MESSAGE REGISTER CAMERA

KS-14593 L1

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-14593 List 1 message register camera used for photographing message registers. It also covers approved procedures for replacing these parts. The KS-14593 List 1 message register camera consists of the KS-14593 List 2 message register camera and the KS-14594 power unit.

1.02 This section is reissued to:

- Incorporate information previously covered in Addendum 030-301-801, Issue 1.
- Revise List of Tools and Materials.
- Add information pertaining to 34533-G1 Kit.
- Add information for grounding clamp on trigger.

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 in the maintenance of the message register camera and power unit. 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 Fig. 1 through 8, included in this part, show the piece-part numbers of the various parts together with their corresponding names.

2.02 When ordering parts for replacement purposes, specify the number and name of the part, stating whether the part is for the KS-14593 List 2 message register camera or the KS-14594 power unit; for example, 34264-P1 flash lamp for KS-14593 List 2 message register camera. Do not refer to the BSP number or to any information shown in parentheses or brackets following the piece-part number. All part numbers and names of parts covered in this section were assigned by Graflex Incorporated, Rochester 8, N.Y.

2.03 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 where the name in general use in the field differs from the part name assigned by the manufacturer.

2.04 If a cover latch pin is to be replaced, order the 34533-G1 kit which includes two cover latch pins, two lock washers, and two hexagon nuts.

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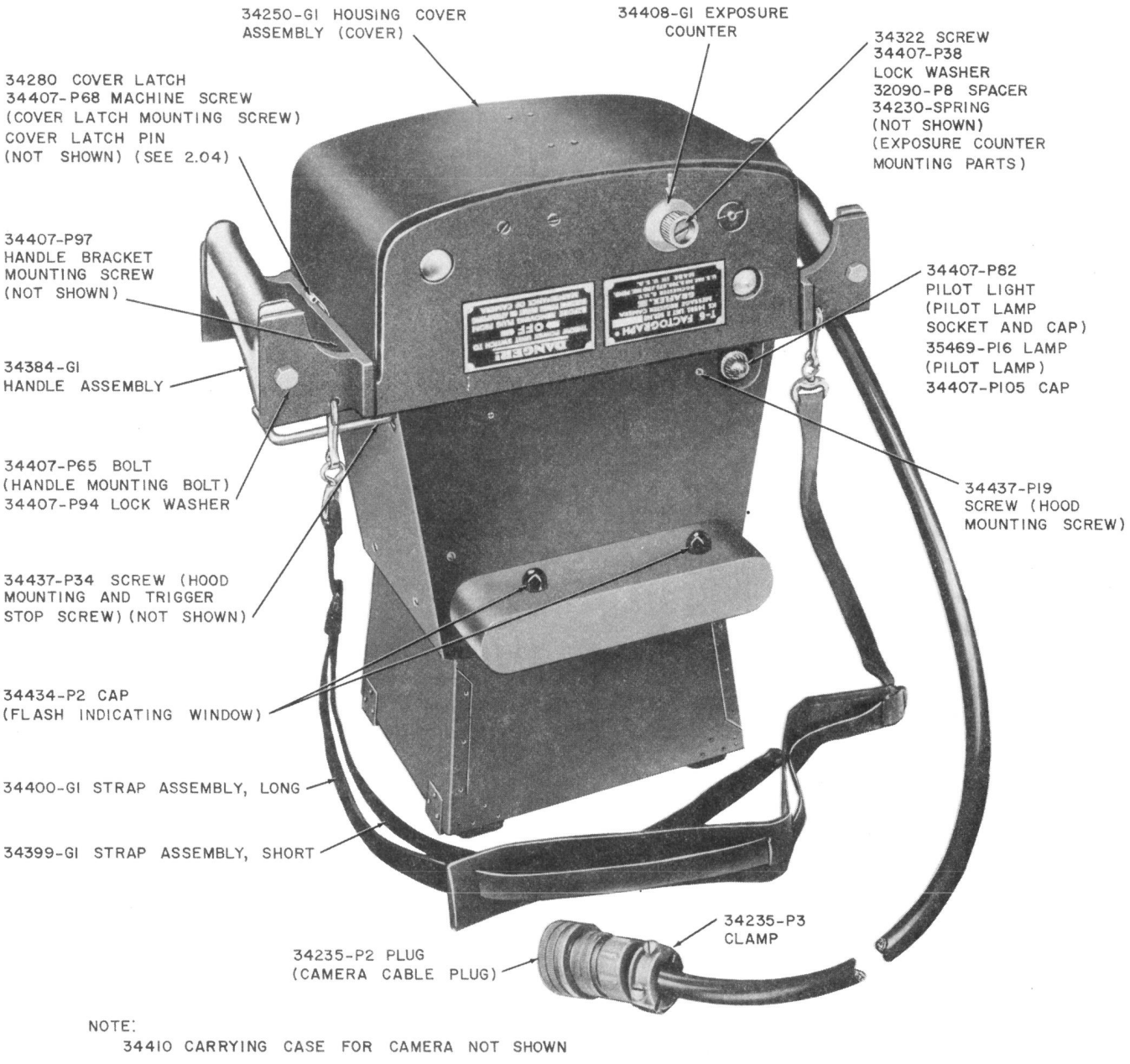


NOTE:
34410 CARRYING CASE FOR CAMERA NOT SHOWN

Fig. 1 — KS-14593 L2 Message Register Camera

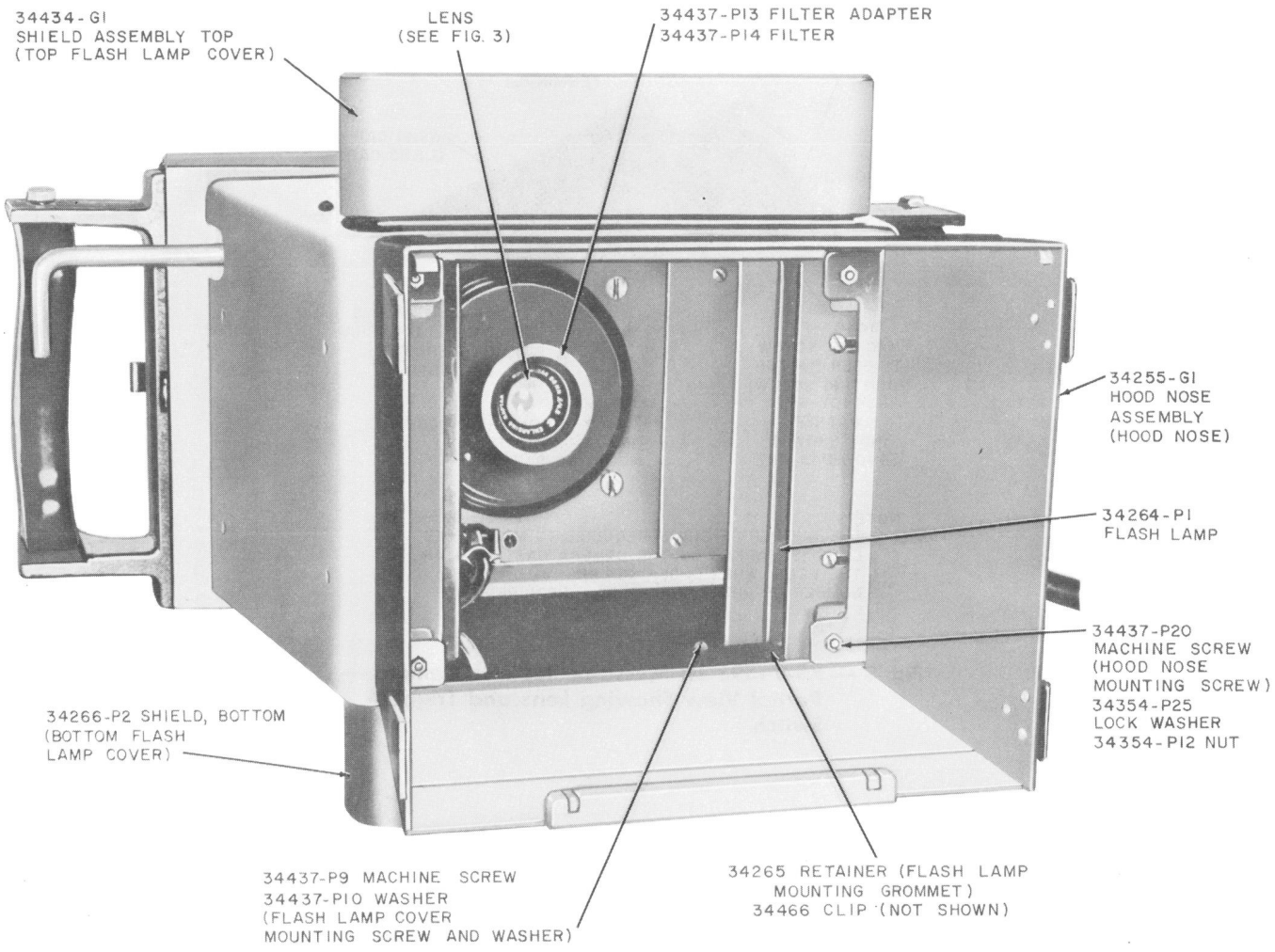
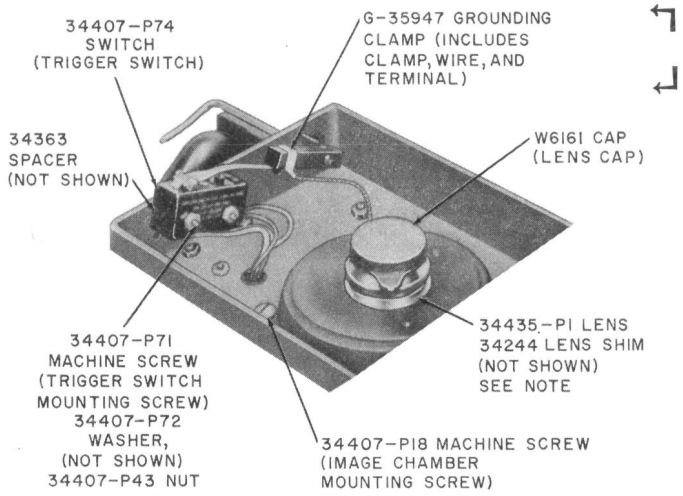


Fig. 2 — KS-14593 L2 Message Register Camera Showing Hood Nose Assembly, Filter, and Flash Lamp Covers



NOTE:
THE NUMBER OF SHIMS REQUIRED TO MOUNT THE LENS IS MARKED ON THE CAMERA CASTING NEAR THE LENS. WHEN ORDERING LENS, ALSO ORDER NUMBER OF SHIMS INDICATED, IF REQUIRED.

Fig. 3 — KS-14593 L2 Message Register Camera — Partial View Showing Lens and Trigger Switch

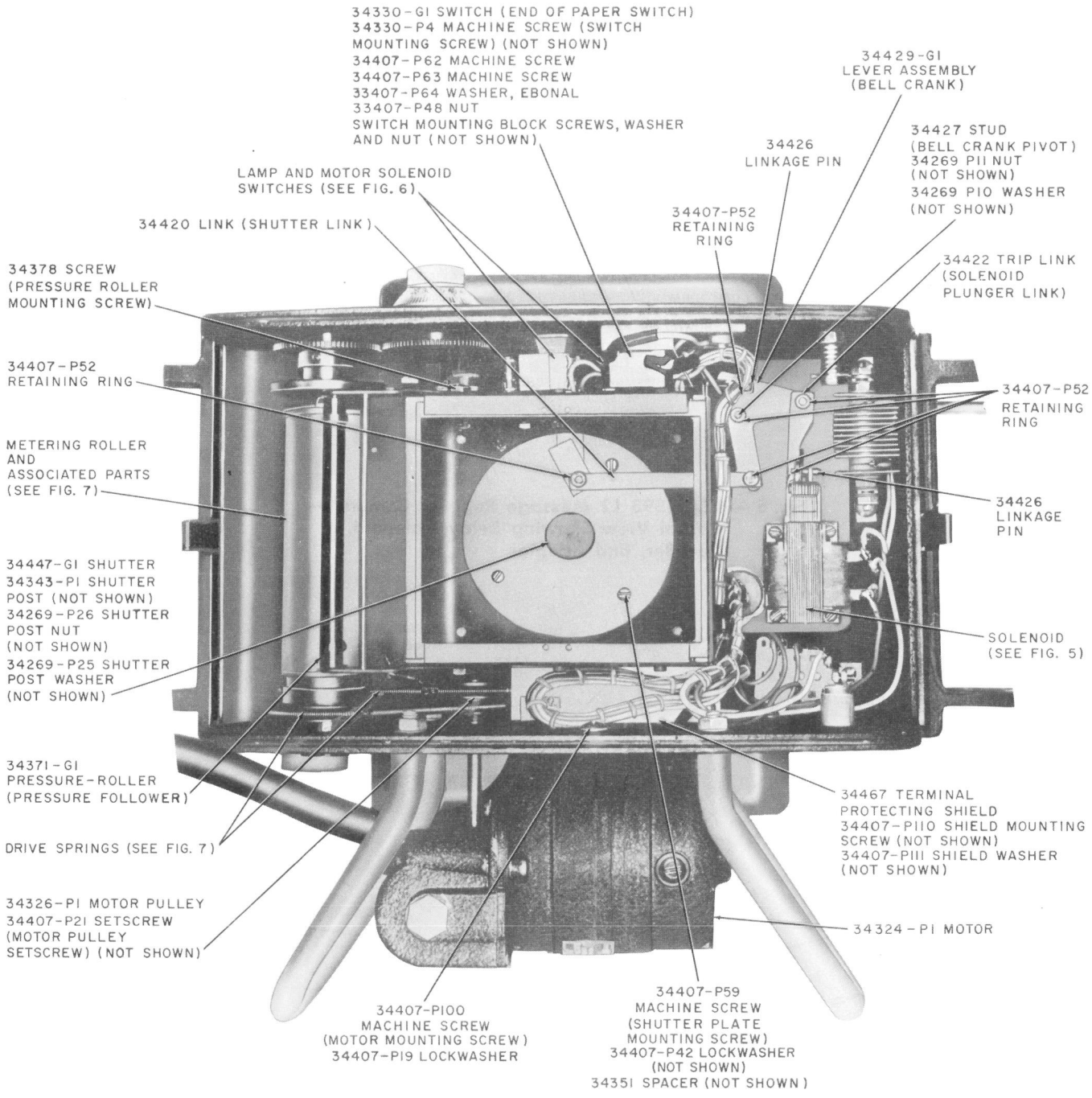


Fig. 4 — KS-14593 L2 Message Register Camera with Cover Removed

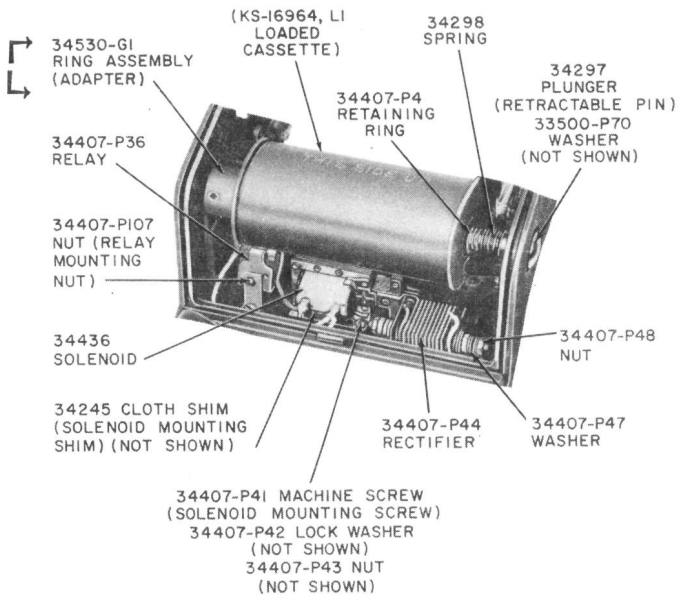


Fig. 5 — KS-14593 L2 Message Register Camera — Partial View Showing Relay, Solenoid, Rectifier, and Adapter

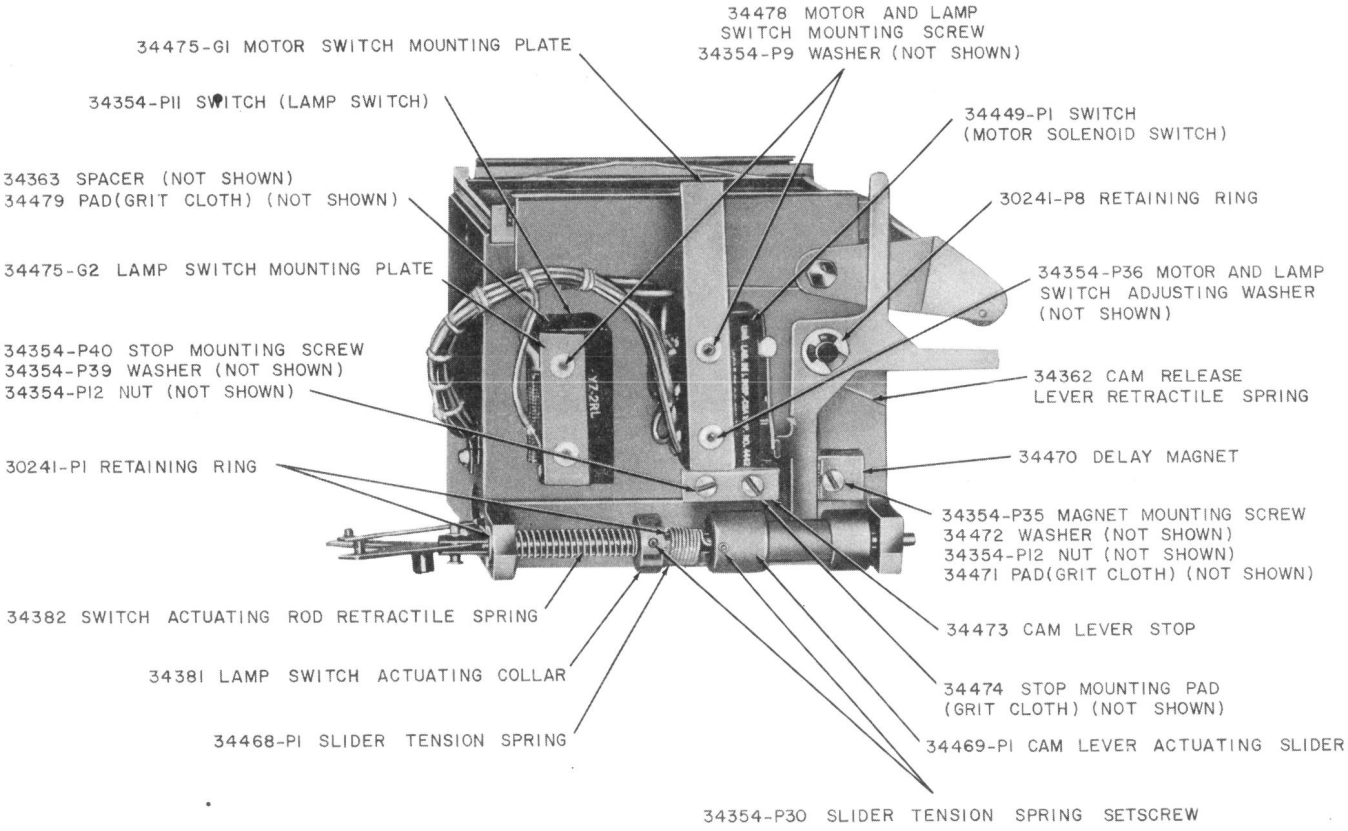


Fig. 6 — Lamp and Motor-Solenoid Switches (Image Chamber Removed from Camera)

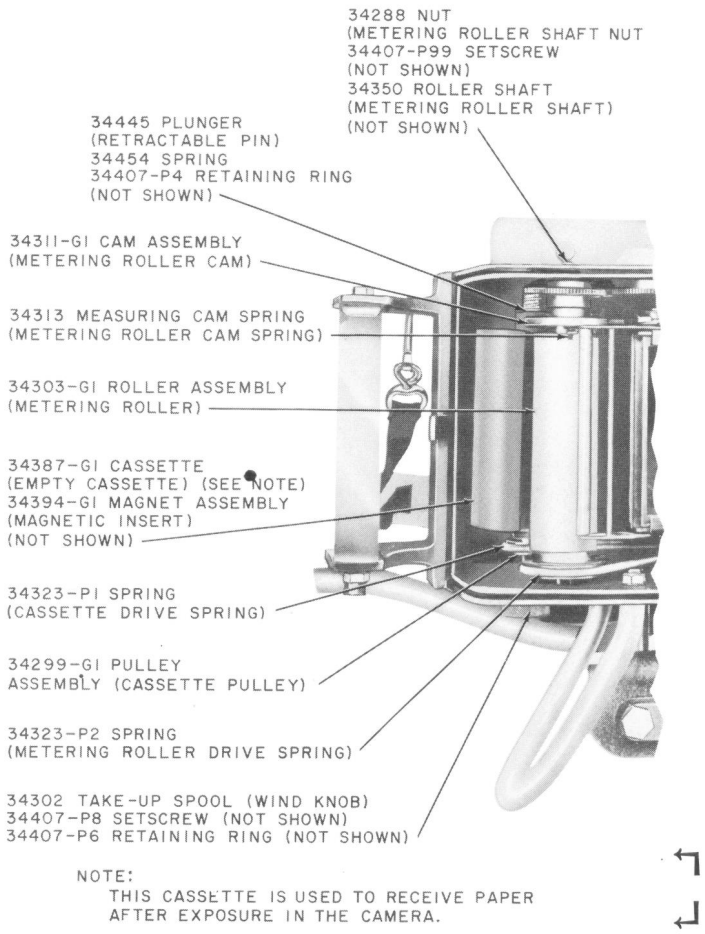


Fig. 7 — KS-14593 L2 Message Register Camera — Partial View Showing Cassette, Metering Roller, and Associated Parts

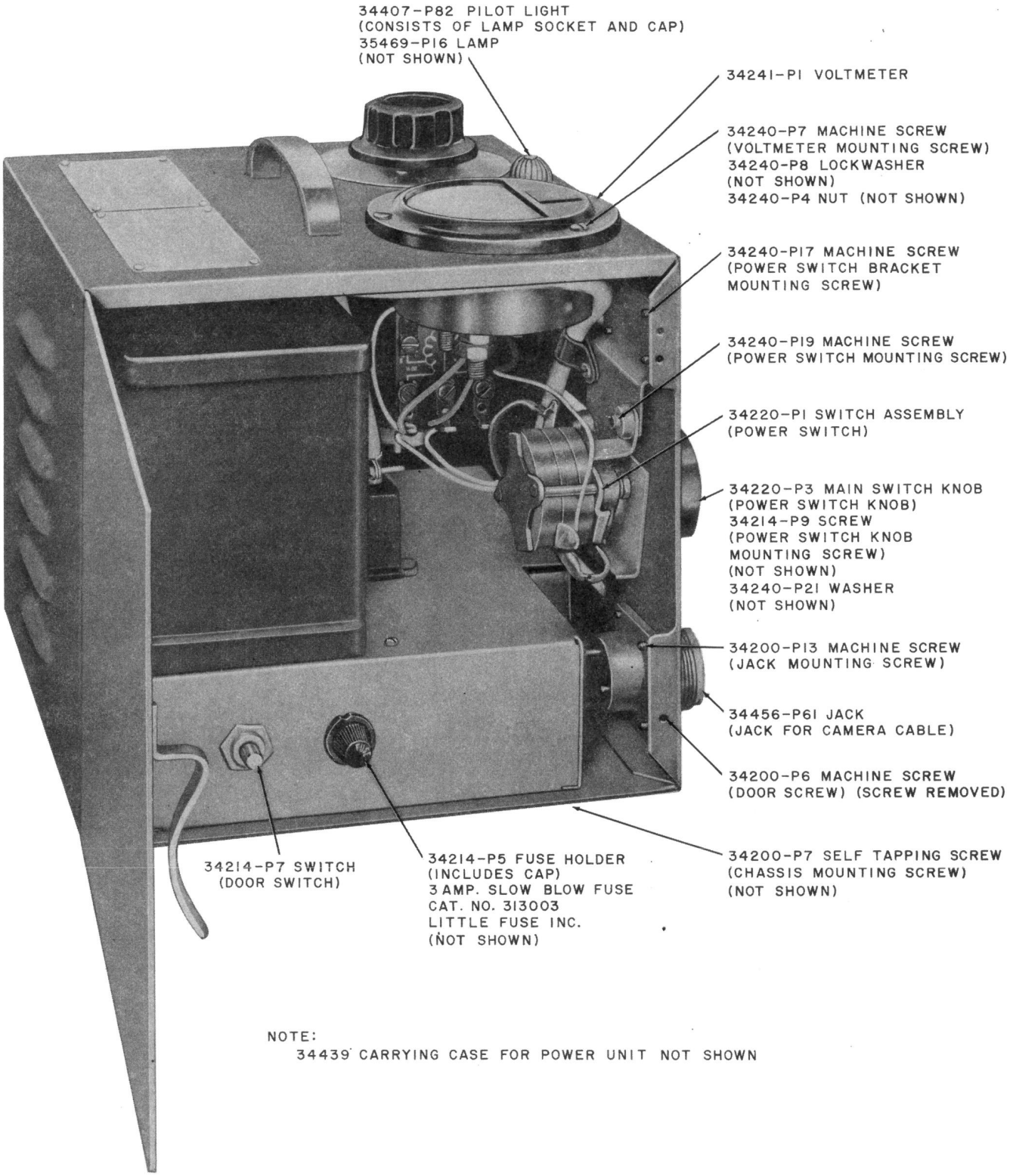


Fig. 8 — KS-14594 Power Unit

3. REPLACEMENT PROCEDURES

3.01 *List of Tools and Materials*

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
209	5/16-Inch Hex. Open Single-End Offset Wrench
→ 349	3/16- and 7/32-Inch Hex. Closed, Double-End Offset Wrench
417A	1/4- and 3/8-Inch Open Flat Wrench
418A	5/16- and 7/32-Inch Open Double-End Flat Wrench
565A	90-Degree Offset Screwdriver
R-1005	Jewelers Screwdriver
R-1102	Spudger
R-2653	No. 5 Bristo Setscrew Wrench
R-2670	3/32-Inch Allen Socket Screw Wrench
R-2671	1/8-Inch Allen Socket Screw Wrench
R-2739	90-Degree Offset Screwdriver
→ R-2958	5/64-Inch Allen Socket Screw Wrench
R-2959	1/16-Inch Allen Socket Screw Wrench
R-2966	No. 5 Flat Stiff Artists Brush
R-2975	Adjustable Snap Ring Pliers
R-3193	9/32- and 11/32-Inch Open Double-End Wrench
KS-2630	5/16-Inch Hex. Socket Wrench
KS-6320	Orange Stick
KS-6367	7/16- and 5/8-Inch Open Double-End Flat Wrench
KS-6854	Screwdriver
KS-8511	Tweezers
KS-14336	Screwdriver
—	3-Inch C Screwdriver
—	4-Inch E Screwdriver
—	5-Inch E Screwdriver
—	P-Long-Nose Pliers
—	No. 2 Phillips-Type Screwdriver
—	1/8-Inch Twist Drill (2 reqd)
—	11/16- and 25/32-Inch Open Double-End Flat Wrench No. 29 J. H. Williams Co.
—	3/4- and 13/16-Inch Open Double-End Flat Wrench No. 731 J. H. Williams Co.
—	Screwdriver, No. 2012, Stanley Tools
—	4-Ounce Riveting Hammer
—	1/16-Inch Drive Pin Punch, L. S. Starrett Co. No. 565 (or equivalent)
MATERIALS	
KS-2423	Cloth
KS-7471	Grease
KS-7860	Petroleum Spirits

3.02 Before making any replacement of parts, turn the switch knob on the power unit to the OFF position and disconnect the power unit from the power supply.

3.03 If it is necessary to remove the camera cover to replace parts, release the cover latches and lift the cover from the camera. When remounting the cover, make sure that the cover slot engages the cover locating pin and that the hole in each latch engages the associated pin in the cover.

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

3.05 After making any replacement of parts of the camera or power unit, the part or parts replaced shall meet the requirements involved as specified in Section 030-301-701. Other parts whose adjustments may have been directly disturbed by the replacement operations shall be checked to applicable requirements.

3.06 ***Removing and Remounting Camera Hood:*** Fig. 9 —

(1) To remove the camera hood, place the camera so that it is supported on the motor guard. Reach into the hood and disconnect the lamp cable plug. Pull the filter off the lens and mount the lens cap, furnished with the camera, over the lens. Remove the mounting screws from the top and sides of the hood using the 3-inch C screwdriver for the round head screw adjacent to the trigger switch, and the No. 2 Phillips screwdriver for all other screws. Turn the camera over so that the motor side is up and remove the remaining hood mounting screws with the No. 2 Phillips screwdriver. Remove the hood.

Caution: To prevent damage to the lens or trigger switch, do not place the camera with the lens side down when the hood is removed.

(2) Remount the hood in the reverse order of removal covered in (1). Remove the lens cap and remount the filter. Reconnect the lamp cable plug.

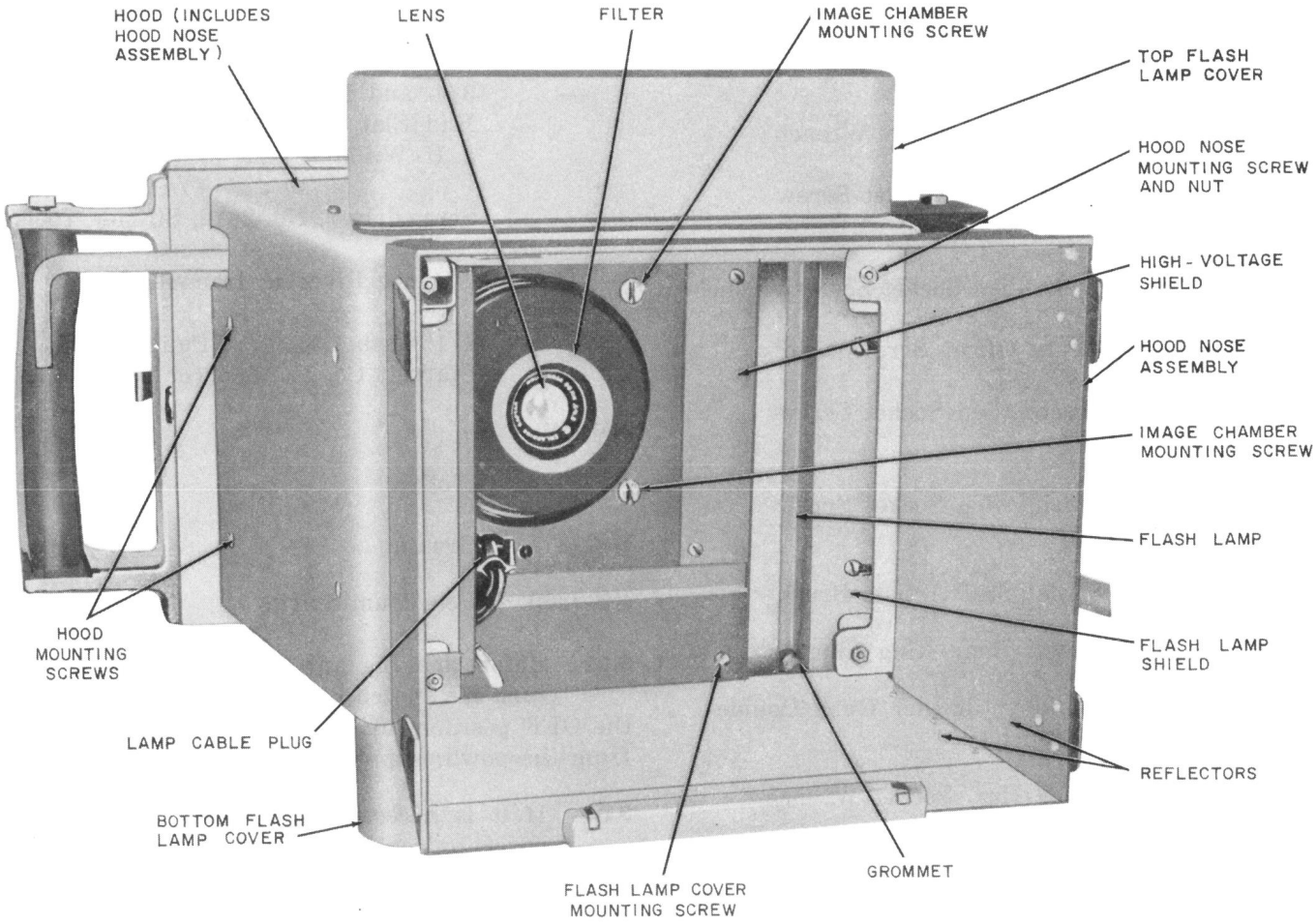


Fig. 9 — KS-14593 L2 Message Register Camera Showing Lens, Filter, and Hood Nose Assembly

3.07 ***Removing and Remounting Image Chamber:*** Fig. 10 —

(1) To remove the image chamber, first remove the camera hood as covered in 3.06. Referring to Fig. 10, remove the retaining rings from the bell crank pivot, from the pin which connects the solenoid plunger link to the bell crank, and from the shutter operating arm pin. To remove a retaining ring, insert the blade of the R-1005 jewelers screwdriver in one of the openings in the ring. Slowly turn the screwdriver toward the center projection of the ring to disengage the ring from the pin. Remove the ring. Remove the end-of-paper switch mounting screws using the 4-inch E screwdriver. Use the R-3193 wrench to hold the nut on the screw nearer the trigger side of the camera while removing this screw. Swing the end-of-paper switch out of the way. Remove the four image chamber mounting screws (Fig. 9) from the lens side of the camera using the 5-inch E screwdriver. Lift the image chamber from the camera and place it adjacent to the camera taking care not to disconnect any leads.

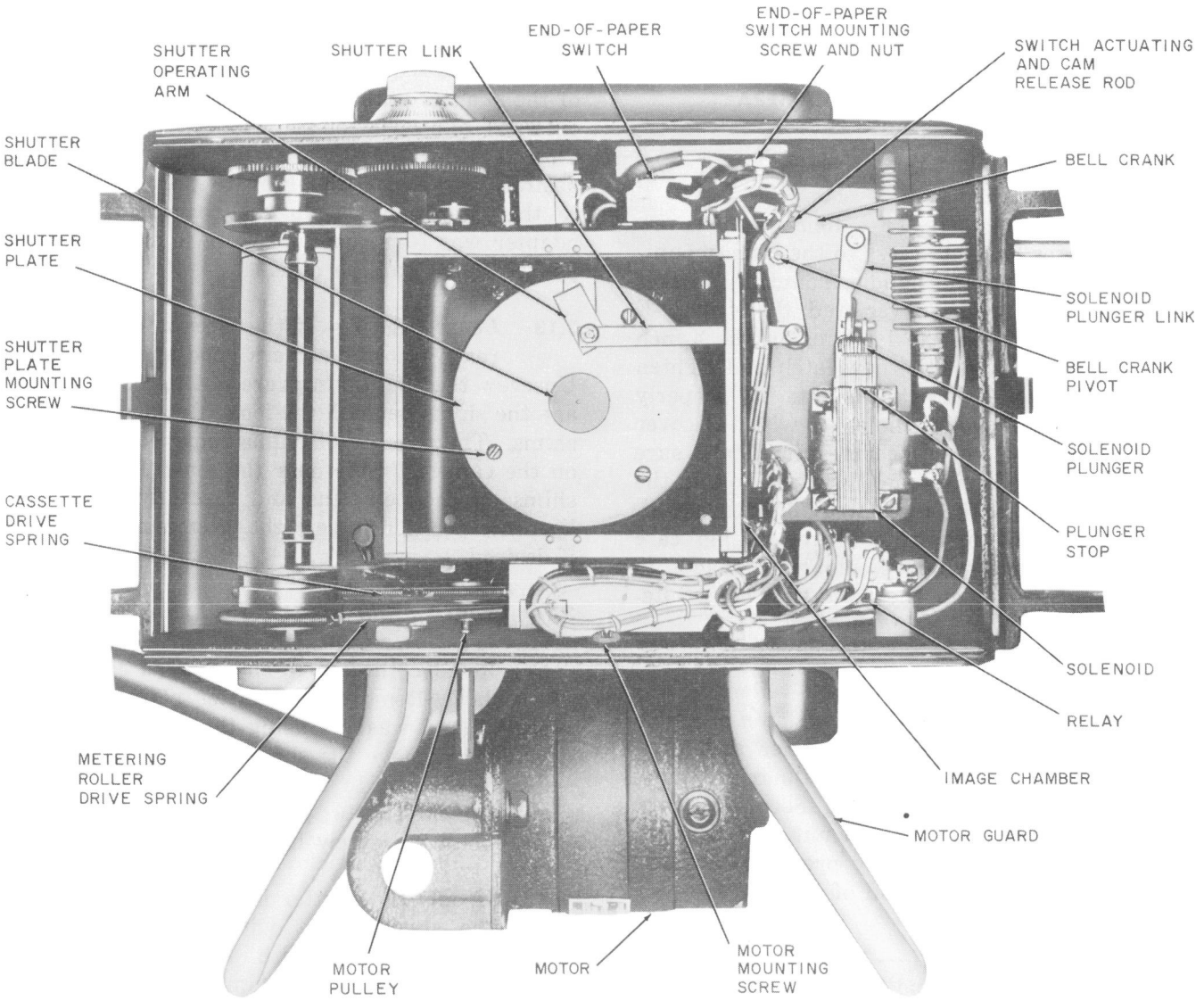


Fig. 10 — KS-14593 L2 Message Register Camera with Cover Removed

(2) To remount the image chamber, remount the parts removed in (1) in the reverse order of removal. To remount a retaining ring, position the ring with its opening against the groove in the pin. Place the blade of the 3-inch C screwdriver against the outer edge of the ring opposite the center projection. Push the ring into position on the pin. Before tightening the image chamber mounting screws, insert the shanks of the 1/8-inch drills into the image chamber locating holes (Fig. 12) from the lens side of the camera, making sure that the drills enter the corresponding locating holes in the image chamber. With the drills in place, securely tighten the image chamber mounting screws. Remove the drills and remount the camera hood as covered in 3.06.

KS-14593 L2 MESSAGE REGISTER CAMERA

Cover Latch, Handle, and Hood Nose

3.08 ***Cover Latch:*** Fig. 11 — Remove the cover. In order to gain access to the latch mounting screws, remove the handle mounting bracket using the 565A screwdriver and the 4-inch E screwdriver. Remove the latch using the 4-inch E screwdriver. Mount the new latch and tighten the mounting screws friction tight. To properly position the latch, mount the cover with the cover slot engaging the cover locating pin. Make sure that the cover is firmly seated and the hole in the cover latch engages the associated pin in the cover. Tighten the latch mounting screws taking care not to exert force which would be sufficient to damage the threads in the mounting holes. Remount the handle mounting bracket.

3.09 ***Cover Latch Pin:*** Fig. 11 — Remove the cover. Remove the defective latch pin from the cover using the riveting hammer and drive pin punch as required. Substitute a replacement latch pin from the 34533-G1 kit. Securely fasten the pin with a lockwasher and nut from the kit, using the 349 wrench. Apply pressure carefully to avoid stripping the thread of the pin.

3.10 ***Handle:*** Fig. 11 — Remove the handle mounting bolts and lockwashers using the KS-6367 wrench. Remove the handle. Mount the new handle and securely tighten the mounting bolts, making sure the lockwashers are in place.

3.11 ***Hood Nose:*** Fig. 9 — Remove the hood nose mounting screws using the R-2739 offset screwdriver and the 418A wrench, taking care not to lose the lockwasher under each nut. Remove the hood nose. Mount the new hood nose and insert the mounting screws with their threaded portion toward the open end of the hood nose. Make sure the lockwashers are in place and securely tighten the mounting nuts. Clean the reflectors, if necessary.

Filter, Filter Adapter, Lens, Shutter, and Shutter Post

3.12 ***Filter and Filter Adapter:*** Fig. 9 — If the filter is mounted on the lens, reach into the hood and pull it off. Unscrew the retaining ring from the body of the adapter and remove the filter from the adapter. Substitute new parts as required. Place the filter in the body of the adapter with the wide side of the filter rim outward, and screw on the adapter retaining ring fingertight. Remount the filter on the lens if desired; otherwise, in order to prevent damage to the filter, place it in the box in which the adapter was furnished and store it in the plastic pocket of the camera case.

3.13 ***Lens:*** Fig. 9 — If the filter is on the lens, reach into the camera hood and pull it off. Unscrew the lens taking care not to lose or damage the shims beneath the lens. Replace damaged shims. The number of shims required is marked on the camera frame near the lens. Position the shims on the new lens and carefully screw the lens into position fingertight. Remount the filter, if desired.

3.14 ***Shutter and Shutter Post:*** Fig. 10 —

(1) Remove the image chamber as covered in 3.07. Remove the shutter plate mounting screws and washers using the 3-inch C screwdriver. Remove the shutter plate and shutter. Take care not to lose the spacers positioned between the shutter plate and camera frame at the mounting screw holes.

(2) If only the shutter is to be replaced, clean the shutter post with a KS-2423 cloth slightly moistened with KS-7860 petroleum spirits and apply a thin film of KS-7471 grease to the post using the R-2966 brush. Substitute the new shutter and check the position of solenoid requirement in Section 030-301-701.

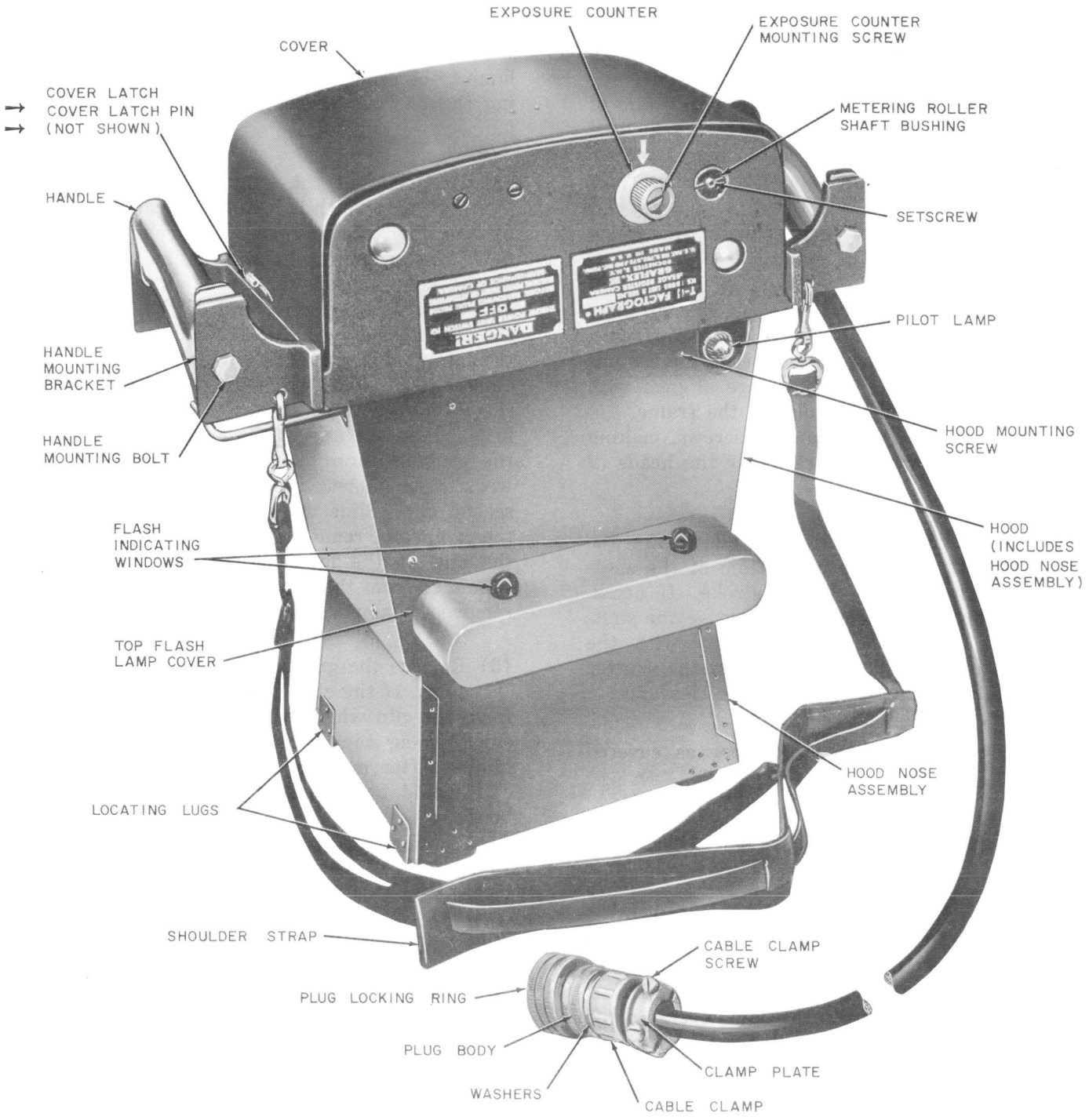


Fig. 11 — KS-14593 L2 Message Register Camera (Exterior View)

(3) If the shutter post is to be replaced, remove the post nut (Fig. 12) and washer using the 417A wrench. Remove the post using the 209 wrench. Mount the new post and securely tighten the post nut making sure the washer is under the nut. Apply a thin film of KS-7471 grease to the cylindrical surface of the post and the top of the hexagonal section at the base of the post using the R-2966 brush. Mount the shutter on the post. Check the position of solenoid requirement in Section 030-301-701.

(4) Position a spacer over each shutter plate mounting screw hole in the camera frame. Position the shutter plate so that the mounting screw holes in the plate are aligned with the spacers and screw holes in the frame. Insert and tighten the mounting screws, making sure that the washers are under the heads of the screws.

(5) Check that the shutter blade clears the shutter plate and the bottom of the shutter housing through its full stroke. If necessary to obtain this clearance, remove the shutter and adjust the blade slightly with the fingers as required. Then remount the shutter and shutter plate and recheck the clearance.

(6) Remount the image chamber as covered in 3.07.

Flash Lamp, Pilot Lamp, and Associated Parts

3.15 ***Flash Lamp Cover:*** Fig. 9 and 11 — Place the camera on its side so the cover to be replaced will be accessible. Remove the cover mounting screws and washers from the inside of the camera hood using the KS-14336 screwdriver. Remove the cover. Mount the new cover. In the case of the cover equipped with the flash indicating windows (Fig. 11), mount the cover with the windows facing the exposure counter. Securely tighten all screws.

3.16 ***Flash Indicating Windows:*** Fig. 11 — Manually unscrew and remove the window. If necessary, apply the P-long-nose pliers as close as possible to the flash lamp cover to loosen the window. Mount the new window fingertight.

3.17 ***Flash Lamp:*** Fig. 9 —

(1) Remove the flash lamp covers as described in 3.15. Tag and unsolder the leads to the lamp to be replaced in order to insure connecting them to the proper terminals on the new lamp.

(2) Each end of the lamp is mounted in a grommet which is held in the camera hood by two clips. To remove a grommet, first remove the grommet clip nearer the outer end of the hood as follows: Reach into the hood and disengage the inner end of the clip from the edge of the lamp shield. To do this, spring the lamp shield outward with the fingers just enough to clear the end of the clip. Then, using the P-long-nose pliers from the outside of the hood, grasp the clip at the outer periphery of the grommet and remove the clip. Manually work the grommet out of the hood. Remove the second clip. Slide the grommet to the end of the lamp and remove it by stretching it over the end of the lamp. Similarly remove the grommet from the other end of the lamp and remove the lamp.

(3) Replace the grommets and clips, if necessary. If the clips are being replaced, preform the clip which will not engage the lamp shield using the corresponding old clip as a guide. After mounting, the inner end of this clip should press against the lamp inside the hood.

(4) Place the new lamp in the camera so that the end having one terminal is associated with the single lead. Position the lamp so that both ends protrude approximately the same distance beyond the hood. Mount a grommet on each end of the lamp and position the grommets adjacent to the mounting holes. Mount the grommets in the holes as covered in (5).

(5) Place the two clips on the grommet approximately 180 degrees apart with the clip which is to engage the lamp shield toward the outer end of the hood. Work the grommet into the mounting hole taking care not to disturb the position of the lamp and push the outer end of each clip against the outside of the grommet. Then, reach into the hood and

bend the nearer clip against the lamp shield, springing the shield slightly, so that the end of the clip is engaged by the edge of the shield. If necessary, slide the clip along the periphery of the grommet to engage the lamp shield. Similarly mount the other grommet with its clips in the hole.

(6) Connect and solder the flash lamp leads. Remount the covers as described in 3.15.

3.18 ***Pilot Lamp:*** Fig. 11 — Unscrew the lamp cap. With the tips of the fingers, press the lamp inward and turn it counterclockwise to disengage it from the socket. Remove the lamp. Mount the new lamp in reverse order of removal and remount the lamp cap.

3.19 ***Pilot Lamp Socket:*** Fig. 11 and 12 — Remove the pilot lamp as covered in 3.18. Remove the camera hood as covered in 3.06. Remove the high-voltage shield (Fig. 9) using the 3-inch C screwdriver. Unsolder and disconnect the lamp socket leads. Remove the lamp socket mounting nut and washer using the Williams No. 731 wrench. Remove the lamp socket. Mount the new lamp socket and securely tighten its mounting nut making sure the lockwasher is in place. Connect and solder the leads. Remount the high-voltage shield and hood. Remount the lamp as covered in 3.18.

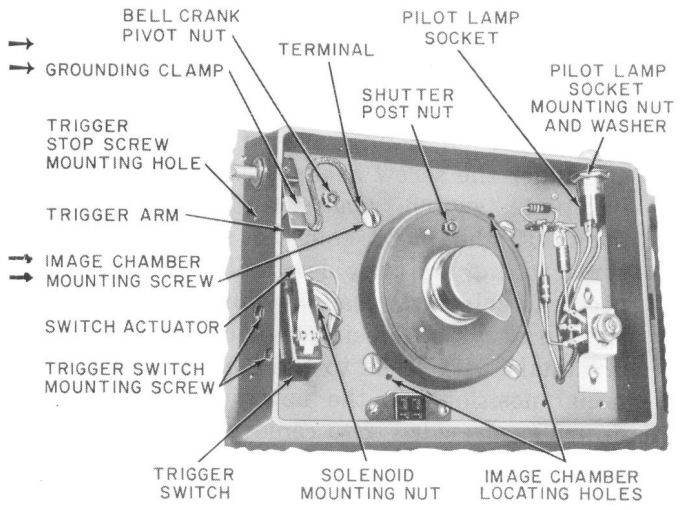


Fig. 12 — KS-14593 L2 Message Register Camera — Partial View with Hood Removed

Solenoid and Associated Linkage

3.20 ***General:*** The linkage associated with the solenoid consists of the shutter link, solenoid plunger link, bell crank, and bell crank pivot. This linkage is secured by retaining rings mounted on the linkage pins. Remove retaining rings as covered in 3.07(1) and remount them as covered in 3.07(2). When replacing any parts of the linkage, clean the linkage pins which are made accessible using a KS-2423 cloth slightly moistened with KS-7860 petroleum spirits. Apply a thin film of KS-7471 grease to the pins with the R-2966 brush before remounting the parts. After replacing any parts of the linkage, check the requirement covering freedom of movement of solenoid plunger and associated linkage in Section 030-301-701.

3.21 ***Solenoid:*** Fig. 10 and 13 —

(1) Remove the camera cover. Remove the hood as covered in 3.06. Tag and unsolder the leads to the solenoid. Remove the retaining ring from the pin connecting the solenoid plunger link to the solenoid. Remove the pin. Remove the solenoid mounting screws with the 3-inch C screwdriver while holding the mounting nuts (Fig. 12) on the hood side of the camera with the 418A wrench. Take care not to lose the lockwashers. Remove the solenoid. Check the solenoid mounting shim and replace it if torn or otherwise damaged.

(2) Mount the new solenoid on the shim and tighten the mounting screws friction tight, making sure the washers are in place under the nuts on the hood side of the camera. Connect and solder the leads. Adjust the position of the solenoid to meet the position of solenoid requirement in Section 030-301-701. Securely tighten the solenoid mounting screws. Remount the hood cover.

3.22 ***Shutter Link:*** Fig. 10 — Remove the camera cover. Remove the retaining rings from the pins connecting each end of the link. Remove the link through the image chamber. Mount the new link and remount the retaining rings.

3.23 ***Solenoid Plunger Link:*** Fig. 10 — Remove the camera cover. Remove the retaining ring on the pin connecting the link to the solenoid

plunger. Remove the pin. Remove the retaining ring from the pin connecting the link to the bell crank. Remove the link. Mount the new link and insert the pin at the solenoid end. Remount the retaining rings.

3.24 ***Bell Crank:*** Fig. 10 — Remove the image chamber as covered in 3.07. Remove the retaining ring on the pin connecting the bell crank to the switch actuating and cam release rod. Remove the pin. Substitute the new bell crank. Insert the pin and mount the retaining ring. Wipe the bell crank pivot with a KS-2423 cloth slightly moistened with KS-7860 petroleum spirits and apply a thin film of KS-7471 grease to the pivot using the R-2966 brush. Remount the image chamber as covered in 3.07.

3.25 ***Bell Crank Pivot:*** Fig. 10 — Remove the image chamber as covered in 3.07. Using the 417A wrench, remove the bell crank pivot nut on the lens side of the camera shown in Fig. 12. Remove the pivot taking care not to lose the washer. Mount the new pivot and securely tighten the nut making sure the washer is in place under the nut. Apply a thin film of KS-7471 grease to the pivot with the R-2966 brush. Remount the image chamber as covered in 3.07.

Grounding Clamp, Switches, Rectifier, and Relay

3.26 ***Grounding Clamp:*** Fig. 12 —

(1) ***General:*** The trigger on the KS-14593 L1 camera must be grounded to the camera case with a grounding clamp as shown in Fig. 12. To check this, remove the camera hood in accordance with 3.02 and 3.06. If the trigger arm is not grounded, order a grounding clamp (see Fig. 3) and mount the part as covered in (3). If it is necessary to replace a grounding clamp, proceed as covered in (2) and (3).

(2) To replace a grounding clamp, loosen the image chamber mounting screw with the 5-inch E screwdriver and remove the grounding terminal. Hold the switch actuator away from the trigger arm and slide the grounding clamp until it is off the trigger arm.

(3) Mount the new grounding clamp as follows: Hold the switch actuator away from the trigger arm and slide the grounding clamp on the trigger arm until the clamp is approximately 1/4-inch from the end of the arm. Loosen the image chamber mounting screw nearest the trigger arm, using the 5-inch E screwdriver. Position the grounding terminal under the screw and securely tighten the screw.

3.27 ***Trigger Switch:*** Fig. 12 —

(1) Remove the camera hood as covered in 3.06. Remove the trigger switch mounting screws and nuts using the 3-inch C screwdriver and 418A wrench. Take care not to lose the washers under the mounting nut and the spacer between the switch and the camera frame. Replace the spacer if damaged. Tag and unsolder the leads.

(2) Connect and solder the leads to the new switch. Mount the new switch and tighten the mounting screws friction tight making sure the washers and spacer are in place. Remount the trigger stop screw (round head screw that also serves as a hood mounting screw). Position the switch so that it operates while the trigger is being pulled and so that there is slight additional movement of the switch actuator when the trigger arm is against the trigger stop screw. Securely tighten the switch mounting screws. Remove the trigger stop screw. Remount the hood.

3.28 ***Lamp and Motor-Solenoid Switches:*** Fig. 14 —

(1) To replace either of these switches, remove the image chamber as covered in 3.07. Remove the switch mounting screws using the R-2670 wrench, taking care not to lose the washers under the screw heads. Remove the clamping plate, switch, spacer, and two grit cloth pads. If the motor-solenoid switch is being replaced, tag and unsolder the leads. Then connect and solder the leads to the new switch. If the lamp switch is being replaced, transfer the terminals with leads to the corresponding terminal positions on the new switch using the 3-inch C screwdriver to remove and tighten the terminal screws.

(2) Substitute other new parts, if required, and remount the parts in the reverse order of removal. Tighten the mounting screws friction tight.

(3) If the motor-solenoid switch is being replaced, position the switch to meet the position of motor-solenoid switch requirement covered in Section 030-301-701. Then remount the image chamber as covered in 3.07. If the lamp switch is being replaced, remount the image chamber and then position the switch to meet the position of lamp switch requirement in Section 030-301-701.

3.29 ***End-of-Paper Switch and Mounting Block:*** Fig. 10 —

(1) Remove the camera cover. Pull back the insulating sleeves covering the switch terminals, and tag and unsolder the leads. Remove the switch mounting screws using the 4-inch E screwdriver. Use the R-3193 wrench to hold the nut on the screw nearer the trigger side of the camera while removing the screw, taking care not to lose the associated washer. Remove the switch and mounting block. Remove the switch from its mounting block using the 3-inch C screwdriver. Substitute new parts as required.

(2) Mount the switch on the block and securely tighten the mounting screws. Mount the block with the switch and tighten the mounting screws friction tight making sure that the washer is in place under the nut. Connect and solder the leads. Pull the insulating sleeves up to cover the switch terminals. Adjust the position of the switch to meet the position of the end-of-paper switch requirement in Section 030-301-701 and securely tighten all screws.

3.30 ***Rectifier:*** Fig. 13 — Remove the camera cover. Tag and unsolder the rectifier leads. Loosen the rectifier mounting nuts using the R-3193 wrench. Remove the rectifier. Remove the nut and four washers from each end of the rectifier and transfer them to the corresponding positions on the new rectifier. Mount the new rectifier so that two washers are on each side of both mounting brackets. Securely tighten the nuts. Connect and solder the leads. Remount the camera cover.

3.31 ***Relay:*** Fig. 13 — Remove the camera cover. Tag and unsolder the relay leads. Loosen the relay mounting nut with the 417A wrench and remove the relay. Transfer the nut to the new relay. Mount the new relay and securely tighten the nut. Connect and solder the leads.

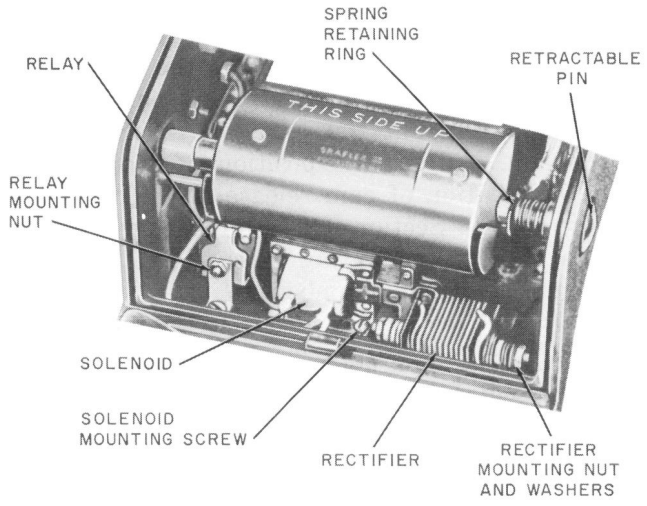


Fig. 13 — KS-14593 L2 Message Register Camera — Partial View Showing Relay, Solenoid, and Rectifier

Cam Release Lever Delay Magnet and Front Stop

3.32 ***Cam Release Lever Delay Magnet:*** Fig. 14 —

(1) Remove the image chamber as covered in 3.07. Remove the magnet mounting screw locknut on the inside of the image chamber with the KS-2630 wrench taking care not to lose the lockwasher under the nut. Remove the magnet mounting screw with the 3-inch C screwdriver and remove the clamping plate, magnet, and two grit cloth pads.

(2) Substitute new parts as required and remount the parts in reverse order of removal. Position the magnet to meet the position of cam release lever delay magnet requirement covered in Section 030-301-701, and tighten the mounting screw and locknut securely. Remount the image chamber.

3.33 ***Cam Release Lever Front Stop:*** Fig. 14 — Remove the front stop mounting screw locknuts on the inside of the image chamber with the KS-2630 wrench taking care not to lose the

lockwashers under the nuts. Remove the front stop mounting screws and flat washers using the 3-inch C screwdriver and remove the front stop and grit cloth pad. Substitute new parts as required and remount the parts in reverse order of removal. Adjust the position of the stop to meet the position of cam release lever front stop requirement in Section 030-301-701, and securely tighten the stop mounting screws and locknuts. Remount the image chamber.

Switch Actuating Rod Retractile Spring, Cam Release Actuating Slider, Slider Tension Spring, Lamp Switch Actuating Collar, and Cam Release Lever Retractile Spring

3.34 *General:* To replace any of these parts, remove the image chamber as covered in 3.07. Then remove the switch actuating and cam release rod (Fig. 14) from the image chamber as follows: Move the lamp switch actuating collar away from the retaining ring which locates it on the rod just far enough to grasp the ring with the P-long-nose pliers. Grasp the ring at the center projection and pull the ring from the rod. Remove the rod and the parts which were mounted on it. After replacing parts as covered in 3.35 to 3.39, remount the image chamber in the camera.

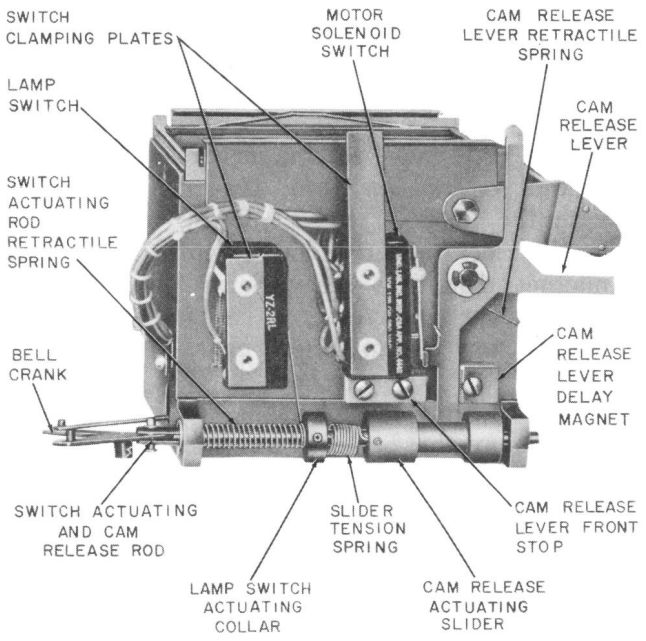


Fig. 14 — Lamp and Motor — Solenoid Switches (Image Chamber Removed from Camera)

3.35 *Switch Actuating Rod Retractile Spring:* Fig. 14 — Substitute the new spring and remount the actuating rod on the image chamber with the associated parts in place on the rod as shown in Fig. 14. Remount the retaining ring on the rod.

3.36 *Cam Release Lever Actuating Slider:* Fig. 14 — Remove the slider setscrew using the R-2653 wrench and mount the screw in the new slider. Remount the actuating rod on the image chamber with the associated parts in place on the rod as shown in Fig. 14. Insert the end of the slider tension spring in the associated hole in the slider. Remount the retaining ring on the rod. Position the slider to meet the position of cam release actuating slider requirement covered in Section 030-301-701. Securely tighten the slider setscrew against the spring and recheck the requirement.

3.37 *Slider Tension Spring:* Fig. 14 — Loosen the setscrews in the lamp switch actuating collar and the actuating slider using the R-2653 wrench and remove the spring. Substitute the new spring and remount the actuating rod on the image chamber with the associated parts in place on the rod as shown in Fig. 14. Insert the ends of the slider tension spring in the respective holes in the lamp switch actuating collar and the slider. Remount the retaining ring on the rod. With the cam release lever against the delay magnet, hold the slider against the lever. Position the slider spring so that the turns are approximately centered between the collar and the slider. Make sure that the end of the spring which enters the collar does not protrude beyond the switch actuating surface of the collar and tighten the collar setscrew against the spring. Position the slider to meet the position of cam release actuating slider requirement covered in Section 030-301-701 and securely tighten the slider setscrew against the spring. Recheck the requirement.

3.38 *Lamp Switch Actuating Collar:* Fig. 14 — Remove the setscrew in the actuating collar and remove the collar from the slider tension spring. Mount the setscrew in the new collar. Remount the actuating rod on the image chamber with the associated parts in place on the rod

as shown in Fig. 14. Insert the end of the slider spring in the associated hole in the collar. Remount the retaining ring on the rod. Position the slider to meet the position of cam release actuating slider requirement covered in Section 030-301-701. Securely tighten the collar setscrew against the spring and recheck the requirement.

3.39 ***Cam Release Lever Retractile Spring:*** Fig. 14 — Remove the retaining ring which secures the cam release lever on its pivot as follows: Insert the blade of the KS-6854 screwdriver in one of the openings in the ring and turn the screwdriver toward the center projection of the ring to disengage the ring from the lever pivot. Remove the cam release lever and the retractile spring. Substitute the new spring and remount the lever, spring, and retaining ring. Remount the actuating rod with the associated parts in place on the rod as shown in Fig. 14. Remount the retaining ring on the rod.

Drive Springs, Metering Roller, Motor, and Associated Parts

3.40 ***Cassette and Metering Roller Drive Springs:*** Fig. 15 —

(1) ***Removing Springs:*** Remove the camera cover. If the hooked ends of the cassette drive spring are not accessible, slip the spring around the motor pulley while turning the wind knob or, in the case of the metering roller spring, turn the exposure counter in a clockwise direction without disengaging the gear until the hooked ends are accessible. Disengage the hooked ends of the spring using the KS-8511 tweezers or P-long-nose pliers and remove the spring:

(2) ***Mounting Springs:*** Pass one end of the spring under the motor pulley in line with the proper groove using the KS-8511 tweezers. In the case of the metering roller drive spring, pass the lower portion of the spring around the metering roller pulley and engage the hooked ends of the spring using the KS-8511 tweezers or P-long-nose pliers. In mounting the cassette drive spring, engage the hooked ends after the spring has been positioned on the motor pulley and slip the spring over the cassette pulley. Remount the camera cover.

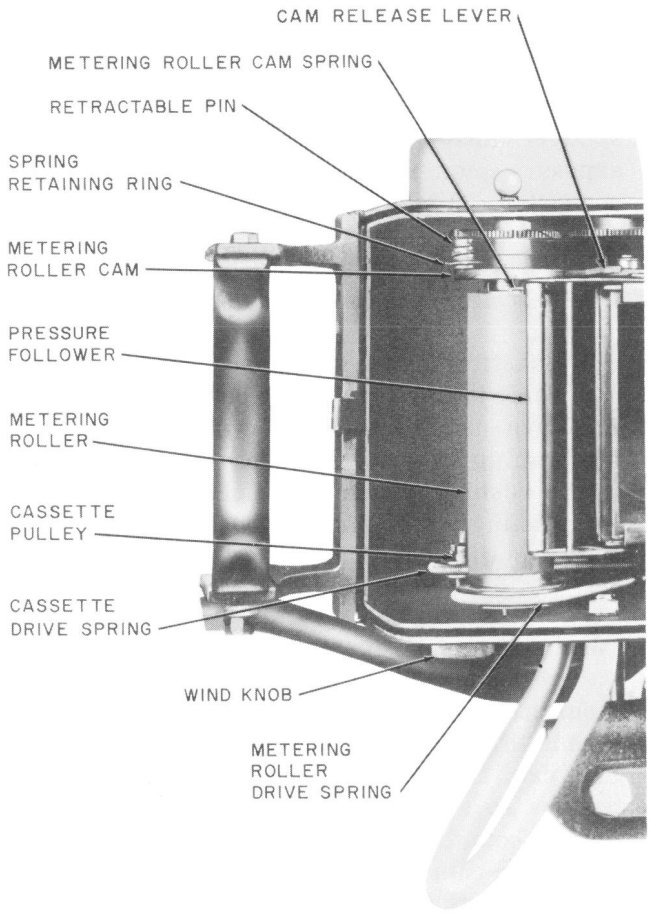


Fig. 15 — KS-14593 L2 Message Register Camera — Partial View Showing Metering Roller and Associated Parts

3.41 ***Metering Roller Cam Spring:*** Fig. 15 — Remove the camera cover. Disengage the ends of the spring from the holes in the metering roller and metering roller cam using the KS-8511 tweezers. Remove the spring. Mount the new spring using the tweezers to engage the ends of the spring in the holes in the cam and roller. Remount the camera cover.

3.42 ***Metering Roller, Metering Roller Shaft, and Metering Roller Cam:*** Fig. 11 and 15 —

(1) Remove the camera cover. Remove the metering roller cam spring using the KS-8511 tweezers. Then, remove the metering roller drive spring as covered in 3.40. Remove the setscrew in the metering roller shaft bush-

ing at the wind knob side of the camera using the R-2671 wrench. Unscrew the bushing from the end of the shaft using the 5-inch E screwdriver. Push the shaft inward with the R-1102 spudger until the bushing on the shaft at the exposure counter side of the camera (Fig. 11) is accessible. While holding the metering roller and metering roller cam in one hand, grasp this bushing with the other hand and remove the shaft. Remove the metering roller and cam.

(2) Substitute new parts as required. If the shaft is to be replaced, loosen the setscrew 1/4 turn using the R-2671 wrench. Unscrew the bushing from the shaft leaving the setscrew in the bushing. Turn the setscrew 1/4 turn in the bushing and mount the bushing on the new shaft so that the shaft butts against the setscrew.

(3) To mount the parts, position the cam with relation to the roller so that the holes for mounting the cam spring in both parts are adjacent to each other. Then, holding the roller and cam in one hand, position them in the camera so that the cam gear engages the exposure counter gear, the notch in the cam engages the cam release lever, and the parts are aligned so the shaft can be inserted through the cam and roller. Hold the shaft at the bushing end and insert it through the cam and roller from the exposure counter side of the camera until the bushing is fully seated in the hole in the camera frame. Screw the bushing on the other end of the shaft until it is fully seated in its associated hole in the camera frame. Mount the setscrew in the bushing and securely tighten the setscrews in both bushings. Mount the metering cam spring using the KS-8511 tweezers to engage the ends of the spring in the holes in the cam and roller. Remount the metering roller drive spring as covered in 3.40. Remount the camera cover.

3.43 ***Pressure Follower:*** Fig. 15 — Remove the camera cover. Remove the pressure follower mounting screws using the 418A wrench. Mount the new pressure follower, making sure that the shoulder on each mounting screw engages the hole in the pressure follower. Securely tighten the mounting screws.

3.44 ***Wind Knob:*** Fig. 15 — Loosen the wind knob setscrew using the R-2959 wrench and remove the wind knob. Mount the new wind knob and securely tighten the setscrew against the flat on the shaft.

3.45 ***Exposure Counter and Associated Parts:*** Fig. 11 — Remove the exposure counter mounting screw using the 4-inch E screwdriver taking care not to lose the spring, lockwasher, and spacer mounted under the screw head. Remove the exposure counter. Substitute new parts as required. Mount the new exposure counter on the shaft. Position the spacer and lockwasher on the mounting screw with the spacer nearer the head of the screw. Position the spring in the recess in the exposure counter and mount the screw, spacer, and washer. With the exposure counter and metering roller gears engaged, hold the metering roller to prevent it from turning and securely tighten the exposure counter mounting screw.

3.46 ***Cassette Pulley:*** Fig. 15 — Remove the camera cover. Remove the drive spring from the pulley as covered in 3.40. Loosen the wind knob setscrew using the R-2959 wrench and remove the wind knob. Remove the pulley retaining ring from the outside of the camera using the R-2975 adjustable snap ring pliers. Remove the pulley. Apply a thin film of KS-7471 grease to the bearing surface of the shaft of the new pulley using the R-2966 brush. Mount the new pulley using a new retaining ring. Remount the wind knob and securely tighten its setscrew against the flat on the pulley shaft. Remount the drive spring as covered in 3.40. Remount the camera cover.

3.47 ***Motor Pulley:*** Fig. 10 — Remove the image chamber as covered in 3.07. Slip the drive springs off the motor pulley using the KS-6320 orange stick. Loosen the pulley setscrew (in the groove of the larger diameter portion of the pulley) using the R-2959 wrench and remove the pulley. Mount the new pulley with its larger diameter away from the camera frame. Securely tighten the setscrew against the flat on the shaft. Remount the drive springs with the metering roller drive spring adjacent to the camera frame. Remount the image chamber as covered in 3.07.

3.48 ***Motor:*** Fig. 10 — Remove the motor pulley as covered in 3.47. Unsolder the motor leads noting the terminals from which they were

removed. Remove the motor mounting screws and washers using the Stanley No. 2012 screwdriver taking care not to damage the shutter. Remove the motor and pull the motor leads out of the grommet in the camera frame. Insert and pull the leads of the new motor through the grommet. Mount the motor, tightening the screws alternately a little at a time until they are securely tightened. Connect and solder the leads. Remount the motor pulley as covered in 3.47. Remount the image chamber as covered in 3.07.

3.49 ***Retractable Pins and Associated Parts:*** Fig. 13 and 15 — Remove the camera cover. Pull the retaining ring from the pin with the P-long-nose pliers while holding the spring in place. Remove the spring from the pin and remove the pin. Take care not to lose the washer under the head of the retractable pin at the trigger side of the camera. Substitute new parts as required and mount the parts in reverse order of removal making sure that the washer is in place under the head of the retractable pin at the trigger side of the camera. Remount the camera cover.

3.50 ***Adapter:*** Fig. 5 — Remove the camera cover. Loosen the setscrew in the adapter using the proper size Allen wrench. Remove the adapter from the fixed pin. With the camera resting on the locating lugs on the hood nose as shown in Fig. 11 of the section, position the new adapter on the fixed pin so that the side of the adapter without the locating pin is against the camera frame and the locating pin on the other side of the adapter is directly above the center of the fixed pin. This position of the locating pin is important in order to insure proper positioning of the cassette for withdrawal of the paper. Securely tighten the setscrew in the adapter.

CAMERA CABLE PLUG

3.51 ***Camera Cable Plug:*** Fig. 11 —

(1) Remove the cable clamp screws with the 4-inch E screwdriver taking care not to lose the lockwashers. Remove the clamp plate. Unscrew the cable clamp from the body of the plug and slide the clamp and the three washers directly in front of it back on the camera cable.

(2) The body of the plug consists of two parts which screw together under the plug locking ring. To facilitate holding the plug, insert it into the jack of the power unit and slightly tighten the plug locking ring. Unscrew the rear half of the plug body and slide it back on the cable. Disconnect the plug from the power unit. Tag and unsolder the leads. Remove the plug and clamp from the cable. Disassemble the new plug.

(3) Mount the cable clamp, washers, rear half of the plug body, and the plug locking ring on the cable in the order noted with the nonmetallic washer between the two metal washers. Connect and solder the leads to the terminals of the front half of the body. Assemble the plug in reverse order of removal of the replaced plug. Securely tighten the clamp screws making sure that the lockwashers are in place.

KS-14594 POWER UNIT

Caution: Before replacing any parts, turn the power switch knob to the OFF position and disconnect the power unit from the power supply.

PARTS NOT REQUIRING REMOVAL OF POWER UNIT CHASSIS

3.52 ***Power Switch:*** Fig. 16 —

(1) Remove the switch knob mounting screw using the 3-inch C screwdriver taking care not to lose the lockwasher under the head of the screw and the spacing washers on the shaft of the screw between the knob and the switch shaft. Remove the door screws using the 3-inch C screwdriver and swing the door open. While holding the switch, remove the switch bracket mounting screws from the outside of the case using the 4-inch E screwdriver. Tag and unsolder the switch leads. Remove the switch from its mounting bracket using the 4-inch E screwdriver.

(2) Substitute the new switch and mount all parts in reverse order of removal using spacers as required to prevent the switch knob binding on the case. Close the door and securely tighten the door screws.

3.53 ***Pilot Lamp:*** Fig. 16 — Unscrew the lamp cap. With the tips of the fingers, press the lamp inward and turn it counterclockwise to disengage it from the socket. Remove the lamp.

Mount the new lamp in reverse order of removal and remount the lamp cap.

3.54 ***Voltmeter:*** Fig. 16 —

(1) Remove the door screws using the 3-inch C screwdriver and swing the door open. Tag and remove the voltmeter leads using the KS-6367 wrench. Remove the voltmeter mounting screws using the 4-inch E screwdriver and 418A wrench taking care not to lose the lockwashers. Remove the voltmeter.

(2) Mount the new voltmeter and securely tighten its mounting screws making sure the lockwashers are in place. Reconnect the leads. Close the door and securely tighten the door screws.

Parts Requiring Removal of Power Unit Chassis

3.55 ***General:*** In order to replace the door switch, pilot lamp socket, fuse holder, or jack for the power cable, it is necessary to remove the chassis from the power unit. To do this, remove the door screws using the 3-inch C screwdriver and swing the door open. Unplug the Jones plug. Remove the camera cable jack mounting screws from the outside of the case using the 4-inch E screwdriver and push the jack inward so that it clears the case. Place the power unit with the power switch facing upward. Remove the chassis mounting screws using the 4-inch E screwdriver. Remove the chassis from the case. After replacing parts, remount the chassis and jack in reverse order of removal. Close the door and securely tighten the door screws.

3.56 ***Door Switch:*** Fig. 16 — Tag and unsolder the door switch leads. Remove the switch mounting nut using the KS-6367 wrench and remove the switch. Mount the new switch and securely tighten its mounting nut. Connect and solder the leads.

3.57 ***Pilot Lamp Socket:*** Fig. 16 — Remove the pilot lamp as covered in 3.53. Unsolder and disconnect the lamp leads. Remove the lamp socket mounting nut and washer using the Williams No. 731 wrench. Remove the lamp socket. Mount the new lamp socket and securely tighten its nut making sure the lockwasher is in place. Connect and solder the leads. Mount the lamp in the new socket, as covered in 3.53.

3.58 ***Fuse Holder:*** Fig. 16 — Remove the fuse from the fuse holder. Tag and unsolder the fuse holder leads. Remove the fuse holder mounting nut using the Williams No. 29 wrench. Remove the fuse holder. Mount the new fuse holder and securely tighten its mounting nut. Connect and solder the leads. Mount the fuse in the new fuse holder.

3.59 ***Jack for Camera Cable:*** Fig. 16 — Unsolder the jack leads at the chassis terminals, tagging the terminals. Remove the jack and leads. The new jack is furnished with leads attached. Connect and solder the leads to the proper terminals.

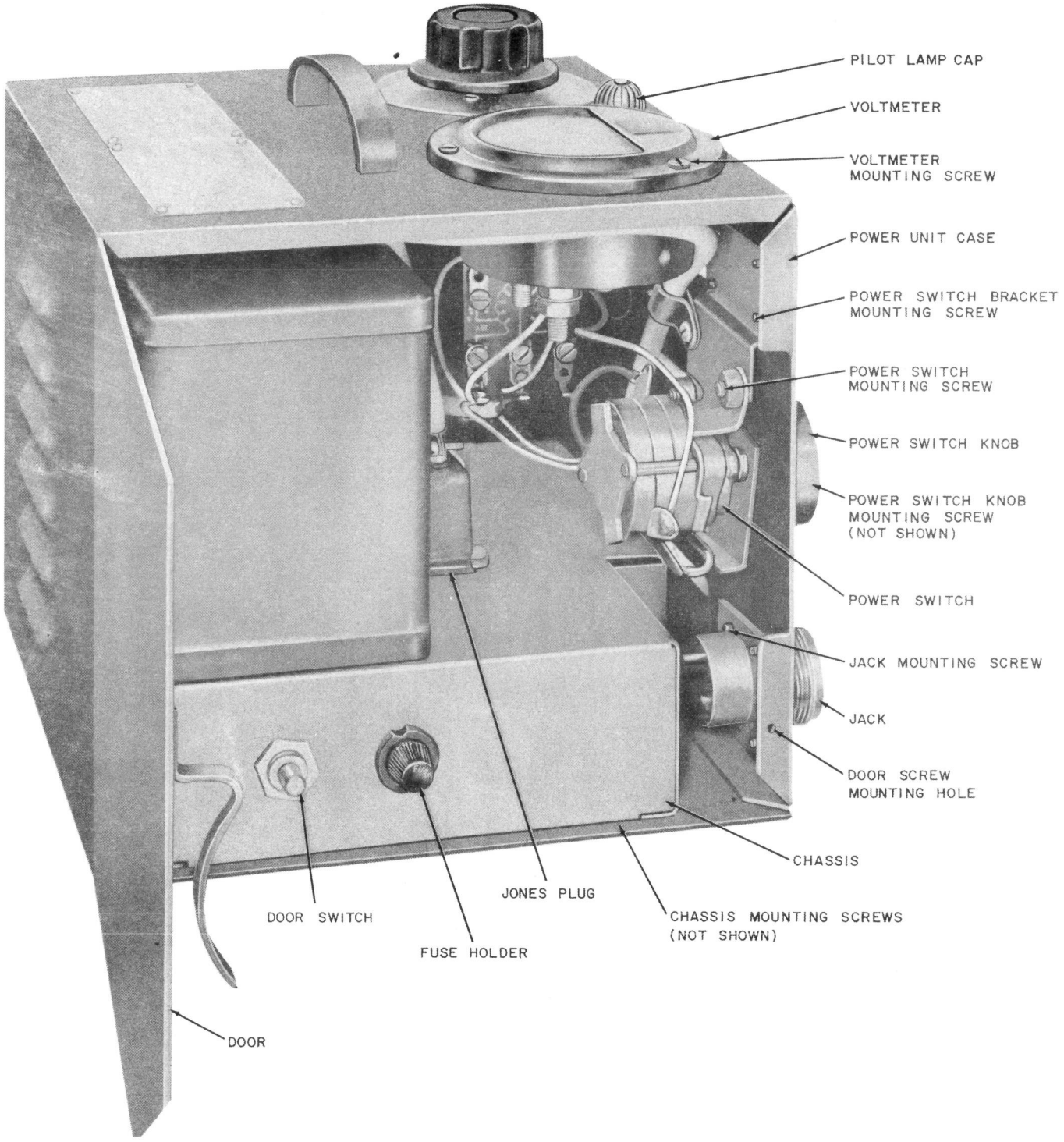


Fig. 16 — KS-14594 Power Unit