10-TYPE CLOSURE

DESCRIPTION AND INSTALLATION

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1. GENERAL

1.01 This section covers the description and installation of the 10-type closure used to repair buried PIC cables. Information outlined herein was originally contained in Section 629-295-301.

1.02 The 10-type closures provide a facility for encapsulation of splices in buried PIC air core cables.

1.03 Wire joints are vulnerable to the effects of moisture. Moisture entering a sheath will migrate to the wire joints. Therefore, it is necessary to protect them from moisture. This can be done in several ways, depending on the requirements, as follows:

(a) Where reentry into the splice is not required, the splice can be encapsulated within a 10-type closure.

(b) Where it is known that the splice will need to be reentered, splice the conductor with 700- or 710-type connectors and enclose using 16-type closure (Section 631-600-216) filled with D encapsulant.

2. PRECAUTIONS

2.01 Careful consideration must be exercised in all work operations, to ensure that safe conditions exist for employees, for other persons, and for tools and supplies.

2.02 Electrical continuity of the cable shield must be established across all sheath openings using B temporary bond AT-7781 until the permanent bond is installed.

2.03 Become familiar with the following practices:

- 620-135-012 Guarding Work Areas
- 629-100-010 Buried Plant Precautions

3. DESCRIPTION

3.01 The 10A1, 10B1, 10C1, and 10D1 cable closures are a formed plastic cover, hinged at the bottom, and after installation closed at the top by means of C clamps. Figure 1 illustrates a 10-type closure. Table A lists the dimensions.

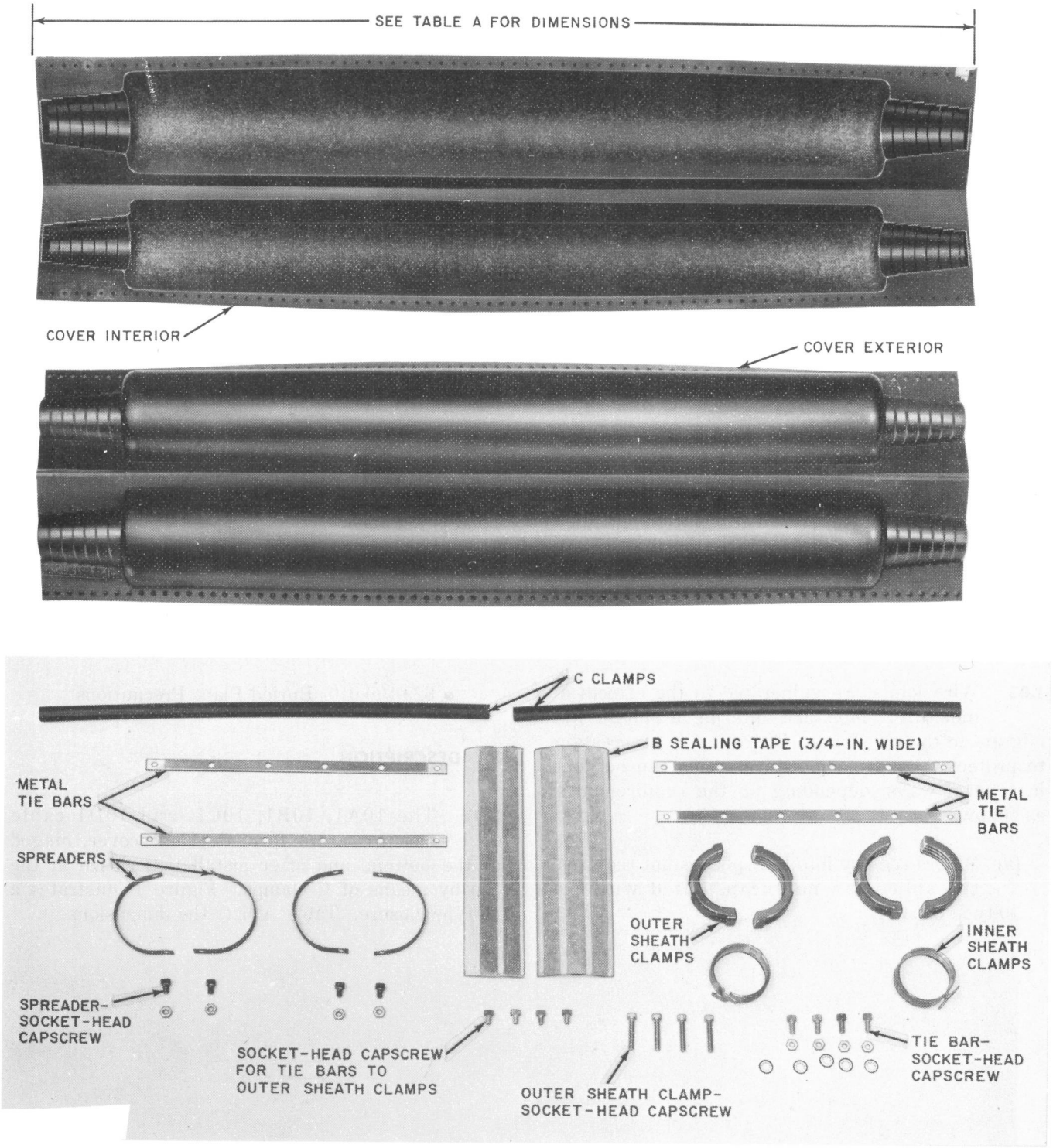


Fig. 1—10-Type Closure

TABLE A

10-TYPE CABLE CLOSURES
DIMENSIONS

CABLE CLOSURE	CABLE DIA (INS.)	INSIDE DIA (INS.)	LENGTH (INS.)
10A1	To 1	3	25-1/2
10B1	1.1 to 1.6	3-1/2	30
10C1	1.7 to 2.2	4	32
10D1	2.3 up	4-1/2	34

3.02 Each 10-type closure consists of the following components:

(a) ***Cover:*** Used to enclose the splice. A molded form of black plastic with treated cavity to which B or C encapsulant will adhere.

(b) ***C Clamps:*** Used to seal the closure after filling with B or C encapsulant. The clamps are pushed on from each end of the cover.

(c) ***Inner Sheath Clamps, (2):*** Used under the metallic shield at each end of the sheath opening to provide shield continuity through the outer sheath clamps and metal tie bars. They are stainless steel with a chamfered corner on one ear.

(d) ***Outer Sheath Clamps, (2):*** Used over the inner sheath clamps at each end of the sheath opening. They make metal-to-metal contact with the inner sheath clamp and metal tie bars to provide shield continuity across the opening. Also, in conjunction with the inner sheath clamp provide mechanical protection against pull out.

(e) ***Metal Tie Bars, (4):*** Used across the sheath opening in conjunction with the inner and outer sheath clamps to provide shield continuity. They also provide mechanical protection against pull outs and rigidity to the sheath opening. Each tie bar has 5 holes for adjustments to the required sheath opening (Fig. 3 and Table B).

(f) ***Spreaders, (2):*** Used to center the wire work. The spreaders are bolted to the tie bars approximately one-third the distance from each end of the sheath opening.

(g) ***B Sealing Tape (3/4-inch wide):*** Used to form collars and inner seal.

(h) ***Socket-Head Capscrews:*** Used to assemble the hardware. A 3/16-inch Allen wrench is required.

3.03 The following materials are required for the closure installation and must be ordered separately:

(a) ***B Paper Tape:*** Used to mark cable sheath for sheath opening.

(b) ***Vinyl Tape E (2-inch wide):*** Used to secure each end of the cover.

(c) ***Vinyl Tape F (1-inch wide):*** Used to tape the stepped ends of the cover to the cable.

(d) ***C Encapsulant:*** Consists of two separate liquid components (Part I and II). When properly mixed it forms a polyurethane compound, for filling closure. (Section 081-852-123)

4. INSTALLATION—SINGLE SHEATH CABLE

4.01 At the sheath opening, using a B measuring tape (Fig. 2) determine the diameter of the cable. Select the required closure as determined by the cable diameter. (See Table A for the type closure as determined by the cable diameter.)

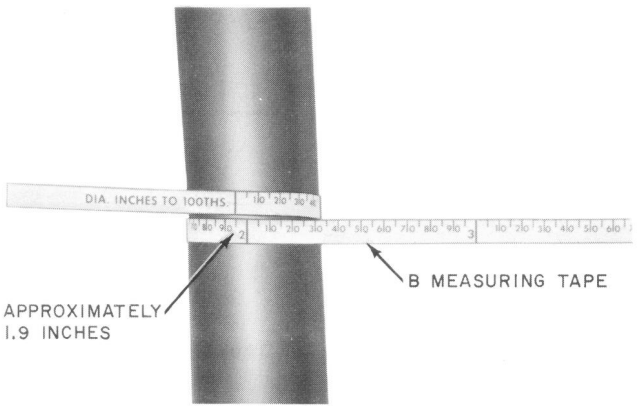


Fig. 2—Measuring Cable Diameter

4.02 Establish the length of the sheath opening as determined by the adjusted length of the tie bars (Fig. 3 and Table B).

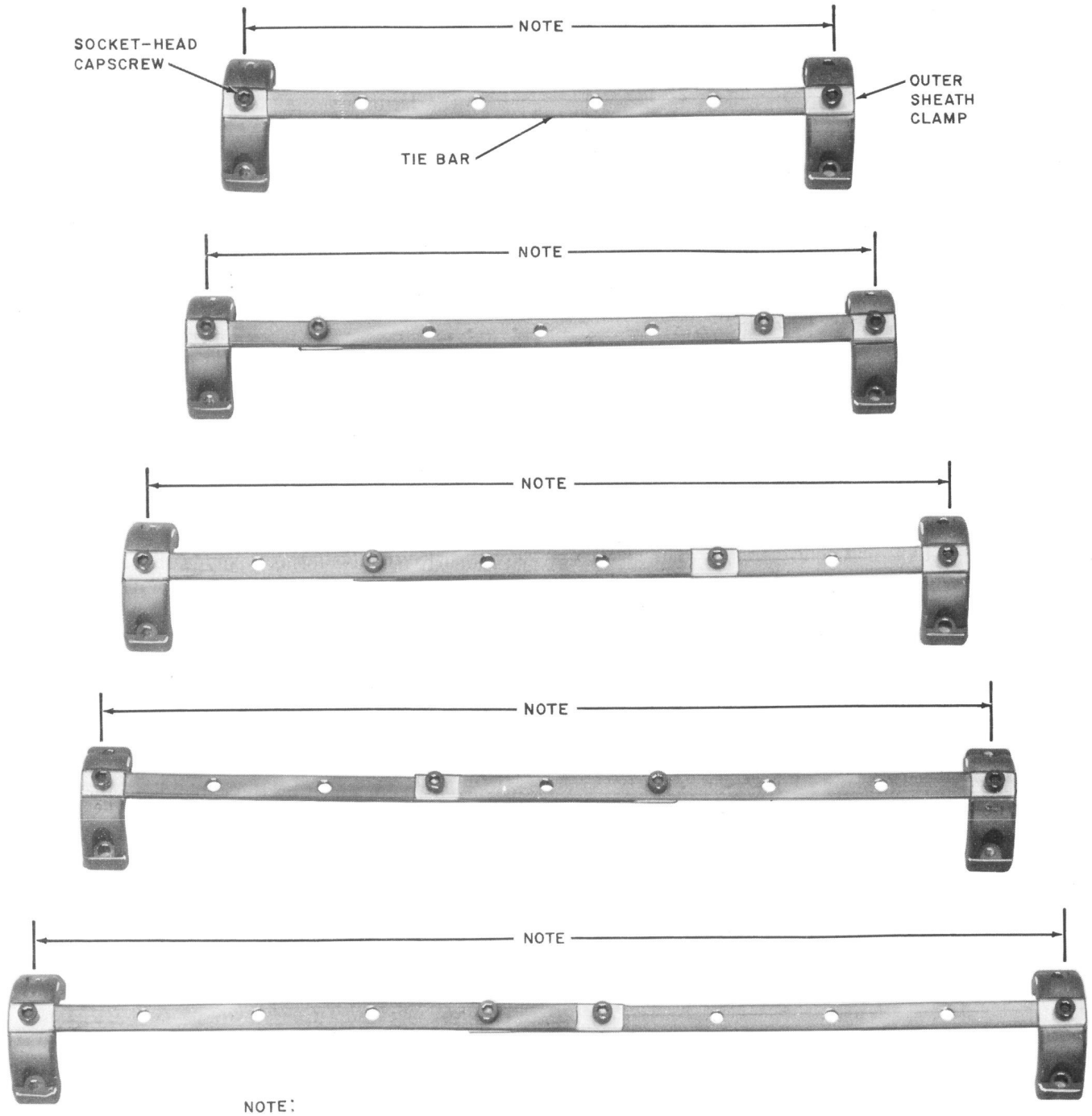


Fig. 3—Tie Bar Lengths

TABLE B

SHEATH OPENINGS
SINGLE SHEATH CABLE

CABLE CLOSURE	LENGTH OF TIE RODS (INS.)	SHEATH OPENING (INS.)
10A1	8-1/2	6-1/2
	10-5/8	8-5/8
	12-3/4	10-3/4
	14-7/8	12-7/8
10B1	10-5/8	8-5/8
	12-3/4	10-3/4
	14-7/8	12-7/8
	17	15
	19-1/8	17-1/8
10C1	11-3/4	9-3/4
	14-1/8	12-1/8
	16-1/2	14-1/2
	18-7/8	16-7/8
	21-1/8	19-1/8
10D1	12-3/4	10-3/4
	14-7/8	12-7/8
	17	15
	19-1/8	17-1/8
	21-1/4	19-1/4
	23-3/8	21-3/8

Note: The distance between centers of the end mounting holes of the tie rods controls all other length measurements.

4.03 Using a carding brush, scuff the cable for approximately 6 inches on each side of the proposed sheath opening. Using B paper tape, mark the sheath opening (Table B), remove the sheath, cut the required number of tabs (Table C), place the inner and outer sheath clamps as illustrated in Fig. 4.

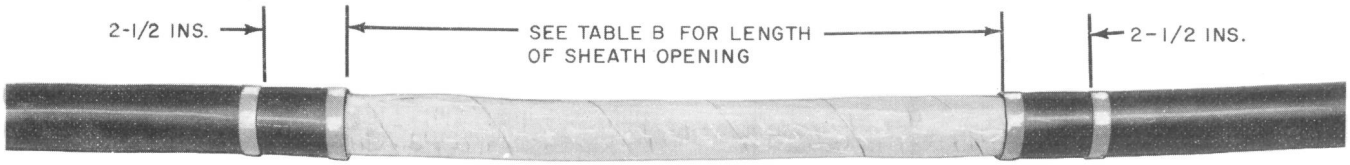
TABLE C

CABLE SHEATH TABBING

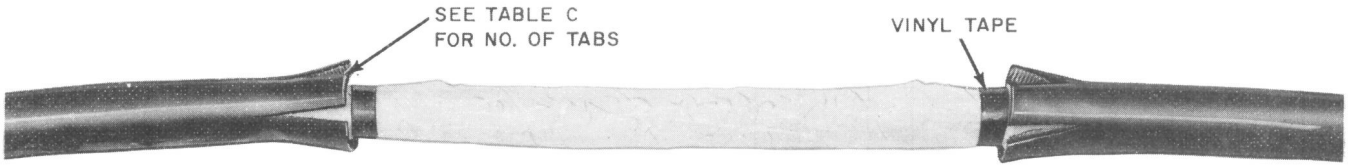
CABLE DIA (INS.)	NO. TABS
Up to 1	3
1.1 to 1.6	4
Over 1.6	8

4.04 Before placing the tie bars, remove all unit binders from the binder groups. At the required length, bolt the tie bars together and bolt to the outer sheath clamps as illustrated in Fig. 5. ***This is the only approved method of providing sheath continuity and adequate mechanical strength.***

DO NOT USE B BOND CLIPS AND B APPLIANCE WIRE FOR THE INNER SHEATH CLAMP. THEY DO NOT PROVIDE ADEQUATE MECHANICAL STRENGTH OR ELECTRICAL BONDING.

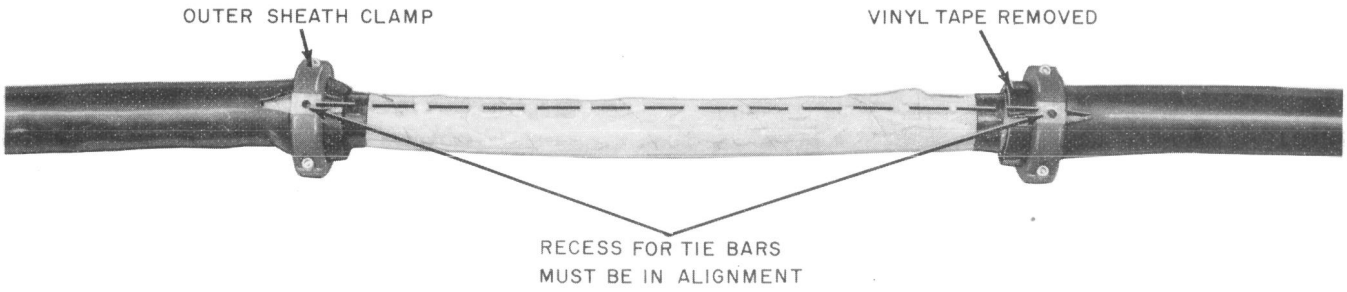


STEP 1 - SHEATH OPENING



STEP 2 - TABBING SHEATH

STEP 3 - PLACING INNER SHEATH CLAMPS



STEP 4 - PLACING OUTER SHEATH CLAMPS

Fig. 4—Sheath Opening—Single Sheath

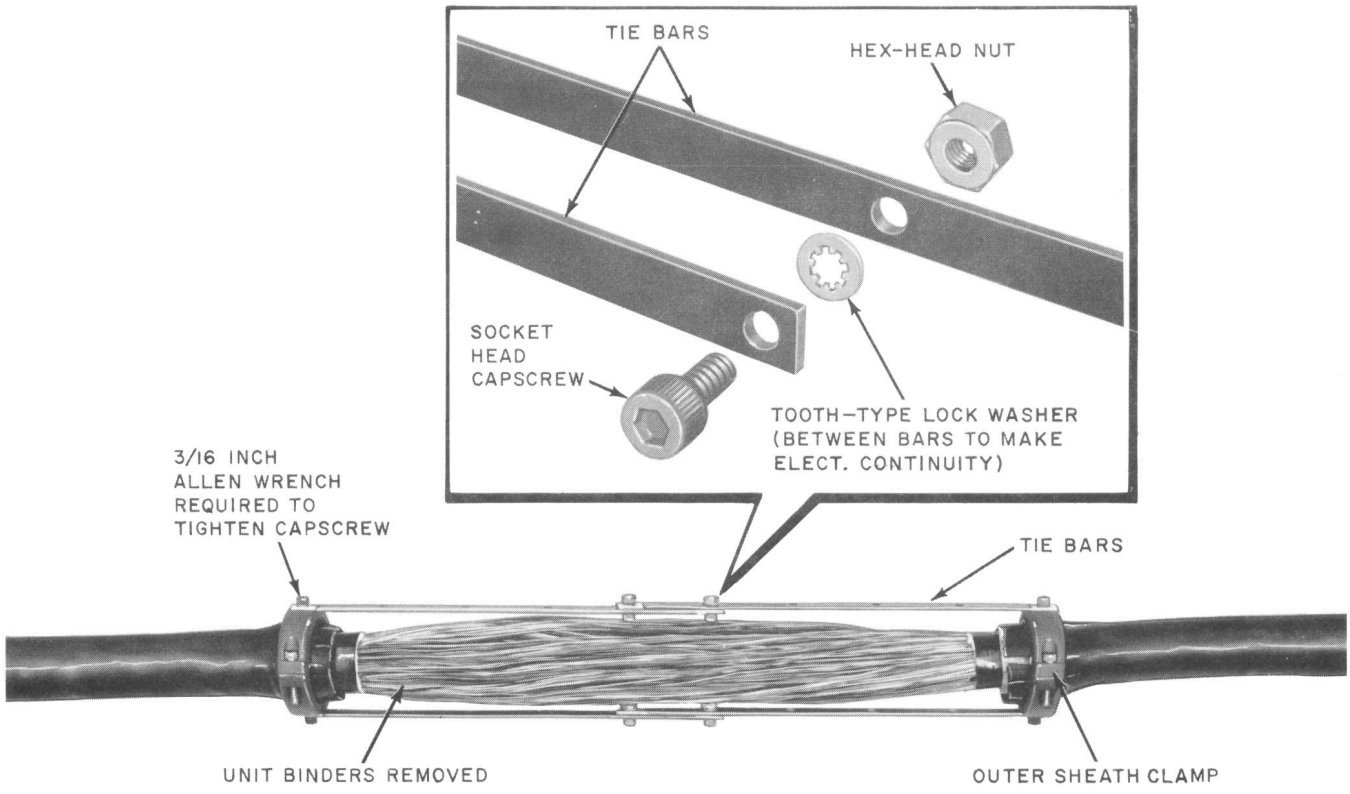


Fig. 5—Tie Bars Placed

4.05 Measure the diameter of the cable (Fig. 2) and at the corresponding step, at each end of the closure cover, using tabing shears or splicer's scissors, cut the ends from the closure cover (Fig. 6). At the next diameter step, tab the closure cover as illustrated in Fig. 6.

4.06 To provide positive adhesion between the sheath and encapsulant and to prevent water from penetrating along the sheath, collars are placed on the cable as follows:

(1) Adjacent to the sheath clamps, place one full wrap of 3/4-inch wide B sealing tape around the cable (Fig. 7). Butt the ends together. Do not stretch the tape.

(2) Overlapping the B sealing tape, with the white side out, wrap 3 layers of 3/4-inch wide DR tape over the B sealing tape (Fig. 7). Fully stretch the DR tape as it is applied. The last layer of the DR tape should not be stretched.

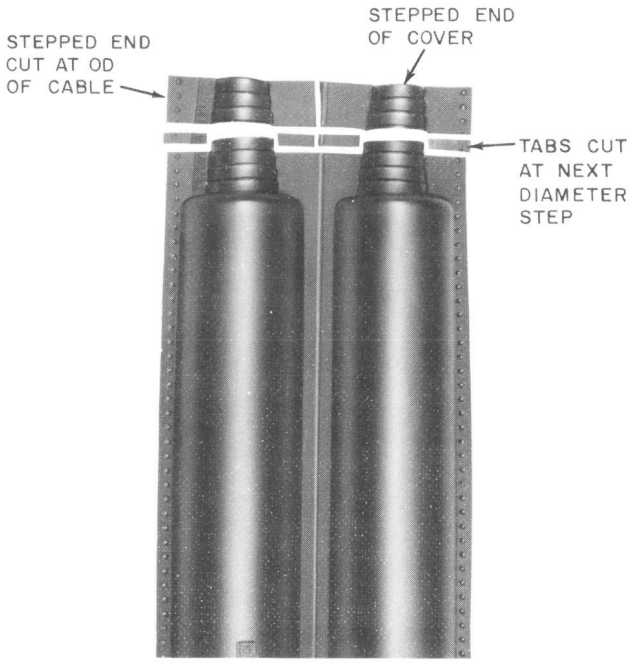
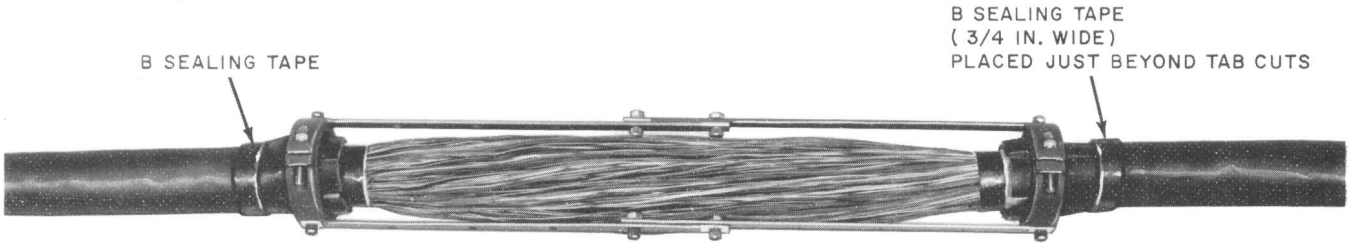
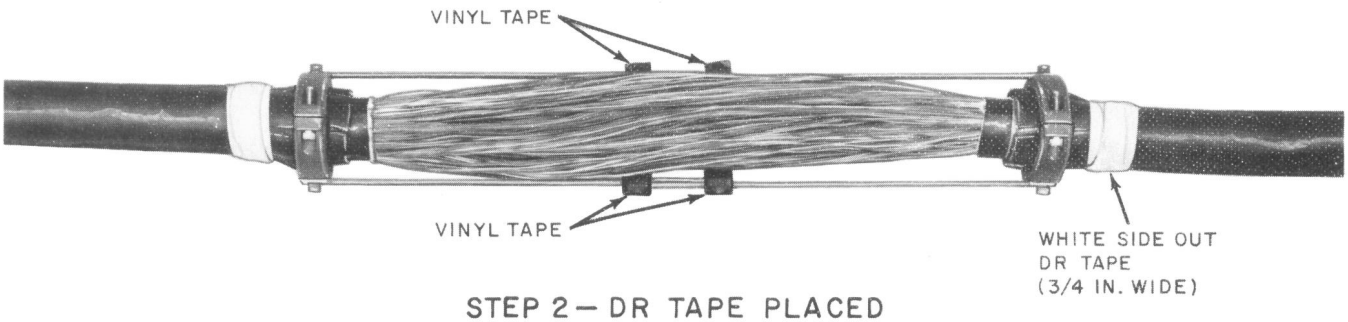


Fig. 6—Preparing Closure Cover



STEP 1 — B SEALING TAPE PLACED



STEP 2 — DR TAPE PLACED

Fig. 7—Inner Collars Placed

4.07 To center the closure cover, place the closure cover over the sheath opening. At each end of the closure cover, place B paper tape markers (Fig. 8).

4.08 Remove the closure cover. Place 3/4-inch wide B sealing tape around the cable at the B paper tape markers (Fig. 9). Butt the ends of the tape. Do not stretch the tape. Bolt the spreaders to the tie bars. Cover the exposed nuts and bolts on the tie bar with vinyl tape (Fig. 9).

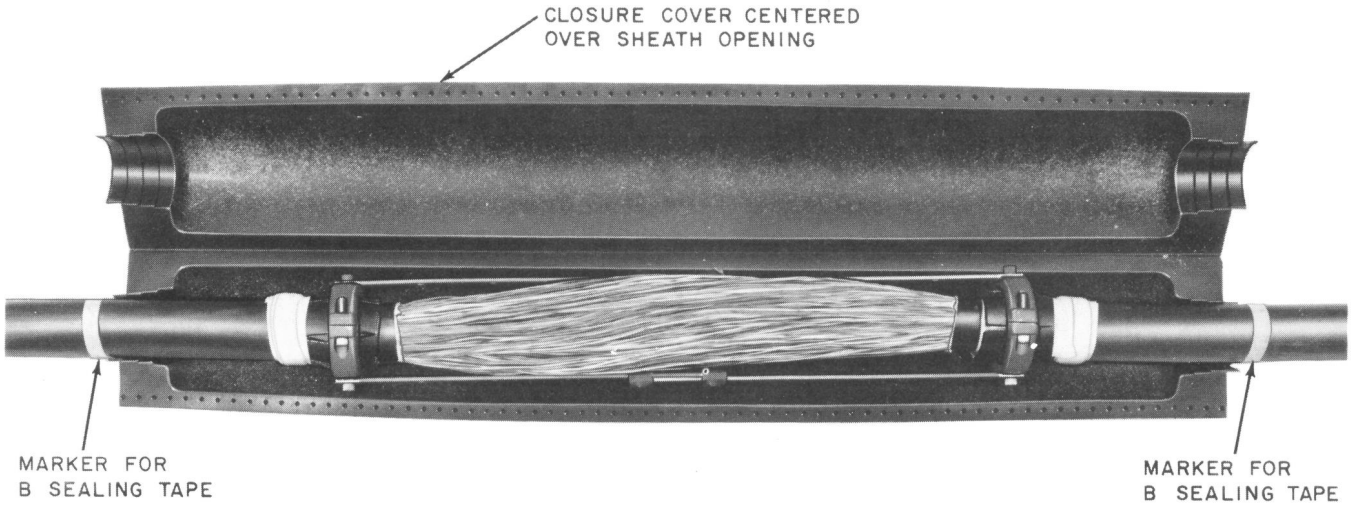


Fig. 8—Markers Placed for Closure Cover

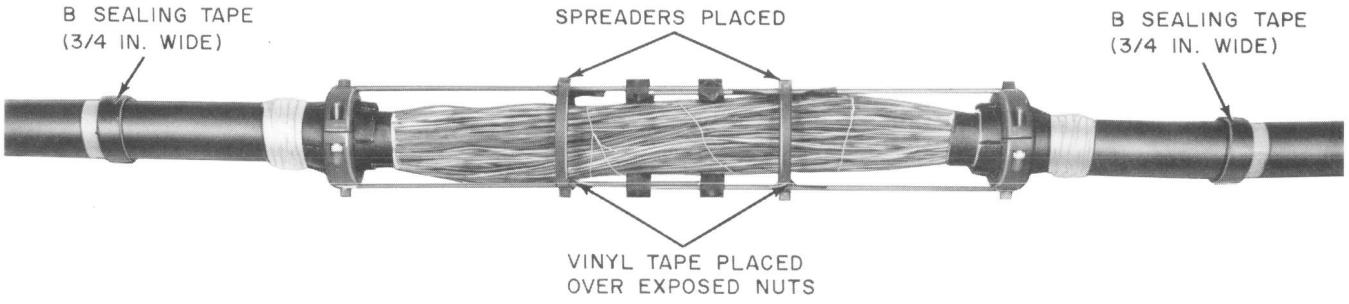


Fig. 9—Sealing Tape and Spreaders Placed

4.09 At each end of the closure cover, place cut lengths of B sealing tape (Fig. 10). Position the closure cover over the sheath opening as illustrated in Fig. 10.

4.10 Close the closure cover. Using combination pliers, firmly squeeze the ends of the cover as illustrated in Fig. 11.

4.11 Place three half-lapped layers of vinyl tape around the cable and tabbed step ends of the closure cover. To completely seal the vertical ends of the closure cover, place cut lengths of E vinyl tape over the ends. From each end, slide the C clamps approximately 3 inches into position on the closure cover. To hold the closure cover open while pouring the encapsulating compound, place one or two stirring paddles in the cover opening as illustrated in Fig. 12.

Note: Table D lists the approximate quantity of encapsulant required for each 10-type closures.

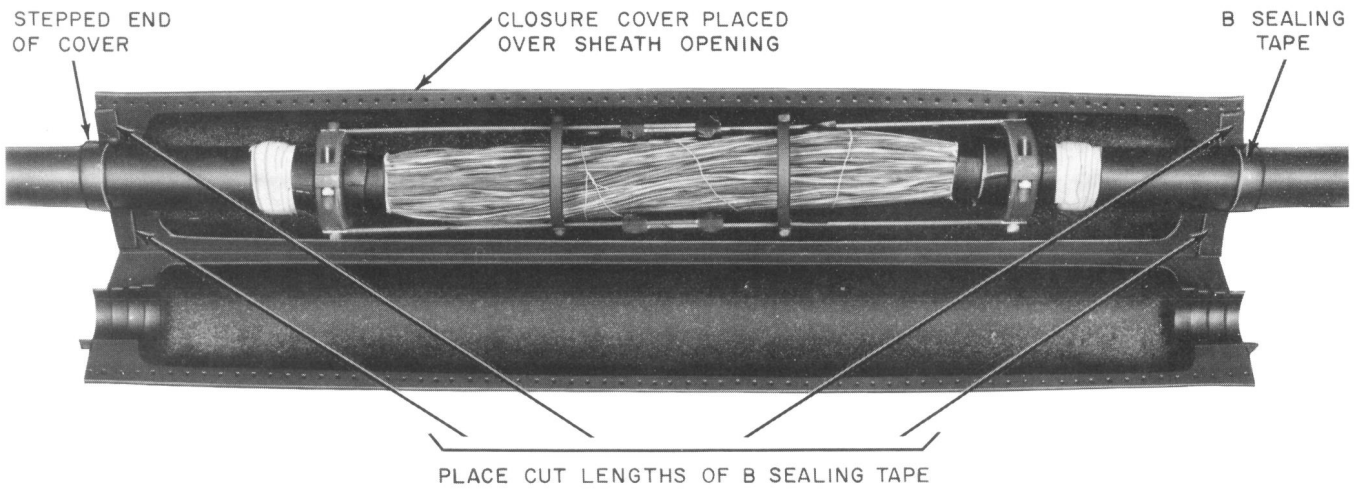


Fig. 10—Closure Cover Placed

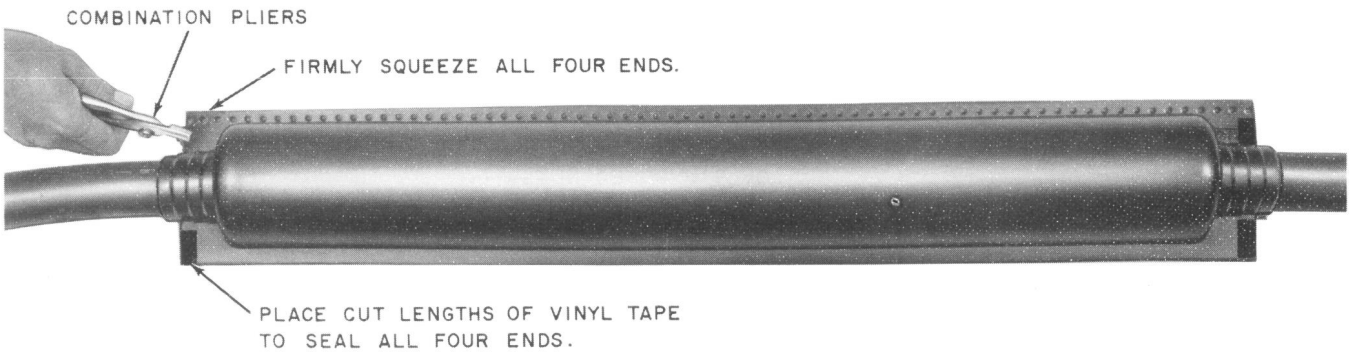


Fig. 11—Sealing Ends

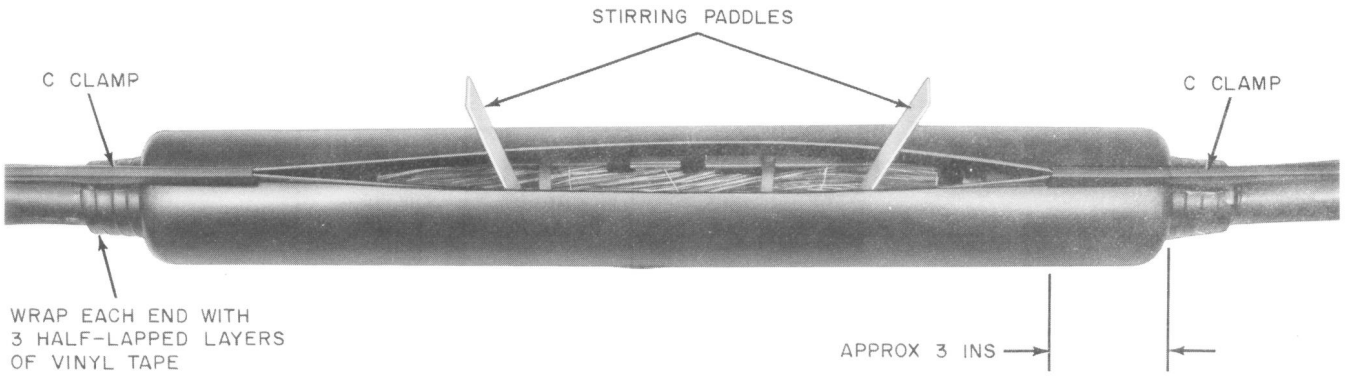


Fig. 12—Closure Prepared for Pouring Encapsulating Compound

TABLE D

QUANTITIES OF C ENCAPSULANT

TYPE CLOSURE	APPROX MAX AMT OF ENCAPSULANT
10A1	1900 grams
10B1	2800 grams
10C1	3800 grams
10D1	5300 grams

4.12 Pour the C encapsulant into the closure cover opening, distributing it evenly along the length of the opening, until the cover is filled approximately 1/4 inch from top of opening. (This prevents compound from overflowing when the paddles are removed.) Carefully remove the paddles and slide the C clamps toward the center until the ends butt together (Fig. 13).

4.13 At locations where vertical openings are to be encapsulated, the closure is placed as outlined in 4.01 through 4.10. Seal the bottom stepped end of the cover as outlined in 4.11. Slide

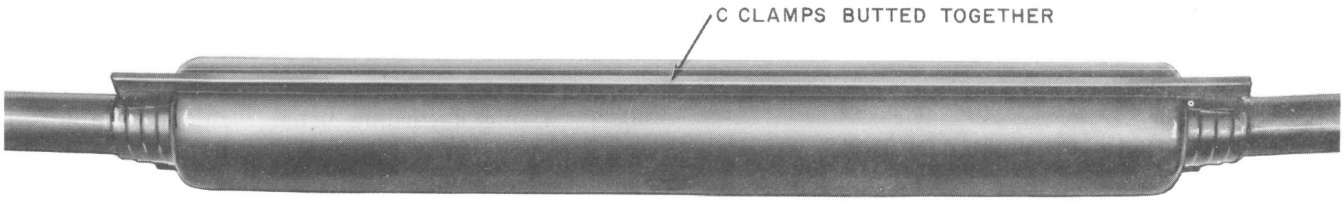


Fig. 13—Completed Closure

the C clamps until the ends are butted together. To hold the cover open while pouring the plugging compound, place a stirring paddle in the stepped end as illustrated in Fig. 14. After the closure has been filled, remove the stirring paddle and tape the top stepped end with vinyl tape.

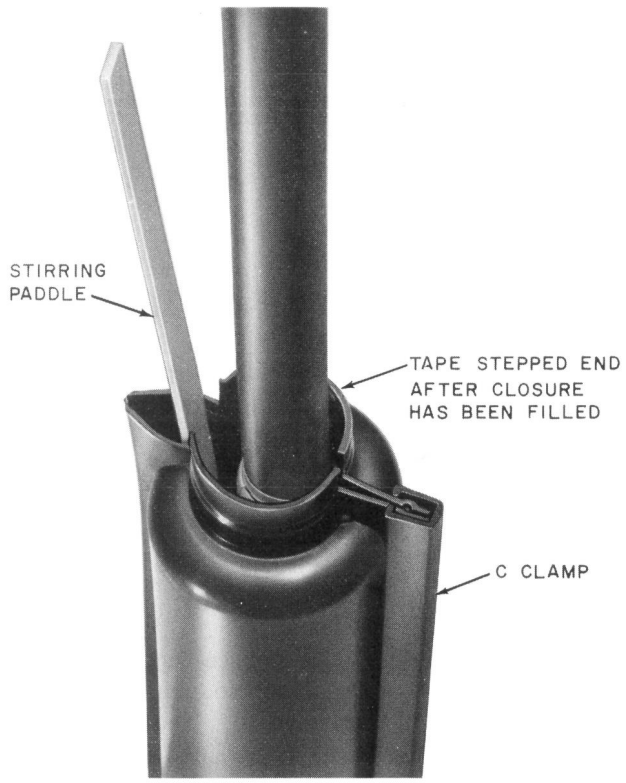


Fig. 14—Vertical Closure Prepared for Encapsulant

5. INSTALLATION—DUAL SHEATH CABLE

5.01 At the sheath opening, using a B measuring tape (Fig. 2), determine the diameter of the cable. Select the required closure as determined by the cable diameter (see Table A).

5.02 Establish the length of the outer sheath opening as determined by the adjusted length of the tie bars (Fig. 3 and Table E).

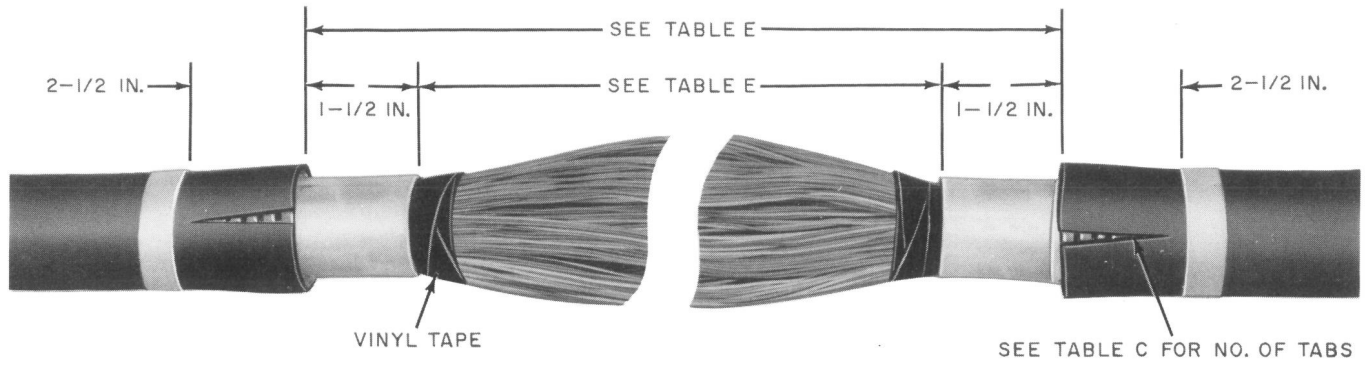
TABLE E

SHEATH OPENING
DUAL SHEATH CABLE

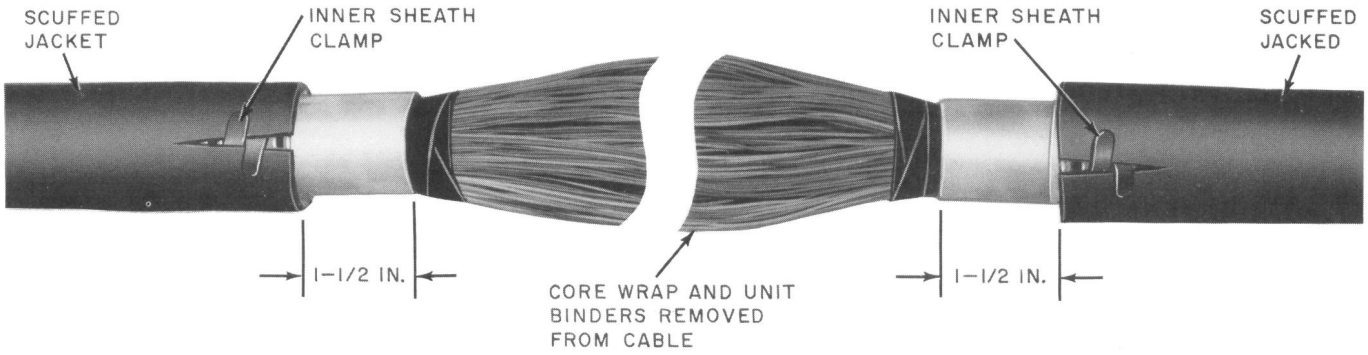
CABLE CLOSURE	LENGTH OF TIE RODS (INS.)	SHEATH OPENING	
		OUTER SHEATH (INS.)	INNER SHEATH (INS.)
10A1	8-1/2	6-1/2	3-1/2
	10-5/8	8-5/8	5-5/8
	12-3/4	10-3/4	7-3/4
	14-7/8	12-7/8	9-7/8
10B1	10-5/8	8-5/8	5-5/8
	12-3/4	10-3/4	7-3/4
	14-7/8	12-7/8	9-7/8
	17	15	12
	19-1/8	17-1/8	14-1/8
10C1	11-3/4	9-3/4	6-3/4
	14-1/8	12-1/8	9-1/8
	16-1/2	14-1/2	11-1/2
	18-7/8	16-7/8	13-7/8
	21-1/8	19-1/8	16-1/8
10D1	12-3/4	10-3/4	7-3/4
	14-7/8	12-7/8	9-7/8
	17	15	12
	19-1/8	17-1/8	14-1/8
	21-1/4	19-1/4	16-1/4
	23-3/8	21-3/8	18-3/8

Note: The distance between centers of the end mounting holes of the tie rods controls all other length measurements

5.03 Using a carding brush, scuff the cable for approximately 6 inches on each side of the proposed opening. Using B paper tape, mark the outer sheath opening (Table E). Remove the outer sheath between the paper tape markers. Score the inner sheath 1-1/2 inches from the butt ends of the outer sheath. Remove the inner sheath. Place B paper tape markers 2-1/2 inches from the butt ends of the outer sheath. In the outer sheath only, cut tabs (Table C lists the number of tabs) of approximately equal widths through the outer sheath and metallic shield. Figure 15 illustrates the sheath opening.



STEP 1—OUTER AND INNER SHEATHS REMOVED.



STEP 2—INNER SHEATH CLAMPS PLACED.

Fig. 15—Dual Sheath Opening

5.04 Place sheath clamps and collars on the inner and outer cable sheaths as outlined in 4.03 and 4.06, respectively. Figure 16 illustrates the sheath clamps and collars placed.

5.05 Complete the installation of the closure as outlined in 4.04 through 4.12.

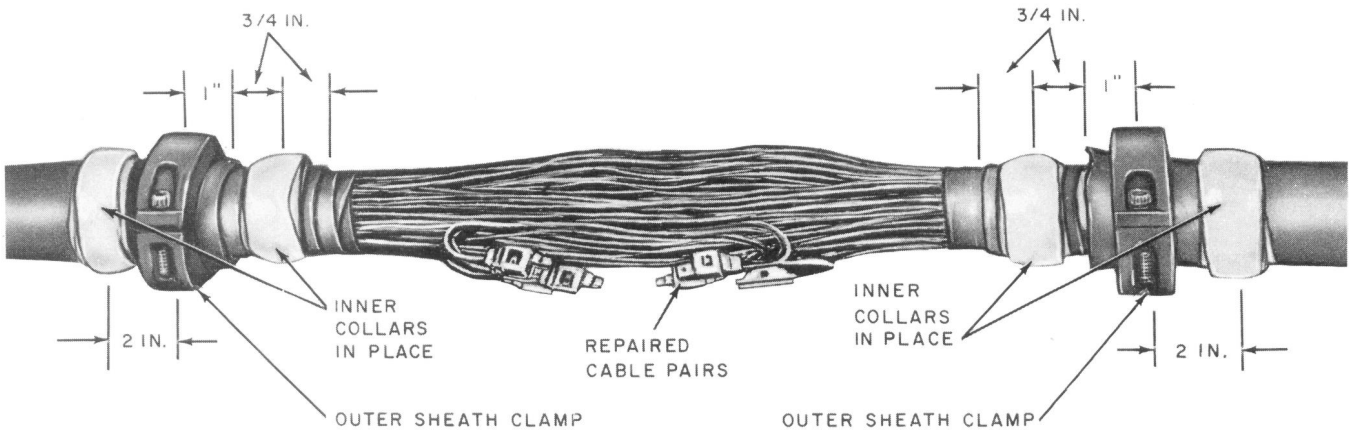


Fig. 16—Sheath Clamps and Collars Placed—Dual Sheath Cable