50- AND 51-TYPE CLOSURE DESCRIPTION AND INSTALLATION

	CONTENTS PAGE	1.03	The 50- and 51-type closures are coded with	
1.	GENERAL	which	two numbers, a letter, and a single number indicate the following:	
2.	DESCRIPTION 1	(a)	Two numbers indicate the kind of splice—	
2.	DESCRIPTION		50-type closures are for straight splices	
3.	CABLE SHEATH PREPARATION AND INSTAL-		51-type closures are for Y or double Y splice	
LATION OF CLOSURE		(b)	A letter indicates the size—	
4.	OPENING AND REASSEMBLING 29		♦AA—The first letter A is for cable with sheath diameter 1.0 inch and smaller The second letter A denotes a shorter than the standard 19-inch sheath opening.◀	
1. 1.01	GENERAL This section covers the description and instal-		B-For cable with sheath diameter 1.6 inches and smaller	
lation of the 50- and 51-type closures on single C-For	C-For cable with sheath diameter 2.2 inches and smaller			
•			D-For cable with sheath diameter 3.0 inches and smaller.	
1.02	This section is reissued to:	(0)	A single number at the end indicates the mate-	
	• Delete reference to 51C3 closure	(e)	rial used in construction—	
	• Include 50AA and 51AA closures		3—Plastic.	
	• Include abrasive strip, solvent wipes, and vinyl tape as components of closures	for a	example, a closure coded 50B3 would be used straight splice on a cable with a sheath diameter	
	• Change number of toothed clamps required per cable	between 1.0 and 1.6 inches and a standard sheath opening, and the case is made of pi		
	 Include kits of spare parts D-181224, D- 181225, D-181226, D-181227, D-181228, and D- 	1. 04 each	Table A lists the 50- and 51-type closures with general information on the capacity and use of closure.	

Revision arrows are used to emphasize the more significant changes.

181229.

2. DESCRIPTION

2.01 The 50- and 51-type closures are illustrated in Fig. 1 2, 3, and 4.

NOTICE

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

TABLE A

CLOSURE — CAPACITY AND USE

	CABLE SHEA	TH DIAMETER	INSIDE	SHEATH		
CLOSURE	MIN (INCHES) (NOTE)	MAX (INCHES)	DIAMETER (INCHES)	OPENING (INCHES)	USE	TYPE OF SPLICE
50AA3	0.3	1.0	2.0	13	Aerial and	Straight
50B3	0.3	1.6	3.0	19	Underground	
50C3	0.3	2.2	4.5	19		
50D3	0.3	3.0	6.25	19		MONEY.
51AA3	0.3	1.0	3.0	13	Aerial and	Y or
51B3	0.3	1.6	5.0	19	Underground	Double Y
51D3	0.3	3.0	7.0	19	STATE OF THE PARTY	MAT MILATER

Note: Refer to Table B for sealing washer sizes.

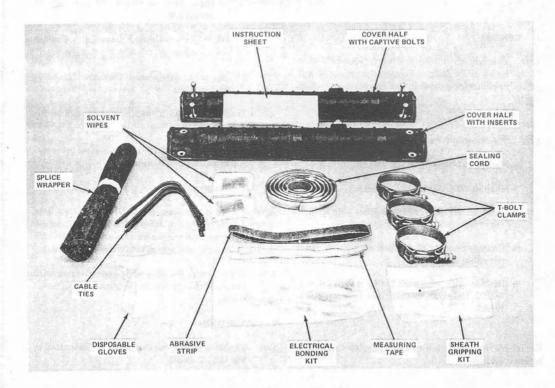


Fig. 1-\$50AA3 Closure

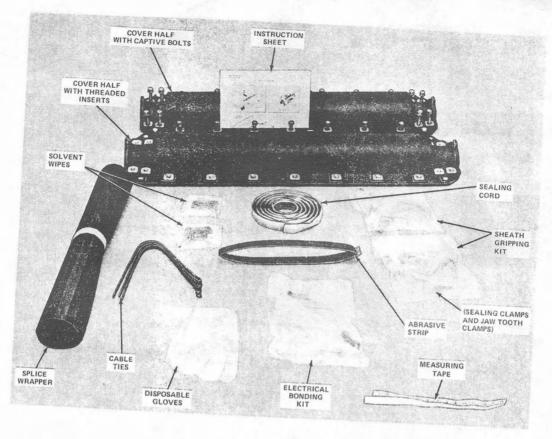


Fig. 2-50-Type Closure (Except 50AA3)

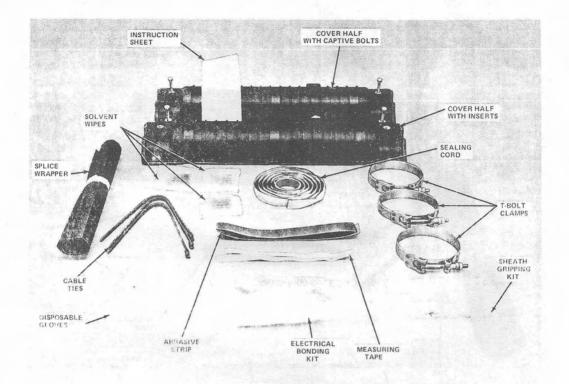


Fig. 3-\$51AA3 Closure

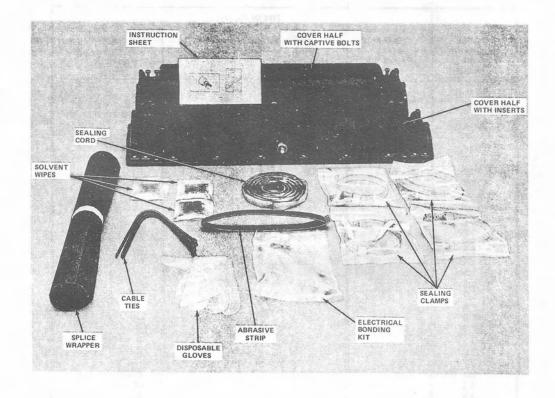


Fig. 4-51-Type Closure (Except 51AA3)

- 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 FO, GO, HX, and JX are used for sealing unused openings in the closure. The FO and GO sealing washers are used for dead ending purposes and 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-7512. The F, 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 1.0 for the F, 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.

♦TABLE B♦

SEALING WASHERS — AT-8583

***************************************	TYPE OF CLOSURE					
CABLE SHEATH DIA (INCHES)	50AA3 51AA3 WASHER NO. (NOTE)	50B3 51B3 WASHER NO. (NOTE)	50C3 WASHER NO. (NOTE)	50D3 51D3 WASHER NO. (NOTE)		
0 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7	FO* F3 F4 F5 F6 F7 F8 F9 F10	GO*† G3 G4 G5 G6 G7 G8 G9 G10 G11 G12 G13 G14 G15 G16	HO* HX* HF + F3 HF + F5 HF + F5 HF + F6 HF + F7 HF + F8 HF + F9 HF + F10‡ H11 H12 H13 H14 H15 H16 H17 H18 H19 H20 H21 H22	JO* JX* JG + G3 JG + G4 JG + G5 JG + G6 JG + G7 JG + G8 JG + G9 JG + G10 JG + G11 JG + G12 JG + G13 JG + G15 J16 J17 J18 J19 J20 J21 J22 J23 J24 J25 J26 J27		
2.8 2.9 3.0				J28 J29 No washer required for sealing collar		

Note: A KO sealing washer can be used with 849A sealing washer cutter to cut appropriate sealing washer as outlined in Section 081-020-136.

^{*} The HX and JX sealing washers are used for sealing vacant openings in closure. When reentry is planned, use the FO, GO, JO, or HO sealing washer as required.

[†] The GO 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.

 $[\]ddagger$ The HF sealing washer is used with the F sealing washer to seal cables 0.3 through 1.0 inch OD.

[§] The JG sealing washer is used with the G sealing washer for sealing cables 0.3 through 1.5 inches OD by inserting the proper G series sealing washer in the recess provided.

- (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. 5) 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 ratchest
- (d) ♦The G connector AT-8944 (Fig. 6) is intended to provide a solderless ground connection on plain bonding ribbon to No. 6 ground wire. This bronze connector is tin-coated to resist corrosion and can be tightened over the bonding ribbon with a ratchet •

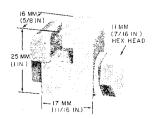


Fig. 5—B Connector AT-7827

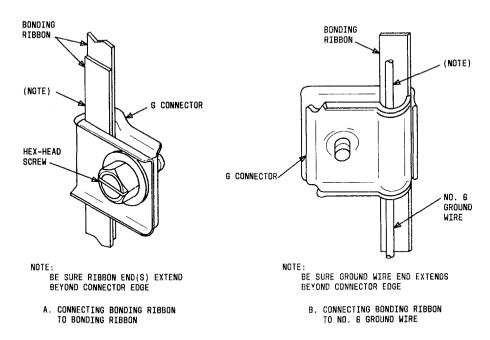


Fig. 6-G Connector AT-8944

- (e) Two 54A hangers (Fig. 7) are required to make an aerial installation of 50- and 51-type closures.
- (f) Reentry Kit of Parts D-180995 (Fig. 8) is a kit for sealing splice closure which elimi-

nates 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.

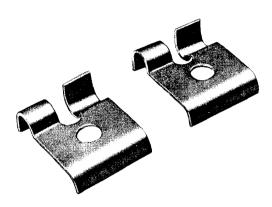


Fig. 7—Hangers for Strand Mounting

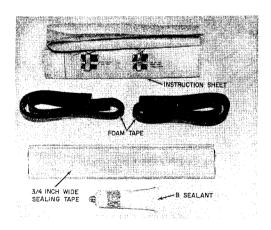


Fig. 8-Kit of Parts D-180995

- ♦(g) The following kits of spare parts can be ordered to replace damaged or lost parts:
 - (1) Kit of Parts D-181224 (Fig. 9) consists of 10 thru-seal ground straps for bonding cable sheath to external ground.
 - (2) Kit of Parts D-181225 (Fig. 10) consists of 10 clearance inserts for cover half.

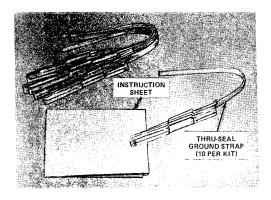


Fig. 9-\$Kit of Parts D-181224

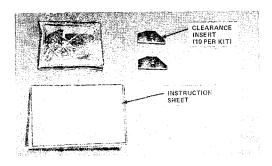


Fig. 10-\$Kit of Parts D-181225\$

- (3) Kit of Parts D-181226 (Fig. 11) consists of 10 threaded inserts for cover half.
- (4) Kit of Parts D-181227 (Fig. 12) consists of 10 T-bolt clamps for 50AA3 closure.

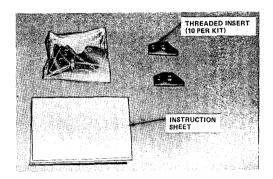


Fig. 11—₱Kit of Parts D-181226

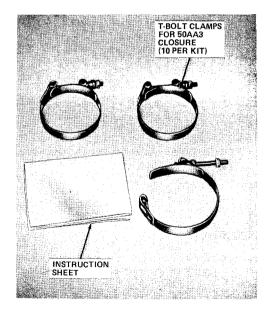


Fig. 12—₱Kit of Parts D-181227

- (5) Kit of Parts D-181228 (Fig. 13) consists of 10 T-bolt clamps for 51AA3 closure.
- (6) Kit of Parts D-181229 (Fig. 14) consists of ten 1/4-10×2 inch bolts for 50AA3 and 51AA3 closures.
- (h) C cement.

- 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.

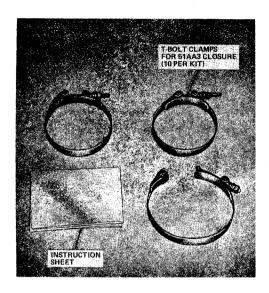


Fig. 13-\$Kit of Parts D-181228\$

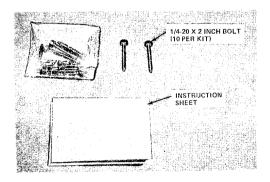
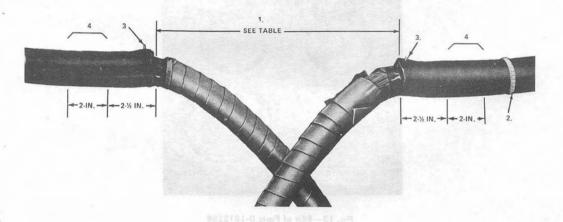


Fig. 14—₱Kit of Parts D-1812294

50-Type Closure

3.02 Prepare the cable sheaths and install 50-type closure as outlined in Fig. 15 through 26.

CLOSURE	SHEATH OPENING INCHES
50AA3	13.0
50B3	19.0
50C3	19.0
50D3	19.0

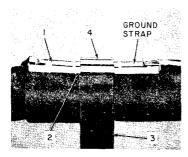


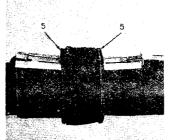
- Mark cable sheath for the proper opening, then remove the outer jacket and metallic shield from each cable end.
- 2. Using B measuring tape furnished with the closure, measure the diameter of the cable and select six sealing washers per Table B. The sealing washers that are to be placed over the *thru-seal ground strap* (Fig. 16) must be *one size larger* than the cable diameter.

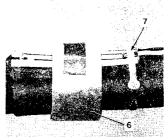
Note: Three sealing washers or combination of sealing washers are required for each cable.

- Install inner plate of the B bond clamp as outlined in Section 081-852-118. Do not install outer plate at this time.
- 4. Using solvent wipes, remove any residue from cable sheath, then using abrasive strip or carding brush, scuff around the cable sheath on each side of the sheath opening. Remove the scuffing debris from the cable sheath.

Fig. 15—Preparation of Cable Sheath







- Place the thru-seal ground strap so the slotted end is around stud of B bond clamp and flush with end
 of cable sheath.
- **♦Note:** The thru-seal ground strap must be placed on cable 0.4 inches in diameter or larger. •
- 2. Mark cable sheath at the inside edge of the offset on ground strap for positioning of B sealing tape collar. Remove the ground strap.
- 3. 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 mark as guide, wrap one layer of 1-1/2 inch wide B sealing tape around scuffed area of cable.

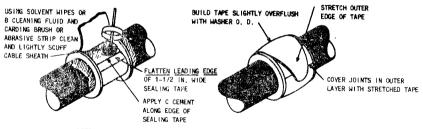
Note: If Kit of Parts D-180995 (reentry seal) is to be used, flatten the leading edge of sealing tape and apply C cement as shown in Fig. 17.

- 4. Place the ground strap on the cable sheath with the offset straddling the single layer of B sealing tape.
- 5. Place a sealing washer (selected in Fig. 15) on each side of layer of B sealing tape, then build up collar on the 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.
- Wrap the collar with release paper from strips of B sealing tape and secure with vinyl tape to protect collar during splicing.
- 7. Secure the ground strap to cable sheath using cable tie.

Fig. 16—Placing Ground Strap

MITIAL 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-0, H-0 AND G-0 SEALING WASHERS (NOT JX OR HX WASHERS)

2. ASSEMBLE CLOSURE

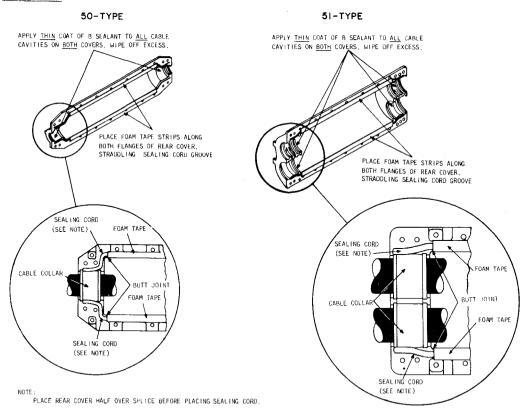
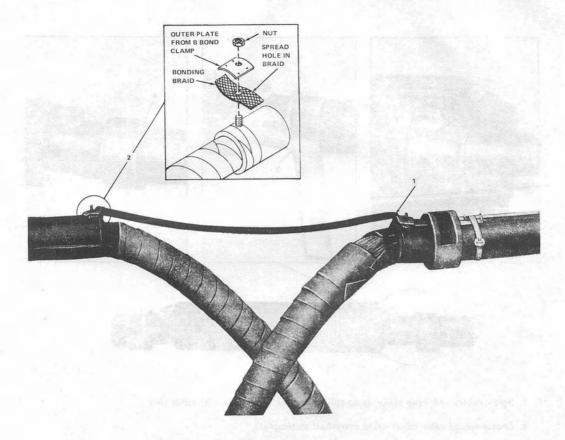
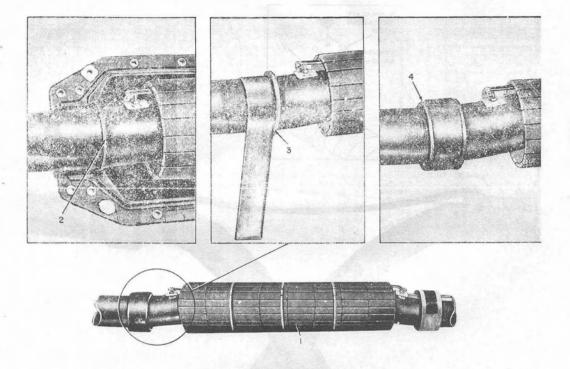


Fig. 17—Installation of Closure Using D-180995 Kit of Parts



- 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. 18-Bond Cable Sheath

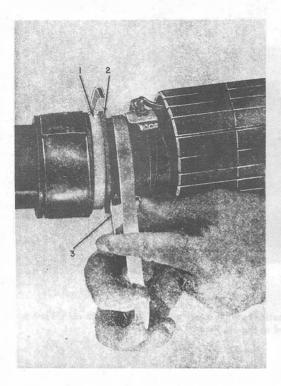


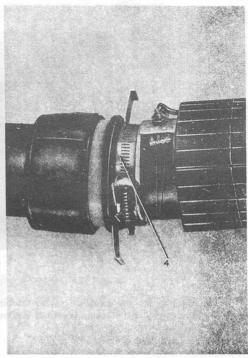
- 1. Splice cables and wrap splice using splice wrapper and secure with cable ties.
- 2. Locate second cable collar using cover half as template.
- 3. Caution: Do not heat the tape directly in the airflow of a heater or blower. This reduces the adhesion of the tape to the cable sheath. If preheating in cold weather is required, place the tape in a warm place prior to use. Place washers and build up a collar of B sealing tape to a diameter equal to or slightly larger than that of the sealing washer.

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. 17.

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

Fig. 19—Locating and Placing Collar on Side of Splice Opposite Ground Strap



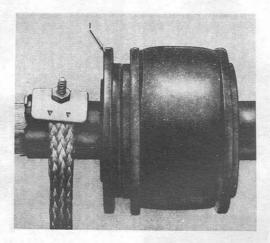


- 1. Peel backing from foam tape and wrap one layer around cable against inside sealing washer.
- 2. Place the third sealing washer against foam tape.
- Using paper tape, tape two jaw-toothed clamps against the third sealing washer and evenly around cable. Do not place a clamp on top of bond clamp.

Note: Jaw-toothed clamps are not required with 50AA3 closures or in other closures when closing cables less than 1 inch in diameter; however, sealing clamps are required for proper sheath retention in these applications.

- 4. Secure toothed clamps with C sealing clamp provided with closure.
- 5. Repeat 1 through 4 on opposite side of splice.

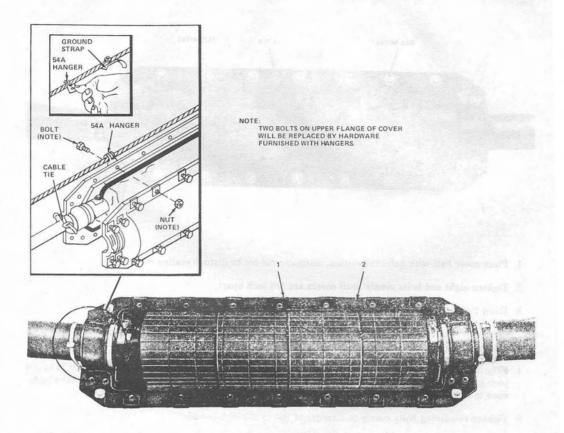
Fig. 20—Placing Jaw-Toothed Clamps on All Cables (See Fig. 21 for Cables Where HF or JG Sealing Washers Have Been Used)



Place an identical extra sealing washer combination against inside sealing washer, then install and secure toothed clamps on cable sheath as outlined in Fig. 20, Steps 3 and 4.

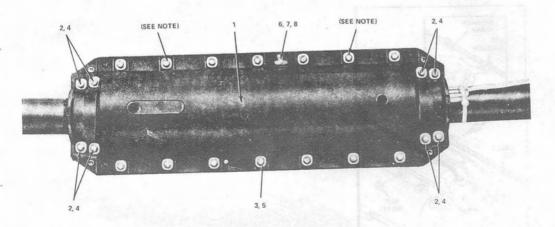
Note: Foam tape spacer is not required.

Fig. 21—Placing Sealing Washers and Jaw-Toothed Clamp on Cables Where HF or JG Sealing Washers Have Been Used



- 1. Thoroughly clean the sealing surface of the two cover halves with solvent wipes 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. 17.
 - Note 2: \$\text{\$\text{\$\$Use cable ties to hold cables in rear cover as shown in sketch.}} \text{\$Do not use cable ties to permanently secure closure to strand; use 54A hangers.}\$
- Place B sealing cord in the side grooves, being careful to avoid making flat spots or dents in the cord. Do not stretch.

Fig. 22-Placing Closure



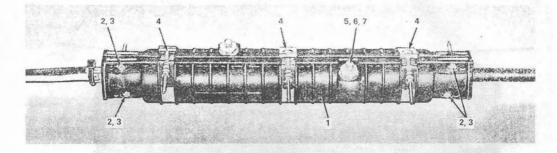
- 1. Place cover half with bolts in position, being careful not to disturb sealing cord.
- 2. Tighten eight end bolts evenly until covers are 1/4 inch apart.
- 3. Hand tighten the remaining bolts.

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

- 4. ♦The 50B3 closure is equipped with 1/4-20 bolts. These bolts should be tightened to a torque of 75 to 100 inch-pounds. The 50C3 and 50D3 closures are equipped with 5/16-18 bolts and these bolts should be tightened to a torque of 200 to 250 inch-pounds. ♦
- 5. Tighten remaining bolts evenly to a torque of 200 to 250 inch-pounds.
- 6. ♦Remove the pipe plug from the closure and install F pressure test valve with PIPETITE-STIK* compound on threads, and tighten to a torque of 50 to 75 inch-pounds maximum.♦
- 7. Apply a back pressure of 5 psi and flash test closure to check for leaks.
- 8. Remove the F pressure test valve, apply PIPETITE-STIK compound to the threads of the pipe plug removed earlier, and install on closure. Tighten to a torque of 50 to 75 inch-pounds maximum.

Fig. 23-Securing Closure

^{*} Registered trademark of Lake Chemical Co.



- 1. Place the cover half with bolts in position, being careful not to disturb sealing cord.
- 2. Engage four end bolts by hand, then tighten evenly until covers are 1/4 inch apart.
- 3. Tighten four end bolts to a torque of 75 to 100 inch-pounds.
- 4. Place and tighten T-bolt clamps to a torque of 75 to 100 inch-pounds.
- 5. Remove the pipe plug from the closure and install F pressure test valve with PIPETITE-STIK compound on threads and tighten to a torque of 50 to 75 inch-pounds maximum.
- 6. Apply a back pressure of 5 psi and flash test the closure to test for leaks.
- 7. Remove the F pressure test valve, apply PIPETITE-STIK compound to the threads of the pipe plug removed earlier, and install on closure. Tighten to a torque of 50 to 75 inch-pounds maximum.

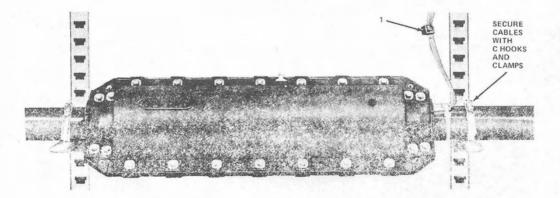
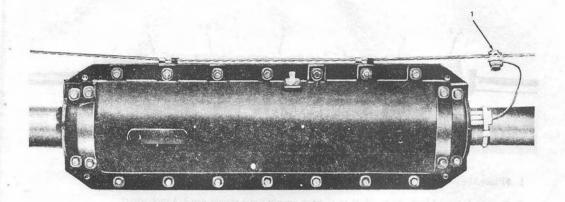


Fig. 24-\$Securing 50AA3 Closure

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

Fig. 25 - Grounding Closure in Manhole



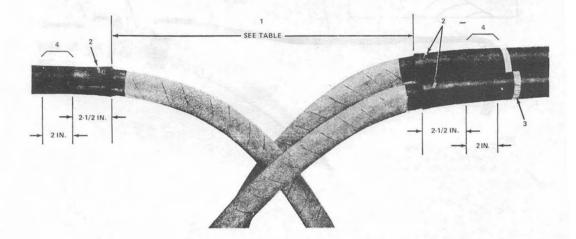
1. Using a C connector or B strand clamp, attach bonding ribbon to strand.

Fig. 26—Grounding Closure to Strand

51-Type Closure

3.03 Prepare cable sheaths and install 51-type closure as outlined in Fig. 27 through 32.

CLOSURE	SHEATH OPENING INCHES	
51AA3	13.0	
5183	19.0	
51D3	19.0	

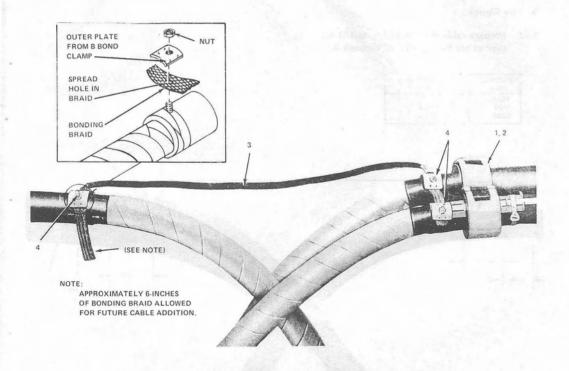


- Mark cable sheath for proper sheath opening, then remove outer jacket and metallic shield from each cable end.
- Install inner plate of B bond clamp on top of each cable as outlined in Section 081-852-118. Do not install outer plate at this time.
- Using B measuring tape furnished with closure, measure diameters of cables and select sealing washers per Table B.

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

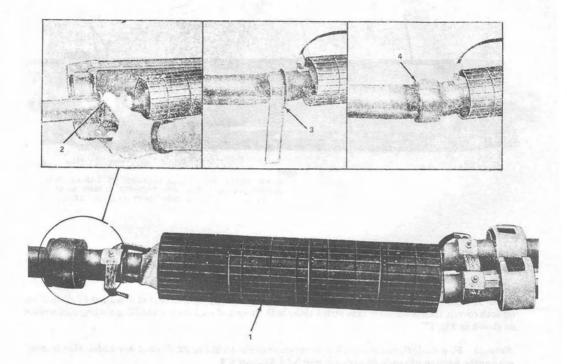
4. #Using solvent wipes, remove any residue from cable sheath with solvent wipes; then using abrasive strip or carding brush, scuff around the cable sheath on each side of sheath opening. Remove scuffing debris from cable sheath.

Fig. 27—Preparation of Cable Sheath



- 1. Place ground strap on one cable sheath as outlined in Fig. 16.
- Place sealing washers on adjacent cable and using 1-1/2 inch wide B sealing tape build up a collar as outlined in Fig. 16. 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 with 9-inch side-cutting pliers.

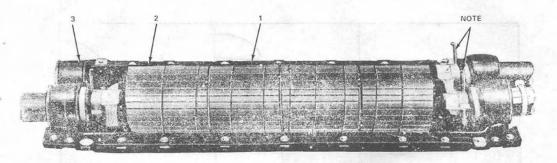
Fig. 28-Bonding Cable Sheath



- 1. Splice cables and wrap the splice using splice wrapper and secure with cable ties.
- 2. Locate next 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 sealing washer.
- 4. 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. 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. 20 or 21.

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. \$\psi Toothed clamps are not required for the 51AA3 closure or in other closure with cables less than 1 inch in diameter; however, sealing clamps are required for proper sheath retention in this application.\$\psi\$

Fig. 29—Locating and Placing Collar on Side of Splice Opposite Ground Strap

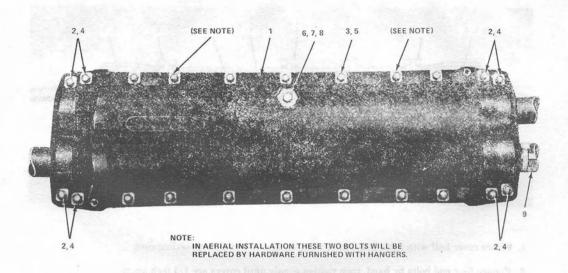


NOTE:

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.

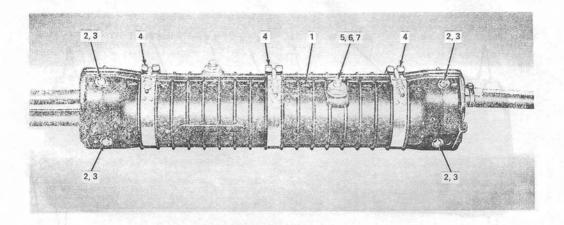
- Thoroughly clean the sealing surface of the two cover halves with solvent wipes to remove any oil, grease, dirt, filings, moisture, etc. Remove the release paper from the collars, then place the cover half with threaded inserts flush against the collar.
 - **Note 1:** If Kit of Parts D-180995 (reentry 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. 17.
 - Note 2: \$\text{\$\text{\$\$}\$Use cable ties to hold cables in rear cover as shown in Fig. 22. Do not use cable ties to permanently secure closure to strand; use 54A hangers. \$\text{\$\$}\$
- 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 HX or JX washers in any unused opening of closures except when using reentry seal, then use FO, GO, JO, or HO sealing washers.

Fig. 30—Placing 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 to 250 inch-pounds.
- 5. Tighten remaining bolts evenly to a torque of 200 to 250 inch-pounds.
- 6. Remove the pipe plug from the closure and install F pressure test valve with PIPETITE-STIK compound on threads and tighten to a torque of 50 to 75 inch-pounds maximum.
- 7. Apply a back pressure of 5 psi and flash test closure to check for leaks.
- 8. Remove the F pressure test valve, apply PIPETITE-STIK compound to the threads of the pipe plug removed earlier and install on closure. Tighten to a torque of 50 to 75 inch-pounds maximum.
- 9. Ground closure as outlined in Fig. 25 or 26.

Fig. 31-Securing 51B3 or 51D3 Closure



- 1. Place cover half with bolts in position being careful not to disturb sealing cord.
- 2. Engage four end bolts by hand, then tighten evenly until covers are 1/4 inch apart.
- 3. Tighten end bolts to a torque of 75 to 100 inch-pounds.
- 4. Place and tighten T-bolt clamp to a torque of 75 to 100 inch-pounds.
- Remove the pipe plug and install F pressure test valve with PIPETITE-STIK compound on threads. Tighten to a torque of 50 to 75 inch-pounds maximum.
- 6. Apply a back pressure of 5 psi and flash test closure to check for leaks.
- 7. Remove the F pressure test valve, apply PIPETITE-STIK compound to the thread of the pipe plug removed earlier, and install on closure. Tighten to a torque of 50 to 75 inch-pounds maximum.

Fig. 32-Securing 51AA3 Closure

4. OPENING AND REASSEMBLING

4.01 Loosen the bolts on the closure.

♦ Note: On the 50AA3 and 51AA3 closure, remove the T-bolt clamp first, then loosen the remaining bolts. •

4.02 Insert four dog point 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 cover halves are free from the cable (Fig. 33).

4.03 Remove the closure from the cable.

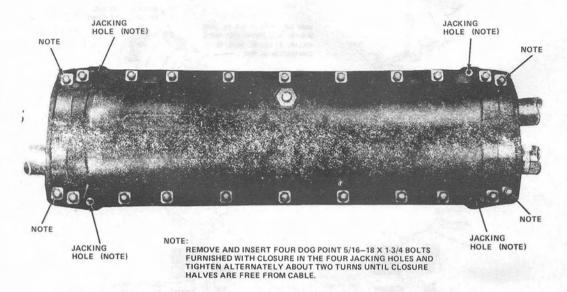
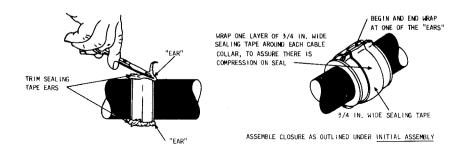


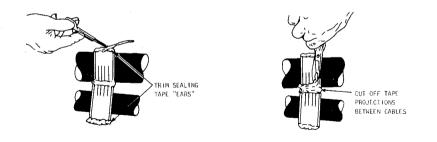
Fig. 33-Reentering Closure

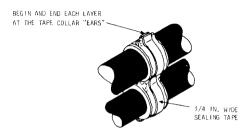
- 4.04 If reentry seal was used, reassemble closure as shown in Fig. 34.
- **4.05** Remove sealing tape and sealing washers from cable sheath and discard.
- 4.06 Install new sealing washers and sealing tape collars on the cable sheath as outlined herein.
- 4.07 Clean sealing cord and sealing tape from removed closure and replace over splice as outlined herein.

REASSEMBLY OF 50 TYPE CLOSURE



REASSEMBLY OF 51 TYPE CLOSURE





ASSEMBLE CLOSURE AS OUTLINED UNDER INITIAL ASSEMBLY

Fig. 34—Installation of Closure Using D-180995 Kit of Parts