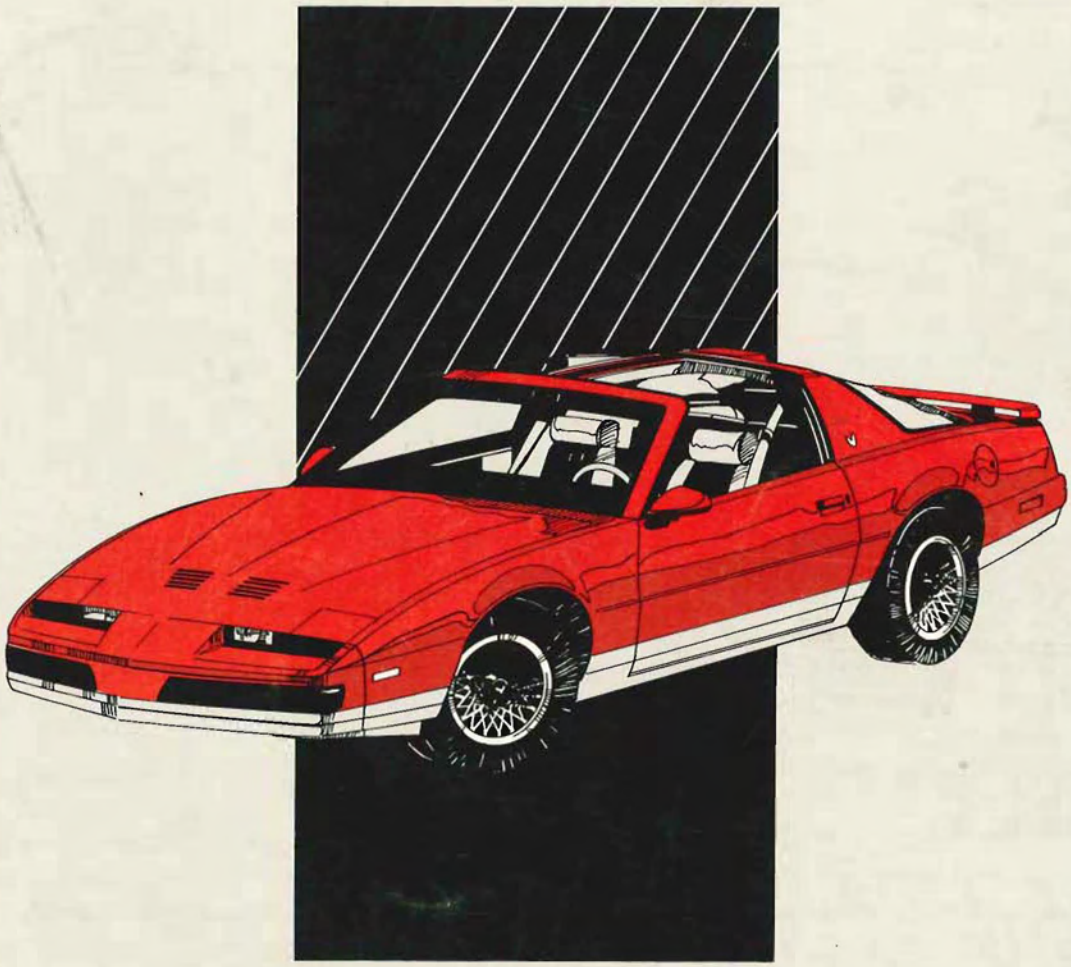
T-TOP WATERLEAK CORRECTION- CAMAROS & FIREBIRDS



STG
GM Service Technology Group

22002.63-1

FOREWORD

The reference information contained in this booklet does not constitute an endorsement by GM of any single manufacturer's product or procedure.

Contained in this booklet is repair information based on the latest data available at the time of publication approval. The right is reserved to make product or publication changes, at any time, without notice. This booklet, or any portion thereof, may not be reproduced without written consent of GM Product Service Training, General Motors Corporation.

INTRODUCTION

This booklet will serve as a ready reference with some available techniques and products that can be utilized to diagnose and correct waterleak conditions encountered on those Camaros and Firebirds GM series vehicles equipped with the T-Top Roof Option. It **IS NOT** intended to replace any product manufacturer's label instructions or procedures.

This booklet is divided into seven main categories: General Information, Body Construction, Headlining and Interior Garnish Moldings, Diagnosis Techniques, Sealers and Related Product Usage, Waterleak Repair Operations, and Final Watertest. Each section contains pertinent service information and applicable illustrations as required.

Copyright © 1987 General Motors Corporation

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd)

GENERAL INFORMATION

GM vehicles are designed to operate under normal environmental conditions. The designed criteria for sealing materials and components takes into consideration the sealing forces required to withstand the natural elements. These specifications do not and cannot take into consideration all artificial conditions such as may be encountered in some high pressure car washes.

The Waterleak Condition

The source of waterleak entry is not always where the water appears. A careful inspection of each reported leak is very important in order to make a satisfactory repair the first time.

To aid in the waterleak repair, the three "W's" should be covered with the customer concerning the vehicle. The three "W's" are as follows:

1. **What?** — Waterleak.
2. **Where?** — Specific area(s) leak(s) are located.
3. **When?** — Under what condition(s) does the leak(s) occur.

A **"Customer Comment Worksheet"** similar to the one shown on page three (3), can be very beneficial in obtaining helpful information necessary for all persons involved in the repair cycle.

Material and Equipment List

- Standard Complement of Hand Tools
- Tool J-23457 or BT-7107 Door Lock Striker Adjustment Tool
- Tool J-24595-B or BT-7323 Trim Removal Tool
- Tool J-9886 Window Crank Handle Removal Tool
- Urethane Adhesive Sealant GM #12345633
- Rubber Wedge Door Stop
- New 1986 Style Weatherstrips

Left Side Set:

— GM #20667535 — Lift-Off Panel Opening On Body
— GM #20680014 — Side Roof Rail On Lift-Off Glass

GENERAL INFORMATION

Right Side Set:

— GM #20667534 — Lift-Off Panel Opening On Body
— GM #20680014 — Side Roof Rail On Lift-Off Glass
— GM #20329444 — Plate, Wedge Body Side
— GM #20329442 — Plate, Wedge Door Side
— GM #2032443-5 — Silencer, Wedge Plate Door Side
— Customer Comments Worksheet
— Chart of Available Adhesives, Sealers and Related Items
— Water Test Stand Unit
— Black Weatherstrip Adhesive 3M-8011
— Auto Bedding and Glazing Compound
— Liquid Soap
— Soft Chalk or Talc
— 3M Tape No. 969, Part 06493 Acrylic Adhesive
— Transfer Tape
— 3M-6375 Scotchfoam Black Vinyl Foam Tape
— General Purpose Adhesive Cleaner
— Release Agent
— Brushable Seam Sealer
— Strip Caulk
— Auto Joint & Seam Sealer (Flow Grade)
— GM #1042863 — Silicone Paste
— Heavy Drip-Check Sealant
— Window-Weld Primer
— Acid Brushes
— Drip Check Sealer
— Shop Cloths
— Blow Gun
— Putty Knife
— Hot Air Gun
— Waterproof Tape
— China Marking Pencil
— Protective Covers
— (2) Rules, 4″-6″ in Length

CUSTOMER COMMENT WORKSHEET

Repair Order No.: _____ Date: _____

Customer Name: _____

Telephone No.: _____ Bus. No.: _____

VIN: _____ License No.: _____

Make: _____ Series: _____ Body Type: _____

DRIVER'S SIDE	AREA(S) OF LEAK OR NOISE	PASSENGER'S SIDE
	Grille	
	Hood	
	Fender	
	Windshield	
	Windshield Pillar	
Upr. / Lwr.	Shroud (Cowl)	Upr. / Lwr.
	Instrument Panel	
	Heater-A/C Module	
	Side Roof Rail	
	Front Door/Glass	
	Rear Door/Glass	
	Sun Roof/Vista Vent	
	Hatch Roof/T-Top	
Front / Rear	Floor/Carpet	Front / Rear
	Side Trim Panels	

DRIVER'S SIDE	AREA(S) OF LEAK OR NOISE	PASSENGER'S SIDE
	Parcel Shelf	
	Quarter Glass	
Front / Rear	Wheelhouse	Front / Rear
	Rear Window	
	Tailgate/Window	
	Rear Compartment (Trunk)	
Front / Rear	Bumper	Front / Rear
	Tail Lamp	
	Other, Specify:	

Remarks: _____

CONDITION:

☐ Water Leak ☐ Dust Leak
☐ Wind Noise ☐ Rattle

WEATHER CONDITION:

☐ Rain ☐ Light ☐ Heavy
☐ Dry

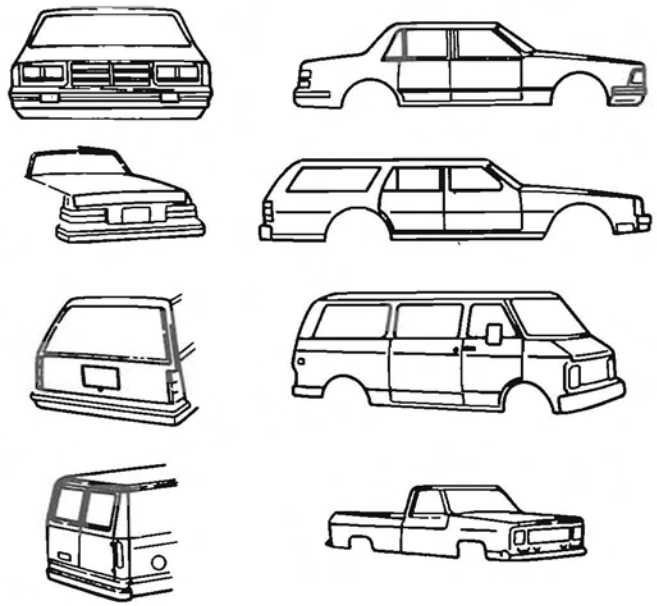
ROAD TYPE WHEN NOTICED:

☐ Paved ☐ Other, Specify: _____
☐ Gravel _____

POSITION OF VEHICLE WHEN CONDITION NOTICED:

☐ In Motion/Speed _____ ☐ Parked ☐ Level ☐ Incline
☐ In Car Wash ☐ Automatic ☐ Wand ☐ Hand

CIRCLE TROUBLE AREA IN VEHICLE SHOWN BELOW:



GENERAL INFORMATION

NOTES

BODY CONSTRUCTION

To provide the background for effective and reliable service repair procedures, a thorough understanding of how the unit is designed and installed is necessary.

Roof Assembly

The roof inner consists of ribbed reinforcements welded together. This reinforcements assembly ties into the windshield pillars and sail panels and forms the windshield and back light headers.

Latch Rod Strikers

Two steel latch rod strikers with elongated holes are screw-retained at the upper ends of the windshield and body lock pillars in the panel opening.

Latch Assembly

The latch assembly consists of the following components which are riveted into a single serviceable unit: a mounting bracket, detent spring, two sector links, two steel tubular rods and a keyed driver stud.

The outboard ends of the steel tubular rods are coated with a black nylon material which serves as an antisqueak feature. The rods pass through the screw retained latch rod strikers. This arrangement permits a range of up/down and in/out adjustments.

Lift-Off Panel Assembly

Commonly called the "T-Top," the lift-off panel assembly consists of a tempered glass panel contoured to match the roof outer panel surface, glass support, latch mechanism, weatherstrip and sealing strip.

The glass support panel is constructed of plastic. It is bonded along the outboard edge of the glass panel and along the area of the support adjacent to the glass with urethane adhesive.

Each glass panel is secured into the body opening with a latch assembly that is mounted to the glass panel support with screws.

On some earlier style vehicles with the T-Top option, a three-piece, formed, black polycarbonate plastic channel is bonded to the glass panel around three sides with urethane adhesive. The plastic channel is a serviceable unit and is available through GM Service Parts Organization.

Lift-Off Panel Opening Center Upper Finishing Molding

The center upper finishing molding provides inboard retention of the left and right glass panels and the center inboard weatherstrip retainers. It is held in position with sheet metal screws.

NOTES

HEADLINING AND INTERIOR GARNISH MOLDINGS

Formed Headlining

The headlining is a one-piece fiberglass substrate covered with a foam cloth facing. The construction of the fiberglass substrate does not allow for replacement of the cloth facing and requires that the headlining be serviced as a complete assembly. Cut-out sections are provided for the lift-off panel openings.

Final attachment is accomplished when the interior moldings and attaching screws that retain the sunshade brackets, dome lamp base and coat hooks are installed.

Interior Garnish Moldings

Interior garnish moldings are constructed of plastic or metal and color impregnated or are painted to match the interior of the vehicle. Retention is accomplished with sheet metal screws and/or plastic clips.

The following are the garnish moldings used in "F" style vehicles with the Twin Lift-Off Panel option:

1. Windshield Side Upper Garnish Moldings
2. Lift-Off Panel Trim Cover Garnish
3. Body Lock Pillar Trim Panel Garnish

NOTES

DIAGNOSIS TECHNIQUES

Proper diagnosis of a waterleak condition is most important and can vary depending on the type and location of the leak. The repair procedure, however, is determined by the type of seal regardless of condition.

Waterleak Diagnosis Methods

1. VISUAL INSPECTION

WATERLEAK DIAGNOSIS

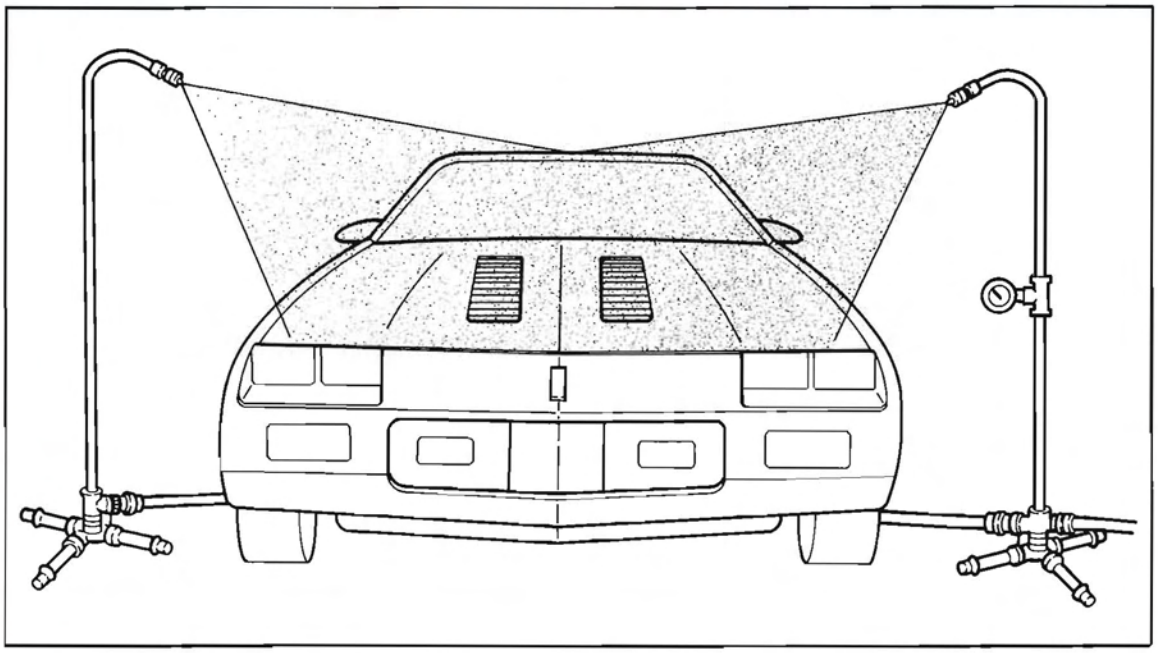
INSPECT SUSPECTED AREAS OF LEAK FOR:

- **MISALIGNED COMPONENTS**
- **TORN WEATHERSTRIPS**
- **BROKEN WELD JOINTS**
- **SEALER AND/OR ADHESIVE SKIPS**
- **EVIDENCE OF WATER, DIRT AND RUST STAINS ACCUMULATION OF WATER CLEAR WATER IS PROBABLY RAIN WATER**

2. SPOT WATER TEST (WITH WATER HOSE)

If area of the leak(s) are known, a spot water test check with a water hose test may be used. The hose test should always start at the base of the suspected leak area with a small stream of water. As the hose is moved up, water will not enter the vehicle until the leak area has been reached. This method can be utilized on any area of the body.

WATERTEST STANDS



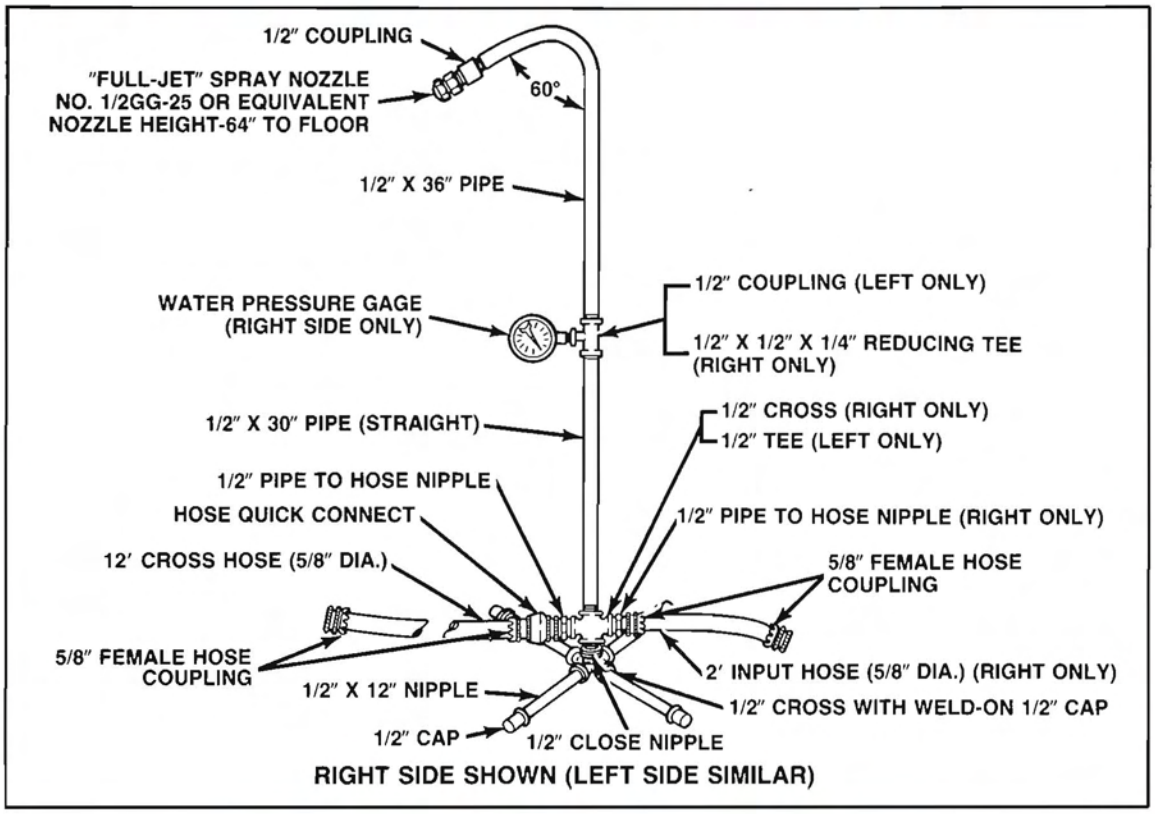
3. OVERALL WATERTEST

Can be easily done using a watertest stand. This allows the technician to set up the watertest equipment, turn the water on and drive the vehicle under the stands, permitting a one man watertest. The duration of the overall watertest should be at least four (4) minutes. Use only if owner did not know where vehicle leaked.

4. AIR HOSE AND SOAPY WATER TEST

Using a mixture of liquid soap and water, spray the area of the suspected leak with the solution, then apply air pressure to the suspected area from inside of the vehicle (205 kPa-30 p.s.i.). The result will be large bubbles at the exact leak point.

WATERTEST STAND COMPONENTS



RIGHT SIDE SHOWN (LEFT SIDE SIMILAR)

WATERTEST STAND SPECIFICATIONS

Type of Nozzle — Full cone spray with 60° included angle — "Full Jet" Spray Nozzle No. 1/2 GG-25 or equivalent.

Nozzle Height — Approximately 1 600 mm (63") from floor.

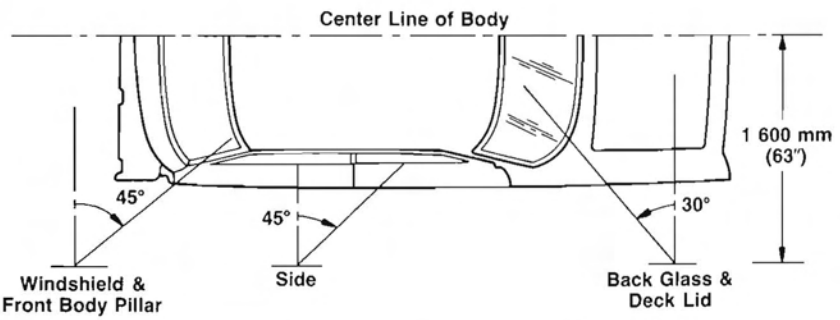
Volume of Flow — 14 liters (3.7 gallons) per minute.

Pressure — 155 kPa (22 psi) measured at nozzle.

Windshield and Front Body Pillar — approximately 30 degrees down, 45 degrees toward rear and aimed at corner of windshield.

Side — approximately 30 degrees down, 45 degrees toward rear and aimed at center of rear door or rear quarter.

Back Window and Rear Compartment Lid — approximately 30 degrees down, 30 degrees toward front and aimed approximately 600 mm (24") from corner of back window.

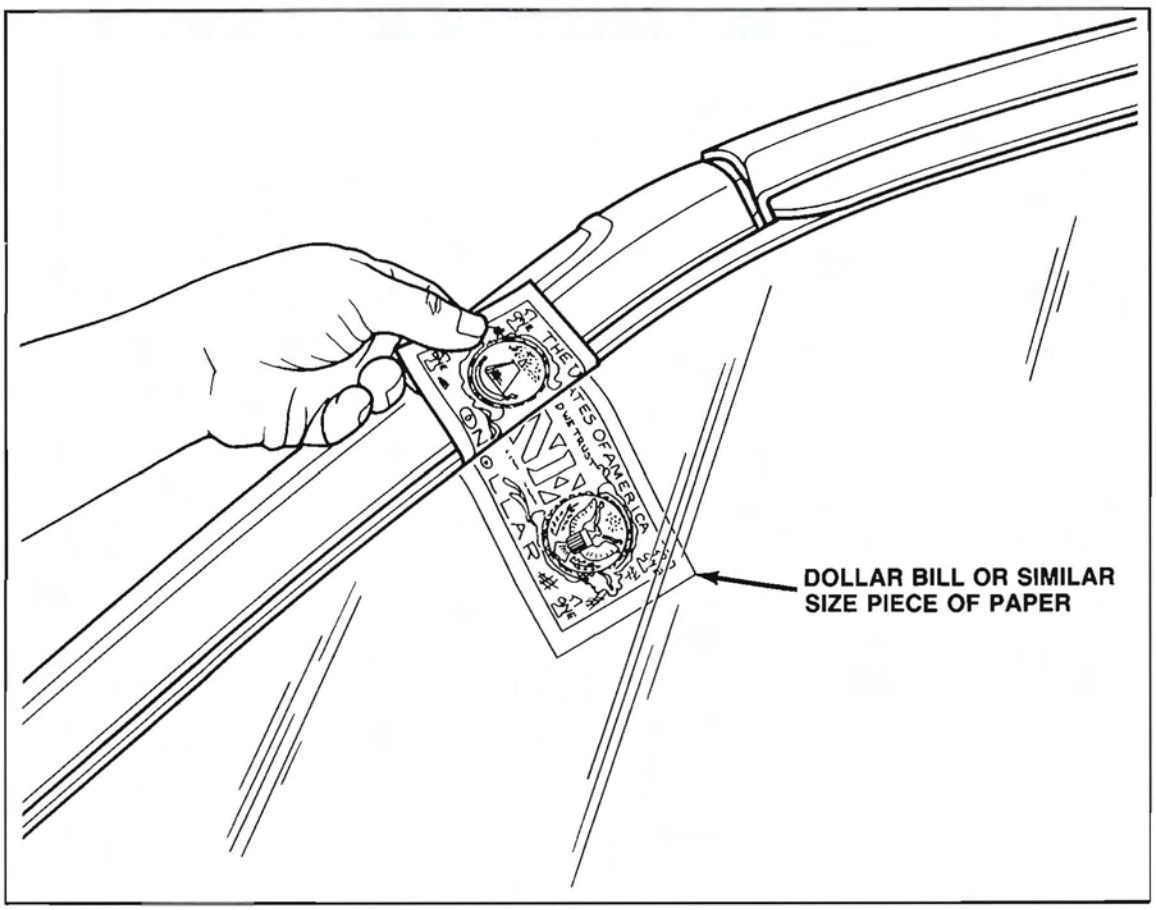


DIAGNOSIS TECHNIQUES

5. POWDER TEST

Best suited for checking weatherstrip contact of door, door glass, and lift-off panel areas. Powder is also available in an aerosol can which is one of the most convenient methods of use. Spray weatherstrip contact surface with powder and close. When you reopen, those areas of the weatherstrip which are properly contacting the surface will have traces of powder on them.

DOLLAR BILL TEST



6. DOLLAR BILL TEST

Place a dollar bill or similar size piece of paper between weatherstrip and contact surface, then close door.

Slowly withdraw the bill or paper after door is closed to check the amount of pressure on the weatherstrip. There should be some resistance as the bill or paper is withdrawn. If little or no resistance is noted, it indicates that there is insufficient contact between weatherstrip and surface.

7. CHALK TEST

Apply soft chalk to surface of the weatherstrip around the perimeter of the door or hatch roof panel. Be sure the chalk line is unbroken and that surrounding areas are free of chalk.

Close the door or panel completely, without slamming, to firmly compress the weatherstrip against its mating surface, and then reopen.

The chalk line on the weatherstrip will be marred where it has good contact. There will be a corresponding imprint left where weatherstrip touched its mating surface. Any irregularities in chalk line on either surface indicate a poor seal.

Potential Waterleak Areas (Diagnosis Chart)

To assist you in the diagnosis and correction of T-Top waterleaks, a chart has been developed and is included in your handouts. Use as help aid if you so desire.

The Chart Includes:

Possible water entry points, probable causes and possible repair solutions.

The conditions and corrections on the chart were developed from in-plant and field watertests.

Appropriate corrections have been instituted at the plant level to control build and sealing operations.

Design changes have also been made and will continue to be made where necessary to improve and simplify sealing operations.

Items listed on this chart should not be misconstrued as the only possible waterleak areas but rather as a guide in locating the types of waterleaks that can be encountered.

In addition, there may be a combination of causes which contribute to the same leak condition; therefore, it is advantageous to eliminate all known conditions in that general area.

DIAGNOSIS TECHNIQUES

T-TOP WATERLEAK DIAGNOSIS CHART

POINT OF WATER ENTRY	PROBABLE CAUSE(S) OF LEAK	CORRECTION
Headliner — between twin lift-off roof panels or at rear of roof panel opening.	Skips or voids in the sealing of body seams underneath twin lift-off panel center upper finishing molding.	Remove upper finishing molding, raise sealing pads and apply sealer along front and rear cutout seams, also, check front and rear foam pads.
Outboard corners of weatherstrip between roof sheet metal and weatherstrip.	Skips or voids in the sealing or bridge material between the weatherstrip and the roof sheet metal.	Remove weatherstrip and existing sealer material from front and rear upper corners of roof panel to windshield and center pillars. Apply strip-caulk and smooth material in area to be bridged.
Any area between roof portion of weatherstrip and retainers or at outboard ends of retainers.	Skips or voids in weatherstrip adhesive. Skips or voids in secondary sealing.	Apply a smooth continuous 3/15″ bead of adhesive in the inboard lip of retainer around total body opening. Apply a secondary sealing bead of adhesive at front and rear portion of weatherstrip in body opening.
Twin lift-off panel between glass and outer plastic support panel.	Skips or voids in urethane adhesive.	Apply a bead of adhesive sealing material the entire length of weatherstrip retainer.
Twin lift-off panel between outer plastic support panel and the sealing strip, weatherstrip and/or weatherstrip retainer.	Skips, voids or improperly sealed weatherstrips or sealing strips.	1. Apply double adhesive backed tape to under surface of sealing strip. 2. Install retainer over sealing strip and loosely drive screws. 3. Apply a bead of strip caulk to ends of retainer. 4. Place lift-off panel in opening, align weatherstrip retainer with body opening weatherstrip butt joint and tighten screws. 5. Smooth sealer flush at front and rear of retainer. 6. Apply a bead of adhesive the entire length of the weatherstrip retainer.
Door glass to side weatherstrips (especially at the butt joint areas).	Misaligned, misadjusted twin lift-off panel weatherstrip at butt joints. Misaligned, misadjusted door glass.	1. Position weatherstrip into weatherstrip retainer inserting retainer tabs through slots in retainer. 2. Roll outboard edge of weatherstrip into retainer. 3. Insert both inboard and outboard edges of weatherstrip into retainer. 4. Push side roof rail weatherstrip lightly to opening weatherstrip butt joint and drive retainer tab screws. Increase slot size in retainer if additional adjustments are required.

SEALERS AND RELATED PRODUCT USAGE

Before sealing any leaks, it is important to know which sealer to use to repair the various areas where a leak may be encountered.

Stationary Glass

Urethane Sealant (GMWWD #12345633) is the only GM recommended sealant for:

1. Windshield to body opening
2. Lift-off panel glass to support
3. Panel glass to three piece poly-carbonate channel

Metal Joints, Seams and Small Pin Holes

1. Paintable body sealers such as: Heavy Drip Check Sealer, Leak Stop Sealer, Wet/Dry Leak Check Sealer, etc.

Weatherstrip Retainers

1. 3M 6375 Scotchfoam Black Vinyl Foam Tape
2. Bedding and glazing compound

Screws and Nuts

1. Thumb grade type sealers such as:
   a. Bulk-caulk
   b. Strip caulk

Weatherstrips

1. Black weatherstrip adhesive such as:
   a. 3M 08011

Release Agent

A special blend of solvents that quickly softens adhesive bonds between weatherstrips and metals to aid in weatherstrip removal. Will not harm paint finish.

1. Kent 30125 — Special Release Agent SR-A
2. 3M 08971 — Release Agent
3. American Sure Seal SRI — Release It

SEALERS AND RELATED PRODUCT USAGE

Tracing Powder

Used to check weatherstrip contact to a mating surface.

1. American Sure Seal STP — Tracing Powder
2. Kent 20065 — Tracing Powder STP

Adhesive Cleaner

A special blended cleaning solvent that will not harm the paint finish, vinyl or plastics.

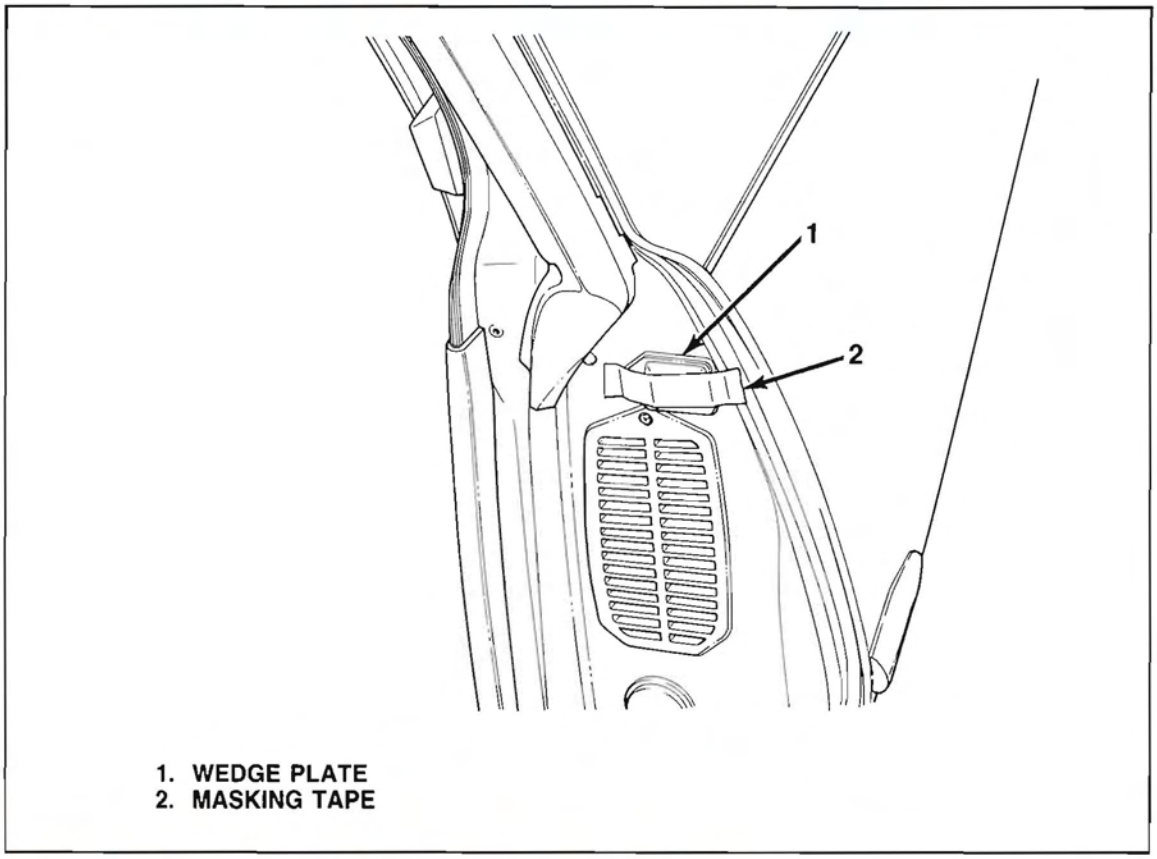
1. Kent 60070 — Acrysol Body Solvent
2. American Sure Seal BSS — General Purpose Sure Solve
3. 3M 08984 — General Purpose Adhesive Cleaner

Silicone Paste

A paste material. When applied on the weatherstrips, deposits a thin protective film coating over the outer surface.

1. GM part number 1042863

BODY LOCK PILLAR WEDGE PLATE



1. WEDGE PLATE
2. MASKING TAPE

Door and Body Lock Pillar Wedge Plates

Before adjusting the lift-off panel or door glass make sure that the door to lock pillar makes contact.

The door side of wedge plate is a plastic material, and the lock pillar side of wedge plate is stamped metal.

To check wedge plate contact, proceed as follows:

Open door and apply a piece of masking tape over the body lock pillar wedge plate. Close door and reopen. Then, check tape.

If tape **IS NOT** torn, add additional shims as required. Shims are available for door and body side wedge plates.

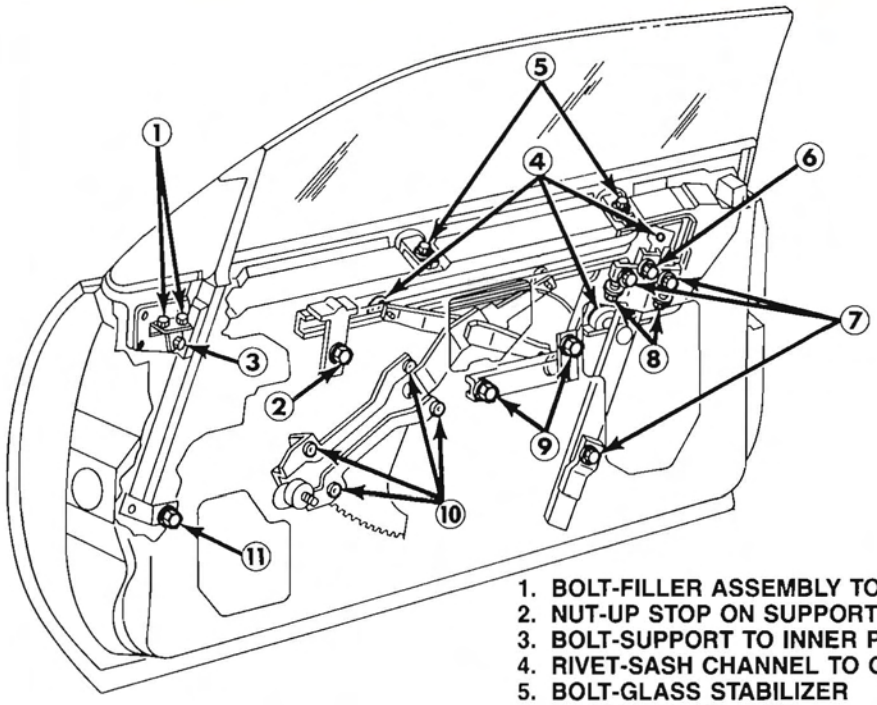
Perform the check again, if the tape **IS** torn, alignment is correct.

WATERLEAK REPAIR OPERATIONS

A common repair for most waterleak conditions is adjusting the components that form the seal.

Before attempting to seal any leak it is important to know what sealers and/or related products to use on the different areas of the vehicle.

DOOR WINDOW GLASS ADJUSTMENTS



1. BOLT-FILLER ASSEMBLY TO SUPPORT
2. NUT-UP STOP ON SUPPORT
3. BOLT-SUPPORT TO INNER PANEL
4. RIVET-SASH CHANNEL TO GLASS
5. BOLT-GLASS STABILIZER
6. BOLT-REAR UP STOP
7. BOLT-REAR GUIDE CHANNEL
8. BOLT-GUIDE CHANNEL TO SUPPORT
9. BOLT-CAM CHANNEL
10. RIVET-REGULATOR
11. ADJUSTING STUD AND NUT-FILLER ASSEMBLY

Door Window Glass Adjustments

Any work performed on window system hardware requires removal of the door trim and inner panel water deflector.

After making adjustments, tighten all loosened attachments to 10 to 14 N•m (90 to 125 in-lbs) torque.

To seat it more firmly against its weatherstrip, the door window glass may need to be tipped forward, tipped rearward, or raised SLIGHTLY. To do this:

1. Remove door interior trim panels and hardware, including the water deflector.
2. Determine the needed adjustment, and follow appropriate procedure.

Window Rotated — Loosen up-stop bolts (2 and 6), and inner panel cam bolts (9). Adjust window as required and tighten attaching screws.

Window Upper Edge Too Far Inboard or Outboard — Loosen the following:

a. Filler at belt (1 and 11)
b. Rear guide upper support lower bolts (8)
c. Adjust rear guide as needed and tighten bolts. Adjust and tighten filler assembly.

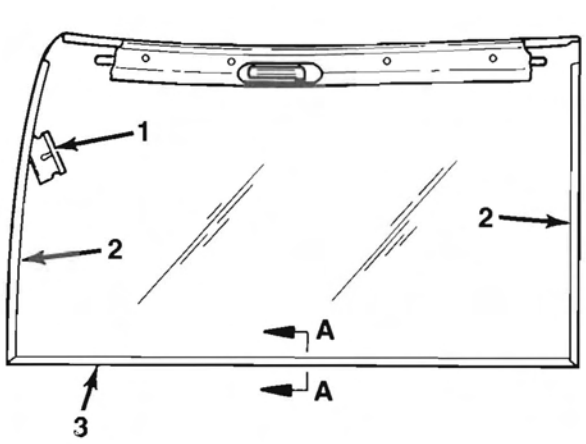
Window Too Far Forward or Rearward — Loosen filler assembly bolts (3 and 11).

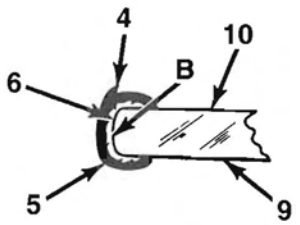
With the window partially down, loosen bolts on rear guide channel (7). Position glass to opening as needed and tighten bolts. Position filler to glass and opening as needed and tighten bolts.

Window Too High or Too Low in Up Position — Loosen up-stop bolts (5). Adjust up-stops as needed and tighten bolts.

3. Check the window seal for proper adjustment.
4. Install water deflector, and door interior trim panels and hardware.

LIFT-OFF GLASS PANEL CHANNEL





SECTION A-A

VIEW B

1. SINGLE EDGE RAZOR BLADE
2. SIDE CHANNEL
3. CENTER CHANNEL
4. CHANNEL LIP
5. LIFT-OFF GLASS PANEL CHANNEL
6. URETHANE SEALANT
7. CHANNEL
8. URETHANE SEALANT
9. GLASS TOP SURFACE
10. GLASS BOTTOM SURFACE

Lift-Off Glass Panel Channel

On some earlier style vehicles with the T-Top option, a three-piece, formed, black polycarbonate plastic channel is bonded to the glass around three sides with urethane sealant.

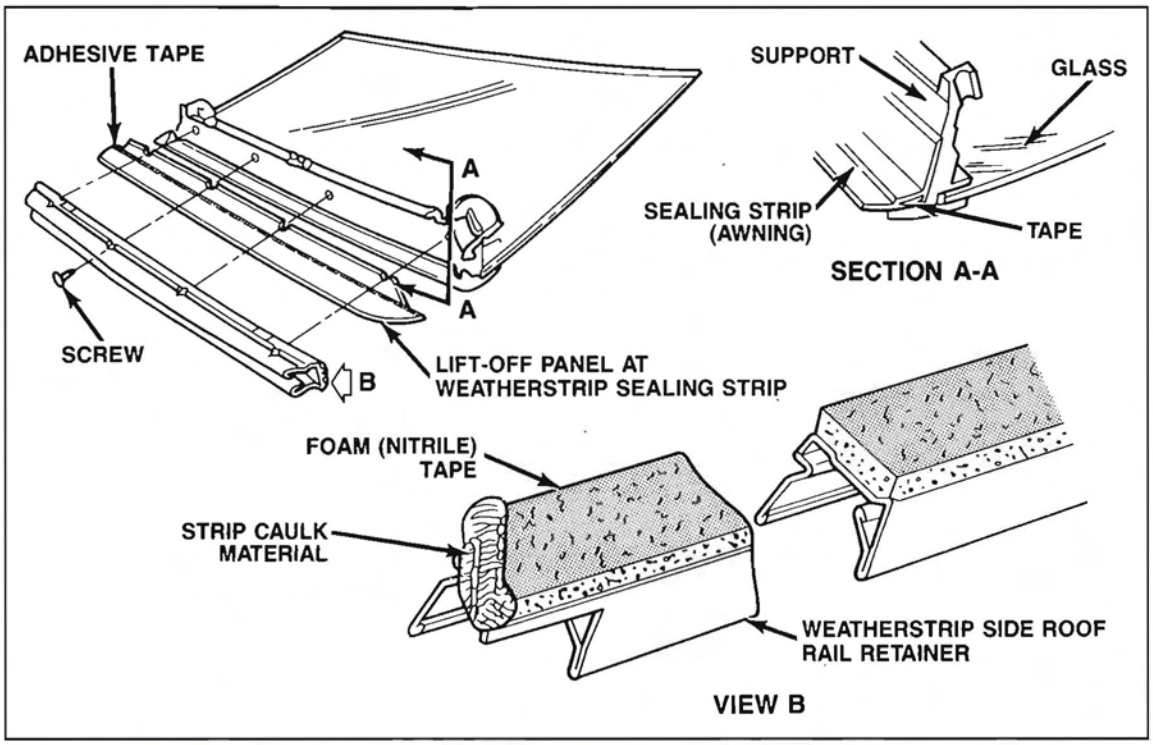
DISASSEMBLY

1. Place lift-off glass assembly on a clean, protected surface.
2. With a single edge razor blade, cut the urethane adhesive between the glass and glass channel.
3. Place glass assembly upside down on the work surface. With a single edge razor blade, cut the channel next to the channel lip.
4. Grasp edge or end of channel and pull upward and/or outward to disengage channel from glass.
5. Remove excess urethane from glass with razor blade and clean surfaces with a glass cleaner.

REASSEMBLY

1. Apply the clear glass primer to edges of the glass and interior sides of channel.
2. Position new channel on glass and remove any excess material in the area of the glass and metal frame.
3. Remove channels and apply a small bead of Urethane Sealant (GMWDD #12345633) into the interior of the channels.
4. Install long, center channel over edge of glass (Section A) and press firmly in position.
5. Install side channels by first placing the end of each channel against the end of the center channel, then over the edge of the glass making certain that channel is under the metal frame before pressing channel in position.
6. Place cloth-backed tape over channels to hold firmly in place. To reduce urethane cure time, warm water may be applied to channel installation.
7. Allow sufficient time for urethane to cure, trim off excess urethane and then install lift-off panel.

LIFT-OFF PANEL WEATHERSTRIP RETAINER AND SEALING STRIP INSTALLATION



Side Roof Rail Lift-Off on Glass Panel Weatherstrip

The side rail lift-off panel weatherstrip is of hollow tubular construction with slotted integral reinforced tabs at each end. The weatherstrip ends are mitered to mate with the body side weatherstrip at the side roof rail to windshield and body lock pillar joints.

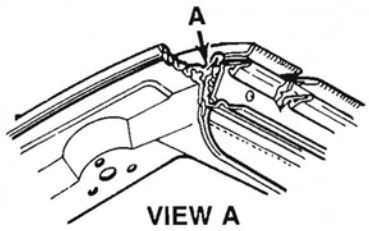
The edges are tucked into a retainer which is attached by screws to the glass panel support. The retainer is sealed to the support assembly with a foam (nitrile) tape.

Black weatherstrip adhesive is applied to the inboard edge of the retainer.

The slotted tabs of the weatherstrip permit it to be positioned for a uniform fit to the mating mitered joints of the panel opening weatherstrip before the tab screws are tightened.

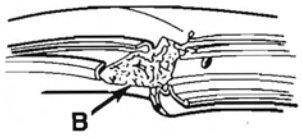
Sealer skips and voids can cause waterleaks between the outer plastic support panel and sealing strip, weatherstrip and/or weatherstrip retainer.

BODY OPENING SEALING



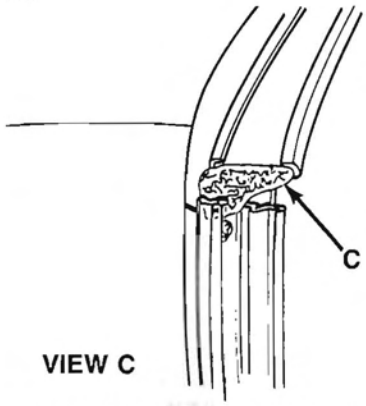
VIEW A

VIEW OF RIGHT FRONT CORNER OF THE ROOF ASSEMBLY AT LIFT OFF PANEL OPENING.



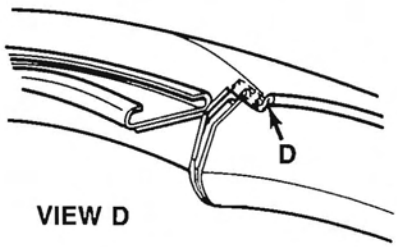
VIEW B

VIEW OF THE RIGHT FRONT CORNER OF THE ROOF ASSEMBLY SHOWING THE BRIDGING OF THE SEALING MATERIAL.



VIEW C

VIEW OF THE RIGHT REAR CORNER OF ROOF OPENING SHOWING SMOOTH MATERIAL BRIDGE BETWEEN ROOF AND PILLAR WEATHERSTRIP RETAINERS.



VIEW D

VIEW OF THE UPPER FRONT CORNER FORMED BY THE ROOF PANEL AND WINDSHIELD INNER UPPER FRAME.

Replacement of Side Roof Rail Lift-Off Panel Weatherstrip Retainers and Sealing Strips:

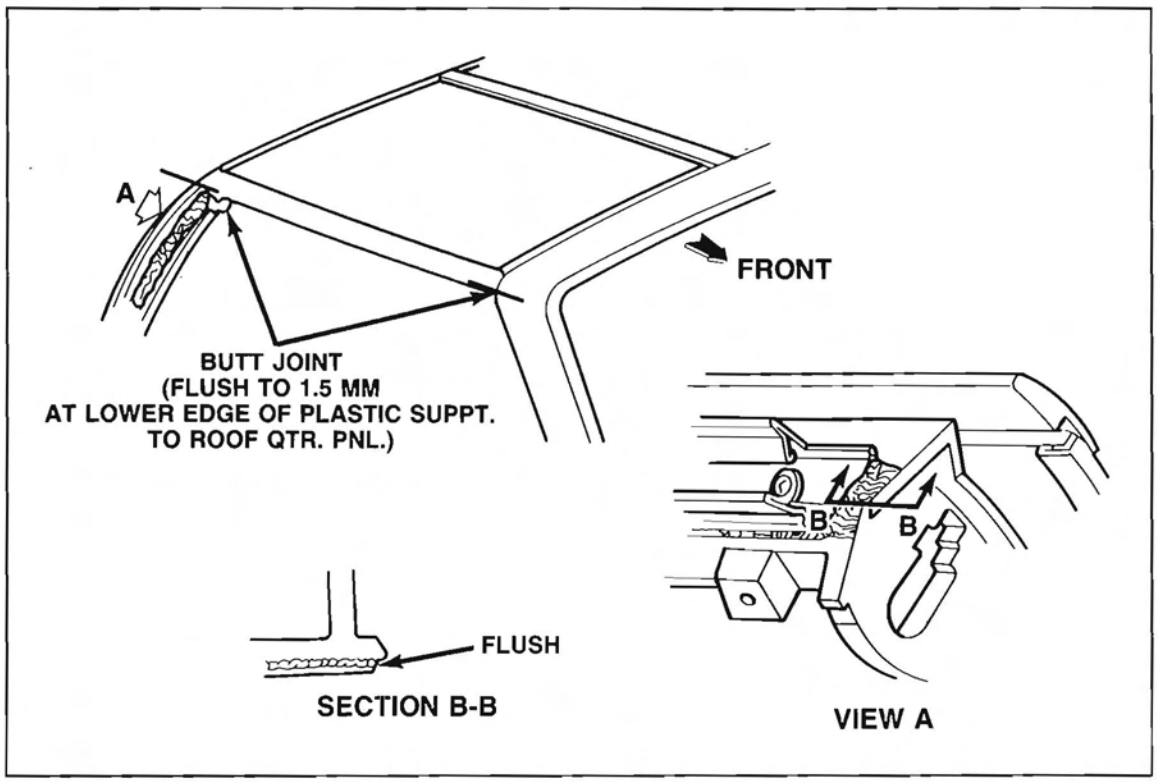
1. Remove lift-off panel and place upside down on a clean protected work surface.
2. Remove handle and lift-off panel trim cover.
3. Remove screws holding tabs at each end of lift-off panel weatherstrip.
4. Begin to remove weatherstrip from weatherstrip retainer by carefully pulling on weatherstrip while breaking sealer bond between weatherstrip and retainer with a flat-bladed tool. A suitable release agent (Kent Special Release Agent, 3M Release Agent or equivalent) or a heat gun will aid in breaking the weatherstrip adhesive bond. Remove plastic tabs on weatherstrip through retainer slots.
5. Remove screws located along retainer and carefully lift up retainer using a flat-bladed tool.

NOTE

If sealing strip displays a wavy or rippling effect prior to the removal of the lift-off panel from the roof opening, it should be replaced.

6. Remove sealing strip (awning) by pulling upward.
7. Scrape excess sealer from weatherstrip retainer.

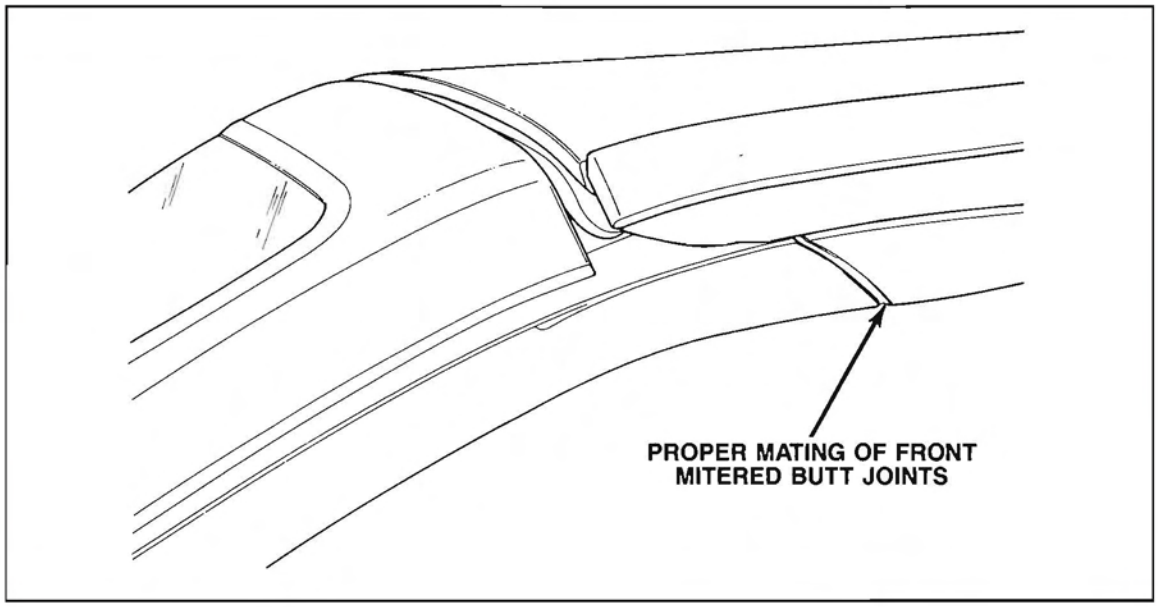
LIFT-OFF PANEL WEATHERSTRIP RETAINER AND SEALING STRIP INSTALLATION



INSTALLATION PROCEDURES

1. If original sealing strip is to be replaced, apply 3M's 969 High Tack 1/2″ Acrylic Adhesive or equivalent to the under surface of the sealing strip. Then, press strip to support.
2. Apply 3M's 6375 Scotchfoam 1/2″ Black Vinyl Foam Tape or its equivalent to the bottom surface of retainer.
3. Install retainer over sealing strip and drive screws loosely.
4. Place lift-off panel in the opening, align weatherstrip retainer with body opening weatherstrip butt joint for in and out alignment.
5. If aligned properly, tighten screws securely.
6. Remove lift-off panel and place upside-down on a clean protected work surface.
7. Apply a bead of strip caulk to each end of the weatherstrip retainer.

MATING OF LIFT-OFF PANEL AND BODY OPENING WEATHERSTRIPS MITERED JOINTS

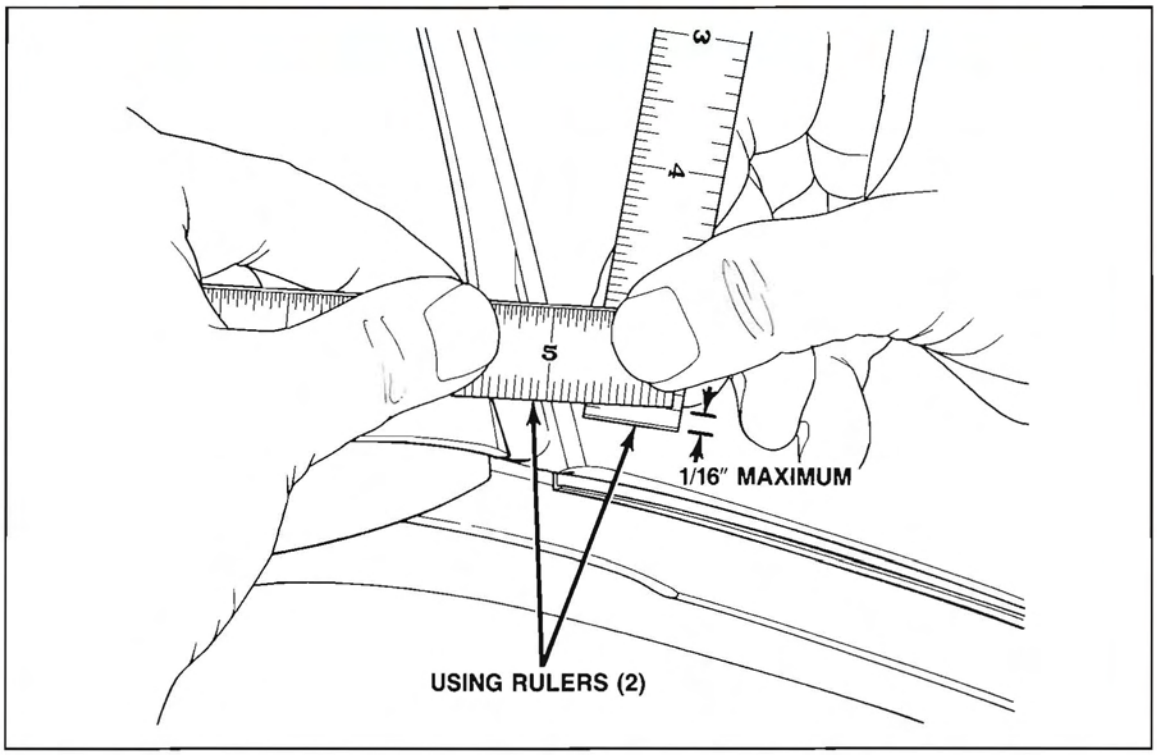


8. Apply a 3/16" bead of sealing material (3M's 8011 or Sure Seal BSG-B) the entire length of weatherstrip retainer.
9. Position weatherstrip into weatherstrip retainer inserting retainer tabs through slots in retainer.
10. Roll outboard edge of weatherstrip into retainer.
11. Insert both inboard and outboard edges of weatherstrip into retainer.
12. Place lift-off panel in the opening, align weatherstrip with body opening weatherstrip butt joint.
13. Push side roof rail weatherstrip lightly to opening weatherstrip butt joint and drive retainer tab screws. Increase slot size in retainer if additional adjustments are required.
14. Remove unit and replace all previously removed hardware and trim panel.
15. Remove and replace unit several times to check alignment then, test the assembly for leaks.

Lift-Off Panel Adjustments

Proper lift-off panel adjustments are important to prevent waterleaks. If it is determined that the panel requires adjusting, make sure that the condition is not caused by another component such as the door glass and/or door to lock pillar without making proper contact.

LIFT-OFF PANEL UP/DOWN HEIGHT CHECK



To check and align up/down height of lift-off panel:

1. Place a straight edge, horizontally across the front lower edge of the lift-off panel plastic support and front roof header panel.
2. Hold a second scale or ruler vertically against the horizontally placed straight edge, directly above and touching front roof header panel.
3. Notice how much of the vertical scale or ruler extends below the bottom of the horizontal placed one. It should read not more than 1/16", or one-and-a-half millimeters.

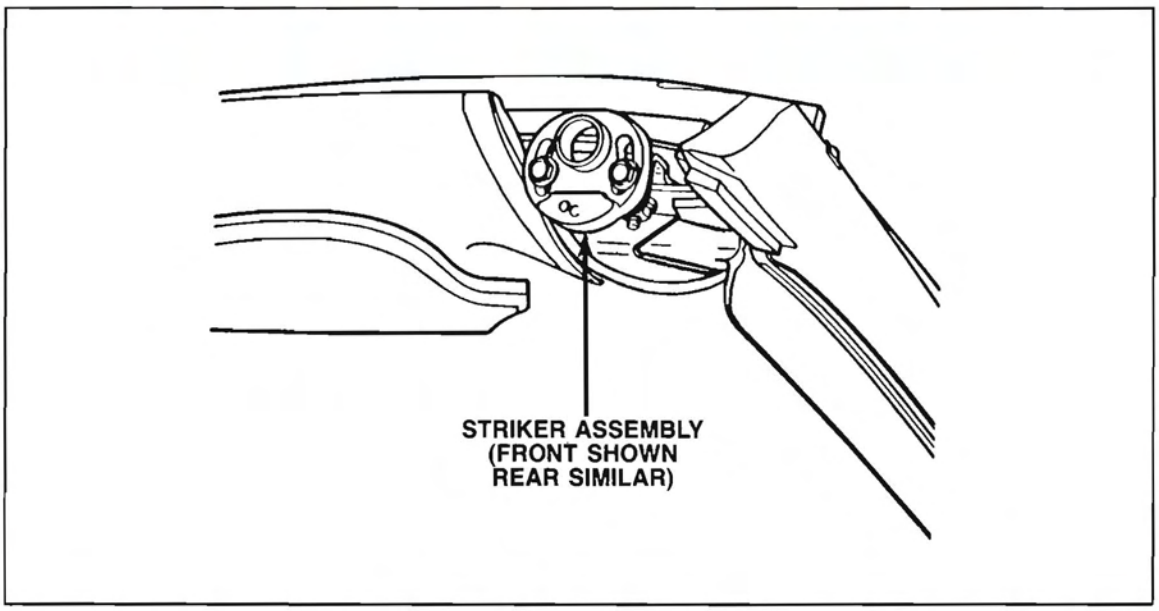
The rear of the lift-off panel can be checked in the same manner by placing the vertical scale or ruler across the horizontal straight edge directly above and touching the roof at the lock pillar.

NOTE

If lift-off panel is high in the opening, you would place the vertical straight edge or ruler above the front roof header or the roof panel at the lock pillar. To be considered properly aligned, it should be flush to not more than 1.5mm (1/16″).

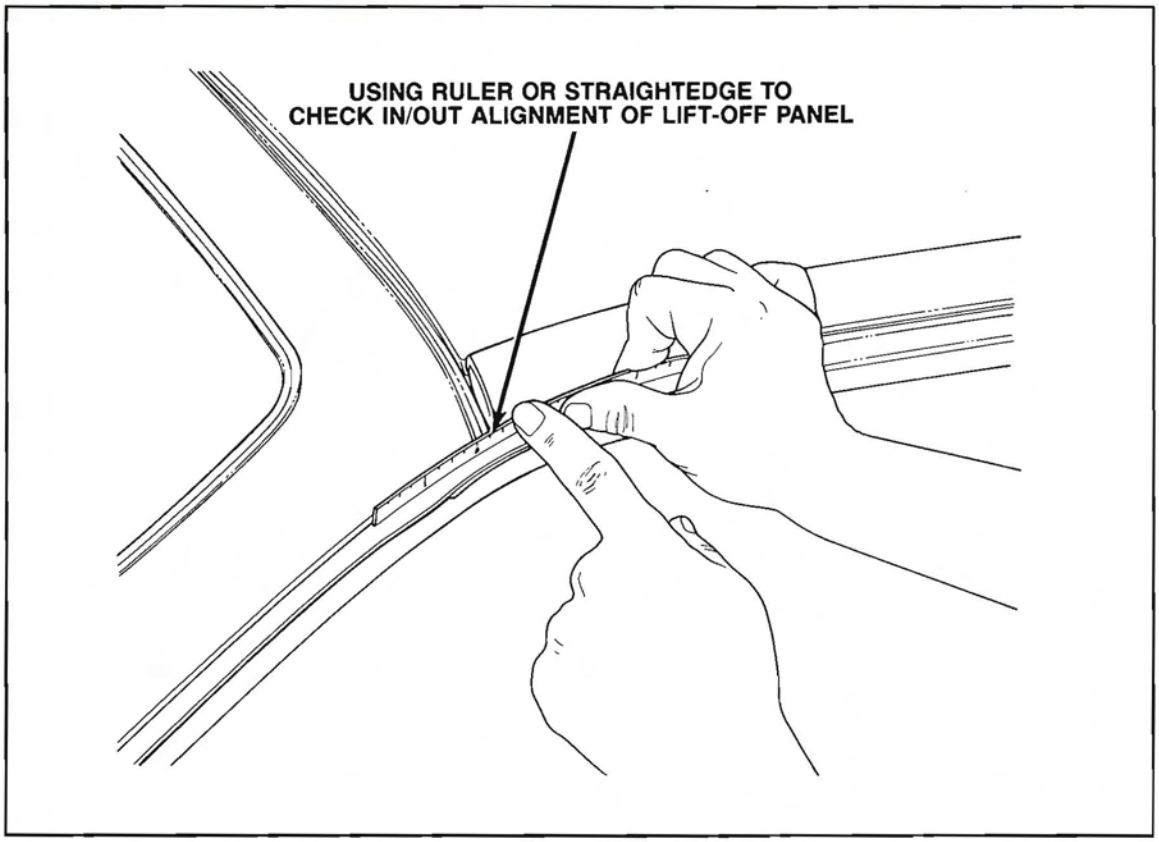
4. Disengage lift-off panel from roof.

LIFT-OFF PANEL UP/DOWN ADJUSTMENT



5. If front, left, or right side of panel needs adjusting, remove windshield pillar trim to adjust.
6. If rear needs adjusting, remove body lock pillar upper trim panel.
7. Loosen the striker assembly attaching bolts.
8. Adjust up or down travel of lift-off panel assembly as required.
9. Retighten bolts to 5 to 7 N•m (4 to 5 ft./lbs.).
10. Install lift-off panel assembly and check for proper fit.
11. If properly aligned, replace previously removed garnish molding or trim panel.

LIFT-OFF PANEL IN/OUT ALIGNMENT CHECK



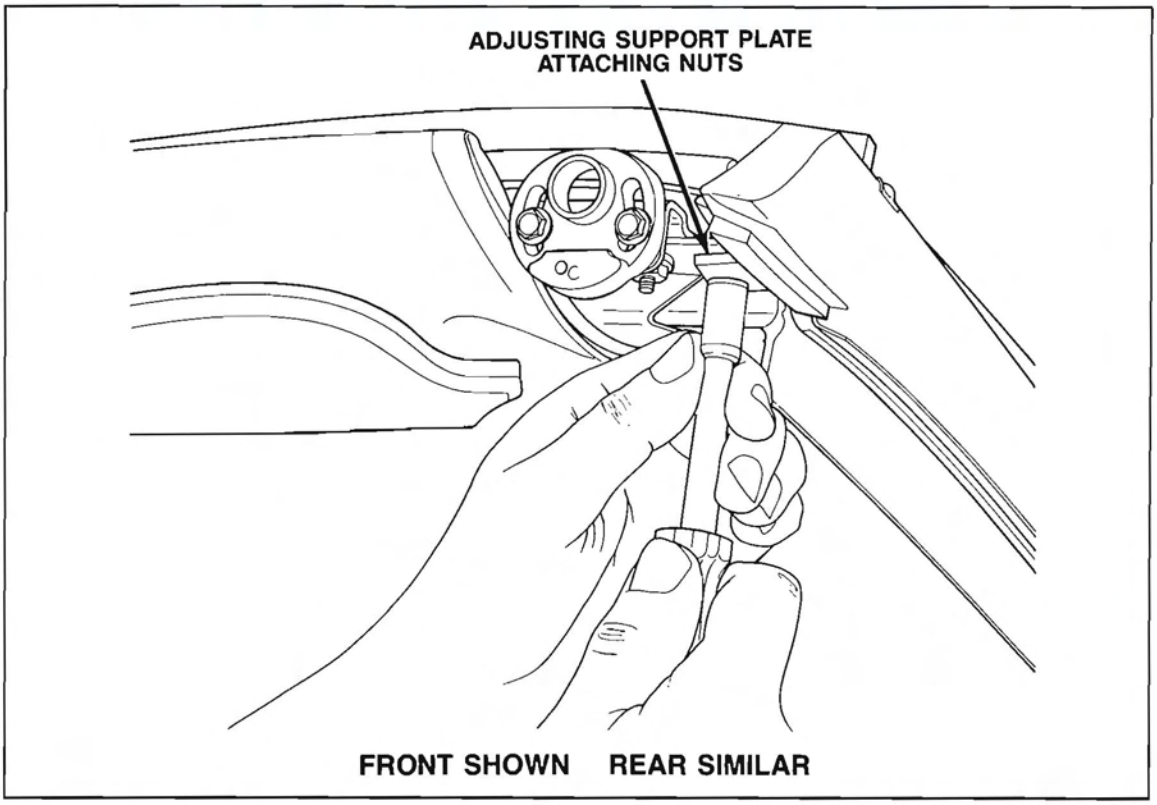
To check and adjust in/out alignment of lift-off panel:

1. Place the flat side of a straight edge against the curved radius at the front leading edge of the lift-off panel outer plastic support and the upper outboard corner of the windshield header panel.

NOTE

Adjust front of lift-off panel flush before attempting to adjust the rear of the panel.

LIFT-OFF PANEL IN/OUT ADJUSTMENT



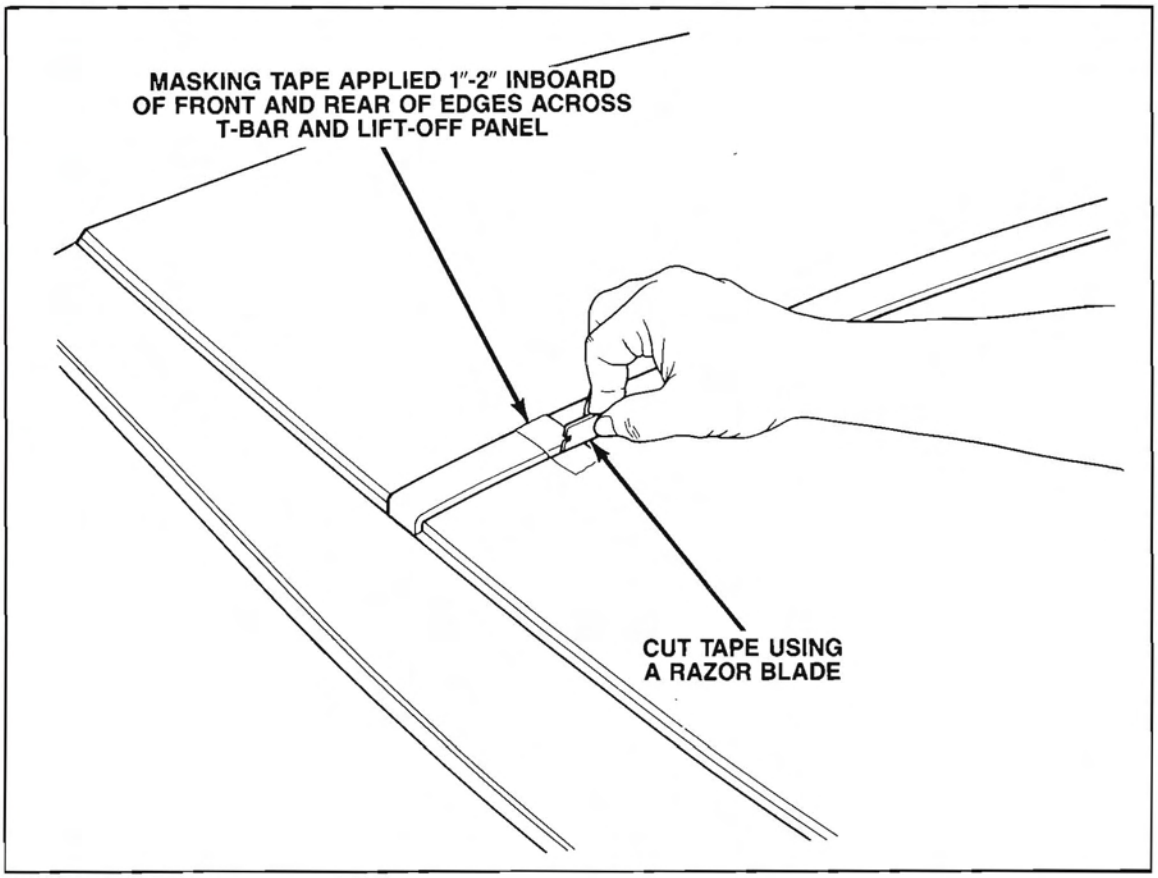
FRONT SHOWN REAR SIMILAR

To adjust the front of lift-off panel, perform the following:

a. Remove lift-off panel from the opening.
b. Remove windshield pillar upper garnish molding.
c. Loosen nuts securing front support plate.
d. Adjust front striker fore or aft as required.
e. Retighten nuts to 6-8 N•m (4.5-6 ft./lbs.).
f. Install panel and check curved radius again.

If straight edge lies flat with no voids between it and the curved radius, proceed to step number two (2).

EDGE OF GLASS TO UPPER FINISH MOLDING ALIGNMENT CHECK



2. With lift-off panel latched in the opening, apply a piece of masking tape across the glass panel and the center upper finishing molding (T-Bar) approximately 1″-2″ inboard of the front and rear edges of the lift-off panel.
3. Cut the masking tape along the side of the center upper finishing molding.
4. Disengage and remove lift-off panel assembly.
5. With a ruler, measure the distance from the applied masking tape to the edge of the glass.

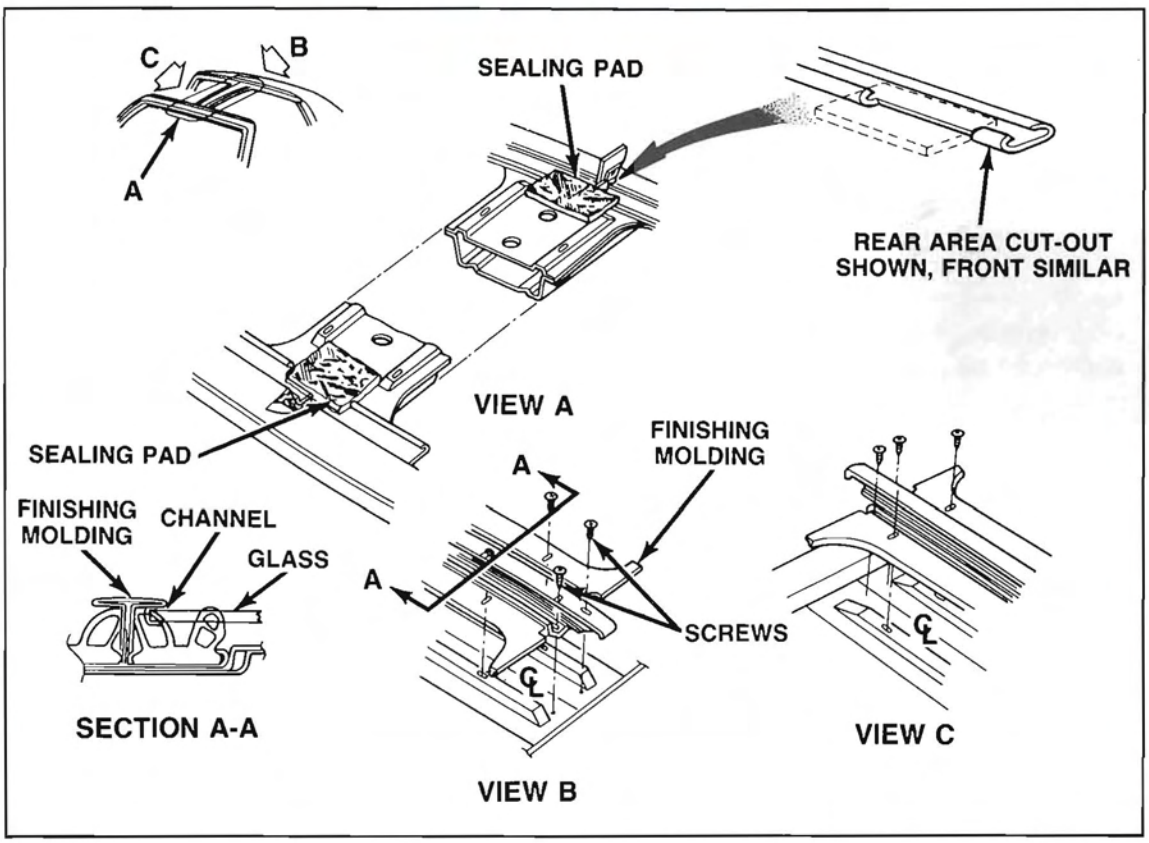
NOTE
The distance from edge of masking tape to edge of glass at both front and rear of panel should be identical.

6. If not the same, the rear of the panel must be adjusted.
7. After all adjustments are made, install glass and check for proper fit.
8. Reinstall all previously removed trim.

Lift-Off Panel Opening Center Upper Finishing Molding

The center upper finishing molding provides inboard retention of both right glass panels and the center inboard weatherstrip retainer and is retained with sheet metal screws.

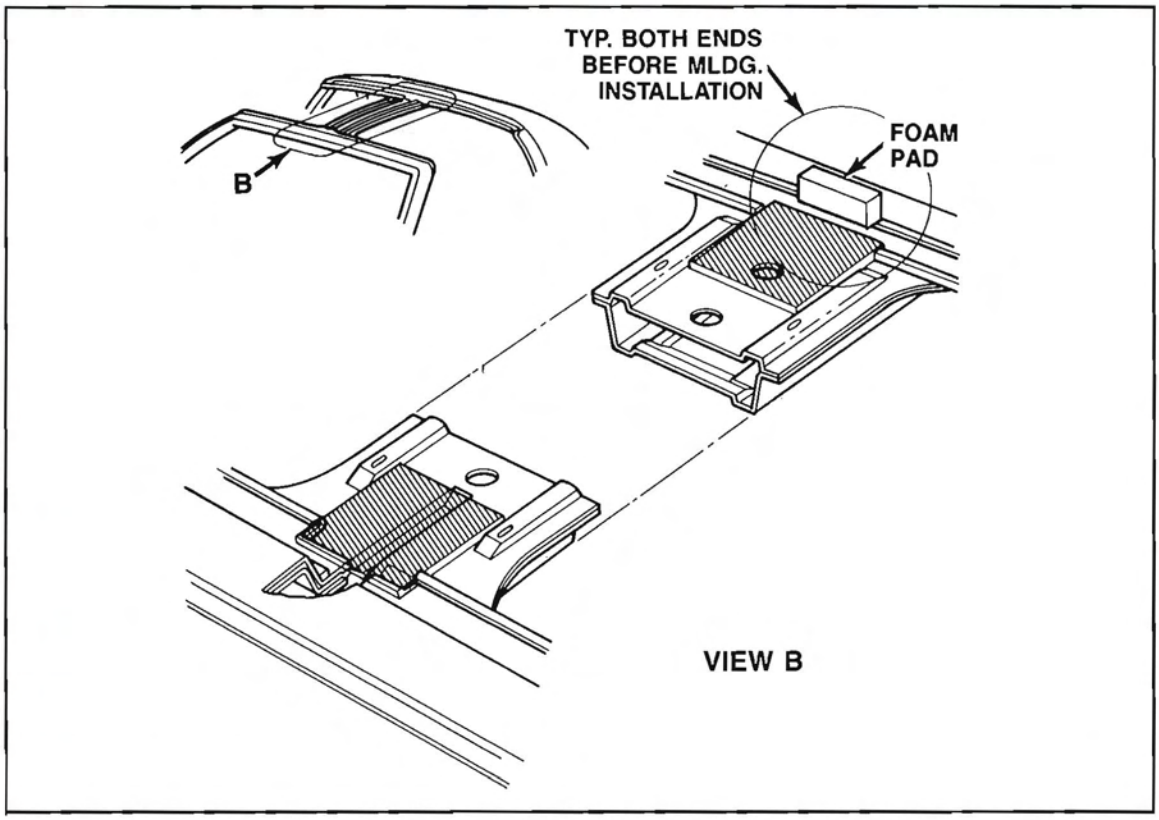
LIFT-OFF PANEL OPENING CENTER UPPER FINISH MOLDING SEALING AND INSTALLATION



To prevent water from entering into the passenger compartment at the lift-off panel upper finishing molding, perform the following:

1. Remove lift-off panel from vehicle.
2. Remove both body opening weatherstrips in the area of the Upper Finishing Molding (T-Bar) utilizing a flat-bladed tool and/or a suitable weatherstrip release agent.
3. Remove attaching screws.
4. Raise sealing pads and apply continuous beads of bedding and glazing compound, such as Sure Seal LSW or 3M 08531, along front and rear weatherstrip retainer cutouts.
5. Reinstall sealing pads over retainer cutouts.

FOAM SEALING PADS



6. Inspect and replace as required, front and rear foam sealing blocks.
7. Reinstall finishing panel molding and attaching screws.

Lift-Off Panel Opening Weatherstrip

The body opening is a one-piece tubular construction. It includes the windshield and the body lock pillar sections as well as the perimeter of the lift-off panel opening.

The section of the weatherstrip around the perimeter of the lift-off panel opening incorporates a double tubular section. The area along the lock pillar has a raised lip. Both serve as channels for water drainage. The opening butt joints are mitered to insure a uniform fit to the lift-off glass weatherstrip.

The inner lip of the weatherstrip closest to opening serves to seal the glass of the lift-off panel from water entry into the vehicle. The outer lip, (furthest from opening), serves to seal against the lift-off panel edge thereby creating a double seal.

NOTE

It will not be necessary to replace the weatherstrips in all cases. However, in those cases where it is necessary, current weatherstrips are the only parts to be used and MUST BE REPLACED IN SETS (roof opening and lift-off panel) on the affected side.

CURRENT WEATHERSTRIP PART NUMBERS ARE:

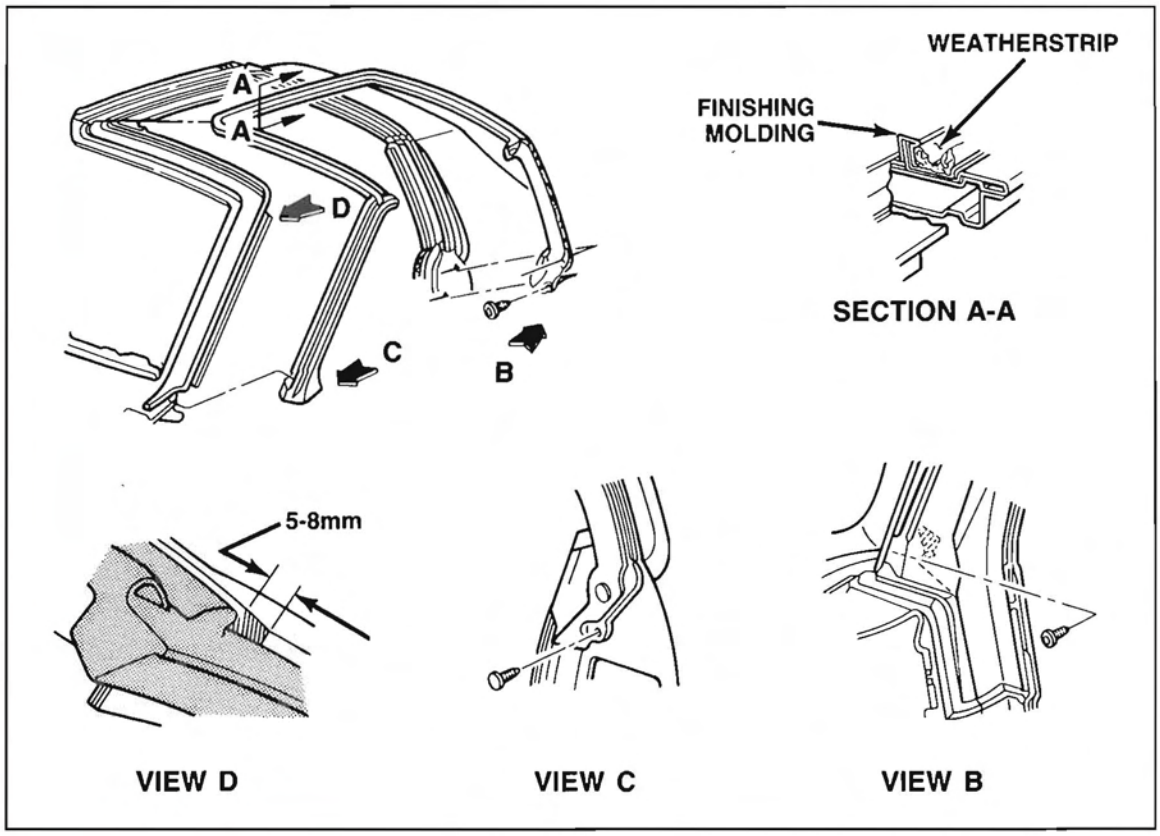
Left Side Set:

- Weatherstrip, Lift-Off Panel Opening On Body — 20667535
- Weatherstrip, Side Roof Rail On Lift-Off Glass — 20680014

Right Side Set:

- Weatherstrip, Lift-Off Panel Opening On Body — 20667534
- Weatherstrip, Side Roof Rail On Lift-Off Glass — 20680014

LIFT OFF PANEL OPENING WEATHERSTRIP INSTALLATION



REMOVAL PROCEDURES

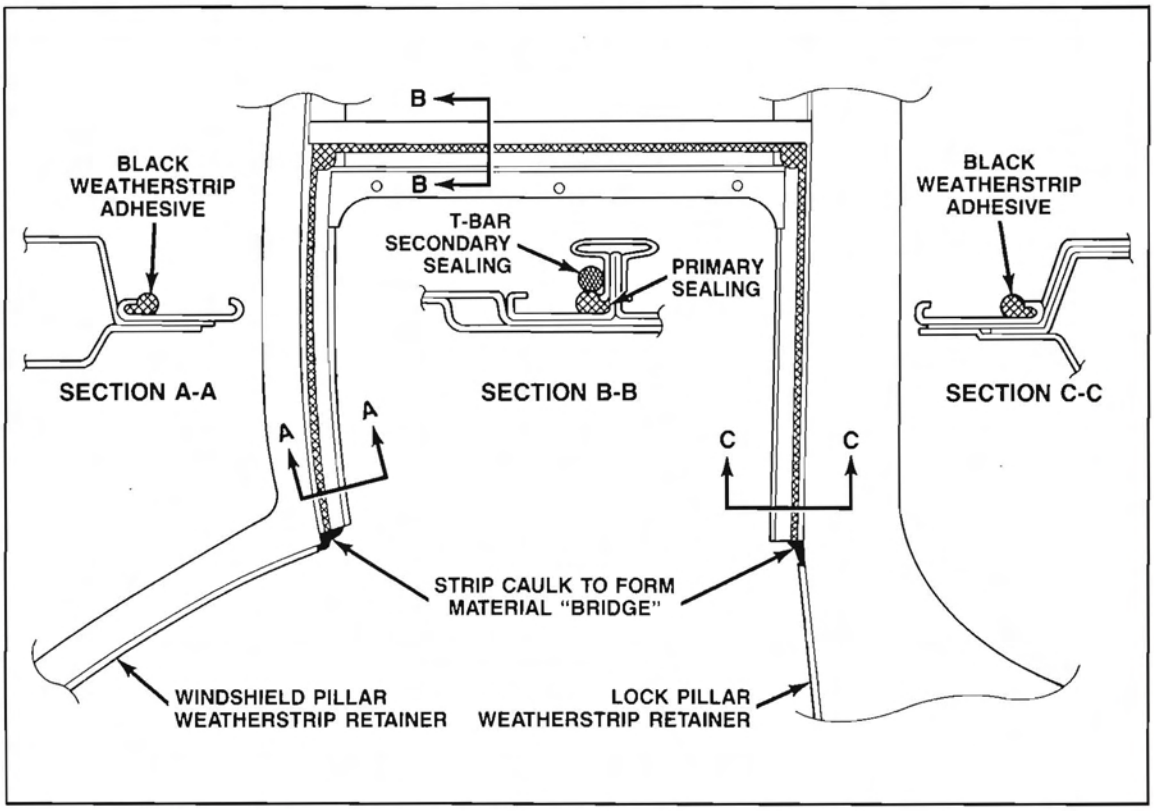
1. Remove lift-off panel.
2. Remove plastic fasteners located at rear end of lift-off panel opening weatherstrip using tool J-21104 or equivalent.

NOTE
The following operation must be performed carefully to prevent damage to the weatherstrip.

3. Remove retaining screws from upper front and rear corners of weatherstrip opening.
4. Grasp weatherstrip and pull upward gently while inserting a flat-bladed tool between weatherstrip retainer and weatherstrip to break cement bond.

   Using a suitable release agent, (Kent Special Release Agent or equivalent) or heat gun will aid in breaking the weatherstrip adhesive bond.

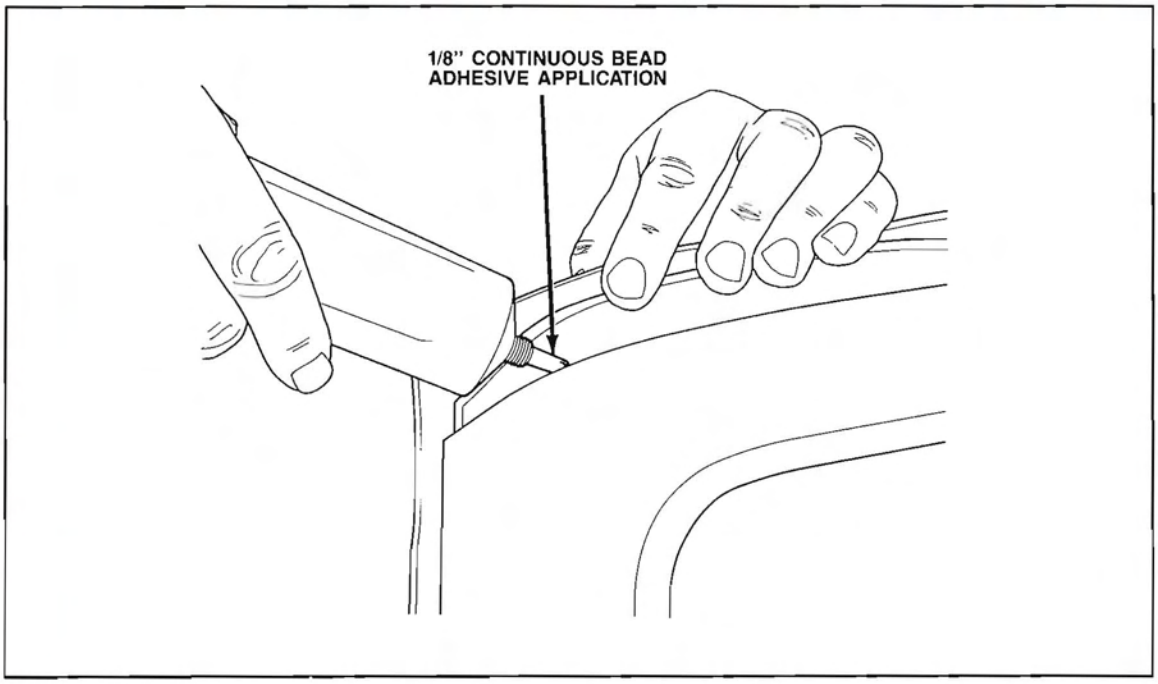
SEALING LOCATIONS AND PATTERNS FOR BODY OPENING WEATHERSTRIP



INSTALLATION PROCEDURES

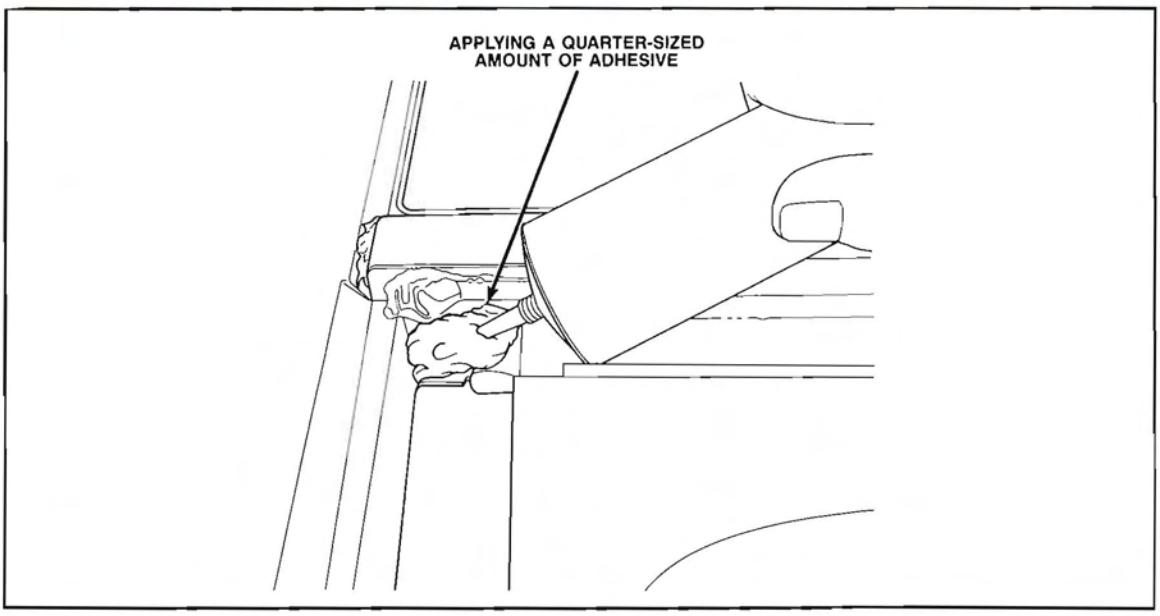
1. Remove excess sealer from weatherstrip retainer.
2. Apply a coat of 3M 08643 — Window Weld Primer as a corrosion protection barrier in areas where paint damage was done during clean up operations.

SEALING OUTBOARD EDGES — ROOF RETAINER AREA



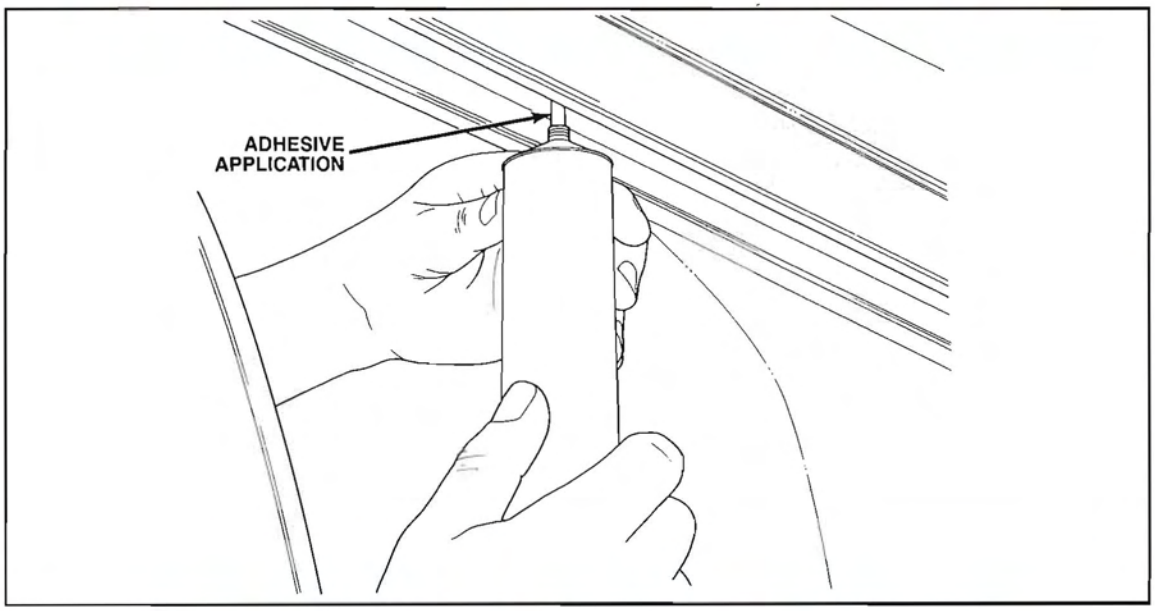
3. Apply a smooth, continuous bead (1/8") of 3M 08011 or Sure Seal BSG-B adhesive in the outboard edges of the roof area retainer.

FRONT AND REAR OUTBOARD EDGES ADHESIVE BEAD APPLICATION

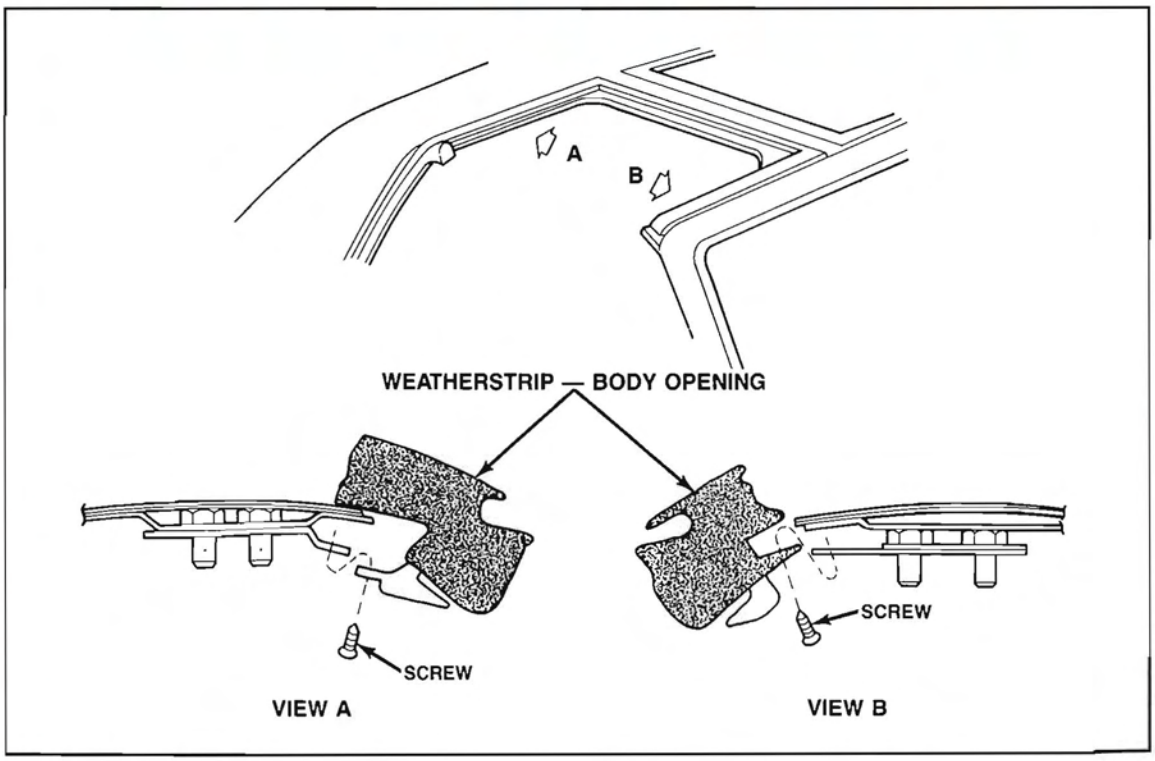


4. Apply a quarter-sized amount of 3M 08011 or Sure Seal BSG-B adhesive in the front and rear inboard corners of the roof opening weatherstrip retainer.
5. Apply a smooth, continuous bead (1/8") of 3M 08011 or Sure Seal BSG-B adhesive in the outboard edges of the windshield pillar and body lock pillar weatherstrip retainers.

OUTBOARD EDGE ADHESIVE BEAD APPLICATION

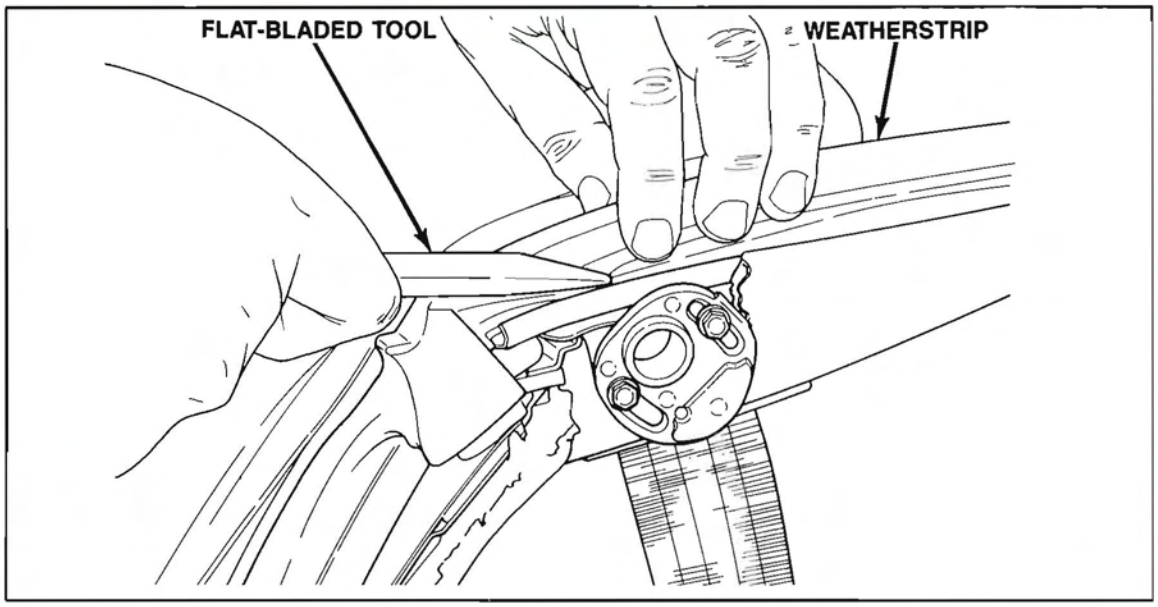


BODY OPENING TO SUPPORT ATTACHMENT



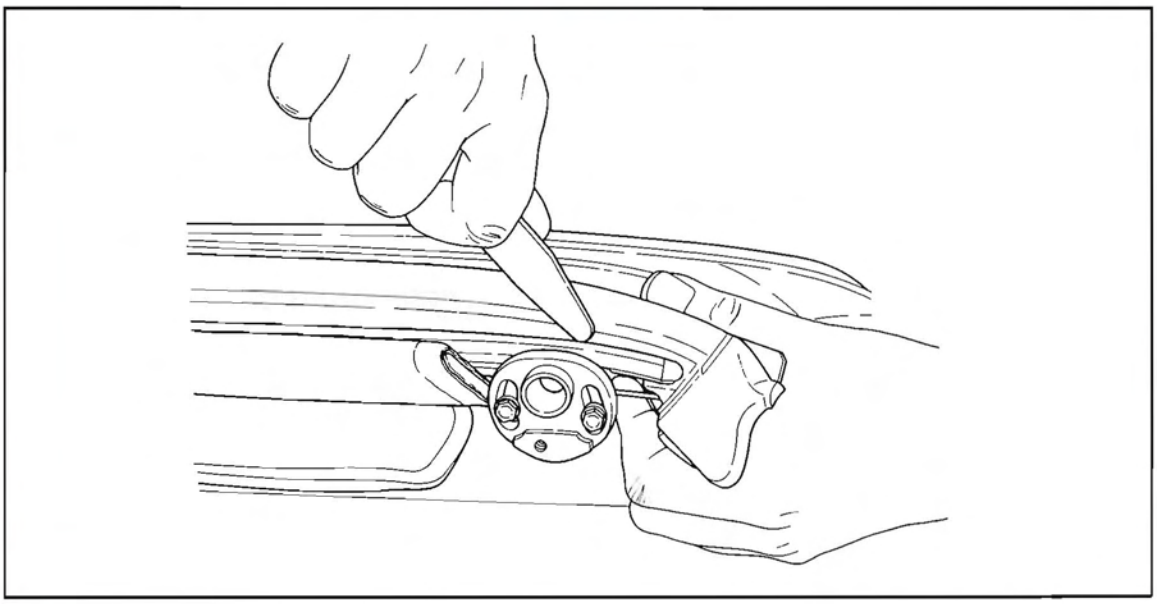
6. Position weatherstrip at both outboard corners of lift-off panel opening. Align holes in weatherstrip to supports and install screws.

POSITIONING WEATHERSTRIP AT LEFT OUTBOARD CORNER

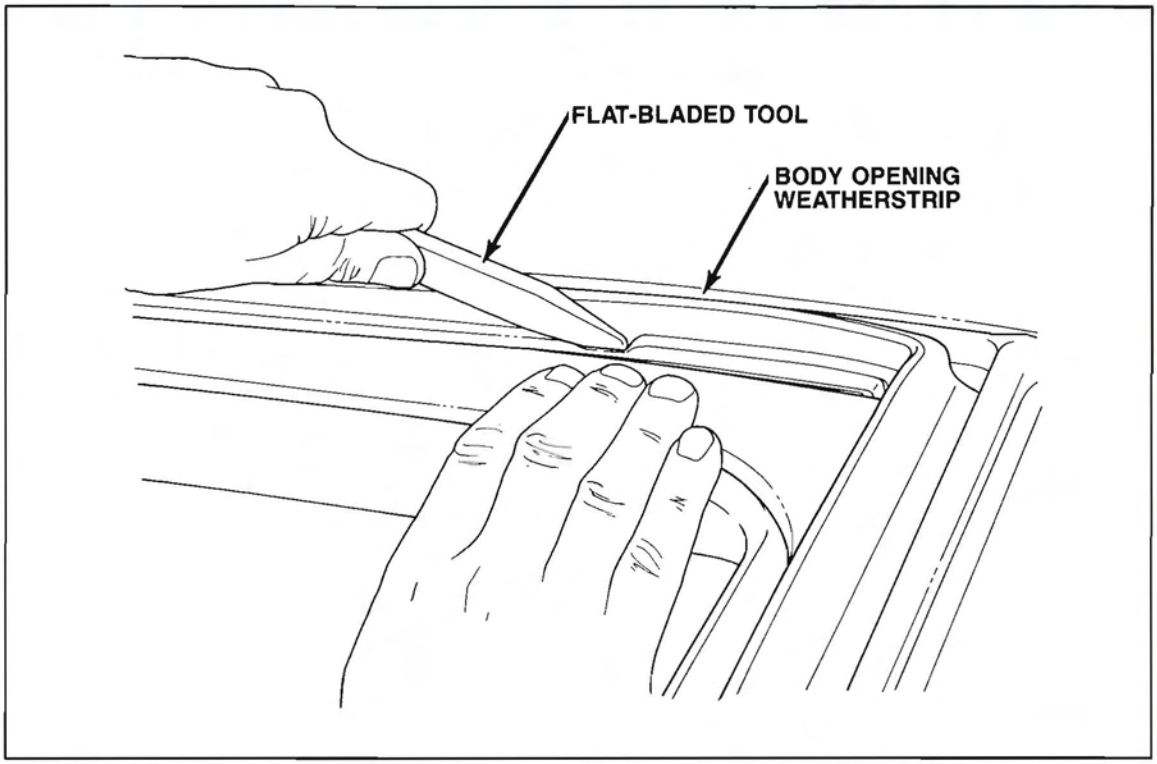


7. Continue to position weatherstrip from outboard corners following roof opening to center upper finishing molding (front and rear).

POSITIONING WEATHERSTRIP AT RIGHT OUTBOARD CORNER



WEATHERSTRIP INSTALLATION UNDER T-BAR



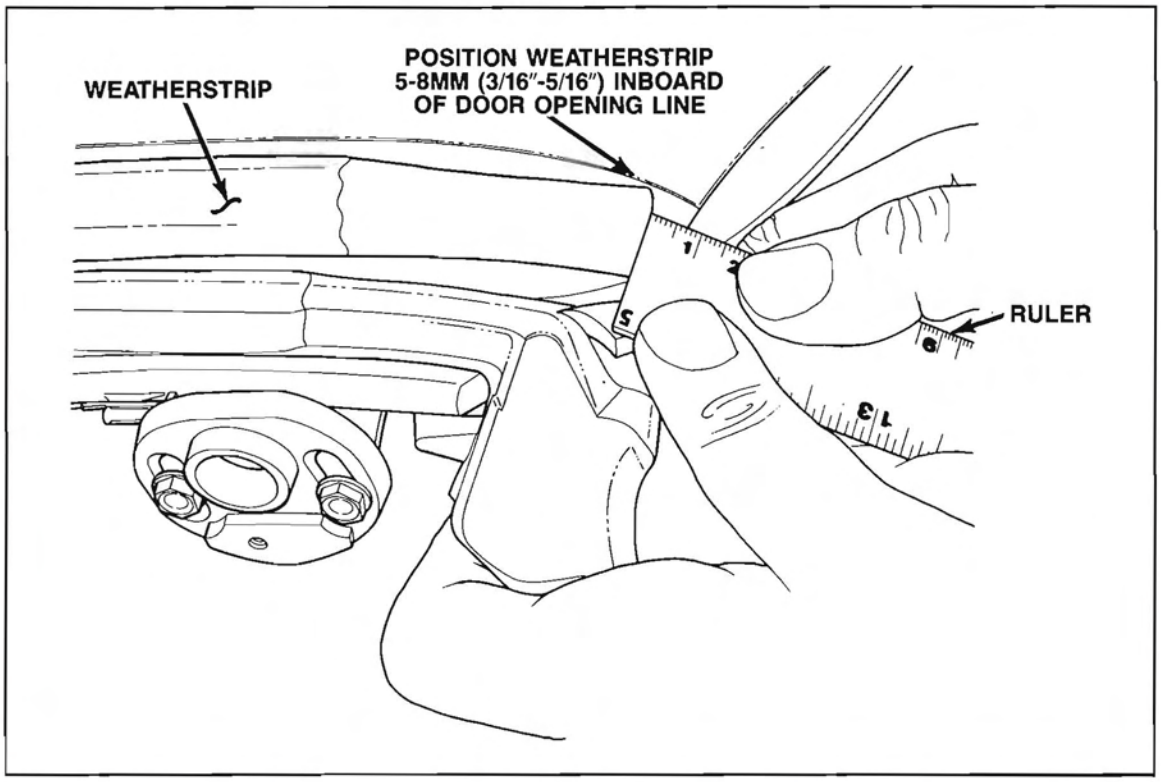
8. Complete installation of weatherstrip by positioning it under center upper finishing molding.

NOTE

To assist in inserting weatherstrip into retainer in the area of the center upper finishing molding (T-bar), use a flat-bladed tool to tuck in corners, ends and top edges of weatherstrip.

9. Insert windshield pillar and body lock pillar ends of weatherstrip into retainer (outboard edges first) starting at hatch opening and working downward. Roll inboard edges of weatherstrips into retainer.
10. Remove protective liner from front end of weatherstrip and align front end of weatherstrip to hinge pillar and press firmly to secure.
11. Align holes in rear end of weatherstrip to pierce holes in body lock pillar and drive fasteners to secure.

BODY OPENING WEATHERSTRIP POSITIONING CHECK — FRONT UPPER CORNER



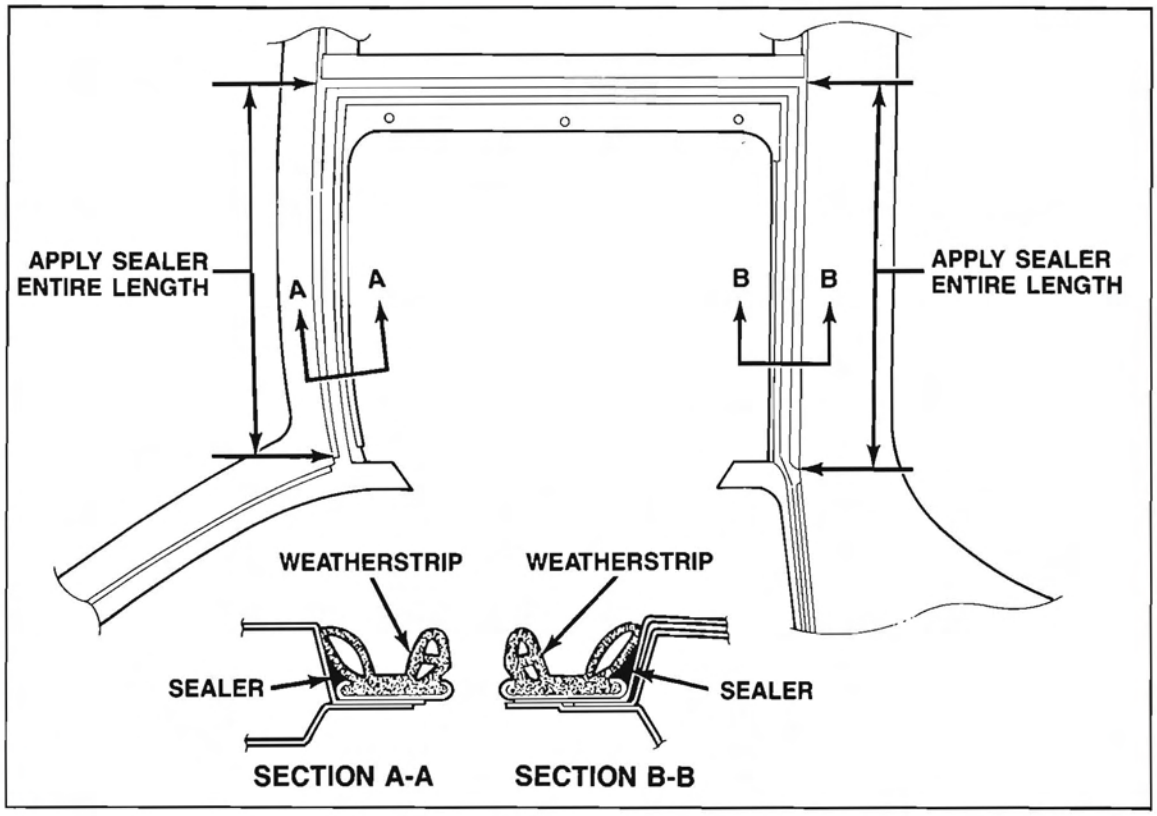
NOTE

To insure proper fit of weatherstrip at front upper corner, weatherstrip must be positioned 5-8mm (3/16″-5/16″) inboard of door opening line. At rear corner, it must be positioned as far inboard as possible.

12. Two additional 5mm (3/16″) beads of adhesive must be applied as follows:
    a. Between the outer lip of opening weatherstrip and roof header panel.
    b. Between the outer lip of opening weatherstrip and roof panel at rear of body opening.

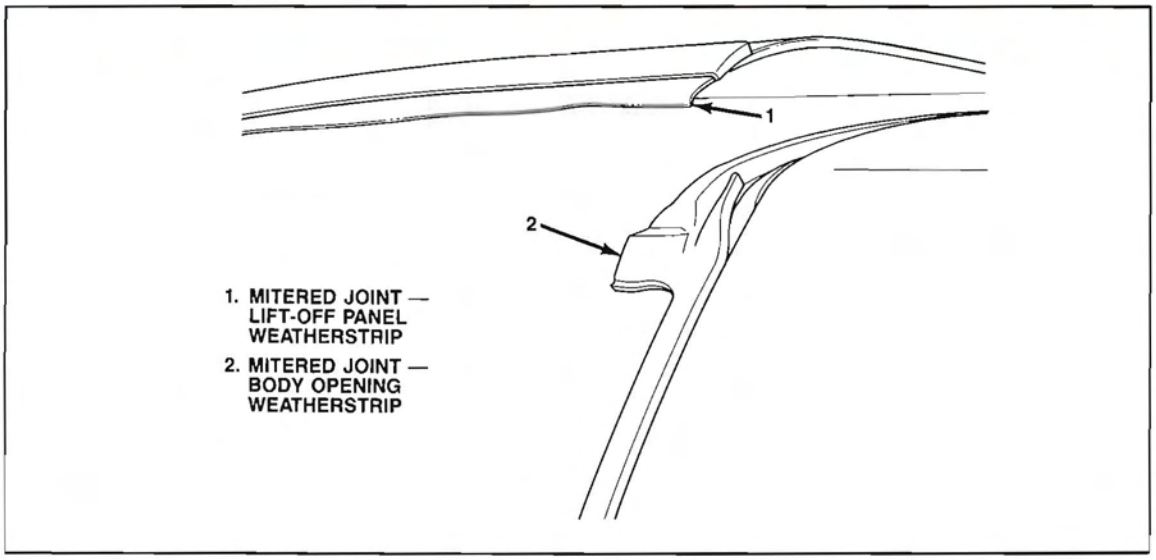
    The beads of weatherstrip adhesive should be continuous and extend the full length of the weatherstrip at both front and rear weatherstrip outer lip to panel contact points.

SECONDARY SEALING OF BODY OPENING WEATHERSTRIP

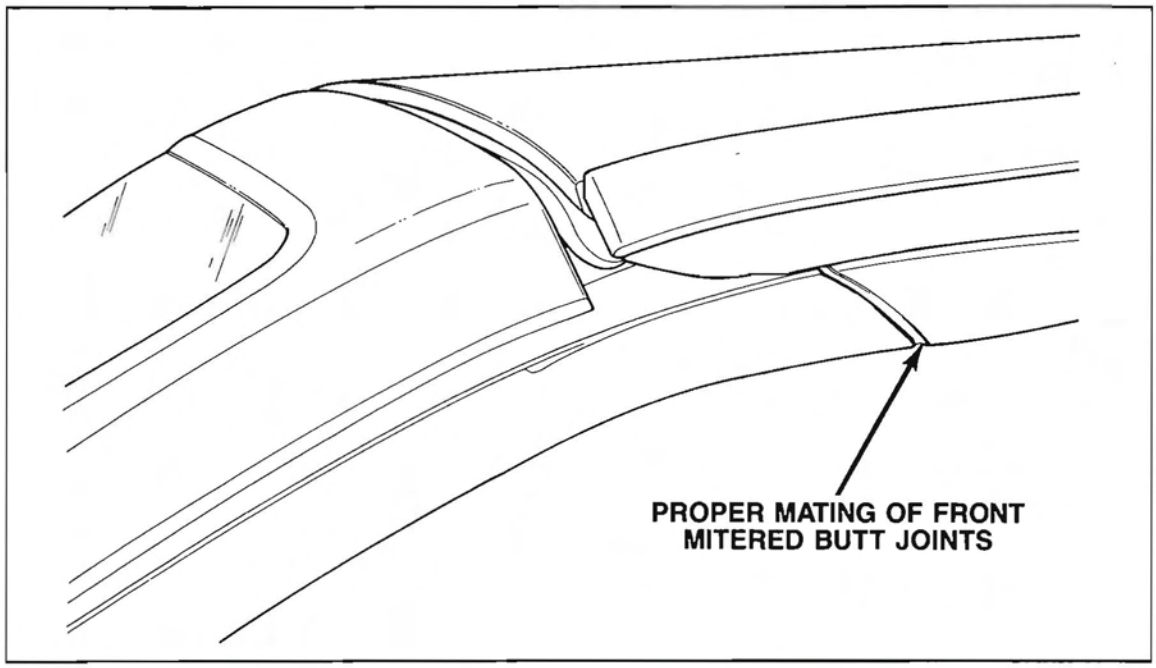


13. Replace lift-off panel and remove several times to insure a proper fit. Make sure lift-off panel weatherstrip mitered joint and body opening weatherstrip mitered joint are properly mated.

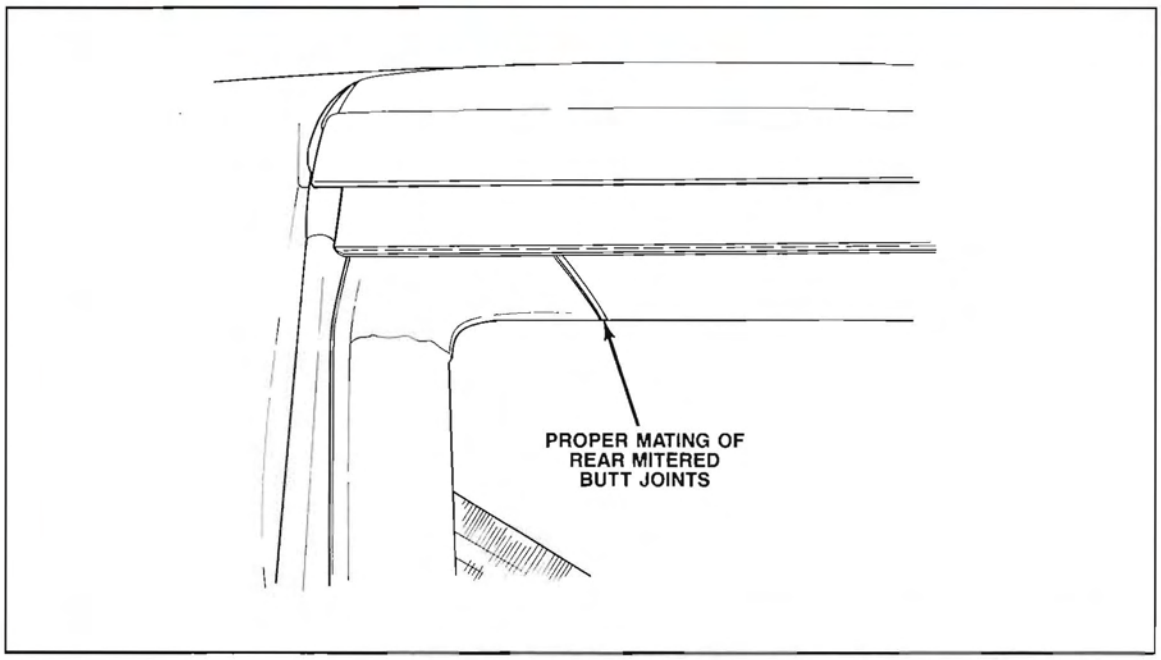
LIFT-OFF PANEL AND BODY OPENING WEATHERSTRIP



MATING OF WEATHERSTRIP FRONT MITERED BUTT JOINTS



MATING OF WEATHERSTRIP REAR MITERED BUTT JOINTS

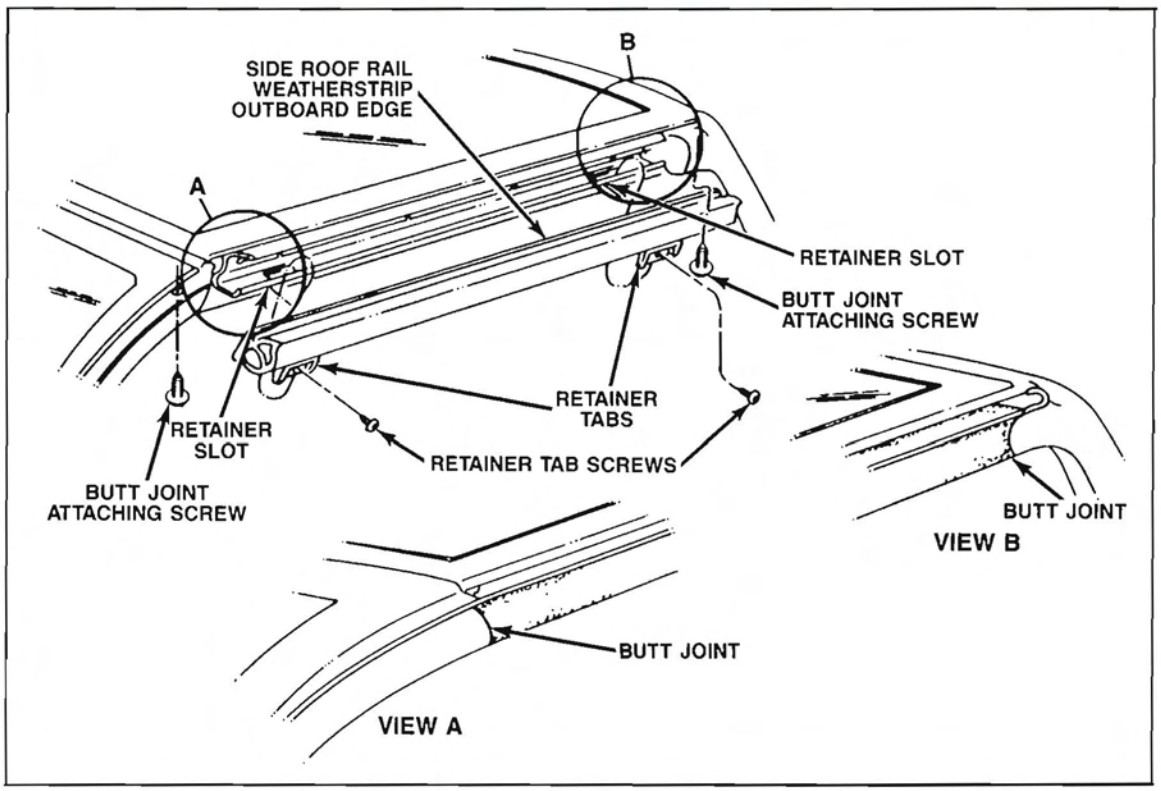


14. Water test assembly to insure no leak exists.

LEAKS BETWEEN LIFT-OFF PANEL AND OUTER PLASTIC SUPPORT PANEL AND/OR WEATHERSTRIP RETAINER

Sealer skips and voids can cause waterleaks between the outer plastic support panel and sealing strip, weatherstrip and/or weatherstrip retainer.

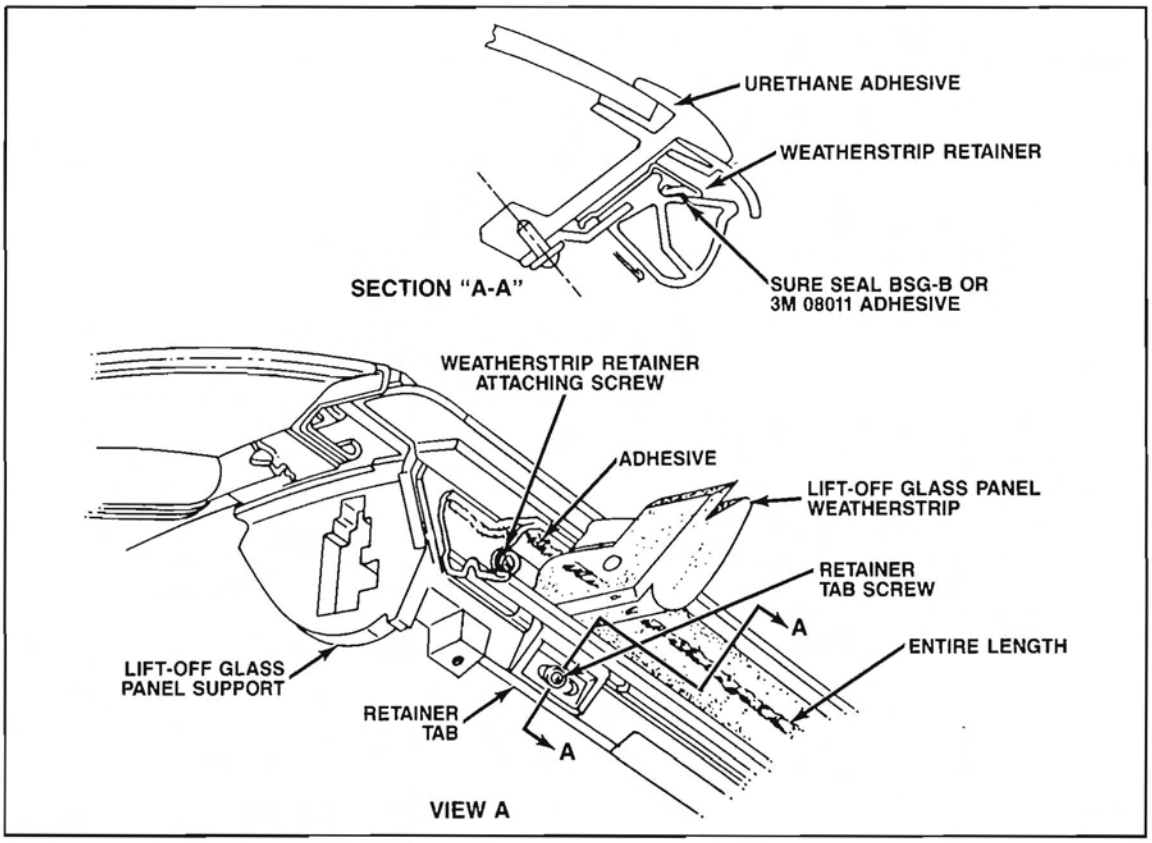
SIDE ROOF RAIL ON LIFT-OFF GLASS WEATHERSTRIP INSTALLATION



To repair leak(s), perform the following operations:

1. Replace double adhesive backed tape to under surface of sealing strip.
2. Reinstall retainer over sealing strip and loosely drive screws.
3. Apply a bead of strip caulk to the ends of retainer.
4. Place lift-off panel in opening.
5. Align weatherstrip retainer with body opening weatherstrip butt joint and tighten screws.
6. Smooth sealer flush at front and rear of retainer.
7. Apply a bead of adhesive the entire length of the weatherstrip retainer.

LIFT-OFF GLASS PANEL WEATHERSTRIP TO RETAINER SEALING



WEATHERSTRIP INSTALLATION

1. Position weatherstrip into weatherstrip retainer inserting retainer tabs through slots in retainer.
2. Roll outboard edge of weatherstrip into retainer.
3. Insert both inboard and outboard edges of weatherstrip into retainer.
4. Push lift-off glass weatherstrip lightly to properly mate with body opening weatherstrip mitered butt joint and drive retainer screws.

NOTE

Retainer screw slots will have to be increased in size if additional adjustments are required.

Final Watertest

No vehicle should ever be returned to an owner after a waterleak correction without retesting. You cannot be certain that the leak was corrected unless you give the vehicle a final watertest.

After all necessary repairs are performed, the lift-off panel(s) should be removed and replaced several times to determine if proper alignments are maintained. Retest the unit with the proper watertest equipment to insure a satisfactory repair.

Apply a light coating of paste silicone, GM part number 1042863, with a clean cloth to all weatherstrip surfaces to prevent squeaks and prolong weatherstrip life.

December 1990

GENERAL MOTORS CORPORATION

LITHO IN USA