

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

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PROTECTION
108 TYPE PROTECTORS

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1. GENERAL

1.01 This section provides instructions for installing the 108 type protectors when required on open wire telephone circuits that are exposed to induced power voltages, particularly in joint use. ↴

1.02 This section is revised to include information on the 108B Protector and to revise the component parts of the 108A Protector.

1.03 The 108B Protector may be used on open wire lines operating at both voice and carrier frequencies. The 108A Protector should be used only on open wire lines operating at voice frequency. ↴

1.04 Install 108 type protectors only when directed by detail plans or other instructions.

2. DESCRIPTION

2.01 The 108 type protector is designed to reduce voltages that are induced in open wire telephone circuits as a result of close exposure to power circuits. The voltage induced in a telephone circuit depends principally on the voltage of the power circuit to ground and the distance between the telephone wires and the power wires. The 108 type protectors act to reduce such induced voltages. Each protector provides drainage for one open wire pair.

2.02 The 108 type protector consists of an assembly of inductors, capacitors, and protector blocks mounted in a galvanized steel housing that is about 11-1/4 inches high, 6-7/8 inches wide, and 4 inches deep. Wire entrance holes in the bottom of the housing have temporary putty fillings.

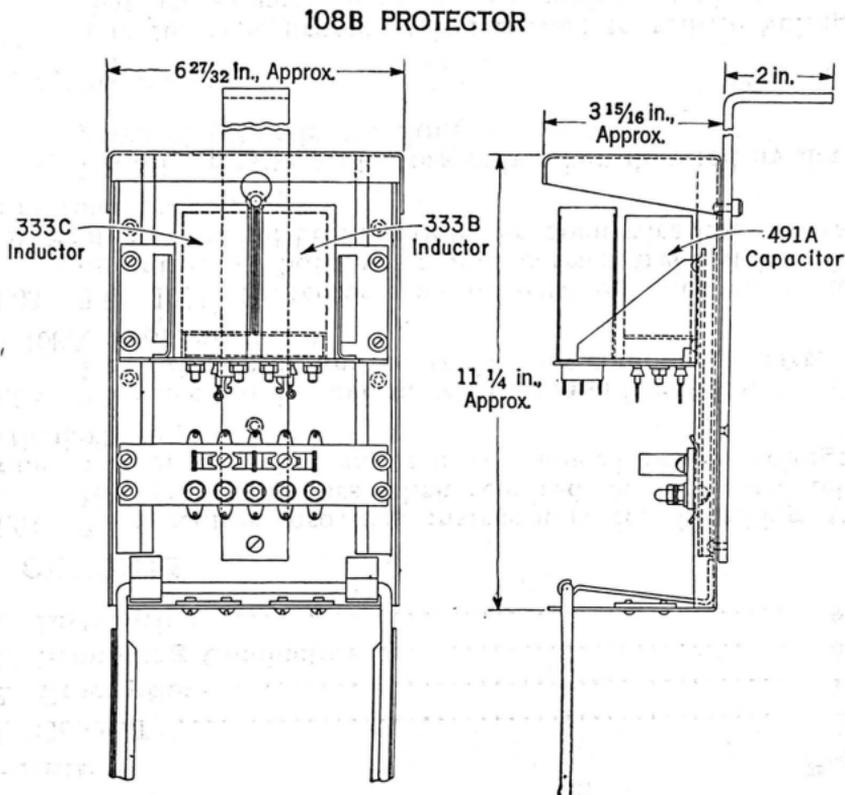
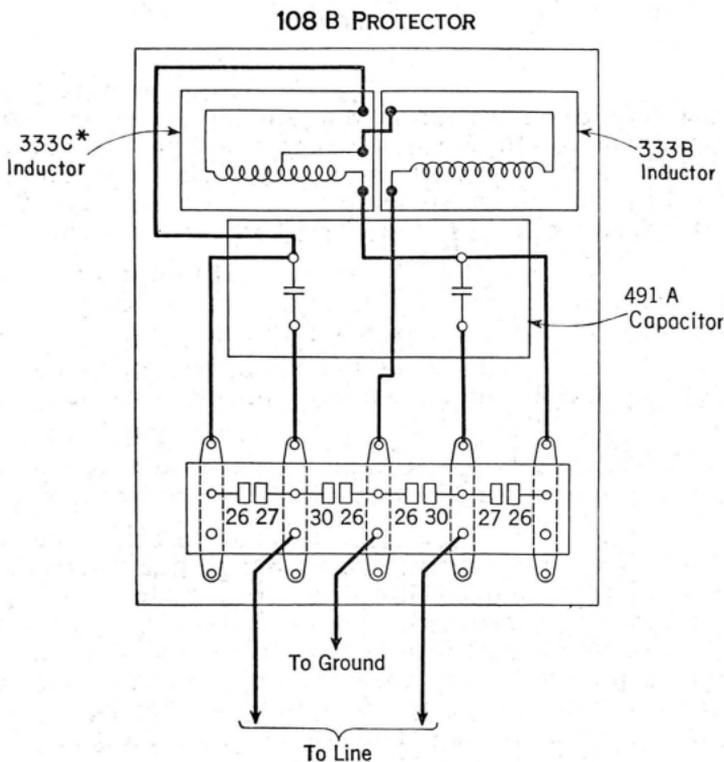


Fig. 1

2.03 The following diagram shows the circuit arrangement of the 108B and the 108A Protectors:



*The 108A Protector has a 333A Inductor
In place of the 333C Inductor

Fig. 2

2.04 The 108A Protector can be converted to a 108B Protector by replacing the 333A Inductor with a 333C Inductor following the wiring diagram above.

3. GROUNDING CONDUCTORS

3.01 If 108 type protectors are installed on telephone circuits that are carried on joint-use poles with a power circuit which includes a multi-grounded neutral wire, the ground

wire from each 108 type protector should, wherever possible, be connected to a power system vertical grounding conductor that is connected to the neutral wire and to a ground. Grounding conductors on transformer poles in multi-grounded neutral systems are satisfactory for grounding 108 type protectors. Grounding conductors from power system lightning arrestors shall not be used unless they are connected to the power neutral wire.

3.02 If 108 type protectors are installed on telephone circuits that are carried on poles that are not equipped with a grounding conductor that meets the requirements of Paragraph 3.01, it will be necessary to install a grounding conductor (104 copper, 104 copper-steel, 109 steel, or larger) and connect it to ground rods placed at the base of the pole, in accordance with detail plans.

4. INSTALLATION

4.01 The housing cover is opened by grasping the sides near the bottom, and pulling the cover out, away from the back of the housing. This releases the cover and permits it to be swung down, thus giving access to the equipment. To close the housing, swing the cover up, and insert the top end of the cover under the hood at the upper end of the housing, then force the lower end of the cover toward the back of the housing until it snaps into place.

4.02 To remove the protector housing from the mounting bracket, proceed as follows:

- (1) Open the cover.
- (2) Remove the round-head machine screw located below the protector block mounting.
- (3) Move the housing up a short distance, thus releasing the knob in the back of the housing from the keyhole slot in the mounting bracket.

4.03 The manner of mounting 108 type protectors and wiring to open wire lines is shown in the following illustrations. The protector leads should be connected to the line wires with bridging sleeves or bridging connectors. Use AL Wire or HD Wire for making connections to line wires and to grounding conductors.

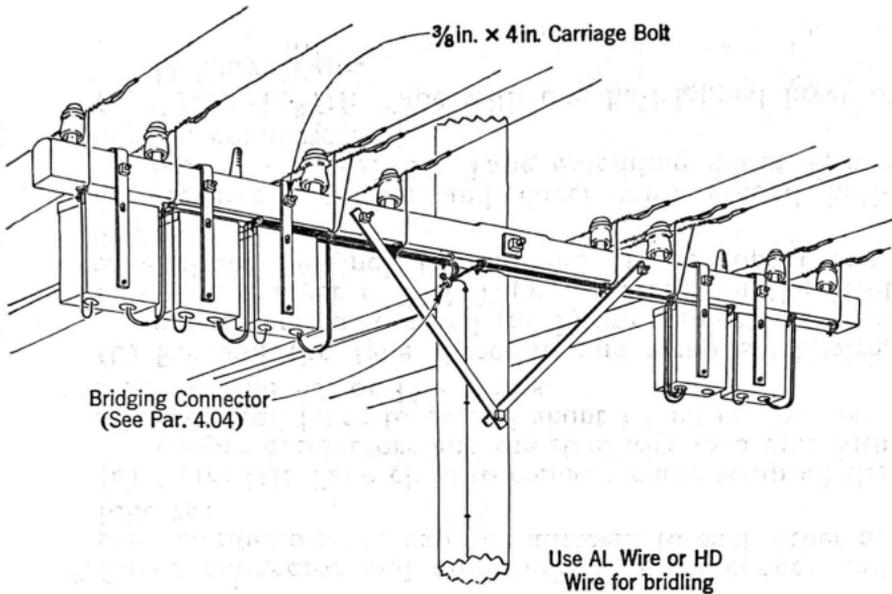


Fig. 3

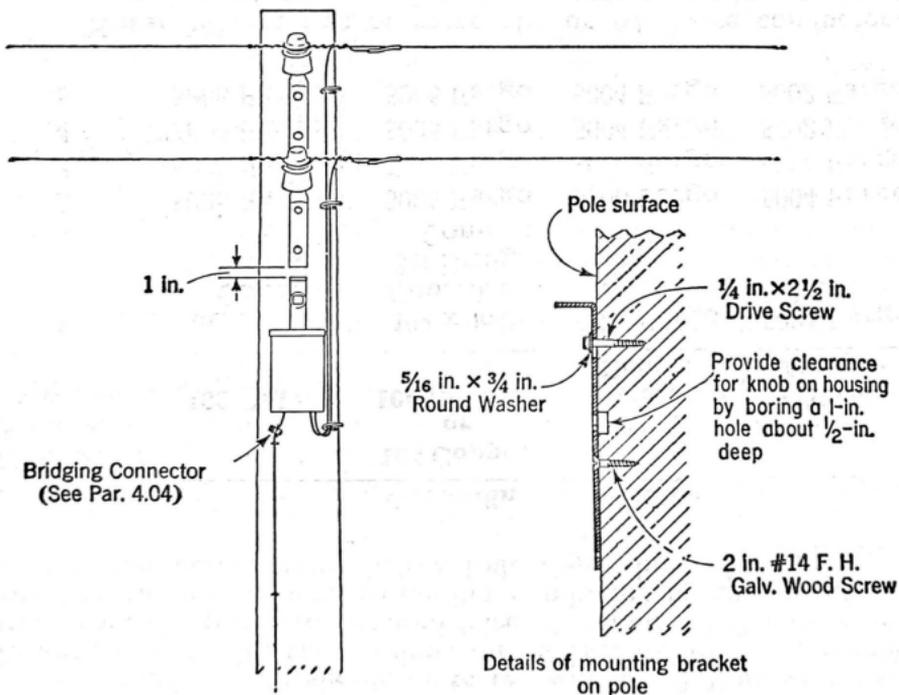


Fig. 4

4.04 Before contacting a power system vertical grounding conductor, it should be **tested with the B Voltage Tester** in accordance with the sections on its use. Remove the insulation from the protector ground wire for about 1-1/2 inches and connect to the vertical grounding conductor by means of the proper connector shown in the following table.

Number of Protector Ground Wires	Grounding Conductor			
	109 Galv. Steel	104 Copper or 104 Copper-Steel	No. 6 Copper	No. 4 Copper
1	6C Bridg. Conn.	104 x 064S Cop. Sl. or 3B Bridg. Conn.	5006 Fargo	5004 Fargo
2	5006 Fargo *	5006 Fargo	5006 Fargo	5004 Fargo
3	5006 Fargo *	5006 Fargo	5006 Fargo	5004 Fargo
4	5006 Fargo *	5006 Fargo	5004 Fargo	5002 Fargo
5	5006 Fargo *	5006 Fargo	5004 Fargo	5002 Fargo

Note: Where two or more HD or AL Wire conductors are to be connected to a grounding conductor, twist conductors together before inserting in the Fargo connector.

* Cover connector and all locations where copper and steel conductors are exposed adjacent to each other as follows:

(a) Start DR Tape close to connector and wrap all the copper conductors and the steel wire as a unit with a half-lapped layer to extend about 1 inch on the insulation of the AL or HD Wires.

(b) Reverse the tape direction and wrap steel wire, copper conductors and the Fargo connector with a half-lapped layer of DR Tape to extend on the steel wire about 3/4 inch beyond end of the copper conductors.

(c) Reverse direction and cover with second half-lapped layer of DR Tape extending about 1 inch beyond connector.

(d) Cover the DR Tape with one half-lapped layer of D Vinyl Tape.