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BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

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AT&T Co Standard

CABLE SPLICING—GENERAL
TWISTED STRAIGHT JOINT

Contents **Page**

1. General 1
2. Sleeves Placed by Helper 2
3. Sleeves Placed by Splicer 9
4. Soldering 11
5. Quadded Conductors 11

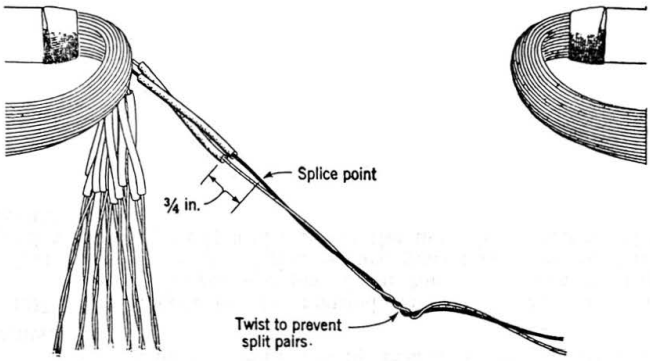
1. GENERAL

1.01 This section describes the method of joining paired and quadded conductors by means of twisted straight joints.

1.02 The details of the method depend on whether the cotton sleeves are placed on the conductors by the helper in advance of splicing or are placed on each pair or quad as it is spliced; and also on the need for soldering the twisted joints.

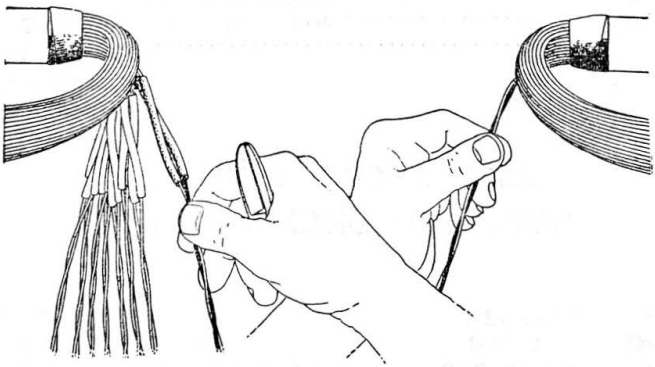
2. SLEEVES PLACED BY HELPER

2.01 The pairs sleeved in advance of splicing should have the sleeves placed on the side of the splice from which it will be convenient to slip the sleeves over the joint.



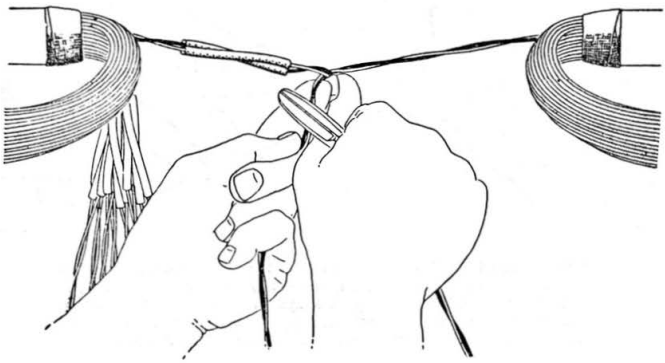
2.02 The sequence of splicing operations is as follows:

The pairs are grasped between the thumb and forefinger of each hand.



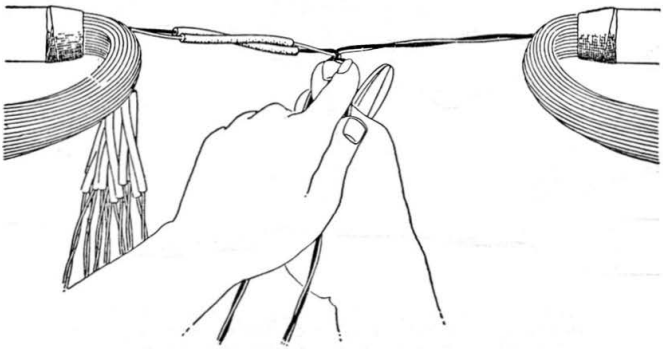
2.03

Bring the pairs together for splicing, leaving enough slack so that the completed splice will have a symmetrical lay up.



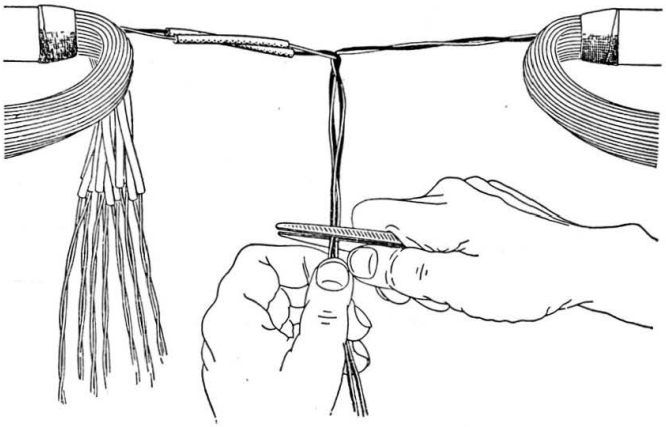
2.04

Give pairs a ½ turn twist to break the insulation



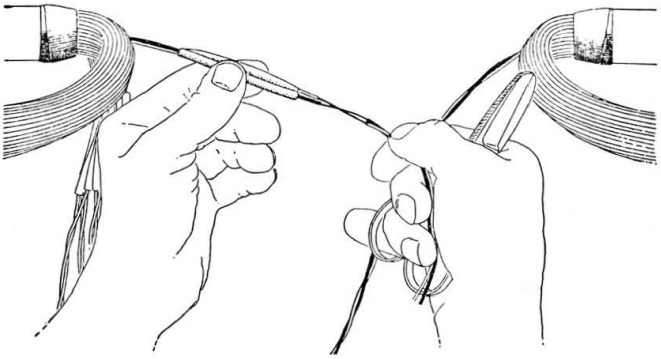
2.05

Take both pairs in the left hand, slide the hand along the pairs and cut off the excess as shown. The length of wire needed depends on the wire gauge - 3 inches for 24 gauge; somewhat longer for heavier wires.



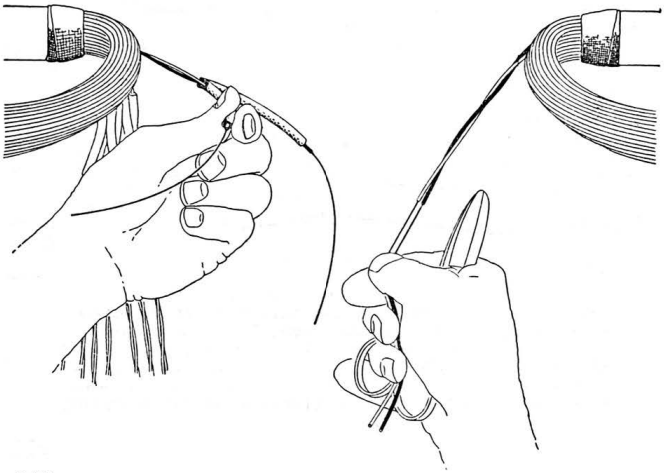
2.06

Remove the insulation by grasping the conductors just below the twist with thumb and forefinger, while holding the free ends of the wires against the palm with the second and third fingers. While removing the insulation take hold of one of the conductors with left hand as shown. If the insulation does not strip readily it can be removed with back edge of splicers' scissors



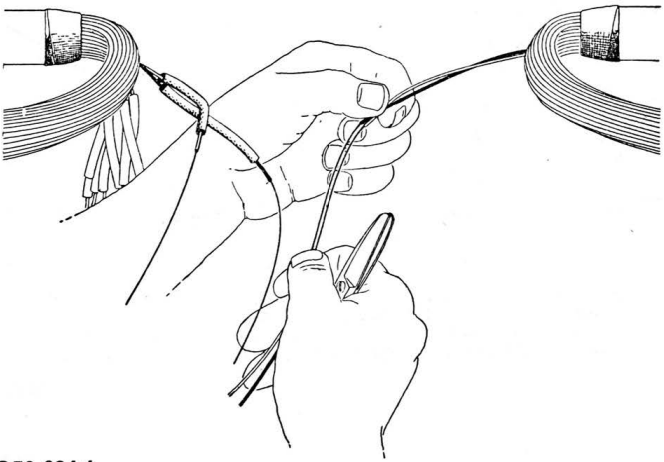
2.07

While removing the insulation from the right hand pair separate the conductors of the left hand pair



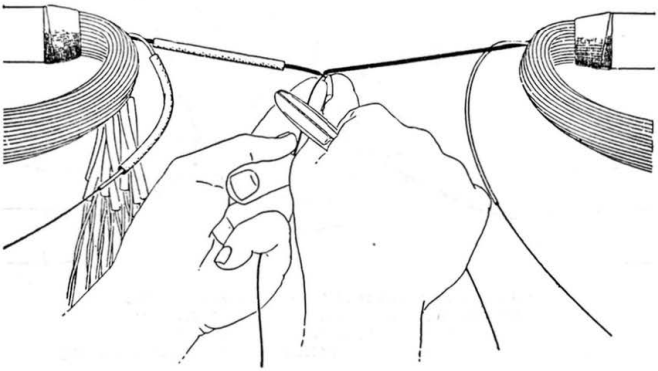
2.08

Slide the left-hand under the separated pair, letting the pair lie on the left wrist. Select one conductor of the right hand pair for splicing. Allow the remaining conductor to fall out of the way, or if necessary push it away with the free fingers of the left hand.



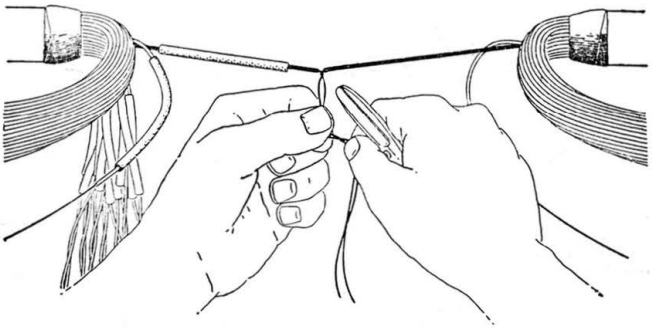
2.09

Select the corresponding conductor from the left side. Draw the skinned wires together and give them a half turn twist. If the conductors are insulated with strip paper it should be caught in the twist to prevent unfurling. If the conductors have pulp insulation the twist should start at the ends of the insulation.



2.10

Grasp the wires between thumb and forefinger of the left-hand and roll the wire on the left-hand side over the wire on the right-hand side. Take the tails of the wires between the thumb and forefinger of the right hand and bend them nearly at a right angle. Hold the wires tightly in the left hand and twist them by cranking with a wrist movement of right-hand allowing the wires to turn loosely between the thumb and forefinger. The crank should be about ½ to 1 inch in length



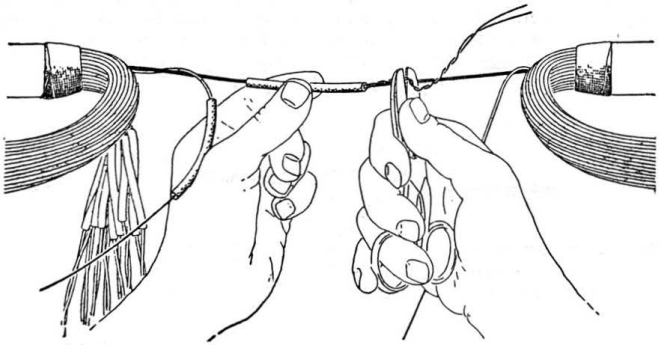
2.11 Continue cranking until the twist is forced beyond the thumb and forefinger of the left hand. After a little practice the twist can be made by giving the crank several turns with the wires held tightly in the left hand, followed by several turns with the wires held loosely. The finished joint should be loosely twisted at the neck but tightly twisted at the end. The looseness at the neck reduces the possibility of breakage, and the tightness at the end provides good electrical contact.

2.12 In twisting 19 and 16 gauge wires it is not practicable to produce a finished joint with a definite change between looseness and tightness of twist. However, by holding the wires properly, the twist will be loose at the neck and progressively tighter toward the end.

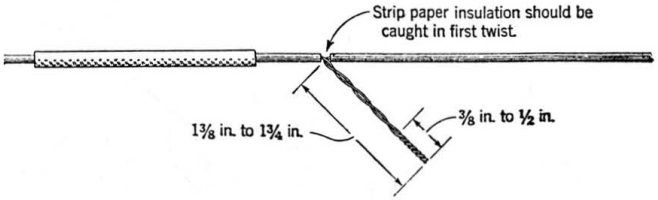
2.13 In joining 26 gauge wires with 22 or 24 gauge wires, or 24 gauge with 19 gauge, it is necessary to hold the wires tightly between the thumb and forefinger of the left hand to obtain a twisted joint instead of a spiral of the smaller wire around the larger wire.

2.14

Grasp the sleeve with the left hand. Bend the pigtail with the shears to an angle of about 45 degrees and cut the twisted wires off square just as the sleeve is slipped over the neck of the twist



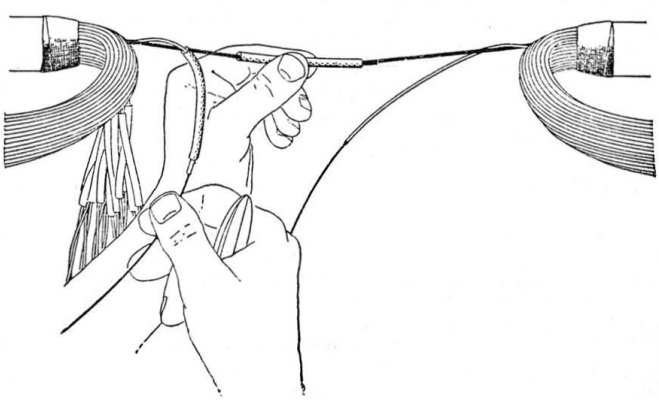
2.15 The length of the cut pigtail may vary from about 1-3/8 inches for fine gauge conductors such as 24 or 26 gauge, to about 1-3/4 inches for coarse gauge conductors such as 16 or 19 gauge. The tightly twisted end may similarly vary from 3/8 inch for the fine gauge conductors to 1/2 inch for the coarse gauge conductors. The finished pigtail should have the following appearance.



2.16 In a duct splice in a maximum size exchange cable it may be desirable to use cotton sleeves shorter than the standard prepared sleeves and to correspondingly reduce the length of the pigtail to about 1 inch. The loosely twisted part and the tightly twisted part of the pigtail should be each about 1/2 inch in length.

2.17

The joint is completed by slipping the sleeve. While slipping the sleeve reach for the second wire with the right hand. Center sleeve on pigtail



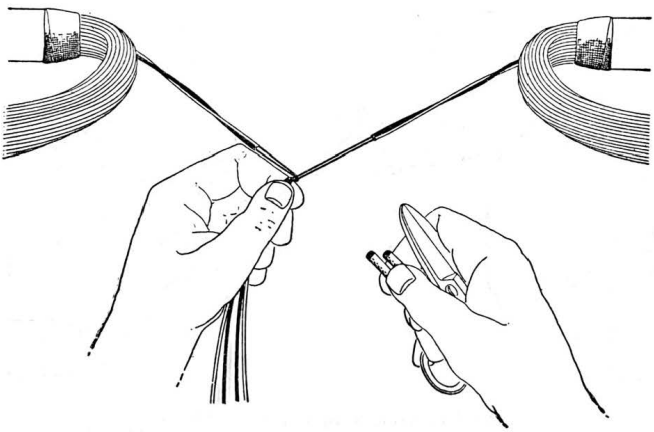
2.18 When the sleeve is in place grasp the second wire with the left hand, make the twist, cut the pigtail and slip the sleeve in the same way as for the first wire. While the sleeve is being slipped over the second pigtail reach for another pair with the right hand. When the sleeve is in place the left hand should continue moving toward the right to grasp another pair.

3. SLEEVES PLACED BY SPLICER

3.01 When the sleeves are placed as part of the splicing operations, the initial steps of selecting the pairs, bringing them into splicing position, giving them a half turn twist and cutting about 3 to 4 inches from the twist, are done in the same way as described and illustrated in Paragraphs 2.02 to 2.05, inclusive.

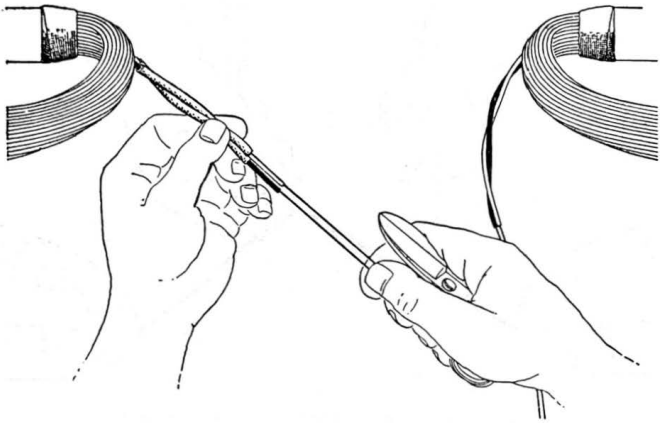
3.02

Remove the insulation by grasping the conductors just below the twist with thumb and forefinger, while holding the free ends of the wires against the palm with the second and third fingers. The pull should be made away from the twist and slightly toward that side on which the cotton sleeves are to be slipped. This will prevent the ends of these wires from curling. While the left hand is engaged in stripping the insulation, take two sleeves in the right hand and hold them parallel to one another but with the ends staggered approximately ½ inch.



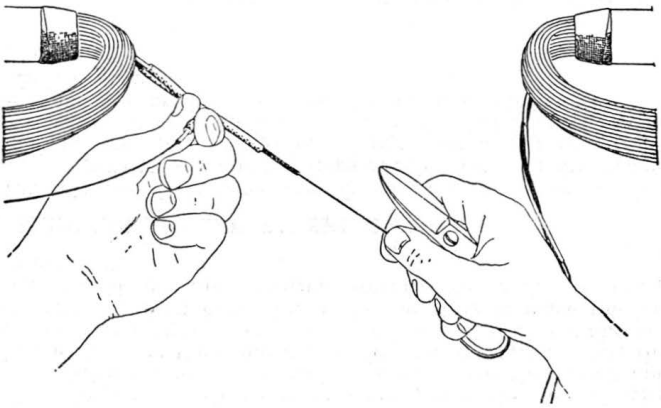
3.03

Hold the pair of wires on the left side of the splice in the left hand and slip the sleeves over them with a rolling motion until they have reached a point where they will not interfere in twisting the joints



3.04

Bend back one of the conductors so that it will be out of the way while the other conductor is being spliced



3.05 The remaining twisting and sleeving operations are done as shown in Paragraphs 2.09 to 2.18, inclusive.

4. SOLDERING

4.01 If the twisted joints are to be soldered it will be desirable to complete twisting about six pairs or three quads distributed along the splice, leaving the sleeves to one side. After the pigtails are soldered, bend them back and slip the sleeves in place.

5. QUADDED CONDUCTORS

5.01 Quadded conductors of 16 and smaller gauge are straight spliced in the same way as paired conductors. All four conductors of the quad are spliced at the same point in the splice and the pigtails must be soldered.