M.I. 1803
*Rev. B

ELECTRO-MOTIVE DIVISION • GENERAL MOTORS CORPORATION
SERVICE DEPARTMENT
MAINTENANCE INSTRUCTION

WEATHERPROOFING AND SEALING

INTRODUCTION

The purpose of this Maintenance Instruction is to provide weatherproofing and sealing information covering the locomotive cab, carbody, electrical cabinet, and inertial filter compartment.

The engineroom and electrical cabinet are maintained at low positive pressures, whereas the inertial filter compartment area (sealed at cab end by the electrical cabinet, and long hood end by engineroom partition) is maintained at a negative pressure. These areas must be well maintained to avoid air leakage. Proper application and maintenance of access panels, doors, seals, weather strip, latches, and fasteners will result in properly sealed compartments. Within a properly sealed compartment, the entry of dirt is prohibited, and positive pressurization or depressurization is maintained as required.

Personnel comfort in the cab environment is directly related to protection from the elements. Similarly, fewer carbody leaks result in less rusting and longer equipment life.

The Service Data at the back of this Instruction gives part numbers, descriptions, and applications of various seals and compounds available from Electro-Motive Parts Centers.

GENERAL CONTENTS

COMBINATION WEATHER STRIP

MATERIAL AND TOOLS

The weather strip consists of two parts; a sealing strip, and a filler strip, and is used primarily with the application of glass in openings designed to accommodate this method of sealing, Fig. 1.

Special tools, Fig. 2, are required for application of the weather strip. Use of these tools not only permits easy installation, but also ensures an adequate seal.

APPLICATION

Though there may be several different configurations, the following procedures can generally be followed when door and fixed (non-sliding) cab windows are fitted with weather stripping. Where differences occur in the installation, it will be noted.

Prior to the replacement of weather strip, the sealing and filler strips should be carefully examined for cuts and general deterioration. Any sign of defect or

*This bulletin is revised and supersedes previous issues of this number.

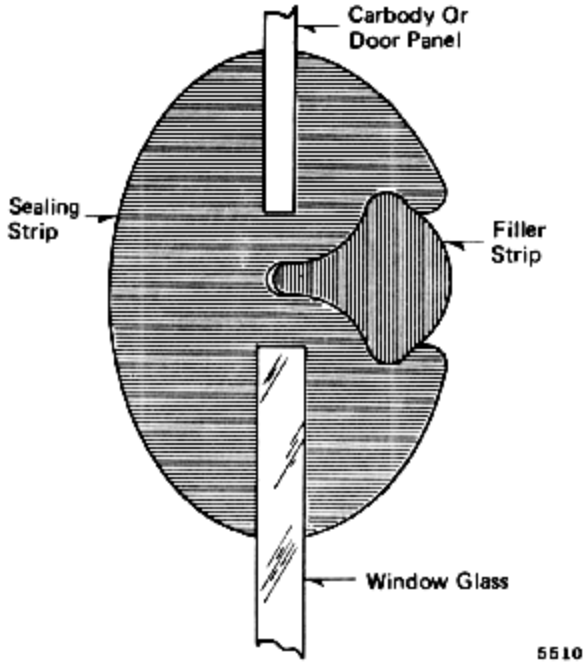


Fig. 1 - Typical Weather Strip Installation

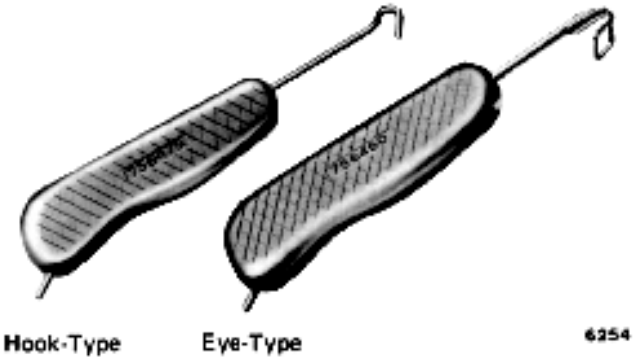
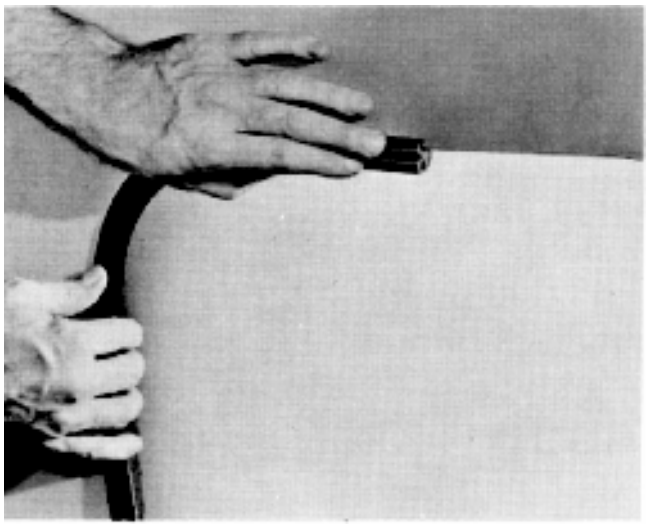


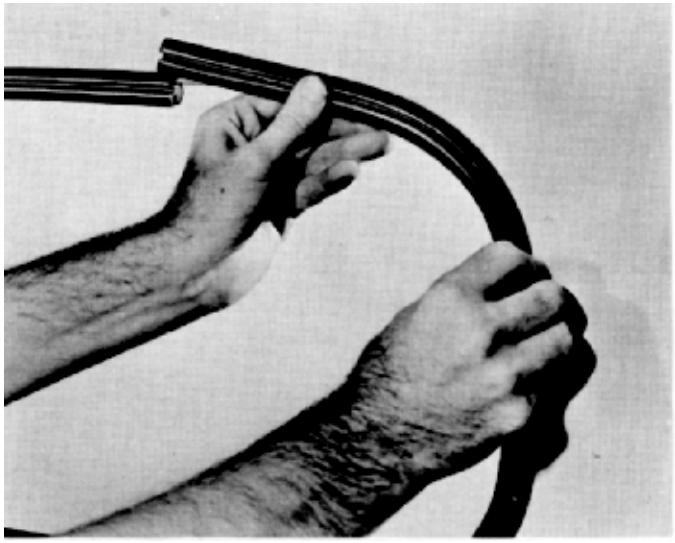
Fig. 2 - Seal And Filler Strip Installation Tools

condition that could cause leakage or difficulty in installation, is cause for replacement.

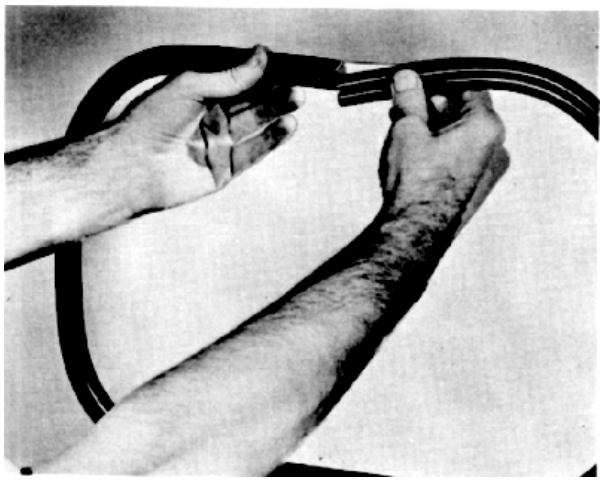
1. Lubricate seal with liquid soap or water. On fixed cab window installations, evenly coat back side of sealing strip with rubber adhesive.



2. Working from top to bottom, fit the smaller channel of the sealing strip over the edge of the window frame. On fixed cab window installations, apply sealing strip so that adhesive coated side of the strip is firmly seated in the channel of the window frame.

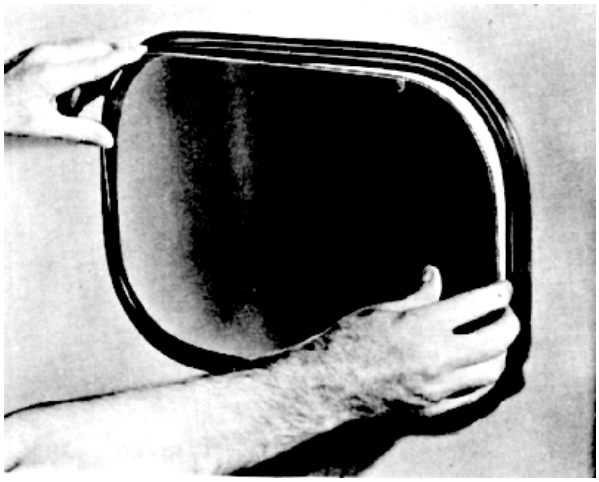


3. Continue fitting seal around opening until starting point is reached. The seal should overlap starting point between approximately 3-13 mm (1/8"-1/2"), to ensure a snug fit.

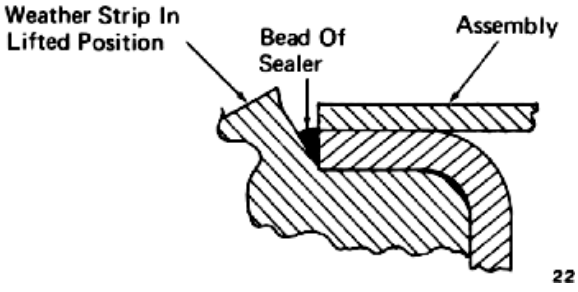


4. Compress and fit overlap over the edge of the opening. Release compressed overlap allowing ends to meet. The result is a tight, smooth joint.

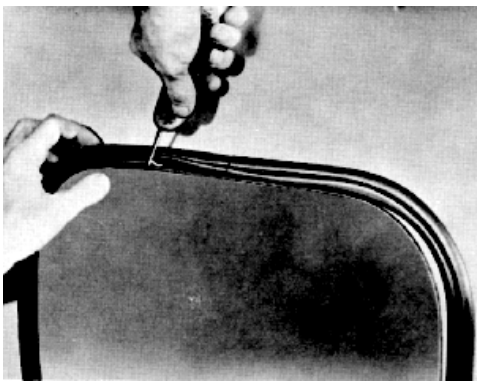
NOTE: Compression is easily accomplished using flat of screwdriver blade and rubber mallet.



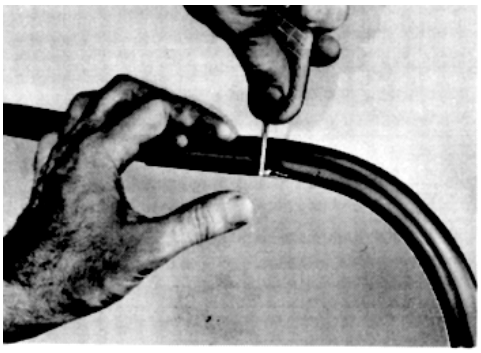
5. Seal is designed with glass channel lip opened at 45° for easy installation of glass panel. Starting from lower corner, fit glass panel into channel as far as it will go without forcing.



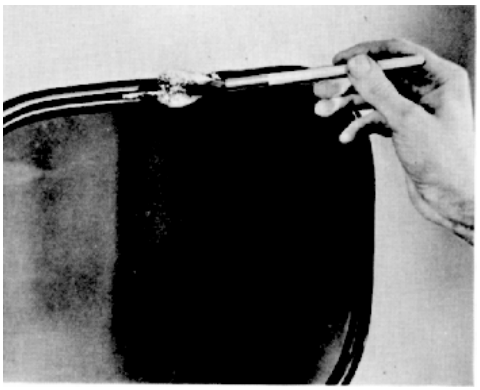
6. On cab door window installations, raise lip of weather strip away from door and apply an approximate 3 mm (1/8") bead of rubber sealer between door frame and weather strip. Press down on strip to ensure good adhesion.



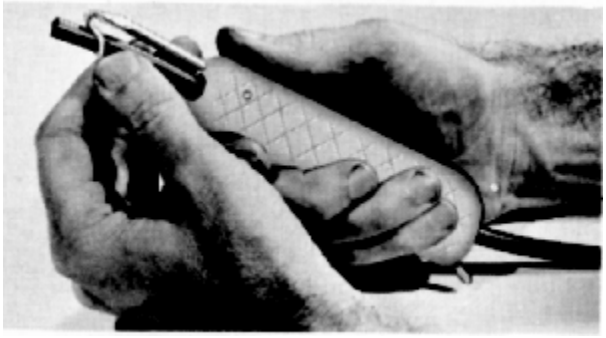
7. Lift glass channel lip using the hook-type seal installation tool, and slip glass into position.



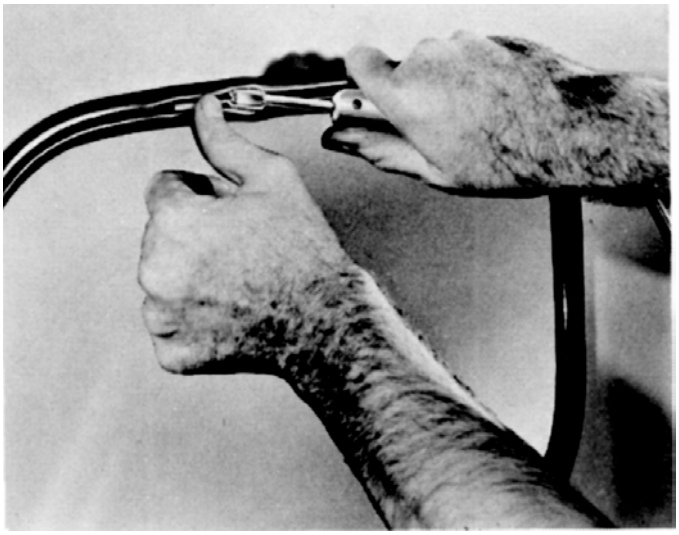
8. Continue seating glass into channel until operation is complete.



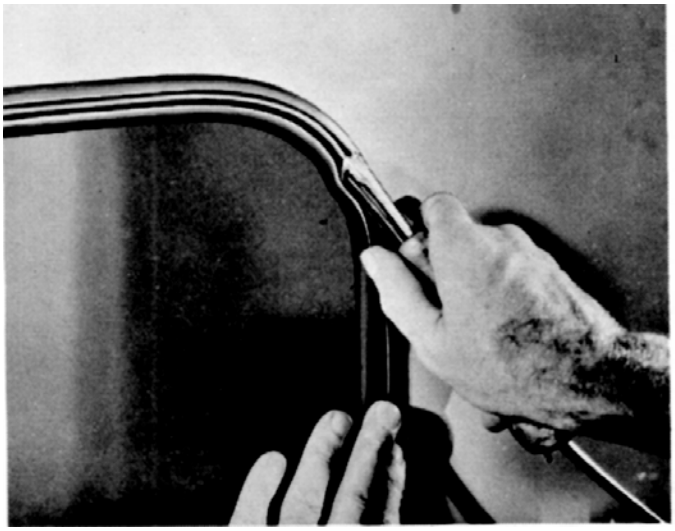
9. Apply liquid soap or water to seal filler channel to facilitate installation of filler strip.



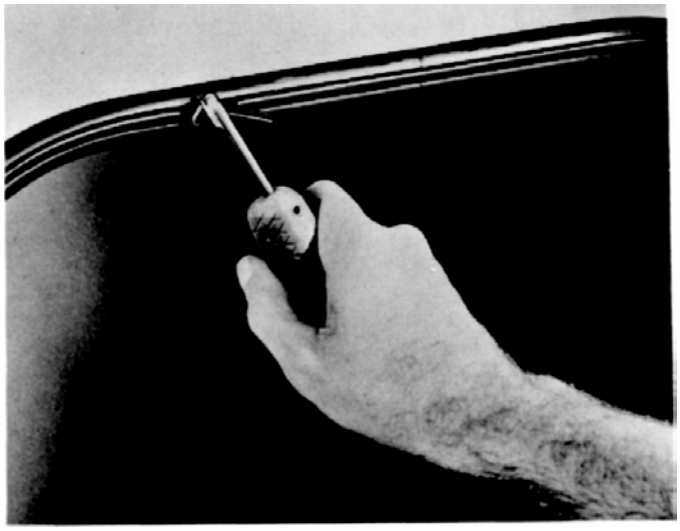
10. Thread filler strip through handle and eye of filler strip installation tool.



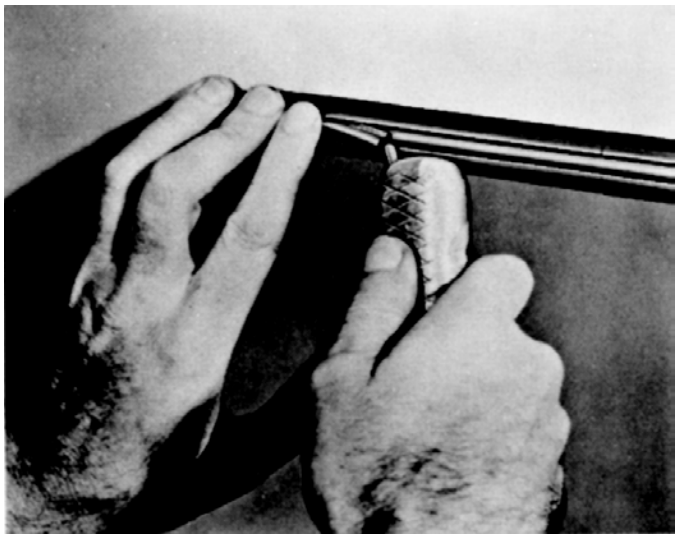
11. Start at top, AWAY from seal joint. Insert eye of tool with filler strip into channel of seal, pressing filler strip in place with thumb.



12. Move tool along channel. It may be necessary to "wiggle" tool when rounding corners.



13. Remove tool when starting point is reached. Cut filler strip to overlap starting point.



14. Compress filler strip overlap into channel using spur on tool handle. Check entire installation. If necessary, reposition improperly seated filler strip, again using spur.

DOORS

DOOR EDGE WEATHER SEAL(S)

Numerous door configurations and seal combinations exist covering a variety of different model locomotives. Many door/seal application procedures are quite similar. Identify the proper door configuration, Figs. 3 through 10, and follow the applicable weather seal installation instructions.

FIG. 3 - CAB ACCESS DOOR/LIP-TYPE SEAL

Loosely fit the one-piece molded rubber seal around the door. Lubricate with liquid soap or water, and position protecting rim of seal into retainer using a blunt-edged tool.

NOTE: It is not necessary to remove door to replace molded weather seal.

FIG. 4 - VIEWS A AND B - CAB ACCESS DOOR/COMPRESSION-TYPE CELLULAR STRIP

Latch door in closed position, and measure and cut each piece of weather strip to required size. Do not stretch gasket. Place weather strip and respective retainer strip firmly against door. Drill through, using retainer as template. Apply tapping screws as required, and tighten only enough to ensure snug fit.

CAUTION: Overtightening will result in weather strip distortion and will interfere with door latching.

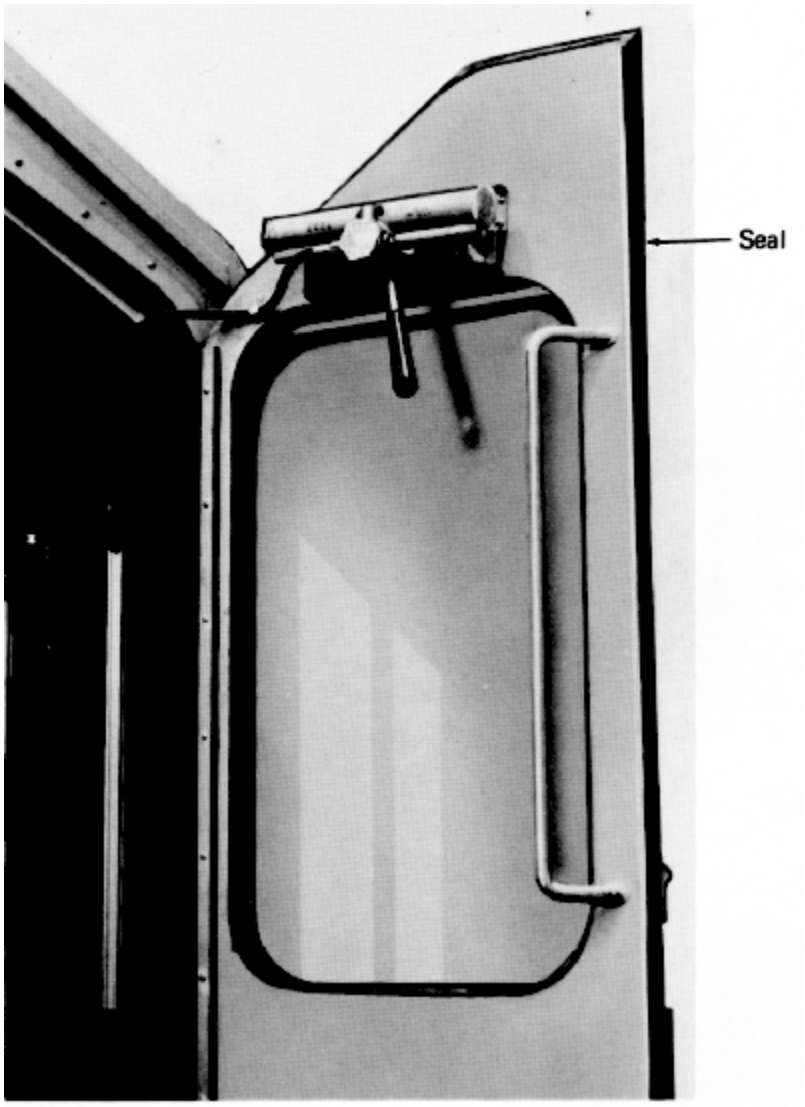


Fig. 3 - Cab Access Door/Lip-Type Seal

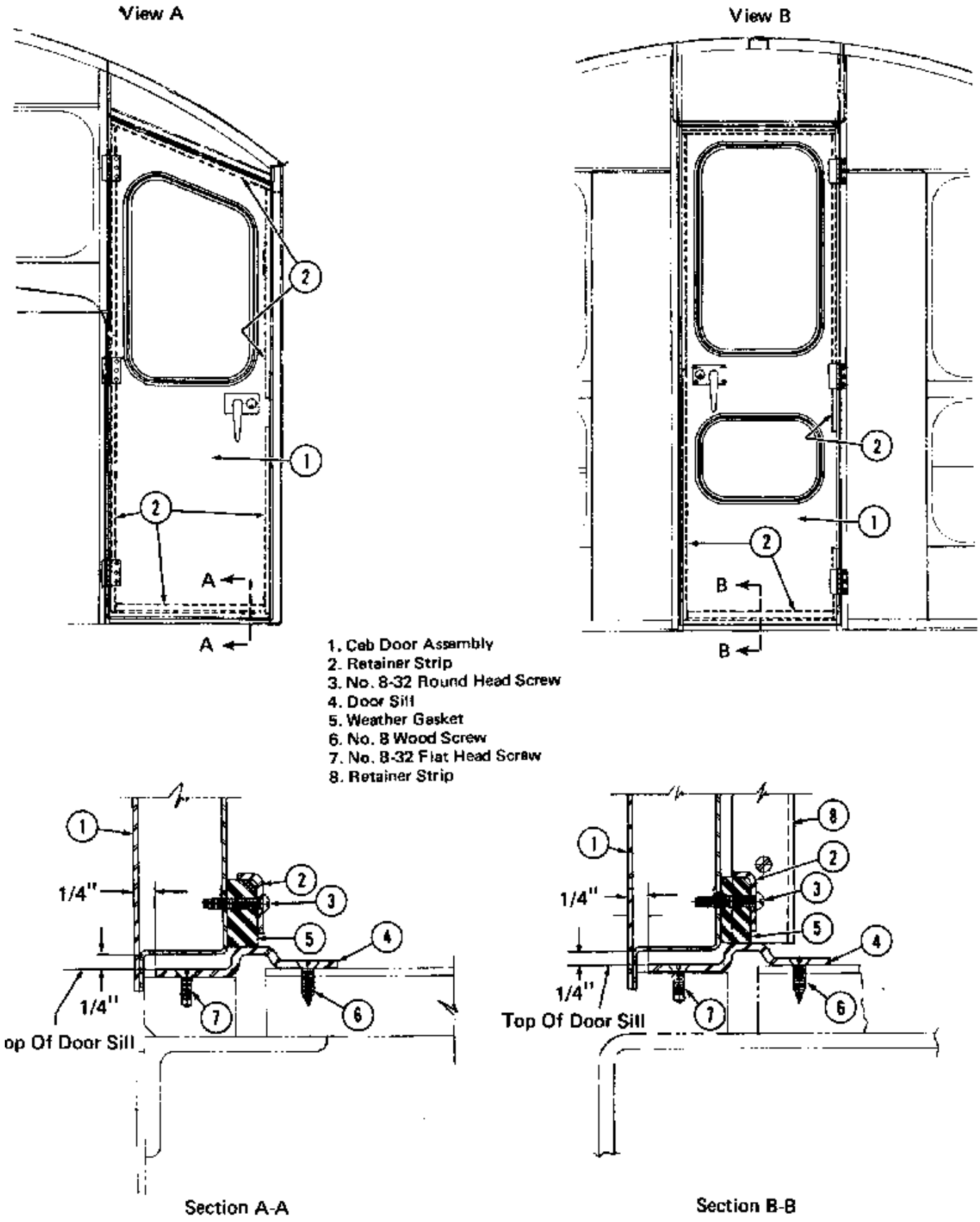


Fig. 4 - Cab Access Door/Compression Type Cellular Strip

FIG.5- CAB ACCESS DOOR/PRECUT COMPRESSION-TYPE CELLULAR STRIP

Apply precut weather strip and respective precut and drilled retainer strip to door using tapping screws. Tighten screws only enough to retain firmly. Weather strip should not bulge from under retainer.

CAUTION: Do not stretch. Mitered corners will not join properly if stretching occurs.

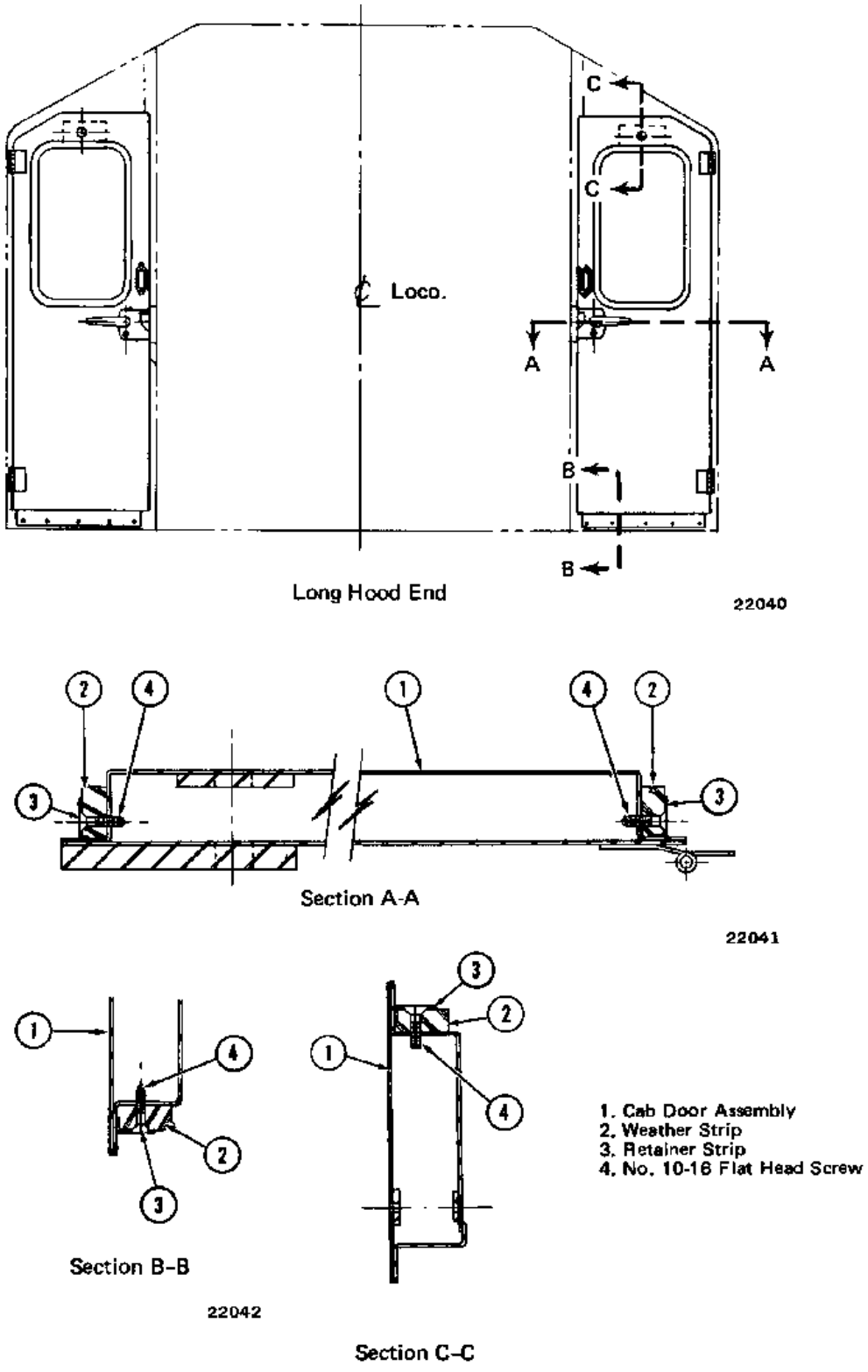
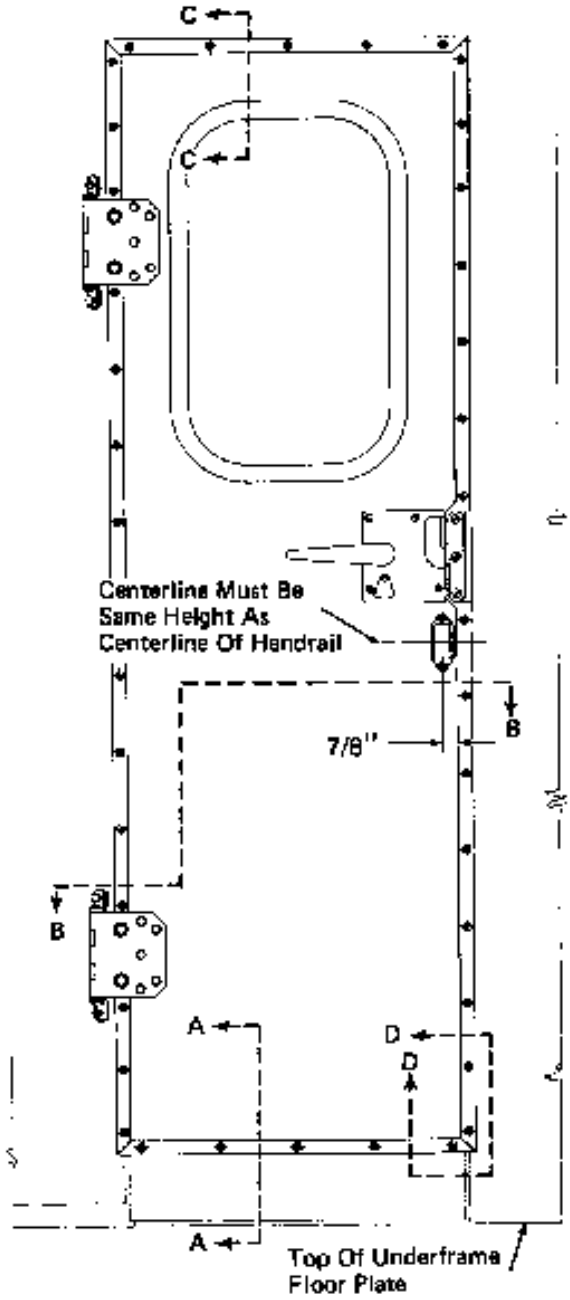


Fig. 5 - Cab Access Door/Precut Compression Type Cellular Strip

FIG. 6- CAB ACCESS DOOR/PRECUT COMPRESSION-TYPE CELLULAR STRIP

Refer to information given under Fig. 5 for basic weather strip application procedure. Seal integrity is maintained only by careful fitting of door to frame. Proper shimming under hinges is mandatory to ensure against door distortion. (Refer to "Locks, Keepers, And Shimming" section.)

NOTE: Pressure sensitive tape is also required during shimming to keep door frame in flat of frame structure, Section B-B.



1. Cab Door Assembly
2. Retainer Strip
3. 1/4"-20 Hex. Head Screw
4. Pressure Sensitive Tape
5. Shim
6. Shim
7. 5/16"-18 Hex. Head Screw
8. Weather Strip
9. Hinge
10. Rubber Base Adhesive

Fig. 6 - Cab Access Door/Precut Compression Type Cellular Strip

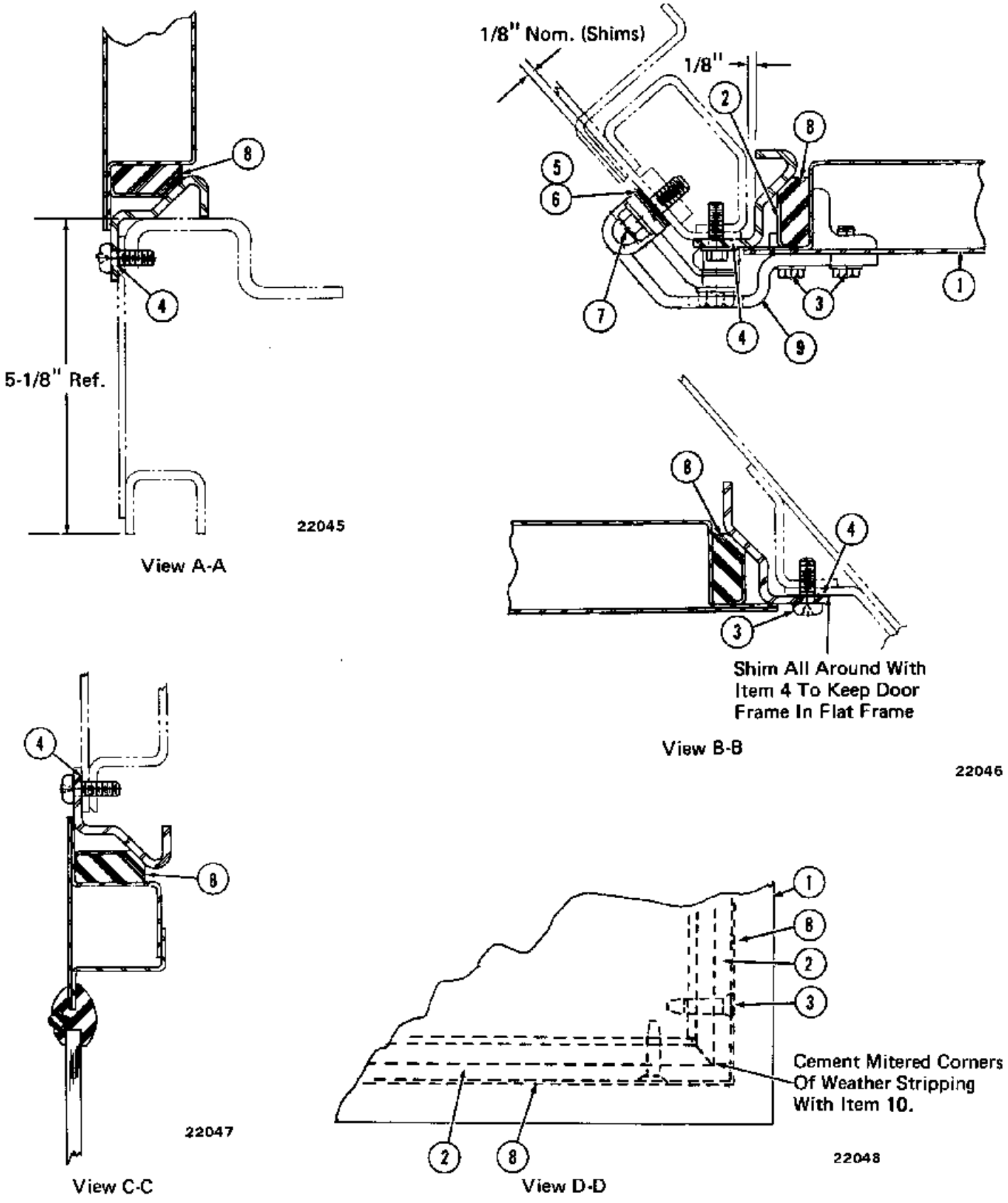


Fig. 6 - Cab Access Door/Precut Compression Type Cellular Strip (Cont'd)

FIG. 7 - CAB SIDE DOOR/COMPRESSION-TYPE TUBULAR STRIP

Weather strip corners are bonded over 90° sponge rubber inserts to form a one-piece rectangular seal. Improper handling will result in damage.

CAUTION: Do not over-stretch. Also, ensure against plugged vent holes at corners.

Apply weather strip and retainer strips to door using pan head screws. Tightly apply tapping screws through retainer strips.

NOTE: Keeper mounting pad on frame must retain a 90° relationship to plane of door to ensure equalized weather strip pressure. (Refer to "Locks, Keepers, And Shimming" section.)

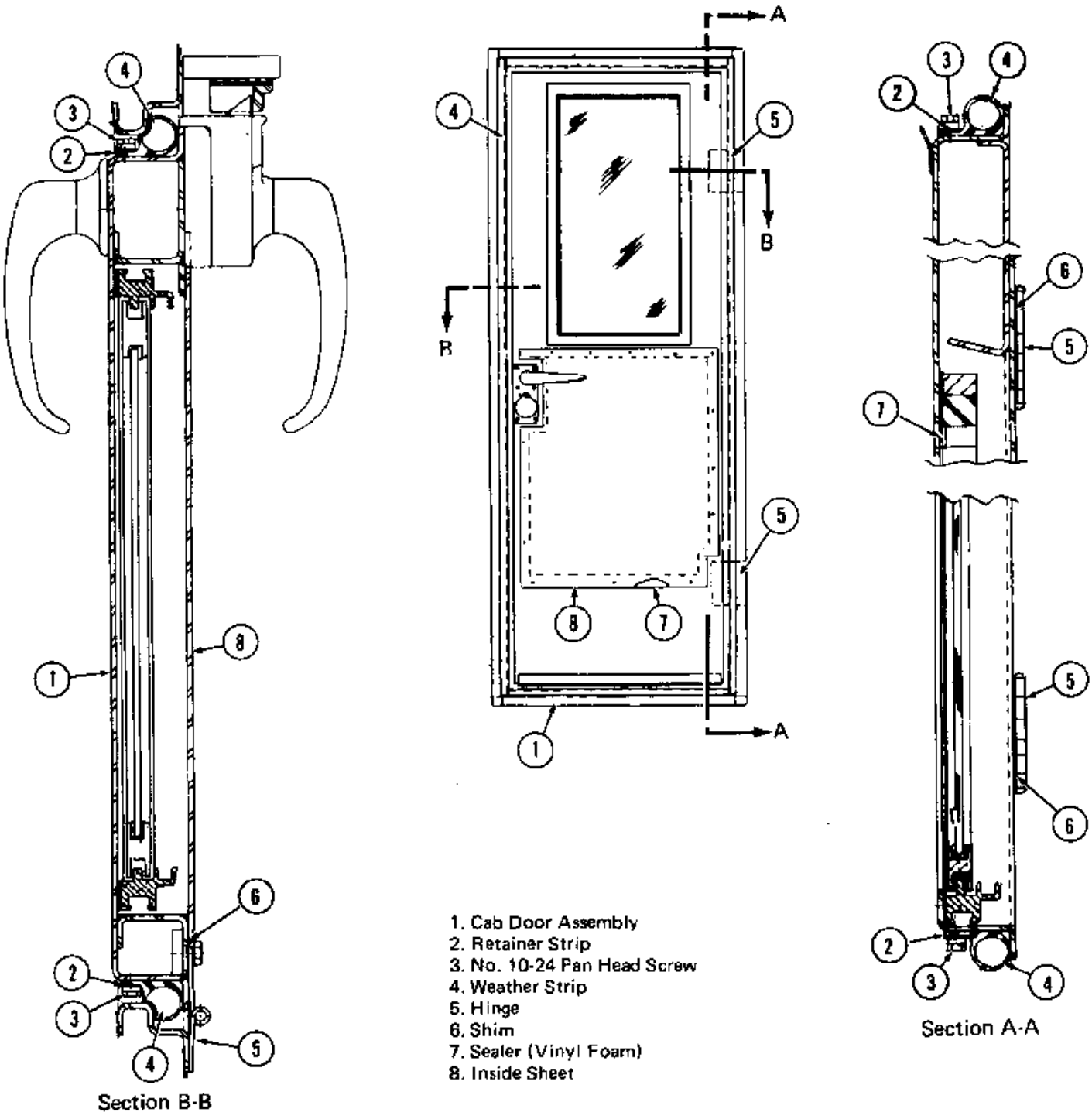


Fig. 7 - Cab Side Door/Compression Type Tubular Strip

FIG. 8 – PERSONNEL DOOR/TUBULAR STRIP

Apply weather strip and retainer strips to door using flat head screws.

NOTE: Effective sealing is achieved by proper shimming of lock keeper. (Refer to "Locks, Keepers, And Shimming" section.)

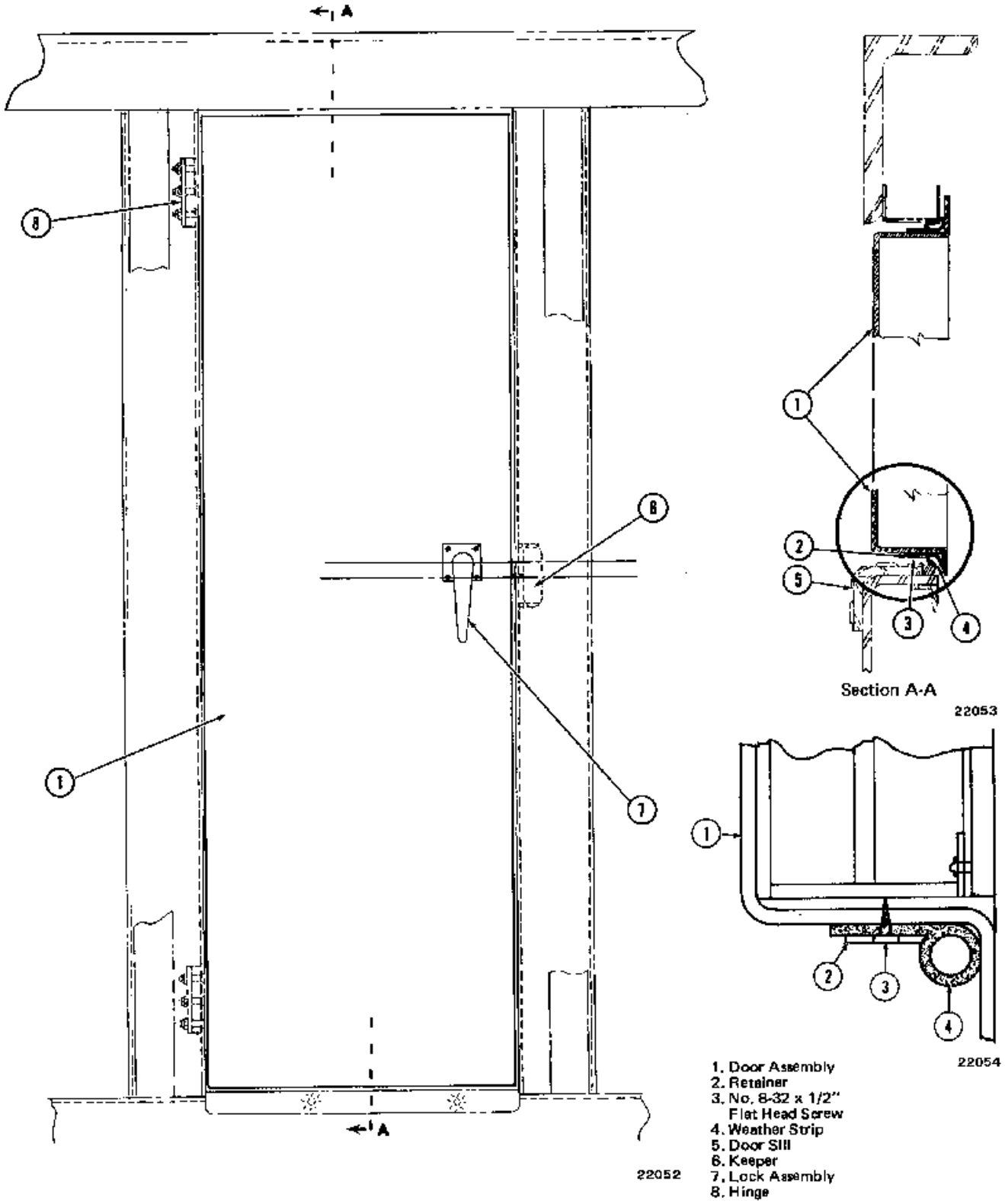


Fig. 8 - Personnel Door/Tubular Strip

FIG. 9 – MAINTENANCE DOOR/TUBULAR STRIP

Apply strip to side-frame of hood structure. Position top and bottom retainer angle slots to clear locking bolts. Align vertical seal strips in the same manner. Drill and apply tapping screws. Cement rubber seal strips to inner lip of door assembly with rubber adhesive, Section A -A

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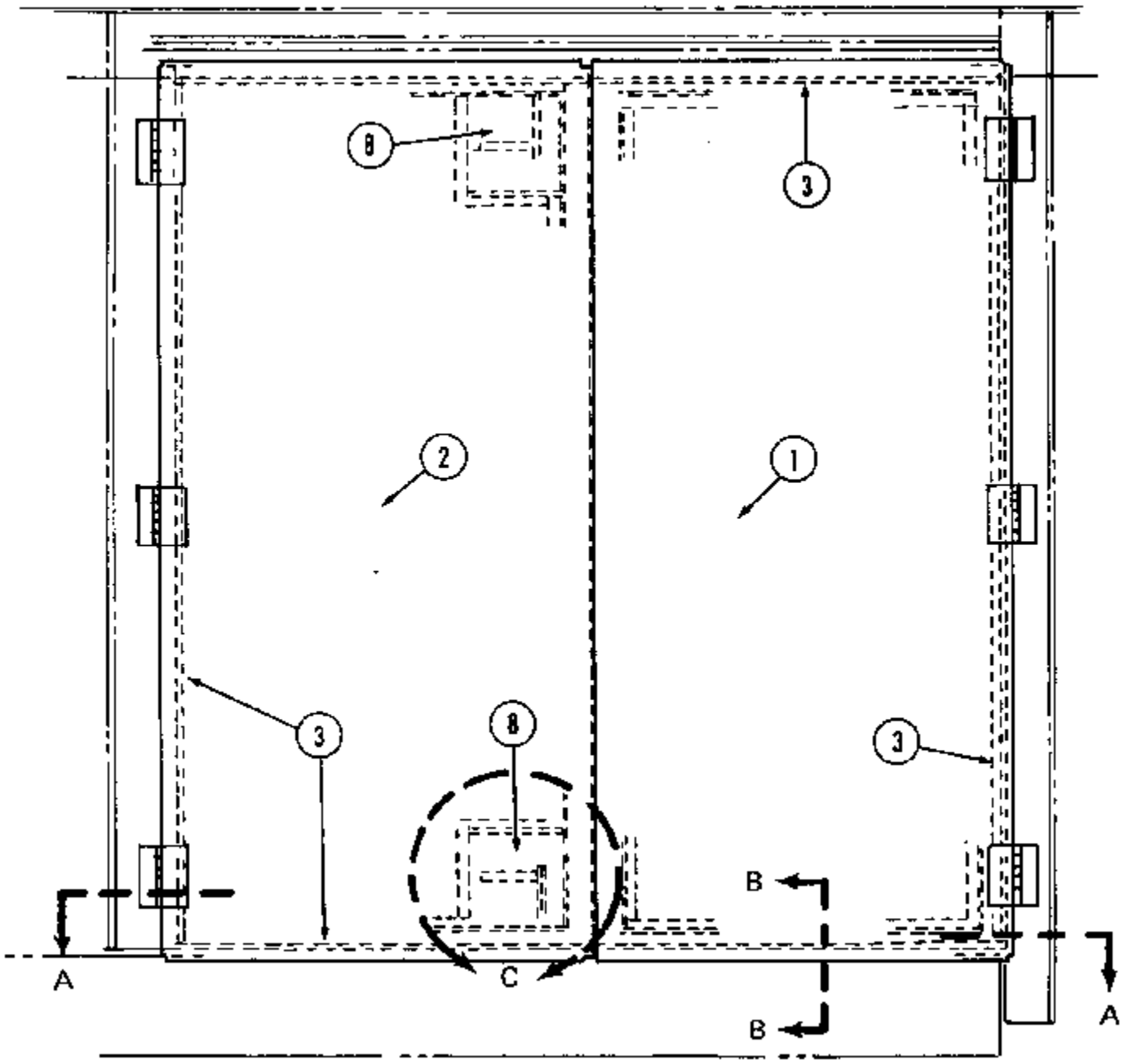
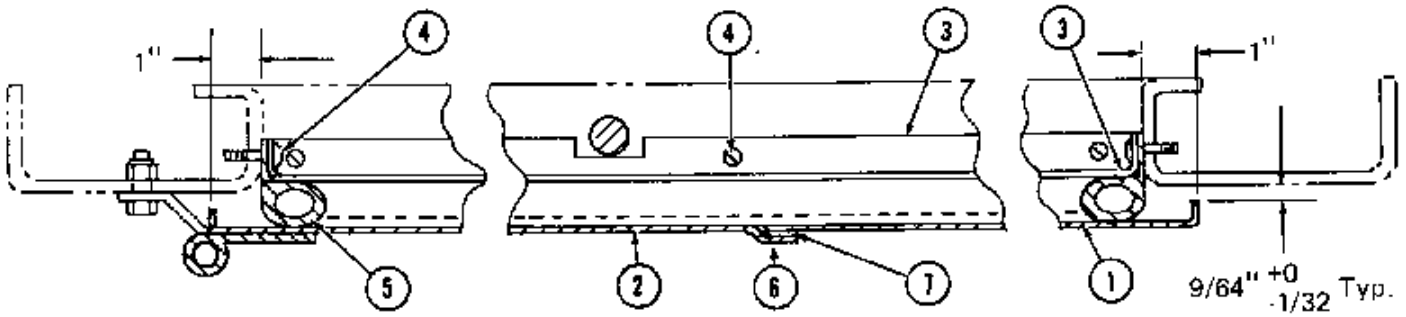
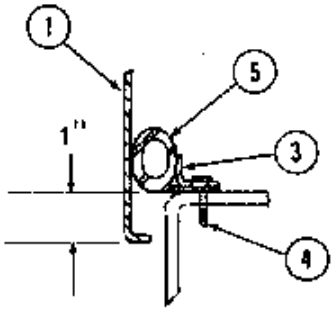


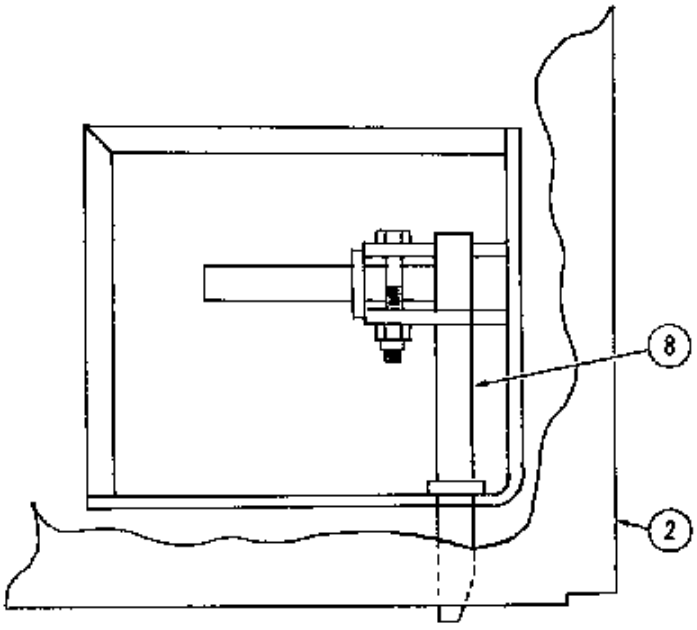
Fig. 9 - Maintenance Door/Tubular Strip



Section A-A



Section B-B



View C

1. Door Assembly (RH)
2. Door Assembly (LH)
3. Retainer
4. No. 10-24 Pan Head Tapping Screw
5. Tubular Weather Strip
6. Rubber Seal
7. Rubber Adhesive
8. Latch Bar Assembly

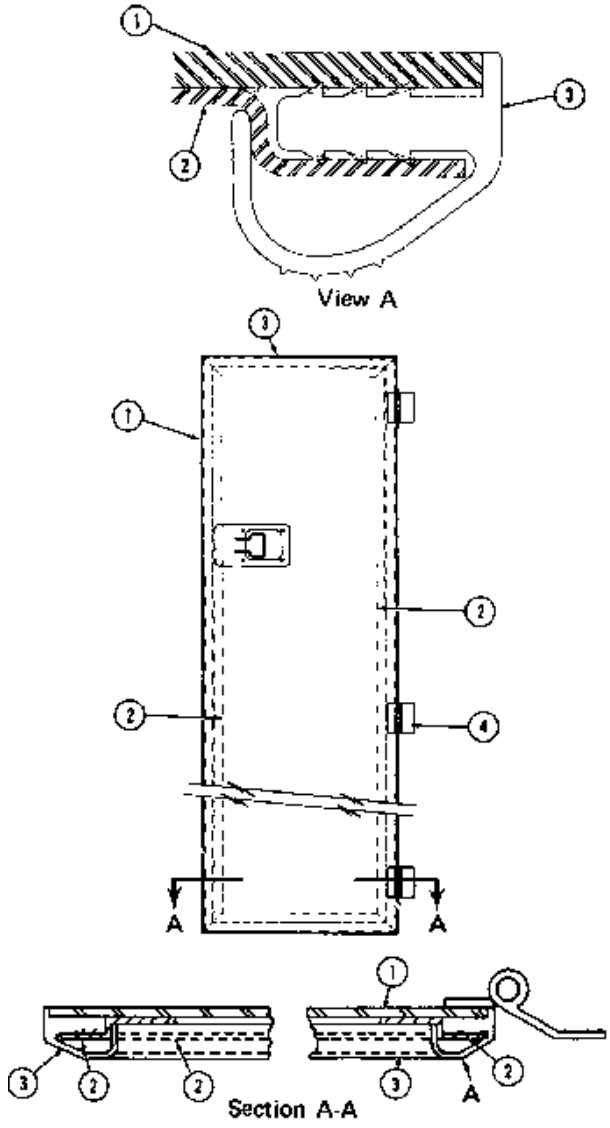
Fig. 9 - Maintenance Door/Tubular Strip (Cont'd)

FIG. 10 - FULL LENGTH ACCESS DOOR-SHORT HOOD

Press finned linear portion of seal into retainer channel on door. When properly seated, retainer seal lip will contact the door edge.

If fit is too loose, the channel may be forced down to lessen the gap; if too tight, channel may be pried up slightly. Proper retention is accomplished by friction in the groove.

NOTE: It is important that the rubber be fully seated in channel to ensure contact of restraining lip at door edge.



1. Door Assembly
2. Retainer
3. Seal
4. Hinge

Fig. 10 - Full Length Access Door - Short Hood

LOCKS, KEEPERS, AND SHIMMING

The following general information is intended to recommend practices to properly adjust a keeper to lock assembly.

KEEPERS

1. To ensure engagement of latch in keeper, maintain a 1.59 mm - 3.18 mm (1/16" -1/8") clearance between keeper face and lock face.

2. The use of shims is recommended between keeper and structure to which keeper is applied, to compensate for variations in width of doors and door frames.

3. Shims must have latch and bolt holes slotted or punched out to provide latch and bolt clearance. Ensure against "bottoming out" of bolt and latch on shims.

4. On GP and SD locomotives, position keeper with latch and bolt of lock assembly centrally located in keeper cutout. Keeper should be parallel to lock body after lock assembly has been secured to tapping pad on cab door assembly. Slotted holes are used as a means of keeper adjustment prior to locating door assembly in final "closed" position.

5. Weather strip should completely seal door from the elements. If leakage exists, keeper must be repositioned and scribe mark made on hood at outer edge of keeper. Insert shims under keeper as necessary to ensure minimum clearance of 1.59 mm (1/16") between lock face and keeper.

6. Perform final positioning of keeper ensuring 0.79 mm (1/32") parallelism between keeper face and lock face.

NOTE: On GP22 locomotives, keeper does not require use of shims. However, pad and keeper assemblies must conform to the same minimum and maximum tolerances allowed in Steps 1 and 6 above.

7. Ensure latch slot in keeper aligns with flat surface of latch to allow latch entry into slot when door is closed. Check closely to avoid excessive pressure on lock body latch and bolt.

8. Cast keepers have a reverse bevel of one degree minimum on latch slot to eliminate creeping of latches. It is necessary to maintain this reverse bevel to ensure proper functioning of lock latch or bolt.

NOTE: Do not weld keepers in a fixed position. This practice eliminates any possibility of adjustment.

DOOR LOCKS AND DOOR LATCHES

1. Protect latches and keepers from paint or any substance that will impair freedom of operation.

2. Dust lock interiors with graphite powder to ensure operation of working parts. Lubricate latch heads with a graphite base oil to reduce creeping of latches caused by high frequency vibrations.

3. Locks which do not have a flange bearing on door edge must be applied so face of lock is flush with edge of door.

WEATHER STRIPPING

Do not allow weather strip to become wedged along hinged side of door, or to accumulate excessive pressure on door frame molding.

CAUTION: On GP and SD cab doors, excessive frame molding pressure will result in spring-back of door. This condition prevents latch from properly engaging keeper slot.

INSPECTION

Ensure latch engages keeper a minimum of 9.5 mm (3/8").

UNITIZED SLIDING SASH WINDOW WEATHER STRIP

Cab sliding sash window assemblies require various weather strip and sealing applications, Figs. 11 and 12. (See Service Data.)

To eliminate leakage between the carbody and unitized frame assembly, plastic sealer tape (either black or green) is applied to back side of frame assembly prior to installing in carbody, Fig. 13.

The tape is protected from itself by a waxed paper covering applied to one side only. Application is easily performed by pressing the exposed side of tape directly on to back outer frame. Since tape is pressure adherent on both sides, it is necessary to remove protective covering before installing unitized frame assembly in carbody. This will provide adequate sealing upon tightening of the 1/4"-20 x 3/4" pan head tapping screws or installation of daisy head blind rivets, Fig. 29, which secure frame assembly to carbody. (Refer to "Unitized Sash Panel Reinforcement And Repair" for installation procedure of rivets.)

Two rubber bumpers 65 mm - 75 mm (2-1/2" - 3") long each, are inserted into the extreme right and left sliding sash channel assemblies, (2) Fig. 11. Bumpers are designed to tightly fit into sash channel, Fig. 14. These bumpers are positioned approximately 127 mm (5") from the top and bottom frame edges to equally absorb shock when windows are slid wide open. The aluminium sash assemblies are crimped at the bumper edges to ensure stationary position.

Sash-to-sash rubber bumping weather strip, Fig. 15, is designed to be inserted into sash assembly channel. This weather strip is installed only on sash assembly side having latch assembly application, (3) Fig. 11. A bead of rubber putty compound or rubber adhesive is used at the top of sash channel to initially secure weather strip and facilitate insertion into channel.

Vertical lip type side rubber weather strip (8) Fig. 11, is trimmed to necessary length, and installed into the side frame of the insulating panel, Fig. 11, View B-B. Perform the following procedure:

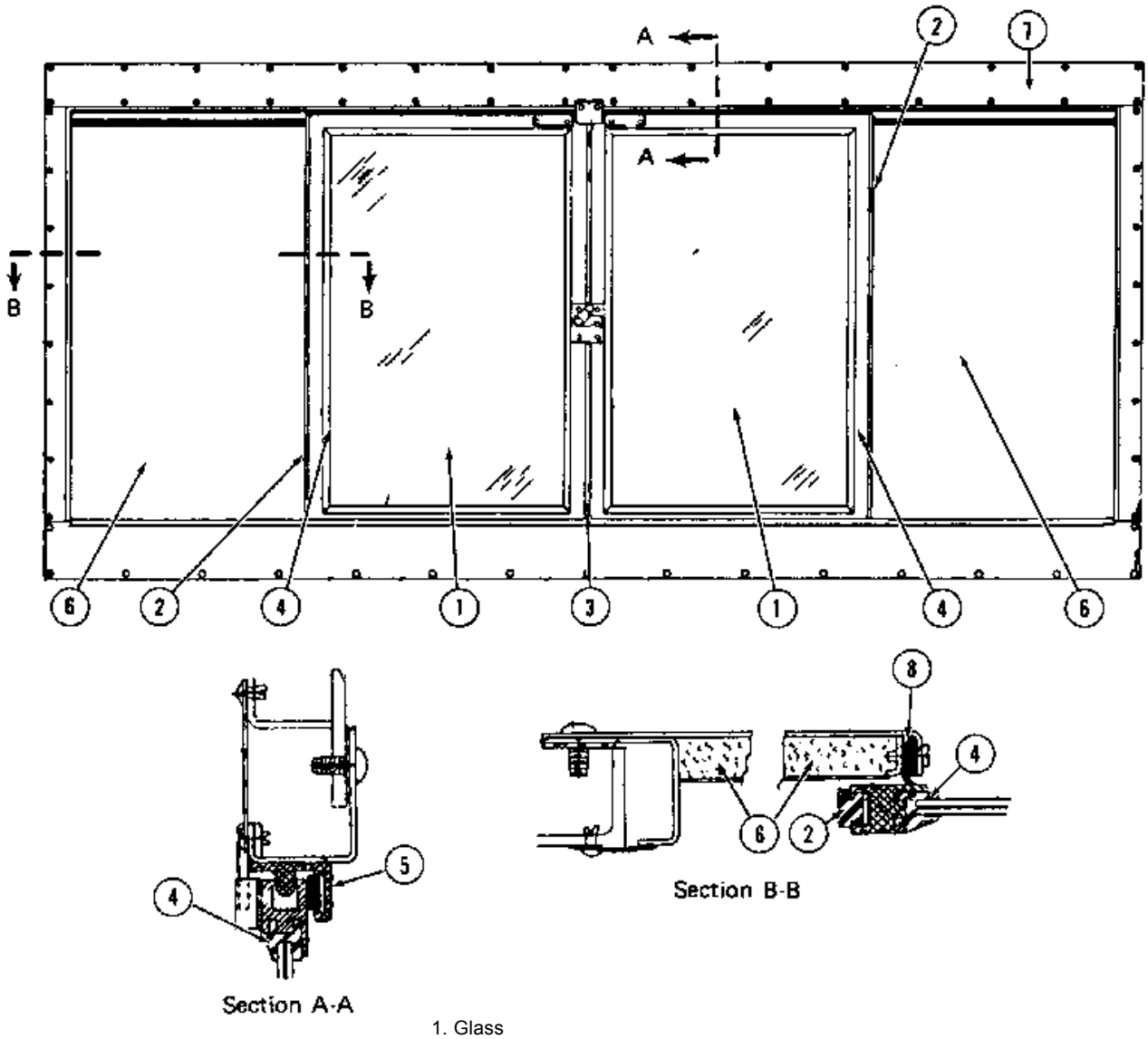
1. Replace seal by removing the stationary center block mounted to the upper slide rail of sash, and position both sash frames to one side of the opening.

2. Remove the No. 10 pan head screws that hold the lip seal mounting strip to the side panel.

3. Slide defective seal from mounting strip and install replacement seal. (See Service Data.) 4. Reapply mounting strip to the side panel.

5. Replace the seal on the opposite side of window opening.

6. Reapply stationary center block.



1. Glass
2. Rubber Bumpers
3. Sash-To-Sash Bumping Weather Strip
4. Rubber Glazing Weather Strip
5. Aluminum Bound Felt-Pile Weather Strip
6. Insulating Panel
7. Frame Assembly
8. Vertical Lip Type Side Rubber Weather Strip

Fig. 11 - Front View Of Unitized Assembly

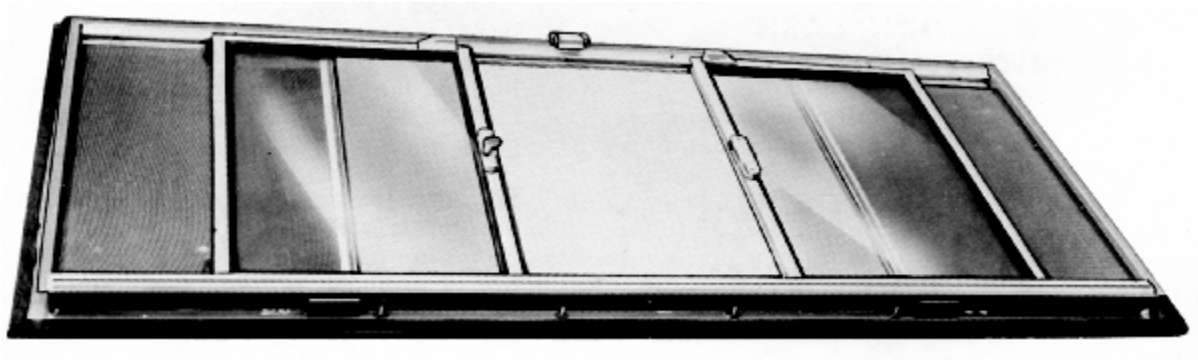


Fig. 12 - Back View Of Unitized Assembly

Fig. 13 - Plastic Tape Application To Back Side

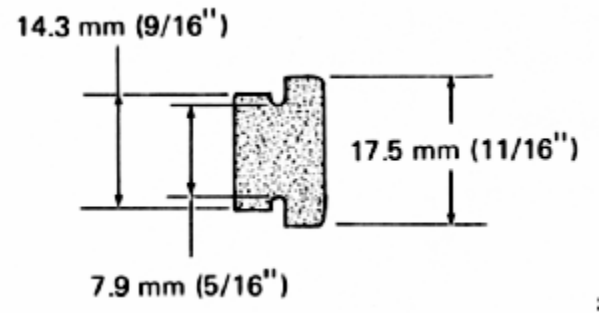


Fig. 14 - Side View Of Rubber Bumper(s)

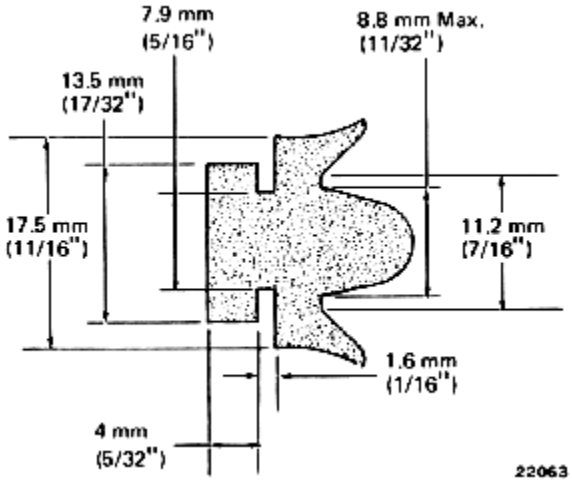


Fig. 15 - Sash-To-Sash Bumping Weather Strip

Four strips of rubber glazing weather strip, (4) Fig. 11, are applied to each sliding sash before the glass is installed. The glazing strip application is a multi-step procedure as follows:

1. Lubricate individual strips.

2. Using a bone stick, Fig. 16, first insert mated corners into glass track. When all four corners are seated, continue to insert remainder of strip all around until starting point is reached.

Fig. 16 - Mated Corners Being Inserted Into Glass Track With Bone Stick

3. Following previously described window application, install glass, Fig. 17.

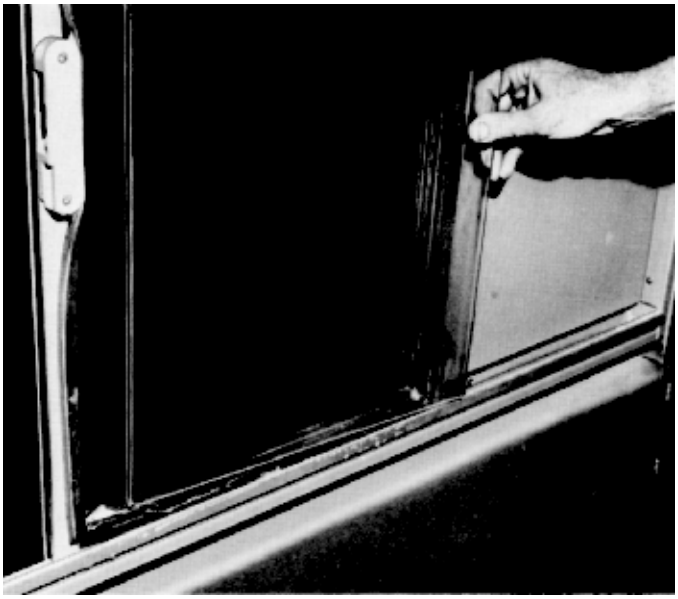


Fig. 17 - Initial Step In Glass Application

4. Again using bone stick, tuck glazing strip flap cutaway (corners first) into outside edge of sliding sash.

5. When corners are completed, continue using bone stick with zipper-like motion to complete glazing strip installation, Fig. 18.

Fig. 18 - Corners Completed - Zipper-Like Bone Stick Motion Completes Glazing Strip Installation

No adhesive is necessary to retain glazing strip in sash glass track.

NOTE: As previously mentioned, liquid soap or water may be used as required to facilitate rubber weather strip insertion into channels.

Aluminum bound felt-pile weather strip, (5) Fig. 11, is used along the entire length of top sash track. To gain access to the weather strip, it is necessary to perform the following procedure:

1. Remove both window sash assemblies.

2. Remove staggered screws holding the top sash track frame to unitized frame assembly.

3. Drop sash track frame enough to slide off felt-pile weather strip.

Reassembly procedure is the reverse of the above.

UNITIZED SASH PANEL REINFORCEMENT AND REPAIR

Older assemblies can be updated to current production standards by:

1. Installing reinforcing bars between the cab side sheets and inner perforated panels.

2. Replacing sash frame tapping screws with daisy head blind rivets.

PURPOSE

Performance of Step 1 will eliminate outward or inward distortion (bulging) in the inner edge of fixed panels adjacent to sliding window opening. Performance of Step 2 will ensure against loosening of the sash.

Either condition allows water to enter the insulated panels and causes rusting of the inner perforated panels.

GENERAL

It is recommended both modifications be performed simultaneously without removing sash assembly from carbody. Work should be performed in a well equipped shop, and perferably where deck level ramps are available. Completion of these modifications will require approximately 10 hours.

MATERIAL REQUIRED

	SD & GP	SDP40F & F40C
Reinforcement Bar	4	4
Blind Rivets	72 (36 ea. side)	66 (33 ea. side)
Plain Washers	20	20
Drive Rivets	As required	As required

(Refer to Service Data.)

DISASSEMBLY

1. Remove wind deflectors (if used).

2. Remove sash stops at center of top track.

3. Remove screws holding upper track to steel frame. With stop removed, sliding windows may be moved to expose screws. Remove windows and upper track. If track is stuck due to paint bond, pry out carefully. Do not deform aluminum track.

4. Remove the retaining screws and the inner perforated metal panels.

5. Remove the insulation material to expose the inside of outer side sheets.

6. Remove the two 25.4 mm x 76.2 mm x 4.7 mm (1 " x 3" x 3/16 ") wind deflector mounting pads located at top and bottom inside surface of each outer panel. These pads are tack and spotwelded in place.

CAUTION: Do not attempt to chisel pads loose or spotweld may tear a hole in the No.13 gauge steel.

The most satisfactory removal method is to grind away tack welds and rotate pad to twist spotweld away from panel. After removal, smoothly grind these areas to permit proper seating of reinforcing bar when applied.

7. Cut off 82.55 mm (3-1/4") from the channel section retainer, Fig. 19 View A, for the lower edge of the perforated panels, This will allow the application of reinforcing bar.

8. Remove all but four or five tapping screws holding the side sash to the cab side frame.

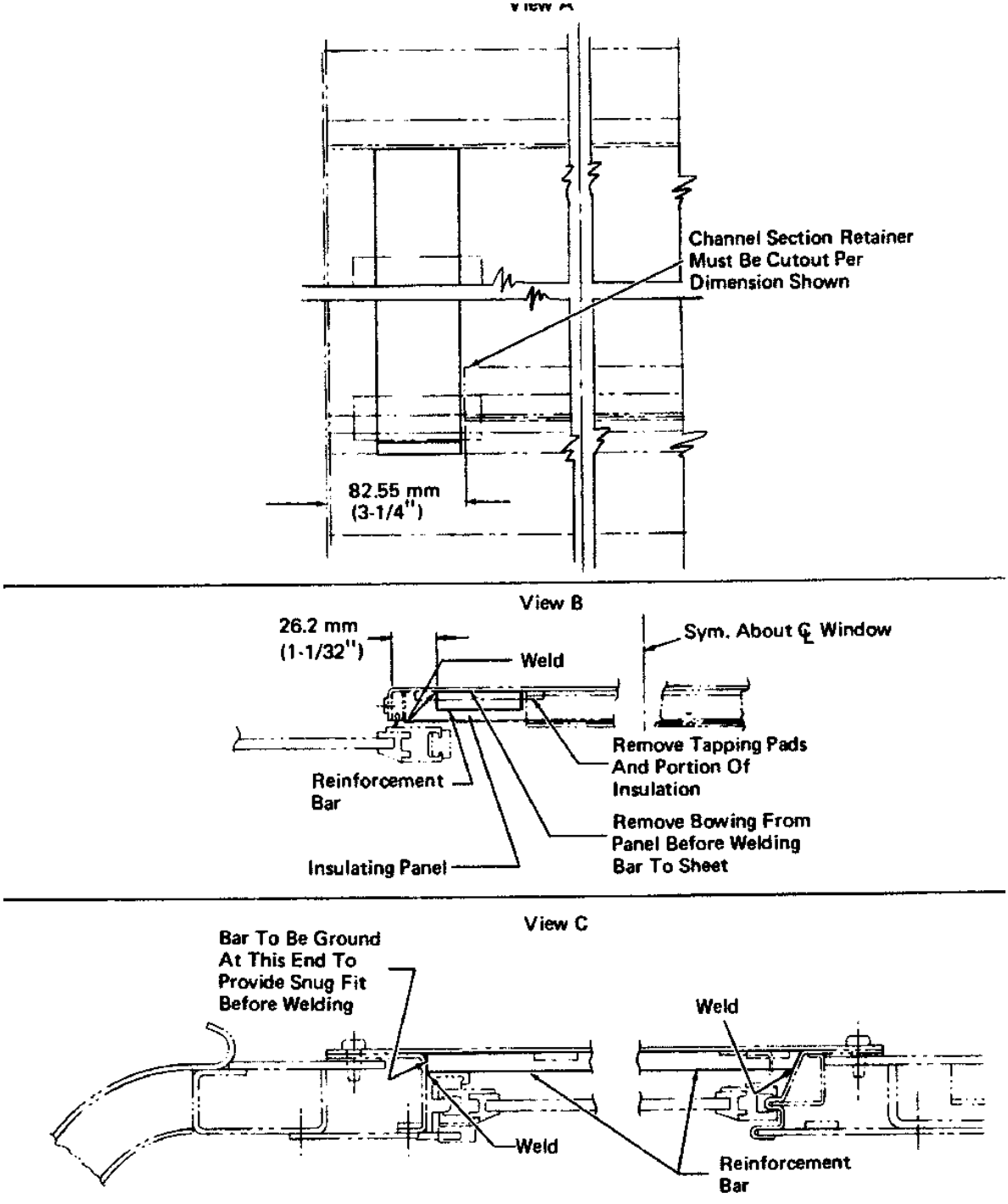


Fig. 19 - Unitized Sash Panel Reinforcement And Repair - Cross Sectional

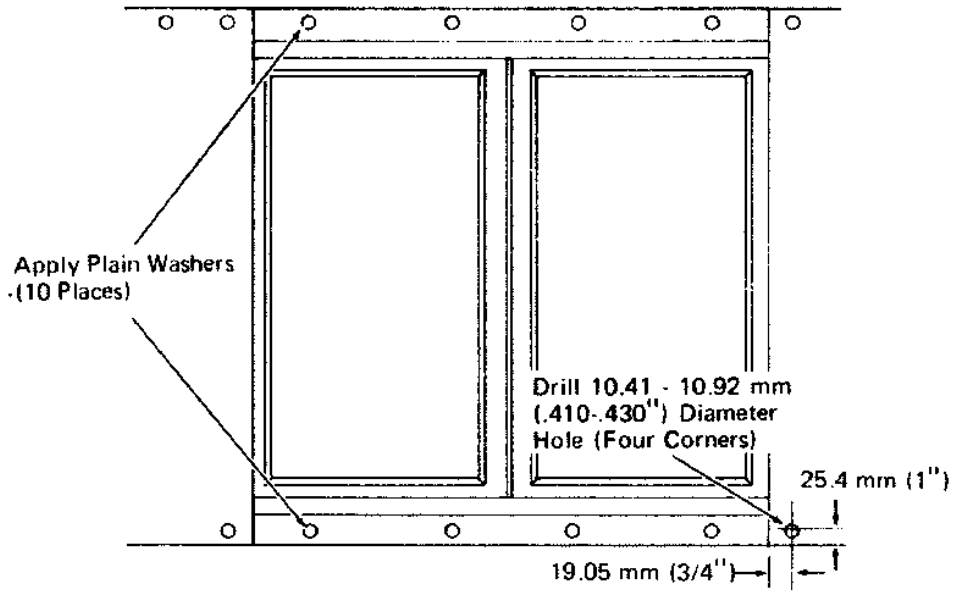
REINFORCEMENT PREPARATION

1. Inspect sash panels for cracks at top and bottom inside corners adjacent to window opening. If no cracks are present, but separation between panels and upper and lower frame members is noted, DO NOT WELD. Application of rivets will correct this condition. If cracks are present, weld and smoothly grind surface.

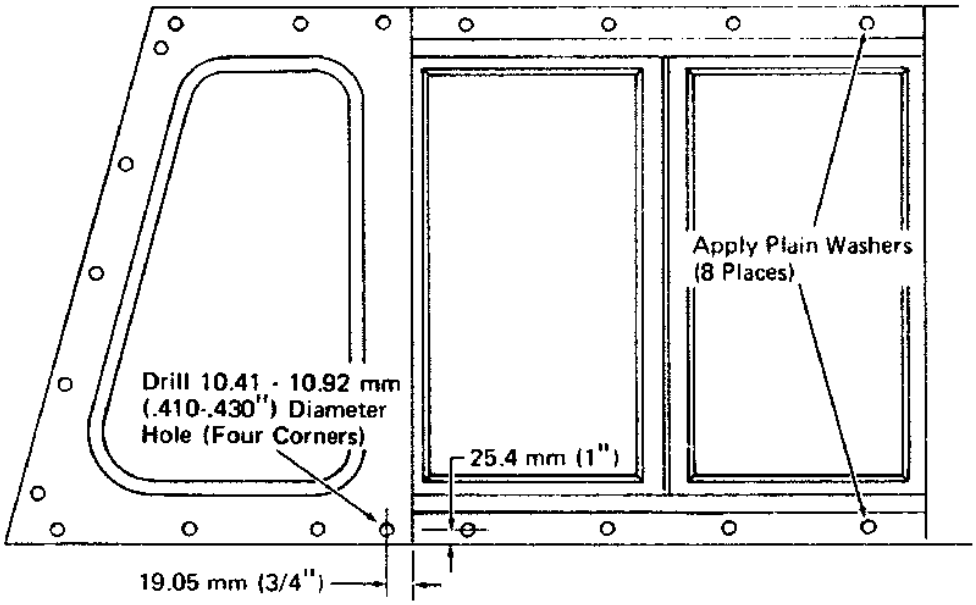
CAUTION: Care should be exercised when welding to prevent burn-through.

2. Enlarge existing tapping screw holes to 10.41 mm - 10.92 mm (.410" - .430") diameter.

3. Add four additional 10.41 mm - 10.92 mm (.410" - .430") holes in each sash as shown in Fig. 20. These holes will reinforce the corner welds or, if panels have separated, will clamp the sheets together.



GP & SD LOCOMOTIVES



SDP40F & F40C LOCOMOTIVES

Fig. 20 - Locomotive Sash Assemblies

4. Ensure reinforcement bars are available, and side panel deflection is removed at the inner vertical edge. Panels not severely bowed can be easily straightened by placing reinforcement bar in location shown in Fig. 19, View B. Compress tightly to side sash using large "C" clamps.

   To correct more severe bowing, place 102 mm x 102 mm (4" x 4") timber horizontally across each window opening. Pull together with a large turnbuckle device, Fig. 21. If sash is bowed inward, place timber inside cab wall using a jacking arrangement.

WARNING: Extreme care should be exercised when using jacking devices to ensure against injury to personnel.

APPLICATION OF REINFORCEMENT BARS AND SASH FASTENERS

1. After proper installation of reinforcing bars, the side panels will be straight. Weld intermittently as shown in Fig. 19, View C.

CAUTION: Care should be exercised when welding to prevent burn-through.

2. With sash panels clamped or secured in place, remove the remaining four or five tapping screws. Enlarge these holes to 10.41 mm - 10.92 mm (.410" - .430") diameter.

3. After all holes are enlarged to proper diameter, apply blind rivets.

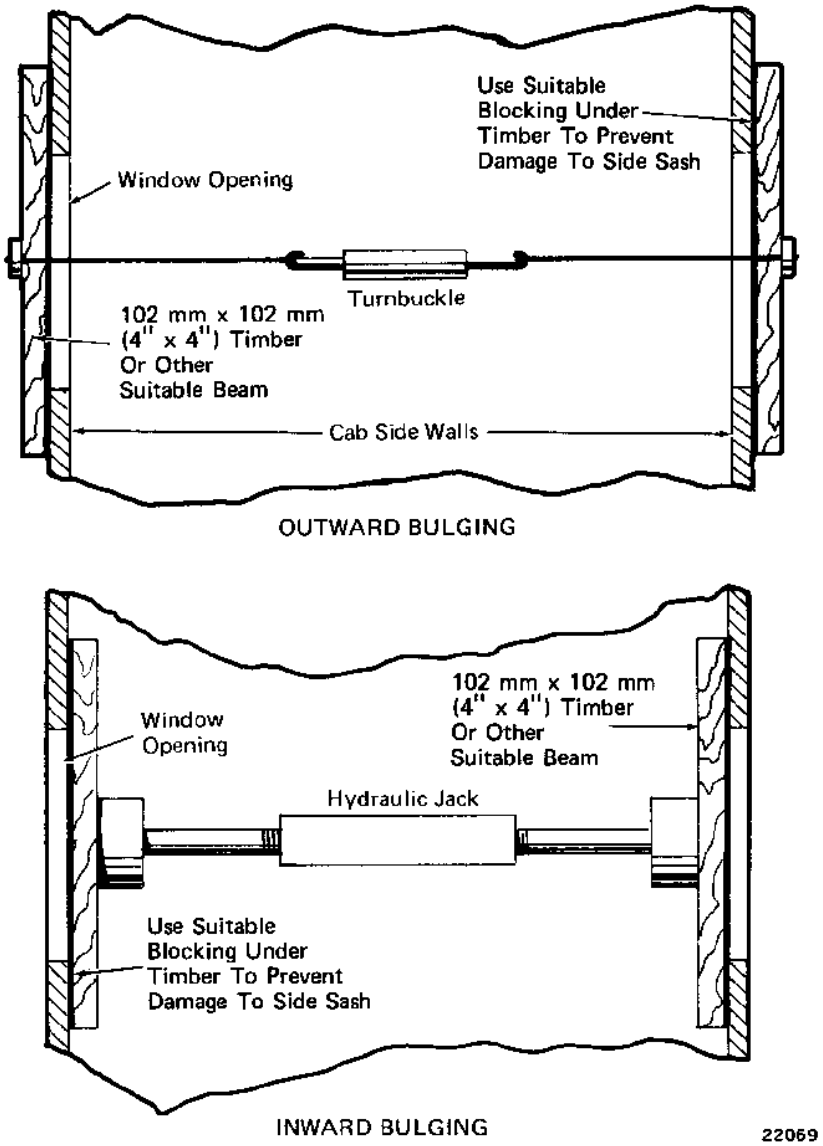


Fig. 21 - Turnbuckle And Jacking Arrangements For Outward And Inward Bulging

4. The rivets applied to top and bottom of window opening, Fig. 20, require plain washers. (See Service Data.) Place washer under rivet head prior to insertion to ensure tightness.

NOTE: Use Huck Manufacturing Company model 353 Pneumatic Installation Tool with a 922-29 nose and 620.5 kPa (90 psi) air pressure to apply blind rivets. Huck Manufacturing Company has major offices in Detroit, MI; Los Angeles, CA; Fort Worth, TX; and Washington, D.C. Personnel are available at these locations for technical assistance in the use of this equipment.

WARNING: During operation of riveting tool, the hardened steel shank is snapped off when rivet is fully seated. This shank is ejected by the tool with considerable force. Precautions should be taken to prevent injury to personnel in the area.

5. After completing the riveting operation, scrape away the excessive plastic sealer tape that has been squeezed out from between the sash frames and cab structure.

REASSEMBLY

1. To reapply wind deflectors, drill and tap 1/4"-20 holes into reinforcement bar using panel sheet as a hole location guide.

2. Trim each piece of insulating material to clear reinforcement bar and reapply.

3. Reapply perforated inner panels. If badly rusted, replace.

4. Reapply upper track, sash stop, and wind deflectors in reverse order of removal described in Steps 1 through 4.

5. If any drive rivets that screw the inner trim strips between sash and cab structure have sheared off or are loose, they should be replaced. (See Service Data.)

Remove loose rivets by driving metal drive pin through rivet, and pulling out head portion.

CARBODY

INTERIOR

SEALING OF HOLES

Interior locomotive holes are sealed to prevent elements of weather and dirt from being drawn into the carbody during conditions of low pressure inside the carbody, and also to prevent loss of engine compartment pressurization.

The recommended procedures for hole sealing are:

1. Holes where the clearance diameter between the pipe or tube and edge of hole is 13 mm (1/2") or less, should be sealed by uniformly applying rubber putty caulking compound in the form of a fillet.

2. Holes having a clearance diameter between the pipe or tube and edge of hole greater than 13 mm (1/2") should have a flashing applied to minimize the gap. Sealing compound should then be applied as above.

EXTERIOR

HANDRAIL TO CAB SIDE WALL MOUNTING BOLTS

If leakage occurs in the cab side wall area through the handrail mounting bolts, Fig. 22, perform the following procedure.

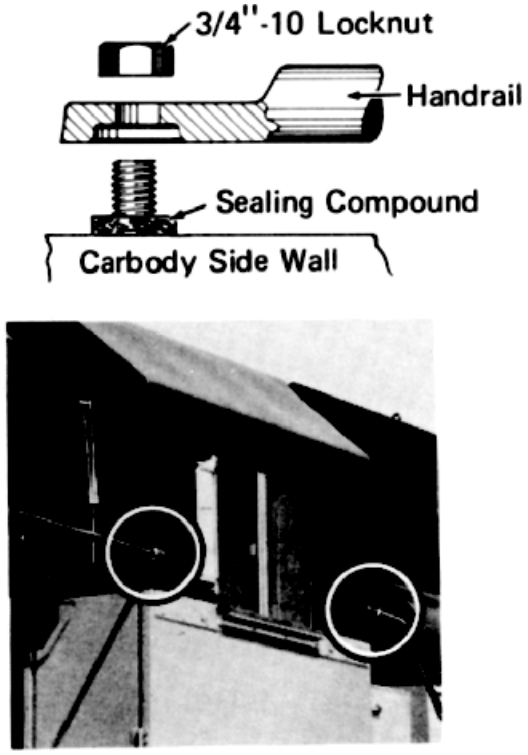


Fig. 22 - Sealing Of Handrail Mounting Bolts

1. Remove the 3/4"-10 locknut holding the handrail to the cab side wall and remove the handrail.

2. Wrap a 5 mm x 10 mm x 60 mm (3/16 " x 3/8" x 2-3/8") strip formed from rubber putty compound around the base of the handrail bolt to be sealed. (See Service Data.)

3. Replace the handrail and locknut and torque to 278 N-m (205 ft-lbs).

4. Trim excess sealing compound from around handrail.

ELECTRICAL CABINET

PANELS

When installing panels in electrical cabinet or when mounting equipment, ensure panel is supported evenly so tightening down will not result in panel distortion. Distortion may cause breakage of insulating panels, twisting of metal panels or equipment, and result in improper apparatus functioning.

COMPARTMENT SEALING

Domestic electrical cabinet door edges are sealed internally with 32 mm x 10 mm (1-1/4" x 3/8") molded foam rubber, Fig. 23, to damp vibration and eliminate air leakage. To apply, measure and cut rubber into necessary lengths. (Four strips are required for each door.) Evenly brush on a coat of rubber adhesive to one side of the rubber strip. Align strip parallel along inside edge of electrical cabinet door, and firmly press adhesive side down.

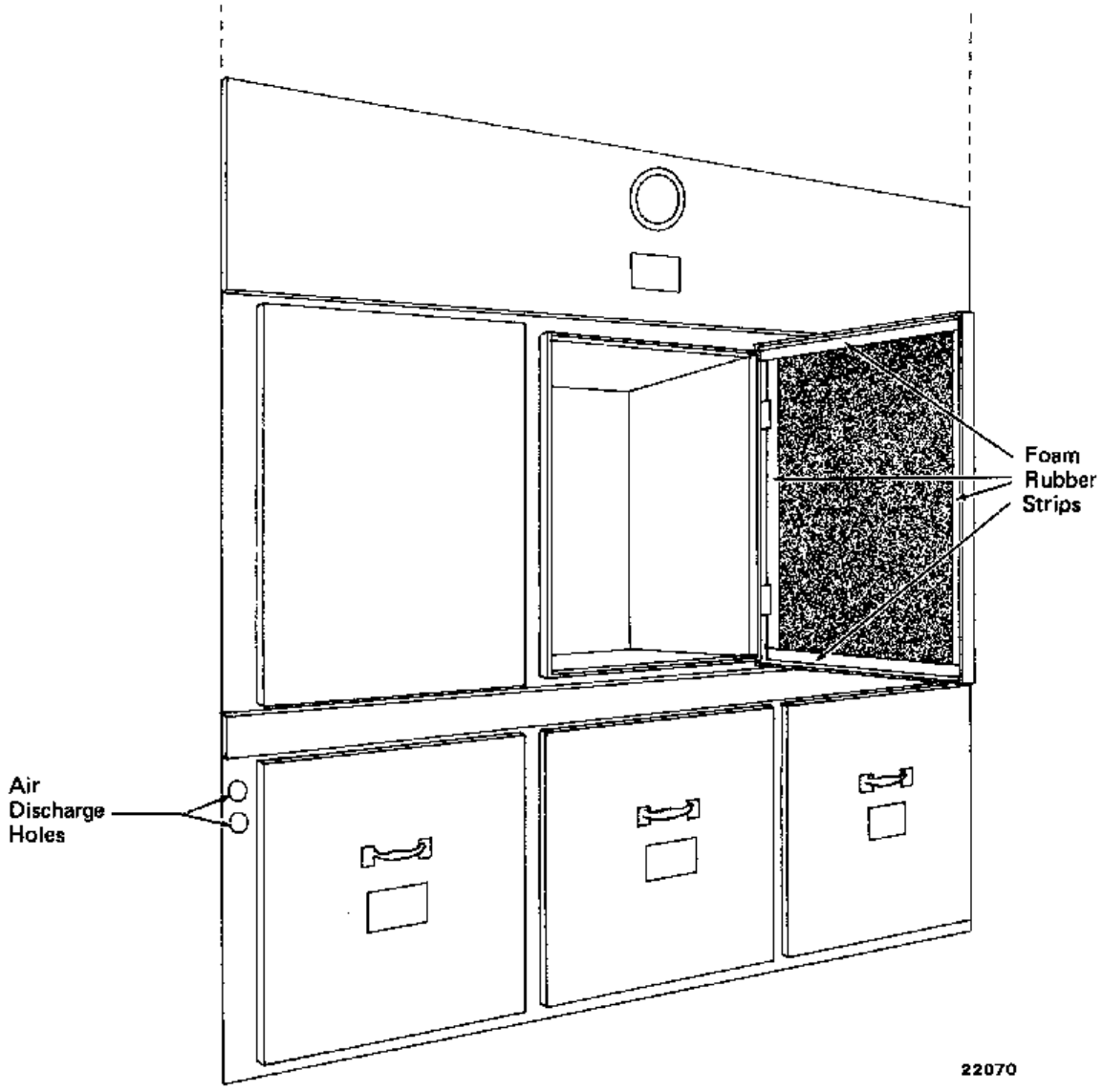


Fig. 23 - -2 Type Electrical Cabinet, Front

Export type electrical cabinet door edges are sealed with weather seal, Fig. 24. A rubber mallet and liquid soap or water are necessary for this application. Lubricate the bottom (split portion) of the seal with liquid soap or water. Lubrication aids entry of the seal into the frame channel, and ensures proper seating of the seal. Insert the seal into the frame channel, Fig. 24, by hand, tapping with mallet when necessary. Avoid stretching the foam rubber. Continue to lubricate and insert seal into channel until compartment panel or door is completed. When starting point is reached, cut to overlap starting point by approximately 6 mm (1/4") so, when both ends are installed, joint will be under pressure.

CAUTION: Care is advised when applying weather seal around corners. Do not stretch. Stretching will result in the eventual cracking or loosening of the seal.

Wipe off excess lubricant with a clean shop rag. The dried contact face of the seal may be lightly coated with glycerin or silicone grease if desired.

SEALERS

Models having pressurized electrical cabinets constructed so the control or dynamic brake panel seals the equipment section from atmosphere, should have all unused, drilled holes sealed. Nylon plugs are used for this purpose. (Refer to Electrical Cabinet Service Data.)

After determining proper size plug, insert with sufficient pressure to make the underside of the plug cap flush with the face of the panel. Any holes located under a device where plug application is impossible, may be sealed with masking tape.

NOTE: On -2 type electrical cabinets, the main control panel holes do not require plugging because the sheet for the mounting panel forms a seal with the cabinet structure when applied.

Rubber putty compound and liquid neoprene are used to seal electrical control equipment. Generally, a compound thickness of 13 mm (1/2") provides adequate mechanical and sealing characteristics. Wider openings will require the use of a closure plate or similar repair to reduce the clearance gap prior to sealing.

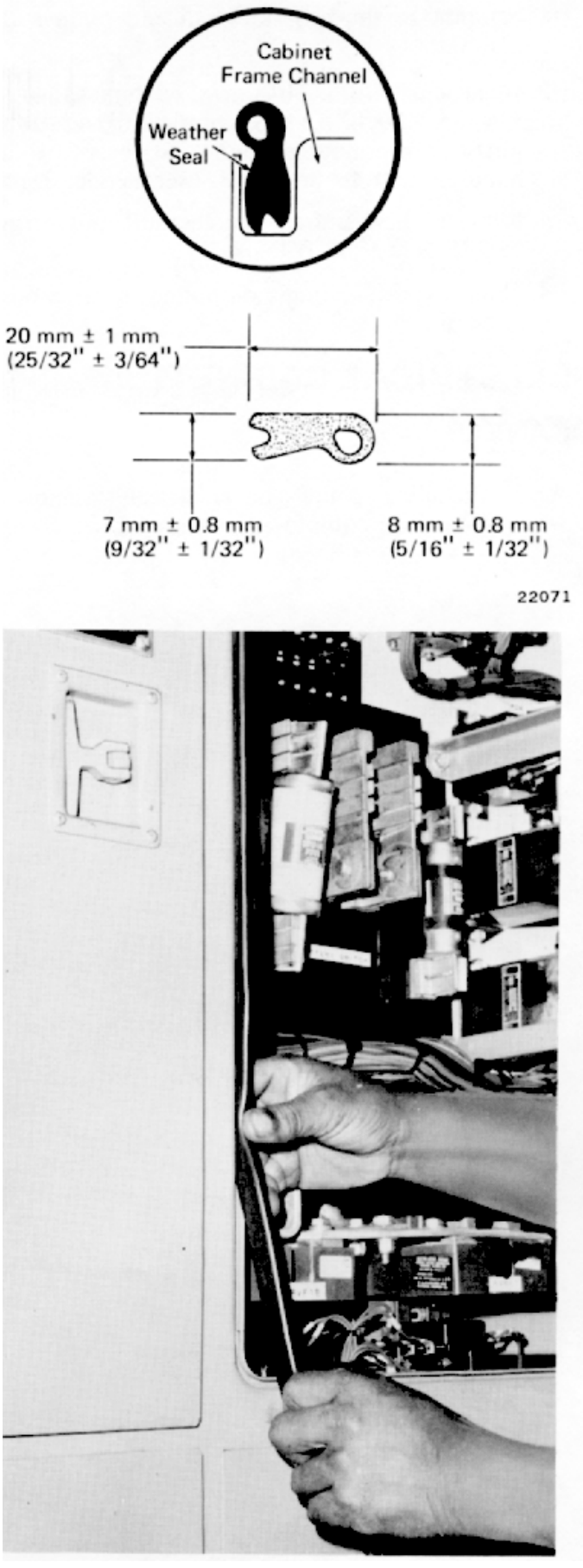


Fig. 24 - Weather Seal Insertion Into Electrical Cabinet Frame Channel

SEALING OF HEAVY CABLES IN PRESSURIZED AREAS

Cable cleats, Fig. 25, fastened to structural members where cables enter pressurized areas, or areas where dirt is not desirable, should be sealed with rubber putty compound.

In addition, cable cleats fastened to pressurized electrical control cabinets, should have the cable outlets in the cleat sealed with a minimum of three individual layers of liquid neoprene sealer. Cable cleats mounted on a horizontal plane may have the liquid neoprene sealer poured into the cleat if the cleat assembly lends itself to this type of application.

Liquid neoprene may also be applied to cable cleats mounted on underframe where cables enter pressurized areas or areas in which elements of weather are not desirable.

CONTROLLED LEAKAGE ORIFICES

Breakers and switches inside the control panel are used as controlled leakage orifices and should not be sealed. The electrical cabinet is also equipped with cabinet air discharge holes, to maintain proper ventilation.

HARDWARE INFORMATION

Latches should be checked for proper mechanical functioning and replaced if necessary.

NOTE: The electrical cabinet latch assemblies, Fig. 26, on -2 locomotives are not adjustable. Replacement latch assemblies may be obtained from EMD Parts Centers.

If necessary to replace latch assemblies, apply a bead of rubber or plastic sealer, Fig. 27, between latch assembly and frame assembly when installing new latch assembly.

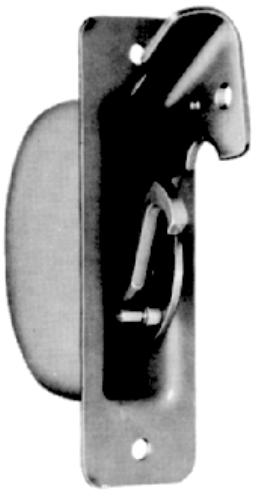


Fig. 26 - -2 Type Electrical Cabinet Latch Assembly

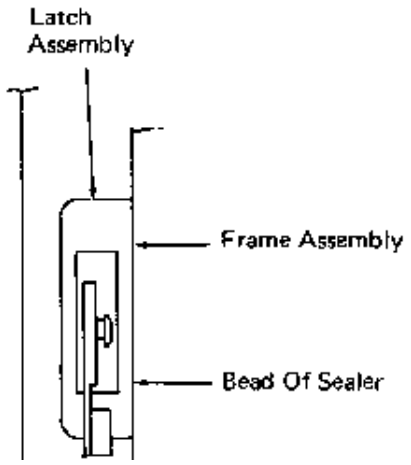


Fig. 27 - Latch Assembly Installation And Sealing

NOTE: Surfaces must be clean, dry, and grease free to ensure satisfactory adhesion.

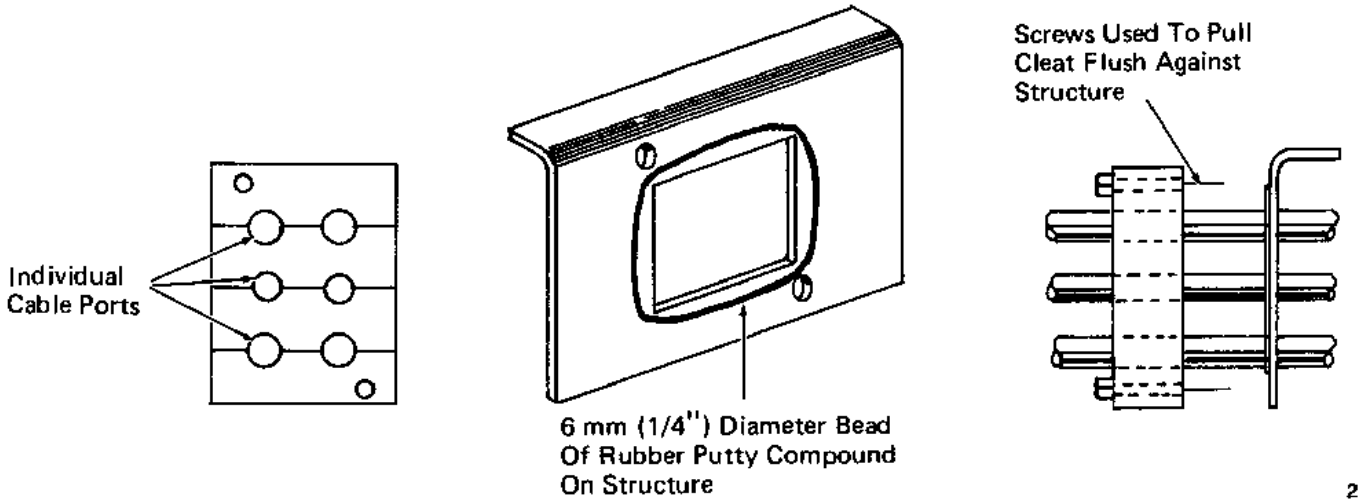


Fig. 25 - Cable Cleats Fastened To Structural Members

The fasteners used to connect the engineroom side electrical cabinet assembly panels, Fig. 28, are daisy head blind rivets, Fig. 29. These fasteners are installed with a special air tool at the factory, and are permanent installations. Rivets cannot be adjusted. If leakage occurs between the assembly panels and cabinet structure, RTV sealer or plastic sealing compound may be used to seal the leak.

The removable engineroom side electrical cabinet panels are fastened with 3/8" bolts, Fig. 30. These bolts should be periodically checked for tightness to ensure proper sealing of cabinet. Replacement bolts and washers are available through EMD Parts Centers.

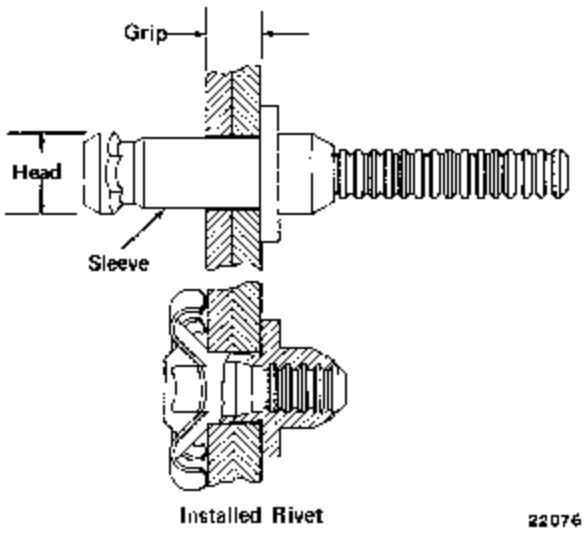


Fig. 29 - Daisy Head Blind Rivet

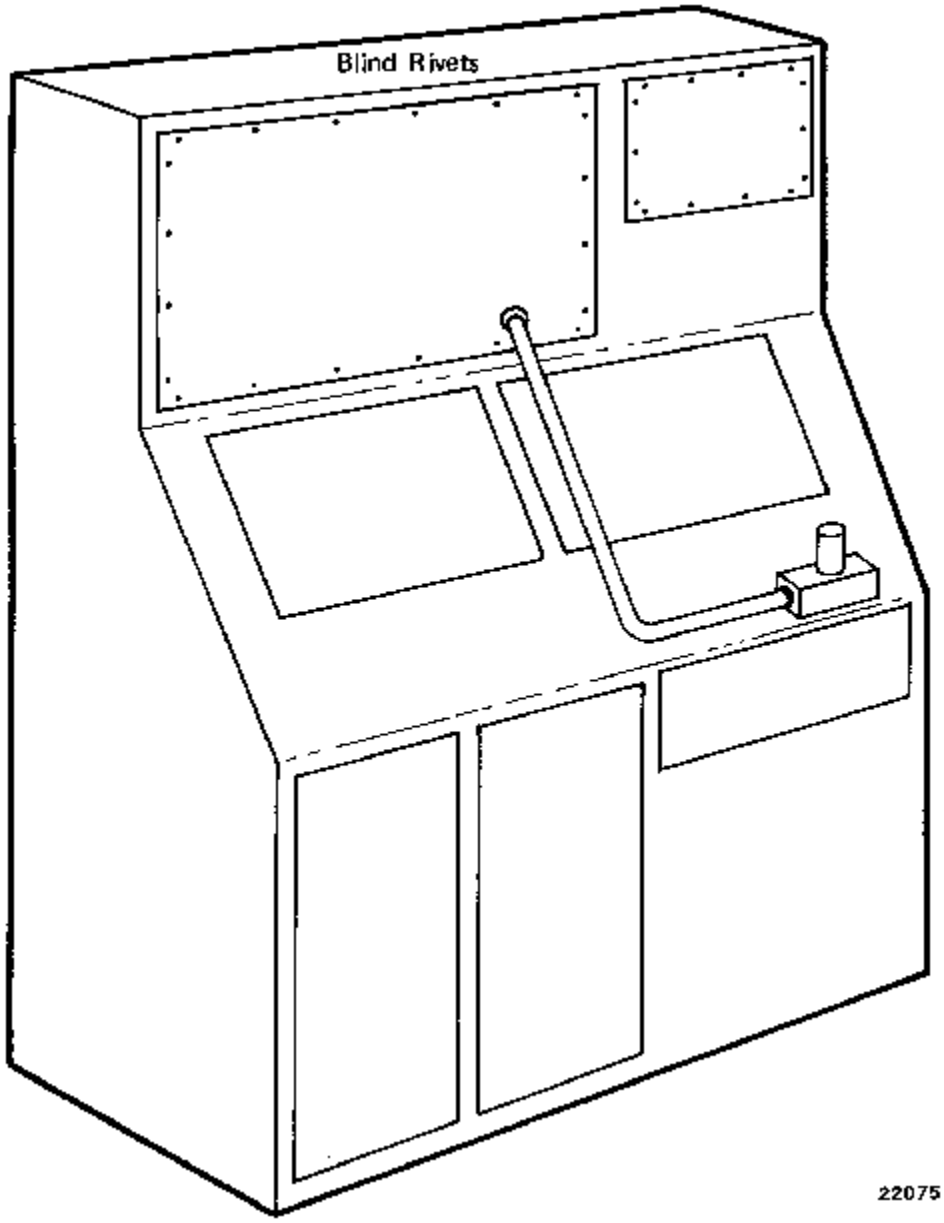


Fig. 28 - Engineroom Side Assembly Panels Permanently Fastened With Daisy Head Blind Rivet(s)

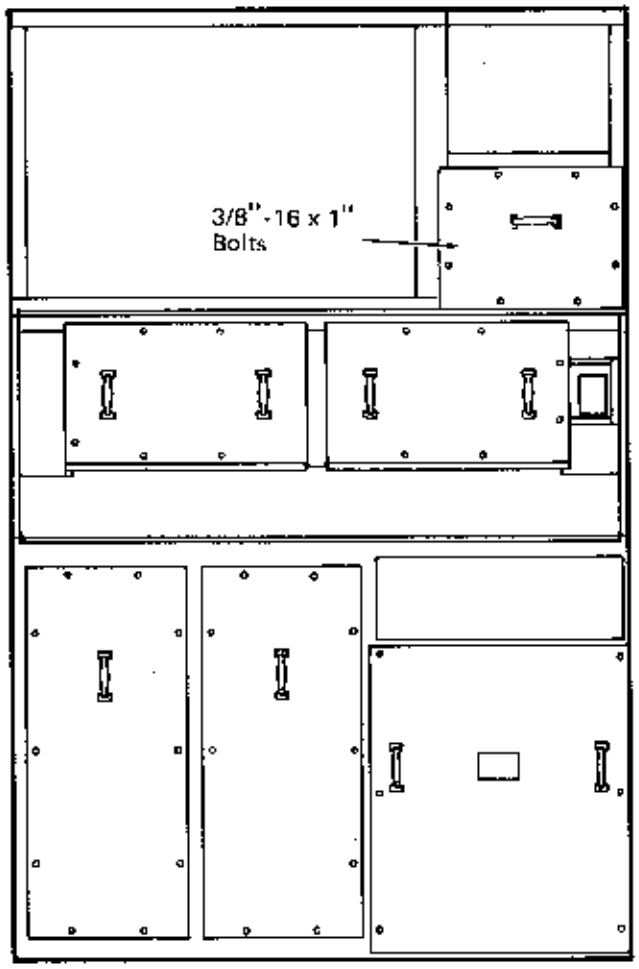


Fig. 30 - Electrical Cabinet Engineroom
Side Removable Panels

INERTIAL FILTER STRUCTURE ASSEMBLY

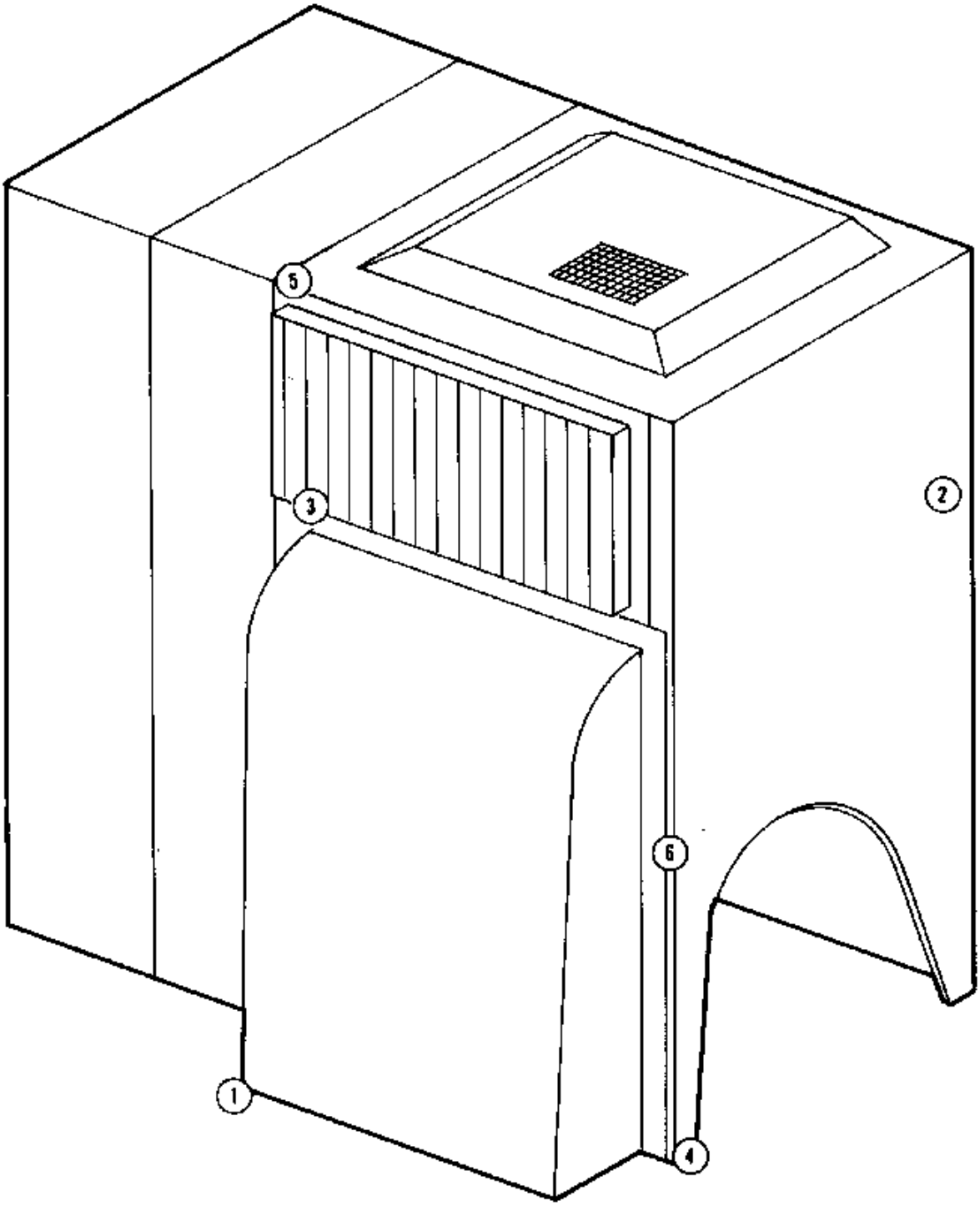
An isometric drawing, Fig. 31, is provided for orientation reference regarding seal and weather strip locations mentioned in the text as applicable to the inertial filter structure assembly.

NOTE: Prior to application of replacement seals, ensure removal of defective seals has been accomplished.

SEALS AND SEALANTS

Oil resistant molded sponge rubber tape is used to seal the interior perimeter of the inertial filter compartment to generator personnel door, Fig. 32. Evenly apply a coat of rubber adhesive to the precut sponge rubber strip. Align strip parallel along inside edge of door, and firmly press adhesive side to door. Complete entire inside edge of door following this procedure. When door is closed, the lip of the inertial filter structure compresses the sponge rubber on the interior perimeter of door, forming an air seal.

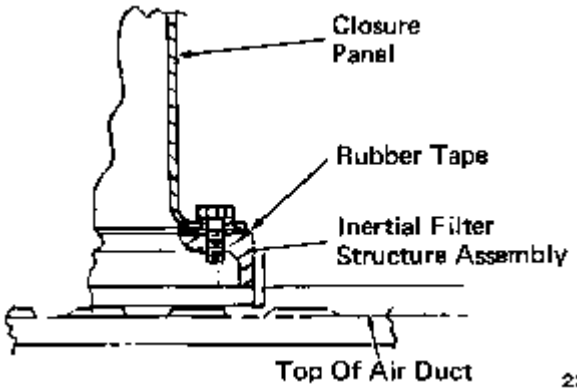
This tape is also applied between the traction motor down duct closure panel assembly and inertial filter structure assembly located at the top of the air duct, (1) Fig. 31, and cutaway, Fig. 33.



1. Traction Motor Down Duct Closure And Inertial Filter Structure Assembly At Top Of Air Duct
2. Inertial Filter Structure Assembly
3. Inertial Filter Structure Assembly And Inertial Filter Assembly
4. Inertial Filter Compartment To Hood Joint
5. Hatch To Inertial Filter Structure Assembly
6. Weather Seal Along Batten

Fig. 31 - Isometric Drawing Of Inertial Filter Structure Assembly

Fig. 32 - Sponge Rubber Tape Applied To Interior Perimeter Of Inertial Filter Compartment-To-Generator Personnel Door



[22]Fig. 33 - Cutaway of Bulged Traction Motor Down Duct Closure Panel And Inertial Filter Structure Assembly

Weather seal (6) Fig. 31, is applied to the inertial filter structure assembly. Fill channel along inertial filter structure assembly with gasket adhesive. Insert weather seal by pressing split portion of seal, Fig. 34, into gasket adhesive and allow to dry.

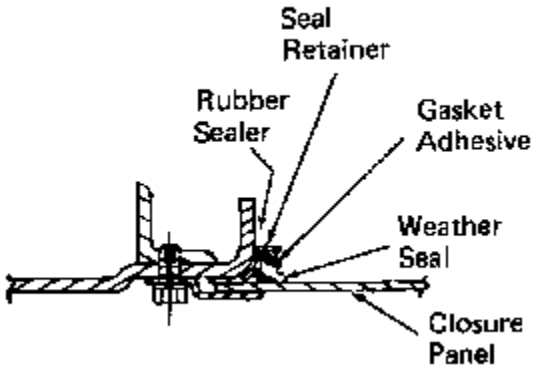


Fig. 34 - Cutaway Of Weather Seal Cemented To Inertial Filter Structure Assembly Batten

CAUTION: To eliminate future weather seal destruction when removing closure panel, it is necessary to use care when applying weather seal to gasket adhesive. Do not cement seal to both the inertial filter structure assembly and the closure panel. Ensure seal is cemented to the inertial filter structure assembly side only, thus allowing freedom to remove closure panel without harm to the weather seal.

The split portion of this seal conforms under pressure to surface contours ensuring weatherproof protection. Rubber cork composition pressure sensitive tape (available in different sizes), has various applications. It is used primarily to damp vibration and ensure snug fit between connected structural assemblies, such as the inertial filter structure assembly and the inertial filter assembly, (3) Fig. 31, cutaway, Fig. 35.

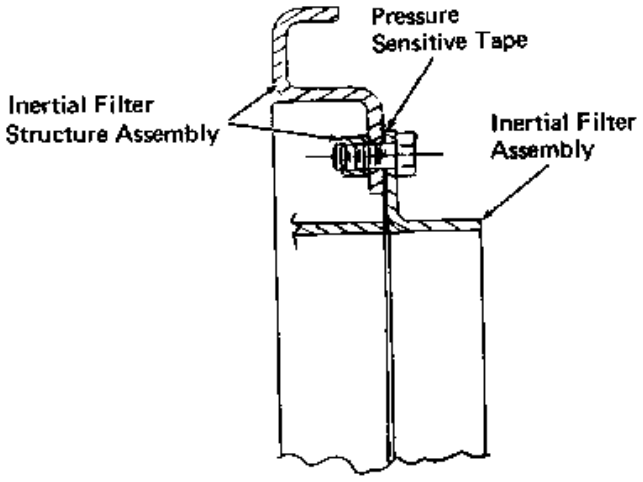


Fig. 35 - Cutaway Of Inertial Structure Assembly And Inertial Filter Assembly

The pressure sensitive tape may be applied directly for most structural applications by peeling off the white outer covering, and firmly pressing adhesive side of tape to surface material. However, for applications in which the pressure sensitive tape is used as gasketing through which a bolt or screw shaft will pass, it is recommended that adequate diameter holes be punched in tape prior to application, (5) Fig. 31, cutaway, Fig. 36.

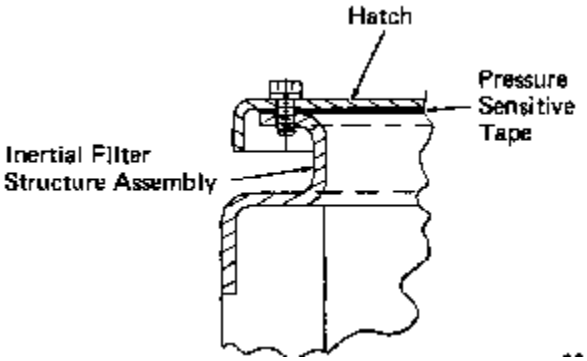


Fig. 36 - Cutaway of Pressure Sensitive Tape Application Between Hatch-To-Inertial Filter Structure Assembly

To apply pressure sensitive tape around the inertial filter compartment access panel opening, Fig. 37, punch (18) 7.14 mm (.281") diameter holes to accommodate the 5/16"-18 hex head screws. Peel off white outer covering of tape; position, and press into place on inertial filter structure assembly framing. Consistent finger pressure should be applied to ensure proper adhesion.

Plastic or rubber sealing compound is used to fill gaps at inertial filter compartment to hood joint, (4) Fig. 31, and cutaway, Fig. 38.

HARDWARE INFORMATION

Inertial filter compartment to generator personnel door hinge assembly should be checked for proper functioning, and periodically lubricated with any good light oil.

Check all screws which fasten the access panels, closure assemblies, and engineroom partition to the inertial filter structure assembly framing for tightness or broken or sheared screws. If loose, wrench tighten to ensure proper panel sealing. Replace broken or sheared screws as required.

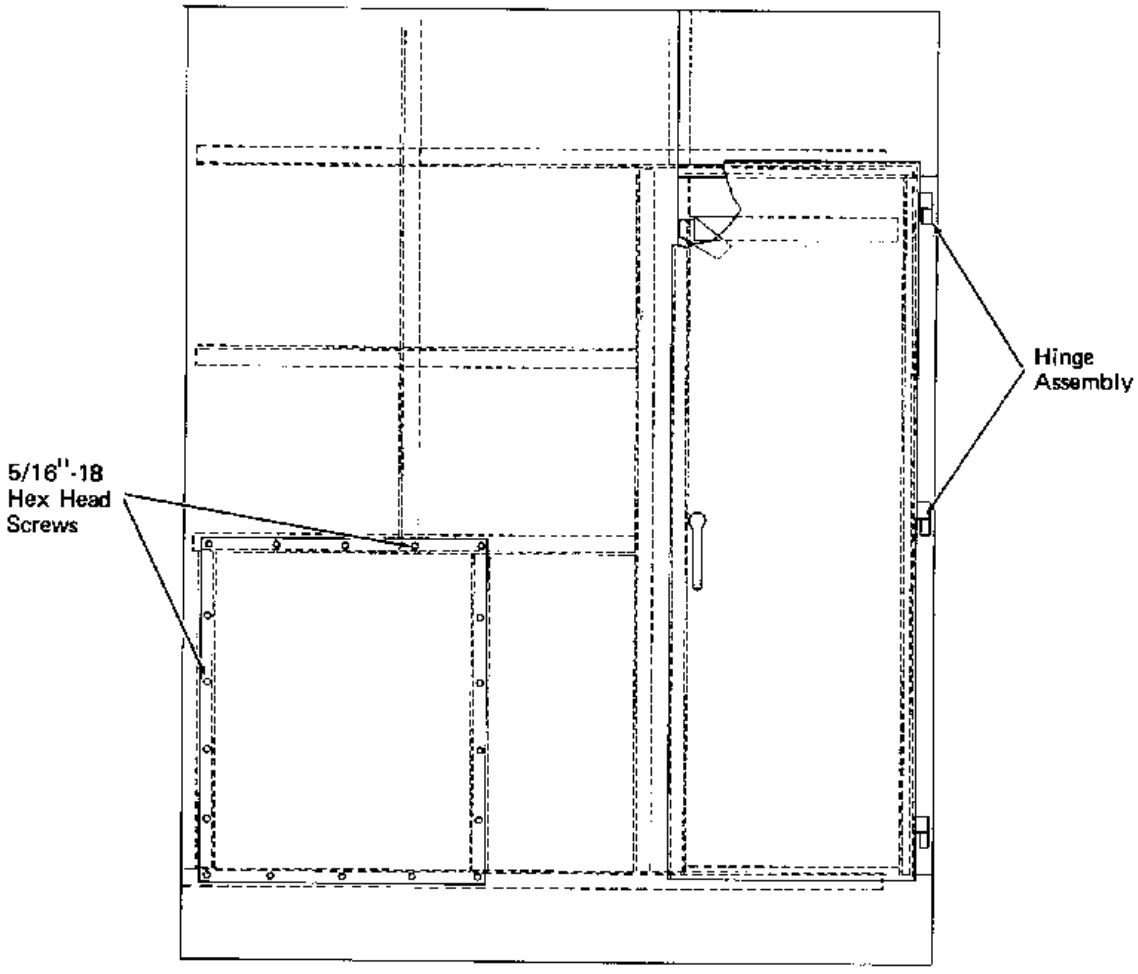


Fig. 37 - Access Panel And Personnel Door

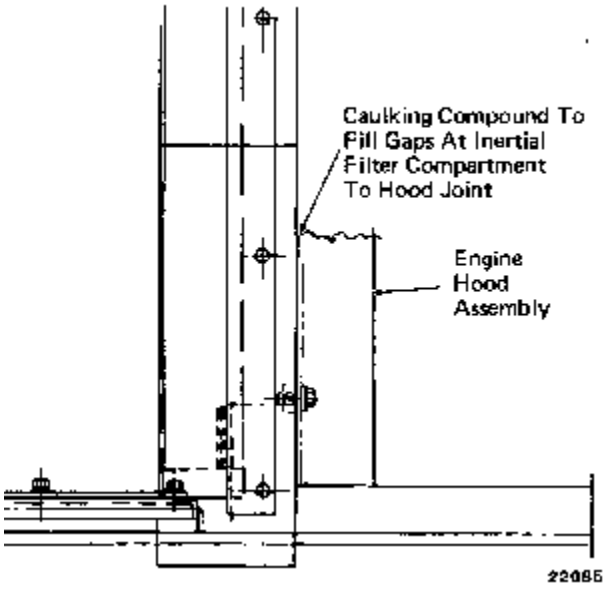


Fig. 38 - Cutaway Of Inertial Filter Compartment To Hood Joint Sealed With RTV

SEALING OF ENGINEROOM PARTITION

Two different views of engineroom partitions showing blown and turbocharged applications are represented in Figs. 39 and 40, respectively.

On both applications, a closing sheet is bolted to the inertial filter compartment framing on each side of main generator fitted at corners at the top of sill. An angle assembly is then stud welded to the inertial filter structure, Figs. 39 and 40. Sheet partitions are applied to the angle assembly by the use of clips and 5/16" hex head tapping screws. After the closing sheet and angle assembly are applied to the inertial filter structure, the engineroom partition is positioned over the main generator, and rubber putty (caulking) compound is applied all around the main generator between the angle assembly and generator on engineroom side only, forming an air seal.

No seals are applied behind the battens, however, any small, open holes along these areas should be filled with rubber putty compound to eliminate air leaks.

AUXILIARY GENERATOR COVER ASSEMBLIES

The auxiliary generator cover assemblies do not require use of gasketing or sealer. Application of these cover assemblies is designed to ensure against leakage.

TURBO INLET HOLE

On turbocharged locomotives, the turbo inlet hole through the engineroom partition must also be air tight. A clamping ring assembly is applied to a felt wool seal, Fig. 40, with the use of washers and 1/4"-20 round tapping screws.

REPLACING THE INERTIAL FILTER COMPARTMENT SEAL UNDER GENERATOR

The area under the generator on top of underframe, Fig. 41, is sealed with an oil resistant neoprene sponge rubber strip. Basically, two sizes are available for this purpose.

If the gap between the angle and generator is less than 38 mm (1-1/2"), a strip 864 mm long x 38 mm wide x 25.4 mm thick (34" x 1-1/2" x I") is used. A gap in excess of 38 mm (1-1/2") requires a replacement seal 864 mm x 51 mm x 38 mm (34" x 2" x 1-1/2"). Gasket adhesive is required for this application. (See Service Data.) Normally, this seal is replaced during class overhaul or rebuild when generator is removed. However, it is not necessary to remove generator to replace seal. A person, lying on the bottom plate, has accessibility to the entire seal length. Prior to inserting seal, it is necessary to clean retaining angle and evenly coat with gasket adhesive. Replace seal by compressing and inserting it slowly and constantly.

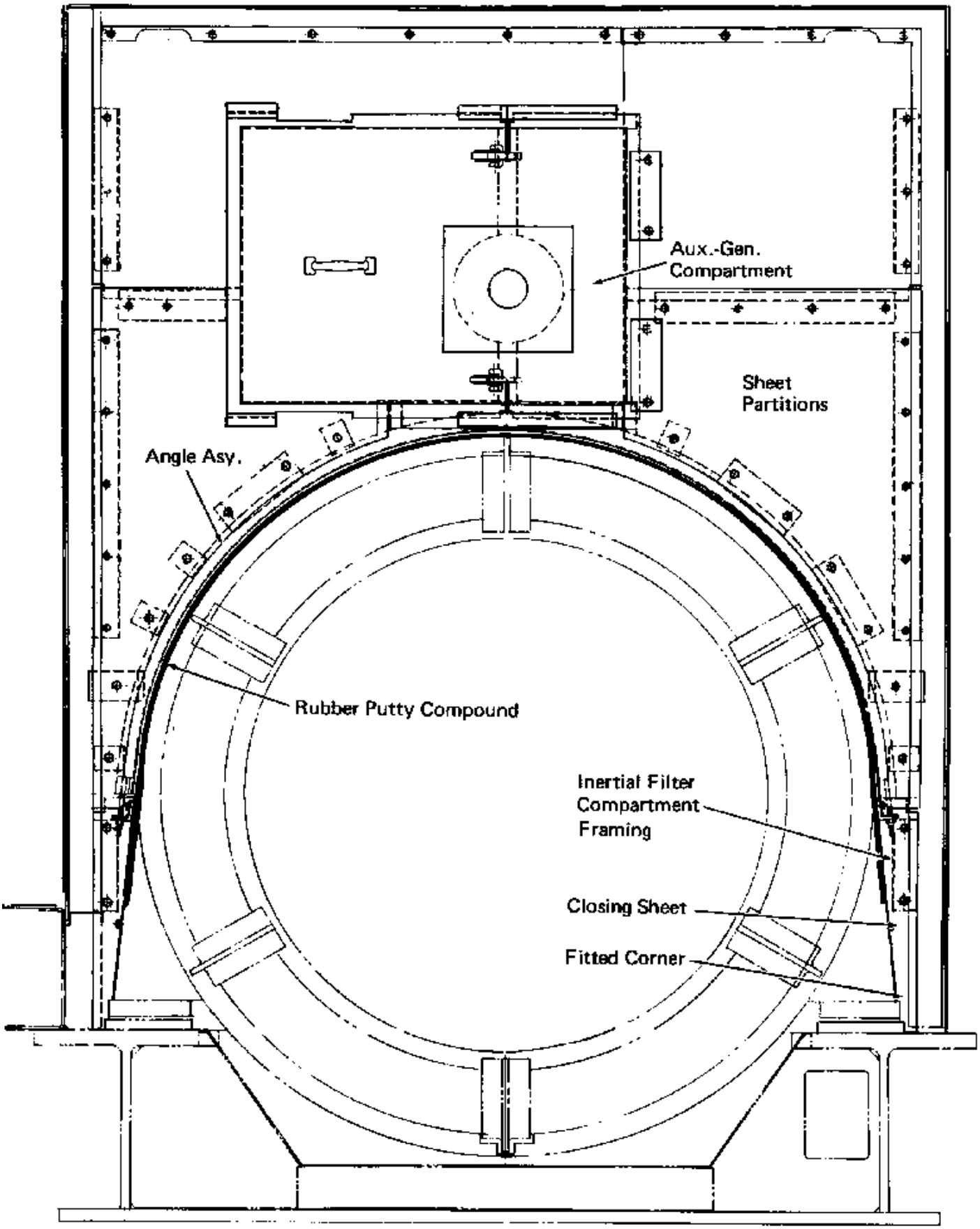


Fig. 39 - Engineroom Partition (Blower-Type Engine)

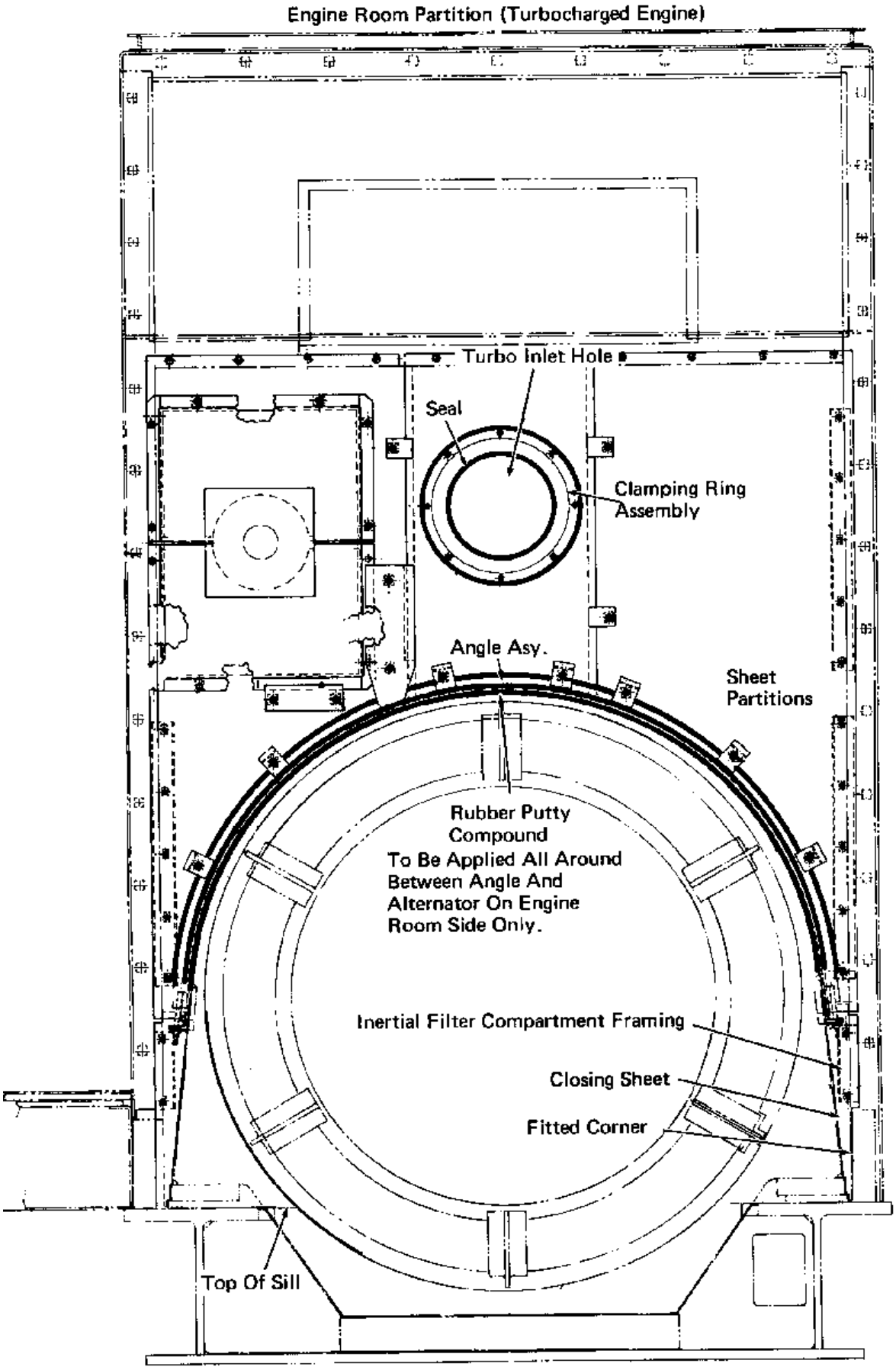


Fig. 40 - Cutaway Of Engineroom Partition Application (Turbocharged Application)

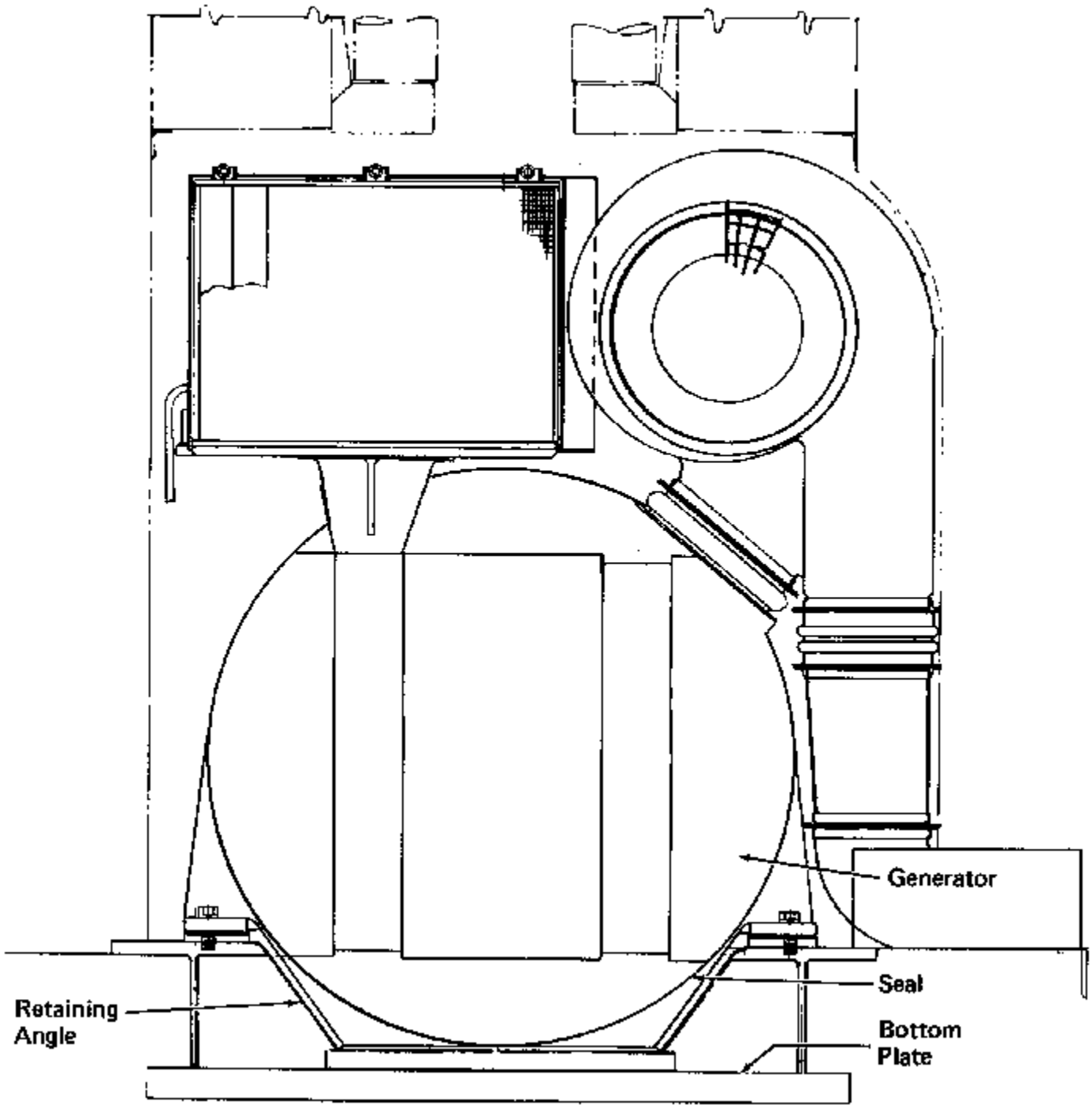


Fig. 41 - Inertial Filter Compartment Seal Under Generator

SERVICE DATA

GLASS

Part Number	Description	Purpose or Application
756475	Hook type sealing strip installing tool	Self-sealing combination window weather strip
756460	Eye type filler strip tool	
8329872	Self-sealing combination weather strip	All stationary cab glass including cab access door glass
8166637	Filler strip	
8404104	Plastic sealer tape, green	Unitized sliding sash window assembly
9080389	Plastic sealer tape, black	
8411454	Rubber bumper	
8107252	Sash-to-sash bumping weather strip	
8165001	Rubber putty compound	
8255268	Rubber adhesive	
8116587	Rubber glazing weather strip	
8411452	Aluminum bound felt-pile weather strip	
9320855	Vertical lip type side rubber weather strip	
8465020	"Daisy head" blind rivets	
9098572	Reinforcement bar	
106263	Plain washers	
8185457	Drive rivets (GP and SD)	
8185446	Drive rivets (SDP40F and F40C)	

SERVICE DATA (CONT'D)

DOORS

Part Number	Description	Purpose Of Application
8420664	One-piece molded rubber seal	Cab access door/Lip type seal
8057831	Weather strip	Cab access door/Compression type cellular strip
8208082 8208083 8208084	Weather strip	Cab access door/Precut compression type cellular strip
8135382	Pressure sensitive tape	Cab access door/Precut compression type cellular strip
8496222 9080934	Weather strip Vinyl foam sealer	Cab side door/Compression type tubular strip
9312081	Weather strip	Personnel door/Tubular strip
9099928 9099895 8255268	Weather strip Rubber seal Adhesive gasket	Maintenance door/Tubular strip
9321285	Finned seal	Full length access door - Short hood

CARBODY

8165001	Rubber putty compound	Interior sealing of holes; exterior sealing - Handrail to cab side wall mounting bolts

ELECTRIC CABINET

8421197	32 mm x 10 mm (1-1/4" x 3/8") foam rubber strip	Interior perimeter of cabinet door edges
8255268	Rubber adhesive	(Used to apply above)
8324100	Weather seal	Channeling around cabinet compartment doors (Export only)
8344979	Nylon plug 3.04 mm - 3.18 mm (.120" - .125")	Sealing of holes in equipment section
8344980	Nylon plug 3.33 mm - 3.81 mm (.131" -.150")	
8344981	Nylon plug 4.21 mm - 4.75 mm (.166" - .187")	
8344982	Nylon plug 5.54 mm - 5.69 mm (.218" - .224")	

SERVICE DATA (CONT'D)

ELECTRICAL CABINET (CONT'D)

Part Number	Description	Purpose Of Application
8165001	Rubber putty compound	Sealing of electrical control equipment
8213281	Liquid neoprene	
8425276	Left-hand latch assembly (-2's)	Electrical cabinet doors
8425277	Right-hand latch assembly (-2's)	
8210618	Sealer	Applied between frame and latch assemblies
8465020	"Daisy head" blind rivets	Engineroom side electrical cabinet assembly panels
120382	3/8" lock washer	Fasten removable engineroom side electrical cabinet panels
120394	3/8" plain washer	
180122	3/8"-16 x 1" bolt	
8265656	Self-sealing combination weather strip	Annunciator window
8166637	Filler strip	

INERTIAL FILTER

8424601	3.2 mm x 32 mm (1/8" x 1-1/4") molded sponge rubber tape	Interior perimeter of personnel door
8255268	Rubber adhesive	(Used to apply above.)
8324100	Weather seal	Inertial filter structure assembly and traction motor down duct
8133198	1.5 mm x .19 mm (1/16" x 3/4") rubber cork composition pressure sensitive tape	Inertial filter structure assembly to other metal assemblies as closure panel and hatch
8135383	1.5 mm x 48 mm (1/16" x 1-7/8") rubber cork composition pressure sensitive tape	
8345495	RTV compound	Used to fill gaps at inertial filter to hood compartment joint
8210618	Rubber sealer	

SERVICE DATA (CONT'D)

INERTIAL FILTER (CONT'D)

Part Number	Description	Purpose Of Application
8444614	Hinge assembly	Inertial filter compartment personnel door
*8365583	Clamping ring assembly	Turbo inlet hole through engineroom partition
*8365584	Felt wool seal	(Used in conjunction with the above.)
8304908	864 mm x 38 mm x 25.4 mm (34" x 1-1/2" x 1 ") sponge rubber strip	Inertial filter compartment seal under generator

*Turbocharged engines only.