

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

SECTION G50.725.2
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AT&TCo Standard

SPLICE CASES — BURIED
20 AND 21 TYPES
ISOLATION OF METAL SHIELD
ALPETH SHEATH PIC CABLES

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1. GENERAL

1.01 This section describes the method of installing 20- and 21-Type Splice Cases on alpeth sheath buried PIC cables. The section is reissued to include a new and improved material to isolate the metal shield from the splice cases. The new material, Mylar Tape, is of higher dielectric and smaller bulk and permits full size cables to be more easily installed in the cases. This tape must be ordered separately.

1.02 **Only galvanized cast iron splice cases shall be used in buried plant.** The methods outlined in this practice shall be followed in installing splice cases **on all buried alpeth sheath PIC cables.**

1.03 **Only C Sealing Tape and C Sealing Cord shall be used.** C Sealing Tape and Cord, made of an insulating material, are identical in appearance to B Sealing Tape and Cord except for the wrappings and the markings on the package. The materials are not interchangeable. **B Sealing Tape and Cord are made of a semiconducting material** and are for use only on aerial and underground splice case installations.

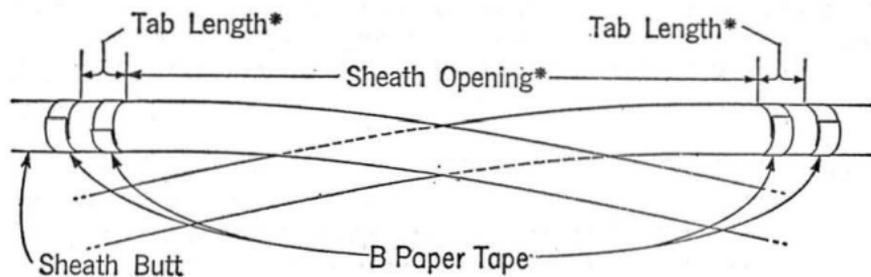
1.04 If corrosion protection is to be applied to the splice cases it will be specified in the detailed plans.

1.05 If the cable has mechanical protection in the form of tape or wire armor it shall be made continuous across the splice opening as outlined in Section G56.608.2. **Remove only enough of the mechanical protection so that when the splice case installation is completed the tape or armor will extend to within one-half inch of the case at each end.**

2. PREPARATION OF SHEATH ENDS

2.01 **Before removing the sheath the cables should be set up and tied firmly in position with the cables straight and in line for a minimum length of 8 inches from the sheath butt.**

2.02 Place paper tape markers on the sheath. Make sure that the distance between the outer tape markers is as given in the table in Fig. 1. **This is a critical dimension. It should be checked regularly during all succeeding operations because the assembly of the splice cases depends on holding this dimension accurately.**



* See Par. 1.02-G50.700.2

<u>Splice Case Code Number</u>	<u>Distance between Outer Tape Markers</u>
20A2	16
21A2	18 $\frac{3}{4}$
20B2	19
21B2	20 $\frac{3}{4}$
20C2, 20D2	21 $\frac{1}{2}$
21C2, 21D2	21 $\frac{1}{2}$

Fig. 1

Note: At openings in straight cable such as at load points it is desirable to make the original sheath opening approximately 1 inch shorter to allow for creeping of the sheath.

2.03 Remove polyethylene sheath between inner paper tape markers. **Do not disturb underlying metal shield.** Remove inner tape markers. Then select and place over the sheath the proper size sealing washers from the tables in Paragraph 2.01 of Section G50.700.2.

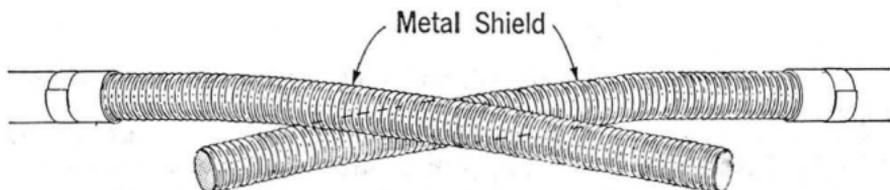


Fig. 2

Note: The washer sizes in the table are furnished as a guide. Because of variations in sheath diameters from the nominal sizes it may be necessary to use washers one size smaller or larger than those indicated.

2.04 With the tabbing shears make 6 or 8 longitudinal cuts, depending on the cable size through the polyethylene sheath to the edge of the paper tape markers. Avoid injuring the metal shield. Fold the tabs back and tape.

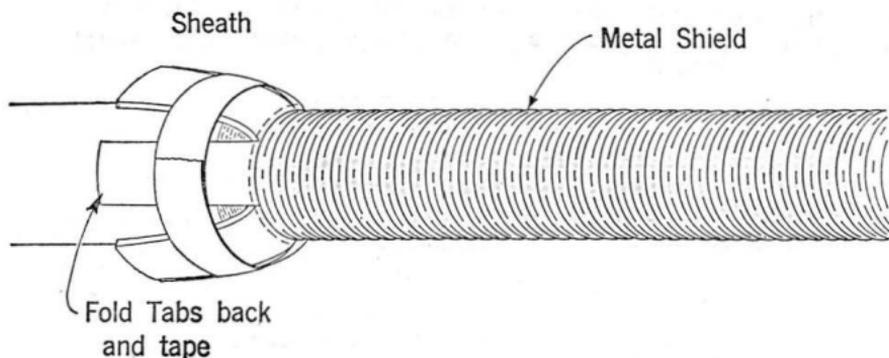


Fig. 3

2.05 Remove metal shield as described in note following Fig. 4, except for two strips each 3/4-inch minimum width and no more than 1 inch wide. Allow the greatest practicable separation between the two strips. Avoid injuring the core wrap.

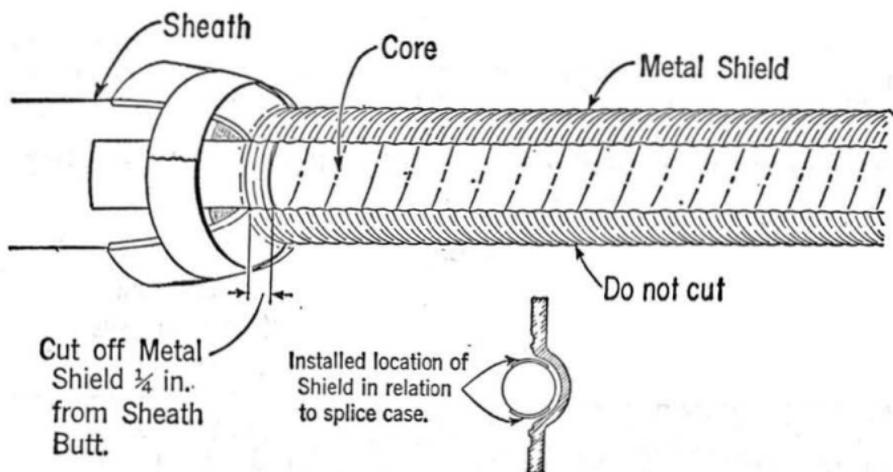


Fig. 4

Note: The metal shield can be readily peeled back by making a short longitudinal cut one inch from the exposed outer edge and about one inch long, then grasping the narrow strip and peeling it back about 6 inches at each pull to the sheath butt. The entire metal shield can be peeled back to the sheath butt in 3/4-inch wide strips, using this method. None of the strips should be cut off at the sheath butt until the entire metal jacket has been peeled back. Then, two strips, which will be approximately in line with the sides of the splice cases when they are installed, shall be left and the remainder trimmed as illustrated in Fig. 4. The metal strips can also be cut with scissors.

2.06 Carefully fold back the long metal strips and tape to the sheath. **Do not bend sharply.** Bend the short metal tabs away from the core wrapper and place a collar of two turns of 2-inch wide B Polyethylene Tape as illustrated in Fig. 5. The collar should be wrapped tightly and the inner and outer edges held in position with a short length of D Vinyl Tape.

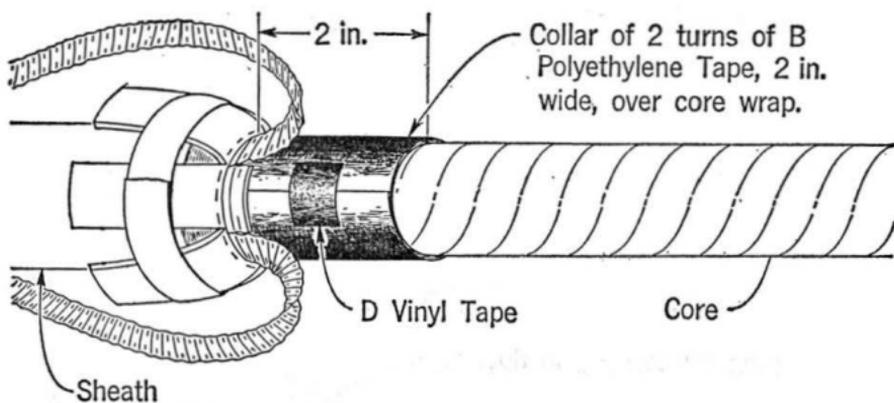


Fig. 5

2.07 Form the metal strips and tabs over the polyethylene tape. **Tap the strips and tabs at the sheath butt with a tack hammer to flatten any burrs or sharp edges.** Then protect the strips at the sheath butt with a collar of two turns of D Vinyl Tape.

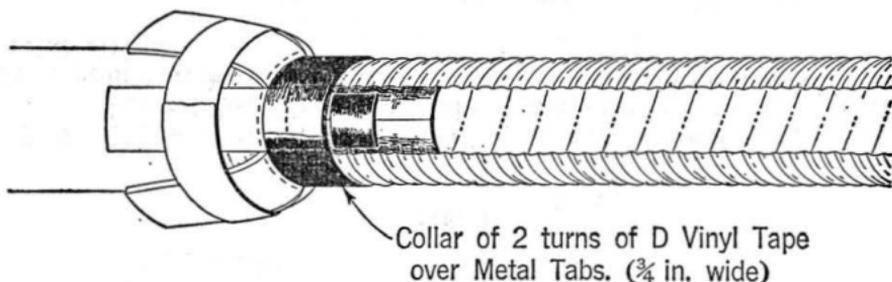


Fig. 6

2.08 Place a collar of three turns of 2-inch wide Mylar Tape over the metal and butted against the sheath. The collar should be wrapped tightly and the inner and outer edges held in position with a short length of D Vinyl Tape.

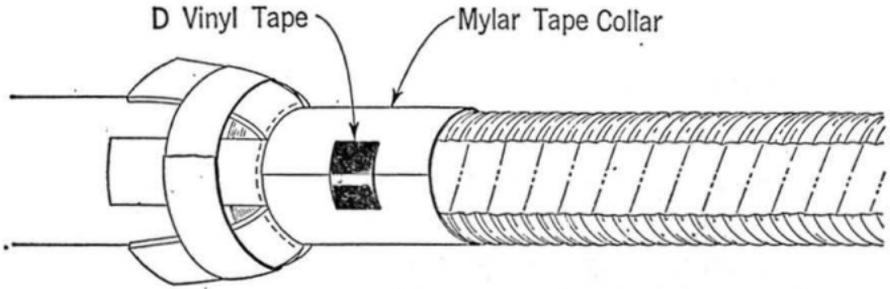


Fig. 7

2.09 Place a collar of C Sealing Cord alongside the folded back tabs. Then place the inner clamp over the Mylar Tape collar with the ears of the clamp centered between the two metal strips.

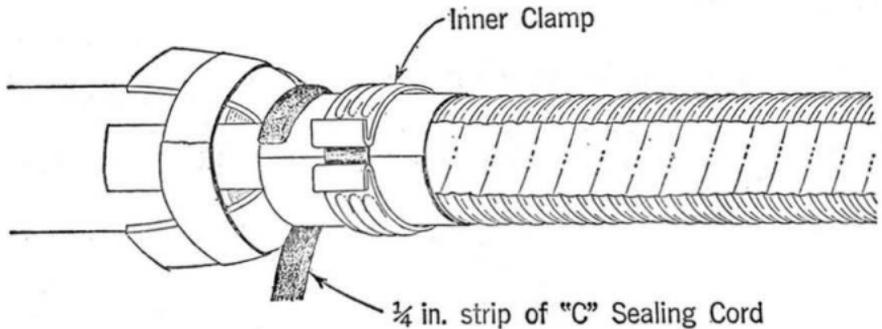
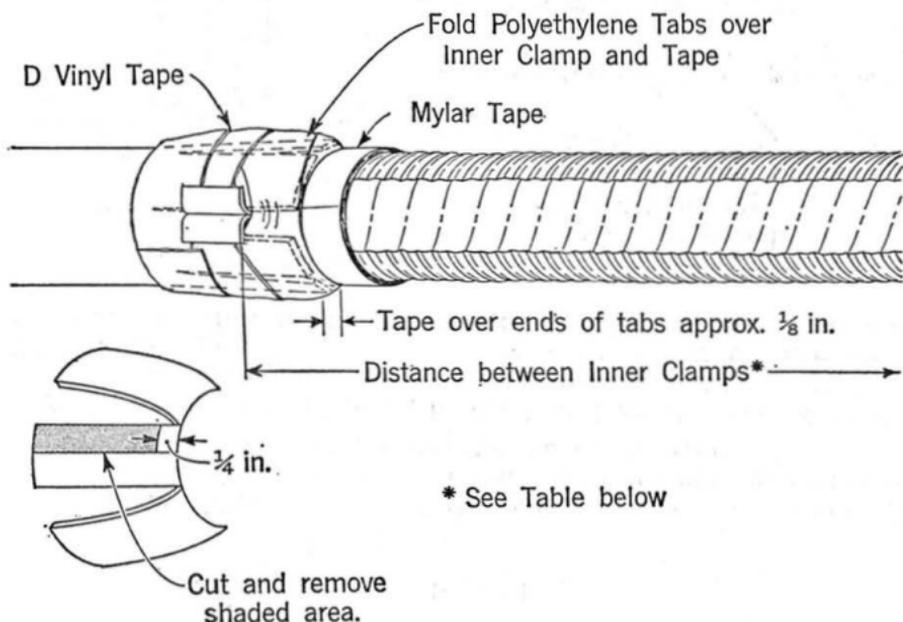


Fig. 8

2.10 Fold the sheath tabs over the inner clamp. Remove paper tape markers. It may be necessary to cut out a section of one of the tabs to make space for the ears of the clamp as illustrated in Fig. 9. The clamp should be forced back as close as possible to the sealing cord collar **but should not overlap it**. Tape the clamp in position, using only enough D Vinyl Tape to securely anchor the clamp. **Check the distance between the inner clamps.**



* See Table below

Splice Case Code Number	Distance between Inner Clamps
20A2	14 $\frac{3}{8}$
21A2	17
20B2	17 $\frac{1}{4}$
20C2, 20D2	19
21B2, 21C2, 21D2	19

Fig. 9

2.11 Carefully fold back the two metal strips and tape to the sheath so that they will not interfere with the wire work. **Do not bend sharply.**

2.12 On completion of the wire work place a collar of four turns of muslin over one end of the splice butted against the Mylar Tape.

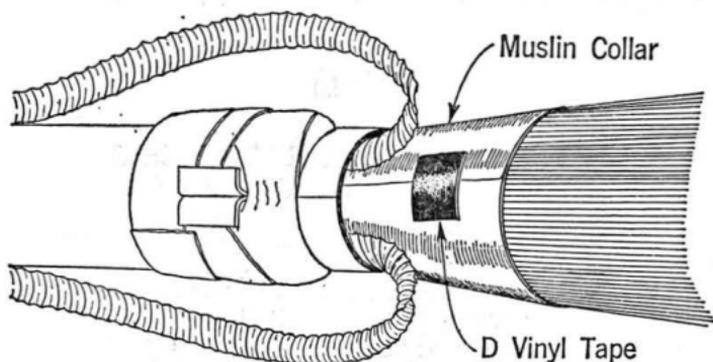


Fig. 10

Note: The purpose of the collar is to permit a free flow of air between the core and the splice case after the protective wrappings are applied to the splice.

2.13 Cover the splice with one half-lapped layer of B Polyethylene Tape followed by a half-lapped layer of muslin. The polyethylene tape should not extend beyond the end of the muslin collar placed in Paragraph 2.12 but should finish on top of it.

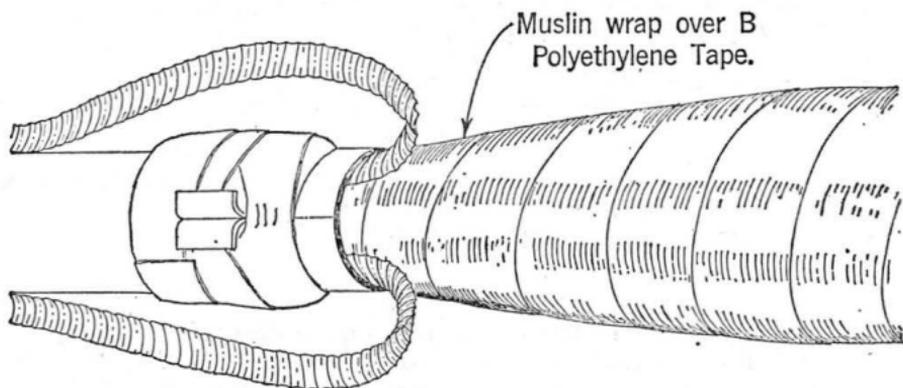


Fig. 11

2.14 Lay the metal strips across the splice opening, bolt them together at the center of the splice and tape as illustrated in Fig. 12. Any commercially available small bolt, washer and nut assembly is satisfactory.

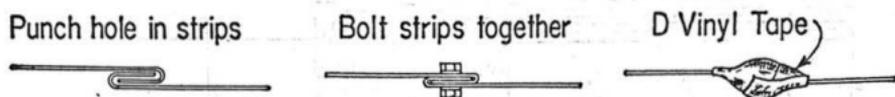


Fig. 12

2.15 Wrap the splice bundle, **including the metal strips**, with one additional half-lapped layer of B Polyethylene Tape followed by a loose half-lapped layer of muslin.

3. INSTALLING SPLICE CASE

3.01 **Thoroughly scuff** the sheath for a distance of about 2 inches, starting at the ends of the wrappings covering the inner clamp.

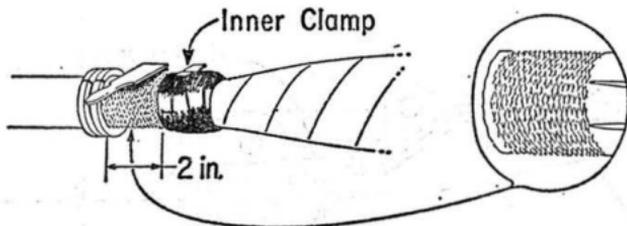


Fig. 13

3.02 Position the cable in the splice case and slide inner sealing washers in place as shown. Mark position of washers on sheath. Make sure that the inner clamps are aligned with the clamping grooves of the splice case as illustrated in Fig. 14.

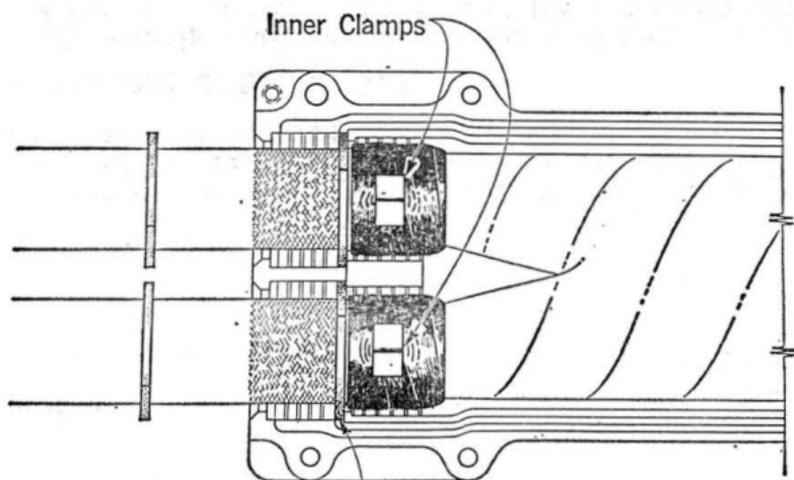
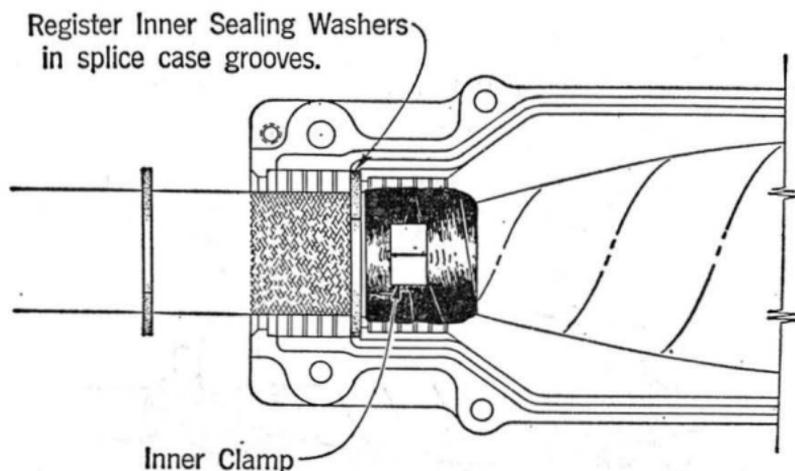


Fig. 14

3.03 Build up collars of C Sealing Tape on the 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.

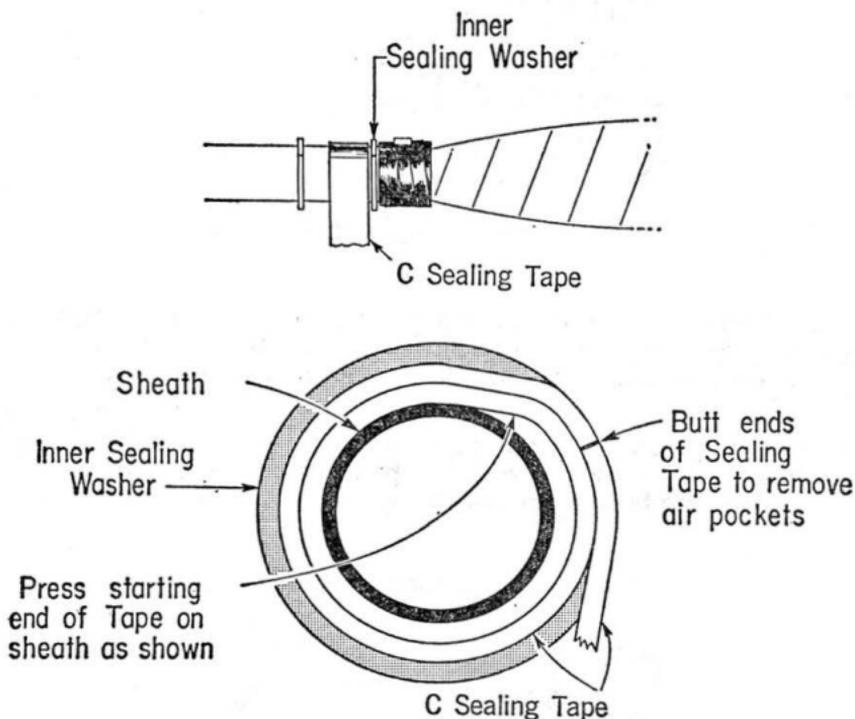


Fig. 15

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

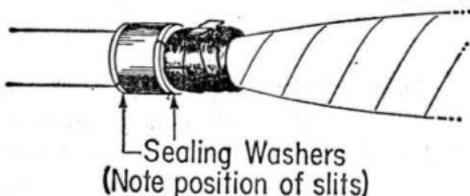


Fig. 16

3.05 If a small size cable is to be installed an adapter of the proper size and type, Section G50.700.5, shall be placed over the inner clamp as outlined in Fig. 17.

- (a) Place spacers around inner clamp with ears of clamp centered in one of the spacers.
- (b) Bind down securely with lashing wire.

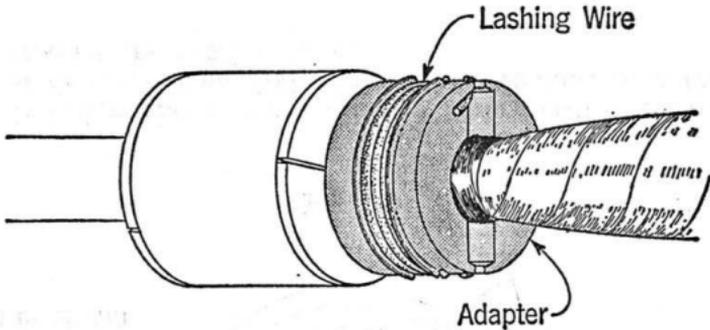


Fig. 17

3.06 Thoroughly clean the areas of the splice cases where the sealing tape and cord will seat with a clean, dry, lint-free cloth, KS-14666, soaked with a small quantity of KS-16302 cleaner.

3.07 Any unused cavity in the splice case should be filled with a plug of C Sealing Tape. A No. 100, 200, 300 or 400 sealing washer should be placed at each end of the plug.

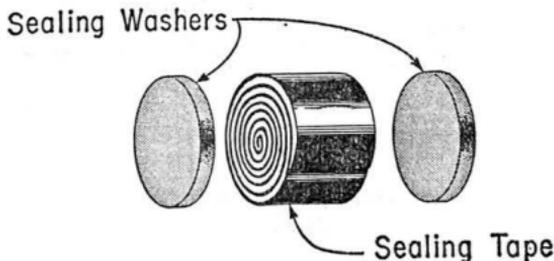


Fig. 18

- 3.08 Place the cables in one of the splice cases with the inner clamp centered in the clamping cavity. Place C Sealing Cord in the side grooves of the case.

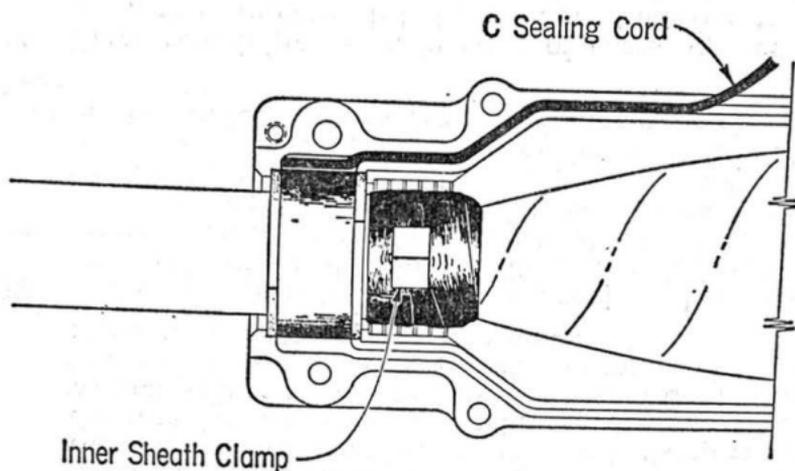


Fig. 19

- 3.09 On 21-type cases place a 1-1/2 inch length of sealing cord in each crotch.

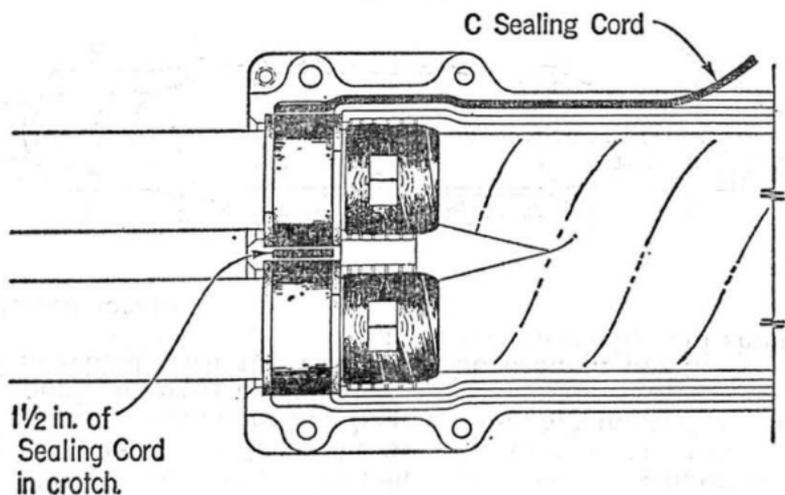


Fig. 20

3.10 Place the other case in position, being careful not to disturb the C Sealing Cord.

3.11 Place bolts in positions 3, 4, 7 and 8 as shown in Fig. 21. If full size cables are being installed the separation may be so great that it will not be possible to start the nuts on the bolts. In these instances hex headed bolts 3/8 in. x 16 x 2 inches long should be used to pull the cases together until the regular bolts provided with the cases can be used in positions 1, 2, 5 and 6. The 2-inch bolts are available commercially and should be purchased locally.

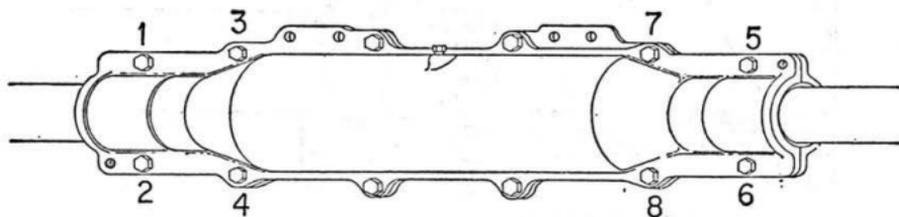


Fig. 21

Note: The cases are now ready for the all-important bolt tightening operation. Only a very light pull on the wrench is required to bring the two splice case halves together. If the bolts do not tighten with an easy pull, the washers are jamming or the sheath clamp is causing the interference. In either instance a heavy pull on the wrench will cause the cast iron to break. **Only when the two splice case halves are metal to metal is it safe to apply a heavy torque on the bolts.**

3.12 If the long bolts have been used, replace them with the standard bolts and tighten bolts 1, 2, 5, 6, 3, 4, 7 and 8 in that sequence until the splice cases are about 1/8 inch apart. **Bring the cases together evenly and never tighten any bolt more than two turns at a time. If at any time a bolt requires more than any easy turning effort, go to the next bolt. Then, if turning is still difficult, check for misalignment of clamps and washers.**

3.13 Place remaining bolts, in sides of cases, tighten hand-tight, then tighten all bolts no more than one turn at a time until **metal-to-metal contact is obtained at every bolt location.** Then continue to tighten, using **only the tools furnished with the B Wrench Kit** until all bolts are completely tight.

4. FLASH TESTING

4.01 Flash test each splice case installation after a back pressure of 5 pounds has been reached. Use B Pressure Testing solution for test.

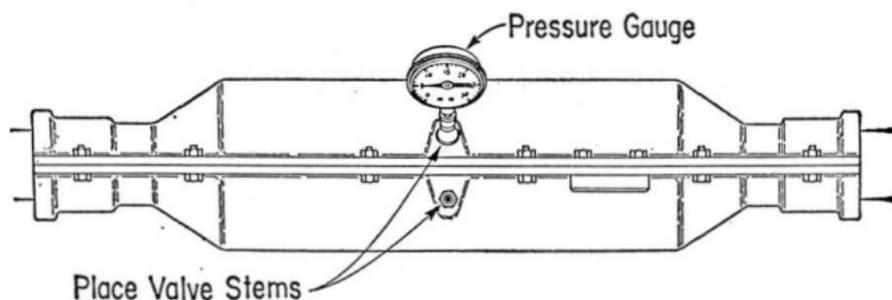


Fig. 22

4.02 Bolts may loosen due to the presence of sealing compound at the bolt location. Relaxation of this compound will completely occur during the pressure testing interval. The final operation, after pressure testing is completed and before leaving the job, should be to recheck and tighten all nuts and bolts.