

## C-, E-, AND SIMILAR TYPE PROTECTORS MAINTAINING PROTECTORS

### 1. GENERAL

**1.01** This section describes methods of maintaining protector blocks and heat coils used with C-, E-, and similar type protector mountings associated with main distributing frames.

**1.02** This section is issued to include and update information previously contained in Section 201-205-302 pertaining to carbon blocks and heat coils used with C-, E-, and similar type protector mountings.

**1.03** Maintaining protectors or protector units other than C-, E-, and similar types are covered in Sections 201-207-301 and 201-208-301.

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

- (a) Notify the office supervisor or 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.
- (d) If the test center requests that heat coils or protector blocks be inspected, wear insulating gloves while performing operations on the frame.
  - (1) On C-, E-, 1177, or similar type protector mountings, use the KS-2827 heat coil pliers to remove and replace heat coils; use B long-nose pliers to remove and replace protector blocks.

*Note:* Insulating gloves shall be mechanically inspected immediately before they are used in accordance with Section 075-141-501.

### 2. TOOLS AND MATERIALS

#### 2.01 *List of tools and materials.*

CODE OR	SPEC NO.	DESCRIPTION
	KS-2827	Heat Coil Pliers
	KS-14540 List 1	Protector Spring Support (for 1177, C-, and E-type protectors)
	KS-14540 List 2	Protector Spring Support (for 1268- and 1269-type protectors)
	R-1102	Fibre Spudger
	—	Insulating Gloves per Specification AT-7743
	—	B Long-nose Pliers

### 3. STORAGE AND USE OF HEAT COILS AND PROTECTOR BLOCKS

**3.01** Both the porcelain and carbon blocks shall be handled and stored carefully. They should be kept either in the original shipping cartons or in approved holders or cabinets.

**3.02** When protector blocks are removed from equipment for any reason, they shall be inspected.

**3.03** On all circuits where heat coils are used the same type of heat coil shall be used in both sides of the same circuit. In the case of phantom toll line groups, the same type of heat

#### NOTICE

Not for use or disclosure outside the  
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coil shall be used in each line associated with the same group.

**3.04** Before reusing heat coils, they shall be inspected for dirty contact surfaces and defects. Heat coils which have operated or have any of the following defects shall be discarded:

- (a) Loose connections on head of coil
- (b) Loose contact pin or washer
- (c) Damaged or loose winding
- (d) Contact pin showing evidence of having been cut or operated.

**3.05** The method of cleaning the contacts of heat coils and protector springs is covered in Section 069-315-801.

#### **4. MAINTAINING HEAT COILS AND PROTECTOR BLOCKS**

##### **A. Removing Protector Blocks**

**4.01** When removing protector blocks from circuits which are *not* suspected of having abnormally high voltages present and do *not* require special safeguarding measures (telegraph loops, carrier circuits, PBX battery, and ringing supply circuits), the following procedure is recommended.

- (1) Press the flat end of the spudger against the inside of the protector spring and move outward sufficiently to relieve the tension on the protector block.
- (2) Pull the blocks forward carefully by hand until entirely clear of the protector mounting and withdraw the spudger.

**4.02** When removing protector blocks from circuits which are suspected of having abnormally high voltages present, insulating gloves (note in 1.04) shall be worn and the following procedure should be followed.

- (1) Press the flat end of the spudger against the inside of the protector spring and move outward sufficiently to relieve the tension on the protector block.

- (2) Pull the blocks forward carefully by using the B long-nose pliers until entirely clear of the protector mounting and withdraw the spudger.

**4.03** When removing protector blocks from circuits requiring special precautions (telegraph loops, carrier circuits, PBX battery, and ringing supply circuits, etc), the KS-14540 tool should be used when directed by the test center. This tool prevents the line from becoming grounded and is used in the following manner.

- (1) Insert the metal prong of the KS-14540 tool under the front end of the protector spring and raise the spring about 1/8 inch. Slide the tool along the spring approximately 1/2 inch, taking care not to dislodge adjacent protector blocks.
- (2) Allow the spring tension to draw the tool toward the protector, noting that the fibre legs of the tool rest on the porcelain frames of the adjacent blocks (Fig. 1).
- (3) With the tool in place, as shown in Fig. 1, remove the blocks by hand.
- (4) Reverse the procedure to place the blocks in the protector mounting.

##### **B. Inspecting Porcelain and Carbon Blocks**

**4.04** Inspect porcelain and carbon blocks for indications of chips and cracks. One side of the carbon block may show sufficient pitting to cause rejection of the use of that side, but if the reverse side appears satisfactory, the latter side of the block should be utilized. Discard porcelain and carbon blocks if subject to any of the defects listed below. Judge all dimensions by eye.

- (a) Porcelain blocks which have chips in the porcelain of greater dimensions than those shown in Fig. 2 and 3. As shown in Fig. 2, all four spring groove wall corners may be chipped provided the two larger chips are on opposite ends of the block.
- (b) Porcelain blocks which have any chip or crack in the porcelain that extends to the carbon insert.

- (c) Porcelain blocks which show evidence that the carbon insert has moved.

**Note:** This condition may be indicated by cracked or otherwise damaged cement between the carbon insert and the porcelain.

- (d) Porcelain and carbon blocks in which the operating surfaces contain any pit greater than 1/16 inch in diameter.

- (e) Porcelain blocks in which the carbon insert contains a chip which extends closer to the center than 1/16 inch. On the spring contact surface this chip shall not extend along the edge for a distance greater than the width of the block. On the sparking surface this chip shall not extend along the edge for a distance greater than the width of the insert.

- (f) Carbon blocks in which the chips exceed the following requirements.

- On 26-type protector blocks, chips shall not extend closer to the center than 1/16 inch from the long sides and 3/8 inch from the ends.
- On 28-type protector blocks, chips shall not extend closer to the center than 1/32 inch from the long sides and 1/4 inch from the ends.

**4.05** Do *not* attempt to clean the operating surfaces of porcelain and carbon blocks. Discard blocks which are noisy or have grounded.

- (g) Carbon sparking areas which are glazed, scratched or cracked, or show signs of soft or unduly roughened spots on those areas.

**Note:** Do not discard blocks because of discoloration of the carbon or porcelain surfaces.

- (h) There is a black deposit on the porcelain extending from the carbon insert to the raised edge of the block on the moat side.

**4.06** Reuse carbon and porcelain blocks which do not have any evidence of the defects outlined in 4.04 and 4.05.

### C. Placing Protector Blocks

**4.07** Place carbon and porcelain blocks, except as covered in 1.04 and 4.03, by holding the blocks firmly by hand and pressing in place on the protector mounting so that the outside protector spring rests squarely against the carbon insert of the porcelain block. Avoid sliding motion between the blocks as resultant loosened particles are a potential service hazard.

**Note:** Check to see that the blocks rest between the protector springs properly.

### D. Removing and Placing Heat Coils

**4.08** When it is necessary to remove heat coils from circuits which *do not* have abnormally high voltages present, the heat coils may be removed with the KS-2827 heat coil pliers. When it is suspected that high voltages *are* present, wear insulating gloves (note in 1.04).

**4.09** Place heat coils in the protector mounting so that the solder on the washer of the heat coil will be in the protector spring slot and the protector spring will be in contact with the metal washer. If the coil is placed in any other position, the protector spring may rest on a portion of the solder; this condition will likely cause a poor connection with resultant service trouble.

**Note 1:** This procedure need not be observed when placing the 73A-type heat coils.

**Note 2:** When placing the 75A- and 76A-type heat coils, the slot must be oriented toward the rear to avoid damage to the wire where it is welded to the cap.

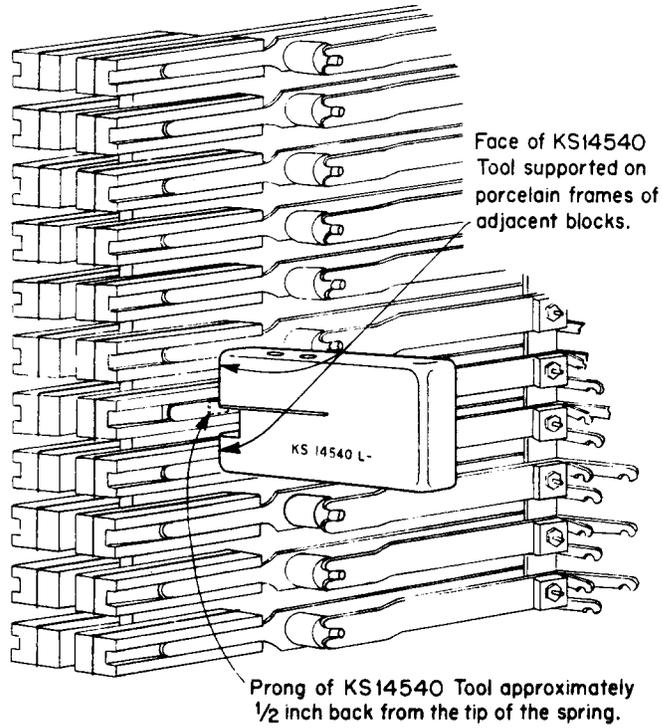


Fig. 1—Method of Using KS-14540 Tool

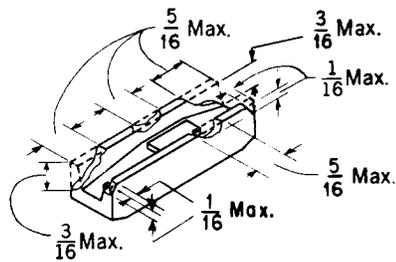


Fig. 2—Maximum Permissible Chips in Spring Groove Walls

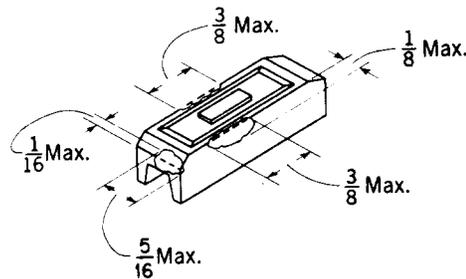


Fig. 3—Maximum Permissible Chips in Moat Walls