

MAIN FRAME PROTECTION

"B" TYPE FRAMES

| | CONTENTS | PAGE |
|----|--|------|
| 1. | GENERAL | 1 |
| | A. Classes of Conductors | 3 |
| | B. Classes of Protection | 3 |
| | C. Types of Protector Mountings, Blocks, and Heat Coils | 3 |
| | D. Battery Feeders | 5 |
| | E. Test Trunks | 5 |
| 2. | 300-TYPE CONNECTORS | 5 |
| | A. Spare Conductors | 5 |
| | B. Working Conductors | 6 |
| 3. | OTHER TYPE PROTECTORS | 7 |
| | A. Spare Conductors | 7 |
| | B. Working Conductors | 7 |
| 4. | 444-TYPE JACKS | 8 |
| | A. General Description | 8 |

1. GENERAL

1.01 This section covers the types of protective apparatus required on "B" type main distributing frames. Reference to "Main Frame" as used in this section shall be considered as also applying to "Protector Frame" in offices where the protector frame is separate from the main distributing frame. These requirements apply to all conductors whether protected by fuses or by protective (fuse) cable.

1.02 This section is reissued to make reference to the 300-type connector which replaces the 121-type protector, to revise Fig. 1 to include the dummy protector unit, and to revise Fig. 3 to better illustrate the No. 34A1 dummy protector block.

1.03 On "B" type main distributing frames the outside cables terminate at protector mountings or 444-type jacks on the vertical side of the frame. On separate "Protector Frames" the outside cables terminate at protector mountings or jacks, on both sides of the frame, from which cables are run to terminal strips on the vertical side of a main distributing frame. Cables from the central office equipment terminate at terminal strips on the horizontal side of the main distributing frame. Protection is provided by placing protector blocks and heat coils as specified. The methods of testing, handling, and cleaning protection equipment are covered in A200 and A500 sections.

1.04 A recent arrangement for terminating exchange cables and providing protection is the 300-type connector. The name "connector" is used to avoid the conflicting connotations of the name "protector" which, in the past, has been used to designate protector blocks, assemblies within a protector block, etc. The 300-type connector supersedes a similar arrangement coded the 121-type protector. All references in the section to the 300-type connector shall be considered to apply to the 121-type protector.

1.05 The following is a brief description of some of the characteristics of the 300-type connector:

(a) In the working position, the protector unit (see Fig. 1) is inserted and turned in a clockwise direction so that the stripe on the cap is horizontal (see Fig. 4).

(b) In the open position, the protector unit is rotated 90° counterclockwise from the working position. In this position, the stripe on the cap is vertical and the cap projects further from the faceplate (see Fig. 4). In the open position, the central office equipment is disconnected from the outside plant conductor. Protective carbons, where provided, are still effective.

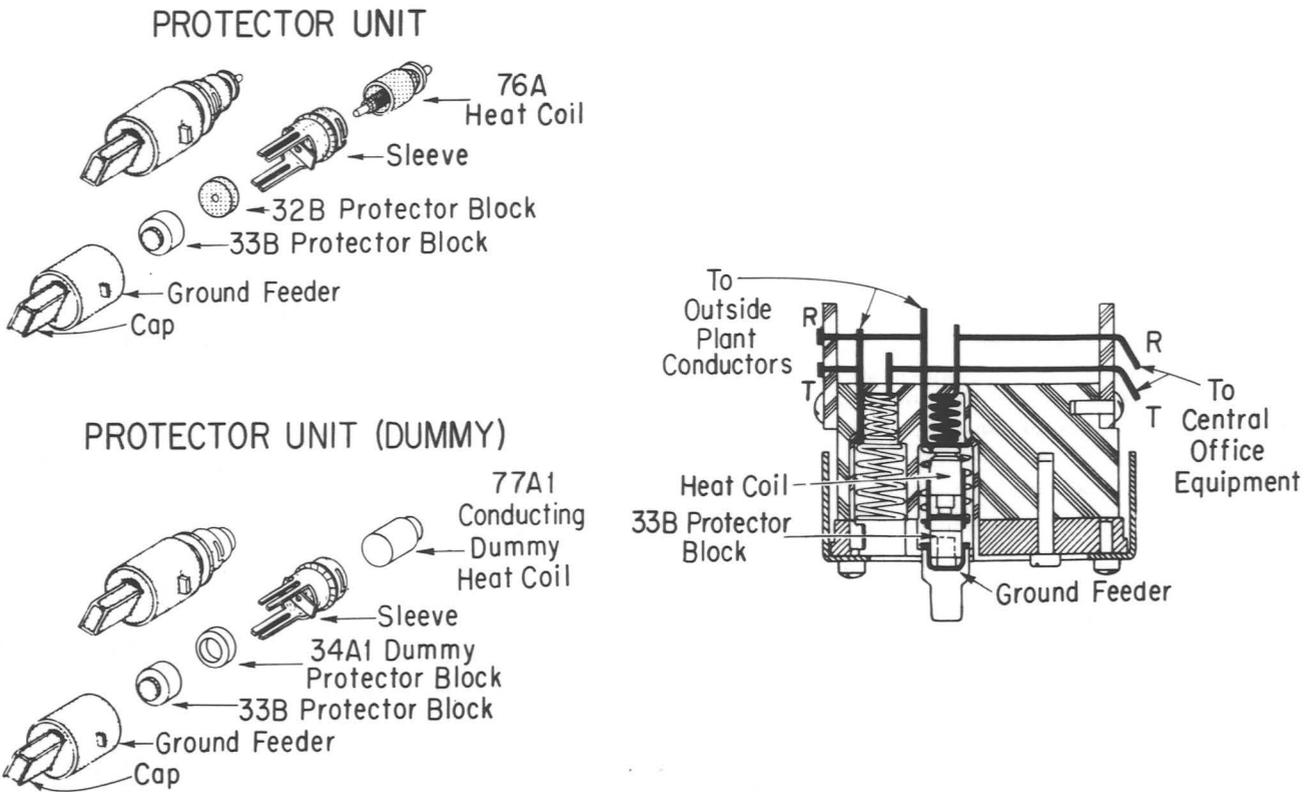


Fig. 1 - 300-type Connector

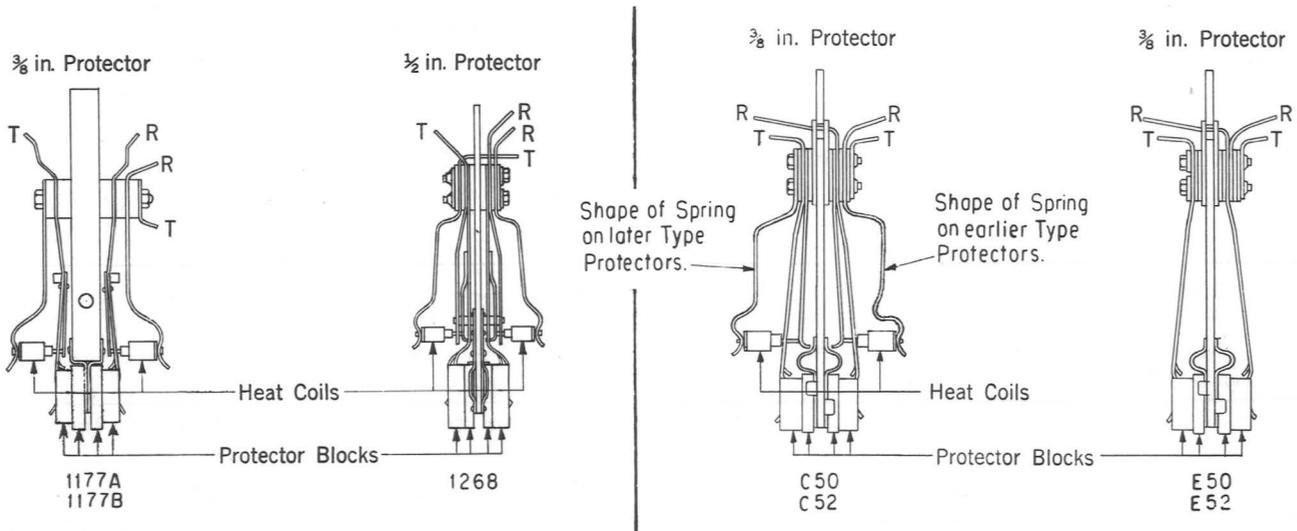


Fig. 2 - Other Type Protectors

(c) When the protector unit is removed, the central office equipment is disconnected from the outside plant conductor and no protection is provided.

(d) In either the working or open position, the ground feeder of the protector unit (see Fig. 1) rests against the inside surface of the grounded aluminum faceplate. This ground is fed through the ground feeder to the carbon insert of the No. 33B protector block.

(e) If the heat coil operates, the tip of the coil passes through the hole in the No. 32B carbon block or No. 34A1 porcelain block and makes contact with the grounded insert of the No. 33B protector block (see Fig. 1).

(f) The terminals are arranged for solderless wrapped connections.

1.06 Some circuits, for engineering reasons, require straps between the cable and equipment terminals. For a detailed explanation of the approved procedures for placing straps, refer to Section A502.001.

Note 1: Straps are not required on 300-type connectors due to improved design of essential components.

Note 2: Straps are not required on E-type protector mountings, which differ from the C-type mountings in that the heat coil springs are omitted and the protector block springs are provided with two sets of terminals which are multiplied together within the pile-up. One set projects to the left for the termination of the entering cable pair and the other projects to the right for connection to the jumper. Since the entering cable pair and the jumper are bridged on the protector block springs, there is no facility for opening the line for test purposes.

A. Classes of Conductors

1.07 Conductors entering a central office are generally classified as either exposed or unexposed. In general, an unexposed conductor

is one so located that it is unlikely that a foreign voltage in excess of 300 volts will accidentally contact it. An exposed conductor is one that does not meet this requirement.

1.08 Occasionally, in order to provide adequate protection, it is necessary to divide the unexposed class into two parts (see 1.10).

B. Classes of Protection

Class "NP"

1.09 Interoffice cable circuits which are entirely underground and have no outside terminals connected to them are classified as "NP" and require neither protective heat coils nor protective blocks. These circuits consist principally of interoffice trunks and toll circuits.

Class "TP"

1.10 Buried or underground interoffice toll cable circuits which are subject to lightning, low-frequency induction, or magnetic storm potentials, are classified as "TP." These circuits require protector blocks; protective heat coils are not required.

Class "P"

1.11 These circuits usually involve aerial plant. Since there is the possibility of having voltage from foreign sources, including lightning, impressed on these circuits, full protection, consisting of protective heat coils and protector blocks, is required.

C. Types of Protector Mountings, Blocks, and Heat Coils

1.12 Fig. 1 and 2 show the typical arrangement of protectors used on "B" type frames and Fig. 3 shows the various types of protector blocks and heat coils including the older types which may still be in use. Table 1 shows the present standard types of heat coils and protector blocks and also the corresponding older types.

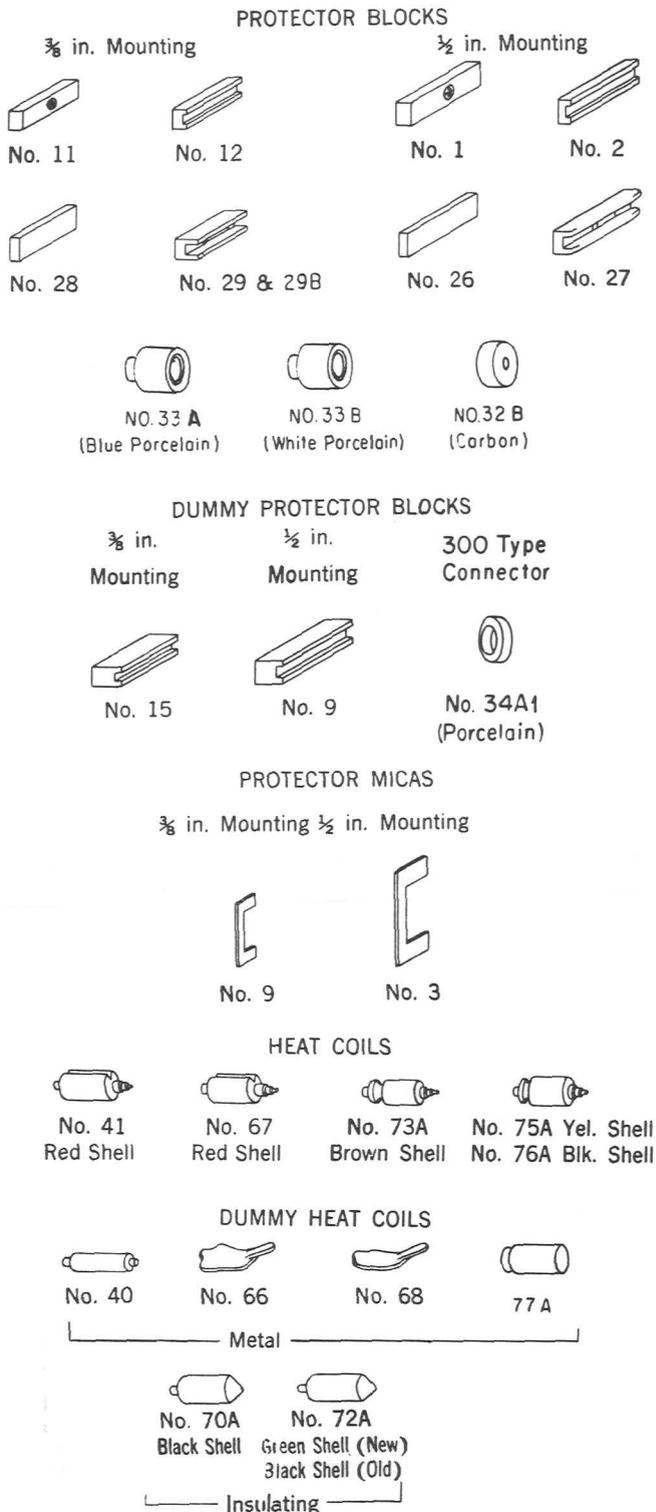


Fig. 3 - Types of Protector Blocks and Heat Coils

TABLE 1

| | STANDARD | OLDER TYPES |
|--------------------------------------|----------|-------------|
| PROTECTOR BLOCKS | | |
| 3/8" Mounting | | |
| Ground Side | 28 | *11 |
| Line Side | ***29 | *12 |
| 1/2" Mounting | | |
| Ground Side | 26 | ** 1 |
| Line Side | ***27 | ** 2 |
| 300-type Connector | | |
| Ground Side | #33B | — |
| Line Side | 32B | — |
| DUMMY PROTECTOR BLOCKS | | |
| 3/8" Mounting | 15 | — |
| 1/2" Mounting | 9 | — |
| 300-type Connector | 34A1 | — |
| HEAT COILS | | |
| Battery Feeders | 75A | — |
| All Other Lines Requiring Heat Coils | 76A | 41, 67, 73A |
| DUMMY HEAT COILS | | |
| Metal | | |
| 300-type Connector | 77A1 | — |
| 3/8" or 1/2" Mtg. | 40 | 66, 68 |
| Insulating | | |
| 3/8" or 1/2" Mtg. | †72A | †70A |

- * Use No. 9 protector micas with No. 11 and 12 protector blocks.
- ** Use No. 3 protector micas with No. 1 and 2 protector blocks.
- *** Use No. 29B and 30 protector blocks instead of No. 29 and 27, respectively, where the MDF protector mountings are connected to drainage coil assemblies.
- Note:** Where the No. 377H transformer is used, use the No. 15 and 9 dummy protector blocks, respectively.
- # Use No. 33A protector block instead of No. 33B where the MDF protector mountings are connected to drainage coil assemblies.
- Note:** Where the No. 377H transformer is used, use the No. 34A1 dummy protector block.
- † The No. 70A and 72A dummy heat coils are insulating dummy coils used in the protectors of lines which are to be kept open, as an indication that regular heat coils are not to be put in.

D. Battery Feeders

1.13 The protector mountings using class "P" conductors for private branch exchange or other battery feeders including the return conductors of metallic feeders, shall be equipped with protector blocks and No. 75A heat coils in all cases. The No. 75A heat coil has a yellow shell.

1.14 Where conductors are used in parallel, and protector mountings are provided, each conductor shall be equipped with protector blocks and a No. 75A heat coil.

1.15 Methods of strapping protectors and 444-type jacks where conductors are used in parallel for battery feeders are covered in Section A502.011.

E. Test Trunks

1.16 Test trunks from the test desk to the main frame within an office, plugging-up lines in dial offices terminating at the main frame and service observing lines which are arranged for connection to subscriber lines by plugging in at the main frame protectors shall be protected by using heat coils and dummy protector blocks.

2. 300-TYPE CONNECTORS

Note: Piece-part numbers for the colored caps and designation plates specified in the following paragraphs for use on the 300-type connector are contained in Section A505.146.

A. Spare Conductors

2.01 A conductor is considered spare if it is not connected to any office equipment other than the protector.

Class "P" Conductors

2.02 The protector units of all spare class "P" conductors shall be equipped with protector blocks, No. 76A heat coils, and black caps. The protector units shall be in the open position; the white line on the cap will be vertical, and the cap will protrude further from the faceplate. The black capped assemblies will then

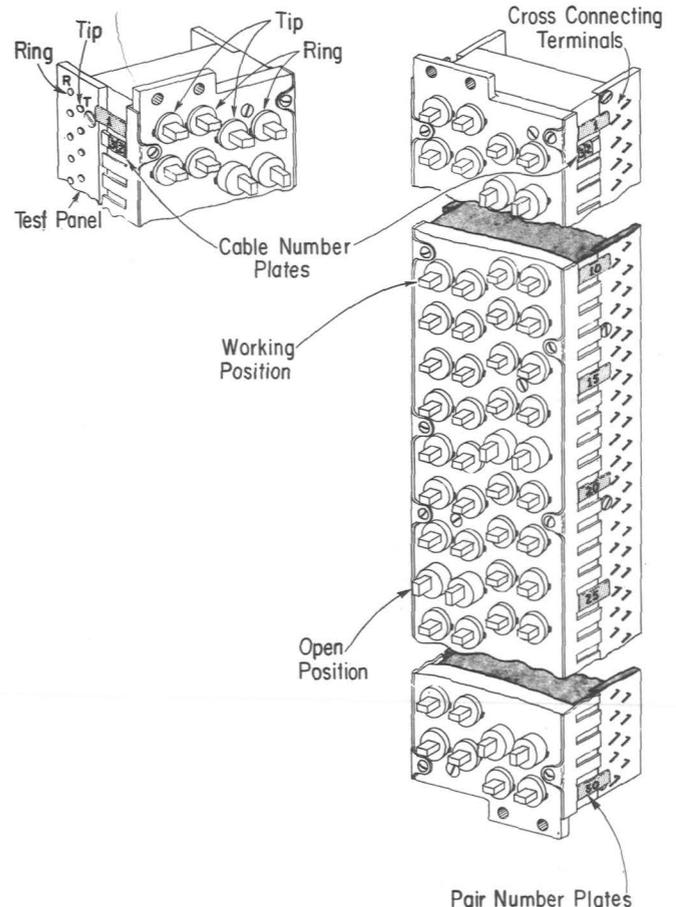


Fig. 4 - 300-type Connector

serve as a designation of class "P" conductors in addition to providing the required protection; in the open position, the protective carbons are still effective.

Class "NP" Conductors

2.03 The protector units of all spare class "NP" conductors shall be equipped with dummy protector blocks, metal dummy coils, gray caps, and gray designation plate. The protector units shall be in the open position; the white line on the cap will be vertical, and the cap will protrude further from the faceplate.

Class "TP" Conductors

2.04 The protector units of all spare class "TP" conductors shall be equipped with protector blocks, metal dummy coils, gray caps,

and gray designation plate. The protector units shall be in the open position; the white line on the cap will be vertical, and the cap will protrude further from the faceplate.

Note: If further identification of these lines appears desirable, tags or other indicating devices may be provided locally.

B. Working Conductors

Class "P" Conductors

2.05 Class "P" conductors shall be provided with protector units equipped as follows:

(a) Subscriber lines, and all others not requiring exceptional treatment as indicated below, shall be equipped with protector blocks, No. 76A (black) heat coils, and black caps.

(b) Battery feeders shall be equipped with protector blocks, No. 75A (yellow) heat coils, yellow caps, and yellow designation plate.

(c) Special lines — telegraph loops, radio broadcast lines, police and fire alarms, etc — shall be equipped with protector blocks, heat coils (to be specified locally), red caps, and red designation plate. The red designation plate is long enough to cover the test terminals and protect the special lines from circuit interference.

Note: Additional procedures for the protection of special lines against service interruptions are covered in Section A502.001.

(d) Denied lines shall be equipped with protector blocks, green caps, and green designation plate. The protector units shall be in the open position; the white line on the cap will be vertical, and the cap will protrude further from the faceplate.

Note: To avoid restoring service to a subscriber line with protector units containing a green cap, these assemblies should not contain heat coils.

Class "NP" Conductors

2.06 Class "NP" conductors shall be provided with protector units equipped with dummy protector blocks, metal dummy coils, gray caps, and gray designation plate.

Class "TP" Conductors

2.07 Class "TP" conductors shall be provided with protector units equipped with protector blocks, metal dummy coils, gray caps, and gray designation plate.

Note: If further identification of these lines appears desirable, tags or other indicating devices may be provided locally.

Conductors Requiring Drainage Coil or Relay Protector Equipment

2.08 Where circuits on main frames require drainage coil or relay protector (SCR) equipment to minimize interference, protector blocks shall be provided as follows:

(a) **Protector Mountings at Main Frame:** The protector mountings associated with circuits to which the drainage coil assembly or relay protector is connected shall be equipped with No. 32B and 33A protector blocks; the No. 33A block is readily identified inasmuch as it is made of *blue* porcelain.

Note: Where the No. 377H transformer is used for drainage coil protection, use the No. 34A1 dummy protector with the No. 33B block in place of the No. 32B and 33A combination.

(b) **Protector Mountings at Drainage Coil Assembly or Relay Protector Mounting:** The protector mountings associated with the drainage coil assembly or relay protector shall be equipped with the standard protector block combination for that type of protector, i.e., *white* porcelain.

3. OTHER TYPE PROTECTORS

A. Spare Conductors

3.01 A conductor is considered spare if it is not connected to any office equipment other than the protector.

Class "P" and "TP" Conductors

3.02 The protector mountings of all spare class "P" and "TP" conductors shall be equipped with protector blocks. The provision of protector blocks will then serve as a designation of class "P" or "TP" conductors in addition to providing the protection required.

Class "NP" Conductors

3.03 The protector mountings of all spare class "NP" conductors shall be equipped with dummy protector blocks. The provision of dummy protector blocks will then serve as a designation of class "NP" conductors.

B. Working Conductors

Class "P" Conductors

3.04 With the exception of private branch exchange and other battery feeders, as covered in Part 1, all subscriber lines, trunk circuits, private branch exchange trunks, ringing supply feeders, etc, using class "P" conductors, shall be protected with protector blocks and heat coils.

Class "TP" Conductors

3.05 Class "TP" conductors shall be protected by using protector blocks. Metal dummy heat coils or soldered straps shall be provided where heat coil springs are furnished on the protector mountings.

3.06 Where "TP" conductors do not appear on the main frame in well-defined groups so as to readily distinguish them from class "P" conductors, heat coils should ordinarily be used in order to minimize the probability of accidentally omitting heat coils from the protectors of class "P" conductors.

Class "NP" Conductors

3.07 The protector mountings of class "NP" conductors shall be equipped with dummy protector blocks. Metal dummy heat coils or soldered straps shall be provided where heat coil springs are furnished on the protector mountings. Protector blocks and heat coils are not involved where 444-type jacks are furnished instead of protector mountings.

3.08 Where "NP" conductors do not appear on the main frame in well-defined groups so as to readily distinguish them from class "P" conductors, heat coils and protector blocks should ordinarily be used in order to minimize the probability of accidentally omitting such protection from the protectors of class "P" conductors.

Conductors Requiring Drainage Coil or Relay Protector Equipment

3.09 Where circuits on main frames require drainage coil or relay protector (SCR) equipment to minimize interference, protector blocks shall be provided as follows:

- (a) **Protector Mountings at Main Frame:** The protector mountings associated with circuits to which the drainage coil assembly or relay protector is connected shall be equipped with No. 28 and 29B protector blocks where the protector mountings are on 3/8-inch centers, and No. 26 and 30 protector blocks where the protector mountings are on 1/2-inch centers.

Note: Where the No. 377H transformer is used for drainage coil protection, use the No. 15 and 9 dummy blocks for the 3/8- and 1/2-inch protectors, respectively.

- (b) **Protector Mountings at Drainage Coil Assembly or Relay Protector Mounting:** The protector mountings associated with the drainage coil assembly or relay protector shall be equipped with No. 26 and 27 protector blocks.

3.10 Fig. 5 shows a typical protector — other than 300-type connector — with one cable pair protected with the special attachments used on special lines. A description of the additional procedures for the protection of special lines against service interruptions is covered in Section A502.001.

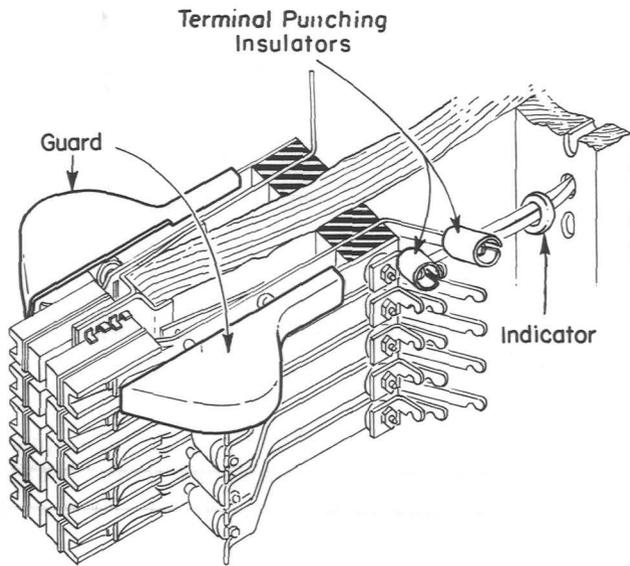


Fig. 5

4. 444-TYPE JACKS

A. General Description

4.01 The 444-type jacks provide for connecting the cable pairs to the central office circuits through normally closed precious metal contacts. This is essentially the same as standard protectors equipped with metal dummy coils and dummy protector blocks (see Fig. 6).

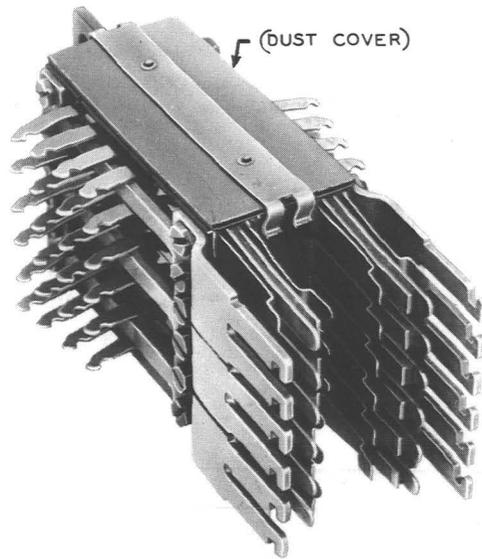


Fig. 6