# 3-, 4-, AND 5-TYPE PROTECTOR UNITS

# DESCRIPTION

# CONVENTIONAL MAIN DISTRIBUTING FRAMES AND PROTECTOR FRAMES

CONTENTS PAGE



## 1. GENERAL

**1.01** This section describes the 3-, 4-, and 5-type plug-in protector units. These protector units are used in the 302-, 303-, 305-, and 308-type connectors. Only the 3- and 4-type are used in 310-type connectors. The 4C-type protector units, used in the 307-type connectors, are described in Section 201-222-112.

**1.02** This section is reissued for the reasons listed below. Since this reissue is a general revision, no revision arrows have been used to denote significant changes.

(a) Add "Conventional Main Distributing Frames and Protector Frames" to the title

(b) Add references to the 310-type connectors throughout the text

(c) Revise Table A

(d) Add Tables B and C

(e) Include information on additional types of protector units.

**1.03** The 3-, 4-, and 5-type plug-in protector units, reversing plugs, and minibridge lifters are not included with the various connectors and must be ordered separately.

**1.04** All standard plug-in protector units, reversing plugs, and minibridge lifters are equipped with four gold-plated tip and ring pins and a solder-plated ground pin.

**1.05** Manufacture discontinued (MD) plug-in protector units, reversing plugs, and minibridge lifters are equipped with five solder-plated contact pins and are directly replaceable with the protector units with gold-plated pins.

**1.06** Plug-in protector units with gold-plated pins will eventually become intermixed into connector panels that have solder-plated socket terminals. This will occur as the existing stocks are depleted and/or as in-service solder-plated plug-in protector units are replaced by gold-plated equivalents. ***Care should be exercised to avoid installation of protector units having solder-plated contact pins into connectors containing gold-plated socket terminals.***

**1.07** When the protector units are properly inserted into a terminal group on the connector

panel, they provide the following contacts for one pair:

(a) Tip and ring to outside plant conductors (long pins)

(b) Tip and ring to central office equipment (short pins)

(c) Ground which also serves to properly orient the protector unit into the connector panel (center pin).

## 2. DESCRIPTION

**2.01** The 3B-type protector units (Fig. 1 and Table A) contain protector blocks (or gas tubes) and are used on circuits requiring voltage protection (carbon blocks or gas tubes) but not sneak current protection (heat coils). The 3B-type protector unit is a direct replacement for the 3A-type which is MD. The 3B2A and 3B2E protector units ([green housing] used to deny service) provide voltage protection for the outside plant, but do not provide continuity to the central office equipment.

**2.02** 4B-type protector units (Fig. 1 and Table B) contain both protector blocks (or gas tubes) and heat coils. The 4B-type protector units are used on circuits requiring both voltage protection (carbon blocks or gas tubes) and sneak current protection (heat coils). The 4B-type protector unit is a direct replacement for the 4A-type (which is MD). The 4B2C and 4B2E protector units ([green housing] used to deny service) provide voltage protection for the outside plant through protector blocks or gas tubes but have dummy heat coils. These protector unit do not provide continuity to the central office equipment.

**2.03** The 4B9C protector unit (Fig. 2), as well as the 4B9E protector unit, contains a polarity reversing circuit board in addition to the standard protector blocks or gas tubes and heat coils for voltage and sneak current protection. These protector units are white with a black X marked on the finger grip indicating that the tip and ring-out are reversed from the tip and ring-in. The 4B9C protector unit is a direct replacement for the 429F reversing plug (MD).

**2.04** The 4B11C protector unit (Fig. 3), as well as the 4B11E protector unit, contains bridge-lifting circuitry in addition to the standard protector blocks (or gas tubes) and heat coils. This device is a semiconductor switch-type bridge lifter. In the idle state, the semiconductor switches open, isolating the subscriber loop from the central office by adding impedance. In the active state, the semiconductor switches are closed, thereby removing the high impedance from the subscriber loop. The minibridge lifter may be used to bridge a maximum of four outside plant subscriber lines to the same central office subscriber line. The 4B11C protector unit is a direct replacement for the 4A11C minibridge lifter (MD).

**2.05** The 4B12C protector unit is used only in 310-type connectors to provide continuity only. Normally, 5-type protector units are used for this application but, due to the recessed mounting area housing on the 310-type connectors, the 5-type protector units would be inaccessible and are, therefore, not used.

**2.06** The 5A-type plug-in protector units (Fig. 1 and Table C) may be used to provide circuit continuity where ***no*** protection is required. The 5A2D ([green housing] used to deny service) plug-in protector unit does not provide continuity between outside plant and central office cables.

**2.07** The 5A9D plug-in protector unit (white housing) has an X marked on the face of the handle to indicate that the protector unit is equipped with a polarity reversing circuit board, reversing tip and ring.

**2.08** The protector units are listed in Tables A, B, and C showing the standard and MD codes, housing color, protection devices (if any), and the circuit application of each protector. Beginning with the manufacture of the 3B- and 4B-type protector units, the quarter and year of manufacture appear on the plastic housing.

## 3. APPLICATION

**3.01** Full insertion of the protector units into the connector panel interconnects outside plant with central office equipment, providing the protection previously described. Protector units with green housings do not provide this interconnection; therefore, only voltage protection is provided to the outside plant with 3- and 4-type protector units (no protection with 5-type protector units). Ground, for protection purposes, is provided for the heat coils and carbon blocks (or gas tubes) through the grounding pin of the protector unit.

**3.02** When the protector unit is pulled out to the detent position, the central office equipment

is disconnected to isolate outside plant pairs for testing purposes. In this position, voltage protection is still provided on the outside plant cable pair. A small white marking on the finger grip of the protector unit is exposed when the protector unit is in the detent position. Removing the protector unit from the connector removes all protection.

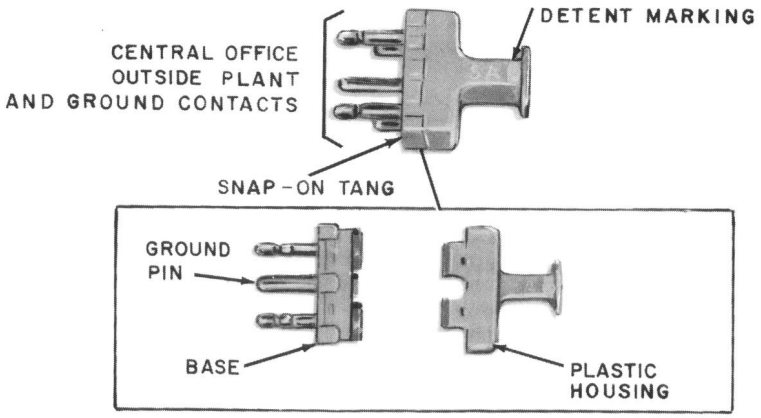
## 4. DESIGNATION PINS

**4.01** The color of the protector unit housing identifies the type of circuit that is interconnected. In addition, a KS-14174 designation pin, having the same color as the protector unit housing, indicates the particular terminal group that is associated with the circuit. Tables A, B, and C show the various list numbers of the KS-14174 designation pins which correspond to the different protector units.

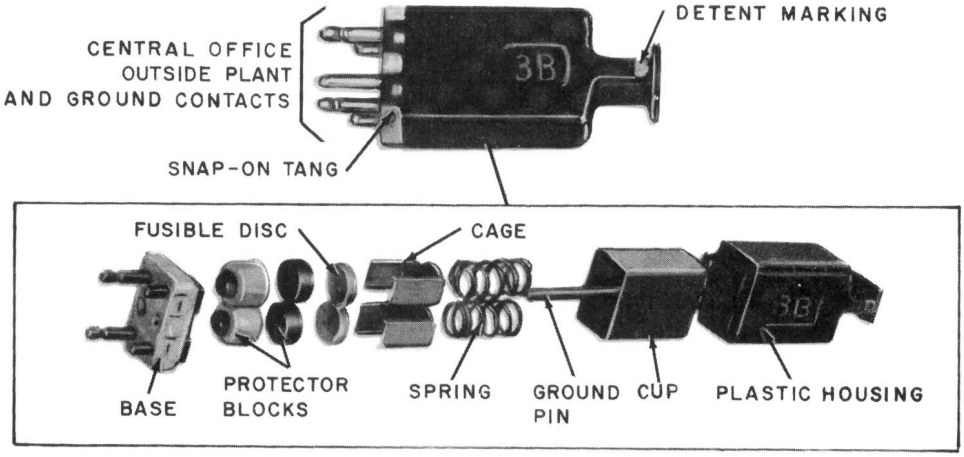
**4.02** Except for the regular service (standard circuit), the designation pin is inserted in the small hole provided in the terminal group of the 302-, 303-, 305- and 308-type connectors. The local office should specify when the KS-14174 designation pins are to be used, especially on the 305-type connector. Due to the mounting orientation of the 305-type connector, the designation pins are difficult to see.

## 5. REPAIR PROCEDURES

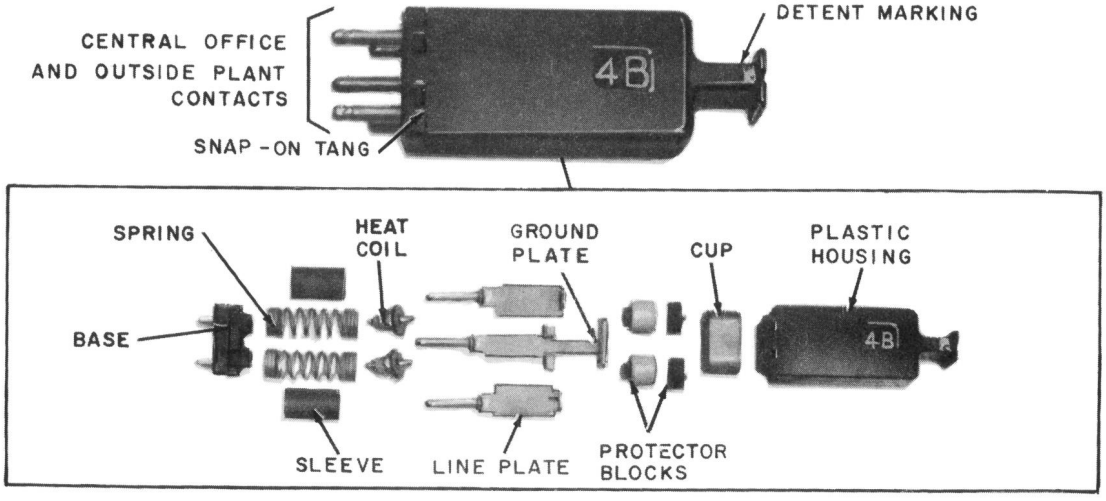
**5.01** Any protector units which are defective or suspected of being defective should be discarded, except for the 4B11C, 4B11E, (minibridge lifters) or the superseded 4A11C. Return defective 4B11C, 4B11E, or 4A11C protector units to the appropriate Western Electric Company repair facility for repair. See Section 201-208-301 for maintenance of protector units and Section 201-208-501 for testing of protector units.




A. 5A-TYPE PROTECTOR UNIT




B. 3B-TYPE PROTECTOR UNIT




C. 4B-TYPE PROTECTOR UNIT

**Fig. 1—Protector Units**

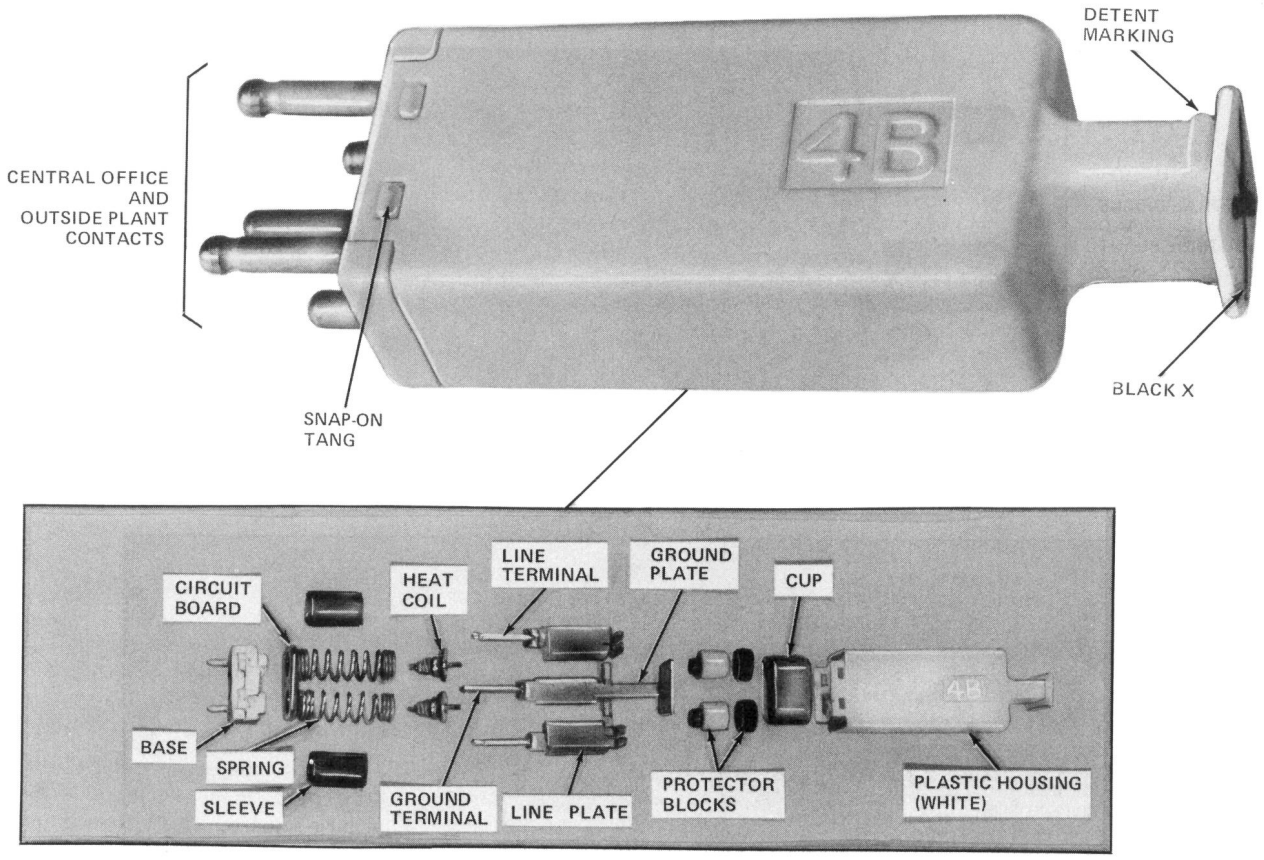



**Fig. 2—4B9C Protector Unit (Line Reversing)**

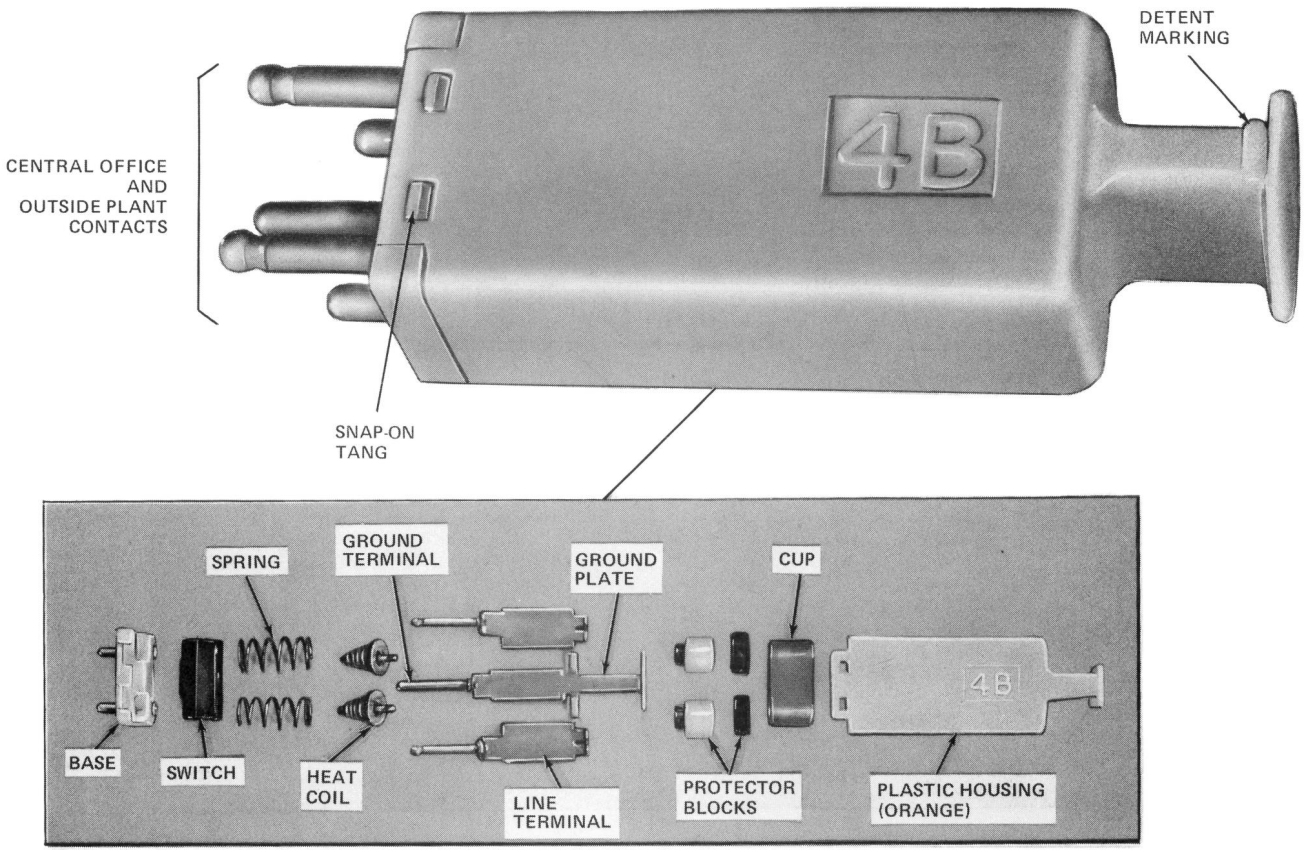



**Fig. 3—4B11C Protector Unit (Minibridge Lifter)**

**TABLE A**

**3-TYPE PROTECTOR UNITS**

| CODE AND RATING (NOTE 1) | | HOUSING COLOR | CIRCUIT APPLICATION | DESIGNATION PIN KS-14174 LIST NO. | PROTECTOR BLOCKS OR GAS TUBES (NOTE 3) (2 EACH) | |
|---|---|---|---|---|---|---|
| STANDARD | MANUFACTURE DISCONTINUED | | | | 32A, 33B CARBON | 471A OR 201A GAS TUBE |
| 3B1A | 3A1A, 3A5A, 3B5A | Black | Standard | — | X | |
| 3B2A | 3A2A, 3A6A, 3B6A | Green | Denied Line | 4 | X | |
| 3B3A | 3A3A, 3A7A, 3B7A | Red | Special | 7 | X | |
| 3B4A | 3A4A, 3A8A, 3B8A | Yellow | PBX Battery | 5 | X | |
| 3B13A | | Green | Check cable fault | — | (Note 2) | |
| 3B1E | | Black | Standard | — | | X |
| 3B2E | | Green | Denied Line | 4 | | X |
| 3B3E | | Red | Special | 7 | | X |
| 3B4E | | Yellow | PBX Battery | 5 | | X |

***Note 1:*** All protector units rated Standard have gold-plated terminals. All protector units rated Manufacture Discontinued (MD) have solder-plated terminals and are shown on the same line as the codes that replace them.

***Note 2:*** The 3B13A has a special application and is equipped with a 3.9 megohm resistor connected between the outside plant tip and ring terminals. It has carbon blocks and fusible alloy discs. It has a white resistance symbol (W) marked on the handle.

***Note 3:*** Protector units containing gas tubes have the symbol "O" marked on the face of the handle.

## TABLE B

### 4-TYPE PROTECTOR UNITS

| CODE AND RATING (NOTE 1) | | HOUSING COLOR | CIRCUIT APPLICATION | DESIGNATION PIN KS-14174 LIST NO. | PROTECTOR BLOCKS OR GAS TUBES (NOTE 2) (2 EACH) | | HEAT COILS (2 EACH) |
|---|---|---|---|---|---|---|---|
| STANDARD | MANUFACTURE DISCONTINUED | | | | 32A & 33B CARBON | 471A OR 201A GAS TUBES | |
| 4B1C | 4A1C, 4A5C | Black | Standard | — | X | | 82B |
| 4B2C | 4A2C, 4A6C | Green | Denied Line | 4 | X | | 82A |
| 4B3C | 4A3C, 4A7C | Red | Special | 7 | X | | 82B |
| 4B4C | 4A4C, 4A8C | Yellow | PBX Battery | 5 | X | | 82C |
| 4B9C | 429F | White | Reverse T&R | — | X | | 82B |
| 4B11C | 4A11C | Orange | Minibridge Lifter | 2 | X | | 82B |
| 4B12C | | Gray | Continuity only | — | — | — | — |
| 4B1E | | Black | Standard | — | | X | 82D |
| 4B2E | | Green | Denied Line | 4 | | X | 82A |
| 4B3E | | Red | Special | 7 | | X | 82D |
| 4B4E | | Yellow | PBX Battery | 5 | | X | 82E |
| 4B9E | | White | Reverse T&R | — | | X | 82D |
| 4B11E | | Orange | Minibridge Lifter | 2 | | X | 82D |

***Note 1:*** All protector units rated Standard have gold-plated terminals. All protector units rated Maufacture Discontinued (MD) have solder-plated terminals and are shown on the same line as the codes that replace them.

***Note 2:*** Protector units containing gas tubes have the symbol "O" marked on the face of the handle.

## TABLE C

### 5-TYPE PROTECTOR UNITS

| CODE AND RATING (NOTE) | | HOUSING COLOR | CIRCUIT APPLICATION | DESIGNATION PIN KS-14174 LIST NO. |
|---|---|---|---|---|
| STANDARD | MANUFACTURE DISCONTINUED | | | |
| 5A1D | 5A5D | Gray | Standard | — |
| 5A2D | 5A6D | Green | Denied Line | 4 |
| 5A3D | 5A7D | Red | Special | 7 |
| 5A4D | 5A8D | Yellow | PBX Battery | 5 |
| 5A9D | | White | Reverse T&R | — |

*Note:* All protector units rated Standard have gold-plated terminals. All protector units rated Manufacture Discontinued (MD) have solder-plated terminals and are shown on the same line as the codes that replace them.