

B VOLTAGE TESTER

USE

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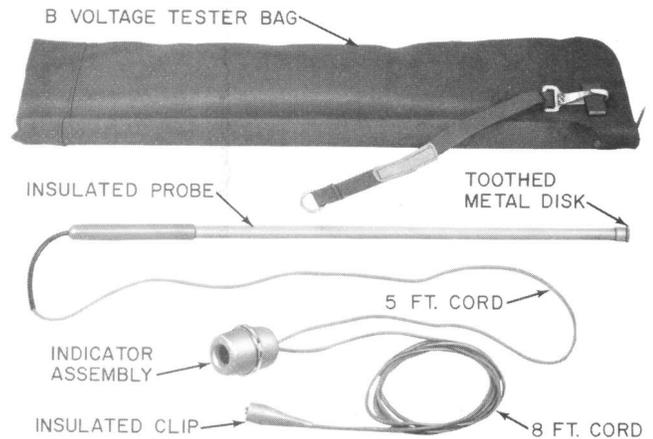


Fig. 1—B Voltage Tester

1. GENERAL

1.01 This section covers the use of the B voltage tester for testing electrical hazards before working on joint-use plant. These tests are for protection of workmen against electrical shock from vertical power ground wires, metallic power conduit, street light fixtures, or cable closures (pedestals) that may be energized.

1.02 This section is reissued to include procedures for checking cable closures used in joint buried plant. Since this section covers a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 These instructions supplement those given in Sections 620-131-010, 620-132-010, and 620-133-010 which cover precautions involving hazards other than electrical.

1.04 The B voltage tester (Fig. 1) is used in conjunction with a B temporary bond (Fig. 2) and the B shunting capacitor (Fig. 3).

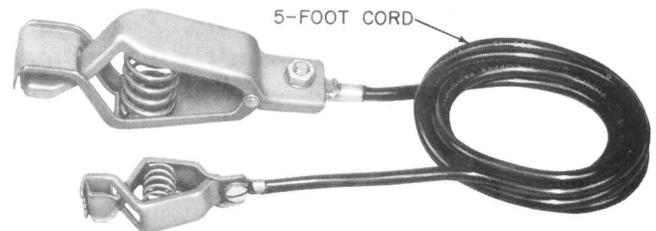


Fig. 2—B Temporary Bond

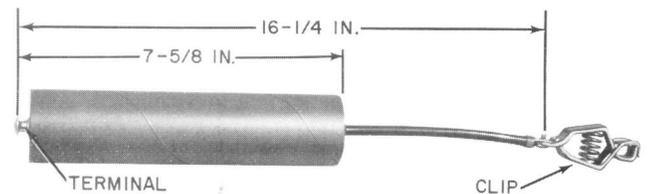


Fig. 3—B Shunting Capacitor

2. PRECAUTIONS

2.01



The B voltage tester is designed to detect the presence of voltages in the 60 to 7600 volt range. When used in the manner described in this section, it can prevent serious or FATAL electrical shock. Do not take unnecessary risks when potential electrical hazards are present. Use the B voltage tester whenever required.

2.02



The B voltage tester should be touched to the facility being tested only long enough to determine whether or not the indicator glows. Higher voltages can damage the tester if left connected too long.

2.03



To be an effective and reliable safety tool, the B voltage tester must be in good working condition. Ensure this by carefully following the instructions for the testing, handling, and storage of the B voltage tester covered in Section 081-705-101.

2.04 Do not use the B voltage tester to test power wires other than vertical ground wires.

2.05 Insulating gloves are used to protect against electrical shock in potentially hazardous situations. See Section 081-710-200 for information on these gloves.

2.06 **Remember:**

NO JOB IS SO IMPORTANT AND NO SERVICE IS SO URGENT THAT WE CANNOT TAKE TIME TO PERFORM OUR WORK SAFELY.

3. OBSERVATIONS TO BE MADE BEFORE CLIMBING

3.01 Examine the pole for potential electrical hazards (Fig. 4) such as a vertical power ground wire, vertical metallic power conduit, a

street light fixture, or other foreign metal objects. Also observe the pole and adjacent spans for hazards such as improper clearances from power conductors or equipment, dangling power wires, etc. If none of these is present, the pole may be climbed provided that there are no other hazards present.

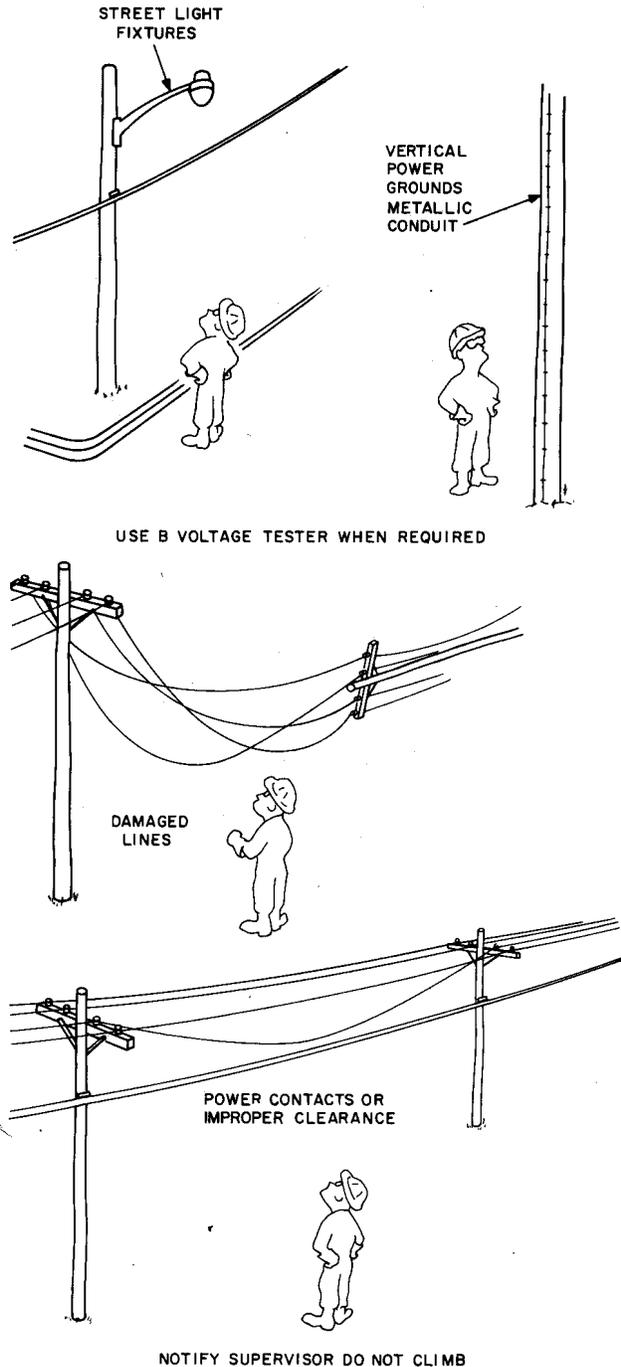


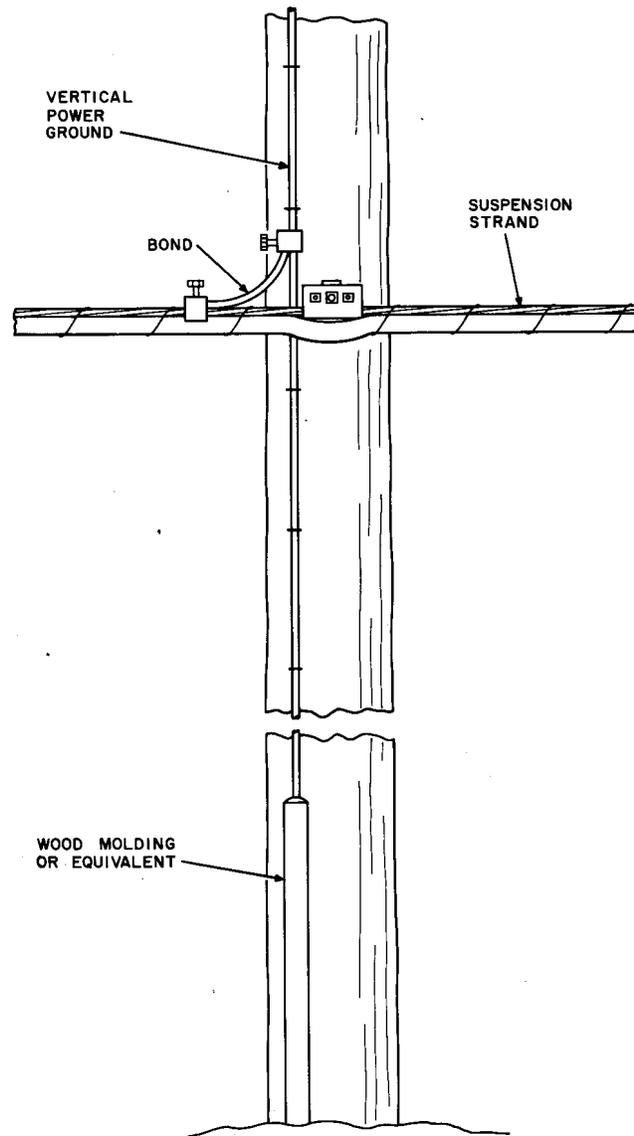
Fig. 4—Visual Inspection for Potential Electrical Hazards

3.02 If a vertical power ground wire is present, make a voltage test in accordance with Part 4 before climbing or working on the pole, unless it meets any one of the following conditions (Fig. 5):

(a) The ground wire is bonded to a telephone cable strand

(b) The ground wire is covered with wood molding, or equivalent, up through telephone space

(c) The ground wire is of the insulated type and the insulation is in good condition.



NOTES:

1. NO B VOLTAGE TESTER TEST REQUIRED IF:
 - A. VERTICAL GROUND IS BONDED TO SUSPENSION STRAND
 - B. COVERED BY UNDAMAGED INSULATION
 - C. WOOD MOLDING EXTENDS THROUGH TELEPHONE COMPANY SPACE.
2. IN ALL OTHER CASES B VOLTAGE TESTER MUST BE USED.

Fig. 5—Vertical Power Ground—Conditions Not Requiring Use of B Voltage Tester

3.03 If vertical metallic power conduit is present, make a voltage test in accordance with Part 4 before climbing or working on the pole unless it can be clearly seen that the conduit is bonded to the telephone cable strand.

3.04 Where a street light fixture is present, make a voltage test in accordance with Part 5 if the pole also carries multiple line wire, telephone cable, or a bare vertical power ground wire (Fig. 6), except as covered in 3.06.

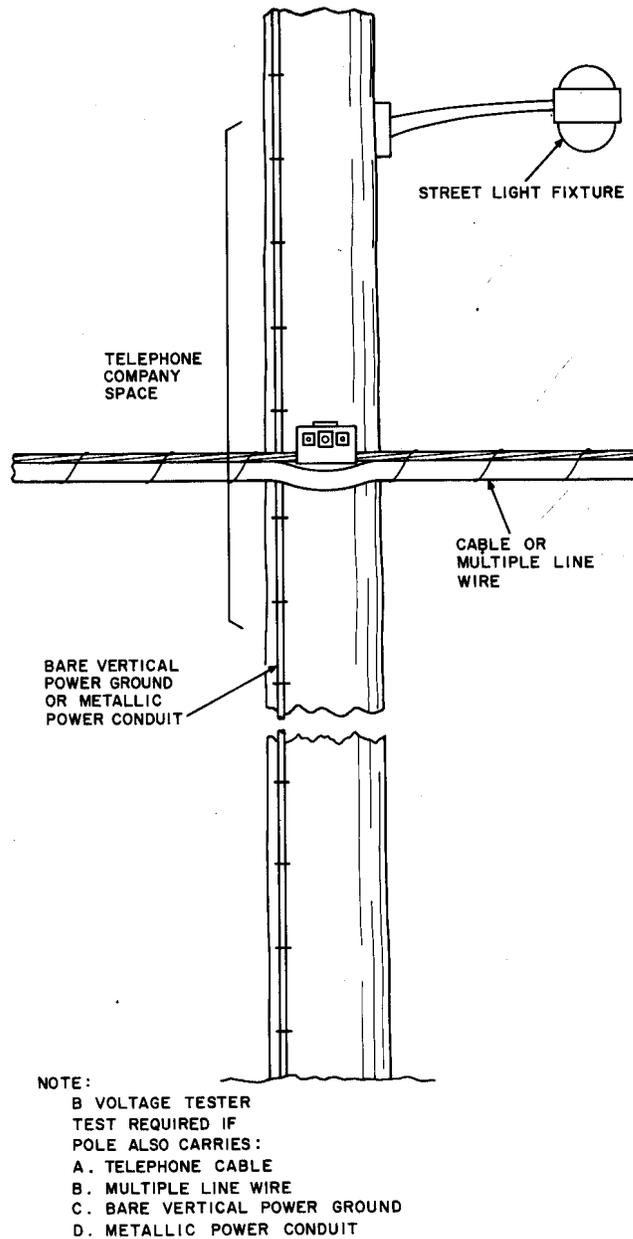


Fig. 6—Street Light Fixture—Conditions Requiring Use of B Voltage Tester

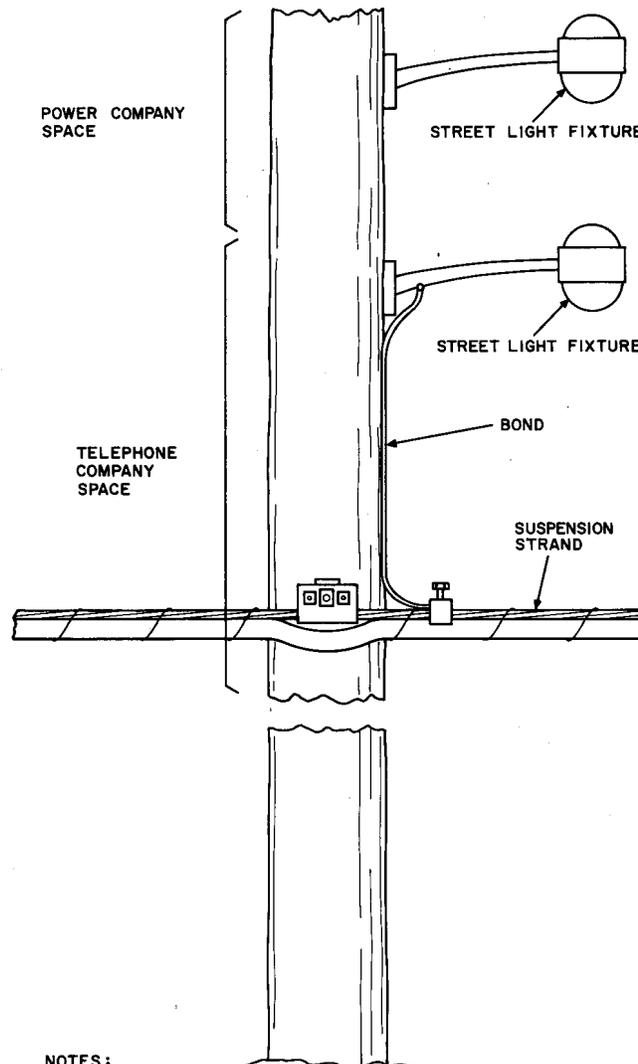
3.05 If a street light fixture is present in the telephone space on a pole not carrying a telephone cable or a bare vertical power ground wire, **wear insulating gloves and avoid contact with it or its wiring**, even though a voltage test has been made, since it is not possible to place a temporary bond to an effective ground.

3.06 Poles carrying street light fixtures may be worked on without making a voltage test under any of the following conditions (Fig. 7):

(a) The fixture is located in power space.

(b) The fixture is located **above** telephone attachments and it can be clearly seen that it is bonded to the telephone cable strand.

(c) The fixture is located **below** telephone cable and it can be clearly seen that it is bonded to the telephone cable strand. However, in this case **insulating gloves must be worn** in climbing the pole unless the wiring through and below telephone space is either 40 inches out from the pole surface or is otherwise made inaccessible.



NOTES:

1. NO B VOLTAGE TESTER TEST REQUIRED IF:
 - A. FIXTURE IS IN POWER COMPANY SPACE
 - B. FIXTURE IS BONDED TO SUSPENSION STRAND
2. IF FIXTURE IS BELOW TELEPHONE CABLE AND BONDED TO STRAND, INSULATING GLOVES MUST BE WORN.

Fig. 7—Street Light Fixture—Conditions Not Requiring Use of B Voltage Tester

4. VOLTAGE TEST—VERTICAL POWER GROUND WIRES OR METALLIC POWER CONDUIT

4.01 When a voltage test is required in accordance with 3.02 or 3.03, proceed as follows before climbing or working on the pole:

(a) Attach the insulated clip of the B voltage tester (Fig. 8) to one of the following:

- (1) A 5-inch screwdriver blade pushed into the earth about 5 feet from the pole.
- (2) A guy rod or telephone anchor guy. (Do not attach to an anchor rod that carries an uninsulated guy.)
- (3) A substantial metal object such as a piece of lead sleeving, a metal crossarm brace, or a 1/2-pound bar of D seam solder, etc, laid on the ground or pavement about 5 feet from the pole.

(b) Standing about 3 feet from the pole, grasp the insulated probe in one hand and the indicator assembly in the other. Push the toothed metal disk at the end of the probe firmly against the ground wire or metal conduit being tested, and promptly look into the open end of the indicator assembly.

(c) ***If the indicator glows, the ground wire or metal conduit is energized.*** Immediately remove the probe from contact with the ground wire or metal conduit and notify the supervisor. ***DO NOT CLIMB OR CONTACT THE POLE IF THE INDICATOR GLOWS.***

(d) If the ground wire is broken, test the ***upper*** part as previously described, unless the break occurs above the telephone space. Do ***not*** attempt to test a broken ground wire if the break is observed to be in the power space. Report the broken ground wire to the supervisor.

(e) If the lower 8 feet or so of the ground wire is protected with wood molding, test above the molding.

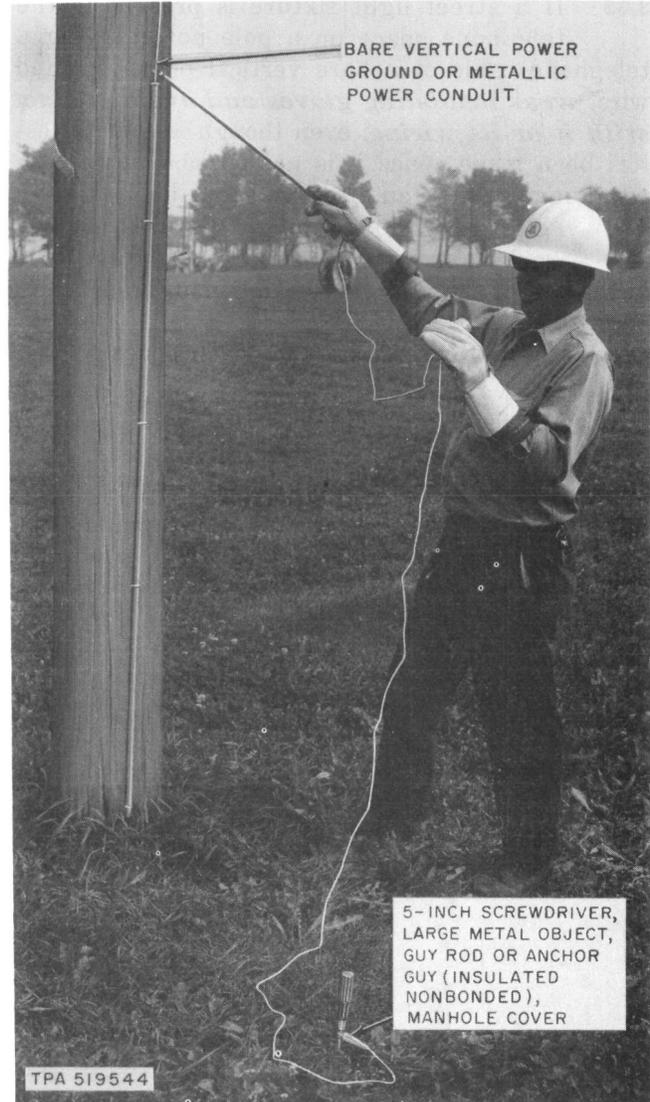
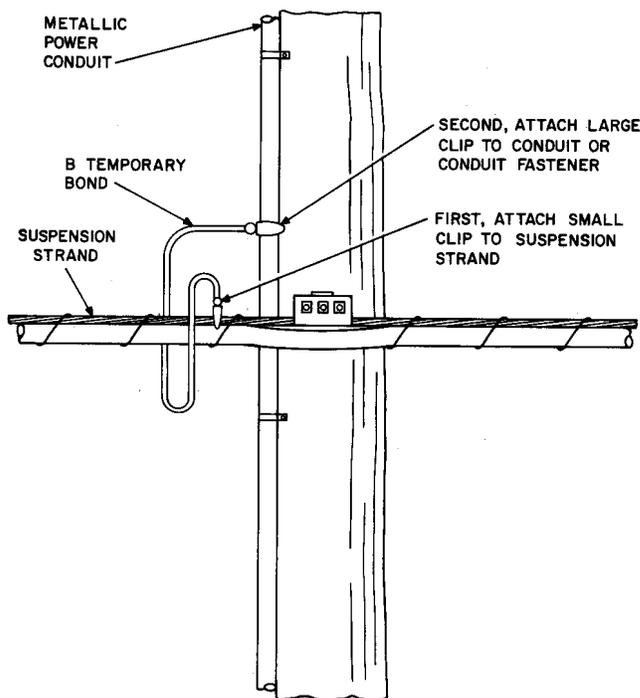


Fig. 8—Testing Vertical Power Ground

4.02 If the voltage tester ***does not glow*** in making the test described in 4.01, poles carrying vertical power ground wires and telephone cable may be climbed. Care should be exercised to avoid simultaneous contact between power ground wires and telephone cable or guys since a small voltage (60 volts or less) may be present. This is recommended to avoid the possibility of surprise shock which might cause a fall from the pole.

4.03 After making the voltage test on a pole carrying vertical metallic power conduit and telephone cable, put on insulating gloves and place a B temporary bond (Fig. 9) as follows. **First attach the small clip to the suspension strand.** Then attach the large clip to the conduit (or a conduit fastening if the conduit is too large). **Leave the bond in place until all work operations at this pole have been completed for the day.** If the bond starts to smoke **do not attempt to remove it.** Put on insulating gloves and descend the pole. Avoid contact with the bond or the conduit and notify the supervisor.

Note: A low impedance ground can be obtained from the jacketed strand of self-supporting cable by attaching a C or D connector as covered in Section 627-700-014.



NOTE:
WEAR INSULATING GLOVES

Fig. 9—B Temporary Bond Attachment to Metallic Power Conduit

4.04 On completion of work operations on the pole, remove the bond as follows:

- (a) Put on insulating gloves.
- (b) Remove the clip from the conduit **first**.
- (c) Remove the other clip from the strand.
- (d) If a spark is observed in removing the bond, notify the supervisor.

4.05 If a shock is experienced as a result of simultaneous contact between the ground wire or conduit and grounded objects such as telephone cable, strand, guy, etc, descend the pole at once and report the matter to the supervisor immediately.

5. VOLTAGE TEST AND SAFEGUARDS—POLES WITH STREET LIGHT FIXTURES

5.01 The B shunting capacitor (Fig. 3) is required under certain conditions in testing street light fixtures. Workmen will usually know those areas where it will be required and they will be properly equipped.

5.02 When a voltage test is required, proceed to test and safeguard the street light fixture as follows.

- (a) Attach B voltage tester bag to the body belt.
- (b) Put on insulating gloves and climb to a convenient height to make the test. **Avoid contacting the light fixture or its wiring.**

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(c) Attach the insulated clip of the voltage tester to the cable suspension strand, support bracket of multiple line wire, or a bare vertical power ground wire. Push the toothed metal disk of the voltage tester probe firmly against the street light fixture while looking into the open end of the indicator assembly (Fig. 10).

(d) If the indicator glows, immediately remove the probe from contact with the fixture and remove the insulated clip from its attachment. If a B shunting capacitor is not available, descend the pole and notify the supervisor. ***Avoid contact with fixture or its wiring.***

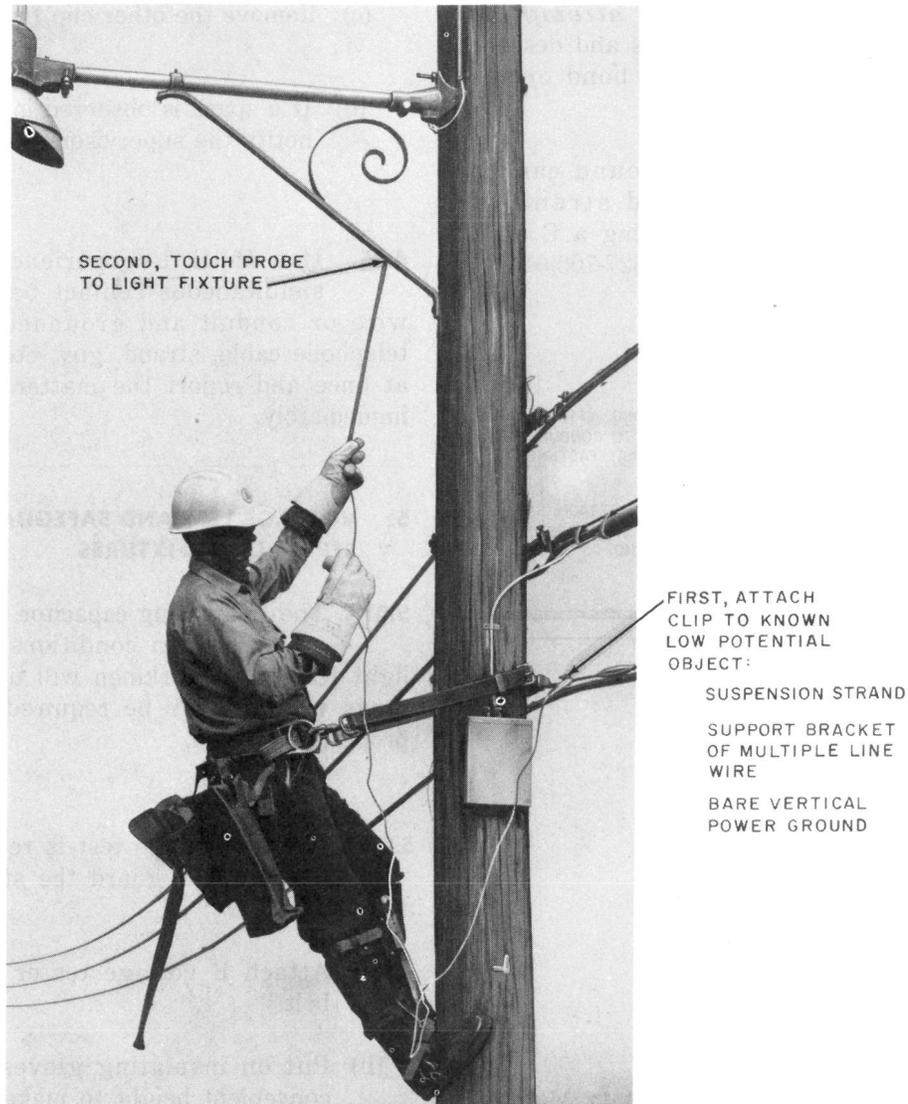


Fig. 10—Testing Streetlight Fixture

5.03 If a B shunting capacitor is available, make a second test as follows:

- (a) Attach the clip of the voltage tester and the clip of the shunting capacitor to the cable suspension strand or to the bare power vertical ground wire.
- (b) Attach the small clip of the temporary bond to the metal terminal of the capacitor, and the other clip to the metal cap behind the toothed metal disk of the insulated probe of the voltage tester. If this metal cap or ferrule has been tape reinforced, attach the clip of the temporary bond to the toothed metal disk of the voltage tester probe.
- (c) **Make attachments so that at least 1 foot of separation is maintained between the leads of the voltage tester and the temporary bond or shunting capacitor.**
- (d) Touch the toothed metal disk to the street light fixture and promptly look into the open end of the indicator assembly. **Avoid bodily contact with temporary bond or capacitor during test.**
- (e) If the indicator glows, the fixture is energized. Immediately remove the probe from contact with the fixture, replace testing equipment in the carrying case, descend the pole, and notify the supervisor. **Avoid contact with the fixture or its wiring.**

5.04 If the indicator does not glow, contact the fixture with the probe again to be sure that good contact has been made. If the indicator still does not glow, place a temporary bond as follows (Fig. 11):

- (a) Attach the small clip of the B temporary bond to the cable suspension strand or the bare power vertical ground wire so it will not be in the way of work operations. **Do this first.** Then attach the other clip of the bond wire to the street light fixture. Do not bond to the support bracket of multiple line wire or the suspension strand of isolated cable. **Do not attach to the street light wires or terminals to which they are attached. Never attach the clip to a fixture which causes the indicator to glow.**

- (b) The insulating gloves may be removed only after the temporary bond is in place, and then only if other protection requirements permit. **Leave the B temporary bond in place until all work operations have been completed at this pole for the day.** If the bond starts smoking, put on insulating gloves and descend the pole immediately. Avoid contact with the bond, the fixture, or its wiring. Notify your supervisor.

5.05 On completion of work operations on a pole, remove the B temporary bond as follows:

- (a) Put on insulating gloves.
- (b) Remove the clip from the street light fixture **first.**
- (c) Remove the other clip from its attachment. If a spark is noticed when removing the bond, descend the pole immediately and notify your supervisor.

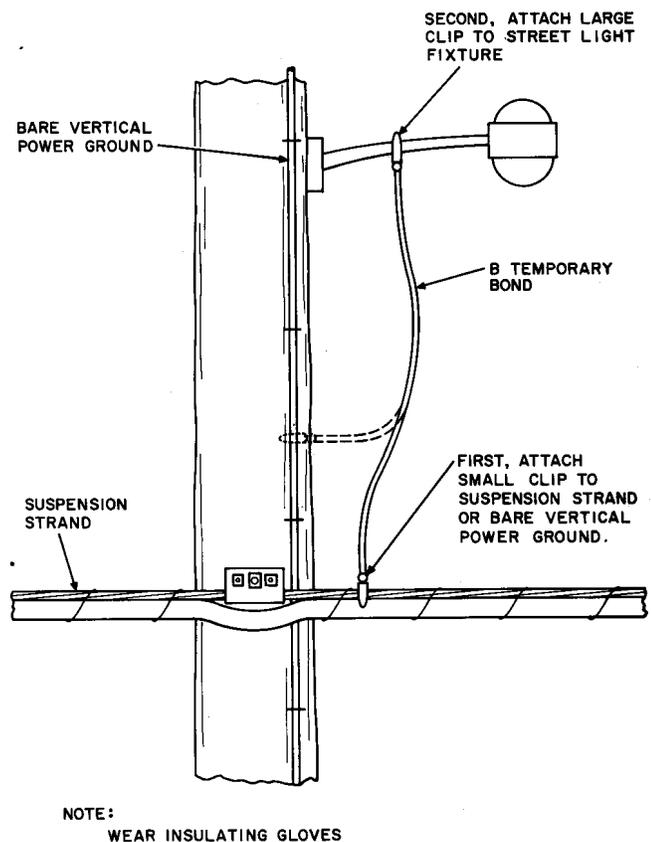


Fig. 11—B Temporary Bond Attachment to Streetlight Fixture

6. VOLTAGE TEST—DAMAGED CABLE CLOSURE USED IN JOINT-BURIED PLANT

6.01 When a telephone or power pedestal closure (this applies to all closures used in joint buried plant whether standing alone or mounted back to back with power) has been damaged or disturbed, eg, knocked over or driven into the earth by a motor vehicle or a trouble condition involving power is suspected, both telephone and power representatives shall be present before performing any type of maintenance work. Any power work shall be performed first.

6.02 After the power company has completed its work, the pedestal shall be tested with the B voltage tester before any bodily contact is made with it. To guard against the possibility of serious injury WEAR INSULATING GLOVES and EYE PROTECTION; then, using B voltage tester, check the cable closure as follows

(a) Attach the insulated clip of the voltage tester to a suitable ground no closer than 5 feet to the closure being tested. A screwdriver with a 5-inch or longer blade driven into the earth can be used as a ground. Standing approximately 3 feet from the closure, grasp the insulated probe in one hand and the indicator assembly in the other hand. Push the toothed metal disk of the probe firmly against the closure while looking into the indicator assembly. ***If the indicator glows the closure is energized.*** Immediately remove the probe from contact with the closure and report the condition at once in

accordance with local instruction. ***No attempt shall be made to correct the condition or proceed with any telephone work.*** It shall be the responsibility of the power company to clear its trouble. ***Telephone employees shall not work on the telephone plant until the power company has completed repairs.***

(b) If the indicator assembly of the voltage tester ***does not glow*** in making the test described in (a), remove the cover from the closure and visually inspect the cable sheath ground. If the cable sheath ground is not intact or is loose, test the cable sheath with the voltage tester as described in (a) before doing any maintenance work.

(c) If for any reason it becomes necessary to open the bond between telephone facilities and power, or across cable sheath openings, a temporary bond strap must be placed ***before*** the bond is opened. If due to physical conditions the temporary bond cannot be placed, consult with the power company representative. It may be necessary to deenergize the power briefly for repair operations. When temporary or permanent bonds are placed or removed, insulating gloves and eye protection must be worn.

Warning: Electrical continuity of all bonds, including cable shield bonds in closures or at splice locations must be preserved during the repair process. Until the permanent bond is installed, maintain continuity using a temporary bond strap.