

2-TYPE CLOSURE

DESCRIPTION AND INSTALLATION

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1. GENERAL

1.01 This section covers the description and installation of the 2-type plastic closure used to enclose straight, Y, or 4-way splices in aerial, underground, and buried splices.

1.02 This section is reissued to:

- Revise Table G to include HO, JO, and modified FO and GO sealing washers
- Delete use of 2-type closure on waterproof cable
- Revise Tables A, B, C, H, and I to include 2B2-type covers and 2B2-type end plates, respectively
- Add Tables D and E.

Revision arrows are used to emphasize the more significant changes.

1.03 Section 640-010-010 covers the use of the end plate grommets for T-carrier systems.



Do not use 2-type closures in cable vaults, buildings, or to enclose splice on steampeth cable.

1.04 Section 633-506-200 covers the use of the 23-type closure for waterproof cable.

NOTICE

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

1.05 Tables A, B, C, D, and E list the 2-type closures to use for various splice configurations.

◆TABLE A◆

SPLICE CASE SIZE FOR STRAIGHT SPLICES

PAIR SIZE (GAUGE)	IN LINE				FOLDBACK		
	1 BANK	2 BANK	3 BANK	4 BANK	2 BANK	3 BANK	4 BANK
200 (22-26)	2B2A				2B2A		
300 (22-26)	2B2A				2B2A		
400 (22-26)	2B2A				2B2A		
600 (22-26)	2B2A				2B2A		
900 (22-26)	2B2A				2B2A		
1200 (22-26)	2C2A	2B2A			2C2A		
1500 (24-26)	2C2A	2C2A			2D2A		
1800 (24-26)	2D2A	2C2A	2B2B		2D2A		
2100 (26)		2C2A	2B2B	2C2C	2D2A	2C2B	2C2C
2400 (26)		2D2A	2C2B	2C2C	2D2A	2C2B	2C2C
2700 (26)		2D2A	2C2B	2C2C	2D2A	2C2B	2C2C
3000 (26)		2D2A	2C2B	2C2C	2D2A	2D2B	2C2C
3600 (26)		2D2A	2C2B	2C2C	2D2A	2D2B	2C2C
4200 (26)		2D2A	2D2B	2C2C		2D2B	2D2C

TABLE B4

SPLICE CASE SIZE STRAIGHT SPLICE WITH STUB

CABLE PAIR SIZE	STUB PAIR SIZE																		
	IN LINE	25	50	100	150	200	300	400	600	900	1200	1500	1800	2100	2400	2700	3000	3600	4200
200	2B2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
300	2B2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
400	2B2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
600	2C2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
900	2C2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
1200	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
1500	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
1800	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
2100	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
2400	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
2700	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
3000	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
3600	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
4200	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
FOLDBACK																			
200	2B2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
300	2B2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
400	2B2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
600	2C2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
900	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
1200	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
1500	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
1800	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
2100	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
2400	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
2700	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
3000	2D2A	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
3600	2D2B	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←
4200	2D2C	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←	←

♦TABLE C♦

CLOSURE SIZE FOR JUNCTION SPLICES

MAIN CABLE (FEEDER)		SINGLE JACKET		DUAL JACKET	
		MAX TOTAL PAIRS INCLUDING MAIN CABLE	SPLICE CASE	MAX TOTAL PAIRS INCLUDING MAIN CABLE	SPLICE CASE
PAIRS	GAUGE				
600	22	1800	2C2A	1800	2C2B
900	22	2700	2C2A	2700	2C2B
1200	22	3600	2D2A	3600	2D2B
900	24	2700	2C2A	2700	2C2B
1200	24	3600	2C2A	3600	2C2B
1500	24	4500	2D2A	4500	2D2B
1800	24	4800	2D2A	4800	2D2B
900	26	2700	2C2A	2700	2C2B
1200	26	3600	2C2A	3600	2D2B
1500	26	4500	2C2A	4500	2D2B
1800	26	4800	2D2A	4800	2D2B
2100	26	4800	2D2A	4800	2D2B
2400	26	4800	2D2A	4800	2D2B
2700	26	8100	2D2C	4800	2D2C
3000	26	9000	2D2C	4800	2D2C
3600	26	9600	2D2C	4800	2D2C
4200	26	9600	2D2C		

♦TABLE D♦

CLOSURE SIZE FOR SINGLE SHEATH INLINE SPLICE—LOADING USING SPlicing CONNECTORS

NUMBER OF LOAD COILS	CABLE GAUGE AND SIZE																		
	22 GAUGE						24 GAUGE						26 GAUGE						
	200	300	400	600	900	1200	900	1200	1500	1800	900	1200	1500	1800	2100	2400	2700	3000	4200
100	2B2A	2B2A	2B2A	2C2A	2C2A	2C2A	2C2A	2C2A	2C2A	2C2A	2C2A	2C2A	2C2A	2C2A	2C2A	2C2A	2D2A	2D2A	2D2B
150	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
200	2B2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
250		↕	2B2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
300		2B2A	2C2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
350			↕	2C2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
400			2C2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
450				↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
500				↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
550				2C2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
600				↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	2C2A	↕	↕	↕
650					↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	2D2A	↕	↕	↕	↕
700					↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
750					↕	↕	↕	↕	2C2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
800					↕	↕	↕	↕	2D2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
850					2C2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	2D2A
900					↕	2C2A	↕	2C2A	↕	2C2A	↕	↕	↕	↕	2C2A	↕	↕	↕	2D2A
950						2D2A	↕	↕	↕	↕	↕	↕	↕	↕	2D2A	↕	↕	↕	2D2B
1000						↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
1050						↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
1100						↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
1150						↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
1200						2D2A	↕	2C2A	↕	↕	↕	↕	↕	↕	2C2A	↕	↕	↕	2D2A
1250						↕	↕	↕	↕	↕	↕	↕	↕	↕	2D2A	↕	↕	↕	2D2B
1300						↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
1350						↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
1400						↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
1450						↕	↕	↕	2D2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
1500						↕	↕	↕	2D2A	↕	↕	↕	2C2A	↕	↕	↕	↕	↕	2D2B
1550						↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	2D2C
1600						↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
1650						↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
1700						↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
1750						↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
1800						↕	↕	↕	2D2B	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕

TABLE E

CLOSURE SIZE FOR SINGLE SHEATH INLINE SPlice LOADING USING BRIDGE/SPlicing CONNECTORS

NUMBER OF LOAD COILS	CABLE GAUGE AND SIZE																			
	22 GAUGE					24 GAUGE				26 GAUGE										
	200	300	400	600	900	1200	900	1200	1500	1800	900	1200	1500	1800	2100	2400	2700	3000	3600	4200
100	2B2A	2B2A	2B2A	2C2A	2C2A	2C2A	2C2A	2C2A	2C2A	2C2A	2C2A	2C2A	2C2A	2C2A	2C2A	2C2A	2D2A	2D2A	2D2B	NR
150	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
200	2B2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
250		↕	2B2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
300		2B2A	2C2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
350			↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
400			2C2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
450				↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
500				↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
550				2C2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
600					2C2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
650						2D2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
700							↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
750								2C2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
800								2D2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
850									↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
900					2C2A	↕	↕	↕	↕	2C2A	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
950											↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
1000												↕	↕	↕	↕	↕	↕	↕	↕	↕
1050														↕	↕	↕	↕	↕	↕	↕
1100															↕	↕	↕	↕	↕	↕
1150																↕	↕	↕	↕	↕
1200																	↕	↕	↕	↕
1250																		↕	↕	↕
1300																			↕	↕
1350																				↕
1400																				
1450																				
1500																				
1550																				
1600																				
1650																				
1700																				
1750																				
1800																				

NR—not recommended.

2. DESCRIPTION

2.01 The 2-type closure is illustrated in Fig. 1. It can be obtained as a complete package as listed in Table F (except 2B type) or by component ordering as outlined in paragraph 2.03.

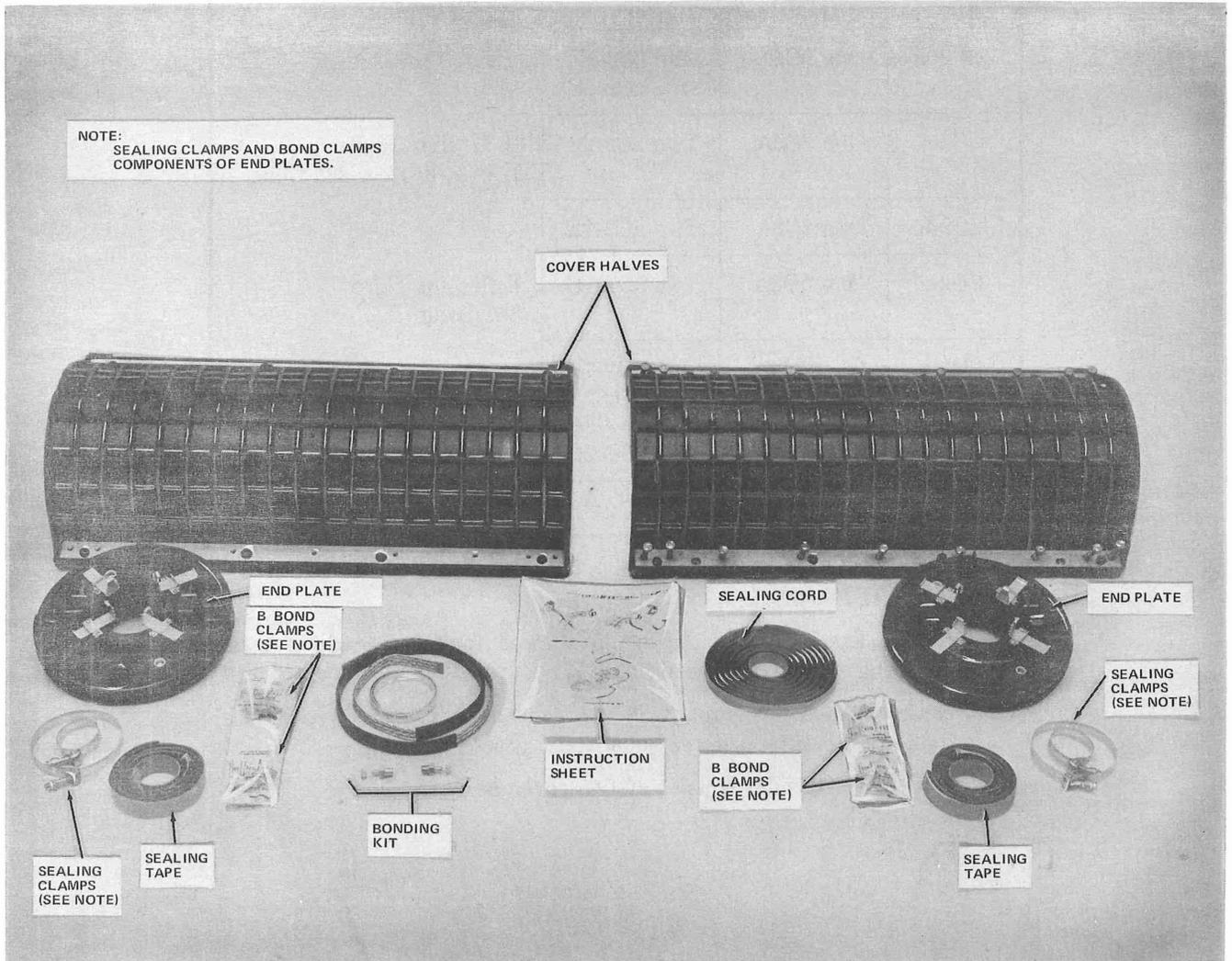


Fig. 1—2-Type Closure

TABLE F

2-TYPE CLOSURE CODES (EXCEPT 2B TYPE) (See Note 1)

CLOSURE CODE (NOTE 2)	COMPONENTS FURNISHED		
	COVER (NOTES 3 & 4)	END PLATES	MISC HARDWARE
2C2-2	One 2C2A	Two 2C2-1E	D-180575 Bonding Kit
2C2-3	One 2C2A	One 2C2-1E One 2C2-2E	
2C2-4	One 2C2A	Two 2C2-2E	B Sealing Tape 1/4" × 3/4" × 32" Long
2C2-6	One 2C2A	Two 2C2-3E	
2D2-2	One 2D2A	Two 2D2-1E	B Sealing Cord 32" Long
2D2-3	One 2D2A	One 2D2-1E One 2D2-2E	
2D2-4	One 2D2A	Two 2D2-2E	Instruction Sheets
2D2-6	One 2D2A	Two 2D2-3E	

Note 1: The 2B-type closure has to be component ordered as listed in Tables H and I.

Note 2: The 2C2-type closure has an 8 inch inside diameter whereas the 2D2-type closure has a 9-1/2 inch inside diameter.

Note 3: Standard covers are 28-1/2 inches long. Longer covers are available and can be ordered separately. (See Table H.)

Note 4: Cover codes consist of two cover halves.

2.02 In addition to the 2-type closure package, it will be necessary to order the following items for a complete installation:

(a) **Sealing Washers AT-8583:** Listed in Table G, are flat circular discs made of black plastic. The FO, GO, HO, JO, HX, JX, and KX washers are used for sealing unused openings in the closure. The FO and GO sealing washers have the option for use in installation of cables from 0.3 inch to 1.6 inches in diameter by cutting along the proper annular groove with the B washer cutter AT-7065.♦

(b) **B Sealing Tape—1-1/2 inches wide:** Used to form collars for sealing cavities in end plates.

(c) **53A Hangers:** Used for hanging closure on strand when used in aerial plant.

(d) **PIPETITE Stik* Compound:** A commercial pipe joint compound to coat threads of pipe plug insert.

*Registered trademark of Lake Chemical Company

TABLE G

SEALING WASHERS—AT-8583

F WASHER			G WASHER			H WASHER (NOTE 1)			J WASHER (NOTE 2)			K WASHER (NOTES 3 AND 4)		
WASHER NO.	USED ON CABLE DIA (IN.)	END PLATE WASHER GROOVE DIA	WASHER NO.	USED ON CABLE DIA (IN.)	END PLATE WASHER GROOVE DIA	WASHER NO.	USED ON CABLE DIA (IN.)	END PLATE WASHER GROOVE DIA	WASHER NO.	USED ON CABLE DIA (IN.)	END PLATE WASHER GROOVE DIA	WASHER NO.	USED ON CABLE DIA (IN.)	END PLATE WASHER GROOVE DIA
FO*†	0	1-1/2	GO*‡	0	2-1/2	HO*	0	2-23/32	JO*	0	3-15/32	KX*	0	4-1/16
F3	0.3	1-1/2	G3	0.3	2-1/2	HX*	0	2-23/32	JX*	0	3-15/32	K17	1.7	4-1/16
F4	0.4	1-1/2	G4	0.4	2-1/2	H11	1.1	2-23/32	J16	1.6	3-15/32	K18	1.8	4-1/16
F5	0.5	1-1/2	G5	0.5	2-1/2	H12	1.2	2-23/32	J17	1.7	3-15/32	K19	1.9	4-1/16
F6	0.6	1-1/2	G6	0.6	2-1/2	H13	1.3	2-23/32	J18	1.8	3-15/32	K20	2.0	4-1/16
F7	0.7	1-1/2	G7	0.7	2-1/2	H14	1.4	2-23/32	J19	1.9	3-15/32	K21	2.1	4-1/16
F8	0.8	1-1/2	G8	0.8	2-1/2	H15	1.5	2-23/32	J20	2.0	3-15/32	K22	2.2	4-1/16
F9	0.9	1-1/2	G9	0.9	2-1/2	H16	1.6	2-23/32	J21	2.1	3-15/32	K23	2.3	4-1/16
F10	1.0	1-1/2	G10	1.0	2-1/2	H17	1.7	2-23/32	J22	2.2	3-15/32	K24	2.4	4-1/16
			G11	1.1	2-1/2	H18	1.8	2-23/32	J23	2.3	3-15/32	K25	2.5	4-1/16
			G12	1.2	2-1/2	H19	1.9	2-23/32	J24	2.4	3-15/32	K26	2.6	4-1/16
			G13	1.3	2-1/2	H20	2.0	2-23/32	J25	2.5	3-15/32	K27	2.7	4-1/16
			G14	1.4	2-1/2	H21	2.1	2-23/32	J26	2.6	3-15/32	K28	2.8	4-1/16
			G15	1.5	2-1/2	H22	2.2	2-23/32	J27	2.7	3-15/32	K29	2.9	4-1/16
			G16	1.6	2-1/2				J28	2.8	3-15/32	K30	3.0	4-1/16
												K31	3.1	4-1/16
												K32	3.2	4-1/16
												K33	3.3	4-1/16
												K34	3.4	4-1/16
												K35	3.5	4-1/16

Note 1: The HF sealing washer is used in the same end plate as the H sealing washer to seal cables smaller than 1.0 inch OD by the insertion of the proper F sealing washer in the recess provided.

Note 2: The JG sealing washer is used in the same end plate as the J sealing washer for sealing cables smaller than 1.6 inches OD by inserting the proper G series sealing washer in the recess provided.

Note 3: The KG sealing washer is used in the same end plate as the K sealing washer for sealing cables smaller than 1.6 inches OD by inserting the proper G series sealing washers in the recess provided.

Note 4: The KO sealing washer should be used with 849A sealing washer cutter to cut appropriate sealing washers for the seals of the 2-type closure as outlined in Section 081-020-136.

* The FO, GO, HO, HX, JO, JX, and KX sealing washers are used for sealing vacant opening in end plate.

† The FO sealing washer may be cut to fit 0.3 inch to 1.0 inch cable using the AT-7605 B washer cutter, and cutting along one of its concentric grooves.

‡ The GO sealing washer may be cut to fit 0.3 inch to 1.6 inch cable using the AT-7605 B washer cutter and cutting along one of its concentric grooves.

- (e) **B Paper Tape:** For marking cable sheath.
- (f) **Spare Parts Kit D-180576 (Fig. 2):** Replacement parts for 2-type closure.
- (g) **Insert Repair Washer Kit D-180861 (Fig. 3):** Used to repair leaking insert on end plates.
- (h) **Reentry Seal D-180674 (Fig. 4):** Kit for sealing splice closure which eliminates the need for cleaning the case upon reentry. This kit of parts should be used when reentry is anticipated. Otherwise, use the less costly B sealing tape and B sealing cord.

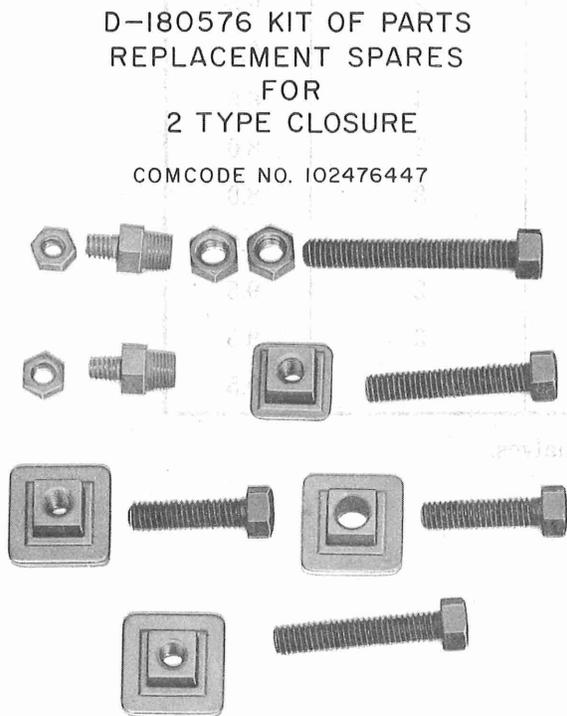


Fig. 2—Spare Parts Kit D-180576

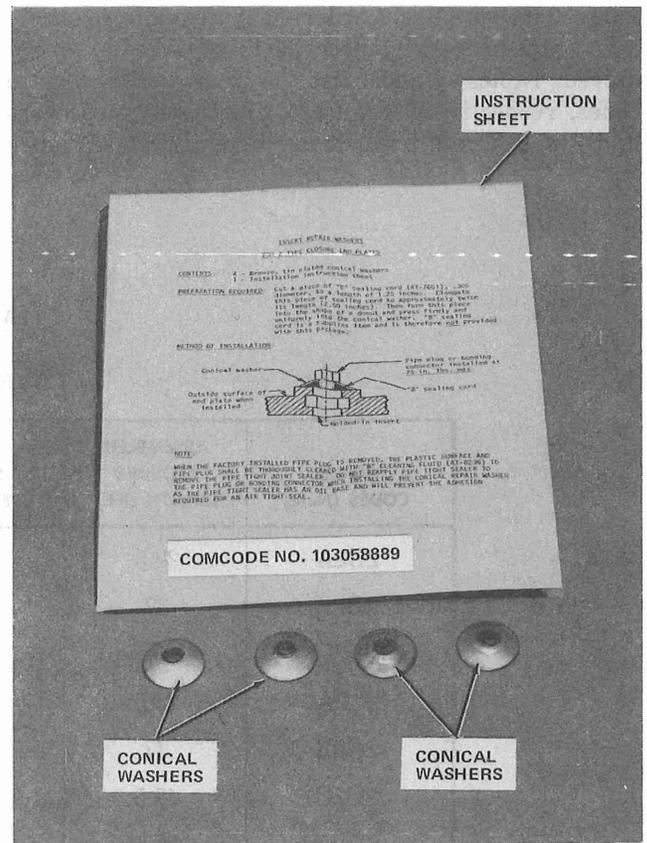


Fig. 3—Insert Repair Washer Kit D-180861

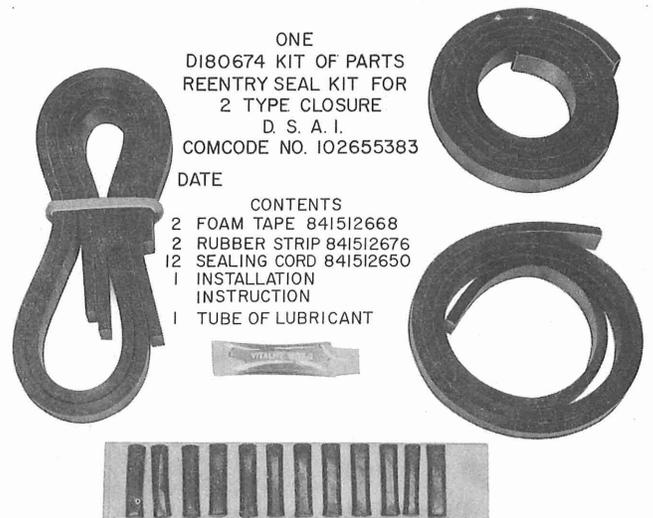


Fig. 4—Reentry Seal Kit D-180674

SECTION 633-506-201

2.03 The component ordering system allows ordering necessary piece parts separately, as required. Tables H and I list the cover and end plate codes, respectively. Figure 5 illustrates the covers and Fig. 6, 7, and 8 illustrate the end plates. Figure

9 illustrates the HX, JX, and KX plastic spool-shaped washers used with two or three layers of 1-1/2 inch B sealing tape to provide a quick and easy means of plugging unused cable entrance in 2-type end plates.

**TABLE H
COVER CODES**

COVER CODES (Note)	ASSEMBLED CLOSURE LENGTH (IN.)	SHEATH OPENING (IN.)	NUMBER OF 710 MODULE BANKS	COVER ID (IN.)
2B2A	28.5	19	2	6.5
2B2B	37	27.5	3	6.5
2B2C	45.5	36	4	6.5
2C2A	28.5	19	2	8.0
2C2B	37	27.5	3	8.0
2C2C	45.5	36	4	8.0
2D2A	28.5	19	2	9.5
2D2B	37	27.5	3	9.5
2D2C	45.5	36	4	9.5

Note: Cover codes consist of two cover halves.

TABLE I
END PLATE CODES

END PLATE CODE	NUMBER OF HOLES	MAX CABLE DIAMETER	SEALING WASHER SERIES
2B2-1E	1	2.8	J
2B2-2E	2	2.2	H
2B2-3E	3	One 2.2 and two 1.0	H, F
2C2-1E	1	3.4	K
2C2-2E	2	2.8	J
2C2-3E	3	One 2.8 and two 1.6	J, G
2D2-1E	1	3.4	K
2D2-2E	2	3.4	K
2D2-3E	3	One 3.4 and two 2.2	K, H

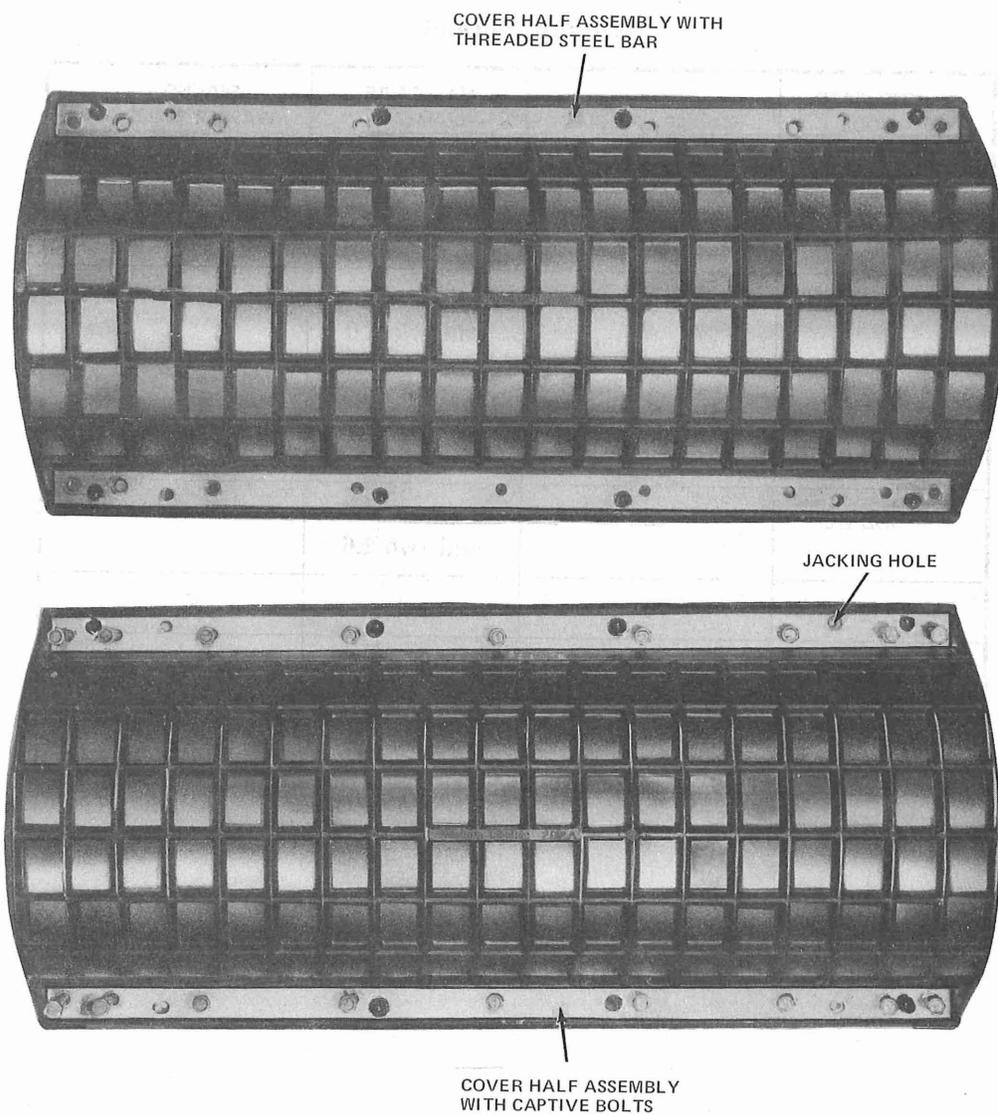


Fig. 5—Cover

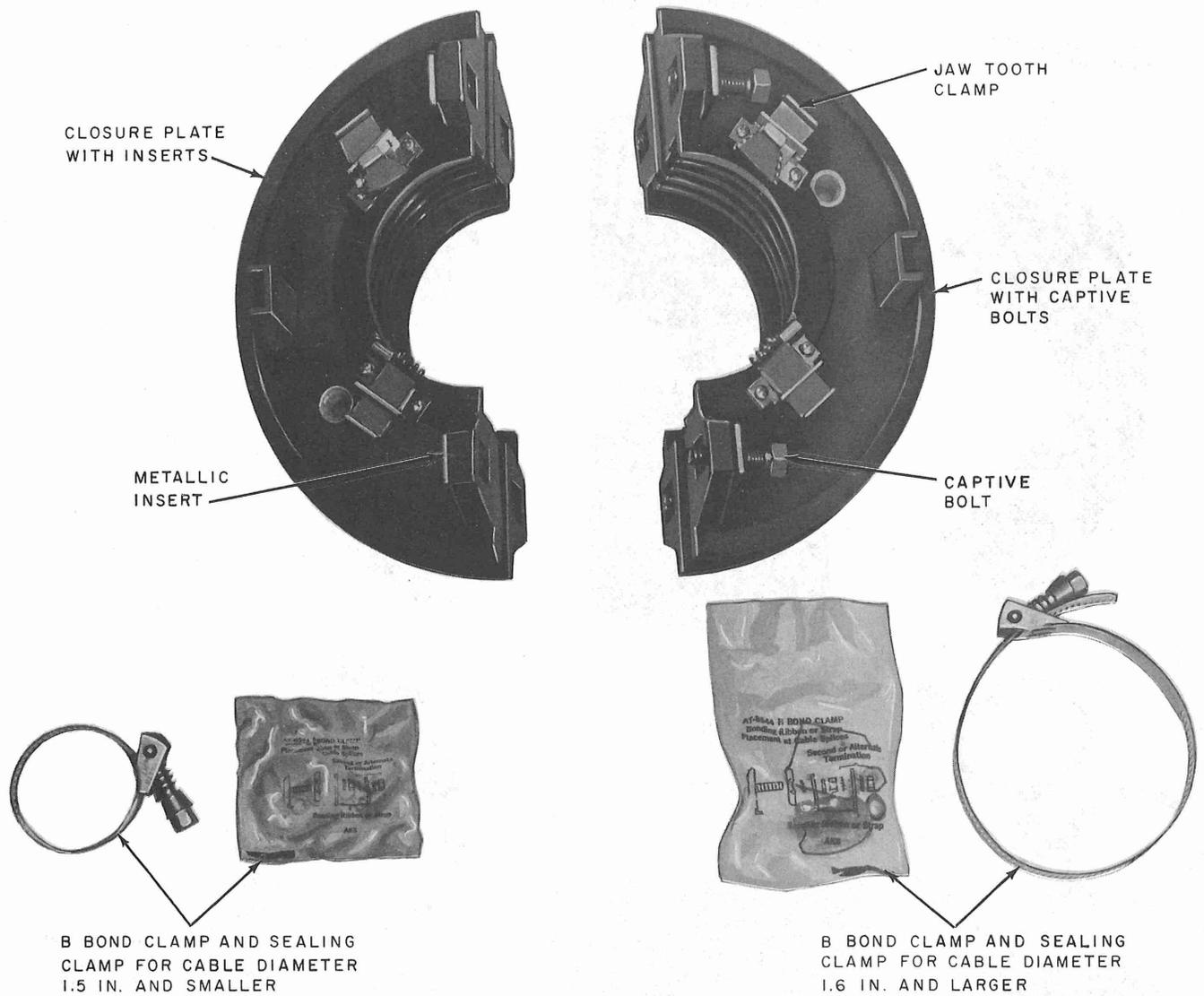
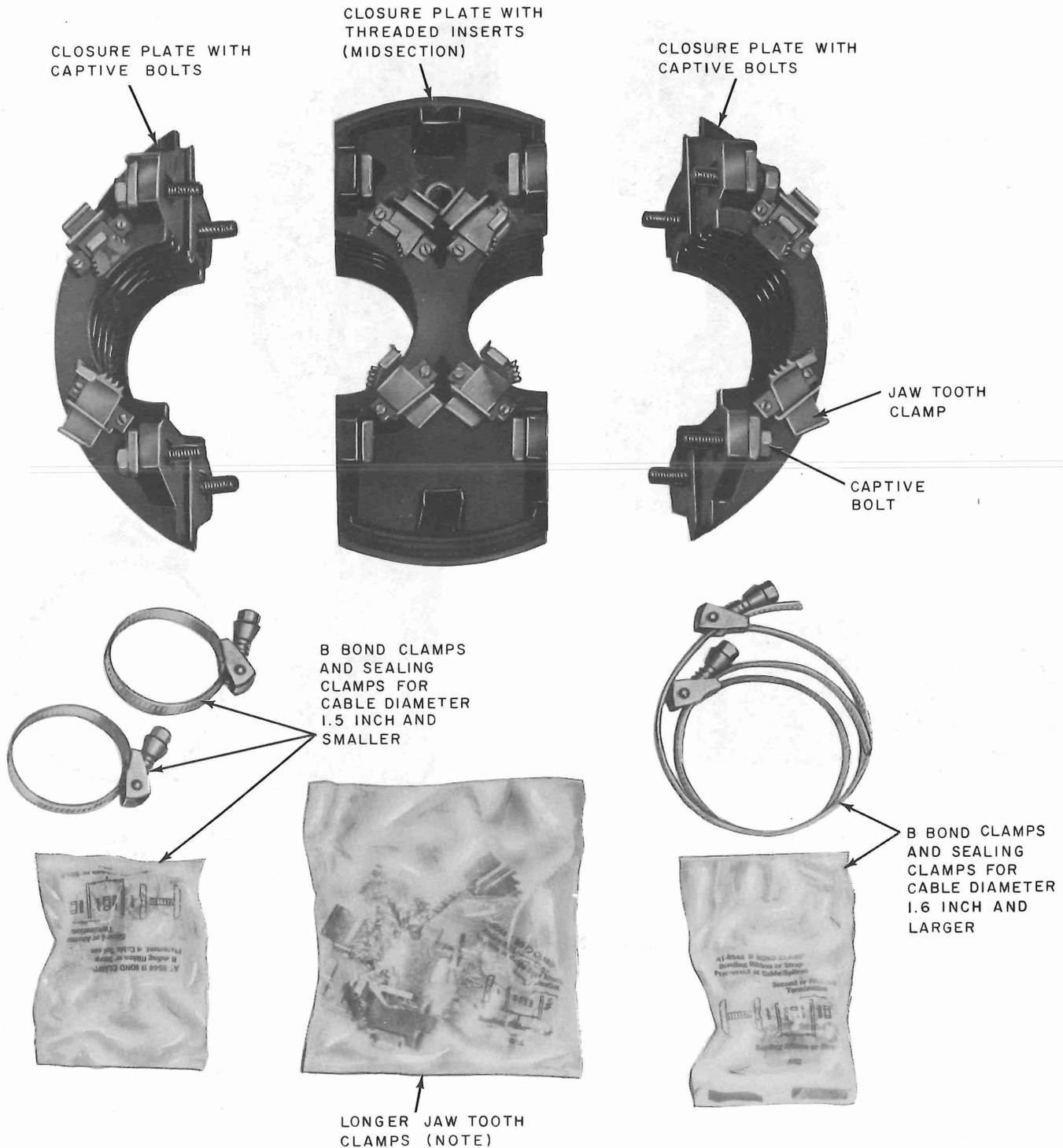


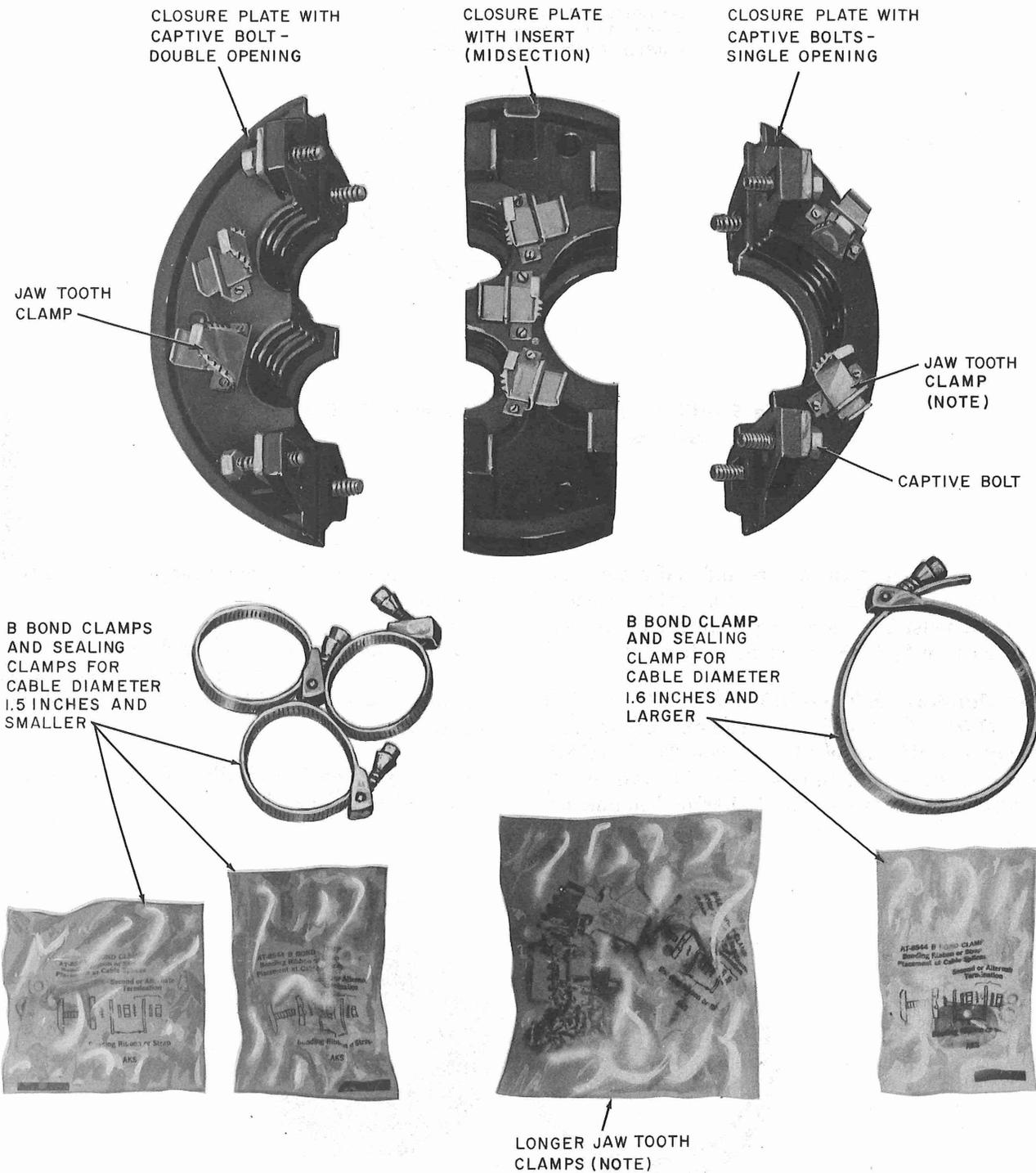
Fig. 6—2-Type 1E End Plate



NOTE:

THE STANDARD JAW TOOTH CLAMPS MUST BE REPLACED BY THESE LONGER JAW TOOTH CLAMPS BEFORE PLACING END PLATES ON CABLES 1.9 INCHES AND SMALLER FOR 2C2 AND 2D2, AND 1.4 INCHES AND SMALLER FOR 2B2.

Fig. 7—2-Type 2E End Plate



NOTE:
 THE STANDARD JAW TOOTH CLAMP ON THE LARGE ENTRANCE MUST BE REPLACED BY THESE LONGER CLAMPS BEFORE PLACING THE END PLATE ON CABLES 1.9 INCHES AND SMALLER FOR 2C2 AND 2D2, AND 1.4 INCHES AND SMALLER FOR 2B2.

Fig. 8—2-Type 3E End Plate

2-3 LAYERS OF 1-1/2 IN. B SEALING TAPE TO BUILD UP TO A DIAMETER EQUAL TO OR SLIGHTLY LARGER THAN EDGE OF WASHER

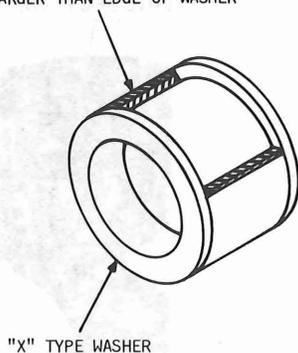


Fig. 9—HX, JX, and KX Sealing Washers for Sealing Vacant Opening in End Plate

2.04 In addition to the covers and end plates, the following items and the items listed in paragraph 2.02 must be ordered separately, as required, when ordering by the component system.

(a) **Bonding Kit D-180575 or D-180678 (Fig. 10):** Consists of bonding connectors, bonding braid, and bonding ribbon. The D-180575 bonding kit should be used with the standard A length set of covers. The D-180678 bonding kit

should be used with the longer B and C length set of covers.

(b) **B Sealing Tape:** 3/4 inch wide by 1/4 inch thick—Used to provide seals between the end plate components and between the assembled end plate and cover.

(c) **B Sealing Cord:** Place in groove of cover half to form seal.

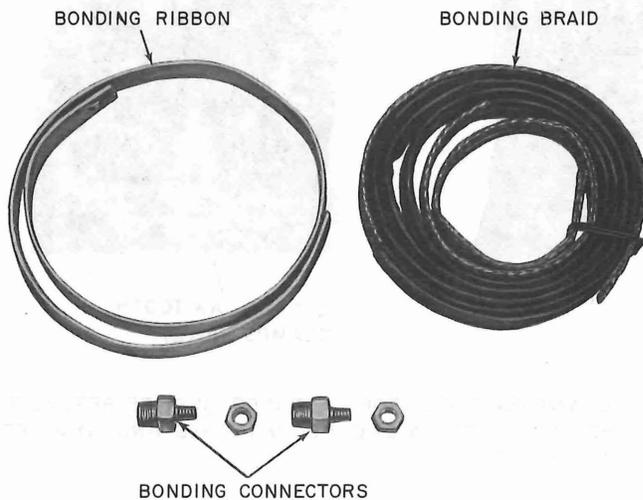


Fig. 10—Bonding Kit

3. CABLE SHEATH PREPARATION

Single Jacket Cable

3.01 Prepare cable sheath as illustrated in Fig. 11 and 12.

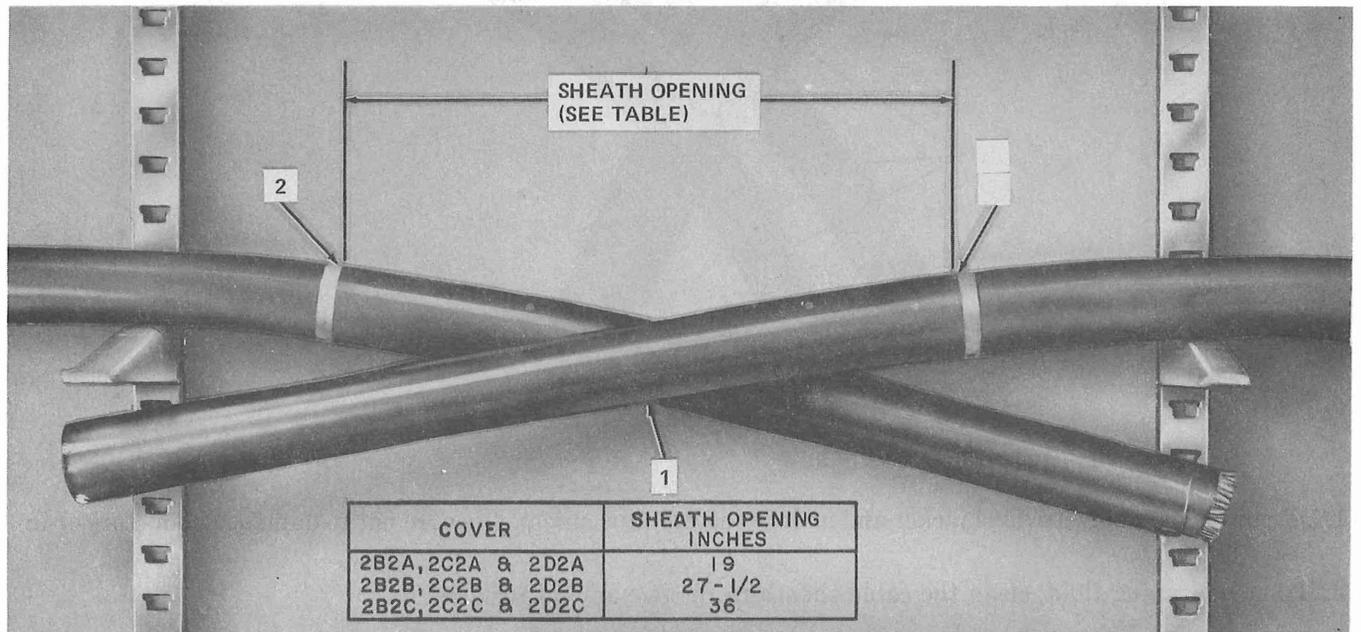


Fig. 11—Mark Cable Sheath

1. Set up cables and locate center of splice.
2. Mark cable sheath opening for cover to be used.

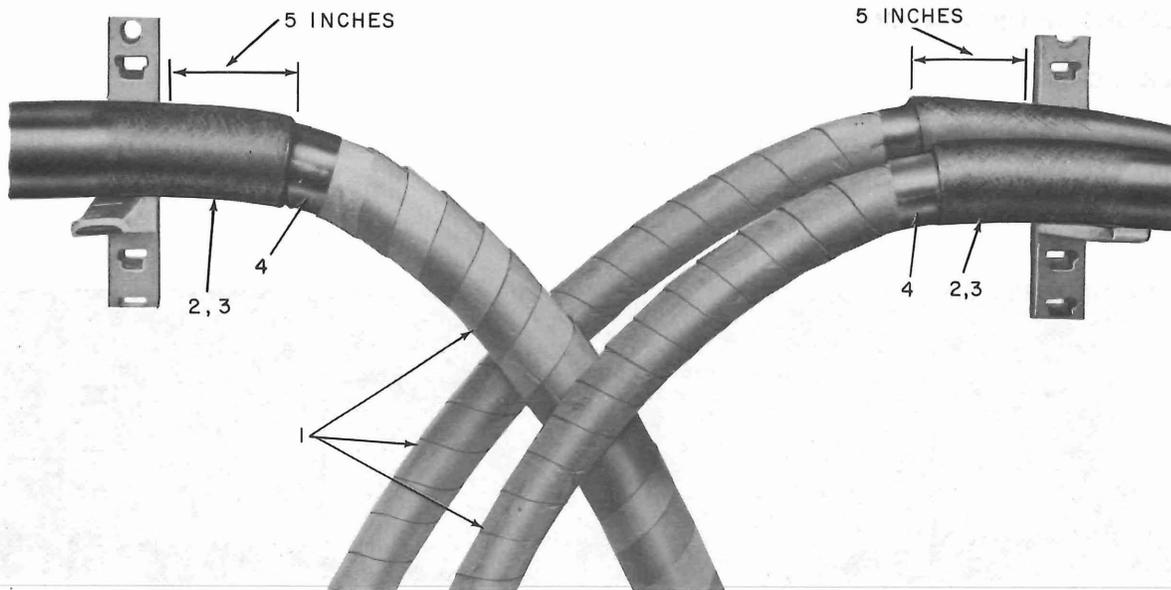


Fig. 12—Prepared Cable Sheath

1. Remove outer polyethylene jacket and underlying metallic shield. Use care not to damage conductors or insulation.
2. Using B cleaning fluid, clean the cable sheath to remove any oil residue.

Caution: *Do not scuff the sheath longitudinally as this could produce leak channels.*

3. Using a carding brush, thoroughly scuff the entire circumference of each cable sheath for a distance of approximately 5 inches, starting at sheath opening.
4. Make a collar over the cable core with two layers of vinyl tape for each cable end; place the first layer with adhesive side out lapped about 1/4 inch, then one layer with adhesive side in. Slide the collar back underneath metallic shield to protect core.

Dual Jacket Cable

3.02 The following items must be ordered for constructing a wrapped gastight joint on dual jacket cable:

- (a) D-180660 Kit of Parts (Fig. 13) (one kit required for each dual jacket entrance cable)

(b) B bond clamp (two required for each joint)

(c) DR tape

(d) Friction tape or B glass tape, if available.

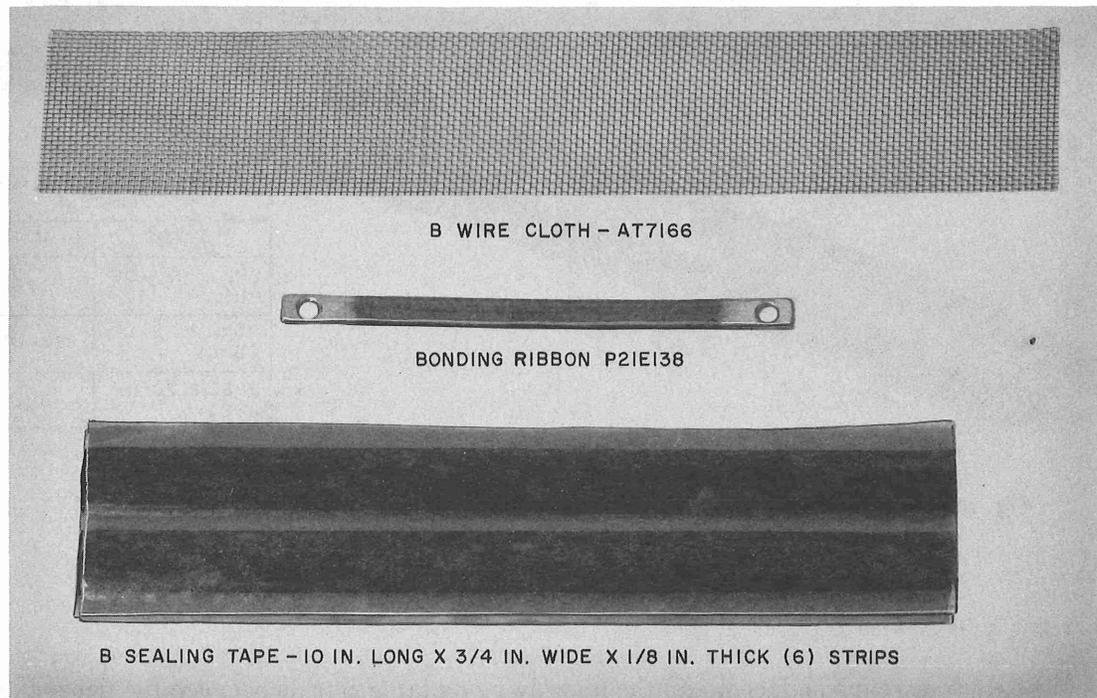


Fig. 13—Kit of Parts D-180660

3.03 Prepare the cable sheath as outlined in Fig. 14 through 19. The wrapped gastight joint should be placed and bonding ribbon installed before splicing.

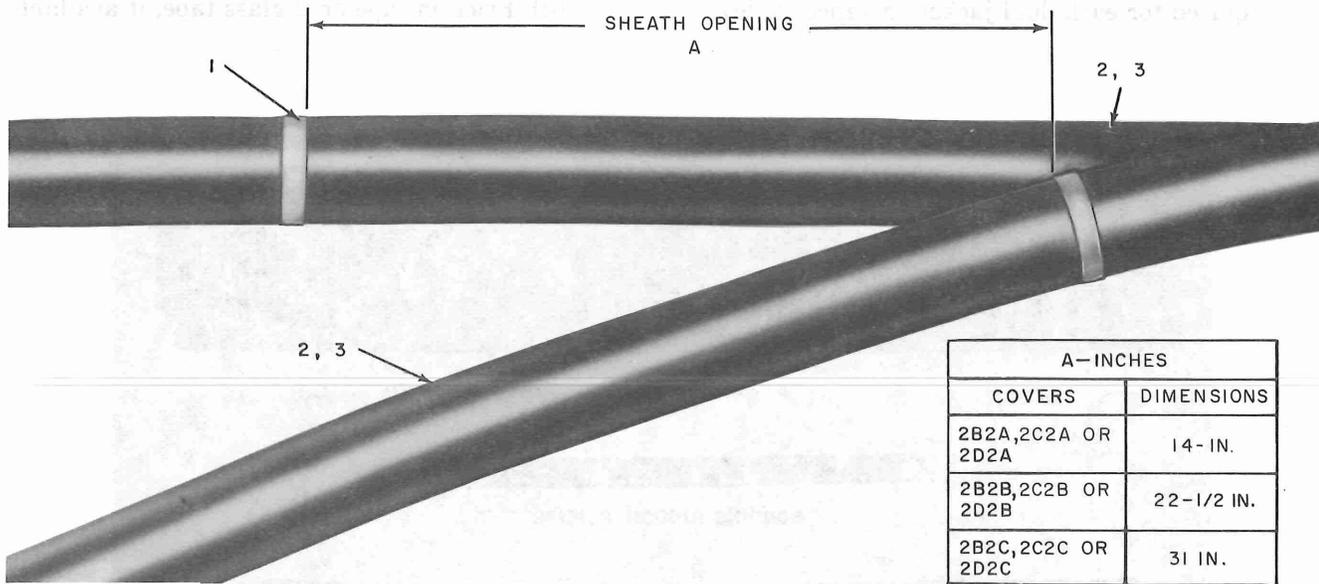


Fig. 14—Mark Cable Sheath and Remove Polyethylene Jacket and Flooding Compound

1. Mark the cable sheath with B paper tape.
2. Remove the outer polyethylene jacket and the underlying metallic shields between the paper tape marker and the end of the cable. Exercise care not to damage the inner polyethylene jacket.

Note: If the PASP sheath is flooded with black thermoplastic compound, **do not clean**. Continue to Fig. 16.
3. Remove the clear petroleum jelly flooding compound from the inner and outer polyethylene jacket of the PASP sheath cables as follows:
 - (a) Obtain a 3-foot length of 1/4 inch wide B cotton tape, then wrap this around the inner jacket. Using a sawing action, work it down the jacket to remove the mass of the flooding compound.
 - (b) Using a KS-14666 cloth soaked with KS-21446 solvent, wipe down the inner jacket to remove the flooding compound.
 - (c) Using a small amount of B cleaning fluid, remove the KS-21446 solvent. Both inner and outer jacket should be completely clean of flooding compound and solvent.

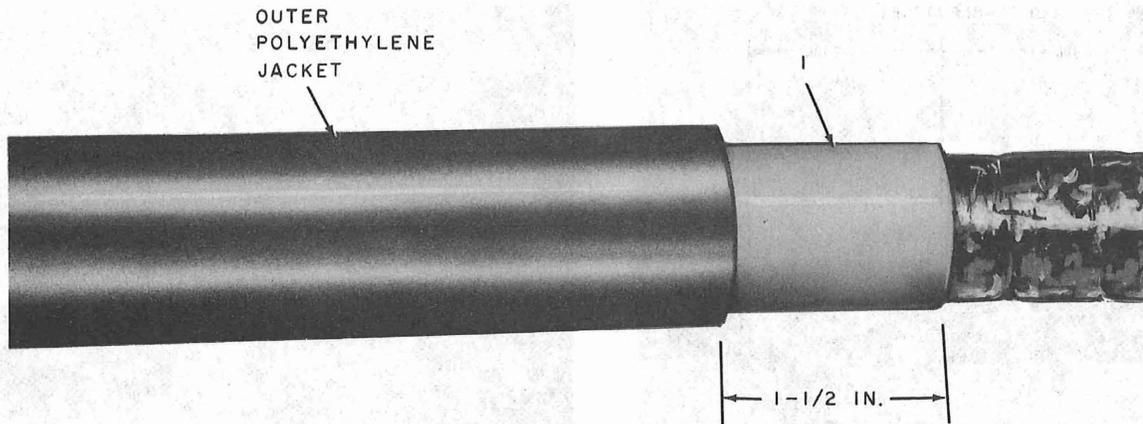


Fig. 15—Removed Cable Sheath

1. Cut and remove the inner polyethylene jacket leaving 1-1/2 inches exposed.

Note: Only the left-hand cable is illustrated in Fig. 16 through 20; however, the steps outlined herein apply equally to both cable ends unless otherwise noted.

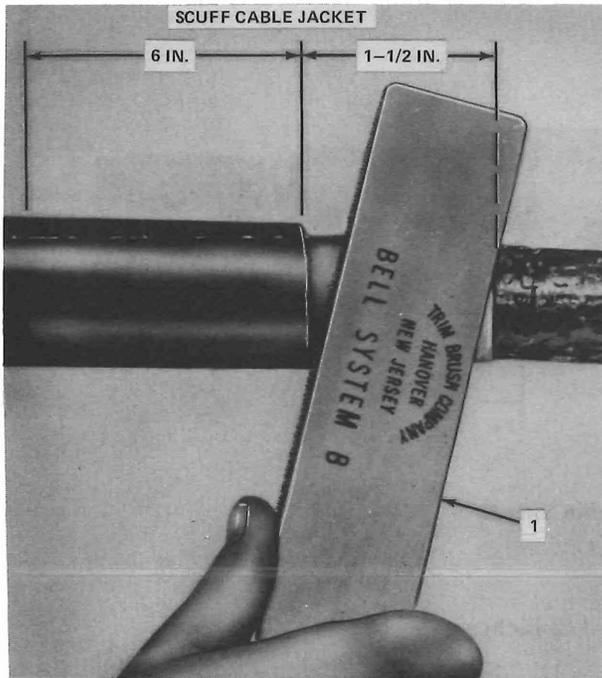


Fig. 16—Cleaning Cable Sheath

1. Using a carding brush, scuff the outer and inner polyethylene jacket.
2. Using B cleaning fluid in a well ventilated area, clean the scuffed area. This removes any oily residue from the cable jacket. This must be done to assure a reliable seal.

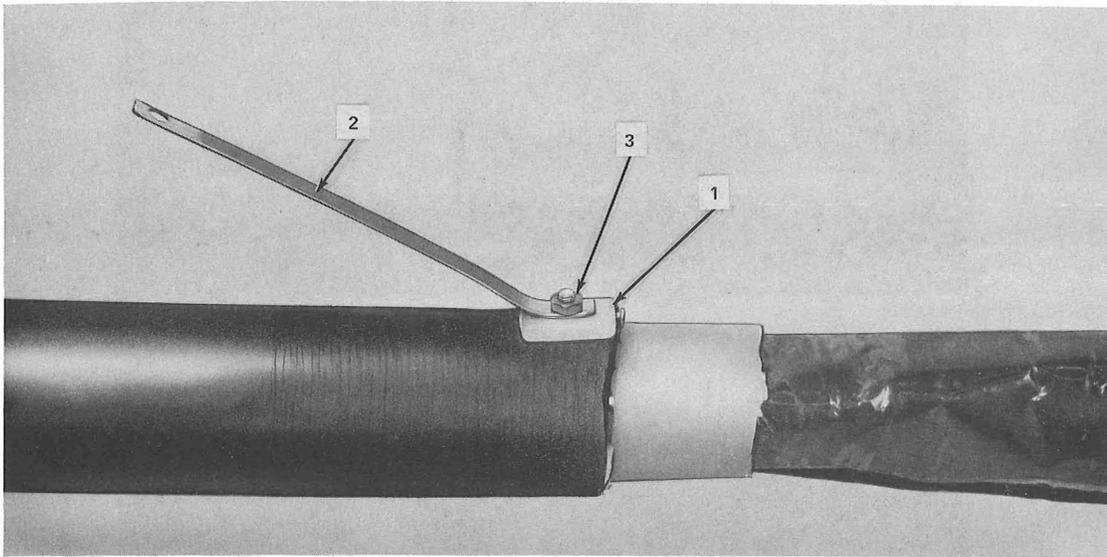


Fig. 17—Bonding Cable Sheath

1. Slit cable outer jacket and metallic shield and install B bond clamp as outlined in Section 081-852-118.
2. Install P21E138 bonding ribbon (from kit of parts D-180660) on stud of B bond clamp.
3. Secure bonding ribbon with nut from B bond clamp. Tighten with 216-type tool, then cut off excess stud length with B side cutting pliers.

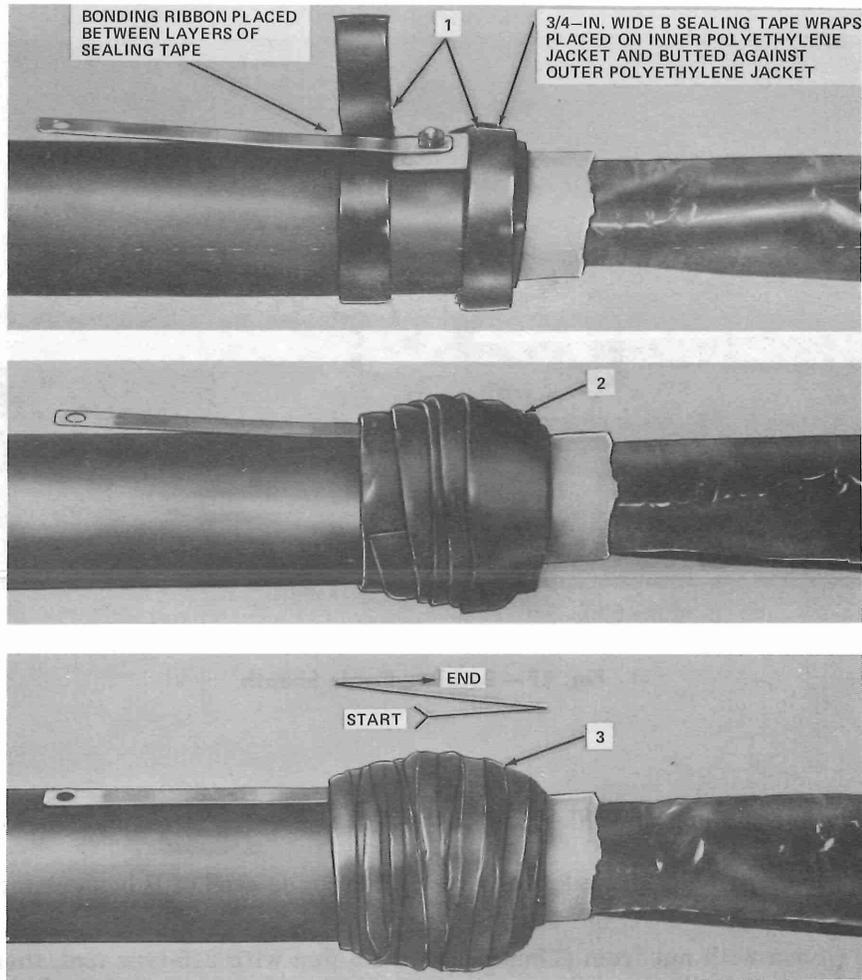


Fig. 18—Constructing Wrapped Joint

Caution: Do not heat the tape directly in the airflow of a heater or blower. This reduces the adhesion of the tape to the cable sheath. If preheating in cold weather is required, place the tape in a warm place prior to use.

1. Wrap 3/4 inch wide B sealing tape around sheath at each end of bond clamp. Feather the leading edge of sealing tape and build up above bond clamp level.
2. Place half-lapped layers of 1-1/2 inch wide B sealing tape over clamp and previous wraps.
3. Starting at the center, wrap the B sealing tape with DR tape (black side out) stretching the DR tape as tight as possible and going from one end to the other. This compresses the B sealing tape to form a better seal.

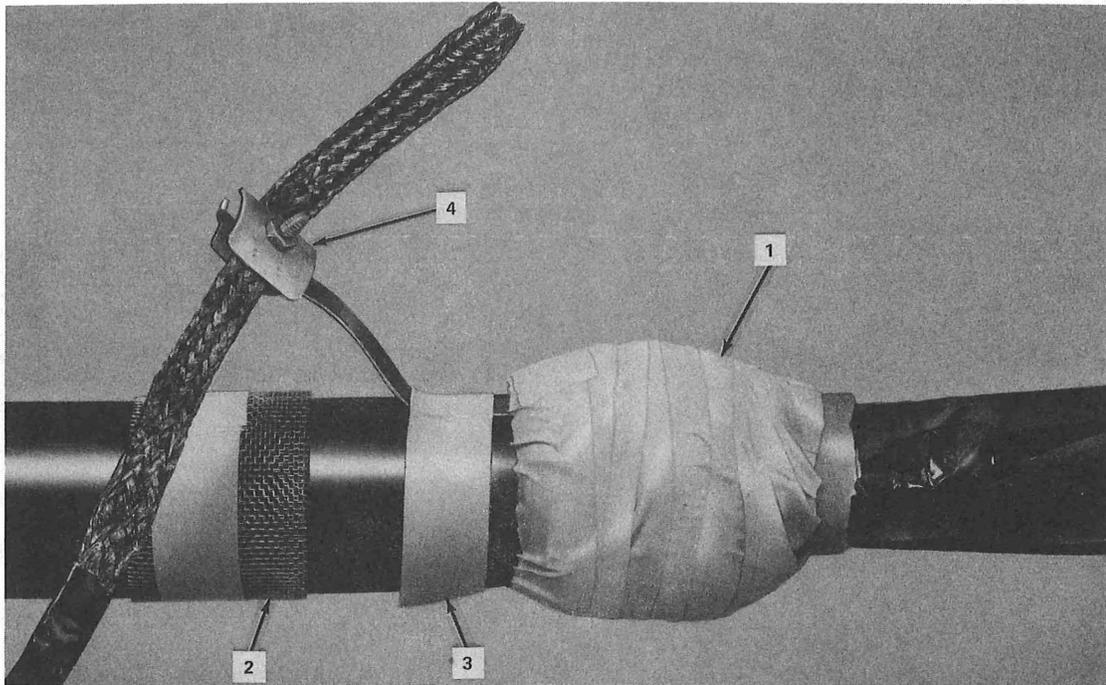


Fig. 19—Completed Wrapped Joint

1. Wrap the DR tape with friction tape, or glass tape if available. The tape strengthens the wrapped joint.
2. Place the brass wire cloth on the cable sheath and secure with a wrap of tape. The brass wire cloth is placed on the cable sheath to prevent the jaw tooth clamps on the end plate from piercing outer polyethylene jacket.
3. Place a wrap of tape around the bonding ribbon for strain relief.
4. Install B bond clamp and braid on the bonding ribbon.

Installation of B Sealing Tape Collars

3.04 Install B sealing tape collars on single and dual jacket cables as outlined in Fig. 20.

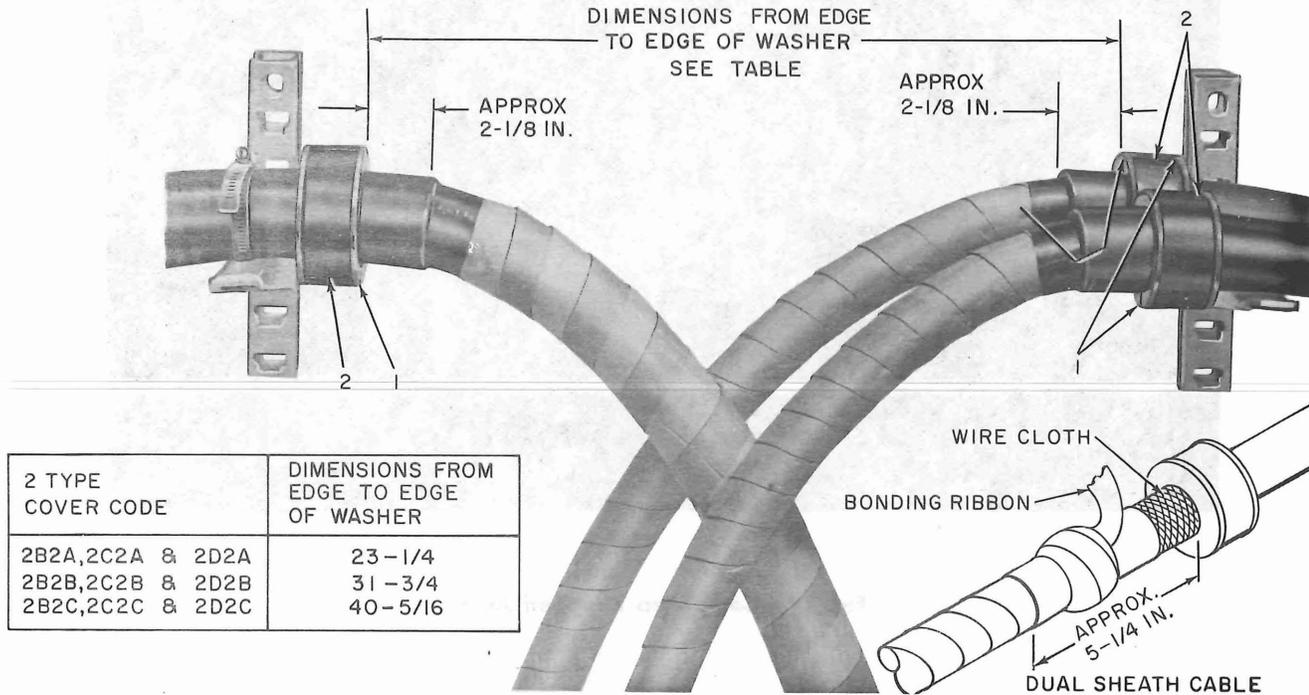


Fig. 20—Installation of B Sealing Tape Collars

- Using appropriate splice closure guide, or Table G, select sealing washers and place on cables approximately 2-1/8 inches from the end of the cable sheath on single jacket cable or adjacent to wire cloth on dual jacket cable. The dimension from edge to edge of washer **must be** as listed in the table. **This dimension is important as it establishes the fit of the end plates into the cover.**

Caution: Do not heat the tape directly in the airflow of a heater or blower. This reduces the adhesion of the tape to the cable sheath. If preheating in cold weather is required, place the tape in a warm place prior to use.

- Using 1-1/2 inch wide B sealing tape, build up collars on the cable sheath adjacent to the washers to a diameter equal to or slightly larger than that of the washers. The tape should be kept as clean as possible and should not be stretched.

4. INSTALLATION OF END PLATES

Note: Only the installation of end plates on single jacket cable are illustrated herein; however, the steps apply equally to both single and dual jacket except the toothed clamps must be

positioned over the brass cloth on dual jacket cables to prevent the teeth from penetrating the outer cable jacket.

Single Entrance End Plate

4.01 Figures 21 through 24 outline procedures for installing single entrance end plate on cable.

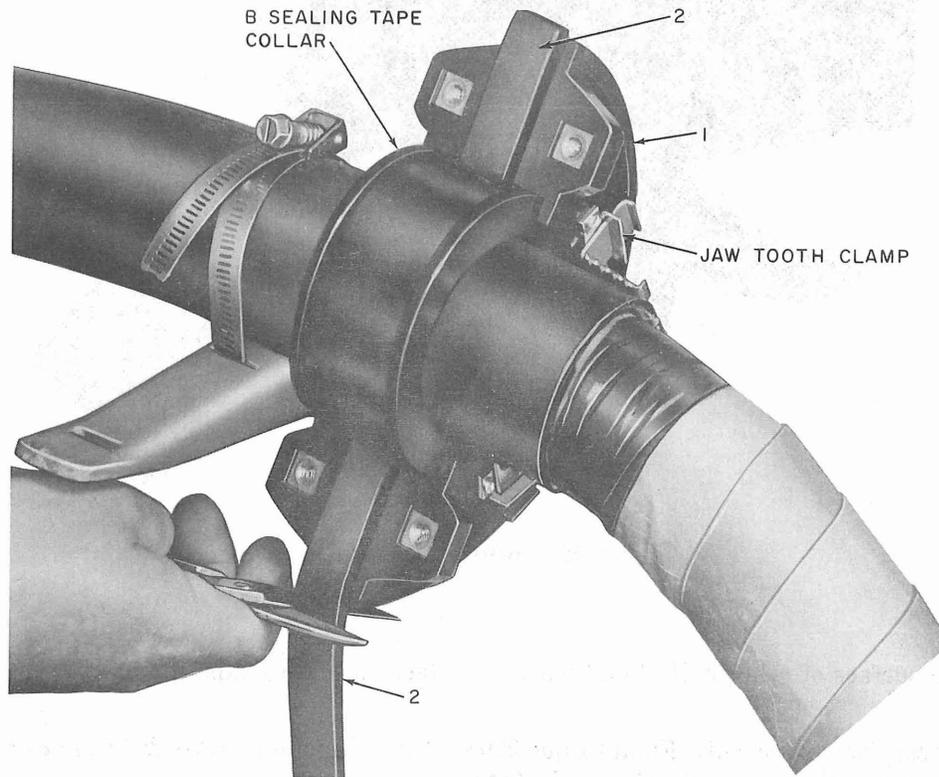


Fig. 21—Placing Threaded Insert Section of End Plate

1. Using B cleaning fluid, clean the inner sealing surface of the end plate with threaded inserts, then place on the B sealing tape collar at the back of the cable.
2. Clean the groove on the inner face of the end plate. Then place a length of 3/4 inch wide by 1/4 inch thick B sealing tape in each groove. Cut the tape.

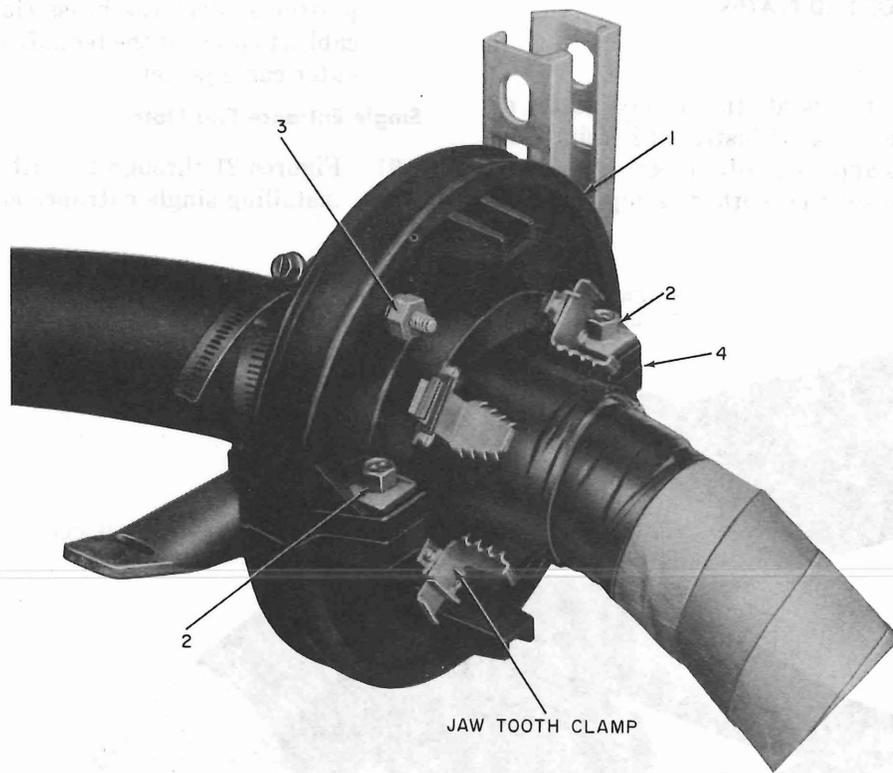


Fig. 22—Installed End Plate

1. Clean sealing surface of other half of end plate and place on sealing tape collar.
2. Tighten four captive bolts evenly. Final torque 200 to 250 inch-pounds. ***Check to assure sealing washers remain properly seated in the end plate.***

Warning: Do not tighten more than 50 to 75 inch-pound.

3. If external bond is required, remove pipe plug and place bonding connectors from bonding kit in both sides of end plate.
4. Trim the B sealing tape flush to end plate. ***Do not pull off excess tape.***

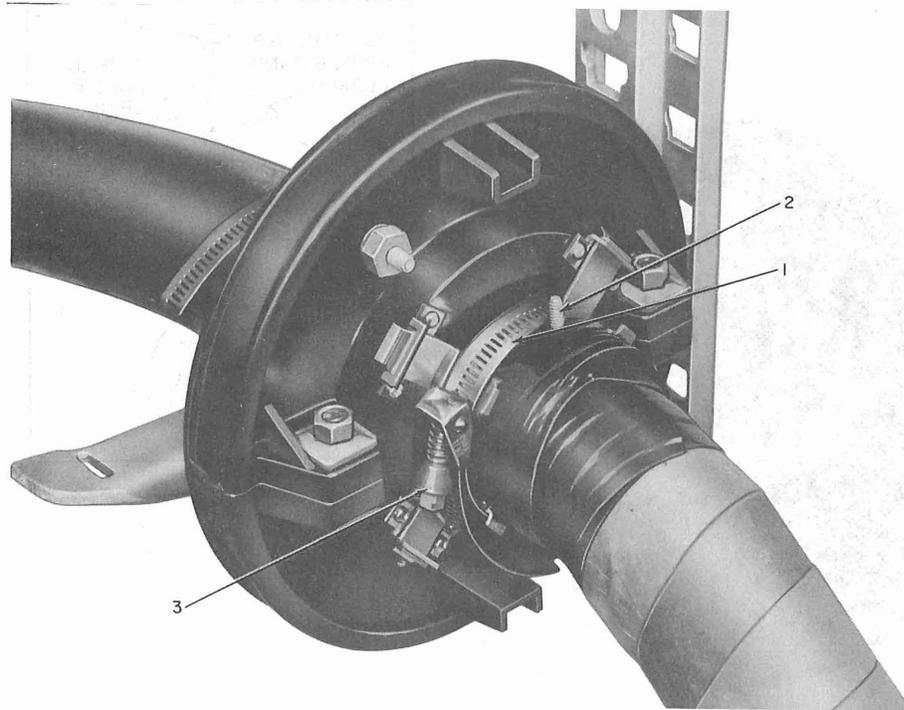


Fig. 23—Installation of B Bond Clamp and Sealing Clamp

1. On smaller size cables, it may be necessary to remove a jaw tooth clamp from end plate to provide space for installation of B bond clamp.
2. Remove and discard washers from B bond clamp. Slit cable sheath for 1-1/2 inches and install inner clamp of B bond clamp as outlined in Section 081-852-118.
3. Place sealing clamp over jaw tooth clamps, then tighten sealing clamp to set teeth of jaw tooth clamp firmly into cable jacket.

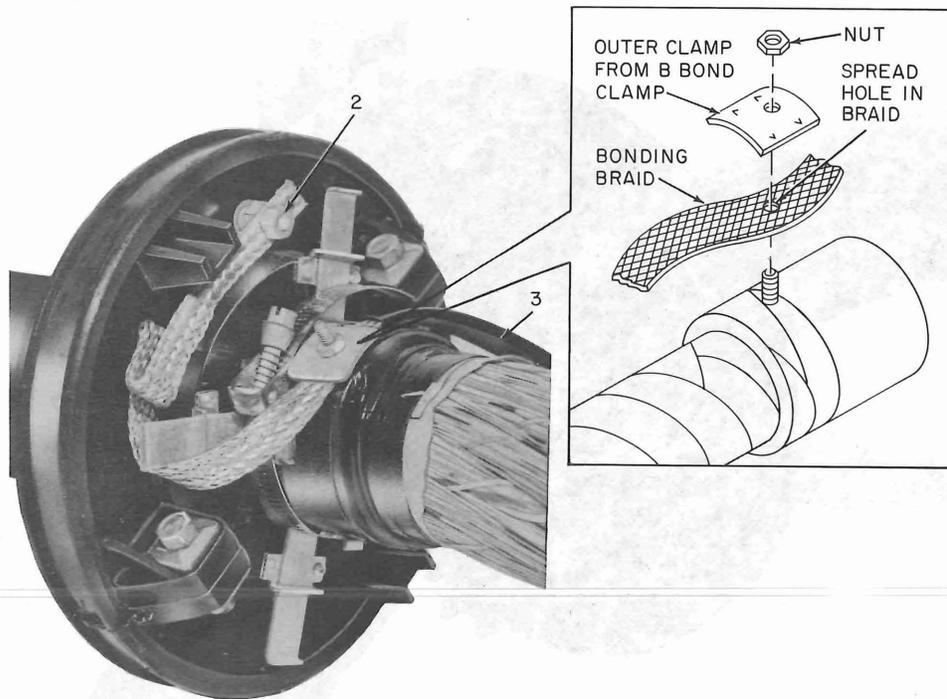


Fig. 24—Attaching Bonding Braid

1. Spread bonding braid and place over stud of B bond clamp. Install and secure outer clamps of B bond clamp. Tighten nut with 216-type tool **only**.

Warning: Do not tighten more than 50 to 75 inch-pounds.

2. Place prepared hole at end of bond braid over bonding connector and secure with 216-type tool.
3. Attach bonding braid to bond clamp(s) on opposite side of sheath opening.

Double Entrance End Plate

4.02 Figures 25 through 28 outline procedures for installing double entrance end plate.

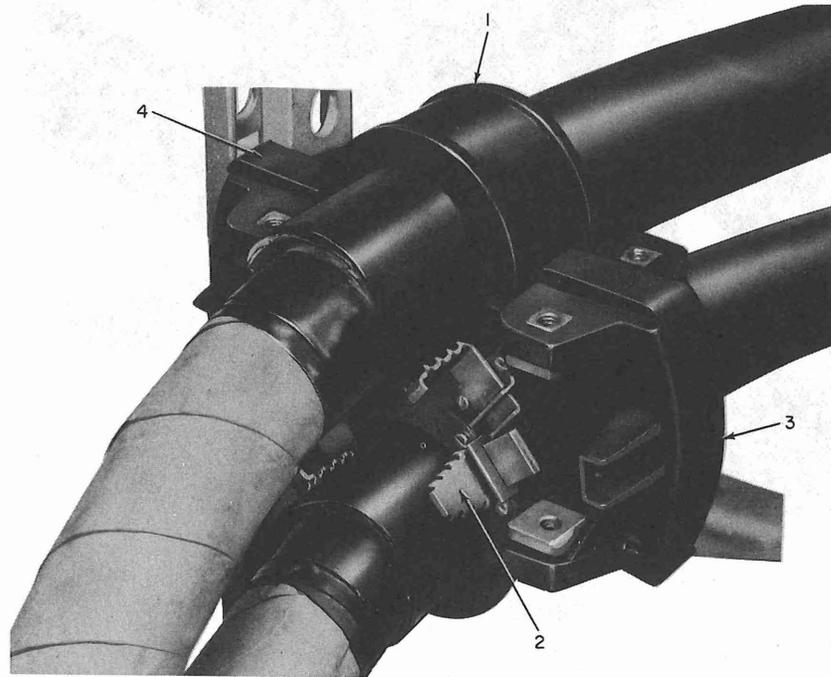


Fig. 25—Placing Midsection of 2-Type 2E End Plate

1. Install B sealing tape collars on cable sheath as outlined in Step 9.
2. On cable size 1.9 inches and smaller for 2C2 and 2D2, and 1.4 inches and smaller for 2B2, the standard jaw tooth clamps **must be** replaced by the longer jaw tooth clamps before placing midsection between cables.
3. Using B cleaning fluid, clean the inner sealing surface of the midsection of end plate, then place between the two cables.
4. Using B cleaning fluid, clean the grooves of the midsection (four places); then place length of 3/4 inch wide by 1/4 inch thick B sealing tape in the groove.

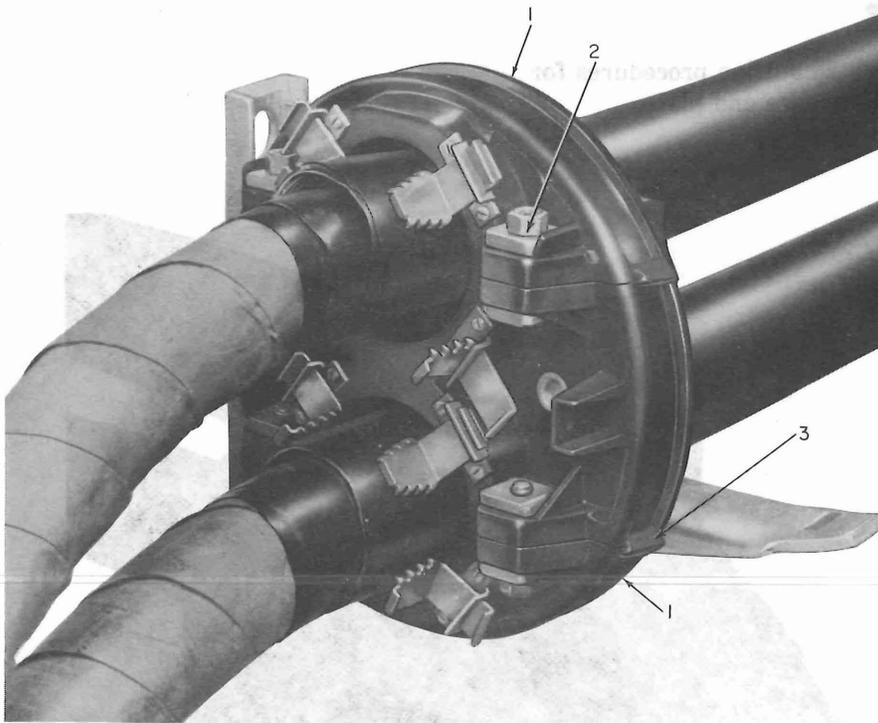


Fig. 26—Installed End Plate

1. Clean the grooves of the top and bottom closure plates with B cleaning fluid. Install the plates on each side of the midsection.
2. Secure plates by alternately tightening captive bolts so sections close evenly to a torque of 200 to 250 inch-pounds. **Check to assure sealing washers remain properly seated in the end plate.**
3. Trim the B sealing tape flush to end plate. **Do not pull off the excess tape.**

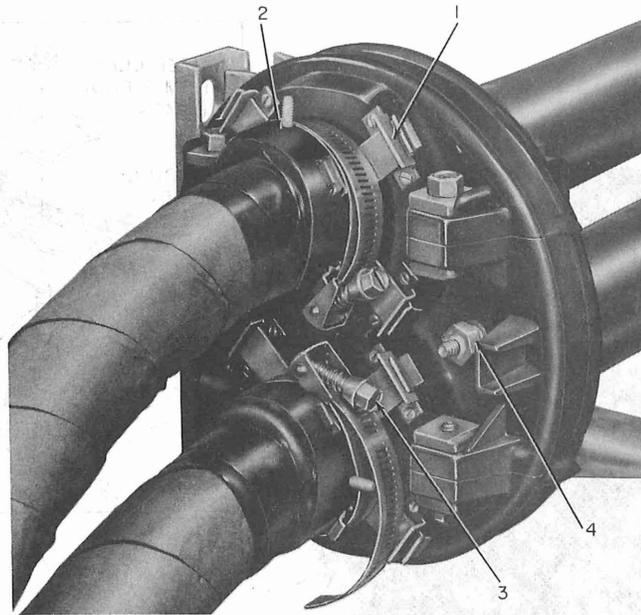


Fig. 27—Installation of B Bond Clamp and Sealing Clamp

1. On smaller size cables it may be necessary to remove a jaw tooth clamp from each end plate to provide space for installation of B bond clamp.
2. Remove and discard washers from B bond clamp. Slit cable sheath for 1-1/2 inches and install inner clamp of B bond clamp as outlined in Section 081-852-118.
3. Place sealing clamp over jaw tooth clamp, then tighten sealing clamp to set teeth of jaw tooth clamp firmly into cable jacket.

Warning: *Do not tighten more than 50 to 75 inch pounds.*

4. If external bond is required, remove pipe plug and place bonding connectors from bonding kit in both sides of end plate.

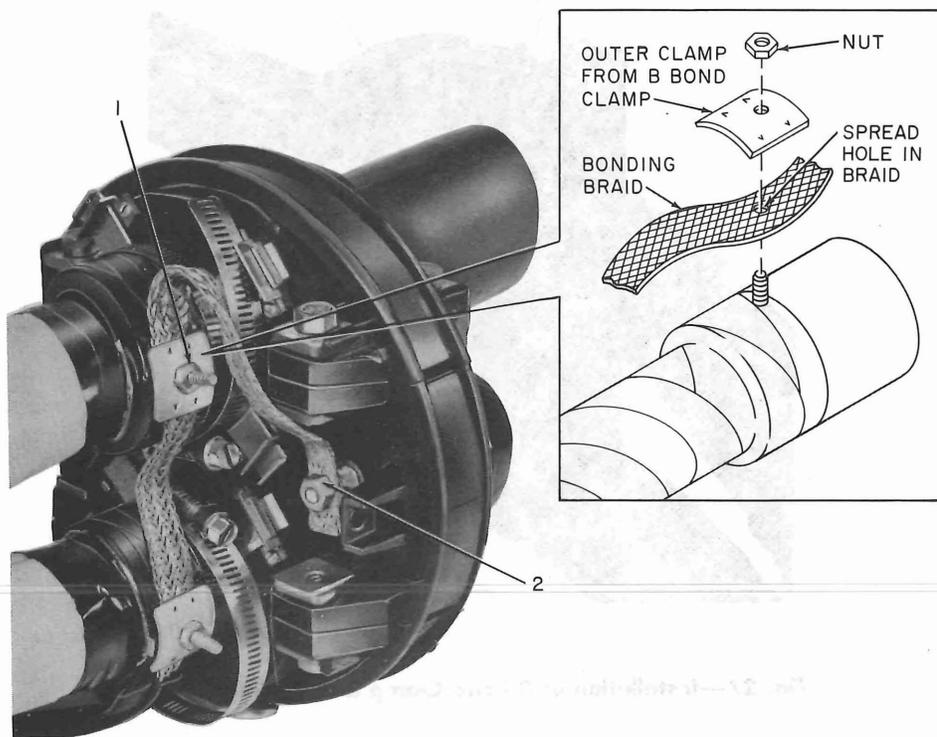


Fig. 28—Attaching Bonding Braid

1. Spread braid and place over studs of B bond clamps, then install and secure outer clamp of B bond clamp. Tighten nuts with 216-type tool **only**.

Warning: Do not tighten more than 50 to 75 inch-pounds.

2. Place prepared hole at end of braid over bonding connector and secure with 216-type tool.
3. Attach bonding braid to bond clamp(s) on opposite side of sheath opening.

Triple Entrance End Plate

4.03 The procedures for installing the triple entrance end plate are outlined in Fig. 29 through 32.

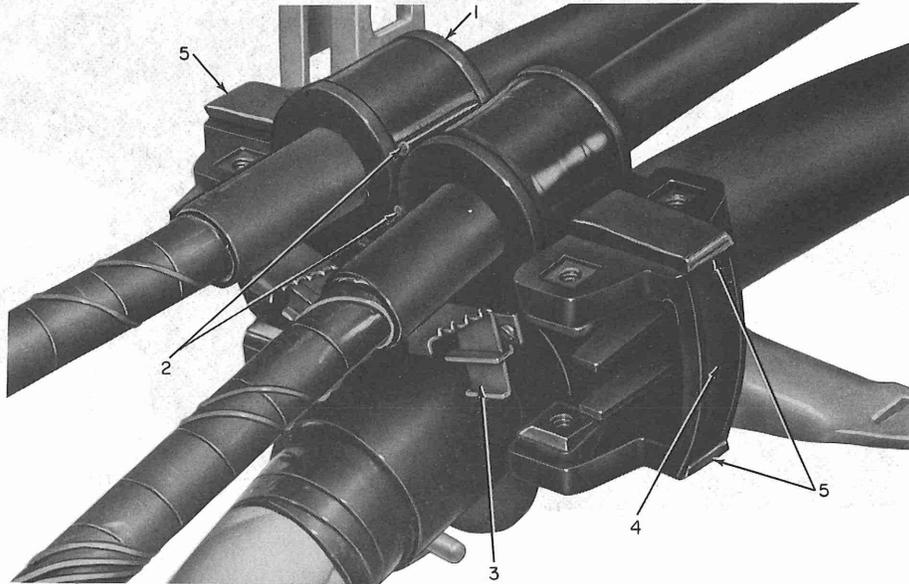


Fig. 29—Placed Midsection

1. Install B sealing tape collars on cable sheaths as outlined in Fig. 20.
2. Place B sealing cord in crotch of cables.
3. When placing cable sizes 1.9 inches and smaller for 2C2 and 2D2, 1.4 inches and smaller for 2B2, in the larger cable entrance *only*, the standard jaw tooth clamps *must be* replaced by the longer jaw tooth clamps before placing midsection between cables.
4. Using B cleaning fluid, clean the inner sealing surface of the midsection of the end plate, then place between the three cables.
5. Using B cleaning fluid, clean the grooves of the midsection (four places). Place lengths of 3/4 inch wide by 1/4 inch thick B sealing tape in the grooves.

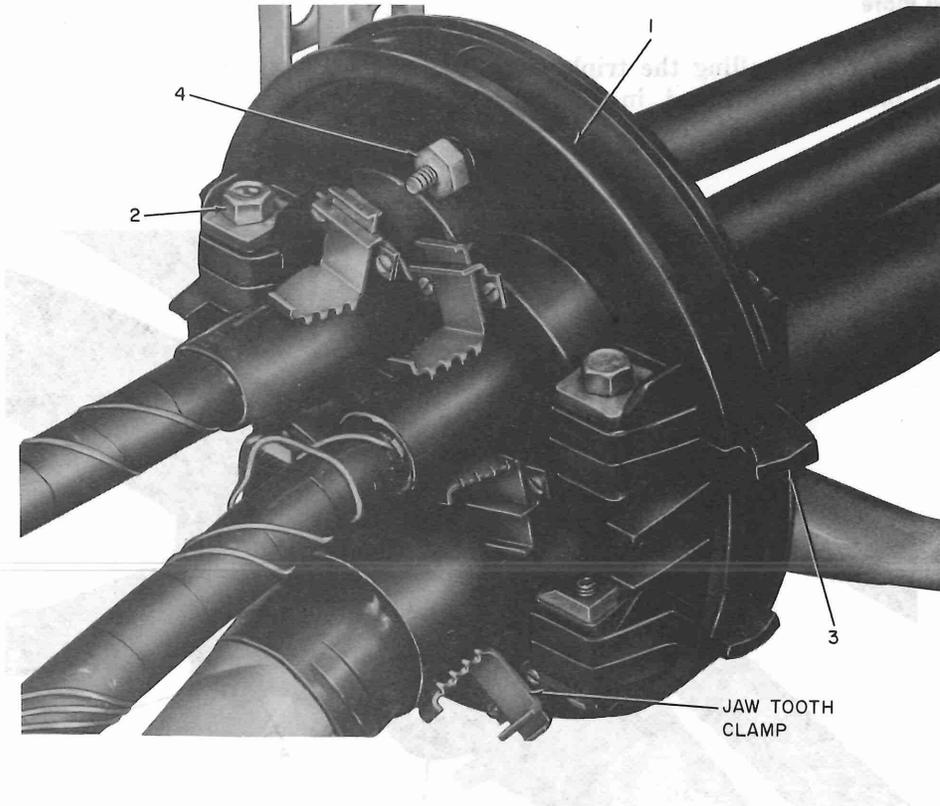


Fig. 30—Installed End Plates

1. Clean the grooves of the top and bottom closure plates with B cleaning fluid, then install the plates on each side of the midsection.
2. Secure plates by alternately tightening captive bolts so sections close evenly to a torque of 200 to 250 inch-pounds. **Check to assure sealing washers remain properly seated in the end plate.**
3. Trim the B sealing tape flush to end plate. **Do not pull off the excess tape.**
Warning: Do not tighten more than 50 to 75 inch-pounds.
4. If external bond is required, remove pipe plug and place bonding connectors from bonding kit in both sides of end plate.

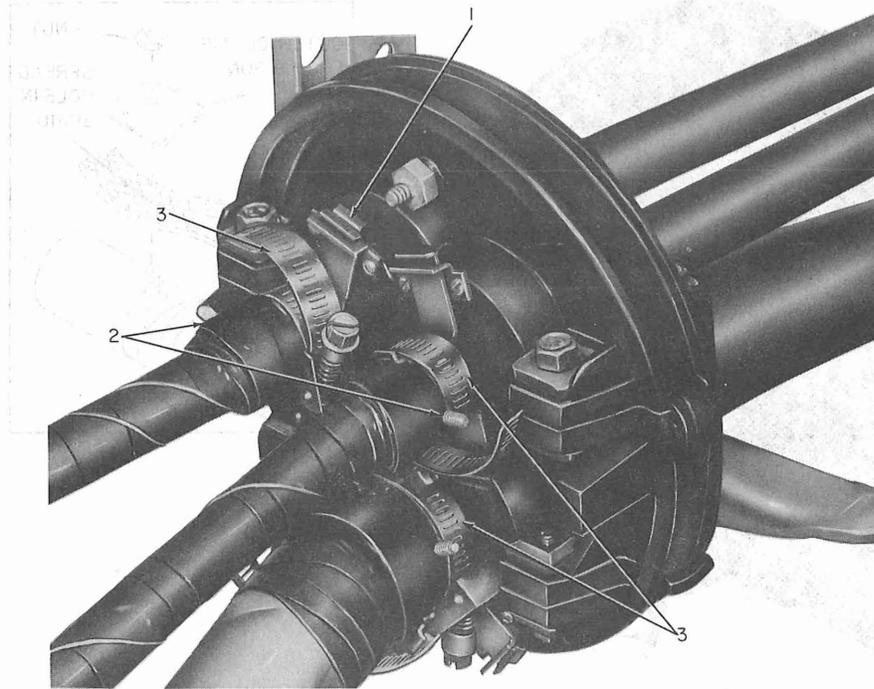


Fig. 31—Installation of B Bond Clamp and Sealing Clamp

1. On smaller size cables, it may be necessary to remove a jaw tooth clamp from each end plate to provide space for installation of B bond clamp.
2. Remove and discard washers from B bond clamp. Slit cable sheath for 1-1/2 inches and install inner clamp of B bond clamp as outlined in Section 081-852-118.
3. Place sealing clamp over jaw tooth clamp, then tighten sealing clamp to set teeth of jaw tooth clamp firmly into cable jacket.

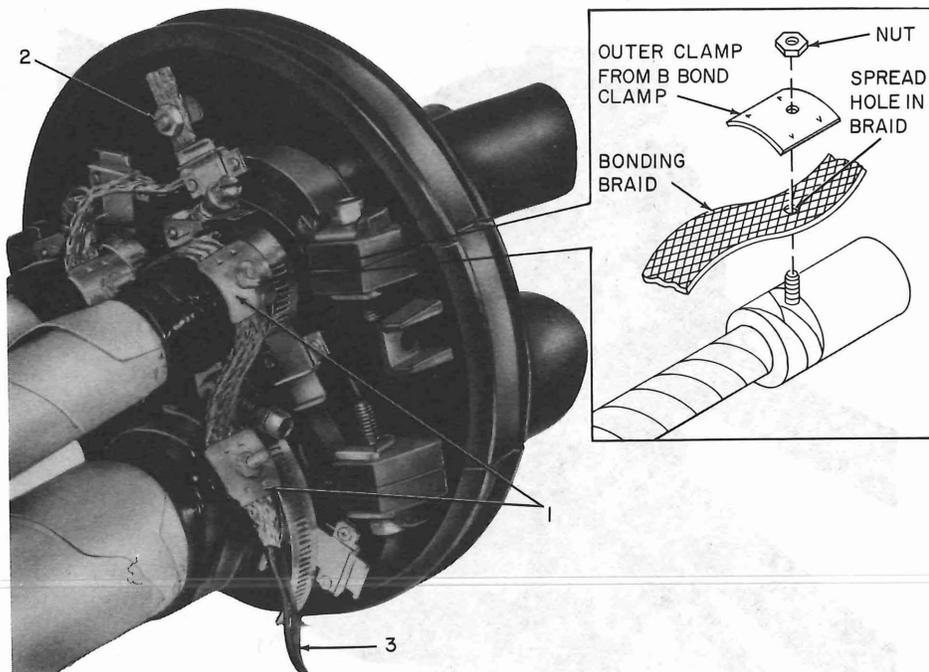


Fig. 32—Installed Bonding Braid

1. Spread braid and place over studs of B bond clamp, and then install and secure outer clamp of B bond clamp. Tighten nuts with 216-type tool *only*.

Warning: *Do not tighten more than 50 to 75 inch-pounds.*

2. Place prepared hole at end of braid over bonding connector and secure with 216-type tool.
3. Attach bonding braid to bond clamp(s) on opposite side of sheath opening.

5. HOLDING END PLATES IN PROPER ALIGNMENT AND SPACING DURING SPLICING

5.01 Following are three ways to maintain proper alignment and spacing of end plates during splicing. The method selected depends on the level of difficulty arising from the condition at the work location, cable size, and cable stiffness.

(a) **Standard Method:** If the work location provides the means for rigidly securing the cable, and the splice is a standard one- or two-bank and the cables are reasonably straight, no further hardware or techniques are normally required. Procedures for installing cover halves on end plates are outlined in paragraph 6.03.

(b) **819A Alignment Bar:** If the work location lacks suitable anchorage or the cables are unusually curved or stiff, 819A alignment bar is used in pairs (Fig. 33) to provide the required end plate position as outlined on instruction sheet furnished with alignment bar.

(c) **Back Cover Method:** The back cover (cover half with threaded holes in the bar) is placed on the end plates before splicing and secured in place by a pair of straps. The procedures for placing the back cover on the end plates to maintain proper alignment and spacing during splicing are outlined in paragraph 5.02.

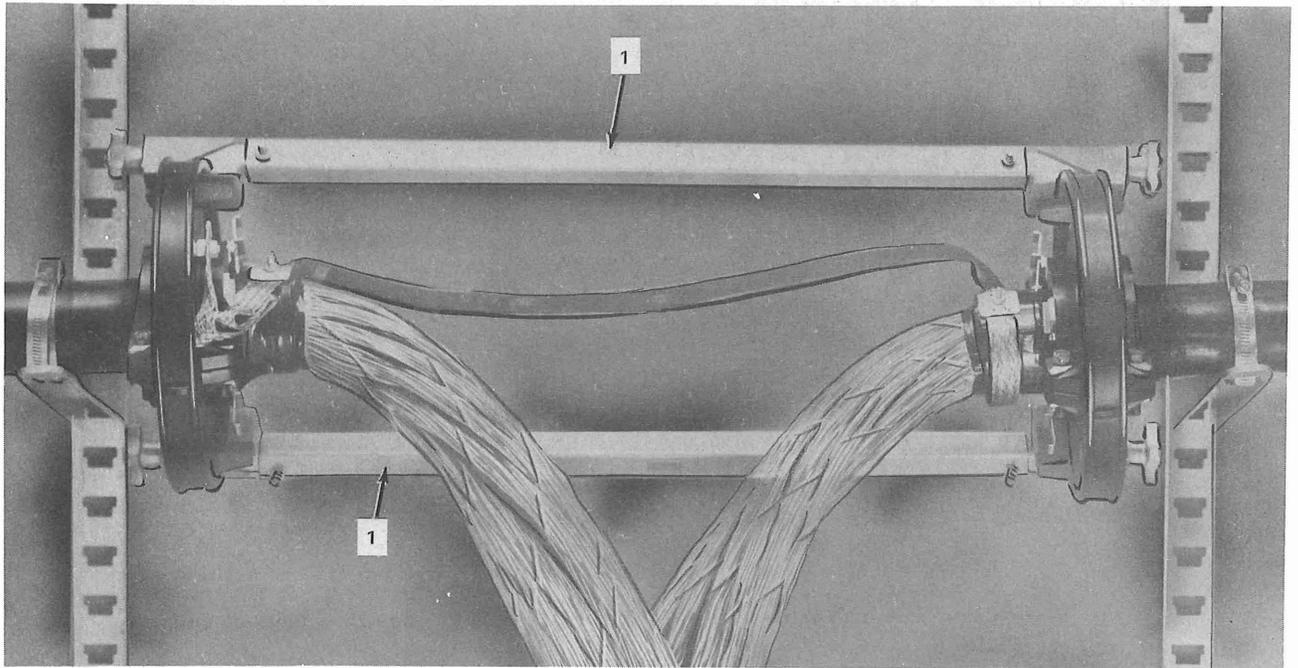


Fig. 33—Installed 819A Alignment Bar

1. Install 819A alignment bars on end plates as outlined on instruction sheet furnished with alignment bar.

5.02 The procedures for placing the back cover (the half with threaded holes in the bar) on the end plates to maintain proper alignment and spacing during splicing are outlined in Fig. 34 through 37.

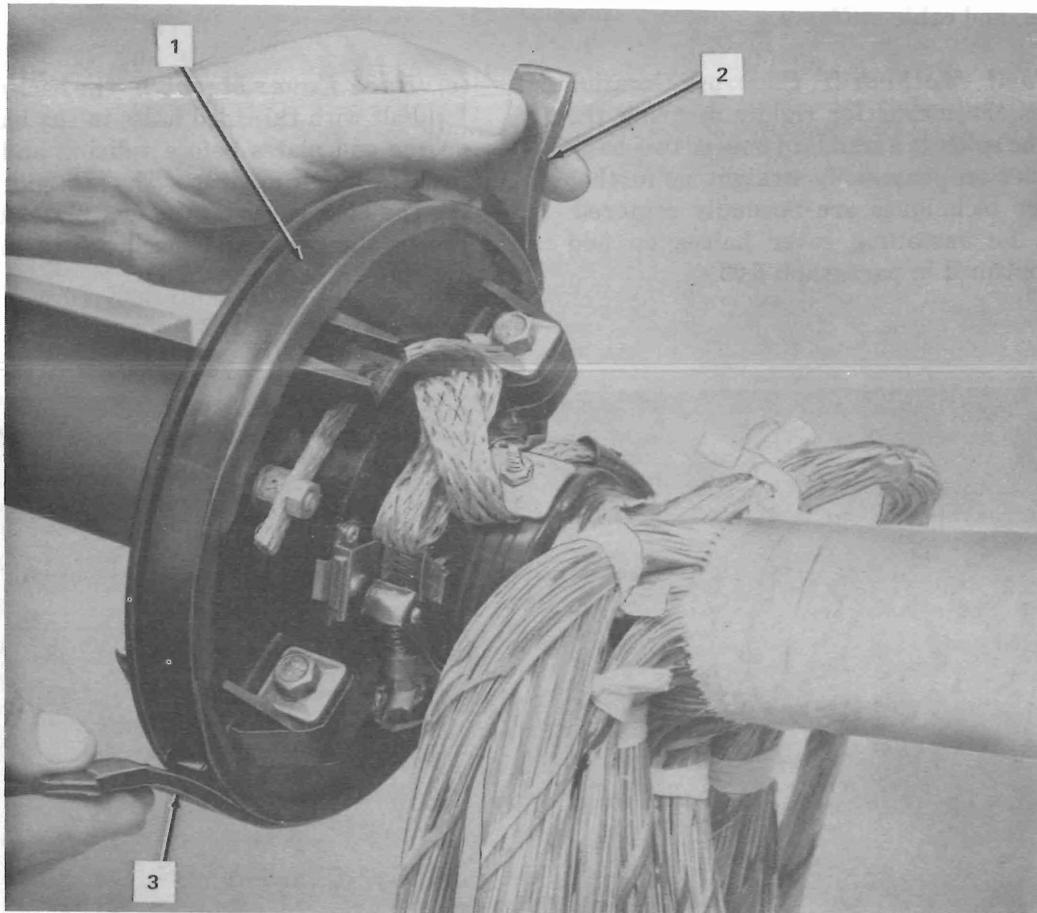


Fig. 34—Placing 3/4 Inch Wide \times 1/4 Inch Thick B Sealing Tape in Groove of End Plate

1. Clean end plate groove with B cleaning fluid.
2. Obtain a length of 3/4 inch wide by 1/4 inch thick B sealing tape several inches longer than one-half the circumference of the end plate.

Caution: Do not heat B sealing tape in airflow of heater or blower. This reduces the adhesion of the tape to the cable sheath. If preheating in cold weather is required, place the tape in a warm place prior to use.

3. Place B sealing tape in the back half of the end plate where the cover will be placed.

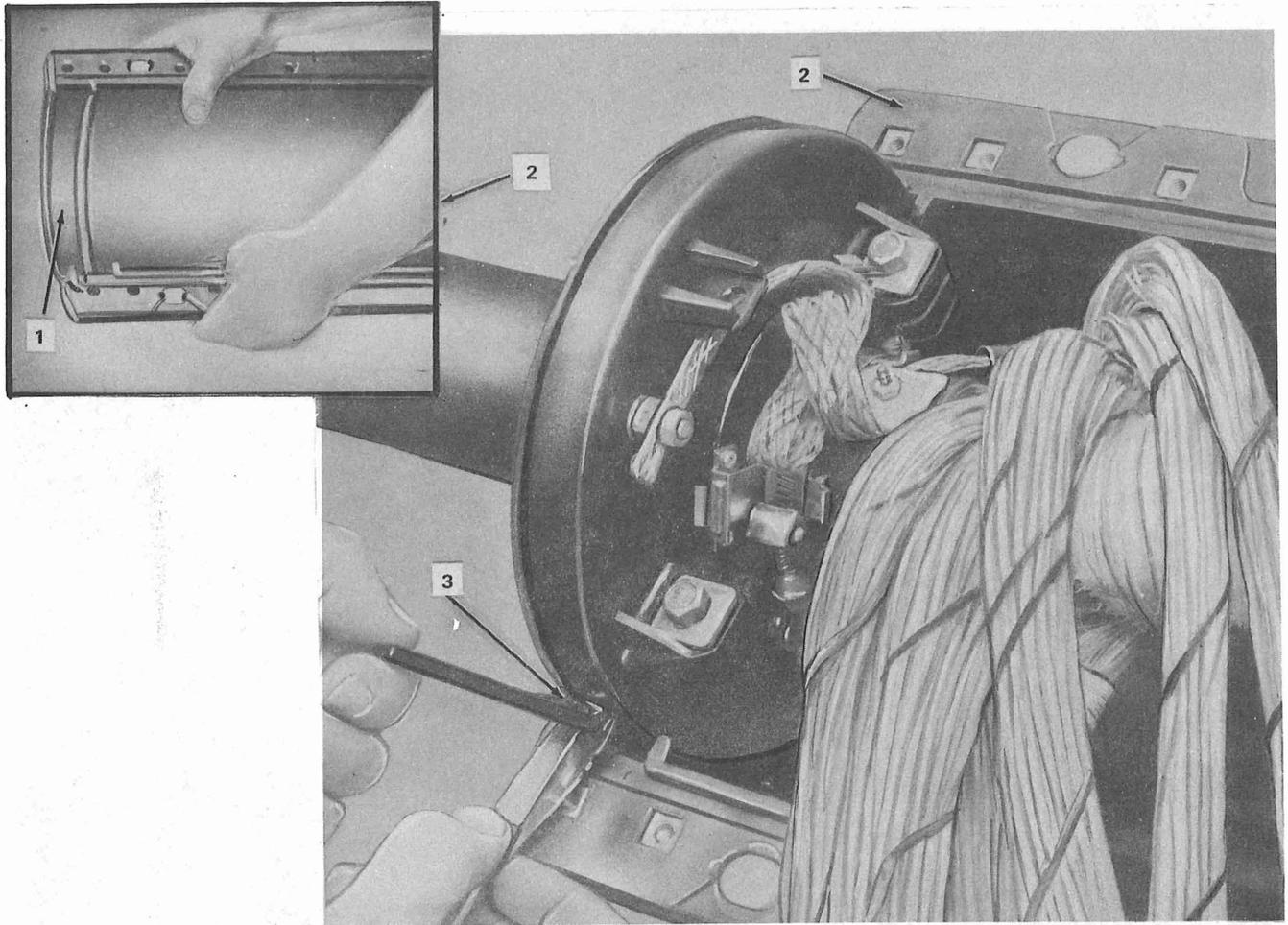


Fig. 35—Placing Cover on End Plate

1. Clean sealing surface of back cover half (half with threaded holes in the bar) with B cleaning fluid.
2. Spread back cover apart and position over end plates, then seat end plates into cover grooves.
3. Trim off excess B sealing tape.

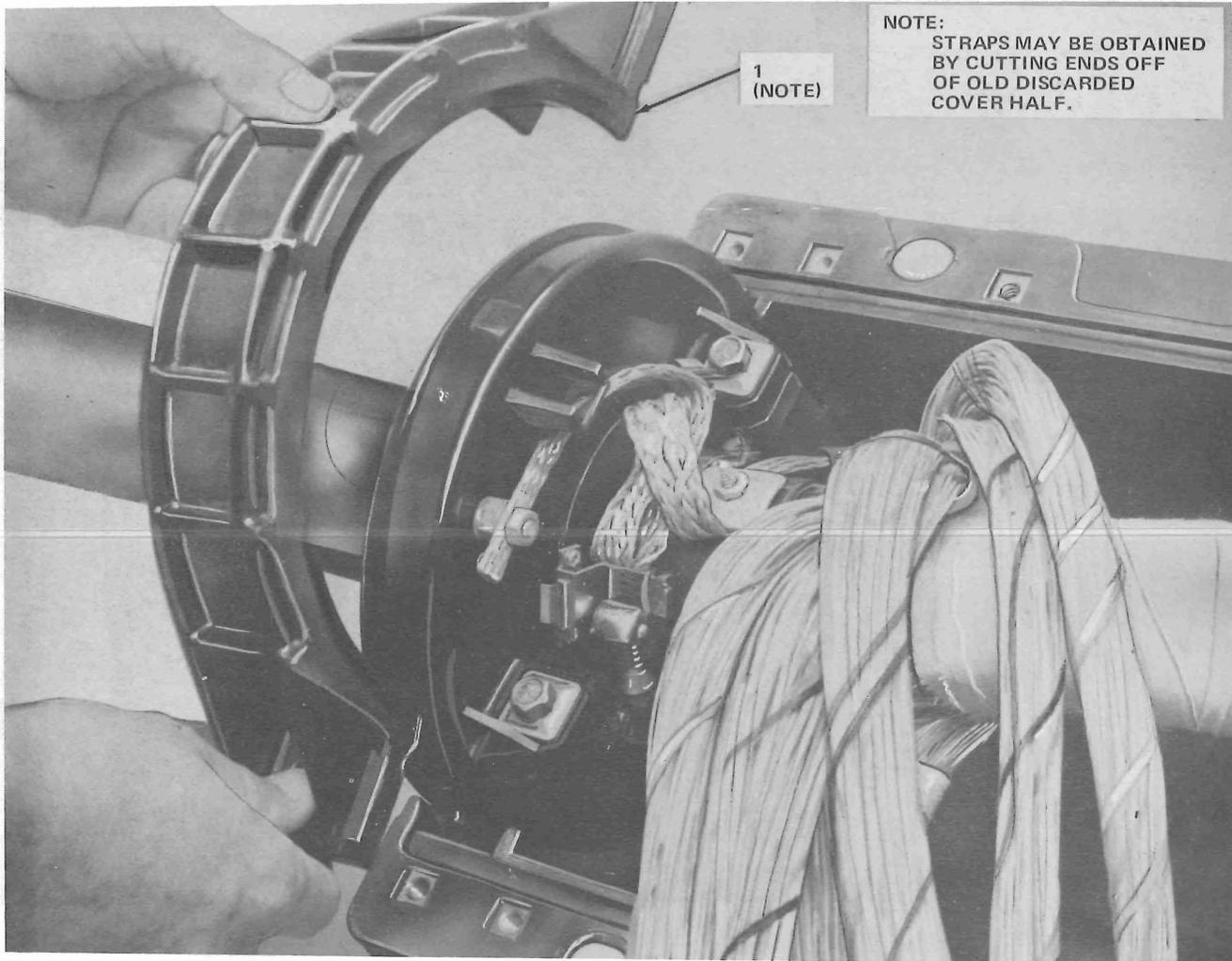


Fig. 36—Securing Cover Half

1. Place straps over end plate and secure to cover half by tightening captive bolts. ***Assure no sealing tape is placed between strap and end plate.***

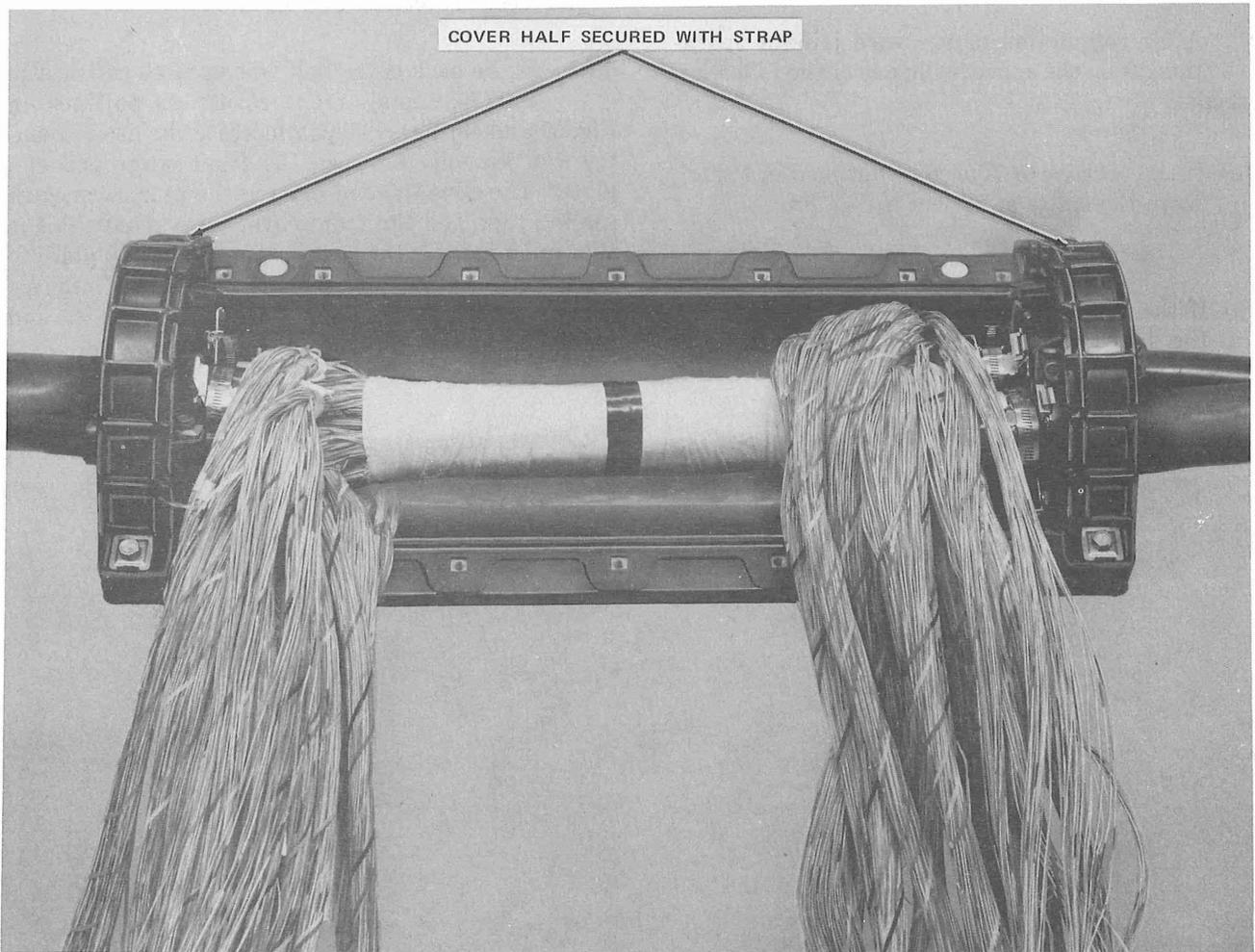


Fig. 37—Installed Back Cover Half

6. CLOSING SPLICE

6.01 After completion of the wire joining operation, wrap the splice using one of the following methods.

- (a) If the back cover is used as outlined in Part 5, wrap the splice as shown in Fig. 38.
- (b) If the back cover method *is not used*, wrap the splice with muslin (paper or pulp) or B

polyethylene tape (PIC) as outlined in Section 632-490-200. Proceed to Fig. 42 or 43.

6.02 If the back cover half was used as outlined in Part 5, install front covers as outlined in Fig. 39 and 40. These steps illustrate the use of reentry seal kit only between the front cover and end plates. The advantage of placing the rear cover with sealing tape and the front cover with reentry kit is that upon reentry the rear cover will stay in place to hold the end plates in perfect alignment. If reentry is not planned, place sealing tape and cord on the end plates and cover and bolt on the front cover.

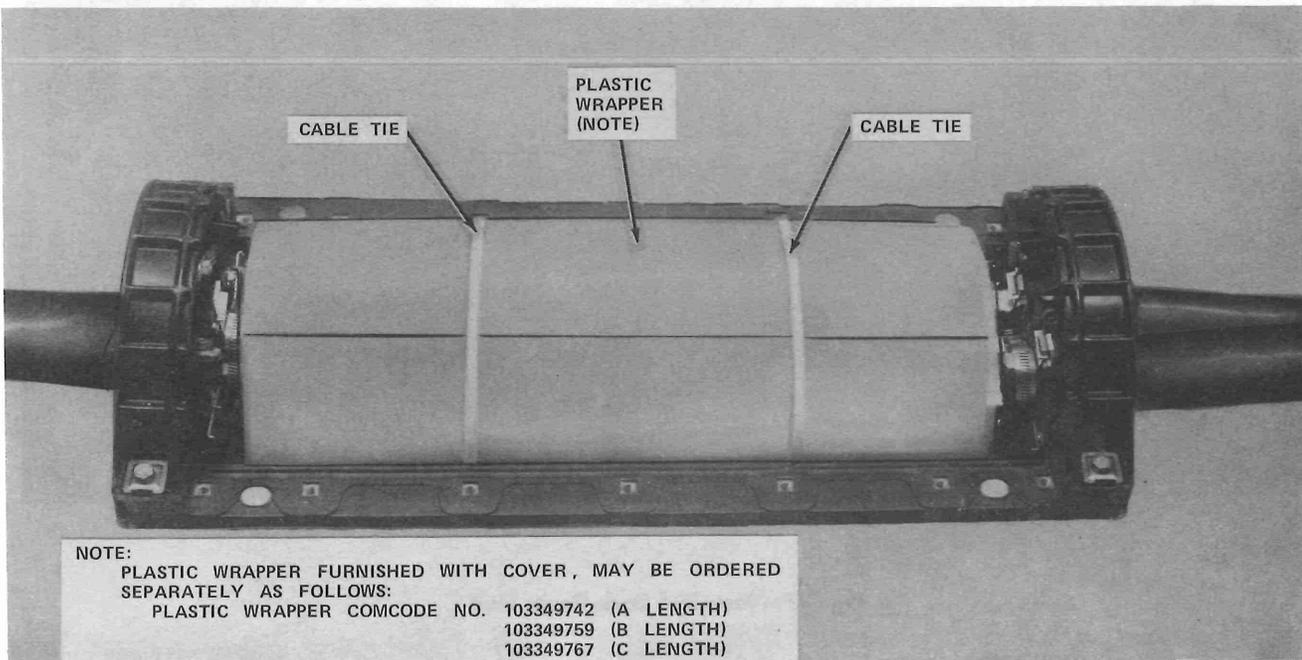


Fig. 38—Completed Splice

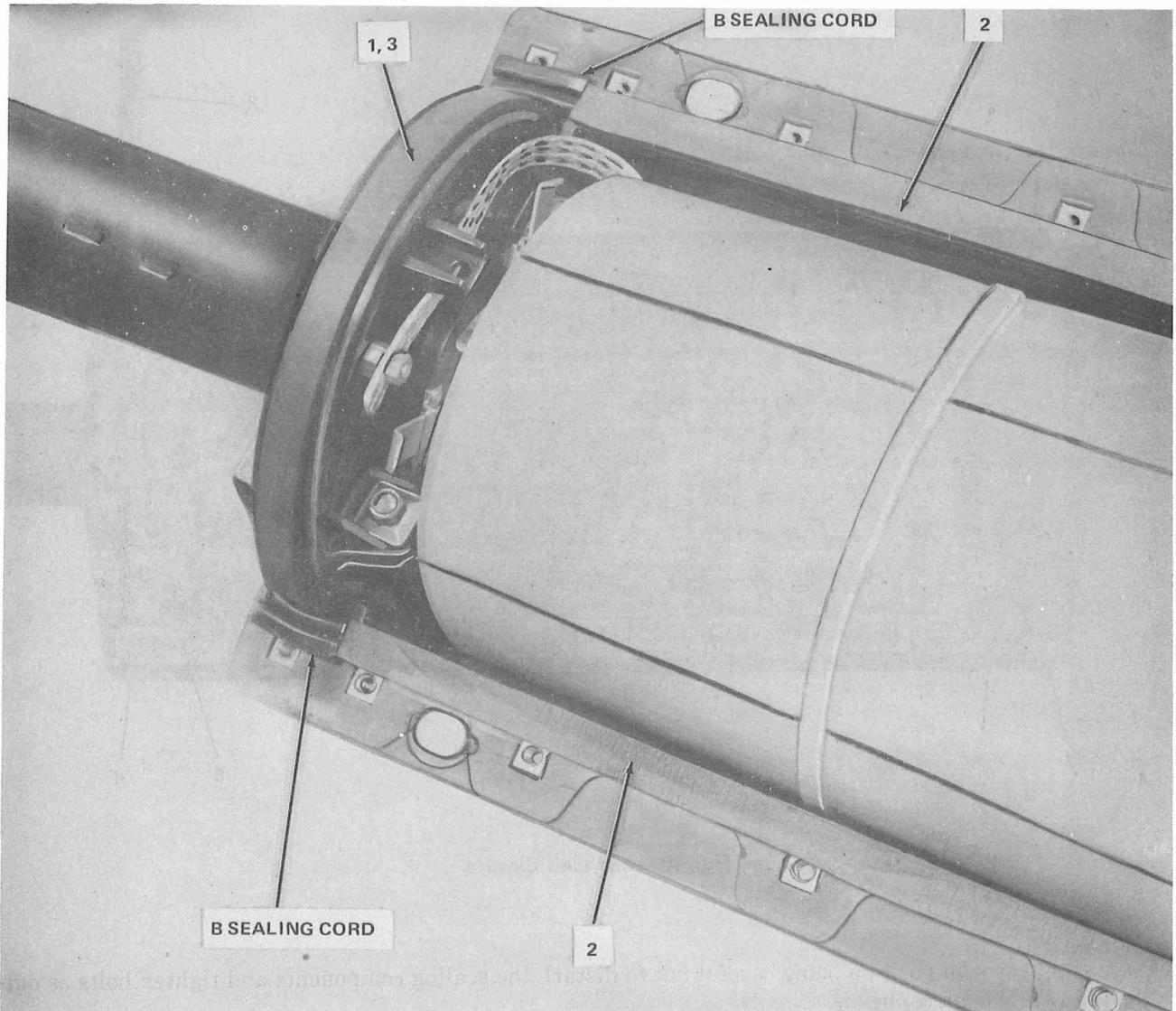


Fig. 39—Placing Sealing Components (Reentry Kit)

1. After completion of wire joining operation, remove strap from each end plate.
2. Obtain a D-180674 reentry kit, then remove backing paper and place foam tape astraddle sealing cord grooves on rear cover.
3. Place rubber strip on each end plate and secure with strips of B sealing cord.

Note: If reentry is not anticipated, B sealing tape and cord should be used to seal closure.

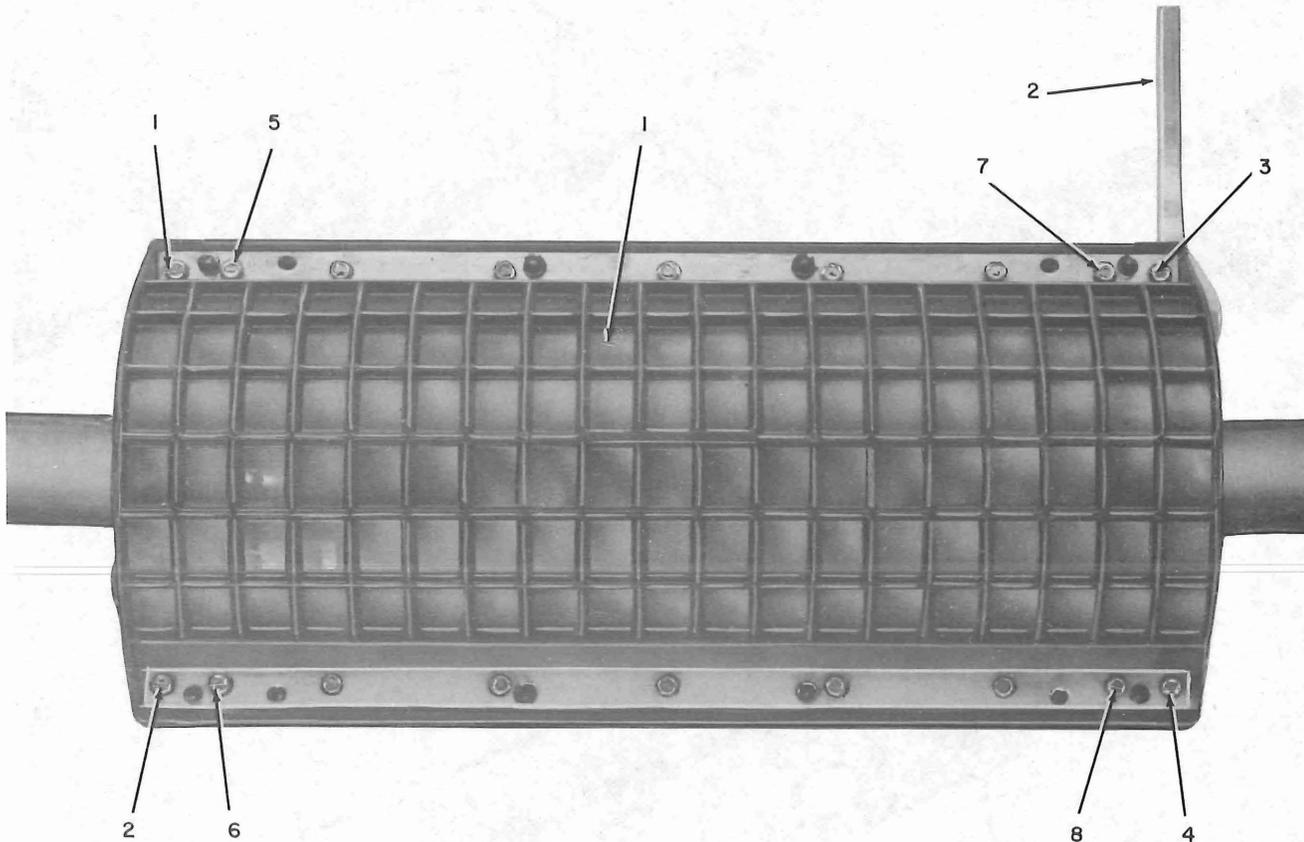


Fig. 40—Installed Closure

1. Place front cover in position being careful not to disturb the sealing components and tighten bolts as outlined in (a) through (c) below.
 - (a) Push the eight corner bolts down until dog points of bolts enter the threaded area and **engage bolts by hand**, then tighten evenly in numerical order as shown until covers are approximately 1/2 inch apart. Push remaining bolts on through to assure dog points enter the threaded area and run down hand tight.
 - (b) Tighten the eight corner bolts evenly in numerical order and then the remaining bolts to a final torque of 200 to 250 inch-pounds (C and D size) or 75 to 125 inch-pounds (B size) using a torque wrench.
 - (c) Install an F pressure test valve and flash test after a back pressure of 5 pounds has been reached. After about 10 minutes, or before leaving the site, retorque all bolts. If pressure test valve is to be left in place, use a low profile H pressure test valve in place of an F pressure test valve.

Warning: Do not tighten to more than 75 inch-pounds.

Note: If leaks occur at any of the 1/8 NPT plugs, connectors, or valves, install washer from insert repair washer kit as outlined in Fig. 41.
2. Attach one end of bonding ribbon to splice closure and other end to grounding system.

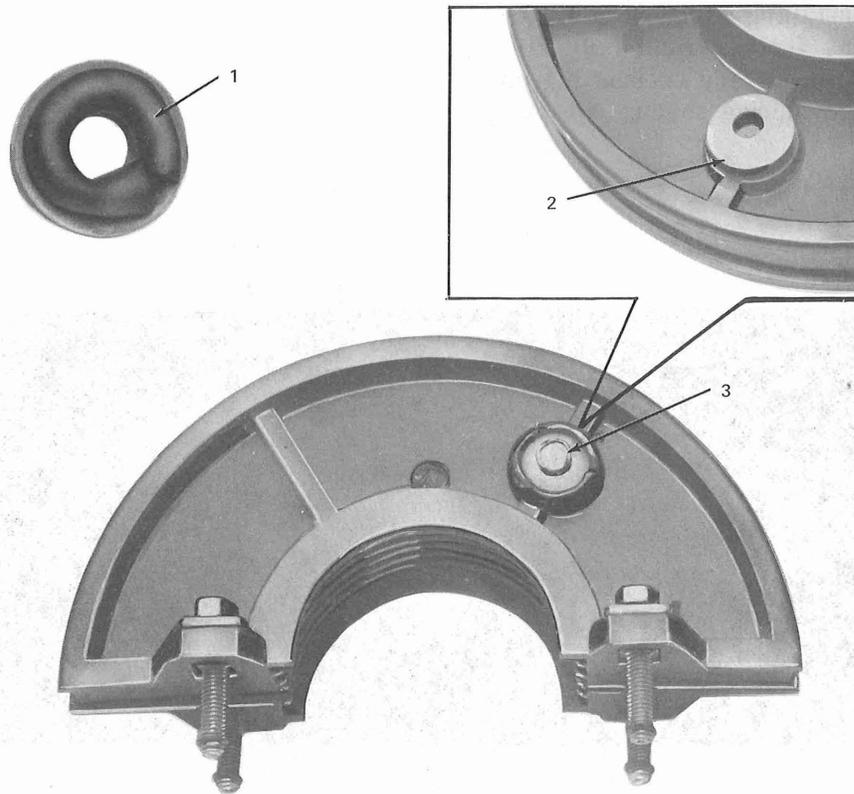


Fig. 41—Installed Repair Washer on End Plate

1. Cut a length of B sealing cord approximately 1-1/4 inches long, stretch to approximately 2-1/2 inches and place on inside of conical washer.
2. Remove pipe plug from insert and thoroughly clean pipe plug, plastic surface, and insert with B cleaning fluid to remove pipe-tight joint sealer, then place conical washer over insert.
3. Secure washer with pipe plug or bonding connector as required. ***Do not reapply pipe-tight sealer. The sealer has an oil base and will prevent adhesion required for airtight seal. Tighten to 50 to 75 inch-pounds.***

6.03 Procedures for installing 2-type cover halves on end plates that *did not* require any tools to maintain proper alignment and spacing of end plates (Standard Method) during splicing are outlined in Fig. 42 or 43.

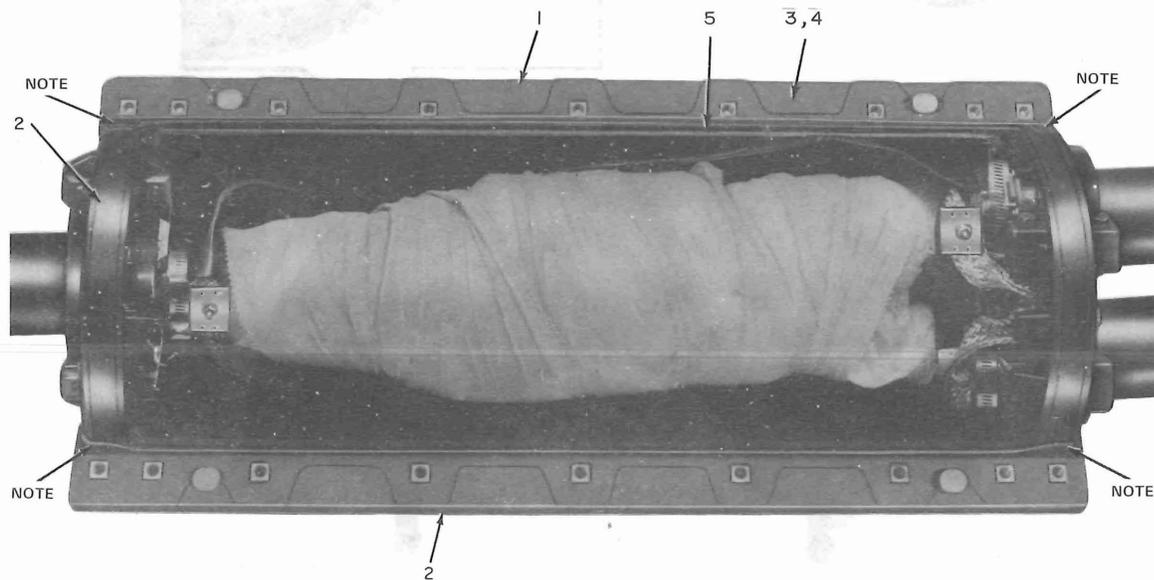


Fig. 42—Placing Cover Halves Using B Sealing Tape and Cord

1. Use back cover half (half with threaded holes in the bar), check the end plate alignment, and redress cables if necessary to assure proper cover engagement. Remove cover half.
2. Using B cleaning fluid, clean the sealing surfaces of the end plates, then place one layer of 3/4 inch wide B sealing tape in groove of each end plate.
3. Thoroughly clean the end sealing cavity and flange sealing grooves of each cover with B cleaning fluid to remove foreign contamination.
4. Spread back cover apart and position over end plates, then seat end plates into cover grooves. For underground installations, tilt cover approximately 45 degrees to facilitate placing of hardware and so a minimum of vertical space is taken up by the case.
5. Place B sealing cord in the grooves on the back of cover ***being careful to avoid making flat spots or dents in the cord. Do not stretch or handle with damp or oily hands. Inspect to ensure that cord is in the grooves and free from moisture or dirt. If moisture or dirt is present, replace cord.***

Note: When using B sealing cord to seal closure after use of reentry kit, it will be necessary to place a double thickness of sealing cord in each corner of cover.

6. Place and secure front cover as outlined in Fig. 40.

6.04 Procedures for using D-180674 reentry seal to install 2-type covers on end plates are packaged with kit and as shown in Fig. 43.

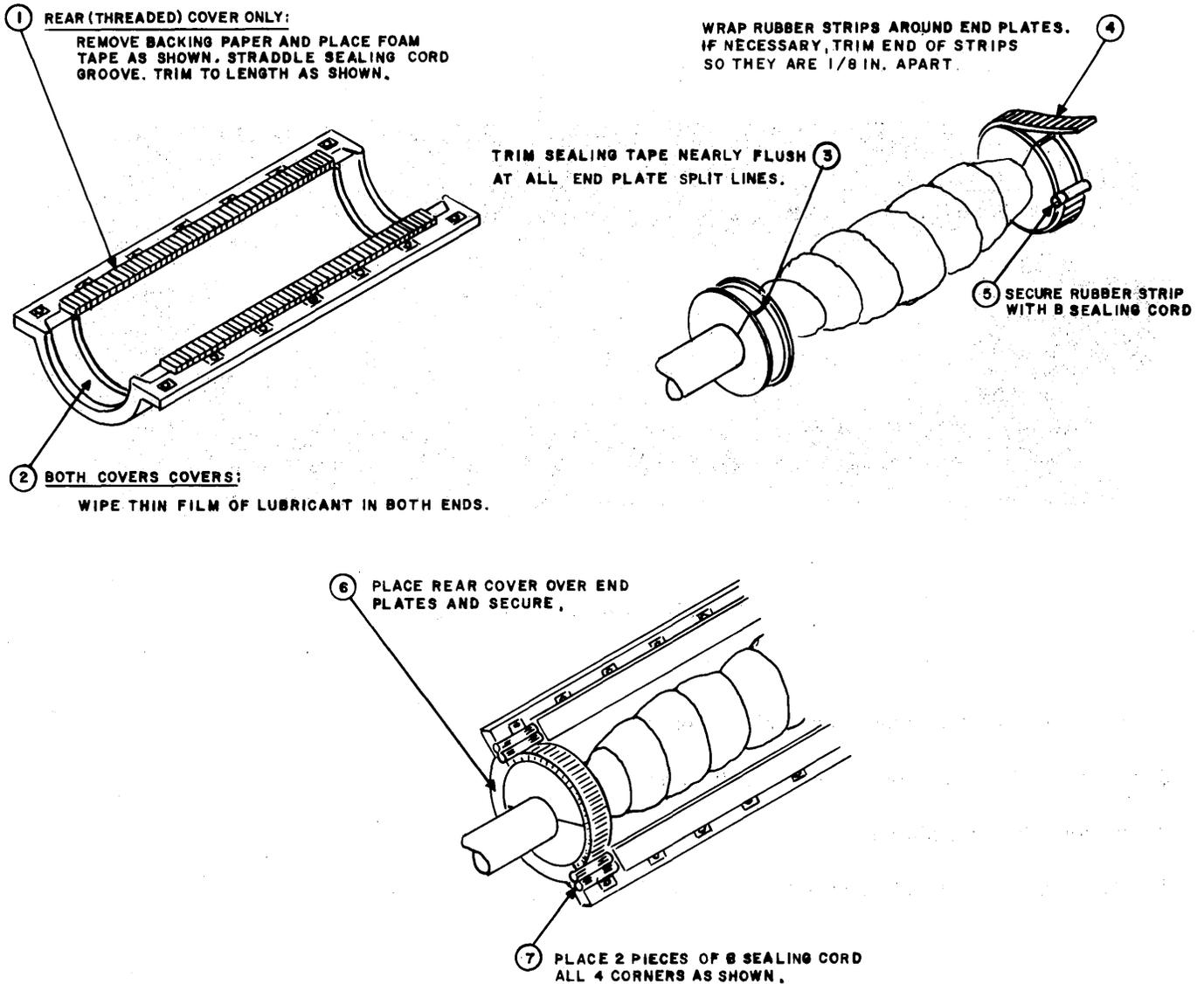


Fig. 43—Installation of Reentry Kit D-180674

6.05 Procedures for installing 2-type cover halves on end plates that were held in alignment during splicing by use of 819A alignment bar are outlined in Fig. 44.

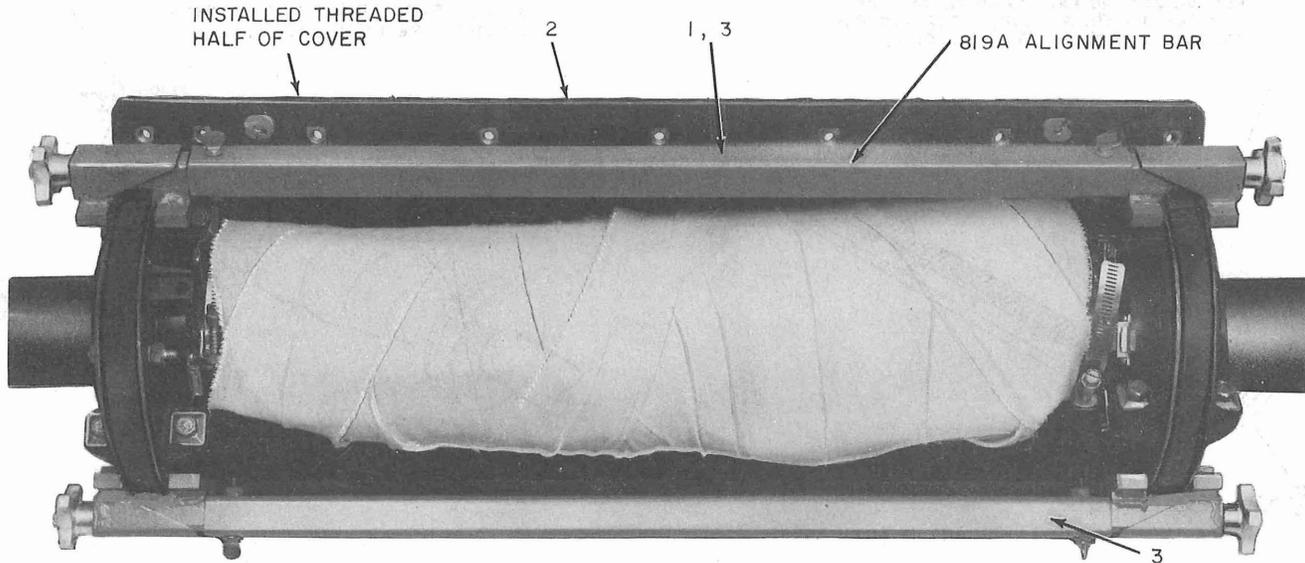


Fig. 44—Installing Cover Halves

1. Move the rear 819A tool to front of the splice.
2. Install back cover as outlined in Fig. 42 or 43.
3. Remove the 819A alignment bar.
4. Place and secure front cover half as outlined in Fig. 40.

7. GROUNDING

7.01 When grounding is required, secure bonding ribbon to connector and manhole grounding system (Fig. 40).

8. PRESSURE TESTING INSTALLATIONS

8.01 Flash test each installation after a back pressure of 5 pounds has been reached. Use B or C pressure testing solution as appropriate for test. The air pressure valves may be installed in place of any of the unused end plate pipe plugs.

8.02 The bolts may loosen due to the relaxation of the sealing compound during the pressure testing operation. **Therefore, after the pressure testing is completed, recheck and tighten all bolts to a torque of 200 to 250 inch-pounds (C or D size) or 75 to 125 inch-pounds (B size) maximum torque level. Further relaxation of sealing compound is normal and no further retightening of bolts should be required during normal service of closure.**

8.03 Before replacing the pipe plug in the end plate, apply PIPETITE-Stik compound to the threads of the plug. Replace and tighten plug to a torque of 75 inch-pounds maximum.

9. TEMPORARY OVERNIGHT CLOSURE

9.01 If the splicing operation cannot be completed in the normal work day, it may only be necessary to complete installation of the end plates as outlined in Part 4, then a temporary watertight cover may be placed as outlined in Section 633-040-201.

10. OPENING AND REASSEMBLY

10.01 Remove the bolts from the flanges of the splice closure using the D wrench kit or low pressure impact wrench.

10.02 Insert four of the 2-5/16 inch long bolts in the jacking holes provided near the ends of the front cover. Tighten alternately about two turns on each bolt until one or both covers are free from the end plate.

10.03 Remove both covers from the splice. If a new cover is to be used for reassembly, place the used cover in the new cover carton and process according to local procedures. If the cover is to be reused, remove the bulk (about 80 percent) of the old sealing compound using the following technique.

- (a) Wad new 1-1/2 inch wide B sealing tape into a ball approximately 1-1/2 to 2 inches in diameter.
- (b) Press the ball firmly against the old compound; then using a **quick** snapping action in the peeling direction, strip the old compound off the sealing surfaces.

This procedure is often assisted by starting the peel with a screwdriver taking care not to gouge the sealing surface. **Remember a quick snapping action is required.** Clean dirt and other residue from outer surfaces of covers. Set covers aside in a clean area.

10.04 Using the technique described in paragraph 10.03, clean sealing compound from peripheral grooves in end plates.

10.05 Reassemble covers using reentry seal or B sealing compound as outlined in Part 5.

SECTION 633-506-201

11. SECURING CLOSURE

Underground Plant

11.01 *When the closure is used in manholes, it will be necessary to tie the closure*

down as it has positive buoyancy because of its lightweight and internal air volume. Use B locking clips or equivalent to lock the cable hooks on the rack as shown in Fig. 45.

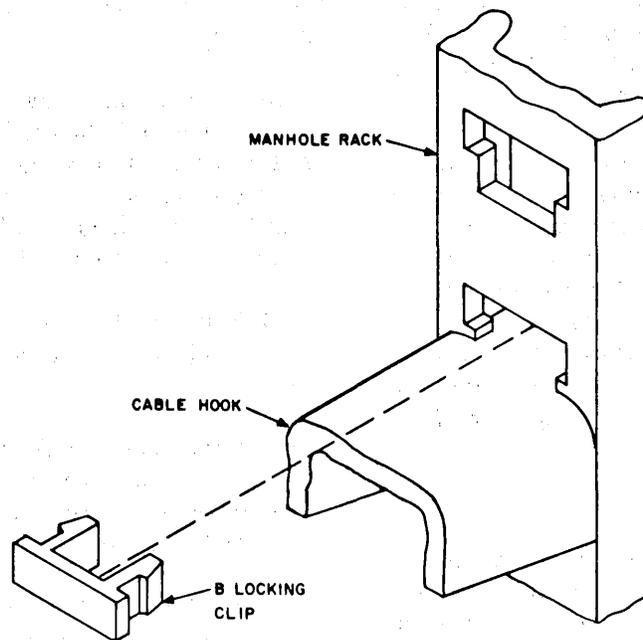


Fig. 45—Installation of Locking Clip

Aerial Plant

11.02 Secure closure to strand using two 53A hangers as shown in Fig. 46 and bond to strand as shown in Fig. 47.

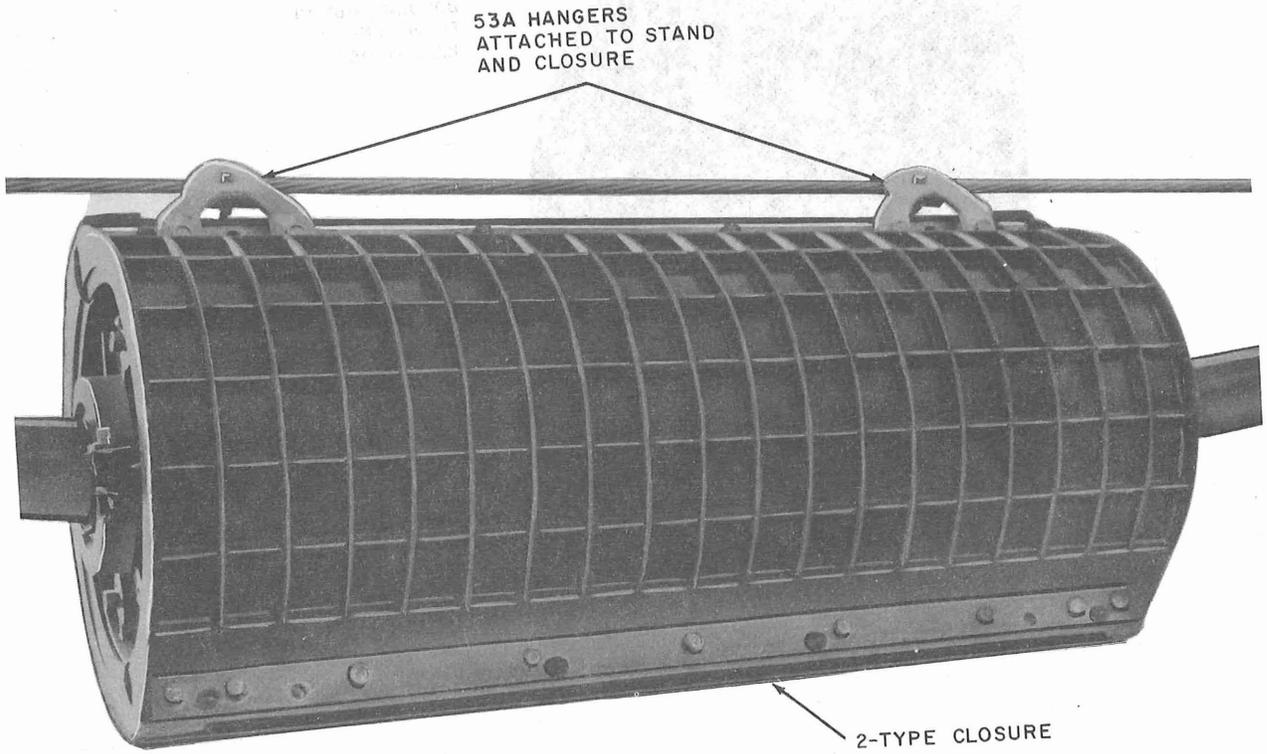


Fig. 46—Strand-Mounted Closure

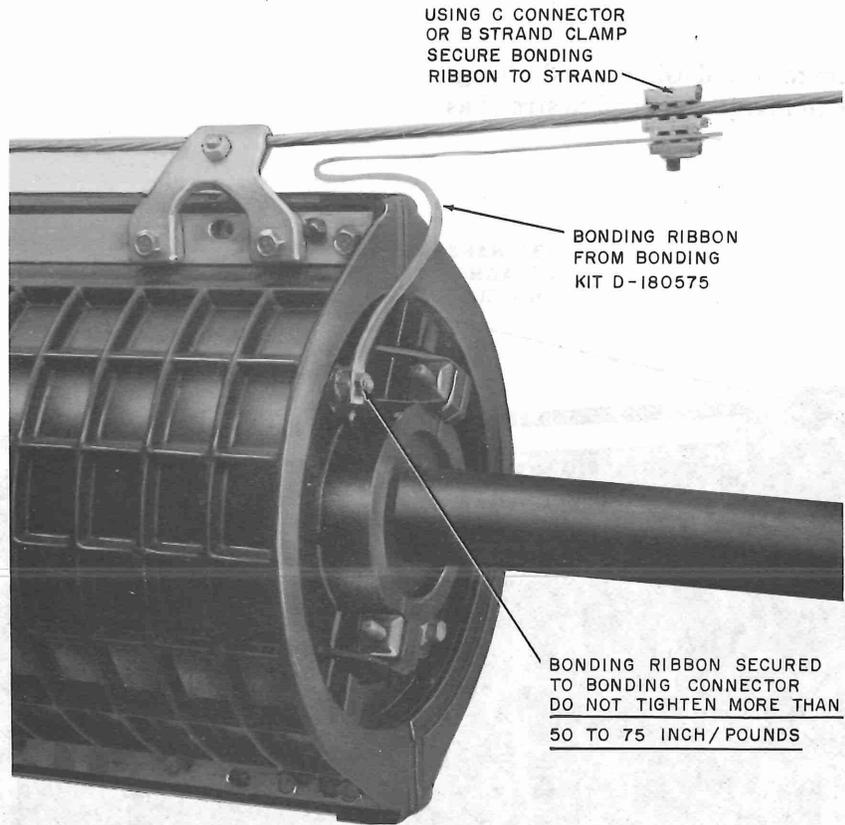


Fig. 47—Bonding 2-Type Closure to Strand