

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

SECTION G50.635.3
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AT&T Co Standard

CABLE SPLICING — GENERAL
PUNCHED COPPER JOINTS

Contents	Page
1. General	1
2. Description of Joint	2
3. E Splice Sleeves	2
4. Joining Wires	3
5. Forming the Splice	8

1. GENERAL

- 1.01 This section replaces Issue 1. It describes the splicing of copper cable conductors by the punched sleeve method.
- 1.02 This section has been revised to advise that the punched sleeve method of splicing is also satisfactory for use in splicing intercity cables, including pairs used for carrier, in lieu of the pigtail method or soldered pigtail with the following exceptions:
- (1) Where the wires differ by more than four numerical gauges, the conductors should be twisted and soldered, i.e., 19-ga. can be spliced to 22-ga. but not 19-ga. to 24-ga.
 - (2) Quadded copper conductors in cables used for phantom voice frequency purposes also should be soldered.
- 1.03 Two or three copper conductors can be joined in a splice sleeve; none of the conductors, however, should be aluminum.
- 1.04 The method should not be used to splice copper conductors having double paper (conductors of terminal stubs) or plastic insulation; such conductors should be spliced by twisting the wires together and soldering where necessary.
- 1.05 The E Splice Sleeve is used to join two or three copper conductors. The E Sleeves come in three sizes designated 128, 088, and 063 and are colored orange, white, and yellow, respectively. The size and number of cable conductors each sleeve will accommodate are given in the table.

2. DESCRIPTION OF JOINT

2.01 In the punched sleeve method of splicing copper cable conductors, the electrical connection is made by placing the ends of two or three conductors in an E Splice Sleeve, illustrated below, without removing the insulation from the wires to be spliced, and then punching the sleeve with a Pneumatic Presser equipped with a D Presser Die and a C Guard.



2.02 A completed splice made by joining the wires by the punched sleeve method is comparable in size to one made by twisting the wires and insulating them with prepared cotton sleeves. Accordingly, the method entails no change in practice for closing splices.

3. E SPLICE SLEEVES

3.01 Three sizes of E Splice Sleeves are required in splicing copper cable conductors by the punched sleeve method. **The 128 sleeves are colored Orange, the 088 sleeves White, and the 063 sleeves Yellow.** The table lists the recommended two- and three-wire combinations of copper conductors having either pulp or strip paper insulation. The punched sleeve method should not be used (1) on combinations not listed, (2) joints in intercity cables where the wires differ by more than four numerical gauges or quadded copper conductors in cables used for phantom voice frequency purposes, (3) in splicing wires having plastic insulation and (4) conductors having both pulp and strip paper insulation (conductors of terminal stubs).

<u>Two-Wire Joints</u>	<u>Size of E Sleeve</u>
19-19	128
19-22	088
19-24	088
22-22	088
22-24	088
22-26	063
24-24	063
24-26	063
26-26	063

**Three-Wire
Joints**

**Size of
E Sleeve**

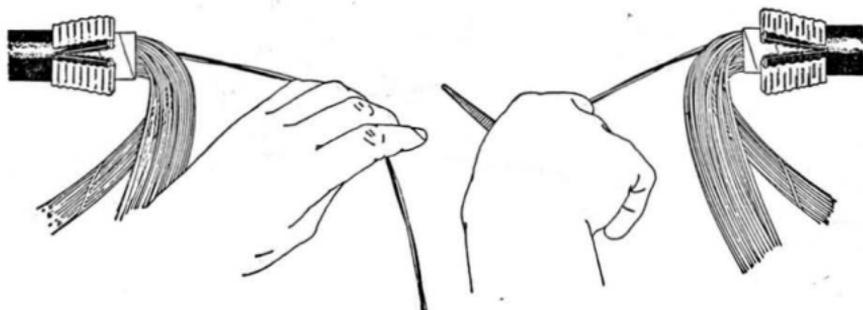
19-19-19	128
19-19-22	128
19-19-24	128
19-22-22	128
19-22-24	088
19-24-24	088
22-22-22	088
22-22-24	088
22-22-26	088
22-24-26	088
24-24-22	088
24-24-24	088
24-24-26	088
26-26-22	088
26-26-24	063
26-26-26	063

4. JOINING WIRES

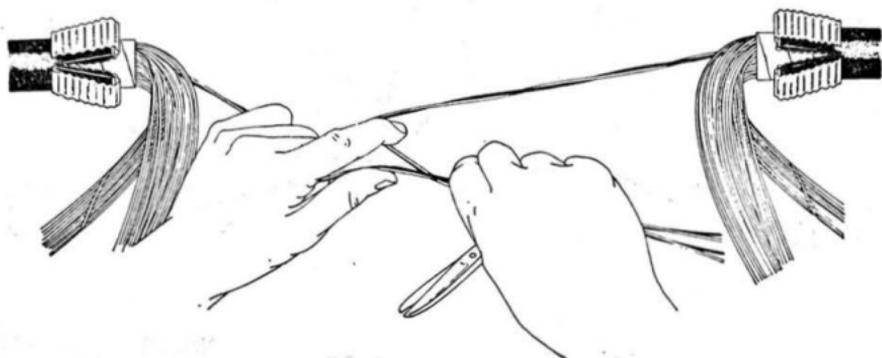
4.01 Follow the standard practice in preparing the splice opening.

Splicing Two Wires:

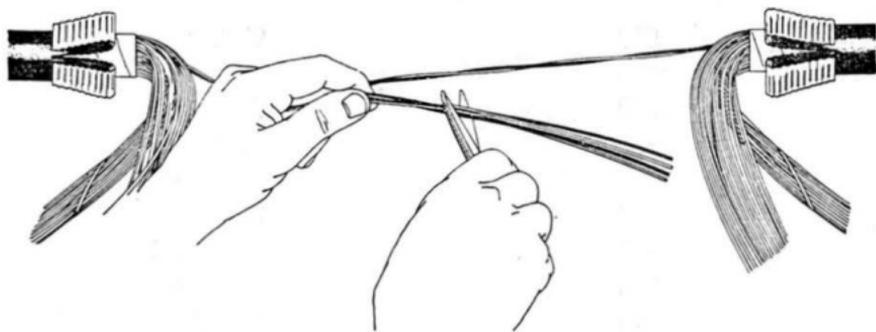
4.02 Grasp a pair of wires from the left-hand side of the splice with the left hand, and a pair from the right with the right hand.



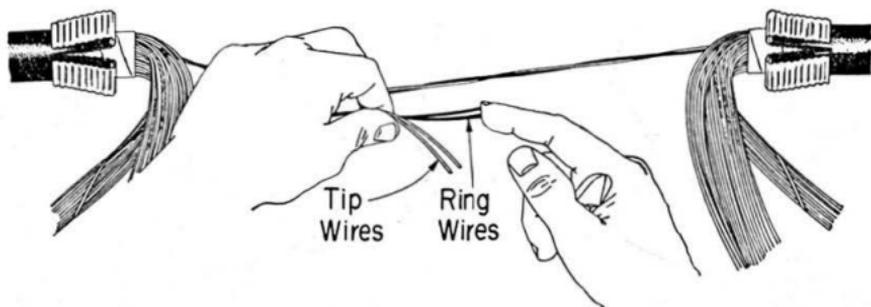
4.03 Make a loop in the right-hand pair, holding the loop with the forefinger of the left hand; then bring the free ends of the wires together.



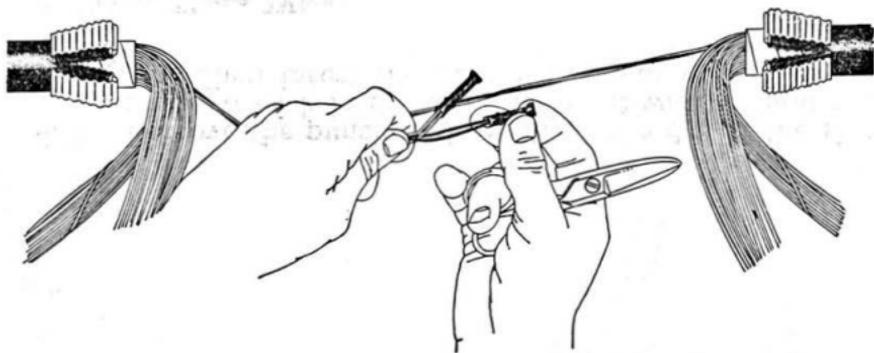
4.04 Hold the two pairs with the left hand, as shown, and cut the wires about 2 inches from the left thumb. Cut the ends about 2-1/2 inches long if it is likely that a wire will subsequently be bridged to the conductor.



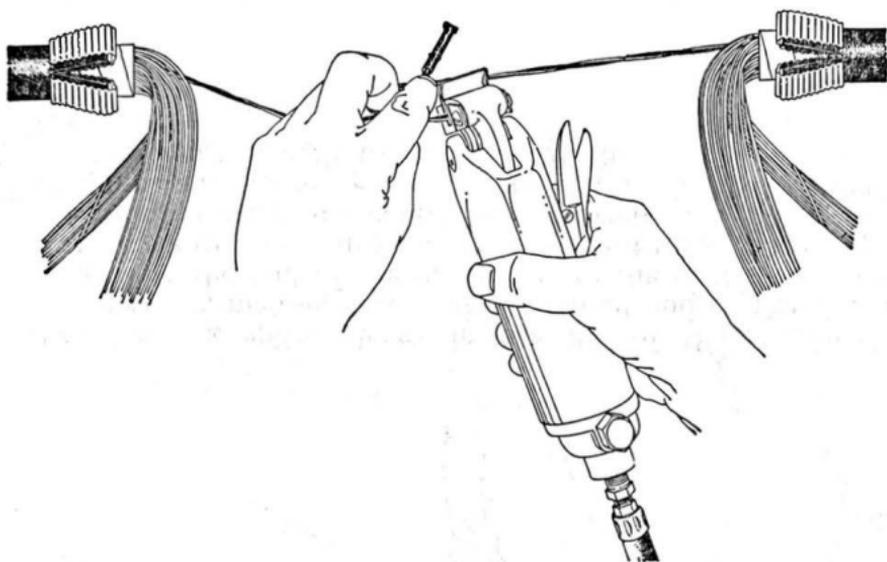
- 4.05 Separate the pairs, bringing the two tip and the two ring wires together.



- 4.06 Place E Splice Sleeves over the ends of the conductors, making sure that the ends of the wires butt against the closed ends of the sleeves.



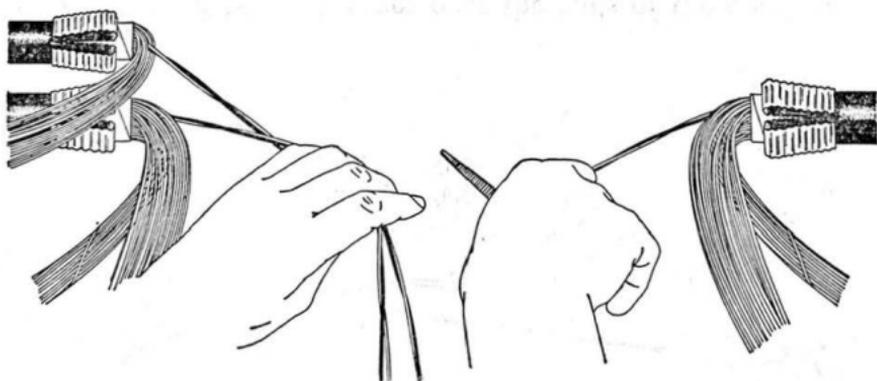
- 4.07 Place a splice sleeve in the die of the pneumatic presser, making sure that the closed end of the sleeve butts against the end of the die and is to the back of the die (toward body of tool). Give the wires a slight push to the right to ensure that they are completely inserted into the sleeve. Then punch the sleeve by pressing the lever. The lever should be pressed long enough to ensure that the jaws have closed completely.



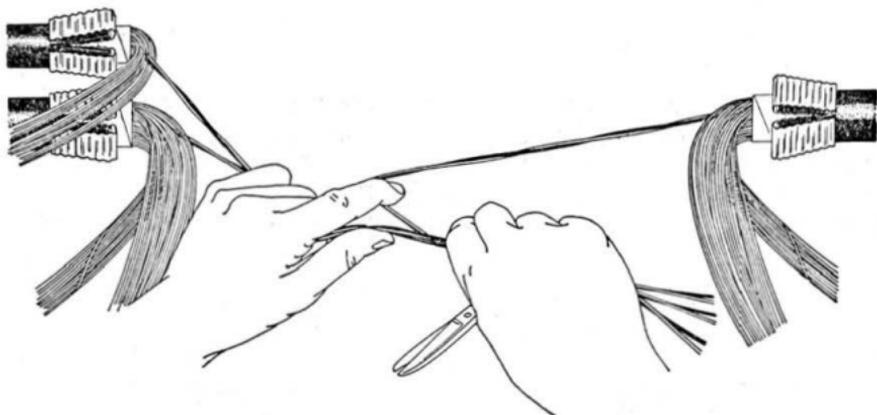
4.08 Remove the punched sleeve from the die. If the sleeve tends to stick in the teeth, loosen it with a slight rocking motion. Then insert the next sleeve into the presser and punch it.

Splicing Three Wires

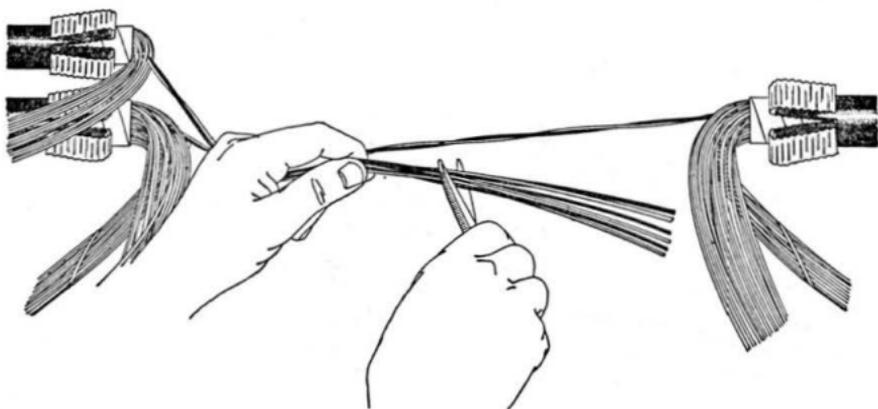
4.09 Grasp a pair of wires from each cable, as shown.



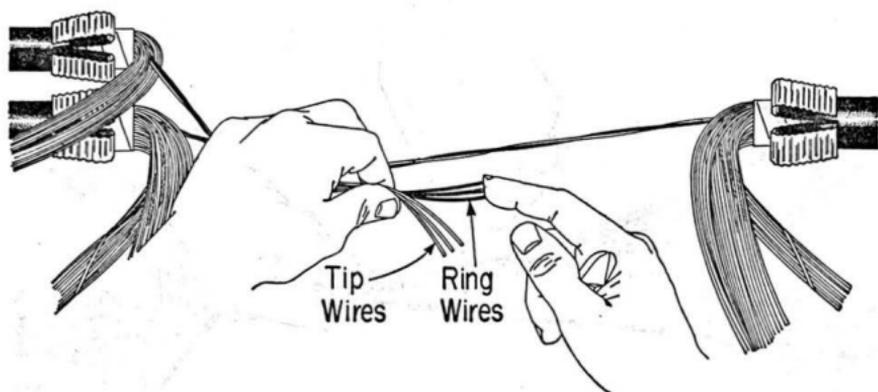
4.10 Make a loop in the right-hand pair, holding the loop in the forefinger of the left hand; then bring the free ends of the wires together.



4.11 Hold the three pairs of wires in the left hand and cut them about 2 inches from the left thumb.



- 4.12 Separate the pairs, bringing the three tip and the three ring wires together.



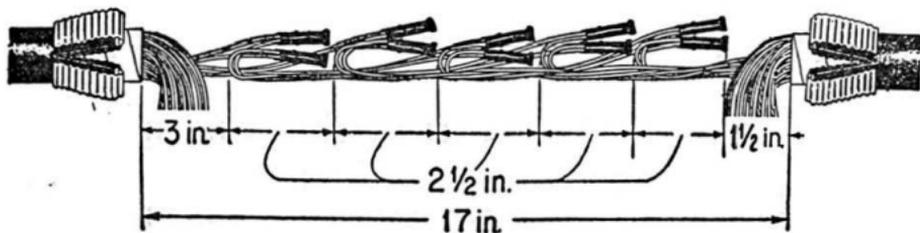
- 4.13 Complete the splice as outlined for a two-wire joint.

5. FORMING THE SPLICE

5.01 Joints should be made in rows and the number of rows should depend on the size of the splice opening. The following is the suggested number of rows of joints in a splice.

<u>Sheath Opening (Inches)</u>	<u>Row of Joints</u>
12	3
13-1/2 to 14	4
17	5

5.02 The sleeves of the right-hand row of joints should be about 1-1/2 inches from the right-hand side sheath end. The loop in the conductors in the left-hand row should be about 3 inches from the left-hand side of the sheath end. The arrangement of the joints in a splice having a 17-inch opening is shown below.



5.03 Two pairs of conductors should be prepared for punching in each row across the splice, beginning at the right-hand side. Then all these sleeves should be punched, working from left to right across the splice, with one handling of the presser.

5.04 Press the completed joints down into the splice to provide clearance for the next conductors to be spliced. After a group of about 50 conductors have been spliced, tie the punched sleeve down to prevent them from interfering with the splicing of other conductors.

5.05 If necessary, some of the completed joints can be bent to the left, in order to improve the form of the splice.

5.06 After all wires have been joined, the splice should be wrapped in the usual manner.