

BURIED SERVICE WIRE TERMINATIONS

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NOTICE

Not for use or disclosure outside the
Bell System except under written agreement

1.05 In order to minimize fire or shock hazards at the subscriber's premises when fuseless station protectors are used, a short piece of fine gauge wire must be placed in the circuit at the junction of the buried service wire and the aerial facility so it will fuse open **at the pole** in the event of a sustained power contact. This fine gauge wire is known as a **fusible link**, and it must be smaller in current-carrying capacity than the conductors of the service wire in order to make certain that it will burn open instead of the conductors of the buried service wire. The 24-gauge copper conductors used in the stub cable of a cable terminal (such as a 104/105 type, 49 type, 53 type or N type) are satisfactory fusible links for service wire conductors. **Block wire is a satisfactory fusible link for E buried wire conductors but is not satisfactory with C service wire, or E armored service wire,** because of an insufficient difference in fusing characteristics.

1.06 Service wires should be identified at termination by one of the following methods, depending on the length of time required to retain wire identity:

Less Than Three Months

- Self-laminating label (obtain from T&B Co., W.H. Brady Co., or other companies with equivalent labels) (Fig. 1)—Mark the label with a pen or felt marker. Remove label from the pad and place on service wire by wrapping it on itself so that the transparent adhesive covers the written identity.

More Than Three Months

- TY-RAP* tie and marker (obtained from T&B Co., or equivalent obtained from W.H. Brady Co. or other companies with equivalent labels) (Fig. 2)—Twist off and retain locking head from nylon tie. Wrap the tie around the service wire and slip the tail of the tie through the eye of the grommet end and pull taut. Slide the desired preprinted tubular marker on the tail of the tie, then slide the locking head on the tie and push snug against the marker.

* Registered trademark of Thomas & Betts Company

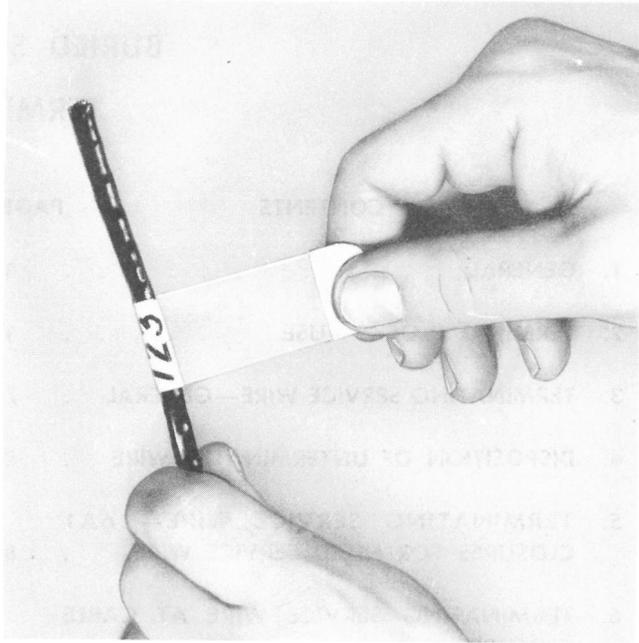


Fig. 1—Placing Self-Laminating Label

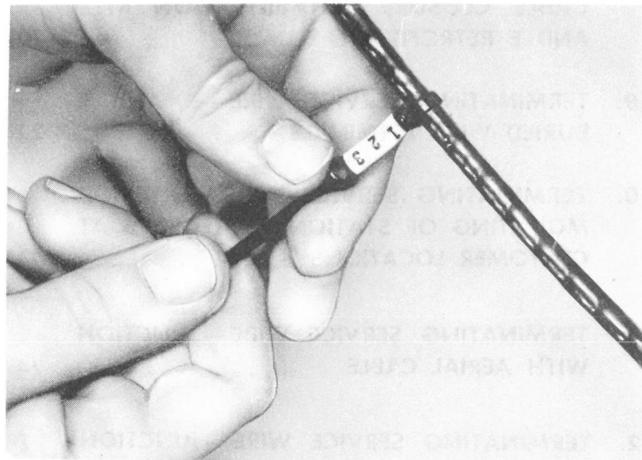


Fig. 2—Placing Tie and Marker

1.07 The 700-type connectors are used to join conductors in any combination of gauges without stripping the insulation (see note) as follows:

- **701-2A Connector**—19 through 26 gauge:
Used to splice two wires.
- **702-2A Connector**—19 through 26 gauge:
Used to bridge one wire to one through wire.
- **700-3B Connector**—17 through 26 gauge:
Used to splice two or three wires and bridge up to two wires to one through wire.

Section 632-205-215 covers the complete description and use of the 700-type connectors.

Note: Where 700-type connectors are used to splice E buried wire, the insulation must be removed.

1.08 The E, F, and H connector pressers and the G long-nose pliers are the only approved tools for pressing the 700-type connectors. Use of other tools may result in improperly made connections.

1.09 Do not use B wire connectors to join plastic insulated conductors.⚡

2. TERMINAL BLOCKS—USE

2.01 The 6- and 9-type terminal blocks for use with buried service wire are listed in Table A.

TABLE A
TERMINAL BLOCKS

TERMINAL BLOCK CODE	FIG. NO.	NO. PAIRS	TYPE PROTECTION	PROTECTOR UNITS	TERMINAL LEADS OR STUB CABLE
6A3A-3	3	3	Station	2A1A	24 AWG Terminal Leads 20 In. Length
6A4B-3	4	3	Cable	2A1B	
6A2-3	5	3	Fusing*	—	
9A1-5	6	5	Fusing*	—	24 AWG Stub 4 Ft Length
9A1-10	7	10	Fusing*	—	24 AWG Stub 4 Ft Length
9A1-25	7	25	Fusing*	—	
9A1A-5	8	5	Station	2A1A	24 AWG Stub 4 Ft Length
9A1B-5	8	5	Cable	2A1B	

* Fusing protection is accomplished through 24 AWG conductors of terminal leads or stub cable.

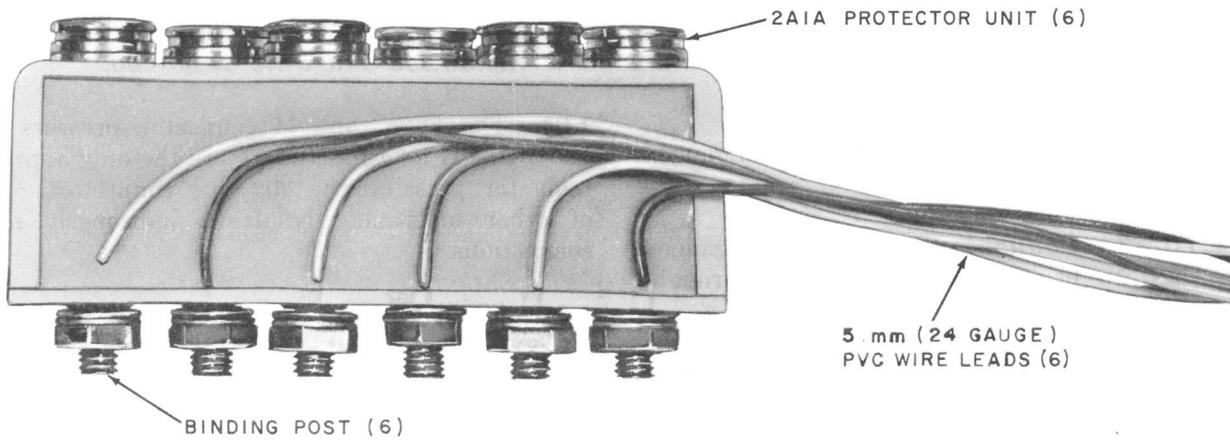


Fig. 3—6A3A-3 Terminal Block—Station Protection

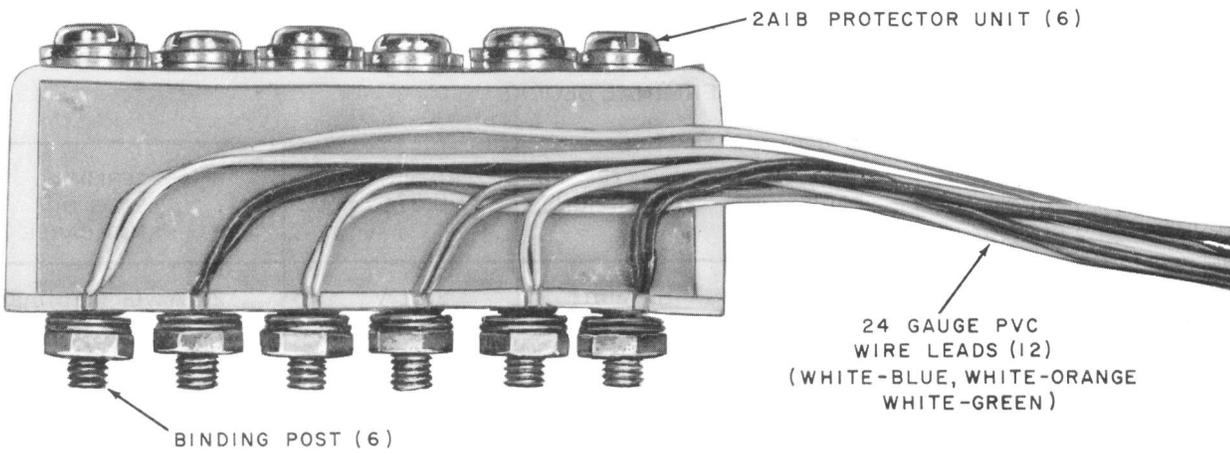


Fig. 4—6A4B-3 Terminal Block—Cable Protection

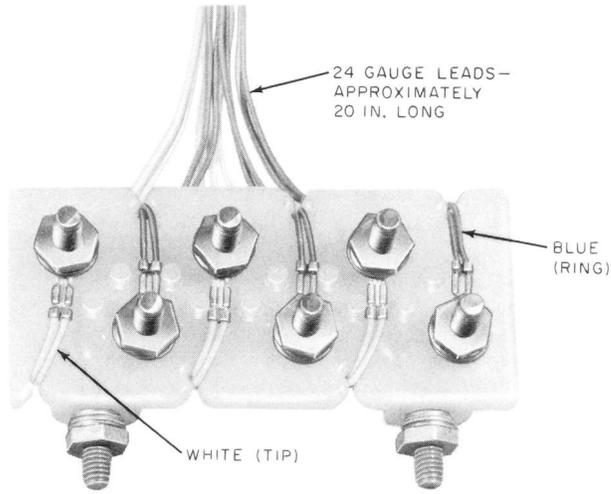


Fig. 5—6A2-3 Terminal Block—Fusing Protection

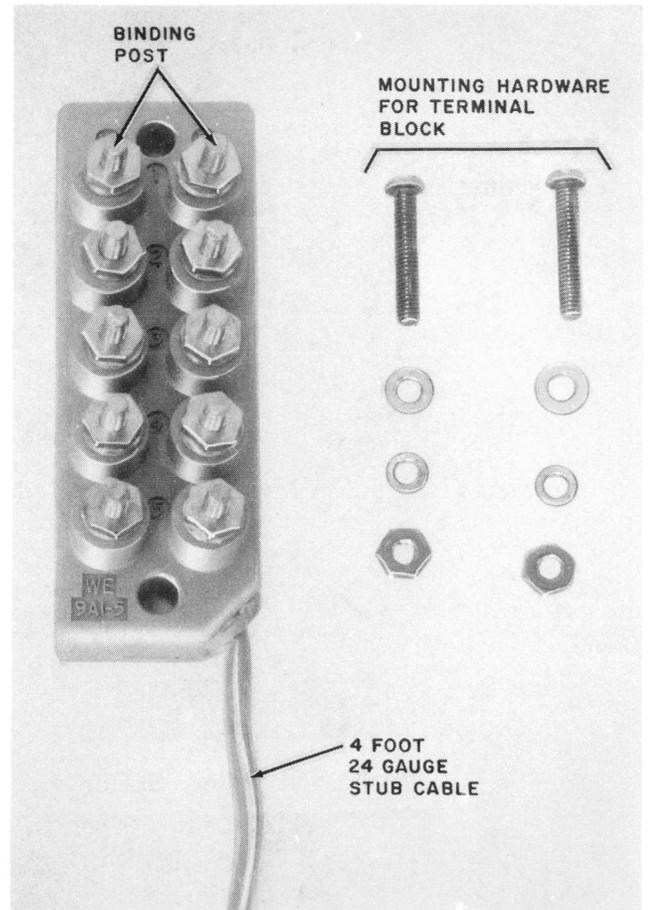


Fig. 6—9A1-5 Terminal Block—Fusing Protection

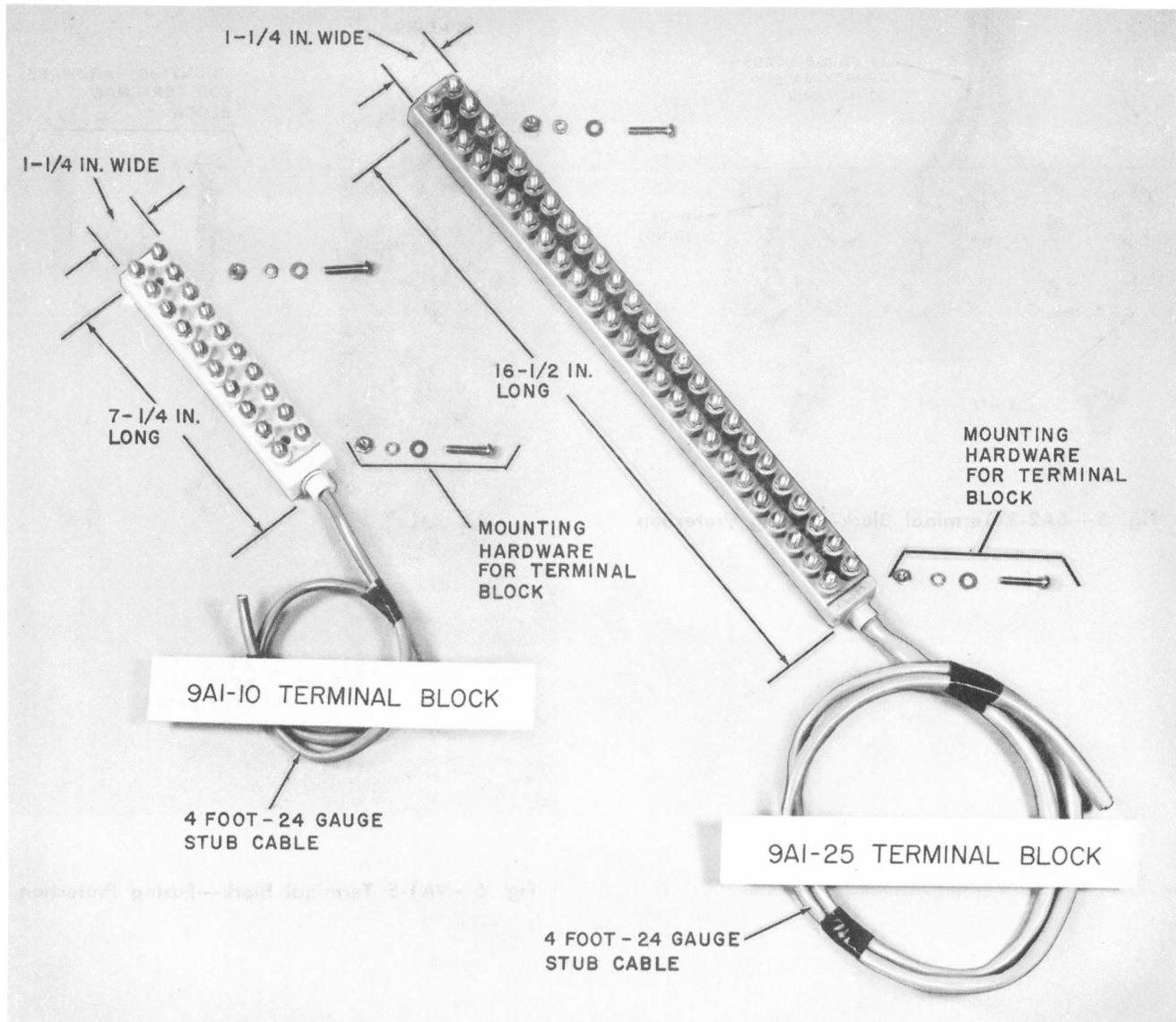


Fig. 7—9A1-10 and 9A1-25 Terminal Block—Fusing Protection

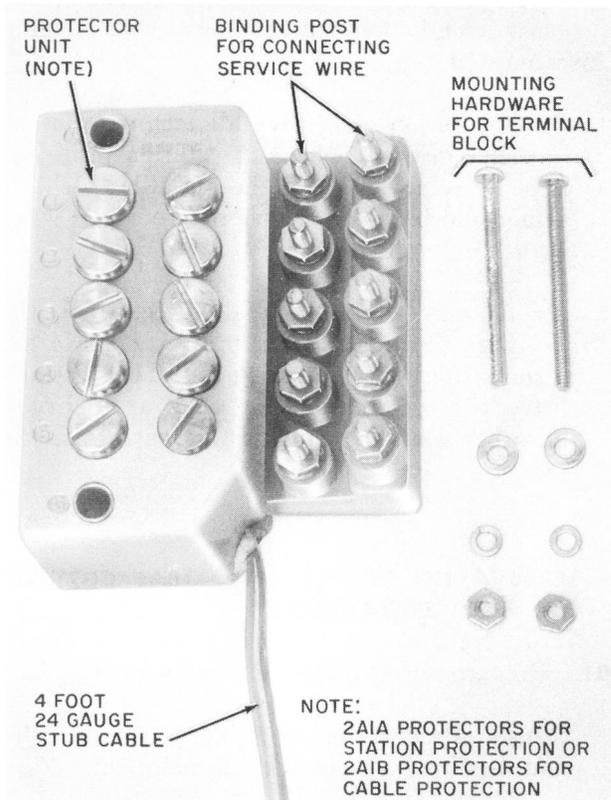


Fig. 8—9A1A-5 or 9A1B-5 Terminal Block

3. TERMINATING SERVICE WIRE—GENERAL

3.01 The administrative (and construction) methods for terminating service wires are referred to as:

- (a) **Preferred count access (PCA)**—Terminations are made in areas of stable demand and thus a preferred count of 25 or 50 cable pairs appear at each terminal for latter service connection. Service wire connections are made on terminal blocks (6A and 9A type).

(b) **Fixed count access (FCA)**—Terminations are made when customer demand for service is expected to change frequently, thus a predetermined quantity and cable pair count appear at each terminal for latter service connections. The assigned cable pairs are permanently connected and appear on terminal blocks (6A and 9A type).

(c) **Permanent connections**—Connections are made in buried and/or encapsulated closures. Sufficient connections must be made initially to provide service without reentering the closure.

3.02 A binder group identification tie should be placed around cable binder group containing cable pair to be terminated using plastic insulated wires of the same color as the unit binder.

3.03 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 Serving Area Interface (SAI) 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.

3.04 E armored service wire, C service wire, and E buried wire contain slitting cords to assist in removal of the outer jacket.

3.05 The 700-type connector should be used to terminate service wires for **all** new connections. The 700-type connectors are also required to terminate filled service wires in the prefilled closures covered in Part 5.

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

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



**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 using vinyl tape.
- All cable ties have been placed.
- The cable loop is dressed.
- All defective pairs are repaired or reported.
- Any defective bonds are repaired.

4. DISPOSITION OF UNTERMINATED WIRE

4.01 Buried wire not in use may include new installations when some time may elapse before the buried wire is placed in service or where existing service is being disconnected. To avoid differences in potential between conductors and the metallic shield or armor, buried wire which is not in use should be protected as follows:

(a) **New installations** where the wire is not being terminated on a station protector at time of placing.

- (1) At station end, twist the bare conductors and metallic shield together and wrap with vinyl tape.
- (2) At end toward central office, bridge metallic shield or armor and conductors to a common ground post, or if not available, follow instructions in (1).

(b) **Service disconnections** where the wire has been terminated and existing service is being disconnected.

- (1) At station end, leave all terminations as they are, but where the station protector is being removed, twist the metallic shield or armor and bare conductors together and wrap with vinyl tape.
- (2) At end toward central office, when the wire terminates on a protector, leave the terminations as they are. Under SAI conditions, leave the terminations as they are. Under all other conditions follow the instructions in (a)(2).

5. TERMINATING SERVICE WIRE—16A1 CLOSURES FOR FILLED SERVICE WIRE

5.01 Prepare service wire as shown in Fig. 9.

Note: Preparation of 2-pair C service wire and 5-pair C service wire is identical.

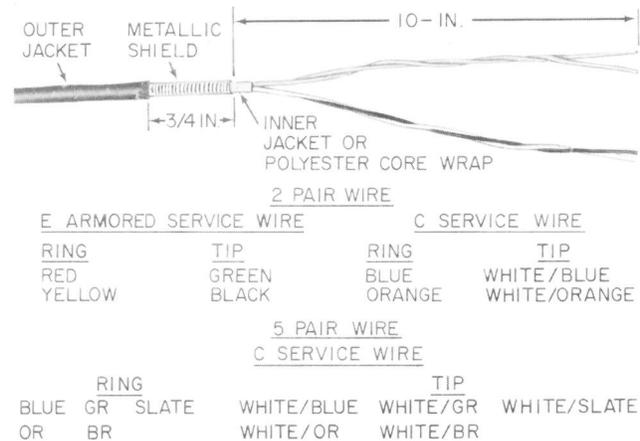


Fig. 9—Service Wire Prepared for 16-Type Closure

5.02 Install the metallic shield of the filled service wire in the AT-7796X connector as shown in Fig. 10 and tighten the screw.

5.03 Splice the service wire to the cable pairs using 700-type connectors *only* as shown in Fig. 11.

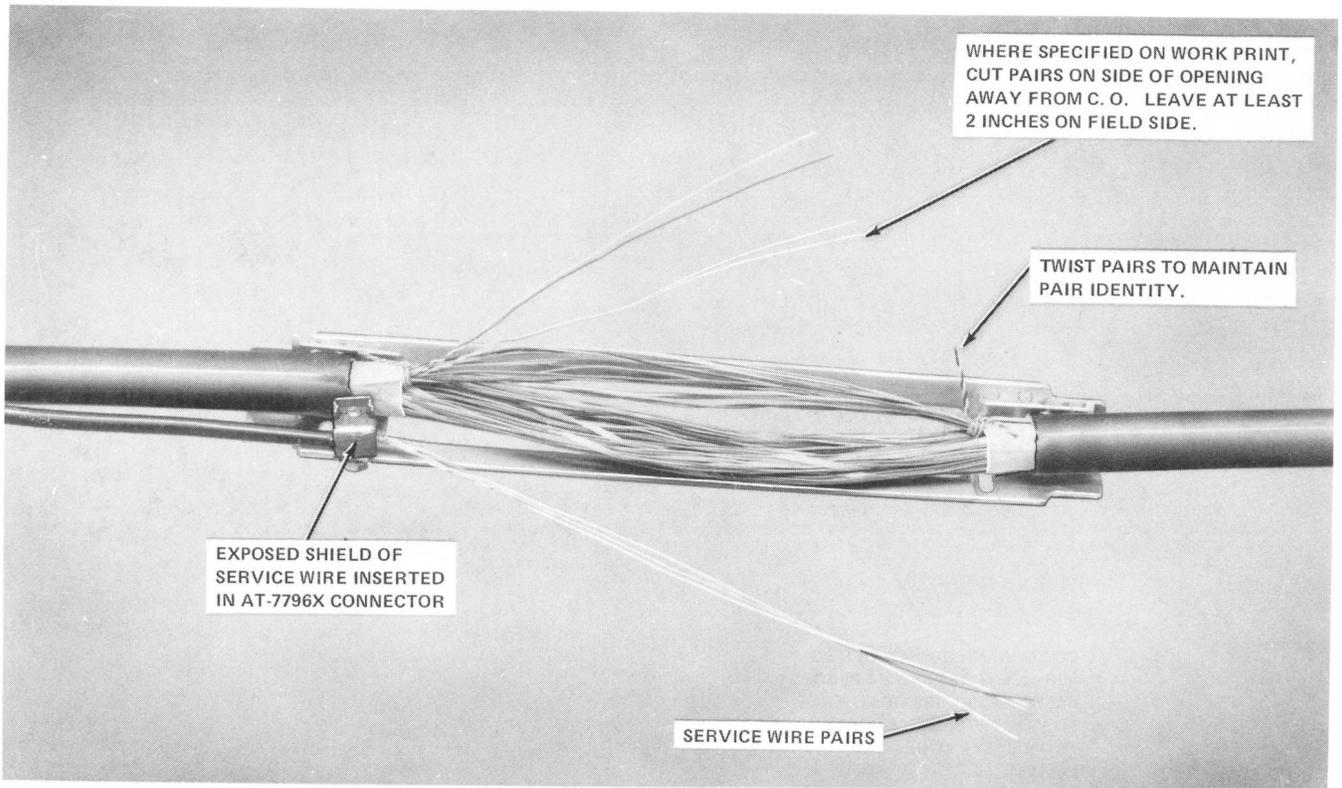


Fig. 10—▶Metallic Shield of Service Wire Installed in AT-7796X Connector—16A1 Closure◀

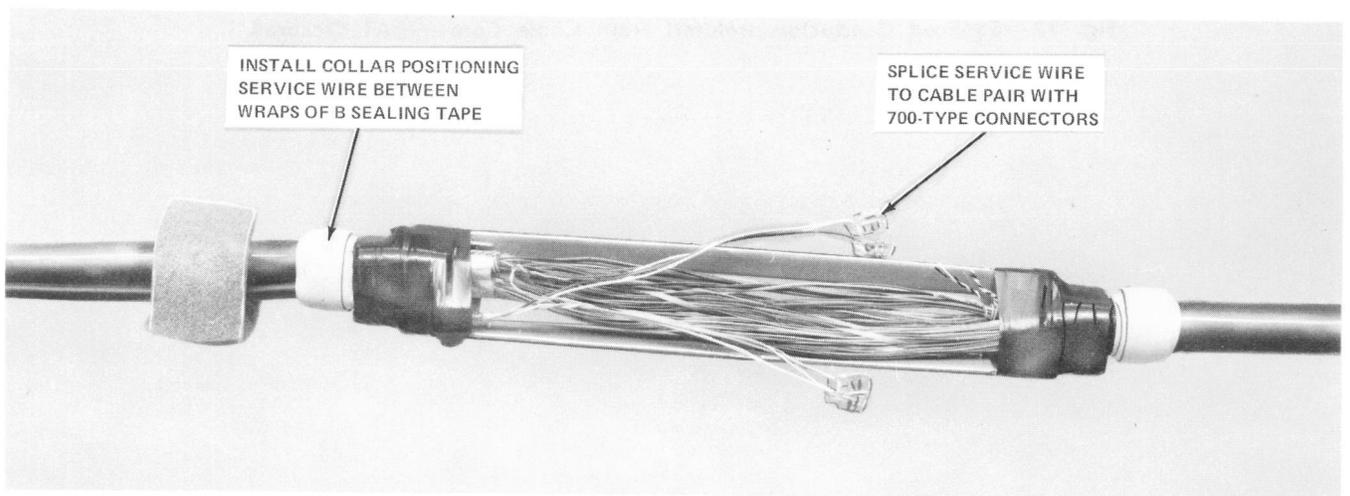


Fig. 11—▶Service Wire Conductors Spliced to Cable Pairs—16A1 Closure◀

5.04 Place spliced conductors between layers of the liner to isolate spliced pairs from the cable core as shown in Fig. 12.

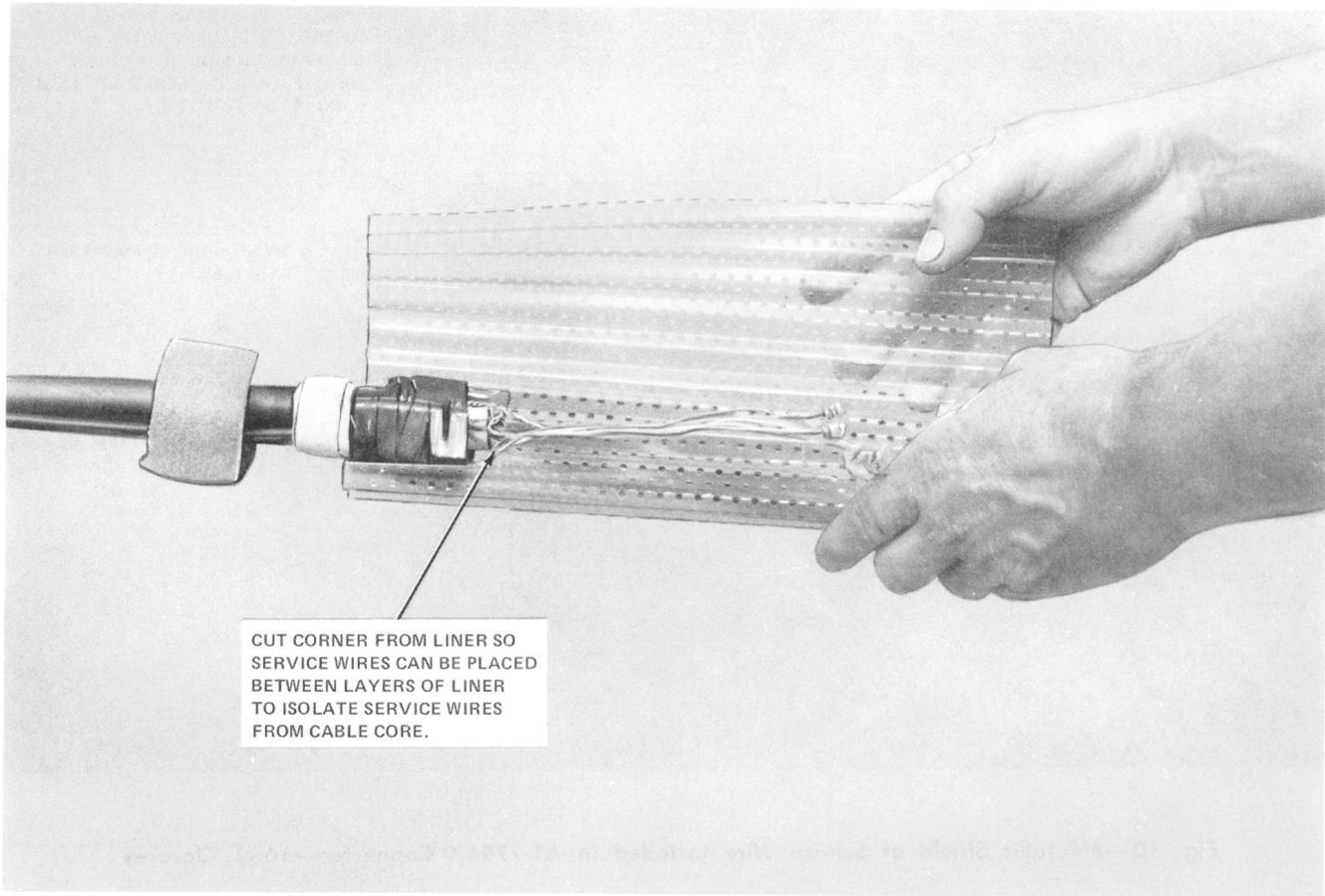


Fig. 12—Spliced Conductors Isolated From Cable Core—16A1 Closure

6. TERMINATING SERVICE WIRE AT CABLE CLOSURES

RC4/72 Cable Closure

6.01 Prepare the service wire as shown in Fig. 13 and install the metallic shield in the AT-7796X connector as illustrated in Fig. 14.

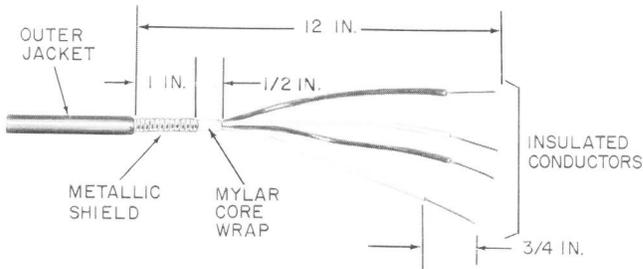
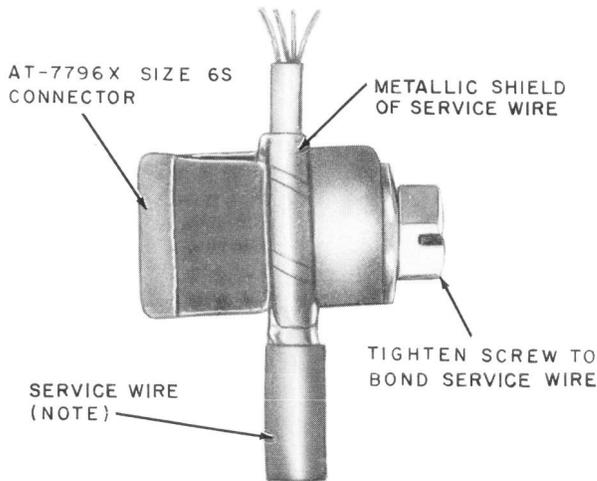


Fig. 13—Service Wire Prepared for RC4/72 Cable Closure



NOTE:
UP TO THREE 2-PAIR SERVICE WIRES
MAY BE INSTALLED IN AN
AT-7796X SIZE 6S CONNECTOR

Fig. 14—Service Wire Installed in AT-7796X Connector

6.02 Where *fixed count* or *preferred count* termination is desired, run the service wire up to the assigned binding post of the terminal block as shown in Fig. 15.

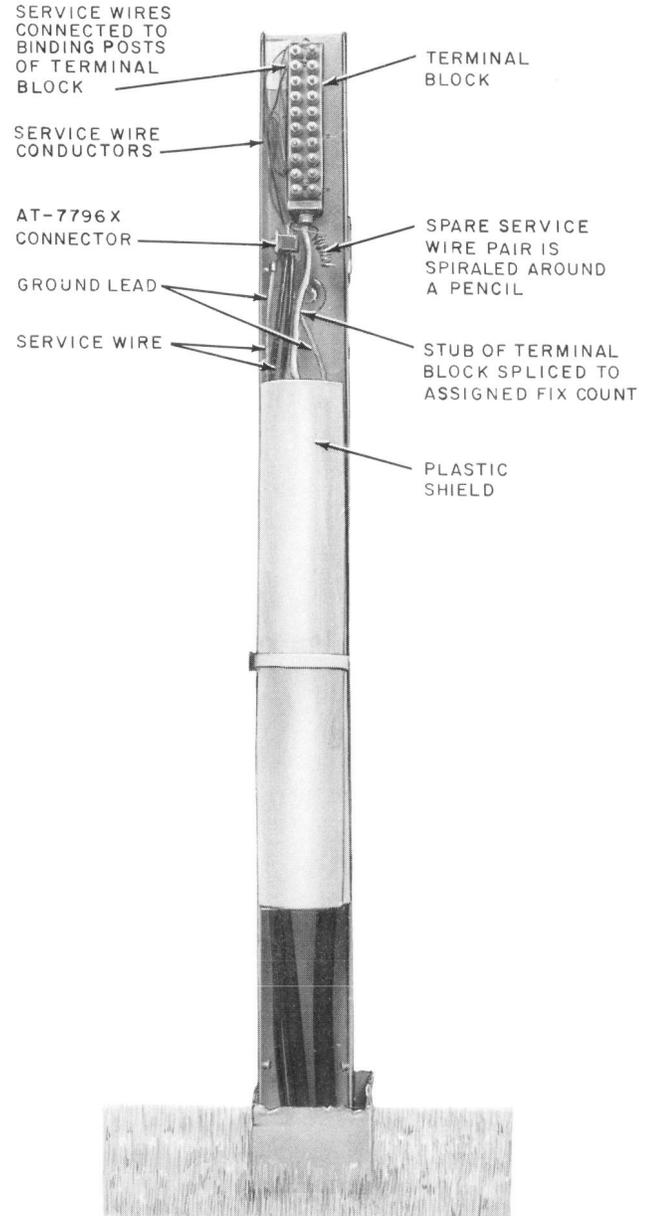


Fig. 15—Service Wires Terminated in RC4/72 Cable Closure

PC6/48 and PC12/55 Cable Closure

6.03 Prepare the service wire as shown in Fig. 16 and install the metallic shield in the AT-7796X connector as illustrated in Fig. 14.

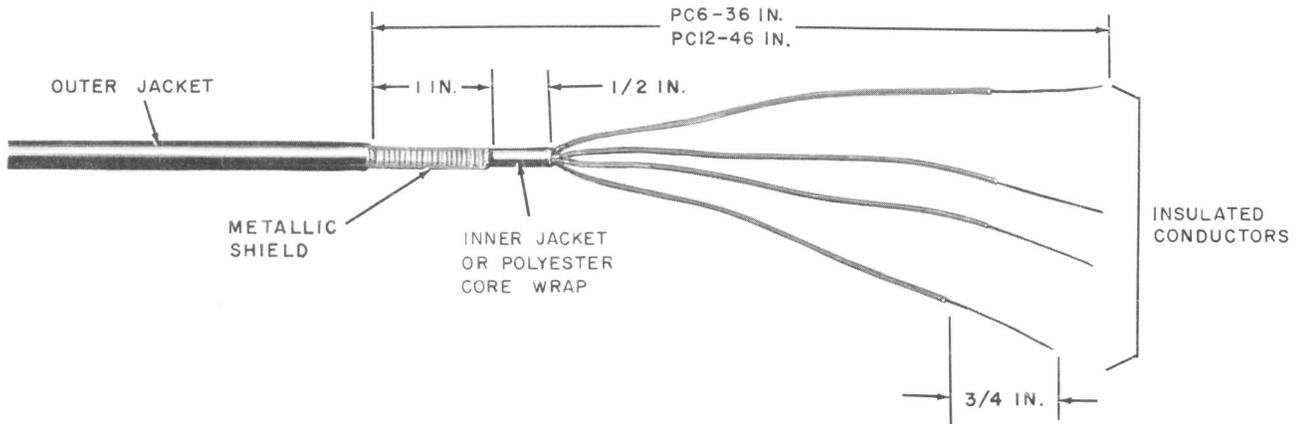


Fig. 16—Prepared Service Wire—PC6/48 or PC12/55 Cable Closure

6.04 Run the conductors of the service wire to the assigned binding post on the terminal block as shown in Fig. 17, 18, and 19.

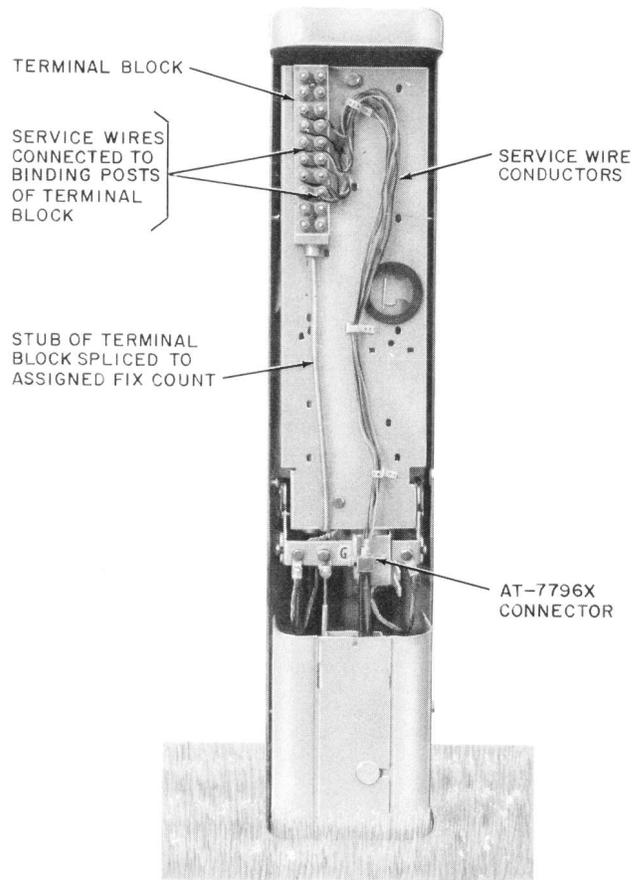


Fig. 17—Service Wires Terminated in PC6/48 Cable Closure—Fixed Count Mode

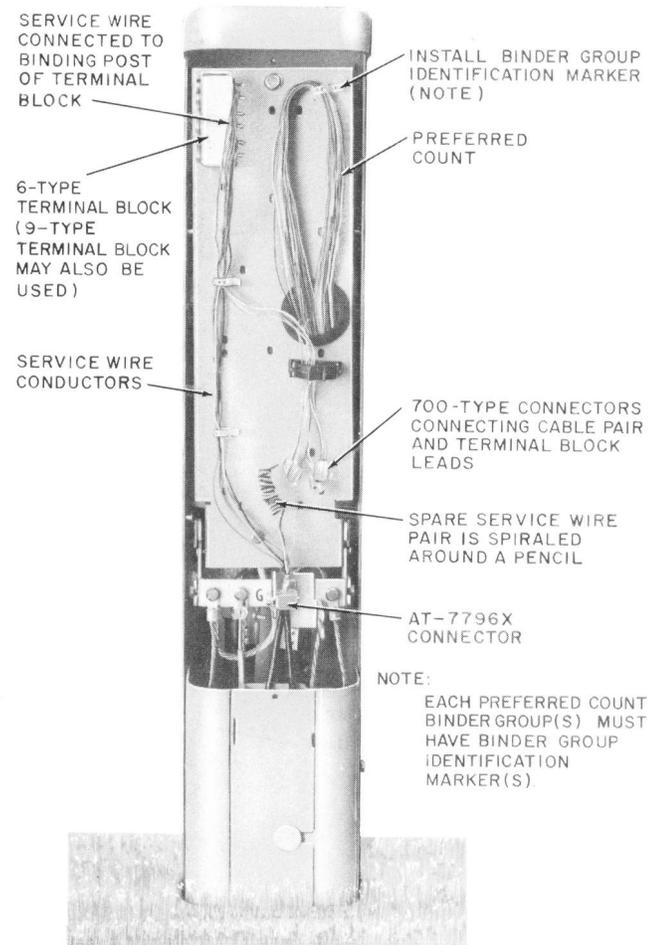


Fig. 18—Service Wires Terminated in PC6/48 Cable Closure—Preferred Count Mode

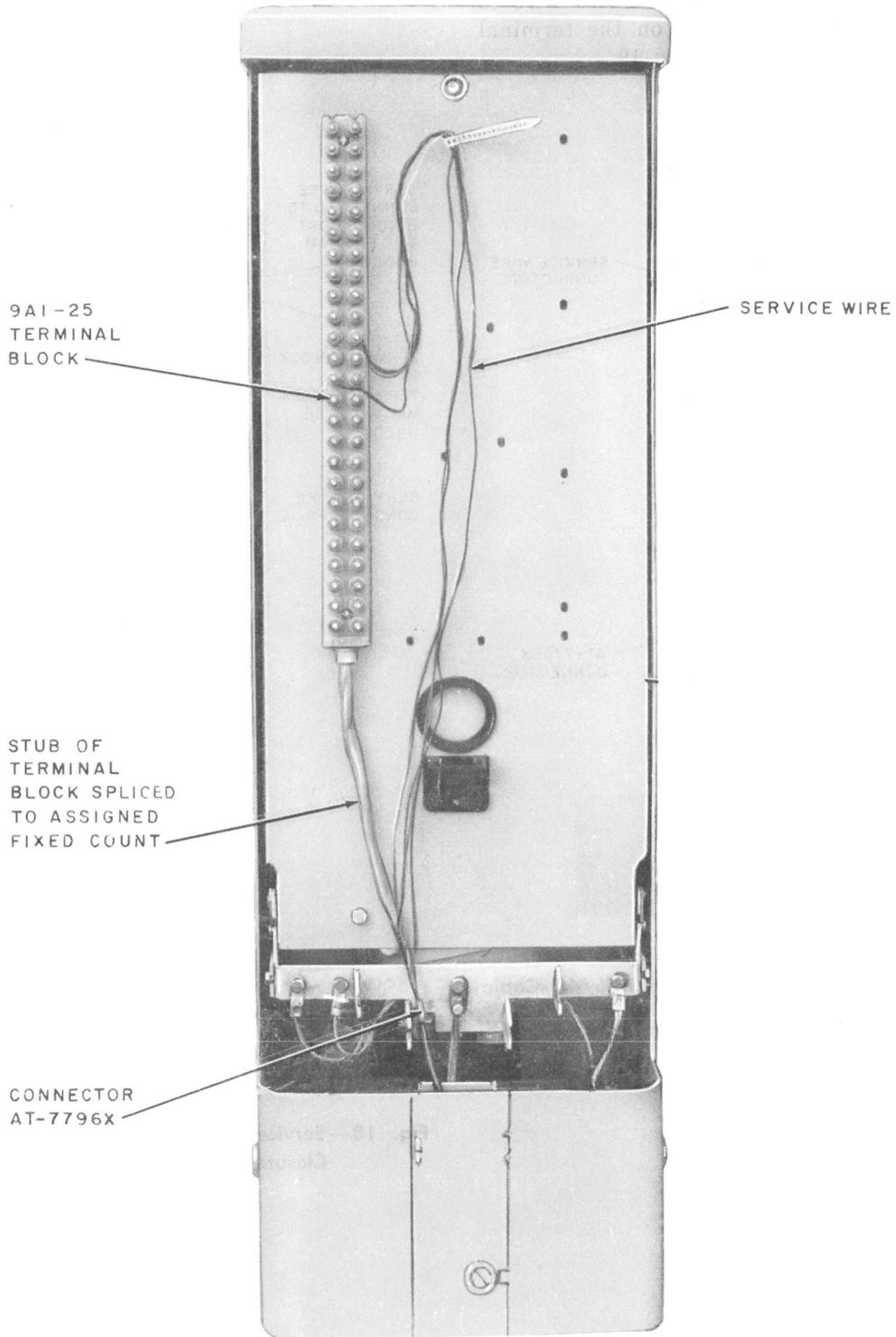


Fig. 19—Service Wire Terminated in PC12/55 Cable Closure—Fixed Count Model

7. TERMINATING SERVICE WIRE AT SUPERSEDED TYPE CABLE CLOSURES

7.01 The B, C, D, E, G, H, J, K, LD, UP-200, and UP-200S cable closures have been rated Manufacture Discontinued (Mfr Disc.). Where these closures have been damaged and must be replaced, use the PC6/48 or PC12/55 cable closure as outlined in Section 644-200-032.

Note: Use 700-type connectors for all new connections.

B Cable Closure

7.02 Prepare the service wire for B cable closure as illustrated in Fig. 20. A rehabilitation kit is available for use with the B cable closure (see paragraph 8.01).

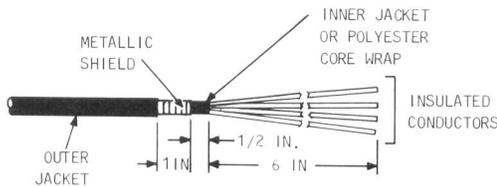


Fig. 20—Prepared Service Wire—B Cable Closure

D Cable Closure

7.03 Prepare service wire for D cable closure as illustrated in Fig. 21. A rehabilitation kit is available for use with the D cable closure (see paragraph 8.01).

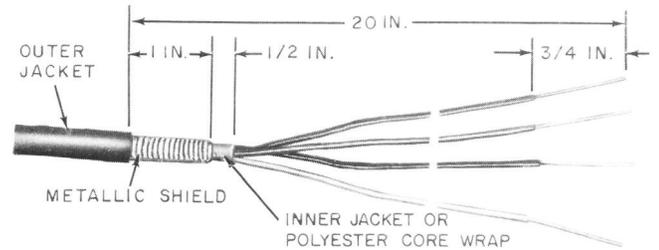


Fig. 21—Prepared Service Wire—D Cable Closure

E Cable Closure

7.04 Prepare service wire for E cable closure as illustrated in Fig. 22. The E retrofit kit is available for use with the E cable closure (see paragraph 8.01).

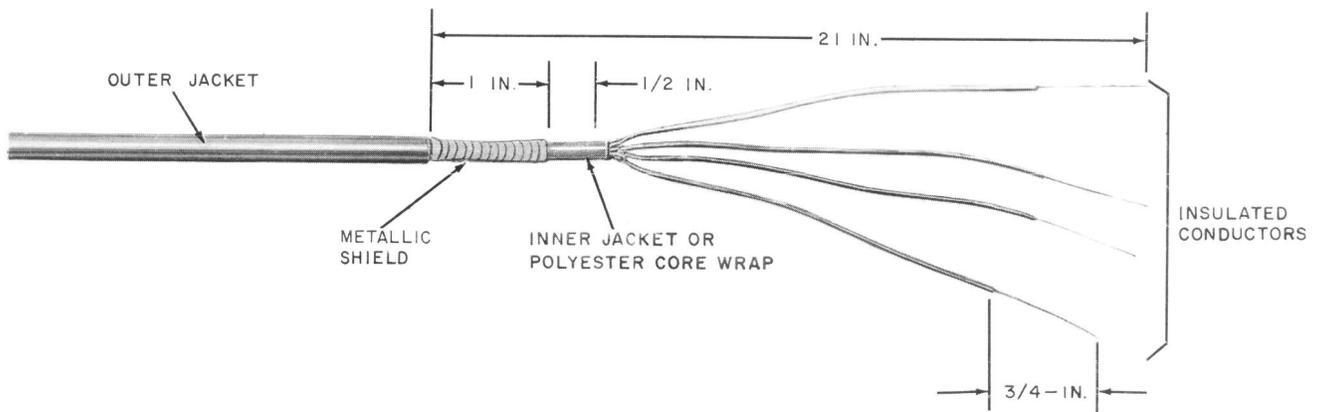


Fig. 22—Prepared Service Wire—E Cable Closure

G and H Cable Closures

7.05 The G and H cable closures are superseded by the LD6/42 and LD10/42, respectively. The termination of service wire in the G and H cable closure is the same as the LD-type cable

closures outlined in paragraph 7.11.

J Cable Closure

7.06 Terminate service wire in the J cable closure as shown in Fig. 23.

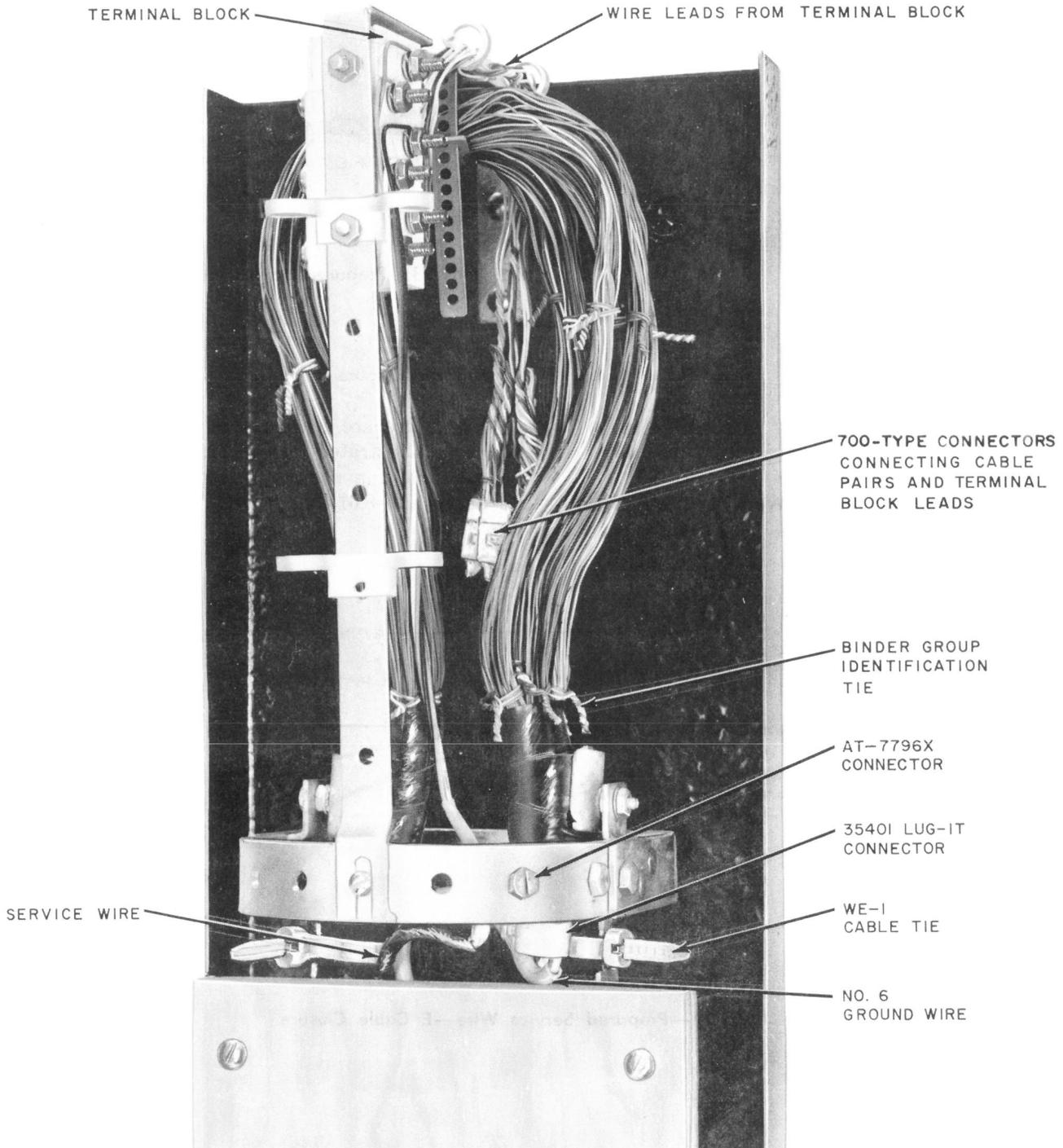


Fig. 23—Service Wire Installed—J Cable Closure (Protected)

K Cable Closure

7.07 Prepare the service wire for termination in the K cable closure as shown in Fig. 24.

7.08 Terminate the service wire as shown in Fig. 25.

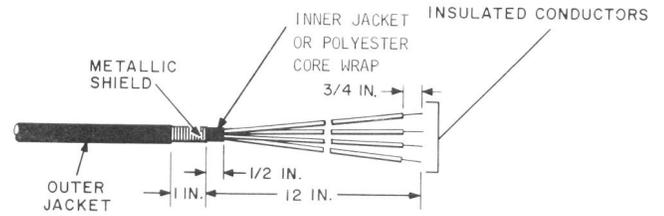


Fig. 24—Prepared Service Wire—K-Type Cable Closure

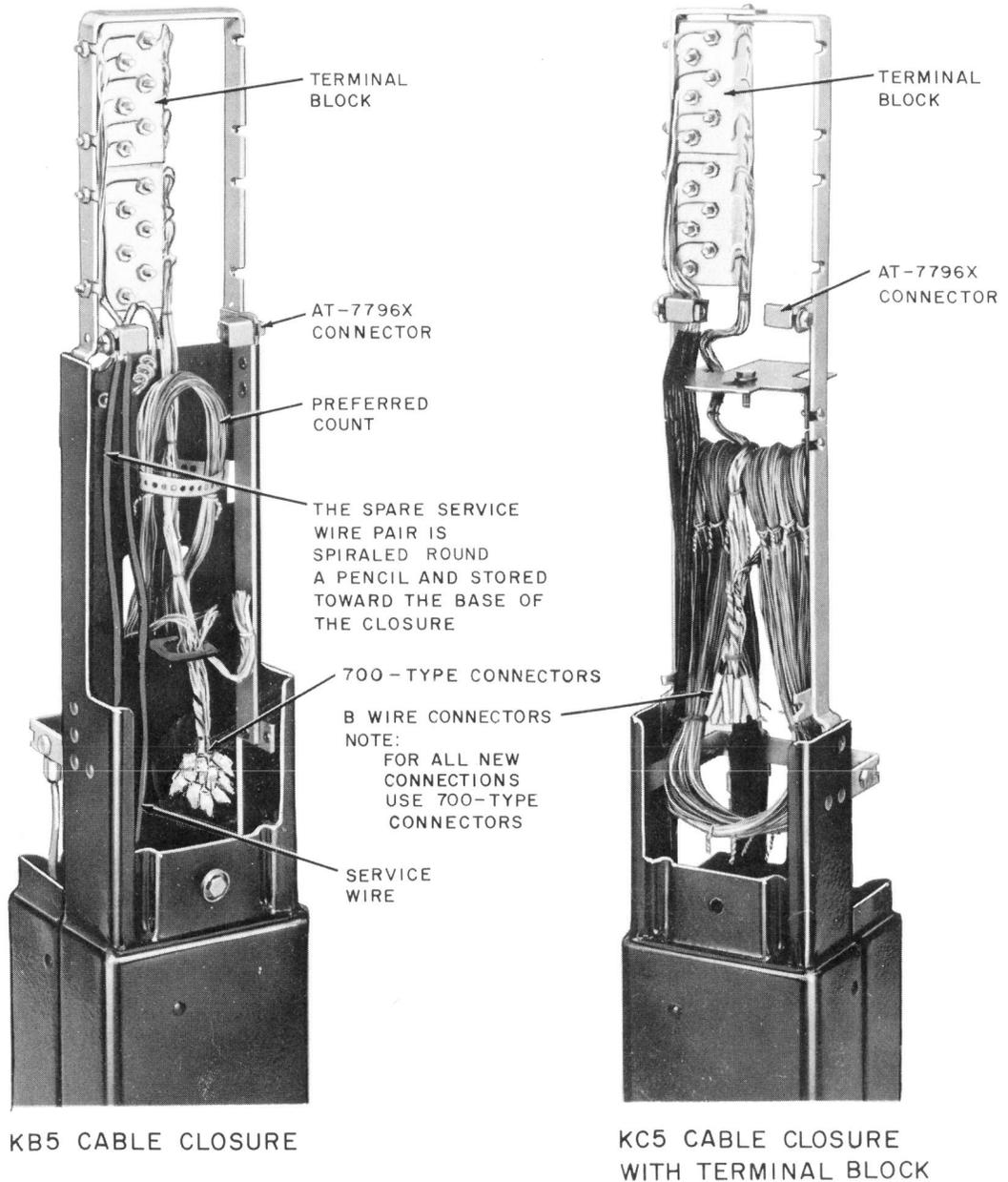


Fig. 25—Service Wire Installed—K-Type Cable Closure (Protected)

SECTION 629-720-200

LD Cable Closures

7.09 The termination of service wire is identical in both the LD6/42 and LD10/42 cable closures.

7.10 Prepare the service wire as shown in Fig. 26 and terminate as illustrated in Fig. 27.

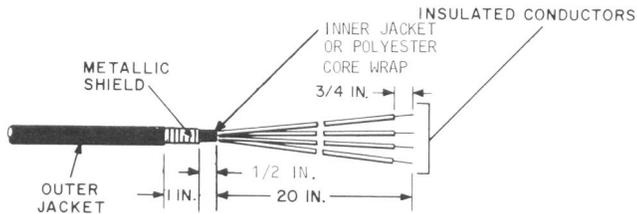


Fig. 26—Prepared Service Wire—LD-Type Cable Closure

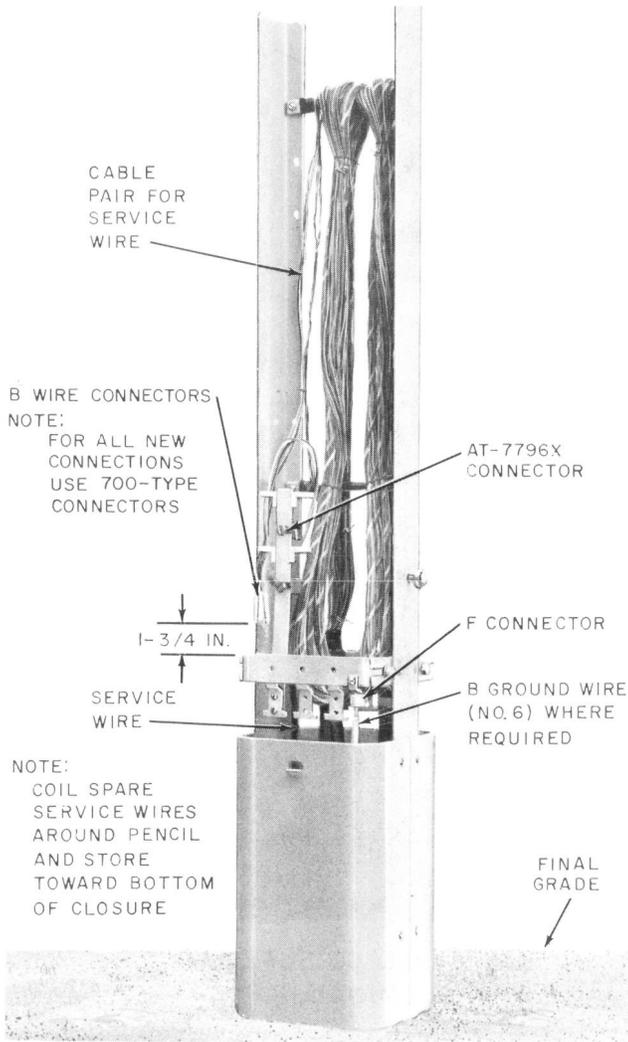


Fig. 27—Service Wire Installed—LD-Type Cable Closure

7.11 The bracket assembly (Fig. 28) used for terminating service wire in the LD-type cable closures must be ordered separately.

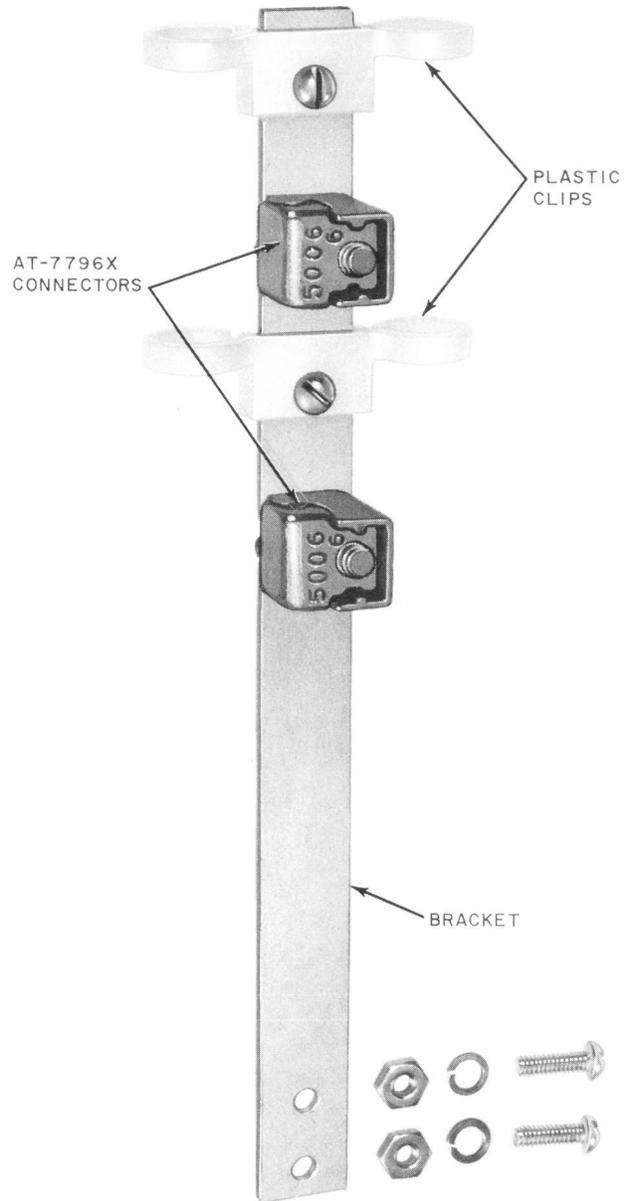


Fig. 28—Bracket Assembly for LD-Type Cable Closure

UP-200 Cable Closures

Note: There are no facilities for installing terminal blocks in the UP-200 cable closure. The UP-200S cable closure is for splicing only.

7.12 Prepare the service wire as shown in Fig. 29.

7.13 Terminate the service wire as shown in Fig. 30.

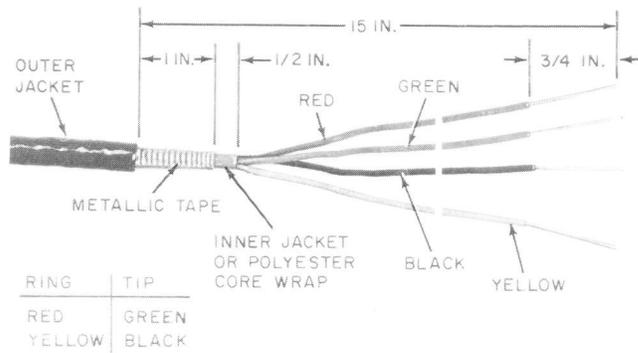


Fig. 29—Prepared Service Wire—UP-200 Cable Closure

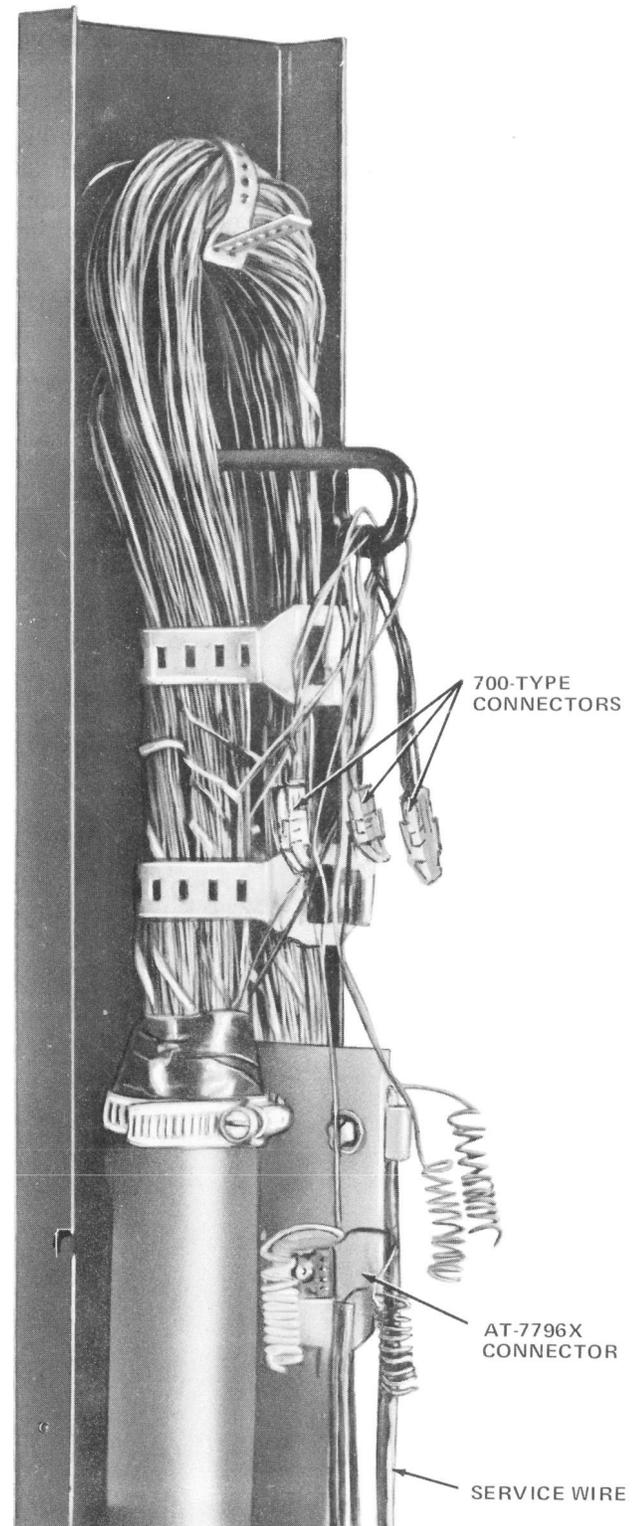


Fig. 30—Service Wire Installed—UP-200 Cable Closure

8. TERMINATING SERVICE WIRE—B AND D CABLE CLOSURE REHABILITATION KITS AND E RETROFIT KIT

8.01 The B and D cable closure rehabilitation kits and the E retrofit kits (Fig. 31 through 33) are available for converting the B, D, and E cable closures, respectively, from ready access to either fixed count or preferred count capability. See Section 644-200-032 for additional information on these kits.

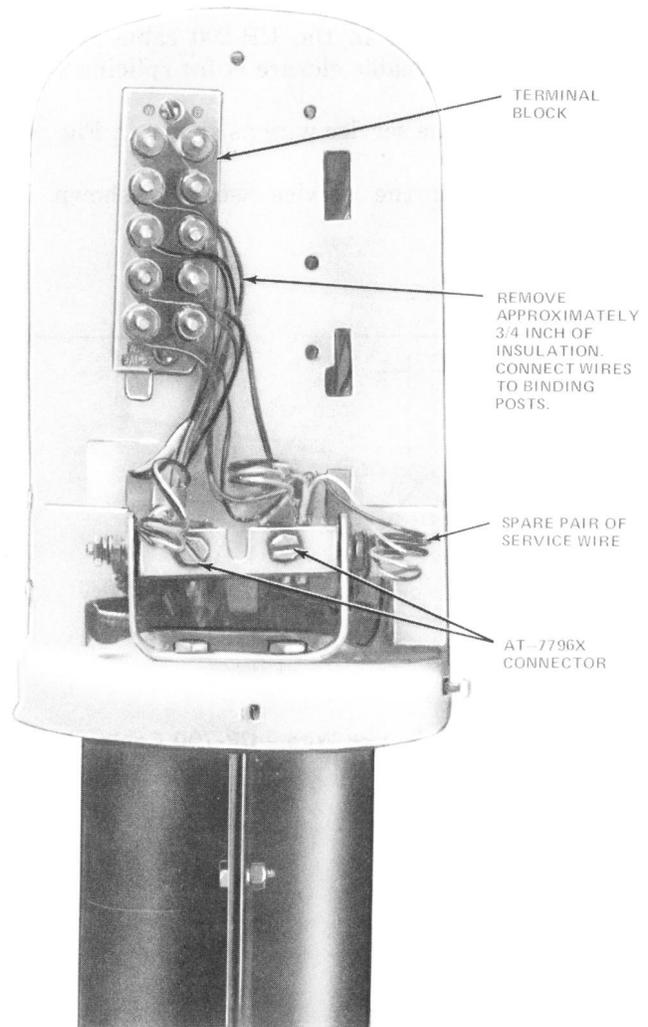


Fig. 31—B Cable Closure Rehabilitation Kit—Unprotected Fixed Count

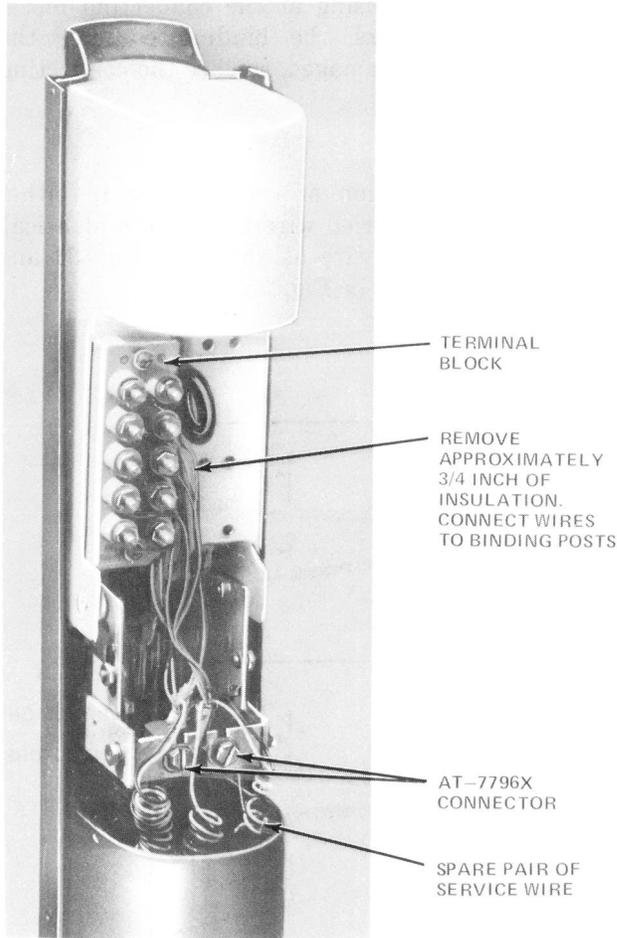


Fig. 32—D Cable Closure Rehabilitation Kit—Unprotected Fixed Count

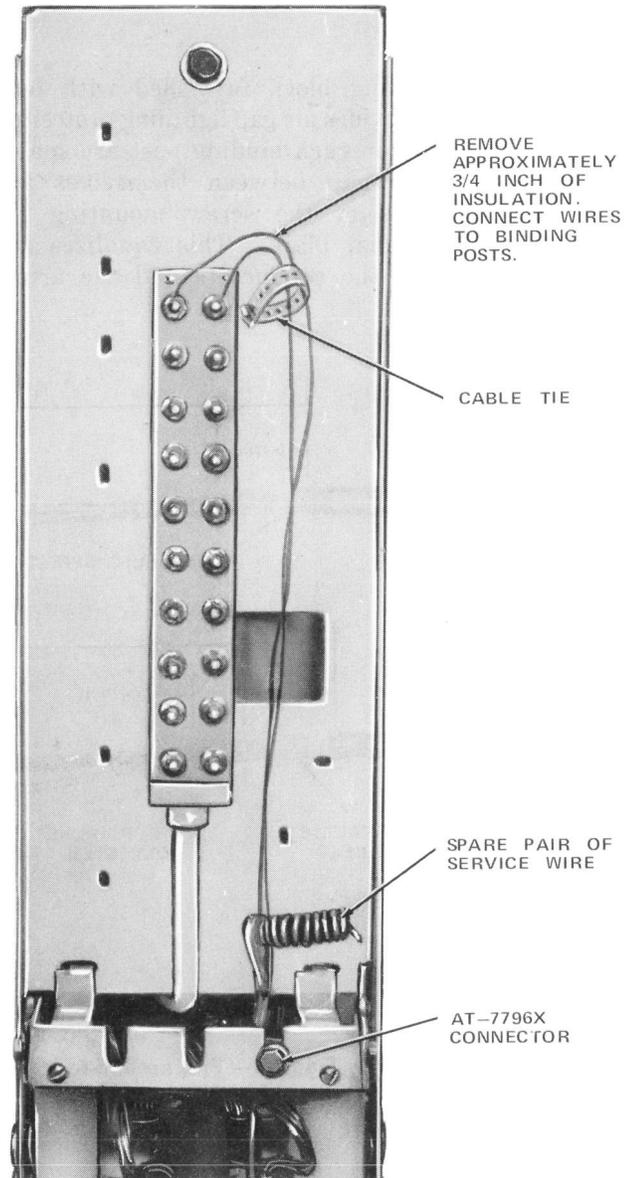


Fig. 33—E Retrofit Kit—Unprotected Fixed Count

9. TERMINATING SERVICE WIRE—D AND E BURIED WIRE TERMINALS

9.01 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.

9.02 The termination of service wire in either the D or E buried wire terminal is identical. Prepare the service wire as shown in Fig. 34 and terminate as shown in Fig. 35.

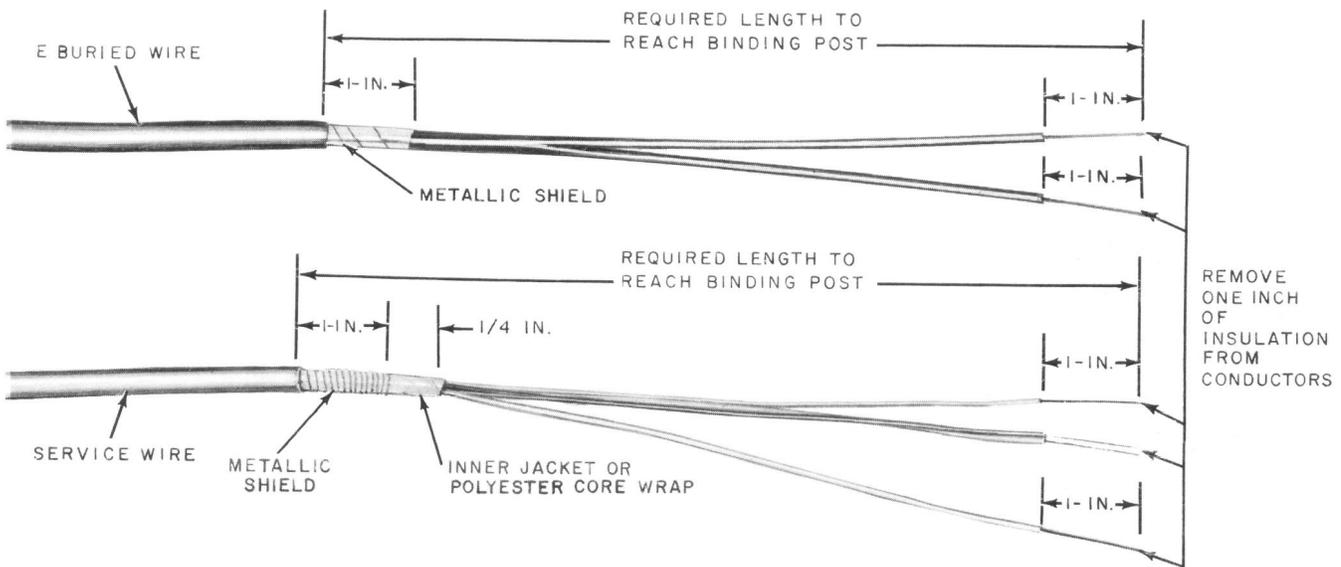


Fig. 34—Prepared Service Wire—D or E Buried Wire Terminal

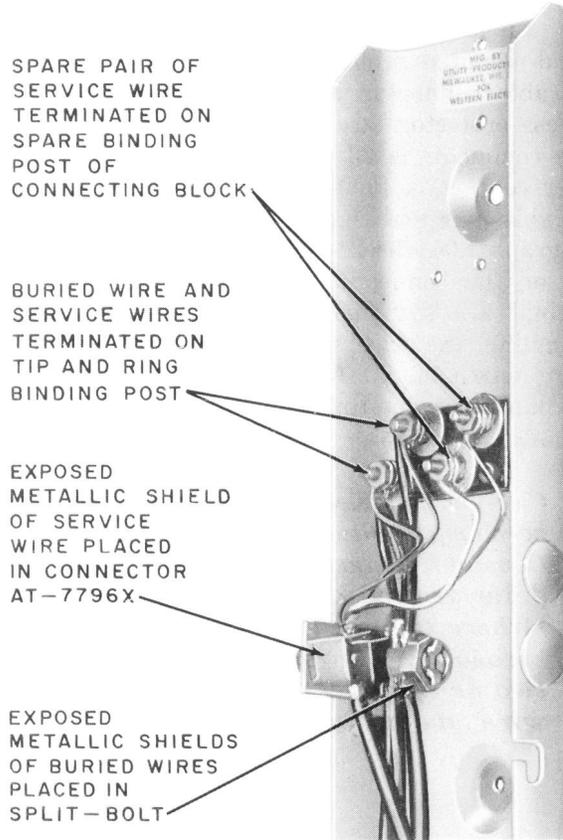


Fig. 35—Service Wire Terminated—D or E Buried Wire Terminal

10. TERMINATING SERVICE WIRE—EXTERIOR MOUNTING OF STATION PROTECTORS AT CUSTOMER LOCATIONS

10.01 Locate station protectors on exterior building walls following the guidelines listed below (see Fig. 36):

- (a) Locate in close proximity to power entrance to facilitate common grounding.
- (b) Locate in an accessible location where it is not likely to be subjected to damage or immersion.
- (c) Avoid locations on fronts of buildings.

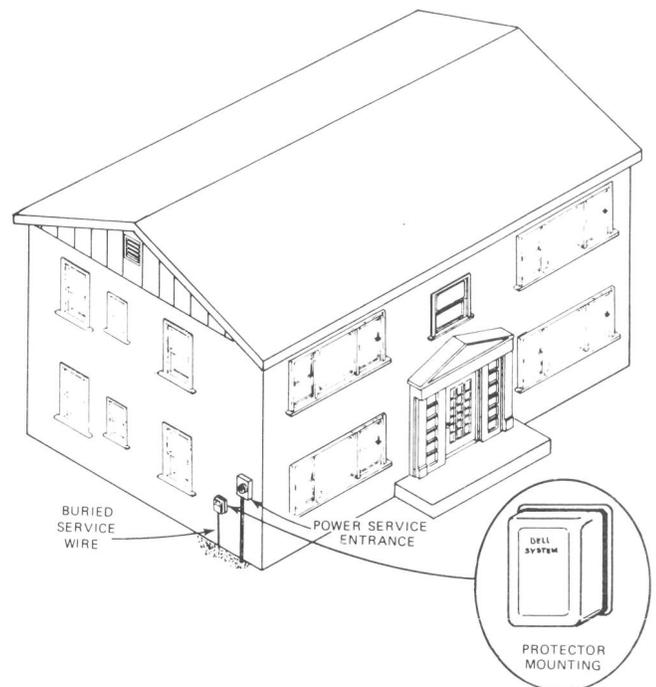


Fig. 36—Recommended Location of Station Protector

10.02 See Section 460-100-400 of the Bell System Practices for information on the selection and installation of station protectors.

11. TERMINATING SERVICE WIRE—JUNCTION WITH AERIAL CABLE

11.01 At the cable terminal or closure where buried service wire feeds from aerial cable and where the length of the buried service wire is:

(a) **700 feet or less, do not bond** the metallic shield of service wire to the strand or terminal housing. This will **protect the subscriber's location from possible fire** caused by excessive power fault should the circuit come in sustained contact with power lines of any voltage.

(b) **More than 700 feet**, use E buried wire and bond the metallic shield to the strand or terminal housing. When the length of buried wire is greater than 700 feet, the resistance of the E buried wire, because of its length, will limit the fault current to safe values. **C service wire and E armored service wire are not to be used for distances of more than 700 feet.**

11.02 No carbon block protection is required between the cable conductors and the buried service wire conductors unless severe lightning exposure exists. (See paragraph 11.08.)

11.03 Buried service wire can be brought up a pole and terminated directly in a pole- or strand-mounted cable terminal or cable closure if the cable conductor is 24 or 26 gauge. Where fuseless protectors are used at the station and the cable conductor is 22 or 19 gauge and exposed to power contact, a fusible link is required between the cable pair and the service wire. As stated in paragraph 1.05, the 24-gauge conductors in a cable stub or the connecting block of a 49-type cable terminal are satisfactory fusible links. At the groundline, the wire should be protected with an 8-foot length of No. 0 U cable guard. A typical installation terminating in a 49-type cable terminal is shown in Fig. 37.

Caution: Buried service wires should not be clamped directly against creosote poles. Constant contact with creosote may cause deterioration of the outer PVC jacket. Where the service wire is attached to a creosote pole with cable clamps, apply two or three wraps of vinyl tape to the wire under the clamps.

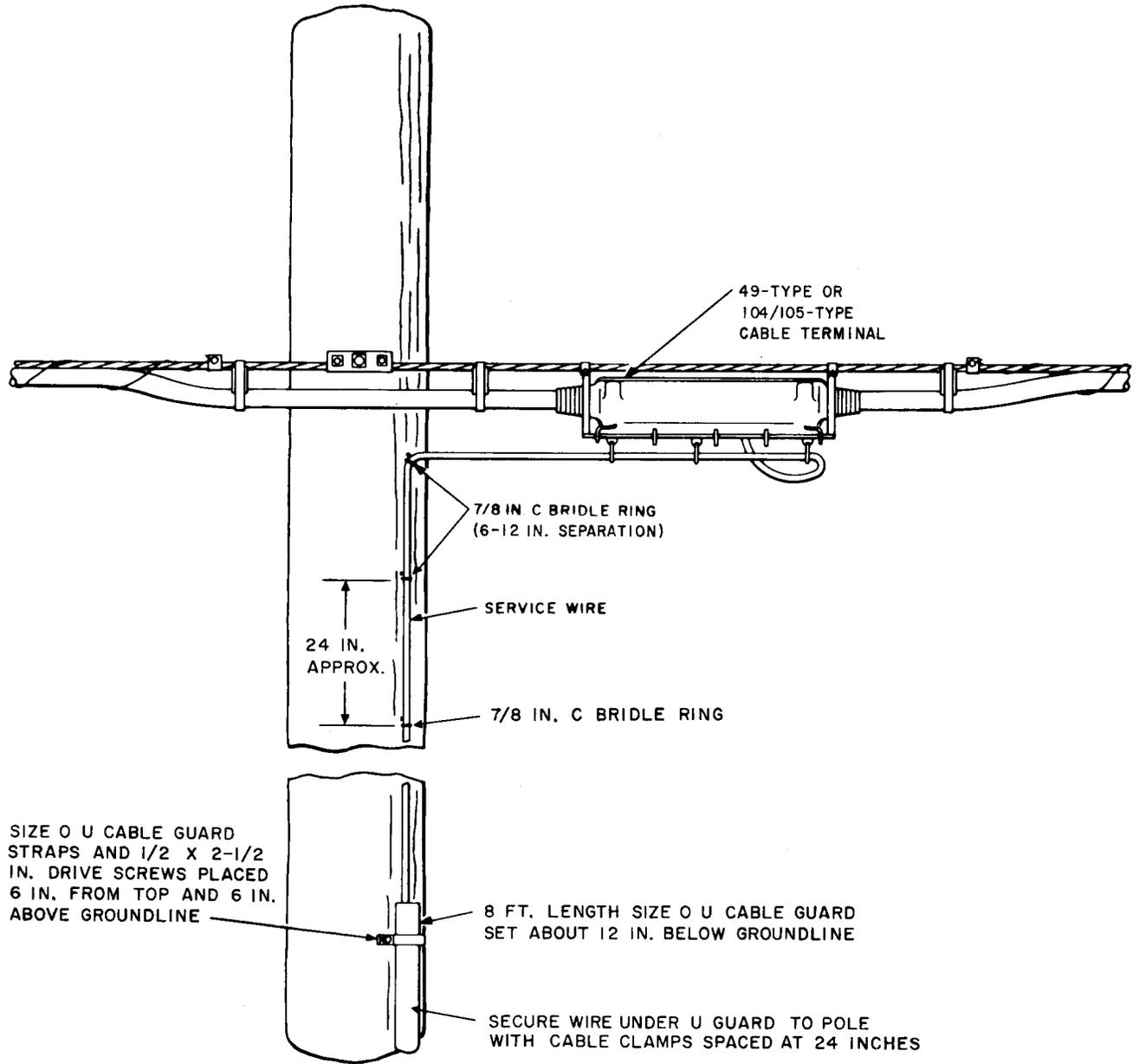


Fig. 37—Buried Plant Run Up a Pole

Inside a Cable Terminal

11.04 Where the buried wire is 700 feet or less in length, grounding of the metallic shield at the cable terminal is omitted. Cut off the metallic shield at the terminal location and wrap with two turns of vinyl tape to protect against sharp edges (Fig. 38).

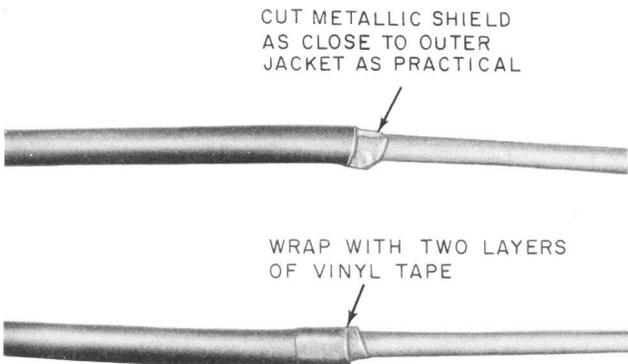


Fig. 38—Removal of Metallic Shield

11.05 Where the buried wire is over 700 feet in length, the metallic shield of the E buried wire must be bonded to the cable terminal. A B bond clip and B appliance wire may be installed on the metallic shield in a solderless connector as shown in Fig. 39.

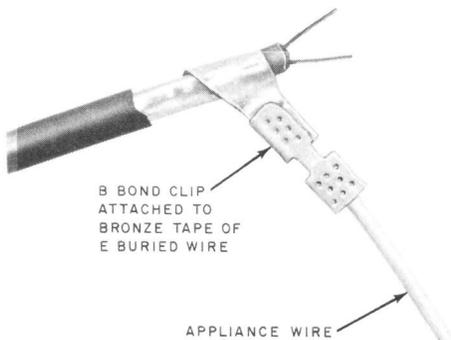


Fig. 39—Bonded Shield of E Buried Wire

11.06 Inside a cable terminal, the conductors of service wires are terminated on the binding post in the usual manner. The stub cable conductors of the terminal provides the fusible link.

11.07 Where the length of buried wire is over 700 feet, bond the metallic shield to the terminal housing with a B bond clip and B appliance wire. In the 104-/105-type and 49-type cable terminals, fasten the appliance wire under a convenient screw in the bond bar assembly. Fasten the appliance wire under a terminal block mounting screw in the N-type cable terminal and under the existing ground screw in a 53-type cable terminal.

Special Lightning Protection

11.08 In lightning areas where the subscriber's station is exposed to lightning, it may be desirable to furnish additional lightning protection to buried service wires which are 700 feet or less in length. Under these conditions, detailed plans or other special instructions will authorize bonding the metallic shield at the aerial cable terminal. Such installations require the use of a 123- or 128-type protector (equipped with 2B2E protector units) and bonding the metallic shield to the ground post of the protector. A bond is also required between the protector ground post and the cable strand. For the latter purpose, block wire is required as a fusible link to prevent the metallic shield from overheating. A typical installation is shown in Fig. 40.

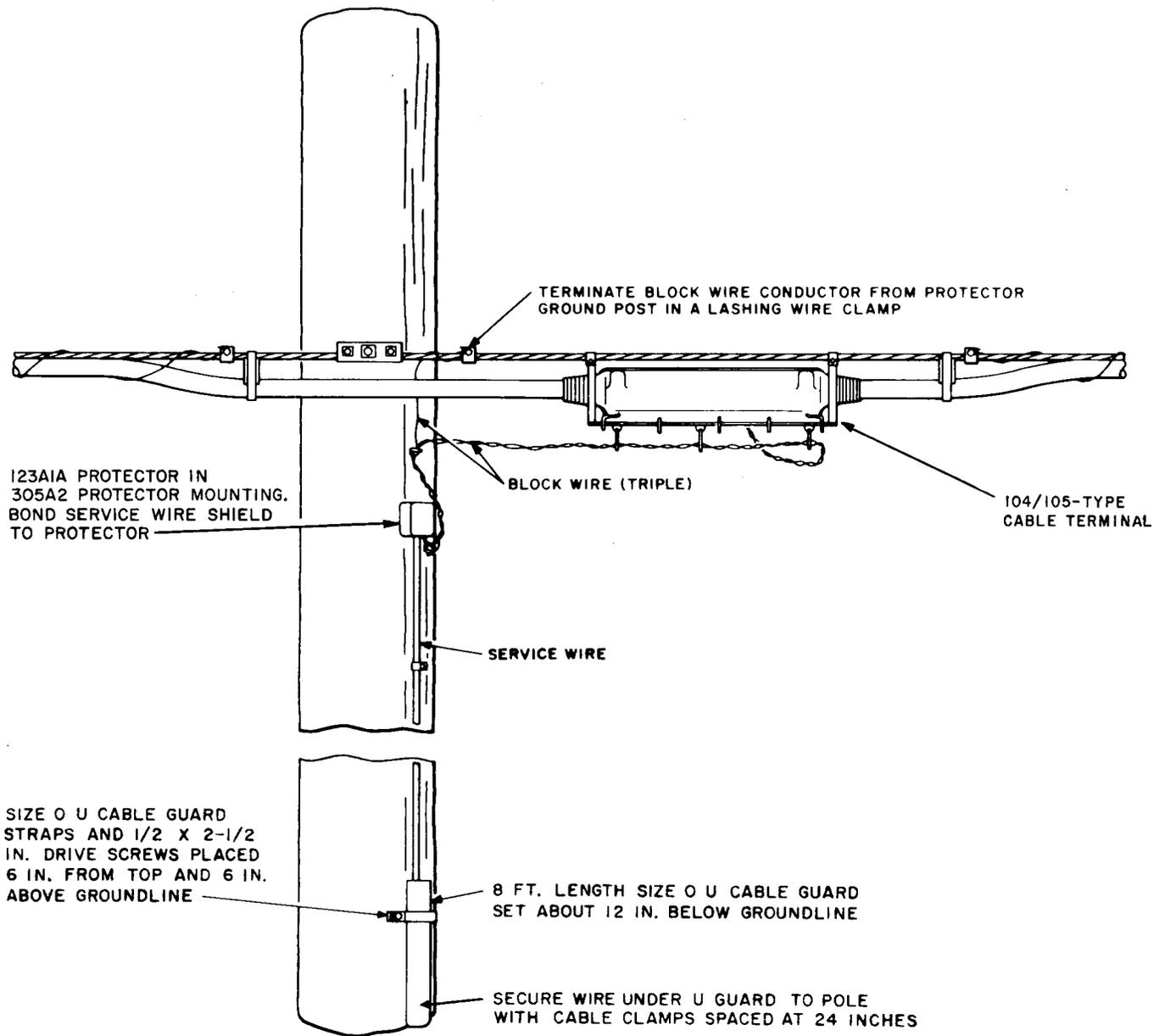


Fig. 40—Termination for Special Lightning Protection

12. TERMINATING SERVICE WIRE—JUNCTION WITH MULTIPLE WIRE

12.01 Where multiple wire is exposed to power contact and a fuseless protector is used at the station, C service wire or E armored service wire **must not** be used with or fed from multiple wire of current manufacture, because of the relatively small size and low fusing level of the conductors of the service wires. A satisfactory fusible link is not available for use between the multiple wire conductors and the service wire conductors.

Note: Earlier manufactured multiple wire with 24-gauge conductors may be satisfactorily used with C service wire or E armored service wire.

12.02 E buried wire can be used with or fed from multiple wire where the multiple wire is exposed to power contact and fuseless station protection is used. E buried wire should be brought up a pole and terminated in a 101B2 wire terminal. The metallic shield should be cut back and taped as shown in Fig. 38. Connect the conductors of E buried wire to the conductors of the multiple wire with block wire. At the groundline, the wire should be covered with an 8-foot length of No. 0 U cable guard. Figure 41 shows a typical example of E buried wire being connected to a 105-type wire terminal.

12.03 The block wire serving as a fusible link between the E buried wire conductors and the multiple wire conductors can be terminated in a 105A wire terminal, a 104-type wire terminal, a 116-type protector, a 108-type wire terminal, or in similar wire terminals used with multiple wire.

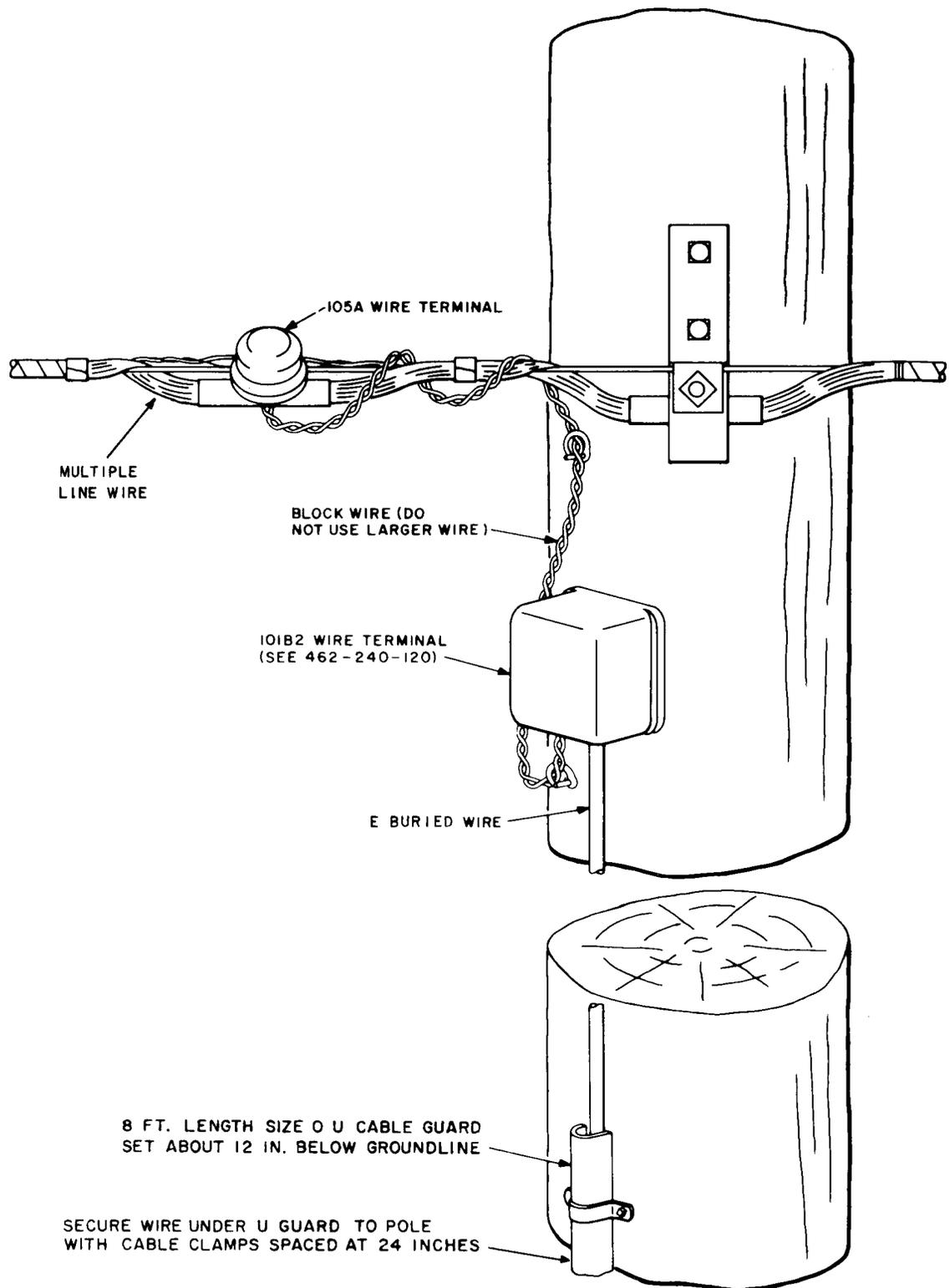


Fig. 41—E Buried Wire Terminated at Multiple Line Wire

SECTION 629-720-200

**13. TERMINATING SERVICE WIRE—JUNCTION WITH
C RURAL WIRE**

13.01 Where fuseless protectors are used, do not connect C service wire or E armored service wire to C rural wire because of the small size of the conductors of the service wire and no satisfactory fuse link is available.

13.02 At the junction with C rural wire, E buried wire can be brought up a pole and terminated in a 101B2 wire terminal. The metallic shield should be cut off and taped as shown in Fig. 38. Block wire should be used to bridle between the 101B2 wire terminal and the 107-type wire terminal on the C rural wire. At the groundline, the E buried wire should be covered with an 8-foot length of No. 0 U cable guard. A typical installation is shown in Fig. 42.

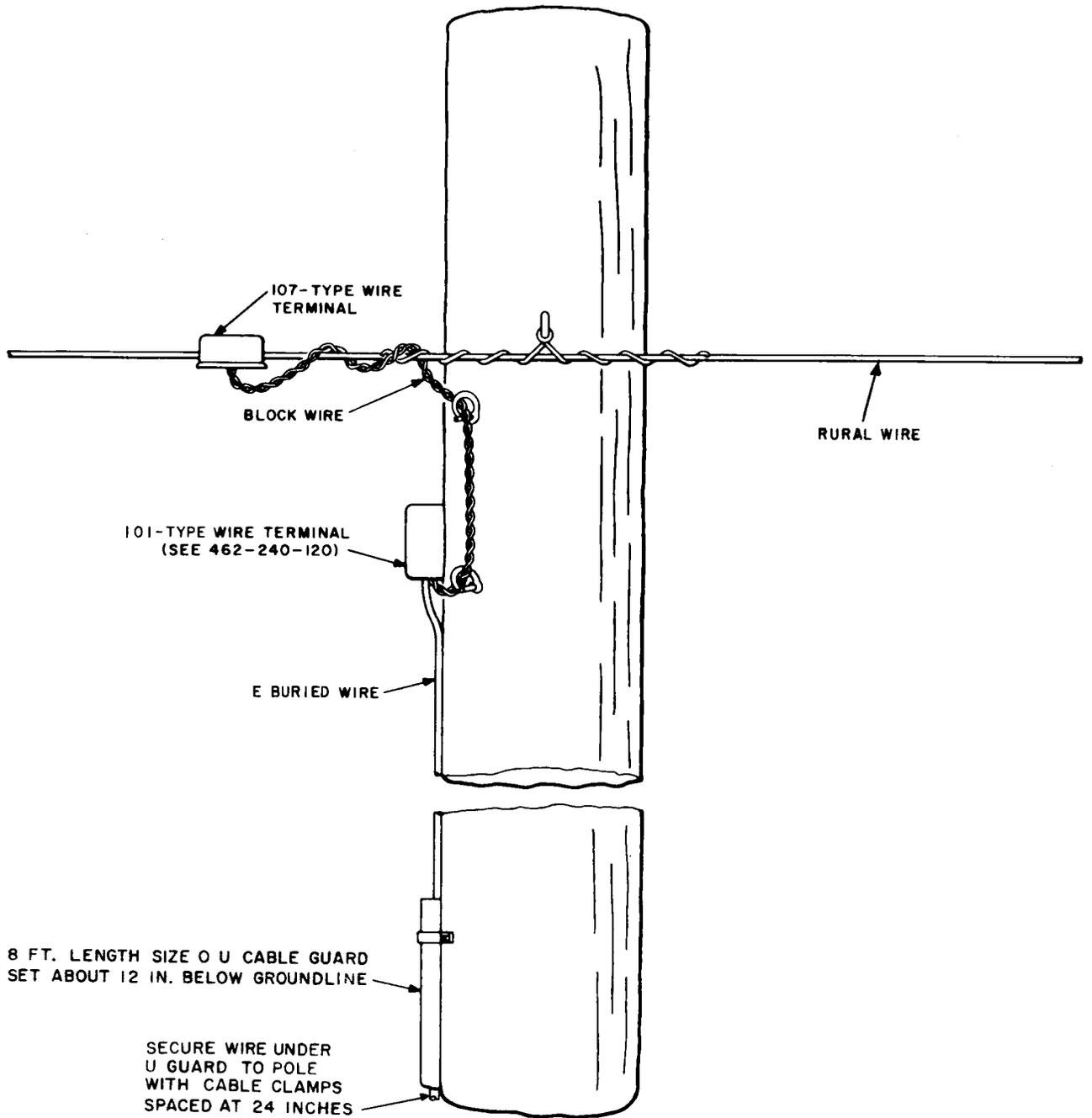


Fig. 42—Termination of E Buried Wire and Rural Wire

SECTION 629-720-200

14. TERMINATING SERVICE WIRE—JUNCTION WITH OPEN WIRE

14.01 Where fuseless protectors are used, C service wire and E armored service wire should not be used with or fed from open wire due to the relatively small size and low fusing level of the conductors of the service wire and no satisfactory fuse link is available.

14.02 At the junction with open wire, E buried wire can be brought up a pole and terminated in a 101B2 wire terminal. The metallic shield should be cut off and taped as shown in Fig. 38. Block wire must be used between the protector and the open wire. At the groundline, the wire should be covered with an 8-foot length of No. 0 U cable guard. A typical installation is shown in Fig. 43.

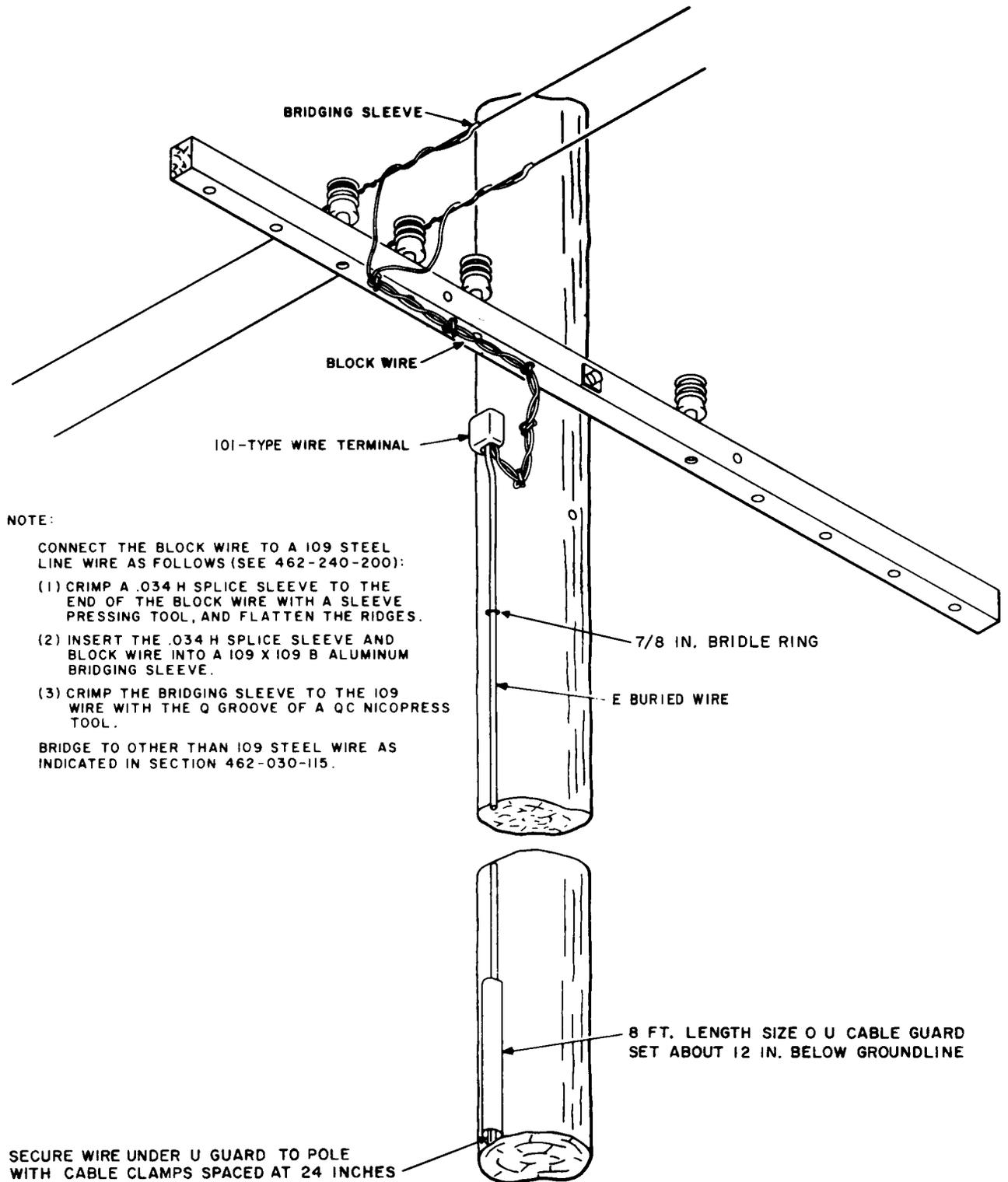


Fig. 43—Termination of Buried Wire and Open Wire