

FLANGES AND SCREW PLUGS

FOR LEAD OR PLASTIC-SHEATHED CABLE

DESCRIPTION AND INSTALLATION

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1. GENERAL		

1.01 This section covers the description and installation of pressure flanges and screw

plugs in plain lead and plastic-jacketed cables. This section also covers the installation of the F pressure flange for reclaiming wet buried PIC cable. The flanges and plugs are used to:

- Introduce and bleed air in pressurized cable
- Measure cable air pressure
- Seal holes made in flash test cable
- Inject reclamation compound when reclaiming wet buried PIC cable
- Repair minor sheath breaks.

1.02 This section is reissued to:

- Correct the information covering the F pressure flange
- Delete information which is no longer applicable
- Correct references
- Change installation procedures for the C pressure flange
- Indicate that the B screw plug (AT-7278) and the B flange clamp (AT-7306) are rated Manufacture Discontinued.

Revision arrows are used to indicate significant changes.

1.03 ♦When an area of lead cable must be cleaned, that area must be cleaned with LEPEC (lead particle entrapment compound) in conjunction with a carding brush. The following procedures are to be followed when cleaning all lead surfaces:

- (1) Use a clean, dry cloth to apply a generous amount of LEPEC to the lead surface to be cleaned and to at least 2 inches beyond the

NOTICE

This document is either
AT&T - Proprietary, or WESTERN
ELECTRIC - Proprietary

Pursuant to Judge Greene's Order of August 5, 1983, beginning on January 1, 1984, AT&T will cease to use "Bell" and the Bell symbol, with the exceptions as set forth in that Order. Pursuant thereto, any reference to "BELL" and/or the BELL symbol in this document is hereby deleted and "expunged".

area to be cleaned. ***Do not use the carding brush on any lead surface that has not been coated with LEPEC.***

(2) Apply a 1/2-inch wide strip of LEPEC over the length of the bristles of the carding brush and brush the surface to be cleaned.

(3) As the LEPEC begins to dry while brushing, apply additional compound to the carding brush and continue brushing. Remove lead particulate from the carding brush by striking the brush against a solid object. The lead particulate should be caught in a container and disposed of in accordance with local practices covering scrap lead disposal.

(4) When the lead surface has been thoroughly cleaned, remove excess LEPEC with a clean, dry cloth. Since stearine is a component of the LEPEC, it is not necessary to apply additional stearine to the cleaned area to protect against oxidation. Dispose of cleaning cloths in accordance with local practices covering scrap lead disposal.♦

2. DESCRIPTION (FLANGES)

C PRESSURE FLANGE

2.01 The C pressure flange (Fig. 1) is made of tinned bronze and is sealed with a C pressure flange plug (paragraph 3.04). The C pressure flange is furnished in packages of 25. This flange is used in:

(a) Placing a temporary valve such as the F pressure testing valve for measuring pressure in lead sheathed cable.

(b) Sealing existing holes in lead sleeve or lead sheath cable.

(c) Making C cable drill pressure measurements. To avoid loss of air, solder the flange in position on the lead sheathed cable before drilling hole.

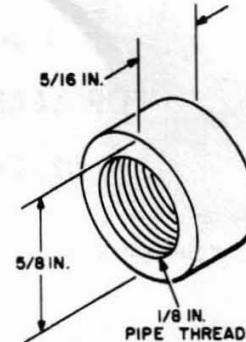


Fig. 1—C Pressure Flange

F PRESSURE FLANGE

2.02 The F pressure flange (Fig. 2) consists of the following:

(a) A black rubber saddle with a sealing compound protected by release paper on the underside. The sealing compound has an approximate 1-inch square opening. The saddle is equipped with a flange having a brass insert with a 1/8-inch female pipe thread that will accommodate a variety of fittings.

(b) A strip of thin sheet metal with a hole punched in the center to fit over the flange.

(c) A green plastic warning marker cap, for use when the flange is not used as a pressure connection. The cap bears the following legend:

**SHEATH REPAIR FLANGE
NOT A PRESSURE CONNECTION**

2.03 The release paper protects the sealing compound against contamination before installation.

2.04 Two C sealing clamps (Fig. 3) are required for installing the F pressure flange and must be ordered separately.

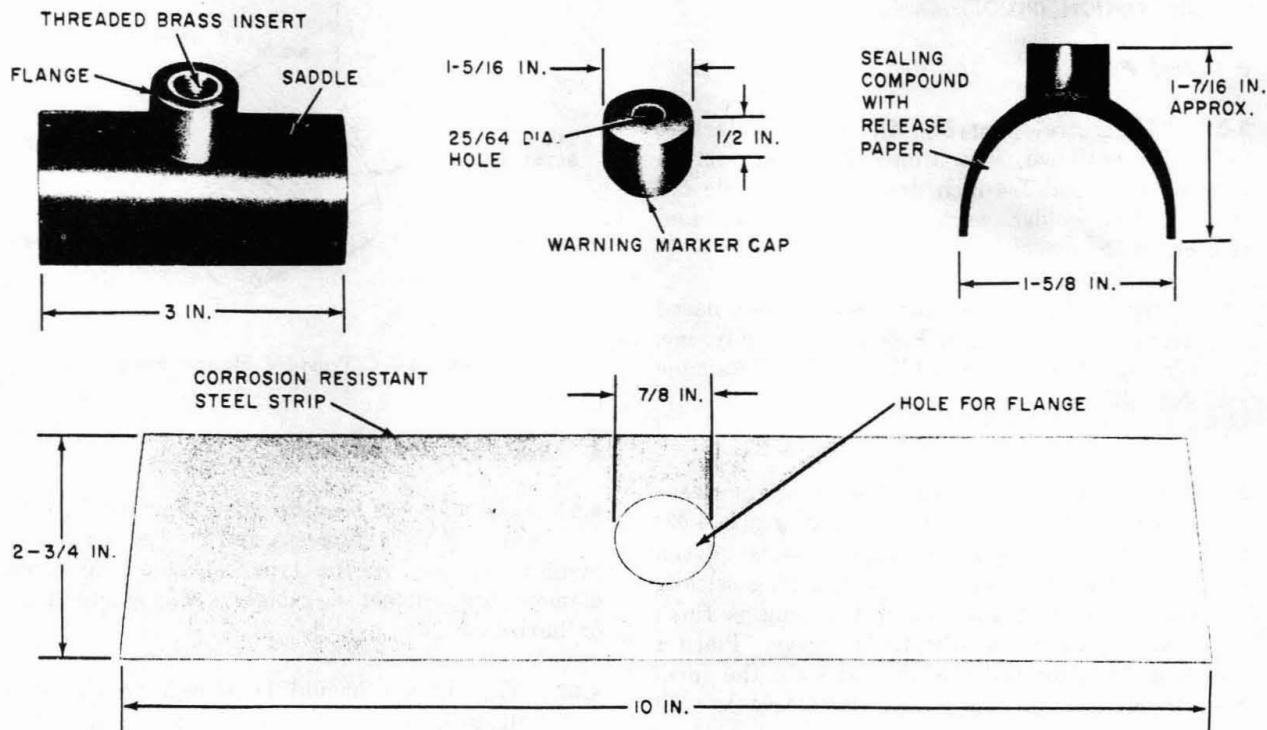


Fig. 2—F Pressure Flange

2.05. The F pressure flange is used to provide an air pressure connection on a 3/4-inch or larger cable. The brass insert accommodates any of the following fittings:

- (a) F pressure testing valve (Section 637-235-100)
- (b) B and C plastic tubing fittings (Section 637-235-100)
- (c) Any other fitting having 1/8-inch male NPT threads.

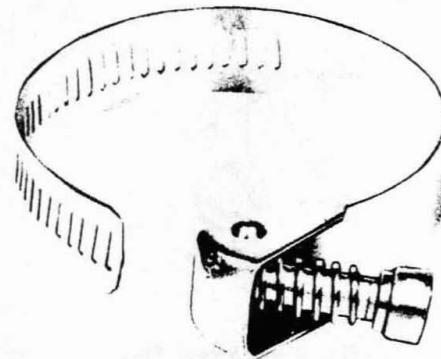


Fig. 3—C Sealing Clamp for F Pressure Flange

3. DESCRIPTION (PLUGS)

B SCREW PLUG

3.01 The B screw plug (Fig. 4), rated Manufacture Discontinued, is a tinned brass set screw. It is used to seal 1/4-inch drilled holes made for flash testing solder work on lead sheaths and sleeves.

Note: The B screw plug may be purchased from General Machine Products Company, Inc., Trevose, Pennsylvania 19047—GMP Catalogue No. 7278.

3.02 To install the plug, scuff the sheath or sleeve with a B carding brush (paragraph 1.03) around the hole where the plug is to be placed and coat with stearine. Install the plug with a screwdriver so that the top of the plug is flush with the surface of the sheath or sleeve. Place a soldering form around the plug and fill the form with solder, making sure that the sleeve is well tinned.

3.03 ***Do not use the plug in sealing holes in pressurized cable***, due to the possibility of air leakage during soldering. Use a C pressure flange, with a C pressure flange plug, to seal holes in pressurized cables.

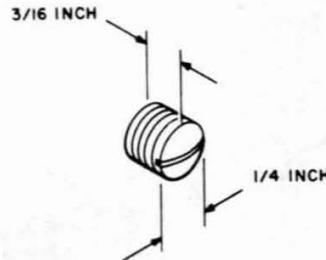


Fig. 4—B Screw Plug

C PRESSURE FLANGE PLUG

3.04 The C pressure flange plug (Fig. 5) is a hex head brass plug with 1/8-inch pipe threads. It is used for sealing C, F, and similar flanges. Order the plugs separately as needed, since they are not furnished as part of the flange. The plug is furnished in packages of 25.

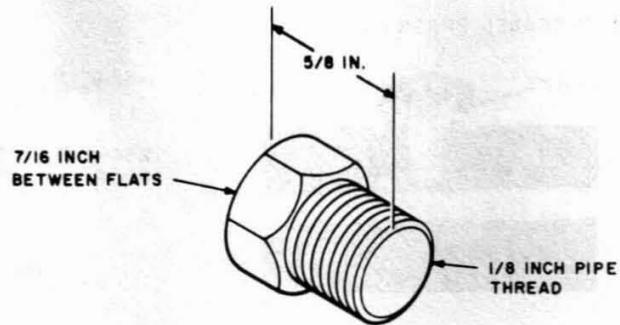


Fig. 5—C Pressure Flange Plug

4. INSTALLATION METHODS

4.01 The methods used for installing the fittings are shown in Tables A and B. The particular method depends on the type of cable, the cable diameter, and whether the cable is aerial, underground, or buried.

4.02 The fittings should be placed on the side of aerial cable or offset from the strand.

TABLE A

METHODS OF INSTALLING VALVES, FLANGES, ELLS, OR FITTING ON AERIAL CABLE

CABLE DIA (INCHES)	LEAD	ALPETH, STALPETH	PAP, PASP
Up to 0.75	C Pressure Flange	13A Splice Case	13A Splice Case
0.75 to 1.00	C or F Pressure Flange	13A Splice Case or F Pressure Flange	13A Splice Case or F Pressure Flange
1.01 to 1.60	C or F Pressure Flange	F Pressure Flange	14A Splice Case or F Pressure Flange
1.61 and larger	C or F Pressure Flange	F Pressure Flange	Split Sleeve or F Pressure Flange

TABLE B

METHODS OF INSTALLING VALVES, FLANGES, ELLS,
OR FITTINGS ON UNDERGROUND OR BURIED CABLE

CABLE DIA (INCHES)	LEAD	ALPETH, STALPETH	PAP. PASP
Up to 0.75	C Pressure Flange	Split Sleeve	Split Sleeve
0.75 to 1.00	C or F Pressure Flange	Split Sleeve or F Pressure Flange	Split Sleeve or F Pressure Flange
1.01 to 1.60	C or F Pressure Flange	F Pressure Flange	Split Sleeve or F Pressure Flange
1.61 and larger	C or F Pressure Flange	F Pressure Flange	Split Sleeve or F Pressure Flange

(5) To hold the flange in place, engage the flat hooks of the B flange clamp in the upper edge of the flange as shown in Fig. 6 and adjust the length of the chain by engaging the appropriate links in the open S hooks. Center the spring to equalize the tension on the chains.

Note: ♦The B flange clamp (AT-7306) is rated Manufacture Discontinued; however, this item may be purchased from General Machine Products Company, Inc, Trevose, Pennsylvania 19047—GMP catalog No. 7306.♦

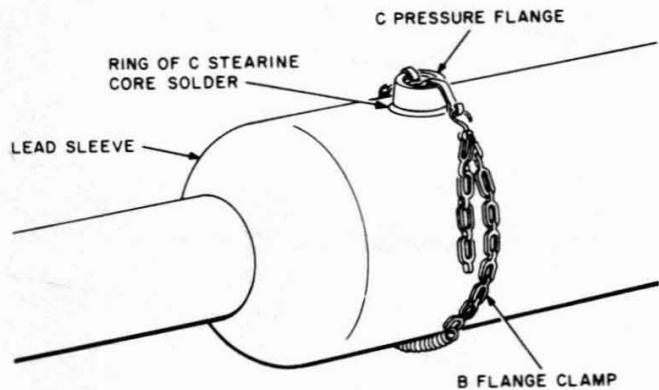


Fig. 6—Placing C Pressure Flange

C PRESSURE FLANGE METHOD

4.03 The C pressure flange is installed on lead sheathed cable or lead sleeves as follows:

- (1) Scuff the sheath or sleeve with a carding brush (paragraph 1.03) where the flange is to be placed and coat with stearine.
- (2) When the flange is to be soldered to a relatively small diameter cable or sleeve, slightly flatten the sheath or sleeve to provide a closer fit, which will facilitate soldering.
- (3) Form a ring from a piece of C stearine core solder 2-1/2 inches long.
- (4) Place the flange on top of the sleeve and place the solder ring around the base of the flange.

- (6) If sealing an existing hole or if the hole was drilled prior to installing the flange, plug the hole with paper or muslin to prevent solder from flowing into the hole during the soldering operation.
- (7) Apply a hot soldering copper to the top of the flange or play the flame from a torch on the flange until the solder flows and adheres evenly to the flange and sheath.
- (8) Drill a hole in the sheath and prepare the sheath as covered in ♦Section 637-235-100, Part 9.♦
- (9) Be sure to remove the paper or muslin from the drill hole after the solder work is completed, and make sure that the opening is clear for the free flow of air.

(10) Before placing either the C pressure flange plug or F pressure testing valve in the flange (Fig. 7), coat the threads with teflon pipe sealing tape to ensure an airtight seal.

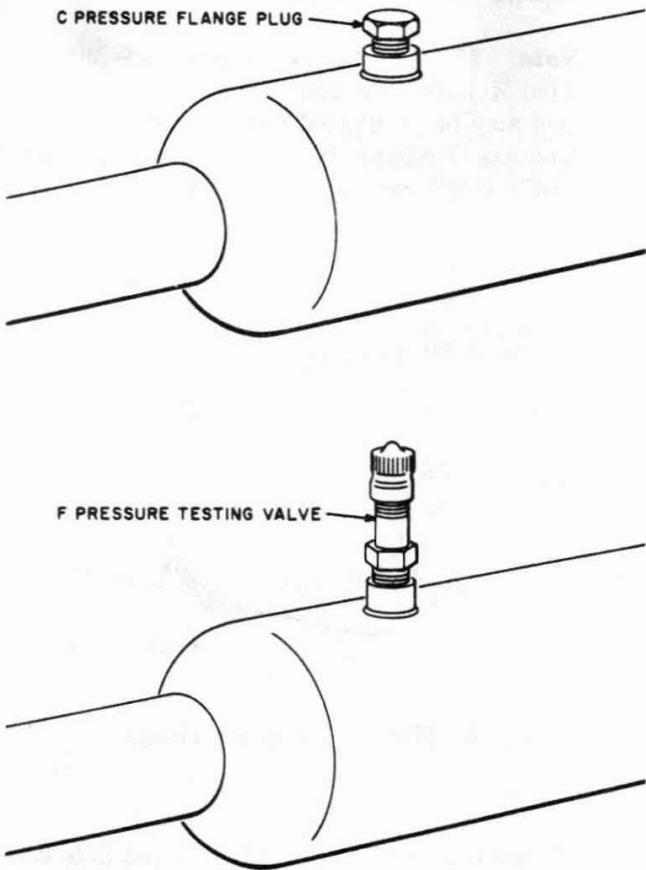


Fig. 7—Placing Flange Plug or Pressure Testing Valve in C Pressure Flange

(11) Seal the flange by means of a C pressure flange plug. When it is necessary to apply air pressure or to take pressure readings, replace the plug with the F pressure testing valve. The F pressure testing valve may be either left in place or replaced with the plug, whichever agrees with company policy. A 7/16-inch wrench may be used to place and remove the valve and plug.

F PRESSURE FLANGE METHOD

4.04 The F pressure flange is installed on lead, alpeth, or stalpeth cables as follows:

- (1) Scuff the surface area of the sheath to be covered by the saddle with a B carding bursh (paragraph 1.03).
- (2) Using a cable drill, drill a hole through the sheath at the pressure fitting location. **Exert light pressure on the drill to avoid pressing the cut metal edges into the core. Remove jagged metal edges with tweezers.**
- (3) Prepare the sheath by the muslin spacing method (for pulp cable only) to preserve the dielectric strength between core and sheath (Section 637-235-100). **Do not press the cut metal edges into the core.**
- (4) Apply a thin coat of C cement to the entire scuffed area around the drilled hole.
- (5) Carefully place a KS-6320 orange stick between the conductors in the center of the drilled hole and leave the stick in place.
- (6) Remove the release paper from the flange saddle. Place the orange stick through the insert opening in the flange, as shown in Fig. 8. Then press down on the saddle to seat the flange against the cable sheath.

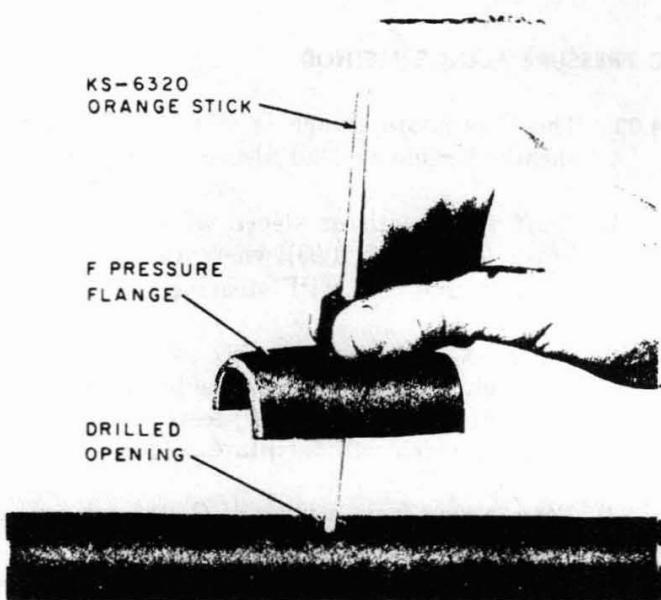


Fig. 8—Placing Flange

(7) Hold the flange in place with two turns of vinyl tape on each side of the flange and remove the orange stick (Fig. 9).

(8) Open the two sealing clamps and place loosely around the cable on each side of the prepared sheath area.

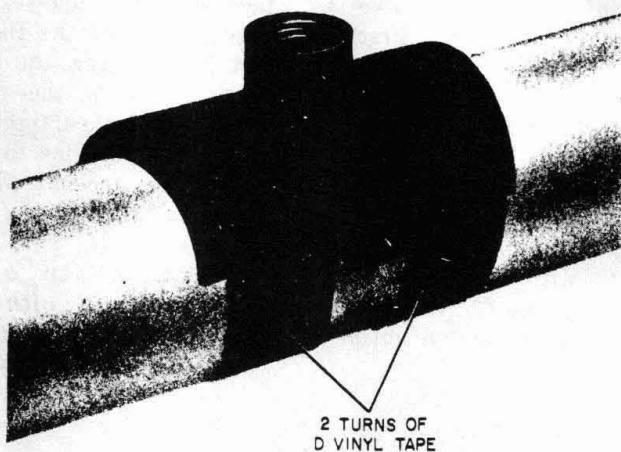


Fig. 9—F Pressure Flange Saddle Taped to Cable

(9) Place the hole in the strip of sheet metal over the flange and form the strip snugly around the flange. Using shears, cut one end of the strip so the end lies directly under the cable and parallel to it (Fig. 10).

(10) Cut the other end of the strip in like manner so that its edge overlaps the first edge by about 1 inch.

(11) Cut 45-degree 1/4-inch corners off the strip; then, smooth all cut edges with a file.

(12) Position the sealing clamps on the strip near the flange ends, with the heads of the tightening screws at the bottom of the cable, and tighten securely. Alternately tighten until both clamps are secure.

(13) **♦**Inspect the threads of the valve or fitting to be installed in the flange to ensure that they are free from burrs and nicks that would prevent a good air seal. To prevent the engaged threads from galling or seizing, the male threads shall be coated with pipe-stick, teflon pipe-sealing tape, or teflon pipe-sealing spray. Holding the neck portion of the flange between the thumb and finger, screw the valve or fitting into the brass insert of the flange, using a suitable wrench, and then tighten **carefully** until the neck portion begins to twist (approximately 40 inch-pounds torque). The F pressure flange is shown installed in Fig. 11.

Warning: An excessive amount of torque will either break the flange neck or twist the brass insert out of the neck.♦

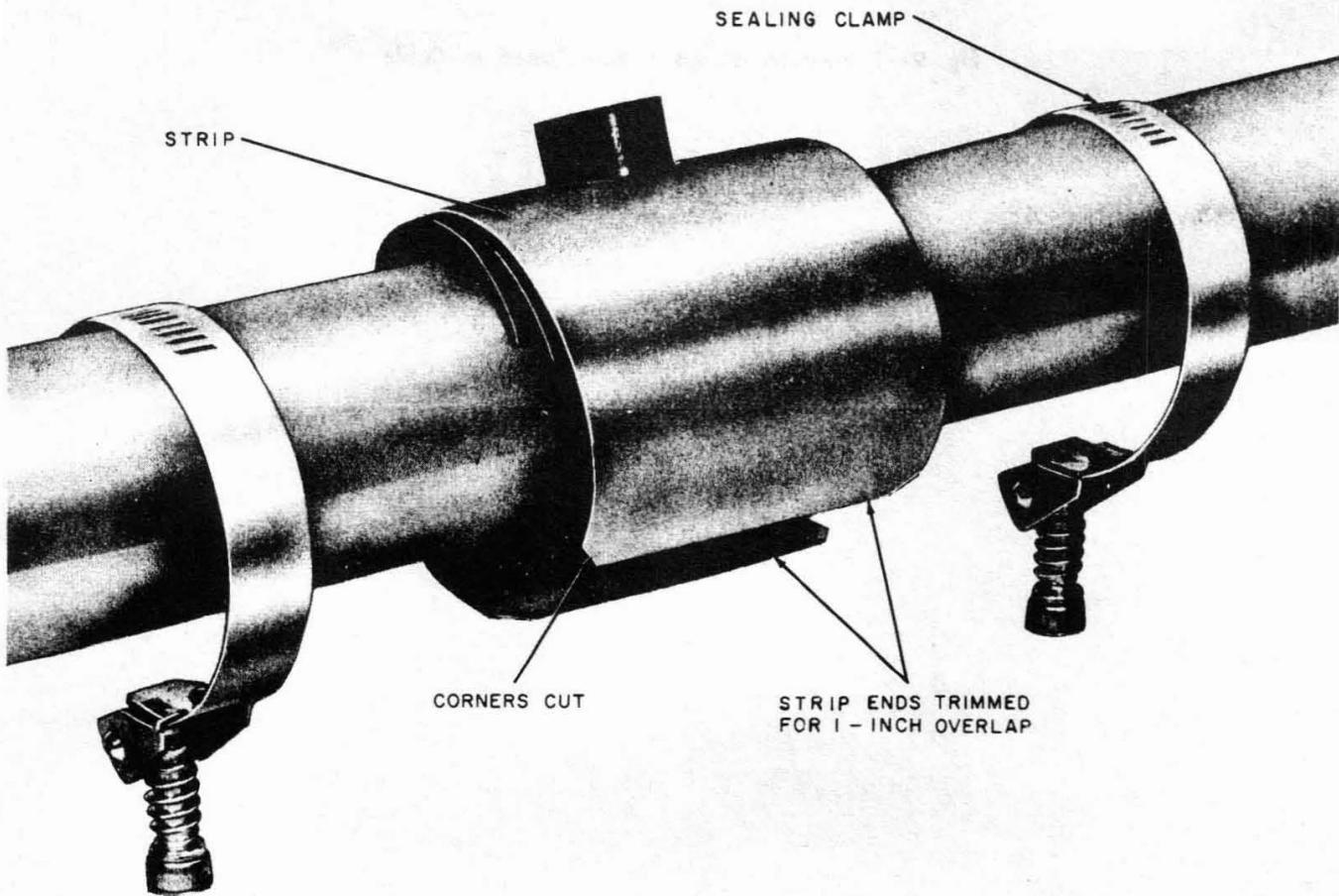


Fig. 10—Strip Formed Around Saddle and Cable

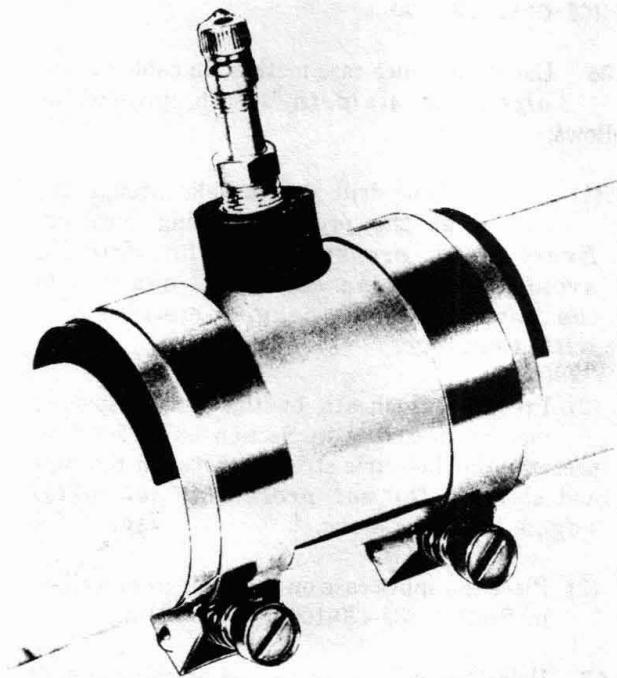


Fig. 11-F Pressure Flange Installed

4.05 Using the F pressure flange method of cable having **PAP** or **PASP** sheath, proceed as follows:

- (1) As illustrated in Fig. 12, mark the cutout area on the outer polyethylene jacket on top of the cable at the pressure fitting location. Using a B carding brush, scuff the surface of the jacket for 1/2 inch around the marked area. Cut out and remove the outer polyethylene jacket inside the marked area.

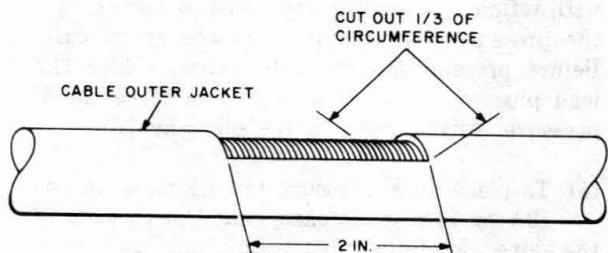


Fig. 12—Cutout in Outer Jacket

- (2) Remove the underlying metal (aluminum if PAP, aluminum and steel if PASP) to the edges of the cutout area. Do not damage the inner polyethylene jacket. Carefully turn the metal edges away from the inner polyethylene jacket to maintain dielectric strength. Remove any metal slivers with tweezers.
- (3) Using a cable drill, make a hole in the center of the inner polyethylene jacket to expose the core wrap. Make an opening in the core wrap without damaging the conductor insulation.
- (4) Cut three strips of 2-inch DR tape slightly longer than the cutout area. Press the strips together to form a 3-layer insulating pad. Cut a 1/4-inch hole with scissors in the center of the pad (Fig. 13).

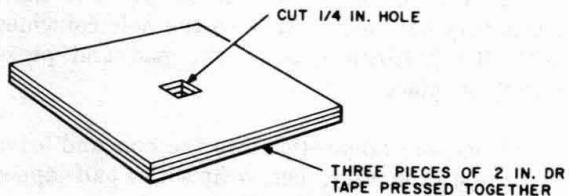


Fig. 13—Insulating Pad

- (5) Carefully trim the pad to fit in the cutout in the outer polyethylene jacket. The pad should butt against the cut edges of the polyethylene along all four sides.
- (6) Remove the pad from the cutout. Coat the exposed inner polyethylene jacket and the cut edges of the outer polyethylene jacket with C cement and allow to dry. **Do not allow cement to get into the drilled hole.**

(7) Place the pad back in the cutout and press firmly in position. Coat the insulating pad and the area of the outer jacket around the pad with C cement and allow to dry (Fig. 14).

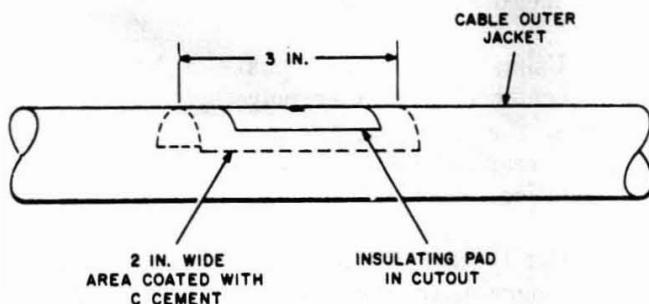


Fig. 14—Cutout With Pad in Place

(8) Cut a strip of 2-inch DR tape to cover this area. Cut a small hole in the DR tape. Place this strip of DR tape so the hole coincides with the 1/4-inch hole in the pad and press firmly in place.

(9) Place an orange stick into the hole and leave the stick in place; then, wrap with a half-lapped layer of vinyl tape (Fig. 15)

(10) Follow the procedure outlined in paragraph 4.04 (6) through (13) to complete the installation.

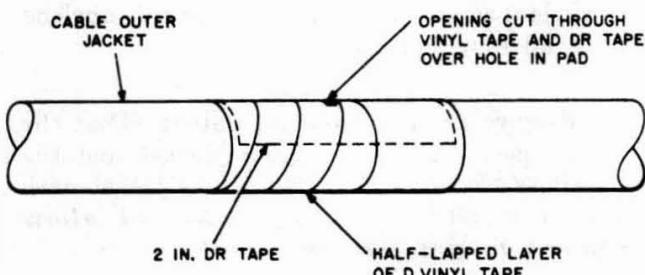


Fig. 15—Insulating Pad Wrapped

SPlice CASE METHOD

4.06 Using the splice case method on cable having **alpeth** or **stalpeth** sheath, proceed as follows:

- (1) Using a cable drill, drill a hole through the sheath at the pressure fitting location. **Exert light pressure on the drill to avoid pressing the cut metal edges into the core. Remove jagged metal edges with tweezers.**
- (2) Prepare the sheath by the muslin spacing method described in Section 637-235-205 to preserve the dielectric strength between the core and sheath. **Do not press the cut metal edges into the core.**
- (3) Place the splice case on the cable as described in Section 633-470-100.

4.07 Using the splice case method on cable having **PAP** or **PASP** sheath, proceed as follows:

- (1) Follow the procedures outlined in paragraph 4.05 (1) through (8) to prepare the sheath for splice case installation.
- (2) Place an orange stick into the hole; then, wrap with a half-lapped layer of vinyl tape (Fig. 15). Remove the orange stick after wrapping.
- (3) Place the splice case on the cable as described in Section 633-470-100.
- (4) To place the B pressure ell in the 13A or 14A splice case, coat the threads of the ell with teflon pipe sealing tape. Screw the ell into the pressure testing flange on the splice case. Before pressurizing the splice case, solder the lead pipe to the ell pipe stem and place the F pressure testing valve in the ell (Fig. 16).
- (5) To place an F pressure testing valve in the 13A or 14A splice case, coat the threads of the valve with teflon pipe sealing tape and screw the valve into the pressure testing flange on the splice case (Fig. 17).

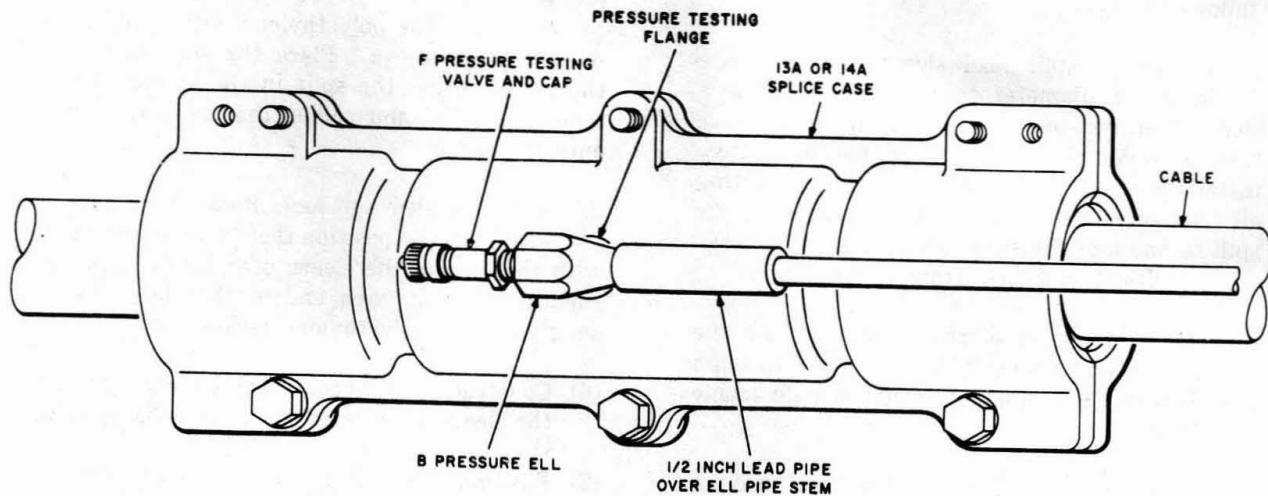


Fig. 16—Splice Case With B Pressure E11 and F Pressure Testing Valve Installed

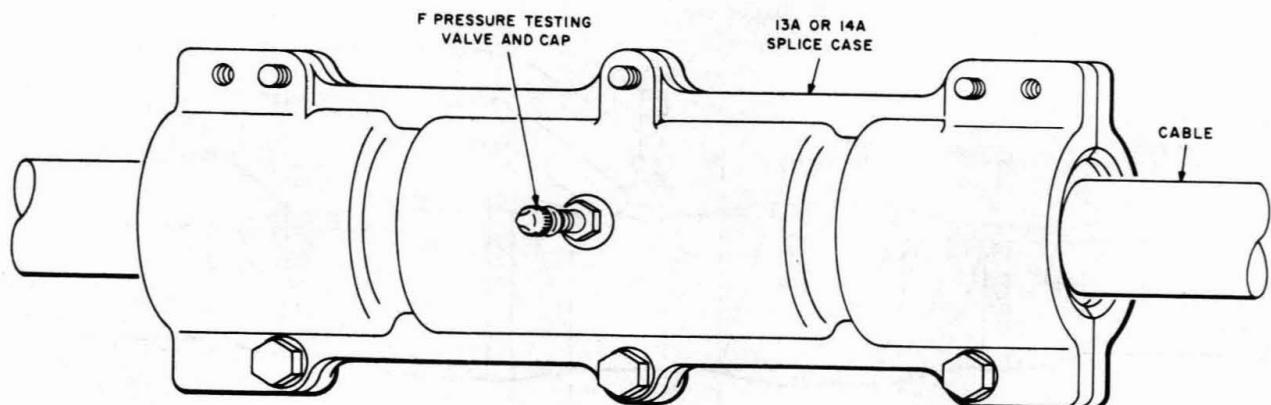


Fig. 17—Splice Case With F Pressure Testing Valve Installed

SPLIT SLEEVE METHOD

4.08 Using the split sleeve method on cable having **alpeth** or **stalpeth** sheath, proceed as follows:

- (1) Prepare a split lead sleeve the next size larger in diameter than the cable. Use a sleeve 8 inches long for either an F pressure testing valve and C pressure testing flange installation or a B pressure ell or pressure testing ell connection. Bevel the outer edges along the split to one-half the sleeve thickness and remove the identification ridges from the sleeve.
- (2) Mark the center of the sleeve opposite the split. Using a cable drill, drill a hole through the sleeve at the mark. Bevel the hole inside the sleeve.
- (3) Using the cable drill, drill a hole through the sheath at the pressure fitting location. **Exert light pressure on the drill to**

avoid pressing the cut metal edges into the core. Remove jagged metal edges with tweezers.

- (4) Wrap the outer jacket with muslin to avoid damaging the polyethylene with heat when soldering the sleeve. Place the lead sleeve on the cable. Close the split in the sleeve with a seam of solder, and solder the pressure flange onto the sleeve.
- (5) Allow the sleeve to cool. Remove the muslin wrapping and position the sleeve on the cable with the hole in the sleeve over the hole in the sheath. Beat in each end of the sleeve to fit snugly on the polyethylene jacket.
- (6) Construct a wrapped joint on each end of the sleeve, as covered in Section 633-300-200.
- (7) Position two sealing clamps on each wrapped joint as described in Section 633-300-204. The complete installation is shown in Fig. 18.

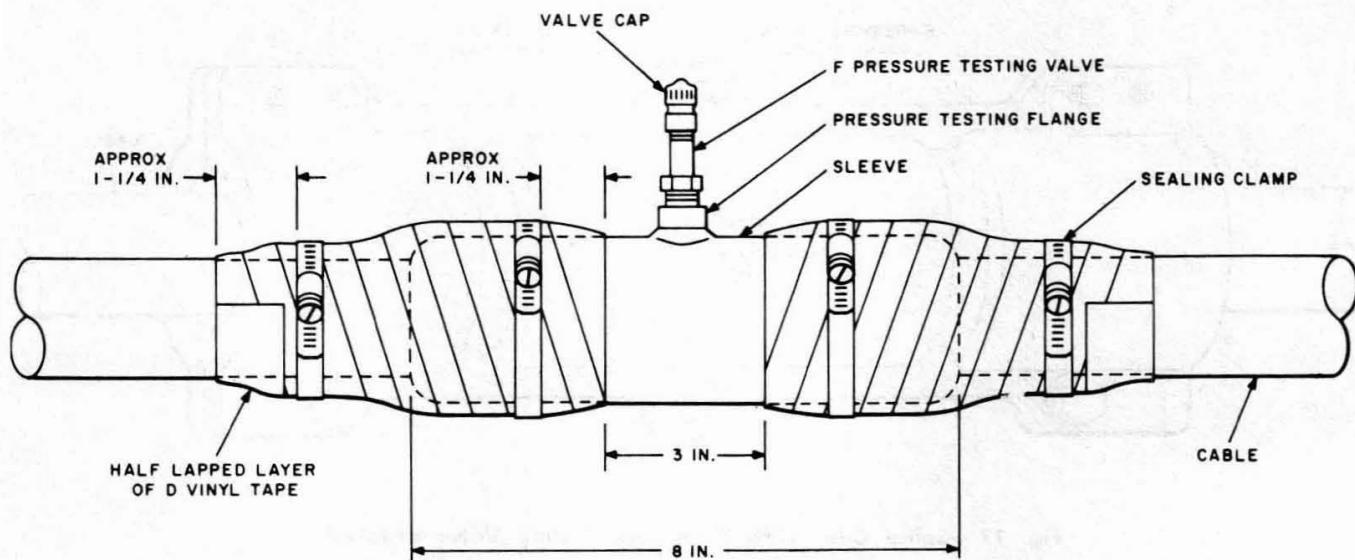


Fig. 18—Split Sleeve Installed

4.09 Using the split sleeve method of cable having **PAP** or **PASP** sheath, proceed as follows:

- (1) Follow the procedures outlined in paragraph 4.05 (1) through (8) to prepare the sheath for split sleeve installation.
- (2) Place an orange stick into the hole; then, wrap with a half-lapped layer of vinyl tape (Fig. 15). Remove the orange stick after wrapping.
- (3) Place the split sleeve and complete the installation as described in paragraph 4.08 (4) through (7).

5. INSTALLATION OF F PRESSURE FLANGE FOR RECLAIMING WET BURIED PIC CABLE

SHEATH PREPARATION (ALPETH)

5.01 At the injection and bleed points, a 1-inch "window" (or smaller, depending on cable size) is placed in the cable sheath as follows:

- (1) With a B carding brush, scuff the sheath around the entire circumference for a distance of approximately 6 inches (Fig. 19).

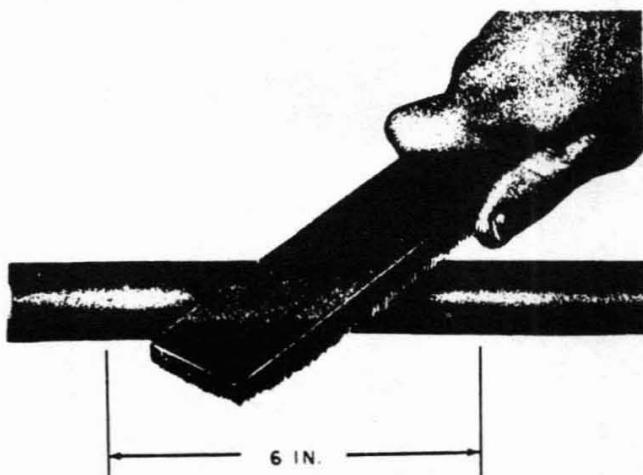


Fig. 19—Scuffing Sheath

- (2) Cut out and remove a 1-inch square of the outer poly-jacket at the top of the cable in the center of the scuffed area (Fig. 20).

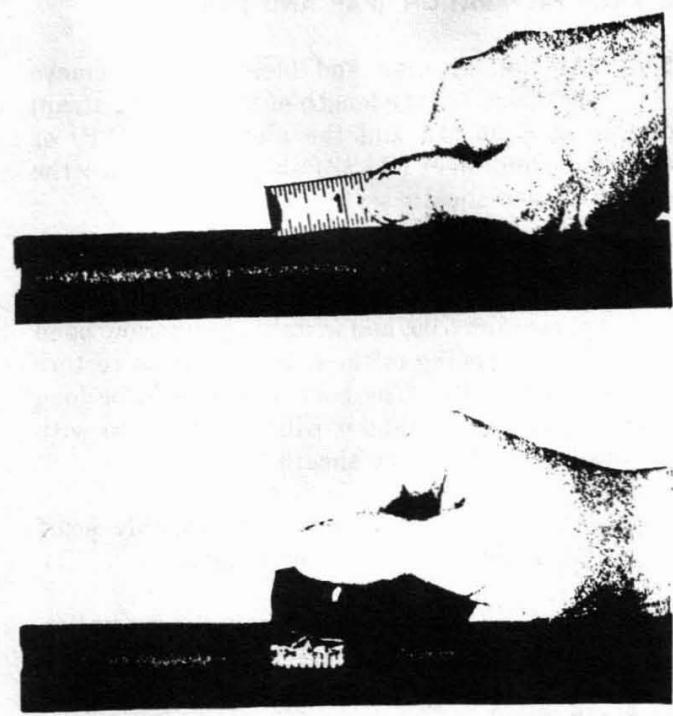


Fig. 20—Measuring and Removing Poly-Jacket

- (3) Carefully remove the inner aluminum shield, taking care not to damage the conductors (Fig. 21).

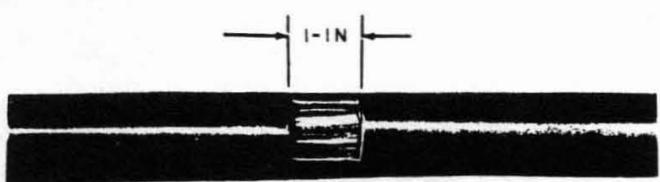


Fig. 21—1-Inch Opening Completed

- (4) Remove the exposed core wrapper and all unit binders that are accessible through the "window."

SHEATH PREPARATION (PAP AND PASP)

5.02 At the injection and bleed points, remove 12 inches (or the length of the bonding strap) of the outer sheath and the aluminum (PAP) or aluminum and steel (PASP) shields. Prepare the exposed inner sheath as follows:

- (1) Place two D bond clamps as mentioned in paragraph 5.05, and install a temporary bond across the opening in the outer sheath to restore shield continuity. The bond wire should be long enough to ensure that it will not interfere with working on the inner sheath.
- (2) With a B carding brush, thoroughly scuff the entire exposed inner sheath.
- (3) Carefully remove a 1-inch square (or smaller, depending on cable size) of the inner sheath at the top of the cable in the center of the outer sheath opening.
- (4) Remove the exposed core wrapper and all unit binders accessible through the opening. Take care not to damage the conductors.

INSTALLATION

5.03 The F pressure flange is installed over the "window" cut in the cable sheath (paragraph 5.01 or 5.02) similar to the installation covered in paragraph 4.04 (4) through (13). Flash test the installed flange at 15 psi and check for leaks.

RESTORING ELECTRICAL SHIELD CONTINUITY—PAP AND PASP

5.04 For reasons of safety and transmission, the shield electrical continuity of PAP and PASP sheathed cables **must be restored** across that portion removed for installation of the flange.

5.05 Restore the shield electrical continuity with D bond clamps, as outlined in Section 081-852-118.

5.06 Place two layers of half-lapped 2-inch DR tape over the sheath opening and three inches beyond each end. **Do not** cover the pressure flange opening.

5.07 Place the two layers on half-lapped vinyl tape over the DR tape wrapping.