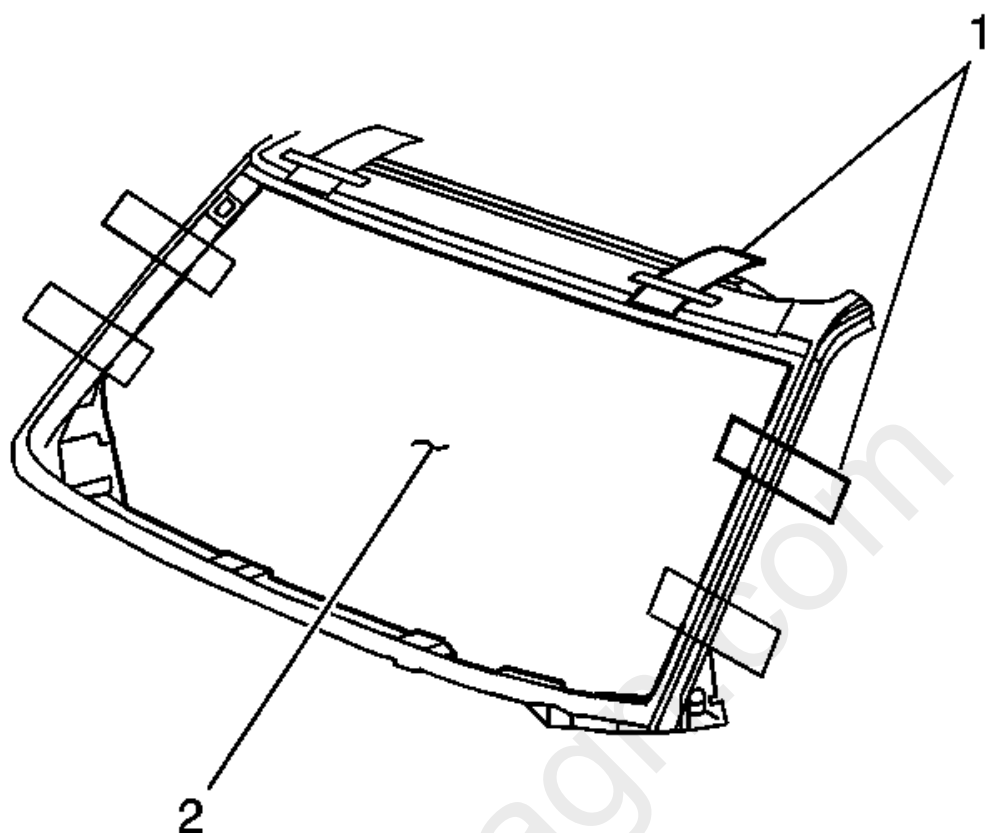


Fig. 45: Aligning Tape Lines On Window To Body
Courtesy of GENERAL MOTORS COMPANY

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

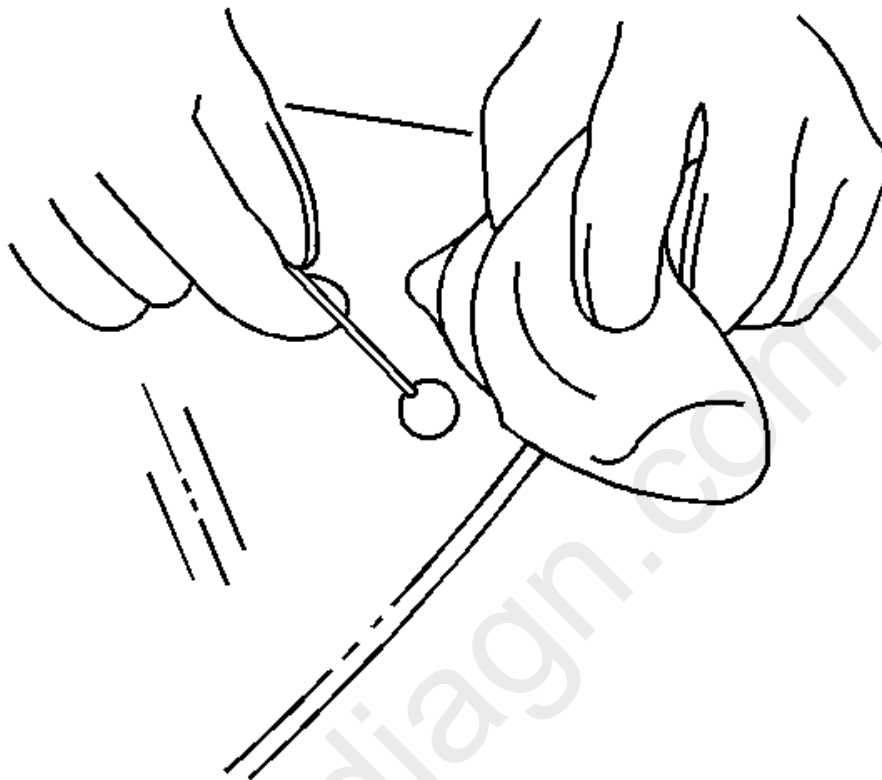


Fig. 46: Applying Glass Prep

Courtesy of GENERAL MOTORS COMPANY

NOTE: Use the existing window as a guide for position of the urethane primers.

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

15. Use a new dauber in order to apply glass prep clear to the area approximately 18 mm (0.71 in) around the entire perimeter of the window inner surface.

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

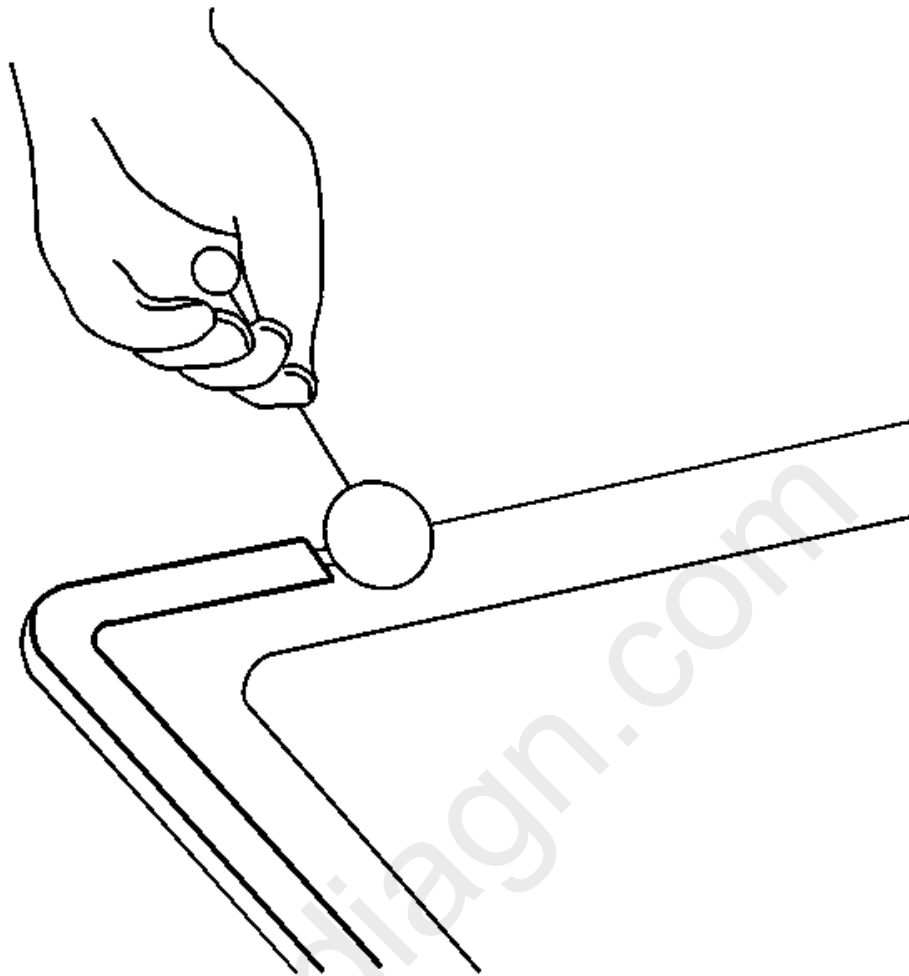


Fig. 47: Applying Glass Prep
Courtesy of GENERAL MOTORS COMPANY

16. Apply a second coat of the glass prep clear to the same area of the glass.

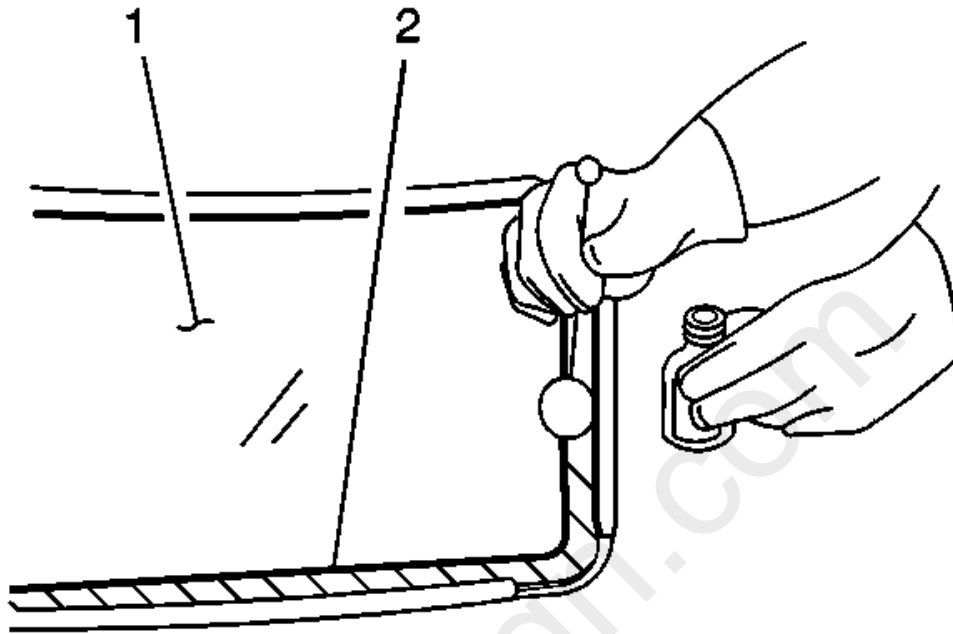


Fig. 48: Applying Glass Primer

Courtesy of GENERAL MOTORS COMPANY

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

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

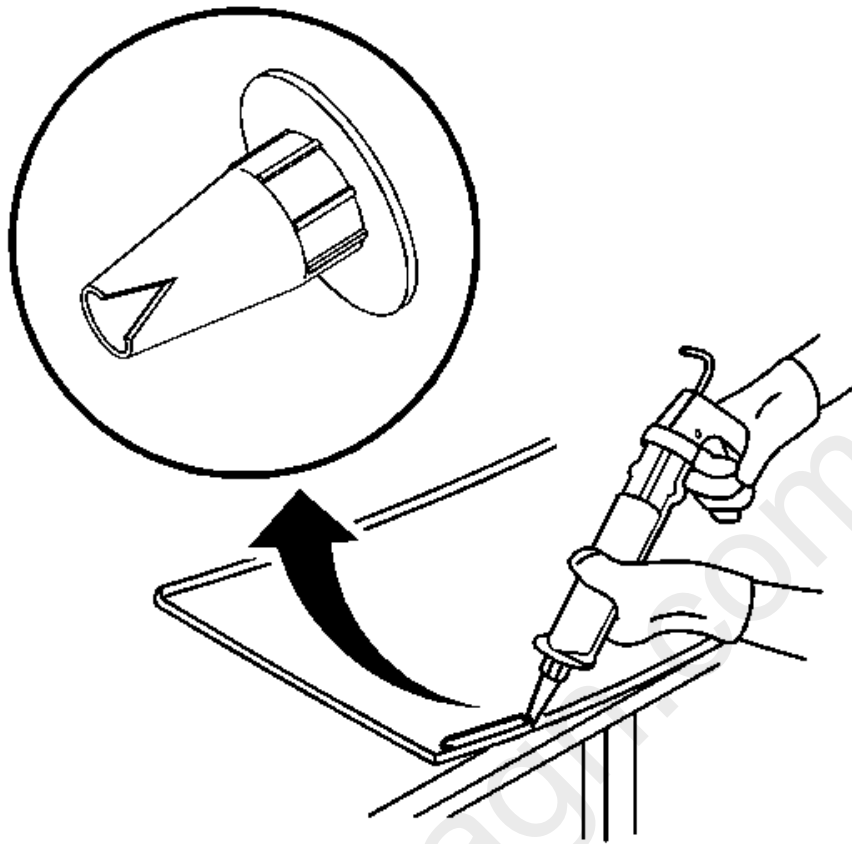


Fig. 49: View Of Modified Applicator Nozzle
Courtesy of GENERAL MOTORS COMPANY

20. Cut the applicator nozzle in order to provide a minimum urethane bead of 8 mm (0.31 in) wide and 16 mm (0.63 in) high.

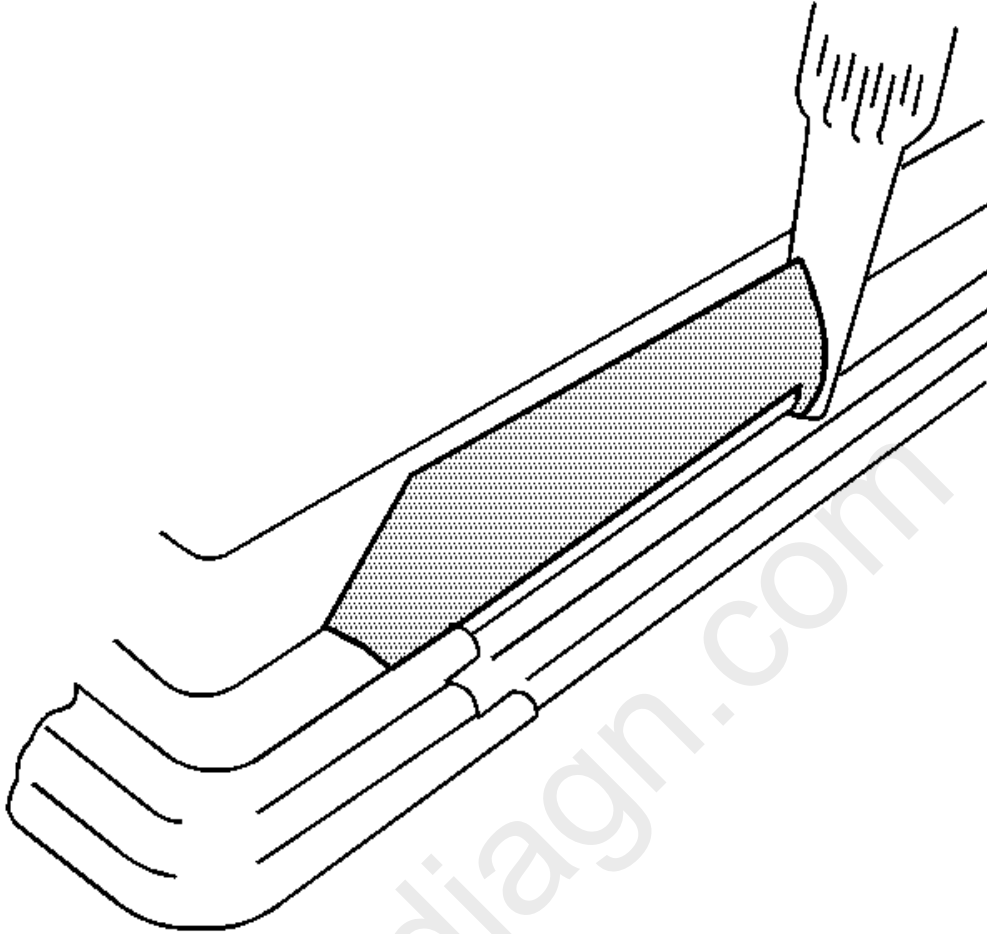


Fig. 50: Applying Continuous Bead Of Urethane Adhesive
Courtesy of GENERAL MOTORS COMPANY

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

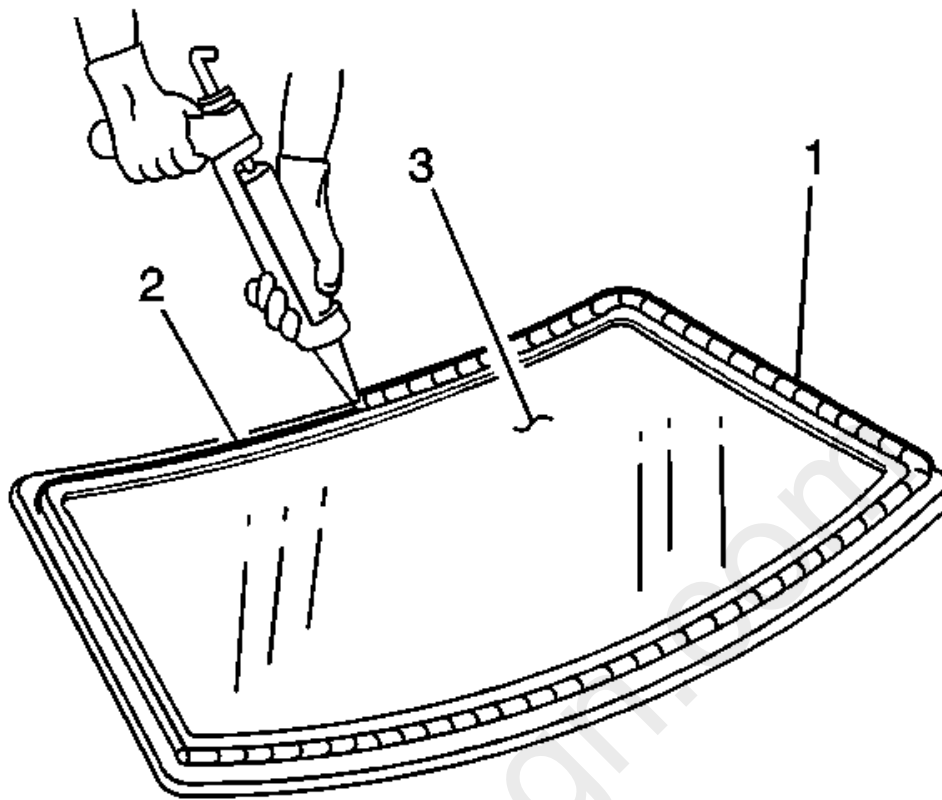


Fig. 51: Applying Urethane Adhesive To Inner Surface Of Window
Courtesy of GENERAL MOTORS COMPANY

22. Use the edge of the window as a guide for the nozzle in order to apply the urethane adhesive (1) to the inner surface of the window (3).

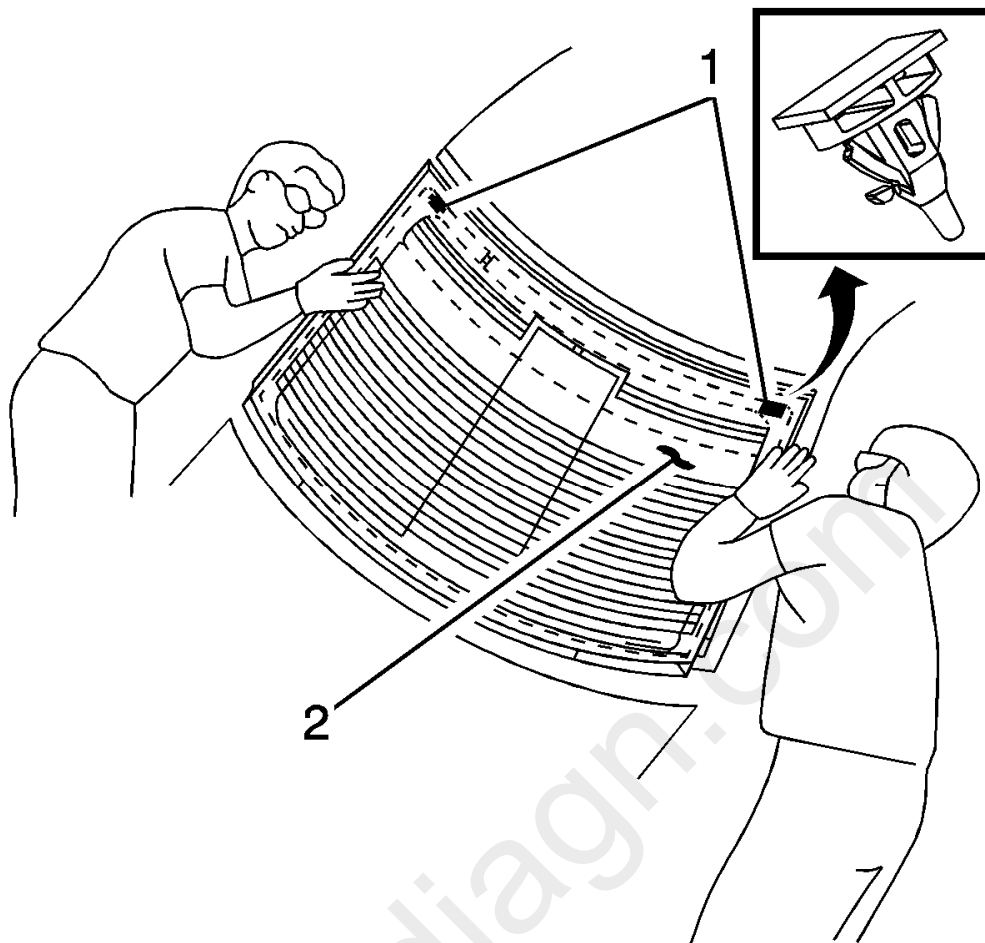


Fig. 52: Installing Rear Window
Courtesy of GENERAL MOTORS COMPANY

NOTE: If the locators pins were cut off the window when removing tape the window in place, do step 23.

23. With an assistant, position the locators (1) and window (2) into the slots of the pinchweld flange, set the window in place.

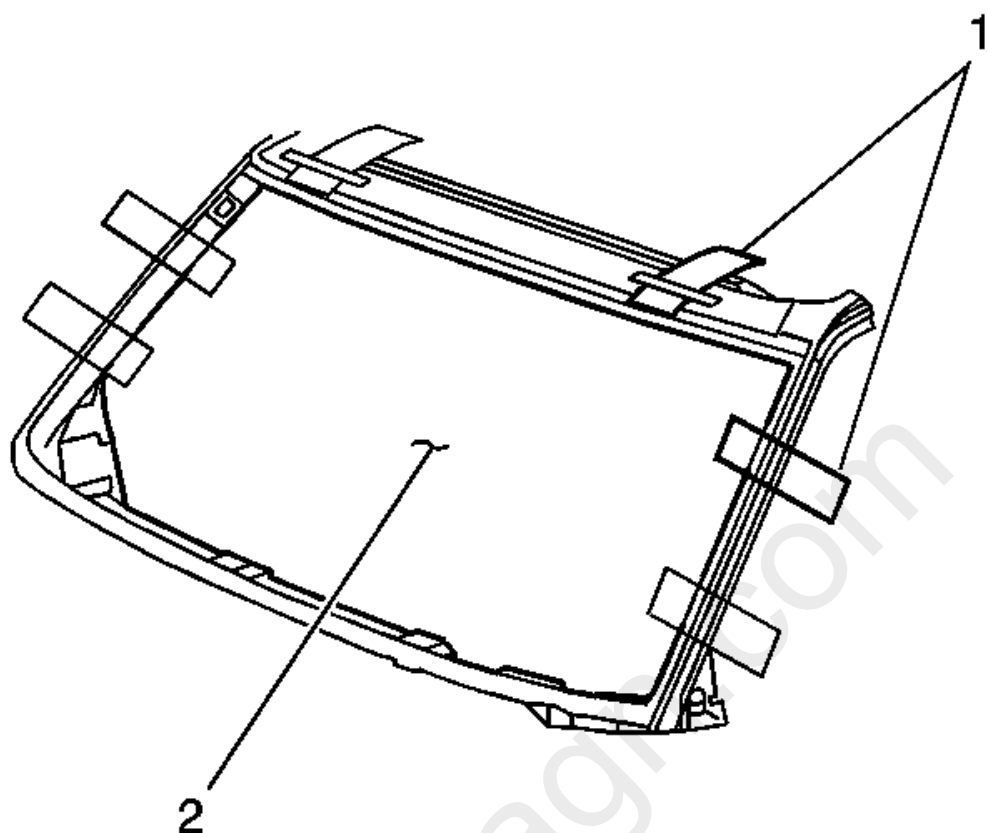


Fig. 53: Aligning Tape Lines On Window To Body
Courtesy of GENERAL MOTORS COMPANY

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

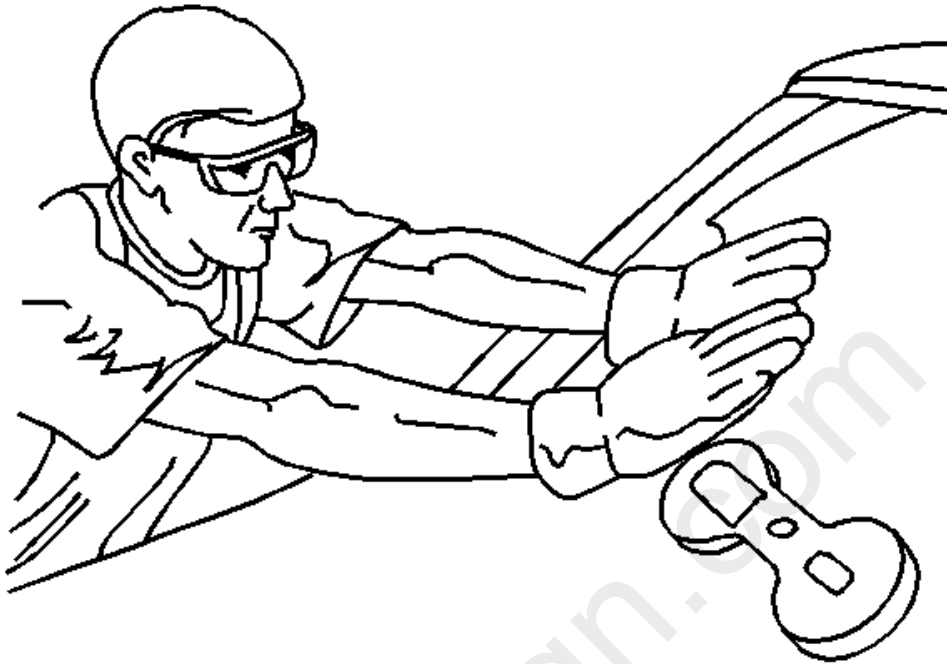


Fig. 54: Pressing Window Into Place
Courtesy of GENERAL MOTORS COMPANY

NOTE: To prevent damage to the window due to objects impacting an exposed edge, upon installation, the window must rest 1 mm (0.040 in) below the surface of the sheet metal.

25. Press firmly around the entire periphery of the window in order to wet-out the urethane bead.
26. Tape the window to the body in order to minimize movement until the urethane adhesive cures.
27. Make sure to observe the auto-adhesive curing time before releasing the vehicle per auto-adhesive instructions by the manufacturers.

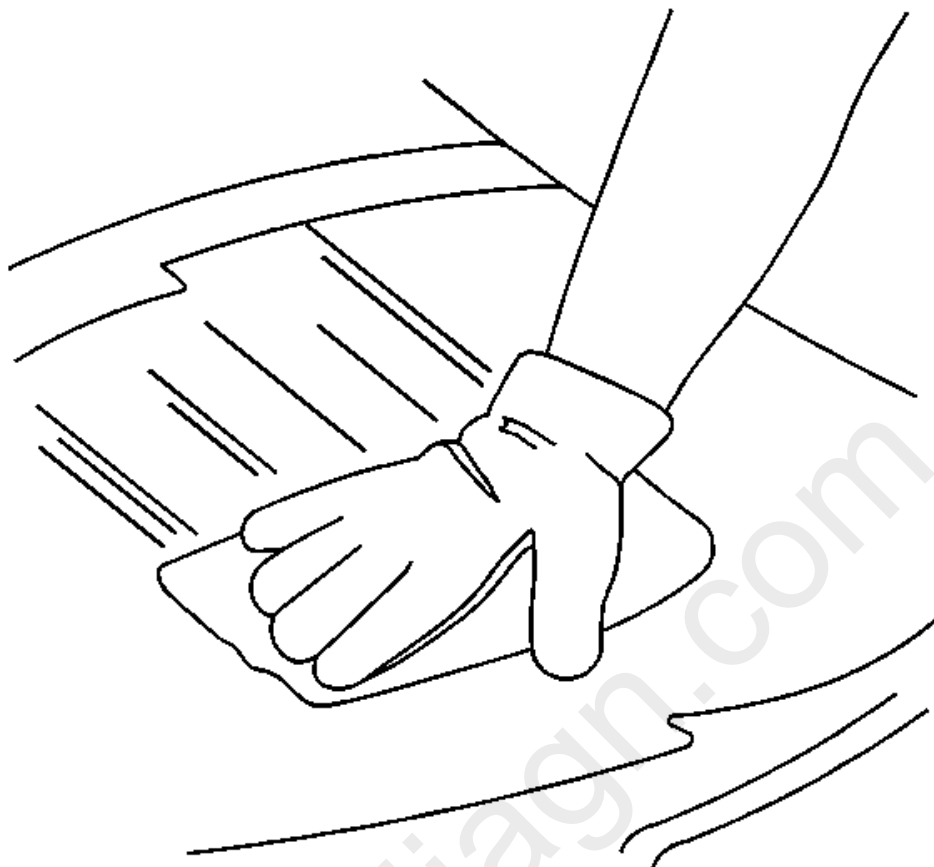


Fig. 55: Cleaning Excess Urethane Adhesive From Body
Courtesy of GENERAL MOTORS COMPANY

28. Clean any excess urethane adhesive from the body.

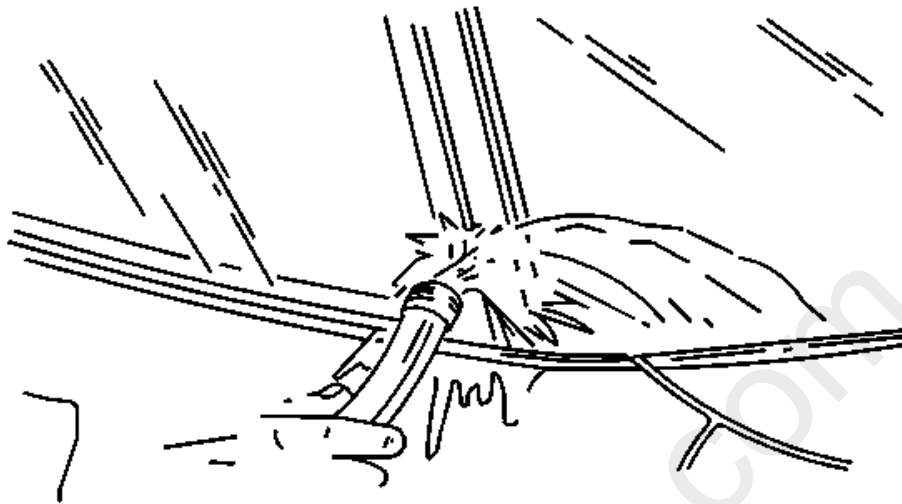


Fig. 56: Performing Water Hose Test
Courtesy of GENERAL MOTORS COMPANY

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

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

WARNING: 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.

33. 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.
34. Complete the window installation.

FRONT SIDE DOOR WINDOW REAR CHANNEL REPLACEMENT

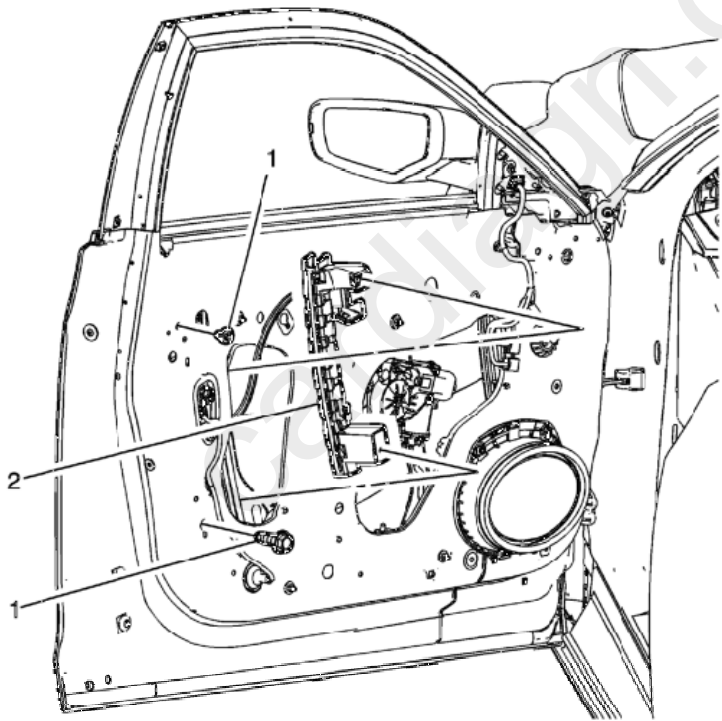


Fig. 57: Front Side Door Window Rear Channel
Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Rear Channel Replacement

Callout	Component Name
Preliminary Procedures	

1. Remove the front side door trim. Refer to <u>Front Side Door Trim Replacement</u> . 2. Remove the front door water deflector.	
1	Front Side Door Window Rear Channel Bolt (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Procedure 1. Place the window in the full up position. 2. Use masking tape to tape the window to the upper door frame. 3. Disconnect the window from the window regulator. 4. Reposition the front side door window regulator rear rail for access to the rear channel. Refer to <u>Front Side Door Window Regulator Replacement</u>. 5. Pull the lower section of the window weatherstrip out of the rear lower channel . 6. Unclip the door wiring harness from the channel. 7. Pull the front side door window rear channel downward releasing it from the stationary window. Tighten 11.5 N.m (102 lb in)
2	Front Side Door Window Rear Channel Procedure 1. When installing the front side door window rear channel ensure that it is in line with the stationary window so that the window will roll properly. 2. After install the front side door window rear channel, start at the top of the channel working downward. NOTE: Inspect the window for proper operation before installing the trim.

DESCRIPTION AND OPERATION

FULL-CUT METHOD DESCRIPTION

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, use adhesive systems which meet GM Specification GM 3651G.**

Use only the full cut method, also known in the field as full strip method, when installing windows.

This method includes the following:

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

No mounds or loose pieces of adhesive should remain on the pinch-weld flange. Do not remove all traces of adhesive.

POWER WINDOWS DESCRIPTION AND OPERATION

Power Windows System Components

The power window system consists of the following components:

- Driver window switch
- Passenger window switch
- Left rear window switch
- Right rear window switch
- Right rear door latch
- Left rear door latch
- Window motors in each of the doors
- 30A Fuse
- Body control module (BCM)

14 Power Windows Block Diagram

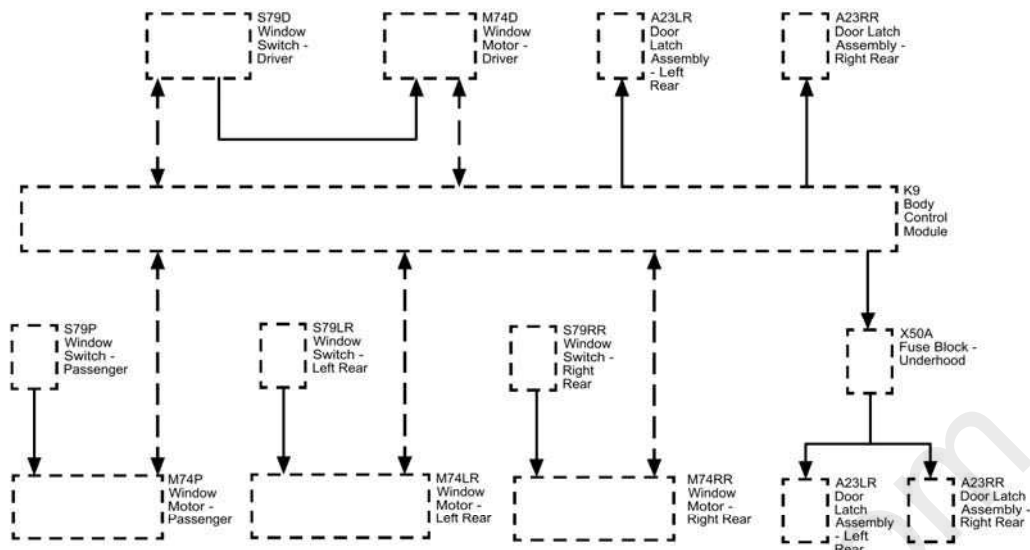


Fig. 58: 14 Power Windows Block Diagram
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
DA	Serial Data
DA	Serial Data
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
DA	Serial Data
DA	Serial Data
DA	Serial Data
S79D	S79D Window Switch - Driver
M74D	M74D Window Motor - Driver
A23LR	A23LR Door Latch Assembly - Left Rear
A23RR	A23RR Door Latch Assembly - Right Rear
K9	K9 Body Control Module

S79P	S79P Window Switch - Passenger
S79LR	S79LR Window Switch - Left Rear
S79RR	S79RR Window Switch - Right Rear
X50A	X50A Fuse Block - Underhood
A23RR	A23RR Door Latch Assembly - Right Rear
A23LR	A23LR Door Latch Assembly - Left Rear
M74RR	M74RR Window Motor - Right Rear
M74P	M74P Window Motor - Passenger
M74LR	M74LR Window Motor - Left Rear

Express Up and Express Down Window Motors

The driver and passenger, left rear and right rear doors contain smart motors that will detect excessive resistance while performing the express up function and automatically reverse direction to prevent injury to any occupants that may become trapped between the closing window and the door frame. The automatic reverse safety feature can be overridden by pulling and holding the window switch.

The logic circuit within the window motors monitor the up, down and express signal circuits which are normally equal to B+ voltage. When a switch is used on the driver, passenger, left rear or right rear window switch, the contacts close causing a voltage drop within the appropriate signal circuit. The window motor will detect the voltage drop and will command the window to move in the direction requested.

Each window motor communicates to the body control module (BCM) by a serial data circuit. When the driver wishes to control the passenger, left rear or right rear window, the driver will use the appropriate switch on the driver window switch. When this switch is used, a serial data message is sent to the BCM requesting a window motor command, the BCM will then send a serial data message to the appropriate window motor which will then move in the direction requested.

Rear Window and Rear Door Lockout Operation

The operator has the option to disable the rear window switches and the interior rear door handles to prevent the unauthorized opening of the rear door doors and windows while still retaining normal driver and passenger door window and handle functions. The driver door window switch has a lockout switch that will disable the interior rear door handles and the local rear window switches. The rear door latches contain switches that are open when the rear doors are unlocked and closed when the rear doors are locked. The operator will first lock all the doors by pressing the central door lock switch. When the lockout switch is pressed, the BCM will confirm that the rear doors have been locked, if the rear doors are locked the BCM will then command the child lockout latches and will also send a disable command to the local rear window switches. The driver and passenger doors will still function normally by pressing the central door lock switch which will unlock the doors but the child lockout latches will continue to disable the interior rear door handles. Pressing the lockout switch again will signal a command to the BCM to unlatch the rear doors, restore normal interior rear door handle functions and restore normal function of the rear window switches.

If the lockout indicator flashes while commanding the lockout system, indicates that the BCM has detected a fault in the system and that one or both interior rear door handles are not locked out and/or the local rear window switches are not locked out.

REAR WINDOW DEFOGGER DESCRIPTION AND OPERATION

Rear Window Defogger System Components

The rear window defogger system consists of the following components:

- HVAC Control Module
- Radio/HVAC Controls
- Rear Defogger Relay
- Rear Defogger Grid
- Driver Outside Rearview Mirror
- Passenger Outside Rearview Mirror
- 40A Fuse

A20-K33-X50A Defogger Block Diagram

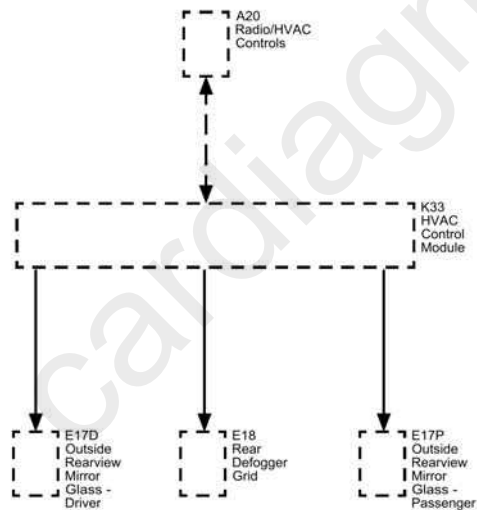


Fig. 59: A20-K33-X50A Defogger Block System Diagram

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
HW	Hard-Wired
HW	Hard-Wired
HW	Hard-Wired
DA	Serial Data
E17D	E17D Outside Rearview Mirror Glass - Driver
E18	E18 Rear Defogger Grid
E17P	E17P Outside Rearview Mirror Glass - Passenger
A20	A20 Radio/HVAC Controls
K33	K33 HVAC Control Module

Rear Window Defogger Operation

The rear defog control system utilizes a single zone backlight design, driven with a single relay configuration. Additionally, up to two outside rear view mirrors can be heated if required. A switch for the customer to control the system is provided within the radio/HVAC controls. Also included in the radio/HVAC controls is an indicator to inform the customer with the current state of the system. The system is only operational when engine is running or during remote start.

Pressing the heated rear window switch causes the radio/HVAC controls to send a serial data message to the HVAC control module requesting rear window defog operation. The HVAC control module upon receipt of the serial data message will provide voltage to the coil side of the rear defogger relay, this will energize the relay causing the relay switch contacts to close allowing B+ voltage to flow through the rear defogger grid control circuit to the rear defogger grid.

When the rear heated window switch is pressed and the engine is running, the rear defog control system will remain active for 10 minutes. After the initial cycle has lapsed, pressing the switch again will continue rear window defogger operation, but the cycle will only last 5 minutes. The rear defog control system will function continuously if the vehicle speed is greater than 70 kilometers per hour (45 mph).

Heated Mirrors

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

STATIONARY WINDOW DESCRIPTION

Most stationary windows, specifically windshields, are retained to the body with adhesive which adheres the window to the body, increasing structural integrity. The reinstallation of the windows with adhesive requires complete replacement of the adhesive bead, and is known as the full cut method. All stationary windows must use a adhesive systems which meet GM Specification GMW-15672.

URETHANE ADHESIVE DESCRIPTION

For replacement of any adhesive-installed window, use the full cut method only.

Use an adhesive that is approved by GM, Specification GMW-15672.

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

Always follow the system manufacturers instructions for application, handling, and curing.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/ Description
	BO-39032 J-39032 Stationary Glass Removal Tool

