CABLING METHODS – CENTRAL OFFICE
SPLICING SWITCHBOARD CABLE
USING A-MP MODEL VS-3 TOOL

CONTENTS PAGE

1. GENERAL

1.01 This section is issued to present the approved procedure to be followed when splicing switchboard cable using the A-MP VS-3 tool (Figure 1) and Picabond (TM) connectors.

1.02 Picabond connectors can be used to splice strip paper, pulp and plastic insulated conductors or any combination of them. Splices correctly made with the VS-3 tool and Picabond connectors are considered electrically equivalent to a soldered joint.

2. CONNECTOR DESCRIPTION

2.01 The Picabond connector is a channel shaped, plated brass material, insulated with a mylar covering. Metal tangs located in the bottom of the connector are **used** to pierce the conductor insulation when the connector is properly compressed with the VS-3 tool. Figures 2 and 3 illustrate the connector and its application on various combinations of conductors.

2.02 Stuffers in the barrel force the conductor down into the lances to ensure good contact. They also press against the wire to increase tensile strength. See Figure 4.

2.03 Picabond connectors are supplied with color-coded insulation to facilitate ready recognition of the wire range of the connector. Red and yellow connectors handle No. 19 AWG wire combinations with No. 22 and No. 24 AWG wires. Green and purple connectors are for combinations of No. 22, 24, and 26 AWG wires. These connectors are supplied as standard and weather resistant connectors. See Table 1.

2.04 Precautions to be observed in using Picabond connectors for splicing switchboard cable conductors are indicatcd below.

(a) Never use Red Connectors on No. 26 gauge wire.

(b) Never place two No. 19 gauge wires in the same *end* of a Red Connector.

(c) Never place more than one wire in the same *side* of a connector.

(d) Never place more than two wires in the same *end* of any connector.

3. SPLICING OPERATION

Straight Splice

3.01 The VS-3 tool applies the Picabond connectors to the wires to be spliced by crimping them between a set of dies. The moving die is called the Anvil and the fixed die, which is in two parts, the Crimpers. A wire cutter is attached to the anvil. When the tool cycles, the cutter passes through the slot between the crimpers where it shears off the excess wire. The wire supports on the outer sides of the crimpers hold the wires in the correct location to assure their proper placement in the connector. See Figure 1.

3.02 The VS-3 tool is equipped with two handles. The fixed handle is firmly attached to the tool head. The moving handle contains the quick-take-up lever. To cycle the tool, the operator simply depresses the quick-take-up lever, and as the handles start to close, squeezes the handles until they are fully closed. If the tool operator only partly closes the handles, they will not open. A Certi-Crimp ratchet in the moving handle engages

(TM) Trademark A-MP Incorporated

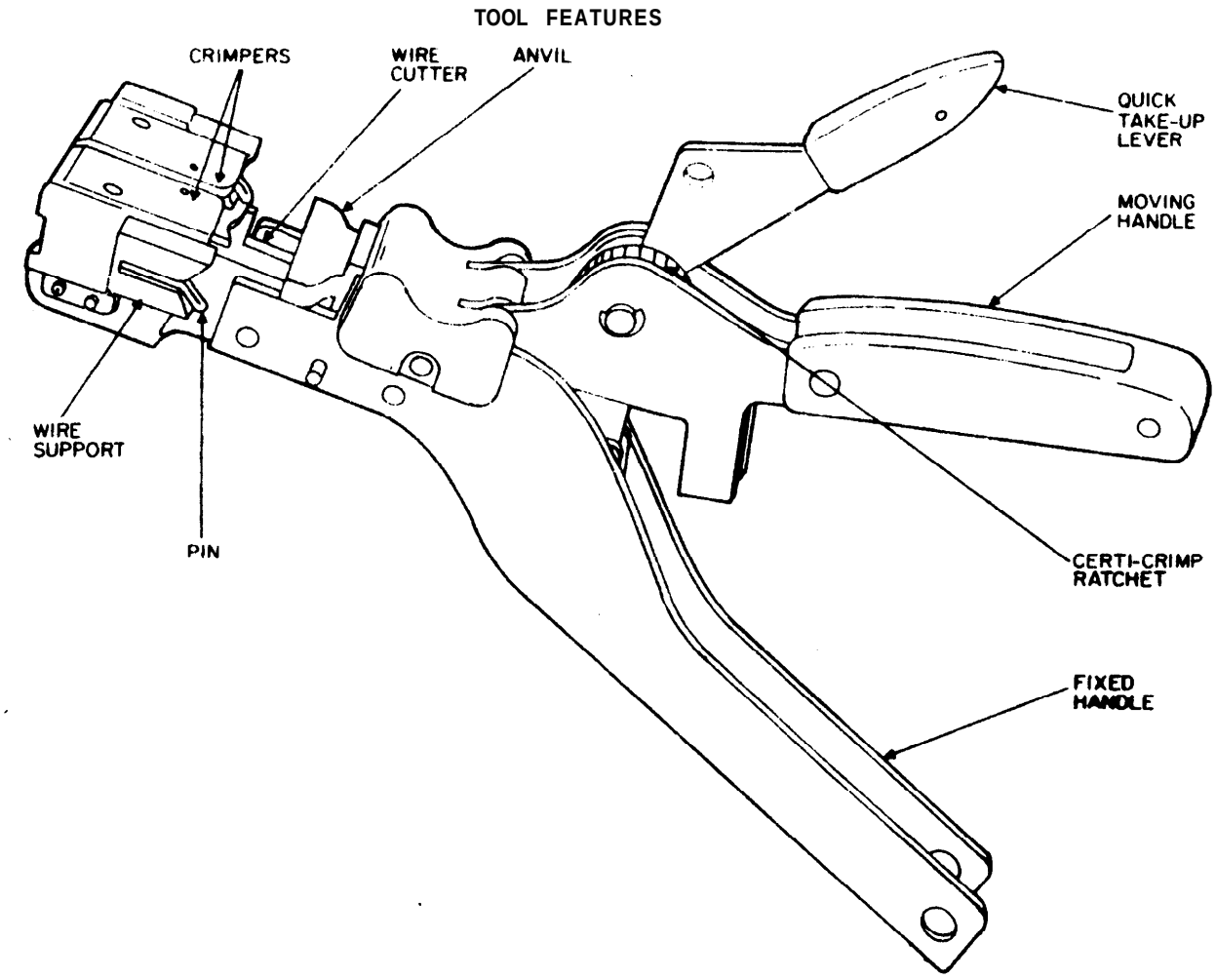


Figure 1. A-MP VS-3 Crimping Tool

as the operator starts to close the handles and will not release until they are fully closed. This ensures that the crimping dies close the same amount every cycle to produce highly uniform finished connections. When the ratchet releases, a handle spring automatically opens the handles.

3.03 The A-MP VS-3 tool should be held with the slot in the head and anvil facing up in preparation for the loading operation.

3.04 Select a wire of the same gauge and color as the wire that will be spliced.

3.05 Hold the tool with one hand and feed the wire to be spliced into the wire support so that it enters the slot in the head of the VS-3 tool ABOVE the pin in the wire support. Bottom the wire in the support and introduce some slack in the wire. Pull the end of the wire out through the slot between the crimpers. Repeat this procedure inserting tht second wire into the opposite side cf the crimpers as shown in Figures 5 and 6.

3.06 With t.he wires properly placed, insert the c'onnector into the tool. Notice the slot in the center of the connector. When you insert the connector into the tool, make sure the'wire cutter in the tool engages the slot in the connector. Make sure the connector lies flat against the anvil. See Figure 6.

3.07 For correct method of completing crimping operations, refer to Paragraph 4.

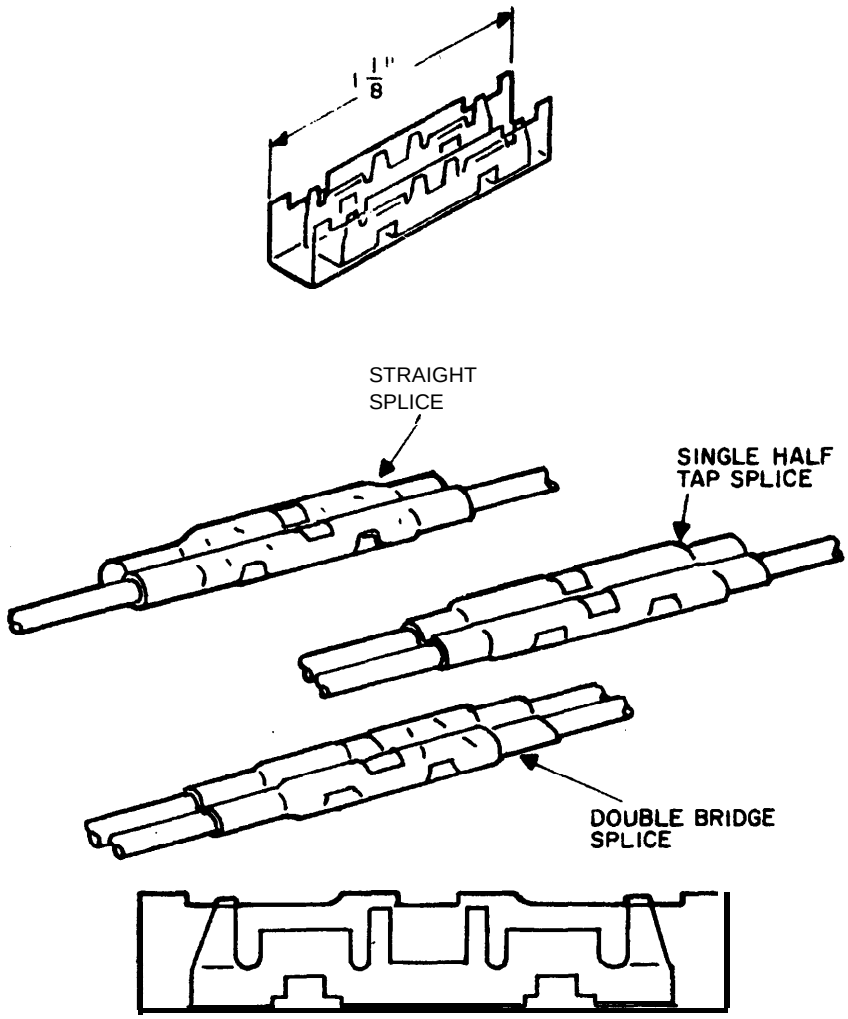


Figure 2. Picabond Connector Shown Joining Various Combinations of Conductors.

Bridging Splice

3.08 When inserting the wires for bridging, use the same procedure as described for straight splicing except: (see Figure 7)

(a) Position the through wires in the VS-3 tool so they enter the wire supports BELOW the pin.

(b) Position the bridge wire in the VS-3 tool so that it enters the wire support ABOVE the pin.

3.09 With the wires properly placed, insert the connector and proceed as described in Paragraph 4.

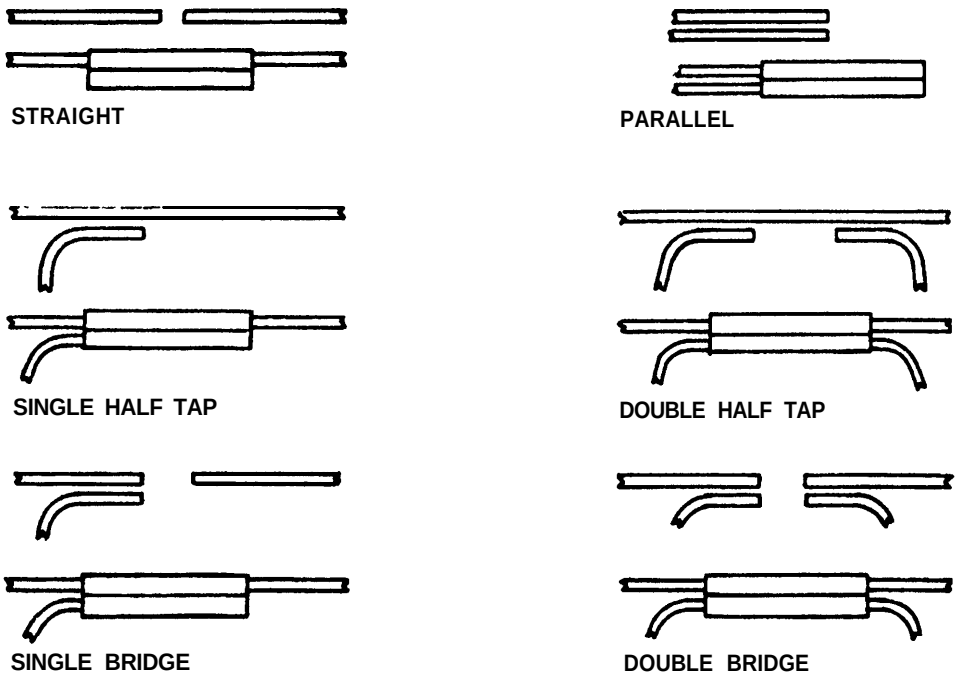
Tapping Splice

3.10 When inserting the wires for tapping: (see Figure 8)

(a) Feed the wire into the wire supports so that, it enters both supports BELOW the pins. Make sure the wire is completely bottomed in both supports.

(b) Insert the tap wire into the wire support so that it enters ABOVE the pin. Introduce slack in the wire as you pull the end of the wire out through the slot between the crimpers.

3.11 With the wires properly placed, insert the connector and proceed as stated in Paragraph 4.



FiLwre 3. Various Types of Connections Possible with the Picabond Connector.

4. COMPLETING CONNECTION

4.01 It is essential to hold the VS-3 tool as steady as possible while crimping the connector since any movement may shift the wires and cause them to pull out of their position in the tool head.

4.02 A **suggested** method of steadying the tool during the crimping operation consists of grasping the front portion of the fixed handle with one hand while you use your other hand to close the quick-take-up lever (small lever at **top of tool) and** the movable handle. (See Figure 9) In completing the crimp, remember to close the handles fully until the ratchet releases and the handles open. Remove the crimped connection from the tool.

5. CONNECTOR INSPECTION

5.01 A crimp gauge (See Figure 10) is provided with the A-MP VS-3 tool to enable the tool operator to periodically check the quality **of the** finished Picabond connections. It is recommended that a minimum of ten test crimp connections be gauged at least once each quarter year. This will verify whether or not the VS-3 tool is in good working order.

5.02 The crimp gauge has been designed as a double ended tool which will permit the user to check the full range (19 to 26 AWG) of connections possible with Picabond connectors. Each of the ends has **been labeled with the wire size it accepts. Each end also has a color Dot to assist the user to quickly spot the proper gauge end for a particular connection.**

(a) Use the end with the green dot for green or purple Picabond connectors.

(b) Use the end with the red dot for red or yellow Picabond connectors.

5.03 After a splice has been completed, one side of the crimped connector will have a seam. Insert the connector into the proper gauge end so the seam faces the double rib of the gauge as shown in Figure 11. Position the connector so the edge of the connector is flush with the side of the gauge.

5.04 Hold the free end of the connector and release the gauge momentarily. The weight of the gauge must cause it to fall free. Insert the other end of the connector in the proper gauge and repeat the procedure. If either end of the connector stays in the gauge, the connector is defective and should be replaced.

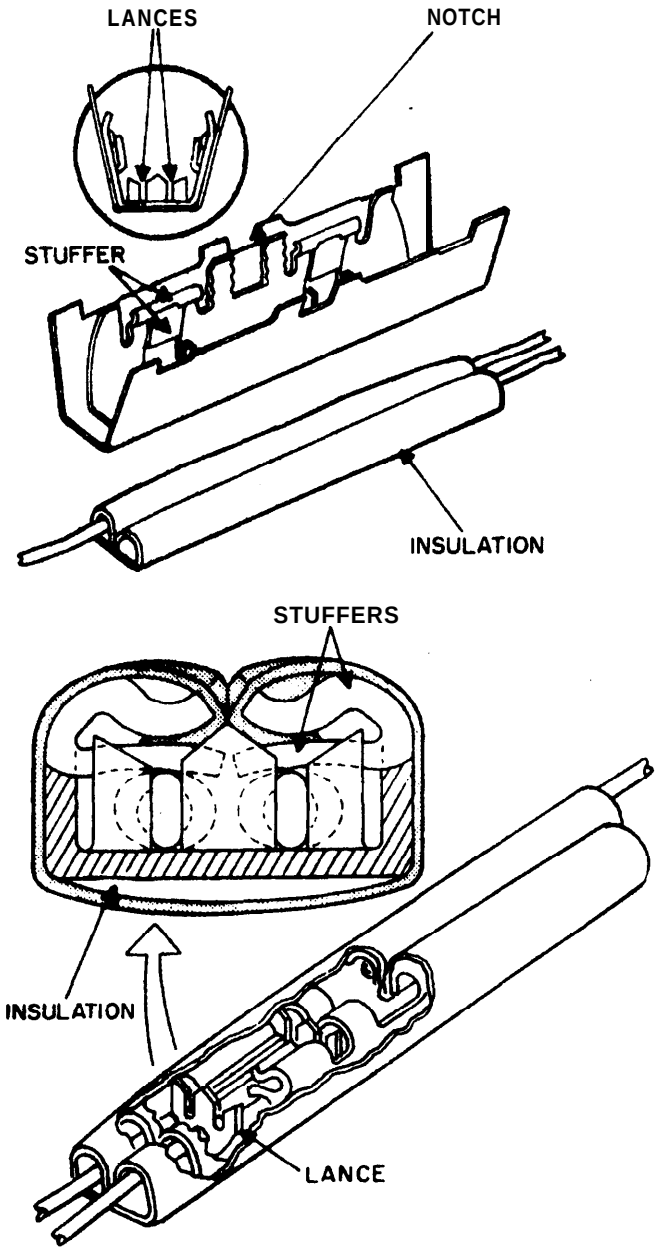


Figure 4. Connector Features—Uncrimped and Crimped.

TABLE 1. CONNECTOR COLOR CODE

COLOR	SIZE	CONDUCTOR SIZE
GREEN	STANDARD	#22 THROUGH x26
RED	STANDARD	#19 THROUGH #24
PURPLE	WEATHER RESISTANT	22 THROUGH #26
YELLOW	WEATHER RESISTANT	#19 THROUGH #24

5.05 In the event that the gauging process detects one or more defective connectors the VS-3 tool operator should make a determination as to whether his crimping technique is at **fault.** the Picobond connectors are defective, or the VS-3 tool is not functioning correctly. If the latter proves to be the case, the tool should be replaceed with one that is **in** good working condition. The defective tool should be returned to the manufacturer for repair in accordance with local procedures.

5.06 In the course of making crimped connections with the VS-3 tool or when using the crimp gauge, visually check the Picabond connectors for the following: (See Figure 12)

(a) Check for insulation or wire protruding from the center of the connector. If you find any, replace the tool and all such connectors.

(b) Examine the connectors insulation for any cuts or score marks. If you find any, check for burrs or foreign matter on the anvil or crimper of the tool. If you can remove the foreign matter, continue to use the tool. If you can't, replace the tool. Either replace or post insulate any defective connections.

(c) **Check** for metal legs protruding from the center of the connectors. This is caused by improper location of the connector in the tool so the slot. in the connector engages the wire cutter.

(d) If you are tapping or bridging, make sure the end of the connector with two wires contains one wire on each side of the seam. If both wires are on one side, replace the connection. Be very careful to place the wires in the wire supports correctly. If the wires are still incorrectly placed. replace the tool with a good one. Refer to Paragraph 5.05.

SAFETY PRECA UTIONS

6.01 Exercise ex treme caution when performing splicing operations with the VS-3 tool in the vicinity of power connections or other locations as listed in the 200-201 series of General System Practices.

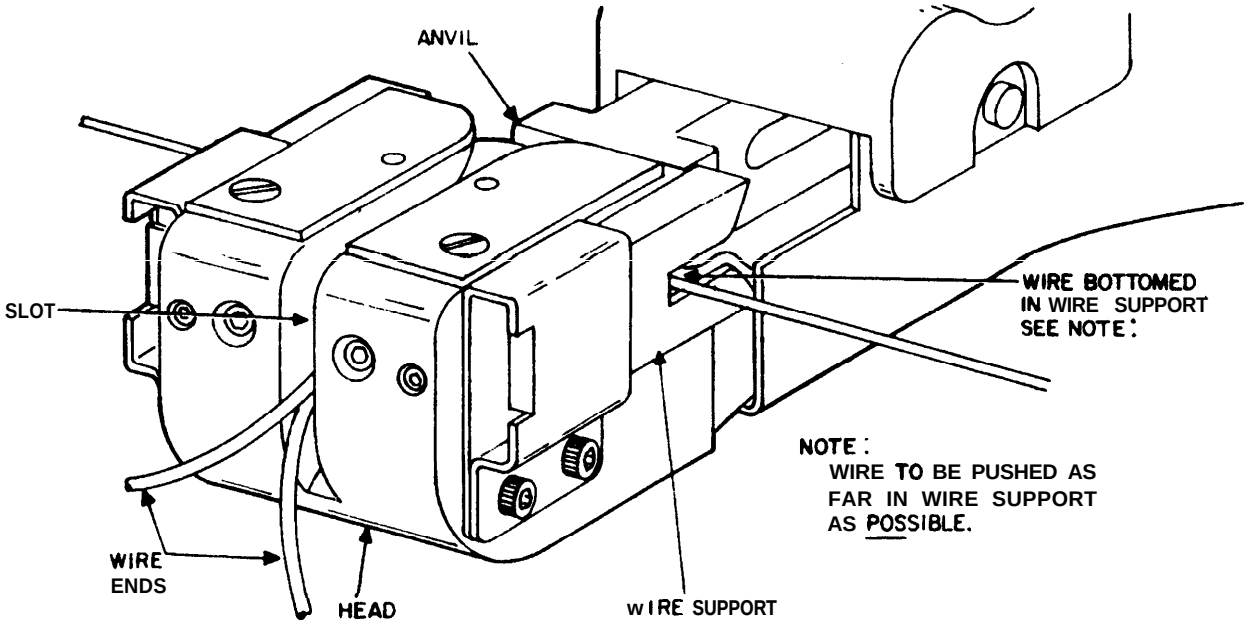


Figure 5. Placing Wires in VS-3 Tool Head Slot and Wire Supports.

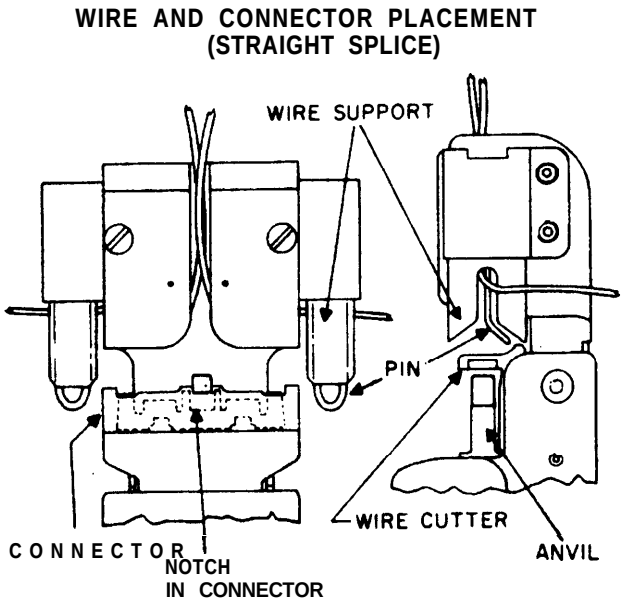


Figure 6. Placing Wires in VS-3 Tool for Straight Splice Operation.

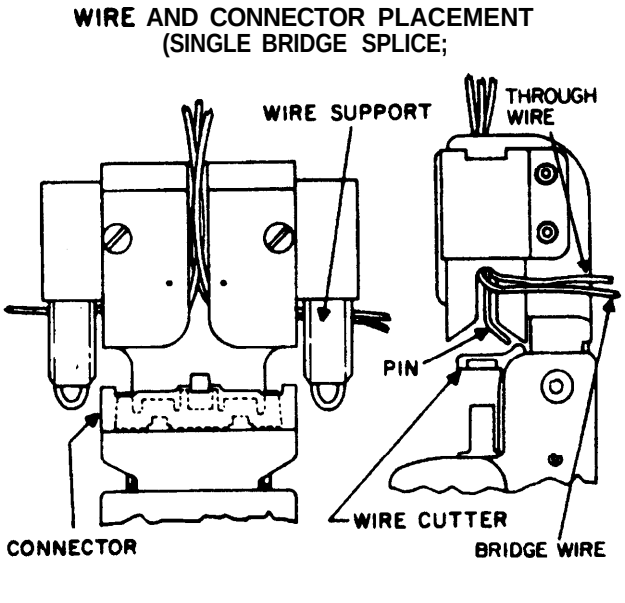


Figure 7. Placing Wires in VS-3 Tool for Single Bridge Splice Operation.

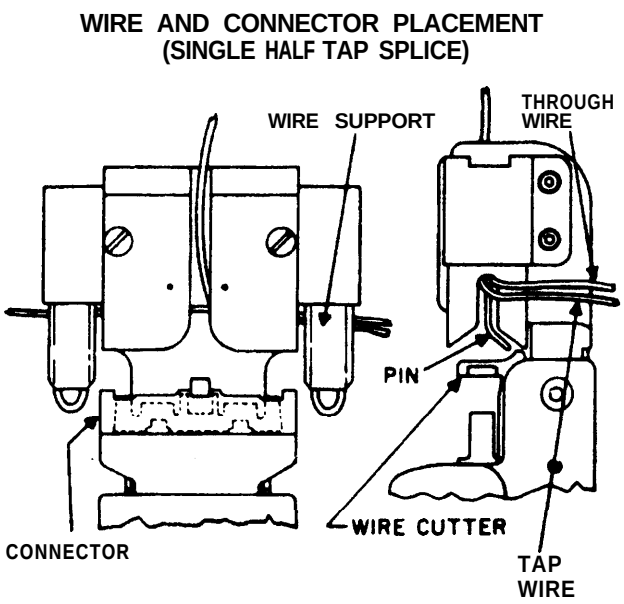


Figure 8. Placing Wires in VS-3 Tool for Single Half Tap Splice Operation.

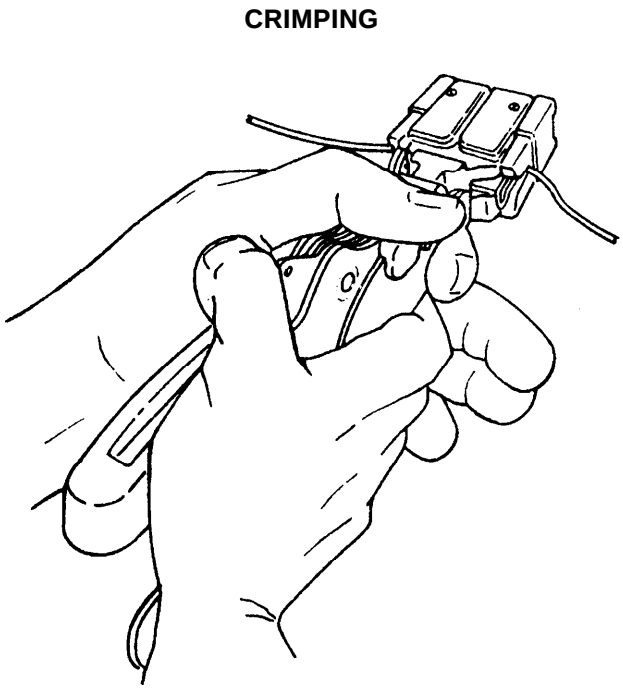


Figure 9 Method of Holding Tool Steady While Crimping.

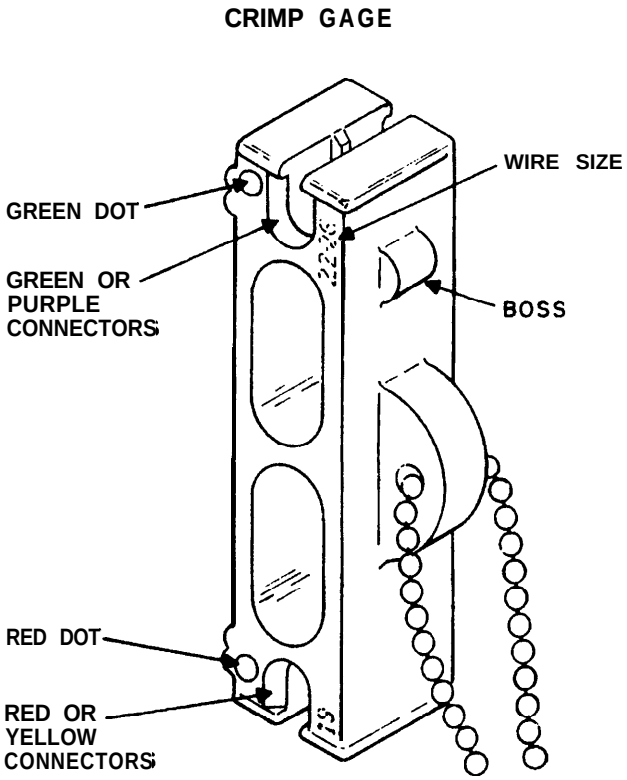


Figure 10. Crimp Gauge Showing Color Designations for Gauge Ends.

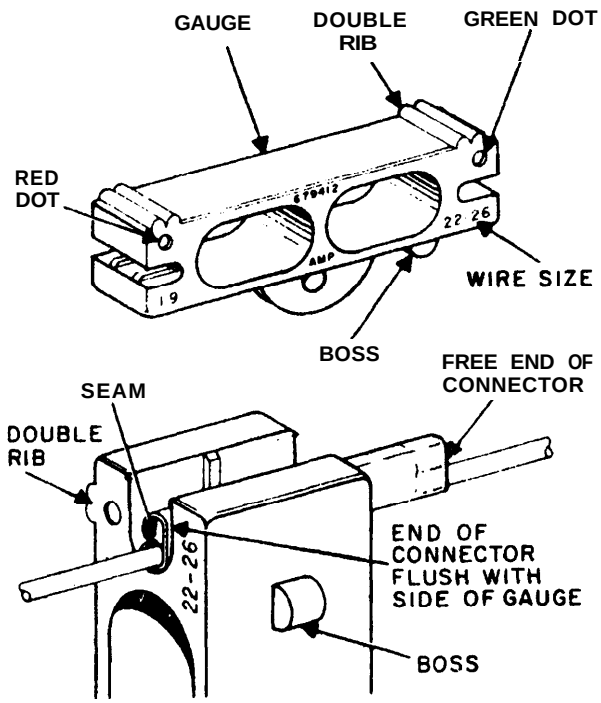


Figure 11. Method of Inserting Connector in Crimp Gauge.

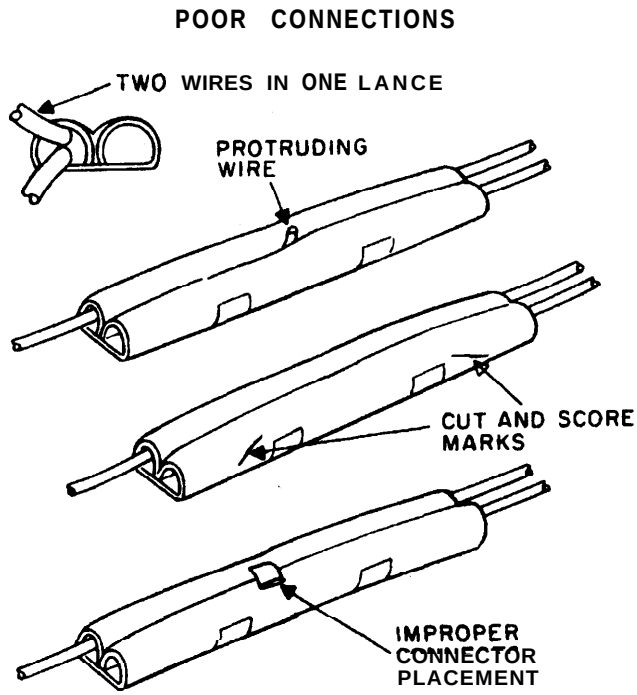


Figure 12. Examples of Poor Connections.