SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Door Control Module Screws	3 N.m	27 lb in
Fender Mounting Screws	1.9 N.m	17 lb in
Front Side Door Window Front Weatherstrip Retainer Screws	3 N.m	27 lb in
Front Side Door Window Outer Sealing Strip Screw	2.5 N.m	22 lb in
Front Side Door Window Regulator Guide Bolts	11 N.m	97 lb in
Front Side Door Window Regulator Motor Bolts	11 N.m	97 lb in
Front Side Door Window Regulator Nuts	11 N.m	97 lb in
Rear Compartment Lift Latch Bracket Nuts	10 N.m	89 lb in
Rear Compartment Lift Window Latch Screws	10 N.m	89 lb in
Windshield Frame Weatherstrip Nuts	4.7 N.m	42 lb in

SCHEMATIC WIRING DIAGRAMS

MOVEABLE WINDOW WIRING SCHEMATICS

Driver Wiring Schematics

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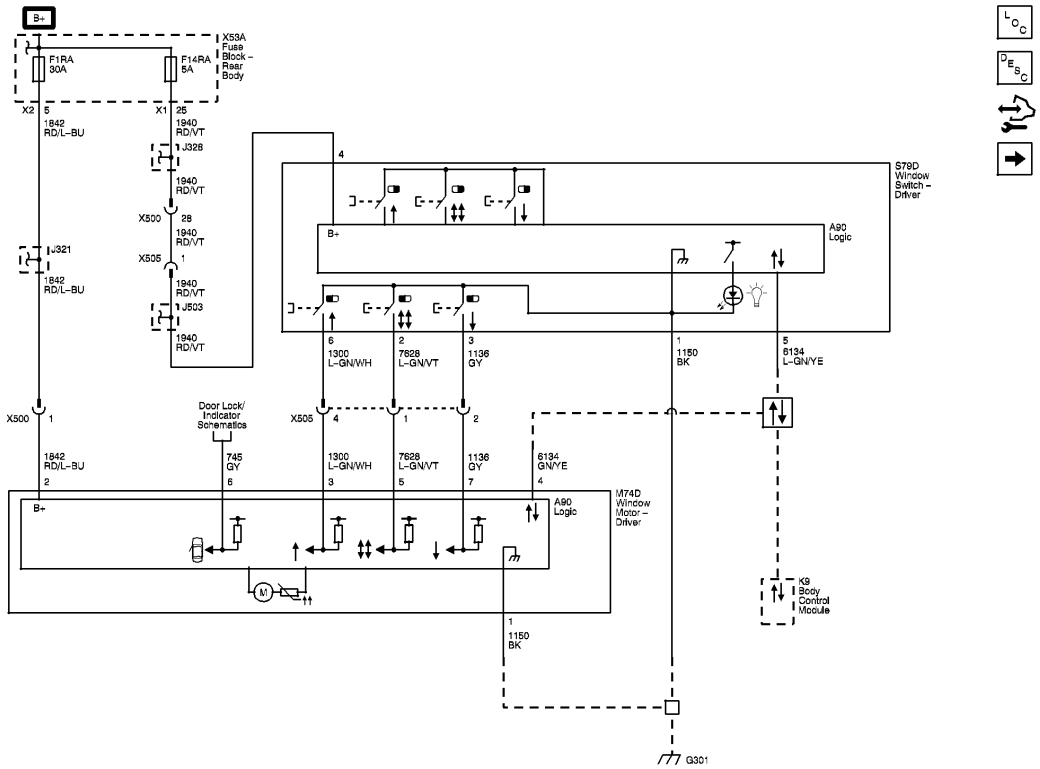

Fig. 1: Driver Window Wiring Schematic
Courtesy of GENERAL MOTORS COMPANY

Passenger Wiring Schematics

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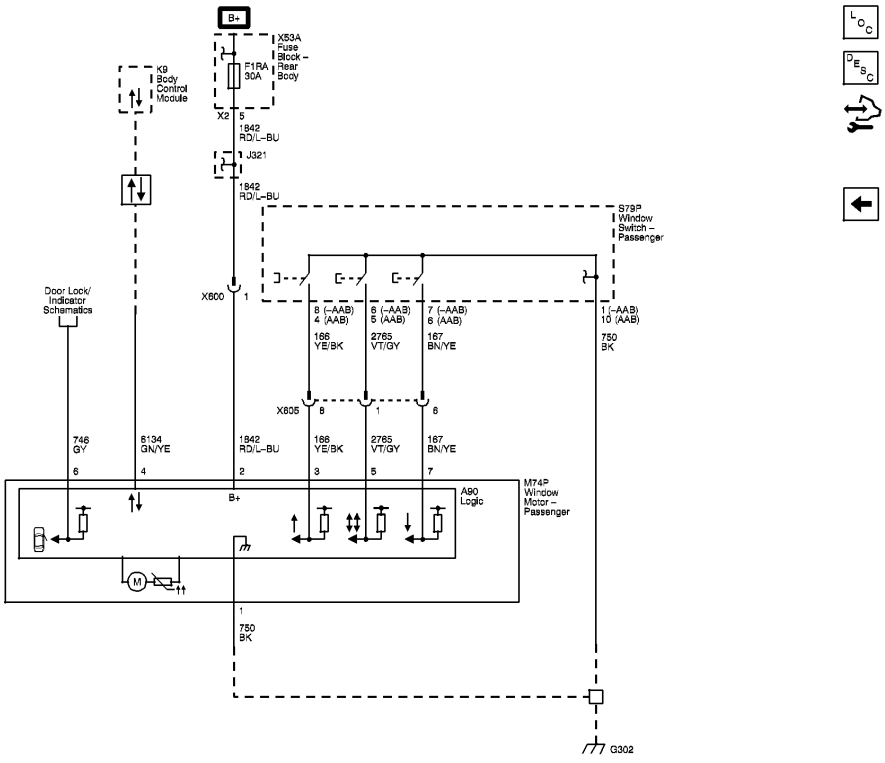

Fig. 2: Passenger Window Wiring Schematic
Courtesy of GENERAL MOTORS COMPANY

REAR WINDOW DEFOGGER WIRING SCHEMATICS

Rear Window Defogger Wiring Schematics

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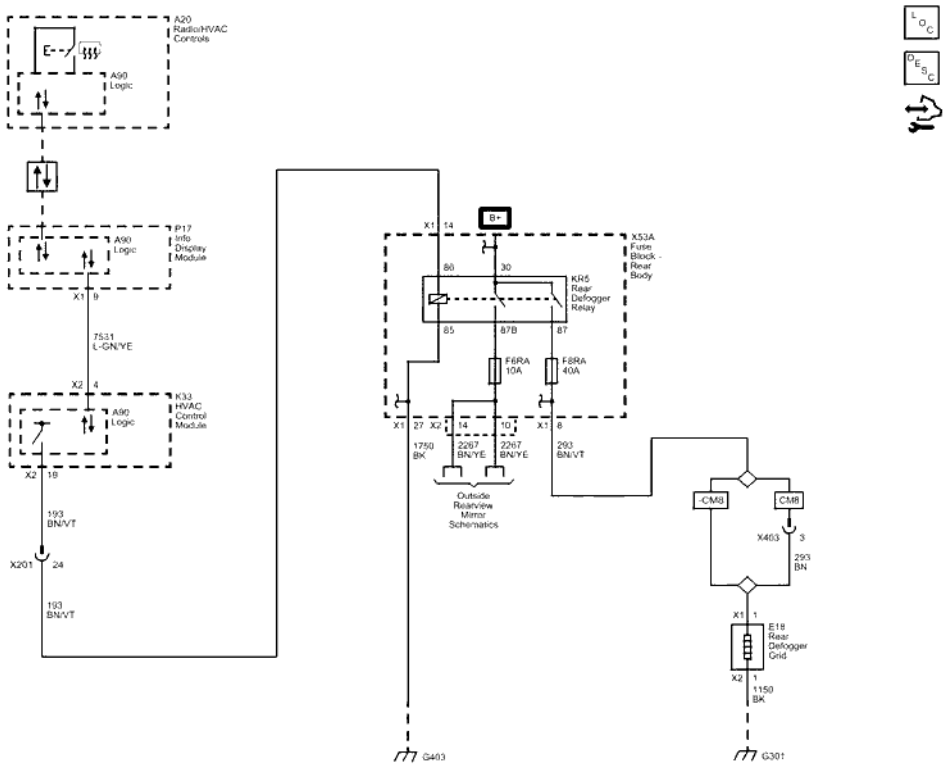

Fig. 3: Rear Window Defogger Wiring Schematic
Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
DTC B0283	DTC B0283 Electric Rear Defrost Circuit
DTC B316B or B317A	DTC B316B 02 Driver Window Switch Short to Ground DTC B317A 02 Passenger Window Switch Short to Ground
DTC B3205 or B3210	DTC B3205 Driver Window Motor DTC B3210 Passenger Window Motor

DTC B0283: ELECTRIC REAR DEFROST

Diagnostic Instructions

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

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- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B0283

Electric Rear Defrost Circuit

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

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 rear window defogger switch is pressed, the HVAC control module will supply voltage to the relay coil. Battery positive voltage is supplied at all times to the relay switched input and the relay coil is always grounded. This allows battery positive voltage from the relay switched input to flow through the switch contacts and out the relay switched output to the rear defogger grid.

Conditions for Running the DTC

Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

B0283 02

The HVAC control module detects a short to ground in the relay control circuit.

B0283 05

The HVAC control module detects a short to voltage or an open/high resistance in the relay control circuit.

Action Taken When the DTC Sets

- If B0283 02 is current, the rear defogger grid will operate continuously.
- If B0283 05 is current, the rear defogger grid will be inoperative.

Conditions for Clearing the DTC

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- 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

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.

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- **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 85 and 86.
    - **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:

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- 30 and 86
- 30 and 87
- 30 and 85
- 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 85 and 12 V. Install a jumper wire between relay terminal 86 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, setup and programming

DTC B316B OR B317A: DRIVER/PASSENGER 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 02

Driver Window Switch Short to Ground

DTC B317A 02

Passenger Window Switch Short to Ground

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Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Driver Window Motor Control	B316B 02	1	1	-
Passenger Window Motor Control	B317A 02	2	2	-
1. Driver Window Malfunction 2. Passenger Window Malfunction				

Circuit/System Description

The driver and passenger 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 switch 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 left front window 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.

Action Taken When the DTC Sets

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The affected power window will malfunction.

Conditions for Clearing the DTC

- The DTC will be current 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.

Reference Information

Schematic Reference

Moveable Window Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

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 window on the driver window master control;
    - 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**

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- **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 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 Passenger Window Switch at Door parameters change to Inactive, Up, Express Up, Down, Express Down when pressing and pulling the S79P Window Switch-Passenger.
   - **If any parameter does not change**

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

   - **If all the parameters change**
5. All OK.

Circuit/System Testing

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.

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- **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.

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- **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 Window Switch Malfunction

1. Ignition OFF, and all vehicle systems OFF, disconnect the harness connector at the S79P Window Switch-Passenger. It may take up to 2 minutes for all vehicle systems to power down

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- **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 scan tool Passenger Window Switch at Door parameter is Inactive.
    - **If not Inactive**

    1. Ignition OFF, disconnect the harness connector at the M74P Window Motor-Passenger
    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
        - If less than infinite resistance, repair the short to ground on the circuit.
        - If infinite resistance, replace the M74P Window Motor-Passenger.

    - **If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 8 and ground:
6. Verify the scan tool Passenger Window Switch at Door parameter is Up
    - **If not Up**

    1. Ignition OFF, remove the fused jumper wire, disconnect the harness connector at the M74P Window Motor-Passenger, ignition ON.
    2. Test for less than 1 V between the S79P Window Switch-Passenger signal circuit terminal 8 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 M74P Window Motor-Passenger.

    - **If Up**

7. Install a 3 A fused jumper wire between the signal circuit terminal 7 and ground.
8. Verify the scan tool Passenger Window Switch at Door parameter is Down
    - **If not Down**

    1. Ignition OFF, remove the fused jumper wire, disconnect the harness connector at the M74P Window Motor-Passenger, ignition ON.
    2. Test for less than 1 V between the S79P Window Switch-Passenger signal circuit terminal 7 and ground.
        - If 1 V or greater, repair the short to voltage on the circuit.
        - If less than 1 V

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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 M74P Window Motor-Passenger.
- **If Down**

9. Test for greater than 10 V between the signal circuit terminal 6 and ground
    - **If less than 10 V**
    1. Ignition OFF, disconnect the harness connector at the M74P Window Motor-Passenger.
    2. Test for infinite resistance between the S79P Window Switch-Passenger signal circuit 6 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 M74P Window Motor-Passenger.
    - **If greater than 10 V**
10. Test or replace the S79P Window Switch-Passenger.

Repair Instructions

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

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

DTC B3205 OR B3210: DRIVER/PASSENGER 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

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Circuit/System Description

The body control module (BCM) monitors, receives and transmits serial data messages to the driver and passenger 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

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

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

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

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

The affected motor will be inoperative.

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B3205 4B, B3210 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

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

B3205 39, B3210 39

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

B3205 42, B3210 42

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

B3205 4B, B3210 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

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

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Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the driver and passenger functions while commanding the Driver Window Motor or Passenger 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 and passenger 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

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** .

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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.

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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	-
Rear Defogger Grid Control	1	1	2	-
Relay Ground	-	B0283 05	-	-
Rear Defogger Grid Ground	-	1	-	-
1. Rear Defogger Inoperative 2. Rear Defogger Always ON				

Circuit/System Description

When the rear window defogger switch is pressed, the HVAC control module will supply voltage to the relay coil. Battery positive voltage is supplied at all times to the relay switched input and the relay coil is always grounded. This allows battery positive voltage from the relay switched input to flow through the switch contacts and out the relay switched output to the rear window defogger grid.

Diagnostic Aids

The rear window defogger indicator will still function when the rear defogger switch is pressed, but any of the following conditions may cause the rear window defogger grid not to function:

- The battery state of charge is out of range causing the HVAC control module to suspend the rear window defogger operation.
- The Remote Start Enable ambient temperature is greater than 5°C (40°F).

Reference Information

Schematic Reference

Defogger Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Rear Window Defogger Description and Operation

Electrical Information Reference

- **Circuit Testing**

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- **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 K33 HVAC Control Module.

    - **If the parameter changes between On and Off**
3. 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**
4. Verify the rear window defogger indicator turns ON and OFF when pressing the rear window defogger switch.
    - **If the indicator does not turn ON and OFF**

      Replace the K33 HVAC Control Module.

    - **If the indicator 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.

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- **If less than 10 ohms**

3. Engine Running.
4. Verify a test lamp illuminates between the B+ circuit terminal 30 and ground.
   - **If the test lamp does not illuminate**
   - Replace the X50A Fuse Block-Underhood
   - **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.

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- **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, 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 85 and 86.
    - **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:
    - 30 and 86
    - 30 and 87
    - 30 and 85
    - 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 85 and 12 V. Install a jumper wire between relay terminal 86 and ground.
5. Test for less than 2 ohms between terminals 30 and 87.

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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 Compartment Lift Window Replacement**
- **Relay Replacement (Within an Electrical Center)** , **Relay Replacement (Attached to Wire Harness)**
- **Control Module References** for HVAC control module 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.

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- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Driver Window Motor B+	U1530 00, U1534 00	U1534 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	-	-
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	-	U1530 00	-	-
Passenger Window Switch Ground	-	2	-	-
1. Driver Window Malfunction 2. Passenger Window Malfunction				

Circuit/System Description

The driver and passenger 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.

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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 which will perform the command as requested.

Diagnostic Aids

The loss of the express up and express down functions for the driver and passenger 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
- If the convertible top has not been completely closed and firmly latched

The window motors may 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

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

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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 - Driver/Passenger 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 window on the driver window master control;
    - 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 the parameters do not change**

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

    - **If the parameters changes**
5. Verify the passenger window moves while commanding the Passenger Window Motor Up and Down with a scan tool.
    - **If the passenger window does not move UP and DOWN as commanded**

      Refer to Circuit/System Testing - Driver/Passenger Window Motor Malfunction.

    - **If the passenger window moves UP and DOWN as commanded**
6. Verify the passenger window moves while commanding the window UP, express UP, DOWN

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

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

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

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

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

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

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

7. All OK.

Circuit/System Testing

Driver/Passenger Window Motor Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the appropriate driver or passenger 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.

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        - 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

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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

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        - 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 Window Switch Malfunction

1. Ignition OFF, and all vehicle systems OFF, disconnect the harness connector at the S79P Window Switch-Passenger. 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 scan tool Passenger Window Switch at Door parameter is Inactive.
    - **If not Inactive**
    1. Ignition OFF, disconnect the harness connector at the M74P Window Motor-Passenger
    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
        - If less than infinite resistance, repair the short to ground on the circuit.
        - If infinite resistance, replace the M74P Window Motor-Passenger.

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- **If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 8 and ground:
6. Verify the scan tool Passenger Window Switch at Door parameter is Up
   - **If not Up**
   1. Ignition OFF, remove the fused jumper wire, disconnect the harness connector at the M74P Window Motor-Passenger, ignition ON.
   2. Test for less than 1 V between the S79P Window Switch-Passenger signal circuit terminal 8 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 M74P Window Motor-Passenger.
   - **If Up**
7. Install a 3 A fused jumper wire between the signal circuit terminal 7 and ground.
8. Verify the scan tool Passenger Window Switch at Door parameter is Down
   - **If not Down**
   1. Ignition OFF, remove the fused jumper wire, disconnect the harness connector at the M74P Window Motor-Passenger, ignition ON.
   2. Test for less than 1 V between the S79P Window Switch-Passenger 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 M74P Window Motor-Passenger.
   - **If Down**
9. Test for greater than 10 V between the signal circuit terminal 6 and ground
   - **If less than 10 V**
   1. Ignition OFF, disconnect the harness connector at the M74P Window Motor-Passenger.
   2. Test for infinite resistance between the S79P Window Switch-Passenger signal circuit 6 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 M74P Window Motor-Passenger.
   - **If greater than 10 V**

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10. Test or replace the S79P Window Switch-Passenger.

Repair Instructions

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

- **Front Side Door Window Control Switch Replacement**
- **Front Side Door Window Switch Replacement**
- **Front 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 **Symptoms - Fixed and Moveable Windows** 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

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Special Tools

- **J 39032** Stationary Glass Removal Tool
- Use a urethane adhesive systems which meet GM Specification GM 3651G

Removal Procedure

1. Open the hood.
2. Lower the door windows.

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

3. Remove the windshield wiper arms. Refer to **Windshield Wiper Arm Replacement** .
4. Perform the appropriate step:
   - For the coupe, remove the roof lift-off panel.
   - For the convertible, lower the folding top.
5. Remove the air inlet screen. Refer to **Air Inlet Screen Replacement (Left Side)** , **Air Inlet Screen Replacement (Right Side)** , **Air Inlet Screen Replacement (Center)** .
6. Remove the lower windshield supports from the cowl panel, if equipped.
7. Remove the windshield frame weatherstrip. Refer to **Windshield Frame Weatherstrip Replacement**.
8. Remove the front side door window front weatherstrip retainer. Refer to **Front Side Door Window Front Weatherstrip Retainer Replacement**.

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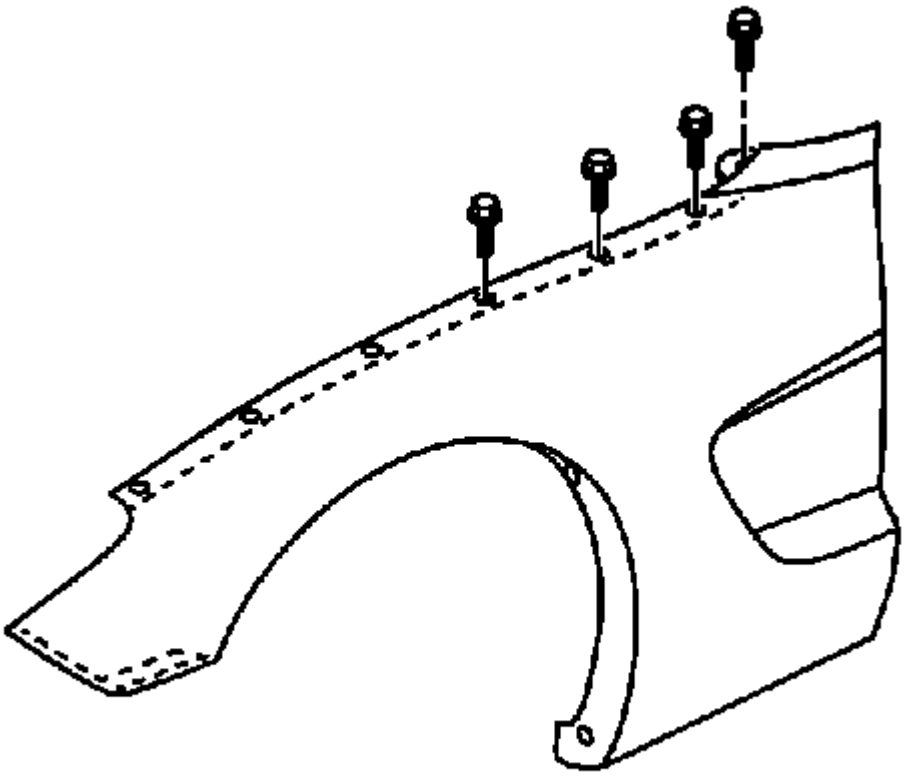

Fig. 4: Rearmost Screws At Top Of Fender To Wheelhouse
Courtesy of GENERAL MOTORS COMPANY

9. Remove the 4 rearmost screws that attach the top of the fender to the wheelhouse.

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

NOTE: Tape or otherwise protect the fender from the cutting tool.

10. Reposition the top of the fender for tool access.

WARNING: Refer to Defroster Outlet Warning .

11. Cover the following parts to protect from broken glass:
    1. The upper dash pad

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3. The seats and the carpeting

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

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

NOTE: **If reusing the window use care not to cut off the locator pins located in the upper corners. If the locating pins are cut off in the removal it will be necessary to use masking tape to tape the window in place until the urethane adhesive cures.**

13. Do the following steps when separated 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.

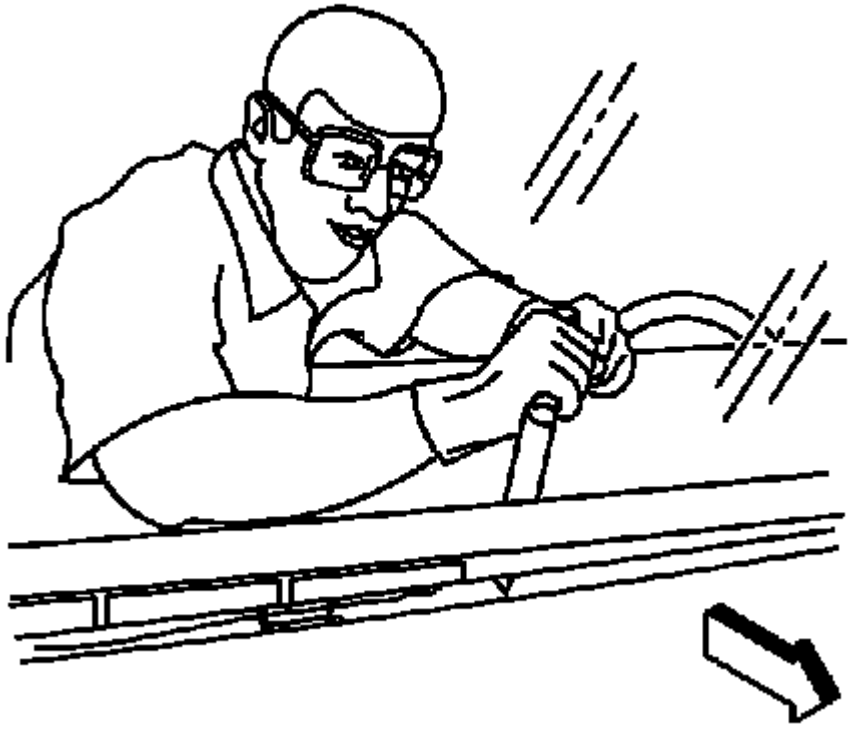

Fig. 5: Separating Bottom Of Window
Courtesy of GENERAL MOTORS COMPANY

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14. 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.

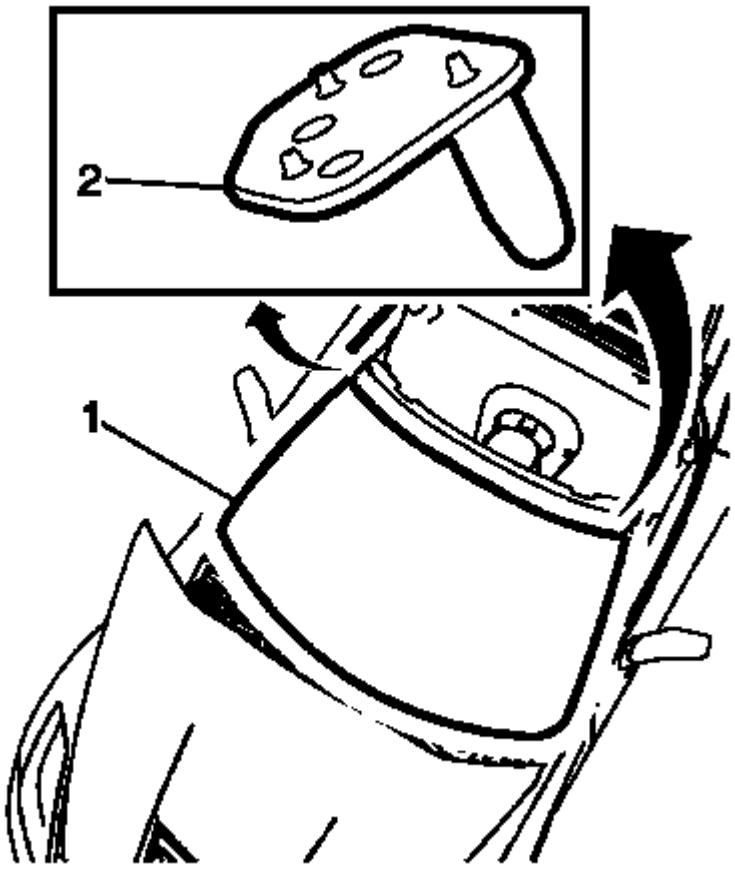

Fig. 6: Window And Locator Pins
Courtesy of GENERAL MOTORS COMPANY

15. Remove the window (1) from the vehicle with an assistant and Do the following:
    1. After removing the window spacers, mark the location of each one, If equipped.
    2. Check that the locator pins (2) are still attached to each upper corner of the window (1) for installing, if reusing.
    3. Remove all mounds or loose pieces of urethane adhesive from the pinchweld area.
    4. If the original window (1) is being reused, remove all but approximately 2 mm (0.078 in) of the existing bead of urethane adhesive from the pinchweld flange surface, using a clean utility knife or razor blade scraper.
16. Inspect for any of the following conditions in order to help prevent future breakage of the window:
    - High weld

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- Hardened sealer
- Any other obstruction or irregularity in the pinchweld flange

NOTE: **If corrosion of the pinchweld flange is present or if sheet metal repairs or replacements are required, the pinchweld 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.**

17. 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.

Installation Procedure

1. Transfer all necessary components.

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.**

2. Verify that all primers and urethane adhesive being used are within expiration dates.
3. If reusing or replacing the window, use the appropriate tool, remove the urethane adhesive bead on the window surface and pinchweld flange to approximately 2 mm (0.078 in).

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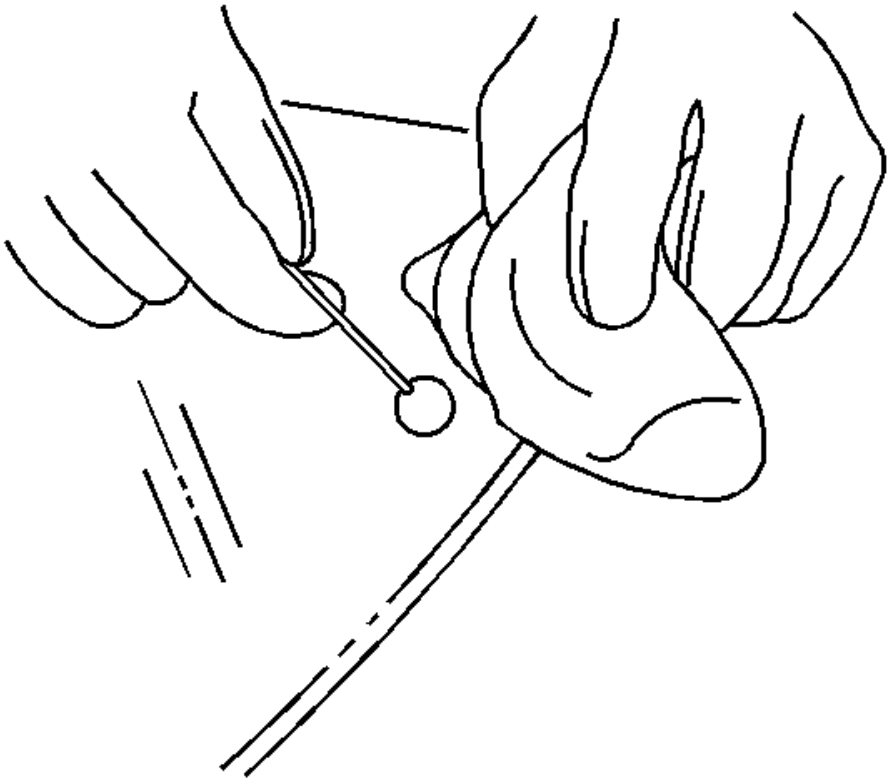

Fig. 7: Applying Glass Prep
Courtesy of GENERAL MOTORS COMPANY

NOTE: Use Prep #1 Clear

4. Apply the Prep #1 clear primer to the bonding surface of the windows inside edge and the bonding surface of the pinchweld flange opening, refer to the instructions of the manufacturer's.

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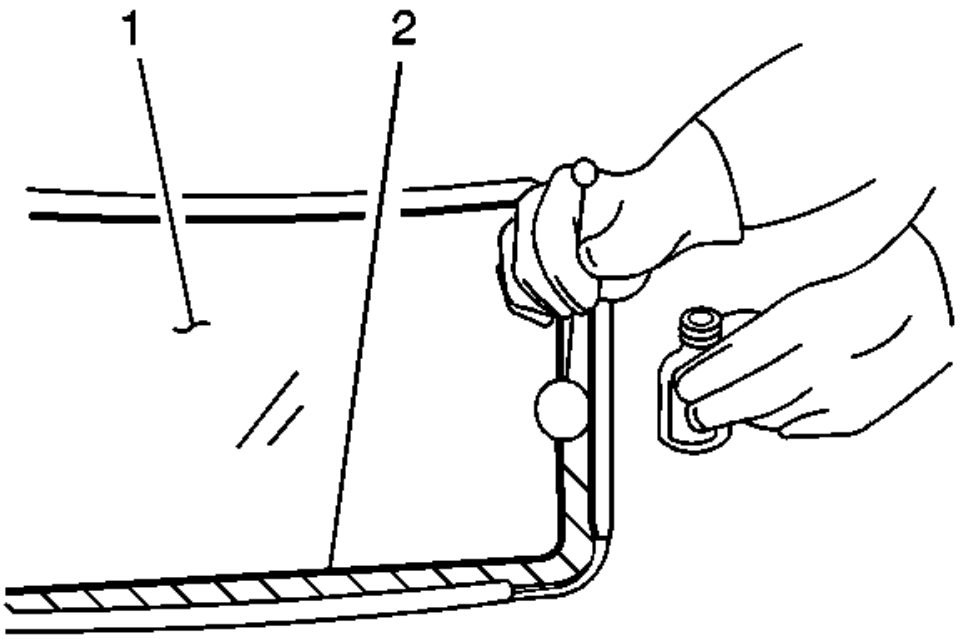

Fig. 8: Applying Glass Primer
Courtesy of GENERAL MOTORS COMPANY

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

NOTE: **Following the urethane adhesive installation instructions, using P/N 9981062 (VM/P Naphtha) or equivalent to remove any excess of urethane adhesive within 3 minutes, otherwise it may not be possible to remove the urethane adhesive excess unless using mechanical means.**

NOTE: **The Prep #2 Black Primer is for, Blackout primer, UV Blackout.**

5. Apply the Prep #2 urethane adhesive primer (2) around the perimeter of the window (1), refer to the instructions of the manufacturer's.
6. Install the spacers for the window to the marked locations on the pinchweld flange, If equipped

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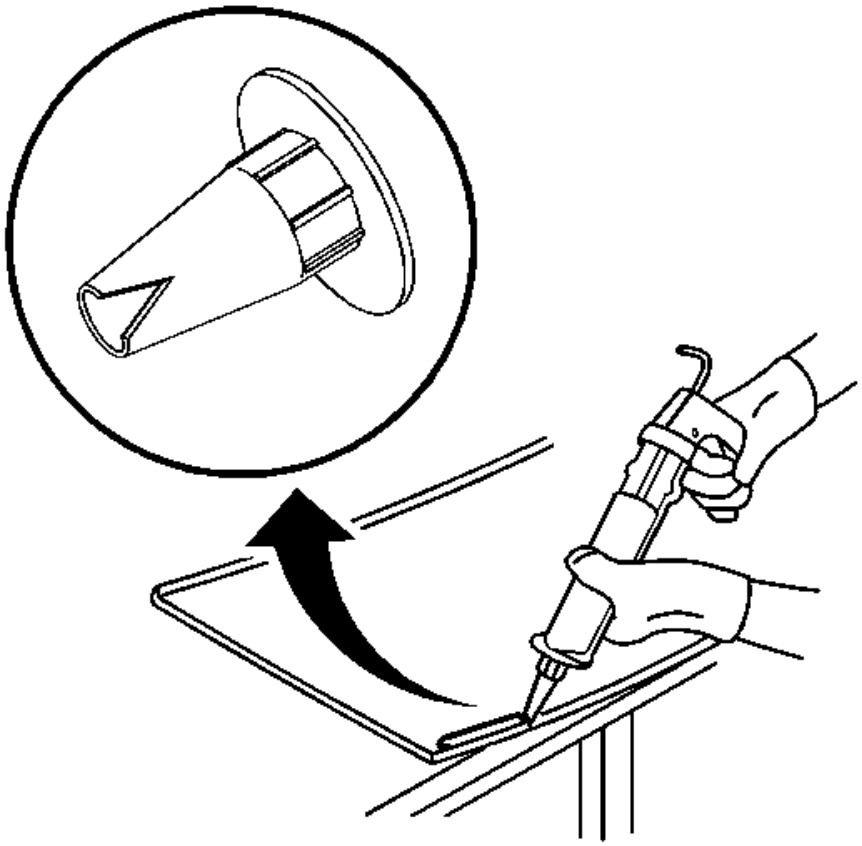

Fig. 9: View Of Modified Applicator Nozzle
Courtesy of GENERAL MOTORS COMPANY

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

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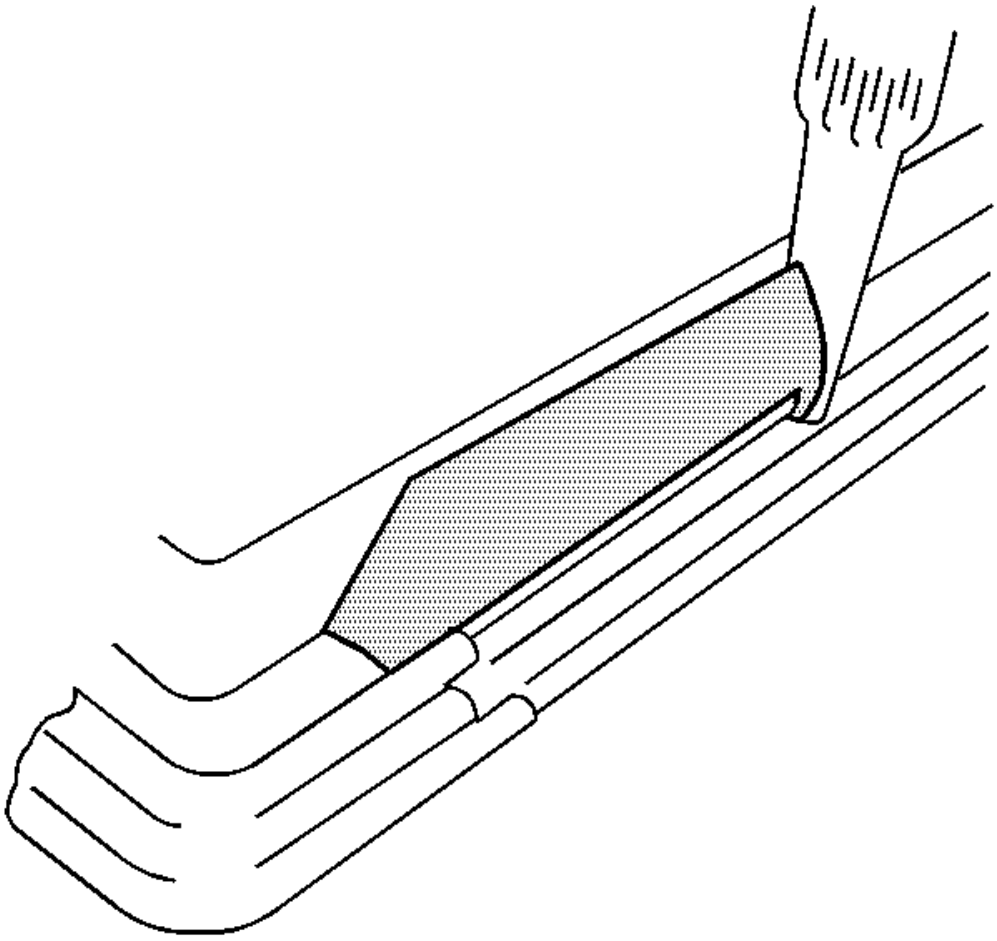

Fig. 10: Applying Continuous Bead Of Urethane Adhesive
Courtesy of GENERAL MOTORS COMPANY

8. Use the appropriate tool in order to apply a smooth, continuous bead of urethane adhesive to the window or the pinchweld flange.

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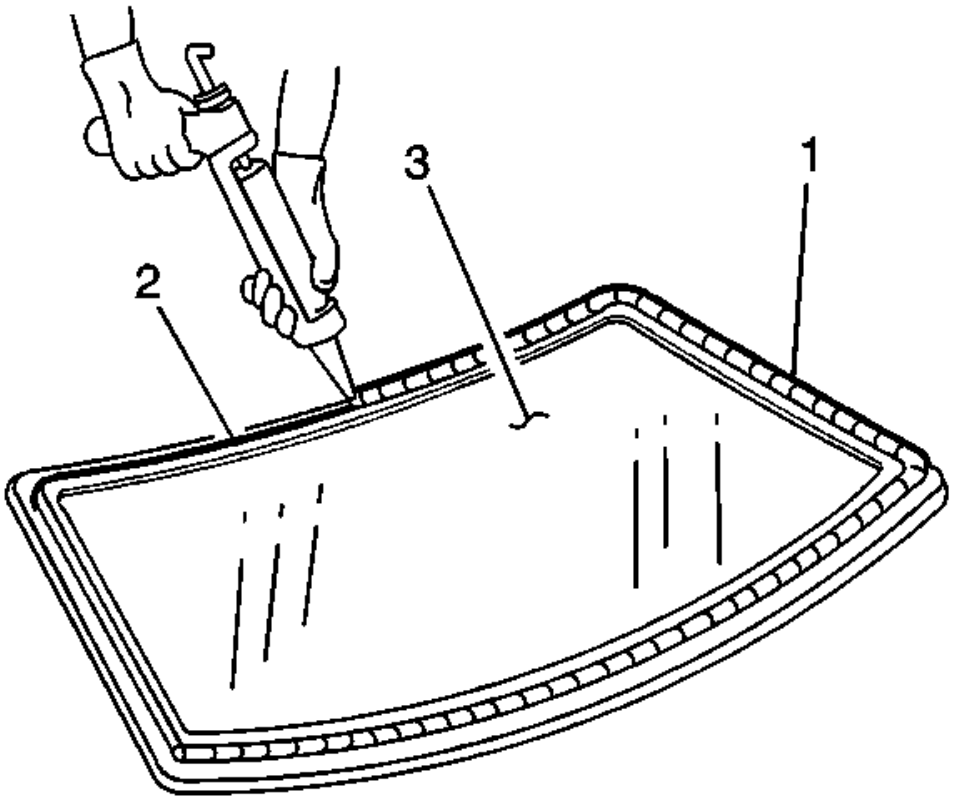

Fig. 11: Applying Urethane Adhesive To Inner Surface Of Window
Courtesy of GENERAL MOTORS COMPANY

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

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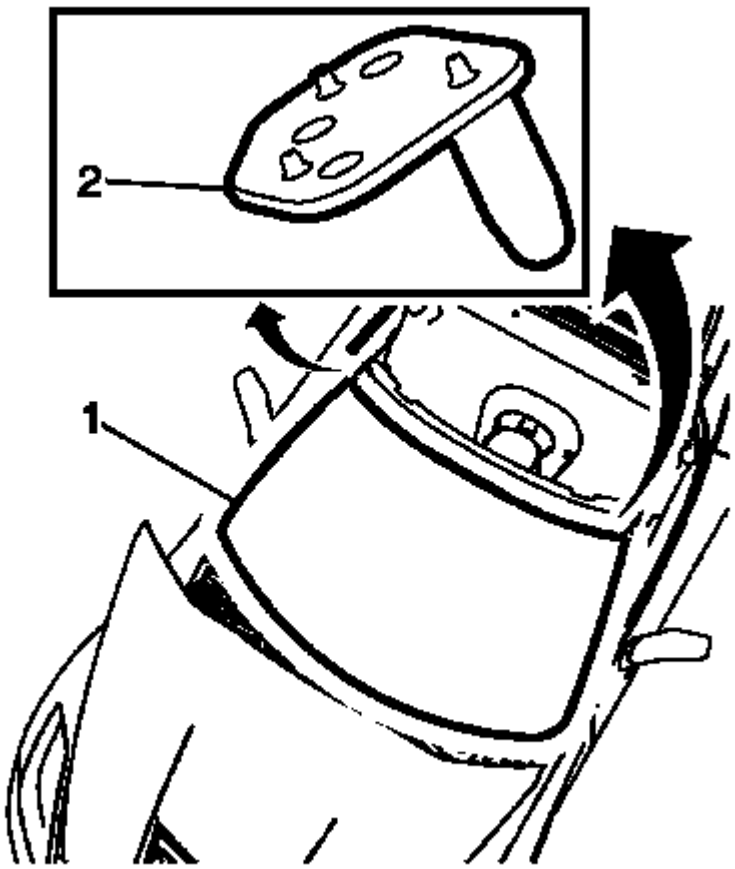

Fig. 12: Window And Locator Pins
Courtesy of GENERAL MOTORS COMPANY

10. With an assistant, place the window (1) and locator pins (2) into the locator slots in the pinchweld flange of the vehicle.

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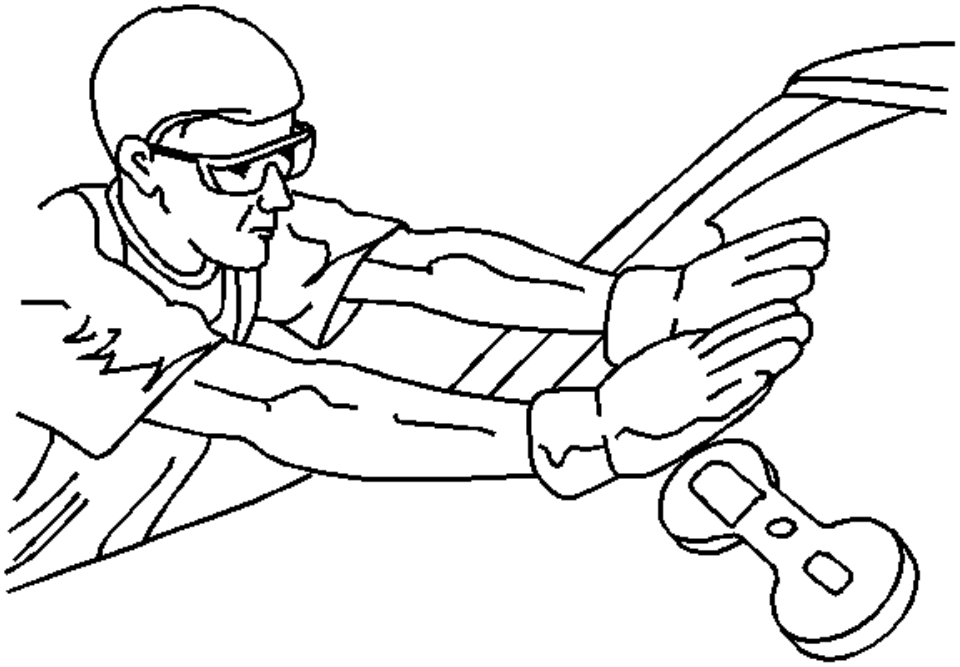

Fig. 13: Pressing Window Into Place
Courtesy of GENERAL MOTORS COMPANY

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 roof sheet metal.

11. Press firmly around the entire periphery of the window in order to wet-out the urethane adhesive bead.

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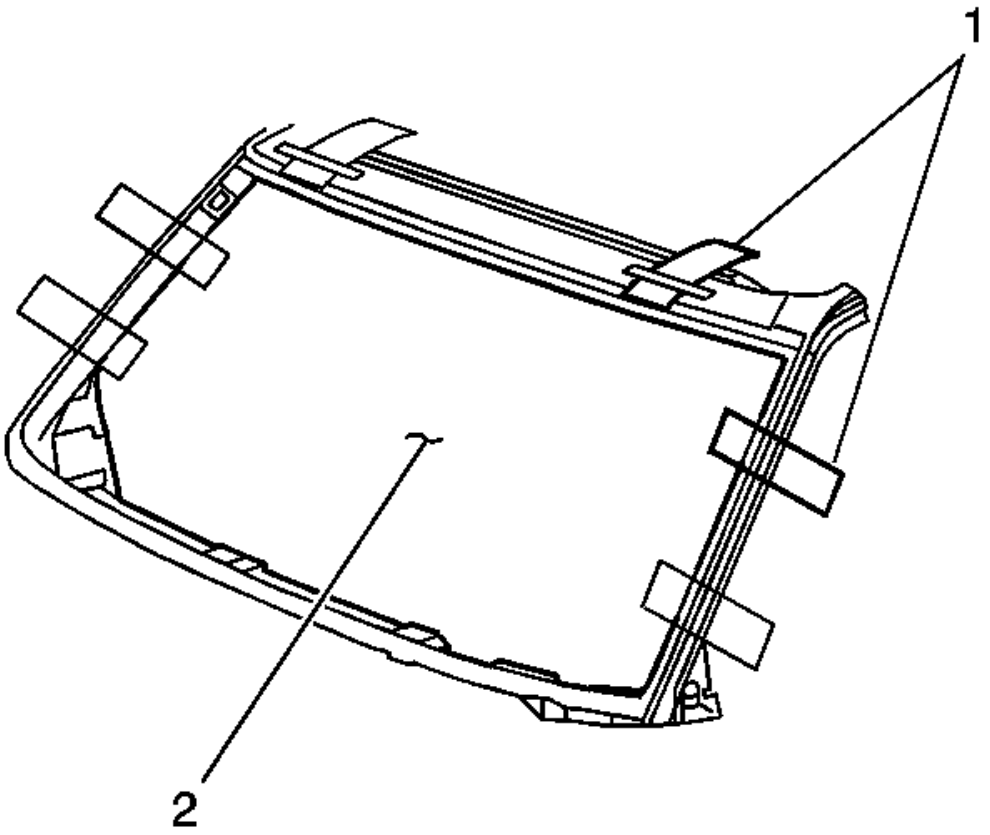

Fig. 14: Aligning Tape Lines On Window To Body
Courtesy of GENERAL MOTORS COMPANY

12. Use masking tape (1) to hold the window (2) in the position until the urethane adhesive completely cures.
13. Remove the double layer of masking tape around the perimeter of the painted surfaces and the interior trim.

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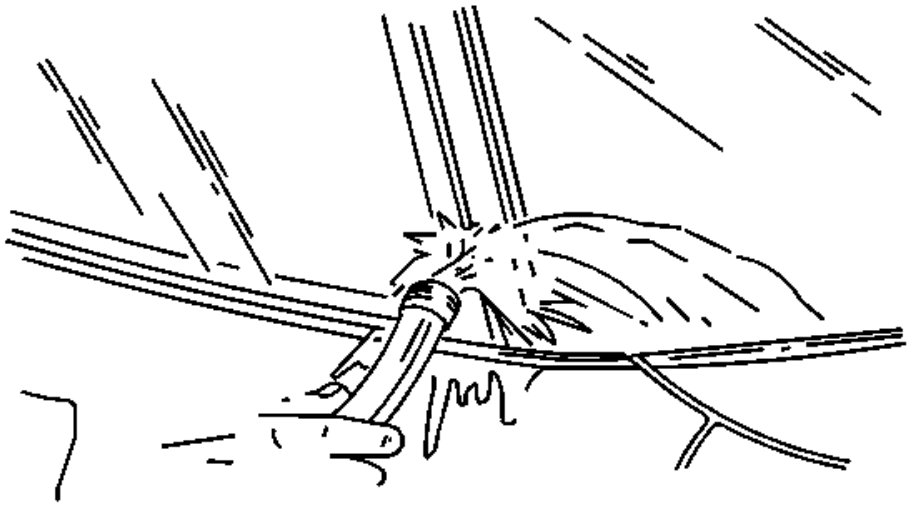

Fig. 15: Performing Water Hose Test
Courtesy of GENERAL MOTORS COMPANY

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

14. Use a soft spray of warm water in order to immediately water test the window.
15. Inspect the window for leaks.
16. If any leaks are found, use a plastic paddle in order to apply extra urethane adhesive at the leak point.
17. 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**

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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.

18. Maintain the following conditions in order to properly cure the urethane adhesive by manufacturers instructions:
    - 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 instructions of the manufacturers curing times.
    - Do not use compressed air in order to dry the urethane adhesive.
19. Install the front side door window front weatherstrip retainer. Refer to **Front Side Door Window Front Weatherstrip Retainer Replacement**.
20. Install the windshield frame weatherstrip. Refer to **Windshield Frame Weatherstrip Replacement**.

CAUTION: Refer to Fastener Caution .

21. Install the fender mounting screws.

    Tighten

    Tighten the screws to 1.9 N.m (17 lb in).

22. Install the air inlet screen. Refer to **Air Inlet Screen Replacement (Left Side)** , **Air Inlet Screen Replacement (Right Side)** , **Air Inlet Screen Replacement (Center)** .
23. Install the windshield wiper arms. Refer to **Windshield Wiper Arm Replacement** .
24. Perform the appropriate step:
    - For the coupe, install the roof lift-off panel.
    - For the convertible, raise and close the folding top.
25. Close the door windows.
26. Remove the double layer of masking tape around the perimeter of the painted surfaces and the interior trim.
27. Close the hood.

WINDSHIELD FRAME WEATHERSTRIP REPLACEMENT

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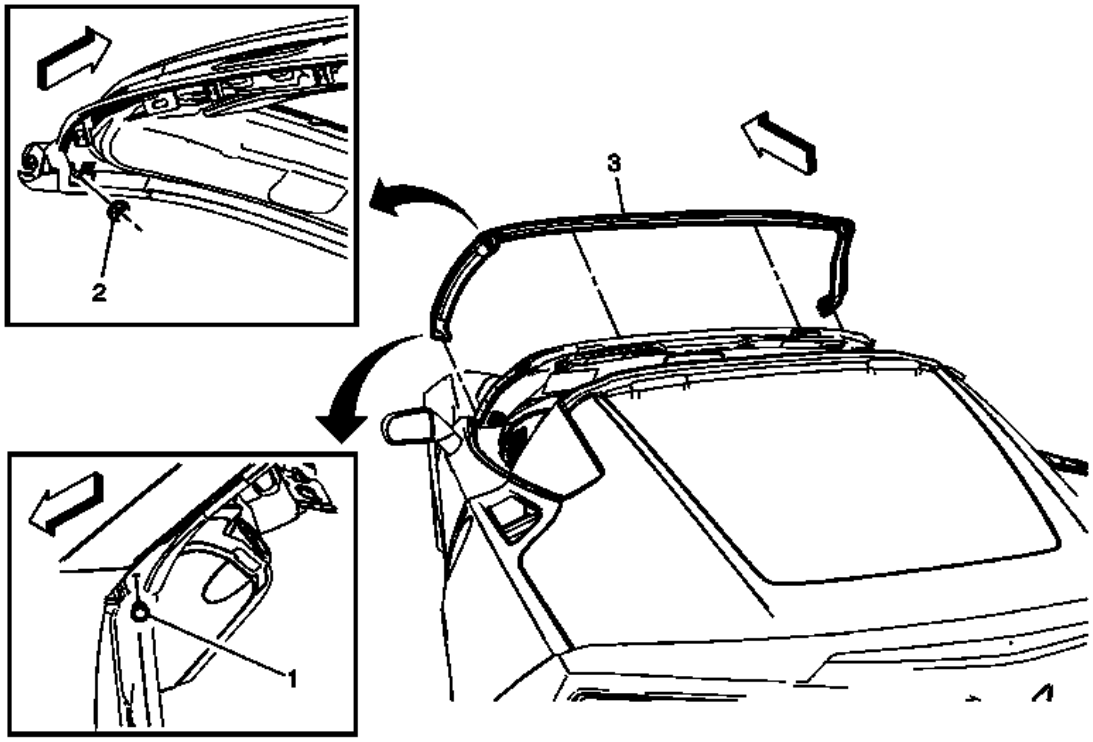

Fig. 16: Windshield Frame Weatherstrip
Courtesy of GENERAL MOTORS COMPANY

Windshield Frame Weatherstrip Replacement

Callout	Component Name
Preliminary Procedures 1. Open the driver and passenger side doors. 2. Remove the roof lift off panel (coupe) or lower the top (convertible). 3. Remove the windshield side garnish molding. Refer to **Windshield Garnish Molding Replacement** .	
1	Windshield Frame Weatherstrip Retainer (Qty: 2) **Procedure** Remove the push in retainers from the weatherstrip, located at the base of the windshield pillars.
2	Windshield Frame Weatherstrip Nut (Qty: 2) **CAUTION:** **Refer to Fastener Caution .** **Procedure** Remove the upper corner nuts from the weatherstrip.

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	4.7 N.m (42 lb in).
3	Windshield Frame Weatherstrip **Procedure** 1. Remove the weatherstrip from the windshield frame channel, full the weatherstrip gently to disengage the foam adhsive tape. 2. Use a solution of 50/50 isopropyl alcohol and water to clean the adhesive surface. 3. Peel the protective film from the foam tape on the sides of the new weatherstrip, or install two sided tape to the sides of a reused weatherstrip. 4. Insert the weatherstrip into the upper retainer starting in the center and working outwards and down the sides. **NOTE:** **Water test the vehicle to ensure no leaks.**

FRONT SIDE DOOR WINDOW ADJUSTMENT

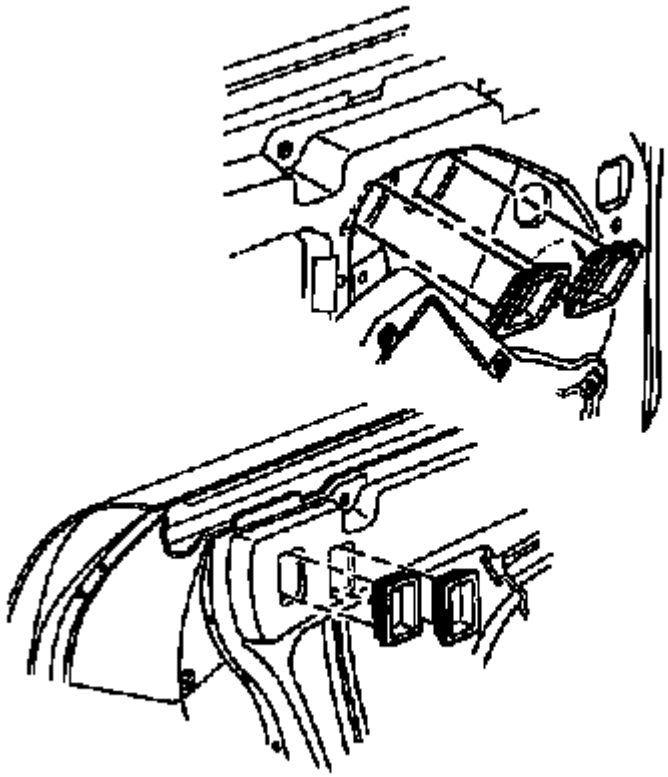

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Fig. 17: View of Window Clamp Access Plugs
Courtesy of GENERAL MOTORS COMPANY

1. Remove the front side door trim panel. Refer to **Front Side Door Trim Replacement (Driver Side)** , **Front Side Door Trim Replacement (Passenger Side)** .
2. Reconnect the window switch to the door harness.
3. Raise the window.
4. Disconnect the window switch from the harness.
5. Remove the window guide sight access plugs.

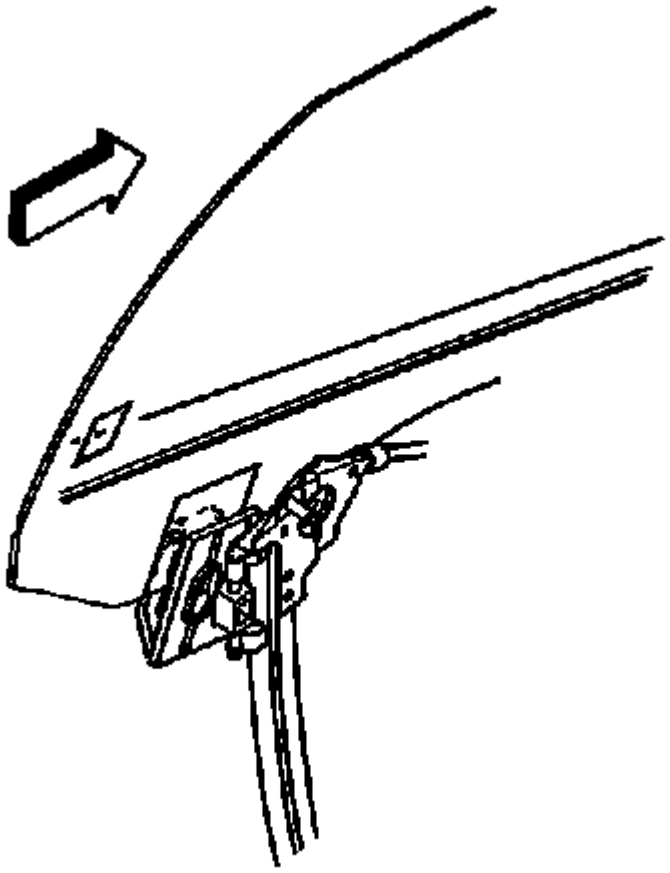

Fig. 18: View Of Door Window
Courtesy of GENERAL MOTORS COMPANY

6. Mark the location of the guide on the window.
7. Loosen the window guide bolts.
8. Jiggle the window to break the window loose from the guide rubber seals.
9. Adjust the window using one of the following methods:
    - Put a socket on the guide bolt and use the socket to move the window.

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1. Adjust the window forward or reward first.
2. Adjust the front height second.
3. Adjust the rear height last.

- Sit in the vehicle with the door closed and with the aid of an assistant standing outside of the vehicle, position the window in the door opening.
  1. Adjust the window forward or reward first.
  2. Adjust the front height second.
  3. Adjust the rear height last.

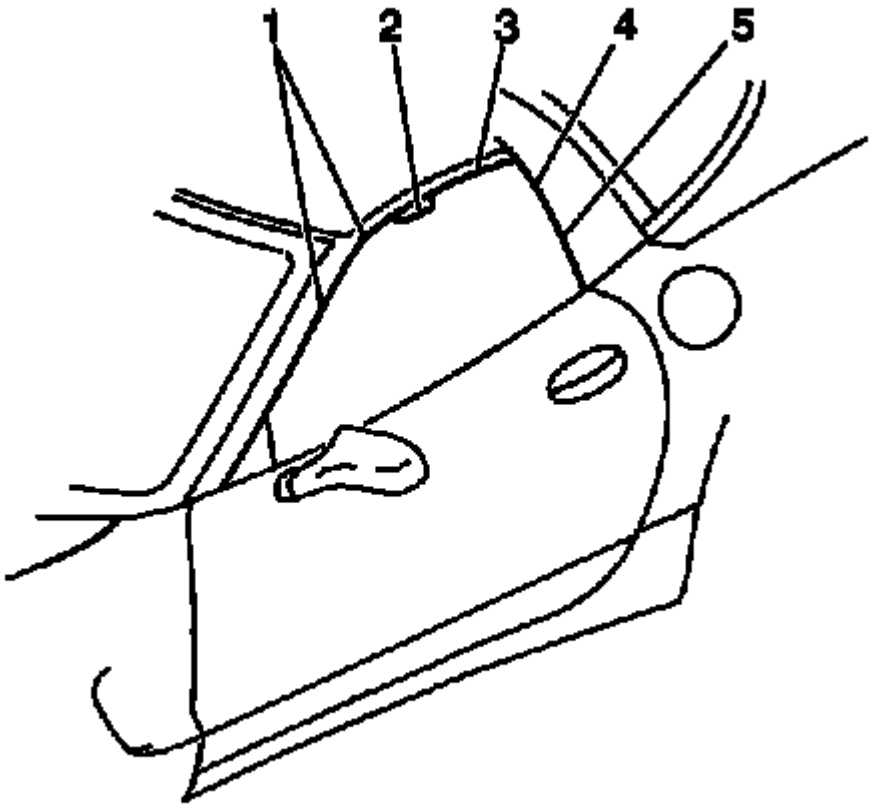

Fig. 19: Window Clamps, Molding & Retainer
Courtesy of GENERAL MOTORS COMPANY

10. Slide the window in the window clamps as necessary.
    - The gap to the reveal molding (1) should be 5-8 mm (0.2-0.3 in).
    - The gap to the retainer (3) should be 5-8 mm (0.2-0.3 in).

CAUTION: Refer to Fastener Caution .

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11. Tighten the window clamps.

    Tighten

    Tighten the window regulator window guide bolts to 11 N.m (97 lb in).

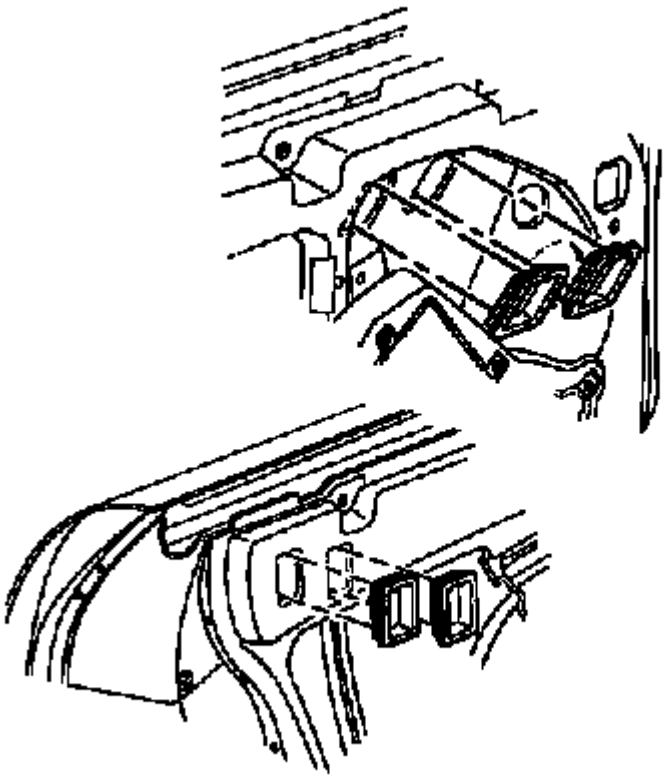

Fig. 20: View of Window Clamp Access Plugs
Courtesy of GENERAL MOTORS COMPANY

12. Open the door and install the window guide sight access plugs.
13. Install the front side door trim panel. Refer to **Front Side Door Trim Replacement (Driver Side)** , **Front Side Door Trim Replacement (Passenger Side)** .

FRONT SIDE DOOR WINDOW REPLACEMENT

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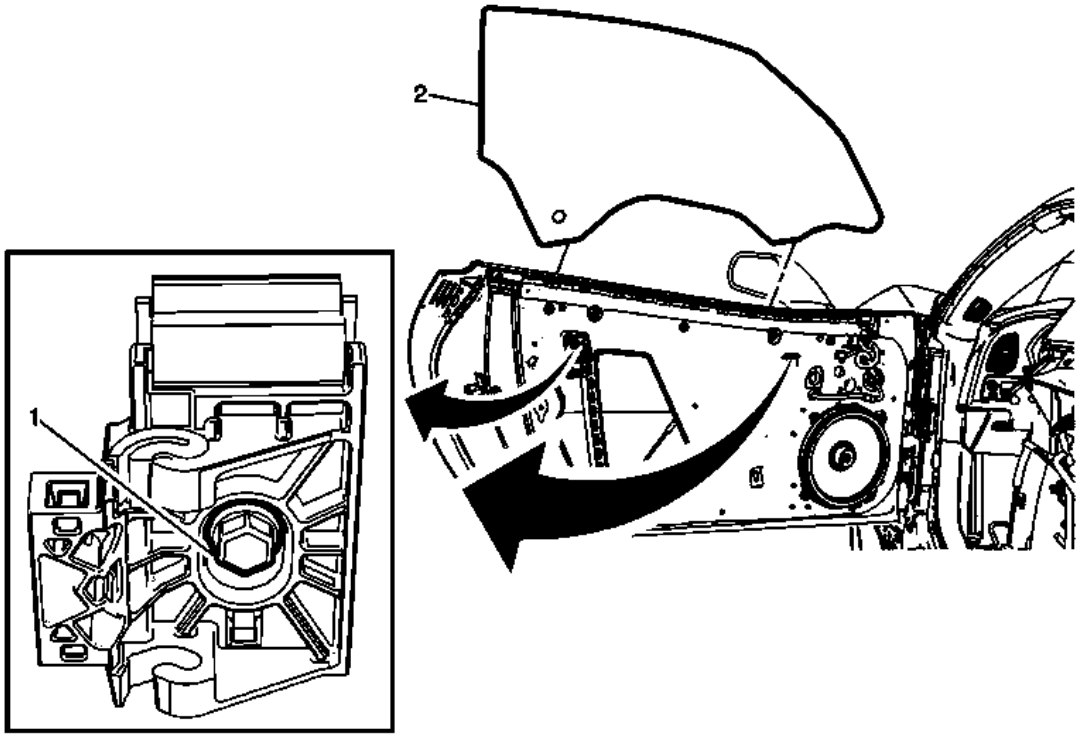

Fig. 21: Front Side Door Window
Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Replacement

Callout	Component Name
WARNING: **Refer to Glass and Sheet Metal Handling Warning .** **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 inner sealing strip. Refer to **Front Side Door Window Inner Sealing Strip Replacement**. 2. Remove the front side door water deflector.	
	Front Side Door Window Regulator Guide Bolt (Qty: 2) **CAUTION:** **Refer to Fastener Caution .**

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1	1. Use masking tape, tape off the outer door frame to prevent scratching. 2. Lower the window to align the guide bolts with the access holes in the inner door panel. 3. Loosen the bolts that attach the window to the window regulator guides. **Tighten** 11 N.m (97 lb in)
2	Front Side Door Window **Procedure** 1. Do not operate the regulator motor without supporting the window. Ensure that the window remains in the guide when operating the regulator motor. 2. Carefully grasp and tilt the window as you guide the window up and forward. **NOTE:** **Inspect the window for proper operation before installing the door trim.**

QUARTER WINDOW REPLACEMENT

Special Tools

- **BO-39032** Stationary Glass Removal Tool, or equivalent in order to remove the window.
- Use a urethane adhesive systems which meet GM Specification GM 3651G

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 inner trim of the window.

1. Remove the rear quarter window trim finish panel. Refer to **Quarter Window Trim Finish Panel Replacement** .

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

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2. 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: **Keep the cutting edge of the tool against the window. Do this from inside the vehicle to protect the outer painted surface.**

3. Carefully cut around the inside of the quarter modular window to expose the urethane adhesive bead.

   Use care not to damage the retainers. If the retainer get damaged it will be necessary to use masking tape to tape it in place while curing.

4. Keep the cutting edge of the tool against the inside of the window.

   This will allow the urethane adhesive to be separated from the window.

   - Leave a base of urethane on the pinch-weld flange.
   - The only suitable lubrication is clear water.
   - **BO-39032** Stationary Glass Removal Tool, or equivalent in order to remove the window.

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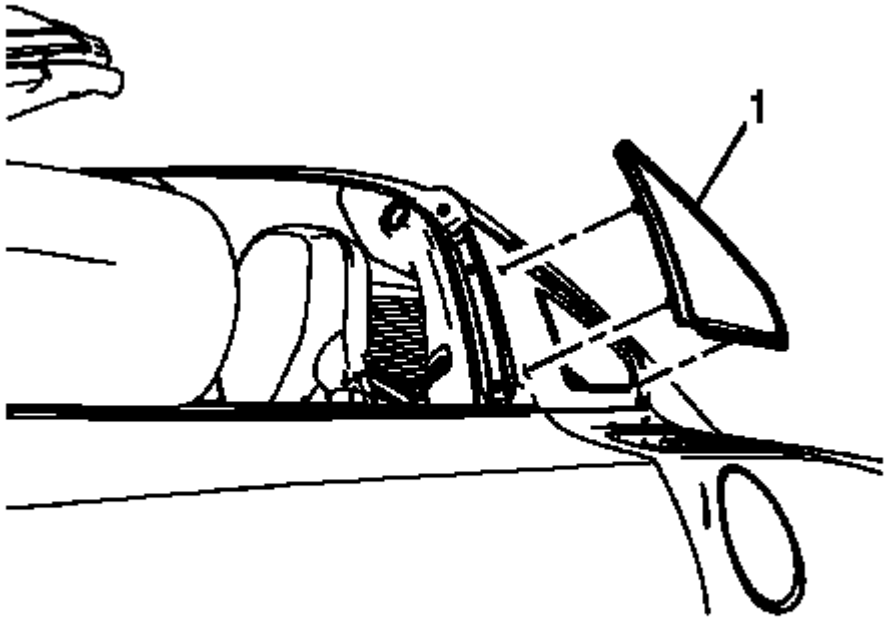

Fig. 22: Removing Window
Courtesy of GENERAL MOTORS COMPANY

5. Remove the window (1) from the vehicle with an assistant and Do the following:
    1. Check that the retainers are still attached to the window (1) for installing, if reusing.
    2. Remove all mounds or loose pieces of urethane adhesive from the pinchweld area.
    3. If the original window (1) is being reused, remove all but approximately 2 mm (0.078 in) of the existing bead of urethane adhesive from the pinchweld flange surface, using a clean utility knife or razor blade scraper.
6. Inspect for any of the following conditions in order to help prevent future breakage of the window:
    - High weld
    - Solder spots
    - Hardened sealer
    - Any other obstruction or irregularity in the pinchweld flange

NOTE: **If corrosion of the pinchweld flange is present or if sheet metal repairs or replacements are required, the pinchweld flange must be refinished in order to restore the bonding area strength. If paint repairs are required,**

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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.

7. 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.

Installation Procedure

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.

1. Verify that all primers and urethane adhesive being used are within expiration dates.
2. If reusing or replacing the window, use the appropriate tool, remove the urethane adhesive bead on the window surface and pinchweld flange to approximately 2 mm (0.078 in).

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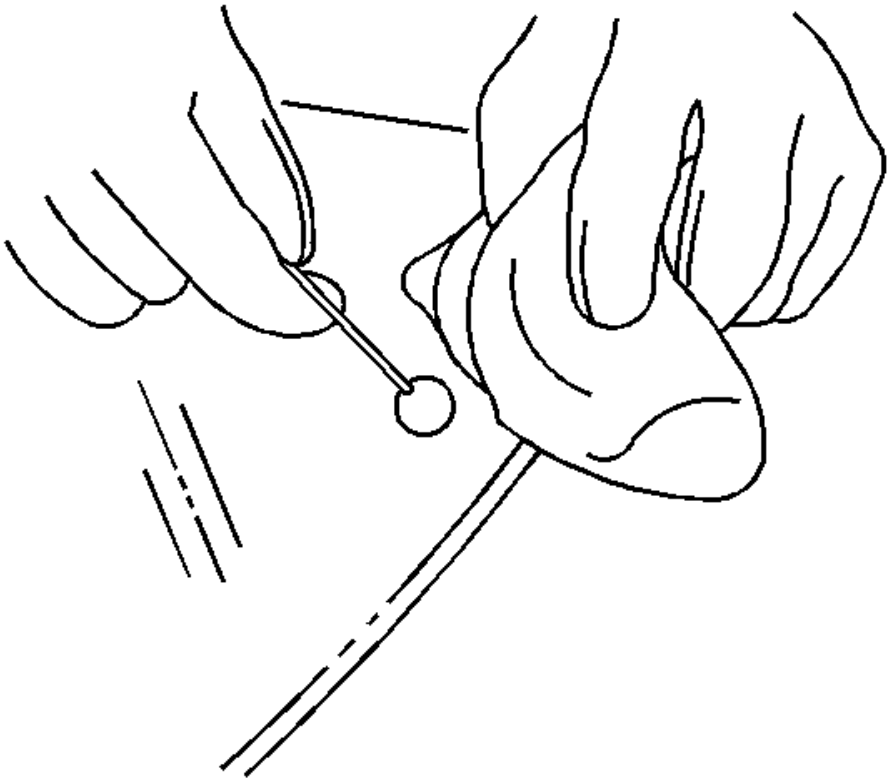

Fig. 23: Applying Glass Prep
Courtesy of GENERAL MOTORS COMPANY

NOTE: Use Prep #1 Clear

3. Apply the Prep #1 clear primer to the bonding surface of the windows inside edge and the bonding surface of the pinchweld flange opening, refer to the instructions of the manufacturer's.

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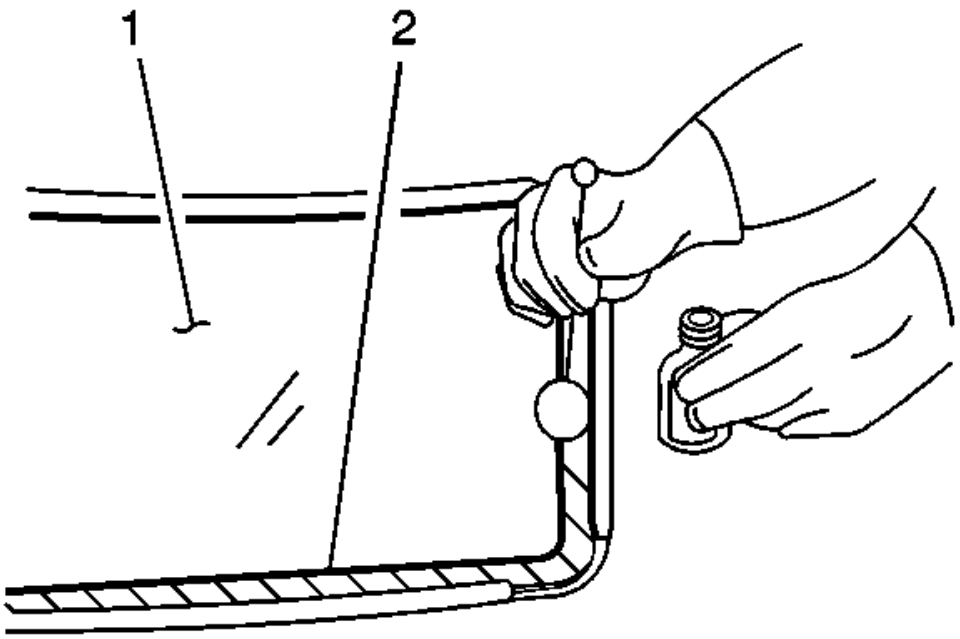

Fig. 24: Applying Glass Primer
Courtesy of GENERAL MOTORS COMPANY

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

NOTE: **Following the urethane adhesive installation instructions, using P/N 9981062 (VM/P Naphtha) or equivalent to remove any excess of urethane adhesive within 3 minutes, otherwise it may not be possible to remove the urethane adhesive excess unless using mechanical means.**

NOTE: **The Prep #2 Black Primer is for, Blackout primer, UV Blackout.**

4. Apply the Prep #2 urethane adhesive primer (2) around the perimeter of the window (1), refer to the instructions of the manufacturer's.

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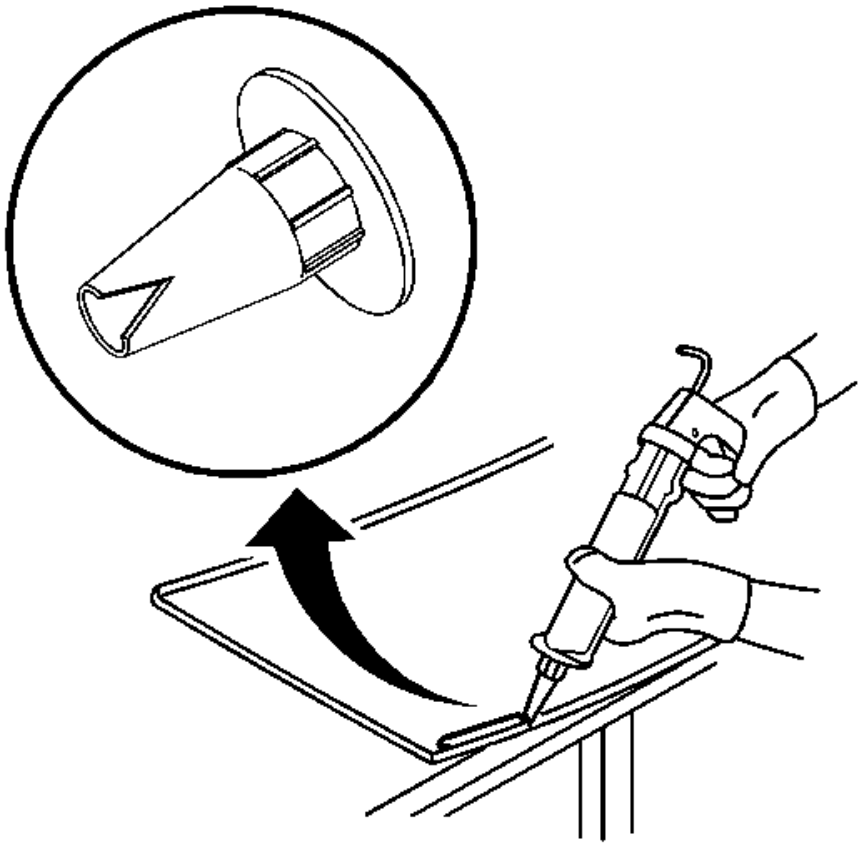

Fig. 25: View Of Modified Applicator Nozzle
Courtesy of GENERAL MOTORS COMPANY

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

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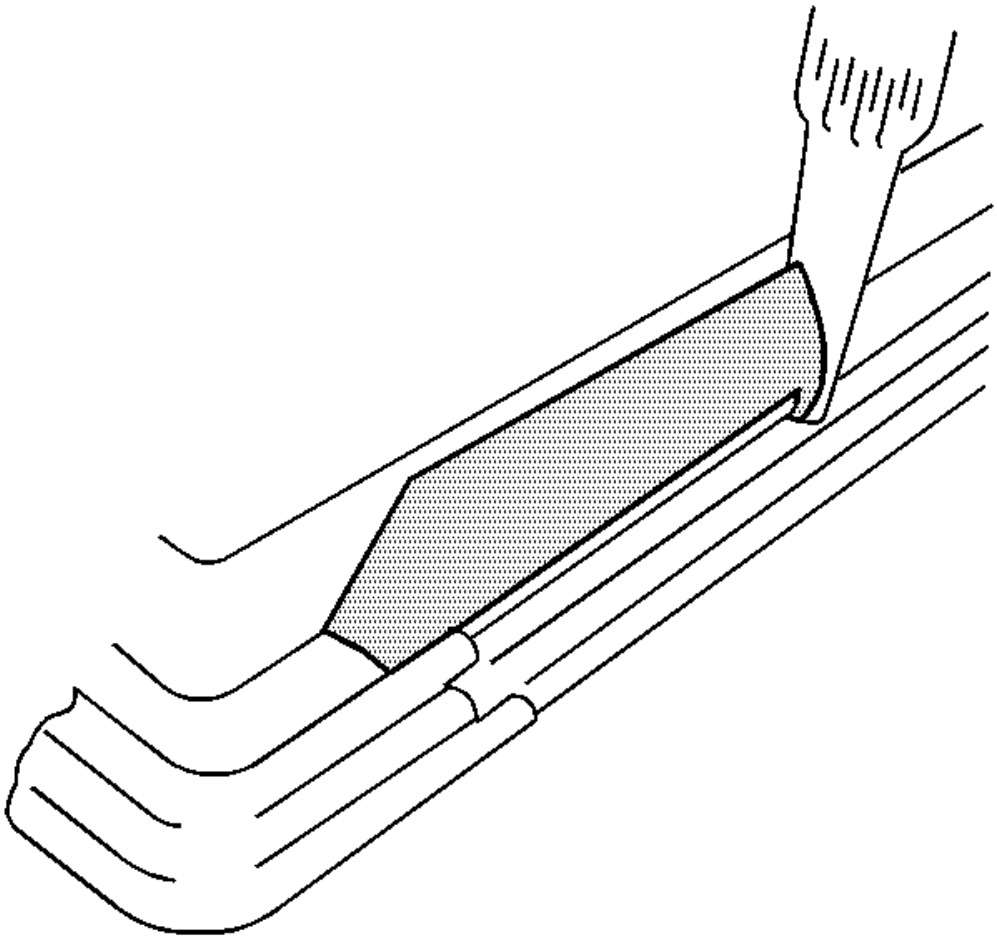

Fig. 26: Applying Continuous Bead Of Urethane Adhesive
Courtesy of GENERAL MOTORS COMPANY

6. Use the appropriate tool in order to apply a smooth, continuous bead of urethane adhesive to the window or the pinchweld flange.

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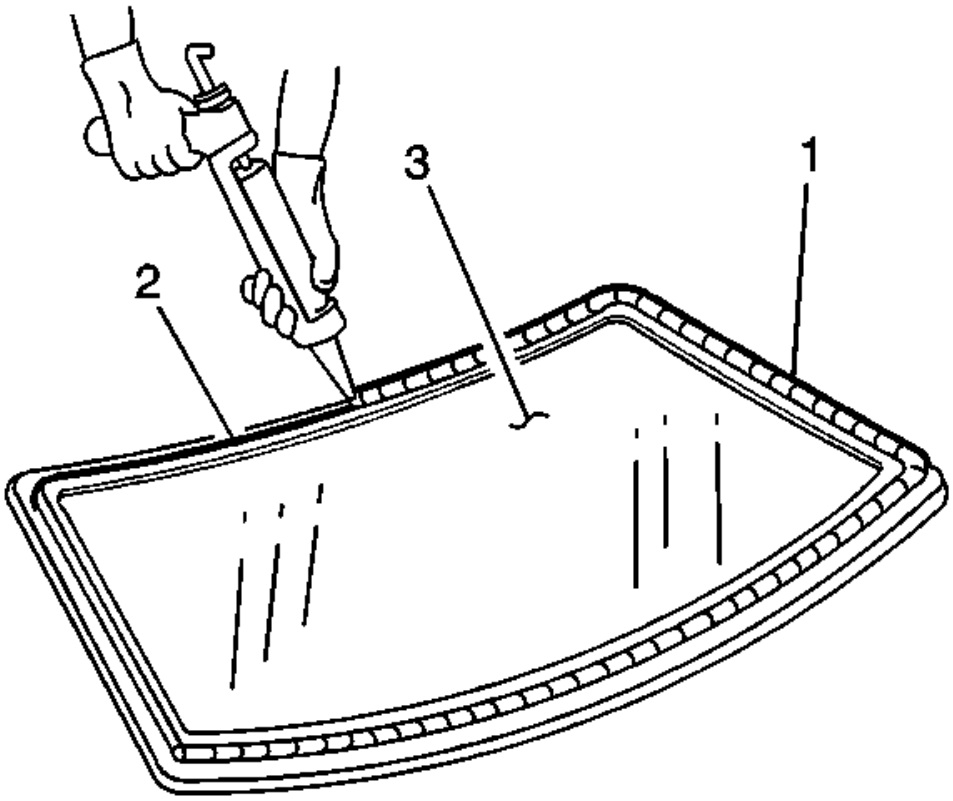

Fig. 27: Applying Urethane Adhesive To Inner Surface Of Window
Courtesy of GENERAL MOTORS COMPANY

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

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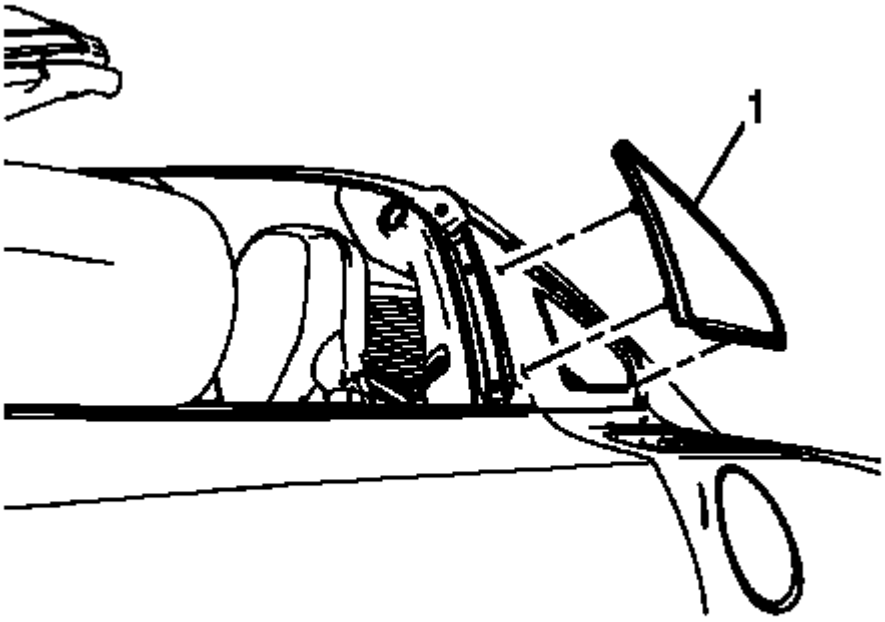

Fig. 28: Removing Window
Courtesy of GENERAL MOTORS COMPANY

8. With an assistant, place the window (1) and retainers into the retainer slots in the pinchweld flange of the vehicle.

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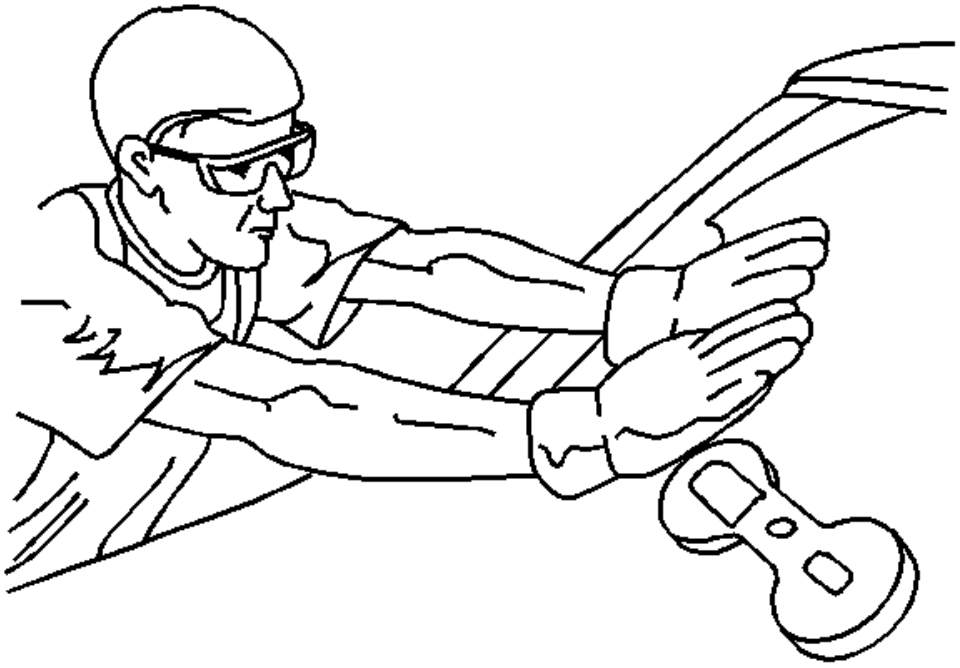

Fig. 29: Pressing Window Into Place
Courtesy of GENERAL MOTORS COMPANY

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 roof sheet metal.

9. Press firmly around the entire periphery of the window in order to wet-out the urethane adhesive bead.
10. Use masking tape (1) to hold the window (2) in the position until the urethane adhesive completely cures.
11. Remove the double layer of masking tape around the perimeter of the painted surfaces and the interior trim.

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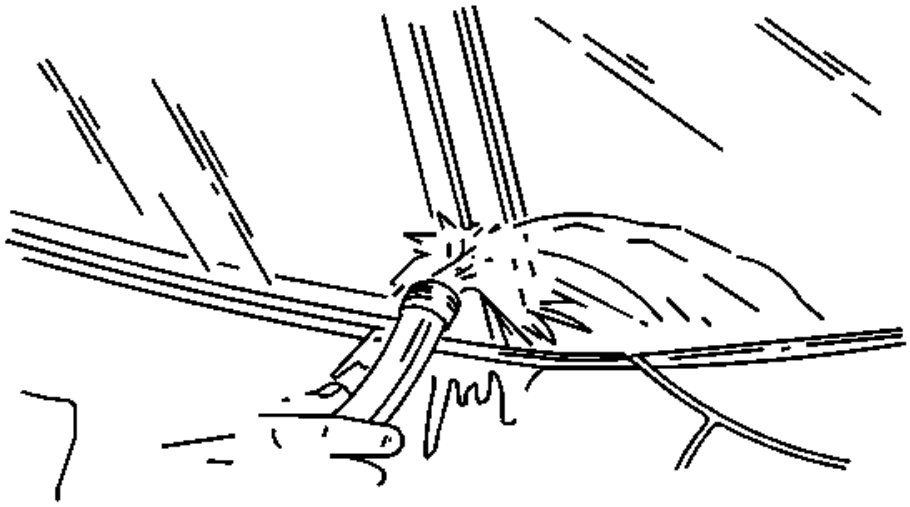

Fig. 30: Performing Water Hose Test
Courtesy of GENERAL MOTORS COMPANY

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

12. Use a soft spray of warm water in order to immediately water test the window.
13. Inspect the window for leaks.
14. If any leaks are found, use a plastic paddle in order to apply extra urethane adhesive at the leak point.
15. 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**

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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.

16. Maintain the following conditions in order to properly cure the urethane adhesive by manufacturers instructions:
    - 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 instructions of the manufacturers curing times.
    - Do not use compressed air in order to dry the urethane adhesive.
17. Install the rear quarter window trim finish panel. Refer to **Quarter Window Trim Finish Panel Replacement** .

REAR COMPARTMENT LIFT WINDOW REPLACEMENT

Special Tools

- **BO-39032** Stationary Glass Removal Tool or equivalent
- Use a urethane adhesive systems which meet GM Specification GMW 15672.

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

Removal Procedure

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

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.

CAUTION: DO NOT close the lift window panel with the struts attached unless the window is installed and the window adhesive fully cured. The window adds strength and rigidity to the lift window panel. Attempting to close the lift window panel, with the struts installed, without a window or with the window adhesive not fully cured, could cause the panel to crack.

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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 liftgate.
2. Remove the rear liftgate trim finish panel. Refer to **Liftgate Trim Finish Panel Replacement** .
3. Remove the rear lift window struts. Refer to **Liftgate Strut Replacement** .
4. Disconnect the electrical connectors from the liftgate window defogger bus bar.
5. Cover the following parts to protect from broken glass, seats and carpeting.

NOTE: **Keep the cutting edge of the appropriate tool against the window. There are window locating pins, one in each upper 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.**

6. This will allow the auto-adhesive to be separated from the window.
   - 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.

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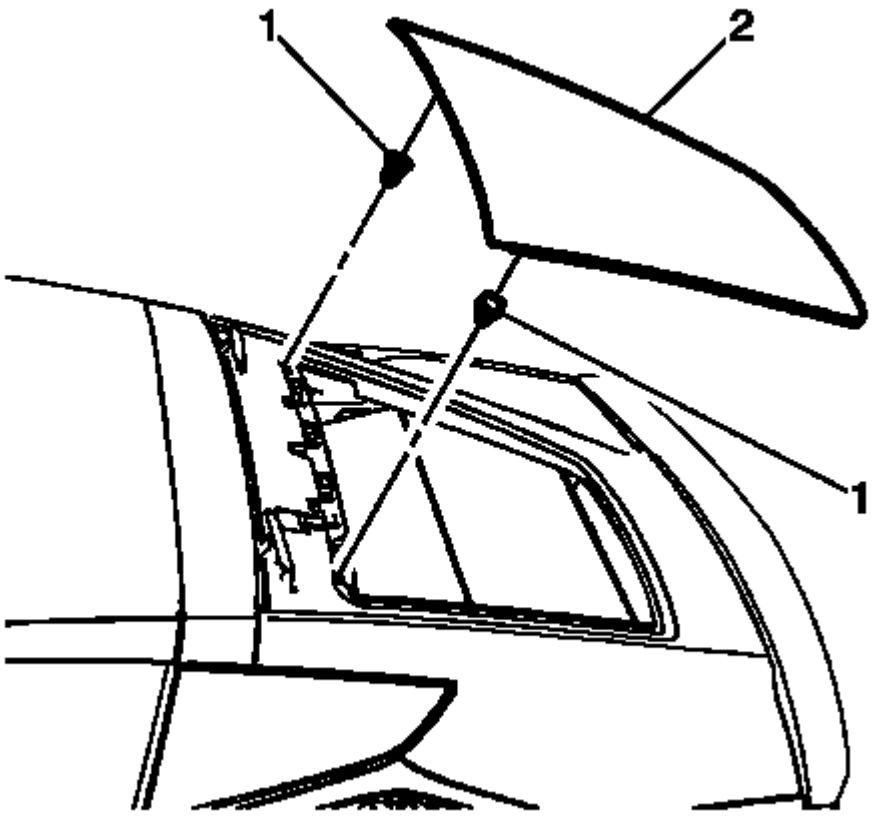

Fig. 31: Window And Locator Pins
Courtesy of GENERAL MOTORS COMPANY

7. Remove the window (1) from the vehicle with an assistant and Do the following:
    1. After removing the window spacers and mark the location of each one. If equipped.
    2. Check that the locator pins (2) are still attached to each upper corner of the window for installing, if reusing.
    3. Remove all mounds or loose pieces of urethane adhesive from the pinchweld area.
    4. If the original window is being reused, remove all but approximately 2 mm (0.078 in) of the existing bead of urethane adhesive from the pinchweld flange surface, using a clean utility knife or razor blade scraper.
8. Inspect for any of the following conditions in order to help prevent future breakage of the window:
    - High weld
    - Solder spots
    - Hardened sealer
    - Any other obstruction or irregularity in the pinchweld flange

NOTE: If corrosion of the pinchweld flange is present or if sheet metal repairs or

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replacements are required, the pinchweld 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.

9. 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.

Installation Procedure

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.

1. Verify that all primers and urethane adhesive being used are within expiration dates.
2. If reusing or replacing the window, use the appropriate tool, remove the urethane adhesive bead on the window surface and pinchweld flange to approximately 2 mm (0.078 in).

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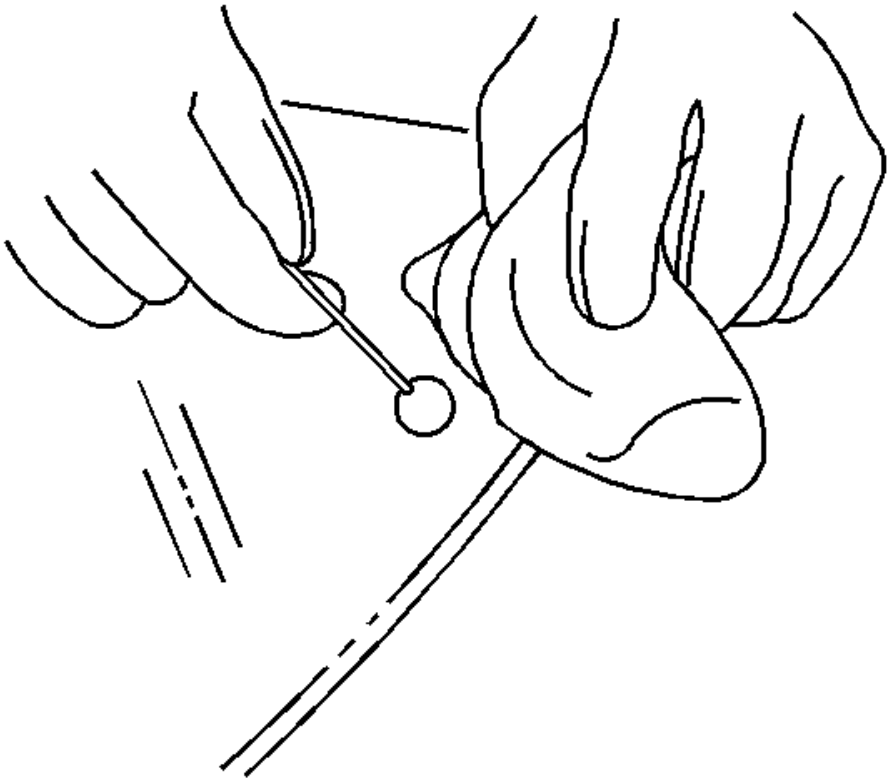

Fig. 32: Applying Glass Prep
Courtesy of GENERAL MOTORS COMPANY

NOTE: Use Prep #1 Clear

3. Apply the Prep #1 clear primer to the bonding surface of the windows inside edge and the bonding surface of the pinchweld flange opening, refer to the instructions of the manufacturer's.

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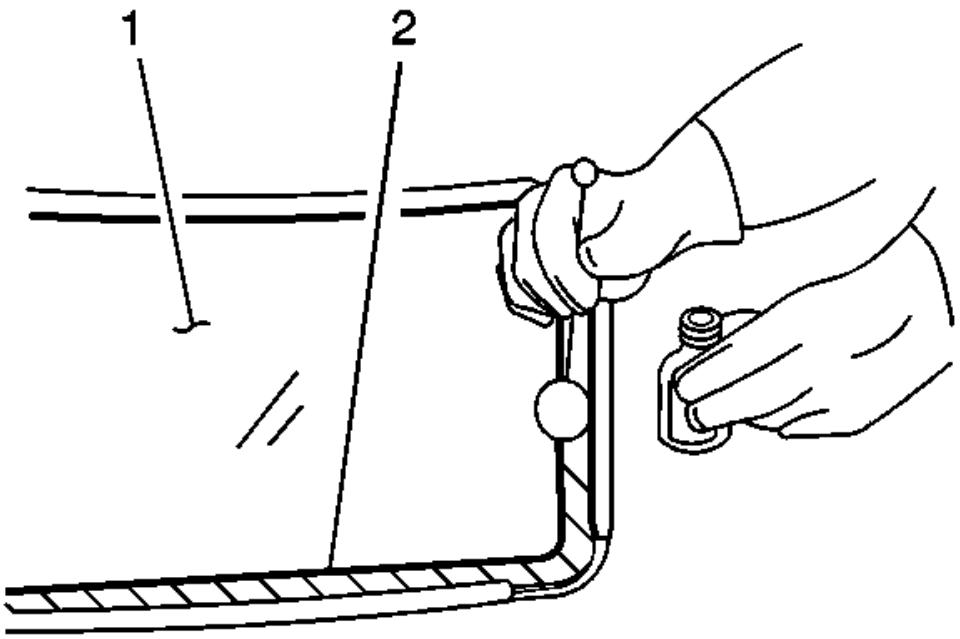

Fig. 33: Applying Glass Primer
Courtesy of GENERAL MOTORS COMPANY

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

NOTE: **Following the urethane adhesive installation instructions, using P/N 9981062 (VM/P Naphtha) or equivalent to remove any excess of urethane adhesive within 3 minutes, otherwise it may not be possible to remove the urethane adhesive excess unless using mechanical means.**

NOTE: **The Prep #2 Black Primer is for, Blackout primer, UV Blackout.**

4. Apply the Prep #2 urethane adhesive primer (2) around the perimeter of the window (1), refer to the instructions of the manufacturer's.
5. Install the spacers for the window to the marked locations on the pinchweld flange. If equipped

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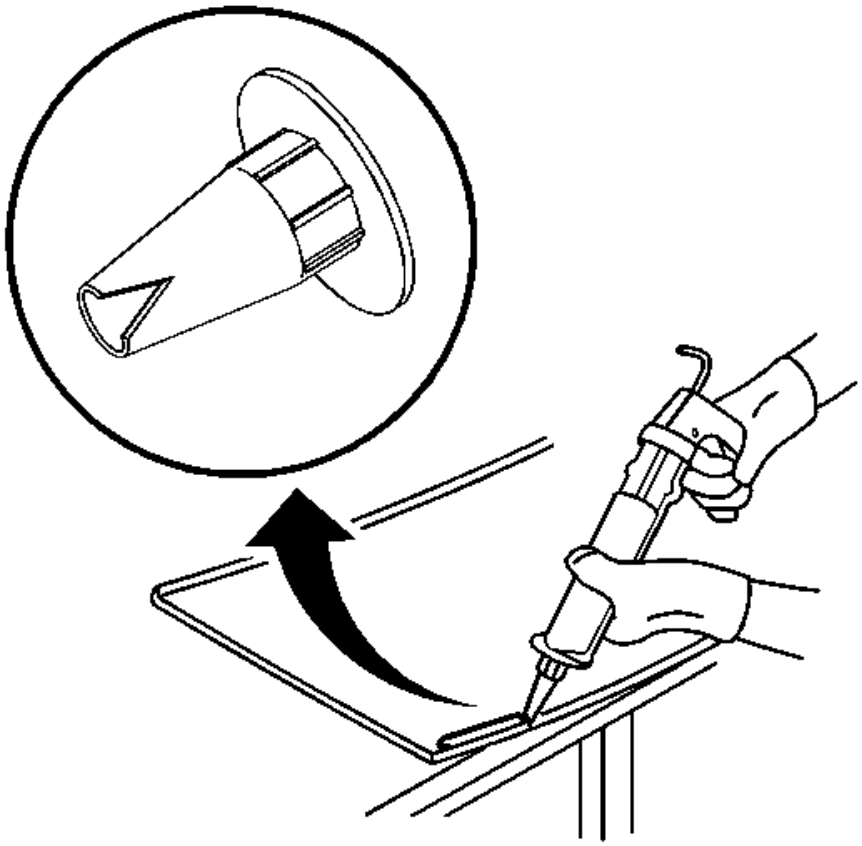

Fig. 34: View Of Modified Applicator Nozzle
Courtesy of GENERAL MOTORS COMPANY

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

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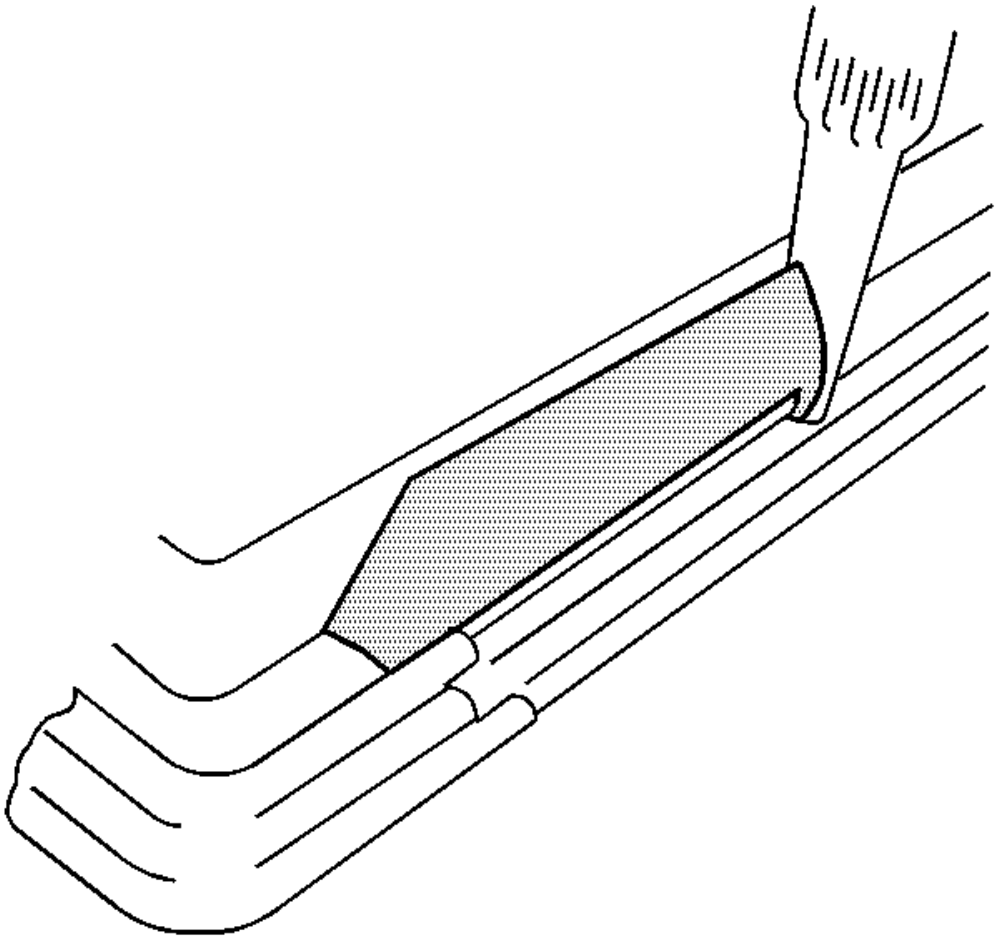

Fig. 35: Applying Continuous Bead Of Urethane Adhesive
Courtesy of GENERAL MOTORS COMPANY

7. Use the appropriate tool in order to apply a smooth, continuous bead of urethane adhesive to the window or the pinchweld flange.

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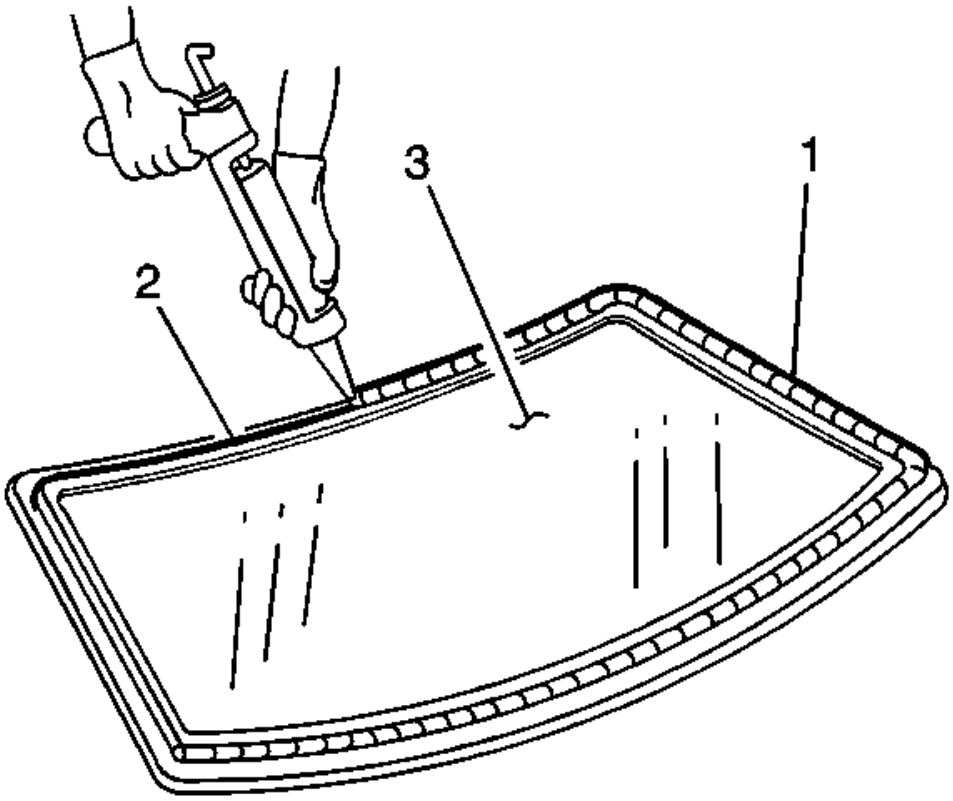

Fig. 36: Applying Urethane Adhesive To Inner Surface Of Window
Courtesy of GENERAL MOTORS COMPANY

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

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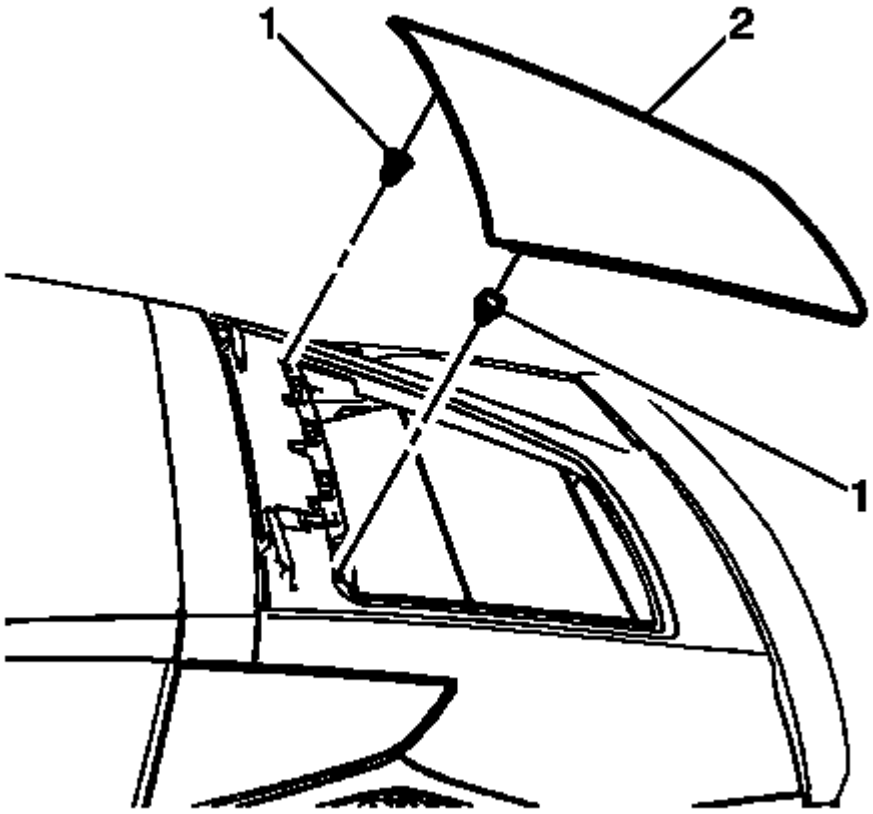

Fig. 37: Window And Locator Pins
Courtesy of GENERAL MOTORS COMPANY

9. With an assistant, place the window (2) and locators (1) into the locator slots in the pinchweld flange of the vehicle.

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 roof sheet metal.**

10. Press firmly around the entire periphery of the window in order to wet-out the urethane adhesive bead.
11. Use masking tape to hold the window in the position until the urethane adhesive completely cures.
12. Remove the double layer of masking tape around the perimeter of the painted surfaces and the interior trim.

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

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14. Inspect the window for leaks.
15. If any leaks are found, use a plastic paddle in order to apply extra urethane adhesive at the leak point.
16. 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.

17. Maintain the following conditions in order to properly cure the urethane adhesive by manufacturers instructions:
    - 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 instructions of the manufacturers curing times.
    - Do not use compressed air in order to dry the urethane adhesive.
18. Connect the liftgate window defogger electrical connectors to the bus bar.
19. Install the rear lift window struts. Refer to **Liftgate Strut Replacement** .
20. Install the rear liftgate trim finish panel. Refer to **Liftgate Trim Finish Panel Replacement** .
21. Install the double layer of masking tape around the perimeter of the painted surfaces and the interior trim.
22. Close the liftgate.

REAR COMPARTMENT LIFT WINDOW LATCH REPLACEMENT

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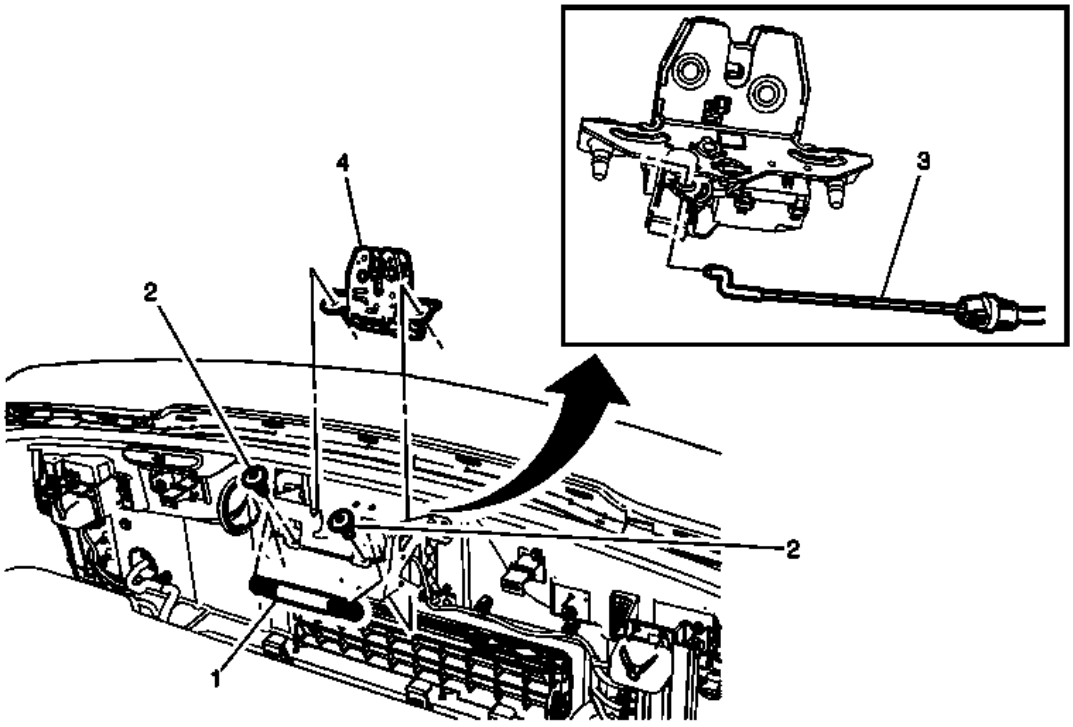

Fig. 38: Rear Compartment Lift Window Latch
Courtesy of GENERAL MOTORS COMPANY

Rear Compartment Lift Window Latch Replacement

Callout	Component Name
Preliminary Procedure Remove the radio rear speaker. Refer to **Radio Rear Speaker Replacement (Coupe, Left Side)** , **Radio Rear Speaker Replacement (Coupe, Right Side)** , **Radio Rear Speaker Replacement (Convertible)** .	
1	Rear Compartment Lift Window Latch Spring
2	Rear Compartment Lift Window Latch Screw (Qty: 2) **CAUTION:** **Refer to Fastener Caution .** **Tighten** 10 N.m (89 lb in)
3	Rear Compartment Lid Lock Cylinder Cable
4	Rear Compartment Lift Window Latch **Procedure** Disconnect the electrical connector.

REAR COMPARTMENT LIFT WINDOW LATCH ADJUSTMENT

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Minor Adjustment

1. Loosen the latch mounting bolts.
2. Reposition the latch. Refer to **Rear Compartment Lift Window Latch Replacement**.

Major Adjustment

1. Loosen the latch bracket mounting bolts.
2. Reposition the bracket. Refer to **Rear Compartment Lift Window Latch Bracket Replacement**.

FRONT SIDE DOOR WINDOW CONTROL SWITCH REPLACEMENT

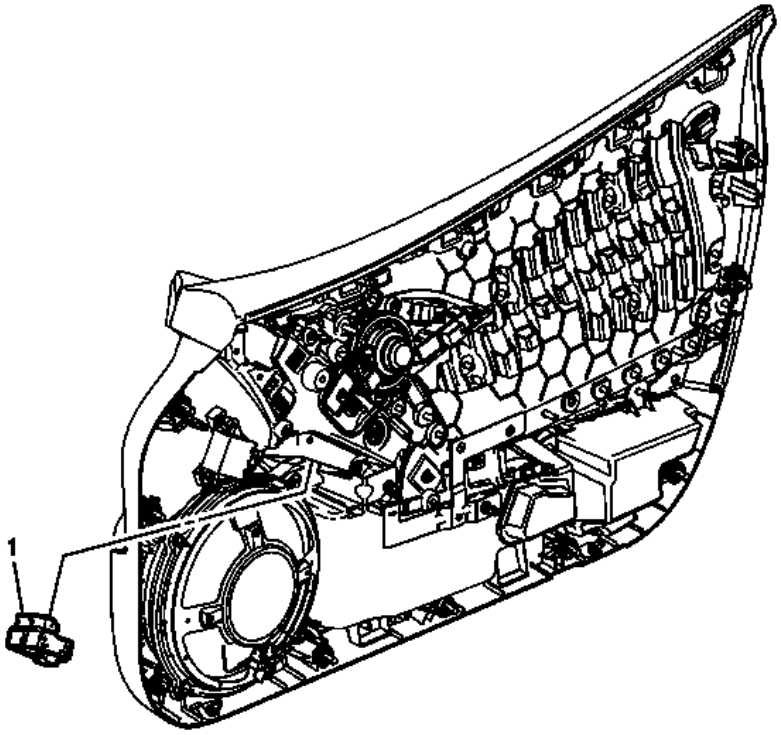

Fig. 39: Front Side Door Window Control Switch
Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Control Switch Replacement

Callout	Component Name
Preliminary Procedure Remove the front side door trim - drivers side door. Refer to **Front Side Door Trim Replacement (Driver Side)** , **Front Side Door Trim Replacement (Passenger Side)** .	
	Front Side Door Window Control Switch Assembly

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1	1. Using a plastic pry tool, gently pry on the sides to release the switch. 2. Disconnect the electrical connectors. 3. Refer to **Control Module References** for programming and set up procedures.

FRONT SIDE DOOR WINDOW SWITCH REPLACEMENT

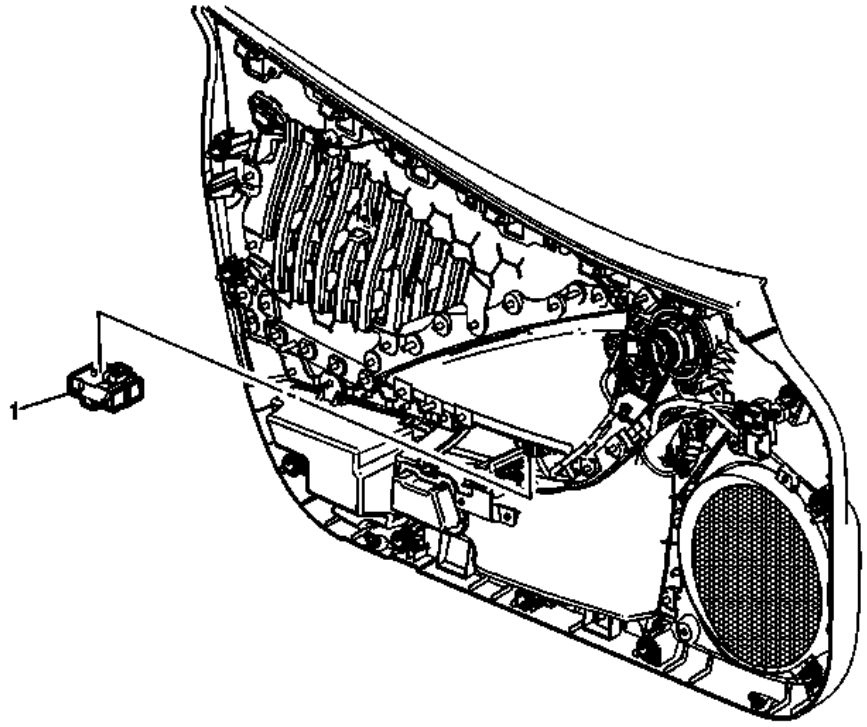

Fig. 40: Front Side Door Window Switch
Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Switch Replacement

Callout	Component Name
Preliminary Procedure Remove the front side door trim- - passenger door. Refer to **Front Side Door Trim Replacement (Driver Side)** , **Front Side Door Trim Replacement (Passenger Side)** .	
1	Front Side Door Window Switch Assembly **Procedure** 1. Using a plastic pry tool, gently pry on the sides to release the switch. 2. Disconnect the electrical connectors. 3. Refer to **Control Module References** for programming and set up procedures.

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FRONT SIDE DOOR WINDOW REGULATOR REPLACEMENT

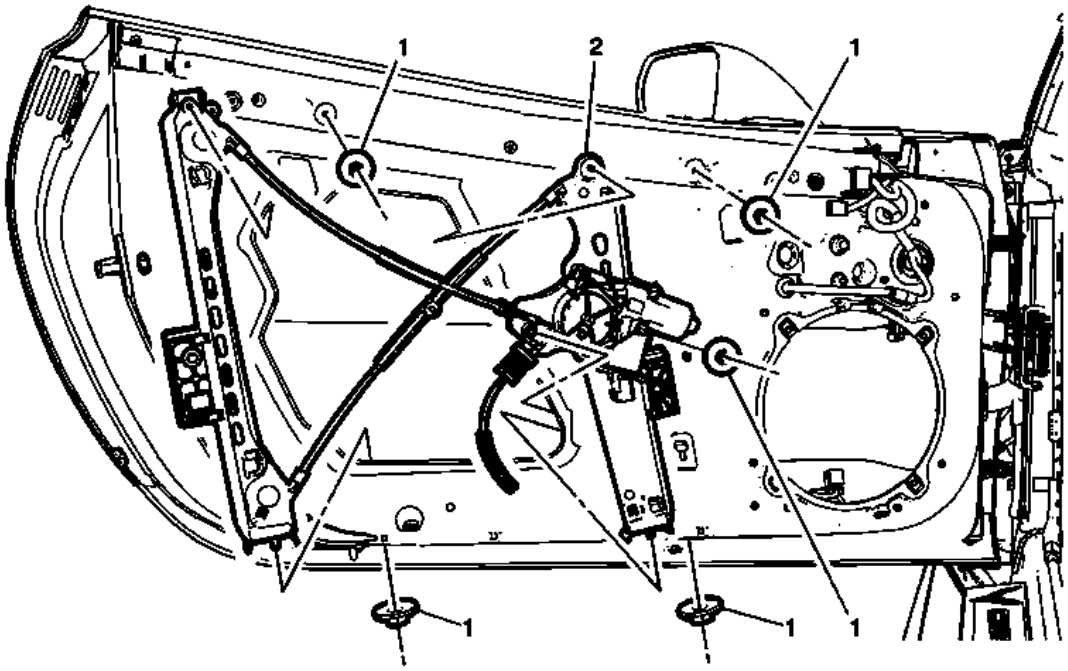

Fig. 41: Front Side Door Window Regulator
Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Regulator Replacement

Callout	Component Name
Preliminary Procedures 1. Remove the front side door window. Refer to **Front Side Door Window Replacement**. 2. Remove the front side door radio speaker. Refer to **Radio Front Side Door Speaker Replacement** .	
1	Front Side Door Window Regulator Nut (Qty: 5) **Tighten** 11 N.m (97 lb in)
2	Front Side Door Window Regulator **Procedure** Transfer the power window motor and program after installing in the vehicle. Refer to **Window Motor Programming - Express Function**. **NOTE:** **Inspect the door window for proper operation before installing the door trim.**

WINDOW MOTOR PROGRAMMING - EXPRESS FUNCTION

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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:

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- 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

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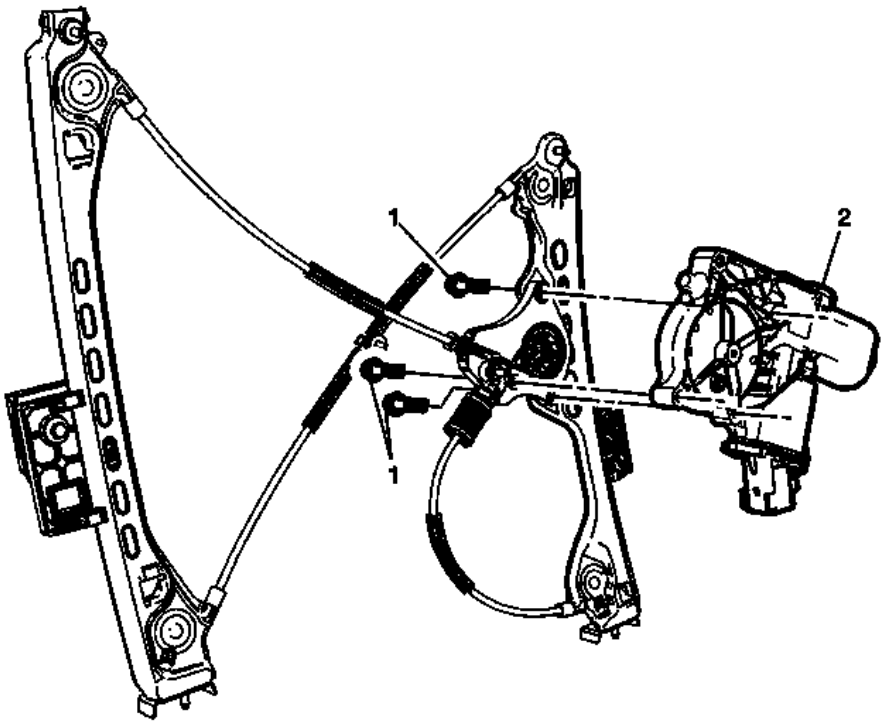

Fig. 42: Front Side Door Window Regulator Motor
Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Regulator Motor Replacement

Callout	Component Name
Preliminary Procedure Remove the front side door window regulator. Refer to **Front Side Door Window Regulator Replacement**.	
1	Front Side Door Window Regulator Motor Bolt (Qty: 3) **Tighten** 11 N.m (97 lb in)
2	Front Side Door Window Regulator Motor

FRONT SIDE DOOR WINDOW OUTER SEALING STRIP REPLACEMENT

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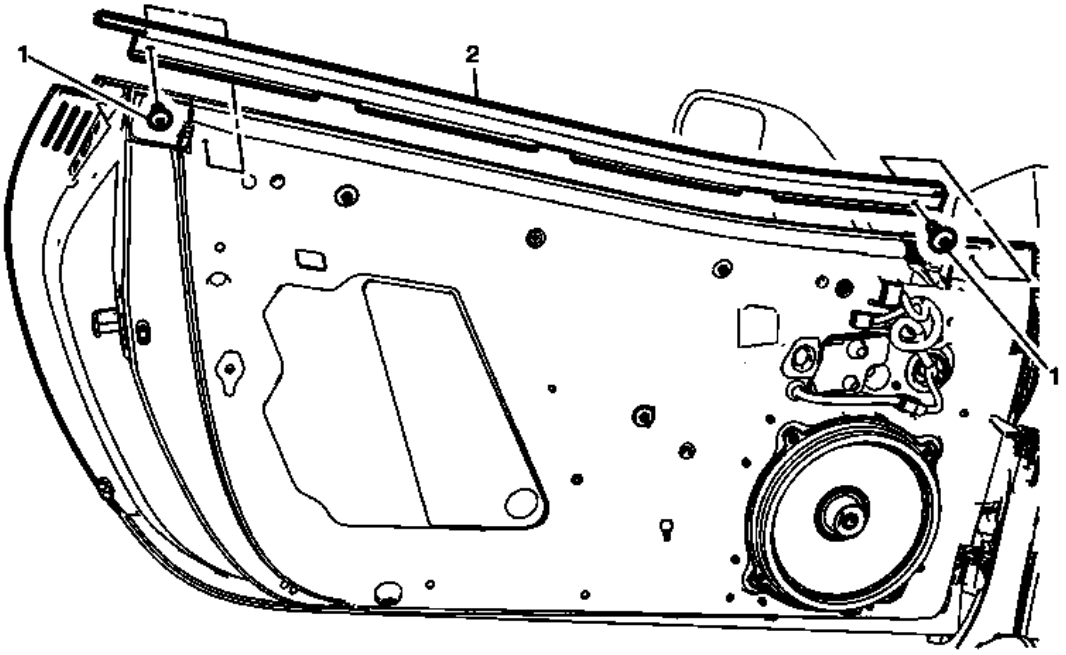

Fig. 43: Front Side Door Window Outer Sealing Strip
Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Outer Sealing Strip Replacement

Callout	Component Name
Preliminary Procedures Remove the front side door weatherstrip. Refer to **Front Side Door Weatherstrip Replacement**	
1	Front Side Door Window Outer Sealing Strip Screw **CAUTION:** **Refer to Fastener Caution .** **Tighten** 2.5 N.m (22 lb in)
2	Front Side Door Window Outer Sealing Strip **Procedure** Pull the outer sealing strip up and away from the upper door flange. **NOTE:** **Inspect the door for proper operation before installing the door trim panel.**

FRONT SIDE DOOR WINDOW INNER SEALING STRIP REPLACEMENT

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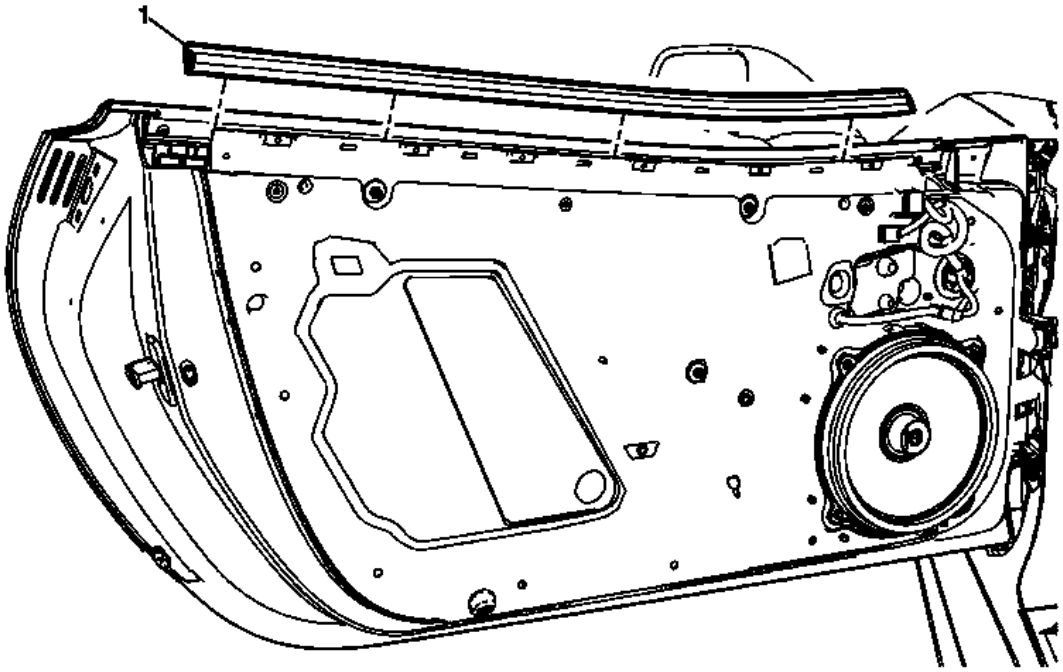

Fig. 44: Front Side Door Window Inner Sealing Strip
Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Inner Sealing Strip Replacement

Callout	Component Name
Preliminary Procedure Remove the front side door window weatherstrip. Refer to **Front Side Door Weatherstrip Replacement** .	
1	Front Side Door Window Inner Sealing Strip **Procedure** Pull up and away from inner panel to remove from the door. **NOTE:** **Inspect the door for proper operation before installing the door trim panel.**

FRONT SIDE DOOR WINDOW FRONT WEATHERSTRIP RETAINER REPLACEMENT

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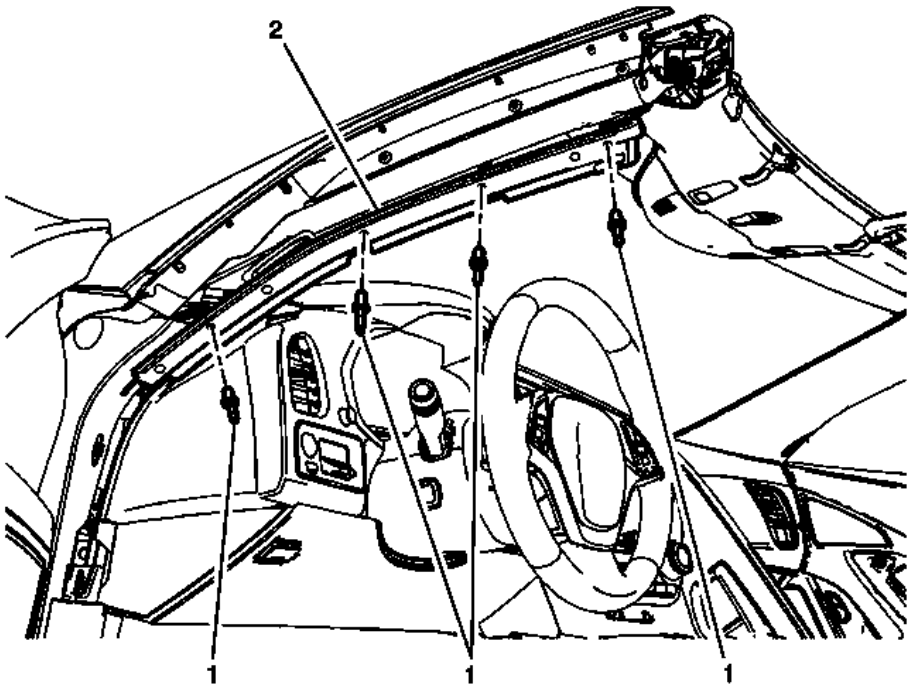

Fig. 45: Front Side Door Window Front Weatherstrip Retainer
Courtesy of GENERAL MOTORS COMPANY

Front Side Door Window Front Weatherstrip Retainer Replacement

Callout	Component Name
WARNING: **Eye protection must be worn when drilling rivets to reduce the chance of personal injury.** **Preliminary Procedure** Remove the body side upper front applique. Refer to **Body Side Upper Front Applique Replacement** .	
1	Front Side Door Window Front Weatherstrip Retainer Rivet (Qty: 4)
2	Front Side Door Window Front Weatherstrip Retainer **Procedure** 1. Use a solution of 50/50 isopropyl alcohol and water to clean the adhesive surface. 2. Replace the foam sealing tape if reusing the retainer. • Extend the tape 2.0 mm (0.08 in) beyond the retainer ends. • Do not stretch the tape to fit. The tape may shrink back, or creep, after installation, resulting in a gap which may cause a leak. **NOTE:** **Water test the vehicle to ensure no leaks.**

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REAR COMPARTMENT LIFT WINDOW LATCH BRACKET REPLACEMENT

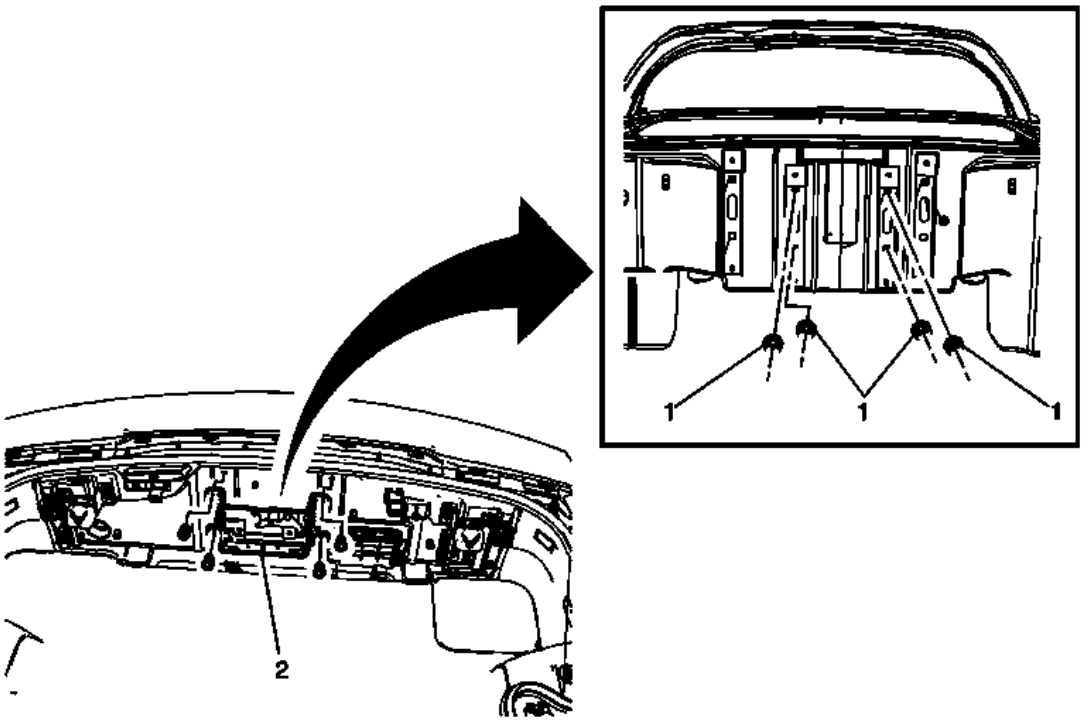

Fig. 46: Rear Compartment Lift Window Latch Bracket
Courtesy of GENERAL MOTORS COMPANY

Rear Compartment Lift Window Latch Bracket Replacement

Callout	Component Name
Preliminary Procedures 1. Remove the rear compartment lift window latch. Refer to **Rear Compartment Lift Window Latch Replacement**. 2. Remove the tail lamps. Refer to **Rear Fascia Lower Signal Lamp Replacement** .	
1	Rear Compartment Lift Window Latch Bracket Nut (Qty:4) **CAUTION:** **Refer to Fastener Caution .** **Tighten** 10 N.m (89 lb in)
2	Rear Compartment Lift Window Latch Bracket

DESCRIPTION AND OPERATION

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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
- Window motors both doors
- Body control module
- 30A Fuse

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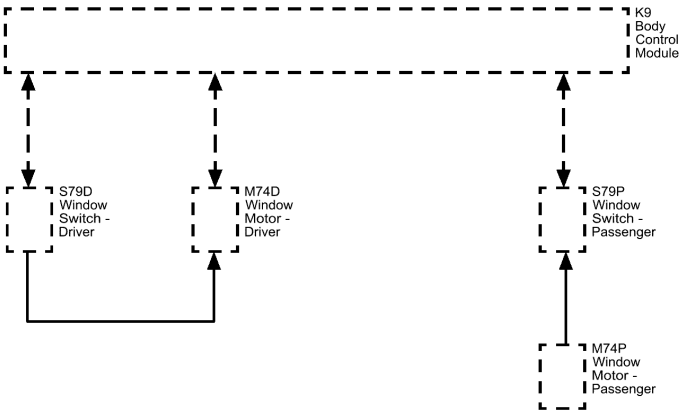

Fig. 47: Power Window Components
Courtesy of GENERAL MOTORS COMPANY

Express Up and Express Down Window Motors

The driver and passenger 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 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 passenger window motor which will then move in the direction requested.

REAR WINDOW DEFOGGER DESCRIPTION AND OPERATION

Rear Window Defogger System Components

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The rear window defogger system consists of the following components:

- HVAC control module
- Rear defogger relay
- Rear defogger grid
- 40A fuse

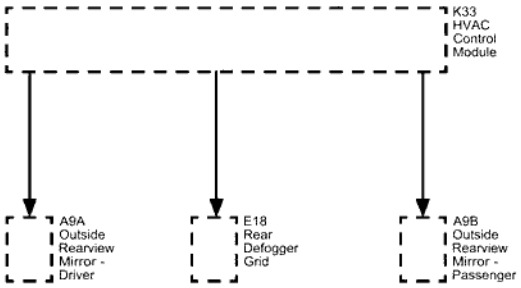

Fig. 48: Rear Window Defogger Block Diagram
Courtesy of GENERAL MOTORS COMPANY

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 equipped. A switch for the customer to control the system is provided within the HVAC control module, also included in the HVAC control module 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 on the HVAC control module causes the HVAC control module to 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

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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).

STATIONARY WINDOW DESCRIPTION

Most stationary windows, specifically windshields, are retained to the body with urethane adhesive which adheres the window to the body, increasing structural integrity. The reinstallation of the windows with urethane adhesive requires complete replacement of the urethane adhesive bead, and is known as the full cut method.

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

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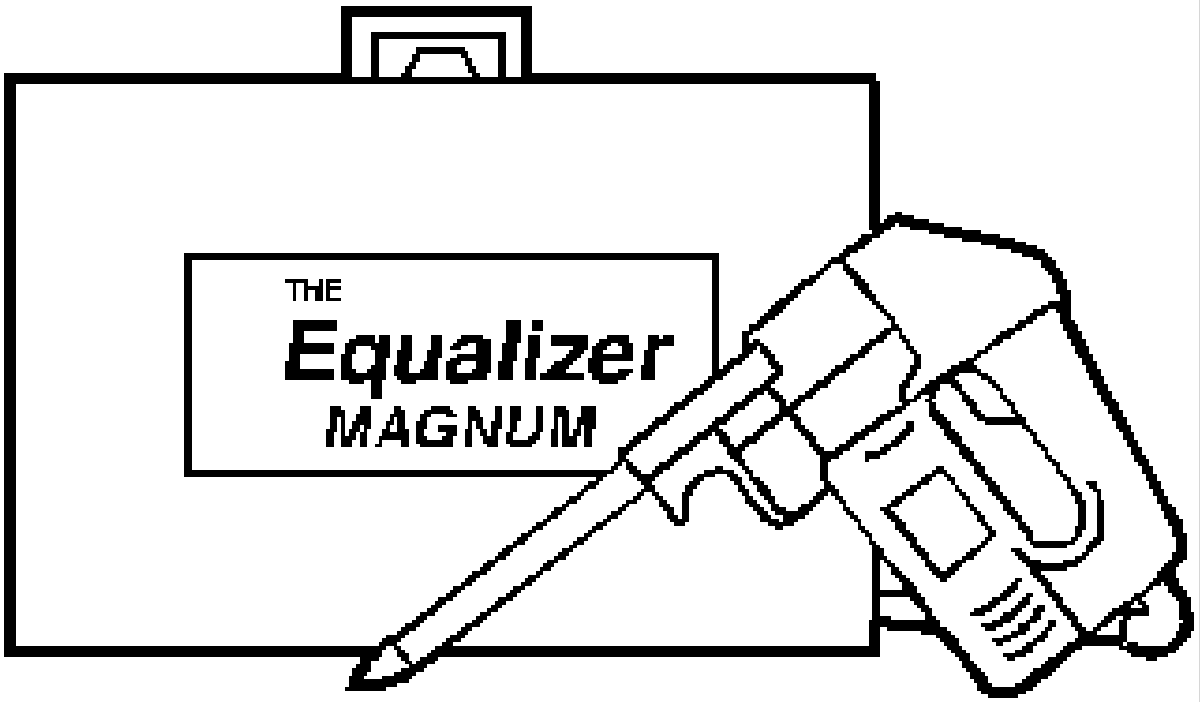
Stationary Glass Removal Tool



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