K AND B SPLICE CLOSURE

DESCRIPTION AND INSTALLATION

CONTENTS PAGE

1. GENERAL

1.01 This section covers the description and installation of the K and B splice closures for use on plastic sheath cables in central office cable vaults and subscriber buildings.

1.02 This section is reissued to:

- Delete requirements for the aluminum foil wrap
- Update tables to include additional closures and caps
- Provide an alternate method of closure support
- Revise grounding requirements
- Note that sleeves and caps are made of material that is fire resistant
- Reiterate requirements for tightly wrapped splice bundle.

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

1.03 The closures are intended to provide a moisture-resistant covering for splices not subjected to water submersion.

1.04 *Do not use these closures at the following locations:*

(a) Where the temperature may exceed 150°F.

(b) To enclose a splice in an exposed building entrance cable containing 400 pairs or less. These smaller splices must be enclosed in a metallic splice case. This requirement is to provide a safer closure around the cable pairs that could carry excessive current under power conditions. Cables larger than 400 pairs are judged to contain sufficient copper to act as a "heat sink" under power fault conditions permitting use of nonmetallic splice cases.

(c) In manholes or other locations subject to flooding.

1.05 These closures provide adequate space for splicing a cable using any of the approved wire joining methods covered in the 632 Division of the Bell System Practices. The closures are available for use as in-line or butt type configuration as appropriate.

1.06 Open splices should not be left unattendd. If the permanent closure is not to be installed before leaving the job it will be necessary to protect the splice using muslin and CR tape as outlined in Section 633-040-201.

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2. DESCRIPTION

2.01 The K and B closure (Fig. 1) is available in the sizes listed in Table A. Each closure consists of the following components:

One (1) PVC sleeve

One (1) collared end cap (except for the KB2-100-2, KB3-155 and KBR-175-1 closures which consists of two collared end caps)

One (1) multiple end cap

Two (2) stainless steel clamps.

Sleeves

2.02 The sleeves are fire resistant PVC cylinders available as either solid or double split. When split a flange is welded on one side of each split to help align the edges when the sleeve is closed. The split sleeve is used primarily to enclose splices on through or uncut cables; whereas the solid sleeves are used primarily for straight splices. Codes for each sleeve are listed in Table A.

End Caps

2.03 There are several different fire resistant end caps for each size sleeve (Table A).

(a) ***Collared end caps*** are for main cables and are coded as listed in Table A. Following is an explanation of codes:

C 8 — 289 — 1C

Cap — Sleeve Size (8-in. Diam.) — For Cable Diam. (2.89-in.) — Number of Openings (1)

(b) ***Multiple opening end caps*** are for tip cables and are coded as listed in Table A. Following is an explanation of codes:

C 8 — 100 — 24

Cap — Sleeve Size (8-in. Diam.) — Cable Diam. (1-in.) — Number of Openings (For 24 1-in. Diam. Cables)

(c) ***Special end caps*** are used primarily for building cable splices. These caps are coded as listed in Table B. Following is an explanation of codes:

C 5 — SP — 4

Cap — Sleeve Size (5-in. Diam.) — Special — Number of Openings (4) (See Table For Opening Diam.)

(d) Butt caps for butt splices are coded as listed in Table A and described as follows:

C2-2—A 2-inch cap with 2 stepped cable entries. May be trimmed to fit cables from 0.25-inch diameter to 1.0-inch diameter.

C3-3—A 3-inch cap with 3 stepped cable entries. May be trimmed to fit cables from 0.25-inch diameter to 1.0-inch diameter.

C5-4—A 5-inch cap with 6 cable entries. The two 2.25-inch diameter openings are for main cable. Two 1.25-inch diameter openings and two 1.0-inch diameter openings are for branch cables.

C7-6—A 7-inch cap with 9 cable entries. One main entry 2.75 inches by 5.75 inches, four 1.75-inch diameter entries and four 1.0-inch diameter entries.

C9-8—A 9-inch cap with 10 cable entries. One main entry 2.75 inches by 6.50 inches, four 1.0-inch diameter and six 1.75-inch diameter entries.

(e) Flat caps are used as end caps for butt splices and are listed in Table A and coded as follows:

C 7 — Cap / Sleeve Size (7 in.)

Clamps

2.04 Two stainless steel clamps are furnished with each closure; these clamps are used to secure the end caps to the sleeve. Clamps for each closure are listed in Table A.

Bonding Harness

2.05 The bonding harness (Fig. 2) consists of a group of insulated wire leads all strapped together. A bond clip is attached to the free end of each lead. A sufficient number of bonding harnesses must be ordered to allow the shields of all cables entering the closure to be electrically bonded together. Each bonding harness consists of two 12-gauge insulated wire leads of sufficient length to reach across the splice and attach to the main cable, and up to nine 14-gauge leads (one for each terminating cable).

2.06 The parts listed in Table C are not furnished and must be ordered separately, as required.

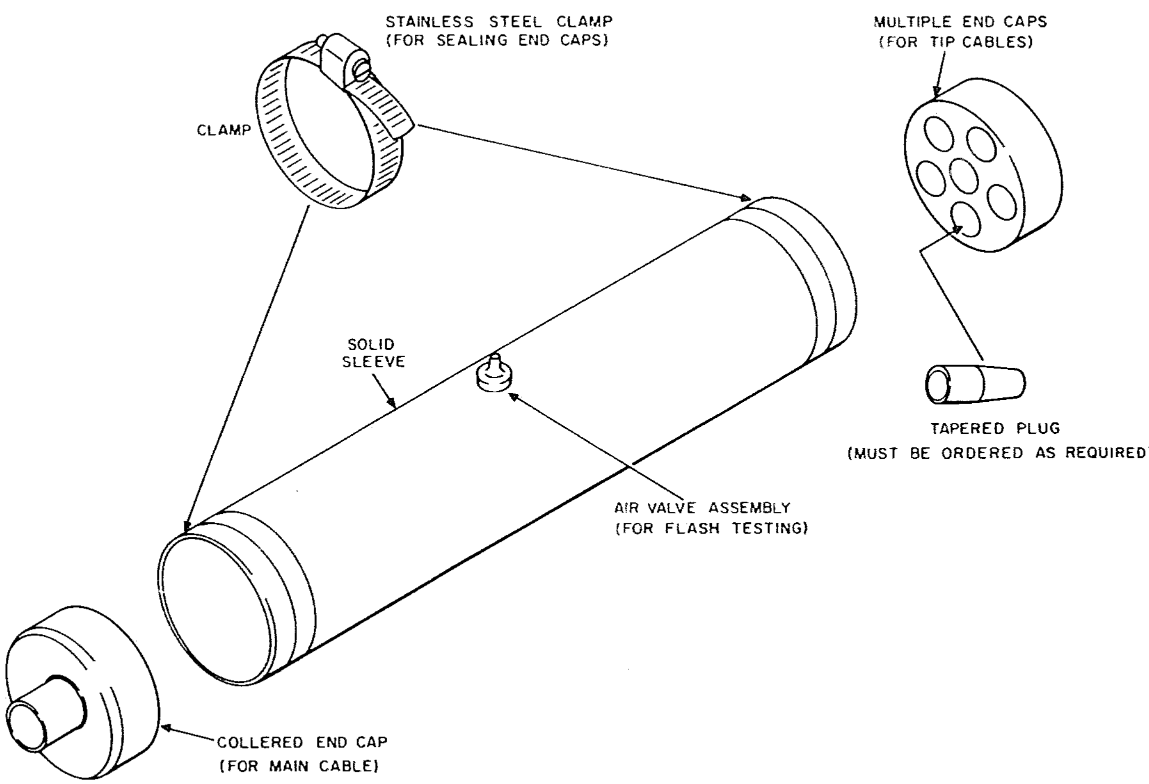


Fig. 1—K and B Closure

TABLE A

CLOSURES FOR VAULT AND RISERS

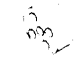
CLOSURE CODE	SLEEVE DIAM (INCHES)	SLEEVE LENGTH (INCHES)	 SOLID	 DOUBLE SPLIT	 COLLARED	 MULTIPLE	 SPECIAL	 BUTT	CAPS  FLAT	CAPS  MULTIPLE			CLAMPS  STAINLESS STEEL
KB2-100-2	2	18	2-18	2DS-18	C2-2 (two)			C2-2	C2				(2) 40SS
KB3-155	3	18	3-18	3DS-18	C3-155-1C (two)		C3-SP-3	C3-3	C3				(2) 60SS
KB4-175-1	4	18	4-18	4DS-18	C4-175-1C (two)		C4-SP-4	C5-4	C4	C4-175-2			(2) 76SS
KB4-175-2	4	18	4-18	4DS-18	C4-175-1C	C4-175-2	C4-SP-4	C5-4	C4				(2) 76SS
KB5-100-6	5	20	5-20	5DS-20	C5-225-1C	C5-100-6	C5-SP-4	C5-4	C5	C5-120-6	C5-130-6	C5-175-2	(2) 96SS
KB5-120-6	5	20	5-20	5DS-20	C5-225-1C	C5-120-6	C5-SP-4	C5-4	C5	C5-100-6	C5-130-6	C5-175-2	(2) 96SS
KB5-130-6	5	20	5-20	5DS-20	C5-225-1C	C5-130-6	C5-SP-4	C5-4	C5	C5-100-6	C5-120-6	C5-175-2	(2) 96SS
KB5-175-2	5	20	5-20	5DS-20	C5-225-1C	C5-175-2	C5-SP-4	C5-4	C5	C5-100-6	C5-120-6	C5-130-6	(2) 96SS
KB6-100-9	6	22	6-22	6DS-22	C6-267-1C	C6-100-9	C6-SP-4	C7-6	C6	C6-120-9	C6-130-9	C6-175-3	(2) 112SS
KB6-120-9	6	22	6-22	6DS-22	C6-267-1C	C6-120-9	C6-SP-4	C7-6	C6	C6-100-9	C6-130-9	C6-175-3	(2) 112SS
KB6-130-9	6	22	6-22	6DS-22	C6-267-1C	C6-130-9	C6-SP-4	C7-6	C6	C6-100-9	C6-120-9	C6-175-3	(2) 112SS
KB6-175-3	6	22	6-22	6DS-22	C6-267-1C	C6-175-3	C6-SP-4	C7-6	C6	C6-100-9	C6-120-9	C6-130-9	(2) 112SS
KB7-100-15	7	23	7-23	7DS-23	C7-275-1C	C7-100-15	C7-SP-4	C7-6	C7	C7-175-5			(2) 128SS
KB7-175-5	7	23	7-23	7DS-23	C7-275-1C	C7-175-5	C7-SP-4	C7-6	C7	C7-100-15			(2) 128SS
KB8-100-24	8	26	8-26	8DS-26	C8-289-1C	C8-100-24	C8-SP-4	C9-8	C8	C8-120-18	C8-130-18	C8-175-8	(2) 144SS
KB8-120-18	8	26	8-26	8DS-26	C8-289-1C	C8-120-18	C8-SP-4	C9-8	C8	C8-100-24	C8-130-18	C8-175-8	(2) 144SS
KB8-130-18	8	26	8-26	8DS-26	C8-289-1C	C8-130-18	C8-SP-4	C9-8	C8	C8-100-24	C8-120-18	C8-175-8	(2) 144SS
KB8-175-8	8	26	8-26	8DS-26	C8-289-1C	C8-175-8	C8-SP-4	C9-8	C8	C8-100-24	C8-120-18	C8-130-24	(2) 144SS
KB9-100-27	9	26	9-26	9DS-26	C9-298-1C	C9-100-27	C9-SP-4	C9-8	C9	C9-120-24	C9-130-24	C9-175-9	(2) 160SS
KB9-120-24	9	26	9-26	9DS-26	C9-298-1C	C9-120-24	C9-SP-4	C9-8	C9	C9-100-27	C9-130-24	C9-175-9	(2) 160SS
KB9-130-24	9	26	9-26	9DS-26	C9-298-1C	C9-130-24	C9-SP-4	C9-8	C9	C9-100-27	C9-120-24	C9-175-9	(2) 160SS
KB9-175-9	9	26	9-26	9DS-26	C9-298-1C	C9-175-9	C9-SP-4	C9-8	C9	C9-100-27	C9-120-24	C9-130-24	(2) 160SS
KB10-100-30	10	26	10-26	10DS-26	C10-298-1C	C10-100-30			C10				(2) 184SS
KB12-100-37	12	28	12-28	12DS-28	C12-350-1C	C12-100-37			C12	C12-120-37			(2) 216SS
KB12-120-37	12	28	12-28	12DS-28	C12-350-1C	C12-120-37			C12	C12-100-37			(2) 216SS

TABLE B

SPECIAL END CAPS

CODE	FITS ON SLEEVE SIZE (INCHES ID)	NUMBER OF OPENINGS	SIZE OF EACH OPENING (INCHES ID)	TYPE OF OPENING
C3-SP-3	3	3	(1) 1.50 (2) 0.5-1.0	Collar Internal Tapered Nipples
C4-SP-4	4	4	(1) 1.75 (3) 0.75-1.25	Collar Internal Tapered Nipples
C5-SP-4	5	4	(1) 2.25 (2) 1.25-1.75 (1) 1.75-2.25	Collar Internal Tapered Nipples Internal Tapered Nipples
C6-SP-4	6	4	(1) 2.67 (2) 1.25-1.75 (1) 2.25-2.67	Collar Internal Tapered Nipples Internal Tapered Nipples
C7-SP-4	7	4	(1) 2.75 (1) 3.75 (2) 1.75	Collar
C8-SP-4	8	4	(1) 2.89 (1) 3.75 (2) 1.75	Collar
C9-SP-4	9	4	(1) 2.98 (1) 3.75 (2) 2.25	Collar

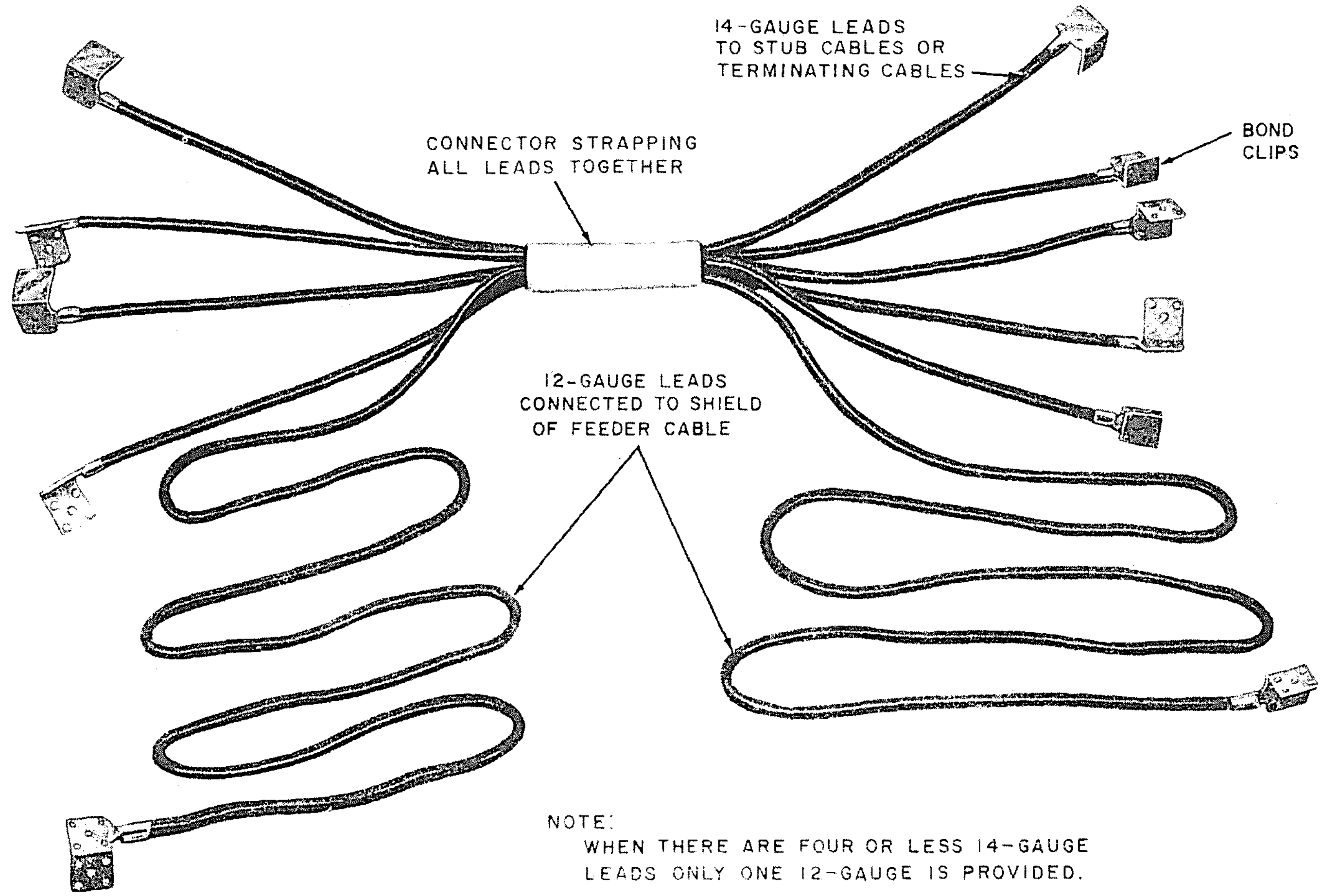
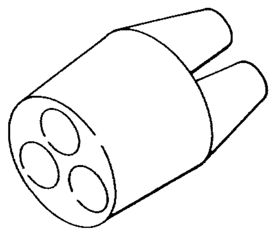


Fig. 2—Bonding Harness—Typical

TABLE C

PARTS THAT MUST BE ORDERED SEPARATELY AS REQUIRED

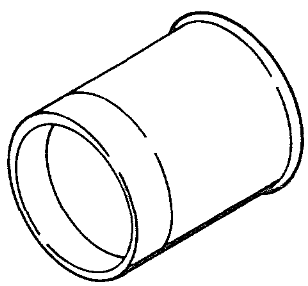


ADAPTERS

For use with end caps that have one main cable entry and 3 or 4 smaller entries are needed.

Product Numbers:
A-375-3 A-375-4

Example Explanation:
A-375-3 = Adapter — Fits (3.75 inch) opening, has 3 openings each (1.5 inch) id A-375-4 same but 4 openings (1.25 inch) id.

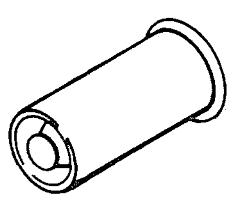


ADAPTER PLUGS

For use with adapters: To seal cable entries for future use.

Product Numbers:
AP-125 AP-150

Example Explanation:
AP-150 = Adapter plug (1.50 inch) od



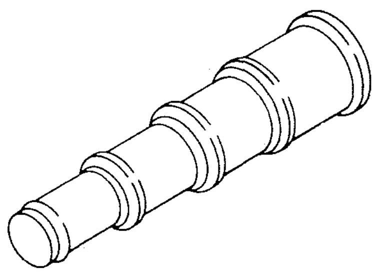
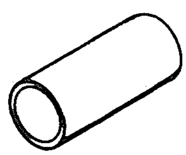
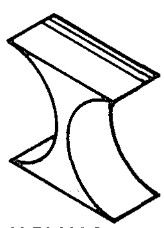
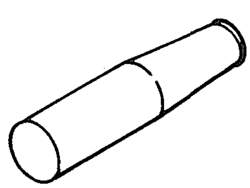
BUSHINGS

For use with end cap openings: To reduce the inside diam. cap opening.

CODE	OD (INCHES)	ID (INCHES)	TYPE
B-125	1.25	0.5 — 1.0	Tapered
B-175	1.75	0.5 — 1.0	
B-175A	1.75	0.75 — 1.25	
B-225	2.25	1.25 — 1.75	
B-267	2.67	1.25 — 1.75	
B-267A	2.67	1.75 — 2.25	
B-375	3.75	2.67	Collar
B-375A	3.75	2.75	
B-375B	3.75	2.89	
B-375C	3.75	2.98	

TABLE C (Cont)

PARTS THAT MUST BE ORDERED SEPARATELY AS REQUIRED

 VARIABLE BUSHINGS	For use with end cap openings: To reduce the inside diam. cap opening to accommodate up to 4 different cable sizes with one bushing. Product Numbers: B-1.0-.25 B-1.75-1.50-1.0 B-2.5-1.0 Example Explanation: B-1.0-.25 = Bushing — can be trimmed to accommodate cable sizes of 1.0 inch, 0.84 inch, 0.75 inch, 0.55 inch, 0.25 inch
 COLLARED PLUGS	For use with special end caps: For plugging unused cable entries for future use. Product Numbers: PC-155 PC-275 PC-175 PC-289 PC-225 PC-298 PC-267 Example Explanation: PC-155 = Plug collared — 1.55 inch od
 H PLUGS	For use with butt caps: To provide space between cables: Product Numbers: H-267 H-289 H-275 H-298 Example Explanation: H-267 = H plug — 2.67 inch od cable accommodation
 TAPERED PLUGS	For use with multiple end caps: For plugging unused tip cable entries for future use. Product Numbers: PT-100-L PT-130 PT-267 PT-120 PT-175 PT-125 PT-225 Example Explanation: PT-120 = Plug Tapered — 1.2 inch od

3. ORDERING INFORMATION

3.01 Closure for central office vault splices can be ordered as a complete unit. Due to the large number of combinations of closures for building cable splices, the various components must be ordered separately.

3.02 A complete closure for central office vaults and entrance cable splices consists of the following items:

1 sleeve

1 single opening end cap

1 multiple opening end cap

sealing clamps.

3.03 The type of multiple opening end cap required is determined by terminating cables. Since these end caps are different, the closure must be ordered by size and type of end cap required. Use Table A as a guide for ordering the complete closure.

3.04 As an example: If the main cable is 2.89 inches in diameter and eighteen 24-gauge 300-type connector stub cables are to be spliced, the correct closure to order is ***KB8-100-24.*** In this case the six unused cable entry ports may be plugged for future use by using PT-100-L tapered plugs (Table B). If the 300-type connector stubs are 22-gauge, then the correct closure to order is ***KB8-120-18.***

3.05 Closure components for building cable splices are ordered individually, depending on the number and size of cables proposed on the work order. Since cable diameters determine which components are required, refer to Table D for cable diameters.

3.06 As an example, the following closure components are required for a 900-pair, 26-gauge, BKTA building riser cable with four 100-pair gauge, BKMA floor distribution cables:

QUANTITY	COMPONENT
1	6-22 Sleeve or 6DS 22 Sleeve
2	C6-SP-4 End Caps
2	267A Bushings (a)
4	175 Bushings (b)
2	T267 Plugs (c)

(a) The 267A bushings are required to reduce the 2.67-inch inside diameter hole of each C6-SP-4 end cap to 1.75 through 2.25 inches to accommodate the 900-pair, 26-gauge cable which is 2.0 inches outside diameter.

(b) The 175 bushings are placed in the 1.25- to 1.75-inches inside diameter holes of each C6-SP-4 end cap to reduce these openings to 0.5 to 1.0 inch to accommodate the 100-pair, 24-gauge BKMA floor distribution cable which is 1.0-inch outside diameter.

(c) The T267 plug is placed in the 2.25- to 2.67-inch inside diameter hole of each C6-SP-4 end cap to seal it for future use.

Note: If a split end cap is required (main cable not cut) rubber cement is also required.

TABLE D

CABLE DIAMETERS (INCHES)

ALPETH					STALPETH				
SIZE (PRS)	BKTA 26	BKMA 24	BHAA 22	BHBA 19	SIZE (PRS)	ADTC 26	ADMC 24	ADAC 22	ADBC 19
50	0.6	0.7	0.8	1.1	200	1.1	1.3	1.7	2.3
75	0.7	0.8	1.0	1.3	400	1.3	1.5	1.9	2.7
100	0.8	1.0	1.1	1.5	450	—	—	—	2.8
150	0.9	1.1	1.3	1.8	600	1.5	1.8	2.3	
200	1.0	1.2	1.5	2.0	900	1.8	2.2	2.7	
300	1.2	1.5	1.8	2.5	1100	—	—	3.0	
400	1.4	1.7	2.1		1200	2.0	2.5	3.15	
600	1.7	2.0	2.5		1500	2.3	2.8		
900	2.0	2.4			1800	2.5	3.0		
					2100	2.6			
					2400	2.8			
					2700	3.0			
					3000	3.17			
					3600	3.4			

STALVYN					ALVYN				
SIZE (PRS)	ADTN 26	ADMN 24			SIZE (PRS)	ABMM 24	ABAM 22		
600	1.5	1.8			51	—	0.9		
900	1.8	2.2			76	—	1.1		
1200	2.1	2.5			101	1.0	1.2		
1500	2.3	2.8			152	1.2	1.5		
1800	2.5	3.0			202	1.3	1.7		
2100	2.7				303	1.6	2.0		
2400	2.8				404	1.8	2.3		
2700	3.0				606	2.2	2.8		
					909	2.7			

4. CABLE SHEATH PREPARATION AND INSTALLATION OF CLOSURES FOR CENTRAL OFFICE VAULT SPLICE

4.01 The main cables entering central office vaults normally terminate with 300-type connector stubs.

4.02 All cables to be joined will normally be cable ends, and a solid sleeve will be used. However, in some instances, due to bends in the main cable in close proximity to the splice location, a split sleeve may be required. ***Sleeves cannot be split in the field.***

4.03 Select the proper closure size from Table A. The size closure is determined by the size of the feeder cable and splicing methods used. A complete unit should be ordered as outlined in Part 3.

4.04 When setting the cables up for splicing, provide sufficient straight length in the main cable to allow placing an end cap and sleeve prior to starting the splicing operation.

4.05 After setting up the cables for splicing, locate the center of the splice, then place B paper tape markers on the main cables and terminating cables so that the distance between the markers is 3 inches shorter than the length of the sleeve to be installed. These 3 inches will be used by the internal nipples of the multiple opening end cap and bonding harness connection to the cables.

SHEATH PREPARATION—MAIN CABLES

4.06 Using the procedures outlined in Section 632-316-200, remove the polyethylene jacket between the paper tape marker and the end of the cable.

4.07 Remove the corrugated steel terneplate between the paper tape marker and the end of the cable.

4.08 Cut the aluminum shield (Fig. 3) 3/4 inch from the paper tape marker and remove from the cable. Remove the paper tape marker.

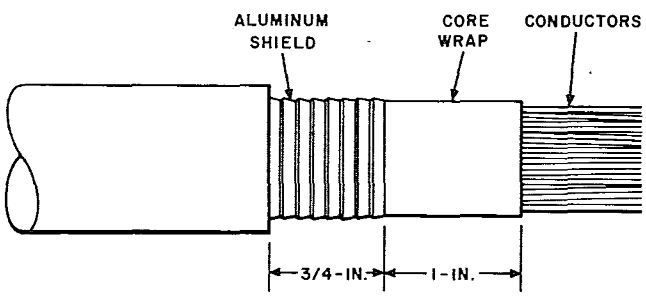


Fig. 3—Cable Sheath Preparation

SHEATH PREPARATION—STUB CABLES FOR TERMINATING CABLES

4.09 Remove the PVC jacket between the paper tape marker and the end of the cable.

4.10 Cut the aluminum shield (Fig. 3) 3/4 inch from the paper tape marker and remove from the cable. Remove the paper tape marker.

INSTALLATION

4.11 Install a sealing clamp on the single-opening end cap.

4.12 Position the single-opening end cap and sleeve on the feeder cable and slide back along the cable sheath approximately the length of the sleeve as shown in Fig. 4.

4.13 Prior to installing the multiple end cap, determine the number of openings, if any, to be left vacant, then insert the tapered plugs as shown in Fig. 5 in the unused openings. (These openings should be located in the front of the splice.) Be sure that the plug is inserted with the shoulder of the plug extended beyond the narrow end of the nipple inside the cap.

4.14 ***Starting at the back of the end cap,*** insert a terminating stub cable into an individual opening of the multiple end cap.

> *Note:* If difficulty is encountered in inserting the cables through the end cap, use B pressure testing concentrate as a lubricant.

4.15 Remove the core wrapper from the stub cable to within 1 inch of the aluminum as shown in Fig. 3. Tape the ends of the stub cables to hold the binder units intact.

4.16 Install and crimp one 6-inch lead of the bonding harness to the aluminum shield of the stub cable as shown in Fig. 6.

4.17 Wrap the butt of the stub cable with two layers of vinyl tape to reinforce the bond clip connection as shown in Fig. 7.

4.18 Repeat 4.14 through 4.17 for each stub cable.

4.19 Remove the core wrapper from the feeder cable to within 1 inch of the aluminum shield as shown in Fig. 3, then cut and fold back the aluminum shield on each side of the overlay.

4.20 Connect the long leads, of the first bonding harnesses installed, to the aluminum shield of the feeder cable. This provides sheath continuity between the shields of the stub cables and the feeder cables during the splicing operation.

4.21 Splice the bonded cables.

4.22 As the slicing operation progresses, repeat 4.20 and 4.21 for the remaining bonding harnesses and stub cables.

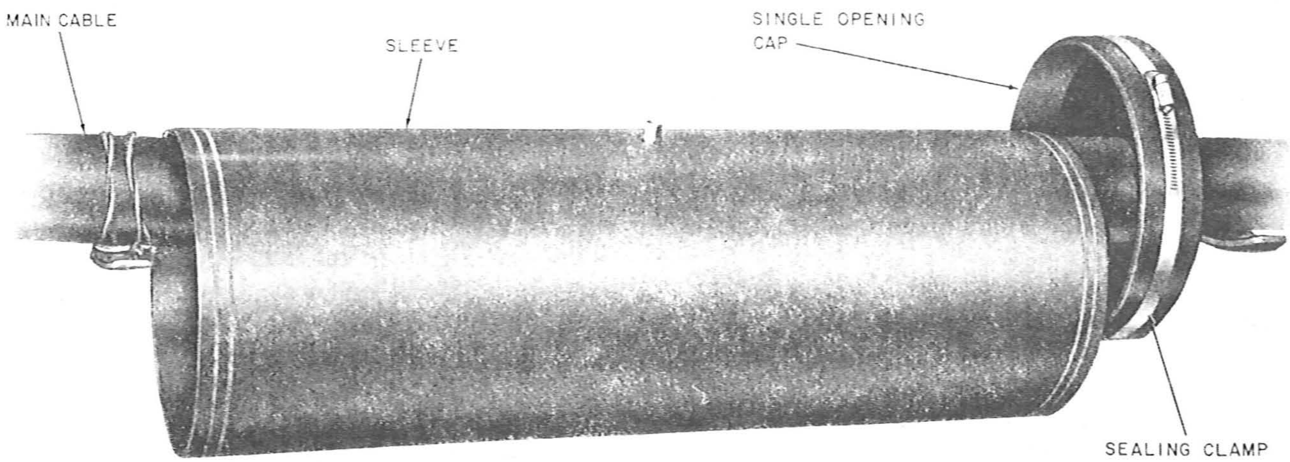


Fig. 4—Single Opening End Cap and Sleeve Placed on Main Cable

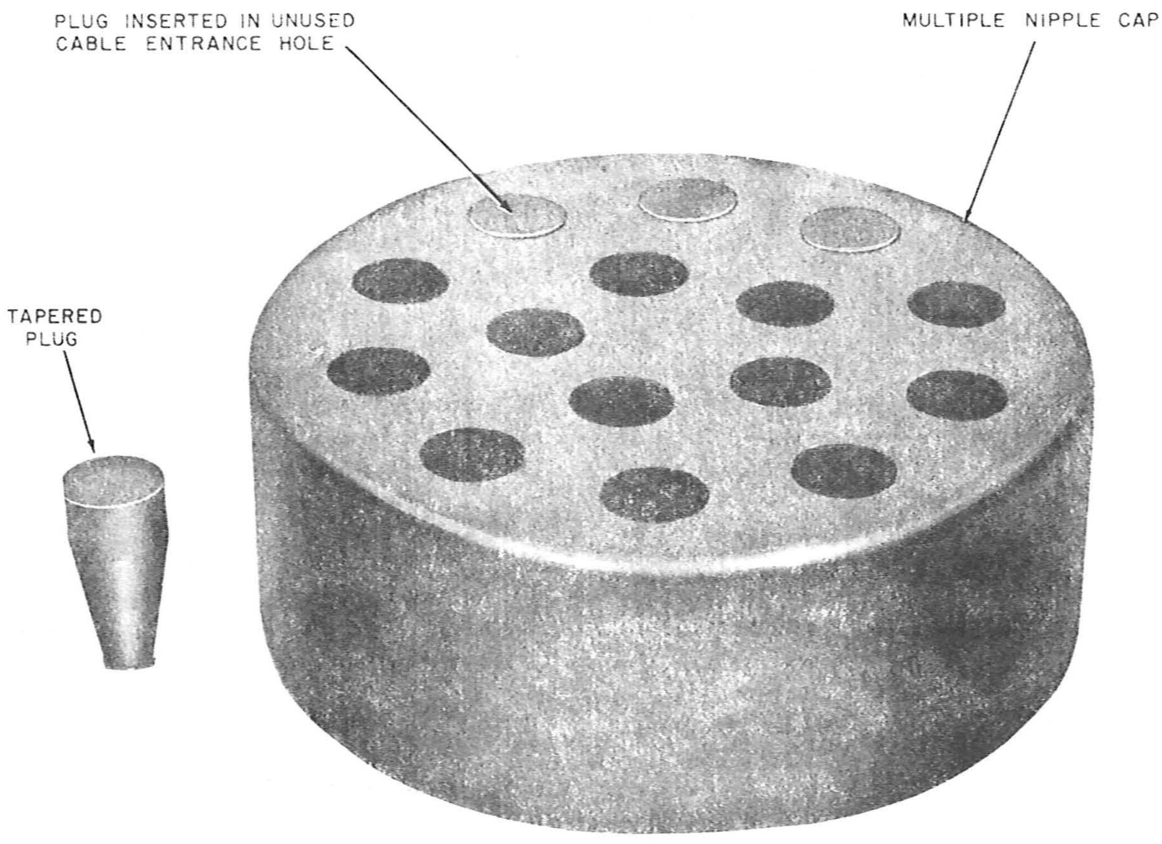


Fig. 5—Tapered Plugs Inserted in Unused Openings

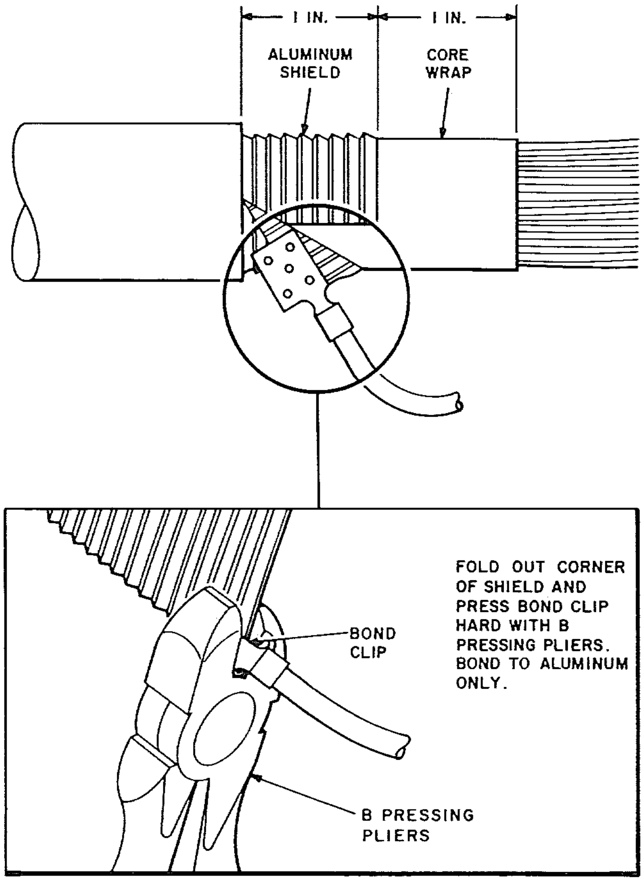


Fig. 6—Installing Bond Clip to Cable Shield

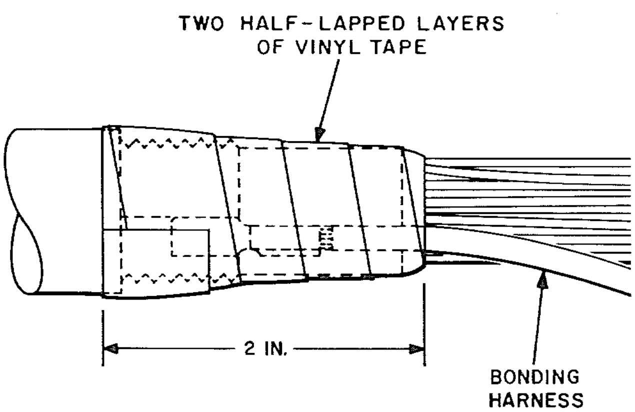


Fig. 7—Butt of Cable Wrapped With Vinyl Tape

4.23 After ***all*** the long leads of the bonding harnesses have been crimped to the shield of the feeder cable (Fig. 8), wrap the butt of the feeder cable with two layers of vinyl tape to reinforce the bond clip connections.

4.24 After all wire joining has been completed, protect the splice by wrapping a half-lapped layer of B polyethylene tape (for PIC) or muslin (for pulp) around the splice as shown in Fig. 9. Secure the end turn with vinyl tape.

> ***Note:*** This wrap must be made as tight as possible for maximum splice protection. Do not leave unwrapped splice unattended. If necessary to leave unwrapped splice unattended, it should be protected as outlined in Section 633-040-201.

ENCLOSING SPLICE

4.25 Slip the sleeve over the splice into the multiple end cap. If the sleeve will not slide over the splice ***do not beat*** the splice with a dresser. Re-form the splice. (For installing split sleeve see 4.29.)

4.26 Secure the multiple end cap to the sleeve with a sealing clamp.

4.27 Slide the single opening end cap over the opposite end of the sleeve and secure it to the sleeve with the sealing clamp. The assembled splice closure is shown in Fig. 10.

4.28 Install and secure a sealing clamp on the collar of the single opening end cap.

SINGLE SPLIT SLEEVE INSTALLATION

4.29 Grasp one end of the sleeve with a hand on each side of the split. Force the split open and place on the main cable. Move the hands along the split and work the sleeve onto the cable and over the splice.

4.30 When the sleeve has been placed over the splice, insert the rubber strip-type gasket into the flanged edge of the seam. Place the additional sealing clamp, furnished with the closure, over the sleeve and tighten securely. The clamps should be evenly spaced.

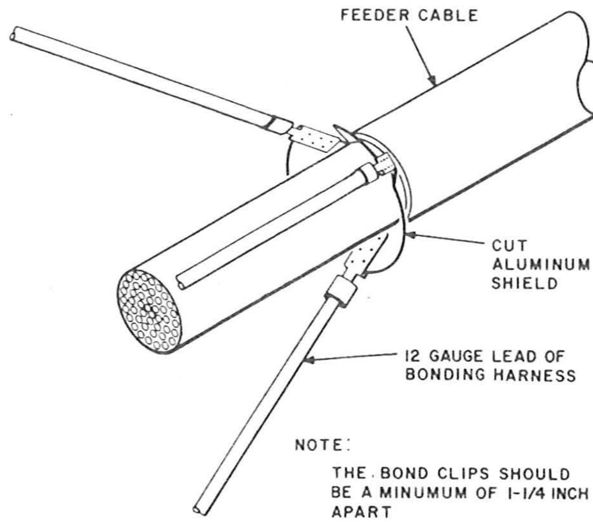


Fig. 8—Feeder Cable With 12-Gauge Leads of Bonding Harness Attached

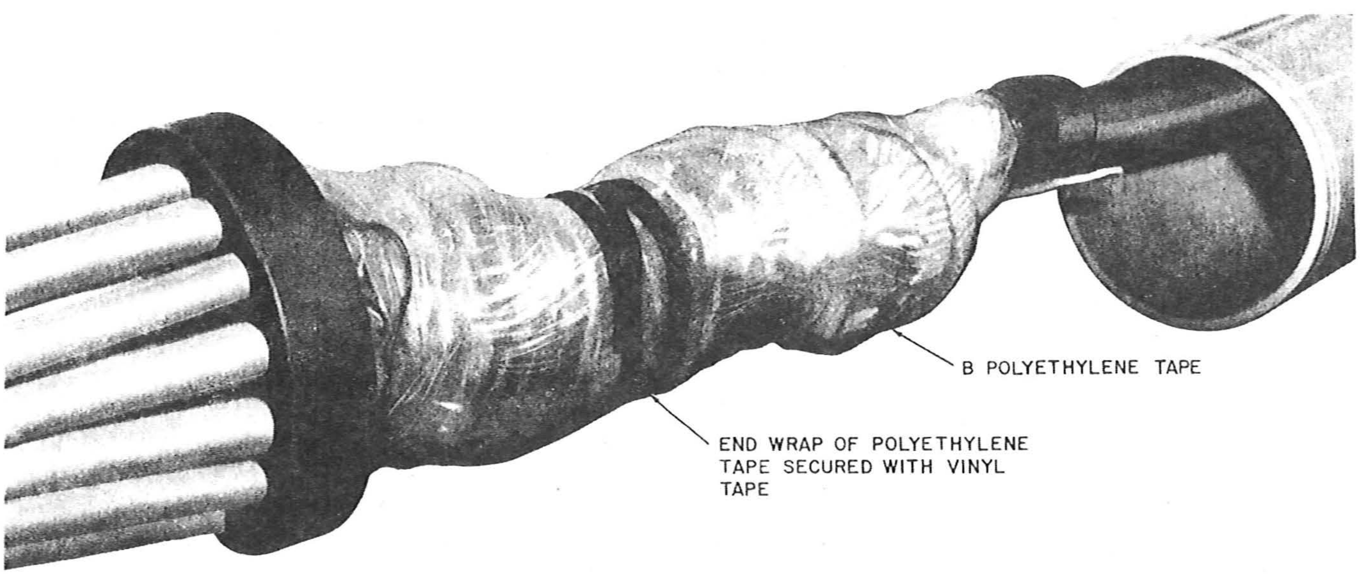


Fig. 9—Splice Wrapped With Polyethylene Tape

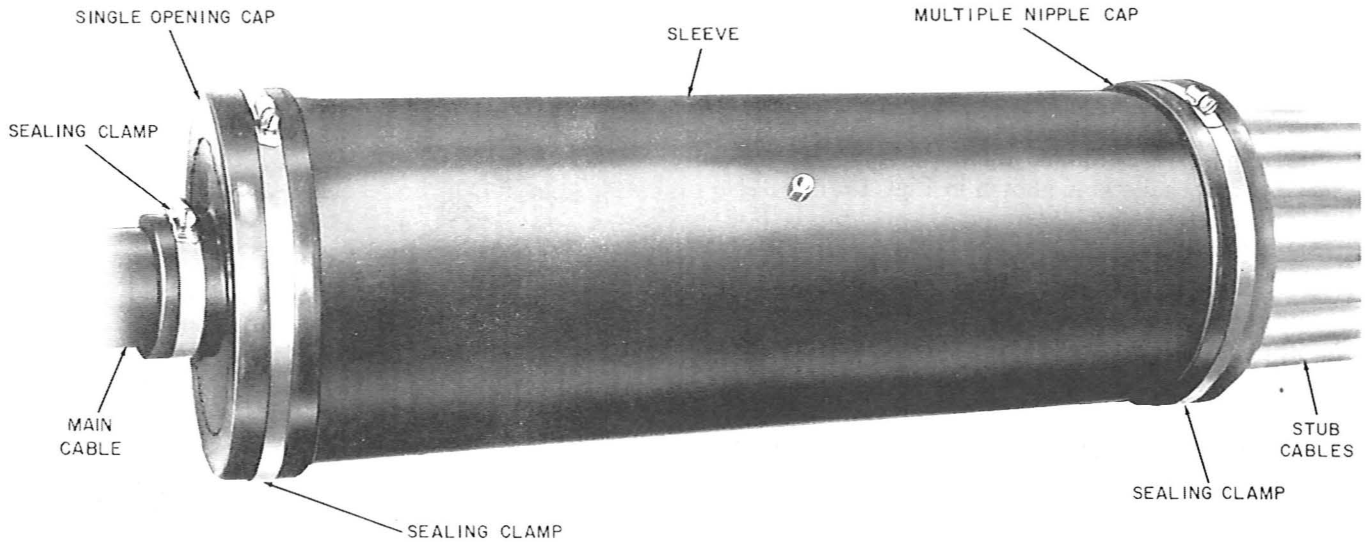


Fig. 10—Enclosed Splice

4.31 Repeat 4.25 through 4.28 for sealing the end caps.

SUPPORTING CLOSURE

4.32 To support the closure, place a manhole cable rack between two cable hooks above the closure. Place lashed cable supports at each end of the closure and over the cable rack. Tighten the lashed cable support until the closure is fully supported. Use additional lashed cable supports to secure the cable rack to the cable hooks.

4.33 An alternate method of supporting closure using RC-100 rack clips is as follows:

(a) The 3M/K&B rack clips RC-100 (Fig. 11) consist of two brackets and two clips. The brackets are holding devices for positioning a standard manhole rack horizontally on vertical standard manhole rack; the clips are holding devices for positioning standard manhole hooks on a horizontal manhole rack.

(b) Install the rack clips as follows:

(1) Determine height of required splice support, insert bottom tab of bracket to T slot of the vertial manhole rack, then insert the top tab. Push down a bracket to lock into rack (Fig. 12). Insert second bracket into adjacent T slot of vertical manhole rack at the same height as the first bracket.

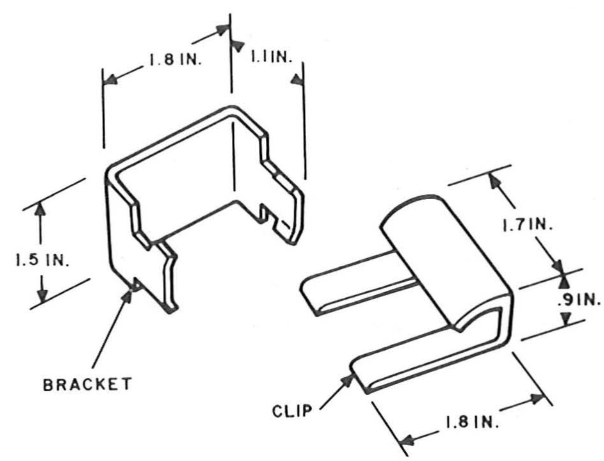


Fig. 11—3 M/K&B Rack Clips Set RC-100

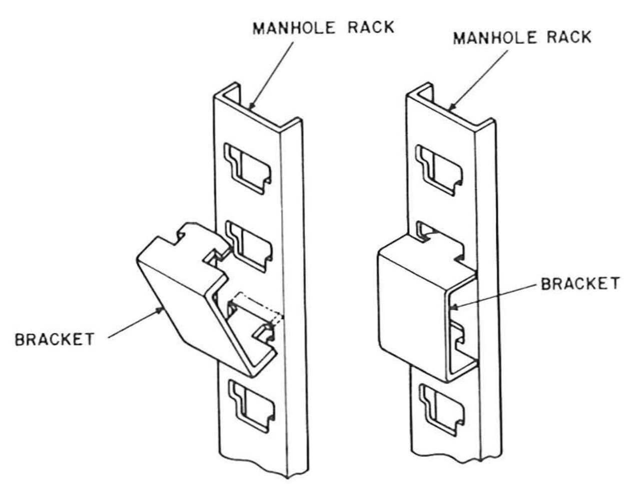


Fig. 12—Bracket Installation

(2) Insert a standard manhole rack through the brackets as shown in Fig. 13.

(3) Insert clips over manhole hooks as shown in Fig. 14, then determine horizontal position of required support. Hook clip over upper flange of horizontal rack and rotate into position as shown in Fig. 15.

(4) Position closure on hook as shown in Fig. 16.

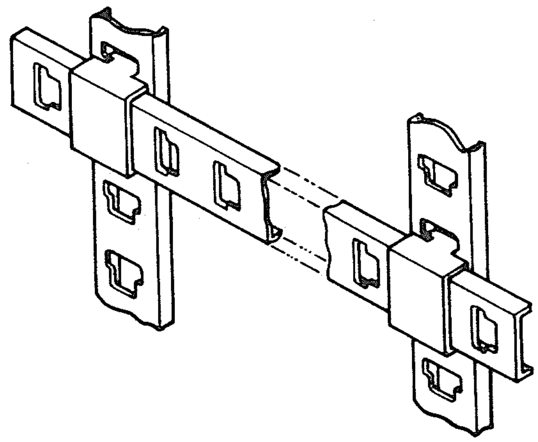


Fig. 13—Installed Manhole Rack

FLASH TESTING

4.34 Flash test each closure with a back pressure of 6 to 8 psi as indicated on a pressure gauge.

4.35 Apply a solution of ***B pressure testing concentrate*** to the closure and entrance cables. Check the closure for leaks indicated by bubbles. The use of ultrasonic leak-detecting equipment is preferable when available since it is difficult to apply concentrate between the stub cables. ***Do not use a soap solution or detergent*** since these materials will damage polyethylene.

GROUNDING

4.36 The shield of the feeder cable must be connected to the central office ground near the point where the cable enters the building.

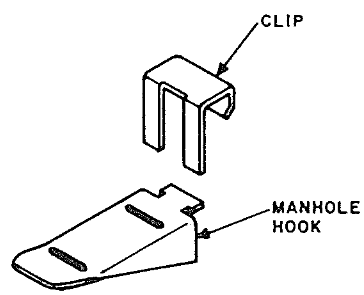


Fig. 14—Placing Clip on Manhole Rack

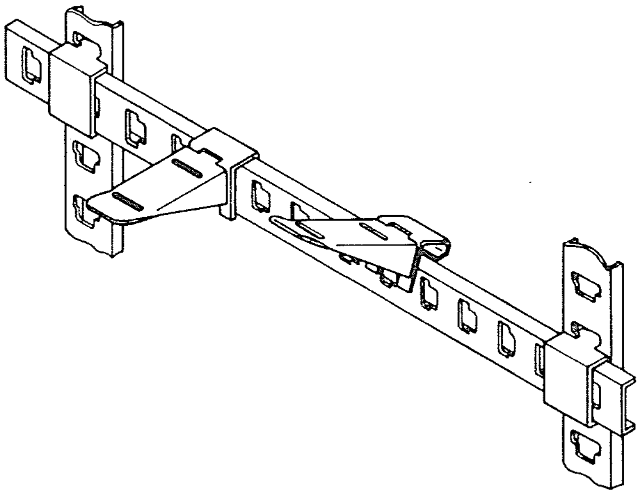


Fig. 15—Placing Hook on Rack

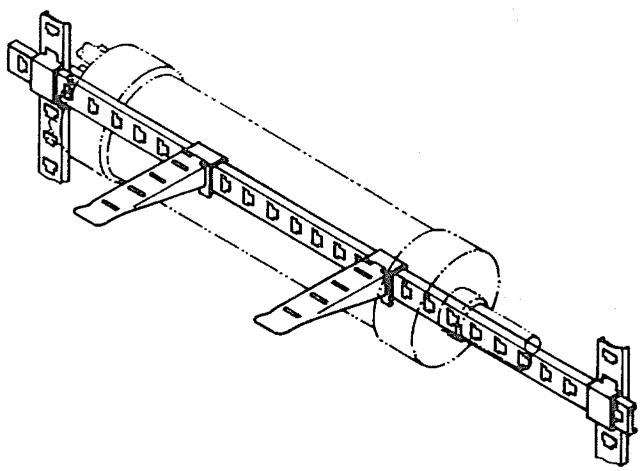


Fig. 16—Supporting Closure

4.37 Refer to Section 633-020-208 for methods of bonding, grounding, and shield continuity requirements in subscriber building and central office.

5. CABLE SHEATH PREPARATION AND INSTALLATION OF CLOSURES FOR SUBSCRIBER BUILDING CABLE SPLICES

5.01 Prior to cable sheath preparation it will be necessary to select the proper size closure and components for the particular installation (Parts 2 and 3). At locations where future cable additions may be required, select an end cap with more cable openings than required for initial installation.

MAIN CABLE

5.02 When measuring for the splice opening in the main cable, the distance should be 3 inches shorter than the sleeve length. Splice openings in cables utilizing nipple-type openings in the end cap shall be 1 inch shorter than the splice opening for the main cable. This additional inch is necessary for bending the cable shield since the nipples protrude 1-1/2 inches inside the end cap. Measure and mark the sheath opening.

5.03 If the main cable is cut, place the cable through the main cable opening of the end cap. Slide the end cap far enough onto the cable to permit placing the sleeve where it will not interfere with the splicing operation. Place the sleeve on the main cable.

5.04 If the main cable is not cut, two split end caps and a split end sleeve must be used. These caps can be ordered split or they can be split with a sharp knife or scissors. ***Do not split the tapered nipples of the end cap.*** The sleeve will have to be ordered as a split sleeve; ***it cannot be split in the field.***

5.05 Place the split end caps on the main cable and reseal as follows. The 3M adhesive 910 required to reseal the split end caps takes about six hours to cure. If possible, work should be planned so that the sealing and curing process can be done over the core wrapper of the main cable without being disturbed for this period of time.

(a) Apply a generous coating of the adhesive to both surfaces of the split in the caps. Keep these surfaces separated, allow the cement to dry, then apply a second coat to the surfaces.

(b) Place the end caps over the cable and match the two surfaces. Place a sealing clamp over the collar of the cable openings and the collar that fits over the sleeve. Tighten these clamps until the surfaces press firmly together. Allow six hours to cure.

5.06 If the main cable is ***unexposed*** remove the cable sheath as outlined in 4.06 through 4.08. If the main cable is ***exposed*** and the splice is more than 50 feet from the entrance, the cable must be grounded as outlined in Part 6. Prepare the cable sheath as follows:

(a) Install a D bond clamp as outlined in Section 081-852-118.

BRANCH CABLES

5.07 Remove the sheath from the branch cables as outlined in 4.09 and 4.10.

5.08 Place bushings or adapters, if required, in the openings of the end cap.

5.09 Insert the branch cables into the tapered openings or the adapters and install the bonding harness as outlined in 4.14 through 4.17.

5.10 If the feeder cable is ***unexposed,*** run the 12-gauge leads of the wiring harness across the splice opening and connect to the sheath of the feeder cable as outlined in 4.19 and 4.20. If the feeder cable is ***exposed,*** connect the 12-gauge leads of the wiring harness to the sheath of the feeder cable as follows:

(a) Remove the bond clips from each 12-gauge lead and strip approximately 1 inch of insulation from each lead.

(b) Secure the leads and bonding ribbons (P-21E138) to the stud of D bond clamp as shown in Fig. 17.

(c) Form and run the bonding ribbon along the cable sheath as shown in Fig. 17.

5.11 Splice the bonded cables.

ENCLOSING SPLICE

5.12 Position one end cap so that the internal nipples are approximately 1 inch from the end of the cable sheath, and secure by placing a sealing clamp around the collar of the main cable opening.

5.13 If the sleeve was placed prior to making the splice, slide it over the splice and insert the end into the end cap. If the sleeve will not slide over the splice, re-form the splice. ***Do not beat the splice with a dresser.***

5.14 A double split sleeve can be placed directly over the splice. Single split sleeves must be placed over the main cable and slid over the splice.

5.15 Place the gasket in the flanged edge of the seam. Using the additional sealing clamps furnished with split sleeve, close the seam and slide the sleeve into the end cap.

5.16 Slide the other end cap over the end of the sleeve. Place sealing clamps on both ends to secure the ends to the sleeve and also effect the seal.

5.17 Place sealing clamps on the collars of both end caps and tighten securely.

5.18 Unused openings in the end caps shall be plugged using the plugs which are available (Table C).

5.19 Fill ***all*** voids between the cable sheaths and end caps with B sealing cord or B sealing tape.

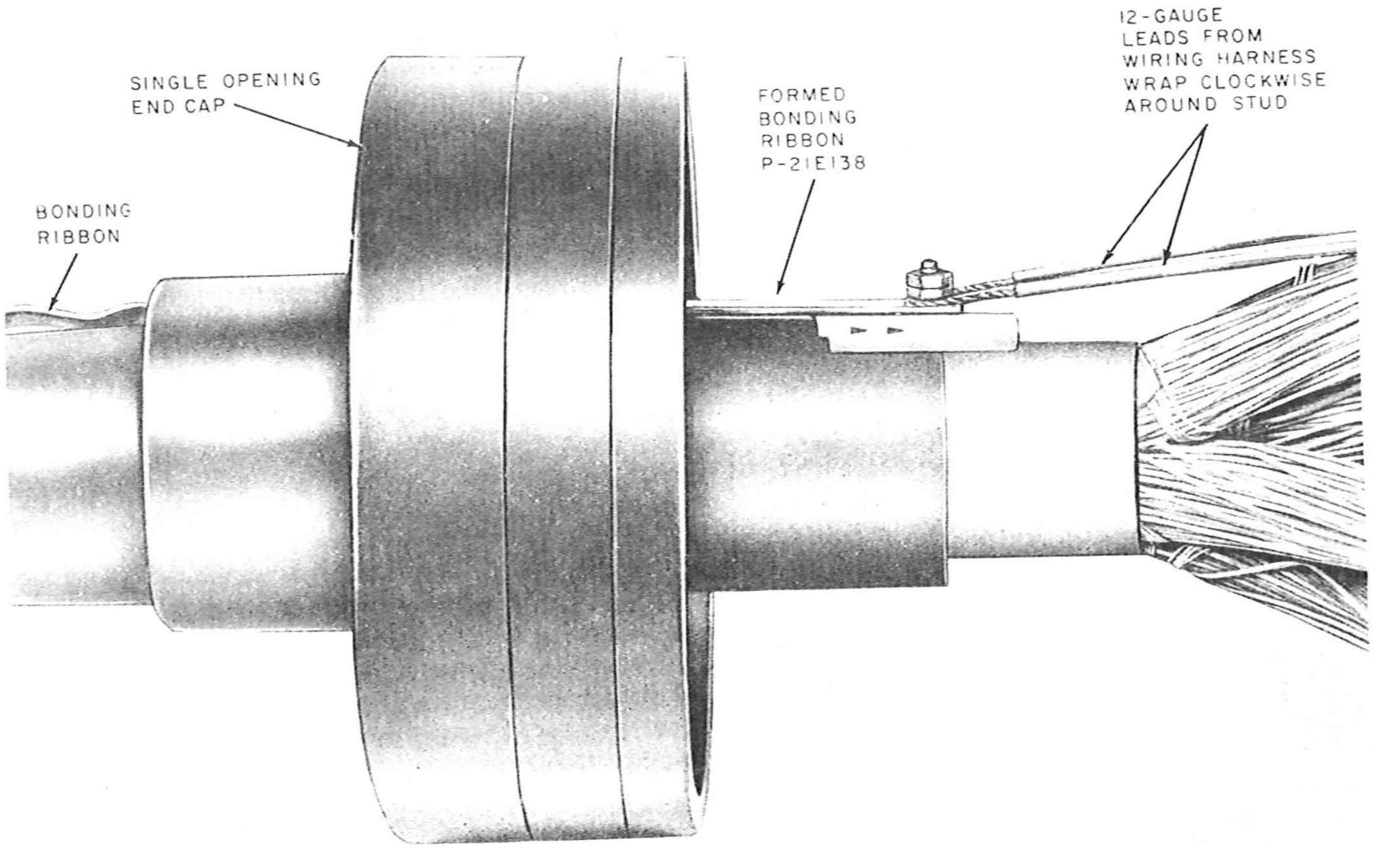


Fig. 17—Installed Bonding Ribbon

6. SUBSCRIBER BUILDINGS—BONDING AND GROUNDING EXPOSED CABLES

6.01 The bonding harness does not have the current-carrying capacity to handle the high currents to which the main cable may be exposed, therefore a ground must be provided as follows:

(a) Using a AT-7796X Size 6 connector, attach a No. 6 ground wire (Fig. 18), with one inch of insulation removed, to the bonding ribbon installed in 5.10. Connect the other end of the No. 6 ground wire to the protector ground or if the protector is closer, connect the ground wire to the ground lug of the protector. Refer to Section 460-100-201 for method of grounding protector.

(b) If the splice is located more than 50 feet from the entrance, place a 9-type closure as near the entrance as possible, then attach the No. 6 ground wire to the 9-type closure.

6.02 If the exposed entrance cable is pulp insulated, a plug should be provided as close to the building entrance as possible; ground at the pressure plug as outlined in 4.37.

6.03 If the exposed entrance cable is plastic insulated and an insulating joint is required, refer to Section 633-020-208 for methods of bonding and grounding.

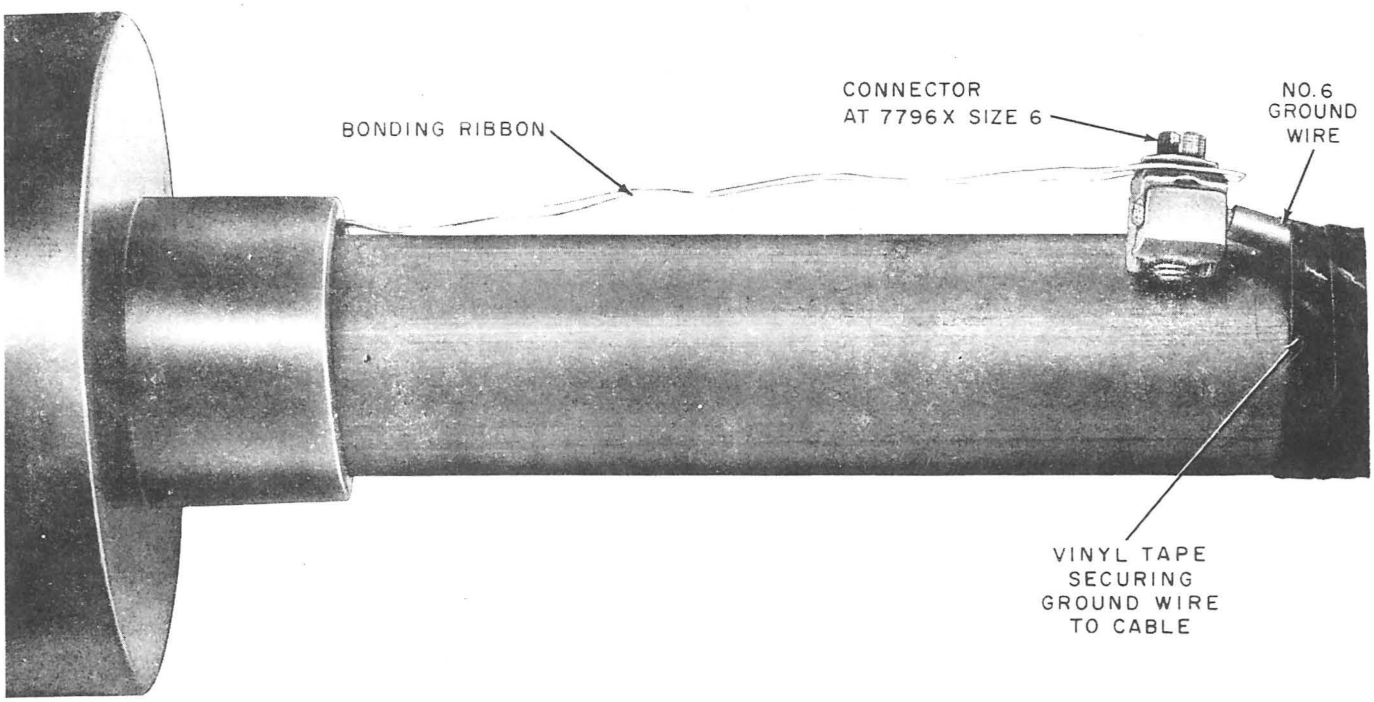


Fig. 18—Grounding Exposed Cable