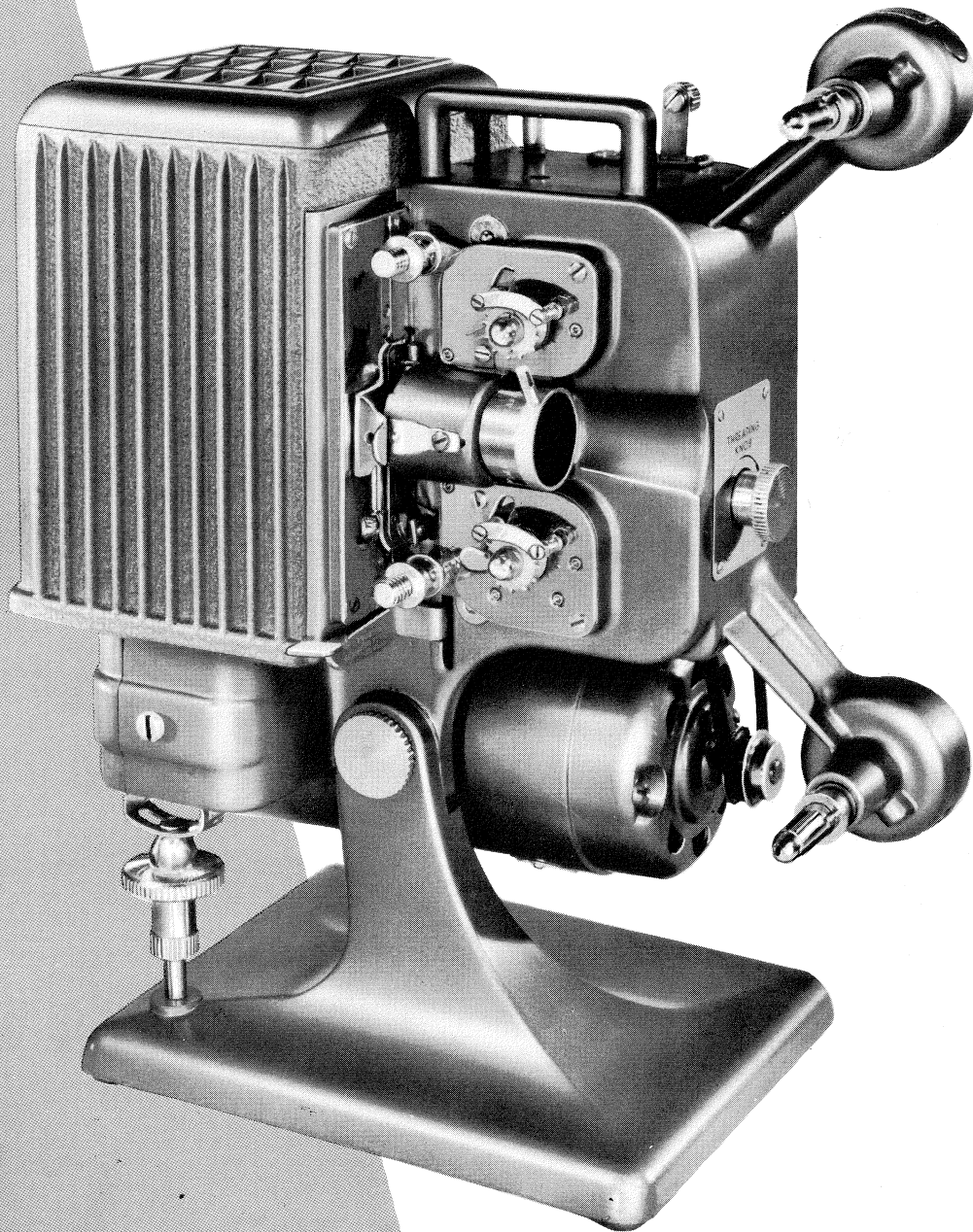


**SERVICING THE**

**DECEMBER 1948  
S. M. No. 1-5006**

# **KODASCOPE EIGHT-90 and EIGHT-90A PROJECTORS**



**EASTMAN KODAK COMPANY • ROCHESTER 4, N. Y.**

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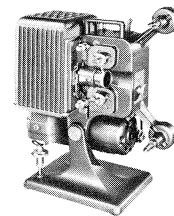
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*The sequence given in the section on disassembly is recommended for complete disassembly of the Projector. However, many parts and / or assemblies can be removed without strict regard to this order of disassembly.*

*Capitalized words in the text indicate nomenclature which appears on illustrations. Such nomenclature, when not followed by a direct figure reference, will be found on the figure indicated in the last preceding figure reference.*

# DISASSEMBLY AND REASSEMBLY



## REMOVING THE UPPER SPROCKET PLATE ASSEMBLY

Remove the upper SPROCKET, figure 1, upper sprocket HUB, and the HUB WASHER by removing the upper sprocket NUT and LOCKWASHER. Remove the UPPER SPROCKET PLATE ASSEMBLY by removing the two sprocket PLATE assembly SCREWS. The lower screw holds the upper sprocket STRIPPER to the plate assembly.

## REPLACING THE UPPER SPROCKET PLATE ASSEMBLY

Replace the upper sprocket plate assembly and the upper sprocket stripper and secure them with the two sprocket plate assembly screws. Replace the upper sprocket, hub, and hub washer, and secure them with the upper sprocket nut and lockwasher.

**NOTE:** The instructions for the removal and replacement of the lower sprocket plate assembly are the same as the instructions for the upper sprocket plate assembly except that no sprocket stripper is used in the lower assembly.

## REMOVING THE APERTURE PLATE AND FILM GATE ASSEMBLY

Turn the threading KNOB, figure 2, until the PULL-DOWN CLAW, figure 3, is withdrawn from the APERTURE PLATE AND FILM GATE ASSEMBLY, figure 4. Push the focusing lever down as far as it will go and remove the projection lens by drawing it from the lens holder. Remove the four aperture PLATE and film gate SCREWS and carefully lift off the aperture plate and film gate assembly.

## REPLACING THE APERTURE PLATE AND FILM GATE ASSEMBLY

Place the aperture plate and film gate assembly in position on the Projector, and replace, but do not tighten, the four aperture plate and film gate assembly screws. Center the assembly so that the claw remains clear of all sides of the slot in the aperture plate while the threading knob is turned and the claw is actuated through at least one complete cycle. When it is in the proper position, tighten the four aperture plate and film gate assembly screws. Replace the projection lens in the lens holder.

Thread the machine with film. Turn the threading knob to see that the claw engages the film cor-

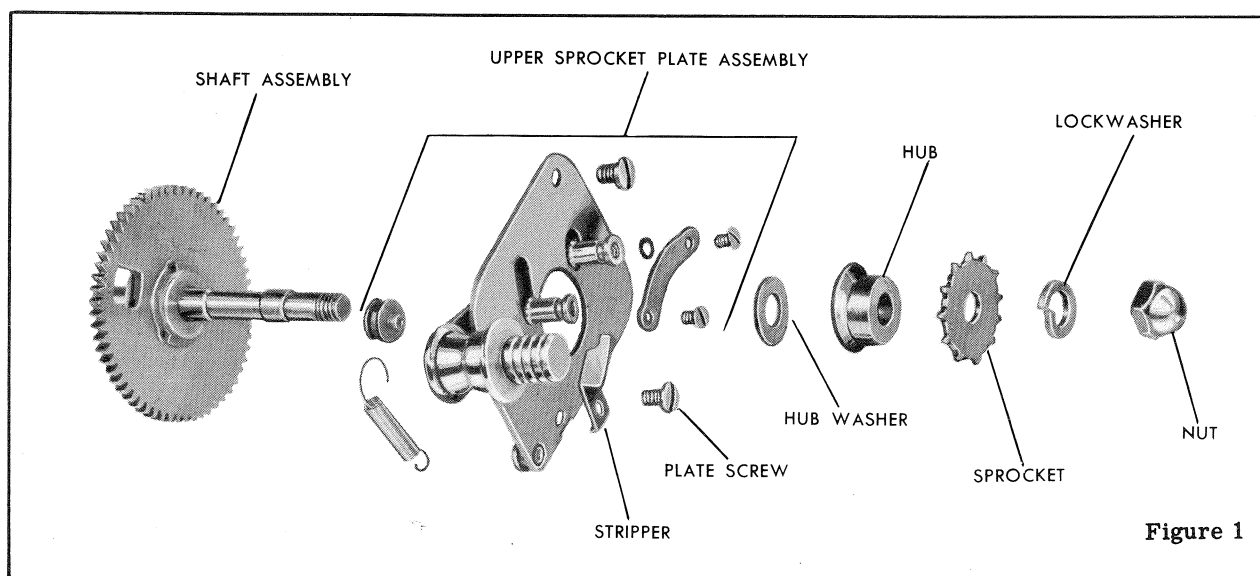
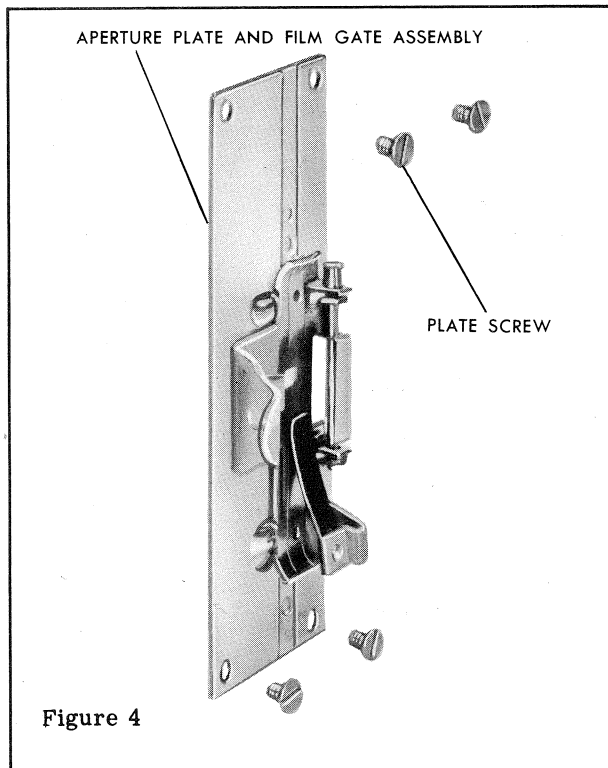
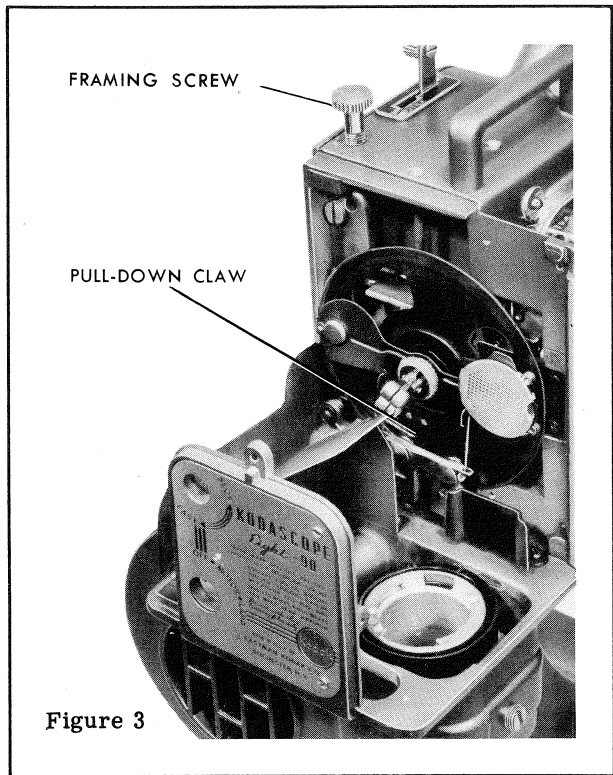
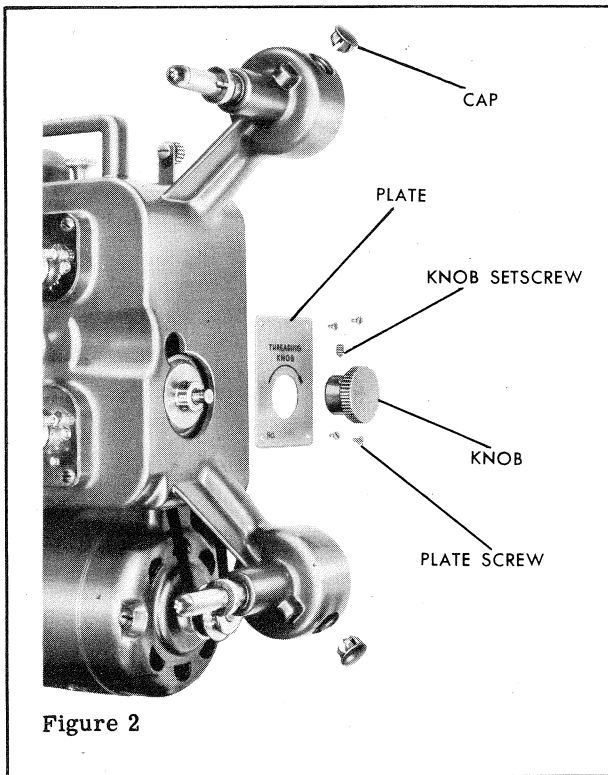


Figure 1





rectly. The claw must not strike either side of the perforation in the film during the pull-down stroke. If adjustment is necessary, loosen the aperture plate and film gate assembly screws and move the aperture plate and film gate assembly horizontally until the film is being pulled down correctly. Then tighten the four aperture plate and film gate assembly screws.

Start the projector and check the adjustment of the framing mechanism. If the frame line is uneven, adjust it by loosening the four aperture plate and film gate assembly screws, and by moving the plate assembly up or down until an even frame line is obtained with the FRAMING SCREW, figure 3, in either position. When correct framing has been obtained, tighten the four aperture plate and film gate assembly screws.

#### REMOVING THE FILM PULL-DOWN MECHANISM

Loosen the lamphouse LOCKING SCREW, figure 5, at the rear of the LAMPHOUSE ASSEMBLY, figure 6. Lift and remove the lamphouse assembly. Press down slightly on the projection lamp and give it a quarter turn to the left; then lift it from the lamp socket. Remove the LAMPHOUSING SCREW, figure 5, which connects the fan housing COVER to the LAMPHOUSING ASSEMBLY, figure 7. Draw out the lamphousing assembly.



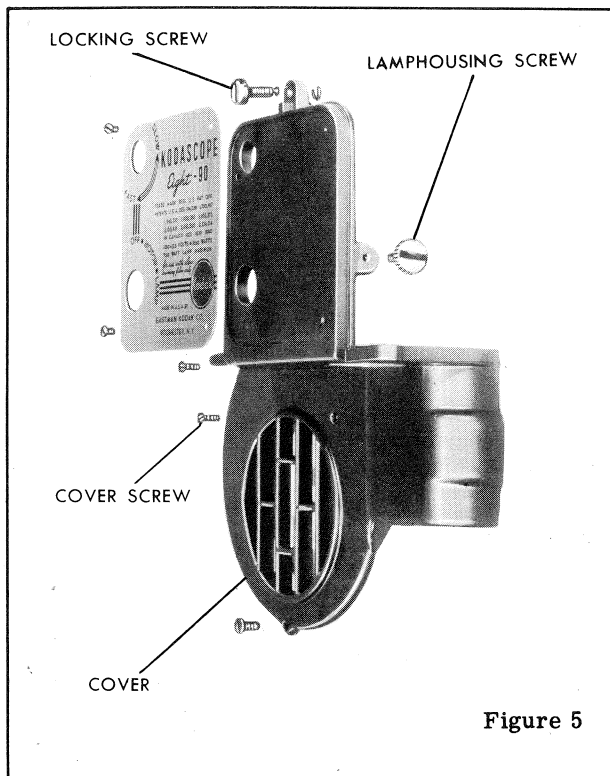


Figure 5

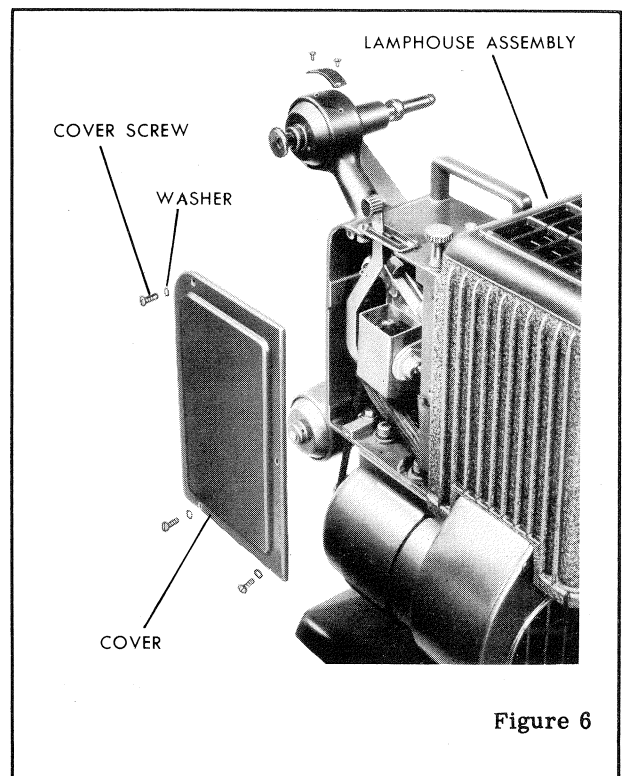


Figure 6

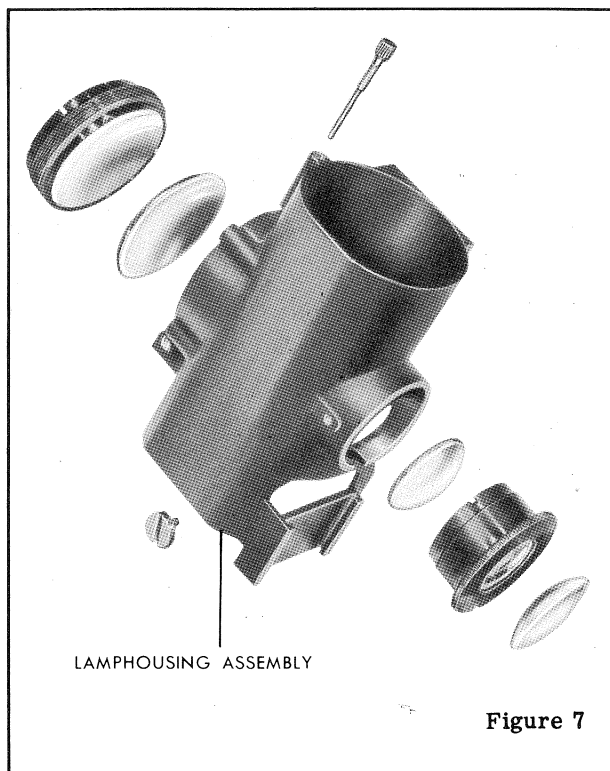


Figure 7

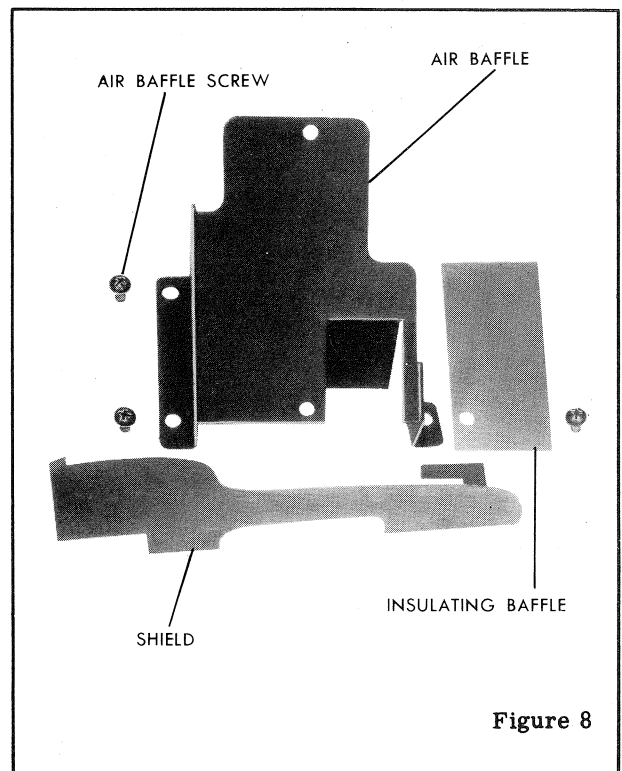
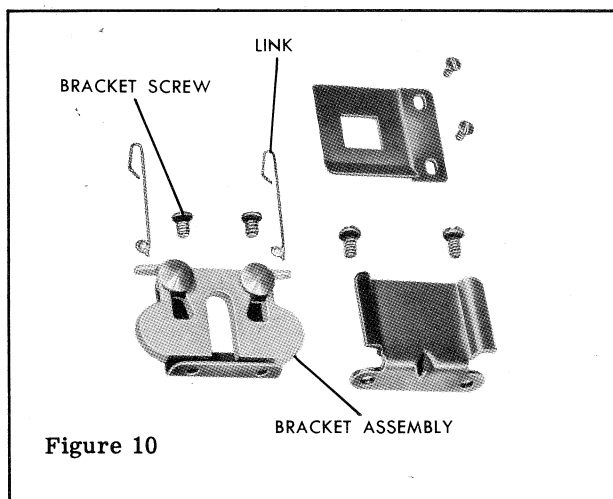
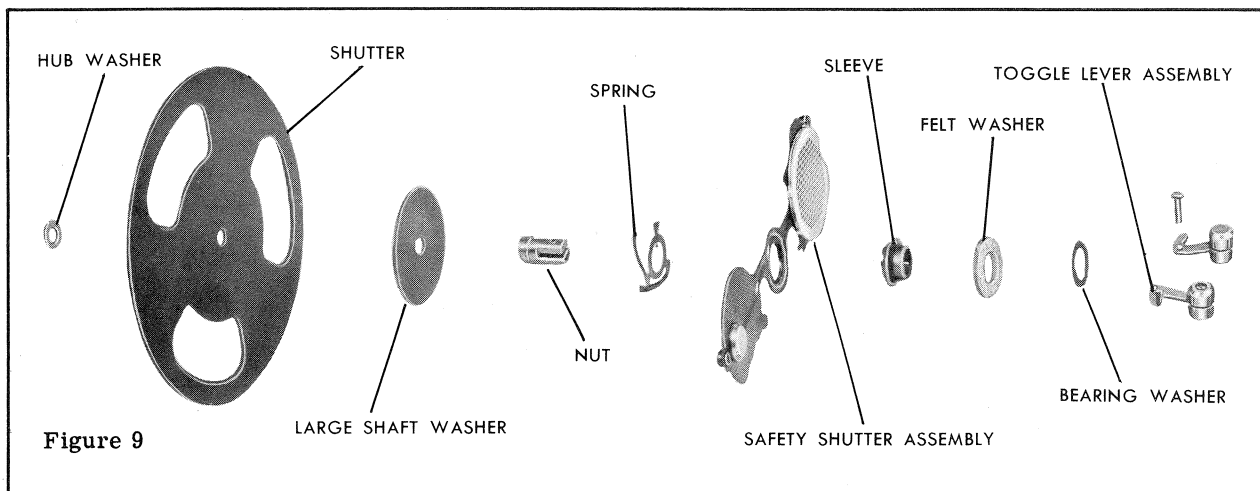


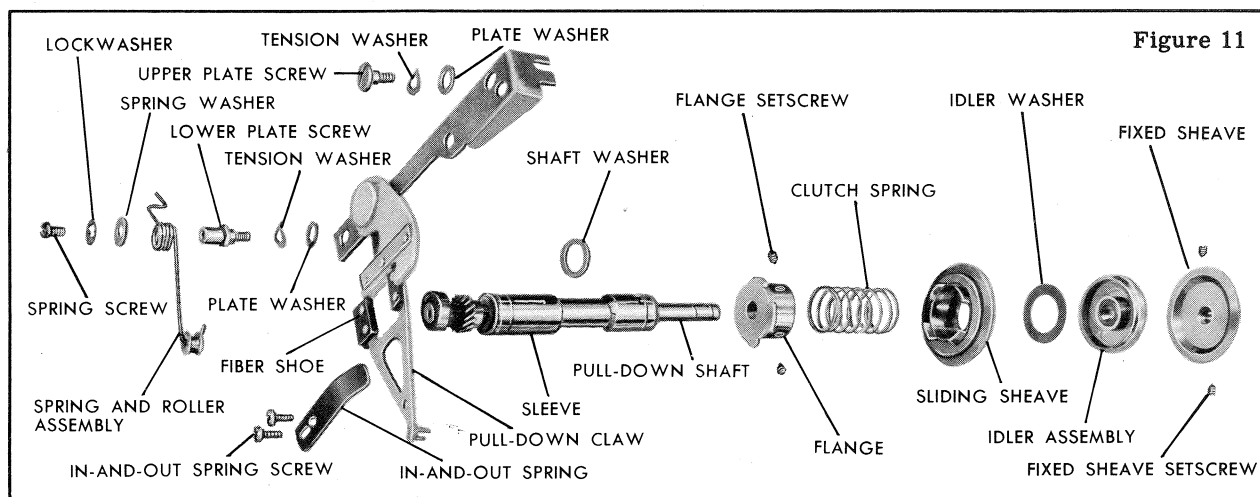
Figure 8



Remove the AIR BAFFLE, figure 8, by removing the three AIR BAFFLE SCREWS. Remove the mechanism COVER, figure 6, by removing the three mechanism COVER SCREWS and WASHERS. Lift off the lamphouse light SHIELD, figure 8, and the control switch INSULATING BAFFLE.

Remove the three fan housing COVER SCREWS, figure 5, and move the fan housing COVER away from the fan housing, being careful not to damage the connecting wires. (On the Model Eight-90A the elevating bracket must be removed.)

Grasp the safety shutter SLEEVE, figure 9, behind the FELT WASHER, with a pair of pliers and carefully unscrew and remove as an assembly the shutter NUT, the safety shutter sleeve, the toggle lever BEARING WASHER, the safety shutter felt washer and the TOGGLE LEVER ASSEMBLIES. Remove the SAFETY SHUTTER ASSEMBLY, the



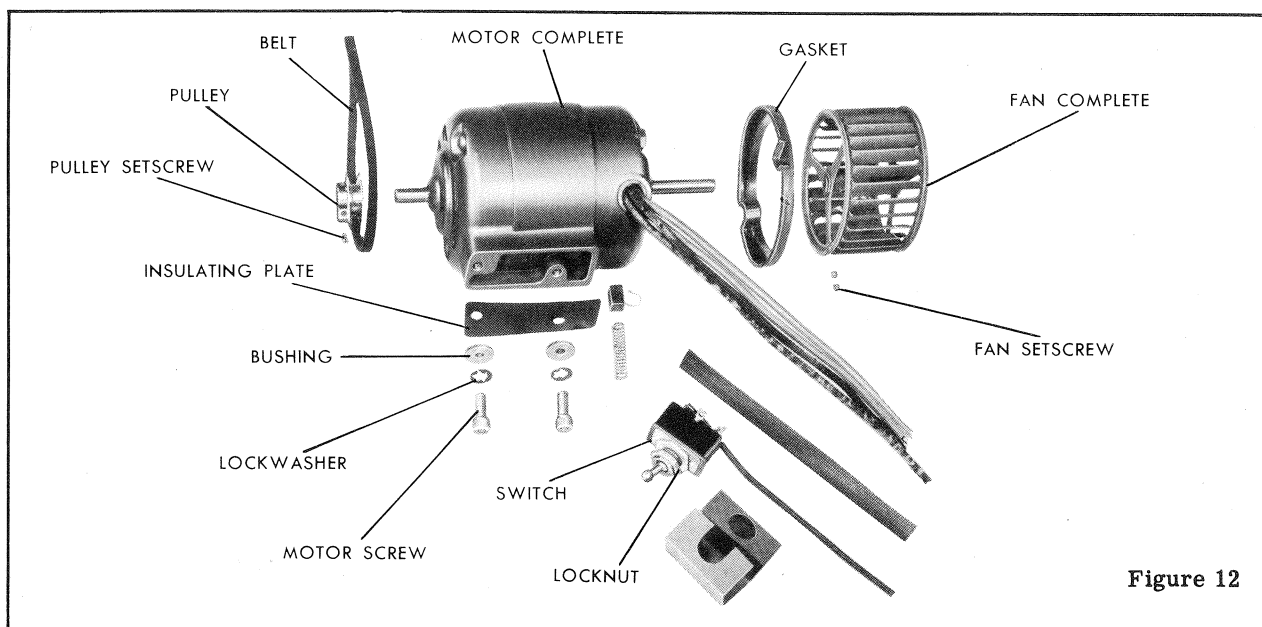


Figure 12

safety shutter LINKS, figure 10, and the safety shutter weight and BRACKET ASSEMBLY by removing the two safety shutter weight and BRACKET assembly SCREWS. Lift off the safety shutter release SPRING, figure 9. Remove the LARGE shutter SHAFT WASHER, the SHUTTER, and the in-and-out cam HUB WASHER.

Remove the tension from the pull-down claw SPRING AND ROLLER ASSEMBLY, figure 11, by moving the roller-held end of the spring away from the FIBER SHOE on the PULL-DOWN CLAW. Remove the top pull-down claw IN-AND-OUT SPRING SCREW. Loosen the bottom pull-down claw in-and-out spring screw and move the IN-AND-OUT SPRING away from the pull-down claw. Remove the pull-down claw SPRING SCREW, the spring screw LOCKWASHER, the SPRING WASHER and the pull-down claw spring and roller assembly. Remove the LOWER framing PLATE SCREW, the TENSION WASHER, and the framing PLATE WASHER. Remove the pull-down claw by removing the UPPER framing PLATE SCREW, the TENSION WASHER and the framing PLATE WASHER.

Unscrew the reversing switch LOCKNUT, figure 12, nearest the back of the Projector, as far as it will go. Remove the reversing switch and the locknut from the mechanism PLATE COMPLETE, figure 13. Disengage the still picture lever SPRING, figure 14, from the still picture LEVER and from the mechanism plate complete. Remove the three mechanism plate SCREWS, figure 13. Carefully remove the mechanism plate complete, making sure that the REWIND and TAKE-UP FLEXIBLE SHAFTS, figure 19, are withdrawn from the REWIND and

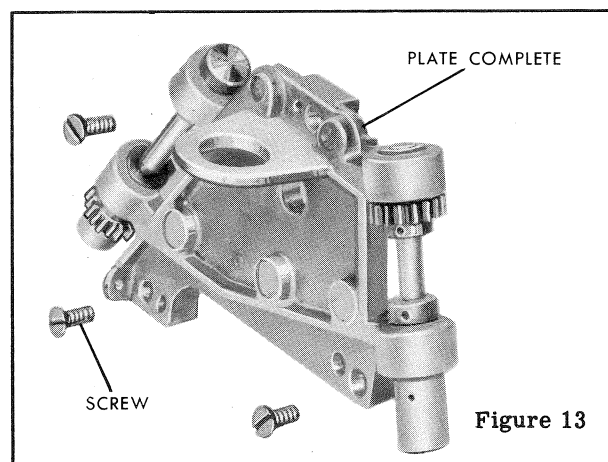


Figure 13

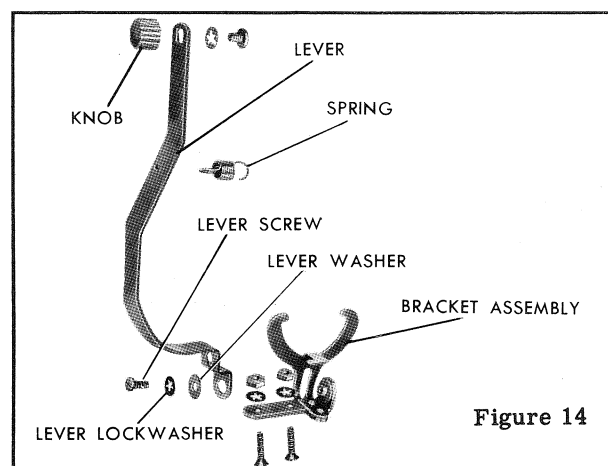


Figure 14



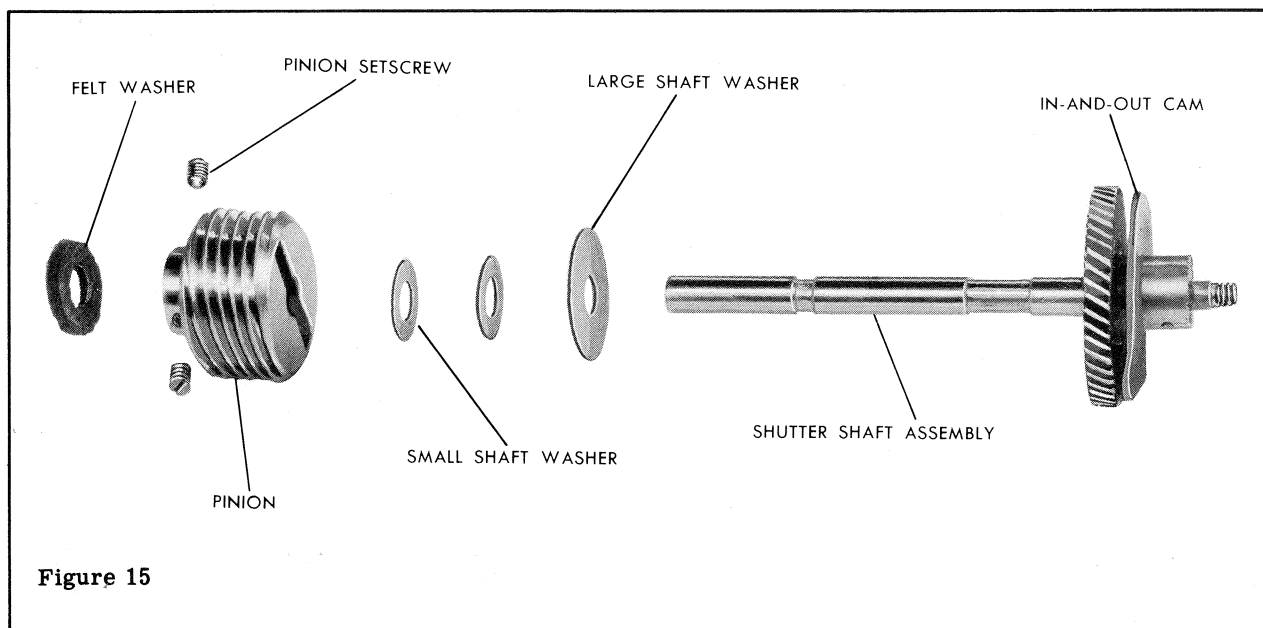


Figure 15

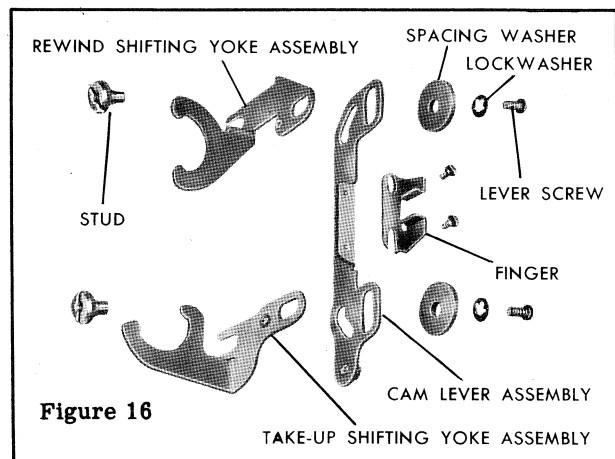


Figure 16

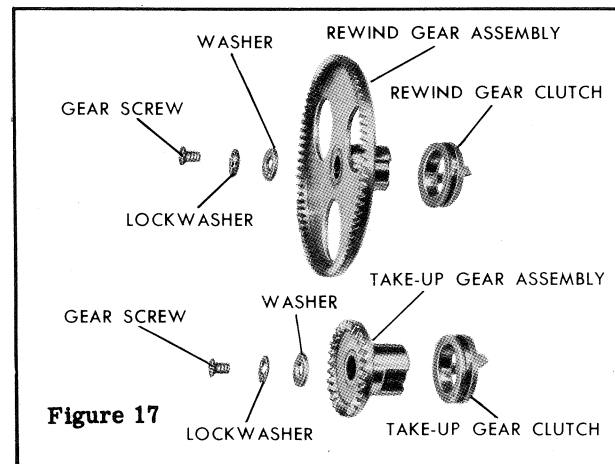


Figure 17

**TAKE-UP PINION SHAFT ASSEMBLIES** as the plate is removed. Remove the still picture lever **Knob**, figure 14, by removing the retaining screw and lockwasher. Remove the still picture **Lever Screw**, **Lockwasher**, and **Washer**. Disengage the lever from the still picture lever **Bracket Assembly** and draw the lever out through the mechanism cover opening. Remove the bracket assembly by removing the two retaining screws, lockwashers, and nuts.

Loosen the threading **Knob Setscrew**, figure 2, and remove the threading **Knob**. Remove the threading knob **Plate** by removing the four threading knob **Plate Screws**. Slide the mechanism drive belt, figure 12, off the motor **Pulley**.

Loosen the two **Fixed Sheave Setscrews**, figure 11, and remove the **Fixed Sheave** from the **Pull-Down Shaft**. Then remove the belt **Idler Assembly**, the belt **Idler Washer**, the **Sliding Sheave**, and the driving **Clutch Spring**. Remove the mechanism drive belt by sliding it over the pull-down shaft. Remove the driving **Flange** by loosening the two driving **Flange Setscrews** and drawing the flange off the pull-down shaft.

Remove the pull-down **Shaft Washer** from the pull-down shaft. Turn the **Shutter Shaft Assembly**, figure 15, until the cut-off side of the **In-and-Out Cam** is opposite the pull-down shaft gear. Then draw out the pull-down shaft. Remove the remaining pull-down shaft washer. Loosen the four setscrews which hold the adjustable **Sleeve**, figure 11, and bearing assembly to the bracket castings inside the mechanism housing. Turn the adjustable sleeve and bearing assembly until the

cut-off side of the sleeve is opposite the cut-off side of the in-and-out cam on the shutter shaft assembly. Draw out the adjustable sleeve and bearing assembly.

## REPLACING THE FILM PULL-DOWN MECHANISM

Clean all the parts of the pull-down mechanism with a grease solvent. Fill the adjustable sleeve and bearing assembly with Keystone 84H Grease. Replace the sleeve in the casting. Holding the pull-down shaft washer at the end of the sleeve nearest the back of the Kodascope, replace the pull-down shaft in the sleeve with the timing mark on the shaft gear opposite the timing mark on the shutter shaft assembly gear.

Replace the pull-down shaft washer on the pull-down shaft. Replace the driving flange on the shaft and secure it with the two driving flange setscrews. Be sure there is no end play in the pull-down shaft. Place the mechanism drive belt on the driving flange. Replace the driving clutch spring, the sliding sheave, the belt idler washer, the belt idler assembly, and the fixed sheave on the pull-down shaft and secure them by tightening the fixed sheave setscrews. Be sure the lugs on the sliding sheave just enter the notches on the driving flange. Place the mechanism drive belt in the pulley formed by the two sheaves and the belt idler assembly. Replace the belt on the motor pulley.

Replace the still picture lever bracket assembly and secure it with the two retaining screws, nuts, and lockwashers. Secure the threading knob plate to the front of the machine with the four threading knob plate screws. Replace the threading knob on the pull-down shaft and secure it by tightening the threading knob setscrew. Oil and grease the gears on the pull-down shaft and the shutter shaft assembly, using light Turbine Oil and Keystone 84H Grease.

Plug in the extension cord and start the Projector. With a pair of pliers, and being careful not to damage the shutter shaft pinion, turn the adjustable sleeve and bearing assembly until a distinct squeal is heard. Then back off the sleeve until no noise is heard. (Turning the sleeve varies the space between the pull-down shaft gear and the shutter shaft assembly gear.) Tighten the upper right sleeve retaining setscrew. Tightening of this screw may induce a squeal so the sleeve will have to be backed off until the screw can be tightened without inducing a squeal and without adding too much drag to the working of the shaft. Do not tighten the screw too tightly. Tighten the lower right setscrew until there is a slight amount of drag added to the pull-down shaft. Then tighten the two remaining setscrews, adding a slight amount of drag to the shaft when each screw is tightened. If the gears remain noisy, apply a small amount of grinding compound directly to the gears. Care should be taken to avoid getting the compound on the pull-down shaft and the

shutter shaft. Allow the machine to run for a few minutes; then thoroughly clean and grease the gears, using Keystone 84H Grease. Be sure the sleeve is adjusted correctly as faulty alignment will cause noise and excessive wear of the gears.

Clean the claw of all foreign particles. Grease the fiber shoes on the claw, using Luberate-210 Grease. Attach the claw by replacing the upper framing plate screw, the tension washer, and the framing plate washer. Replace the lower framing plate screw, the tension washer, and the framing plate washer. Replace the pull-down claw spring and roller assembly, the spring washer and the spring screw lockwasher and secure them with the pull-down claw spring screw. Place the roller-held end of the spring in tension against the underside of the lower fiber shoe. Replace the pull-down claw in-and-out spring and secure it with the retaining screws.

Insert the pull-down claw gauge, Tool No. 632, between the aperture plate and film gate assembly with the lower set-back surface of the tool toward the claw. Turn the threading knob and observe the action of the claw. The claw should touch only the upper step. If necessary, bend the arm of the claw slightly.

Replace the still picture lever bracket assembly and secure it with the two retaining screws, lockwashers and nuts. Replace the still picture lever and secure it with the still picture lever screw, washer, and lockwasher. Replace the mechanism plate complete, making sure that the rewind shaft is in the rewind pinion shaft assembly and that the take-up shaft is in the take-up pinion shaft assembly. Se-

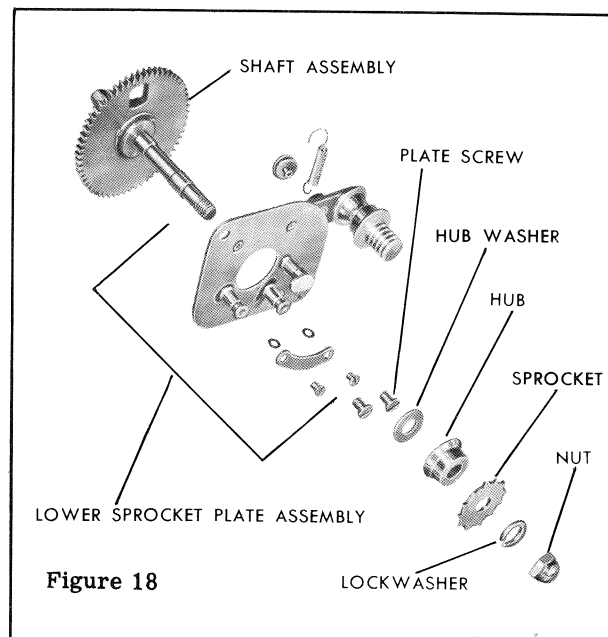


Figure 18

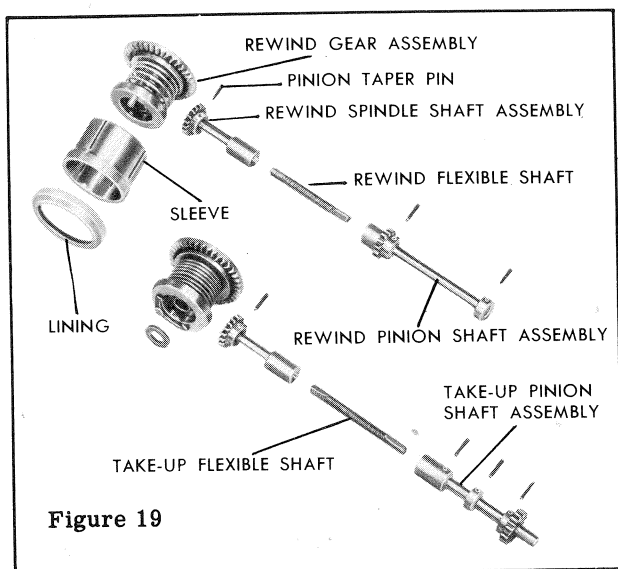


Figure 19

cure the mechanism plate complete with the three mechanism plate screws. Attach the still picture lever spring to the mechanism plate complete and to the still picture lever. Replace the still picture knob and secure it with the retaining screw and lockwasher. Replace the reversing switch and attach it with the switch locknut.

If a new pull-down mechanism has been installed, run the projector intermittently. Continue to grease the fiber shoes to allow the pull-down shaft to operate freely. The pull-down claw should not touch any surface when the machine is operating.

Thread the machine with film. Operate the mechanism by hand to check the action of the claw in pulling the film. If adjustment is necessary, see page 3, Replacing the Aperture Plate and Film Gate Assembly. Replace the projection lamp with the large flange over the large opening in the lamp socket, toward the front of the Projector; press the lamp down into the socket and give it a quarter turn to the right so that it snaps into position. Start the machine and operate it at various speeds. Check for steadiness and loss of loop. Check the action of the framing screw. If the framing is off, loosen the four aperture plate screws and move the aperture plate up or down until proper framing is secured. Then tighten the aperture plate screws.

Oil the felt pad which is part of the pull-down mechanism, using light Turbine Oil. Attach the safety shutter weight and bracket assembly to the mechanism housing with the two retaining screws. Replace the in-and-out cam hub washer, the shutter, and the large shutter shaft washer on the end of the shutter shaft complete. Replace the safety shutter release spring and the safety shutter assembly and secure them by replacing the shutter nut, the safety shutter sleeve, the two washers and the toggle lever

assemblies which were removed as a complete assembly. Turn the mechanism until the pull-down claw is at the top of its stroke (in a perforation ready to pull down the film). Now turn the shutter with the shutter shaft remaining stationary until the top edge of one of the shutter blades just covers the opening in the aperture plate. Then with a pair of pliers tighten the shutter nut. Be sure the shutter rides on the shoulder of the shutter shaft before tightening the nut. Check the clearance between the shutter blades and the pull-down claw in-and-out spring. If more clearance is needed, bend the blades out slightly. The safety shutter assembly should begin to rise when the take-up sprocket is turning at approximately 45 R.P.M. The friction studs on the safety shutter should be as close to the shutter as possible without causing the safety shutter to rise at low speeds.

Replace the air baffle and secure it with the two air baffle screws. Place the control switch insulating baffle in position on the fan housing cover with the screw hole in the baffle lined up with the screw hole in the cover. Secure the fan housing cover to the mechanism housing with the three fan housing screws. Be sure the end of the air baffle with the screw hole nearest the fan housing cover is under the control switch insulating baffle and that the screw holes line up. Secure the air baffle and the insulating baffle to the fan housing cover with the remaining air baffle screw. Replace the lamphouse light shield. Replace the mechanism cover and secure it with the three mechanism cover screws and washers.

Replace the lamphousing assembly and secure it with the lamphousing screw. Replace the lamphouse assembly and secure it by tightening the lamphouse locking screw.

#### REMOVING THE UPPER SPROCKET SHAFT ASSEMBLY

Remove the pull-down claw and the mechanism plate complete by following the instructions for removal of the pull-down mechanism on pages 4 to 8. Remove the CAM LEVER ASSEMBLY, figure 16, to which is fastened the switch control FINGER, by removing the two cam lever STUDS, cam LEVER SCREWS, LOCKWASHERS, and SPACING WASHERS. Carefully remove the REWIND GEAR ASSEMBLY, figure 17, the REWIND GEAR CLUTCH and the REWIND SHIFTING YOKE ASSEMBLY, figure 16, by removing the rewind GEAR SCREW, figure 17, LOCKWASHER and WASHER. Draw out the upper sprocket SHAFT ASSEMBLY, figure 1.

#### REPLACING THE UPPER SPROCKET SHAFT ASSEMBLY

Replace the upper sprocket shaft assembly in the opening in the casting. Replace the rewind gear



clutch, the rewind shifting yoke assembly, and the rewind gear assembly and secure them with the rewind gear screw, lockwasher, and washer. Replace the cam lever assembly and the switch control finger and secure the assembly in place with the two cam lever studs, screws, lockwashers, and spring washers. Replace the mechanism plate complete and the pull-down claw by following the instructions for replacement of the pull-down mechanism on pages 9 and 10.

#### REMOVING THE LOWER SPROCKET SHAFT ASSEMBLY

Remove the pull-down mechanism by following the instructions on pages 4 to 8.

Remove the lower SPROCKET, figure 18, lower sprocket HUB, and the hub washer by removing the lower sprocket NUT and LOCKWASHER. Remove the lower sprocket plate assembly by removing the two sprocket PLATE assembly SCREWS.

Remove the CAM LEVER ASSEMBLY, figure 16, to which is fastened the switch control FINGER, by removing the two cam lever STUDS, cam LEVER SCREWS, LOCKWASHERS and SPACING WASHERS. Carefully remove the TAKE-UP GEAR ASSEMBLY, figure 17, the TAKE-UP GEAR CLUTCH and the TAKE-UP SHIFTING YOKE ASSEMBLY, figure 16, by removing the take-up GEAR SCREW, figure 17, LOCKWASHER and WASHER. Draw out the lower sprocket SHAFT ASSEMBLY, figure 18.

#### REPLACING THE LOWER SPROCKET SHAFT ASSEMBLY

Replace the lower sprocket shaft assembly in the opening in the casting. Replace the take-up gear clutch, the take-up shifting yoke assembly, and the take-up gear assembly and secure them with the take-up gear screw, lockwasher, and washer. Replace the cam lever assembly and the switch control finger and secure the assembly in place with the two cam lever studs, screws, lockwashers, and spring washers.

Replace the pull-down mechanism by following the instructions on pages 9 and 10.

Replace the lower sprocket plate assembly and secure it with the two sprocket plate assembly screws. Replace the lower sprocket, hub and hub washer and secure them with the lower sprocket nut and lockwasher.

#### REMOVING THE SHUTTER SHAFT PINION

Remove the pull-down mechanism by following the instructions on pages 4 to 8. Remove the CAM LEVER ASSEMBLY, figure 16, to which is attached the switch control FINGER, by removing the two cam lever STUDS, cam LEVER SCREWS, LOCKWASHERS, and SPACING WASHERS. Carefully

remove the REWIND GEAR ASSEMBLY, figure 17, the REWIND GEAR CLUTCH and the REWIND SHIFTING YOKE ASSEMBLY, figure 16, by removing the rewind GEAR SCREW, figure 17, LOCKWASHER, and WASHER.

Loosen the two shutter shaft PINION SET-SCREWS, figure 15, which hold the shutter shaft PINION to the shutter shaft assembly. Remove the shutter shaft pinion, the two SMALL shutter SHAFT WASHERS and the FELT WASHER by removing the shutter shaft assembly. The LARGE shutter SHAFT WASHER is located on the shaft next to the gear.

#### REPLACING THE SHUTTER SHAFT PINION

Place the large shutter shaft washer on the shutter shaft assembly. Line up the two small shutter shaft washers, the shutter shaft pinion, and the felt washer with the openings in the mechanism housing bearings. Insert the shutter shaft assembly in the opening in the first bearing, through the openings in the pinion and the three washers, and into the second bearing. The end of the pinion with the two setscrews should be toward the front or pulley end of the projector. Tighten the two pinion setscrews, making sure that there is no end play between the pinion and the rear bearing in the casting.

Replace the rewind gear assembly, the rewind gear clutch and the rewind shifting yoke assembly and secure them with the rewind gear screw, lockwasher and washer. Replace the cam lever assembly and the switch control finger and attach the assembly with the two cam lever studs, cam lever screws, lockwashers and spacing washers.

Replace the pull-down mechanism by following the instructions on pages 9 and 10.

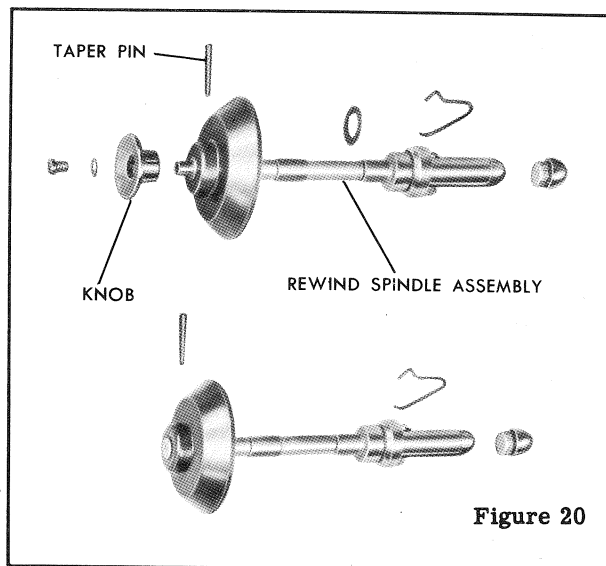


Figure 20

## REMOVING THE MOTOR COMPLETE

Loosen the lamphouse LOCKING SCREW, figure 5, at the rear of the LAMPHOUSE ASSEMBLY, figure 6. Lift and remove the lamphouse assembly. Press down slightly on the projection lamp and give it a quarter turn to the left; then lift it out of the lamp socket. Remove the LAMPHOUSING SCREW, figure 5, which connects the fan housing cover to the LAMPHOUSING ASSEMBLY, figure 7. Draw out the lamphousing assembly. Remove the AIR BAFFLE, figure 8, by removing the three AIR BAFFLE SCREWS. Remove the mechanism COVER, figure 6, by removing the three mechanism COVER SCREWS and WASHERS. Lift off the lamphouse light SHIELD, figure 8, and the control switch INSULATING BAFFLE. Remove the three fan housing COVER SCREWS, figure 6, and move the fan housing COVER away from the fan housing, being careful not to damage the connecting wires.

Unscrew the reversing switch LOCKNUT, figure 12, nearest the back of the Projector, as far as it will go. Remove the reversing SWITCH and the locknut from the mechanism PLATE COMPLETE, figure 13.

Slide the mechanism drive BELT, figure 12, off the motor pulley. Loosen the motor PULLEY SET-SCREW and remove the motor pulley. Remove the FAN COMPLETE by loosening the two FAN SET-SCREWS and sliding the fan off the motor shaft. Disconnect the two wires which lead from the motor to the motor rheostat and extension cord receptacle (see wiring diagram). Remove the motor GASKET, the motor INSULATING PLATE, and the MOTOR COMPLETE by removing the two MOTOR SCREWS, LOCKWASHERS, and BUSHINGS.

## REPLACING THE MOTOR COMPLETE

Replace the motor gasket, the motor insulating plate, and the motor complete and secure them with the two motor screws, lockwashers, and bushings. Connect the two wires which lead from the motor to the motor rheostat and extension cord receptacle. Replace the fan complete in its original position on the motor shaft and secure it by tightening the two fan setscrews. Replace the motor pulley and fasten it by tightening the pulley setscrew. Replace the mechanism drive belt on the motor pulley. Replace the reversing switch and attach it with the switch locknut. Replace the air baffle and secure it with the two front air baffle screws. Place the control switch insulating baffle in position on the fan housing cover with the screw hole in the baffle lined up with the screw hole in the cover. Secure the fan housing cover to the mechanism housing with the three fan housing screws. Be sure the end of the air baffle, with the screw hole nearest the fan housing cover, is under the switch insulating baffle and that the screw holes line up. Secure the air baffle and the insulating baffle to the fan housing

cover with the remaining air baffle screw. Replace the lamphouse light shield. Replace the mechanism cover and secure it with the three cover screws and washers. Replace the lamphousing assembly and secure it with the lamphousing screw. Replace the projection lamp. Replace the lamphouse assembly and secure it by tightening the lamphouse locking screw.

## REMOVING THE REWIND FLEXIBLE SHAFT

Remove the mechanism COVER, figure 6, by removing the three COVER SCREWS and WASHERS. Unscrew the reversing switch LOCKNUT, figure 12, nearest the back of the Projector, as far as it will go. Remove the reversing SWITCH and the locknut from the mechanism PLATE COMPLETE, figure 13. Disengage the still picture lever SPRING, figure 14, from the mechanism plate. Remove the three mechanism plate SCREWS, figure 13. Carefully remove the mechanism plate complete, making sure that the REWIND and TAKE-UP FLEXIBLE SHAFTS, figure 19, are withdrawn from the REWIND and TAKE-UP PINION SHAFT ASSEMBLIES as the plate is removed.

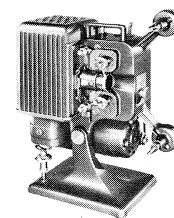
Remove the rewind clutch KNOB, figure 20, by removing the retaining screw and washer. Drive out the driving collar TAPER PIN. Remove the reel arm housing snap CAP, figure 2. Then remove the REWIND GEAR ASSEMBLY, figure 19, and rewind friction SLEEVE and LINING by removing the REWIND SPINDLE ASSEMBLY, figure 20. Remove the gear on the end of the REWIND SPINDLE pinion SHAFT ASSEMBLY, figure 19, by removing the PINION TAPER PIN. Lift out the remainder of the shaft assembly and the rewind flexible shaft.

## REPLACING THE REWIND FLEXIBLE SHAFT

Replace the rewind flexible shaft in the rewind spindle pinion shaft assembly and secure the pinion gear to the shaft with the pinion taper pin. Replace the rewind gear assembly, to which is attached the rewind friction sleeve and lining, and the rewind spindle assembly. Replace the driving collar taper pin. Replace the reel arm housing snap cap. Secure the rewind clutch knob in place with the retaining screw and washer. Replace the mechanism plate complete, making sure that the rewind and take-up flexible shafts are in the rewind and take-up pinion shaft assemblies. Secure the mechanism plate complete with the three mechanism plate screws. Attach the still picture lever spring to the mechanism plate. Replace the reversing switch and attach it with the switch locknut. Replace the mechanism cover and secure it with the three cover screws and washers.

NOTE: The instructions for the removal and replacement of the take-up flexible shaft are essentially the same as the instructions for the rewind flexible shaft.

# TROUBLE CHART

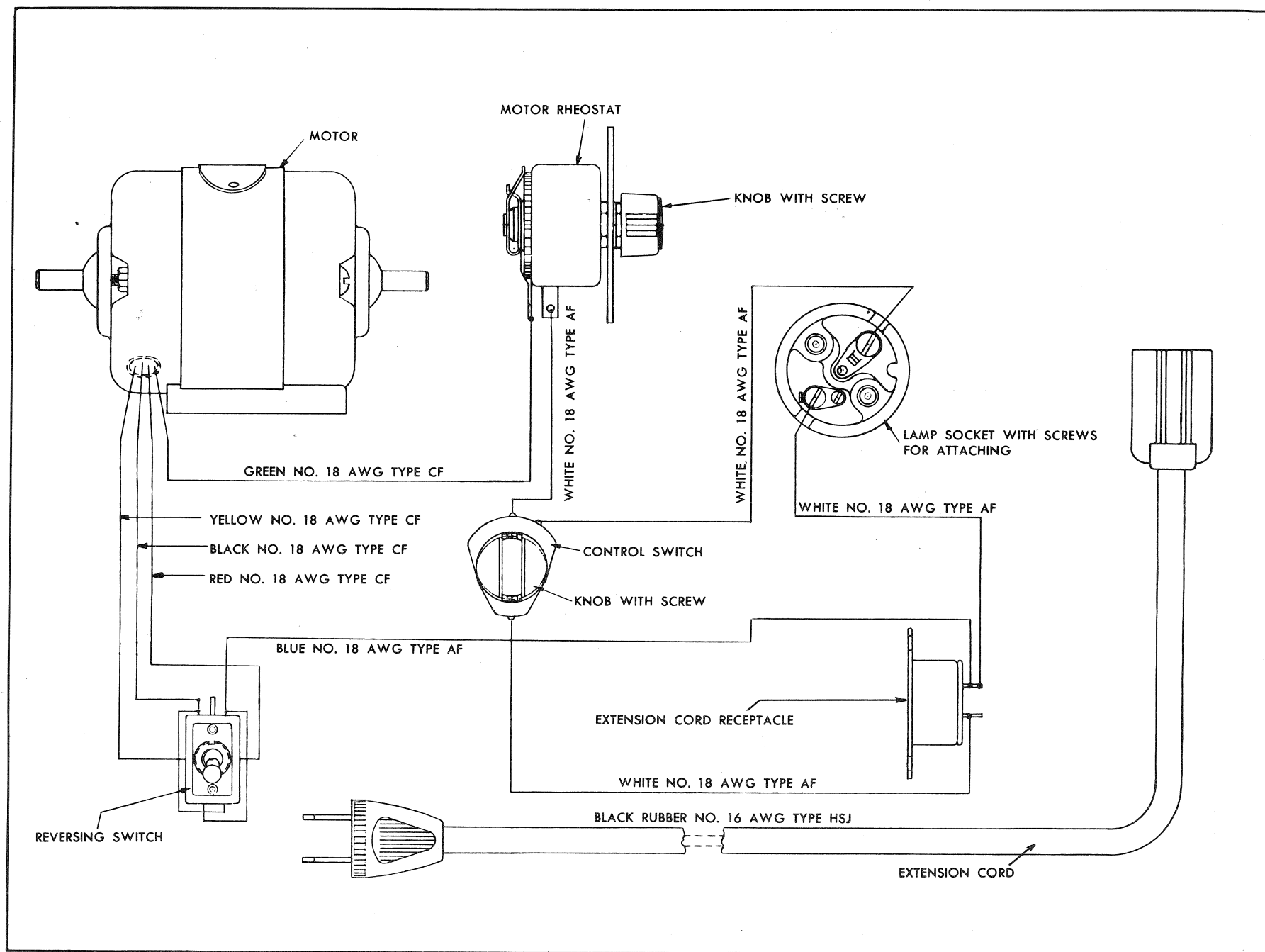


TROUBLE	CAUSE	REMEDY
Film damaged during projection	Sprocket plate assembly damaged or not adjusted correctly.	Adjust or replace the sprocket plate assembly. (See page 3.)
	Sprocket not entering the film perforations correctly.	If the sprocket is damaging the film in the picture area, add sufficient spacing washers on the shaft between the sprocket plate assembly and the sprocket hub to move the sprocket out toward the center of the film perforations. If the sprocket is damaging the film between the outside edge and the film perforation, remove sufficient spacing washers from the shaft to move the sprocket inward toward the center of the film perforation.
	Rewind spindle assembly binding.	Replace the rewind spindle assembly.
	Pull-down claw damaged.	Replace the pull-down claw.
	Pull-down claw not centered in film perforation during pull-down stroke.	Adjust the aperture plate and film gate assembly. (See page 3.)
Excessive noise	Pull-down claw entering the film perforation too deep or too shallow.	Adjust the claw depth. (See page 9.)
	Pull-down claw is striking the aperture plate.	Adjust the pull-down claw depth. (See page 9.)
	Pull-down claw sleeve is not adjusted correctly.	Adjust the sleeve. (See page 9.)
	Pull-down claw fiber shoes are worn.	Replace the pull-down claw.
	Sleeve bearings loose or worn.	Replace the pull-down mechanism or tighten the sleeve setscrews. (See page 9.)
Unsteady pictures	Top claw point on the pull-down claw is worn.	Replace the pull-down claw.
	Pull-down claw is not entering the film perforation correctly.	Adjust the aperture plate. (See page 3.)
	Worn aperture plate.	Replace the aperture plate.
Loss of upper loop	Upper sprocket plate assembly damaged.	Replace the upper sprocket plate assembly. (See page 3.)
	Rewind spindle assembly binding.	Replace the rewind spindle assembly.



TROUBLE	CAUSE	REMEDY
Loss of lower loop	<p>Lower sprocket plate assembly damaged.</p> <p>Pull-down claw entering the film perforation too deep or too shallow.</p> <p>Pull-down claw not centered in film perforation during pull-down stroke.</p>	<p>Replace the lower sprocket plate assembly. (See page 3.)</p> <p>Adjust the claw depth. (See page 9.)</p> <p>Adjust the aperture plate and film gate assembly. (See page 3.)</p>
Film will not rewind	<p>The lugs on the rewind gear clutch are slipping past the lugs on the upper sprocket shaft assembly.</p> <p>Take-up spindle assembly binding.</p>	<p>With the rewind lever engaged, bend the rewind shifting yoke assembly slightly until it holds the clutch tight against the gear assembly.</p> <p>Replace the take-up spindle assembly.</p>
Film will not take-up	<p>Take-up spindle assembly binding.</p> <p>Take-up gear clutch assembly slipping.</p>	<p>Replace the take-up spindle assembly.</p> <p>Bend the take-up shifting yoke assembly slightly until it holds the clutch tight against the take-up assembly gear.</p>
Projection lamp will not light	<p>Lamp burned out.</p> <p>Damaged lamp switch.</p> <p>Defective wiring.</p>	<p>Replace the lamp.</p> <p>Replace the lamp switch.</p> <p>Check wiring (See wiring diagram).</p>
Projector will not start	<p>Rheostat burned out.</p> <p>Motor burned out.</p> <p>Defective extension cord.</p> <p>Defective wiring.</p>	<p>Replace the rheostat.</p> <p>Replace the motor.</p> <p>Replace the extension cord.</p> <p>Check wiring (See wiring diagram).</p>
Unable to focus picture	<p>Film gate assembly out of alignment.</p> <p>Aperture plate damaged.</p>	<p>Make sure the film gate assembly is square with the aperture plate. If it is not, twist it in the correct direction to square it up with the aperture plate.</p> <p>Replace the aperture plate.</p>
Only part of picture in focus	<p>Aperture plate not correctly aligned with film plane.</p>	<p>Replace the aperture plate.</p>

**EASTMAN KODAK COMPANY**  
**ROCHESTER 4, N. Y.**





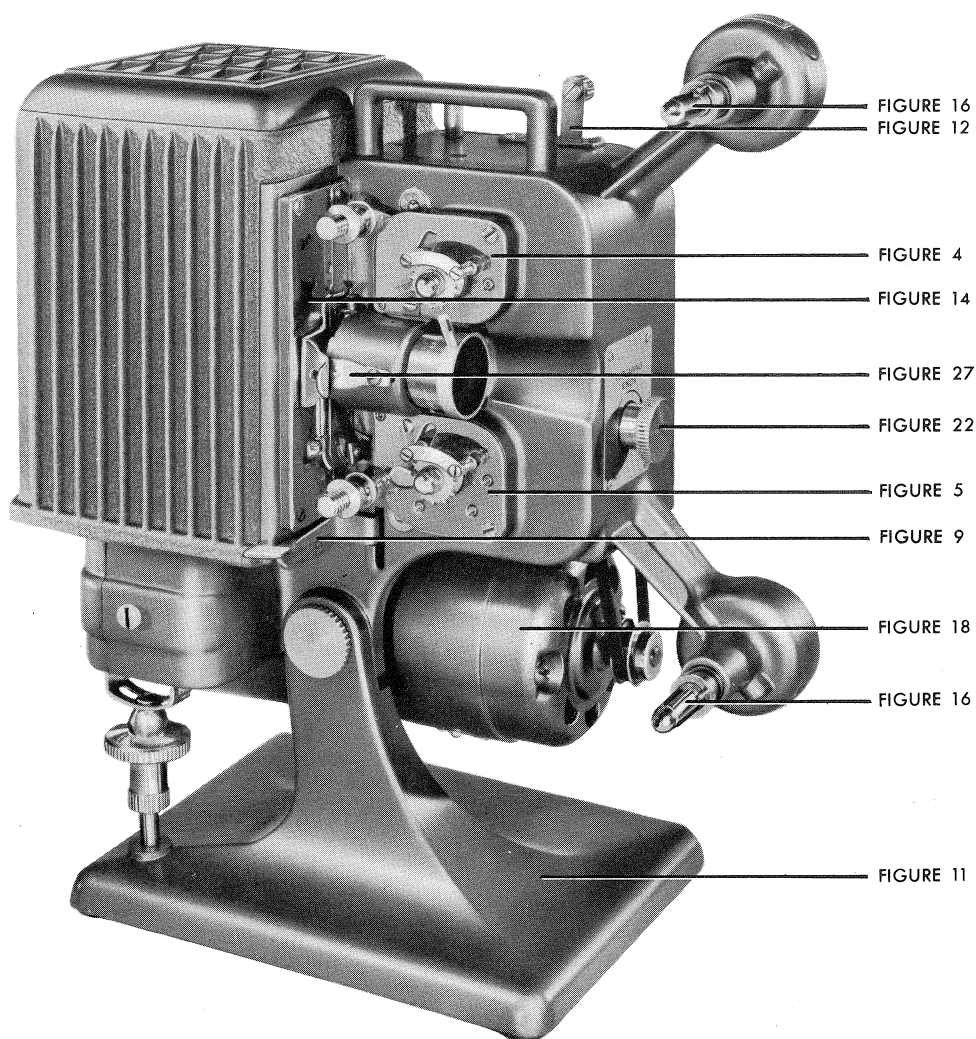


DECEMBER 1947

PARTS LIST No. 1-5006

# KODASCOPIES

## EIGHT-90 AND EIGHT-90A



EASTMAN KODAK COMPANY • ROCHESTER 4, N.Y.

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FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.
								Kodascope Model Eight-90 Complete (see page 6 for Model Eight-90A)	
								Mechanism Housing Complete	1
3	86955							Mechanism Housing Assembly	1
3	57098							Sprocket Gear Oil Tube Assembly	1
3	74103							Shutter Gear Oil Tube Assembly	1
3	67971							Bearing - Shutter shaft, front	1
3	67972							Bearing - Shutter shaft, rear	1
3	76726							Bearing - Sprocket shaft	2
3	84036							Bearing - Spindle pinion shaft	2
3	84502							Bearing - Reel spindle	2
3	84552							Stud - Rewind shift lever	1
3	84551							Stud - Take-up shift lever	1
3	86938							Loop Former Stop Assembly	2
3	84593							Plate - Still picture lever stop	1
3	84164							Plate - Still picture lever retaining	1
3	98539							Screw - Still picture lever stop and retaining plate to mechanism housing (for machines using studs, refer to Part No.84201)	2
3	30511							Lockwasher - Still picture lever stop and retaining plate screw, Shakeproof No. 1204	2
3	45322							Nut - Still picture lever stop and retaining plate screw, hex No. 4-40 steel nickel	2
	84201							Stud - Still picture lever stop and retaining plate to mechanism housing	2
3	106285							Dowel - Mechanism plate to mechanism housing	2
27	57032							Ball - Lens retaining	1
27	57033							Spring - Lens retaining	1
27	98561							Catch - Film gate	1
27	68039							Screw - Film gate catch and lens retaining spring to mechanism housing	1
4	86935							Sprocket Plate Assembly, Upper	1
4	84520							Spring - Loop former lever	1
4	58134							Washer - Sprocket threading plate spacing	AR
4	84518							Plate - Sprocket threading	1
4	68036							Screw - Sprocket threading plate to post	2
4	84521							Stud - Loop former lever spring	1
5	86936							Sprocket Plate Assembly, Lower	1
5	84520							Spring - Loop former lever	1
5	58134							Washer - Sprocket threading plate spacing	AR
5	84518							Plate - Sprocket threading	1
5	68036							Screw - Sprocket threading plate to post	2
5	84521							Stud - Loop former lever spring	1
4,5	68039							Screw - Sprocket plate assembly to mechanism housing	4
4	67934							Stripper - Sprocket, upper	1
9	84560							Lever - Reverse and rewind shift	1
9	33640							Washer - Reverse and rewind shift lever stud	1
9	84561							Stud - Reverse and rewind shift lever	1
9	42190							Washer - Reverse and rewind shift lever stud spacing	1
9	30511							Lockwasher - Reverse and rewind shift lever stud, Shakeproof No. 1204	1
9	42959							Screw - Reverse and rewind shift lever stud	1
4,5	86951							Sprocket Shaft Assembly, Upper and Lower	2
4,5	23660							Washer - Sprocket hub, upper and lower	2
4,5	67940							Hub - Sprocket, upper and lower	2
4,5	74102							Sprocket - Upper and lower	2
4,5	37512							Lockwasher - Sprocket nut, upper and lower	2
4,5	67992							Nut - Sprocket, upper and lower	2
6	86932							Shutter Shaft Assembly	1
6	57129							Washer - Shutter shaft, small	2
6	71667							Washer - Shutter shaft, large	1
8	84512							Clutch - Take-up and rewind gear	2
Parts List indentations indicate assembly relationship.									
FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.

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FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.
10	86943							Rewind Shifting Yoke Assembly	1
8	84587							Rewind Gear Assembly	1
8	84513							Washer - Take-up and rewind gear	2
8	62083							Lockwasher - Take-up and rewind gear to sprocket shaft screw	2
8	60027							Screw - Take-up and rewind gear to sprocket shaft	2
10	86942							Take-Up Shifting Yoke Assembly	1
8	84586							Take-Up Gear Assembly	1
7	109041							Pull-Down Claw and Shaft Complete	1
1	77829							Setscrew - Adjustable sleeve to mechanism housing, No. 4-40 x 1/8 in. cup pt	2
7	57129							Washer - Pull-down shaft	2
7	84548							Flange - Driving	1
7	39401							Setscrew - Driving flange to shaft	2
7	84077							Spring - Driving clutch	1
7	84547							Sheave - Sliding	1
7	84590							Belt Idler Assembly	1
7	109243							Washer - Belt idler	1
7	84546							Sheave - Fixed	1
7	39401							Setscrew - Fixed sheave to shaft	2
18	106025							Mechanism Drive Belt	1
10	86944							Cam Lever Assembly	1
10	84591							Washer - Cam lever spacing	2
10	84553							Stud - Cam lever	2
10	30511							Lockwasher - Cam lever screw, Shakeproof No. 1204	2
10	42959							Screw - Cam lever to stud	2
13	86946							Mechanism Plate Complete	1
15	84588							Rewind Pinion Shaft Assembly	1
15	65658							Taper Pin - Collar to shaft	1
15	65658							Taper Pin - Pinion to shaft	1
15	84589							Take-Up Pinion Shaft Assembly	1
15	65658							Taper Pin - Pinion to shaft	1
15	65658							Taper Pin - Flexible shaft adapter to shaft	1
15	65658							Taper Pin - Collar to shaft	1
13	42959							Screw - Mechanism plate to mechanism housing	3
12	86940							Still Picture Lever Bracket Assembly	1
12	101372							Screw - Still picture lever bracket to mechanism housing, flthd FC rec No. 4-40 x 1/2 in. steel rustproof	2
12	30511							Lockwasher - Still picture lever bracket screw, Shakeproof No.1204	2
12	57155							Nut - Still picture lever bracket screw, hex No. 4-40 steel rustproof	2
15	86937							Take-Up and Rewind Spindle Pinion Shaft Assembly	2
15	65658							Taper Pin - Pinion to shaft	1
15	84505							Shaft - Rewind flexible	1
15	84507							Shaft - Take-up flexible	1
16	106109							Rewind Spindle Assembly	1
16	42701							Spring - Reel retaining	1
16	68020							Plug - Reel spindle	1
16	48829							Taper Pin - Driving collar to spindle	1
16	65585							Washer - Rewind spindle, spacing .003 in. thk	AR
16	48023							Washer - Rewind spindle, spacing .010 in. thk	AR
15	106112							Rewind Spindle Gear Assembly	1
15	106097							Sleeve - Rewind friction	1
15	106098							Lining - Rewind friction	1
16	106095							Knob - Rewind clutch	1
16	106106							Washer - Rewind clutch knob screw	1
16	106107							Screw - Rewind clutch knob retaining	1
15	84233							Take-Up Spindle Gear Assembly	1
16	84580							Take-Up Spindle Assembly	1
16	48829							Taper Pin - Driving collar to spindle	1
16	42701							Spring - Reel retaining	1
16	68020							Plug - Reel spindle	1
15	84191							Washer - Take-up spindle spacing	1
Parts List indentations indicate assembly relationship.									
FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.

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FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.
12	84544							Lever - Still picture	1
12	61100							Washer - Still picture lever	1
12	30511							Lockwasher - Still picture lever screw, Shakeproof No. 1204	1
12	42959							Screw - Still picture lever to bracket	1
12	84071							Spring - Still picture lever	1
12	109004							Knob - Still picture lever	1
12	49402							Lockwasher - Still picture lever knob to bracket screw	1
12	56123							Screw - Still picture lever knob to bracket	1
2	67977							Screw - Framing	1
7	67980							Screw - Framing plate	1
7	67979							Washer - Framing plate tension	2
7	68027							Screw - Framing plate, lower	1
7	33640							Washer - Framing plate	2
7	74097							Pull-Down Claw Spring and Roller Assembly	1
7	61100							Washer - Pull-down claw spring	1
7	62083							Lockwasher - Pull-down claw spring screw	1
7	101337							Screw - Pull-down claw spring, rdhd FC rec No. 4-40 x 3/16 in. steel	1
7	61624							Spring - Pull-down claw in-and-out	1
7	101337							Screw - Pull-down claw in-and-out to mechanism housing, rdhd FC rec No. 4-40 x 3/16 in. steel rustproof	2
24	84603							Baffle - Light	1
24	66012							Screw - Light baffle to mechanism housing	2
17	76190							Washer - In-and-out cam hub	1
17	84594							Shutter	1
17	75582							Washer - Shutter shaft, large	1
6	57144							Washer - Shutter shaft, felt	1
17	68028							Nut - Shutter	1
6	67973							Pinion - Shutter shaft	1
6	41868							Setscrew - Shutter shaft pinion to shaft	2
24	84565							Adapter - Lamphousing	1
24	101337							Screw - Lamphousing adapter to mechanism housing, rdhd FC rec No. 4-40 x 3/16 in. steel rustproof	2
25	106248							Plate - Rewind instruction	1
25	68017							Screw - Rewind instruction plate to mechanism housing	2
11	84228							Elevating Screw Knob Assembly	1
21	84577							Bracket - Elevating	1
21	49402							Lockwasher - Elevating bracket screw	2
21	68039							Screw - Elevating bracket to mechanism housing	2
11	84571							Screw - Pivot	1
11	58969							Washer - Pivot screw spacing	1
11	84573							Washer - Pivot screw tension	1
11	56066							Lockwasher - Pivot screw	1
11	81138							Nut - Pivot screw	1
22	84506							Cap - Reel arm housing snap	2
22	84532							Knob - Threading	1
22	41868							Setscrew - Threading knob to shaft	1
22	104612							Plate - Threading knob instruction	1
22	68017							Screw - Threading knob instruction plate to mechanism housing	4
18	84567							Motor Complete	1
18	109205							Brush and Spring - Motor	2
18	84607							Pulley - Motor	1
18	41868							Setscrew - Motor pulley to shaft	1
18	71177							Bushing - Motor insulating	2
18	77542							Screw - Motor to mechanism housing	2
18	33992							Lockwasher - Motor to mechanism screw, Shakeproof No. 1210	2
18	83829							Plate - Motor insulating	1
18	104915							Sleeving - Reversing switch	1
18	84614							Switch - Reversing	1
18	84609							Box - Reverse switch insulation	1
25	84566							Cover - Mechanism	1
25	68035							Screw - Mechanism cover to mechanism housing	3
Parts List indentations indicate assembly relationship.									
FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.

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FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.
25	74904							Washer - Mechanism cover to mechanism housing screw	3
17	68030							Spring - Safety shutter release	1
17	86941							Safety Shutter Assembly	1
17	84592							Sleeve - Safety shutter	1
17	74095							Washer - Safety shutter, felt	1
17	48969							Washer - Toggle lever bearing	1
17	86930							Toggle Lever Assembly	2
17	68031							Rivet - Toggle lever	1
24	68034							Link - Safety shutter	2
24	74099							Safety Shutter Weight and Bracket Assembly	1
24	60027							Screw - Safety shutter weight and bracket assembly to mechanism housing	2
								Lamp Socket Assembly	1
21	109174							Socket - Lamp, with screws for attaching	1
21	71638							Clamp - Lamp socket	1
21	101431							Screw - Lamp socket clamp	1
21	57155							Nut - Lamp socket clamp screw	1
21	57434							Washer - Lamp socket screw	2
21	69345							Spring Washer - Lamp socket screw	2
18	106263							Gasket - Motor to fan housing	1
18	106261							Fan Complete with Setscrews	1
18	107101							Setscrew - Fan to motor shaft	2
2	68057							Screw - Lamp adjusting	1
26	68000							Baffle - Air	1
26	101337							Screw - Air baffle to mechanism housing, rdhd FC rec No. 4-40 x 3/16 in.	3
26	106262							Shield - Lamphouse light	1
26	88193							Baffle - Control switch, insulating	1
								Lamphousing Assembly	1
23	83830							Reflector Mount Assembly	1
23	84166							Reflector	1
23	84564							Lamphousing	1
23	83813							Screw - Reflector mount clamp	1
23	83816							Screw - Condenser mount clamp	1
23	84578							Condenser Mount Assembly	1
23	49857							Lens - Condenser, front	1
23	68059							Lens - Condenser, rear	1
19	71368							Screw - Lamphousing to fan housing	1
								Fan Housing Cover Assembly	1
19	84568							Cover - Fan housing	1
20	77065							Receptacle - Extension cord	1
20	68035							Screw - Extension cord receptacle to fan housing	2
19	106306							Nameplate	1
19	68017							Screw - Nameplate to fan housing	2
19	98562							Screw - Lamphouse locking	1
19	69185							Washer - Lamphouse locking screw	1
20	68005							Switch - Control	1
20	63841							Knob - Control switch, with screw	1
20	53768							Screw - Control switch knob	1
20	109198							Motor Rheostat Assembly	1
20	64777							Nut - Motor rheostat	2
20	65347							Knob - Motor rheostat, with screw	1
20	53768							Screw - Motor rheostat knob	1
19	68035							Screw - Fan housing cover to mechanism housing	3
14	86954							Aperture Plate and Film Gate Assembly	1
14	74093							Screw - Aperture plate and film gate assembly to mechanism housing	4
11	86956							Base Assembly	1
11	19705							Washer - Felt foot leveling	AR
11	49379							Shim - Felt foot	AR
11	57115							Foot - Felt	4
11	84574							Screw - Elevating	1
11	84575							Ring - Elevating screw	1
Parts List indentations indicate assembly relationship.									
FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.



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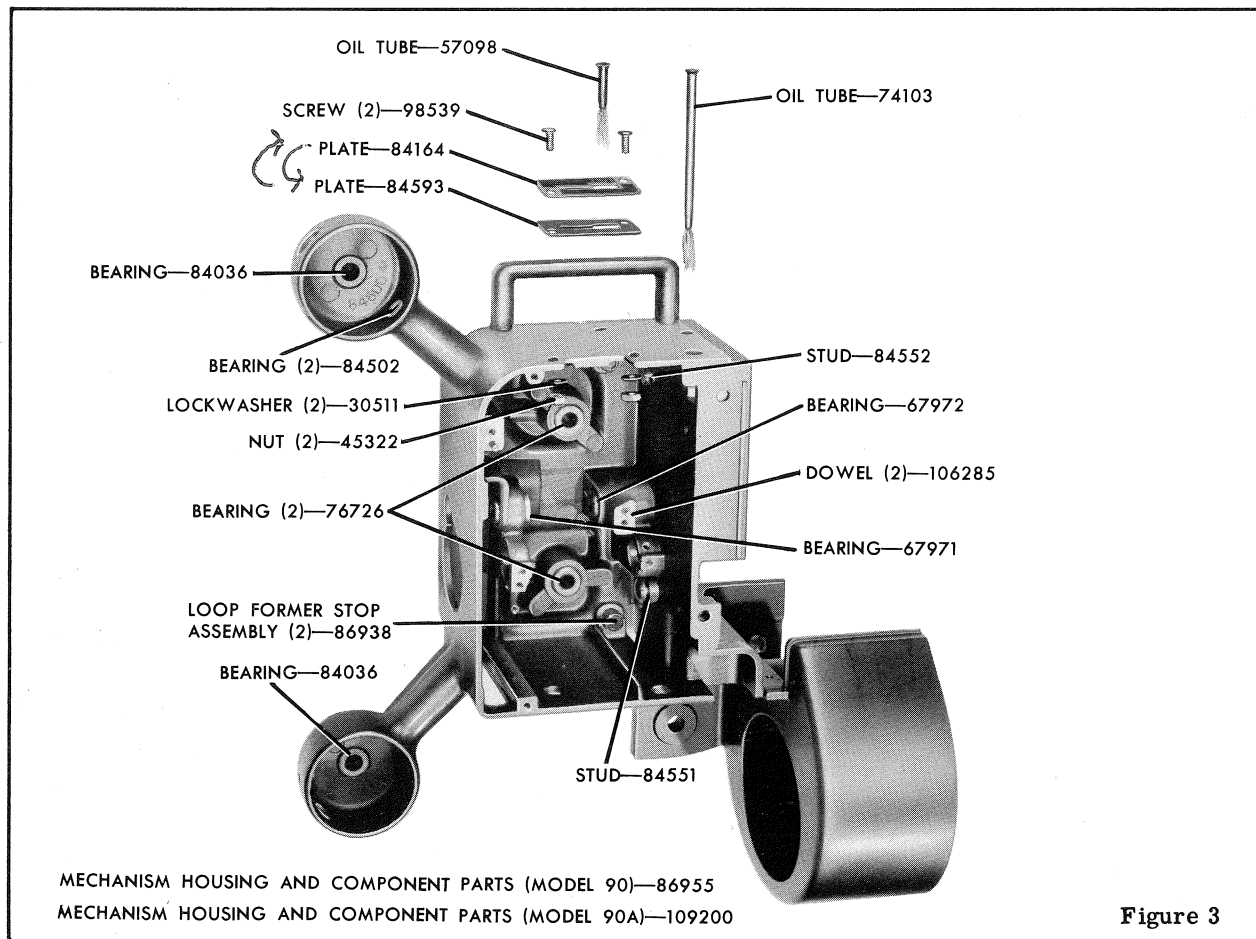
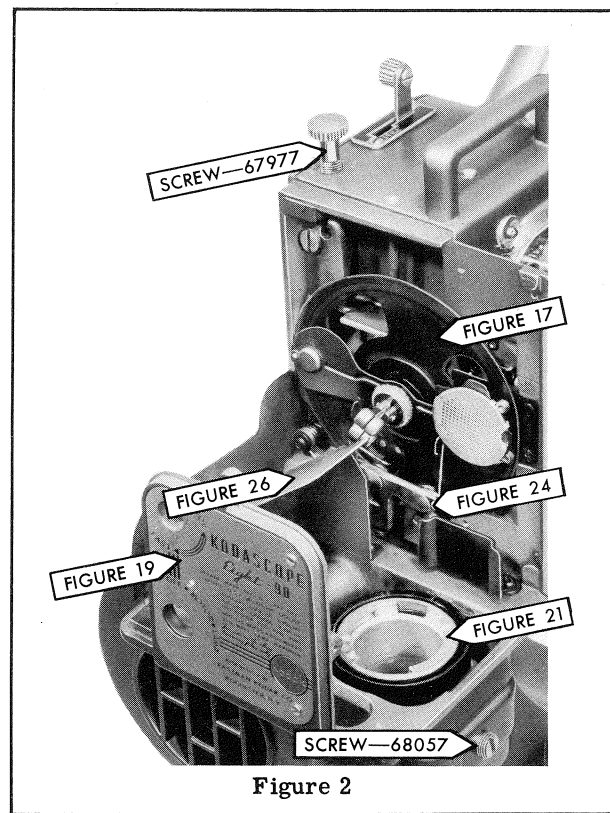
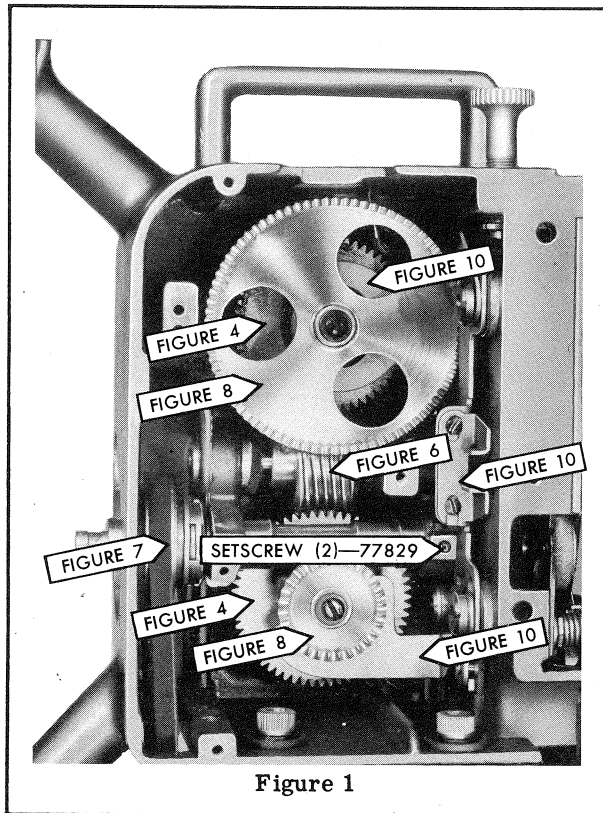
FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.
10	84558							Finger - Switch control	1
10	98939							Screw - Switch control finger to cam lever	2
25	74087							Lamphouse Assembly	1
WD	63089							Cord - Extension	1
27	68009							Kodak Projection Ektanon F/1.6 Lens	1
27	HE14917							Stud - Focusing	1
	54909							Lamp - Projection, 750 watt, 115 volt T-12 C-13 D filament prefocus base	1
Use all parts as listed for the Kodascope Eight-90 except omit the following:									
	86955							Mechanism Housing Assembly	1
	84505							Shaft - Rewind flexible drive	1
	84507							Shaft - Take-up flexible drive	1
	84568							Cover - Fan housing	1
	106306							Nameplate	1
	86956							Base Assembly	1
	84574							Screw - Elevating	1
	84577							Bracket - Elevating	1
ADD THE FOLLOWING PARTS:									
3	109200							Mechanism Housing Assembly (listed Parts are same as Model Eight-90)	1
15	84621							Shaft - Rewind flexible drive	1
15	84622							Shaft - Take-up flexible drive	1
19	84623							Cover - Fan housing	1
19	106307							Nameplate	1
11	109197							Base Assembly	1
11	84111							Screw - Elevating	1
21	84089							Bracket - Elevating	1
Parts List indentations indicate assembly relationship.									

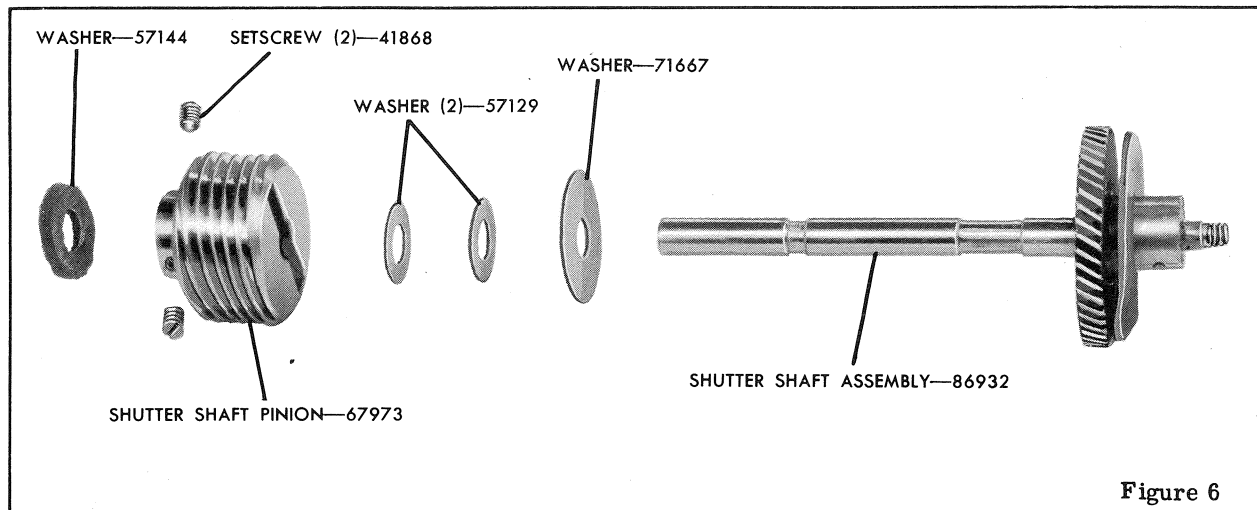
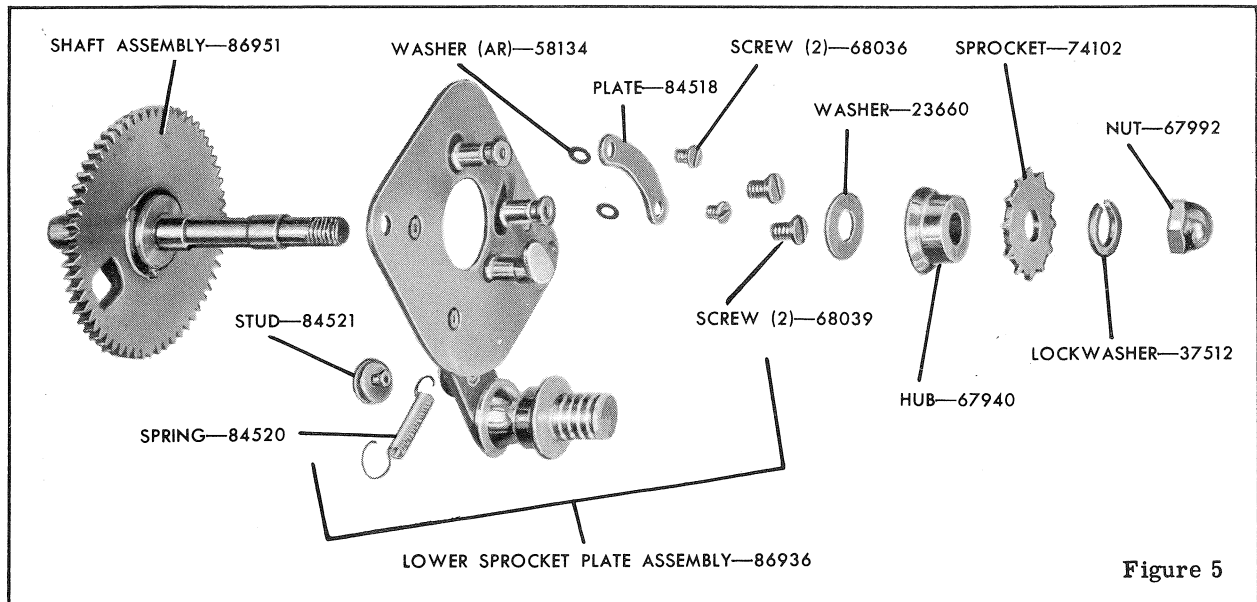
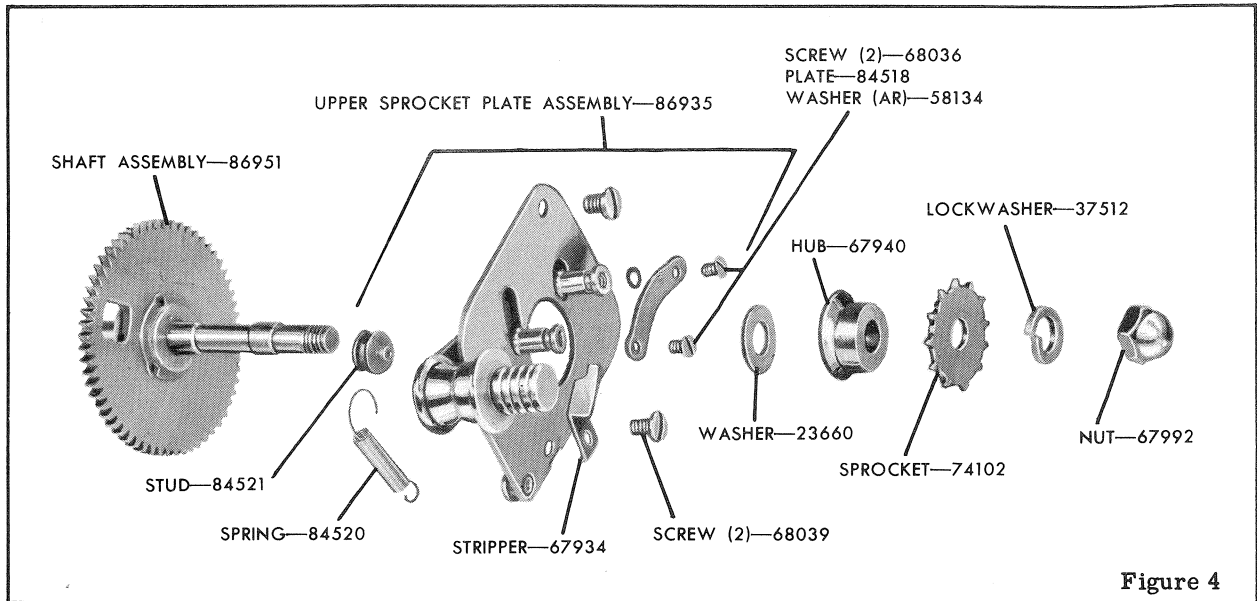
## NUMERICAL LIST

PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.
19705	5	11	42190	2	9	49379	5	11
23660	2	4,5	42701	3	16	49402	4	12,21
30511	2,3,4	3,9,10,12	42959	2,3,4	9,10,	49857	5	23
33640	2,4	7,9			12,13	53768	5	20
33992	4	18	45322	2	3	54909	6	
37512	2	4,5	48023	3	16	56066	4	11
39401	3	7	48829	3	16	56123	4	12
41868	4	6,18,22	48969	5	17	57032	2	27

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PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.
57033	2	27	76726	2	3	84593	2	3
57098	2	3	77065	5	20	84594	4	17
57115	5	11	77542	4	18	84603	4	24
57129	2,3	6,7	77829	3	1	84607	4	18
57144	4	6	81138	4	11	84609	4	18
57155	3,5	12,21	83813	5	23	84614	4	18
57434	5	21	83816	5	23	84621	6	15
58134	2	4,5	83829	4	18	84622	6	15
58969	4	11	83830	5	23	84623	6	19
60027	3,5	8,24	84036	2	3	86930	5	17
61100	4	7,12	84071	4	12	86932	2	6
61624	4	7	84077	3	7	86935	2	4
62083	3,4	7,8	84089	6	21	86936	2	5
63089	6	WD	84111	6	11	86937	3	15
63841	5	20	84164	2	3	86938	2	3
64777	5	20	84166	5	23	86940	3	12
65347	5	20	84191	3	15	86941	5	17
65585	3	16	84201	2		86942	3	10
65658	3	15	84228	4	11	86943	3	10
66012	4	24	84233	3	15	86944	3	10
67934	2	4	84502	2	3	86946	3	13
67940	2	4,5	84505	3	15	86951	2	4,5
67971	2	3	84506	4	22	86954	5	14
67972	2	3	84507	3	15	86955	2	3
67973	4	6	84512	2	8	86956	5	11
67977	4	2	84513	3	8	88193	5	26
67979	4	7	84518	2	4,5	98539	2	3
67980	4	7	84520	2	4,5	98561	2	27
67992	2	4,5	84521	2	4,5	98562	5	19
68000	5	26	84532	4	22	98939	6	10
68005	5	20	84544	4	12	101337	4,5	7,24,26
68009	6	27	84546	3	7	101372	3	12
68017	4,5	19,22,25	84547	3	7	101431	5	21
68020	3	16	84548	3	7	104612	4	22
68027	4	7	84551	2	3	104915	4	18
68028	4	17	84552	2	3	106025	3	18
68030	5	17	84553	3	10	106095	3	16
68031	5	17	84558	6	10	106097	3	15
68034	5	24	84560	2	9	106098	3	15
68035	4,5	19,20,25	84561	2	9	106106	3	16
68036	2	4,5	84564	5	23	106107	3	16
68039	2,4	4,5,21,27	84565	4	24	106109	3	16
68057	5	2	84566	4	25	106112	3	15
68059	5	23	84567	4	18	106248	4	25
69185	5	19	84568	5	19	106261	5	18
69345	5	21	84571	4	11	106262	5	26
71177	4	18	84573	4	11	106263	5	18
71368	5	19	84574	5	11	106285	2	3
71638	5	21	84575	5	11	106306	5	19
71667	2	6	84577	4	21	106307	6	19
74087	6	25	84578	5	23	107101	5	18
74093	5	14	84580	3	16	109004	4	12
74095	5	17	84586	3	8	109041	3	7
74097	4	7	84587	3	8	109174	5	21
74099	5	24	84588	3,6	15	109197	6	11
74102	2	4,5	84589	3	15	109198	5	20
74103	2	3	84590	3	7	109200	6	3
74904	5	25	84591	3	10	109205	4	18
75582	4	17	84592	5	17	109243	3	7
76190	4	17				HE14917	6	27





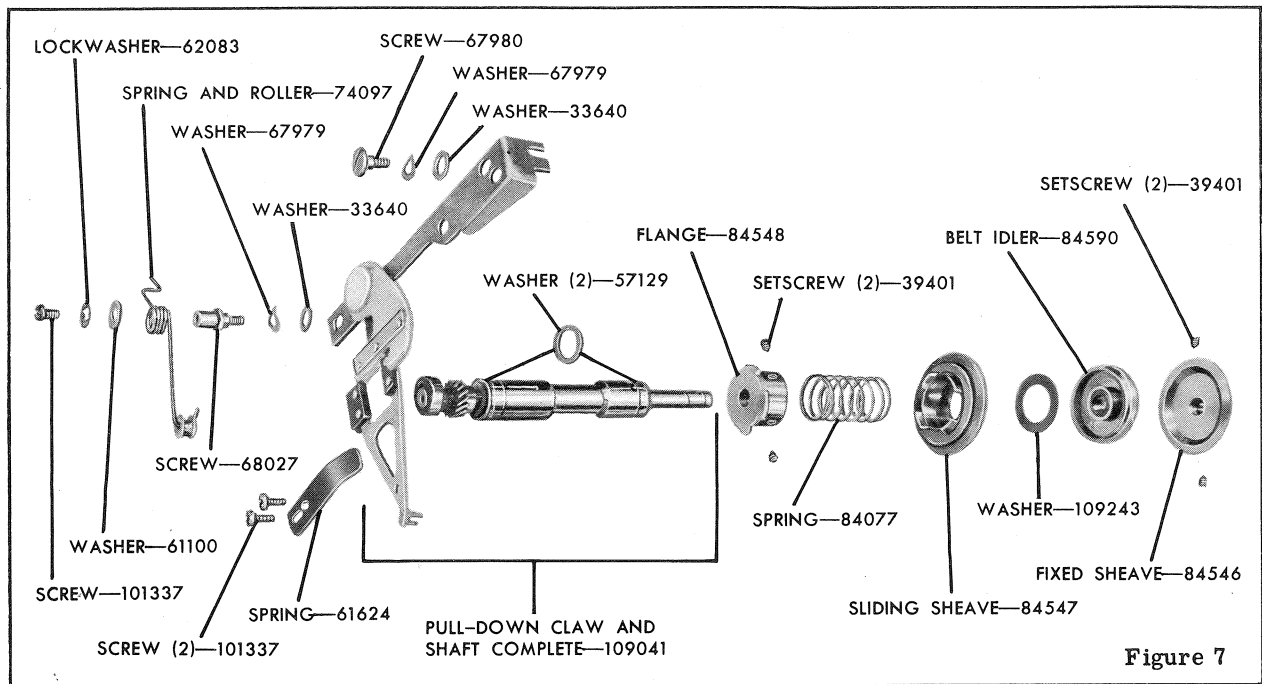


Figure 7

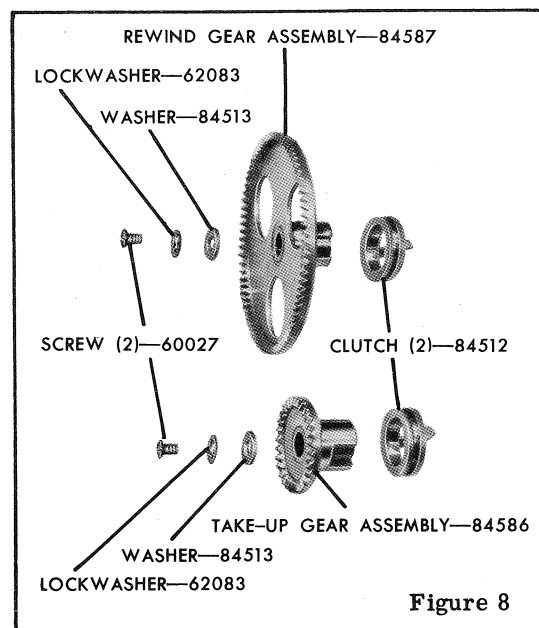


Figure 8

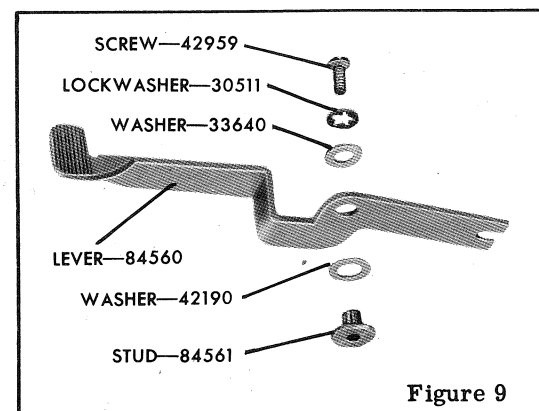


Figure 9

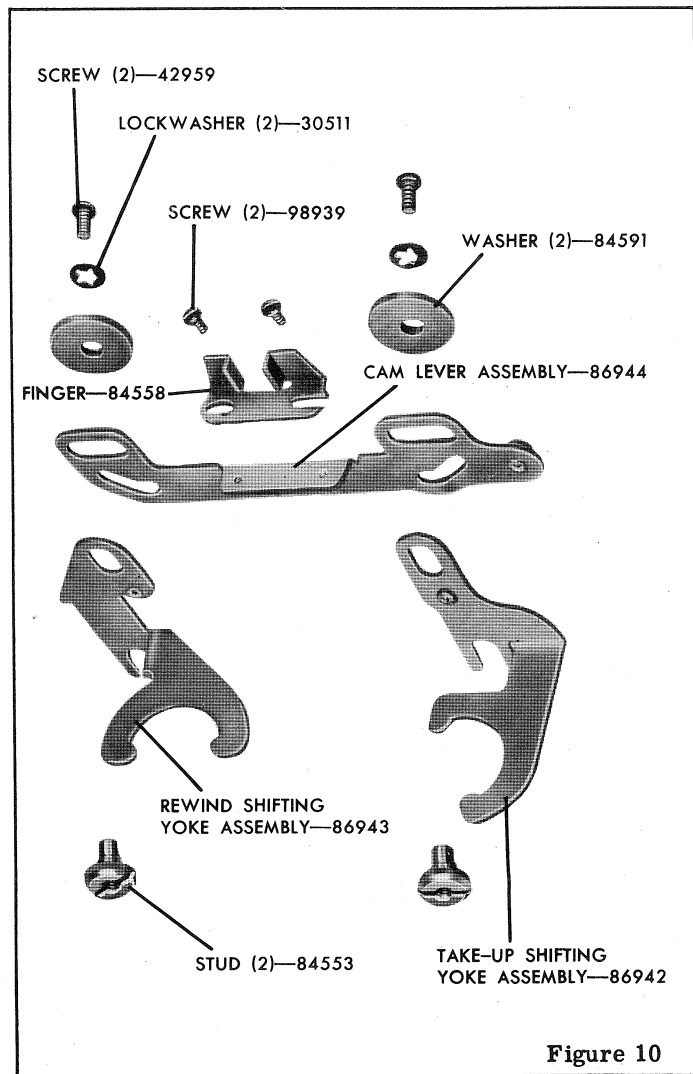
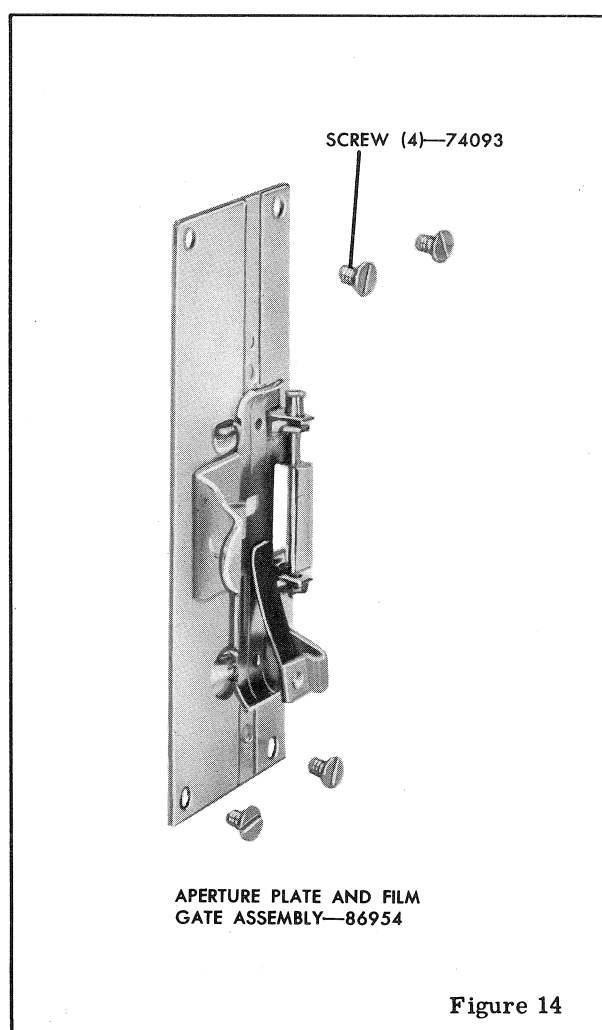
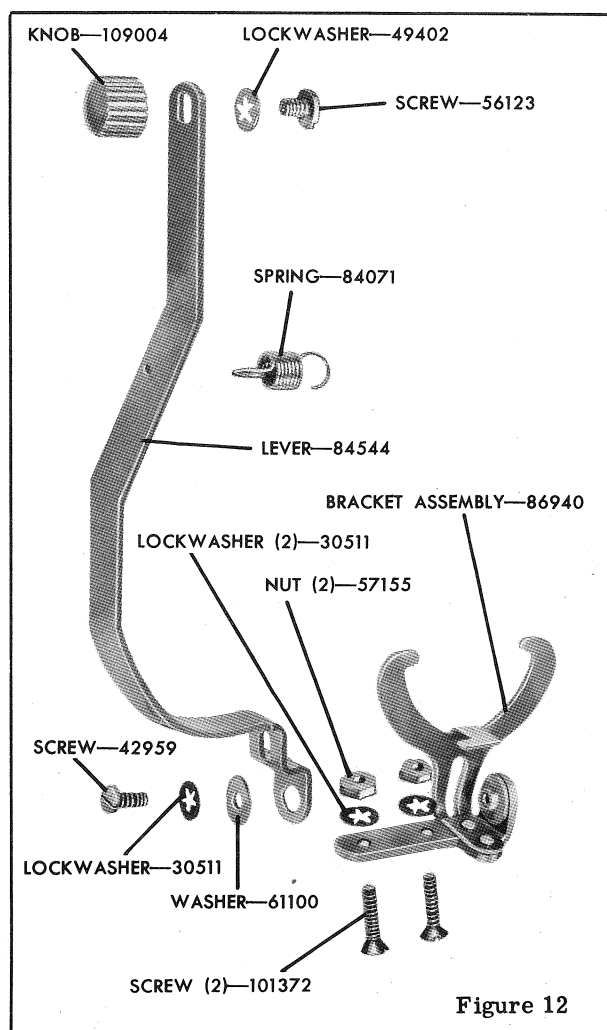
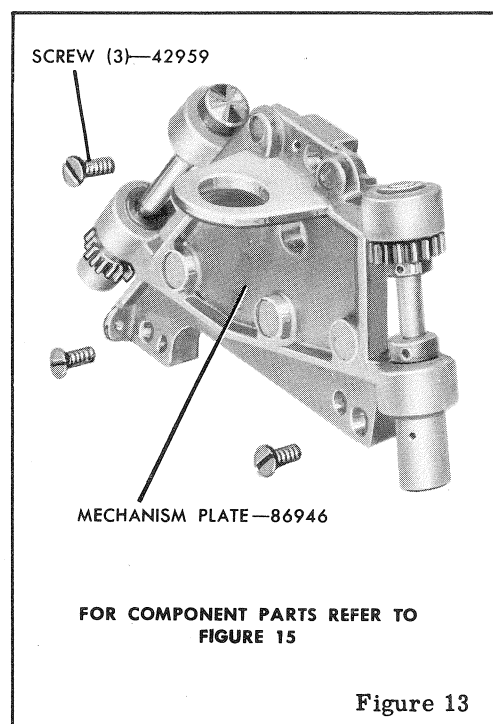
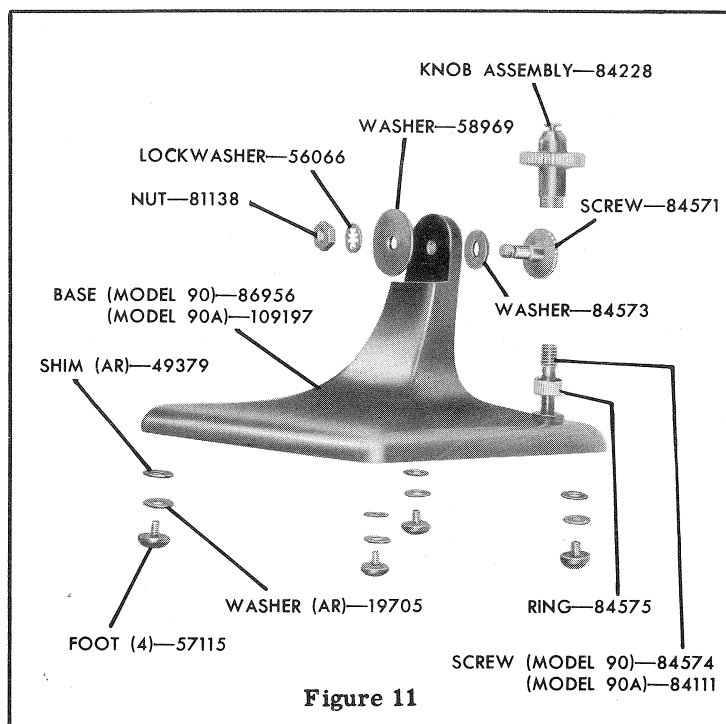
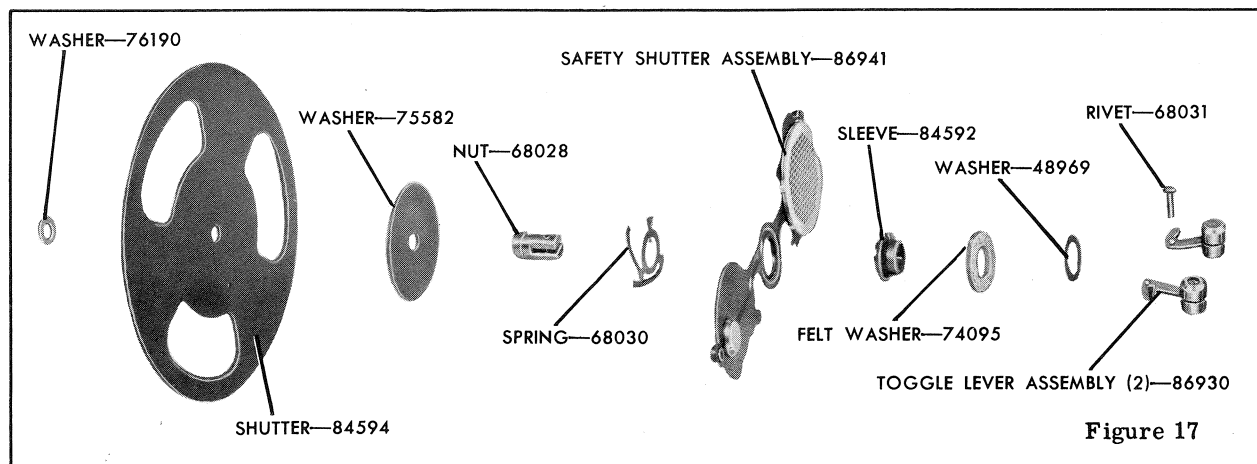
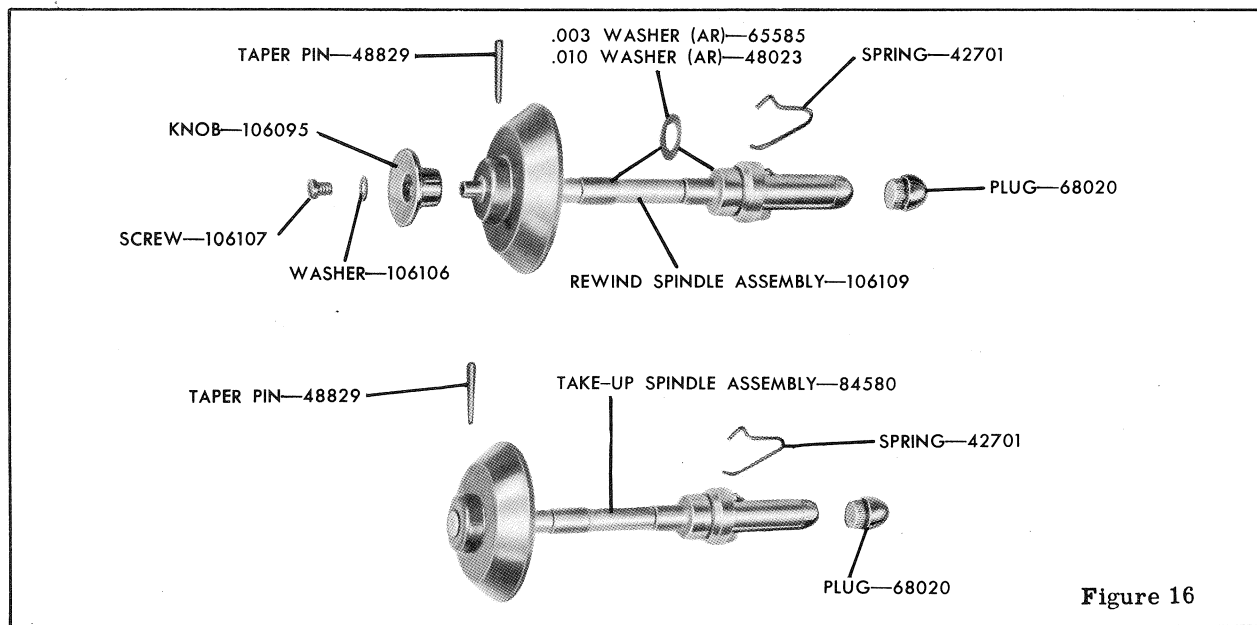
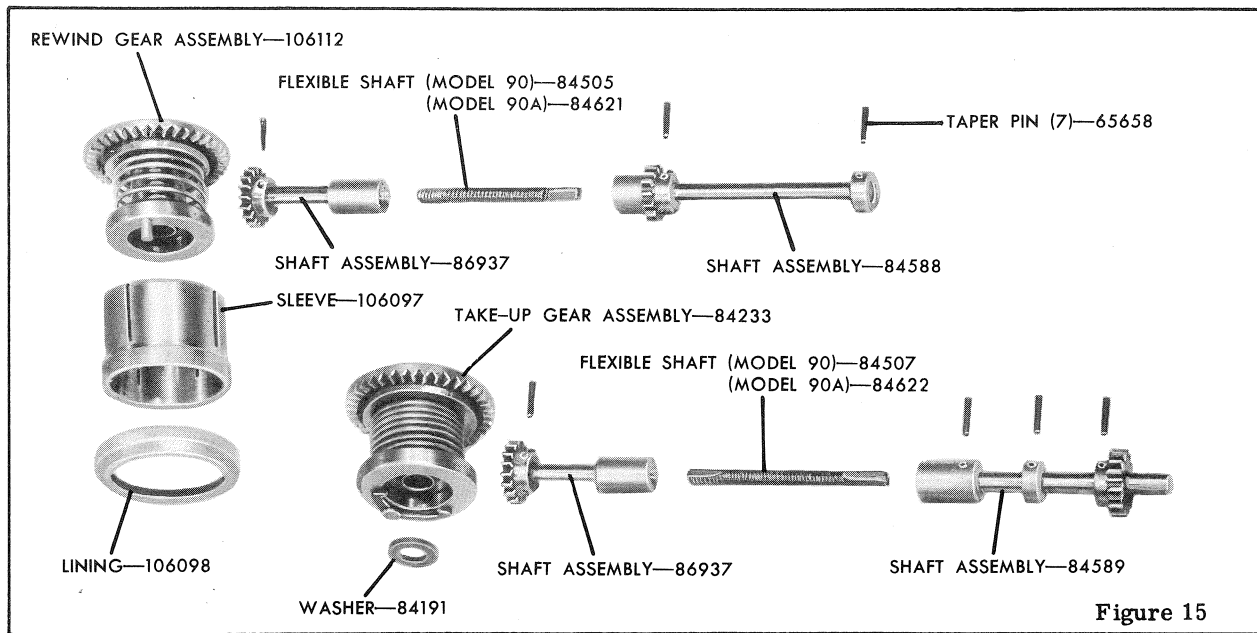
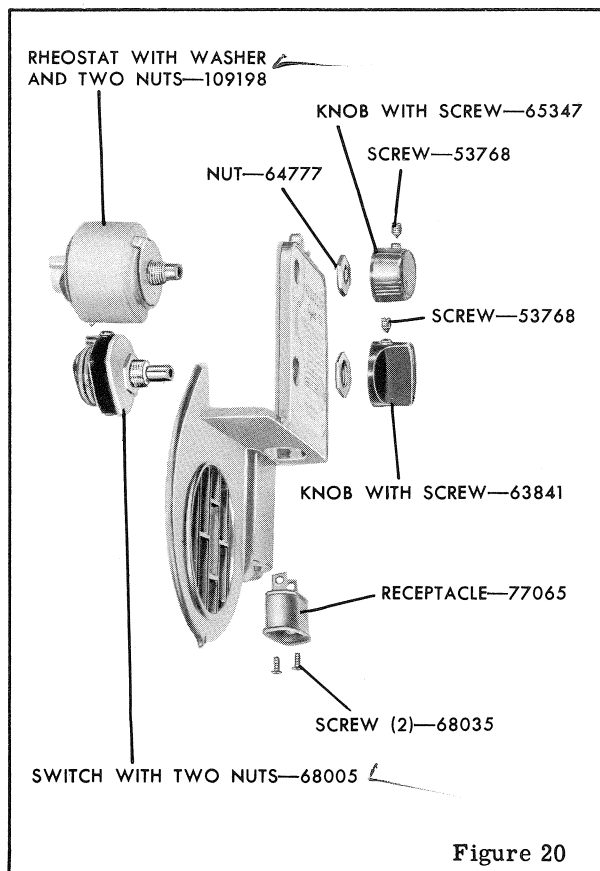
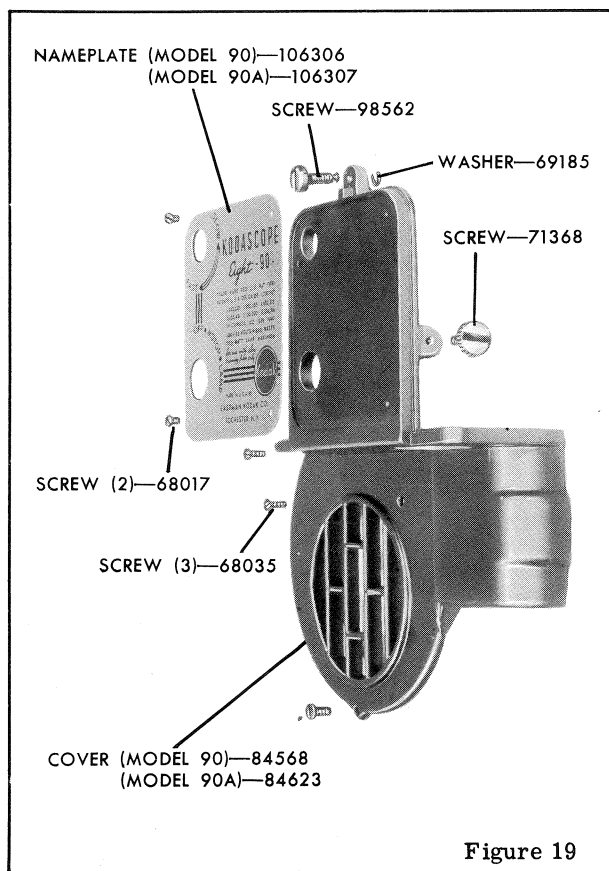
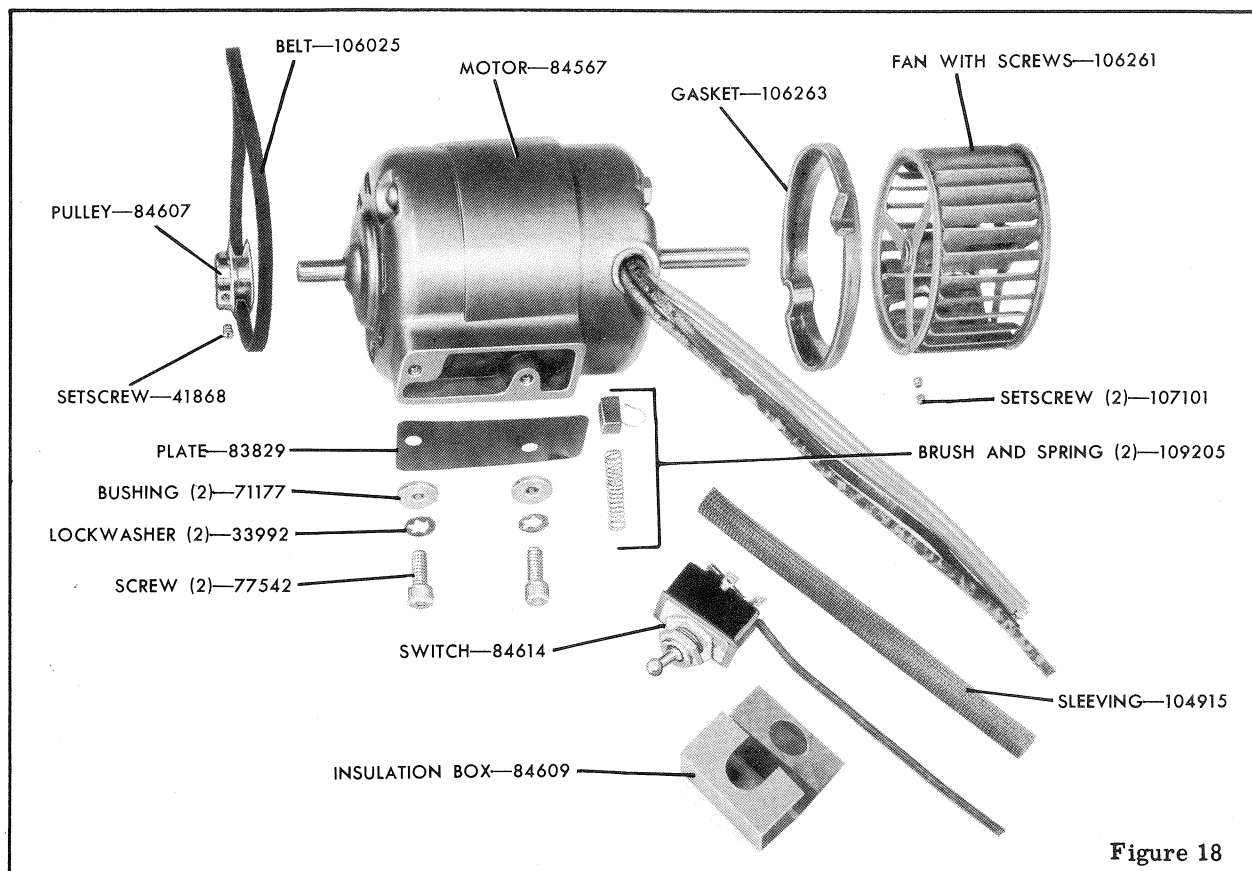


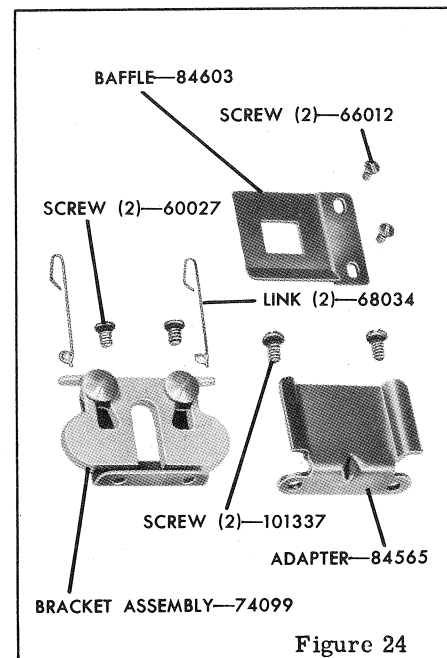
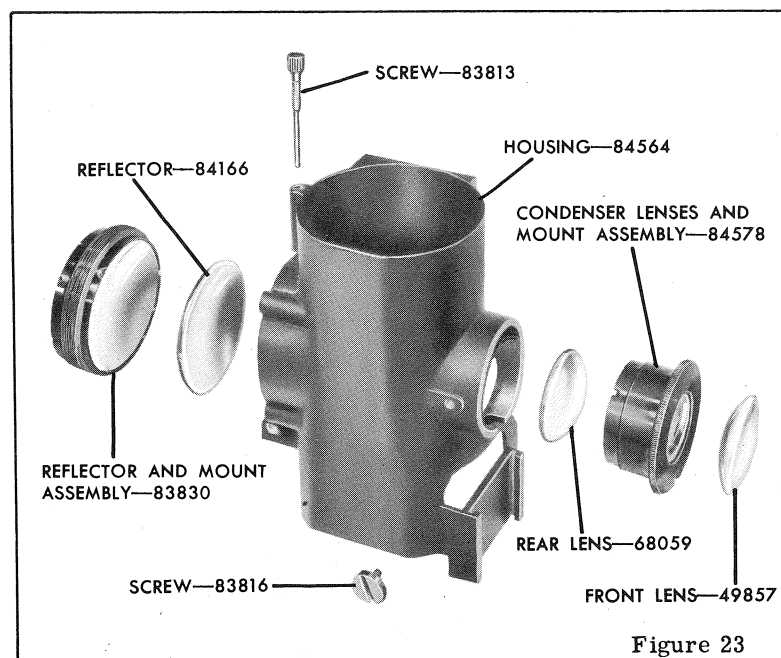
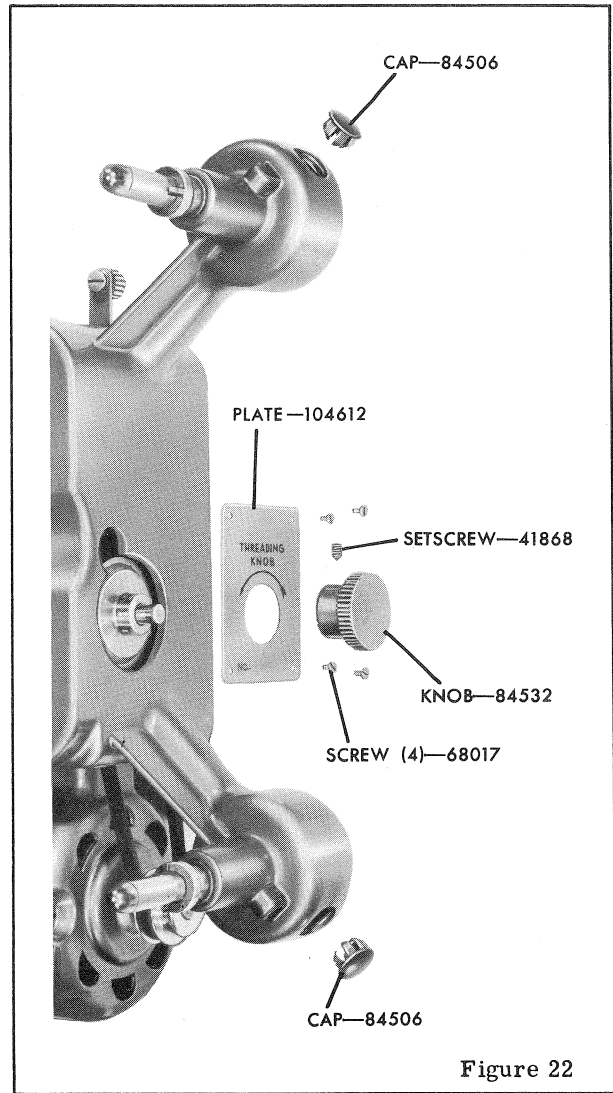
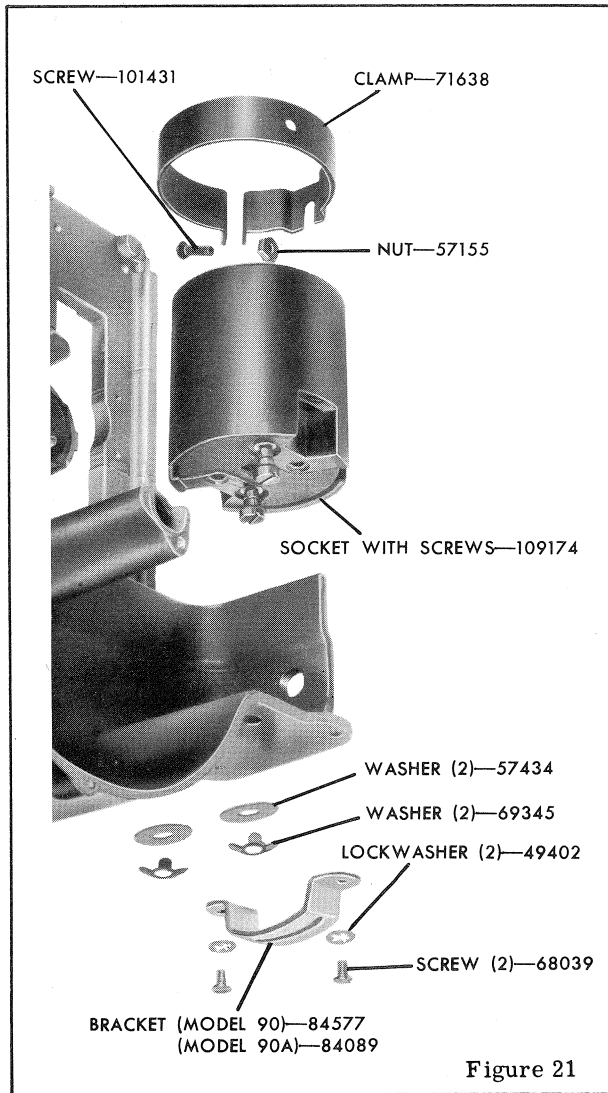
Figure 10











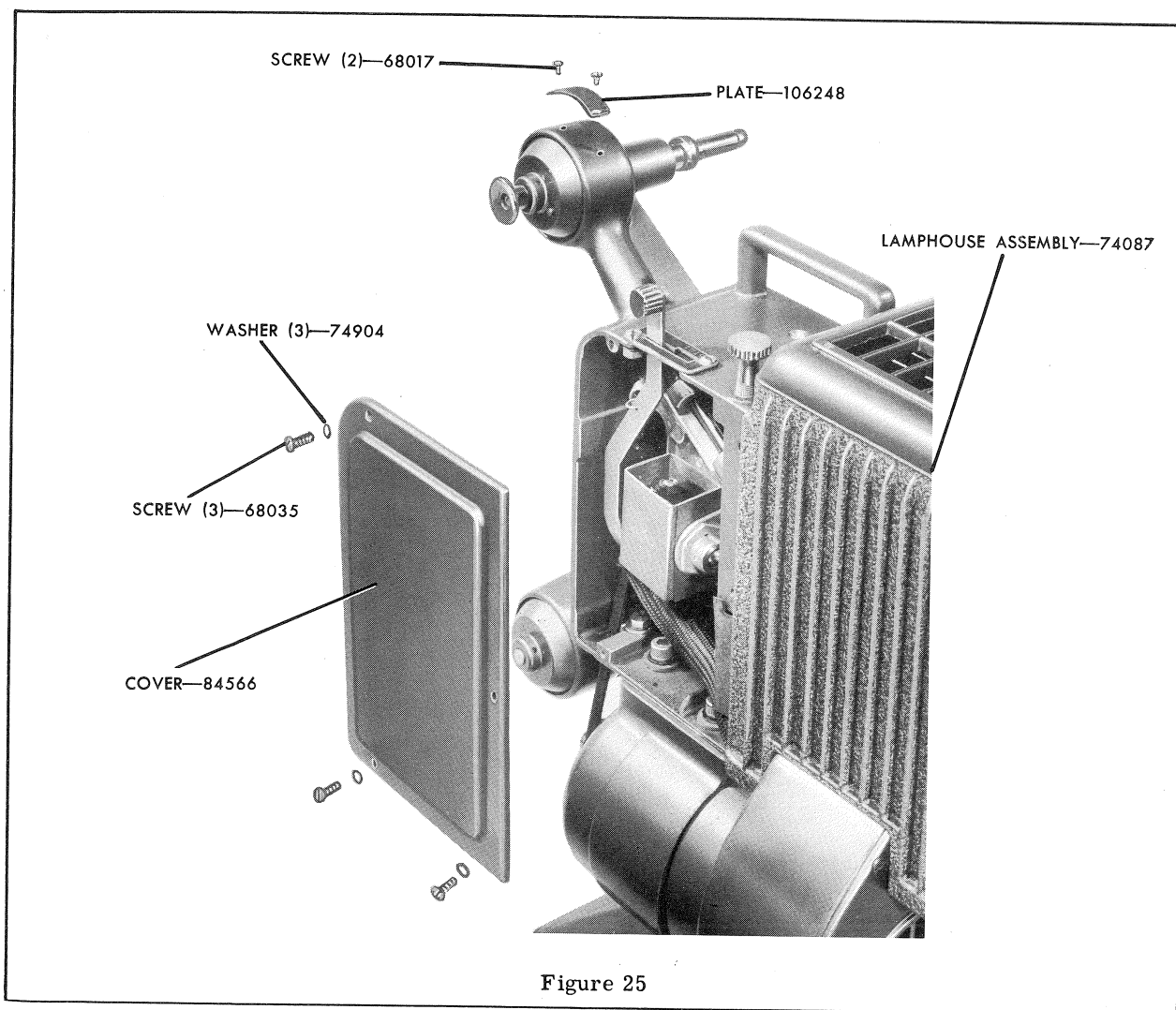


Figure 25

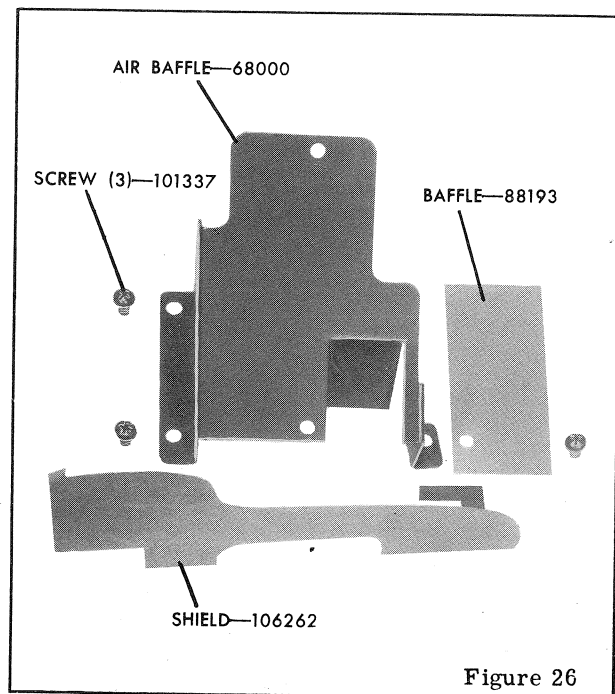


Figure 26

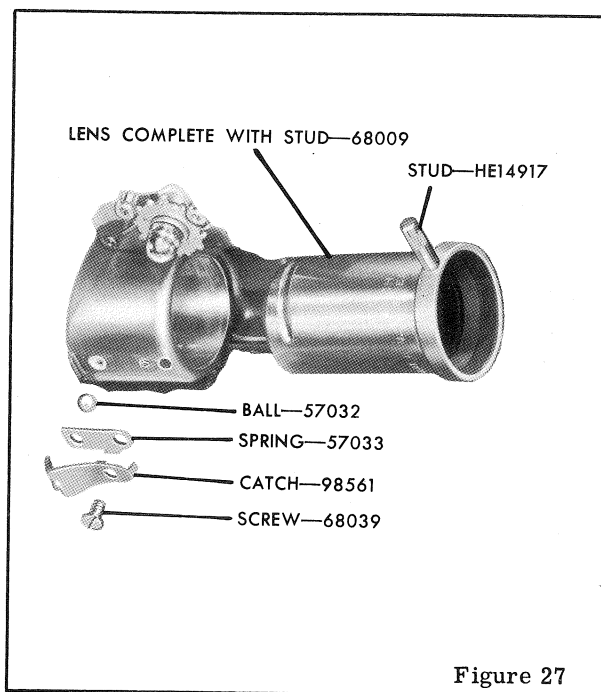


Figure 27

Always give PART NUMBER and NAME when ordering parts

