

16-TYPE CABLE CLOSURES

DESCRIPTION AND INSTALLATION

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conjunction with D (reenterable) or E (solid) encapsulant for encapsulating buried sheath openings in either waterproof or air core cables.

1.02 This section is reissued to:

- Include 16A2, 16B2, 16C2, and 16D2 closures
- Delete reference to C encapsulant and include use of E encapsulant.

Since this is a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 The 16A2, 16B2, 16C2, and 16D2 closures replace the 16A1, 16B1, 16C1, and 16D1 closures, respectively, which are presently covered in Section 633-500-103.

1.04 The 16-type closures will accommodate maximum size cables and splice bundles as listed in Table A. Table B lists the various types of splices that can be accommodated in the 16-type closure.

1. GENERAL

1.01 This section covers the description and installation of the 16-type closure used in

TABLE A

MAXIMUM SIZE CABLES AND SPLICE BUNDLE (INCHES)

CLOSURE	SINGLE CABLE MAX DIA	BRANCH CABLE MAX DIA (Note)	SPLICE BUNDLE MAX DIA
16A2	1.2	1.7	2.5
16B2	2.5	3.7	3.7
16C2	2.5	3.7	4.2
16D2	3.4	5.0	5.3
16E2	3.4	5.0	5.4

Note: Diameter is total diameter for through cable plus branch cable.

NOTICE

Not for use or disclosure outside the
Bell System except under written agreement

TABLE B

TYPES OF SPLICES THAT CLOSURES WILL ACCOMMODATE

710 CONNECTOR	LARGEST PAIR SIZE									
	16A2 CLOSURE		16B2 CLOSURE		16C2 CLOSURE		16D2 CLOSURE		16E2 CLOSURE	
	COPPER	ALUMINUM	COPPER	ALUMINUM	COPPER	ALUMINUM	COPPER	ALUMINUM	COPPER	ALUMINUM
Straight Splice (Foldback)	100/22	75/20	300/22	100/20	400/22	200/22	600/22	300/20	900/22	400/20
Straight Splice (In-Line)	100/22	100/20	300/22	200/20	400/22	300/20	600/22	400/20	900/22	600/20
Branch (No Bridge)	100/22	75/20	300/22	100/20	400/22	200/20	600/22	300/20	900/22	400/20
Branch (In-Line)	100/22	100/20	300/22	100/20	400/22	300/20	600/22	400/20	900/22	600/20
Load Splice (Foldback)	50/22	75/20	200/24	100/20	200/22	100/20	300/22	400/20	400/22	300/20
700 CONNECTOR 701-2A on 19-26 Ga 700-3B on 17 Ga										
Straight (Foldback)	50/19	50/17		75/17	100/19	100/17	200/19	100/17	300/19	200/17
	100/24	75/20	100/22	100/20	200/22	100/22	300/22	200/20	400/22	300/20
Branch	100/24	75/20	100/20	100/20	100/19	100/22	200/19	200/20	300/19	200/17
					200/22		300/22		400/22	300/20
CONECS										
Straight (Foldback)	50/22		200/22		300/22		600/24	300/20	900/24	400/20
Straight (In-Line)	50/22		300/24		400/24		600/22	400/20	900/22	600/20
IN SPLICE LOAD							200/22 with 100 Pair Loaded			

2. DESCRIPTION

2.01 The 16-type closure is illustrated in Fig. 1.

KIT OF PARTS CONSIST OF:

- INSTRUCTION SHEET
- CORRUGATED LINER
- B SEALING TAPE
- EXTRUDED CLAMP
- FOAM BLOCK
- FOAM STRIP
- CABLE TIE
- FUNNEL
- PLUGS

CLOSURE	KIT OF PARTS
16A2	D - 180841
16B2	D - 180829
16C2	D - 180829
16D2	D - 180773
16E2	D - 180773

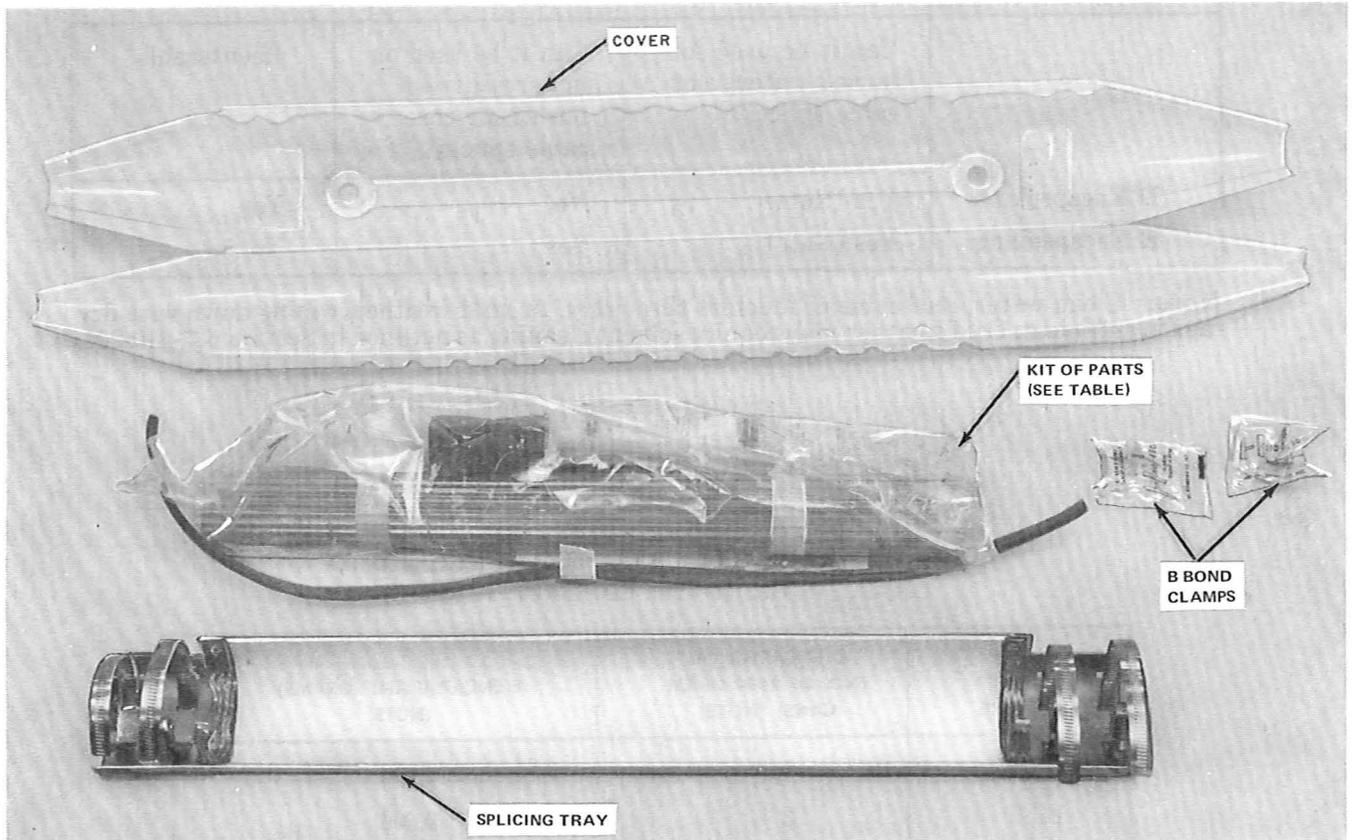


Fig. 1—16-Type Closure

2.02 Since the closure is not watertight, the splice must be totally encapsulated to guarantee its integrity. Tables C and D list the materials and estimated quantities of encapsulant that encapsulate the splice. These materials are described in Section 081-852-123. ***It is recommended that D encapsulant be used due to its:***

- Excellent waterproofness
- Long life
- Low toxicity
- Easy mixing
- Premeasured packages
- Excellent penetration of voids and crevices
- Bonding to itself
- Nonfoaming in presence of water
- Ease in reentering.



Do not experiment with other encapsulants. The 16-type closure is part of a splicing system, ie, 700/710 connectors, D encapsulant, and 16-type

closures. Variations of either the connector, encapsulant, or closure may result in splice failure.

TABLE C

MATERIAL FOR ENCAPSULATING SPLICE

MATERIALS	USE		
	Can it be used for buried waterproof cable splices?	Can it be used on nonpressurized buried air core cable splices?	Reenterable
D Encapsulant	Yes (Note)	No	Yes
E Encapsulant	Yes (Note)	Yes	No

Note: Clean waterproof cable conductors thoroughly. In mild weather, wiping down with dry rags is sufficient. Cold weather may require solvent cleaning as outlined in Section 632-410-204.

TABLE D

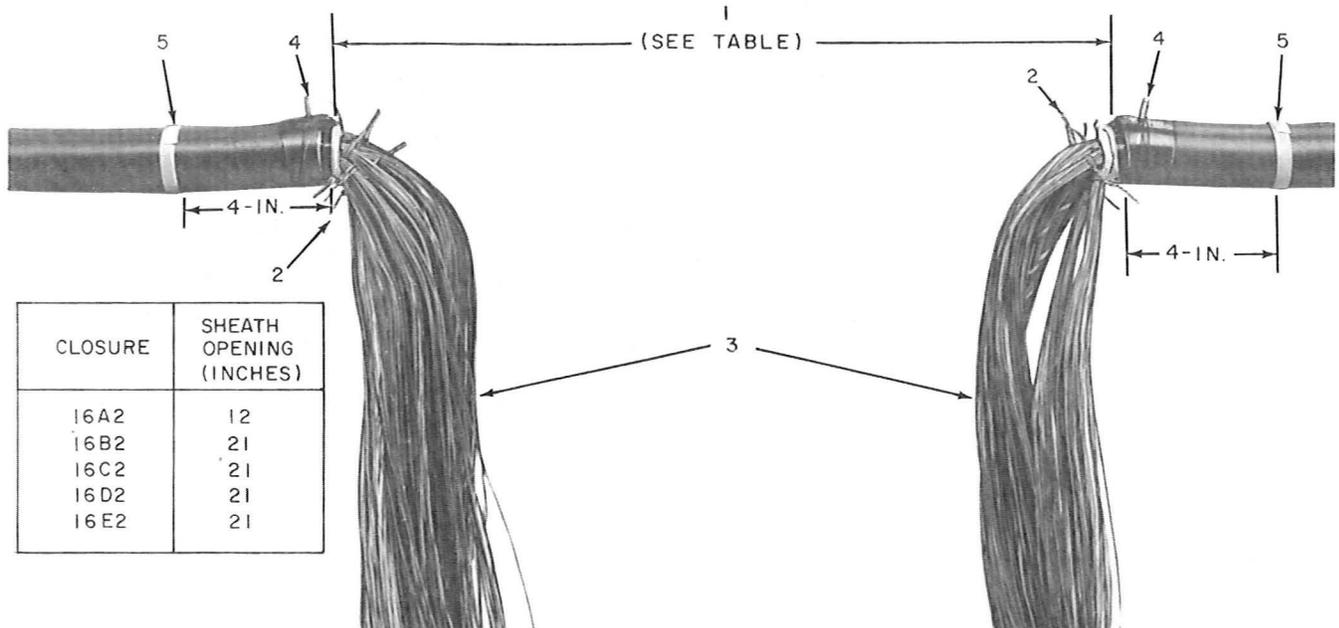
ESTIMATED QUANTITY OF ENCAPSULANT REQUIRED TO FILL 16-TYPE CLOSURES

CLOSURE	D ENCAPSULANT (NO. OF 2600 GRAM CANS) (NOTE)	E ENCAPSULANT (GRAMS) (NOTE)
16A2	1	3,000
16B2	3	9,000
16C2	4	12,000
16D2	5	15,000
16E2	6	18,000

Note: It is suggested that extra kit of encapsulant be on hand in case splice is smaller than anticipated to insure closure is completely filled at time of installation.

3. CABLE SHEATH PREPARATION

3.01 Prepare cable sheath as illustrated in Step 1.



Step 1—Cable Sheath Preparation

- 1 Mark cable sheaths per table, then remove outer jacket, metallic shield, and core wrap from each cable end. When cables have UM-type protection, remove the outer polyethylene jacket and underlying corrugated steel shield back 14 inches from butt of cable (see Step 13).

CAUTION: Exercise care when cutting to prevent damage to inner sheath.

- 2 Install binder group identification ties and remove unit binders.
- 3 Thoroughly clean cable conductors to remove waterproof compound.

Note: Clean waterproof cable conductors thoroughly. In mild weather wiping down with dry rags is sufficient. Cold weather may require solvent cleaning as outlined in Section 632-410-204.

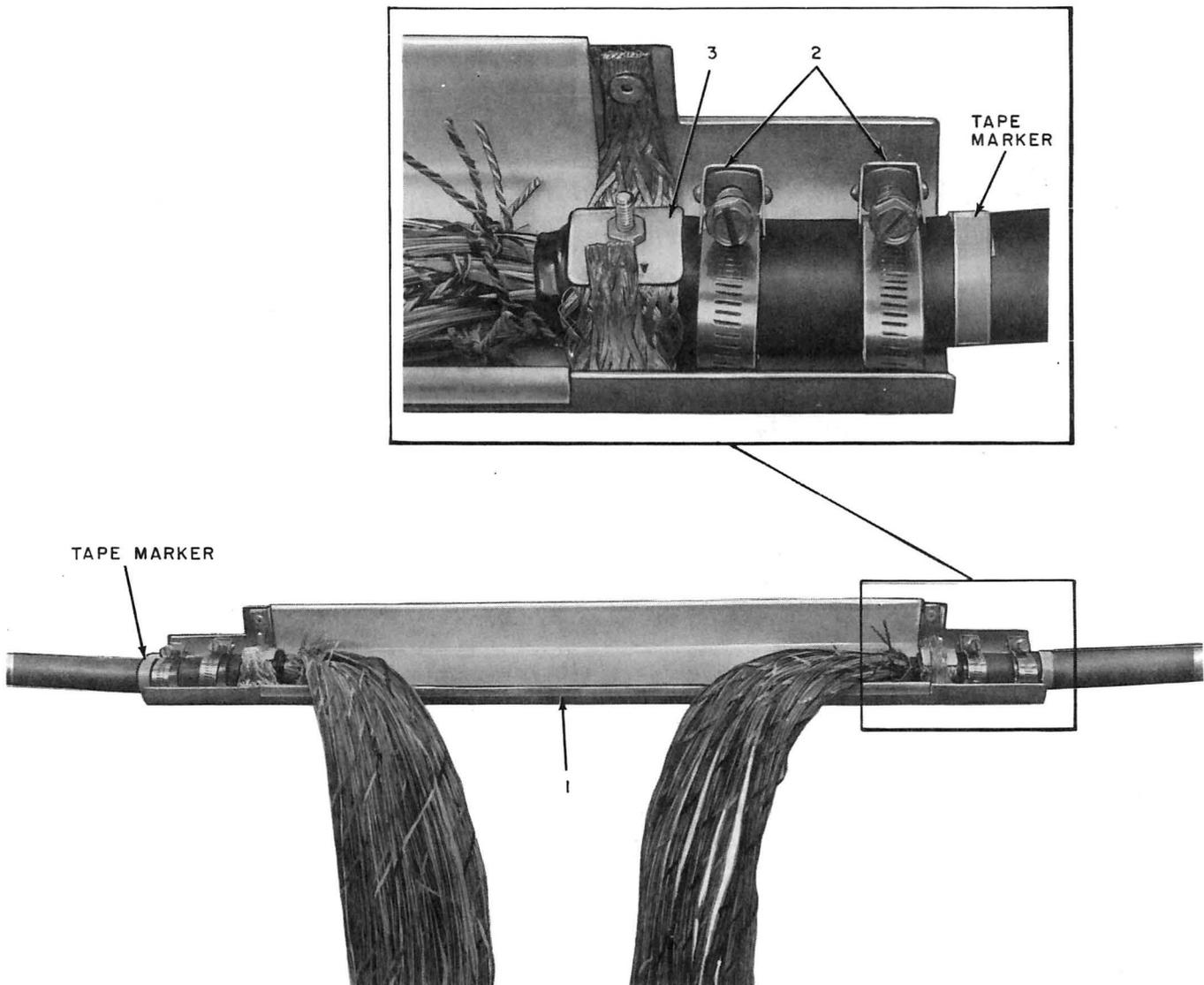
- 4 Install **inner** plate of B bond clamp as outlined in Section 081-852-118. Do not install outer plate at this time.

WARNING: Do not force the bond clamp between the aluminum shield and core wrap as this could damage the conductors.

- 5 Install paper tape marker 4 inches from butt of cable to aid in positioning metal tray.

4. INSTALLATION OF SPLICING TRAY

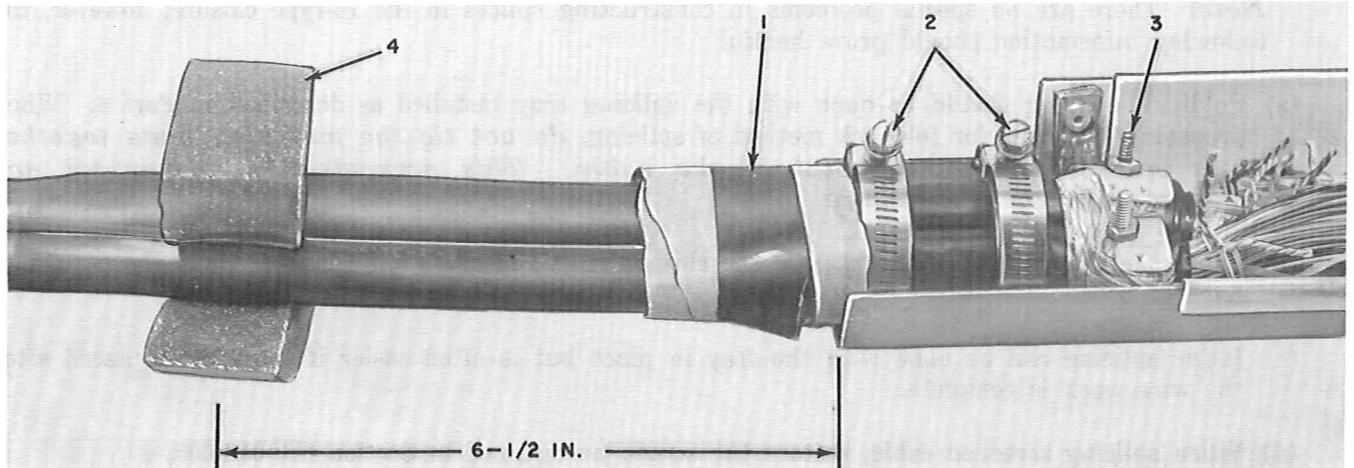
4.01 Install splicing tray at straight splice as illustrated in Step 2.



Step 2—Installed Splicing Tray at Straight Splice

- 1 Position splicing tray between tape markers.
- 2 Place sealing clamps around cable sheath, and secure metal tray by RATCHET TIGHTENING sealing clamps. Fold back excess length of sealing clamp and store in base of metal tray. Do not push the excess through a tray slot.
- 3 Push bond braid over stud of B bond clamp, then place outer plate and secure with nut. **Tighten nut with 216-type tool ONLY.**

4.02 Install splicing tray at branch splice as illustrated in Step 3.



Step 3—Installed Splicing Tray at Branch or Butt Splice

- 1 Prior to installation of splicing tray, form a collar on each cable as outlined in Step 6. Protect collars during splicing by wrapping with release paper from strips of B sealing tape secured with vinyl tape.

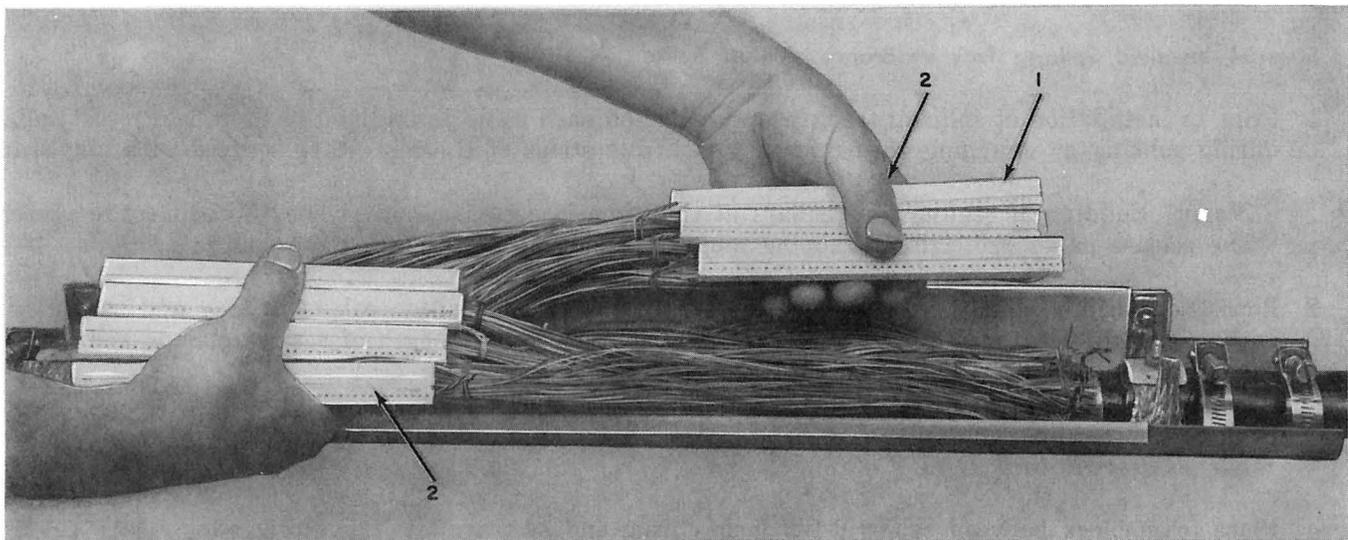
Note: Building of sealing tape collars at this time is necessary only when two cables are present. The release paper protection wrapping must be removed before closing the splice.
- 2 Reposition sealing clamps in appropriate slots of tray, then position cables in tray and secure with sealing clamps. **Ratchet tighten clamps.** Fold back excess length of sealing clamps and store in base of metal tray. Do not push the excess through a tray slot.
- 3 Push bond braid over stud of each B bond clamp, then place outer plate and secure with nut. **Tighten with 216-type tool ONLY.**
- 4 Place foam block between cables 6-1/2 inches from end of tray.

5. SPLICING

5.01 Splice cables as outlined in Step 4.

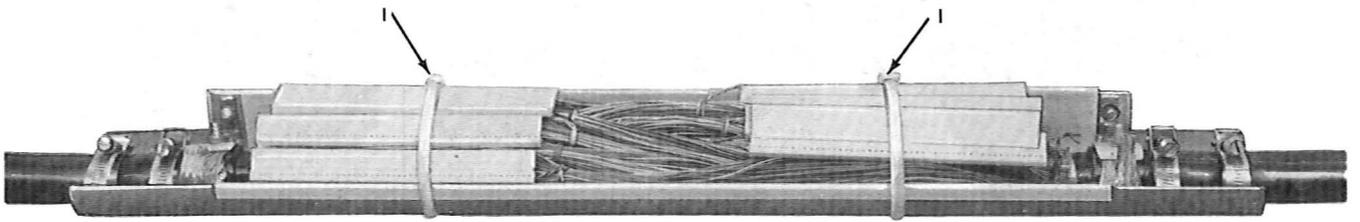
Note: There are no special problems in constructing splices in the 16-type closure; however, the following information should prove helpful:

- (a) Foldback splicing should be done with the splicing tray installed as described in Part 4. When preparing the cable for foldback method of splicing, **do not tie the matching units together with a common tie at the butt of the cable. This prevents wire movement and uses more room in the closure.**
- (b) Splice the groups toward the back of the closure first and dress foldback loosely in the bottom of tray.
- (c) Inline splicing can be done with the tray in place but is often easier if the tray is placed after the wire work is complete.
- (d) When splicing screened cable, restore the screen as outlined in Section 640-010-005.



Step 4—Positioning Spliced Conductors on Top of Cable Core

- 1 Splice cable conductors using 700- or 710-type connectors as outlined in Section 632-205-215 or 632-205-220, respectively. When splicing, using 710-type connectors, use the 152A test set to verify joint. When using 700/701 connectors, test through the splice prior to encapsulation.
- 2 Position spliced conductors on top of cable core as shown.

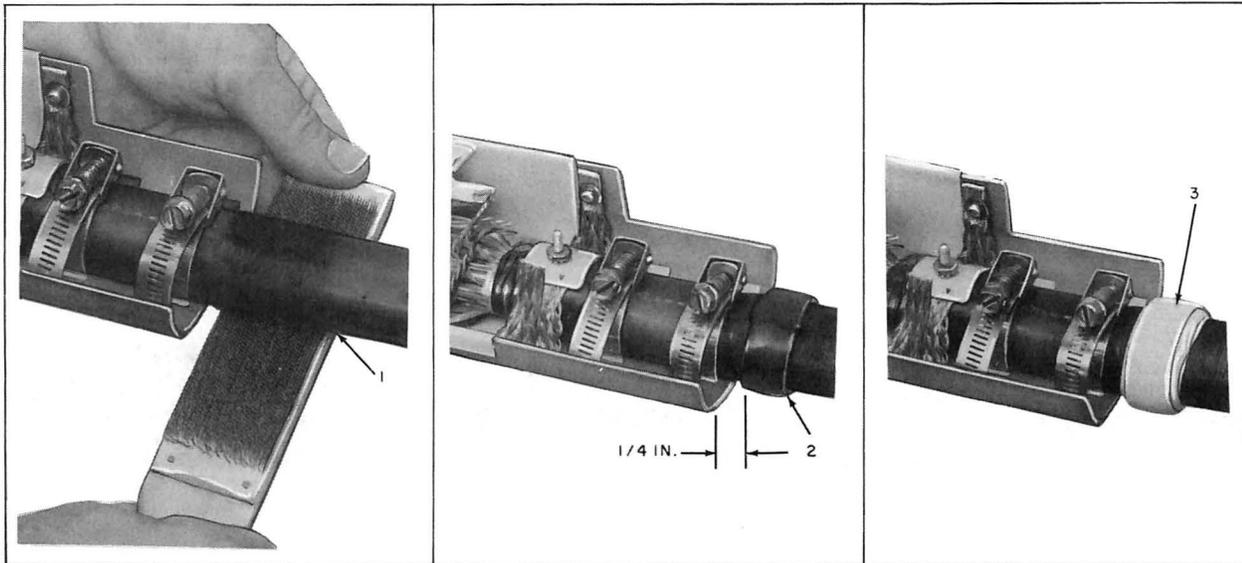


Step 5—Securing Splice Bundle

- 1 Tie down splice bundle with cable ties and cut off excess cable tie.

6. FORMING COLLARS ON CABLE SHEATH

6.01 Place a collar on each cable sheath as outlined in Step 6 to form a seal. D encapsulant will not bond to cable sheath; however, it will bond to white side of DR tape, thus preventing a leak between the polyethylene jacket and the encapsulant.



Step 6—Forming Collar

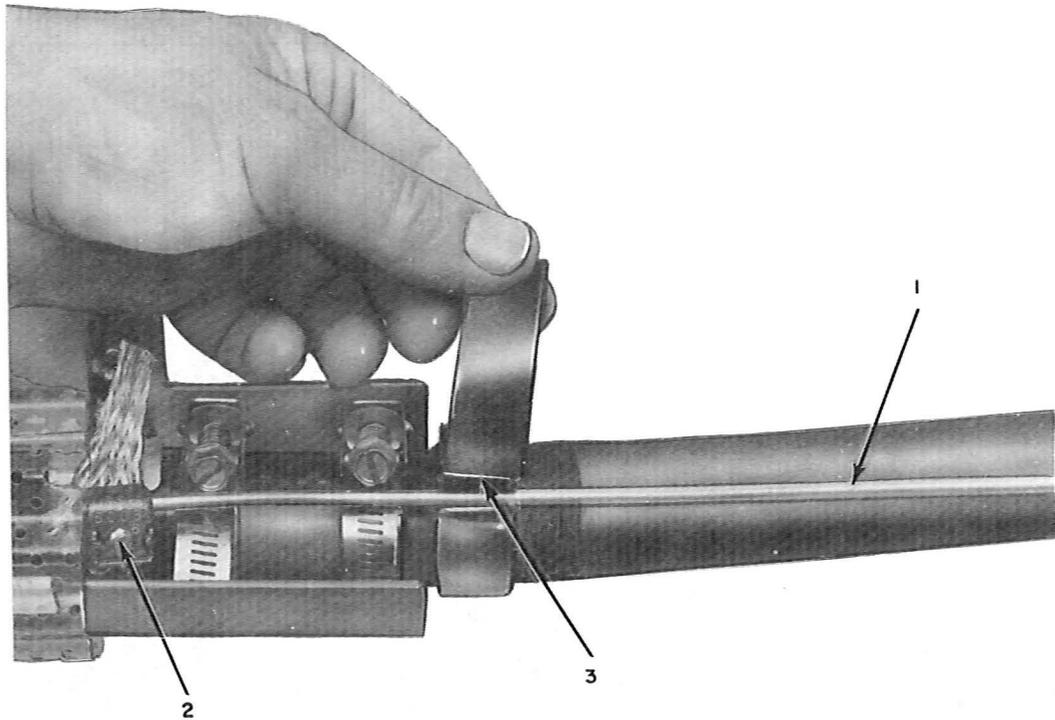
- 1 Remove grease residue from cable sheath with B cleaning fluid; then using carding brush, scuff cable sheath.
- 2 Using 3/4-inch wide B sealing tape, form a collar approximately 1/4 inch from metal tray.

Note: When a No. 6 ground wire is used to bond the cable sheath to power company ground as shown in Step 7, the copper conductor must be placed between layers of B sealing tape as shown in Step 7.

- 3 Wrap B sealing tape collar with several fully stretched turns of DR tape (white side out). **Wrap last layer loosely.** DR tape has a tendency to unwrap itself while encapsulant is setting up; therefore, it is necessary to wrap last layer loosely.

Note: Remove release paper from collar at branch splice.

- 6.02 Where indicated by work prints, bond the cable sheath to power company ground using No. 6 ground wire as covered in local instructions or as shown in Step 7.

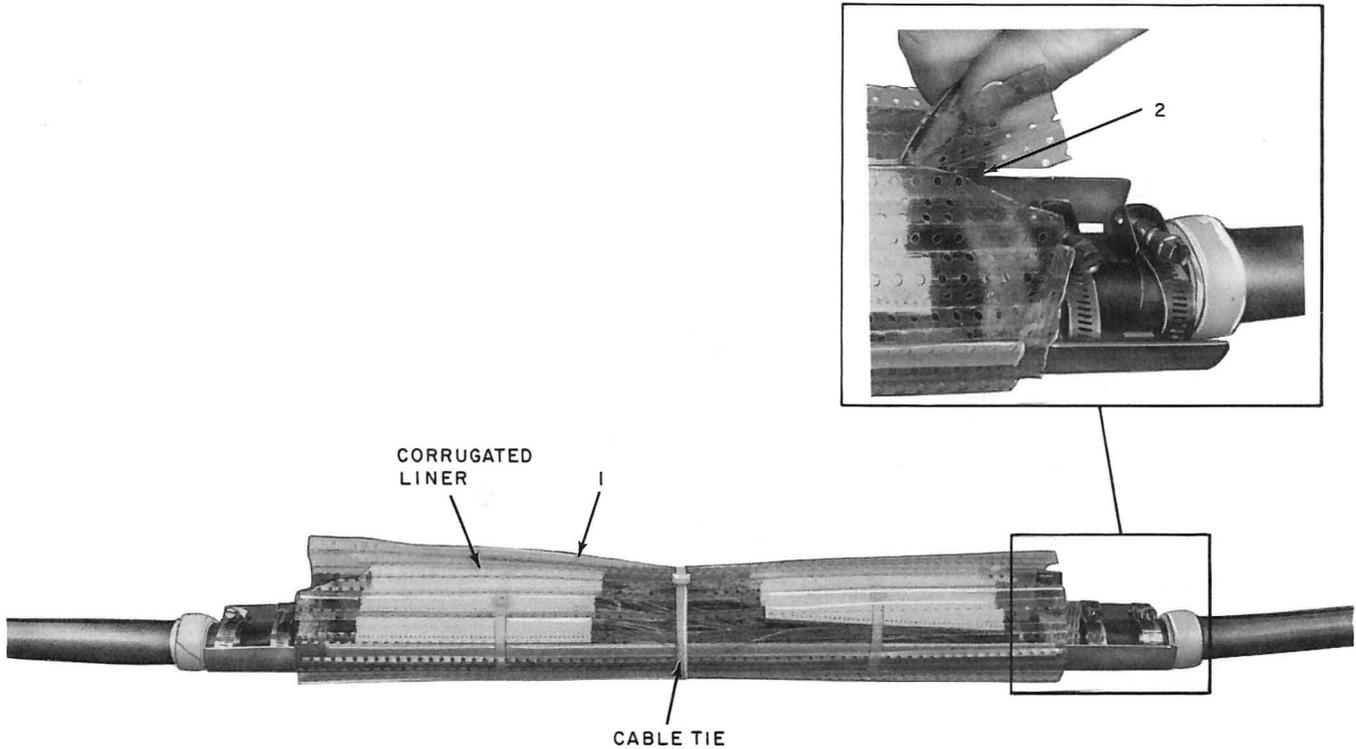


Step 7—Bonding Cable Sheath to Power Company Ground

- 1 Remove enough insulation from ground wire so it does not extend inside closure. Water migrates between the copper conductor and insulation.
- 2 Punch hole in braid and attach AT-7796X connector to braid. Install and secure copper conductor of ground wire in the connector.
- 3 Place copper conductor of No. 6 ground wire between layers of B sealing tape at collar and complete as outlined in paragraph 6.01.

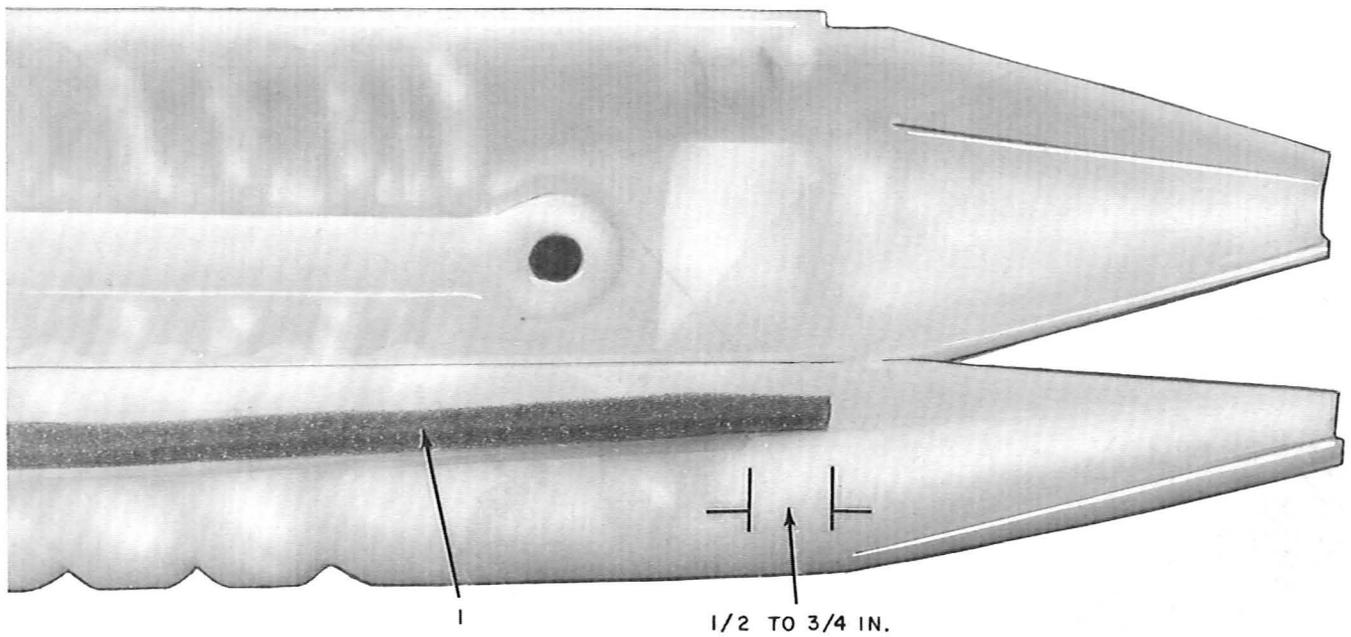
7. INSTALLING CORRUGATED LINER AND COVER

7.01 The installation of the corrugated liner and cover is illustrated in Steps 8, 9, 10, 11, and 12.



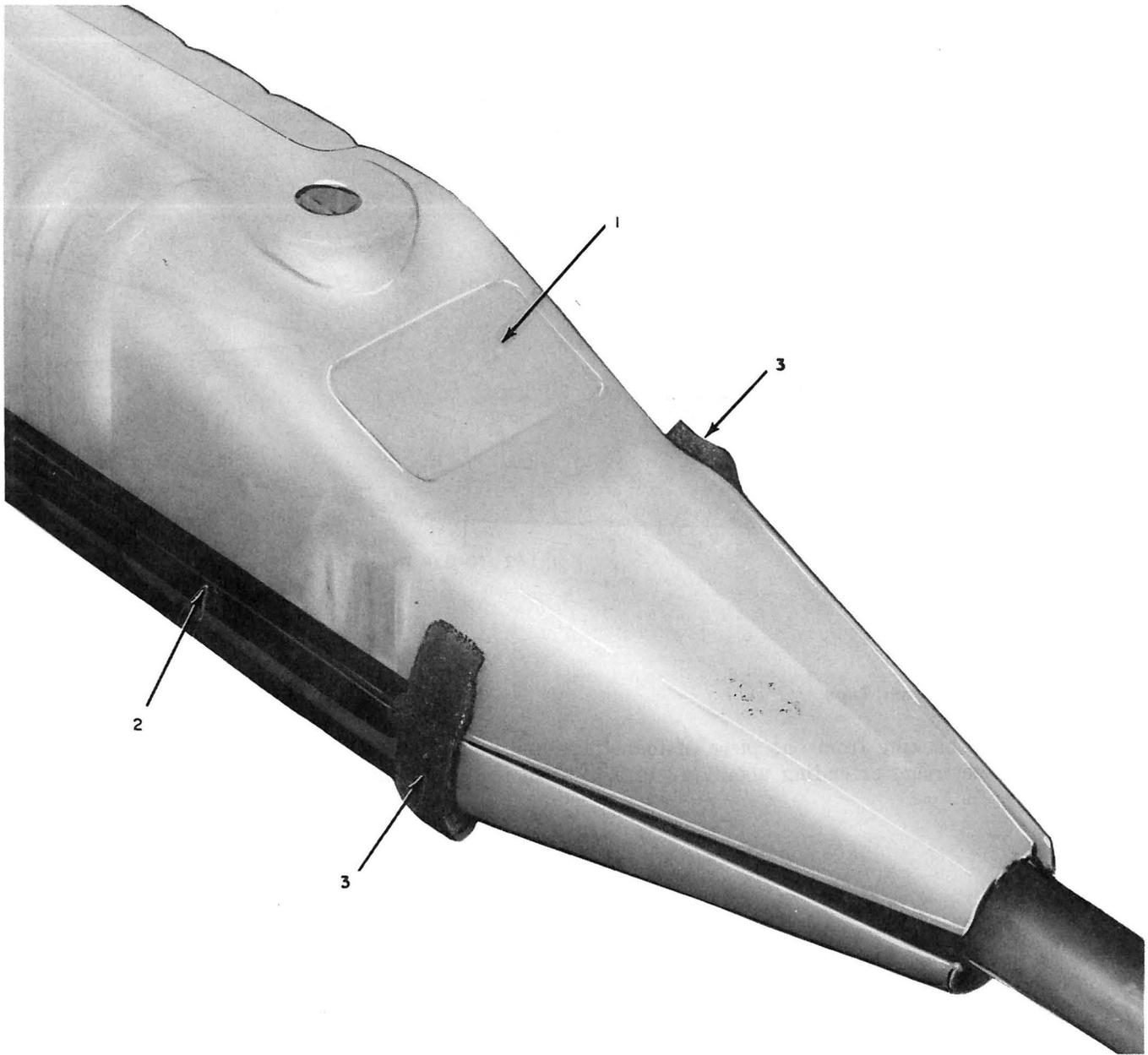
Step 8—Installed Corrugated Liner

- 1 Place and center corrugated liner with seam up around outside of metal tray and secure with cable tie. The liner to which both D and E encapsulant will adhere controls the splice and prevents conductors and connectors from contacting the closure cover, thus assuring complete encapsulant coverage and penetration. No other wrap is required.
- 2 Cut a V-notch approximately 1-1/4 by 2-1/2 inches on top of corrugated liner under filling hole location to provide an unrestricted flow while encapsulating.



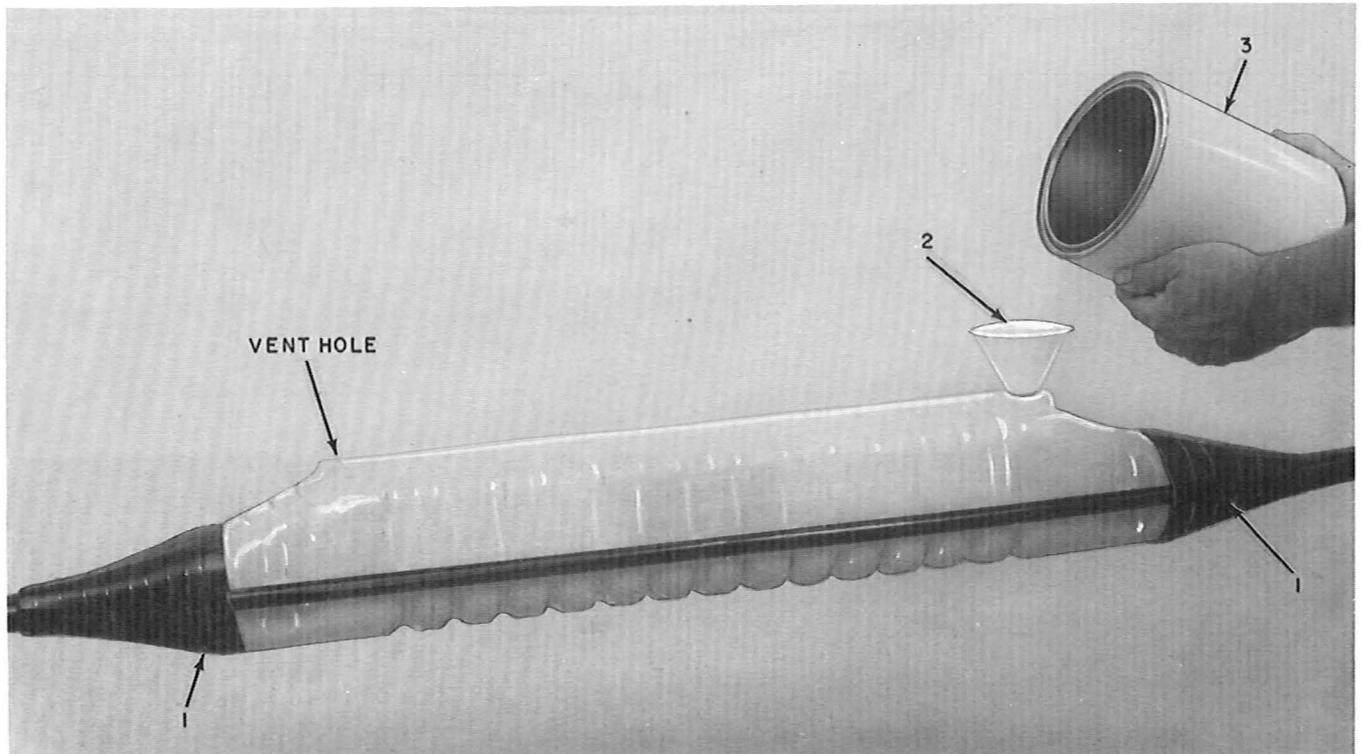
Step 9—Applying Foam Tape

- 1 Remove the backing from one piece of foam tape and place flush with the inside edge of the closure opposite the hinge extending about 1/2 to 3/4 of an inch past the flange area on each end.



Step 10—Applying Tape Over Ends of Closure

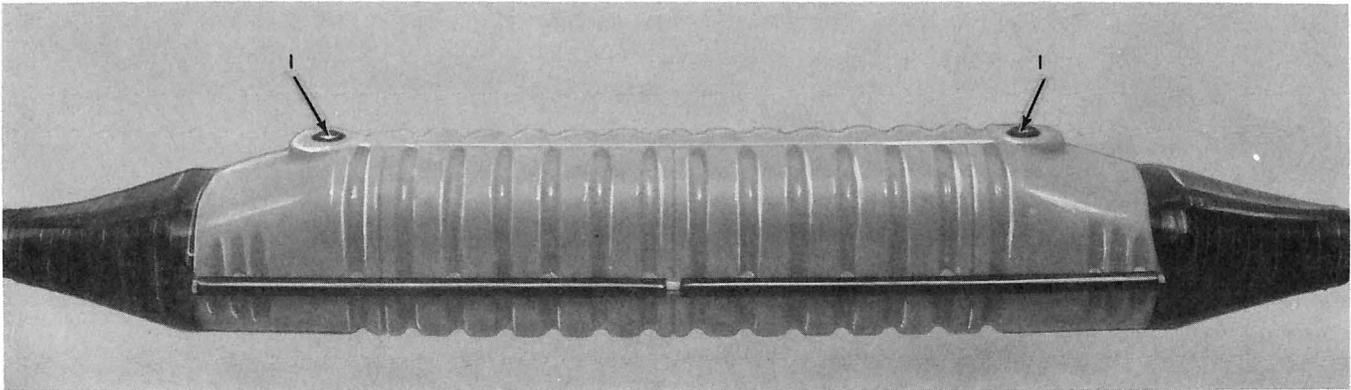
- 1 Place and center cover over completed splice with holes on top.
- 2 Slide extruded plastic clamps on seam of cover to secure in closed position.
- 3 Cut 4 pieces of foam tape 2 inches long. Remove the backing and install over the ends of the closure.



Step 11—Filling Splice With Encapsulant

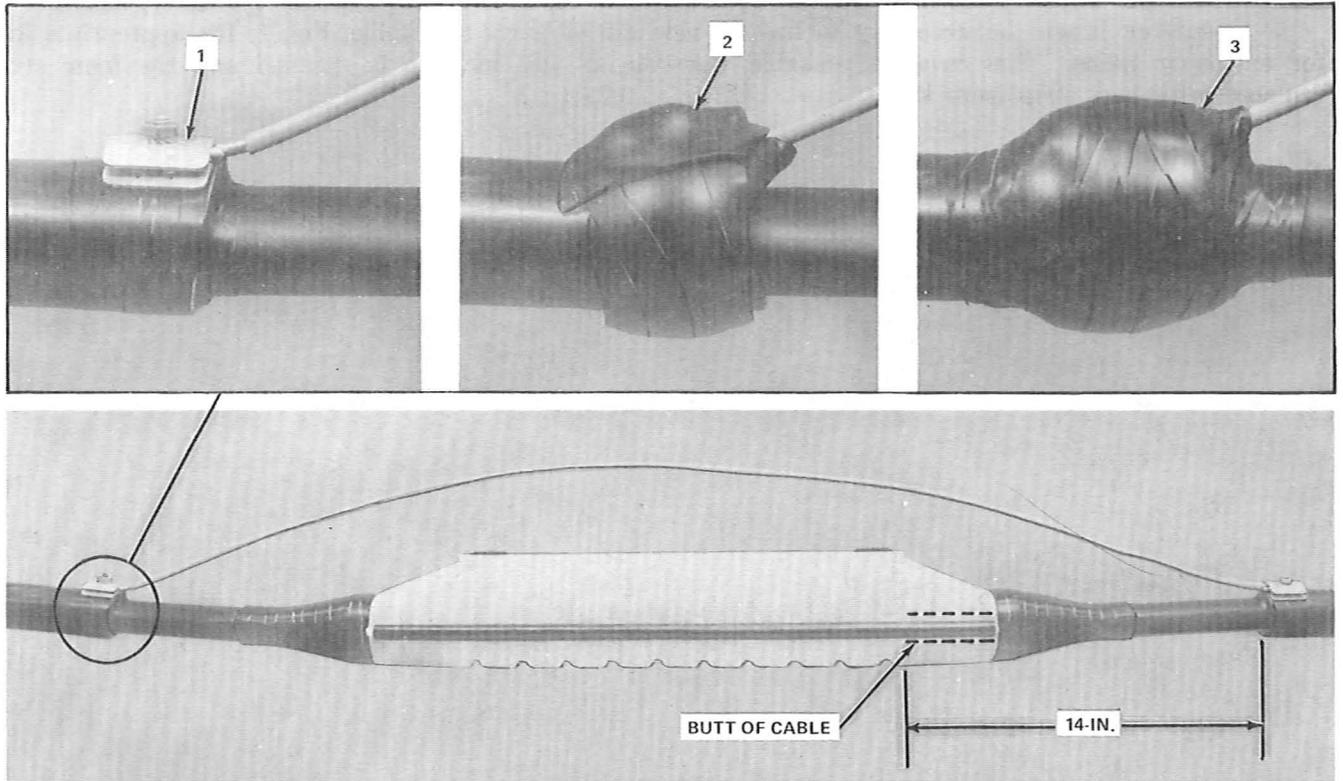
- 1 Wrap each nozzle with vinyl tape starting on the cable and extending to edge of extruded clamps, assuring all foam tape is covered to prevent leakage. Hold cover while wrapping to prevent movement and rotation about the splice.
- 2 Snap funnel in upper filling hole (if closure is not level).
- 3 Mix encapsulant per instructions on container and pour into funnel until encapsulant runs from vent hole. Plug vent hole and complete pour.

Note: Prior to pouring encapsulant, be sure splice has been tested.



Step 12—Completed Installation

- 1 Insert plugs in holes.

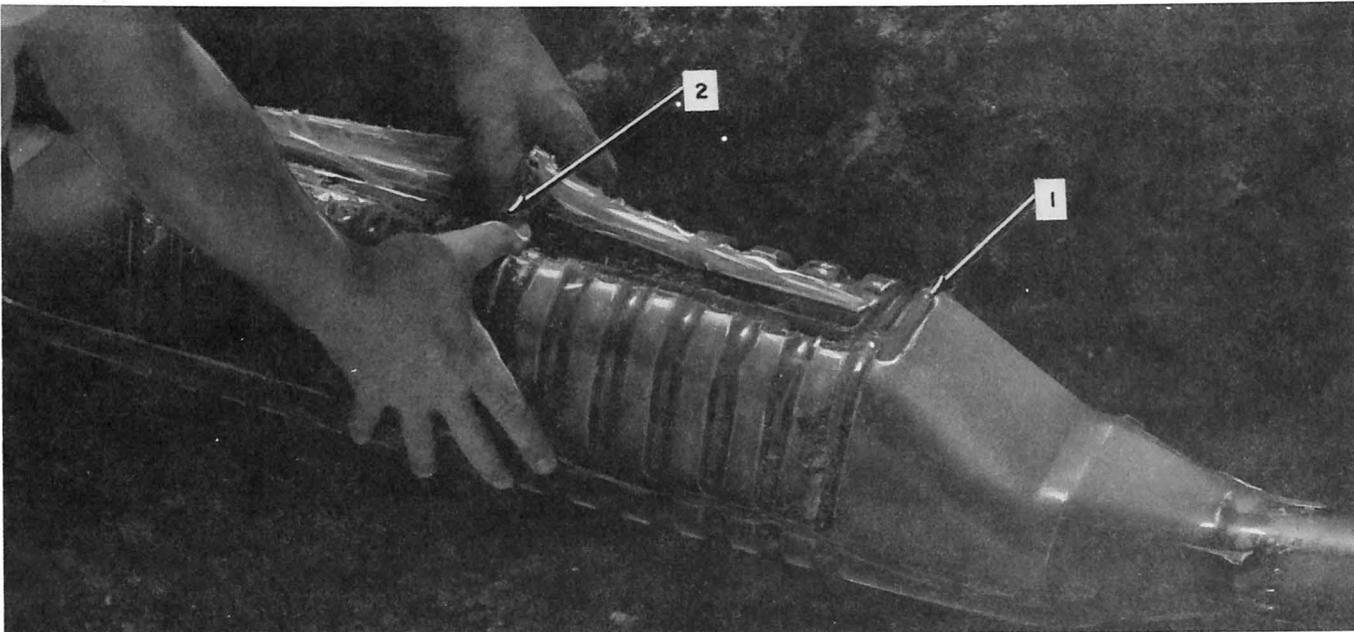


Step 13—Providing Continuity for UM-Type Protection

- 1 Install B bond clamps and No. 6 ground wire to provide continuity across UM-type protection as outlined in Section 081-852-118.
- 2 Wrap bond clamps with B sealing tape.
- 3 Wrap B sealing tape with DR tape and vinyl tape. This provides corrosion protection.

8. REENTRY

8.01 *Planned reentry is not recommended, but if for some reason* the 16-type closure is reentered it will be necessary to have a new kit of parts (see table, Fig. 1, for appropriate kit) for enclosing splice. The cover is reusable; however, it will have to be cleaned and the foam strip replaced with new strip from kit.



Step 14—Reentering Splice

- 1 Remove vinyl cover, extruded C channels and cover from splice to expose D encapsulant.
 - 2 Tear encapsulant with fingers to expose seam of corrugated liner, peel off liner to expose connectors. Work from the ends of the splice and handle units carefully to prevent damage to wire work. Complete removal of encapsulant is not necessary.
- 8.02 Perform the necessary wire work, then install new kit of parts and cover as outlined in Steps 8, 9, 10, 11, and 12.

CAUTION: *Reentered splices will tend to increase in size and loose pieces of cured encapsulant may further increase the bulk to a point where the next larger size cover may be required to enclose splice.*