

**RELAYS**  
**U, UA, AND 271 TYPE**  
**PIECE-PART DATA AND REPLACEMENT PROCEDURES**

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**1.05** Before making any replacement on the apparatus covered herein, remove the circuit from service.

**1. GENERAL**

**1.01** This section covers the information necessary for ordering parts to be used in the maintenance of U-, UA-, and 271-type relays. It also covers approved procedures for replacing these parts.

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

- (1) To revise list of tools and gauges
- (2) To revise paragraph 3.05(1) and change it to 4.04(1).

**1.03** Part 3 of this section covers the piece-part numbers and the corresponding names of the parts which it is practicable to replace in the field in the maintenance of the relays. No attempt should be made to replace parts not designated. Part 3 also contains explanatory figures showing the different parts.

**1.04** Part 4 of this section covers the approved procedures for the replacement of the parts covered in Part 3.

**2. APPARATUS**

**2.01 List of Tools and Gauges**

CODE OR SPEC NO.	DESCRIPTION
<b>TOOLS</b>	
474A	3/16- by 1/4-inch closed double-end offset wrench
KS-6320 L1	Orange stick (wood)
KS-6320 L2	Orange stick (plastic)
—	B scissors
—	3-inch C screwdriver
—	4-inch E screwdriver
—	B long-nose pliers
—	Diagonal pliers
<b>GAUGES</b>	
131A	Thickness gauge nest (Consists of a nest of 132-type gauges)

**3. PIECE-PART DATA**

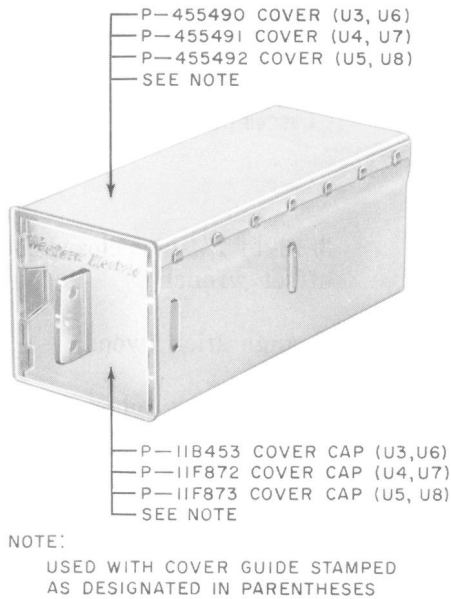
**3.01** The figures included in this part show the various piece parts in their proper relation to other parts of the relay. The piece-part numbers of the various parts are given together with the names of the parts as listed by the Western Electric

**NOTICE**

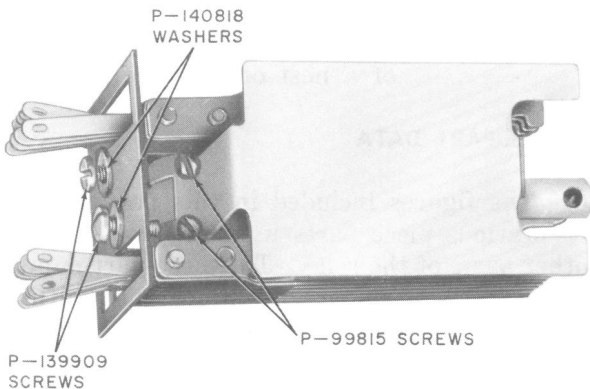
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Company Merchandise Department. When these names differ from those in general use in the field, the latter names, in some cases, are shown in parentheses.

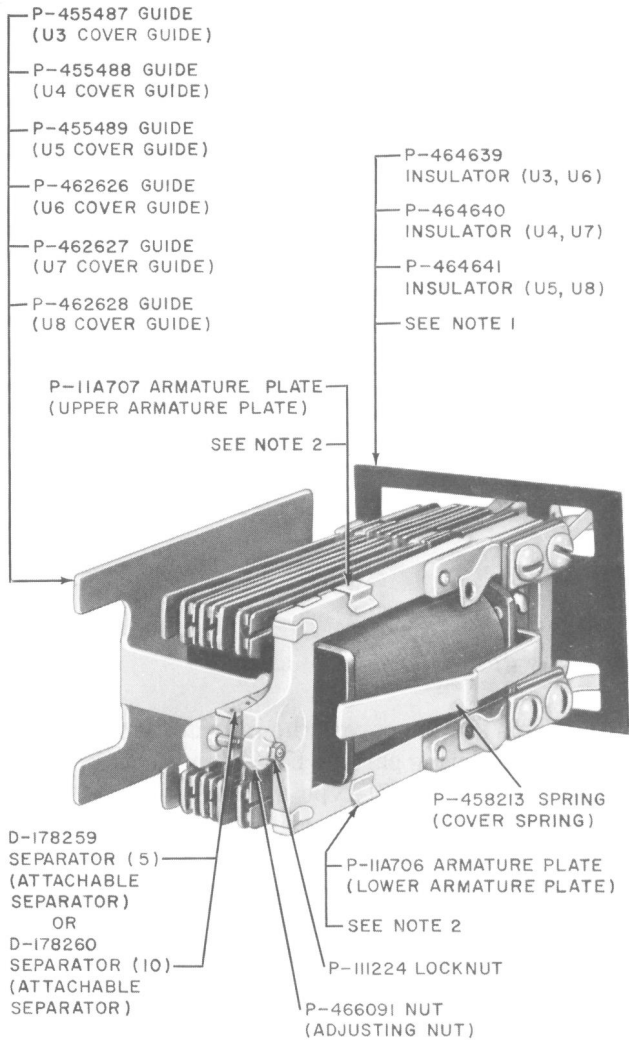
**3.02** When ordering parts for replacement purposes, give both the piece-part number and the name of the part; for example, "P-466091 Nut." Do not refer to the BSP number or to any information shown in parentheses following the piece-part number.



**Fig. 1—Cover and Cover Cap (U4 Illustrated)**



**Fig. 2—U-Type Relay—Side View**



NOTES:  
 1. USED WITH COVER GUIDE STAMPED AS DESIGNATED.  
 2. USED ON U-TYPE RELAY ONLY.

**Fig. 3—U-Type Relay—General View**

**4. REPLACEMENT PROCEDURES**

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

**4.02** After making any replacement of parts of a U-, UA-, or 271-type relay, the part or parts replaced shall meet the readjust requirements involved as specified in Section 040-518-701 covering the U- and UA-type relays and Section 040-260-701 covering the 271-type relay. Other parts whose

adjustments may have been directly disturbed by the replacing operations shall be checked to the readjust requirements, and an overall operation check shall be made of the relay before restoring the circuit to service.

**4.03 Cover Spring, Cover Guide, and Insulator:** To replace a cover spring, cover guide, or insulator, remove the relay from the mounting plate as follows. Unsolder and tag the leads. Remove the mounting screws with the 4-inch E screwdriver and remove the relay. If the insulator is to be replaced, remove it and substitute the new insulator. If the cover spring or cover guide is to be replaced, remove the associated mounting screws using the 3-inch C screwdriver. Remove the spring or guide, as required, and substitute the new parts. Position the mounting end of the cover spring under the winding terminals at the rear of the relay core and, while holding the spring in place, mount the cover guide over the core at the opposite side of the relay. Insert and securely tighten the associated mounting screws. Check that the cover spring clears the winding terminals. Remount the relay securely on the mounting plate. Connect and solder the leads to the proper terminals.

**4.04 Attachable Separator (U and 271 Type)**

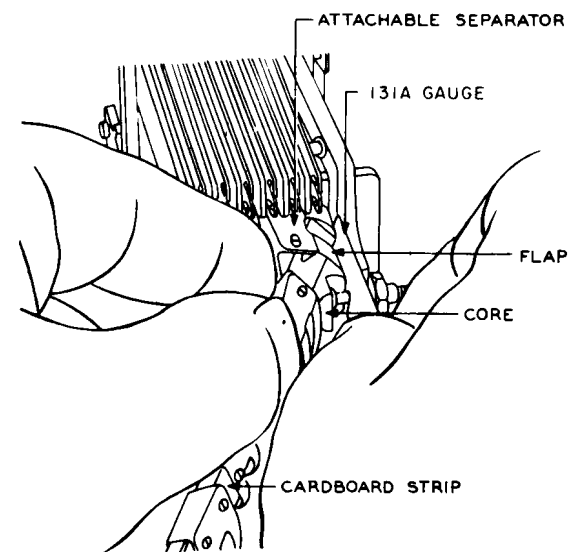
- (1) Where an attachable separator has previously been used and is to be replaced, use a 3-inch C screwdriver to remove the separator from the core. Note the thickness of the separator that was removed.

Separators should be used as follows: When metal clip is marked 5 (0.005) use D-178259, 10 (0.010) use D-178260, and 15 (0.015) use D-178261.

To mount a separator, proceed as covered in (2) for relays having an adjusting stud and (3) for relays having a welded stud.

- (2) Insert the 0.004-inch blade of the 131A gauge into the armature gap to guide the flap of the attachable separator into position. This is done to prevent the flap of the separator snagging on the stop discs. Hold the cardboard strip of separators in the left hand, with the flap of the first separator toward the core of the relay and the free edge of the flap downward. Straighten the right-hand end of the strip. Using

the index finger of the left hand, slide the separator approximately 1/8 inch over the end of the strip and insert the free edge of the flap between the gauge and the core. Take care that the flap is entirely behind the adjusting stud and that the front and rear corners of the flap enter the armature gap at the same time. Slide the flap into position and, while holding the separator in place with the index finger of the left hand, as shown in Fig. 4, withdraw the strip. Turn the metal clip in a counterclockwise direction until the ears are in a vertical position. Snap the metal clip over the core so that the ears rest against the step on the later type of core or against the front end of the earlier type of core and then remove the gauge. Proceed as covered in (4).



**Fig. 4—Method of Applying Attachable Separator on Core**

- (3) Using the B scissors or the diagonal pliers, remove the ears of the attachable separator after removing the separator from the cardboard strip. Remount the separator on the cardboard strip, and proceed as follows. Insert the 0.004-inch blade of the 131A gauge into the armature gap to guide the flap of the attachable separator into position. This is done to prevent the flap of the separator from snagging on the stop discs. Hold the cardboard strip of separators in the left hand with the flap of the first separator

toward the core of the relay and the free edge of the flap downward. Straighten the right-hand end of the strip. Using the index finger of the left hand, slide the separator approximately 1/8 inch over the end of the strip and insert the free edge of the flap between the gauge and the core. Take care that the flap is entirely behind the welded backstop and that the front and rear corners of the flap enter the armature gap at the same time. Slide the flap into position and, while holding the separator in place with the index finger of the left hand as shown in Fig. 4, withdraw the strip. Turn the metal clip in a counterclockwise direction until the side of the metal clip having the stamped designation (thickness of separator) is in the vertical position. Snap the metal clip over the core, and then proceed as covered in (4).

(4) With the separator in place, make sure that the edges of the window of the flap do not touch the stop discs and that there are no wrinkles or snags in the flap. If there are wrinkles or snags, remove the separator as covered in (1) and replace it.

#### 4.05 *Attachable Separators (UA Type)*

(1) When an attachable separator has previously been used and is to be replaced, use a 3-inch C screwdriver or B long-nose pliers to remove the separator. Note the thickness of the separator that was removed. Replace the separator with an 840280127 (0.005 inch) or 84028135 (0.010 inch) as applicable. Mount a new separator as covered in (2) below.

(2) Perform the plastic separator to a U shape by bending both tabs at the coined grooves on the tabs. Grasp the separator by one tab with the KS-8511 tweezers and, with the formed tabs pointing toward the relay core, guide the separator into a position above the core and between the top spring pileup and the armature. Using the KS-6320 orange stick, slide the separator downward between the core and armature until the lower tab of the separator projects below the core. Release the separator, and wrap both of its tabs around the core with the KS-6320 orange stick. Pick up the retaining clip at its midsection with the KS-8511 tweezers and, holding it vertically in the plane of the armature, insert the lower tab of the clip downward through the slot in the separator. Using the KS-6320

orange stick, bend the lower end of the clip upward to form a bend line approximately 1/8 inch from the midsection and flatten the end against the clip. Hold the clip against the core with the KS-6320 orange stick, and use the KS-8511 tweezers to guide the upper end of the clip through the slot on the upper tab of the separator. Bend the end of the clip downward to form a bend line approximately 1/8 inch from the midsection of the clip, and flatten the clip firmly against the core with the KS-6320 orange stick. Manually operate the armature to ensure proper relay operation.

***Warning: Only light tension is required to retain the attachable separator. Excessive tightening of the clip will result in either buckling or tearing of the plastic separator.***

**4.06 *Adjusting Nut and Lockout:*** To replace the locknut, if provided, remove it with the 474A wrench. Substitute the new locknut, and tighten it to meet the requirement covered in Section 040-518-701. To replace the adjusting nut, remove the locknut, if provided, and then the adjusting nut using the 474A wrench. Substitute the new adjusting nut, and tighten it to meet the requirement specified in Section 040-518-701 covering the U- and UA-type relays and Section 040-260-701 covering the 271-type relay. Mount the locknut, if provided, and tighten it to meet the requirement covered in Section 040-518-701.

#### 4.07 *Armature Plate*

(1) To remove an armature plate, proceed as follows. Using the KS-6320 orange stick, push the front clip of the armature plate so that the vertical portion of the plate projects slightly beyond the armature. Grasp this portion of the plate with the B long-nose pliers, and pull the plate forward off the armature. Mount a new armature plate as covered in (2) and (3).

(2) Insert the KS-6320 orange stick between the armature leg and the adjacent spring until the tip of the orange stick rests against the spring stud. Move the spring away from the armature to provide stud clearance for mounting the armature plate. Holding the armature plate with the disc toward the relay springs, place the rear clip of the plate over the leg of the armature. Slide the plate toward

the rear of the relay until the front clip fits snugly against the front edge of the armature leg. Withdraw the orange stick, and check that the end of the spring stud rests against the armature plate within the circumference of the disc on the plate. Also check that the positioning tab and rear clip of the plate rest against the inner edge of the armature leg as shown in

Fig. 3. If necessary, properly position the plate on the armature leg with the orange stick.

(3) After mounting the armature plate, check the relay to all requirements covering the springs and also to the electrical requirements covered in Section 040-518-701.