

## BURIED WIRE

### DESCRIPTION AND TERMINATION

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#### 1. GENERAL

**1.01** This section covers the description and termination of B service wire, F-59307 and F-59377 filled service wires, F-44541 armored service wire, and E buried wire.

**1.02** This section is reissued to include:

- Information for terminating service wires in the F cable closure in the superseded cable closure sections (Part 15)
- Information for terminating service wires in the PC6/48 cable closures.
- Information for splicing filled service wires and enclosing splice with 15AW1 service wire splice closure, 13- and 14-type prefilled waterproof distribution closures.

Since this is a general revision, arrows showing changes have been omitted.

**1.03** The outer jacket of buried wire is marked at 2-foot intervals, from the inside end, to show the accumulated footage. These markings simplify the measuring and recording of wire lengths for accounting purposes and permit a more accurate measurement of lengths being cut to fit a specific location. The markings also indicate the amount of wire remaining on a reel.

**1.04** E buried wire supersedes D underground wire.

**1.05** The recommended depths for placing service or distribution wires are specified in Section 629-200-206.

#### 2. B SERVICE WIRE—DESCRIPTION

**2.01** B service wire is intended for direct burial without added mechanical protection in nonrodent infested areas. It is used as a buried drop connection to customer's premises. Its use is limited to lengths not to exceed 500 feet. The

approximate breaking strength is 230 pounds. It weighs 36 pounds per 1000 feet.

**2.02** B service wire, shown in Fig. 1, consists of one quad of 20-gauge (AWG) copper covered steel conductors, individually insulated with distinctively colored (red, green, yellow, and black) solid polyethylene. The insulation of the conductors is colored for purpose of identification.

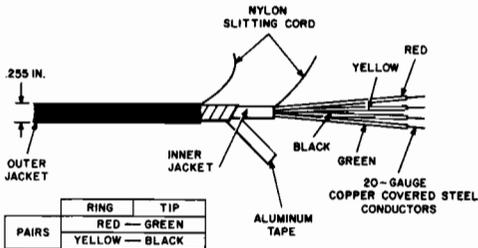


Fig. 1—B Service Wire

**2.03** The quad is formed into a spiral and is jacketed with gray PVC underlaid by a jacket slitting cord of nylon. An aluminum tape is applied over the jacketed quad and is covered with an outer jacket of black PVC which is also underlaid with a slitting cord of nylon.

**2.04** B service wire is furnished:

- On reels containing lengths totaling approximately 5000 feet.
- On small reels containing lengths totaling approximately 2000 feet for use with the pivot mounted vibratory plows.
- In coils of approximately 1000 feet for use with C drop wire reels.

**3. FILLED SERVICE WIRES—DESCRIPTION**

**3.01** F-59307 filled service wire (Fig. 2) is the same as B service wire except:

- (a) A flame and water resistant thermoplastic compound is applied throughout the quad and enclosed by a vinyl jacket.

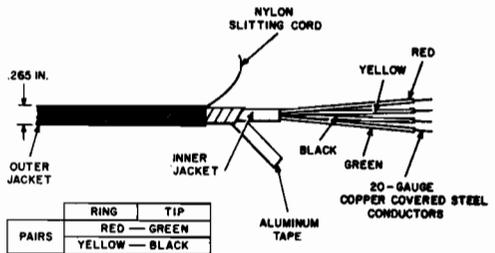


Fig. 2—F-59307 Filled Service Wire

- (b) An inner jacket rip cord is not provided.

**3.02** The F-59377 filled service wire is intended for use in providing buried service connections and is approved for building entrances.

**3.03** The F-59377 filled service wire (Fig. 3) consists of five pairs of 22-gauge solid copper conductors individually insulated with distinctively colored polyethylene. The insulation on the conductors is colored for purpose of identification.

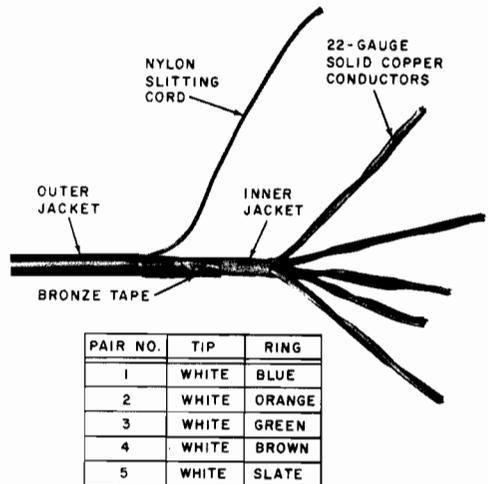


Fig. 3—F-59377 Filled Service Wire

**3.04** A flame and water resistant thermoplastic filling compound is applied throughout the twisted pairs and enclosed by an inner vinyl jacket. A helical bronze tape shield is applied over the inner vinyl jacket. A slitting cord of nylon is laid between the bronze tape shield and black outer PVC jacket.

**3.05** The F-59377 filled service wire is furnished:

- On reels containing lengths totaling approximately 5000 feet. The lengths of pieces are marked on the reel. No length of wire is less than 1000 feet.
- On small reels containing 950 feet for use with wire plows.

#### 4. F-44541 ARMORED SERVICE WIRE—DESCRIPTION

**4.01** F-44541 armored service wire is a rodent resistant-wire intended for direct burial without added mechanical protection in rodent infested areas. It is used as a buried drop connection to customer's premises. Its use is limited to lengths not to exceed 500 feet. The approximate breaking strength is 200 pounds. It weighs 39 pounds per 1000 feet.

**4.02** F-44541 armored service wire, shown in Fig. 4, consists of one quad of 22-gauge (AWG) annealed copper conductors, individually insulated with distinctively colored (red, green, yellow, and black) solid polyethylene. The insulation of the conductors is colored for purpose of identification.

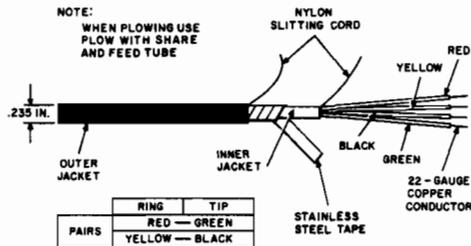


Fig. 4—F-44541 Armored Buried Wire

**4.03** The quad is formed into a spiral and is jacketed with gray PVC underlaid by jacket slitting cord of nylon. A stainless steel tape is applied over the jacketed quad and is covered with an outer jacket of black PVC which is also underlaid with a slitting cord of nylon.

**4.04** F-44541 armored service wire is packaged in the same manner as B service wire (see 2.04).

#### 5. E BURIED WIRE—DESCRIPTION

**5.01** E buried wire is a rodent resistant wire intended for direct burial without added mechanical protection. It is used for buried rural distribution of telephone circuits. The approximate breaking strength is 200 pounds. It weighs 51 pounds per 1000 feet.

*Note:* The 500 foot limitation for B service wire, filled service wire, and F-44541 armored service wire does not apply to E buried wire.

**5.02** E buried wire, shown in Fig. 5, consists of two parallel 19-gauge (AWG) annealed copper conductors, insulated with brown-colored polyethylene. An armor of flat bronze tape is applied over the insulated conductors and is covered with an outer jacket of black PVC which is underlaid with a nylon slitting cord. One conductor is tinted a bluish white color for conductor identification.

*Note:* The brown-colored polyethylene conductor insulation is provided with slots to facilitate separation of the insulated conductors when cut with a suitable cutting tool, ie, diagonal pliers, splicer's scissors, etc.

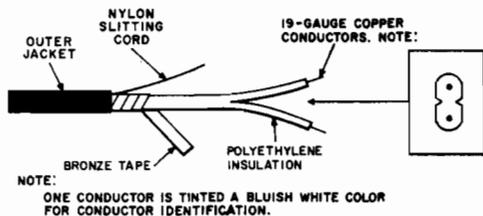


Fig. 5—E Buried Wire

5.03 E buried wire is furnished on reels containing continuous lengths of either 1500 or 10,000 feet.

6. 6A-TYPE TERMINAL BLOCKS—DESCRIPTION

6.01 To provide protection at exposed locations, the following terminal blocks are available:

(a) **6A3A-3 Terminal Blocks (Fig. 6):** Used for 3-pair station protection. Each terminal block will be marked "STATION PROTECTION". The terminal block is equipped with six color coded leads (white-blue, white-orange, white-green)

one to each binding post and 2A1A protector unit.

(b) **6A4B-3 Terminal Block (Fig. 7):** Used for 3-pair cable protection. Each terminal block will be marked "CABLE PROTECTION". The terminal block is equipped with twelve color coded (white-blue, white-orange, white-green) leads, two to each binding post and 2A1B protector unit. When using the terminal block, either join both wires from each binding post to the cable conductors or terminate the spare wire under the rear washers of the associated binding post and cut off the ends as short as possible.

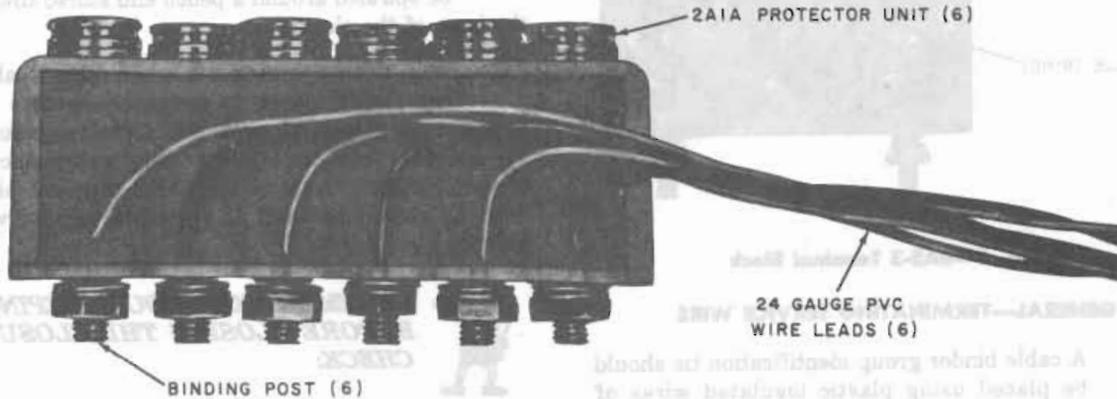


Fig. 6—6A3A-3 Terminal Block

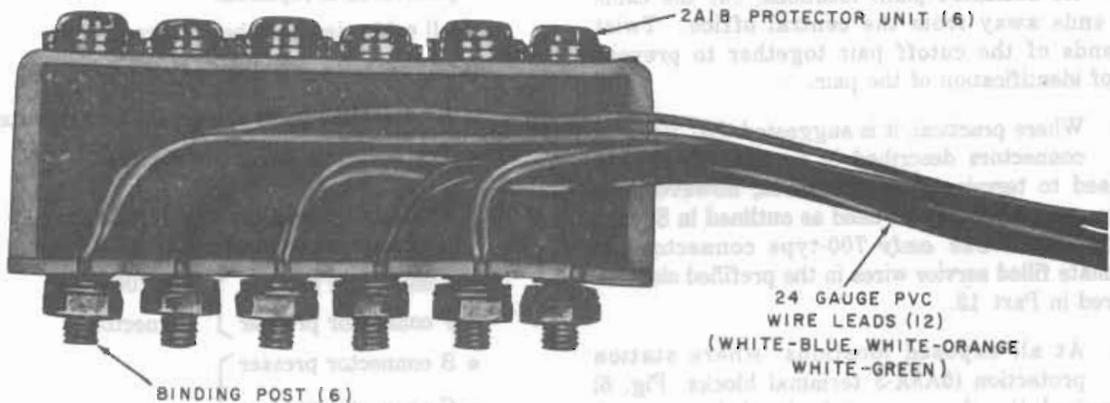


Fig. 7—6A4B-3 Terminal Block

(c) **6A2-3 Terminal Block (Fig. 8):** Used at the junction of distribution cable and service wire where only fusing is required. The terminal block is 3-pair nonprotected, equipped with twelve 24-gauge (blue, ring and white, tip) leads, two to each binding post.

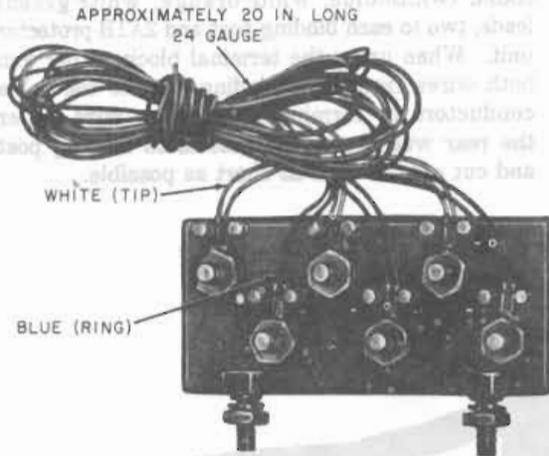


Fig. 8—6A2-3 Terminal Block

## 7. GENERAL—TERMINATING SERVICE WIRE

**7.01** A cable binder group identification tie should be placed using plastic insulated wires of the same color as the unit binder.

**7.02** At multiple plant locations, bridge the service wire to the cable pairs at the center of the loop to obtain maximum length of both cable pair ends. At dedicated plant locations, cut the cable pair ends away from the central office. Twist the ends of the cutoff pair together to prevent loss of identification of the pair.

**7.03** Where practical, it is suggested that 700-type connectors described in Section 632-205-215 be used to terminate service wires; however, the B wire connector may be used as outlined in Section 632-205-201. Use *only* 700-type connectors to terminate filled service wires in the prefilled closures covered in Part 13.

**7.04** At all exposed locations, where station protection (6A3A-3 terminal blocks, Fig. 6) is required, the closure must be bonded to ground. To bond the closure, terminate No. 6 ground wire to the F connector on the ground bracket assembly. Bond the other end to ground as outlined in Section 460-100-201.

**7.05** When the closure is placed at exposed locations, bond the closure to the power company ground with No. 6 ground wire. At the closure, terminate the No. 6 ground wire to the F connector on the ground bracket assembly. Bond the other end to the power company ground as covered in local instructions.

**7.06** A maximum of three 2 pair or two 5 pair wires can be installed in each AT-7796X connector. The maximum number of service wires that can be installed in each type of closure is dependent upon the number of AT-7796X connectors that can be installed in the closure.

**7.07** The spare service wire conductors should be spiraled around a pencil and stored toward the base of the closure.

**7.08** Fuse wiring is required when buried cables containing 19- or 22-gauge conductors are exposed to power of over 300 volts to ground. To provide fuse wire protection, nonprotected terminal blocks, such as the 6A2-3 terminal block (Fig. 8), should be used at the cable, service wire junction.



### REMEMBER GOOD HOUSEKEEPING— BEFORE CLOSING THE CLOSURE CHECK:

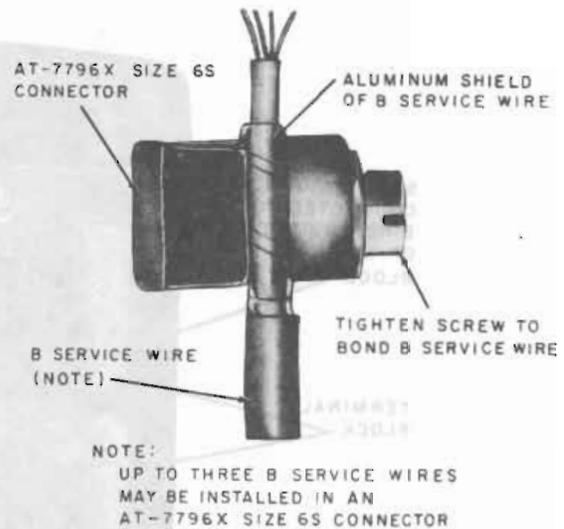
- All binder group identification ties have been placed.
  - All conductor insulation that has been punctured is repaired.
  - All cable ties have been placed.
  - The cable loop is dressed.
  - All defective pairs are repaired or reported.
  - Any defective bonds are repaired.
- 7.09** No tools other than the following may be used to press connectors:
- |  |                              |
|--|------------------------------|
| • E connector presser                    | } For 700-type<br>connectors |
| • F connector presser                    |                              |
| • B connector presser                    | } For B wire<br>connectors   |
| • C connector presser                    |                              |
| • C pneumatic presser                    |                              |
| • CS-6 Pair-A-Matic<br>connector presser |                              |

**7.10** The term service wire as used in this section refers to B service wire, filled service wire, F-44541 armored service wire, and E buried wire.

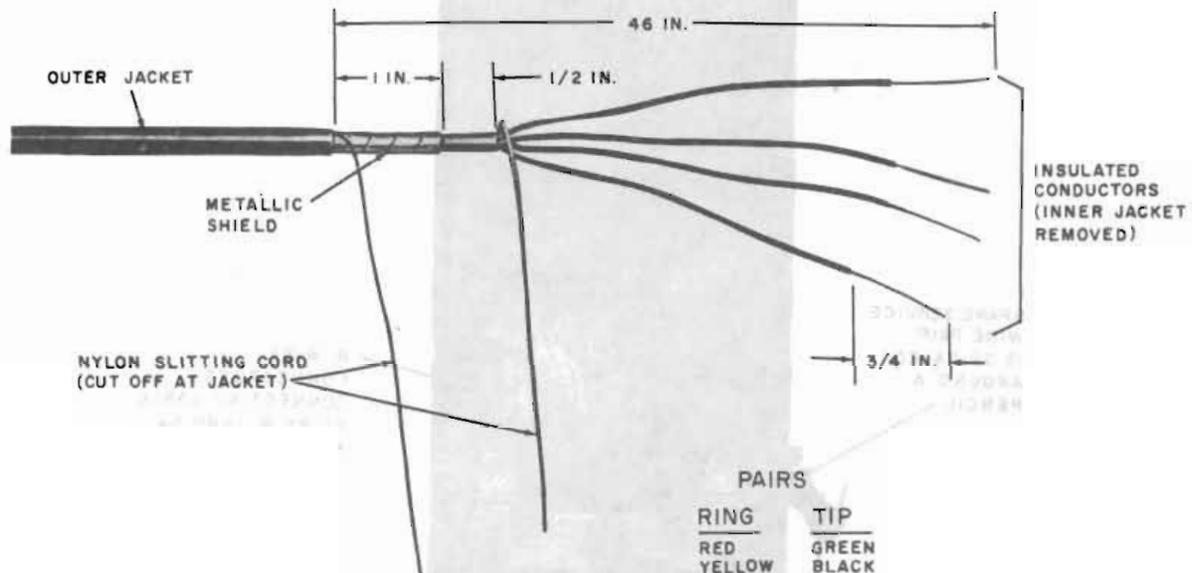
**8. TERMINATING SERVICE WIRE—PC6/48 CABLE CLOSURE**

**8.01** Prepare the service wire as shown in Fig. 9 and install the metallic tape in the AT-7796X connector as illustrated in Fig. 10.

**8.02** Run the conductor of the service wire up through the three wire rings, back down through the center ring then up or down to the assigned binding post on the terminal block as shown in Fig. 11, 12, 13, or 14.



**Fig. 10—Service Wire in AT-7796X Connector**



**Fig. 9—Prepared Service Wire PC6/48 Closure**

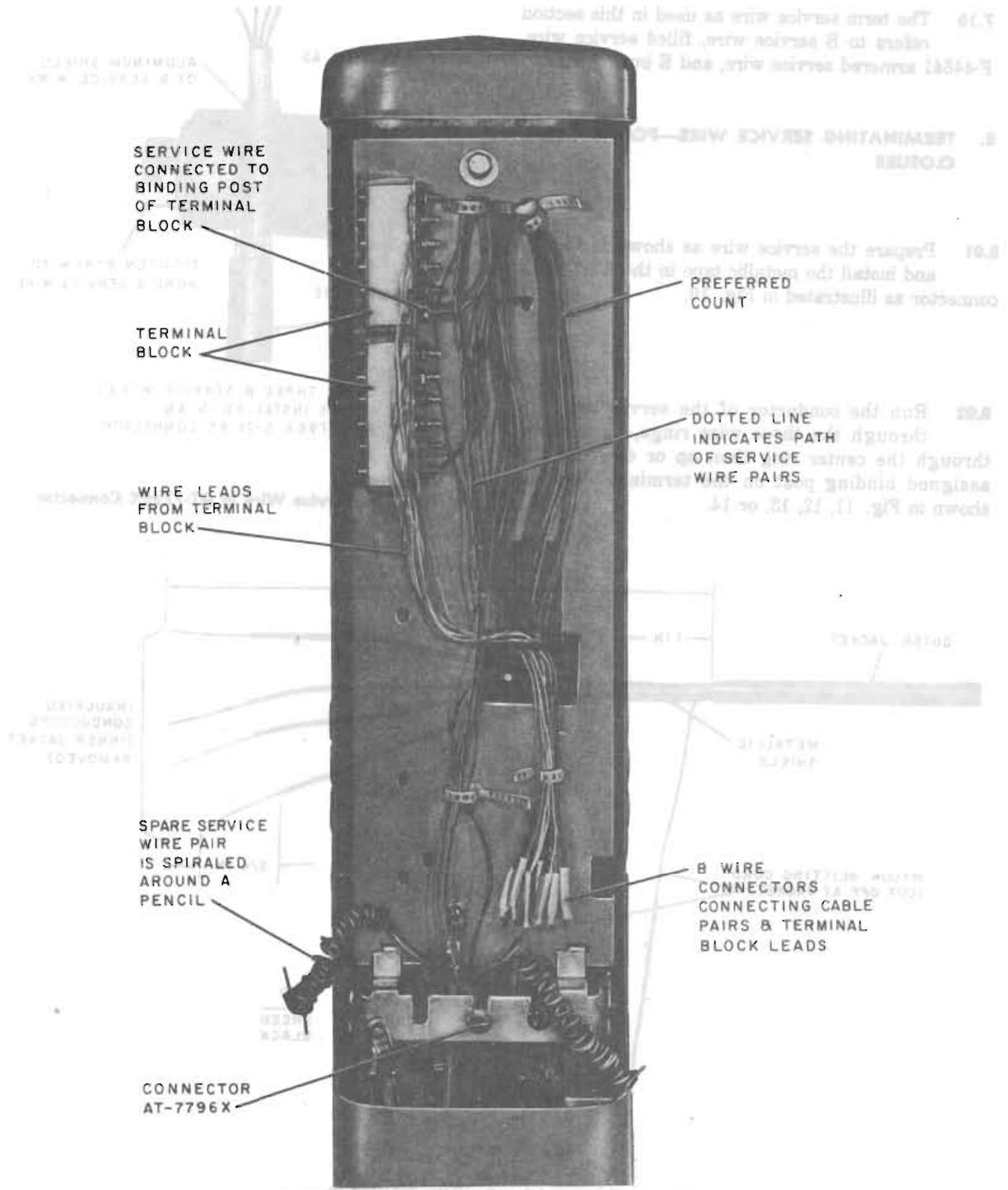


Fig. 11—Service Wire Installed

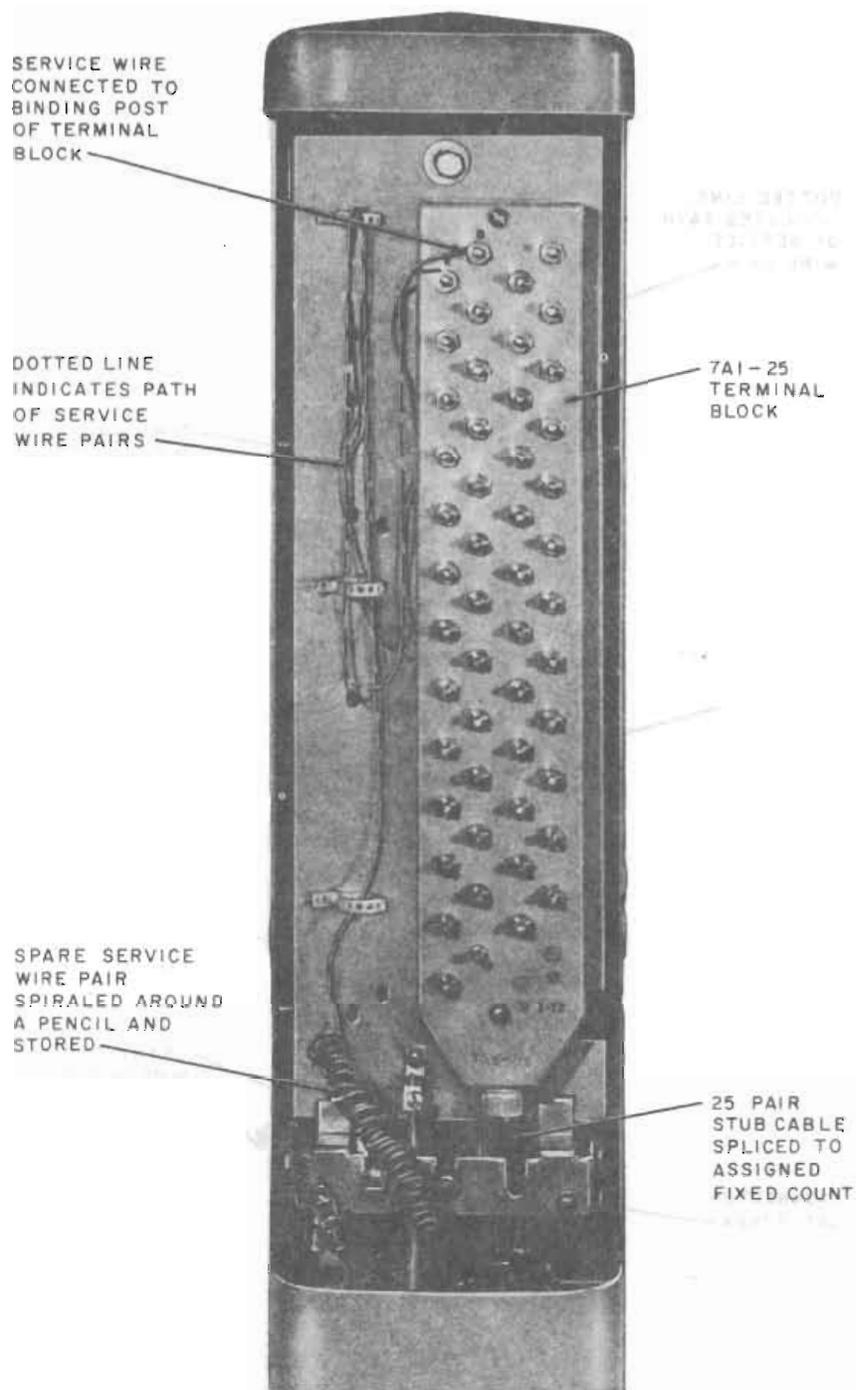


Fig. 12—Service Wire Terminated on 7A1-25 Terminal Block—Fixed Count PC6/48

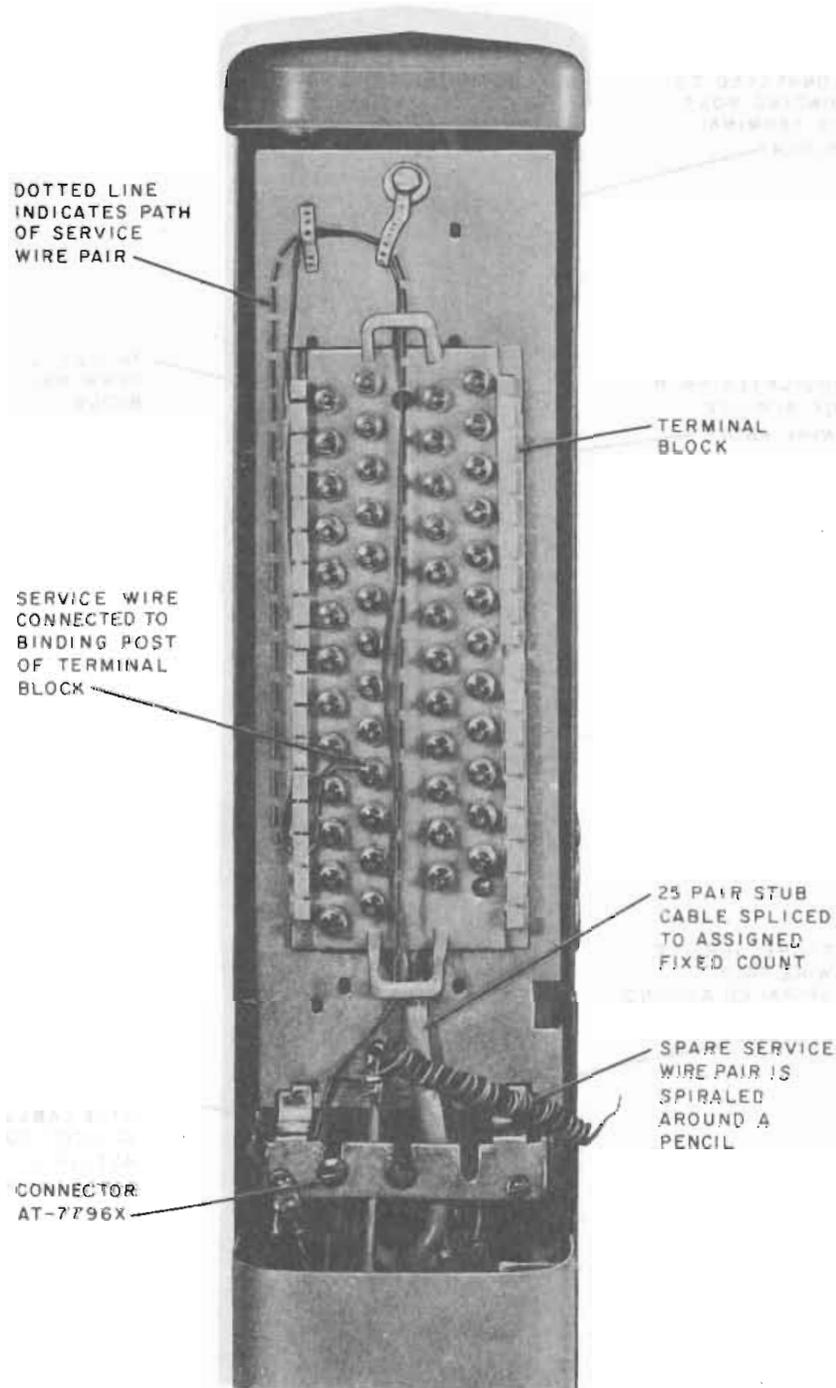


Fig. 13—Service Wire Terminated on 25-Pair Reliable Block—Fixed Count PC6/48

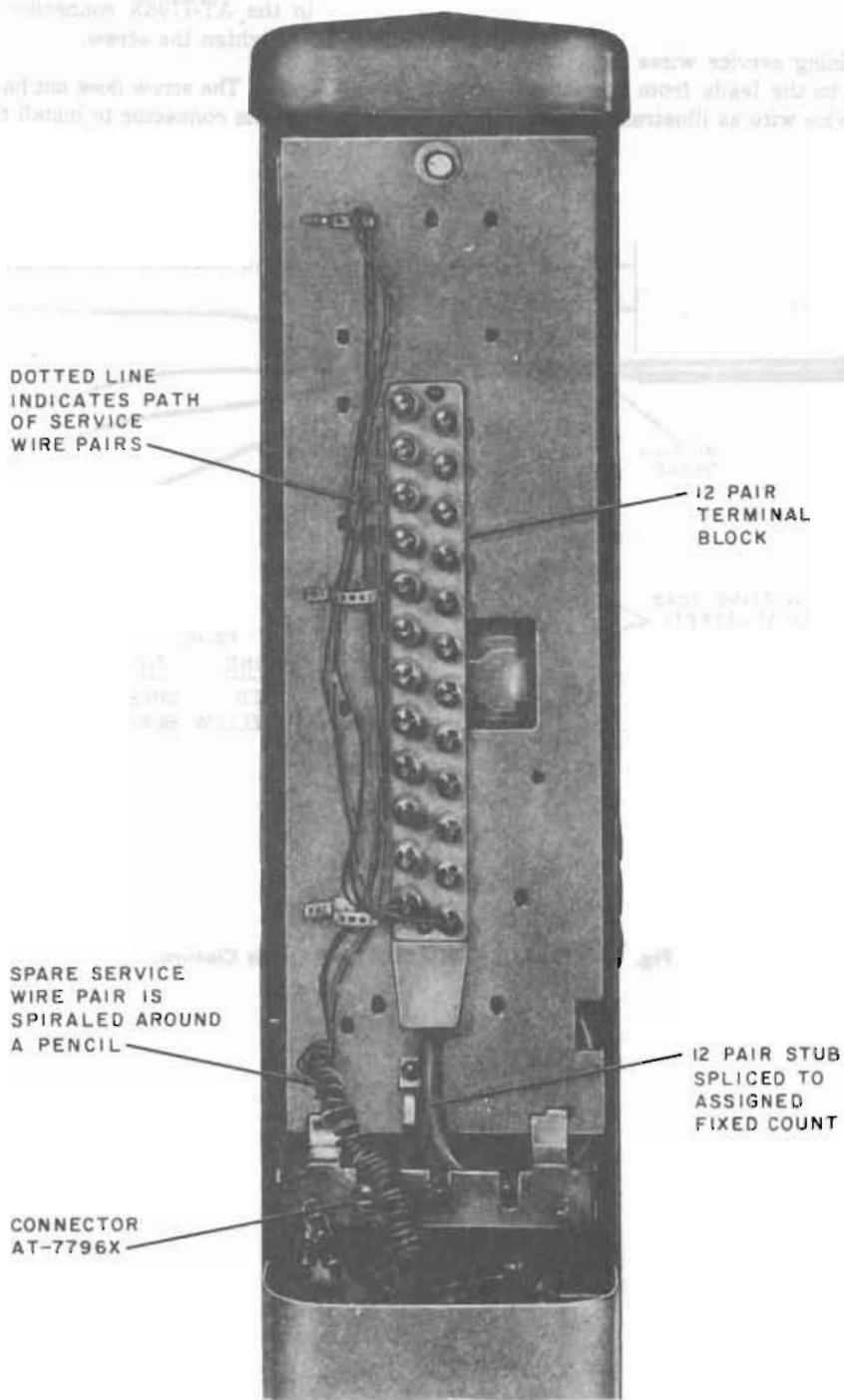


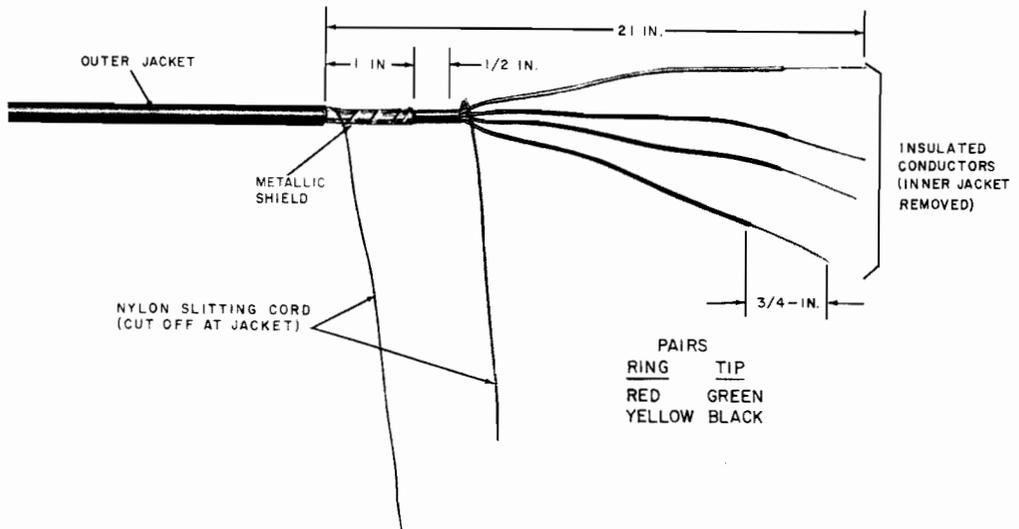
Fig. 14—Service Wire Terminated on 12-Pair Terminal Block—Fixed Count PC6/48

**9. TERMINATING SERVICE WIRE—E CABLE CLOSURE**

**9.01** When joining service wires directly to cable pairs or to the leads from terminal blocks, prepare the service wire as illustrated in Fig. 15.

**9.02** Install the metallic tape of the service wire in the AT-7796X connector as illustrated in Fig. 10. Tighten the screw.

**Note:** The screw does not have to be removed from the connector to install the service wire.



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**Fig. 15—Prepared Service Wire E Cable Closure**

**9.03** Run the service wire through the plastic clips on the bracket assembly and down through the plastic clips on the backplate (Fig. 16).

**9.04** At each cable butt, place binder group identification ties (see 7.01) around the binder group containing the cable pair to be connected. Remove the unit binder. Remove the assigned cable pair from the binder group and cut the cable pair (see 7.02). Place the cable pair up through the plastic clip on the backplate and bend down. Cut the cable pair and service wire conductors even, 1-1/2 inches below the plastic clip. Connect the service wire conductors to the cable pair conductors with 700-type connectors or B wire connectors (Fig. 17 see 7.03).

**9.05** Where the closure has terminal blocks, proceed as follows:

(a) Remove the outerjacket from the service wire and install the metallic tape in the AT-7796X connector as illustrated in Fig. 10.

(b) Run the service wire up through the plastic clips on the bracket assembly and terminate the conductors on the assigned binding posts of the terminal block (Fig. 17).

(c) Run the leads from the assigned binding posts up through the plastic clips on the bracket assembly and down through the plastic clips on the backplate (Fig. 17).

(d) Remove the assigned cable pair from the binder group, place binder group identification ties as outlined in 9.04.

(e) Cut the cable pair (see 7.02). Place the cable pair up through the plastic clip on the backplate and bend down. Cut the cable pair and terminal block conductors even, 1-1/2 inches below the plastic clip. Connect the terminal block conductors to the cable pair conductors with 700-type connectors or B wire connectors (Fig. 17, see 7.03), then attach service wire conductor to appropriate terminals on the terminal block.

**10. TERMINATING SERVICE WIRE—J CABLE CLOSURE**

**10.01** When joining service wire directly to the cable pair prepare the service wire and install the metallic tape in the AT-7796X connector as illustrated in Fig. 10.

**10.02** Run the service wire through the plastic clip on the bracket assembly and down through the plastic clip on the backplate (Fig. 18).

**10.03** At each cable butt, place binder group identification ties (see 7.01) around the binder group containing the cable pairs to be connected. Remove the unit binder. Remove the assigned cable pair from the binder group and cut the cable pair (see 7.02). Place the cable pair up through the plastic clip on the backplate and bend down. Cut the cable pair conductors and service wire conductors even, 1-1/2 inches below the plastic clip. Connect the service wire conductors to the cable pair conductors with 700-type connectors or B wire connectors (Fig. 18, see 6.03).

**10.04** Where the closure has terminal blocks, proceed as follows:

(a) Remove the outer jacket from the service wire and install the metallic tape in the AT-7796X connector as illustrated in Fig. 10.

(b) Run the service wire up through the plastic clips on the bracket assembly and terminate the conductors on the assigned binding posts of the terminal block (Fig. 19).

(c) Run the leads from the assigned binding posts up through the plastic clips on the bracket assembly and down through the plastic clip on the backplate (Fig. 19).

(d) Remove the assigned cable pair from the binder group. Cut the cable pair (see 7.02).

(e) Place the cable pair up through the plastic clips on the backplate and bend down. Cut the cable pair and terminal block conductors even, 1-1/2 inches below the plastic clip. Connect the terminal block conductors to the cable pair conductors with 700-type connectors or B wire connectors (Fig. 19, see 7.03). Attach the service wire to appropriate terminals on the terminal block.

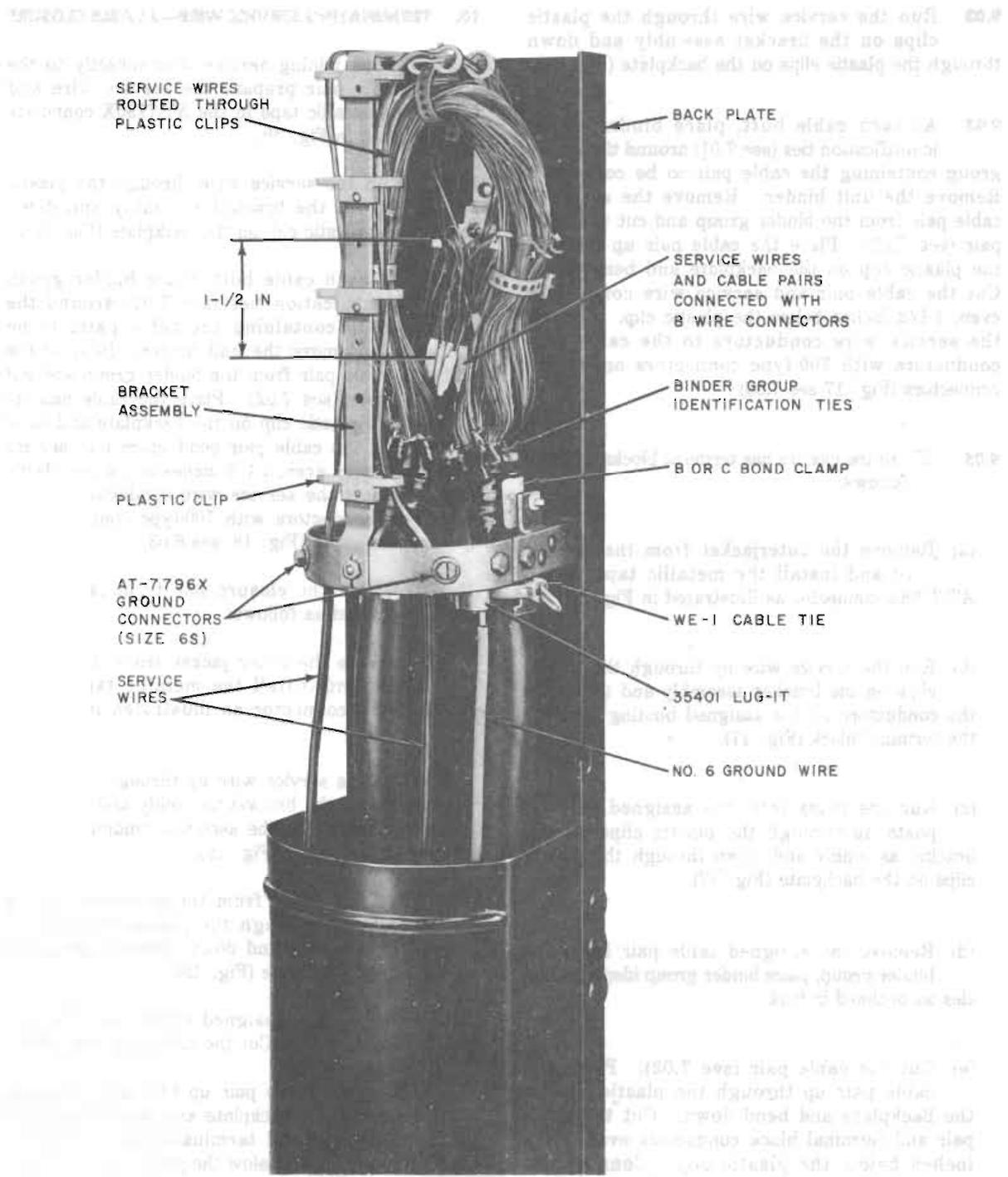


Fig. 16—Service Wire Installed—E Cable Closure (Nonprotected)

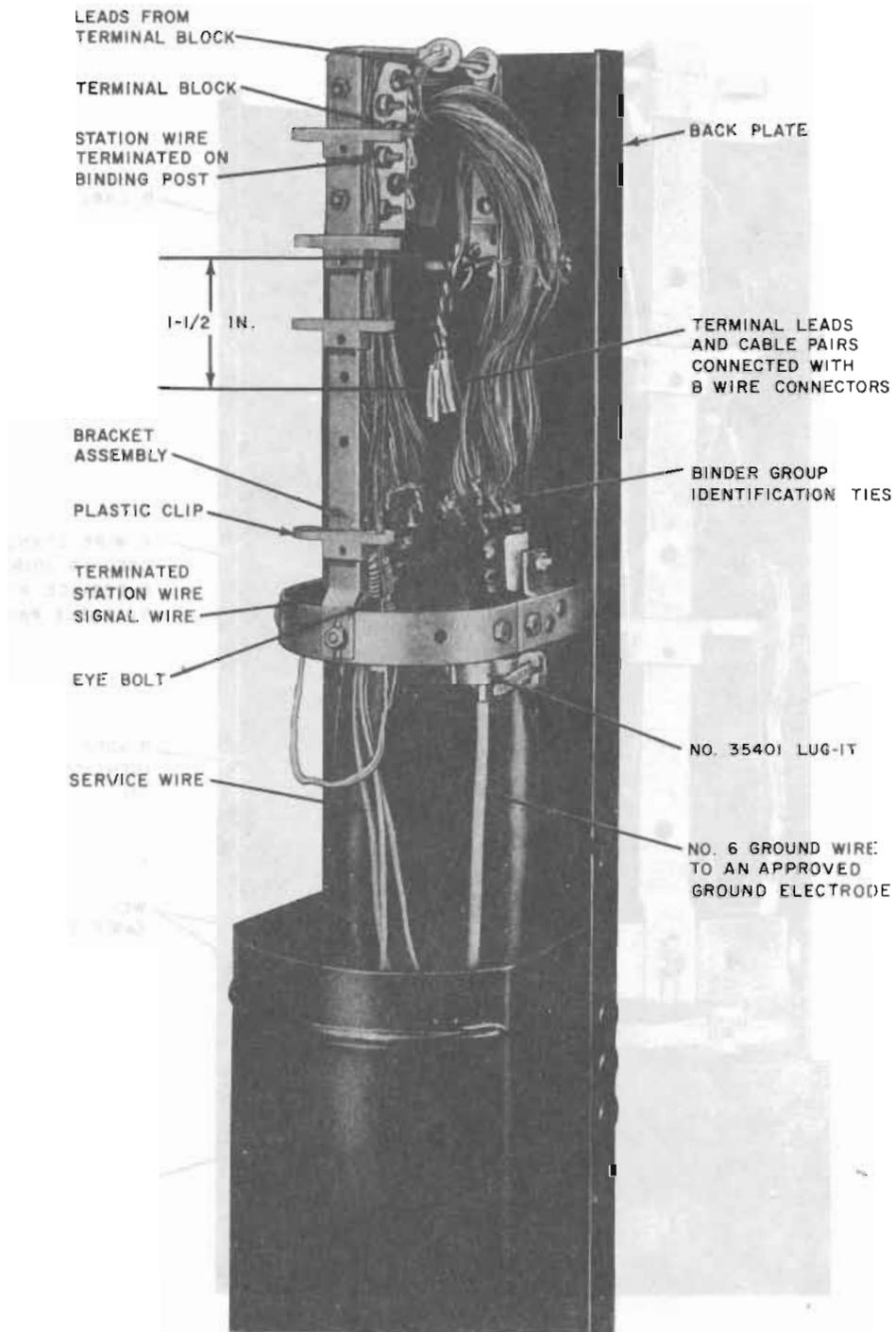


Fig. 17—Service Wire Installed—E Cable Closure (Protected)

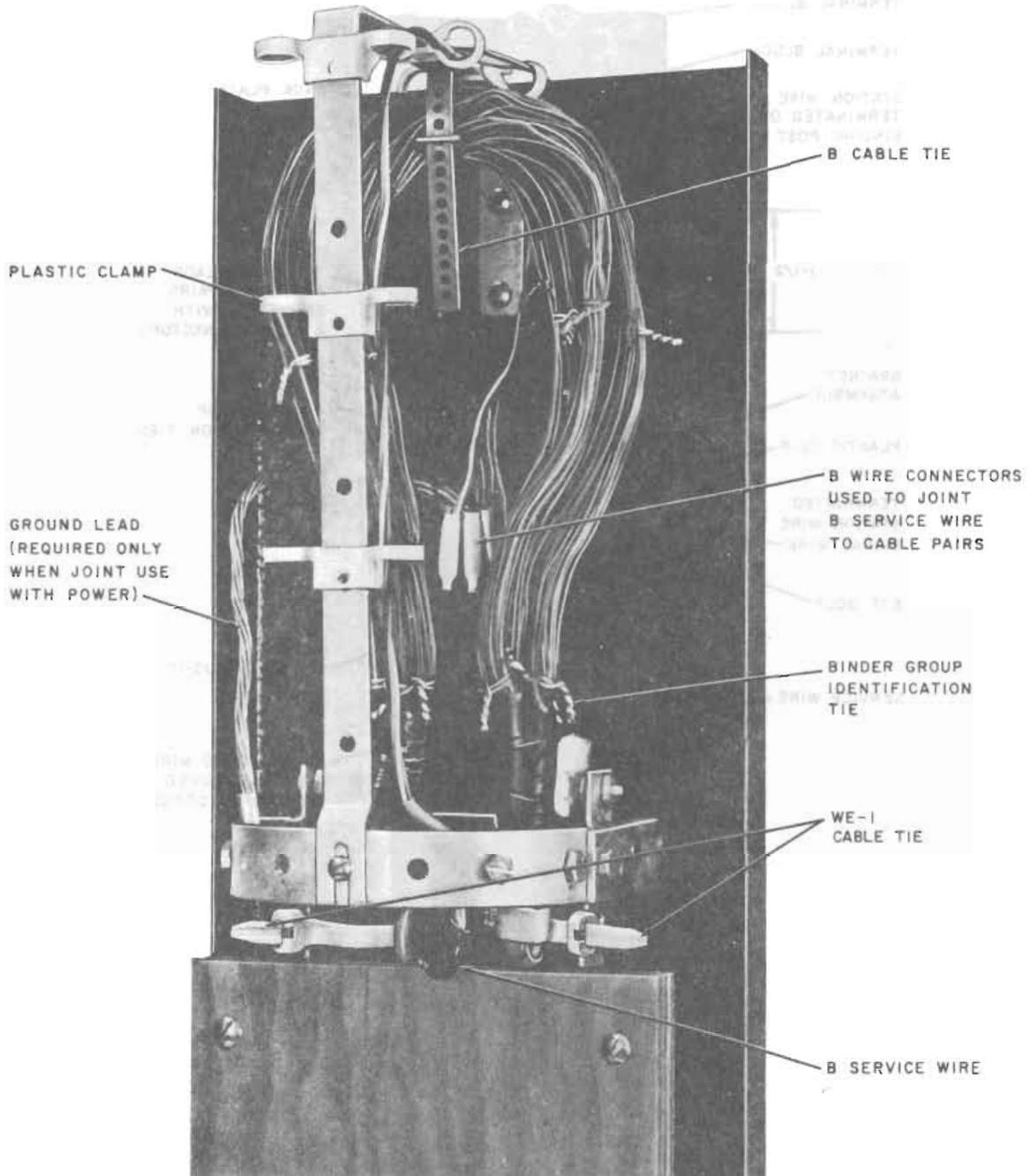


Fig. 18—Service Wire Installed—J Cable Closure (Nonprotected)

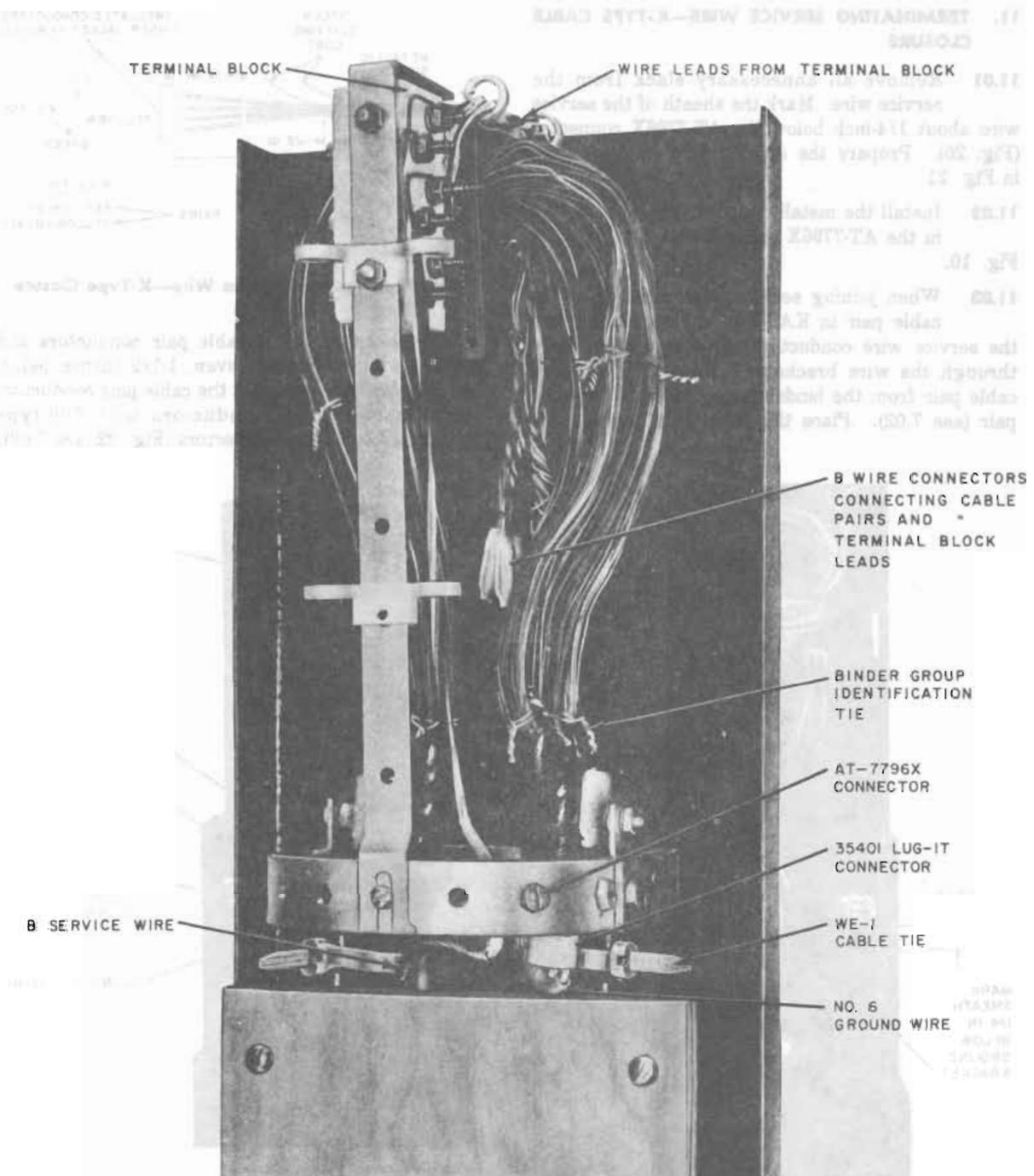


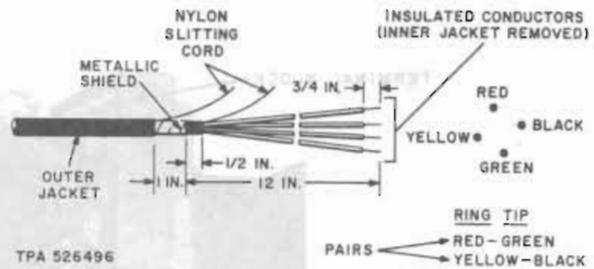
Fig. 19—Service Wire Installed—J Cable Closure (Protected)

**11. TERMINATING SERVICE WIRE—K-TYPE CABLE CLOSURE**

**11.01** Remove all unnecessary slack from the service wire. Mark the sheath of the service wire about 1/4-inch below the AT-7796X connector (Fig. 20). Prepare the service wire as illustrated in Fig. 21.

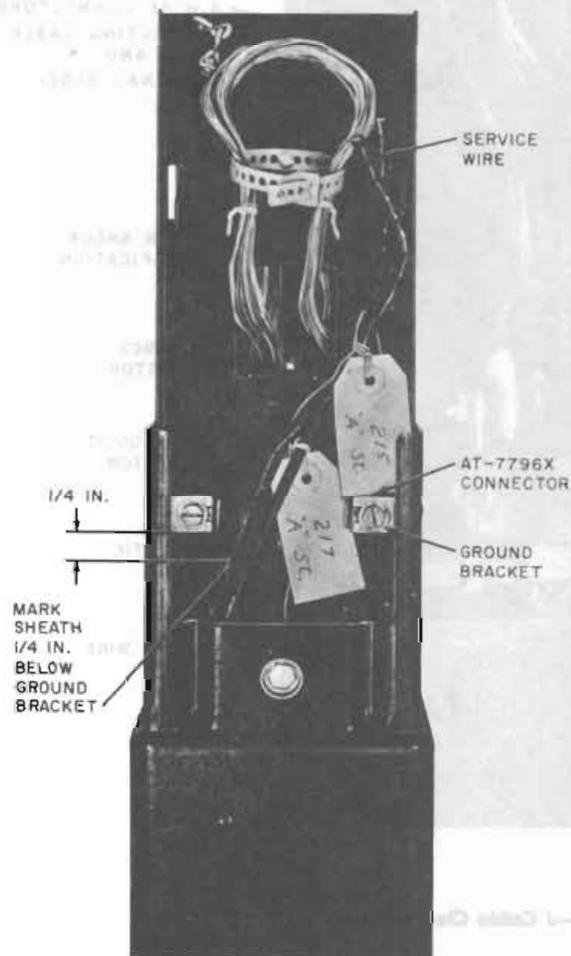
**11.02** Install the metallic tape of the service wire in the AT-7796X connector as illustrated in Fig. 10.

**11.03** When joining service wire directly to the cable pair in KA5-type cable closures, run the service wire conductors to be connected down through the wire bracket. Remove the assigned cable pair from the binder group and cut the cable pair (see 7.02). Place the cable pair through the

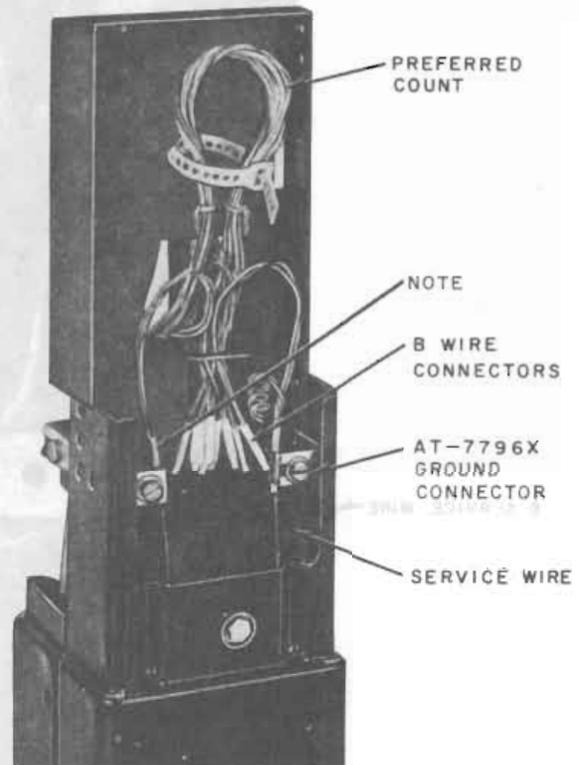


**Fig. 21—Prepared Service Wire—K-Type Closure**

wire bracket. Cut the cable pair conductors and service wire conductors even, 1-1/2 inches below the wire bracket. Connect the cable pair conductors to the service wire conductors with 700-type connectors or B wire connectors (Fig. 22, see 7.03).



**Fig. 20—Marking Service Wire**



**NOTE:**  
THE SPARE SERVICE WIRE IS SPIRALED AROUND A PENCIL AND STORED TOWARD THE BASE OF THE CLOSURE

**Fig. 22—Service Wire Installed KA-Type Closure (Nonprotected)**

## SECTION 462-260-202

**11.04** At locations where fuse wire or cable protection is required, terminal blocks (Part 6) are installed in the KB5- or KC5-type cable closures (Fig. 23).

**11.05** To install the service wire in the KB5- or KC5-type cable closures, proceed as follows:

(a) Mark and remove the outer jacket from the service wire as illustrated in Fig. 20 and 21, respectively. Install the metallic tape of the service wire in the AT-7796X connector as illustrated in Fig. 10.

(b) Run the service wire conductors up the mounting bracket assembly and terminate the conductors on the assigned binding post of the terminal block (Fig. 23).

(c) Run the leads from the assigned binding post down through the wire bracket of the KB5-type closure or into the splicing area of the KC5-type closure (Fig. 23).

(d) Remove the assigned cable pair from the binder group. Cut the cable pair (see 7.02).

(e) Place the cable pair through the wire bracket (KB5-type closure) or into the splice area (KC5-type closure). Cut the cable pair conductors and terminal block conductors even. Connect the terminal block conductors to the cable pair conductors with 700-type connectors or B wire connectors (Fig. 23, see 7.03). Attach service wires to appropriate terminal on terminal blocks.

**11.06** Where the service wires are to be joined directly to the cable pair in the KC5-type cable closure, prepare the service wire and install the metallic tape in the AT-7796X connector as outlined in 11.01 and 11.02. Proceed as follows:

(a) Place the service wire conductors and cable pair conductors down through the wire bracket. Cut the service wire conductors and cable pair conductors even, 1-1/2 inches below the wire bracket. Connect the service wire conductors to the cable pair conductors with 700-type connectors or B wire connectors (Fig. 24, see 7.03).

## 12. TERMINATING SERVICE WIRES—PEE WEE CLOSURE—ENCAPSULATION

**12.01** The Pee Wee Closure is used to join new buried service wires or to repair damaged service wires.

**12.02** The following precautions must be observed when using the Pee Wee Closure:

(a) Do not open or remove the outer bag which contains the plugging compound until ready for use.

(b) Avoid prolonged or repeated contact with skin or breathing of vapors.

(c) Use only with adequate ventilation.

(d) In case of contact with the eyes, flush with water for at least 15 minutes and get medical attention.

(e) In cold weather, before mixing, preheat the plugging compound to approximately 70°F.

**12.03** The Pee Wee Closure (Fig. 25) is an encapsulated splice kit which contains the following components:

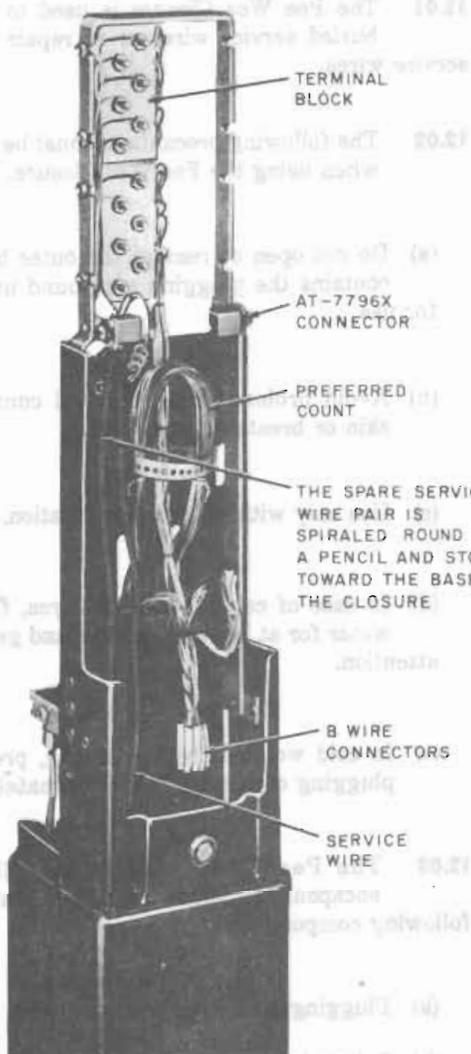
(a) Plugging compound (polyurethane)

(b) Split-bolt clamp

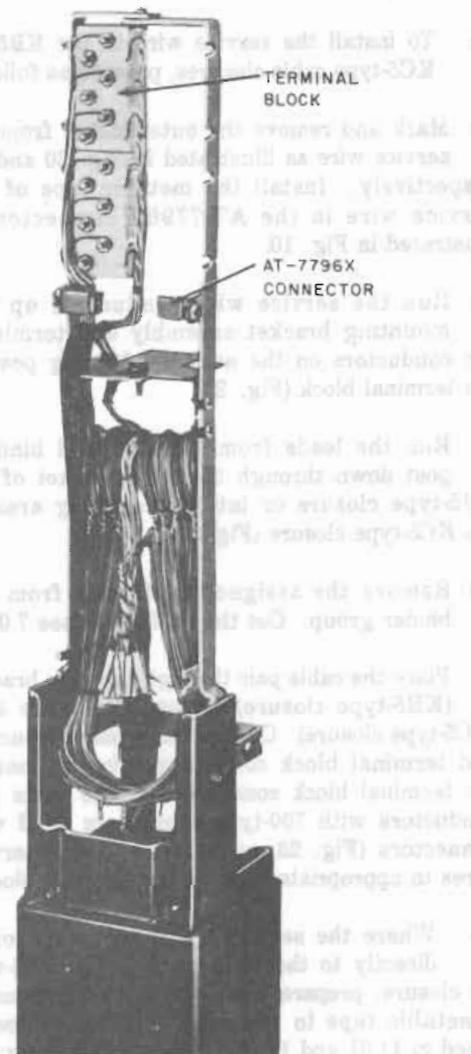
(c) Two end caps

(d) Two pieces of tubing—one split and one with an elongated slot.

**Note:** The B wire connectors used to join the conductors must be ordered separately.



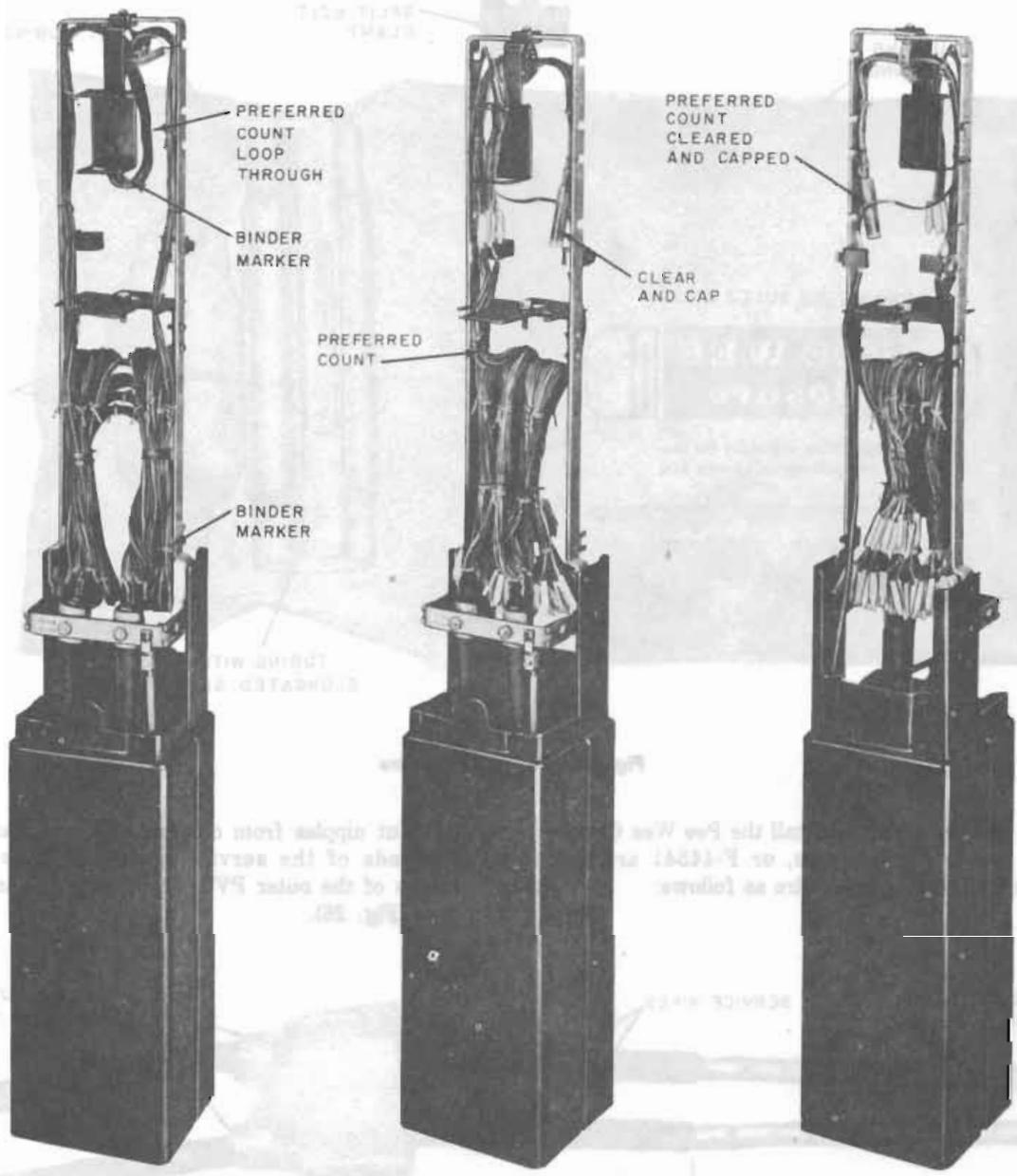
KB5 CABLE CLOSURE



KC5 CABLE CLOSURE WITH TERMINAL BLOCK

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Fig. 23—Service Wire Installed KB or KC Type Cable Closure (Protected)



LOOP THROUGH FOR BRIDGE OR LOAD POINT

LOOP THROUGH FOR BRIDGE OR LOAD POINT PREFERRED COUNT CLEARED AND CAPPED

STRAIGHT SPLICE WITH PREFERRED COUNT CLEARED AND CAPPED

TPA 538778

Fig. 24—Service Wire Installed KC-Type Closure (Nonprotected)

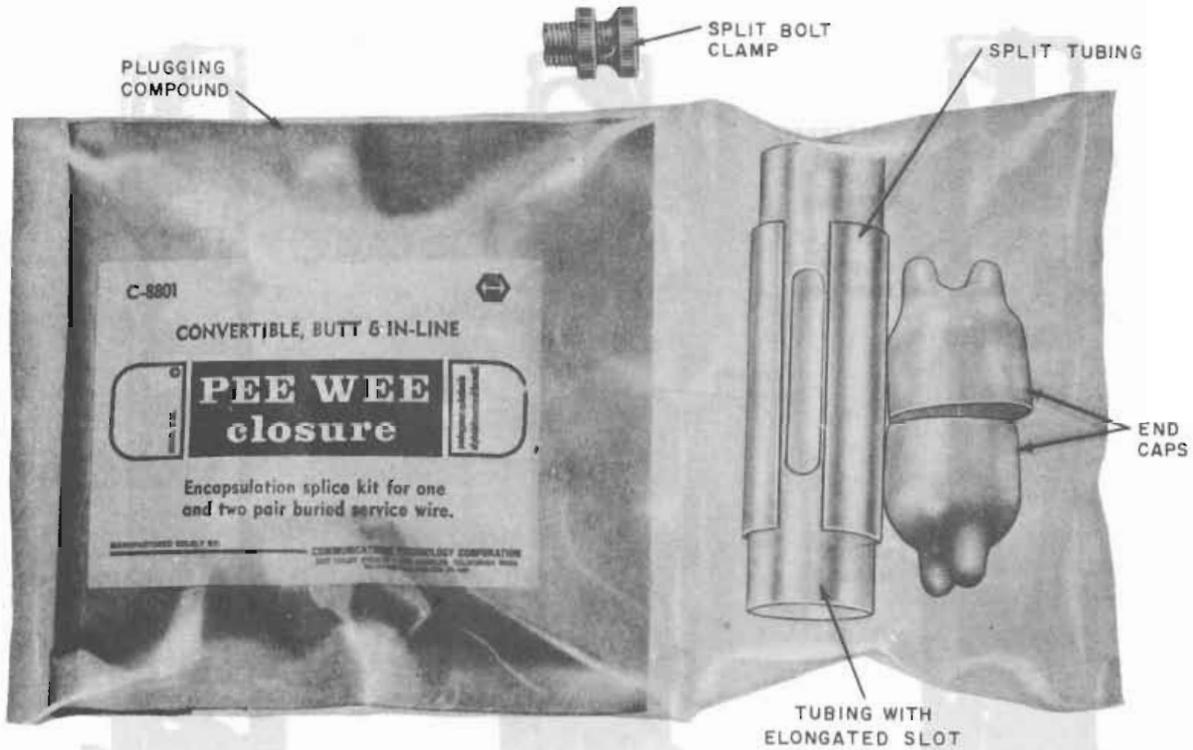


Fig. 25—Pee Wee Closure

**12.04** At butt splices, install the Pee Wee Closure on B service wire, or F-44541 armored service wire, or E buried wire as follows:

(1) Cut nipples from one end cap, slip over the ends of the service wire, and remove 3 inches of the outer PVC jacket from the service wire (Fig. 26).

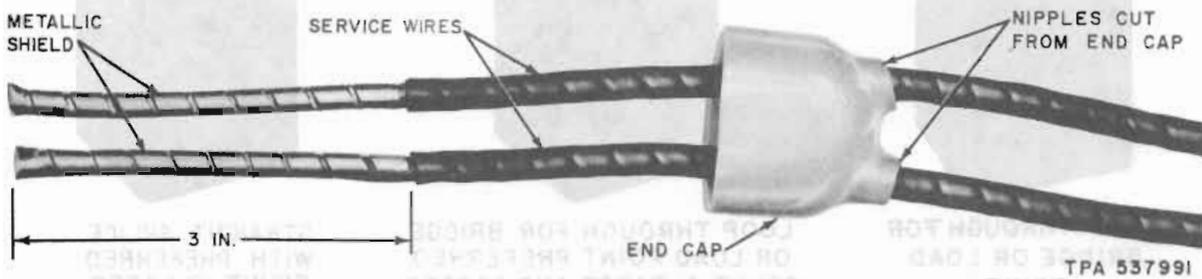


Fig. 26—Prepared Service Wire—Pee Wee Closure

- (2) Install the split-bolt clamp on the exposed metallic shield of the two service wires. Hand tighten the knurled nut (Fig. 27).
- (3) Remove the exposed metallic shield and inner insulation. Remove 3/4-inch of insulation from each end of each conductor (Fig. 28).
- (4) Using B wire connectors, splice the conductors, color-to-color, or tracer-to-tracer (Fig. 29).
- (5) Slip the end cap on the end of the tube with the elongated slot. Slip the tube with the split over the tube with the elongated slot. Slip the tubes over the splice and into the end cap that was placed on the service wires. Align the split with the elongated slot (Fig. 30).
- (6) Remove the plastic bag containing the polyurethane plugging compound from the protective bag. When the temperature is below 60°F, the compound should be placed in a warm place before mixing to shorten the set-up time.

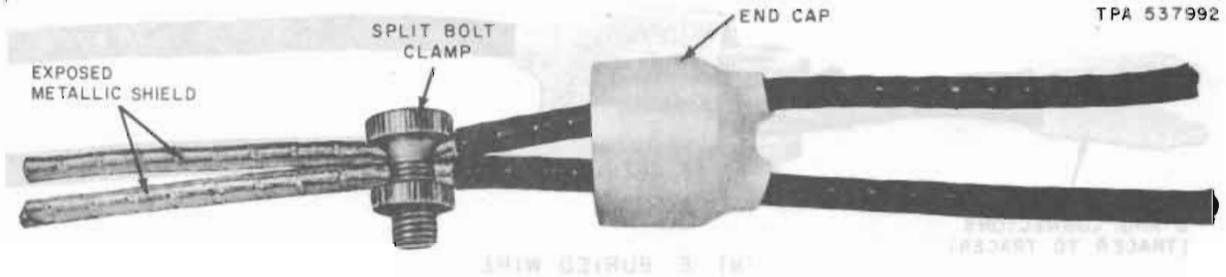


Fig. 27—Installed Split-Bolt Clamp

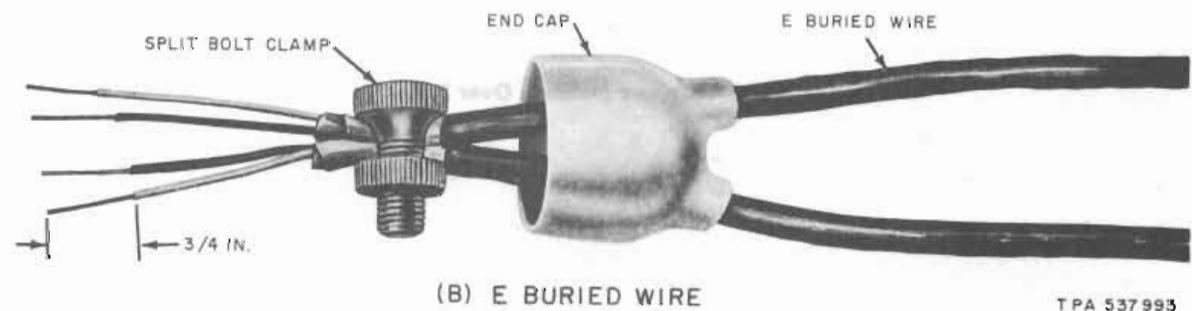
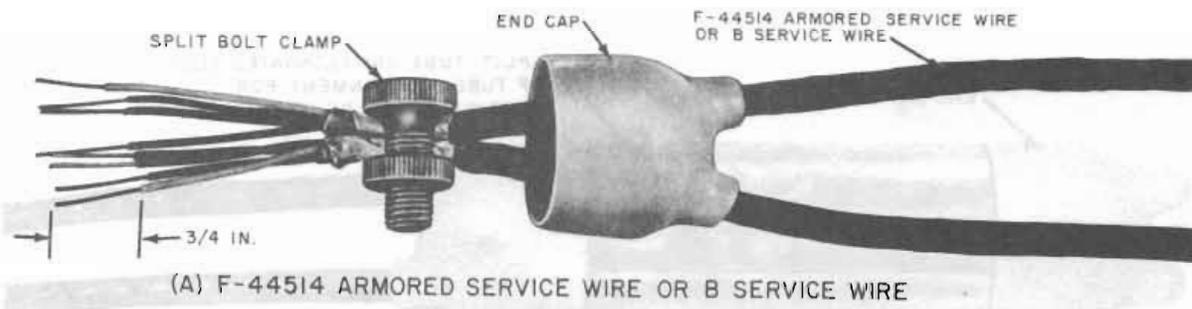
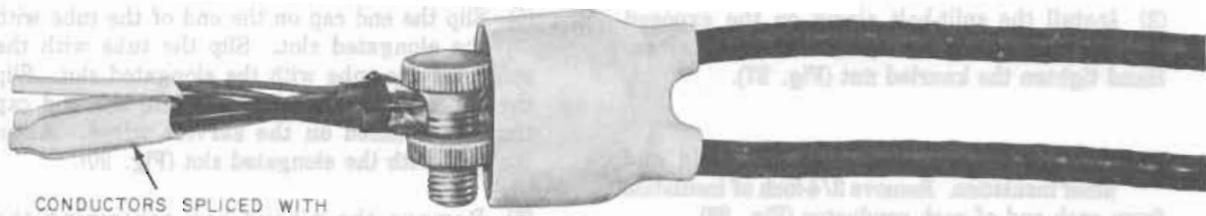


Fig. 28—Service Wire Prepared for Splicing



CONDUCTORS SPLICED WITH  
B WIRE CONNECTORS  
(COLOR TO COLOR)

(A) B SERVICE WIRE OR F-44514 ARMORED SERVICE WIRE



CONDUCTORS SPLICED WITH  
B WIRE CONNECTORS  
(TRACER TO TRACER)

(B) E BURIED WIRE

TPA 537994

Fig. 29—Spliced Service Wire

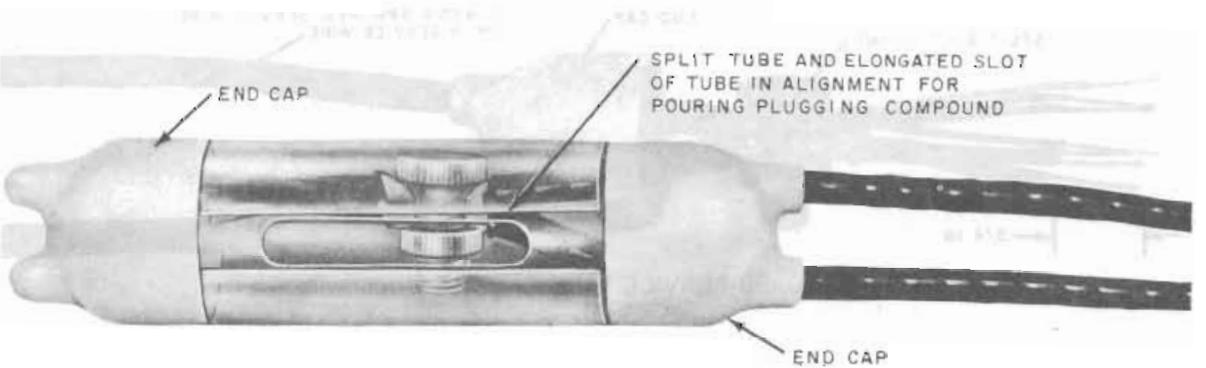


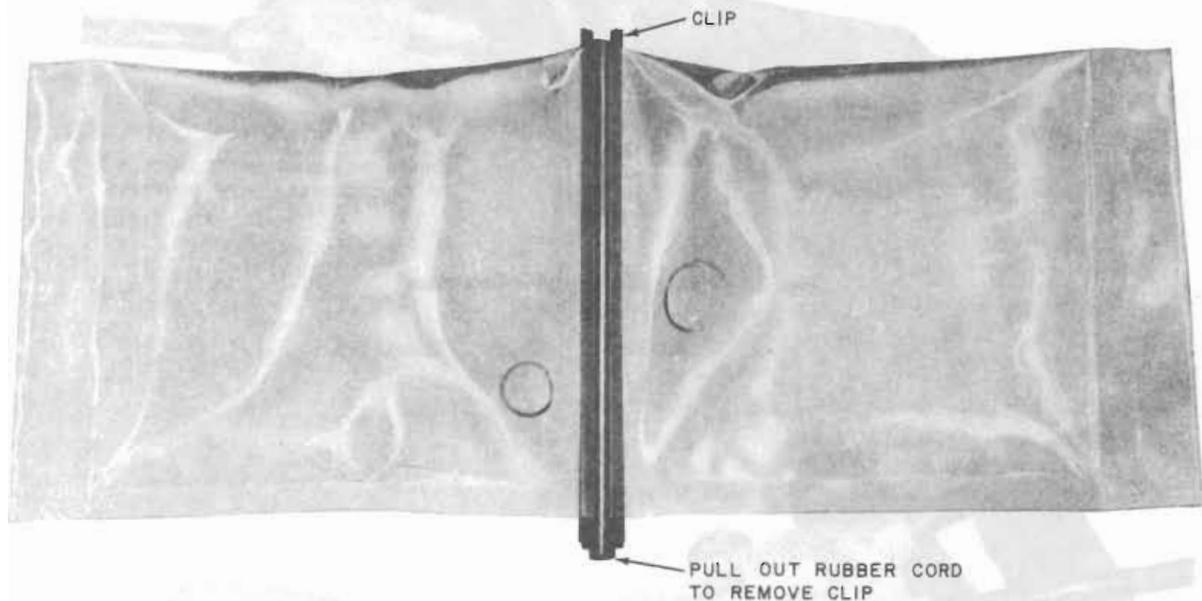
Fig. 30—Closure Installed Over Splice

- (7) Remove the clip on the plastic bag by pulling out the rubber cord (Fig. 31).
- (8) Mix the plugging compound thoroughly by laying the plastic bag on a flat surface and using the clip to scrape back and forth across the plastic bag for approximately one minute or until the bag begins to feel warm to the touch. When the compound is thoroughly mixed, scrape all contents to one end.
- (9) Cut off a corner of the plastic bag and squeeze the compound into the closure until the compound runs out the filling slot (Fig. 32).

- (10) Rotate the outer tube to close the filling slot (Fig. 33).

**12.05** At 70°F the compound will begin to set within approximately 5 minutes. Place the closure in the trench and backfill. (The first 6 inches of backfill should be granular or other selected material.)

*Note:* At temperatures below 70°F it will take longer. At temperatures above 70°F it will be shorter.



**Fig. 31—Plugging Compound**



CORNER OF BAG INSERTED IN SLOT TO FILL CLOSURE WITH COMPOUND

Fig. 32—Filling Closure with Compound

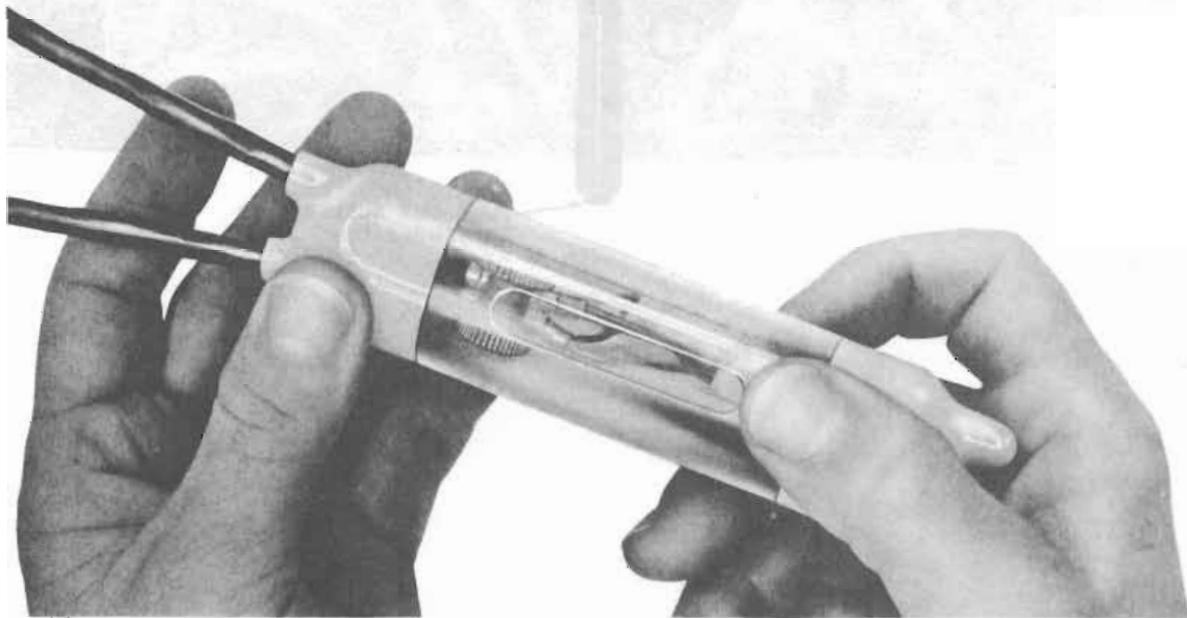


Fig. 33—Rotating Outer Tube to Seal Closure

SECTION 462-260-202

12.06 The procedures for installing the Pee Wee Closure at an in-line splice are illustrated in Fig. 34, 35, and 36.

12.07 Splice the conductors with B wire connectors. Slip the tubes over the completed splice and encapsulate as outlined in 12.04, (6) through (10).

13. TERMINATING SERVICE WIRE—PREFILLED CLOSURES FOR FILLED SERVICE WIRE

13- and 14-Type Closure

13.01 The prefilled 13- and 14-type prefilled waterproof distribution closures are used in completely out-of-sight plant for encapsulating the connection between buried waterproof distribution cable to filled service wire *only*.

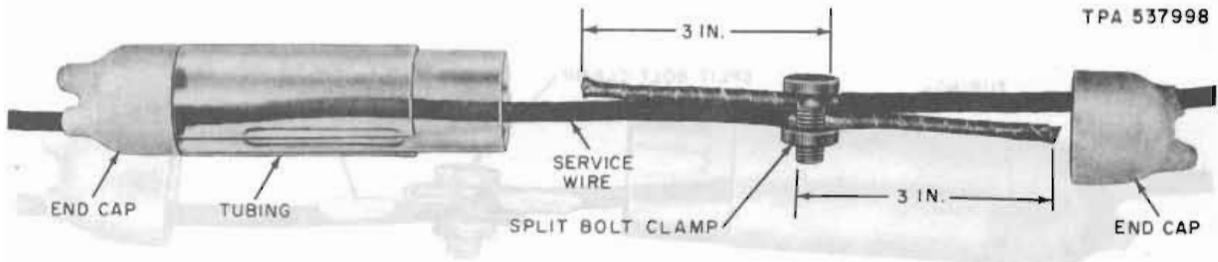
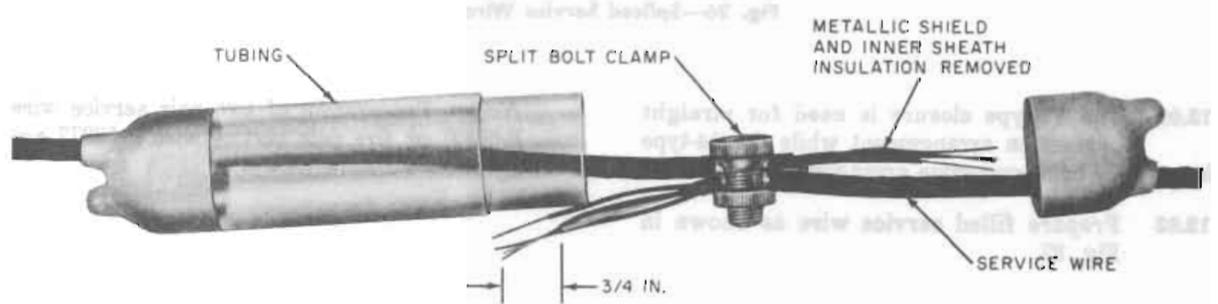
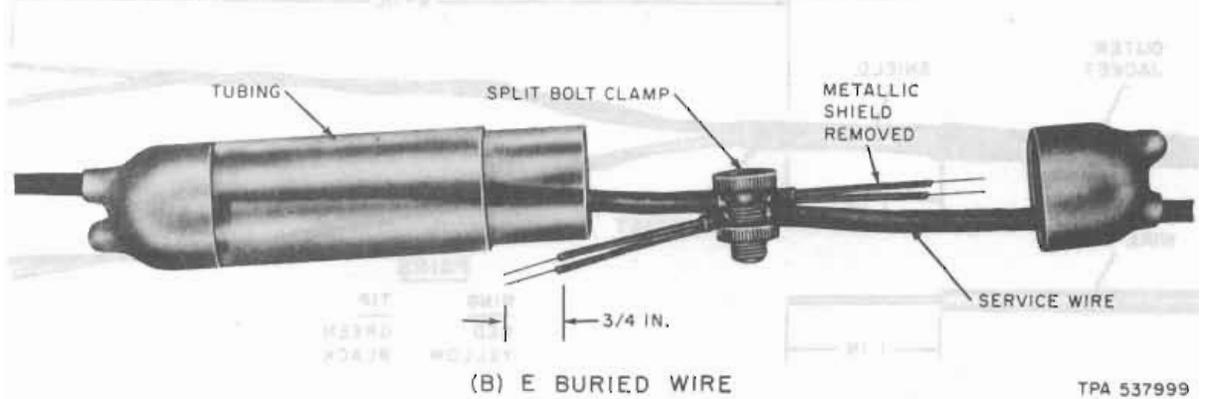


Fig. 34—Preparing Service Wire In-Line Splice

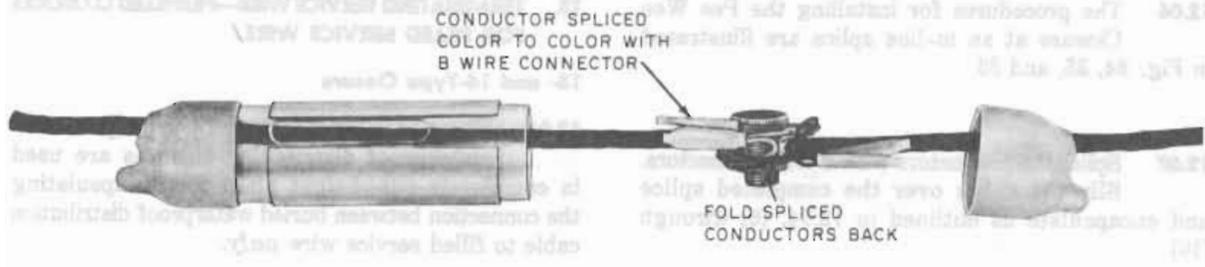


(A) B SERVICE WIRE OR F-44514 ARMORED SERVICE WIRE

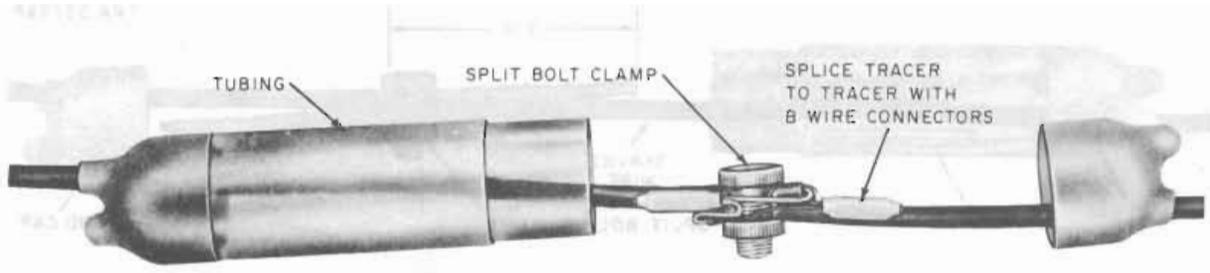


(B) E BURIED WIRE

Fig. 35—Prepared Service Wire



(A) B SERVICE WIRE OR F-44514 ARMORED SERVICE WIRE



(B) E BURIED WIRE

TPA 538000

Fig. 36—Spliced Service Wire

13.02 The 13-type closure is used for straight connection arrangement while the 14-type is used for butt connection arrangements.

*Note:* Preparation of two pair service wire F-59307 or five pair service wire F-59377 are identical.

13.03 Prepare filled service wire as shown in Fig. 37.

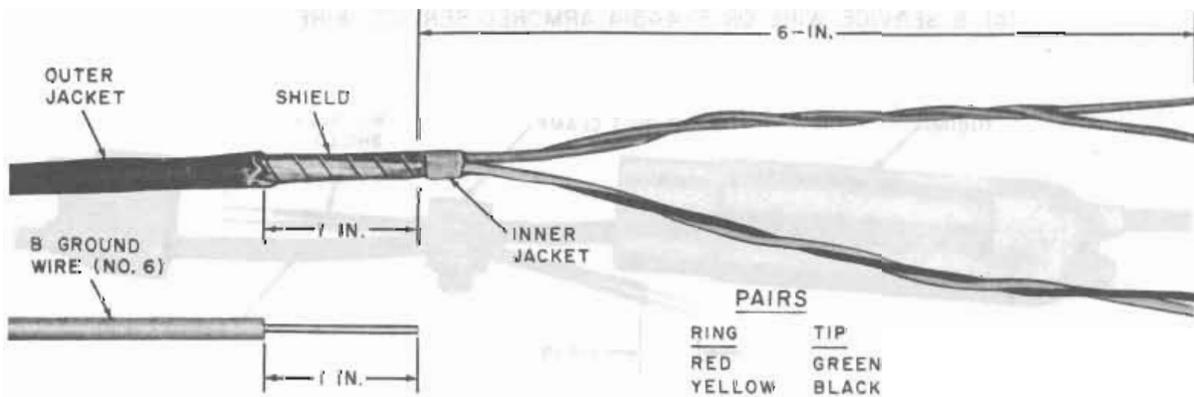


Fig. 37—Prepared Service Wire 13- or 14-Type Closure

13.04 Install the metallic shield of the filled service wire in the AT-7796X connector as shown in Fig. 38 or Fig. 39 and tighten the screw. This grounds the shield of the service wire.

13.05 Splice the service wire to the cable pairs using 700-type connectors *only* as shown in Fig. 40 or Fig. 41.

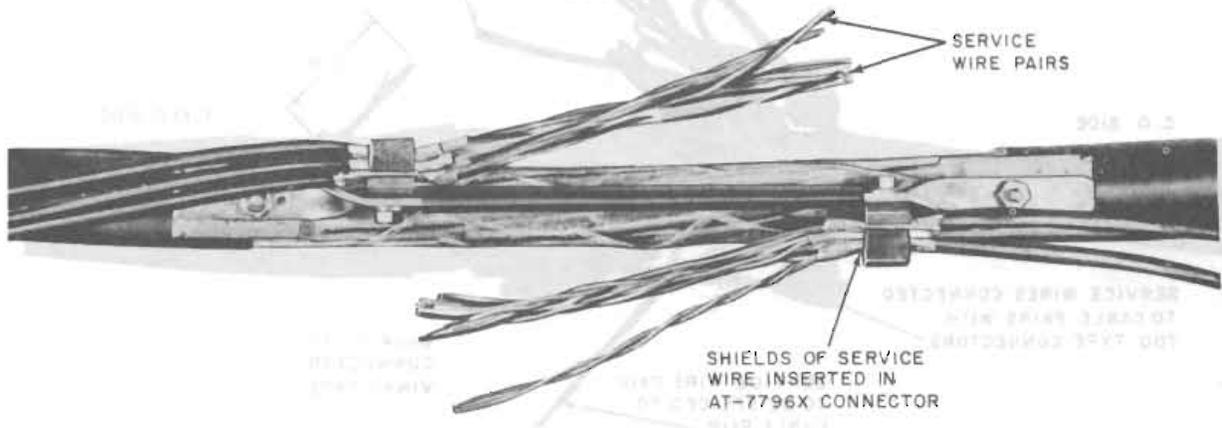


Fig. 38—Installed Service Wire—13-Type Closure

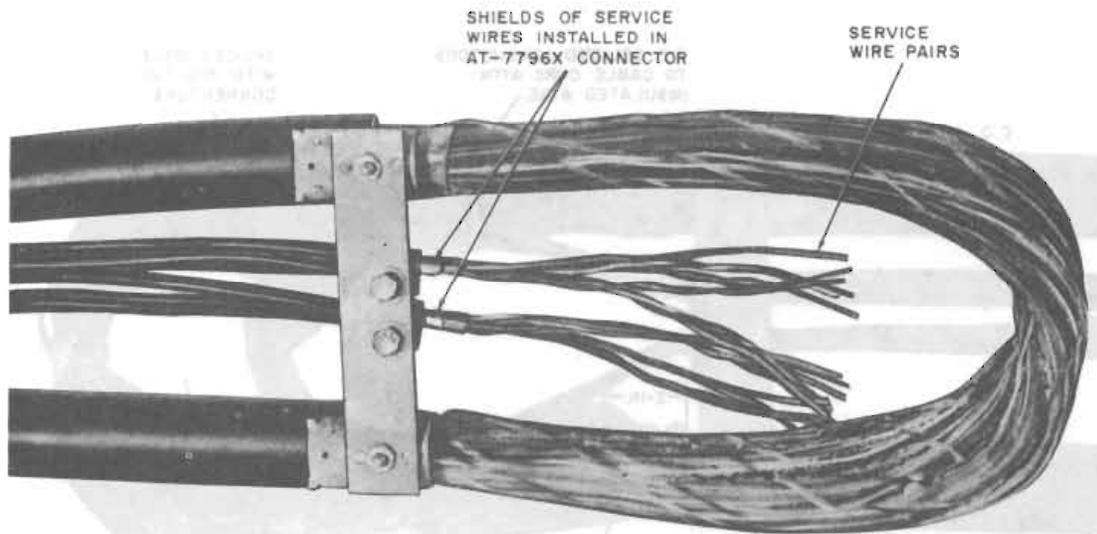


Fig. 39—Installed Service Wire—14-Type Closure

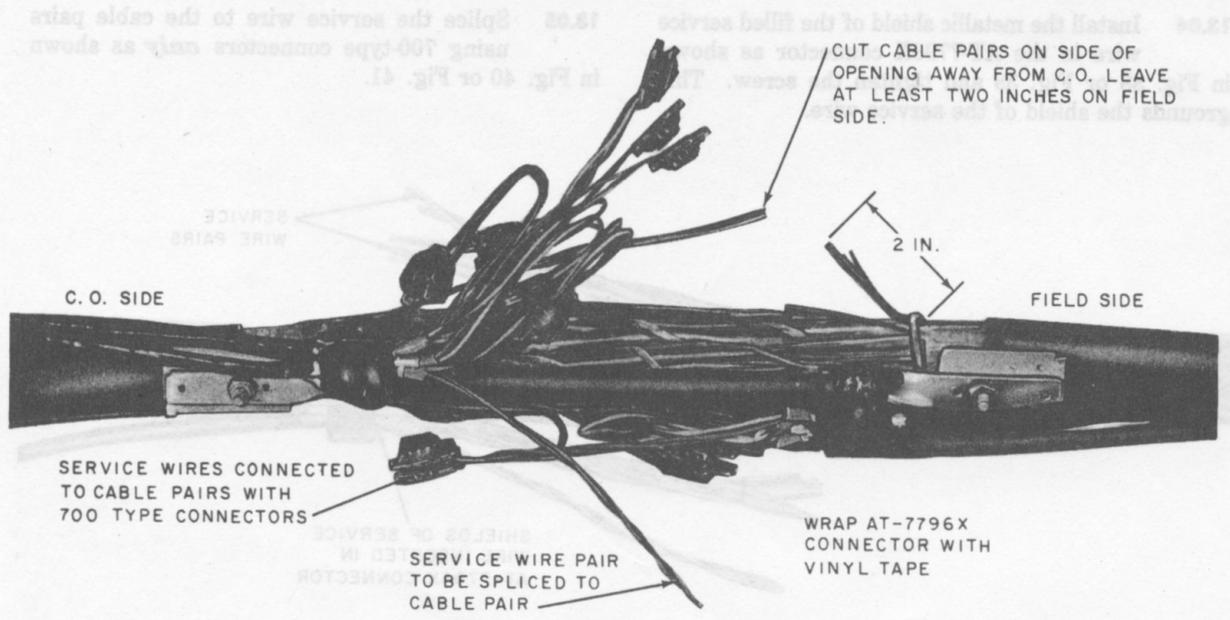


Fig. 40—Splicing Cable Pairs—13-Type Closure

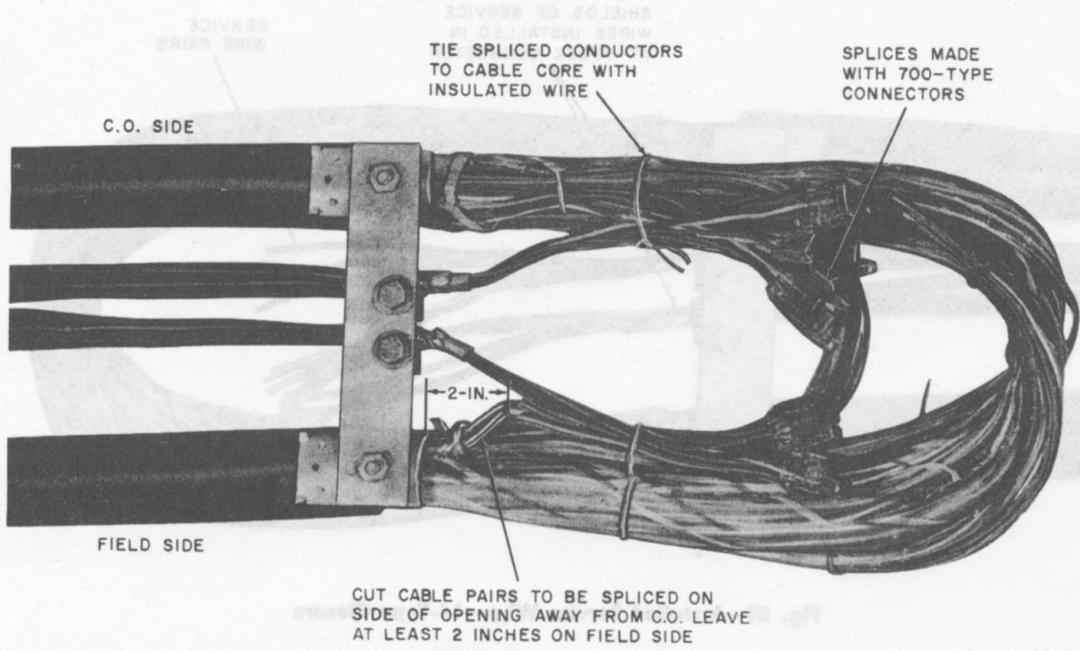


Fig. 41—Wire Work Complete—14-Type Closure

13.06 Remove the separators and plastic liner from closure then place the completed splice in the closures as shown in Fig. 42 or Fig. 43 and enclose as outlined in Section 631-600-217.

15AW1 Service Wire Closure

13.07 The prefilled 15AW1 service wire splice closure is used to enclose a splice on F-59307 or F-59377 filled service wire *only*.

13.08 Prepare the service wire as shown in Fig. 44.

*Note:* Preparation of two pair service wire F-59307 or five pair service wire F-59377 are identical.

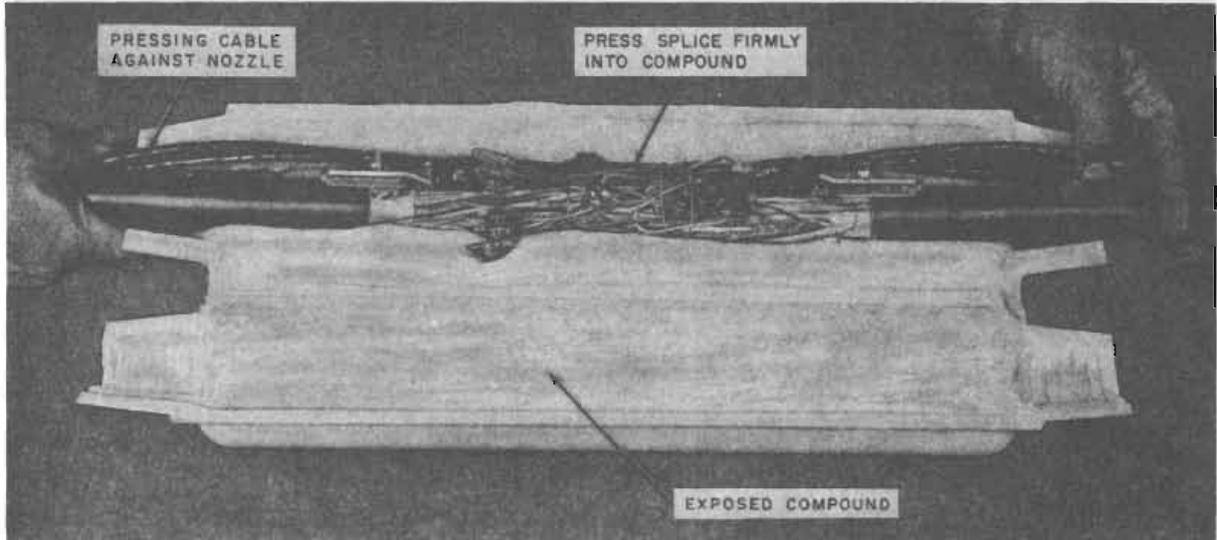
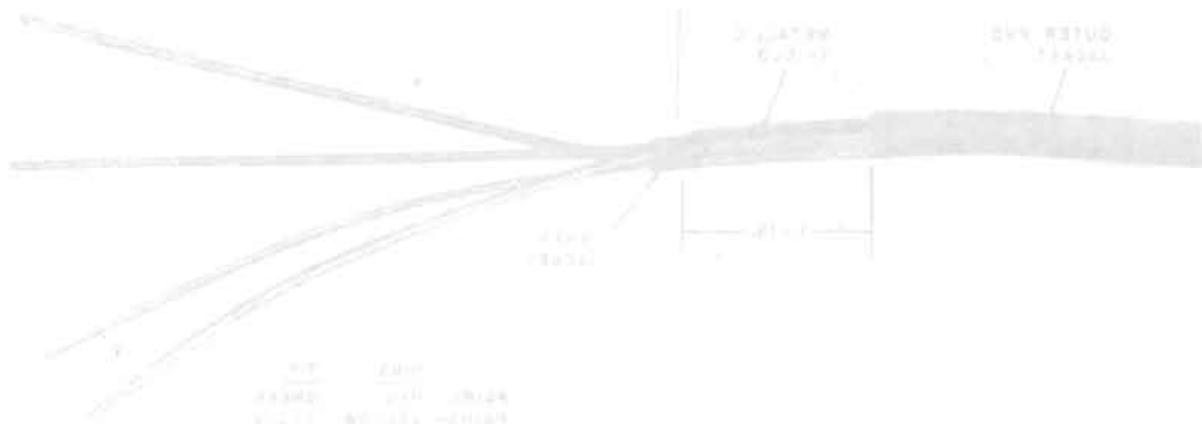


Fig. 42—Placing Cable in 13-Type Closure



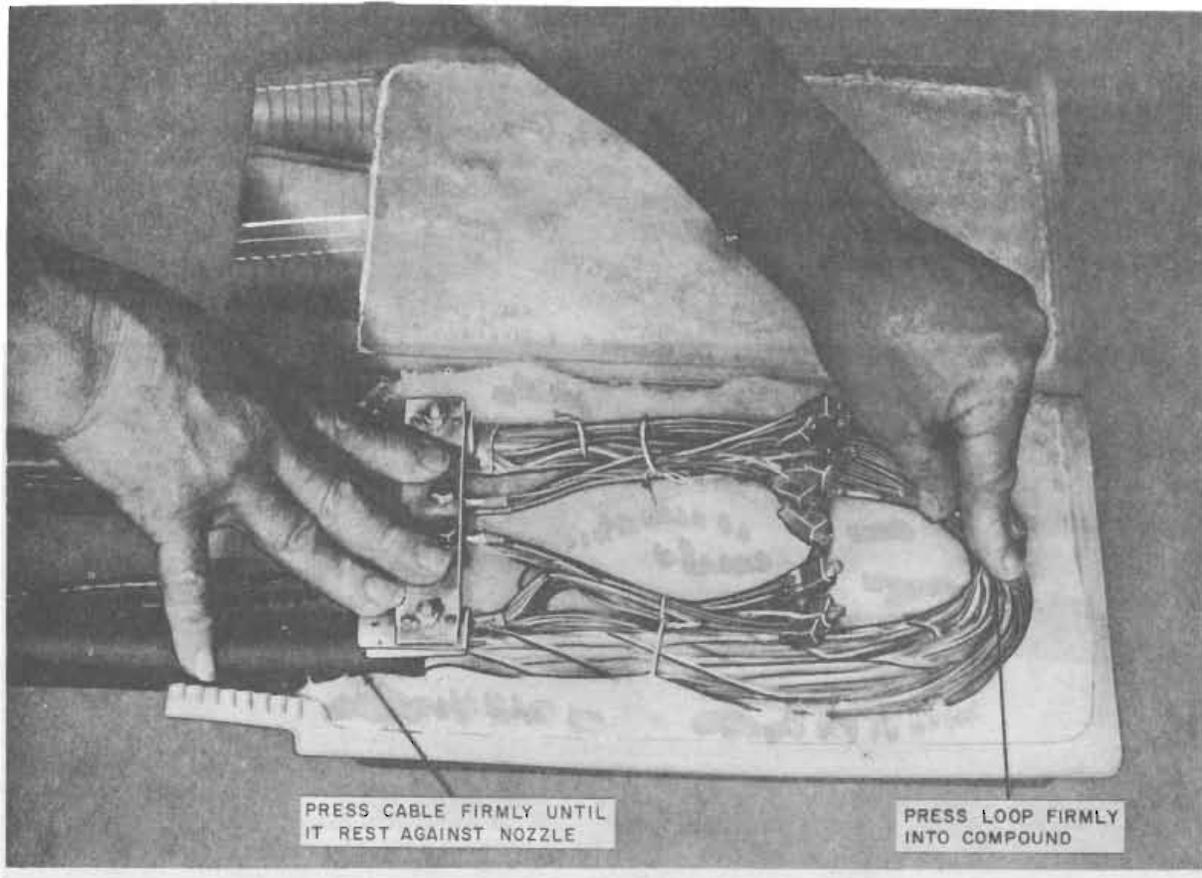


Fig. 43—Placing Cable in 14-Type Closure

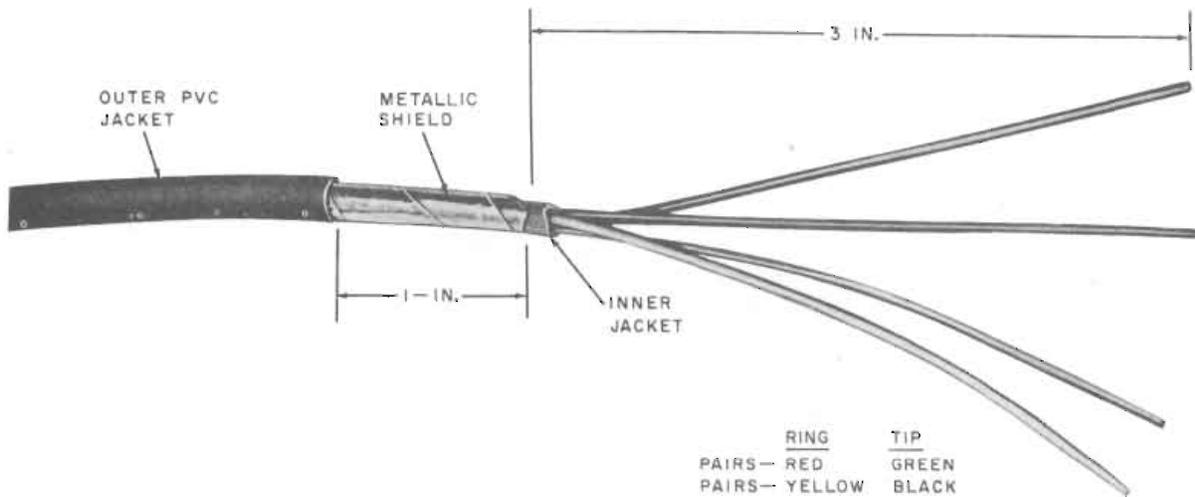


Fig. 44—Prepared Service Wire—15-Type Closure

13.09 Install the metallic shield of the filled service wire in the AT-7796X connector as shown in Fig. 45 or Fig. 46 and tighten the screw. This grounds the shield of the service wires.

13.10 Using 700-type connector *only* splice the conductor as shown in Fig. 47 or Fig. 48. The E connector presser is used for installing the 700-type connectors.

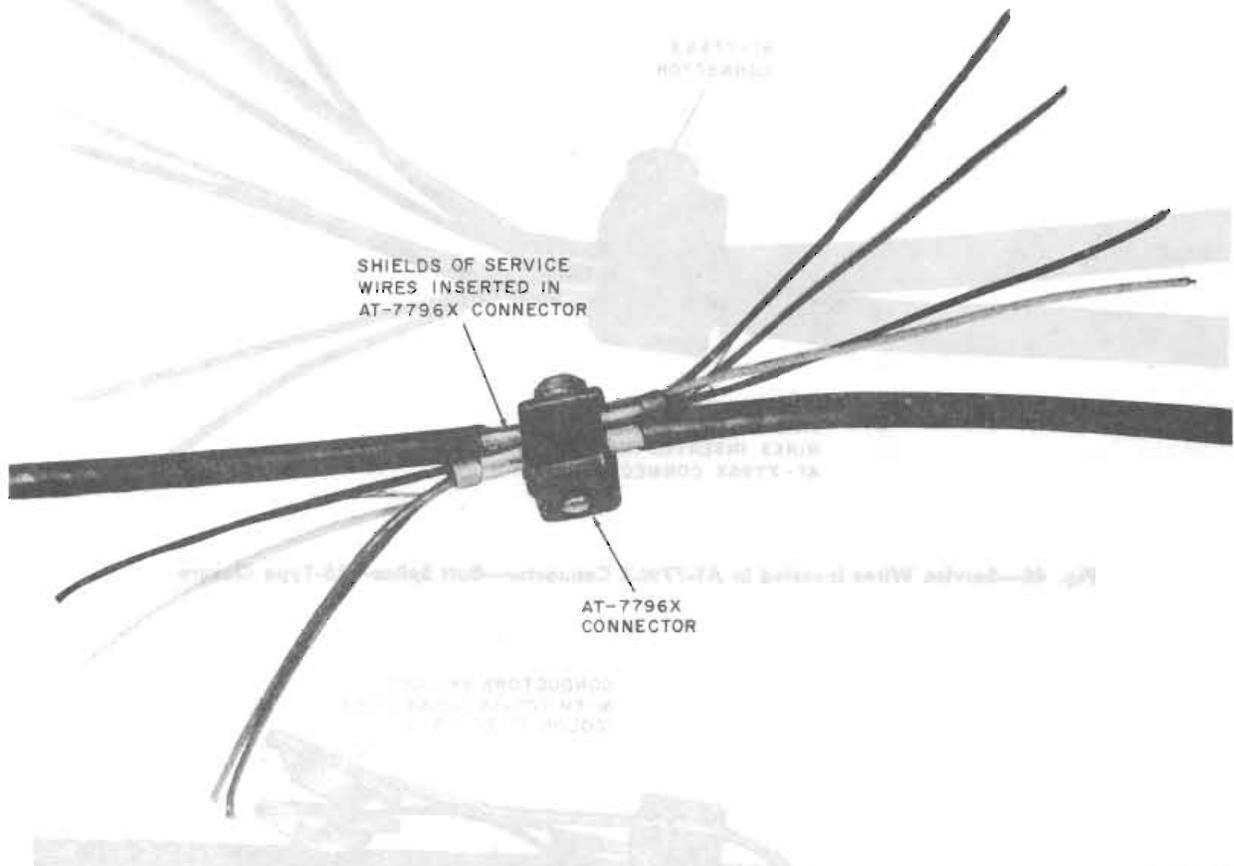


Fig. 45—Service Wires Inserted in AT-7796X Connector Straight or In-Line Splice—15-Type Closure

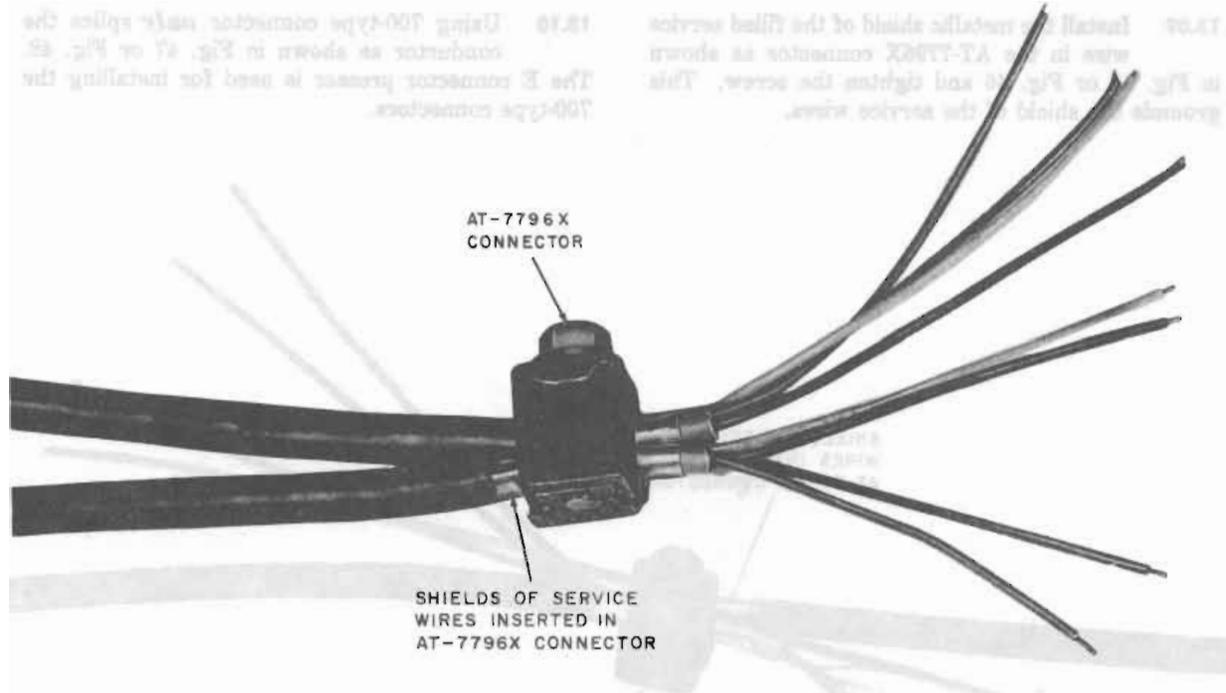


Fig. 46—Service Wires Inserted in AT-7796X Connector—Butt Splice—15-Type Closure

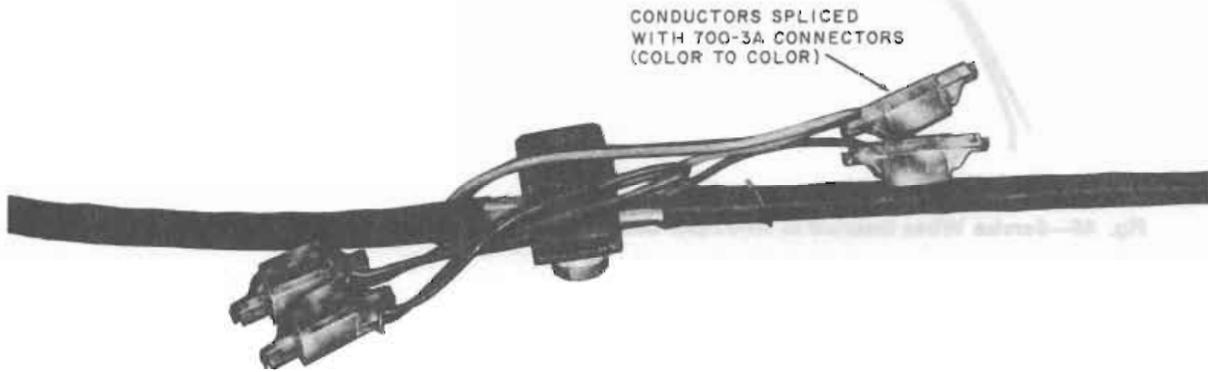


Fig. 47—Spliced Service Wires—Straight or In-Line—15-Type Closure

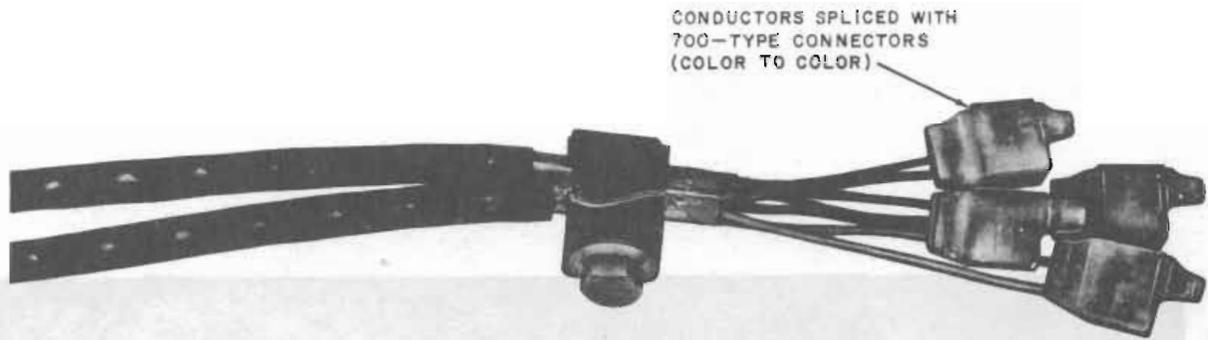


Fig. 48—Spliced Service Wires—Butt Splice—15-Type Closure

13.11 The procedure for placing the spliced service wire in the closure are shown in Fig. 49, 50, and 51. Enclose as outlined in Section 629-760-202.

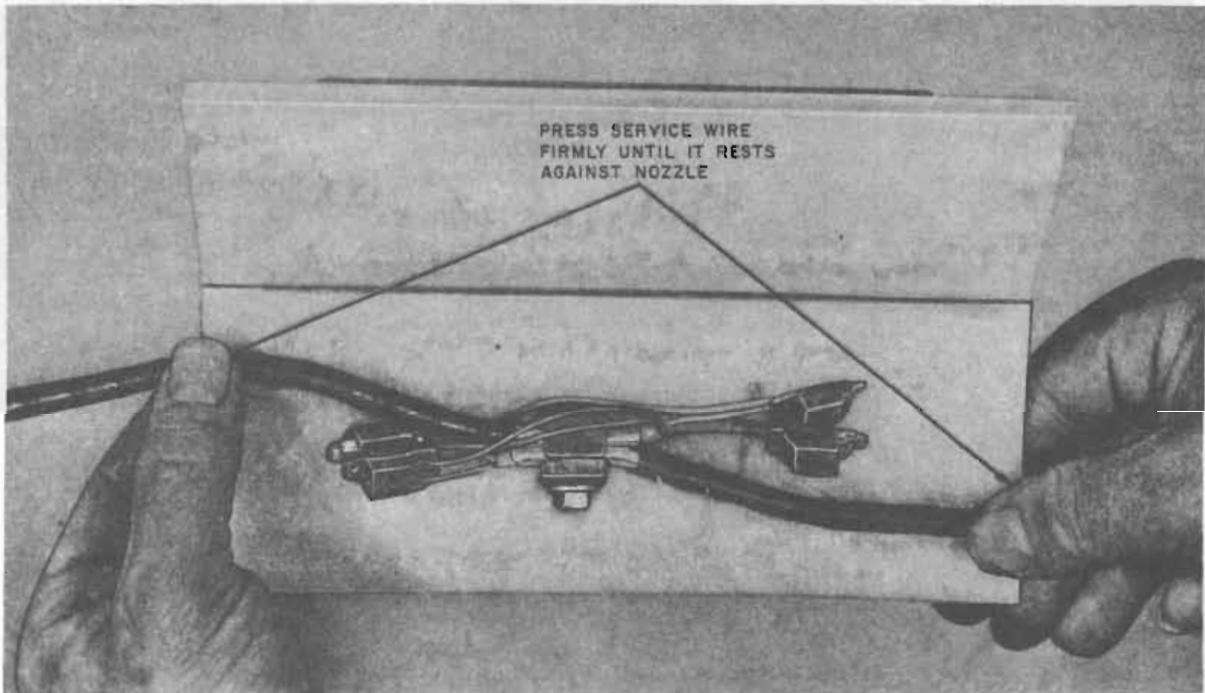


Fig. 49—Straight or In-Line Splice Placed in 15-Type Closure



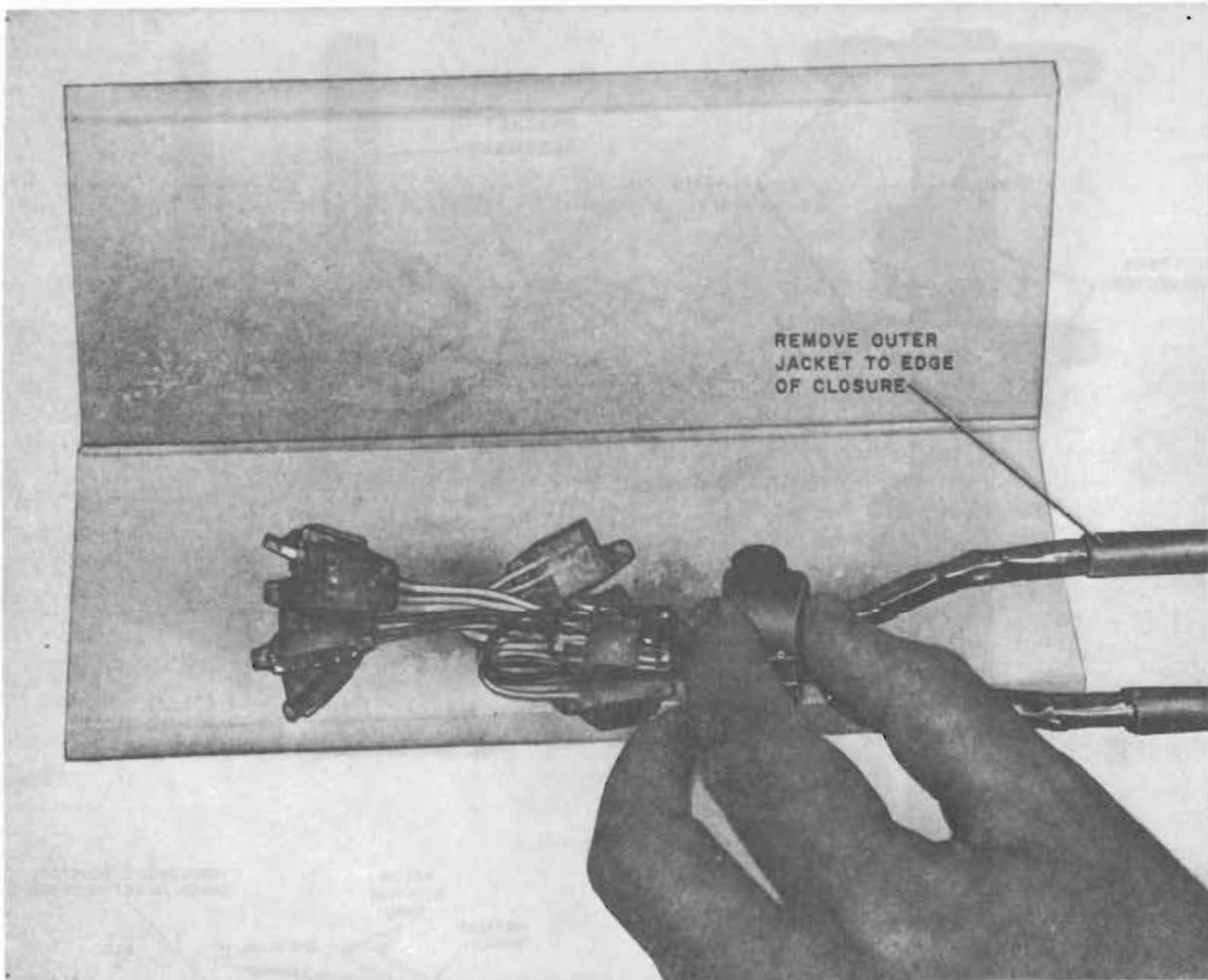


Fig. 51—Placing 5-Pair Butt Splice in 15-Type Closure

#### 14. TERMINATING SERVICE WIRE—LD-TYPE CABLE CLOSURE

14.01 The joining of service wire is identical in either the LD6/42 or LD10/42 cable closure.

14.02 The bracket assembly (Fig. 52) used for terminating service wires in the LD-type closures must be ordered separately. It is equipped with two AT-7796X connectors and two plastic clips. Where terminal blocks (Part 6) are required, remove the plastic clips and top AT-7796X connector. Install the terminal block in the positions vacated by the plastic clips.

14.03 Install the bracket assembly on the closure ground bracket with the nuts and bolts provided. The plastic clips and AT-7796X connectors (terminal blocks) are faced to the inside of the closure (Fig. 53).

14.04 Remove all unnecessary slack from the service wire. Mark the outer jacket of the service wire 1/4-inch below the AT-7796X connector. Prepare the service wire as illustrated in Fig. 54.

14.05 Install the metallic tape of the service wire in the AT-7796X connector as illustrated in Fig. 10.

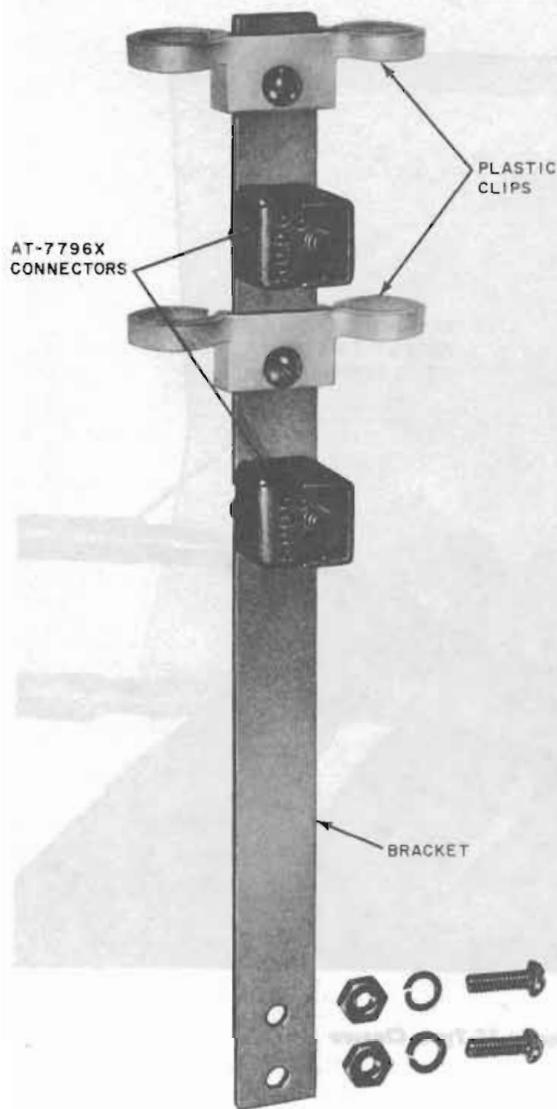


Fig. 52—Bracket Assembly

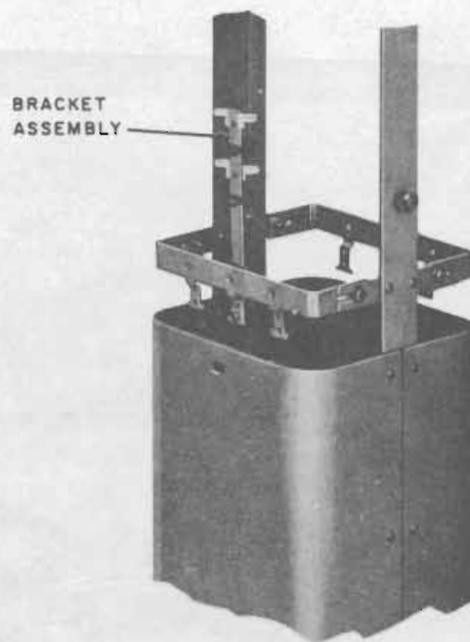


Fig. 53—Bracket Assembly Installed

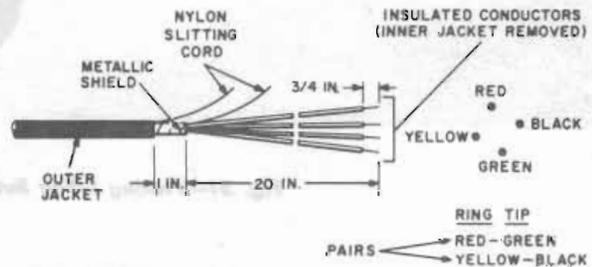
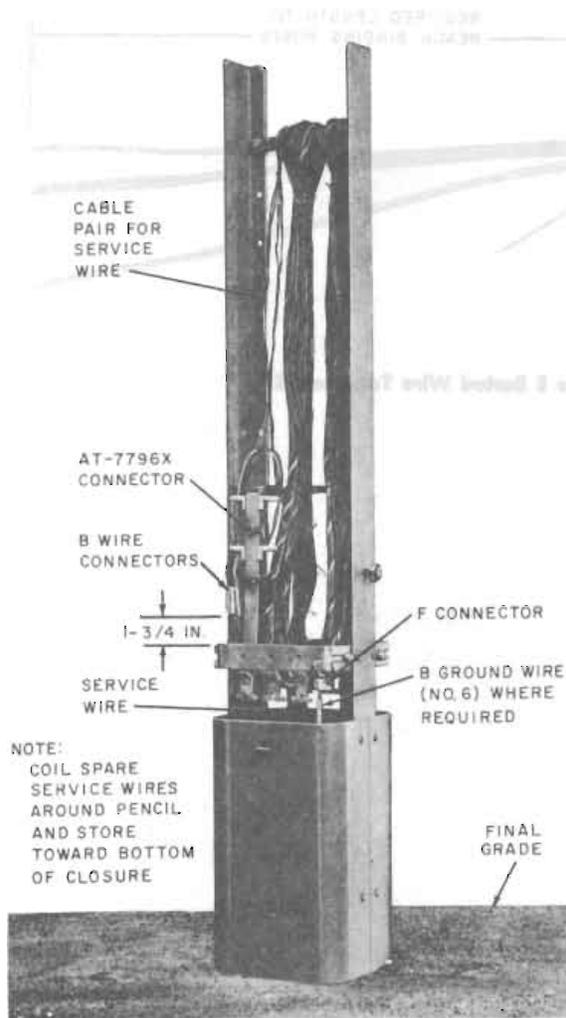


Fig. 54—Prepared Service Wire—LD-Type Cable Closure

**14.06** To connect the service wire directly to the cable pair, run the service wire up through the plastic clips on one side of the bracket assembly and down through the plastic clips on the opposite side. Remove the assigned cable pair from the binder group (see 7.02). Run the cable pair down through the plastic clips containing the ends of the service wire conductors. Cut the cable pair conductors even, 1-1/2 inches below the bottom plastic clip. Connect the cable pair conductors to the service wire conductors with B wire connectors or 700-type connectors (Fig. 55, see 7.03).



**Fig. 55—Service Wire Installed—LD-Type Cable Closure (Nonprotected)**

**14.07** Where protection (terminal blocks) is required, remove the plastic clips and AT-7796X connector and place the terminal block as outlined in 14.02. Proceed as follows:

- (1) Prepare the service wire as illustrated in Fig. 54.
- (2) Install the metallic tape in the AT-7796X connector as illustrated in Fig. 10. Terminate the service wire conductors on the assigned binding posts of the terminal block.
- (3) Remove the assigned cable pair from the binder group. Cut the cable pair (see 7.02).
- (4) Select the leads from the assigned binding posts. Cut the cable pair conductors and leads even with the top edge of the ground bracket assembly.
- (5) Connect the cable pair conductors and service wire conductors with 700-type connectors or B wire connectors.

#### 15. TERMINATING SERVICE WIRE—D AND E BURIED WIRE TERMINALS

**15.01** The D and E buried wire terminals are used to terminate, splice, and load buried wire.

**15.02** The D buried wire terminal mounts directly in the ground on its steel post. The E buried wire terminal has brackets for wall or pole mounting. Section 629-720-215 covers the complete description and installation of the wire terminals.

**15.03** The connecting block furnished with both terminals provides air gap lightning protection. The large washers on each binding post are spaced to provide an air gap between themselves and between the heads of the screw mounting the block to the terminal plate. This equalizes any discharge between the conductors and the armor wire or terminal housing at the connecting block. If the large washers, the binding post, or the connecting block is damaged, replace the connecting block.

**15.04** The termination of service wire in either the D or E buried wire terminal is identical. To terminate the wire, proceed as follows:

(1) Pull the slack from the wires and mark the outer jacket about 6 inches above the ground

post. Prepare the ends of the wires as illustrated in Fig. 56.

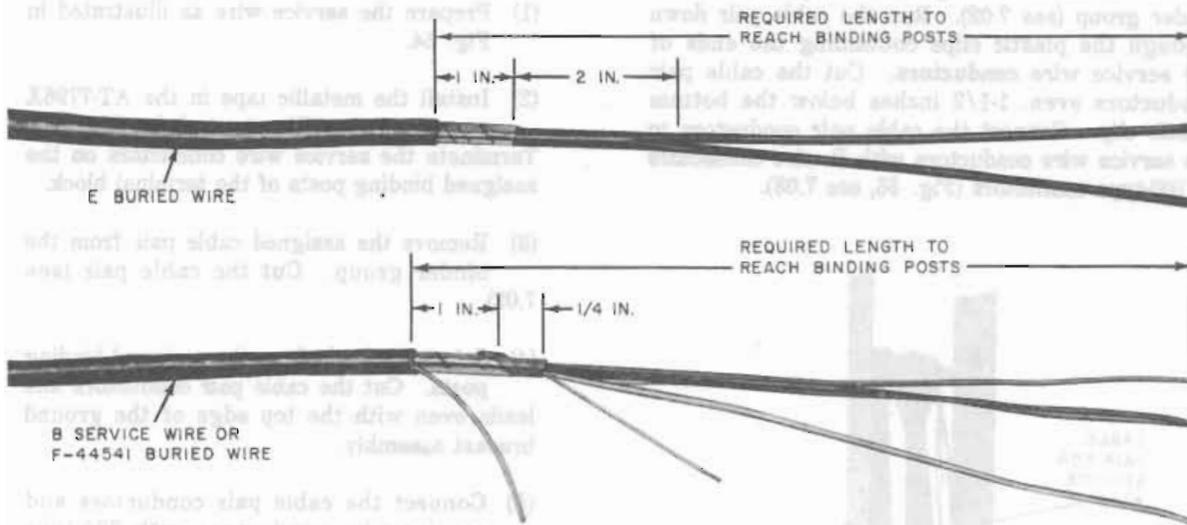


Fig. 56—Prepared Service Wire D or E Buried Wire Terminated

The D and E buried wire terminals are used to terminate wires and lead lines.

The D buried wire terminal mounts directly in the ground on its base. The D buried wire terminal has provision for wire or lead mounting. Section 25-72-210 covers the mounting description and installation of the terminal.

The mounting block is furnished with both female and male terminals. The large female terminal is used for the wire or lead mounting and the small male terminal is used for the wire or lead mounting. The large female terminal is used for the wire or lead mounting and the small male terminal is used for the wire or lead mounting.

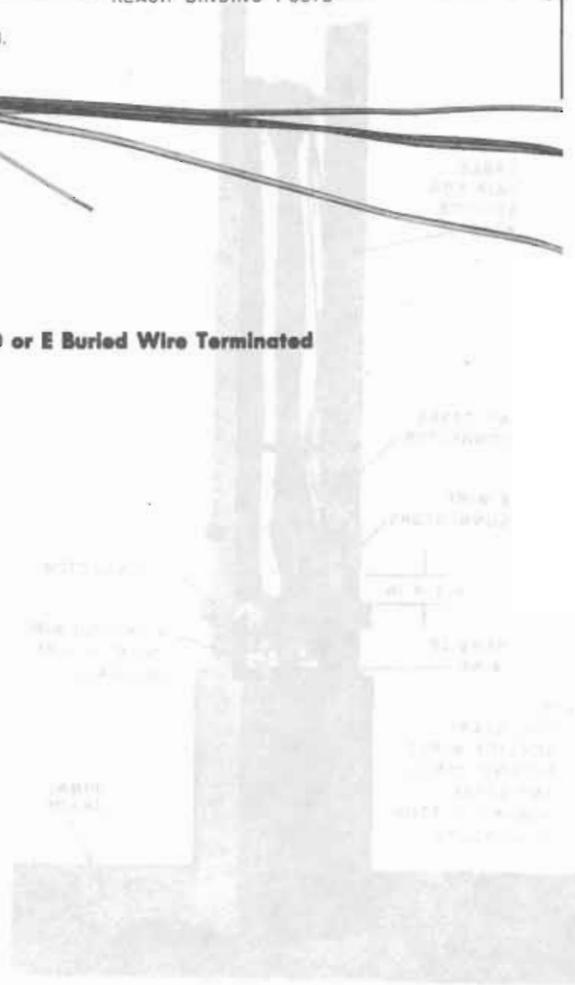
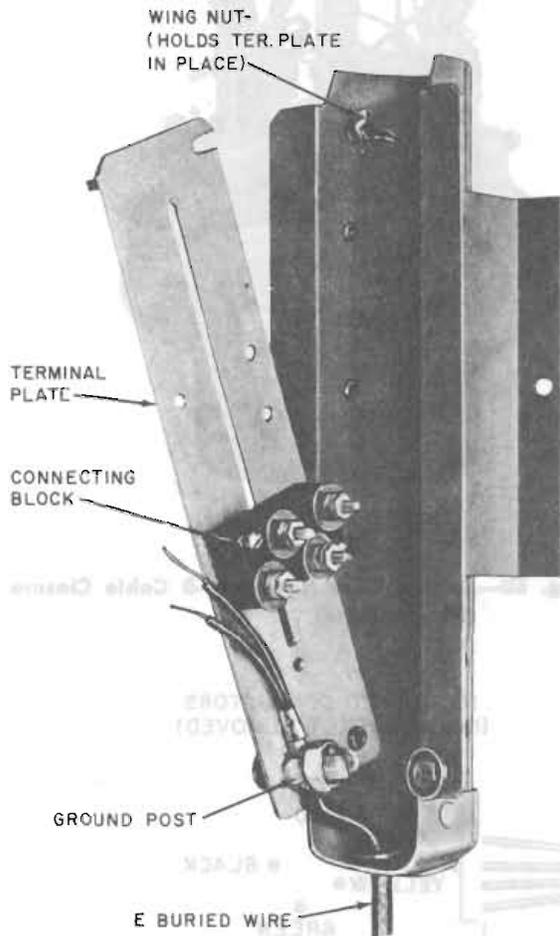


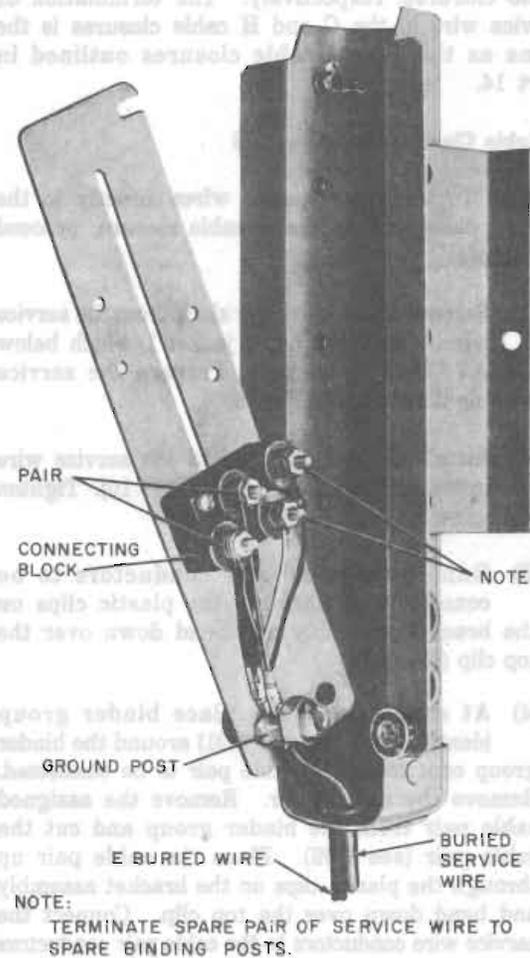
Fig. 57—Service Wire Terminal—D-Type Cable Clamps (Continued)

(2) Place the metallic shield of the buried wire under the nut of the ground post and remove the insulation from the conductors as illustrated in Fig. 57.

(3) Place the metallic shield of the service wire under the nut of the ground post. Tighten the nut securely. Terminate the buried wire conductors and the pair of service wire conductors on the proper binding posts. The service wire spare pair of conductors is terminated on the spare binding posts (Fig. 58).



**Fig. 57—Bonding Metallic Tape of Buried Wire—E Buried Wire Terminal**



**Fig. 58—Buried Wire and Service Wire Terminated—E Buried Wire Terminal**

## 16. TERMINATING SERVICE WIRE—SUPERSEDED TYPE CABLE CLOSURES

**16.01** The B, C, D, UP200, and UP200S cable closures have been rated "Manufacture Discontinued." Where these closures have been damaged and must be replaced, the appropriate K-type closure, listed in Section 631-600-301 should be used.

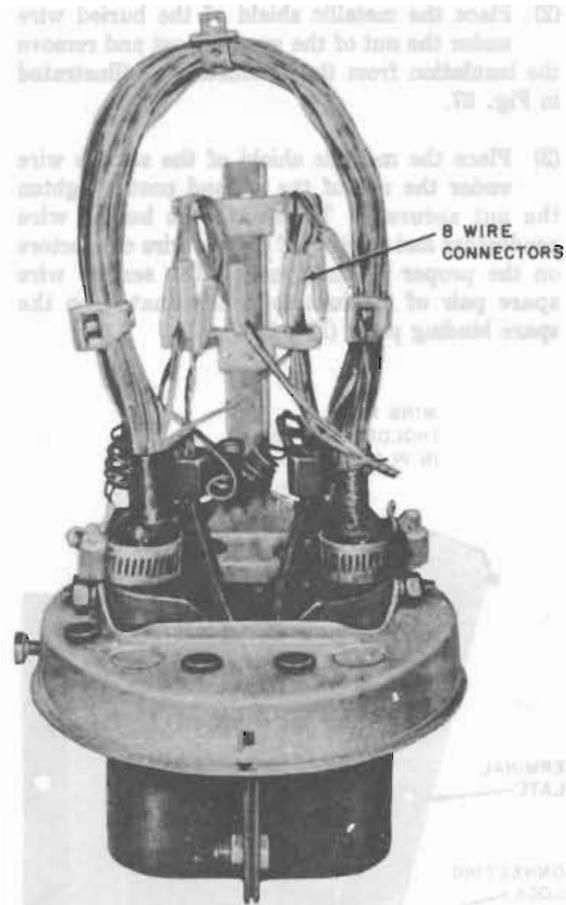
**16.02** The G and H cable closures have been superseded by the LD10/42 and LD6/42

cable closures, respectively. The termination of service wire in the G and H cable closures is the same as the L-type cable closures outlined in Part 14.

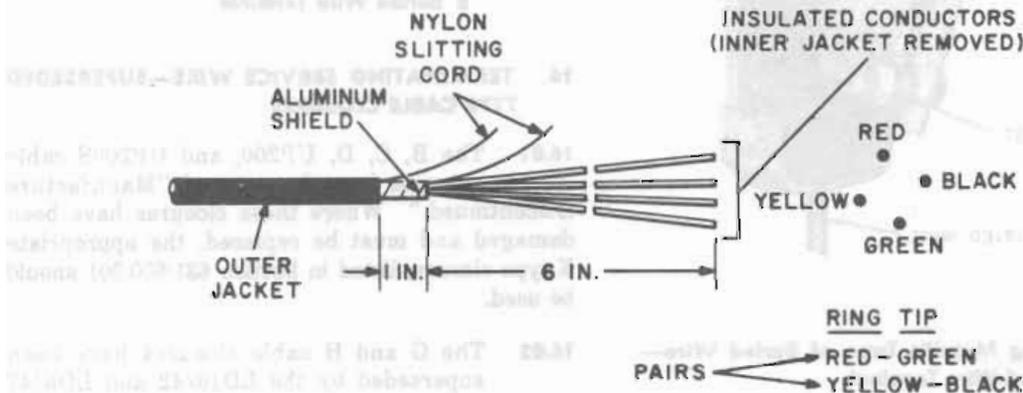
**B Cable Closure—Nonprotected**

**16.03** To terminate service wires directly to the cable pair in the B cable closure, proceed as follows:

- (1) Remove all unnecessary slack from the service wire. Mark the outer jacket 1/4-inch below the AT-7796X connector. Prepare the service wire as illustrated in Fig. 59.
- (2) Install the metallic tape of the service wire in the AT-7796X connector (Fig. 10). Tighten the screw.
- (3) Run the service wire conductors to be connected up through the plastic clips on the bracket assembly and bend down over the top clip (Fig. 60).
- (4) At each cable butt, place binder group identification ties (see 7.01) around the binder group containing the cable pair to be connected. Remove the unit binder. Remove the assigned cable pair from the binder group and cut the cable pair (see 7.02). Place the cable pair up through the plastic clips on the bracket assembly and bend down over the top clip. Connect the service wire conductors to the cable pair conductors with B wire connectors or 700-type connectors (Fig. 60, see 7.08).



**Fig. 60—Service Wire Installed—B Cable Closure (Nonprotected)**



**Fig. 59—Prepared Service Wire—B Cable Closure**

**B Cable Closure—Protected**

**Note:** The binding posts of 60A1B-3 connecting blocks previously installed in B cable closures are provided with insulation crushing washers. To terminate the cable pair conductors on the binding post it is not necessary to remove the conductor insulation.

**16.04** To terminate service wire on the 60A1B-3 connecting block used in the B cable closure, proceed as follows:

- (1) Remove all unnecessary slack from the service wire. Mark the outer jacket 1/4-inch below the AT-7796X connector. Prepare the service wire as illustrated in Fig. 59. Install the metallic tape in the AT-7796X connector as illustrated in Fig. 10. Tighten the screw.
- (2) At each cable butt, place binder group identification ties (see 7.01) around the binder group containing the cable pair to be connected. Remove the unit binder. Remove the assigned cable pair from the binder group. At the approximate center form a hairpin loop with each cable pair conductor.
- (3) Place the hairpin loop around the binding post between the pronged washer and the plain washer (Fig. 61). Avoid pulling the conductors against the threads of the binding post. This will prevent cutting the conductors when tightening the locknuts.
- (4) Place the bare wire ends of the service wire conductors around the binding post between the outside plain washers. Tighten the locknuts (Fig. 61).

**B Cable Closure—6A-Type Terminal Blocks—Protected**

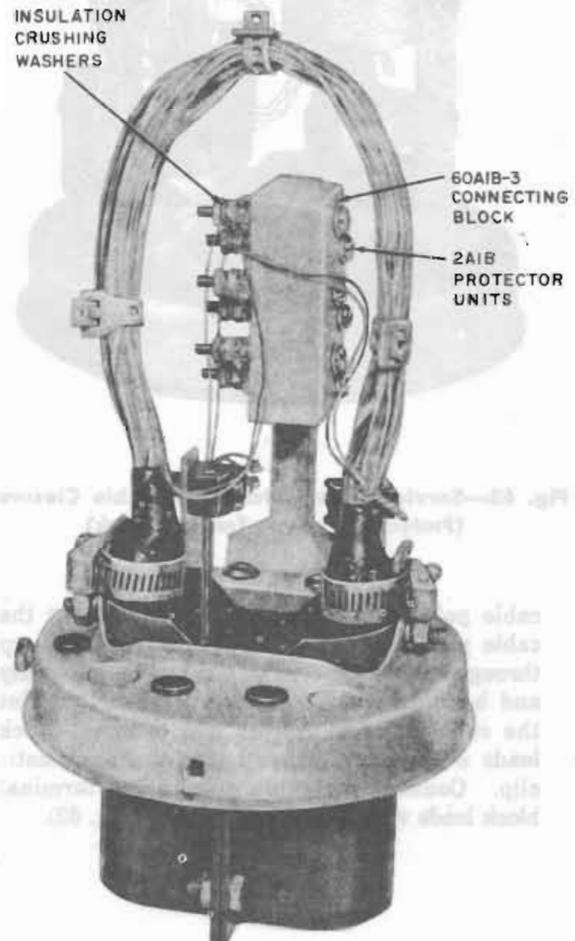
**Note:** Where 6A-type terminal blocks (Part 5) are installed in B cable closures an additional bracket assembly must be placed in the closure for mounting the terminal block.

**16.05** To terminate the service wire on the 6A-type terminal blocks, proceed as follows:

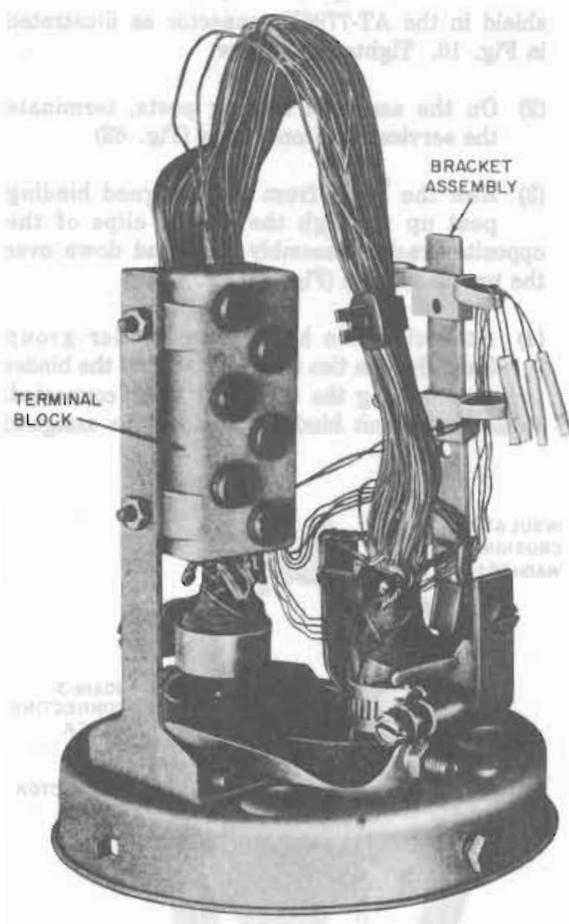
- (1) Remove all unnecessary slack from the service wire. Mark the outer jacket 1/4 inch from the AT-7796X connector. Prepare the service wire as illustrated in Fig. 59. Install the metallic

shield in the AT-7796X connector as illustrated in Fig. 10. Tighten the screw.

- (2) On the assigned binding posts, terminate the service wire conductors (Fig. 62)
- (3) Run the leads from the assigned binding post up through the plastic clips of the opposite bracket assembly and bend down over the top plastic clip (Fig. 62).
- (4) At each cable butt, place binder group identification ties (see 7.01) around the binder group containing the cable pair to be connected. Remove the unit binder. Remove the assigned



**Fig. 61—Service Wire Installed—B Cable Closure (Protected)**



**Fig. 62—Service Wire Installed—B Cable Closure (Protected 6A-Type Terminal Block)**

cable pair from the binder group and cut the cable pair (see 7.02). Place the cable pair up through the plastic clips on the bracket assembly and bend down over the top plastic clip. Cut the cable pair conductors and terminal block leads even, 1-1/2 inches below the top plastic clip. Connect the cable pair to the terminal block leads with B wire connectors, (Fig. 62).

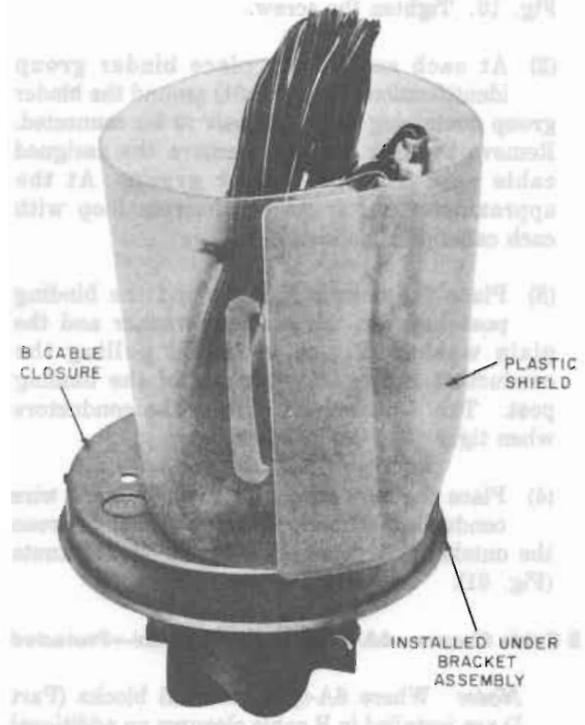
**16.06** To prevent damage to the cable pairs when the dome of the B cable closure is removed and replaced, a B closure shield is installed around the cable loop as illustrated in Fig. 63.

**C Cable Closure**

**16.07** Where the B cable closure is used in conjunction with the C cable closure, service wires are terminated as outlined in 16.03 through 16.05.

**D Cable Closure**

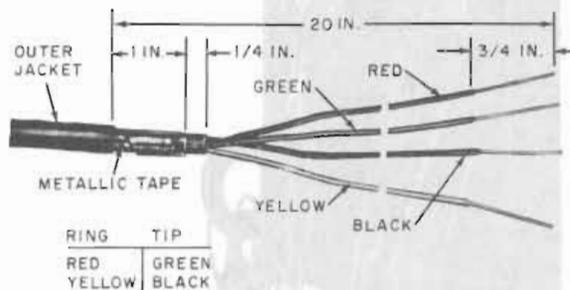
**Note:** There are no facilities for installing terminal blocks in the D cable closure.



**Fig. 63—B Closure Shield Installed in B Cable Closure**

**16.08** To terminate service wire directly to the cable pair in the D cable closure, proceed as follows:

- (1) Remove all unnecessary slack from the service wire. Mark the outer jacket 1/4 inch below the AT-7796X connector. Prepare the service wire as illustrated in Fig. 64.

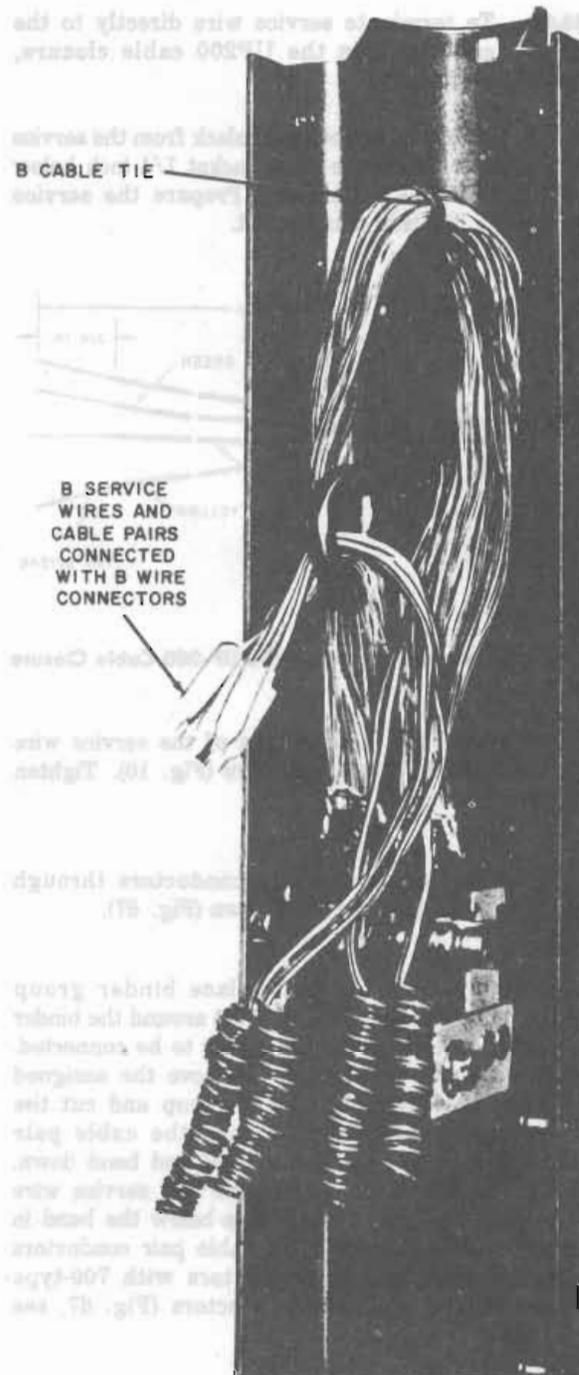


**Fig. 64—Prepared Service Wire—D Cable Closure**

- (2) Install the metallic tape of the service wire in the AT-7796X connector (Fig. 10). Tighten the screw.
- (3) Run the service wire conductors through the eyebolt and bend down (Fig. 65).
- (4) At each cable butt, place binder group identification ties (see 7.01) around the binder group containing the cable pair to be connected. Remove the unit binder. Remove the assigned cable pair from the binder group and cut the cable pair (see 7.02). Place the cable pair conductors through the eye bolt and bend down. Cut the cable pair conductors and service wire conductors even, 1-1/2 inches below the bend in the eyebolt. Connect the cable pair conductors to the service wire conductors with 700-type connectors or B wire connectors (see 7.03).

#### UP200 Cable Closure

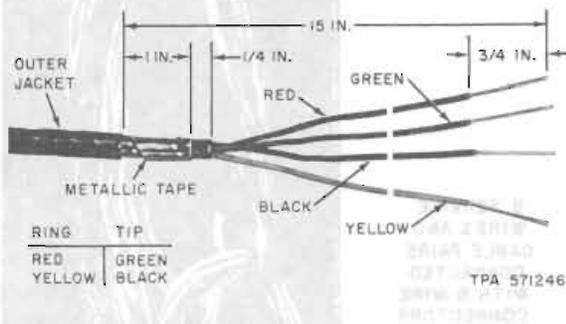
**Note:** There are no facilities for installing terminal blocks in the UP200 cable closure. The UP200S cable closure is for splicing only.



**Fig. 65—Service Wire Installed—D Cable Closure**

**16.09** To terminate service wire directly to the cable pair in the UP200 cable closure, proceed as follows:

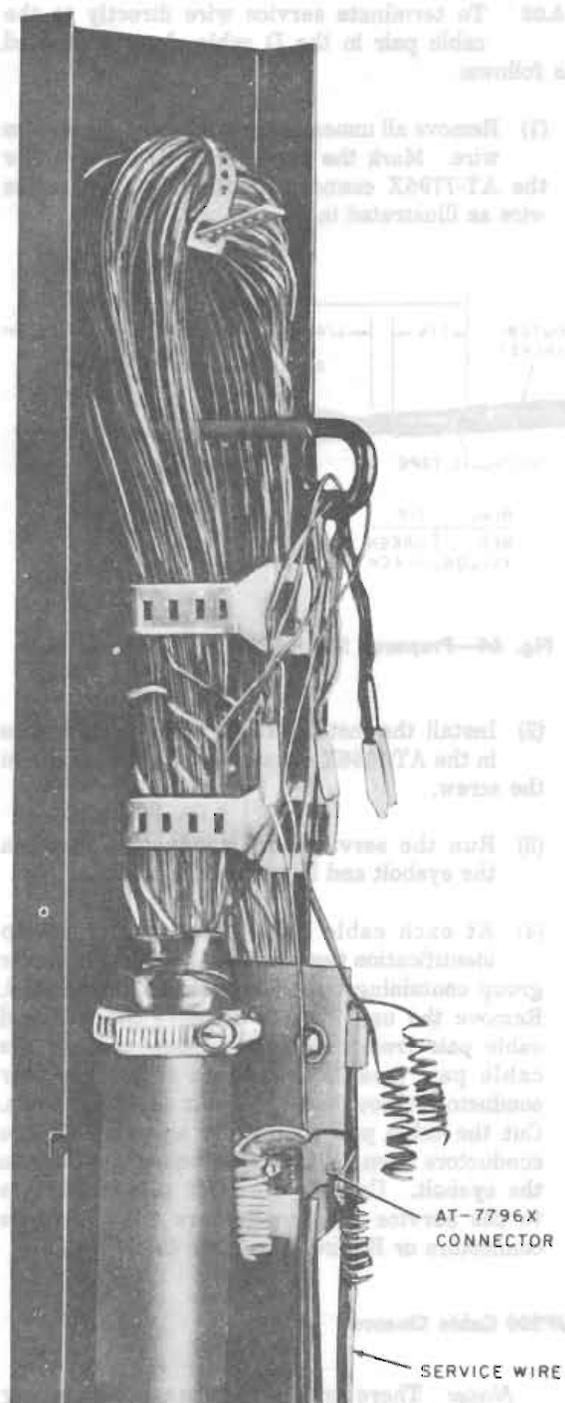
- (1) Remove all unnecessary slack from the service wire. Mark the outer jacket 1/4 inch below the AT-7796X connector. Prepare the service wire as illustrated in Fig. 66.



**Fig. 66—Prepared Service Wire UP-200 Cable Closure**

- (2) Install the metallic tape of the service wire in the AT-7796X connector (Fig. 10). Tighten the screw.
- (3) Run the service wire conductors through the eyebolt and bend down (Fig. 67).
- (4) At each cable butt, place binder group identification ties (see 7.01) around the binder group containing the cable pair to be connected. Remove the unit binder. Remove the assigned cable pair from the binder group and cut the cable pair (see 7.02). Place the cable pair conductors through the eyebolt and bend down. Cut the cable pair conductors and service wire conductors even, 1-1/2 inches below the bend in the eyebolt. Connect the cable pair conductors to the service wire conductors with 700-type connectors or B wire connectors (Fig. 67, see 7.03).

**16.10** The F cable closure shall not be used in random separation with cables containing 19- or 22-gauge conductors, since there is no facility for mounting terminal blocks with leads to serve as fusible links.



**Fig. 67—Prepared Service Wire Installed UP-200 Cable Closure**

**16.11** B sealant, a silicone rubber compound is used to encapsulate (water proof) B wire connector joints. (Wear regular eye protection when handling B sealant). **Do not** use any silicone rubber compound or sealant other than B sealant. Other silicone rubber compounds or sealants are corrosive to copper wire joints and may cause rapid degradation of the joints.

**16.12** B sealant (Fig. 68) is contained in a 3-ounce tube. A plastic nozzle is furnished with the tube of sealant.

**Warning:** *With the recommended procedures outlined in 16.13 there is no necessity for the workman to make physical contact with the uncured silicone rubber. Accordingly, the use of protective barrier creams is unnecessary when using this material. However, in the event that the skin is accidentally exposed to the uncured silicone rubber, steps should be taken to remove the material with soap and water as soon as practical.*

**16.13** To encapsulate the B wire connectors, fill the F plastic caps as follows:

(1) Mark the cap with a line placed about 1-1/4 inches from the sealed end (Fig. 69).

(2) Remove the cap from the sealant tube and replace it with the nozzle (Fig. 69).

(3) Insert the nozzle into the F plastic cap as far as possible. Place the cap and tube on a flat firm surface, then gradually inject the silicone rubber compound into the cap until the cap is filled to the 1-1/4 inch line (Fig. 69). During the filling operation gradually withdraw the nozzle to avoid air pockets in the silicone rubber.

**Note:** Prepare any additional F plastic caps that may be required. Approximately 15 to 20 F plastic caps may be filled to the required level with one 3-ounce tube of B sealant. As many as four B wire connectors may be placed in one F plastic cap.

**16.14** Remove all unnecessary slack from the service wire. Mark the sheath of the service wire 1/4-inch below the AT-7796X connector. Prepare the service wire as illustrated in Fig. 70.



Fig. 68—B Sealant

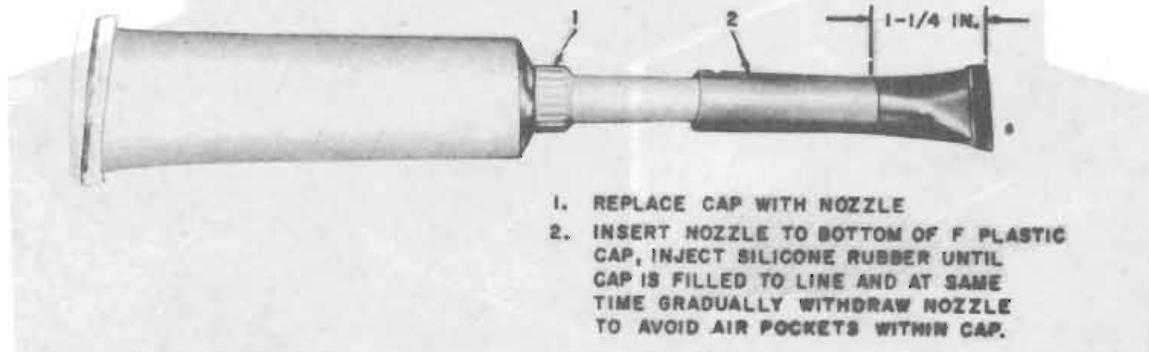


Fig. 69—Filling F Plastic Cap

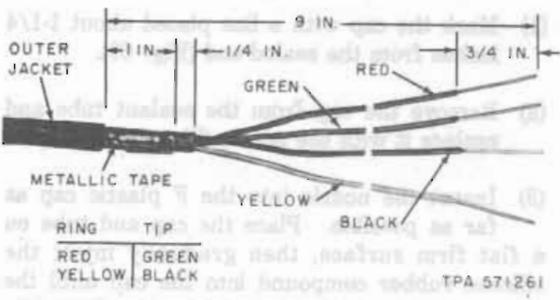


Fig. 70—Prepared Service Wire—F Cable Closure

16.15 Install the service wire in the AT-7796X connector as illustrated in Fig. 10.

16.16 To join the service wire directly to the cable pair, proceed as follows:

- (1) Run the service wire conductors to be joined, up through the plastic clips on the wire bracket and bend down (Fig. 71).
- (2) Remove the assigned cable pair from the binder group and cut the cable pair (see 7.02).

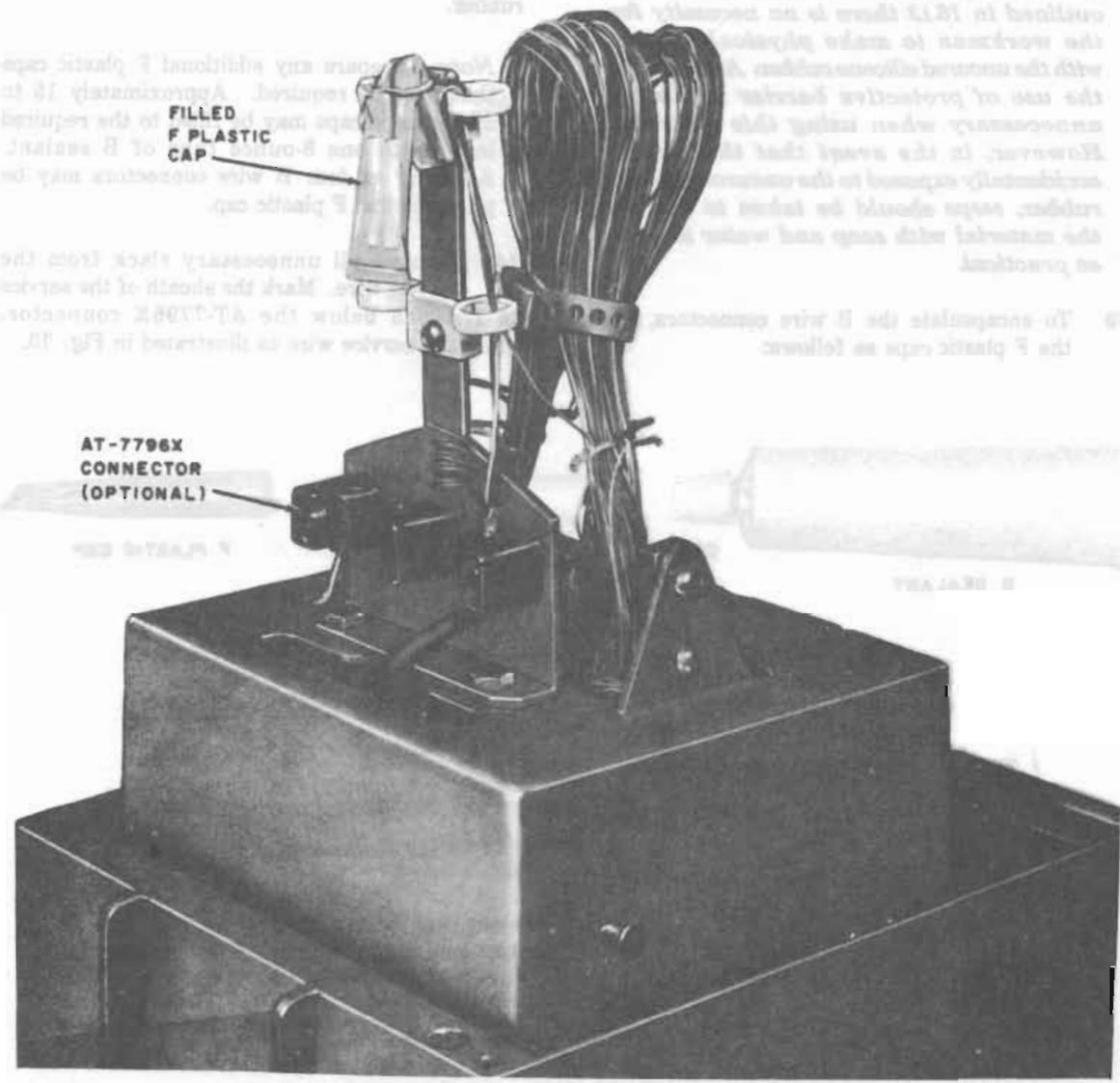


Fig. 71—Service Wire Installed—F Cable Closure

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- (3) Run the cable pair up through the plastic clips on the wire bracket and bend down (Fig. 71).
- (4) Cut the service wire conductors and cable pair conductors even, 3 inches below the top plastic clip.
- (5) Connect the cable pair and service wire conductors with B wire connectors (see 7.03).
- (6) Insert the B wire connectors as far as possible into the filled F plastic cap.
- (7) Fold the F plastic cap at a point approximately 1/4- to 3/8-inch from the nearest connector. The silicon rubber compound should extrude to both sides of the fold. Place the folded cap so the open end faces downward. This will prevent the collection of the water in the cap. Bind the folded cap with a scrap conductor or tape with two turns of vinyl tape (Fig. 71).

**17. TERMINATING BURIED WIRE—123A1A AND 128A1A-2 PROTECTORS**

**17.01** Before installing protectors, the following should be taken into consideration:

- (a) **Fuseless Protector:** The length of ground wire from the protector should be as short as possible to provide a low-resistance path to ground.
- (b) **Accessibility:** The protectors should be placed where they can be reached from ground level.
- (c) **Appearance:** Avoid locations on the fronts of buildings or in living quarters.
- (d) **Location of Telephone And Power Ground:** The telephone ground shall be located to facilitate common grounding.

**Note:** Section 460-100-201 covers the selection and installation of station protector ground and signaling grounds.

- (e) Dry and well ventilated locations when installed indoors or underneath buildings.
- (f) Where possible and with permission of the power company, entrance into the customer's premises through the same opening as the power company wires provided:

- (1) The power service cable and telephone service wire that serve the building are in random construction.

- (2) The entrance hole or sleeve through the foundation is less than 2 feet long.

- (3) There is adequate cross sectional area in the hole or sleeve to place the power cable and telephone service wire without damage to either.

**17.02** Protectors installed indoors may be mounted in any position.

**17.03** Terminate the buried wire and inside wire on the protector so the ring conductors (single tracer or red and yellow wires) shall be connected to the binding posts on the right side of the protectors. (On ceilings, the right side as viewed from the inside wiring end of the protector.)

**17.04** All screws and fasteners shall be of sufficient length to mount securely. The 080 Division of the Bell System Practices contains information concerning the various types of screws, anchors, etc, required to install the protectors.

**17.05** The size ground wire required for single or multiple installation of protectors is listed in Table A.

**TABLE A**  
GROUND WIRE CAPACITY

GROUND WIRE SIZE	NO. OF PROTECTED CIRCUITS FUSELESS
No. 14	1
No. 12	2
No. 10	6
No. 6	7 or more

*Note:* The ground wire between protectors shall be the same size as the ground wire between the protector and the grounding electrode.

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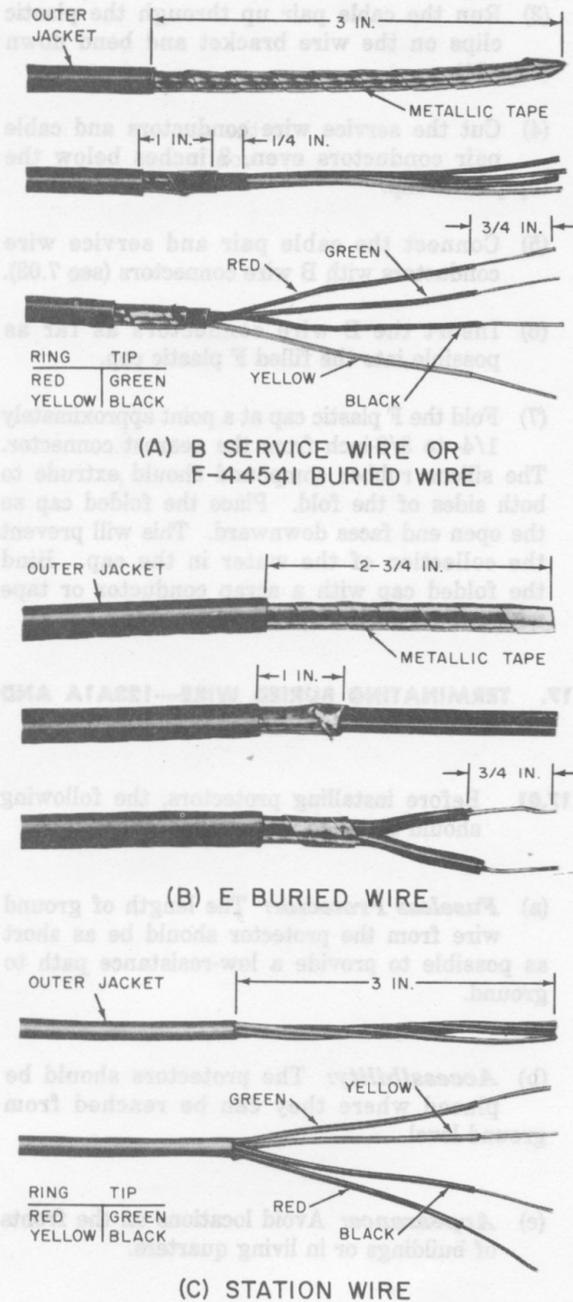


*When the initial protector ground wire is installed, it should be of sufficient size to provide protection for any future protector installation (Table A).*

**17.06** Where the 123A1A or 128A1A-2 protectors are installed inside the customer's premises, they should preferably be installed directly on an acceptable metallic cold water pipe by means of a 72A or 90A bracket as outlined in Section 460-100-200.

**17.07** Unless otherwise indicated, the 123A1A or 128A1A-2 protectors should be installed, on the wall, directly above the location where the buried wire enters the ground.

**17.08** Remove all unnecessary slack from the buried wire. Mark the outer jacket of the buried wire 1-1/4 inches from the ground binding post. Prepare the buried wire and station wire as illustrated in Fig. 72.



**Fig. 72—Prepared Buried and Station Wire 123A1A or 123A1A-2 Protector**

17.09 Place the F connector on the buried wire, positioning it on the metallic tape (Fig. 73). Tighten the screw securely.

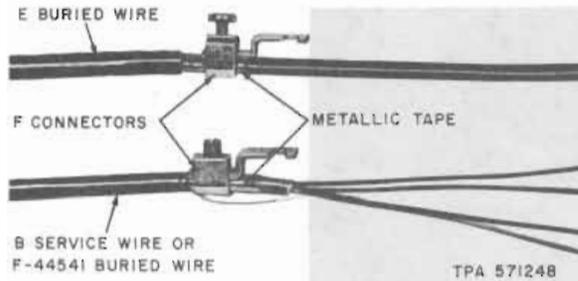


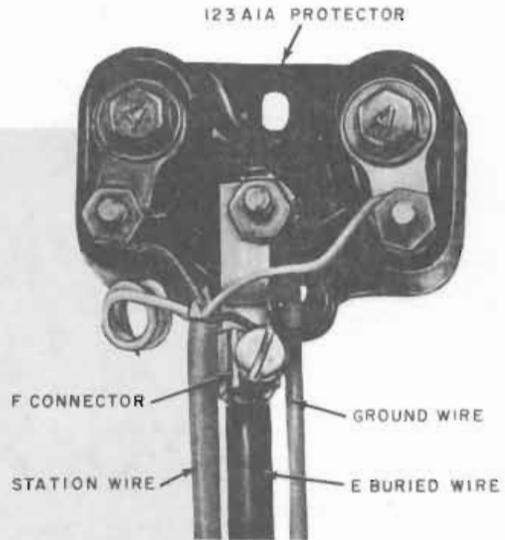
Fig. 73—F Connector Placed

17.10 To terminate the buried wire on the 123- or 128-type protector, proceed as follows:

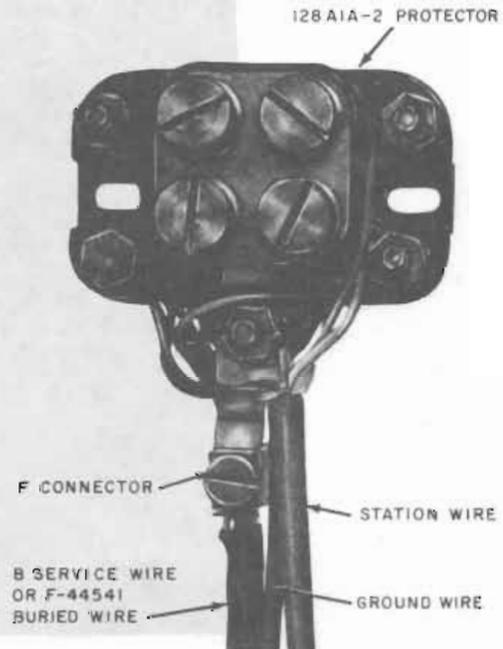
- (1) Remove approximately one inch of insulation from the end of the ground wire. Preform the bare end of the ground wire in the shape of a "U". Place the "U" under the pronged washers of the ground binding post (Fig. 74).
- (2) Place the spade end of the F connector between the two flat washers. Tighten the ground binding post nut securely (Fig. 74).
- (3) Terminate the bare ends of the buried wire conductors between the bottom two flat washers on the binding posts. Terminate the bare ends of the station wire conductors between the top two flat washers. Tighten the nuts securely (Fig. 74).

**Note:** Where B service wire or F-44541 armored service wire is used, a 128-type protector should be installed. The spare pair of conductors from the service or buried wire should be terminated on the spare binding post.

17.11 To protect the buried wire, between the 123- or 128-type protector and final grade, place a No. 0 U guard. The ground end of the U guard should be approximately two inches below final grade (Fig. 75).



A-E BURIED WIRE TERMINATED



B-B SERVICE WIRE OR F-44541 BURIED WIRE TERMINATED

TPA 571249

Fig. 74—Service Wire or Buried Wire Terminated

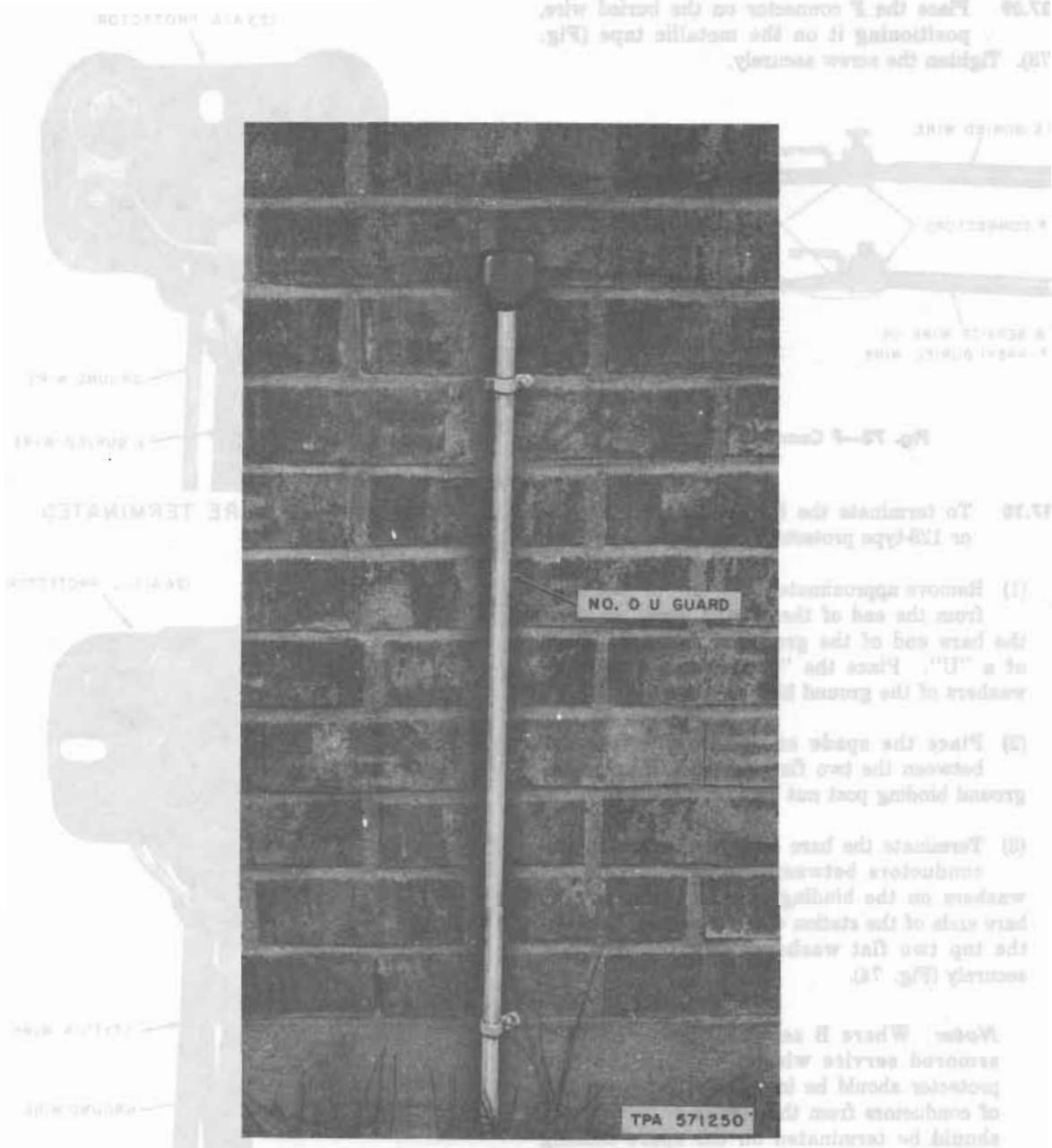


Fig. 75—Completed installation