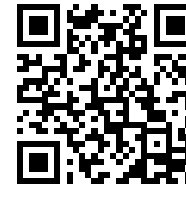

TM 11-2387

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

CAMERA

PH-330-K

DEPARTMENT OF THE ARMY • AUGUST 1951

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For explanation of distribution formula, see SR 310–90–1.

CONTENTS

Figure 1. Camera PH–330–K.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual is published for the information and guidance of the personnel to whom the equipment is issued. It contains information on the assembly and operation of the equipment as well as a discussion of the theory of operation. This manual applies only to Camera PH–330–K.

b. Appendix I contains a list of current references, including supply catalogs, technical manuals, and other available publications applicable to the equipment; appendix II contains an identification table of parts and a catalog statement.

2. Forms and Records

The following standard forms will be used for reporting unsatisfactory conditions of equipment, or improper preservation, packaging, packing, marking, loading, stowage, or handling thereof.

a. DD Form 6, Report of Damaged or Improper Shipment, will be filled out and forwarded as prescribed in SR 745–45–5.

b. DA AGO Form 468, Unsatisfactory Equipment Report, will be filled out and forwarded to the Office of the Chief Signal Officer as prescribed in SR 700–45–5.

c. DA AGO Form 419, Preventive Maintenance Checklist for Signal Corps Equipment, will be prepared in accordance with instructions on back of the form.

d. Use other forms and records as authorized.

Section II. DESCRIPTION AND DATA

3. General
(fig. 1)

Camera PH–330–K is a 35-mm (millimeter) silent motion picture camera with accessories. The camera component has a three-lens turret and may be operated either by a spring motor drive unit or by an electric motor drive unit (par. 5*d* (1) and (2)) which is powered by storage Battery BB–239/U or by any other 12-volt, 125-watt d-c (direct-current) source. Camera PH–330–K can be used with or without a tripod for newsreel, location, and field work.

4. Table of Components

Quantity	Name of component	Dimensions (in.)		
		Height	Width	Length
1	Case, camera carrying, containing:	9	17½	23½
	4 belt, drive	-------	-------	13¾
	1 book, American Cinematographer			
	1 brush, cleaning			
	8 brush, electrical contact			
	1 brush, paint			
	1 cable assembly (bridging)	-------	-------	36
	1 cable assembly	-------	-------	96
	1 camera, w/200-ft magazine			
	2 cap, lens turret			
	1 case filter holder			
	1 cleaner, lens			
	1 crank, hand	-------	3½	6¾
	2 crank, spring, motor winding	-------	4	----------
	6 filter, Wratten A	4	4	----------
	6 filter, Wratten G	4	4	----------
	6 filter, Wratten Aero	4	4	----------
	6 filter, Wratten 5N5	4	4	----------
	6 filter, Wratten .50ND	4	4	----------
	6 filter, Wratten 1.00ND	4	4	----------
	1 gage, film spool			
	6 holder, filter	1	3	----------
	1 lens, 152.4-mm w/2 caps	-------	-------	5¼
	1 lens, 75-mm w/2 caps	-------	-------	3¾
	1 lens, 50-mm w/2 caps	-------	-------	2½
	1 lens, 35-mm w/2 caps	-------	-------	2¼
	1 motor, electric, 12 v d-c			
	1 motor, spring			
	1 oil, lubricating, 2 oz			
	1 oiler, hand			
	2 paper, lens tissue			
	1 plate, tripod adapter	-------	2¾	2½
	2 reel, film, 35-mm, 100 ft			
	2 strap, carrying	-------	-------	8½
	1 thumb grip	2	3	2½
	1 trimmer			
	1 viewfinder, extra lg, 1″ dia x 10″ lg			
1	Tripod PH-520B/U w/case and head	-------	-------	44 (collapsed); 73 (extended)
1	Case, magazine carrying, containing:	12	8¾	21
	2 boxes chalk, white	-------	⅜	3
	1 cable assembly (bridging)	-------	-------	36
	1 cable assembly	-------	-------	96
	2 magazine, film, 400 ft w/core	8⅝	2¼	15⅜

Quantity	Name of component	Dimensions (in.)		
		Height	Width	Length
	Case, magazine carrying—Continued			
	1 slate, identifying (PH–384–B)	⅛	9	13½
	1 strap, carrying			66
2	Battery BB–239/U			

This list is for general information only. See appropriate publications for information pertaining to requisition of spare parts.

5. Component Parts (fig. 2)

a. CAMERA (figs. 3 and 4). The camera supplied with Camera PH–330–K consists of a metal frame housing containing a film movement mechanism, a lens turret, a governor control, a sequence speed meter, a viewfinder, a reflex shutter, and an aperture plate.

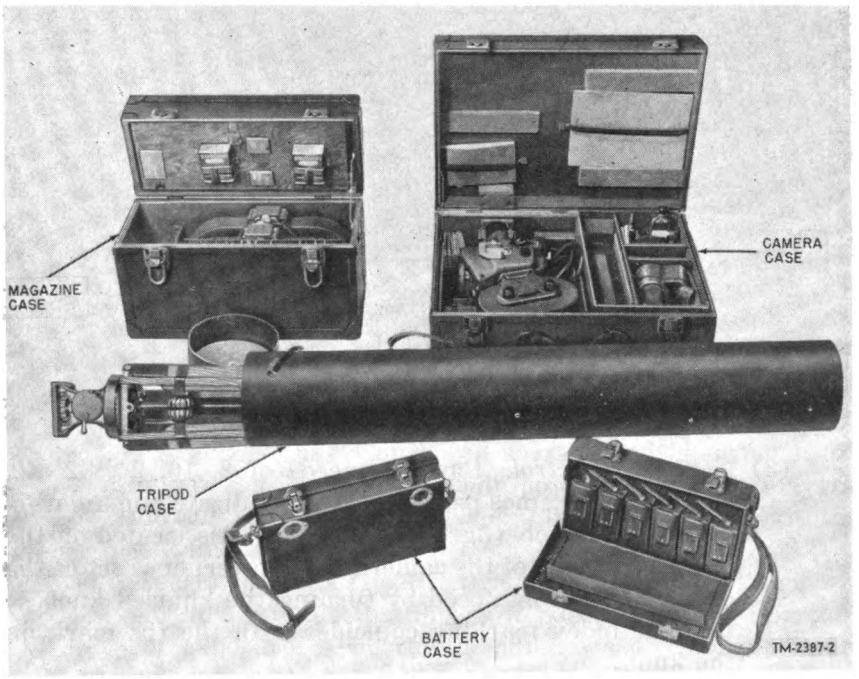

Figure 2. Camera PH–330–K, in carrying case.

(1) *Camera frame.* The main frame of the camera is die-cast aluminum alloy with a crackle finish. This casting holds the optical system and all the camera moving parts in alinement. A camera door (fig. 3) is detachable as a unit

and is held to the frame by a latch lock. The viewfinder tube is an integral part of the camera door.

(2) *Lens turret.* The rotatable turret head (fig. 3) mounts three lenses. The turret may be rotated in either direction so that any one of the three lenses may be placed in position instantly. The turret is constructed with a detent mechanism so that each lens may be positioned properly either for critical focusing or for photographing.

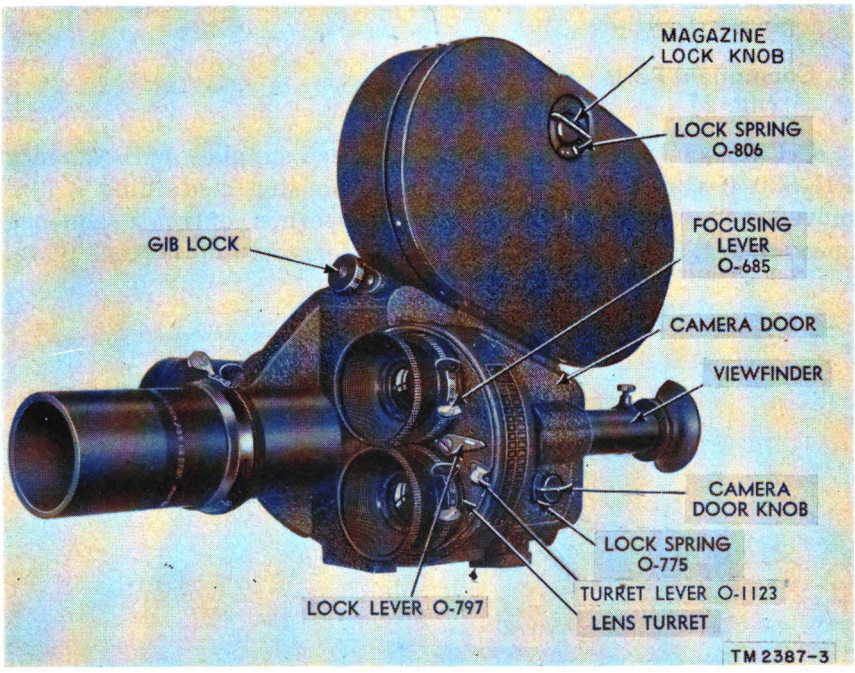

Figure 3. Camera, front and left side.

(3) *Governor control.* Camera speeds of 8, 16, 24, 32, 40, and 48 fps (frames per second) are indicated on a governor control knob (fig. 4). This control is located on the lower right side of the camera. The governor is set at the desired operating speed by turning the knurled knob so that the index marking coincides with the fps mark on the knob.

(4) *Sequence speed meter.* The sequence speed meter (fig. 4) indicates the fps at which the camera is operating. The meter is marked 8, 16, 24, 32, 40, and 48 fps in steps of 2. The meter is located at the right rear of the camera.

(5) *Viewfinder.* The viewfinder is an eye-level spyglass type which provides an upright image. The image is reflected

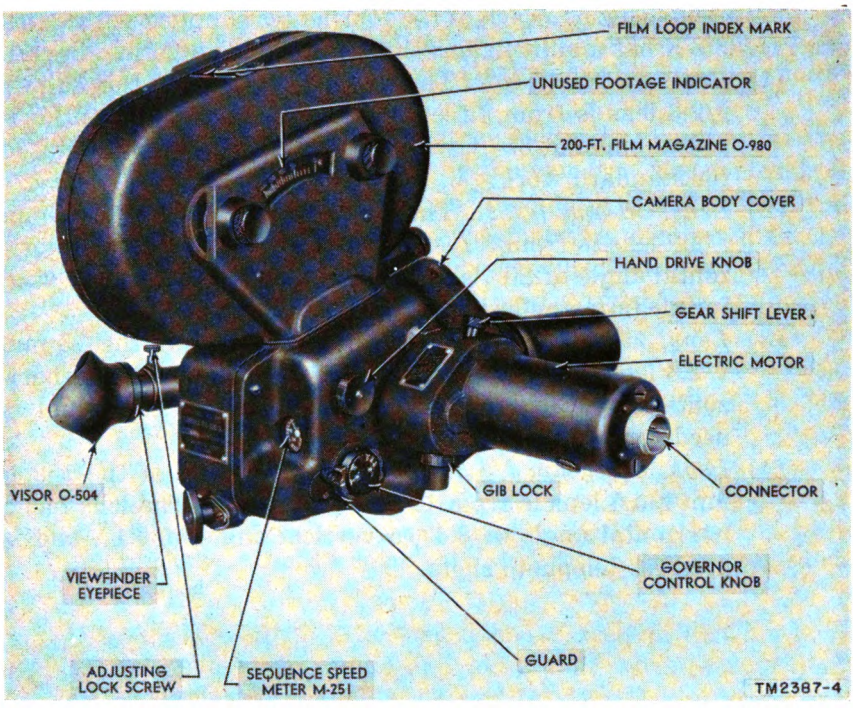

Figure 4. Camera, rear and right side.

from the mirrored surface of the shutter ((6) below) through a ground glass and then through a filter (if used) and the focusing eyepiece. An extra-long viewfinder is provided for use with the 400-foot magazine.

(6) *Reflex shutter.* The shutter is a balanced two-reflex-type shutter with two open segments of 60° each. One revolution of the shutter equals two frames of film. A shutter index is mounted on the left side of the camera (fig. 16). The shutter has a mirrored surface and is set at a 45° angle from the camera body so that the scene may be viewed and photographed simultaneously through the viewfinder.

(7) *Aperture plate.* The aperture plate and connecting pressure plate guide the film as it passes over the aperture for exposure. A horizontal pull-down arm of the intermittent movement, which is geared to the camera motor, extends through a slot in the inner side of the aperture plate. This arm engages the sprocket holes on one side of the film and positions each frame in front of the aperture for exposure.

b. LENSES (fig. 5). Each of the four lenses supplied with Camera PH–330–K has a built-in lens shade and is mounted in a barrel.

(1) *Lens, 35-mm f/2.3.* The focusing range of the 35-mm f/2.3 lens is from 3 feet to infinity. The lens has a horizontal angle of 35°, a vertical angle of 25.7°, and is used for standard work.

(2) *Lens, 50-mm f/2.3.* The focusing range of the 50-mm f/2.3 lens is from 3 feet to infinity. The lens has a horizontal angle of 25°, a vertical angle of 18.3°, and is used for medium angle shots.

(3) *Lens, 75-mm f/2.3.* The focusing range of the 75-mm f/2.3 lens is from 5 feet to infinity. The lens has a horizontal angle of 16.7°, a vertical angle of 12.2°, and is used for medium telephoto work.

(4) *Lens, 152.4-mm f/4.5.* The focusing range of the 152.4-mm f/4.5 lens is from 10 feet to infinity. The lens has a horizontal angle of 8.4°, a vertical angle of 6.1°, and is used for telephoto shots.

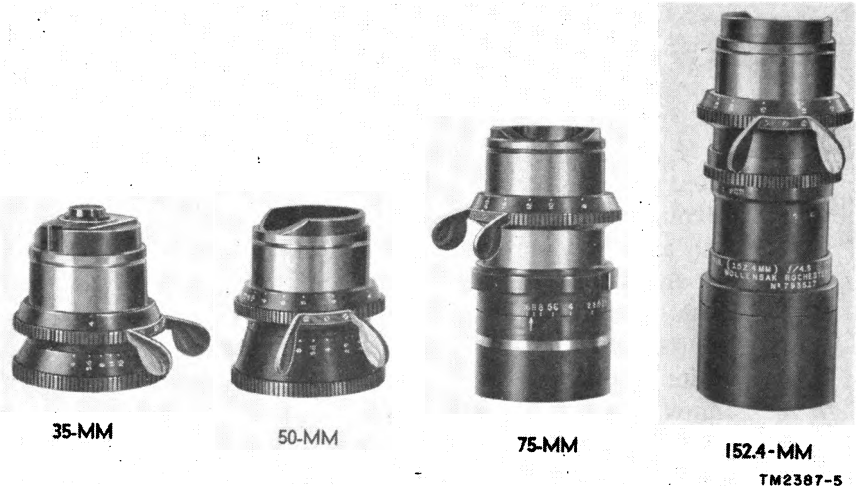

Figure 5. Lenses.

c. MAGAZINES. Three 35-mm magazines, two with a 400-foot and one with a 200-foot film load capacity, are furnished with Camera PH–330–K. Each magazine contains a feed and take-up compartment and spool. The magazines are set in the magazine depression on top of the camera and are secured by a movable gib (par. 16*d*). Each film magazine has a footage indicator (fig. 4) which shows the amount of unexposed film remaining in the feed compartment. The 200-foot magazine will accept 100-foot daylight-loading film spools.

d. MOTOR DRIVE. Operating power for Camera PH–330–K is supplied by an electric motor drive attachment and a spring motor drive unit.

(1) *Electric motor.* The electric motor is mounted on the right side or the bottom of the camera. The motor is a two-speed, HI—LO unit and usually is operated from the 12-volt storage battery. The motor is connected to the battery by a cable assembly provided with an AN-type connector at the camera end and a twist-lock connector at the battery end.

(2) *Spring motor.* One full winding of the spring motor drive will drive approximately 45 feet of film at a constant speed.

Note. A geared hand crank is included with Camera PH–330–K for use in case the motor drive units fail. The crank fits on the right side of the camera and advances the film eight frames per revolution. Use the crank only when the camera is mounted on a tripod.

e. TRIPOD PH–520B/U. The tripod has a vertical and horizontal panning head with handle and locks that permits 360° pan action and 80° tilt action. The legs of the tripod are adjustable from 40 to 73 inches by means of a fluted knob set between each leg. Steel spurs are provided on the bottom of each leg. One T-type spirit level is located on the head to aid in leveling the tripod when the equipment is set up.

f. CARRYING CASES (figs. 2 and 6).

(1) *Camera case.* The camera carrying case is an olive-drab laminated fiber, plywood, watertight case. The case is provided with compartments for the camera (to which are attached a 200-foot magazine, an adapter plate, a carrying strap, a 35- or 50-mm lens, and an electric drive motor), spring drive unit, cables, hand crank, filter kit and filter, three lenses, oilcan and 2-ounce bottle of oil, lens tissue and cleaner, 100-foot daylight reel, two spring cranks, brushes (paint and aperture), gage, spare springs, and electric motor brushes. Space for a 400-foot magazine is provided under the accessory compartment. This technical manual and the American Cinematographer Book are placed in the top of the case; the case may be locked.

(2) *Magazine case.* The magazine case is divided into compartments for two 400-foot and one 200-foot film magazines, two boxes of chalk, a slate, and two spare cables.

g. BATTERY EQUIPMENT. Battery BB–239/U consists of two Batteries BB–229/U connected in series. The batteries are housed

in a fiber case provided with a webbed carrying strap. Two female receptacles are provided. One receptacle accommodates the male twist-lock plug which terminates the connecting cable from the electric motor. The other receptacle receives a bridging cable which is used when two Batteries BB–239/U are connected in parallel (pars. 16*e* and *f*).

h. TECHNICAL CHARACTERISTICS.

TYPE: Silent.
SIZE: 35 mm.
FILM MOVEMENT: Intermittent.
DRIVE: Electric (12 v) or spring motor, or hand crank.
SPEED: 8, 16, 24, 32, 40, and 48 fps.
LENSES: 35-mm, f/2.3.
50-mm, f/2.3.
75-mm, f/2.3.
152.4-mm, f/4.5.
CAPACITY: 400 feet.

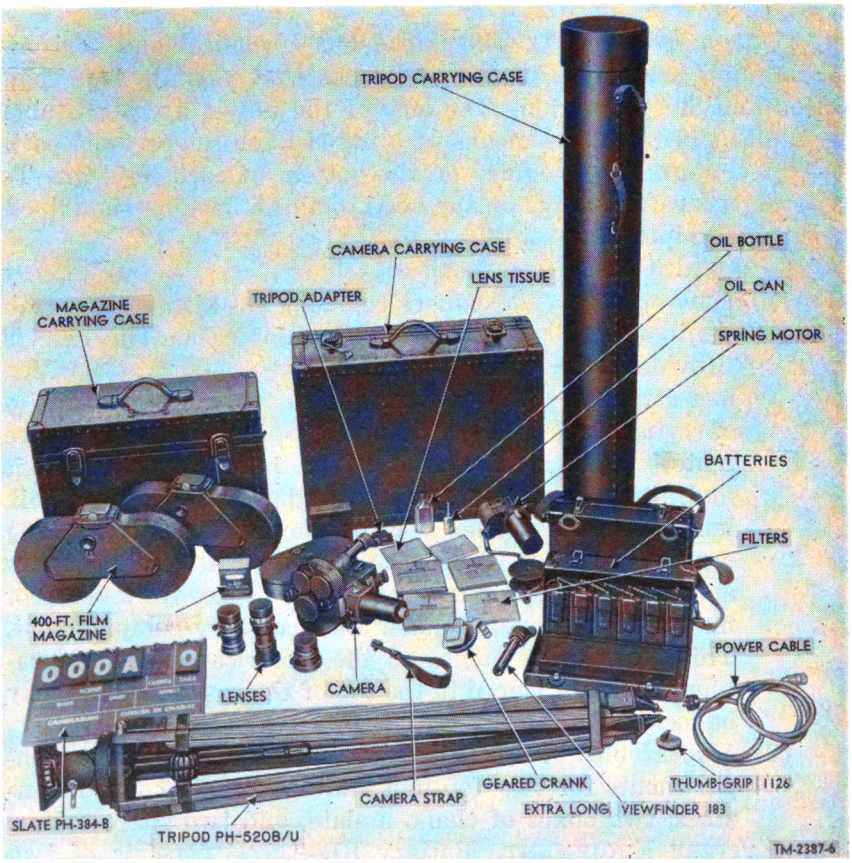

Figure 6. Camera PH–330–K, components.

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

6. Unpacking and Checking

Be careful when unpacking or handling the equipment. Avoid thrusting tools into the interior of the shipping containers. When unpacking, follow the steps below:

a. Unpack the equipment in a location where it will not be exposed to dust, dirt, or excessive moisture.

b. Cut the metal straps with a suitable cutting tool, or twist them with pliers until the straps break. Remove all nails from the top of the shipping container with a nail puller.

c. Remove the material around the fiberboard box and lift it out of the wooden case. Cut the sealing tape; be careful not to damage the carton. Open the carton and remove the moisture-vaporproofed package.

d. Cut and remove the moisture-vaporproofed wrapping.

e. Cut the tape sealing the inner carton; be careful not to damage the carton. Open the carton, remove the cushioning and the desiccant, and lift out the carrying cases.

f. Open the carrying cases and remove the cushioning and the desiccants from inside each carrying case.

g. Place the cushioning and the cartons in the wooden box for re-use in packaging the equipment.

h. When the cases are opened, thoroughly check the equipment against the shipping documents to see if any equipment is missing. Thoroughly inspect the equipment for possible damage during shipment.

7. Preparation for Use

a. GENERAL. The camera and lenses must be kept clean at all times. Clean the film guides and aperture plate thoroughly before use to remove any possible accumulation of film or emulsion. Clean each lens; use only lens cleaner and lens tissue. Each lens cap must be in place on the proper lens when the camera is not in use.

b. LOADING FILM MAGAZINE.

(1) Use a film trimmer to cut the leader of film so that it will thread properly through the film magazine sprockets.

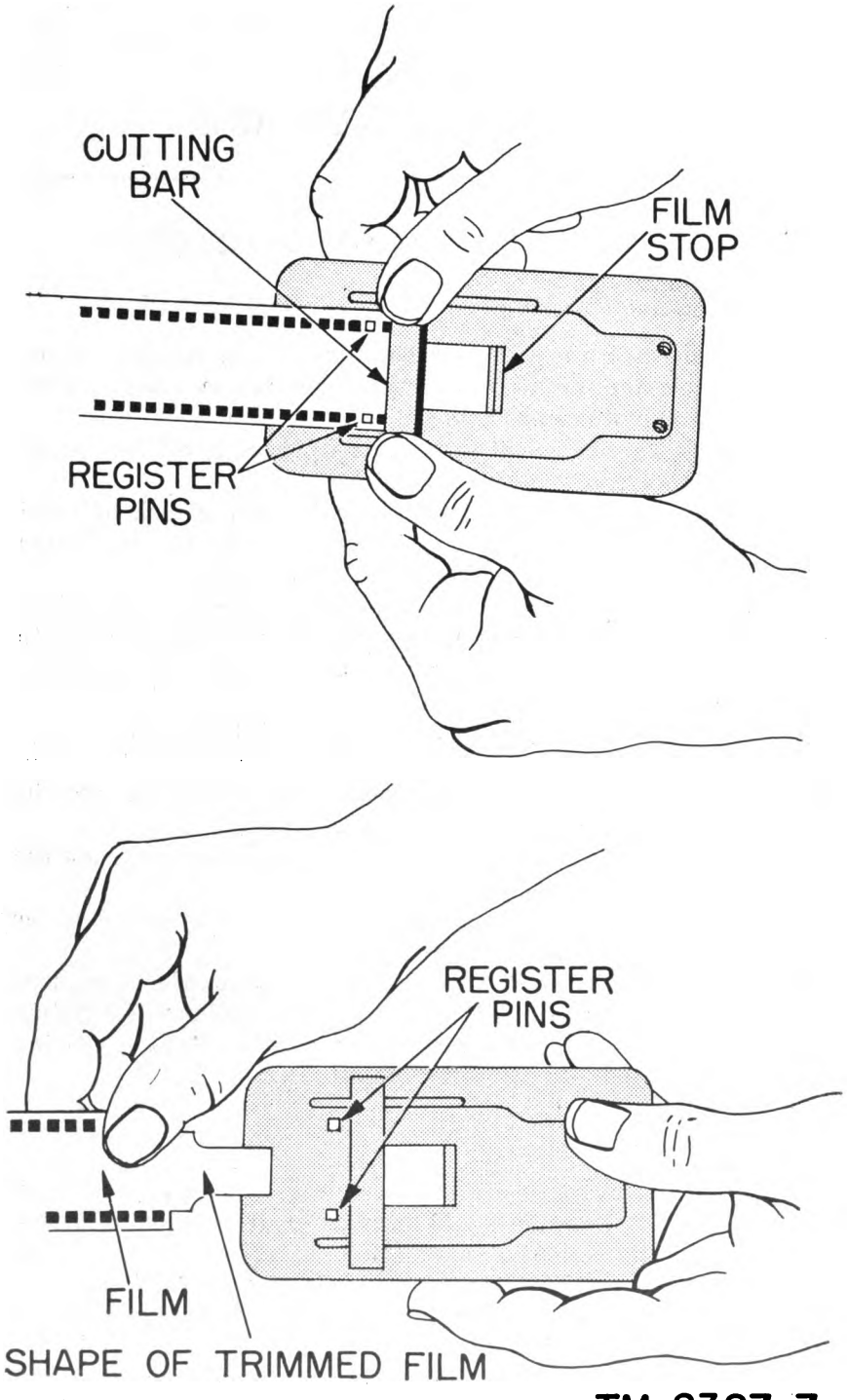

Figure 7. Trimming film for loading.

Locate the end of the film so that it is as near as possible to the trimmer film stop while still engaging the film register pins (fig. 7). Press down the trimmer cutting bar and remove the trimmed film.

(2) Open the magazine door by pressing on the film lock spring and by rotating the lock knob (fig. 3) in the direction indicated by the arrow on the magazine body. Lift off the door. Hold the magazine with the light trap toward your body and thrust the trimmed end of the film through the left-hand side of the light trap, moving the sprocket with the gear at the bottom of the magazine.

(3) Pull the end of the film through the film feed and around the outside of the case to the film loop index mark (fig. 4) on top of the case. This produces the proper size film loop.

(4) Thrust the trimmed end of the film into the other side of the light trap, and feed through with the idler gear after engaging perforations in the sprocket gear.

(5) Attach the end of the film to the take-up spool, rotate the spool clockwise as indicated, and replace the magazine cover. *The emulsion side of the film must be on the outside of the loop.*

Note. This procedure applies to threading either magazine. However, when the magazine is used without daylight-loading spools, load the magazines only in a darkroom or changing bag. The 200-foot magazine will accept 100-foot capacity, daylight-loading spools, and 200-foot rolls of regular packed film.

Section II. CONTROLS AND INSTRUMENTS

Note. This section describes, locates, illustrates, and furnishes the operator sufficient information pertaining to the various controls and instruments provided for the proper operation of the equipment.

8. Lens Turret

a. ROTATING LENS INTO PHOTOGRAPHING POSITION. The lens turret accommodates three lenses of different focal lengths. To position the desired lens for operation, rotate the turret until the indicator mark, opposite the lens, lines up with the indicator mark on the camera body and seats in its stop, as indicated by a slight click or greater opposition to further rotation. *Be sure to remove any lens longer than 75-mm when shooting with short focal length lenses, because the field of view of wide angle lenses will include the long focal length lens.*

b. CHANGING LENS ON TURRET (fig. 8). To remove a lens from the turret, press the release (lock) lever away from the lens to

be removed and withdraw the lens from the turret. Replace the lens in the same manner.

Caution. Do not rotate the lens in the turret cavity during removal or replacement because twisting may damage the cavity or the mount, or may upset the lens alinement.

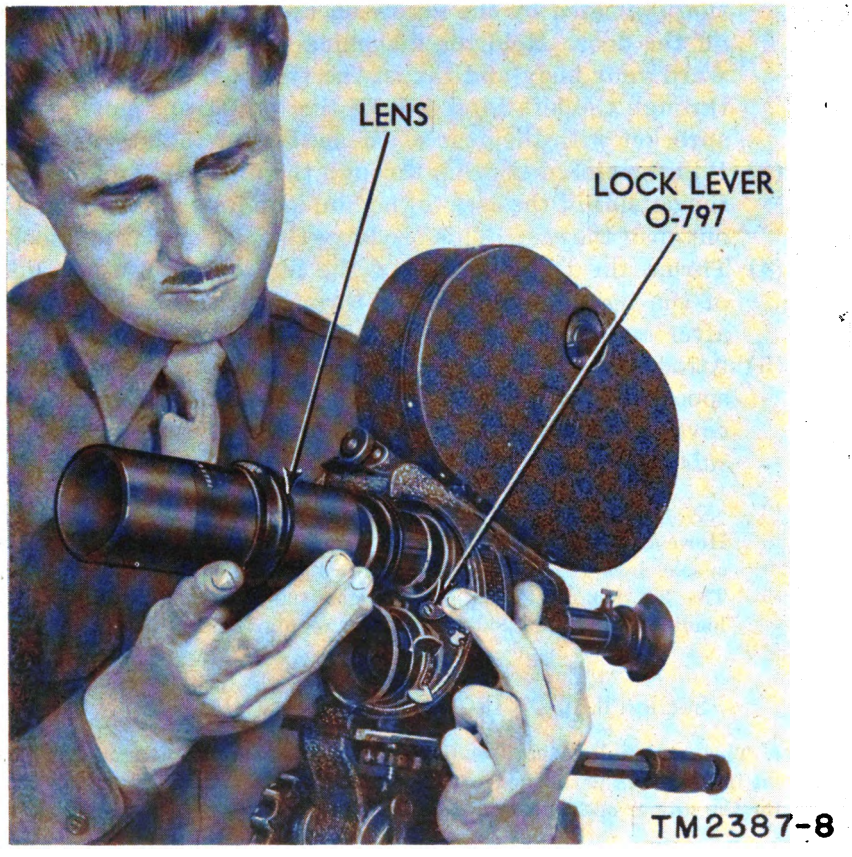

Figure 8. Changing lens on turret.

9. Viewfinder

a. GENERAL. The optical system of the camera provides for viewing the scene in an upright, correct right-to-left position while being photographed. The adjustment of the viewfinder lens is required only when necessary to compensate for individual variations in the operator's eyesight. When the 400-foot magazine is used, it may be more convenient to substitute the longer viewfinder (B, fig. 9) for the shorter viewfinder (A, fig. 9).

b. FOCUSING VIEWFINDER.

(1) Remove the lens in the photographing position (par. 8).

(2) Loosen the focusing tube adjusting lockscrew (fig. 9) and, while looking through the viewfinder lens, slide the eyepiece back and forth until the cross marks in the center of the ground glass are sharply in focus.
(3) Tighten the adjusting locking screw.
(4) Replace the lens in the photographing position.

Figure 9. Focusing viewfinder eyepiece.

10. Focusing Controls

a. The barrel of each lens (fig. 5) has two sets of calibrations. A focal distance scale shows distance in feet from the lens to the subject; the index mark for this scale is located on the turret. The aperture scale provides f/stop calibrations which indicate the diaphragm openings; the index mark for the aperture scale is located on the focusing mount. Tables showing relationship between f/stop and depth of focus for the lens at each stop opening are given in the American Cinematographer. This handbook is part of the equipment and is packed in the camera carrying case.

b. Before a scene is photographed, the operating lens on the turret must be focused on the scene. Rotate the camera with the hand drive knob (fig. 4) until the shutter is in position, back of the photographing lens. Observe through the viewfinder; the shutter is in the correct position when the image of the scene can be viewed. Rotate the lens barrel to bring the scene into focus.

11. Filters

A filter may be inserted in the filter slot located in the camera body near the camera body door (fig. 10). The choice of filter (par. 19*c*) depends upon the type of film in use, the color, and/or the brightness of the scene. A table of filters and their uses follows:

Filters	Use
WRATTEN G	Full color correction for all types of panchromatic films; produces more contrast than Aero 2 and is used more for open landscape; darkens sky, bringing out clouds; strengthens relief of foreground; lightens all yellow, orange, red, and slightly lightens green and magenta colors.
WRATTEN A	Great over-correction for all types of panchromatic films; darkens blue sky and water for night effects in sunlight; penetrates aerial haze; darkens greens, lightens yellow, orange, red, and magenta colors.
WRATTEN 5N5	Combination of Aero 2 and .50 ND filter; medium color correction without excessive contrast; softens strong glare and contrast; used for snow scenes and strong contrast with heavy shadows; gives pleasing values when used on open water scenes.
WRATTEN .50ND	Medium contrast neutralizer; medium softening of glare and contrast; medium exposure compensator; may be used in combination with any filter and with all types of film.
WRATTEN 1.00ND	Extreme contrast neutralizer; same action as .50MD filter but with greater degree of softening effect.
WRATTEN Aero 2	Normal color correction for all types of panchromatic films; produces medium contrast; darkens blue sky a few shades; brings out clouds; penetrates haze; particularly useful when more contrast is desired on cloudy days.

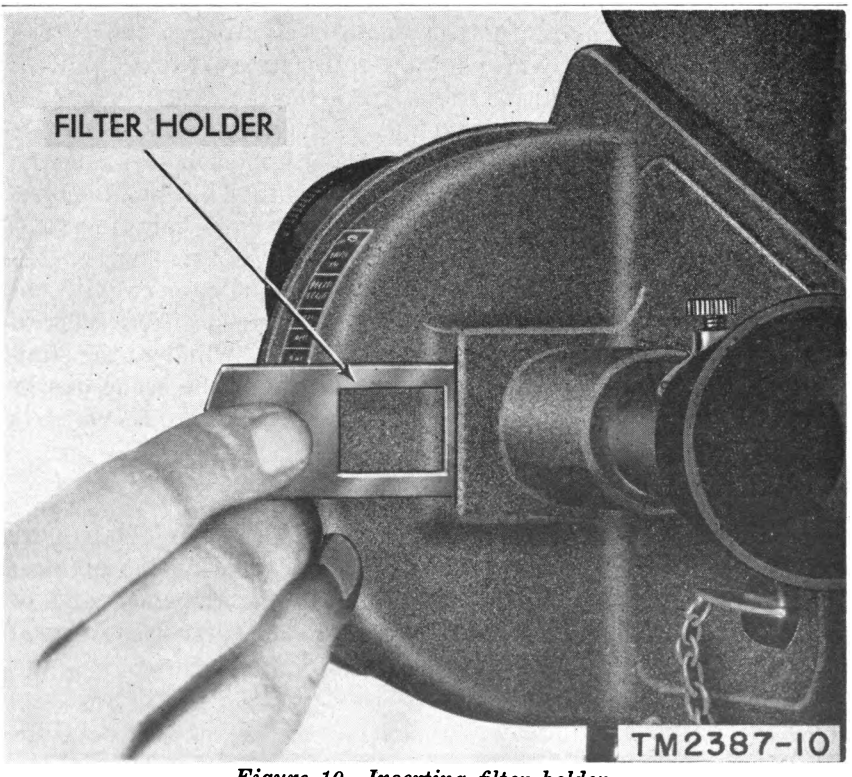

Figure 10. Inserting filter holder.

12. Sequence Speed Control

a. The sequence speed is regulated by a governor in the camera which may be adjusted for different fps speed as required. The governor control knob located on the right side of the camera (fig. 4) is marked 8, 16, 24, 32, 40, and 48 fps. A sequence speed meter (fig. 4) calibrated in fps is located within the operator's view to enable the fps to be checked as required.

Note. The meter is an accurate indicator of frame speed, whereas the figures on the governor control knob are only for purposes of setting approximate sequence speed in advance.

b. The electric drive unit has two ranges of speed, marked HI—LO on the drive unit gear box near the gear shift lever (fig. 4). The lever should be in the LO position for 8 to 24 fps operation, and in the HI position for 24 to 48 fps operation. If the lever does not move to the extreme points when changing from the HI to LO positions, rotate the hand drive knob (fig. 4) until the gears mesh.

Caution. Do not attempt to change positions while the electric drive unit is rotating.

c. When using the spring motor drive unit, be sure that the motor is fully wound after each take so that the sequence speed will be constant during long takes.

13. Unused Footage Indicator

Each film magazine has an indicator and scale which indicate the amount of unexposed film remaining in the magazine. This indicator is located on the right side of the film magazine (fig. 4).

14. Drive Unit Controls

a. In addition to the HI—LO control (par. 12*b*), the electric drive unit has an ON-OFF toggle switch for continuous operation and a pushbutton switch for intermittent operation. When the drive unit is in position on the side of the camera, the toggle switch is away from the operator; and when the drive unit is located on the bottom of the camera the toggle switch is on the operator's left. The push-button switch is located at the bottom of the drive unit when the drive unit is in position on the side of the camera, and the push button faces the front of the camera when the drive unit is located on the bottom of the camera.

b. The spring drive unit has a winding crank cavity with a square shaft for winding to full tension (fig. 14). The ON-OFF release trigger on this unit is located at the top of the spring barrel when the drive unit is attached on the side of the camera body.

The trigger is located away from the operator when the drive unit is attached to the bottom of the camera. A safety catch, when moved toward the bottom housing assembly (fig. 28), releases the trigger. Another safety, the safety plunger, is released when the drive unit is attached to the camera body. *The spring drive unit will not operate unless both safety devices are released properly.*

Note. Store the spring drive unit in a completely unwound condition only. Do not allow the spring motor to run unless the unit is attached to the camera. After a day's shooting, if the spring motor is still wound, run the camera without film until the motor is unwound completely and *then* remove the drive unit from the camera.

Section III. OPERATION UNDER USUAL CONDITIONS

15. General

The equipment must be assembled and disassembled in the same order with each change of shooting location. This will enable the operator to set up and check the equipment for proper operation in a minimum of time. The following paragraphs in this section discuss a recommended procedure for this routine and, also, provide information to insure proper performance of the equipment during operation.

16. Setting up Equipment, Using Tripod

a. SETTING UP TRIPOD. Choose an approximate location for the camera, considering distance from the scene, shooting angles, lens coverage, and light conditions; place all carrying cases near the camera location. Remove the tripod from its carrying case. Do not allow the tripod head to hit or rest on the ground or to collide with any nearby objects. Position the tripod so that one of the legs faces the subject; this permits the operator to stand between the other legs. Place the tripod legs in a spider or triangle, if available, when setting up on hard surfaces such as hardwood floors, cement or tile, or on soft surfaces where tripod spurs cannot hold. Set up one leg at a time and adjust to tentative height. Unscrew the panning handle from its socket under the base casting. Insert the handle into the socket under the adapter plate and screw it firmly into place. Check the levels on the tripod head and tighten the knurled clamping nuts on the legs (fig. 11). Recheck the levels after rotating the tripod head 90°.

b. ATTACHING CAMERA TO TRIPOD. Remove the camera from the camera carrying case and check to determine that the adapter is located in place and securely fasten to the bottom of the camera

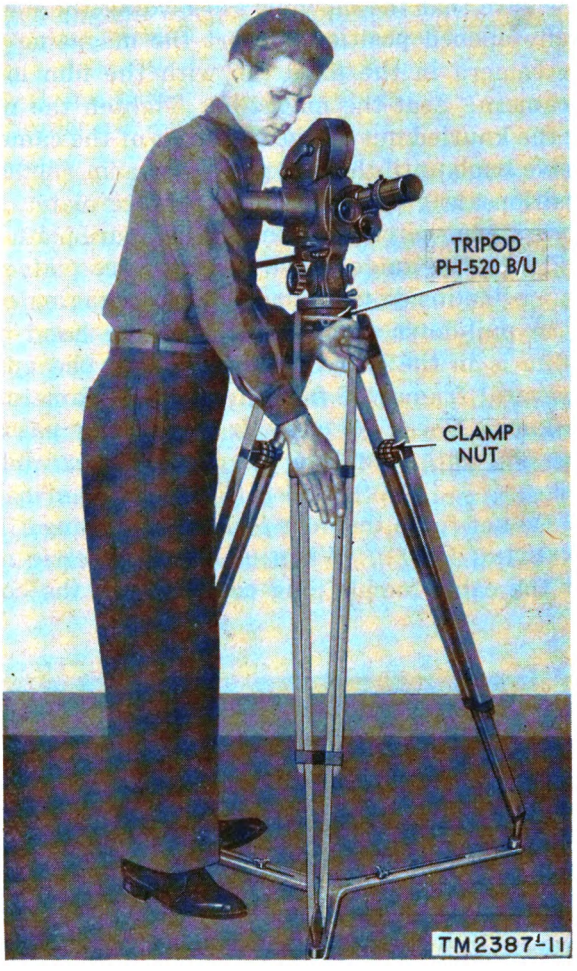

Figure 11. Setting up camera and locking tripod.

body. Locate the camera on the tripod head and tighten the hold-down screw.

c. ATTACHING DRIVE UNIT. When the camera is located on the tripod, the drive unit is attached to the right side of the camera body. Be sure that the movable gib is in the lowest position by rotating the gib lock knob (fig. 4). Engage the drive unit in the top of gib, and rotate the camera mechanism with the hand drive knob (fig. 4) until the camera drive coupling engages with the coupling on the drive unit. Hold the drive unit firmly in the upper gib and tighten the gib lock knob.

d. ATTACHING MAGAZINE AND THREADING FILM (fig. 12). Before attaching the magazine, open the camera door by releasing the lock knob spring and rotating the lock knob (fig. 3). Remove

the door. Be sure that the movable gib holding the film magazine is in the fully opened position. Insert the magazine toward the rear of the camera in the fixed gib with the film loop inserted inside the camera. Seat the magazine. Tighten the movable gib by rotating the knurled nut on the top front of the camera. Rotate the hand drive knob until the film pull-down arm (fig. 16) is in its farthest position away from the film aperture plate. Release the aperture plate spring catch and open the aperture plate completely. Insert the film in the guide above the aperture plate; follow the loop indicating line inside the camera body, engaging one perforation with the pull-down arm by rotating the hand drive knob. When the film is in the correct position, close the aperture gate and move several frames of film through the camera, using the hand drive knob. Check for smooth and proper passage of film through the film gate. Replace the camera door and lock it in position.

Caution. Do not force the door lock when closing.

e. CONNECTING CABLE. When using the electric motor drive unit, insert the cable female plug connector in the connector on

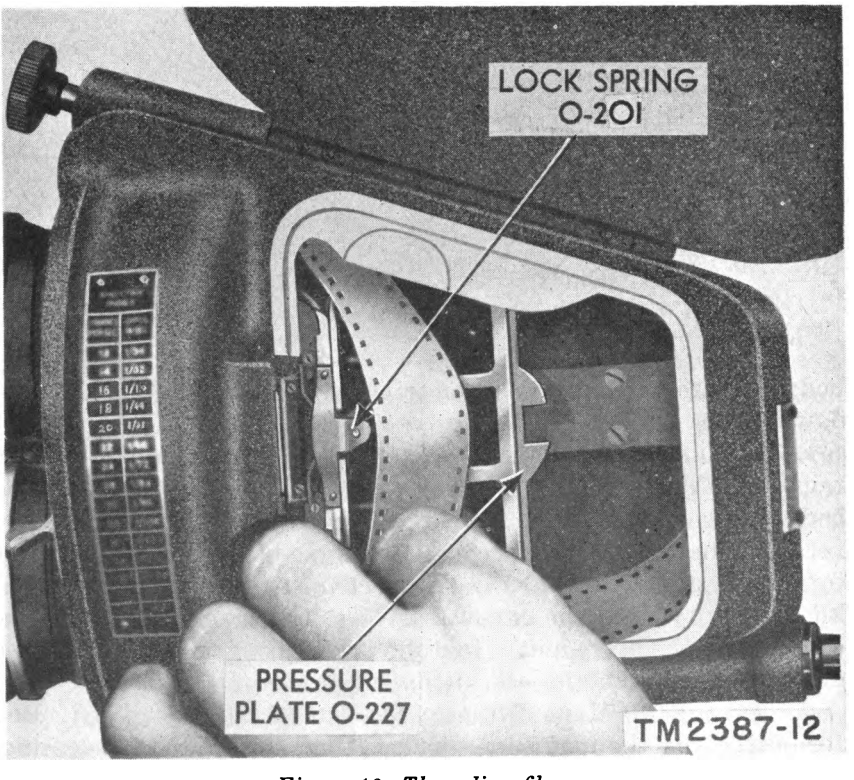

Figure 12. Threading film.

the drive unit and the twist-lock plug into either connector on the battery case.

Note. Use only one battery except when the batteries are only half-charged or under extremely cold conditions.

f. BATTERIES. Before starting a day's shooting, open the battery cases and check the state of charge and water level of the batteries. Add distilled water to bring the level up to the mark. Each battery is equipped with built-in hydrometer balls. When all three balls float, the battery is charged fully. When only two float, the battery is only half-charged. If possible, do not use batteries in a half-charged condition.

g. WINDING SPRING MOTOR. The electric drive unit and the spring motor cannot be mounted on the camera at the same time. When the spring motor is used, wind it as illustrated in figure 14. When the spring motor is used with the camera set-up for hand-held operation (par. 17), wind in a similar manner. Approximately 75 complete turns of the winding crank are required to wind the spring fully.

17. Setting up Hand-held Camera (fig. 13)

When the camera is to be hand-held, the drive unit is attached to the bottom of the camera body. Remove the tripod adapter plate from the bottom by unlocking the gib lock knob at the rear of the camera. Place the adapter in the side gib. Open the movable gib on the bottom of the camera and place the drive unit against the fixed gib. Rotate the camera mechanism with the hand drive knob (fig. 4) until the camera drive coupling engages the coupling on drive unit. Hold the drive unit firmly in the fixed gib and tighten the movable gib. Do not force. Be sure the camera is held firmly while attaching the drive unit. Attach the film magazine and thread the film (par. 16*d*). When the spring motor drive unit is used, wind fully with winding crank (par. 16*g*). When the electric motor drive unit is used, connect cables and batteries (par. 16*e* and *f*).

18. Preoperating Checks

If necessary, focus the viewfinder (par. 9). Remove lens dust caps and focus lenses (par. 10). Set the governor control knob at 24 fps and check the position of the HI–LO shift lever on the electric drive unit. Be sure the control lever is set in LO. Recheck the level of the tripod and make any necessary adjustment. Set the lens diaphragm opening for the desired exposure and insert

Figure 13. Correct position for hand-held camera.

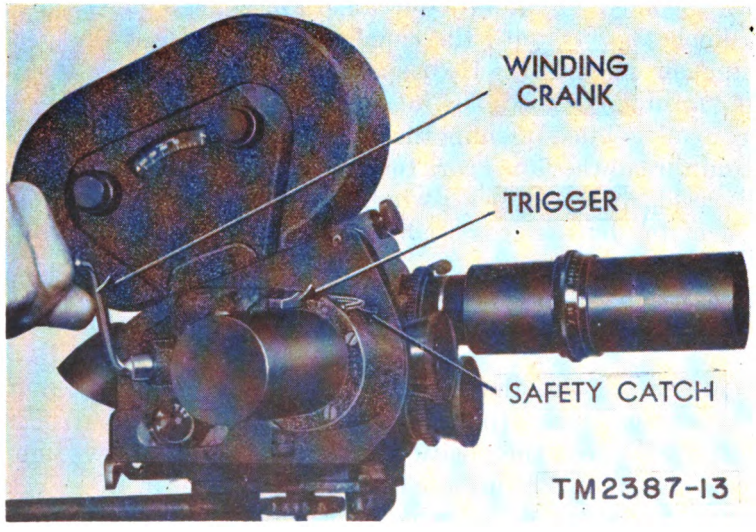

Figure 14. Winding spring motor.

the filter as desired. Rotate the film with the hand drive knob and check for any binding which indicates abnormal operation of the internal drive mechanism or of the film travel. Operate the camera for a short run with the electric drive unit, setting film speed accurately by adjusting the governor knob disk to the speed indicated on the speed sequence meter (fig. 4). When using the spring motor, be sure the motor is wound fully before and after each take.

19. Photographing

a. FILM EXPOSURE. Film exposure is controlled by the f/stop opening and camera speed. Control of the f/stop is explained in paragraph 10, and regulation of camera speed is described in paragraph 12.

b. PANNING. Vertical and horizontal panning is controlled with the panning handle attached to the tripod head. Locks are provided on both vertical and horizontal movement of the tripod. When the electric drive unit is used with the camera on a tripod, the drive unit can be used to control panning.

c. FILTERS. Different types of filters are used in black and white photography. Correction filters are used to alter the response to the film so that the final exposure will more nearly record the color brightness recorded by the eye. Contrast filters modify the brightness so that two colors of approximately the same brightness to the eye will be photographed in contrast. Haze filters overcome the light scattering effect of the atmosphere and improve the contrast of distant objects. All filters require an adjustment of exposure. The number of times the exposure must be increased is known as the filter factor of the particular filter. Table I is a sample table which indicates the relation between filter factors and lens stop openings.

Table I.

Filter factors computed into f/stop openings from normal.

Factor	Open from normal	Factor	Open from normal	Factor	Open from normal
1	0	5	2.25	20	4.25
1.5	.5	6	2.5	24	4.5
2	1	7	2.75	28	4.75
2.5	1.25	8	3	32	5
3	1.5	10	3.25	40	5.25
3.5	1.75	12	3.5	48	5.5
4	2	14	3.75	56	5.75
4.5	2.125	16	4	64	6

20. Other Equipment

Photographic aids may be used with the camera to assure better photography. The exposure meter and lighting equipment (*a* and *b* below) are not supplied with Camera PH–330–K; Slate PH–384–B, however, is a component of the camera.

a. Exposure Meter PH–260–A may be used to calculate the correct exposure on the scene being photographed. When the light reading has been determined by means of a meter, and correlated with the camera speed, it should be converted for relative exposure, as needed. For complete information covering the exposure meter, refer to TM 11–2356.

b. Lighting equipment is required when shooting indoors, and reflectors of various types may be necessary when shooting out-of-doors.

c. Slate PH–384–B is used for recording data on takes to aid in editing film and identifying scenes.

21. Equipment Performance Checklist

a. GENERAL. The equipment performance checklist is used to determine whether Camera PH–330–K is operating properly. The information given under the Action column represents the control setting at which the item is to be checked, or the action that must be taken in order to check the normal indication given in the Normal Indication column. The normal indication listed includes the visible and audible signs the operator will perceive when he checks the items. If the indications are not normal, the operator should apply the recommended corrective measures. The corrective measures listed are those that the operator can make without turning the equipment in for repairs. If the equipment will not operate, or if the recommended corrective measures do not yield the desired results, turn the equipment in for repair by proper authorized personnel.

b. CHECKLIST.

	Item No.	Item	Action	Normal indication	Corrective measures
PREPARATION	1	Tripod	Set tripod firmly on ground or in spider or triangle (par. 16*a*).	Tripod spurs hold in ground. Legs do not spread when held in triangle or spider.	Push spurs deeper in ground.
	2	Clamps	Tighten tripod clamp nuts (par. 16*a*).	Clamp nuts hold tripod legs firmly. Both halves of clamp nuts are tight.	Tighten clamp nuts
	3	Tripod head.	Level tripod head. Check bubbles (par. 16*a*).	Bubble in each level centered in all positions.	Adjust leveling.
	4	Panning handle.	Attach panning handle.	Handle screws in without binding.	Check for crossed threads and reinsert.
	5	Camera	Attach camera to tripod head (par. 16*b*). Be sure adapter plate is on.	Camera hold-down screw on tripod head tightens and camera is flat on tripod head.	Remove camera and recheck tightening of screw. Check for dirt on adapter plate and tripod head.
	6	Magazine	Load film magazine (par. 7*b*).	Film threads easily through sprockets. End of film properly attached to take-up spool.	Recheck loading of film.
	7	Magazine	Attach film magazine to camera (par. 16*d*).	Gib lock tightens magazine in place with film loop inside camera.	Recheck attachment of film magazine.
	8	Threading	Thread film in camera (par. 16*d*).	Film runs easily through film gate.	Recheck threading of film and film loop size.
	9	Batteries	Two batteries connected in parallel when used for cold weather operation of single battery connected for usual operation (par. 16*e* and *f*).	Electric motor drive unit (when connected) operates camera.	Check state of charge of batteries and water levels in batteries (par. 16*f*).

	Item No.	Item	Action	Normal indication	Corrective measures
PREPARATION	10	Drive unit	Attach drive unit (par. 16*c*).	Gib locks tighten drive unit to camera and drive unit moves camera mechanism when trigger or switch is actuated.	Check engagement of drive coupling and tighten gib lock.
	11	Cable	Attach cable if electric motor drive unit is used (par. 16*e*).	Camera mechanism operates when switch is turned on.	Recheck attaching of cable and check batteries (par. 16*f*).
	12	Spring motor.	Wind spring motor drive unit (par. 16*g*), if spring motor is used.	Camera mechanism operates when trigger is pressed. Be sure safety lever is unlocked.	Recheck winding of spring motor.
	13	Guide and lens.	Clean film guides and lenses (par. 7*a*).	Film guides are free of collected emulsion and lenses are free of dirt.	Clean lenses with liquid lens cleaner and tissue. Brush film guides thoroughly. Check cleanliness of aperture plate.
OPERATION	14	Viewfinder	Focus viewfinder (par. 9*b*).	Cross hairs in ground glass in sharp focus.	Recheck focus. Tighten adjustment lockscrew.
	15	Lens	Focus photographing lenses as required (par. 10).	Scene being photographed is in sharp focus.	Be sure to remove all lenses longer than 75-mm when shooting with short focal lenses.
	16	Turret	Check turret rotation (par. 8*a*).	Turret seats in each of three positions opposite indicator marks.	Recheck rotation.
	17	Filter holder.	Insert filter holder if required (pars. 11 and 19*c*).	Filter holder slides in place easily.	Check for barbs and out-of-shape filter holder.
	18	Aperture scale.	Check f/stop for exposure required (par. 19*a*).	Aperture stop scale rotates easily to f/stop index mark.	Recheck f/stop and required exposure.
	19	Sequence speed meter.	Set shooting speed (par. 12).	Sequence speed meter shows actual shooting speed when film is run for short time.	Recheck governor control knob.

	Item No.	Item	Action	Normal indication	Corrective measures
OPERATION	20	Push-button switch.	Depress to run camera intermittently.	Sound of film driving mechanism.	Check connections. Check for film jam.
	21	ON-OFF switch.	Throw to ON for continuous operation.	----do----------	do
	22	Footage dial.	Note amount of film remaining.	Enough unexposed film for proposed take.	Change magazine.
STOPPING	23	Push-button switch and ON-OFF switch.	Release to stop camera.	Film mechanism silent.	Button jammed; pull cables.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

22. Operation in Tropical Climates

In climates of high humidity, such as the tropics, pay particular attention to the aperture and pressure plates to prevent corrosion of the polished surfaces. Inspect the camera for traces of fungus, mold, mites, and metallic corrosion. All fouling should be removed immediately. When not in use, the camera equipment should be stored in a reasonably dry, cool place. If the camera must be kept standing in sunlight, it should be covered with a white cloth until it is to be used.

23. Operation in Desert Climates

Dustproofing of Camera PH–330–K is necessary only under adverse conditions of operation, as follows:

a. When the camera is operated outdoors where wind and dust are present, be careful to keep the camera door closed at all times, except when threading or adjusting the camera.

b. Before using the camera, use a soft-bristle brush to clean off any sand or other foreign matter accumulated on the surface of the camera or tripod head. Use a camel's-hair brush to clean the pressure plate, the aperture plate, the sprockets, and the lenses of the camera. *Do not use lens tissue to clean lenses unless they have first been dusted with a camel's-hair brush.* Cleaning the lens with

tissue before it has been dusted will scratch the lens. Do this cleaning indoors or under cover to insure that no dust remains on equipment when stored.

c. If possible, avoid storing the camera outdoors. When it is necessary to store the equipment outdoors, cover it with a shelter cloth or other improvised material to protect it from dust.

24. Operation in Arctic Climates

Cold weather operational procedures and general precautions, as indicated in TB SIG 189, should be followed when Camera PH–330–K is operated at temperatures below 32° F. When the equipment has been stored outdoors, or has been kept at low temperatures for an extended period of time, the following procedure is recommended before transferring the equipment to warmer air:

a. Gradually transfer the equipment from the cold to the warmer temperature by intermediate temperature steps. Allow 6 hours or more for this gradual transfer so that the equipment will have attained the ambient temperature of the warmer room.

b. Do not open the carrying cases before the equipment has reached the room temperature, because water may condense on the equipment and cause permanent damage. Whenever possible, inclose the carrying case in a water-repellent material while transferring from cold to normal room temperature. This precaution will eliminate the possibility of water condensing on the equipment.

c. After the equipment has reached the warmer temperature, open the camera door and use a lint-free cloth to remove any water that has condensed on the inside surfaces of the camera, being particularly careful to clean the aperture plate, the pressure plate, and the sprockets. Clean the various lenses. Carefully blot moisture condensation from lenses with lens-cleaning tissues.

CHAPTER 3
MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION AND WEATHERPROOFING

25. Lubrication

All parts of Camera PH–330–K are lubricated when assembled. Lubricate, when required, as instructed below:

a. Lubricate the intermittent cam with grease, instrument (QMC 14–G–611–5) in the hole (fig. 16) after shooting 2,000 feet of film.

b. If the drive plate is washed out or if 5,000 feet of film has been shot (par. 35*b*(4)), each bearing and all mating gears must be lubricated with grease (QMC 14–G–611–5). If these parts have been cleansed with Solvent, dry-cleaning (SD), do not lubricate until the parts have dried thoroughly. Be sure neither solvent (SD) nor any lubricant comes in contact with the phenolic pads on the governor brake. If these materials come in contact with the phenolic pads on the governor brake, they may cause sticking and faulty operation, particularly at low temperatures. Place sufficient grease in the keyway of the governor shaft to lubricate the sides of the keyway, and slide the governor control on the shaft to spread the lubricant (fig. 17).

c. If any roller bearing is replaced, any lubricant, with which it was packed for stock, must be washed out thoroughly and the bearing lubricated with grease (QMC 14–G–611–5) after assembly.

Note. Use Oil, lubricating, aircraft instrument (QMC 14–O–1341) in low temperature areas only. Use grease in all other areas.

26. Weatherproofing

Signal Corps equipment, when operated under severe climatic conditions such as prevail in tropical, arctic, and desert regions, requires special treatment and maintenance. Fungus growth, insects, dust, corrosion, salt spray, excessive moisture, and extreme temperatures are harmful to most materials. Camera PH–330–K has been moistureproofed and fungiproofed during manufacture.

a. TROPICAL MAINTENANCE. A special moistureproofing and fungiproofing treatment has been devised which, if properly applied, provides a reasonable degree of protection. This treatment is explained fully in TB SIG 13 and TB SIG 72.

b. WINTER MAINTENANCE. Special precautions necessary to prevent poor performance or total operational failure of equipment in extremely low temperatures are explained fully in TB SIG 66. Further instructions for operation at low temperatures are contained in TB SIG 219.

c. DESERT MAINTENANCE. Special precautions necessary to prevent equipment failure in areas subject to extremely high temperatures, low humidity, and excessive sand and dust are explained fully in TB SIG 75.

d. LUBRICATION UNDER UNUSUAL CONDITIONS. The effects of extreme cold and heat on materials and lubricants are explained in TB SIG 69. Observe all precautions outlined in TB SIG 69 and pay strict attention to all lubrication instructions when operating equipment under conditions of extreme cold or heat.

Section II. PREVENTIVE MAINTENANCE SERVICES

27. Definition and Importance of Preventive Maintenance

a. DEFINITION. Preventive maintenance is work performed on equipment, usually when it is not in use, to keep it in good working condition so that breakdowns and needless interruptions in service will be kept at a minimum. The object of preventive maintenance is to eliminate the need for trouble shooting and repair.

b. IMPORTANCE. Since the failure or inefficient operation of even one component may cause the breakdown of the entire equipment, the importance of preventive maintenance is obvious. Operators must maintain equipment placed in their charge in such condition that it will work at top efficiency at all times.

28. Tools and Materials

The following materials must be on hand before performing preventive maintenance:

Brushes (camel's-hair and aperture).
Lens tissue.
Lens-cleaning fluid (Sig C stock No. 8A819 or 8A819.2).
Screw driver set.
Soft, clean, lint-free cloths.
Solvent, dry-cleaning (SD).

29. Preventive Maintenance Checklist

The checklist below shows preventive maintenance procedures for Camera PH–330–K. The list contains information on what to

check, when to check, how to check, and precautions to be taken before, during, and after checking.

Item No.	What to check	When to check	How to check	Precautions
1	Exterior of camera.	Weekly	Inspect for damaged places, chipped paint, dirt, and loose or missing screws.	Do not force screws when tightening. Refer to paragraph 52 for painting or touch-up.
2	Exterior of film magazines and drive units.	--do----	------do----------	Do
3	Fit of film magazine and drive unit on camera body.	--do----	Inspect mating surfaces for dirt or damage. Check gib locks for proper operation. Check drive gears on magazine and camera.	Do not force gib locks. Use solvent (SD) for cleaning surfaces.
4	Interior of film chamber.	Daily--	Clean interior with brush and dry cloths. Check operation of pull-down claw by rotating camera by hand.	Be sure there is no film emulsion on film guides of aperture plate. Be sure side pressure guides of aperture plate operate freely and be sure there are no barbs on pull-down claw.
5	Camera drive mechanism and drive units.	Weekly	Operate drive mechanism with either drive unit. Listen for any unusual sounds. Vary sequence speed with governor control.	Do not shift electric motor from LO to HI or HI to LO when motor is running. If shift knob doesn't drop into position, rotate camera with hand drive knob until gears mesh.
6	Lenses and lens turret.	--do----	Rotate turret and feel for any excessive pressure required for rotation. Remove lenses from turret and check for cleanliness. Replace lenses on turret and check operation of locks on turret. Check lens focusing by moving focusing handle. Check lens diaphragms by operation.	Be careful when removing lenses (par. 8*b*). Clean the lenses with lens cleaner and tissue. Do not attempt to remove lens element. Clean mating surfaces of lens mounts and turret. Do not get solvent (SD) on elements or interior of camera. Do not touch the shutter surface with the fingers.

Item No.	What to check	When to check	How to check	Precautions
7	Viewfinder and camera door.	Weekly	Open camera door and visually check mirror for damage. Clean lenses and replace door. Check door lock and focusing of viewfinder.	Do not attempt to remove lens elements. Clean only exposed lens surfaces.
8	Batteries	Weekly	Check state of charge of batteries and water level. State of charges is indicated by built-in hydrometer balls. Recharge if half-charged or less.	Use only distilled water to fill batteries (par. 16*f*).
9	Tripod	do	Inspect for damage, chipped paint, dirt, and broken levels and locks. Open legs and check clamp nuts.	Refer to paragraph 52 for painting or touch-up. Clean surfaces with solvent (SD) and cloths. Do not force clamp nuts.

CHAPTER 4
FIELD MAINTENANCE INSTRUCTIONS

Note. The repair instructions in sections II through VI are primarily for field maintenance personnel and are applicable for all purposes of repair through and including rebuilding. The amount of repair to be performed by any particular unit having field maintenance will be limited only by the tools, by the test equipment available, and by the skill of assigned personnel.

Section I. THEORY OF OPERATION

30. General

Camera PH–330–K is essentially an equipment for moving light sensitized film and for exposing successive frames during intervals when the film is at rest behind a lens. The process as a whole involves three basic operations—the feeding of the film to the exposure aperture, the intermittent exposure of the film at the aperture, and the rewinding of the exposed film after leaving the aperture. The process is accomplished inside the camera component by a mechanism which feeds, carries, positions, and takes up the film during the operation, and regulates the intervals of motion and rest. The camera equipment also includes lenses which form the image, filters which control the relative brightness of colors in the subject, a diaphragm which controls the amount of light at the exposure aperture, a shutter which regulates the period of exposure, viewing devices which aid in determining the framing and composition of the picture, and a tripod which supports the camera. The camera mechanism may be driven by either an electric motor driven unit, a spring motor driven unit, or a geared hand crank drive unit.

31. Operation of Camera

a. Specifically, the picture-taking process involves the following operations inside the camera component: Film is drawn from the feed reel of the magazine by the magazine sprocket, and is fed to the intermittent mechanism. A pull-down claw engages a perforation on one side of the film and moves the film over the aperture for exposure, frame by frame. The movement of the pull-down claw is controlled by a cam which is actuated by a train of gears coupled with the drive unit. The pressure plate holds the film

stationary in the aperature for the moment of exposure; one of the open segments of the rotating shutter passes directly in front of the aperture at a designated speed, exposing the film to light. The closed portion of the rotating shutter then interrupts the light, and the pull-down claw engages the perforation of the next frame and pulls it down into position for the next exposure when the cycle is repeated.

b. While the unexposed film is being drawn into position by the pull-down claw, one of the opaque sections of the shutter is passing before the aperture, excluding light from the film. Both the pull-down action and the rotary action of the shutter are synchronized, permitting light to enter the camera only when the film is stationary, and interrupting the light when the film is in motion. The shutter revolves once for two complete cycles of the pull-down arm; the operating speed, or number of frames exposed per second, is regulated by a friction-controlled governor mechanism which is adjustable (par. 5*a*(3)). After exposure, the film is drawn up into the magazine take-up chamber by the take-up sprocket; then it is rewound on the take-up core.

c. An analysis of the standard optical theory embodied in the optical components of this camera is not within the scope of this manual; refer to TM 11–2324 for this information.

Section II. TEST AND REPAIR EQUIPMENT

32. Tool Equipment

The tools listed below are required for the disassembly, repair, and adjustment of Camera PH–330–K and are part of Tool Equipment TK–24/GF.

Balance, spring: 5-oz. min. capacity (Sig C stock No. 4T138–55).
Brush, camel's-hair: round, size 9.
Micrometer: depth 2 to 3 in.
Punch, pin: .050-in. dia x ½-in. lg shank.
Punch, pin: .125-in. dia x 1-in. lg shank.
Punch, pin: .250-in. dia x 1-in. lg shank.
Screw driver, cabinet: 2-in. lg blade.
Screw driver, jeweler's: .080-in. blade.
Screw driver, jeweler's: .055-in. blade.
Tweezers, jeweler's.
Wrench, hex. socket head: for No. 6 Allen-head set screw.
Wrench, hex. socket head: for No. 8 Allen-head set screw.
Wrench, open-end: ⅜-in. 15° and 7/16-in. 15° openings.

Wrench, open-end: 5/16-in. 90° and 3/8-in. 15° openings.
Wrench, spanner: two .062-in. dia x .062-in. lg pins, .500 in. c to c.

33. Power Requirements

A source of 12-volt d-c is required to operate the electric motor or to charge storage batteries (BB–229/U) in the battery cases. The battery equipment, which is part of Camera PH–330–K (par. 5*g*), may be used as a source of power for checking operation of the electric motor if the batteries are charged properly (par. 16*f*).

Section III. INSPECTION, STRIPPING, AND CLEANING

34. Inspection

Make a visual inspection of the camera and other components to determine the extent of repairs required. Use a spool of test film to check camera operation. Inspect for obvious damage and check tightness of all screws. The camera and/or components may require only trouble shooting and replacement of defective parts causing trouble, or the equipment may require a complete overhaul or rebuilding.

35. Stripping and Cleaning

a. STRIPPING. Before cleaning the camera, remove the lenses from the turret (par. 8), and remove the aperture plate (par. 38*c*), the film magazine (par. 16), the drive unit, and the adapter plate from the camera. No tools are required to remove these parts. As each of these parts is removed, inspect visually to determine the extent of repairs necessary. For complete step-by-step disassembly of the camera assemblies, refer to section V, this chapter.

b. CLEANING.

(1) *General.* Clean the outside of the camera body with a dry cloth or, if necessary, with a cloth moistened with solvent (SD). Clean the film chamber with a camel's-hair brush, and the photographing and viewfinder lenses with lens cleaner and lens tissue. Clean all surfaces of the film gate. *Do not allow any dirt, abrasive, or foreign materials to come in contact with the highly polished film guide surfaces.* Clean all gibs and gib locks, and check proper operation by locking a film magazine in the top gib and by locking the adapter plate or a drive unit in the side and bottom gibs.

(2) *Turret.* Clean the exposed surfaces of the turret; be careful not to mar the mating lens mount surfaces. If dirt has accumulated between the turret and the housing, clean out with a camel's-hair brush and solvent (SD). Remove the turret (par. 38*f*) only if flushing fails to dislodge dirt or the turret does not rotate and seat in all three lens positions.

(3) *Shutter.* Remove the camera body cover (par. 38*d*), the shutter, and the shutter bearing housing assembly (par. 38*e*). The shutter mirror must be clean and free of any surface damage. Do not touch the surface of the shutter with the fingers. If necessary, remove the mirror from the assembly (par. 38*e*) and wash in a solution of lukewarm water and white soap. Use the palm of the hand and plenty of soap suds. Flush in clean, running, lukewarm water and air dry. If required, wipe with lens cleaner and lens tissue.

(4) *Drive mechanism.* Check all parts of the drive mechanism for obvious damage or excessive wear, particularly shafts, bearings, and gears. Remove the tachometer (par. 39*b*) and immerse the entire plate in solvent (SD) for cleaning. Wash all parts thoroughly, using a camel's-hair brush and then allow the mechanism to dry thoroughly. Be sure that all the solvent (SD) has dried. Lubricate as instructed in paragraph 25. Be sure that there is no lubricant or dirt in the governor brake and that the brake is dried thoroughly. Reassemble the drive plate to the camera body (par. 38*a*), and reassemble the shutter and shutter bearing housing to the plate (par. 38*e*). Place the camera body cover (par. 38*d*) on the camera.

Section IV. TROUBLE LOCATION

36. Trouble Location

All drive mechanism parts are located on a single plate. Most of the troubles encountered may be located by inspecting all the parts mounted on the drive mechanism plate (fig. 17). The governor, the intermittent cam, and the shutter and bearing housing assemblies are subjected to the most wear and require careful checking when trouble develops. The distance between the lens mount seat on the turret and the plane of the film in the aperture plate is critical (par. 45). The turret requires careful inspection if it offers much opposition to rotation or does not seat in its stops. The pressure

of the film pressure plate on the film, when too great, may cause film scratching or unsteady pictures. Refer to paragraph 39 for disassembly and reassembly procedures for parts mounted on the drive mechanism plate, and for information required should repair of other items be necessary. Do not disassemble any further than is required for the replacement of parts, unless a complete overhaul or rebuilding is required.

37. Trouble-shooting Chart

The trouble-shooting chart below provides a table of specific equipment defects which represent the failure of a part to function adequately.

Trouble	Probable cause	Remedy
Film scratched	Dirt or emulsion on aperture plate of film guards.	Clean aperture plate and guards.
	Aperture plate or pressure plate nicked or damaged.	Repair, polish, or replace aperture plate.
	Film loop too large	Shorten loop.
	Too much pressure from pressure plate.	Check spring pressure with film in gate (par. 48*a*). Correct pressure is 3 ounces.
Picture frame lines	Edges of aperture plate dirty.	Clean aperture plate.
Light struck film	Film loaded or unloaded in bright light.	Load magazine in subdued light. The 400-foot magazine must be loaded in dark room or changing bag.
	Magazine cover not fastened securely.	Fasten securely.
	Camera door not shut properly.	Check for proper fit of door and proper operation of door lock.
Pictures not in sharp focus.	Lens focus not checked in viewfinder. Viewfinder not focused properly.	Recheck viewfinder focus before shooting. Check lens focus before shooting.
	Lens covered with dirt, oil, or moisture.	Clean lens with lens tissue and cleaner.
	Lens elements removed and improperly reassembled.	Replace with new lens. *Never disassemble lens elements.*
	Lens not seated properly in turret.	Recheck fit of lenses on turret.

Trouble	Probable cause	Remedy
Speed of camera not steady (electric motor and batteries).	Batteries not charged	Refer to paragraph 16*f*.
	Cable connector not tight	Check and tighten connectors.
	Film loop too large or too small.	Recheck threading of film (par. 16*d*).
	Governor defective	Replace governor (par. 39*c*).
Speed of camera not steady (spring motor).	Film loop too large or too small.	Recheck threading of film (par. 16*d*).
	Spring wound insufficiently	Wind fully after each take.
Camera cannot be brought up to operational speed.	With electric motor operation, cause may be low battery power or poor cable connections.	Check batteries (par. 16*f*), and check and tighten connectors. If low temperature operation, be sure to use both battery cases.
	With spring motor operation, motor wound insufficiently.	Wind fully after each take.
Camera speed cannot be controlled by speed control knob.	Defective governor	Return to repair service.

Section V. REPAIR

38. Removal and Replacement of Major Assemblies

a. GENERAL. The instructions in this paragraph give the step-by-step methods for the complete disassembly of the camera. In the following procedure, the order of removal of parts should be followed because, in some instances, it is necessary to remove one particular part before another may be removed.

b. CAMERA DOOR (fig. 15). Open the camera door (par. 16*d*) and remove screw H755 which fastens the chain to the camera body. Door lock knob O–386 and lock H307 are held to the door casting by two screws H313. The viewfinder tube is held in place by hexagonal socket head set screw H314–4, and the eyepiece slides out of the tube when screws H658 which hold adjusting lockscrew H660 are removed. Do not lose fiber pin H657. The thumbscrew is staked to prevent complete removal. *Do not remove the optical elements of the viewfinder.* If optical elements are defective, replace the tube assembly or eyepiece, as required. Reassemble the parts in reverse order. Be sure the keyway in the eyepiece is alined with the adjusting lockscrew when the eyepiece is replaced.

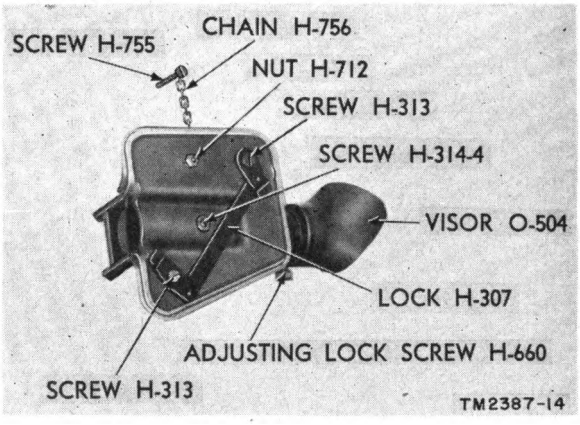

Figure 15. Camera door.

c. APERTURE PLATE (fig. 16). The aperture plate, held in place by two spring catches 223 which fit over a boss in the drive plate, is locked in place with springs O–604 and O–605 near the front of the camera door. To remove the aperture plate, process as follows:

(1) Position the pull-down arm, in the upward motion of its stroke, opposite the horizontal groove in the aperture plate (fig. 24), and close the pressure plate.
(2) Move locking springs O–604 and O–605 with the fingernail to unlock the aperture plate.
(3) Remove the aperture plate, moving it slightly to the rear of the camera to clear the camera body and then at right angles to the body. *The plate must be removed so that the pull-down arm travels in the groove in the plate.*
(4) When replacing the aperture plate, be sure that the pull-down arm is in the position described above, and that the fit spring catches over the boss and locks in place.
(5) For disassembly of the aperture plate, refer to paragraph 40.

d. CAMERA BODY COVER. To remove the camera body cover, do the following:

(1) Remove hexagonal socket headscrew H728 (fig. 17) which holds drive coupling O–725.
(2) Remove the drive coupling and washer H727.
(3) Remove key 279 from the drive shaft with tweezers.
(4) Remove three screws H373–6 which hold the cover to the body and lift it off. Make sure that the contour of the cover over the shutter is moved parallel to the shutter.

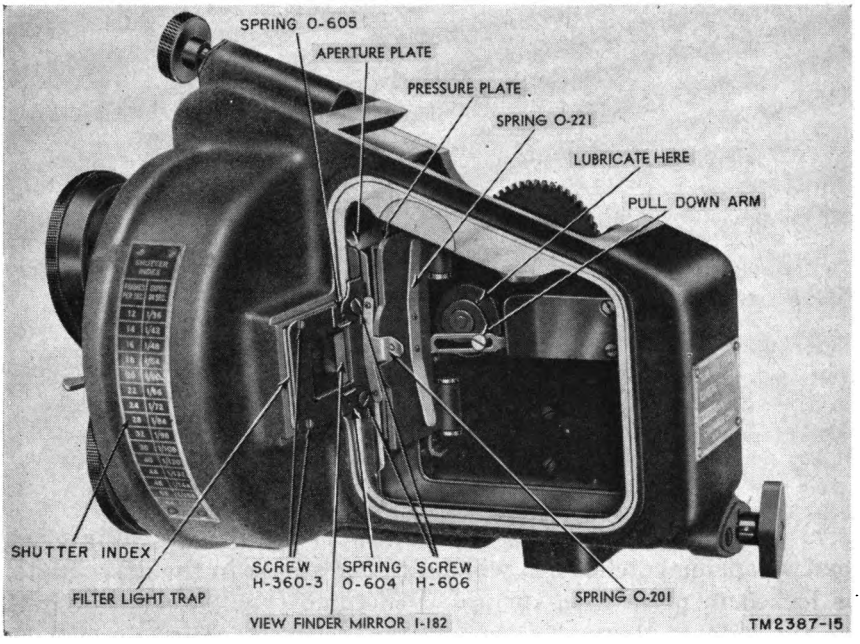

Figure 16. Film chamber.

(5) When replacing the cover to the camera body, move the governor shaft collar (fig. 21) to either of its extreme positions and aline ball bearing O–507 (fig. 25) inside the cover with the corresponding extreme position. The ball bearing moves with the rack and is controlled by the governor control knob.

(6) Replace the cover on the camera body, and replace the key and the drive coupling.

e. SHUTTER BEARING HOUSING ASSEMBLY AND DRIVE PLATE (figs. 17 and 18). To remove the shutter bearing housing assembly and the drive plate, proceed as follows:

(1) Remove four screws H371–6 which hold the shutter bearing housing assembly to the bearing plate.

(2) Lift the assembly from the drive plate at right angles to the mounting surface because the assembly is located with pins. For disassembly of the shutter and shutter bearing housing assembly, refer to paragraph 42.

(3) Remove screws H373–6 which hold the drive plate in place and remove the plate. The plate is located with pins. For disassembly of the drive plate, refer to paragraph 39.

(4) To replace, attach the drive plate to the camera body and secure it in place with screws H373–6.

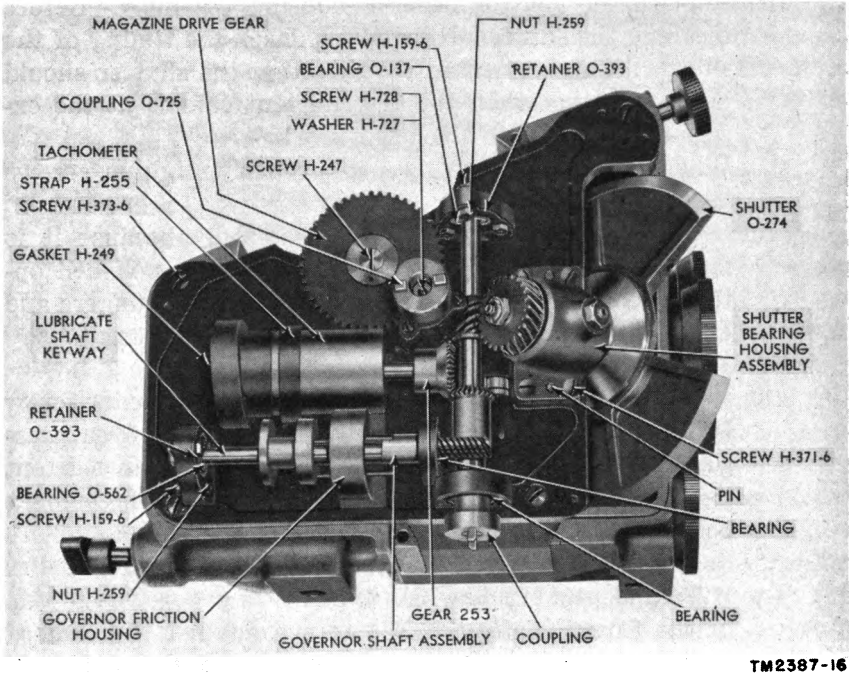

Figure 17. Camera drive mechanism, drive unit side.

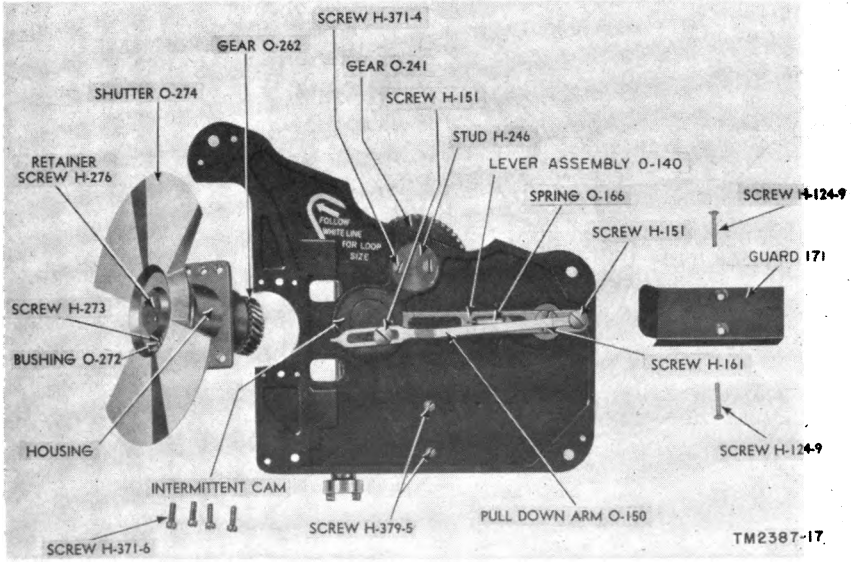

Figure 18. Camera drive mechanism, film chamber side.

(5) Replace the shutter bearing housing assembly. Before meshing the shutter drive gears, check the timing of the shutter. Correct timing requires that the shutter should begin opening when the intermittent cam is at the extreme bottom of its stroke.

(6) When the gears have meshed properly, tighten screws H371–6.

Caution. Handle the shutter carefully because it is made of glass which has been ground and polished optically flat. Do not touch the surface with the fingers and carefully protect the polished surface.

f. LENS TURRET (fig. 19).

(1) Remove the lenses (par. 8) and then remove center screw H298 and key washer H297. Exert a steady, even pressure on the turret casting until the locking rollers (detent mechanism) snap into the machined ring in the camera body casting. Remove slowly so that the locking rollers do not fly out. Each locking roller consists of washer H294 and stud H295, which slips into a groove in the side of the turret casting and is forced against the camera body by spring O–296. Angle plate A292, which locates the lens mount, is held to the casting by screws H159–3. To remove the lens lock assembly, remove screw H312 and knob 803 and lift off. Pin H799 fits into the hole in the

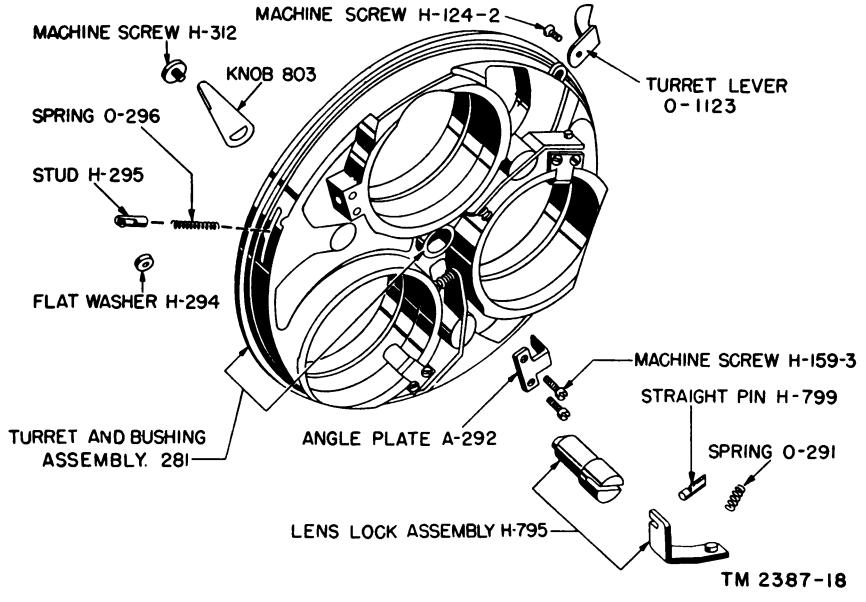

Figure 19. Lens turret, exploded view.

casting near angle plate A292, and spring O–291 fits over the bosses on the lens lock and the turret casting. Reassemble in the reverse order.

(2) If it is necessary to replace the turret casting, the replacement casting requires machining so that the distance between the lens mount seat and the film plane meets the tolerance requirements (par. 45). When reassembling, be sure the indexing rollers seat in the ring. Exert a steady, even pressure on the casting until the turret seats against the shoulder of its shaft.

g. VIEWFINDER GROUND GLASS AND MIRROR (fig. 16). This assembly is held in place by a plate held by screws H360–3 and H606. Screws H606 also hold aperture plate locking springs O–604 and O–605. Hold the camera body so that the mirror surface faces up when the plate is removed. Be careful that light trap roller 257 and spring O–256 do not drop out. Remove the latter two pieces with tweezers and remove four screws H360–2 which hold the mirror and the ground assembly. Hold the unit near the ground glass and lift out. *Do not pry on the mirror.* Do not change the position of the locking pins in the camera body. To replace, reverse the above procedure.

h. GIB LOCKS AND FILM GUARDS (fig. 20). Each movable gib (lock plate) is held to the shaft with a single screw H159–4. After removing this screw, remove the screws which hold the spring

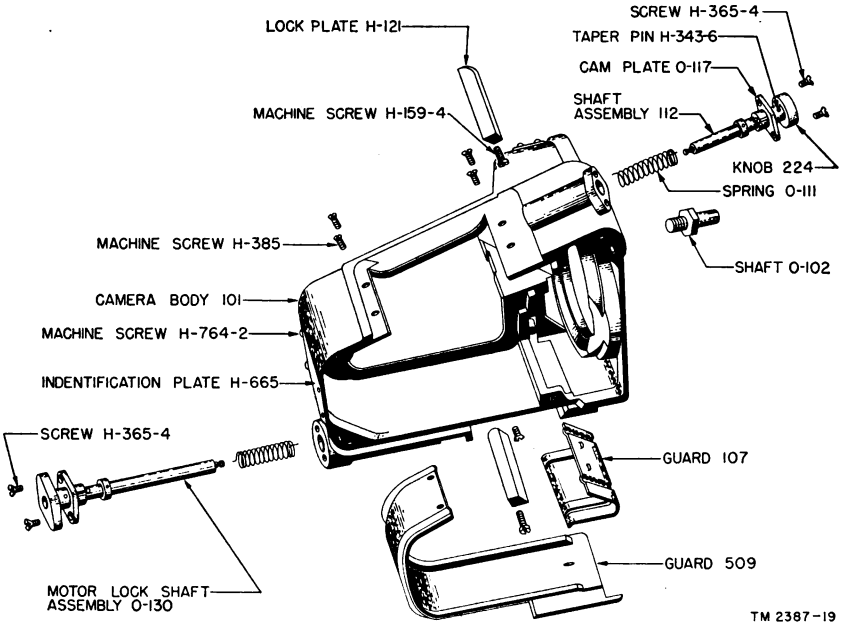

Figure 20. Camera body, exploded view.

assembly and shaft to the camera body. The larger film guard 509 is held by three screws. Two screws are located near the fixed gib of the film magazine and the third is located on the surface at the bottom of the camera where the drive unit is attached. The smaller guard 107 is held by two screws located near the movable gib which locks the film magazine in place.

39. Disassembly and Reassembly of Drive Plate (figs. 17 and 19).

a. GENERAL. When disassembling the drive plate, follow the order listed in *b* through *f* below and reverse the order when reassembling. Do not remove more assemblies than is necessary when replacing parts.

b. TACHOMETER (fig. 17). Loosen two screws H371–5 which secure strap H255 to the plate and slide tachometer assembly 251 to the rear of the camera. Drive gear 253 is held to the shaft with taper pin O–343–7. Gasket H249 slides over the meter end.

c. GOVERNOR ASSEMBLY (figs. 17 and 21). Remove three nuts H259 and screws H159–6 which hold retainer plates O–393 of rear bearing O–562. Remove two screws H379–5 (fig. 18) located on opposite sides of the drive plate which hold governor friction housing A568. Remove bearing retaining locknut H561 from the end of the shaft and push the governor assembly toward the rear of the camera. Remove the ball bearing O–562 from the rear. Then remove the shaft assembly by moving it toward the front of the camera so that the front bearing and gear clear the front bearing housing. Slide the governor assembly out of the governor friction housing and slide governor collar O–570 off the shaft. Reassemble in reverse order, making sure that the phenolic studs of the weights are clean and thoroughly dry.

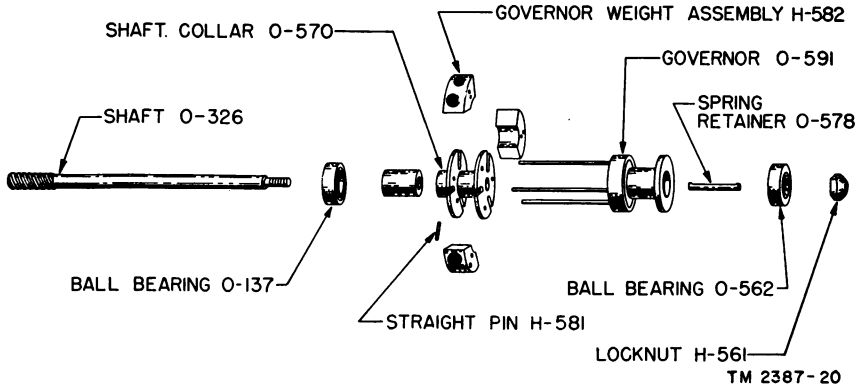

Figure 21. Governor assembly, exploded view.

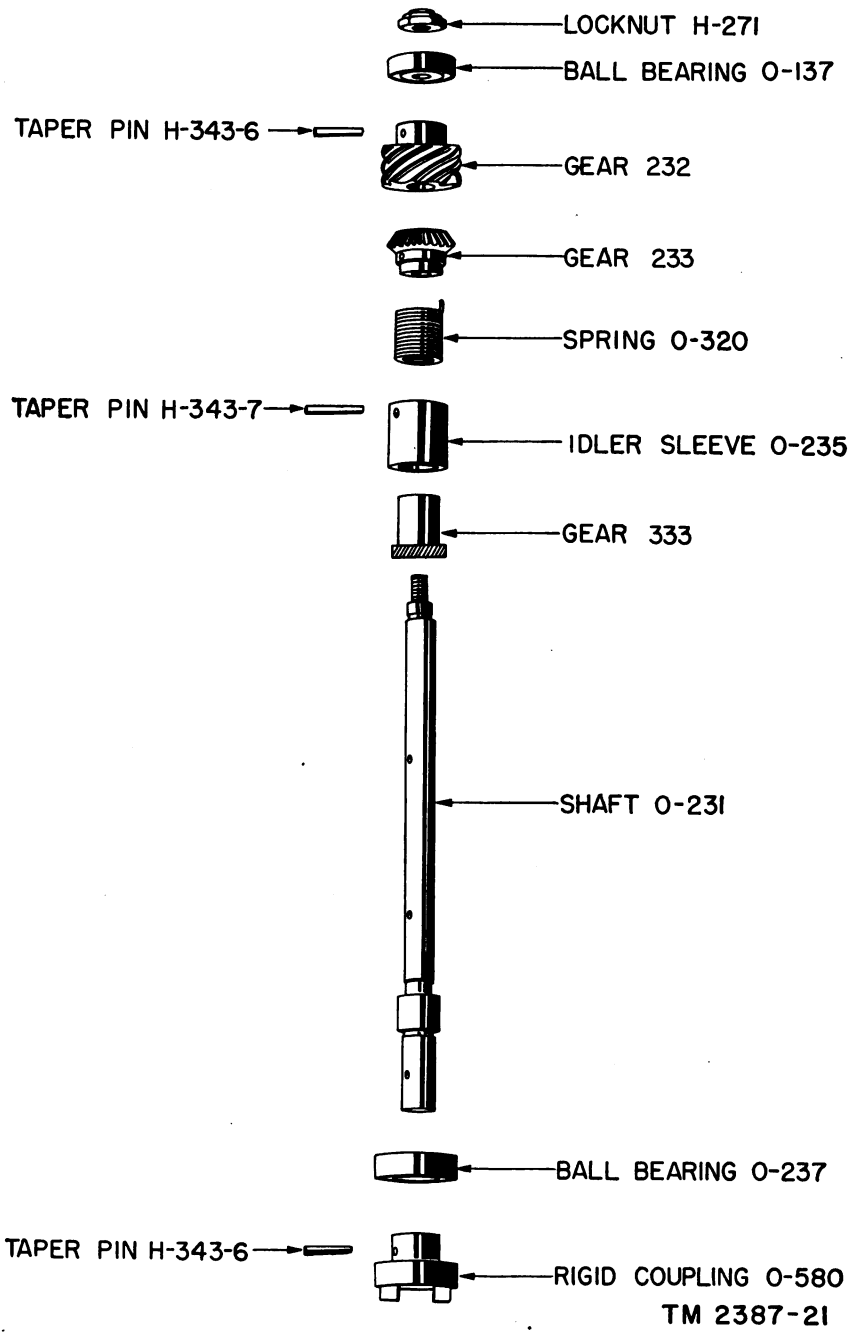

Figure 22. Main drive shaft, exploded view.

d. MAGAZINE DRIVE GEARS. Remove two screws H371–4 (fig. 18) on the film chamber side of the plate. Remove gear retainer screw H247 (fig. 17) and drive stud H246 (fig. 18). Lift off the gears. Both gears are pinned to a sleeve bushing; knock out the pin to disassemble. Reassemble the gears to the plate in the reverse order.

e. MAIN DRIVE SHAFT (fig. 22). Remove screws H159–6 and nuts H259 which hold retainer plate O–393 to the top of the drive shaft (fig. 17). Remove locknut H271, push out the top ball bearing O–137, and remove from shaft. Push the shaft toward the top of the camera, until the lower ball bearing O–237 is free, and lift from the drive plate. Coupling O–580 is held to shaft O–231 by taper pin H343–6. The lower ball bearing O–237 is a slight push fit on the shaft at gear 233. Gear 333, idler sleeve O–235, and spring O–320 are fastened to the shaft with pin H343–7 which passes through the sleeve and gear. Gear 232 is held to the shaft with pin H343–6. Reassemble in the reverse order, placing one retainer plate O–393 on the shaft before inserting in the top bearing housing.

f. PULL-DOWN CLAW AND INTERMITTENT CAMSHAFT ASSEMBLY (fig. 18).

(1) Remove two screws H124–9 and guard 171.
(2) Remove two shoulder screws H151 which hold the pull-down arm to the cam and oscillator lever assembly O–140.
(3) Unhook spring O–166 from the lever assembly and remove shoulder screw H161 while holding the lever to the plate.
(4) Press on the cam drive shaft from the coupling side of the drive plate and remove.
(5) Remove three screws H371–5, which were exposed when the magazine drive gears were removed, and lift off bearing housing assembly H179. Ball bearing O–137 (fig. 23) is held to the housing with retainer plate O–393 (fig. 17) and screws H159–6.
(6) Replace the parts in reverse order.

40. Disassembly and Reassembly of Aperture Plate (fig. 24)

Remove screws H396 which hold flat spring O–221 and screws H151, under the flat spring, which hold the pressure plate. Remove gate hinge screws H217 and H210. Remove one screw H159–3 which holds each spring catch 223, and two screws H760 which hold fastener spring O–201. Further disassembly is not recommended because of extremely close tolerances which must be maintained.

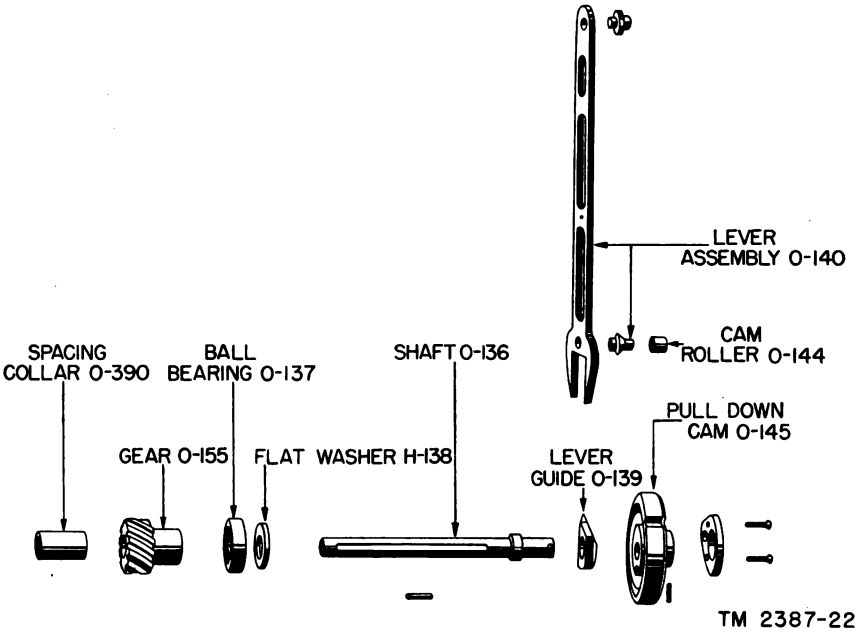

Figure 23. Intermittent camshaft assembly, exploded view.

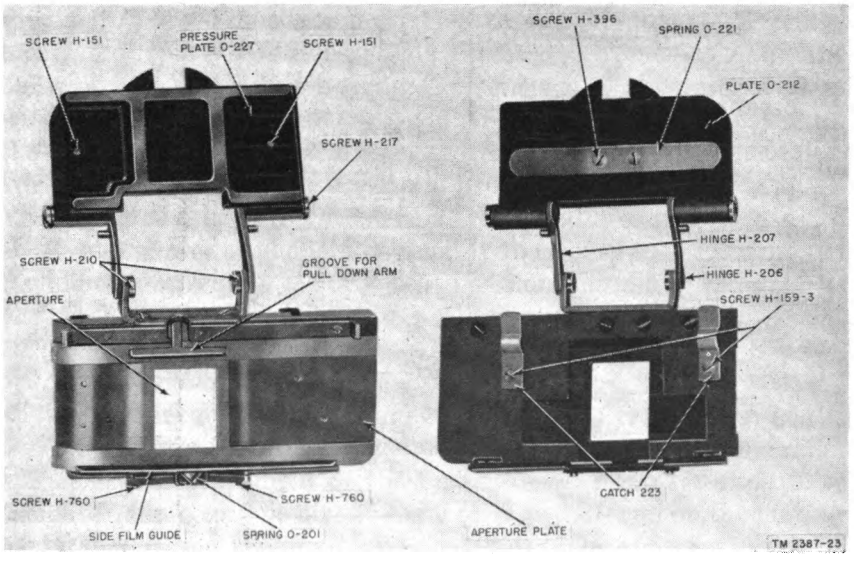

Figure 24. Film aperture plate and gate.

41. Disassembly and Reassembly of Camera Cover (fig. 25)

Remove dowel screw H772 and lock plate H132. Unscrew knob cover A771 which has a left-hand thread and slip out knob 770. Remove machine screw H615 and knock out two pins H225–7 which release alinement block O–729. Remove pin H343–5 from knob 399 and release spring O–614. From the inside of camera cover A187, remove shaft assembly O–842. Remove two screws H1099–2 and governor plate O–844. Remove two screws 124–6 and guard 714. Remove the pin from knob 334 and release the knob and spring

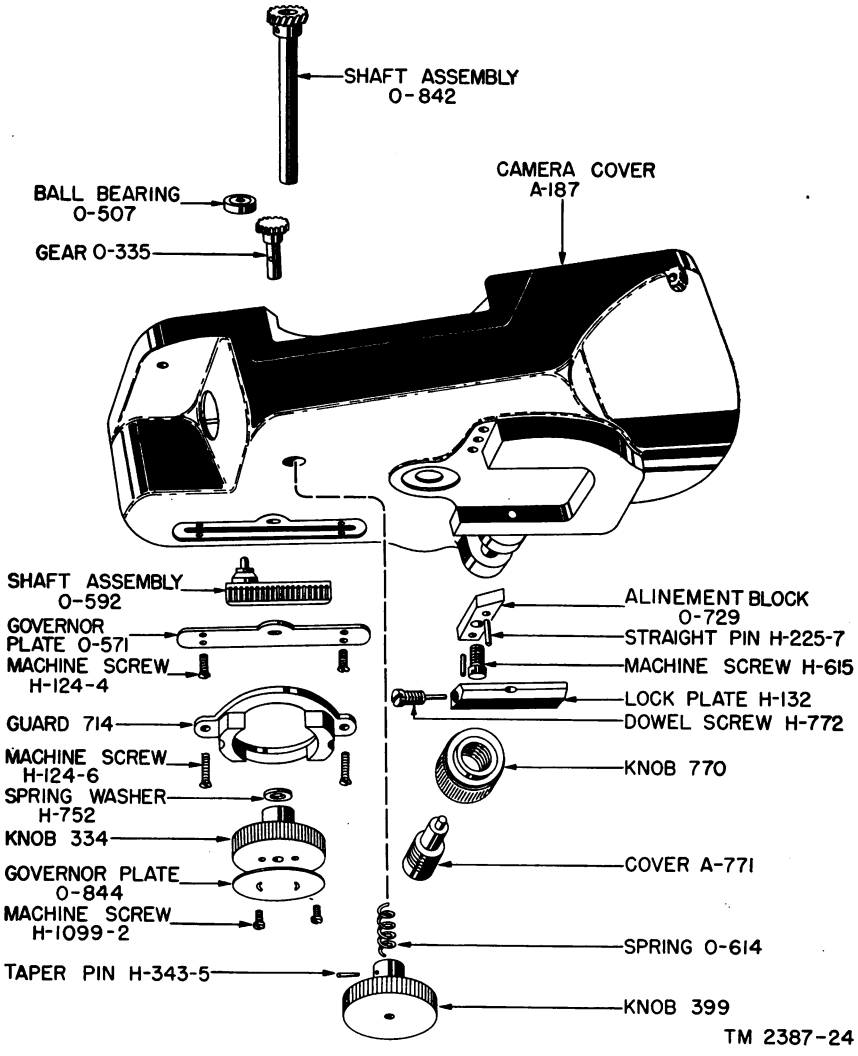

Figure 25. Camera cover, exploded view.

washer H752. Remove two screws H124–4 and release governor plate O–571 and slip gear O–335 from the inside of camera cover A187. Remove ball bearing O–507 from the end of shaft assembly O–592. Remove the shaft assembly. Reassemble in the reverse order.

42. Disassembly and Reassembly of Shutter and Shutter Bearing Housing

a. Use a spanner wrench, and remove screw H276 (fig. 26) which holds shutter O–274 to shutter shaft O–266; carefully lift off the shutter screw and flat washer H275. Remove screw H273 and washer H272 and carefully lift off shutter O–274. Carefully check washer H272 for fit in the shutter and felt washer H275 to be sure it is dry and does not have a permanent set. Remove nut H271 from shutter shaft O–266 and use a gear puller to remove gear O–268 and key O–279. Remove shutter shaft O–266 from the opposite end of the shutter bearing housing. Remove nut H378 and screw H397 which lock bearing sleeve O–394 in place in the housing. Unscrew bearing sleeve O–394 to remove it from the housing. Use a bearing puller to remove ball bearings O–265. Be careful when handling shutter O–274 and when removing bearings O–265. Do not touch the surface of the shutter with the fingers, and carefully protect the surfaces at all times. Do not disassemble any further than is necessary.

b. Be careful when reassembling the bearings in the bearing sleeve. If new bearings are installed, any lubricant with which they were packed must be washed out thoroughly and the bearings lubricated (par. 25). Reassemble bearing sleeve O–394 and the ball bearings in shutter bearing housing A261, and lock in place with screw H397 and nut H378. Press shutter shaft O–266 into the bearings. Exert a steady, even pressure; do not force. Place key O–279 on the shutter shaft and press gear O–268 on the shaft. Tighten nut H271 until there is a slight amount of end play in the shaft, and mount the housing assembly in a fixture which will hold the shutter mirror in a horizontal position and allow the gear to be spun by hand. Place shutter O–274 on the shaft and tighten nut H271 until the bearings have a thrust load of 3 pounds. *Do not overtighten nut H271.* After tightening, place a fluorescent lamp above the mirror so that the image of the lamp can be seen in the shutter. Rotate the shutter by spinning the gear rapidly by hand, and check for movement of the image of the lamp. If the image oscillates, there may be dirt or some foreign material on the mating surfaces between the shaft and the shutter, or the shaft may be damaged or bent. Remove the shutter and carefully clean the mat-

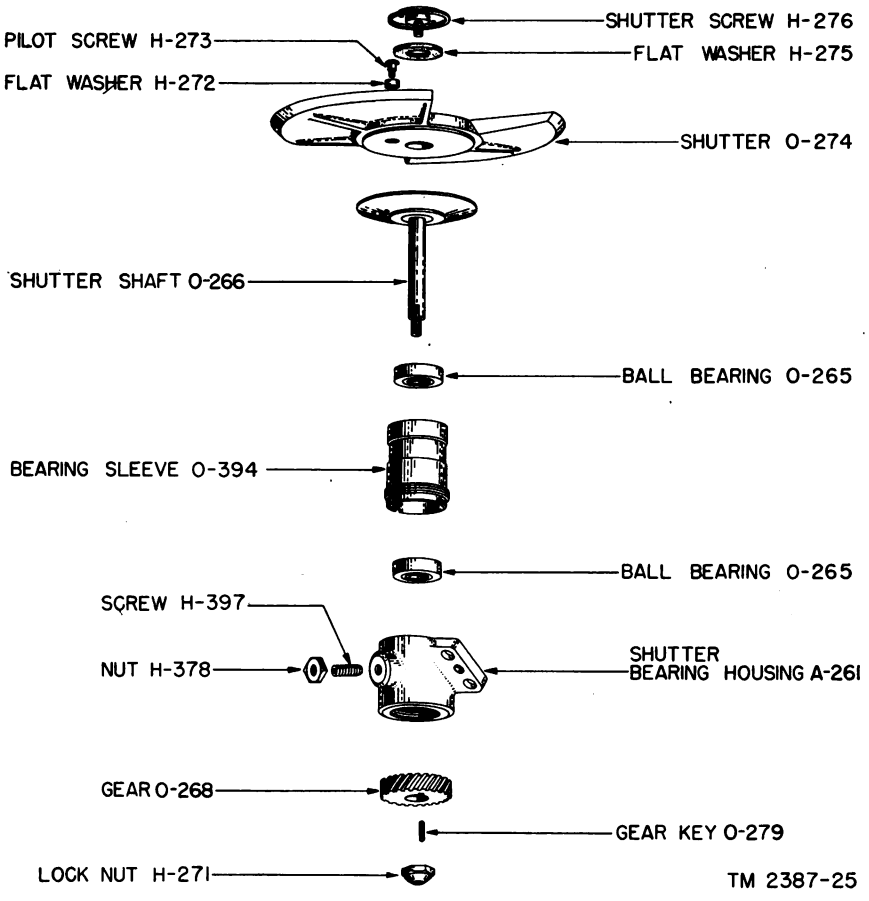

Figure 26. Shutter and shutter bearing housing assembly, exploded view.

ing surfaces. If this fails to clear the trouble, replace the defective parts.

Note. Handle the shutter carefully because it is made of glass and is ground and polished optically flat. Do not touch the surface with the fingers, and carefully protect the polished surface.

43. Disassembly and Reassembly of Drive Units

a. ELECTRIC MOTOR (fig. 27). Remove four machine screws H363–6 which hold motor gear housing cover A538 in place and remove cover from the assembly. This exposes the speed reduction gears. Lift out idler gear assembly A748 and motor shaft assembly 747. Gear 593 is attached to the armature shaft with pin H116–6. The HI—LO shift lever knob 793 is attached with screw H794. Do not lose spring O–740 when screw H794 is removed.

Toggle switch S546 is held to gear housing A537 with a hexagonal nut. When replacing the switch, be sure to tag the wires before unsoldering the connection. Retainer ring O–773 holds push button H555 to gear housing A537. Push button H555 actuates the switch pile-up which is held in place by machine screws H124–10. Two flathead machine screws hold gear housing A537 to the motor housing. Two screws H387–16 hold the rear cap and receptacle O–813 in place. The connections to the cap and receptacle O–813 are soldered in place; be sure to tag the wires and connect them to the same receptacle prongs with respect to polarizing the keyway, if replaced. Reassemble in reverse order.

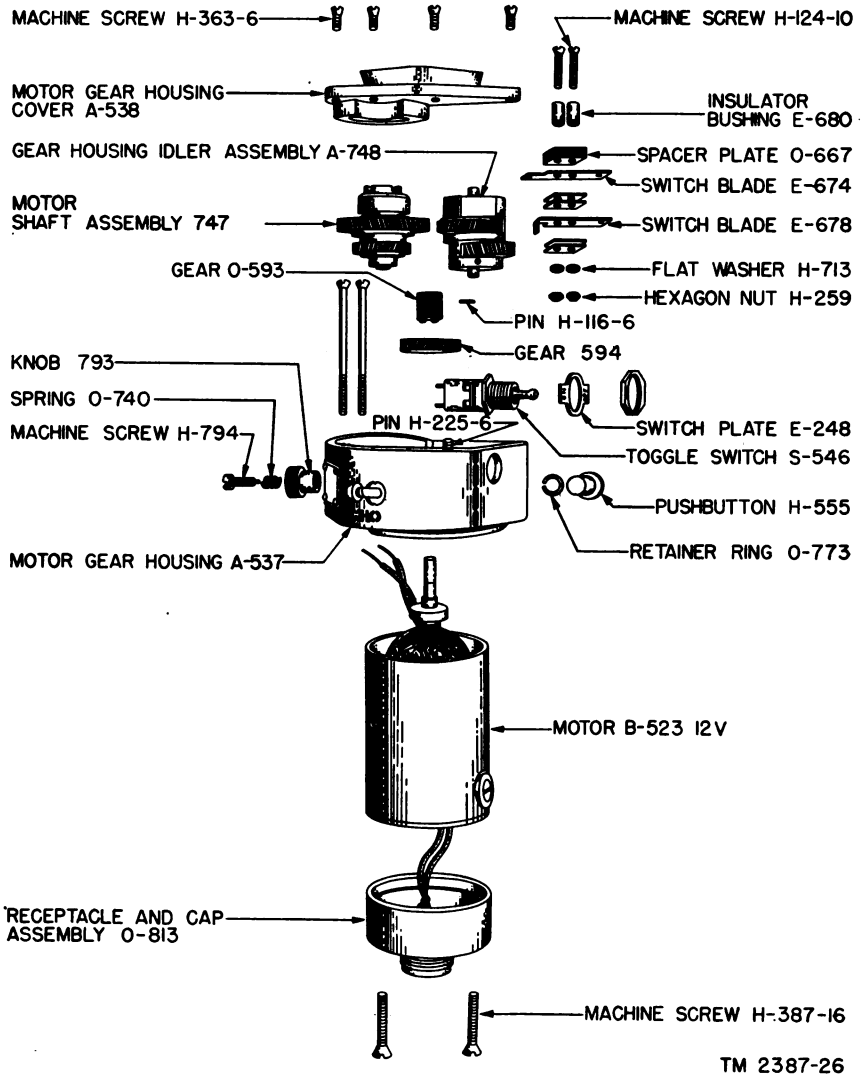

Figure 27. Electric motor drive unit, exploded view.

b. SPRING MOTOR (fig. 28).

(1) *Disassembly.* Before disassembling the spring motor, be sure the spring is unwound fully. Never allow the spring motor to unwind without a load. Attach the drive unit to the camera and operate the unit until fully unwound. Be sure safety lever O–1034 is in the unlocked position.

(*a*) Remove taper pin H343–6 which holds the trigger on its shaft and machine screws H363–11 and H363–16 which hold bottom housing assembly A1019 to top housing assembly A–1012 and lift off the cover.

(*b*) Remove three Allen-head screws H1021 which hold spring assembly O–1080 to top housing assembly A–1012 and remove the assembly. Remove safety plunger O–1119 and spring O–1029.

(*c*) Loosen machine screw H159–6 on the top of runner stop O–1054 and rotate the stop toward the bottom of the thread.

(*d*) Remove gear and shaft assembly O–1051.

(*e*) Unhook torsion spring O–1077 from brake lever arm O–1071.

(*f*) All shafts fit the roller bearings with a medium push fit; lift off the shaft and the gear assemblies, as required; gear assembly O–1045 and gear O–1049 cannot be removed until taper pin H–1056–8 is driven out.

(*g*) Gears are pinned to the shafts; drive out the pins and remove the gears from the shafts, as required.

(*h*) Drive out taper pin H343–7 which holds the bevel gear 1016 and shaft in the housing, and remove the gear.

Note. To replace spring assembly O–1080 only, remove three Allen-head screws H1021 which hold the housing to the top housing assembly, and remove the assembly. Remove screws H110–2 which hold the nameplate to the gearcase. The bearing housing of spring assembly O–1080 must be removed before reassembly.

(2) *Reassembly.* Reassemble the gears and the shafts in place on the top housing assembly in the reverse of disassembly procedure ((1) above). Lubricate the gears and the bearings as required (par. 25). Before replacing gear assembly O–1051, be sure bottom stop O–1054 is seated against the shoulder on the shaft and that machine screw H159–6 is tightened.

(*a*) Replace the brake lever assembly O–1071, torsion spring O–1077, and bottom housing assembly A1019. Be sure the nameplate is removed to allow access to the interior through the inspection hole.

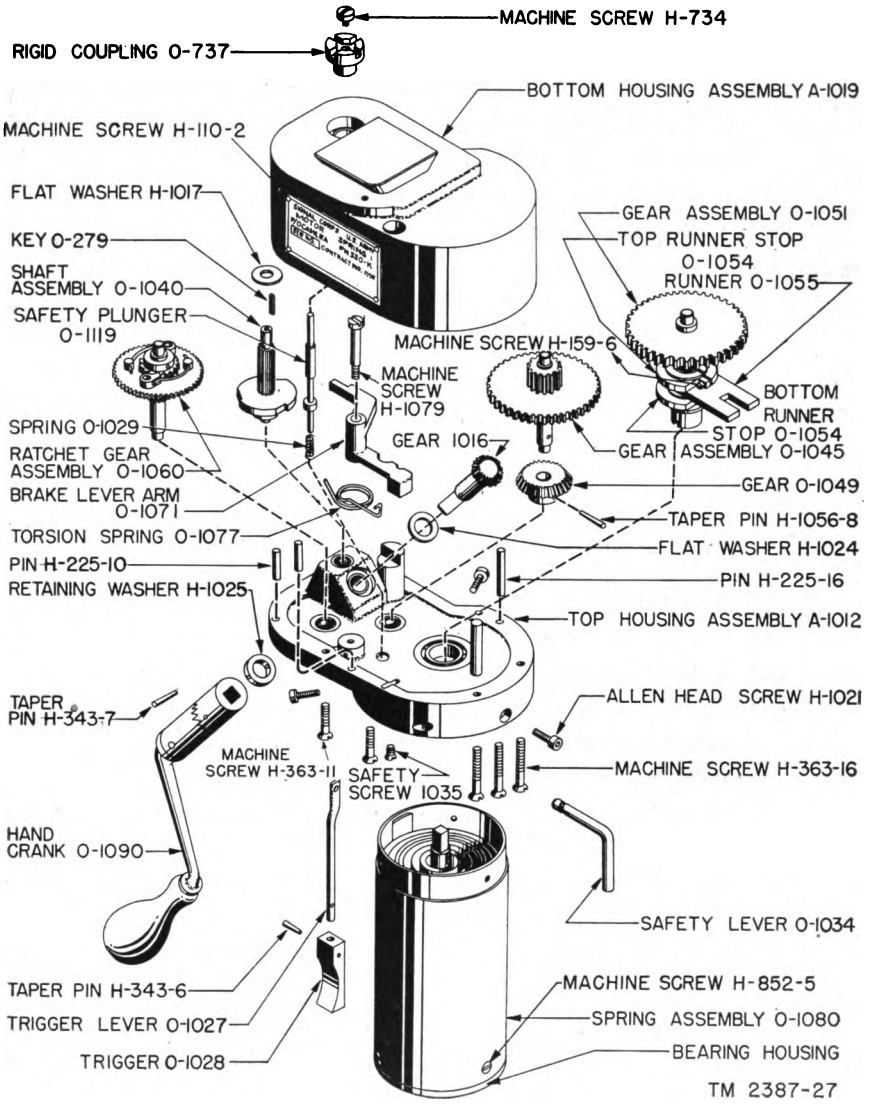

Figure 28. Spring motor drive unit, exploded view.

(*b*) Rotate the large diameter spur gear until runner O–1055 is ½ turn from the surface of bottom runner stop O–1054.

(*c*) Rotate top runner stop O–1054 on its thread until clearance between the two stops measures .340 to .345 inch, then tighten machine screw H159–6 in the top runner stop.

(*d*) Remove machine screws H852–5 which hold the bearing housing in the spring assembly.

(*e*) Insert spring assembly O–1080 in top housing assembly A–1012, engaging the spring shaft in the coupling slot.

(*f*) Rotate the spring shaft from the rear, if necessary, to accomplish engagement.

(*g*) Replace the bearing housing.

(*h*) Hold the large spur gear to prevent turning, and rotate the spring assembly ⅔ to 1 turn clockwise (as viewed from the spring assembly side of the top housing assembly).

(*i*) Line up the holes in the spring assembly with the holes in the top housing assembly, and insert and tighten the Allen-head screws H1021. Replace the nameplate.

44. Disassembly and Reassembly of Film Magazines

a. Disassembly of 400-Foot Magazine (fig. 29).

(1) Unscrew magazine covers A–801.

(2) Remove machine screws H124–3 and cover plate A–876.

(3) Turn the magazine over, and remove shoulder screw H869 which holds knob 867, and remove three machine screws H365–9 which hold dial cover A–802.

(4) Lift off the dial cover and wheel ratchet O–865, and then move pawl O–879 completely away.

(5) Lift off pawl O–863, washer H878, and unhook spring O–864.

(6) Remove cam gear O–880. Be careful not to stretch tension spring O–864.

(7) Unhook take-up pulley spring belt O–872, and remove the four screws which hold sprocket housing assembly A453 to the case. For further disassembly of the sprocket, refer to *b* below.

(8) Remove hexagonal socket headscrews H380–6 which hold hubs O–444 on the shafts. Press out shaft assemblies O–437 and O–858.

(9) Remove machine screws H452–4 which hold ball bearing housing A856.

(10) Disassemble only those parts which require replacement.

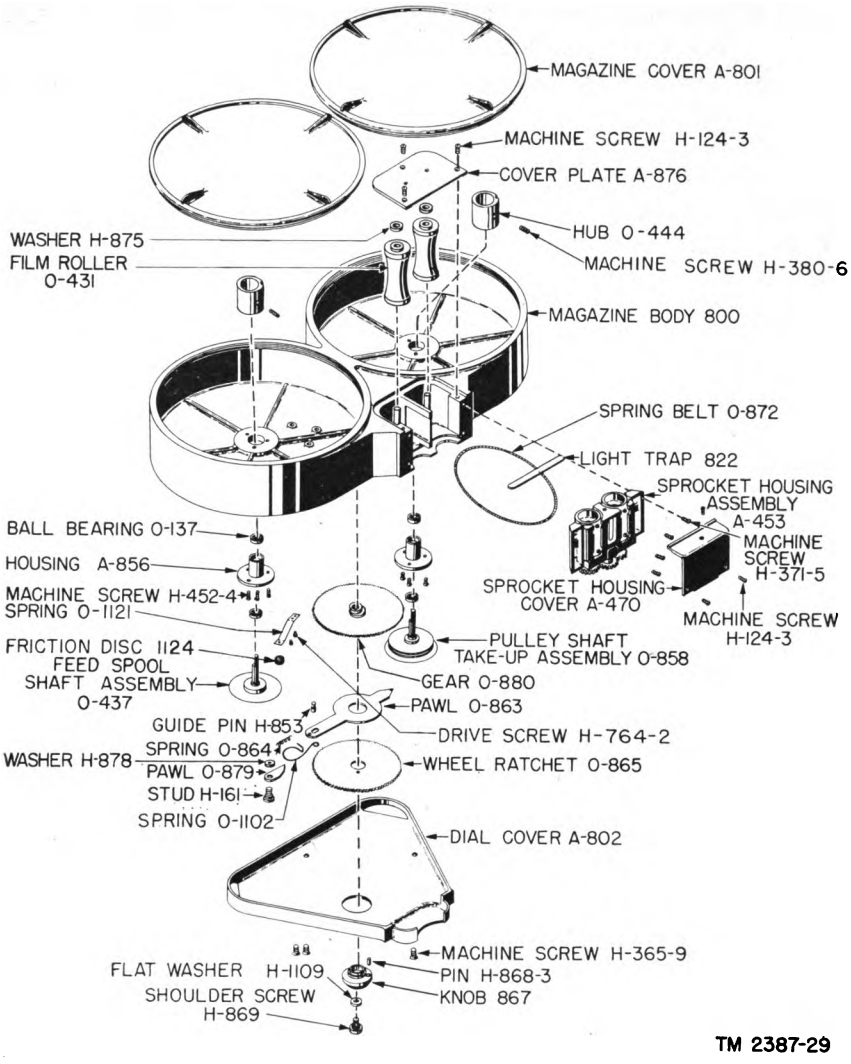

Figure 29. 400-foot magazine, exploded view.

b. DISASSEMBLY AND REASSEMBLY OF SPROCKET HOUSING ASSEMBLY (fig. 30).

(1) Remove set screws H380–5 located in sprockets O–450 which hold shaft assemblies O–457 and O–462.

(2) Remove stud 468 which holds idler gear O–465.

(3) Slide out take-up shaft assembly O–462 and shaft assembly O–457, releasing sprockets O–450. Be careful not to lose flat washers H455 which are bearing washers for the sprockets.

(4) Machine screws H159–3 hold bearing housing assembly A454 to housing A754.

(5) Ball bearings 137 are a press fit into each end of housing A454.

(6) Reassemble in reverse order.

c. REASSEMBLY OF 400-FOOT MAGAZINE. To reassemble, reverse the procedure described in *a* above. Be careful when meshing teeth of the footage indicating cam gear O–880 with the sprocket. Be

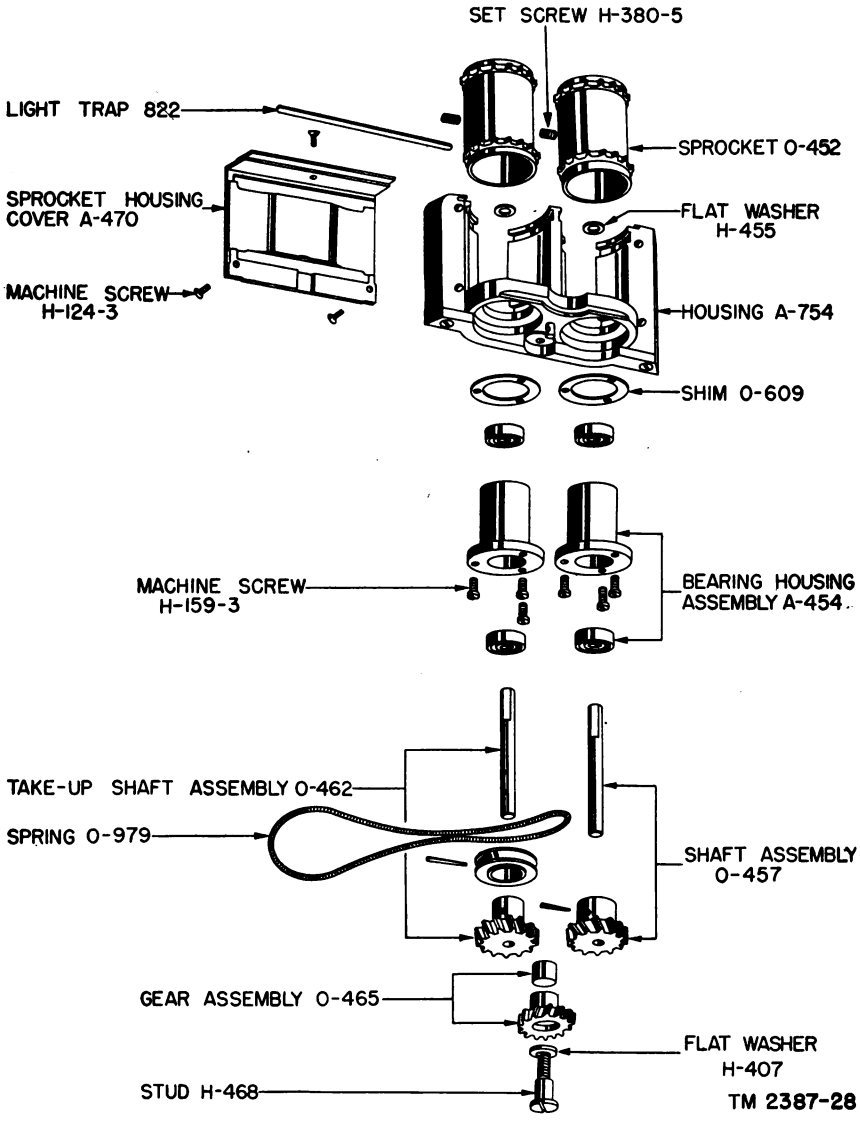

Figure 30. Sprocket housing assembly, exploded view.

sure to engage pin H868–3 on finger knob 867 in the hole in wheel ratchet O–865 before tightening screw H869.

d. DISASSEMBLY OF 200-FOOT MAGAZINE (fig. 31).

(1) Remove magazine door assembly A988 and remove the film and/or the film spools from the spindles.

(2) Remove machine screws H365–9 which hold footage indicator cover A473 and remove spring belt O–979 from magazine pulley O–985. Knurled cap 984 is fastened in place with set screw H397–2, and spool shaft O–983 and

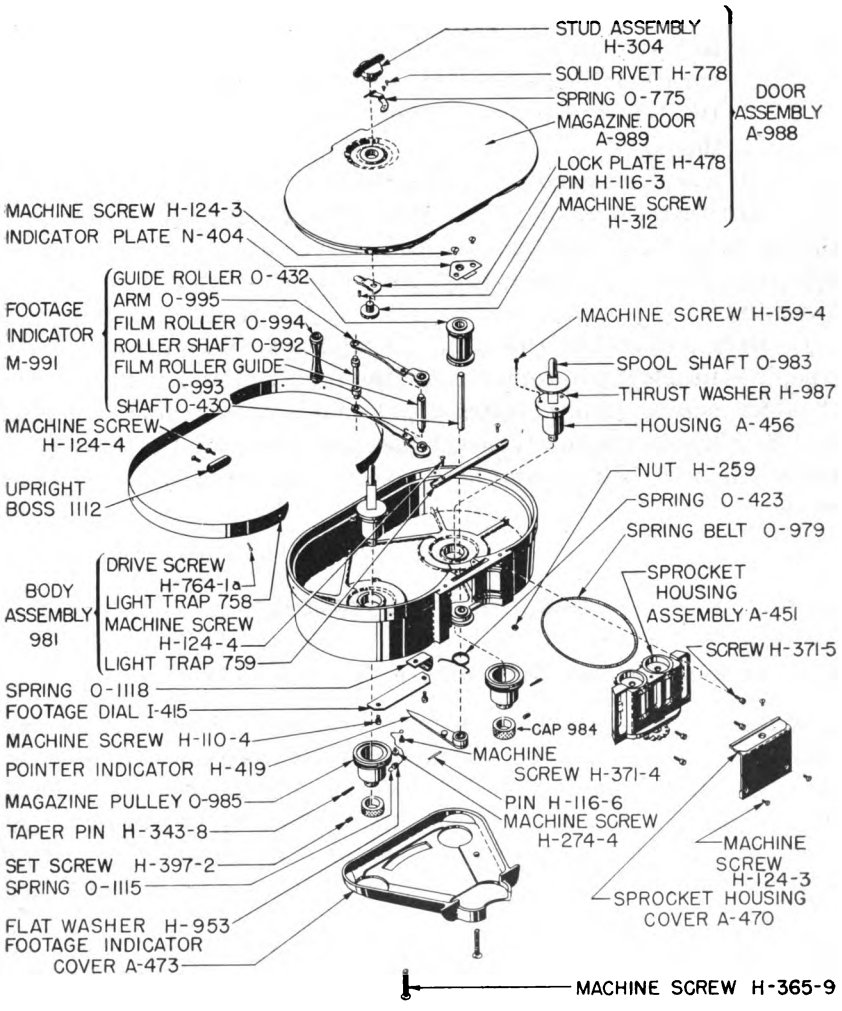

Figure 31. 200-foot film magazine, exploded view.

magazine pulley O–985 are assembled by taper pin H343–8 which is exposed when the knurled cap is removed.

(3) Lift off the shaft and thrust washer H987. This exposes three screws H159–4 which hold bearing housing A456 to the body.

(4) Release pointer tension spring O–423 and knock-out pin H116–6 which holds pointer indicator H419. Two machine screws H110–4 hold footage dial I–415 to the body.

(5) Remove two machine screws H124–3 which hold film roller assembly support indicator plate N404 on the other side of body and remove footage indicator M–991.

(6) Remove three machine screws H124–3 which hold sprocket housing cover A470 and remove four screws H371–5 which hold sprocket housing assembly A451 to the body.

(7) For disassembly of the sprocket, refer to *b* above.

e. REASSEMBLY OF 200-FOOT MAGAZINE. To reassemble, reverse the procedure described above. If bearings are removed, wash in solvent (SD), dry thoroughly, and lubricate (par. 25) before assembly.

f. REPLACING BELT (fig. 30). To replace a belt, on either magazine, it is necessary to remove only the footage indicator cover and shoulder screw (stud) H468 which holds magazine drive gear O–465. Unhook the belt from the take-up pulley and the drive gear. Install the new belt around both pulleys and replace the gear and cover.

Section VI. FINAL TESTING

45. Checking Distance between Lens Seat and Film Plane

Whenever difficulty in focusing is encountered, or when a new turret casting is installed, the distance between the lens seat on the turret and the film plane at the aperture plate must be checked. Place a piece of flat ground stock on the film aperture plate, and measure the distance with a depth micrometer placed on the turret lens seat. This distance must measure 2.1070 inches ± .0005 inch.

46. Film Magazine

Check the take-up belt tension on both magazines, and check the roller assembly on the interior of the 200-foot magazine. Check the sprockets for free operation.

47. Camera Test Run

Make a test run with 200 feet of film to determine that all gears are in good working order. Turn the governor knob from 8 to 48 frames and check the sequence speed meter reading. As the film is being run, check the action of the take-up spool. The film should wind tightly on the spool. Check the shutter action visually through the viewfinder eyepiece. Make a second test run, using a 100-foot daylight-loading spool of film, and photograph a lens test chart at several distances to check the focusing markings on each lens. The distance from the object to the film plane of the camera should be ± 2 percent of the lens barrel reading. Change from the electric motor to the spring motor during this test.

48. Aperture Plate

a. Before running the film, check the surface of the aperture plate and the film gate for scratches and knicks which may cause scratches on the film. Insert a short piece of film or leader in the aperture plate and measure, using a spring balance, the force required to pull the film through the gate. The force required must be between 3 and 3½ ounces. Adjust flat springs O–221 (fig. 24) until the pressure is within these limits.

b. Carefully inspect both the aperture plate and the film gate after the film running test. When either part causes a film scratch, look for an accumulation of emulsion at the damaged point on the aperture plate or film gate.

49. Magazine Door and Camera Door

Check the fit of the magazine door and the camera door. Check the door latches to see that they hold the doors securely closed.

50. Light Leak Test

Use a piece of unexposed panchromatic film about 3 feet long and load the camera in the usual manner, using both a feed and take-up spool. Securely close the door and, when possible, lay the camera in direct sunlight for 15 minutes. Move the camera frequently so that all the edges of the door are exposed to the direct light. If it is not possible to place it in the sunlight, use several No. 2 photoflood bulbs, mounted in highly polished reflectors and placed 3 feet away from the camera, and expose the camera in the same manner. Be sure that the lenses and lens caps are in position during this test. Process the exposed and unexposed film and check the intensity of each.

51. Film Steadiness Test

a. Place the camera, mounted on a tripod, in a dark room. Fasten the tripod to the floor with a guy wire or a tie rod.

b. Place a 6-inch piece of ¼-inch white masking tape horizontally and a similar piece vertically on a 36- by 48-inch black, solid background so that they cross each other. Place these strips in the center of the background.

c. Place the camera the correct distance from the background in order to photograph the full area of the background. Center the camera on the point where the masking tapes cross each other.

d. Photograph the background, using about 10 feet of film.

e. Take out the exposed film and reload it in the film magazine.

f. Reload the camera with the same film and photograph the background again.

Caution: Do not disturb the position of the camera.

g. Process the film and project it on a screen. The distance between the lines (horizontal or vertical) should not exceed ¼ of 1 percent of the width or height of the picture.

52. Rustproofing and Painting

a. Whenever the finish on the exterior of the camera has been scratched, touch up the bared surface to prevent corrosion. Clean the scarred surface down to the bare metal, using No. 000 sandpaper, to obtain a bright, smooth surface. For severe corrosion, use solvent (SD) to soften the corrosion and then use sandpaper to remove it.

b. Before repainting, touch up the bared metal spots with a prime coat and allow it to dry. Apply paint with a small brush.

CHAPTER 5

SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

53. Disassembly of Camera and Components

Remove the camera with the electric drive unit, adapter plate, carrying strap, three lenses and lens caps, and the 200-foot magazine attached, from the tripod. Place the unit in its compartment in the camera carrying case. Place the other components in their proper compartments in either the camera carrying case or the magazine carrying case. Fold the tripod and place it in its carrying case. Close the lid and secure the fastenings of each case.

54. Packaging Camera

Place the carrying cases and battery case in a corrugated fiberboard case with the required amount of desiccant. Seal the box. Place the boxed equipment within a moisture-vaporproofed barrier, and seal the barrier. Place the moisture-vaporproofed case within a second close-fitting corrugated fiberboard box. Seal the entire closure with suitable water-resistant tape. Place the packaged equipment in a sealed waterproof bag and place it in a wooden box. Close and strap the wooden box.

Section II. DEMOLITION TO PREVENT ENEMY USE

55. General

The demolition procedures outlined in paragraphs 56 and 57 will be used to prevent the enemy from using or salvaging this equipment. Demolition of the equipment will be accomplished *only* upon order of the commander.

56. Methods of Destruction

a. SMASH. Use sledges, axes, handaxes, pickaxes, hammers, crowbars, and heavy tools.

b. CUT. Use axes, handaxes, machetes.

c. BURN. Use gasoline, kerosene, oil, flame throwers, incendiary grenades.

d. EXPLODE. Use firearms, grenades, TNT.

e. DISPOSE. Bury in slit trenches, fox holes, other holes. Throw in streams. Scatter.

f. OTHER. *Use anything immediately available for destruction of this equipment.*

57. Destruction of Components

a. Smash all lenses, filters, camera cases, battery cases, adapters, filters, all glass, internal parts, metal tripod parts, reels, and magazines.

b. Cut film, fabric, leather.

c. Burn film, wooden tripod legs, fabric, leather, and this instruction book.

d. Bury or scatter all remaining parts of the equipment.

e. Destroy everything.

APPENDIX I

REFERENCES

Note. For availability of items listed, check SR 310–20–3 and SR 310–20–4.

1. Technical Publications

TB SIG 13	Moistureproofing and Fungiproofing Signal Corps Equipment.
TB SIG 66	Winter Maintenance of Signal Equipment.
TB SIG 69	Lubrication of Ground Signal Equipment.
TB SIG 72	Tropical Maintenance of Ground Signal Equipment.
TB SIG 75	Desert Maintenance of Ground Signal Equipment.
TB SIG 149	Tropicalization of Photographic Equipment.
TB SIG 189	Cold Weather Photography.
TB SIG 211	Still and Motion Picture Data and Formulary.
TM 11–453	Shop Work.
TM 11–462	Signal Corps Tactical Communications Reference Data.
TM 11–2324	Fundamentals of Photography.
TM 11–2325	Specialized Photography.
TM 38–650	Basic Maintenance Manual.
TM 55–405	Preventive Maintenance of Electric Motors and Generators.

2. Painting and Preserving

SB 11–47	Preparation and Submission of Requisitions for Signal Corps Supplies.
SB 11–76	Signal Corps Kit and Materials for Moisture- and Fungi-Resistant Treatment.
SB 11–124	Repair of Photographic Equipment.
TB SIG 123	Preventive Maintenance Practices for Ground Signal Equipment.

3. Packaging and Packing Instructions

a. MILITARY (JAN) SPECIFICATIONS.

JAN–D–169 Desiccants (activated).

JAN–P–100 Packaging and packing for overseas shipment—General specification.

JAN–P–106A Packaging and packing for overseas shipment—Boxes; wood, nailed.

JAN–P–116 Packaging and packing for overseas shipment—Preservation, methods of.

JAN–P–125 Packaging and packing for overseas shipment—Barrier-materials, waterproof, flexible.

JAN–P–131 Packaging and packing for overseas shipment—Barrier-material; moisture-vaporproof, flexible.

b. U. S. ARMY SPECIFICATIONS.

100–2E Marking Shipments by Contractors Standard Specifications for (and Signal Corps Supplement thereto).

c. SIGNAL CORPS INSTRUCTIONS.

720–7 Standard Pack.

726–15 Marking of Interior containers (for Signal Corps Equipment).

4. Other Publications

SR 310–20–3 Index of Training Publications (Field Manuals, Training Circulars, Firing Tables and Charts, Army Training Programs, Mobilization Training Programs, Graphic Training Aids, Joint Army-Navy Air Force Publications, and Combined Communications Board Publications).

SR 310–20–4 Index of Technical Manuals, Technical Regulations, Technical Bulletins, Supply Bulletins, Lubrication Orders, Modification Work Orders, Tables of Organization and Equipment, Reduction Tables, Tables of Allowances, Tables of Organization, and Tables of Equipment.

SR 700–45–5 General — Unsatisfactory Equipment Report (Reports Control Symbol CSGLD–247).

SR 745–45–5 Report of Damaged or Improper Shipment (Reports Control Symbols CSGLD–66 (Army)).

APPENDIX II

IDENTIFICATION TABLE OF PARTS

Note. The fact that a part is listed in this table is not sufficient basis for requisitioning the item. Requisitions must cite an authorized basis, such as the specific T/O&E, T/A, SIG 6, SIG 7, SIG 7 & 8, SIG 7–8–10, SIG 10, list of allowances of expendable material, or other authorized supply basis. For an index of available supply catalogs in the Signal portion of the Department of the Army Supply Catalog, see the latest issue of SIG 1. .

Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
	CAMERA COMPONENTS		
809	ADAPTER, assembly: rectangular; 2½″ x 2¾″ x 1″ thk o/a; ¼″ dia mtg shaft; .20 31″ ID hole in bushing.	Mounts hand crank	8P15–200–2
0–781	ADAPTER, shaft: stainless steel; straight; 1.203″ lg x .499″ dia; mtd to adapter plate shaft hole; shaft end tapped w/#4–40 NC–2 thread, .218″ d.	Used as shaft for hand crank plate assembly.	8P15–200–1
0–995	ARM: steel, polished; straight shaped; 3⅛″ lg x .406″ wd x .05″ thk; single .116″ dia mtg hole on one end.	Part of footage indicator	8P15–200–6
0–150	ARM: stainless steel, polished; arrow shaped; 3.702″ lg x ¼″ wd x .088″ thk	Pulls down film	8P15–200–3
0–207	ARM ASSEMBLY: flat; 1$\frac{3}{32}$″ lg x 1$\frac{17}{64}$″ wd x .062″ thk o/a; two #3–56 NC–2 tapped holes on .834″ mtg/c.	Left-hand hinge for gate assembly	8P15–200–5
0–206	ARM ASSEMBLY: flat, 1$\frac{3}{32}$″ lg x 1$\frac{17}{64}$″ wd x .062″ thk o/a; two #3–56 NC–2 tapped holes on .834″ mtg/c.	Right-hand hinge for gate assembly	8P15–200–4
137	BEARING, ball: single row radial; plain; light duty; .1375″ bore, .5″ OD, .1562″ wd; 7 balls, $\frac{3}{32}$″ dia each; packed with low temp grease.	Facilitates movement of shafts in camera.	3H305–67
0–237	BEARING, ball: single row radial; plain; light duty; .25″ bore, .625″ OD, .196″ wd; 8 balls, $\frac{3}{32}$″ dia each; packed with low temp grease.	Same as 137	8P15–200–175
0–507	BEARING, ball: single row radial; plain; light duty; .3125″ OD, .0937″ ID, .1094″ wd; 10 balls.	Used in governor control mechanism	8P15–200–184
0–562	BEARING, ball: single row radial; plain; light duty; .125″ bore, .5″ OD, .172″ wd; 7 balls, 1/16″ dia each.	Retains governor drive shaft	8P15–200–185
0–683	BEARING, ball: single row radial; plain; light duty; .375″ bore, .875″ OD, .281″ wd; 7 balls.	Supports shaft in camera	8P15–200–186
0–1014	BEARING, ball: single row radial; plain; light duty; .5″ bore, 1.125″ OD, .25″ wd; 8 balls; packed with low temp grease.	Retains spring shaft on spring motor	8P15–200–187
0–1039	BEARING, ball: single row radial; plain; light duty; .125″ bore, .275″ OD, .1362″ wd; 7 balls; packed with low temp grease.	Retains coupling shaft in spring motor	3H320–28
0–242	BEARING, sleeve: .625″ OD x .1875″ ID x .406″ lg o/a	Bearing for magazine drive	8P15–200–189
H283	BEARING, sleeve: brass; male and female; .407″ OD, .3125″ ID, .497″ lg o/a.	Acts as bushing for turret shaft	8P15–200–190

0-339	BEARING, sleeve: CRS; male and female bushing; .479″ OD x .583″ ID x .187″ lg.	Bearing for motor gear housing	8P15-200-199
0-394	BEARING, sleeve: seamless steel tubing; .75″ OD, .531″ ID, 1.073″ lg o/a, w/.8125″-48NS3 thread; .109″ lg on one end.	Receives ball bearings for shutter shaft	8P15-200-173
0-433	BEARING, sleeve: brass; male and female bushing; .375″ OD, .1875″ ID, .233″ thk.	Acts as bushing for film footage indicator shaft.	8P15-200-201
0-467	BEARING, sleeve: oilite bearing; male and female; .251″ OD x .1875″ ID x .312″ lg.	Acts as bearing for idler stud	8P15-200-200
0-567	BEARING, sleeve: stainless steel; male and female; .3125″ OD, .1875″ ID, .434″ lg.	Spaces mechanical elements on governor drive shaft.	8P15-200-191
0-784	BEARING, sleeve: oilite; male and female bushing; .502″ OD, .2031″ ID, .25″ thk.	Acts as bushing for pinion gear (hand crank.)	8P15-200-199
0-786	BEARING, sleeve: oilite; male and female bushing; .498″ OD x .25″ ID x .781″ lg o/a.	Acts as bushing for adapter shaft (hand crank).	8P15-200-198
0-862	BEARING, sleeve: stainless steel; .624″ OD x .3125″ ID x .198″ lg o/a	Actuates pawl on film footage indicator	8P15-200-172
1018	BEARING, sleeve: male and female bushing; .377″ OD x .313″ ID x .405″ lg	Retains bevel pinion	8P15-200-192
0-872	BELT, spring: music wire, .022″ dia; .093″ OD x 13.75″ lg	Used to drive take-up spool	8P15-200-179
0-979	BELT, spring: metal spring; .089″ dia, outside circumference 2.8″	Drives take-up spool	8P15-200-180
E674	BLADE, switch: beryllium copper; rectangular; 1.48″ lg x .28″ wd x .02″ thk o/a; two holes .161″ dia on .281″ mtg/c.	Part of motor switch	8P15-200-181
E678	BLADE, switch: beryllium copper; rectangular; 1.32″ lg x .28″ wd x .02″ thk o/a; two holes .161″ dia on .281″ mtg/c.	Same as E674	8P15-200-182
0-729	BLOCK, alinement: CRS; straight; 1.016″ lg x .25″ wd x .276″ thk o/a; two .125″ dia dowel holes on .625″ mtg/c.	Retains gib on camera drive units	8P15-200-183
H555	BUTTON, push: laminated phenolic; round; .468″ lg x .5″ dia; shoulder .375″ lg x .310″ dia.	Motor switch	8P15-200-178
0-811	CAP: 1.876″ dia x .75″ h x .077″ thk	For 12-volt motor connection	8P15-200-204
0-813	CAP: 10 amp, 200 v d-c or 150 rms max oper v; round shaped; 1.876″ dia x 1.312″ h o/a.	Receives battery cable	8P15-200-203

Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
1002	CASE: laminated plywood and fiber, od finish, fungus proofed; 23½" wd x 9" h x 17½" lg; one leather flush type handle in front and two leather flush type handles on each end; contains brackets for shoulder strap; latches can be locked with key.	Houses camera and all lenses and accessories.	8P15–200–205
1003	CASE: laminated plywood and fiber, od finish, fungus proofed; one leather flush type handle in front and two leather flush type handles on each end; contains end brackets for shoulder strap; latches can be locked with key.	Houses 400-foot magazine and Slate PH–384–B.	8P15–200–206
1004	CASE: .075" thk fiber; 12½" wd x 6½" d x 3" lg; rings, one each end for shoulder strap; contains connectors for connecting battery and electric motor.	Houses one 12-volt battery, consisting of six Batteries BB–229/U.	8A782–403
201	CATCH, fastener: Z shape; 1.25" lg x .5" wd x .02" thk o/a; two mtg holes .07" dia on 1.046" mtg/c.	Locks film gate	8P15–200–8
223	CATCH, fastener: flat shape; 1 5/6" lg x .203" wd x .02" thk; single. 096" dia mtg hole.	Acts as clip for aperture plate and gate	8P15–200–9
H356	CATCH, fastener: flat spring, shaped like #2; 2¾" lg x ¾" wd x ⅛" thk o/a; three .0935" dia holes, two on 1.312" mtg/c and one on .469" mtg/c.	Retains film gate when in operating position.	8P15–200–10
H756	CHAIN: #50 solid link type .187" ID x .054" dia links; steel; approx 3½" lg consisting of 13 links.	Prevents misplacing camera door	8P15–200–11
H812	CLAMP, die-cast aluminum; 2 bolts used; 1 5/64" lg x 1/062" dia o/a	Aids connection with AN connector	2Z1587–284
0–370	COLLAR, shaft: brass; round; .1875" dia x .362" thk o/a; .1875" dia shaft mtg hole.	Retains weights	8P15–200–14
0–576	COLLAR, shaft: brass; round; .594" lg x .687" dia; .1877" dia shaft mtg hole	Holds spring retaining governor	8P15–200–208
0–390	COLLAR, spacing: brass; round; .424" lg x .25" OD x .035" wall tubing.	Acts as spacer for camshaft	8P15–200–13
0–703	COLLAR, spacing: brass; .75" dia x .117" thk; .3125" dia hole for shaft mtg	Acts as disk and spacer friction spacer	8P15–200–15
J815	CONNECTOR, plug: 2 round female cont, polarized; straight type; 1 1/16" lg x 1⅛" dia o/a; 2 cont for #16 AWG wire, 20 amp max, 200 v d-c or 150 rms oper v.	AN connector on battery cable	8P15–200–16

P810	CONNECTOR, receptacle: 2 round male cont, polarized; straight box type; $2\frac{9}{32}$″ lg less term w/$1\frac{3}{32}$″ sq flange; 2 cont for #20 AWG wire, 20 amp max, 200 v d-c or 150 rms max oper v.	Receives AN connector from cable connector.	8P15–200–7
0–725	COUPLING, rigid: stainless steel; split flanged type; .1875″ dia shaft; .710″ lg x .625″ dia o/a.	Transmits power to drive shaft from the drive units.	8P15–200–18
0–737	COUPLING, rigid: stainless steel; split flanged type; 0.1875″ dia shaft; 0.453″ lg x 0.610″ dia o/a.	Transmits power to drive shaft from spring motor drive unit.	8P15–200–19
0–782	COUPLING, rigid: stainless steel; split flanged type; .292″ dia shaft size; key mtg; .610″ dia x .375″ lg.	Drives the camera	8P15–200–20
A771	COVER: shaft motor lock; stainless steel; straight; 1.406″ lg x $\frac{5}{16}$″ dia; $\frac{5}{16}$″–18 NC–2 LH thread for mtg.	Holds gib lock nob in position	8P15–200–22
A146	CRANK ASSEMBLY: flat shaped; $\frac{3}{4}$″ lg x $\frac{15}{32}$″ wd x $\frac{15}{64}$″ thk o/a; 2 mtg holes .125″ dia x 82° csk.	Aids in pull down movement of camera	8P15–200–23
0–779	CRANK ASSEMBLY, hand: round shape; $3\frac{3}{4}$″ dia x 3″ wd o/a; dove-tail mtg to camera.	Drives camera by hand motion	8P15–200–210
0–1042	DRUM, brake: brass, polished; round shape; 1″ dia x $\frac{5}{16}$″ thk; single .1875″ lg shaft mtg hole.	Acts to stop spring motor	8P15–200–25
H476	FASTENER, spring lock: snap slide; door; CRS; .625″ lg x .25″ wd x .062″ thk; single .130″ dia mtg hole.	Acts as catch on cover of magazine	6Z3810–16.11
155	GEAR: spur; spiral teeth; rh; 12 teeth; 34 pitch, .408″ pitch dia; .463″ OD, .1875″ bore, .500″ thk.	Drives intermittent camshaft assembly	8P15–200–26
232	GEAR: spur; spiral teeth; rh; 9 teeth; 34 pitch, .529″ pitch dia; .588″ OD, .2187″ bore, .469″ thk.	Transmits energy to shutter gear	8P15–200–27
233	GEAR: bevel; brass; straight teeth; rh; 24 teeth; 48 pitch, .500″ pitch dia; .533″ OD, .2187″ bore, .344″ thk.	Drives tachometer shaft	8P15–200–28
241	GEAR: spur; spiral teeth; LH; 48 teeth; 34 pitch, 1.630″ pitch dia; 1.683″ OD, .3125″ bore, .187″ thk.	Idler gear for magazine drive	8P15–200–29
244	GEAR: spur; stainless steel; spiral teeth; LH; 13 teeth; 21 pitch, .709″ pitch dia; .804″ OD, .3125″ bore, .2325″ thk.	Same as 241	8P15–200–30
253	GEAR: bevel; straight teeth; pressure angle $14\frac{1}{2}$°; 32 teeth; 48 pitch, .6666″ pitch dia; .692″ OD, .1970″ bore.	Drives tachometer	8P15–200–31

Ref symbol	Name of part and description	Function of part	Signal Corps stock No
268	GEAR: spur; phosphor-bronze; spiral teeth; rh; 24 teeth; 34 pitch, .815″ pitch dia; .874″ OD, .1973″ bore, .265″ thk.	Drives camera shutter	8P15–200–32
333	GEAR: spur; stub tooth; rh, 30°; 18 teeth; 54 pitch, .385″ pitch dia; .422″ OD, .2188″ bore, .093″ thk.	Drives governor shaft	8P15–200–33
335	GEAR: spur; straight teeth; 18 teeth; 48 pitch, .375″ pitch dia; .416″ OD w/pinion shaft .1248″ dia x .541″ lg.	Pinion for governor shaft	8P15–200–34
389	GEAR: spur; phosphor-bronze; spiral teeth; rh; 12 teeth; 34 pitch, .408″ pitch dia; .463″ OD, .1875″ bore, .289″ thk.	Aids in manual operation of pull-down knob.	8P15–200–35
460	GEAR: spur; laminated phenolic; spiral teeth; LH; 13 teeth; 21 pitch, .709″ pitch dia; .804″ OD, .1875″ bore, .576″ thk.	Drives feed sprocket	8P15–200–36
461	GEAR: spur; laminated phenolic; spiral teeth; LH; 13 teeth; 21 pitch, .709″ pitch dia; .804″ OD, .1875″ bore, .376″ thk.	Drives take-up sprocket	8P15–200–37
0–465	GEAR ASSEMBLY: sprocket drive; round; .804″ OD, .406″ thk o/a; .1875″ dia shaft mtg; consists of:	Drives sprocket housing assembly	8P15–200–38
466	GEAR: spur; aluminum; spiral teeth; rh; 13 teeth; 21 pitch, .709″ pitch dia; .804″ OD, .25″ bore, .406″ thk.		8P15–200–212
593	GEAR: spur; spiral teeth; LH; 17 teeth; 48 pitch, .3746″ pitch dia; .4162″ OD, .1875″ bore, .495″ thk.	Pinion for motor	8P15–200–39
594	GEAR: spur; spiral teeth; rh; 43 teeth; 48 pitch, .9475″ pitch dia; .9891″ OD, .1875″ bore, .187″ thk.	Intermediate gear for transmitting motor power to camera drive shaft.	8P15–200–40
595	GEAR: spur; steel, stressproof #2; spiral teeth; rh; 43 teeth; 48 pitch, .9475″ pitch dia; .9891″ OD, .3125″ bore, .156″ thk.	Acts as electric motor drive gear	8P15–200–41
596	GEAR: spur; steel, stressproof #2; spiral teeth; LH; 68 teeth; 48 pitch, 1.4983″ pitch dia; 1.5399″ OD, .3125″ bore, .397″ thk.	Same as 595	8P15–200–42
597	GEAR: spur; laminated phenolic; spiral teeth; rh; 35 teeth; 48 pitch, .7712″ pitch dia; .8128″ OD, .4998″ bore, .218″ thk.	Acts as electric motor idler gear	8P15–200–43
598	GEAR: spur; laminated phenolic; spiral teeth; LH; 35 teeth; 48 pitch, .7712″ pitch dia; .8128″ OD, .437″ bore, .218″ thk.	Same as 597	8P15–200–44

0–684	GEAR ASSEMBLY: round; .9891″ OD x 9/16″ thk; .3125″ dia shaft mtg hole; consists of:	Acts as electric motor drive shaft	8P15–200–213
788	GEAR: internal; brass; straight teeth; 96 teeth; 48 pitch, 2″ pitch dia; 2.75″ OD, .125″ thk, no bore.	Drives the coupling through a pinion (hand crank).	8P15–200–45
861	GEAR: spur; stainless steel; straight teeth; 104 teeth; 32 pitch, 3.25″ pitch dia; .5″ dia shaft mtg holes.		8P15–200–211
0–860	GEAR ASSEMBLY: round; .198″ lg x 3.312″ dia o/a; 5/16″ dia shaft mtg hole; consists of:	Aids in film footage counter movement	8P15–200–215
1016	GEAR: bevel; straight teeth; 14 teeth; 35 pitch, .4″ pitch dia; .455″ OD, .127″ face, 1.212″ lg o/a.	Multiplier gear for winding spring motor.	8P15–200–46
1041	GEAR: spur; steel, 20 carbon; straight teeth; 12 teeth; 48 pitch; .292″ dia OD x 1.419″ lg; ends turned down for shaft, one end .365″ lg x .187″ dia, other end .125″ dia x .156″ lg.	Serves as third pinion in spring motor gear train.	8P15–200–47
0–1045	GEAR ASSEMBLY: round; 1 15/16″ lg x 1.792″ OD o/a; consists of:	Transmits spring power to rigid coupling.	8P15–200–217
1046	GEAR: spur; stainless steel; straight teeth; 84 teeth; 48 pitch, 1.75″ pitch dia; 1.792″ OD, .25″ bore, .156″ thk.	Serves as second gear in spring motor gear train.	8P15–200–48
1047	GEAR: spur; stainless steel; straight teeth; 16 teeth; 32 pitch, 1/2″ pitch dia; .562″ OD, 29/64″ thk, pinion shaft 1 15/16″ lg x .25″ dia.	Acts as first pinion in gear train of spring motor.	8P15–200–49
1049	GEAR: bevel; straight teeth; 35 teeth; 35 pitch, 1″ pitch dia; 1.045″ OD, .25″ bore, .187″ thk.	Intermediate gear for transmitting spring motor power to the camera drive shaft.	8P15–200–50
0–1051	GEAR ASSEMBLY: 2 1/2″ lg x 1 1/4″ wd o/a; .625″ lg x .25″ dia mtg shaft; consists of:	Intermediate assembly for transmitting spring motor power to the drive shaft.	8P15–200–216
1052	GEAR: spur; stainless steel; straight teeth; 64 teeth; 32 pitch, 2″ pitch dia; 2.062″ OD, .3125″ bore, 1/4″ thk.	Acts as first gear in gear train of spring motor.	8P15–200–51
0–1060	GEAR ASSEMBLY: round; 1 13/32″ OD x 1 3/4″ lg o/a; 5/32″ lg x 7/32″ dia mtg shaft each end; consist of:	Acts as gear ratchet assembly used in gear train of spring motor in winding spring.	8P15–200–218
1061	GEAR: spur; stainless steel; straight teeth; 14 teeth; 48 pitch, .291″ pitch dia; .333″ OD, 1/4″ thk w/pinion shaft 1 15/16″ lg x .25″ dia.	Acts as second pinion in gear train of spring motor.	8P15–200–52

Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
0–1062	GEAR ASSEMBLY: round; 1.417″ OD x 9/32″ thk o/a; consist of:----	Acts as gear pawl assembly used in spring motor gear train.	8P15–200–219
1063	GEAR: spur; brass; straight teeth; 66 teeth; 48 pitch, 1.375″ pitch dia; 1.417″ OD, .25″ bore, 1/8″ thk.	Acts as third gear in gear train of spring motor.	8P15–200–53
MS–180	GLASS: rectangular; .868″ lg x .6693″ wd x .1929″ thk o/a----	Used as ground glass for viewfinder assembly.	8P15–200–166
0–591	GOVERNOR: round; 19/32″ lg x 5/8″ dia o/a; .1877″ dia shaft mtg hole----	Controls speed of camera----	8P15–200–54
H249	GROMMET: rubber; fits .910″ dia hole; .75″ hole dia x .312″ thk----	Protects tachometer----	8P15–200–55
107	GUARD: U shaped; 1.7″ lg x 1.78″ wd x .159″ h o/a----	Keeps film from getting scratched in camera body.	8P15–200–221
171	GUARD: aluminum; rectangular; 1.973″ lg x .73″ wd x .02″ thk----	Covers pull down assembly and acts as guard.	8P15–200–222
509	GUARD: L shaped; 3.086″ lg x 1.406″ wd x 4″ h o/a----	Protects film on lower camera body----	8P15–200–223
714	GUARD: aluminum alloy; round; .389″ h x 1.374″ dia o/a----	Protects governor knob----	8P15–200–56
0–993	GUIDE, film roller: steel; straight round; 1.156″ lg x .187″ dia; .115″ dia x .062″ wd ends for mtg.	Acts as a retaining spacer on film footage indicator.	8P15–200–224
139	GUIDE, oscillating lever: brass, polished; round w/one side cut; .5″ dia x .085″ thk.	Aids in pull down movement----	8P15–200–57
H787	HANDLE: aluminum; 1.5″ lg x .625″ dia----	Used to turn handcrank----	8P15–200–58
A830	HOOD, lens: aluminum tubing; round; .765″ lg x 1.8″ OD o/a----	Acts as sunshade for 75-mm lens----	8P15–200–226
A456	HOUSING: aluminum; round; .906″ x .94″ dia o/a----	Retains ball bearings for film spool shafts.	8P15–200–227
A568	HOUSING: stainless steel; rectangular w/round top shape; .926″ lg x 1.016″ h x .36″ thk o/a.	Provides frictional surface for rotating governor weights.	8P15–200–59
A754	HOUSING: 3 3/8″ h x 1 31/32″ wd x 1 1/4″ d o/a----	Acts as a light trap and contains sprockets and gears.	8P15–200–229
A856	HOUSING: aluminum alloy; round; 1.245″ OD x .641″ lg o/a----	Holds bearings for take-up spool in 400-foot magazine.	8P15–200–228

A857	HOUSING: aluminum alloy; round; 1.245″ OD x .641″ lg o/a	Holds bearings for take-up and feed spool shafts.	8P15–200–61
0–406	HUB: brass; round; .1875″ ID, .344″ OD, .125″ thk	Acts as bearing for shaft on film footage indicator.	8P15–200–230
0–444	HUB: aluminum; round; 1.375″ wd x 1″ dia	Receives film spool in 400-foot magazine.	8P15–200–62
0–1000	HUB: aluminum; round; 1.375″ wd x 1″ dia	Used to wind film when 100-foot daylight reel is not used.	8P15–200–63
991	INDICATOR, footage: rectangular; 3⅜″ lg x 1.507″ wd x .406″ thk o/a	Rests on film to register amount of film left on spool.	8P15–200–231
M251	INDICATOR, speed: 2.629″ lg x 1.115″ dia; dial graduated double units, numbered multiples of 4.	Indicates speed of camera from 8 to 48 fps.	8P15–200–232
M252	INDICATOR, speed: 2.5″ lg x .986″ dia; dial graduated in double units, numbered in multiples of 4.	Indicates camera speed from 8 to 48 fps.	8P15–200–64
H697	INSERT, threaded: steel; round; .655″ OD x .5″ lg; ⅜″–16 NC–2 tapped for tripod mtg.	Accepts tripod	8P15–200–233
H698	INSERT, threaded: steel; round; .531″ OD x .5″ lg; ¼″–20 NC–2 tapped for tripod mtg.	Same as H697	8P15–200–234
E680	INSULATOR, bushing: round post; .36″ lg x .104″ ID, .156″ OD o/a	Acts as a switching bushing	8P15–200–65
279	KEY GEAR: steel; straight; .25″ lg x .62″ sq	Holds gear on shaft assembly in spring motor.	8P15–200–66
0–735	KEY, machine: sq; steel; ¼″ lg x ⅛″ h x 1/16″ thk o/a	Used to retain coupling to shaft on electric motor drive.	8P15–200–57
0–777	KEY, machine: flat; brass; 1.344″ lg x .312″ wd x .05″ thk o/a	Used as knob for magazine cover lock	8P15–200–68
214	KNOB: oval; brass; for .25″ dia shaft; 1.1″ lg x .5″ thk o/a	Used in motor lock assembly of camera	8P15–200–69
224	KNOB: round; dural; for .25″ dia shaft; .379″ lg x .885″ dia	Used in magazine lock of camera	8P15–200–70
334	KNOB: round; for ⅛″ dia shaft; 1″ dia x .379″ h o/a	Used to regulate speed of governor	8P15–200–71
399	KNOB: round; for 5/16″ dia shaft; .885″ dia x .500″ h o/a	Hand drive knob for camera mechanism.	8P15–200–72
442	KNOB: round; aluminum; for .1875″ dia shaft; 1.812″ dia x .396″ lg	Used to rotate indicator knob of magazine film spools.	8P15–200–73

Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
770	KNOB: round; LH thread for mtg; .750″ dia x .3743″ thk	Loosens and tightens the side gib lock	8P15–200–74
793	KNOB: round; for .156″ dia shaft; .500″ lg x .500″ dia	Facilitates shifting of motor drive unit lever to HI or LO.	8P15–200–75
803	KNOB: bar; for ¼″ dia shaft; 1.094″ lg x .375″ wd x .050″ thk	Permits the removal of lens from the lens turret.	8P15–200–235
867	KNOB: round; for .313″ dia shaft; 1.000″ dia x .312″ lg	Resets footage indicator	8P15–200–76
866	KNOB ASSEMBLY: round; aluminum; .1875″ mtg shaft hole; .885″ dia x .5″ lg.	Used to set film footage indicator	8P15–200–236
H846	LABEL: decalcomania; 1.406″ lg x 1″ wd	Gives instructions for loop size	6D16858–2
H308	LATCH, fastener: CRS; rectangular, w/.25″ dia hole; 1″ lg x .5″ wd x .25″ dia.	Acts as latch on camera door knob	8P15–200–237
H309	LATCH, fastener: CRS; oval, w/.1875″ dia hole in ctr; 1.265″ lg x .5″ wd x .036″ thk.	Same as H308	8P15–200–238
I–693	LENS, motion picture: f/lg 35 mm; aperture range f/2.3 to f/16; wide angle type; iris diaphragm; 2¼″ lg x 2 3/16″ OD o/a.	Used for general purpose lens work	8P15–200–168
I–831	LENS, motion picture: f/lg 75 mm; aperture range f/2.3 to f/28; telephoto; iris diaphragm; 3¾″ lg x 2″ OD o/a.	Used for telephoto work	8P15–200–170
I–838	LENS, motion picture: f/lg 50 mm; aperture range f/2.3 to f/16; standard; iris diaphragm; 2½″ lg x 2⅜″ OD o/a.	Used for general purpose lens work	8P15–200–169
I–967	LENS, motion picture: f/lg 152 mm; aperture range f/4.5 to f/32; telephoto; iris diaphragm; 5¼″ lg x 2″ OD o/a.	Used for telephoto work	8P15–200–171
0–639	LEVER: round; 1.000″ lg x .193″ dia	Used to focus lens	8P15–200–240
0–797	LEVER: flat, L shaped; 1 13/32″ lg x .281″ wd x .050″ thk	Locks lens in turret	8P15–200–239
0–1071	LEVER: aluminum; L shaped; 1¾″ lg x ¾″ wd x 5/16″ thk o/a	Used as stop against brake drum of spring motor.	8P15–200–78
0–140	LEVER ASSEMBLY: fork shaped; 3 1/16″ lg x ⅝″ wd x .062″ thk o/a	Oscillates intermittent camshaft assembly.	8P15–200–77
0–310	LINK, lever: CRS; flat; 3.468″ lg x .312″ wd x .032″ thk	Controls lock assembly on camera door	8P15–200–241

H307	LOCK: approx 3½″ lg x 1½″ wd x .070″ thk o/a	Locks camera door to camera body	8P15–200–79
H795	LOCK: lever clip; 1 13/32″ lg x .375″ dia x ⅝″ h o/a	Locks lens in turret	8P15–200–80
I–182	MIRROR: glass, 1.375″ lg x .660″ wd x .060″ thk; nonmagnifying	Reflects object from shutter face	8P15–200–81
0–849	MAGAZINE, film: daylight loading; cast aluminum; 15⅜″ lg x 8⅝″ h x 2¼″ wd o/a.	Holds 400-foot 35-mm motion picture film.	8P15–200–242
0–980	MAGAZINE, film: daylight loading; cast aluminum; 8⅜″ lg x 6½″ h x 3¼″ wd o/a.	Holds 200-foot 35-mm motion picture film.	8P15–200–248
H259	NUT, hexagon: steel; #2–56 NC–2; .057″ thk	Holds drive bearing in place	6L3602–56P
H–378	NUT, hexagon: steel; #6–32 NC–2; .114″ thk	Used on shutter bearing housing assembly.	6L3606–32–5.2
H271	NUT, lock: aluminum; #6–40 NF–2; .125″ thk	Used on main drive assembly	6L2406–40–5
H561	NUT, lock: brass; #5–40 NC–2; .141″ thk	Used at end of governor assembly	6L3105–40.4
H712	NUT, lock: aluminum; #4–40 NC–2; .141″ thk	Used on center frame assembly	6L2404–40–4F
0–863	PAWL: stainless steel; straight; 4.022″ lg x 1.625″ dia x .1062″ thk o/a	Locks footage guide	8P15–200–82
0–879	PAWL: stainless steel; flat; .781″ lg x .375″ wd x .062″ thk o/a	Locks footage indicator	8P15–200–83
0–1065	PAWL: CRS; straight; 9/64″ x ⅜″ lg x ¼″ wd	Rachet for camera spring motor	8P15–200–84
H853	PIN, alinement: stainless steel; straight; .359″ lg x .1245″ dia	Guide for pawl in 400-foot magazine	8P15–200–86
H1067	PIN, anchor: stainless steel; straight; .234″ lg x .125″ dia	Anchors spring of ratchet assembly of spring motor.	8P15–200–85
H757	PIN, hinge: steel; straight; .187″ lg x .082″ dia	Acts as stop pin on hinge gate	8P15–200–244
H896	PIN, locating: steel; straight; .411″ lg x .0937″ dia		8P15–200–88
H104–4	PIN, straight: steel; .25″ lg x .0937″ dia		8P15–200–246
H104–6	PIN, straight: steel; .375″ lg x .0937″ dia		8P15–200–247
H114	PIN, straight: steel; .335″ lg x .0937″ dia		8P15–200–248
H116–3	PIN, straight: steel; .187″ lg x .625″ dia	Holds lock plate to 200-foot magazine cover.	8P15–200–249
H116–4	PIN, straight: steel; .25″ lg x .625″ dia		8P15–200–250
H116–5	PIN, straight: steel; 5/16″ lg x .0625″ dia		8P15–200–251
H116–6	PIN, straight: steel; ⅜″ lg x .0625″ dia		8P15–200–252
H116–7	PIN, straight: steel; .437″ lg x .625″ dia		8P15–200–253
H167	PIN, grooved: SAE #1112 steel; straight; .375″ lg x .101″ dia		8P15–200–87

Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
H225–5	PIN, straight: drill rod steel; .313″ lg x .125″ dia		8P15–200–254
H225–6	PIN, straight: drill rod steel; .375″ lg x .125″ dia		8P15–200–255
H327	PIN, straight: steel; 1.105″ lg x .046″ dia	Used in spring operated brake shoe	8P15–200–256
H753	PIN, straight: steel; .281″ lg x .0625″ dia		8P15–200–262
H762	PIN, straight: steel; .187″ lg x .063″ dia		8P15–200–263
H799	PIN, straight: stainless steel; .537″ lg x .1243″ dia	Locates lens mounts axially	8P15–200–264
H868–1	PIN, straight: drill rod steel; .662″ lg x .0632″ dia		8P15–200–265
H868–2	PIN, straight: drill rod steel; .125″ lg x .0832″ dia		8P15–200–266
H868–3	PIN, straight: drill rod steel; .187″ lg x .0632″ dia		8P15–200–267
H868–4	PIN, straight: drill rod steel; .250″ lg x .0632″ dia		8P15–200–268
H868–5	PIN, straight: drill rod steel; .312″ lg x .0632″ dia		8P15–200–269
H868–6	PIN, straight: drill rod steel; .375″ lg x .0632″ dia		8P15–200–270
H868–7	PIN, straight: drill rod steel; .437″ lg x .0632″ dia		8P15–200–271
H868–8	PIN, straight: drill rod steel; .500″ lg x .0632″ dia		8P15–200–272
H868–9	PIN, straight: drill rod steel; .562″ lg x .0632″ dia		8P15–200–273
H868–10	PIN, straight: drill rod steel; .625″ lg x .632″ dia		8P15–200–274
H343–4	PIN, taper: stainless steel; .0625″ largest dia; ¼″ lg o/a		8P15–200–275
H343–5	PIN, taper: stainless steel; .625″ largest dia; .312″ lg o/a		8P15–200–276
H343–6	PIN, taper: stainless steel; .0625″ largest dia; .375″ lg o/a		8P15–200–277
H343–8	PIN, taper: stainless steel; .0625″ largest dia; .437″ lg o/a		8P15–200–278
H343–8	PIN, taper: stainless steel; .0623″ largest dia; .500″ lg o/a		8P15–200–279
H343–9	PIN, taper: stainless steel; .0625″ largest dia; .562″ lg o/a		8P15–200–280
H357–1	PIN, straight: steel; .062″ lg x .1094″ dia		8P15–200–257
H357–4	PIN, straight: steel; .250″ lg x .1094″ dia		8P15–200–258
H574	PIN, locking: lamented phenolic; round; .156″ lg x .1275″ dia		8P15–200–245
H579	PIN, straight: steel; .350″ lg x .0550″ dia		8P15–200–260
H581	PIN, straight: steel; .312″ lg x .0468″ dia		8P15–200–89
H657	PIN, straight: hard fiber; .180″ lg x .094″ dia o/a		8P15–200–261

H1048–10	PIN, taper: stainless steel; .141″ largest dia; .626″ lg o/a		8P15–200–281
H1056–8	PIN, taper: stainless steel; .125″ largest dia; .5″ lg o/a		8P15–200–282
A648	PLATE, anchor: steel; rectangular; .375″ lg x .1255″ wd x .042″ thk	Focusing key for six-inch lens	8P15–200–284
A292	PLATE, angle: CRS; L shape; .484″ lg x .406″ wd x .04″ thk o/a	Locates lens angle	8P15–200–90
A198	PLATE, cover: aluminum alloy; flat; 2.75″ lg x .437″ wd x .078″ thk	Locks and retains film, aperture and gate in correct position in camera.	8P15–200–92
A673	PLATE, filter: aluminum; flat; 1.642″ lg x 1.343″ wd x .063″ thk	Forms part of light trap and receives filter holder.	8P15–200–93
0–571	PLATE, governor: steel; rectangular; 2.234″ lg x .824″ wd x .048″ thk	Covers opening for governor rack	8P15–200–94
0–844	PLATE, governor: aluminum; round; 1″ dia x .02″ thk	Indicates governor speed	8P15–200–95
A785	PLATE, housing: aluminum alloy; round; 3″ dia x ½″ thk o/a	Used to retain internal gear and winding handle (hand crank).	8P15–200–96
H665	PLATE, identification: aluminum; 1 11/16″ lg x 1⅛″ wd x 1/32″ thk	Nomenclature plate	8P15–200–288
N723	PLATE, identification: aluminum; 1½″ lg x ¾″ wd x 1/32″ thk	Motor nameplate	8P15–200–289
N1072	PLATE, identification: aluminum; 2 9/32″ lg x 1 1/16″ wd x 1/32″ thk	Spring motor nameplate	8P15–200–290
N404	PLATE, indicator: triangle; 1.156″ lg x .7187″ wd x .037″ thk o/a	Support assembly for footage indicator	8P15–200–404
N405	PLATE, indicator: triangle; 1.156″ lg x .6562″ wd x .037″ thk o/a	Supports footage indicator	8P15–200–291
N847	PLATE, instruction: aluminum; arrow shaped; 4 1/16″ lg x ½″ wd x .025″ thk	Sizes loop of film	8P15–200–293
H121	PLATE, lock: steel; straight; 1.890″ lg x .355″ sq o/a	Locks magazine to camera	8P15–200–98
132	PLATE, lock: steel; straight; 1.360″ lg x .290″ x .262″ o/a	Locks drive unit to camera	8P15–200–99
H478	PLATE, lock: annealed spring steel; flat; 1″ lg x ⅜″ wd x .037″ thk	Locks 200-foot magazine door	8P15–200–100
H763	PLATE, lock: steel; oval shape; 9/16″ lg x 5/16″ wd x 7/32″ thk o/a	Locks magazine top of camera and locks tripod plate adapter or motor drive to bottom of camera.	8P15–200–294
0–193	PLATE, pressure: stainless steel; flat; 2⅜″ lg x .33″ wd x .026″ thk	Provides side pressure on aperture plate	8P15–200–101
0–227	PLATE, pressure: flat; 2⅜″ lg x 1 5/16″ wd x 1 1/32″ thk o/a	Provides back pressure on aperture plate.	8P15–200–102
0–393	PLATE, retainer: CRS; triangle; 57/64″ lg x 25/32″ wd x 1/16″ thk o/a	Holds ball bearing in place	8P15–200–103
0–667	PLATE, spacer: phenolic plate; rectangular; .562″ lg x .36″ wd x .031″ thk	Spaces switch blades	8P15–200–104
E248	PLATE, switch: steel; flat; 1″ lg x 5/8″ wd x .031″ thk o/a	Serves as on-off plate for motor switch	8P15–200–105

Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
0–656	PLATE, shutter: aluminum; rectangular; 3.375″ lg x .625″ wd x .025″ thk	Indicates frames per second	8P15–200–295
H419	POINTER, indicator: straight; 2¾″ lg x .05″ thk x ⅝″ wd	Footage indicator on 200-foot magazine	8P15–200–106
H991	POINTER, indicator: rectangular; 4⅛″ lg x 1⅝″ wd x 13/16″ thk o/a	Film footage indicator	8P15–200–107
0–858	PULLEY ASSEMBLY: straight; approx 1¾″ dia x 1½″ lg o/a	Used in take-up in 400-foot magazine	8P15–200–299
0–859	PULLEY: flat; aluminum; 1.812″ dia x 13/32″ thk o/a	Used in 400-ft magazine	8P15–200–109
0–990	PULLEY: single groove type; aluminum; .875″ dia x .344″ thk o/a	Used in take-up drive	8P15–200–298
0–1064	RATCHET, spring motor: CRS; round; ¾″ dia x ¼″ thk	Used in spring motor gear train to wind spring motor.	8P15–200–110
0–578	RETAINER, spring: steel; straight; .594″ lg x .08″ wd x .062″ o/a	Holds key in governor assembly	8P15–200–111
0–492	RING, retainer: brass; round; .715″ ID, .937″ OD, .894″ thk	Retains lens in focusing telescope assembly.	8P15–200–300
0–577	RING, retainer: stainless steel; round; .667″ OD, .571 ID″, .188″ thk	Retains springs in spring retaining collar.	8P15–200–301
0–765	RING, retainer: brass; round; .687″ dia x .25″ ID x .125″ thk	Acts as stop for lens	8P15–200–302
0–767	RING, retainer: brass; round; .625″ ID, .73″ OD, .125″ thk	Retains erecting lens in its mount	8P15–200–303
0–773	RING, retainer: steel spring wire; round; .265″ ID, 5/16″ OD, .031″ dia	Retains push button on electric motor	8P15–200–112
H216	RIVET, solid: stainless steel; RH; .093″ dia; .05″ lg	Acts as film guide in pressure plate	6L4280–.05
H477	RIVET, brass; FH; .127″ dia; .25″ lg		9L4023–.2
H535–1	RIVET, solid: aluminum alloy; round head; .093″ dia; .062″ lg		6L4021–.8AL
H535–4	RIVET, solid: aluminum alloy; round head; .093″ dia; .25″ lg		6L4021–.6AL
H778	RIVET, solid: annealed brass; RH; .062″ dia; .125″ lg		6L4023–.1FAL
H798	RIVET, solid: stainless steel; headless; .093″ dia; .163″ lg	Used as guide for spring	6L4280–.1
H807	RIVET, solid: annealed brass SAE #70; FH; .062″ dia; .156″ lg		9L4023–.1F–1
H836	RIVET, solid: aluminum; FH; .187″ dia; .343″ lg		6L4271–3AL
H845	RIVET, solid: aluminum; headless; .0625″ dia; .2″ lg	Retains dust cover to adapter plate (hand crank).	6L4021–.5AL
H1066	RIVET: stainless steel; flat fillister head; .145″ dia; .315″ lg; .095″ shoulder	Used to rivet pawl in gear ratchet assembly of spring motor.	8P15–200–113

0–1022	ROD, fulcrum: stainless steel; 5/8″ lg x 1/4″ dia	Fulcrum for brake release trigger	8P15–200–114
0–144	ROLLER, cam: stainless steel; round; .14″ lg x .1565″ dia	Oscillating lever cam roller in pull-down cam.	8P15–200–115
0–431	ROLLER, film: black molded bakelite; round; 1.398″ lg x .625″ dia	Rests on film on feed spool to indicate film footage.	8P15–200–304
0–994	ROLLER, film: black molded bakelite; round; 1.14″ lg x .312″ dia	Film footage indicator roller	8P15–200–305
0–432	ROLLER, guide: black molded bakelite; round; 1.398″ wd x .824″ dia	Film guide roller in 200-foot magazine	8P15–200–306
H110–1	SCREW, machine: slot drive; RH; stainless steel; #2–56 NC–2; .062″ lg; fully threaded.		6L6256–1.15
H110–4	SCREW, machine: RH; stainless steel; #2–56 NC–2; .25″ lg; fully threaded		6L6256–4.15–1
H110–5	SCREW, machine: RH; stainless steel; #2–56 NC–2; .312″ lg; fully threaded		6L6256–5.15
H124–10	SCREW, machine: FH; stainless steel; #2–56 NC–2; .825″ lg; fully threaded		6L6256–10.S
H124–3	SCREW, machine: FH; stainless steel; #2–56 NC–2; .187″ lg; fully threaded		6L6256–352
H124–4	SCREW, machine: FH; stainless steel; #2–56 NC–2; .25″ lg; fully threaded		6L6256–45
H124–6	SCREW, machine: FH; stainless steel; #2–56 NC–2; .375″ lg; fully threaded		6L6256–6S–1
H124–9	SCREW, machine: FH; stainless steel; #2–56 NC–2; 9/16″ lg; fully threaded		6L6256–9.S
H151	SCREW, machine: stainless steel; #1–72 NF–2; .125″ lg; fully threaded		6L20901–38.S
H159–1	SCREW, machine: FH; stainless steel; #2–56 NC–2; .062″ lg; fully threaded		6L6256–1.3.S–1
H159–3	SCREW, machine: FH; stainless steel; #2–56 NC–2; 3/16″ lg; fully threaded		6L6256–352
H159–4	SCREW, machine: FH; stainless steel; #2–56 NC–2; 1/4″ lg; fully threaded		6L72105C
H159–5	SCREW, machine: FH; stainless steel; #2–56 NC–2; .312″ lg		6L6256–5.3.S–1
H159–6	SCREW, machine: FH; stainless steel; #2–56 NC–2; 3/8″ lg; fully threaded		6L6256–6.3.S
H210	SCREW, machine: FH; stainless steel; #3–56 NF–2; 9/64″ lg; .07″ lg; fully threaded.	Hinge in aperture gate and plate assembly.	6L20903–2.3S
H217	SCREW, machine: Bind H; stainless steel; #3–56 NF–2; .667″ lg; .07″ lg; fully threaded.		6L20903–28S
H247	SCREW, machine: Bind H; stainless steel; #5–40 NC–2; 7/32 lg; fully threaded.		6L20905–3.8S
H273	SCREW, pilot: RH; stainless steel; #2–64 NF–2; .234″ lg; .1″ lg; fully threaded.		6L7929–3

Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
H276	SCREW, machine: stainless steel; #4–48 NF–2; .328″ lg; .203″ lg; fully threaded.		6L20904–5.1S
H298	SCREW, machine: flat top Bind H; stainless steel; #10–32 NF–2; .375″ lg; fully threaded.	Retains turret in its seat	6L20910–6.23S
H312	SCREW, machine: stainless steel; #4–48 NF–2; .187″ lg; fully threaded		6L20904–3.8S
H313	SCREW, machine: stainless steel; #4–48 NF–2; .156″ lg; .109″ lg; fully threaded.		6L20904–2.23S
H314–2	SCREW, set: headless; steel; #5–40 NC–2; .125″ lg		6L18505–2.31SF
H314–4	SCREW, set: headless; steel; #5–40 NC–2; .25″ lg		6L18505–4.31SF
H360–2	SCREW, machine: FH; stainless steel; #0–80 NF–2; .125″ lg; fully threaded		6L6080–2S12
H360–3	SCREW, machine: FH; stainless steel; #0–80 NF–2; .187″ lg; fully threaded		6L6080–3S
H360–4	SCREW, machine: FH; stainless steel; #0–80 NF–2; ¼″ lg; fully threaded		6L6080–4S
H361–1	SCREW, machine: FH; stainless steel; #2–64 NF–2; .062″ lg; fully threaded		6L6364–1S
H361–4	SCREW, machine: FH; stainless steel; #2–64 NF–2; .25″ lg; fully threaded		6L6264–4S
H363–1	SCREW, machine: FH; stainless steel; #6–32 NC–2; .062″ lg; fully threaded		6L6632–1S
H363–6	SCREW, machine: FH; stainless steel; #6–32 NC–2; .375″ lg; fully threaded		6L6632–6S–2
H365–1	SCREW, machine: OH; stainless steel; #4–40 NC–2; .062″ lg; fully threaded		6L6440–1.2S
H365–4	SCREW, machine: OH; stainless steel; #4–40 NC–2; ¼″ lg; fully threaded		6L6440–4.2S
H365–9	SCREW, machine: OH; stainless steel; #4–40 NC–2; .562″ lg; fully threaded		6L6440–9.2S–1
H371–2	SCREW, machine: Fil H; stainless steel; #4–40 NC–2; .125″ lg; fully threaded		6L6440–2.3S–1
H371–6	SCREW, machine: Fil H; stainless steel; #4–40 NC–2; ⅜″ lg; fully threaded		6L6440–6.35–1
H373–1	SCREW, machine: Fil H; stainless steel; #6–32 NC–2; .062″ NC–2; fully threaded.		6L6632–1.3S
H373–4	SCREW, machine: Fil H; stainless steel; #6–32 NC–2; .25″ lg; fully threaded		6L6632–4.3S–3
H373–5	SCREW, machine: Fil H; stainless steel; #6–32 NC–2; .312″ lg; fully threaded.		6L6632–5.3S–3
H373–6	SCREW, machine: Fil H; stainless steel; #6–32 NC–2; ⅜″ lg; fully threaded		6L6632–6.3S–1
H379–1	SCREW, machine: Fil H; stainless steel; #3–48 NC–2; .062″ lg; fully threaded.		6L6348–1.3S

H379–5	SCREW, machine: Fil H; stainless steel; #3–48 NC–2; 5/16″ lg; fully threaded		6L6348–5.3S–1
H379–6	SCREW, machine: Fil H; stainless steel; #3–48 NC–2; .437″ lg; fully threaded.		6L6348–7.3S
H385	SCREW, machine: FH; stainless steel; #0–80 NF–2; .4″ lg; fully threaded		6L6080–2S–1
H387–1	SCREW, machine: FH; stainless steel; #8–36 NF–2; .062″ lg; fully threaded		6L6836–1S
H387–16	SCREW, machine: FH; stainless steel; #8–36 NF–2; 1″ lg; fully threaded		6L6836–16S
H396	SCREW, machine: Fil H; stainless steel; #2–56 NC–2; .093″ lg; fully threaded.		6L6256–1.3S
H608	SCREW, machine: Bind H; stainless steel; #2–56 NC–2; .281″ lg; fully threaded.		6L20902–4.61S
H615	SCREW, machine: RH; steel; #4–40 NC–2; .312″ lg; fully threaded		6L6440–5.35F
H640	SCREW, machine: Bind H; stainless steel; #1–72 NF–2; .069″ lg; fully threaded.	Retains focusing key in six-inch lens mount.	6L6172–1.9S
H658	SCREW, machine: OH; stainless steel; #0–80 NF–2; .125″ lg; fully threaded		6L6080–2.2S
H725	SCREW, machine: RH; steel; #4–40 NC–2; .187″ lg; fully threaded		6L20904–3.1S
H734	SCREW, machine: Bind H; stainless steel; #4–40 NC–2; .281″ lg; .188″ lg threaded.		6L20904–4.23S
H755	SCREW, machine: FH; steel; #4–40 NC–2; .375″ lg; fully threaded		6L20904–6.23S
H760	SCREW, machine: FH; steel; #0–80 NC–2; .058″ lg; fully threaded		6L6080–1.3S–1
H772	SCREW, dowel: Fil H; stainless steel; straight; .5″ lg; #2–56–NC–2 thread, 7/32″ lg.		6L5014–8
H789	SCREW, machine: Fil H; stainless steel; #10–24 NC–2; 1.787″ lg; .312″ lg threaded.	Retains winding handle	6L20910–28.10S
H794	SCREW, machine: Fil H; stainless steel; #4–40 NC–2; .687″ lg; .125″ lg threaded.	Retains shifting knob	6L20904–11.10S
H841–1	SCREW, machine: Fil H; stainless steel; #2–64 NF–2; .062″ lg; fully threaded.		6L6264–1.3S
H841–2	SCREW, machine: Fil H; stainless steel; #2–64 NF–2; .125″ lg; fully threaded.		6L6264–2.3S
H841–3	SCREW, machine: Fil H; stainless steel; #2–64 NF–2; 3/16″ lg; fully threaded		6L6264–3.3S–1

Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
H841–4	SCREW, machine: Fil H; stainless steel; #2–64 NF–2; .25″ lg; fully threaded		6L6264–4.3S
H841–5	SCREW, machine: Fil H; stainless steel; #2–64 NF–2; .312″ lg; fully threaded.		6L6264–5.3S–2
H841–6	SCREW, machine: Fil H; stainless steel; #2–64 NF–2; .375″ lg; fully threaded.		6L6264–6.3S
H841–7	SCREW, machine: Fil H; stainless steel; #2–64 NF–2; .437″ lg; fully threaded.		6L6264–7.53S
H841–8	SCREW, machine: Fil H; stainless steel; #2–64 NF–2; .5″ lg; fully threaded		6L6264–8.3S
H852–1	SCREW, machine: FH; stainless steel; #4–40 NC–2; .062″ lg; fully threaded		6L6440–1S
H852–2	SCREW, machine: FH; stainless steel; #4–40 NC–2; .125″ lg; fully threaded		6L6440–2S
H852–3	SCREW, machine: FH; stainless steel; #4–40 NC–2; .187″ lg; fully threaded		6L6440–3S–1
H852–4	SCREW, machine: FH; stainless steel; #4–40 NC–2; .25″ lg; fully threaded		6L6440–4S–1
H852–5	SCREW, machine: FH; stainless steel; #4–40 NC–2; .312″ lg; fully threaded		6L6440–5S–1
H852–6	SCREW, machine: FH; stainless steel; #4–40 NC–2; .375″ lg; fully threaded		6L6440–6S
H852–7	SCREW, machine: FH; stainless steel; #4–40 NC–2; .437″ lg; fully threaded		6L6440–7S–1
H852–8	SCREW, machine: FH; stainless steel; #4–40 NC–2; .5″ lg; fully threaded		6L6440–8S–1
H852–9	SCREW, machine: FH; stainless steel; #4–40 NC–2; .562″ lg; fully threaded		6L6440–9S
H869	SCREW, shoulder: FH; CRS; #5–40 NC–2; .343″ lg; .125″ lg threaded	Retains knob assembly	6L20905–5.59S
H852–10	SCREW, machine: FH; stainless steel; #4–40 NC–2; .625″ lg; fully threaded		6L6440–10S–1
H1021	SCREW, machine: RH; stainless steel; #6–32 NC–2, ½″ lg; fully threaded		6L20906–8.1S
H1079	SCREW, machine: RH; stainless steel; #6–32 NC–2; 1 3/32″ lg; fully threaded		6L20906–19.1S
H397	SCREW, set: headless; #6–32; .375″ lg		6L18506–6.31SF
H613	SCREW, thumb: stainless steel; 3/8″–16 NC–2; .594″ lg; ¼″ lg threaded	Retains wrist strap to camera	6L17503–9.8K
H661	SCREW, thumb: stainless steel; #8–32 NC–2; .313″ lg; fully threaded	Locks viewfinder in place	6L17108–5.8K
102	SHAFT: stainless steel; straight; .905″ lg x .500″ hex; #16–24 NF–3 thread 5/16″ lg on one end.	Holds lens turret	8P15–200–17
112	SHAFT ASSEMBLY: straight; 2.463″ lg x .437″ dia o/a	Locks magazine to camera	8P15–200–308
0–136	SHAFT: stainless steel; straight; 2.093″ lg x .281″ dia	Used in camshaft assembly	8P15–200–118

0–230	SHAFT ASSEMBLY: straight; 4 3/16″ lg x 5/8″ dia o/a	Used in center plate of camera	8P15–200–310
0–231	SHAFT: stainless steel; straight; 4.062″ lg x .312″ dia o/a	Used in gear train on center plate	8P15–200–119
0–326	SHAFT: stainless steel; straight; 3.621″ lg x .215″ dia o/a; #5–40 NC–2 thread 5/32″ lg one end.	Used as governor drive in camera	8P15–200–120
0–430	SHAFT: stainless steel; straight; 2 7/32″ lg x .1868″ dia	Footage pointer, 200-foot magazine	8P15–200–121
0–457	SHAFT ASSEMBLY: straight; 1 7/8″ lg x .504″ dia o/a	Used in sprocket assembly of 200-foot magazine.	8P15–200–122
0–458	SHAFT ASSEMBLY: straight; 1.875″ lg x .804″ dia o/a	Used to drive take-up sprocket and take-up spool.	8P15–200–123
0–512	SHAFT: stainless steel; straight 1.367″ lg x .1868″ dia	Receives pull down knob and gear when operating film movement manually.	8P15–200–124
0–592	SHAFT ASSEMBLY: straight; 1.187″ lg x 1/4″ wd x 29/64″ h o/a	Used to activate governor assembly	8P15–200–311
0–738	SHAFT: stainless steel; straight; 1.253″ lg x .1873″ dia	Used to drive coupling in electric motor camera drive.	8P15–200–125
0–744	SHAFT: stainless steel; straight; .730″ lg x .2498″ dia o/a	Used on shifting mechanism of electric motor.	8P15–200–125
0–745	SHAFT: stainless steel; straight; .559″ lg x .2498″ dia o/a	Same as 0–744	8P15–200–127
0–870	SHAFT ASSEMBLY: straight; 1 7/8″ lg x 7/8″ OD o/a	Used to drive feed spool sprocket and film footage counter movement.	8P15–200–220
0–874	SHAFT: stainless steel; straight; 1.851″ lg x .1865″ dia	Used in 200-foot magazine	8P15–200–128
0–1053	SHAFT: #416 stainless steel; straight; 2.155″ lg x .562″ dia o/a	Acts as coupling shaft for camera spring motor.	8P15–200–129
0–609	SHIM: steel; round; .940″ dia x .036″ thk	Used in sprocket housing of 200-foot magazine.	8P15–200–313
0–274	SHUTTER, camera: high pressure molded glass; 3.927″ dia	Regulates period of exposure	8P15–200–167
0–235	SLEEVE, idler: aluminum alloy; round; .5″ lg x .438″ OD, .375″ ID o/a	Used in main drive shaft assembly	8P15–200–131
0–111	SPRING: torsion; .375″ OD x 1.25″ lg o/a; 13 turns; LH		8P15–200–133
166	SPRING: .012″ dia music wire; .125″ OD x .563″ lg o/a; approx 26; LH turns.	Used in oscillating lever assembly	8P15–200–134
0–195	SPRING: .012″ dia music wire; .110″ OD x .406″ lg; 18 turns; LH	Used to spring load oscillating arm of film transport.	8P15–200–135

Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
0–221	SPRING: flat; 2.312″ lg x .312″ wd x .012″ thk	Exerts pressure on pressure plate	8P15–200–136
0–256	SPRING: flat; beryllium copper; 1.035″ lg x .125″ wd x .012″ thk	Exerts pressure on light trap roller	8P15–200–137
0–291	SPRING: .02″ music wire, polished; .312″ lg x .115″ ID, .155″ OD 4; turns	Exerts pressure on lens lock	8P15–200–138
0–296	SPRING: .02″ dia music wire, polished; .5″ lg x .1140″ OD; 14 turns	Retains pressures under indexing roller	8P15–200–139
0–320	SPRING: .025″ dia music wire; .312″ OD x .3125″ lg o/a; 13 turns; LH	Used as slip clutch to allow governor overrun.	8P15–200–140
0–423	SPRING: loop; 1⅛″ lg x .5″ ID o/a; 3 turns; LH	Maintains tension on footage indicator	8P15–200–141
0–604	SPRING: flat; .757″ lg x .45″ x .02″ thk o/a	Aperture lock	8P15–200–142
0–605	SPRING: flat; .757″ lg x .45″ wd x .02″ thk o/a	Aperture lock	8P15–200–143
0–614	SPRING: helical compression; .406″ lg x .248″ OD o/a; 5 turns; LH	Exerts tension on pull-down gear	8P15–200–144
0–740	SPRING: helical compression; .281″ lg x .25″ OD o/a; 3 turns; LH	Applies tension on speed shift on electric motor.	8P15–200–145
0–775	SPRING: flat; ⅞″ lg x 3/16″ wd x .018″ thk o/a	Lock spring on 200-foot magazine door	8P15–200–315
0–806	SPRING: flat; 1.093″ lg x .75″ wd x .016″ thk o/a	Locks door on 200-foot magazine	8P15–200–314
0–864	SPRING: torsion; .454″ lg x .156″ dia; 10 turns; LH	Applies tension on pawl on 400-foot magazine.	8P15–200–146
0–1068	SPRING: loop; 1/32″ dia music wire; 27/32″ lg; x 1/32″ dia o/a	Pawl spring for spring motor	8P15–200–148
0–1077	SPRING: torsion; 4″ lg x 5/8″ wd x ⅛″ lg; 2 turns; RH	Applies tension on brake lever	8P15–200–149
0–1080	SPRING ASSEMBLY: 90″ /lb torque assembly; 5 15/16″ lg x 2 5/32″ dia	Drives spring motor	8P15–200–150
0–1054	STOP, runner: brass; round; 1″ dia x ⅛″ lg	Holds gear assembly in spring motor drive.	8P15–200–151
H660	STRAP ASSEMBLY: half round; .75″ lg x .25″ wd x .75″ h o/a	Locks focusing tube	8P15–200–153
H659	STRAP, mounting: brass casting; .75″ lg x .25″ wd x .406″ h o/a	Retains locking screw on viewfinder	8P15–200–317
H255	STRAP, retaining: .05″ brass; 1.25″ lg; x .737″ h x .25″ wd o/a	Holds tachometer in place	8P15–200–152
H161	STUD: stainless steel; .335″ lg x .156″ dia o/a	Fastens oscillating lever to camera	8P15–200–154
H295	STUD: stainless steel; round; .343″ lg x .1243″ dia o/a	Index on turret	8P15–200–156
H246	STUD: stainless steel; .75″ lg x .687″ dia o/a	Retains magazine drive gear in camera	8P15–200–155

H304	STUD ASSEMBLY: 1.334″ lg x .687″ dia o/a	Used as knob to lock and unlock magazine door.	8P15–200–157
H305	STUD: brass; .306″ lg x .687″ dia o/a	Acts as shaft in magazine lock knob assembly.	8P15–200–318
H386	STUD ASSEMBLY: 1.344″ lg x .687″ dia o/a	Used as knob to lock camera door	8P15–200–158
H468	STUD: stainless steel; .73″ lg x .375″ dia o/a		8P15–200–159
H479	STUD: stainless steel; .297″ lg x .125″ dia o/a	Acts as pressure plate retainer stud	8P15–200–319
H796	STUD: stainless steel; .776″ lg x .375″ dia o/a	Acts as lens lock assembly	8P15–200–320
H854	STUD: stainless steel; .484″ lg x .3125″ dia o/a	Acts as bearing for gear in film footage indicator.	8P15–200–160
1015	STUD: stainless steel; 1 5/16″ lg x 3/16″ dia	Acts as guide runner preventing it from rotating.	8P15–200–161
S546	SWITCH, toggle: SPST; 3 amp 250 v; phenolic	Starts and stops electric motor	3Z9849.10
257	TRAP, light: roller spring; black phenolic; straight; 1.096″ lg x .125″ dia	Prevents light from entering film chamber.	8P15–200–163
821	TRAP, light: aluminum; 3.339″ lg x .625″ wd x .156″ thk	Prevents light from entering magazine	8P15–200–321
822	TRAP, light: aluminum; straight; 2.531″ lg x .25″ wd x .025″ thk	Prevents light from entering film magazine.	8P15–200–164
0–504	VISOR: flexible, black rubber; tulip shaped; 2 1/4″ lg x 1 3/8″ dia o/a	Aids in sighting through viewfinder	8P15–200–322
138	WASHER, flat: stainless steel; round; .1885″ ID, 3/8″ OD, .024″ thk	Acts as a spacer on the camshaft assembly.	6L58023S
H272	WASHER, flat: black gum rubber; round; .104″ ID, .208″ OD, .094″ thk	Acts as a bushing with the shutter bearing housing assembly.	6L54001
H275	WASHER, flat: hard felt; round; .312″ ID, .563″ OD, .094″ thk	Used on shutter shaft assembly to prevent tightening down too hard.	6L50415–1
H294	WASHER, flat: stainless steel; round; .0937″ ID, .250″ OD, 0.56″ thk	Used as roller index in lens turret	6L58021.S
H297	WASHER, flat: stainless steel; round; .318″ ID, .3″ OD, .08″ thk	Retains lens turret in film reference tolerance.	6L5805S
H455	WASHER, flat: steel; round; .189″ ID, .312″ OD, .031″ thk	Used as retainer on ball bearing	6L5803–45
H713	WASHER, flat: steel; round; .094″ ID, .250″ OD, .031″ thk		6L58021
H727	WASHER, flat: steel; round; .125″ ID, .246″ OD, .032″ thk		6L58022S

Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
H732	WASHER, flat: steel; round; .313″ ID, .75″ OD, .015″ thk; plain	Used as part of friction clutch in electric motor drive.	6L58025–33
H733	WASHER, flat: hard fiber; round; .313″ ID, .75″ OD, .031″ thk	Same as H732	6L505255–1
H743	WASHER, flat: stainless steel; round; .1875″ ID, .281″ OD, .088″ thk	Used to space mechanical elements in idler assembly in electric motor.	6L58023S–1
H746	WASHER, flat: CRS; round; .12″ ID, .187″ OD, .04″ thk	Used to retain coupling in electric motor drive.	6L58022S–1
752	WASHER, spring: annealed spring steel; round; .135″ ID, .344″ OD, .018″ thk.		6L75022
H761	WASHER, flat: CRS; round; .12″ ID, .187″ OD, .187″ thk		6L58022–35
H790	WASHER, flat: steel; round; .75″ ID, 2.687″ OD, .031″ thk	Acts as dust cover for gears on hand crank.	6L58032–10
H875	WASHER: steel; round; .312″ OD, .188″ ID, .088″ thk	Cuts down friction on film guide roller	6L58023–46
H878	WASHER: steel; round; .12″ ID, .375″ OD; .13″ thk o/a	Acts as spacer and cuts down friction on pawl.	6L58022–36
1017	WASHER, flat: stainless steel; round; ½″ OD, .188″ ID, .032″ thk		6L58023S–2
1024	WASHER, flat: stainless steel; round; ½″ OD, .315″ ID, .032″ thk		6L58025S–2
1025	WASHER, retainer: stainless steel; round; 17/32″ OD, .328″ ID, ⅛″ thk		6L58025S–3
1057	WASHER, flat: stainless steel; round; 9/16″ OD, .25″ ID, .016″ thk	Used as spacer in spring motor	6L58024S
0–865	WHEEL, ratchet: stainless steel; round; 3.156″ dia x .062″ thk	Dial face for 400-foot magazine	8P15–200–165
W524–2	WIRE, electrical: insulated; two #18 AWG cond; SD copper, tinned; stranded, 41–#30 AWG strands; 300 v working; moisture-resistant and for low temp weather; color code, black and white.	Used to fabricate power cord	1B3014–2.18
	TRIPOD COMPONENTS		
A–900	TRIPOD: friction head; 40″ lg collapsed, 73″ lg extended; tilt head	Supports camera	8A4160
961	CASE: fiber; 46″ lg x 7½″ OD	Carrying case for tripod	8P15–3470

H–908	CLAMP: steel; 1 5/16″ lg x 1″ wd o/a	Holds tripod legs at desired height	8P15–3471
957	GRIP, handle: black rubber; 3 1/4″ lg x 5/8″ ID, 1″ OD	Grip part of panning handle	8A4160/G1
H931	HANDLE: aluminum; 1 7/8″ lg x 5/8″ wd x 9/16″ thk o/a	Locks head in any position	8P15–3473
H933	HANDLE: steel tube; 12″ lg x 5/8″ OD; 7/16″–20 NF–2 thd, 5/16″ lg	Manipulates friction head	8P15–3472
0927	HEAD, tripod: cast aluminum alloy; 7″ h x 5″ dia o/a	Friction head assembly tilt	8P15–3474
939	KEY, lock: steel; rectangular; 1/2″ lg x 3/8″ wd x 3/16″ thk o/a		8P15–3475
904	KNOB: round; aluminum; 1/2″ lg x 2″ OD	Locks and unlocks extension legs of tripod.	8P15–3477
932	KNOB: round; aluminum; 9/16″ lg x 2″ dia	Turns screw which engages with camera on mounting.	8P15–3478
947	KNOB: round; aluminum; 1 3/8″ lg x 2 1/2″ dia o/a	Allows tripod head to rotate in vertical plane.	8P15–3476
A917	LEG, tripod: maple wood; 34 1/4″ lg x 1″ wd x 1/2″ thk	Supports tripod head and camera	8P15–3480
A918	LEG, tripod: maple wood; 33 3/4″ lg x 1″ wd x 1/2″ thk	Supports tripod and camera	8P15–3479
H954	LEVEL, spirit: sq; steel; 1 1/2″ lg x 1″ wd x 1/4″ thk o/a	Levels friction head	6Q63001
H919	NUT, hexagon: jam type; steel; #5/16–18 NC–2; 3/16″ thk	Keeps spur leg from loosening	6L3505–18–8N
H923	NUT, lock: elastic stop; steel; #1/4–28 NF–3; 5/16″ h o/a	Prevents leg from loosening from tripod head.	6L3674–28–7N
H912	NUT, round: seamless steel tube; #10–24 NC–2; 13/16″ thk		6L3410–32–3S
H930	NUT, round: aluminum; #1 11/16–14 thd class 2 fit; 7/8″ thk; 2 1/2″ OD	Tightens friction head to tripod	6L2477–14F
H938	NUT, round: aluminum; #3/4–32 thd class 2 fit; 1/2″ thk; 1 3/8″ OD	Keeps friction head together	6L2442–20F
H935	PIN, straight: drill rod steel; 11/32″ lg x 1/8″ dia	Pins tilt shaft to locking knob on friction head.	8P15–3481
H952	PIN, taper: steel; 3/16″ largest dia	Pins tilting head to shaft	6L3911–3
H–953	PIN, taper: steel; 7/64″ largest dia		6L3913–2
910	PLATE, clamp: steel; rectangular; 1 3/8″ lg x 1 3/16″ wd x 0.065″ thk o/a	Bearing surface for screw in nut assembly.	8P15–3482
H909	SCREW, machine: OH; brass; #10–24 NC–2; 1/2″ lg; fully threaded	Holds lower leg strap	6L7024–8.50B
934	SCREW, machine: steel; #1/4–20 NC–2; 27/32″ lg; thd portion 7/16″ lg	Locks on friction head when rotated by handle brake.	
H949	SCREW, machine: RH; steel; #8–32; 3/8″ lg	Tightens split pan nut	6L6832–6.49S

Ref symbol	Name of part and description	Function of part	Signal Corps stock No.
H950	SCREW, machine: OH; brass; #10–32 NF–2; ¼″ lg	Holds brake handle	6L7032–4.50
H951	SCREW, machine: FH; steel; #8–32; ⅜″ lg; fully threaded	Holds key in friction head	6L6832–6.47S
H955	SCREW, machine: FH; brass; #4–40; ¼″ lg; fully threaded		6L6440–4.7–1
H956	SCREW, machine: FH; steel; #10–32 NF–2; ½″ lg	Mounts camera mounting plate	6L7032–8.47S
H905	SCREW, wood: OH; brass; #4; ⅜″ lg	Fastens leg extension bracket to wooden legs.	6L8204–3N
H922	SCREW, wood: RH; brass; #4; ½″ lg	Fastens strap to leg	6L8104–4N
0945	SHAFT: steel; 4½″ lg x 1¼″ dia o/a	Allows vertical rotation	8P15–3483
0936	SHOE, brake: brass; round; ⅝″ dia x ⅛″ wd	Locks friction head by means of brake handle.	8P15–3484
A906	SHOE, tripod: aluminum; 4⅛″ lg x 2″ wd x 1⅛″ thk o/a	Acts as leg shoe on lower tripod leg	8P15–3485
0958	SPRING: helical compression type; $^{53}/_{64}$″ lg x 5/16″ OD; 8 turns; RH	Keeps screw normally above plate	8P15–3486
H911	STRAP, leg: strip steel; ⅞″ lg x 1$^{1}/_{16}$″ sq w/0.065″ thk wall	Keeps upper and lower legs from spreading.	8P15–3487
H920	STRAP, leg: cotton webbing; 16″ lg x ⅜″ wd x 1/16″ thk	Ties legs together when not in use	8P15–3488
H913	STUD: steel; 5¾″ lg x ¼″ dia o/a	Acts as pivot to spread legs	6L31174–1
915	STUD: steel; $^{15}/_{16}$″ lg o/a	Tightens legs in set position	6L31133–2N
916	STUD: steel; 1⅜″ lg o/a	Same as 915	6L31137–1N
934	STUD: CRS; $^{27}/_{32}$″ lg w/9/16″ dia shoulder	Acts as tripod head locking unit	6L31132–5
H937	STUD: steel; 1$^{9}/_{16}$″ lg x ¼″ dia o/a	Mounts camera on tripod	6L31139–2N
H943	STUD: steel; 2$^{25}/_{32}$″ lg x 9/16″ dia o/a	Allows tightening or loosening on brake handle assembly.	6L31151–1
902	TIP, leg: CRS; round; 1½″ lg x 5/16″ dia	Provides good footing in ground	8P15–3489
H914	WASHER, flat: red fiber; round; 0.255″ ID; ⅛″ thk	Bearing surface for nut on leg pivot	6L50524–21
H921	WASHER, flat: steel; round; 5/32″ ID x ⅜″ OD, $^{3}/_{64}$″ thk	Bearing surface on strap	6L58022–3BN4
H940	WASHER, flat: fiber; round; $^{33}/_{64}$″ ID x 2$^{9}/_{32}$″ OD, 0.015″ thk	Bearing surface for pan nut	6L50528–9
H942	WASHER, flat: fiber; round; $^{49}/_{64}$″ ID x 4$^{5}/_{16}$″ OD, 0.015″ thk	Bearing surface for panning base	6L50532–7
H946	WASHER, flat: fiber; round; $^{33}/_{64}$″ ID x 2$^{15}/_{32}$″ OD, 0.015″ thk	Limits vertical oscillation of head	6L50528–10
H929	WASHER, thrust: aluminum; round; $^{13}/_{16}$″ lg x 2$^{9}/_{32}$″ dia		6L75073–1

INDEX

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