

300-TYPE CONNECTORS AND ASSOCIATED PROTECTORS AND 121-TYPE PROTECTORS REPAIR PROCEDURES

1. GENERAL

1.01 This section provides the information required for ordering parts to be used in the maintenance of 300-type connectors and 121-type protectors. It also provides procedures for replacing these parts.

1.02 The reasons for reissuing this section are listed below. Since this issue is a general revision, no revision arrows have been used to denote significant changes. Equipment Test Lists are not affected.

- (1) To move warning markers and guards to Section 201-207-101
- (2) To include protector assembly and disassembly
- (3) To include the KS-20100, L4 test set adapter
- (4) To generally update existing information.

1.03 The information shown for the 300-type connectors (code marking shown on the test panel of the connector) is applicable to the 121-type protectors (no code marking shown) except as indicated in paragraph 4.04.

1.04 This section covers the parts which are practicable to replace in the field. No attempt should be made to replace parts not covered.

1.05 The figures included in this section show the various parts in their proper relation to other parts of the apparatus. The piecepart numbers of the various parts are given together with the names of the parts.

1.06 When ordering piece parts for replacement purposes, give both the number and name of the piece part; for example: P-181434 Screw.

Do not refer to the BSP number or to any information shown in parentheses following the piece-part numbers.

1.07 Information enclosed by parentheses () is not ordering information. It may be references to notes, parts referred to in other portions of the section and not considered replaceable, or part names in general use in the field if these names differ from those assigned by the manufacturer.

1.08 A design change on the 300-type connector eliminates the aluminum finger-type holders (Fig. 1) and replaces it with a prestenciled holder which is molded as a part of the phenolic block (Fig. 2).

2. REPLACEMENT PROCEDURES

2.01 No replacement procedures are specified for screws or other parts where the procedure consists of a simple operation.

2.02 Before making any replacement of parts of connectors, appropriate steps should be taken to remove from service any associated circuit or adjacent circuits which may be affected.

2.03 *List of Tools and Test Apparatus:*

CODE OR SPEC. NO.	DESCRIPTION
73B	Bracket
411A	Test pick (2 reqd)
KS-6320	Orange stick
KS-7139	Notched diagonal pliers
KS-14250,L1	Flashlight

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KS-14440,L2	Soldering copper
KS-16567	Tool (protector unit wrench)
TP-75765	Pull spring hook
—	Long-nose pliers
—	4-inch E screwdriver
1W13B	Cord consisting of one No. 893 cord, 6 feet long, equipped with two No. 360A tools (1W13B) (2 reqd).

3. REPAIR PROCEDURES

3.01 A front view of the 300-type connector and replaceable parts are shown in Fig. 1. Internal parts such as cross-connect terminals, test contact terminals, and springs are shown in other figures throughout this section.

3.02 To make any replacement of parts, a 50-pair section of the connector must be removed from the frame. Remove the screws that attach the faceplate of the connector to the mounting brackets. Rotate the connector toward the fanning strip. Attach the 73B bracket to the top of the connector unit and to the mounting bracket as shown in Fig. 2. The superseded 73A bracket is installed in the same manner but cannot be used on 300-type connectors.

3.03 Before attempting to repair any replaceable parts, remove the protector unit from the connector as follows:

- (1) If the unit is in the working position (mark shown horizontal), turn the unit 45 degrees counterclockwise and remove it. The KS-16567 protector unit wrench may be used for this operation (Fig. 5).
- (2) If the unit is in the open position (mark shown vertical), turn the unit 45 degrees clockwise and remove it.

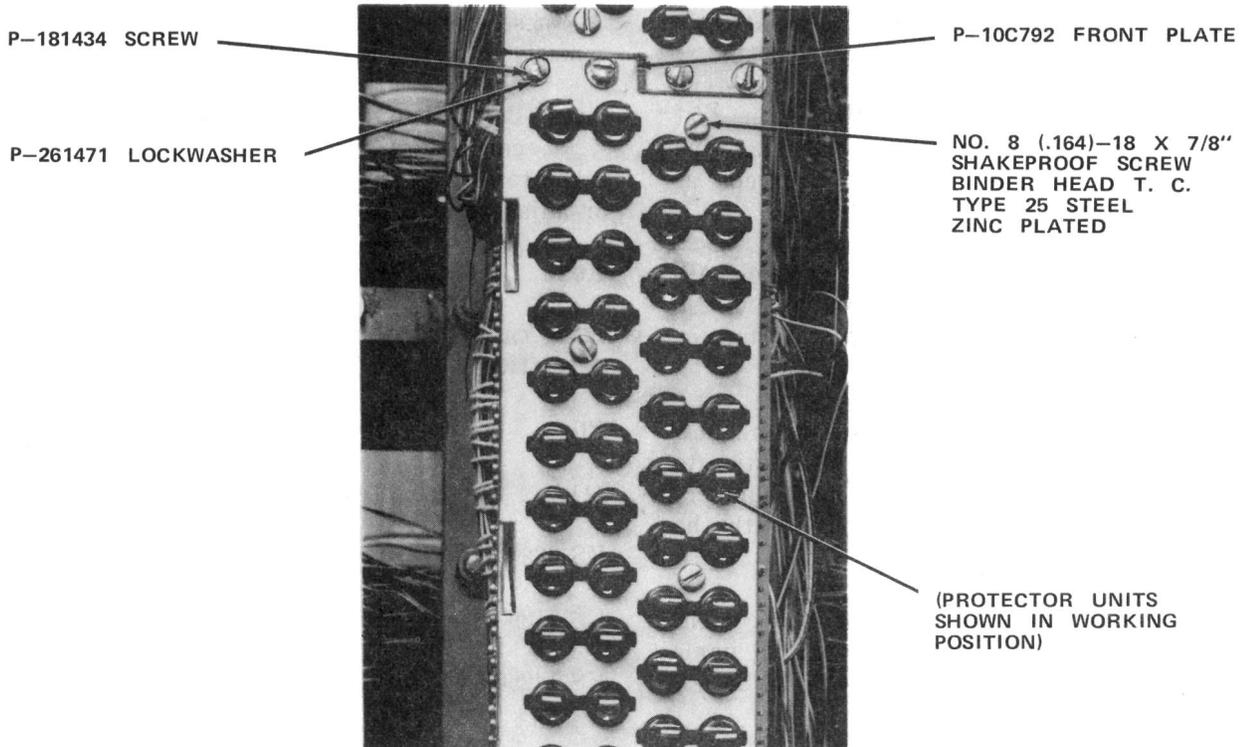


Fig. 1—Front View of Connector

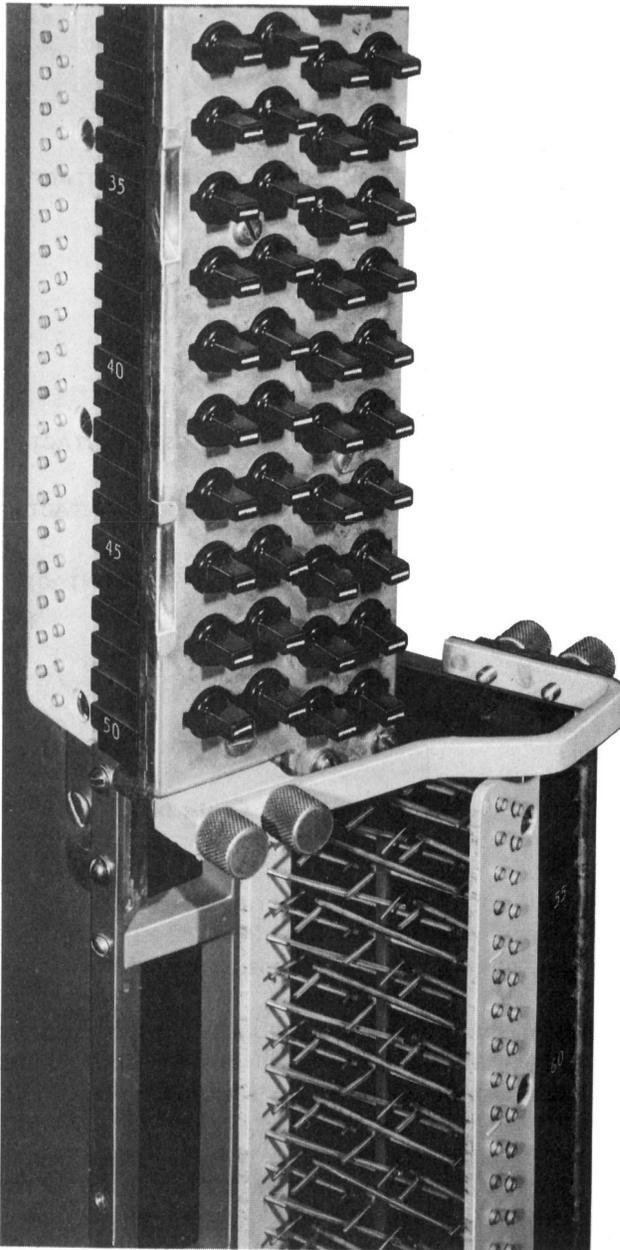


Fig. 2—73B Bracket Supporting a 300-Type Connector

- 3.04 Solder all connections of parts replaced. Soldered joints should be made on clean surfaces. The surface opposite a weld may be used if it is clean. Some difficulty may be experienced in soldering old parts. If so, replace both parts with new parts.
- 3.05 Where wire-wrapped connections must be removed, refer to the appropriate part of

Section 069-132-811, covering making and removing wrapped connections.

Cross-Connect Terminals and Small Springs (Fig. 3 and 4)

3.06 To replace a cross-connect terminal, cut the terminal, using the KS-7139 pliers, as cleanly as possible to separate it from the spring. Cut the terminal in half, if necessary, and remove the parts. Substitute a terminal of the proper length.

3.07 To replace a small spring, cut the terminal end of the small spring at a point as near the housing as possible, using the KS-7139 pliers. Cut the rest of the spring, using the pliers, as cleanly as possible to separate it from the cross-connect terminal. Remove the loose portion of the small spring. Remove the protector unit. Remove the small spring from the front of the connector, using the TP-75765 pull spring hook. Substitute a new small spring, taking care that the long straight end of the spring is inserted into the hole in the housing and that the spring is not distorted when pushing it into place. Mount and secure the protector unit in the working position (mark on cap should be horizontal).

3.08 Solder the terminal and tail of the small spring together, using the KS-14440, L2 soldering copper as follows. Using the long-nose pliers, pull on the spring tail until the spring is fully seated in the housing. Using the KS-6320 orange stick, hold the cross-connect terminal in contact with the terminal end of the small spring and as close to the housing as possible and solder the two parts together. Cut the cross-connect terminal, using the KS-7139 pliers, to give approximately 1/8-inch clearance between the cross-connect terminal and the test contact.

Test Contacts and Large Springs (Fig. 3 and 4)

3.09 To replace a test contact, cut it as cleanly as possible to separate it from the large spring, using the KS-7139 pliers. Cut the test contact in half, if necessary, and remove the parts. Substitute a test contact of the proper length.

3.10 To replace a large spring, proceed as directed in paragraphs 3.07 and 3.08, with the following difference being considered. The **large spring** is soldered to the **test terminal** rather than the cross-connect terminal for the small spring.

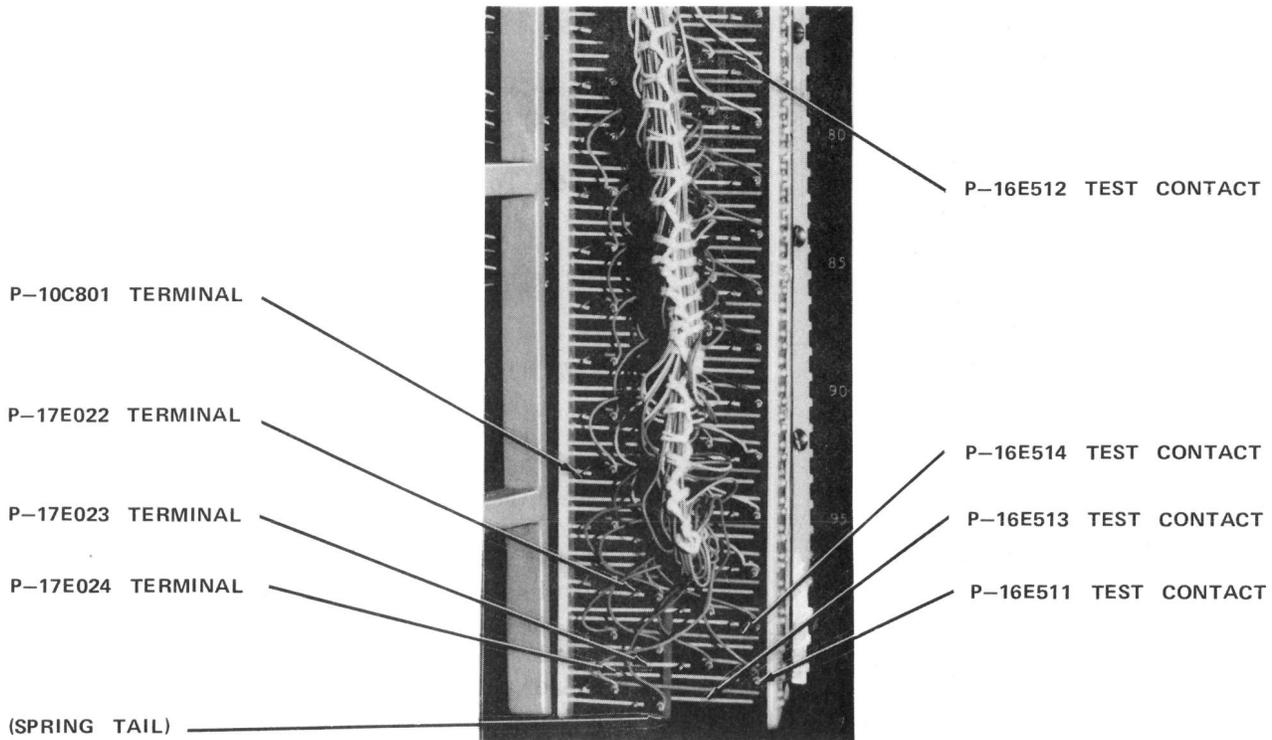


Fig. 3—Rear View of Connector Showing Cross-Connect Terminals and Test Contacts

Continuity Check

3.11 Check for continuity and shorts as follows, using the KS-14250, L1 flashlight and two 1W13B cords connected to 411A test picks:

- (1) With the protector unit in the working position (mark on cap should be horizontal), make a continuity check between springs. If an open circuit is indicated, clear the trouble or replace the springs.
- (2) With the protector unit in the open position (mark should be vertical), make a check between springs to ensure that they are not shorted. If they are shorted, clear the trouble or replace the springs.
- (3) With the protector unit removed, make a check between springs to ensure that they are not shorted. If they are shorted, clear the trouble or replace the springs.

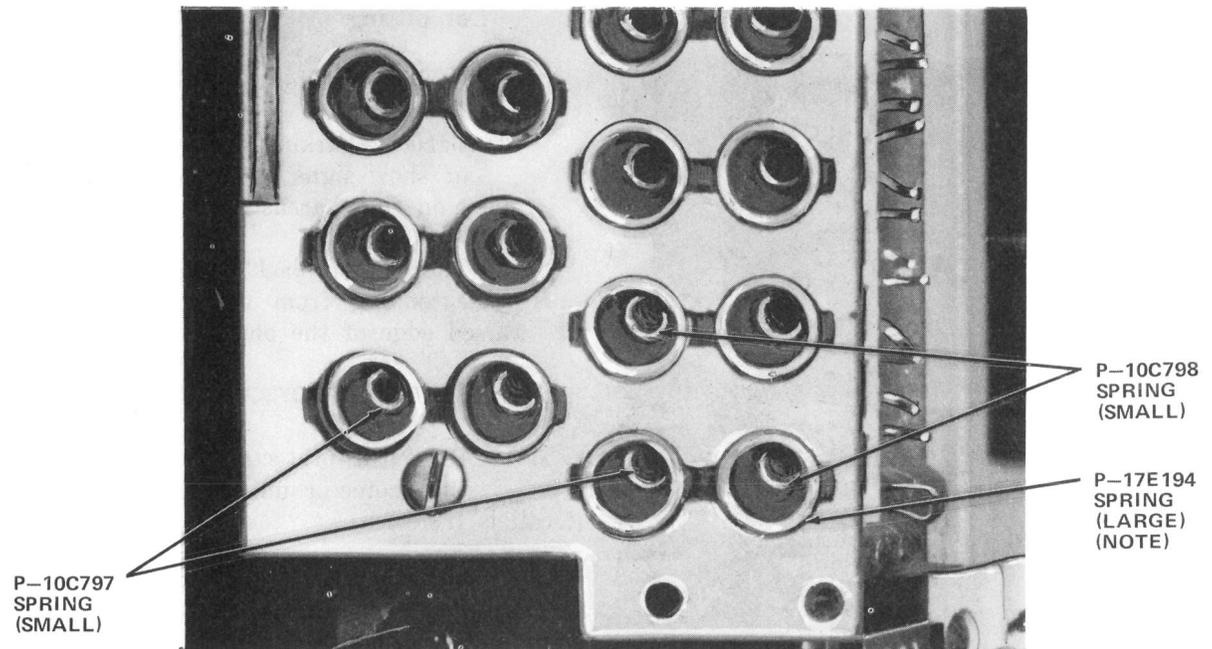
3.12 Reconnect the wire-wrapped connections as covered in Section 069-132-811 covering making and removing wrapped connections.

3.13 After making any replacement of parts, an overall operational check should be made and the circuits restored to service.

4. REMOVAL AND DISASSEMBLY OF PROTECTOR UNITS

4.01 If evidence is found or there is suspicion of abnormally high voltage conditions or contact between central office main frame terminations, observe all of the following precautions:

- (a) Notify the office supervisor and test center.
- (b) Notify other employees who may have occasion to work on the frame.
- (c) Avoid contact with associated frame terminations until authorized by the test center.



NOTE:
WHEN REPLACING A LARGE SPRING MAKE CERTAIN THAT A P-17E203 WASHER IS ASSEMBLED ON THE ASSOCIATED PROTECTOR UNIT. (SEE FIG. 6)

Fig. 4—Housing With Front Plate Removed Showing the Springs

- (d) If the test center requests that the protector unit be inspected, wear insulating gloves and remove the protector unit from the frame with the KS-16567 tool (Fig. 5).

Note: Insulating gloves shall be mechanically inspected immediately prior to use in accordance with Section 075-141-501.

Removing Protector Units From 300-Type Connector

4.02 To remove protector units from circuits which **do not** have abnormally high voltages present, proceed as described in paragraph 3.03.

4.03 When it is necessary to remove protector units from circuits which are suspected of having abnormally high voltages present, insulating gloves should be worn and the KS-16567 tool should be used in all cases.

Removing 121-Type Protector Units From 121-Type Protector

4.04 When protector units are removed from the 121-type protector, the cable conductors may be automatically grounded. Therefore, before removing these protector units from circuits which have potential on the cable side (telegraph loops, carrier circuits, etc), the associated equipment should be taken out of service. It may be necessary to disconnect the equipment from the cable pair to prevent damage to the equipment. For this reason, the modified B test clip with the M2EM cord is not recommended for use with the protector units, on the 121-type protector.

Disassembly of Protector Units

4.05 Disassemble the protector unit by holding the cap in one hand and the sleeve (Fig. 6) with the other hand. Withdraw the sleeve (containing the heat coil and protector blocks) from the cap.

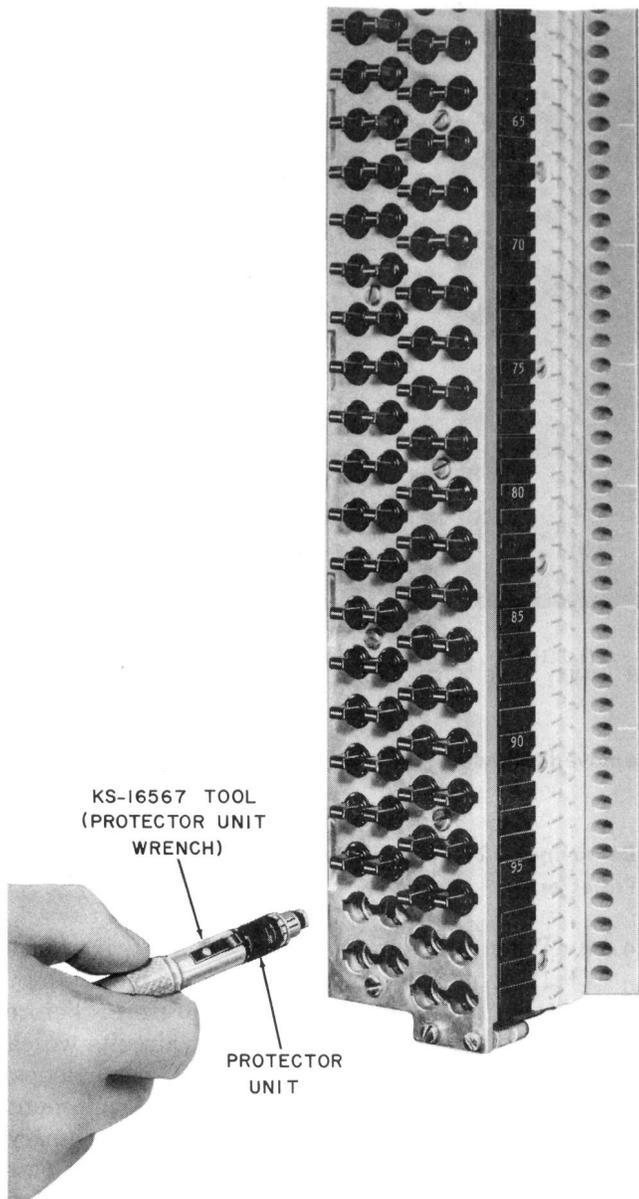


Fig. 5—Removing Protector Unit From 300-Type Connector With KS-15567 Tool

4.06 To remove the protector blocks from the sleeve, first withdraw the heat coil and then remove the blocks.

4.07 Discard porcelain blocks (33B), carbon blocks (32A or 32B), or dummy blocks (34A1) where provided, having any of the defects listed below:

- (a) Chips or cracks

- (b) Carbon surfaces show evidence of glazing or pitting
- (c) Carbon inserts are loose
- (d) Carbon sparking areas which are scratched or show signs of soft or unduly roughened spots on those areas
- (e) There is a black deposit on the porcelain extending from the carbon insert to the raised edge of the block on the moat side.

5. ASSEMBLING PROTECTOR UNITS

5.01 Place the protector blocks in the sleeve of the protector unit (Fig. 6) before the heat coil is installed.

Note: If the ends of the sleeve have been spread too far apart to hold the blocks in place, they may be squeezed together with the fingers before the blocks are placed in the sleeve.

5.02 After the protector blocks (or dummy blocks) are in place, insert the heat coil so that the operating pin falls within the hole in the sleeve of the carbon block.

5.03 Place the assembled sleeve containing the protector blocks and coil in the cap so that the end containing the protector blocks is within the cap.

Note: It may be necessary to rotate the sleeve slightly before it will enter the grooves within the cap.

5.04 The protector unit may then be held with fingers or with the KS-16567 tool and inserted into the 300-type connector. With the unit in place, twisting it 45° counterclockwise leaves it in the open position; pushing it in to the limit and twisting it 45° clockwise leaves it in the cut-through position.

6. TESTING 1A1-TYPE PROTECTOR UNITS

6.01 The 1A1-type protector units are tested on the KS-20100 test set. The test set is used in conjunction with the KS-20100, L4 adapter. The L4 adapter plugs into the test set the same as the 3- and 4-type protector units. The L4 adapter is designed to interface the test set with the

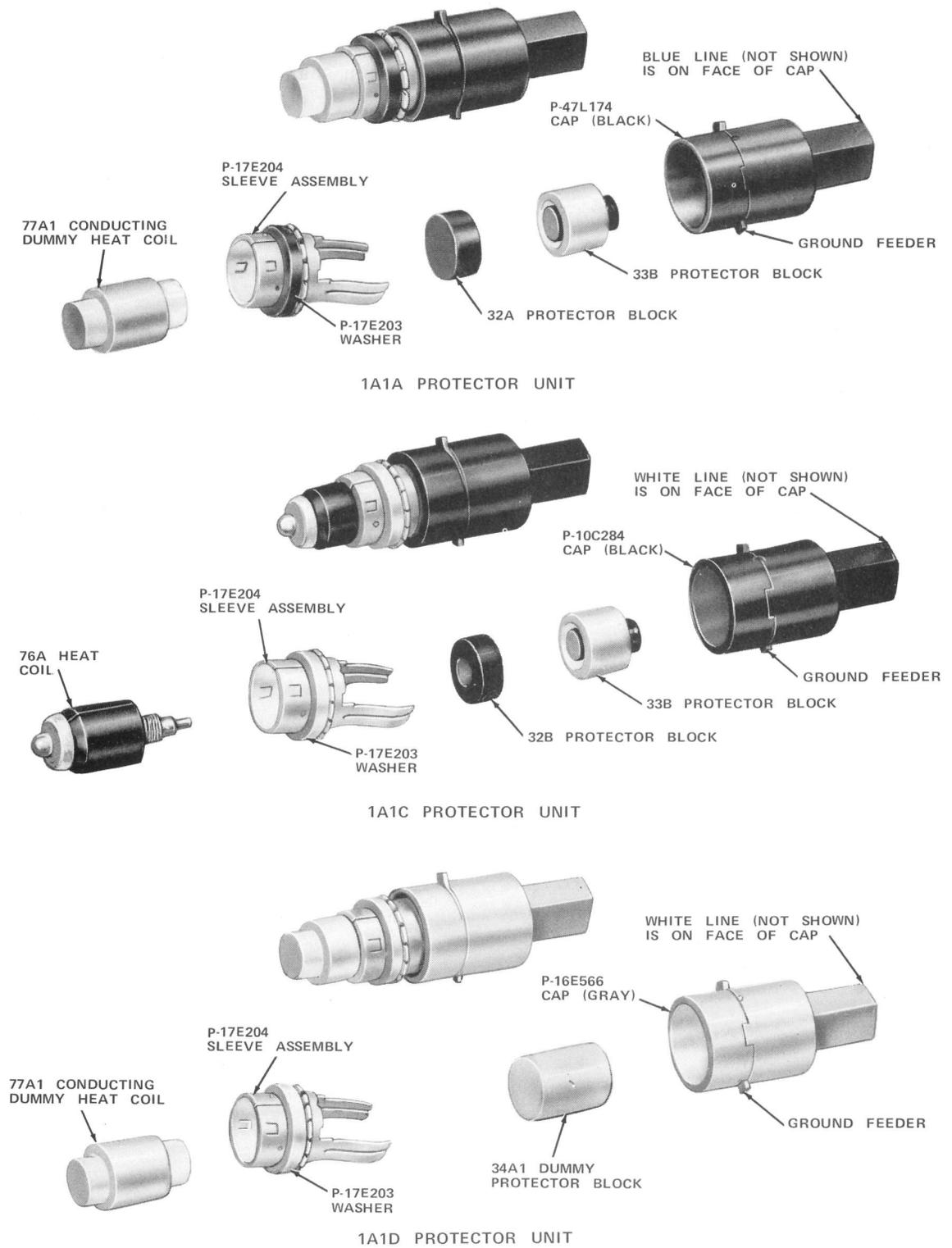


Fig. 6—1A1A, 1A1C, 1A1D Protector Unit Assemblies

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1A1-type protector unit. See Section 201-208-501 for testing procedures and perform the test as indicated for the 3- and 4-type protector units.

7. STORAGE AND USE OF HEAT COILS, PROTECTOR BLOCKS, AND PROTECTOR UNITS

7.01 Protector units and associated components shall be handled and stored carefully. They should be kept in either the original shipping cartons or in approved containers or cabinets.

7.02 Before reusing heat coils, they shall be inspected for dirty or defective contact surfaces. Heat coils which show signs of having operated, loose connections or winding, or damaged contact pin shall not be reused.

7.03 When protector units are removed from the equipment for any reason, they should be tested prior to reuse. See paragraph 6.01 for testing information.