50- AND 51-TYPE CLOSURES

DESCRIPTION AND INSTALLATION

CONTENTS PAGE

1. GENERAL

1.01 This section covers the description and installation of the 50- and 51-type closure on single sheath pressurized cable in underground and aerial plant.

1.02 This section is reissued to include:

- Use of D-180995 Reentry Kit
- 50B3 closure torque requirements
- Pressure recommendation for flash testing
- Toothed clamp information for 51D3 closure
- Blank sealing washer selection when using reentry kit
- New sealing washers in Table B.

Revision arrows are used to emphasize the more significant changes.

1.03 The 50- and 51-type closures are coded with two numbers, a letter, and a single number which indicate the following:

(a) Two numbers indicate the kind of splice—

50-type closures are for straight splices

51-type closures are for Y or double Y splice.

(b) A letter indicates the size—

B—For cable with sheath diameter between 1.0 and 1.6 inches

C—For cable with sheath diameter between 1.6 and 2.2 inches

D—For cable with sheath diameter between 1.6 and 3.0 inches.

(c) A single number at the end indicates the material used in construction—

3—Plastic.

As an example, a closure coded 50B3 would be used for a straight splice on a cable with a sheath diameter between 1.0 and 1.6 inches, and the case is made of plastic.

1.04 Table A lists the 50- and 51-type closures with general information on the capacity and use of each closure.

2. DESCRIPTION

2.01 The 50- and 51-type closures are illustrated in Fig. 1 and 2, respectively.

TABLE A

CLOSURE—CAPACITY AND USE

CLOSURE CODE	CABLE SHEATH DIAMETER		INSIDE DIAMETER (INCHES)	SHEATH OPENING (INCHES)	USE	TYPE OF SPLICE
	MIN (INCHES)	MAX (INCHES)				
50B3 50C3 50D3	1.0 1.6 1.6	1.6 2.2 3.0	3.0 4.5 6.25	19 19 19	Aerial and Underground	Straight
51B3 51C3 51D3	1.0 1.6 1.6	1.6 2.2 3.0	5.0 6.0 7.0	19 19 19	Aerial and Underground	Y or Double Y

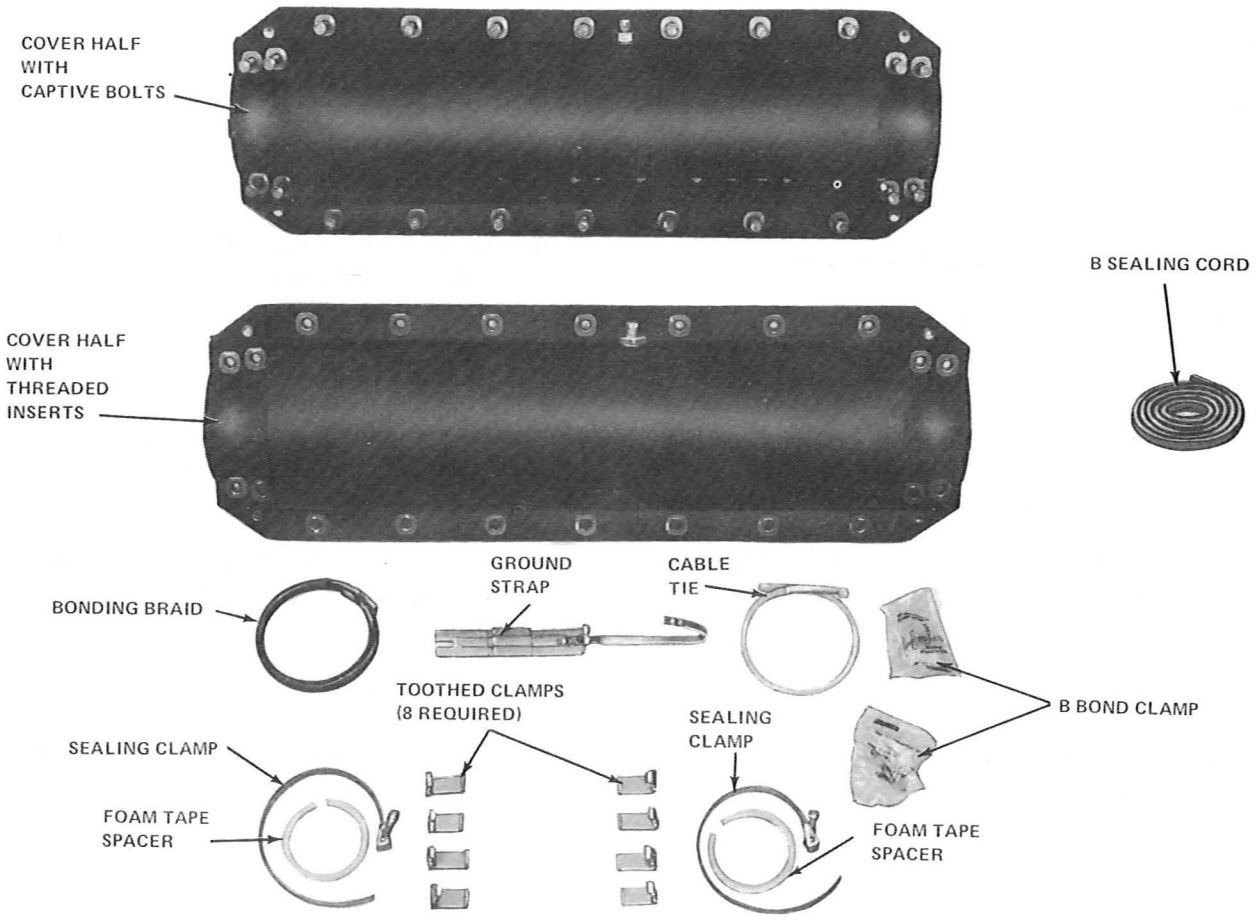


Fig. 1—50-Type Closure

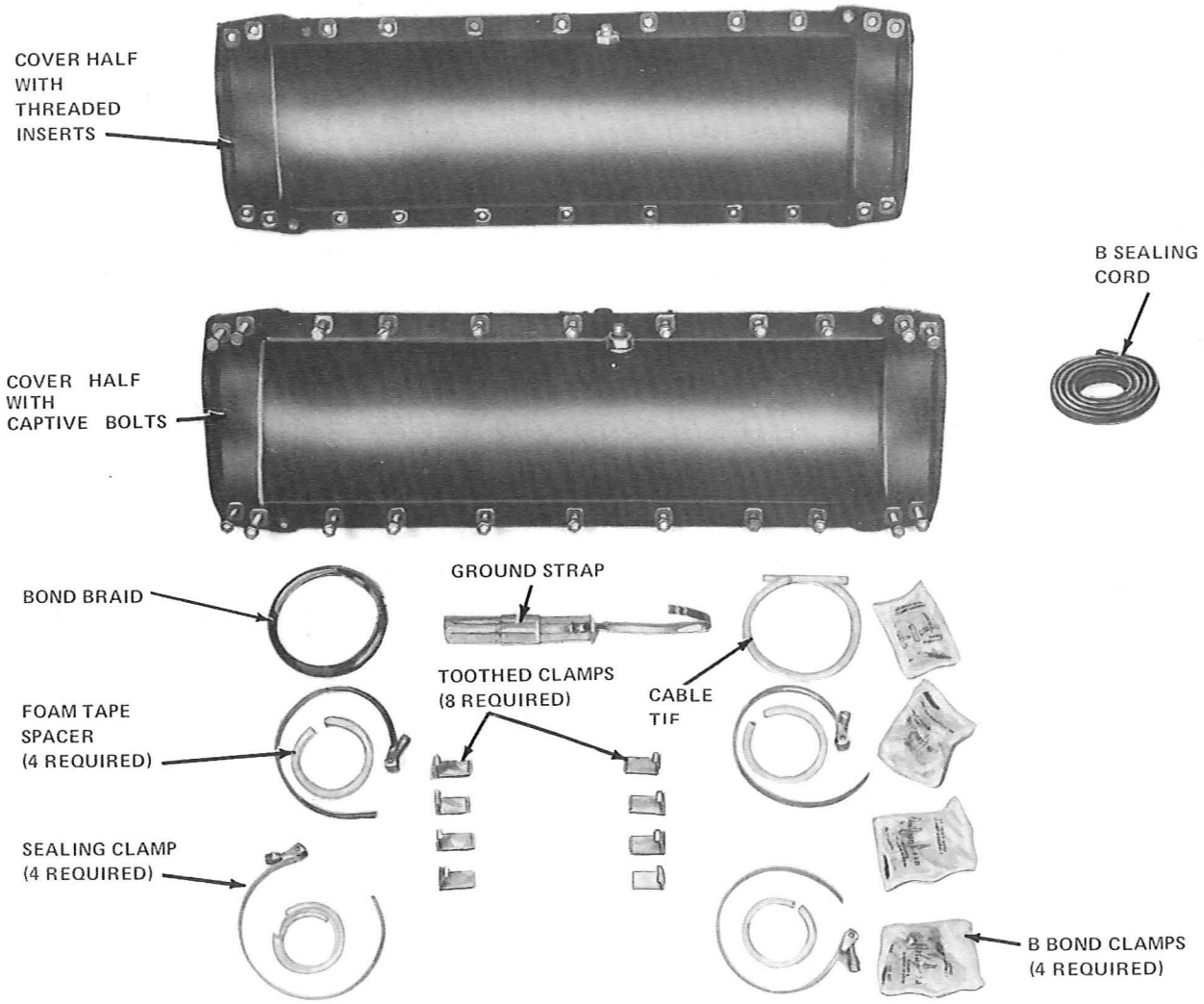


Fig. 2—51-Type Closure

2.02 The following hardware and materials are not furnished with the closure and must be ordered separately as required.

(a) ***Sealing Washers,*** AT-8583, listed in Table B are flat circular discs made of polypropylene. The HX and JX are used for sealing unused openings in the closure. The G0 sealing washer is used for dead ending purposes and has 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-7512. The G, H, and J series washers are provided with holes varying in 0.1 inch diameter increments to accommodate cable sizes from 0.3 to 1.6 for the G, 1.1 to 2.2 for the H, and 1.6 to 3.0 for the J. The HF and JG sealing washers are recessed to accommodate the smaller F- and G-type washer respectively, when sealing small size cables in the larger size cable openings. The sealing washers are furnished four in a package except the X-type which is two per package; each package is marked with the washer name, size, and diameter of the cable with which it is used.

(b) ***B Sealing Tape 1-1/2 inches wide*** is required for sealing the cable at each closure end.

(c) ***The B Connector AT-7827*** (Fig. 3) is intended to provide a solderless ground connection on plain bonding ribbon. This bronze vise-type connector is tin-coated to resist corrosion and can be tightened over the bonding ribbon with a ratchet.

(d) ***B Measuring Tape AT-8234*** (Fig. 4) made of flexible plastic is used for measuring cable diameter. One side of the tape is calibrated to indicate cable diameters up to 4 inches to the nearest one-tenth inch.

(e) ***Two 54A hangers*** (Fig. 5) are required to make an aerial installation of 50- and 51-type closures.

(f) ***Kit of Parts D-180995*** (Fig. 6)—Kit for sealing splice closure which eliminates the need for cleaning sealing tape from the cover halves 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.

TABLE B

SEALING WASHERS — AT-8583

CABLE SHEATH DIA (INCHES)	TYPE OF CLOSURE		
	50B3 51B3 WASHER NO.	50C3 51C3 WASHER NO.	50D3 51D3 WASHER NO.
		H0	J0
	G0*	HX†	JX†
1.0	G10	HF + F10‡	JG + G10§
1.1	G11	H11	JG + G11
1.2	G12	H12	JG + G12
1.3	G13	H13	JG + G13
1.4	G14	H14	JG + G14
1.5	G15	H15	JG + G15
1.6	G16	H16	J16
1.7		H17	J17
1.8		H18	J18
1.9		H19	J19
2.0		H20	J20
2.1		H21	J21
2.2		H22	J22
2.3			J23
2.4			J24
2.5			J25
2.6			J26
2.7			J27
2.8			J28
2.9			J29
3.0			J29

* ◗The G0 sealing washer is used for sealing vacant opening in closure and has 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-7512.◖

† ◗The HX and JX sealing washers are used for sealing vacant opening in closure except when reentry kit is used, then G0, J0, or H0 sealing washers are required.◖

‡ The HF sealing washer is used with the F10 sealing washer to seal cables 1.0 inch OD.

§ The JG sealing washer is used wth the G sealing washer for sealing cables 1.0 to 1.5 inches OD by inserting the proper G series sealing washer in the recess provided.

◗ A K0 sealing washer can be used with 849A sealing washer cutter to cut appropriate sealing washer as outlined in Section 081-020-136.◖

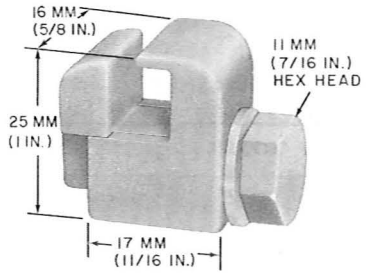


Fig. 3—B Connector

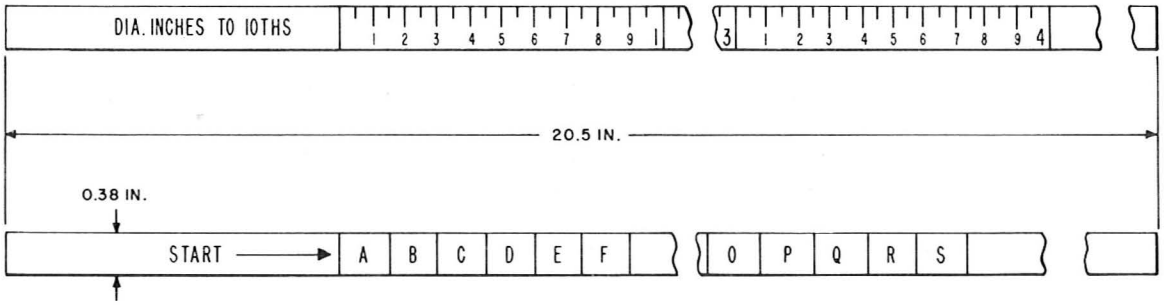


Fig. 4—B Measuring Tape

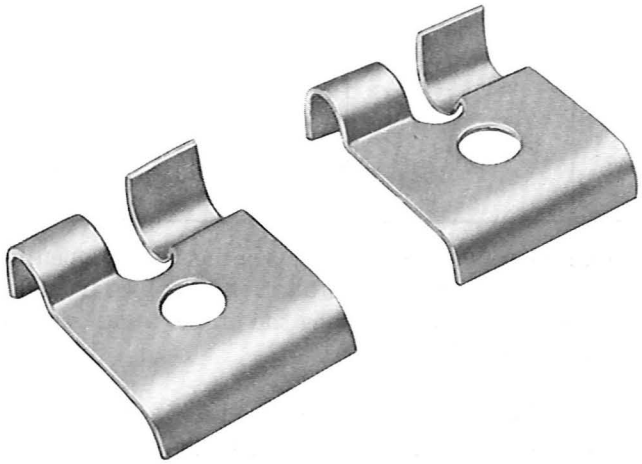


Fig. 5—Hanger for Strand Mounting

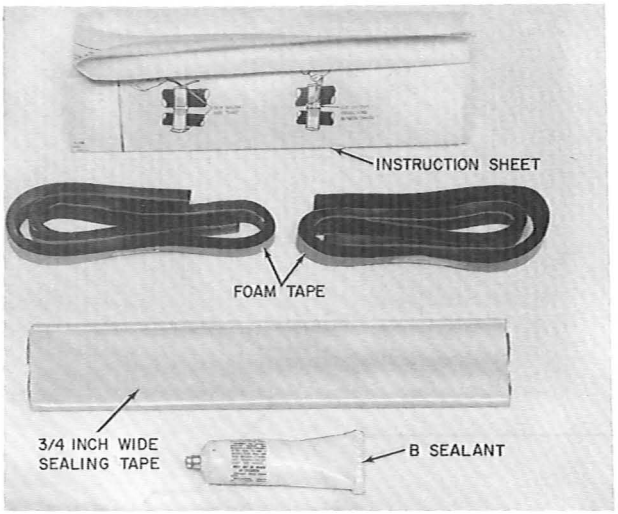


Fig. 6—Kit of Parts D-180995

3. CABLE SHEATH PREPARATION AND INSTALLATION OF CLOSURE

3.01 Set up the cables and secure firmly in position with the cable sheaths straight and in line for a minimum length of 8 inches back from the sheath butt. This is required to prevent movement of the sheath and cable while splicing the conductor.

50-Type Closure

3.02 Prepare the cable sheaths and install 50-type closure as outlined in Fig. 7 through 17.

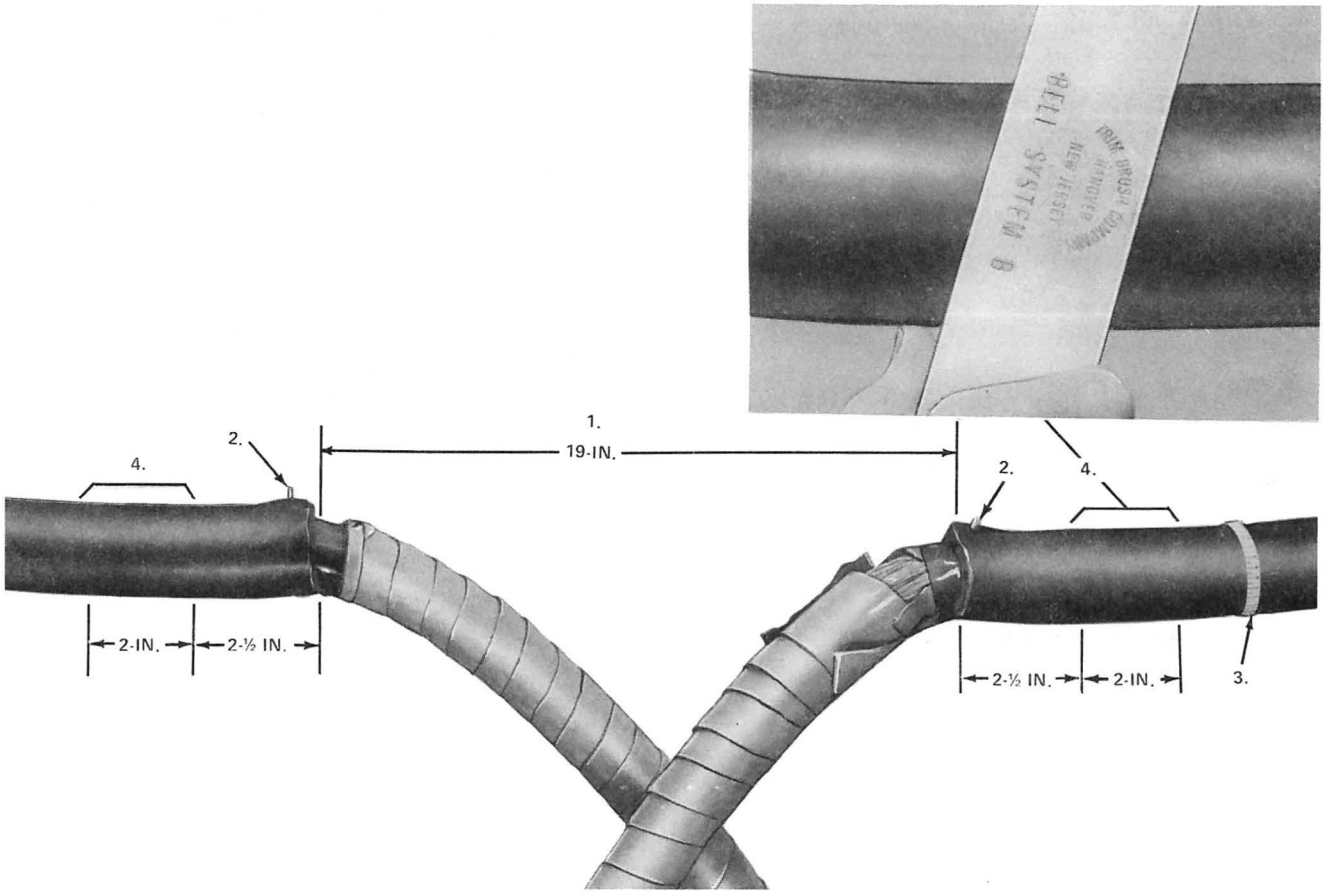


Fig. 7—Preparation of Cable Sheath

1. Mark cable sheath for 19-inch sheath opening, then remove outer jacket and metallic shield from each cable end.

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

3. Using B measuring tape, measure diameter of cable and select six sealing washers per Table B.

   Note: Three sealing washers or combination of sealing washers are required for each cable.

4. Remove any residue from cable sheath with B cleaning fluid, then use carding brush to scuff cable sheath on each side of sheath opening.

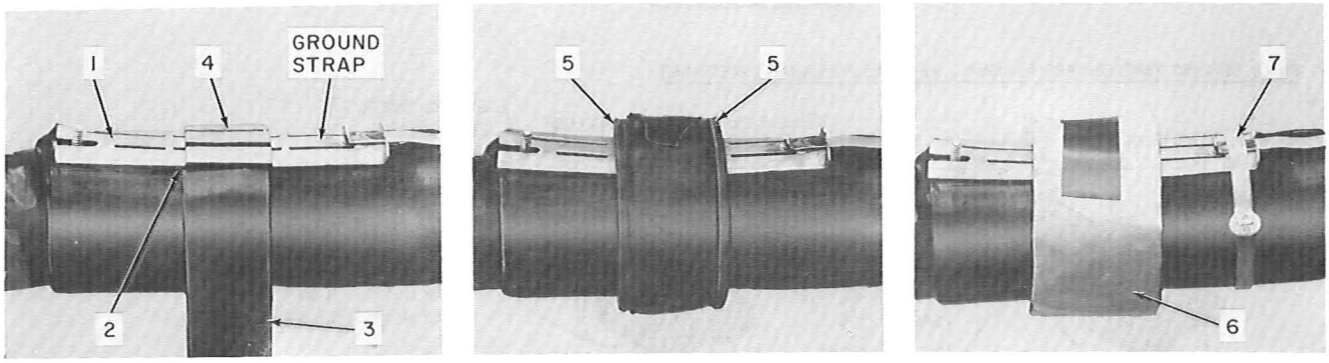


Fig. 8—Placing Ground Strap

1. Place ground strap so the slotted end is around stud of B bond clamp flush with end of cable sheath.

2. Mark cable sheath at the inside edge of the offset on ground strap for positioning of B sealing tape collar. Remove ground strap.

3. Using mark as guide, wrap ***one*** layer of 1-1/2 inch wide B sealing tape around scuffed area of cable.

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.

Note: If Kit of Parts D-180995 (reentry seal) is to be used, flatten leading edge of sealing tape and apply C cement as shown in Fig. 9.

4. Place ground strap on cable sheath with the offset straddling the single layer of B sealing tape.

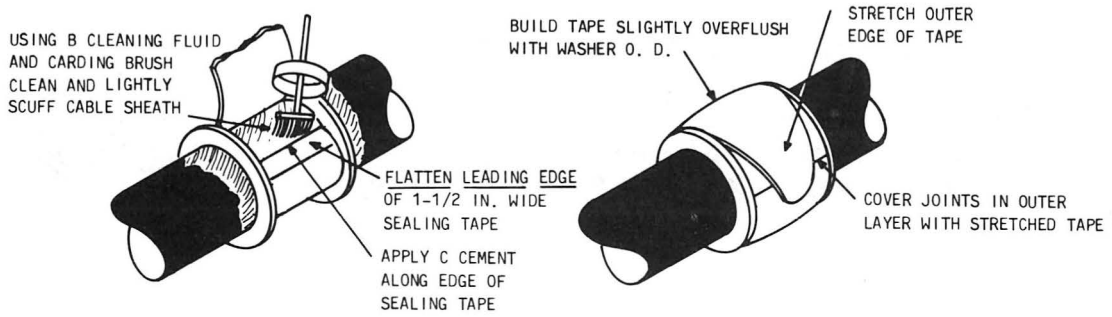
5. Place a sealing washer (selected in Fig. 7) on each side of layer of B sealing tape, then build up collar on cable sheath to a diameter equal to or slightly larger than that of the washer. The tape should be kept as clean as possible and should not be stretched.

6. Wrap collar with release paper from strips of B sealing tape and secure with vinyl tape to protect collar during splicing.

7. Secure ground strap to cable sheath using cable tie.

INITIAL ASSEMBLY

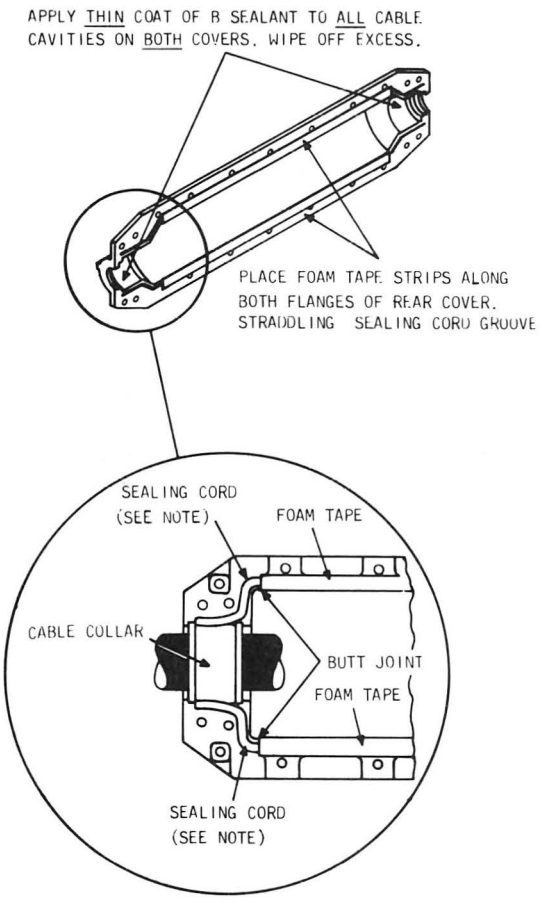
1. BUILD SEALING TAPE COLLARS AS USUAL, WITH THE FOLLOWING EXCEPTIONS:



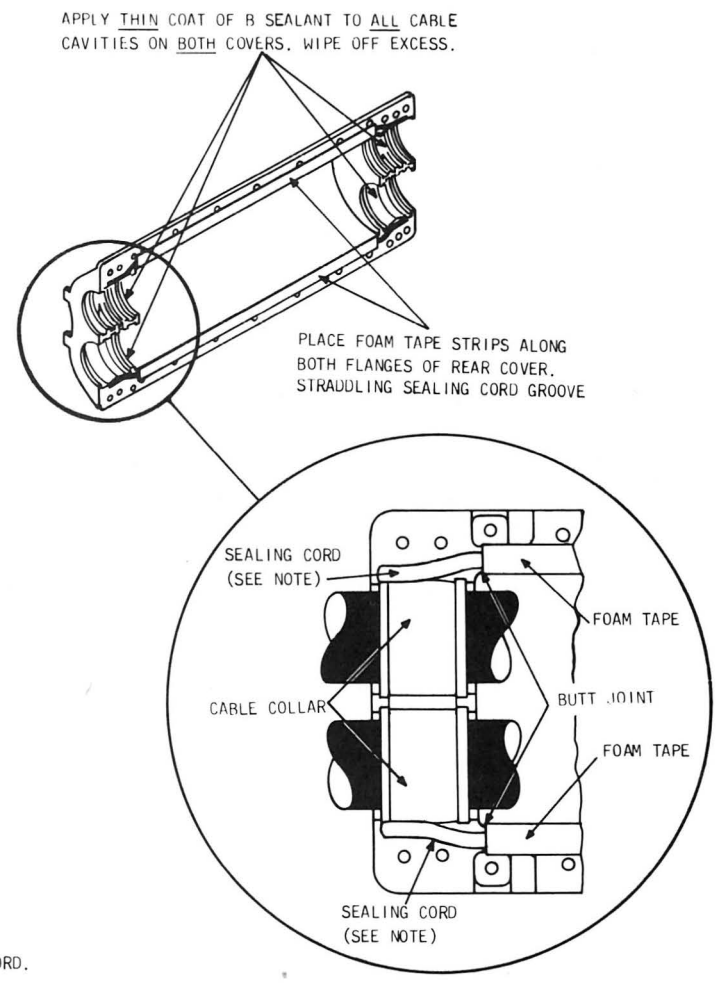
NOTE:
BUILD BLANK ("DUMMY") PLUGS FOR 51 TYPE CLOSURES (IF REQUIRED) USING J-O, H-O AND G-O SEALING WASHERS (NOT JX OR HX WASHERS).

2. ASSEMBLE CLOSURE

50-TYPE



51-TYPE



NOTE:
PLACE REAR COVER HALF OVER SPLICE BEFORE PLACING SEALING CORD.

Fig. 9—Installation of Closure Using D-180995 Kit of Parts

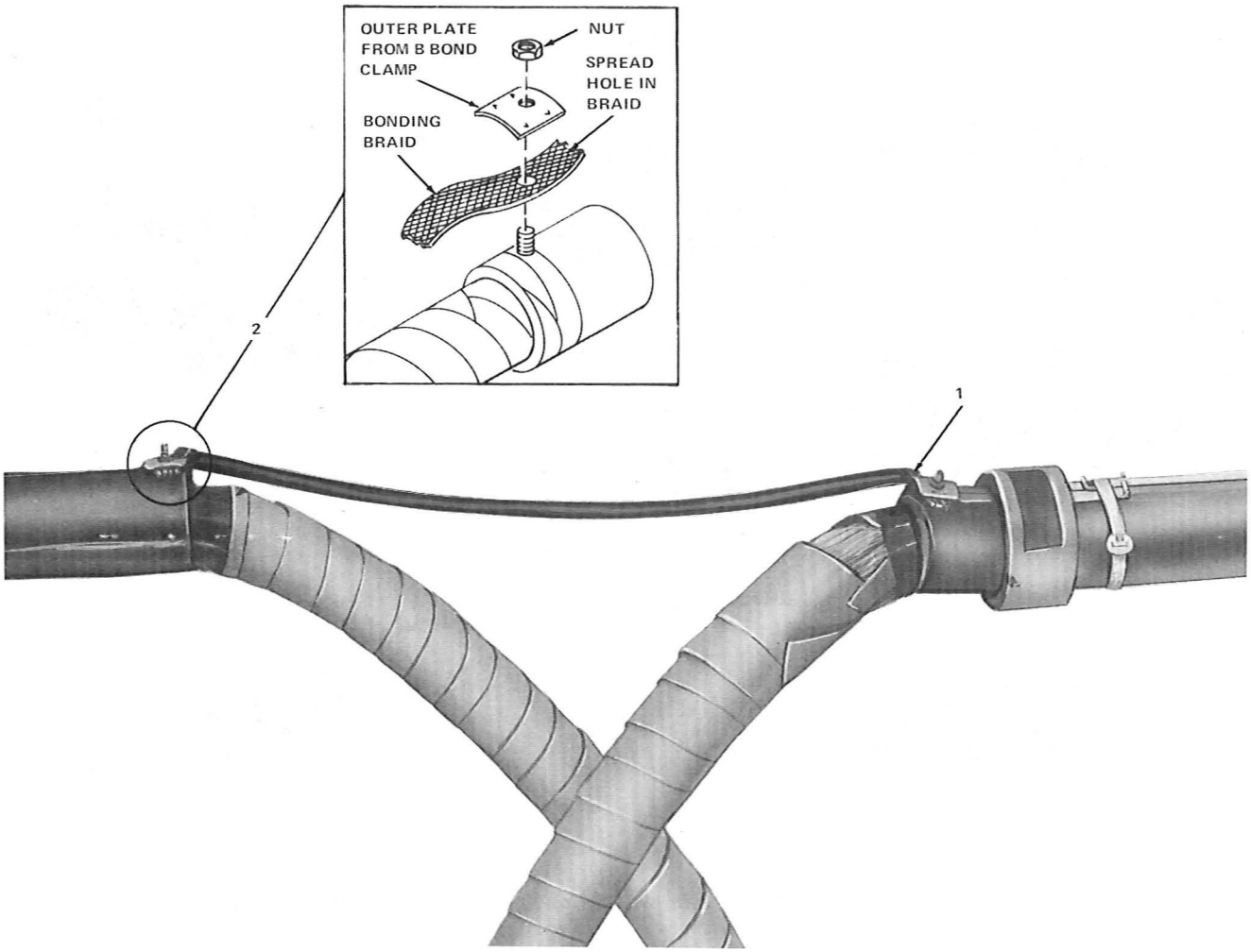


Fig. 10—Bond Cable Sheath

1. Place bonding braid over bond clamp stud on each cable.
2. Place outer plate of B bond clamp over the braid and secure with nut. Tighten nut with 216-type tool ***only.***

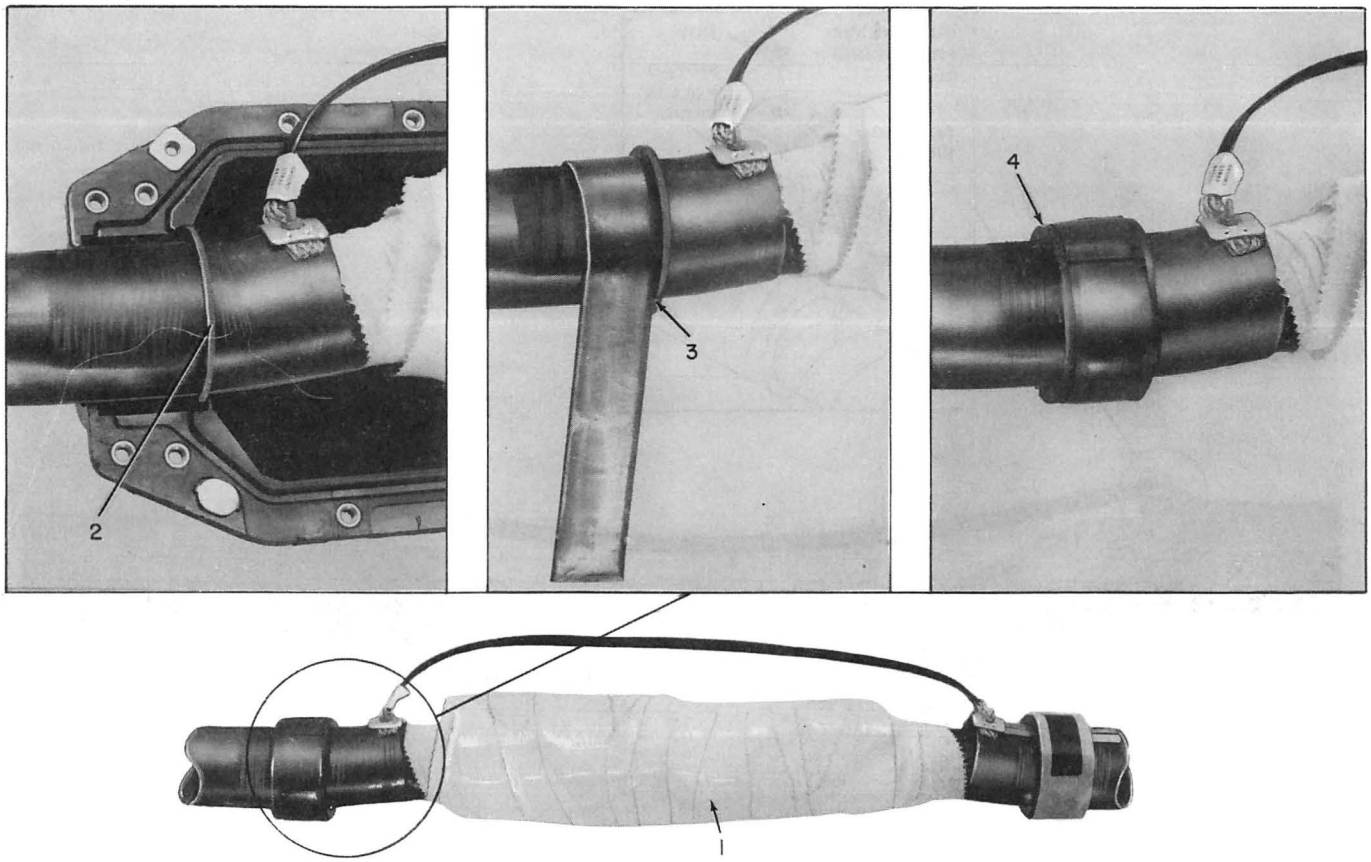


Fig. 11—Locating and Placing Collar on Side of Splice Opposite Ground Strap

1. Splice cables and wrap splice.

2. Locate second cable collar using cover half as template.

3. Place washers and build up a collar of B sealing tape to a diameter ***equal to or slightly larger than that of the washer.***

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.

Note: If Kit of Parts D-180995 (reentry seal) is to be used, flatten leading edge of sealing tape and apply C cement as shown in Fig. 9.

4. Position an outer washer with the slit about 90 degrees from that of the inner washer. Butt against the sealing tape collar.

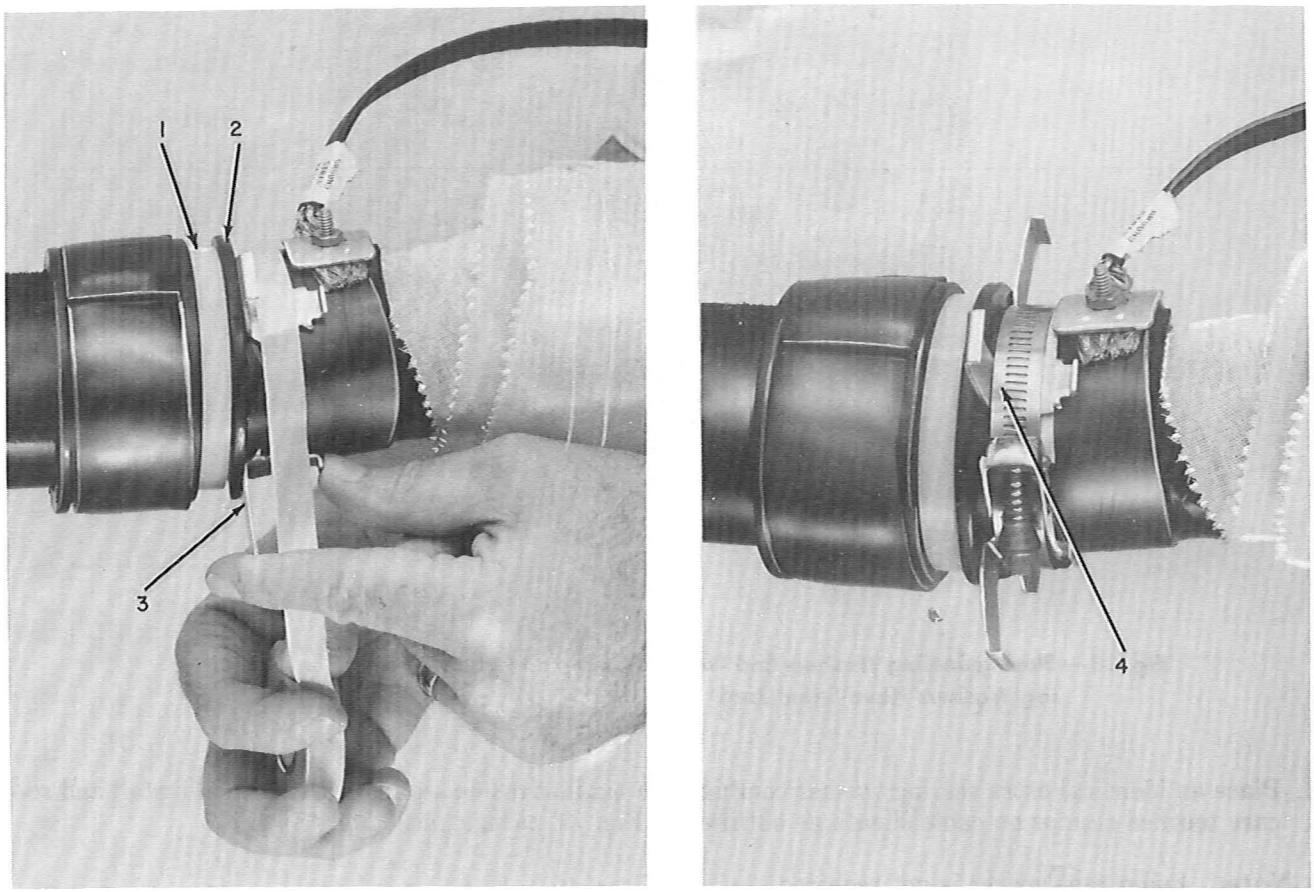


Fig. 12—Placing Toothed Clamps on All Cables (See Fig. 13 for Cables Where HF or JG Sealing Washers Have Been Used)

1. Peel backing from foam tape and wrap one layer around cable against inside sealing washer.
2. Place sealing washer against foam tape.
3. Using paper tape, tape toothed clamps evenly around cable. ***Do not place a clamp on top of ground strap.*** On smaller cables, some clamps may have to be discarded.
4. Secure toothed clamps with C sealing clamp provided with closure.
5. Repeat 1 through 4 on opposite side of splice.

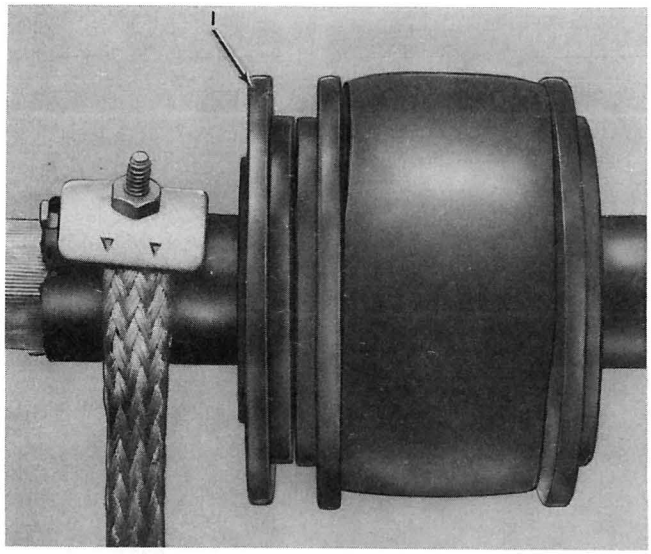


Fig. 13— Placing Sealing Washers and Toothed Clamp on Cables Where HF or JG Sealing Washers Have Been Used

1. Place an identical extra sealing washer combination against inside sealing washer, then install and secure toothed clamps on cable sheath as outlined in Fig. 12, paragraphs 3 and 4.

Note: Foam tape spacer is not required.

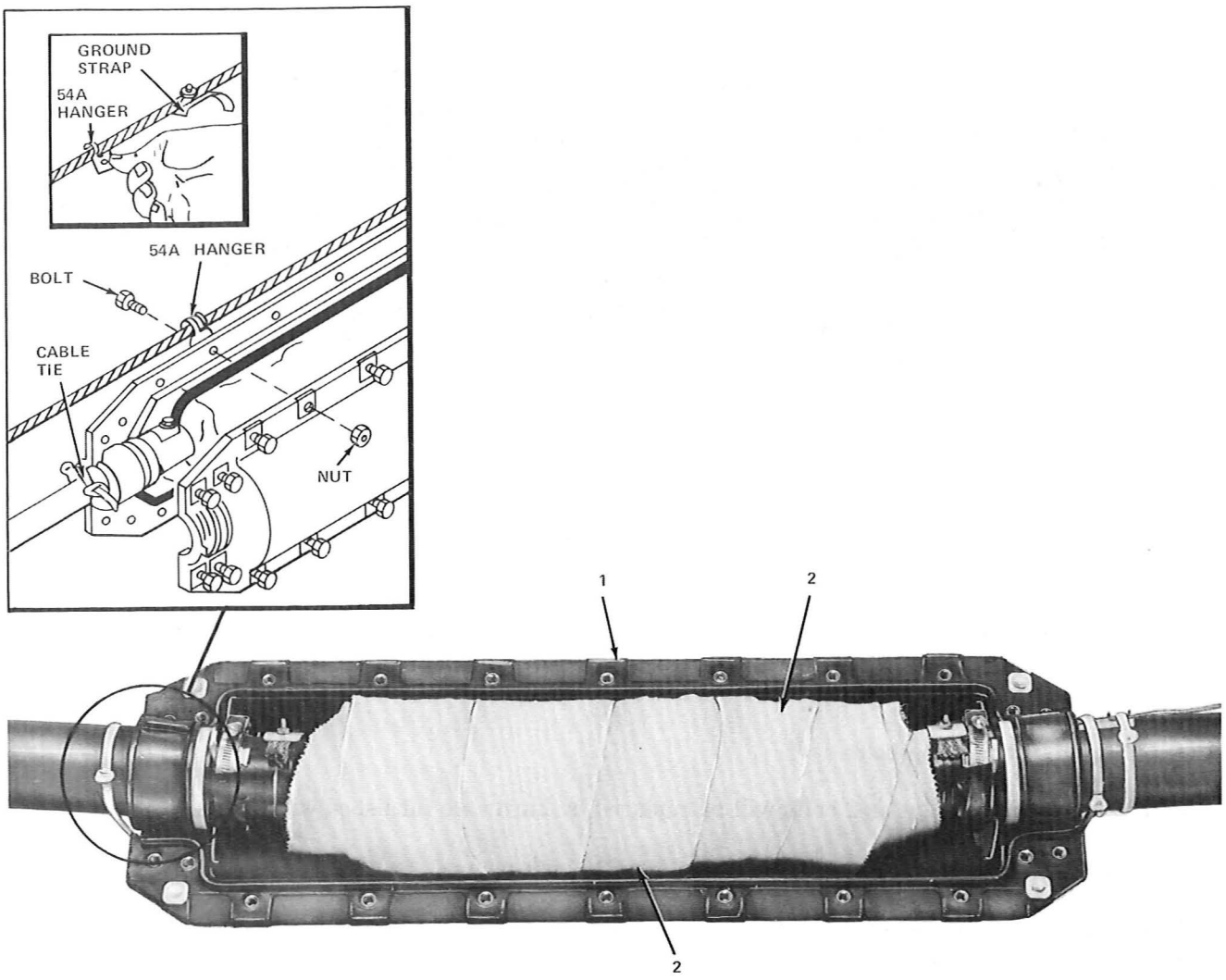


Fig. 14—Placing Closure

1. Thoroughly clean the sealing surface of the two cover halves with B cleaning fluid to remove any oil, grease, dirt, filings, moisture, etc. Remove the release paper from the collar, then place the cover half with threaded inserts flush against the collars.

Note 1: If Kit of Parts D-180995 (reentry seal) is to be used, apply thin coat of B sealant to all cavities on both covers, then place foam tape strips along both flanges of rear cover straddling sealing cord groove as shown in Fig. 9.

Note 2: If aerial installation, the threaded half of closure can be secured to strand and cable as shown in sketch.

2. Place B sealing cord in the side grooves, ***being careful to avoid making flat spots or dents in the cord. Do not stretch.***

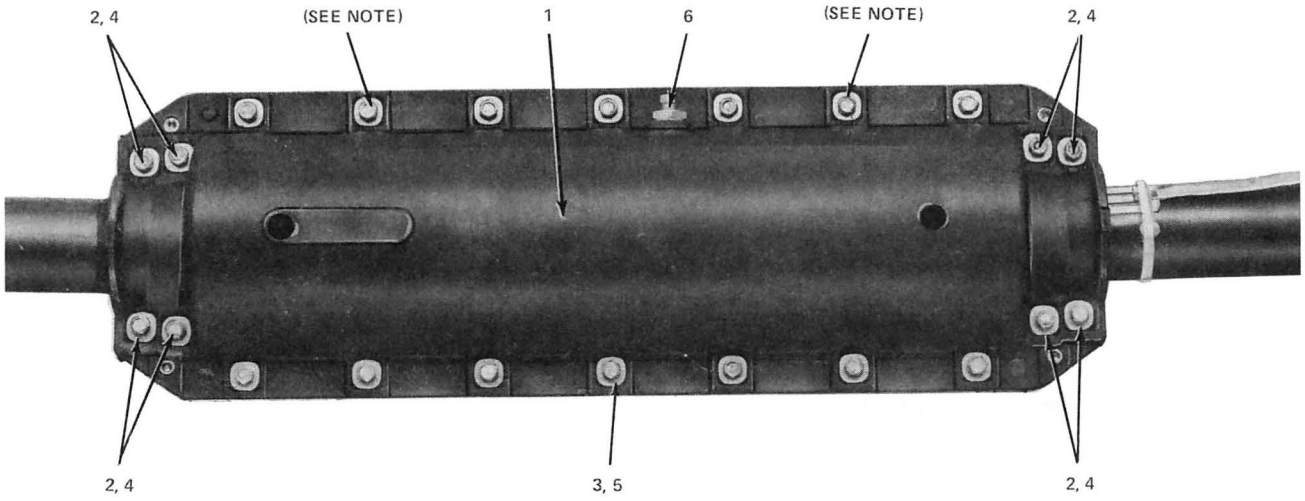


Fig. 15—Securing Closure

1. Place cover half with bolts in position, being careful not to disturb sealing cord.
2. Tighten eight end bolts evenly until covers are 1/4 inch apart.
3. Hand tighten remaining bolts.

   Note: In aerial installations, bolts will be replaced by hardware furnished with hangers.

4. Tighten eight end bolts evenly to a torque of 200-250 inch-pounds.

   ▶Caution: On 50B3 closures equipped with 1/4-20 bolts, tighten bolts to 75 inch-pounds minimum and 100 inch-pound maximum.◀

5. Tighten remaining bolts evenly to a torque of 200-250 inch-pounds.
6. ▶Apply a back pressure of 5 psi and flash test closure to check for leaks.◀

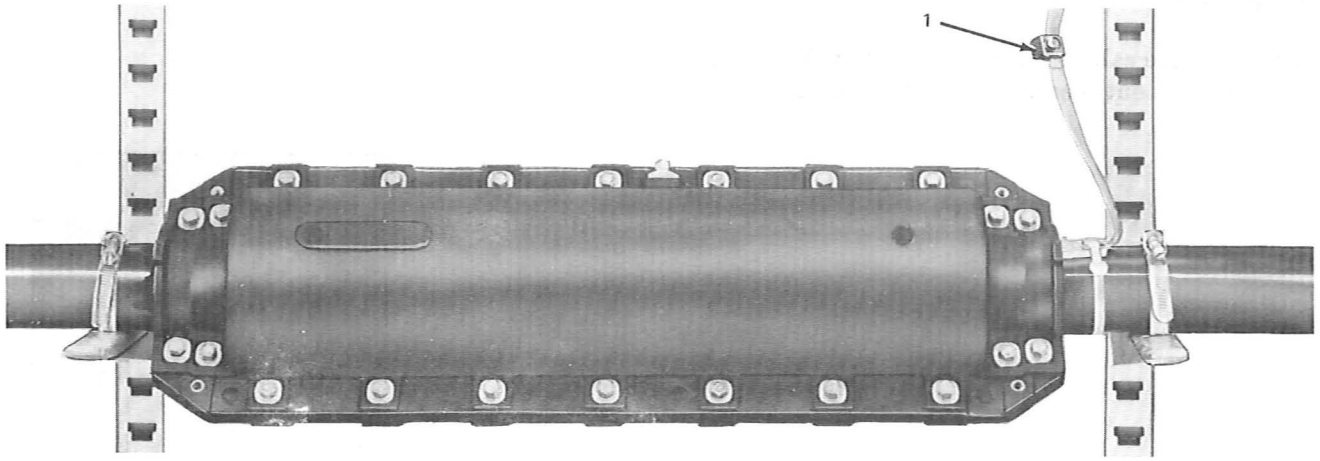


Fig. 16—Grounding Closure in Manhole

1. Using B connector AT-7827, connect ground ribbon to ground strap.

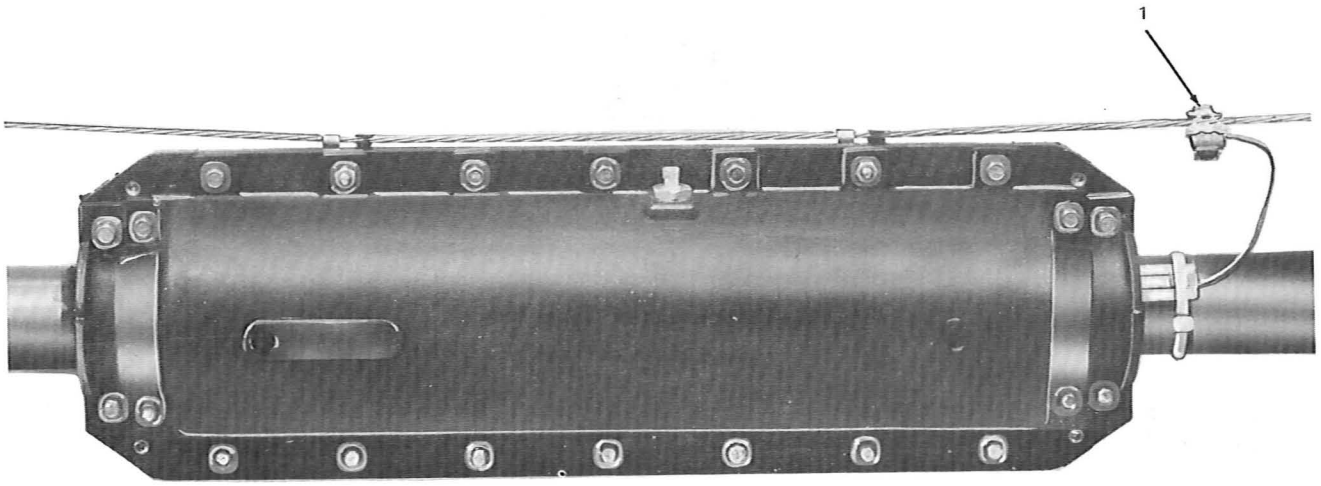


Fig. 17—Grounding Closure to Strand

1. Using a C connector or B strand clamp, attach bonding ribbon to strand.

51-Type Closure

3.03 Prepare cable sheaths and install 51-type closure as outlined in Fig. 18 through 22.

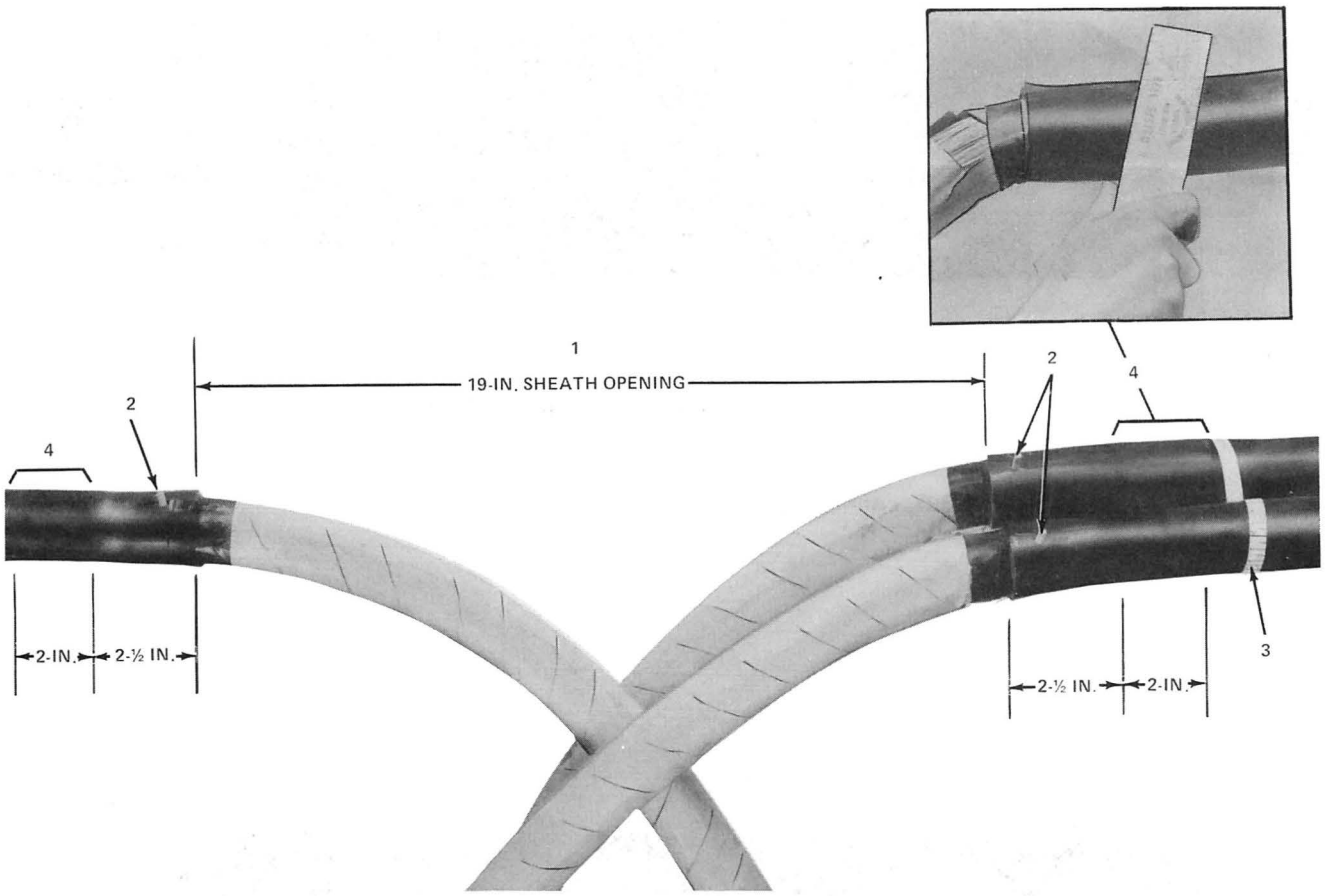


Fig. 18—Preparation of Cable Sheath

1. Mark cable sheath for 19-inch sheath opening, then remove outer jacket and metallic shield from each cable end.

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

3. Using B measuring tape, measure diameters of cables and select sealing washers per Table B.

   Note: Three sealing washers or combination of sealing washers are required for each cable.

4. Remove any residue from cable sheath with B cleaning fluid, then use carding brush to scuff cable sheath on each side of sheath opening.

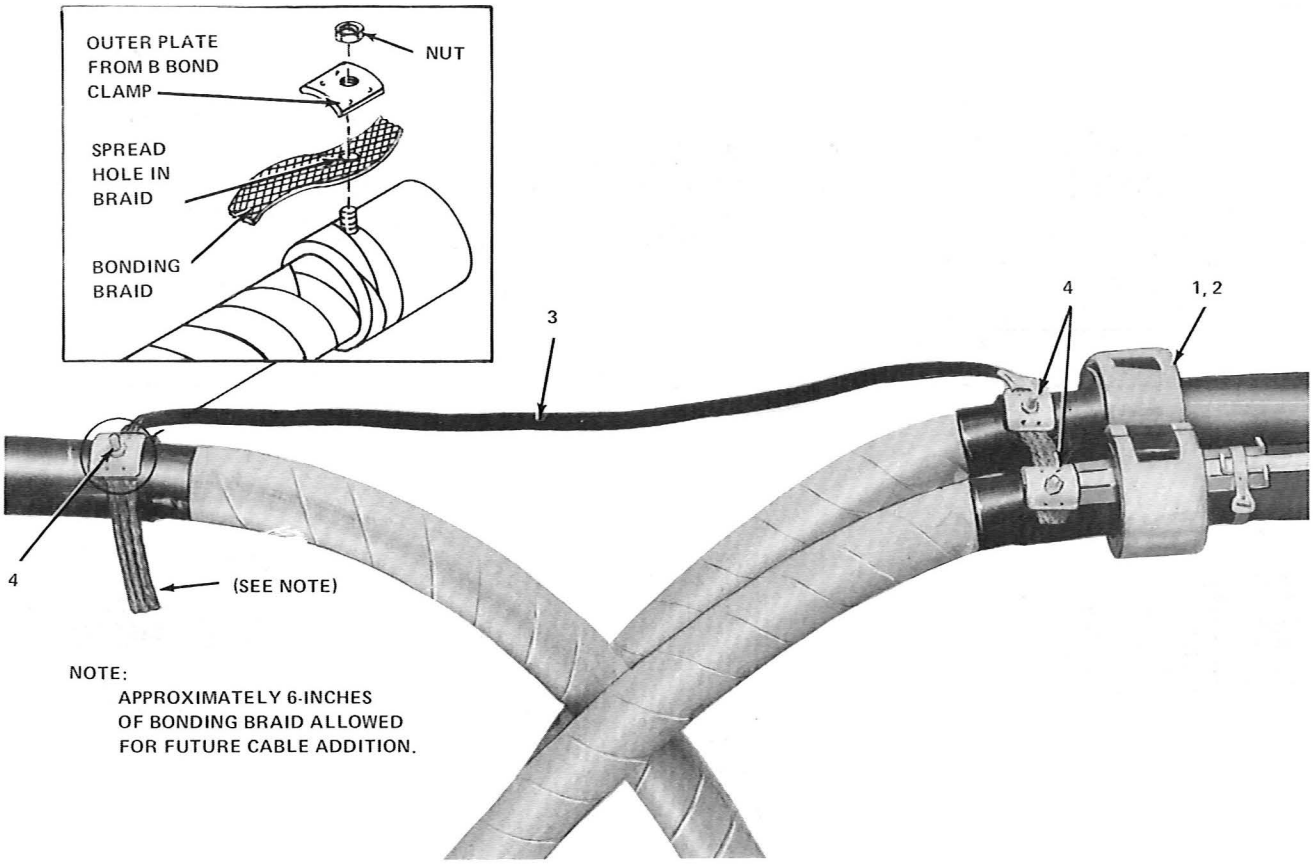


Fig. 19—Bonding Cable Sheath

1. Place ground strap on one cable sheath as outlined in Fig. 8.

2. Place sealing washers on adjacent cable and using 1-1/2 inch wide B sealing tape build up a collar as outlined in Fig. 8. Wrap collar with release paper and secure paper with vinyl tape. This protects collar during splicing operation.

3. Place bonding braid over bond clamp studs.

4. Place outer plates of B bond clamps over the braid and secure with nut. Tighten nut with 216-type tool ***only.*** Cut off excessive length of bond clamp studs.

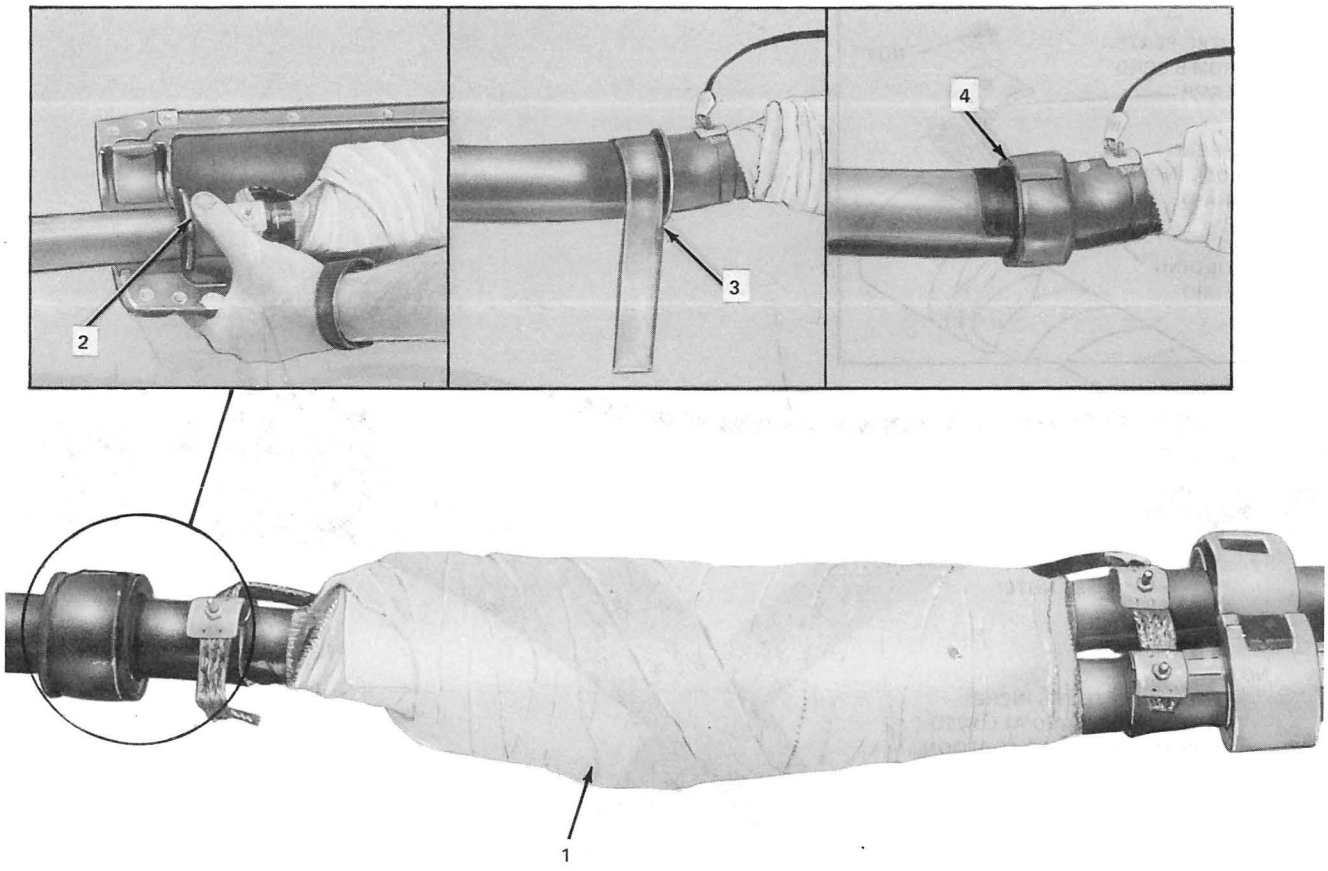


Fig. 20—Locating and Placing Collar on Side of Splice Opposite Ground Strap

1. Splice cables and wrap splice.

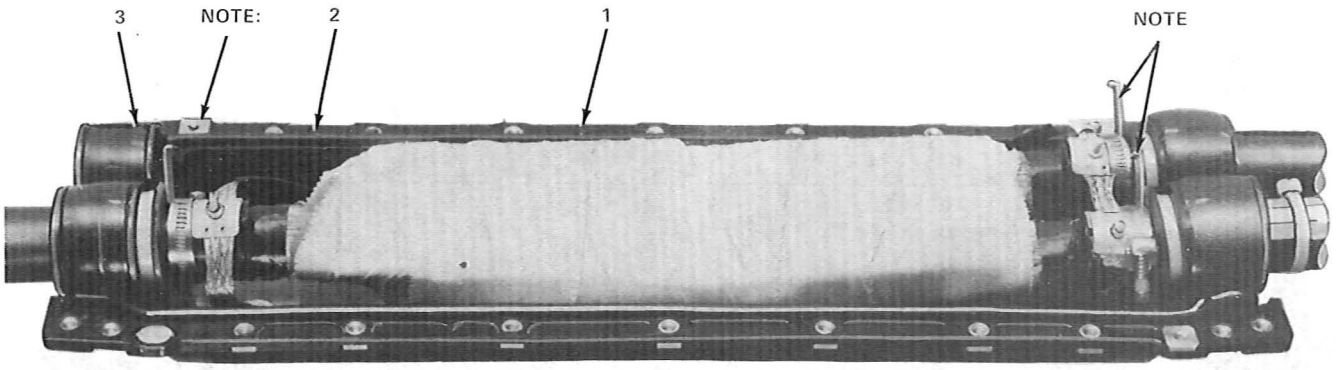
2. Locate second cable collar using cover half as template.

3. Place washers and build up collar of B sealing tape to a diameter ***equal*** to or slightly larger than that of the washer.

4. Position an outer washer with the slit about 90 degrees from that of the inner washer. Butt against the sealing tape collar.

5. Place toothed clamps on all cables as outlined in Fig. 12 or 13.

Note: When installing a 51D3 closure on cables over 2 inches in diameter, the toothed clamp must be at right angles with split line of case.



NOTE:
WHEN INSTALLING A 51D3 CLOSURE ON CABLES OVER 2-INCHES IN DIAMETER THE TOOTHED CLAMPS MUST BE AT RIGHT ANGLES WITH SPLIT LINE OF CASE.

Fig. 21—Placing Closure

1. Thoroughly clean the sealing surface of the two cover halves with B cleaning fluid to remove any oil, grease, dirt, filings, moisture, etc. Remove the release paper from the collars, then place the cover half with threaded inserts flush against the collar.

   Note 1: If Kit of Parts D-180995 (reentry seal) is to be used, apply thin coat of B sealant to all cavities on both covers, then place foam tape strips along both flanges of rear cover straddling sealing cord groove as shown in Fig. 9.

   Note 2: In aerial installation, the threaded half of the closure may be temporarily secured to the strand and cable as shown in Fig. 14 for 50-type closure.

2. Place B sealing cord in the side grooves, ***being careful to avoid making flat spots or dents in the cord. Do not stretch.***

3. Place blank sealing washer plugs using GO, JO, HO, NX, or JG washer in any unused opening of closures except when using reentry seal, then use GO, JO, or HO sealing washers.

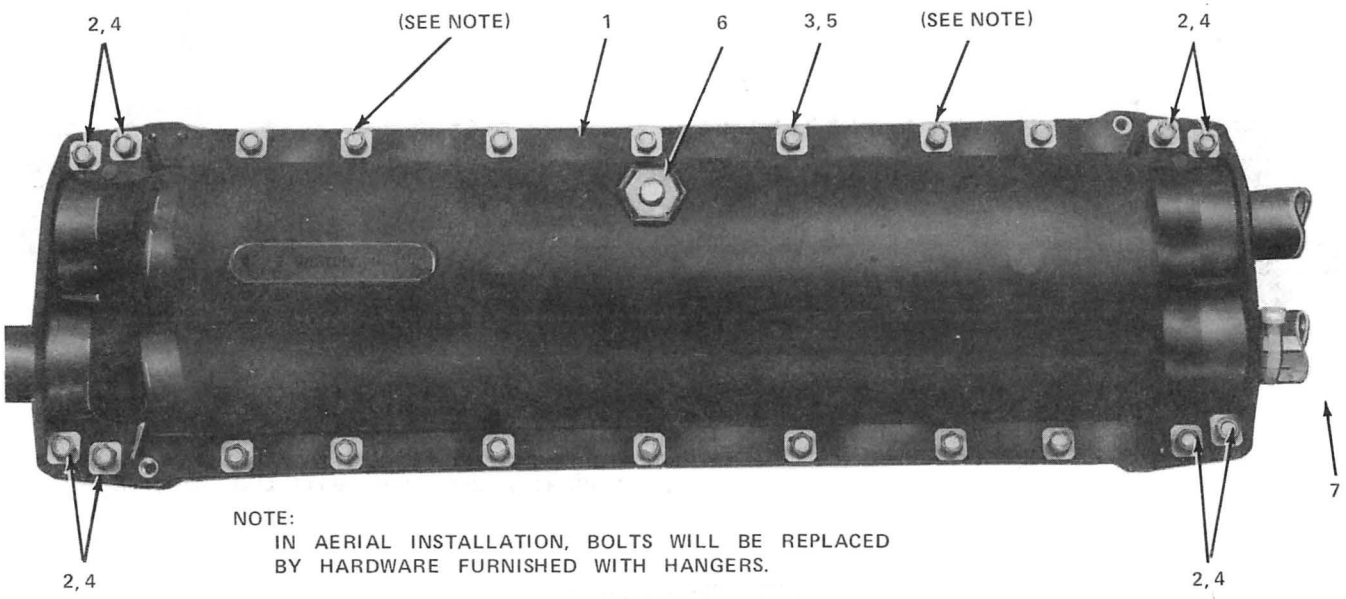


Fig. 22—Securing Closure

1. Place cover half with bolts in position, being careful not to disturb sealing cord.
2. Tighten eight end bolts evenly until covers are 1/4 inch apart.
3. Hand tighten remaining bolts.
4. Tighten eight end bolts evenly to a torque of 200-250 inch-pounds.
5. Tighten remaining bolts evenly to a torque of 200-250 inch-pounds.
6. ⏵Apply a back pressure of 5 psi and flash test closure to check for leaks.⏴
7. Ground closure as outlined in Fig. 16 or 17.

4. OPENING AND REASSEMBLING

4.01 Loosen the bolts on the closure.

4.02 Insert four chamfered 5/16-18 X 1-3/4 bolts in the four jacking holes (two on each end of the closure) and tighten alternately about two turns on each bolt until one or both sides are free from the cable (Fig. 23).

4.03 Remove the closure from the cable.

4.04 ⏵If reentry seal was used, reassemble closure as shown in Fig. 24.⏴

4.05 Remove sealing tape and sealing washers from cable sheath and discard.

4.06 Install new sealing washers and sealing tape collars on the cable sheath as outlined herein.

4.07 Clean sealing cord and sealing tape from removed closure and replace over splice as outlined herein.

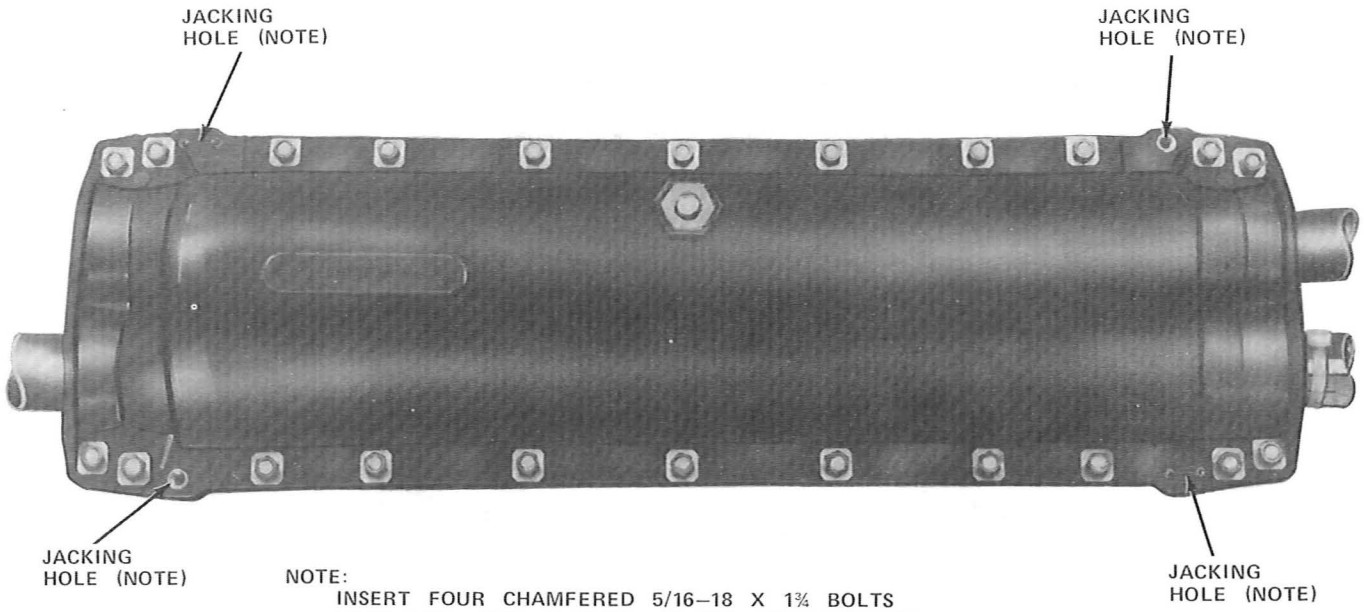
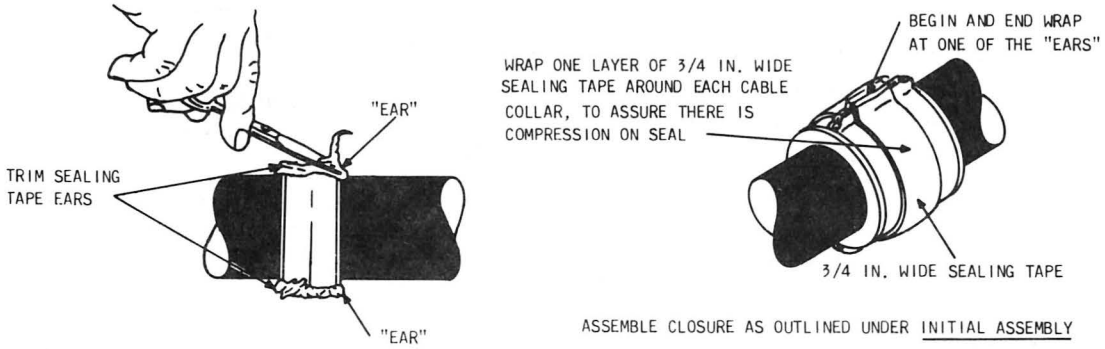


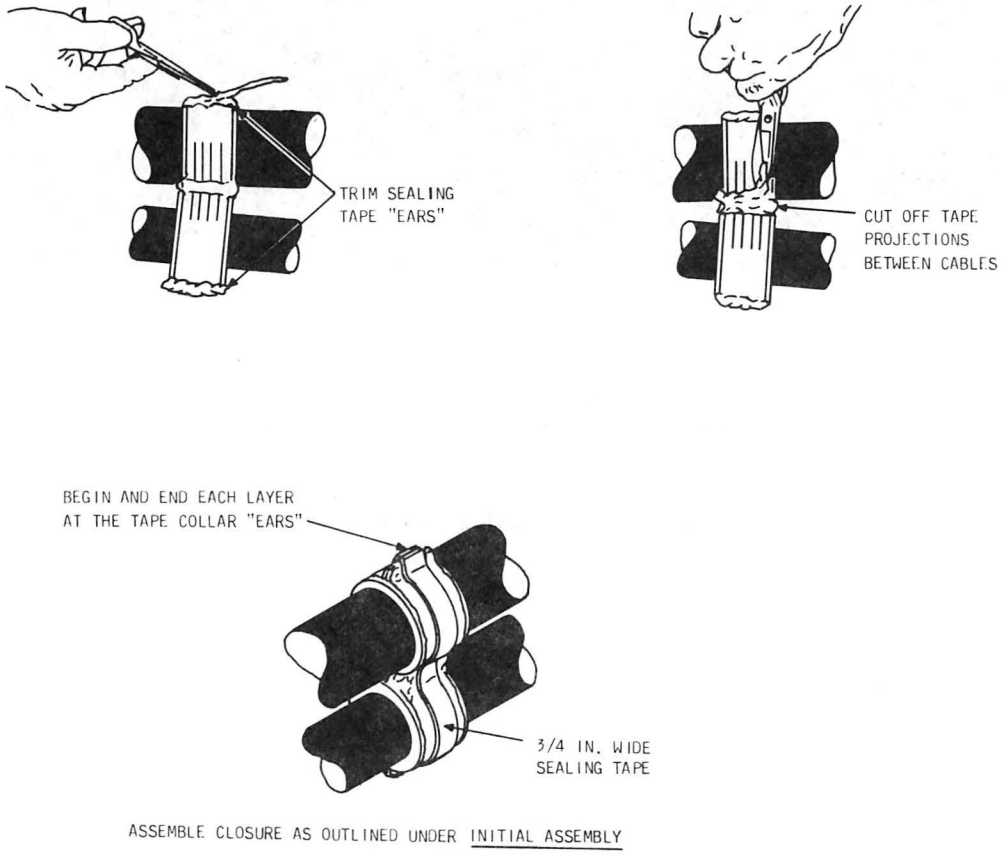
Fig. 23—⏵Reentering Closure⏴

REASSEMBLY OF 50 TYPE CLOSURE



ASSEMBLE CLOSURE AS OUTLINED UNDER INITIAL ASSEMBLY

REASSEMBLY OF 51 TYPE CLOSURE



ASSEMBLE CLOSURE AS OUTLINED UNDER INITIAL ASSEMBLY

Fig. 24—Installation of Closure Using D-180995 Kit of Parts