

## 9A, 10A, 11A, 12A, 40E2, AND 41E2 SPLICE CASES

### DESCRIPTION AND INSTALLATION

### FOR DUAL JACKETED CABLES

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1.05 The design of the 9A, 10A, 11A, 12A, 40E2, and 41E2 splice cases provides space in the case for two seals at the sheath butt. Two seals are required on multijacketed cables such as PASP, ARPASP, PAP, ARPAP, etc. One seal is placed on the inner polyethylene jacket and the other on the outer jacket. The inner seal will prevent the flow of water into the splice in the event the outer sheath is ruptured.

1.06 Table A lists the various splice cases and contains general information about each of them.

TABLE A  
9A, 10A, 11A, 12A, 40E2, AND 41E2 SPLICE CASES

| CASE NO. | CABLE DIAMETER (INCHES) |     | NO. OF CABLES | USE    |    |        |
|----------|-------------------------|-----|---------------|--------|----|--------|
|          | MIN                     | MAX |               | AERIAL | UG | BURIED |
| 9A       | 0.3                     | 1.6 | 2             | X      | X  | X      |
| 10A      | 1.7                     | 3.0 | 2             | X      | X  | X      |
| 11A      | 0.3                     | 1.6 | 4             | X      | X  | X      |
| 12A      | 1.7                     | 3.0 | 4             | X      | X  | X      |
| 40E2     | 3.0                     | 3.5 | 2             | X      | X  | X      |
| 41E2     | 3.0                     | 3.5 | 4             | X      | X  | X      |

**1. GENERAL**

- 1.01 This section covers the description and installation of 9A, 10A, 11A, 12A, 40E2, and 41E2 splice cases for use on dual jacketed cables.
- 1.02 This section is reissued to include requirements and precautions on use of D sealing cord. Revision arrows are used to emphasize significant changes.
- 1.03 Two identical splice cases, such as two 9A cases, are required for a splice closure.
- 1.04 All buried splice cases must be protected from corrosion as outlined in Section 633-020-205.

**2. DESCRIPTION**

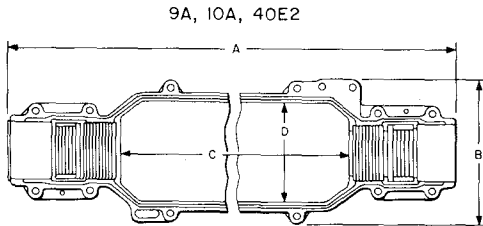
**SPLICE CASES AND FURNISHED HARDWARE**

2.01 Each splice case is shipped in an individual carton which is not waterproof and should be stored indoors. Each carton includes one half of the hardware needed for a complete splice closure.

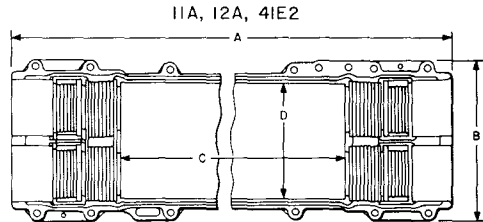
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2.02 The 9A, 10A, and 40E2 splice cases are used for straight splices. The 11A, 12A, and 41E2 splice cases which are similar in design are used for Y and double-Y splices.

2.03 Figures 1 and 2 illustrate the splice case designs and the hardware furnished with each.



| CASE | DIMENSIONS (INCHES) |           |            |         | WEIGHT (APPROX POUNDS) |
|------|---------------------|-----------|------------|---------|------------------------|
|      | OUTSIDE             |           | INSIDE     |         |                        |
|      | LENGTH (A)          | WIDTH (B) | LENGTH (C) | DIA (D) |                        |
| 9A   | 33                  | 5-5/8     | 21         | 3       | 18                     |
| 10A  | 33                  | 8-5/8     | 20         | 6       | 22                     |
| 40E2 | 33                  | 11-7/16   | 20-1/8     | 8       | 35.5                   |



| CASE | DIMENSIONS (INCHES) |           |            |         | WEIGHT (APPROX POUNDS) |
|------|---------------------|-----------|------------|---------|------------------------|
|      | OUTSIDE             |           | INSIDE     |         |                        |
|      | LENGTH (A)          | WIDTH (B) | LENGTH (C) | DIA (D) |                        |
| 11A  | 33                  | 7-3/8     | 21         | 4-1/2   | 20                     |
| 12A  | 33                  | 10        | 20         | 7       | 24                     |
| 41E2 | 33                  | 12-3/8    | 20-1/8     | 9       | 52.5                   |

Fig. 1—Splice Cases and Dimensions

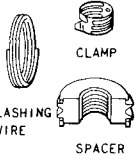





| PART   | PART NO.<br>(THIS INFORMATION SHOULD BE USED WHEN ORDERING PARTS) | USED FOR   | NUMBER (QUANTITY) OF PARTS FURNISHED WITH EACH CASE |     |     |     |      |      |
|--|---|--|---|-----|-----|-----|------|------|
|  |   |  | CASE NUMBER   |     |     |     |      |      |
|  |   |  | 9A  | 10A | 11A | 12A | 40E2 | 41E2 |
| <br>LASHING WIRE<br>CLAMP<br>SPACER | 129A ADAPTER ASSEMBLY   | INSTALLING CABLES SMALLER THAN 1 IN. DIA   | 1   |     | 2   |     |      |      |
|  | 133C ADAPTER ASSEMBLY   | INSTALLING CABLES FROM 1.7 IN. TO 2.2 IN. DIA  |   | 1   |     | 2   |      |      |
|  | A AND B ADAPTER ASSEMBLY  | INSTALLING CABLES FROM 2.3 IN. TO 2.9 IN. DIA  |   |     |     |     | 1    | 2    |
| <br>INNER SHEATH CLAMP              | P-18E117 CLAMP  | SLIDES UNDER SHEATH TABS FOR CLAMPING  | 1   |     | 2   |     |      |      |
|  | P-18E834 CLAMP  |  |   | 1   |     | 2   |      |      |
|  | P-21E429 CLAMP  |  |   |     |     |     | 1    | 2    |
| <br>BOLT 3/8 BN. 16 X 2 IN.<br>NUT  | BOLT HEX HEAD CAP 3/8 IN. - 16 X 2 IN. P-17E863                   | FOR JOINING SPLICE CASES AND SECURING COMPRESSION COLLARS                                    | 10  | 12  | 12  | 16  | 12   | 16   |
|  | NUT 3/8 IN. - 16 X 9/16 IN. P17E868                               |  | 10  | 12  | 12  | 16  | 12   | 16   |
| <br>COMPRESSION COLLARS             | P-14A860 COLLAR   | TWO PIECE COLLAR WHICH COMPRESSES SEALING TAPE BETWEEN WASHERS TO FORM AND SEAL AROUND CABLE |   | 2   |     | 4   |      |      |
|  | P-15A078 COLLAR   |  | 2   |     | 4   |     |      |      |
|  | P-21E430 COLLAR   |  |   |     |     |     | 2    | 4    |
| <br>1/8 IN. PIPE PLUG             | P-13A314 PLUG   | PRESSURE TESTING FITTING   | 3   | 3   | 5   | 5   | 3    | 5    |
| <br>STAINLESS STEEL WASHER        |   | PLACED BETWEEN BOLT AND COMPRESSION COLLAR   | 2   |     | 4   |     | 0    | 0    |

Fig. 2—Splice Case Parts

## HARDWARE AND MATERIALS NOT FURNISHED

TABLE B

**2.04** The hardware and materials covered in paragraphs 2.05 through 2.10 are not furnished with the splice cases and must be ordered as required.

**Sealing Washers**

**2.05** The sealing washers AT-8583 listed in Table B are flat circular discs made of polypropylene. The G-O, J-O, K-O, J-X, and K-X sealing washers are solid discs for sealing unused splice case openings; the G, J, and K series sealing washers are provided with holes varying in 0.1-inch diameter increments to accommodate cable sizes from 0.3- to 3.5-inch diameter. The JG and KG sealing washers are recessed to accommodate the smaller G-type washers when sealing small size cables in the larger size splice cases. Sealing washers with an inner diameter from 1 inch to 3.4 inches may be cut from a KO sealing washer using the 849A sealing washer cutter as outlined in Section 081-020-136.

**2.06** Four washers or combination of washers are required for each end seal. The size of the washers required for the outer seal is shown in Table B. The sealing washers required for the inner seal are also listed in Table B, immediately above the washer sizes listed for the outer seal. As an example, on a cable 2.4 inches in diameter in a 10A or 12A splice case, two J-24 sealing washers would be required for the outer seal and two J-23 sealing washers would be required for the inner seal.

**2.07** The sealing washers are furnished four in a package; each package is marked with the name, size, and diameter of the cable with which it is used.

**Sealing Tape and Cord**

**2.08** Requirements for B sealing tape and D sealing cord are indicated in Table C. Type D sealing cord should be used in petrochemical polluted environments.

**Adapters**

**2.09** The 133A and 133B adapters are required to assemble cables less than 1.7 inches in diameter in the 10A and 12A splice cases and must be ordered separately. The 191A, 191B, and 191C adapters are required to assemble cables less than 2.3 inches in diameter in the 40E2 and 41E2 splice cases and must be ordered separately. The adapter assemblies are furnished complete and are shown in Fig. 3.

SEALING WASHERS - AT 8583 (NOTE)

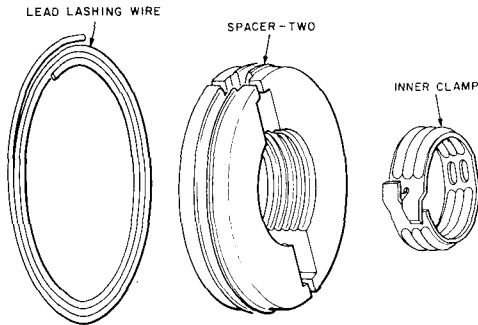
| CABLE SHEATH DIA. (IN.) | TYPE OF CASE        |                      | 40E2 & 41E2 WASHER NO. |
|-------------------------|---------------------|----------------------|------------------------|
|                         | 9A & 11A WASHER NO. | 10A & 12A WASHER NO. |                        |
| 0                       | G-0                 | J-0 or J-X           | K-0 or K-X             |
| 0.3                     | G-3                 | JG + G-3             | KG + G-3               |
| 0.4                     | G-4                 | JG + G-4             | KG + G-4               |
| 0.5                     | G-5                 | JG + G-5             | KG + G-5               |
| 0.6                     | G-6                 | JG + G-6             | KG + G-6               |
| 0.7                     | G-7                 | JG + G-7             | KG + G-7               |
| 0.8                     | G-8                 | JG + G-8             | KG + G-8               |
| 0.9                     | G-9                 | JG + G-9             | KG + G-9               |
| 1.0                     | G-10                | JG + G-10            | KG + G-10              |
| 1.1                     | G-11                | JG + G-11            | KG + G-11              |
| 1.2                     | G-12                | JG + G-12            | KG + G-12              |
| 1.3                     | G-13                | JG + G-13            | KG + G-13              |
| 1.4                     | G-14                | JG + G-14            | KG + G-14              |
| 1.5                     | G-15                | JG + G-15            | KG + G-15              |
| 1.6                     | G-16                | J-16                 | KG + G-16              |
| 1.7                     |                     | J-17                 | K-17                   |
| 1.8                     |                     | J-18                 | K-18                   |
| 1.9                     |                     | J-19                 | K-19                   |
| 2.0                     |                     | J-20                 | K-20                   |
| 2.1                     |                     | J-21                 | K-21                   |
| 2.2                     |                     | J-22                 | K-22                   |
| 2.3                     |                     | J-23                 | K-23                   |
| 2.4                     |                     | J-24                 | K-24                   |
| 2.5                     |                     | J-25                 | K-25                   |
| 2.6                     |                     | J-26                 | K-26                   |
| 2.7                     |                     | J-27                 | K-27                   |
| 2.8                     |                     | J-28                 | K-28                   |
| 2.9                     |                     | J-29                 | K-29                   |
| 3.0                     |                     |                      | K-30                   |
| 3.1                     |                     |                      | K-31                   |
| 3.2                     |                     |                      | K-32                   |
| 3.3                     |                     |                      | K-33                   |
| 3.4                     |                     |                      | K-34                   |
| 3.5                     |                     |                      | K-35                   |

◆Note: Sealing washers with an inner diameter from 1 inch to 3.4 inches may be cut from a KO sealing washer using 849A sealing washer cutter as outlined in Section 081-020-136.◆

◆TABLE C◆

B SEALING TAPE AND D SEALING CORD

| ITEM   | USE                           | QUANTITIES REQUIRED                 |
|--|-------------------------------|-------------------------------------|
| B Sealing Tape (package unit 3-10 in. strips)  | Sealing Ends of Splice Cases  | As required                         |
| D Sealing Cord (package unit 2-32 in. lengths) | Sealing Sides of Splice Cases | 1 package required per installation |



| DIAMETER OF CABLE TO BE INSTALLED | ADAPTER USED IN SPLICE CASES |             |              |
|-----------------------------------|------------------------------|-------------|--------------|
|                                   | 9A AND 11A                   | 10A AND 12A | 40E AND 41E2 |
| 0 - 1.0 INCH                      | 129A                         | 133A        | 191A         |
| 1.1 - 1.6 INCHES                  | ---                          | 133B        | 191B         |
| 1.7 - 2.2 INCHES                  | ---                          | 133C        | 191C         |
| 2.3 - 2.9 INCHES                  | ---                          | ---         | 191D         |

Fig. 3—Adapter Assemblies for 9A, 10A, 11A, 12A, 40E2, and 41E2 Splice Cases

**PIPETITE-Stik\***

2.10 PIPETITE-Stik, a commercial pipe joint compound in cylindrical form, is applied to the threads on the pipe plug each time it is removed and replaced on a splice case. One stick will make several applications.

**B Measuring Tape**

2.11 The B measuring tape (Fig. 4), made of flexible plastic, is used for measuring cable diameters. One side of the tape is calibrated to indicate cable diameters up to 4 inches, to the nearest one-tenth inch.

\* Registered trademark of Lake Chemical Co.

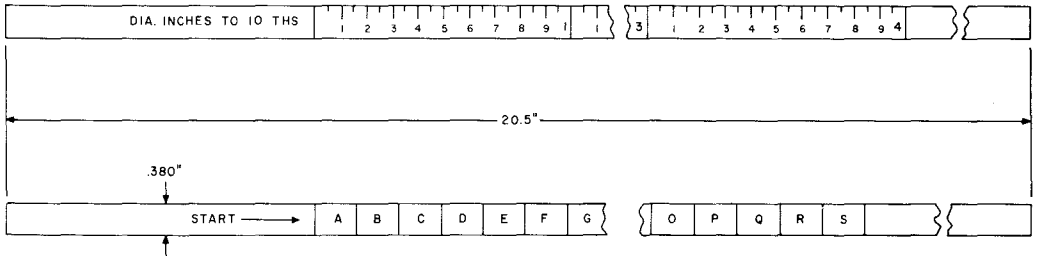


Fig. 4—B Measuring Tape

Splice Case Guide Form E-4805

2.12 The Splice Case Guide provides, in pocket form, all the information required to install various splice cases (Fig. 5).

**Note:** The Splice Case Guide lists AD cables which have been superseded by CD cables; however, the cable dimensions are the same.

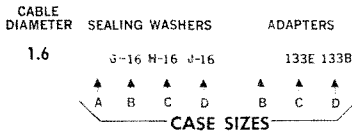
3. PREPARATION OF SHEATH OPENING AND INSTALLATION

3.01 The methods described in this section are for use on aerial, buried, and underground installations.

# SPLICE CASE GUIDE

## DIRECTIONS

- DETERMINE THE CABLE DIAMETERS FROM THE TABLES ON THE REVERSE SIDE.
- SELECT TYPE OF CASE FROM "CODING."
- SLIDE INNER CARD UNTIL THE LARGER CABLE DIAMETER APPEARS IN THE SLOT.
  - (A) THE NUMBER WHICH APPEARS OPPOSITE THE CASE SIZE SELECTED IN 2 IS THE PROPER SEALING WASHER.
- FOR MULTIPLE TYPE CASES RESET INNER CARD TO DIAMETER OF THE SMALLER CABLE.
  - (A) THE TYPE ADAPTER WILL APPEAR OPPOSITE THE CASE SIZE SELECTED IN 2.
  - (B) THE TYPE SEALING WASHER WILL APPEAR OPPOSITE THE CASE SIZE SELECTED IN 2.



- ON REVERSE SIDE DETERMINE THE SHEATH OPENING, TAB LENGTH AND DISTANCE BETWEEN SEALING WASHERS FOR THE TYPE CASE BY SETTING THE SLIDE TO THE LARGER CABLE DIAMETER.

## CODING

- 20 OR 30 STRAIGHT SPLICE
- 21 OR 31 MULTIPLE SPLICE
- A CABLE 0.3-1.6 DIAMETER
- B CABLE 1.1-1.6 DIAMETER
- C CABLE 1.7-2.7 DIAMETER
- D CABLE 2.3-3.0 DIAMETER
- 1 ALUMINUM
- 2 GALVANIZED CAST IRON

## PLASTIC

|     | ALPETH |      |      |      | PAP OR PASP |     |     |     |
|-----|--------|------|------|------|-------------|-----|-----|-----|
|     | BKTA   | BKMA | BHAA | BHBA | BKT         | BKM | BHA | BHB |
| GA  | 26     | 24   | 22   | 19   | 26          | 24  | 22  | 19  |
| 11  | 4      | 4    | 5    | 6    | 5           | 5   | 6   | 7   |
| 16  | 4      | 5    | 6    | 7    | 5           | 6   | 7   | 8   |
| 25  | 5      | 6    | 6    | 8    | 6           | 7   | 7   | 10  |
| 50  | 6      | 7    | 8    | 11   | 7           | 8   | 10  | 12  |
| 75  | 7      | 8    | 10   | 13   | 8           | 10  | 11  | 14  |
| 100 | 8      | 10   | 11   | 15   | 9           | 11  | 12  | 17  |
| 150 | 9      | 11   | 13   | 18   | 10          | 12  | 14  | 20  |
| 200 | 10     | 12   | 15   | 20   | 11          | 14  | 17  | 23  |
| 300 | 12     | 15   | 18   | 25   | 13          | 16  | 20  | 26  |
| 400 | 14     | 17   | 21   |      | 15          | 18  | 22  |     |
| 600 | 17     | 20   | 25   |      | 18          | 21  | 26  |     |
| 900 | 20     | 24   |      |      | 21          | 26  |     |     |

|            |    |                                |                |                               |    |                                |                                  |
|------------|----|--------------------------------|----------------|-------------------------------|----|--------------------------------|----------------------------------|
| 1.6        | 16 | 17 <sup>3</sup> / <sub>8</sub> | —              | 1 <sup>1</sup> / <sub>2</sub> | 19 | 20 <sup>3</sup> / <sub>4</sub> | —                                |
| CABLE DIA. | 20 | 21                             | 30-31          | TAB LENGTH                    | 20 | 21                             | 30-31                            |
|            |    |                                | SHEATH OPENING |                               |    |                                | DISTANCE BETWEEN SEALING WASHERS |

## PULP

|      | LEAD |      |      | STALPETH |      |      | PASP |      |      |      |      |      |
|------|------|------|------|----------|------|------|------|------|------|------|------|------|
|      | ADTL | ADMJ | ADAL | ADBL     | ADTC | ADMC | ADAC | ADBC | ADTH | ADMH | ADAH | ADBH |
| GA   | 26   | 24   | 22   | 19       | 26   | 24   | 22   | 19   | 26   | 24   | 22   | 19   |
| 300  | 1.0  | 1.3  | 1.6  | 2.2      | 1.1  | 1.3  | 1.7  | 2.3  | 1.3  | 1.5  | 1.9  | 2.6  |
| 400  | 1.2  | 1.4  | 1.8  | 2.5      | 1.3  | 1.5  | 1.9  | 2.7  | 1.4  | 1.7  | 2.1  | 2.9  |
| 450  | —    | —    | —    | 2.7      | —    | —    | —    | 2.8  | —    | —    | —    | 3.0  |
| 600  | 1.4  | 1.7  | 2.2  |          | 1.5  | 1.8  | 2.3  |      | 1.7  | 2.2  | 2.5  |      |
| 900  | 1.7  | 2.1  | 2.6  |          | 1.8  | 2.2  | 2.7  |      | 2.0  | 2.4  | 2.9  |      |
| 1100 | —    | —    | 2.9  |          | —    | —    | 3.0  |      | —    | —    | —    |      |
| 1200 | 1.9  | 2.4  |      |          | 2.0  | 2.5  |      |      | 2.3  | 2.7  |      |      |
| 1500 | 2.2  | 2.6  |      |          | 2.3  | 2.8  |      |      | 2.5  | 3.0  |      |      |
| 1800 | 2.4  | 2.9  |      |          | 2.5  | 3.0  |      |      | 2.7  |      |      |      |
| 2100 | 2.5  |      |      |          | 2.6  |      |      |      | 2.9  |      |      |      |
| 2400 | 2.7  |      |      |          | 2.8  |      |      |      | 3.0  |      |      |      |
| 2700 | 2.9  |      |      |          | 3.0  |      |      |      |      |      |      |      |

DIAMETERS OF TABLES NOT COVERED IN THE ABOVE TABLES SHOULD BE DETERMINED USING THE 3 MEASURING TAPE AT R234

Fig. 5—Splice Case Guide, Form E-4805

**SHEATH PREPARATION**

**3.02** The cables must be set up and secured firmly in position with the cable 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 conductors.

**3.03** Determine the diameters of the cables to be spliced, using the B measuring tape (Fig. 4) or Splice Case Guide, Form E-1805 (Fig. 5).

**3.04** Select the proper size sealing washers or combination of sealing washers from Table B and slip two on each cable away from the sheath opening. For cables which have not been cut, place these washers over the cables and slip out of the way.

**Note:** The tightness of the end seals is dependent upon the correct washer size.

The circular hole in the washer should fit as close to the cable as possible. The packages containing the washers specify the size of cable for which they were designed. However, if the cable is oversize or undersize, a better fit can be obtained by using the next larger or smaller size washer. Cables that are oval or flattened will become rounded by the pressure of the sealing washers during the installation of the splice cases.♦

**3.05** Table D gives pertinent dimensions required in the sheath preparation and installation of 9A, 10A, 11A, 12A, 40E2, and 41E2 splice cases.

**3.06** Mark the center of the splice. Then place B paper tape markers on the jacket as illustrated in Fig. 6.

**3.07** See DANGER below. Remove the jacket between inner tape markers exposing the core wrapper. Remove the intermediate tape markers (Fig. 7).

**DANGER: Gloves must be worn when handling the metal shield to avoid injury.**

**3.08** Remove 2-1/4 inches of outer jacket and underlying metal up to tape markers as illustrated in Fig. 8. Then remove inner tape markers.

**3.09** Make equally spaced longitudinal cuts through the outer jacket to the edge of the remaining tape marker as shown in Fig. 9. The cuts should be made through the polyethylene and metal layers. Avoid injuring the inner polyethylene jacket. Tab lengths are purposely made one inch longer to facilitate binding the tabs over the inner sheath clamp. Tabs will ultimately be trimmed back as outlined in paragraph 3.14.

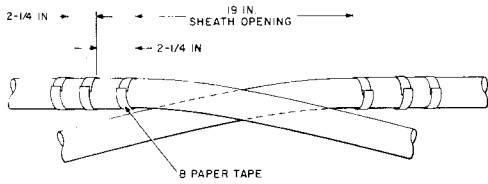
**3.10** Cut out and remove a section of one tab to accommodate the inner clamp as illustrated in Fig. 9. Leave a 1/4-inch width to assist in limiting the inward travel of the clamp. The ears of the inner clamp must fall in the center of one of the cases after assembly to ensure good electrical contact with the splice case.

TABLE D

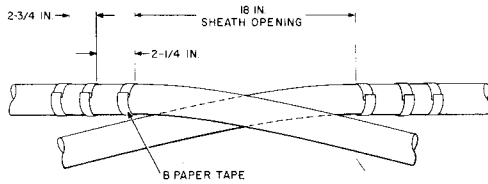
SHEATH PREPARATION DIMENSIONS (INCHES)

| SPLICE CASE NO. | SHEATH OPENING | FINAL TAB LENGTH (NOTE) | BETWEEN OUTER MARKERS | BETWEEN INNER SEALING WASHERS | BETWEEN INNER CLAMPS (APPROX) | MAX CABLE SHEATH DIA |
|-----------------|----------------|-------------------------|-----------------------|-------------------------------|-------------------------------|----------------------|
| 9A<br>11A       | 19             | 1-1/4                   | 28                    | 21-1/2                        | 26-1/2                        | 1.6                  |
| 10A<br>12A      | 18             | 1-3/4                   | 28                    | 20-1/2                        | 25-1/2                        | 3.0                  |
| 40E2<br>41E2    | 18             | 1-3/4                   | 28                    | 20-1/2                        | 25-1/2                        | 3.5                  |

**Note:** Tabs are initially cut one inch longer, then trimmed to final length after taping.



FOR 9A AND IIA SPLICE CASE



FOR 10A, 12A, 40E2, AND 41E2 SPLICE CASE

Fig. 6—Marking Sheath Using Paper Tape Markers

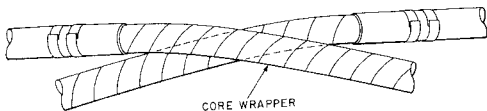


Fig. 7—Jacket Removed Between Inner Tape Markers

3.11 Prior to removing the core wrapper from the cable core of ARPAP- and ARPASP-sheathed cables, form a vinyl tape insulating collar over the core wrapper at each end of the sheath opening as follows:

- (1) Place two turns of vinyl tape around the core wrapper with the adhesive side out.
- (2) Slide this collar halfway under the end of the inner aluminum moisture barrier.
- (3) Place two wraps of vinyl tape over the exposed vinyl collar and over 1/2 inch of the polyethylene layer.

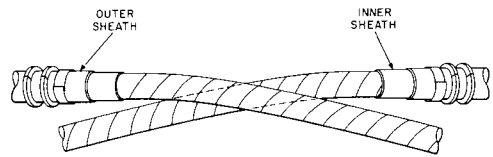


Fig. 8—2-1/4 Inches of Outer Jacket Removed

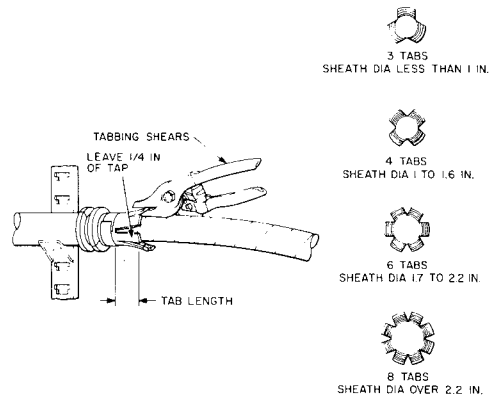


Fig. 9—Cutting Tabs

3.12 Make sure the distance between the remaining tape markers is 28 inches. Remove the paper tape markers (Fig. 10).

3.13 Slip the inner sheath clamp under the tabs with the ears extending from the slot from which the half tab was removed (Fig. 11). If a small cable is to be installed in the splice case, an inner sheath clamp of the proper size will be furnished with the adapter assembly (Fig. 3).



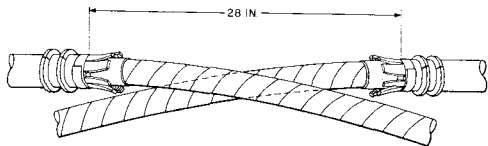


Fig. 10—Verifying Opening Length

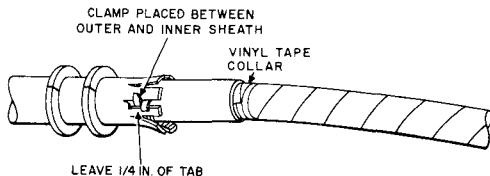


Fig. 11—Inner Clamp Placed

3.14 Bind down the tabs with at least two layers of vinyl tape to hold the clamp firmly in place. Position the other inner clamp at the correct spacing and bind down the tabs. Do not cover the projecting ears of the clamps because this will prevent electrical connection with the splice case and bonding of the metal shield (Fig. 12). Do not wrap tape over the clamping area. ***Tape buildup will interfere with the seating of the inner sheath clamp in the splice case halves.*** After taping, remove the excess 1 inch of tab length.

3.15 Place a **B** temporary bond across the splice opening (Fig. 12).

3.16 Check the separation between the ears of the inner sheath clamps. The correct distance between clamps can be determined from Table D.

3.17 Sheath preparation for Y or double-Y splices is the same as described in paragraphs 3.01 through 3.14.

3.18 Using Table B and the B measuring tape, select the proper size of inner sealing washers and position on the core next to the inner sheath ends.

## INSTALLATION

3.19 After the wire joining has been completed, wrap the completed splice in the usual manner. Muslin, loose desiccant, or any other water-absorbent materials should not be used in splice cases containing all plastic-insulated conductors.

3.20 Thoroughly clean the sheath in the area where the sealing tape will be placed with a clean, dry, lint-free KS-14666 cloth moistened with a small quantity of B cleaning fluid. Remove with a carding brush any deep scratches caused in the placing operation.

3.21 Thoroughly scuff the sheath as illustrated in Fig. 13.

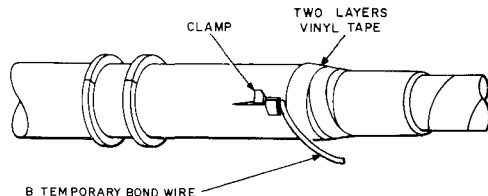


Fig. 12—Binding Tab Ends Down—Excess Tab Length is Now Trimmed Off

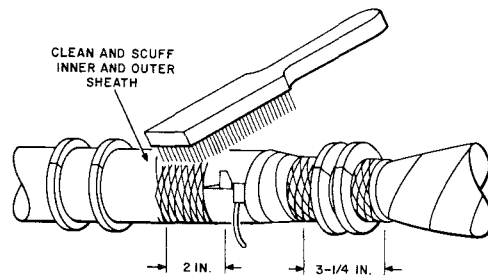


Fig. 13—Scuffing Inner and Outer Jacket

**3.22** Using the splice case as a template, position the washers so they register properly in the splice case grooves (Fig. 14). Mark the jacket.

**3.23** Remove the splice case and check the position of the washers on either side of the inner sheath clamp with the marks on the cable jacket. See Caution below. Build up collars of B sealing tape on the inner and outer jacket adjacent to the washers, equal to or slightly larger than the washers. Butt all joints between sealing tape strips (Fig. 15).

**Caution:** ♦The B sealing tape and D sealing cord should be kept clean and should not be stretched. Do not handle tape or sealing cord with damp or oily hands. Do not heat sealing tape or sealing cord directly in the airflow of heater or blower. This reduces the adhesion to the cable sheath. If heating is required, place in a warm location prior to use.♦

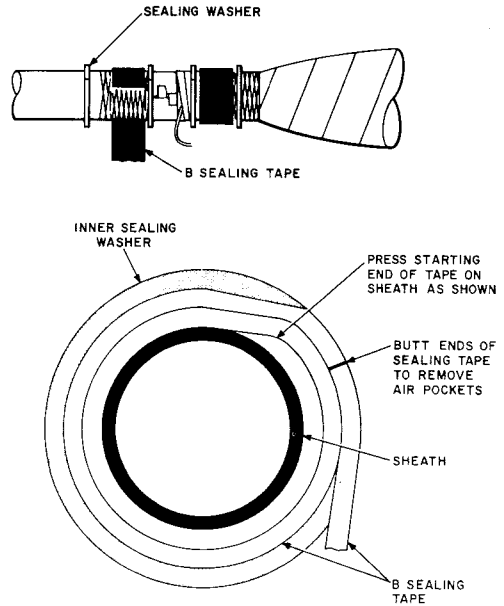


Fig. 15—Placing B Sealing Tape

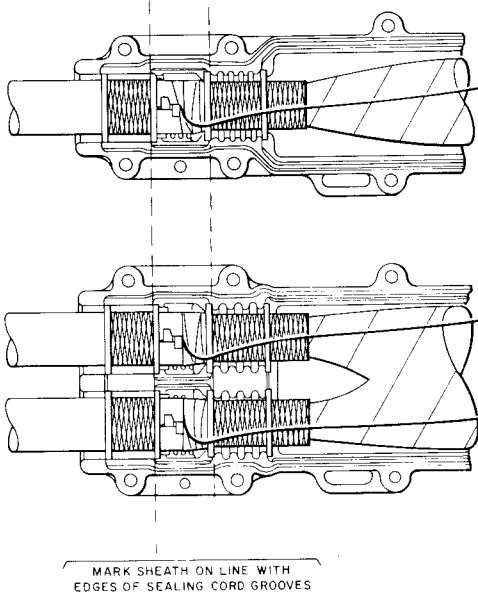


Fig. 14—Using Splice Case as a Template

**3.24** Position the outer washers on the outer seal and the inner washers on the inner seal, butted against the B sealing tape, as shown in Fig. 16. Rotate the washers at the ends of each seal so that the slits are 180 degrees apart and coincide with the flange level of the splice case. Then wrap a collar of D vinyl tape about 1/2 inch wide around the inner jacket, closing the opening between the sheath and the sealing washer.

**3.25** Remove the temporary bond. The splice case will become the permanent bond.

**3.26** If a small size cable is being installed, an adapter of proper size and type shall be placed on the cable to provide contact with the case for bonding as follows:

- (1) Place spacers around the inner clamp with the ears of clamp centered in one of the spacers.
- (2) Bind down securely with three turns of lashing wire placed in the grooves provided in the spacers for that purpose (Fig. 17).

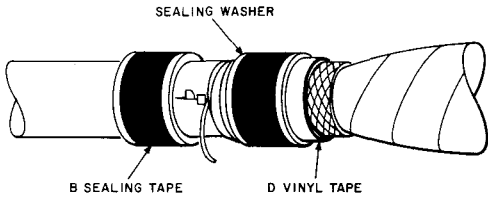


Fig. 16—Sealing Washers in Place

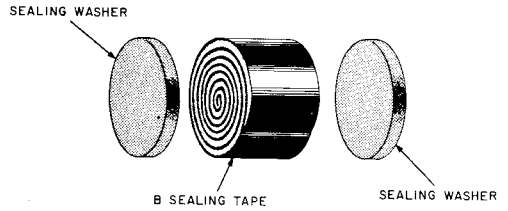


Fig. 25 - Sealing Tape Plug

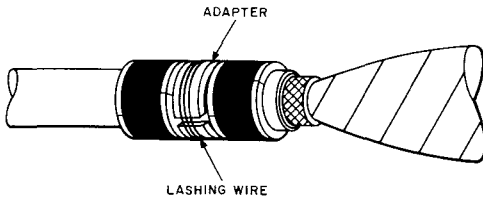


Fig. 17—Adapter Installed

Fig. 18—B Sealing Tape Plug

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

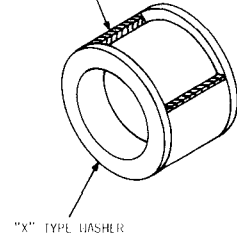


Fig. 19—J-X and K-X Sealing Washer for Sealing Vacant Opening in Splice Case

3.27 An unused cavity in the splice case can be filled with a plug of B sealing tape and a solid sealing washer of the proper diameter placed at each end of the plug (Fig. 18) or with a J-X or K-X sealing washer as shown in Fig. 19.

3.28 Thoroughly clean the sealing surface of each splice case with a clean, dry, lint-free KS-14666 cloth moistened with a small quantity of B cleaning fluid. This will ensure the removal of any oil, grease, dirt, filings, moisture, desiccant, etc.

3.29 Place the back (or bottom) splice case against the cable with the sealing washers on the cable flush against the shoulder of the housing.

3.30 Place sealing cord in the side grooves, being careful to avoid making flat spots or dents in the cord. **Do not stretch.** It may be necessary to push the B sealing tape away from the grooves at the ends in order to permit placing the  $\blacklozenge$ D $\blacklozenge$  sealing cord (Fig. 20). On Y or double-Y splice cases, place a 1-1/2 inch length of  $\blacklozenge$ D $\blacklozenge$  sealing cord in the crotch between the two inner and two outer seals on each end.

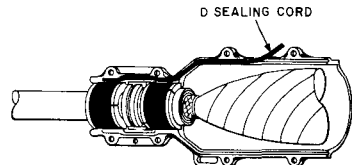


Fig. 20—Placing D Sealing Cord

- 3.31 Place the other splice case in position, being careful not to disturb the **◆D◆** sealing cord.
- 3.32 Check the bolts furnished with the splice case. If the bolts have the numeral 3 on the heads and are 2 inches long, they are satisfactory (Fig. 21). **No other bolts should be used.**
- 3.33 Place bolts in positions 1, 2, 3, 4, 5, 6, 7, and 8 as shown in Fig. 22.

**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 type case to break. Only the tools furnished with the D wrench kit and the B torque wrench should be used. **When the two splice case halves are metal to metal, it is safe to apply the recommended torque on the bolts.**

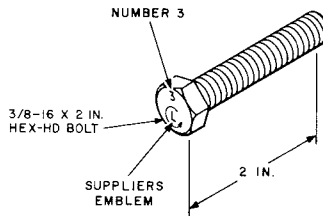


Fig. 21—Approved Splice Case Bolt

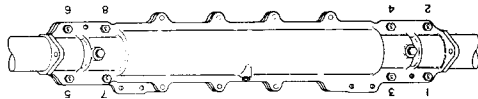


Fig. 22—Bolts Placed in Splice Case

- 3.34 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 an easy turning effort, go to the next bolt. Then, if turning is still difficult, check for misalignment of cases, washers, or sheath clamps.
- 3.35 Place the remaining bolts in sides of cases, tighten hand tight, and then tighten all bolts no more than one turn at a time until the cases are approximately 1/16 inch apart.
- 3.36 Place end collars in position and insert bolts until they completely engage the nuts. Then tighten the bolts on the sides of the case until metal-to-metal contact is obtained. The arrangement of the two types of end collars is shown in Fig. 23. The end collar shown on the straight splice is furnished with 10A, 12A, 40E2, and 41E2 cases. The end collar shown on the Y splice is furnished with 9A and 11A cases.
- 3.37 Tighten bolts on end collars uniformly. The presence of sealing tape oozing out between the sheath and the outer washers indicates that they are sufficiently tight. If the end collars pull up easily metal to metal with the splice case and there is no evidence of sealing tape, it is likely that an insufficient quantity of B sealing tape was used on the outer seal. This can usually be repaired by removing the end collars and placing an additional sealing washer of the same size adjacent to the outer washer. Replace the end collars, tighten the bolts, and again look for B sealing tape oozing out between the sheath and the outer sealing washers.
- 3.38 In addition to all of the components being metal to metal, the bolts must be tightened to a torque of 300 inch-pounds minimum to 450 inch-pounds maximum. All bolts should be checked with the B torque wrench to ensure that they are tightened within these limits.
- 3.39 When required, place a P-18A678 ground lug and secure the bonding ribbon.

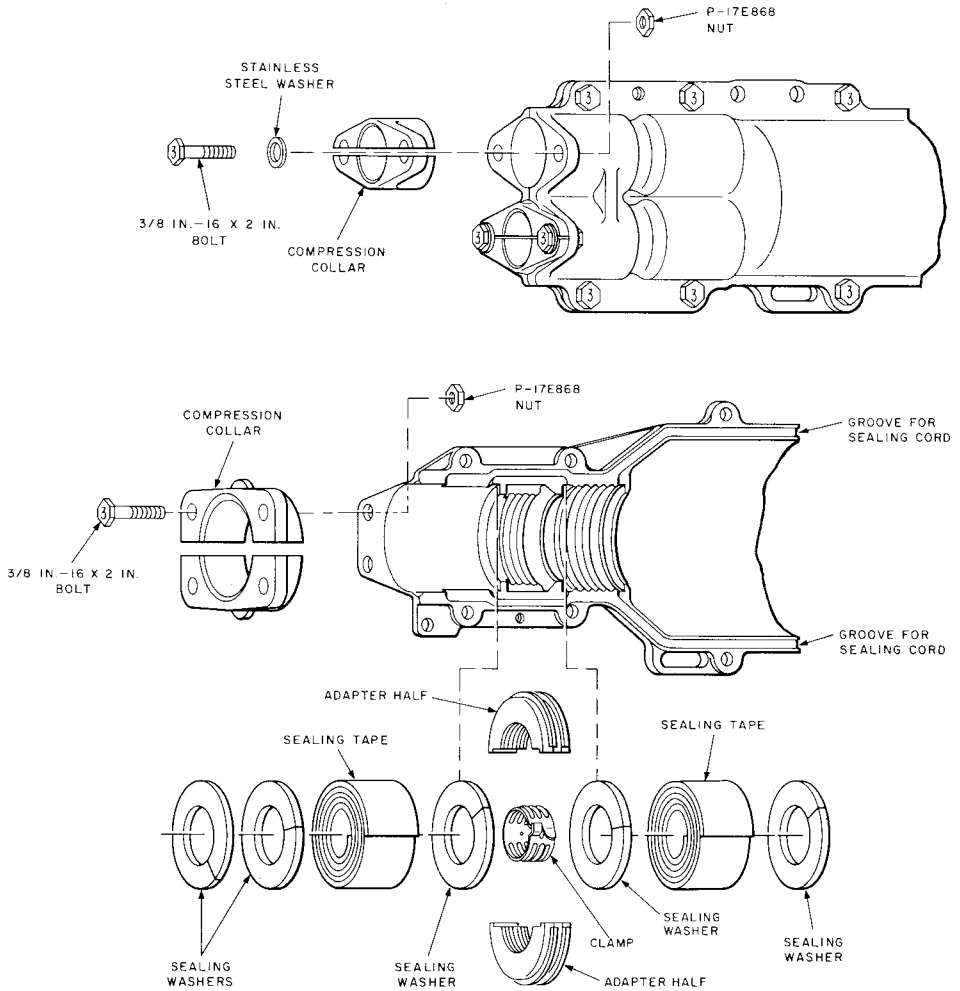


Fig. 23—Expanded Splice Case Ends

#### 4. PRESSURE TESTING

**4.01** Flash testing is done after closing and sealing the splice, using the flash testing material approved for use with the type of cable sheath involved. Place gauges and valve stems on the cases as shown in Fig. 24.

**4.02** Test the side seals between the inner and outer seals at each end, and the two outer seals, by admitting air under pressure in valves A and C until gauges A and C indicate 5 pounds. Use the appropriate pressure testing solution for the tests. Then vent valves A and C until gauges A and C indicate zero.

**4.03** Put air in valve B until gauge B indicates 5 pounds. Then test the side seals between the two inner seals with pressure-testing solution. If no pressure is indicated on gauges A and C after the side seals have been tested, the two inner seals are satisfactory.

**4.04** Before replacing a P-13A314 plug in the splice case, apply PIPETITE-Stik to the threads of the plug. The plug shall be tightened to a torque of 35 inch-pounds minimum to 50 inch-pounds maximum.

**4.05** *Bolts may loosen due to the pressure of sealing compound at the bolt locations. Relaxation of this compound will completely occur during the pressure testing interval. The final operation before leaving the job should be to recheck and tighten all nuts and bolts with the B torque wrench to ensure that the bolts are tightened with the specified limits (paragraph 3.38). Further relaxation of sealing compound is normal and no further retightening of bolts should be required during normal service of the closure.*

#### 5. OPENING AND REASSEMBLING

**5.01** Using the D wrench kit, remove the bolts and nuts from the end collars and from the sides of the cases.

**5.02** Using the B pry bar, remove the end collars from the cases. Care must be taken to avoid breaking the collars or the ears on the splice cases.

**5.03** Insert four mounting bolts in the jacking holes provided near the ends of each case for that purpose. Tighten alternately about two turns on each bolt until one or both cases are free from the cable (Fig. 25). **Place a temporary bond across the splice** between the inner clamps.

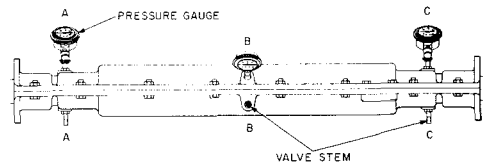


Fig. 24—Valve and Gauge Placement

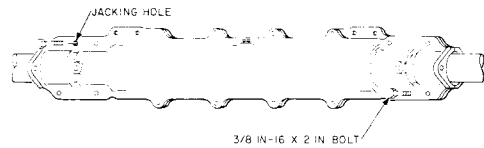


Fig. 25—Splice Case With Bolts in Jacking Holes

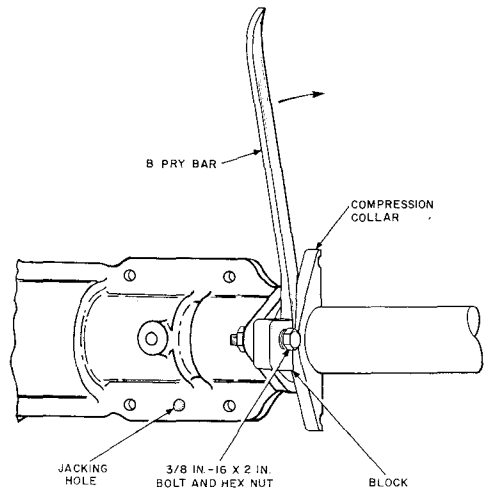
**5.04** If only one of the cases has been freed in the preceding operation, assemble the pry bar block in the end collar mounting hole. Place an end collar on the sheath adjacent to the case to prevent damage to the cable, as shown in Fig. 26. Then, using the B pry bar, loosen the case from the sheath. The block can be rotated to provide the proper spacing for inserting the end of the bar.

**5.05** After one end of the case is loosened, the cable at the other end can usually be removed by alternately raising and lowering the free end of the case. If the cable remains tight in the case, it will be necessary to release the cable as outlined in paragraph 5.04.

**5.06** Remove the sealing tape and sealing washers from cable sheath and discard.

**5.07** Install new splice cases as outlined in Part 3. Pressure test the completed closure as outlined in Part 4.

**5.08** The splice cases which were removed from the cable should be returned to the local Western Electric Distributing House for cleaning and for any necessary repair.



**Fig. 26—Prying Case From Cable Sheath**