

RELAYS

245, 254, 263, AND 264 TYPES

PIECE-PART DATA AND REPLACEMENT PROCEDURES

1. GENERAL

1.01 This section covers the information necessary for ordering parts to be used in the maintenance of 245, 254, 263 and 264 type relays. It also covers approved procedures for replacing these parts.

1.02 This section is reissued to incorporate material from the addendum in its proper location. In this process marginal arrows have been omitted.

1.03 Part 2 of this section covers the piece part numbers and the corresponding names of the parts which it is practicable to replace in the field. No attempt should be made to replace parts not designated. Part 2 also contains explanatory figures showing the different parts. This information is called "Piece Part Data".

1.04 Part 3 of this section covers the approved procedures for the replacement of the parts covered in part 2. This information is called "Replacement Procedures".

2. PIECE PART DATA

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

2.02 When ordering piece parts for replacement purposes, give both the number and name of the piece part. For example: "P-454330 Armature". Do not refer to the B.S.P. number or to any information shown in parenthesis following the piece part numbers.

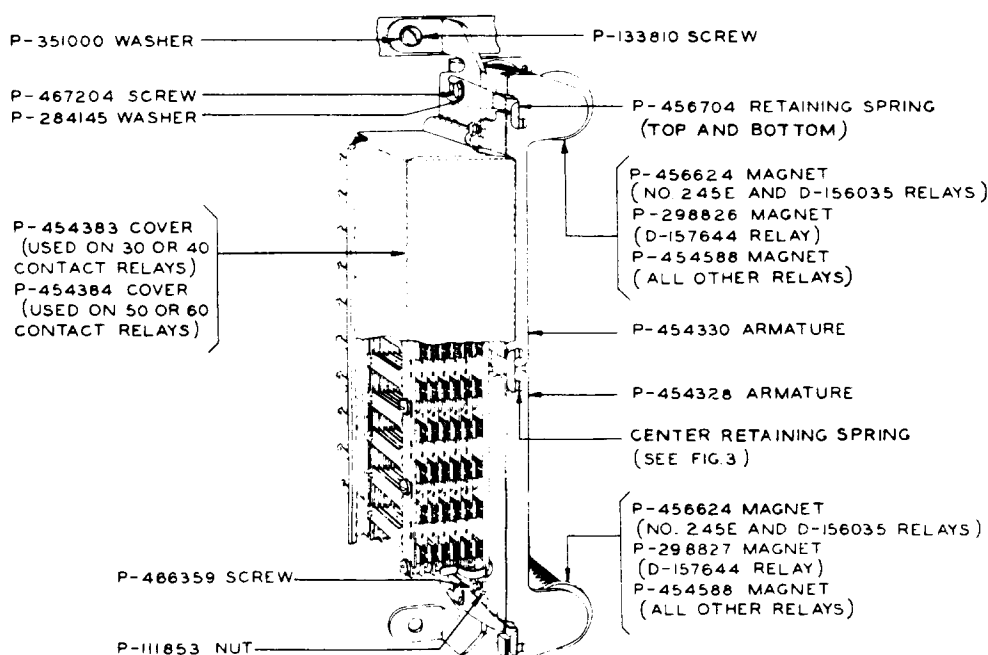
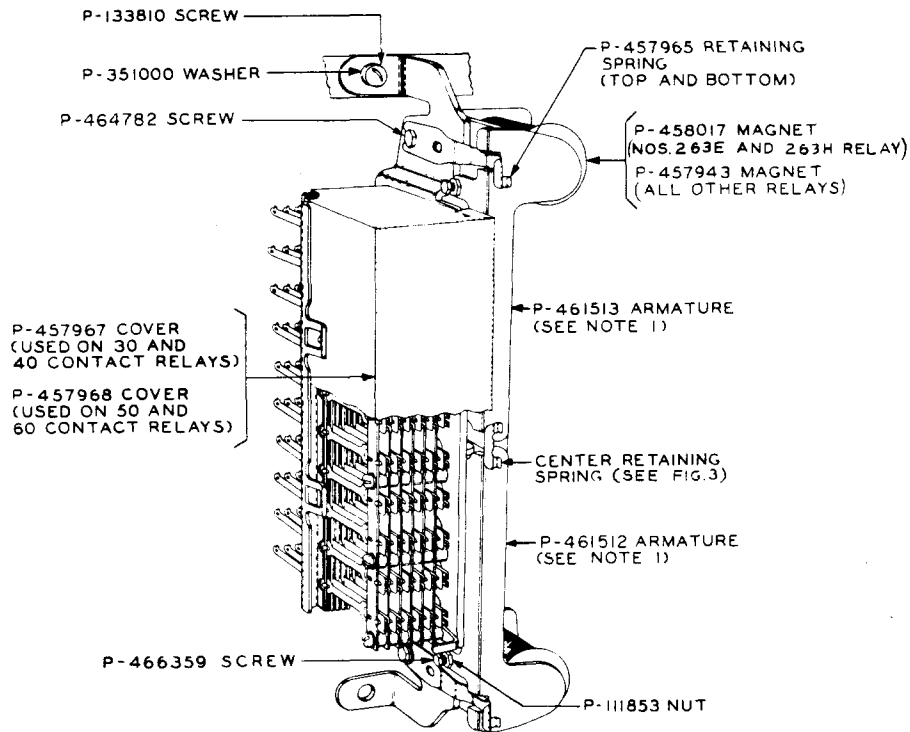


FIG. 1 - PARTS OF 245 AND 254 TYPE RELAYS



NOTE 1 - WHEN THE ARMATURE TO BE REPLACED IS ONE OF TWO SOLID TYPE ARMATURES, ORDER P-461512 AND P-461513 ARMATURES ("TAB" TYPE ARMATURES) AND REPLACE BOTH PARTS. IF THE ARMATURE TO BE REPLACED IS A "TAB" TYPE ARMATURE, ORDER ONLY THE ARMATURE THAT REQUIRES REPLACEMENT.

FIG. 2 - PARTS OF 263 AND 264 TYPE RELAYS

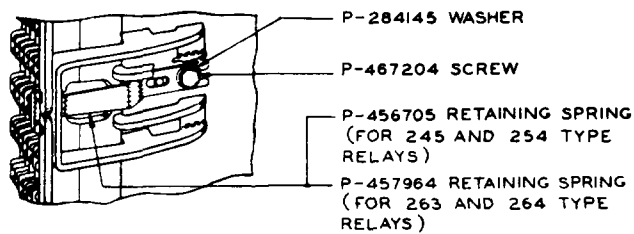


FIG. 3 - CENTER RETAINING SPRINGS AND ASSOCIATED PARTS

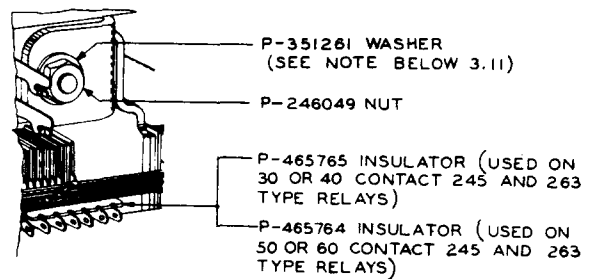


FIG. 4 - MAGNET CLAMPING NUT AND INSULATOR MOUNTED ON SOLDERING TERMINALS

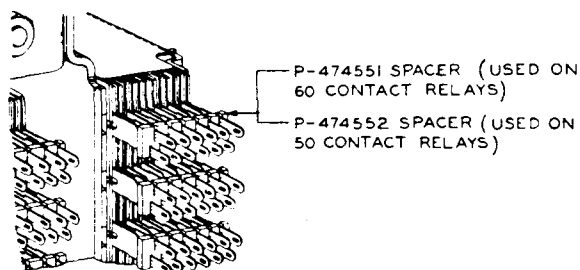
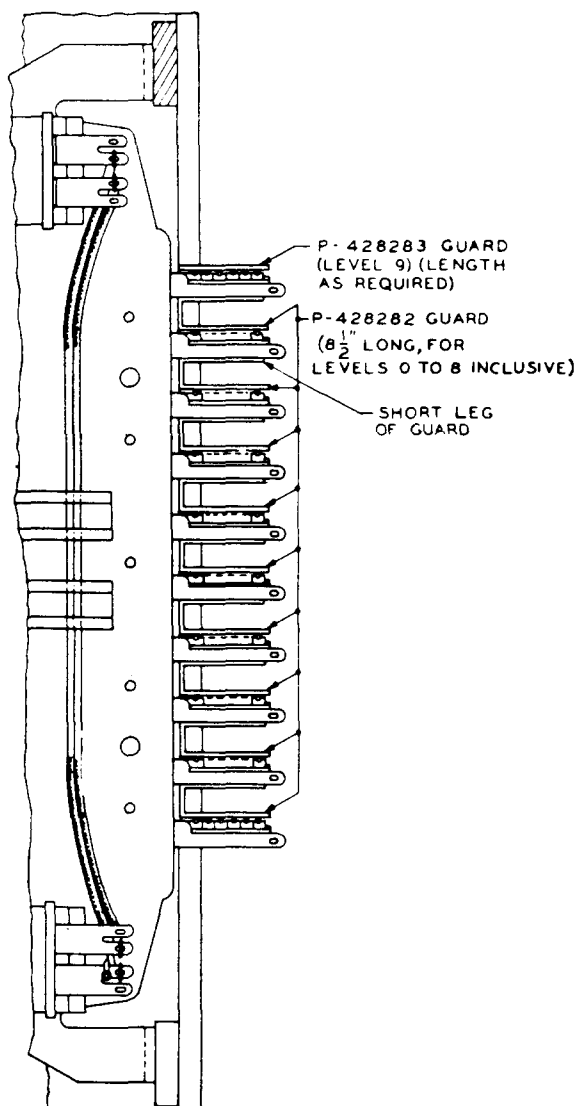


FIG. 5 - TERMINAL SPACER MOUNTED ON TERMINALS OF 264 TYPE RELAYS



PARTIAL END VIEW

FIG. 6 - GUARDS USED TO PROTECT HORIZONTAL STRAP WIRING OF 263 AND 264 TYPE RELAYS

3. REPLACEMENT PROCEDURES

3.01 List of Tools and Materials

Code or Spec. No.	Description
485A	Smooth Jaw Pliers
532B	Adjuster
541A	1/4" 12 Point Double End Box Wrench
544A	1/4" Hex. Offset Socket Wrench (For 245 and 254 type relays only)
568A	1/4" 12 Point Offset Box Wrench (For 263 and 264 type relays only)
569A	Spring Support
KS-6320	Orange Stick
KS-14164	No. 4 Artists Show Card Brush
-	4" Regular Screwdriver
KS-14220 List 1, 7 and 14	7/16" T-Handle Socket Wrench
-	P-Long Nose Pliers
-	Electricians Scissors

Materials

KS-8496	No. 3 Lubricating Compound
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3.02 After making any replacement of parts of a relay, the part or parts replaced shall meet the readjust requirements involved as specified in B.S.P. Section 040-247-701 covering this apparatus. Other parts whose adjustments have been disturbed by the replacing operations shall be checked to the test requirements and an over-all operation check shall be made of the relay before restoring the circuit to service.

3.03 No replacement procedures are specified for screws or other small parts where the replacement consists of a single operation.

3.04 Do not apply excessive pressure when tightening any screw or nut as the head of the screw may be twisted off the thread or the nut stripped.

3.05 Relay Cover Tightness: When the cover of a 245 or 254 type relay equipped with a cover clamp of the type illustrated in Fig. 7 is removed, exercise

care to replace the cover on the same relay from which it was removed. If the covers of these relays are interchanged, a loose fit may result. If the cover rattles when the relay operates, indicating looseness, this may be corrected by bowing the portion of the cover which is engaged by the cover clamp toward the clamp with the fingers.

3.06 Top and Bottom Retaining Spring:

Loosen the retaining spring mounting screw of the spring affected with the No. 541A wrench and remove the spring. Substitute the new part, sliding the slotted end of the spring under the mounting washer

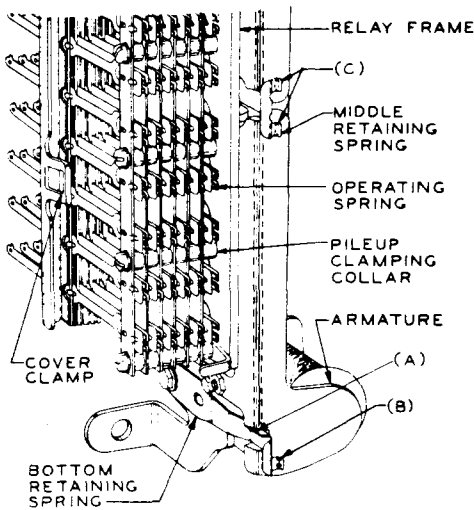


FIG. 7 - LUBRICATION POINTS BETWEEN ARMATURE AND RETAINING SPRINGS

Tighten the mounting screw securely. Apply a thin coat of KS-8496 No. 3 lubricating compound with the KS-14164 brush to the points of contact between the retaining spring and the armature, designated A and B, shown on Fig. 7. To insure a thin coat of the lubricant, remove the excess lubricant from the brush by scraping it on the edge of the container. After applying the lubricant, allow the parts lubricated to remain idle for approximately 15 minutes to permit the solvent in the lubricant to evaporate.

3.07 Middle Retaining Spring and Armature:

Place the No. 569A spring support between the relay frame and the operating springs nearer the relay frame as shown on Fig. 8. Position the spring support so that the slots in the spring support engage the spring assembly clamping collars and the beveled edge is toward the contacts. Then lift the top retaining spring out of the slot in the upper armature and pull the end of the armature forward about 1/4". Raise the middle retaining

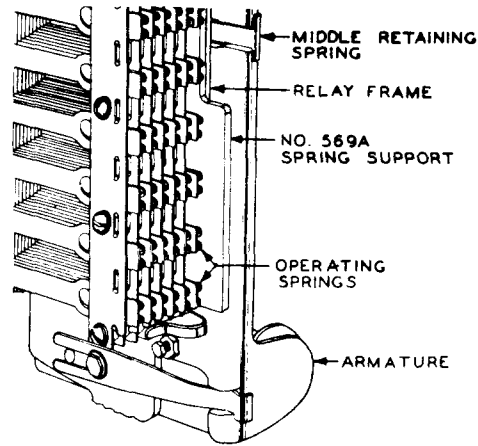


FIG. 8 - POSITION OF SPRING SUPPORT WHEN REMOVING AND REPLACING ARMATURE

spring and remove the armature. Remove the lower armature in the same manner. Loosen the middle retaining spring mounting screw about 3/4 turn with the No. 544A or No. 568A wrench and remove the spring. Take care not to loosen the screw much beyond the specified amount. Use care in tightening it to avoid twisting off the head, since replacing the screw is a difficult operation (see 3.10).

3.08 Where an armature is replaced, the pole piece knife edges and the armature backstop bracket knife edge should be lubricated. First remove the top and bottom retaining spring as covered in 3.06. Then apply a thin coat of KS-8496 No. 3 lubricating compound with the KS-14164 brush to the pole piece knife edges and the armature backstop bracket knife edges shown in Fig. 9. Take care that the lubricant does not extend for more than approximately 3/32" on either side of the knife edges. The pole piece is 5/32" thick. To insure a thin coat of the lubricant, remove the excess lubricant from the brush by scraping it on the edge of the container. Also lubricate the points of contact between the armature and the top and bottom retaining springs as covered in 3.06. A thin coat of KS-8496 lubricating compound should also be applied at the points of contact between the middle retaining spring and the armature, designated C in Fig. 7. After applying the lubricant, allow the parts lubricated to remain idle for approximately 15 minutes to permit the solvent in the lubricant to evaporate. Where only an upper or lower armature is replaced, only the knife edges associated with the replaced part and contact points with retaining springs need be lubricated. Where the middle retaining spring only is replaced, the knife edges need not be lubricated, but the points of contact between the retaining spring and the armature should be lubricated.

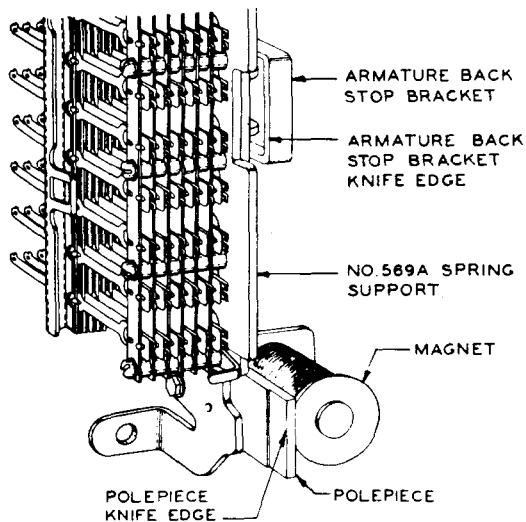


FIG 9 - LUBRICATION OF KNIFE EDGES

3.09 When the lubricant is dry, remount the top and bottom retaining springs as covered in 3.06. Substitute the new middle retaining spring and mount it in its place. It will be necessary to turn out the middle retaining spring mounting screw a few turns in order to place (with the assistance of a screw driver blade) the spring under the washer. The number of turns that the screw may be turned out safely can be determined by observing the amount that the screw projects through the relay frame. This will be usually about 5 turns, except on some 245 and 254 type relays, where a shorter screw was used. In these cases, it may be found advisable to replace the shorter screw by the longer one used on the present design of relay, so that the spring may be placed under the washer. Partially tighten the spring mounting screw. Raise either the top or bottom retaining spring and place the associated armature under it. Then raise the middle retaining spring and push the armature into position. Reassemble the other armature in the same manner. Remove the No. 569 spring support.

Caution: When replacing the middle retaining spring on 245 and 254 type relays, make sure that the spring does not bind with the armature backstop lugs. If necessary, reposition the armature backstop lugs as follows: Place the handle of the No. 532B adjuster between the top and bottom armature backstop lugs as shown in Fig. 10. To position the top lug away from the retaining springs, use the tool as a lever pressing it slightly upwards. To position the bottom lug, press the tool downwards. Take care not to spread the lug more than necessary

to obtain a clearance, as the lug controls the armature position. Also make sure that the end of the tool is positioned at the rear of the backstop bracket.

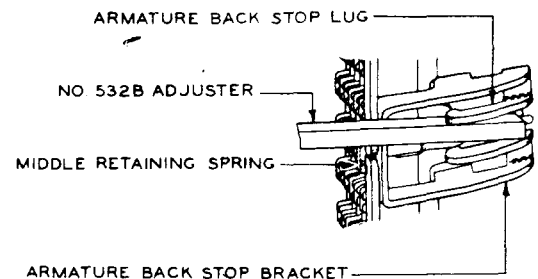


FIG 10 - METHOD OF ADJUSTING ARMATURE BACK STOP LUG FOR CLEARANCE

3.10 Middle Retaining Spring Mounting Screw and Washer: Where adjacent apparatus does not permit easy access to the middle retaining spring mounting screw, loosen the relay mounting screws of the relay under consideration, and the relay to the immediate right, with the 4" regular screw driver. Shift the relays so as to allow as much room as possible between them, taking care not to break the soldered connections. Remove the armatures as outlined in 3.07. Remove the retaining spring mounting screw with the No. 544A or 568A wrench and remove the washer, taking care not to allow the washer to drop off the screw. Substitute the new parts. Set the screw in the wrench and note its position. If difficulty is experienced in mounting the screw, shift the position of the screw slightly. Repeat this operation until the screw takes hold. Remount the retaining spring as outlined in 3.09 and tighten the screw securely. Remount the armatures as outlined in 3.09. Tighten the relay mounting screws securely in place.

3.11 Magnet: Remove the armature associated with the magnet to be replaced as outlined in 3.07. Disconnect the wiring to the magnet. Remove the magnet clamping nut with the T-handle socket wrench and remove the washer (see note). Remove the magnet and substitute the new one. To prevent the magnet from twisting and crossing the winding terminals with the frame when the nut is tightened, it will be necessary to have a helper insert the blade of the 4" regular screw driver from the front of the relay between the magnet spoolhead and the frame and twist it enough to hold the spoolhead in its proper position. Mount the washer (see note) and clamping nut and tighten the nut securely in place. Remount the armature as outlined in 3.09 and connect the wiring to the magnet.

Note: Some 245 and 254 type relays were equipped with washers under

the magnet clamping nuts. On these relays, it is advisable to use the washer when remounting the magnet.

3.12 Terminal Spacer: Unsolder the wires from the terminals associated with the spacer to be replaced and remove all excess solder from the terminals. Then remove the old spacer with the No. 485A smooth jaw pliers. Hold the new spacer so that the wide surfaces are vertical and the staggered arrangement of the slots lines up with the terminal arrangement. Then carefully push the spacer into position, making sure that each terminal enters its slot in the spacer. When all terminals are properly engaged, use a screw driver blade to continue pushing the spacer until it is locked behind the embossing on the terminal. Resolder the wires to their proper terminals.

Wiring Guards on Levels 0-8 Inclusive

3.13 Removing Guard: To remove a wiring guard, proceed as follows. Where necessary, break the guard away from the wires using the fingers or a KS-6320 orange stick. Then grasp the guard near one end with the P-long nose pliers and pinch the edges together. Pull the guard forward at a slight angle until it clears the wires. In some cases, it may be necessary to move the wires up or down to permit the withdrawal of the guard. Where the relay positions adjacent to the guard to be removed are unequipped, the guard may be slid sideways before removing it, instead of at an angle.

3.14 Preparation of Guards: Before mounting a guard, proceed as follows. Determine the size of the guard to be used. Where the guard that is furnished is too long, cut it to the proper size using the electricians scissors. Where the guard is too short, use two or more guards as required. In such cases, cut the guards long enough to permit them to overlap one another approximately 1/2". Where a guard is adjacent to multi-duct sleeving, make sure that it is long enough to extend beyond the adjoining end of the sleeving so as to overlap the sleeving approximately 1/4".

3.15 Mounting Guards: Hold the guard with the long nose pliers as described in 3.13 with the short leg up. Then, starting at the point from where the guard was previously removed, insert the new guard at a slight angle between the rows of terminals. As the guard is moved to the left, pinch the front end and insert it into position. Take care that the guard does not snag on the terminals as it is inserted. Make sure that where two or more guards are used on one level that the guards overlap adjacent guards approximately 1/2". The overlap should be made between relays. Also see that it overlaps adjacent multi-duct sleeving, when used, by approximately 1/4".

3.16 Dress all wires that were disturbed during the removing and replacing procedures.

Wiring Guards on Level 9

3.17 Removing Guard: To remove a guard from level 9, proceed as follows. Remove the guard from level 8 as described in 3.13. Remove the guard from level 9 using the fingers or a KS-6320 orange stick to loosen the guard. Where the guard cannot be removed in this manner, apply a soldering copper to the strap wires at the points where the guard is secured on the wires. Take care that the soldering copper does not touch adjacent wiring. Hold the soldering copper against the wire long enough to soften the guard sufficiently to permit prying it from the wiring with the P-long nose pliers. Repeat this at each point where the wire is secured to the guard and remove the guard.

3.18 Preparation of Guards: Cut the guard to proper length using the electricians scissors. When the guards terminate at the ends of multi-duct sleeving make sure to cut them long enough so that they extend beyond the adjoining end of the sleeving by approximately 1/4".

3.19 Mounting Guards: Place the guard in position. Starting at the center relays, apply a soldering copper beneath the outer strap wire at a point between the terminals of adjacent relays, at the same time pressing the guard down on the strap wiring with the long nose pliers until the wire becomes embedded in the guard. Withdraw the copper but do not release the pressure on the guard until the guard has cooled sufficiently to stay in position. Repeat this at several other points so that the guard is held firmly in position. A slight bending of the guard is permissible where necessary to clear the soldering notches of the terminals. After the guard has been secured in place, check the soldered connections at the relays adjacent to the points where the guard was secured to the wire.

Caution: Take care when applying the soldering copper to the wires not to cross adjacent wires.

Note: It is important that the tip of the soldering copper is clean and free from tin, because any solder or foreign material embedded in the guard may cause shorts, or partial shorts, which would be difficult to locate. Remove the tin from the tip of the soldering copper before heating the soldering copper.

3.20 When the top guard has been securely fastened in position, remount the guard between the 8th and 9th levels as described in 3.15.