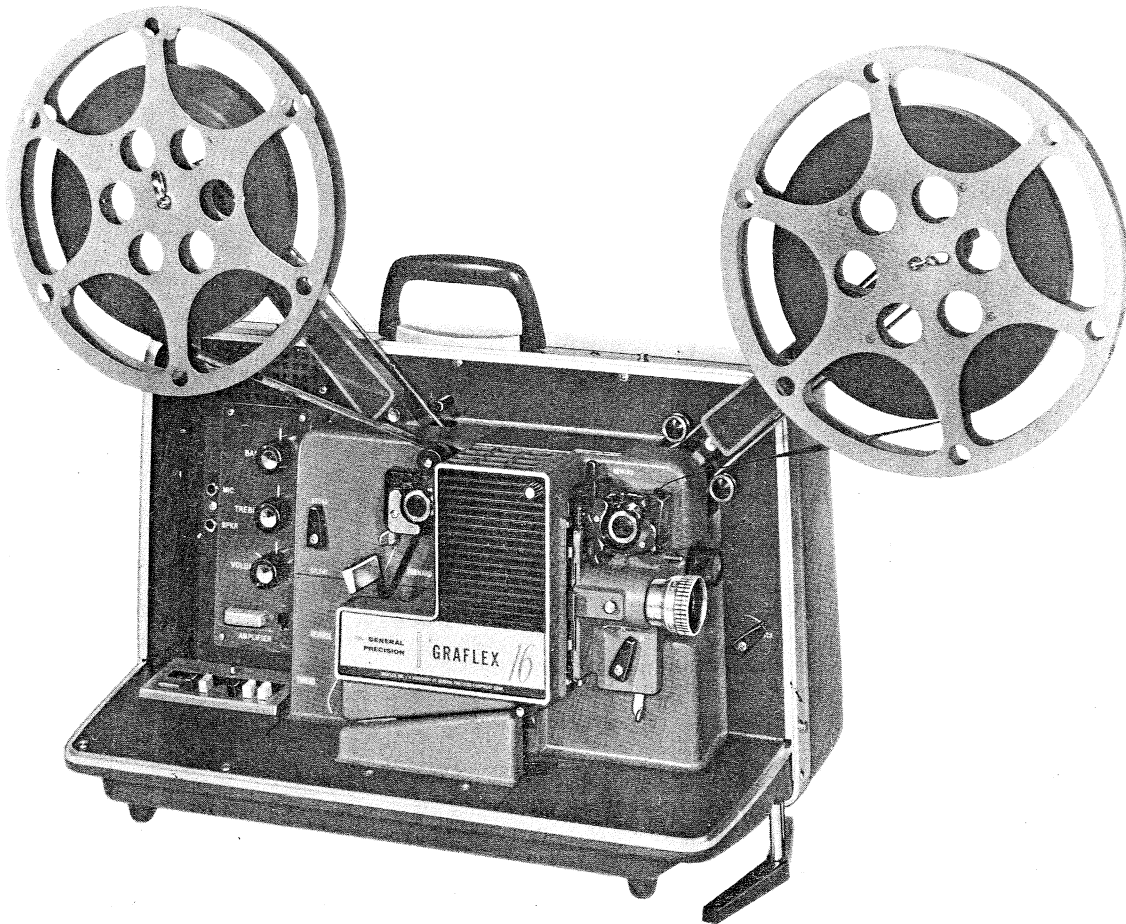


VOLUME 6812 PR

price \$7.50



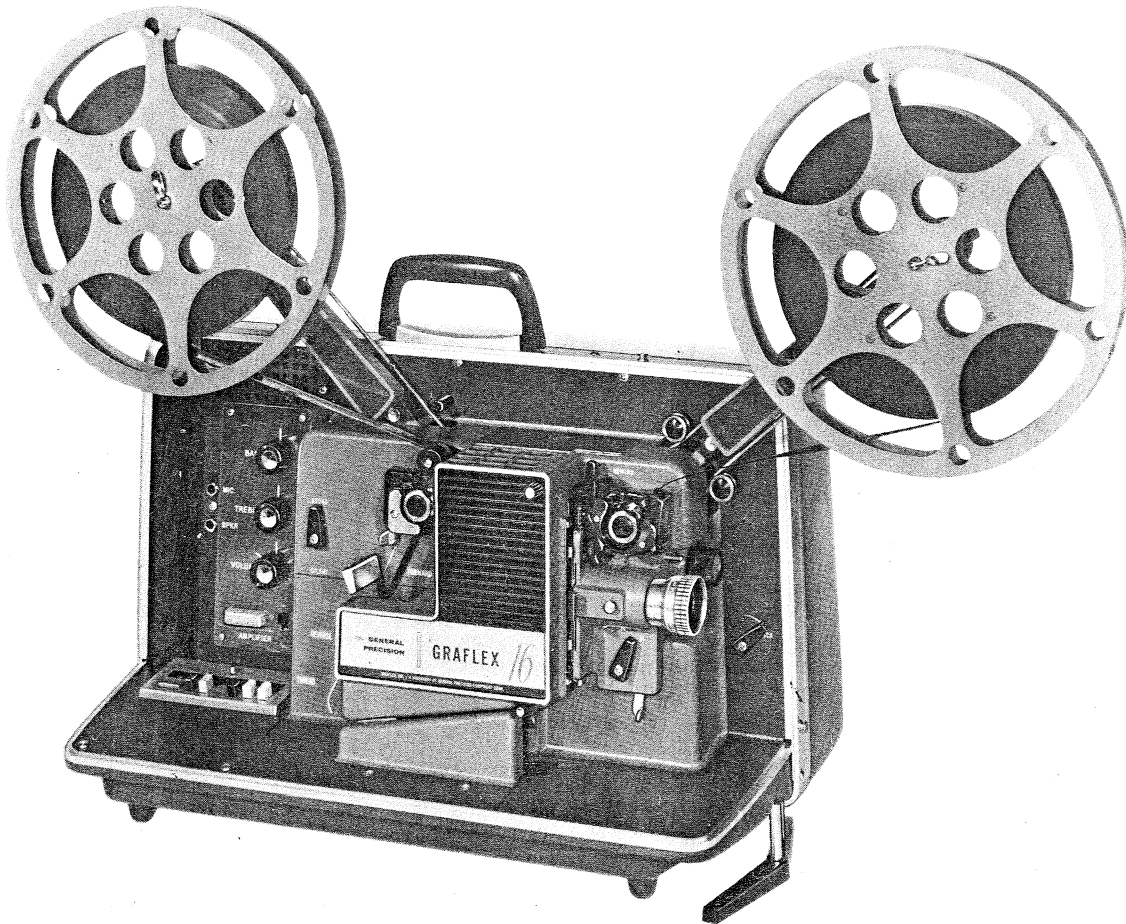
GRAFLEX 16mm PROJECTOR

SERVICE INSTRUCTIONS AND PARTS LIST

SINGER
EDUCATION & TRAINING PRODUCTS

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GRAFLEX 16mm PROJECTOR

SERVICE INSTRUCTIONS AND PARTS LIST

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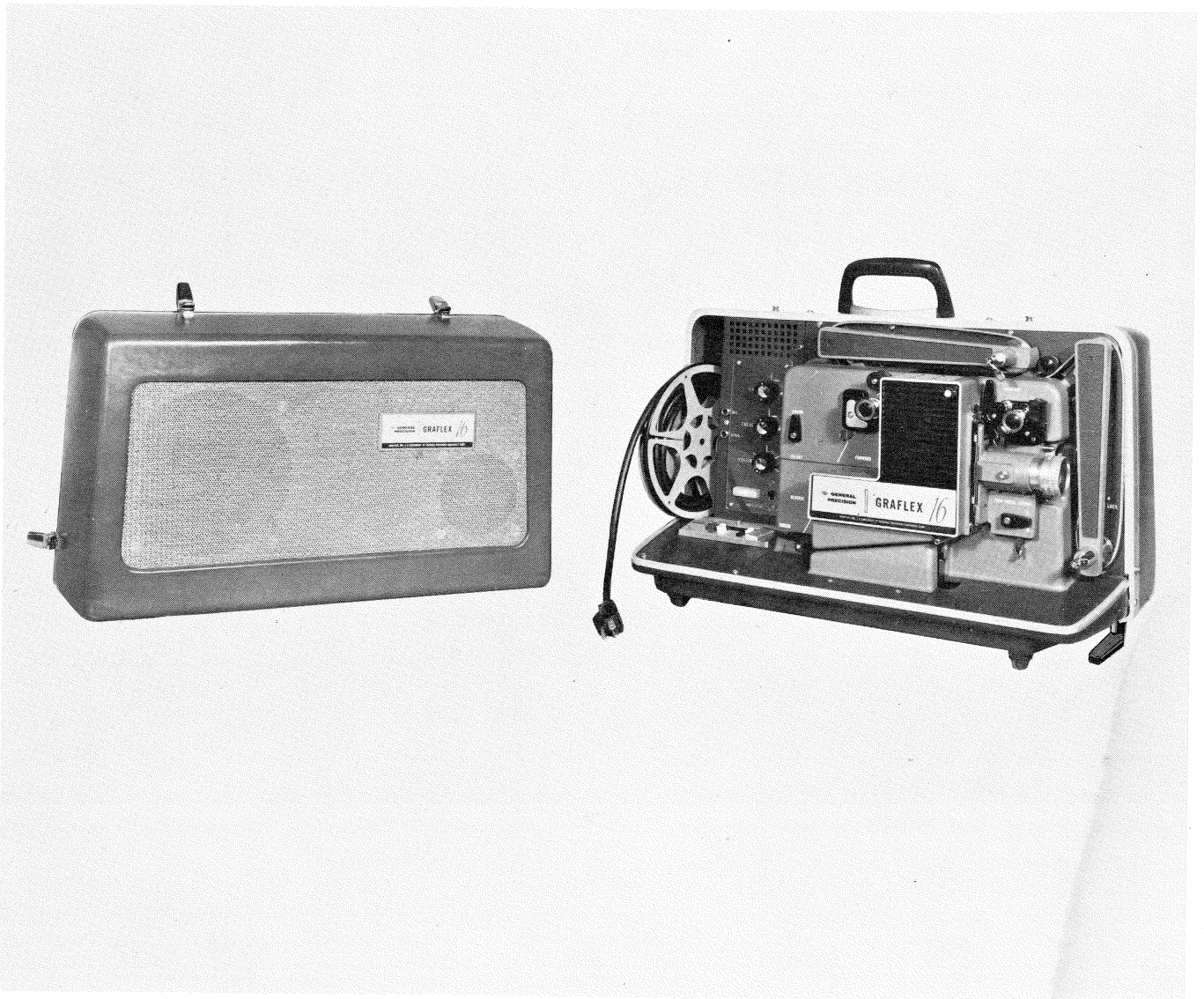
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INTRODUCTION

This manual provides service instructions for the Graflex 16 Series 16 mm sound motion picture projectors (700 Series, 800 Series, 900 Series, 900 Synchronous Series, Model 930 TV, and 900 Magnetic Series). For the convenience of the user, the manual is divided into eight sections: Principles of Operation, Operational Check and Troubleshooting, Service Procedures, Illustrated Parts List Introduction, 900 Series Parts List, 800 Series Parts List, Subassemblies Parts List, and 700 Series Projector Parts List, and Modification.

Section I contains fundamental explanations of the operating principles of the projector. The Operational Check and Trouble and Remedy Table of Section II provides an immediate reference for quick and positive localization of malfunctions. Section III contains service procedures which are based on 900 Series Projectors. Differences in service Procedures for other models are also indicated in this section. Sections V through VIII contain illustrated Parts Lists which clearly describe the differences among models. Section IV describes the use of these parts lists.



GRAFLEX 16 PROJECTOR

SECTION I

PRINCIPLES OF OPERATION

A. DRIVE SYSTEM

A 1/30 - hp induction motor, or 1/20 - hp synchronous motor, coupled to the main drive shaft by a belt and pulley arrangement operates the mechanisms which move the film through the film path of the projector.

B. FORWARD OPERATION

Film is fed by a feed sprocket into a channel formed by the aperture plate assembly and the film pressure shoe. A claw enters the film sprocket holes near the bottom of the aperture and transports film downward while it is being held in position by a spring-loaded film pressure shoe and is fed continuously by the feed sprocket. The film emerging from the channel is looped downward; this portion of the film is called the "lower loop". An automatic measurement of the film is made over the guide rollers of the threading control arm when the film is threaded. The loop is formed when the Master Control Lever is moved from the THREAD position to the FORWARD position. (The loop is necessary for synchronization of sound with the picture.) The film then passes over the sound head. A roller on the pressure roller arm assembly exerts a downward force on the film immediately in front of the sound head while another roller, on the threading control arm assembly, performs the same function on the opposite side of the sound head. The film exerts sufficient pressure on the sound drum to cause it to rotate. A balanced flywheel, attached to the rotating sound drum, stores rotational energy and stabilizes rate of film travel as it passes over the sound head. The film is then drawn up to the take-up reel by the take-up sprocket.

The take-up clutch arm pulley fits into the hub of the take-up sprocket gear assembly, the inner surface of which is lined with a felt liner. The torque of the take-up clutch arm pulley is governed by a weight-sensitive clutch drive. The arm assembly of the take-up clutch arm is coupled to an eccentric on the shaft of the Master Control Lever by a rod and bracket. When the Master Control Lever is placed in the FORWARD position, the rod moves slightly out of the slot, removing the downward pressure of the rod on the arm assembly. This permits a spring on the rod to apply upward pressure on the arm assembly. A slight off-center movement of the pulley places it against the felt liner and it is driven by the inner surface of the hub (through contact with the liner). The amount of force exerted by the pulley hub on the liner determines the torque applied to the pulley; therefore the increasing weight of the film on the reel is utilized to increase the torque. The upward pressure of the spring against the bottom of the arm assembly at one end exerts a constant force sufficient to supply an initial fixed torque drive for reels containing very little film.

C. REVERSE OPERATION

Placing the Master Control Lever in the REVERSE position rotates a slotted cam plate on the control lever shaft. The actuating lever of the switch engages a slot in the cam plate on the control lever shaft which switches the connections to the drive motor winding. The rod of the take-up clutch arm is pulled down by the eccentric on the Master Control Lever, relieving the upward pressure on the spring. The pulley is concentric with the hub of the take-up drive gear and is disengaged from the clutch liner, allowing the take-up reel to rotate freely as the film is drawn downward by the take-up sprocket. The film is then drawn up to the supply reel by the supply reel sprocket. The supply reel is driven by the film feed clutch assembly pulley.

The film feed clutch assembly pulley is driven in reverse by the uni-directional clutch. . . driving clutch plate fixed to the shaft of the gear and rotating the driven clutch plate by friction on the clutch facing. When the cam plate (coupled to the driven clutch plate) is turned in the reverse direction, three spring-loaded balls become wedged against the pulley hub. Turning the cam plate in the forward direction releases the pressure of the balls against the pulley hub, and the pulley becomes free-wheeling.

D. REWIND OPERATION

Rewinding film directly from the take-up reel to the supply reel is facilitated by altering the operation of the film feed clutch assembly while the drive system is operated in reverse. The driving clutch plate is directly coupled to the driven clutch plate, by-passing the clutch facing. Since the direct drive clutch plate assembly is substituted for the slipping action of clutch facing between the two plates, a greater torque is applied to the uni-directional clutch and the reel drive belt pulley.

E. SOUND & SILENT SPEEDS

Placing the SOUND/SILENT control lever in the SILENT position rotates an eccentric approximately 180 degrees (some model projectors do not have this lever and operate at SOUND speed only). A slot in the belt shift fork lever on the drive belt shift fork assembly straddles the pin portion of the eccentric, rotating the fork through a small arc. As the fork position shifts, the drive belt is "carried" to different steps on the pulleys causing a change in the projector speed. Returning the SOUND/SILENT lever to the SOUND position rotates the eccentric in the opposite direction, causing a reversal of the mechanical operations described previously.

F. PROJECTION OPTICAL SYSTEM

The projector casting is designed to accommodate a blower motor and is specially formed to duct the air intake of the blower directly around the projection lamp. A dichroic reflector built into the lamp reflects visible light forward through the optical system but allows the heat producing infrared rays to pass through it to the rear of the projector. The rotary shutter, which is mounted on, and rotates with, the main drive shaft, cuts off the light during periods of film movement to prevent blurring of the image. The shutter also prevents flicker of the projected image.

NOTE:

"Still" model projectors are provided with a 2-3 blade automatic shutter. Other models have a standard 3 blade shutter.

The automatic shutter consists of three blades of equal size. One blade is fixed; the other two are movable and are controlled by a spring-loaded actuator plate. The fixed blade cuts off light from the aperture while the film is in motion; the other blades interrupt the light additionally at regular intervals in between. When the projector drive system is operated at the SOUND speed (24 frames per second), the movable blades of the shutter move into coincidence as centrifugal force is exerted on the actuator plate. When the drive system is operated at SILENT speed (18 frames per second), the tension of the springs overcomes the decrease in centrifugal force caused by decrease in rotational speed, and the blades are pulled back to form the three-blade configuration. When the projector is operated at SOUND speed, under certain conditions, the intensity of the light projected on the screen may be too great, even with the projection lamp operating at the NORM (normal) level of brilliancy. To permit further reduction of light intensity, the shutter is equipped with a latch which, when pressed inward, locks the inner and outer shutter blades to provide a fixed three-blade configuration.

The still (safety) shutter is composed of a fluid clutch and a blade with an optical filter. One end of a return spring is attached to the blade and the other end to a link. Rotation of the main drive shaft causes the shutter to move out of the optical path. The return spring and link limit the shutter movement. A slot in the link engages a pin on a bracket; this determines the maximum movement of the shutter. The torque, caused by rotation of the drive shaft, overcomes spring tension, and the limited link movement on the pin prevents excessive movement of the shutter. Depressing the STILL button cuts the power from the drive motor, stopping the main drive shaft. The still shutter is then pulled into the optical path by the return spring.

G. SOUND OPTICAL SYSTEM

As the film is driven through the projector, the sound track portion of the film passes between the sound optics cartridge and the phototransistor unit. The sound optics cartridge shapes and focuses the light from the exciter lamp into a rectangular beam, which passes through the sound track onto the phototransistor unit. Variations in the sound track image density, or area, cause corresponding fluctuations in the amount of light transmitted to the phototransistor and results in a voltage change which is applied to the amplifier.

H. MAGNETIC OPTICAL SYSTEM

Projectors incorporating the magnetic optical system are designated by the letter "R" (record and playback) or the letter "P" (playback only) as part of the model number. This system allows the use of magnetic striped film when the Master Control Lever is in the FORWARD MAG (magnetic) position. The system is disengaged when the Master Control Lever is in the FORWARD OPT (optical) position.

1. Models "R" & "P"

With the Master Control Lever in the MAG position, the Record/Play Knob in the PLAY position ("R" models only), and the Erase Head Shift Knob in the PLAY position ("R" models only), the film passes beneath the Record/Playback Head where it is energized by magnetic variations on the magnetic stripe. These variations are converted into electrical impulses which are applied to the amplifier to produce sound.

2. Model "R" Only

With the Master Control Lever in the MAG position, the Record/Play Knob in the RECORD position, the Erase Head Shift Knob in the RECORD position, and a microphone plugged into the MIC jack on the amplifier, voice or music can be recorded on the magnetic striped film regardless of previously recorded material. The Level Control Knob and the V. U. Meter control the audio input level.

SECTION II

OPERATIONAL CHECK AND TROUBLESHOOTING

A. GENERAL

This section includes an Operational Check, a Trouble and Remedy Table, Projector Wiring Diagrams, Projector Schematic Diagrams, and Amplifier Schematic Diagrams.

B. OPERATIONAL CHECK

It is recommended that SMPTE Jiffy Test Film be used for this check.

1. Connect power cord to AC wall outlet. Insert speaker plug into SPKR (speaker) jack (800 Series only). Swing reel arms up until they lock.
2. Press RUN button and check to see that sprockets and reels turn properly. Listen for unusual noises.
3. Press LAMP NORM button and check for screen illumination and even distribution of light. Press HI button; screen illumination should increase.
4. Sound/Silent Projectors only - Press STILL button. Illumination should decrease and motion of sprockets and reels should stop.
5. Press OFF button.
6. Turn Amplifier On - Lamp Test.
 - a. All 900 Series Projectors - Pilot lamp should glow. Threading lamp is on independent switch that should be placed in ON position to test.
 - b. 800 Series - Both threading and pilot lamps should glow.
 - c. 700 Series - Not applicable.
7. Move Master Control Lever to THREAD position and thread film into projector.
8. Move Master Control Lever to FORWARD position. (On 900 Series R and P Models, place Master Control Lever in FORWARD OPT position.)
9. Check for proper threading by rotating the inching knob and checking the film movement through the projector.
10. Press RUN button and observe film movement through the projector.
11. Check for proper take-up clutch film tension. Refer to Section III, para. E. 8, for proper procedure.
12. Check picture for focus, double image, or ghost.
13. Adjust framing knob so frame line shows on screen. Check for picture jump, side shake or weave.
14. Rotate FILM PRESSure ADJUSTment Lever from LO to HI. Film should run best when noise is at its lowest level.
15. Set TONE control(s) to normal. Adjust VOLUME control to comfortable listening level. Listen for full range of tones, wow, or flutter.
16. Rotate TONE control(s) and listen for change in pitch.
17. Advance VOLUME control to a loud listening level. Check for case rattle or buzz.
18. Reduce volume to normal room level.
19. Rotate speed control to SILENT position (Sound/Silent Projectors only). Projector should slow down to 18 frames per second. Shutter should shift from 2 blade position to 3 blade position on automatic shutter models.
20. Return speed control to SOUND position (Sound/Silent Projectors only). Projector should return to 24 frames per second. Shutter should shift back to 2 blade position.
21. Reduce volume to minimum level and move Master Control Lever to REVERSE position.
22. Check operation of supply reel and observe film handling in projector. Return Master Control Lever to FORWARD position and run balance of film through projector.
23. Press OFF button. Thread film from take-up reel to rewind reel. Move Master Control Lever to REVERSE position and press RUN button.
24. Pull REWIND lever outward. Rewind reel should increase in torque and rewind film within flanges of the reel.
25. Load projector with a 2000-foot reel of film ... 1700 to 1800 feet on supply reel and balance on take-up reel. With speed control in SOUND position (if there is no speed control on projector, projector is in SOUND position), move Master Control Lever from FORWARD to REVERSE position; supply reel must take-up film loop within 2 to 5 seconds. Run film through projector, rewind film, unload and turn projector off.
26. Check elevation lock control by releasing elevating foot, extending it, and locking it in down position.

Steps 27 through 32 are applicable to 900 Series R and P Models only.

27. Thread projector with a reliable strip of pre-recorded magnetic striped film.

28. 900 Series R Models only - Place Record/Play Knob in PLAY position. Place Erase Head Shift Knob in PLAY position.

29. Place Master Control Lever in FORWARD MAG position.

30. Press RUN button.

31. Set TONE control to normal. Adjust VOLUME control to comfortable listening level. Listen for full range of tones, wow, or flutter.

32. Turn projector off and rewind film.

Steps 33 through 39 are applicable to 900 Series R Models only.

33. Thread projector with a known reliable test strip of magnetic striped film.

34. Place Record/Play Knob in RECORD position. Place Erase Head Shift Knob in RECORD position. Plug microphone into MIC jack on amplifier.

35. Place Master Control Lever in FORWARD MAG position.

36. Turn Amplifier on. Press RUN button.

37. Set Level Control Knob to hold the pointer on the V. U. Meter in the green region when recording.

38. When finished recording, place Record/Play Knob in PLAY position, Erase Head Shift Knob in PLAY position, and unplug microphone from amplifier.

39. Rewind test strip and play back recording. Check for clarity.

40. (ALL PROJECTORS) If all tests are satisfactory, proceed with Preventive Maintenance, Sect. III, para. F. If any portion of the test was unsatisfactory, refer to Troubleshooting, para. C. below for a diagnostic aid.

C. TROUBLESHOOTING

The purpose of the following tables is to list commonly encountered troubles and to indicate corrective repairs and adjustments. Generally, troubles caused by operational error are not listed as it is assumed the repairman is familiar with troubles of this type. Disassemble only as needed for repair. Before disassembly, check for loose or missing screws, or parts that are binding because of misalignment or lack of lubrication. Electrical troubleshooting will be facilitated by referring to the wiring and schematic diagrams following this table.

TROUBLE	PROBABLE CAUSE	REMEDY
1. Film Handling & Picture Troubles (NOTE - Test film must be in good condition.)		
a. Film slap	Claw protrusion or stroke out of adjustment	Adjust (Sec. III, para. E. 13)
	Pressure shoe out of adjustment	Adjust (Sec. III, para. E. 3)
	Film pressure incorrectly set	Reset - Green film - LO Used film - HI
	Film Gate not closing properly.	Lubricate (Sect. III, para. G.)
b. Film scratch	Aperture plate (Fig. 3-26) or pressure shoe (Fig. 3-34) dirty	Clean
	Film handling rollers stuck	Clean and lubricate (Sect. III, para. G.)
c. Film damage at feed sprocket (reverse operation)	Feed clutch torque too high	Back off nut (8, Fig. 3-24)
d. Film spills at supply reel (reverse operation)	Feed clutch torque too low	Tighten nut (8, Fig. 3-24)
e. Loss of upper loop	Feed sprocket (6, Fig. 5-2, 6, Fig. 5-11 or 6, Fig. 6-2) loose on shaft or sprocket teeth damaged	Tighten screw (7, Fig. 5-2, 7, Fig. 5-11, or 7, Fig. 6-2) or replace sprocket

TROUBLE	PROBABLE CAUSE	REMEDY
f. Loss of lower loop	<p>Follower assembly rollers on feed sprocket shoe (10, Fig. 5-2, 10, Fig. 5-11 or 10, Fig. 6-2) not functioning</p> <p>Claw protrusion or stroke out of adjustment</p> <p>Pressure shoe (1, Fig. 5-2, 1, Fig. 5-11 or 1, Fig. 6-2) not seated properly</p>	<p>Check for interference with other components</p> <p>Adjust (Sect. III, para. E. 13)</p> <p>Check position of shoe, if necessary, realign (Sect. III, para. E. 3)</p>
g. Loss of both upper and lower loop	<p>Take-up sprocket (37, Fig. 5-5, 25, Fig. 5-14 or 27, Fig. 6-5) loose on shaft</p>	<p>Tighten screw (26, Fig. 5-4, 38, Fig. 5-5, or 28, Fig. 6-5)</p>
h. Clicking noise (film picking)	<p>Teeth of feed sprocket (6, Fig. 5-2, 6, Fig. 5-11 or 6, Fig. 6-2) damaged</p> <p>Teeth of take-up sprocket (37, Fig. 5-5, 25, Fig. 5-14, or 27, Fig. 6-5) damaged</p> <p>Claw arm (Fig. 3-41c) teeth worn or damaged</p>	<p>Replace feed sprocket</p> <p>Replace take-up sprocket</p> <p>Replace claw arm (Sect. III, para. D. 3)</p>
i. Little or no take-up	<p>Take-up reel belt (20, Fig. 5-5, 8, Fig. 5-14, or 22, Fig. 6-5) damaged</p> <p>Bias force too low</p> <p>Take-up clutch lift-off linkage too short</p> <p>Take-up clutch (27, Fig. 5-5, 15, Fig. 5-14 or 14, Fig. 6-5) inoperative</p>	<p>Replace (Sect. III, para. E. 12)</p> <p>Tighten nut (1, Fig. 3-20)</p> <p>Adjust (Sect. III, para. E. 7)</p> <p>Replace defective component</p>
j. Take-up belt squeal	<p>Take-up film tension too high</p>	<p>Back off nut (1, Fig. 3-20)</p>
k. Damaged film at take-up sprocket	<p>Take-up film tension too high</p> <p>Worn or dry film</p> <p>Incorrect threading</p>	<p>Back off nut (1, Fig. 3-20)</p> <p>Replace</p> <p>Thread correctly and check</p>
m. Erratic take-up	<p>Brake surface of take-up reel arm pulley (21, Fig. 5-5, 9, Fig. 5-14 or 21, Fig. 6-5) dirty</p> <p>Clutch liner (43, Fig. 5-5, 31, Fig. 5-14 or 31, Fig. 6-5) worn</p>	<p>Wipe inner surface of pulley</p> <p>Replace</p>
n. Film spills at take-up reel when moving Master Control Lever from FORWARD TO REVERSE	<p>Take-up clutch lift-off linkage too long</p>	<p>Adjust (Sect. III, para. E. 7)</p>

Section II
Troubleshooting

GRAFLEX 16 PROJECTOR

TROUBLE	PROBABLE CAUSE	REMEDY
o. Rewind stall part way through reel	Ramp on rewind lever stop assembly does not throw the pawl assembly properly	Adjust (Sect. III, para. E. 9)
p. Loose rewind	Supply reel belt (25, Fig. 5-2, 25, Fig. 5-11 or 25, Fig. 6-2) stretched	Replace (Sect. III, para. E. 12)
q. No rewind	Supply or take-up reel bent	Replace
r. Picture jumps (possible loss of loop)	Pin (6, Fig. 3-24) not seated	Reseat
r. Picture jumps (possible loss of loop)	Film feed clutch (26, Fig. 5-2, 26, Fig. 5-11 or 26, Fig. 6-2) defective	Replace defective component in clutch
r. Picture jumps (possible loss of loop)	Claw protrusion or stroke out of adjustment	Adjust (Sect. III, para. E. 13)
s. Picture moves from side to side	Aperture plate (Fig. 3-26) or pressure shoe (Fig. 3-34) dirty	Clean
t. Picture goes in and out of focus at random	Correct film pressure not set	Reset pressure Green film - LO Used film - HI
t. Picture goes in and out of focus at random	Correct film pressure in gate not set	Reset (Sect. III, para. E. 2)
t. Picture goes in and out of focus at random	Claw arm (33, Fig. 5-7, 33, Fig. 5-16 or 33, Fig. 6-7) damaged (face of claw arm must be visibly parallel to adjacent face of casting)	Replace and adjust (Sect. III, paras. D. 3 and E. 13)
t. Picture goes in and out of focus at random	Claw arm (33, Fig. 5-7, 33, Fig. 5-16 or 33, Fig. 6-7) not functioning properly	Adjust (Sect. III, paras. D. 3 and E. 13)
u. Picture "streams" vertically	Film edge guide spring (Fig. 3-26) out of tolerance	Readjust (Sect. III, para. D. 14)
u. Picture "streams" vertically	Aperture plate (23, Fig. 5-2, 23, Fig. 5-11, or 23, Fig. 6-2) or pressure shoe (1, Fig. 5-2, 1, Fig. 5-11, or 1, Fig. 6-2) damaged	Replace
u. Picture "streams" vertically	Correct film pressure in gate not set	Reset (Sect. III, para. E. 2)
u. Picture "streams" vertically	Pressure shoe (1, Fig. 5-2, 1, Fig. 5-11, or 1, Fig. 6-2) not aligned	Align (Sect. III, para. E. 3)
u. Picture "streams" vertically	Film edge guide spring (Fig. 3-26) out of tolerance	Readjust (Sect. III, para. D. 14)
u. Picture "streams" vertically	Incorrect threading	Thread correctly and check

TROUBLE	PROBABLE CAUSE	REMEDY
<p>v. Film Burns when in STILL operation</p>	<p>Safety shutter (11, Fig. 5-7, 11, Fig. 5-16, or 11, Fig. 6-7) binding on lamp chimney</p>	<p>Seat lamp chimney. Visually align safety shutter midway between lamp chimney and closest moving part on shutter and cam assembly. Safety shutter spring and link must clear shutter and cam assembly by 1/8". Adjust by bending safety shutter spring bracket.</p>
<p>2. Optical & Illumination Troubles</p>		
<p>a. Intensity of light on screen same in FORWARD or REVERSE as it is in STILL</p>	<p>Safety shutter (11, Fig. 5-7, 11, Fig. 5-16, or 11, Fig. 6-7) not operating</p>	<p>Locate counterweight (speed nut) flush with rear end of safety shutter blade. If failure continues, add 3 drops DC-550R fluid (see lubrication table). Do not substitute any other fluid.</p>
<p>b. Light output low at SOUND speed on applicable automatic shutter models</p>	<p>Automatic 2-3 blade shutter (13, Fig. 5-7, 13, Fig. 5-16, or 13, Fig. 6-7) locked in 3 blade position</p> <p>Automatic 2-3 blade shutter not functioning</p>	<p>Pull plastic slide lock out over detent on fixed blade assembly</p> <p>Clean sliding blades of shutter and cam assembly (Fig. 3-17)</p>
<p>c. Low light output</p>	<p>Low lamp filament voltage</p>	<p>Check use of transformer taps (Sect. III, para. E. 15)</p>
<p>d. Short projection lamp life</p>	<p>High line voltage</p>	<p>Check use of transformer taps (Sect. III, para. E. 15)</p>
<p>e. Short exciter lamp life</p>	<p>Excessive lamp voltage</p> <p>Defective transistor or diode in low voltage section of amplifier</p>	<p>Adjust (Sect. III, para. E. 15)</p> <p>Test and replace, as required</p>
<p>3. Sound Troubles</p>		
<p>a. No sound (amplifier pilot lamp does not light)</p>	<p>Circuit breaker (7, Fig. 7-22) open</p> <p>Circuit breaker defective</p> <p>Diode (4, Fig. 7-26) defective</p> <p>Amplifier ON/OFF switch (40, Fig. 7-27) defective</p> <p>Defective amplifier</p> <p>Defective network capacitor (800 Series)</p>	<p>Turn off amplifier. Reset circuit breaker then turn amplifier on. If circuit breaker continues to pop, check transistors for a short per para. D. 1 of Sect. III.</p> <p>Replace</p> <p>Replace</p> <p>Replace</p> <p>Repair</p> <p>Replace</p>
<p>b. No sound (pilot lamp lights - exciter lamp does not light - hiss from speaker)</p>	<p>Defective exciter lamp (4, Fig. 5-3, 17, Fig. 5-12, or 4, Fig. 6-3)</p>	<p>Replace</p>

TROUBLE	PROBABLE CAUSE	REMEDY
c. No sound (no hiss from speaker - exciter lamp and pilot lamp light)	Defective exciter lamp socket (Fig. 5-9, 5-18, or 6-9) Defective low voltage power supply section of amplifier (800 Series) Wrong exciter lamp Speaker connection defective Defective microphone jack (7, Fig. 5-8, 7, Fig. 5-17, or 4, Fig. 6-8) Defective speaker (8 and 11, Fig. 7-1 or 4, Fig. 7-2) Defective tubes (800 Series) Defective phototransistor in sound drum (49, Fig. 5-5, 37, Fig. 5-14 or 12, Fig. 6-5)	Replace Remove amplifier and service Replace with correct lamp Locate and repair Replace Replace Test and replace, as required Replace
d. Low volume	Insufficient exciter lamp voltage (800 Series) Record/Play Head (items 9 thru 19, Fig. 7-19) out of alignment Defective tubes or transistors Volume control (40, Fig. 7-27 or 3, Fig. 7-34) defective Capacitor C-2 (17, Fig. 7-34) defective (800 Series)	Adjust voltage (Sect. III, para. E. 15) Align (Sect. III, para. E. 17) Test and replace, as required Replace Replace
e. Low volume and/or excessive hum	Defective tubes (800 Series) Defective capacitor (9, Fig. 7-33 or 32, Fig. 7-25) Defective power supply Defective pre-amp (900 Series R and P Models)	Test and replace, as required Replace Remove amplifier and service Remove and service
f. Microphonic noise	Defective exciter lamp (4, Fig. 5-3, 17, Fig. 5-12, or 4, Fig. 6-3)	Replace
g. Pitch of sound incorrect - no highs - insufficient volume	Sound optical system dirty or out of focus Sound drum support misaligned Slow projector speed	Clean or refocus cartridge (Sect. III, para. E. 4) Realign (Sect. III, para. E. 4) Belt (10, Fig. 5-4, 11, Fig. 5-13, or 32, Fig. 6-4) slipping
h. Pitch of sound changes rapidly	Sound drum support bearing dirty or worn	Clean or replace sound drum, as required (Sect. III, para. E. 4)

TROUBLE	PROBABLE CAUSE	REMEDY
<p>i. Sound distortion</p> <p>j. Motorboating</p>	<p>Film tension arm assembly inoperative</p> <p>Thermal stability of output transistors poor</p> <p>Dirt on edge of sound drum (49, Fig. 5-5, 37, Fig. 5-14, or 12, Fig. 6-5)</p>	<p>Repair (Sect. III, para. E. 16)</p> <p>Refer to Sect. III, para. D. 1. a.</p> <p>Clean (Sect. III, para. E. 4)</p>
<p>4. Miscellaneous Troubles</p>		
<p>a. Motor runs but drive shaft does not rotate</p> <p>b. Fails to start on low power</p>	<p>Pulleys dirty</p> <p>Pulleys out of alignment</p> <p>Drive belt (10, Fig. 5-4, 11, Fig. 5-13, or 32, Fig. 6-4) worn or damaged</p> <p>Shipping bolt not removed</p> <p>Spring motor pulley on drive unit assembly not functioning properly</p>	<p>Clean (Sect. III, para. F. 3)</p> <p>Align (Sect. III, para. E. 10)</p> <p>Replace (Sect. III, para. E. 10)</p> <p>Remove</p> <p>Check as follows: (1) Hold pulley without binding motor shaft. Wind spring to full tight position by rotating fan (Fig. 3-21)</p> <p>(2) Release fan. Spring must throw fan 180°. If less, clean and lubricate (Sect. III, para. F. 3)</p>
<p>c. Loss of power and/or speed</p>	<p>Cam lubrication pad dry</p> <p>Bearing for shaft of take-up or supply sprocket gear assembly dirty</p> <p>Adjusting screw assembly on drive unit out of adjustment</p>	<p>Lubricate (Sect. III, para. D. 20)</p> <p>Clean and lubricate (Sect. III, para. D. 6)</p> <p>Adjust (Sect. III, para. F. 3)</p>
<p>d. Excessive vibration</p> <p>e. Projector drive system does not shift from SOUND to SILENT speed when in forward operation.</p>	<p>Adjusting screw assembly on drive unit out of adjustment</p> <p>Drive belt (10, Fig. 5-4, 11, Fig. 5-13, or 32, Fig. 6-4) worn or damaged</p> <p>Belt shift forks (Fig. 3-22) out of adjustment</p>	<p>Adjust (Sect. III, para. F. 3)</p> <p>Adjust (Sect. III, para. F. 3)</p> <p>Replace (Sect. III, para. E. 10)</p> <p>Adjust (Sect. III, para. D. 9)</p>
<p>f. Clicking sound when in REWIND operation</p>	<p>Ramp for rewind pawl assembly out of adjustment</p>	<p>Adjust (Sect. III, para. E. 9)</p>
<p>g. Projector does not run (amplifier pilot lamp does not light)</p>	<p>Line fuses blown because of defective reverse switch assembly (37, Fig. 5-4, 37, Fig. 5-13, or 25, Fig. 6-4)</p>	<p>Replace reverse switch and blown fuse</p>

TROUBLE	PROBABLE CAUSE	REMEDY	
5. Recording Troubles (900 Series R Models only)			
a. Projector does not record	Record/play head out of adjustment or defective	Adjust (Sect. III, para. E. 17) or replace	
	Microphone defective	Replace	
	Jack (9, Fig. 5-17) defective	Replace	
	Switch (15, Fig. 7-24) defective	Replace	
	Control (35, Fig. 7-24) defective	Replace	
	Defective component(s) in pre-amp section of amplifier (Fig. 7-24)	Replace defective component(s)	
	Defective component(s) in record amplifier (Fig. 7-28)	Replace defective component(s)	
	b. Projector does not erase previously recorded audio	Erase head out of adjustment or defective	Adjust (Sect. III, para. E. 18) or replace
		Defective component(s) in record amplifier (Fig. 7-28)	Replace defective component(s)
	c. Recorded audio weak or distorted when played back	Record/play head out of adjustment or defective	Adjust (Sect. III, para. E. 17) or replace
Microphone defective		Replace	
Jack (9, Fig. 5-17) defective		Replace	
Control (35, Fig. 7-24) defective		Replace	
Record level meter (22, Fig. 7-22) giving false readings		Replace	
Defective component(s) in pre-amp section of amplifier (Fig. 7-24)		Replace defective component(s)	
Defective component(s) in record amplifier (Fig. 7-28)		Replace defective component(s)	

D. ALTERNATE MOTOR MODELS

Certain series of Models 900, 901, 915, and 920 Projectors have been equipped with an alternate motor. These models are identified by the letter "R" at the end of the nameplate serial number and will vary in

wiring configuration and parts from the basic model. If your projector is equipped with the alternate motor, refer to the separate wiring and schematic diagrams provided at the end of this section. These diagrams will show parts and wiring configurations.

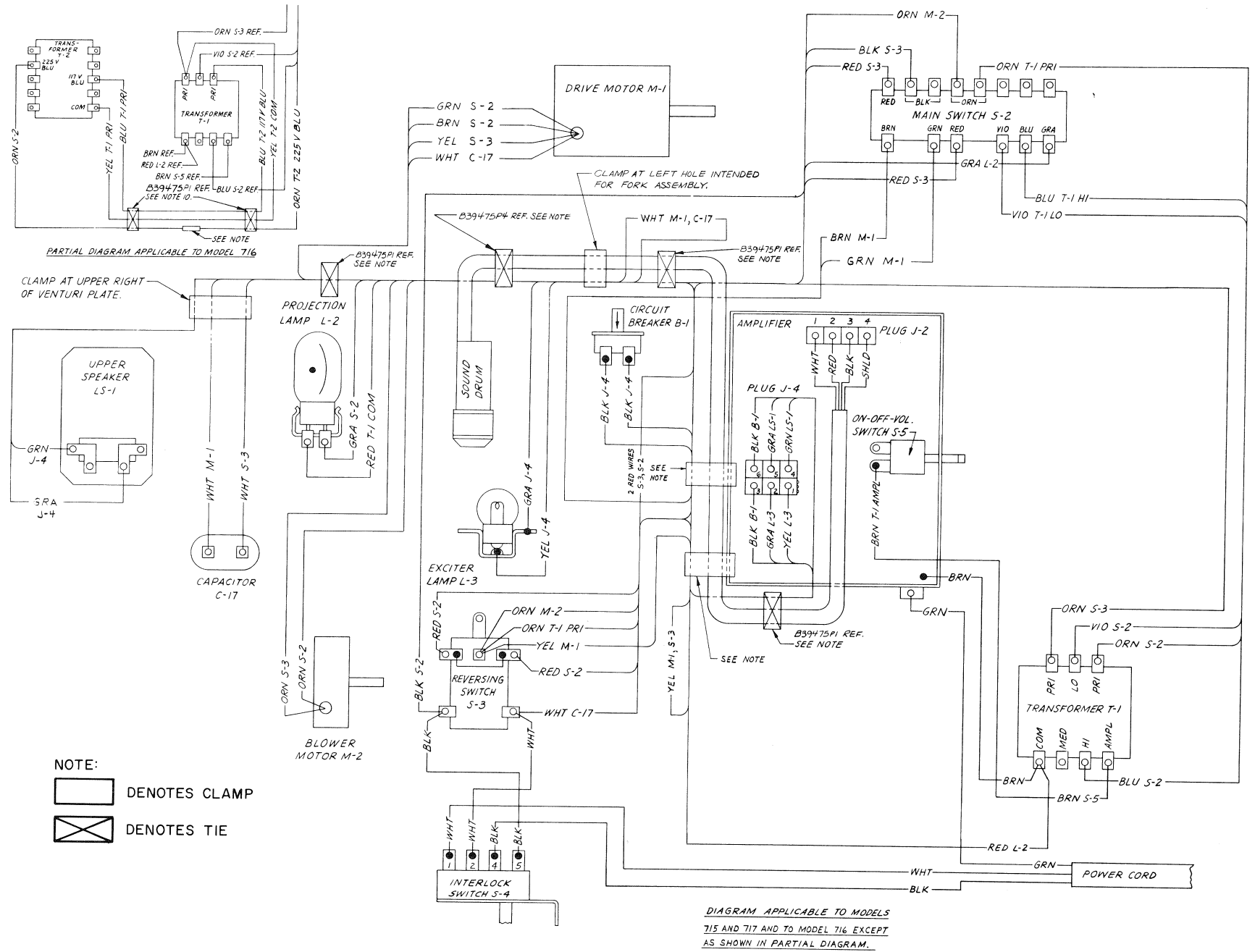


Figure 2-1. PROJECTOR WIRING DIAGRAM (700 SERIES)

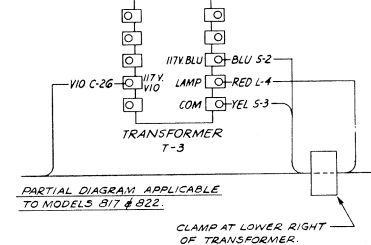
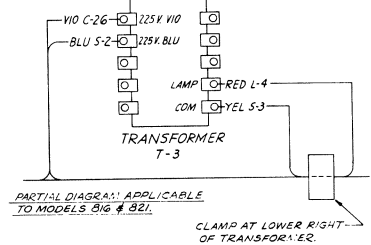
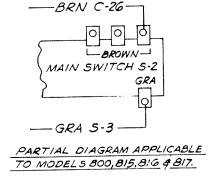
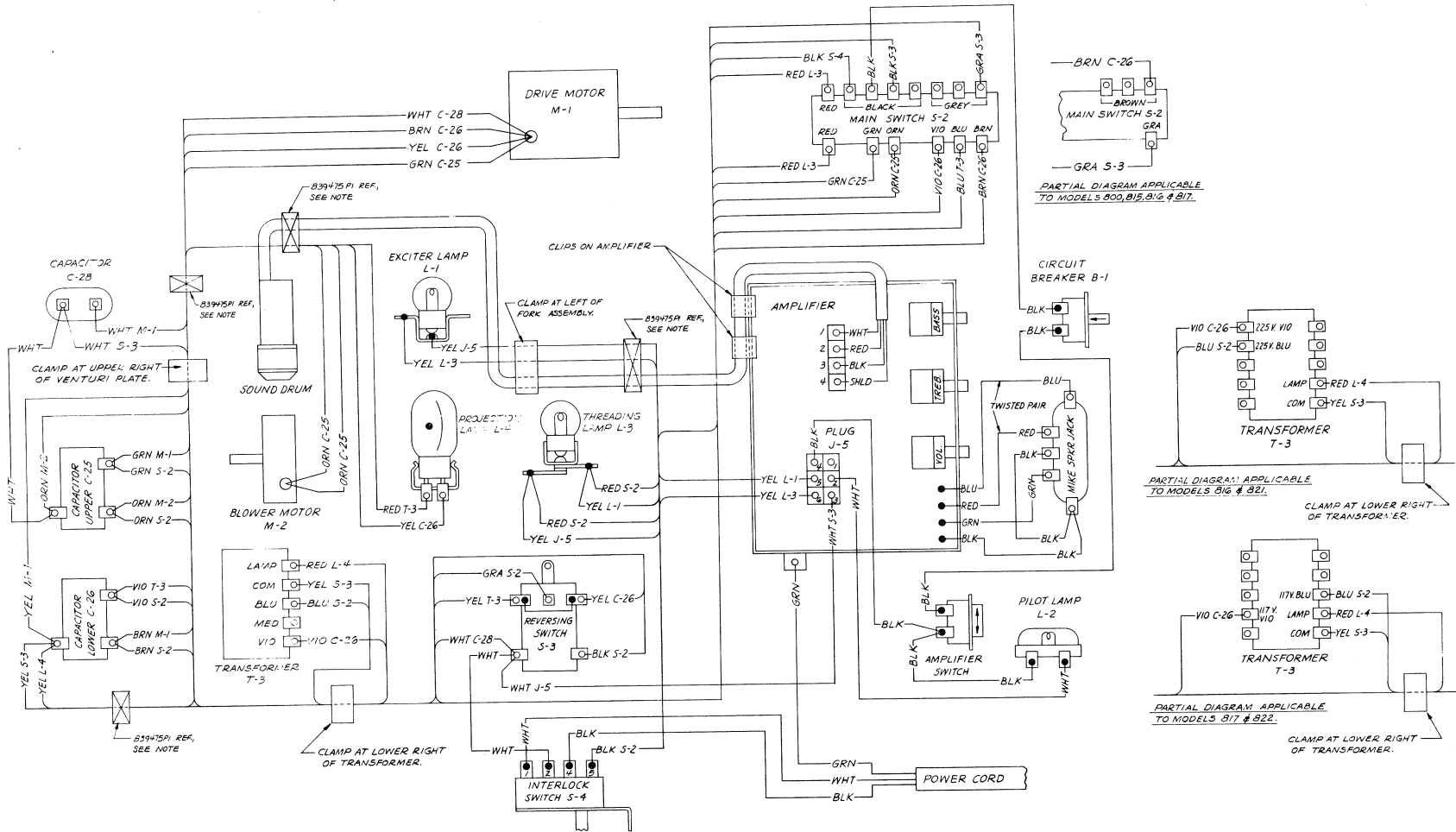




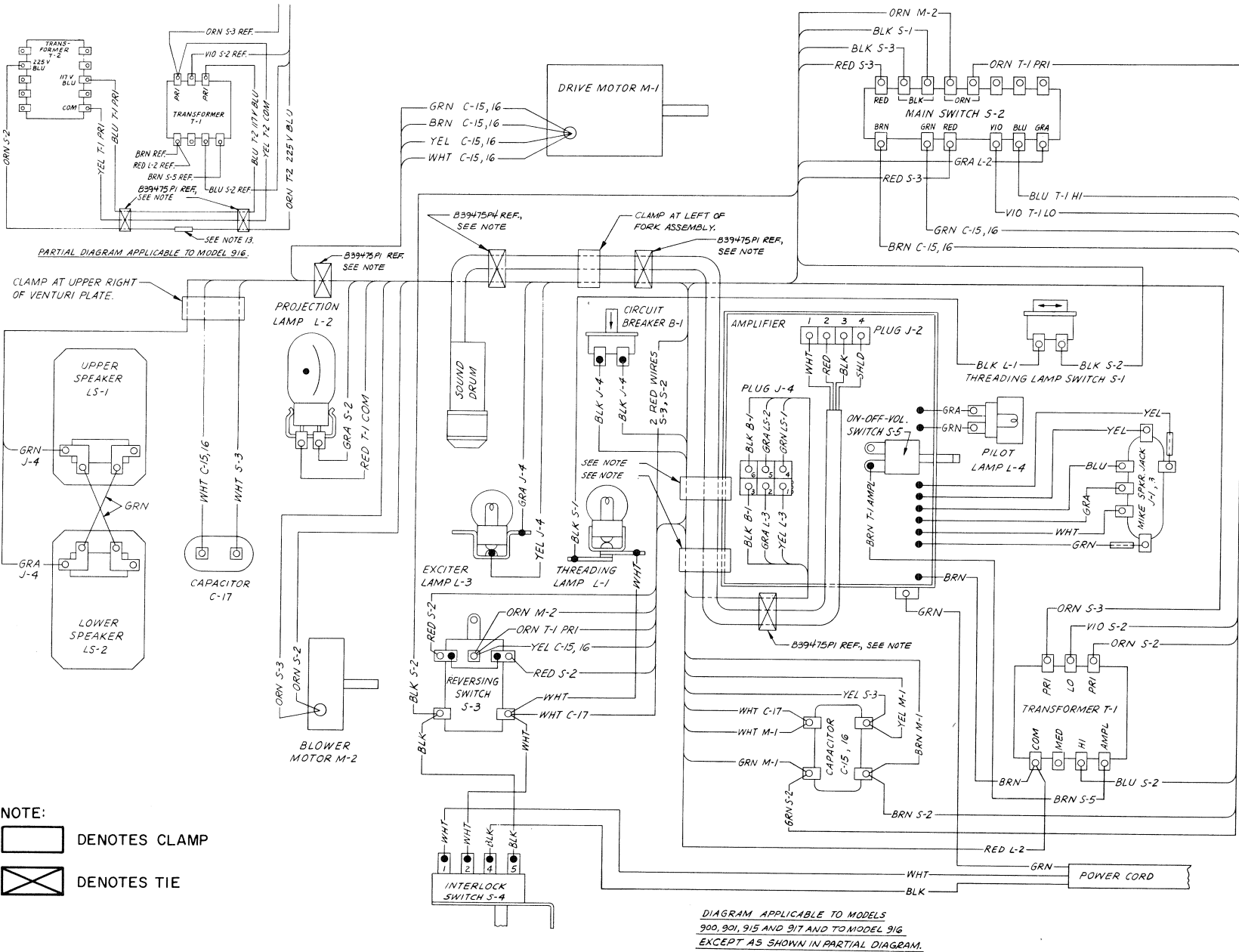
DIAGRAM APPLICABLE TO MODEL 820 AND TO MODELS 800, 815, 816, 817, 821 & 822, EXCEPT AS SHOWN IN PARTIAL DIAGRAMS.

NOTE:
 DENOTES CLAMP
 DENOTES TIE

(Ref. 39065)

Figure 2-2. PROJECTOR WIRING DIAGRAM (800 SERIES)

GRAFLEX 16 PROJECTOR



(Ref. 39481)

Figure 2-3. PROJECTOR WIRING DIAGRAM (MODELS 900, 901, 915, 916, & 917)

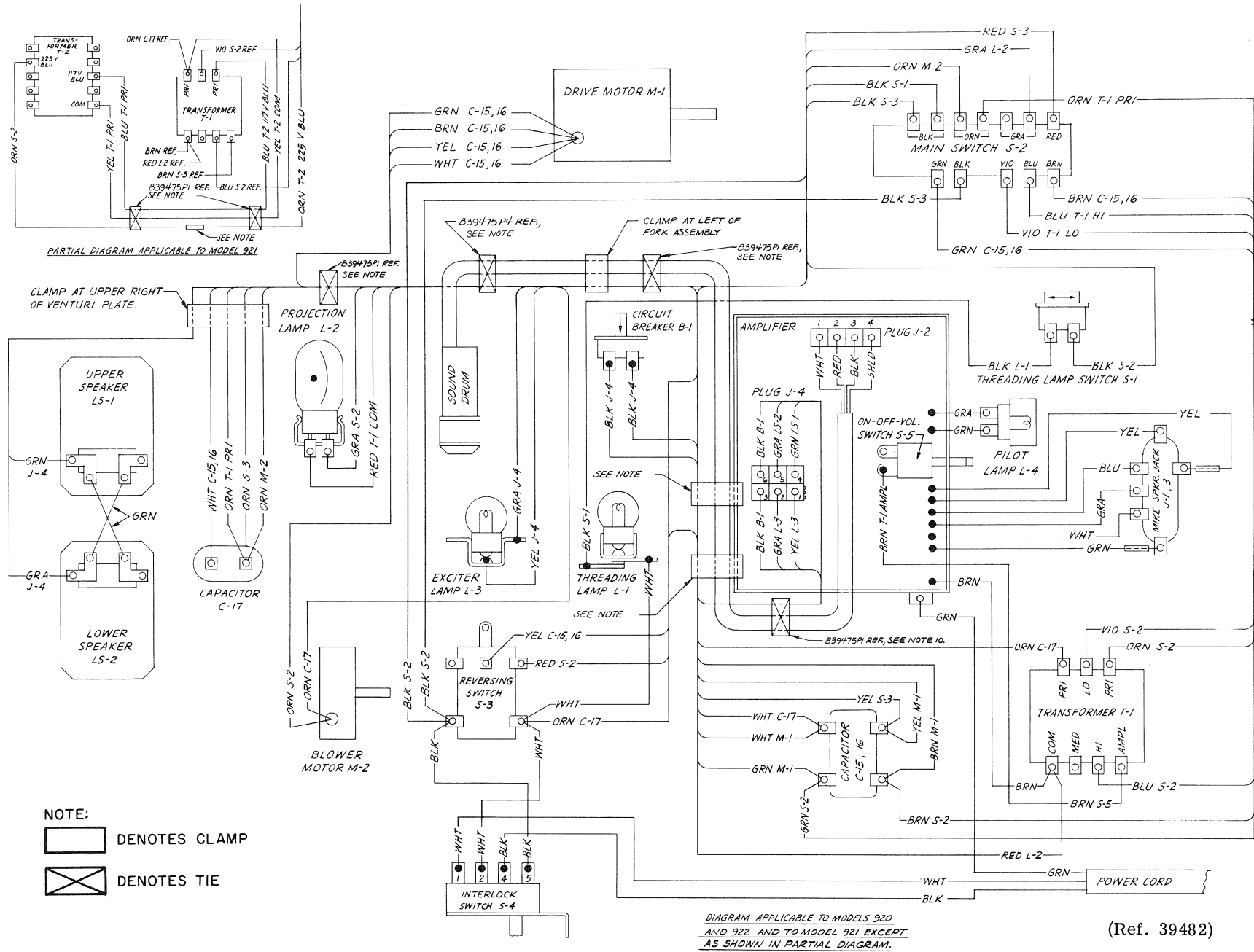
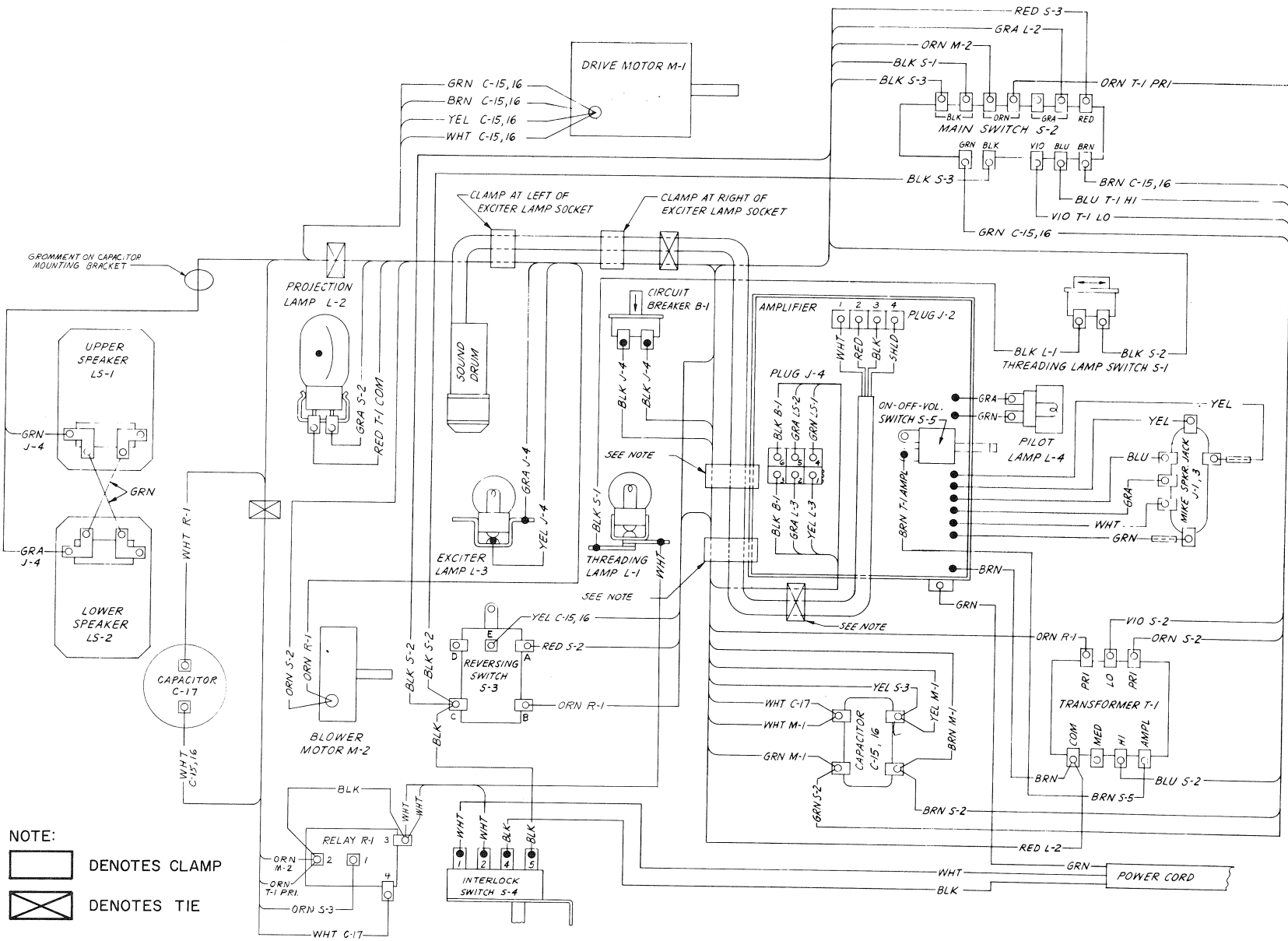


Figure 2-4. PROJECTOR WIRING DIAGRAM (MODELS 920, 921, & 922).

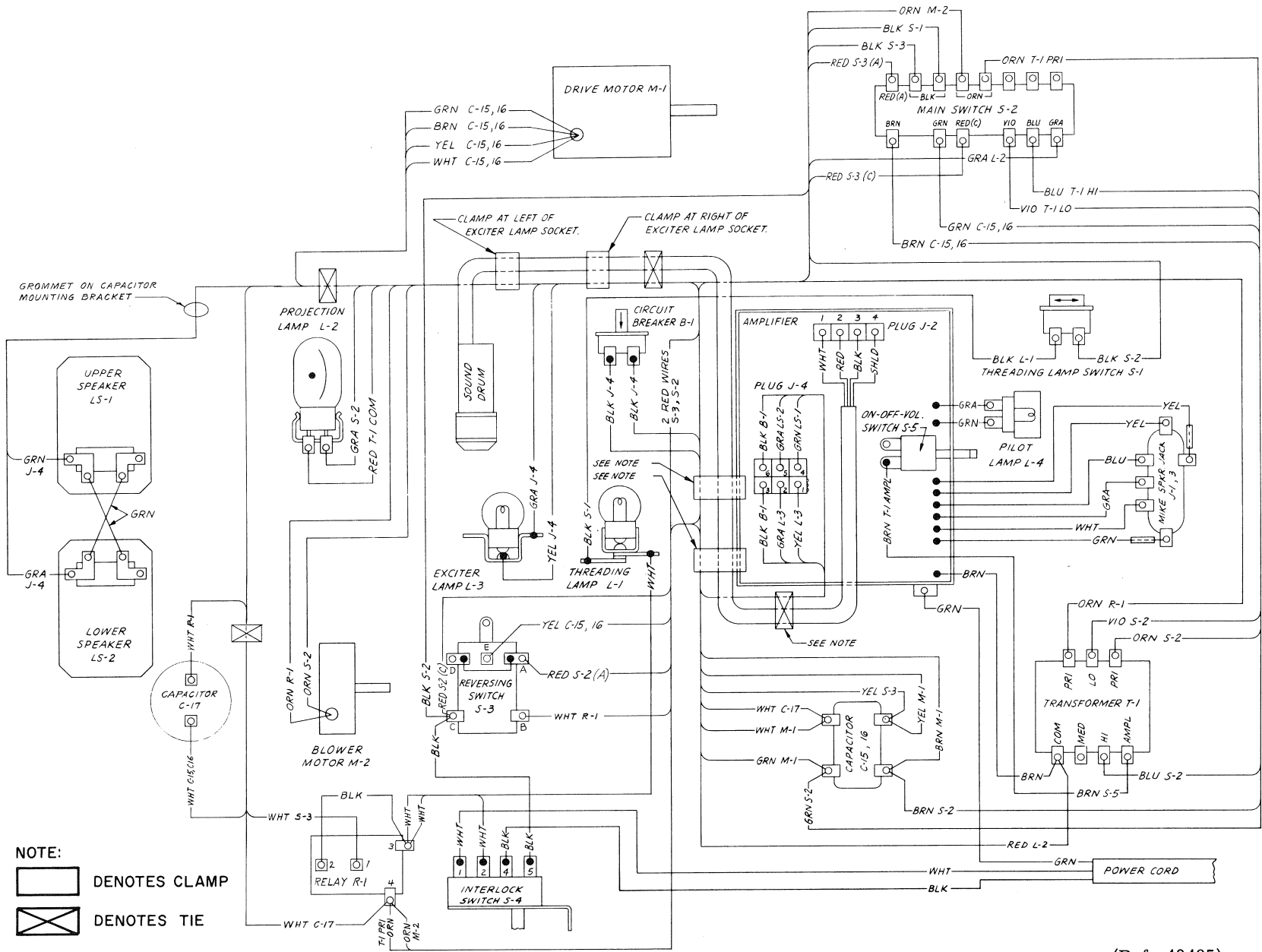
GRAFLEX 16 PROJECTOR



NOTE:
 [Symbol: Rectangle with horizontal line] DENOTES CLAMP
 [Symbol: Rectangle with 'X'] DENOTES TIE

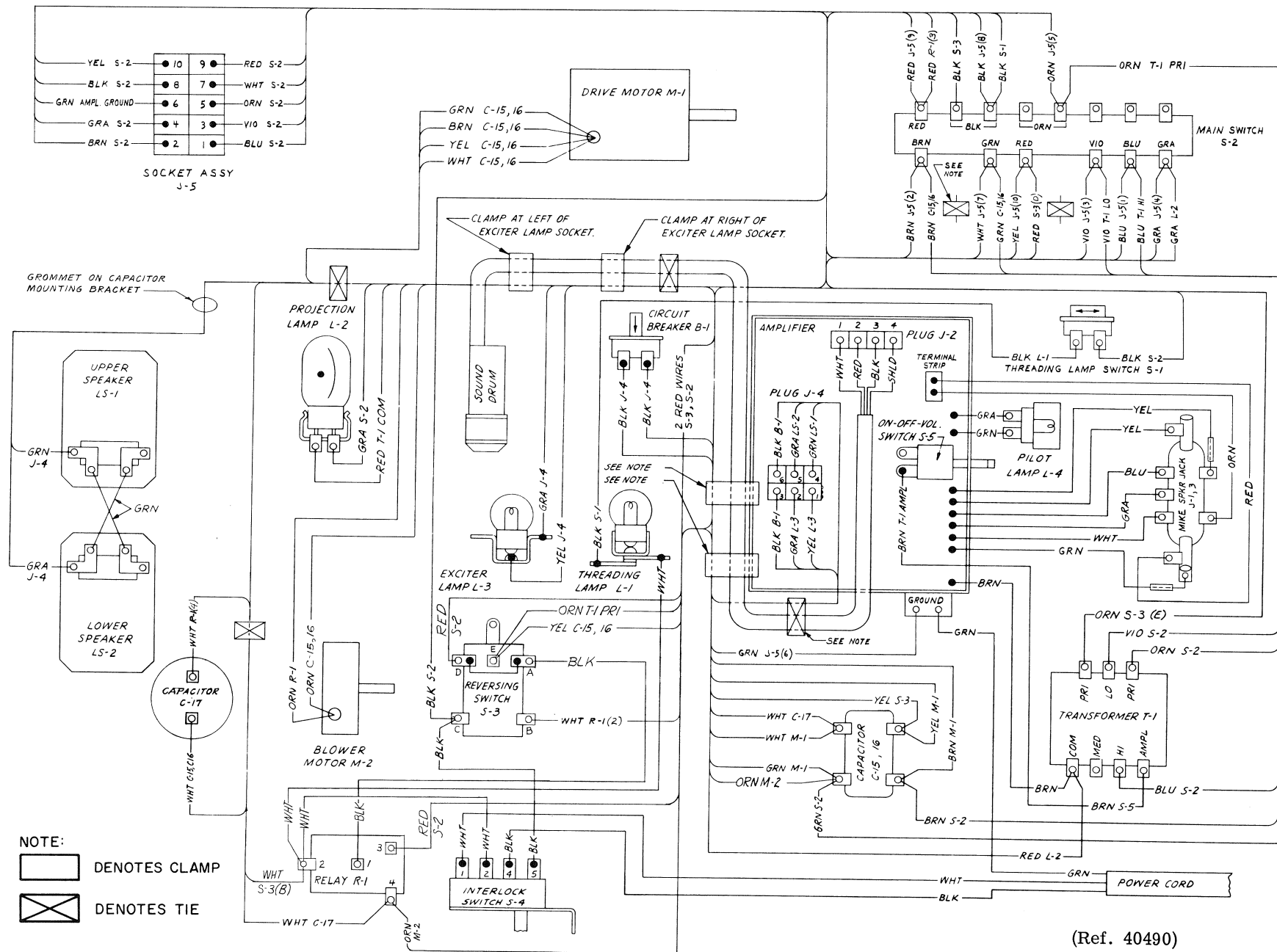
(Ref. 40483)



Figure 2-5. PROJECTOR WIRING DIAGRAM (MODELS 900-S, 901-S, & 915-S)



(Ref. 40485)

Figure 2-6. PROJECTOR WIRING DIAGRAM (MODEL 920-S)



NOTE:
 DENOTES CLAMP
 DENOTES TIE

(Ref. 40490)

Figure 2-7. PROJECTOR WIRING DIAGRAM (MODEL 930 TV)

GRAFLEX 16 PROJECTOR

Section II
 Troubleshooting

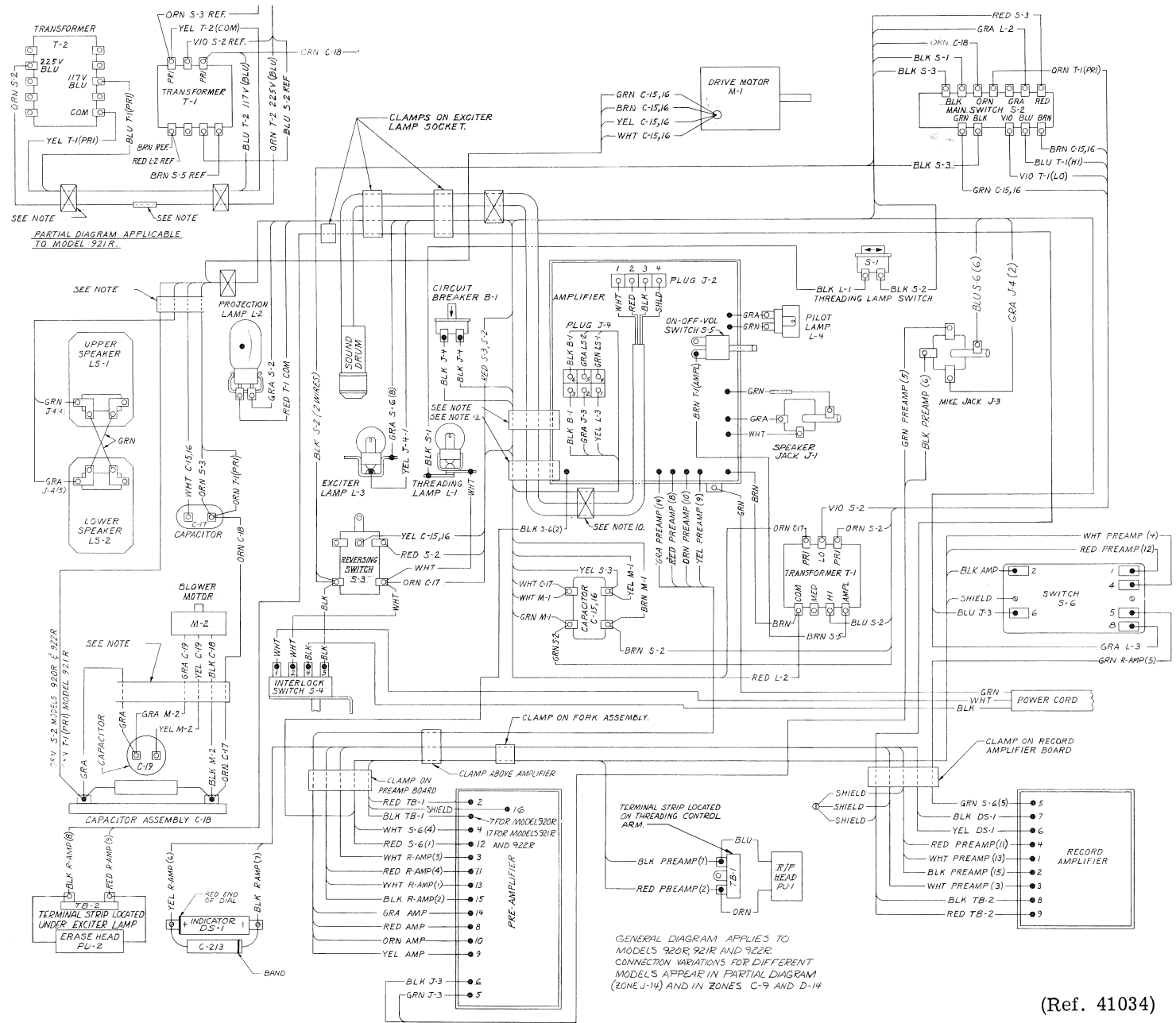
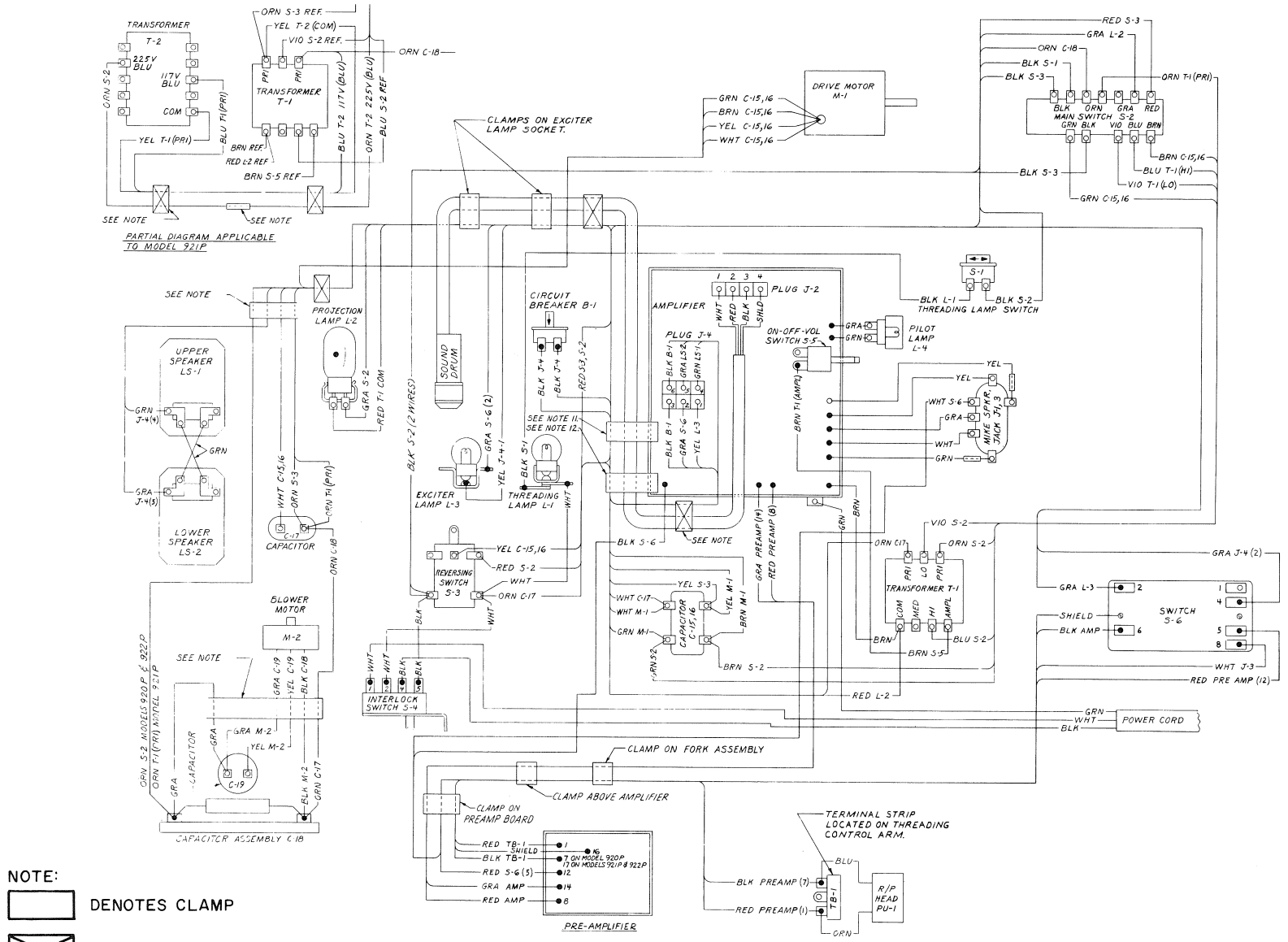




Figure 2-8. PROJECTOR WIRING DIAGRAM (MODELS 920-R, 921-R, & 922-R)



NOTE:
 DENOTES CLAMP
 DENOTES TIE

GENERAL DIAGRAM APPLIES TO MODELS 920P 921P AND 922P. CONNECTION VARIATIONS FOR DIFFERENT MODELS APPEAR IN PARTIAL DIAGRAM (ZONE J-14) AND IN ZONES C-9 AND D-14.

(Ref. 41052)

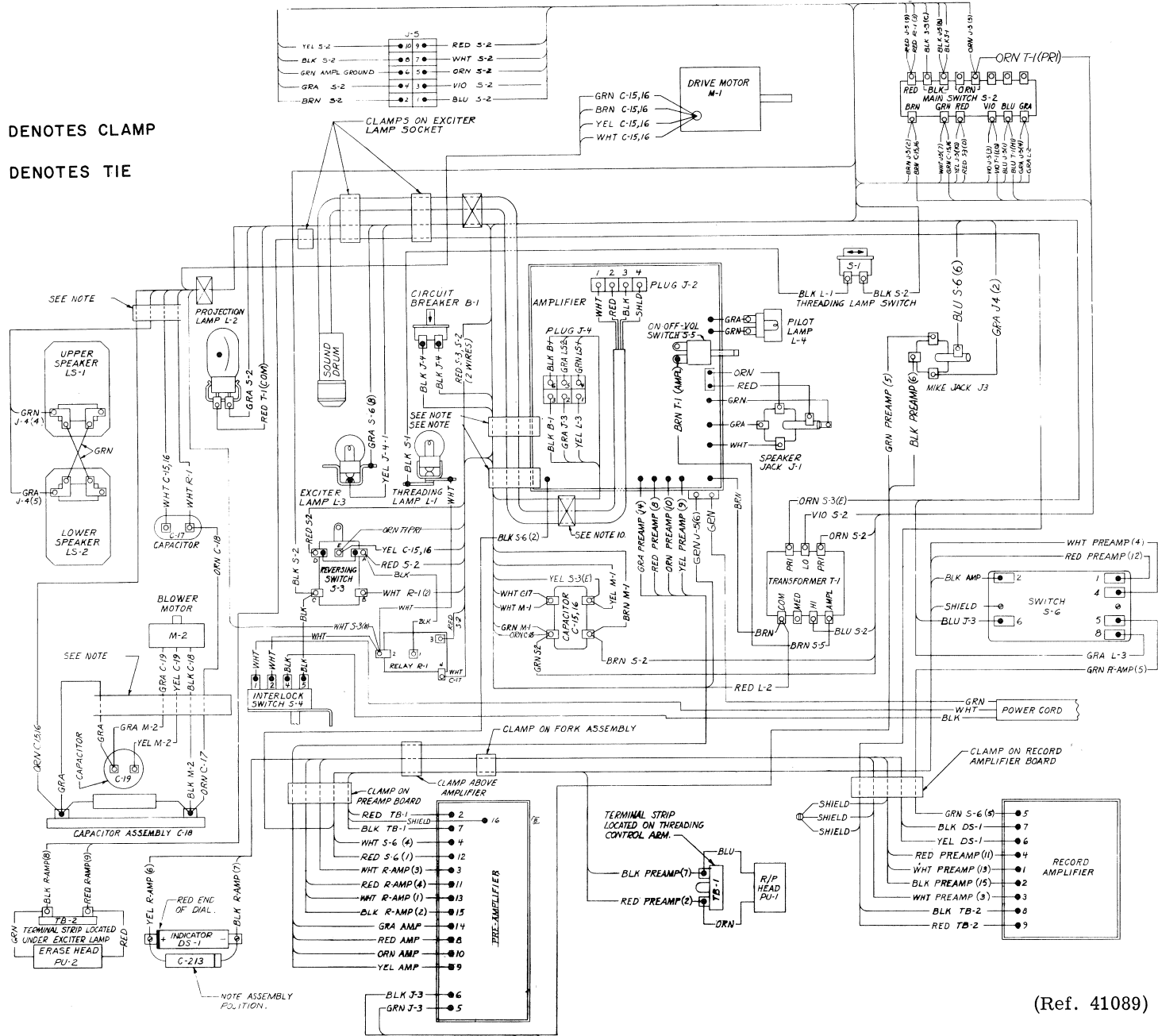
Figure 2-9. PROJECTOR WIRING DIAGRAM (MODELS 920-P, 921-P, & 922-P)

NOTE:



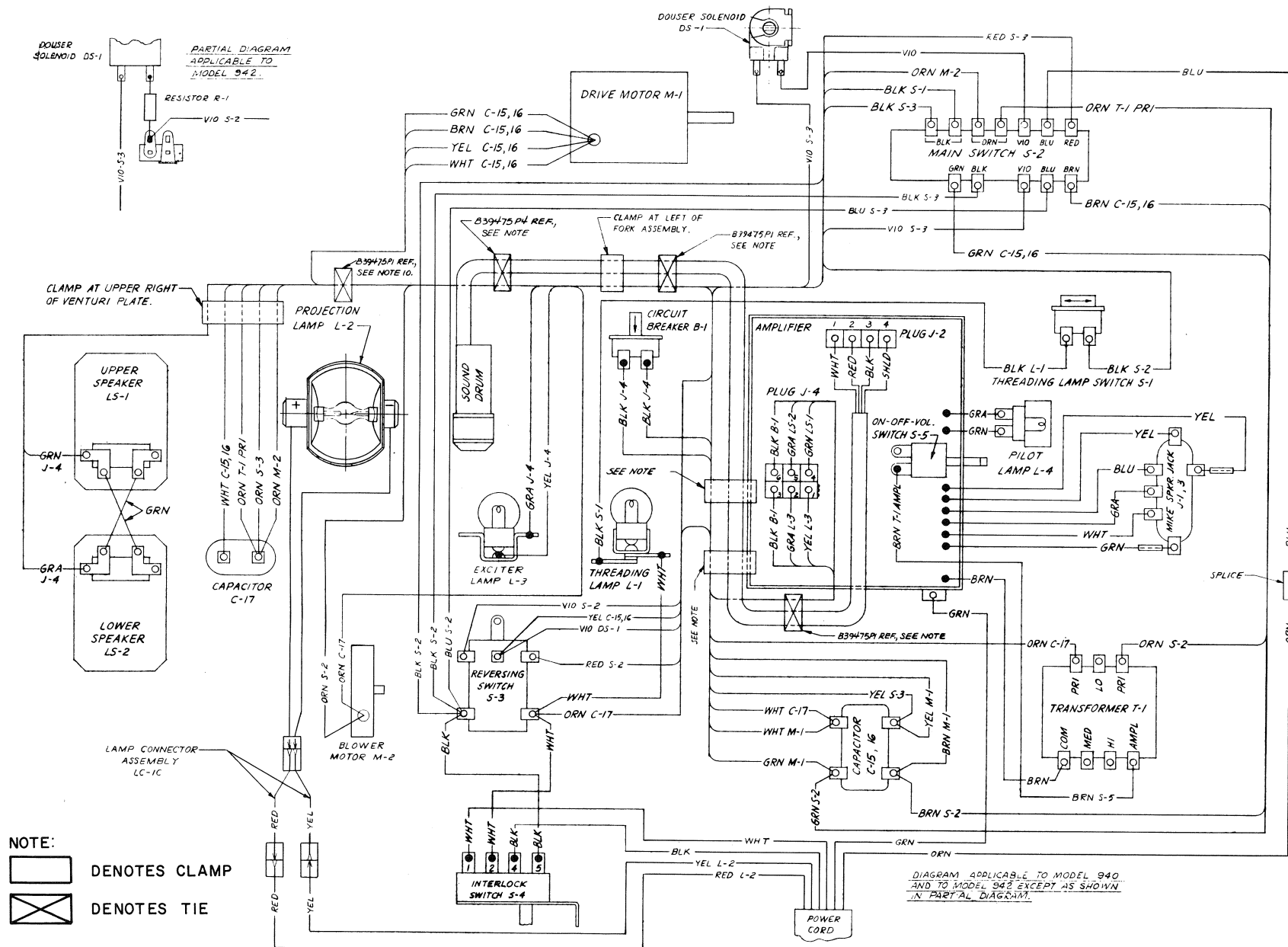
DENOTES CLAMP

DENOTES TIE



(Ref. 41089)

Figure 2-10. PROJECTOR WIRING DIAGRAM (MODEL 930-R)



NOTE:
 DENOTES CLAMP
 DENOTES TIE

(Ref. 41391)

Figure 2-11. PROJECTOR WIRING DIAGRAM (MODEL 940)

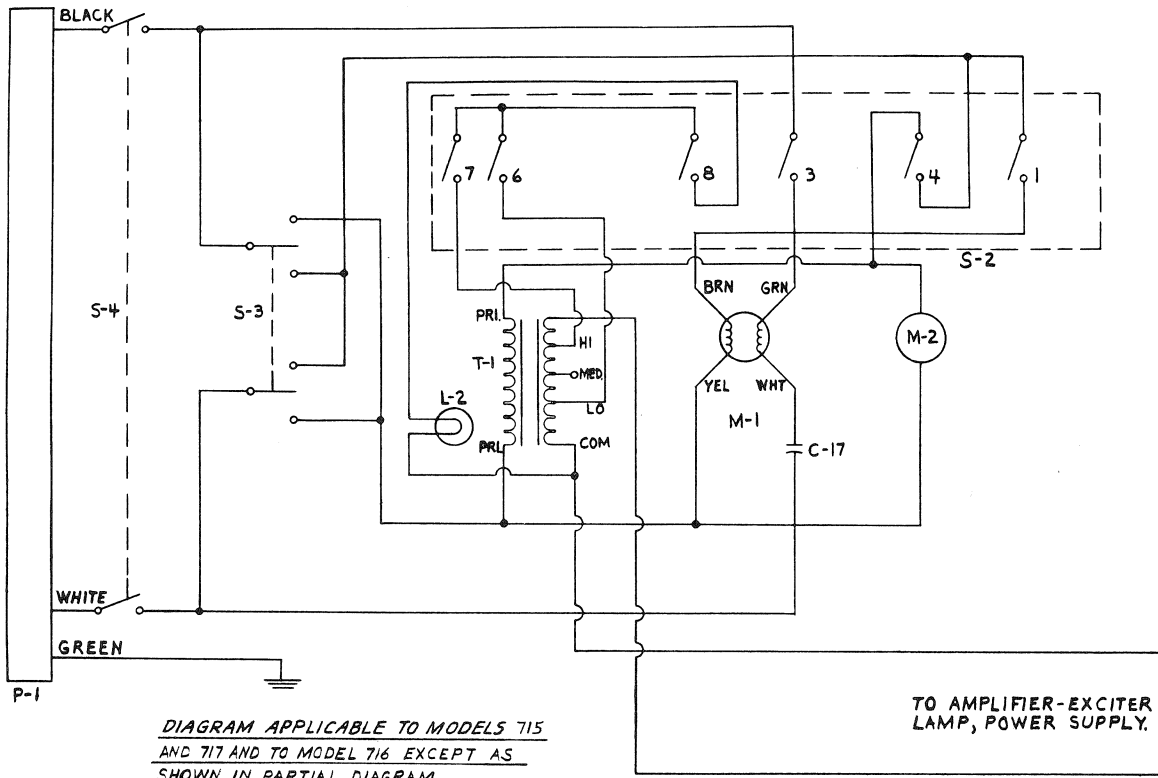
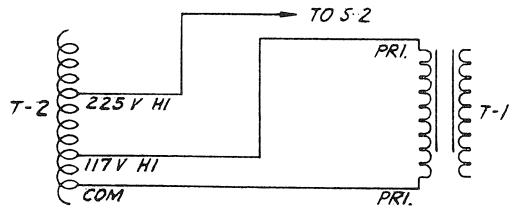


DIAGRAM APPLICABLE TO MODELS 715 AND 717 AND TO MODEL 716 EXCEPT AS SHOWN IN PARTIAL DIAGRAM.

TO AMPLIFIER-EXCITER LAMP, POWER SUPPLY.



PARTIAL DIAGRAM APPLICABLE TO MODEL 716.

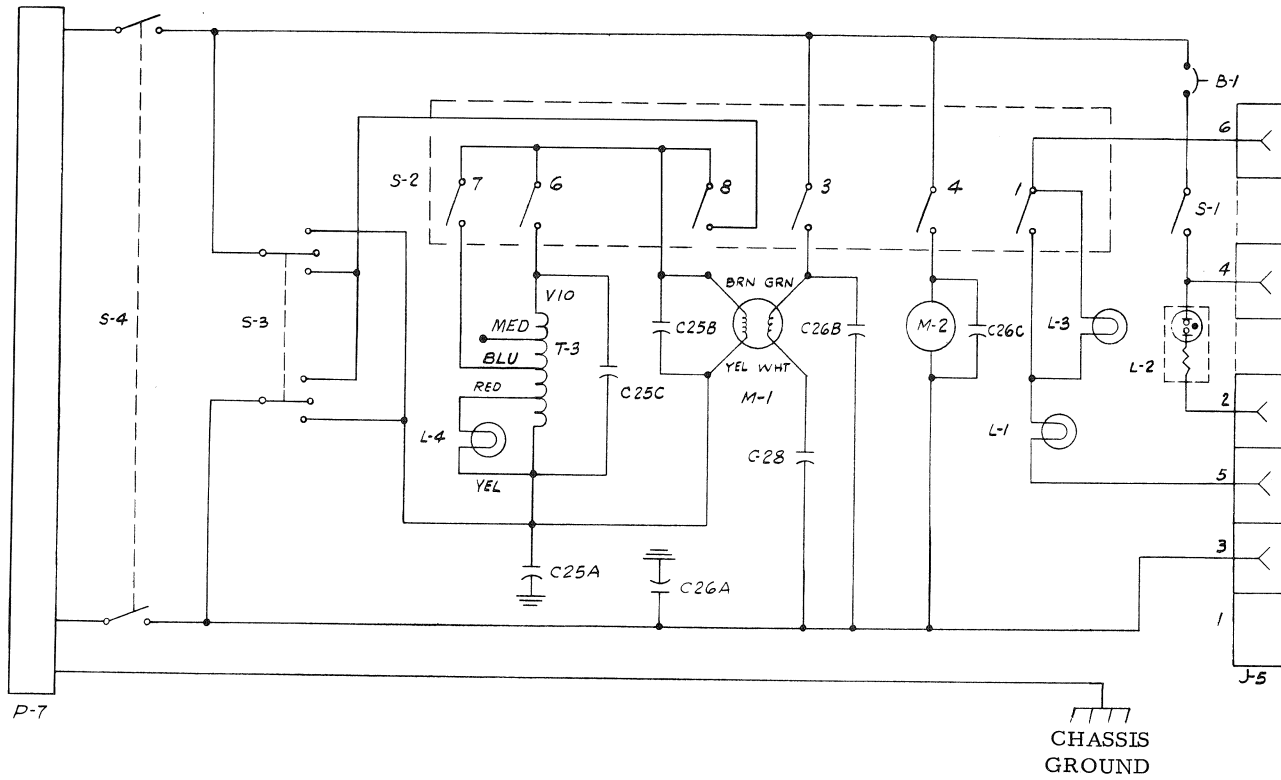
		1	3	4	6	7	8
OFF		0	0	0	0	0	0
RUN		X	X	X			X
LAMP	OFF			X	0	0	
	LO			X	X	0	
	HI			X	0	X	

SWITCH TABLE

Depressing a button on Switch S-2 will open (O), close (X), or leave unchanged (no mark) contacts, as indicated.

(Ref. 40692)

Figure 2-12. PROJECTOR SCHEMATIC DIAGRAM (700 SERIES)



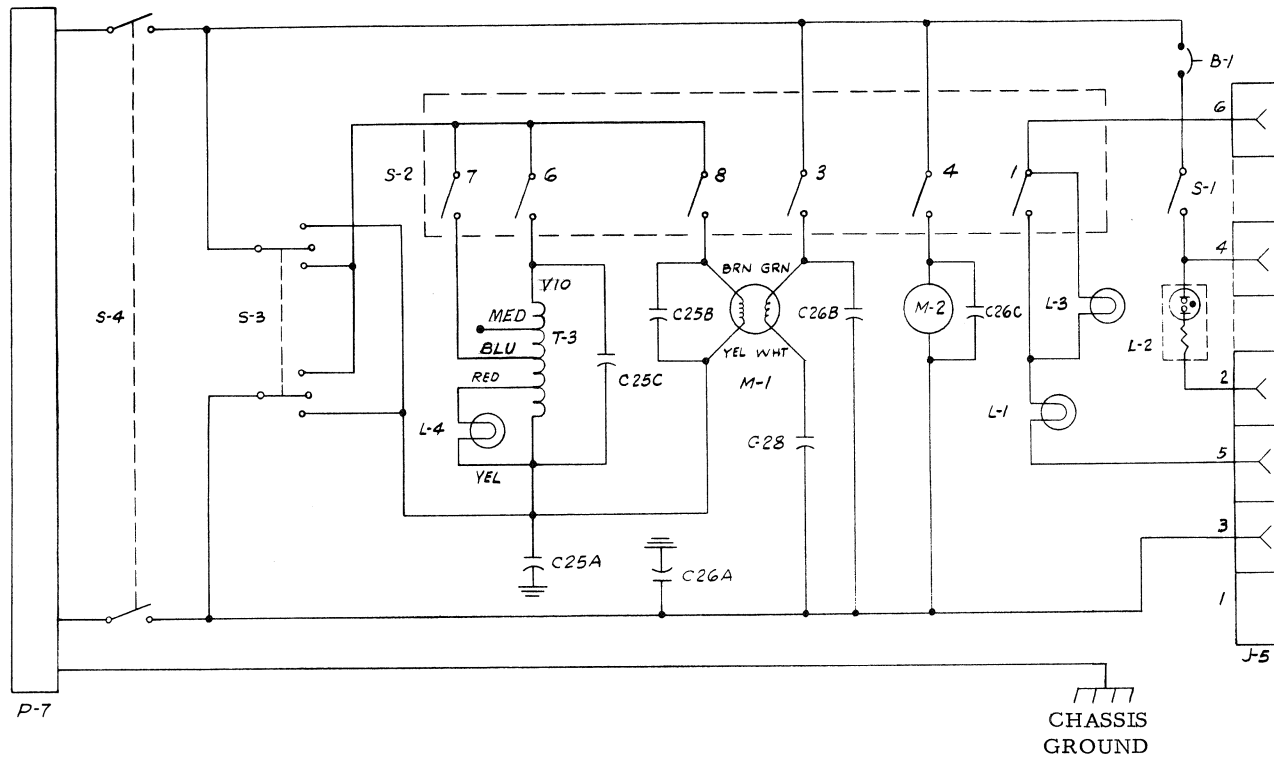
		1	3	4	6	7	8
OFF		○	○	○	○	○	○
RUN		X	X	X			X
LAMP	OFF			X	○	○	
	LO			X	X	○	
	HI			X	○	X	

SWITCH TABLE

Depressing a button on Switch S-2 will open (O), close (X), or leave unchanged (no mark) contacts, as indicated.

(Ref. 39218)

Figure 2-13. PROJECTOR SCHEMATIC DIAGRAM (MODELS 800, 815, 816, & 817)



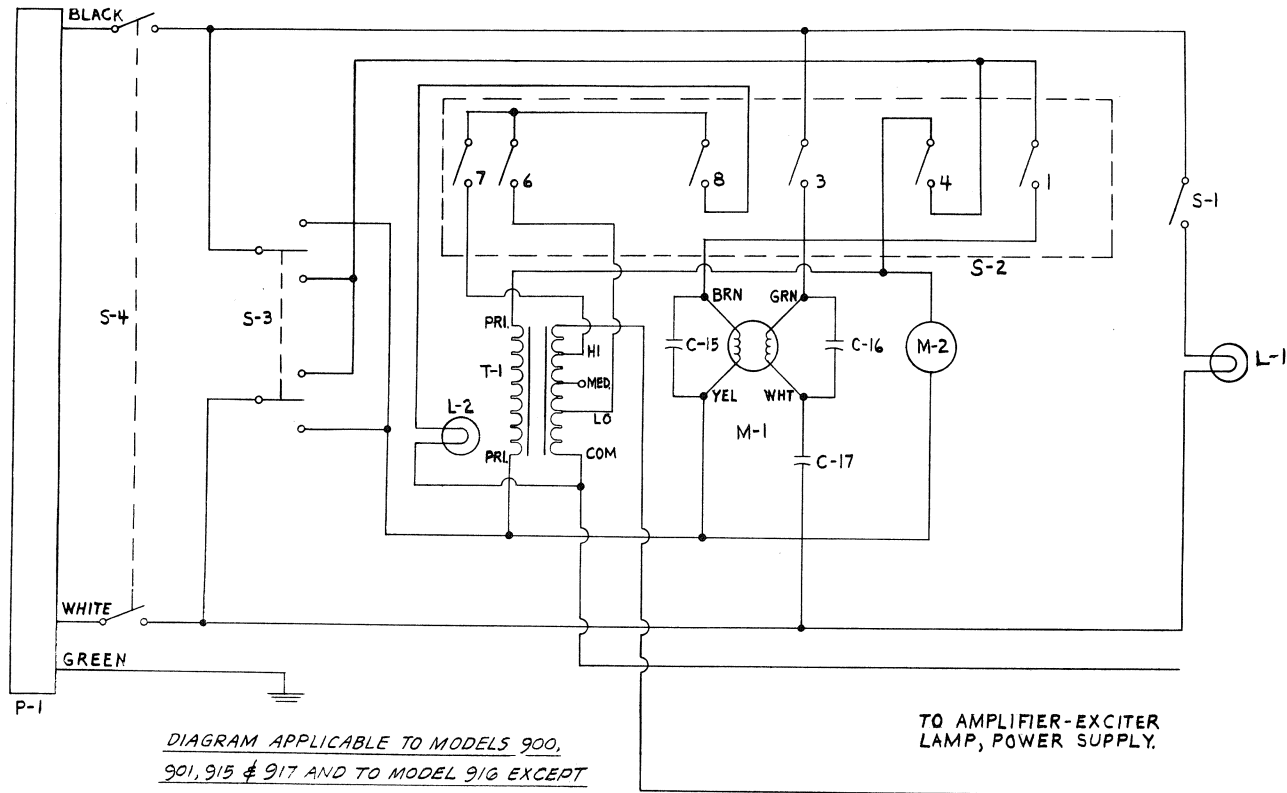
		1	3	4	6	7	8
OFF		○	○	○	○	○	○
STILL		○	○	X			○
RUN		X	X	X			X
LAMP	OFF			X	○	○	
	LO			X	X	○	
	HI			X	○	X	

SWITCH TABLE

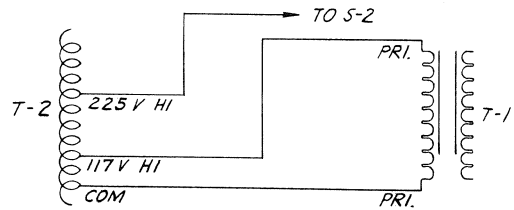
Depressing a button on Switch S-2 will open (O), close (X), or leave unchanged (no mark) contacts, as indicated.

(Ref. 39218)

Figure 2-14. PROJECTOR SCHEMATIC DIAGRAM (MODELS 820, 821, & 822)



*DIAGRAM APPLICABLE TO MODELS 900,
901, 915 & 917 AND TO MODEL 916 EXCEPT
AS SHOWN IN PARTIAL DIAGRAM.*



PARTIAL DIAGRAM APPLICABLE TO MODEL 916.

	1	3	4	6	7	8
OFF	0	0	0	0	0	0
RUN	X	X	X			X
LAMP	OFF		X	0	0	
	LO		X	X	0	
	HI		X	0	X	

SWITCH TABLE

Depressing a button on Switch S-2 will open (O), close (X), or leave unchanged (no mark) contacts, as indicated.

(Ref. 39305)

Figure 2-15. PROJECTOR SCHEMATIC DIAGRAM (MODELS 900, 915, 916 & 917)

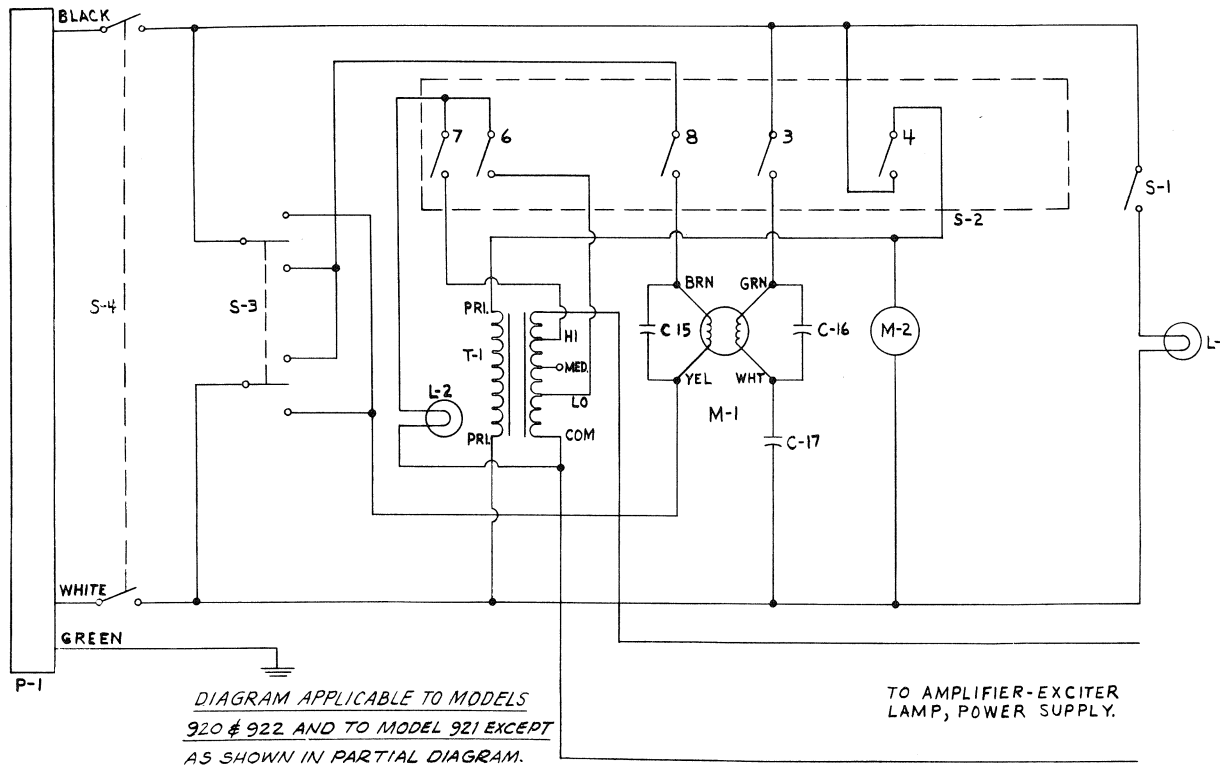
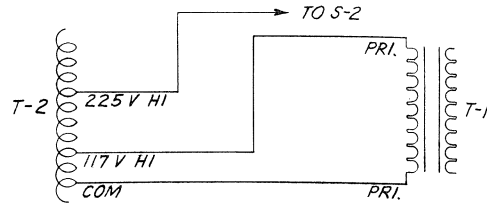


DIAGRAM APPLICABLE TO MODELS
920 & 922 AND TO MODEL 921 EXCEPT
AS SHOWN IN PARTIAL DIAGRAM.

TO AMPLIFIER-EXCITER
LAMP, POWER SUPPLY.



PARTIAL DIAGRAM APPLICABLE TO MODEL 921.

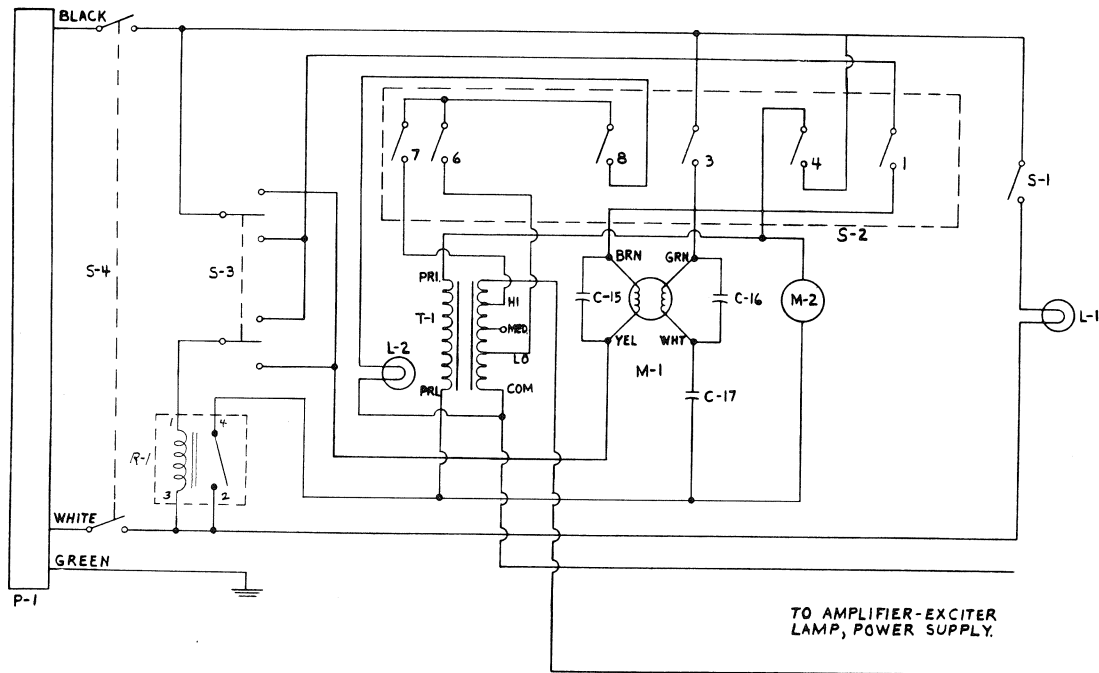
		3	4	6	7	8
LAMP	OFF		0	0	0	0
	STILL		0	X		0
	RUN		X	X		X
LAMP	OFF		X	0	0	
	LO		X	X	0	
	HI		X	0	X	

SWITCH TABLE

Depressing a button on Switch S-2 will open (O), close (X), or leave unchanged (no mark) contacts, as indicated.

(Ref. 39304)

Figure 2-16. PROJECTOR SCHEMATIC DIAGRAM (MODELS 920, 921, & 922)



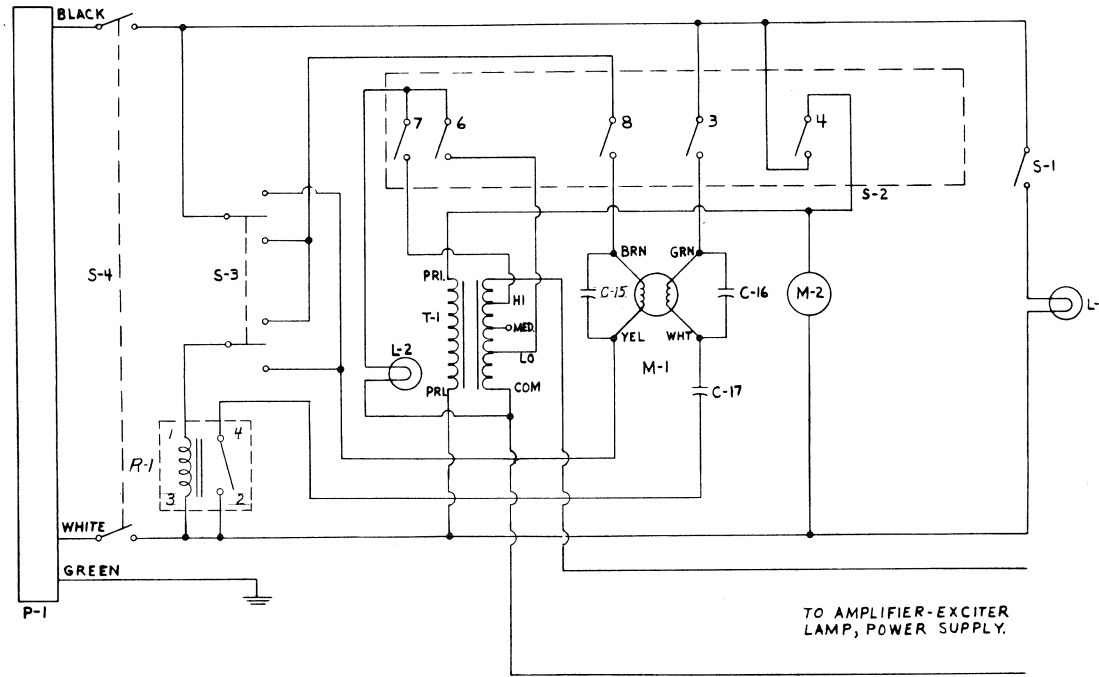
		1	3	4	6	7	8
OFF		○	○	○	○	○	○
RUN		X	X	X			X
LAMP	OFF			X	○	○	
	LO			X	X	○	
	HI			X	○	X	

SWITCH TABLE

Depressing a button on Switch S-2 will open (○), close (X), or leave unchanged (no mark) contacts, as indicated.

(Ref. 40482)

Figure 2-17. PROJECTOR SCHEMATIC DIAGRAM (Models 900-S, 901-S & 915-S)



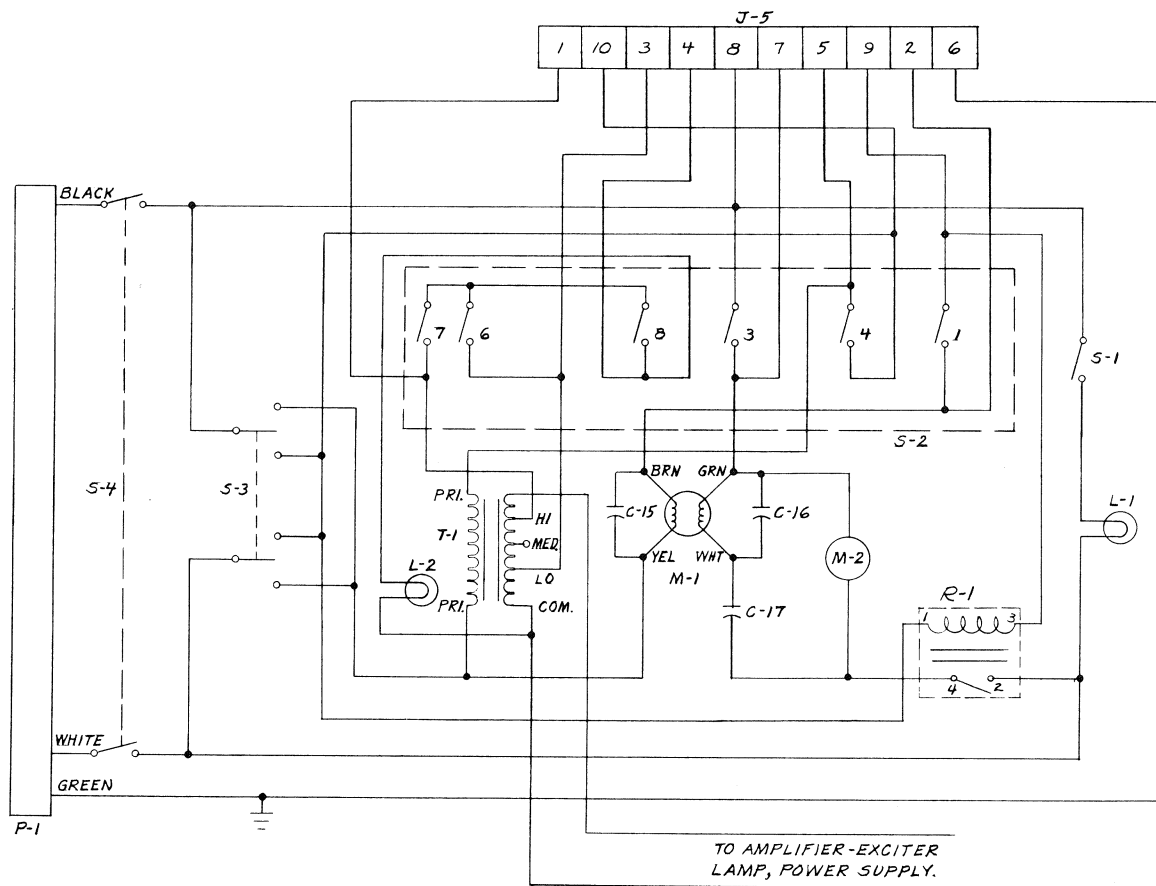
		3	4	6	7	8
OFF		0	0	0	0	0
STILL		0	X			0
RUN		X	X			X
LAMP	OFF			X	0	0
	LO			X	X	0
	HI			X	0	X

SWITCH TABLE

Depressing a button on Switch S-2 will open (O), close (X), or leave unchanged (no marks) contacts, as indicated.

(Ref. 40484)

Figure 2-18. PROJECTOR SCHEMATIC DIAGRAM (MODEL 920-S)



	1	3	4	6	7	8
OFF	0	0	0	0	0	0
RUN	X	X	X			X
LAMP	OFF		X	0	0	
	LO		X	X	0	
	HI		X	0	X	

SWITCHING TABLE

NOTE:
DEPRESSING A BUTTON ON SWITCH S-2 WILL OPEN (0), CLOSE (X) OR LEAVE UNCHANGED (NO MARK) CONTACTS, AS INDICATED IN THE TABLE.

Figure 2-19. PROJECTOR SCHEMATIC DIAGRAM (MODEL 930 TV)

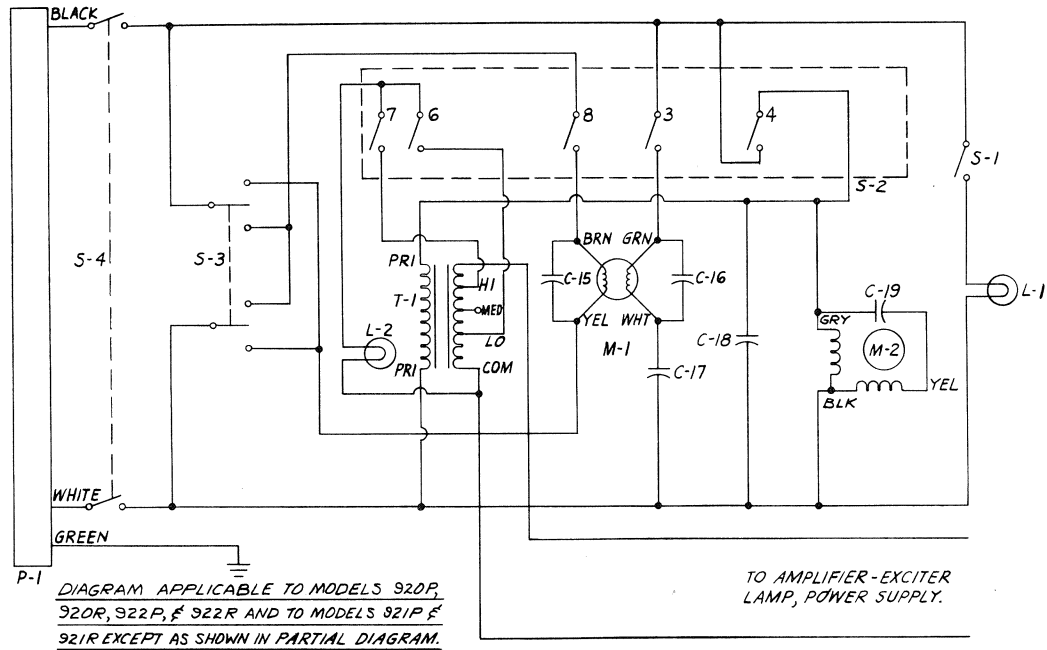
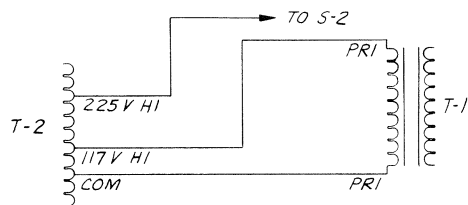


DIAGRAM APPLICABLE TO MODELS 920P, 920R, 922P, & 922R AND TO MODELS 921P & 921R EXCEPT AS SHOWN IN PARTIAL DIAGRAM.



PARTIAL DIAGRAM APPLICABLE TO MODELS 921P & 921R.

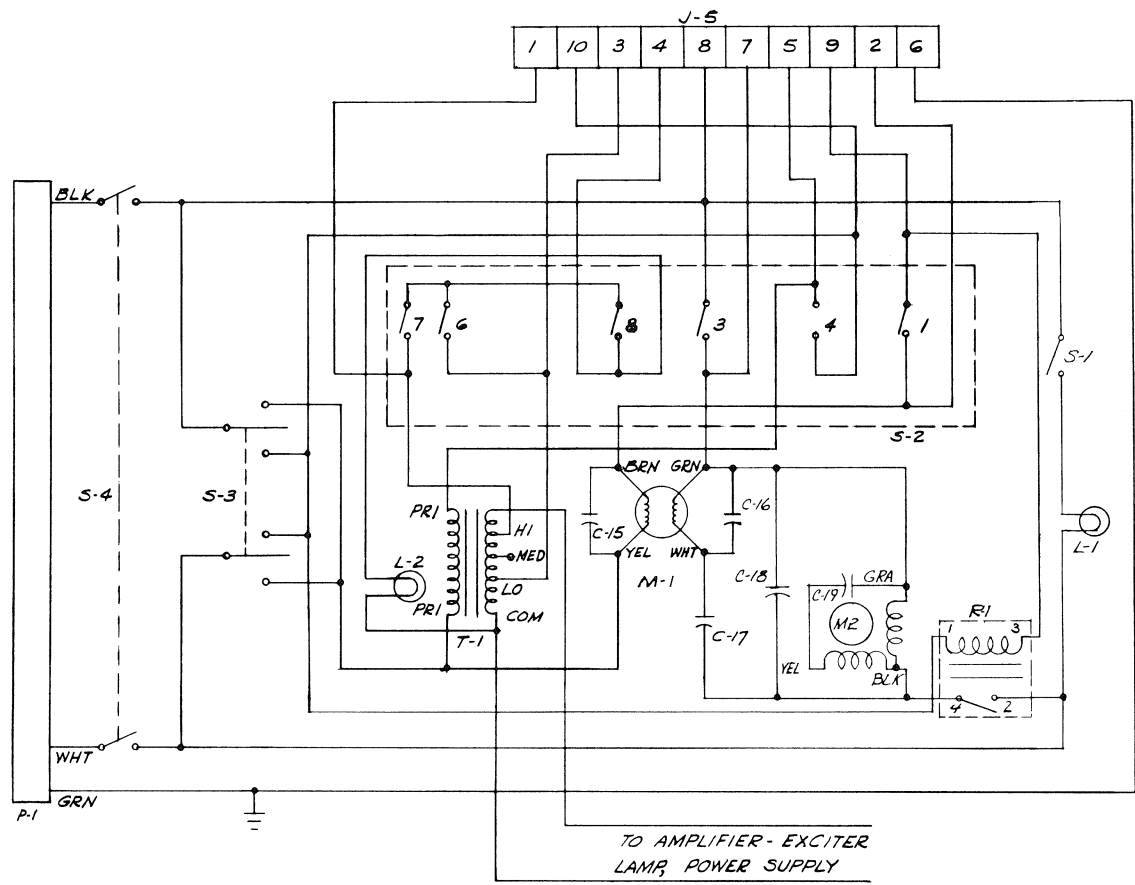
	3	4	6	7	8
OFF	0	0	0	0	0
STILL	0	X			0
RUN	X	X			X
LAMP OFF			X	0	0
LAMP LO			X	X	0
LAMP HI			X	0	X

SWITCH TABLE

Depressing a button on Switch S-2 will open (O), close (X), or leave unchanged (no marks) contacts, as indicated.

(Ref. 41066)

Figure 2-20. PROJECTOR SCHEMATIC DIAGRAM (MAGNETIC SERIES)



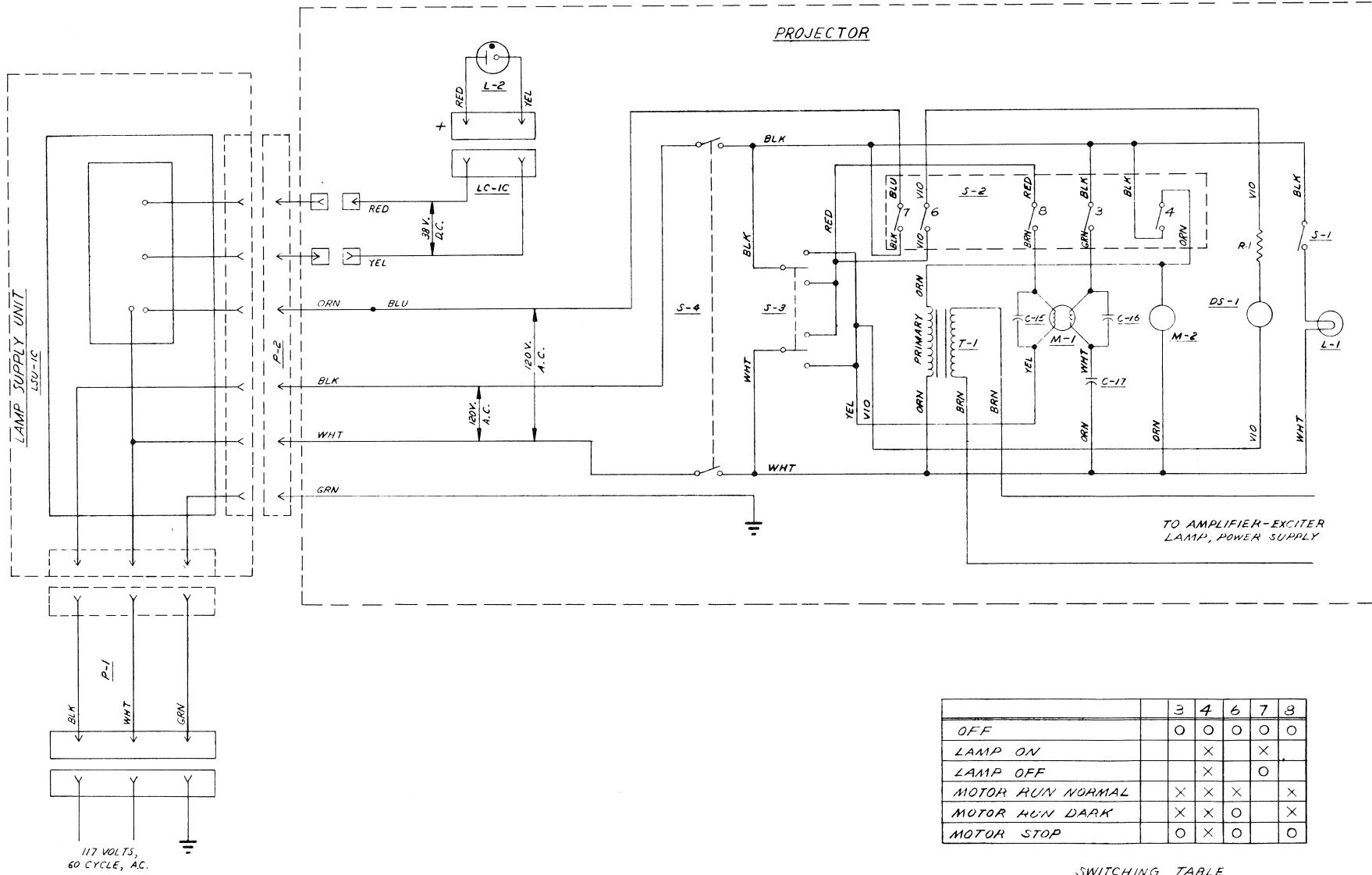
	1	3	4	6	7	8
OFF	0	0	0	0	0	0
RUN	X	X	X			X
LAMP	OFF		X	0	0	
	LO		X	X	0	
	HI		X	0	X	

SWITCHING TABLE

NOTE:
DEPRESSING A BUTTON ON SWITCH S-2 WILL OPEN (O), CLOSE (X) OR LEAVE UNCHANGED (NO MARK) CONTACTS, AS INDICATED IN THE TABLE.

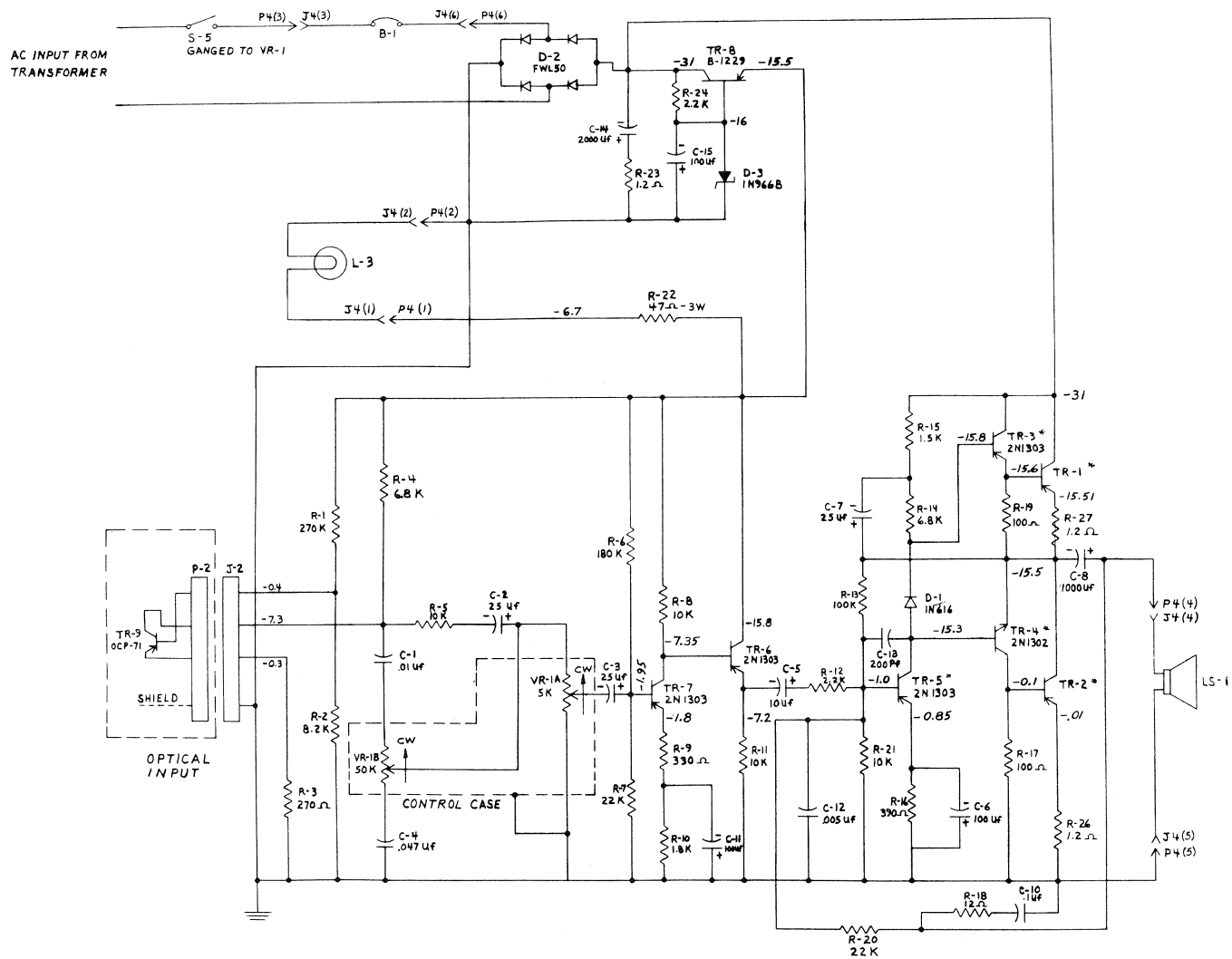
Figure 2-21. PROJECTOR SCHEMATIC DIAGRAM (MODEL 930-R)

(Ref. 41090)



(Ref. 41392)

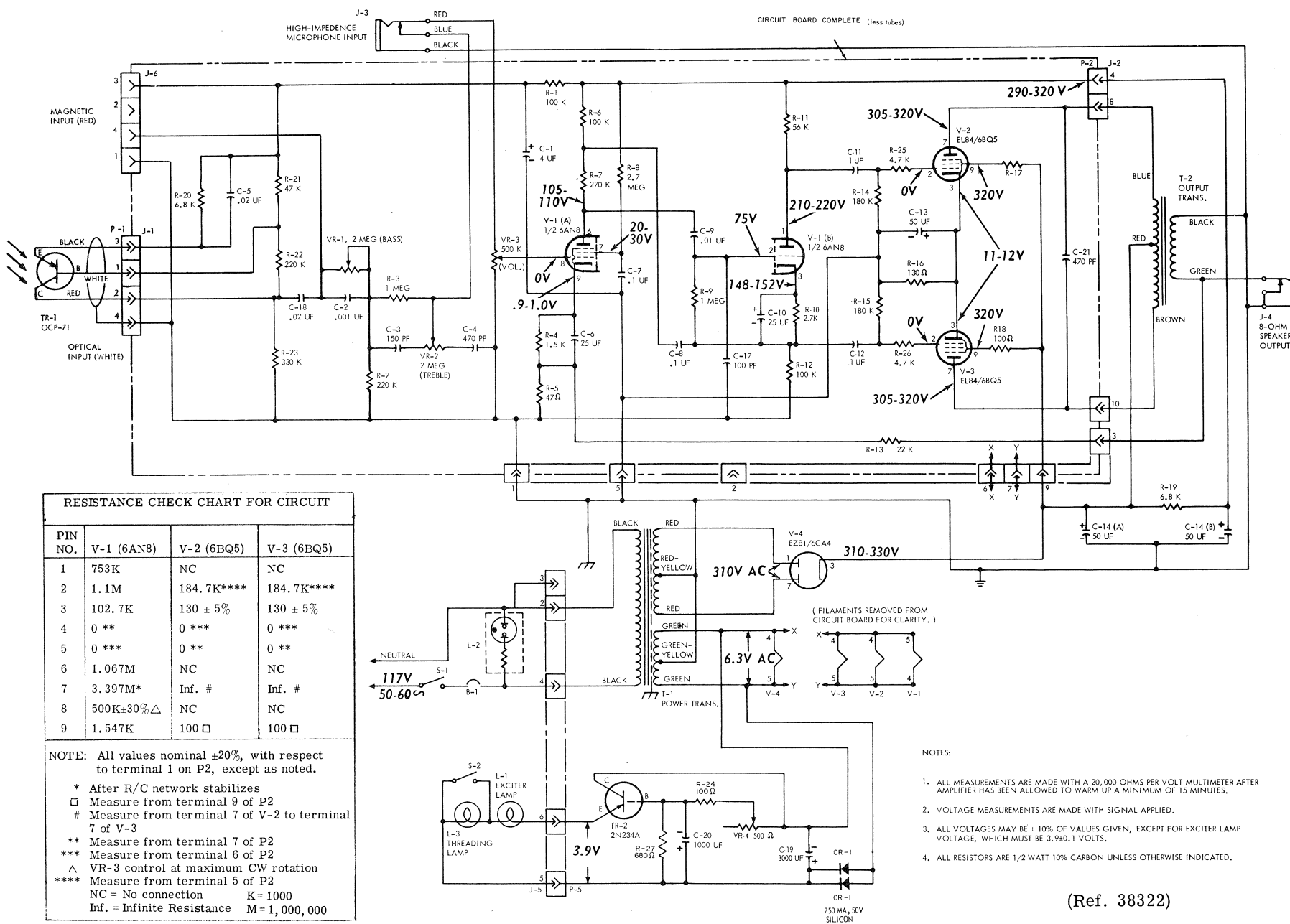
Figure 2-22. PROJECTOR SCHEMATIC DIAGRAM (MODEL 940)



*TR 1 thru TR 5 - selected and must be procured from Graflex.

(Ref. 40694)

Figure 2-23. AMPLIFIER SCHEMATIC DIAGRAM (700 SERIES)



RESISTANCE CHECK CHART FOR CIRCUIT

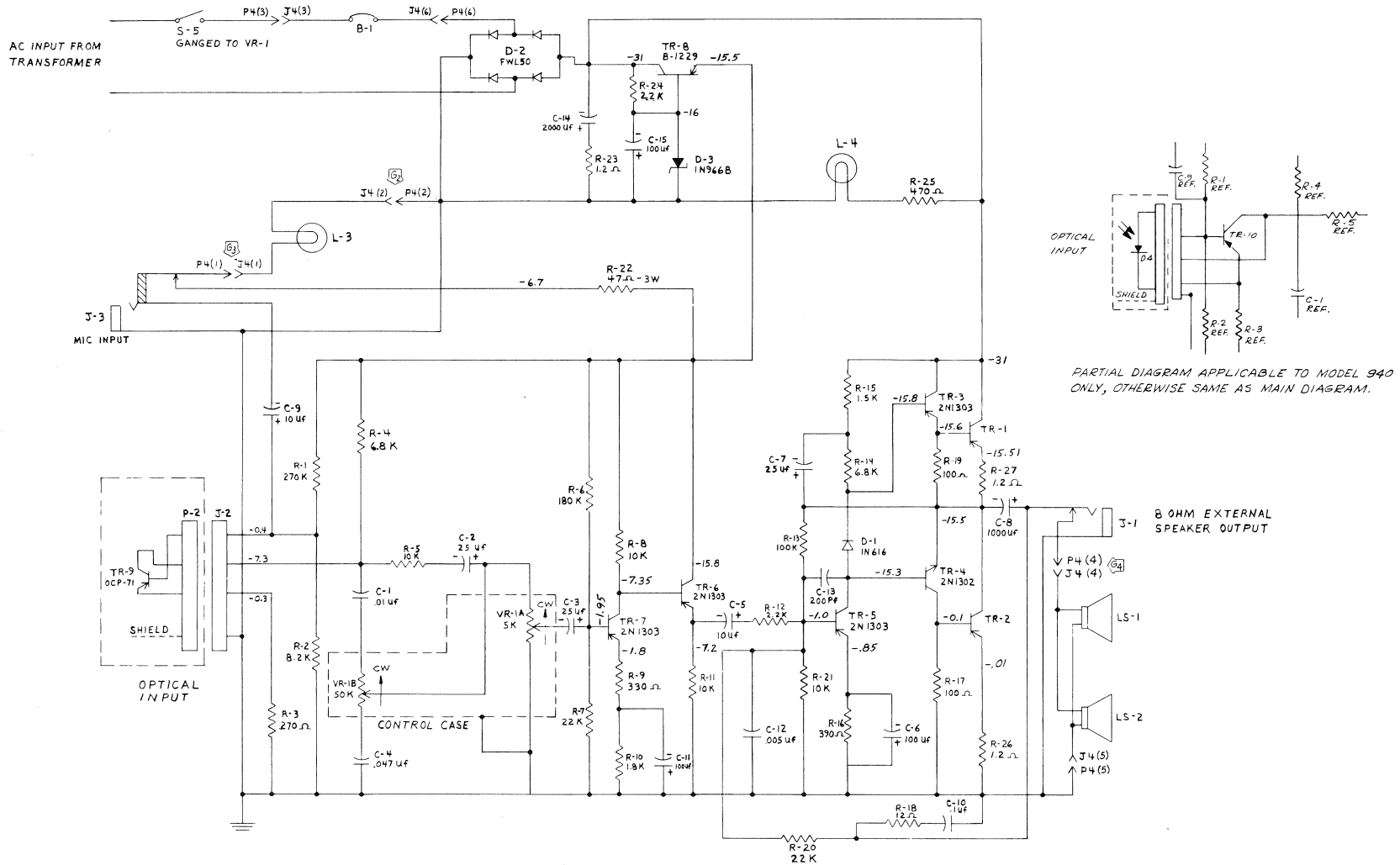
PIN NO.	V-1 (6AN8)	V-2 (6BQ5)	V-3 (6BQ5)
1	753K	NC	NC
2	1.1M	184.7K****	184.7K****
3	102.7K	130 ± 5%	130 ± 5%
4	0 **	0 ***	0 ***
5	0 ***	0 **	0 **
6	1.067M	NC	NC
7	3.397M*	Inf. #	Inf. #
8	500K±30%△	NC	NC
9	1.547K	100 □	100 □

NOTE: All values nominal ±20%, with respect to terminal 1 on P2, except as noted.

* After R/C network stabilizes
 □ Measure from terminal 9 of P2
 # Measure from terminal 7 of V-2 to terminal 7 of V-3
 ** Measure from terminal 7 of P2
 *** Measure from terminal 6 of P2
 △ VR-3 control at maximum CW rotation
 **** Measure from terminal 5 of P2
 NC = No connection K = 1000
 Inf. = Infinite Resistance M = 1,000,000

Figure 2-24. AMPLIFIER SCHEMATIC DIAGRAM (800 SERIES)

(Ref. 38322)



*TR 1 thru TR 5 - selected and must be procured from Graflex.

(Ref. 39325)

Figure 2-25. AMPLIFIER SCHEMATIC DIAGRAM (900 SERIES, 900-S SERIES, & MODELS 940 & 942)

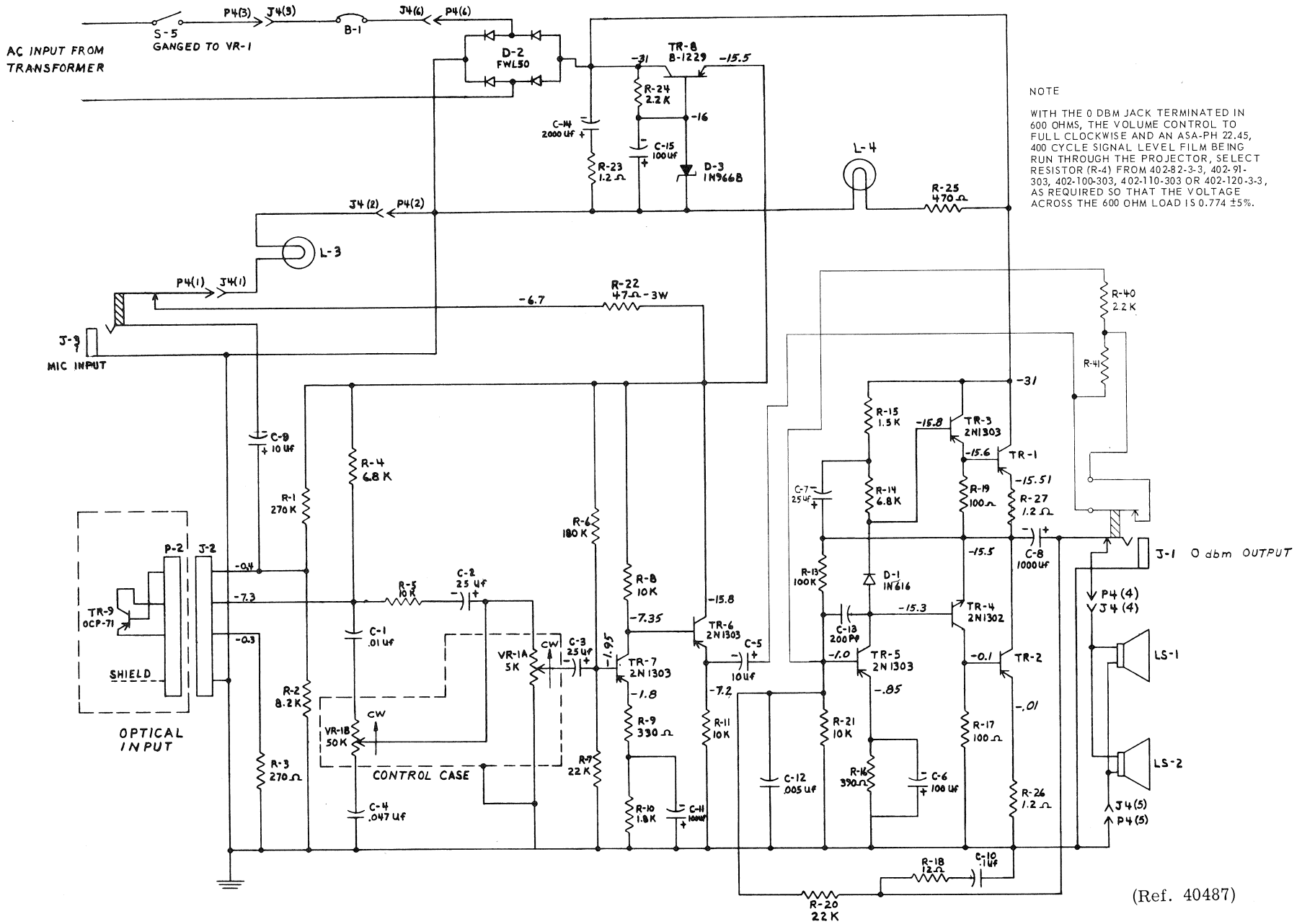
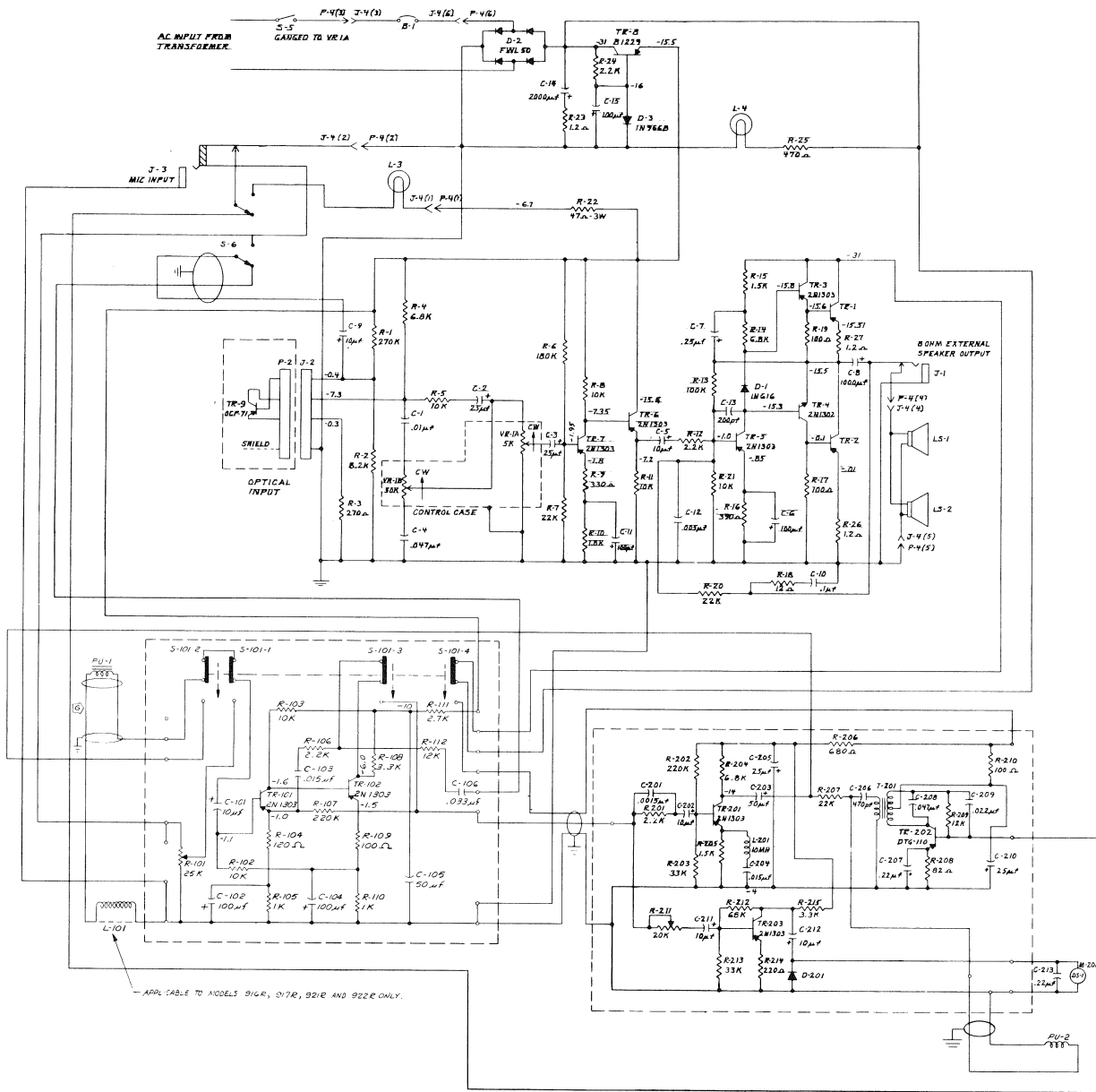
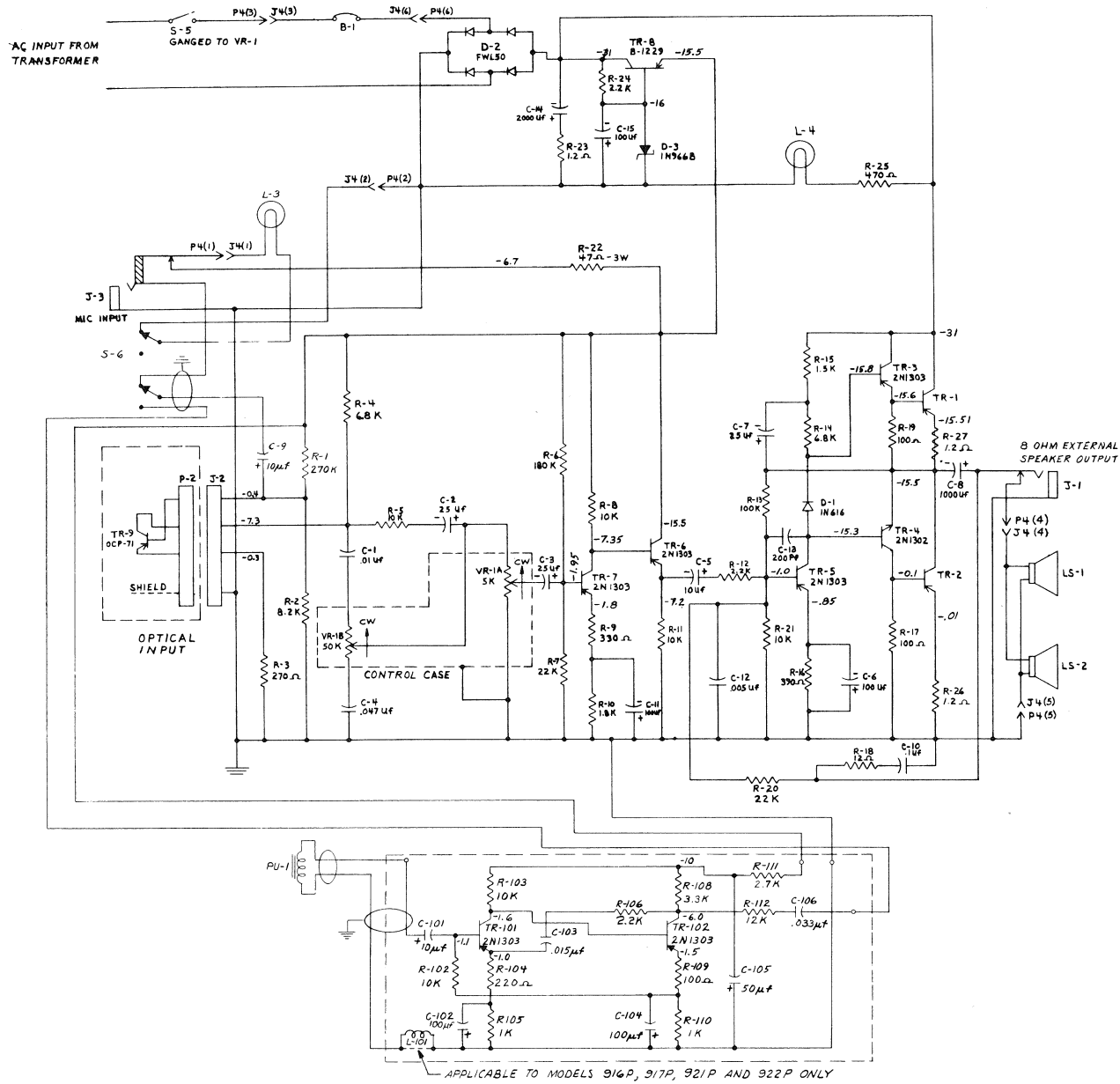


Figure 2-26. AMPLIFIER SCHEMATIC DIAGRAM (MODEL 930 TV)



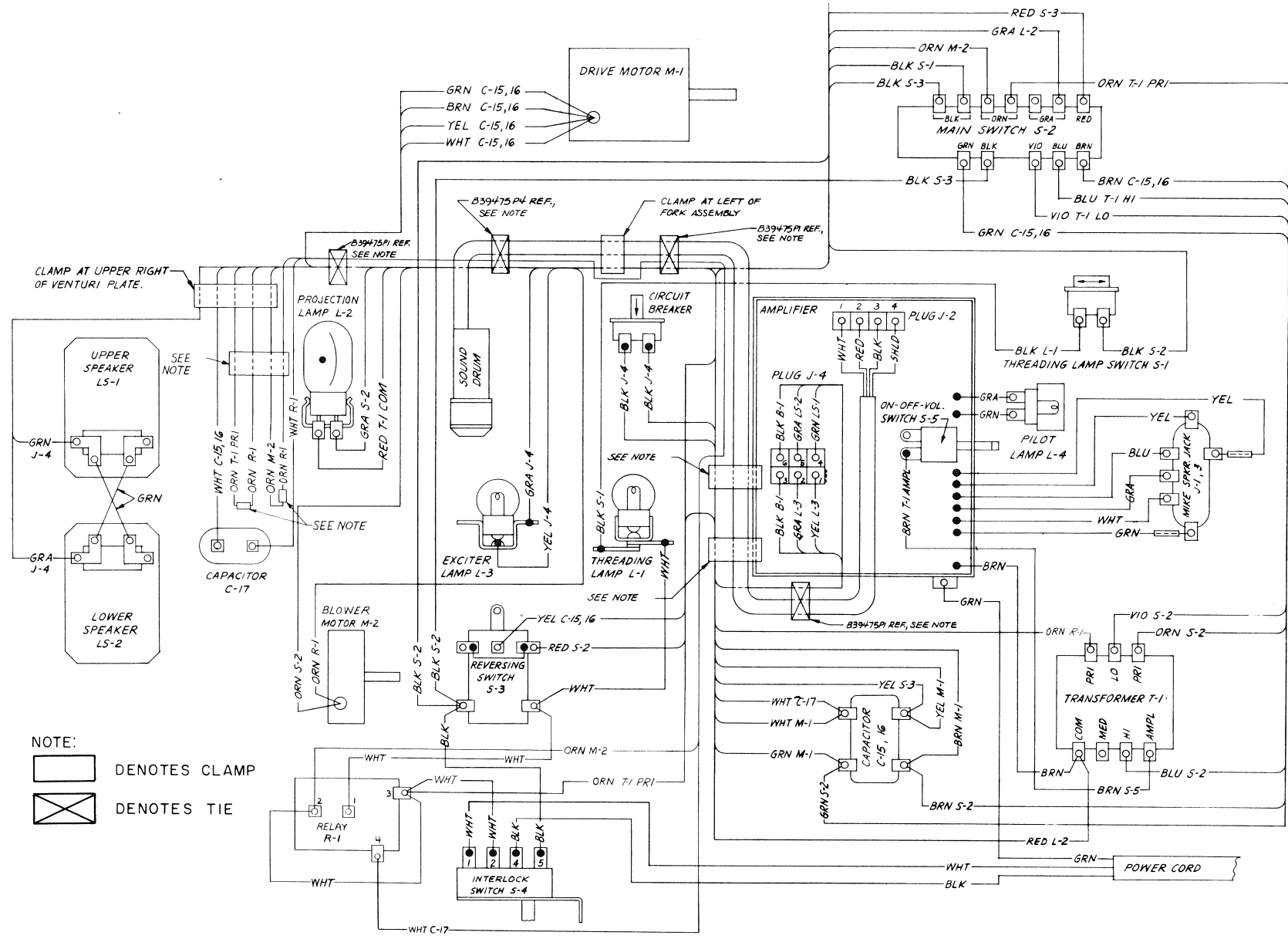
(Ref. 41069)

Figure 2-27. AMPLIFIER SCHEMATIC DIAGRAM (MODELS 920-R, 921-R, & 922-R)



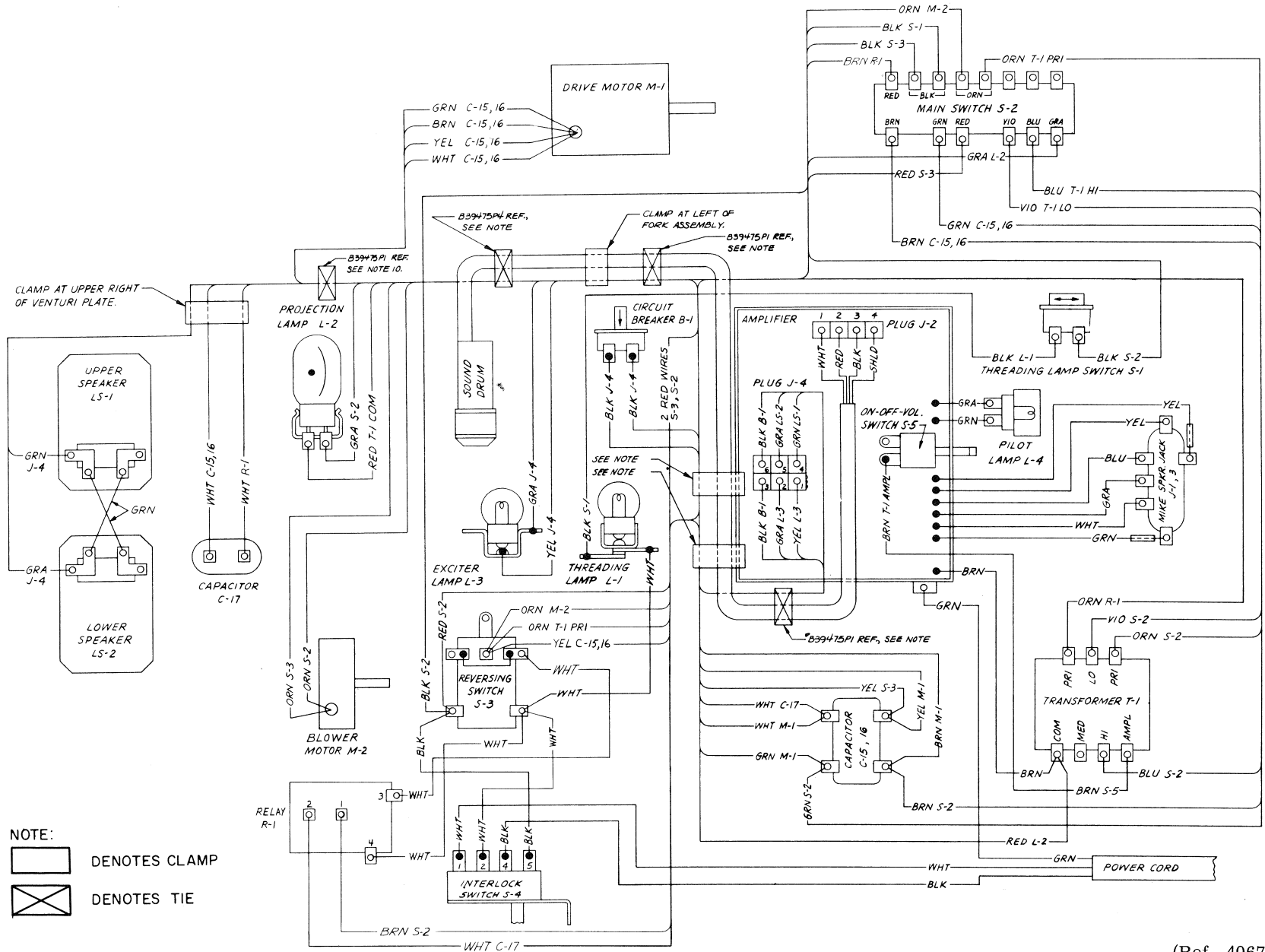
(Ref. 41068)



Figure 2-28. AMPLIFIER SCHEMATIC DIAGRAM (MODELS 920-P, 921-P, & 922-P)



(Ref. 40670)

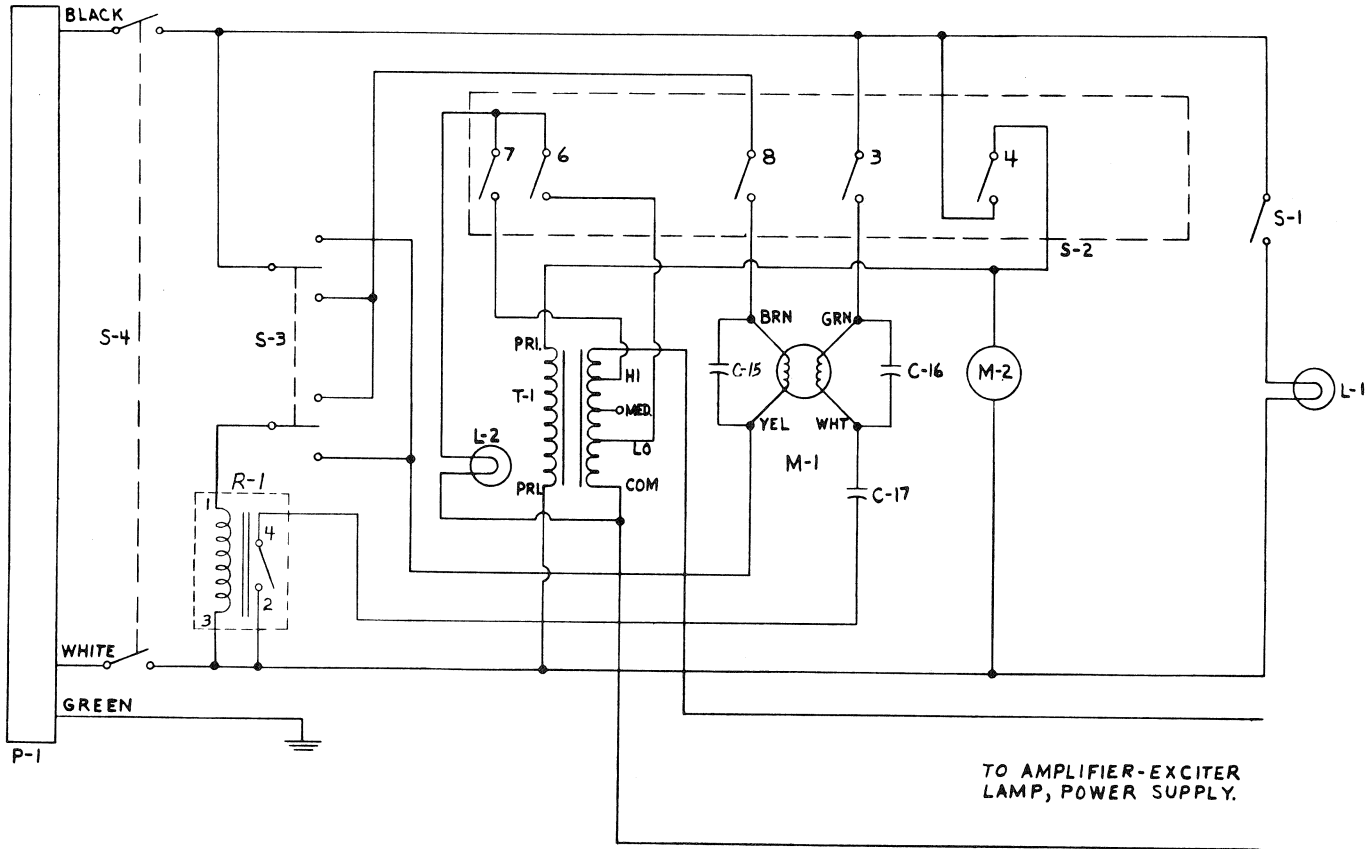
Figure 2-29. ALTERNATE MOTOR - PROJECTOR WIRING DIAGRAM (MODEL 920)



NOTE:
 DENOTES CLAMP
 DENOTES TIE

(Ref. 40671)

Figure 2-30. ALTERNATE MOTOR - PROJECTOR WIRING DIAGRAM (MODELS 900, 901, & 915)



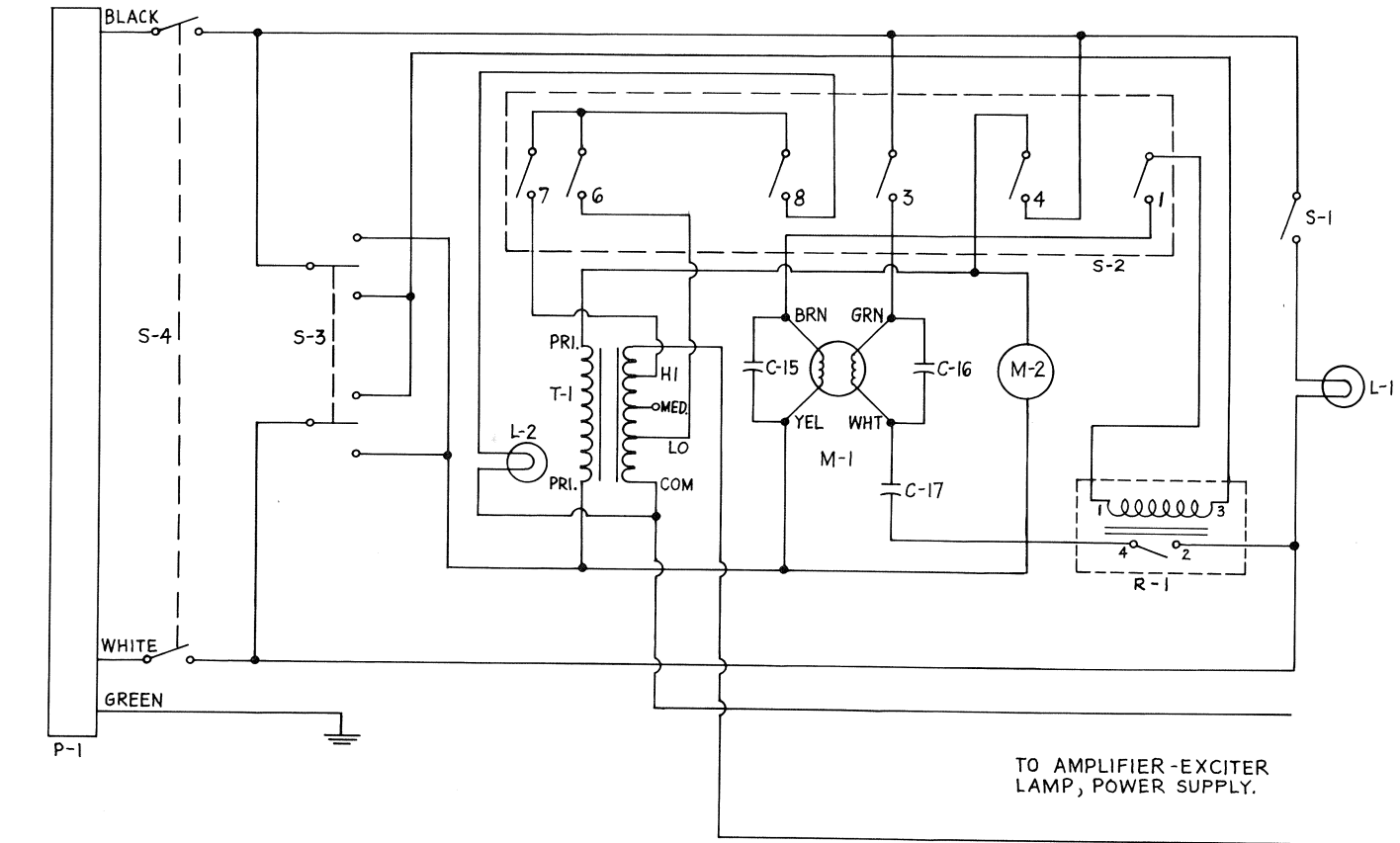
		3	4	6	7	8
OFF		0	0	0	0	0
STILL		0	X			0
RUN		X	X			X
LAMP	OFF		X	0	0	
	LO		X	X	0	
	HI		X	0	X	

SWITCHING TABLE

NOTE:
DEPRESSING A BUTTON ON SWITCH S-2 WILL OPEN (O), CLOSE (X) OR LEAVE UNCHANGED (NO MARK) CONTACTS, AS INDICATED IN THE TABLE.

(Ref. 40668)

Figure 2-31. ALTERNATE MOTOR - PROJECTOR SCHEMATIC DIAGRAM (MODEL 920)



		1	3	4	6	7	8
LAMP	OFF	○	○	○	○	○	○
	RUN	×	×	×			×
	OFF			×	○	○	
	LO			×	×	○	
	HI			×	○	×	

SWITCHING TABLE

NOTE:
DEPRESSING A BUTTON ON SWITCH S-2 WILL OPEN (○), CLOSE (×) OR LEAVE UNCHANGED (NO MARK) CONTACTS, AS INDICATED IN THE TABLE.

(Ref. 40669)

Figure 2-32. ALTERNATE MOTOR - PROJECTOR SCHEMATIC DIAGRAM (MODELS 900, 901 & 915)

SECTION III SERVICE PROCEDURES

A. GENERAL

This section provides instructions for repair and re-assembly, adjustments, and preventive maintenance. Because of the similarities among the Graflex 16 Projector Models, all text and illustrations are based on the 900 Series Projectors unless otherwise noted. The following chart is a list of similar projector models:

MODELS	COMPARE WITH	MODEL
715, 915-S, & 930TV		915
716		916
717		917
900-S		900
920-S, 920-R, & 920-P		920
921-R & 921-P		921
922-R & 922-P		922

Differences between similar models are indicated in this section.

B. SPECIAL TOOLS

Servicing of the Graflex "16" Series projectors will be facilitated by tools described in this section. Some tools may be fabricated according to the illustrations provided; some are standard tools. However, each tool has been assigned a tool number and is available from Graflex.

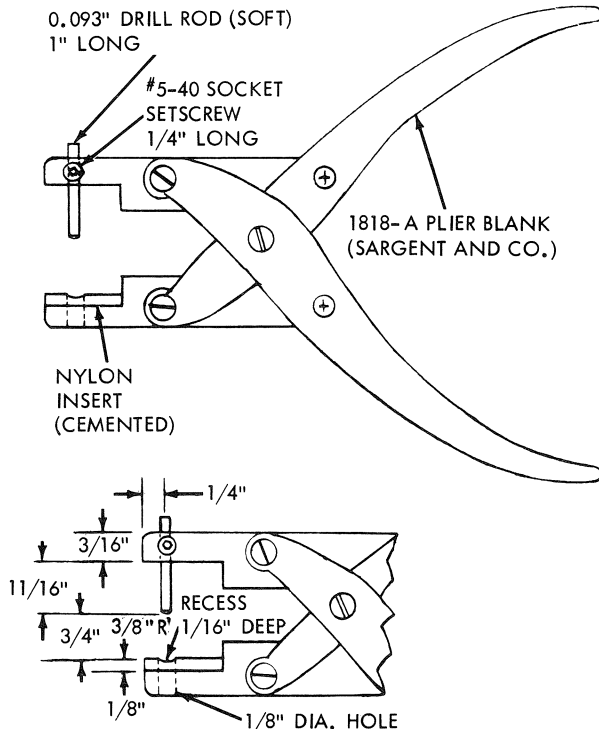


Figure 3-1. ROLL PIN EXTRACTING TOOL
T-38000-P

1. A standard hand tool, No. 1818-A (Sargent and Co., Chicago, Ill.), modified for extraction of spirol pins securing two drive (worm) gears on main drive shaft.

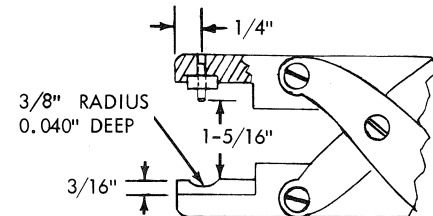
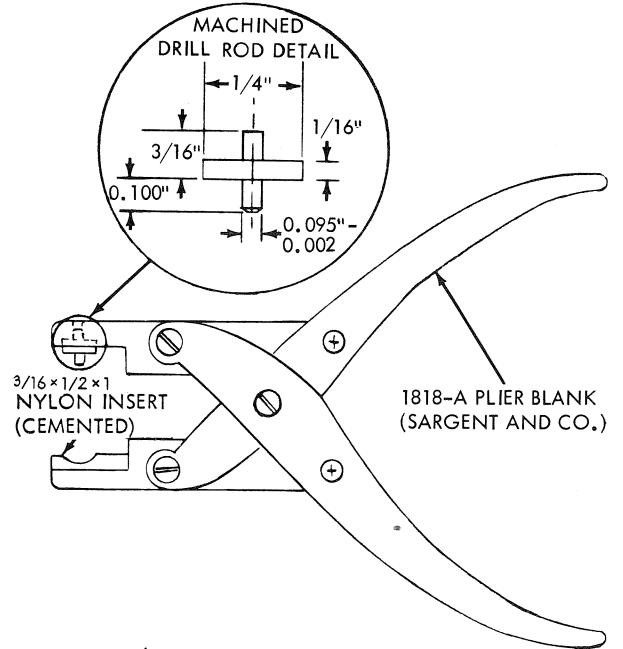


Figure 3-2. ROLL PIN INSERTING TOOL T-38000-N

2. A standard hand tool, No. 18-18-A (Sargent and Co., Chicago, Ill.), modified for insertion of spirol pins securing two drive (worm) gears on main drive shaft.

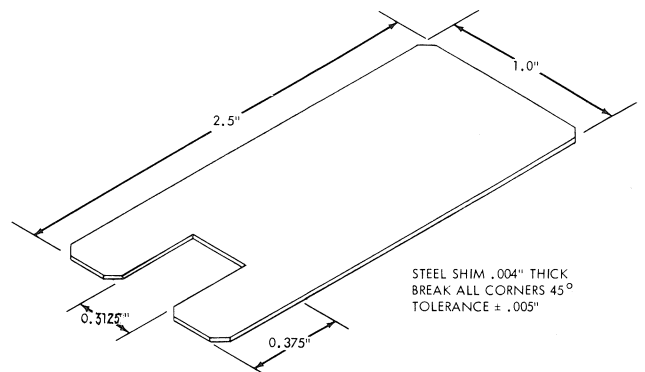


Figure 3-3. FEELER GAGE T-38000-Y

3. This gage is used to set the end play of the sprocket shafts.

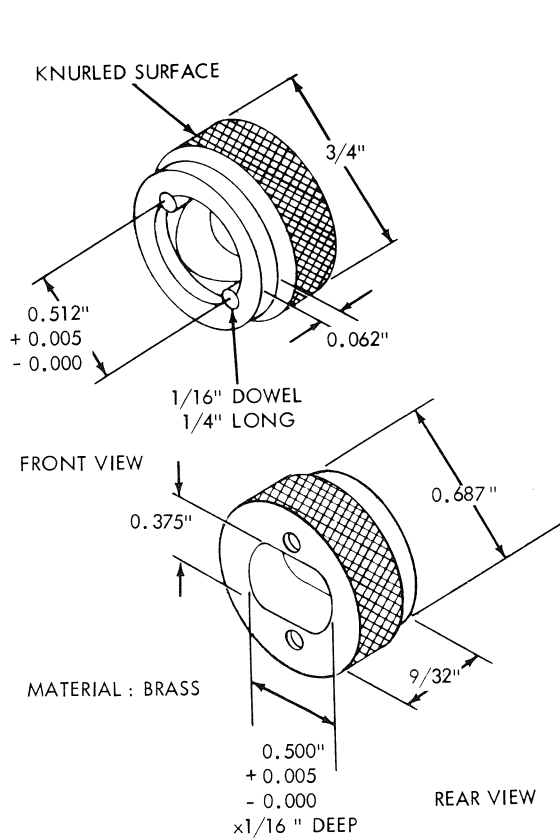


Figure 3-4. SHUTTLE CAM ADJUSTING TOOL ST-5884

4. This tool is used to adjust claw arm side clearance and pull-down stroke.

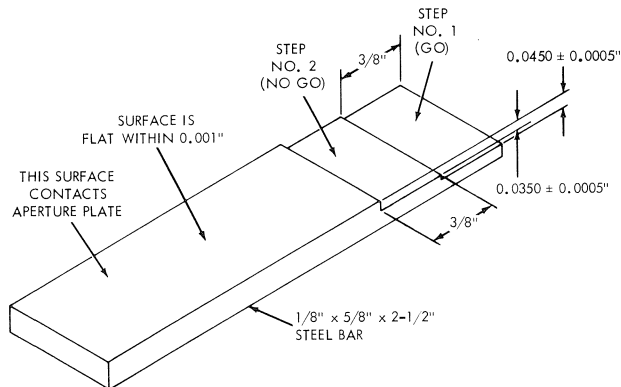


Figure 3-5. CLAW ARM PROTRUSION GAGE G14-38000

5. This gage is used to set claw pin protrusion.

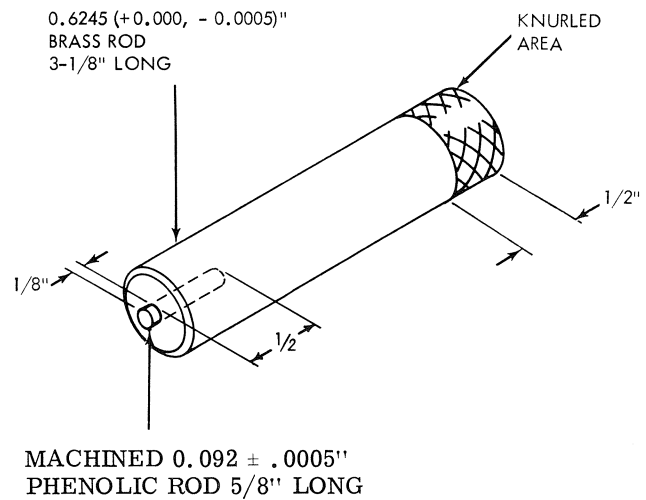


Figure 3-6. SOUND DRUM LOCATING PLUG T-38001-G

6. This tool is used to locate the lateral and rotational position of the sound drum.

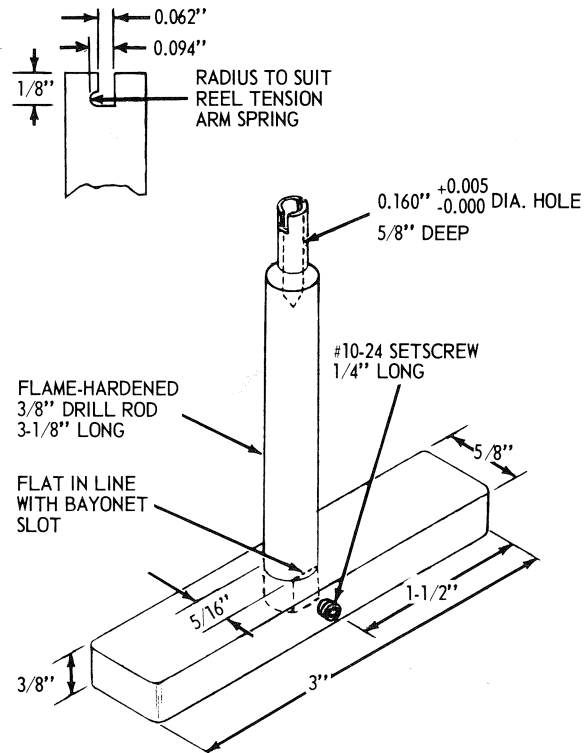


Figure 3-7. SPRING LOADING TOOL T-38001-M

7. This tool is used to pre-load the reel tension arm and the take-up sprocket shoe arm springs.

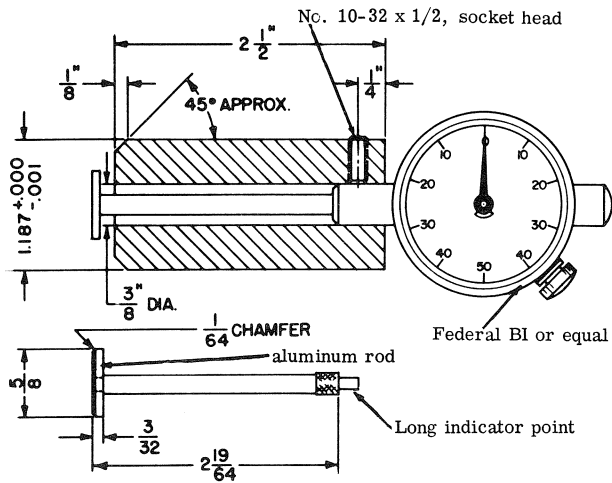


Figure 3-8. FILM PRESSURE ADJUSTING GAGE G8-38000

8. This gage is used to check the displacement of the film pressure shoe springs.

Material- Kodak double perforated 16mm film gage tape 0.003" thk.

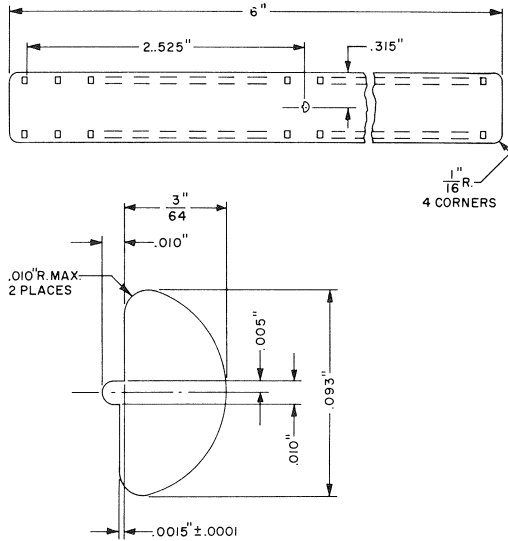
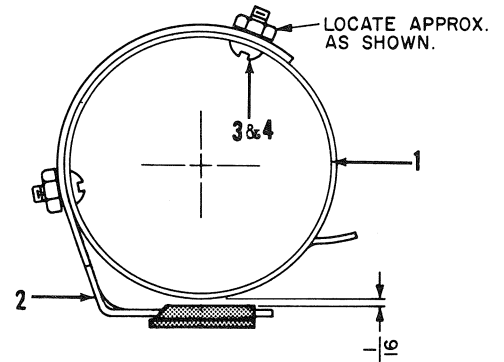


Figure 3-9. STROKE SETTING GAGE ST-5880

9. This gage is a piece of stainless steel with perforations exactly like double-perforated 16 mm motion picture film. This gage is used to adjust the stroke of the projector. The projector functions as an optical comparator when this tool is used.

10. This tool is used in place of the regular chimney in projectors without a STILL position, when the stroke adjustment is made. Its function is to reduce heat from the projection lamp to the stroke setting gage during this adjustment.



- Item 1 - Chimney (Graflex P/N 38182P2)
- Item 2 - Safety Shutter Assembly (Graflex P/N 38456G1)
- Item 3 & 4 Round Hd. Screw & Machine Nut to suit

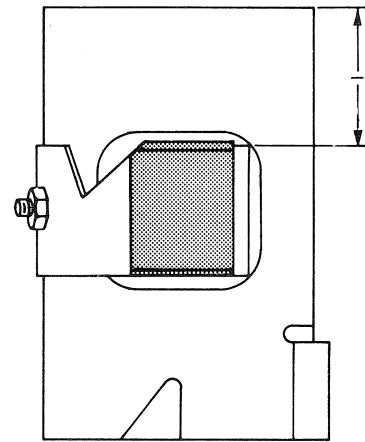


Figure 3-10. HEAT FILTER ADAPTER TOOL G13-38000

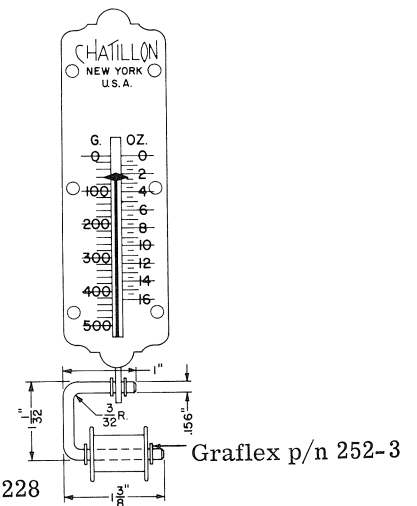


Figure 3-11. FILM TENSION GAGE T-38000-S

11. This gage is used to measure forward take-up tension. The scale reading is twice the actual film tension.

GRAFLEX 16 PROJECTOR

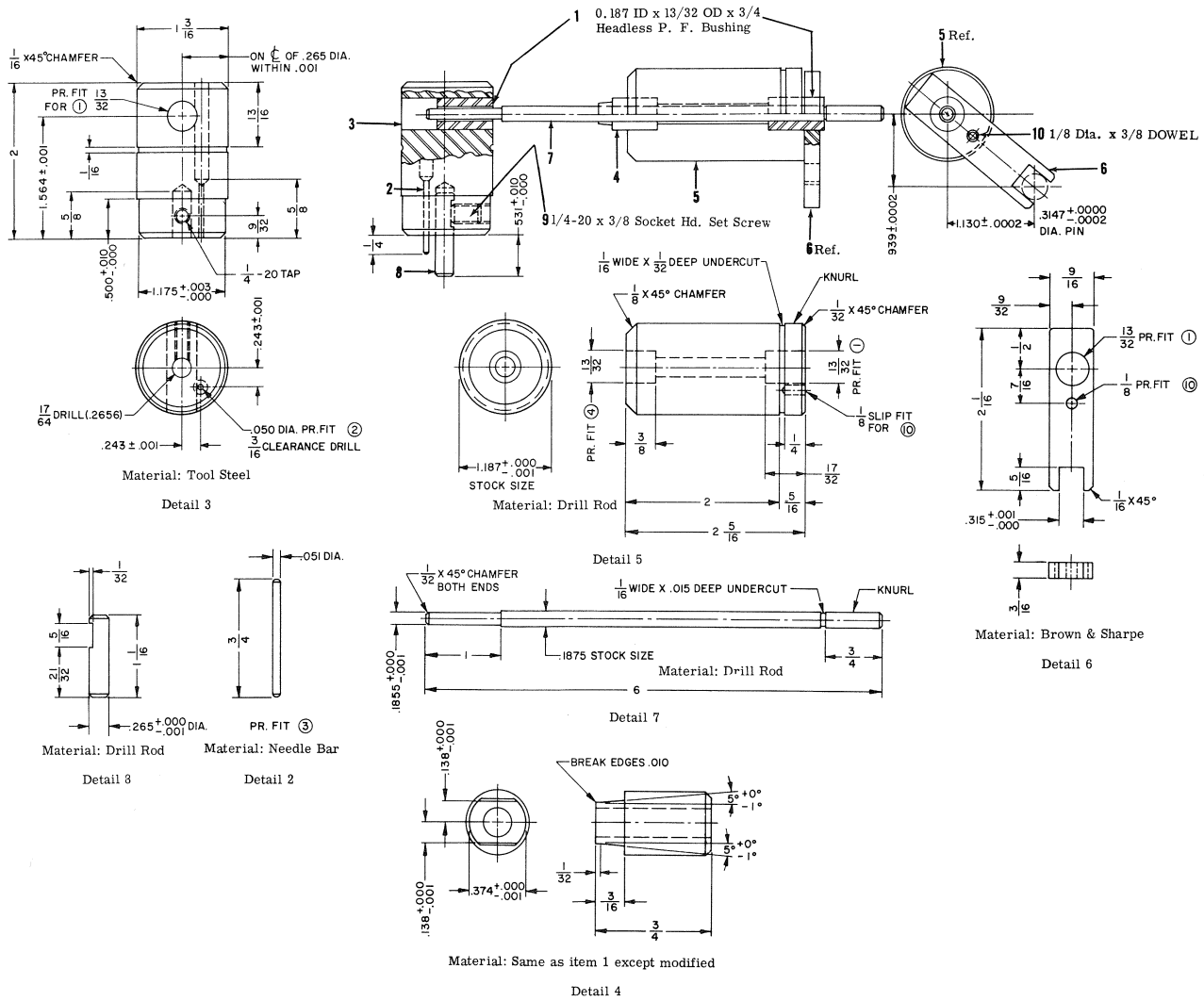


Figure 3-12. LAMP AND OPTICAL PATH ALIGNMENT TOOL G3-38000

12. This tool is used to position the lamp socket and the aperture plate in correct alignment with respect to the lens axis.

13. This gage is used to measure the front spindle reverse drive torque.

14. Waldes Tru-Arc No. 52 Applicator T-38000-U. This tool is used to remove and assemble small retaining rings.

15. Waldes Tru-Arc No. 54 Applicator T-38000-V. This tool is used to remove and assemble large retaining rings.

16. Waldes Tru-Arc No. CR-31 Applicator T-38000-X. This tool is used to remove and assemble "C" rings.

C. MATERIALS

Materials are listed in tabular form. The stock numbers of materials available from Graflex are included. If there is no Graflex Part No., the product will not be supplied by Graflex. (Numbers for test film are those of the Society of Motion Picture and Television Engineers, 55 West 42nd Street, New York 36, N. Y. and are not procurable from Graflex.)

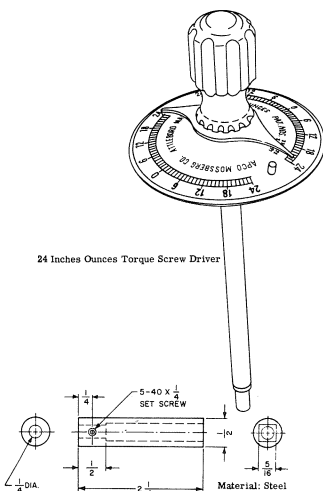


Figure 3-13. SUPPLY REEL SPINDLE TORQUE GAGE G17-38000

GRAFLEX 16 PROJECTOR

Section III
Service Procedures

GRAFLEX STOCK NO.	GRAFLEX STOCK PACKAGE	DESCRIPTION
39479G1	-----	Lubrication Kit (includes first 8 items)
39479P2	1 oz.	Anderol L-793 Grease (Lehigh Chemical Co., Chestertown, Md.)
39479P3	1/2 oz.	A-121-5P Lubricant (Keystone Carbon Co., St. Mary's, Pa.)
39479P4	1/2 oz.	FS-1290 Fluorosilicone Grease (Dow-Corning Corp., Midland, Mich.)
39479P5	1/2 oz.	DC-200 Silicone Fluid; 200,000 centistroke viscosity (Dow-Corning Corp., Midland, Mich.)
39479P6	1/2 oz.	DC-550R Silicone Fluid; 115 centistroke viscosity (Dow-Corning Corp., Midland, Mich.)
39479P7	1/2 oz.	00-9 Lubricant (Keystone Carbon Co., St. Mary's, Pa.)
39479P8	1/2 oz.	Graflex Instrument Oil - Cosmolubric 270 Instrument Oil (E. F. Houghton & Co., Phila., Pa.)
39479P9	2 oz.	DC-44 Silicone Grease; light consistency (Dow-Corning Corp., Midland, Mich.)
-----	-----	No. 44 Gulf Harmony Oil (Gulf Oil Corp., Houston, Texas)
-----	-----	8101-S Silicone Compound (General Cement, Rockford, Ill.)
39490P2	3 oz.	Glyptal No. 1276; clear (General Electric Co., Schenectady, N. Y.)
39490P1	3 oz.	Glyptal ZV-903; purple (General Electric Co., Schenectady, N. Y.)
39491P3	3 oz.	EC-880 (Minnesota Mining & Manufacturing Co., St. Paul, Minn.)
-----	-----	A-963-B Cement (W. J. Ruscoe Co., Akron, Ohio)
-----	-----	RES-N-BOND Cement (Schwartz Chemical Co., Inc., N. Y., N. Y.)
36-16-221	4 oz.	Blue touch-up paint
36-16-224	4 oz.	Charcoal gray touch-up paint
-----	-----	PH22.57 Buzz-track Film
-----	-----	PH22.42 7000 cps Film
-----	-----	16mm Registration Test Film
-----	-----	SMPTE Jiffy Test Film
-----	-----	M16AL Magnetic Azimuth Alignment Test Film
-----	-----	M16MF Magnetic Multifrequency Test Film
-----	-----	M16SL Magnetic 400 Cycle Signal-Level Test Film
-----	-----	TV16AS 16mm Television Test Film (Alignment & Resolution)
-----	-----	Chlorothene (Dow Chemical Co., Midland, Mich.)
-----	-----	Methyl Alcohol
-----	-----	Camel Hair Brush
-----	-----	Hand Air Bulb
39490P3	3 oz.	Glyptal Thinner 1511M
39490P4	8 oz.	Glyptal Thinner 1511M

D. REPAIR AND REASSEMBLY

1. Amplifier Complete (800 Series excluded)

CAUTION

Amplifier should never be operated with the circuit breaker disconnected.

a. Shorted Transistors - Transistors cannot be tested in the circuit with an "in circuit" tester, but as a preliminary test. A 20,000 ohm-per-volt ohmmeter should be used to check front-to-back resistance ratio. Use the R x 10 or R x 100 scale for all checks except power transistors. Power transistors should be tested on the R x 1 scale. Measure the resistance from emitter to collector. Reverse the polarity of the test prods. This same test is performed from emitter to base and base to collector. There should be a significant difference in the readings obtained. If a very low reading is obtained and there is little or no difference when the polarity is reversed, the transistor should be removed and replaced. If there is an extremely high resistance in both directions, the transistor is open.

NOTE

When replacing power transistors, a small quantity of General Cement Silicone Compound No. 8101-S should be used on each side of the mica insulator.

b. Shorted Diodes - Diodes are checked in the same manner as transistors (para c above).

c. Transistor "Leakage"

- (1) Attach a dummy 8 ohm, 10 watt (minimum) load in place of the speaker.
- (2) With projection lamp and amplifier in "OFF" position, plug projector into 125 volt AC line.
- (3) Connect the vertical sweep of an oscilloscope across the dummy load.
- (4) Turn the amplifier on and off; observe the wave shape on the oscilloscope. Repeat the test two or three times. Operate the amplifier only for short periods of time at this high voltage. If the waveform appears exactly as in Figure 3-14A, proceed to step (5). If high frequency spikes are present as shown in Figure 3-14B, replace TR-3 immediately.

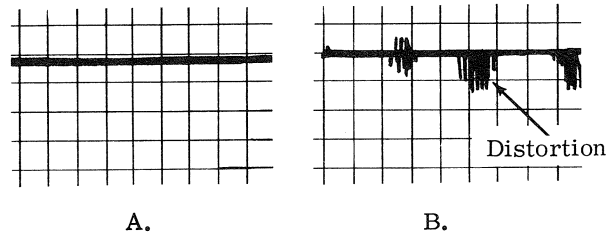


Figure 3-14. AMPLIFIER WAVEFORMS

(5) Connect an audio signal of 1000 cps into the microphone jack. With the tone control in normal position, increase the volume until the sine wave is distorted, as shown in Figure 3-15A. If high frequency distortion pulses are present as shown in Figure 3-15B, replace TR-5. If this does not eliminate distortion, change TR-4.

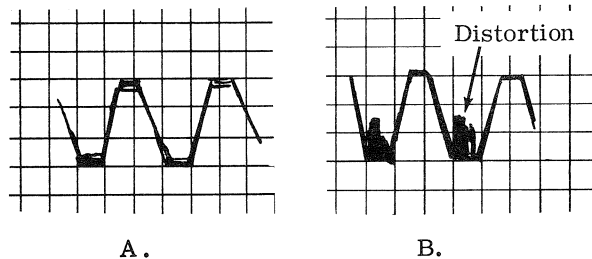


Figure 3-15. AMPLIFIER WAVEFORMS

(6) After any transistor replacement, repeat test in step (4) to be certain the amplifier is operating correctly.

2. Amplifier Cover Assembly

a. To attach switch instruction plate, activate the adhesive backing using the least amount of tichloroethylene. Check activation; adhesive should pull away in string-like fashion. If only slightly tacky, use more solvent. If gummy, excessive solvent has been applied. Allow to dry slightly before applying. When properly activated plate should be applied to control switch escutcheon within seven seconds. After application, smooth plate with dry cloth or roller to assure proper contact and eliminate wrinkles or air bubbles. Apply moderate pressure only.

b. Cement back face of pilot lamp to face of instruction plate with Res-N-Bond cement.

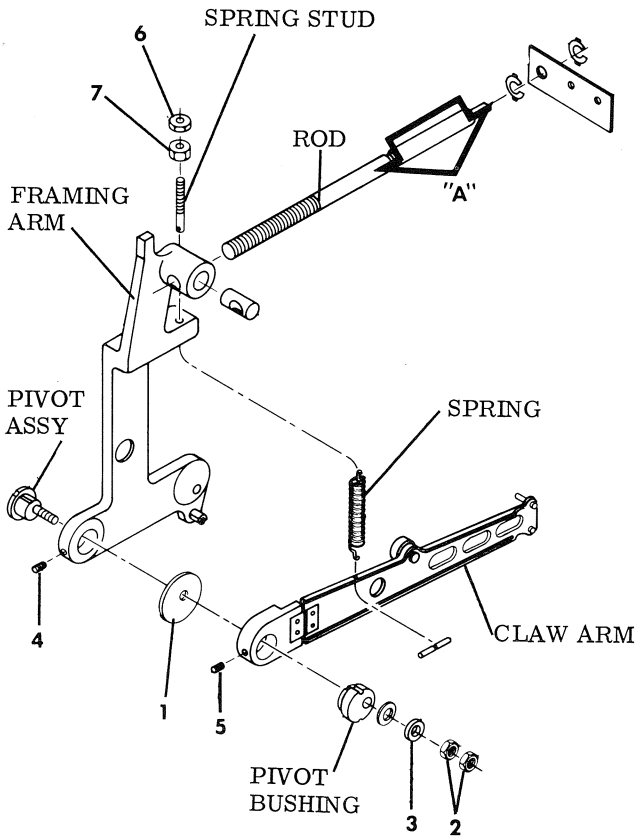


Figure 3-16. CLAW ARM COMPLETE

3. Claw Arm Complete (Figure 3-16)

- a. Lubricate threads and diameter of rod at "A" with DC-44 grease.
- b. Lubricate interface between claw arm and washer (1) with FS-1290 grease.
- c. Adjust nuts (2) to obtain a minimum end play of 0.001 to permit claw arm to pivot freely on the framing arm before spring is assembled.
- d. Apply Glyptal ZV-903 to nuts (2) and washers (3).

4. Shutter & Cam Assembly (Figure 3-17)

- a. Ring (1) must be pressed on hub allowing no end play on cam.
- b. Outer steps of blades (2, 3, & 4) must not rub during operation. If necessary, bend blades away from each other to obtain clearance. Use a suitable hand bending fixture.

5. Threading Control Arm (Figure 3-18)

- a. Apply Anderol L-793 grease to roller shafts. Clean grease off roller ends.

- b. Allow 0.005 to 0.015 end play between rings (1) and rollers by adjusting rings (1) to obtain end play.
- c. Ring (2) must be assembled with throat parallel to bottom edge of control arm (surface "A") and facing closest edge of control arm. Return spring must rotate freely without end play.
- d. Apply DC-200 to surface of stud (3) and to face and inside diameter of hub.
- e. Tighten screw (4) to 95-105 inch ounces of torque.
- f. Record/play head must (applicable to 900 Series R and P Models only) be free to rotate with 0.002 maximum end play.

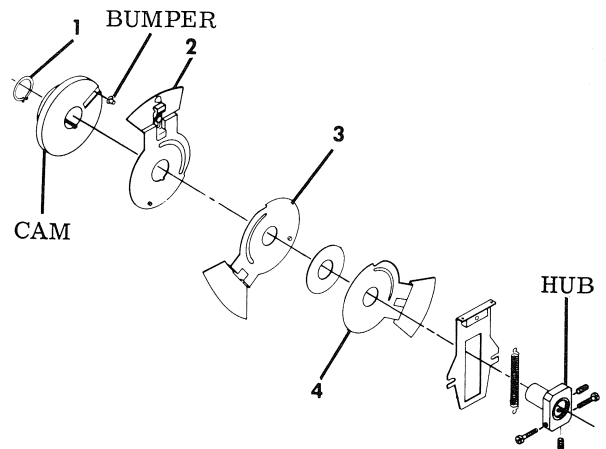


Figure 3-17. SHUTTER & CAM ASSEMBLY

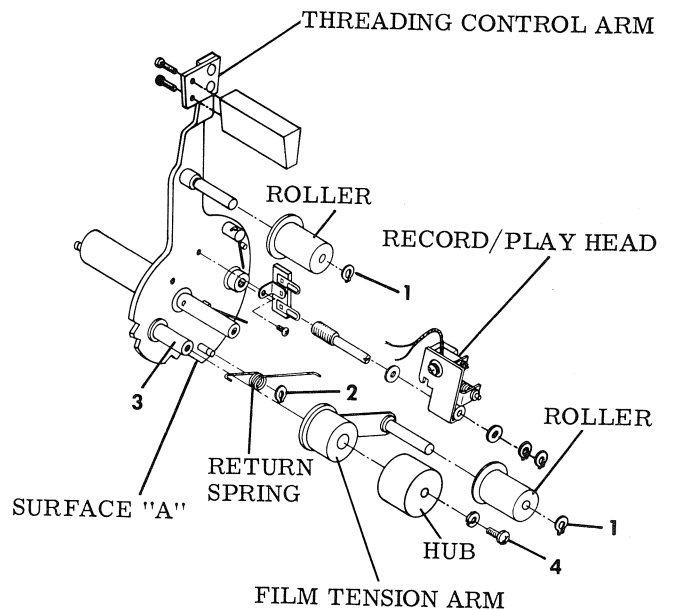


Figure 3-18. THREADING CONTROL ARM

6. Take-up Sprocket Shoe Arm Complete (Figure 3-19)

a. Apply Anderol L-793 grease to studs of arm assembly. Rollers must rotate freely. Wipe off any excess grease.

b. Attach pad to arm assembly with A-963-B adhesive.

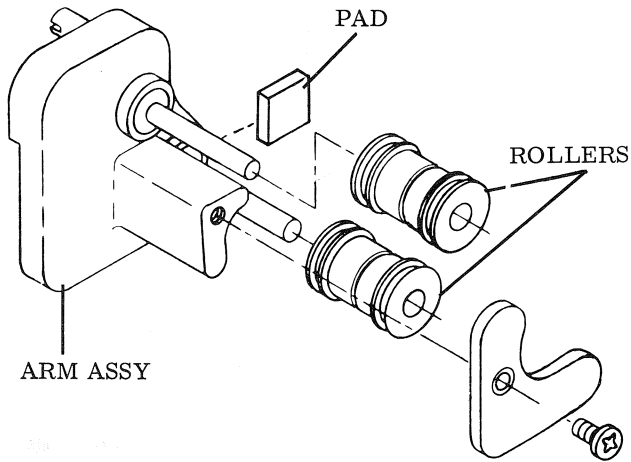


Figure 3-19. TAKE-UP SPROCKET SHOE ARM COMPLETE

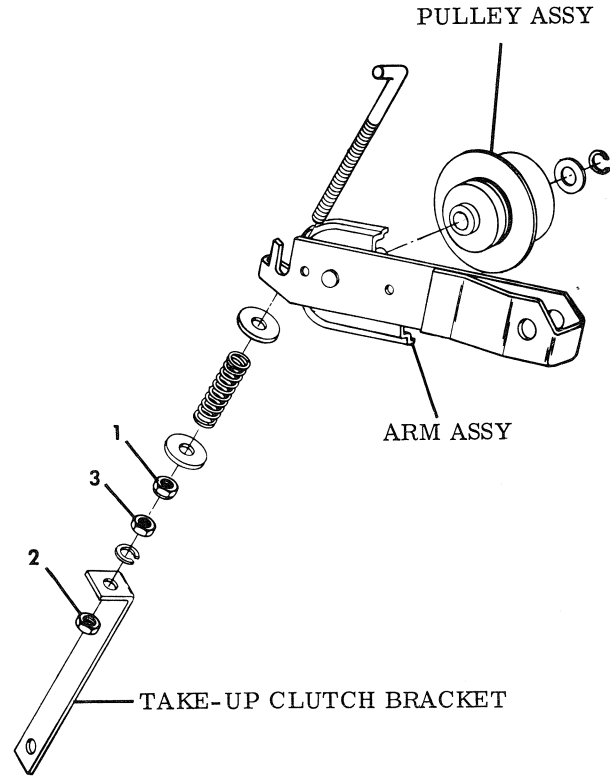


Figure 3-20. TAKE-UP CLUTCH ARM COMPLETE

7. Take-up Clutch Arm Complete (Figure 3-20)

a. Wipe pulley assembly with cloth dampened with chlorothene. Other components of the take-up arm can be washed in chlorothene if cleaning is required.

b. Lubricate stud on arm assembly with 00-9 Keystone lubricant before assembling pulley.

8. Drive Unit Assembly (Figure 3-21)

a. Lubricate inside diameter and outside face of bearings with FS-1290 grease.

b. Collar must be adjusted to allow pulley assembly to rotate freely with 0.005 to 0.010 end play.

c. Setscrew (900 Series Synchronous and TV Models only) must be tightened to 50-65 inch ounces of torque.

9. Drive Belt Shift Fork Assembly (Figure 3-22)

a. Lubricate washer (1), spacer (2), working surfaces of lever, and washer (3) with Anderol L-793 grease. Lubricate part of fork that holds washers (4), rollers, and spacers (5) with L-793.

b. Rollers must rotate freely with 0.007 maximum end play.

c. Tighten nut (6) until fork and lever rotate freely with no perceptible end play.

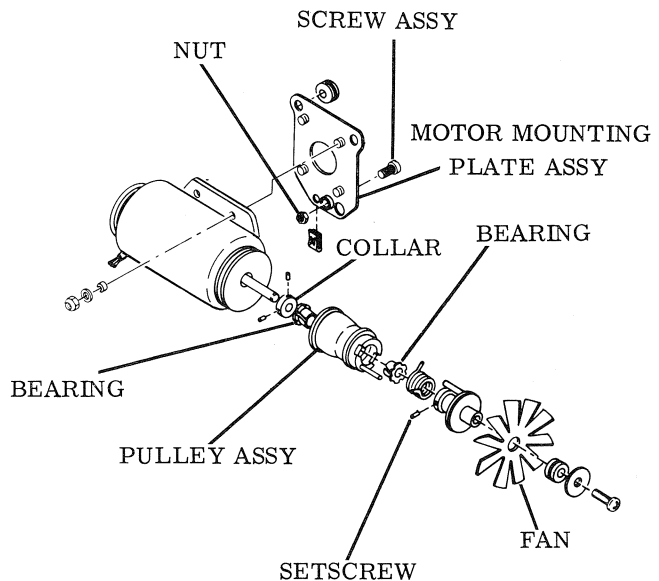


Figure 3-21. DRIVE UNIT ASSEMBLY

10. Motor Mounting Plate Assembly (Figure 3-23)

With motor shaft play taken up toward motor, the following dimensions must be set:

a. The distance between the wheel and plate must be 0.109 ± 0.008 for all 900 Series R and P Models. The wheel must also clear screw heads while rotating.

b. For all other models the distance between the wheel and plate must be 0.135 ± 0.010 and the wheel must clear the screw heads while rotating.

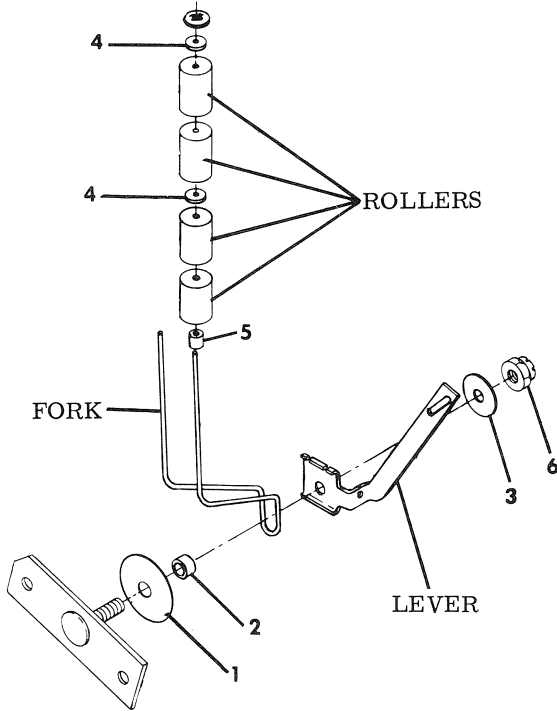


Figure 3-22. DRIVE BELT SHIFT FORK ASSEMBLY

11. Lens Holder Assembly

Apply Glyptal ZV-903 to No. 4-40 screw holding lower spring and to No. 4-40 screw holding projection lens spring assembly.

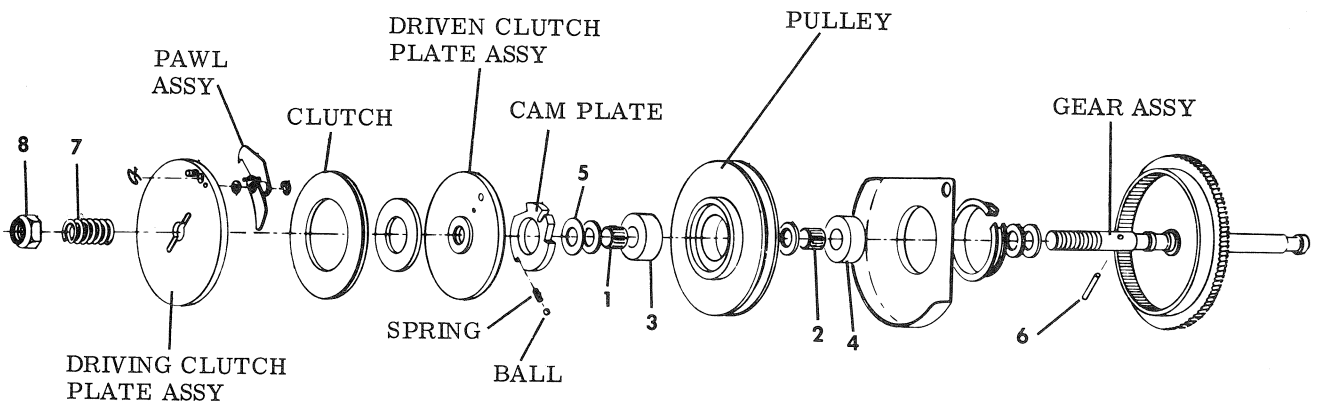


Figure 3-24. FILM FEED CLUTCH ASSEMBLY

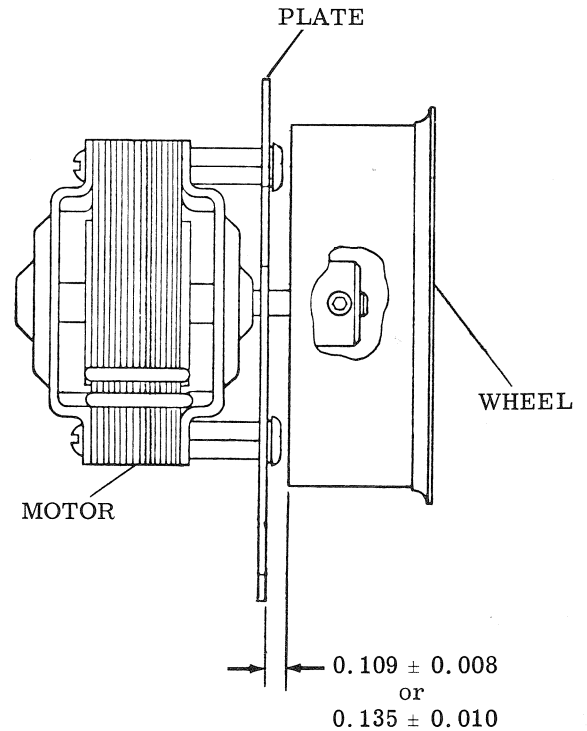


Figure 3-23. MOTOR MOUNTING PLATE ASSEMBLY

12. Film Feed Clutch Assembly (Figure 3-24)

a. When removing cam plate do not lose three spring loaded balls or the springs. Rings (1 & 2) hold bearings (3 & 4) on shaft of gear assembly. Remove bearing (3) by holding pulley; tap end of shaft of gear assembly with rubber or plastic mallet. Use a padded pliers to pull bearing from shaft.

b. Clean inner face of gear assembly with a clean dry cloth. Clutch facing and bearings (3 & 4) are permanently lubricated and should not be cleaned in a solvent. All other metal parts of this assembly can be cleaned with chlorothene.

c. Apply a light coat of DC-44 grease to slot and hole of driving clutch plate assembly. Washer (5) is used, as required to obtain 0.020 ± 0.005 clearance

between driven clutch plate assembly and rim of hub on pulley. Pin (6) must locate fully within the thickness of the driving clutch plate assembly and must not contact spring (7).

d. Lubricate stud of pawl assembly with the least amount of Graflex Instrument Oil.

e. Adjust supply reel belt (Sect. III para. E. 12).

f. Adjust take-up clutch film tension (Sect. III, para E. 7)

13. Feed Sprocket Shoe Complete (Figure 3-25)

a. Wash all parts in methyl alcohol. Inspect rollers for wear. Apply Anderol L-793 grease to studs on shoe assembly. Apply one drop of Graflex Instrument Oil (Cosmolubric 270) between halves of roller on follower assembly.

b. When reassembling, load springs with one full turn of pretension. Follower assembly and dampener assembly must swing freely, smoothly, and be returned by their respective springs. Wipe excess lubricant from rollers and supporting parts.

c. Fasten pad in position using A-963-B adhesive.

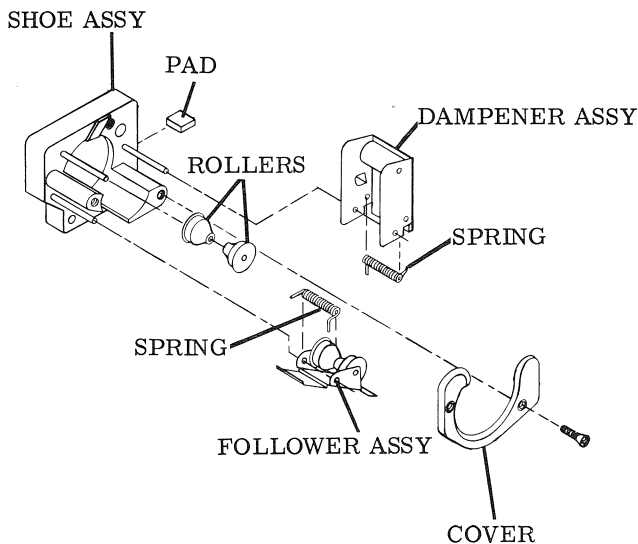


Figure 3-25. FEED SPROCKET SHOE COMPLETE

14. Aperture Plate Assembly (Figure 3-26)

a. Clean guide and aperture plate using a cloth dampened with chlorothene. Use a toothpick or brush to remove deposits of dirt and emulsion. Inspect all parts for wear and damage.

b. When assembled, film edge guide must move freely, smoothly, and be returned by action of the spring.

c. If guide pressure is not within tolerance, reshape spring to maintain 1.250 ± 0.125 oz. at each pad.

d. Measure guide pressure with Push-Pull Gage No. 516-500 or equivalent (16 oz. x 1/4 oz. increment). This tool will not be supplied by Graflex Inc., but should be ordered from John Chatillon & Son, 85 Cliff Street, New York 38, New York.

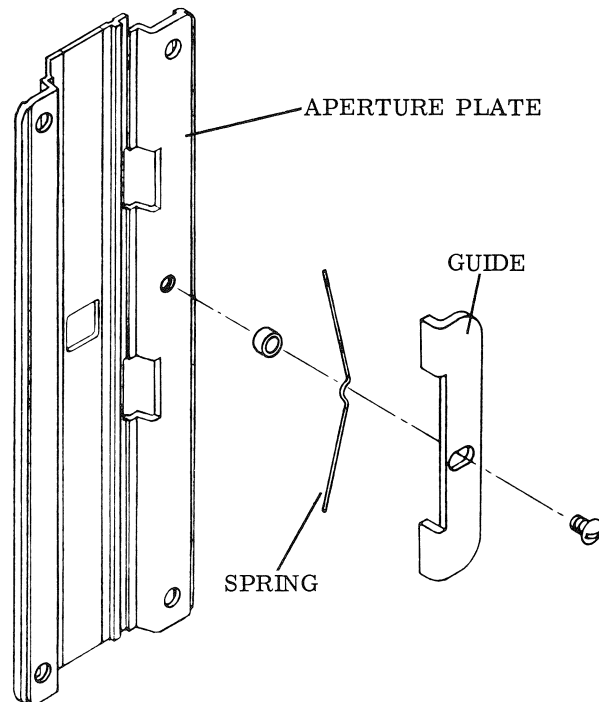


Figure 3-26. APERTURE PLATE ASSEMBLY

15. Drive Shaft (Figure 3-27)

a. Wipe all visible surfaces of shutter and cam assembly, bearings, and metal parts using a cloth dampened with chlorothene. Hub and cam of shutter and cam assembly are permanently impregnated with oil; do not immerse in cleaning solvent.

CAUTION

Do not use a chlorine-base solvent on plastic parts as it will cause crazing or cracking.

b. Apply DC-44 grease liberally to both sides of spring washer and place washer in rear bearing mounting hole in projector housing. Lubricate outside of bearings. Place bearings in their respective bearing mounting holes. Assemble front collar with collar setstrews and front drive gear with spirol pin to drive shaft. Insert spirol pin in drive gear using Rollpin Inserting Tool T-38000-N (Figure 3-2). Feed drive shaft through front hole in projector housing and through subassemblies and parts as shown. Secure rear collar in same manner as front collar.

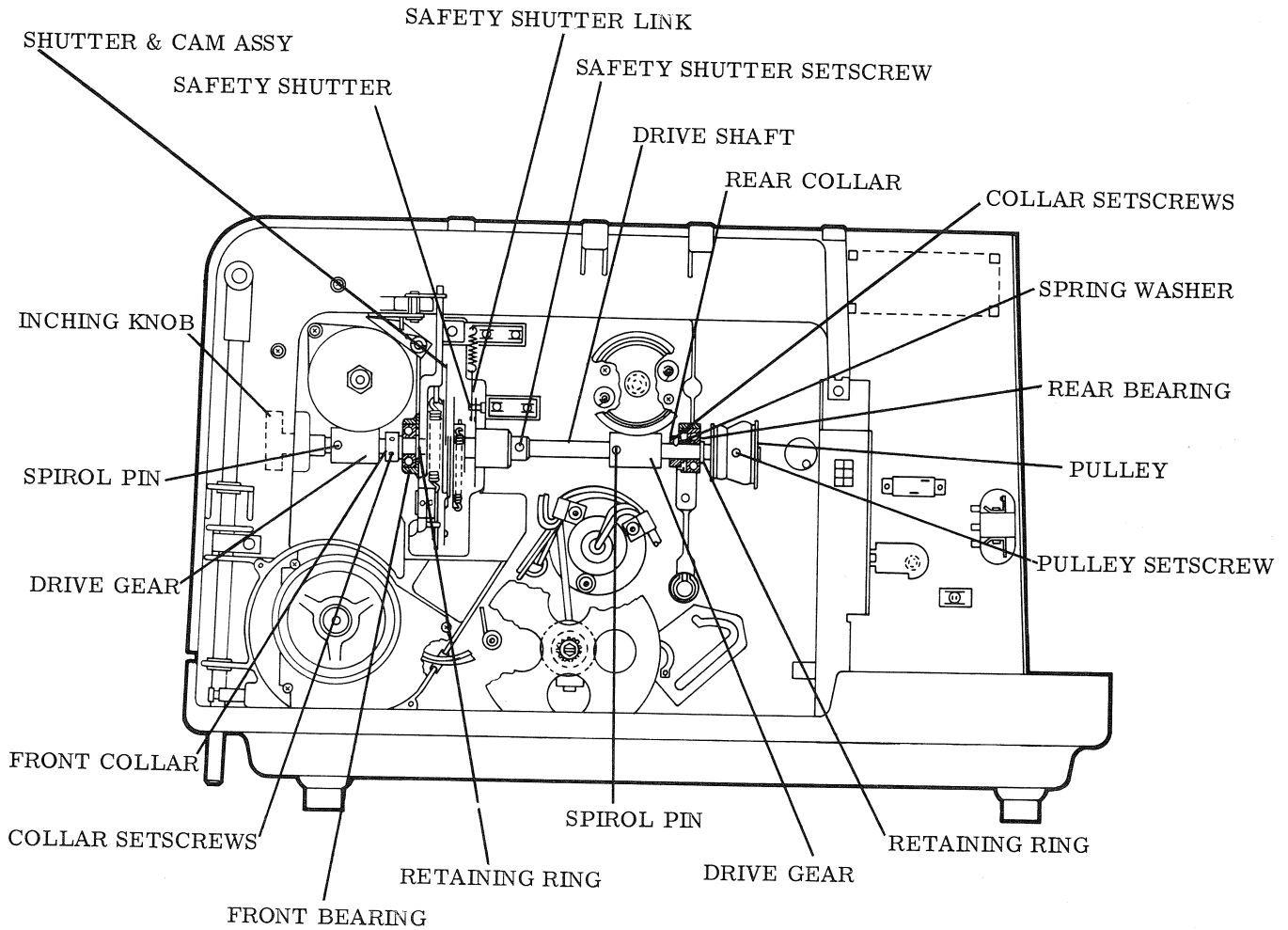


Figure 3-27. DRIVE SHAFT

- c. Set claw protrusion (Sect. III, para. E. 13).
- d. Position safety shutter to avoid striking either the shutter and cam assembly or the chimney. Secure safety shutter in position with setscrew. Hook safety shutter link under tab on safety shutter assembly. Assemble inching knob and pulley.

16. Reel Tension Arm To Projector (Figure 3-28)

- a. Wash all parts in methyl alcohol. Inspect roller and stud on arm assembly for wear.
- b. Apply Anderol L-793 grease to stud on arm assembly and assemble roller. Wipe excess lubricant from roller surfaces and arm assembly. Apply DC-44 grease to arm pivot. Assemble reel tension arm to projector and secure with two retaining rings (1). Arm must rotate smoothly and freely with maximum end play of 0.005. Hold arm against stop on projector housing. Apply Glyptal ZV-903 adhesive to threads of screw (2) and secure loop of spring (3) with screw. Do not completely tighten screw. Rotate spring in a clockwise direction until short tail of spring engages first position of slot on arm pivot. Tighten screw (2). Disengage short tail of spring

from pivot slot and preload spring by turning it 220° in a clockwise direction. Use Spring Loading Tool

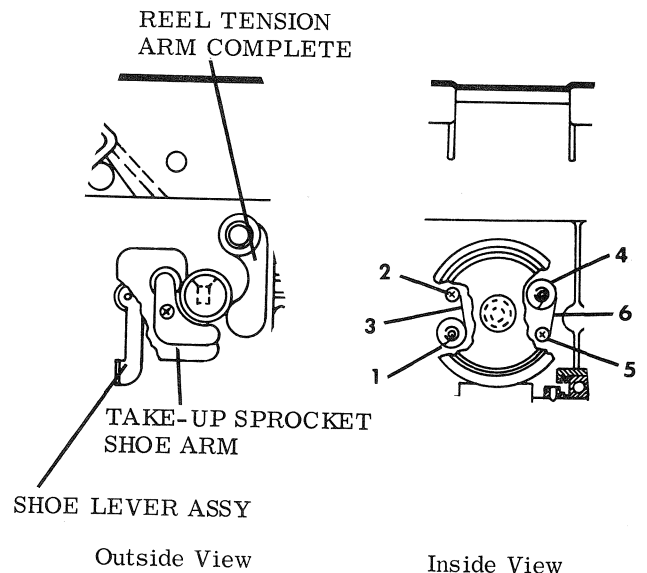


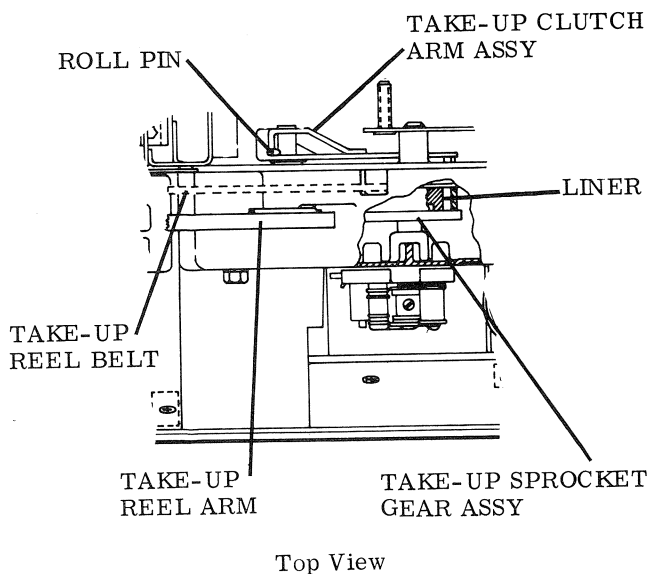
Figure 3-28. REEL TENSION ARM & TAKE-UP SPROCKET SHOE ARM

T-38000-M (Figure 3-7). Align pivot slot to loaded spring and re-insert tail of spring into slot.

17. Take-up Sprocket Shoe Arm to Projector (Figure 3-28)

a. Apply DC-44 grease to sprocket shoe arm pivot and shoe lever assembly (pivot and slot) and assemble.

b. Assemble take-up sprocket shoe arm to projector and secure with two retaining rings (4). Sprocket shoe arm must rotate smoothly and freely with maximum end play of 0.005. Apply Glyptal ZV-903 adhesive to threads of screw (5). With sprocket shoe arm in the closed position, secure loop of spring (6) with screw. Do not completely tighten screw. Rotate spring in a clockwise direction until short tail of spring engages first position of slot on arm pivot. Tighten screw. Disengage tail of spring from pivot slot and preload spring by turning it 220° in a clockwise direction. Use Spring Loading Tool T-38000-M (Figure 3-7). Align pivot slot to loaded spring and re-insert tail of spring into slot.



18. Take-up Clutch Arm to Projector (Figure 3-29)

a. Before assembling take-up clutch arm to projector, remove take-up clutch liner. Use a new liner for reassembly. Wipe inside diameter of take-up sprocket gear assembly using a cloth dampened with methyl alcohol. Seat liner against inner surface of take-up sprocket gear assembly.

b. Apply small amount of DC-44 grease to eccentric stud (located on Master Control Lever pivot) and to reel arm pivot. Insert pulley assembly in take-up sprocket gear assembly; be careful not to damage liner. Locate take-up clutch arm assembly on take-up arm pivot and insert rollpin. Drive rollpin to a depth not to exceed 1/4 inch. Locate take-up clutch bracket on eccentric stud and secure with retaining ring. Assemble take-up reel belt.

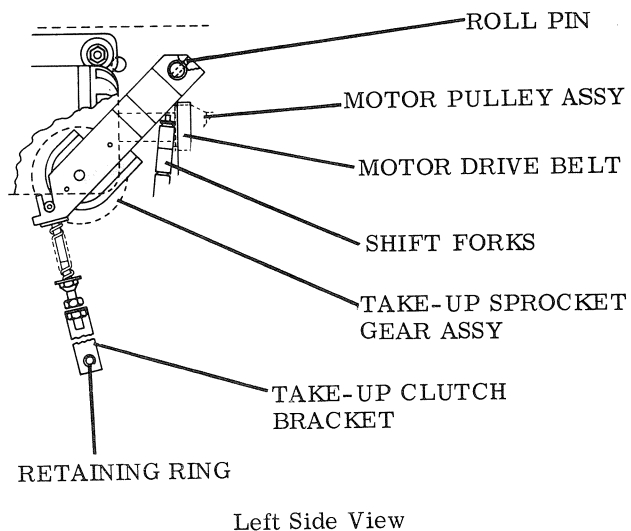


Figure 3-29. TAKE-UP CLUTCH ARM TO PROJECTOR

c. Adjust belt (Section III, para. E. 12). Adjust take-up clutch lift-off linkage (Section III, para. E. 7) and test take-up clutch film tension (Section III, para. E. 8)

19. Erase Head & Yoke Assembly (900 Series R Models only) Figure 3-30

a. Yoke must pivot freely on mount with 0.002 maximum end play.

b. Tighten nut to 24-32 inch ounces of torque.

20. Lubricator Pad Assembly (Figure 3-31)

a. When replacing pad assembly, pad must remain in contact with cam surfaces "A" and "B" during entire revolution of cam.

b. Lubricate pad assembly with 16 drops (0.4 grams) of Graflex Instrument Oil (Cosmolubric 270).

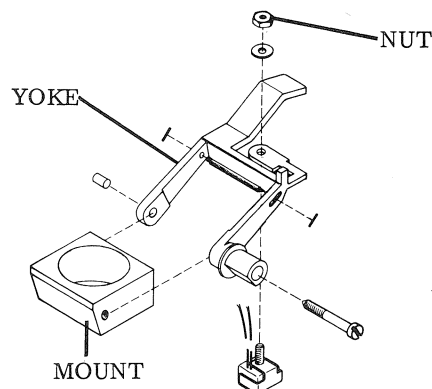


Figure 3-30. ERASE HEAD & YOKE ASSEMBLY

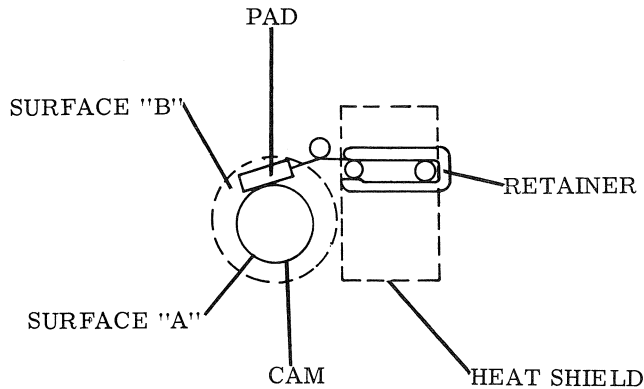


Figure 3-31. LUBRICATOR PAD ASSEMBLY

21. Threading Slot Guard

Visually align left side of guard (14, Fig. 5-6, 14, Fig. 5-15, or 18, Fig. 6-6) with bottom edge of lamphouse cover assembly. Apply Glyptal 1276 to threads of attaching screw and part interfaces.

E. ADJUSTMENTS

1. Aperture Plate and Lamp Socket (Figure 3-32)

WARNING

Unplug AC power cord before inserting aligning plug in lamp socket.

a. Remove lens holder assembly from projector. Loosen four screws (1) slightly so aperture plate assembly can be moved. Replace lens holder assembly but do not secure in position.

b. Aperture Plate - Use Lamp and Optical Path

Alignment Tool G3-38000 (Figure 3-12) to align aperture plate assembly.

Remove projection lens and insert optical path alignment tool into lens holder assembly. (Be sure film gate is closed.) Engage lens holder guide rod with the alignment tool and carefully slide tool rearward so aperture locating tip engages aperture plate. (This tip is tapered to easily accommodate insertion of tool.) Press tool firmly against sides of aperture in aperture plate; be sure top and bottom edges are in positive contact. Tighten screws (1) securely. Secure lens holder assembly to projector. Adjust claw pin side clearance (Sect. III, para. E. 13) and check framing limits (Sect. III, para. E.9).

c. Lamp Socket - Loosen lamp socket attaching screw. With lamp socket aligning plug in position, slide aligning rod through optical path alignment tool and into lamp socket aligning plug as a basis for vertical and lateral alignment. To establish lateral alignment, rotate plug until aligning rod can be inserted into alignment hole of lamp socket aligning plug. To establish vertical alignment, slightly bending the lamp socket bracket upward or downward may be necessary. When aligned, apply Glyptal 1276 to threads of lamp socket screw and tighten screw. Apply Glyptal 1276 to tab of lamp socket which engages projector casting. Check screen illumination after installing projection lamp. If illumination is uneven, replace projection lamp.

2. Film Pressure (Figure 3-33)

a. Film pressure shoe deflection is measured with Film Pressure Gage G8-38000 (Figure 3-8). Open film gate, remove projection lens from lens holder assembly, and insert film pressure gage into holder assembly. Seat contact button of gage against pressure shoe. Needle should move slightly. Lock gage in place with lens locking screw. Set dial of gage to 0. Thread a piece of black and white film in film

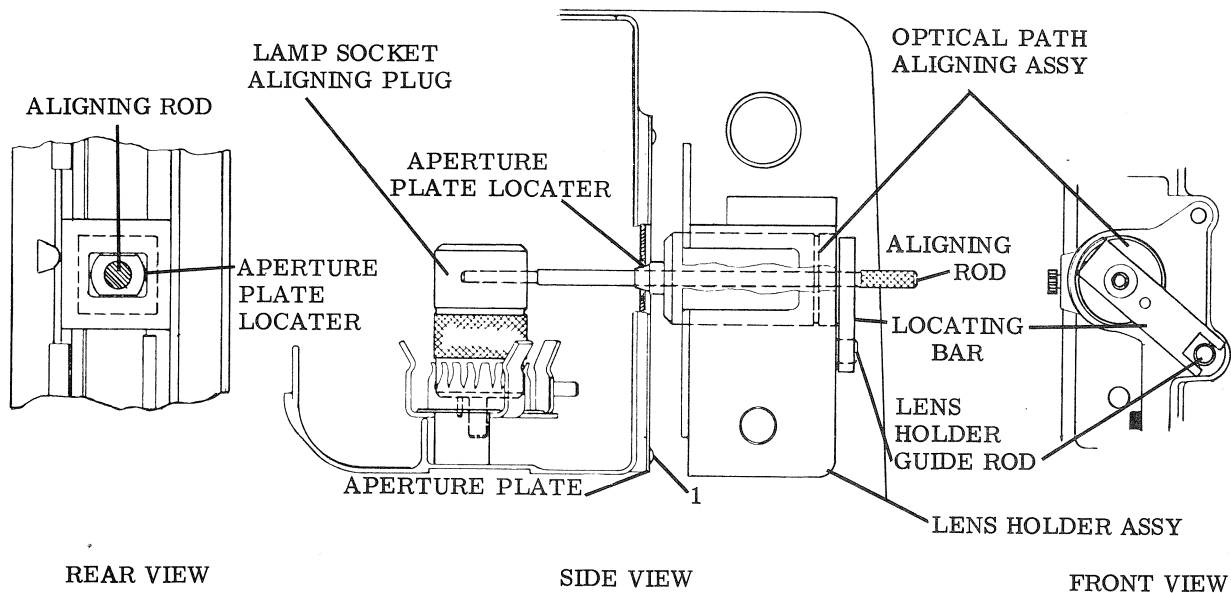


Figure 3-32. APERTURE PLATE & LAMP SOCKET ALIGNMENT

channel and close gate. Deflection must measure 0.000" to 0.004" with film pressure adjusting lever in the LO position and 0.025" to 0.035" with lever in the HI position.

b. If indicator readings are not within tolerances specified, adjust deflection range by removing film pressure adjusting lever and rotating gate lever eccentric (beneath adjusting lever) until dial indicator on gage reads 0.030". Replace adjusting lever, orienting it to touch stop pin when lever is in HI position.

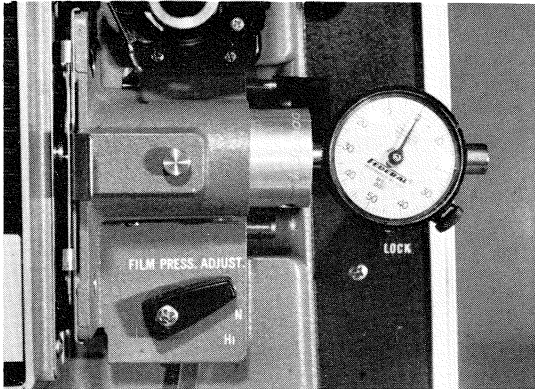


Figure 3-33. FILM PRESSURE ADJUSTMENT

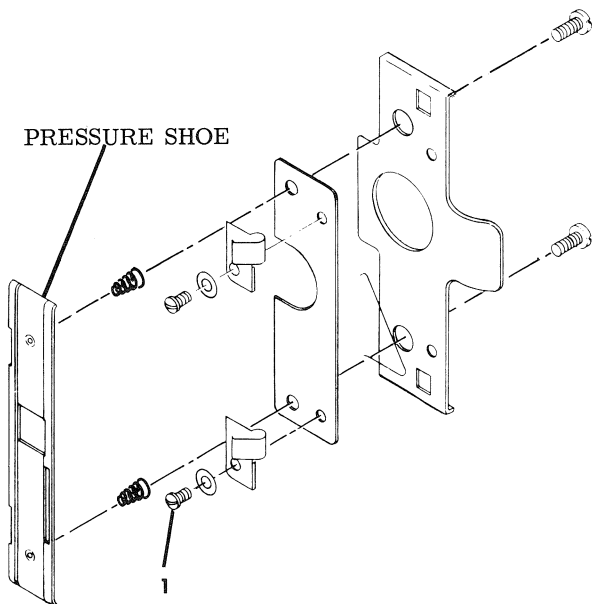


Figure 3-34. FILM PRESSURE SHOE

3. Film Pressure Shoe (Figure 3-34)

Adjustment is made for quietest film handling. As a suggested procedure to help when making adjustments, place a piece of plain white paper on the projector base beneath the lens housing assembly and film gate area. Sight down through the film gate area on to the white paper. This will give all parts a sharp definition and facilitate adjustments. Align pressure shoe

so its outside edge is parallel to edge rail of aperture plate (opposite side on which film guide is located). Loosen screws (1) only enough to move shoe assembly laterally. Insert pressure shoe assembly in film gate, close gate, and make alignment. Distance between side edge of pressure shoe and side wall of film track should be approximately 0.003" (or when light is barely perceptible between edge of pressure shoe and side wall of film track when sighting down to the white paper). Open gate and tighten screws completely. Thread film in projector and check for quiet handling with projector operating in FORWARD position at SOUND speed. If film handling is not quiet, repeat adjustment until satisfactory.

4. Sound Head Area (Figure 3-35, 36, and 37)

a. Sound Drum Support (phototransistor) - Insert Sound Drum Locating Plug T-38001G (Figure 3-6) in place of sound optics cartridge (Figure 3-35). Seat plug so phenolic rod just clears phototransistor. Center clear area of phototransistor under rod and push sound drum support toward casting until edge of sound drum just touches rod. Tighten sound drum support retaining screws (Figure 3-36).

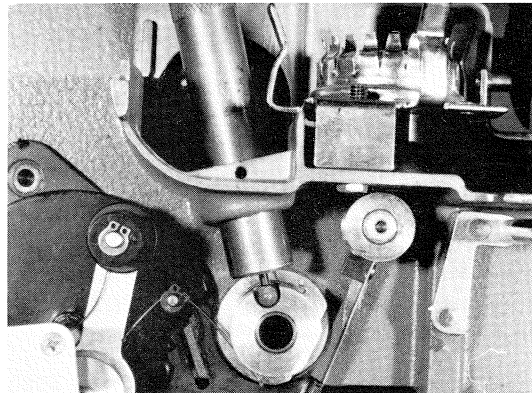
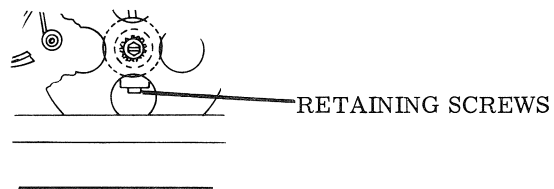


Figure 3-35. SOUND DRUM SUPPORT ADJUSTMENT



(Partial cut-away inside view)

Figure 3-36. SOUND DRUM SUPPORT RETAINING

b. Focusing Sound Optics Cartridge - Connect AC voltmeter across speaker terminals. Thread loop of 7000 cycle test film (PH22.42) into projector and set tone control for maximum treble output. Set voltmeter on lowest scale. Focus cartridge by moving

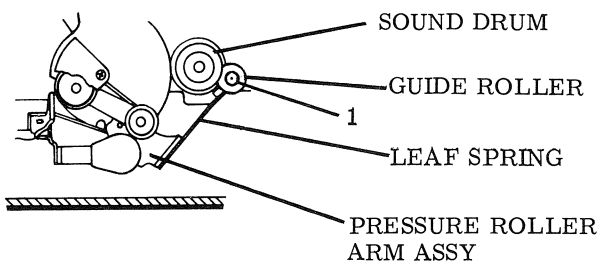
it up or down and rotating until maximum output is indicated on voltmeter. If voltmeter goes off scale, reduce volume of projector. Check buzz track and reset if necessary.

NOTE

Setscrew securing sound optic cartridge is tightened against a plastic plug. If cartridge doesn't move freely when screw is loosened, the plastic plug has been wedged in hole. Plastic plug must be replaced.

To clean, fold lens tissue over toothpick and clean exposed surfaces of sound optics cartridge. No attempt should be made to remove lens elements. Hold unit in front of bright light and look through it from the end which was located adjacent to exciter lamp. A narrow, sharply defined and evenly illuminated beam of light should be seen. If beam is hazy or unevenly illuminated, send cartridge to nearest Graflex Service Center for repair.

c. Pressure Roller Arm Assembly - Check pressure roller arm assembly (Figure 3-37), for correct adjustment. Place Master Control Lever in FORWARD (FORWARD OPT for 900 Series R and P Models) position. Adjust axis of film guide roller assembly pivot so guide roller is spring loaded flat against sound drum. (Edge of guide roller toward repairman should contact guide roller first.) This adjustment is made by twisting the leaf spring. The leaf spring may also be adjusted by bending it to exert 3.2 to 4.8 ounces of force between sound drum and guide roller. Push-Pull Gage No. 516-500 or equivalent (1 lb. x 1/4 oz.) is used to measure this force. This tool will not be supplied by Graflex Inc., but should be ordered from John Chatillon & Son, 85 Cliff Street, New York 38, New York.



(Partial cut-away outside view)

Figure 3-37. PRESSURE ROLLER ARM ADJUSTMENT

d. Film Guide Roller Assembly - Thread projector with "buzz track" test film (PH22.57). Adjust film guide roller assembly, by tightening or loosening nut (1, Fig. 3-37), until no sound is heard or until high and low frequencies are balanced for equal output.

5. Exciter Lamp Voltage (800 Series only)

Reset voltage by adjusting rheostat (31, Fig. 4-38).

Adjustments should be made only after the projector has been operating for 15 minutes on a line voltage of 120 VAC (or the line voltage at which the projector has been operating). Exciter voltage measured across exciter lamp should measure 3.9 VDC. If voltage cannot be adjusted, replace transistor (26, Fig. 4-38).

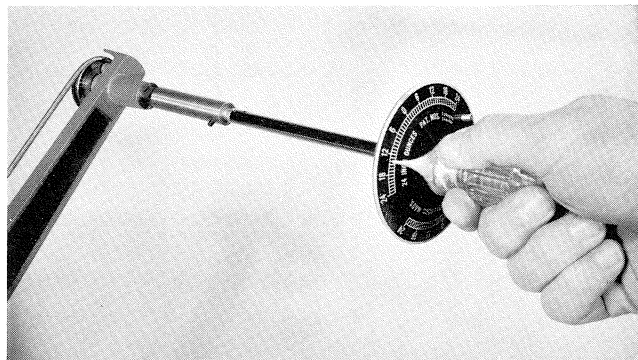


Figure 3-38. REVERSE DRIVE FILM TENSION

6. Reverse Drive Film Tension (Reverse Supply Reel Spindle Torque) Figure 3-38

With projector running in reverse, front spindle reverse drive torque must be 14 ±2 inch ounces measured with Supply Reel Spindle Torque Gage G17-38000 (Figure 3-13). Turn handle of gage counterclockwise to obtain proper reading. If film feed clutch assembly torque is too high, reduce by backing off stop nut (8, Fig. 3-24). If too low, tighten stop nut.

7. Take-up Clutch Lift-off Linkage

During adjustment, projector must not be running. The clutch interfaces should disengage when lever on threading control arm is rotated counterclockwise two-thirds the distance between FORWARD and REVERSE. This is also the position at which the drag is no longer felt and the belt turns free. If the lift-off is not felt at this position, loosen nut (2, Fig. 3-20), move nut (3) up or down to change linkage length. Tighten nut (2) to bring pressure against nut (3). This adjustment may have to be repeated. Proceed to para. E. 8.

8. Take-up Clutch Film Tension (Figure 3-39)

Check take-up lift-off linkage (para. E. 7) before proceeding. Measure take-up film tension with Film Tension Gage T-38000-S (Figure 3-11). Thread projector and run approximately 300 feet of film onto a 400 foot take-up reel. Stop projector and pull a 12 inch loop of film up between the take-up sprocket and roller of reel tension arm. Insert roller of gage in loop. Start projector and check gage reading. Scale should read 8 oz. -2 +4 oz. (This is a double true value equivalent to 4 oz. of film tension.) If reading does not meet specified tension measurement, tighten stop nut (1, Fig. 3-20) to increase tension and loosen stop nut to decrease tension.

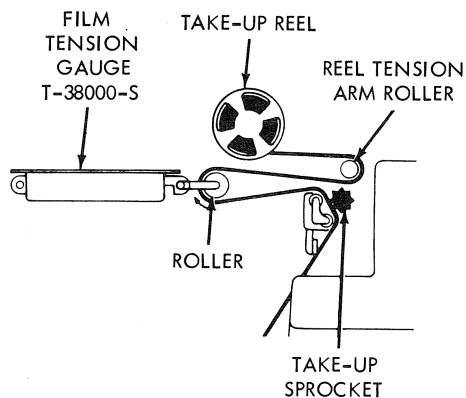


Figure 3-39. TAKE-UP CLUTCH FILM TENSION

9. Rewind Engagement and Framing Limits (Figure 3-40)

Adjust limit plate for lateral placement of rewind lever assembly and equal picture framing at top and bottom of picture.

Ramp of rewind lever assembly should throw pawl assembly of film feed clutch to its limits with REWIND control positioned "in" and "out". Ramp should clear pawl assembly by 0.020 inch minimum in both "in" and "out" positions. Adjust tab on limit plate by bending, if necessary. Check operation by rotating inching knob.

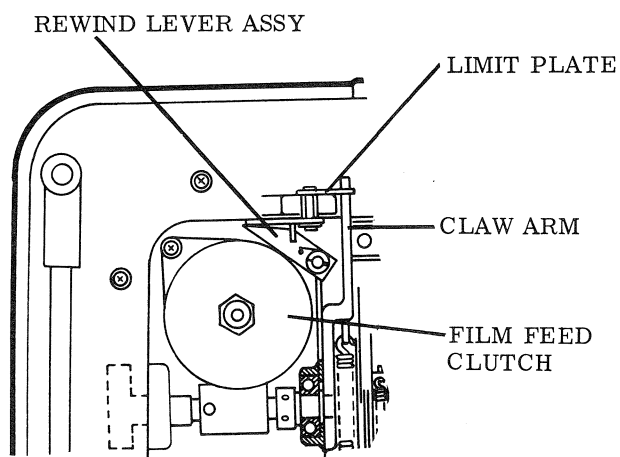


Figure 3-40. REWIND ENGAGEMENT AND FRAMING LIMITS

10. Motor Drive Belt Tracking and Drive Belt Shift Forks

a. Correct position for motor drive belt (Figure 3-29) should be 1/16" from flanged edge (nearest motor) of motor pulley assembly when projector is operated in FORWARD drive at SOUND speed.

b. Main shaft pulley adjustment - loosen two set-screws and slide pulley in desired direction. Be sure to retighten screws securely. (If there is a flat on the drive shaft, the screws must be tightened on the flat.) The position of the drive belt relative to the rollers on drive belt shift forks should be checked. A clearance of 1/8" minimum between belt and rollers should be maintained in both SOUND and SILENT speeds. If adjustment is required, bend shift forks slightly. Check belt shifting and adjust for best operation in FORWARD.

11. Motor Damper

With projector running in FORWARD/SOUND speed, adjust screw assembly (Figure 3-21) until rubber pad on screw assembly just contacts motor (mounting) plate assembly. Tighten nut.

NOTE

This adjustment is made to reduce motor vibrations and projector noise. DO NOT OVERTIGHTEN. DO NOT make this adjustment to establish belt tracking.

12. Reel Arm Belt (Take-up and Supply)

If ends of belts (25, Fig. 5-2, 20, Fig. 5-5, 25, Fig. 5-11, 8, Fig. 5-14, 25, Fig. 6-2 or 22, Fig. 6-5) were disconnected, close gaps between hook ends and body of belt by bending hooks slightly. The two ends of the belt must appear to be in line with each other when belt is held taut.

13. Claw Arm (Figures 3-41A, B, C and 42)

a. Pin Protrusion - Pin protrusion should be set at 0.040", using Claw Arm Pin Protrusion Gage G14-38000 (Figure 3-5). Place gage flush against aperture plate as shown in Figure 3-41A. Pin should just clear the 0.045" step (Step 1) of gage and touch the 0.035" step (Step 2) of gage. To change pin protrusion, remove setscrew (2, Fig. 3-41B). Loosen setscrews (1 & 3) in hub of assembly and move assembly forward or backward on shaft until correct pin protrusion has been reached. Relock hub of assembly on shaft, tightening setscrews (1, 2, 3) in that order. Note orientation of flat on drive shaft. Failure to adjust screws to torques specified in Figure 3-41B may cause a bind in the automatic shutter operation. If required pin protrusion cannot be obtained, replace entire claw arm assembly. DO NOT BEND CLAW ARM.

b. Side Clearance - Side clearance is measured by inserting a short length of 0.042" rod between claw pins and edge of aperture plate. The claw pins should just touch rod but should not bind against it when claw arm assembly is rotated through one complete cycle. Do not force claw during adjustment as this may result in breakage of claw pins. To adjust side clearance, turn pivot assembly (Figure 3-41C) using Shuttle Cam Adjusting Tool ST-5884 (Figure 3-4). Always tighten setscrew before rotating inching knob.

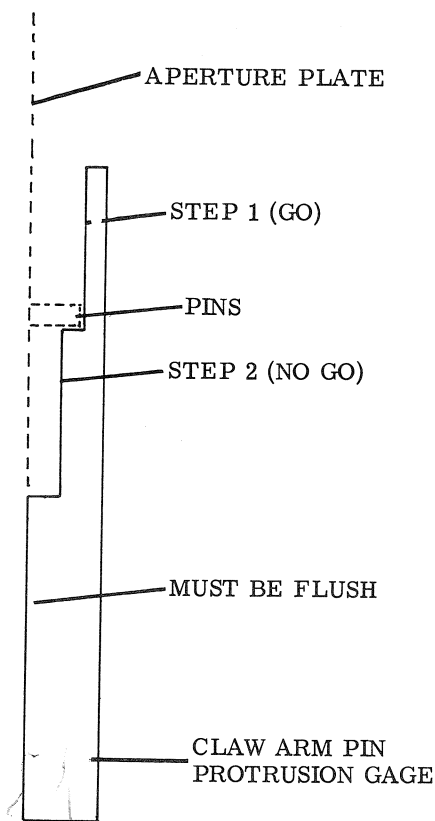


Figure 3-41A. PIN PROTRUSION

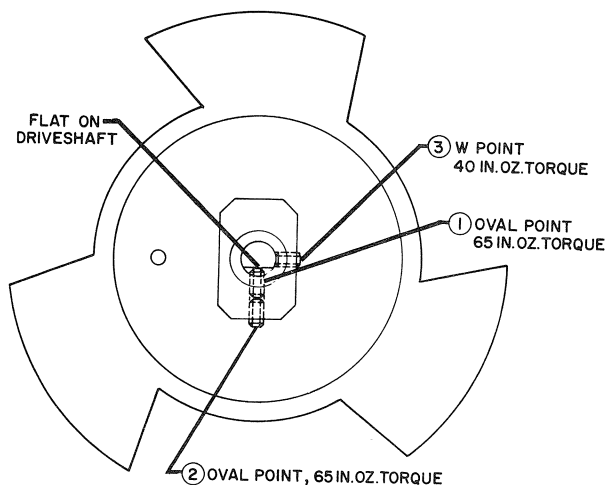


Figure 3-41B. SECURING SHUTTER AND CAM ASSEMBLY

NOTE

When making side clearance adjustments, pull-down adjustments must be checked also. Should side clearance adjustment be required, pull-down and side clearance adjustments should be made simultaneously.

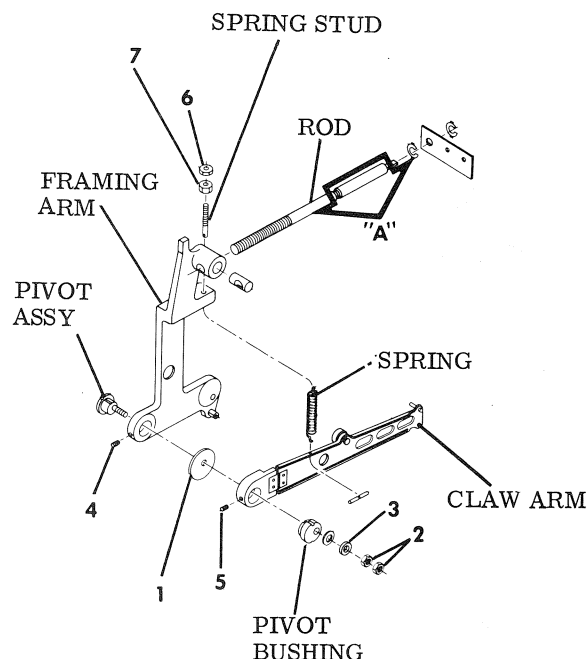


Figure 3-41C. CLAW ARM

c. Claw Pull-down Stroke - Pull-down is measured with Stroke Setting Gage ST-5880 (Figure 3-9) and is adjusted with Shuttle Cam Adjusting Tool ST-5884 (Figure 3-4). Depress STILL pushbutton. (On models having no STILL setting, it is necessary to remove drive belt to prevent rotation of main drive shaft when power is applied to projection lamp. Use Heat Filter Adapter Tool G13-38000 (Figure 3-10) in place of lamp chimney.) Depress STILL and LAMP-NORM pushbutton (STILL models) or RUN and LAMP-NORM pushbuttons (non-STILL models) to illuminate projection lamp at normal brightness. Insert Stroke Setting Gage into film aperture and close gate. Rotate inching knob to bring step wedge of gage into projection aperture. Focus image of gage for a minimum height of eight inches. To make image larger, increase distance from projector to screen. Continue turning inching knob until claw has reached the bottom of its stroke, has withdrawn from gage, and is returned to top of stroke. Stop turning inching knob when claw pins have just entered gage but have not started next downward stroke.

Draw a straight reference extension line at the lowest gage step on the surface used as a screen (Figure 3-42A). Push up on gage until it seats lightly against claw pins. The image on the screen will move downward. The distance of downward movement of the image is the distance used to determine pull-down stroke. Adjust stroke as closely as possible to the image displacement shown (Figure 3-42B).

CAUTION

If stroke adjustment is necessary, side clearance must be rechecked after stroke adjustment is completed and before main shaft is rotated.

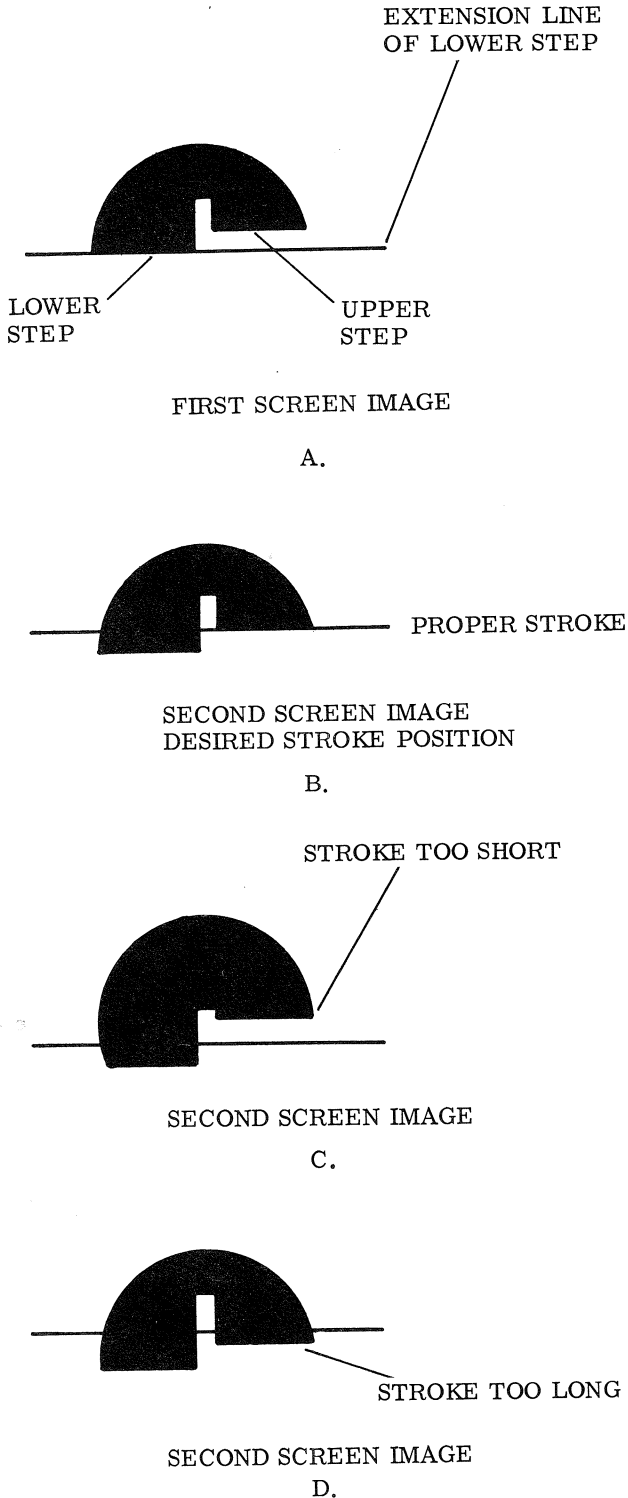


Figure 3-42. CLAW PULL-DOWN STROKE MEASUREMENT

To adjust pull-down stroke, loosen setscrews (4 & 5, Fig. 3-41C), and while holding pivot assembly with Shuttle Cam Adjusting Tool, rotate pivot bushing and pivot assembly simultaneously, by hand. When facing projector front, a good starting point is seen when the pivot of the pivot assembly is in the 7 o'clock

position. This pivot is never rotated out of 6 to 9 o'clock position. Rotating pivot toward main shaft lengthens the stroke and rotating pivot away from main shaft shortens the stroke. Always tighten pivot bushing setscrews before rotating inching knob.

d. Claw Pivot End Play - Adjust gap between washer and framing arm at pivot joint for maximum clearance of 0.002" by tightening machine nuts (2, Fig. 3-41C). (This is equivalent to 0.001" end play when claw has complete freedom.)

e. Claw Arm Spring (Figure 3-41C) - Tension of the claw arm spring has been factory adjusted and should not normally require adjustment. Correct tension on the claw arm spring is maintained by proper positioning of nut (6) on spring stud. Nut (7) and nut (6) are locked against each other and nut (6) must be flush with end of spring stud.

14. Safety Shutter Location (Figure 3-43)

Visually align safety shutter midway between lamp chimney and closest moving part on shutter and cam assembly. Safety shutter spring must clear shutter and cam assembly by 1/8". Adjust by bending safety shutter spring bracket.

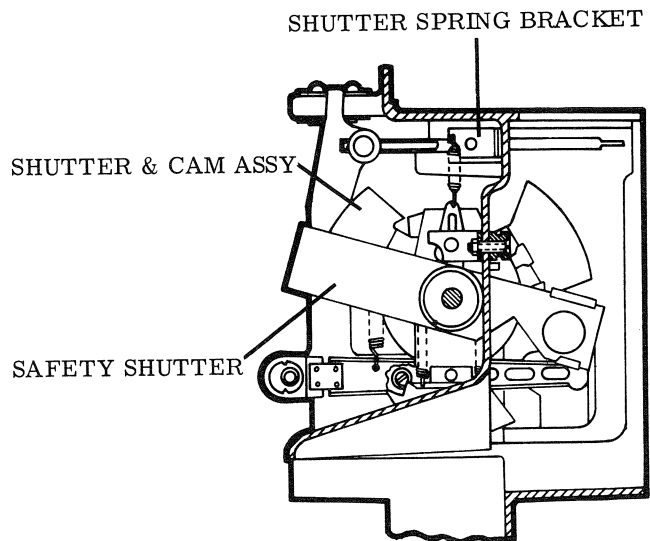


Figure 3-43. SAFETY SHUTTER LOCATION

15. Projection Lamp Transformer Connections

The projection lamp is powered by a low voltage supplied from the projection lamp transformer. Normal wiring connections are shown in the wiring diagrams in Section II. Extra "tap" connections are provided on the transformer as a convenience for operation in areas where incoming line voltage is not normal. This option can also be used to "tailor" the lamp brightness versus lamp life.

a. 700 & 900 Series Projectors (Figure 3-44A) - Line input to the transformer is applied to PRI. Low voltage output is normally taken across COM and HI,

or optionally across COM and LO, by selection of HI or NORM pushbuttons on main switch.

b. Models 800, 815, & 820 (Figure 3-44B) - Line input to the transformer is normally applied across COMMON and BLU, or optionally across COMMON and VIO, by selection of HI or NORM pushbutton on main switch. The low output voltage is taken from LAMP and COMMON connections.

c. Models 816 & 821 (Figure 3-44C) - Line input to the transformer is normally applied across COMMON and 225V BLU, or optionally across COMMON and 225V VIO, by selection of HI or NORM pushbutton on main switch. The low output voltage is taken from LAMP and COMMON connections.

d. Models 817 & 822 (Figure 3-44C) - Line input to the transformer is normally applied across COMMON and 117V BLU, or optionally across COMMON and 117V VIO, by selection of HI or NORM pushbutton on main switch. The low output voltage is taken from LAMP and COMMON connections.

e. 900 Series Synchronous, TV, & Magnetic Model Projectors (Figure 3-44A) - Refer to para. a. above.

f. Model 823 (Figure 3-44C) - Line input to the transformer is normally applied across COMMON and 245V BLU, or optionally across COMMON and 245V VIO, by selection of HI or NORM pushbutton on main switch. The low output voltage is taken from LAMP and COMMON connections.

g. If the following situations are encountered, the extra transformer "taps" can be used as indicated:

CAUTION

Projector models 716, 916, 921, 921-R, and 921-P have an extra transformer which is used to step down the voltage applied to the regular transformer. NEVER change the "tap" connections on the extra transformer. On models 817 and 822, no extra "taps" are provided for transformer connection changes.

- (1) Short lamp life because of high line voltage.
 - (a) Refer to paras. a. and b. above; disconnect the wire from HI (para. a.) or BLU (para. b.) and connect to MED.
 - (b) Refer to para. c. above; disconnect the wire from 225V BLU and connect to 245V BLU.
 - (c) Use a DKM lamp.

This will reduce the output voltage of the transformer when the HI pushbutton is being used.

- (2) Increased lamp brightness required when operating in NORM position.
 - (a) Refer to paras. a. and b. above; disconnect the wire from LO (para. a.) or VIO (para. b.) and connect to MED.
 - (b) Refer to para. c. above; disconnect the wire from 225V VIO and connect to 205V VIO.

This will increase the output voltage of the lamp when NORM pushbutton is being used.

- (3) Lamp brightness in HI setting is too great for (permanent) short projector-to-screen distance.
 - (a) Refer to paras. a. and b. above; disconnect the wire from HI (para. a.) or BLU (para. b.) and connect to MED.
 - (b) Refer to para. c. above; and disconnect wire from 225V BLU and connect to 245V BLU.

This will reduce the output voltage of the lamp transformer when the HI pushbutton is used.

16. Threading Control Arm Complete - Special Adjustment (Figure 3-18)

The film tension arm should be checked for performance after reassembly. Rotate arm fully counter-clockwise and release. Arm should return to original position within 3 to 8 seconds (700, 800, 900, 900-S, and 930TV Series Models) or 2.5 to 3.5 seconds

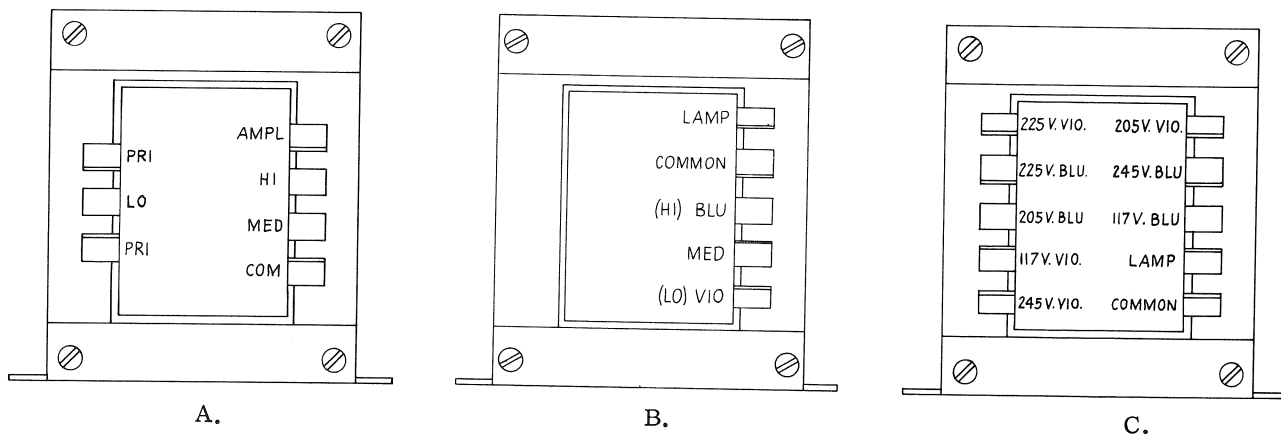


Figure 3-44. LAMP TRANSFORMER CONNECTIONS

(900-R and 900-P Series Models). If performance does not conform to specified time interval, trim return spring by bending it. It must return arm fully to stop. If spring does not return arm in specified time after adjustment, disassemble, clean, and re-lubricate arm. Readjust spring. Coat the outside diameter of the larger stud on film tension arm, the inside diameter of damper hub, and film damper pivot (3) with DC-220 fluid. After assembly, remove excess fluid. Repeat performance test.

17. Record/Play Head (Figure 3-45)

a. Head Pressure - Lift head away from film path using a spring scale calibrated in grams. Reading should be 15 to 25 grams at break-away. If not within these limits, bend pressure spring to obtain proper reading.

b. Head Contact - Load projector with M16SL test film, connect an 8 ohm dummy test load at the speaker jack. Connect an AC Vacuum Tube Voltmeter across the dummy load. Place Master Control Lever in FORWARD MAG position, place record/play knob in PLAY position, and place erase head shift knob in PLAY position. Push RUN button. Bend bracket at point "N" and rotate head on axis of mounting stud to point where maximum voltage output is observed. Tighten retaining nut to 24-32 inch ounces of torque.

c. Lateral Position

(1) Use M16SL test film and cut and splice film to form a three foot loop.

(2) Load projector with test film, connect an 8 ohm dummy test load at the speaker jack. Connect an AC Vacuum Tube Voltmeter across the dummy load. Place Master Control Lever in FORWARD

MAG position, place record/play knob in PLAY position, and place erase head shift knob in PLAY position. Push RUN button.

(4) Adjust lateral position screw to point where maximum voltage output is observed.

d. Azimuth - Load projector with M16AL test film, connect an 8 ohm dummy test load at the speaker jack. Connect an AC Vacuum Tube Voltmeter across the dummy load. Place Master Control Lever in FORWARD MAG position, place record/play knob in PLAY position, and place erase head shift knob in PLAY position. Push RUN button. Adjust azimuth adjusting screw to point where maximum voltage output is observed.

18. Erase Head (Figure 3-45)

a. Head Pressure - Lift head away from film path using a spring scale calibrated in grams. Reading should be 15 to 25 grams at break-away. If not within these limits, bend yoke spring to obtain proper readings.

b. Head Contact - Align erase head by bending mounting tab at point "D" (View A) to obtain proper azimuth, full head width contact, and tangency of erase head to sound drum.

c. Lateral Position - Loosen locking screw (View A) and rotate erase head to visually center head on sound track (16 mm film with 100 mm sound track) with mounting block of head as far up on optical sound cartridge as possible. Tighten locking screw to 24-32 inch ounces of torque.

19. Miscellaneous End Play and Clearance Requirements

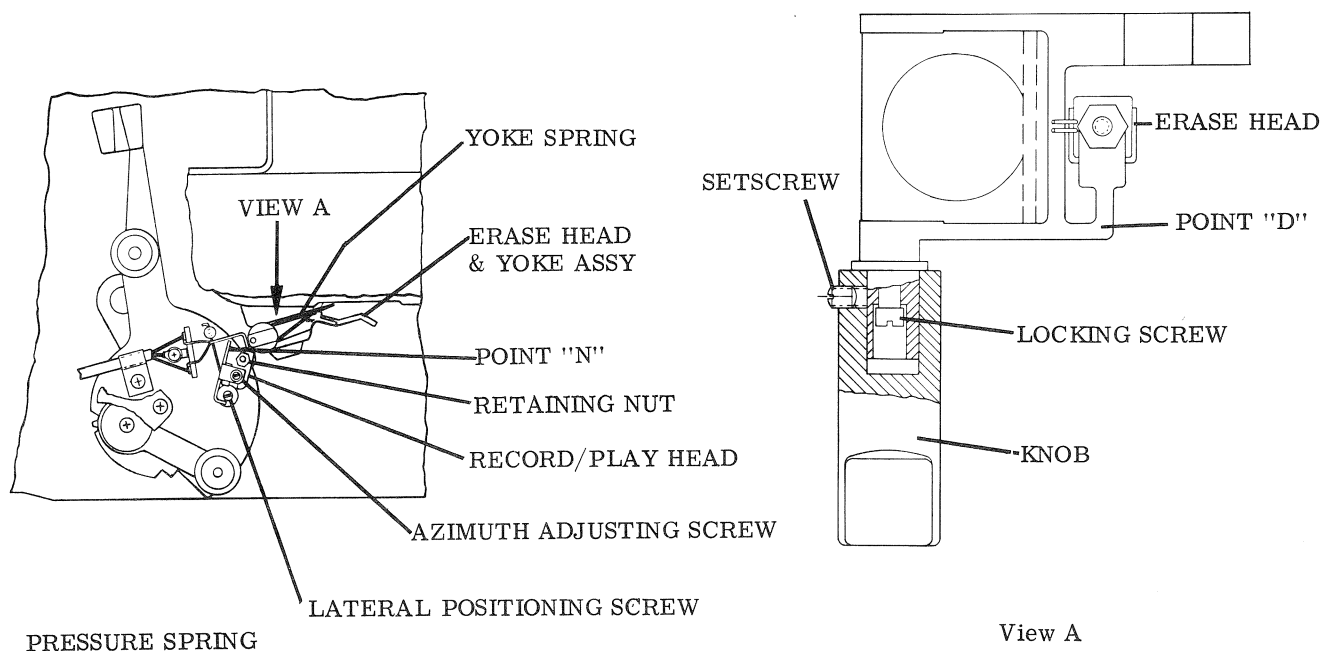


Figure 3-45. RECORD/PLAY HEAD & ERASE HEAD

- a. Claw Arm Pivot - Maximum clearance of 0.002". (Equivalent to 0.001" end play when claw has complete freedom.)
- b. Threading Control Arm Rollers - 0.005" to 0.015" end play.
- c. Record/Play Head Pivot - 0.002" maximum end play.
- d. Drive Unit Assembly Pulley - 0.005" to 0.010" end play.
- e. Drive Belt Shift Fork Assembly Rollers - 0.007" maximum end play.
- f. Reel Tension Arm Pivot - 0.005" maximum end play.
- g. Take-up Shoe Pivot - 0.005" maximum end play.
- h. Erase Head Yoke Pivot - 0.002" maximum end play.
- i. Threading Control Arm Pivot - 0.005" maximum end play.
- j. Pressure Roller Arm Assembly Pivot - 0.005" maximum end play.
- k. Sprockets - 0.003" to 0.005" end play.

F. PREVENTIVE MAINTENANCE

To insure proper operation of the Graflex "16" Projector, preventive maintenance should be performed every 500 hours or once a year, whichever occurs first. All references are made to the 900 Series; however identical items on other series should be treated in the same manner. Before starting maintenance procedures, check the operation of the projector (Section II, para. B.).

1. Parts to be Replaced

- a. Take-up Reel Belt (20, Fig. 5-5) - Refer to Section III, para. E. 12.
- b. Supply Reel Belt (25, Fig. 5-2) - Refer to Section III, para. E. 12.
- c. Motor Drive Belt (10, Fig. 5-4) - Refer to Section III, para. E. 10.
- d. Spirol Pin (1, Fig. 7-12) - Refer to Section III, para. F. 3.
- e. Cam Lubricator Pad Assembly (5, Fig. 5-3) - Refer to Section III, para. D. 20.

2. Lubrication Points

For 500 hour lubrication points, refer to the asterisked item in the lubrication chart of para. 3. E.

3. Motor Drive Unit Components

a. Disassembly

- (1) Place SOUND/SILENT lever in SILENT position (if lever is on projector).
- (2) Loosen nut (22, Fig. 7-12) and screw (21).
- (3) Remove drive belt (10, Fig. 5-4).
- (4) Remove fan and hub assembly (items 1 thru 9, Fig. 7-12) by gently tapping out spirol pin (1). Motor shaft should be supported to prevent bending. Discard pin.

b. Cleaning

- (1) Wash pulley assembly (9, Fig. 7-12) in chloro-thene. Wipe motor shaft with dry cloth. Wash bearings (8 & 10) and fan and hub assembly in detergent and luke warm water.

CAUTION

Do not use a solvent on these parts.

- (2) Dry all parts thoroughly.

c. Lubrication

NOTE

During reassembly, keep all lubricants from contacting drive belt or outer surfaces of drive pulley.

- (1) Coat inside diameter of spring (7, Fig. 7-12) with Anderol L-793 grease.
- (2) Insert two bearings (8 & 10) in pulley assembly (9).
- (3) Coat motor drive shaft with FS-1290.
- (4) Coat inside diameters and outside faces of bearings (8 & 10) with FS-1290.
- (5) Install motor pulley.
- (6) Install fan & hub assembly using a new spirol pin.
- (7) Replace drive belt with new drive belt.
- (8) Adjust drive belt to ride 1/8" from flange of main shaft pulley with projector running in FORWARD/SOUND position.
- (9) Place Master Control Lever in FORWARD (or FORWARD OPT) position. Adjust screw assembly (21) until rubber pad on screw assembly just contacts motor mounting plate assembly with projector running in FORWARD/SOUND position. Tighten nut (22). This adjustment is made to reduce motor vibrations and projector noise.

4. Over-All Cleaning

Clean the following areas:

- a. Brake Face of Pulley Assembly (9, Fig. 7-10). Wipe with a dry cloth to remove lubricants and foreign material.
- b. Sound Optics Cartridge (13, Fig. 5-3) - Fold lens tissue over toothpick and clean exposed lens surfaces.
- c. Projection Lens (2, Fig. 5-2) - Remove lens and clean exposed surfaces only. Dampen lens tissue with lens cleaner and wipe surfaces gently.

NOTE

Do not apply lens cleaner directly to lens elements. DO NOT USE silicone impregnated lens tissue.

- d. Aperture Plate Assembly (23, Fig. 5-2).
 - e. Film Pressure Shoe Complete (1, Fig. 5-2) - Clean with methyl alcohol or chloroethene.
 - f. Film Rollers and Sprockets
5. Adjustments

Check the following areas and adjust if necessary:

- a. Reverse Drive Film Tension (Section III, para. E. 6)
- b. Take-up Clutch Lift-off Linkage Length (Section III, para. E. 7)
- c. Take-up Clutch Film Tension (Section III, para. E. 8)
- d. Rewind Engagement (Section III, para. E. 9)
- e. Claw Arm Operation (Section III, para. E. 13)
- f. Pressure Shoe Seating (Section III, para. E. 3)
- g. Exciter Lamp Voltage (Section III, para. E. 5)
- h. Miscellaneous
 - (1) Check secureness of all clip-on terminals. If not tight, crimp with pliers and reconnect.
 - (2) Be sure that wiring is sufficient distance from moving parts.

6. Functional Checks

Check the following with a demonstration film and projector speaker connected:

- a. Amplifier Controls
 - (1) ON/OFF switch

- (2) VOLUME control
 - (3) BASS control
 - (4) TREBLE control
 - (5) Record/Play Knob - Leave knob in PLAY position.
- b. Main Switches
 - (1) OFF
 - (2) RUN
 - (3) STILL
 - (4) LAMP-HI
 - (5) LAMP-NORM
 - (6) LAMP-OFF
 - c. Master Control Lever
 - (1) FORWARD (or FORWARD OPT and FORWARD MAG)
 - (2) REVERSE
 - (3) THREAD
 - (4) Film damper action
 - d. Threading Lamp
 - e. Loop Restorer
 - f. 2-3 Blade Shutter - Rotate SOUND/SILENT control.
 - g. Safety Shutter Operation - Sound, silent, and still. Check lamp chimney for seating. Chimney must not interfere with safety shutter operation.
 - h. Elevation Lock Control
 - i. Framing Control
 - j. Picture Quality

k. SOUND speed - With projector operating at SOUND speed, main drive shaft should rotate at a minimum speed of 1420 RPM. If below 1400 or above 1460 RPM, major repair is necessary. If between 1400 and 1420 RPM, check shaft for binds, insufficient lubrication, or motor drive belt slippage.

- l. Recording ability of Magnetic Models

G. LUBRICANTS & ADHESIVES

As a convenience for service and repair, materials have been set up in economic quantities. If the amount of lubricant used on individual parts is not listed, use a nominal amount and wipe off any excess lubricant. Materials identified with a Graflex part number can be ordered by part number directly from Graflex, Inc.

GRAFLEX 16 PROJECTOR

Section III
Service Procedures

USED ON	REFERENCE			REMARKS	LUBRICANT	
	800	900 GROUP 1	900 GROUP 2			
Flatwasher	8, fig. 6-2	8, fig. 5-2	8, fig. 5-11	Coat both sides	DC44 Light Consistency Silicone Grease 39479P9 (2 oz.)	
Flatwasher	9, fig. 6-2	9, fig. 5-2	9, fig. 5-11	Coat both sides		
Lower lens holder spring	21, fig. 6-2	21, fig. 5-2	21, fig. 5-11	Apply to side that interfaces with projector housing		
Film gate lever assembly	22, fig. 6-2	22, fig. 5-2	22, fig. 5-11	Apply to side that interfaces with projector housing		
Lens holder guide rod	fig. 6-2	fig. 5-2	fig. 5-11	Coat completely		
Film feed clutch assembly	26, fig. 6-2	26, fig. 5-2	26, fig. 5-11	Apply to bearing interface and gear teeth		
Flatwasher	29, fig. 6-2	29, fig. 5-2	29, fig. 5-11	Coat both sides		
Supply reel arm complete	20, fig. 6-3	21, fig. 5-3	34, fig. 5-12	Coat pivot		
Supply arm locking plunger	24, fig. 6-3	30, fig. 5-3	38, fig. 5-12	Coat lightly		
Reel arm guard	26, fig. 6-3	32, fig. 5-3	40, fig. 5-12	Light coat area that contacts housing		
Reversing switch assembly	*25, fig. 6-4	*37, fig. 5-4	*37, fig. 5-13	Bearing surface		
Take-up reel arm complete	21, fig. 6-5	21, fig. 5-5	9, fig. 5-14	Coat pivot completely		
Reel arm guard	23, fig. 6-5	24, fig. 5-5	12, fig. 5-14	Coat area that interfaces with projector housing		
Take-up arm locking plunger	24, fig. 6-5	25, fig. 5-5	13, fig. 5-14	Bearing surface		
Washers	29 and 30, fig. 6-5	39 and 40, fig. 5-5	27 and 28, fig. 5-14	Coat both sides		
Take-up sprocket gear assembly	*32, fig. 6-5	*41, fig. 5-5	*29, fig. 5-14	Coat gear teeth and bearing interface		
Washer	33, fig. 6-5	42, fig. 5-5	30, fig. 5-14	Coat both sides		
Reel tension arm complete	*4, fig. 6-6	*4, fig. 5-6	*4, fig. 5-15	Coat pivot and area that interfaces with projector housing		
* Denotes items to be lubricated at 500 hour intervals.						

USED ON	REFERENCE			REMARKS	LUBRICANT
	800	900 GROUP 1	900 GROUP 2		
Shoe lever assembly	12, fig. 6-6	12, fig. 5-6	12, fig. 5-15	Shaft	DC44 Light Consistency Silicone Grease 39479 P9 (2 oz.)
Take-up shoe arm complete	10, fig. 6-6	10, fig. 5-6	10, fig. 5-15	Coat pivot and area that interfaces with projector housing	
Washer	13, fig. 6-6	13, fig. 5-6	13, fig. 5-15	Coat both sides	
Spacer	22, fig. 6-6	20, fig. 5-6	20, fig. 5-15	Coat both sides	
Threading control arm complete	21, fig. 6-6	19, fig. 5-6	19, fig. 5-15	Coat pivot	
Pressure roller arm assembly	23, fig. 6-6	25, fig. 5-6	25, fig. 5-15	Coat pivot and area that interfaces with projector housing	
Loop set lever complete	30, fig. 6-6	32, fig. 5-6	32, fig. 5-15	Coat pivot and area that interfaces with projector housing	
Drive shaft bearing	5, fig. 6-7	5, fig. 5-7	5, fig. 5-16	Pack all moving surfaces	
Spring washer	6, fig. 6-7	6, fig. 5-7	6, fig. 5-16	Apply to interface surfaces	
Take-up drive gear	9, fig. 6-7	9, fig. 5-7	9, fig. 5-16	Apply to worn surface	
Drive shaft bearing	16, fig. 6-7	16, fig. 5-7	16, fig. 5-16	Pack all moving surfaces	
Safety shutter link	22, fig. 6-7	22, fig. 5-7	22, fig. 5-16	Apply to inside edges	
Feed drive gear	19, fig. 6-7	19, fig. 5-7	19, fig. 5-16	Apply to worn surface	
Framing arm pivot	31, fig. 6-7	31, fig. 5-7	31, fig. 5-16	Apply to interface surfaces	
Elevation clamp stud	25, fig. 6-9	36, fig. 5-9	34, fig. 5-18	Apply to bearing and interface surface	
Drive clutch plate complete	*3, fig. 7-7	*3, fig. 7-7	*3, fig. 7-7	Apply a light coating to plate contact surface	
Rod	17, fig. 7-23	17, fig. 7-23	17, fig. 7-23	Apply to pivot periphery, threads, and bearing surfaces	

* Denotes items to be lubricated at 500 hour intervals.

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USED ON	REFERENCE			REMARKS	LUBRICANT
	800	900 GROUP 1	900 GROUP 2		
Belt shift eccentric	21, fig. 6-4	33, fig. 5-4	33, fig. 5-13	Coat pivot and bearing interfaces	FS1290 Fluorosilicone Grease 39479P4 (1/2 oz.) 39484P5 (8 oz.)
Threading control arm complete	19, fig. 5-6	19, fig. 5-6	19, fig. 5-6	Coat edge which contacts spring (28) Fig. 5-6	
Bearings	*8 & 10, fig. 7-12	*8 & 10, fig. 7-12	*8 & 10, fig. 7-12	Apply to inside diameter and outside face	
Claw arm assembly	8, fig. 7-23	8, fig. 7-23	8, fig. 7-23	Apply to interface between arm and washer	
Film gate lever eccentric	18, fig. 6-2	18, fig. 5-2	18, fig. 5-11	Apply to area that interfaces with lens holder assembly	Anderol L-793 Grease 39479P2 (1 oz.)
Belt guide post	15, fig. 6-3	28, fig. 5-3	32, fig. 5-12	Coat lightly	
Supply reel belt guide	*16, fig. 6-3	*25, fig. 5-3	*29, fig. 5-12	Coat interface areas. Do not get grease on belt contact areas	
Feed shoe assembly	9, fig. 7-4	9, fig. 7-4	9, fig. 7-4	Apply a light coating to roller shafts	
Spring	7, fig. 7-12	7, fig. 7-12	7, fig. 7-12	Apply a light coating to interface areas	
Washer	8, fig. 7-13	8, fig. 7-13	8, fig. 7-13	Coat both sides	
Lever	5, fig. 7-13	5, fig. 7-13	5, fig. 7-13	Apply to eccentric slot	
Fork	11, fig. 7-13	11, fig. 7-13	11, fig. 7-13	Coat roller contact area	
Spacer	9, fig. 7-13	9, fig. 7-13	9, fig. 7-13	Coat interface areas	
Washer	10, fig. 7-13	10, fig. 7-13	10, fig. 7-13	Coat both sides	
Take-up shoe arm assembly	5, fig. 7-17	5, fig. 7-17	5, fig. 7-17	Apply a light coating to roller shafts	
Film tension arm assembly	8, fig. 7-18	8, fig. 7-18 27, fig. 7-19	8, fig. 7-18 27, fig. 7-19	Apply a light coating to roller rod	
Threading control arm assembly	13, fig. 7-18	13, fig. 7-18 30, fig. 7-19	13, fig. 7-18 30, fig. 7-19	Apply a light coating to roller rod	

* Denotes items to be lubricated at 500 hour intervals.

USED ON	REFERENCE			REMARKS	LUBRICANT
	800	900 GROUP 1	900 GROUP 2		
Lubricator as- sembly	*5, fig. 6-3	*5, fig. 5-3	*18, fig. 5-12	16 drops on pad every 500 hours and during reas- sembly	Graflex Instrument Oil (Cosmolubric 270) 39479P8 (1/2 oz.) Note: When supply is exhausted use TERESSO OIL No. V79 39479P11 (1 oz.)
Rewind assembly knob	*36, fig. 6-7	*34, fig. 5-7	*34, fig. 5-16	Apply a light coating on bear- ing surfaces	
Roller	5, fig. 7-4	5, fig. 7-4	5, fig. 7-4	One drop between halves of roller	
Follower assem- bly	*7, fig. 7-4	*7, fig. 7-4	*7, fig. 7-4	Apply two drops between rollers after assembly	
Toggle spring	*3a, fig. 7-7	*3a, fig. 7-7	*3a, fig. 7-7	Apply two drops after assembly	
Bracket	*1, fig. 7-16	*1, fig. 7-16	*1, fig. 7-16	Apply to pivot hole	
Roller	*3, fig. 7-17	*3, fig. 7-17	*3, fig. 7-17	One drop between halves of roller	
Roller	*1, 3, fig. 7-18	*1, 3, Fig. 7-18	*1, 3, fig. 7-18	One drop between halves of roller	
Roller	*3, 22, fig. 7-19	*3, 22, fig. 7-19	*3, 22, fig. 7-19	One drop between halves of roller	
Cap	5, fig. 7-18	5, fig. 7-18	5, fig. 7-18	Apply a light coating to inside diameter	DC-200 Silicone Fluid (200,000 centistroke) 39479P5 (1 oz.)
Film tension arm assembly	8, fig. 7-18	8, fig. 7-18 27, fig. 7-19	8, fig. 7-18 27, fig. 7-19	Apply a light coating to cap mounting surface and control arm interface areas	
Film feed clutch assembly	26, fig. 6-2	26, fig. 5-2	26, fig. 5-11	3 drops on bear- ing	A-121-5P Oil 39479P3 (1/2 oz.)
Take-up sprocket shoe arm complete	10, fig. 6-6	10, fig. 5-6	10, fig. 6-15	Apply 3 drops on sprocket bearing	
					ADHESIVE OR SEALANT
Setscrew	15, fig. 6-2	12, fig. 5-2	12, fig. 5-11	Apply to threads during assembly	Glyptal ZV-903 39490P1 (3 oz)
Lamp base cap screw	11, fig. 6-3	8, fig. 5-3	21, fig. 5-12	Apply to threads during adjustment	
* Denotes items to be lubricated at 500 hour intervals.					

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USED ON	REFERENCE			REMARKS	ADHESIVE OR SEALANT
	800	900 GROUP 1	900 GROUP 2		
Lamp socket plate complete	10, fig. 6-3	7, fig. 5-3	20, fig. 5-12	Apply to bottom of mounting surface during adjustment	Glyptal ZV-903 39490P1 (3 oz.)
Nut	28, fig. 6-4	12, fig. 5-4	13, fig. 5-13	Apply to threads and back during assembly	
Threading control spring assembly	26, fig. 6-6	28, fig. 5-6	28, fig. 5-15	Apply coating to interface during assembly	
Screw	7, fig. 6-8	24, fig. 5-8	17, fig. 5-17	Apply to threads during assembly	
Screw	16, fig. 5-18	17, fig. 5-9	9, fig. 6-9	Apply to threads during assembly	
Screw	5, fig. 7-5	5, fig. 7-5	5, fig. 7-5	Apply to threads during assembly	
Screw	41, fig. 5-18	43, fig. 5-9	32, fig. 6-9	Threads	
Screw	3, fig. 7-5	3, fig. 7-5	3, fig. 7-5	Apply to threads during assembly	
Nut	3, fig. 7-23	3, fig. 7-23	3, fig. 7-23	Apply during adjustment	
Washer	4, fig. 7-23	4, fig. 7-23	4, fig. 7-23	Apply during adjustment	
Washer	5, fig. 7-23	5, fig. 7-23	5, fig. 7-23	Apply during adjustment	
Screw	19, fig. 6-6	15, fig. 5-6	15, fig. 5-15	Apply to threads during assembly	Glyptal No. 1276 39490P2 (3 oz.)
Rewind lever stop	28, fig. 6-7	28, fig. 5-7	28, fig. 5-16	Apply coating to mounting side during adjustment	
Limit plate	27, fig. 6-7	27, fig. 5-7	27, fig. 5-16	Apply coating to mounting side during adjustment	
Nut	6, fig. 6-9	6, fig. 5-9	6, fig. 5-18	Apply coating to threads during assembly	
Pad	8, fig. 7-4	8, fig. 7-4	8, fig. 7-4	Use for mounting	A-963-B
Pad	4, fig. 7-17	4, fig. 7-17	4, fig. 7-17	Use for mounting	
* Denotes items to be lubricated at 500 hour intervals.					

SECTION IV

ILLUSTRATED PARTS LIST INTRODUCTION

A. INTRODUCTION

Sections V through VII contain illustrated parts lists for basic models and subassemblies of the Graflex 16 Projector. Section V provides parts lists for the basic 900 Series Projectors and Section VI provides parts lists for the basic 800 Series Projectors. Subassemblies which are common to the 700, 800, and 900 Series of Projectors are covered in Section VII. Modification to the 800 and 900 Series Projectors and a list of the differences that comprise the 700 Series Projectors are covered in Section VIII.

The parts lists in Sections V through VII are presented in the order of disassembly. In the case of the overall projector assemblies (Sections V and VI), the sequence of illustrations is also the sequence of projector disassembly.

The parts lists are arranged in five columns that include "Figure & Index No.", "Part Number", "Description", "Qty", and Model Code" or "Part Number Code". An explanation of the information in each column follows:

Figure & Index No. Column

The Figure & Index No. column contains a list of index numbers that are keyed to the accompanying illustrations. The figure to which the index numbers apply is listed at the top of the column on each page containing a parts list.

Part Number Column

The Part Number column contains the number that is to be used for ordering parts. When there is more than one number for a part, both numbers are listed and only one index number is provided. The models or subassemblies to which the part numbers apply are covered by the Model Code or Part Number Code columns.

Description Column

The Description column contains the name of the part which should also be included with the part number when ordering parts. The description column also shows the relationship between assemblies, subassemblies, and detail parts. All parts common to an assembly or subassembly are indented one space and are listed directly under the item. Assemblies or subassemblies that are shown disassembled are not indexed.

Main assemblies and subassemblies that are not disassembled in the list are indexed and shown in their order of removal from the projector. The Description column contains a reference to the figure in

Section VII where the parts of the subassembly are disassembled.

Attaching parts are shown throughout the parts lists by the use of the words "ATTACHING PARTS" in the Description column. The end of a listing of attaching parts is denoted by ---*---.

Qty Column

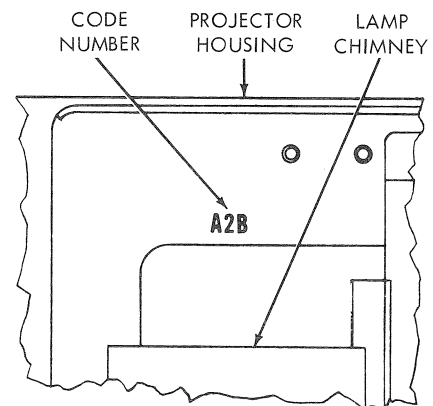
The Qty column lists the total quantity of parts used in the projector. When the quantity varies for different models, the part is listed more than once and the different quantity is given.

Model Code or Part Number Code Column

The Model Code or Part Number Code column denotes the model or subassembly to which each part in the list applies. The model numbers or part numbers which the list covers are listed at the top of the column. The applicability of parts to each model is then indicated by x in the model or part number columns.

B. PROJECTOR CODING

Parts used in one projector model configuration may not be interchangeable with those used in another; therefore always state the three-element production code when writing about, or ordering parts for your projector. This code may be found stamped on the nameplate or on the main projector casting as shown below.



PROJECTOR CODE LOCATION

Replacement parts should be ordered by part number and description from:

GRAFLEX INC.
3750 MONROE AVENUE
ROCHESTER, NEW YORK 14603

SECTION V

900 SERIES PROJECTOR PARTS LIST

A. INTRODUCTION

This section contains an illustrated parts list for the 900 Series Graflex 16 Projector. For easy reference, the listings are separated into two groups; Group 1 and Group 2. Group 1 contains illustrations and parts lists for eight basic models, four synchronous motor models, and two TV models. Group 2 contains illustrations and parts lists for six record/playback models and two arc light models.

Group 2
(Figures 5-10 thru 5-18)

Record/Playback Models:

920R
920P
921R
921P
922R
922P

B. MODEL GROUPING

Group 1
(Figures 5-1 thru 5-9)

Basic Models:

900
901
915
916
917
920
921
922

Synchronous Motor Models:

900-S
901-S
915-S
920-S

TV Models:

930
930R

Arc Light Models:

940
942

C. MODIFICATIONS

Special modification to 900 Series Models are not shown in this section. For modifications, refer to Section VIII.

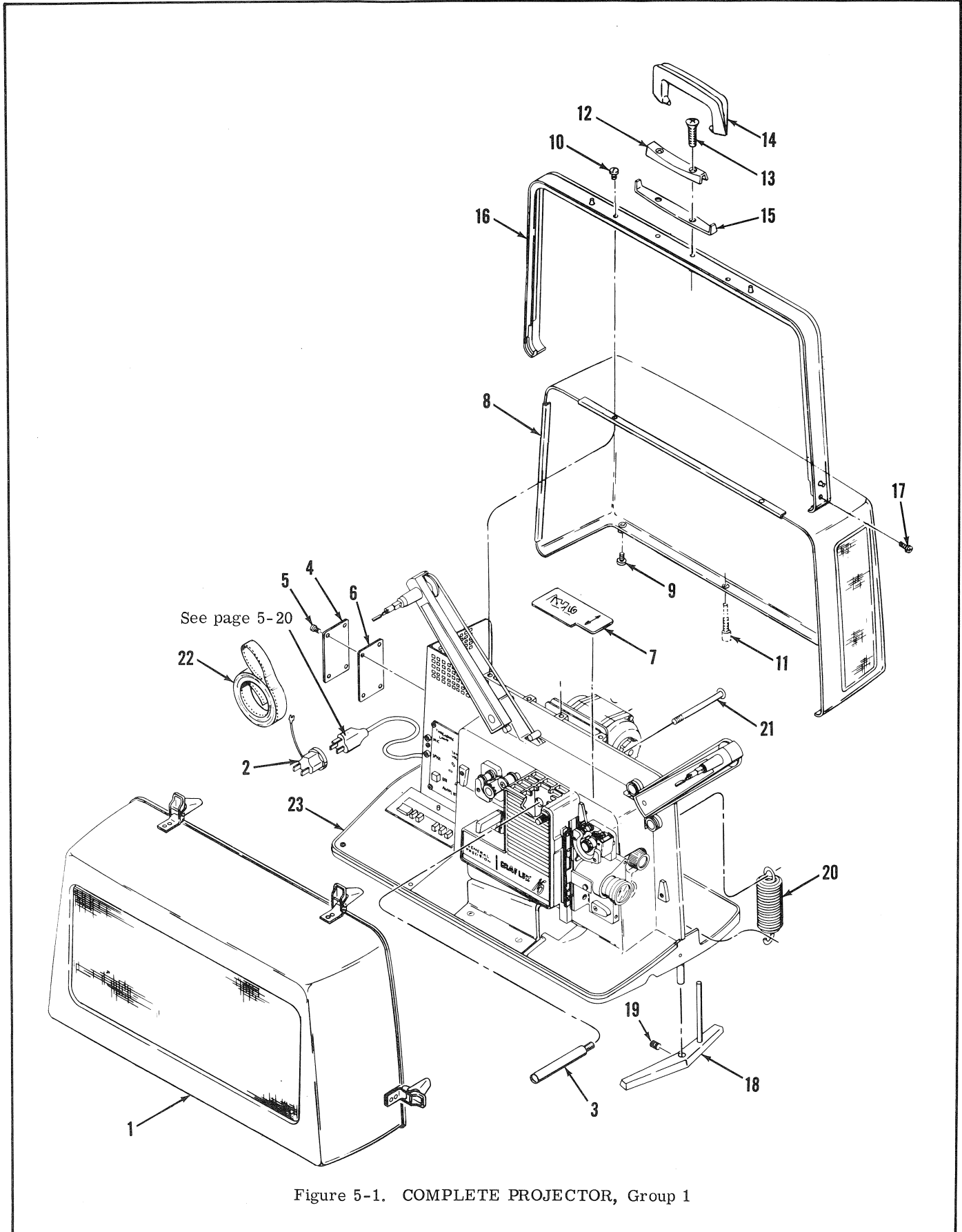


Figure 5-1. COMPLETE PROJECTOR, Group 1

GRAFLEX 16 PROJECTOR

Section V
900 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS																	
				1	2	3	4	5	920	915	900	901	916	917	921	922	930	930R	900-S	901-S	915-S	920-S
		COMPLETE PROJECTOR, Group 1																			
1-	39290-G1	PROJECTOR, Complete (117 V, 60 cycle) . . .																			
	39290-G2	PROJECTOR, Complete (117 V, 60 cycle) . . .																			
	39290-G3	PROJECTOR, Complete (117 V, 60 cycle) . . .																			
	39290-G4	PROJECTOR, Complete (117 V, 60 cycle) . . .																			
	39290-G5	PROJECTOR, Complete (230 V, 50 cycle) . . .																			
	39290-G6	PROJECTOR, Complete (117 V, 50 cycle) . . .																			
	39290-G7	PROJECTOR, Complete (230 V, 50 cycle) . . .																			
	39290-G8	PROJECTOR, Complete (117 V, 60 cycle) . . .																			
	40478-G1	PROJECTOR, Complete (117 V, 60 cycle) . . .																			
	40478-G2	PROJECTOR, Complete (117 V, 60 cycle) . . .																			
	40470-G1	PROJECTOR, Complete (117 V, 60 cycle) . . .																			
	40470-G2	PROJECTOR, Complete (117 V, 60 cycle) . . .																			
	40470-G3	PROJECTOR, Complete (117 V, 60 cycle) . . .																			
	40470-G4	PROJECTOR, Complete (117 V, 60 cycle) . . .																			
-1	39291-G1	COVER ASSEMBLY, Front (See figure 7-1 for breakdown)	1																		
	39291-G2	COVER ASSEMBLY, Front (See figure 7-1 for breakdown)	1																		
	39047-G1	COVER ASSEMBLY, Front (See figure 7-1 for breakdown)	1																		
-2	38435-P1	ADAPTER, Power Cord	1																		
-3	39085-G1	SCREW ASSEMBLY, Shipping	1																		
-4	38189-P22	PLATE, Identification	1																		
	38189-P21	PLATE, Identification	1																		
	38189-P20	PLATE, Identification	1																		
	38189-P23	PLATE, Identification	1																		
	38189-P26	PLATE, Identification	1																		
	38189-P27	PLATE, Identification	1																		
	38189-P28	PLATE, Identification	1																		
	38189-P29	PLATE, Identification	1																		
	38189-P24	PLATE, Identification	1																		
	39488-P18	PLATE, Identification	1																		
	39488-P2	PLATE, Identification	1																		
	39488-P3	PLATE, Identification	1																		
	39488-P4	PLATE, Identification	1																		
	39488-P5	PLATE, Identification	1																		
		(ATTACHING PARTS)																			
-5	38215	SCREW, Drive	4																		
		----*----																			
-6	39474-P1	DAMPENER	1																		
-7	39212-P1	PLATE, Threading Diagram	1																		
-8	39295-G1	COVER COMPLETE, Rear (See figure 7-2 for breakdown)	1																		
	39295-G2	COVER COMPLETE, Rear (See figure 7-2 for breakdown)	1																		
		(ATTACHING PARTS)																			
-9	116-6R12H	SCREW, No. 6-32 x 3/4, pan hd	2																		
	40471	SCREW, Interlock Switch	2																		
-10	116-6R12H	SCREW (See index 9)	2																		
-11		SCREW, Interlock (Part of index 23)	REF																		
		----*----																			
-12	39034-P1	HOUSING, Handle	1																		
		(ATTACHING PARTS)																			
-13	104-8R16H	SCREW, No. 8-32 x 1 oval hd	2																		
		----*----																			
-14	39039-P1	HANDLE	1																		
-15	39011	RETAINER	1																		
-16	39058-G1	FRAME ASSEMBLY	1																		
		(ATTACHING PARTS)																			
-17	116-6R12H	SCREW (See index 9)	2																		
		----*----																			

Section V
900 Series Projector Parts List

GRAFLEX 16 PROJECTOR

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS																		
				1	2	3	4	5	920	915	900	901	916	917	921	922	930	930R	900-S	901-S	915-S	920-S
		COMPLETE PROJECTOR, Group 1 (Cont.)																				
1-18	38234-G2	. FOOT ASSEMBLY	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	39237	. . . . .	2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		(ATTACHING PARTS)																				
-19	136-6R8H	. SCREW, Thread Cutting No. 6 x 0.500 oval hd ----*----	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-20	38213-P1	. SPRING, Elevation	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-21	116-10-10A	. SCREW, Shipping, No. 10-24 x 5/8 pan hd .	1											X	X	X	X	X	X	X	X	X
-22	40478-P3	. FILM LOOP, Alignment	1											X	X							
-23	39300-G1	. PROJECTOR ASSEMBLY (See figures 5-2. . thru 5-9 for breakdown)	1	X																		
	39300-G2	. PROJECTOR ASSEMBLY (See figures 5-2. . thru 5-9 for breakdown)	1		X																	
	39300-G3	. PROJECTOR ASSEMBLY (See figures 5-2. . thru 5-9 for breakdown)	1			X	X															
	39300-G4	. PROJECTOR ASSEMBLY (See figures 5-2. . thru 5-9 for breakdown)	1					X														
	39300-G6	. PROJECTOR ASSEMBLY (See figures 5-2. . thru 5-9 for breakdown)	1						X													
	39300-G5	. PROJECTOR ASSEMBLY (See figures 5-2. . thru 5-9 for breakdown)	1							X												
	39300-G7	. PROJECTOR ASSEMBLY (See figures 5-2. . thru 5-9 for breakdown)	1								X											
	40432-G1	. PROJECTOR ASSEMBLY (See figures 5-2. . thru 5-9 for breakdown)	1									X										
	41001-G13	. PROJECTOR ASSEMBLY (See figures 5-2. . thru 5-9 for breakdown)	1												X							
	40474-G1	. PROJECTOR ASSEMBLY (See figures 5-2. . thru 5-9 for breakdown)	1													X	X					
	40474-G2	. PROJECTOR ASSEMBLY (See figures 5-2. . thru 5-9 for breakdown)	1															X				
	40474-G3	. PROJECTOR ASSEMBLY (See figures 5-2. . thru 5-9 for breakdown)	1																		X	

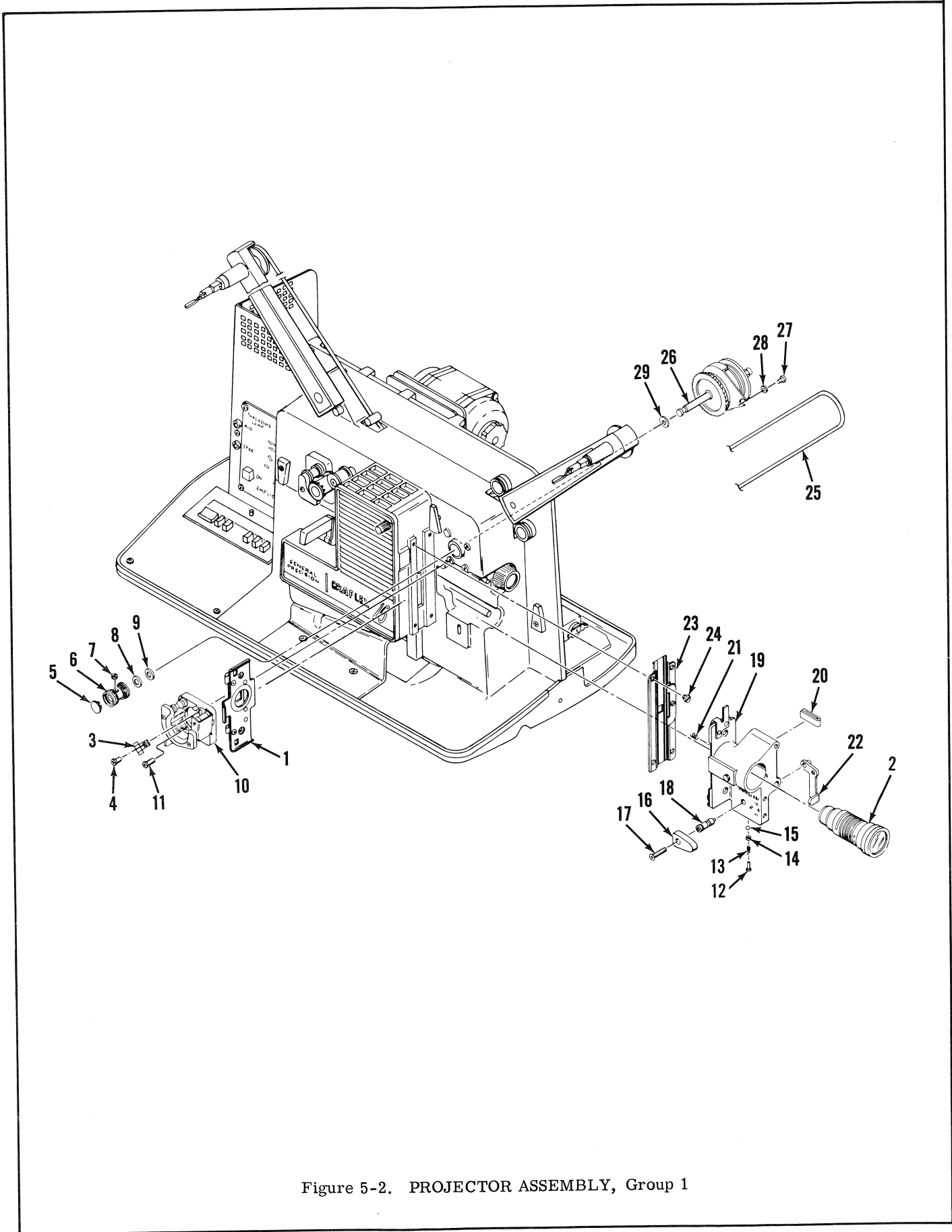


Figure 5-2. PROJECTOR ASSEMBLY, Group 1

GRAFLEX 16 PROJECTOR

Section V
900 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS														
				920	915	900	901	916	917	921	922	930	930R	900-S	901-S	915-S	920-S	
PROJECTOR ASSEMBLY, Group 1																		
2-	39300-G1	PROJECTOR ASSEMBLY		X														
	39300-G2	PROJECTOR ASSEMBLY			X													
	39300-G3	PROJECTOR ASSEMBLY				X	X											
	39300-G4	PROJECTOR ASSEMBLY						X										
	39300-G6	PROJECTOR ASSEMBLY							X									
	39300-G5	PROJECTOR ASSEMBLY								X								
	39300-G7	PROJECTOR ASSEMBLY									X							
	40432-G1	PROJECTOR ASSEMBLY										X						
	41001-G13	PROJECTOR ASSEMBLY											X					
	40474-G1	PROJECTOR ASSEMBLY												X	X			
	40474-G2	PROJECTOR ASSEMBLY														X		
	40474-G3	PROJECTOR ASSEMBLY															X	
-1	38472-G2	SHOE COMPLETE, Film Pressure (See figure 7-3 for breakdown)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-2	38428-P1	LENS, Projection	1	X					X	X								X
-3	38427-P1	LENS, Projection	1		X	X	X	X	X					X	X	X		
-3	38373	STRIPPER (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-4	123-4R4H	SCREW, No. 4 x 1/4 truss hd	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-5	38841-P2	BUTTON	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-6	38261-G1	SPROCKET ASSEMBLY, Film (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-7	38438	SETSCREW	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-8	35473-30H	WASHER, Flat, 0.500 x 0.254 x 0.032	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-9	35473-65	WASHER, Flat, 0.500 x 0.257 x 0.020	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-10	38350-G2	SHOE COMPLETE, Feed Sprocket (See figure 7-4 for breakdown) (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-11	106-4R8H	SCREW, No. 4-40 x 1/2	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-12	171-416-4L	SETSCREW, No. 1/4-20 x 1/4 hex socket	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-13	39222-P1	SPRING	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-14	38473-25	WASHER, Flat	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-15	300-6	BALL	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-16	38212	LEVER, Control (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-17	104-6R6H	SCREW, No. 6-32 x 3/8 oval hd	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-18	39220-P1	ECCENTRIC, Gate Lever	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-19	38071-G2	HOLDER ASSEMBLY, Lens (See figure 7-5 for breakdown)	1	X	X	X	X	X	X					X	X	X	X	
	38071-G4	HOLDER ASSEMBLY, Lens (See figure 7-5 for breakdown)	1									X	X					
-20	38075	SPRING, Lens Holder	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-21	39238-P1	SPRING, Lens Holder (Lower)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-22	38067-G1	LEVER ASSEMBLY, Gate	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-23	38820-G1	PLATE ASSEMBLY, Aperture (See figure 7-6 for breakdown) (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-24	112-4R3H	SCREW, No. 4-40 x 3/16 truss hd	4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-25	39211-P2	BELT, Supply	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-26	39151-G1	CLUTCH ASSEMBLY, Film Feed (See figure 7-7 for breakdown) (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-27	121-6R5H	SCREW, No. 6 x 5/16 pan hd	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-28	38473-16A	WASHER, Flat, 0.375 x 0.156 x 0.050	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-29	35473-48	WASHER, Flat, 0.500 x 0.254 x 0.050	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

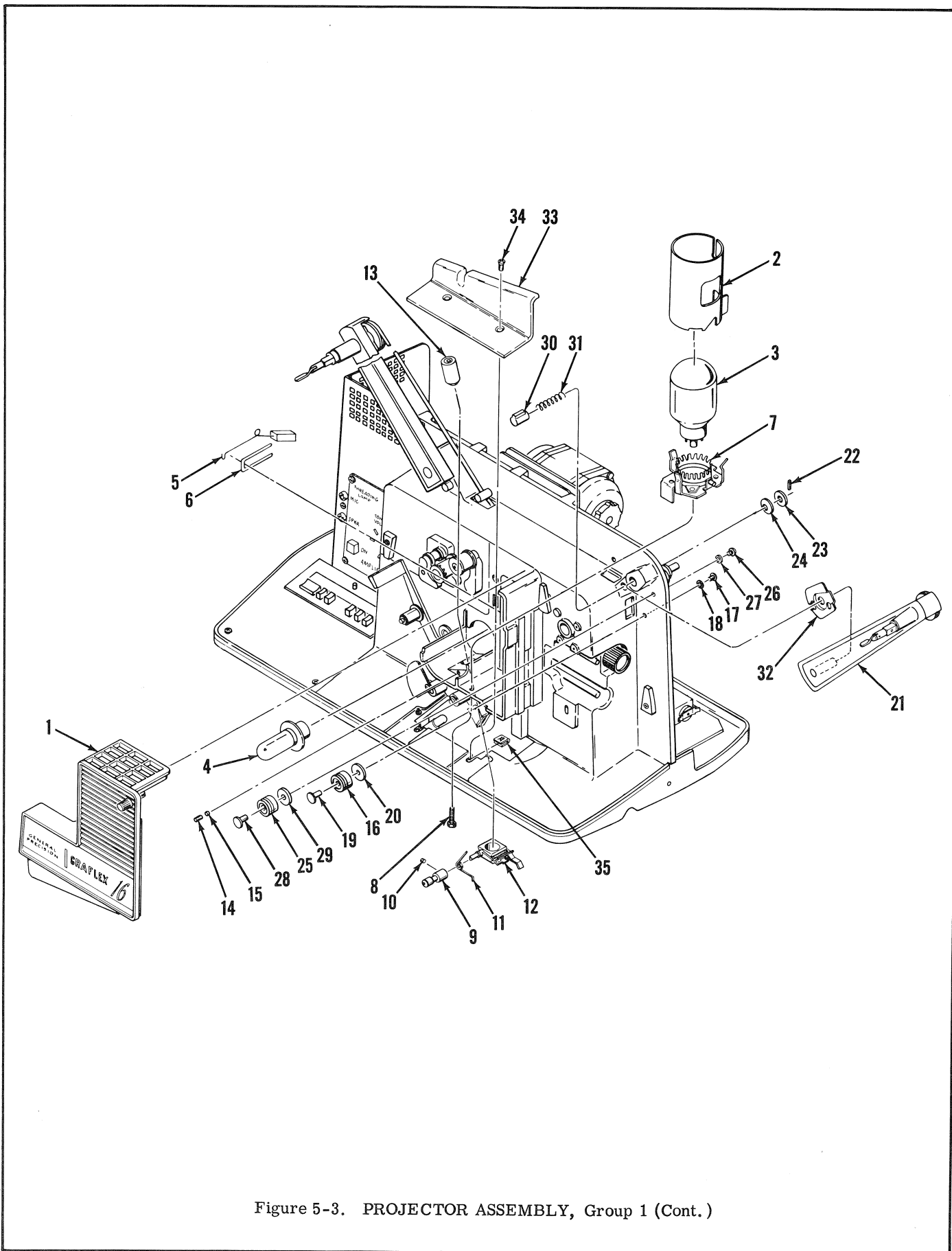
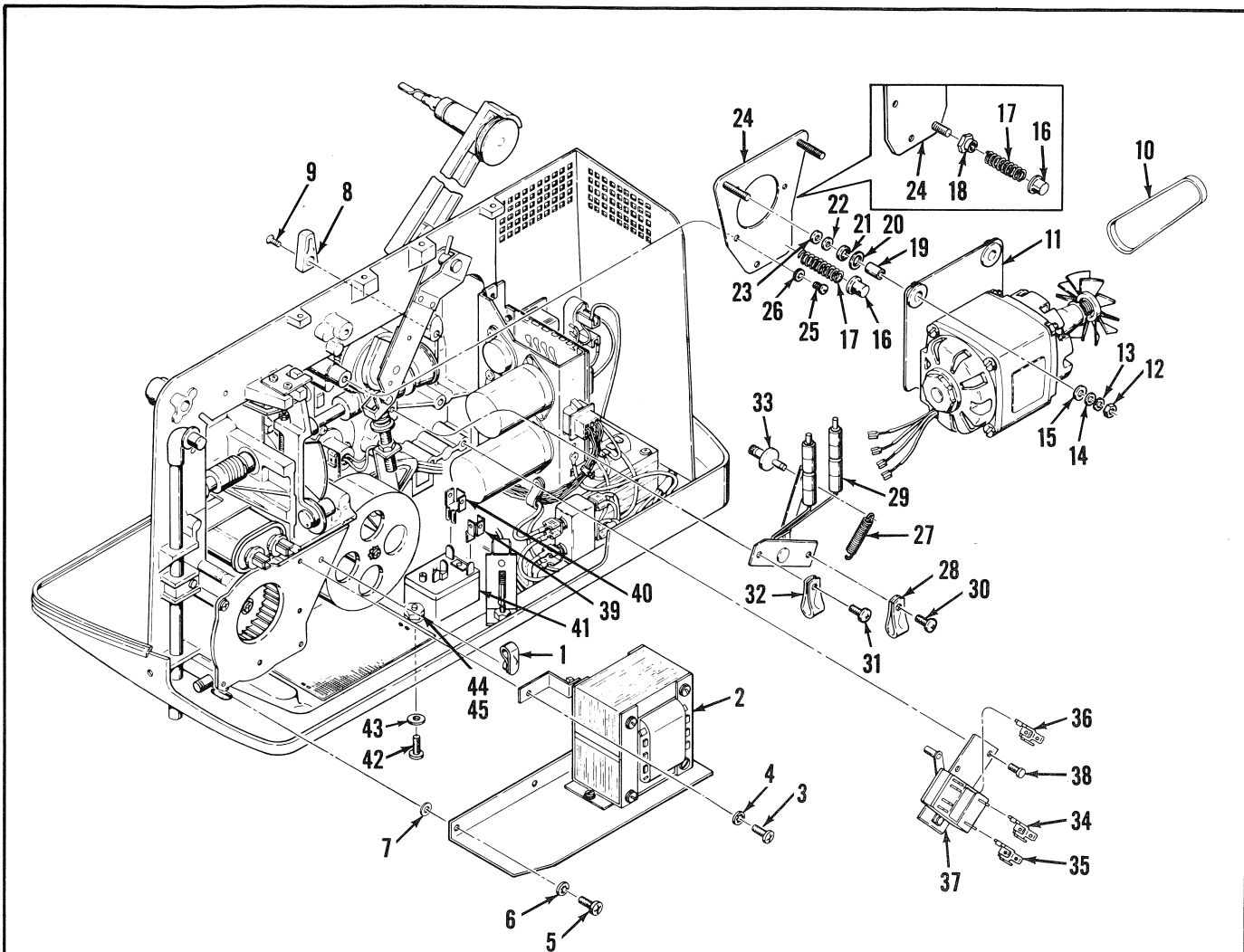


Figure 5-3. PROJECTOR ASSEMBLY, Group 1 (Cont.)

GRAFLEX 16 PROJECTOR

Section V
900 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS																		
				1	2	3	4	5	920	915	900	901	916	917	921	922	930	930R	900-S	901-S	915-S	920-S
3-1	39184-G1	PROJECTOR ASSEMBLY, Group 1, (Cont.) COVER ASSEMBLY, Lamphouse (See figure 7-8 for breakdown)	1																			
	39184-G4	COVER ASSEMBLY, Lamphouse (See figure 7-8 for breakdown)	1														x					
-2	38182-P2	CHIMNEY	1																			
	40435-G1	CHIMNEY ASSEMBLY	1																			
-3	38170-P1	LAMP, Projection	1																			
	38170-P3	LAMP, Projection	1																			
-4	38386-P2	LAMP, Exciter	1																			
-5	39002-G1	PAD ASSEMBLY, Lubricator (ATTACHING PARTS)	1																			
-6	39001	RETAINER, Pad Assembly ----*----	1																			
-7	38230-G2	PLATE COMPLETE, Lamp Socket (ATTACHING PARTS)	1																			
-8	39225	SCREW, Cap ----*----	1																			
-9	41030-P1	KNOB (ATTACHING PARTS)	1																			
-10	171-4-2L	SETSCREW, No. 4-40 x 1/8 hex socket ----*----	1																			
-11	41028-P1	SPRING, Yoke	1																			
-12	41021-G1	ERASE HEAD AND YOKE ASSEMBLY (See figure 7-9 for breakdown)	1																			
-13	38431-P1	CARTRIDGE, Sound Optics (ATTACHING PARTS)	1																			
-14	171-6-4L	SETSCREW, No. 6-32 x 1/4 hex socket	1																			
-15	38162	PLUG ----*----	1																			
-16	39153-P1	GUIDE, Supply Reel Belt (ATTACHING PARTS)	2																			
-17	116-6R6H	SCREW, No. 6-32 x 3/8 pan hd	2																			
-18	221-6	WASHER, Lock	2																			
-19	39154	POST, Belt Guide	2																			
-20	38473-23	WASHER, Flat, 0.312 x 0.055 x 0.031 ----*----	2																			
-21	39175-G1	ARM COMPLETE, Supply Reel (See figure 7-10 for breakdown)	1																			
	39175-G5	ARM COMPLETE, Supply Reel (See figure 7-10 for breakdown) (ATTACHING PARTS)	1																			
-22	189-5-10	ROLL PIN	1																			
-23	38473-19L	WASHER, Flat, 0.495 x 0.259 x 0.040	1																			
-24	224-12	WASHER, Spring 0.568 x 0.090 x 0.020 ----*----	1																			
-25	39153-P1	GUIDE, Supply Reel Belt (ATTACHING PARTS)	1																			
-26	102-6R6A	SCREW, No. 6-32 x 3/8 rd hd	1																			
-27	221-6	WASHER, Lock	1																			
	230-6	WASHER, Spring (Split type)	1																			
-28	39154	POST, Belt Guide	1																			
-29	38473-23	WASHER, Flat (See index 20) ----*----	1																			
-30	38089-P1	PLUNGER, Supply Arm	1																			
-31	38088-P1	SPRING, Reel Arm Lock	1																			
-32	39182-P1	GUARD, Belt Reel Arm	1																			
	39182-P2	GUARD, Belt Reel Arm	1																			
-33	38164-P3	COVER, Sound Head (ATTACHING PARTS)	1																			
-34	125-6R8H	SCREW, No. 6 x 1/2 oval hd	2																			
-35	38316	NUT, Speed ----*----	2																			



NOTE: See page 8-6 before ordering parts for replacement

Figure 5-4. PROJECTOR ASSEMBLY, Group 1 (Cont.)

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS																		
				1	2	3	4	5	920	915	900	901	916	917	921	922	930	930R	900-S	901-S	915-S	920-S
		PROJECTOR ASSEMBLY, Group 1 (Cont.)																				
4-1	39235	. STRAP, Cable	1																			
-2	39045-G3	. PLATFORM COMPLETE, Transformer . . . (See figure 7-11 for breakdown)	1																			
		(ATTACHING PARTS)																				
-3	121-8R8H	. SCREW, No. 8 x 1/2 pan hd	2																			
-4	221-8A	. WASHER, Lock	2																			
-5	140-8R10H	. SCREW, No. 8-32 x 5/8 pan hd	2																			
-6	221-8A	. WASHER, Lock	2																			
		---*---																				
-7	38473-18	. WASHER, Flat, 0.312 x 0.127 x 0.062 . . .	2																			
-8	38212	. LEVER, Control	1																			
		(ATTACHING PARTS)																				
-9	104-6R6H	. SCREW, No. 6-32 x 3/8 oval hd	1																			
		---*---																				
-10	39086-P1	. BELT, Motor Drive	1																			
	40475-P1	. BELT, Motor Drive	1																			

NOTE: See page 8-6 before ordering parts for replacement

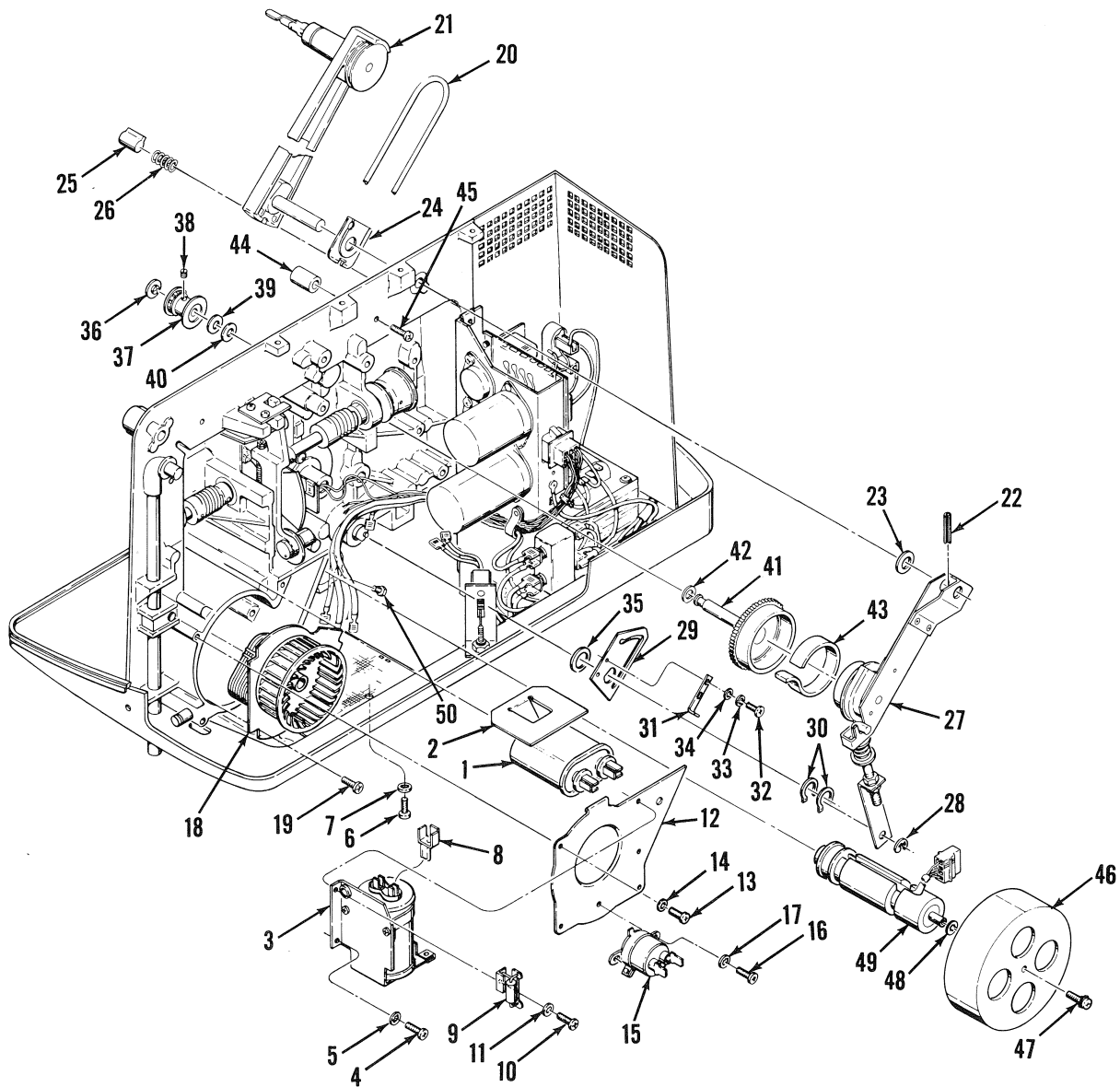


Figure 5-5. PROJECTOR ASSEMBLY, Group 1 (Cont.)

GRAFLEX 16 PROJECTOR

Section V
900 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS																
				920	915	900	901	916	917	921	922	930	930R	900-S	901-S	915-S	920-S			
		PROJECTOR ASSEMBLY, Group 1 (Cont.)																		
5-1	38177-P5	. CAPACITOR, Motor	1	X	X	X	X													
	38177-P6	. CAPACITOR, Motor	1					X	X											
	38177-P7	. CAPACITOR, Motor	1							X	X									
-2	38452-P1	. SPRING, Capacitor	1	X	X	X	X	X	X	X	X									
-3	40472-G1	. CAPACITOR AND BRACKET ASSEMBLY . . (See figure 7-14 for breakdown)	1									X	X	X	X	X	X	X	X	X
		(ATTACHING PARTS)																		
-4	121-8R8H	. SCREW, No. 8 x 1/2 pan hd	2								X	X	X	X	X	X	X	X	X	X
	121-8R8H	. SCREW, No. 8 x 1/2 pan hd	1									X								
-5	221-8A	. WASHER, Lock	2									X	X	X	X	X	X	X	X	X
	221-8A	. WASHER, Lock	1									X								
-6	121-8R8H	. SCREW (See index 4)	1								X	X	X	X	X	X	X	X	X	X
-7	33500-18	. WASHER, Flat, 0.625 x 0.178 x 0.064 . . . ----*----	1								X	X	X	X	X	X	X	X	X	X
-8	39343	. ADAPTER	1									X								
-9	41059-G1	. CAPACITOR ASSEMBLY (ATTACHING PARTS)	1									X								
-10	121-8R8H	. SCREW (See index 4)	1									X								
-11	221-8A	. WASHER, Lock ----*----	1									X								
-12	38172-P1	. PLATE, Venturi	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	38172-P2	. PLATE, Venturi (ATTACHING PARTS)	1									X								
-13	121-8R8H	. SCREW (See index 4)	4	X	X	X	X			X	X									
	121-8R8H	. SCREW (See index 4)	1					X	X											
	121-8R8H	. SCREW (See index 4)	2								X	X	X	X	X	X	X	X	X	X
-14	221-8A	. WASHER, Lock	4	X	X	X	X			X	X									
	221-8A	. WASHER, Lock	1					X	X											
	221-8A	. WASHER, Lock ----*----	2								X	X	X	X	X	X	X	X	X	X
-15	41058-P1	. CAPACITOR (ATTACHING PARTS)	1									X								
-16	121-8R6H	. SCREW, No. 8 x 3/8 pan hd	1									X								
-17	221-8H	. WASHER, Lock ----*----	1									X								
-18	38167-G1	. PLATE ASSEMBLY, Motor Mounting (See figure 7-15 for breakdown)	1	X	X	X	X				X		X	X	X	X	X	X	X	X
	38167-G2	. PLATE ASSEMBLY, Motor Mounting (See figure 7-15 for breakdown)	1				X		X											
	38167-G3	. PLATE ASSEMBLY, Motor Mounting (See figure 7-15 for breakdown)	1					X	X											
	41042-G1	. PLATE ASSEMBLY, Motor Mounting (See figure 7-15 for breakdown) (ATTACHING PARTS)	1									X								
-19	121-8R6H	. SCREW (See index 16) ----*----	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-20	39211-P1	. BELT, Takeup	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-21	39175-G2	. ARM COMPLETE, Takeup Reel (See figure . 7-10 for breakdown) (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-22	189-5-10	. ROLL PIN ----*----	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-23	35473-35H	. WASHER, Flat	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-24	39182-P1	. GUARD, Belt Reel Arm	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-25	38089-P3	. PLUNGER, Takeup Arm	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-26	38088-P1	. SPRING, Reel Arm Lock	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-27	39155-G1	. ARM COMPLETE, Takeup Clutch (See . . . figure 7-16 for breakdown) (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-28	251-14	. RING, Retaining ----*----	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Section V
900 Series Projector Parts List

GRAFLEX 16 PROJECTOR

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS																		
				1	2	3	4	5	920	915	900	901	916	917	921	922	930	930R	900-S	901-S	915-S	920-S
		PROJECTOR ASSEMBLY, Group 1 (Cont.)																				
5-29	39167-P1	. CAM, Reverse Switch	1	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
	39167-P2	. CAM, Reverse Switch (ATTACHING PARTS)	1													X						
-30	252-6	. RING, Retaining ---*---	2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-31	41035	. ACTUATOR, Switch (ATTACHING PARTS)	1													X						
-32	116-2R2H	. SCREW, No. 2-56 x 1/8 pan hd	2													X						
-33	221-2H	. WASHER, Lock	2													X						
-34	30473-67H	. WASHER, Flat, 0.208 x 0.096 x 0.032 ---*---	2													X						
-35	38278-P2	. SPACER	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-36	38841-P2	. BUTTON	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-37	38261-G2	. SPROCKET ASSEMBLY, Film (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-38	38438	. SETSCREW, No. 10-32 x 3/16 cup pt. ---*---	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-39	35473-30H	. WASHER, Flat, 0.500 x 0.254 x 0.031	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-40	35473-65	. WASHER, Flat, 0.500 x 0.252 x 0.020	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-41	39169-G1	. GEAR ASSEMBLY, Takeup Sprocket	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-42	35473-48	. WASHER, Flat, 0.500 x 0.254 x 0.005	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-43	39203	. LINER	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-44	38464	. POST (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-45	131-6R8A	. SCREW, No. 6 x 1/2 pan hd ---*---	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-46	38159-P1	. FLYWHEEL (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-47	38160-P2	. SCREW ---*---	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-48	221-416	. WASHER, Lock	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-49	38374-G2	. SUPPORT COMPLETE, Sound Drum (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-50	38283	. SCREW, Special ---*---	2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

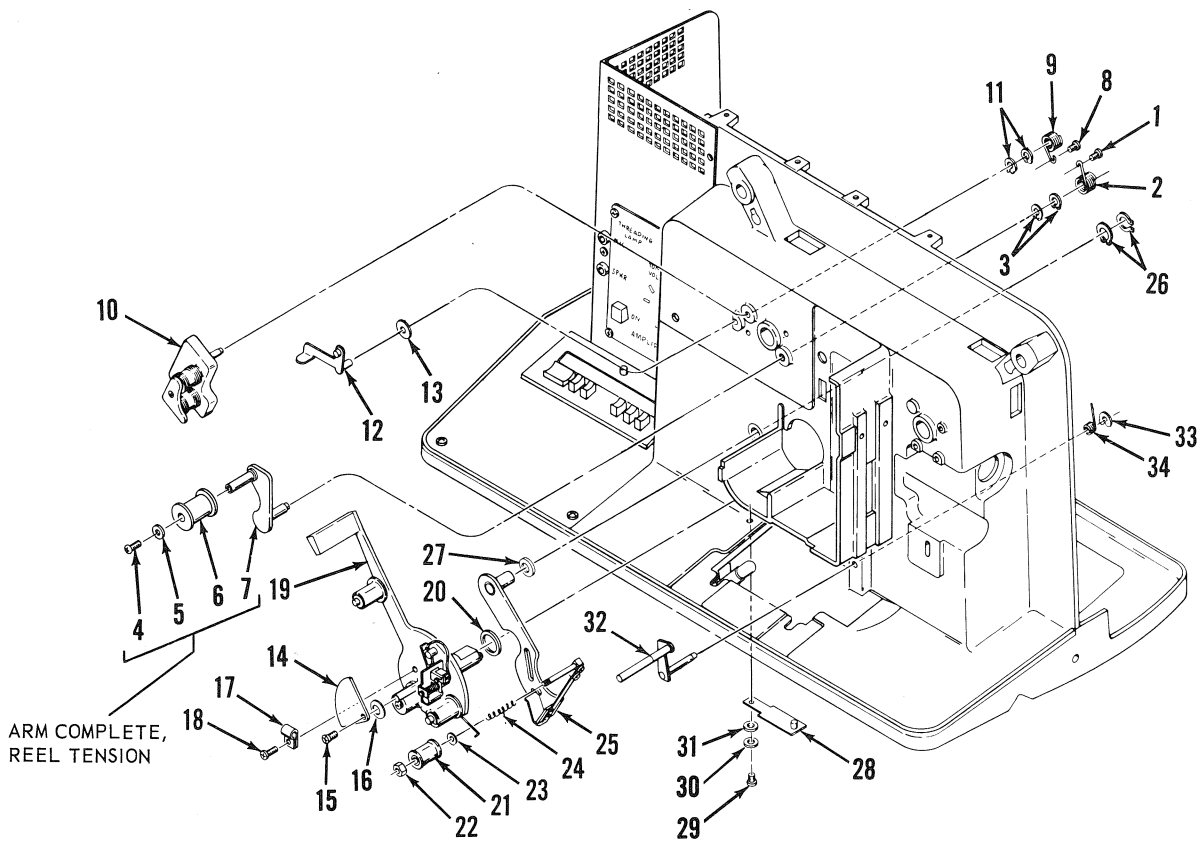
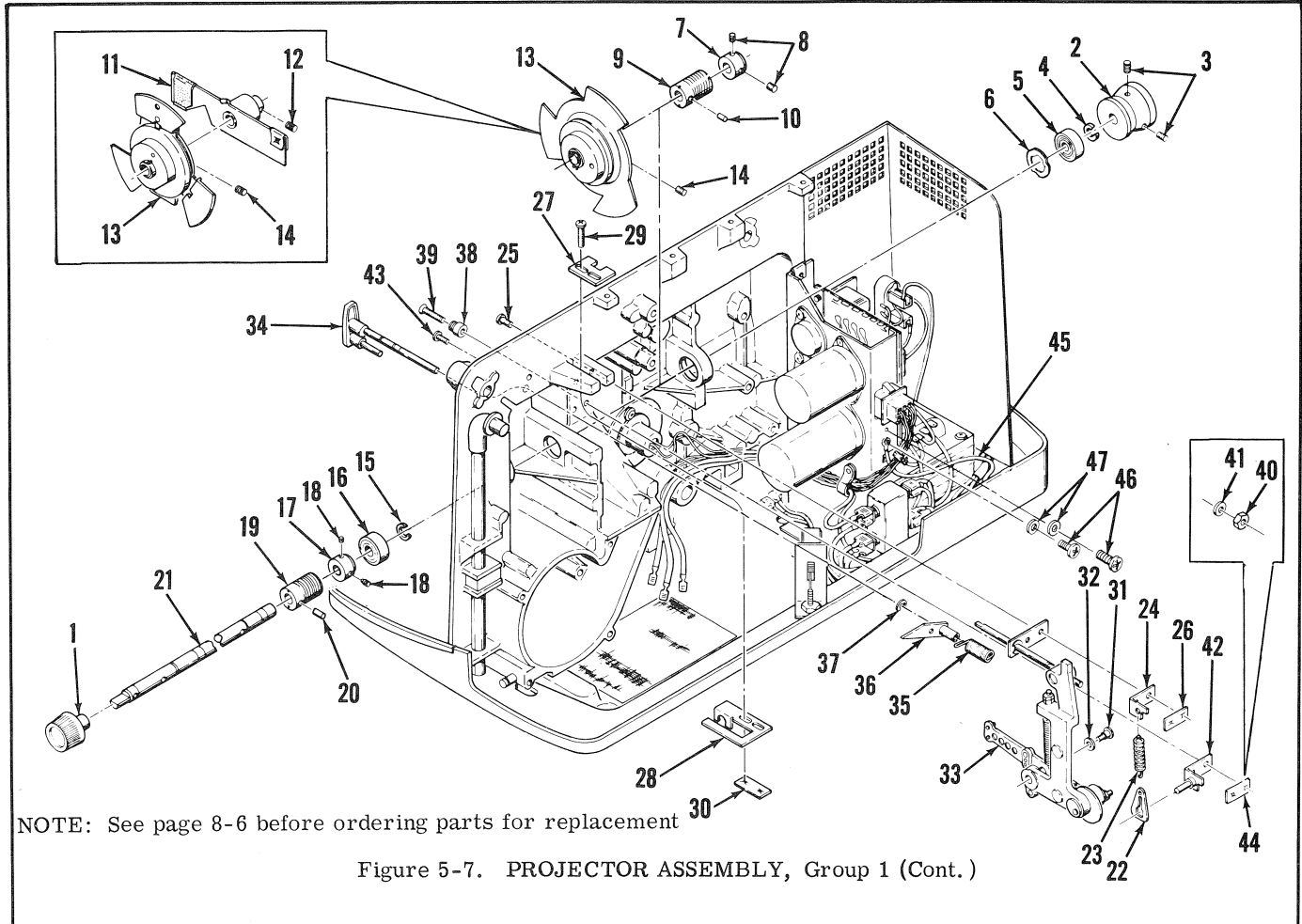


Figure 5-6. PROJECTOR ASSEMBLY, Group 1 (Cont.)

Section V
900 Series Projector Parts List

GRAFLEX 16 PROJECTOR



NOTE: See page 8-6 before ordering parts for replacement

Figure 5-7. PROJECTOR ASSEMBLY, Group 1 (Cont.)

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS																		
				1	2	3	4	5	920	915	900	901	916	917	921	922	930	930R	900-S	901-S	915-S	920-S
PROJECTOR ASSEMBLY, Group 1 (Cont.)																						
7-1	38184-P1	. KNOB, Inching	1																			
-2	39101-P1	. PULLEY, Main Shaft	1																			
	39236-P2	. PULLEY, Main Shaft	1																			
	40455-G1	. PULLEY, Main Shaft	1																			
-3	171H6-4L	. SETSCREW, No. 6-32 x 1/4 hex socket ----*----	2																			
-4	253-4	. RING, Retaining	1																			
-5	38007	. BEARING	1																			
-6	38492	. WASHER, Spring	1																			
-7	38471	. COLLAR (ATTACHING PARTS)	1																			
-8	171F6-3L	. SETSCREW, No. 6-32 x 3/16 hex socket ----*----	2																			
-9	38806-P1	. GEAR, Drive (ATTACHING PARTS)	1																			
-10	191S6-10	. PIN, Spirol	1																			
-11	38456-G1	. SHUTTER ASSEMBLY, Safety NUT, Speed (ATTACHING PARTS)	1 REF																			
-12	171-4-2L	. SETSCREW, No. 4-40 x 1/8 hex socket ----*----	1																			

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FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS																		
				1	2	3	4	5	920	915	900	901	916	917	921	922	930	930R	900-S	901-S	915-S	920-S
		PROJECTOR ASSEMBLY, Group 1 (Cont.)																				
7-13	38011-G2	. SHUTTER AND CAM ASSEMBLY (See figure 7-21 for breakdown)	1											X	X					X	X	
	38321-G2	. SHUTTER AND CAM ASSEMBLY (See figure 7-21 for breakdown)	1											X								X
	38321-G3	. SHUTTER AND CAM ASSEMBLY (See figure 7-21 for breakdown) (ATTACHING PARTS)	1													X	X					
-14	171A6-3L	. SETSCREW (See index 8) ----*----	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-15	253-4	. RING, Retaining	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-16	38007	. BEARING	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-17	38471	. COLLAR (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-18	171F6-3L	. SETSCREW (See index 8) ----*----	2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-19	38806-P1	. GEAR, Drive (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-20	191S6-10	. PIN, Spirol ----*----	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-21	38010-P2	. SHAFT, Drive	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-22	38194	. LINK	1	X						X	X											X
-23	38192-P2	. SPRING	1	X						X	X											X
-24	38325	. BRACKET (ATTACHING PARTS)	1	X						X	X											X
-25	121-4R8H	. SCREW, No. 4 x 1/2 pan hd	2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-26	39247-P2	. NUT, Speed ----*----	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-27	38233	. PLATE, Limit	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-28	39152-P1	. STOP, Rewind Lever (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-29	121-6R12H	. SCREW, No. 6 x 3/4 pan hd	2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-30	38238	. NUT, Speed ----*----	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-31	38063	. PIVOT, Framing Arm	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-32	226-1	. WASHER, Spring	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-33	38040-G1	. ARM COMPLETE, Claw (See figure 7-23 for breakdown)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-34	39142-G1	. KNOB ASSEMBLY, Rewind (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-35	39149-P1	. SPRING, Rewind Lever	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-36	39145-G1	. LEVER ASSEMBLY, Rewind	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-37	251-10	. RING, Retaining ----*----	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-38	39246	. STABILIZER (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-39	100-4R10H	. SCREW, No. 4-40 x 5/8 flt hd	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-40	200-4HA	. NUT, No. 4-40	1		X	X	X	X	X							X	X	X				
-41	220-4	. WASHER, Lock ----*----	1		X	X	X	X	X							X	X	X				
-42	38326-G1	. BRACKET ASSEMBLY, Shutter Stop (ATTACHING PARTS)	1	X						X	X											X
-43	121-4R8H	. SCREW, No. 4 x 1/2 pan hd	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-44	39247-P2	. NUT, Speed ----*----	1	X						X	X											X
-45		. WIRE, Ground (green) (ATTACHING PARTS)	REF	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-46	116-8R6A	. SCREW, No. 8-32 x 3/8 pan hd	1	X	X	X	X	X	X	X						X	X	X				
	116-8R-6A	. SCREW, No. 8-32 x 3/8 pan hd	2												X	X						
-47	221-8A	. WASHER, Lock	1	X	X	X	X	X	X	X						X	X	X				
	221-8A	. WASHER, Lock ----*----	2												X	X						

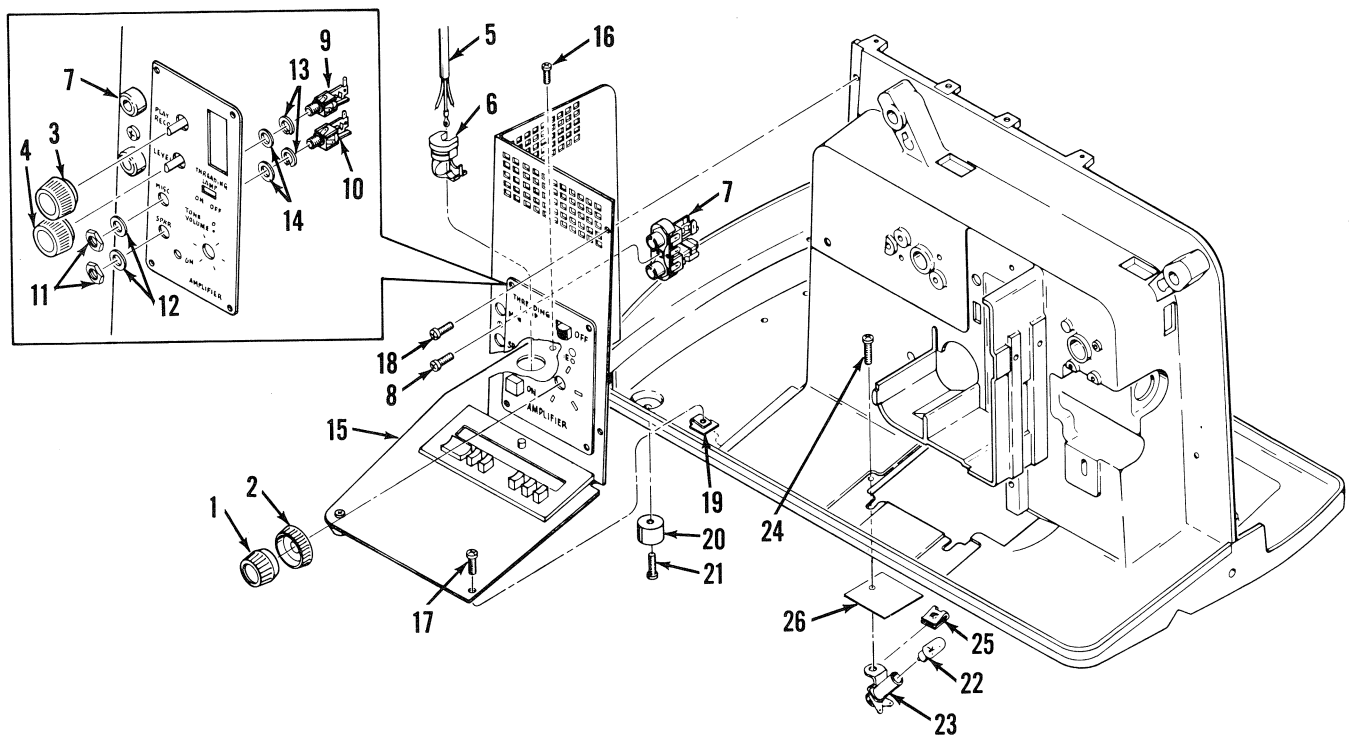


Figure 5-8. PROJECTOR ASSEMBLY, Group 1 (Cont.)

GRAFLEX 16 PROJECTOR

Section V
900 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION 1 2 3 4 5	QTY	MODELS																		
				920	915	900	901	916	917	921	922	930	930R	900-S	901-S	915-S	920-S					
		PROJECTOR ASSEMBLY, Group 1 (Cont.)																				
8-1	39309-P1	. KNOB, Volume	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-2	39310-P1	. KNOB, Tone	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-3	39309-P2	. KNOB, Record-Play	1													X						
-4	39309-P3	. KNOB, Level Control	1												X							
-5	39224-G2	. CORD ASSEMBLY, Power	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-6	241-3	. BUSHING, Strain Relief	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-7	39308-P1	. JACK	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	39308-P2	. JACK	1											X								
		(ATTACHING PARTS)																				
-8	116-6R6H	. SCREW, No. 6-32 x 3/8 pan hd	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		----*----																				
-9	41031-P7	. JACK	1												X							
-10	41031-P9	. JACK	1												X							
		(ATTACHING PARTS)																				
-11	41031-P5	. NUT	2												X							
-12	41031-P4	. WASHER, Flat	2												X							
-13	41031-P3	. WASHER, Lock	2												X							
-14	41031-P4	. WASHER, Flat	2												X							
		----*----																				
-15	39313-G1	. COVER ASSEMBLY, Amplifier (See figure	1	X						X	X											X
		7-22 for breakdown)																				
	39313-G2	. COVER ASSEMBLY, Amplifier (See figure	1		X	X	X	X	X							X	X	X				
		7-22 for breakdown)																				
	39313-G4	. COVER ASSEMBLY, Amplifier (See figure	1											X								
		7-22 for breakdown)																				
	41045-G5	. COVER ASSEMBLY, Amplifier (See figure	1												X							
		7-22 for breakdown)																				
		(ATTACHING PARTS)																				
-16	116-6R4H	. SCREW, No. 6-32 x 1/4 pan hd	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-17	121-6R8H	. SCREW, No. 6 32 x 1/2 pan hd	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-18	121-6R5H	. SCREW, No. 6-32 x 5/16 pan hd	2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		----*----																				
-19	38245	. NUT, Speed	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-20	39243	. FOOT	4	X	X	X	X	X	X	X	X				X	X	X	X				
		(ATTACHING PARTS)																				
-21	116-6R10H	. SCREW, No. 6-32 x 5/8 pan hd	4	X	X	X	X	X	X	X	X				X	X	X	X				
		----*----																				
-22	39311-P1	. LAMP, Threading	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	39311-P2	. LAMP, Threading	1				X		X													
-23	39302-G1	. SOCKET ASSEMBLY, Threading Lamp	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		(ATTACHING PARTS)																				
-24	121-6R8H	. SCREW, No. 6 x 1/2 pan hd	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-25	38248	. NUT, Speed	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-26	41352	. INSULATOR	1											X	X							
		----*----																				

NOTE: See page 8-6 before ordering parts for replacement

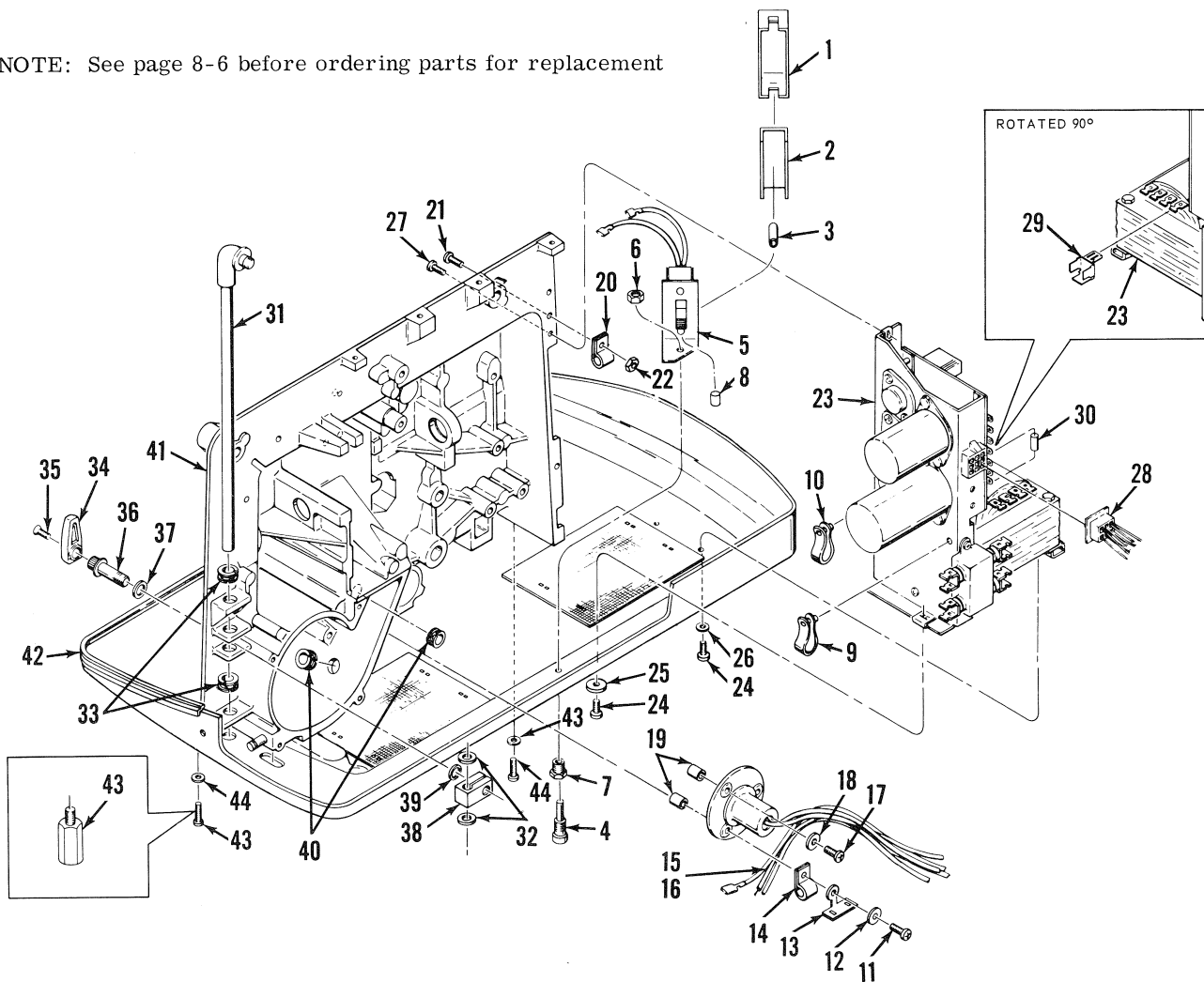


Figure 5-9. PROJECTOR ASSEMBLY, Group 1 (Cont.)

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS																		
				1	2	3	4	5	920	915	900	901	916	917	921	922	930	930R	900-S	901-S	915-S	920-S
PROJECTOR ASSEMBLY, Group 1 (Cont.)																						
9-1	39248-P3	. SHIELD, Interlock Switch	1																			
-2	39248-P4	. LINER, Interlock Switch	1																			
-3	37238-P24	. TUBING	4																			
-4	39216	. SCREW, Interlock Switch	1																			
	40471	. SCREW, Interlock Switch	1																			
-5	39249-G1	. SWITCH ASSEMBLY, Interlock (ATTACHING PARTS)	1																			
-6	30553-1	. NUT, Special	1																			
-7	39187	. GUIDE	1																			
	40453	. GUIDE	1																			
		----*----																				
-8	40461	. PIN, Interlock Switch	1																			
-9	39235	. STRAP, Cable	1																			
-10	39341	. STRAP, Cable	1																			
-11	121-4R8H	. SCREW, No. 4 x 1/2 pan hd	1																			
-12	35473-39	. WASHER, Flat, 0.375 x 0.128 x 0.032	1																			
-13	413-1	. STRIP, Terminal	1																			
-14	267-2	. CLAMP, Cable	1																			

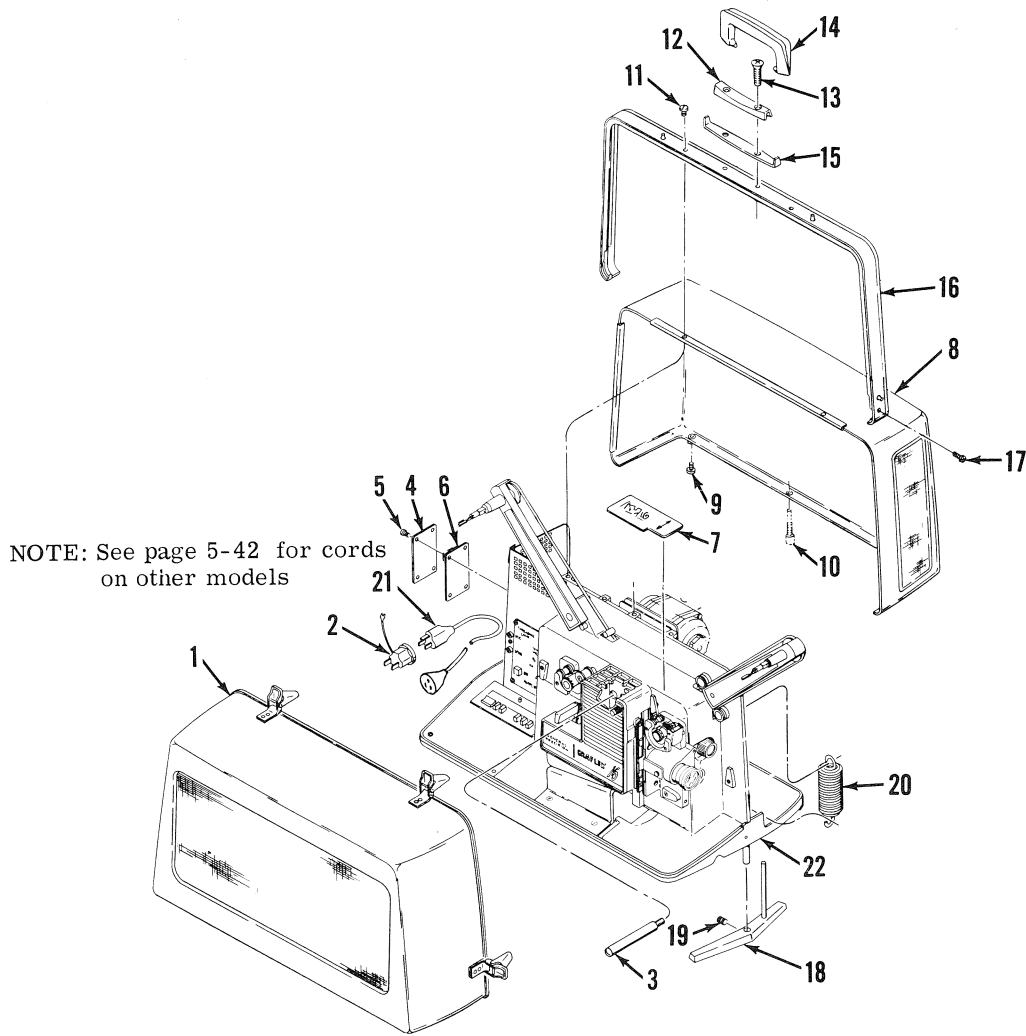


Figure 5-10. COMPLETE PROJECTOR, Group 2

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS													
				1	2	3	4	5	920R	920P	921R	921P	922R	922P	940	942	
		COMPLETE PROJECTOR, Group 2															
10-	41000-G3	PROJECTOR, Complete (117 V, 60 cycle) . .															
	41000-G4	PROJECTOR, Complete (117 V, 60 cycle) . .															
	41000-G9	PROJECTOR, Complete (230 V, 50 cycle) . .															
	41000-G10	PROJECTOR, Complete (230 V, 50 cycle) . .															
	41000-G11	PROJECTOR, Complete (117 V, 50 cycle) . .															
	41000-G12	PROJECTOR, Complete (117 V, 50 cycle) . .															
	41376-G1	PROJECTOR, Complete (117 V, 60 cycle) . .															
	41376-G2	PROJECTOR, Complete (117 V, 50 cycle) . .															
-1	39291-G1	. COVER ASSEMBLY, Front (See figure 7-1 . . for breakdown)	1														
	39291-G3	. COVER ASSEMBLY, Front (See figure 7-1 . . for breakdown)	1														
-2	38435-P1	. ADAPTER, Power Cord	1														

GRAFLEX 16 PROJECTOR

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900 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS																	
				920R	920P	921R	921P	922R	922P	940	942										
		COMPLETE PROJECTOR, Group 2 (Cont.)																			
10-3	39085-G1	. SCREW ASSEMBLY, Shipping	1	x	x	x	x	x	x	x	x	x									
-4	39488-P8	. PLATE, Identification	1	x																	
	39488-P9	. PLATE, Identification	1		x																
	39488-P14	. PLATE, Identification	1			x															
	39488-P15	. PLATE, Identification	1				x														
	39488-P16	. PLATE, Identification	1					x													
	39488-P17	. PLATE, Identification	1						x												
	41397-P2	. PLATE, Identification	1							x											
	41397-P3	. PLATE, Identification	1								x										
		(ATTACHING PARTS)																			
-5	38215	. SCREW, Drive	4	x	x	x	x	x	x	x	x	x									
		----*----																			
-6	39474-P1	. DAMPENER	1	x	x	x	x	x	x	x	x	x									
-7	39212-P1	. PLATE, Threading Diagram	1	x	x	x	x	x	x	x	x	x									
-8	39395-G1	. COVER COMPLETE, Rear (See figure . . .	1	x	x	x	x	x	x												
		7-2 for breakdown)																			
	39395-G2	. COVER COMPLETE, Rear (See figure . . .	1									x	x								
		7-2 for breakdown)																			
		(ATTACHING PARTS)																			
-9	116-6R12H	. SCREW, No. 6-32 x 3/4 pan hd	2	x	x	x	x	x	x	x	x	x									
-10		. SCREW, Interlock)Part of index 22)	REF	x	x	x	x	x	x	x	x	x									
-11	116-6R12H	. SCREW (See index 9)	2	x	x	x	x	x	x	x	x	x									
		----*----																			
-12	39034-P1	. HOUSING, Handle	1	x	x	x	x	x	x	x	x	x									
		(ATTACHING PARTS)																			
-13	104-8R16H	. SCREW, No. 8-32 x 1 oval hd	2	x	x	x	x	x	x	x	x	x									
		----*----																			
-14	39039-P1	. HANDLE	1	x	x	x	x	x	x	x	x	x									
-15	39011	. RETAINER	1	x	x	x	x	x	x	x	x	x									
-16	39058-G1	. FRAME ASSEMBLY	1	x	x	x	x	x	x	x	x	x									
		(ATTACHING PARTS)																			
-17	116-6R12H	. SCREW (See index 9)	2	x	x	x	x	x	x	x	x	x									
		----*----																			
-18	38234-G2	. FOOT ASSEMBLY	1	x	x	x	x	x	x	x	x	x									
	39237	. BUTTON	1	x	x	x	x	x	x	x	x	x									
		(ATTACHING PARTS)																			
-19	136-6R8H	. SCREW, Thread Cutting, No.6 x 0.500 oval hd	1	x	x	x	x	x	x	x	x	x									
		----*----																			
-20	38213-P1	. SPRING, Elevation	1	x	x	x	x	x	x	x	x	x									
-21	41395-P1	. CORD, Power	1									x	x								
-22	41001-G3	. PROJECTOR ASSEMBLY (See figures 5-11 .	1	x																	
		thru 5-18 for breakdown)																			
	41001-G4	. PROJECTOR ASSEMBLY (See figures 5-11 .	1		x																
		thru 5-18 for breakdown)																			
	41001-G9	. PROJECTOR ASSEMBLY (See figures 5-11 .	1			x															
		thru 5-18 for breakdown)																			
	41001-G10	. PROJECTOR ASSEMBLY (See figures 5-11 .	1				x														
		thru 5-18 for breakdown)																			
	41001-G11	. PROJECTOR ASSEMBLY (See figures 5-11 .	1					x													
		thru 5-18 for breakdown)																			
	41001-G12	. PROJECTOR ASSEMBLY (See figures 5-11 .	1							x											
		thru 5-18 for breakdown)																			
	41400-G1	. PROJECTOR ASSEMBLY (See figures 5-11 .	1										x								
		thru 5-18 for breakdown)																			
	41400-G2	. PROJECTOR ASSEMBLY (See figures 5-11 .	1																	x	
		thru 5-18 for breakdown)																			
	41375-G1	. LAMP SUPPLY UNIT COMPLETE (See . . .	1																	x	
		figure 7-31 for breakdown)																			
	41375-G2	. LAMP SUPPLY UNIT COMPLETE (See . . .	1																		x
		figure 7-31 for breakdown)																			

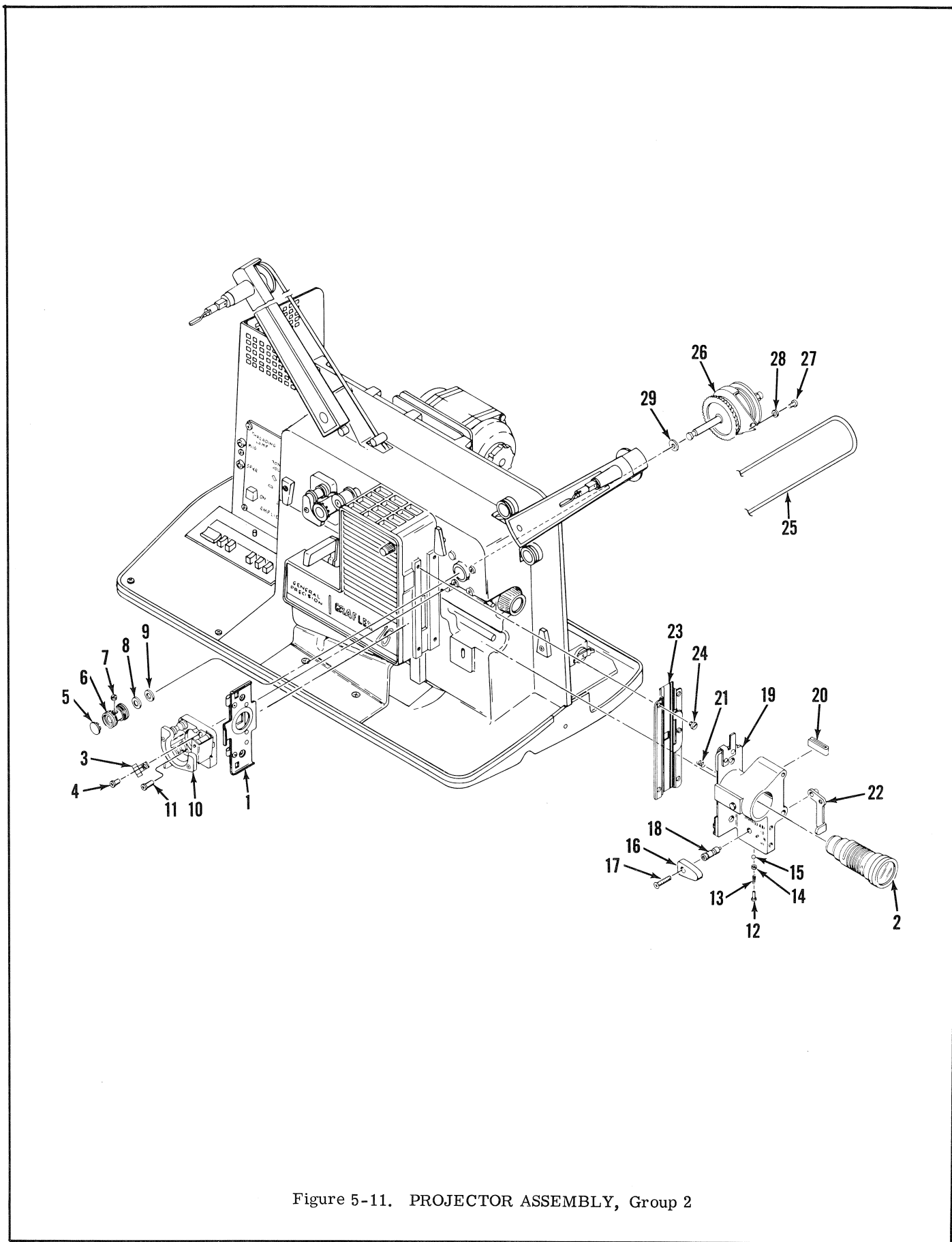


Figure 5-11. PROJECTOR ASSEMBLY, Group 2

GRAFLEX 16 PROJECTOR

Section V
900 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS											
				1	2	3	4	5	920R	920P	921R	921P	922R	922P	940	942
		PROJECTOR ASSEMBLY, Group 2 (Cont.)													
11-	41001-G3	PROJECTOR ASSEMBLY		X											
	41001-G4	PROJECTOR ASSEMBLY			X										
	41001-G9	PROJECTOR ASSEMBLY				X									
	41001-G10	PROJECTOR ASSEMBLY					X								
	41001-G11	PROJECTOR ASSEMBLY						X							
	41001-G12	PROJECTOR ASSEMBLY							X						
	41400-G1	PROJECTOR ASSEMBLY								X					
	41400-G2	PROJECTOR ASSEMBLY									X				
-1	38472-G2	. SHOE COMPLETE, Film Pressure (See figure 7-3 for breakdown)	1	X	X	X	X	X	X	X	X	X	X		
-2	38428-P1	. LENS, Projection	1	X	X	X	X	X	X						
	38427-P1	. LENS, Projection	1									X	X		
-3	38373	. STRIPPER (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-4	123-4R4H	. SCREW, No. 4 x 1/4 truss hd ----*----	1	X	X	X	X	X	X	X	X	X	X		
-5	38841-P2	. BUTTON	1	X	X	X	X	X	X	X	X	X	X		
-6	38261-G1	. SPROCKET ASSEMBLY, Film (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-7	38438	. SETSCREW ----*----	1	X	X	X	X	X	X	X	X	X	X		
-8	35473-30H	. WASHER, Flat, 0.500 x 0.254 x 0.032	1	X	X	X	X	X	X	X	X	X	X		
-9	35473-65	. WASHER, Flat, 0.500 x 0.257 x 0.020	1	X	X	X	X	X	X	X	X	X	X		
-10	38350-G2	. SHOE COMPLETE, Feed Sprocket (See figure 7-4 for breakdown) (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-11	106-4R8H	. SCREW, No. 4-40 x 1/2 oval hd ----*----	3	X	X	X	X	X	X	X	X	X	X		
-12	171-416-4L	. SETSCREW, No. 1/4-20 hex socket	1	X	X	X	X	X	X	X	X	X	X		
-13	39222-P1	. SPRING	1	X	X	X	X	X	X	X	X	X	X		
-14	38473-25	. WASHER, Flat, 0.187 x 0.093 x 0.020	1	X	X	X	X	X	X	X	X	X	X		
-15	300-6	. BALL	1	X	X	X	X	X	X	X	X	X	X		
-16	38212	. LEVER, Control (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-17	104-6R6H	. SCREW, No. 6-32 x 3/8 oval hd ----*----	1	X	X	X	X	X	X	X	X	X	X		
-18	39220-P1	. ECCENTRIC, Gate Lever	1	X	X	X	X	X	X	X	X	X	X		
-19	38071-G2	. HOLDER ASSEMBLY, Lens (See figure 7-5 for breakdown)	1	X	X	X	X	X	X	X	X	X	X		
-20	38075	. SPRING, Lens Holder	1	X	X	X	X	X	X	X	X	X	X		
-21	39238-P1	. SPRING, Lens Holder (Lower)	1	X	X	X	X	X	X	X	X	X	X		
-22	38067-G1	. LEVER ASSEMBLY, Gate	1	X	X	X	X	X	X	X	X	X	X		
-23	38820-G1	. PLATE ASSEMBLY, Aperture (See figure 7-6 for breakdown) (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-24	112-4R3H	. SCREW, No. 4-40 x 3/16 truss hd ----*----	4	X	X	X	X	X	X	X	X	X	X		
-25	39211-P2	. BELT, Supply	1	X	X	X	X	X	X	X	X	X	X		
-26	39151-G1	. CLUTCH ASSEMBLY, Film Feed (See figure 7-7 for breakdown) (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-27	121-6R5H	. SCREW, No. 6 x 5/16 pan hd	1	X	X	X	X	X	X	X	X	X	X		
-28	38473-16A	. WASHER, Flat, 0.375 x 0.156 x 0.050 ----*----	1	X	X	X	X	X	X	X	X	X	X		
-29	35473-48	. WASHER, Flat, 0.500 x 0.254 x 0.050	1	X	X	X	X	X	X	X	X	X	X		

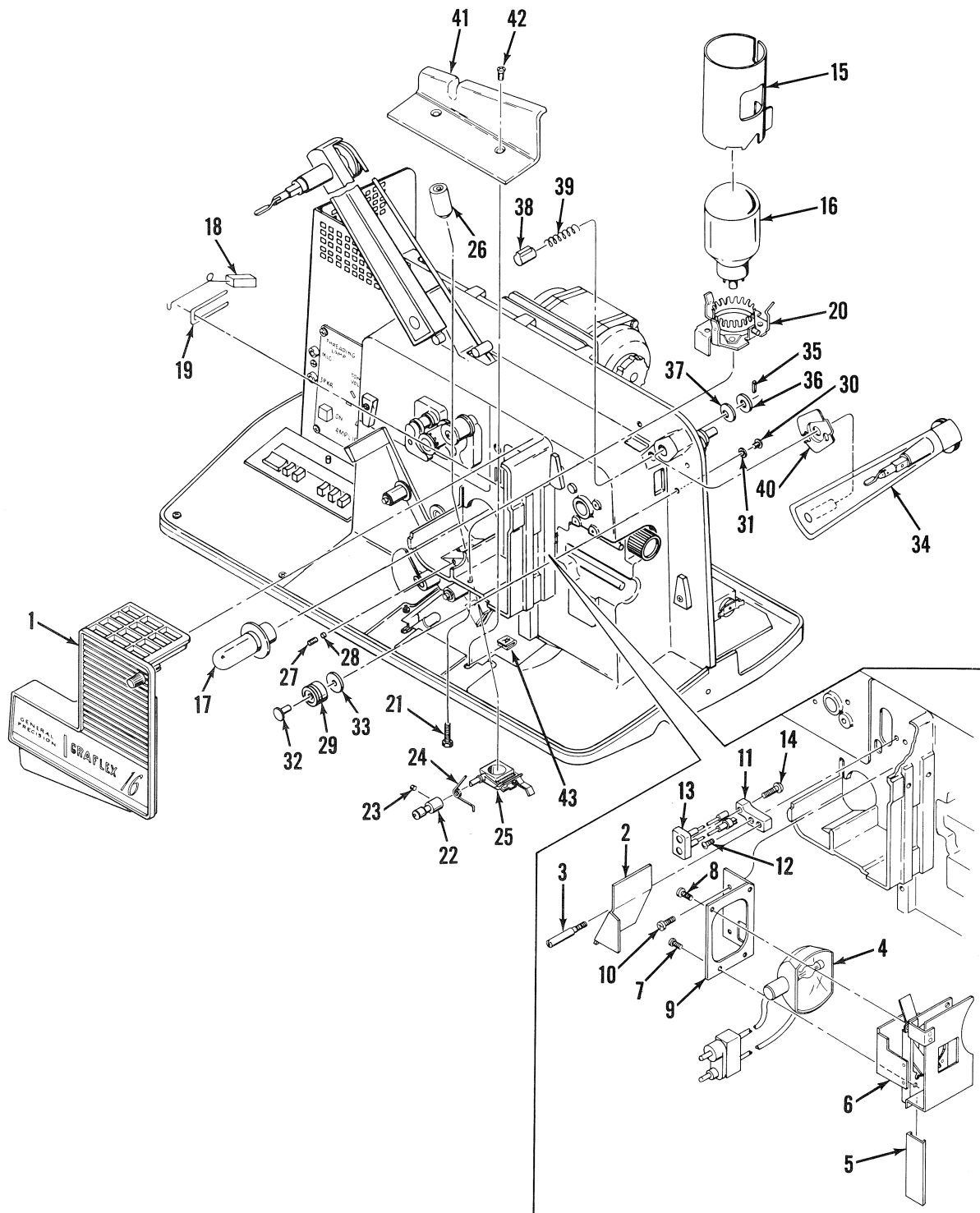


Figure 5-12. PROJECTOR ASSEMBLY, Group 2 (Cont.)

GRAFLEX 16 PROJECTOR

Section V
900 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION 1 2 3 4 5	QTY	MODELS																
				920R	920P	921R	921P	922R	922P	940	942									
12-1	39184-G4	PROJECTOR ASSEMBLY, Group 2 (Cont.) COVER ASSEMBLY, Lamphouse (See figure 7-8 for breakdown)	1	x		x		x												
	39184-G5	COVER ASSEMBLY, Lamphouse (See figure 7-8 for breakdown)	1		x		x		x											
	41368-G1	COVER ASSEMBLY, Lamphouse (See figure 7-8 for breakdown)	1							x	x									
-2	41444-G1	BAFFLE ASSEMBLY (ATTACHING PARTS)	1							x	x									
-3	41447	ROD ----*----	1								x	x								
-4	41358-P1	LAMP, Projection	1								x	x								
-5	41446	CLIP	1								x	x								
-6	41401-G1	BAFFLE ASSEMBLY, Light (ATTACHING PARTS)	1								x	x								
-7	116-4R2H	SCREW, No. 4-40 x 1/8 pan hd	3									x	x							
-8	116-4R3H	SCREW, No. 4-40 x 3/16 pan hd ----*----	1									x	x							
-9	41416-P1	FRAME, Lamp Holder (ATTACHING PARTS)	1									x	x							
-10	116-5R3H	SCREW, No. 5-40 x 3/16 ----*----	3									x	x							
-11	41432	SPACER, Socket (ATTACHING PARTS)	1									x	x							
-12	102-5-7H	SCREW, No. 5-40 x 7/16 rd hd ----*----	1									x	x							
-13	41411-G1	LAMP CONNECTOR ASSEMBLY (ATTACHING PARTS)	1									x	x							
-14	40921-2H	SCREW, Self Threading ----*----	1									x	x							
-15	38182-P2	CHIMNEY	1	x	x	x	x	x	x											
-16	38170-P1	LAMP, Projection	1	x	x	x	x	x	x											
-17	38386-P2	LAMP, Exciter	1	x	x	x	x	x	x	x	x									
-18	39002-G1	PAD ASSEMBLY, Lubricator (ATTACHING PARTS)	1	x	x	x	x	x	x	x	x									
-19	39001	RETAINER, Pad Assembly ----*----	1	x	x	x	x	x	x	x	x									
-20	38230-G2	PLATE COMPLETE, Lamp Socket (ATTACHING PARTS)	1	x	x	x	x	x	x											
-21	39225	SCREW, Cap ----*----	1	x	x	x	x	x	x											
-22	41030-P1	KNOB (ATTACHING PARTS)	1	x		x		x												
-23	171-4-2L	SETSCREW, No. 4-40 x 1/8 hex socket ----*----	1	x		x		x												
-24	41028-P1	SPRING, Yoke	1	x		x		x												
-25	41021-G1	ERASE HEAD AND YOKE ASSEMBLY (See figure 7-9 for breakdown)	1	x		x		x												
-26	38431-P1	CARTRIDGE, Sound Optics (ATTACHING PARTS)	1	x	x	x	x	x	x	x	x									
-27	171-6-4L	SETSCREW, No. 6-32 x 1/4 hex socket	1	x	x	x	x	x	x	x	x									
-28	38162	PLUG ----*----	1	x	x	x	x	x	x	x	x									
-29	39153-P1	GUIDE, Supply Reel Belt (ATTACHING PARTS)	2	x	x	x	x	x	x	x	x									
-30	116-6R6H	SCREW, No. 6-32 x 3/8 pan hd	2	x	x	x	x	x	x	x	x									
-31	221-6	WASHER, Spring, 0.283 x 0.146 x 0.018	2	x	x	x	x	x	x	x	x									
-32	39154	POST, Belt Guide	2	x	x	x	x	x	x	x	x									
-33	38473-23	WASHER, Flat, 0.500 x 0.129 x 0.005 ----*----	2	x	x	x	x	x	x	x	x									

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FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS											
				1	2	3	4	5	920R	920P	921R	921P	922R	922P	940
		PROJECTOR ASSEMBLY, Group 2 (Cont.)													
12-34	39175-G1	. ARM COMPLETE, Supply Reel (See figure 7-10 for breakdown) (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-35	189-5-10	. ROLL PIN	1	X	X	X	X	X	X	X	X	X	X		
-36	38473-19L	. WASHER, Flat, 0.750 x 0.390 x 0.093	1	X	X	X	X	X	X	X	X	X	X		
-37	224-12	. WASHER, Spring, 0.563 x 0.379 x 0.080 ----*----	1	X	X	X	X	X	X	X	X	X	X		
-38	38089-P1	. PLUNGER, Supply Arm	1	X	X	X	X	X	X	X	X	X	X		
-39	38088-P1	. SPRING, Reel Arm Lock	1	X	X	X	X	X	X	X	X	X	X		
-40	39182-P1	. GUARD, Belt Reel Arm	1	X	X	X	X	X	X	X	X	X	X		
-41	38164-P3	. COVER, Sound Head (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-42	125-6R8H	. SCREW, No. 6 x 1/2 oval hd	2	X	X	X	X	X	X	X	X	X	X		
-43	38316	. NUT, Speed ----*----	2	X	X	X	X	X	X	X	X	X	X		

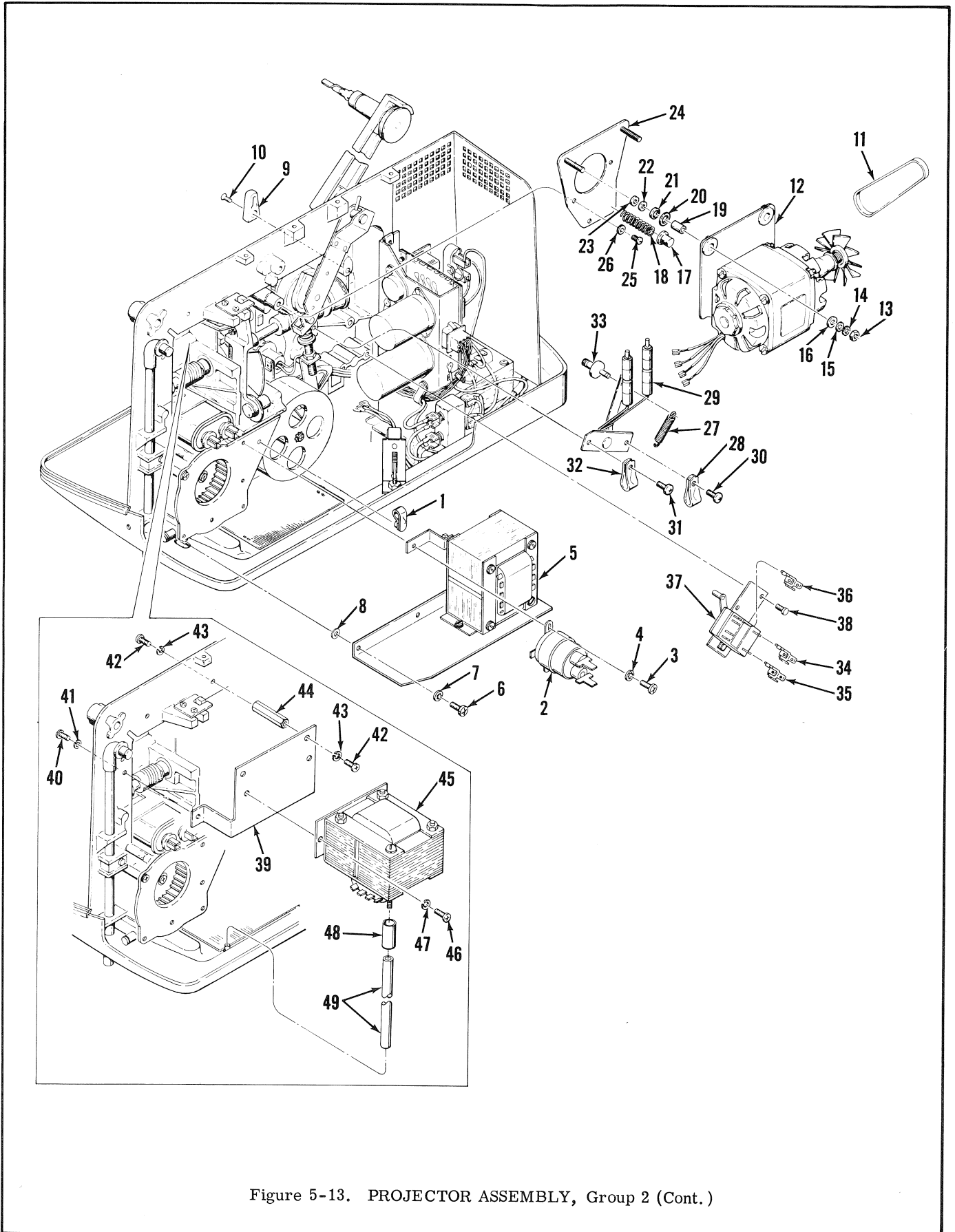


Figure 5-13. PROJECTOR ASSEMBLY, Group 2 (Cont.)

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION 1 2 3 4 5	QTY	MODELS																	
				920R	920P	921R	921P	922R	922P	940	942										
		PROJECTOR ASSEMBLY, Group 2 (Cont.)																			
13-1	39235	. STRAP, Cable	1	x	x	x	x	x	x	x	x	x									
-2	41058-P1	. CAPACITOR (ATTACHING PARTS)	1	x	x	x	x	x	x												
-3	121-8R6H	. SCREW, No. 8 x 3/8 pan hd	1	x	x	x	x	x	x												
-4	221-8A	. WASHER, Lock ---*---	1	x	x	x	x	x	x												
-5	39045-G3	. PLATFORM COMPLETE, Transformer . . . (See figure 7-11 for breakdown) (ATTACHING PARTS)	1			x	x														
-6	140-8R10H	. SCREW, No. 8-32 x 5/8	2			x	x														
-7	221-8A	. WASHER, Lock ---*---	2			x	x														
-8	38473-18	. WASHER, Flat, 0.500 x 0.187 x 0.125 . . .	2			x	x														
-9	38212	. LEVER, Control (ATTACHING PARTS)	1	x	x	x	x	x	x	x	x	x									
-10	104-6R6H	. SCREW, No. 6-32 x 3/8 oval hd ---*---	1	x	x	x	x	x	x	x	x	x									
-11	39086-P1	. BELT, Motor Drive	1	x	x	x	x	x	x	x	x	x									
-12	39114-G4	. DRIVE UNIT ASSEMBLY (See figure 7-12 . . for breakdown)	1	x	x							x									
	39114-G8	. DRIVE UNIT ASSEMBLY (See figure 7-12 . . for breakdown)	1			x	x														
	39114-G7	. DRIVE UNIT ASSEMBLY (See figure 7-12 . . for breakdown) (ATTACHING PARTS)	1					x	x			x									
-13	200-10HA	. NUT, No. 10-24	2	x	x	x	x	x	x	x	x	x									
-14	35473-46A	. WASHER, Flat, 0.500 x 0.200 x 0.032 . . .	2	x	x	x	x	x	x	x	x	x									
-15	39081	. SPACER	2	x	x	x	x	x	x	x	x	x									
-16	30473-73A	. WASHER, Flat, 0.625 x 0.320 x 0.010 . . . ---*---	2	x	x	x	x	x	x	x	x	x									
-17	260-7A	. EYELET	1	x	x	x	x	x	x	x	x	x									
-18	39080-P1	. SPRING	1	x	x							x									
	39498-P1	. SPRING	1			x	x	x	x				x								
-19	32090-48	. SPACER	2	x	x	x	x	x	x	x	x	x									
-20	30473-73A	. WASHER, Flat (See index 16)	2	x	x	x	x	x	x	x	x	x									
-21	39081	. SPACER	2	x	x	x	x	x	x	x	x	x									
-22	35473-63A	. †WASHER, Flat, 0.500 x 0.196 x 0.062 . . .	3	x	x	x	x	x	x	x	x	x									
-23	35473-62L	. WASHER, Flat, 0.500 x 0.196 x 0.032 . . .	1	x	x	x	x	x	x	x	x	x									
-24	39073-G1	. PLATE ASSEMBLY, Motor Mounting (ATTACHING PARTS)	1	x	x	x	x	x	x	x	x	x									
-25	116-10R7H	. SCREW, No. 10-24 x 7/16 pan hd	3	x	x	x	x	x	x	x	x	x									
-26	221-10	. WASHER, Lock ---*---	3	x	x	x	x	x	x	x	x	x									
-27	39095-P1	. SPRING, Belt Shift	1	x	x	x	x	x	x	x	x	x									
-28	267-7	. CLAMP	1	x	x	x	x	x	x												
-29	39112-G1	. FORK ASSEMBLY, Drive Belt Shift (See figure 7-13 for breakdown) (ATTACHING PARTS)	1	x	x	x	x	x	x	x	x	x									
-30	140-10R6A	. SCREW, No. 10-24 x 3/8 pan hd	1	x	x	x	x	x	x	x	x	x									
-31	140-10R9H	. SCREW, No. 10-24 x 9/16 pan hd ---*---	1	x	x	x	x	x	x	x	x	x									
-32	267-7	. CLAMP	1	x	x	x	x	x	x	x	x	x									
-33	39093-P1	. ECCENTRIC, Belt Shift	1	x	x	x	x	x	x	x	x	x									
-34	38412	. ADAPTER	1	x	x	x	x	x	x	x	x	x									
-35	38412	. ADAPTER	1	x	x	x	x	x	x												
	41393-P1	. ADAPTER	1										x	x							
-36	38412	. ADAPTER	1										x	x							

GRAFLEX 16 PROJECTOR

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900 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS											
				1	2	3	4	5	920R	920P	921R	921P	922R	922P	940	942
		PROJECTOR ASSEMBLY, Group 2 (Cont.)													
13-37	38271-G2	. SWITCH ASSEMBLY, Reverse	1												
	41036-G1	. SWITCH ASSEMBLY, Reverse (ATTACHING PARTS)	1	X	X	X	X	X	X				X	X	
-38	121-6R5H	. SCREW, No. 8 x 5/16 pan hd ----*----	2	X	X	X	X	X	X	X	X				
-39	41081-G1	. BRACKET ASSEMBLY, Transformer (ATTACHING PARTS)	1				X	X							
-40	116-10R-6L	. SCREW, No. 10 x 3/8 pan hd	1				X	X							
-41	221-10L	. WASHER, Lock	1				X	X							
-42	116-10R6L	. SCREW (See index 40)	4				X	X							
-43	221-10L	. WASHER, Lock	4				X	X							
-44	41083	. STANDOFF ----*----	2				X	X							
-45	39210-P2	. TRANSFORMER (ATTACHING PARTS)	1				X	X							
-46	116-8R6H	. SCREW, No. 8-32 x 3/8 pan hd	2				X	X							
-47	221-8H	. WASHER, Lock ----*----	2				X	X							
-48	40637-P1	. TUBING	1				X	X							
-49	41084-P1	. SUPPORT	1				X	X							
		† Note: One used on post as shown, two used on opposite post.													

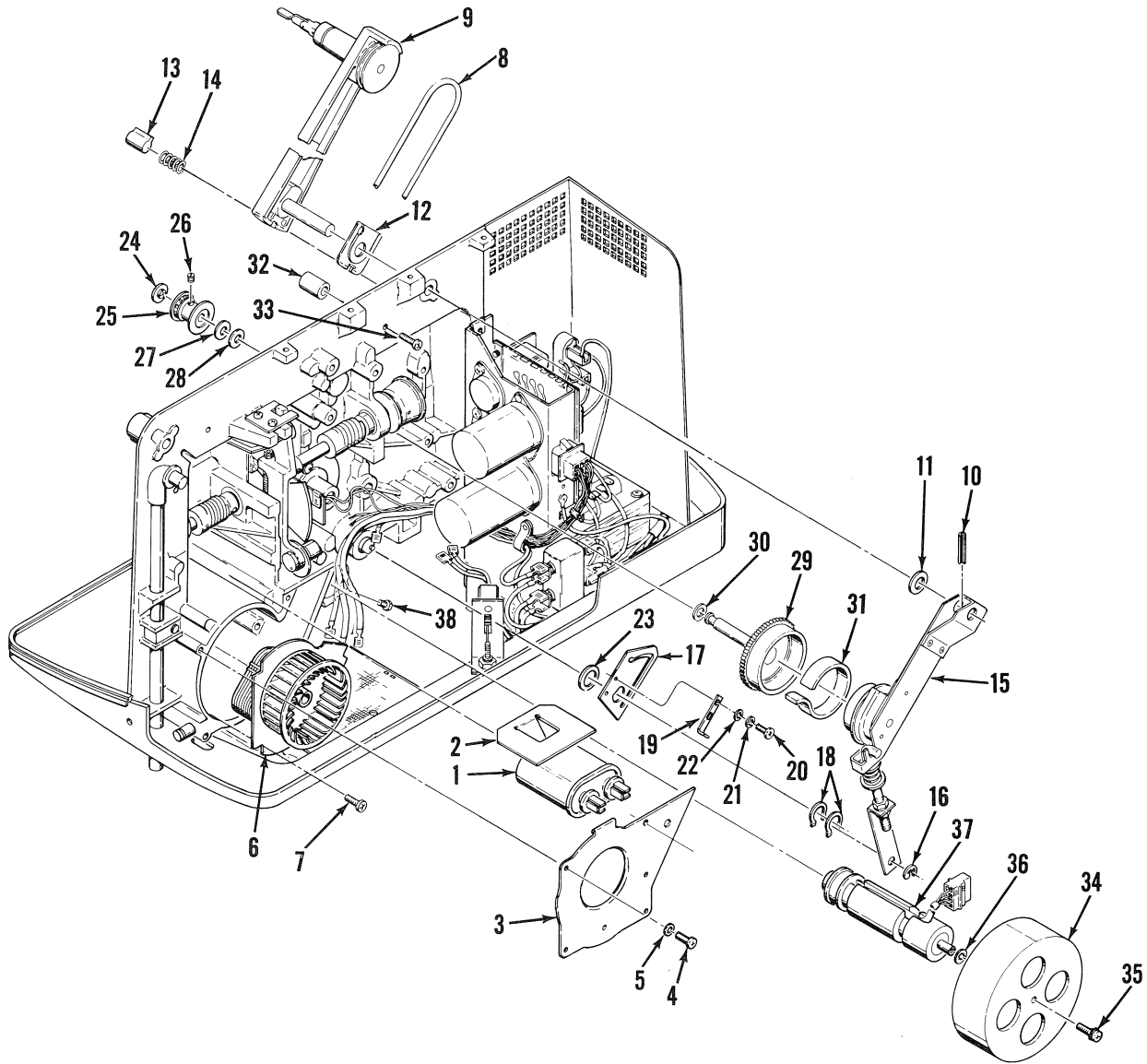


Figure 5-14. PROJECTOR ASSEMBLY, Group 2 (Cont.)

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS													
				1	2	3	4	5	920R	920P	921R	921P	922R	922P	940	942	
		PROJECTOR ASSEMBLY, Group 2 (Cont.)															
14-1	38177-P5	. CAPACITOR, Motor	1														
	38177-P6	. CAPACITOR, Motor	1														
	38177-P7	. CAPACITOR, Motor	1														
-2	38452-P1	. SPRING, Capacitor	1														
-3	38172-P1	. PLATE, Venturi (ATTACHING PARTS)	1														
-4	121-8R8H	. SCREW, No. 8 x 1/2 pan hd	4														
	121-8R8H	. SCREW, No. 8 x 1/2 pan hd	3														
	121-8R8H	. SCREW, No. 8 x 1/2 pan hd	1														
-5	221-8A	. WASHER, Lock	4														
	221-8A	. WASHER, Lock	3														
	221-8A	. WASHER, Lock	1														
	----	*----															

GRAFLEX 16 PROJECTOR

Section V
900 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS											
				1	2	3	4	5	920R	920P	921R	921P	922R	922P	940	942
		PROJECTOR ASSEMBLY, Group 2 (Cont.)													
14-6	38167-G1	. PLATE ASSEMBLY, Motor Mounting (See figure 7-15 for breakdown)	1										x		
	38167-G3	. PLATE ASSEMBLY, Motor Mounting (See figure 7-15 for breakdown)	1											x	
	41042-G1	. PLATE ASSEMBLY, Motor Mounting (See figure 7-15 for breakdown) (ATTACHING PARTS)	1	x	x	x	x	x	x	x					
-7	121-8R6H	. SCREW, No. 8 x 3/8 pan hd ----*----	3	x	x	x	x	x	x	x	x	x			
-8	39211-P1	. BELT, Takeup	1	x	x	x	x	x	x	x	x	x			
-9	39175-G2	. ARM COMPLETE, Takeup Reel (See figure 7-10 for breakdown) (ATTACHING PARTS)	1	x	x	x	x	x	x	x	x	x			
-10	189-5-10	. ROLL PIN ----*----	1	x	x	x	x	x	x	x	x				
-11	35473-35H	. WASHER, Flat, 0.750 x 0.390 x 0.032	1	x	x	x	x	x	x	x	x	x			
-12	39182-P1	. GUARD, Belt Reel Arm	1	x	x	x	x	x	x	x	x				
-13	38089-P3	. PLUNGER, Takeup Arm	1	x	x	x	x	x	x	x	x				
-14	38088-P1	. SPRING, Reel Arm Lock	1	x	x	x	x	x	x	x	x				
-15	39155-G1	. ARM COMPLETE, Takeup Clutch (See figure 7-16 for breakdown) (ATTACHING PARTS)	1	x	x	x	x	x	x	x	x				
-16	251-14	. RING, Retaining ----*----	1	x	x	x	x	x	x	x	x				
-17	39167-P1	. CAM, Reverse Switch	1										x	x	
	39167-P2	. CAM, Reverse Switch (ATTACHING PARTS)	1	x	x	x	x	x	x						
-18	252-6	. RING, Retaining ----*----	2	x	x	x	x	x	x	x	x				
-19	41035	. ACTUATOR, Switch (ATTACHING PARTS)	1	x	x	x	x	x	x						
-20	116-2R2H	. SCREW, No. 2-56 x 1/8 pan hd	2	x	x	x	x	x	x						
-21	221-2H	. WASHER, Lock	2	x	x	x	x	x	x						
-22	30473-67H	. WASHER, Flat, 0.203 x 0.096 x 0.032 ----*----	2	x	x	x	x	x	x						
-23	38278-P2	. SPACER	1	x	x	x	x	x	x						
-24	38841-P2	. BUTTON	1	x	x	x	x	x	x	x	x				
-25	38261-G2	. SPROCKET ASSEMBLY, Film (ATTACHING PARTS)	1	x	x	x	x	x	x	x	x				
-26	38438	. SETSCREW, No. 10-32 x 3/16 cup pt ----*----	1	x	x	x	x	x	x	x	x				
-27	35473-30H	. WASHER, Flat, 0.500 x 0.254 x 0.032	1	x	x	x	x	x	x	x	x				
-28	35473-65	. WASHER, Flat, 0.500 x 0.252 x 0.020	1	x	x	x	x	x	x	x	x				
-29	39169-G1	. GEAR ASSEMBLY, Takeup Sprocket	1	x	x	x	x	x	x	x					
-30	35473-48	. WASHER, Flat, 0.500 x 0.254 x 0.005	1	x	x	x	x	x	x	x					
-31	39203	. LINER	1	x	x	x	x	x	x	x					
-32	38464	. POST (ATTACHING PARTS)	1	x	x	x	x	x	x	x					
-33	131-6R8A	. SCREW, No. 6 x 1/2 pan hd ----*----	1	x	x	x	x	x	x	x	x				
-34	38159-P1	. FLYWHEEL (ATTACHING PARTS)	1	x	x	x	x	x	x	x	x				
-35	38160-P2	. SCREW ----*----	1	x	x	x	x	x	x	x	x				
-36	221-416	. WASHER, Lock	1	x	x	x	x	x	x	x	x				
-37	38374-G2	. SUPPORT COMPLETE, Sound Drum	1	x	x	x	x	x	x						
	38374-G3	. SUPPORT COMPLETE, Sound Drum (ATTACHING PARTS)	1									x	x		
-38	38283	. SCREW, Special ----*----	2	x	x	x	x	x	x	x	x				

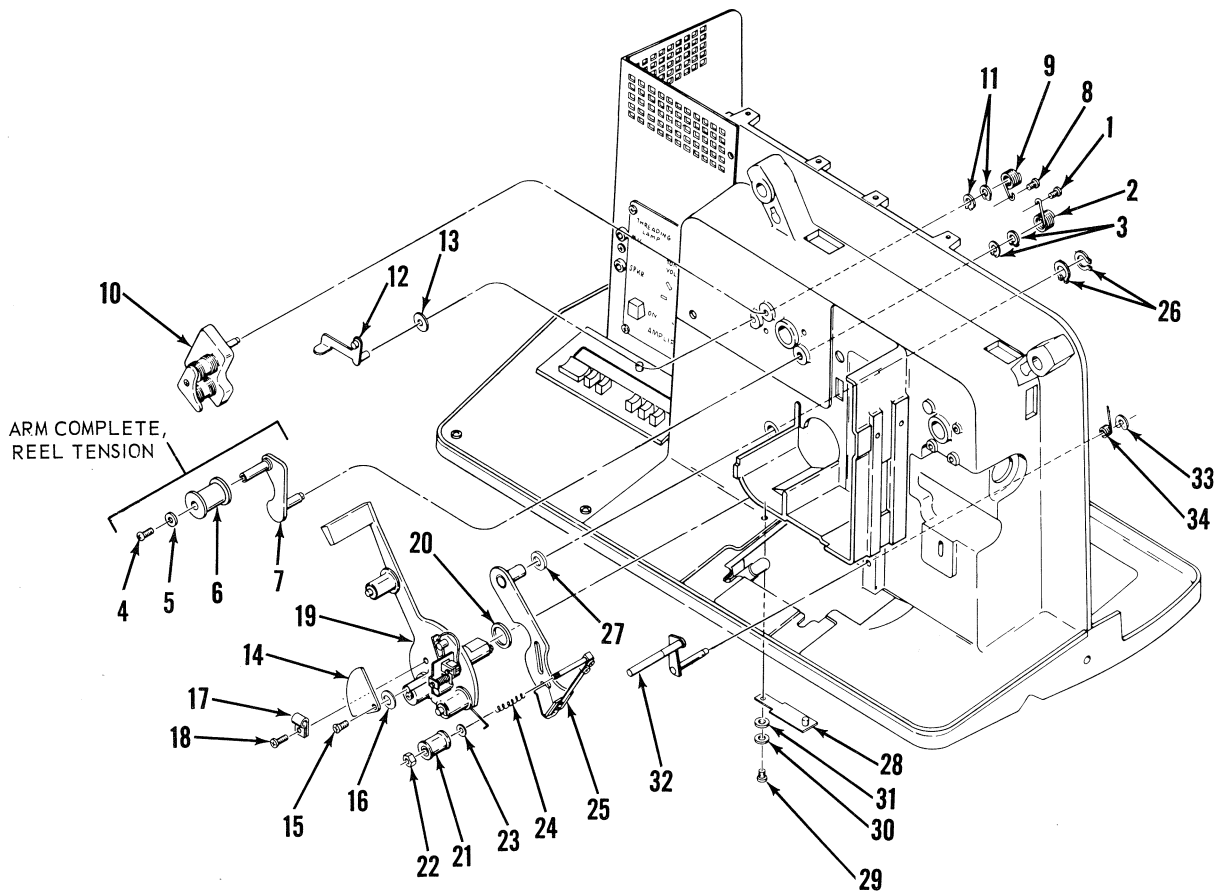


Figure 5-15. PROJECTOR ASSEMBLY, Group 2 (Cont.)

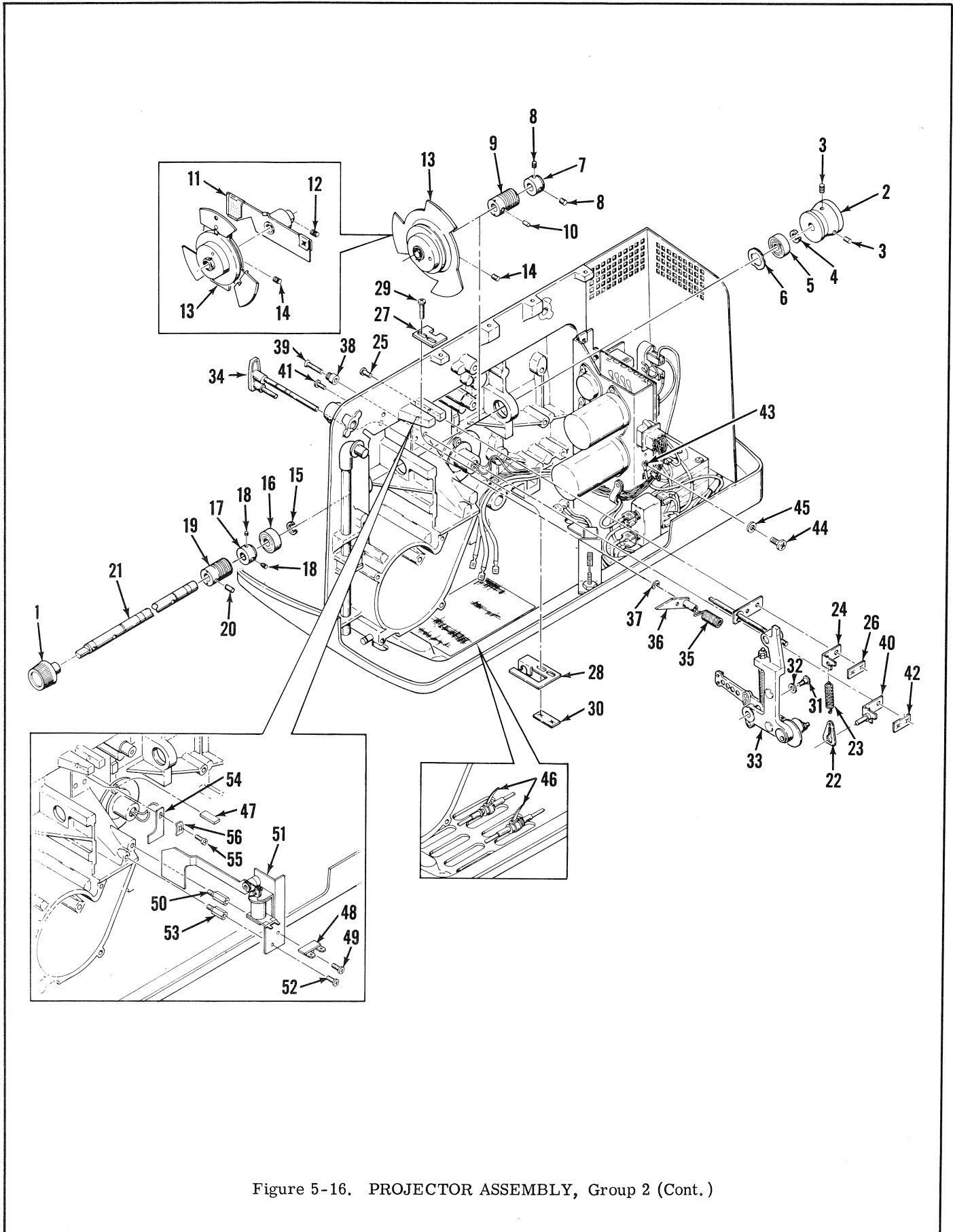


Figure 5-16. PROJECTOR ASSEMBLY, Group 2 (Cont.)

GRAFLEX 16 PROJECTOR

Section V
900 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS											
				1	2	3	4	5	920R	920P	921R	921P	922R	922P	940	942
		PROJECTOR ASSEMBLY, Group 2 (Cont.)													
16-1	38184-P1	. KNOB, Inching	1	X	X	X	X	X	X	X	X	X	X		
-2	39101-P1	. PULLEY, Main Shaft	1	X	X								X		
	39236-P2	. PULLEY, Main Shaft (ATTACHING PARTS)	1			X	X	X	X				X		
-3	171H6-4L	. SETSCREW, No. 6-32 x 1/4 hex socket ---*---	2	X	X	X	X	X	X	X	X	X	X		
-4	253-4	. RING, Retaining	1	X	X	X	X	X	X	X	X	X	X		
-5	38007	. BEARING	1	X	X	X	X	X	X	X	X	X	X		
-6	38492	. WASHER, Spring	1	X	X	X	X	X	X	X	X	X	X		
-7	38471	. COLLAR (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-8	171F6-3L	. SETSCREW, No. 6-32 x 3/16 ---*---	2	X	X	X	X	X	X	X	X	X	X		
-9	38806-P1	. GEAR, Drive (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-10	191S6-10	. PIN, Spirol ---*---	1	X	X	X	X	X	X	X	X	X	X		
-11	38456-G1	. SHUTTER ASSEMBLY, Safety (ATTACHING PARTS)	1	X	X	X	X	X	X						
-12	171-4-2L	. SETSCREW, No. 4-40 x 1/8 hex socket ---*---	1	X	X	X	X	X	X						
-13	38011-G2	. SHUTTER AND CAM ASSEMBLY (See figure 7-20 for breakdown)	1	X	X	X	X	X	X						
	38321-G4	. SHUTTER AND CAM ASSEMBLY (See figure 7-21 for breakdown) (ATTACHING PARTS)	1									X	X		
-14	171A6-3L	. SETSCREW (See index 8) ---*---	1	X	X	X	X	X	X	X	X	X	X		
-15	253-4	. RING, Retaining	1	X	X	X	X	X	X	X	X	X	X		
-16	38007	. BEARING	1	X	X	X	X	X	X	X	X	X	X		
-17	38471	. COLLAR (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-18	171F6-3L	. SETSCREW (See index 8) ---*---	2	X	X	X	X	X	X	X	X	X	X		
-19	38806-P1	. GEAR, Drive (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-20	191S6-10	. PIN, Spirol ---*---	1	X	X	X	X	X	X	X	X	X	X		
-21	38010-P2	. SHAFT, Drive	1	X	X	X	X	X	X	X	X	X	X		
-22	38194	. LINK	1	X	X	X	X	X	X						
-23	38192-P2	. SPRING	1	X	X	X	X	X	X						
-24	38325	. BRACKET (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-25	121-4R8H	. SCREW, No. 4 x 1/2 pan hd	2	X	X	X	X	X	X	X	X	X	X		
-26	39247-P2	. NUT, Speed ---*---	1	X	X	X	X	X	X	X	X	X	X		
-27	38233	. PLATE, Limit	1	X	X	X	X	X	X	X	X	X	X		
-28	39152-P1	. STOP, Rewind Lever (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-29	121-6R12H	. SCREW, No. 6 x 3/4 pan hd	2	X	X	X	X	X	X	X	X	X	X		
-30	38238	. NUT, Speed ---*---	1	X	X	X	X	X	X	X	X	X	X		
-31	38063	. PIVOT, Framing Arm	1	X	X	X	X	X	X	X	X	X	X		
-32	226-1	. WASHER, Spring	1	X	X	X	X	X	X	X	X	X	X		
-33	38040-G1	. ARM COMPLETE, Claw (See figure 7-23 for breakdown)	1	X	X	X	X	X	X	X	X	X	X		
-34	39142-G1	. KNOB ASSEMBLY, Rewind (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-35	39149-P1	. SPRING, Rewind Lever	1	X	X	X	X	X	X	X	X	X	X		
-36	39145-G1	. LEVER ASSEMBLY, Rewind	1	X	X	X	X	X	X	X	X	X	X		
-37	251-10	. RING, Retaining ---*---	1	X	X	X	X	X	X	X	X	X	X		

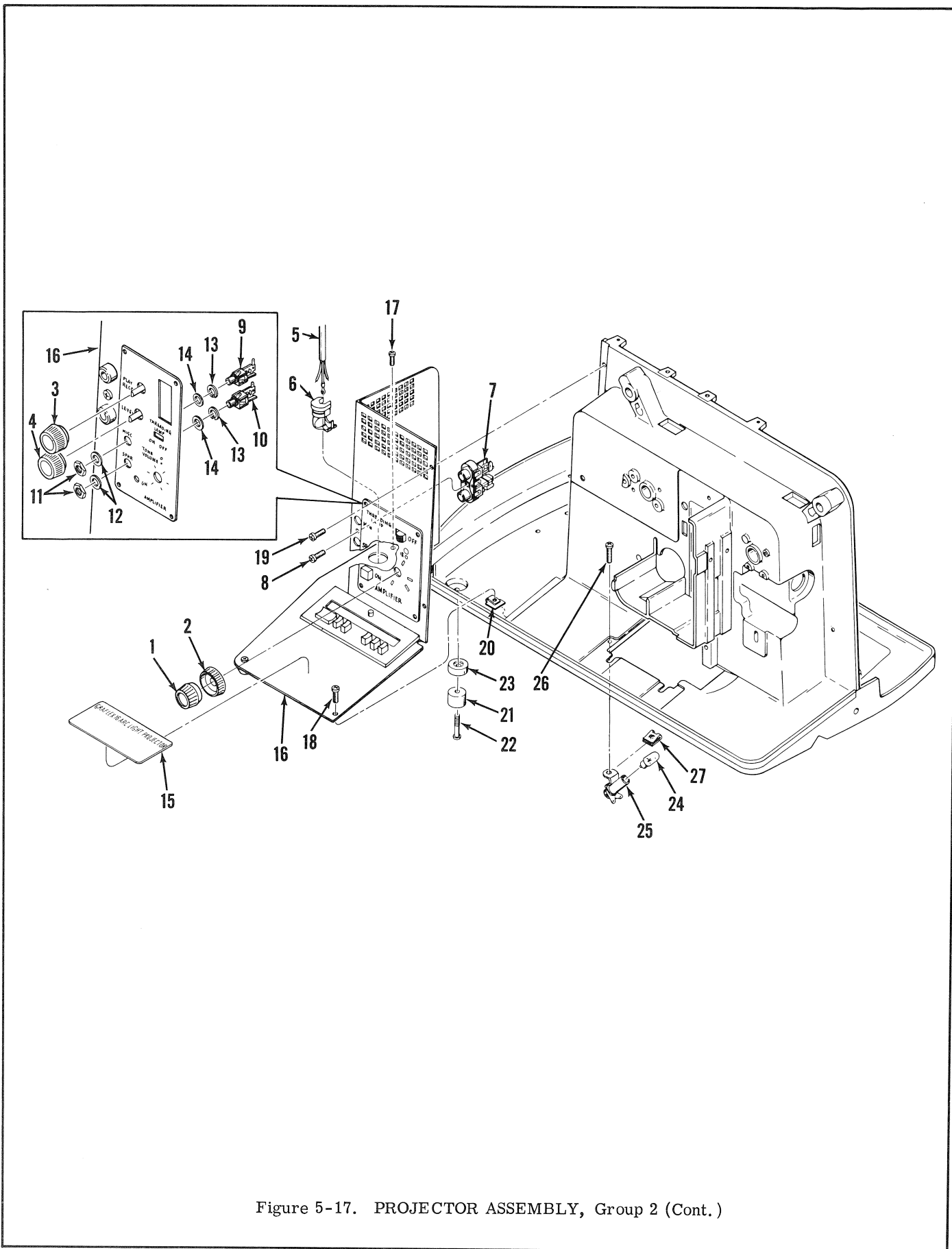


Figure 5-17. PROJECTOR ASSEMBLY, Group 2 (Cont.)

GRAFLEX 16 PROJECTOR

Section V
900 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS											
				1	2	3	4	5	920R	920P	921R	921P	922R	922P	940	942
		PROJECTOR ASSEMBLY, Group 2 (Cont.)													
17-1	39309-P1	. KNOB, Volume	1	X	X	X	X	X	X	X	X	X	X		
-2	39310-P1	. KNOB, Tone	1	X	X	X	X	X	X	X	X	X	X		
-3	39309-P2	. KNOB, Record-Play	1	X		X		X							
-4	39309-P3	. KNOB, Level Control	1	X		X		X							
-5	39224-G2	. CORD ASSEMBLY, Power	1	X	X	X	X	X	X						
	41396-G1	. CABLE ASSEMBLY	1										X	X	
-6	241-3	. BUSHING, Strain Relief	1	X	X	X	X	X	X						
	241-5	. BUSHING, Strain Relief	1										X	X	
-7	39308-P1	. JACK (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-8	116-6R6H	. SCREW, No. 6-32 x 3/8 pan hd ---*---	1		X		X		X	X	X				
-9	41031-P7	. JACK	1	X		X		X							
-10	41031-P2	. JACK (ATTACHING PARTS)	1	X		X		X							
-11	41031-P5	. NUT	2	X		X		X							
-12	41031-P4	. WASHER, Flat	2	X		X		X							
-13	41031-P3	. WASHER, Lock	2	X		X		X							
-14	41031-P4	. WASHER, Flat ---*---	2	X		X		X							
-15	41398-P1	. LABEL, Instruction	1										X	X	
-16	41045-G2	. COVER ASSEMBLY, Amplifier (See figure 7-22 for breakdown)	1	X											
	41045-G4	. COVER ASSEMBLY, Amplifier (See figure 7-22 for breakdown)	1		X										
	41045-G7	. COVER ASSEMBLY, Amplifier (See figure 7-22 for breakdown)	1			X		X							
	41045-G9	. COVER ASSEMBLY, Amplifier (See figure 7-22 for breakdown)	1				X		X						
	39313-G5	. COVER ASSEMBLY, Amplifier (See figure 7-22 for breakdown) (ATTACHING PARTS)	1										X	X	
-17	116-6R4H	. SCREW, No. 6-32 x 1/4 pan hd	1	X	X	X	X	X	X	X	X	X	X		
-18	121-6R8H	. SCREW, No. 6-32 x 1/2 pan hd	1	X	X	X	X	X	X	X	X	X	X		
-19	121-6R5H	. SCREW, No. 6-32 x 5/16 pan hd	2	X	X	X	X	X	X	X	X	X	X		
-20	38245	. NUT, Speed ---*---	1	X	X	X	X	X	X	X	X	X	X		
-21	39243	. FOOT (ATTACHING PARTS)	4	X	X	X	X	X	X	X	X	X	X		
-22	116-6R10H	. SCREW, No. 6-32 x 5/8 pan hd	4	X	X	X	X	X	X						
	116-6R14H	. SCREW, No. 6-32 x 7/8 pan hd	4										X	X	
-23	41448	. SPACER ---*---	4										X	X	
-24	39311-P1	. LAMP, Threading	1	X	X			X	X	X	X				
	39311-P2	. LAMP, Threading	1			X	X								
-25	39302-G1	. SOCKET ASSEMBLY, Threading Lamp (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X	X		
-26	121-6R8H	. SCREW, No. 6 x 1/2 pan hd	1	X	X	X	X	X	X	X	X	X	X		
-27	38248	. NUT, Speed ---*---	1	X	X	X	X	X	X	X	X	X	X		

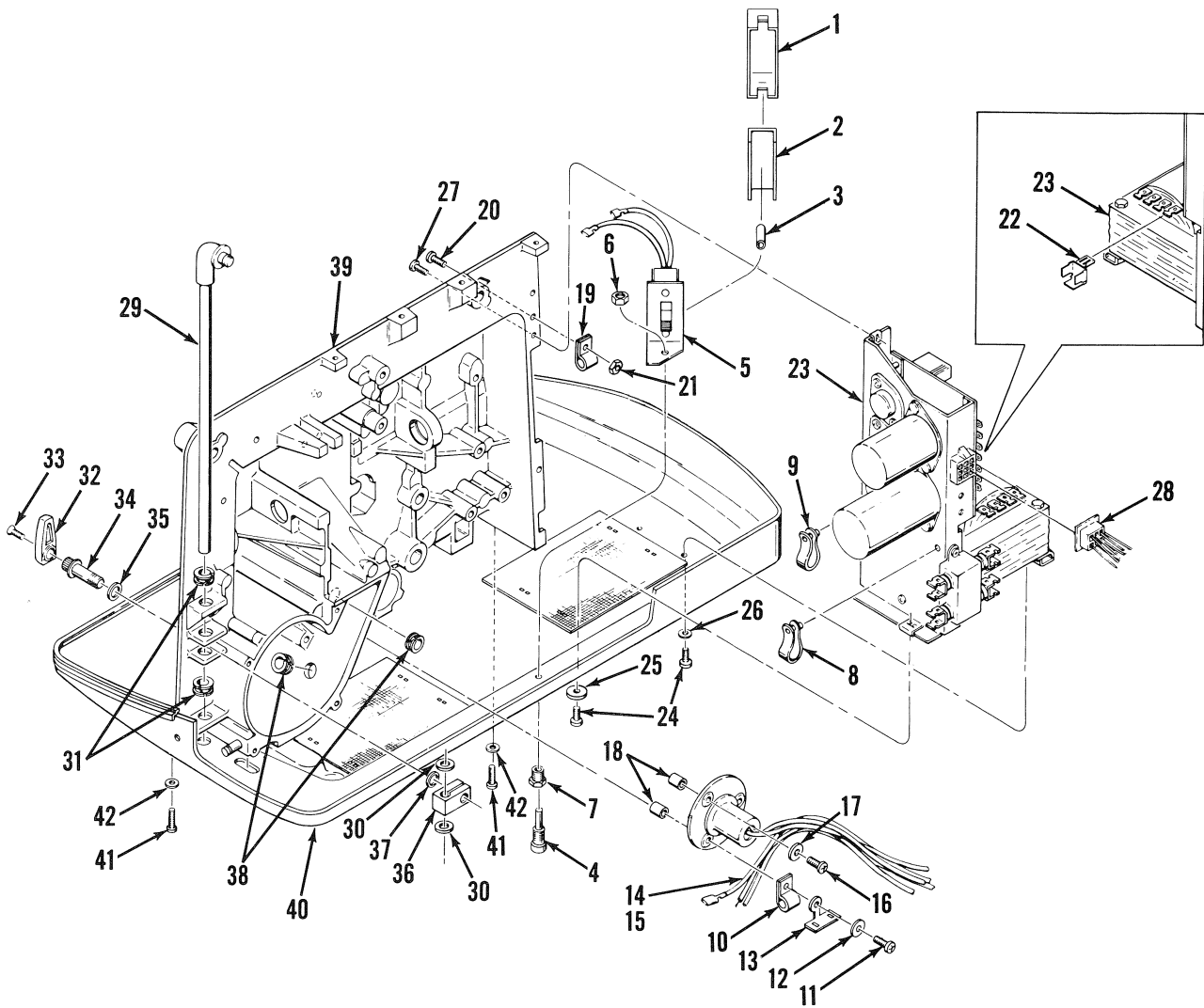


Figure 5-18. PROJECTOR ASSEMBLY, Group 2 (Cont.)

GRAFLEX 16 PROJECTOR

Section V
900 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS											
				1	2	3	4	5	920R	920P	921R	921P	922R	922P	940	942
		PROJECTOR ASSEMBLY, Group 2 (Cont.)													
18-1	39248-P3	. SHIELD, Interlock Switch	1												
-2	39248-P4	. LINER, Interlock Switch	1												
-3	37238-P24	. TUBING	4												
-4	39216	. SCREW, Interlock Switch	1												
-5	39249-G1	. SWITCH ASSEMBLY, Interlock (ATTACHING PARTS)	1												
-6	30553-1	. NUT, Special	1												
-7	39187	. GUIDE	1												
		---*---	1												
-8	39235	. STRAP, Cable	1												
-9	39341	. STRAP, Cable	1												
-10	267-2	. CLAMP, Cable (ATTACHING PARTS)	1												
-11	121-4R8H	. SCREW, No. 4 x 1/2 pan hd	1												
-12	35473-39	. WASHER, Flat, 0.375 x 0.128 x 0.032	1												
-13	413-1	. STRIP, Terminal	1												
		---*---													
-14	39303-G1	. HARNESS ASSEMBLY, Secondary	1												
	39303-G3	. HARNESS ASSEMBLY, Secondary	1												
-15	39471-G4	. HARNESS ASSEMBLY, Main	1												
	41350-G1	. HARNESS ASSEMBLY, Main	1												
	39471-G3	. HARNESS ASSEMBLY, Main	1												
	39471-G2	. HARNESS ASSEMBLY, Main	1												
	38363-G3	. SOCKET COMPLETE, Exciter	1												
	38363-G4	. SOCKET COMPLETE, Exciter	1												
-16	121-4R8H	. SCREW (See index 11)	3												
	121-4R8H	. SCREW (See index 11)	2												
-17	35473-39	. WASHER, Flat (See index 12)	3												
	35473-39	. WASHER, Flat (See index 12)	2												
-18	32090-23	. SPACER	3												
		---*---													
-19	267-6	. CLAMP, Cable (ATTACHING PARTS)	1												
-20	100-6-8H	. SCREW, No. 6-32 x 1/2 flt hd	1												
-21	200-6HH	. NUT, No. 6-32	1												
		---*---													
-22	39343	. ADAPTER	1												
-23	39312-G4	. AMPLIFIER COMPLETE (See figure 7-25 for breakdown)	1												
	41075-G1	. AMPLIFIER COMPLETE (See figure 7-25 for breakdown)	1												
	41075-G2	. AMPLIFIER COMPLETE (See figure 7-25 for breakdown) (ATTACHING PARTS)	1												
-24	121-8R8H	. SCREW, No. 8 x 1/2 pan hd	3												
-25	33500-18	. WASHER, Flat, 0.625 x 0.178 x 0.064	1												
-26	35473-51H	. WASHER, Flat, 0.375 x 0.191 x 0.031	2												
-27	124-6R6H	. SCREW, No. 6 x 3/8 flt hd	2												
		---*---													
-28	38301-P2	. CAP	1												
-29	38207-G1	. ROD ASSEMBLY, Elevation	1												
-30	30473-34	. WASHER, Flat, 0.531 x 0.355 x 0.031	2												
-31	38206-1	. BEARING	2												
-32	38212	. LEVER, Control (ATTACHING PARTS)	1												
-33	104-6R6H	. SCREW, No. 6-32 x 3/8 oval hd	1												
		---*---													
-34	38211	. STUD, Elevating Clamp	1												
-35	35473-22P	. WASHER, Flat, 0.375 x 0.251 x 0.005	1												

SECTION VI

800 SERIES PROJECTOR PARTS LIST

A. INTRODUCTION

This section contains an illustrated parts list for the eight basic models of the 800 Series Graflex 16 Projector as follows:

800	816	820	822
815	817	821	823

These models are illustrated in Figures 6-1 through 6-9.

B. MODIFICATIONS

Special modifications to 800 Series Models are not shown in this section. For modifications, refer to Section VIII.

GRAFLEX 16 PROJECTOR

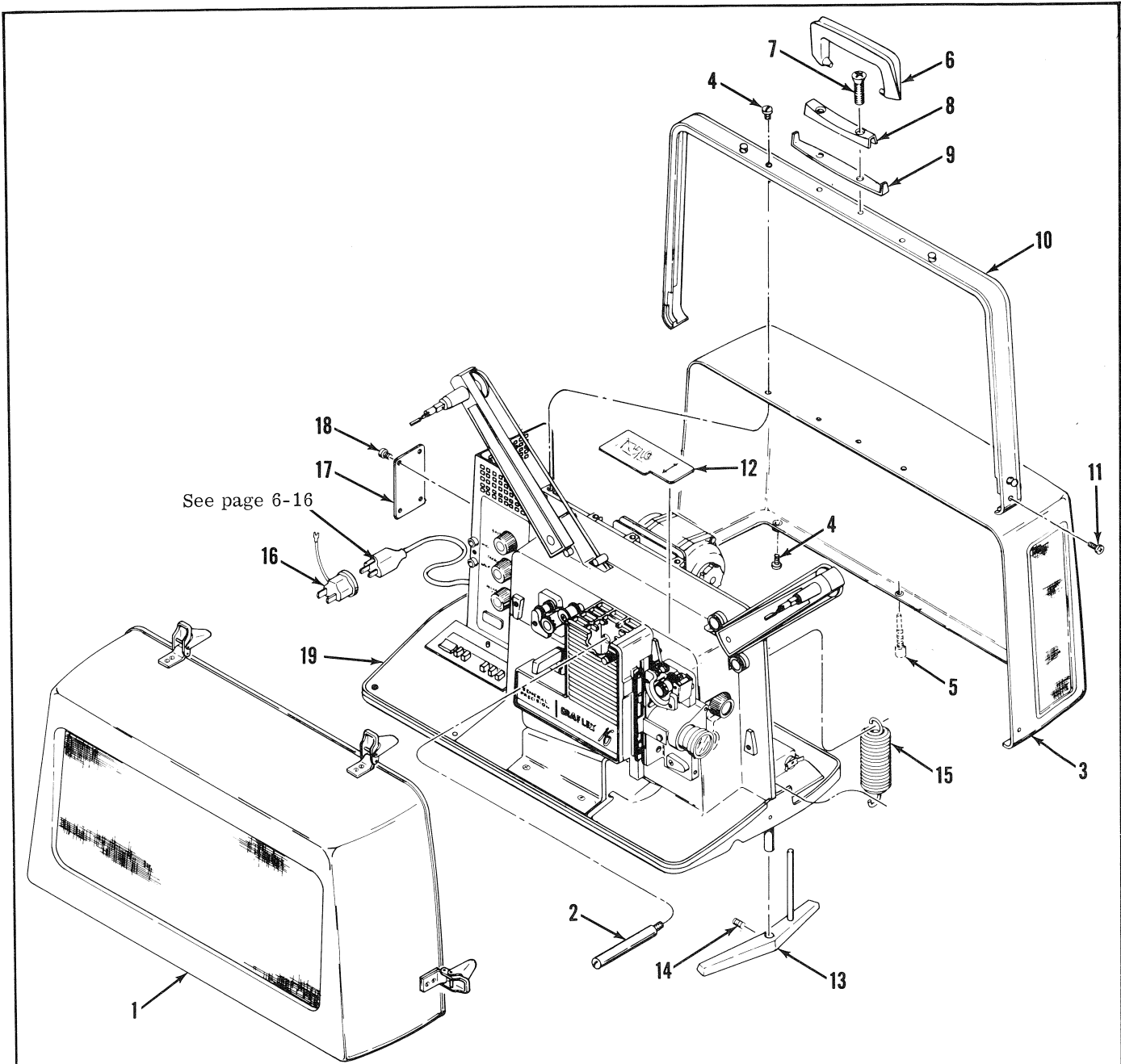


Figure 6-1. COMPLETE PROJECTOR

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS														
				1	2	3	4	5	800	815	816	817	820	821	822	823		
1-	39100-G1	PROJECTOR, Complete (117 V, 60 cycle) . .																
	39100-G2	PROJECTOR, Complete (117 V, 60 cycle) . .																
	39100-G3	PROJECTOR, Complete (117 V, 60 cycle) . .																
	39100-G4	PROJECTOR, Complete (230 V, 50 cycle) . .																
	39100-G5	PROJECTOR, Complete (230 V, 50 cycle) . .																
	39100-G6	PROJECTOR, Complete (117 V, 50 cycle) . .																
	39100-G7	PROJECTOR, Complete (117 V, 50 cycle) . .																
	39489-G1	PROJECTOR, Complete (245 V, 50 cycle) . .																

GRAFLEX 16 PROJECTOR

Section VI
800 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS											
				1	2	3	4	5	800	815	816	817	820	821	822	823
		COMPLETE PROJECTOR (Cont.)													
1-1	39047-G1	. COVER ASSEMBLY, Front (See Figure . . . 7-1 for breakdown)	1							x	x	x	x		
	39047-G2	. COVER ASSEMBLY, Front (See Figure . . . 7-1 for breakdown)	1			x	x	x							
	39047-G3	. COVER ASSEMBLY, Front (See Figure . . . 7-1 for breakdown)	1		x										
-2	39085-G1	. SCREW ASSEMBLY, Shipping	1	x	x	x	x	x	x	x	x	x	x		
-3	39116-G1	. COVER ASSEMBLY, Rear (See figure 7-2 for breakdown)	1		x	x	x	x	x	x	x	x			
	39116-G2	. COVER ASSEMBLY, Rear (See figure 7-2 for breakdown) (ATTACHING PARTS)	1	x											
-4	116-6R12H	. SCREW, No. 6-32 x 3/4 pan hd	4	x	x	x	x	x	x	x	x	x	x		
-5		. SCREW, Interlock (Part of index 19) ---*---	REF	x	x	x	x	x	x	x	x	x			
-6	39039-P1	. HANDLE (ATTACHING PARTS)	1	x	x	x	x	x	x	x	x	x			
-7	104-8R16H	. SCREW, No. 8-32 x 1 oval hd ---*---	2	x	x	x	x	x	x	x	x	x			
-8	39034-P1	. HOUSING, Handle	1	x	x	x	x	x	x	x	x	x			
-9	39011	. RETAINER	1	x	x	x	x	x	x	x	x	x			
-10	39058-G1	. FRAME ASSEMBLY, Rear Cover (ATTACHING PARTS)	1	x	x	x	x	x	x	x	x	x			
-11	116-6R12H	. SCREW, No. 6-32 x 3/4 pan hd ---*---	4	x	x	x	x	x	x	x	x	x			
-12	39212-P1	. PLATE, Threading Diagram	1	x	x	x	x	x	x	x	x	x			
-13	38234-G2	. FOOT ASSEMBLY	1	x	x	x	x	x	x	x	x	x			
	39237	. BUTTON (ATTACHING PARTS)	2	x	x	x	x	x	x	x	x	x			
-14	136-6R8H	. SCREW, Thread Cutting, No. 6-32 x 0.500 oval hd ---*---	1	x	x	x	x	x	x	x	x	x			
-15	38213-P1	. SPRING, Elevation	1	x	x	x	x	x	x	x	x	x			
-16	38435-P1	. ADAPTER, Power Cord	1	x	x	x	x	x	x	x	x	x			
-17	39189-P13	. PLATE, Identification	1							x					
	38189-P16	. PLATE, Identification	1		x										
	38189-P19	. PLATE, Identification	1	x											
	38189-P17	. PLATE, Identification	1			x									
	38189-P14	. PLATE, Identification	1							x					
	38189-P18	. PLATE, Identification	1				x								
	38189-P15	. PLATE, Identification	1								x				
	39488-P1	. PLATE, Identification (ATTACHING PARTS)	1									x			
-18	38215	. SCREW, Drive ---*---	4	x	x	x	x	x	x	x	x	x			
-19	39150-G1	. PROJECTOR ASSEMBLY (See Figures 6-2 thru 6-9 for breakdown)	1							x					
	39150-G2	. PROJECTOR ASSEMBLY (See Figures 6-2 thru 6-9 for breakdown)	1		x										
	39150-G3	. PROJECTOR ASSEMBLY (See Figures 6-2 thru 6-9 for breakdown)	1			x									
	39150-G4	. PROJECTOR ASSEMBLY (See Figures 6-2 thru 6-9 for breakdown)	1							x		x			
	39150-G5	. PROJECTOR ASSEMBLY (See Figures 6-2 thru 6-9 for breakdown)	1							x					
	39150-G6	. PROJECTOR ASSEMBLY (See Figures 6-2 thru 6-9 for breakdown)	1									x			
	39150-G7	. PROJECTOR ASSEMBLY (See Figures 6-2 thru 6-9 for breakdown)	1	x											

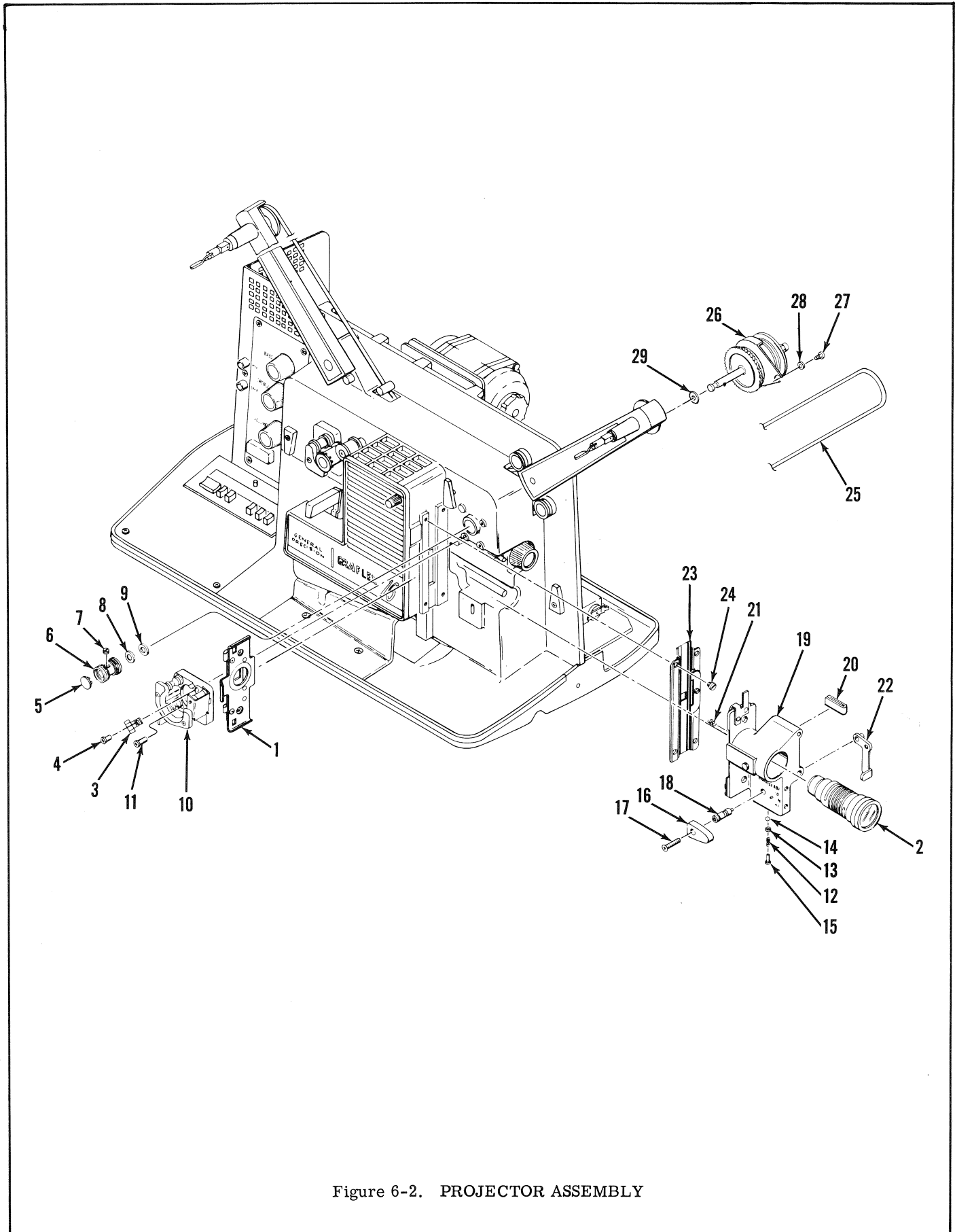


Figure 6-2. PROJECTOR ASSEMBLY

GRAFLEX 16 PROJECTOR

Section VI
800 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS											
				1	2	3	4	5	800	815	816	817	820	821	822	823
		PROJECTOR ASSEMBLY													
2-	39150-G1	PROJECTOR ASSEMBLY													
	39150-G2	PROJECTOR ASSEMBLY													
	39150-G3	PROJECTOR ASSEMBLY													
	39150-G4	PROJECTOR ASSEMBLY													
	39150-G5	PROJECTOR ASSEMBLY													
	39150-G6	PROJECTOR ASSEMBLY													
	39150-G7	PROJECTOR ASSEMBLY													
-1	38472-G2	. SHOE COMPLETE, Film Pressure (See . . . Figure 7-3 for breakdown)	1												
-2	38428-P1	. LENS, Projection	1												
	38427-P1	. LENS, Projection	1												
-3	38373	. STRIPPER (ATTACHING PARTS)	1												
-4	123-4R4H	. SCREW, No. 4 x 1/4 truss hd ---*---	1												
-5	38841-P2	. BUTTON	1												
-6	38261-G1	. SPROCKET ASSEMBLY, Film (ATTACHING PARTS)	1												
-7	38438	. SETSCREW, No. 10-32 x 3/16 cap pt . . . ---*---	1												
-8	35473-30H	. WASHER, Flat, 0.500 x 0.254 x 0.032 . . .	1												
-9	35473-65	. WASHER, Flat, 0.500 x 0.257 x 0.020 . . .	1												
-10	38350-G2	. SHOE COMPLETE, Feed Sprocket (See . . . Figure 7-4 for breakdown) (ATTACHING PARTS)	1												
-11	106-4R8H	. SCREW, No. 4-40 x 1/2 fil hd ---*---	3												
-12	39222-P1	. SPRING	1												
-13	38473-25	. WASHER, Flat, 0.187 x 0.193 x 0.020 . . .	1												
-14	300-6	. BALL (ATTACHING PARTS)	1												
-15	171-416-4L	. SETSCREW, No. 1/4-20 x 1/4 cup pt . . . ---*---	1												
-16	38212	. LEVER, Control (ATTACHING PARTS)	1												
-17	104-6R-6H	. SCREW, No. 6-32 x 3/8 oval hd ---*---	1												
-18	39220-P1	. ECCENTRIC, Gate Lever	1												
-19	38071-G2	. HOLDER ASSEMBLY, Lens (See Figure . . . 7-5 for breakdown)	1												
-20	38075	. SPRING, Lens Holder	1												
-21	39238-P1	. SPRING, Lens Holder (Lower)	1												
-22	38067-G1	. LEVER ASSEMBLY, Gate	1												
-23	38820-G1	. PLATE ASSEMBLY, Aperture (See Figure 7-6 for breakdown) (ATTACHING PARTS)	1												
-24	112-4R3H	. SCREW, No. 4-40 x 3/16 truss hd ---*---	4												
-25	39211-P2	. BELT, Supply	1												
-26	39151-G1	. CLUTCH ASSEMBLY, Film Feed (See . . . Figure 7-7 for breakdown) (ATTACHING PARTS)	1												
-27	121-6R5H	. SCREW, No. 6 x 5/16 pan hd	1												
-28	38473-16A	. WASHER, Flat, 0.375 x 0.156 x 0.050 . . . ---*---	1												
-29	35473-48	. WASHER, Flat, 0.500 x 0.254 x 0.050 . . .	1												

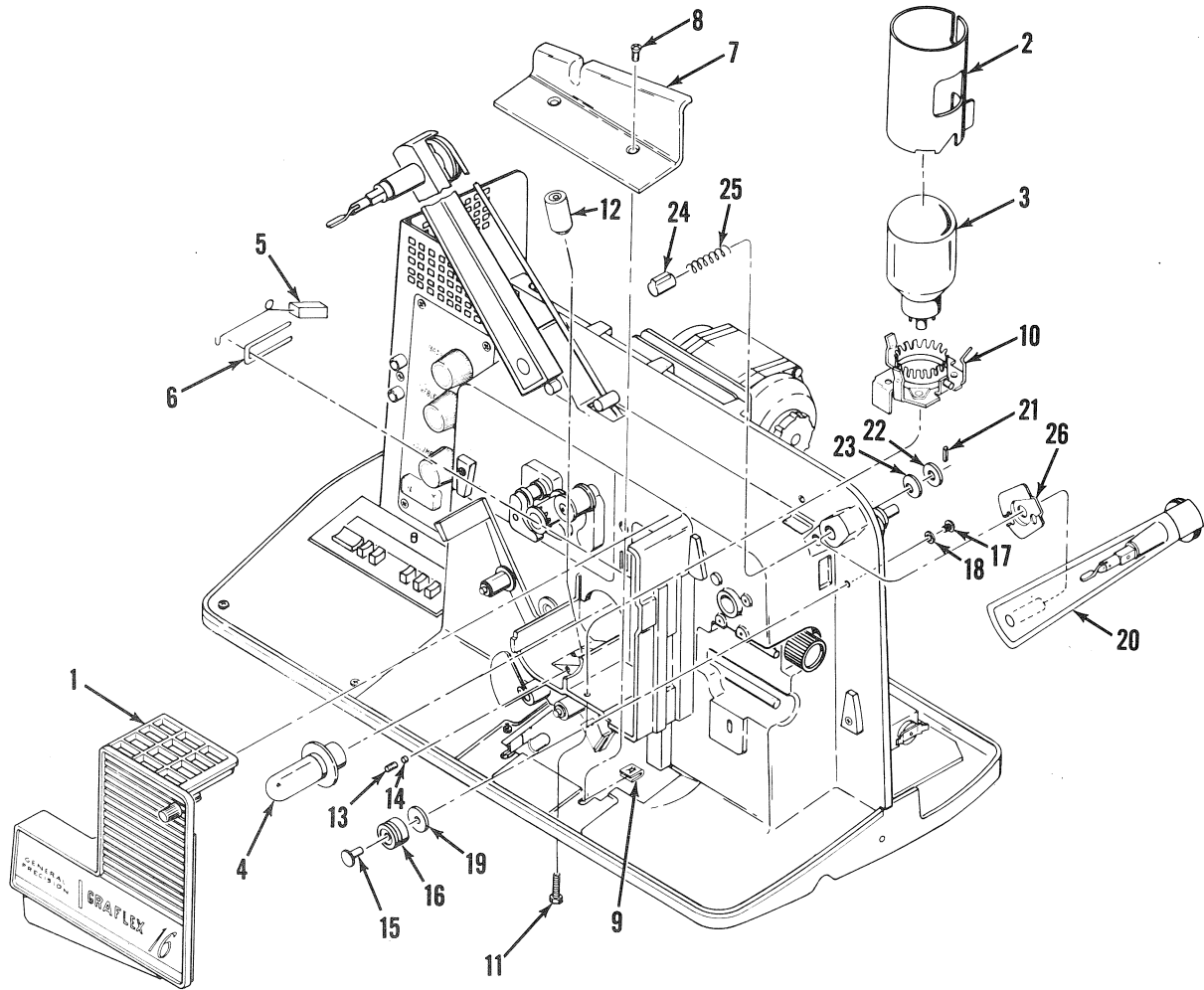


Figure 6-3. PROJECTOR ASSEMBLY (Cont.)

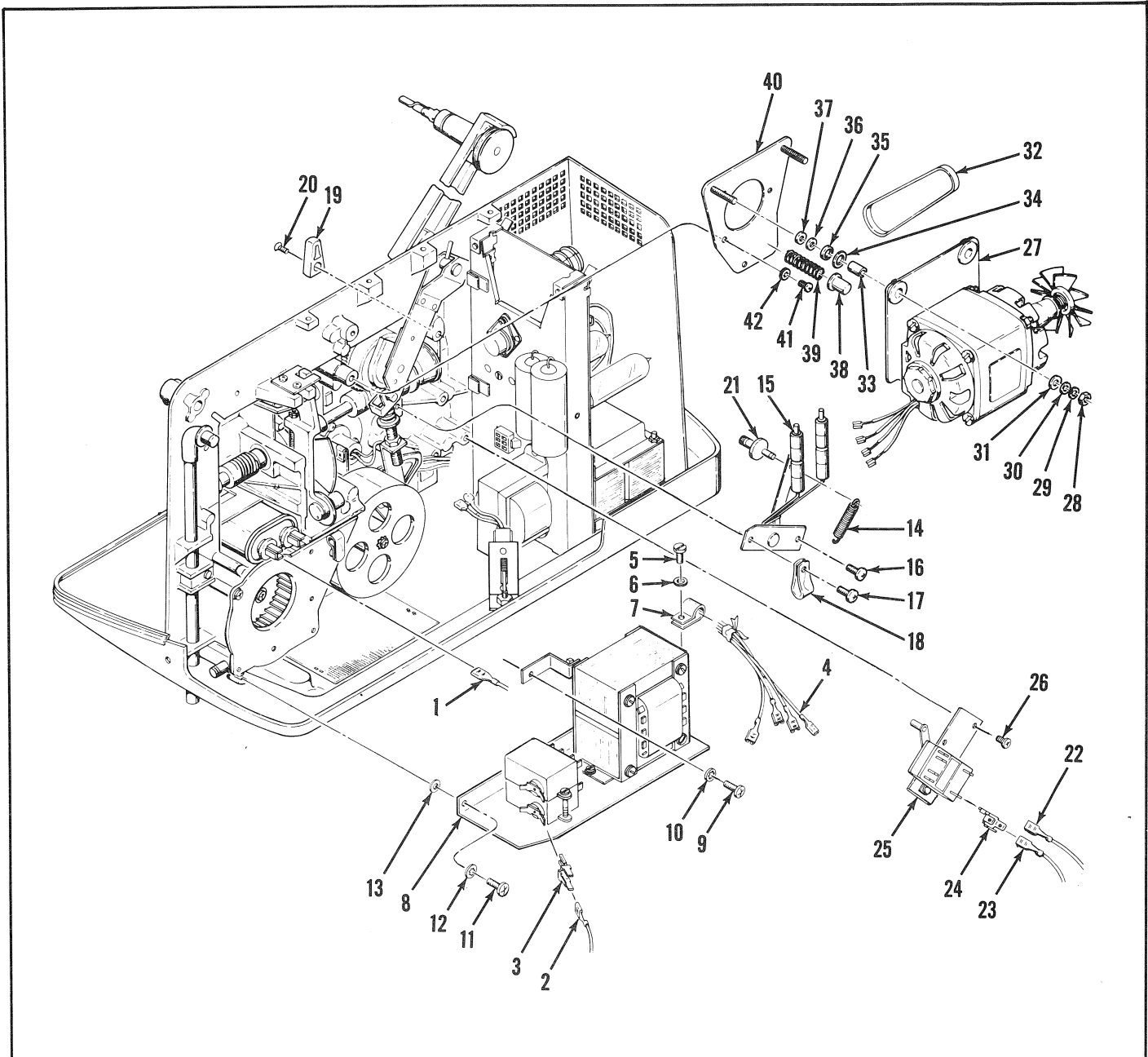


Figure 6-4. PROJECTOR ASSEMBLY (Cont.)

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS													
				1	2	3	4	5	800	815	816	817	820	821	822	823	
PROJECTOR ASSEMBLY (Cont.)																	
4-1		. WIRE ASSEMBLY	REF							X	X	X	X	X	X	X	X
-2		. WIRE ASSEMBLY	REF							X	X	X	X	X	X	X	X
-3	39343	. ADAPTER	1							X	X	X	X	X	X	X	X
-4	38997-G1	. HARNESS ASSEMBLY (ATTACHING PARTS)	1							X	X	X	X	X	X	X	X
-5	116-6R6H	. SCREW, No. 6-32 x 3/8 pan hd	1							X	X	X	X	X	X	X	X
-6	35473-46H	. WASHER, Flat, 0.500 x 0.200 x 0.032	1							X	X	X	X	X	X	X	X
-7	267-7	. CLAMP	1							X	X	X	X	X	X	X	X
		---*---															

GRAFLEX 16 PROJECTOR

Section VI
800 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION 1 2 3 4 5	QTY	MODELS											
				800	815	816	817	820	821	822	823				
PROJECTOR ASSEMBLY (Cont.)															
4-8	39045-G1	. PLATFORM COMPLETE, Transformer (See Figure 7-11 for breakdown)	1	x	x			x							
	39045-G2	. PLATFORM COMPLETE, Transformer (See Figure 7-11 for breakdown)	1			x	x		x	x	x				
		(ATTACHING PARTS)													
-9	121-8R8H	. SCREW, No. 8 x 1/2 pan hd	1	x	x	x	x	x	x	x	x				
-10	221-8A	. WASHER, Lock	1	x	x	x	x	x	x	x	x				
-11	140-8R10H	. SCREW, No. 8-32 x 5/8 pan hd	2	x	x	x	x	x	x	x	x				
-12	221-8A	. WASHER, Lock	2	x	x	x	x	x	x	x	x				
		----*----													
-13	38473-18	. WASHER, Flat, 0.500 x 0.187 x 0.125	2	x	x	x	x	x	x	x	x				
-14	39095-P1	. SPRING, Belt Shift Eccentric	1	x	x	x	x	x	x	x	x				
-15	39112-G1	. FORK ASSEMBLY, Belt Shift (See Figure 7-13 for breakdown)	1	x	x	x	x	x	x	x	x				
		(ATTACHING PARTS)													
-16	140-10R6A	. SCREW, No. 10-24 x 3/8 pan hd	1	x	x	x	x	x	x	x	x				
-17	140-10R9H	. SCREW, No. 10-24 x 9/16 pan hd	1	x	x	x	x	x	x	x	x				
-18	267-2	. CLAMP	1	x	x	x	x	x	x	x	x				
		----*----													
-19	38212	. LEVER, Control (ATTACHING PARTS)	1	x	x	x	x	x	x	x	x				
-20	104-6R6H	. SCREW, No. 6-32 x 3/8 oval hd	1	x	x	x	x	x	x	x	x				
		----*----													
-21	39093-P1	. ECCENTRIC, Belt Shift	1	x	x	x	x	x	x	x	x				
-22		. WIRE ASSEMBLY	REF	x	x	x	x	x	x	x	x				
-23		. WIRE ASSEMBLY	REF	x	x	x	x	x	x	x	x				
-24	39342	. ADAPTER	1	x	x	x	x	x	x	x	x				
-25	38271-G2	. SWITCH ASSEMBLY, Reverse (ATTACHING PARTS)	1	x	x	x	x	x	x	x	x				
-26	121-6R5H	. SCREW, No. 6 x 5/16 pan hd	2	x	x	x	x	x	x	x	x				
		----*----													
-27	39114-G6	. DRIVE UNIT ASSEMBLY (See Figure 7-12 for breakdown)	1			x			x		x				
	39114-G5	. DRIVE UNIT ASSEMBLY (See Figure 7-12 for breakdown)	1				x			x					
	39114-G1	. DRIVE UNIT ASSEMBLY (See Figure 7-12 for breakdown)	1	x	x			x							
		(ATTACHING PARTS)													
-28	200-10HA	. NUT, No. 10-24	2	x	x	x	x	x	x	x	x				
-29	35473-46A	. WASHER, Flat (See index 6)	2	x	x	x	x	x	x	x	x				
-30	39081	. SPACER	2	x	x	x	x	x	x	x	x				
-31	30473-73A	. WASHER, Flat, 0.625 x 0.320 x 0.010	2	x	x	x	x	x	x	x	x				
		----*----													
-32	39086-P1	. BELT, Motor Drive	1	x	x	x	x	x	x	x	x				
-33	32090-48	. SPACER	2	x	x	x	x	x	x	x	x				
-34	30473-73A	. WASHER, Flat (See index 31)	2	x	x	x	x	x	x	x	x				
-35	39081	. SPACER	2	x	x	x	x	x	x	x	x				
-36	35473-63A	. † WASHER, Flat, 0.500 x 0.196 x 0.062	3	x	x	x	x	x	x	x	x				
-37	35473-62L	. WASHER, Flat, 0.500 x 0.196 x 0.032	1	x	x	x	x	x	x	x	x				
-38	260-7A	. EYELET	1	x	x	x	x	x	x	x	x				
-39	39498-P1	. SPRING	1			x	x		x	x	x				
	39080-P1	. SPRING	1	x	x			x							
-40	39073-G1	. PLATE ASSEMBLY, Motor Mounting (ATTACHING PARTS)	1	x	x	x	x	x	x	x	x				
-41	140-10R9H	. SCREW, No. 10-24 x 9/16 pan hd	3	x	x	x	x	x	x	x	x				
-42	221-10	. WASHER, Lock	3	x	x	x	x	x	x	x	x				
		----*----													
† Note: One used on post as shown, two used on opposite post.															

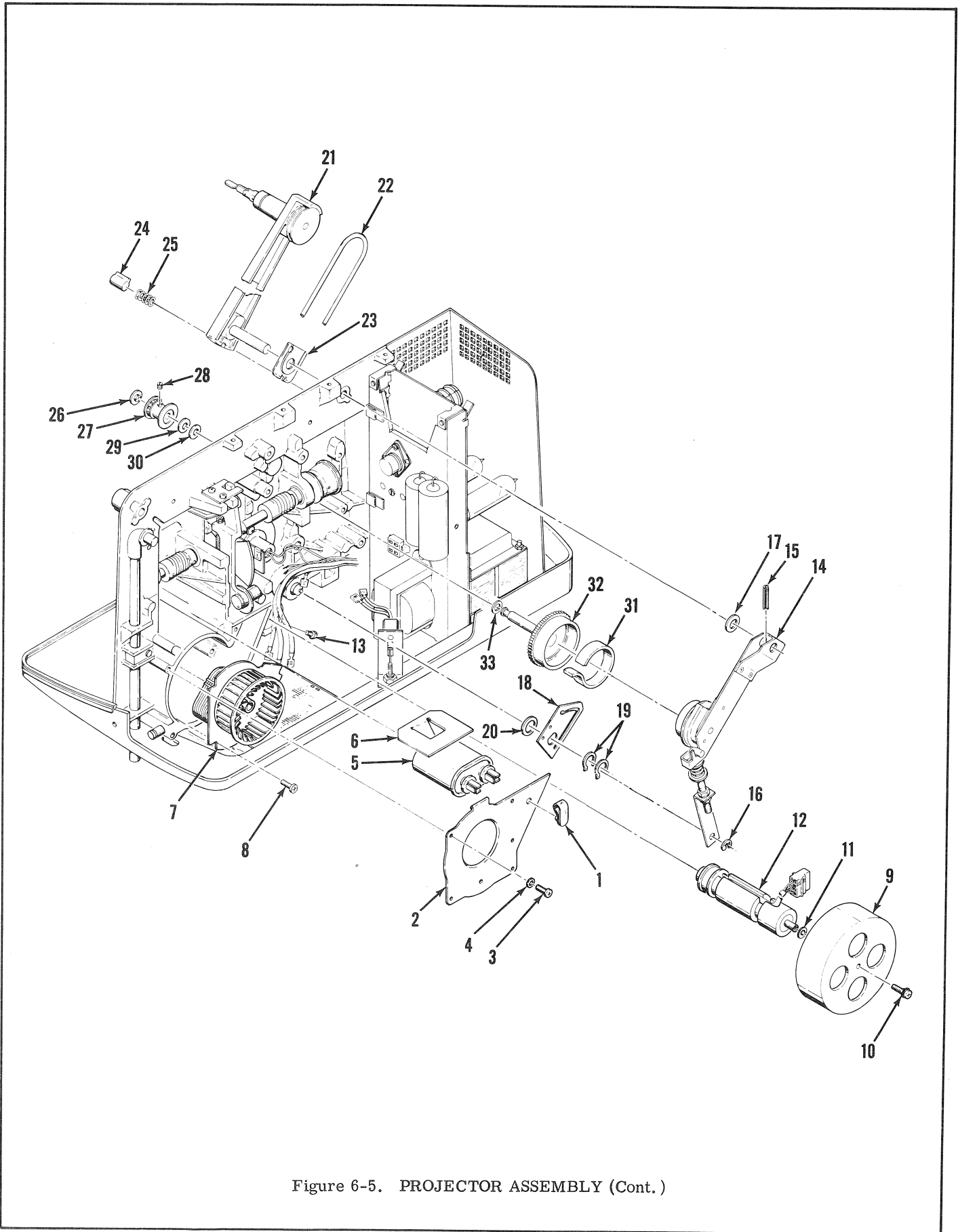


Figure 6-5. PROJECTOR ASSEMBLY (Cont.)

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS											
				1	2	3	4	5	800	815	816	817	820	821	822	823
PROJECTOR ASSEMBLY (Cont.)															
5-1	39235	STRAP, Cable	1						X	X	X	X	X	X	X
-2	38172-P1	PLATE, Venturi (ATTACHING PARTS)	1						X	X	X	X	X	X	X
-3	121-8R8H	SCREW, No. 8 x 1/2 pan hd	1						X	X	X	X	X	X	X
-4	221-8A	WASHER, Lock ---*---	1						X	X	X	X	X	X	X
-5	38177-P5	CAPACITOR, Motor	1						X	X		X			
	38177-P6	CAPACITOR, Motor	1							X		X		X	
	38177-P7	CAPACITOR, Motor (ATTACHING PARTS)	1								X		X		
-6	38452-P1	SPRING, Capacitor ---*---	1						X	X	X	X	X	X	X
-7	38167-G1	PLATE ASSEMBLY, Motor Mounting (See Figure 7-15 for breakdown)	1						X	X		X			
	38167-G2	PLATE ASSEMBLY, Motor Mounting (See Figure 7-15 for breakdown)	1							X		X		X	
	38167-G3	PLATE ASSEMBLY, Motor Mounting (See Figure 7-15 for breakdown) (ATTACHING PARTS)	1								X		X		
-8	121-8R6H	SCREW, No. 8 x 3/8 pan hd ---*---	3						X	X	X	X	X	X	X
-9	38159-P1	FLYWHEEL (ATTACHING PARTS)	1						X	X	X	X	X	X	X
-10	38160-P2	SCREW, Special, lockwasher included ---*---	1						X	X	X	X	X	X	X
-11	221-416	WASHER, Lock	1						X	X	X	X	X	X	X
-12	38374-G1	SUPPORT COMPLETE, Sound Drum (ATTACHING PARTS)	1						X	X	X	X	X	X	X
-13	38283	SCREW, Special ---*---	2						X	X	X	X	X	X	X
-14	39155-G1	ARM COMPLETE, Takeup Clutch (See Figure 7-16 for breakdown) (ATTACHING PARTS)	1						X	X	X	X	X	X	X
-15	189-5-10	PIN, Roll	1						X	X	X	X	X	X	X
-16	251-14	RING, Retaining ---*---	1						X	X	X	X	X	X	X
-17	35473-35H	WASHER, Flat, 0.750 x 0.390 x 0.32	1						X	X	X	X	X	X	X
-18	39167-P1	CAM, Reverse Switch (ATTACHING PARTS)	1						X	X	X	X	X	X	X
-19	252-6	RING, Retaining ---*---	2						X	X	X	X	X	X	X
-20	38278-P2	SPACER	1						X	X	X	X	X	X	X
-21	39175-G2	ARM COMPLETE, Takeup Reel (See Figure 7-10 for breakdown)	1						X	X	X	X	X	X	X
-22	39211-P1	BELT, Takeup	1						X	X	X	X	X	X	X
-23	39182-P1	GUARD, Belt Reel Arm	1						X	X	X	X	X	X	X
-24	38089-P3	PLUNGER, Takeup Arm	1						X	X	X	X	X	X	X
-25	38088-P1	SPRING, Reel Arm Lock	1						X	X	X	X	X	X	X
-26	38841-P2	BUTTON	1						X	X	X	X	X	X	X
-27	38261-G2	SPROCKET ASSEMBLY, Film (ATTACHING PARTS)	1						X	X	X	X	X	X	X
-28	38438	SETSCREW, No. 10-32 x 3/16 cup pt ---*---	1						X	X	X	X	X	X	X
-29	35473-30H	WASHER, Flat, 0.500 x 0.254 x 0.032	1						X	X	X	X	X	X	X
-30	35473-65	WASHER, Flat, 0.500 x 0.254 x 0.020	1						X	X	X	X	X	X	X
-31	39203	LINER	1						X	X	X	X	X	X	X
-32	39169-G1	GEAR ASSEMBLY, Takeup Sprocket	1						X	X	X	X	X	X	X
-33	35473-48	WASHER, Flat, 0.500 x 0.254 x 0.0050	1						X	X	X	X	X	X	X

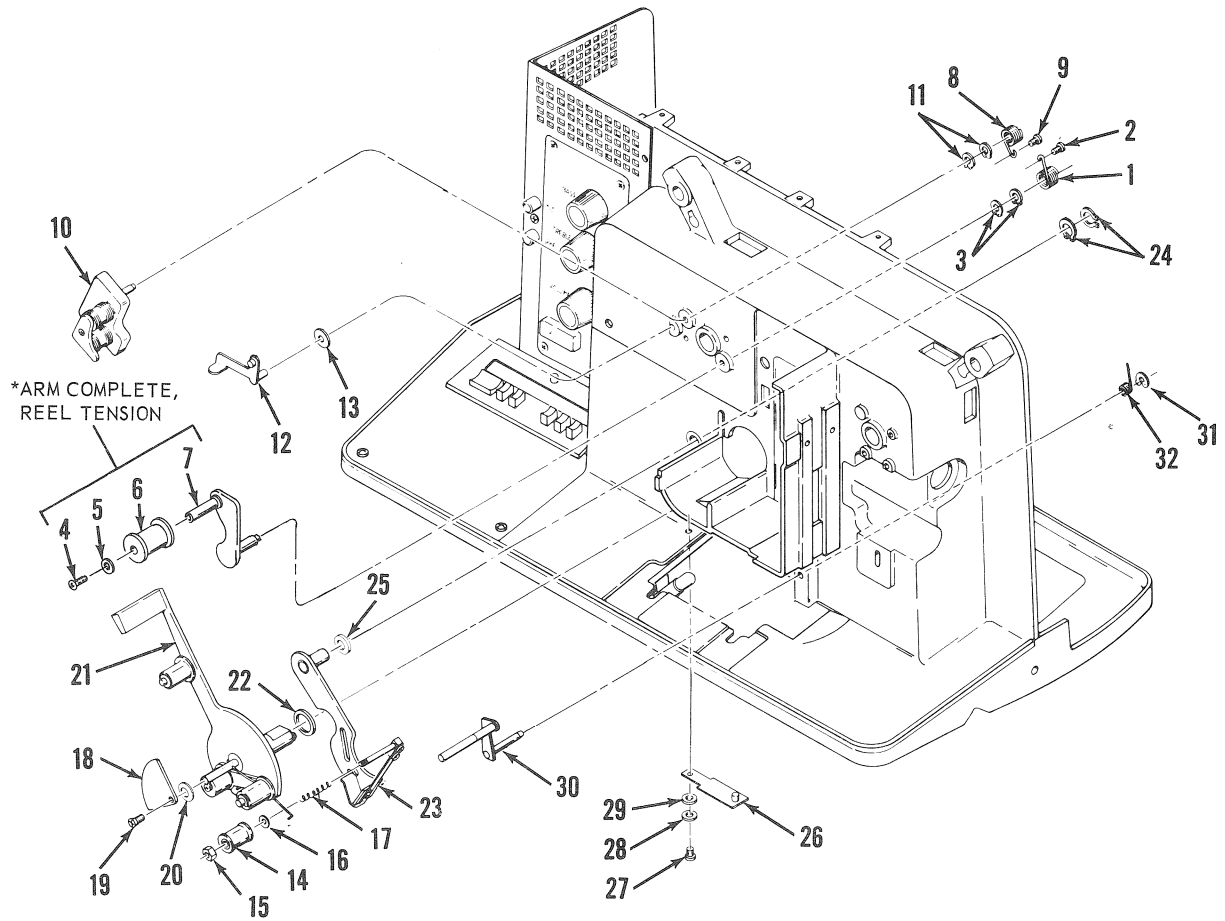


Figure 6-6. PROJECTOR ASSEMBLY (Cont.)

GRAFLEX 16 PROJECTOR

Section VI
800 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS											
				1	2	3	4	5	800	815	816	817	820	821	822	823
PROJECTOR ASSEMBLY (Cont.)															
6-1	38224	. SPRING, Tension Arm (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X			
-2	116-6R2H	. SCREW, No. 6-32 x 1/8 pan hd ---*---	1	X	X	X	X	X	X	X	X	X			
*	38225-G1	. ARM COMPLETE, Reel Tension (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X			
-3	252-3	. RING, Retaining ---*---	2	X	X	X	X	X	X	X	X	X			
-4	112-4R3H	. . . SCREW, No. 4-40 x 3/16 truss hd	1	X	X	X	X	X	X	X	X	X			
-5	35473-27H	. . . WASHER, 0.254 x 0.115 x 0.032	1	X	X	X	X	X	X	X	X	X			
-6	38228	. . . ROLLER	1	X	X	X	X	X	X	X	X	X			
-7	38226-G1	. . . ARM ASSEMBLY	1	X	X	X	X	X	X	X	X	X			
-8	38224	. SPRING, Tension Arm (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X			
-9	116-6R2H	. SCREW, No. 6-32 x 1/8 pan hd ---*---	1	X	X	X	X	X	X	X	X	X			
-10	38217-G1	. ARM COMPLETE, Takeup Sprocket Shoe (See Figure 7-17 for breakdown) (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X			
-11	252-3	. RING, Retaining ---*---	2	X	X	X	X	X	X	X	X	X			
-12	38067-G2	. LEVER ASSEMBLY, Shoe	1	X	X	X	X	X	X	X	X	X			
-13	35473-32H	. WASHER, Flat, 0.312 x 0.190 x 0.020	1	X	X	X	X	X	X	X	X	X			
-14	38147-G1	. ROLLER ASSEMBLY, Film Guide (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X			
-15	38150	. NUT, Special ---*---	1	X	X	X	X	X	X	X	X	X			
-16	30473-79	. WASHER, Flat, 0.312 x 0.128 x 0.015	1	X	X	X	X	X	X	X	X	X			
-17	38221-P1	. SPRING	1	X	X	X	X	X	X	X	X	X			
-18	39205	. GUARD (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X			
-19	100-4R5H	. SCREW, No. 4-40 x 5/16 flt hd ---*---	1	X	X	X	X	X	X	X	X	X			
-20	220-4	. WASHER, Lock	1	X	X	X	X	X	X	X	X	X			
-21	38129-G3	. ARM COMPLETE, Threading Control (See Figure 7-18 for breakdown)	1	X	X	X	X	X	X	X	X	X			
-22	38278-P1	. SPACER	1	X	X	X	X	X	X	X	X	X			
-23	38142-G1	. ARM ASSEMBLY, Pressure Roller (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X			
-24	252-8	. RING, Retaining ---*---	2	X	X	X	X	X	X	X	X	X			
-25	224-4	. WASHER, Spring	1	X	X	X	X	X	X	X	X	X			
-26	38317-G1	. SPRING ASSEMBLY, Threading Control (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X			
-27	116-6R4H	. SCREW, No. 6-32 x 1/4 pan hd	1	X	X	X	X	X	X	X	X	X			
-28	221-6	. WASHER, Lock	1	X	X	X	X	X	X	X	X	X			
-29	33500-67A	. WASHER, Flat, 0.750 x 0.143 x 0.032 ---*---	1	X	X	X	X	X	X	X	X	X			
-30	38198-G2	. LEVER COMPLETE, Loop Set (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X	X			
-31	254-2	. RING, Retaining	1	X	X	X	X	X	X	X	X	X			
-32	38494	. SPRING, Loop Set ---*---	1	X	X	X	X	X	X	X	X	X			

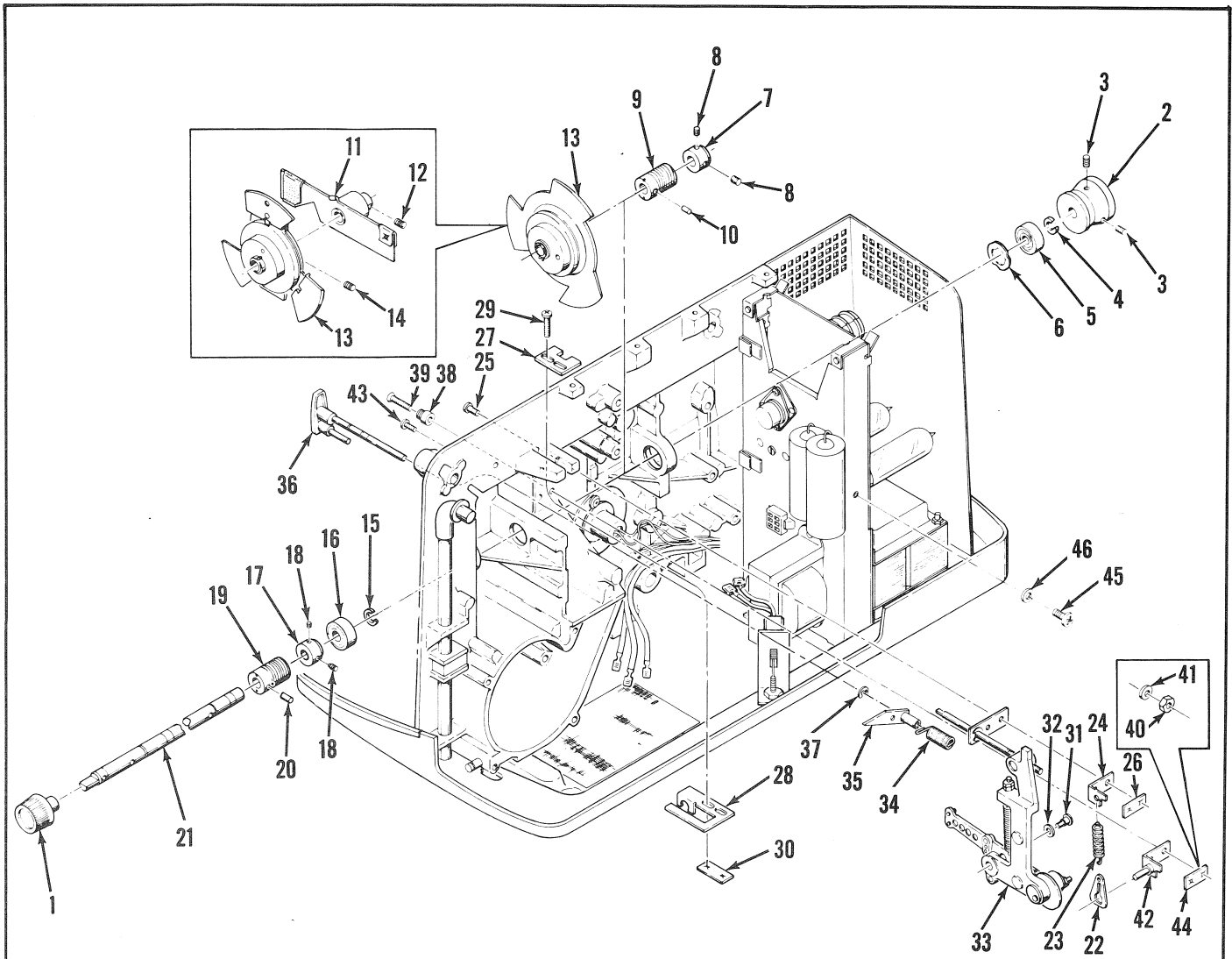


Figure 6-7. PROJECTOR ASSEMBLY (Cont.)

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS													
				1	2	3	4	5	800	815	816	817	820	821	822	823	
PROJECTOR ASSEMBLY (Cont.)																	
7-1	38184-P1	. KNOB, Inching	1														
-2	39101-P1	. PULLEY, Main Shaft	1														
	39236-P2	. PULLEY, Main Shaft	1														
		(ATTACHING PARTS)															
-3	171H6-4L	. SETSCREW, No. 6-32 x 1/4 hex socket	2														
		----*----															
-4	253-4	. RING, Retaining	1														
-5	38007	. BEARING	1														
-6	38492	. WASHER, Spring	1														
-7	38471	. COLLAR	1														
		(ATTACHING PARTS)															
-8	171F6-3L	. SETSCREW, No. 6-32 x 3/16 hex socket	2														
		----*----															
-9	38806-P1	. GEAR, Drive	1														
		(ATTACHING PARTS)															
-10	191S6-10	. PIN, Spirol	1														
		----*----															

GRAFLEX 16 PROJECTOR

Section VI
800 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION 1 2 3 4 5	QTY	MODELS															
				800	815	816	817	820	821	822	823								
PROJECTOR ASSEMBLY (Cont.)																			
7-11	38456-G1	. SHUTTER ASSEMBLY, Safety (ATTACHING PARTS)	1					X	X	X	X								
-12	171-4-2L	. SETSCREW, No. 4-40 x 1/8 ----*----	1					X	X	X	X								
-13	38011-G2	. SHUTTER AND CAM ASSEMBLY (See figure 7-20 for breakdown)	1	X				X	X	X	X								
	38321-G2	. SHUTTER AND CAM ASSEMBLY (See figure 7-21 for breakdown) (ATTACHING PARTS)	1		X	X	X												
-14	171A6-3L	. SETSCREW (See index 8) ----*----	1	X	X	X	X	X	X	X	X	X							
-15	253-4	. RING, Retaining	1	X	X	X	X	X	X	X	X								
-16	38007	. BEARING	1	X	X	X	X	X	X	X	X								
-17	38471	. COLLAR (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X								
-18	171F6-3L	. SETSCREW (See index 8) ----*----	2	X	X	X	X	X	X	X	X								
-19	38806-P1	. GEAR, Drive (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X								
-20	191S6-10	. PIN, Spirol. ----*----	1	X	X	X	X	X	X	X	X								
-21	38010-P2	. SHAFT, Drive	1	X	X	X	X	X	X	X	X								
-22	38194	. LINK	1					X	X	X	X								
-23	38192	. SPRING	1					X	X	X	X								
-24	38325	. BRACKET (ATTACHING PARTS)	1					X	X	X	X								
-25	121-4R8H	. SCREW, No. 4 x 1/2 pan hd	2	X	X	X	X	X	X	X	X								
-26	39247-P2	. NUT, Speed ----*----	1	X	X	X	X	X	X	X	X								
-27	38233	. PLATE, Limit	1	X	X	X	X	X	X	X	X								
-28	39152-P1	. STOP, Rewind Lever (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X								
-29	121-6R12H	. SCREW, No. 6 x 3/4 pan hd	2	X	X	X	X	X	X	X	X								
-30	38238	. NUT, Speed ----*----	1	X	X	X	X	X	X	X	X								
-31	38063	. PIVOT, Framing Arm	1	X	X	X	X	X	X	X	X								
-32	226-1	. WASHER, Spring, 0.375 x 0.175 x 0.030	1	X	X	X	X	X	X	X	X								
-33	38040-G1	. ARM COMPLETE, Claw (See Figure 7-23 for breakdown)	1	X	X	X	X	X	X	X	X								
-34	39149-P1	. SPRING, Rewind Lever	1	X	X	X	X	X	X	X	X								
-35	39145-G1	. LEVER ASSEMBLY, Rewind	1	X	X	X	X	X	X	X	X								
-36	39142-G1	. KNOB ASSEMBLY, Rewind (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X								
-37	251-10	. RING, Retaining ----*----	1	X	X	X	X	X	X	X	X								
-38	39246	. STABILIZER (ATTACHING PARTS)	1	X	X	X	X	X	X	X	X								
-39	100-4R10H	. SCREW, No. 4-40 x 5/8 flt hd	1	X	X	X	X	X	X	X	X								
-40	200-4HA	. NUT, No. 4-40	1	X	X	X	X												
-41	220-4	. WASHER, Lock ----*----	1	X	X	X	X												
-42	38326-G1	. BRACKET ASSEMBLY, Shutter Stop (ATTACHING PARTS)	1					X	X	X	X								
-43	121-4R8H	. SCREW, No. 4 x 1/2 pan hd	1					X	X	X	X								
-44	39247-P2	. NUT, Speed ----*----	1					X	X	X	X								
-45	116-8R6A	. SCREW, No. 8-32 x 3/8 pan hd	1	X	X	X	X	X	X	X	X								
-46	221-8A	. WASHER, Lock	1	X	X	X	X	X	X	X	X								

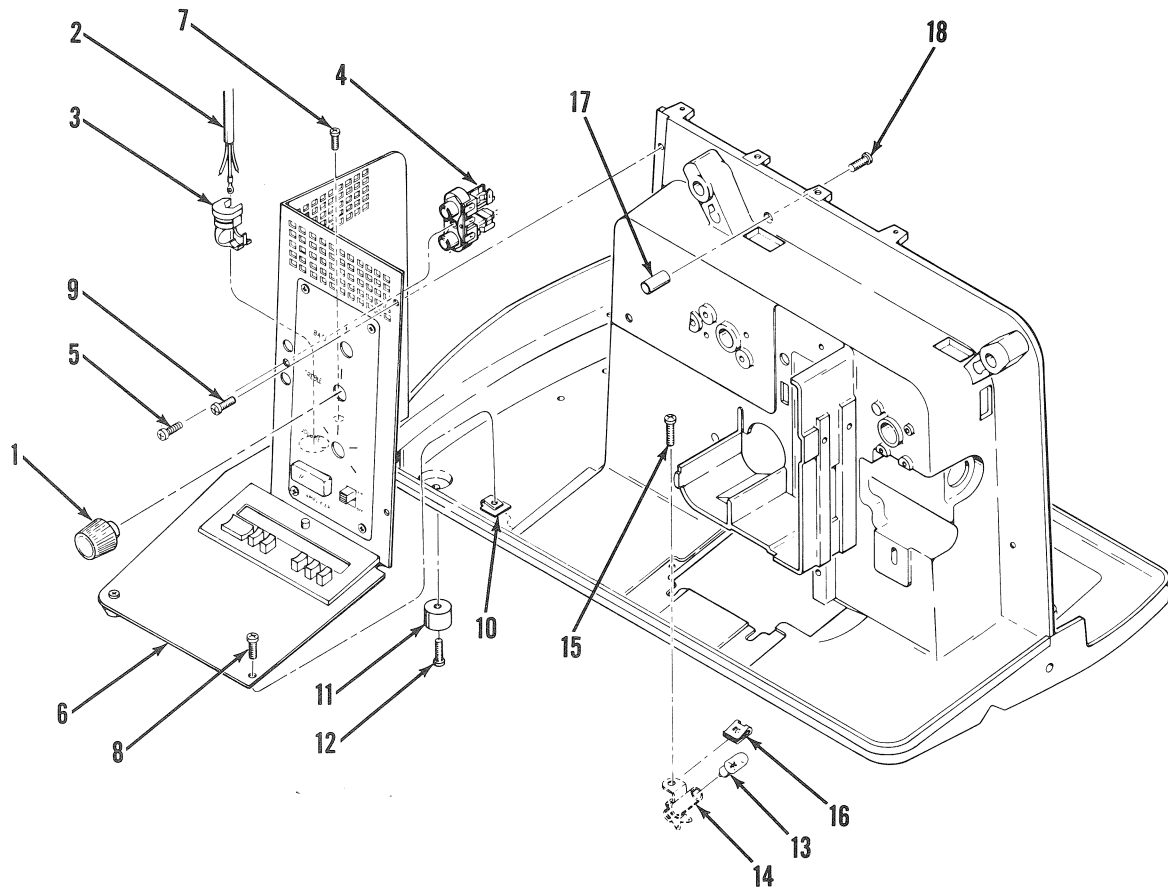


Figure 6-8. PROJECTOR ASSEMBLY (Cont.)

GRAFLEX 16 PROJECTOR

Section VI
800 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS											
				1	2	3	4	5	800	815	816	817	820	821	822	823
PROJECTOR ASSEMBLY (Cont.)															
8-1	37820	. KNOB, Amplifier	3							X	X	X	X	X	X
-2	39224-G2	. CORD ASSEMBLY, Power	1							X	X	X	X	X	X
-3	241-3	. BUSHING, Strain Relief	1							X	X	X	X	X	X
-4	38410-P1	. JACK (ATTACHING PARTS)	1							X	X	X	X	X	X
-5	116-6R6H	. SCREW, No. 6-32 x 3/8 pan hd ---*---	1							X	X	X	X	X	X
-6	39061-G1	. COVER ASSEMBLY, Amplifier (See Figure 7-22 for breakdown)	1									X		X	
	39061-G2	. COVER ASSEMBLY, Amplifier (See Figure 7-22 for breakdown)	1						X	X		X			
	39061-G3	. COVER ASSEMBLY, Amplifier (See Figure 7-22 for breakdown)	1										X		X
	39061-G4	. COVER ASSEMBLY, Amplifier (See Figure 7-22 for breakdown) (ATTACHING PARTS)	1							X					
-7	116-6R4H	. SCREW, No. 6-32 x 1/4 pan hd	1							X	X	X	X	X	X
-8	121-6R8H	. SCREW, No. 6 x 1/2 pan hd	1							X	X	X	X	X	X
-9	121-6R5H	. SCREW, No. 6 x 5/16 pan hd	2							X	X	X	X	X	X
-10	38245	. NUT, Speed ---*---	1							X	X	X	X	X	X
-11	39243	. FOOT (ATTACHING PARTS)	4							X	X	X	X	X	X
-12	116-6R10H	. SCREW, No. 6-32 x 5/8 pan hd ---*---	4							X	X	X	X	X	X
-13	38393	. THREADING LAMP	1							X	X	X	X	X	X
-14		. SOCKET, Threading Lamp (See 8, Fig. 6-9) (ATTACHING PARTS)	REF							X	X	X	X	X	X
-15	121-6R8H	. SCREW (See index 8)	1							X	X	X	X	X	X
-16	38248	. NUT, Speed ---*---	1							X	X	X	X	X	X
-17	38464	. POST (ATTACHING PARTS)	1							X	X	X	X	X	X
-18	131-6R8A	. SCREW, No. 6 x 1/2 pan hd ---*---	1							X	X	X	X	X	X

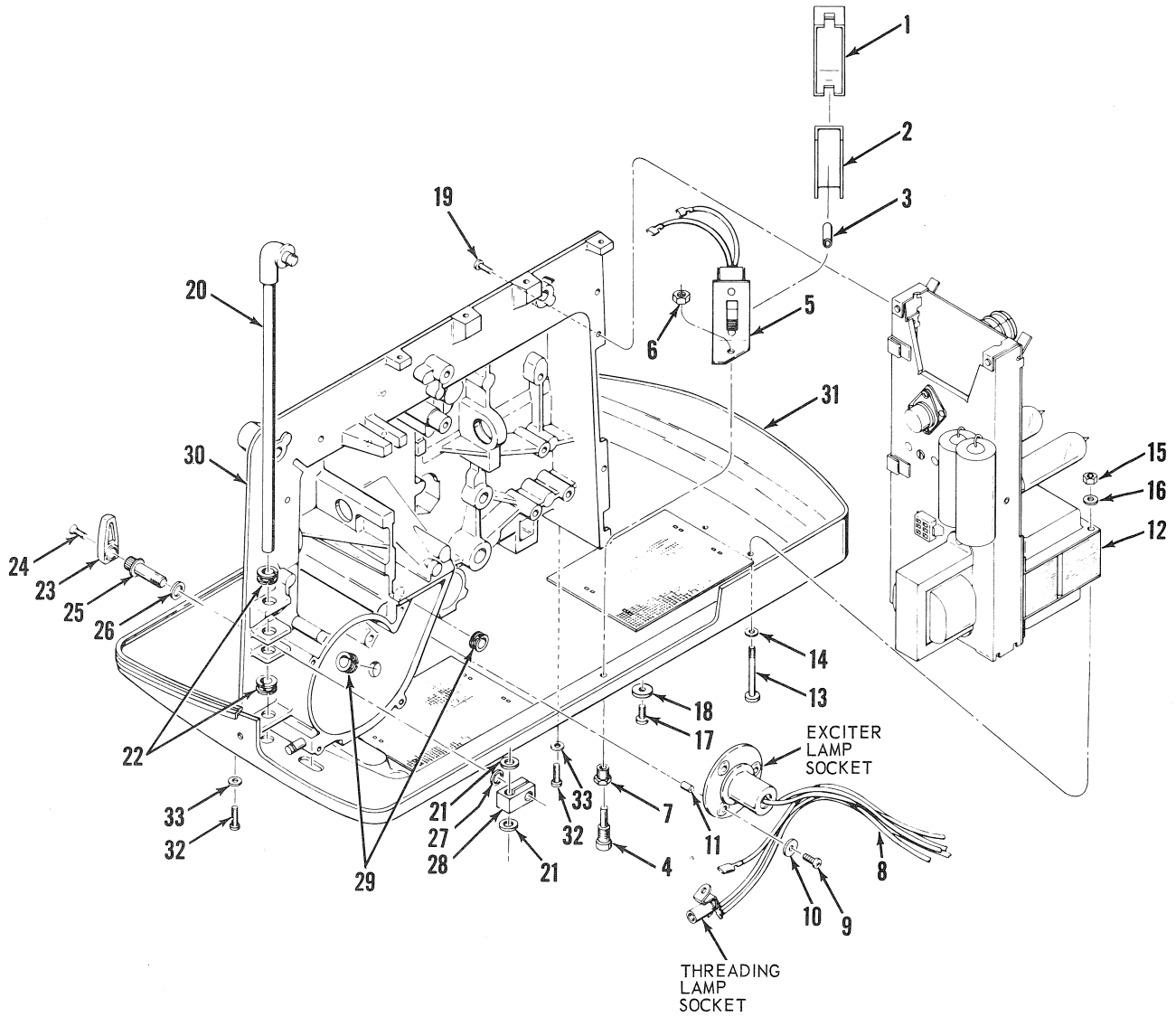


Figure 6-9. PROJECTOR ASSEMBLY (Cont.)

GRAFLEX 16 PROJECTOR

Section VI
800 Series Projector Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	MODELS											
				1	2	3	4	5	800	815	816	817	820	821	822	823
PROJECTOR ASSEMBLY (Cont.)															
9-1	39248-P3	. SHIELD, Interlock Switch	1						X	X	X	X	X	X	X
-2	39248-P4	. LINER, Interlock Switch.	1						X	X	X	X	X	X	X
-3	37238-P24	. TUBING	4						X	X	X	X	X	X	X
-4	39216	. SCREW, Interlock Switch	1						X	X	X	X	X	X	X
-5	39249-G1	. SWITCH ASSEMBLY, Interlock (ATTACHING PARTS)	1						X	X	X	X	X	X	X
-6	30553-1	. NUT, Special	1						X	X	X	X	X	X	X
-7	39187	. GUIDE ----*----	1						X	X	X	X	X	X	X
-8	39214-G1	. HARNESS COMPLETE, Exciter and Threading Lamp	1						X	X	X	X	X	X	X
	38301-P2	. CAP	1						X	X	X	X	X	X	X
	38363-G2	. SOCKET COMPLETE, Exciter	1						X	X	X	X	X	X	X
	38391-P2	. SOCKET, Threading Lamp (ATTACHING PARTS)	1						X	X	X	X	X	X	X
-9	121-4R8H	. SCREW, No. 4 x 1/2 pan hd	3						X	X	X	X	X	X	X
-10	35473-39	. WASHER, Flat, 0.375 x 0.128 x 0.032 . . ----*----	3						X	X	X	X	X	X	X
-11	32090-23	. SPACER	3						X	X	X	X	X	X	X
-12	38284-G3	. AMPLIFIER COMPLETE (See Figure 7-33 for breakdown)	1						X	X		X	X	X	
	38284-G4	. AMPLIFIER COMPLETE (See Figure 7-33 for breakdown) (ATTACHING PARTS)	1							X			X		X
-13	39233	. SCREW, No. 6-32 x 3 rd hd	1						X	X	X	X	X	X	X
-14	38473-16H	. WASHER, Flat, 0.375 x 0.156 x 0.050 . . .	1						X	X	X	X	X	X	X
-15	200-6HA	. NUT, No. 6-32	1						X	X	X	X	X	X	X
-16	220-6A	. WASHER, Lock	1						X	X	X	X	X	X	X
-17	121-8R8H	. SCREW, No. 8 x 1/2 pan hd	1						X	X	X	X	X	X	X
-18	35473-62H	. WASHER, Flat, 0.500 x 0.196 x 0.032 . .	1						X	X	X	X	X	X	X
-19	124-6R6H	. SCREW, No. 6 x 3/8 flt hd ----*----	2						X	X	X	X	X	X	X
-20	38207-G1	. ROD ASSEMBLY, Elevation	1						X	X	X	X	X	X	X
-21	30473-34	. WASHER, Flat, 0.531 x 0.355 x 0.030 . . .	2						X	X	X	X	X	X	X
-22	38206-1	. BEARING	2						X	X	X	X	X	X	X
-23	38212	. LEVER, Control (ATTACHING PARTS)	1						X	X	X	X	X	X	X
-24	104-6R6H	. SCREW, No. 6-32 x 3/8 oval hd ----*----	1						X	X	X	X	X	X	X
-25	38211	. STUD, Elevating Clamp	1						X	X	X	X	X	X	X
-26	35473-22P	. WASHER, Flat, 0.375 x 0.251 x 0.0050 . .	1						X	X	X	X	X	X	X
-27	33500-56A	. WASHER, Flat, 0.437 x 0.252 x 0.048 . .	1						X	X	X	X	X	X	X
-28	38840	. CLAMP, Elevating	1						X	X	X	X	X	X	X
-29	38206-1	. BEARING	2						X	X	X	X	X	X	X
-30	39186-G1	. HOUSING ASSEMBLY (See Figure 7-29 for breakdown)	1						X	X	X	X	X	X	X
-31	39055-G2	. BASE ASSEMBLY (See Figure 7-30 for breakdown) (ATTACHING PARTS)	1						X	X	X	X	X	X	X
-32	116-10R8H	. SCREW, No. 10-24 x 1/2 pan hd	3						X	X	X	X	X	X	X
-33	38473-17H	. WASHER, Flat, 0.500 x 0.219 x 0.050 . . . ----*----	3						X	X	X	X	X	X	X

SECTION VII SUBASSEMBLIES PARTS LIST

A. INTRODUCTION

This section contains individual illustrated parts lists for the main subassemblies that comprise the Graflex 16 Projector. The locations of these subassemblies on the projector are shown in the exploded views of Sections V and VI.

Since many of the subassemblies shown in this section are used on more than one model of projector, no reference is made to projector models. In certain cases a subassembly may be peculiar to only one model. Therefore, in order to establish the model to which a subassembly is applicable, it will be necessary to refer to the overall parts lists given in Sections V and VI or to the 700 Series Models listed in Section VIII.

B. SUBASSEMBLY LISTING

The following subassemblies are shown in this section.

<u>Figure No.</u>	<u>Title</u>
7-1	Front Cover Assembly
7-2	Rear Cover Complete
7-3	Film Pressure Shoe Complete
7-4	Feed Sprocket Shoe Complete
7-5	Lens Holder Assembly
7-6	Aperture Plate Assembly
7-7	Film Feed Clutch Assembly
7-8	Lamphouse Cover Assembly
7-9	Erase Head and Yoke Assembly
7-10	Supply Reel Arm Complete
	Takeup Reel Arm Complete
7-11	Transformer Platform Complete
7-12	Drive Unit Assembly
7-13	Drive Belt Shift Fork Assembly
7-14	Capacitor and Bracket Assembly
7-15	Motor Mounting Plate Assembly
7-16	Takeup Clutch Arm Complete
7-17	Takeup Sprocket Shoe Arm Complete
7-18	Threading Control Arm Complete
7-19	Threading Control Arm Complete
7-20	Shutter and Cam Assembly
7-21	Shutter and Cam Assembly
7-22	Amplifier Cover Assembly
7-23	Claw Arm Complete
7-24	Preamplifier Circuit Board Complete
7-25	Amplifier Complete
7-26	Power Supply Board Assembly
7-27	Circuit Board Complete
7-28	Record Amplifier Circuit Board Complete
7-29	Housing Assembly
7-30	Base Assembly
7-31	Lamp Supply Unit Complete
7-32	Douser and Solenoid Assembly
7-33	Amplifier Complete
7-34	Amplifier Circuit Board Complete

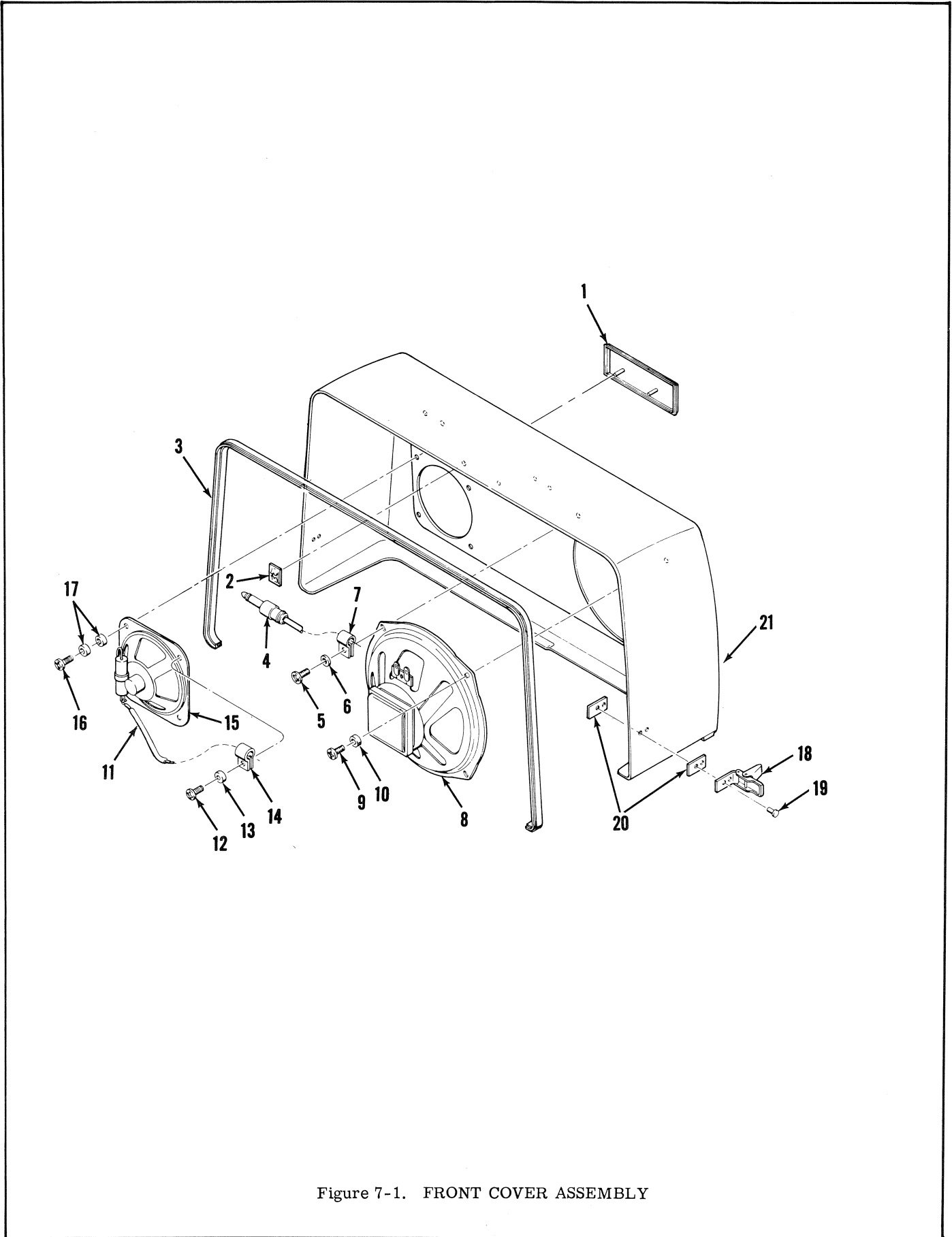


Figure 7-1. FRONT COVER ASSEMBLY

GRAFLEX 16 PROJECTOR

Section VII
Subassemblies Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION 1 2 3 4 5	QTY	PART NUMBER						
				39047-G1	39047-G2	39047-G3	39291-G1	39291-G2	39291-G3	
1-	39047-G1	COVER ASSEMBLY, Front	REF	x						
	39047-G2	COVER ASSEMBLY, Front	REF		x					
	39047-G3	COVER ASSEMBLY, Front	REF			x				
	39291-G1	COVER ASSEMBLY, Front	REF				x			
	39291-G2	COVER ASSEMBLY, Front	REF					x		
	39291-G3	COVER ASSEMBLY, Front	REF						x	
-1	39109-G1	. NAMEPLATE ASSEMBLY.	1	x	x	x	x	x		
	39109-G2	. NAMEPLATE ASSEMBLY.	1						x	
	39110-P1	. . NAMEPLATE.	1	x	x	x	x	x		
	41436-P1	. . NAMEPLATE. (ATTACHING PARTS)	1						x	
-2	38443	. NUT, Speed ----*----	2	x	x	x	x	x	x	
-3	39036-P1	. FRAME	1	x	x	x	x	x	x	
-4	38421-P1	. CABLE, Speaker (ATTACHING PARTS)	1	x	x	x				
-5	116-6R6H	. SCREW, No. 6-32 x 3/8 pan hd.	1	x	x	x				
-6	38473-16	. WASHER, Flat, 0.375 x 0.156 x 0.050	1	x	x	x				
-7	267-3	. CLAMP	1	x						
	267-1	. CLAMP ----*----	1		x	x				
-8	38417-P1	. SPEAKER (ATTACHING PARTS)	1	x	x	x				
-9	116-6R6H	. SCREW (see index 5)	3	x	x	x				
-10	32090-51	. SPACER ----*----	3	x	x	x				
-11	38444-P2	. CABLE, Tweeter (ATTACHING PARTS)	1	x						
-12	116-6R6H	. SCREW (see index 5)	1	x						
-13	32090-51	. SPACER	1	x						
-14	267-1	. CLAMP ----*----	1	x						
-15	38418-P1	. TWEETER. (ATTACHING PARTS)	1	x						
-16	116-6R6H	. SCREW (see index 5)	3	x						
-17	32090-51	. SPACER ----*----	6	x						
-18	39041-P1	. LATCH (ATTACHING PARTS)	4	x	x	x	x	x	x	
-19	175-6-20H	. RIVET, Latch	8	x	x	x	x	x	x	
-20	39042	. SPACER ----*----	8	x	x	x	x	x	x	
-21		. COVER, Subassembly.	1	x	x	x	x	x	x	

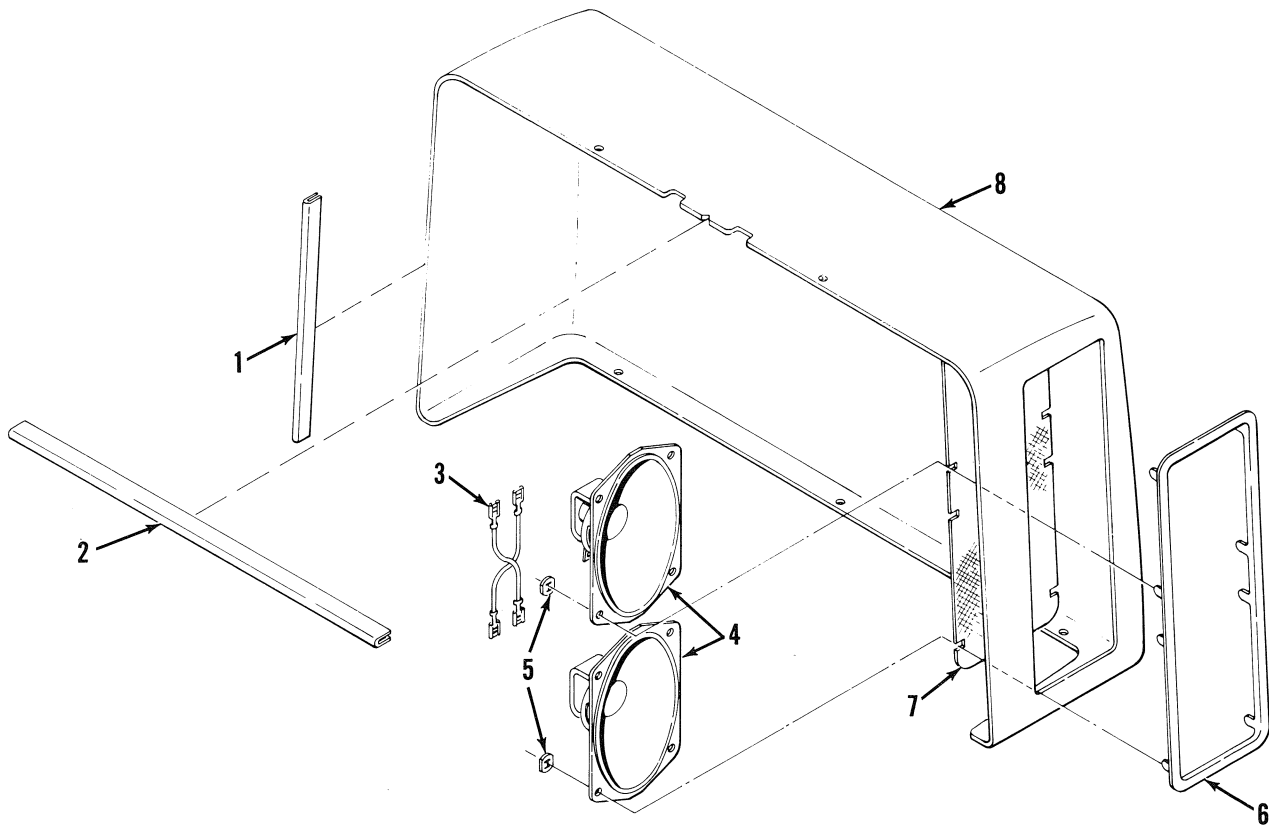


Figure 7-2. REAR COVER COMPLETE

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER				
				1	2	3	4	5
2-	39116-G1	COVER COMPLETE, Rear	REF	x				
	39116-G2	COVER COMPLETE, Rear	REF	x				
	39295-G1	COVER COMPLETE, Rear	REF		x			
	39295-G2	COVER COMPLETE, Rear	REF			x		
	39295-G3	COVER COMPLETE, Rear	REF				x	
-1	39474-P3	. DAMPENER, Side	1		x	x	x	
-2	39474-P2	. DAMPENER, Top	1		x	x	x	
-3	39344-G1	. WIRE ASSEMBLY	2		x	x	x	
-4	39298-P1	. SPEAKER	2		x	x		
	39298-P1	. SPEAKER (ATTACHING PARTS)	1				x	
-5	39299	. NUT, Speed -----*	8		x	x	x	
-6	39296-P1	. BEZEL	1		x	x	x	
-7	39297-P1	. GRILLE	1		x	x		
	39297-P2	. GRILLE	1				x	
-8	39116-G3	. COVER ASSEMBLY	1		x		x	
	39116-G4	. COVER ASSEMBLY	1				x	

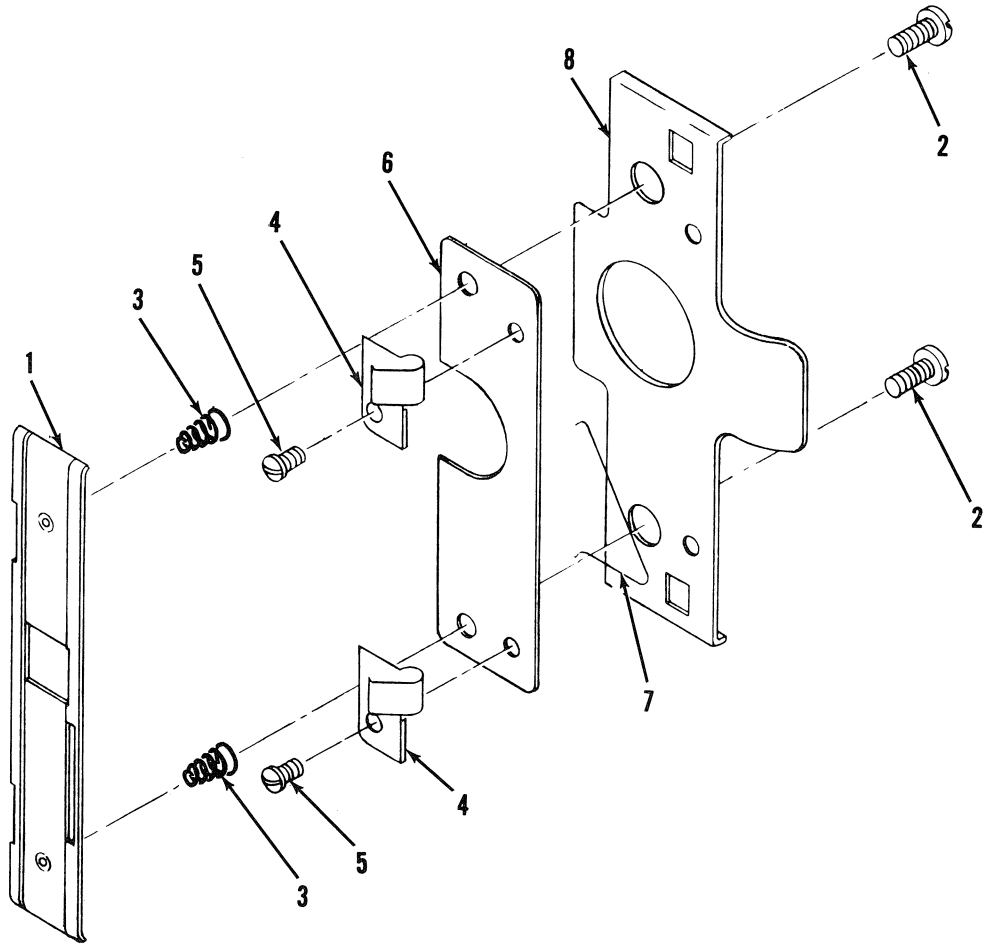


Figure 7-3. FILM PRESSURE SHOE COMPLETE

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																		
				1	2	3	4	5														
3-	38472-G2	SHOE COMPLETE, Film Pressure	REF																			
-1	38476-G1	. SHOE ASSEMBLY	1																			
-2	38479	. SCREW, Special	2																			
-3	38331	. SPRING, Pressure Shoe, Lower	2																			
-4	38035-P1	. GUIDE, Film	2																			
-5	38279	. SCREW, Special	2																			
-6	38258-P1	. PLATE, Shoe Adjusting	1																			
-7	38448	. SPRING, Pressure Shoe,	1																			
-8	38259-P1	. PLATE, Shoe Mounting	1																			

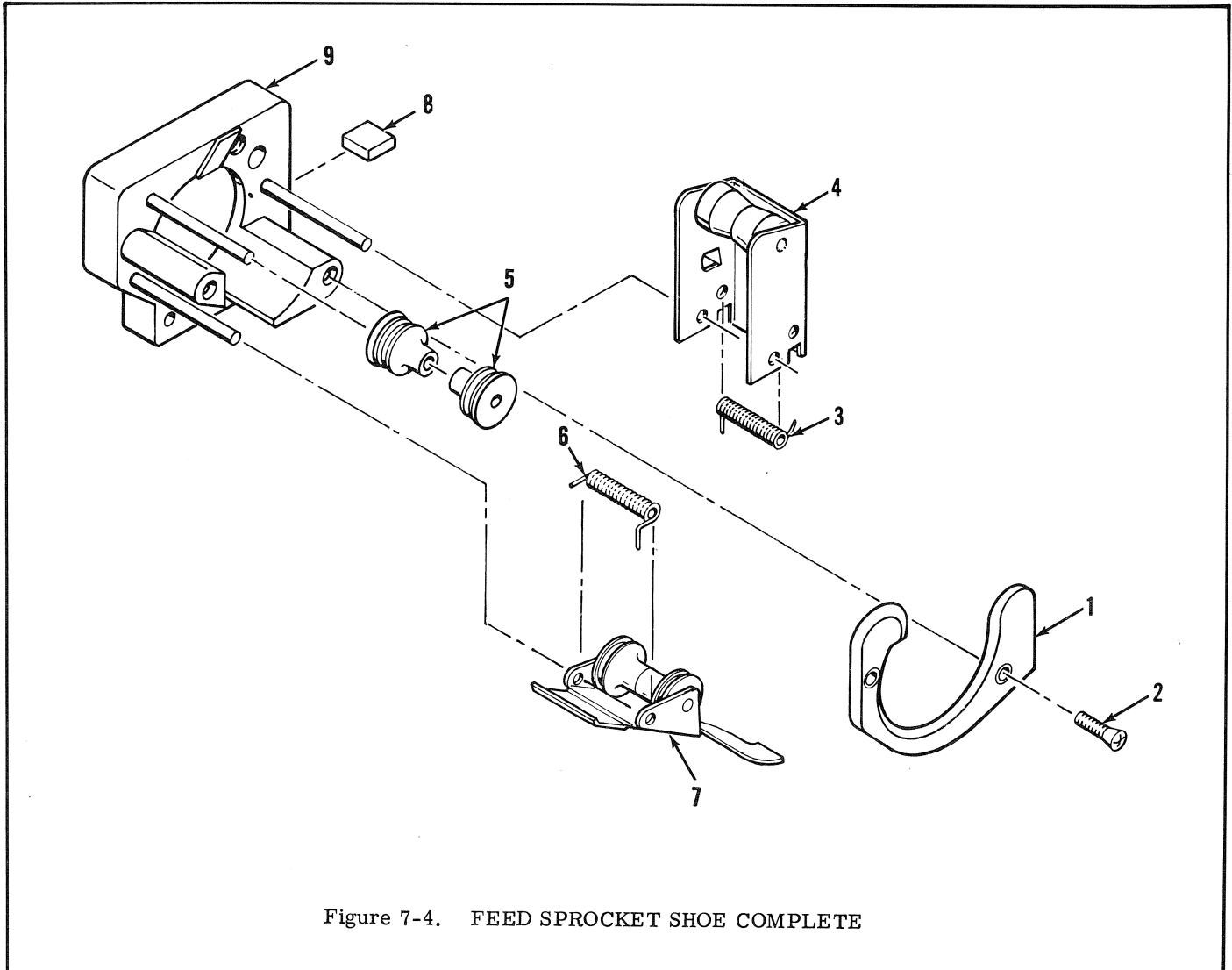


Figure 7-4. FEED SPROCKET SHOE COMPLETE

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																
				1	2	3	4	5												
				38350-G2																
4-	38350-G2	SHOE COMPLETE, Feed Sprocket	REF	X																
-1	38359-P1	. COVER (ATTACHING PARTS)	1	X																
-2	38387	. SCREW, Special -----*	2	X																
-3	39171-P1	. SPRING, Feed Sprocket Dampener	1	X																
-4	38830-G2	. DAMPENER ASSEMBLY	1	X																
-5	38360	. ROLLER	2	X																
-6	38358	. SPRING, Feed Sprocket Follower	1	X																
-7	38353-G1	. FOLLOWER ASSEMBLY	1	X																
-8	39219	. PAD	1	X																
-9	38351-G1	. SHOE ASSEMBLY.	1	X																

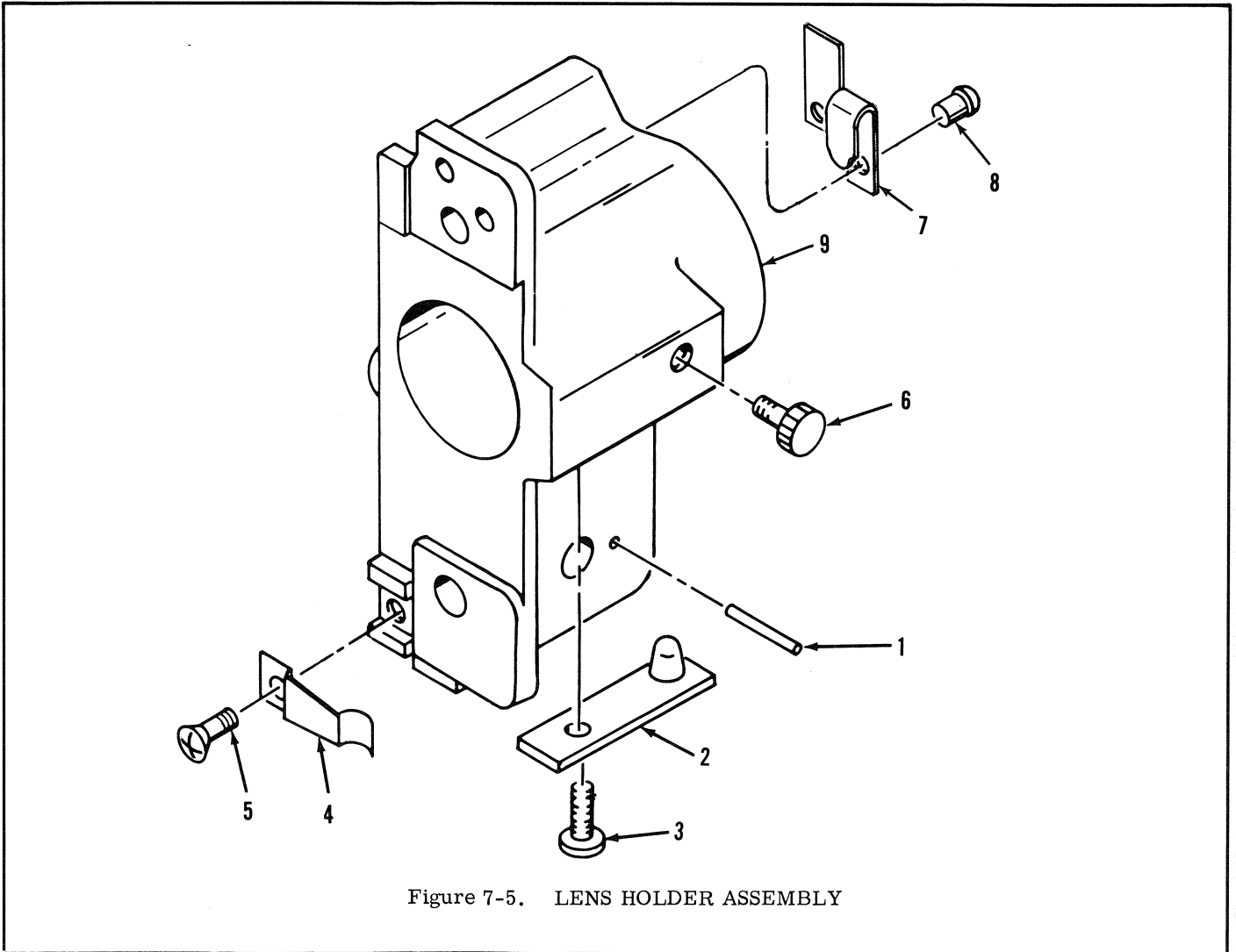


Figure 7-5. LENS HOLDER ASSEMBLY

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER			
				38071-G2	38071-G3	38071-G4	
5-	38071-G2	HOLDER ASSEMBLY, Lens	REF	x			
	38071-G3	HOLDER ASSEMBLY, Lens	REF	x			
	38071-G4	HOLDER ASSEMBLY, Lens	REF		x		
-1	183-2-6	. GROOV PIN	1	x	x	x	
-2	38239-G1	. SPRING ASSEMBLY	1	x	x		
	38239-G2	. SPRING ASSEMBLY (ATTACHING PARTS)	1			x	
-3	116-4R2H	. SCREW, No. 4-40 x 1/8 pan hd. ----*----	1	x	x	x	
-4	38270	. SPRING, Lower (ATTACHING PARTS)	1	x	x	x	
-5	116-4R2H	. SCREW (see index 3) ----*----	1	x	x	x	
-6	38269	. SCREW, Special	1	x		x	
-7	38073-P1	. SPRING, Upper (ATTACHING PARTS)	1	x	x	x	
-8	33561-6H	. RIVET ----*----	2	x	x	x	
-9	38072-P2	. HOLDER	1	x	x		
	38072-P4	. HOLDER	1			x	

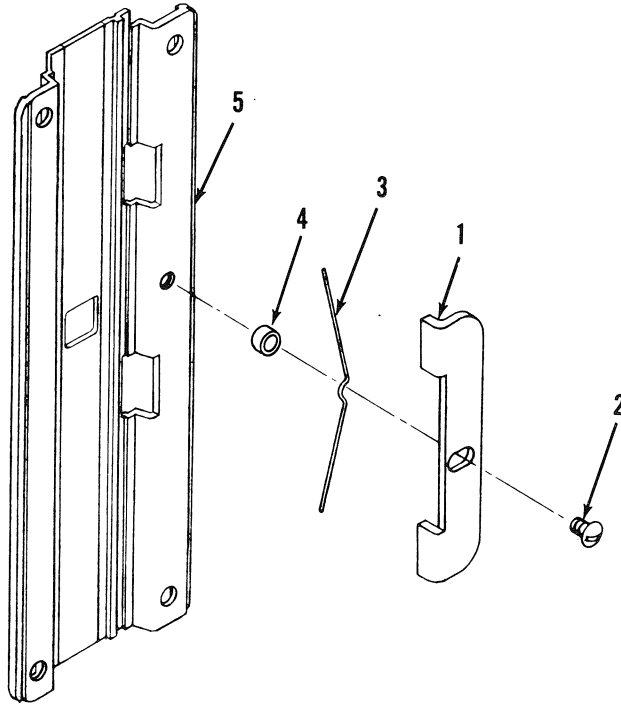


Figure 7-6. APERTURE PLATE ASSEMBLY

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION 1 2 3 4 5	QTY	PART NUMBER																				
				38820-G1																				
6-	38820-G1	PLATE ASSEMBLY, Aperture	REF																					
-1	38818-P1	. GUIDE	1	X																				
-2	112-2-2L	. SCREW, No. 2-56 x 1/8 truss hd.	1	X																				
-3	38819	. SPRING	1	X																				
-4	32090-41	. SPACER	1	X																				
-5	38066-P2	. PLATE	1	X																				

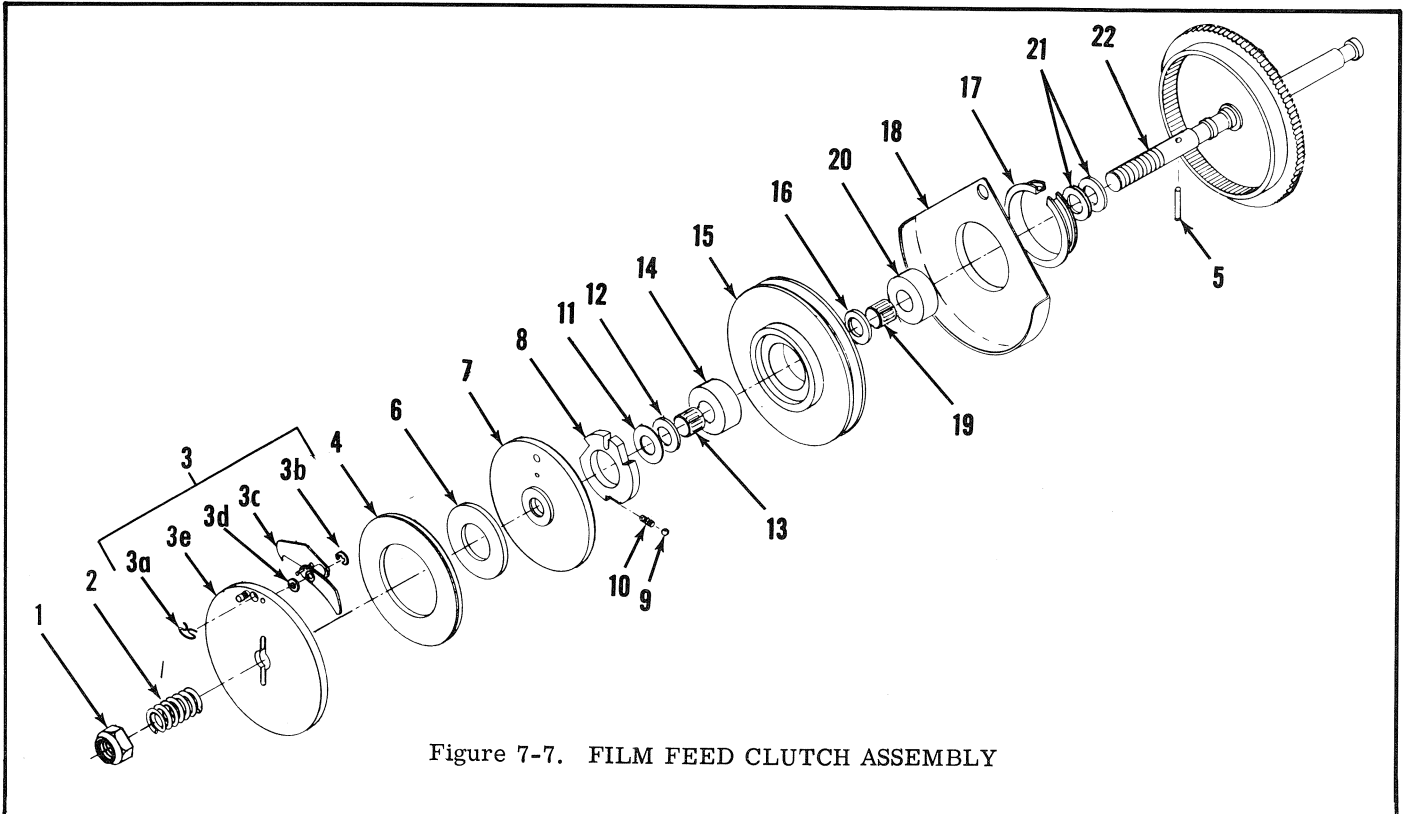


Figure 7-7. FILM FEED CLUTCH ASSEMBLY

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																				
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
7-	39151-G1	CLUTCH ASSEMBLY, Film Feed	REF																					
	39151-G2	CLUTCH ASSEMBLY, Film Feed	REF																					
-1	203-6	. . . NUT, Stop	1																					
-2	39141-P1	. . . SPRING	1																					
-3	39121-G1	. . . PLATE COMPLETE, Drive Clutch	1																					
-3a	39232-P1	. . . SPRING, Toggle	1																					
-3b	251-5	. . . RING, Retaining	1																					
-3c	39126-G1	. . . PAWL ASSEMBLY	1																					
-3d	33500-52	. . . WASHER, 0.203 x 0.094 x 0.008	1																					
-3e	39122-G2	. . . PLATE ASSEMBLY	1																					
-4	39139	. . . FACING, Clutch	1																					
-5	39140	. . . PIN	1																					
-6	38473-15	. . . WASHER, Flat, 0.998 x 0.383 x 0.051	1																					
-7	39117-G1	. . . PLATE ASSEMBLY, Drive Clutch	1																					
-8	39137-P1	. . . PLATE, Cam	1																					
-9	300-18	. . . BALL	3																					
-10	39138-P1	. . . SPRING	3																					
-11	35473-48	. . . WASHER, Flat, 0.500 x 0.254 x 0.005	A/R																					
-12	33500-56H	. . . WASHER, Flat, 0.437 x 0.252 x 0.048	1																					
-13	39136	. . . RING	1																					
-14	39134	. . . BEARING	1																					
-15	39135-P1	. . . PULLEY	1																					
-16	33500-56H	. . . WASHER, Flat (see index 12)	1																					
-17	39198	. . . BEARING	1																					
-18	39199-P1	. . . GUIDE, Belt	1																					
-19	39136	. . . RING	1																					
-20	39134	. . . BEARING	1																					
-21	33500-56H	. . . WASHER, Flat, (see index 12)	2																					
-22	39115-G1	. . . GEAR ASSEMBLY, Feed Sprocket	1																					

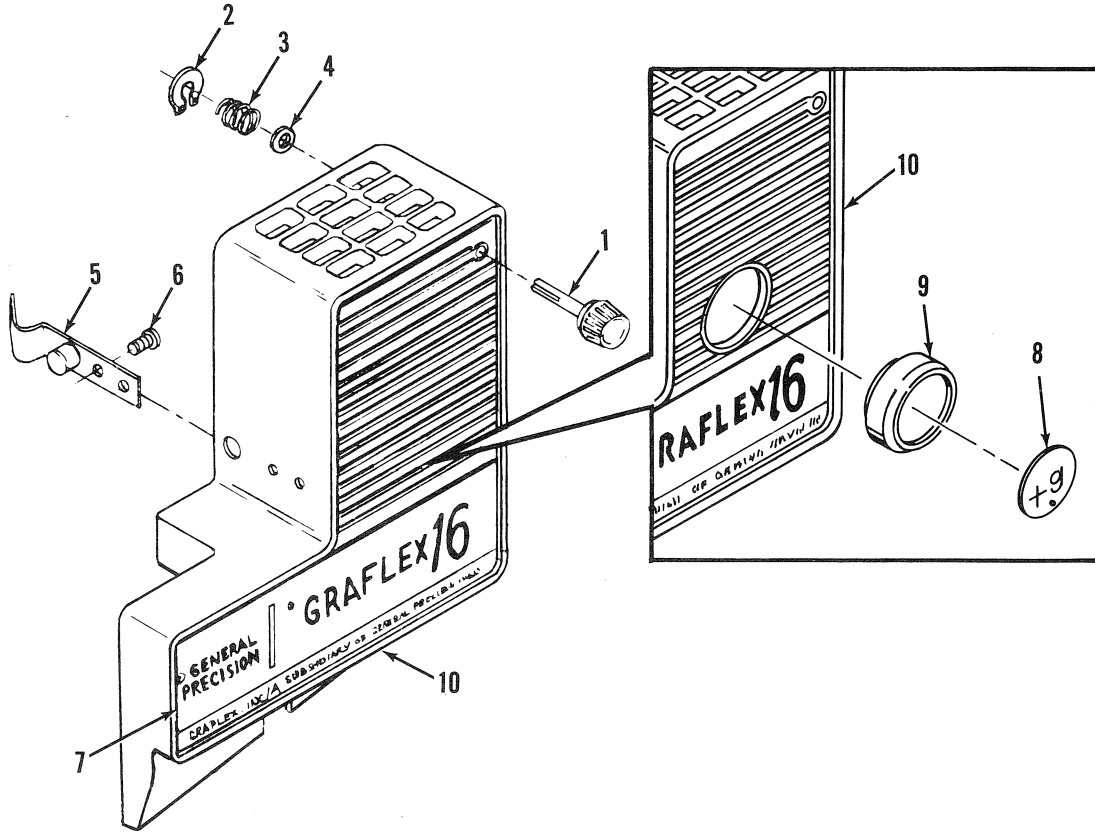


Figure 7-8. LAMPHOUSE COVER ASSEMBLY

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																						
				1	2	3	4	5	39184-G1	39184-G3	39184-G4	39184-G5	41368-G1													
8-	39184-G1	COVER ASSEMBLY, Lamphouse	REF	x																						
	39184-G3	COVER ASSEMBLY, Lamphouse	REF		x																					
	39184-G4	COVER ASSEMBLY, Lamphouse	REF			x																				
	39184-G5	COVER ASSEMBLY, Lamphouse	REF				x																			
	41368-G1	COVER ASSEMBLY, Lamphouse	REF					x																		
-1	38246-G1	. KNOB ASSEMBLY (ATTACHING PARTS)	1	x	x	x	x	x	x																	
-2	252-2	. RING, Retaining ---*---	1	x	x	x	x	x	x																	
-3	38486-P1	. SPRING	1	x	x	x	x	x	x																	
-4	30473-52A	. WASHER, Flat, 0.312 x 0.189 x 0.010 . . .	1	x	x	x	x	x	x																	
-5	38254-G1	. LATCH ASSEMBLY (ATTACHING PARTS)	1	x	x	x	x	x	x																	
-6	140-4R3A	. SCREW, No. 4-40 x 3/16 pan hd. ---*---	2	x	x	x	x	x	x																	
-7	39183-P1	. NAMEPLATE	1	x			x	x																		
	41437-P1	. NAMEPLATE	1						x																	
-8	39626	. MEDALLION	1						x																	
-9	41372	. BEZEL	1						x																	
-10	38181-P1	. COVER	1	x																						
	38181-P2	. COVER	1						x																	
	41032-P1	. COVER	1							x																
	41032-P2	. COVER	1								x															
	41412-P1	. COVER	1									x														

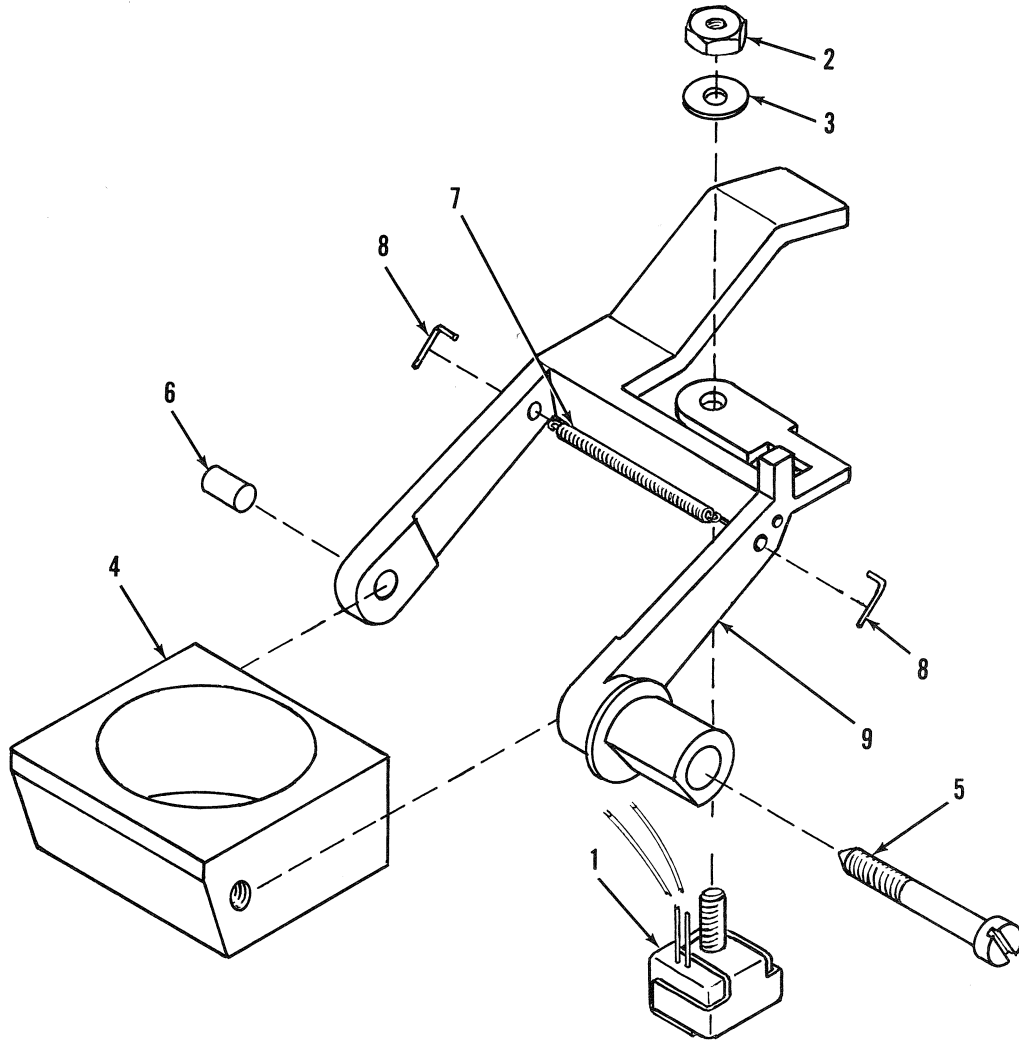


Figure 7-9. ERASE HEAD AND YOKE ASSEMBLY

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER															
				1	2	3	4	5	41021-G1										
9-	41021-G1	ERASE HEAD AND YOKE ASSEMBLY	REF																
-1	41029-P1	. HEAD, Erase	1																
		(ATTACHING PARTS)																	
-2	200-2HL	. NUT, No. 2-56	1																
-3	221-2L	. WASHER, Lock	1																
		-----*																	
-4	41022-P1	. MOUNT	1																
		(ATTACHING PARTS)																	
-5	41027	. SCREW, Locking	1																
-6	30685-25	. PIN, Dowel	1																
		-----*																	
-7	41025-P1	. SPRING	1																
		(ATTACHING PARTS)																	
-8	41026	. ANCHOR	2																
		-----*																	
-9	41024-P1	. YOKE	1																

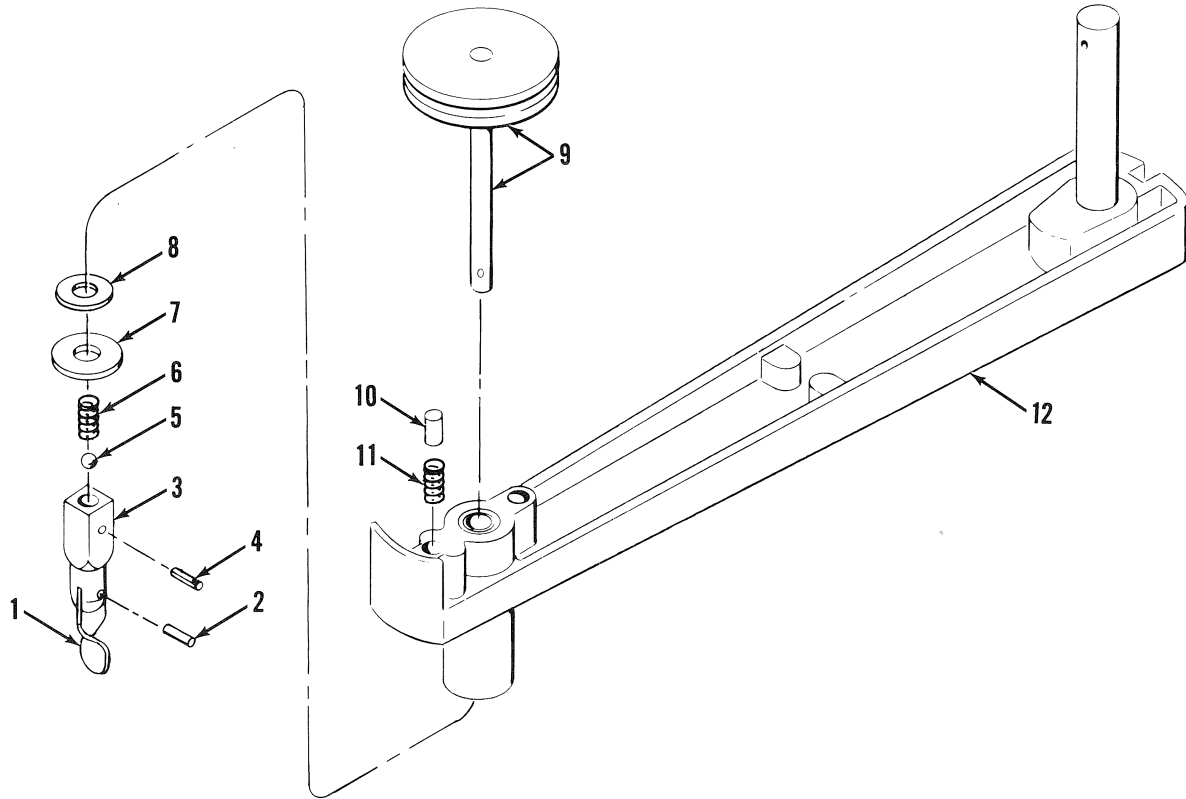


Figure 7-10. SUPPLY AND TAKEUP REEL ARMS COMPLETE

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																		
				39175-G1	39175-G2	39175-G3	39175-G4	39175-G5														
10-	39175-G1	ARM COMPLETE, Supply Reel	REF	x																		
	39175-G2	ARM COMPLETE, Takeup Reel	REF		x																	
	39175-G3	ARM COMPLETE, Supply Reel	REF			x																
	39175-G4	ARM COMPLETE, Takeup Reel	REF				x															
	39175-G5	ARM COMPLETE, Supply Reel	REF					x														
-1	38257	. RETAINER (ATTACHING PARTS)	1	x	x	x	x	x														
-2	38256	. PIN ---*---	1	x	x	x	x	x														
-3	38096-P1	. SPINDLE (ATTACHING PARTS)	1	x	x	x	x	x														
-4	38990	. ROLL PIN ---*---	1	x	x	x	x	x														
-5	300-7	. BALL	1	x	x	x	x	x														
-6	38255-P1	. SPRING, Reel Retainer	1	x	x	x	x	x														
-7	38097-P2	. COLLAR	1		x																	
-8	39197	. WASHER, Special	1	x		x		x														
	35473-72	. WASHER, Flat, 0.500 x 0.190 x 0.010	1		x		x															
-9	39180-G1	. PULLEY ASSEMBLY	1	x		x		x														
	39180-G2	. PULLEY ASSEMBLY	1		x		x															
-10	38099	. BRAKE	1	x		x		x														
	38099	. BRAKE	2		x		x															
-11	39176-P1	. SPRING, Reel Brake	1	x		x		x														
	39176-P1	. SPRING, Reel Brake	2		x		x															
-12	39177-G1	. ARM ASSEMBLY	1	x	x																	
	39177-G2	. ARM ASSEMBLY	1				x															
	39177-G3	. ARM ASSEMBLY	1			x		x														

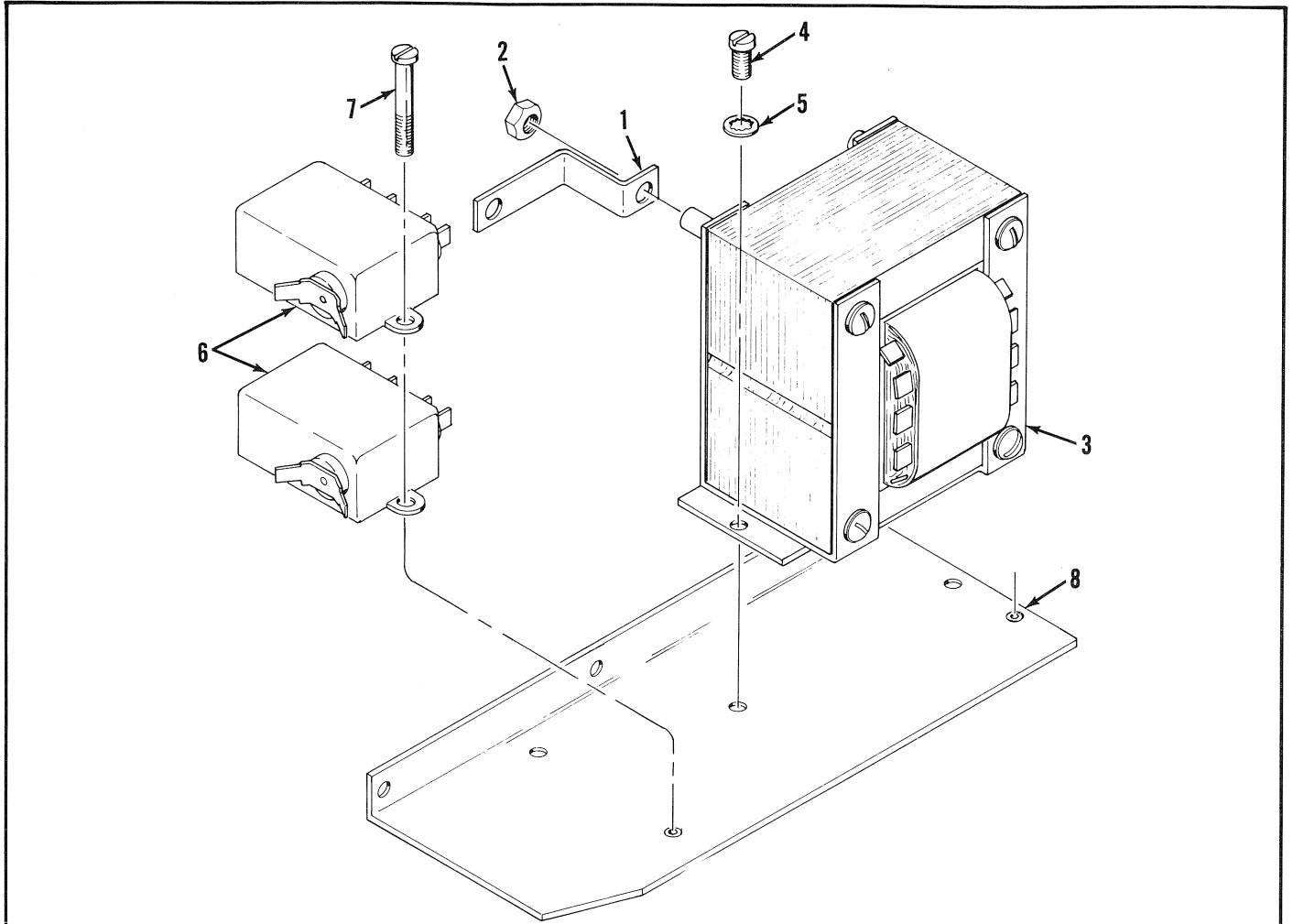
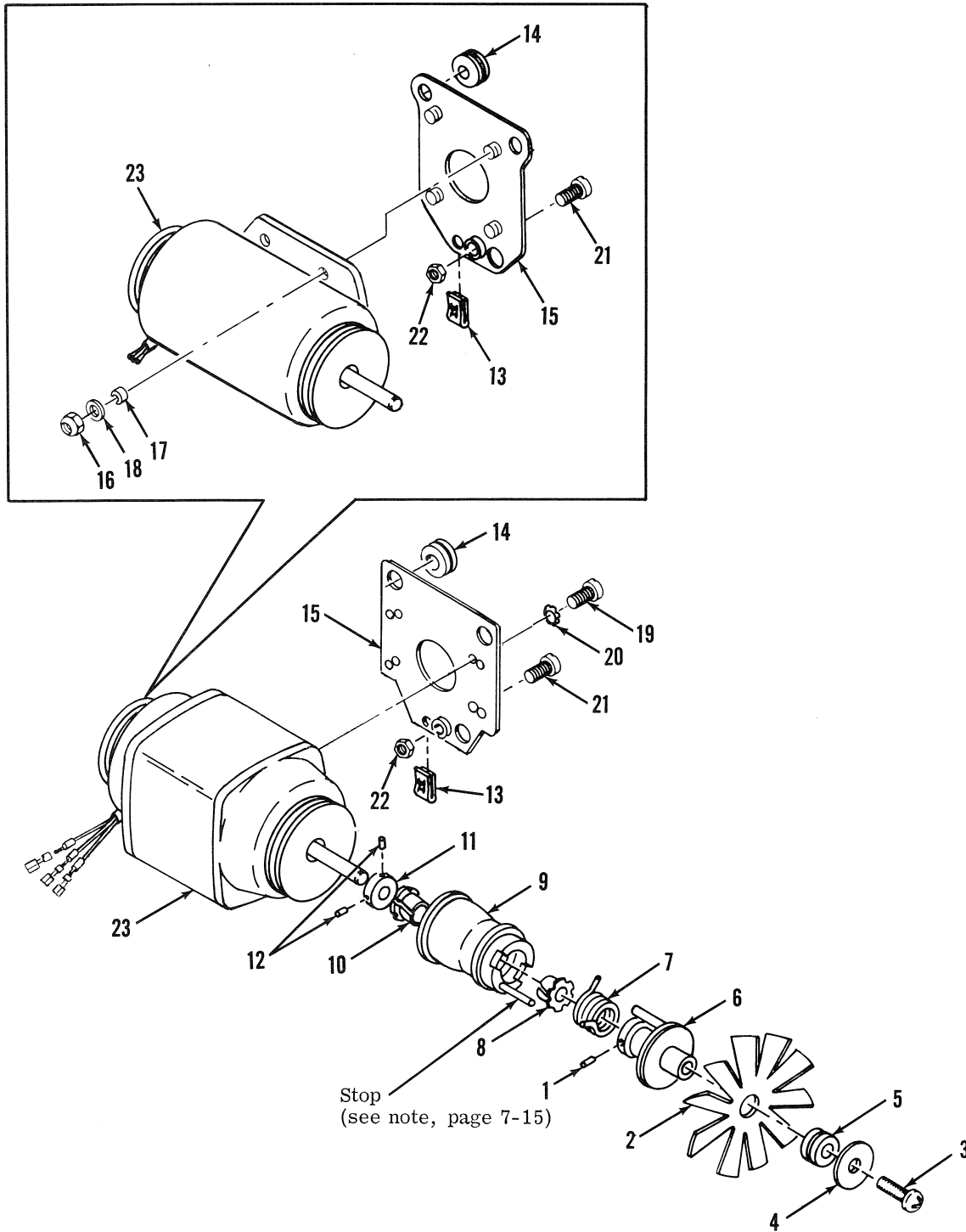


Figure 7-11. TRANSFORMER PLATFORM COMPLETE

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																		
				39045-G1	39045-G2	39045-G3																
11-	39045-G1	PLATFORM COMPLETE, Transformer	REF	x																		
	39045-G2	PLATFORM COMPLETE, Transformer	REF		x																	
	39045-G3	PLATFORM COMPLETE, Transformer	REF			x																
-1	39189-P1	. BRACKET	1	x																		
	39188	. BRACKET (ATTACHING PARTS)	1		x	x																
-2	200-8HH	. NUT, No. 8-32 ---*---	1	x	x	x																
-3	38848-P1	. TRANSFORMER	1	x																		
	39210-P1	. TRANSFORMER (ATTACHING PARTS)	1		x	x																
-4	116-6R6H	. SCREW, No. 6-32 x 3/8 pan hd.	2	x	x	x																
-5	221-6	. WASHER, Lock ---*---	2	x	x	x																
-6	38340-P1	. NETWORK (ATTACHING PARTS)	2	x	x																	
-7	116-6R18H	. SCREW, 6-32 x 1-1/8 pan hd ---*---	2	x	x																	
-8	39191-G1	. PLATFORM ASSEMBLY	1	x	x	x																



NOTE: See page 8-6 before ordering parts for replacement

Figure 7-12. DRIVE UNIT ASSEMBLY

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Subassemblies Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER													
				39114-G1	39114-G4	39114-G5	39114-G6	39114-G7	39114-G8	40458-G1							
12-	39114-G1	DRIVE UNIT ASSEMBLY	REF	x													
	39114-G4	DRIVE UNIT ASSEMBLY	REF		x												
	39114-G5	DRIVE UNIT ASSEMBLY	REF			x											
	39114-G6	DRIVE UNIT ASSEMBLY	REF				x										
	39114-G7	DRIVE UNIT ASSEMBLY	REF					x									
	39114-G8	DRIVE UNIT ASSEMBLY	REF						x								
	40458-G1	DRIVE UNIT ASSEMBLY	REF							x							
-1	192-4-8	. PIN, Spirol	1	x	x	x	x	x	x	x							
	171-6-6	. SETSCREW, No. 6-32 x 3/8 cup pt.	1								x						
*	39105-G1	. FAN AND HUB ASSEMBLY	1	x	x	x	x	x	x	x							
	39105-G3	. FAN AND HUB ASSEMBLY	1									x					
-2	39128-P1	. . FAN (ATTACHING PARTS)	1	x	x	x	x	x	x	x							
-3	140-10R6A	. . SCREW, No. 10-24 x 3/8 pan hd.	1	x	x	x	x	x	x	x							
-4	35473-42	. . WASHER, Flat, 0.875 x 0.203 x 0.062	1	x	x	x	x	x	x	x							
-5	265-5	. . GROMMET	1	x	x	x	x	x	x	x							
		---*---															
-6	39105-G2	. . HUB ASSEMBLY	1	x	x	x	x	x	x								
	39105-G4	. . HUB ASSEMBLY	1								x						
-7	39098-P1	. . SPRING	1	x	x	x	x	x	x	x							
-8	38206-3	. BEARING	2	x	x	x	x	x	x	x							
-9	39096-G1	. PULLEY ASSEMBLY	1	x	x												
	39096-G2	. PULLEY ASSEMBLY	1			x	x	x	x								
	40465-G1	. PULLEY ASSEMBLY	1								x						
-10	38206-3	. BEARING	1	x	x	x	x	x	x	x							
-11	39099	. COLLAR (ATTACHING PARTS)	1	x	x	x	x	x	x	x							
-12	171-4-2L	. SETSCREW, No. 4-40 x 1/8 cup pt	2	x	x	x	x	x	x	x							
		---*---															
-13	39078	. NUT, Speed	1	x	x	x	x	x	x								
-14	265-5	. GROMMET	2	x	x	x	x	x	x	x							
-15	39076-G1	. PLATE ASSEMBLY	1	x	x	x	x	x	x								
	40463-G1	. PLATE ASSEMBLY (ATTACHING PARTS)	1								x						
-16	203-5	. NUT, Stop	4								x						
-17	40590-5	. SPACER	4								x						
-18	35473-46A	. WASHER, Flat, 0.500 x 0.200 x 0.032	4								x						
-19	100-8-5A	. SCREW, No. 8-32 x 5/16 flat hd.	4	x	x	x	x	x	x	x							
-20	223-8	. WASHER, Lock	4	x	x	x	x	x	x								
		---*---															
-21	39082-G1	. SCREW ASSEMBLY	1	x	x	x	x	x	x	x							
-22	200-10HA	. NUT, No. 10-24	1	x	x	x	x	x	x	x							
-23	38415-G3	. MOTOR ASSEMBLY	1	x													
	39349-G1	. MOTOR ASSEMBLY	1		x												
	38415-G6	. MOTOR ASSEMBLY	1			x											
	38415-G7	. MOTOR ASSEMBLY	1				x										
	39349-G2	. MOTOR ASSEMBLY	1					x									
	39349-G3	. MOTOR ASSEMBLY	1							x							
	40459-G1	. MOTOR ASSEMBLY	1									x					

NOTE: Also available for replacement:
 Stop 39091P1 used with Pulley Assembly 39096G1 above
 Stop 39092P2 used with Pulley Assembly 39096G2 & 40465G1 above

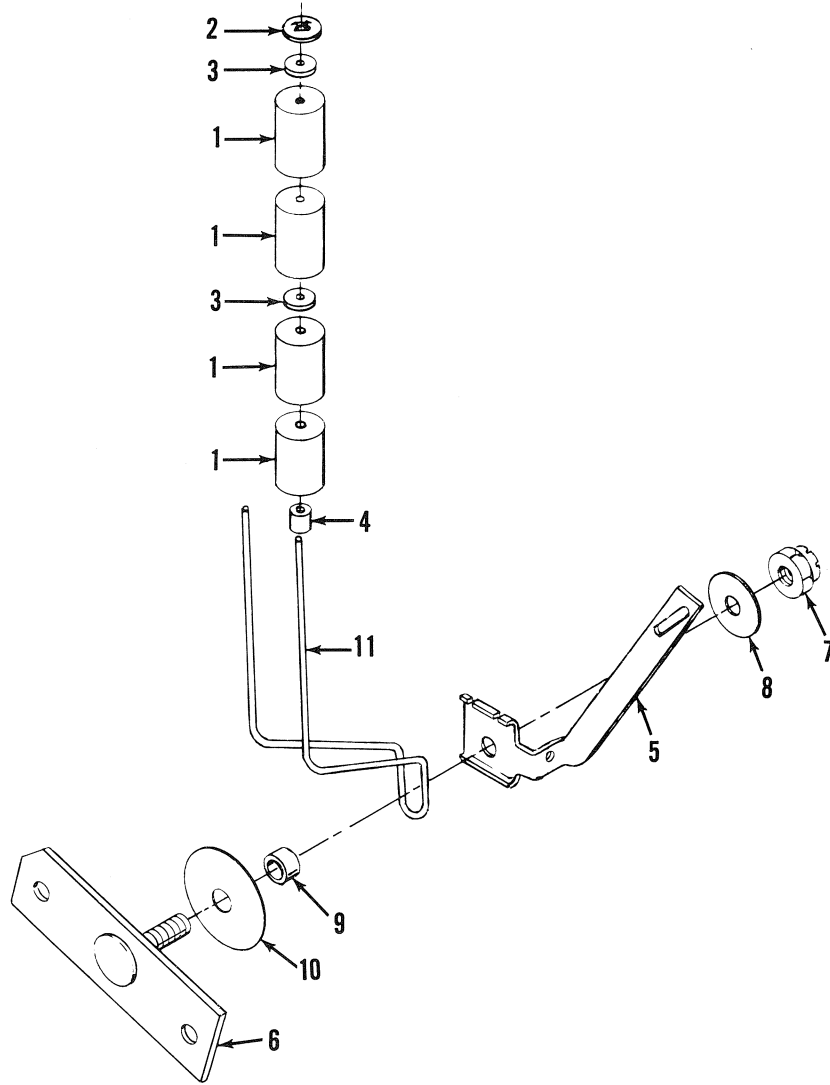


Figure 7-13. DRIVE BELT SHIFT FORK ASSEMBLY

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
13-	39112-G1	FORK ASSEMBLY, Drive Belt Shift	REF	x																
-1	39092	. ROLLER	8	x																
		(ATTACHING PARTS)																		
-2	39106	. NUT, Speed	2	x																
-3	35473-27A	. WASHER, Flat, 0.243 x 0.115 x 0.032 . . .	4	x																
-4	32090-49	. SPACER.	2	x																
		---*---																		
-5	39089-P1	. LEVER	1	x																
-6	39087-G1	. SUPPORT ASSEMBLY	1	x																
		(ATTACHING PARTS)																		
-7	203-5	. NUT, Stop.	1	x																
-8	33500-25A	. WASHER, Flat, 0.437 x 0.190 x 0.014 . . .	1	x																
-9	41086-4	. SPACER.	1	x																
-10	38473-14A	. WASHER, Flat, 0.944 x 0.259 x 0.010 . . .	1	x																
		---*---																		
-11	39090-P1	. FORK	1	x																

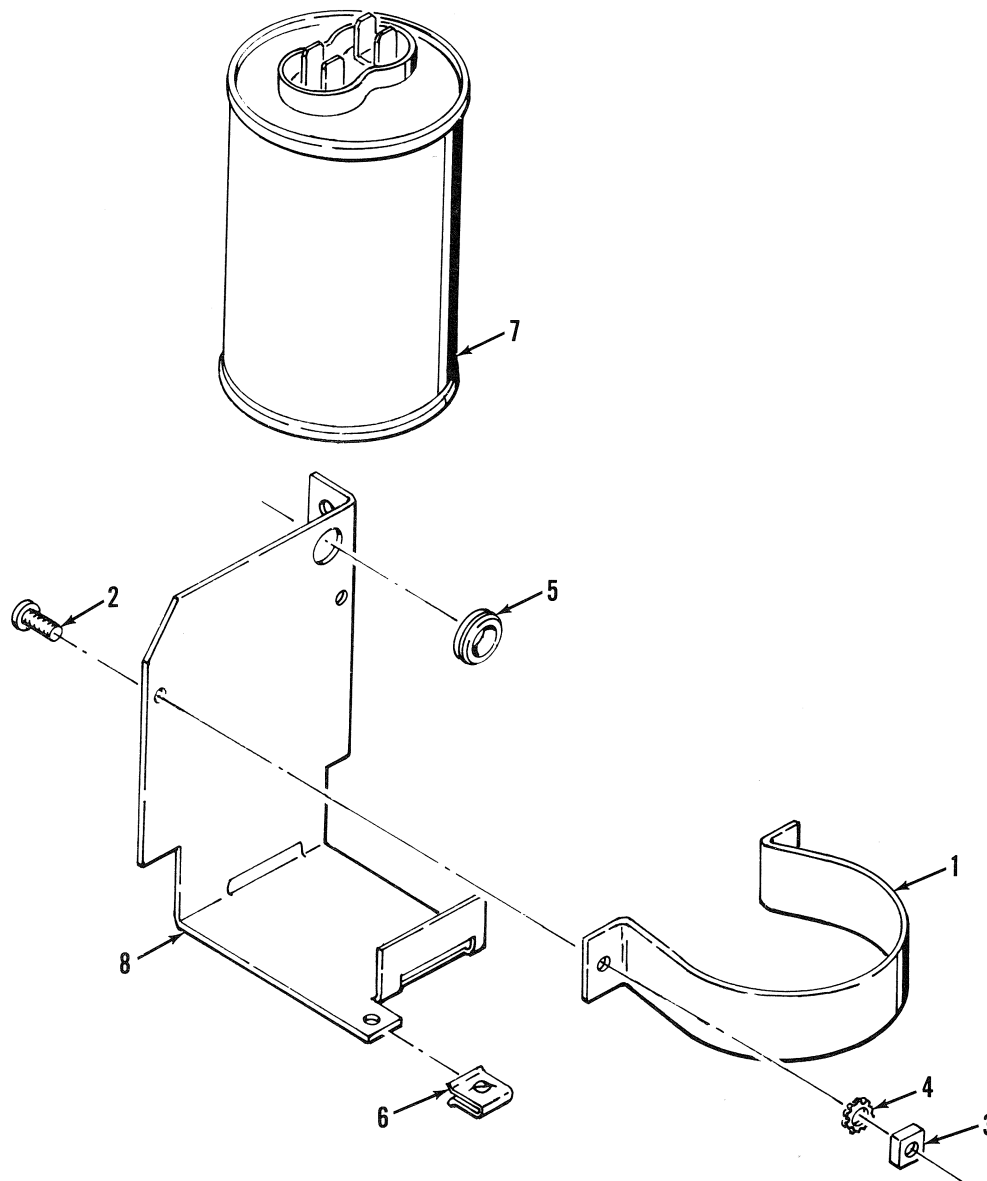


Figure 7-14. CAPACITOR AND BRACKET ASSEMBLY

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER														
				1	2	3	4	5										
14-	40472-G1	CAPACITOR AND BRACKET ASSEMBLY . . .	REF															
-1	40449-P1	CLIP (ATTACHING PARTS)	1	X														
-2	116-6R6H	SCREW, No. 6-32 x 3/8 pan hd.	2	X														
-3	200-6SH	NUT, No. 6-32	2	X														
-4	220-6	WASHER, Lock	2	X														
		-----*																
-5	265-3	GROMMET	1	X														
-6	38309	NUT, Speed	1	X														
-7	40450-P1	CAPACITOR	1	X														
-8	40473-P1	BRACKET	1	X														

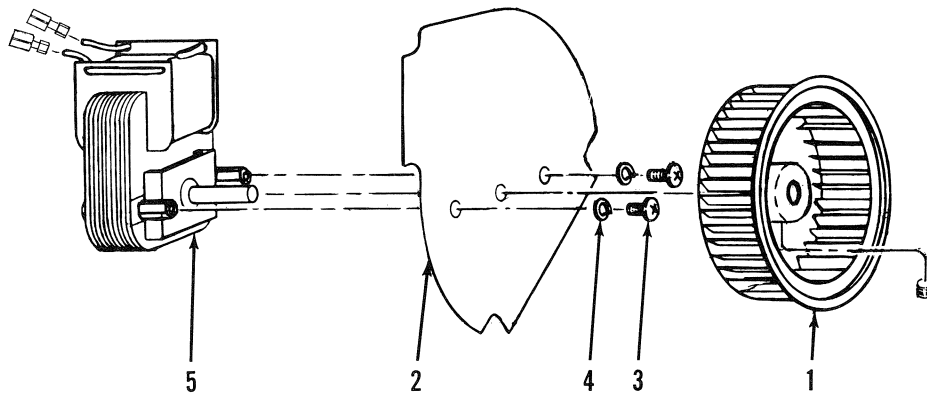


Figure 7-15. MOTOR MOUNTING PLATE ASSEMBLY

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																			
				1	2	3	4	5	38167-G1	38167-G2	38167-G3	41042-G1											
15-	38167-G1	PLATE ASSEMBLY, Motor Mounting	REF	x																			
	38167-G2	PLATE ASSEMBLY, Motor Mounting	REF		x																		
	38167-G3	PLATE ASSEMBLY, Motor Mounting	REF			x																	
	41042-G1	PLATE ASSEMBLY, Motor Mounting	REF					x															
	-1	38195-P1	. WHEEL, Blower	1	x	x	x	x															
-2	39012-P1	. PLATE (ATTACHING PARTS)	1	x	x	x	x																
-3	116-6R4H	. SCREW, No. 6-32 x 1/4 pan hd.	2	x	x	x	x																
-4	221-6H	. WASHER, Lock	2	x	x	x																	
-5	38414-G1	. MOTOR ASSEMBLY	1	x																			
	38414-G2	. MOTOR ASSEMBLY	1		x																		
	38414-G3	. MOTOR ASSEMBLY	1			x																	
	41044-G1	. MOTOR ASSEMBLY	1					x															

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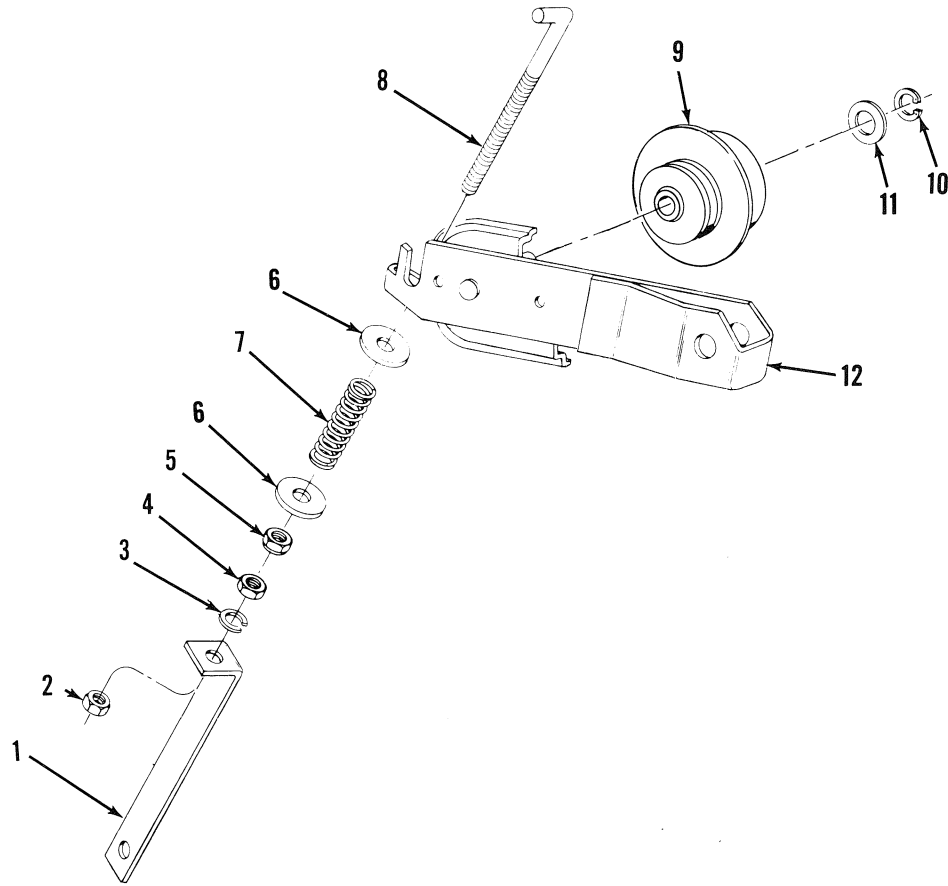


Figure 7-16. TAKEUP CLUTCH ARM COMPLETE

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER													
				39155-G1	39155-G2												
16-	39155-G1	ARM COMPLETE, Takeup Clutch	REF	x													
-1	39155-G2	ARM COMPLETE, Takeup Clutch	REF		x												
-1	39165-P1	. BRACKET (ATTACHING PARTS)	1	x	x												
-2	201-10HA	. NUT, No. 10-24 ----*----	1	x	x												
-3	230-9	. WASHER, Split	1	x	x												
-4	201-10HA	. NUT, (see index 2)	1	x	x												
-5	203-5	. NUT, Stop, No. 10-32	1	x	x												
-6	35473-59A	. WASHER, Flat, 0.625 x 0.195 x 0.020	2	x	x												
-7	39164-P1	. SPRING	1	x	x												
-8	39166-P1	. ROD	1	x	x												
-9	39159-G1	. PULLEY ASSEMBLY (ATTACHING PARTS)	1	x	x												
-10	253-3	. RING, Retaining	1	x	x												
-11	35473-65	. WASHER, Flat, 0.500 x 0.254 x 0.020 ----*----	1	x	x												
-12	39156-G1	. ARM ASSEMBLY	1	x													
-12	39156-G2	. ARM ASSEMBLY	1		x												

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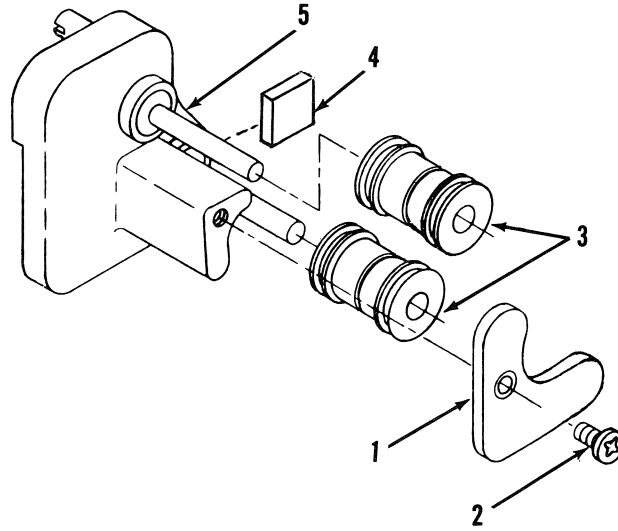


Figure 7-17. TAKEUP SPROCKET SHOE ARM COMPLETE

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																					
				1	2	3	4	5	38217-G1																
17-	38217-G1 38222	ARM COMPLETE, Takeup Sprocket Shoe . . .	REF	X																					
-1		COVER	1	X																					
	116-4R4H	(ATTACHING PARTS)																							
-2		SCREW, No. 4-40 x 1/4 pan hd.	1	X																					
	38223-P2	-----*----																							
-3		ROLLER	2	X																					
-4	39219	PAD	1	X																					
-5	38218-G1	ARM ASSEMBLY	1	X																					

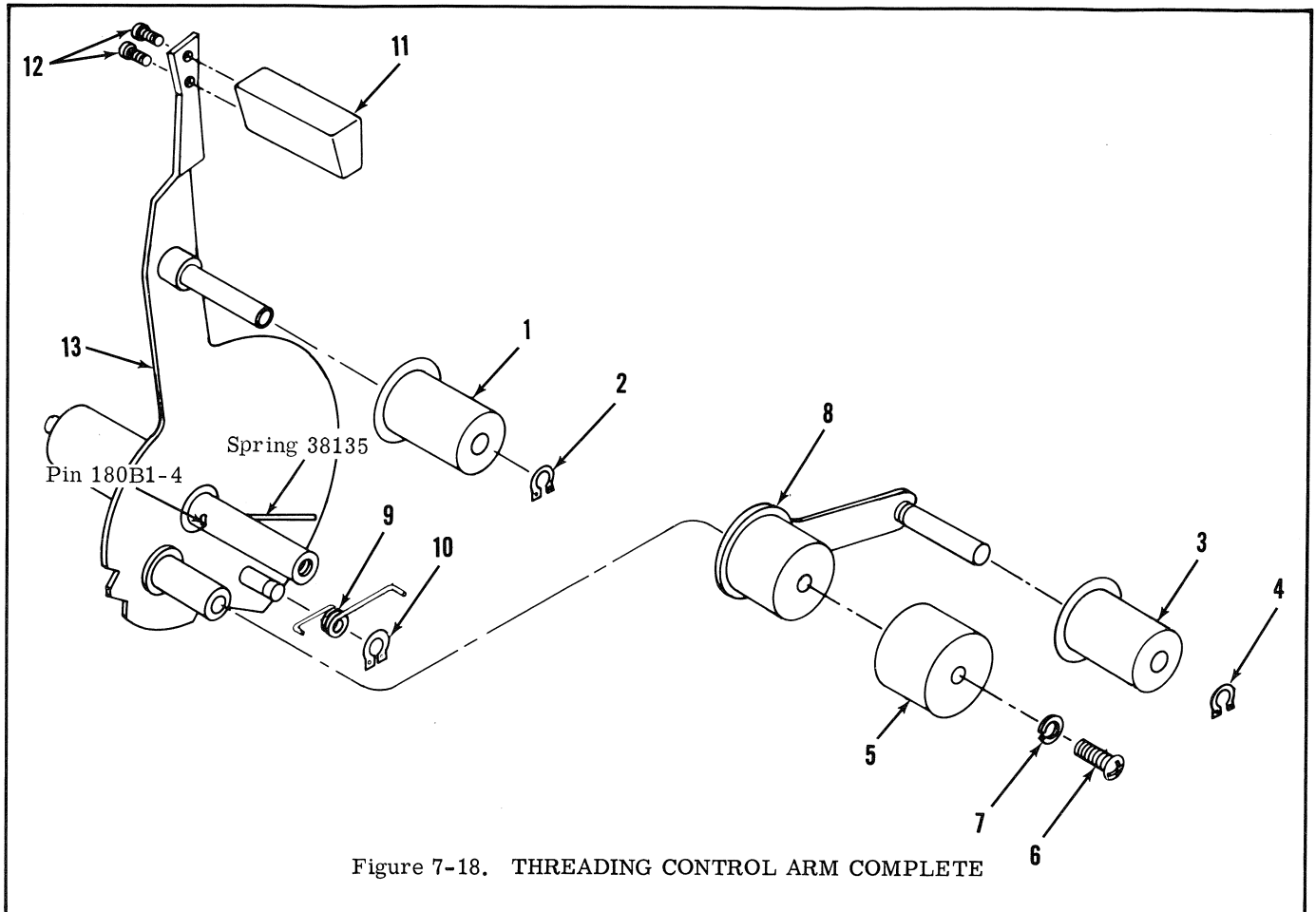


Figure 7-18. THREADING CONTROL ARM COMPLETE

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																		
				1	2	3	4	5	38129-G3													
18-	38129-G3	ARM COMPLETE, Threading Control	REF	X																		
-1	38136	. ROLLER (ATTACHING PARTS)	1	X																		
-2	252-3	. RING, Retaining ---*---	1	X																		
-3	38136	. ROLLER (ATTACHING PARTS)	1	X																		
-4	252-3	. RING, Retaining ---*---	1	X																		
-5	38141	. CAP (ATTACHING PARTS)	1	X																		
-6	140-4R6L	. SCREW, No. 4-40 x 3/8 pan hd.	1	X																		
-7	230-4	. WASHER, Spring ---*---	1	X																		
-8	38137-G1	. ARM ASSEMBLY, Film Tension	1	X																		
-9	38016	. SPRING (ATTACHING PARTS)	1	X																		
-10	252-10	. RING, Retaining ---*---	1	X																		
-11	39206	. HANDLE (ATTACHING PARTS)	1	X																		
-12	140-4R6L	. SCREW (see index 6) ---*---	2	X																		
-13	39208-G1	. ARM ASSEMBLY, Threading Control	1	X																		

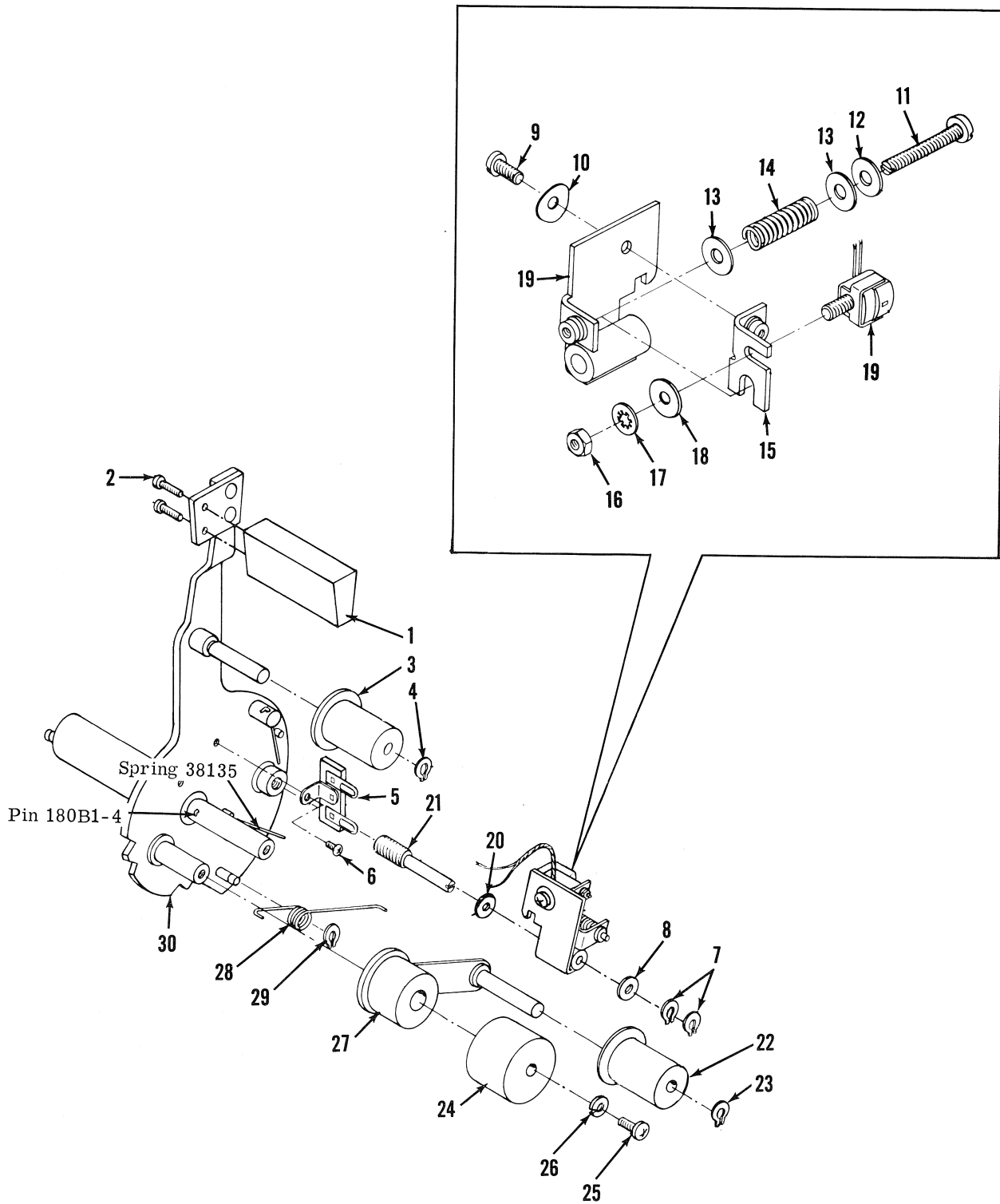


Figure 7-19. THREADING CONTROL ARM COMPLETE

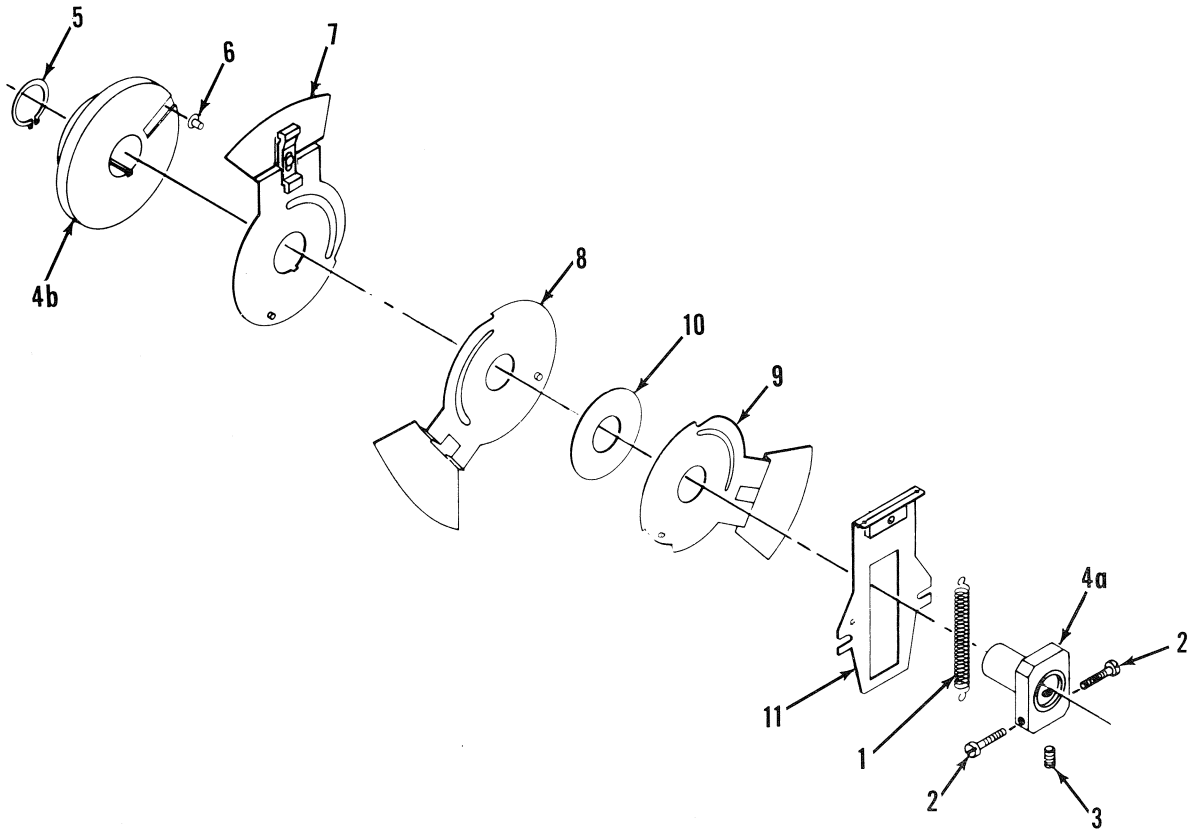


Figure 7-20. SHUTTER AND CAM ASSEMBLY

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																	
				1	2	3	4	5	6	7	8	9	10	11							
20-	38011-G2	SHUTTER AND CAM ASSEMBLY	REF	X																	
-1	38036-P1	• SPRING	2	X																	
-2	121-2-6H	• SCREW, No. 2 x 3/8 pan hd.	2	X																	
-3	171-A6-3L	• SETSCREW, No. 6-32 x 3/16 headless oval pt	1	X																	
-4	38844-G1	• CAM AND HUB ASSEMBLY (includes items 4a and 4b, which are matched parts)	1	X																	
-4a		• • HUB	1	X																	
-4b		• • CAM	1	X																	
-5	252-4	• RING, Retaining	1	X																	
-6	38823	• BUMPER	1	X																	
-7	38012-G1	• BLADE ASSEMBLY, Fixed	1	X																	
-8	38031-G2	• BLADE ASSEMBLY, Inner	1	X																	
-9	38031-G1	• BLADE ASSEMBLY, Outer	1	X																	
-10	35473-34	• WASHER, Flat, 1.250 x 0.625 x 0.005	1	X																	
-11	38017-G1	• ACTUATOR ASSEMBLY	1	X																	

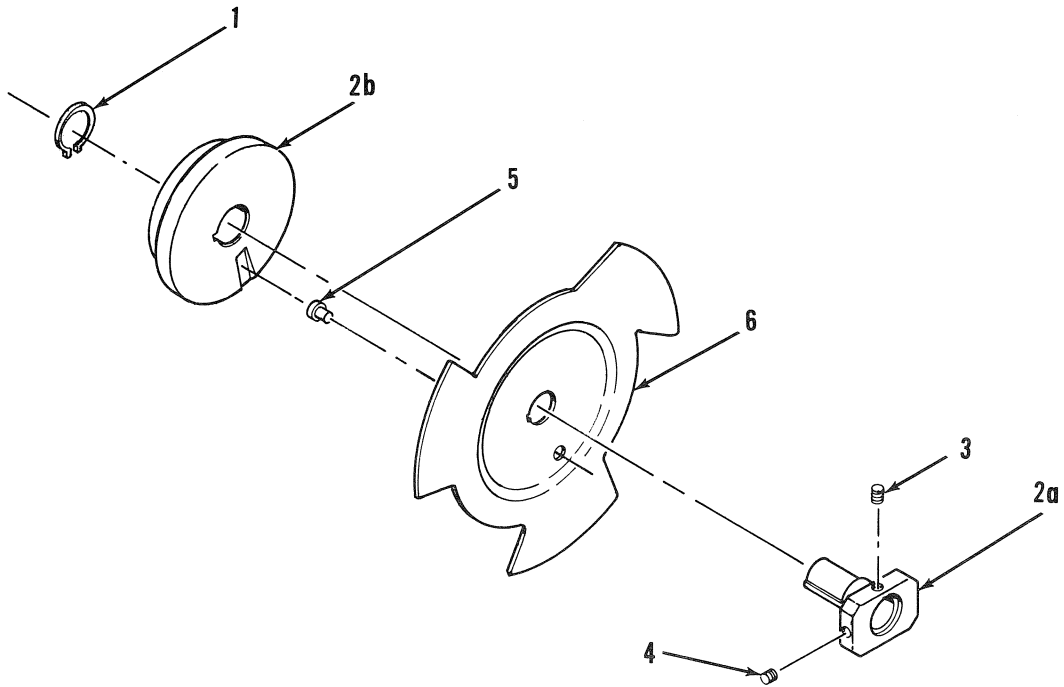


Figure 7-21. SHUTTER AND CAM ASSEMBLY

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																	
				1	2	3	4	5	38321-G2	38321-G3	38321-G4										
21-	38321-G2	SHUTTER AND CAM ASSEMBLY	REF																		
	38321-G3	SHUTTER AND CAM ASSEMBLY	REF																		
	38321-G4	SHUTTER AND CAM ASSEMBLY	REF																		
-1	252-4	. RING, Retaining.	1																		
-2	38844-G2	. CAM AND HUB ASSEMBLY (includes items . 2a and 2b, which are matched parts)	1																		
	38844-G3	. CAM AND HUB ASSEMBLY (includes items . 2a and 2b, which are matched parts)	1																		
-2a		. . HUB	1																		
-2b		. . CAM	1																		
-3	171-H6-3L	. SETSCREW, No. 6-32 x 3/16 cup pt	1																		
-4	171-A6-3L	. SETSCREW, No. 6-32 x 3/16, headless . . . oval pt	1																		
-5	38823	. BUMPER	1																		
-6	38320-P1	. BLADE	1																		
	40454-P1	. BLADE	1																		
	41449-P1	. BLADE	1																		

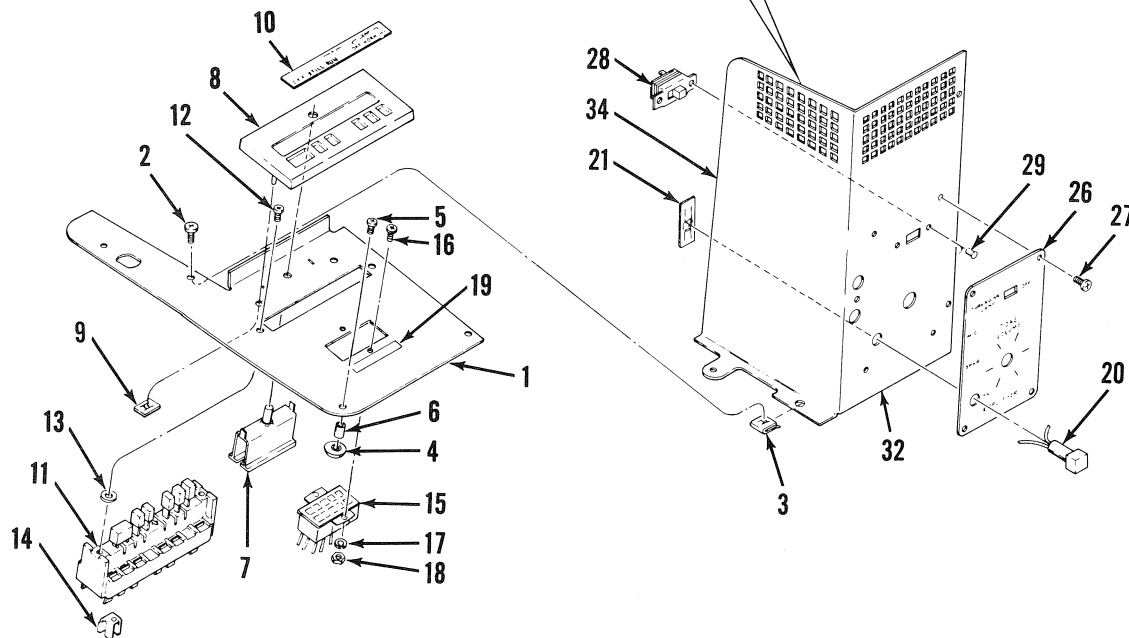
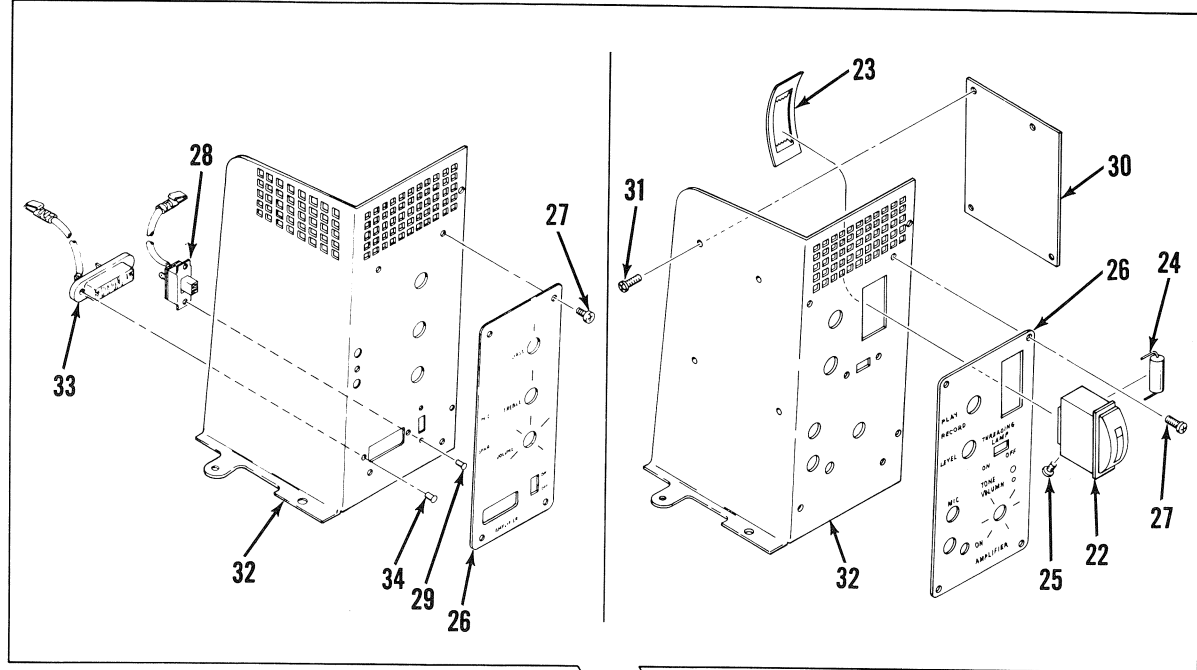


Figure 7-22. AMPLIFIER COVER ASSEMBLY

GRAFLEX 16 PROJECTOR

Section VII
Subassemblies Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER															
				39061-G1	39061-G2	39061-G3	39061-G4	39313-G1	39313-G2	39313-G4	39313-G5	41045-G2	41045-G4	41045-G5	41045-G7	41045-G9			
22-	39061-G1	COVER ASSEMBLY, Amplifier	REF	x															
	39061-G2	COVER ASSEMBLY, Amplifier	REF		x														
	39061-G3	COVER ASSEMBLY, Amplifier	REF			x													
	39061-G4	COVER ASSEMBLY, Amplifier	REF				x												
	39313-G1	COVER ASSEMBLY, Amplifier	REF					x											
	39313-G2	COVER ASSEMBLY, Amplifier	REF						x										
	39313-G4	COVER ASSEMBLY, Amplifier	REF							x									
	39313-G5	COVER ASSEMBLY, Amplifier	REF								x								
	41045-G2	COVER ASSEMBLY, Amplifier	REF									x							
41045-G4	COVER ASSEMBLY, Amplifier	REF										x							
41045-G5	COVER ASSEMBLY, Amplifier	REF											x						
41045-G7	COVER ASSEMBLY, Amplifier	REF												x					
41045-G9	COVER ASSEMBLY, Amplifier	REF													x				
-1	39064-P1	. COVER	1	x	x	x	x	x	x			x	x			x	x		
	39064-P3	. COVER	1							x					x				
	39064-P4	. COVER	1								x								
		(ATTACHING PARTS)																	
-2	121-6R5H	. SCREW, No. 6 x 5/16 pan hd.	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
-3	38248	. NUT, Speed	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
		----*----																	
-4	39200	. FOOT	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
		(ATTACHING PARTS)																	
-5	116-8R6H	. SCREW, No. 8-32 x 3/8 pan hd.	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
-6	32090-47	. SPACER	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
		----*----																	
-7	38399-P1	. CIRCUIT BREAKER	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	38402-P2	. ESCUTCHEON	1	x		x				x	x	x			x	x			
-8	38402-P3	. ESCUTCHEON	1		x		x	x						x					
		(ATTACHING PARTS)																	
-9	38403	. NUT, Speed	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
		----*----																	
-10	38404-P1	. PLATE	1	x		x													
	38404-P2	. PLATE	1		x		x	x											
	38404-P3	. PLATE	1									x							
-11	38388-P1	. SWITCH	1	x		x													
	38388-P2	. SWITCH	1		x		x												
	39470-P1	. SWITCH	1				x				x	x			x	x			
	39470-P2	. SWITCH	1					x	x						x				
	41394-P1	. SWITCH	1									x							
		(ATTACHING PARTS)																	
-12	33921-12H	. SCREW, No. 6 x 3/8 hex hd	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
-13	38473-7A	. WASHER, Flat, 0.375 x 0.146 x 0.042	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
		----*----																	
-14	39343	. ADAPTER	9							x				x					
-15	39638-G1	. SOCKET	1								x				x				
		(ATTACHING PARTS)																	
-16	116-6R6H	. SCREW, No. 6-32 x 3/8 pan hd.	2							x					x				
-17	221-6	. WASHER, Lock	2								x				x				
-18	200-6SH	. NUT, No. 6-32	2								x				x				
		----*----																	
-19	41354	. LABEL	1								x				x				
-20	39315	. LAMP, Pilot	1								x	x	x	x	x	x	x	x	
-21	39316	. NUT, Speed	1								x	x	x	x	x	x	x	x	
-22	41048-P2	. INDICATOR	1												x		x		
		(ATTACHING PARTS)																	
-23	41048-P3	. BRACKET	1												x		x		
		----*----																	
-24	38738-P13	. CAPACITOR	1												x		x		
		(ATTACHING PARTS)																	
-25	41048-P4	. SCREW, Special	2													x		x	
		----*----																	

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																
				1	2	3	4	5	39061-G1	39061-G2	39061-G3	39061-G4	39313-G1	39313-G2	39313-G4	39313-G5	41045-G2	41045-G4	41045-G5	41045-G7	41045-G9
22-		COVER ASSEMBLY, AMPLIFIER (Cont.)																		
-26	39173-P1	. PLATE	1																	
	39314-P1	. PLATE	1																	
	39314-P2	. PLATE	1																	
	41047-P1	. PLATE	1																	
	41047-P2	. PLATE (ATTACHING PARTS)	1																	
-27	121-4R4H	. SCREW, No. 4 x 1/4 pan hd ----*----	4																	
-28	38397-P1	. SWITCH (ATTACHING PARTS)	1																	
-29	175-6-9K	. RIVET ----*----	2																	
-30	41049-G2	. BOARD COMPLETE, Preamplifier, Fig. 7-24	1																	
	41051-G2	. BOARD COMPLETE, Preamplifier, Fig. 7-24	1																	
	41049-G3	. BOARD COMPLETE, Preamplifier, Fig. 7-24	1																	
	41051-G3	. BOARD COMPLETE, Preamplifier, Fig. 7-24 (ATTACHING PARTS)	1																	
-31	116-4R3L	. SCREW, No. 4-40 x 3/16 pan hd ----*----	4																	
-32	39059-P1	. COVER	1																	
	39059-P2	. COVER	1																	
	41046-P1	. COVER	1																	
	41046-P2	. COVER	1																	
-33	38398-P1	. LAMP	1																	
	38398-P2	. LAMP (ATTACHING PARTS)	1																	
-34	175-6-20K	. RIVET ----*----	2																	

GRAFLEX 16 PROJECTOR

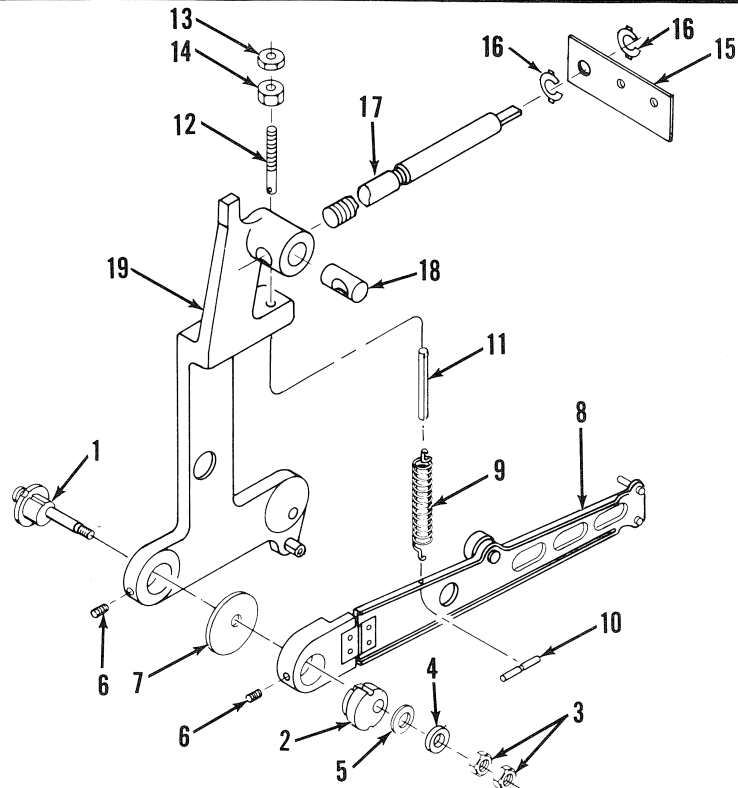


Figure 7-23. CLAW ARM COMPLETE

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																		
				1	2	3	4	5	38040-G1													
23-	38040-G1	ARM COMPLETE, Claw	REF																			
-1	38458-G2	. PIVOT ASSEMBLY	1																			
-2	38052-P2	. BUSHING (ATTACHING PARTS)	1																			
-3	200-3HA	. NUT, No. 3-48	2																			
-4	38473-24L	. WASHER, Flat, 0.500 x 0.129 x 0.062. . .	1																			
-5	38473-23	. WASHER, Flat, 0.500 x 0.129 x 0.005. . .	1																			
-6	171-4-2L	. SETSCREW, No. 4-40 x 1/8 cup pt ---*---	2																			
-7	38473-22	. WASHER, 1.125 x 0.129 x 0.015	1																			
-8	38041-G1	. ARM ASSEMBLY, Claw.	1																			
-9	38817-P1	. SPRING (ATTACHING PARTS)	1																			
-10	38450	. PIN ---*---	1																			
-11	38061	. DAMPENER	1																			
-12	38059-P1	. STUD (ATTACHING PARTS)	1																			
-13	200-4H	. NUT, No. 4-40	1																			
-14	38150	. NUT, Self-locking, No. 4-40 ---*---	1																			
-15	38062	. PLATE (ATTACHING PARTS)	1																			
-16	256-2	. RING, Retaining. ---*---	2																			
-17	38058-P1	. ROD	1																			
-18	38057	. PIVOT	1																			
-19	38054-G1	. ARM ASSEMBLY, Framing.	1																			
	189-5-8	. . ROLLPIN	1																			

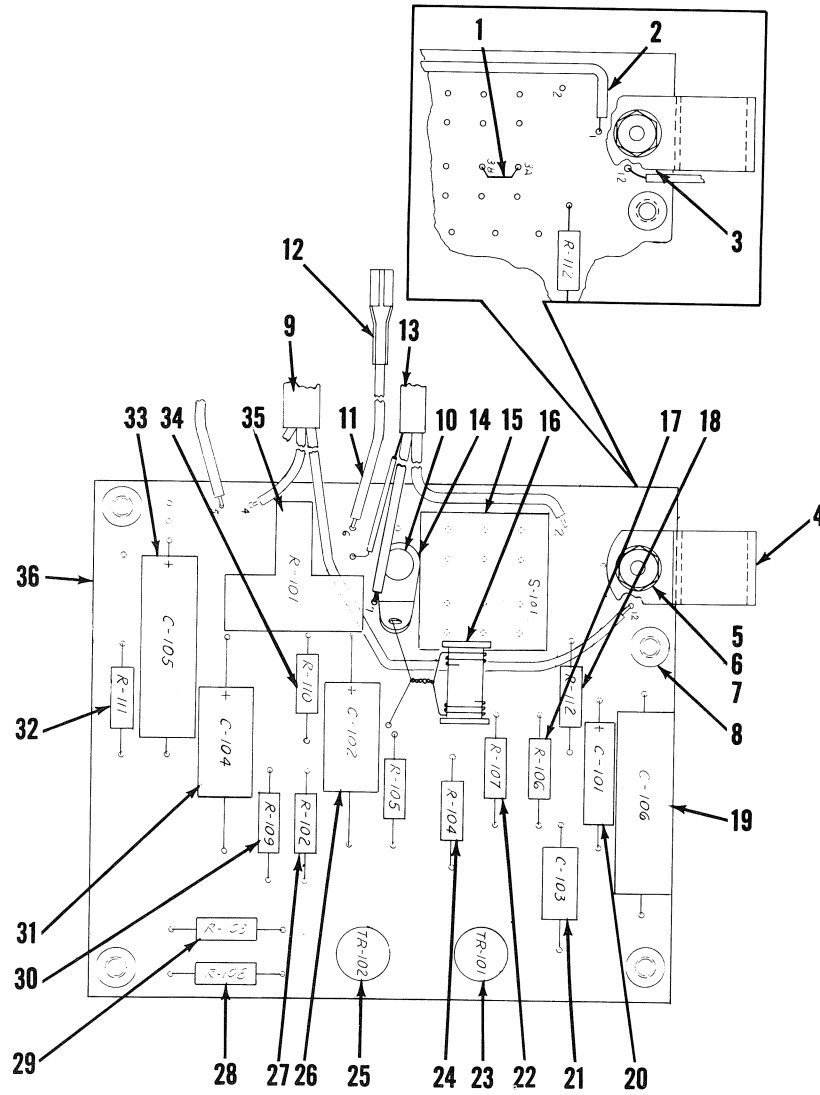


Figure 7-24. PREAMPLIFIER CIRCUIT BOARD COMPLETE

GRAFLEX 16 PROJECTOR

Section VII
Subassemblies Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER										
				41049-G2	41049-G3	41051-G2	41051-G3							
24-	41049-G2	BOARD COMPLETE, Circuit, Preamplifier	REF	x										
	41049-G3	BOARD COMPLETE, Circuit, Preamplifier	REF		x									
	41051-G2	BOARD COMPLETE, Circuit, Preamplifier	REF			x								
	41051-G3	BOARD COMPLETE, Circuit, Preamplifier	REF				x							
-1	41051-P22	. JUMPER	1				x							
-2	41078-P1	. CABLE	1				x							
-3	41039-G2	. CABLE ASSEMBLY	1					x						
-4	267-6	. CLAMP (ATTACHING PARTS)	1	x	x		x							
-5	116-4R5H	. SCREW, No. 4-40 x 5/16 pan hd.	1	x	x		x							
-6	33500-65H	. WASHER, Flat, 0.312 x 0.129 x 0.032	1	x	x		x							
-7	200-4HH	. NUT, No. 4-40 ----*----	1	x	x		x							
-8	206-5	. INSERT	4	x	x		x							
-9	41039-G1	. CABLE ASSEMBLY	1	x	x									
-10	175-6-10R	. RIVET	1		x		x							
-11	37238-P31	. TUBING	1	x	x		x							
-12	41098	. TERMINAL	2	x	x									
-13	41078-P1	. CABLE	1	x	x									
-14	39346	. TERMINAL	1		x		x							
-15	41053-G1	. SWITCH ASSEMBLY	1	x	x									
-16	39293-G1	. COIL ASSEMBLY	1		x		x							
	41049-G1	. CIRCUIT BOARD ASSEMBLY	REF	x	x									
	41051-G1	. CIRCUIT BOARD ASSEMBLY	REF			x	x							
-17	402-22-2-2	. . RESISTOR, Fixed, Comp., 2.2K ±10%, 1/2W	1	x	x	x	x							
-18	402-12-3-2	. . RESISTOR, Fixed, Comp., 12K ±10%, 1/2W	1	x	x	x	x							
-19	38738-P19	. . CAPACITOR, Paper, 0.033 Mfd ±10%, 200V	1	x	x	x	x							
-20	38334-P24	. . CAPACITOR, Elec., 10 Mfd +100 -10%, 12V	1	x	x	x	x							
-21	38738-P15	. . CAPACITOR, Paper, 0.015 Mfd ±10%, 200V	1	x	x	x	x							
-22	402-22-4-2	. . RESISTOR, Fixed, Comp., 220K ±10%, 1/2W	1	x	x									
-23	38542-P4	. . TRANSISTOR, 2N 1303	1	x	x	x	x							
-24	402-12-1-2	. . RESISTOR, Fixed, Comp., 120 ohms ±10%, 1/2W	1	x	x	x	x							
-25	38542-P4	. . TRANSISTOR (see index 23)	1	x	x	x	x							
-26	38334-P25	. . CAPACITOR, Elec., 100 Mfd +100 -10%, 12V	1	x	x	x	x							
-27	402-10-3-2	. . RESISTOR, Fixed, Comp., 10K ±10%, 1/2W	1	x	x	x	x							
-28	402-33-2-2	. . RESISTOR, Fixed, Comp., 3.3K ±10%, 1/2W	1	x	x	x	x							
-29	402-10-3-2	. . RESISTOR (see index 27)	1	x	x	x	x							
-30	402-10-1-2	. . RESISTOR, Fixed, Comp., 100 ohms ±10%, 1/2W	1	x	x	x	x							
-31	38334-P25	. . CAPACITOR (see index 26)	1	x	x	x	x							
-32	402-27-2-2	. . RESISTOR, Fixed, Comp., 2.7K ±10%, 1/2W	1	x	x	x	x							
-33	38334-P26	. . CAPACITOR, Elec., 50 Mfd +100 -10%, 25V	1	x	x	x	x							
-34	402-10-2-2	. . RESISTOR, Fixed, Comp., 1K ±10%, 1/2W	1	x	x	x	x							
-35	38333-P4	. . CONTROL	1	x	x									
-36		. . BOARD, Circuit	REF	x	x	x	x							

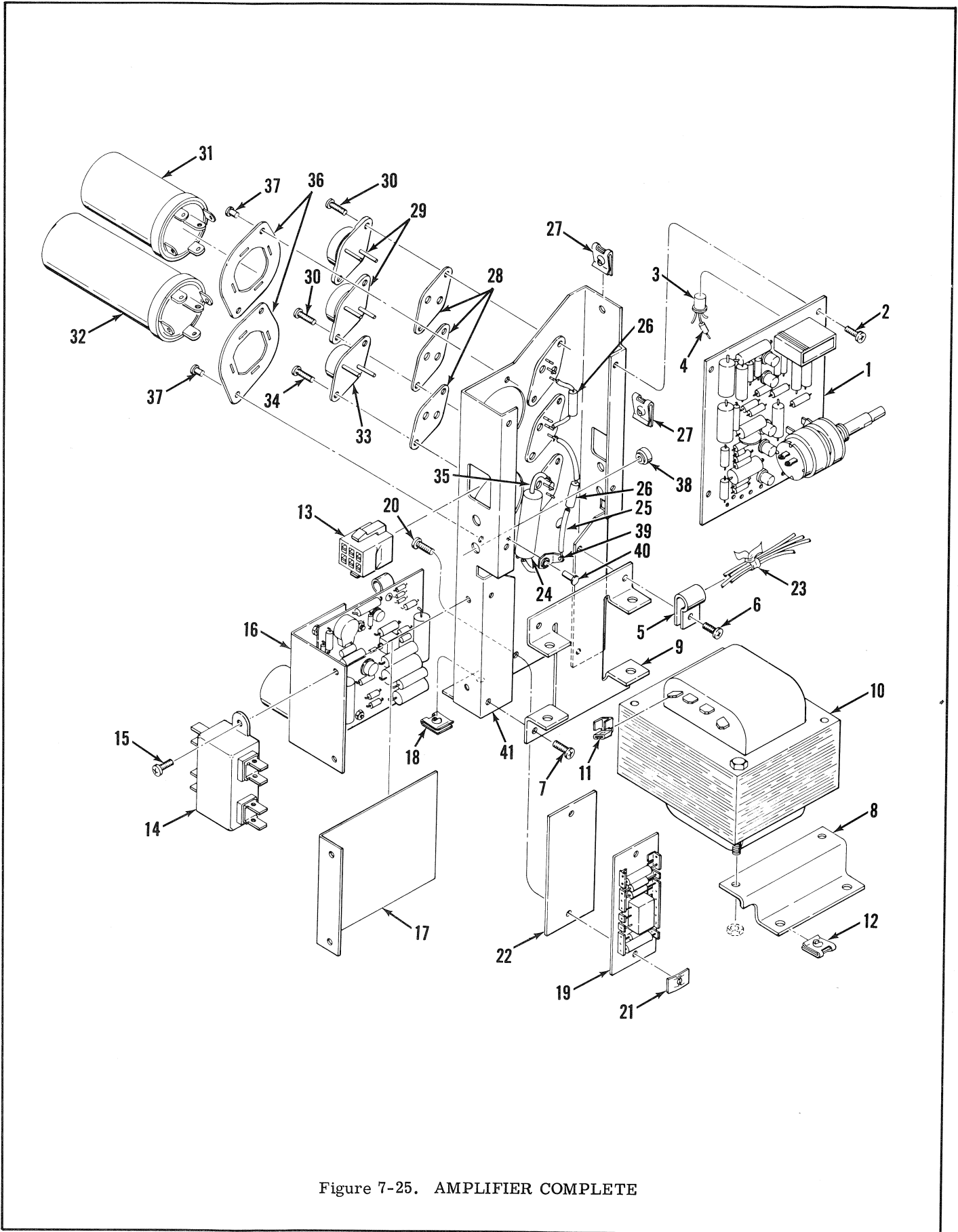


Figure 7-25. AMPLIFIER COMPLETE

GRAFLEX 16 PROJECTOR

Section VII
Subassemblies Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER						
				1	2	3	4	5		
25-	39312-G1	AMPLIFIER COMPLETE	REF	x						
	39312-G3	AMPLIFIER COMPLETE	REF		x					
	39312-G4	AMPLIFIER COMPLETE	REF			x				
	41075-G1	AMPLIFIER COMPLETE	REF				x			
	41075-G2	AMPLIFIER COMPLETE	REF					x		
	41075-G3	AMPLIFIER COMPLETE	REF						x	
-1	39328-G2	. BOARD COMPLETE, Circuit (see figure 7-27 for breakdown)	1	x	x					
	40488-G1	. BOARD COMPLETE, Circuit (see figure 7-27 for breakdown)	1		x					
	41077-G1	. BOARD COMPLETE, Circuit (see figure 7-27 for breakdown)	1				x			
	41077-G2	. BOARD COMPLETE, Circuit (see figure 7-27 for breakdown)	1					x		
	40488-G2	. BOARD COMPLETE, Circuit (see figure 7-27 for breakdown)	1						x	
		(ATTACHING PARTS)								
-2	121-6R-6H	. SCREW, No. 6 x 3/8 pan hd.	4	x	x	x	x	x	x	
-3	41425-P1	. TRANSISTOR, 2N2613	1			x				
-4	40637-P5	. TUBING	1			x				
-5	267-2	. CLAMP, Wire (ATTACHING PARTS)	1	x	x	x	x	x	x	
-6	121-8R-8H	. SCREW, No. 8 x 1/2 pan hd. ----*----	1	x	x	x	x	x	x	
		(ATTACHING PARTS)								
*	39318-G1	. TRANSFORMER ASSEMBLY	1	x	x	x				
	39318-G2	. TRANSFORMER ASSEMBLY (ATTACHING PARTS)	1				x	x	x	
-7	121-8R-8H	. SCREW, (see index 6) ----*----	3	x	x	x	x	x	x	
		(ATTACHING PARTS)								
-8	39319-P1	. FOOT	1	x	x	x	x	x	x	
-9	39320-P1	. BRACKET	1	x	x	x	x	x	x	
-10	39318-P2	. TRANSFORMER	1	x	x	x				
	39318-P6	. TRANSFORMER	1				x	x	x	
-11	39343	. ADAPTER	1	x	x	x	x	x	x	
-12	38309	. NUT, Speed	2	x	x	x	x	x	x	
-13	38288-P1	. PLUG	1	x	x	x	x	x	x	
-14	39317-P1	. CAPACITOR, Network (ATTACHING PARTS)	1	x	x	x	x	x	x	
-15	121-6R-6H	. SCREW (see index 2) ----*----	2	x	x	x	x	x	x	
-16	41061-G1	. BOARD COMPLETE, Circuit Record Amplifier (see figure 7-28 for breakdown)	1				x		x	
		(ATTACHING PARTS)								
-17	41067	. INSULATOR	1				x		x	
-18	38309	. NUT, Speed	1	x	x	x	x	x	x	
-19	39327-G1	. BOARD ASSEMBLY, Power Supply (see figure 7-26 for breakdown)	1	x	x	x				
	41076-G1	. BOARD ASSEMBLY, Power Supply (see figure 7-26 for breakdown)	1				x		x	
	41076-G2	. BOARD ASSEMBLY, Power Supply (see figure 7-26 for breakdown) (ATTACHING PARTS)	1					x		
-20	121-6R-6H	. SCREW (see index 2)	2	x	x	x	x	x	x	
-21	202-4-3	. NUT, Speed ----*----	2	x	x	x	x	x	x	
		(ATTACHING PARTS)								
-22	39336	. INSULATOR	1	x	x	x	x	x	x	
-23	39475-P2	. TIE	1	x	x	x	x	x	x	
-24	38334-P15	. CAPACITOR, Elec., 100 Mfd +100 -10%, 20V	1	x	x	x	x	x	x	
-25	37238-P25	. TUBING	4	x	x	x	x	x	x	
-26	39476-P2	. RESISTOR, Wire wound, 1.2 ohm ±5%, 2W	2	x	x	x	x	x	x	
-27	38248	. NUT, Speed	2	x	x	x	x	x	x	

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																
				1	2	3	4	5												
AMPLIFIER COMPLETE (Cont.)																				
25-28	39323-P1	. INSULATOR	3																	
-29		. TRANSISTOR (Part of item 1) (ATTACHING PARTS)	REF	X	X	X	X	X	X	X										
-30	121-6R-6H	. SCREW (see index 2) ----*----	4	X	X	X	X	X	X	X										
-31		. CAPACITOR (Part of item 1)	REF	X	X	X	X	X	X	X										
-32	38302-P2	. CAPACITOR, Elec. 2000 mfd. +100 -10%, 35V	1	X	X	X	X	X	X	X										
-33	38308-P2	. TRANSISTOR, Power (selected at Graflex) (ATTACHING PARTS)	1	X	X	X	X	X	X	X										
-34	121-6R-6H	. SCREW (see index 2) ----*----	2	X	X	X	X	X	X	X										
-35	37238-P23	. TUBING	2	X	X	X	X	X	X	X										
*	39236-G1	. CHASSIS ASSEMBLY	1	X	X	X	X	X	X	X										
-36	38582-P6	. WAFER, Mounting (ATTACHING PARTS)	2	X	X	X	X	X	X	X										
-37	175-6-12	. RIVET ----*----	4	X	X	X	X	X	X	X										
-38	248-9-2	. INSERT	2	X	X	X	X	X	X	X										
-39	39347	. TERMINAL	1	X	X	X	X	X	X	X										
-40	175-6-9	. RIVET	1	X	X	X	X	X	X	X										
-41	39335-P1	. CHASSIS	1	X	X	X	X	X	X	X										

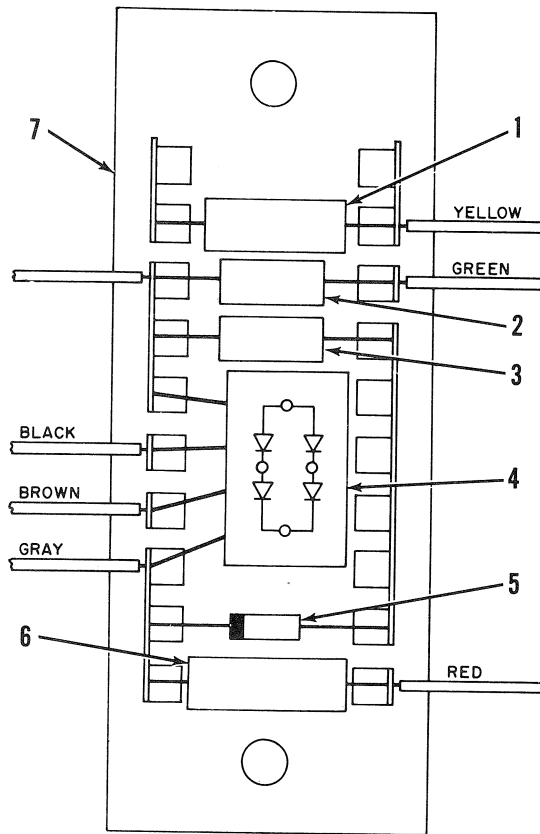


Figure 7-26. POWER SUPPLY BOARD ASSEMBLY

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																	
				1	2	3	4	5	39327-G1	41076-G1	41076-G2										
26-	39327-G1	BOARD ASSEMBLY, Power Supply	REF																		
	41076-G1	BOARD ASSEMBLY, Power Supply	REF																		
	41076-G2	BOARD ASSEMBLY, Power Supply	REF																		
	39340	. TERMINAL (yellow wire)	1																		
	38298	. TERMINAL (yellow wire)	1																		
	39321	. TERMINAL (green wire)	1																		
	38998	. TERMINAL (brown wire)	1																		
	38298	. TERMINAL (black wire)	1																		
-1	39339-P1	. RESISTOR, 47 ohms ±5%, 3W	1																		
-2	402-47-1-2	. RESISTOR, 470 ohms ±10%, 1/2W	1																		
-3	402-22-2-2	. RESISTOR, 2.2K ohms ±10%, 1/2W	1																		
-4	39324-P1	. DIODE, Bridge, FWL50	1																		
-5	39331-P1	. DIODE, Zener 1N966B	1																		
-6	402-12-9-2	. RESISTOR, 1.2 ohms ±10%, 1/2W	1																		
-7		. BOARD	1																		
NOTE: See Wiring diagram for model variations.																					

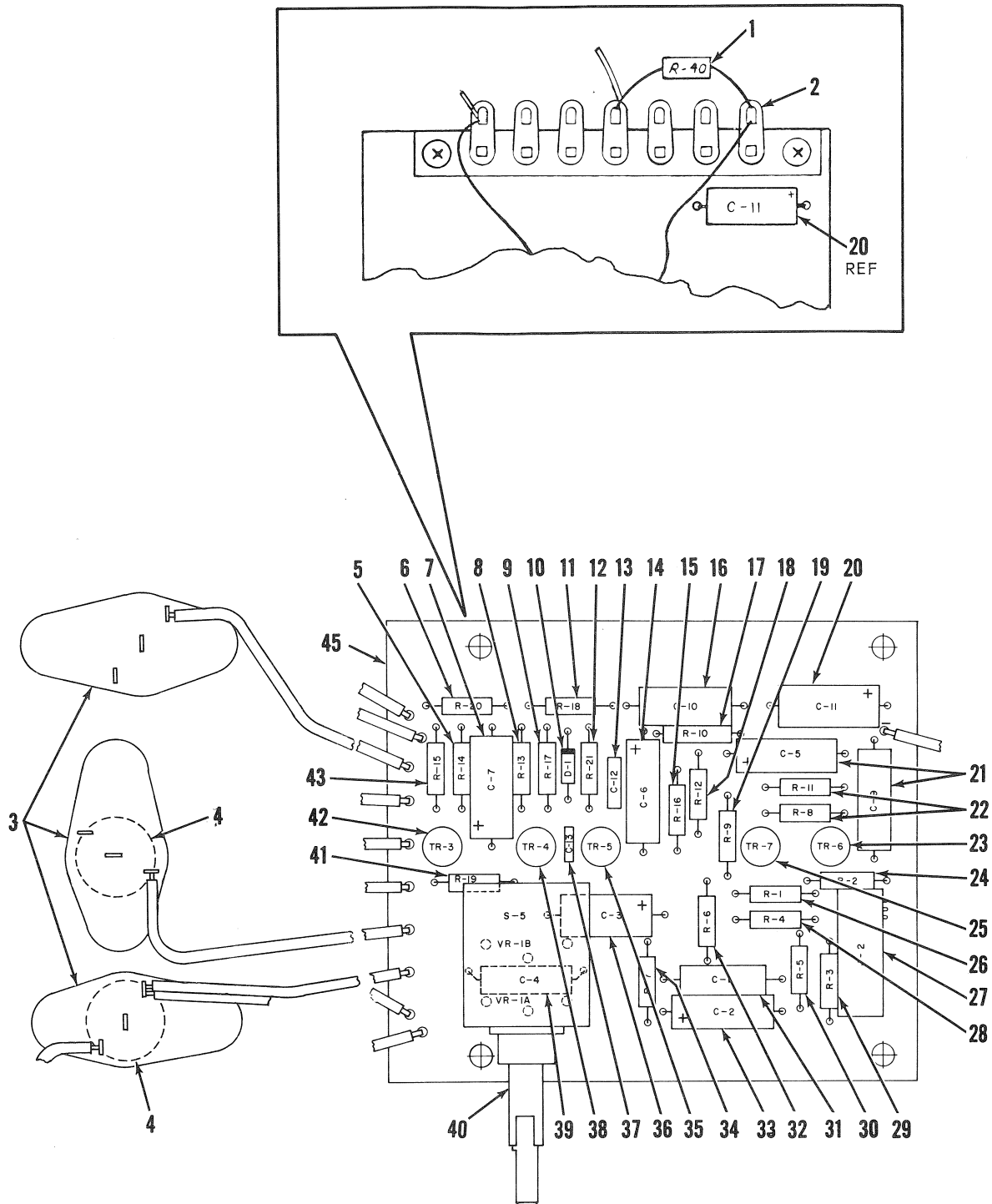


Figure 7-27. CIRCUIT BOARD COMPLETE

GRAFLEX 16 PROJECTOR

Section VII
Subassemblies Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER						
				39328-G2	40488-G1	40488-G2	41077-G1	41077-G2		
27-	39328-G2	BOARD COMPLETE, Circuit	REF	x						
	40488-G1	BOARD COMPLETE, Circuit	REF		x					
	40488-G2	BOARD COMPLETE, Circuit	REF			x				
	41077-G1	BOARD COMPLETE, Circuit	REF				x			
	41077-G2	BOARD COMPLETE, Circuit	REF					x		
-1	402-22-2-2	. RESISTOR, Fixed, Comp., 2.2K ±10%, 1/2W	1		x	x				
-2	411-8	. STRIP, Terminal	1		x	x				
-3	41085-P2	. SOCKET	3	x	x	x	x	x		
-4	39487-P1	. TRANSISTOR, DTG-110	2	x	x	x	x	x		
*	39328-G1	. BOARD ASSEMBLY	1	x	x	x	x	x		
-5	402-68-2-2	. . RESISTOR, Fixed, Comp., 6.8K ±10%, 1/2W	1	x	x	x	x	x		
-6	402-22-3-2	. . RESISTOR, Fixed, Comp., 22K ±10%, 1/2W	1	x	x	x	x	x		
-7	38334-P14	. . CAPACITOR, Paper, 25 Mfd +150 -10%, 25V	1	x	x	x	x	x		
-8	402-10-4-2	. . RESISTOR, Fixed, Comp., 100K ±10%, 1/2W	1	x	x	x	x	x		
-9	402-10-1-2	. . RESISTOR, Fixed, Comp., 100 ohms ±10%, 1/2W	1	x	x	x	x	x		
-10	39332-P1	. . DIODE, 1N616	1	x	x	x	x	x		
-11	402-12-0-2	. . RESISTOR, Fixed, Comp., 12 ohms ±10%, 1/2W	1	x	x	x	x	x		
-12	402-10-3-2	. . RESISTOR, Fixed, Comp., 10K ±10%, 1/2W	1	x	x	x	x	x		
-13	414C502M	. . CAPACITOR, Dielec., 0.005 Mfd ±20%, 500V	1	x	x	x	x	x		
-14	38334-P12	. . CAPACITOR, Elec., 100 Mfd +150 -10%, 4V	1	x	x	x	x	x		
-15	402-39-1-2	. . RESISTOR, Fixed, Comp., 390 ohms ±10%, 1/2W	1	x	x	x	x	x		
-16	38738-P9	. . CAPACITOR, Paper, 0.10 Mfd ±20%, 100V	1	x	x	x	x	x		
-17	402-18-2-2	. . RESISTOR, Fixed, Comp., 1.8K ±10%, 1/2W	1	x	x	x	x	x		
-18	402-22-2-2	. . RESISTOR, Fixed, Comp., 2.2K ±10%, 1/2W	1	x			x	x		
-19	402-33-1-2	. . RESISTOR, Fixed, Comp., 330 ohms ±10%, 1/2W	1	x	x	x	x	x		
-20	38334-P12	. . CAPACITOR, Elec., 100 Mfd +150 -10%, 4V	1	x	x	x	x	x		
-21	38334-P13	. . CAPACITOR, Elec., 10 Mfd +150 -10%, 25V	2	x	x	x	x	x		
-22	402-10-3-2	. . RESISTOR, Fixed, Comp., 10K ±10%, 1/2W	2	x	x	x	x	x		
-23	38542-P4	. . TRANSISTOR, 2N1303	1	x	x	x	x	x		
-24	402-82-2-2	. . RESISTOR, Fixed, Comp., 8.2K ±10%, 1/2W	1	x	x	x	x	x		
-25	38542-P4	. . TRANSISTOR (see item 24)	1	x	x	x	x	x		
-26	402-27-4-2	. . RESISTOR, Fixed, Comp., 270K ±10%, 1/2W	1	x	x	x	x	x		
-27	38336-G1	. . CAP, Four-Way	1	x	x	x	x	x		
-28	402-68-2-2	. . RESISTOR, Fixed, Comp., 6.8K ±10%, 1/2W	1	x	x	x	x	x		
-29	402-27-1-2	. . RESISTOR, Fixed, Comp., 270 ohms ±10%, 1/2W	1	x	x	x	x	x		
-30	402-10-3-2	. . RESISTOR, Fixed, Comp., 10K ±10%, 1/2W	1	x	x	x	x	x		
-31	38738-P8	. . CAPACITOR, Paper, 0.01 Mfd ±10%, 1/2W	1	x	x	x	x	x		
-32	402-18-4-2	. . RESISTOR, Fixed, Comp., 180K ±10%, 1/2W	1	x	x	x	x	x		
-33	38334-P5	. . CAPACITOR, Elec., 25 Mfd +250 -10%, 10V	1	x	x	x	x	x		
-34	402-22-3-2	. . RESISTOR (see item 7)	1	x	x	x	x	x		
-35	38542-P6	. . TRANSISTOR, 2N1303 (selected at Graflex)	1	x	x	x	x	x		
-36	38542-P5	. . TRANSISTOR (may be used interchangeably) 2N1303 (selected at Graflex)	REF	x	x	x	x	x		
	38334-P5	. . CAPACITOR (see item 34)	1	x	x	x	x	x		
-37	414A201M	. . CAPACITOR, Dielec., 200 pf ±20%, 500V	1	x	x	x	x	x		
-38	38542-P3	. . TRANSISTOR, 2N1302	1	x	x	x	x	x		
-39	38738-P10	. . CAPACITOR, Paper, 0.047 Mfd ±10%, 100V	1	x	x	x	x	x		
-40	39322-P1	. . CONTROL	1	x	x	x	x	x		
-41	402-10-1-2	. . RESISTOR (see item 10)	1	x	x	x	x	x		
-42	38542-P5	. . TRANSISTOR, 2N1303 (selected at Graflex)	1	x	x	x	x	x		
-43	402-15-2-2	. . RESISTOR, Fixed, Comp., 1.5K ±10%, 1/2W	1	x	x	x	x	x		
-44	38302-P3	. . CAPACITOR (not shown, mounted directly on chassis) Elec., 1000 Mfd +100 -10%, 25V	1	x	x	x	x	x		
-45	38329-P1	. . BOARD	1	x	x	x	x	x		

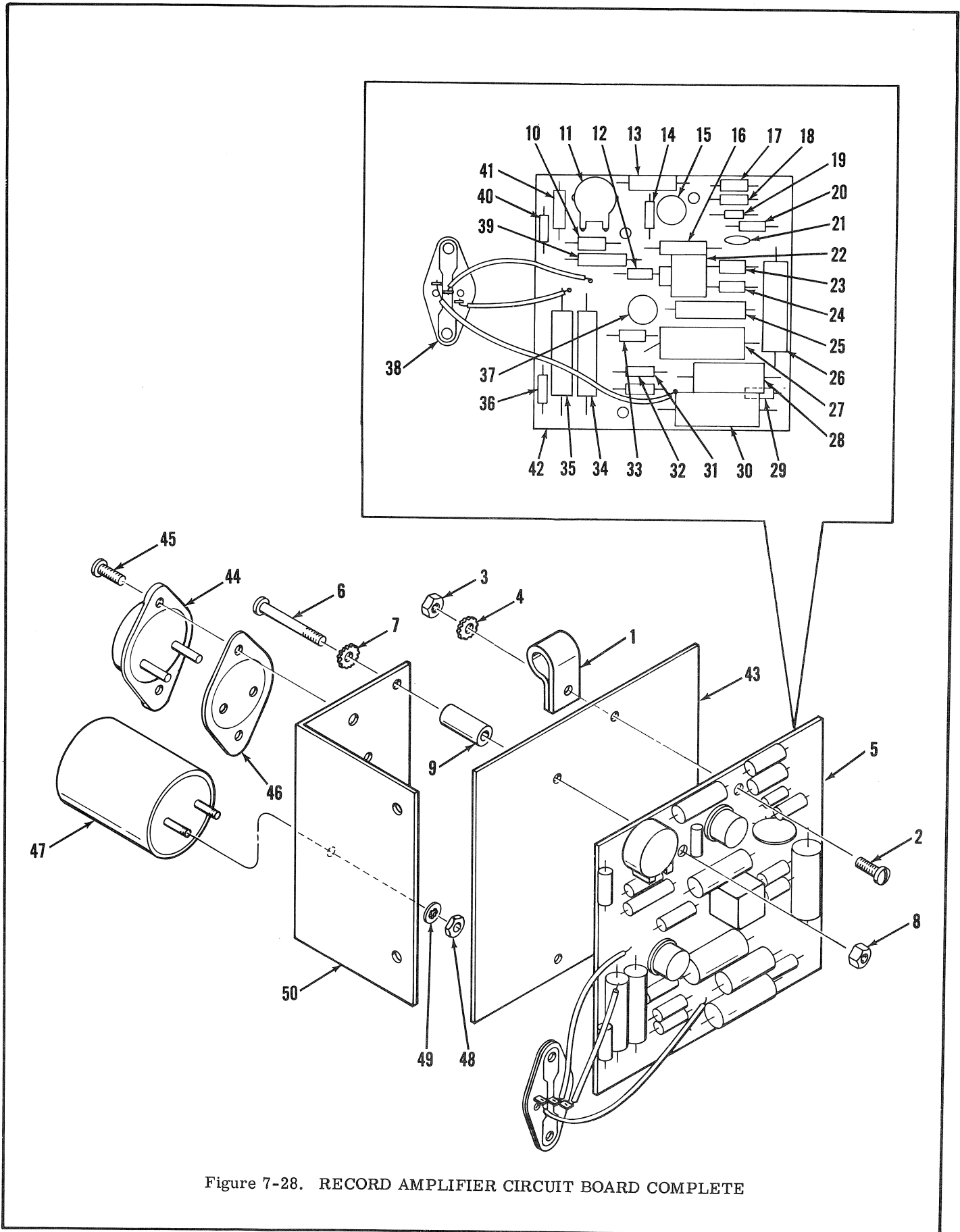


Figure 7-28. RECORD AMPLIFIER CIRCUIT BOARD COMPLETE

GRAFLEX 16 PROJECTOR

Section VII
Subassemblies Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																
				1	2	3	4	5	6	7	8	9	10							
28-	41061-G1	BOARD COMPLETE, Circuit, Record Amplifier	REF																	
-1	267-4	. CLAMP	1	X																
		(ATTACHING PARTS)																		
-2	116-6R6H	. SCREW, No. 6-32 x 3/8 pan hd.	1	X																
-3	200-6HH	. NUT, No. 6-32	1	X																
-4	220-6H	. WASHER, Lock	1	X																
		---*---																		
-5	41062-G2	. BOARD ASSEMBLY, Circuit (Second)	1	X																
		(ATTACHING PARTS)																		
-6	102-4-16H	. SCREW, No. 4-40 x 1" rd. hd.	2	X																
-7	220-4H	. WASHER, Lock	2	X																
-8	200-4HH	. NUT, No. 4-40	2	X																
-9	32090-29	. SPACER	2	X																
		---*---																		
*	41062-G1	. . . BOARD ASSEMBLY, Circuit.	1	X																
-10	402-33-2-2	. . . RESISTOR, Fixed, Comp., 3.3K ±10%, 1/2W . . .	1	X																
-11	41063-P1	. . . POTENTIOMETER	1	X																
-12	402-22-4-2	. . . RESISTOR, Fixed, Comp., 220K ±10%, 1/2W . . .	1	X																
-13	38334-P24	. . . CAPACITOR, Elec., 10 Mfd +100 -10%, 12V . . .	1	X																
-14	402-68-3-2	. . . RESISTOR, Fixed, Comp., 68K ±10%, 1/2W . . .	1	X																
-15	38542-P4	. . . TRANSISTOR, 2N1303	1	X																
-16	38334-P24	. . . CAPACITOR, Elec., 10 Mfd +100 -10%, 12V . . .	1	X																
-17	402-33-3-2	. . . RESISTOR, Fixed, Comp., 33K ±10%, 1/2W . . .	1	X																
-18	402-22-1-2	. . . RESISTOR, Fixed, Comp., 220 ohms ±10%, 1/2W	1	X																
-19	41072-P1	. . . DIODE, OMH550	1	X																
-20	402-22-3-2	. . . RESISTOR, Fixed, Comp., 22K ±10%, 1/2W . . .	1	X																
-21	38339-P15	. . . CAPACITOR, 470 pf ±10%, 500V	1	X																
-22	41071-P1	. . . INDUCTOR, 10 mh ±10%, 36 ohms	1	X																
-23	402-33-3-2	. . . RESISTOR, Fixed, Comp., 33K ±10%, 1/2W . . .	1	X																
-24	402-15-2-2	. . . RESISTOR, Fixed, Comp., 1.5K ±10%, 1/2W . . .	1	X																
-25	38738-P15	. . . CAPACITOR, Paper, 0.015 Mfd ±10%, 200V . . .	1	X																
-26	38334-P4	. . . CAPACITOR, Elec., 50 Mfd +250 -10%, 25V . . .	1	X																
-27	38334-P23	. . . CAPACITOR, Elec., 25 Mfd +150 -10%, 50V . . .	1	X																
-28	38738-P13	. . . CAPACITOR, Paper, 0.22 Mfd ±10%, 100V . . .	1	X																
-29	402-82-0-2	. . . RESISTOR, Fixed, Comp., 82 ohms ±10%, 1/2W .	1	X																
-30	38334-P23	. . . CAPACITOR, Elec., 25 Mfd +150 -10%, 50V . . .	1	X																
-31	402-68-1-2	. . . RESISTOR, Fixed, Comp., 680 ohms ±10%, 1/2W .	1	X																
-32	402-68-2-2	. . . RESISTOR, Fixed, Comp., 6.8K ±10%, 1/2W . . .	1	X																
-33	402-10-1-2	. . . RESISTOR, Fixed, Comp., 100 ohms ±10%, 1/2W .	1	X																
-34	38738-P17	. . . CAPACITOR, Paper, 0.047 Mfd ±10%, 200V . . .	1	X																
-35	38738-P18	. . . CAPACITOR, Paper, 0.022 Mfd ±10%, 200V . . .	1	X																
-36	402-12-3-2	. . . RESISTOR, Fixed, Comp., 12K ±10%, 1/2W . . .	1	X																
-37	38542-P4	. . . TRANSISTOR, 2N1303	1	X																
-38	41085-P1	. . . SOCKET	1	X																
-39	38334-P24	. . . CAPACITOR, Elec., 10 Mfd +100 -10%, 12V . . .	1	X																
-40	402-22-2-2	. . . RESISTOR, Fixed, Comp., 2.2K ±10%, 1/2W . . .	1	X																
-41	38738-P16	. . . CAPACITOR, Paper, 0.0015 Mfd ±10%, 200V . . .	1	X																
-42	41073-P1	. . . BOARD, Circuit	1	X																
-43	41067	. INSULATOR	1	X																
-44	39487-P1	. TRANSISTOR	1	X																
		(ATTACHING PARTS)																		
-45	121-6R6H	. SCREW, No. 6 x 3/8 pan hd.	2	X																
		---*---																		
-46	39323-P1	. INSULATOR	1	X																
*	41064-G1	. BRACKET ASSEMBLY	1	X																
-47	38657-P2	. . . TRANSFORMER	1	X																
-48	200-6HH	. . . NUT, No. 6-32	2	X																
-49	221-6H	. . . WASHER, Lock	2	X																
-50	41065-P1	. . . BRACKET	1	X																

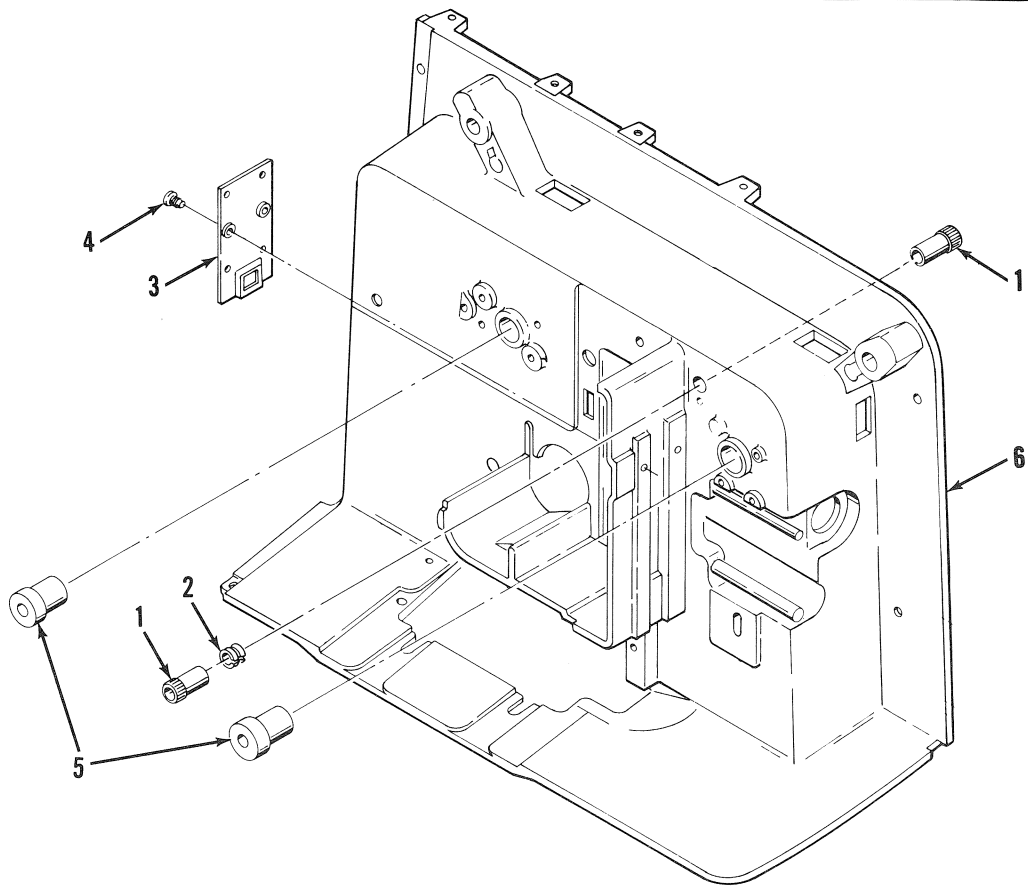


Figure 7-29. HOUSING ASSEMBLY

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																
				39186-G1	39186-G3	39186-G4	39186-G5	39186-G6	39186-G7	39186-G8	39186-G9									
29-	39186-G1	HOUSING ASSEMBLY	REF	x																
	39186-G3	HOUSING ASSEMBLY	REF		x															
	39186-G4	HOUSING ASSEMBLY	REF			x														
	39186-G5	HOUSING ASSEMBLY	REF				x													
	39186-G6	HOUSING ASSEMBLY	REF					x												
	39186-G7	HOUSING ASSEMBLY	REF						x											
	39186-G8	HOUSING ASSEMBLY	REF							x										
	39186-G9	HOUSING ASSEMBLY	REF								x									
-1	39202	. BUSHING	2	x	x	x	x	x	x	x	x	x								
-2	39148	. RING, Detent	1	x	x	x	x	x	x	x	x	x								
-3	38315-P1	. SHIELD (ATTACHING PARTS)	1	x	x	x	x	x	x	x	x	x								
-4	38215	. SCREW, Drive -----*	2	x	x	x	x	x	x	x	x	x								
-5	38006	. BEARING	2	x	x	x	x	x	x	x	x	x								
-6		. HOUSING Subassembly	REF	x	x	x	x	x	x	x	x	x								

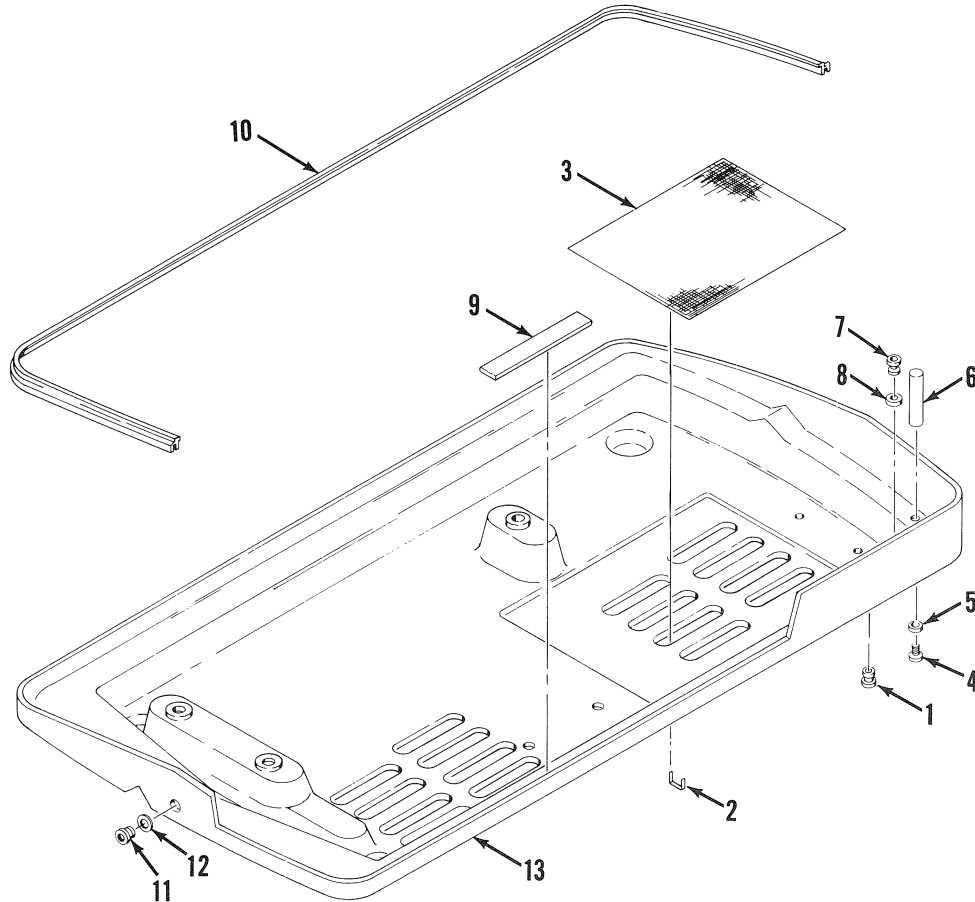


Figure 7-30. BASE ASSEMBLY

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																
				39055-G2	39055-G3	39055-G4	39055-G7													
30-	39055-G2	BASE ASSEMBLY	REF	X																
	39055-G3	BASE ASSEMBLY	REF		X															
	39055-G4	BASE ASSEMBLY	REF			X														
	39055-G7	BASE ASSEMBLY	REF				X													
-1	206-1	. INSERT, Threaded, Short	2	X	X	X	X													
-2	39055-P17	. STAPLE	4	X	X	X														
	39055-P17	. STAPLE	8				X													
-3	39244	. SCREEN	1	X	X	X														
	39244	. SCREEN	2				X													
-4	116-6R6H	. SCREW, No. 6-32 x 3/8 pan hd.	1	X	X	X	X													
-5	35473-16A	. WASHER, Flat, 0.375 x 0.156 x 0.050	1	X	X	X	X													
-6	39108	. STAND OFF	1	X	X	X	X													
-7	206-4	. INSERT, Threaded, Long	2	X	X	X	X													
-8	32090-51	. SPACER	2	X	X	X	X													
-9	39193	. CUSHION	1	X		X														
-10	39038-P1	. FRAME	1	X	X	X	X													
-11	206-1	. INSERT	4	X	X	X	X													
-12	35473-51	. WASHER, Flat, 0.375 x 0.190 x 0.031	2	X	X	X	X													
-13		. BASE	REF	X	X	X	X													

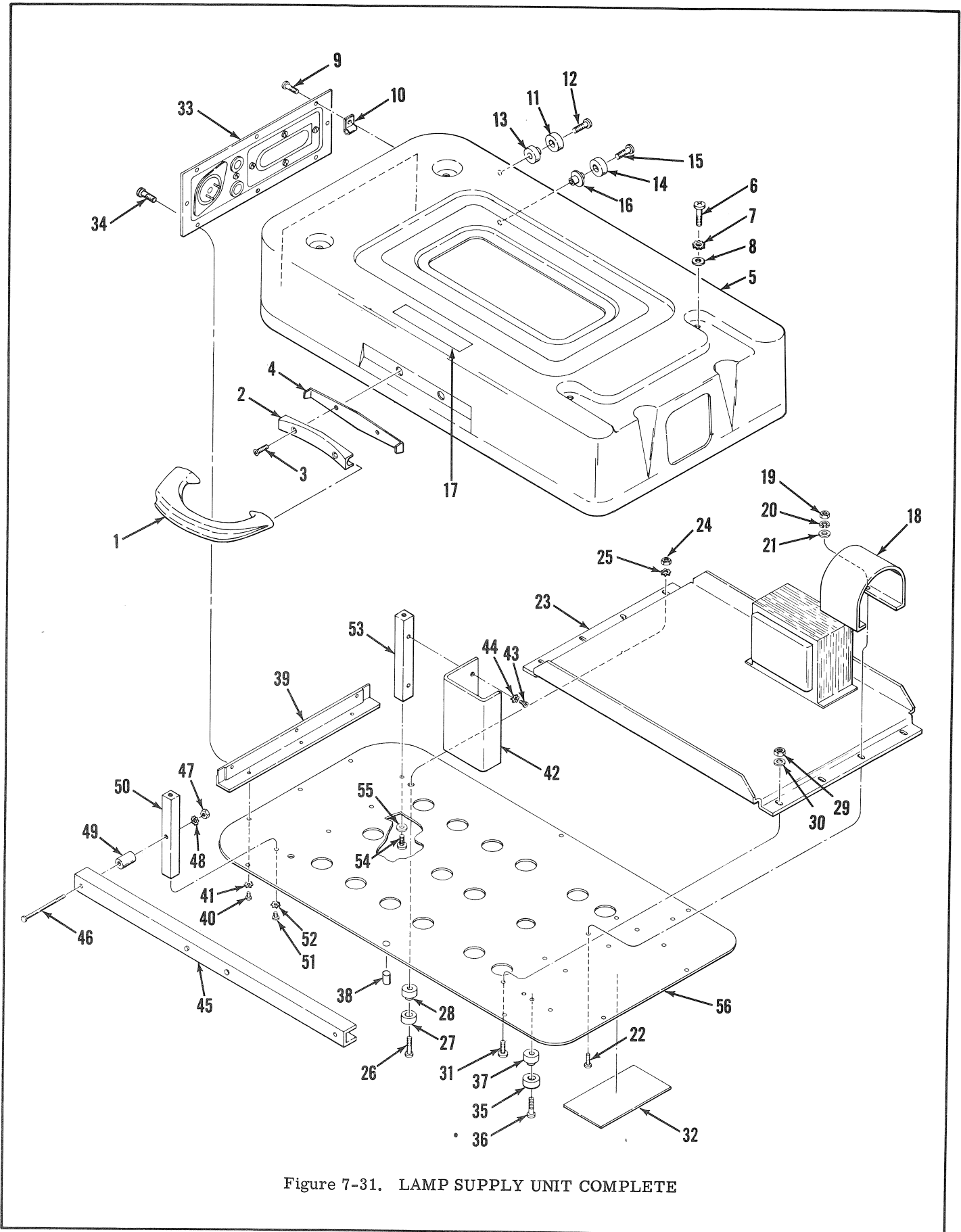


Figure 7-31. LAMP SUPPLY UNIT COMPLETE

GRAFLEX 16 PROJECTOR

Section VII
Subassemblies Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION 1 2 3 4 5	QTY	PART NUMBER																
				41375-G1	41375-G2															
31-	41375-G1	LAMP SUPPLY UNIT COMPLETE	REF	x																
	41375-G2	LAMP SUPPLY UNIT COMPLETE	REF		x															
-1	39039-P1	. HANDLE (ATTACHING PARTS)	1	x	x															
-2	39034-P1	. HOUSING, Handle	1	x	x															
-3	104-8R16H	. SCREW, No. 8-32 x 1 oval hd. ----*----	2	x	x															
-4	39011	. RETAINER	1	x	x															
-5	41377-G1	. COVER ASSEMBLY	1	x																
	41377-G2	. COVER ASSEMBLY (ATTACHING PARTS)	1		x															
-6	110-6R6H	. SCREW, No. 6-32 x 3/8 binding hd	4	x	x															
-7	220-6	. WASHER, Lock	4	x	x															
-8	33500-63H	. WASHER, Flat, 0.500 x 0.164 x 0.032	4	x	x															
-9	110-3R4H	. SCREW, No. 3-48 x 1/4 binding hd	5	x	x															
-10	41433	. NUT, Speed ----*----	5	x	x															
-11	40297	. FOOT (ATTACHING PARTS)	2	x	x															
-12	102-10R14H	. SCREW, No. 10-24 x 7/8 binding hd	2	x	x															
-13	41382	. SPACER ----*----	2	x	x															
-14	40297	. FOOT (ATTACHING PARTS)	2	x	x															
-15	102-10R14H	. SCREW (see index 12)	2	x	x															
-16	41381	. SPACER ----*----	2	x	x															
-17	41353	. LABEL, Instruction	1	x	x															
-18	41351-P1	. GUIDE, Air Flow (ATTACHING PARTS)	1		x															
-19	200-8HH	. NUT, No. 8-32	2		x															
-20	220-8	. WASHER, Lock	2		x															
-21	35473-46H	. WASHER, Flat, 0.500 x 0.200 x 0.032	2		x															
-22	110-8R8H	. SCREW, No. 8-32 x 1/2 binding hd ----*----	2		x															
-23	41390-P1	. LAMP SUPPLY UNIT	1	x																
	41355-P1	. LAMP SUPPLY UNIT (ATTACHING PARTS)	1		x															
-24	200-10HH	. NUT, No. 10-24	2	x	x															
-25	220-10	. WASHER, Lock	2	x	x															
-26	102-10R14H	. SCREW (see index 12)	2	x	x															
-27	40297	. FOOT	2	x	x															
-28	41382	. SPACER	2	x	x															
-29	200-8HH	. NUT (see index 19)	6	x	x															
-30	220-8	. WASHER, Lock	6	x	x															
-31	110-8R8H	. SCREW (see index 22) ----*----	6	x	x															
-32	41422-P1	. NAMEPLATE	1	x																
	41422-P3	. NAMEPLATE	1		x															
-33		. PANEL, Connector (Part of item 23) (ATTACHING PARTS)	REF	x	x															
-34	110-3R4H	. SCREW (see index 9) ----*----	3	x	x															
-35	40297	. FOOT (ATTACHING PARTS)	2	x	x															
-36	102-10R14H	. SCREW (see index 12)	2	x	x															
-37	41382	. SPACER ----*----	2	x	x															
-38	31270-1	. FASTENER, No. 4-40 x 5/16 truss hd	8	x	x															
*	41432-G1	. BASE ASSEMBLY	1	x	x															

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION 1 2 3 4 5	QTY	PART NUMBER															
				41375-G1	41375-G2														
31-		LAMP SUPPLY UNIT COMPLETE (Cont.)																	
-39	41387-P1	. . BRACKET (ATTACHING PARTS)	1	X	X														
-40	110-6R6H	. . SCREW (see index 6)	3	X	X														
-41	220-6	. . WASHER, Lock ---*---	3	X	X														
-42	41388-P1	. . LEG (ATTACHING PARTS)	2	X	X														
-43	110-6R8H	. . SCREW, No. 6-32 x 1/2 binding hd . . .	4	X	X														
-44	220-6	. . WASHER, Lock ---*---	4	X	X														
-45	41424-G1	. . RAIL ASSEMBLY (ATTACHING PARTS)	1	X	X														
-46	100-8R36H	. . SCREW, No. 8-32 x 2-1/4 binding hd . .	2	X	X														
-47	200-8HH	. . NUT, No. 8-32	2	X	X														
-48	220-8	. . WASHER, Lock	2	X	X														
-49	41384	. . SPACER ---*---	2	X	X														
-50	41383-P1	. . POST (ATTACHING PARTS)	2	X	X														
-51	100-8R8H	. . SCREW, No. 8-32 x 1/2 binding hd . . .	2	X	X														
-52	220-8	. . WASHER, Lock ---*---	2	X	X														
-53	41383-P2	. . POST (ATTACHING PARTS)	2	X	X														
-54	110-8R8H	. . SCREW (see index 51)	2	X	X														
-55	220-8	. . WASHER, Lock ---*---	2	X	X														
-56	41380-P1	. . BASE	1	X	X														

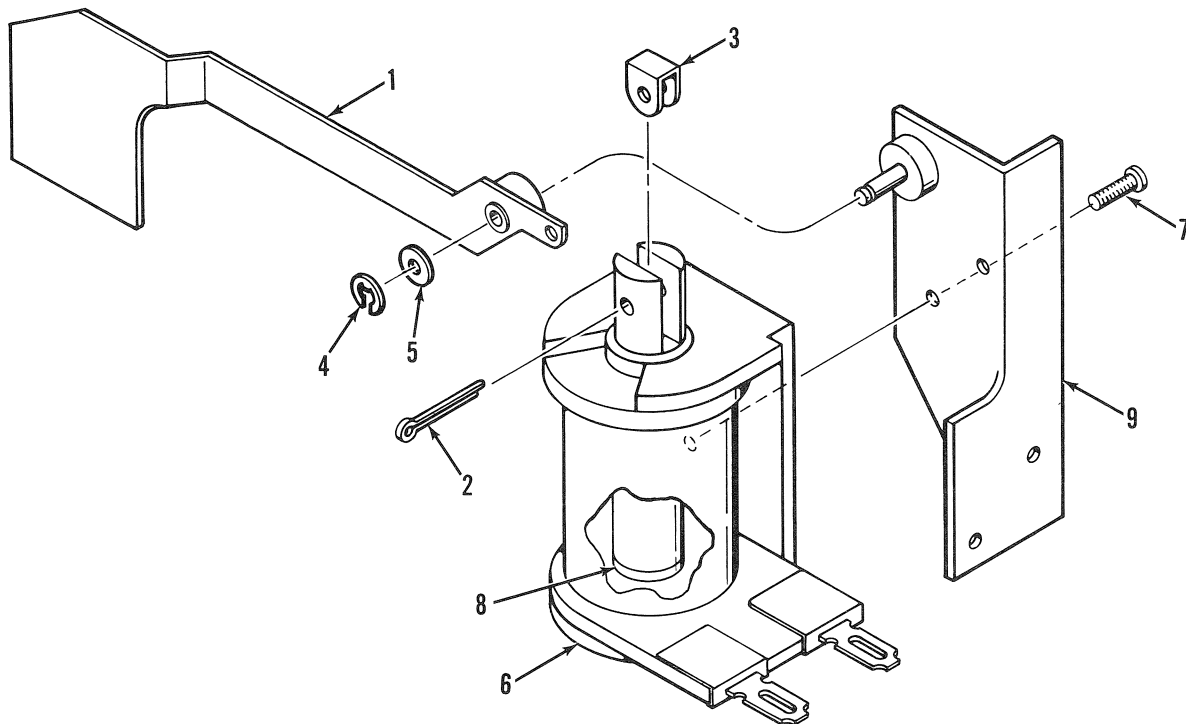


Figure 7-32. DOUSER AND SOLENOID ASSEMBLY

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																		
				1	2	3	4	5	6	7	8	9	10	11	12							
32-	41404-G1	DOUSER AND SOLENOID ASSEMBLY	REF	X																		
-1	41405-G1	. DOUSER ASSEMBLY (ATTACHING PARTS)	1	X																		
-2	30523-5	. PIN, Cotter	1	X																		
-3	41367	. SPACER	1	X																		
-4	251-7	. RING, Retaining	1	X																		
-5	35473-10	. WASHER, Flat, 0.312 x 0.130 x 0.032 . . . -----*-----	1	X																		
-6	41360-P1	. SOLENOID (ATTACHING PARTS)	1	X																		
-7	110-6-3H	. SCREW, No. 6-32 x 3/16 binding hd . . . -----*-----	1	X																		
-8	41442	. INSULATOR	1	X																		
-9	41406-G1	. FRAME ASSEMBLY	1	X																		

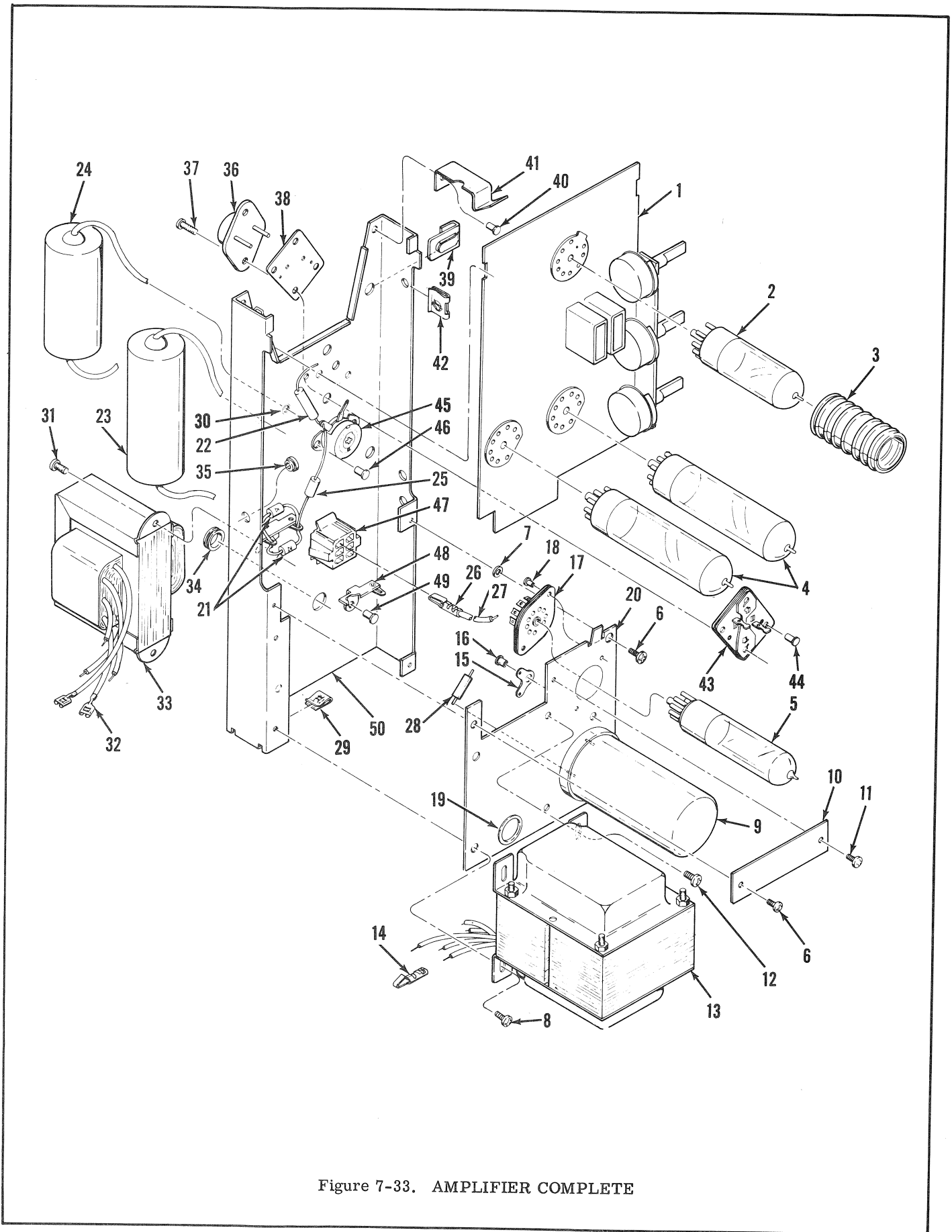


Figure 7-33. AMPLIFIER COMPLETE

GRAFLEX 16 PROJECTOR

Section VII
Subassemblies Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION 1 2 3 4 5	QTY	PART NUMBER																
				38284-G3	38284-G4															
33-	38284-G3	AMPLIFIER COMPLETE	REF	x																
	38284-G4	AMPLIFIER COMPLETE	REF		x															
-1	38289-G2	. . . BOARD COMPLETE (see figure 7-34 for breakdown) . .	1	x	x															
-2	412-1	. . . TUBE, 6AN8	1	x	x															
-3	38285-P1	. . . SHIELD	1	x	x															
-4	412-2	. . . TUBE, 6BQ5	2	x	x															
-5	412-3	. . . TUBE, 6CA4	1	x	x															
*	38292-G3	. . . CHASSIS COMPLETE	1	x																
	38292-G4	. . . CHASSIS COMPLETE	1		x															
*	38299-G1	. . . PLATE ASSEMBLY	1	x																
	38299-G2	. . . PLATE ASSEMBLY (ATTACHING PARTS)	1		x															
-6	121-8R6H	. . . SCREW, No. 8 x 3/8 pan hd.	4	x	x															
-7	30473-39	. . . WASHER, Flat, 0.375 x 0.175 x 0.032	1	x	x															
-8	121-6R5H	. . . SCREW, No. 6 x 5/16 pan hd.	1	x	x															
		---*---																		
-9	38302-P1	. . . CAPACITOR, Elec., 50 Mfd +50 -10%, 450V	1	x	x															
-10	38303	. . . CONNECTOR (ATTACHING PARTS)	1	x	x															
-11	121-6R5H	. . . SCREW (see index 8)	1	x	x															
		---*---																		
*	38305-G1	. . . TRANSFORMER ASSEMBLY	1	x																
	38305-G2	. . . TRANSFORMER ASSEMBLY (ATTACHING PARTS)	1		x															
-12	121-8R6H	. . . SCREW (see index 6)	2	x	x															
		---*---																		
-13	38306-P1	. . . TRANSFORMER	1	x																
	38306-P2	. . . TRANSFORMER	1		x															
-14	38298	. . . CONTACT	2	x	x															
-15	38304	. . . TERMINAL (ATTACHING PARTS)	1	x	x															
-16	176-7-10	. . . RIVET	1	x	x															
		---*---																		
-17	38300-P1	. . . SOCKET, Noval (ATTACHING PARTS)	1	x	x															
-18	175-4-11	. . . RIVET	2	x	x															
		---*---																		
-19	260-5	. . . EYELET	1	x	x															
-20	38250-P1	. . . PLATE	1	x	x															
-21	38293-P1	. . . DIODE, 750 Ma, 50V	2	x	x															
-22	402-10-1-2	. . . RESISTOR, Fixed, Comp., 100 ohms ±10%, 1/2W . .	1	x	x															
-23	38334-P1	. . . CAPACITOR, Elec., 3000 Mfd +110 -0%, 10V	1	x	x															
-24	38334-P2	. . . CAPACITOR, Elec., 1000 Mfd +100 -10%, 10V . . .	1	x	x															
-25	402-68-1-2	. . . RESISTOR, Fixed, Comp., 680 ohms ±10%, 1/2W . .	1	x	x															
-26	38298	. . . TERMINAL	1	x	x															
-27	38291	. . . JUMPER	1	x	x															
-28	402-68-2-2	. . . RESISTOR, Fixed, Comp., 6.8K ±10%, 1/2W	1	x	x															
*	38307-G1	. . . CHASSIS ASSEMBLY	1	x	x															
-29	38309	. . . NUT, Speed	1	x	x															
-30	261-7	. . . EYELET	4	x	x															
*	38311-G1	. . . TRANSFORMER ASSEMBLY (ATTACHING PARTS)	1	x	x															
-31	121-8R6H	. . . SCREW (see index 6)	2	x	x															
		---*---																		
-32	38436	. . . RECEPTACLE	2	x	x															
-33	38312-P2	. . . TRANSFORMER	1	x	x															
-34	38206	. . . BEARING	1	x	x															
-35	248-9-2	. . . INSERT	1	x	x															

Section VII
Subassemblies Parts List

GRAFLEX 16 PROJECTOR

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION 1 2 3 4 5	QTY	PART NUMBER																
				38284-G3	38284-G4															
		AMPLIFIER COMPLETE (Cont.)																		
33-36	38308-P1	. . . TRANSISTOR, Power, B1229 (ATTACHING PARTS)	1	x	x															
-37	121-6R8H	. . . SCREW, No. 6 x 1/2 pan hd. ----*----	2	x	x															
-38	38287-P1	. . . INSULATOR	1	x	x															
-39	38335	. . . CLIP, Speed	2	x	x															
-40	175-6-8	. . . RIVET (ATTACHING PARTS)	2	x	x															
-41	38310-P1	. . . RETAINER ----*----	2	x	x															
-42	38248	. . . NUT, Speed	2	x	x															
-43	38286-P1	. . . SOCKET (ATTACHING PARTS)	1	x	x															
-44	175-6-12	. . . RIVET ----*----	2	x	x															
-45	38313	. . . RHEOSTAT (ATTACHING PARTS)	1	x	x															
-46	175-6-8	. . . RIVET ----*----	2	x	x															
-47	38288-P1	. . . PLUG	1	x	x															
-48	411-1	. . . STRIP, Terminal (ATTACHING PARTS)	2	x	x															
-49	175-6-8	. . . RIVET	2	x	x															
-50	38251-P1	. . . CHASSIS	1	x	x															

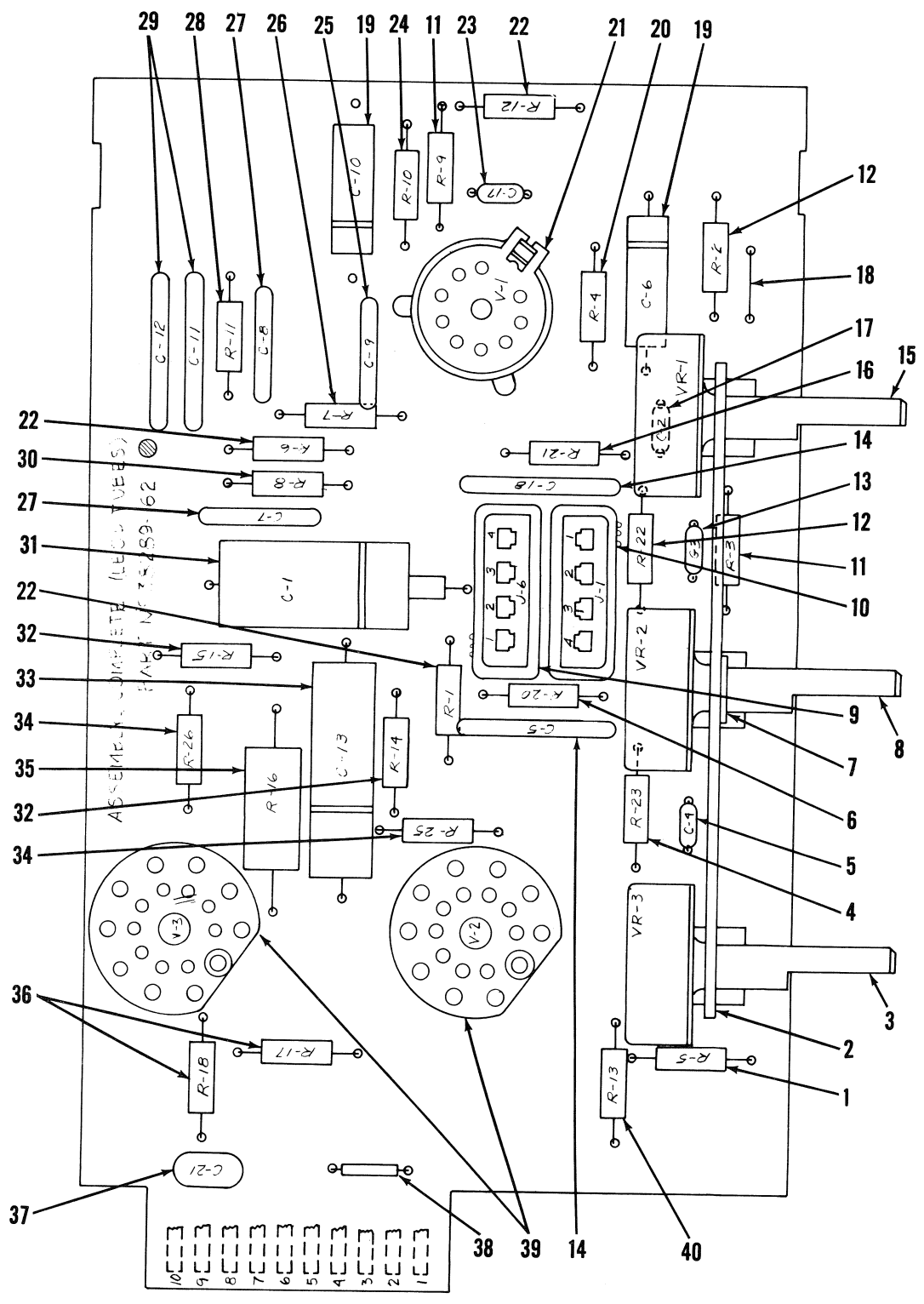


Figure 7-34. AMPLIFIER CIRCUIT BOARD COMPLETE

GRAFLEX 16 PROJECTOR

Section VII
Subassemblies Parts List

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	QTY	PART NUMBER																
				1	2	3	4	5	6	7	8	9	10							
34-	38289-G2	BOARD COMPLETE, Amplifier Circuit	REF	X																
-1	402-47-0-2	. RESISTOR, Fixed, Comp., 47 ohms ±10%, 1/2W	1	X																
-2	38249	. STIFFENER	1	X																
-3	38333-P1	. CONTROL, Volume	1	X																
-4	402-33-4-2	. RESISTOR, Fixed, Comp., 330K ±10%, 1/2W	1	X																
-5	414A471M	. CAPACITOR, Dielec., 470 pf ±20%, 500V	1	X																
-6	402-68-2-2	. RESISTOR, Fixed, Comp., 6.8K ±10%, 1/2W	1	X																
-7	252-5	. RING, Retaining	1	X																
-8	38333-P2	. CONTROL, Treble	1	X																
-9	38336-G2	. CAP ASSEMBLY	1	X																
	38297	. CONTACT	4	X																
-10	38336-G1	. CAP ASSEMBLY	1	X																
	38297	. CONTACT	4	X																
-11	402-10-5-2	. RESISTOR, Fixed, Comp., 1 MEG ±10%, 1/2W	2	X																
-12	402-22-4-2	. RESISTOR, Fixed, Comp., 220K ±10%, 1/2W	2	X																
-13	414A151M	. CAPACITOR, Dielec., 150 pf ±20%, 500V	1	X																
-14	414F203Z	. CAPACITOR, Dielec., 0.02 Mfd +80 -20%, 500V	2	X																
-15	38333-P3	. CONTROL, Base	1	X																
-16	402-47-3-2	. RESISTOR, Fixed, Comp., 47K ±10%, 1/2W	1	X																
-17	414A102M	. CAPACITOR, Dielec., 0.001 Mfd ±20%, 500V	1	X																
-18	38338	. JUMPER, No. 20 AWG Tinned Solid Copper	1	X																
-19	38334-P5	. CAPACITOR, Elec., 25 Mfd +250 -10%, 10V	2	X																
-20	402-15-2-2	. RESISTOR, Fixed, Comp., 1.5K ±10%, 1/2W	1	X																
-21	38324-G1	. SOCKET ASSEMBLY	1	X																
-22	402-10-4-2	. RESISTOR, Fixed, Comp., 100K, ±10%, 1/2W	3	X																
-23	414A101M	. CAPACITOR, Dielec., 100 pf ±20%, 500V	1	X																
-24	402-27-2-2	. RESISTOR, Fixed, Comp., 2.7K ±10%, 1/2W	1	X																
-25	414D103Z	. CAPACITOR, Dielec., 0.01 Mfd +80 -20%, 500V	1	X																
-26	402-27-4-2	. RESISTOR, Fixed, Comp., 270K ±10%, 1/2W	1	X																
-27	38339-P1	. CAPACITOR, Ceramic, 0.1 Mfd +80 -20%, 100V	2	X																
-28	402-56-3-2	. RESISTOR, Fixed, Comp., 56K ±10%, 1/2W	1	X																
-29	38339-P5	. CAPACITOR, Ceramic, 0.1 Mfd +80 -20%, 500V	2	X																
-30	402-27-5-2	. RESISTOR, Fixed, Comp., 2.7 MEG ±10%, 1/2W	1	X																
-31	38334-P3	. CAPACITOR, Elec., 4 Mfd +100 -10%, 250V	1	X																
-32	402-18-4-2	. RESISTOR, Fixed, Comp., 180K ±10%, 1/2W	2	X																
-33	38334-P4	. CAPACITOR, Elec., 50 Mfd +250 -10%, 25V	1	X																
-34	402-47-2-2	. RESISTOR, Fixed, Comp., 4.7K ±10%, 1/2W	2	X																
-35	404-13-1-3	. RESISTOR, Fixed, Comp., 130 ohms ±5%, 2W	1	X																
-36	402-10-1-2	. RESISTOR, Fixed, Comp., 100 ohms ±10%, 1/2W	2	X																
-37	38339-P2	. CAPACITOR, Ceramic, 0.00047 Mfd ±20%, 1400V	1	X																
-38	38289-P48	. JUMPER, No. 20 AWG Copper, Plastic Insulation	1	X																
-39	38323-P1	. SOCKET	2	X																
-40	402-22-3-2	. RESISTOR, Fixed, Comp., 22K ±10%, 1/2W	1	X																
		. BOARD	REF	X																

SECTION VIII

700 SERIES AND OTHER MODIFICATIONS

A. INTRODUCTION

This section contains parts information for the 700 Series Projectors and modification to the 800 and 900 Series Projectors. The information is contained in four parts. Part 1 covers the 700 Series Projectors; part 2 covers the modifications that comprise the Model 920EX Projector; part 3 covers the modifications of Models 815, 820, and 915 Projector for use in the Detroit School system; and part 4 covers the modification to the Model 820 Projector for use by Link Trainer.

700 SERIES PROJECTORS

The 700 Series Projectors are comparable to the 900 Series Projector (Section V) except that several features have been eliminated. The models of 700 Series Projectors covered in this section are Model 715, 716, and 717. These models are comparable to the Model 915, 916, and 917 Projectors, respectively, shown in Section V with the following exceptions.

Figure 5-1

1. Dust cover 40696-P1 replaces item 1 (all 700 models).
2. Elevation rod foot 40695 replaces items 18 and 19 (all 700 models).
3. Part number of item 8 is 39295-G3.

Figure 5-2

1. Items 27 and 28 are deleted (all 700 models).
2. Part number of item 19 is 38071-G3 (all 700 models).
3. Part number of item 26 is 39151-G2 (all 700 models).

Figure 5-3

1. Part number of item 1 is 39184-G3 (all 700 models).
2. Part number of item 21 is 39175-G3 (all 700 models).
3. Part number of item 33 is 39184-G3 (all 700 models).

Figure 5-4

1. Items 8, 9, 26, 27, 28, 29, and 32 are deleted (all 700 models).
2. Part number of item 35 is 39343 (all 700 models).

Figure 5-5

1. Part number of item 21 is 39175-G4 (all 700 models).
2. Part number of item 27 is 39155-G2 (all 700 models).

Figure 5-6

1. Items 29, 30, and 31 are deleted (all 700 models).

Figure 5-7

1. Items 11, 12, 23, 24, 38, 39, 40, and 41 are deleted (all 700 models).

Figure 5-8

1. Part number of item 7 is 39313-G3 (all 700 models).
2. Items 12, 13, 20, 21, 22, 23, 24, 25, and 26 are deleted (all 700 models).

Figure 5-9

1. Part number of item 15 is 39303-G2.
2. Part number of item 16 is 39301-G2.
3. Part number of item 23 is 40693-G1.

MODEL 920EX PROJECTOR

The Model 920EX Projector (part number 42551-G1) is the same as the Model 922 Projector (part number 39290-G8) covered in Figures 5-1 through 5-9 with the following exceptions:

1. Identification Plate 38189-P29 replaces Identification Plate 38189-P19 (4, Figure 5-1).

2. Projector Assembly 42553-G1 replaces Projector Assembly 39300-G7 (23, Figure 5-1). The differences between the two assemblies are as follows:
 - a. Projection Lamp 38170-P1 (3, Figure 5-3) is replaced with Projection Lamp 38170-P2.
 - b. Drive Unit 39114-G7 (11, Figure 5-4) is replaced with Drive Unit 40492-G3. The difference in the two drive units is that Pulley Assembly 39096-G3 replaces Pulley Assembly 39096-G2 in the 40492-G3 assembly. The two pulley assemblies are different in that Pulley 39237-P2 is used in place of Pulley 39237-P1 in the 39096-G3 assembly.
 - c. Housing Assembly 39186-G1 (41, Figure 5-9) is replaced with Housing Assembly 39186-G11. The difference in the two assemblies is that Housing 39185-P10 replaces Housing 39185-P1 in the 39186-G11 assembly.
3. Film Reel 38992-P1 is added to the Complete Projector.

A description of the changes that comprise the above modifications follows:

1. Film Reel 38992-P5 is packaged for shipment with Projector 40678-G2 and 40678-G4.
2. Film Reel 38992-P1 is supplied with Projectors 40678-G1, 40678-G2, and 40678-G4.
3. Projector Assemblies 39150-G1, and 39150-G2 are modified to create Projector Assemblies 40679-G1, 40679-G2, 40679-G4, and 40679-G5 as follows:
 - a. Cover Assembly 39184-G1 (1, Figure 6-3) is replaced with Cover Assembly 39184-G6. The difference between the two assemblies is that Cover 38181-P3 (Figure 7-8) replaces Cover 38181-P1.
 - b. Housing Assembly 39186-G1 (30, Figure 6-9) is replaced with Housing Assembly 39186-G10. The difference between the two assemblies is that Housing 39185-P9 (Figure 7-29) replaces Housing 39185-P1.
 - c. Wiring of the assemblies has been modified and is in accordance with the wiring diagrams of Figures 8-1 and 8-2.
 - d. Projection Lens 38428-P1 (2, Figure 6-2) replaces Projection Lens 38427-P1 on Projector Assemblies 40679-G4 and 40679-G5.
 - e. The parts listed on the following pages have been added to all assemblies.

MODELS 815 and 820 PROJECTORS
(Modified for Detroit Schools)

The Models 815 and 820 Projectors have been modified to provide four different projectors for use in the Detroit schools. Three of these modifications apply to the Model 815 Projector and one applies to the Model 820 Projector. The part numbers and descriptions of the four modified projectors are listed in the table below.

PART NUMBER	DESCRIPTION
40678-G1	PROJECTOR, Complete (117V, 60 Cycles) (Model 820 Modified from 39100-G1)
40678-G2	PROJECTOR, Complete (117V, 60 Cycles) (Model 815 Modified from 39100-G2)
40678-G4	PROJECTOR, Complete (117V, 60 Cycles) (Model 815 Modified from 39100-G2)
40678-G5	PROJECTOR, Complete (117V, 60 Cycles) (Model 815 Modified from 39100-G2)

PART NUMBER	DESCRIPTION	QUANTITY
221-4	WASHER, Lock	2
116-2-5H	SCREW, No. 2-56 x 5/16 pan hd	2
116-4R4H	SCREW, No. 4-40 x 1/4 pan hd	2
38998	TERMINAL	1
36709-P1	SWITCH	1
32090-16	SPACER	1
40684	RIVET	1
40683-P1	SPRING	1
40682	RETAINER	1
40681	ACTUATOR	1
40680	BRACKET	1

MODEL 820 PROJECTOR
(Modified for Link Trainer)

The Model 820 Projector has been modified for Link Trainer by the addition of an audio jack on the amplifier cover assembly. The jack is added into the circuit as shown in the following schematic diagram. Refer to Figure 2-24 for the overall schematic diagram tie-in.

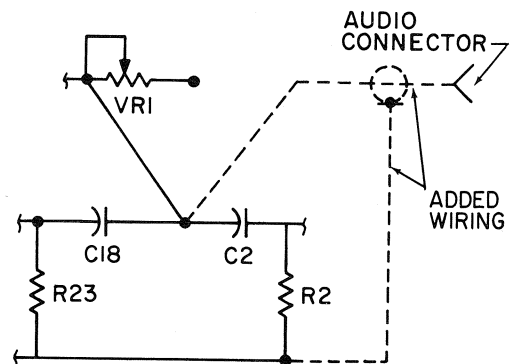
The new parts that comprise this modification are:

PART NUMBER	DESCRIPTION	QTY
GSK1482-P3	CONNECTOR	1
GSK1482-P2	CABLE	1
101C3-5	SCREW	4
201C3H	NUT	4

In addition, the following parts are changed:

- Exciter Lamp GSK1482-P14 replaces Exciter Lamp 38386-P1.
- Projection Lamp 38170-P2 replaces Projector Lamp 38170-P1.

- Film Reel 38992-P5 replaces Film Reel 38992-P1.
- Projection Lens 38428-P1 is omitted.
- Cover Assembly 39059-P1 and Amplifier Plate 39173-P1 are drilled to accommodate Connector GSK1482-P3 and attaching hardware.



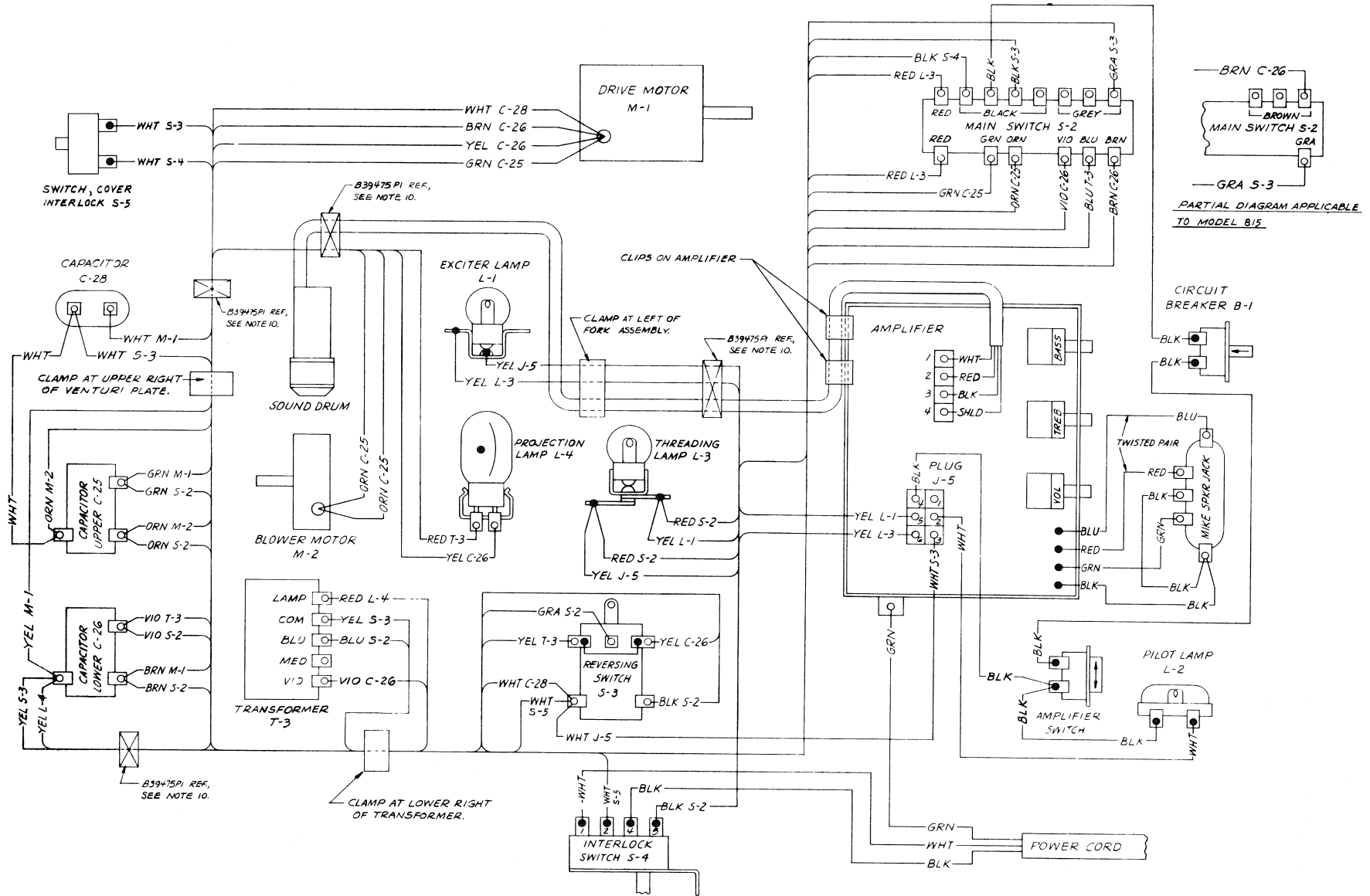


DIAGRAM APPLICABLE TO MODEL 820
AND TO MODEL 815 EXCEPT AS SHOWN IN
PARTIAL DIAGRAM

(Ref. 40685)

FIGURE 8-1. WIRING DIAGRAM FOR MODELS 815 AND 820 PROJECTORS
 (Modified for Detroit Schools)

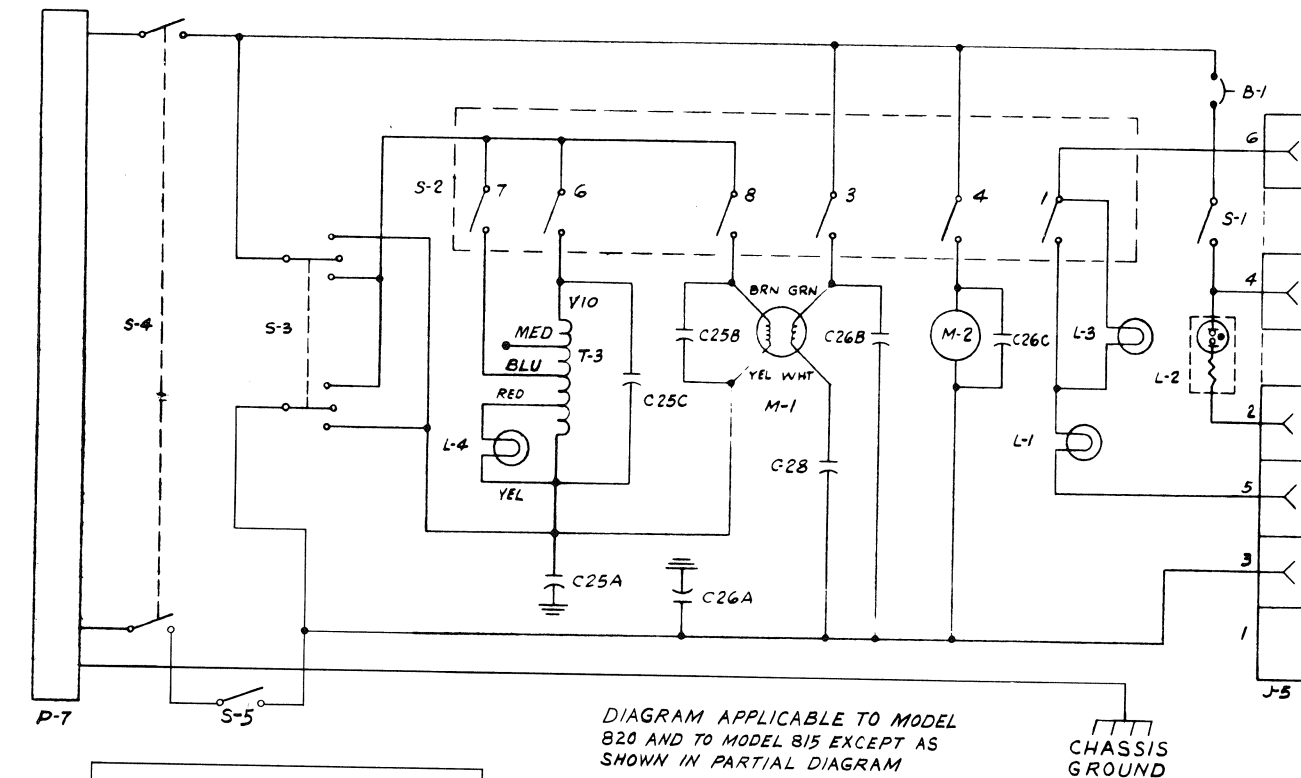
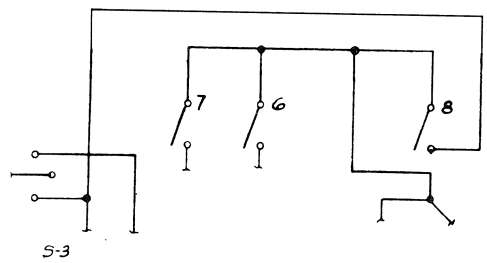


DIAGRAM APPLICABLE TO MODEL 820 AND TO MODEL 815 EXCEPT AS SHOWN IN PARTIAL DIAGRAM



PARTIAL DIAGRAM APPLICABLE TO MODEL 815

	1	3	4	6	7	8
OFF	0	0	0	0	0	0
STILL	0	0	X			0
RUN	X	X	X			X
LAMP	OFF		X	0	0	
	LO		X	X	0	
	HI		X	0	X	

SWITCHING TABLE FOR MODEL 820

	1	3	4	6	7	8
OFF	0	0	0	0	0	0
RUN	X	X	X			X
LAMP	OFF		X	0	0	
	LO		X	X	0	
	HI		X	0	X	

SWITCHING TABLE FOR MODEL 815

NOTE: DEPRESSING A BUTTON ON SWITCH S-2 WILL OPEN(O), CLOSE(X) OR LEAVE UNCHANGED(NO MARK) CONTACTS, AS INDICATED IN THE TABLES.

(Ref. 40686)

FIGURE 8-2. SCHEMATIC DIAGRAM FOR MODELS 815 AND 820 PROJECTORS (Modified for Detroit Schools)

Models 900, 901, 915, 920 Alternate Motor
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3. Some of the above models have been equipped with a Robbins & Myers Motor (instead of a Bodine Motor) and can be identified by "R" preceding the Serial Number on the Identification Plate (4, Figure 5-1). These projectors will differ from the regular 900, 901, 915 & 920 models as follows:
 - a. Wiring in accordance with the wiring diagrams, Figures 2-29, 2-30, 2-31 and 2-32.
 - b. Drive Unit Assembly 39114G4 (Figure 5-4) is replaced by Drive Unit Assembly 40492G2. The difference between the two assemblies is replacement Motor Assembly (Robbins & Myers), 39349G4, for Motor Assembly (Bodine), 39349G1. (See Figure 7-12).
 - c. Motor Drive Belt, 39086P1, (Figure 5-4) is replaced by Motor Drive Belt, 39086P2.
 - d. Spring, 39080P1, (Figure 5-4) is replaced by Spring, 39498P1.
 - e. Main Shaft Pulley, 39101P1, (Figure 5-7) is replaced by Main Shaft Pulley, 39101P2.
 - f. Motor Capacitor, 38177P5, (Figure 5-5) is replaced by Motor Capacitor 38177P9.
 - g. Main Harness Assembly, 39301G1, (Figure 5-9) is replaced by Main Harness Assembly, 39301G5.
 - h. Motor Relay 40481P2 is added.
 - i. Miscellaneous items... terminals, connectors, etc. are added but are not defined here. If required, use local purchase items for replacement.