1A1, 1B1, and 1C1 CLOSURE
DESCRIPTION AND INSTALLATION

CONTENTS PAGE

1. GENERAL

1.01 This section covers the description and installation of the 1A1, 1B1, and 1C1 Closures used for enclosing branch cable splices on aerial polyethylene-insulated conductor (PIC) cable and self-supporting cable.

1.02 This section is reissued to revise 6.01 concerning the method of trimming the nipples on the 1A1, 1B1, and 1C1 Closures. This new method will provide a greater surface area on the nipple for taping which is particularly advantageous for larger-sized cables.

1.03 After cable sheath preparation has been completed, the closure clamping assembly must be installed prior to leaving the job to prevent the cable from creeping.

2. DESCRIPTION

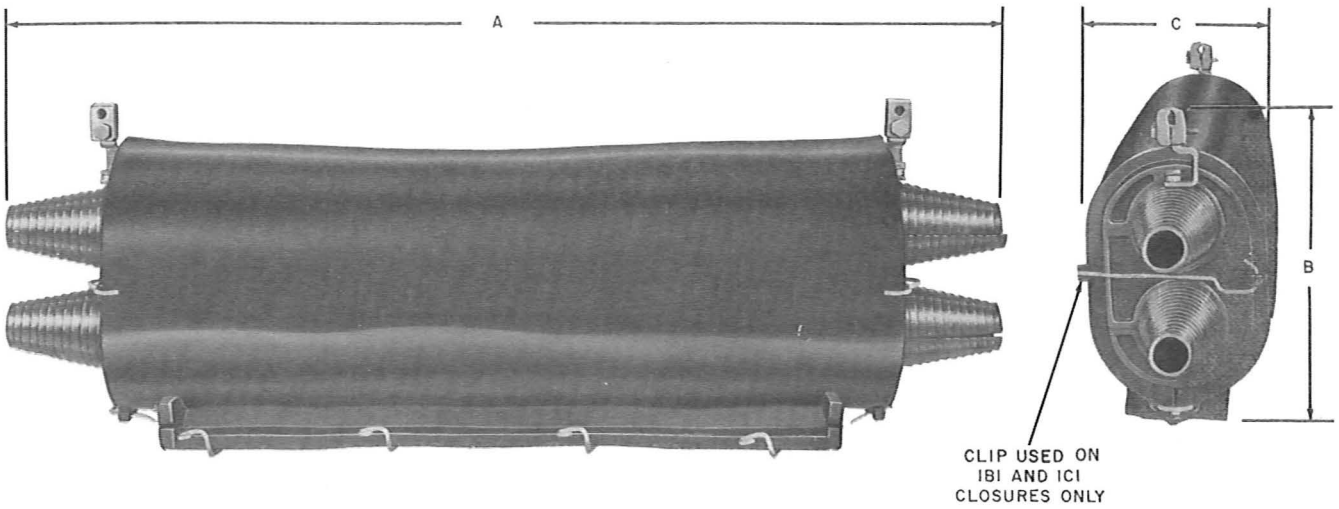
2.01 The closures consist of a molded plastic base assembly and two molded plastic nipples enclosed in a flexible plastic cover. Cable sheath clamps, brackets, and strand lugs are provided for strand mounting.

2.02 Clamping of the cable sheath tabs is provided by an inner sheath clamp and two outer aluminum clamps. Electrical continuity of the metallic portion of the cable sheath is obtained across the sheath opening by a tie-rod assembly and a base bar. The strand lugs provide a permanent electrical bond between the metal shield of the cable and the suspension strand.

2.03 The closures are similar in design except for the difference in size as shown in Fig. 1.

2.04 Following is a description of the major components of the closures.

(a) *Cover*—The molded plastic cover (Fig. 2) is a flexible one-piece hood used as a weatherproof cover when fitted around the nipples and base assembly. The cover is secured in place by means of wire clips.



CLOSURE	DIMENSIONS		
	A	B	C
IA I	24-5/8	7-3/16	3-3/16
IBI	28-1/4	10	5-1/2
ICI	26-1/4	11-3/8	6-5/16

Fig. 1—Closure—Assembled View

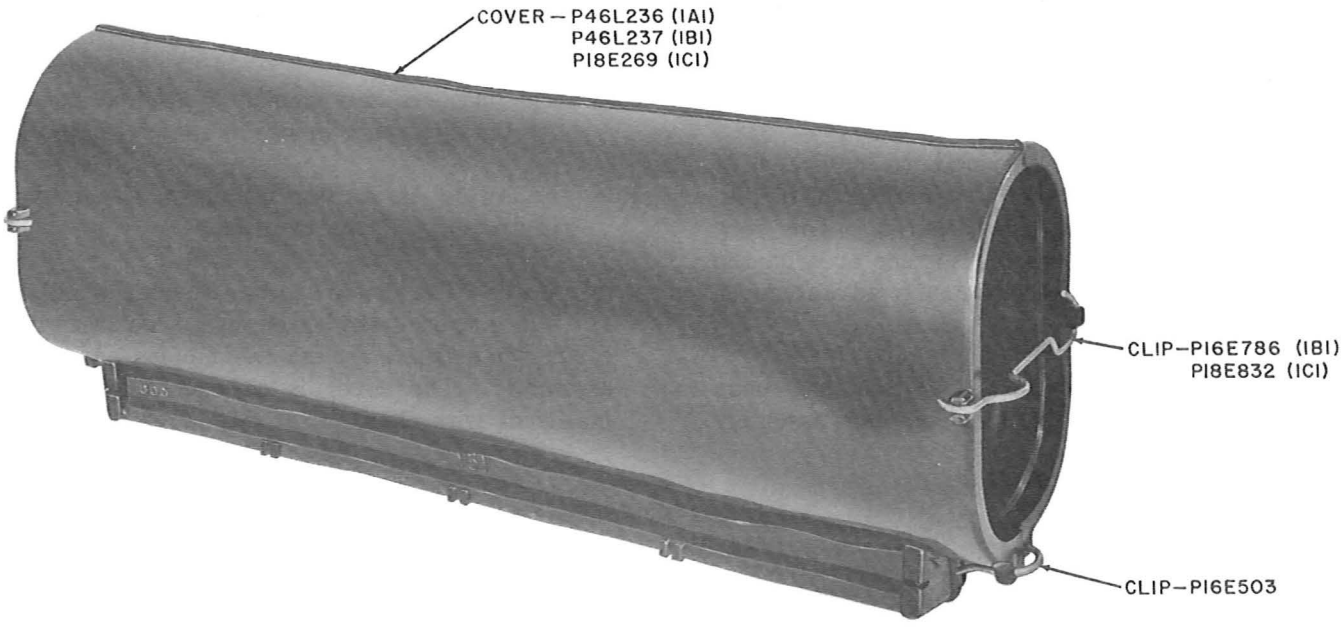


Fig. 2—Cover and Associated Components for 1A1, 1B1, or 1C1 Closure

(b) ***Nipples***—The molded plastic nipples (Fig. 3) are double cone-shaped and are used to weatherproof cable entrances at each end of the cover. The nipples are stepped and the diameter of the steps are marked to indicate the cable diameter.

(c) ***Base Assembly***—The base assembly (Fig. 4) consists of a molded plastic strip fastened between metal strips. The base has 24 numbered entrance points for drop wires. Double sheath clamps, held in position by a tie rod, are provided at each end of the base for fastening the closures to the cables. The tie rod provides a bridge across the splice to maintain electrical continuity of the sheath and prevent sheath pullout.

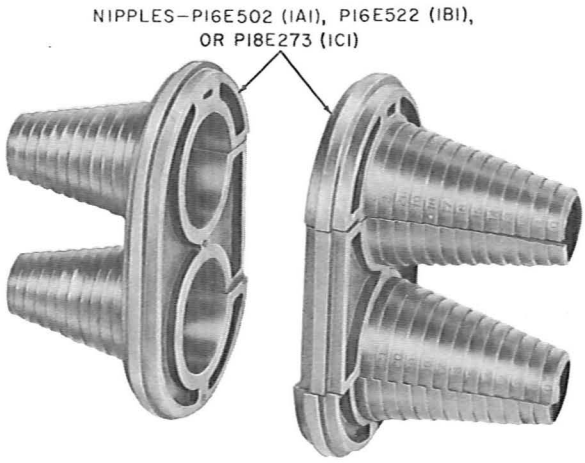


Fig. 3—Nipples for 1A1, 1B1, or 1C1 Closure

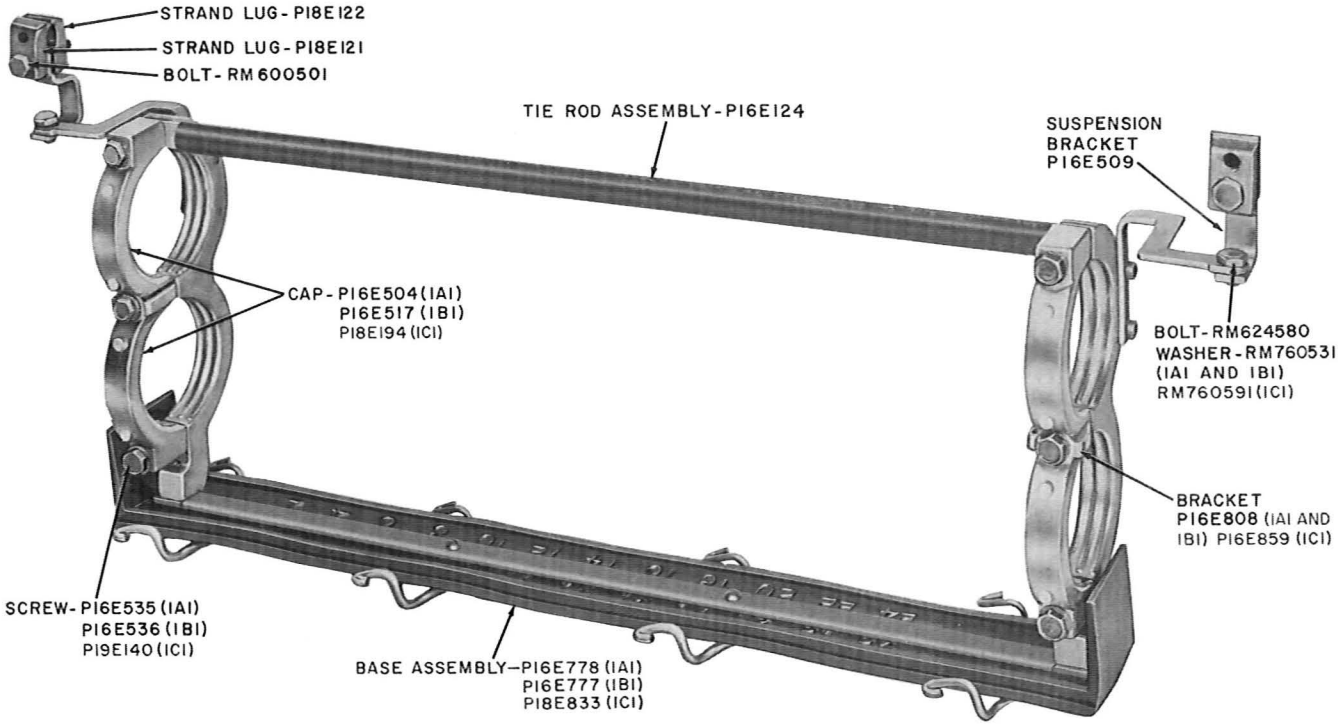


Fig. 4—Base Assembly and Associated Components for 1A1, 1B1, or 1C1 Closure

(d) ***Adapter Assembly***—The 138A Adapter Assembly shown in Fig. 5 consists of an inner sheath clamp, two spacers, and a length of lead lashing wire used to hold the spacers in place until the caps are installed on the base assembly.

(e) ***Suspension Bracket and Strand Lug***—The suspension bracket and strand lug shown in Fig. 4 are used to fasten the closure to the suspension strand. They provide the electrical bond between the closure, cable sheath, and strand.

(f) ***Sealing Tape***—The B Sealing Tape is provided to form drip collars around the cables at each end of the base assembly.

(g) ***End Plug***—The end plug (Fig. 6) is placed in the tapered end of the nipple to plug unused cable entrance holes.

2.05 The replacement parts for the closures are listed in Table A. This information may be used for ordering purposes.

2.06 Where three cables are required to enter one end of a 1B1 or 1C1 Closure, it will be necessary to order a 170B1 Adapter for the 1B1 Closure or a 170C1 Adapter for the 1C1 Closure. The 170B1 Adapter (Fig. 7) and the 170C1 Adapter (similar to Fig. 7) each consists of a plastic nipple, aluminum die-cast clamps, and mounting screws. The 170B1 and 170C1 Adapters will accommodate one cable up to 2.2 and 3.0 inches, respectively, and two additional cables up to 1.0 inch diameter.

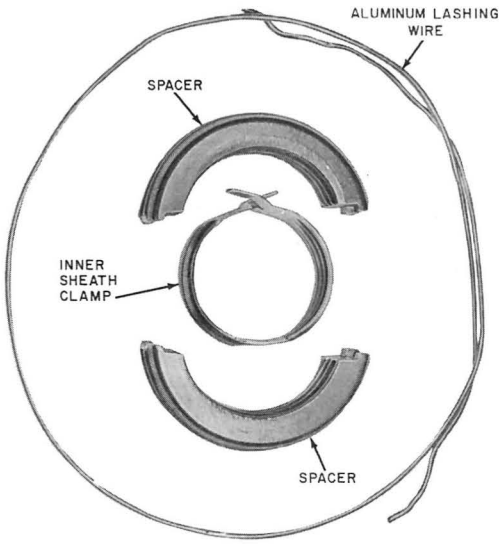


Fig. 5—Adapter Assembly 138A (For 1B1 Closure Only)

3. USE

3.01 The 1A1 Closure is used for enclosing branch cable splices on cable up to and including 1.0 inch in diameter.

3.02 The 1B1 Closure is used for enclosing branch cable splices on cables up to and including 2.2 inches in diameter, and for control and access points in dedicated plant.

3.03 The 1C1 Closure is used for enclosing cable splices on cables from 2.2 inches to 3.0 inches in diameter, and for control and access points in dedicated plant.

3.04 The closures can also be used as ready-access terminals by the addition of a P-18A782 Terminal Block and three P-18A786 Rings. The use of the closures as terminals should be limited to PIC cable with 400 pairs or less and when the ultimate number of drop wires is three or less.

3.05 Install the P-18A782 Terminal Block to utilize the ***ready-access*** feature of the closure as follows:

(a) Remove the vinyl covering from the screw located on the base bar at the low count of the grommets and remove the screw.

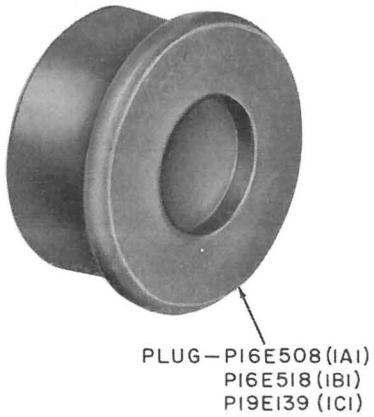


Fig. 6—End Plug

TABLE A — REPLACEMENT PARTS FOR 1A1, 1B1, 1C1 CLOSURES

NOMENCLATURE	PART NUMBERS USED ON CLOSURE			QTY	SHOWN IN FIG.
	1A1	1B1	1C1		
Adapter Assembly		138A			5
Base Assembly	P-16E778	P-16E777	P-18E833	1	4
Bracket	P-16E509	P-16E509	P-16E509	2	4
Bracket	P-16E808	P-16E808	P-16E859	2	4
Cap	P-16E504	P-16E517	P-18E194	4	4
Clamp	P-18E115	P-18E119	P-18E834	4	21
Clip	P-16E503	P-16E503	P-16E503	2	2
Clip		P-16E786	P-18E832	2	2
Cover	P-46L236	P-46L237	P-18E269	1	2
Lug, Strand	P-18E122	P-18E122	P-18E122	2	4
Lug, Strand	P-18E121	P-18E121	P-18E121	2	4
Nipple	P-16E502	P-16E522	P-18E273	2	3
Plug	P-16E508	P-16E518	P-19E139	2	6
Tie Rod Assembly	P-16E124	P-16E124	P-16E124	1	4
Tape, Sealing	P-18A785	P-18A785	P-18A785	12	
Screw, Cap	P-16E535	P-16E536	P-19E140	6	4
Bolt, Hex-Head: 1/4-20 x 1-1/4	RM624580	RM624580	RM624580	2	4
Bolt, Hex-Head: 1/4-20 x 3/8	RM600501	RM600501	RM600501	2	4
Washer, Lock: 1/4 x 3/64 thk	RM760531	RM760531	RM760591	2	4

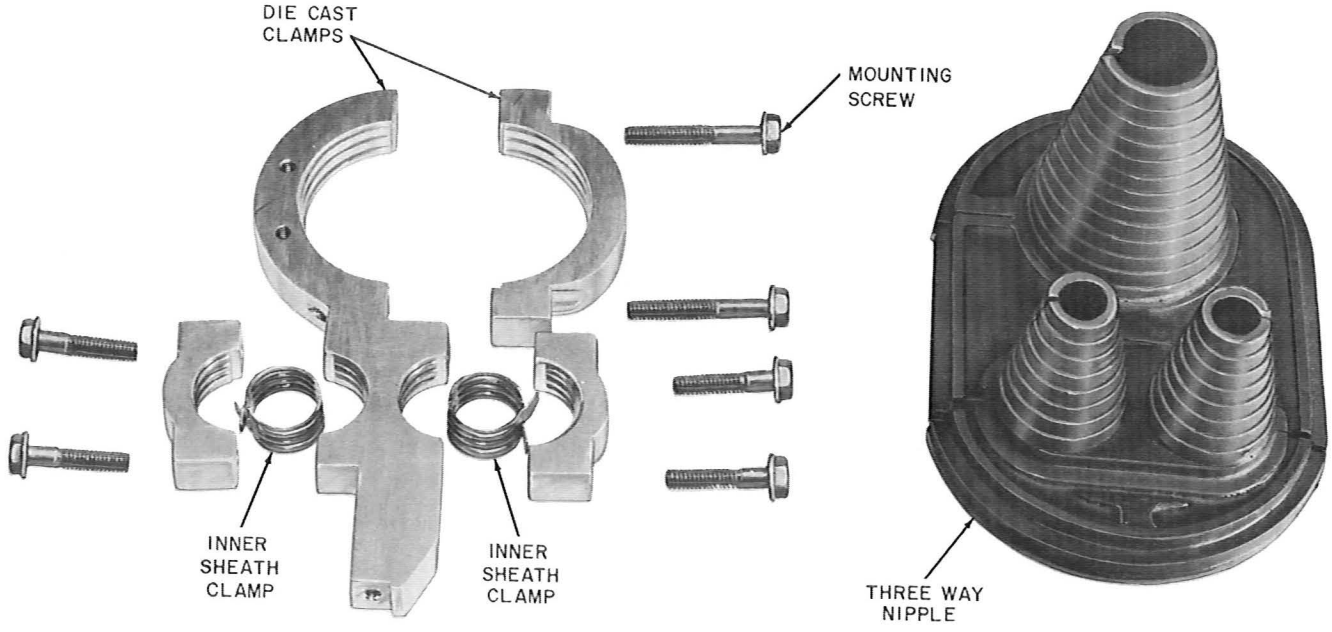


Fig. 7—170B1 Adapter

(b) Puncture the vinyl covering at the hole located approximately 2-1/8 inches from the hole from which the screw was removed in (a).

(c) Install and secure the P-18A782 Terminal Block on the closure utilizing the holes uncovered in (a) and (b).

4. LOCATION OF CLOSURE

4.01 The location of the closures should be positioned for best arrangement of the entering cable. The positions of the closures used to enclose branch splices and ready-access terminals on lashed cable are outlined as follows:

(a) At junction of underground and aerial PIC cables, locate the closure on the right side of the pole as shown in Fig. 8. Form two B Paper Tape collars to mark the closure location and support the cables with temporary ties.

(b) If there is not sufficient space for a closure on the right side of the pole due to the presence of another splice, locate the closure to the left of the pole.

(c) Locate the closure at an aerial branch splice as shown in Fig. 9. Form two B Paper Tape collars to mark the closure location and support the cables with temporary ties.

(d) Where the closure is used with a B-type cable terminal or a 29-type cabinet, the closure should be located in the same manner as the wiped joints shown in Section 632-605-205.

(e) After determining the closure location, it may be necessary to reterminate the lashing wire. If the lashing wire has to be reterminated, secure cable lashing clamps to the strand at position shown in Fig. 8 or 9. Cut and remove the lashing wire.

(f) Using lashing wire or other suitable material, temporarily tie the unlashed portion of the cable to the strand as shown in Fig. 8 or 9.

4.02 The closure may be installed on self-supporting cable as follows:

(a) At intermediate poles slit the web as shown in Fig. 10. Form two B Paper Tape collars to mark the closure location, and support the cable as shown. If the cable is spiraled, it may be necessary to slit the web an additional 20 inches.

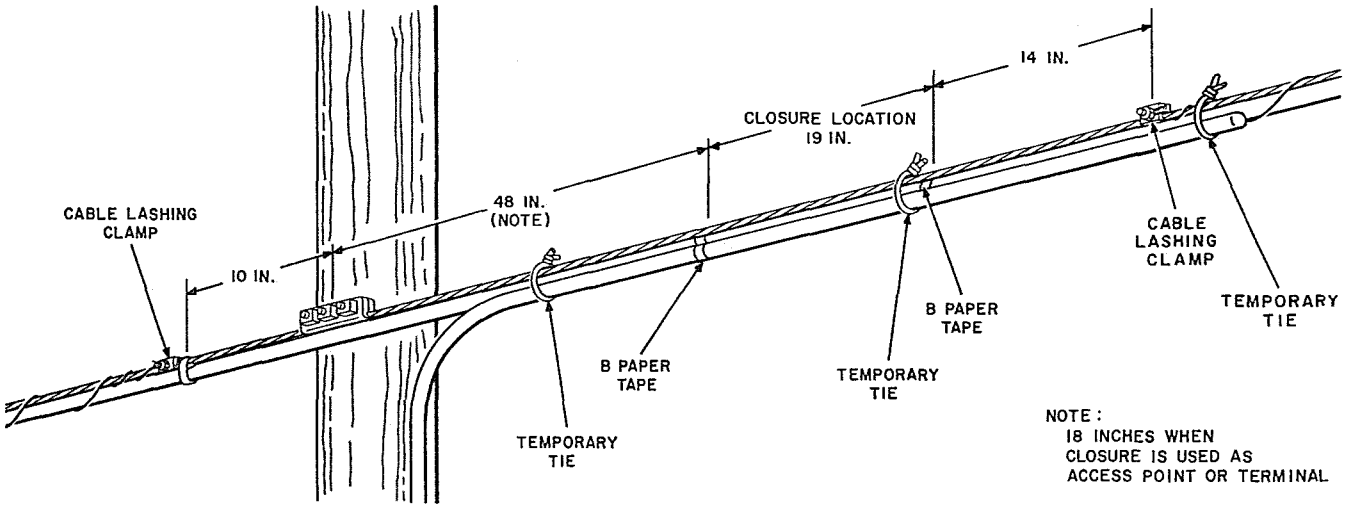


Fig. 8—Location of Closure at Junction of Underground and Aerial Cable

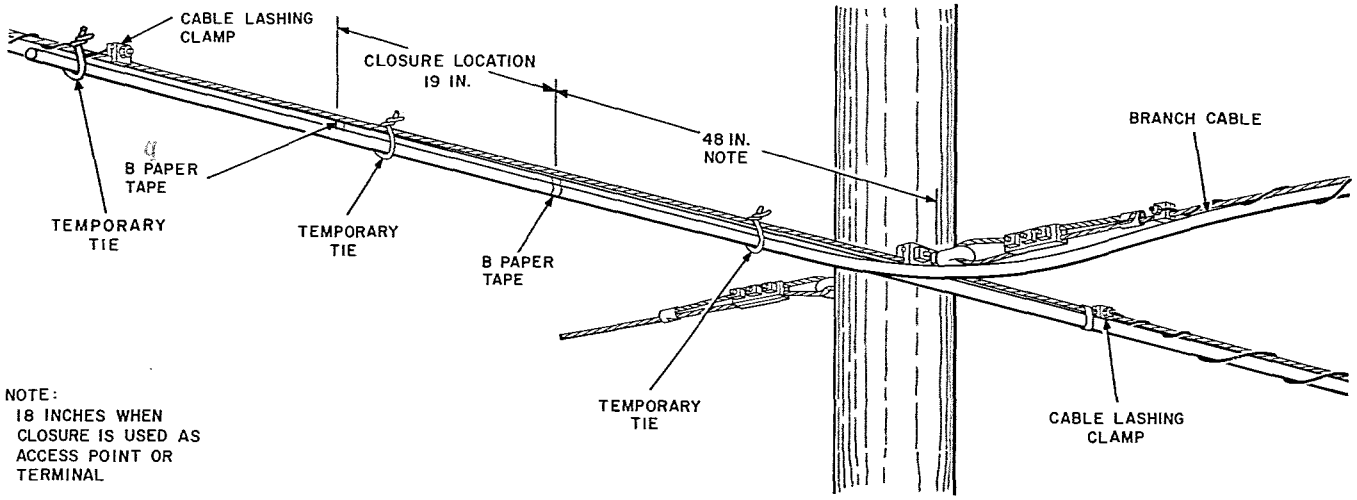


Fig. 9—Location of Closure at Aerial Branch Splice

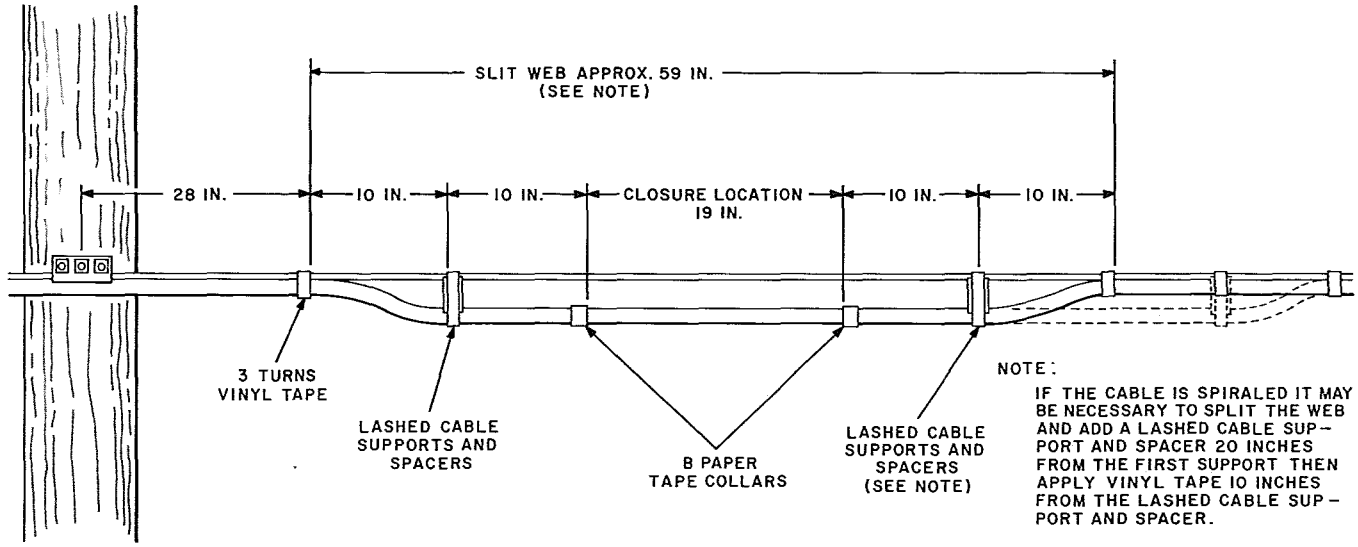


Fig. 10—Location of Closure When Used as a Terminal or Access Point on Self-Supporting Cable at Intermediate Pole

(b) At dead-end poles slit the web approximately 87 inches from the center of the pole, form two B Paper Tape collars, and support the cable as shown in Fig. 11.

5. SHEATH PREPARATION

LASHED CABLE

5.01 If a slack puller is required, install and use the slack puller as outlined in Section 632-300-205.

5.02 Prior to starting the sheath preparation, make sure that the distance between the B Paper Tape collars is as shown in Fig. 12.

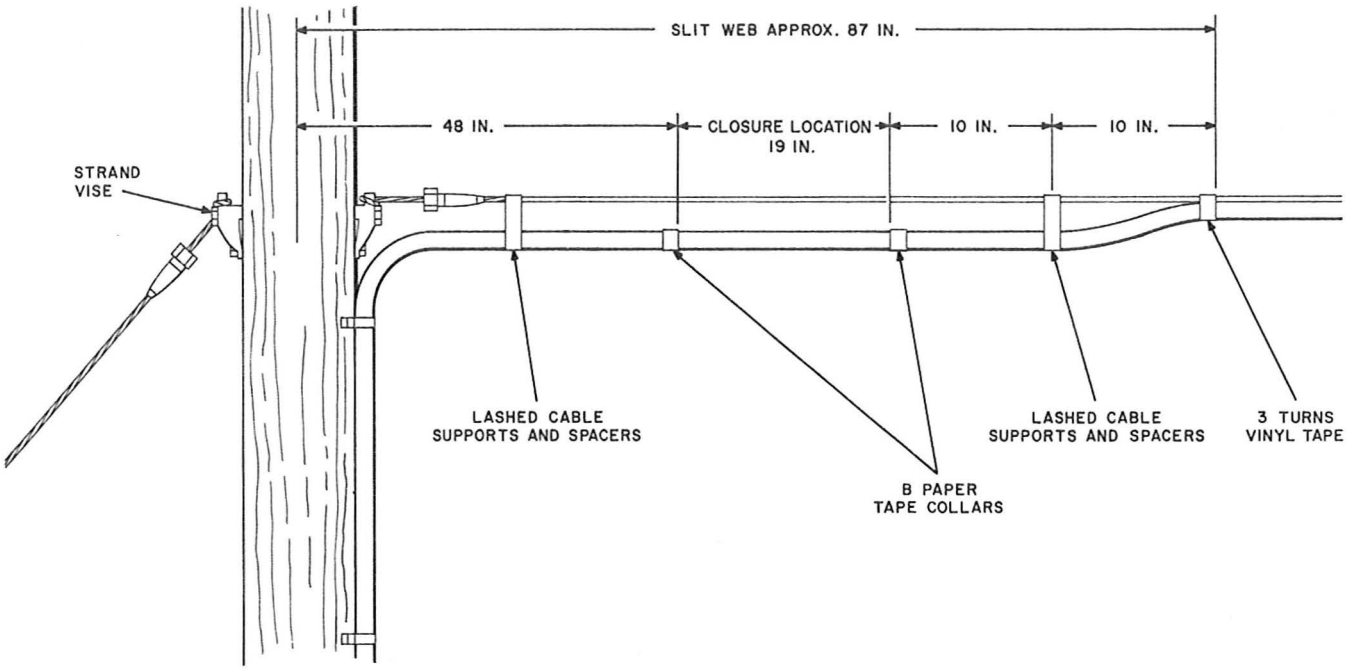


Fig. 11—Location of Closure When Used as a Terminal or Access Point on Self-Supporting Cable at Dead-End Pole

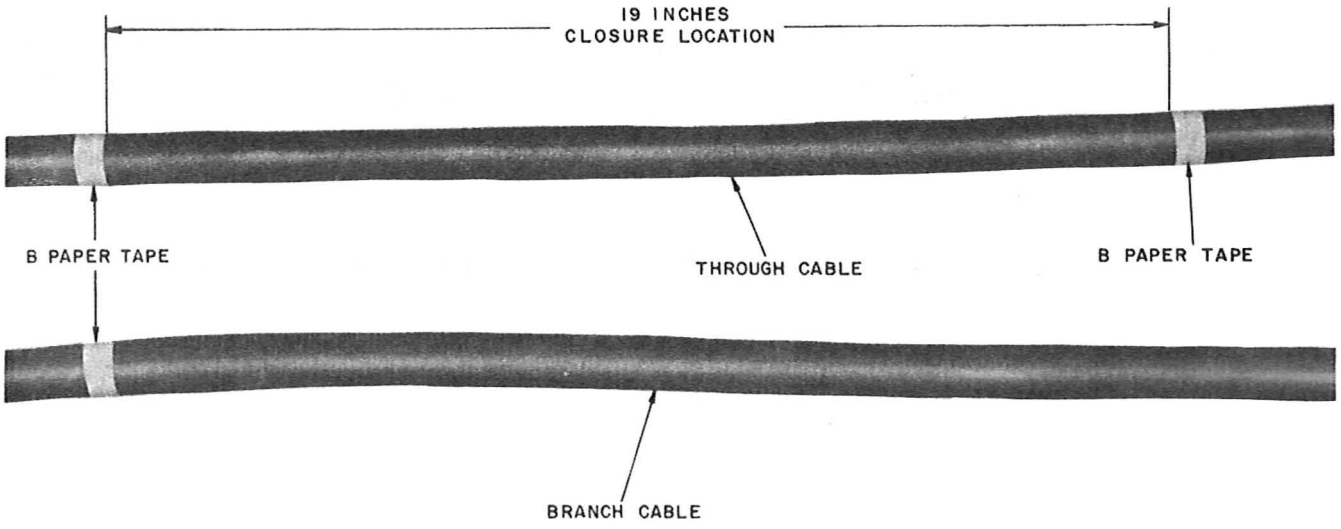


Fig. 12—Marked Closure Location for Lashed Cable

5.03 Mark, cut, and remove the polyethylene sheath from the through cable as shown in Fig. 13.

5.04 Cut and remove the metal sheath as shown in Fig. 14. ***Wear gloves when removing the metal sheath.***

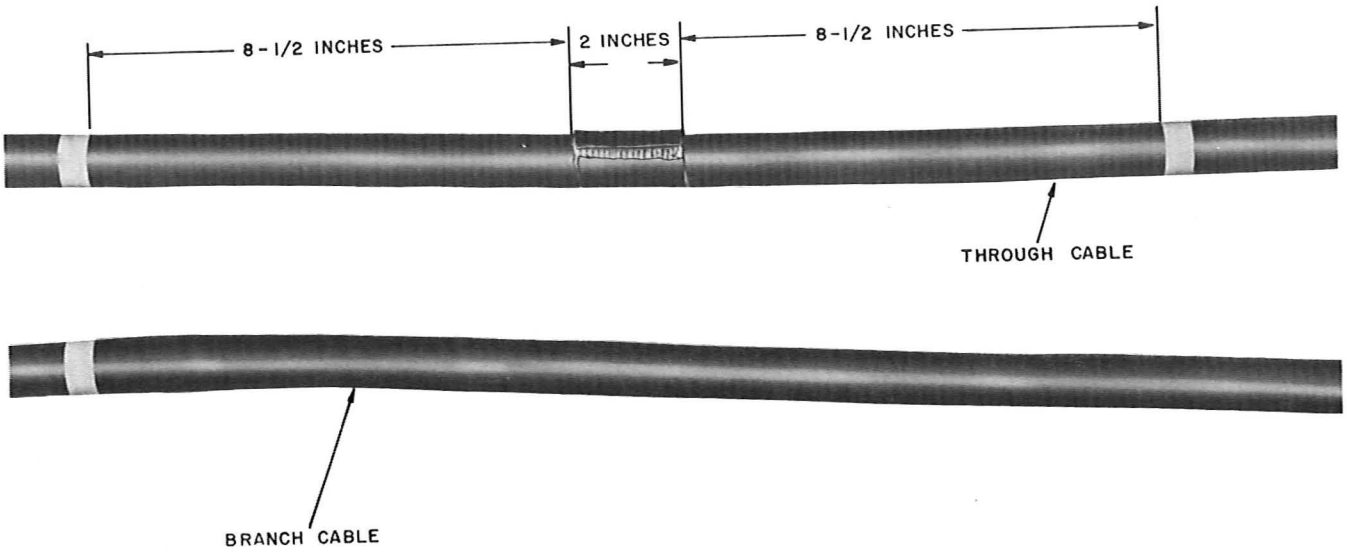


Fig. 13—Polyethylene Sheath—Marked, Cut, and Ready for Removal

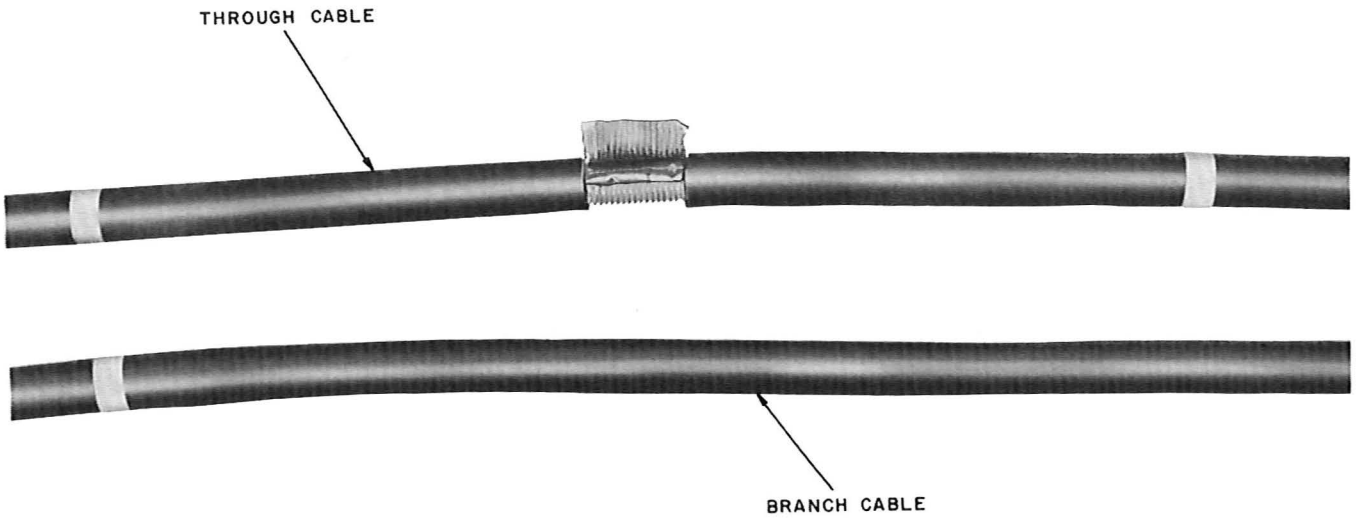


Fig. 14—Removing Metal Sheath

5.05 Grasp the cable sheath as shown in Fig. 15 and pull in opposite directions to relieve any stress that may be in the polyethylene sheath.

5.06 Check the distance between the B Paper Tape collars and compare with the dimensions in Fig. 12. Make corrections if required.

5.07 Mark, cut, and remove the polyethylene sheath from the through cable and the branch cable as shown in Fig. 16.

5.08 Cut the metal sheath and remove from the cables as shown in Fig. 17.

5.09 The number of tabs to be cut in the cable is determined by the diameter of the cable. Use Table B as a guide for cutting the tabs.

5.10 Cut 1-3/4 inch long tabs in each end of the sheath opening as shown in Fig. 18. ***Exercise care not to damage the core wrapper.***

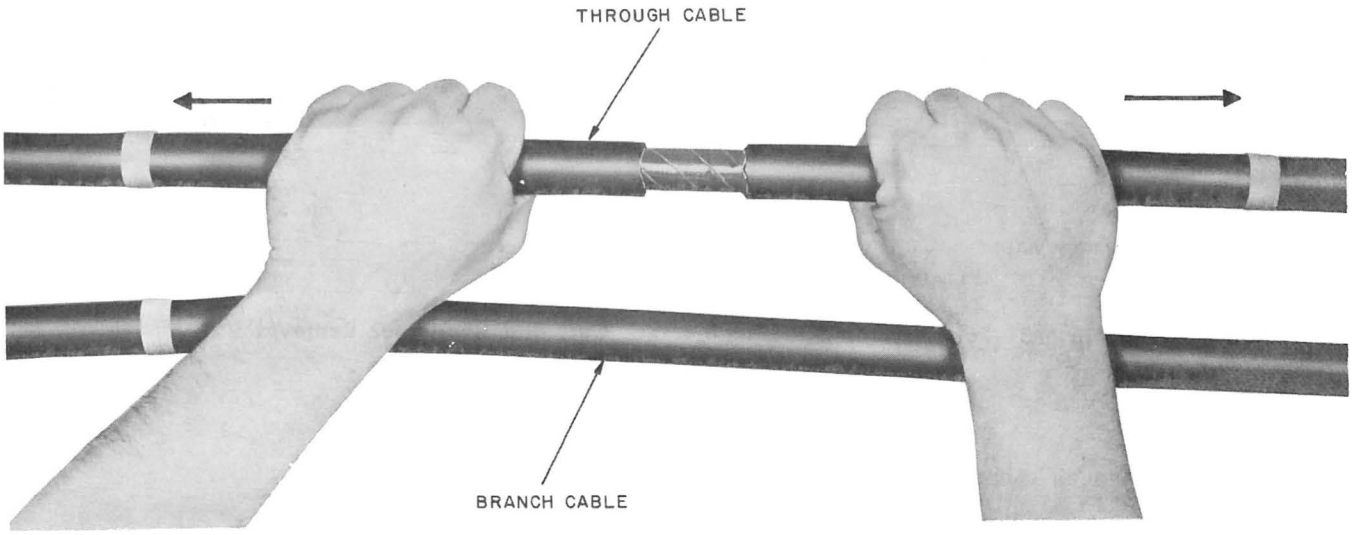


Fig. 15—Removing Stress in Polyethylene Sheath

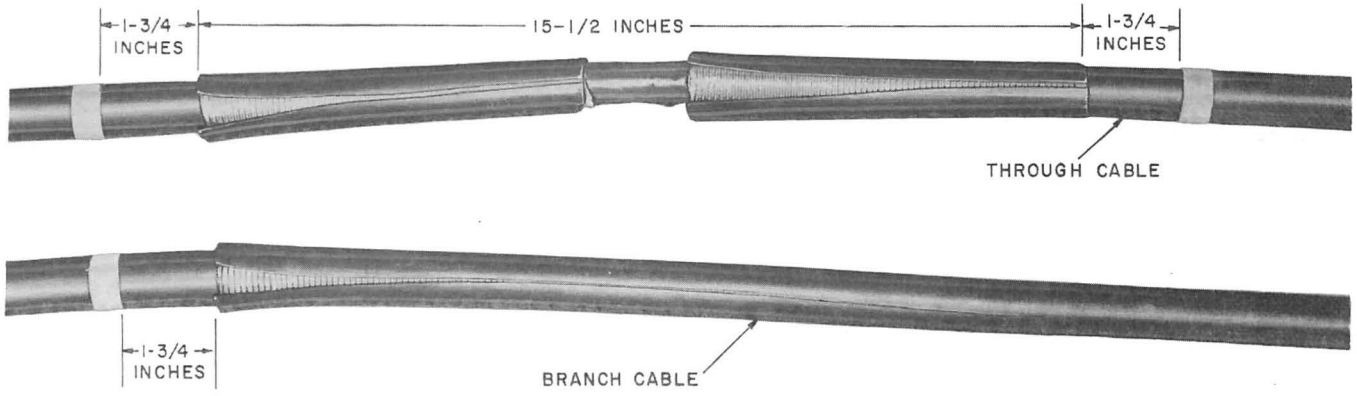


Fig. 16—Polyethylene Sheath—Marked, Cut, and Ready for Removal

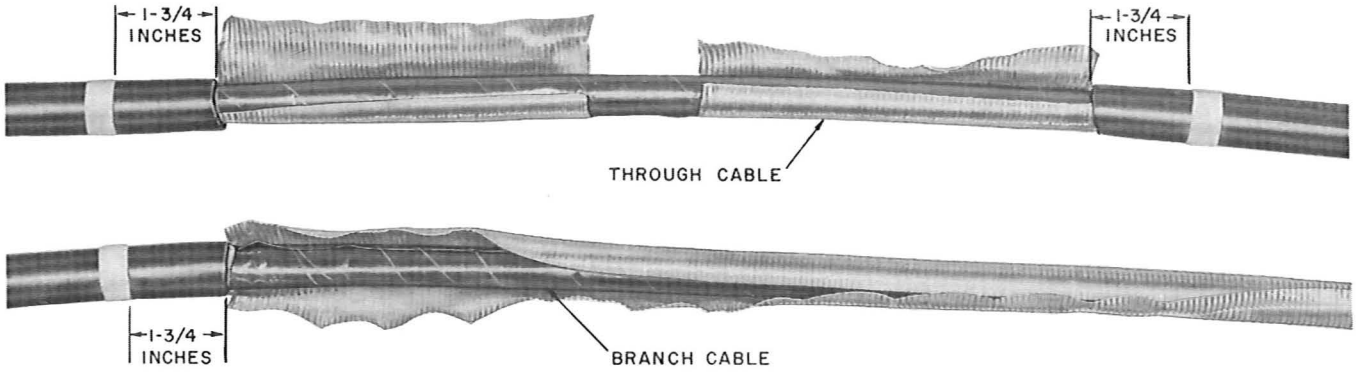


Fig. 17—Removing Metal Sheath

TABLE B — GUIDE FOR TAB CUTTING		
CABLE DIAMETER (INCHES)	NO. OF TABS	DEGREES APART (APPROX)
Up to 0.6	3	120
0.6 to 1.6	4	90
1.6 to 2.2	6	60
2.3 to 3.0	8	45

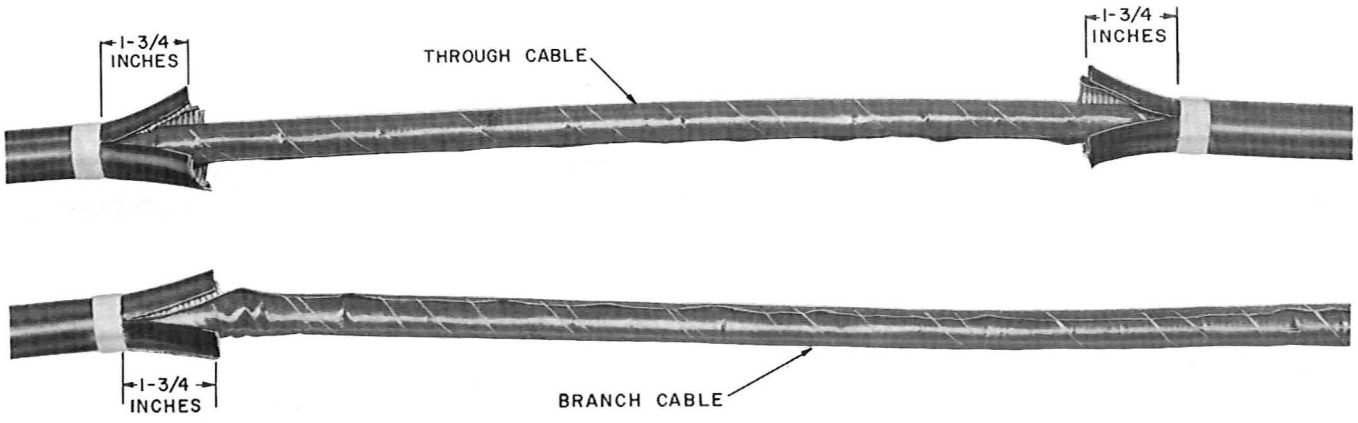


Fig. 18—1-3/4 Inch Tabs Cut

5.11 Cut a 1/8-inch wide strip from each sheath opening as shown in Fig. 19.

5.12 Carefully bend the tabs away from the core. ***Do not bend the tabs sharply.*** This will cause the aluminum to tear at the base of the tabs. ***Remove all projecting slivers of metal to prevent damage to the core wrapper.***

5.13 On cables with more than 0.6-inch diameter, form a collar by wrapping two turns of vinyl tape with adhesive side out around the core.

5.14 Wrap one layer of vinyl tape, adhesive side in, around the collar and slide the collar under the tabs as shown in Fig. 20.

5.15 On cables with less than 0.6-inch diameter, form a collar as outlined in 5.13 and 5.14, except wrap five turns of vinyl tape around the core.

5.16 Place a ***temporary*** bond across the sheath opening as shown in Fig. 21. This provides a temporary shield across the sheath opening for protection against lighting, etc.

5.17 Install the inner sheath clamp over the core and position the clamp over the collar under the tabs as shown in Fig. 22. The inside dimension between the clamps shall not exceed 17 inches. ***Do not substitute bonding ribbon or B Bond Clips for the inner sheath clamps. They do not provide adequate mechanical strength or sufficient current carrying capacity to handle exposures to power or lightning.***

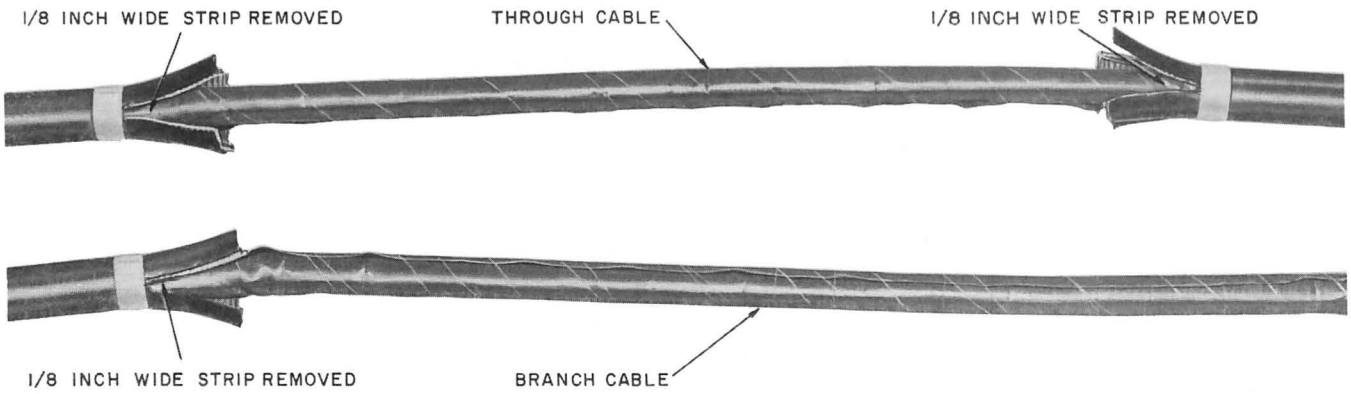


Fig. 19—1/8-Inch Wide Strip Removed From Cable

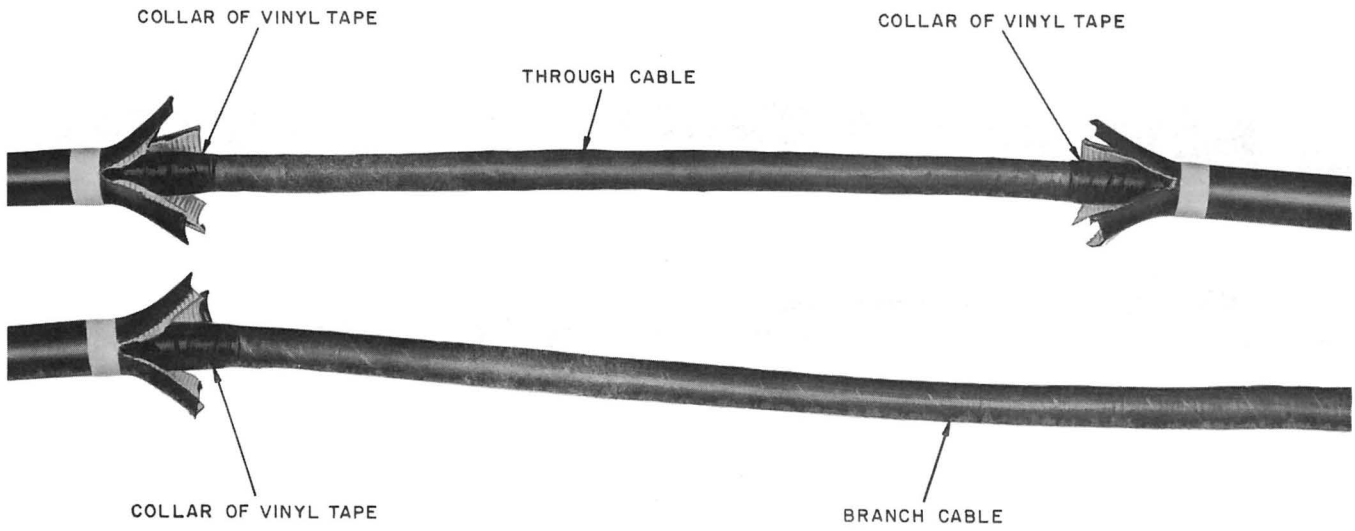


Fig. 20—Collar in Place Under Tabs

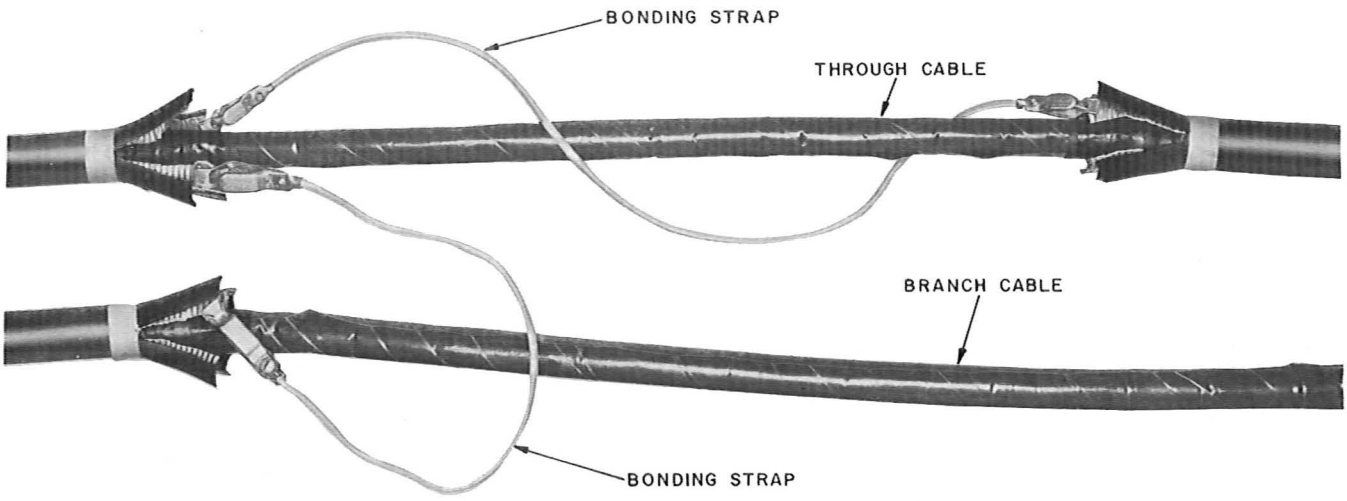


Fig. 21—Installation of Bonding Strap

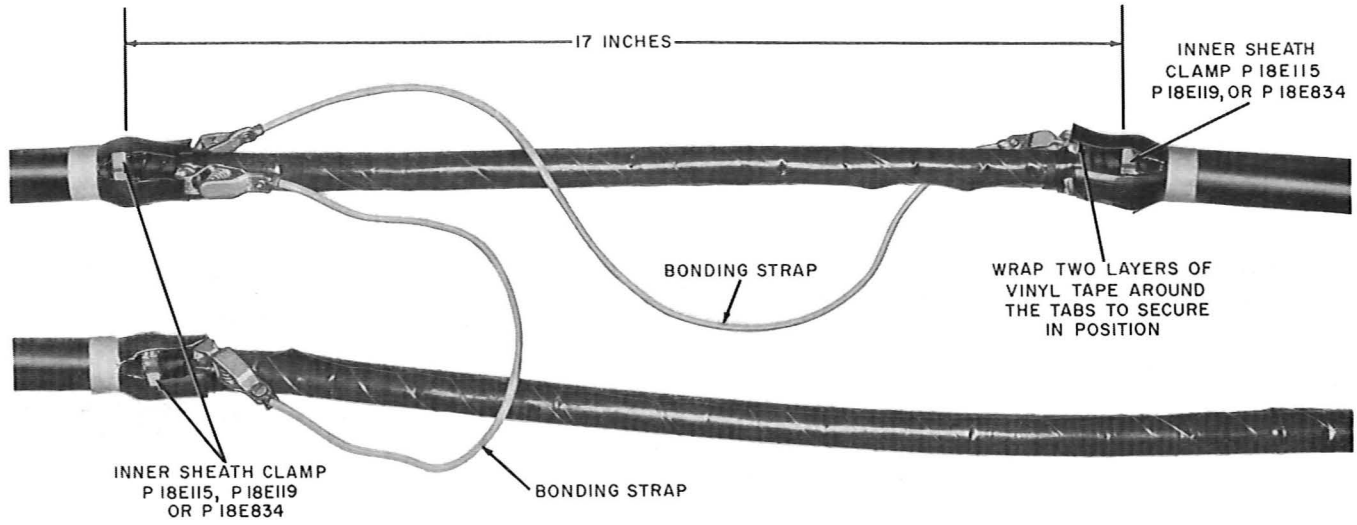


Fig. 22—Inner Sheath Clamp Installed

SELF-SUPPORTING CABLE

5.18 Remove the polyethylene jacket from the support strand for a distance of 1-1/4 inches as shown in Fig. 23.

5.19 Place B Sealing Tape over the exposed portion of the support strand and part of the polyethylene jacket adjacent to the opening as shown in Fig. 24. This will prevent the exposed strand from corroding.

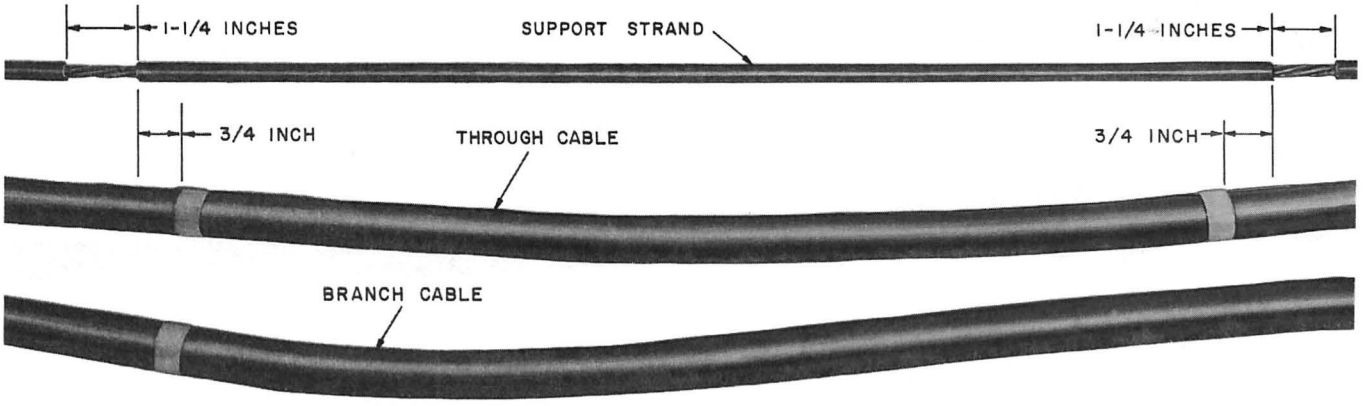


Fig. 23—Removing Polyethylene Jacket From Strand

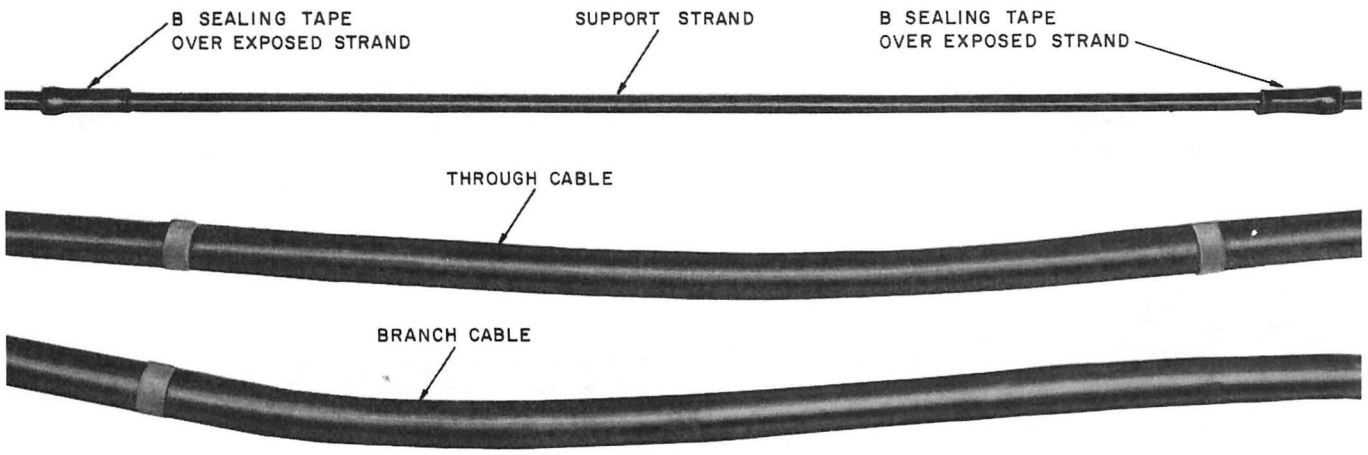


Fig. 24—B Sealing Tape Installed Over Exposed Portion of Strand

5.20 Prior to starting sheath preparation for self-supporting cable, make sure that the distance between the B Paper Tape collars is as shown in Fig. 25.

5.21 Mark, cut, and remove the polyethylene sheath 1-3/4 inches inside the paper tape collars as shown in Fig. 26.

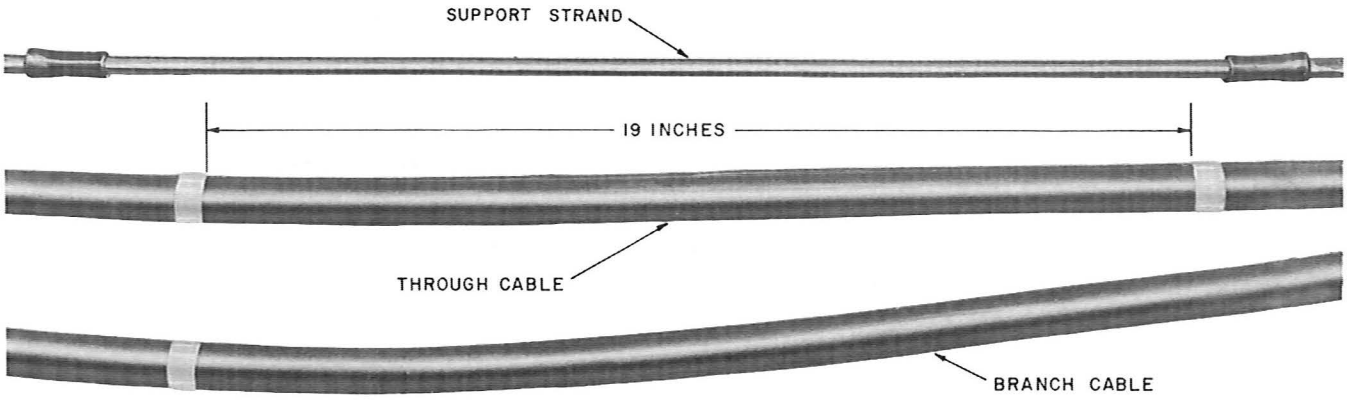


Fig. 25—Closure Location Marked on Self-Supporting Cable

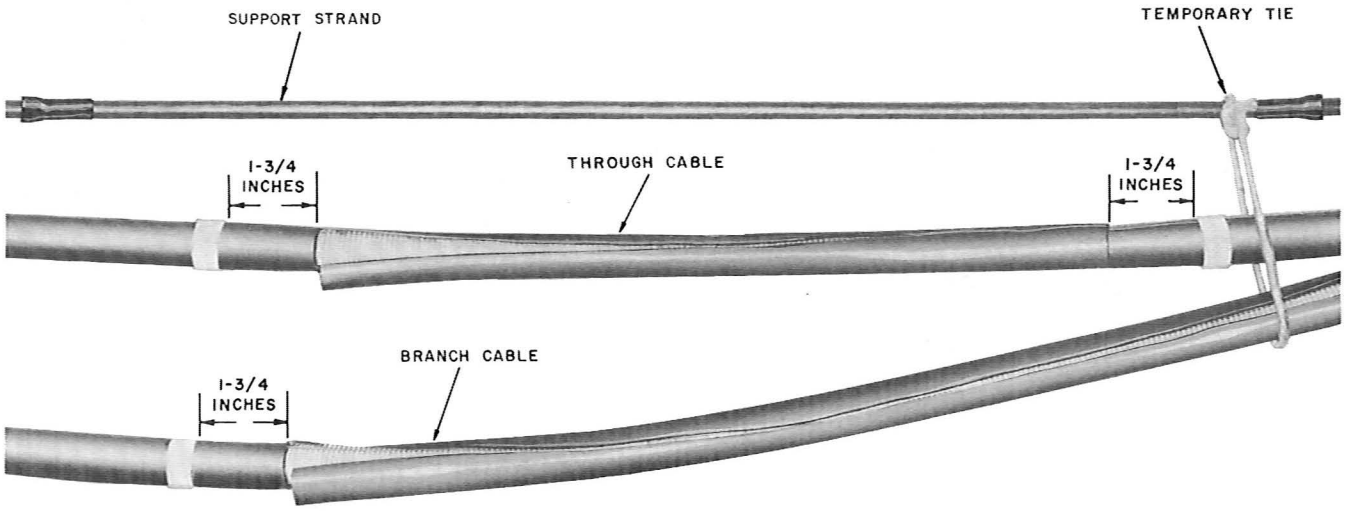


Fig. 26—Polyethylene Sheath—Marked, Cut, and Ready for Removal

5.22 Cut and remove the metal sheath as shown in Fig. 27. ***Wear gloves when removing the metal sheath.***

5.23 Cut tabs, form collars, and install inner sheath clamps as outlined in 5.09 through 5.17.

PAP CABLE

5.24 Polyethylene, aluminum, and polyethylene-sheathed cable (PAP) is prepared as outlined in 5.02, 5.07, and 5.08.

5.25 Cut tabs in the outer layer of polyethylene and the underlying metal shield as outlined in 5.09 through 5.12. ***Do not cut the inner polyethylene sheath.***

5.26 Form collars and install inner sheath clamps as outlined in 5.13 through 5.17.

5.27 The sheath opening is now ready for installation of the closure. ***Install the closure clamping assembly immediately to prevent any longitudinal movement of the cable which may increase the length of the sheath opening.***

6. INSTALLATION OF CLOSURE

6.01 ▶Make 3 longitudinal cuts, 90 degrees apart, along the nipple from the small end (Fig. 28). Extend the cuts up to the nipple step indicating the diameter size of the cable being enclosed.◀

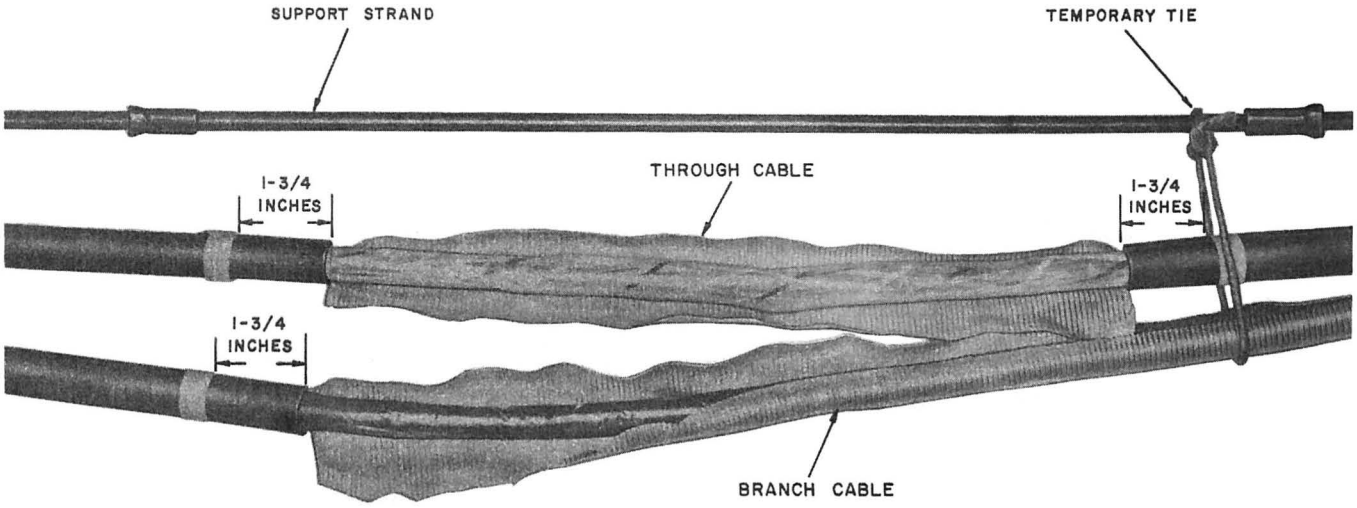


Fig. 27—Removing Metal Sheath

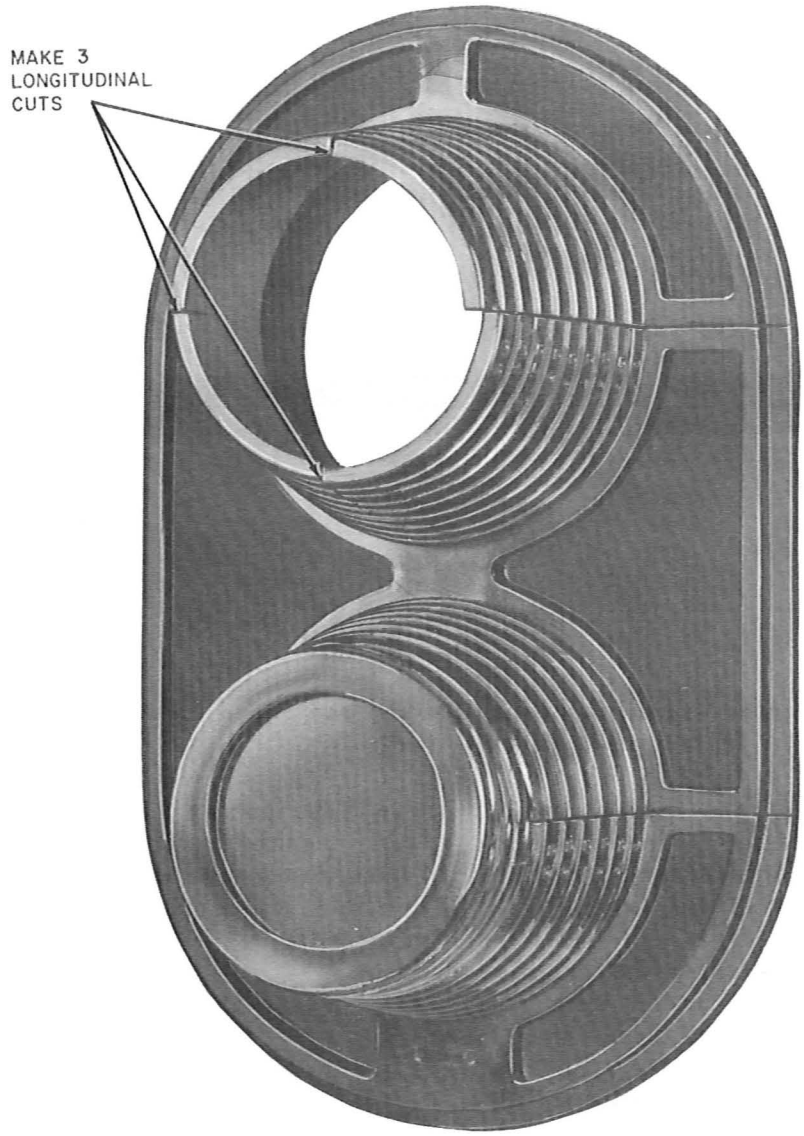


Fig. 28—Prepared Nipple

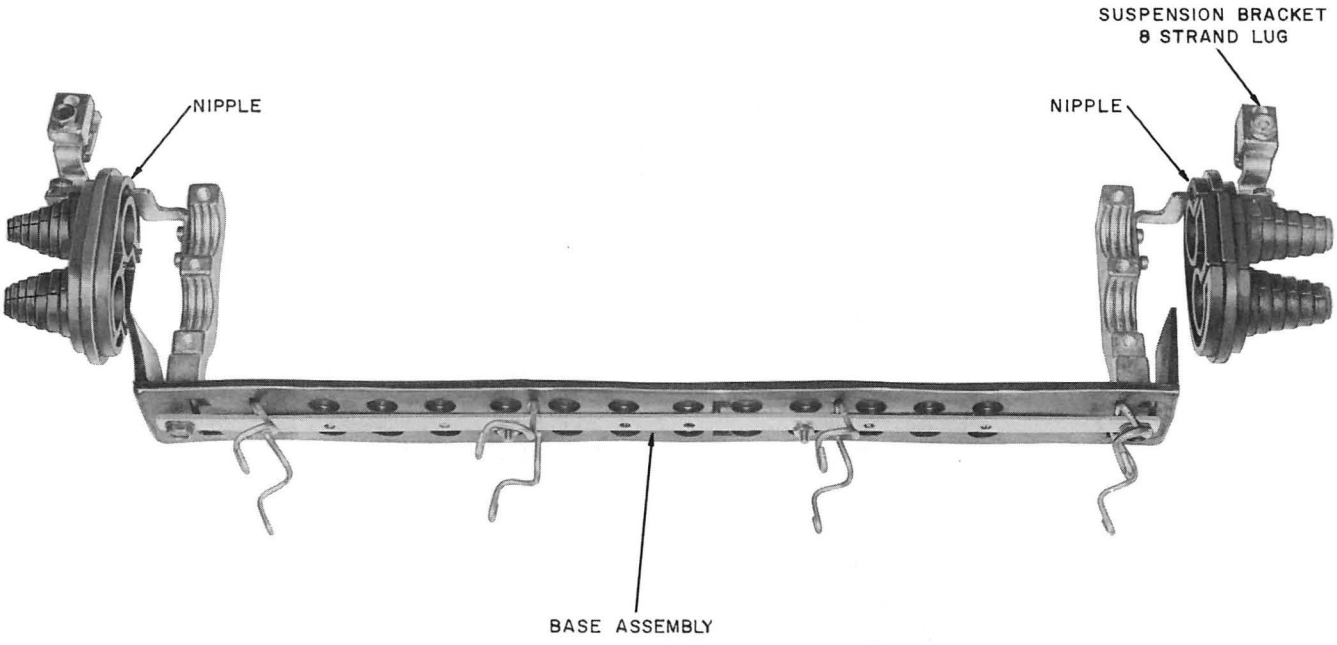


Fig. 29—Installation of Nipples, Suspension Bracket, and Strand Lugs on Base Assembly

6.02 Install the nipple on the base assembly (Fig. 29). Install and secure the suspension brackets and strand lugs as shown in Fig. 29. ***Do not tighten the screws at this time.***

> ***Note:*** If three cables enter the closure, remove the double sheath clamp from the base assembly and install the double sheath clamp of the 170B1 or 170C1 Adapter. Remove the suspension bracket from the double sheath clamp and install on the clamp of the adapter assembly. When using the closure on self-supporting cable, reverse the strand lugs as shown in Fig. 30.

6.03 When installing the closure, adapter assemblies are required for various cable sizes. Use Table C as a guide for selecting the correct adapter assembly.

6.04 Install the two spacers of the adapter assembly over the inner sheath clamp and secure using the lead lashing wire furnished with the adapter assembly as shown in Fig. 31.

6.05 Remove the B Paper Tape collars from the cables.

6.06 The number of strips of B Sealing Tape required to form drip collars is determined by the closure used and the diameter of the cables. Use Table D as a guide for determining the number of strips to use.

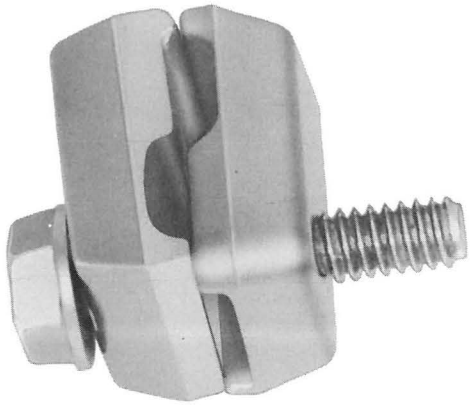


Fig. 30—Strand Lugs Reversed for Self-Supporting Cable

TABLE C — GUIDE FOR SELECTING ADAPTER ASSEMBLY

CABLE DIA (INCHES)	ADAPTER ASSEMBLY		
	(FOR 1A1)	(FOR 1B1)	(FOR 1C1)
Up to 0.6[1]	138C	138D	133A
0.7 to 1.0		138B	133A
1.1 to 1.6		138A[2]	133B
1.7 to 2.2			133C

Note 1: A P-18E113 Inner Sheath Clamp is required for use on cables up to 0.6 inch in diameter.

Note 2: Furnished with 1B1 Closure.

TABLE D — GUIDE FOR DETERMINING NUMBER OF STRIPS OF B SEALING TAPE TO USE TO FORM DRIP COLLARS

CABLE DIA (INCHES)	CLOSURE	NO. OF STRIPS OF B SEALING TAPE
Up to 1	1A1	1
Up to 1	1B1	3
1.0 to 1.6	1B1	2
1.6 to 2.2	1B1	1
2.2 to 3.0	1C1	1

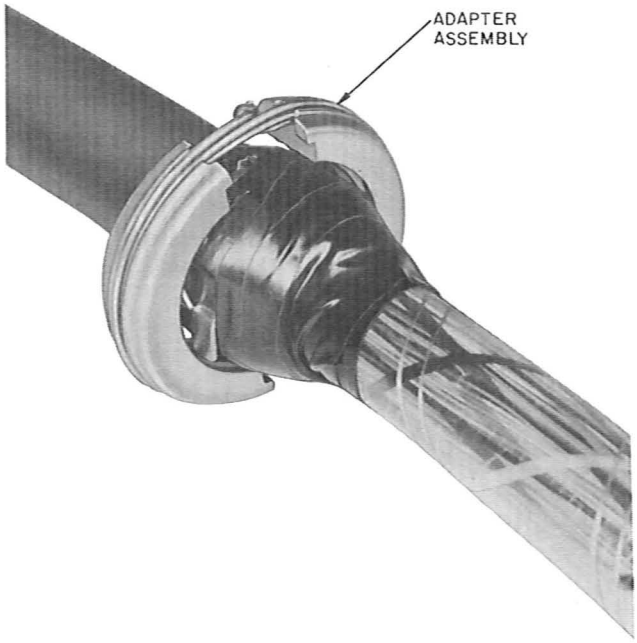


Fig. 31—Adapter Assembly Installed

6.07 Using B Sealing Tape, form drip collars on the cables as shown in Fig. 32.

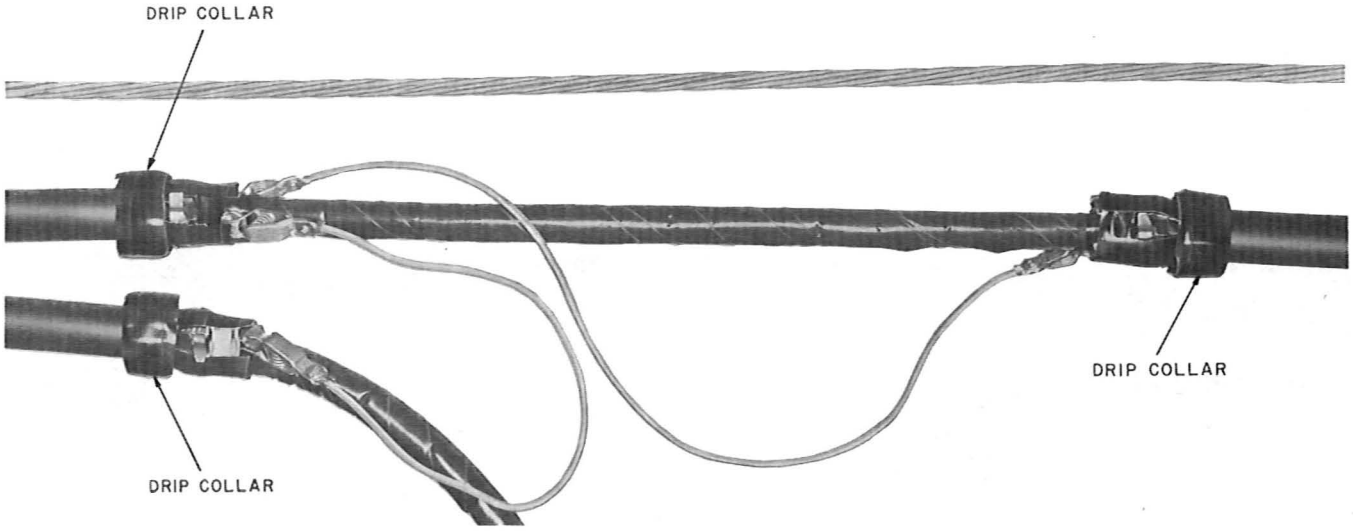


Fig. 32—Drip Collars Installed

6.08 Wrap two layers of vinyl tape over each drip collar to prevent the cover from adhering to the sealing tape.

6.09 When using the 1B1 or 1C1 Closure and the cable is less than 1 inch in diameter form a cone-shaped collar as shown in Fig. 33 to seal off the space between the cable and the nipple.

6.10 Fit the nipples aroung the cables and install the base assembly on the sheath opening with the clamp brackets behind the cable as shown in Fig. 34. Using a B Torque Wrench and a 7/16-inch socket from the D Wrench Kit, position the strand lugs to the strand and tighten the strand lug bolts to 75 to 100 inch-pounds. If the closure is used as a ready-access terminal, the odd-numbered drop wire entrance holes on the base assembly should be on the side of the cable away from the pole.

6.11 Position the through cable or cables and branch cable on the base assembly. Ensure

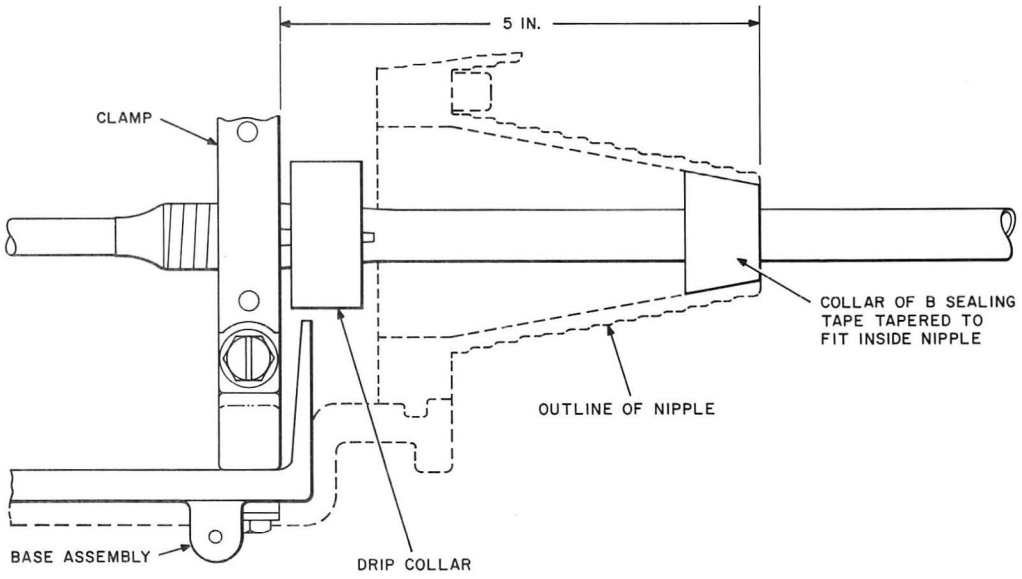


Fig. 33—Cone-Shaped Collar Installed on Cable

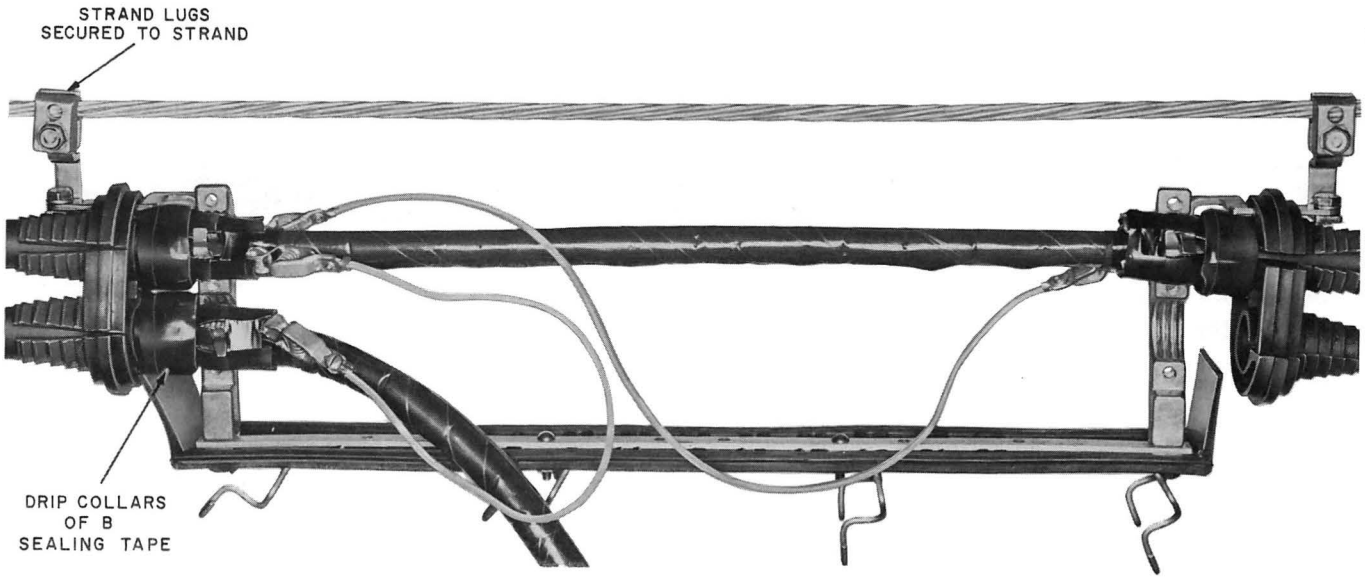


Fig. 34—Installation of Base Assembly

that the inner sheath clamps on the cables align with the clamp brackets and install the caps, tie rod, and clamp bracket as shown in Fig. 35 or 36 and secure using six hexagon-head bolts. ***Do not tighten the bolts at this time.***

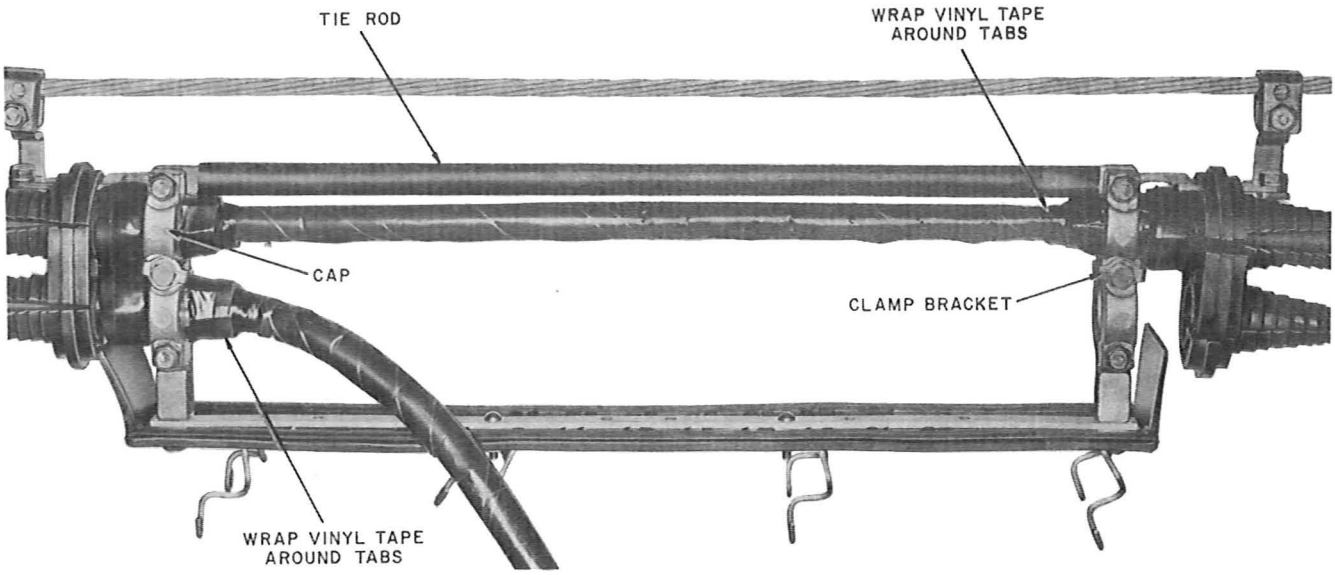


Fig. 35—Assembly of Base

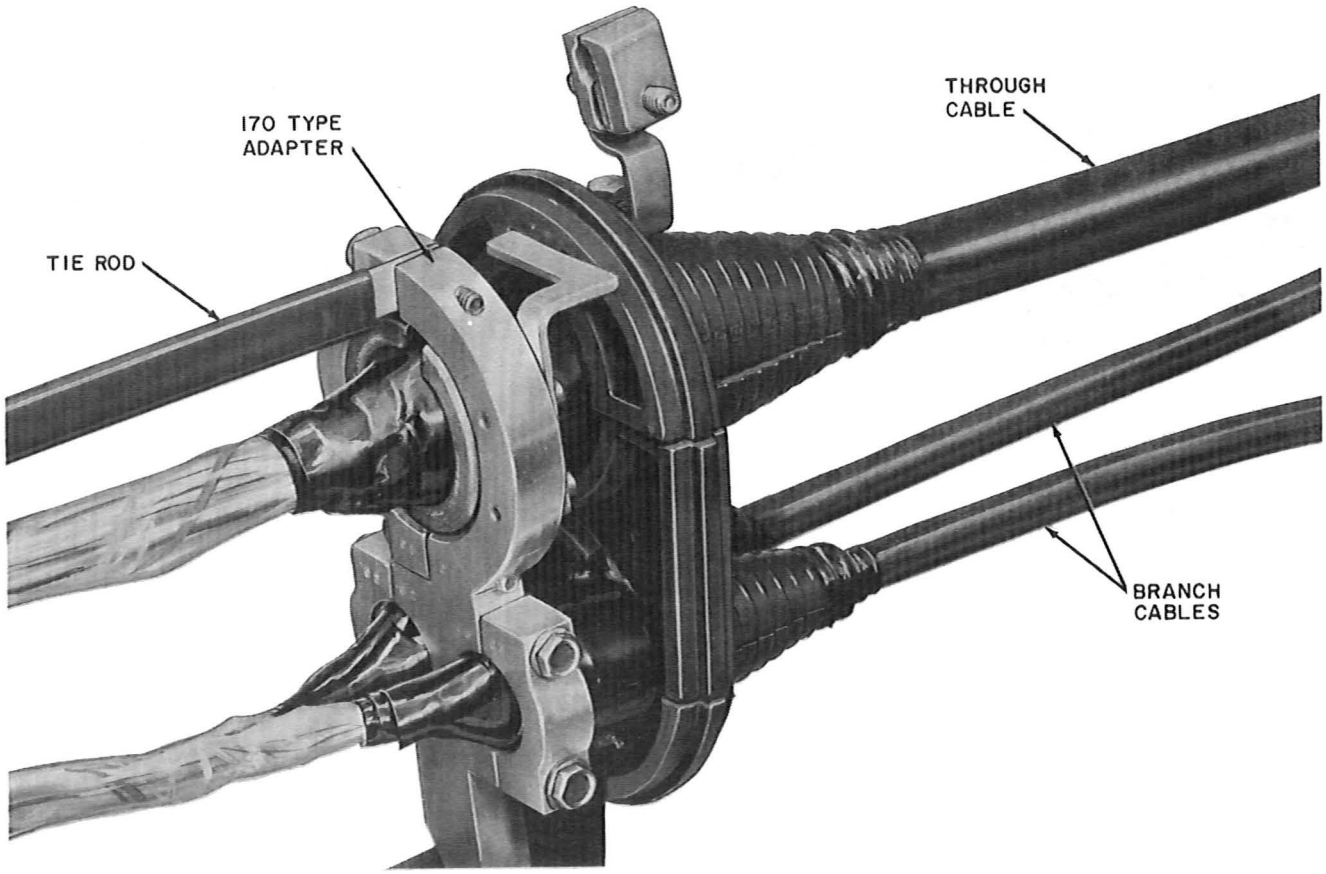


Fig. 36—Assembled 170-Type Adapter

6.12 Remove the temporary bonding strap and wrap vinyl tape around tabs (Fig. 35).

6.13 ***Ensure that the adapter assembly, if used, and the inner sheath clamp make metal-to-metal contact with the outer caps.*** This provides:

(a) Strength across the sheath opening to prevent pullouts.

(b) Shield continuity to provide lightning protection, etc.

6.14 Using a B Torque Wrench and a 7/16-inch socket from the D Wrench Kit, tighten the hexagon head bolts in the die cast clamps a few turns at a time, starting with the middle bolt. Finish tightening by applying a torque of 75 to 100 inch-pounds to each bolt.

6.15 Splice the branch cable or cables to the through cable as covered in Section 632-410-200.

6.16 Install the cover by taking the side marked 1A1, 1B1, or 1C1; and, starting from the rear, work the cover between the strand and the base assembly.

6.17 The sides and the bottom of the cover are grooved to mate with grooves in the nipples and the base. Ensure that all grooves are firmly seated and then clip in place with the bottom and end clips as shown in Fig. 37.

6.18 Install a plug in the unused cable opening of the nipple.

6.19 Tape nipple end to the cable or plug with vinyl tape. Apply sufficient tape to cover the longitudinal cuts, if any, in the nipple plus 2 half-lapped layers on the cable as shown in Fig. 38.

6.20 To remove the cover, release the bottom and end clips. It is not necessary to remove the nipples.

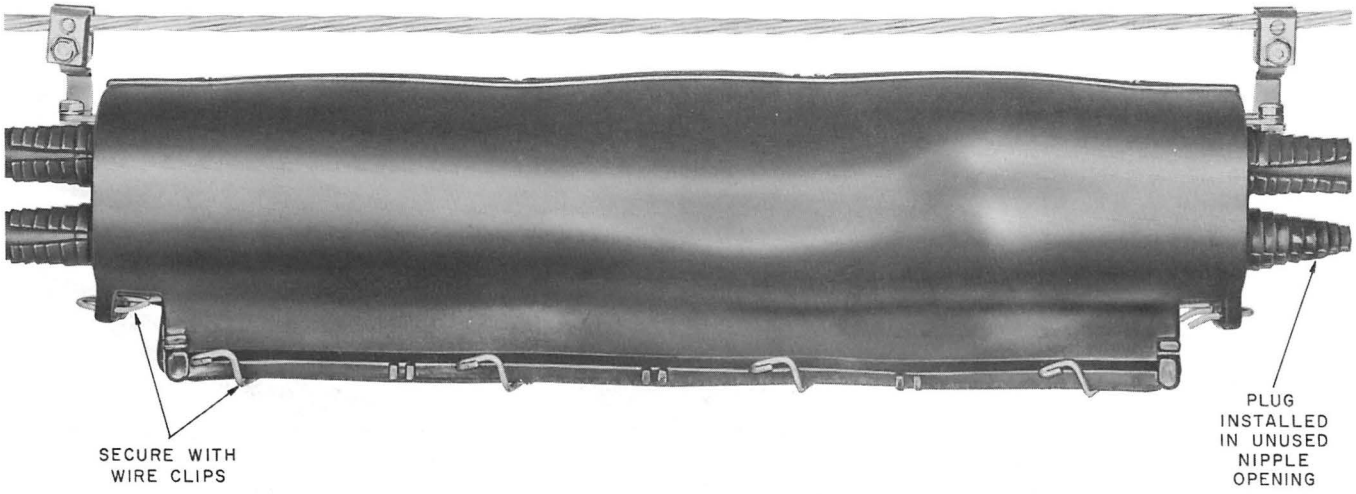


Fig. 37—1A1, 1B1, or 1C1 Closure Installed

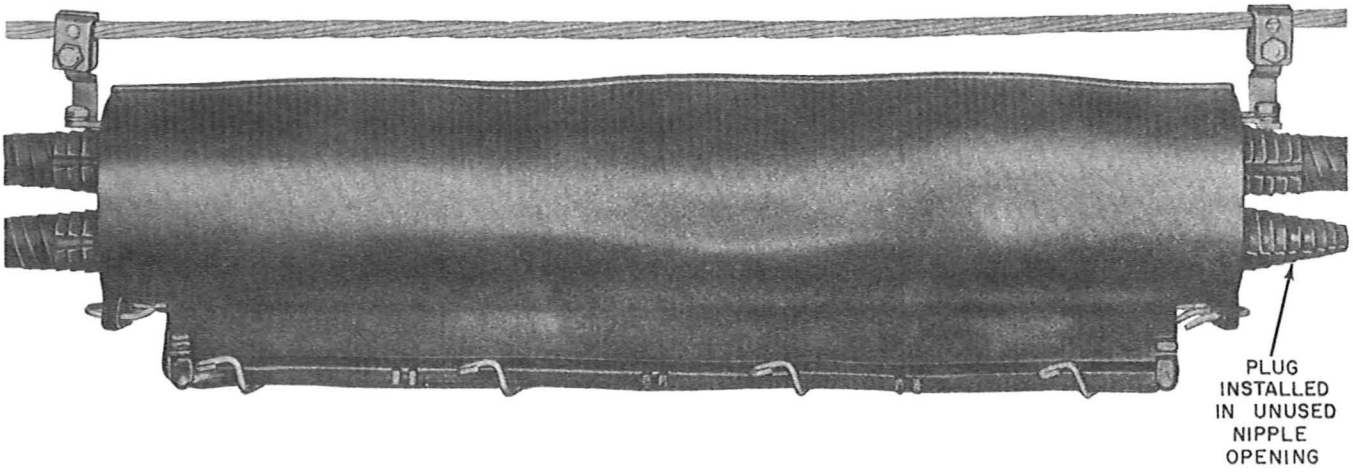


Fig. 38—1A1, 1B1, or 1C1 Closure Installation—Complete