

**PERFORATORS**  
**KS-13882 L1, L2, AND L3**  
**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 the KS-13882 L1, L2, and L3 perforators. It also covers the approved procedures for replacing these parts.

**1.02** This section is reissued to revise the piece-part data, to revise the list of tools and materials, and to revise the replacement procedures covering armature bearing pin and drum advance checking mechanism. Detailed reasons for reissue will be found at the end of the section.

**1.03** Part 2 of this section covers the piece-part numbers and corresponding names of the parts which it is practicable to replace in the field in the maintenance of the KS-13882 L1, L2, and L3 perforators. No attempt should be made in the field 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 piece parts listed in Part 2. This information is called Replacement Procedures.

**1.05** After any part is replaced, it is necessary to check the perforator on the reader and perforator test table per SD-40040-01 or SD-95497-01. To check the perforator, proceed as covered in Section 034-306-501 or 034-306-502. In offices where this test table is not available, it will be necessary to ship the perforator to a maintenance center for check. In shipping the perforator, use the KS-14131 carrying case as covered in Section 034-306-701.

**1.06** *One dip of KS-16326 L1 oil or KS-16832 L2 lubricant* for the purpose of this section is the amount of oil or lubricant retained on the KS-14164 brush after being dipped into the oil or lubricant to a depth of 3/8 inch and scraped lightly against the side of the container as the brush is removed.

**1.07** *Preparation of KS-16832 L2 Lubricant:*

This lubricant is provided in 2-ounce and 1-pint containers. A small wide-mouth container, such as the 2-ounce jar in which the lubricant is available, should be used as a receptacle from which to dispense the lubricant. If allowed to stand more than 1 day without agitation, the lubricant ingredients tend to separate; therefore, before each day's use, shake the container of lubricant for approximately 30 seconds to insure mixing of the ingredients. The proper method of shaking the lubricant consists of repeated, rapid turning of the container to an upside down position and back to the upright position. If the lubricant from a 1-pint container is to be used, the lubricant must be mixed as just described before it is poured into the smaller container. Under storage conditions, the cover should be tight on the container.

**2. PIECE-PART DATA**

**2.01** The figures included in this part show the various piece parts in their proper relation to other parts. 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 parentheses.

**2.02** When ordering piece parts for replacement purposes, give both the number and name of the piece part; for example, P-462781 Magnet Assembly. Do not refer to the BSP number or to any information shown in parentheses following the piece-part number.

**2.03** Information enclosed by parentheses is not ordering information. This information 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.

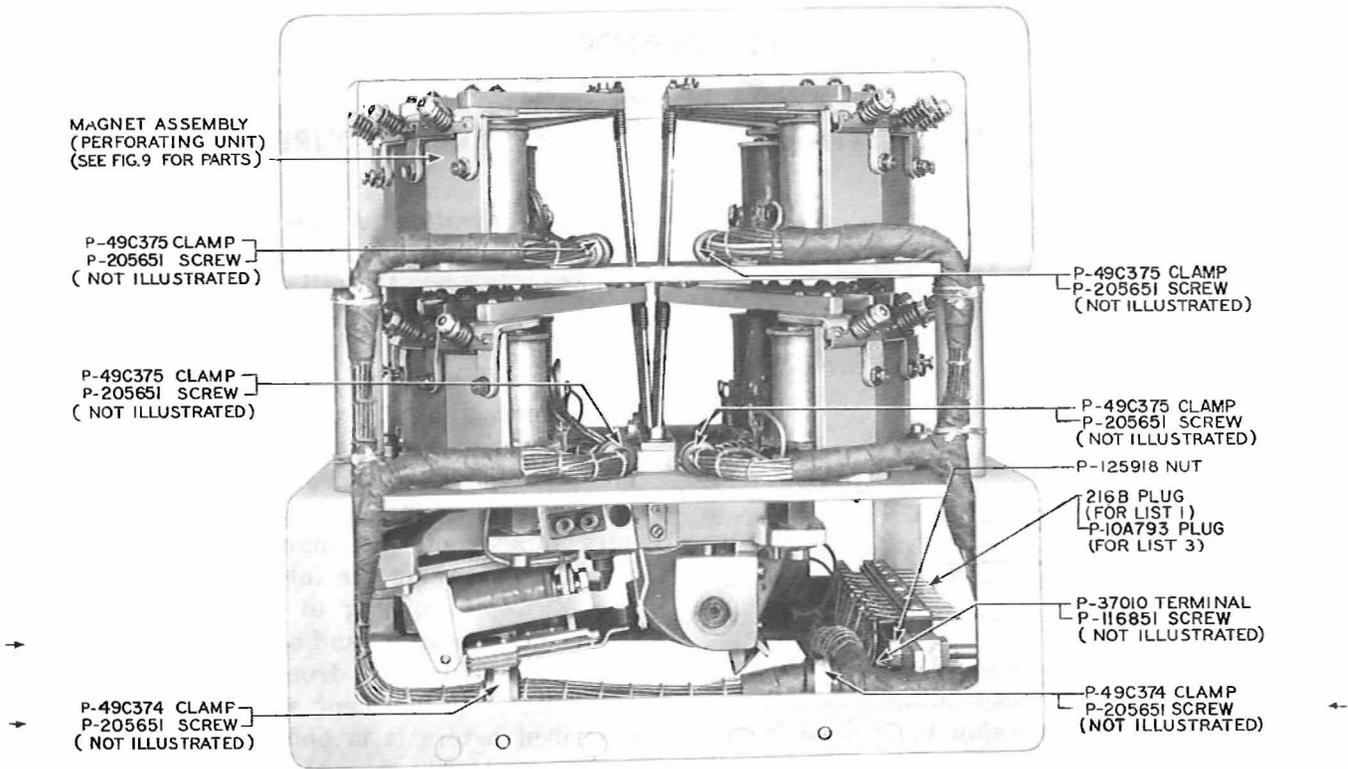


Fig. 1 - KS-13882 L1 and L3 Perforators — Stepper Assembly Side

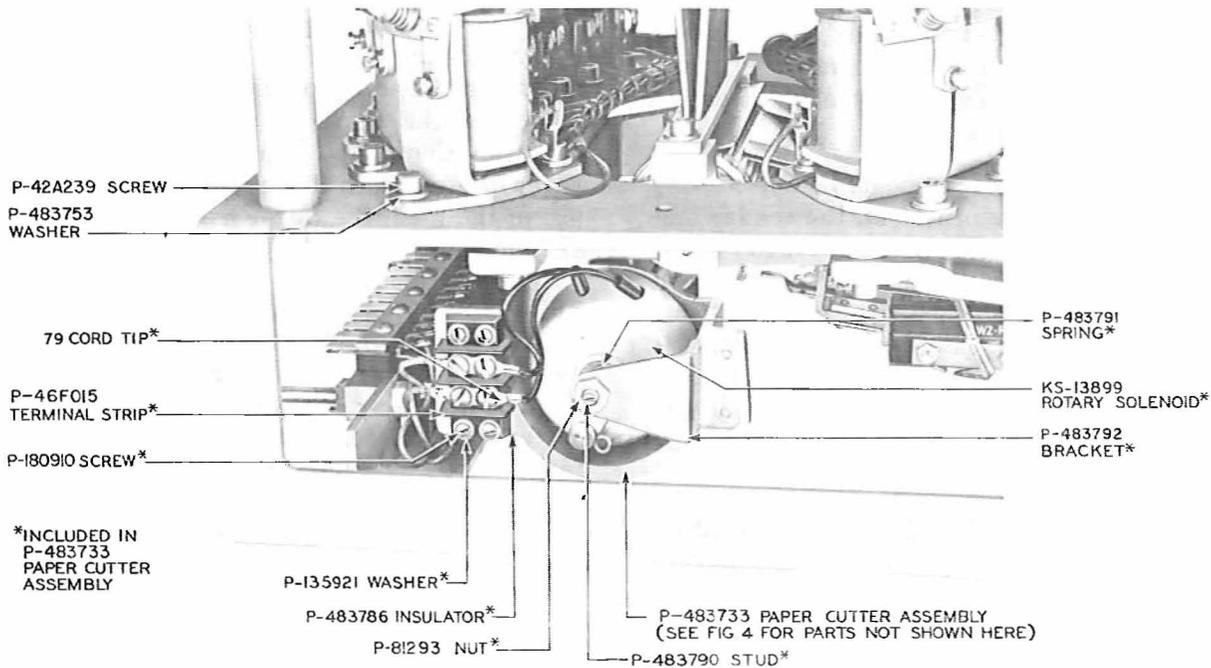


Fig. 2 - KS-13882 L1 and L3 Perforators — Side View — Paper Cutter Side

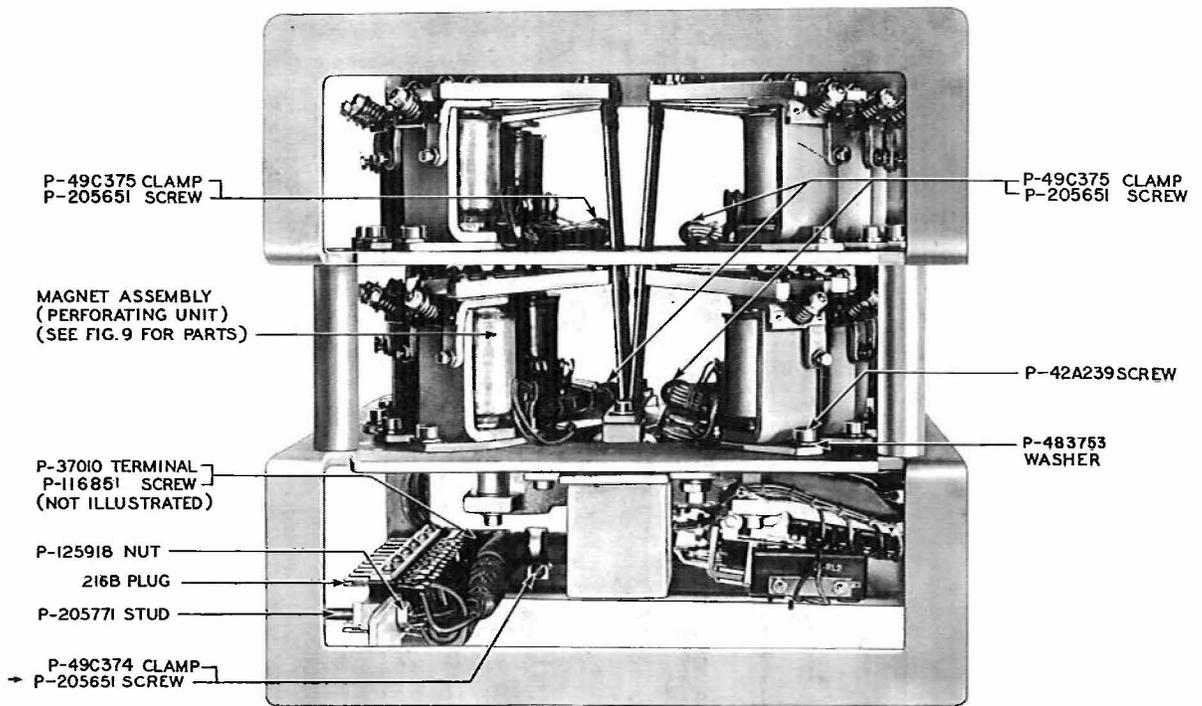


Fig. 3 - KS-13882 L2 Perforator — Side View

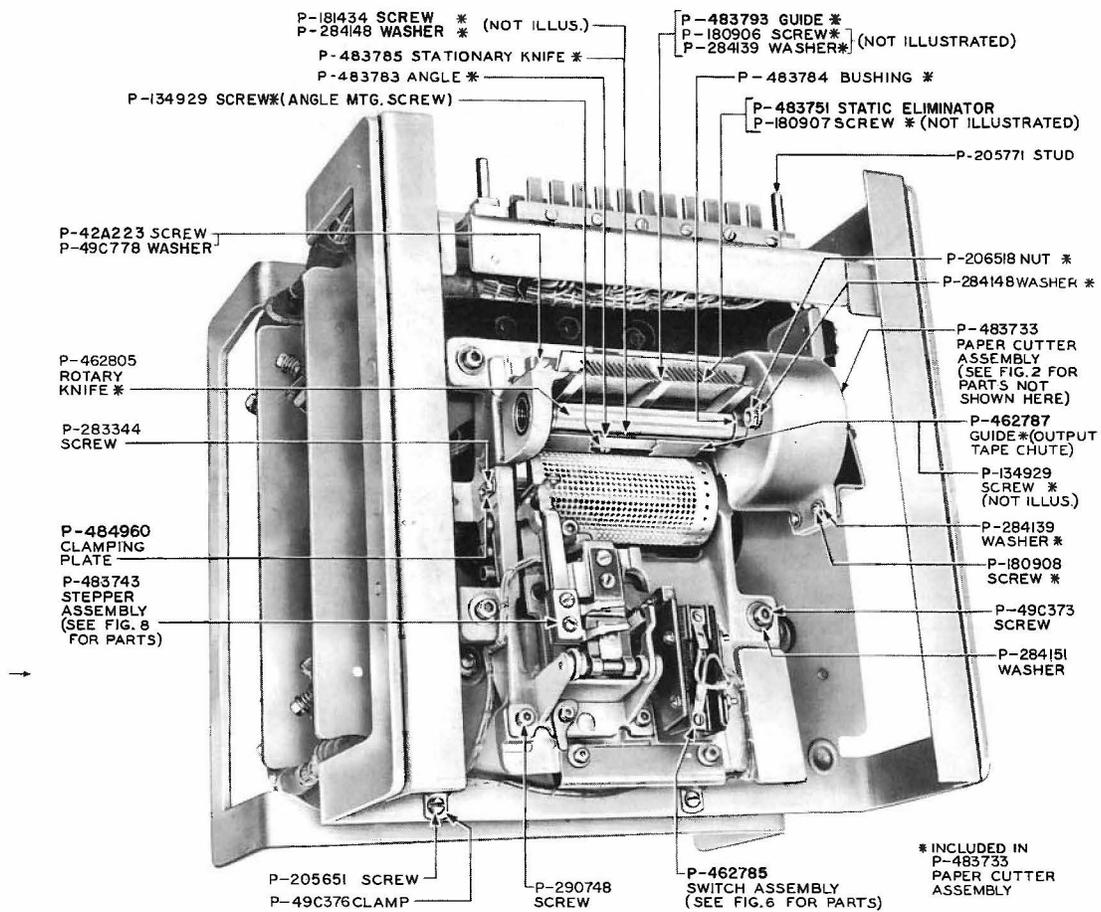


Fig. 4 - KS-13882 L1 and L3 Perforators — Bottom View

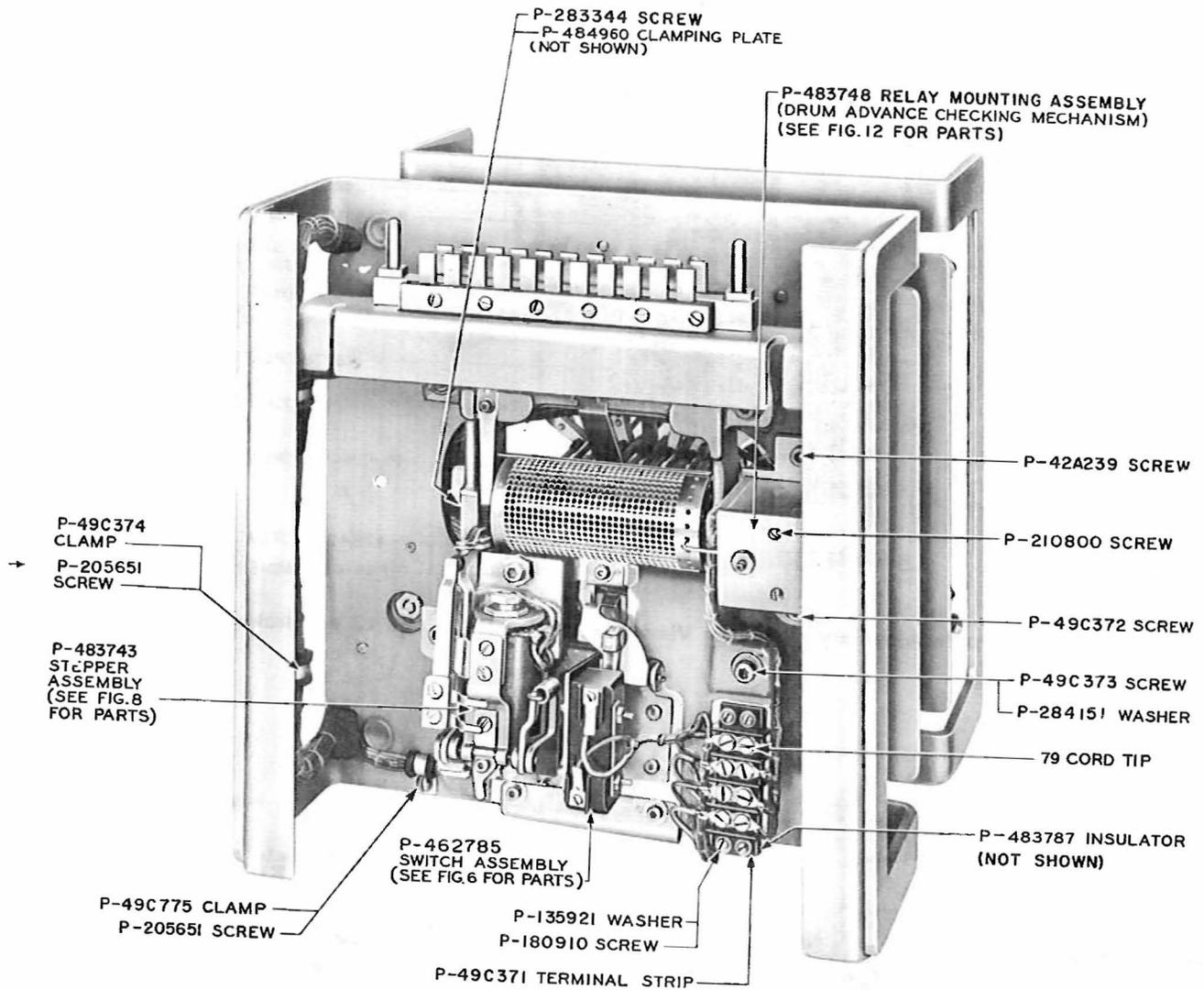


Fig. 5 - KS-13882 L2 Perforator - Bottom View

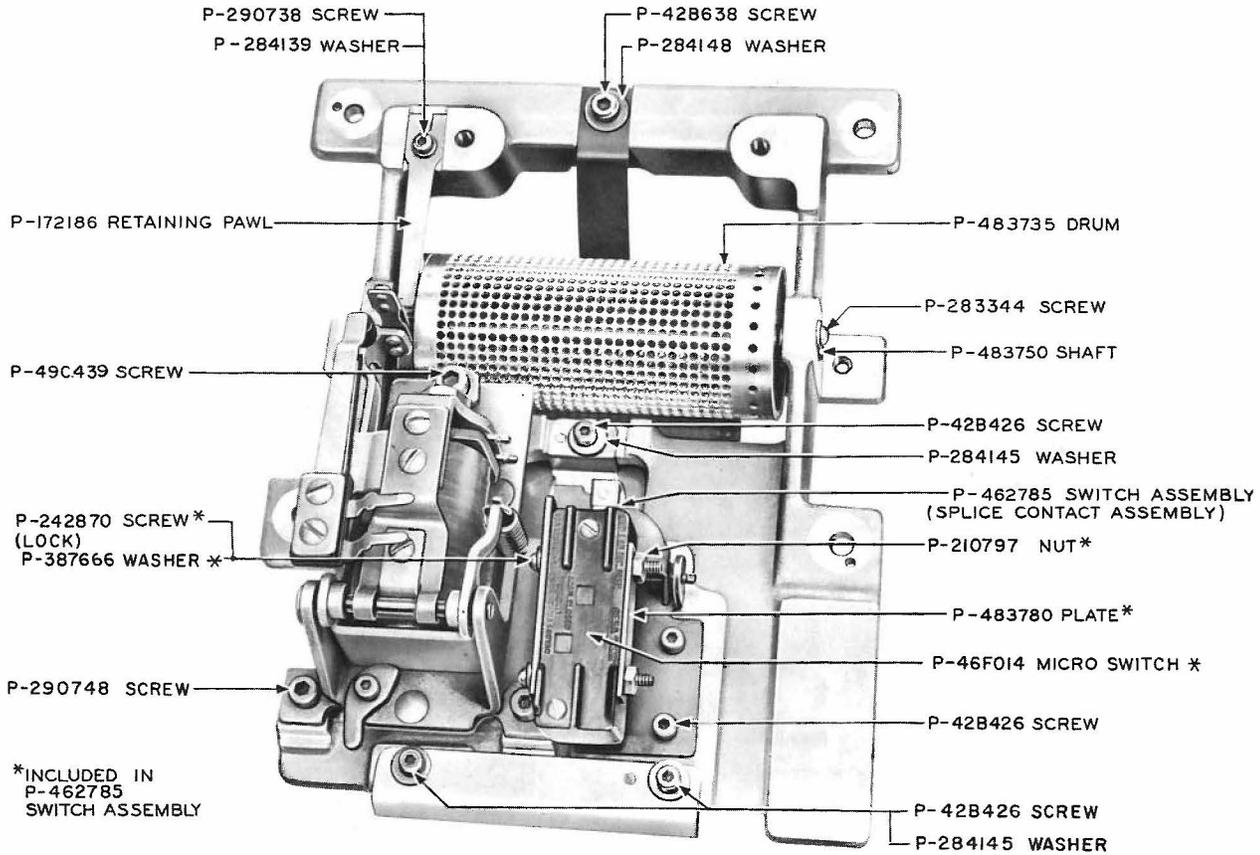


Fig. 6 - Cradle Assembly — Bottom View (KS-13882 L1, L2, and L3 perforators)

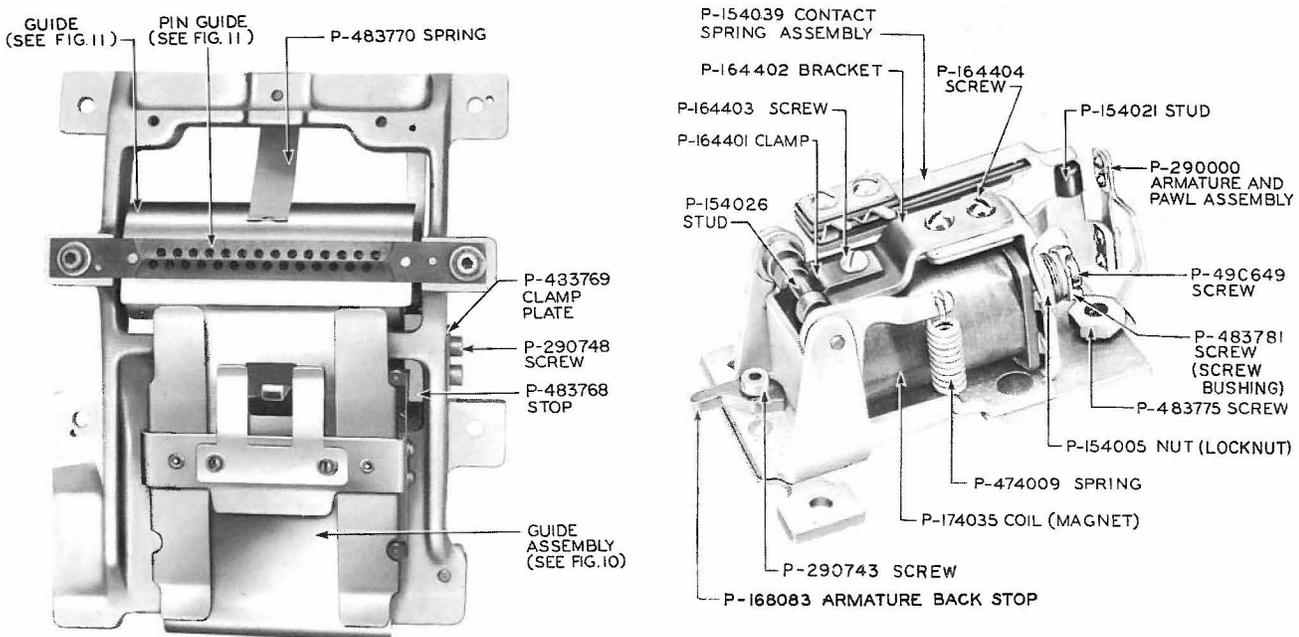


Fig. 7 - Cradle Assembly — Top View

Fig. 8 - Stepper Assembly (drum advance mechanism)

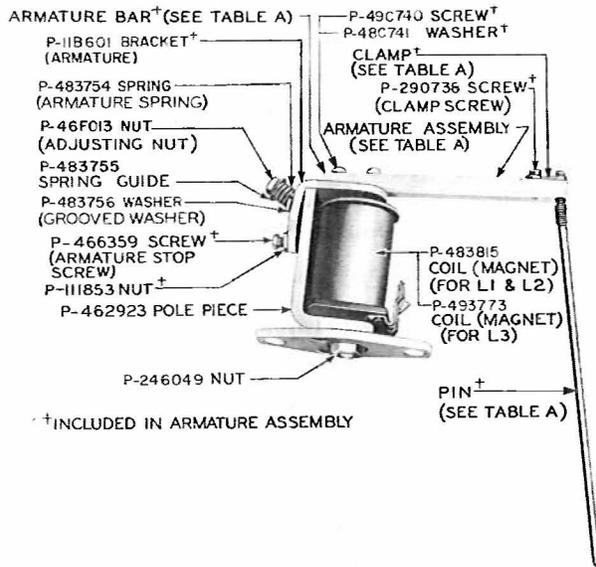


Fig. 9 – Magnet Assembly (performing unit) (see Table A)

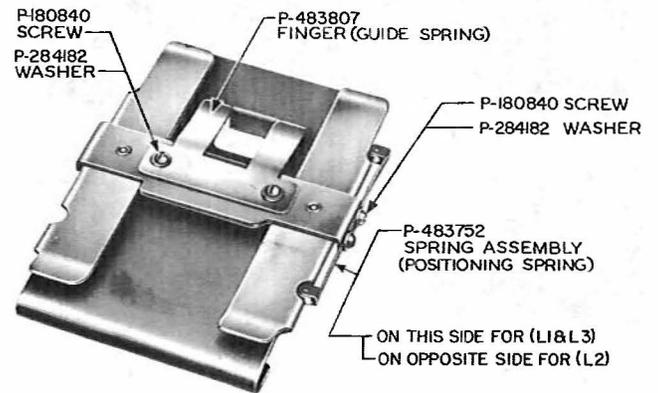


Fig. 10 – Guide Assembly (input tape chute)

TABLE A — Perforating Units and Associated Parts (Fig. 9)

MAGNET ASSEMBLIES KS-13882 L1 AND L2 PERFORATORS	MAGNET ASSEMBLIES KS-13882 L3 PERFORATORS	ARMATURE ASSEMBLY	ARMATURE BAR	CLAMP	PIN	USED ON KS-13882 L1 AND L3 PERFORATORS PERFORATING UNITS	USED ON KS-13882 L2 PERFORATOR PERFORATING UNITS
P-462781	P-493769	P-488739	P-484018	P-483762	P-11B456	A2,B0,B4, B7,C2,C4, D1,D2,E0, E1,E7,F0, F4,F7	A0,A1,B1, B2,C0,C1, C7,D0,D4, D7,E2,E4, F1,F2
P-462782	P-493770	P-488740	P-484018	P-483762	P-11B457	A0,A1,C0, C1,C7,D0, D4,D7	C2,C4,D1, D2,E0,E1, F4,F7
P-462783	P-493771	P-488741	P-488758	P-483762	P-11B457	B1,E4,F2	A2,B4,F0
P-462784	P-493772	P-488742	P-488758	P-483761	P-11B457	B2,E2,F1	B0,B7,E7 ←

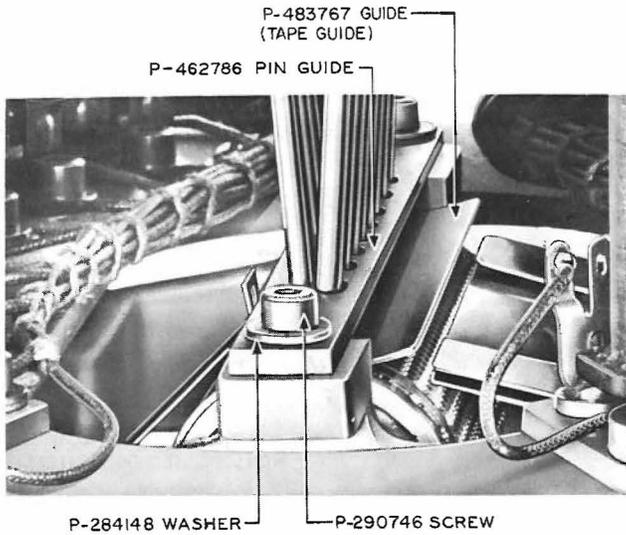
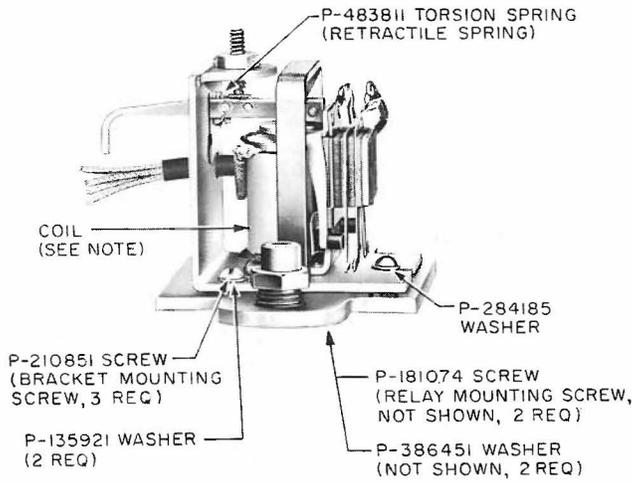


Fig. 11 - Pin Guide and Adjacent Parts



NOTE  
WHEN ORDERING A COIL, ORDER THE COIL FOR  
P-483749 RELAY.

Fig. 12 - Relay Mounting Assembly, Cover Removed  
(drum advance checking mechanism —  
KS-13882 L2 perforator)

3. REPLACEMENT PROCEDURES

3.01 List of Tools and Materials

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
245	3/8- and 7/16-Inch Open Double-End Flat Wrench

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
417A	1/4- and 3/8-Inch Open Double-End Flat Wrench
418A	5/16- and 7/32-Inch Open Double-End Flat Wrench
565A	90-Degree Offset Screwdriver
643A	0.062-Inch Allen Socket Screw Wrench
643B	0.078-Inch Allen Socket Screw Wrench
644A	5/32-Inch Socket Screw Ratchet Wrench
650A	Guard
KS-14131	Carrying Case
KS-14164 (2 reqd)	Brush
KS-14457	Pin Extractor
R-2485	5/32-Inch Allen Socket Screw Wrench
R-2670	3/32-Inch Allen Socket Screw Wrench
R-2671	1/8-Inch Allen Socket Screw Wrench
R-2958	5/64-Inch Allen Socket Screw Wrench
†R-2967	1/8-Inch Allen Straight Wrench
†R-2968	5/32-Inch Allen Straight Wrench
R-3415	7/64-Inch Allen Socket Screw Wrench
R-3416	9/64-Inch Allen Socket Screw Wrench
†R-3449	9/64-Inch Allen Straight Wrench

†The R-2967, R-2968, and R-3449 Allen straight wrenches with handles are intended to supplement the Allen socket screw wrenches specified herein when parts are inaccessible or when sufficient torque cannot be developed using the Allen socket screw wrenches.

CODE OR SPEC NO.	DESCRIPTION
<b>TOOLS</b>	
—	Soldering Copper
—	P-Long-Nose Pliers
—	5-Inch Diagonal Pliers
—	3-Inch C Screwdriver (or the replaced 3-inch cabinet screwdriver)
—	No. 33H, 12-Inch Square L.S. Starrett Co (or equivalent)
—	No. 607 Handle with 5-Inch Long 3/32-Inch Hex Blade, Allen Manufacturing Co.

<b>MATERIALS</b>	
KS-2423	Cloth
KS-7860	Petroleum Spirits
KS-13887	Perforator Tape
KS-16326 L1	Oil
KS-16832 L2	Lubricant

**3.02** Where reference is made in the procedures to the use of an Allen wrench, select the proper size Allen wrench from among those listed in 3.01.

**3.03** When a perforator is to be removed from a central office or accounting center circuit for replacement of any part, remove it in accordance with approved procedures.

**3.04** After making any replacement of parts of a perforator, the unit containing the part, for example, the perforator unit, shall meet the readjust requirements involved as covered in Section 034-306-701. Other parts, the adjustments of which may have been directly disturbed by the replacing operations, shall be checked to meet the readjust requirements and an overall operation check shall be made of the perforator before restoring it to service.

**3.05** No replacement procedures are specified for screws and other small parts when the procedure consists of a simple operation.

**3.06** Certain parts of the perforators are accurately positioned during manufacture and are then doweled in place. Such parts may be removed to obtain access to other parts and

remounted in their correct positions without disturbing the adjustments. *However, these parts are not interchangeable with the corresponding parts on other perforators and must always be remounted on the perforator from which they were removed.*

**3.07** At the time of making replacement of parts, clean and lubricate the perforator as covered in Section 034-306-701.

**3.08** Wiring diagrams of the perforators are covered in Fig. 13, 14, and 15. Fig. 13 covers the KS-13882 L1 perforator, Fig. 14 covers the KS-13882 L2 perforator, and Fig. 15 covers the KS-13882 L3 perforator.

**3.09 Plug Assembly:** To replace a plug, remove the mounting nuts using the 245 wrench and remove the lockwashers and guide pins. Pull the plug out as far as the slack in the cable will permit. Unsolder the wires from the terminals. Substitute a new plug and solder the wires to the terminals taking care that they are connected to the correct terminals as shown in Fig. 13, 14, or 15. Mount the plug in place. Insert the guide pins securing them with the nuts sufficiently tight to hold the plug against the frame, but not tight enough to prevent shifting the plug. Push the perforator in the track of the test table per SD-40040-01 or SD-95497-01 until the guide pins on the plug are fully inserted into the guide holes of the jack of the test table. Tighten the plug mounting nuts securely.

**3.10 Pin Guide:** To replace the pin guide, proceed as follows.

- (1) Place the perforator on its base. Using the KS-14457 pin extractor, remove the perforator pins from the pin guide. Remove the pin-guide mounting screws and washers using the proper size Allen wrench. Lift the pin guide from the cradle. Two dowels which are used to position the pin guide on the cradle during manufacture are located adjacent to the mounting holes of the guide. When the guide is removed from the cradle, the dowels may remain either in the guide or in the cradle. Using the 5-inch diagonal pliers, remove the dowels and discard them. Do not disturb the pins in the guide adjacent to each end of the rows of holes. The replacement pin guide is not drilled for doweling.

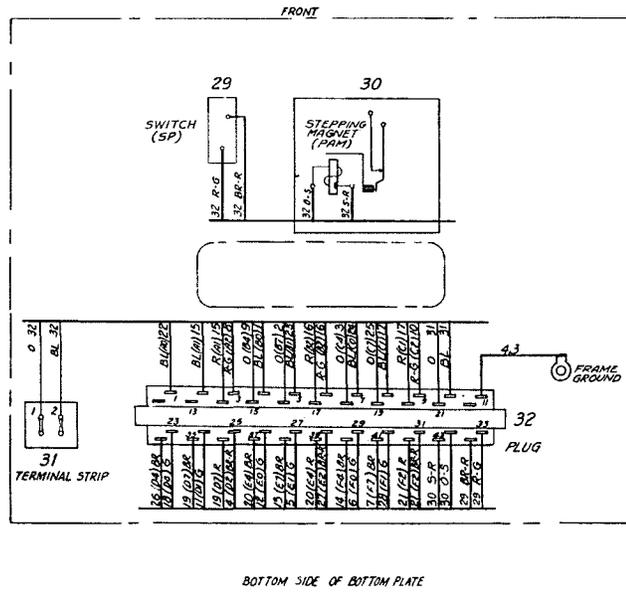
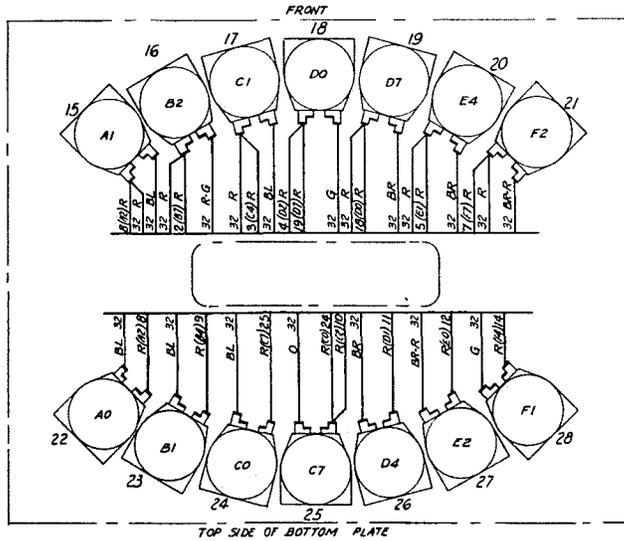
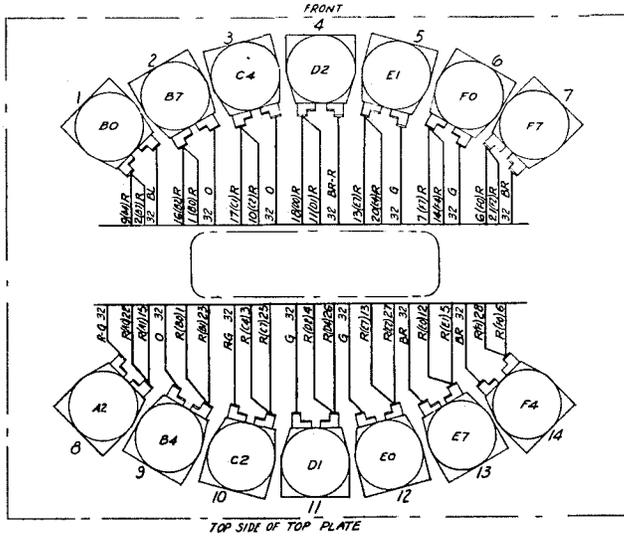


Fig. 13 - KS-13882 L1 Perforator — Wiring Diagram





(2) Hold the new pin guide above the perforator with the longer pin in the guide over the notch at one end of the tape guide and the shorter pin over the hole near the other end. Lower the pin guide between the two rows of perforating pins. This will position the individual pins on the proper sides of the pin guide. Make sure that the pins in the pin guide enter the associated notch and hole in the tape guide referred to above.

(3) Insert the pin-guide mounting screws and washers, leaving the screws just loose enough to permit adjusting the position of the pin guide. Then starting from each end and working toward the center, insert the pins in their respective holes in the pin guide using the KS-14457 pin extractor. Electrically operate F4, F7, A0, and A1 magnets. Center the pin-guide holes with reference to the operated magnet pins and tighten the mounting screws securely. Check that all pins operate freely in the pin guide. If individual pins bind, shift the individual perforating unit. Lubricate the pins where they pass through the pin guide with one dip of KS-16326 L1 oil for each two pins. ←

### Splice Contact Assembly

**3.11 Complete Splice Contact Assembly:** Disconnect the leads from the Micro Switch using the 3-inch C screwdriver. Remove the mounting screws using the proper size Allen wrench and remove the assembly. Substitute the new assembly, insert and securely tighten the mounting screws, and connect the leads. Check the Operation Test Requirement in Section 034-306-701.

**3.12 Micro Switch:** Disconnect the leads from the Micro Switch using the 3-inch C screwdriver. Hold the mounting screws with the 565A screwdriver and remove the nuts with the 417A wrench. Remove the plate from the Micro Switch and remove the Micro Switch. Place the new Micro Switch on the mounting screws. Re-mount the plate and place the nuts on the screws, tightening them securely with the screwdriver and wrench. Connect the leads.

**3.13 Bracket Assembly:** Remove the Micro Switch from the bracket assembly and mount it on the new bracket assembly as described in 3.12. Remove the screws from the

bracket assembly to be replaced using the proper size Allen wrench. Substitute the new bracket assembly and insert the mounting screws. Then locate the assembly as follows. Cut a splice window in a piece of KS-13887 perforator tape. Insert this tape into the tape chute. Move the tape to a position where the bracket arm finger is in the splice window. Take up the sideplay of the finger toward the nearer lengthwise edge of the splice window. With the finger in this position, check that there is a clearance of minimum 1/32 inch between the side of the finger and the edge of the splice window. If the clearance is not satisfactory, shift the position of the bracket as required. Then tighten the mounting screws securely. Recheck that the clearance is met. Check the Operation Test Requirement in Section 034-306-701.

### Drum Advance Mechanism

#### 3.14 Complete Drum Advance Mechanism:

Unsolder the leads to the magnet terminals and tag them so that they can be connected to the corresponding terminals of the new magnet. Remove the two mounting screws and the locking screw, using the proper size Allen wrenches. Loosen the overthrow stop mounting screws using the proper size Allen wrench. Slide the stop away from the driving pawl. Remove the drum advance mechanism from the cradle taking care not to damage the drum. Position the new drum advance mechanism on the cradle so that the relation between the driving pawl and the ratchet wheel is as covered in Section 034-306-701. Tighten the two mounting screws securely using the proper size Allen wrench and insert the locking screw loosely in the positioning bushing. Solder the leads to the proper magnet terminals. Set the backstop so that the retaining pawl just drops in the succeeding tooth as the armature is manually operated and released slowly. Locate the drum advance mechanism by adjusting the positioning bushing using the 245 wrench so that after the locking screw is tightened securely in the bushing, the end of the driving pawl is in the tooth shown in Fig. 16 and the holes in the drum and pin guide are lined up in accordance with Section 034-306-701. Adjust the overthrow stop and check that all requirements specified for the drum advance mechanism are met.

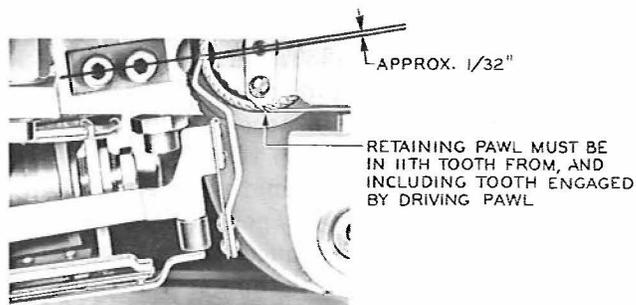


Fig. 16 - Positioning of Driving and Retaining Pawls

**3.15 Contact Spring Assembly:** To replace the contact spring assembly of the drum advance mechanism, remove the screws that mount the frame stiffening bracket and contact spring assembly using the 3-inch C screwdriver and remove the assembly. Substitute the new spring assembly and insert the screws loosely. Align the spring assembly centrally with the driving arm stud and tighten the screws.

**3.16 Driving Arm Stud:** Remove the contact spring assembly as covered in 3.15. Remove the stud by cutting it with the 5-inch diagonal pliers. Before placing the new stud on the projecting lug of the driving arm, heat the stud until it becomes pliant by placing it near a hot soldering copper. Then mount the stud on the projecting lug of the driving arm and press it in place against the shoulder of the driving arm. Remount the contact spring assembly as covered in 3.15. Adjust the clearance between the interrupter spring and the stud as covered in Section 034-306-701.

**3.17 Driving Spring:** Remove the driving spring from the driving spring arm with the P-long-nose pliers and disengage the other end of the spring from the driving spring lug. Engage one end of the new driving spring in the hole in the driving spring lug and attach the other end of the spring in the notch in the driving spring arm using the P-long-nose pliers. → Apply one dip of KS-16326 L1 oil distributed between the hole in the lug, where the driving spring is attached and the notch in the driving arm.

**3.18 Frame Stiffening Bracket and Armature Bearing Pin Clamp:** Remove the screws which mount the frame stiffening bracket and contact spring assembly with the 3-inch C screwdriver. Remove the contact spring assembly. Remove the armature bearing pin clamp mounting screw and the clamp where used. Substitute new parts as required and reassemble the parts that were removed.

#### Armature Bearing Pin

↗ **3.19** Initially, the armature bearing pin consisted of a stud to which was riveted a clamping plate. Later, this clamping plate was eliminated and a plain stud adopted which is held in place by a slightly modified armature bearing pin clamp (P-164401 clamp). When replacing a bearing pin with riveted clamping plate, make sure that a new P-164401 clamp is also used. To replace a bearing pin, proceed as follows.

(1) Remove the driving spring as covered in 3.17.

(2) If a bearing pin with riveted clamping plate is being replaced, remove the clamping plate mounting screw and pin clamp mounting screw using the 3-inch C screwdriver and discard the pin and pin clamp. If a plain bearing pin (P-154026 stud) is being replaced, loosen the pin clamp mounting screw using the 3-inch C screwdriver and remove the pin. ↴

(3) Remove any accumulation of gummy oil or foreign matter on the armature bearings. To do this, apply KS-7860 petroleum spirits with the KS-14164 brush. Take care to keep the petroleum spirits from coming in contact with the spoolhead of the magnet. Remove any oil or grease from the new bearing pin with a KS-2423 cloth moistened with KS-7860 petroleum spirits. Allow the parts to dry and then lubricate them with a light film of KS-16832 L2 lubricant applied with another KS-14164 brush. →

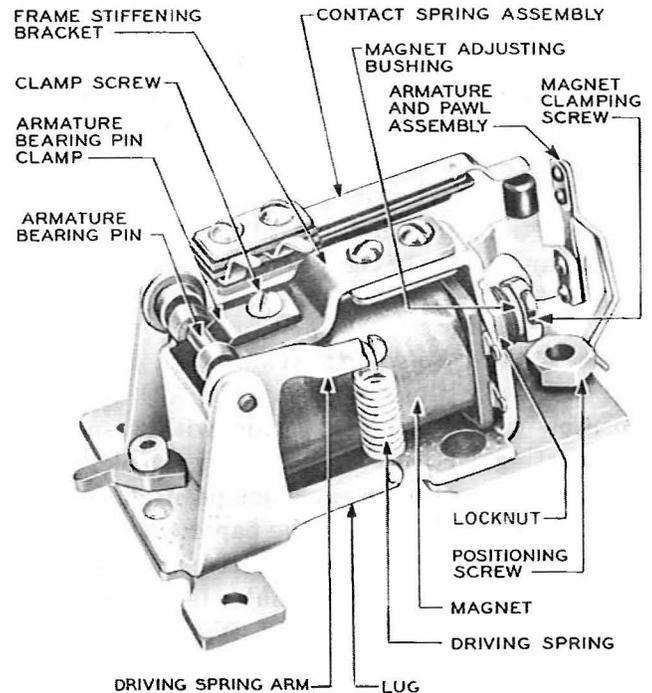
↗ (4) Mount the new pin, and if necessary mount the new pin clamp. Centrally locate the pin in its bearing and securely tighten the pin clamp mounting screw. Remount the driving spring as covered in 3.17. ↴

**3.20 Armature and Pawl Assembly:** Remove the frame stiffening bracket, the spring assembly, and the armature bearing pin as covered in 3.18 and 3.19. Remove the armature and pawl assembly being careful not to damage the drum. Clean and lubricate the bearing pin and armature bearings as covered in 3.19(3). Substitute the new assembly and reassemble the parts being careful not to damage the pawl or drum. Check the position of the pawl with respect to the ratchet wheel and subsequent adjustments as covered in 3.14. Lubricate the hole in the lug and the notch in the arm as covered in 3.17.

**3.21 Magnet:** Unsolder the leads from the terminals and tag them so that they can be connected to the corresponding terminals of the new magnet. Remove the armature and pawl assembly as covered in 3.20. Remove the magnet clamping screw with the proper size Allen wrench, being careful not to damage the drum, and remove the magnet. Substitute the new magnet and reassemble the parts. Solder the leads to the proper magnet terminals. Position the magnet as covered in 3.14 and check all adjustments of the drum advance mechanism as covered in 3.14.

**3.22 Retaining Pawl:** Remove the retaining pawl mounting screw and washer using the proper size Allen wrench. Remove the retaining pawl. Substitute the new retaining pawl. Shift the position of the pawl so that it is in the eleventh tooth from the driving pawl. Check this position as follows. Loosen the overthrow stop mounting screws using the proper size Allen wrench. Then slide the stop away from the driving pawl so that the end of the drum is visible through the hole adjacent to the overthrow stop. Place a mark on the side of the drum adjacent to the tooth engaged by the retaining pawl. Operate the armature manually ten times and note that the marked tooth is then engaged by the driving pawl as shown in Fig. 16. Adjust the overthrow stop as covered in Section 034-306-701.

**3.23 Overthrow Stop:** Remove the drum advance mechanism as covered in 3.14 except that it will not be necessary to unsolder the leads from the magnet coil. Move the drum advance mechanism to one side being careful not to damage it or break the leads. Remove the two overthrow stop mounting screws with the proper



**Fig. 17 – Stepper Assembly (drum advance mechanism)**

size Allen wrench and remove the clamping plate and stop. Substitute the new stop taking care that the beveled edge is adjacent to the pawl and reassemble the clamping plate and mounting screws. Adjust the position of the stop as covered in Section 034-306-701.

**Paper Cutter Assembly (KS-13882 L1 and L3 perforators only)**

**3.24 Complete Paper Cutter Assembly:** Place the 650A guard over the static eliminator. Disconnect the leads from the terminal strip using the 3-inch C screwdriver. Remove the paper cutter assembly mounting screws using the proper size Allen wrench and then remove the paper cutter assembly from the cradle. Transfer the guard to the static eliminator of the new assembly. Before mounting the new assembly, check the relation between the parts as covered in Section 034-306-701. After mounting the assembly, remove the static eliminator guard. Check the clearance between the long lip of the tape chute and the tape guide as covered by Section 034-306-701. Also, check the other requirements covering the position of the assembly when it is mounted on the perforator. Connect the leads to the terminal strip.

**3.25 Static Eliminator and Guides:** Place the perforator on its side with the plug upward. Remove the two static eliminator mounting screws using the 3-inch C screwdriver. Remove the static eliminator. If the guide is to be replaced, remove the guide mounting screws. Remove the guide and substitute the new guide. Insert and securely tighten the mounting screws. Mount the new static eliminator in place.

**3.26 Rotary Solenoid:** Remove the paper cutter assembly as covered in 3.24. Note the position of the solenoid leads with respect to the casting so that when the new solenoid is mounted, it will be in the same position. Remove the bracket at the end of the paper cutter assembly using the 3-inch C screwdriver. Remove the rotary solenoid mounting nuts, using the 418A wrench. Remove the solenoid. Distribute one dip  
→ of KS-16832 L2 lubricant evenly over the coupling and driving pin of the new solenoid using the KS-14164 brush. Make sure the container of KS-16832 L2 lubricant has been shaken as covered in 1.07. Transfer the spacers to the new solenoid. Place the new solenoid on the cutter assembly engaging the driving pin on the solenoid shaft in the slot in the rotary knife. Place the washers and nuts on the solenoid mounting screws before positioning the solenoid against the mounting surface. Tighten the nuts securely. Place the washers on the bracket mounting screws. Mount the bracket and tighten the screws securely. Engage the spring with the solenoid arm in a position that the spring aids the restoring of the arm. Then proceed as covered in 3.24 to check the requirements before and after the paper cutter assembly is mounted.

**3.27 Spring:** Remove the paper cutter assembly as covered in 3.24. Remove the bracket using the 3-inch C screwdriver. Remove the nut from the stud using the 245 wrench. Remove the stud from the bracket and the spring from the stud. Place the new spring on the stud and insert the stud in the bracket. Place the nut on the stud and tighten it. Mount the bracket on the cutter frame. Engage the end of the spring with the arm of the rotary solenoid. Adjust the tension of the spring as covered in Section 034-306-701. Remount the paper cutter assembly on the cradle as covered in 3.24.

**3.28 Rotary Knife and Bushing:** Remove the paper cutter assembly and the rotary solenoid as covered in 3.24 and 3.26. If the bushing at the solenoid end is to be replaced, remove it and substitute the new part. If the rotary knife is to be replaced, remove the bushing and the guide adjacent to the outer end of the knife. Lubricate the driving pin as covered in 3.26. Substitute the new knife and reassemble the parts in the reverse order of removal. Then proceed as covered in 3.24 to check the requirements before and after the paper cutter assembly is mounted.

**3.29 Output Tape Chute and Chromium-plated Angle:** To replace the output tape chute, or angle, proceed as follows. Remove the paper cutter assembly as covered in 3.24. Remove the tape chute mounting screws using the 3-inch C screwdriver. Remove the tape chute. If necessary to replace the angle, also remove the angle mounting screw and the angle. Substitute the new parts. If the angle is to be replaced, mount the angle over the chamfered edge of the stationary knife. Check that there is clearance between the free edge of the angle and the stationary knife as covered in Section 034-306-701. Mount the chute in place over the angle. Check and, if necessary, adjust the position of the chute as covered in 3.24.

**3.30 Stationary Knife:** The stationary knife is a rectangular steel bar with a sharp edge for cutting. To replace this knife, remove the paper cutter assembly as covered in 3.24. Remove the stationary knife mounting screws with the 3-inch C screwdriver. Remove the knife, tape chute, and chromium-plated angle as an assembly. Remove the chute and angle mounting screws. Mount the parts on the new stationary knife. Check the location of these parts as covered in 3.29. Mount the assembly on the paper cutter. Check that the requirements covering the parts are met as covered in Section 034-306-701.

#### **Drum Advance Checking Mechanism (KS-13882 L2 perforator only)**

**3.31 Relay Mounting Assembly:** Disconnect the leads at the terminal strip using the 3-inch C screwdriver. Remove the two mounting screws using the proper size Allen wrench and remove the mechanism. Substitute the new mechanism and securely tighten the mounting screws.

Connect the leads to the terminal strip. Position the mechanism as shown in Fig. 18. To do this, remove the cover and loosen the three screws at the base using the 3-inch C screwdriver. Shift the mechanism, as required. Tighten the screws securely and remount the cover and cover screws.

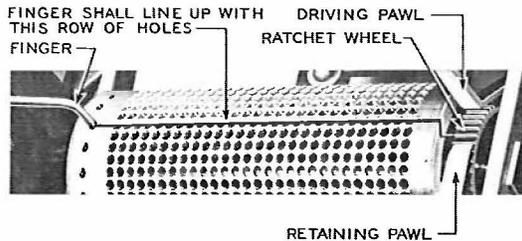


Fig. 18 – Checking Mechanism Line-up

**3.32 Magnet:** Remove the relay mounting assembly as covered in 3.31. Remove the cover using the 3-inch C screwdriver. Remove the three bracket mounting screws and washers using the 3-inch C screwdriver. Remove the two relay mounting screws and washers and the magnet mounting screw using the 3-inch C screwdriver. Hold the end of the retractile spring away from the groove in the finger and move the relay to a position convenient for unsoldering the leads. Unsolder the leads from the terminals of the magnet and tag them so that they can be connected to the corresponding terminals of the new magnet. Substitute the new magnet and solder the leads to the proper magnet terminals. Reassemble the parts in the reverse order of removal, making sure that the end of the retractile spring is positioned in the groove of the finger. Remount the relay mounting assembly as covered in 3.31.

#### Shaft, Drum, and Tape Guide

**3.33** On the KS-13882 L1 and L3 perforators remove the paper cutter assembly as covered in 3.24, and on the KS-13882 L2 perforator remove the drum advance checking mechanism relay mounting assembly as covered in 3.31. Using the proper size Allen wrench, loosen the retaining pawl screw sufficiently to permit moving the pawl away from the ratchet wheel. Using the 3-inch C screwdriver, loosen the clamping plate mounting screw at the ratchet-wheel end of the shaft. Remove the shaft mounting screw at the

opposite end. Remove the shaft from the drum. If the shaft is to be replaced, remove any grease on the new shaft using a KS-2423 cloth moistened with KS-7860 petroleum spirits. Then apply a film of KS-16326 L1 oil to the new shaft, using the KS-14164 brush. Substitute it for the replaced shaft. If the drum or tape guide is to be replaced, disengage the driving pawl from the ratchet and remove the drum being careful not to damage the driving pawl or drum. If the tape guide is to be replaced, remove it and substitute the new tape guide. Make sure that the studs on the pin guide are in the hole and slot in the tape guide. Apply one dip of KS-16832 L2 lubricant, using the KS-14164 brush, evenly over the two studs. Make sure the container of KS-16832 L2 lubricant has been shaken as covered in 1.07. Set the drum in its approximate position in the cradle being careful not to damage the driving pawl or drum. Hold the drum in position and insert the shaft. Securely tighten the shaft and clamping-plate mounting screws. Check that the drum rotates freely. Reset the retaining pawl as covered in 3.22 and remount the paper cutter or drum advance checking mechanism.

#### Tape-guide Spring

**3.34** Remove the paper cutter assembly, if furnished, as covered in 3.24. Remove the tape-guide mounting screw and washer using the proper size Allen wrench. Remove the spring and substitute the new spring. Remount the screw and washer, tightening the screw securely. Remount the paper cutter assembly.

#### Positioning Spring and Guide Spring on Input Tape Chute

**3.35** Remove the splice contact assembly as covered in 3.11. Remove the tape-chute mounting screws and washers using the proper size Allen wrench. Raise the tape chute off the dowels and remove the tape chute. To replace the positioning spring, remove the mounting screws and washers, using the 3-inch C screwdriver, and remove the spring. Substitute the new positioning spring and securely tighten the mounting screws. Check the positioning spring pressure and adjust, as required, as covered in Section 034-306-701. To replace the guide spring, remove the mounting screws and washers using the 3-inch C screwdriver. Remove the spring.

Substitute the new guide spring and securely tighten the mounting screws. Check the clearance between the guide spring and the tape chute and adjust, as required, as covered in Section 034-306-701. Remount the tape-chute assembly on its dowels in the cradle. Insert and securely tighten the tape-chute mounting screws. Remount the splice contact assembly.

**Magnet Assembly (perforating unit)**

**3.36 Complete Magnet Assembly:** Remove the inside mounting screw using the 644A wrench, as shown in Fig. 19, placing the forked end of the sliding part of the wrench under the head of the screw when the screw has been loosened. Remove the washer. Remove the outer screw and washer using the proper size Allen wrench. Pull the unit out as far as the slack in the leads will permit and unsolder the leads. If the unit is in the upper tier, lift it upward; if it is in the lower tier, lift, tilt, and withdraw it. Check that the magnet mounting nut of the new perforating unit is securely tightened. If necessary, tighten it using the 245 wrench. Substitute the new perforating unit. Resolder the leads. Insert the pin in the proper hole in the pin guide using the KS-14457 pin extractor. Place the washers in position and insert and securely tighten the mounting screws. When tightening the inside mounting screw, remove the part of the 644A wrench used for holding the screw as soon as the threads are engaged in order to avoid clamping this part of the tool under the head of screw. Lubricate the pin where it passes through the pin guide with 1/2 dip of →KS-16326 L1 oil applied with the KS-14164 brush.

**3.37 Armature Assembly — Upper Tier:** To replace an upper tier armature assembly, proceed as follows.

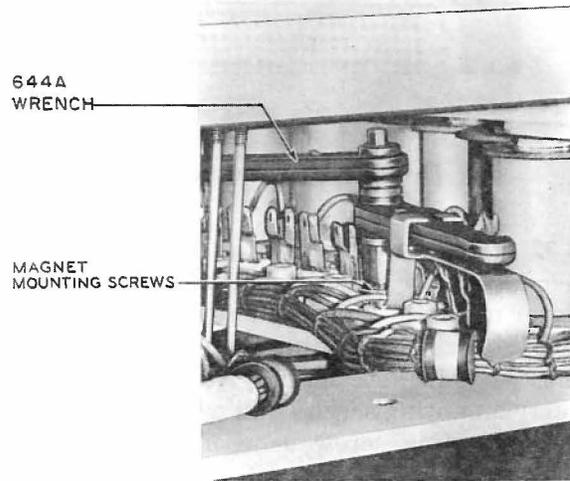
(1) Remove the armature adjusting nut with the 417A wrench. Remove the spring guide, armature spring, and grooved washer. See Fig. 9. Lift the armature assembly up and back to clear the armature spring stud, being careful not to bend or damage the stud. Remove the assembly from the perforator.

(2) Lubricate the knife-edge bearing surface of the new armature assembly and the groove in the grooved washer, see Fig. 20, with

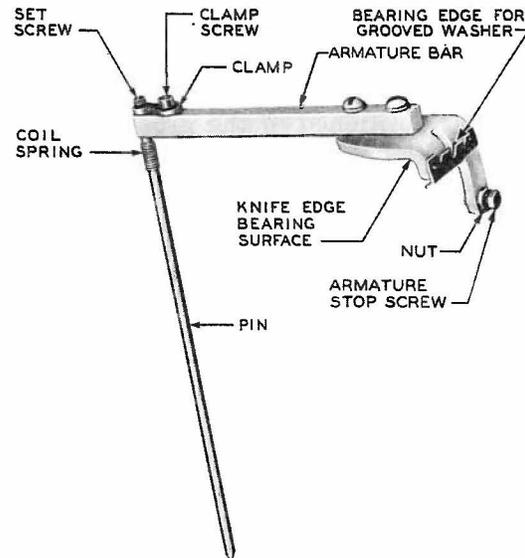
→ 1/4 dip of KS-16832 L2 lubricant applied to

each part with the KS-14164 brush. Make sure the container of KS-16832 L2 lubricant has been shaken as covered in 1.07.

(3) Position the armature assembly on the magnet. Remount the grooved washer, armature spring, spring guide, and adjusting nut. Insert the perforating pin in the proper hole in the pin guide using the KS-14457 pin extractor.



**Fig. 19 – Method of Removing and Tightening Inner Magnet Mounting Screws**



**Fig. 20 – Armature Assembly of Perforating Unit**

**3.38 Armature Assembly—Lower Tier:** To replace a lower tier armature assembly, proceed as follows.

- (1) Remove the associated perforating unit as covered in 3.36.
- (2) Remove the armature assembly as covered in 3.37(1).
- (3) Lubricate the parts as covered in 3.37(2).
- (4) Mount the armature assembly on the magnet and remount the grooved washer, armature spring, spring guide, and adjusting nut. Mount the perforating unit in the perforator as covered in 3.36, but without further lubrication.

**3.39 Armature:** To replace the armature, proceed as follows.

- (1) Remove the armature assembly as covered in 3.37 or 3.38.
- (2) Remove the armature using the 3-inch C screwdriver. Transfer the armature stop screw and nut to the new armature. Replace the screw if necessary.
- (3) Mount the new armature on the armature bar leaving the screws just loose enough to permit adjusting the position of the armature on the bar. Mark a pencil line across the top of the armature bar 2-1/2 inches from the armature end of the bar. This line indicates approximately the beginning of the tapered portion at the outer end of the bar.
- (4) Position the scale of the combination square so that it will not interfere with the perforating pin of the armature assembly when the knife-edge bearing surface of the armature is placed against the base of the square as shown in Fig. 21. With the armature in this position, visually align the left side of the straight portion of the armature bar (as indicated by the pencil line on the bar) and the right side of the scale. Securely tighten the armature mounting screws.

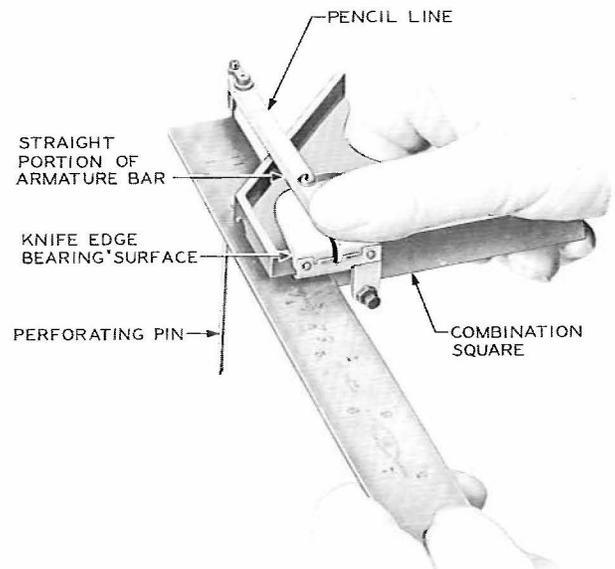
- (5) Lubricate the armature as covered in 3.37(2).
- (6) Remount the armature assembly as covered in 3.37(3) or 3.38(4), as applicable.

**3.40 Pin:** To replace the pin, proceed as follows:

- (1) Remove the armature assembly as covered in 3.37 or 3.38.
- (2) Loosen the pin clamp screw with the 643B wrench. Remove the pin from the bar by turning the pin adjusting screw clockwise with the 643A wrench.
- (3) Mount the new pin in the armature bar as follows. Start the pin screw in its mounting hole in the bar by holding the screw and turning the bar clockwise. Using the 643A wrench, turn the screw counterclockwise into the bar and clamp so that the outer end of the screw is just above the top of the clamp.

*Caution: While handling or mounting the pin, take care not to turn the pin spring with relation to the pin adjusting screw. Relative movement between these two parts would change the spacing between turns of the spring which is set during manufacture.*

- (4) Lubricate the armature as covered in 3.37(2).
- (5) Mount the armature assembly as covered in 3.37 or 3.38.
- (6) Adjust the operated armature gap to the requirement covered in Section 034-306-701.



**Fig. 21 – Method of Positioning Armature on Armature Bar**

## SECTION 034-306-801

**3.41 Armature Bar:** To replace the armature bar, proceed as follows.

- (1) Remove the armature assembly as covered in 3.37 or 3.38.
- (2) Remove the armature from the armature bar using the 3-inch C screwdriver. Mount the armature on the new armature bar as covered in 3.39(3) and (4).
- (3) Remove the pin from the armature bar as covered in 3.40(2), taking care not to disturb the relation between the pin spring and the pin adjusting screw noted in the caution under 3.40(3).
- (4) Mount the pin on the new armature bar as covered in 3.40(3).
- (5) Lubricate the armature as covered in 3.37(2).
- (6) Mount the armature assembly as covered in 3.37.
- (7) Adjust the operated armature gap to the requirement covered in Section 034-306-701.

## REASONS FOR REISSUE

1. To add a reference to Sections 034-306-501 and 034-306-502 (1.05).
2. To revise information covering the definition of one dip of lubricant (1.06).
3. To add information covering the preparation of KS-16832 L2 lubricant (1.07).
4. To revise Fig. 1, 3, 4, and 5 and Table A.
5. To add Fig. 12.
6. To revise the list of tools and materials and to add an associated paragraph (3.01 and 3.02).
7. To revise lubrication information [3.10(3), 3.17, 3.19(3), 3.26, 3.33, 3.36, and 3.37(2)].
8. To revise the procedures covering the armature bearing pin (3.19).
9. To add the procedure covering drum advance checking mechanism magnet (3.32).