

CABLE SPlicing—GENERAL

WRAPPING COMPLETED SPLICE

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1.	GENERAL	1	<p>1.03 Procedures for wrapping insulating joints, gas pressure plugs, or intermediate wrappings around various conductors, as in cables containing coaxials, are not included. These procedures are covered in other sections of the 632 Division of the Practices.</p> <p>1.04 ♦The method used to wrap a cable splice depends on the <i>core makeup and the core-to-sheath dielectric strength</i>. The four degrees of dielectric strength and the methods of identifying them are as follows:</p> <p>(1) <i>850 volts ac rms</i>: Paper- or pulp-insulated conductors with two spirally applied strips of paper between the core and sheath.</p> <p>(2) <i>2000 volts ac rms</i>: Paper- or pulp-insulated conductors with four or more spirally applied strips of paper between the core and sheath.</p> <p>(3) <i>10,000 volts dc (19-22 gauge) 5,000 volts dc (24-26 gauge)</i>: Plastic-insulated conductors with a layer of plastic tape between the core and the lead sheath or metallic shield.</p> <p>(4) <i>20,000 volts</i>: Plastic-, paper-, or pulp-insulated conductors with a plastic jacket between the core and the lead sheath or metallic shield. (In the case of ARPAP sheath, there is also an aluminum moisture barrier bonded to the plastic jacket between the core and the metallic shield.)</p> <p>1.05 The method used to wrap carrier cable splices depends on the type of carrier and on whether the cable is screened. The types of carrier cables are as follows:</p> <p>(1) T1 and T1C nonscreened carrier cable comprises plastic- or pulp-insulated conductor cables.</p> <p>(2) T1 and T1C screened carrier cable comprises plastic- or pulp-insulated conductor cables.</p>
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1.	GENERAL		
1.01	This section describes the methods used to wrap completed splices and sheath openings before placing lead sleeves or splice cases.		
1.02	This section is reissued to:		
	<ul style="list-style-type: none"> ● Revise Table A ● Revise method of wrapping completed splice ● Include preparation of 2-type closure for enclosing spliced waterproof cable. 		

Revision arrows are used to denote the more significant changes.

**Reprinted to comply with modified final judgment.

- (3) T1 and TIC office (tip) cable is a plastic-insulated conductor cable with a bonded alvyn sheath.
- (4) T2 carrier cable is a plastic-insulated nonscreened LOCAP cable.

1.06 Procedures for enclosing encapsulated cable splices on waterproof cable are outlined in Sections 633-500-104 (16-type closure) and 633-506-201 (2-type closure).♦

1.07 Detailed data on the makeup of the various sheaths discussed in this section is contained in Sections 626-020-020 and 626-225-107.

2. WRAPPING METHODS

2.01 A typical straight splice showing the completed wire work before wrapping is shown in Fig. 1.

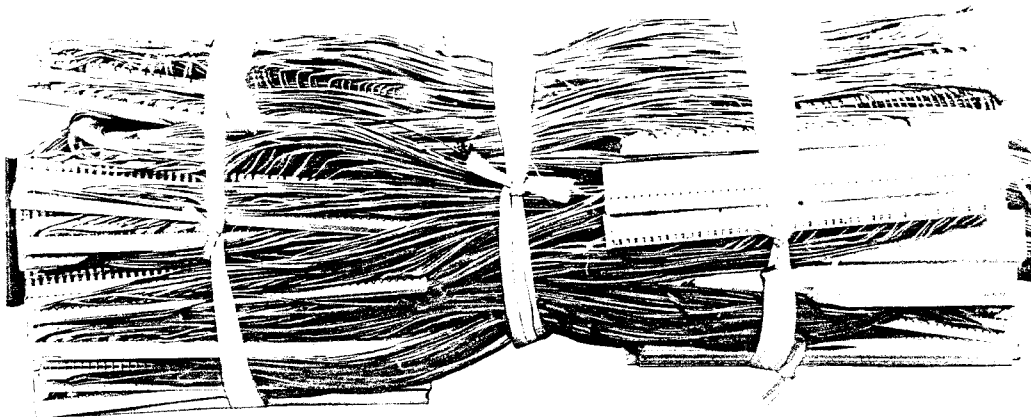


Fig. 1—Splice at Completion of Wire Work

2.02 Table A lists the types of splices and the materials used for wrapping. The methods used are outlined in paragraphs 2.03 through 2.07.

SPLICE WRAPPING—CABLES WITH DIELECTRIC STRENGTH 850-2000 VAC RMS

2.03 After identifying the cable dielectric strength from the data in paragraph 1.04, place

desiccant (if required) in the following manner:

Note: In splices containing both plastic- and paper- or pulp-insulated conductors, use only the amount of desiccant required for the paper- or pulp-insulated conductors. **Do not** use any desiccant in splices containing only plastic-insulated conductors.

TABLE A
SPLICE WRAPPING METHODS

TYPE OF SPLICE	INSULATION	CLOSURE USED	WRAP WITH
Building	Pulp, Paper, or PVC	Metallic or Fire Resistant Plastic	Fire resistant muslin
Building	Pulp, Paper, or PVC	Lead Sleeve	Fire resistant muslin wrapped with half lapped layer of B aluminum tape
Outside	PIC	Metallic Splice Case or Plastic Closure	B polyethylene tape or plastic wrapper
Outside	PIC	Lead Sleeve	B polyethylene tape wrapped with muslin
Outside	Pulp or Paper	Metallic Splice Case or Plastic Closure	Muslin or plastic wrapper
Outside	Pulp or Paper	Using Lead Sleeve	Muslin

C Desiccant

(1) Determine the number of **4-ounce bags of C desiccant** to be used in the splice (Section 632-050-205). Although the 4-ounce bags of C desiccant were originally intended for and must be used in coaxial splices and 710 modular splices, they are **now preferred** over loose desiccant for use in paper- or pulp-insulated paired or quadded cable splices.

(2) The bags are laid in the splice (Fig. 2).

The splice is wrapped using muslin or B polyethylene tape (Fig. 3 and 4). However, the size of the lead sleeve or splice case should be considered when using the bags in the splice, because the bags may appreciably increase the size of the splice bundle.

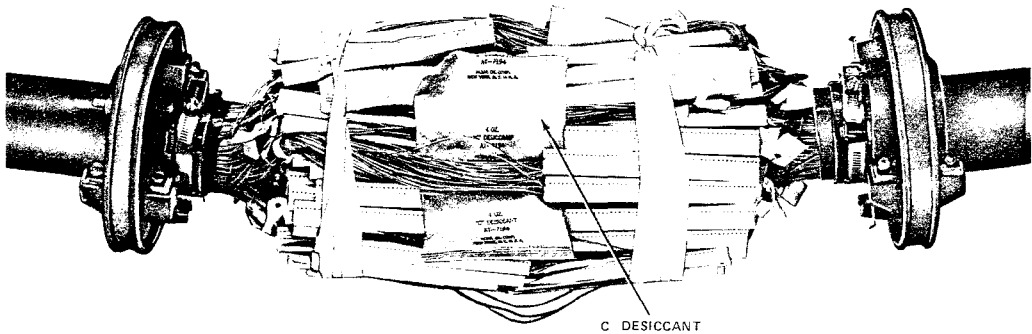


Fig. 2—Placing Bags of C Desiccant

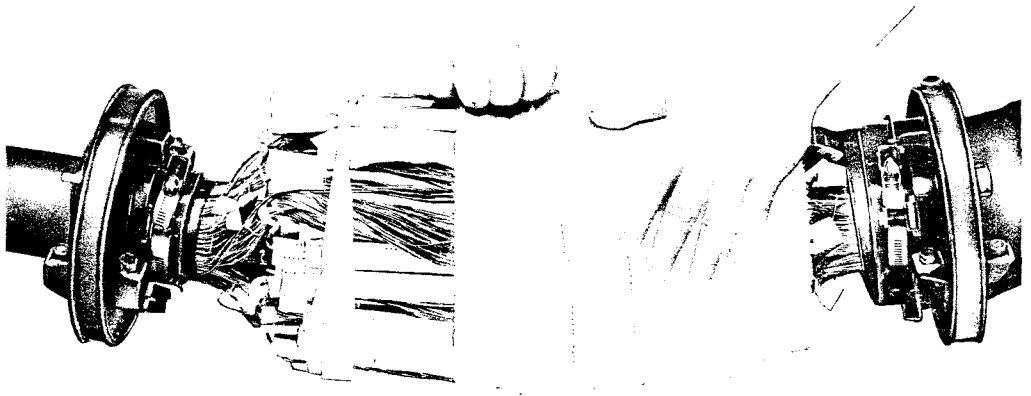


Fig. 3—Wrapping Splice Containing C Desiccant With Muslin



Fig. 4—Splice Wrapped With B Polyethylene Tape

B. Desiccant

(3) If *loose B desiccant* is used, the splice should be enclosed in an envelope made from a single piece of dry muslin, long enough to extend about 1 inch over the sheath at each end and wide enough to overlap about 1 inch

at the top. Tie the muslin around the sheath at each end with dry cotton sleeving or cotton tape as shown in Fig. 5.

Caution: *Do not use loose B desiccant in splices made with 710-type connectors.*

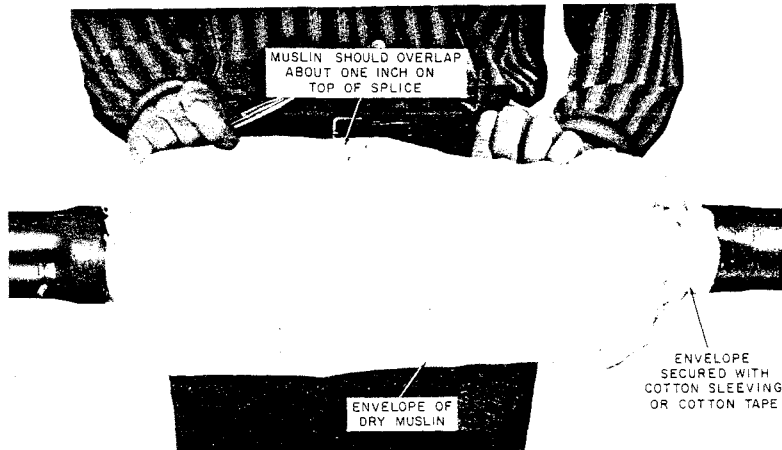


Fig. 5—Muslin Envelope in Place

(4) Pour the required amount of B desiccant (Section 632-050-250) into the envelope through the overlap in the muslin. Distribute the desiccant as uniformly as practical among the conductors.

(5) Close the opening in the muslin so the edges overlap.

(6) Starting at the center, wrap the splice with two half-lapped layers of dry muslin, as shown in Fig. 6, or B polyethylene tape.

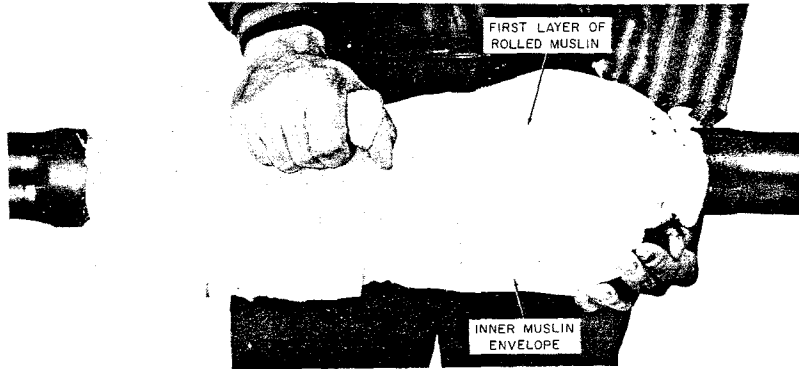


Fig. 6—Applying Rolled Muslin

Cap or Butt Splice

2.04 At a cap or butt splice, the muslin envelope for the desiccant should be securely tied at the butt end.

Y-Splice

2.05 At a Y splice the muslin should not be tied around each cable individually. A tie around both cables is sufficient. The muslin wrapping should not be passed between the cables.

SPLICE WRAPPING—CABLES WITH DIELECTRIC STRENGTH 5,000-10,000 VDC

2.06 ♦5,000-10,000 Vdc dielectric strength cables having PE-PVC insulated conductors with alvyn sheath are wrapped in the following manner:

Splice Outside Building

- (1) Wrap the splice with two half-lapped layers of B polyethylene tape as shown in Fig. 4, or a plastic wrapper as outlined in Section 633-506-201 when enclosing splice with 2-type closure.
- (2) Apply one half-lapped layer of muslin over the polyethylene tape if the splice is to be enclosed with a lead sleeve.

Splice Inside Building

- (1) Wrap the splice with two half-lapped layers of B cable splice wrap (fire retardant muslin). If the splice is to be covered with a lead sleeve, wrap the B cable splice wrap with a half-lapped layer of 4-inch B aluminum tape. ♦

SPLICE WRAPPING—CABLES WITH DIELECTRIC STRENGTH OF 20,000 VDC

2.07 ♦20,000 Vdc dielectric strength cable at a straight splice is wrapped in the following manner:

- (1) On plastic-insulated conductor cable, wrap the splice with B polyethylene tape as outlined in paragraph 2.06, or use the plastic wrapper as outlined in Section 633-506-201.

Note: The only difference between 5K-10K Vdc and 20K Vdc is the number of half-lapped layers of B polyethylene tape, two layers for 5-10K as outlined in paragraph 2.06 and four layers for 20K to restore dielectric strength.

(2) Follow the same procedure in using bagged or loose desiccant as covered in paragraph 2.03 on paper- or pulp-insulated conductor cable.

(3) After the muslin wrap is secured with the B paper tape, **apply four half-lapped layers of B polyethylene tape** leaving 1/2 inch of muslin exposed at each end. ♦

2.08 At a Y splice such as those involving branch cables or coil case stubs, the wrapping should include both cables. Do not make separate wrappings for main or branch cables.

2.09 At Y splices involving 37-type terminal stubs, contactor stubs, and lead pipe, the stubs are not included in the wrappings. The transflex tubing, over the end of the stub and the stub conductors, takes the place of the polyethylene tape. The transflex tubing on the stub conductors should extend under the wraps of polyethylene and muslin.

2.10 Apply one half-lapped layer of muslin over the polyethylene tape if the splice is to be enclosed with a lead sleeve. The outer muslin is omitted if a splice case is used.

SCREENED AND UNSCREENED T CARRIER SPLICING AND WRAPPING

2.11 Splicing nonscreened pulp and plastic T1 and T1C carrier cables and screened pulp, plastic, and MAT cables at **straight field splices** and **offices end splices** (ie, to tip cables) are covered in Section 640-010-005. This section also covers splicing T2 (LOCAP) cables at the reference splice points. Splicing at interconnecting points (ie, repeater stations) are covered in other sections of the 640 Division of Practices.

ENCLOSED ENCAPSULATED CABLE SPLICES ON WATERPROOF CABLE

2.12 Liner kits (Fig. 7) are for use with the 2-type closures, when used for enclosing encapsulated splices on waterproof cable, to insure that all wire work is properly centered and complete encapsulant coverage is obtained. Each kit contains

a corrugated liner, and a number of wire ties and is used with closures as listed:

◆D-180790 2C2A/2D2A Closure◆

D-180791 2C2B/2D2B Closure

D-180791 2C2C/2D2C Closure.

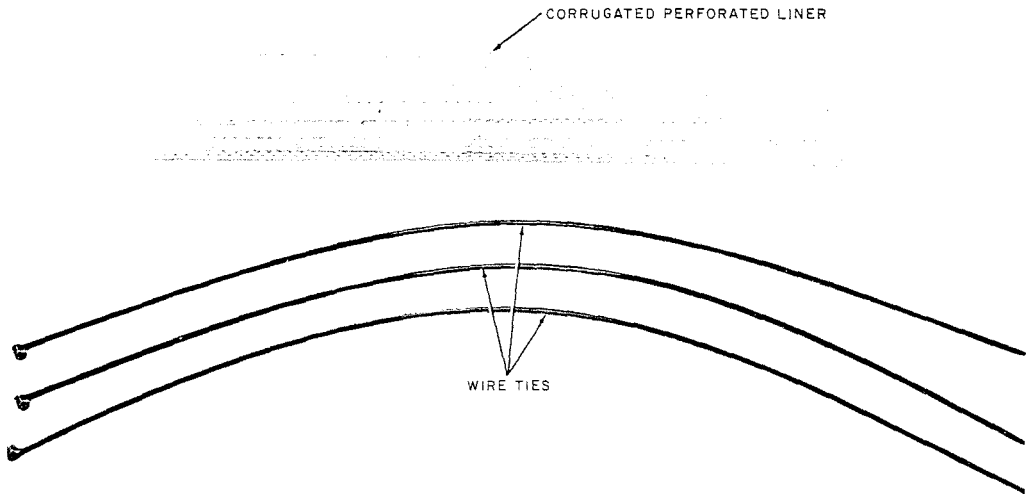


Fig. 7—Corrugated Perforated Liner and Wire Ties

2.13 ♦ **Encapsulated splices on waterproof cable** are enclosed in the following manner:

(1) After completion of the wire work, form a neat uniform splice and secure with two cable ties (Fig. 8).

(2) Wrap the completed splice with the corrugated liner from one of the kits listed in paragraph 2.12 and secure with cable ties. **Assure the bonding braid does not run outside the corrugated liner.**

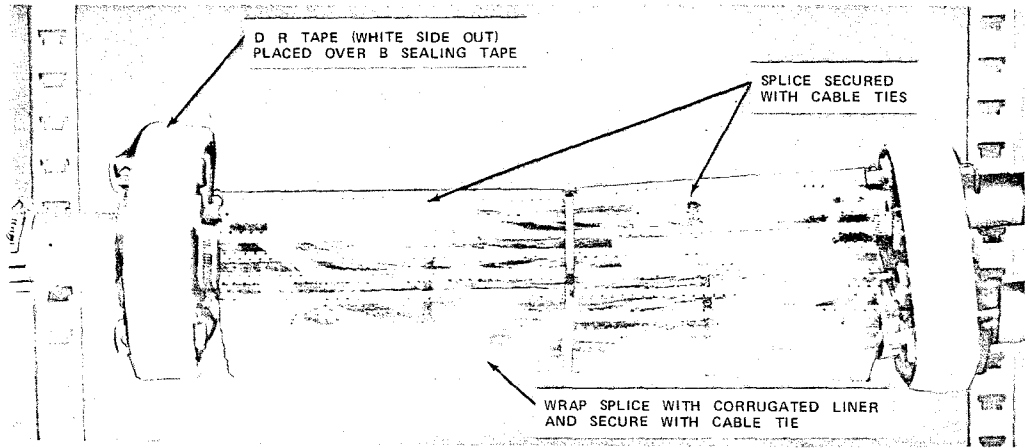


Fig. 8—Wrapping Splice and Preparation of End Plate

(3) Prepare end plates, place the two cover halves, and encapsulate as outlined in Section 633-506-201 (Fig. 9).

3. ADDITIONAL CONSIDERATIONS

3.01 In some older splices, hot paraffin was used to dry the splice. In reopening these splices, it may be necessary to boil out the splice in order to separate the conductors to be bridged or trimmed out. After the wire work is completed, it may be necessary to use paraffin instead of desiccant to dry the conductors. If this becomes necessary, omit the muslin envelope and make the final wrapping with two half-lapped layers of muslin, applied while the splice or sheath opening is still soft and warm from boiling out. After the wrapping is completed, give the splice or sheath opening a

final boiling out with paraffin. Underground splices in paper-insulated cables should be wrapped with one half-lapped layer of 1-inch cotton tape. The tape should be applied tightly while the underground splice is still soft and warm from boiling out. After the wrapping is completed, give the splice the final boiling out.

3.02 Twisted copper joints may be corroded when in close proximity to rubber-insulated conductors. Therefore, when a splice contains a number of rubber-insulated conductors, such as from service cable, the rubber-insulated conductors should be wrapped together as a group with two half-lapped layers of dry muslin. The wrapped group should then be placed in with the other conductors and the splice should be wrapped in the usual way.

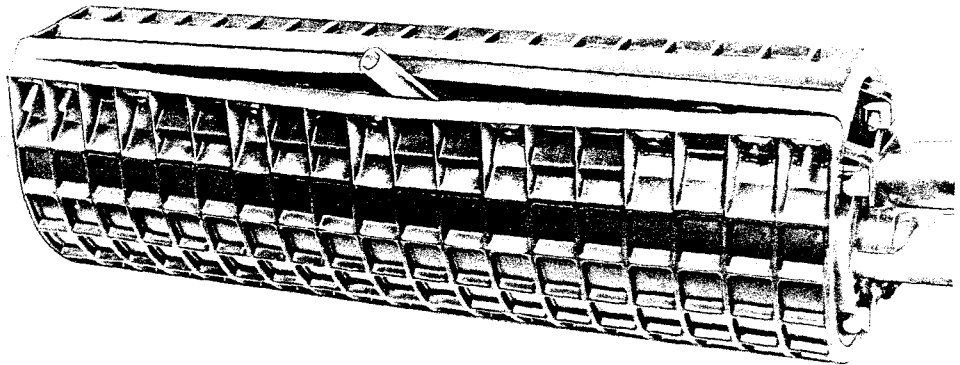


Fig. 9—Covers Installed and Ready for Encapsulant

4. TEMPORARY WRAPPING TO PREVENT FIRES—
KS-21822 TEMPORARY SPLICE COVER

4.01 The KS-21822 temporary splice cover is intended to enclose incomplete *vault splices* while unattended, overnight and over weekends, to prevent propagation of fire accidentally ignited in the unfinished splice (Fig. 10). It consists of an aluminum-lined blanket of nomex, a felt-like material, with a perimeter of hook and loop velcro tape to permit it to be draped over a splice bundle and continuously fastened at its edges. This forms a 50-inch long closure with a wraparound length of 40 inches. Although it is not as pressure-tight as a CR blanket, it is sufficiently airtight to smother an internal fire. When the velcro tape cannot satisfactorily seal the cover at the ends around the cables, it should be augmented by wrapping with rubber cord or cotton tape.

Note: This splice cover is *not* to be used to cover splices such as central office half-tap splices, which will be left unattended until some point in time at which the splice is reentered to trim off the half-tapped cable.

4.02 Incomplete vault splices (Y, straight, and tip) are enclosed with the KS-21822 temporary splice cover (Fig. 10).

Note: Splices in buildings and cable entrance facilities shall be wrapped with B cable splice wrap.

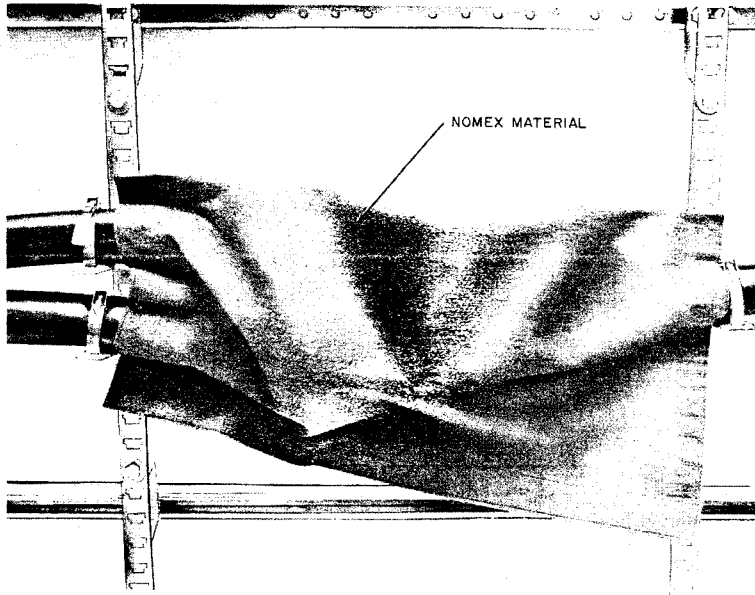


Fig. 10—KS-21822 Temporary Splice Cover

Y-Splice

4.03 Install the KS-21822 temporary splice cover on a Y splice as shown in Fig. 11.

4.04 Secure the hook- and loop-type fasteners together allowing a 2- to 3-inch margin to extend above and below the cable.



11—Y Splice Wrapped in KS-21822 Temporary Splice Cover

4.05 Tie the ends of the splice cover over the cable with rubber cord or cotton tape (Fig. 12).

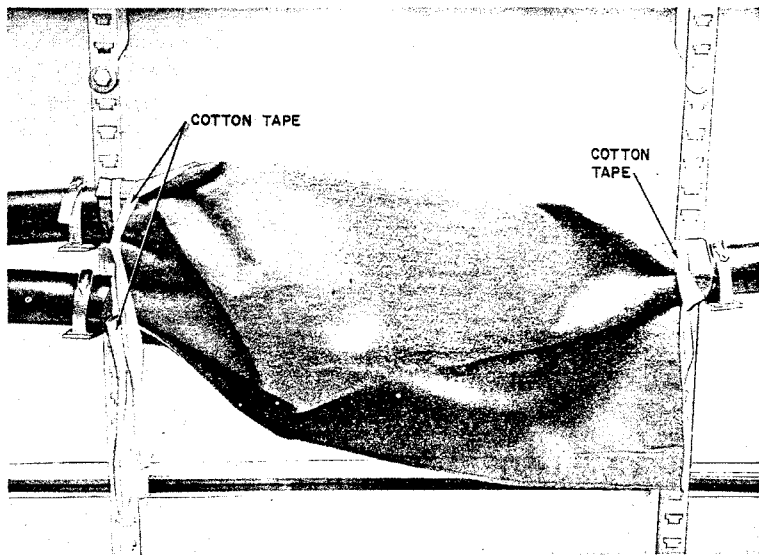


Fig. 12—Y Splice—Completed Installation

Straight Splice

- 4.06 Install the KS-21822 temporary splice cover on a straight splice (Fig. 13) using the same procedure discussed in paragraphs 4.04 and 4.05.

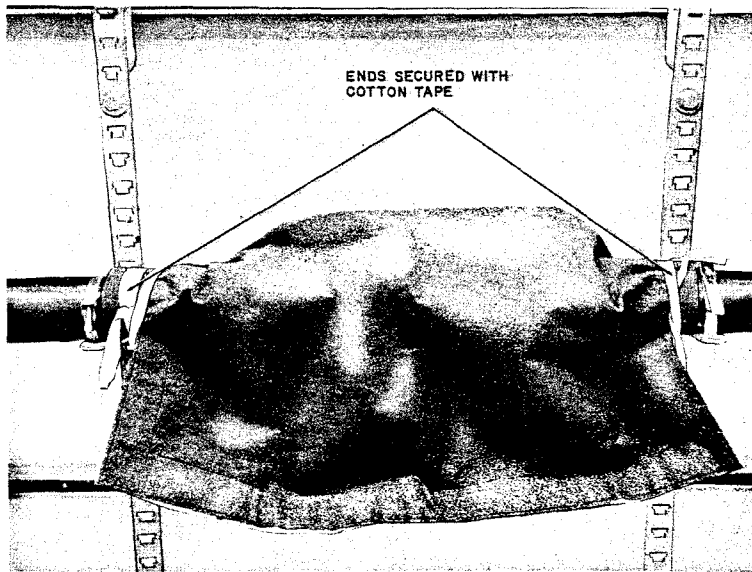


Fig. 13—Straight Splice—Completed Installation

Tip Splice

- 4.07 Install the KS-21822 temporary splice cover on a tip splice as shown in Fig. 14.
- 4.08 The cover does not require a rubber cord or cotton tape to secure it to the closure

end plate. The temporary splice cover is made to fit the size of the bundle as illustrated in Fig. 14.

- 4.09 The irregular end of the bundle should be secured using the procedures discussed in paragraphs 4.04 and 4.05.

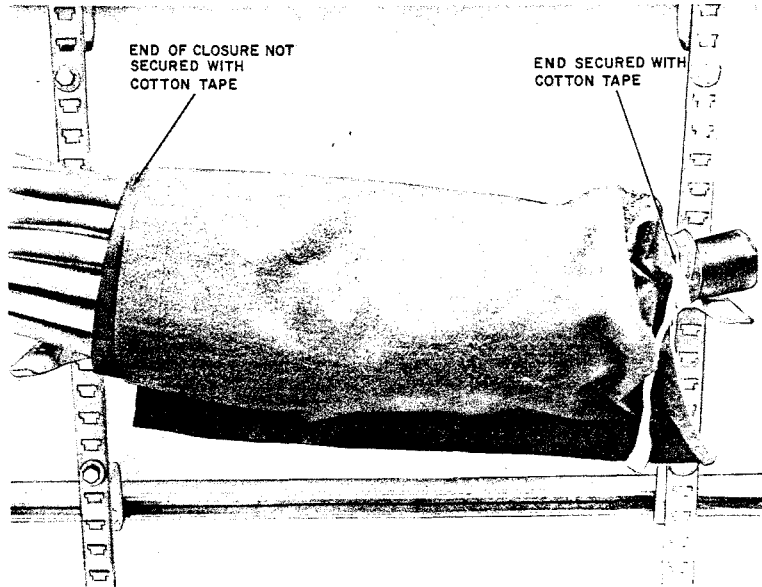


Fig. 14—Tip Splice—Completed Installation