



When the show must go on.

16MM SOUND PROJECTOR

SERVICE MANUAL

—MODEL EX-4000P SERIES—

AUG.8.1983

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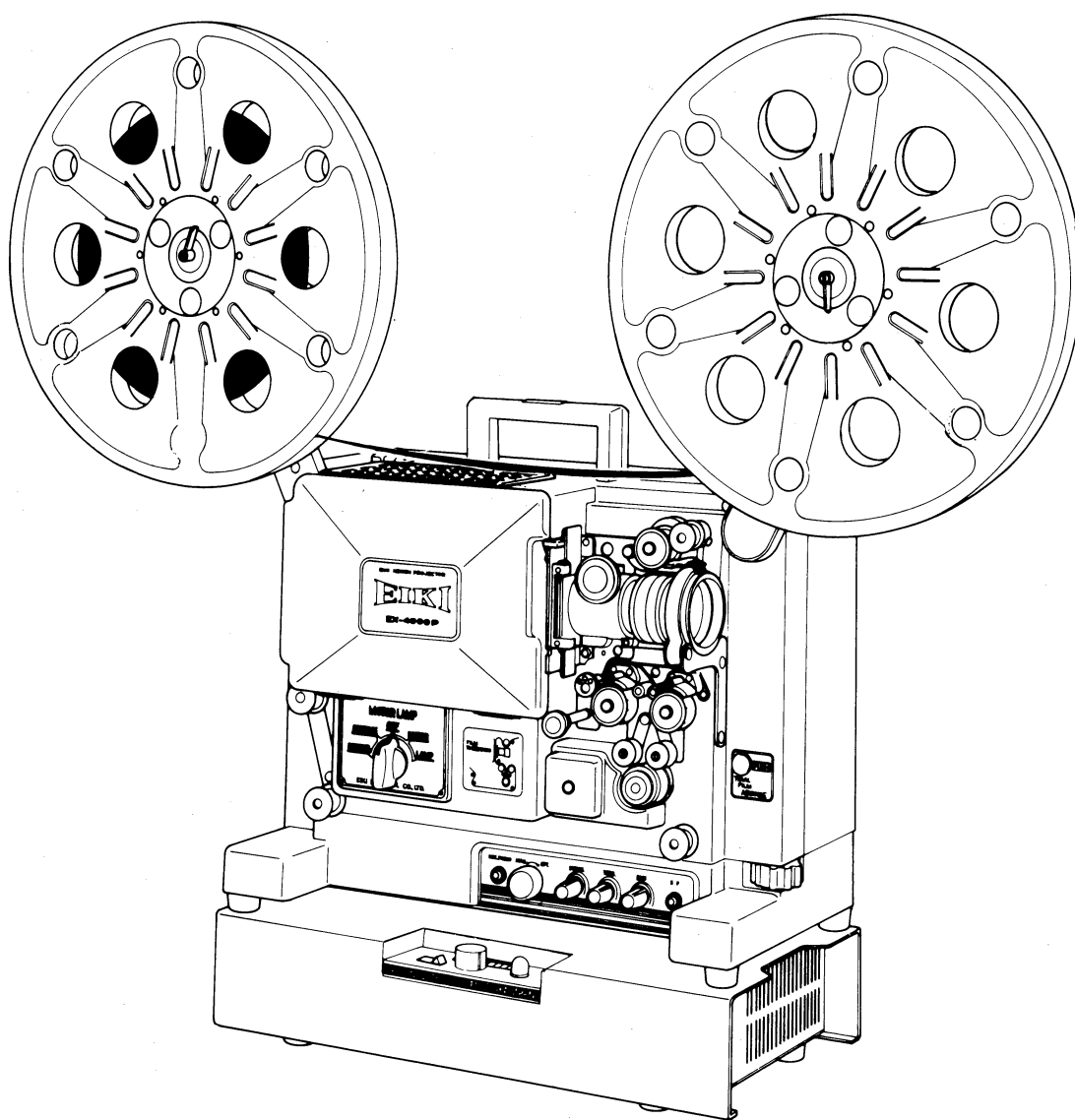
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INTRODUCTION

1. This Service Manual is intended to provide the necessary information for the normal repairs, adjustments and maintenance of the EIKI EX-4000P professional Xenon 16mm projector.
2. Manual contains a number of part numbers for the convenience of identification only. When ordering parts, refer to the EX-4000P replacement parts list.
3. The projector has been modified and improved a number of times. These modifications will be covered where practical.
4. All pertinent schematic diagrams are attached at the end of the appropriate sections.
5. **CAUTION!** Care must be exercised to avoid electrical shocks while servicing the projector.



241-1: GENERAL DESCRIPTION

The EX-4000P is a portable professional type 16mm small theatre or auditorium projector.

The projector offers features of a 550 watt ozone free Xenon lamp rated at 2100 lumens with a typical life expectancy of 1000 hours.

15° maximum vertical adjustment, optical framing and both magnetic and optical sound reproduction.

Amplifier is a plug-in module rated at 35 watts all solid state with individual bass and treble controls.

Inputs for a microphone and outputs for both 8 ohm speaker and 600 ohm balanced line.

1-1: APPLICATIONS

The EX-4000P is intended to be operated as a single unit or in pairs with an optional change-over system.

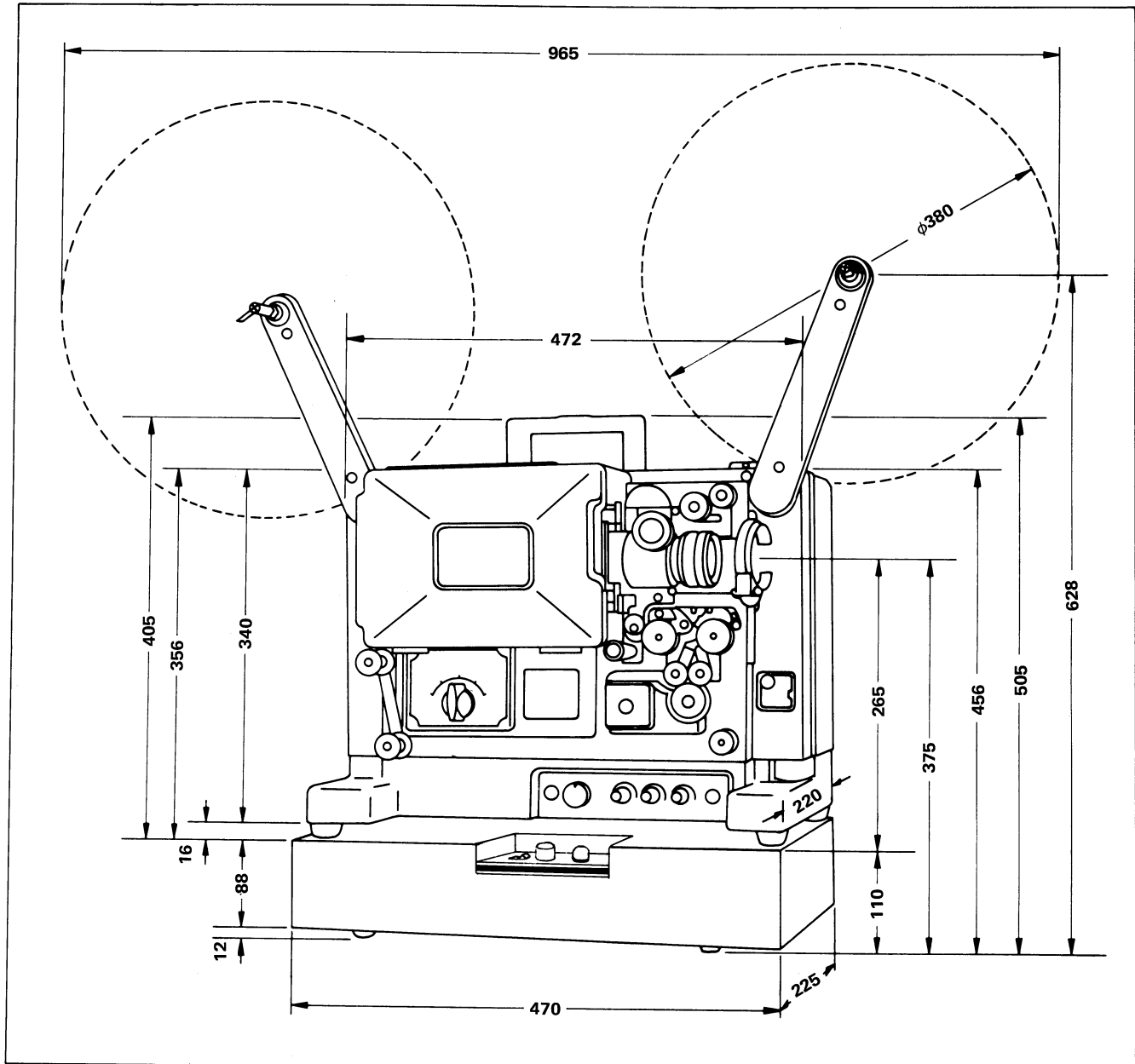
It is recommended that the operating instructions be carefully followed. Each application will determine the type of equipment and options required. For example, if the same length feature film is being shown repeatedly, a single projector with #5350 (for USA only. #5401 for other countries) Long Play Unit may be very convenient, eliminating the need to change reels or watch for change-over cues. In applications where a multiple reel, full-length film is shown only once or twice, it is more practical to operate two projectors with the change-over system.

One of the most important considerations is the brightness of the image. The choice of projector and lamp current adjustment effects screen illumination based on the following factors:

1. Size and type of theater or auditorium
2. Screen size and type
3. Ambient light conditions
4. Distance from the audience to the screen

It is a recommended practice that the projector deliver screen lumens sufficient to produce at least 15 to 16 foot lamberts of reflected light to a viewer in the audience within 15° off center and at least 3 times the screen height away. Less illumination will produce marginal results and excessive illumination will produce objectionable flicker.

1-2: PHYSICAL DIMENSIONS



* ALL DIMENSIONS IN MM

1-3: SPECIFICATIONS

Power Requirements:	100, 120, 220, 240 volts AC Single Phase 50 or 60Hz 15 amps	Audio Inputs:	6.4mm (1/4") high Z mi- crophone jack
Lamp:	UXL-550 DA 550 watt Ozone free Xenon lamp (P/N 5111)	Speaker Output:	8 ohm 6.4mm (1/4") speak- er jack
Brightness:	2100 – 2200 Lumens Typi- cal with two blade shutter, 50mm (2") F1.2 Lens	Line Output:	6.4mm (1/4") 3 conductor 600 ohm
Exciter Lamp:	4 volt 0.75 amp (Type BRK)	Wow & Flutter:	Better than 0.2% weighted average
Standard Lens:	50mm (2") F1.2 6 element coated Resolution exceeds 100 line/mm center	Picture Stability:	Better than 0.25% vertical jitter and 0.2% horizontal weave.
Anamorphic Lens & Holder:	"D" size ϕ 52mm standard Optional "C" size ϕ 43mm	Elevation:	Maximum 15 degree of Horizontal
Shutter:	2 blade standard, optional 3 blade		
Main Drive Motor:	Induction type with capaci- tor, optional Synchronous Motor		
Lamp Cooling:	Dual Squirrel cage fan on main drive motor		
Take-Up & Rewind:	Independent Torque Motor		
Film Speed:	24 FPS sound 50/60Hz (18 FPS optional)		
Loop Restorer:	Automatic		
Function Switch:	Single rotary, motor, lamp, reverse and rewind		
Threading:	Manual, three sprocket drive system		
Reel Capacity:	2000' max (optional 6000' with LP-pedestal)		
Sound:	Optical and magnetic play- back		
Amplifier:	Solid State 35 watts RMS, plug in module with sep- erate volume, bass and treble controls		

241-2: INSTALLATION

2-1: UNPACKING & SETTING UP

The EX-4000P is shipped in a carton with three sub-cartons containing:

- A. Accessories
- B. Power Supply
- C. Projector

- (1) Carefully remove each carton, unpack the lamp power supply.

This supply also serves as a base for the Projector.

- (2) Place the Power Supply on a table or sturdy Projector stand with the cables and connector end away from the screen.

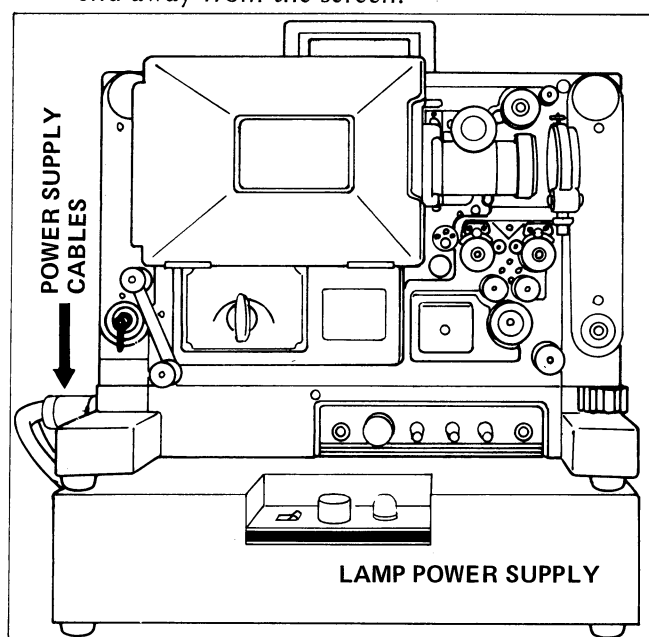


Fig. #1

- (3) Position the Projector on the Power Supply so that the rubber feet fit squarely on the supply.

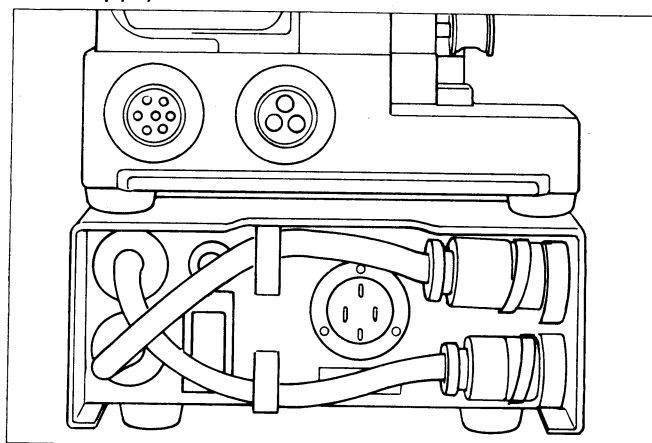


Fig. #2

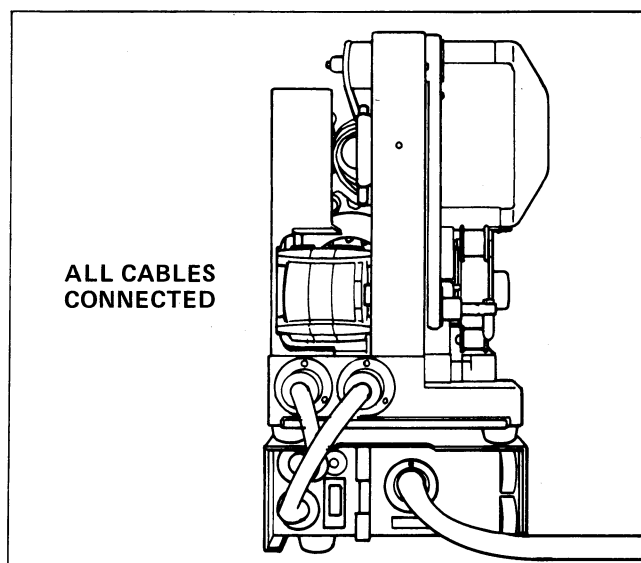


Fig. #3

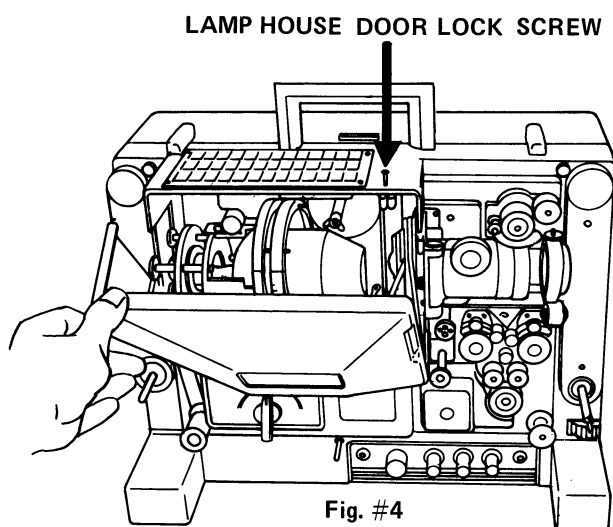
- (4) Raise the supply and take-up arms until they lock in place.
- (5) Remove the lamp power supply interconnect cables from their storage position (Fig #2).
- (6) Connect the 7 conductor power and control cable to the receptacle on the left.
- (7) Connect the 3 conductor lamp power cable to the right receptacle. (Fig. #3).
- (8) Care should be exercised as not to cross thread the retaining rings.
- (9) Connect the power cord to the 3 conductor receptacle on the lamp power supply.
- (10) Be sure the Projector's function switch is in the "OFF" position before connecting the wall outlet.

CAUTION: DO NOT TURN ON THE LAMP UNLESS THE XENON LAMP HAS BEEN INSTALLED.

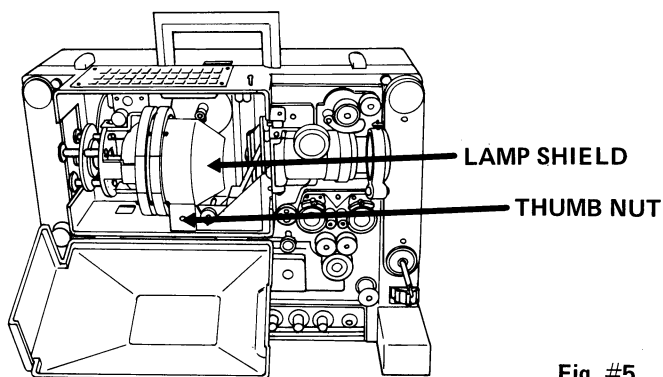
2-2: XENON LAMP INSTALLATION

WARNING:

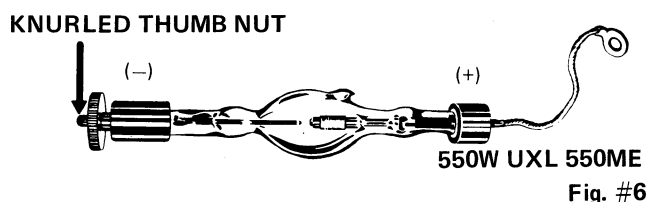
XENON LAMPS ARE UNDER EXTREME PRESSURE AND WILL EXPLODE IF HANDLED CARELESSLY. FINGER PRINTS ON THE GLASS MAY LEAD TO EARLY LAMP AND/OR PICTURE DEGRADATION. THEREFORE, LAMP INSTALLATION OR REPLACEMENT SHOULD ONLY BE PERFORMED BY A QUALIFIED SERVICE TECHNICIAN WEARING PROTECTIVE CLOTHING AND FACE SHIELD. BE SURE THE MAIN POWER SWITCH IS "OFF" WHILE CHANGING LAMPS.



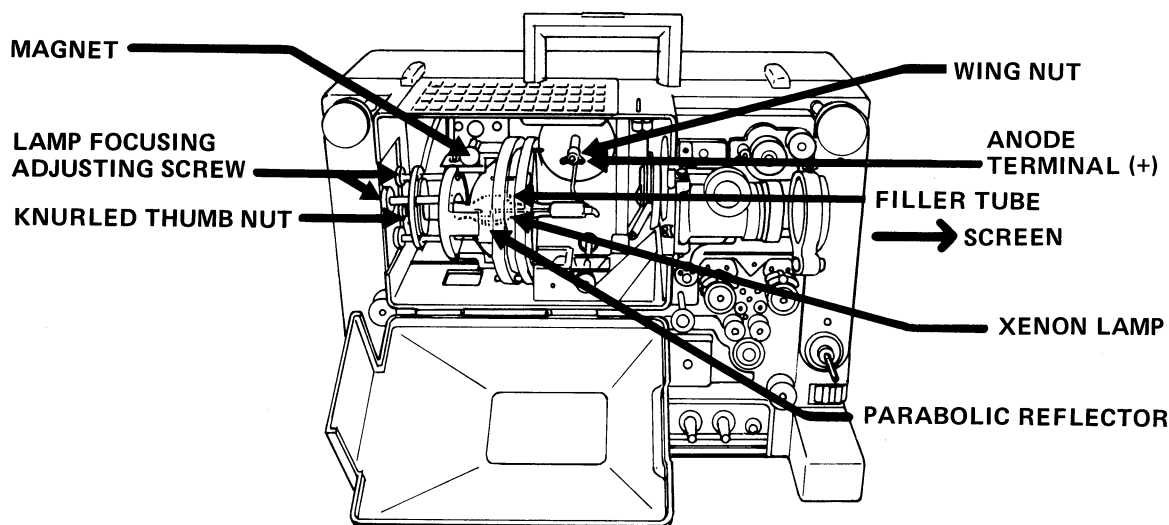
- (1) Loosen the lamp house lock screw.
- (2) Open the lamp house door by pulling from the top and swinging it down. (Fig. #4)
- (3) Remove the thumb nut and the lamp shield. (Fig. #5)



- (4) Carefully remove the lamp from the carton, holding the lamp by the metal ends only, and avoid touching the glass.
- (5) Remove the knurled thumb nut from the cathode (-) end. (Fig. #6)



- (6) Holding the lamp by the metal anode (+) end, insert the cathode (-) end into the center of the parabolic reflector. (Fig. #7)



- (7) The threaded cathode (—) end should now extend through the center hole in the rear of the reflector.
- (8) Rotate the lamp until the filler tube points up.
- (9) Remove the Anode (+) terminal wing nut.
- (10) Locate the lug on the braided anode (+) lead and secure it to the anode (+) terminal using the wing nut previously removed.
- (11) Position the braided anode (+) so that it forms a loop to the terminal away from the metal parts of the projector.
- (12) Screw the knurled thumb nut on the cathode end (—) securing the lamp in the reflector.
- (13) Re-install the lamp shield, removed in step 3, and close the lamp house cover.
- (14) The lamp installation is now complete, except for adjusting the lamp focus.
- (15) Should the glass of the lamp have been accidentally touched, clean the touched area with the alcohol moistened towel provided with the lamp.

2-3: ELECTRICAL POWER CONNECTIONS

The EX-4000P is designed to accept input voltages from 100 VAC to 240 VAC 50/60Hz.

A voltage range selector switch is located on the bottom of the lamp power supply. (Fig. #8)

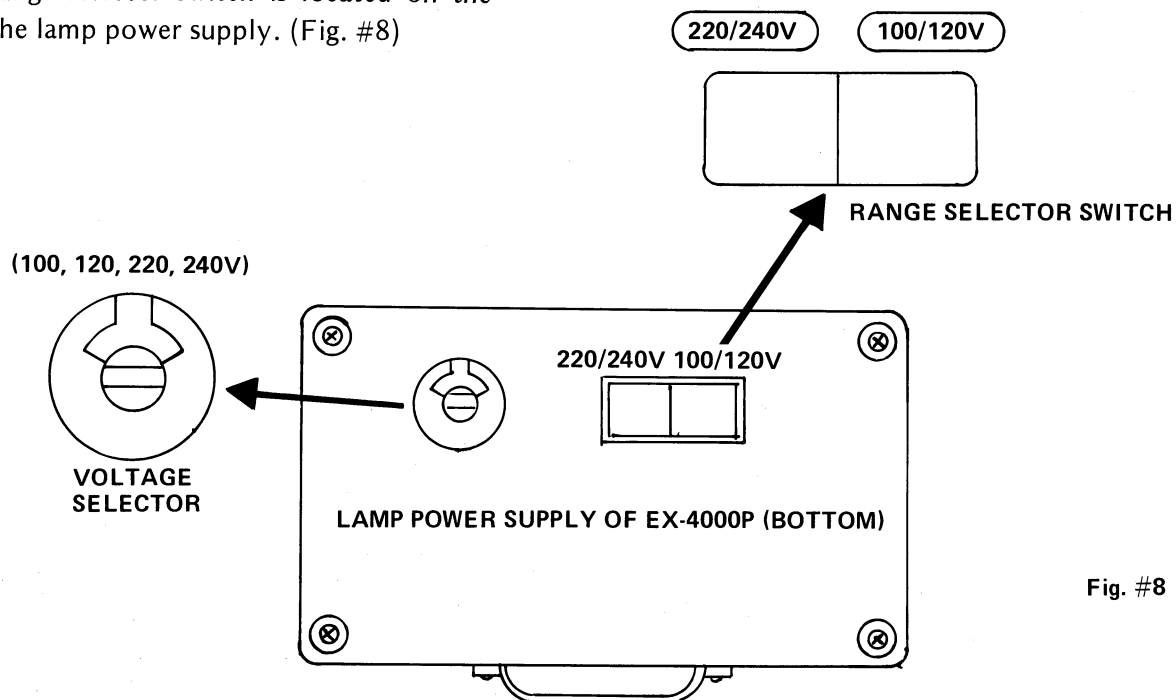


Fig. #8

The individual voltage selector located to the left of the range selector switch should be set at the appropriate voltage to which the projector will be operated. Insert a coin in the slot and rotate the selector until the desired voltage indicator appears. 100, 120, 220, or 240 VAC.

To avoid equipment damage it's important to check the position of the voltage selectors before connecting to the electrical wall outlet.

2-4: AUDIO CONNECTIONS

The EX-4000P is provided with both an 8 ohm speaker output from a 6.4mm (1/4") two conductor phone jack or 600 ohm balanced line level from a 6.4mm (1/4") three conductor phone jack. (See Fig. #9) To avoid possible ground loop conditions, the 8 ohm speaker line must be maintained above electrical or earth ground.

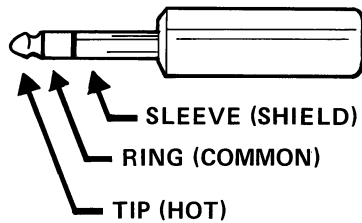


Fig. #9

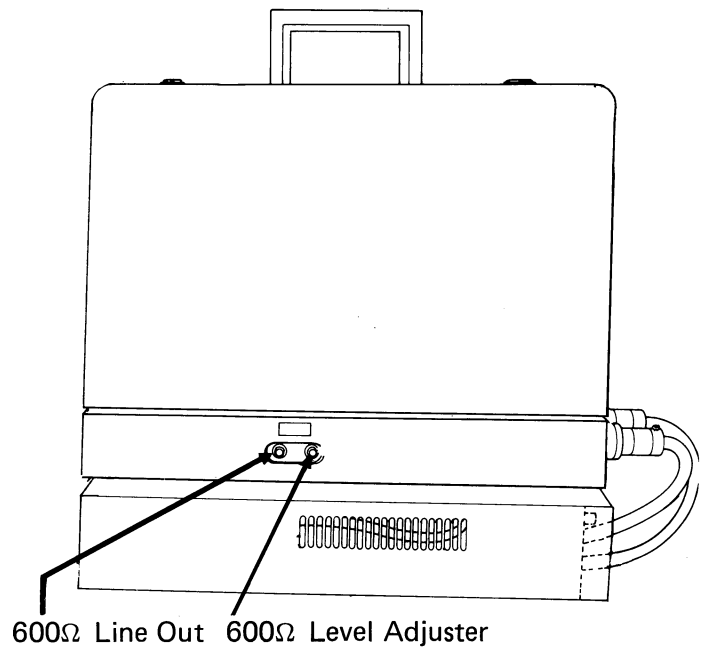


Fig. #11

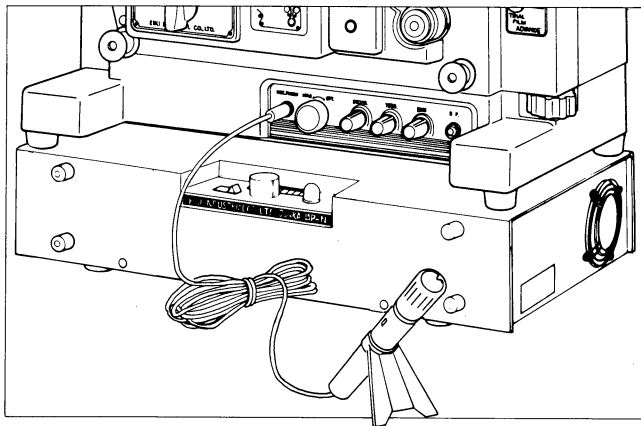


Fig. #10

The 600 ohm output signal level is adjustable from the volume control. For best results the volume control should be somewhere below 12 o'clock position. When making connections to a balance input of the house or auditorium amplifier system, a two conductor shielded cable is required. The projectors connections are shown in (Fig. #9) using a 6.4mm (1/4") 3 conductor phone plug. Where the input to the house amplifier is unbalanced, use the tip and ring connections only.

241-3: OPERATING INSTRUCTIONS

EX-4000P

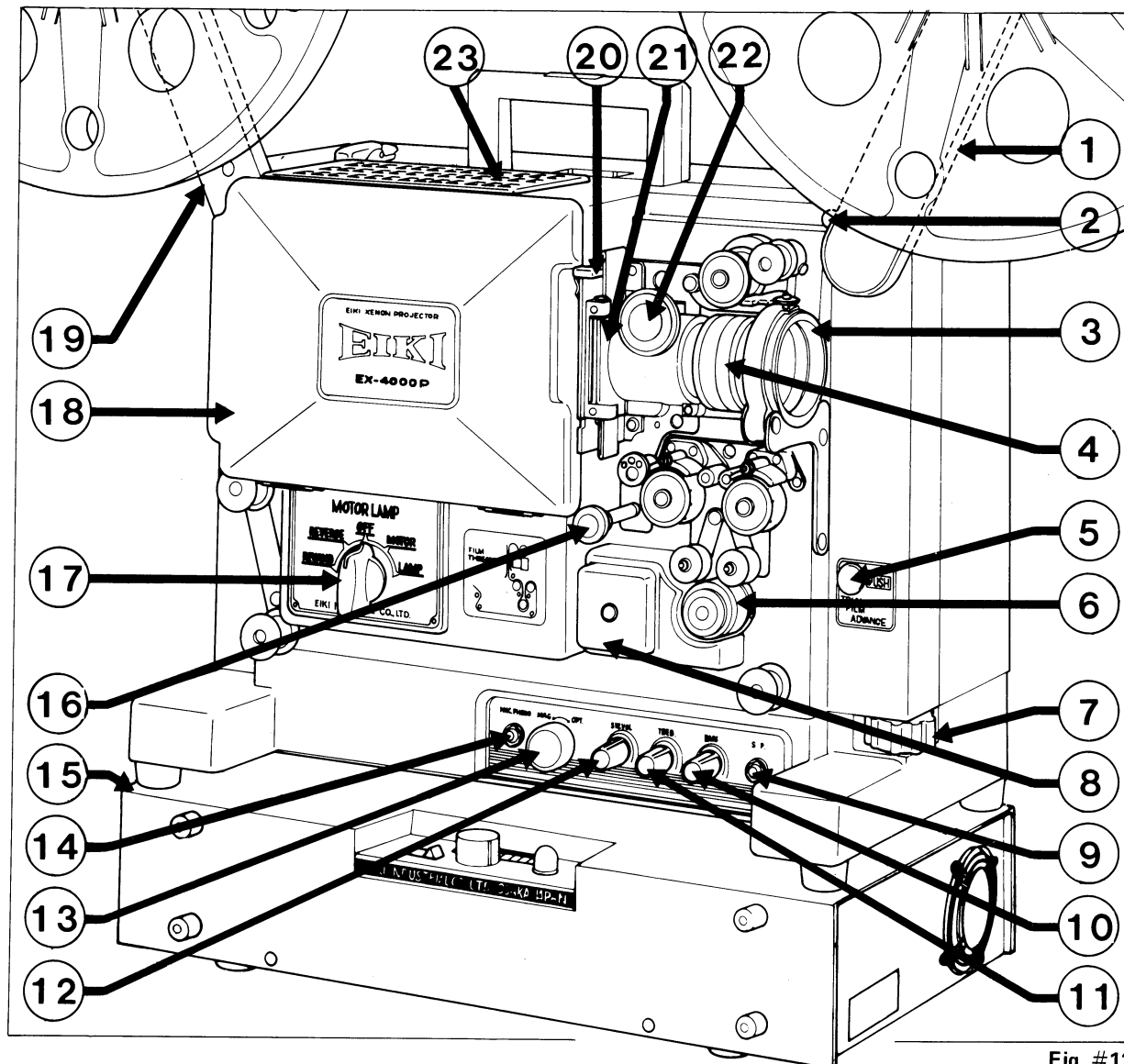


Fig. #12

- | | |
|--|----------------------------|
| 1. Supply arm | 16. Framing control |
| 2. Supply arm lock button | 17. Rotary function switch |
| 3. Anamorphic lens holder (D size) | 18. Lamp house cover |
| 4. Lens | 19. Take-up arm |
| 5. Film trial advance button | 20. Stop lever/douser |
| 6. Sound drum | 21. Film gate |
| 7. Elevator knob | 22. Focus knob |
| 8. Exciter lamp cover | 23. Lamp house lock screw |
| 9. External speaker jack | |
| 10. Bass control | |
| 11. Treble control | |
| 12. Amplifier, ON/OFF and volume control | |
| 13. Magnetic/Optical selector switch | |
| 14. Microphone input | |
| 15. Power supply | |

3-1: OPERATING PROCEDURES

A. Threading

1. Place the film to be shown on the supply arm with the film reeling off in a clockwise direction.

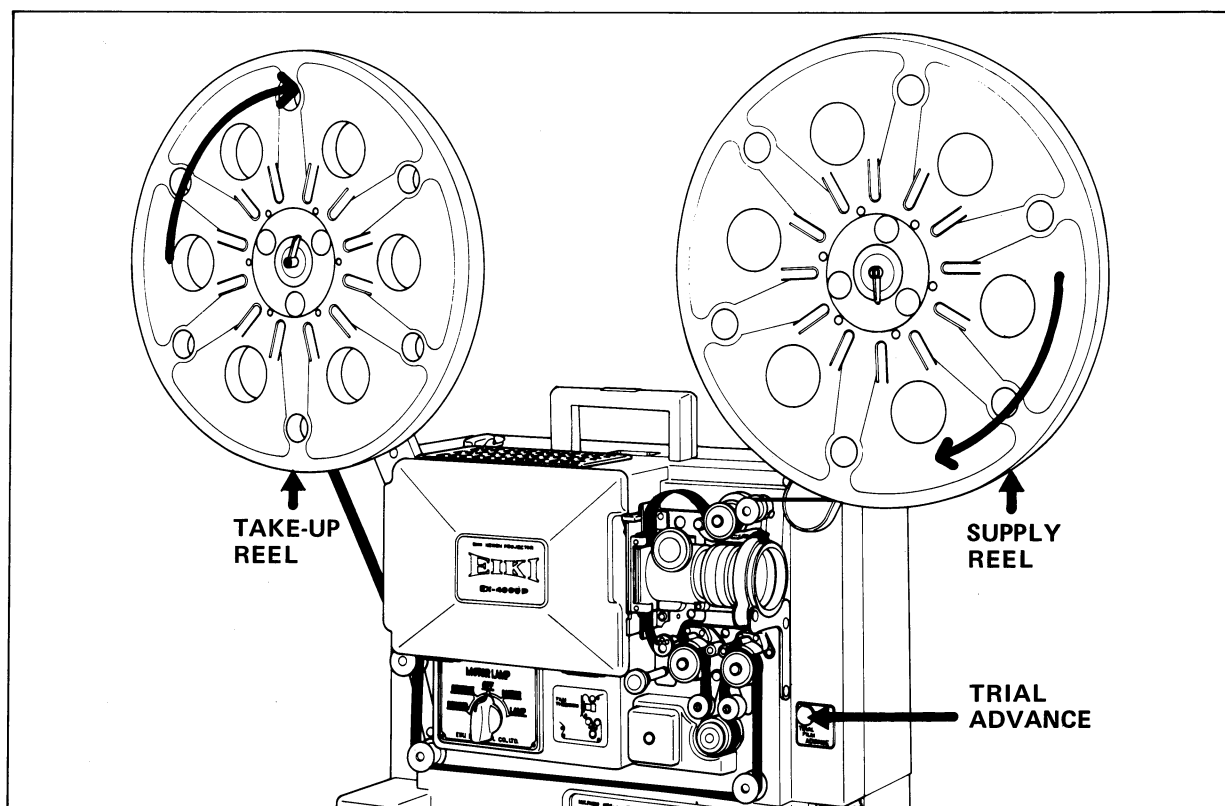


Fig. #13

2. Attach the empty reel to the take-up arm.
3. Pull on the lens towards you to swing open the film gate. (Fig. #14)
4. Reel off approximately 6 feet or (2m) of film.
5. Begin threading at the #1 sprocket by pressing down on the sprocket shoe. Insert the film onto the sprocket. When the film has been seated in the sprockets, close the film shoe.
6. Form the upper loop and insert the film in the gate. With the film seated in the gate, swing the lens closed until it snaps in place.
7. Form the lower loop, open the #2 sprocket shoe, seat the film and close the shoe.
8. Wrap the film around the sound drum on the inside of the two tension rollers.
9. Open sprocket shoe #3 and pull enough tension around the sound drum so that it causes the tension rollers to spread about 7mm — 9mm during projection.

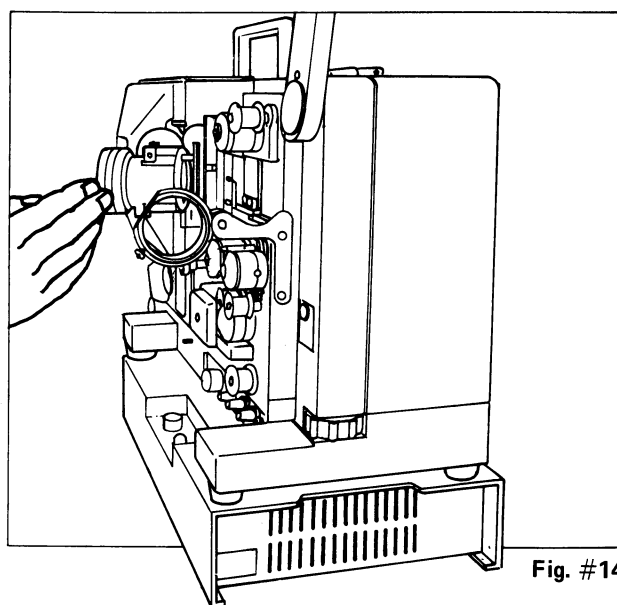


Fig. #14

10. Maintaining the tension, insert the film over the #3 sprocket and close the shoe.
11. The remainder of the film can now follow the guide rollers as shown on the diagram, attaching the film to the take-up reel in a clockwise direction.
12. After completing the threading, push the trial advance button.

If the film is not transported smoothly, re-check the threading.

NOTE: During the threading, if additional film is required, push the trial advance to obtain the film necessary for completing the threading.

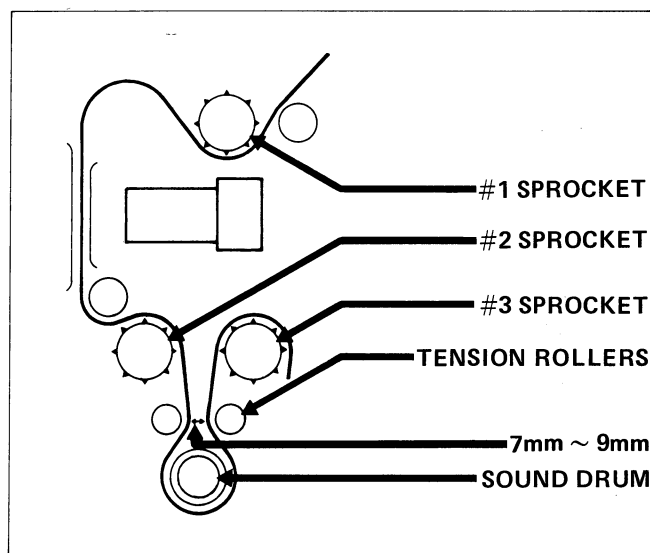


Fig. #15

B. Projecting

1. Thread the projector as previously described.
2. Rotate the function switch first to the motor position.

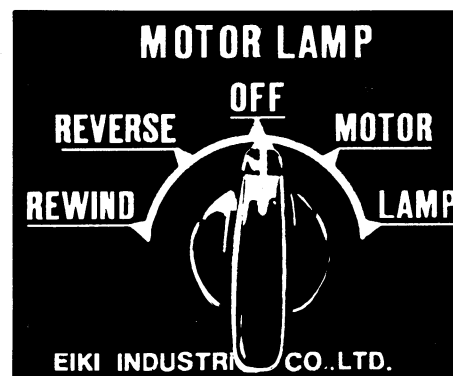


Fig. #16

3. Turn on the lamp and adjust the focus for sharp, crisp picture.
4. Adjust for proper framing.
5. Turn on the amplifier, adjust volume and tone controls for a clear and pleasing sound.

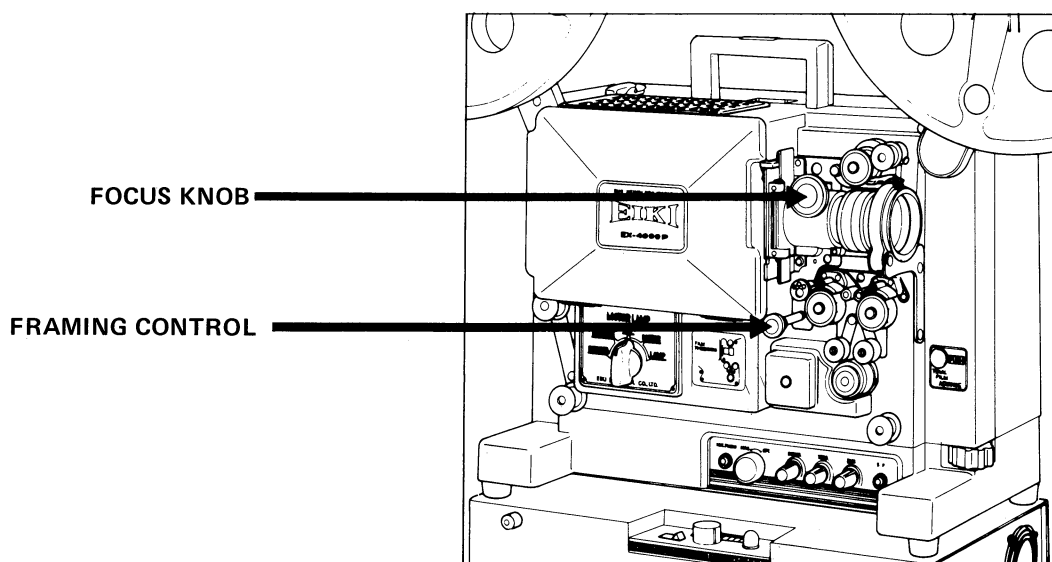


Fig. #17

C. Rewinding

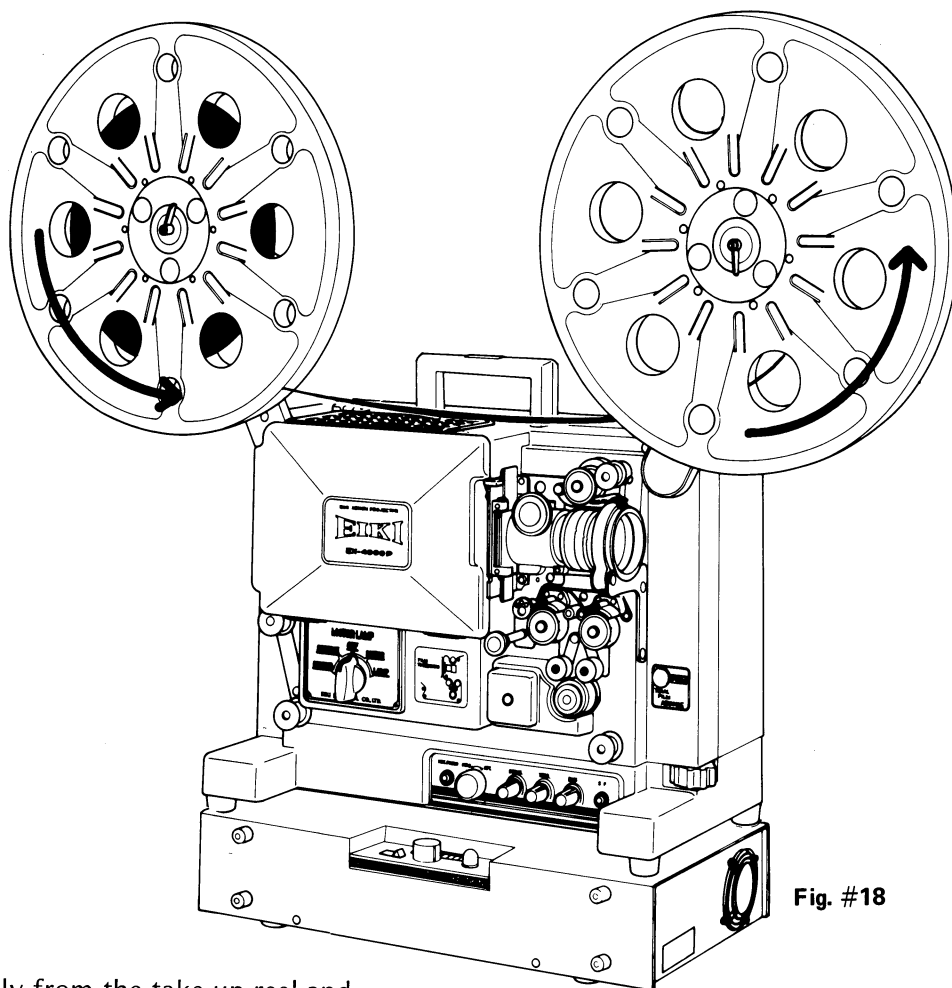
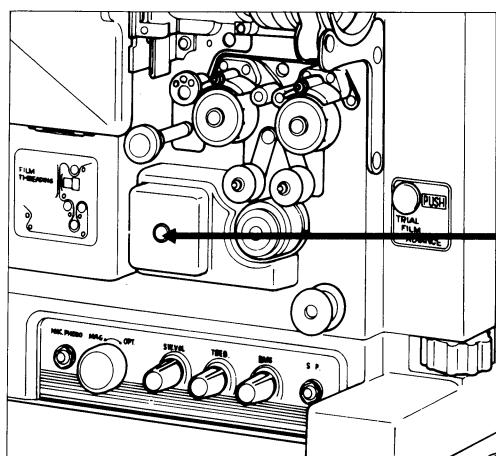


Fig. #18

1. Bring the film directly from the take-up reel and attach it to the supply reel in a counter clock-wise direction.
2. Rotate the function switch counter-clockwise to the rewind position.
3. Return the function switch to "OFF" upon completion of the rewind.

D. Replacement of the Exciter Lamp

1. The Exciter Lamp is located behind the cover next to the sound drum.
2. To remove the Exciter Lamp cover, grasp and pull away from the projector.
3. Push in on the lamp and turn counter-clockwise to remove.
4. Insert a new lamp with the notch on the base flange in the upper right position, turn clockwise, clean finger-prints from the lamp and replace the cover.
5. A green light in the Exciter Lamp cover indicates that it is on.



(BRK/4V 0.75A)
EXCITER LAMP

Fig. #19

3-2: SPECIAL OPERATING PRECAUTIONS

A. Xenon Lamp:

The Xenon lamp is under extreme pressure and will explode if handled carelessly. Lamp changing should be referred to a qualified service technician wearing protective clothing and a face shield. NEVER attempt to open the lamp house or change the lamp while it is hot. A Xenon lamp is exceptionally bright and emits light in the ultra violet spectrum. Do not attempt to look directly at the lamp with unprotected eyes. Weak or defective lamps will exhibit difficult striking, erratic light output and current fluctuation. When this occurs, the lamp is more susceptible to explosive failure and should be replaced.

B. Electrical Shock Hazard:

To avoid electrical shock, all servicing of the projector should be referred to a qualified technician. Never attempt to remove or open the rear cover without first disconnecting all electrical power.

C. Shipping or Transporting the Projector:

The lamp power supply and Projector can be separated for easy carrying. Save the original cartons for future shipping. Never ship the Projector with Xenon lamp installed. Pack the lamp and Projector in its original carton for safe shipping.

3-3: XENON LAMP ADJUSTMENT

The position of the lamp in mirror is critical for maximum screen illumination. The three adjustment screws behind the lamp allow it to be positioned up and down and in and out from the mirror.

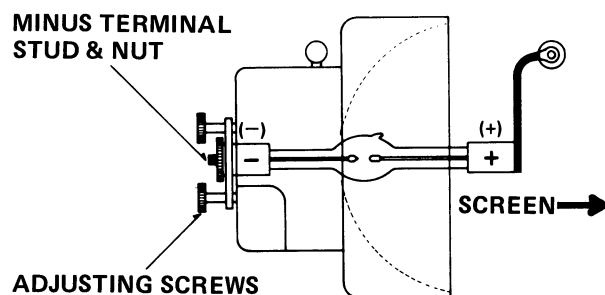


Fig. #20

1. Position the Projector for a screen image of at least 1 meter (3 feet) wide.
2. Without film in the aperture, turn "ON" the Projector and switch "ON" the lamp.
3. Set the lamp current adjustment to read 25 amps.

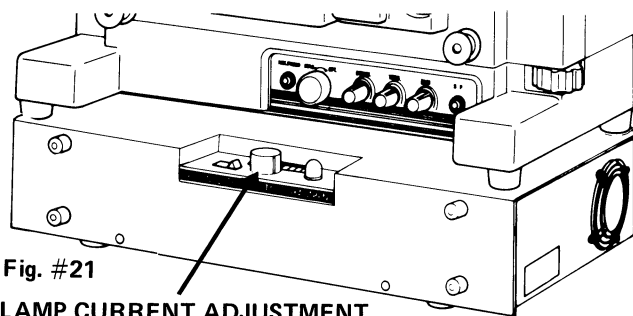


Fig. #21

LAMP CURRENT ADJUSTMENT

4. Open the film gate by swinging the lens out of the way.
5. Observe the dark center on the screen. Adjust the three lamp adjusting screws until the "boiling" appearance surrounding the dark center is in best focus and evenly distributed around the center. The dark spot should be in the center and distance A-A is approximately equal to distance B-B.

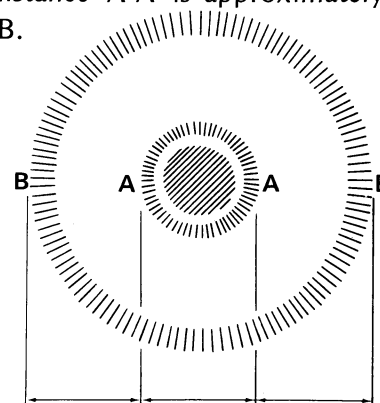


Fig. #22

6. Close the film gate, swinging the lens and gate back into position. Examine the screen for severe hot spots. A severe hot spot can damage the lens — and re-check the adjustment.
7. If the illumination on the screen is brighter in some areas, it is necessary to make minor touch-up adjustments to the lamp's screws until even illumination is obtained. The center should not be more than 50% brighter than the darkest corner for proper screen illumination.
8. The lamp current control may be reduced, if maximum brightness is not required, thus increasing the life of the Xenon lamp.

3-4: 50/60Hz OPERATION

The standard EX-4000P Projector is available as 50Hz/60Hz sound only. Conversion from 50 to 60Hz or 60 to 50Hz can be accomplished by changing the location of the motor belt.

Optional 18/24 Frame Motor and Shutter Pulleys are available.

Models with synchro motors and belt drive systems are single speed only.

See the chart below for selection of pulleys for other than standard speeds.

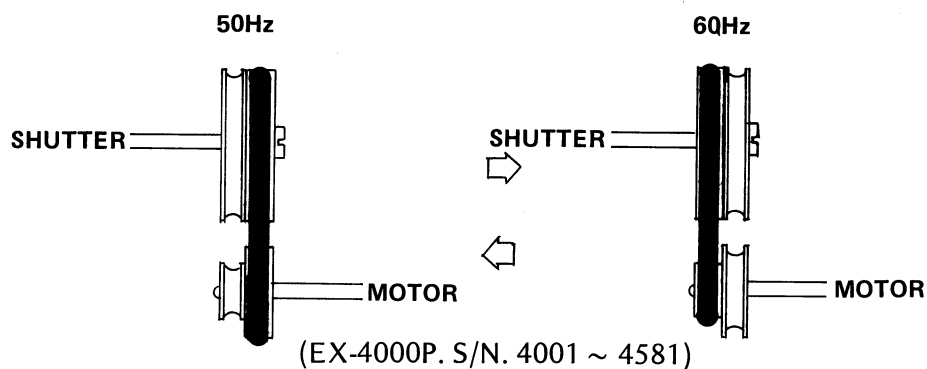
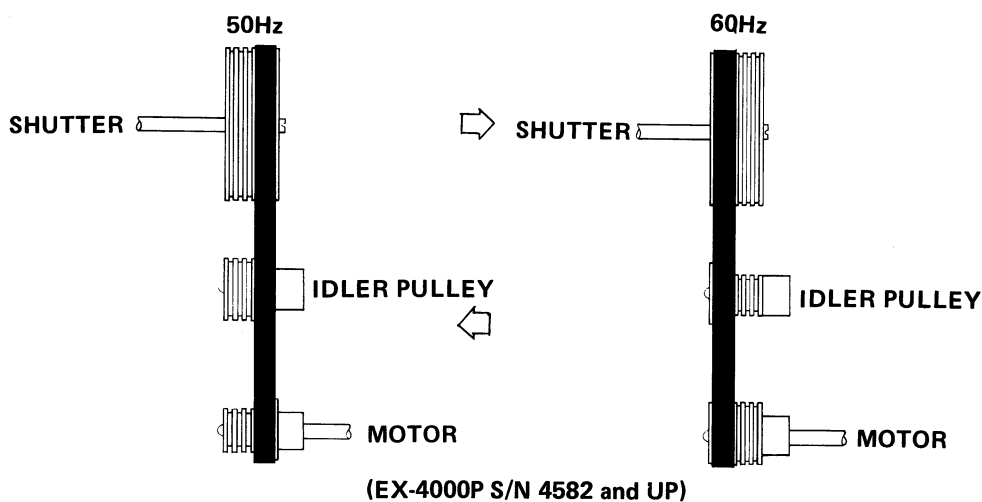


Fig. #23



(Fig. #24)

NOTE: 3V type motor belt with longer durability is used after S/N 4582

Motor Belt	Operation	Motor Pulley	Shutter Pulley
Round Belt (241-12181)	60Hz 18/24 FPS	241-12501	241-11801
	50Hz 18/24 FPS	241-12401	241-11901
	50/60Hz 24 FPS	241-12301	241-11901
Synch. Belt	60Hz 24 FPS	074-05401	074-05801
	60Hz 18 FPS	081-01101	074-05801
	50Hz 24 FPS	074-05401	074-05911
	50Hz 18 FPS	081-01101	074-05911
3V Belt 241-12182	60Hz 18/24 FPS (N/A)	N/A	N/A
	50Hz 18/24 FPS (N/A)	N/A	N/A
	50/60Hz 24 FPS	241-12302 (Requires 241-11401 Idler Pulley)	241-11902

241-4:TROUBLE SHOOTING

4-1: TROUBLESHOOTING HINTS AND AIDS

The EX-4000P is a professional 16mm projector, requiring service and operation by trained personnel.

“High voltage and currents are distributed throughout the machine; all precautions should be taken to avoid electrical shock. Always disconnect electrical power before opening or removing access doors and panels.”

For simplicity the troubleshooting charts have been broken down into four major categories:

1. Electrical
2. Xenon Lamp Supply
3. Mechanical Functions
4. Sound System

The troubleshooting chart is intended to assist the technician in locating the specific area of a malfunction, thus eliminating the need to check all areas possibly suspected. There are four basic steps to logical troubleshooting:

1. Analyze the symptoms
2. Narrow the trouble to an area or function
3. Isolate the problem to the specific section within an area or function
4. Locate the specific component causing the problem.

4-1: TROUBLESHOOTING HINTS AND AIDS

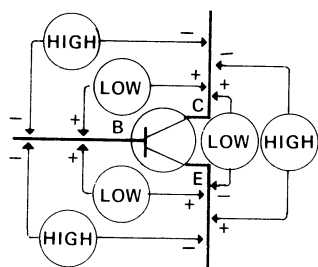
A. There are four basic steps to troubleshooting this projector:

1. Analyze the symptom
2. Localize the trouble to a functional system or module
3. Replace or repair that system or module
 - a. Isolate the trouble within the module
 - b. Locate and repair the specific trouble

B. Checking Semiconductors With A VOM:

1. Set the ohms scale to $R \times 10$
2. The forward resistance should be low
3. The reverse resistance should be high

TRANSISTOR NPN TYPE (2SC, 2SD)



TRANSISTOR PNP TYPE (2SA, 2SB)

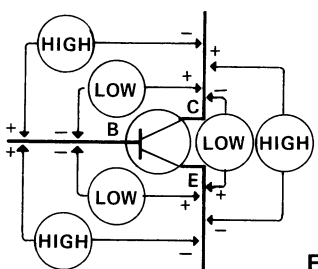


Fig. #25

DIODES

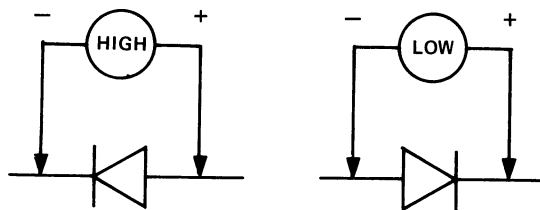


Fig. #26

NOTE: Forward and reverse resistance LOW & HIGH is only a suggested quick and easy check of components out of circuit. This test is only for shorted and open junction test. A VOM will not test the quality of a semi-conductor accurately.

- C. IC's are best checked by checking the signal input and output condition. This can be done by inserting a low level audio tone into the MIC jack and the signal path from the input of IC-1 through IC-2 and to IC-3.
- D. Amplifier test cables can be easily made from locally available parts. A nine pin miniature tube socket and male plug can be wired as an extension power cable, allowing the amplifier to be operated away from the projector. The solar cell and exciter lamp connection can also be extended if so desired.

Typical Amplifier Test Set-Up

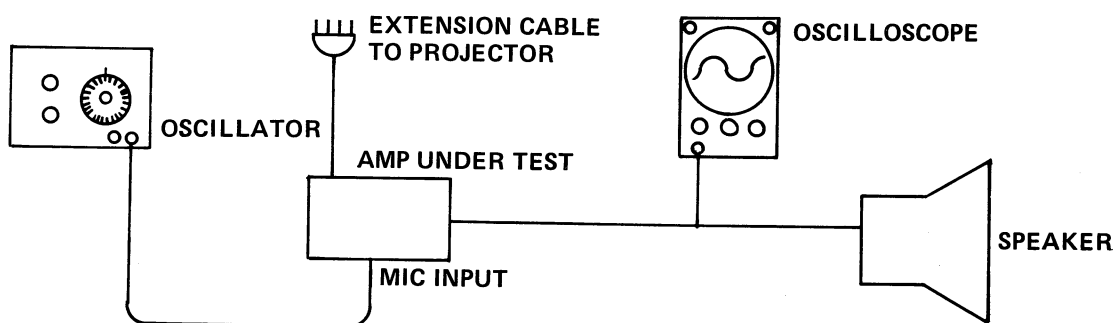


Fig. #27

4-2: EX-4000P TROUBLESHOOTING CHART

I: ELECTRICAL SYSTEM

SYMPTOM	PROBABLE CAUSE	REMEDY
1. Pilot lamp not on when main switch is on	1. No power to the AC wall outlet 2. Defective power cord 3. Defective 10/15 amp fuse 4. Defective pilot lamp	1. Check outlet 2. Check & repair or replace 3. Replace 4. Replace
2. Pilot lamp on, but drive motor does not run in "Forward" position	1. Power supply cable not connected 2. Pause control down 3. Defective drive motor 4. Faulty motor capacitor 5. Switch cam not activating micro SW #1 6. Defective micro SW #1	1. Check 2. Check 3. Replace or repair 4. Check or replace 5. Check & Adjust 6. Replace
3. Pilot lamp on, motor runs but the lamp does not come on in lamp position	SEE XENON LAMP AND RECTIFIER	
4. Pilot lamp on drive motor runs in "forward" but not in "reverse" position	1. Micro switch #2 and/or #3 defective 2. Defective motor	1. Check or replace 2. Replace
5. Function switch does not follow the indicated sequence	1. Loose function switch knob 2. Loose switch cam	1. Re-locate & tighten 2. Re-position & tighten
6. Poor or no take-up in forward	1. Take-up motor defective 2. Take-up arm belt broken	1. Replace 2. Replace
7. Poor or no take-up in reverse	1. Take-up motor defective 2. Supply arm broken 3. Rewind belt broken 4. Incorrect rev. take-up torque	1. Repair or replace 2. Replace 3. Replace 4. Adjust (see take-up section)
8. Poor or no rewind	1. Take-up/rewind motor defective 2. No voltage to take-up/rewind motor 3. Too much back tension 4. Rewind belt slips or broken	1. Repair or replace 2. Check & repair 3. Check and adjust 4. Clean or replace

II: XENON LAMP & RECTIFIER CIRCUIT

EX-4000P

SYMPTOM	PROBABLE CAUSE	REMEDY
9. Lamp life is abnormally short	1. Defective lamp 2. Lamp current too high 3. Abnormal tilt from horizontal	1. Check & replace 2. Set current meter at lower setting 3. Operate closer to horizontal
10. Uneven or insufficient screen illumination	1. Foreign object in lamp path 2. Lamp not properly adjusted 3. Defective lamp 4. Slow or defective lens 5. Lamp current too low	1. Remove 2. Adjust 3. Replace 4. Try another lens 5. Set current for higher setting
11. Fuse blows when lamp is switched on	1. Incorrect fuse 2. Defective rectifier	1. Install proper rating fuse 10A/15A 2. See rectifier section
12. Unstable lamp current	1. Worn out lamp 2. Defective rectifier 3. Abnormal tilt from horizontal	1. Replace 2. See rectifier section 3. Operate closer to horizontal
13. Xenon Lamp will not light	1. Defective lamp 2. Lamp starting relay defective 3. Fuse blown (10/15 amp) 4. Defective starter 5. Current adjuster too low 6. Defective rectifier	1. Replace 2. Check & replace 3. Check & replace 4. See starter section 5. Adjust to higher setting 6. See rectifier section
14. Xenon lamp lights but immediately goes off	1. Defective rectifier	1. See rectifier section

III: MECHANICAL SYSTEM

EX-4000P

SYMPTOM	PROBABLE CAUSE	REMEDY
15. Motor runs but film does not advance	1. Stop lever engaged 2. Broken or defective motor belt 3. Cam tank plate washer loose 4. Motor pulley loose 5. Main drive belt broken	1. Release to normal run position 2. Check & replace 3. Tighten 4. Tighten 5. Replace
16. Film speed is too slow or too fast	1. Belt installed incorrectly 2. Incorrect motor and shutter pulley combination	1. Check & reinstall 2. Replace with correct pulleys
17. Excessive take-up torque in "forward"	1. Too small take-up reel 2. Take-up torque out of adjustment	1. Use larger reel 2. Adjust take-up torque
18. Excessive take-up torque in "reverse"	1. Too small reel 2. Reverse take-up torque out of adjustment	1. Use a larger reel 2. Adjust
19. Take-up poor or not at all in "forward"	1. Take-up torque out of adjustment 2. Take-up motor defective	1. Adjust 2. Replace
20. Take-up poor or not at all in "reverse"	1. Take-up torque out of adjustment 2. Defective supply arm belt 3. Defective take-up motor	1. Adjust 2. Check & replace 3. Replace
21. Loop setter roller continues to activate or activates erratically in "forward"	1. Damaged or poor film 2. Lower loop is too small 3. Insufficient claw protrusion or claw pitch 4. Broken claw 5. Insufficient tension of the film shoe springs	1. Repair or replace 2. Check sprocket timing 3. Check 4. Replace 5. Stretch or replace
22. Upper loop is lost in "forward"	1. Damaged or poor film 2. #1 sprocket teeth plate loose 3. #1 sprocket shoe not seating properly 4. Loop setter roller continues to activate or activates erratically	1. Repair or replace 2. Check & tighten 3. Check & adjust 4. See symptom No. 21
23. Upper loop is lost in "reverse"	1. Damaged or poor film 2. #1 sprocket shoe clearance is too great 3. Supply reel too small 4. Claw protrusion incorrect	1. Repair or replace 2. Check & adjust 3. Use larger reel 4. Check & adjust

SYMPTOM	PROBABLE CAUSE	REMEDY
24. Excessive noise in the film gate in "forward" with a good undamaged film	1. Upper loop too small 2. Film contacting the loop setter roller 3. Dirty film gate 4. Loose claw 5. Incorrect claw protrusion 6. Inner guide rail binding 7. Film shoe bent, worn or binding 8. Claw position incorrect 9. Weak or broken cam follower spring	1. Check #1 sprocket timing 2. Check #2 sprocket & loop setter timing 3. Clean 4. Tighten 5. Check 6. Check & adjust 7. Check & replace 8. Check & adjust 9. Replace
25. Unsteady picture	1. See symptom No. 24, noise in the film gate	
26. Travel ghost	1. Incorrect shutter blade position	1. Check & adjust (See cam tank section)
27. Excessive noise in "reverse" only	1. Claw position incorrect 2. Claw angle is incorrect	1. Check & adjust 2. Check & adjust
28. Insufficient framing	1. Claw position incorrect 2. Worn cam follower (or gliding pin)	1. Check & adjust 2. Replace
29. Excessive noise when the stop lever is depressed	1. Motor pulley misaligned 2. Shutter pulley binding on the shaft	1. Adjust 2. Remove, clean, inspect and lubricate
30. Film transport does not stop in stop lever operation	1. Shutter pulley seized 2. Stop lever shoulder screws loose	1. Remove cam tank, clean & lubricate pulley (see cam tank sec.) 2. Tighten screws
31. Uneven focus	1. Dirty film gate 2. Film shoe binding and not completely seated 3. Inner guide rail binding 4. Lens holder mis-aligned	1. Clean 2. Check & re-align 3. Check 4. Check & adjust

IV: SOUND SYSTEM

EX-4000P

SYMPTOM	PROBABLE CAUSE	REMEDY
32. No sound (magnetic only)	1. Mag/Opt switch in the wrong position 2. Magnetic head not in contact with the sound track 3. Defective or dirty magnetic head 4. Mag/Opt switch defective, or bad connection 5. Defective amplifier module	1. Check & switch 2. Check & adjust 3. Clean, or replace 4. Check & replace 5. Repair or replace
33. Poor sound or low volume (magnetic only)	1. Poor sound track 2. Dirty, or defective head 3. Head not making contact with film 4. Incorrect sound head alignment 5. Defective amplifier	1. Check with another film 2. Clean or replace 3. Adjust (see sound section) 4. Align (see sound section) 5. Repair or replace
34. Exciter lamp fuse blows	1. Excessive AV line voltage 2. Incorrect fuse 3. Incorrect, or defective exciter lamp (BRK) 4. Defective exciter lamp power supply (defective amp)	1. Check wall outlet 2. Check & replace 3. Check & replace 4. Check & repair (replace amp)
35. Amplifier fuse blows	1. Incorrect fuse 2. Improper connection to an external speaker system 3. Defective amplifier module	1. Check & replace 2. Check 3. Repair or replace
36. Excessive amplifier hum (optical)	1. Exciter lamp cover missing or not installed correctly 2. Incorrect grounding when connecting the projector to an external amplifier or sound system 3. Defective exciter lamp supply 4. Defective solar cell or connections to amplifier 5. Defective amplifier module	1. Install cover 2. Check for ground loop conditions 3. Check voltage & repair 4. Check & repair 5. Repair or replace

SYMPTOM	PROBABLE CAUSE	REMEDY
37. Excessive amplifier hum (magnetic)	1. Poor film recording 2. Improper connection to an external amplifier or sound system 3. Magnetic head in poor contact with the film 4. Poor shielding to the head or the head coil shorted to the projector's frame 5. Defective amplifier module	1. Check with another film 2. Check & re-connect properly 3. Adjust 4. Repair 5. Repair or replace
38. Distorted sound	1. Incorrect exciter lamp (BRK) 2. Exciter lamp cover not completely installed 3. Amplifier module is defective 4. Defective speaker 5. Magnetic sound recorded poorly 6. Optical sound lens not aligned correctly 7. Dirt on the sound drum or the solar cell 8. See symptom no. 39 also	1. Check & replace 2. Check & re-install 3. Replace 4. Replace 5. Try a known good recording 6. Check & re-align 7. Check & clean 8. See symptom no. 39
39. Excessive wow & flutter	1. Sound drum bearings defective 2. Incorrect sound drum film tension 3. Flywheel not installed 4. Incorrect alignment or tension of the tension guide and roller assembly	1. Check & replace 2. Check & adjust 3. Check 4. Check & adjust
40. Sound not stabilized soon after starting	1. Insufficient flywheel plate spring tension 2. Incorrect sound drum film tension	1. Check & adjust 2. Check & adjust

241-5:ELECTRICAL SYSTEM

EX-4000P

5-1: DESCRIPTION

The EX-4000P is designed to be operated on voltages from 100 to 240 VAC. The lamp power supply contains an auto-transformer with several taps depending upon the position of the voltage selector switch.

Except for the Xenon lamp voltage all projector control and operating voltages is 100 VAC. All control functions are accomplished by means of a rotary function switch which consists of 5 individual micro switches. The functions controlled are forward, lamp on & off, reverse and rewind.

An additional switch fires the gate to an SCR which in turn activates a sound mute delay relay while the Xenon lamp is fired.

3 relays are employed to control the direction and torque settings of the take-up and rewind motor. The main drive motor is 100 VAC with a capacitor, driving the film advance mechanism and providing lamp cooling. The direction of the motor changes when the projector is operated in reverse.

Take-up is accomplished with an AC torque motor, the speed of which is controlled by the adjustable 100 ohm resistor.

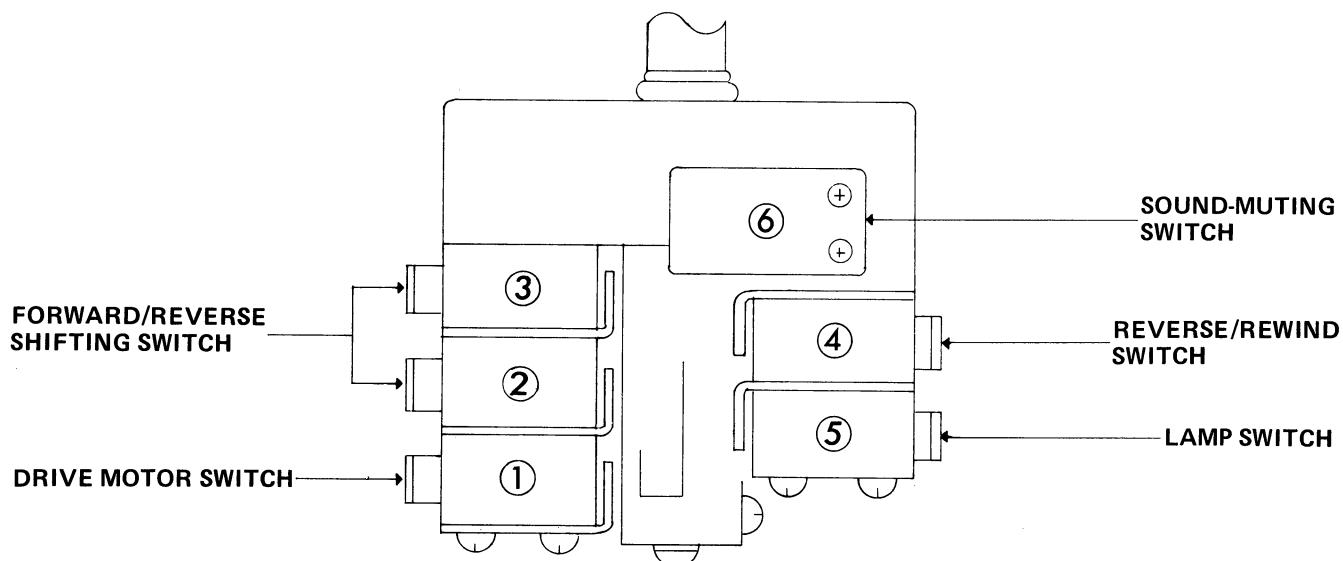
In the rewind operation the torque motor is supplied a full 100 volts for maximum rewind torque and speed.

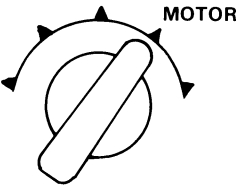
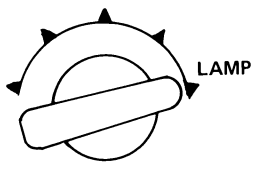
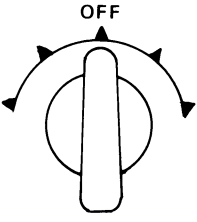
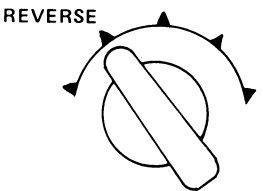
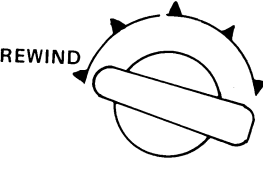
The projection head assembly also houses a small transformer for the AC supply voltage of the amplifier and exciter lamp circuit.

The starter H.V. circuit board is located directly besides the xenon lamp. This circuit is only activated when the lamp is initially started. 100 VAC is applied to the starter which instantly develops a 30KV arc across the lamps electrodes to fire the lamp. (See starter and rectifier section for more details).

Complete diagrams located at the end of this manual.

5-2: ROTARY SWITCH FUNCTION



Position of Sw.	Function	Torque of Take-Up Motor
	Sw. 1 : COM. connected to N.O. Drive Motor runs Forward. Take-Up Motor runs Forward. Sw. 2 : COM. connected to N.C. Sw. 3 : COM. connected to N.C. Sw. 4 : COM. connected to N.O.	With Sw. 1 ON, Take-Up Motor runs at 130g/cm. initially, and at 250g/cm 3 sec. later. (with 2000ft AUTO-Reel)
	Sw. 5 : COM. connected to N.O. Lamp is turned ON. (Main Relay in rectifier is ON.) When COM. is connected to N.C. Lamp is OFF.	— ditto —
	Sw. 1 : COM. connected to N.O. Sw. 5 : COM. connected to N.C.	With Sw. 1 OFF, Take-Up Motor stops 3 sec. later.
	Sw. 1 : COM. connected to N.O. Sw. 2 : COM. connected to N.O. Sw. 3 : COM. connected to N.O. Drive Motor runs Reverse, and Take-Up Motor runs Reverse to apply the back tension. Sw. 4 : COM. connected to N.O.	With Sw. 1 ON, Take-Up Motor runs Reverse at 100g/cm.
	Sw. 1 : COM. connected to N.C. Drive Motor stops. Sw. 4 : COM. connected to N.C. Take-Up Motor runs.	With Sw. 4 ON, Take-Up Motor runs at 100g/cm, and at 1 kg/cm 3 sec. later.
	Sw. 6 : Sound Muting Switch mutes the sound 1-2 sec. while rotary sw. is rotated.	

241-6:MECHANICAL MAINTENANCE

EX-4000P

6-1: SERVICE PROCEDURES

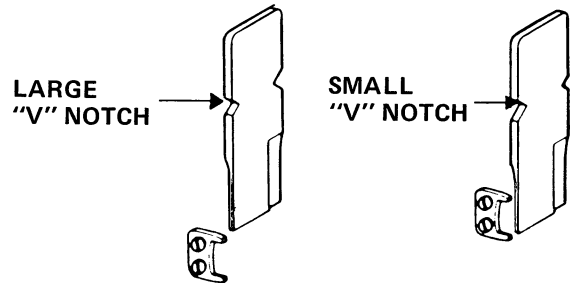
A. Precautions:

1. Eiki Projectors have been designed for the ultimate in simplicity and ease of service. Each screw is essential for proper operation. When servicing and re-assembling the projector screws and small parts should not be carelessly omitted or lost. All screws should be firmly tightened to assure reliable projector operation after re-assembly.
2. When lubricating the projector's plastic parts, silicon oil or grease should be used. Other types of lubricants may harm plastic parts. Avoid using any solvents such as Trichloroethylene, which will harm most plastic or painted parts.
3. EIKI projectors require a minimum of special tools. The most important is an ordinary ISO Phillips screw driver set.
4. To avoid damage to screw heads, it is important to remember the adage "70% push, 30% turn." It is also important to select the right size screw driver blade. A rule of thumb is to use the largest blade possible.
5. To avoid possible electrical shock, always disconnect the projector from the power source when servicing.

B. Tools and Test Equipment:

1. Tools: When servicing Eiki projectors the most important tool is a set of metric I.S.O. (Phillips type) screw drivers, and several small flat blade screwdrivers. (An Eiki Screw Driver Kit p/n 5615 is available from your local dealer). In addition normal electronic service tools such as pliers, needle nose pliers, solder irons, etc. are needed. A Molex type pin extracting tool is very handy when repairing any of the many nylon electrical connections.
2. Special Tools: Eiki projectors have been designed to avoid using special tools supplied only by Eiki. However, a claw protrusion gauge is most helpful for accurately setting of the claw protrusion. In absence of a gauge 6 layers of color film will approximate the correct protrusion.

Tool No. 320-01T
Cam Claw Protrusion Tool



3. Test Equipment: A limited amount of test equipment is required for routine maintenance when servicing the individual modules such as the amplifier, the following equipment and test films would be essential:
 - a. VOM (Voltage/Ohm meter)
 - b. Oscilloscope
 - c. Audio AC VTVM
 - d. Wow & Flutter Meter
 - e. 400Hz SMPTE Test Film
 - f. 3150Hz Wow & Flutter SMPTE Test Film
 - g. Multi Frequency SMPTE Test Film
 - h. 7000Hz Sound Focus SMPTE Test Film
 - i. 7000Hz Mag. Azimuth SMPTE Test Film
 - j. Buzz Track SMPTE Test Film
 - k. Audio Oscillator

6-2: CAM TANK**A. Specifications:****1. Revolutions**

24 fps, 1440 rpm

18 fps, 1080 rpm

2. Cam Claw Protrusion MIN. 1.0mm — MAX.

1.2mm

(.040" to .045")

3. Claw Pitch

7.62 — 7.65mm

Tension of Claw Lever

1.2 — 1.25kg.

Spring 312-11161

NOTE: Tension of Claw Lever Spring is measured with a tension scale pulling on Cam Claw and the Claw Lever Spring stretched to maximum.

B. Removal and Disassembly:

The Cam Tank is removed as a complete unit including the lens holder and the film gate.

1. Remove the rear cover.**2. Remove the drive belt from the motor to the shutter pulley.**

3. From the front of the projector, open the lamp house door and remove the two large (Phillips type) screws above and below the lens holder. (See Fig. #28)

4. The cam tank as an entire unit is removed from the front of the projector.

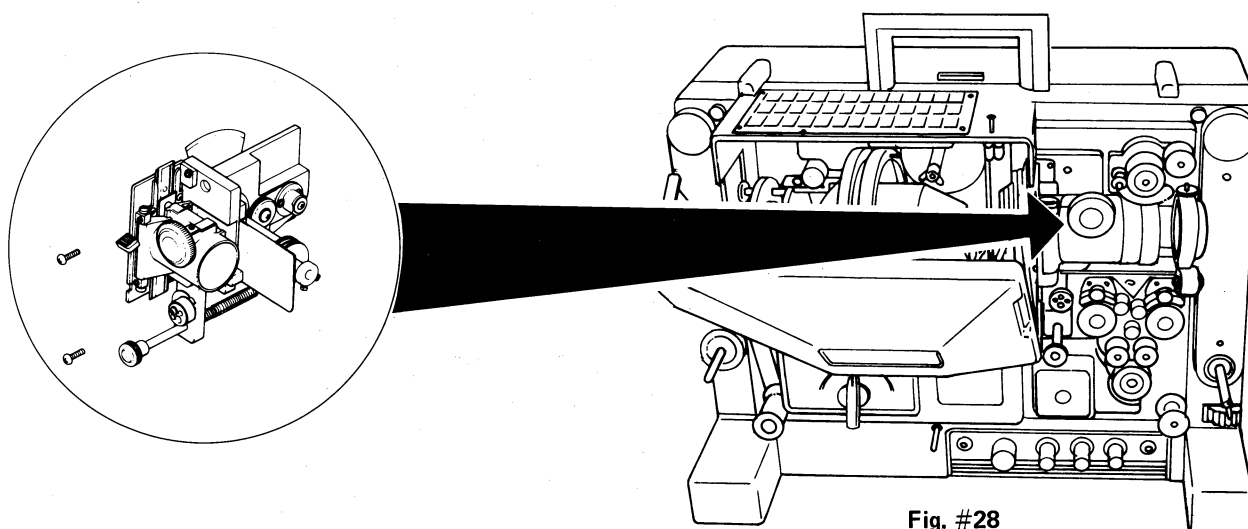
5. To disassemble the cam tank: (Fig. #29)

a. Position the stop lever to the stop position. That is when the shutter pulley rotates freely without turning the cam and worm gear.

b. Remove screw (49) in the center of the shutter pulley and remove the shutter pulley. Care should be taken as to not loose the small shim washer behind the plate washer (51). This is a selected shim washer to provide the correct clearance between the shutter pulley (52) and the shutter blade hub (53).

c. While holding the shutter blade (54) slowly raise the stop lever, releasing the tension of the clutch spring (56) and shutter blade with the hub attached.

d. Remove the shutter blade and hub assembly.

**Fig. #28**

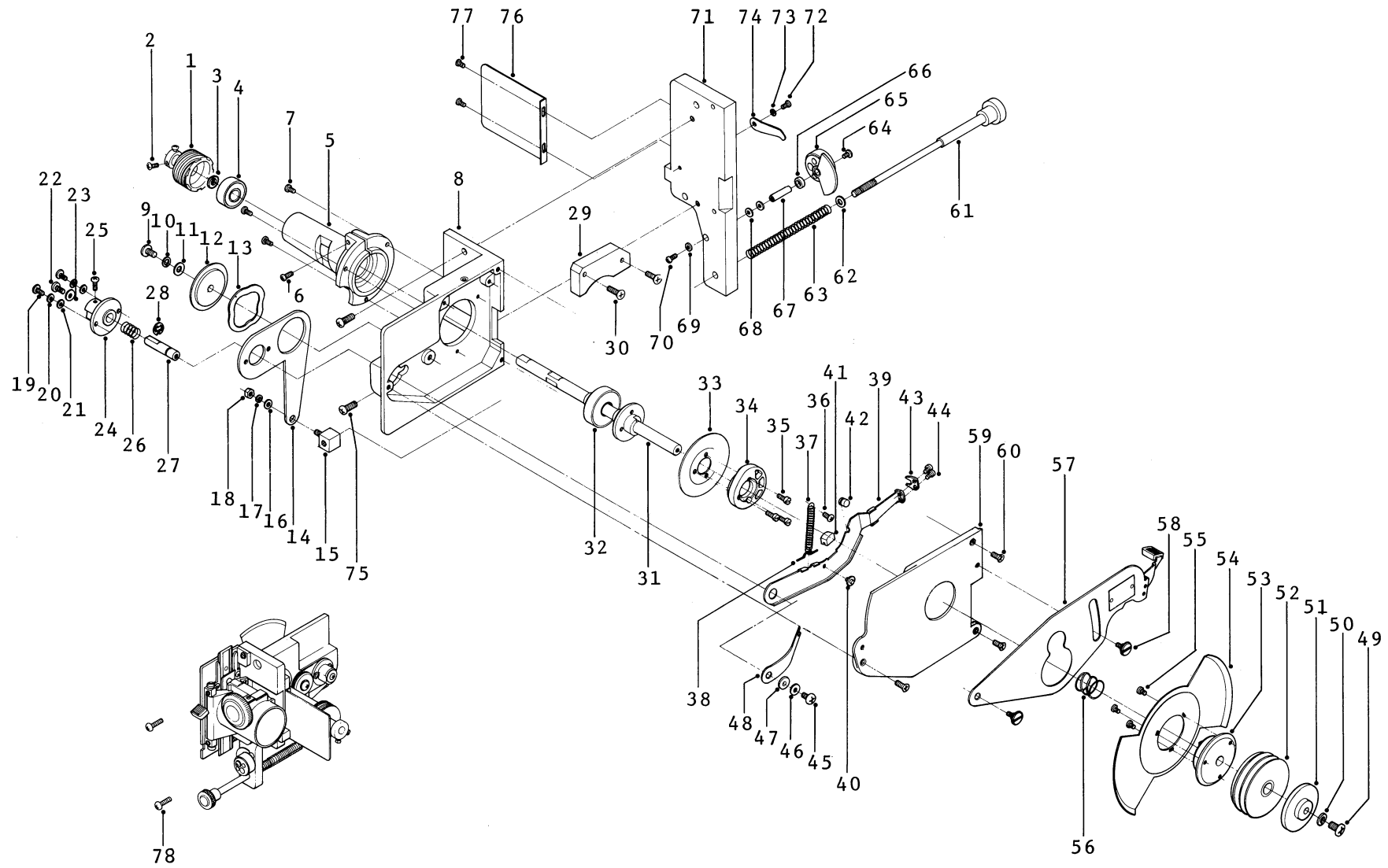


Fig. #29

- e. Position the stop lever where all three cam tank cover screws (1, 2, 3) are accessible. (See Fig. #30)
- f. The curved plate spring (48) fits over the fulcrum pin (27). Unscrew screw (45) to remove the plate spring and washer.
- g. Unhook the claw lever (39) from the tension spring (37) and remove the claw lever assembly.

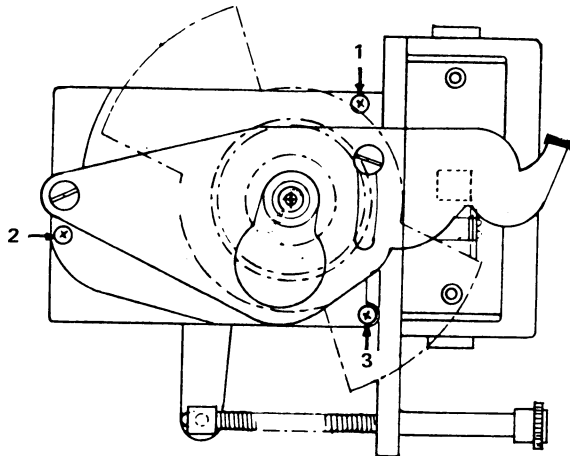


Fig. #30

- h. To remove the cam (34) and cam plate (33), unscrew the three small screws (35).
- i. Remove the cam shaft (31), the worm gear (1).
- j. To remove the cam shaft ball bearings, loosen the inside bearing clamp screws (6) and remove the bearing collar (5). Lightly press out the bearings.
- k. Remove the oil felt (29) and clean the old dried grease from all parts.
- l. Carefully inspect each part for wear or damage, and replace before re-assembly.

C. Re-assembly:

Re-assembly may be accomplished by reversing the disassembly procedure while keeping in mind the following points.

1. If the cam shaft bearing are at all noisy or do not rotate smoothly, they should be replaced with new bearings.

2. When installing the cam shaft use fiber washers (3) and position the worm gear (1) so the shaft rotates smoothly without any end play.
3. When overhauling the cam tank it is suggested that the felt oil pad (29) be replaced and lubricated with molybdenum oil. (Do not over oil).
4. Inspect the cam follower (41) and the glide pin (42) for wear, and replace if necessary.
5. The claw lever bushing (39) and fulcrum shaft (27) should be in good condition. Out of round or sloppy fitting bushings will cause erratic cam tank operation and should be replaced.
6. Clean and re-lubricate all parts as they are assembled.
7. Manually rotate the assembled cam tank to be sure all parts are functioning smoothly.

D. Cam Tank Lubrications:

1. Cam shaft bearings are sealed ball bearings requiring no periodical lubrication.
2. The cam and claw lever mechanism should be completely cleaned and re-lubricated every 500 hrs. with molybdenum disulfide grease p/n 5628 as indicated by the arrows in Fig. #31.

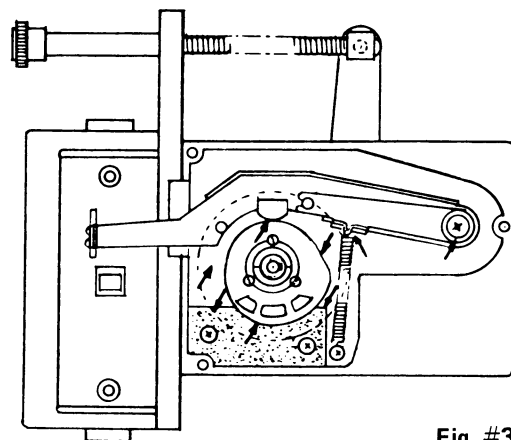


Fig. #31

3. At intervals of about 100 hrs the oil felt should be re-supplied with several drops of molybdenum oil p/n 5632.
4. The stop clutch and shutter pulley (3) (Fig. #32) bushings are lubricated with a drop of molybdenum oil. P/n 5632.

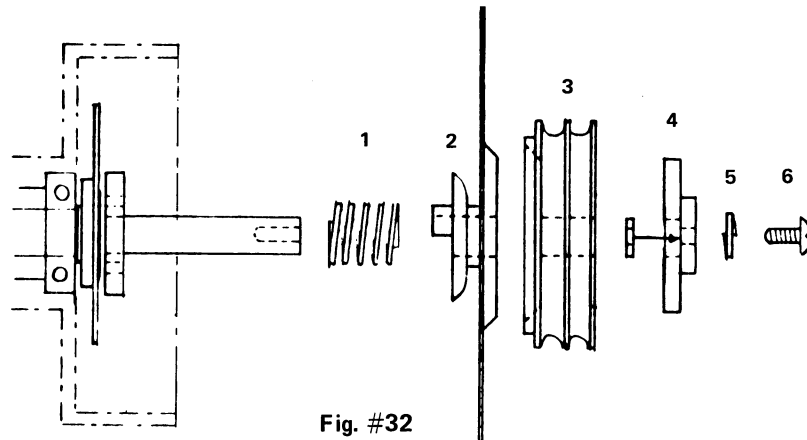


Fig. #32

E. Camtank Adjustments:

1. Claw Protrusion

If the protrusion is too great, the claw will extend and come in contact with the film shoe and releasing the film shoe pressure. The result is not only a noisy operating mechanism but excessive picture jump and jitter. If the protrusion is not enough the claw will miss the film perforations, resulting in loss of loop or possible film damage.

In a normally operating cam tank as the gliding pin (M) (Fig. #33) wears, the claw protrusion will increase. To adjust the claw protrusion loosen set screw (A) (Fig. #33) about 1/8 of a turn, this will allow the pivot shaft (F) to slide in the collar. Now turning screw (B) in a clockwise direction will decrease the protrusion, and counter clockwise will increase the protrusion. Correct protrusion is set with the claw penetrating thru the aperture plate at the upper part of its stroke. A claw protrusion gauge will determine a go-no-go situation, or 6 layers of color film will be approximately equal to the 1mm to 1.2mm protrusion when the claw penetrates through all 6 layers of film. Once the adjustment is set tighten set screw (A) locking the shaft in position.

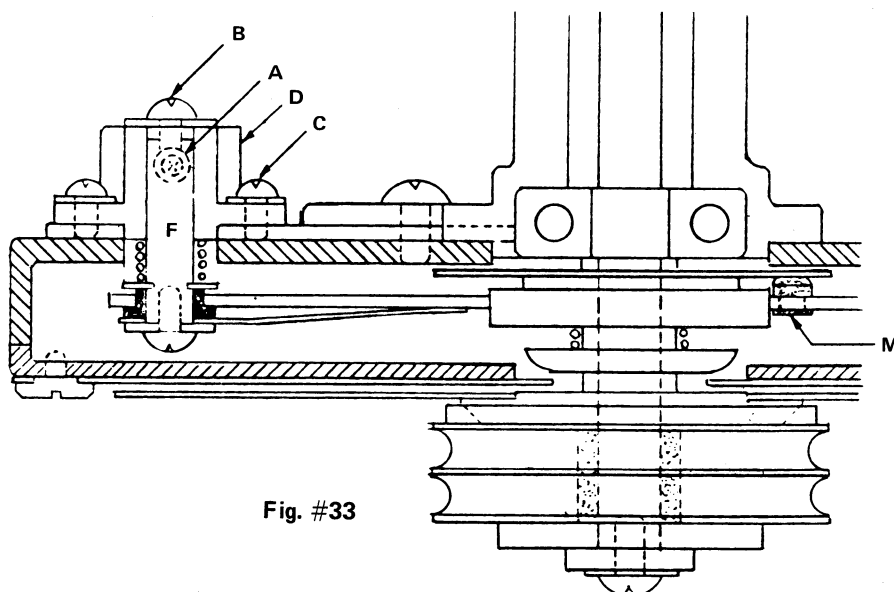


Fig. #33

2. Claw position and framing adjustments:

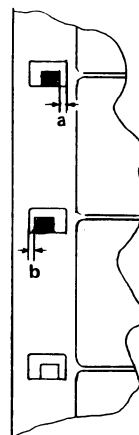
As the claw travels from the top of its stroke to the bottom, pulling the film down to the next frame a slight arc is scribed. For smooth handling of the film it is essential that the position of the claw in relationship to the films sprocket holes be such that at no time during the stroke does the claw contact the sides of the holes. (See Fig. #34) The distance A-B, C & D should all be approximately equal.

To adjust the claw position the fulcrum assembly may be slightly positioned in or out in the horizontal direction by loosening screws (C). (Fig. #34)

Care should be taken to only slightly loosen the screws and to make the adjustment in small increments. If the fulcrum assembly is moved up or down in the vertical position this will affect the framing control.

The EX-4000P is equipped with theatrical type framing which allows the fulcrum assembly to move slightly up or down when the framing knob is adjusted. To check the upper and lower framing range it is necessary to adjust the aperture plate location with respect to the film shoe aperture by loosening nuts (N) Fig. #35.

AFTER PULL DOWN



BEFORE PULL DOWN

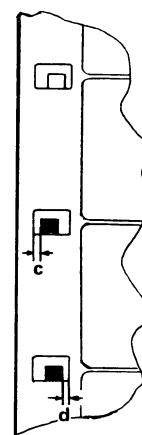


Fig. #34

Adjust the aperture plate to correspond with the film shoe and retighten plate nuts (M). Should you be unable to make the above adjustments, resulting in improper operation of the projector refer back to the section on disassembly and examine the condition of the cam follower (K) and the glide pin (M) for wear, replace if necessary and repeat the adjustments.

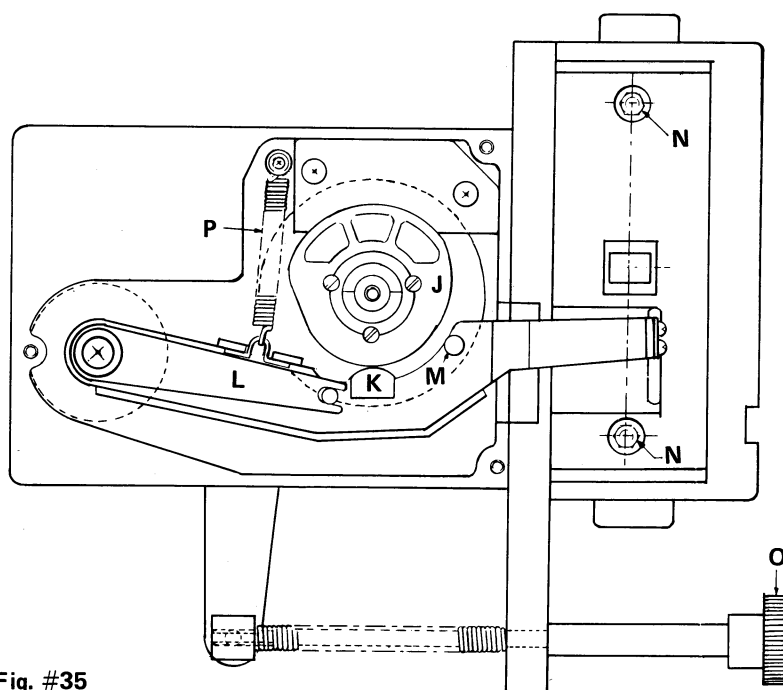
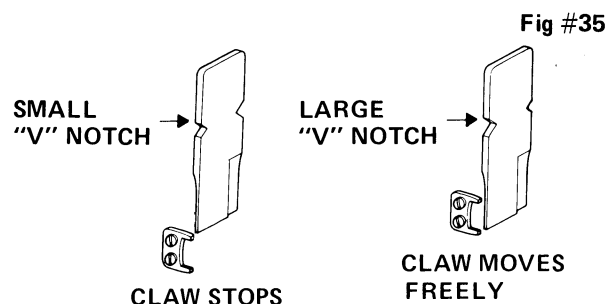


Fig. #35

3. Claw Protrusion Adjustment Using Tool No. 320-01T



- A. Open lens holder and gate assembly.
- B. Hold the tool between the inner guide rail and the outer guide rail, flat against the aperture plate.
- C. With the small "V" notch toward the outer guide rail, the claw should contact the tool at the top of its stroke.
- D. With the large "V" notch toward the outer guide rail, the claw should move freely without contacting the tool.

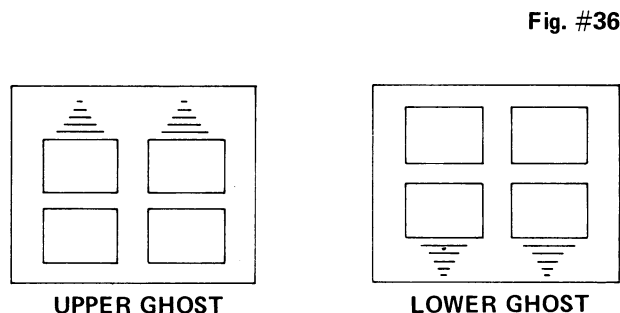
4. Travel Ghost Adjustment:

Travel Ghost is a term referred to when the rotating shutter does not correctly synchronize with the pull-down claw.

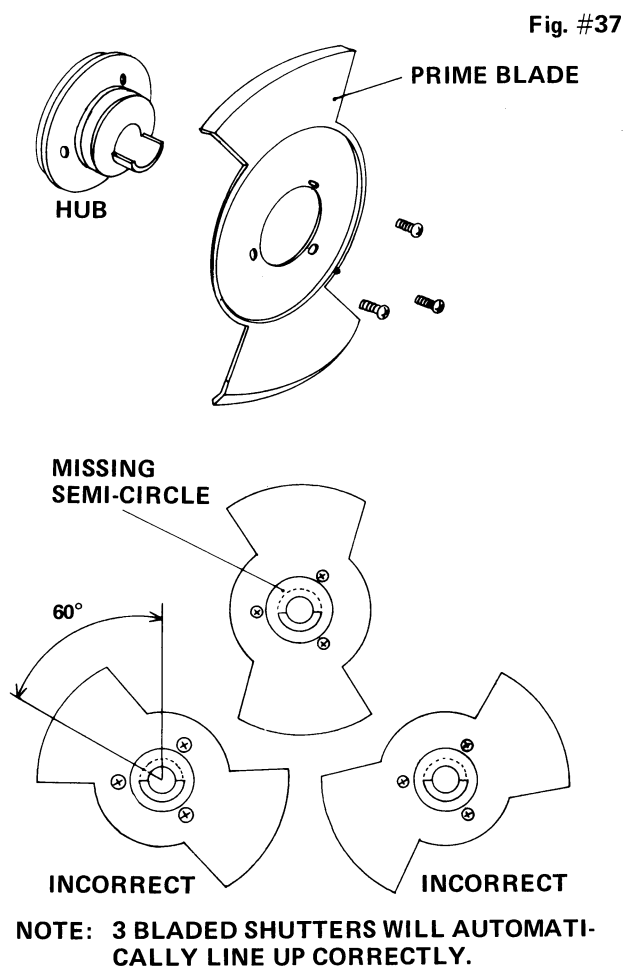
To a small degree it is best observed on a test film with a continuous pattern such as an SMPTE registration film.

Travel Ghost may be leading or trailing depending on the direction of film travel in relation to the shutters rotating direction.

On the screen it is usually observed as shown in Fig. #36 with multiple images from a bright horizontal line. Leading Travel Ghost will be observed at the top of the screen and Trailing Ghost at the bottom.



To adjust for minimum Travel Ghost the shutter blade mounting holes are slightly elongated allowing the shutter to be positioned on the hub for minimum ghost. Since the adjusting screws are only accessible with the cam tank removed this becomes a trial and error adjustment. With a little practice it is not too difficult if you start with the shutter mounted in center of the slot, then each adjustment can be to the right or left of center. When installing a new shutter, careful observance as to how the old shutter was mounted will nearly always assure that the new shutter will be correct. When mounting a 2 blade shutter, the missing semi-circle on the hub must be positioned toward one of the blades. The curved edge of the blade faces away from the cam tank (See Fig. #37). The prime blade is the blade which blocks the light path when the claw advances the film to the next frame.



6-3: ADJUSTMENT OF THE SPROCKET SHOES

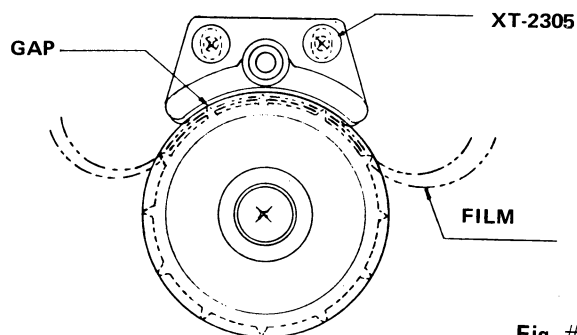


Fig. #38

A. Description:

By loosening screws XT-2305 it is possible to adjust the clearance between the sprocket drum and the shoe. If the gap is too great the film may skip over the sprocket teeth resulting in the loss of the film loops. If the gap is too narrow films with splices may be restricted as they pass over the sprocket, again resulting in loss of the loops or possible film damage.

B. Adjustment:

To set the correct clearance wrap two layers of film over the sprocket drum. With the XT-2305 screws loose gently press down on the film shoe until the shoe is in contact with the film. Secure the screws, remove one layer of film and close the shoe again. A single layer of film should seat well with sufficient clearance to allow a splice to pass unrestricted. If it is not possible to achieve the correct clearance it may be as a result of a worn film shoe. Inspect and replace as required.

6-4: LOOP RESTORER

A. Description:

The loop restorer roller is a counter balanced eccentric roller. If necessary, remove the roller, clean the shaft and re-lubricate by wiping the shaft with a lightly soaked silicone oil cloth. When the lower loop is lost, the film will contact the loop setter roller, causing it to rotate. The eccentric action will pull down a new lower loop while the claw is retracted.

B. To Adjust the loop Setter Timing:

1. Open the transport mechanism access door and manually position the claw to where claw begins its' downward stroke. (See Fig. #39)
2. Position the loop setter so that the three holes point directly down. (See Fig. #39)
3. Thread up a film as normal while maintaining the claw and loop setter in this position.
4. In this position, pull the film up tightly against the loop setter roller. The claw should now line up with the film perforations.

If the perforations do not line up, loosen the #2 sprocket cover screw slightly and adjust the film until it lines up and secure the cover screw.

NOTE: It may be necessary to re-adjust the #3 sprocket to obtain good sound stabilization.

5. The film should now clear the loop setter roller (See Fig. #39) when the projector is running normal, undamaged film, if the above adjustments have been made correctly.

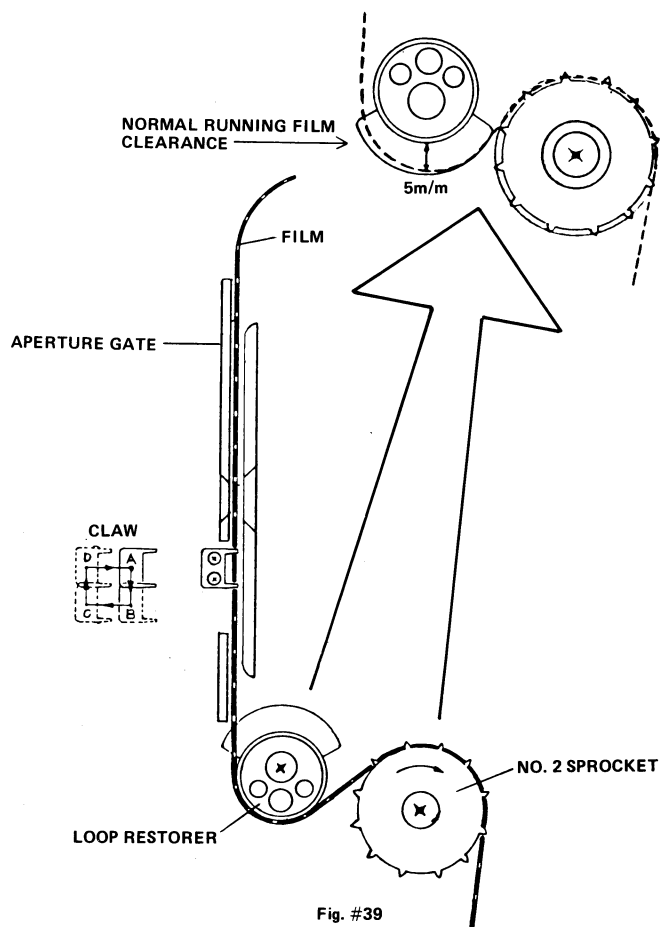


Fig. #39

6-5: MAIN DRIVE MOTOR AND BLOWER ASSEMBLY

A. Description:

Main drive motor assembly consists of an AC induction motor as a standard feature. (Some models are optionally equipped with a synchronous motor). The double shaft motor provides lamp cooling from the fans mounted on each end as well as drive to the projector mechanism by means of a belt. The motor bearings are sealed ball bearings requiring no periodical lubrication.

B. Specifications:

1/20HP

100V AC, 144 Watts

Starting Torque 1.6kg.

Rated Torque 0.8kg.

C. Assembly Breakdown:

The motor as an assembly may be removed from the main frame of the projector by the two large phillips type screws located in the chassis directly below the motor.

D. Electrical Diagram:

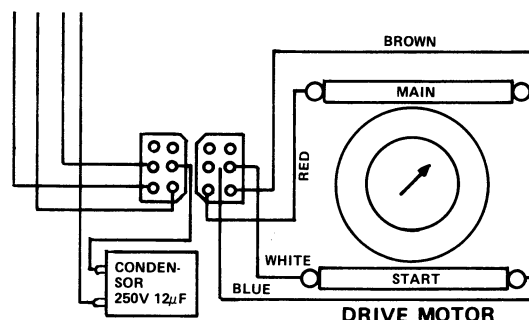


Fig. #41

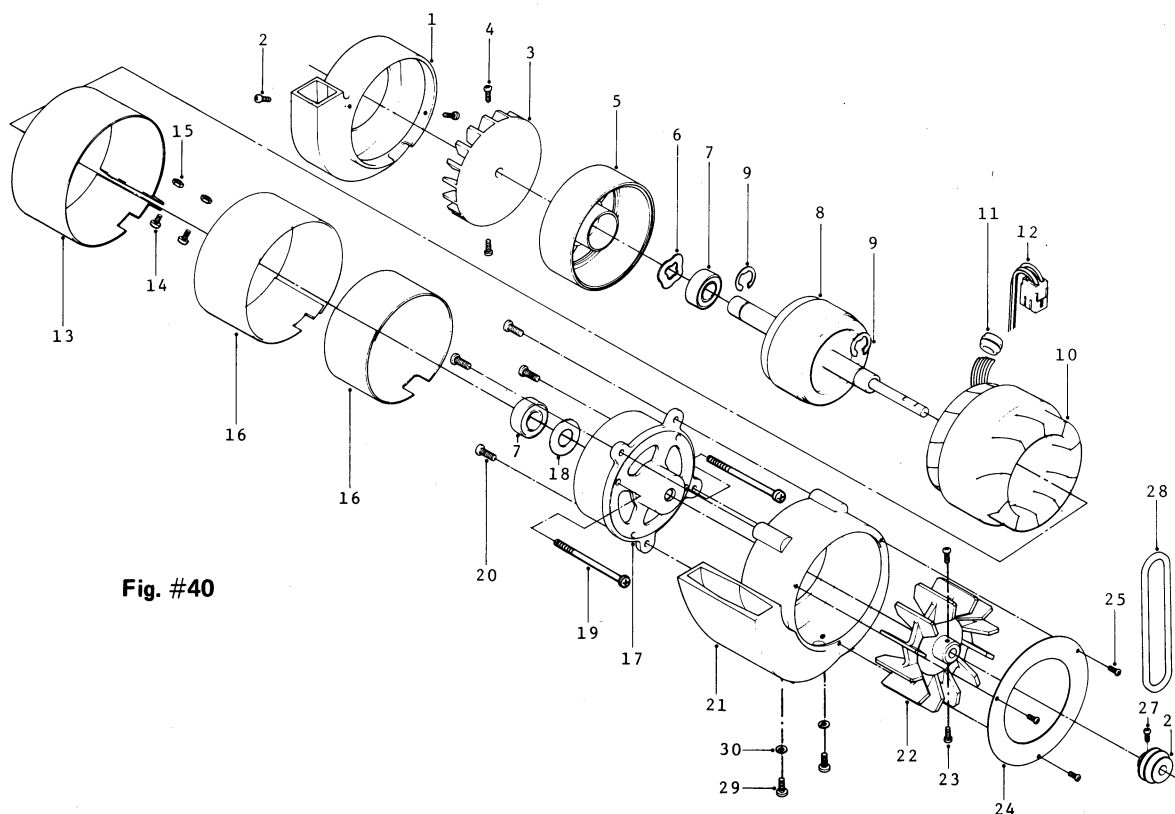


Fig. #40

6-6: SUPPLY ARM ASSEMBLY

A. Description (Fig. #42):

The supply arm serves two main functions:

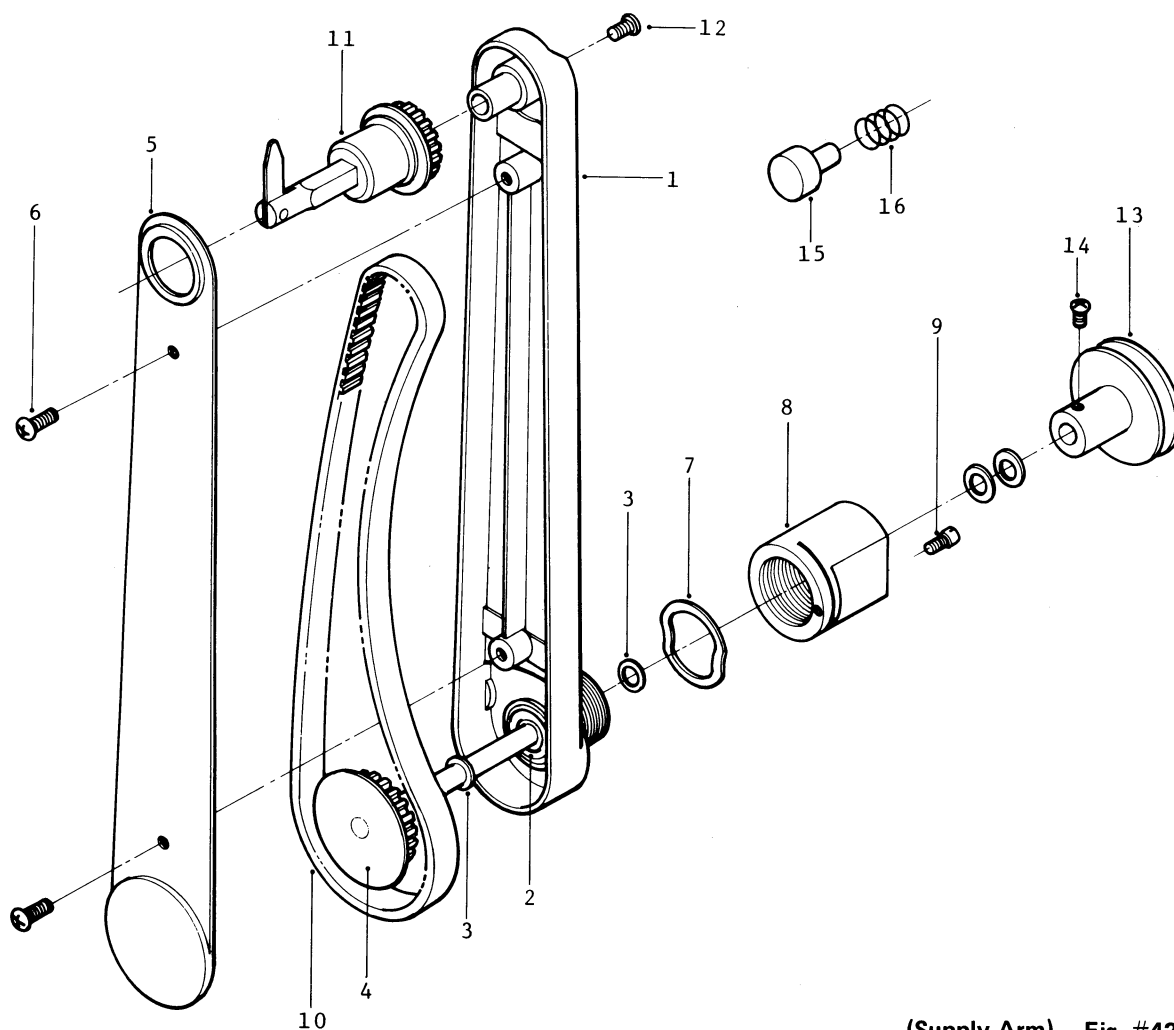
1. Provides a spindle to hold the film for normal forward projection.
2. Provides drive in reverse and rewind to take-up the film.

To assure a positive reverse or rewind take-up the drive from the lower arm pulley (4) to the supply spindle (11) is accomplished by a toothed arm belt.

The upper spindle is mounted in a bushing and the lower pulley is fitted with two ball bearings.

B. Maintenance and Adjustments:

Except for occasional lubrication of the supply spindle bushing no regular maintenance or adjustment is required. The tooth belt is expected to last for hundreds of hours of operation and should be carefully inspected for wear whenever the machine is serviced.



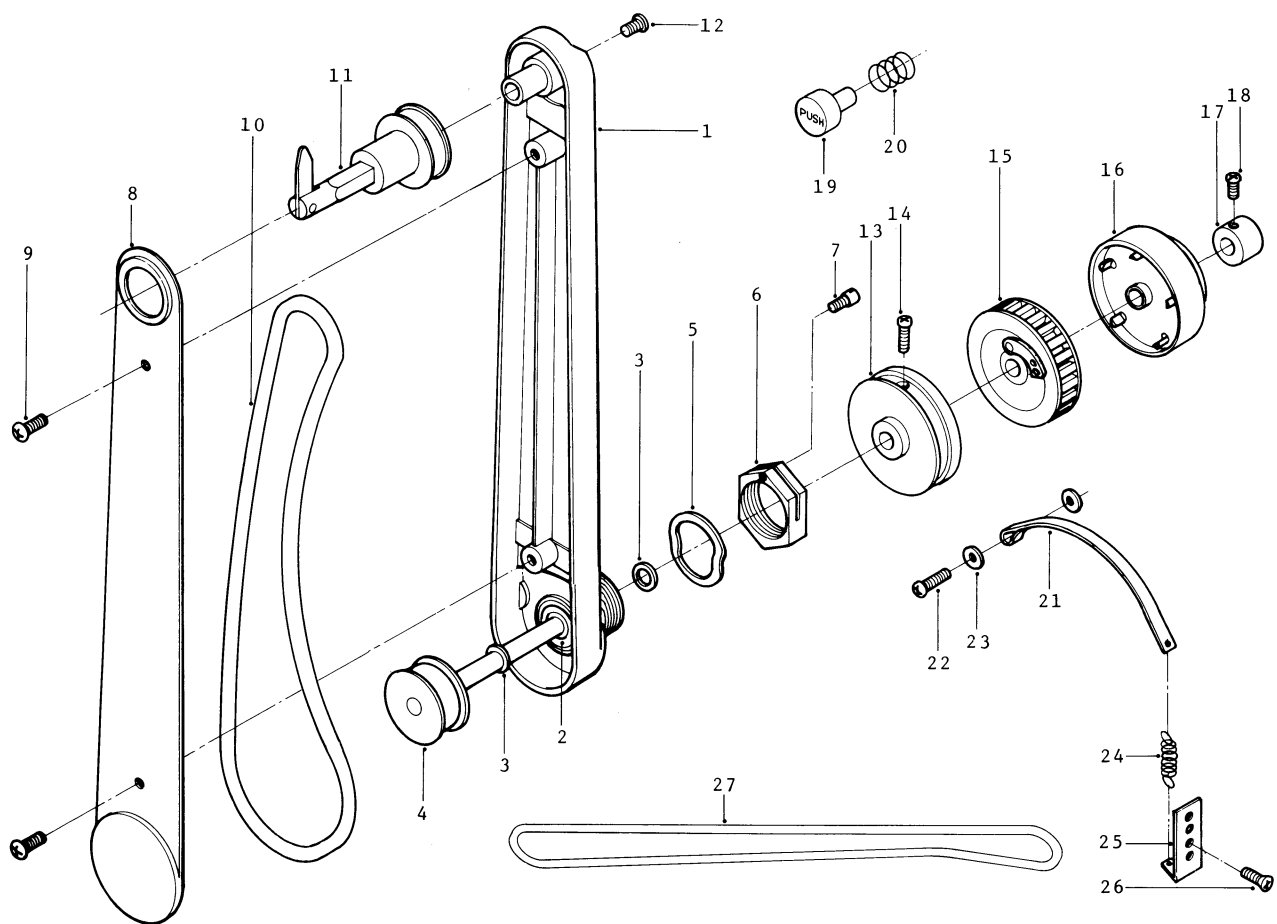
(Supply Arm) Fig. #42

6-7: TAKE-UP MOTOR AND ARM ASSEMBLY

A. Description (Fig. #43):

The take-up arm assembly is very similar to the supply arm except that the arm belt is a round "O" ring type belt allowing some slippage. The main drive pulley is powered by a separate torque motor. A direction clutch (15) is engaged during take-up. In reverse or rewind the take-up arm frees wheels. A leather drag brake (21) is wrapped over the pulley (13) to provide a small amount of back tension during rewind.

The torque motor and relay central circuits are located on the torque motor bracket. The relay circuits control the torque motors direction for rewind or forward take-up. Capacitors and diodes are provided across the relay coils and contacts to reduce noise and pops in the audio system, whenever the relays are activated.



(Take-Up Arm) Fig. #43

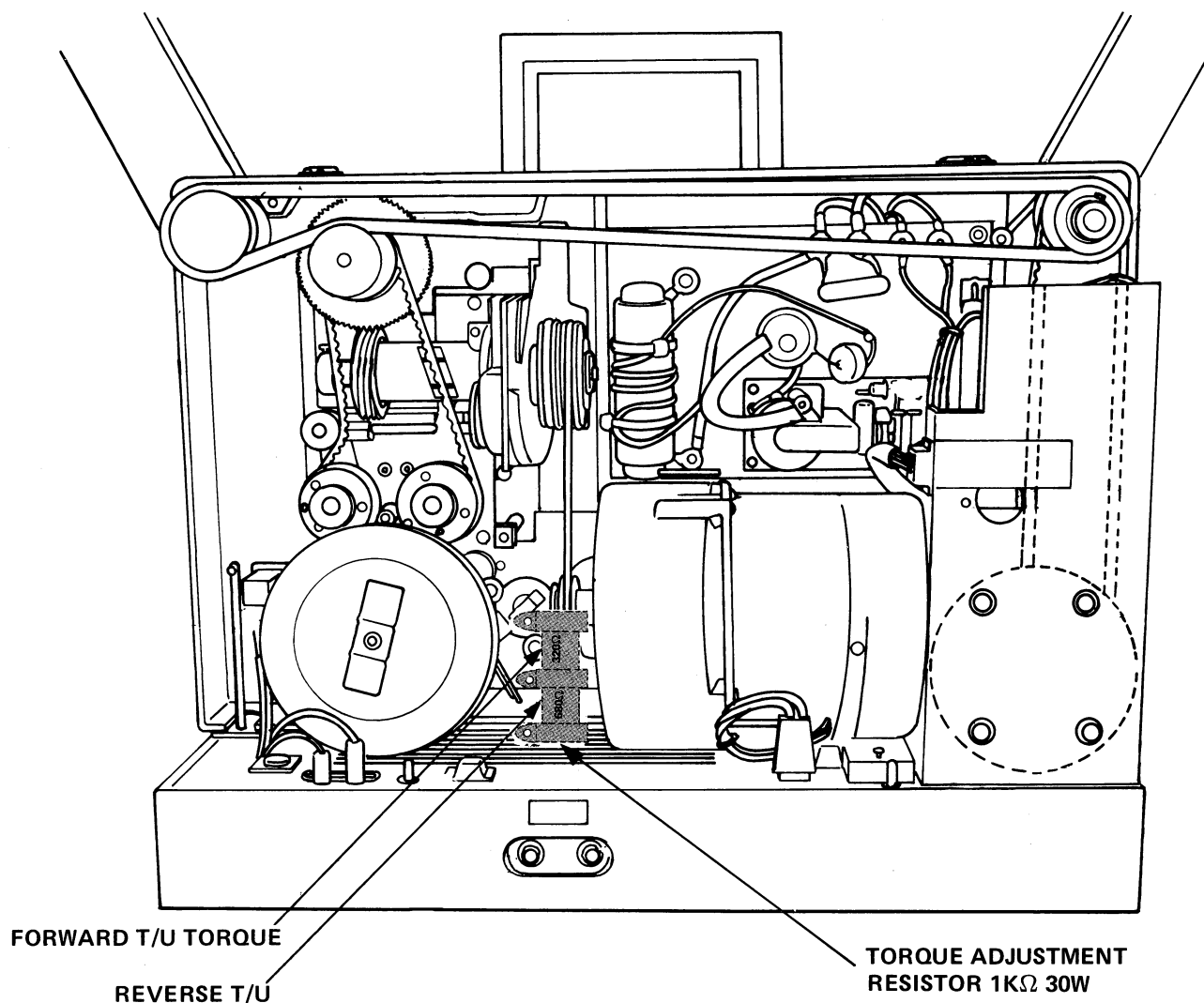


Fig. #44

B. Adjustments:

Rewind back tension is accomplished by the leather brake (21) tension. Too much back tension will result in weak or poor rewind. The torque motor in rewind operates at 100 VAC for full torque. 1K Ω 30 Watt resistor is used to set the take-up and reverse take-up torque.

The correct torque setting is approximately 320 ohms from the top to the center tap in forward and 680 ohms from the bottom to the center tap in reverse. Minor variations may be necessary to achieve optimum torque in either reverse or forward take-up.

A take-up motor defeat switch is also located on the torque motor bracket (9) of Fig. #45 for convenience in servicing the projector or operating with the long play pedestal.

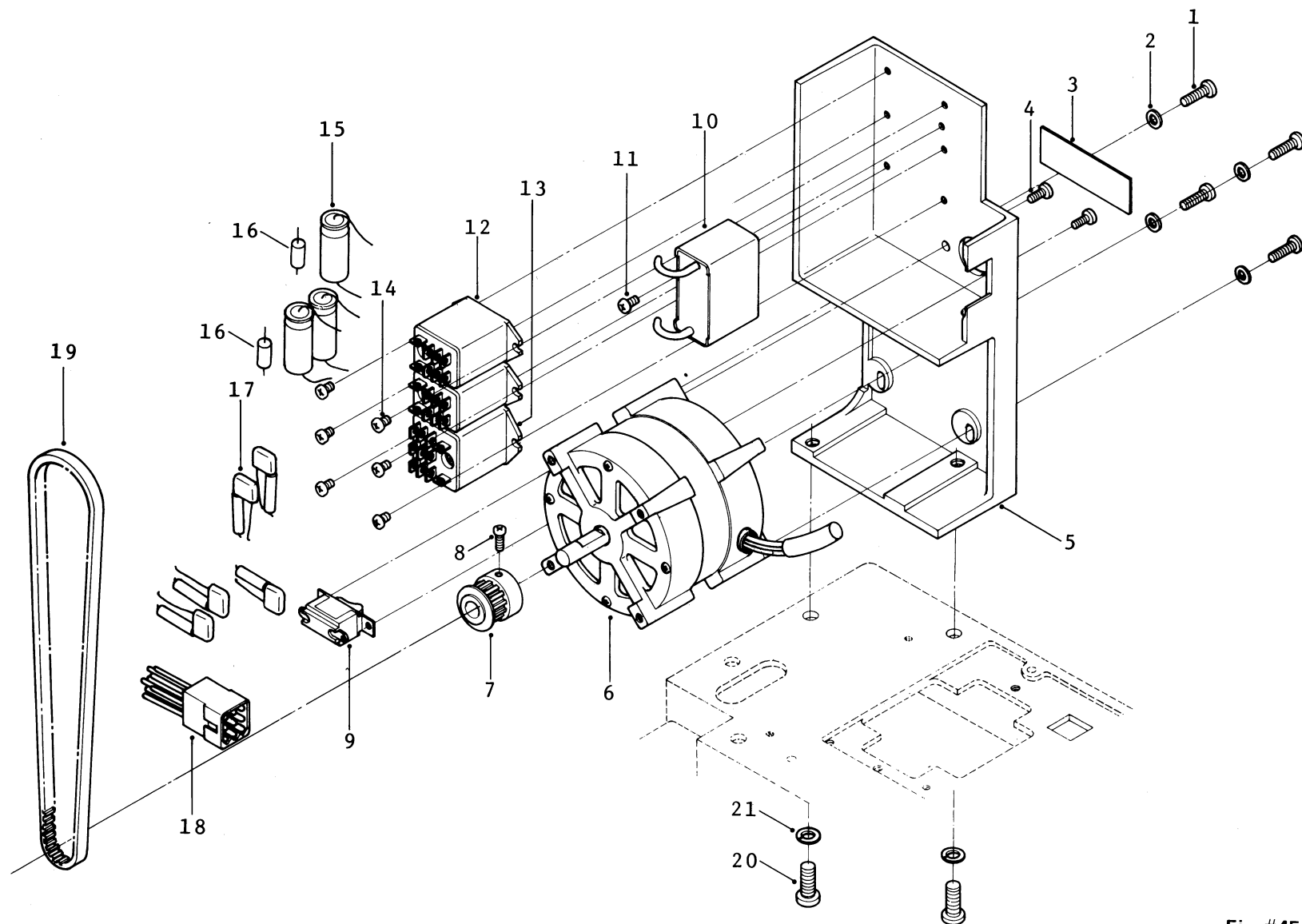
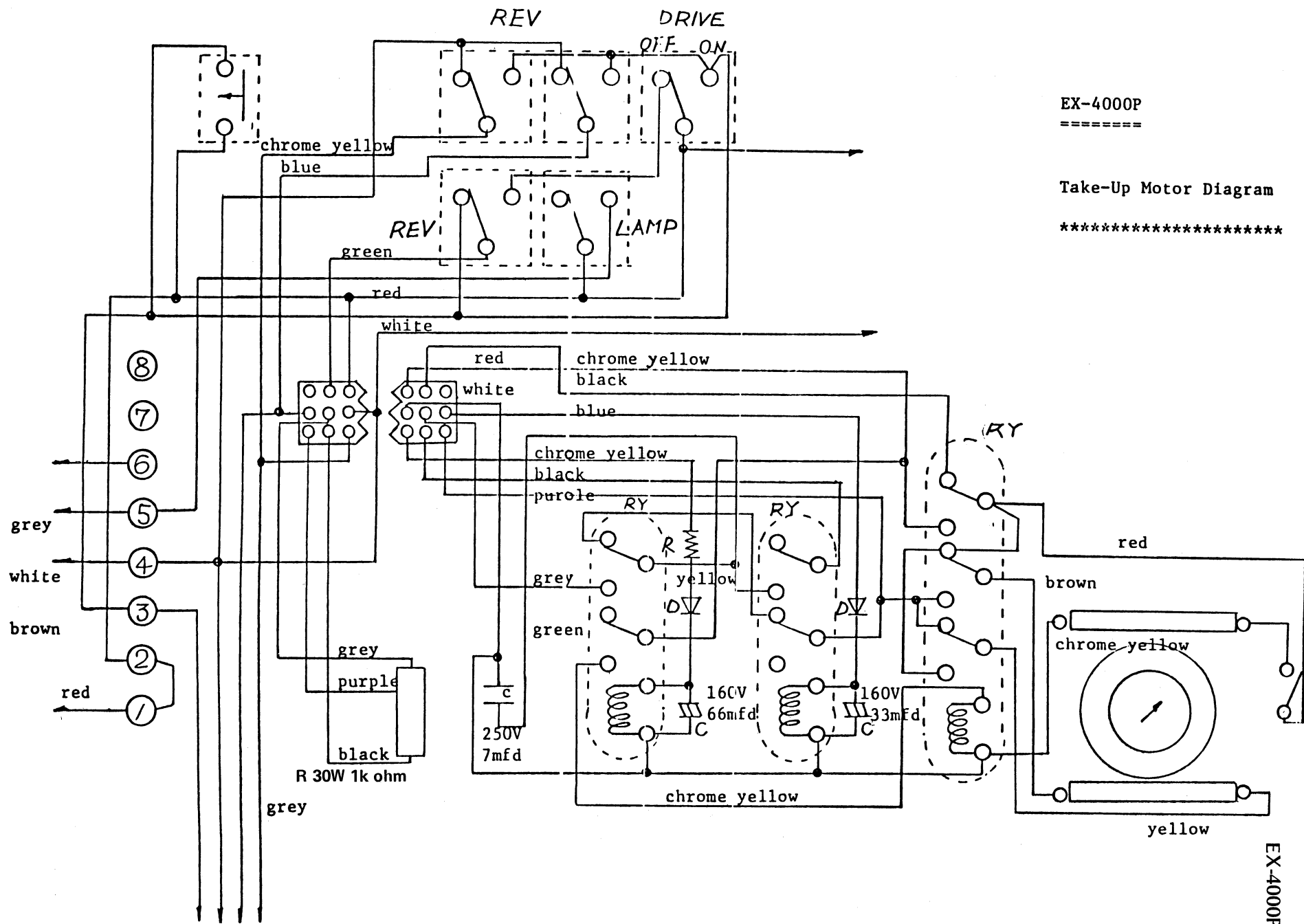


Fig. #45

EX-4000P



6-8: SOUND DRUM AND FLYWHEEL

A. Description:

The sound drum and flywheel's main function is to stabilize the film, allowing the sound optics or magnetic head to read the sound tracks with a minimum of speed variation. The sound drum, shaft, bearing and flywheel are precision machined and balanced to maintain a consistent linear film speed. Care should be used when disassembling or re-assembling these precision parts.

The sound drum shaft (5) is seated in two precision ball bearings (3) which are sealed and factory lubricated. The ball bearings are lightly press fitted into the sound hub casing (2). The shaft is secured in place by a set collar (6). With the fiber washer in place, with no end play in the sound drum shaft, it must rotate freely and not bind. Any binding or imperfections in the ball bearings will result in excessive wow and flutter. The sound drum shaft (5) is driven by the tension of the film. The flywheel is free to slip on the sound drum shaft during the initial start up of the projector to prevent any possible film damage.

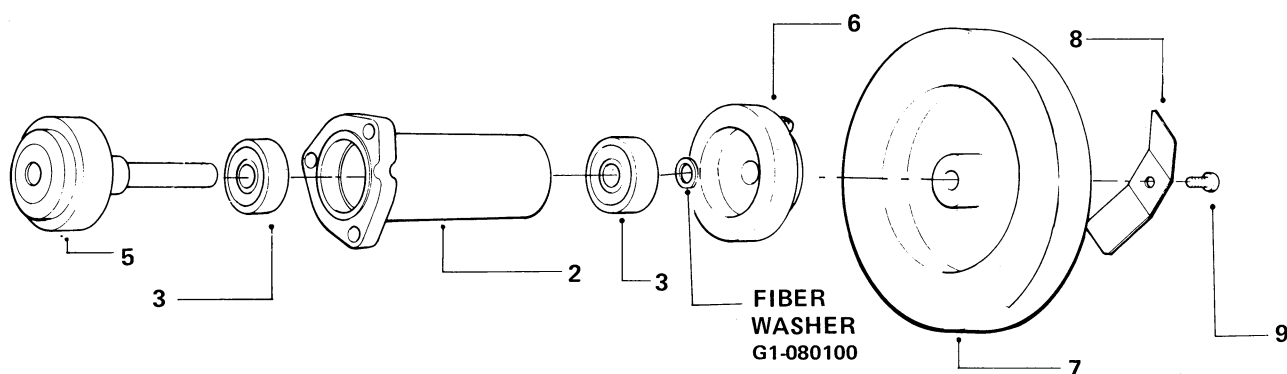
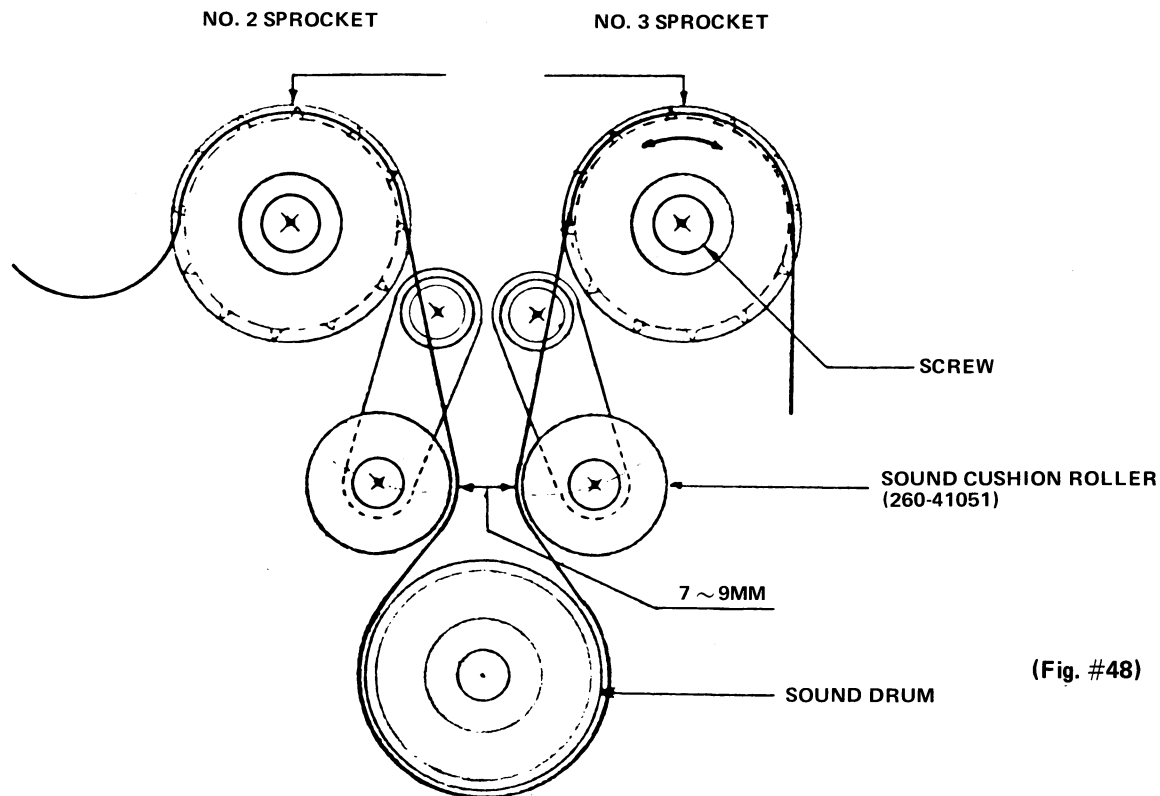
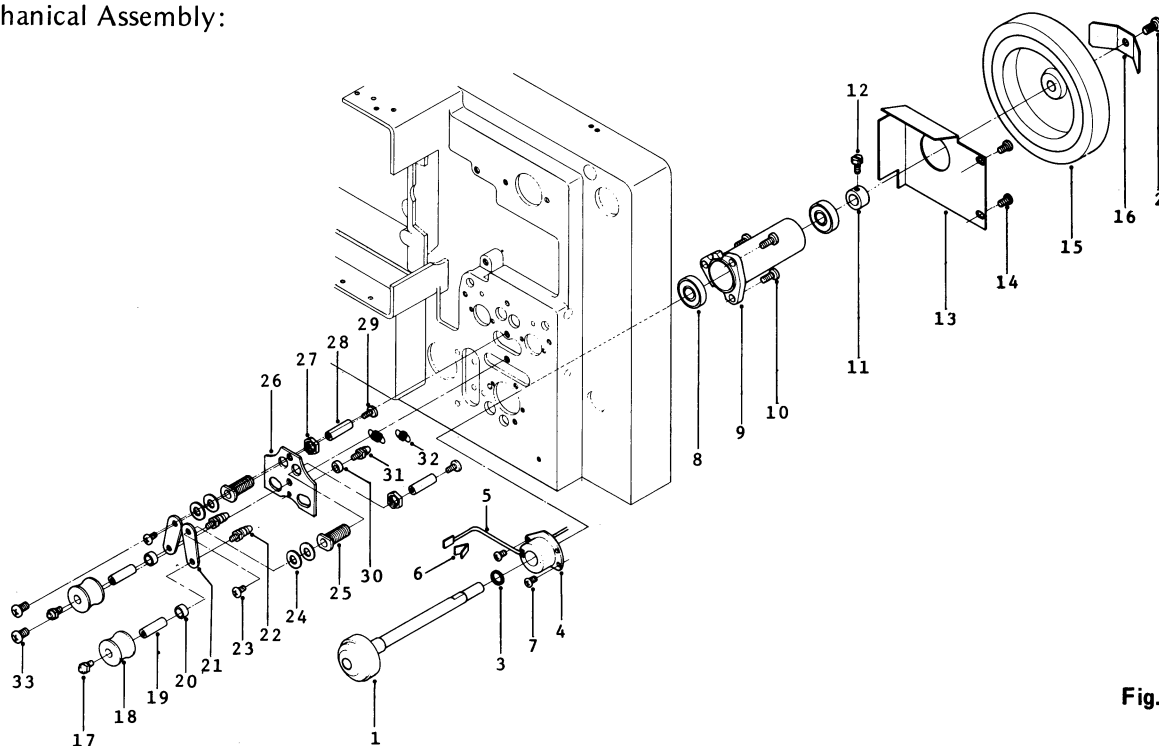


Fig. #47

B. Adjustments:

The tension of the film around the sound drum is critical for accurate sound reproduction with minimum wow and flutter. The sound cushion rollers maintain the correct tension. To adjust the

film tension, loosen the cover of the #3 sprocket and rotate the sprocket plate until approximately 7 to 9mm spacing is obtained between the two cushion rollers. (See Fig. #48)

**C. Mechanical Assembly:**

241-7:SOUND SYSTEM

EX-4000P

7-1: AMPLIFIER MODULE

Refer to the amplifier circuit diagram:

A. Specifications:

1. Solid state: 3 IC's 7 transistors (9 transistors)
2. Output power: 35 watts RMS 8 ohm load
3. Distortion: Less than 4% at 400Hz (measured with SMPTE 400Hz signal level test film)
4. Wow & flutter: Less than 0.2% WRMS
5. Frequency response: Optical 50Hz — 7000Hz
± 4dB
Magnetic 50Hz — 10000
Hz ± 4dB
6. S/N ratio of the amp: 60dB
7. Mic input impedance: (high impedance)
8. Mic input level: 10mv max
9. Phono input level: 50mv (high impedance)
10. Speaker Jacks: 8 ohm
11. 600 ohm balanced line output with adjustable level control

B. Amplifier Power Supply:

52 volts AC is supplied through pins 1 & 2 of the 9 pin connector from T-1 located in the base of the projector. Dual diodes S1 and S2 form a bridge rectifier, which output DC is filtered by C-36 (2200mfd.) supplying the amplifier with approximately 70 volts DC.

C. Exciter Lamp Circuit:

T-1 also provides 8 VAC through Pins #4 & 5 of the 9 pin socket. Dual diodes S-3 & S-4 form a bridge which DC is filtered by capacitors C-14, C-15 and C-16. R-32 is a current sense resistor serving as feedback to the base of the TR-2 through R-29. The DC constant current regulator TR-1 holds the exciter lamp voltage to approximately 3.5 volts. The exciter lamp voltage is routed through the 9 pin connector to the mag/opt selector switch, turning off the exciter lamp when switched to the mag position.

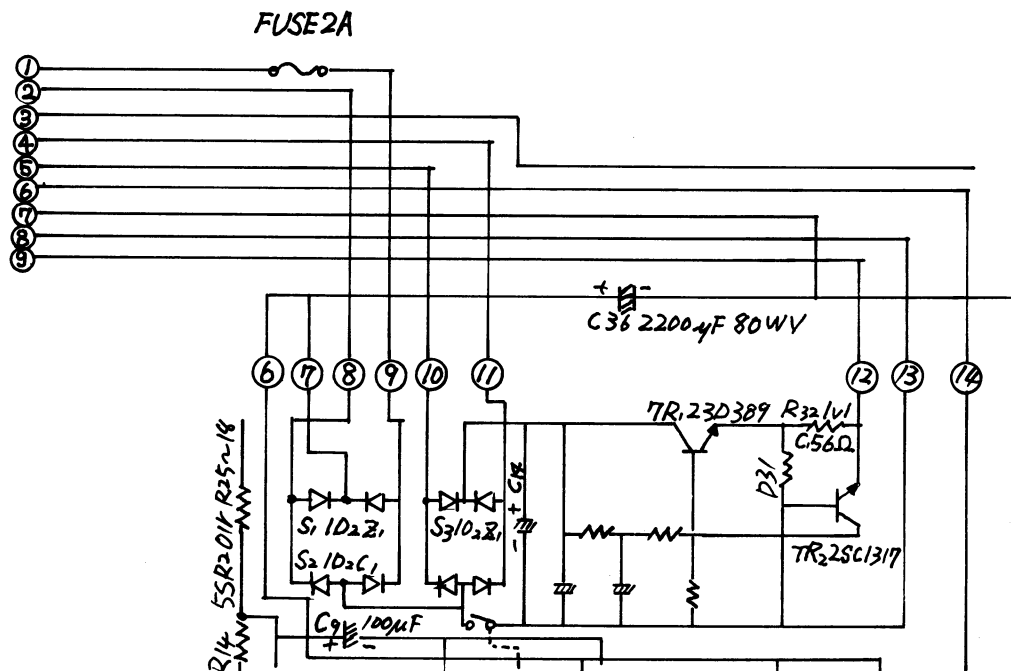


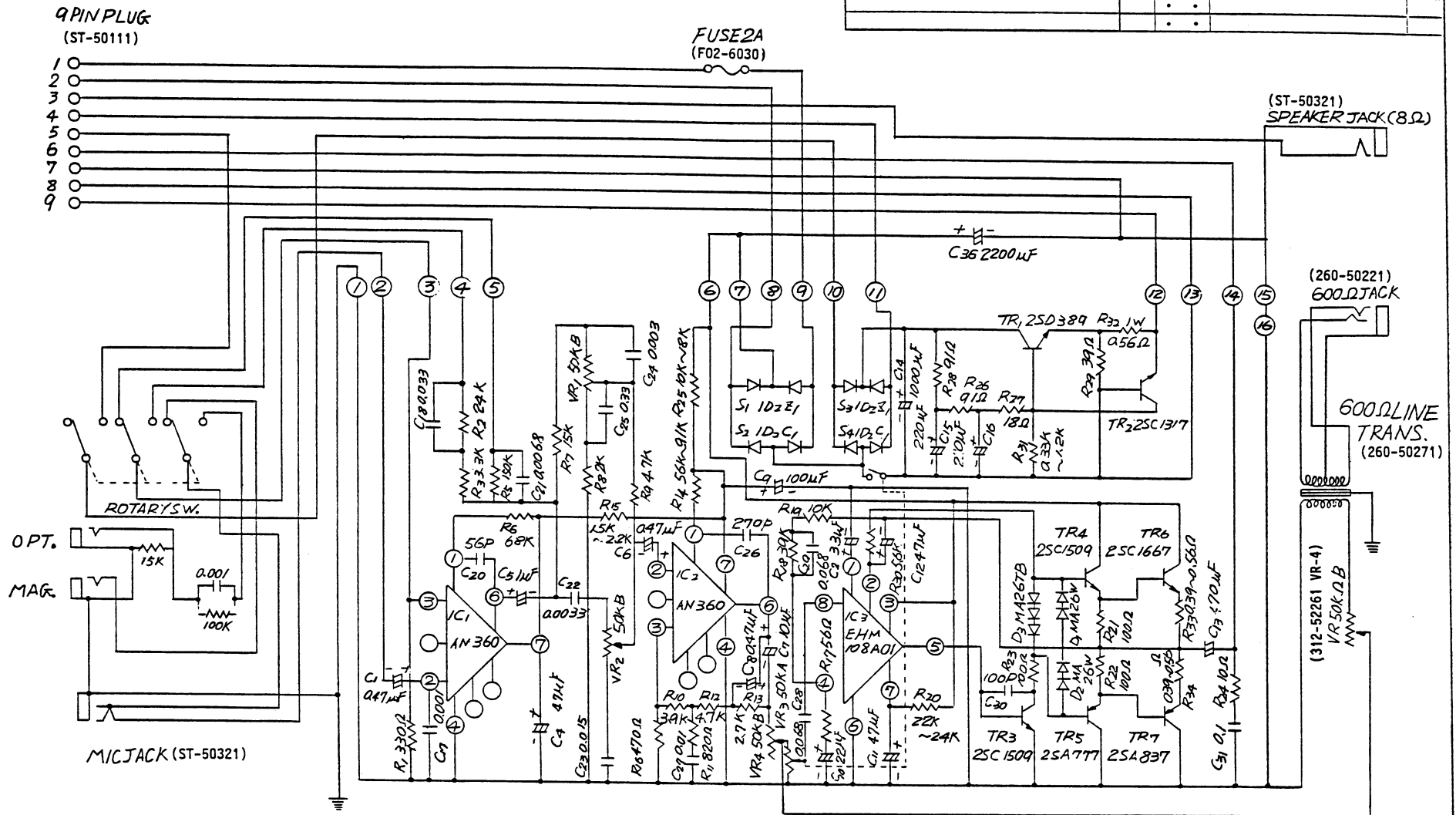
Fig. #50

D. Audio Amplifier Circuit

The signal from the optical solar cell and the magnetic head is routed through the opt/mag selector switch to the amplifier through the small mini plug to Pin 2 of 1C. The 3 pin nylon plug connects the equalization network to the mag/opt selector switch. The mic and phone input are fed through respective attenuator circuits VR-7 and a 10K resistor and VR6 and a 100K resistor to pin 2 of 1C1 (AN360) through capacitor C1. Feedback to 1C1 is accomplished through a selectable network consisting of C18, R2, R3, R5 and C21. The optical/magnetic selector switch provides the playback equalization required. Bass control VR-1, R8, C25, C24 and R9 form a low frequency boost and attenuation equalization network. Treble control VR-2 and C22, C23 provide for high frequency boost and attenuation. The signal from

the tone controls is fed through C6 to pin 2 of 1C2. The output of 1C2 is coupled through C7 to volume control VR-3, to pin 8 of 1C3 through capacitor C28. Feedback for 1C2 is accomplished through the network consisting of C8, R12, R10, R11, C27 and R16. From 1C3 the signal is fed to TR3, TR4 and TR5. TR6 and TR7 act as complimentary final output drivers to an 8 ohm speaker through capacitor C13. Since this is a single ended common ground output, (so called O.T.L. — Output Transformer Less-circuit), care should be taken to avoid a ground loop condition which may result in amplifier damage, when connecting the speaker ground to an external earth or electrical ground. An auxiliary 600 ohm balanced transformer output is provided for convenient connections to external amplifiers or sound systems.

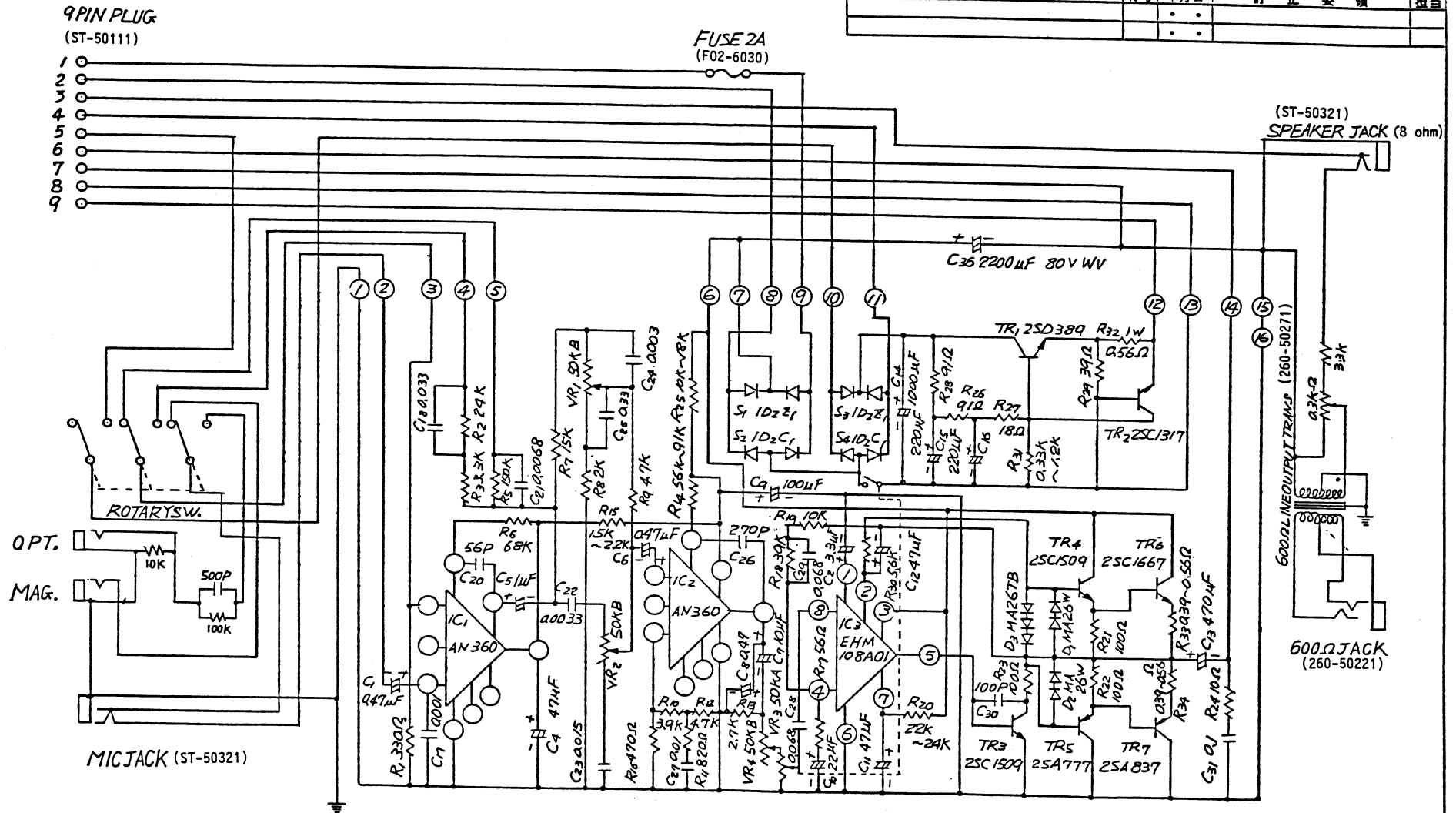
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EX-4000P :
AMPLIFIER CIRCUIT DIAGRAM
(241-51102)
Serial No.4167 & Up

映機工業株式会社				承認設計	製図	品名	EX-4000P AMPLIFIER CIRCUIT DIAGRAM
作図	年月日	尺	寸	Dr			名
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EX-4000P :
AMPLIFIER CIRCUIT DIAGRAM
(241-51101)
Serial No.4001-4166

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材料	實	台	當	量	單	位	CIRCUIT DIAGRAM
							EX4000P
							241-51101

7-2: OPTICAL SOUND PICK-UP SYSTEM

A. Description:

EX-4000P projectors are supplied with both optical and magnetic playback. In the optical position, the exciter lamp is on, and the mag head is raised away from the sound drum. The optical pick-up system resembles a small projector within a projector, consisting of a light source, a lens, an image, and a screen or target.

The light from the exciter lamp is focused through the sound track imaged onto the (target) solar cell where a varied light intensity is converted into minute electrical voltage changes that are amplified and converted into accoustical variation or sound which directly relate to the photographic variation recorded on the film.

B. Sound Focus Alignment Procedure:

1. Tools and equipment required
 - a. Screw driver set (Iso)
 - b. SMPTE sound focus test film 7000Hz
 - c. SMPTE buzz track test film
 - d. AC VTVM (audio range) and or
 - e. Oscilloscope
 - f. 8 ohm 50 watt dummy load resistor
 - g. External speaker

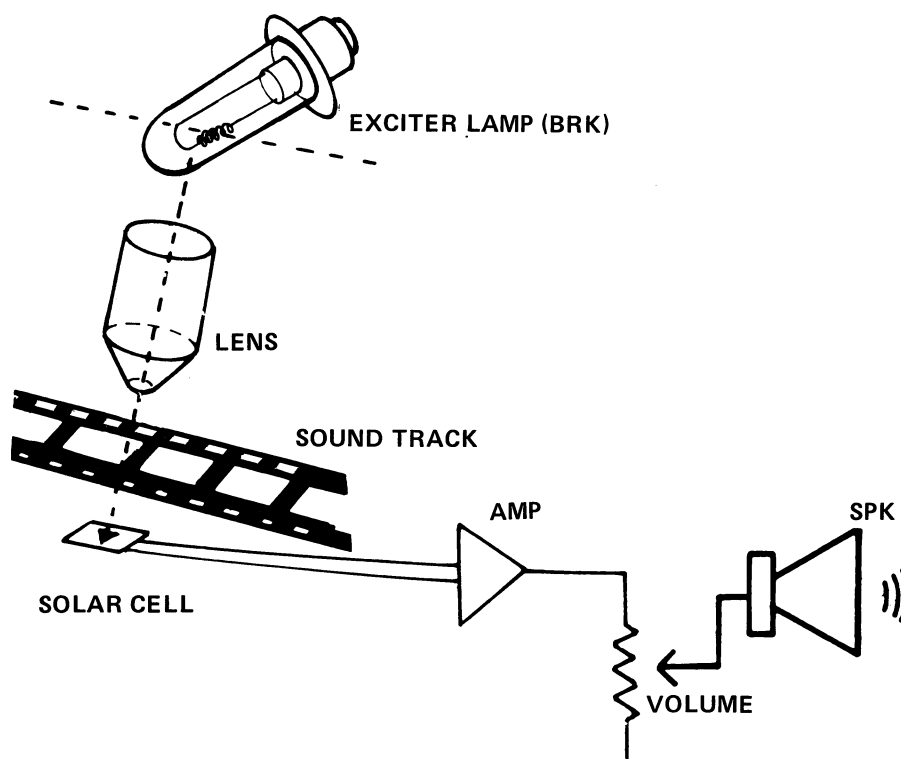


Fig. #51

2. Set-up Procedure

- a. Remove the exciter lamp cover by pulling straight out from the projector

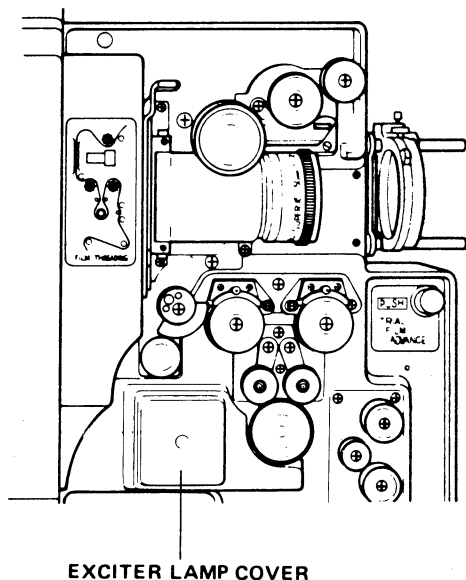


Fig. #52

3. Sound Focusing Adjustment Procedure

- a. Connect the dummy load resistor to the speaker output jack.
- b. Thread the 7000Hz SMPTE test film loop with the emulsion side towards the film shoe.

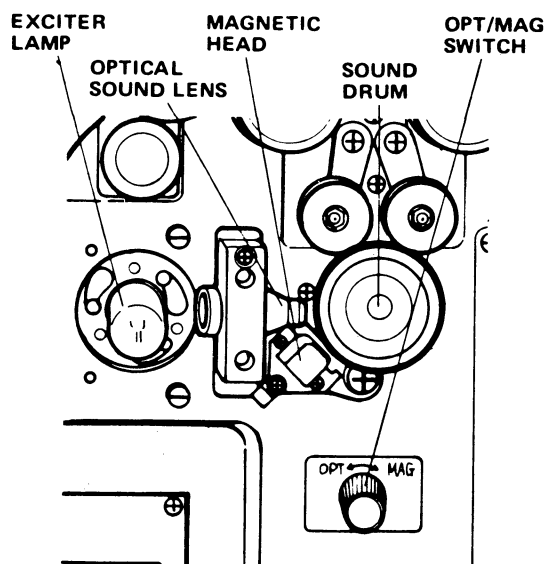


Fig. #53

- c. Connect either an AC VTVM (20 volt range) or an Oscilloscope across the dummy load resistor.

NOTE: When using instruments with a grounded shield input, avoid a ground loop condition by not connecting the shield at the load resistor.

- d. Turn the projector's function switch to forward.
- e. Set the treble control to the max. position and the bass to the minimum. Loosen the sound focus lens clamp screw (2) slightly to allow a rotation of the lens.
- f. Turn on the volume control towards maximum and observe the AC VTVM or the Oscilloscope.

(1) With the AC VTVM connected, observe the meter while slowly moving the lens up or down and slightly rotating until the maximum voltage reading is achieved. Clamp the sound lens and this completes the sound focusing alignment.

(2) With the Oscilloscope connected across the dummy load resistor a more precise alignment can be achieved. Observe the 7000Hz sine wave at both full volume and a lower volume at the same time adjusting the rotation and up or down position of the sound lens, for maximum P-P voltage of the sine wave. A clean undistorted sine wave should be observed as shown in Fig. #54 corresponding to the volume and tone control positions as indicated.

- g. This completes the sound focus adjustment. Clamp the sound lens clamp screw and test with a good sound track film.

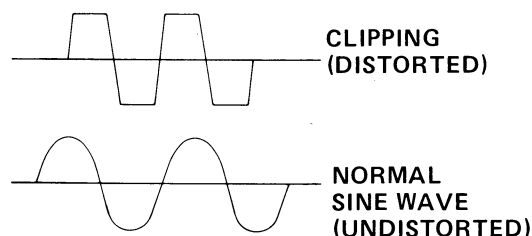
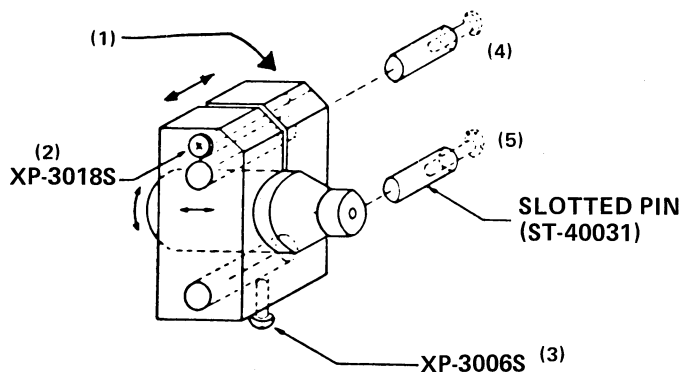


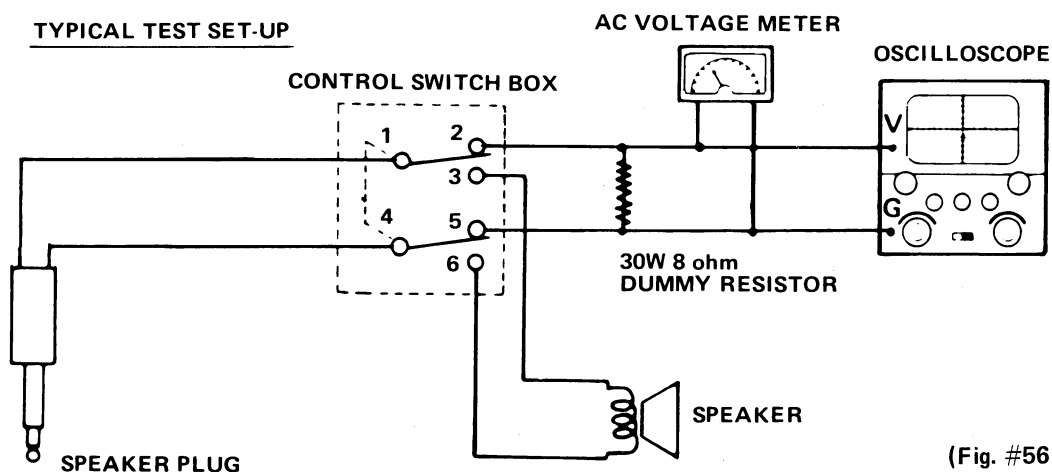
Fig. #54

4. Buzz Track Adjustment Procedure

- Connect the projector to the test set-up as Fig. #56.
- Load an SMPTE buzz track test film loop with the emulsion side towards the film shoe.
- Turn the function control switch to the forward position.
- Turn the amplifier volume and tone controls to maximum (clockwise) and listen for a clear 1000Hz tone.
- Sound lens holder is mounted on two pins (4) and (5) which slide into holes of the sound lens holder. Loosen the screw (3) to allow the adjustment. Adjust the buzz track by slowly sliding out the sound lens holder (1), until the 1000Hz tone is inaudible and a 300Hz tone becomes audible.
- Then slowly slide in the sound lens holder until neither the 300Hz or the 1000Hz tone is audible, indicating correct buzz track alignment. Tighten the lock screw (3).
- Re-check the 7000Hz sound focus alignment.
- Remove the exciter lamp. Remove the sound lens adjustment tool. Re-install the exciter lamp and wipe off any fingerprints.



(Fig. #55)



(Fig. #56)

7-3: MAGNETIC SOUND PLAYBACK SYSTEM

A. Description:

In addition to the standard optical sound playback, the EX-4000P includes magnetic sound track playback. The Mag/Opt selector switch operates a lever which positions the magnetic head against the film's sound track, at the same time the appropriate electrical connections are made.

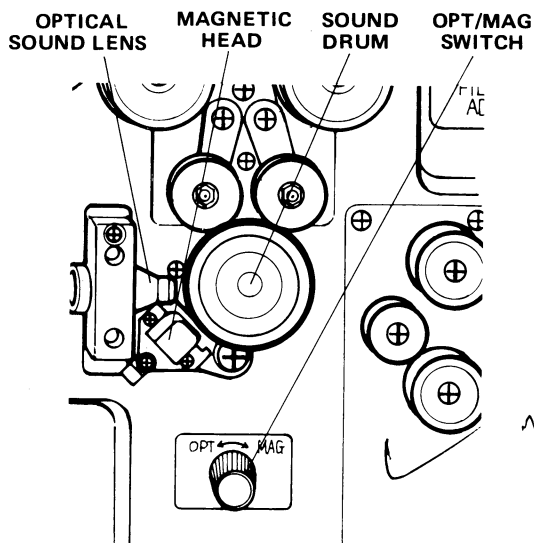


Fig. #57

B. Magnetic Head Alignment Procedure:

1. Tools and equipment required
 - a. Screw driver set (Iso)
 - b. Magnetic Azimuth 7000Hz alignment SMPTE test film loop
 - c. Pliers
 - d. AC VTVM (audio range) and or
 - e. Oscilloscope
 - f. 8 ohm 50 watt dummy load resistor
 - g. External speaker
2. Set Up Procedure
 - a. Remove the exciter lamp cover by pulling straight out from the projector to obtain access to the magnetic reproduce head.
 - b. Thread a magnetic azimuth alignment test film.
 - c. Set Opt/Mag switch to Mag.
 - d. Connect the projector to a dummy load and test set up. (See Fig. 56)
 - e. Turn on the projector and amplifier.

- f. Set the treble control to the "Max" position and the bass at minimum.
 - g. Adjust the volume control to just before the amplifier clips.
3. Azimuth Adjustment
 - a. Carefully loosen or tighten the three azimuth screws until maximum voltage reading is indicated on the AC VTVM, at the same time observing that the sine wave on the Oscilloscope is not clipped.
 - b. While the Oscilloscope is connected across the dummy load resistor, observe that the 7000Hz sine wave is not unusually distorted or clipped at either the high or low volume. If necessary make additional minor adjustments to the head position.
 - c. Secure the adjustment screws with a drop of lock tight sealer.
 - d. Check the sound reproduction with well recorded magnetic striped film.

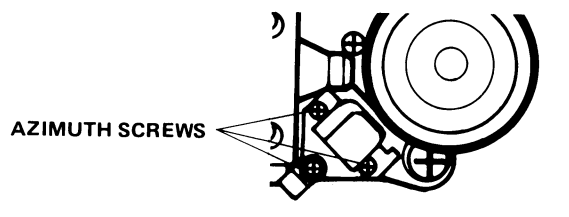


Fig. #58

241-8:XENON LAMP AND MIRROR

CAUTION: The Xenon Lamp is under extreme pressure and will explode if handled carelessly, protective clothing and a face shield must be worn while handling the lamp. NEVER attempt to handle the lamp while it is hot. Xenon Lamps are extremely bright and emit light in the ultra-violet spectrum. Do not attempt to look directly at an operating lamp with unprotected eyes. Lamps which are cloudy, difficult to strike, or exhibit erratic lightout and current meter indications, are more susceptible to explosive failure and should be replaced.

8-1: DESCRIPTION

The Xenon Lamp is mounted horizontally in the Dichroic mirror, electrically, the cathode end (—) is connected through the center hole of the mirror, and the anode end (+) is connected to the braided cable in front of the mirror. The lamp and mirror are adjustable to achieve precise focus of the light through the aperture.

The mirror is aligned from the factory and should not be adjusted, unless it has been replaced or the mirror housing has been removed. For the lamp position adjustment see sec. 3-3.

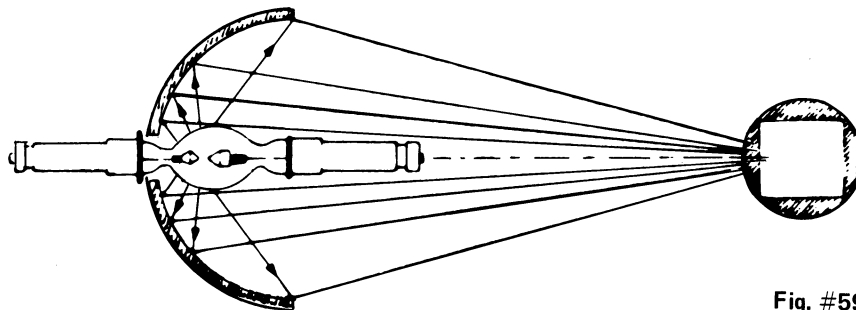


Fig. #59

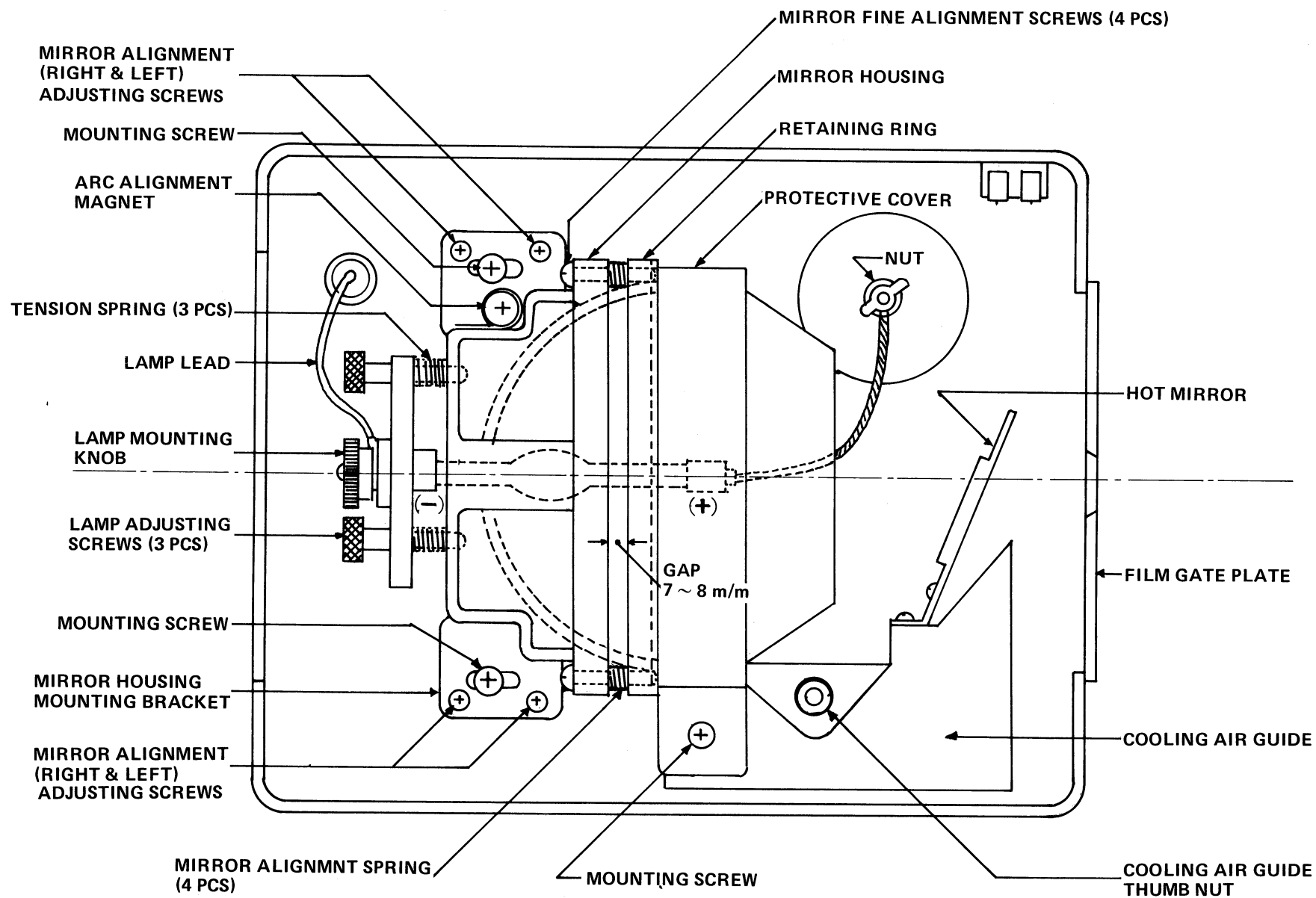


Fig. #60

8-2: MIRROR REPLACEMENT AND ALIGNMENT

A. Mirror Replacement:

1. Open lamp house door.
2. Remove the cooling air guide thumb nut and slide off the guide and lamp shield.
3. Remove the lamp (See lamp replacement section).
4. Scribe a mark on the mirrors retaining ring to identify top from bottom.
5. Remove the four alignment screws and compression springs, while at the same time holding on to the mirror.
6. The mirror may now be removed and a replacement re-installed by following the procedure in reverse.
7. Be sure to leave about a 7 to 8mm uniform gap between the mirror housing and the retaining ring.
8. Re-install the lamp and cooling guide.
9. Align the lamp for best illumination as described in section 3-3.

B. Mirror Alignment:

If proper illumination cannot be achieved after replacing the mirror, minor adjustment of the 4 retaining ring screws will be necessary to optimize the illumination.

C. Mirror Housing Bracket Alignment:

CAUTION: Adjustments to the mirror housing bracket should only be made if it has been necessary to remove the bracket or it is not possible to achieve even illumination any other way.

1. Loosen by one rotation only the two mounting screws marked with red paint.
2. Before moving the mirror housing bracket, mark its original position.
3. The two adjustment screws at the top and bottom will move the mirror bracket from left to right.
4. Once proper alignment has been achieved the center screen illumination should be maximum and evenly distributed.

8-3: LAMP ARC ALIGNMENT

A. Description:

The Xenon Lamp is a high-pressure lamp with two electrodes, the (+) anode and the (–) cathode, which are directly aligned opposite each other. The anode is the larger element in order to dissipate the heat. The arc is discharged from the cathode to the anode and must be straight and direct. (See Fig. #61)

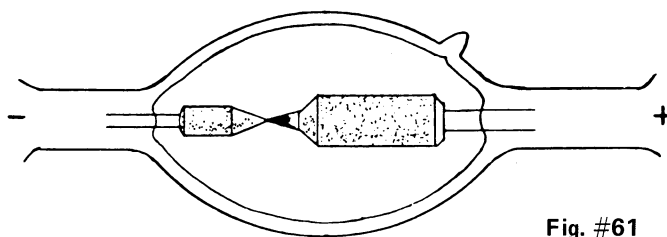


Fig. #61

Lamps which flare or curve the arc (See Fig. #62) indicate a worn or defective lamp and should be replaced. Lamps in this condition are more susceptible to explosion and should not be operated in this condition.

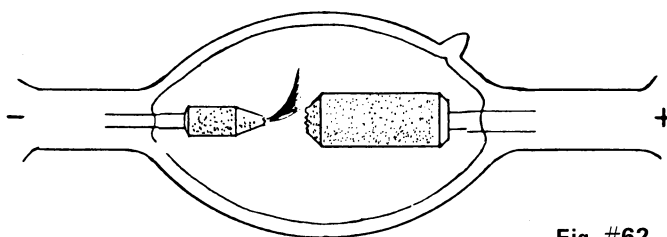


Fig. #62

CAUTION: Do not look directly at the lamp with unprotected eyes. A dark welders helmet may be used to observe the arc.

B. Adjustments:

The arc is affected by magnetic fields. In some installations where the projector is tilted to an extreme off the horizontal, it may be necessary to adjust the arc stabilizing magnets to prevent the arc from flaring.

To make the adjustment, the magnet bracket may be loosened, and re-positioned to where the arc is straight between the electrodes. (See Fig. #61) In some cases it may be necessary to add a few fiber washers between the lamp mount and the magnet bracket.

If the correct arc discharge cannot be obtained, the lamp may be defective or the projector's angle of tilt is beyond compensation. Maximum recommended angle is 15° off horizontal.

WARNING: Xenon Lamps are under extreme pressure. While making lamp and mirror adjustments it is recommended that a face shield and protective clothing be worn. Do not look directly at the lamp with unprotected eyes.

241-9:XENON LAMP STARTER AND RECTIFIER CIRCUITS

EX-4000P

9-1: DESCRIPTION:

The EX-4000P uses the latest technology in a light weight efficient pulse-width modulated power supply for maximum illumination of its 550 watt Xenon lamp. The switching regulator (P.W.M., pulse-width modulated) technique makes maximum efficiency of high frequency transformers, thus reducing the size and weight, while developing a highly regulated D.C. Lamp operating current.

The starter circuit as well employs a latest technology high frequency oscillating circuit consisting of a thydax high voltage pulse transformer.

A. Rectifier Block Diagram Function:

1. Input circuit:

This circuit consists of AC line input, fuse, voltage selector, transformer and main power switch as well as an RF line filter.

2. Rectifier and Filter:

100/120 voltage selector switch RY-1 surge current protection relay, bridge D-1 and filter capacitor block PB-0082-A, providing the initial AC to DC conversion.

3. P.W.M. DC to AC converter:

This is the heart of the power supply consisting of TR-1-TR-4 switching transistors (2SC2139), which are driven by the P.W.M. regulator circuit. These transistors switch the DC voltage at 20KHz from the rectifier and filter circuit to about 250 to 350 volts peak to peak.

4. P.W.M. Regulator:

This circuit compares the lamp current from sensing resistor R-2 against the constant voltage source IC-1 and zener diode D-2. IC-2 adjusts the pulse range to transistors TR-1 and TR-2 which in turn drive the DC to AC converter circuit, ultimately resulting in a constant lamp current.

5. High Frequency Rectifier and Filter:

Consist of high frequency ferrite transformer and rectifier, reactor and filter capacitors C-2, 3, 4 & 5 converting the 250 ~ 350V 120KHz pulse to approximately 40 to 60 volts D.C.

6. Current Sensing Resistor:

The voltage developed across R-2 in series with the lamp is the control feedback voltage supplied to the P.W.M. regulator circuit.

7. Starting Boost Voltage:

Bridge rectifier D-4 supplies a boost voltage across C-2 adding to the rectifier running voltage approximately 60 VDC to provide the lamp with about 90 volts open circuit prior to starting. Once the lamp has started this circuit is switched out by relay RY-3.

8. L.E.D. Current Adjuster:

The current adjust control consists of a double gang potentiometer one which controls the P.W.M. regulator to establish the desired lamp current. The second to provide a current indication on the L.E.D. display. Trim controls are provided for calibration of the display in relationship to the actual lamp current.

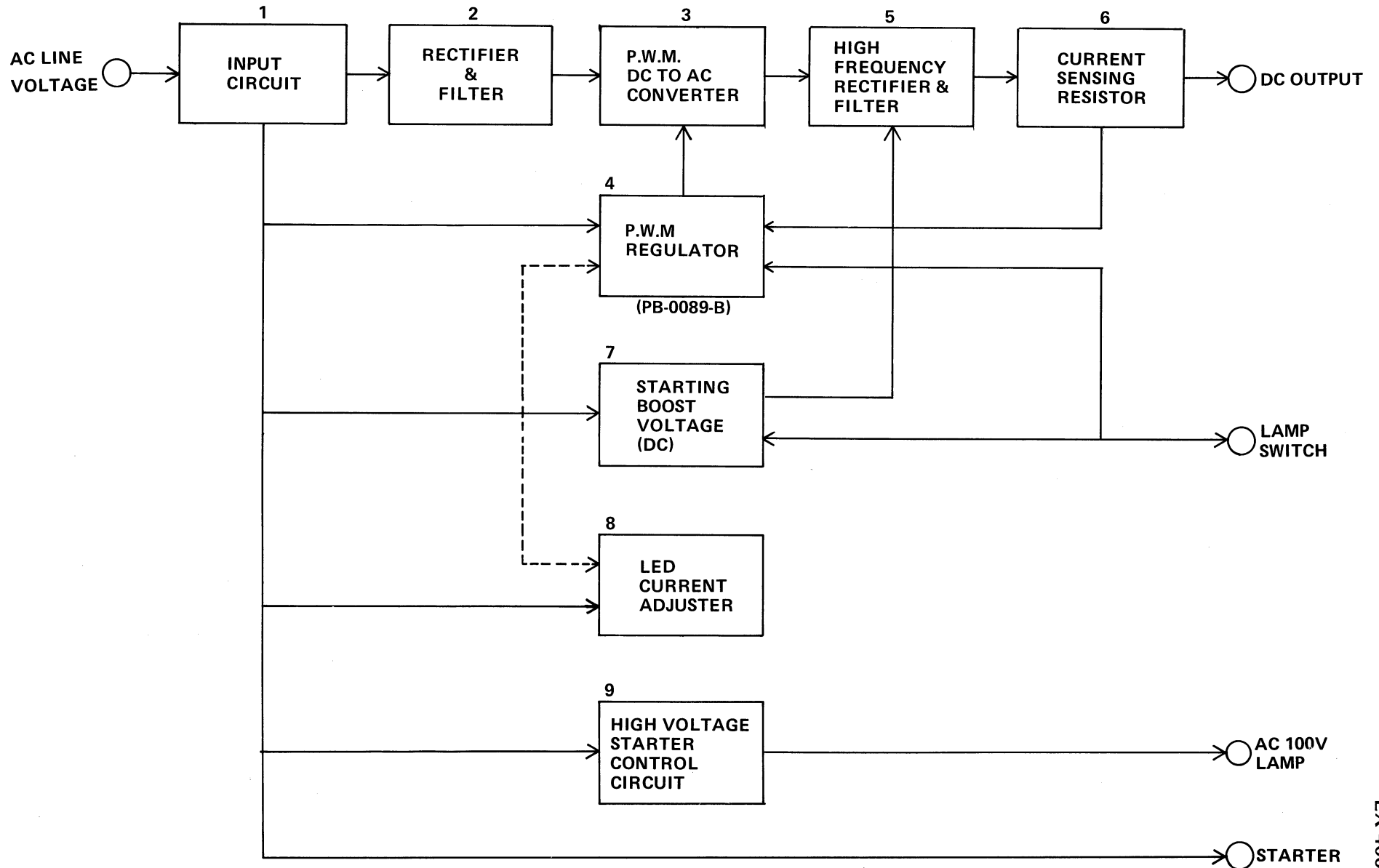
9. High Voltage Starter Control Circuit:

When the lamp's open circuit voltage exceeds approximately 70 volts relay RY-2 closes, supplying 100 volts AC to the high voltage starter board which in turn generates a 25 to 30KV striking pulse. When the lamp begins to draw current the open circuit voltage drops below the 70 volts and relay RY-2 disconnects the starter.

B. Starter Description:

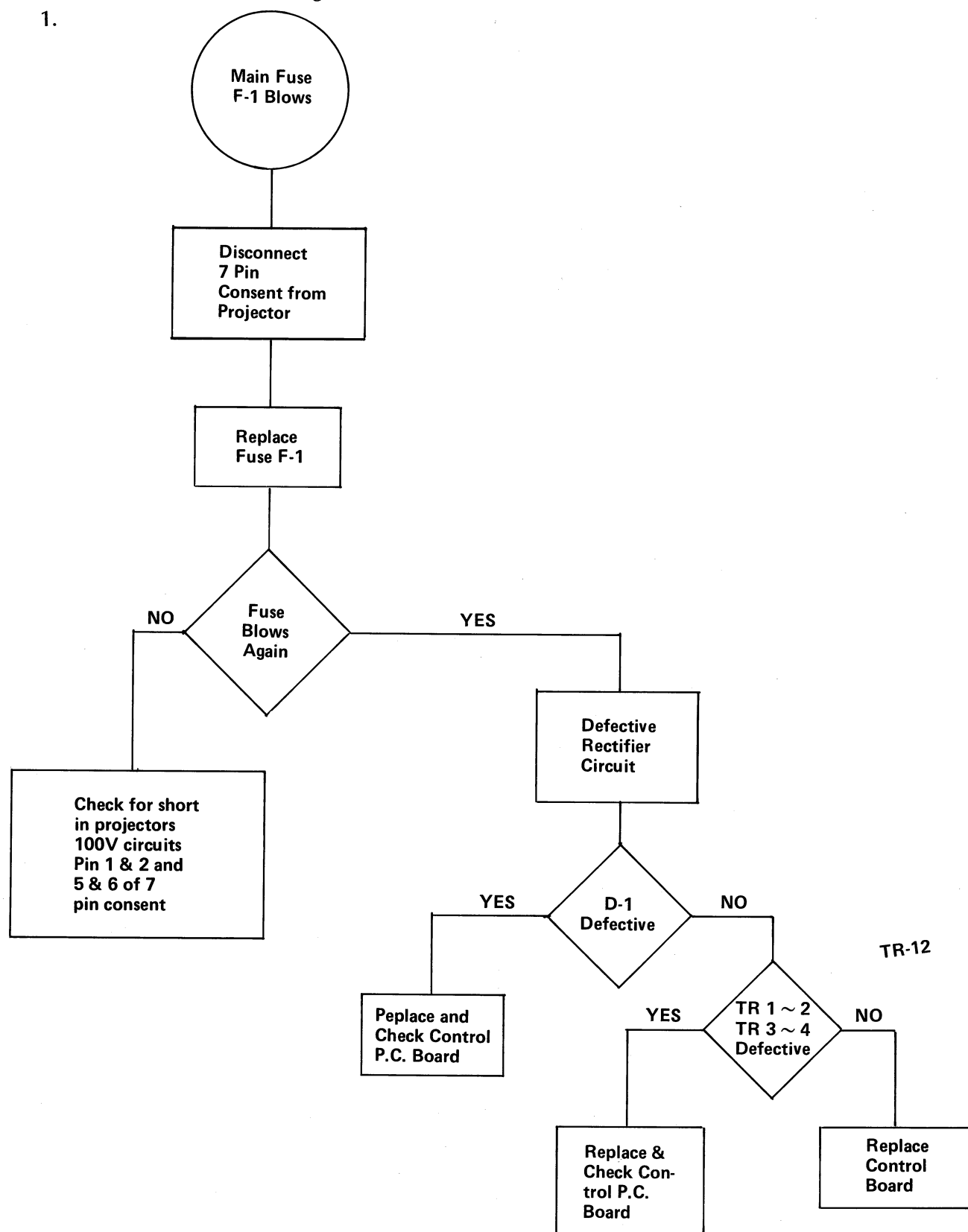
100 volts AC is supplied to terminals 3 & 4 on the starter P.C. Board. Diode D-1 half wave rectifies the AC current and charges C-5. When C-5 is charged to approximately 100 volts DC the Thydax fires and discharges C-5 through the primary winding of T-1. The secondary winding of T-1 develops approximately 10KV charging C-7, and the doubler circuit consisting of diodes D-2 & D-3 and C-6. When C-6 is charged to approximately 15KV, it discharges across the spark gap, and the resonant circuit of the primary of T-2 and C-6, resulting in a 25-30KV discharge of the secondary of T-2 across the Xenon Lamp electrodes, ionizing the gas.

BLOCK DIAGRAM OF EX-4000P RECTIFIER

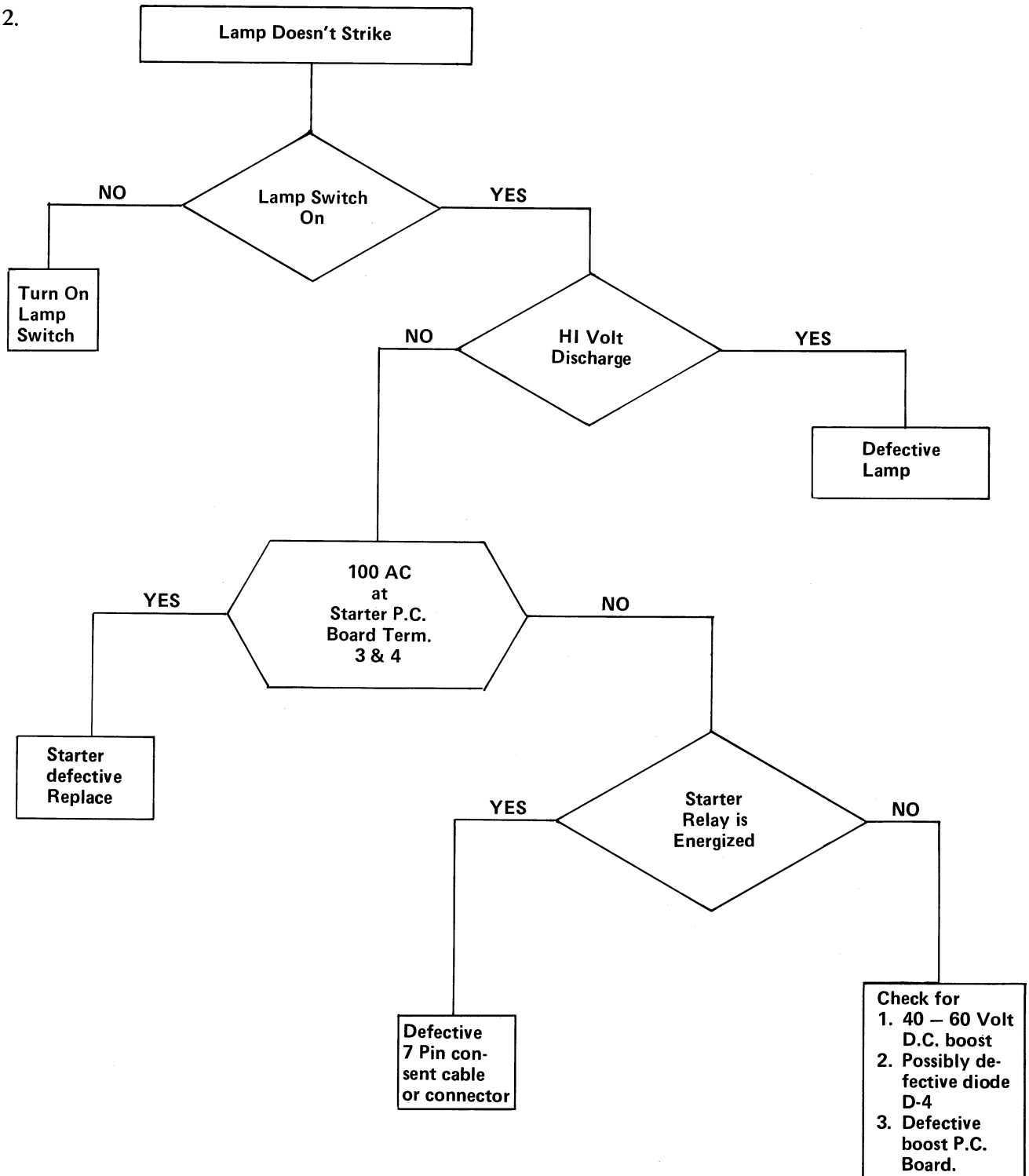


9-2: A. Rectifier Trouble Shooting Chart

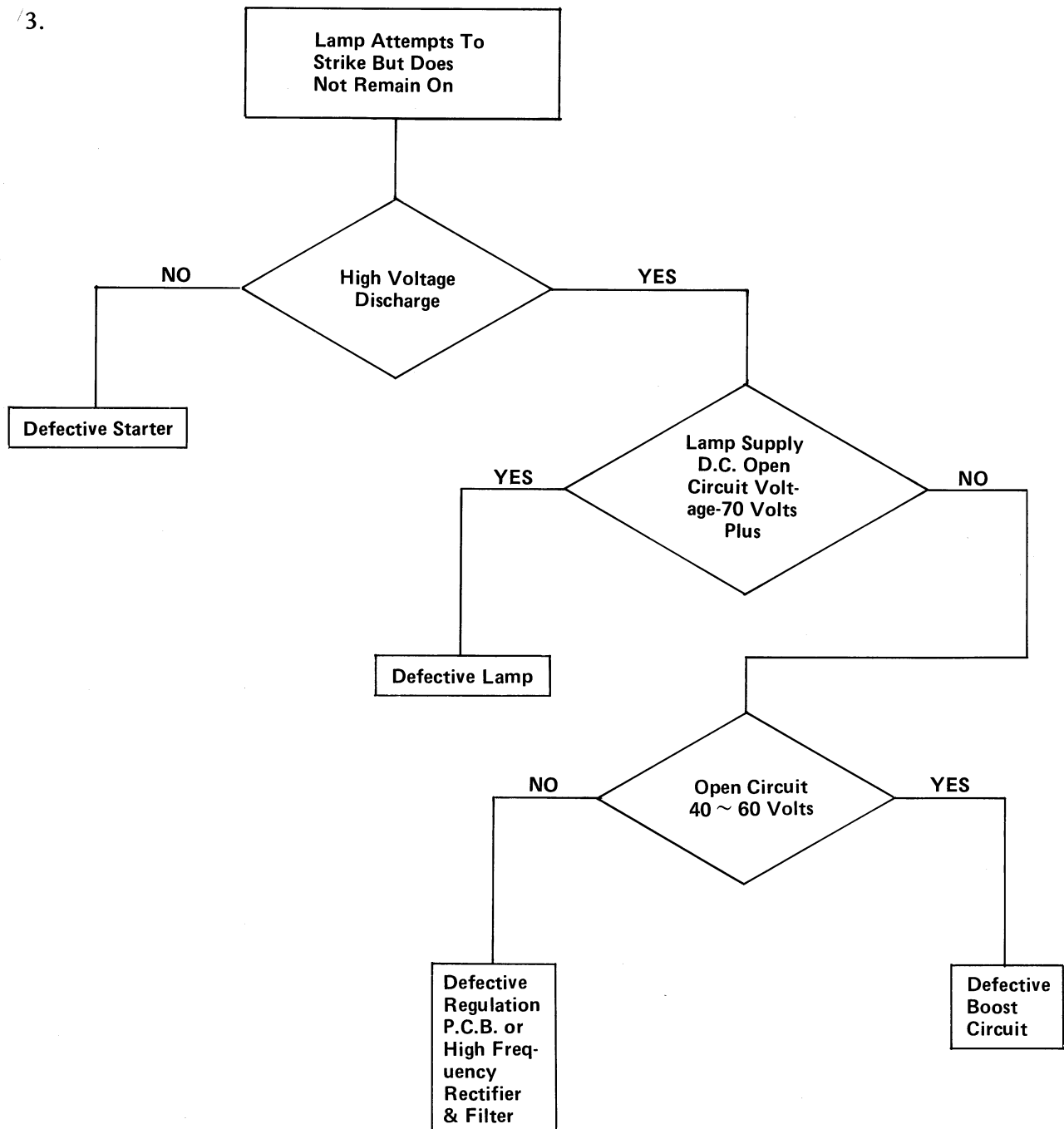
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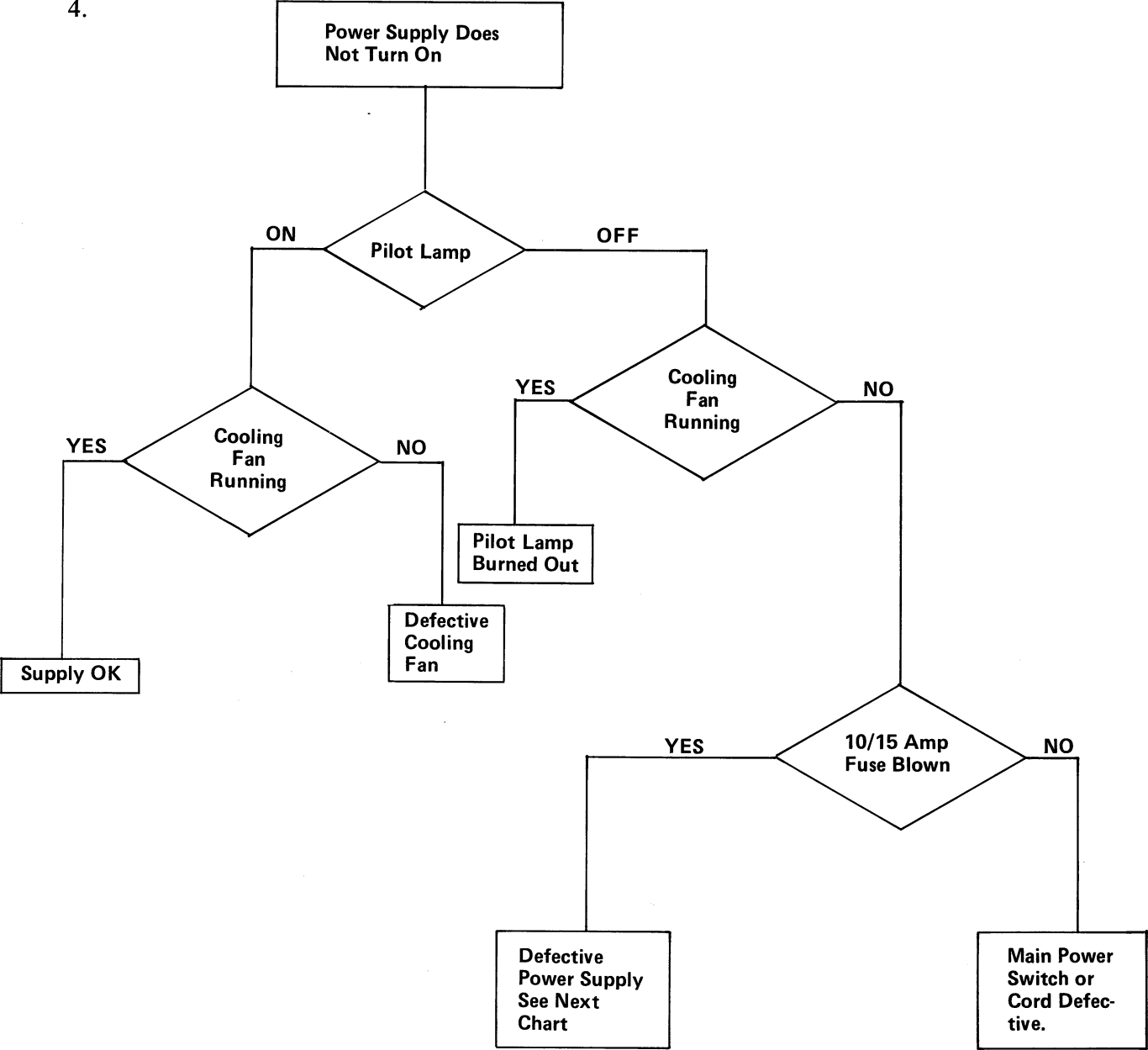
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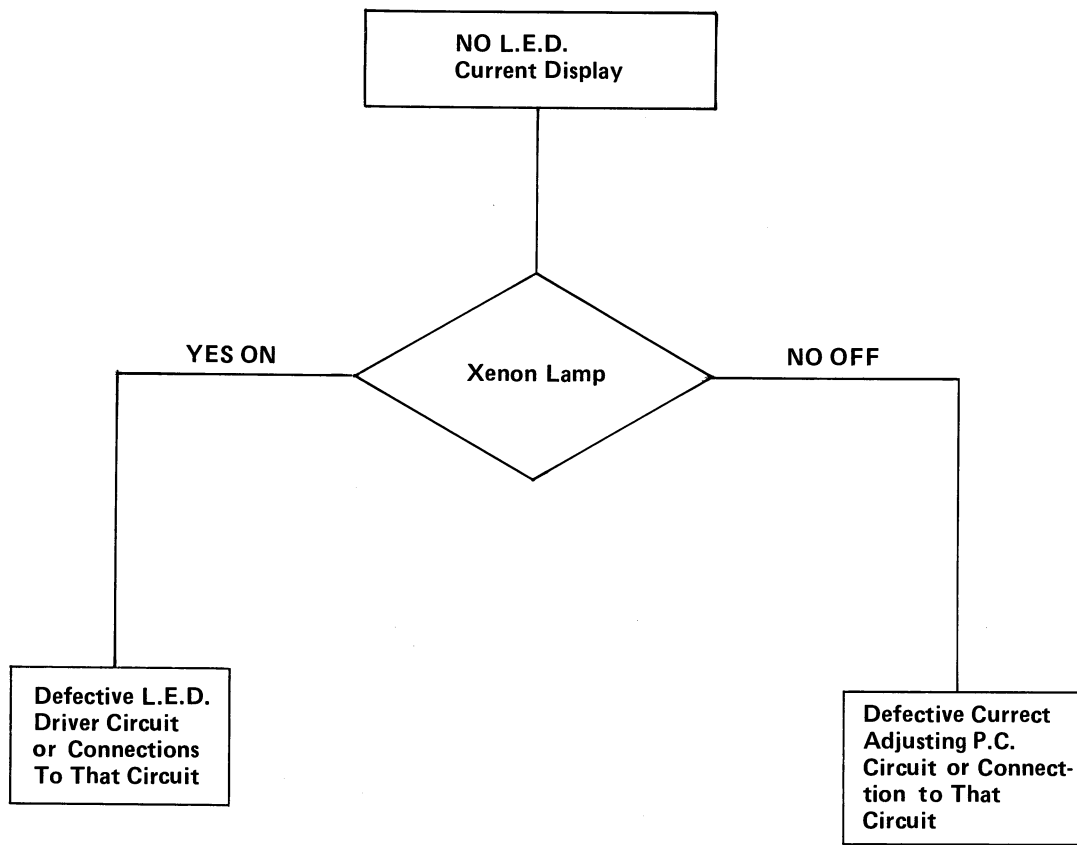
3.



4.



5.



EX-4000P: List of All Circuit Diagrams**1. Head Machine Electrical Circuit Diagrams:**

Diagram No. 241-60104
241-60103
241-60102
241-60101

2. Rectifier Circuit Diagrams:

Diagram No. 241-63121
241-63116
241-63113
241-63108
241-63105
241-63102
241-63101

3. Rectifier Printed Circuit Board Diagrams:

Diagram No. 241-63111 (PB-0035-A)
241-63117 (PB-0073-A)
241-63118 (PB-0082-A)
241-63122 (PB-0089-B)
241-63119 (PB-0066-B)
241-63120 (PB-0084-A)
241-63114 (PB-0068-B)
241-63109 (PB-0033-A)
241-63115 (PB-0066-A)
241-63112 (PB-0031-A)
241-63110 (PB-0019-A)
241-63103 (PM-149)

3. Amplifier Circuit Diagrams:

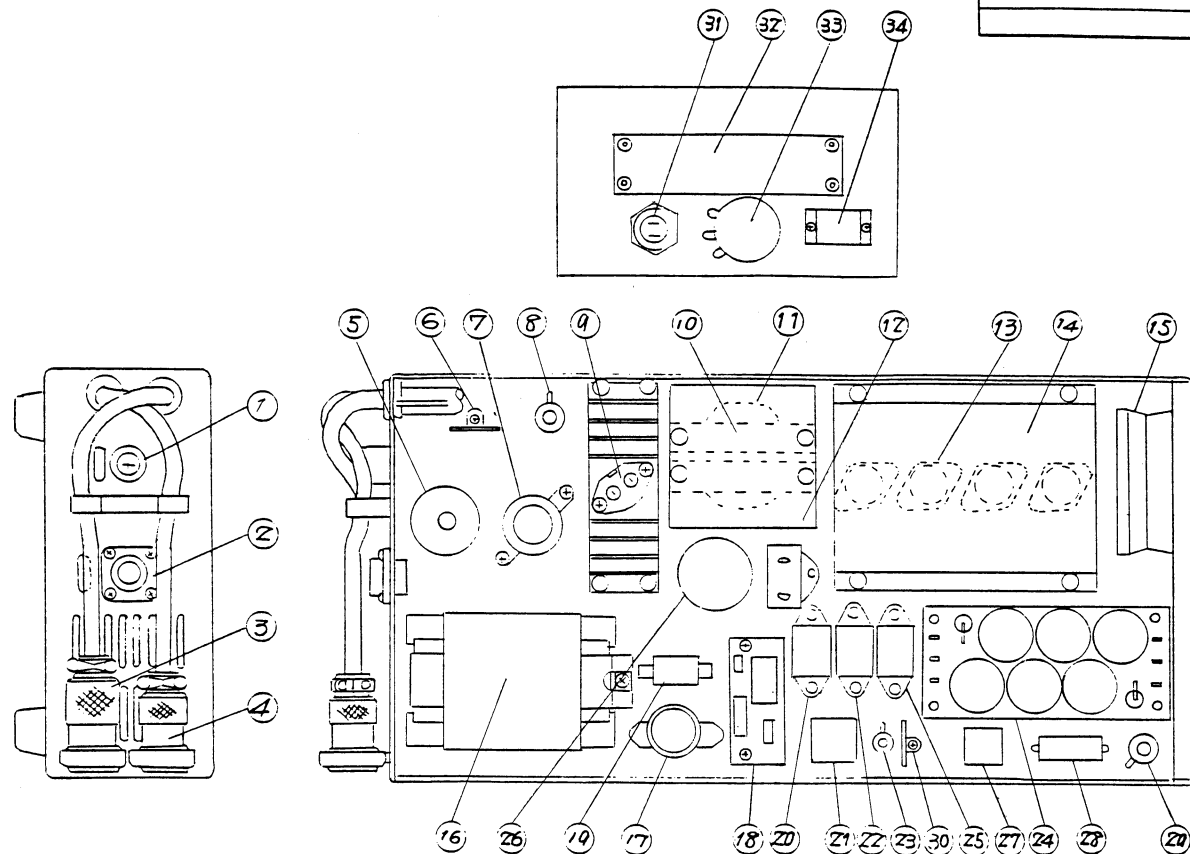
Diagram No. 241-51102 (See page 46)
241-51101 (See page 47)

— Refer to General Index to find Projector's Serial No. applicable —

EX-4000P: GENERAL INDEX					
Projector's S/R No.	Head Machine Electrical Circuit Diagram No.	Rectifier Unit Part No.	Rectifier Circuit Diagram No.	Rectifier P.C. Board Reference No. & Circuit Diagram No.	Amplifier Circuit Diagram No.
4001 ~ 4026	241-60101		241-63101	PB-008-A	241-51101
4028		(Saturable Reactor Type)			
4032 ~ 4036					
4047 ~ 4054					
4072 ~ 4084					
4102 ~ 4111					
4117 ~ 4125					
(Note: The above numbers were sold in Japan only)					
4027	241-60102	241-63001	241-63102	PM-149 (241-63103)	241-51101
4029 ~ 4031	(with Resistor 5W 300Ω)	(Sansha, Switching Type)		PM-156	
4037 ~ 4042		(without Main Power Switch)			
4043 ~ 4046	241-60102	241-63001a	241-63105	PM-180	241-51101
4055 ~ 4071		(Sansha, Switching Type)		PM-181	
4085 ~ 4101		(with Main Power Switch)		PM-182 PM-156	
4112 ~ 4116	241-60103 (with Resistor 30W 1kΩ)	241-63001a	241-63105		241-51101
4126 ~ 4129	241-60104	241-63002	241-63108	PB-0019-A (241-63110)	241-51101
		(USHIO, Switching Type, XB-Z0140-A)		PB-0031-A (241-63112)	
		(with Main Power Switch)		PB-0033-A (241-63109)	
		(with Current Adjuster)		PB-0035-A (241-63111)	

Projector's S/R No.	Head Machine Electrical Circuit Diagram No.	Rectifier Unit Part No.	Rectifier Circuit Diagram No.	Rectifier P.C. Board Reference No. & Circuit Diagram No.	Amplifier Circuit Diagram No.
4130 ~ 4131	241-60103	241-63001a	241-63105		241-51101
4132 ~ 4166	241-60104	241-63002	241-63108		241-51101
4167 ~ 4236	241-60104	241-63002a	241-63113	PB-0019-A (241-63110)	241-51102
		(USHIO, Switching Type, XB-Z040-B)		PB-0033-A (241-63109)	(with VR for 600Ω AUX. OUT)
		(with Main Power Switch)		PB-0035-A (241-63111)	
		(with Current Adjuster)		PB-0066-A (241-63115)	
				PB-0068-B (241-63114)	
4237 ~ 4281	241-60104	241-63002b	241-63116	PB-0035-A (241-63111)	241-51102
		(USHIO, Switching Type.)		PB-0066-B (241-63119)	
		(XB-55102 ~ 105AH, with Main Power Switch)		PB-0073-A (241-63117)	
		(with Current Adjuster)		PB-0082-A (241-63118)	
				PB-0084-A (241-63119)	
4282 and UP	241-60104	241-63002c	241-63121	PB-0035-A (241-63111)	241-51102
		(USHIO, Switching Type)		PB-0073-A (241-63117)	
		(XB-55106AH-A, with Main Power Switch)		PB-0082-A (241-63118)	
		(with Current Adjuster)		PB-0089-B (241-63122)	

EX-4000P :
MAIN PARTS OF RECTIFIER UNIT



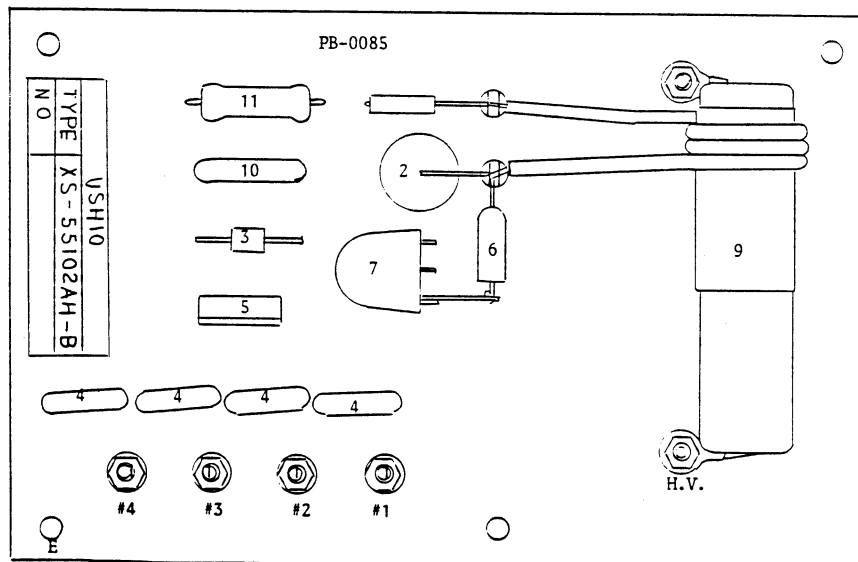
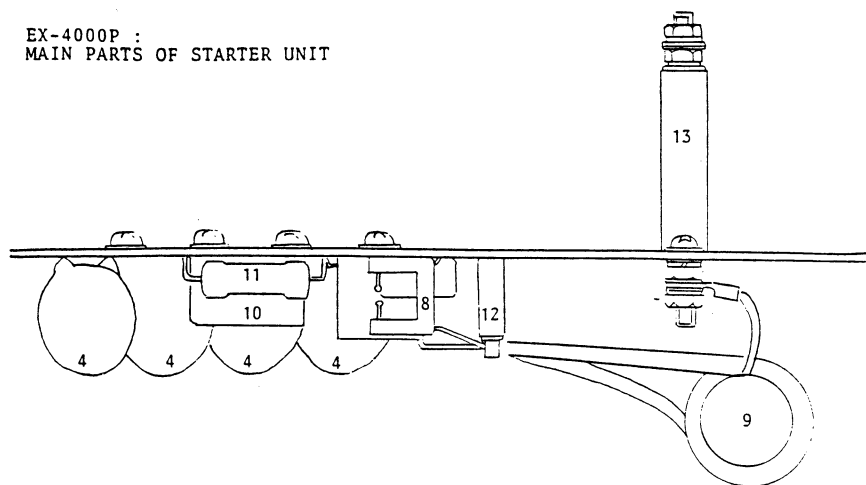
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符号	年月日	訂 正 要 領	担当	

No.	PART NO.	DESCRIPTIONS	PCS.
1	241-63151	Fuse Holder, S-N2059	1
2	241-63161	AC Input Receptacle, NJC-203RM	1
3	X 1-62191	3P Plug, BTS-28P3	1
4	260-63371	7P Plug, NCS-307P	1
5	241-63421	Reactor, 3K4-13003	1
6		2P Terminal, 1L-2P	1
7	C E-161108	Capacitor, 160V 1000mfd.	1
8		Resistor, FAO 20W1H	1
9		Diode, 30GG2C11	1
10		Printed Circuit Board assy PB-0073A	1
11	241-63251	Inverter Main Transformer 3K4-13011	1
12		Capacitor, 180V 4.5mfd.	1
13	TR 2SC 2139P	Transistor 2SC 2139P	4
14		Printed Circuit Board assy PB-0089B	1
15	241-63451	Fan Motor, 109-040UL	1
16	241-63241	Stepdown Transformer 3K-13002	1
17		Switch, S-J2111 #03(S3)	1
18		Printed Circuit Board	1
19	241-63391	Switch, SL-210ND(S2)	1
20		Relay (RY1) LY2F DC48V	1
21		Diode, 15J4B41	1
22	241-63371	Relay (RY2) MY2F AC100V	1
23		Resistor, FWA05W 10 ohm	1
24		Printed Circuit Board assy PB-0082A	1
25		Relay (RY3) LY2F DC48V	1
26	241-63261	Noise Filter, FN-220-15-1	1
27	241-63591	Diode, S4V B40	1
28		Fuse Holder	1
29		Resistor, 20W 400 ohm	1
30		2P Terminal, 1L-2P	1
31	S T-60111	Pilot Lamp Holder	1
32		Printed Circuit Board assy PB-0035A	1
33	241-63061	Volume Control RV24YG20SB 500 ohm	1
34	241-63041	Main Switch, SW-3006A (S1)	1

映機工業株式会社				承認	設計	製 図	品 名
作 図	年 月 日	尺 寸	度				
材 質	台 数	重 量	g	製品記号			部 番

EX-4000P

EX-4000P :
MAIN PARTS OF STARTER UNIT



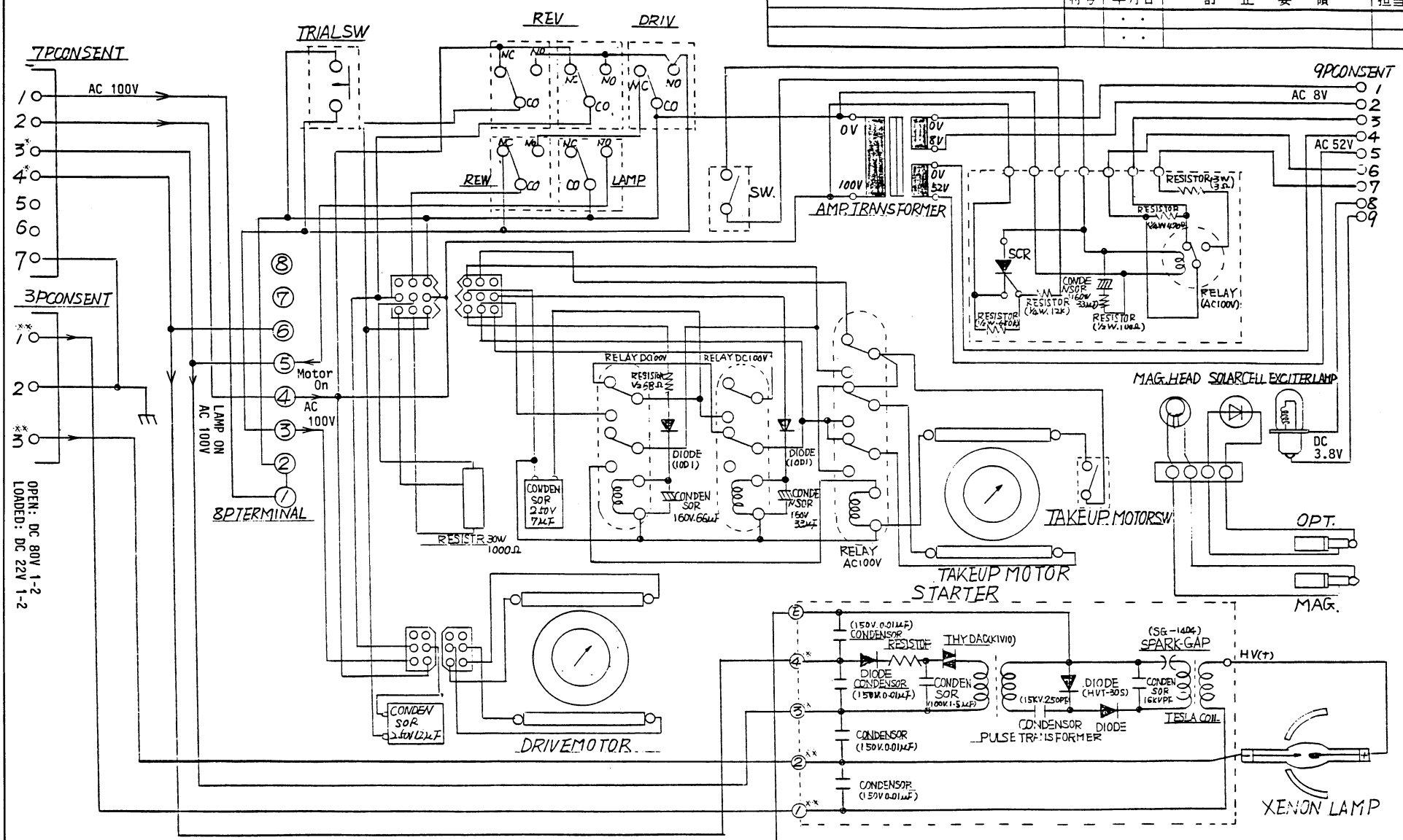
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符号	年月日	訂 正 要 領	担当	

No.	PART NO.	DESCRIPTIONS	PCS.
1		Input Terminal	4
2		Capacitor(HVYK1465)	1
3	241-62051	Thydac (K1V10)	1
4		Capacitor(ECK-DAL472PE)	4
5		Diode (RB-154)	1
6	241-62071	Diode (HVT-30S)	2
7	241-62091	Pulse Transformer (IGT-0101)	1
8	241-62041	Spark Gap (AG4P 802J)	1
9	241-62031	Tesla Coil with lead wire	1
10		Capacitor (ECQ-E1155KZ)	1
11		Resistor (ERG-3ANJ152)	1
12	241-62081	Terminal (ST-A7)	2
13	241-62111	Output(DC) (Lamp Lead Stand-Off)	1

映機工業株式会社				承認設計製図	品名
作図	年 月 日	尺 度			
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EX-4000P

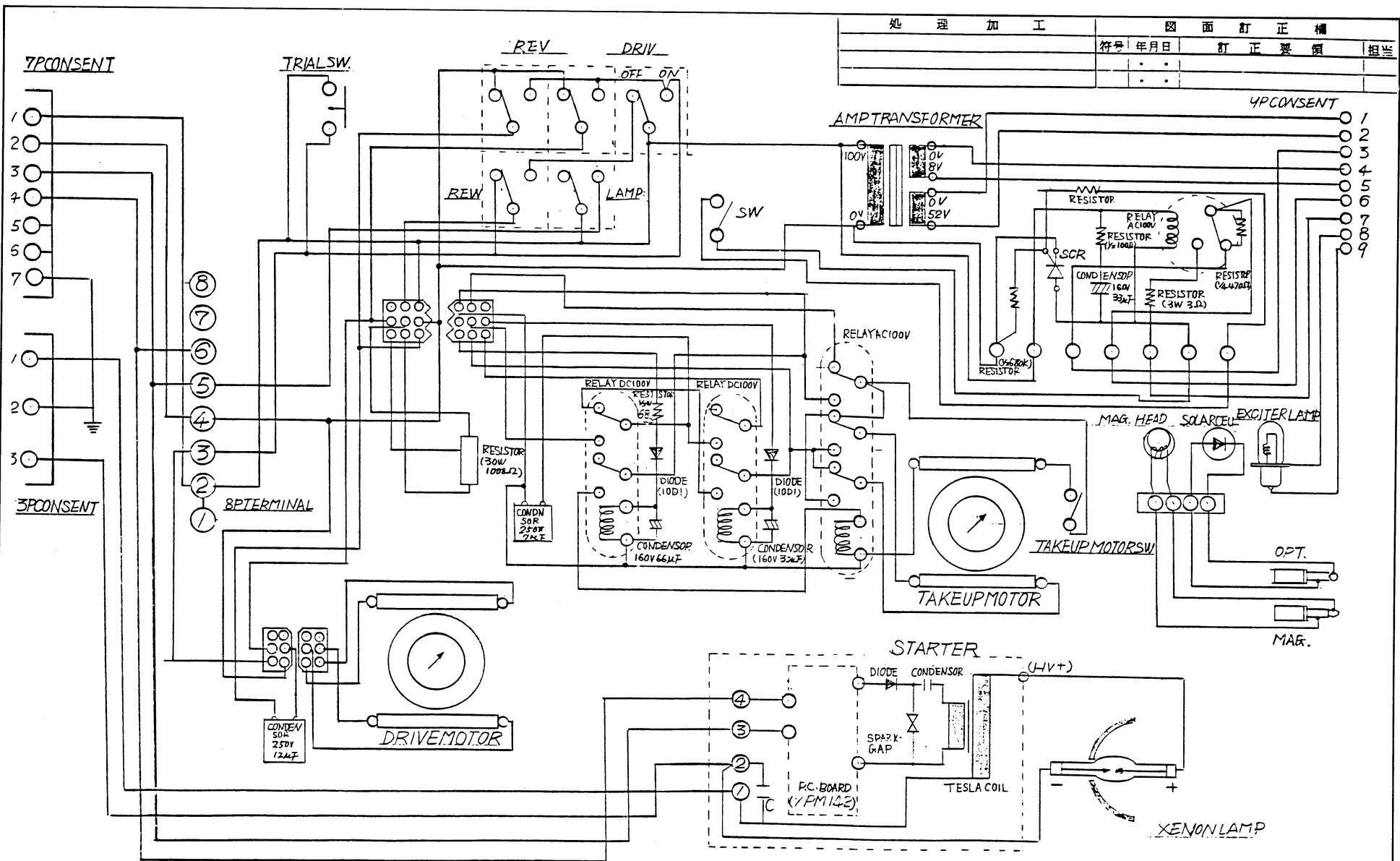
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EX-4000P :
 HEAD MACHINE ELECTRICAL
 CIRCUIT DIAGRAM (241-60104)
 Serial No.4126-4129 & 4132 & UP

映機工業株式会社				承認	設計	製図	品名
作図	年月日	尺度					EX-4000P
材料	資	右当調数	車重減 R				部番
							241-60104

EX-4000P

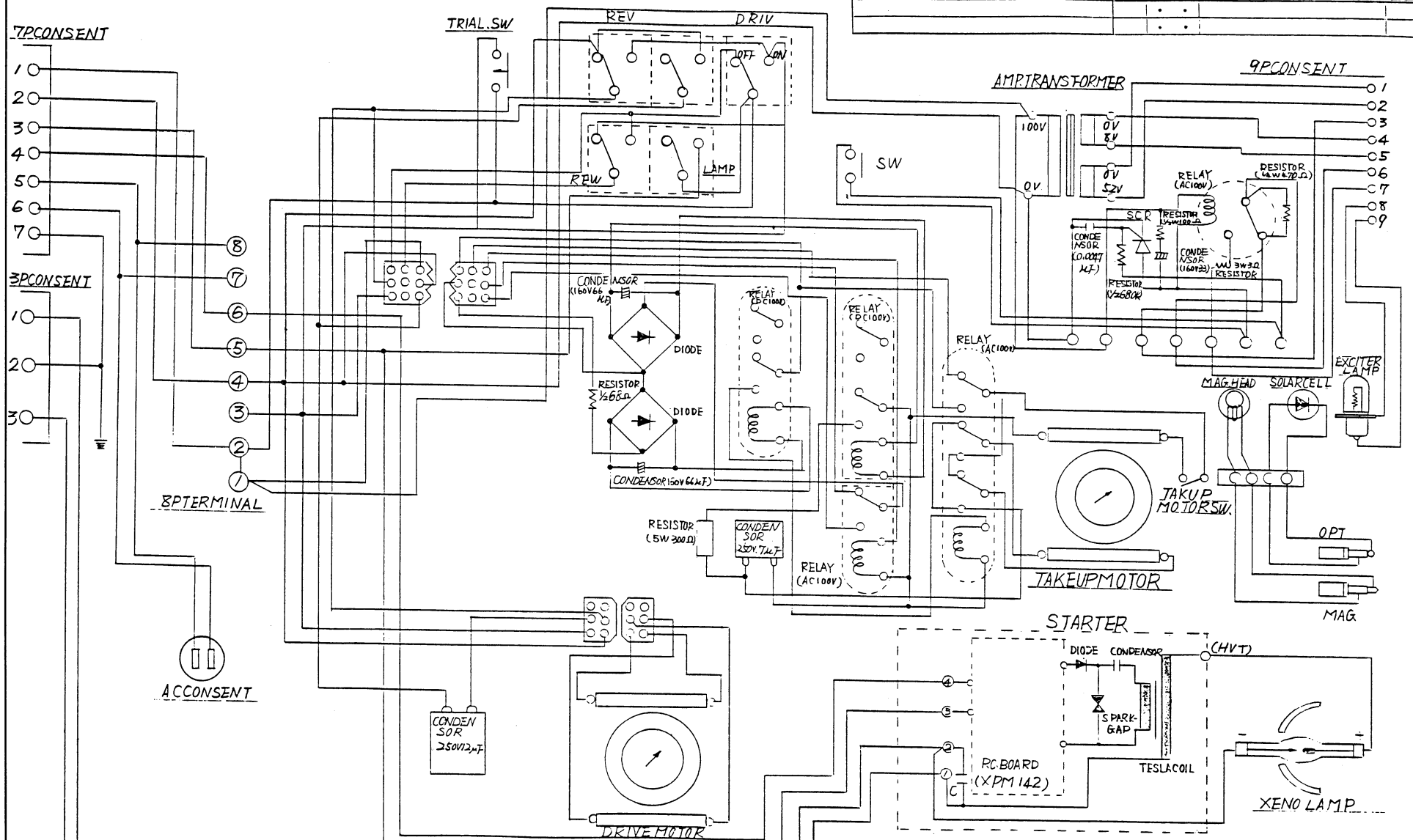


EX-4000P :
HEAD MACHINE ELECTRICAL
CIRCUIT DIAGRAM (241-60103)
Serial No. 4112-4116,
4130-4131

映機工業株式会社				承認	設計	製図	品名
作図	54年9月5日	尺度				<i>Sh</i>	EX4000P(SWITCHING) PROJECTOR HEAD MACHINE ELECTRICAL CIRCUIT DIAGRAM
材質	台当個数	単重量	g	製品記号	EX4000P	部番	241-60103

EX-4000P

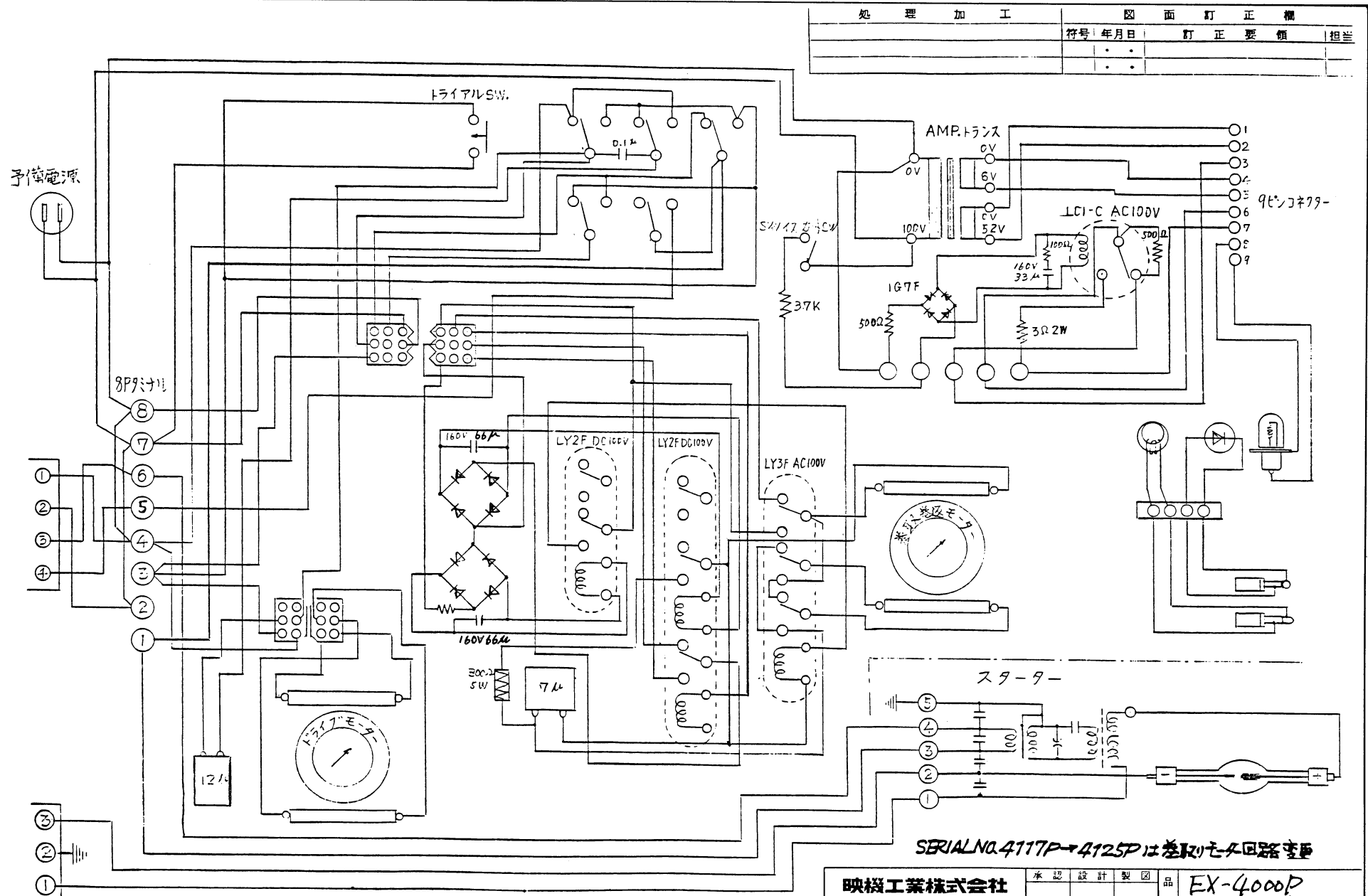
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符号: 年月日	訂正要領
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EX-4000P : HEAD MACHINE ELECTRICAL CIRCUIT Serial No.4027, 4029-4031, 4037-4042
DIAGRAM (241-60102) 4045-4046, 4055-4071, 4085-4101

映機工業株式会社				承認	設計	製図	品名	EX4000P(SWITCHING) PROJECTOR HEAD MACHINE ELECTRICAL CIRCUIT DIAGRAM
作図	年月日	尺度					名	
材	資	台当個数	重量	g			部番	241-60102

EX-4000P



EX-4000P : HEAD MACHINE ELECTRIC AL CIRCUIT DIAGRAM (241-60101)
 Serial No. 4001-4026, 4028, 4032-4036, 4047-4054,
 4072-4084, 4102-4111, 4117-4125
 (These Nos. were sold in Japan only.)

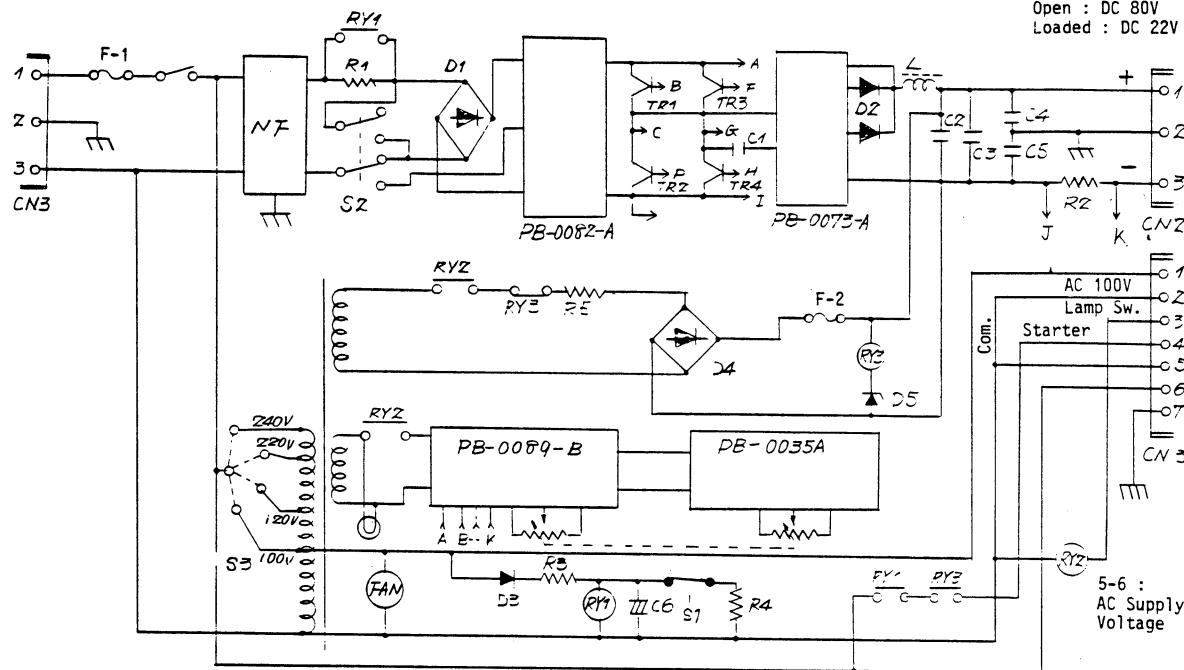
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符号	年月日
	訂 正 要 領
	担 当

SERIAL NO. 4117P → 4125P は差取りモーター回路変更

映機工業株式会社				承認	設計	製図	品名
作図	78年9月12日	尺	度				EX-4000P 三シン電気回路図
材 質	台数	個数	重量	g			部 番
							241-60101

EX-4000P

処 理 加 工		図 面 訂 正 欄		
符号	年月日	訂 正 要 領	担当	
	..			
	..			



Open : DC 80V
Loaded : DC 22V

PARTS LIST

MARK	DESCRIPTION	PC	REMARK
TR-1-4	TRANSISTOR	4	ZSC Z139 P
D. 1	DIODE	1	15J4B41
D. 2	DIODE	1	30GGZC17
D. 3	DIODE	1	1S1888
C. 1	CONDENSOR	1	CM-181-455 (180V, 4.5μF)
C. 2	CONDENSOR	1	CE-161-108 (160V, 100μF)
C. 3~5	CONDENSOR	3	CC-151-103 (150V, 0.01μF)
C. 6	CONDENSOR	1	CE101-ZZ7 (100V, 220μF)
R. 1	RESISTOR	1	RE 5R0100 (5W, 10Ω)
R. 2	RESISTOR	1	RE Z00-R03+R03
R. 3	RESISTOR	1	RA 3R0-1ZZ (3W, 1.2kΩ)
R. 4	RESISTOR	1	RA ZR0-470 (2W, 47Ω)
V. R	VOLUME CONTROL	1	RV24YG ZDS B 500Ω
T.	STEPDOWN TRANS	1	3K4-1300Z
L.	REACTOR	1	3K4-1300Z
S. 1	SWITCH	1	SW-3006A
S. 2	SWITCH	1	SL-Z10ND
S. 3	SWITCH	1	S-JZ111 #03
RY1, 2	RELAY	2	LYZF DC45V
RY. 2	RELAY	1	MYZF AC100V
CN1	IN. PUT CONNECTOR	1	NJC-Z03RM
CN2	OUT. PUT CONNECTOR	1	BTS-Z8P3
CN3	CONTROL CONNECTOR	1	NCS-307P
FAN	FAN MOTOR	1	109-040UL
NF	NOISE FILTER	1	NF-ZZ0-15-1
F. 1	FUSE	1	MF-50-NR1
F. 2	FUSE	1	
PL	PILOT LAMP	1	PL-406 24V
D. 4	DIODE	1	S4V B40
D. 5	ZENER DIODE	1	RD34F
R. 5	RESISTOR	1	REZ00-401 (20W, 400Ω)

Functions of each P.C.Board :

- PB-0082-A : Rectifier & Filter (Capacitors, etc.)
- PB-0073-A : P.W.M. DC to AC Converter (Inverter Transformer, etc.)
- PB-0089-B : P.W.M. Main Regulator
- PB-0035A : LED Current Adjuster

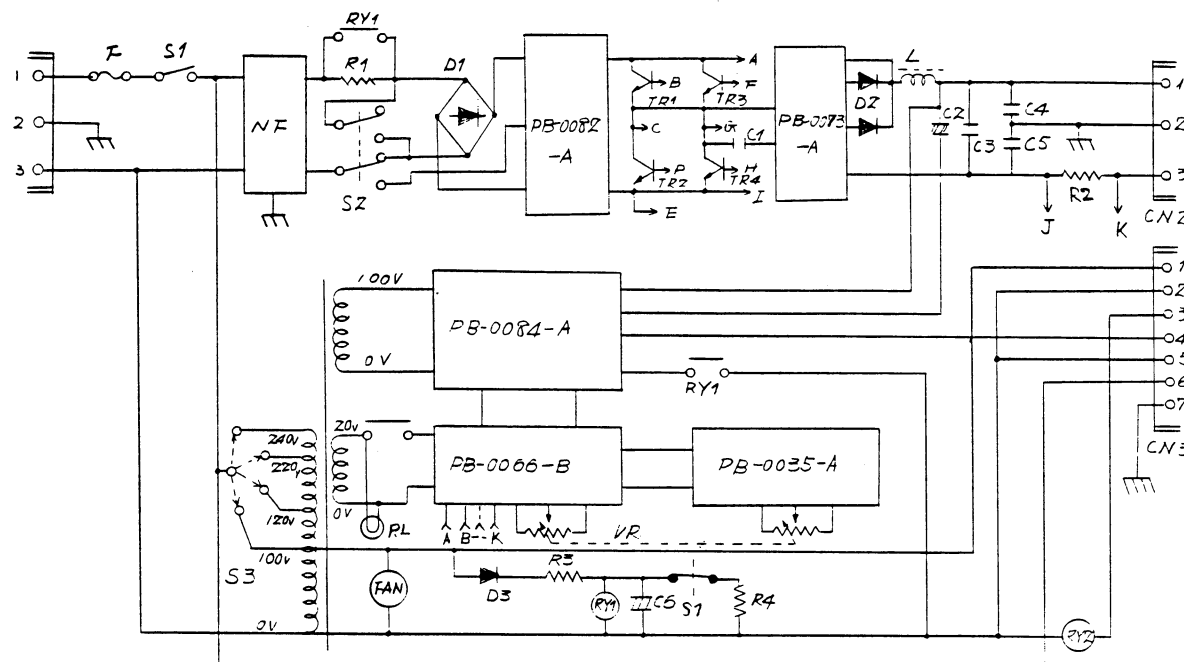
EX-4000P : RECTIFIER CIRCUIT
DIAGRAM (241-63121)
(Ushio Switchin Type, XB-55106AH-A)
(With Main Power Switch &
Current Adjuster)
Serial No.4282 & Up

(TYPE XB-55106AH-A)

映機工業株式会社				承認	設計	製図	品名
作図	57年9月/8日	尺	度				EX-4000P SWITCHING RECTIFIER CIRCUIT DIAGRAM
材	質	古	当	個	数	単	重
							241-63121

EX-4000P

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	符号	年月日	訂 正 要 領	担当
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Function of P.C.Board PB-0084-A :
Starting Boost Voltage (DC) Circuit

DARTS LIST

PART	DESCRIPTION	P.C	REMARK
TR1-4	TRANSISTOR	4	ZSC2134 P
D. 1	DIODE	1	1S14B41
D. 2	DIODE	1	S-5331 G
D. 3	DIODE	1	1S1888
C. 1	CONDENSOR	1	CM-101-455 (80V 4.5u)
C. 2	CONDENSOR	1	CE-161-100 (160V 100u)
C3~5	CONDENSOP	3	CC-151-103 (150V 0.01u)
C. 6	CONDENSOR	1	CE-101-227 (100V 220u)
R. 1	RESISTOR	1	RE-5R0-100 (5W 10u)
R. 2	RESISTOR	1	RE-Z00-R03+R03
R 3	RESISTOR	1	RA-3R0-511 (3W 510u)
R 4	RESISTOR	1	RA-2R0-470 (2W 470u)
V R	VOLUME CONTROL	1	RV24YG Z05E 500u
T	STEPDOWN TRANS	1	3K4-13002
L.	REACTOR	1	3K4-13003
S. 1	SWITCH	1	SW-3006A
S. 2	SWITCH	1	SL-Z10ND
S. 3	SWITCH	1	S-JZ111.#03
RY.1	RELAY	1	MM2-V1
RY.2	RELAY	1	MY1F AC100V
CN.1	INPUT CONNECTOR	1	NJC-Z03R17
CN.2	OUTPUT CONNECTOR	1	BTS-28P3
CN.3	CONTROL CONNECTOR	1	NCS-307P
FAN	FAN MOTOR	1	10g-040UL
N F	NOISE FILTER	1	NF-Z20-15-1
F	FUSE	1	MF-50-NP10-S
PL	PILOT LAMP	1	PL-406 24V

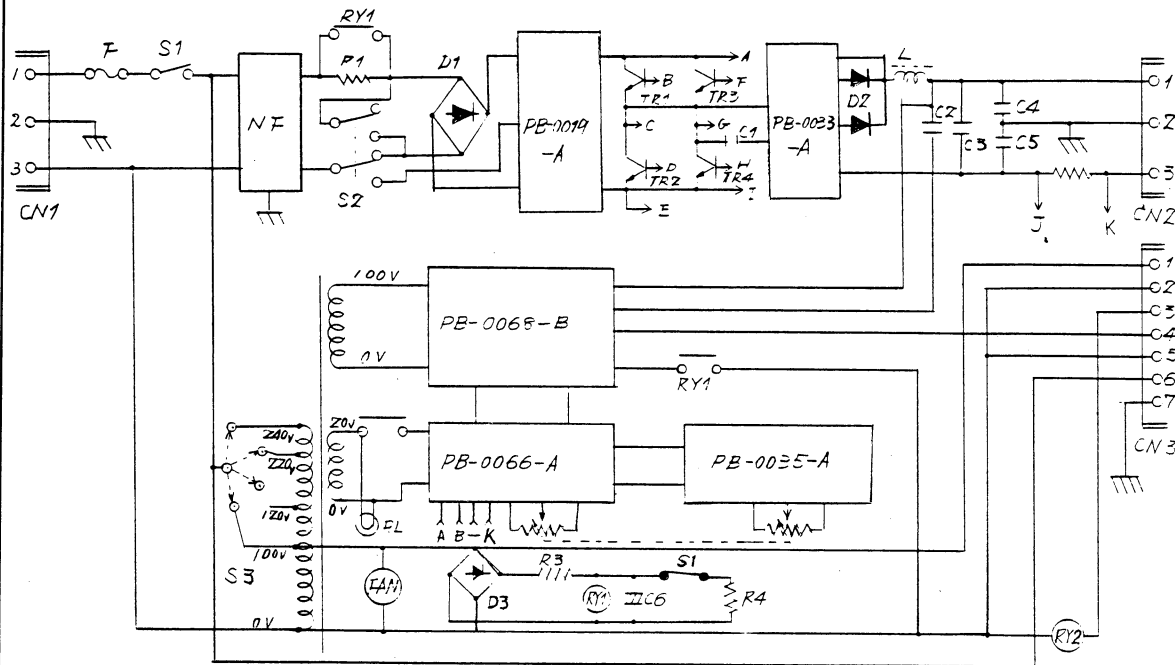
EX-4000P : RECTIFIER CIRCUIT
DIAGRAM (241-63116)
(Ushio Switching Type,XB-55102-105AH)
(With Main Power Switch &
Current Adjuster)

Serial No.4237-4281

(TYPE XB-5510Z-105-AH)

映機工業株式會社			承認設計製圖		品名		EX-4000P SWITCHING RECTIFIER CIRCUIT DIAGRAM	
作圖	57年9月18日	尺度						
材	質	台當個數	重量	g	製品記號	EX-4000p	番	241-63116

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符号	年月日	訂 正 要 領
	..	担 当



Function of P.C.Board PB-0068-B :
Starting Boost Voltage (DC) Circuit

PARTS LIST

MARK	DESCRIPTION	P.C.	REMARK
TR1-4	TRANSISTOR	4	2SC2139
D. 1	DIODE	1	VL848
D. 2	DIODE	1	S-5331G
D. 3	DIODE	1	S-ZVB40
C. 1	CONDENSOR	1	CM-Z51-605(250V6W)
C. 2	CONDENSOR	1	CE-161-108(160V1000μ)
C.3~5	CONDENSOR	3	CC-151-103(150V103)
C. 6	CONDENSOR	1	CE-101-ZZ7(100V 220μ)
R. 1	RESISTOR	1	RE-5R0-ZZ1(5W 22Ω)
R. 2	RESISTOR	1	RE-200-R03+R03
R. 3	RESISTOR	1	RA-ZR0-821(2W 820Ω)
R. 4	PESISTOR	1	RA-ZR0-470(2W 47.2)
V R	VOLUME CONTROL	1	RY24YG 20SB500Ω
S. 1	SWITCH	1	SW-3006A
S. 2	SWITCH	1	SL-Z10ND
S. 3	SWITCH	1	S-JZ110
RY1	RELAY	1	MMZ-U1
RY2	RELAY	1	MYZIFAC100V
CN1	IN. PUT CONNECTOR	1	NJC-203RM
CN2	OUTPUT CONNECTOR	1	BTS-28P3
CN3	CONTROL CONNECTOR	1	NCS-507P
FAN	FAN MOTOR	1	109-040UL
NF	NOISE FILTER	1	NF-Z20-15-1
F	FUSE	1	MF-60-NP15(10)-S
PL	PILOT LAMP	1	PL-406 24V
T	STEADY TRANS	1	
L	REACTOR	1	

EX-4000P : RECTIFIER CIRCUIT
DIAGRAM (241-63113)
(Ushio Switchin Type, XB-Z040-B)
(With Main Power Switch &
Current Adjuster)

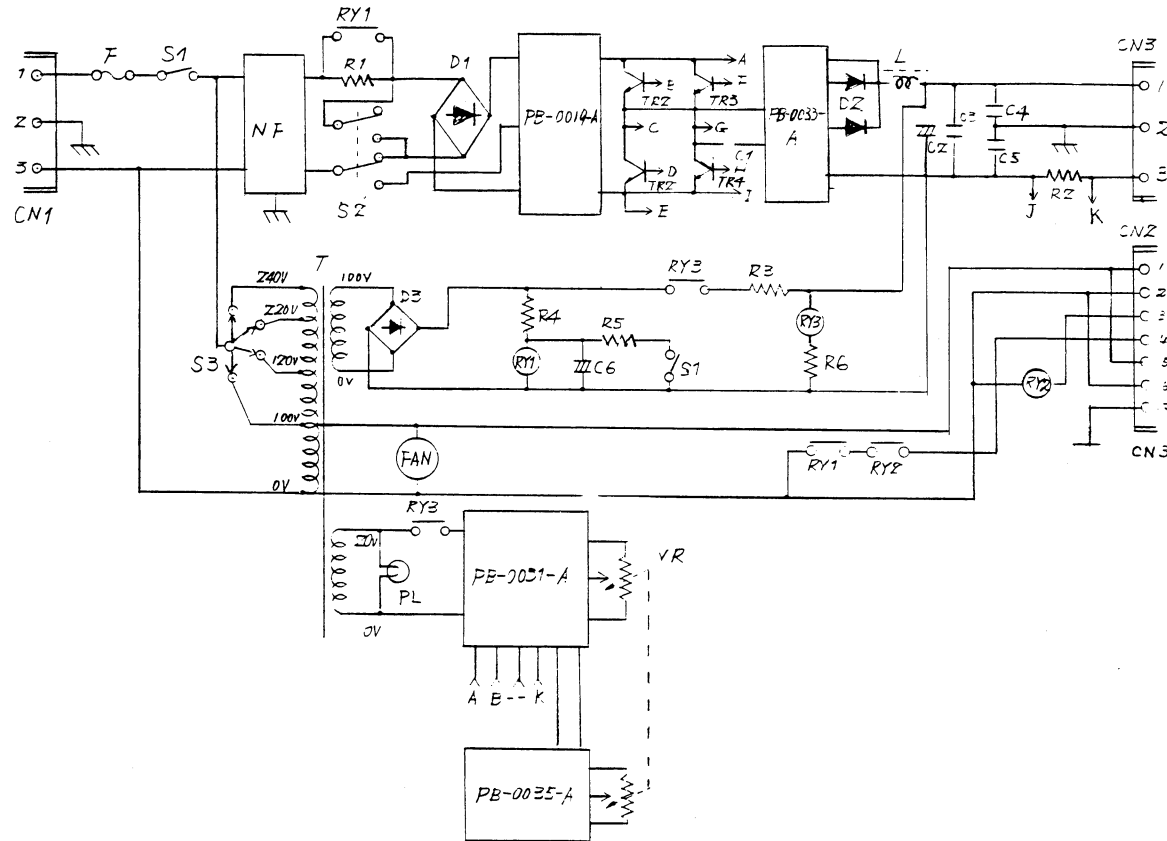
Serial No.4167-4236

(TYPE 13-Z 140-B)

映機工業株式会社		承認	設計	製図	品名
作図	57年9月18日				EX-4000P
材料	数量	単位	重量	部番	241-63113

EX-4000P

処 理 加 工		図 面 訂 正 欄		
符号	年月日	訂 正 要 領	担当	
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PARTS LIST

MARK	DESCRIPTION	P.C	REMARK
TR1-4	TRANSISTOR	1	SSC Z139
D. 1	DIODE	1	VL 848
D. 2	DIODE	1	40CZS20
D. 3	DIODE	1	S4VB40
C. 1	CONDENSOR	1	CM-Z51-655(250V6.5μ)
C. 2	CONDENSOR	1	CE-101-476(100V47μ)
C3-5	CONDENSOR	3	CC-151-103(150V0.01μ)
C. 6	CONDENSOR	1	CE-101-ZZ7(100V22μ)
R. 1	RESISTOR	1	RE-5R0-100(5W10Ω)
R. 2	RESISTOR	1	RE-Z00-R03+R03
R. 3	RESISTOR	1	RE-Z00-501(20W500Ω)
R. 4	RESISTOR	1	RA-ZR0-821(2W820Ω)
R. 5	RESISTOR	1	RA-ZR0-470(2W470Ω)
R. 6	RESISTOR	1	RA-ZR0-821(2W820Ω)
V R	VOLUME CONTROL	1	RVZ4YG20SE 500Ω
S. 1	SWITCH	1	SW-3006A
S. 2	SWITCH	1	SL-Z10ND
S. 3	SWITCH	1	S-J2111
RY1,2	RELAY	2	MMZ-U1
RY3	RELAY	1	MYZFAC100V
CN1	INPUT CONNECTOR	1	NJC-Z03RM1
CN2	OUTPUT CONNECTOR	1	BTS-Z8P3
CN3	CONTROL CONNECTOR	1	NCS-307P
FAN	FAN MOTOR	1	109-040UL
NF	NOISE FILTER	1	NF-Z20-15-1
F	FUSE	1	MF60-NR15-S
PL	PILOT LAMP	1	PL-406 24V
T	STEPDOWN TRANS	1	
L	REACTOR	1	

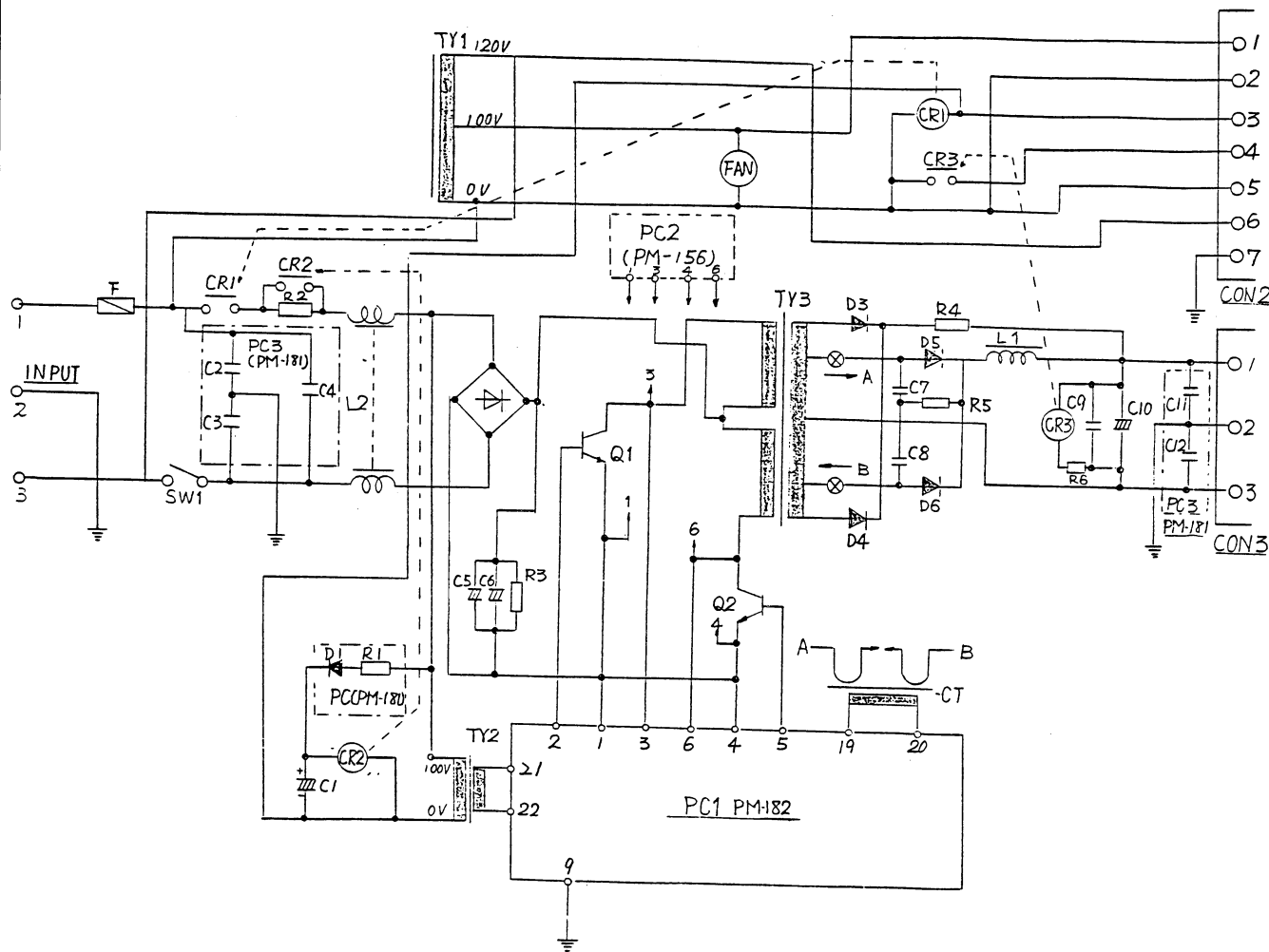
EX-4000P : RECTIFIER CIRCUIT
 DIAGRAM (241-63108)
 (Ushio Switching Type, XB-Z040-A)
 (With Main Power Switch &
 Current Adjuster)

Serial No. 4126-4129, 4132-4166

(TYPE Y3-ZZC-1)

映機工業株式会社				承認	設計	製図	品名
作図	57年9月18日	尺度					EX-4000P SWITCHING RECTIFIER CIRCUIT DIAGRAM
材	質	台当個数	重量	g			241-63108

EX-4000P



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符号	年月日
	訂 正 要 領
	担 当

PARTS LIST

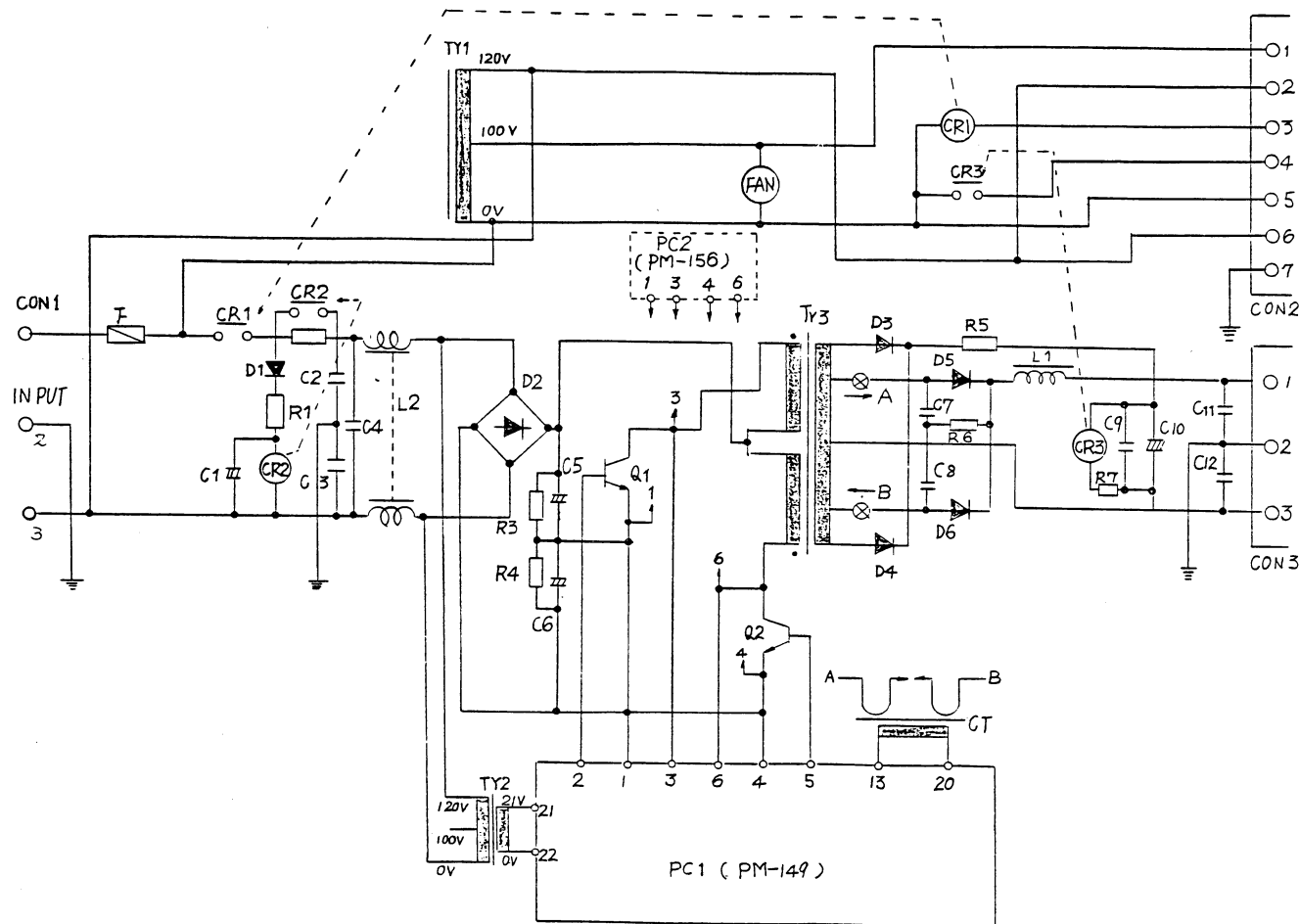
ITEMS	NOMENCLATURE	REMARKS	Q.N.
F	FUSE	15A 250V	1
SW1	MAIN SWITCH	SW-3001A	1
TY1	TRASFORMER	FIA-5101	1
TY2	"	FIA-5021-B	1
TY3	"	FIA-5026-A	1
L1	REACTOR	FIA-4856-A	1
CT	CURRENTTRANS	FIA-5020-A	1
FAN	EXHAUST FAN	NO. 8500	1
Q1,2	TRANSISTOR	2SC-2147	2
D3,4	DIODE	S25VB40	1
D5,6	"	U-06G	2
CR1	RELAY	LY2 AC100V	1
CR2,3	"	LY2 DC100V	2
L2	REACTOR	FIA-5117	1
C1	CAPACITOR	ECE-B160J22 160V 22μF	1
C7,8	"	ECQ-E10103MZ 1000V 0.01μF	2
C5,6,10	"	ECE-6A2D471F 250V 470μF	3
C9	"	ECQ-E2105MZ 250V 1μF	1
PC.1	PRINTED CIRCUIT	PM-182	1
PC.2	"	PM-156	1
PC.3	"	PM-181	1
R2	RESISTOR	KG 10W 10Ω	1
R3	"	ERG-3ANJ203 30kΩ	2
R4	"	KHZ 20W 500Ω	1
R5	"	ERX-2ANJ100 10Ω	1
R6	"	ERD-12TJ22 22kΩ	1
CON1	INPUT CONNECTOR	25-3-B	1
CON2	CONTROL	NCS-307-P	1
CON3	OUTPUT	BTS-28	1

EX-4000P : RECTIFIER CIRCUIT
DIAGRAM (241-63105)
(Sansha Switching Type)
(With Main Power Switch)

Serial No.4043-4046, 4055-4071,
4085-4101 4112-4116
4130-4131

映機工業株式会社				承認設計製図	品名
作図	年月日	尺度			EX-4000P SWITCHING RECTIFIER CIRCUIT DIAGRAM
材 質	台当個数	単重量 g	製品記号	部番	241-63105

EX-4000P



処 理 加 工		図 面 訂 正 欄		
符号	年月日	訂 正 要 領	担当	

PARTS LIST

ITEMS	NOMENCLATURE	REMARKS	Q.N.
F	FUSE	20A 250V	1
TY1	TRANSFORMER	F1A-5021	1
TY2	"	F1A-5026	1
L1	REACTOR	F1A-4856	1
CT	CURRENT TRANS	F1A-5020	1
PC1	PRINTED CIRCUIT	PM-149	1
FAN	EXHAUST FAN	NQ 8500	1
Q1,2	TRANSISTOR	2SC-2147	2
D1	DIODE	F-14F	1
D2	"	C25V B40	1
D3,4	"	U-06G	2
D5,6	"	4DC1S-30	2
PM2	PRINTED CIRCUIT	PM-156	1
CR1	RELAY	LY2 AC100V	1
CR2,3	"	LY2 DC100V	2
L2	REACTOR	F1A-5117	1
C1	CAPACITOR	ECE-B250J10 250V 100μF	1
C2,3,7	"	ECQ-E10103MZ 1000V 0.01μF	6
C4	"	ECQ-E10104MZ 1000V 0.1μF	1
C5,6	"	ECE-GA2DY471F 200V 470μF	2
C9	"	ECQ-E2105MZ 250V 1μF	1
C10	"	ECE-M160V470E 160V 470μF	1
R1	RESISTOR	ERG-2ANJ681 2W 680Ω	1
R2	"	KG 10W 10Ω	1
R3	"	ERG-3ANJ203 200Ω	1
R4	"	KG 30W 500Ω	1
R5	"	ERX-2ANJ100 2W 10Ω	1
CON1	INPUT CONNECTOR	25-3-B	1
CON2	CONTROL	NCS-307-P	
CON3	OUTPUT	E-3P	

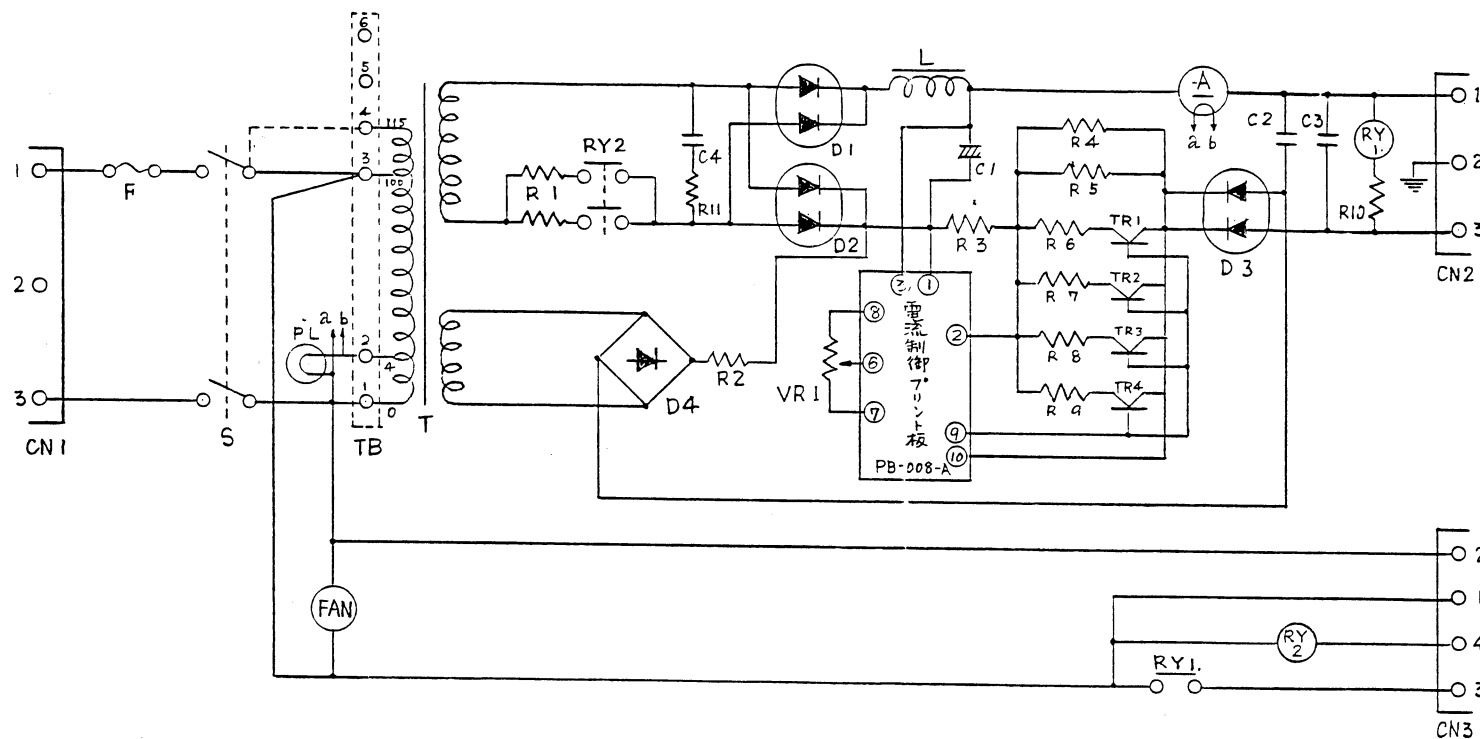
EX-4000P : RECTIFIER CIRCUIT
DIAGRAM (241-63102)
(Sansha Switching Type)
(W/O Main Power Switch)

Serial No.4027, 4029-4031,
4037-4042

映機工業株式会社				承認	設計	製 図	品 名
作 図	56 年 1 月 6 日	尺 寸					EX-4000P
材 質	台 数	単 重	重 量				241-63102
製 品 記 号							部 番

EX-4000P

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符号	年月日
	訂 正 要 領
	担 当



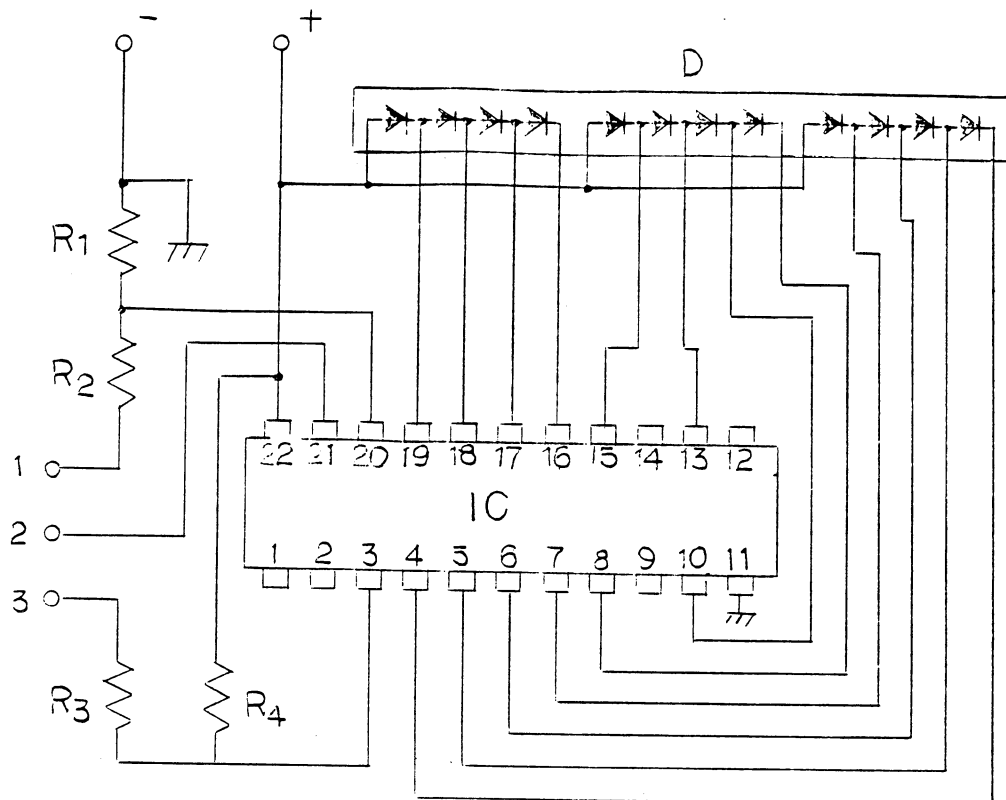
回路 番号	品 名	個 数	形 式
T	トランス	1	
L	43-7	1	
D1,3	シリコンダイオード	2	SG5TS
D2	"	1	SG5TR
D4	"	1	S2VB40
R1	抵抗	1	20W C.0270.025
R2	"	1	5W 500Ω
R3	"	1	50W 0.04Ω
R4,5	"	2	1.6Ω
R6,9	"	4	5W 0.2Ω
R10	"	1	2W 680Ω
R11	"	1	5W 5Ω
VR1	可変抵抗	1	B200Ω
C1	電解コンデンサ	1	80V 15000μF
C2	"	1	100V 470μF
C3	コンデンサ	1	0.01μF
C4	"	1	4.5μF
F	ヒューズ	1	15A
S	電源SW	1	S-21A
TB	電圧切換端子	1	A-04 6F
FAN	ファンモーター	1	CT3B 55
PL	表示灯	1	MP 023
A	電流計	1	30A
TR1,4	トランジスタ	4	2SD-556
RY1	リレー	1	MM2-U1
RY2	"	1	BW56501
CN1	コネクタ	1	BTS-25R3
CN2	"	1	BTS-28P3
CN3	"	1	DA22P4

EX-4000P : RECTIFIER CIRCUIT
 DIAGRAM (241-63101)
 (Saturable Reactor Type)
 Serial No.4001-4026, 4028, 4032-4036
 4047-4054, 4072-4084,
 4102-4111, 4117-4125
 (These Nos. were sold in Japan only.)

映機工業株式会社				承認	設計	製図	品 名
作図	78年9月12日	尺 度					EX-4000P バラスト回路図
材 質	右当個数	単重量	g	製品記号			241-63101

EX-4000P

処 理 加 工		図 面 訂 正 欄			
符号	年月日	訂 正 要 領		担当	
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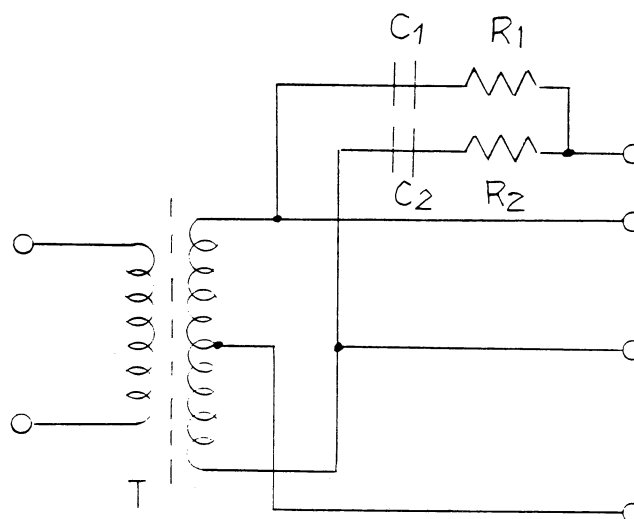
EX-4000P : Refer to Rectifier Diagram
 No.241-63108, or 241-63113, or
 241-63116, or 241-63121
 Serial No.4126-4129, 4132 & Up

PARTS LIST

MARK	DESCRIPTION	P.C	REMARK
I C	IC	1	IR-Z406
D	LED	1	GL-11ZR3
R. 1	RESISTOR	1	RA-R25-101 ($\frac{1}{4}$ 100 Ω)
R. 2	RESISTOR	1	RA-R25-510 ($\frac{1}{4}$ 51 Ω)
R. 3	RESISTOR	1	RA-R25-390 ($\frac{1}{4}$ W 39 Ω)
R. 4	RESISTOR	1	RA-R25-10Z ($\frac{1}{4}$ W 1K Ω)

映機工業株式会社		承認	設計	製図	品名
作図	57年9月20日	尺度	/		PB-0035-A
材 質	台当個数	単重量 g	製品記号	部番	
			EX-4000P	Z41-63111	

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		符号	年月日	訂 正 要 領
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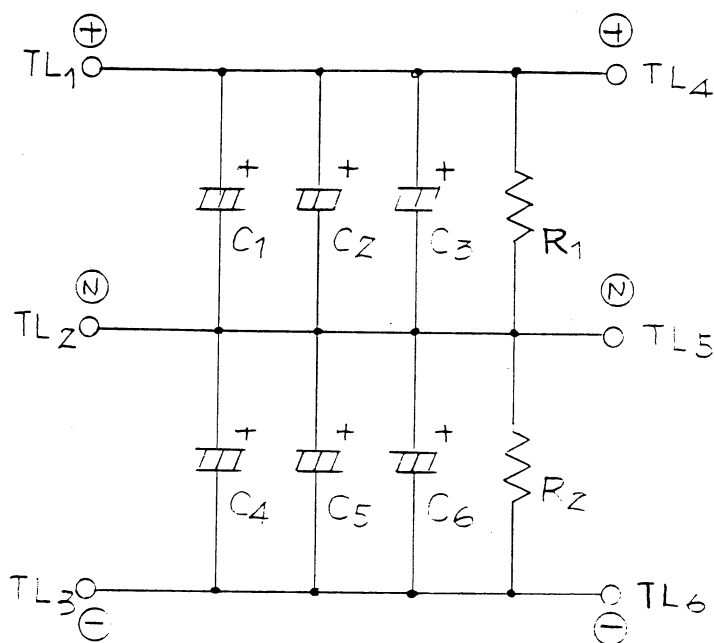
PARTS LIST

MARK	DESCRIPTION	P.C	REMARK
T	TRANS	1	3K4-13011
C.1.2	CONDENSOR	Z	CM-201-68Z(200,0.0068)
R.1.2	RESISTOR	Z	RA-ZR0-101 (2W 100Ω)

EX-4000P : Refer to Rectifier Diagram
 No.241-63116, or 241-63121
 Serial No.4237 & Up

映機工業株式会社				承認	設計	製図	品名
作図	57年9月22日	尺度	/			Ok	PB-0073-A
材 質	台当個数	単重量 g	製品記号	EX4000P			部番
							Z41-63117

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符号	年月日	訂 正 要 領	担当	
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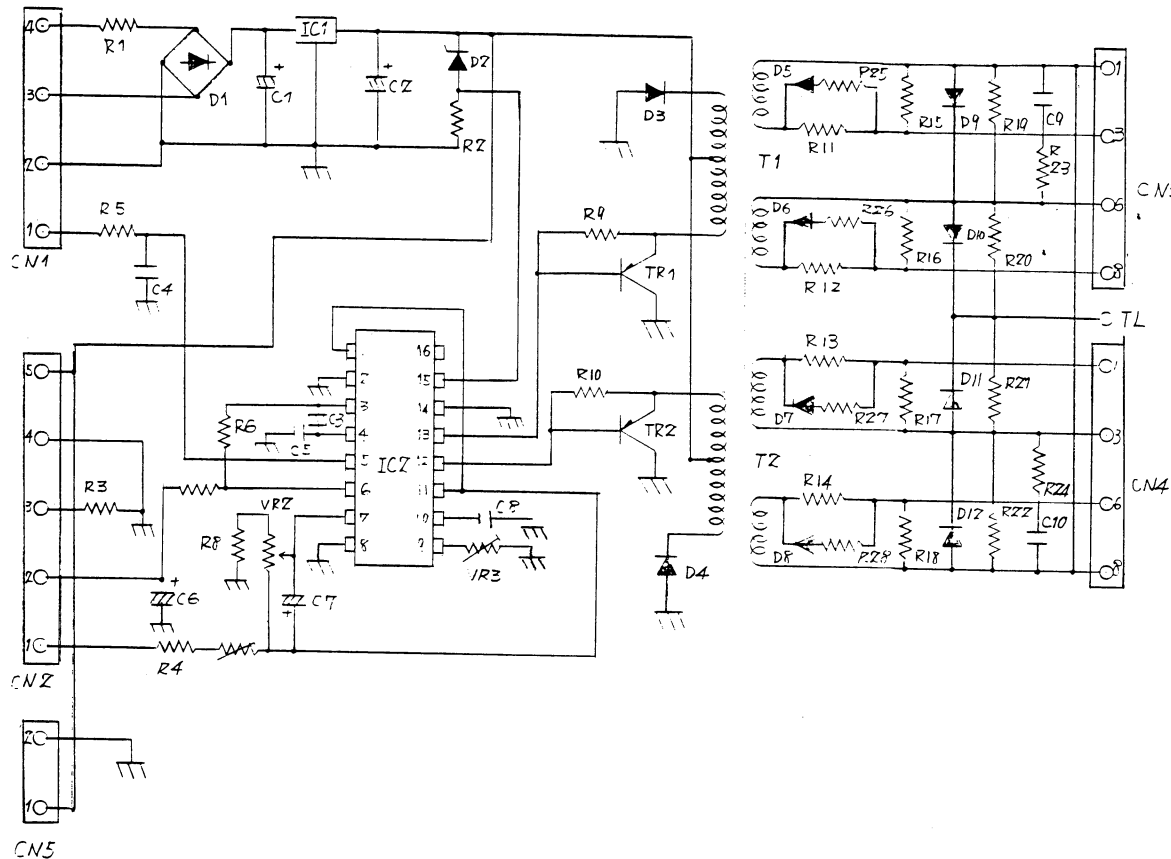
PARTS LIST

MARK	DESCRIPTION	QC	REMARK
TL.1~6		6	61134-1
R.1~2	RESISTOR	Z	RA-3R0-153(3W.15K Ω)
C.1~6	CONDENSOR	1	CE-181-687(180V680 μ)

EX-4000P : Refer to Rectifier Diagram
No.241-63116, or 241-63121

Serial No.4237 & Up

映機工業株式会社				承認	設計	製図	品名
作図	57年9月22日	尺度				<i>J2</i>	PE-0082-A
材 質	台当個数	単重量 g	製品記号	EX-4000P		部番	Z41-63118



TL	CONNECTOR	1	R6Z-3
T1~2	TRANS	2	3K4-13013
CN5	CONNECTOR	1	1L-2P-S3ENZ

EX-4000P : Refer to Rectifier Diagram
No.241-63121
Serial No.4282 & Up

処 理 加 工

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符号	年月日	訂 正 要 領	担当
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PARTS LIST

MARK	DESCRIPTION	P.C	RE MARK
TR1,2	TRANSISTOR	2	ZSA965-0
IC.1	ZENER IC	1	TA78015P
IC.2	PWM CONTROL IC	1	MP0104ZC
D.1	DIODE	1	RB-151
D.2	ZENER DIODE	1	05Z5.1L
D.3~8	HIGH SPEED DIODE	6	1S1834
D.9~12	"	4	1S1835
C.1	CONDENSOR	1	CE-350-108 (35V 1000μF)
C.2	"	1	CE-Z50-107 (25V 100μF)
C.3	"	1	CE-500-474 (50V 0.47μF)
C.4~5	"	1	CM-101-103 (100V 0.01μF)
C.6	"	1	CE-Z50-476 (25V 4.7μF)
C.7	"	1	CE-Z50-476 (25V 4.7μF)
C.8	"	1	CC-500-102 (50V 0.001μF)
C.9,10	"	2	CC-401-123 (400V 0.012μF)
R.1	RESISTOR	1	RA-120-R47 (1W 0.47Ω)
R.2	"	1	RA-R25-102 (1/4W 1KΩ)
R.3	"	1	RA-R25-681 (1/4W 680Ω)
R.4,5,7	"	3	RA-R25-103 (1/4W 10KΩ)
R.6	"	1	RA-R25-105 (1/4W 1MΩ)
R.8	"	1	RA-R25-472 (1/4W 47KΩ)
R.9,10	"	2	RA-R25-470 (1/4W 47Ω)
P.11,14	"	4	RA-ZR0-4R0 (2W 4.7Ω)
P.15~18	"	4	RA-1RZ-101 (1.2W 100Ω)
R.19~22	"	4	RA-R25-274 (1/4W 270KΩ)
R.23~24	"	2	RE-100-131 (10W 130Ω)
VR1,2	VOLUME CONTROL	2	SR19R-B10KΩ
VR-3	"	1	SR19R-B50KΩ
CN1	CONNECTOR	1	1L-4P-S3ENZ
CN2	"	1	1L-5P-S3ENZ
CN3,4	"	2	1L-8P-S3ENZ
R25~28	RESISTOR	4	RA1RZ-R47 (1/2W 0.47Ω)

映機工業株式会社

作 図 57年9月22日 尺 寸

材 質 台 数 数 量 重 量

承認 設計 製 図

品 名

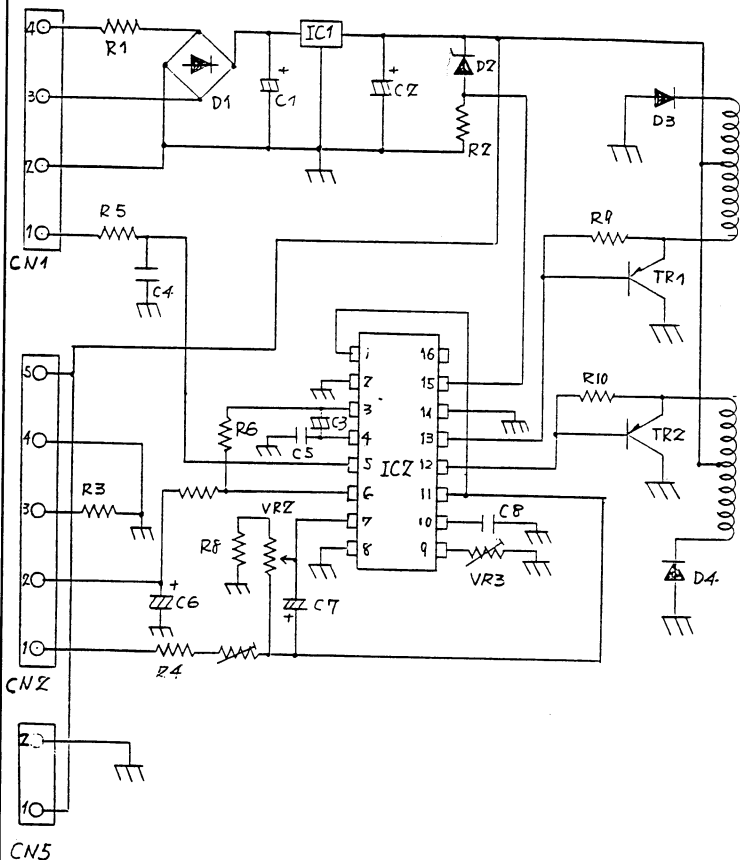
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EX-4000P

PB-0089-B

241-63122

EX-4000P



TL	CONNECTOR	1	R62-3
T1~2	TRANS	2	3K4-13013
CN5	CONNECTOR	1	1L-2P-S3ENZ

EX-4000P : Refer to Rectifier Diagram
No.241-63116
Serial No.4237-4281

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符号	年月日
	訂 正 要 領
	担当

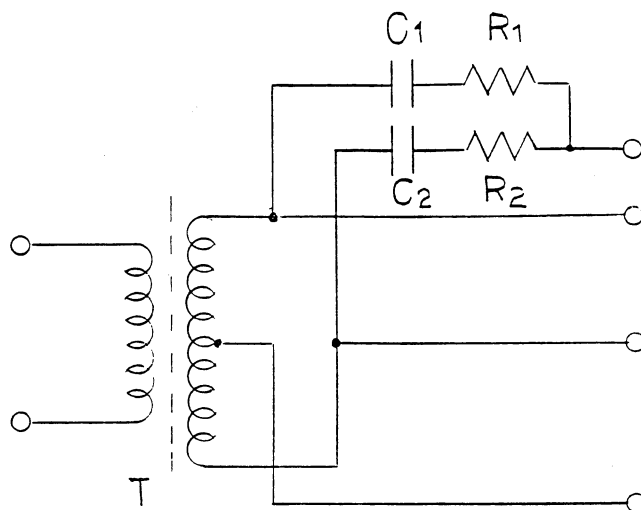
PARTS LIST

MARK	DESCRIPTION	P.C	RE MARK
TR1,2	TRANSISTOR	2	ZSA965-0
IC. 1	ZENER IC	1	TA78015P
IC. 2	PWM CONTROL IC	1	MPC104ZC
D. 1	DIODE	1	RB-151
D. 2	ZENER DIODE	1	05Z5.1L
D.3~8	HIGH SPEED DIODE	6	1S1834
D.4~12	"	4	1S1835
C. 1	CONDENSOR	1	CE-350-108 (35V 1000μF)
C. 2	"	1	CE-Z50-107 (25V 100μF)
C. 3	"	1	CE-500-474 (50V 0.47μF)
C.4~5	"	1	CM-401-103 (100V 0.01μF)
C. 6	"	1	CE-160-106 (16V 1.0μF)
C. 7	"	1	CE-Z50-475 (25V 4.7μF)
C. 8	"	1	CC-500-102 (50V 0.001μF)
C.9~10	"	2	CC-401-123 (400V 0.012μF)
R. 1	RESISTOR	1	RA-1R0-R47 (1W 0.47Ω)
R. 2	"	1	RA-R25-10Z (1/4W 1KΩ)
R. 3	"	1	RA-R25-681 (1/4W 680Ω)
R4.57	"	3	RA-R25-103 (1/4W 10KΩ)
R. 6	"	1	RA-R25-105 (1/4W 1MΩ)
R. 8	"	1	RA-R25-622 (1/4W 6.2KΩ)
R.9~10	"	2	RA-R25-472 (1/4W 47KΩ)
P.11~14	"	4	RA-ZR0-4R0 (2W 4.7Ω)
P.15~18	"	4	RA-1RZ-101 (1/2W 100Ω)
R.19~22	"	4	RA-R25-Z74 (1/4W 270Ω)
R23~24	"	2	RE-100-131 (10W 130Ω)
VR1~2	VOLUME CONTROL	2	SR19R-B10KΩ
VR-3	"	1	SR19R-B50KΩ
CN 1	CONNECTOR	1	1L-4P-S3EN2
CN 2	"	1	1L-5P-S3EN2
CN3,4	"	2	1L-8P-S3EN2
R25~28	RESISTOR	4	RA1R0-1R0 (1W 1.0Ω)

映機工業株式会社

承認	設計	製 図	品 名
57年9月22日	尺 度		PB-0066-B
材 質	台 数	半 重 量	部 番
			EX-4000P 241-63119

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符号	年月日	訂 正 要 領	担当	
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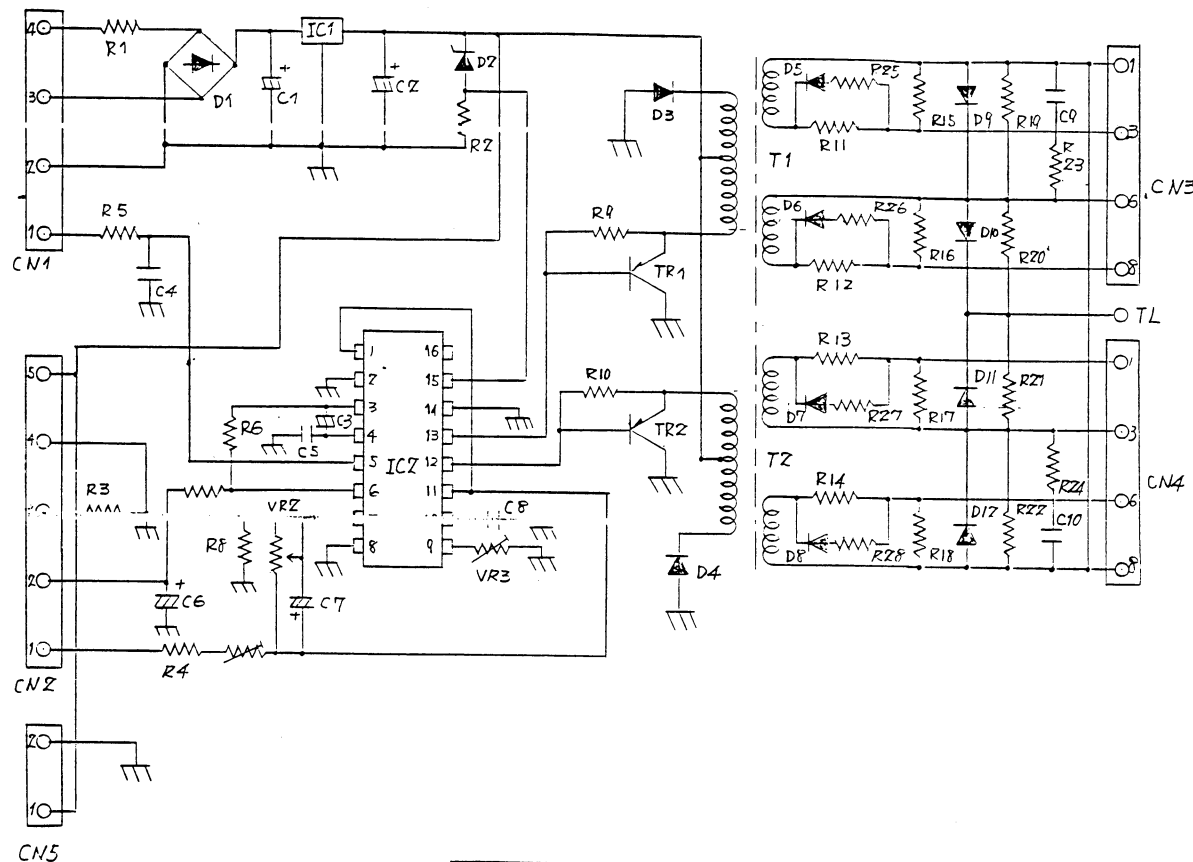
EX-4000P : Refer to Rectifier Diagram
No.241-63108, or 241-63113

Serial No.4126-4129, 4132-4166,
4167-4236

PARTS LIST

MARK	DESCRIPTION	P.C	REMARK
T	TRANS	1	
C	CONDENSOR	Z	CC-ZC1-472(200V0.0047)
R	RESISTOR	Z	RA-ZR0-101(2W100Ω)

映機工業株式会社				承認	設計	製図	品名
作図	57年9月20日	尺度	/			Da	PB-0033-A
材——質	台当個数	単重量 g	製品記号	EX-4000P		部番	Z41-63109



TL	CONNECTOR	1	R6Z-3
T. 2	TRANS	2	"
CN 5	CONNECTOR	1	1L-ZP-S3ENZ

EX-4000P : Refer to Rectifier Diagram
No.241-63113

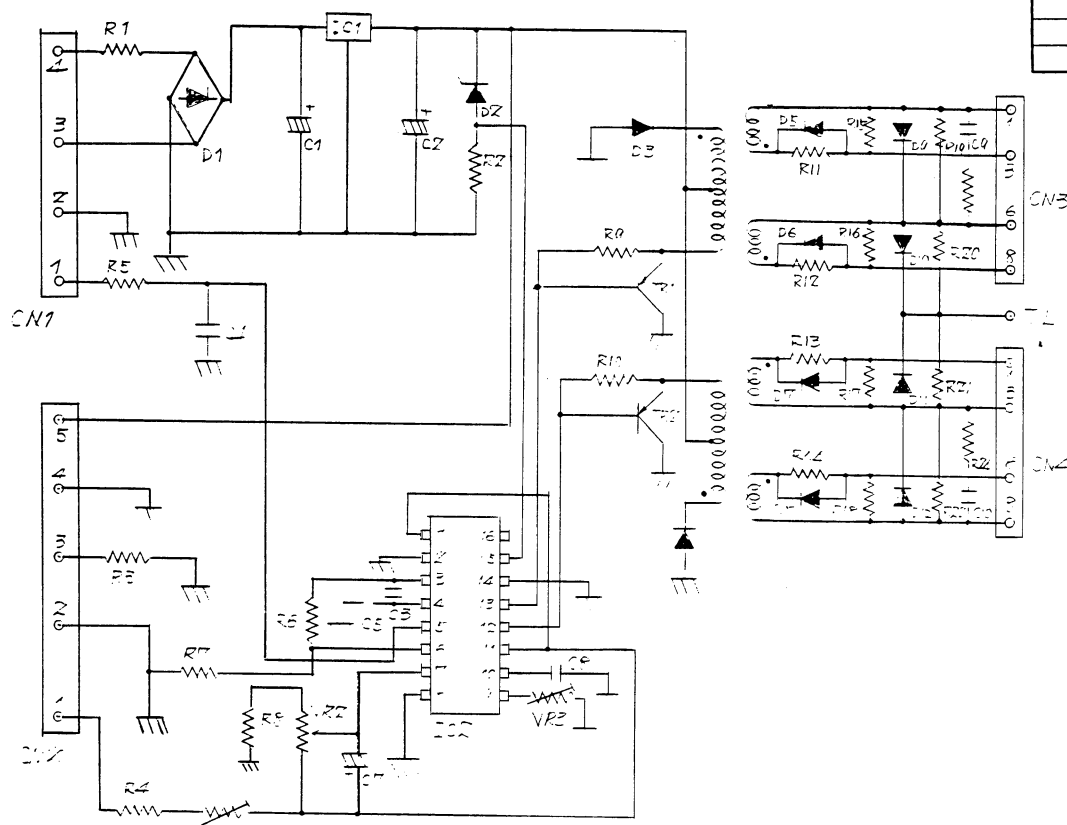
Serial No.4167-4236

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PARTS LIST

MARK	DESCRIPTION	P.C	RE MARK
TR1,2	TRANSISTOR	2	ZSA965-0
IC. 1	ZENER IC	1	TA78015P
IC. 2	PWM CONTROL IC	1	MPC104ZC
D. 1	DIODE	1	RB-151
D. 2	ZENER DIODE	1	OSZ 5.1L
D. 3~8	HIGH SPEED DIODE	6	1S1834
D. 4~12	"	4	1S1835
C. 1	CONDENSOR	1	CE-350-108 (35V 1000μF)
C. 2	"	1	CE-250-107 (25V 1000μF)
C. 3	"	1	CE-500-105 (50V 10μF)
C. 4~5	"	2	CM-101-103 (100V 0.01μF)
C. 6	"	1	CE-160-106 (16V 10μF)
C. 7	"	1	CE-250-475 (25V 47μF)
C. 8	"	1	CC-500-102 (50V 0.001μF)
C. 9, 10	"	2	CC-401-153 (400V 0.015μF)
R. 1	RESISTOR	1	RA-1R0-R47 (1W 0.47Ω)
R. 2	"	1	RA-R25-102 (1/4W 1KΩ)
R. 3	"	1	RA-R25-681 (1/4W 680Ω)
R. 4, 5, 7	"	3	RA-R25-103 (1/4W 10KΩ)
R. 6	"	1	RA-R25-105 (1/4W 1MΩ)
R. 8	"	1	RA-R25-622 (1/4W 6.2KΩ)
R. 9, 10	"	2	RA-R25-471 (1/4W 470Ω)
P. 11~14	"	4	RA-ZR0-390 (2W 3.9Ω)
P. 15~18	"	4	RA-1RZ-101 (1/2W 100Ω)
R. 19~22	"	4	RA-R25-Z74 (1/4W 270KΩ)
R. 23~24	"	2	RE-100-681 (10W 680Ω)
VR1~2	VOLUME CONTROL	2	SR19R-B10KΩ
VR-3	"	1	SR19R-B50KΩ
CN 1	CONNECTOR	1	1L-4P-S3ENZ
CN 2	"	1	1L-5P-S3ENZ
CN3, 4	"	2	1L-8P-S3ENZ
R. 25~28	RESISTOR	4	RA1R0-1R0 (1W 1.0Ω)

映機工業株式会社				承認	設計	製 図	品 名
作 図	57 年 9 月 22 日	尺 寸					PB-0066-A
材 質	台 当 個 数	単 重 量	g	製 品 記 号	EX-4000P	部 番	241-63115



処 理 加 工		図 面 訂 正 欄		
符号	年月日	訂 正 要 領	担当	
	..			
	..			

DARTS LIST

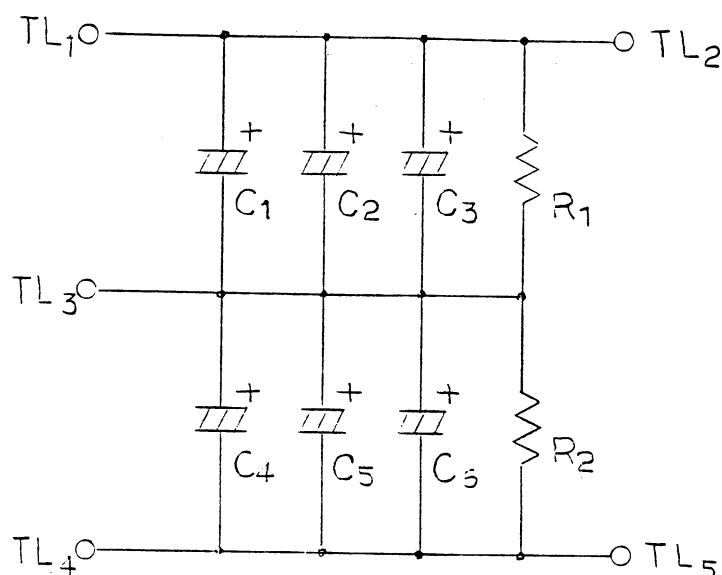
MARK	DESCRIPTION	F C	REMARK
TR1,2	TRANSISTOR	Z	ZSC465-0
IC, 1	SEMI-CON	1	TA78015P
IC, 2	PWM CONTROL IC	1	MP01042C
D, 1	DIODE	1	RB151
D, 2	ZENER DIODE	1	05Z5.1L
D, 3~8	DIODE	6	1S1834
D, 9~12	DIODE	4	1S1835
C, 1	CONDENSOR	1	CE-350-10R(35V1000µF)
C, 2		1	CE-250-10T(25V100µF)
C, 3		1	CE-500-105(50V1µF)
C, 4, 5		2	CE-500-103(50V0.01µF)
C, 6		1	CE-160-106(16V10µF)
C, 7		1	CE-250-475(25V47µF)
C, 8		1	CC-500-10Z(50V0.001µF)
C, 9, 10		2	CC-401-103(400V0.01µF)
R, 1	RESISTOR	1	RL-1R0-P47(1W, 0.47Ω)
R, 2		1	RL-R25-10Z(1/4W 10kΩ)
R, 3		1	RL-R25-681(1/4W 680Ω)
R, 4, 5		2	RL-R25-103(1/4W 10kΩ)
R, 6		1	RL-R25-105(1/4W 1MΩ)
R, 7		1	RL-R25-622(1/4W 6.2kΩ)
R, 8, 10		2	RL-R25-471(1/4W 470Ω)
R, 9, 11, 12		4	RL-3R0-391(3W 39Ω)
R, 13, 14		2	RL-1R0-101(1W 100Ω)
R, 15, 16		2	RL-R25-Z73(1/4W 27kΩ)
PC, 1, 2		2	FE-7R0-680(1W 68Ω)
IC, 1	PWM CONTROL	Z	GEP-0610KJL
IC, 2		1	GEP-0650VJL
T, 1, 2	TRANS	Z	
CON	CONNECTOR	1	IL-5P-03ENZ
CON		1	IL-4P-03ENZ
CON		Z	IL-PP-03ENZ
		1	26Z-3

EX-4000P : Refer to Rectifier Diagram
No.241-63108
Serial No.4126-4129, 4132-4166

映機工業株式会社				承認	設計	製図	品名
作図	57年9月20日	尺度					PB-0031-A
材	質	古当個数	単重量 g	製品記号	EX-4000P	部番	241-63112

EX-4000P

処 理 加 工		図 面 訂 正 欄			
		符号	年月日	訂 正 要 領	担当
			• •		
			• •		



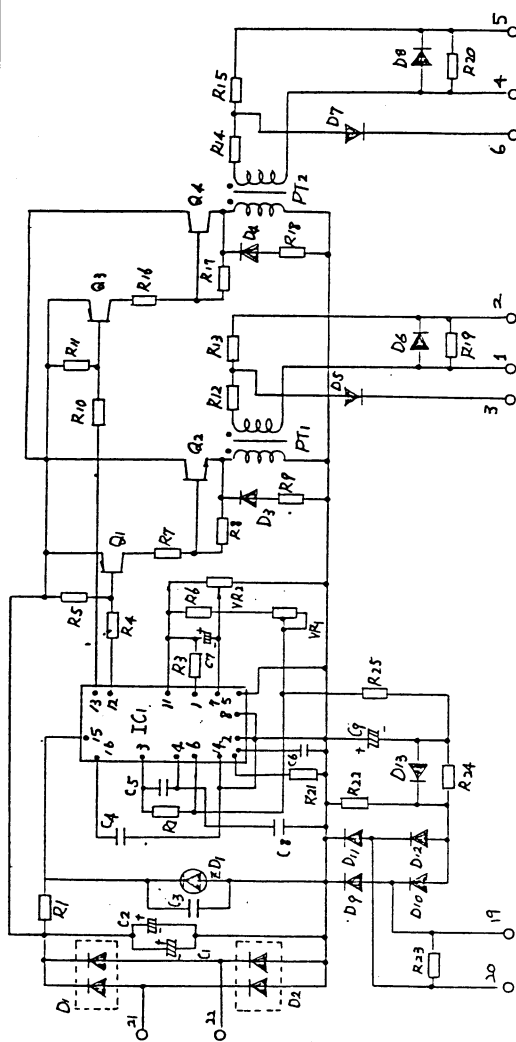
EX-4000P : Refer to Rectifier Diagram
 No.241-63108, or 241-63113
 Serial No.4126-4129, 4132-4236

PARTS LIST

MARK	DESCRIPTION	P.C	REMARK
C.1~6	CONDENSOR	1	CE-Z01-477(200V, 270μ)
R.1~2	RESISTOR	2	RA-3R0-153 (3W, 15KΩ)
TL.1~5	CONNECTOR	5	R93-31

映機工業株式会社		承認	設計	製図	品名
作図	57年0月18日	尺度		On	PB-0019-A
材 質	台当個数	単重量 g	製品記号	部番	
			EX-4000P		241-63110

EX4000P Switching Rectifier's P.C. Board assy PC-1 (PM-149)



Item #	Description	Remarks	Qty
R 1	Resistor	ERG-2ANJ 221 2W 220 Ohm	1
R 2	"	ERD-14TJ 683 1/4W 68k	1
R 3	"	ERD-14TJ 103 " 10K	1
R 4	"	" " 222 " 22K	1
R 5	"	" " 471 " 470	1
R 6	"	" " 472 " 47K	1
R 7	"	ERG-2ANJ 471 2W 470	1
R 8	"	ERD-14TJ 101 1/4W 100	1
R 9	"	ERD-12TJ 221 1/2W 220	1
R 10	"	ERD-14TJ 222 1/4W 2.2K	1
R 11	"	" " 471 " 470	1
R 12	"	ERG-3ANJR 47 3W 0.47	1
R 13	"	ERG-2ANJ 1R0 2W 1.0	1
R 14	"	ERG-3ANJ R47 3W 0.47	1
R 15	"	ERG-2ANJ 1R0 2W 1.0	1
R 16	"	" " 471 2W 470	1
R 17	"	ERD-14TJ 101 1/4W 100	1
R 18	"	ERD-12TJ 221 1/2W 220	1
R 19	"	" " 470 " 47	1
R 20	"	" " 470 " " "	1
R 21	"	ERD-14TJ 332 1/4W 33K	1
R 22	"	ERD-12TJ 470 1/2W 47	1
R 23	"	" " 100 " 10	1
R 24	"	ERD-14TJ 472 1/4W 47K	1
R 25	"	" " " " "	1
D 1	Diode	MI-152	1
D 2	"	MI-152R	1
D 3	"	MA-16Z	1
D 4	"	" "	1
D 5	"	V-09A	1
D 6	"	V-09C	1
D 7	"	V-09A	1
D 8	"	V-09C	1
D 9	"	"	1
D 10	"	"	1
D 11	"	"	1
D 12	"	"	1
D 13	"	MA-16Z	1

[illegible]

映機工業株式會社				承認設計製図		品名	
作 図	年	月	日	尺 度		PM-149 P.C.BOARD DIAGRAM	
材 質		右当個數	單 重 量	g	製品記号	部 番	
					EX-4000P	241-63103	



16MM SOUND PROJECTORS

MODEL
EX-4000P &
LONG PLAY PEDESTAL
SERIES

COVERING S/N. 1001 and up
for Long Play Pedestal
S/N. 4001 and up
for EX-4000P

EIKI INDUSTRIAL CO., LTD.
C.P.O. BOX 1229 OSAKA JAPAN
Tel: (06) 311-9475

EIKI INTERNATIONAL INC.
27882 Camino Capistrano
Laguna Niguel, California 92677
Tel: 714/831-2511 · Telex: 685-638

NOTE

To the user of this parts list:

The following is an explanation of the EIKI part numbering system. Understanding the system used will help you stock and expedite parts orders promptly and correctly.

1. PREFIX CODE:

Describes model that the part was originally designed for.

241 – EX-4000P
 980 – Long Play Pedestal
 611 – EX-350B
 922 – 600FT Endless
 ST – ST/M Series
 210 – EX-300SL
 222 – EX-2000A
 224 – EX-2000N
 260 – EX-6000
 312 – RST/RT/RM Series
 313 – DOMESTIC MODEL
 314 – NST/NT Series
 320 – SL Series
 321 – SL II Series

2. PART NUMBER:

*	241	–	1	1	0	0	1
	Model		Main Assy.		Part No.		Revision No.

Revision No.

1 to 2, 3, 4, etc. Non-Interchangable Revision

1 to 1a, 1b, etc. Interchangable Revision

* ASTERISK indicates parts associated with the above assembly.

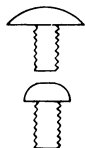
3. SCREWS: “ISO” Standard

X T	3	0	1	0	S (K*)
Head Style	Diameter (3.0mm)	Length (10mm)	Indicates “ISO” No “S” indicates JIS		

X = Philips

T = Truss

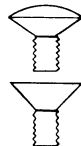
P = Pan



O = Oval Countersunk

F = Flat

* = Black Color



4. WASHERS:

W A	–	3	0	S
Style		Diameter (3.0mm)	Indicates “ISO” No “S” indicates JIS	

WA = Flat washer

WC = Lock Washer

WE = Star Washer External

ER = “E” Ring

WD = Internal Star Washer

5. FIBER WASHERS:

G 1	–	0	3	0	0	7	2
Thickness (.1mm)		I.D. (3mm)		O.D. (7.2mm)			

6. NUTS:

N A	–	3	0	S
Style		Diameter (3.0mm)	“ISO” No “S” indicates JIS	

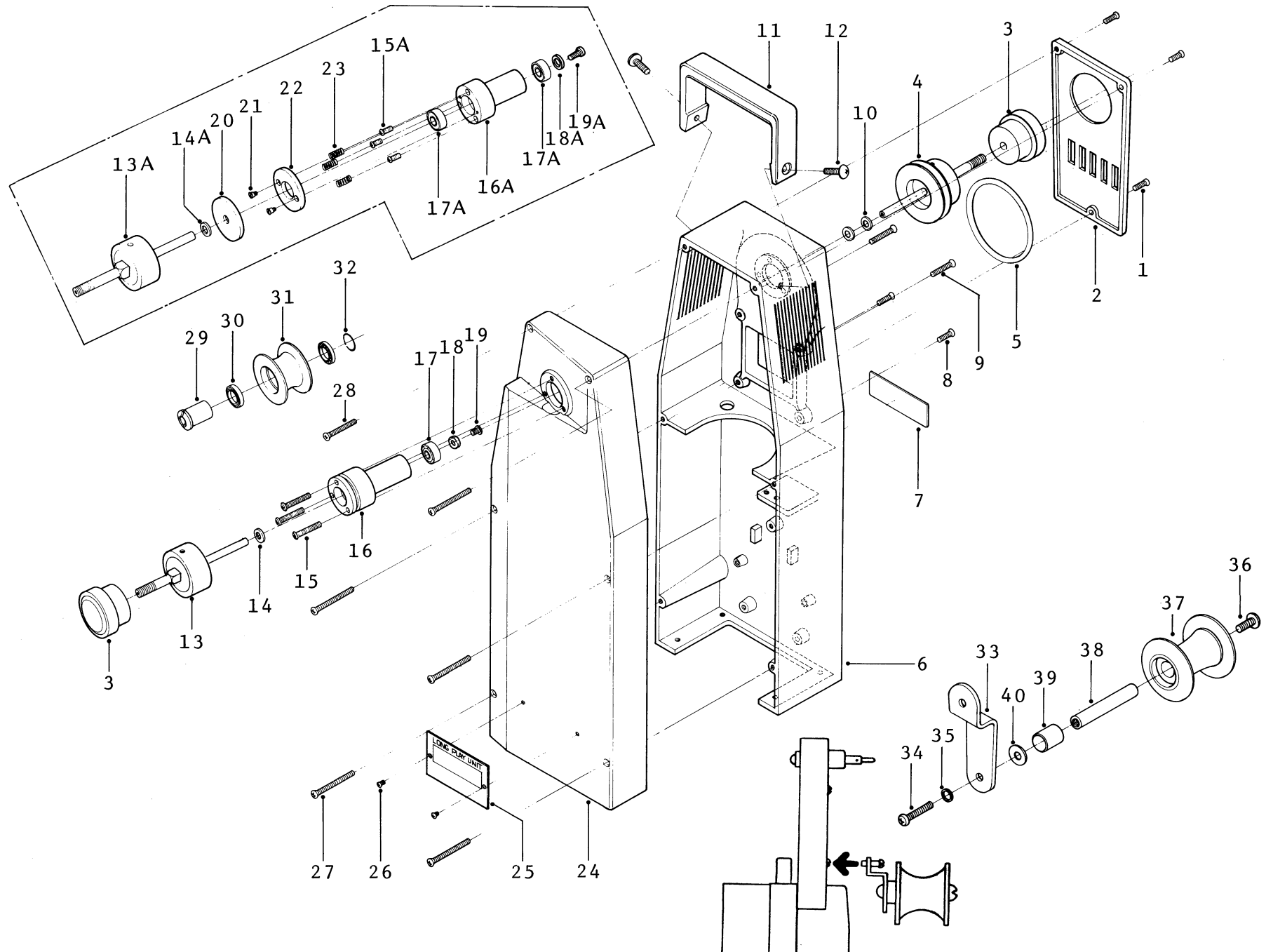
NA = Thick

NB = Thin

CONTENTS

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—11000	11—0	Cam Tank	9
—12000	12—0	Motor	11
—13000	13—0	Supply Arm	13
—14000	14—0	Take-up Arm	15
—15000	15—0	#1 Sprocket & Gear	17
—16000	16—0	#2 #3 Sprocket & Gear	19
—17000	17—0	Film Guide	21
—19000	19—0	Rewind Control	23
—20000	20—0	Base Casting & Elevator Foot	25
—22000	22—0	Rear Cover	27
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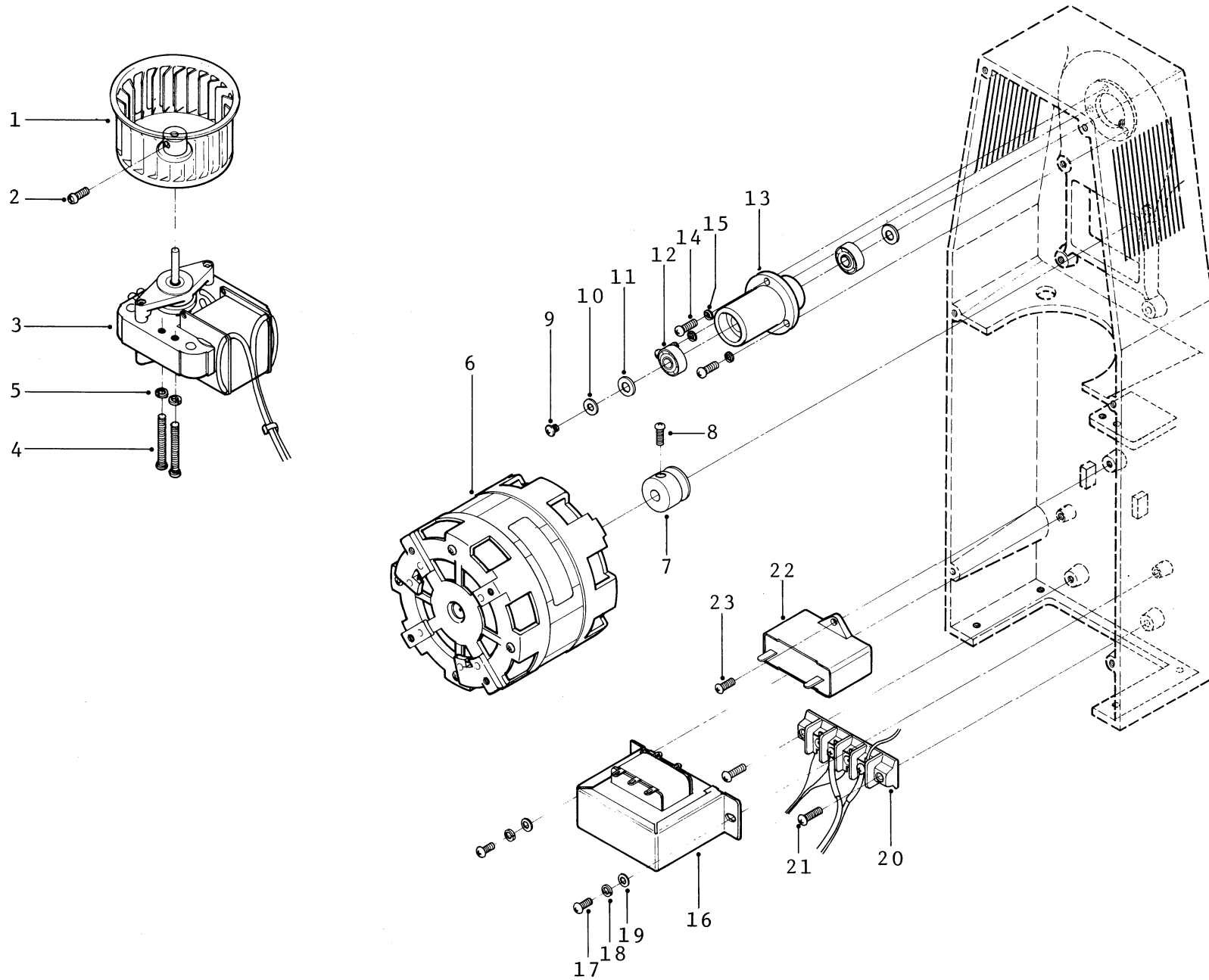
13-0 LONG PLAY PEDESTAL



13-0 LONG PLAY (ARM)

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	X O-3010S	Screw	3	24	980-13181	Main Casting Cover	1
2	980-13021	Belt Cover	1	25	980-13211	Rating Plate	1
3	980-13141	Reel Lock Knob	2	26	X P-2304	Screw	2
4	980-13131	Take-Up Spindle Assy.	1	27	X P-4040S	Screw for 980-13181	5
5	S T-12181	Motor Belt	1	28	X P-4025S	Screw for 980-13181	1
6	980-13011	Main Arm Casting	1	*	980-13401	Supply Arm Roller Assy.	1
7	980-13171	EIKI Decal	1	29	*980-13311	Roller Bracket	1
8	X F-4014S	Screw	2	30	*980-13321	Miniature Bearing	2
9	X F-4022S	Screw	2	31	*980-13291	Supply Arm Roller	1
10	G 4-070150	Fiber Washer	2	32	*980-13331	Ring	1
11	980-13031	Handle	1	*	980-13501	Guide Roller Assy (To use with EX-4000P for rewinding)	1
12	X T-5015S	Screw	2	33	*980-13451	Guide Roller Bracket	1
*	980-13101	Supply Arm Spindle Assy. Compl. (Includes items 13 thru 19)	1 only	34	*X P-3510	Screw	1
13	*980-13201	Supply Arm Spindle Assy.	1	35	*W C-35	Washer	1
14	*G 4-070150	Fiber Washer	1	36	*X T-3506	Screw	1
15	*X P-3525	Screw	3	37	*980-13461	Guide Roller	1
16	*980-13191	Bearing Case	1	38	*922-20471	Shaft	1
17	*O B-607Z	Ball Bearing	1	39	*S T-17321a	Spacer	1
18	*W A-35	Washer	1	40	*W A-35	Washer	1
19	*X T-3506	Screw	1				
*	980-13102	Supply Arm Spindle Assy. Compl. (Includes items 13A-19A, 20-23) **980-13101 to be replaced by 980-13102 from Serial No. 1501	1 only				
13A	*980-13202	Supply Arm Spindle Assy.	1				
14A	*G 4-070150	Fiber Washer	1				
15A	*X P-3510	Screw	3				
16A	*980-13192	Bearing Case	1				
17A	*O B-607Z	Ball Bearing	2				
18A	*W A-35	Washer	1				
19A	*X T-3506	Screw	1				
20	*980-13421	Felt	1				
21	*312-31061	Screw	2				
22	*980-13431	Pressure Ring	1				
23	*980-13441	Spring	3				

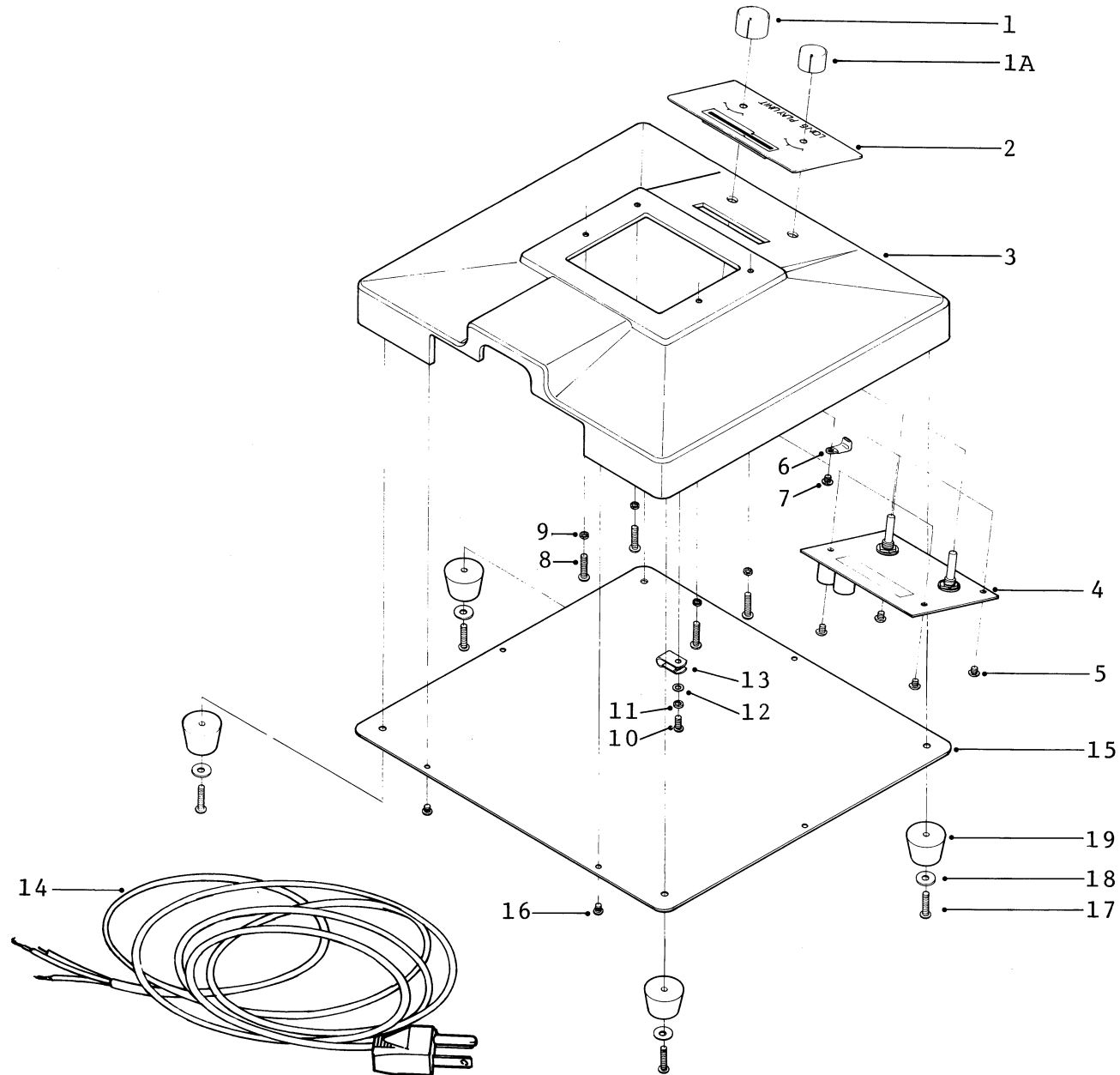
13-1 LONG PLAY PEDESTAL



13-1 LONG PLAY (BASE)

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	980-13111	Fan Assy.	1	23	X T-3008S	Screw	1
2	*X P-3008S	Screw (for above)	1				
3	980-13071	Fan Motor (100V)	1 only				
*	980-13081	Fan Motor (110-120V)	1 only				
*	980-13091	Fan Motor (220-240V)	1 only				
4	X P-4030S	Screw	2				
5	W C-40	Washer	2				
6	980-13041	Drive Motor (100V)	1 only				
*	980-13051	Drive Motor (110-120V)	1 only				
*	980-13061	Drive Motor (220-240V)	1 only				
7	980-13161	Motor Pulley Assy.	1				
8	*X P-3508	Screw	1				
9	X T-3506	Screw	1				
10	WA-35	Washer	1				
11	G 4-070150	Fiber Washer	1				
12	O B-607Z	Ball Bearing	2				
13	980-13151	Hub Casting	1				
14	X P-3510	Screw	3				
15	W C-35	Washer	3				
16	922-20421	Transformer	1				
17	X T-3008S	Screw	2				
18	W C-30	Washer	2				
19	WA-30	Washer	2				
20	S T-60041	AC Terminal 4PD	1				
21	X T-3012S	Screw (for above)	2				
22	980-13351	Motor Condensor (4.5 MFD, 250WV) for Motor (980-13041)	1 only				
*	980-13361	Motor Condensor (3 MFD, 250WV) for Motor (980-13051)	1 only				
*	980-13371	Motor Condensor (0.6 MFD, 480WV) for Motor (980-13061)	1 only				

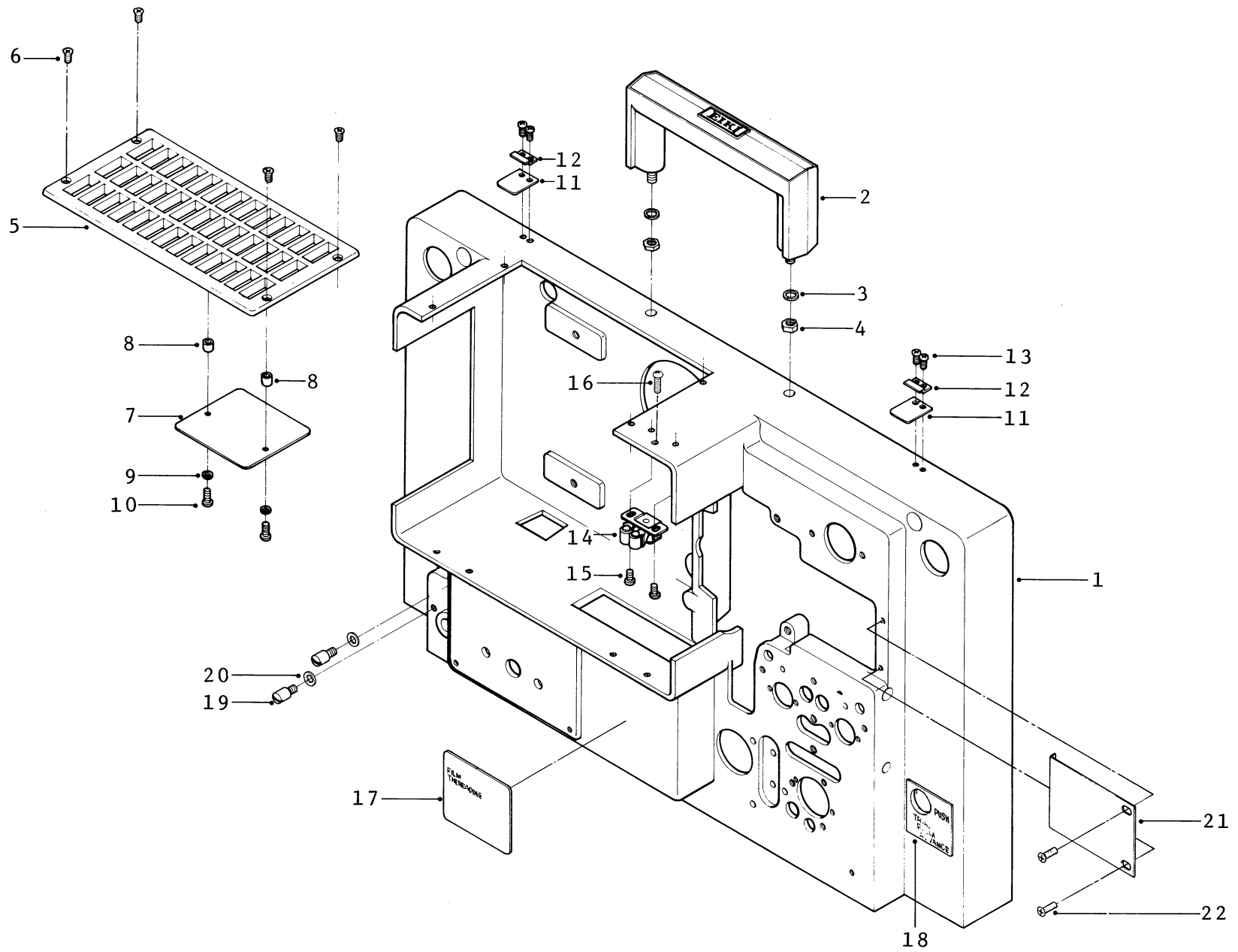
13-2 LONG PLAY PEDESTAL



13-2 LONG PLAY (BASE)

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	980-13601	Control Knob Assy.	1	17	X T-4015S	Screw	4
	*980-13271	Screw	1	18	222-20051	Washer	4
1A	980-13701	Control Knob Assy.	1	19	222-20041	Rubber Foot	4
	*980-13271	Screw	1				
2	980-13241	Control Plate	1				
3	980-13221	Base Casting	1				
4	980-13301	P.C. Board Assy. (for Serial No. 1001-1049)	1 only				
	980-13302	P.C. Board Assy. (for Serial No. 1050-1139)	1 only				
	980-13303	P.C. Board Assy. (for Serial No. 1140-1259)	1 only				
	980-13303a	P.C. Board Assy. (for Serial No. 1260 and up)	1 only				
5	X T-3006S	Screw (for above)	4				
6	980-13341	Diode Holding Bracket (Serial No. 1001 to 1139 only)	1				
7	X T-3006S	Screw (for above)	1				
8	X T-4015S	Screw	4				
9	W C-40	Washer	4				
10	X P-3006S	Screw	1				
11	W C-30	Washer	1				
12	W A-30	Washer	1				
13	314-60341	Cord Clip for Power Cord (980-13381, 980-13391)	1 only				
*	312-60391	Cord Clip for Power Cord (980-13411)	1 only				
14	980-13381	Power Cord with Plug for 240V (Australian Spec.)	1 only				
*	980-13391	Power Cord with Plug for 120V	1 only				
*	980-13411	Power Cord without Plug for 110V, 220V, 240V	1 only				
15	980-13231	Base Plate	1				
16	X T-3506	Screw	2				

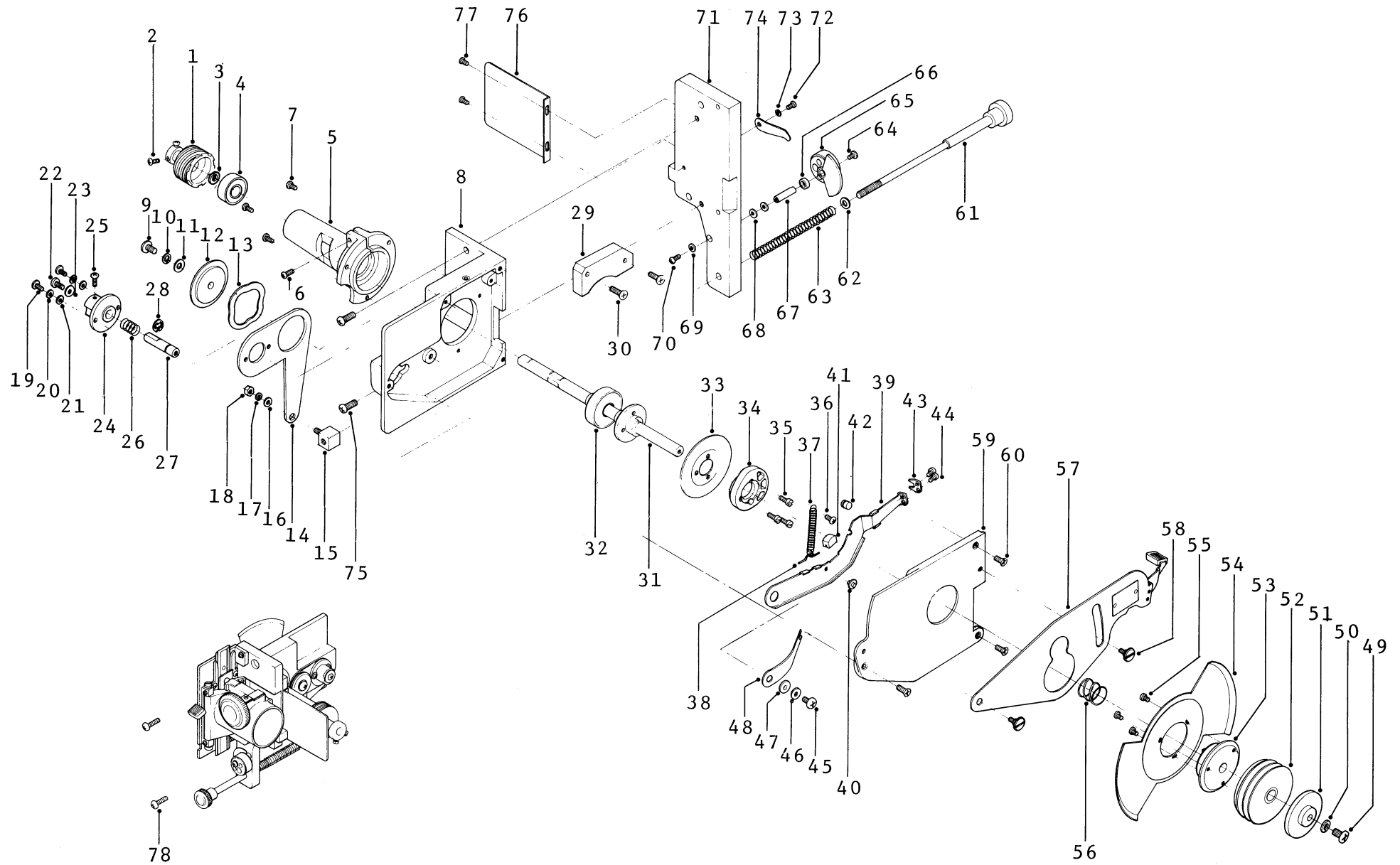
10-0 MAIN FRAME CASTING



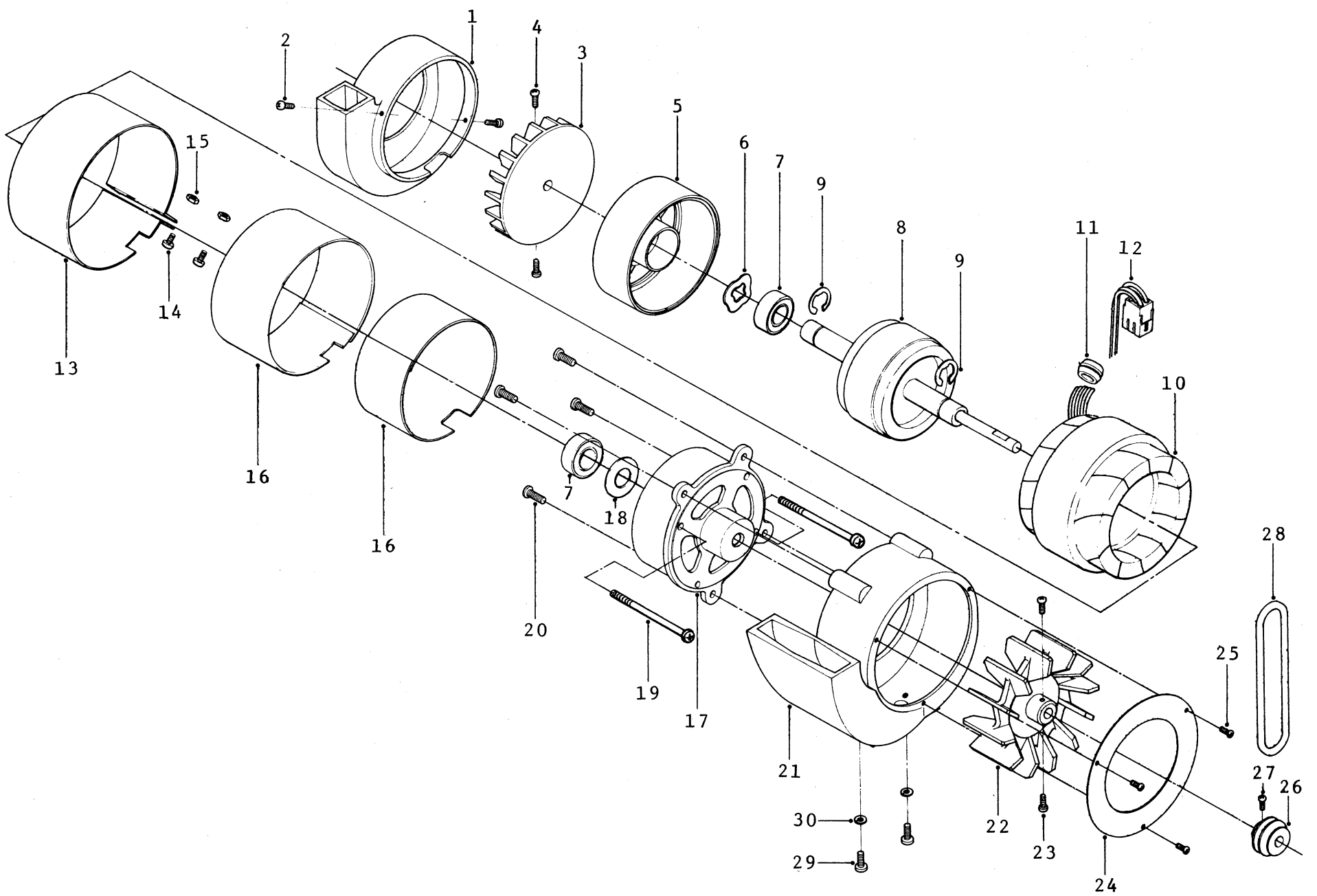
10-0 MAIN FRAME CASTING

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	241-10001	Main Frame Casting	1				
2	312-10102	Handle Assy.	1				
3	*W E-50	Washer	2				
4	*N A-50S	Nut	2				
5	241-10031	Lamp House Cover	1				
6	X F-2308	Screw	4				
7	241-10041	Light Shield Plate	1				
8	241-10051	Spacer	2				
9	W C-23	Washer	2				
10	X P-2308	Screw	2				
11	241-10011	Latch Plate	2				
12	241-10021	Male Latch	2				
13	X P-3005S	Screw	4				
14	S T-32061	Female Latch	1				
15	X T-2305	Screw	2				
16	X T-3012S	Screw	1				
17	241-10061	"FILM THREADING" Plate	1				
18	241-10071	"TRIAL FILM ADVANCE" Plate	1				
19	922-20371	Pin	2				
20	W C-35	Washer	4				
21	241-10081	Cam Tank Plate (Serial No. 4167 and up)	1				
22	X F-2305	Screw (Serial No. 4167 and up)	2				

11-0 CAM TANK / GATE MODULE



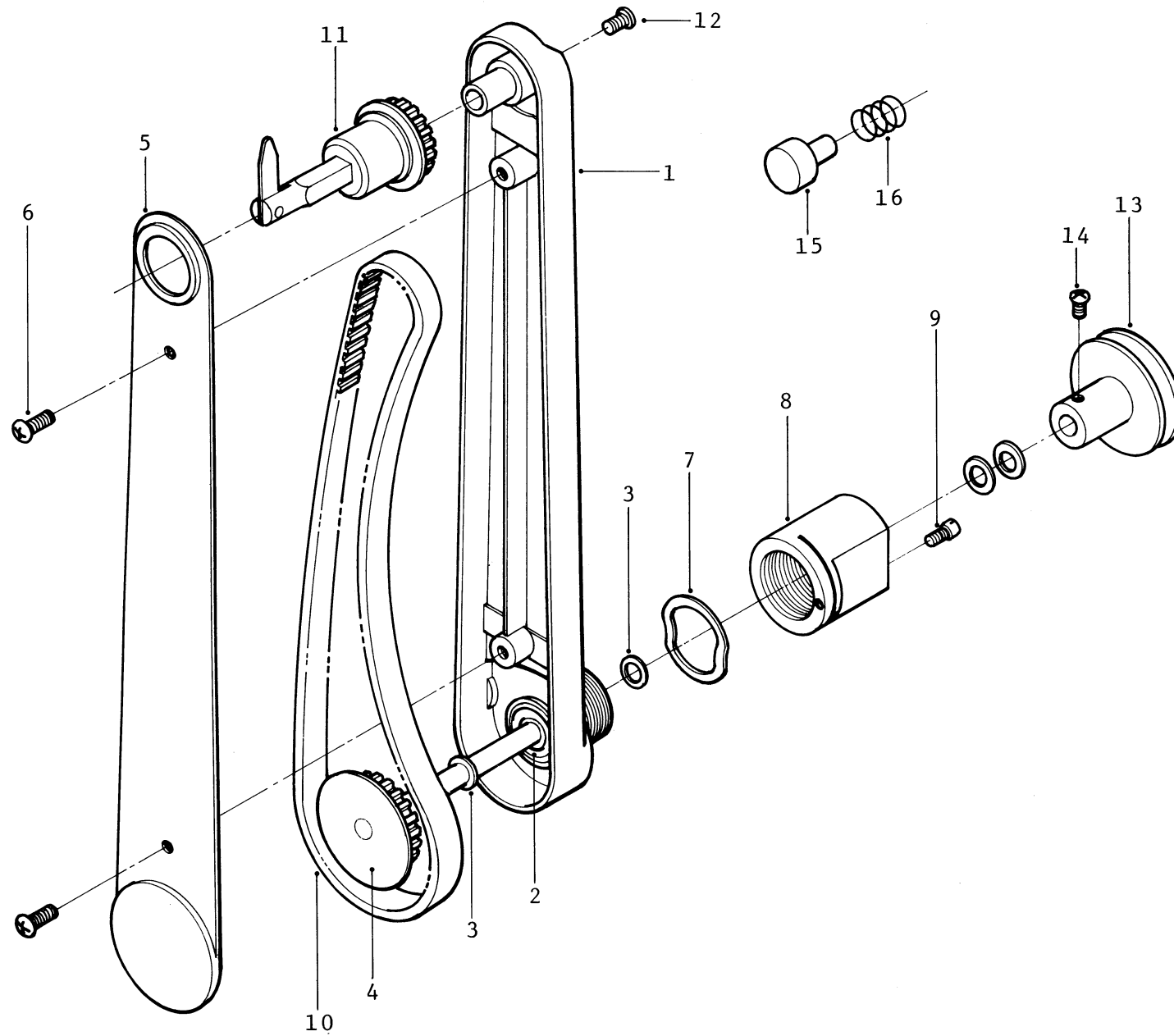
12-0 MOTOR



12-0 MOTOR

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
*	241-12001	MOTOR/FAN MODULE (Includes items 1-25)	1	29	X T-5015S	Screw	2
*	241-12101	MOTOR ASSY. (Includes items 5-19)	1	30	W C-50	Washer	2
1	241-12061	Fan Housing	1				
2	X P-3005S	Screw	2				
3	241-12601	Fan Assy.	1				
4	*X P-3508	Screw (for above)	2				
5	320-12051	Motor Case Cover	1				
6	320-12321	Spring Washer	1				
7	O B-6200ZZ	Ball Bearing	2				
8	241-12701	Rotor Assy.	1				
9	E R-90	"E" Ring	2				
10	222-12812	Stator & Coil Assy.	1				
11	312-12211	Rubber Bushing	1				
12	312-12341	6 Pin Connector (Male)	1				
13	222-12091	Motor Shield Plate	1				
14	X P-3012S	Screw	2				
15	N A-30S	Nut	2				
16	222-12241	Inner Shield Plate.	2				
17	320-12061	Motor Case	1				
18	312-12331	Spacer Washer	1				
19	X P-4065S	Screw	2				
20	X T-4010S	Screw	4				
21	241-12031	Fan Housing	1				
22	241-12201	Main Fan Assy.	1				
23	*X P-3508	Screw (for above)	2				
24	241-12051	Fan Housing Cover	1				
25	X T-2305	Screw	3				
26	241-12301	Motor Pulley Assy. (50/60HZ.)	1 only				
*	241-12401	Motor Pulley Assy. (50HZ.)	1 only				
*	241-12501	Motor Pulley Assy. (60HZ.)	1 only				
27	*X P-3508	Screw (for above)	1				
28	241-12181	Motor Belt	1				

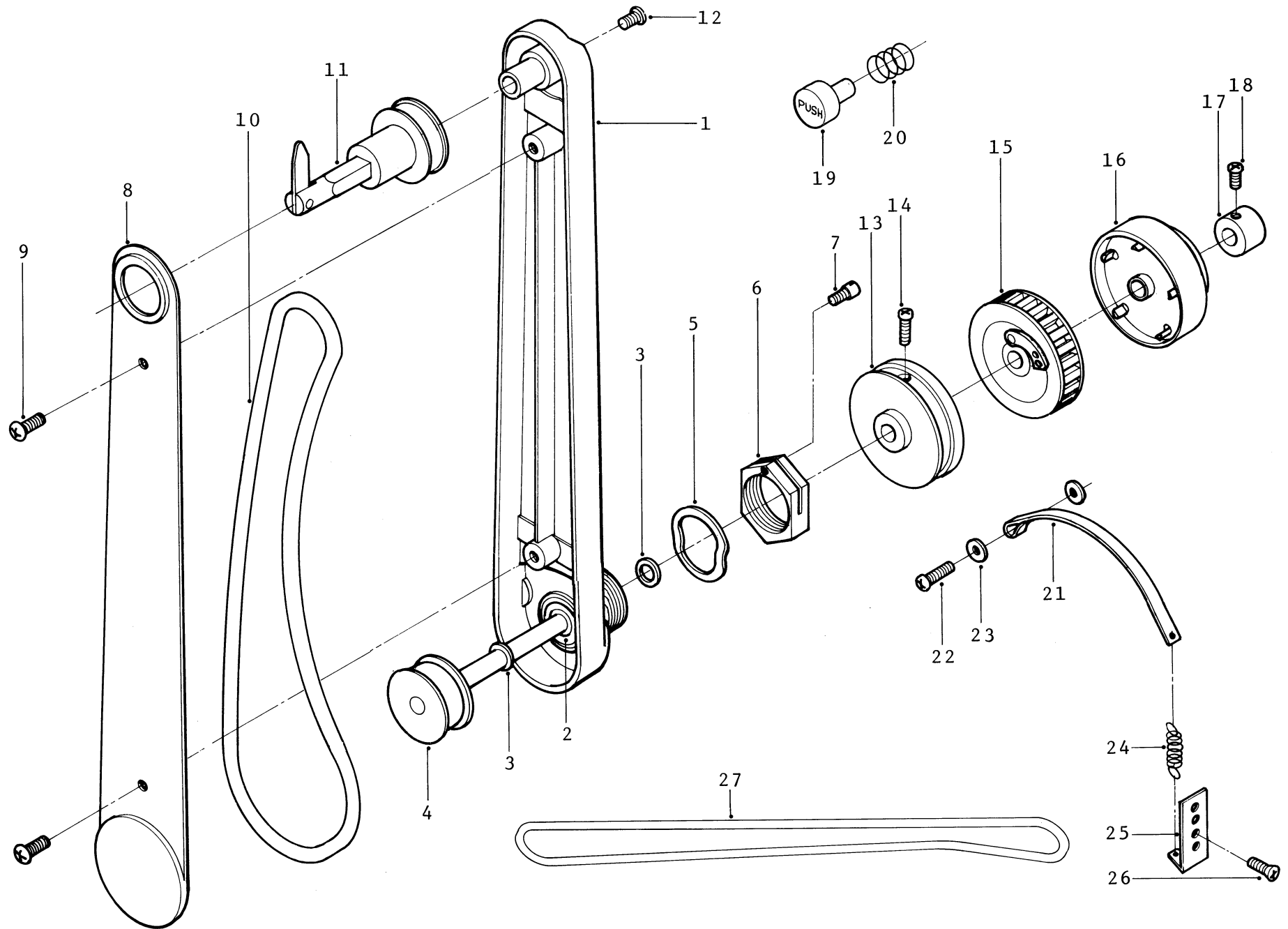
13-0 SUPPLY ARM



13-0 SUPPLY ARM

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
*	241-13001	Supply Arm Assy. (Includes items 1 thru 14)	1				
*	241-13101	Supply Arm Sub-Assy. (Includes items 1 thru 12)	1				
*	241-13301	Inner Half Arm Assy.	1				
1	*241-13311	Inner Half Arm	1				
2	*O B-626	Ball Bearing	2				
3	G 2-060120	Fiber Washer	4				
4	241-13021	Drive Pulley	1				
5	241-13011	Arm Plate	1				
6	X T-4006S	Screw (for above)	2				
7	S T-13051	Spring Washer	1				
8	241-13031	Joint Hub	1				
9	*S T-13221	Screw (for above)	1				
10	320-13151	Toothed Arm Belt	1				
11	320-13201	Spindle Shaft Assy.	1				
12	X T-3506	Screw (for above)	1				
13	241-13401	Supply Arm Drive Pulley Assy.	1				
14	*X P-3508	Screw	1				
15	321-13101	Arm Lock Pin	1				
16	S T-13181	Spring	1				

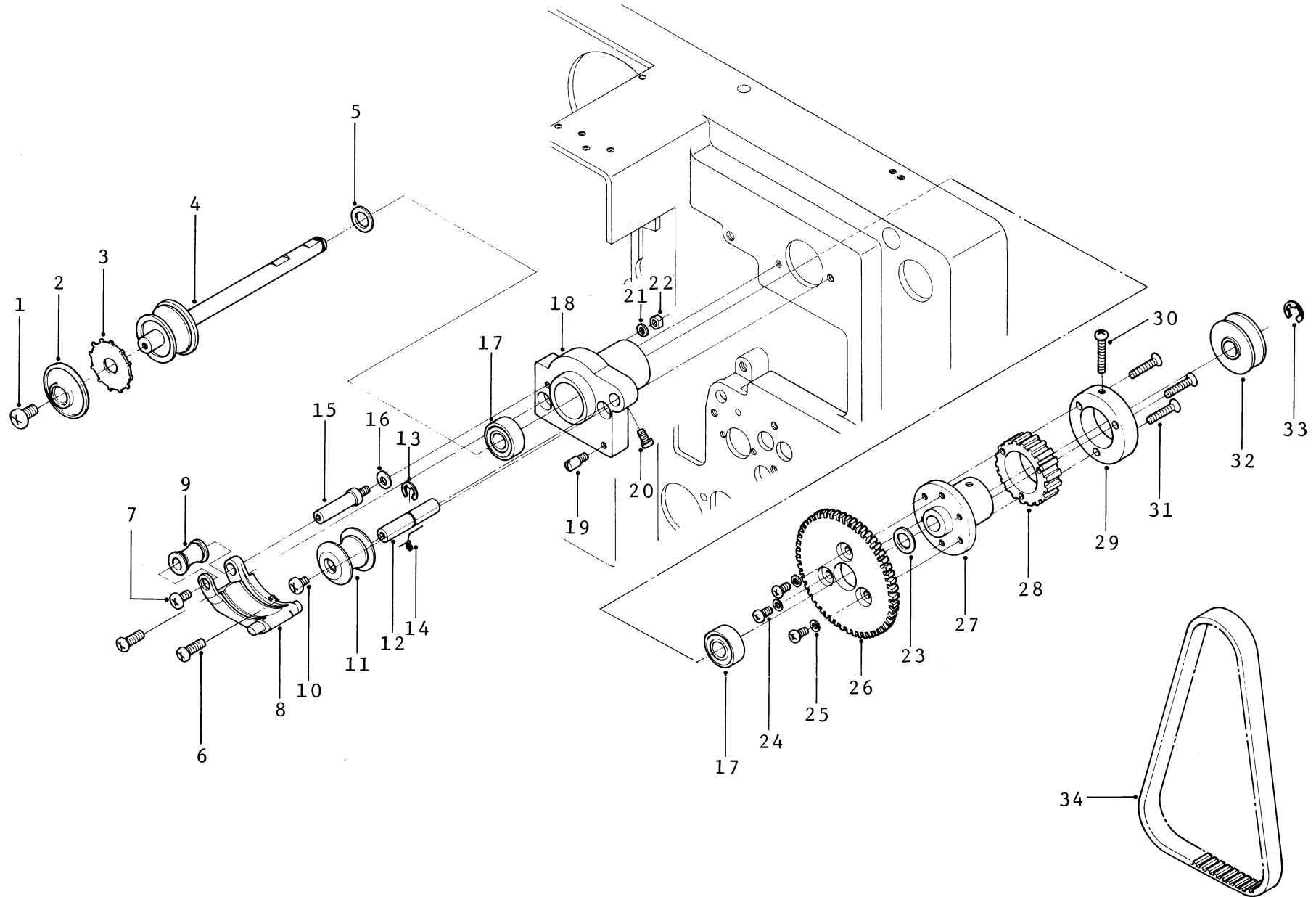
14-0 TAKE-UP ARM



14-0 TAKE-UP ARM

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
*	241-14001	Take-Up Arm Assy. (Includes items 1 thru 18)	1				
*	241-14101	Take-Up Arm Sub-Assy. (Includes items 1 thru 12)	1				
*	241-14301	Inner Half Arm Assy.	1				
1	*241-14311	Inner Half Arm	1				
2	*O B-607Z	Ball Bearing	2				
3	G S-070120	Fiber Washer	2				
4	241-14011	Drive Pulley	1				
5	S T-13051	Spring Washer	1				
6	S T-13401	Nut Assy.	1				
7	*S T-13221	Screw (for above)	1				
8	241-13011	Arm Plate	1				
9	X T-4006S	Screw (for above)	2				
10	241-14321	Take-Up Arm Belt	1				
11	241-14401	Spindle and Pulley Assy.	1				
12	X T-3506	Screw (for above)	1				
13	241-14201	Clutch Pulley Assy.	1				
14	*X P-3512	Screw	1				
15	241-14031	Drive Gear Pulley	1				
16	241-14041	Rewind Drive Pulley	1				
17	312-15901	Set Collar Only	1				
18	*X P-3505	Screw	1				
19	321-13101	Arm Lock Pin	1				
20	S T-13181	Spring	1				
21	241-14061	Brake Band	1				
22	X P-3018S	Screw	1				
23	W C-30	Washer	2				
24	241-14081	Spring	1				
25	241-14071	Bracket	1				
26	X O-3008S	Screw	1				
27	241-14051	Rewind Belt	1				

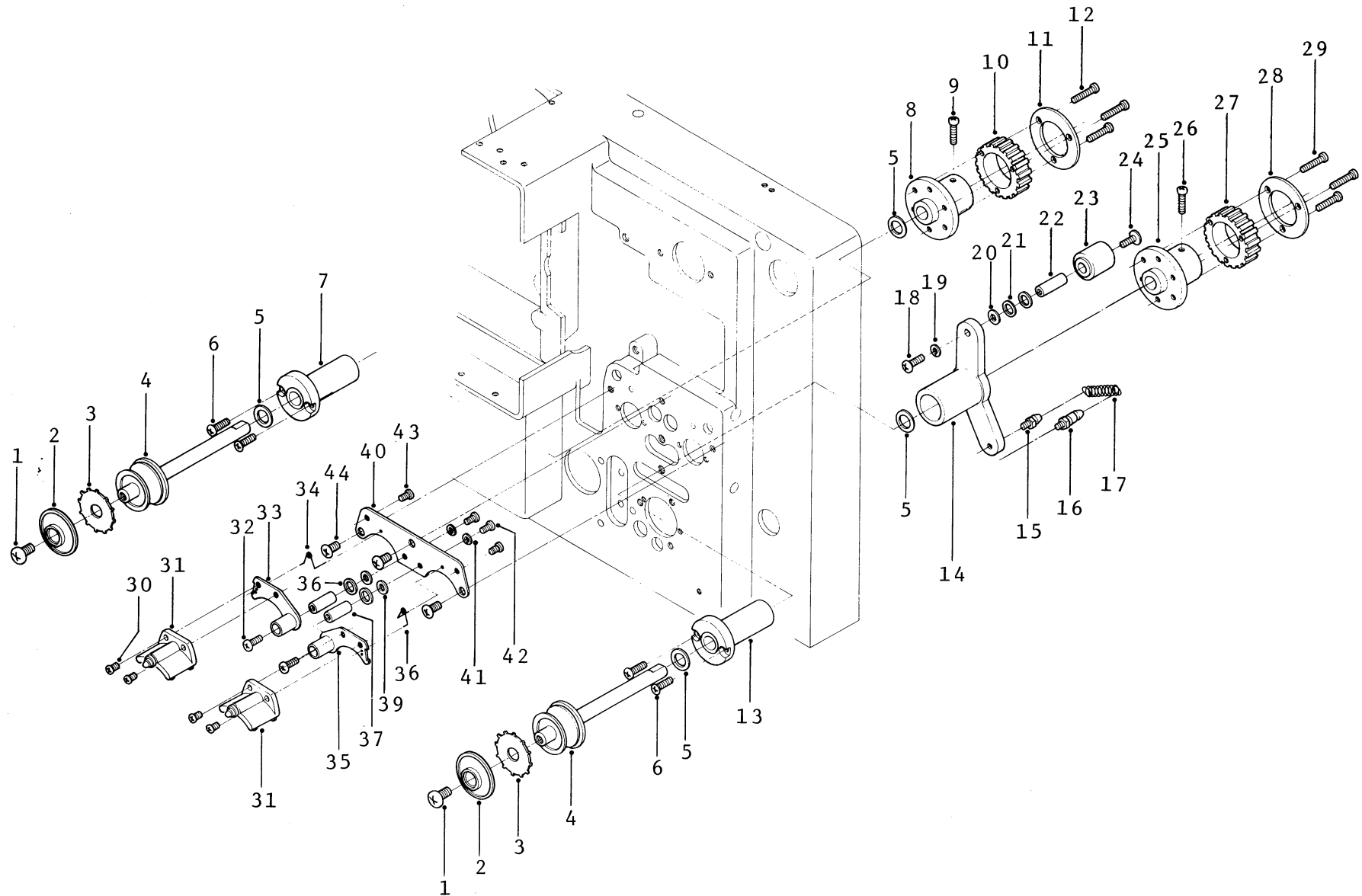
15-0 SPROCKET & GEAR



15-0 # 1 SPROCKET & GEAR

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
*	241-15101	No. 1 Sprocket Drum/Shaft Assy. (Includes items 1 thru 4)	1	32	241-15031	Idler Roller	1
1	X T-4008S	Screw	1	33	E R-60	E Ring	1
2	320-15011	Cover Plate	1	34	260-15211	Drive Belt	1
3	S T-15021	Sprocket Plate	1				
4	241-15011	No. 1 Sprocket Drum/Shaft Sub-Assy.	1				
5	G 4-070120	Fiber Washer	1				
6	X P-3014S	Screw	2				
7	X T-3505	Screw	1				
8	312-15152A	No. 1 Sprocket Shoe Assy.	1				
9	S T-15191	Shoe Roller	1				
10	X T-3506	Screw	1				
11	S T-19011	Nylon Guide Roller	1				
12	260-15011	Shaft	1				
13	E R-50	E Ring	1				
14	312-15181	Shoe Spring	1				
15	312-15171	Shaft	1				
16	WA-30	Washer	1				
17	O B-607Z	Ball Bearing	2				
18	241-15201	Hub Assy.	1				
19	S T-15311	Shoe Stopper	1				
20	X P-3005S	Screw	1				
21	WC-30	Washer	1				
22	NA-30S	Nut	1				
23	G S-070120	Fiber Washer	1				
*	260-15201	No. 1 Sprocket/Gear Assy. (Includes items 24 thru 31)	1				
24	X T-3008S	Screw	3				
25	WA-30	Washer	3				
26	260-15071	Fiber Gear	1				
27	312-16041	Sprocket Hub	1				
28	S T-15091	Drive Gear	1				
29	S T-15111	Spacer	1				
30	X P-3510	Screw	1				
31	X F-3024S	Screw	3				

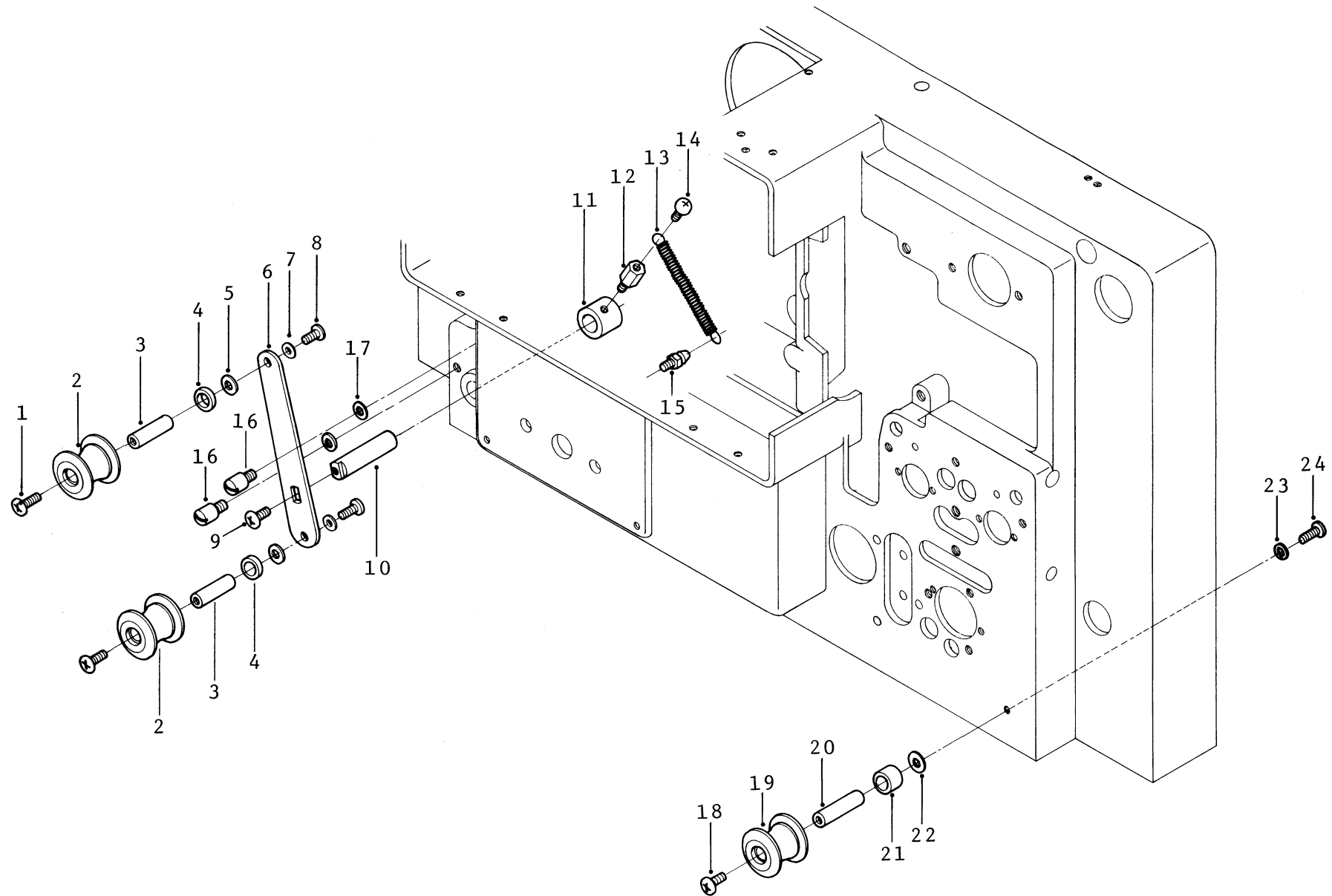
16-0 #2 #3 SPROCKET & GEAR



16-0 # 2 SPROCKET & GEAR

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
*	320-16401A	Sprocket Drum/Shaft Assy. (Includes items 1 thru 4)	2	30	X T-2305	Screw	4
1	X T-4008S	Screw	2	31	241-16301	No. 2/3 Sprocket Shoe Assy.	2
2	320-15011	Cover Plate	2	32	X T-3005S	Screw	2
3	S T-15021	Sprocket Plate	2	33	260-16081	No. 2 Sprocket Shoe Mounting Arm	1
4	320-15102	Sprocket Drum/Shaft	2	34	241-16181	No. 2 Shoe Spring	1
5	G 4-070120	Fiber Washer	4	35	260-16091	No. 3 Sprocket Shoe Mounting Arm	1
6	X P-3010S	Screw	4	36	241-16191	No. 3 Shoe Spring	1
7	313-15301	Hub Assy.	1	37	260-16131	Shaft	2
*	260-16201	No. 2 Sprocket Gear Assy. (Includes items 8 ~ 12)	1	38	G 8-050100	Fiber Washer	2
8	312-15081	Gear Flange	1	39	WA-30	Washer	2
9	X P-3510	Screw	1	40	260-16111	No. 2/3 Shoe Mounting Bracket	1
10	S T-15091	Drive Gear	1	41	W E-30	Washer	2
11	S T-15111	Spacer	1	42	X P-3006S	Screw	2
12	X P-3018S	Screw	3	43	X T-2306	Screw	2
13	260-16021	Hub Assy.	1	44	X T-3006S	Screw	3
14	241-16031	Tension Hub	1				
15	312-10161	Spring Screw	1				
16	312-10171	Spring Screw	1				
17	241-16061	Spring	1				
18	X P-3514	Screw	1				
19	W C-35	Washer	1				
20	WA-35	Washer	1				
21	G 4-060120	Fiber Washer	2				
22	260-16041	Shaft	1				
23	260-16051	Belt Tension Roller	1				
24	X T-3506	Screw	1				
*	241-16201	No. 3 Sprocket Gear Assy. (Includes items 25 ~ 29)	1				
25	312-15081	Gear Flange	1				
26	X P-3510	Screw	1				
27	S T-15091	Drive Gear	1				
28	241-16111	Spacer	1				
29	X P-3014S	Screw	3				

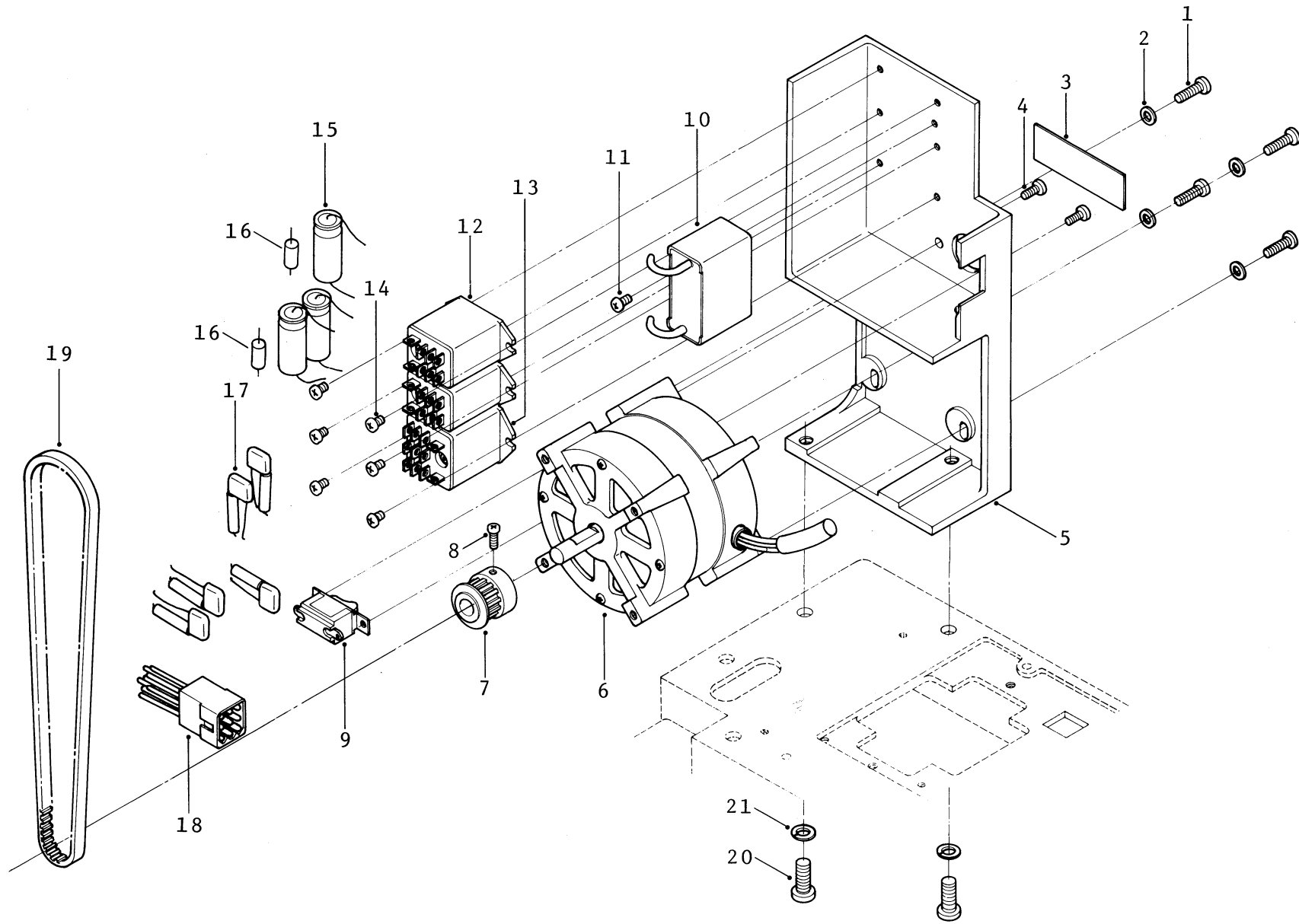
17-0 FILM GUIDE



17-0 FILM GUIDE

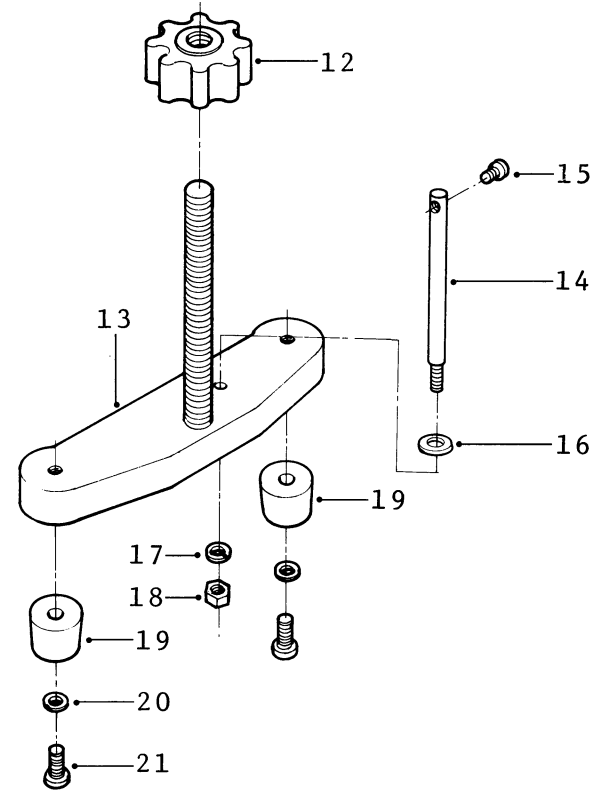
INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	X T-3506	Screw	2				
2	260-17231	Tension Roller	2				
3	260-17161	Shaft	2				
4	241-17041	Spacer	2				
5	WA-35	Washer	2				
6	241-17711	Arm Only	1				
7	WC-35	Washer	2				
8	X T-3506	Screw	2				
9	X T-4006S	Screw	1				
10	241-17171	Shaft	1				
11	241-17141	Set Collar Only	1				
12	241-17021	Set Screw	1				
13	241-17031	Tension Spring	1				
14	X T-3006S	Screw	1				
15	312-10161	Spring Screw	1				
16	922-20371	Stop Pin	2				
17	WC-35	Washer	2				
18	X T-3506	Screw	1				
19	260-17231	Guide Roller	1				
20	922-20471	Shaft	1				
21	312-17451	Spacer	1				
22	WA-35	Washer	1				
23	WC-35	Washer	1				
24	X P-3510	Screw	1				

19-0 REWIND CONTROL



19-0 REWIND CONTROL

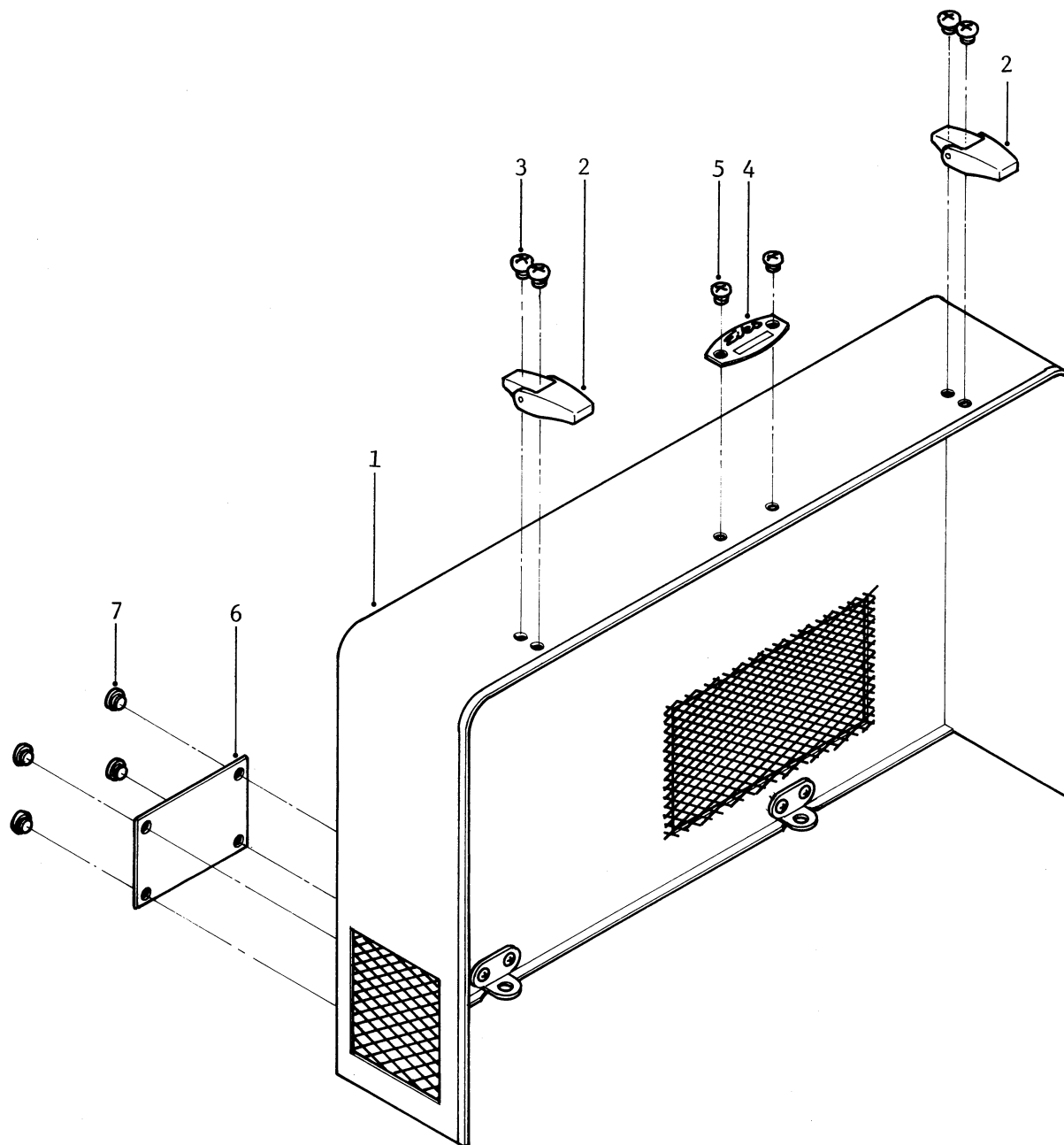
INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
*	241-19101	Take-Up Motor/Relay Assy. Complete (Includes items 1 thru 17)	1				
1	X T-4014S	Screw	4				
2	WA-40	Washer	4				
3	241-19021	"TAKE UP MOTOR DEFEAT" Plate	1				
4	X T-3012S	Screw	2				
5	241-19011	Motor Base	1				
6	241-19201	Take-Up Motor Assy.	1				
7	074-05401	Synchronous Motor Pulley Assy.	1				
8	*X P-3508	Screw	1				
9	241-19031	Take-Up Motor Switch	1				
10	241-19041	Motor Condensor (7 MFD, 250WV)	1				
11	X T-3008S	Screw	1				
12	260-50311	Relay (DC 100V)	2				
13	241-19051	Relay (AC 100V)	1				
14	X T-3005S	Screw	6				
15	C E-161336	Condensor (33 MFD, 160V) for Delay	3				
16	241-60361	Diode 10D1	2				
17	241-19061	Surge Absorber	5				
18	241-19071	9P Nylon Connector (Male)	1				
19	241-12191	Motor Rewind Belt	1				
20	X T-5015S	Screw	2				
21	W C-50	Washer	2				



20-0 BASE CASTING/ELEVATOR FOOT

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	241-20001	Base Casting	1				
2	312-20031	Guide Pin	2				
3	WA-40	Washer	2				
4	WC-40	Washer	2				
5	NA-40S	Nut	2				
6	XT-5015S	Screw	5				
6A	WA-50	Washer	5				
7	222-20041	Rubber Foot	4				
8	222-20051	Washer	4				
9	XT-4016S	Screw	4				
10	241-20011	Base Cover	1				
11	XT-3006S	Screw	6				
*	241-20201	Elevator Foot Assy. Comp. (Includes items 12 thru 21)	1				
*	241-20301	Elevator Foot Assy. (Includes items 13 thru 21)	1				
12	312-20061	Elevator Knob	1				
13	241-20401	Elevator Foot Sub-Assy.	1				
14	241-20141	Guide Bar	1				
15	XP-3006S	Screw	1				
16	WA-40	Washer	1				
17	WC-40	Washer	1				
18	NA-40S	Nut	1				
19	ST-20021	Rubber Foot	2				
20	WA-40	Washer	2				
21	XT-4015S	Screw	2				

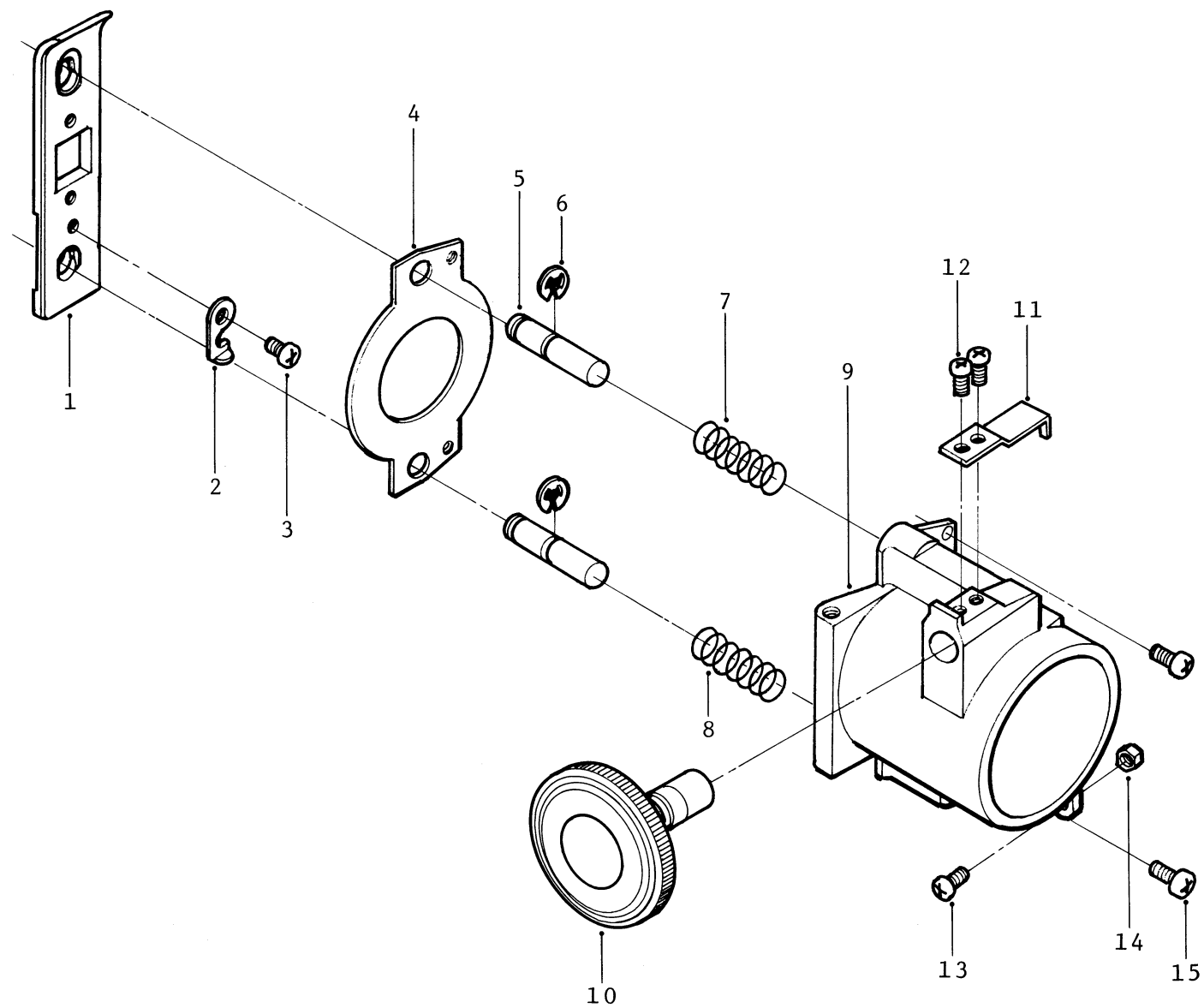
22-0 REAR COVER



22-0 REAR COVER

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
*	241-22001	Rear Cover Assy. (Includes items 1 thru 7)	1				
1	241-22101	Rear Cover Only	1				
2	241-22011	Male Latch	2				
3	X P-3005S	Screw	4				
4	241-22151	Serial Number Plate	1				
5	X P-2303	Screw	2				
6	241-22051	Electrical Rating Plate (110V)	1 only				
	241-22061	Electrical Rating Plate (120V)	1 only				
	241-22071	Electrical Rating Plate (220V)	1 only				
	241-22081	Electrical Rating Plate (240V)	1 only				
7	X P-2303	Screw (for above)	4				

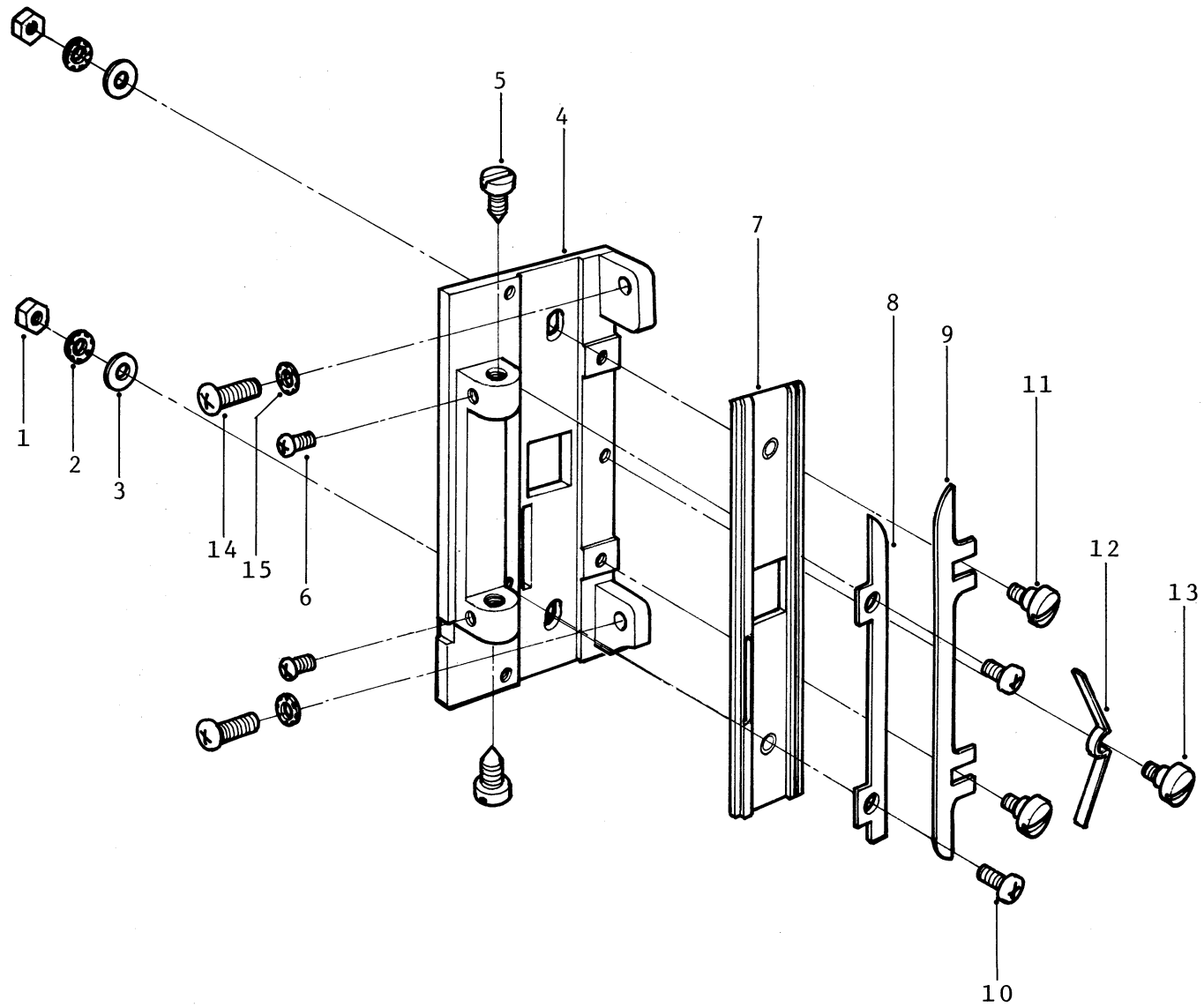
30-0 LENS HOLDER



30-0 LENS HOLDER

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
*	241-30001	Lens Holder Assy. Complete (Includes items 1 thru 15)	1				
*	312-30101	Film Shoe Assy.	1				
1	312-30031	Film Shoe Only	1				
2	S T-30011	Shoe Lock	1				
3	S T-30021	Screw	1				
*	241-30201	Lens Holder Assy. (Includes items 4 thru 15)	1				
4	312-30041	Retaining Plate	1				
5	S T-30051	Shoe Pin	2				
6	E R-30	E Ring	2				
7	S T-30061	Upper Spring	1				
8	S T-30071	Lower Spring	1				
9	241-30501	Lens Holder Sub-Assy.	1				
10	312-30401a	Focus Knob Assy.	1				
11	312-30211	Plate Spring	1				
12	X P-2305	Screw	2				
13	X P-3510	Screw	1				
14	N A-35	Nut	1				
15	X T-2306	Screw	2				

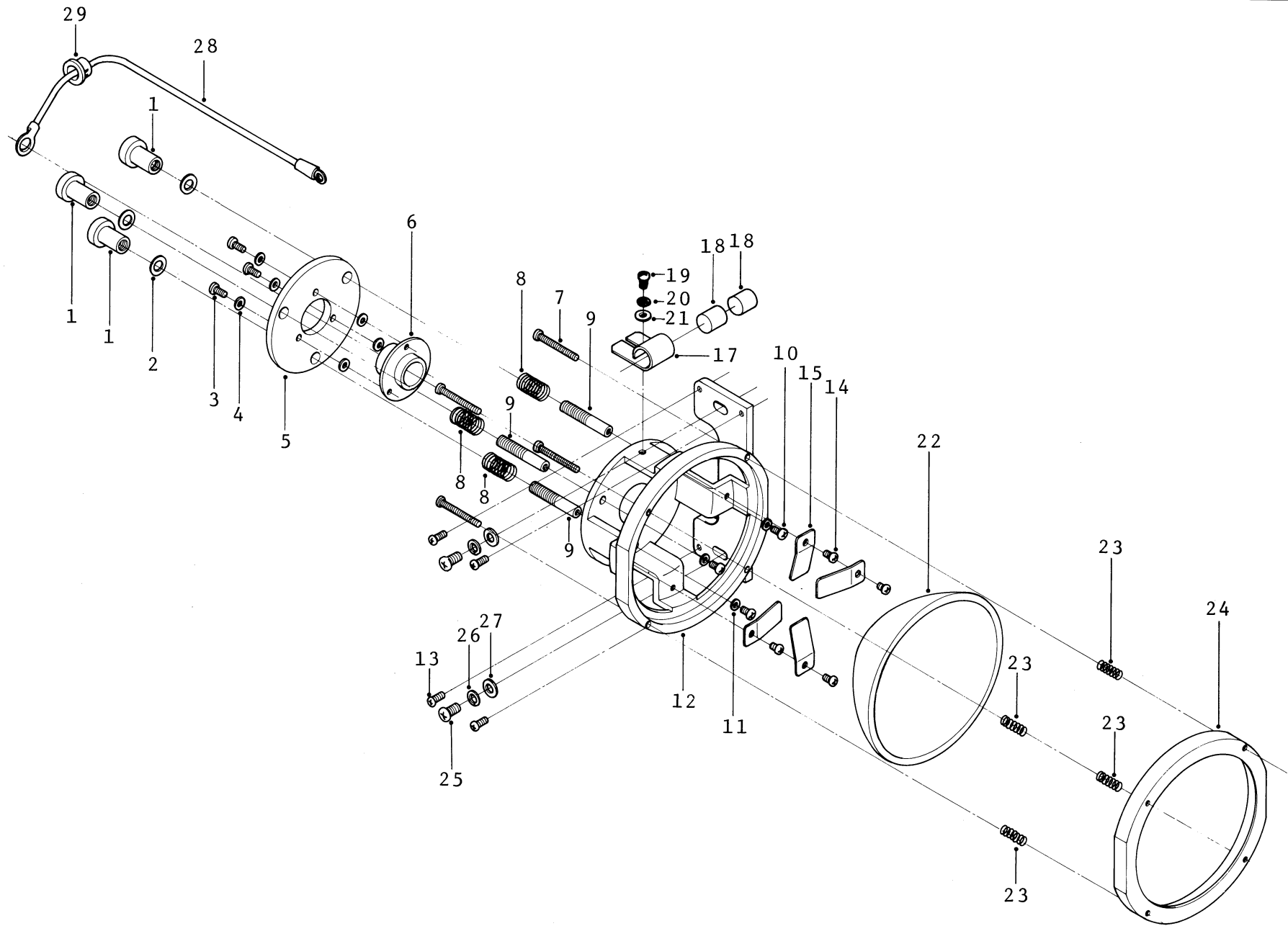
31-0 GATE



31-0 GATE

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
*	260-31001	Gate Assy. Complete (Includes 1 thru 13)	1				
1	N B-30S	Nut	2				
2	W E-30	Washer	2				
3	WA-30	Washer	2				
4	312-31091A	Gate Plate Only	1				
5	312-31081	Set Screw	2				
6	X P-2304	Screw	2				
7	312-31101	Aperture Plate Assy.	1				
8	S T-31071	Outer Guide Rail	1				
9	S T-31111	Inner Guide Rail	1				
10	X T-3006S	Screw	2				
11	312-31061	Screw	2				
12	S T-31121	Side Pressure Spring	1				
13	S T-31131	Screw	1				
14	X P-3510	Screw	2				
15	W E-35	Washer	2				

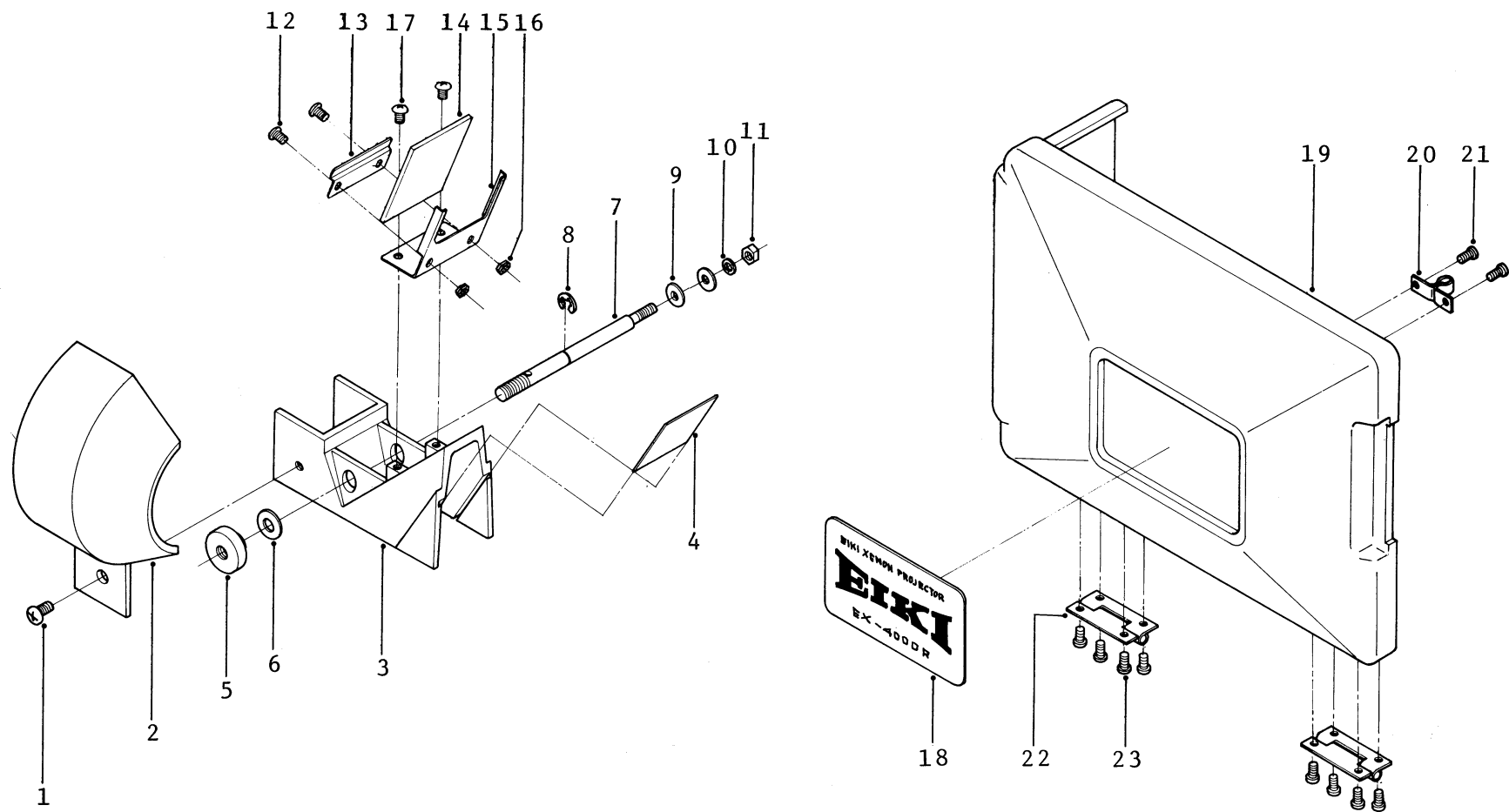
32-0 MIRROR



32-0 MIRROR

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
*	241-32101	Mirror Assy. (Includes items 1 thru 24)	1				
1	241-32141	Adjusting Knob	3				
2	G 4-060120	Fiber Washer	3				
3	X P-3012S	Screw	3				
4	G 1-030070	Fiber Washer	6				
5	611-32241	Lamp Holding Plate	1				
6	241-32111	Lamp Socket	1				
7	X P-3025S	Screw	4				
8	222-32151	Lamp Adjusting Spring	3				
9	222-32221	Lamp Adjusting Screw	3				
10	X P-3512	Screw	3				
11	W C-35	Lock Washer	3				
12	241-32061	Mirror Housing	1				
13	X P-3510	Screw	4				
14	X P-3004S	Screw	4				
15	241-32091	Spring Plate	4				
17	241-32211	Magnet Case	1				
18	222-32171	Magnet	2				
19	X P-3005S	Screw	1				
20	W C-30	Washer	1				
21	W A-30	Washer	1				
22	222-32181	Mirror	1				
23	241-32081	Spring	4				
24	241-32071	Pressure Ring	1				
— Mounting Hardware —							
25	X T-5014S	Screw	2				
26	W C-50	Washer	2				
27	W A-50	Washer	2				
28	241-32201	Lamp Lead Assy.	1				
29	*241-32161	Bushing	1				

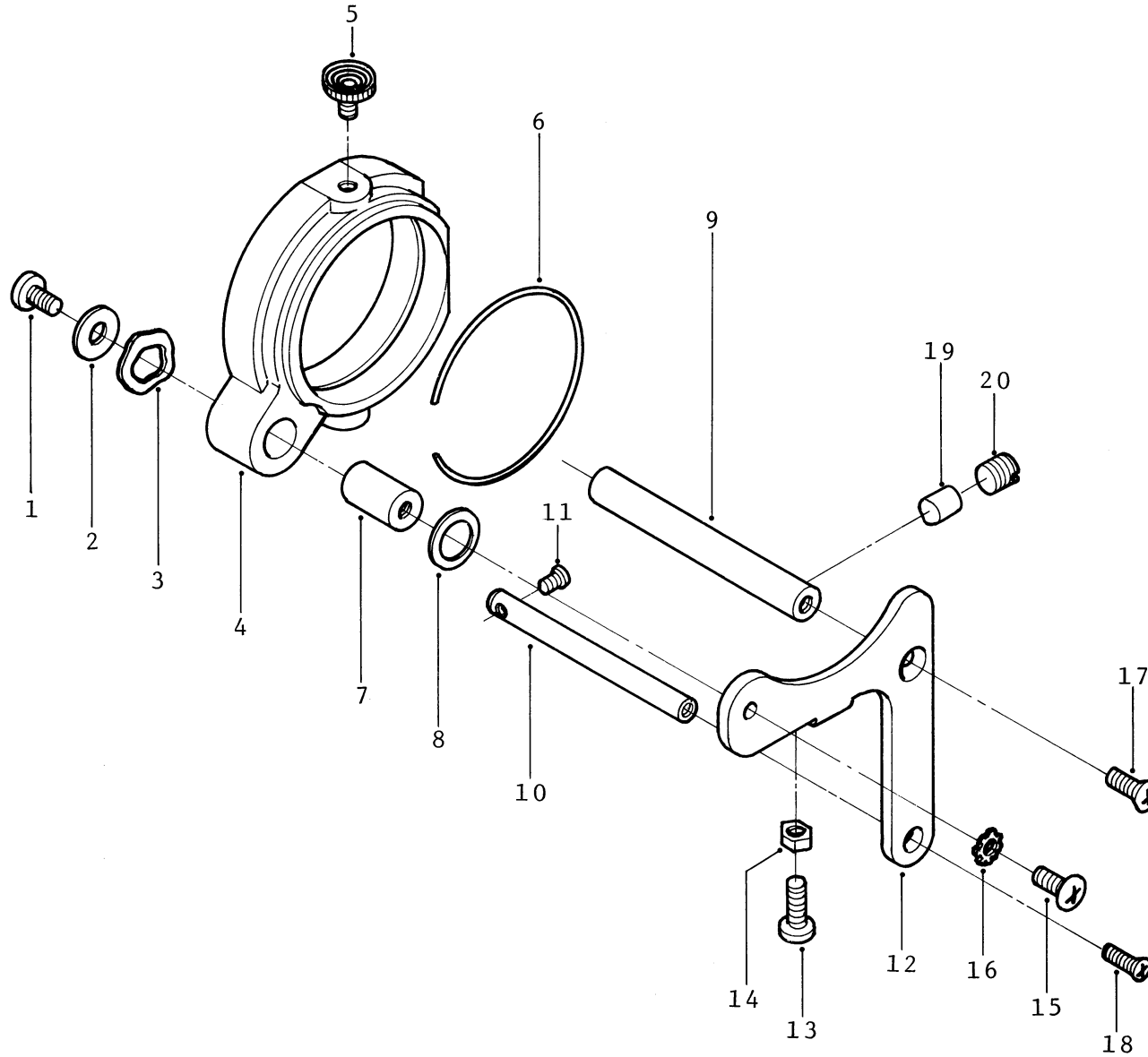
32-1 LAMP HOUSE



32-1 LAMP HOUSE

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	X T-4010S	Screw	1				
2	241-32041	Protective Cover	1				
3	241-32051	Cooling Air Guide	1				
4	241-32181	Cooling Air Guide Plate	1				
5	222-32191	Lamp Adjusting Knob	1				
6	WA-60	Washer	1				
7	241-32191	Shaft	1				
8	E R-50	E Ring	1				
9	WA-40	Washer	2				
10	WC-40	Washer	1				
11	N A-40S	Nut	1				
12	X T-3006S	Screw	2				
13	222-32061	Hot Mirror Support	1				
14	222-32131	Hot Mirror	1				
15	222-32051	Hot Mirror Bracket	1				
16	N A-30S	Nut	2				
17	X T-2306	Screw	2				
*	241-32701	Lamp House Door Assy. (Includes items 18 thru 23)	1				
*	241-32601	Lamp House Door Sub-Assy.	1				
18	*241-32261	EIKI Plate	1				
19	*241-32011	Lamp House Door Only	1				
20	S T-32051	Male Latch	1				
21	X T-2304	Screw	2				
22	241-32031	Hinge	2				
23	X P-3004S	Screw	8				

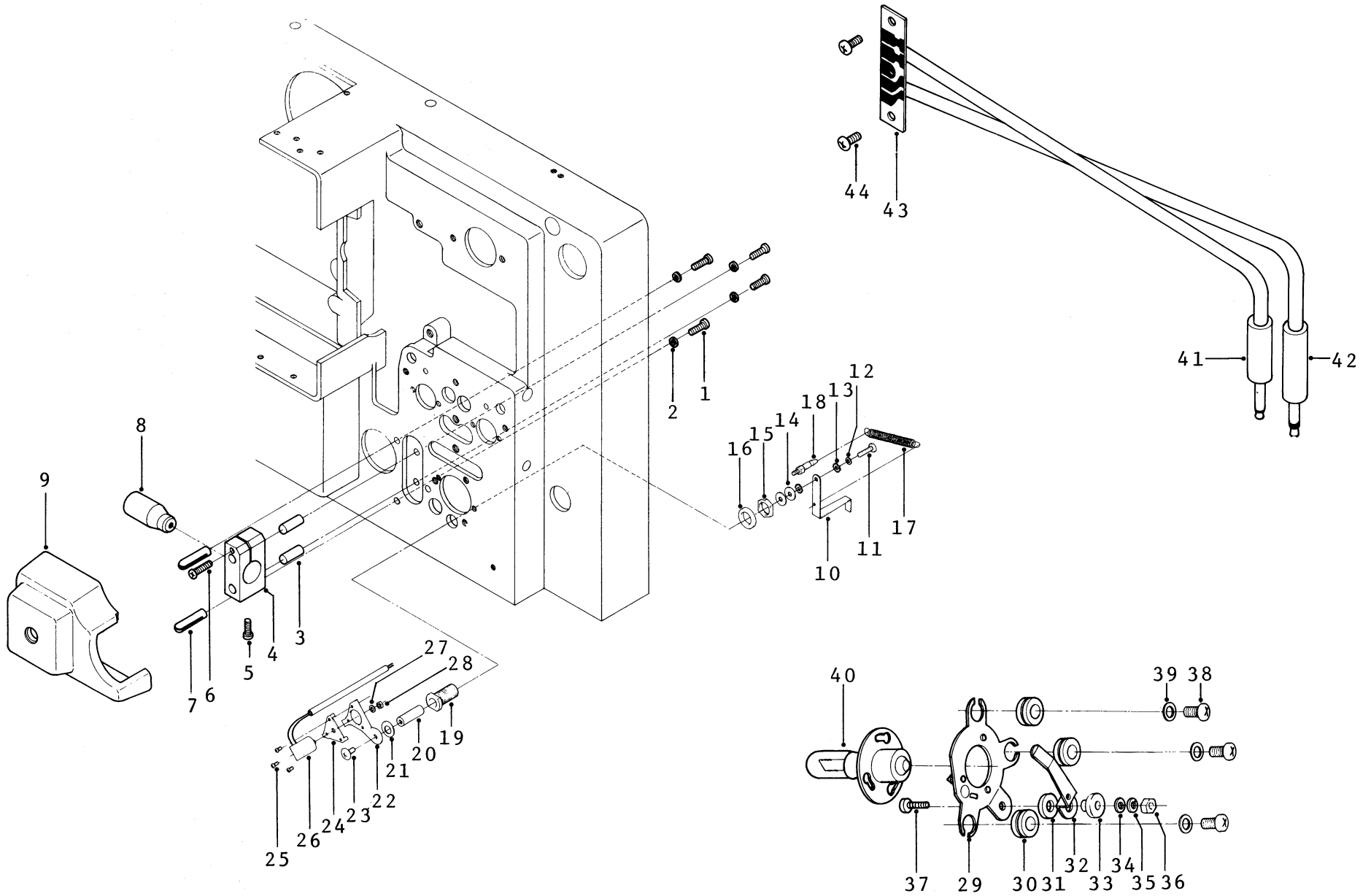
33-0 ANAMORPHIC LENS HOLDER



33-0 ANAMORPHIC LENS HOLDER

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
*	241-33001	Anamorphic Lens Holder Assy. (Includes items 1 thru 18)	1				
1	X T-4008S	Screw	1				
2	S T-20041	Washer	1				
3	241-33111	Spring Washer	1				
*	241-33101	Anamorphic Lens Holder Sub-Assy.	1				
4	*241-33041	Anamorphic Lens Holder Only	1				
5	*312-33051	Adjusting Screw	1				
6	*241-33061	Retaining Ring	1				
7	241-33011	Fulcrum Shaft	1				
8	G 4-100130	Fiber Washer	1				
9	241-33031	Upper Supporting Shaft	1				
10	241-33051	Lower Supporting Shaft	1				
11	X P-3005S	Screw	1				
12	241-33071	Bracket	1				
13	X T-4012S	Screw	1				
14	N A-40S	Nut	1				
15	X T-4012S	Screw	1				
16	W E-40	Washer	1				
17	X F-4008S	Screw	1				
18	X F-3008S	Screw	1				
19	241-33081	Nylon Pressure Plug	1				
20	241-33091	Screw (for above)	1				

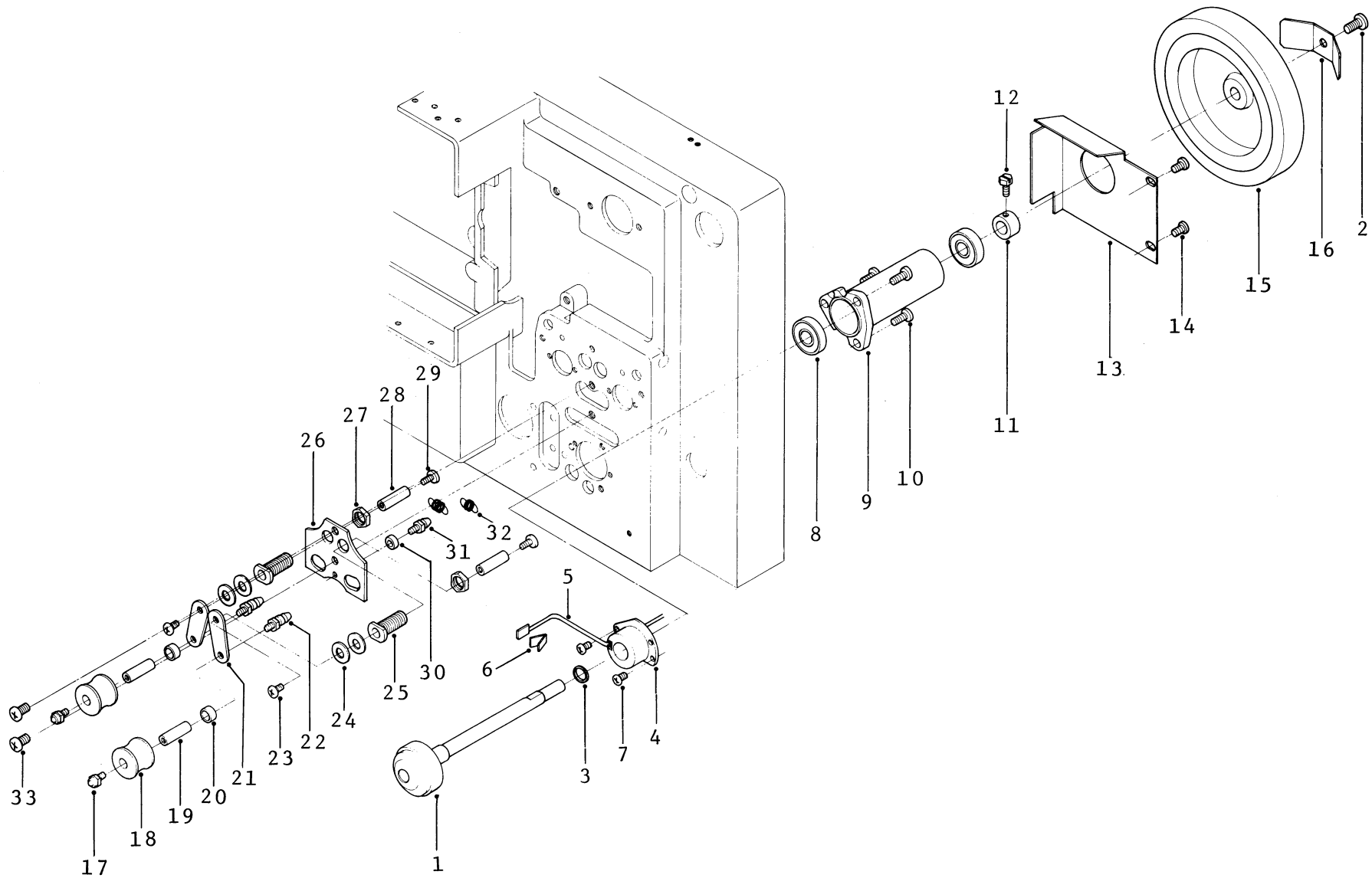
40-0 SOUND PICK-UP



40-0 SOUND PICK-UP

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	X P-3010S	Screw	4	34	WA-30	Washer	1
2	W C-30	Washer	4	35	W C-30	Washer	1
3	312-40021	Sound Lens Holder Pin	2	36	N A-30S	Nut	1
4	241-40101	Sound Lens Holder Assy.	1	37	X T-3012S	Screw	1
5	*X P-3006S	Screw	1	38	X T-3010S	Screw	3
6	*X P-3018S	Screw	1	39	WA-30	Washer	3
7	312-40031	Slot Pin	2	40	S T-40111	Exciter Lamp	1
8	S T-40201	Sound Lens Assy.	1	*	241-40201	Sound Terminal Assy.	1
9	241-40291	Exciter Lamp Cover	1	41	*S T-22051	Optical Input Plug	1
10	241-40171	Bracket	1	42	*S T-40281	Magnetic Input Plug	1
11	X P-3510	Screw	1	43	*S T-40261	Sound Terminal	1
12	W C-35	Washer	1	44	X P-3006S	Screw (for above)	2
13	W E-35	Washer	2				
14	WA-35	Washer	2				
15	S T-15281	Nut	1				
16	X 1-40521	Spacer	1				
17	260-40061	Spring	1				
18	312-10161	Spring Screw	1				
19	X 1-40511	Bushing	1				
20	241-40031	Shaft	1				
21	G 8-060100	Fiber Washer	1				
22	260-40041	Magnetic Head Mounting Arm	1				
23	X T-3506	Screw	1				
24	260-40021	Magnetic Head Adjusting Plate	1				
25	X P-2305	Screw	3				
26	312-40191	Magnetic Head	1				
27	W C-30	Washer	1				
28	N B-30S	Nut	1				
*	312-40601	Exciter Lamp Socket Assy. (Includes items 29 thru 37)	1				
29	312-40401	Exciter Lamp Socket	1				
30	S T-40141	Rubber Grommet	3				
31	S T-40161	Insulating Washer (Female)	1				
32	S T-40171	Lug	1				
33	S T-40151	Insulating Washer (Male)	1				

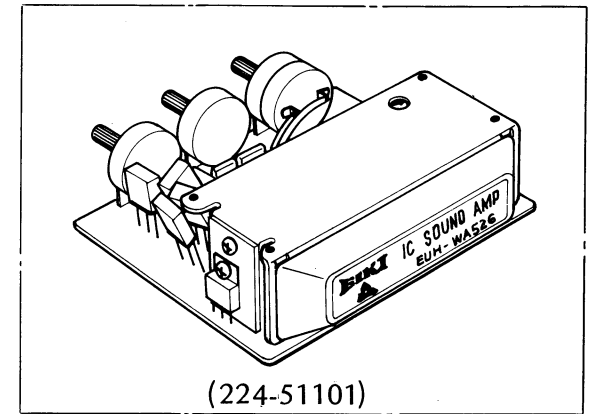
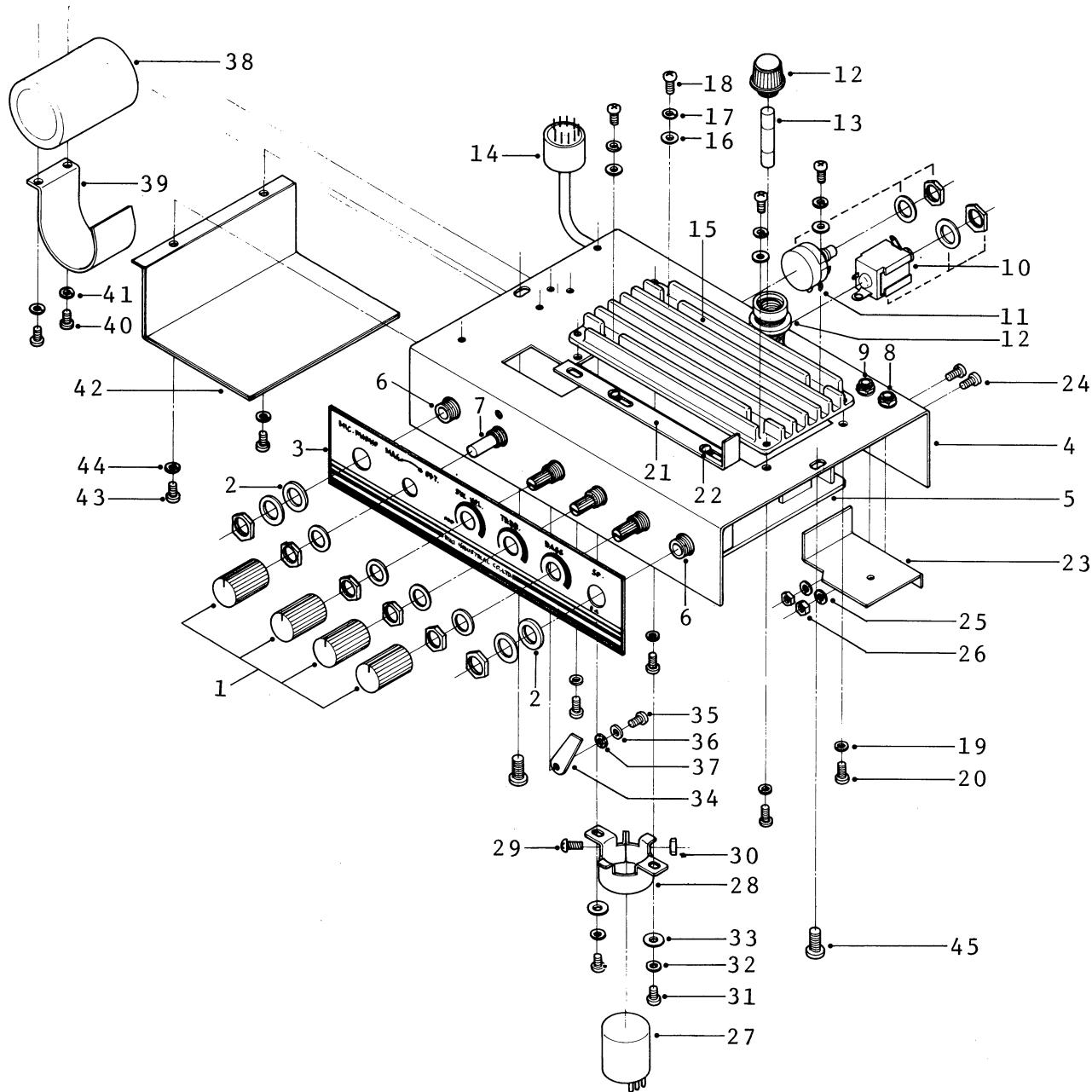
41-0 SOUND DRUM



41-0 SOUND DRUM

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	312-80371	Sound Drum Assy.	1				
2	*X T-4008S	Screw	1				
3	G 4-080100	Fiber Washer	1				
*	241-41101	Solar Cell Case Assy.	1				
4	*260-41021	Solar Cell Case Only	1				
5	*S T-40181	Solar Cell Only	1				
6	*S T-40491	Solar Cell Support	1				
7	X T-2306	Screw (for above)	2				
8	O B-608Z	Ball Bearing	2				
9	241-41031	Hub Casting	1				
10	X P-3510	Screw	3				
11	S T-41041	Set Collar	1				
12	312-17381	Set Screw	1				
13	241-41021	Shield Plate	1				
14	X P-3005S	Screw	2				
15	312-41051	Flywheel	1				
16	S T-41061	Plate Spring	1				
17	260-41041	Screw	2				
18	260-41051	Sound Cushion Roller	2				
19	260-41061	Shaft	2				
20	241-41041	Spacer	2				
21	260-41081	Sound Cushion Roller Arm	2				
22	312-10171	Spring Screw	2				
23	X T-3005S	Screw	2				
24	G 8-050120	Fiber Washer	4				
25	260-41111	Bushing	2				
26	260-41131	Sound Cushion Roller Bracket	1				
27	260-41121	Nut	2				
28	260-41091	Shaft	2				
29	X T-3006S	Screw	2				
30	241-41051	Spacer	1				
31	312-10161	Spring Screw	1				
32	241-41141	Spring	2				
33	X T-3005S	Screw	2				

50-0 AMPLIFIER

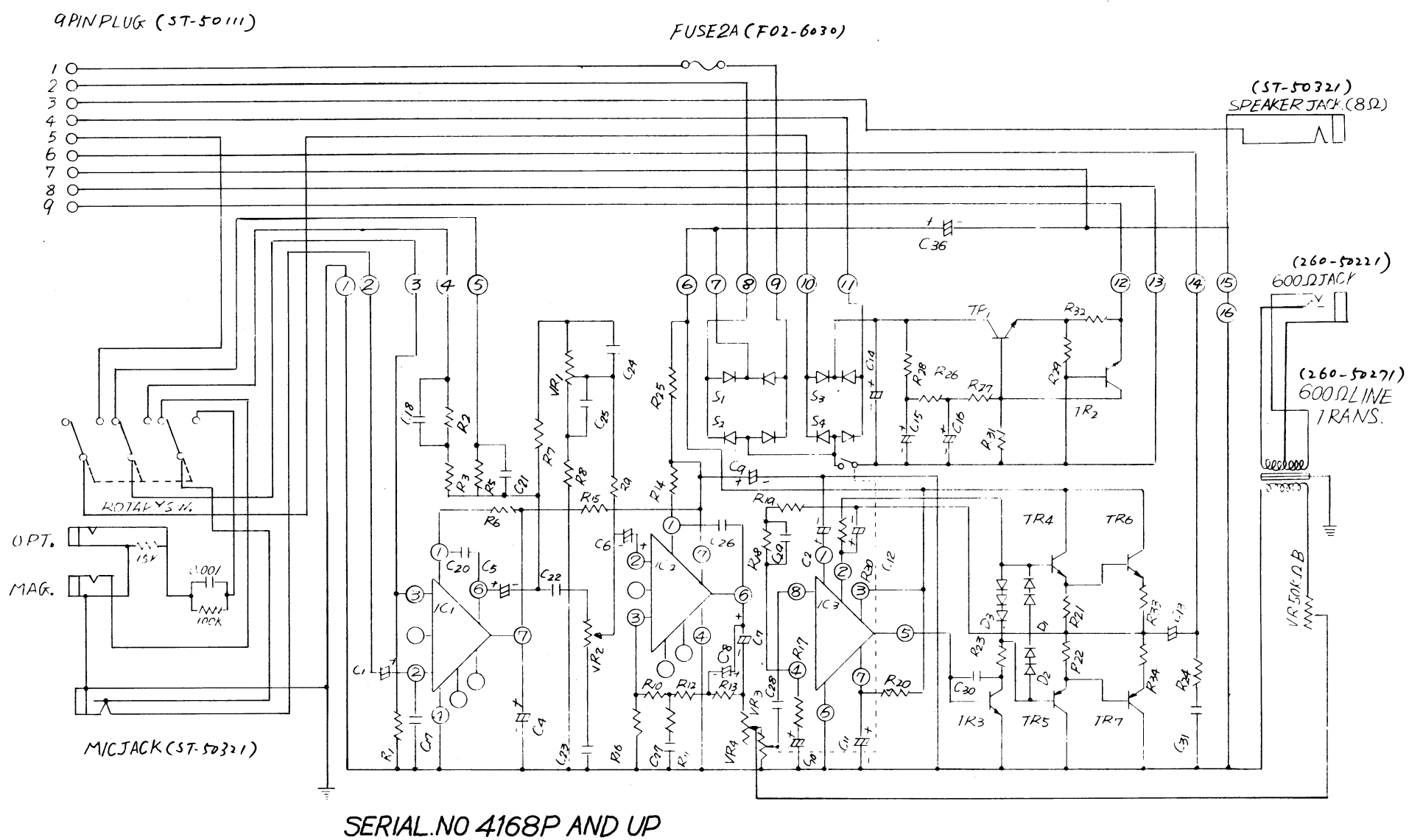
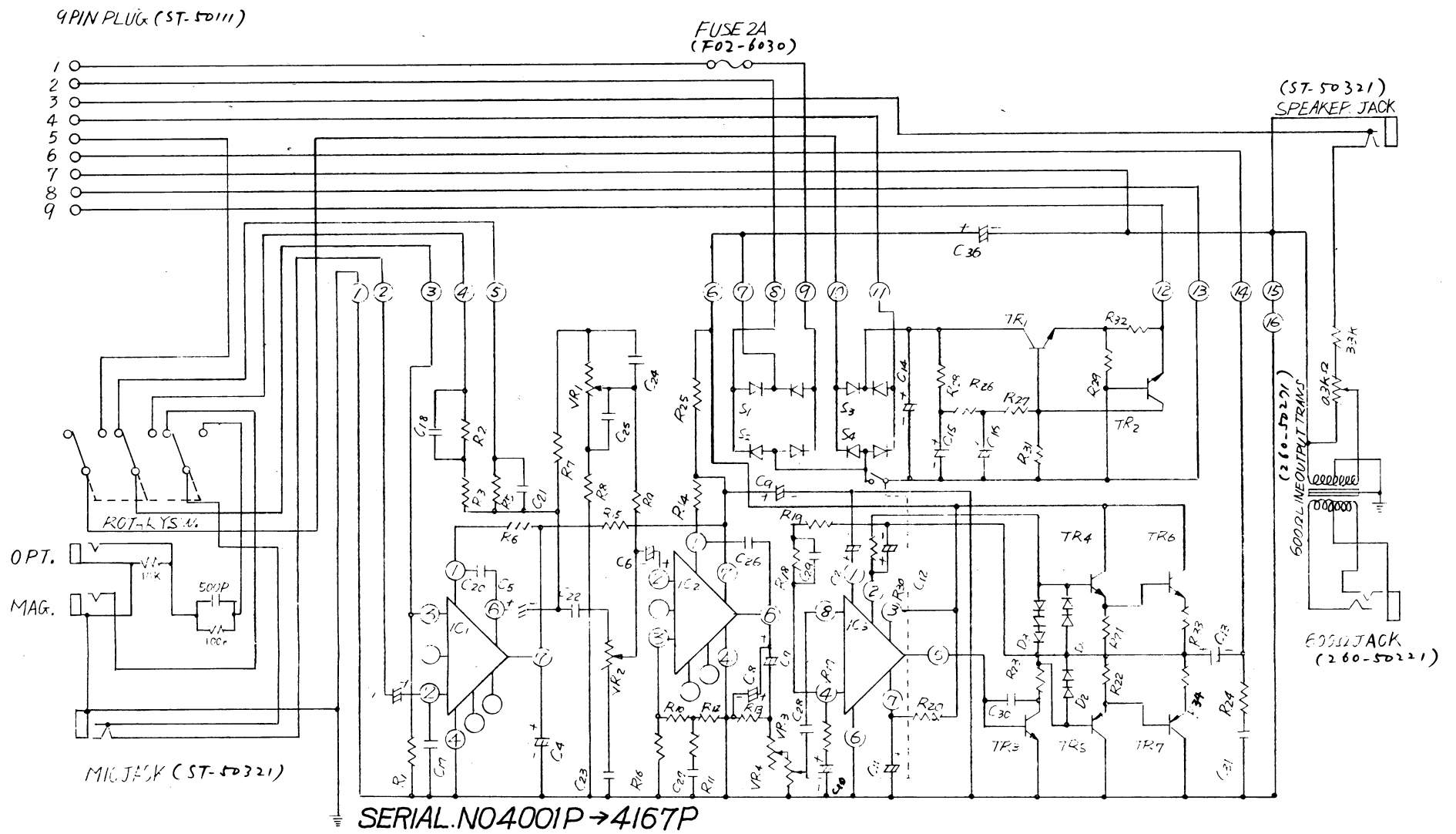


50-0 AMPLIFIER

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
*	241-50101	Amplifier Module (Includes items 1 thru 44)	1	30	* N A-30S	Nut	1
*	224-51101	Main P.C. Board Assy.	1	31	X P-3006S	Screw (for above)	2
1	241-50281	Control Knob	4	32	WA-30	Washer	2
2	312-50221	Insulating Bushing	2	33	WC-30	Washer	2
3	241-50211	Control Panel	1	34	241-50261	Magnetic Head Lever	1
4	241-50591	Amplifier Chassis Only	1	35	X P-3005S	Screw	1
5	312-52591	P.C. Board Only	1	36	WC-30	Washer	1
6	S T-50321	MIC/Speaker Jack	2	37	WE-30	Washer	1
7	S T-50241	OPT/MAG. Selection Switch	1	38	C E-800228	Capacitor (2200 MFD, 80V)	1
8	S T-50131	OPTICAL Input Jack	1	39	260-50231	Capacitor Clamp	1
9	S T-50151	MAGNETIC Input Jack	1	40	X P-3004S	Screw (for above)	2
10	260-50221	3P Jack (600 Ohm Line Output)	1	41	WC-30	Washer	2
11	260-50251	Volume (0.3K Ohm) Control	1	42	241-50231	Shield Plate	1
12	S T-50061	Fuse Holder	1	43	X P-3005S	Screw (for above)	2
13	FO2-6030	Fuse 2A (ø6 x 30)	1	44	WC-30	Washer	2
14	S T-50111	9P MT Plug	1	45	X T-4006S	Screw	2
15	241-50241	Fin Heat-Radiating Plate	1				
16	WA-30	Washer	4				
17	WC-30	Washer	4				
18	X P-3008S	Screw	4				
19	WC-30	Washer	4				
20	X P-3005S	Screw	4				
21	241-50251	Magnetic Head Lever	1				
22	312-31061	Screw (for above)	2				
23	241-50221	Input Shield Plate	1				
24	X P-3005S	Screw (for above)	2				
25	WC-30	Washer	2				
26	N A-30S	Nut	2				
27	260-50271	Line Transformer	1				
28	260-50101	Transformer Holder Assy.	1				
29	*X P-3005S	Screw	1				

50-1 AMPLIFIER P.C. BOARD (EIKI AMPLIFIER)

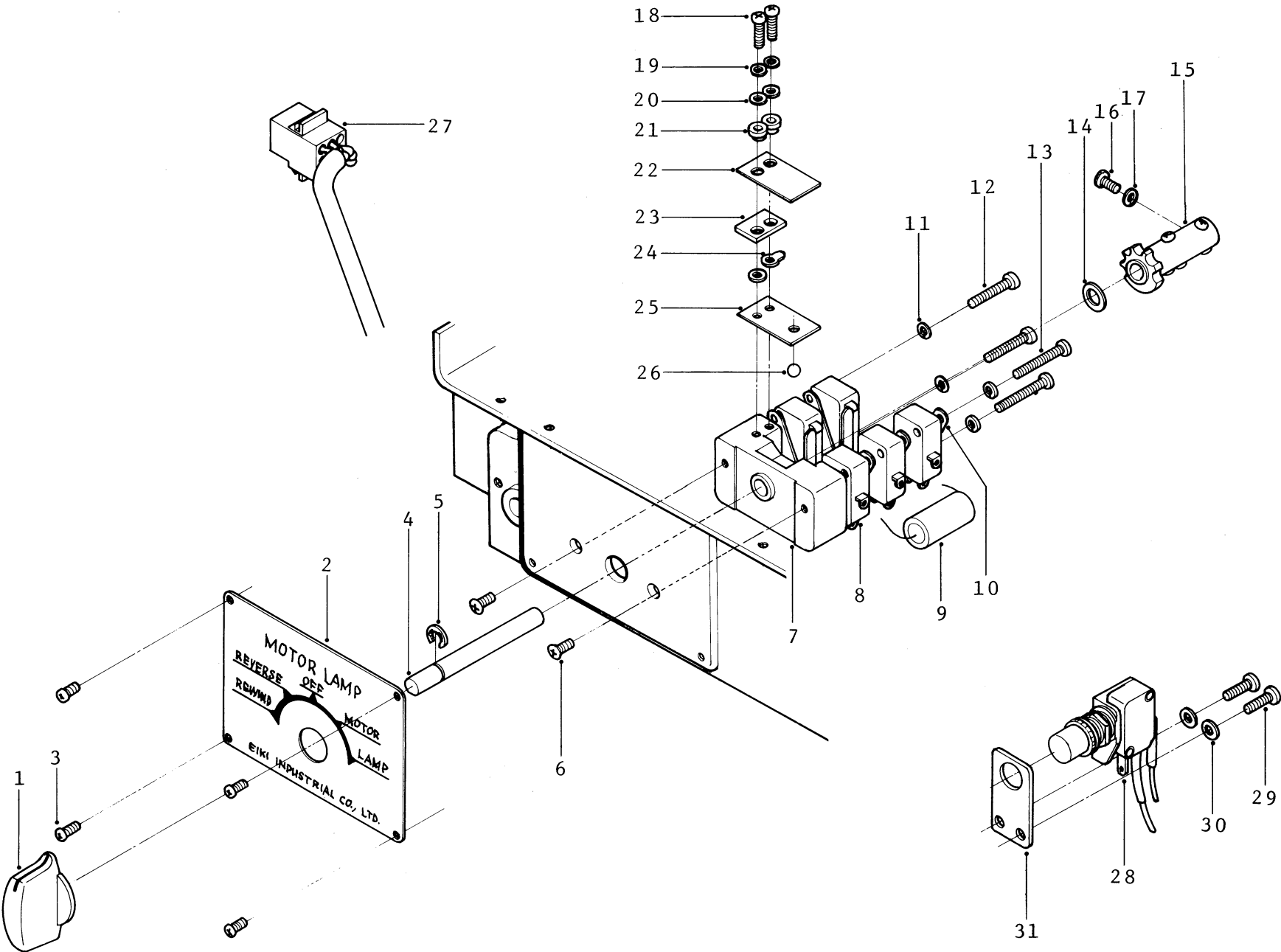
EX-4000P AMP LIFIER CIRCUIT DIAGRAM



50-1 AMPLIFIER P.C.BOARD

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
*	224-51101	P.C. Board Assy.	1	VR-1	312-52061	Volume 50K Ohm B	1
IC-1	312-52521	IC AN360	1	VR-2	312-52061	Volume 50K Ohm B	1
IC-2	312-52521	IC AN360	1	VR-3	312-52041	Volume 50K Ohm A with Switch	1
IC-3	312-52121	IC EHM-108A01	1	VR-4	312-52261	Volume MTVR 50K Ohm B	1
D-1	312-52131	Diode MA26W	1	R-1	R A-R25331	Resistor 1/4W 330 Ohm	1
D-2	312-52131	Diode MA26W	1	R-2	R A-R25103	Resistor 1/4W 10K Ohm	1
D-3	312-52141	Diode MA26TB	1	R-3	R A-R25332	Resistor 1/4W 3.3K Ohm	1
TR-1	2SD-389	Transistor 2SD 389	1	R-5	R A-R25154	Resistor 1/4W 150K Ohm	1
TR-2	2SC-1317	Transistor 2SC 1317	1	R-6	R A-R25683	Resistor 1/4W 68K Ohm	1
TR-3	2SC-1509	Transistor 2SC 1509	1	R-7	R A-R25153	Resistor 1/4W 15K Ohm	1
TR-4	2SC-1567	Transistor 2SC 1567	1	R-8	R A-R25202	Resistor 1/4W 2K Ohm	1
TR-5	2SA-794	Transistor 2SA 794	1	R-9	R A-R25472	Resistor 1/4W 4.7K Ohm	1
TR-6	2SC-1667	Transistor 2SC 1667	1	R-10	R A-R25392	Resistor 1/4W 3.9K Ohm	1
TR-7	2SA-837	Transistor 2SA 837	1	R-11	R A-R25821	Resistor 1/4W 820 Ohm	1
S-1	S T-51091	Diode 1D2C1	1	R-12	R A-R25472	Resistor 1/4W 4.7K Ohm	1
S-2	S T-51111	Diode 1D2Z1	1	R-13	R A-R25272	Resistor 1/4W 2.7K Ohm	1
S-3	S T-51091	Diode 1D2C1	1	R-14	R A-R25563		
S-4	S T-51111	Diode 1D2Z1	1		-R25913	Resistor 1/4W 56K-91K Ohm	1
C-1	C E-500474	Capacitor 50V 0.47 MFD	1	R-15	R A-R25152		
C-2	C E-630335	Capacitor 63V 3.3 MFD	1		-R25222	Resistor 1/4W 1.5K-2.2K Ohm	1
C-4	C E-160476	Capacitor 16V 47 MFD	1	R-16	R A-R25471	Resistor 1/4W 470 Ohm	1
C-5	C E-500105	Capacitor 50V 1 MFD	1	R-17	R A-R25560	Resistor 1/4W 56 Ohm	1
C-6	C E-500474	Capacitor 50V 0.47 MFD	1	R-18	R A-R25393	Resistor 1/4W 39K Ohm	1
C-7	C E-250106	Capacitor 25V 10 MFD	1	R-19	R A-R25103	Resistor 1/4W 10K Ohm	1
C-8	C E-500474	Capacitor 50V 0.47 MFD	1	R-20	R A-R25223		
C-9	C E-250107	Capacitor 25V 100 MFD	1		-R25243	Resistor 1/4W 22K-24K Ohm	1
C-10	C E-500226	Capacitor 50V 22 MFD	1	R-21	R A-R50101	Resistor 1/2W 100 Ohm	1
C-11	C E-500476	Capacitor 50V 47 MFD	1	R-22	R A-R50101	Resistor 1/2W 100 Ohm	1
C-12	C E-500476	Capacitor 50V 47 MFD	1	R-23	R A-R50101	Resistor 1/2W 100 Ohm	1
C-13	C E-500477	Capacitor 50V 470 MFD	1	R-24	R A-R50100	Resistor 1/2W 10 Ohm	1
C-14	C E-160108	Capacitor 16V 1000 MFD	1	R-25	R A-R25103		
C-15	C E-160227	Capacitor 16V 220 MFD	1		-R25183	Resistor 1/4W 10K-18K Ohm	1
C-16	C E-160227	Capacitor 16V 220 MFD	1	R-26	R A-R25910	Resistor 1/4W 91 Ohm	1
C-17	CM-500102	Capacitor 50V 0.001 MFD	1	R-27	R A-R25180	Resistor 1/4W 18 Ohm	1
C-18	CM-500333	Capacitor 50V 0.033 MFD	1	R-28	R A-R25910	Resistor 1/4W 91 Ohm	1
C-20	C C-500560	Capacitor 50V 56 PFD	1	R-29	R A-R25390	Resistor 1/4W 39 Ohm	1
C-21	CM-500682	Capacitor 50V 0.0068 MFD	1	R-30	R A-R25562	Resistor 1/4W 5.6K Ohm	1
C-22	CM-500332	Capacitor 50V 0.0033 MFD	1	R-31	R A-R25331		
C-23	CM-500153	Capacitor 50V 0.015 MFD	1		-R25122	Resistor 1/4W 0.33K-1.2K Ohm	1
C-24	CM-500333	Capacitor 50V 0.033 MFD	1	R-32	RW-1R0R56	Resistor 1W 0.56 Ohm	1
C-25	C E-500334	Capacitor 50V 0.33 MFD	1	R-33	RW-2R0R39		
C-26	C C-500271	Capacitor 50V 270 PFD	1		-2R0R56	Resistor 2W 0.39-0.56 Ohm	1
C-27	CM-500103	Capacitor 50V 0.01 MFD	1	R-34	R A-2R0R39		
C-28	CM-500683	Capacitor 50V 0.068 MFD	1		-2R0R56	Resistor 2W 0.39-0.56 Ohm	1
C-29	CM-500224	Capacitor 50V 0.22 MFD	1				
C-30	C C-500101	Capacitor 50V 100 PFD	1				
C-31	CM-500104	Capacitor 50V 0.1 MFD	1				

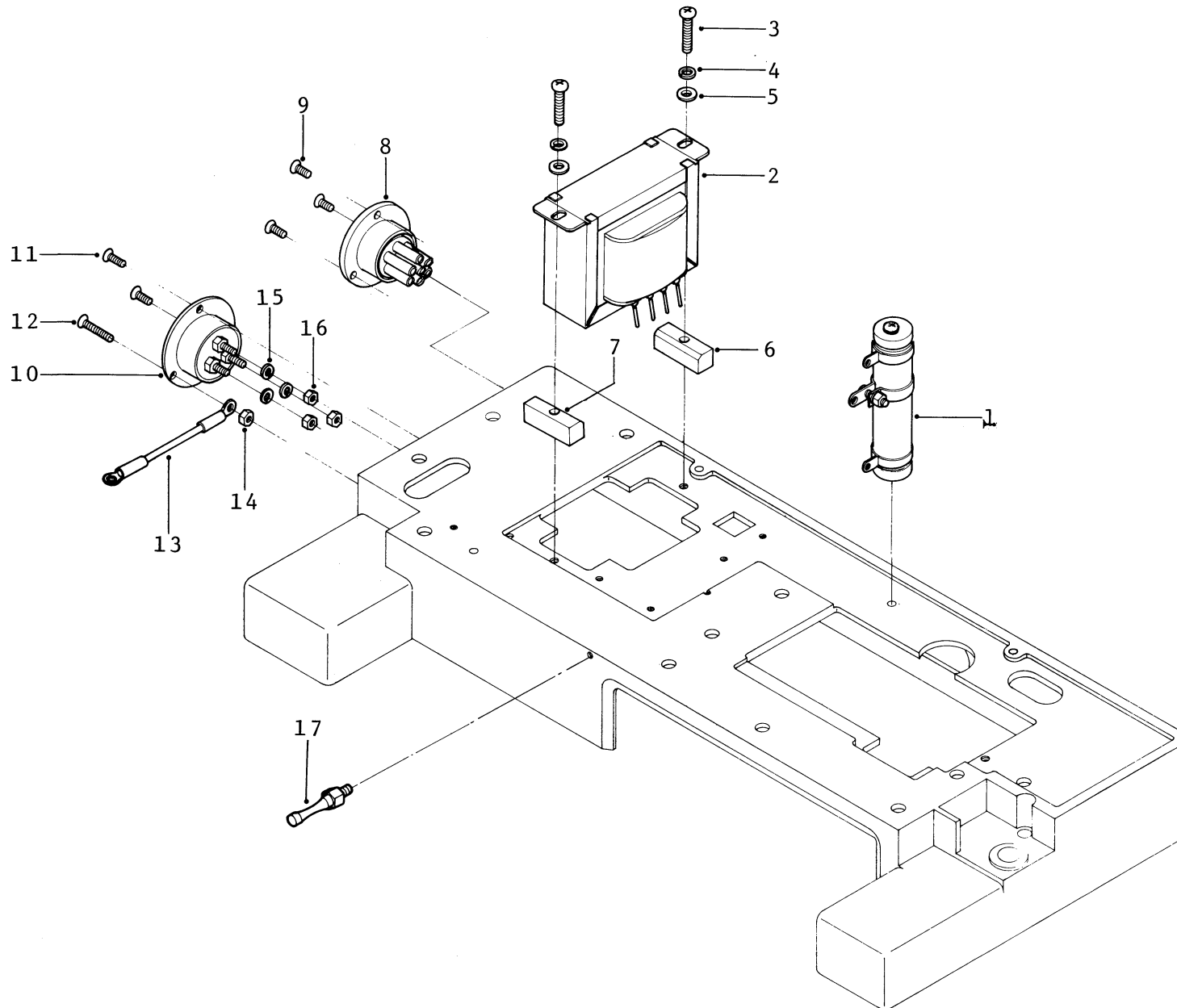
60-0 ELECTRIC PARTS



60-0 ELECTRIC PARTS

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	312-60611	Control Knob	1				
2	241-60141	Switch Plate	1				
3	X P-2304	Screw (for above)	4				
*	241-60501	Rotary Switch Assy. (Includes items 4 thru 26)					
4	260-60571	Shaft	1				
5	E R-40	E Ring	1				
6	X F-3008S	Screw for 222-60521	2				
7	222-60521	Switch Mounting Bracket	1				
8	312-60051A	Micro-Switch	5				
9	CM-601104	Capacitor (600V, 0.1 MFD)	1				
10	312-60531	Actuator	5				
11	WC-30	Washer	4				
12	X P-3028S	Screw	2				
13	X P-3038S	Screw	2				
14	G 2-060120	Fiber Washer	1				
15	260-60601	Cam Bracket Assy.	1				
16	*X T-3014S	Screw (for above)	1				
17	*WC-30	Washer	1				
18	X P-3006S	Screw	2				
19	WC-30	Washer	2				
20	WA-30	Washer	3				
21	241-60131	Insulating Bushing	2				
22	241-60121	Switch Plate	1				
23	241-60111	Insulating Fiber	1				
24	241-60151	Lug	1				
25	312-60561	Plate Spring	1				
26	S T-13231	Clicking Ball	1				
27	241-60091	9 Pin Connector (Female)	1				
28	260-60051	Triad Switch Assy.	1				
29	X P-3008S	Screw (for above)	2				
30	WC-30	Washer	2				
31	241-60081	Plate	1				

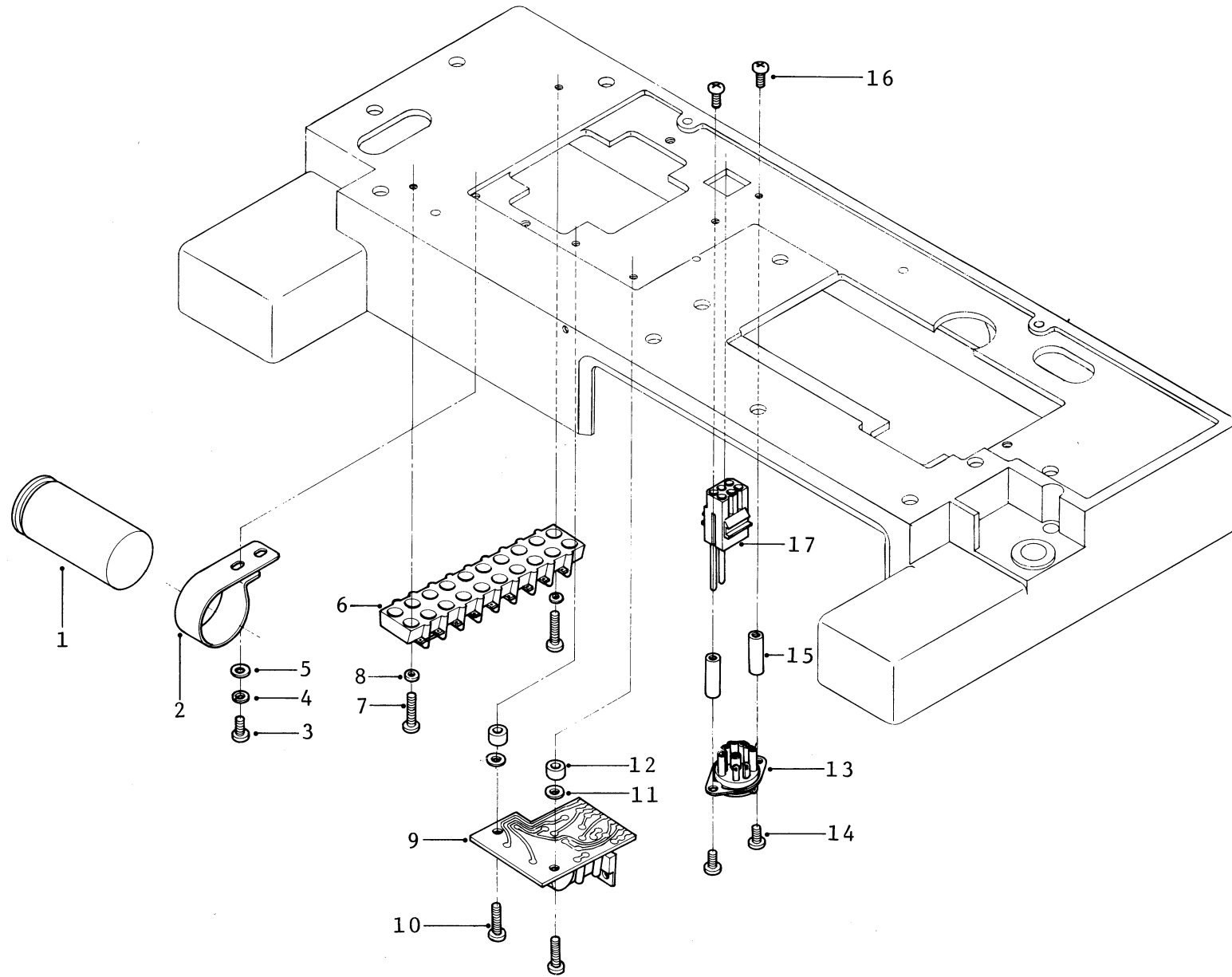
60-1 ELECTRIC PARTS



60-1 ELECTRIC PARTS

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	241-60161	Resistor (30W, 1K Ohm)	1				
2	241-60221	Power Transformer	1				
3	X T-4016S	Screw (for above)	2				
4	W C-40	Lock Washer	2				
5	W A-40	Washer	2				
6	241-60231	Spacer	1				
7	241-60241	Spacer	1				
8	260-63462	Input Receptacle	1				
9	X O-3008S	Screw	3				
10	X 1-62261	Power Input Receptacle	1				
11	X O-3008S	Screw	2				
12	X O-3012S	Screw	1				
13	241-60031	Earth Lead Assy.	1				
14	N A-30S	Nut	1				
15	W C-40	Washer	3				
16	N A-40S	Nut	3				
17	241-17011	Guide Pin	1				

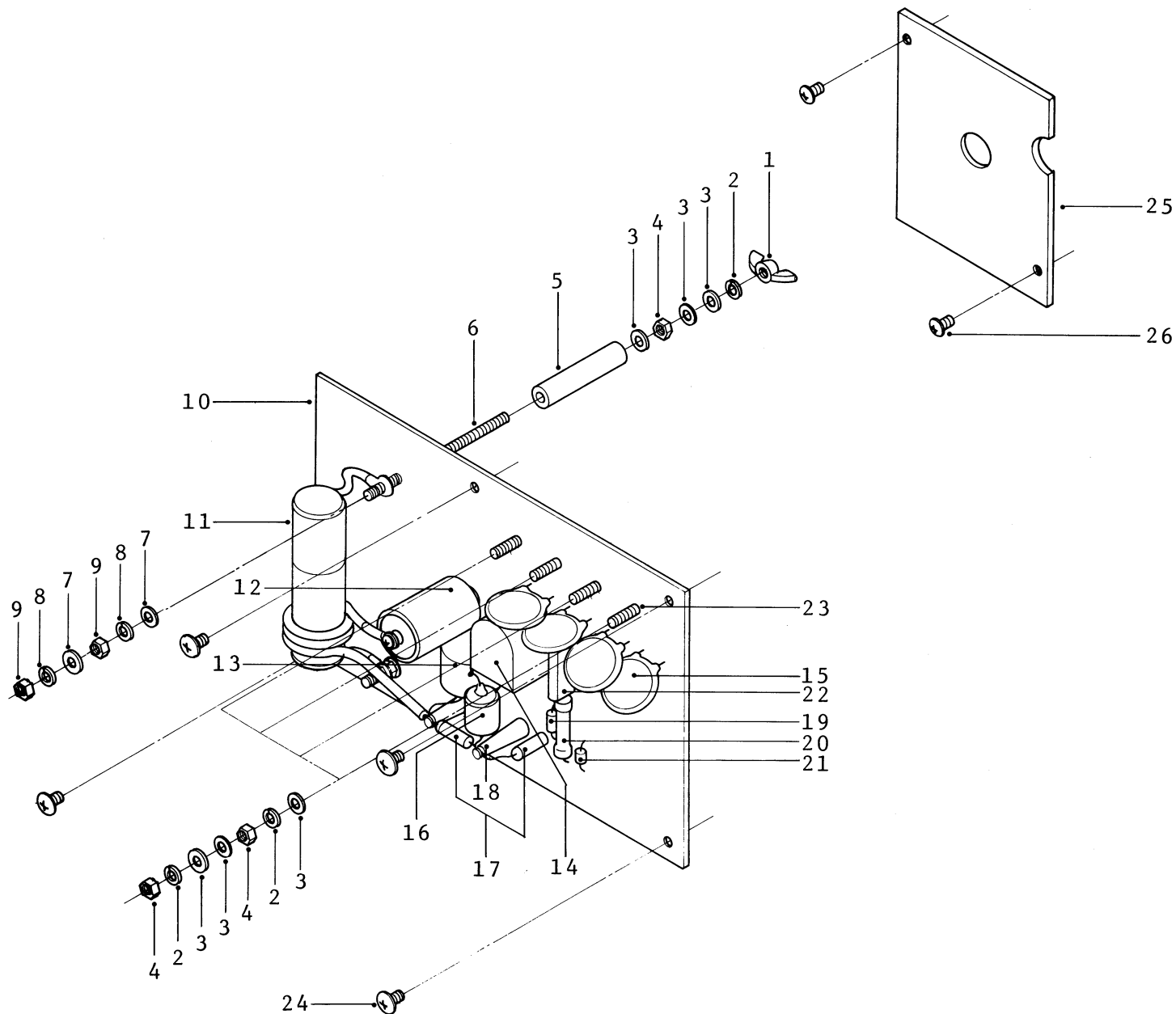
60-2 ELECTRIC PARTS



60-2 ELECTRIC PARTS

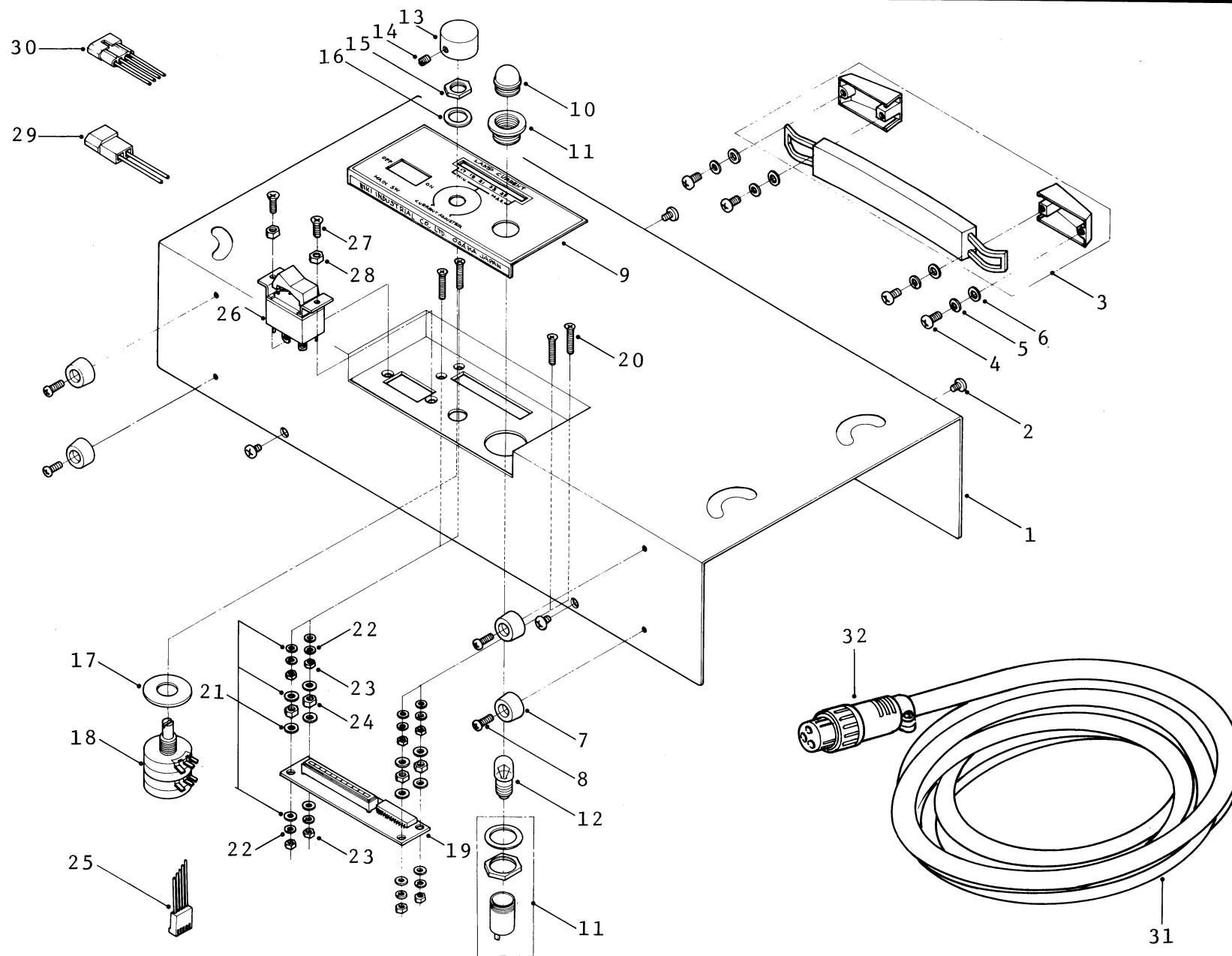
INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	320-12011	Capacitor (200WV, 12 MFD)	1				
2	320-12041	Mounting Bracket	1				
3	X T-3006S	Screw	1				
4	W C-30	Washer	1				
5	W A-30	Washer	1				
6	241-60071	Terminal Strip AC8PD	1				
7	X T-3012S	Screw (for above)	2				
8	W A-30	Washer	2				
9	241-60101	P.C. Board Assy.	1				
	*241-60171	P.C. Board Only	1				
	*R A-R25123	1/4W 12K Ohm	1				
	*R A-R25471	1/4W 470 Ohm	1				
	*R A-R50684	1/2W 680K Ohm	1				
	*R A-R50101	1/2W 100 Ohm	1				
	*R W-2R03R0	2W 3 Ohm	1				
	*C E-161336	Capacitor (160V, 33 MFD)	1				
	*241-60181	Thyristor (SCR)	1				
	*241-60191	AC Relay (100V)	1				
10	X P-3012S	Screw (for above)	2				
11	G 1-030070	Fiber Washer	2				
12	241-60051	Spacer	2				
13	S T-60081	9P Socket	1				
14	X P-3006S	Screw (for above)	2				
15	241-60061	Spacer	2				
16	X T-3008S	Screw	2				
17	312-60581	6P Connector (Female)	1				

62-0 STARTER



62-0 STARTER

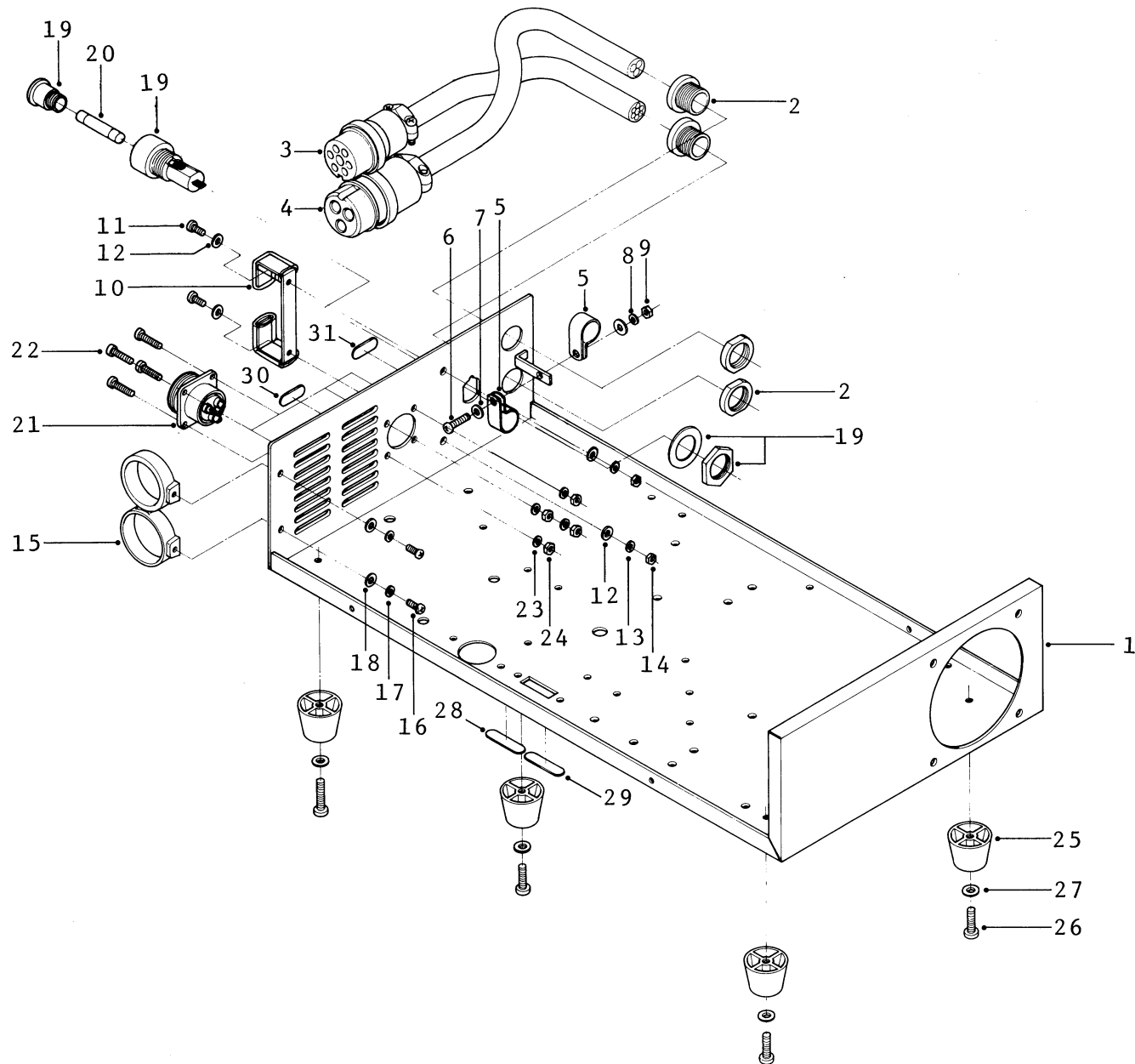
INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
*	241-62001	Starter Assy. (XS-55102AH) (Includes items 1 thru 20)	1				
1	241-62131	Wing Nut	1				
2	241-62151	Lock Washer	9				
3	241-62161	Washer	15				
4	241-62171	Nut	9				
5	241-62111	Lamp Lead Stand-Off	1				
6	241-62121	Screw	1				
7	241-62161	Washer	2				
8	241-62151	Washer	2				
9	241-62171	Nut	2				
10	241-62011	P.C. Board Only	1				
11	241-62031	Tesla Coil with Lead	1				
12	241-62041	Spark Gap (SG-1404)	1				
13	C C-163701	Capacitor (16KV, 700 PFD)	1				
14	241-62091	Pulse Transformer	1				
15	C C-151103	Capacitor (150V, 0.01 MFD)	4				
16	C C-153251	Capacitor (15KV, 250 PFD)	1				
17	241-62071	Diode (HVT-30S)	2				
18	241-62081	Terminal	2				
19	241-62051	Thydac (K1V10)	1				
20	241-62181	Resistor (3W, 1.5K Ohm)	1				
21	241-62061	Diode (10D6)	1				
22	C M-101155	Capacitor (100V, 1.5 MFD)	1				
23	241-62141	Screw	4				
24	X T-4006S	Screw	4				
25	241-62021	Acryl Plate	1				
26	X F-3006S	Screw (for above)	2				



63-0 RECTIFIER

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
*	241-63001	Rectifier Assy. Complete (for Serial No. 4027P, 4029P, 4030P-4031P, 4055P-4071P, 4085P-4101P, 4112P-4116P, 4130P-4131P)	1 only	PB-0035-A P.C. BOARD DIAGRAM			
*	241-63002	Rectifier Assy. Complete with the current adjuster (for Serial No. 4126P-4129P, 4132P-4166P)	1 only				
*	241-63002a	Rectifier Assy. Complete with the current adjuster (for Serial No. 4167P-4236P)	1 only				
*	241-63002b	Rectifier Assy. Complete with the current adjuster (for Serial No. 4237P and up)	1 only				
1	241-63011	Rectifier Chassis Cover	1	19	241-63601	P.C. Board Assy. (PB-0035-A)	1
2	X T-3506	Screw (for above)	4	20	X F-2315S	Screw (for above)	4
3	241-63101	Handle Assy.	1	21	WA-23	Washer	16
4	X T-3506	Screw (for above)	4	22	WC-23	Washer	8
5	WC-35	Washer	4	23	NA-23S	Nut	8
6	WA-35	Washer	4	24	NA-30S	Nut	4
7	241-63021	Rubber Foot	4	25	241-63081	5P Connector (Female) (on 241-63601, PCB Assy.)	1
8	X P-3008S	Screw (for above)	4	26	241-63041	Main Switch	1
9	241-63031	Switch Plate	1	27	X F-3012S	Screw	2
10	S T-60521	Pilot Lamp Cap	1	28	NA-40S	Nut	2
11	S T-60111	Pilot Lamp Holder with Washers	1	29	260-60041	2P Connector (Male) (to 241-63041, Main Switch)	1
12	241-63121	Pilot Lamp	1	30	241-63071	4P Connector (Male) (to 241-63041, Main Switch)	1
13	980-13601	Control Knob Assy.	1	*	241-60201	Power Cord Assy.	1
14	*980-13271	Screw	1	31	*241-60251	Power Cord Only	1
15	N B-80	Nut	1	32	*241-60261	Plug Only	1
16	WA-80	Washer	1				
17	WA-80	Washer	1				
18	241-63061	Variable Resister (RV 24YG20SB 500 Ohm)	1				

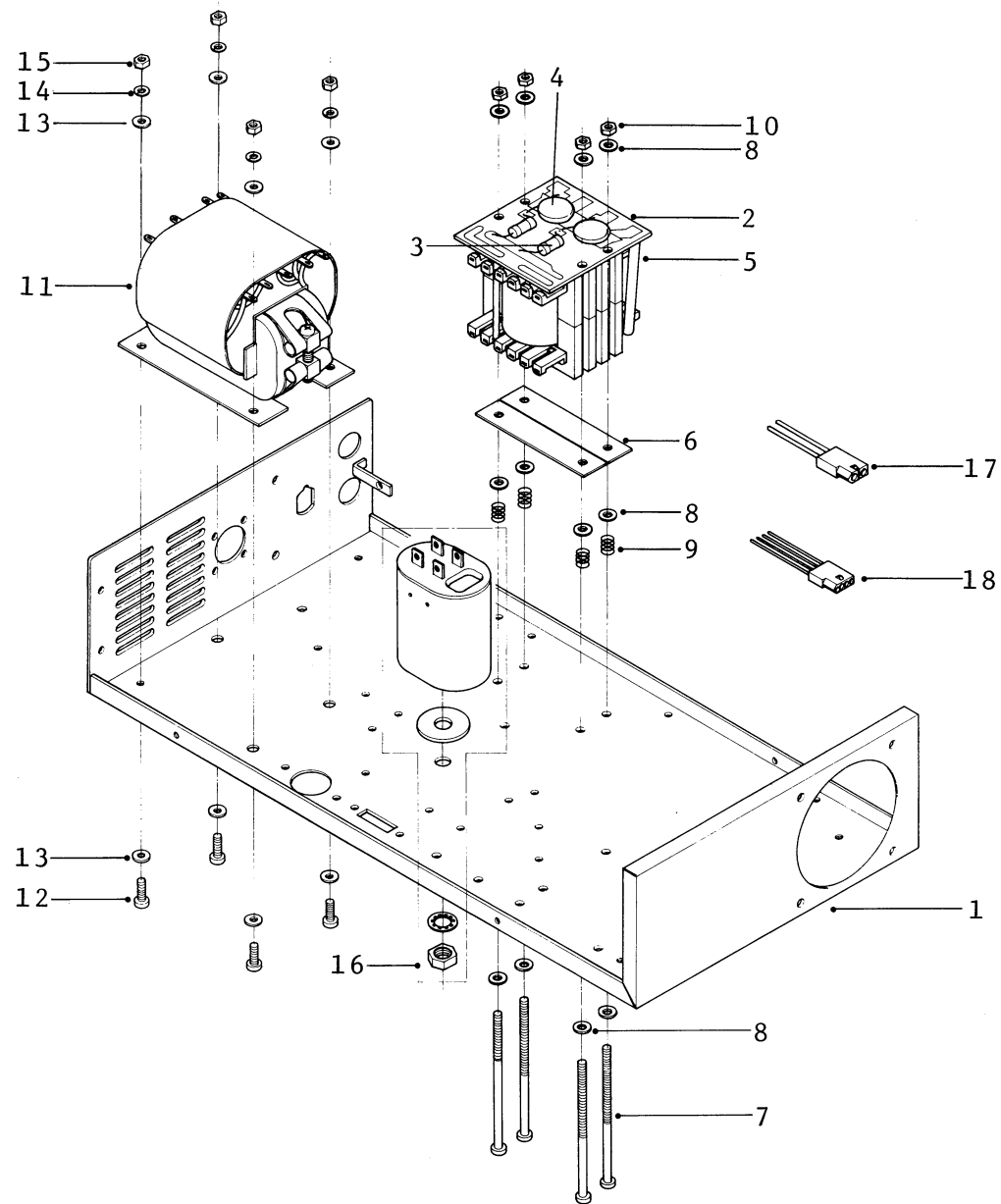
63-1 RECTIFIER



63-1 RECTIFIER

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	241-63231	Rectifier Chassis Base Plate	1	30	241-60271	Voltage Plate (100V)	1 only
2	241-63091	Cord Bushing with Nut	2	*	241-60281	Voltage Plate (120V)	1 only
3	260-63371	Control Plug	1	*	241-60291	Voltage Plate (220V)	1 only
4	X 1-62191	3P Plug	1	*	241-60311	Voltage Plate (240V)	1 only
5	241-63111	Cord Clip	2	31	241-60321	Fuse Plate (10A)	1 only
6	X P-3012S	Screw (for above)	1	*	241-60331	Fuse Plate (15A)	1 only
7	WA-30	Washer	2				
8	WC-30	Washer	1				
9	N B-30S	Nut	1				
10	241-63141	Cord Support	1				
11	X P-3010S	Screw (for above)	2				
12	WA-30	Washer	4				
13	WC-30	Washer	2				
14	N B-30S	Nut	2				
15	241-63131*	Plug Bracket	1				
16	X P-3008S	Screw (for above)	2				
17	WC-30	Washer	2				
18	WA-30	Washer	2				
19	241-63151	Fuse Holder Assy.	1				
20	F15-6030	Fuse 15A ($\phi 6 \times 30$) (for 100V, 110V, 120V)	1 only				
*	F10-6030	Fuse 10A ($\phi 6 \times 30$) (for 220V, 240V)	1 only				
21	241-63161	3P Input Receptacle	1				
22	X P-3012S	Screw (for above)	4				
23	WC-30	Washer	4				
24	N B-30S	Nut	4				
25	241-63171	Rubber Foot	4				
26	X P-4012S	Screw	4				
27	WA-40	Washer	4				
28	241-63181	Voltage (220/240V) Selecting Plate	1				
29	241-63191	Voltage (100/120V) Selecting Plate	1				

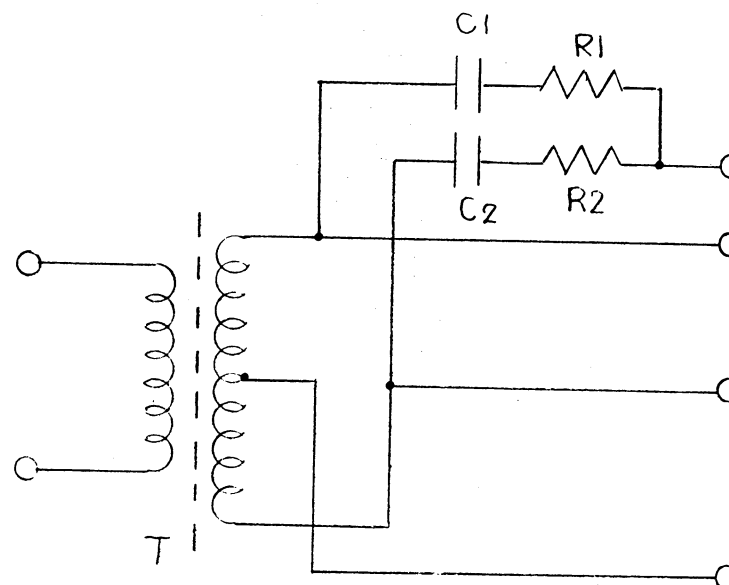
63-2 RECTIFIER



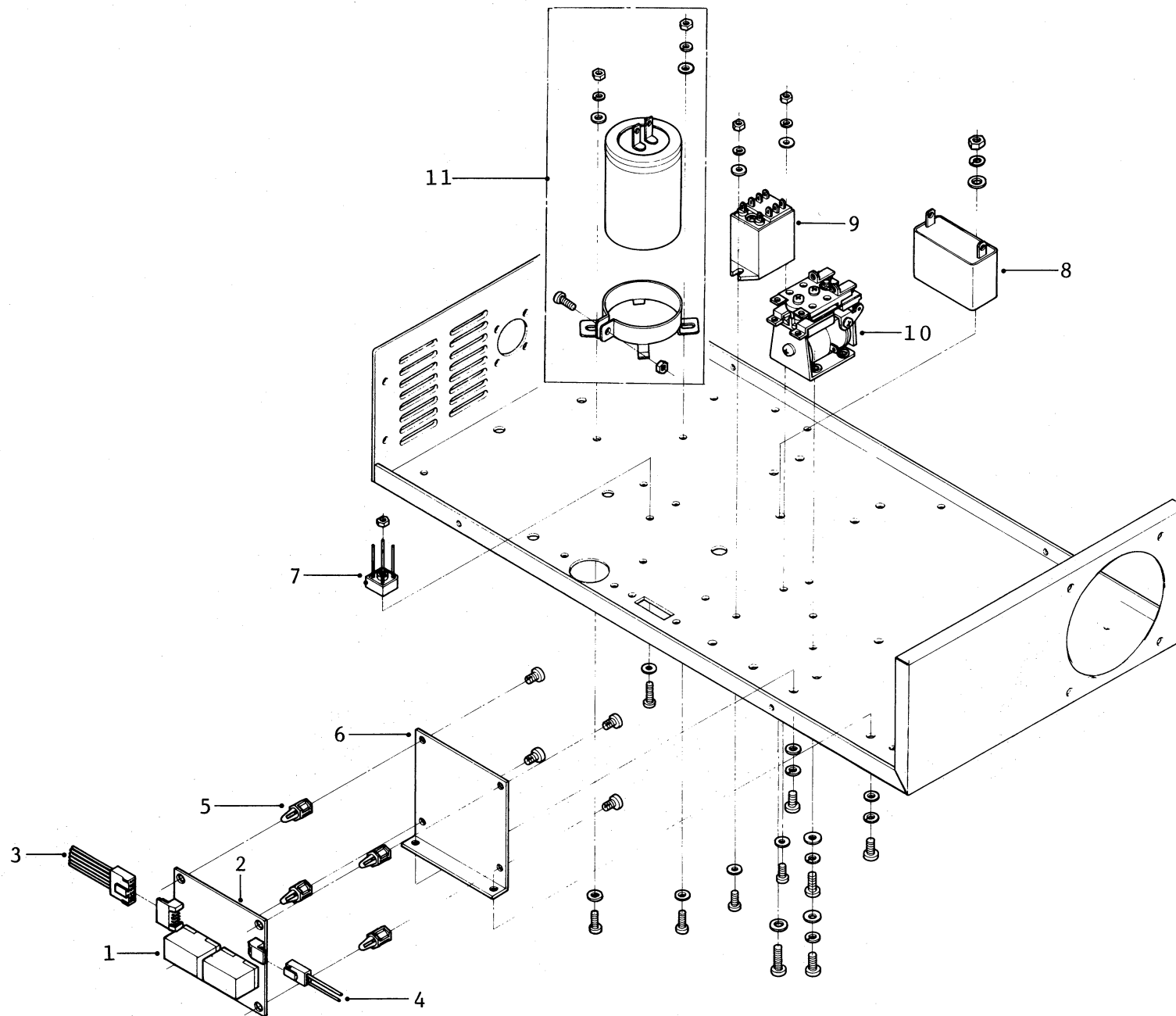
63-2 RECTIFIER

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	241-63231	Rectifier Chassis Base Plate	1				
*	241-63201	P.C. Board Assy. (PB-0033-A)	1				
2	*241-63051	P.C. Board Only	1				
3	*241-63611	Resister, 2W 100 Ohm	2				
4	*C C-401472	Capacitor, 400V 0.0047 MFD	2				
5	*241-63251	Main Transformer (3K4-13011)	1				
6	241-63281	Insulating Plate	1				
7	X P-4090S	Screw (for above)	4				
8	WA-40	Washer	12				
9	241-63271	Spring	4				
10	NA-40S	Nut	4				
11	241-63241	Step Down Transformer (3K4-13002)	1				
12	X P-4012S	Screw (for above)	4				
13	WA-40	Washer	8				
14	WC-40	Washer	4				
15	NA-40S	Nut	4				
16	241-63261	Noise Filter Assy. (NF-220-15-1)	1				
17	260-60131	2P Connector (Female) (To 241-63241, Step Down Transformer)	1				
18	241-63291	4P Connector (Female) (To 241-63041, Main Switch)	1				

PB-0033-A P.C. BOARD DIAGRAM

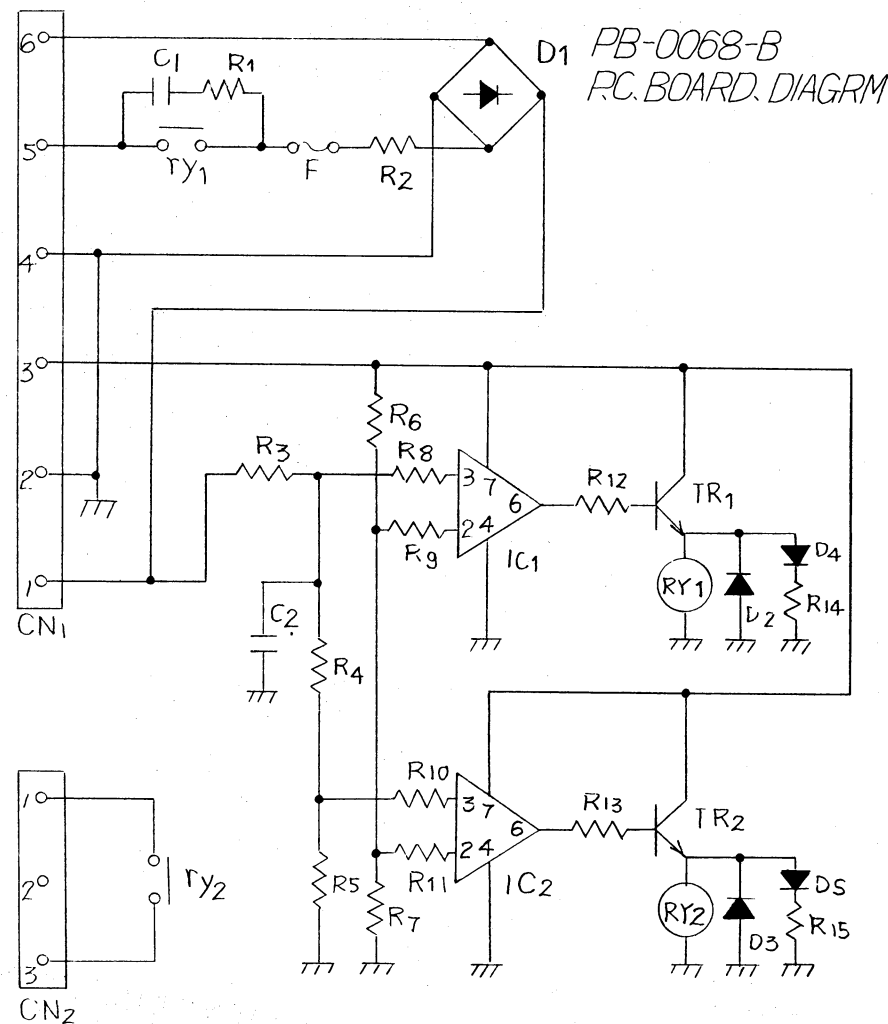


63-3 RECTIFIER

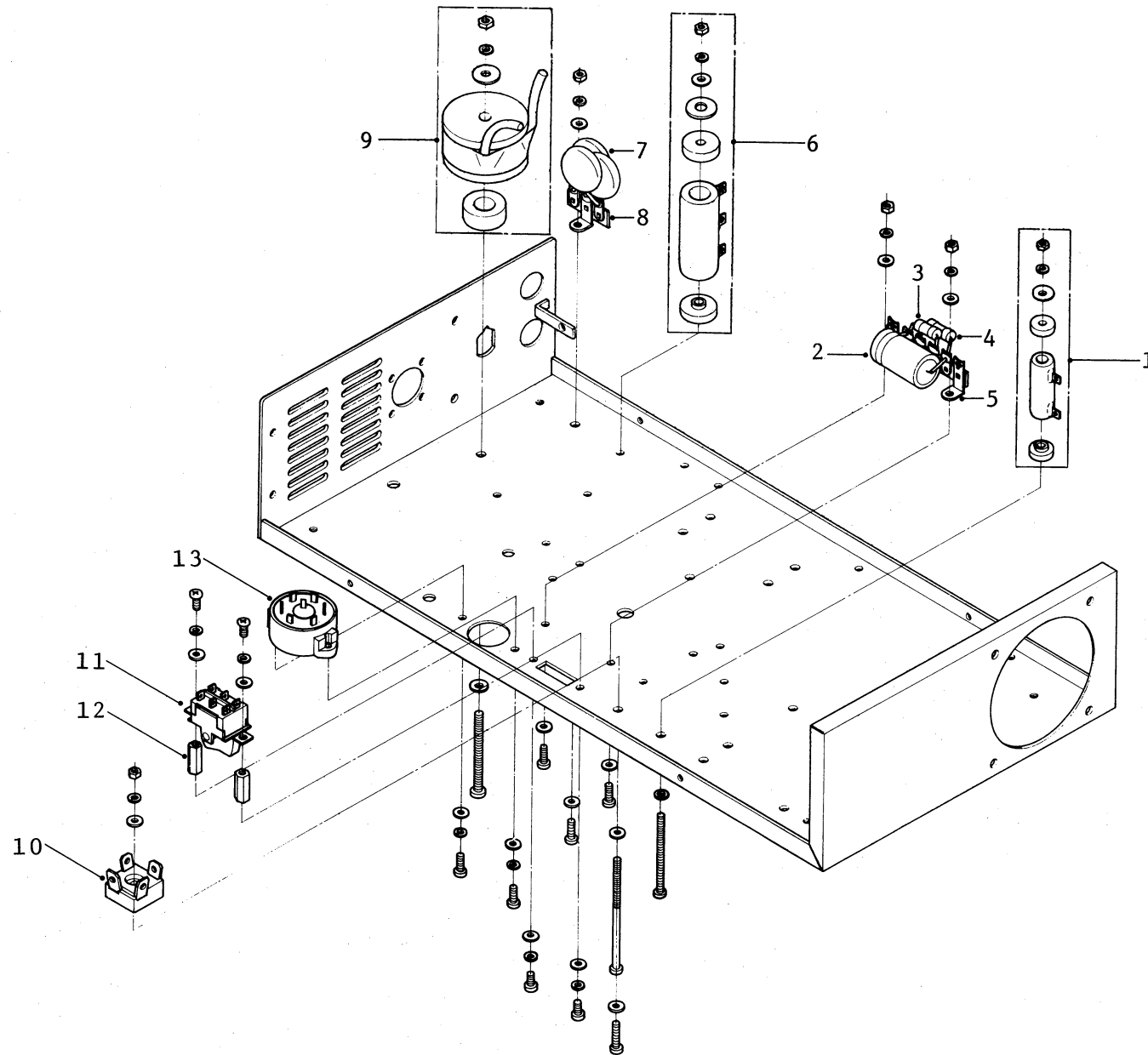


63-3 RECTIFIER

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	241-63301	P.C. Board Assy. (PB-0068-B)	1	8	241-63361	Capacitor, 200V 4.5 MFD	1
2	*241-63881	P.C. Board Only	1	9	241-63371	AC 100V Relay (MY2F)	1
TR-1	*2SC-2235	Transistor 2SC-2235	1	10	241-63381	DC 62.5V Relay (MM2-UI)	1
TR-2	*2SC-2235	Transistor 2SC-2235	1	11	C E-161108	Capacitor, 160V 1000 MFD	1
IC-1	*241-63891	IC MA741CP	1				
IC-2	*241-63891	IC MA741CP	1				
D-1	*241-63911	Diode RB-154	1				
D-2	*241-63861	Diode IS1834	1				
D-3	*241-63861	Diode IS1834	1				
D-4	*241-63921	Diode TLR113	1				
D-5	*241-63931	Diode TLG113	1				
C-1	*CM-201104	Capacitor, 200V 0.1 MFD	1				
C-2	*CM-500103	Capacitor, 50V 0.01 MFD	1				
R-1	*241-63941	Resistor, 1W 10 Ohm	1				
R-2	*241-63951	Resistor, 7W 68 Ohm	1				
R-3	*241-63961	Resistor, 2W 12K Ohm	1				
R-4	*R A-R25751	Resistor, 1/4W 750 Ohm	1				
R-5,14, -15	*R A-R25471	Resistor, 1/4W 470 Ohm	3				
R-6	*R A-R25392	Resistor, 1/4W 3.9K Ohm	1				
R-7,12, -13	*R A-R25102	Resistor, 1/4W 1K Ohm	3				
R-8 to -11	*R A-R25103	Resistor, 1/4W 10K Ohm	4				
F	*241-63971	Temperature Fuse (MT4283A)	1				
CN-1	*241-63981	6P Connector (Male) (IL-6P-S3FP2)	1				
CN-2	*241-63991	3P Connector (Male) (IL-3P-S3FP2)	1				
RY-1	*241-63701	DC Relay (AW 2211)	1				
RY-2	*241-63701	DC Relay (AW 2211)	1				
3	241-63311	6P Connector (Female)	1				
4	241-63321	3P Connector (Female)	1				
5	241-63341	Tapping Support with Screw	4				
6	241-63331	P.C. Board Mounting Bracket	1				
7	241-63591	Diode Stack (S4VB40)	1				



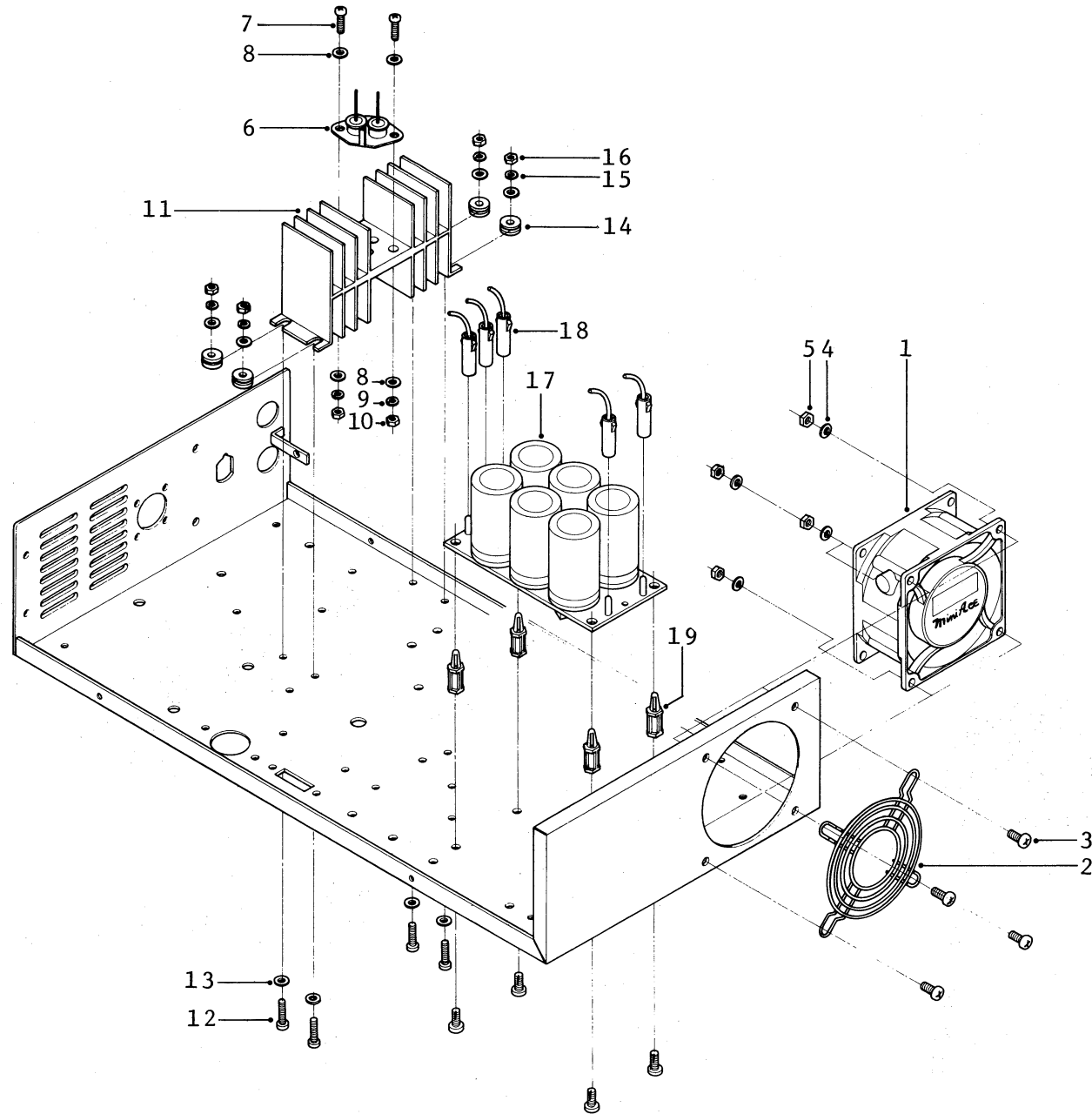
63-4 RECTIFIER



63-4 RECTIFIER

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	R E-2R0100	Resistor with Screw, Nut and Washer, 5W 10 Ohm	1				
2	C E-101227	Capacitor, 100V 220 MFD	1				
3	241-63621	Resistor, 3W 820 Ohm	1				
4	241-63631	Resistor, 2W 47 Ohm	1				
5	241-60341	Lug	1				
6	R E-200R03	Resistor with Screw, Nut and Washer (20W 0.03 & 0.03 Ohm)	1				
7	C C-151103	Capacitor, 150V 0.01 MFD	3				
8	241-60351	Lug	1				
9	241-63421	Choke Coil with Screw, Nut and Washer (3K4-13003)	1				
10	241-63351	Diode Stack (VL848)	1				
11	241-63391	Voltage Selecting Switch (SL-210ND)	1				
12	241-63441	Spacer (for above) (S-J2111)	2				
13	241-63411	Voltage Selecting Switch	1				

63-5 RECTIFIER

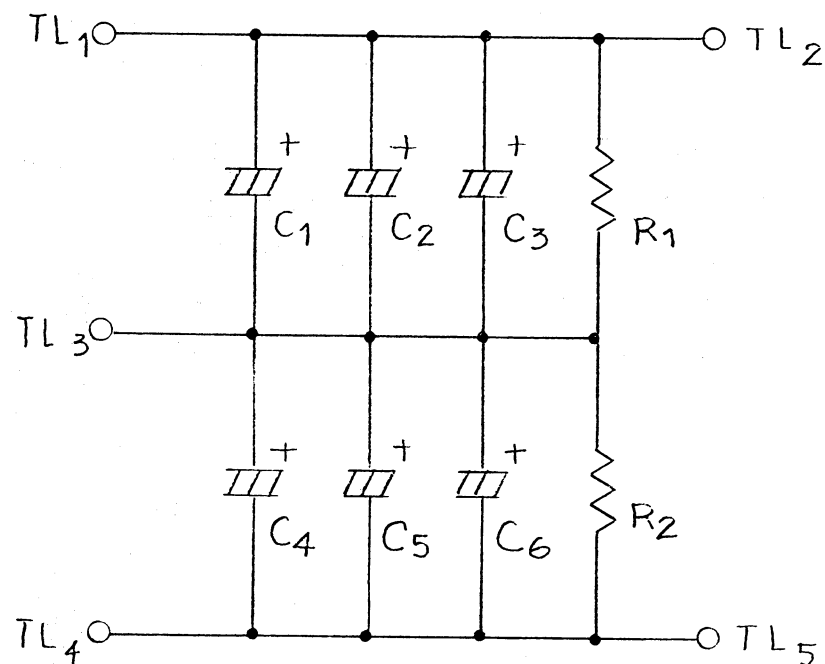


53-5 RECTIFIER

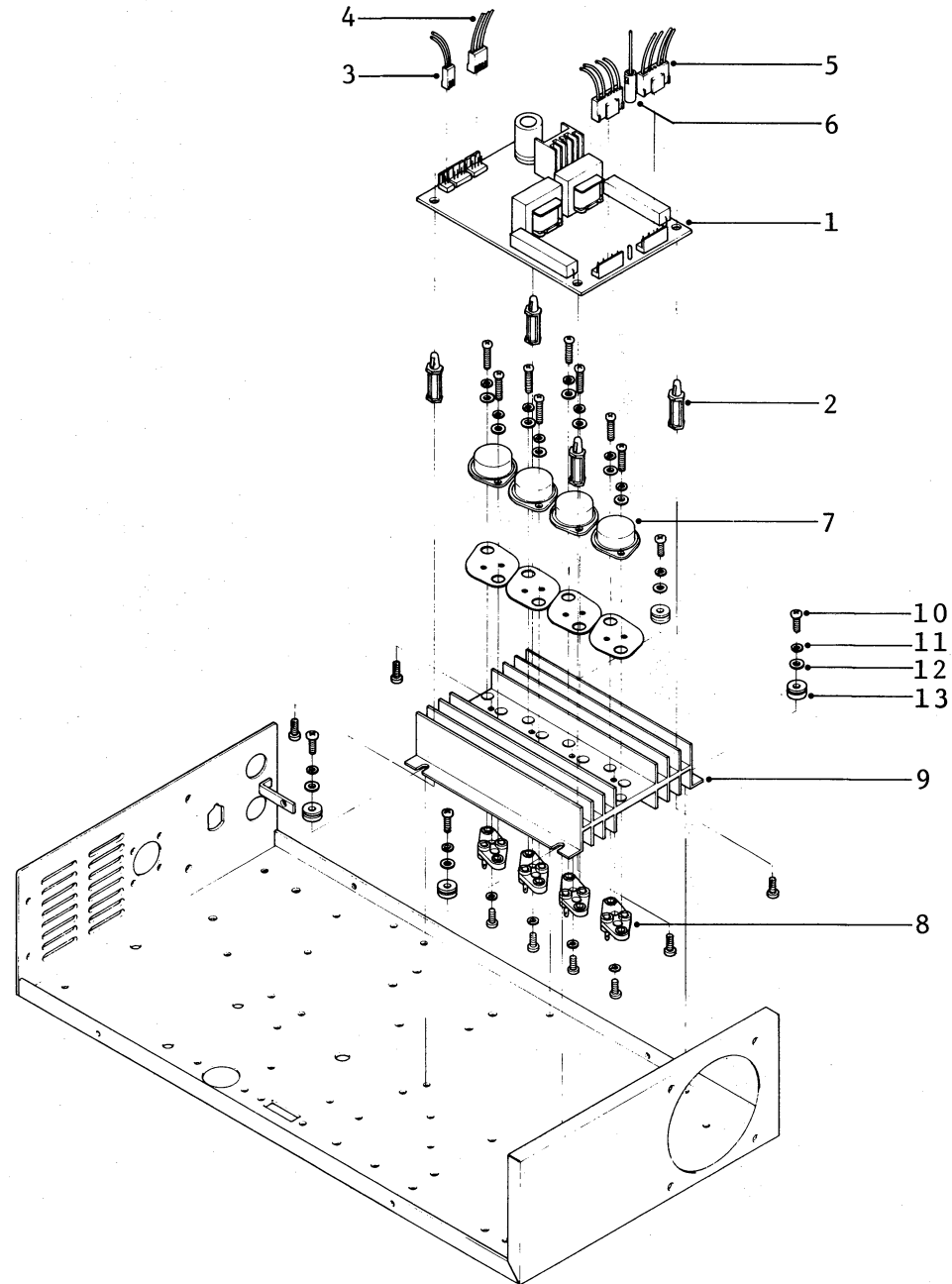
INDEX NO	PART NO	DESCRIPTION	QTY.
1	241-63451	Fan Motor (109-040UL)	1
2	241-63461	Fan Motor Guard	1
3	X P-4014S	Screw	4
4	WC-40	Washer	4
5	NA-40S	Nut	4
6	241-63471	Diode Stack (S-5331G)	1
7	X P-4014S	Screw (for above)	2
8	WA-40	Washer	4
9	WC-40	Washer	2
10	NA-40S	Nut	2
11	241-63481	Diode Fin	1
12	X P-3025S	Screw	4
13	WA-30	Washer	8
14	241-63491	Spacer	4
15	WC-30	Washer	4
16	NA-30S	Nut	4
17	241-63401	P.C.Board Assy. (PB-0019-A)	1
	*241-63431	P.C.Board Only	1
TL-1 to -5	*241-63791	1P Connector (R93-31) (Male)	5
R-1	*241-63811	Resistor, 3W 15K Ohm	1
R-2	*241-63811	Resistor, 3W 15K Ohm	1
C-1 to -6	*C E-201477	Capacitor, 200V 470 MFD	6
18	241-63521	1P Connector (Female)	5
19	241-63511	Tapping Support with Screw	4

INDEX NO	PART NO	DESCRIPTION	QTY.
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PB-0019-A P.C. BOARD DIAGRAM



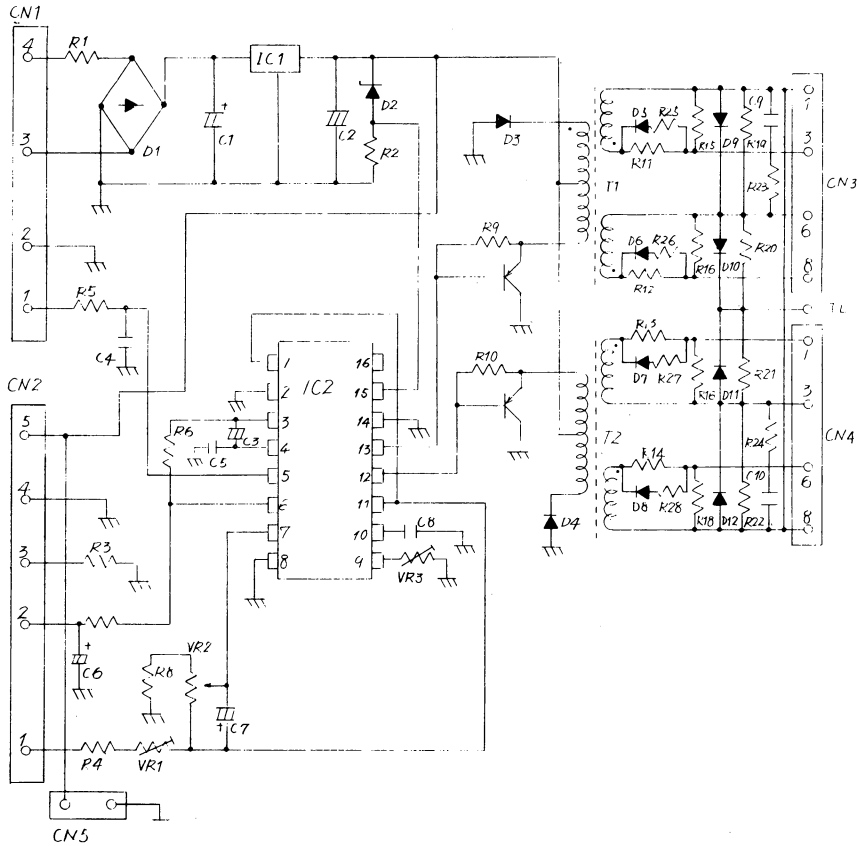
63-6 RECTIFIER

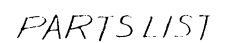


83-6 RECTIFIER

INDEX NO	PART NO	DESCRIPTION	QTY.	INDEX NO	PART NO	DESCRIPTION	QTY.
1	241-63501	P.C.B. Assy. (PB-0066-A)	1	R-23	*241-63691	Resistor, 10W 680 Ohm	4
	*241-63651	P.C.B. Only	1	R-24	*241-63691	Resistor, 10W 680 Ohm	4
TR-1	*2SA-965-0	Transistor 2SA-965-0	1	R-25 to -28	*R A-1R01R0	Resistor, 1W 1 Ohm	4
TR-2	*2SA-965-0	Transistor 2SA-965-0	1	VR-1	*241-63711	Volume 10K Ohm B	1
IC-1	*241-63821	IC TA78015P	1	VR-2	*241-63711	Volume 10K Ohm B	1
IC-2	*241-63831	IC MPC1042C	1	VR-3	*241-63721	Volume 50K Ohm B	1
D-1	*241-63841	Diode Bridge (RB-151)	1	T-1	*241-63731	Transformer	1
D-2	*241-63851	Diode 05Z5.1L	1	T-2	*241-63731	Transformer	1
D-3 to -8	*241-63861	Diode 1S1834	6	CN-1	*241-63741	5P Connector (IL-5P-S3EN2)	1
D-9 to -12	*241-63871	Diode 1S1835	4	CN-2	*241-63751	4P Connector (IL-4P-S3EN2)	1
C-1	*C E-350108	Condensor, 35V 1000 MFD	1	CN-3	*241-63761	8P Connector (IL-8P-S3EN2)	1
C-2	*C E-250107	Condensor, 25V 100 MFD	1	CN-4	*241-63761	8P Connector (IL-8P-S3EN2)	1
C-3	*C E-500105	Condensor, 50V 1 MFD	1	CN-5	*241-63771	2P Connector (Male)	1
C-4	*C M-500103	Condensor, 50V 0.01 MFD	1	TL	*241-63781	1P Connector (Male) (R62-3)	1
C-5	*C M-500103	Condensor, 50V 0.01 MFD	1	2	241-63541	Tapping Support with Screw	4
C-6	*C E-160106	Condensor, 16V 10 MFD	1	3	241-63551	2P Connector (Female)	1
C-7	*C E-250704	Condensor, 25V 4.7 MFD	1	4	241-63561	4P Connector (Female)	1
C-8	*C C-500102	Condensor, 50V 0.001 MFD	1	5	241-63571	8P Connector (Female)	2
C-9	*C C-401154	Condensor, 400V 0.15 MFD	1	6	241-63581	1P Connector (Female)	1
C-10	*C C-401154	Condensor, 400V 0.15 MFD	1	7	2SC-2139	Transistor 2SC-2139	4
R-1	*241-63661	Resistor, 1W 0.47 Ohm	1	8	241-63641	Transistor Socket (for above) (S2-110B-00)	4
R-2	*R A-R25102	Resistor, 1/4W 1K Ohm	1	9	241-63531	Fin	1
R-3	*R A-R25681	Resistor, 1/4W 680 Ohm	1	10	X P-3025S	Screw	4
R-4	*R A-R25103	Resistor, 1/4W 10K Ohm	1	11	WC-30	Washer	4
R-5	*R A-R25103	Resistor, 1/4W 10K Ohm	1	12	WA-30	Washer	4
R-6	*R A-R25105	Resistor, 1/4W 1M Ohm	1	13	241-63491	Spacer	4
R-7	*R A-R25103	Resistor, 1/4W 10K Ohm	1				
R-8	*R A-R25622	Resistor, 1/4W 6.2K Ohm	1				
R-9	*R A-R25471	Resistor, 1/4W 470 Ohm	1				
R-10	*R A-R25471	Resistor, 1/4W 470 Ohm	1				
R-11 to -14	*241-63671	Resistor, 2W 3.9 Ohm	4				
R-15 to -18	*241-63681	Resistor, 1W 100 Ohm	4				
R-19 to -22	*R A-R25274	Resistor, 1/4W 270K Ohm	4				

PB-0066-A P.C. BOARD DIAGM

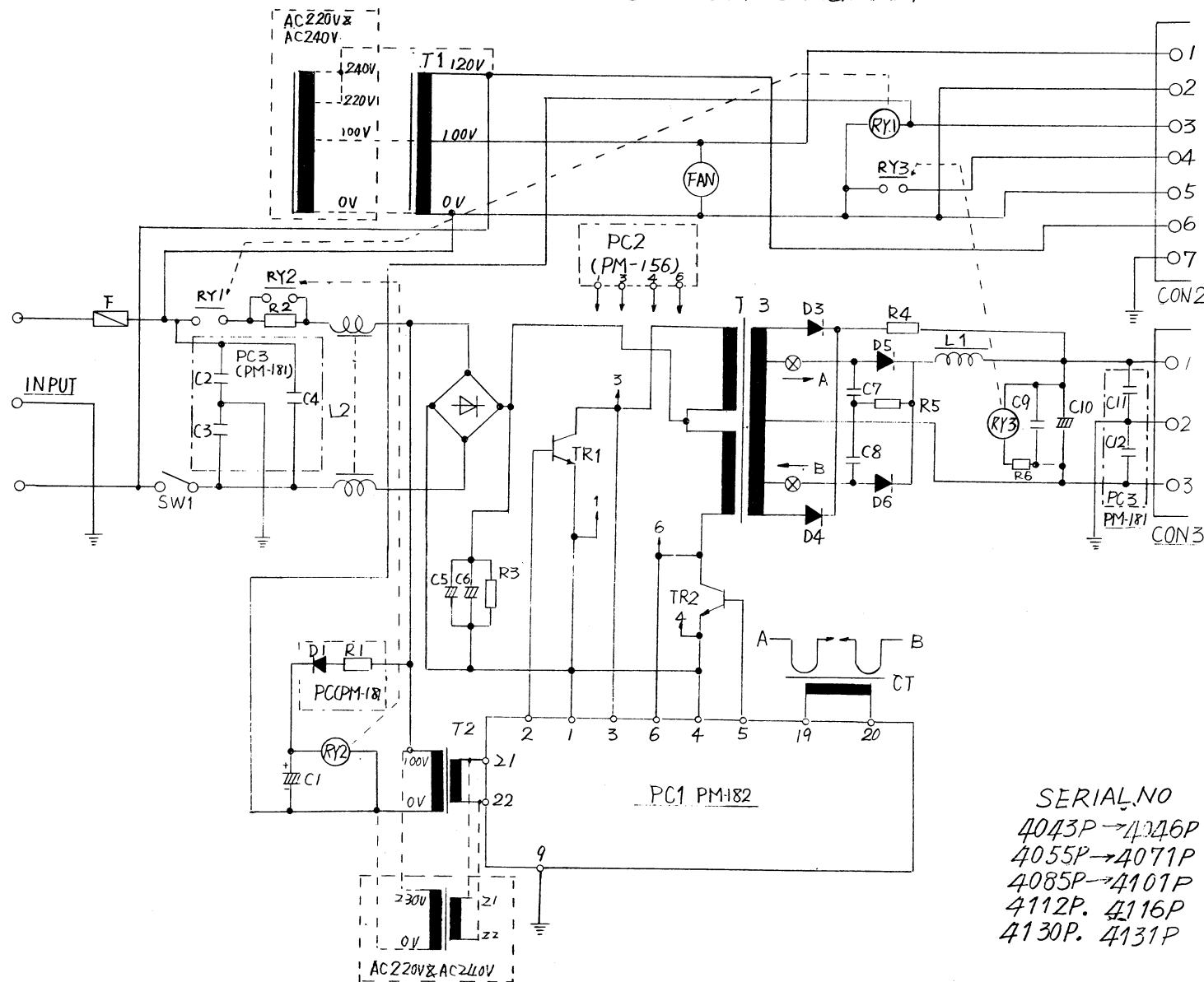




VOLVNO	DESCRIPTION	QTY
1	FUSE F10.6030 F20.6030	1
T1	TRANSFORMER F1A-5015	1
T2	TRANSFORMER F1A-5031	1
T3	TRANSFORMER F1A-5026	1
L1	REACTOR 11A-7856	1
C1	CURRENT TRANS 11A-3027	1
PC1	P.C. BOARD PM-149	1
FAN	EXHAUST FAN NO. 8500	1
TR12	TRANSISTOR 2SC-2147	2
D1	DIODE F-141	1
D2	DIODE S25VB40	1
D3, 4	DIODE U-06G	2
D5, 6	DIODE 40C15-30	2
PC2	P.C. BOARD PM-156	1
RY1	RELAY LY2 AC100V	1
RY2,3	RELAY LY2 DC100V	2
L2	REACTOR F1A-5117	1
C1	CONDENSOR CE-251106(250V) (10M Ω)	1
C2, 3, 6	CONDENSOR CM-102103(100V) (10M Ω)	6
C4	CONDENSOR CM-102102(100V) (10M Ω)	1
C5, 6	CONDENSOR CE-201477(200V) (0.2M Ω)	2
C9	CONDENSOR CM-251105(250V) (1M Ω)	1
C10	CONDENSOR CE-161477(160V) (0.2M Ω)	1
R1	RESISTOR RA-2R022(25W) (20 Ω)	1
R2	RESISTOR RE-100100(25W) (10 Ω)	1
R3, 4	RESISTOR RA-3R0203(25W) (2k Ω)	2
R5	RESISTOR RE-300500(25W) (500 Ω)	1
R6	RESISTOR RA-2R0100(25W) (10 Ω)	1
CN1	INPUT CONNECTOR NCS-3-B	1
CN2	CONTROL CONNECTOR MCS-307-P	1
CN3	OUTPUT CONNECTOR E-3P	1

SERIAL.NO
(4027P → 4042P)

EX-4000P SWITCHING RECTIFIER CIRCUIT DIAGRAM



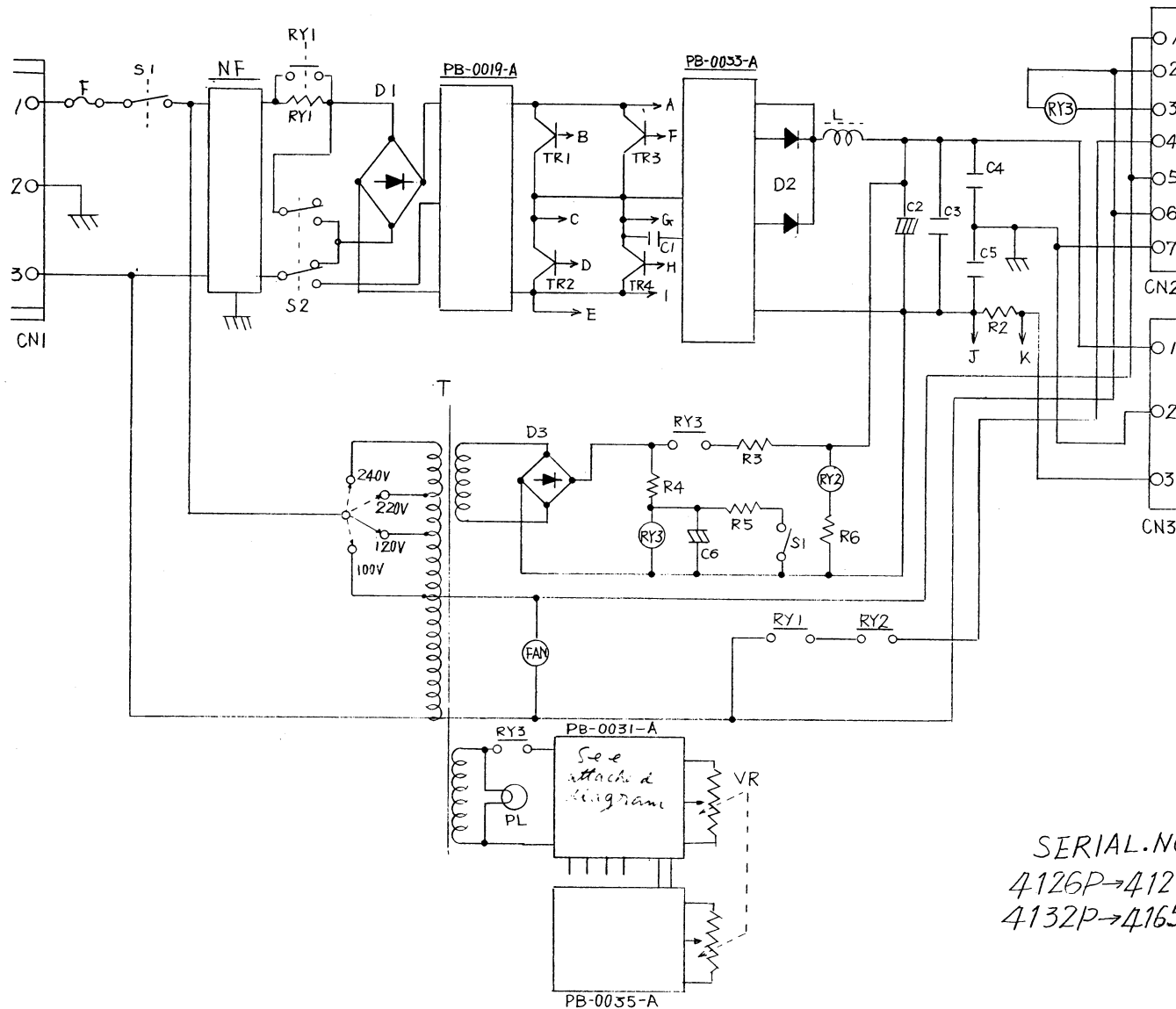
PARTS LIST

INDEX NO	DESCRIPTION	QTY
1	FUSE F-106030 F20.6030	1
T1	TRANSFORMER F1A-5015-B	1
T2	TRANSFORMER F1A-5021-B	1
T3	TRANSFORMER F1A-5026-A	1
L1	REACTOR F1A-4656-A	1
SW	SWITCH SW-3001A	1
CT	CURRENT TRANS F1A-5020-A	1
FAN	EXHAUST FAN N08500	1
TR1,2	TRANSISTOR 2SC-2147	2
D2	DIODE S25VB40	1
D3,4	DIODE U-06G	2
D5,6	DIODE 40C1S-30	2
RY1	RELAY LY2 AC100V	1
RY2,3	RELAY LY2 D.C.100V	2
L2	REACTOR F1A-5117	1
C1	CONDENSOR CE-161226 (110V 22μF)	1
C5,6,10	CONDENSOR CE-201477 (200V 470μF)	3
C7,8	CONDENSOR CM-102103 (1000V 10μF)	2
C9	CONDENSOR CM-251105 (250V 1μF)	1
PC1	PC BOARD PM-182	1
PC2	PC BOARD PM-156	1
PC3	PC BOARD PM-181	1
R2	RESISTOR RE-100100 (10W 10Ω)	1
R3,4	RESISTOR RA-3R0203 (3W 20kΩ)	2
R5	RESISTOR RE-200501 (20W 500Ω)	1
R6	RESISTOR RA-2R0100 (2W 10Ω)	1
R7	RESISTOR RA-R50222 (5W 22kΩ)	1
CN1	INPUT CONNECTOR 25-3-B	1
CN2	CONTROL CONNECTOR NCS-307-P	1
CN3	OUTPUT CONNECTOR B15-28	1

SERIAL NO

4043P → 41246P
 4055P → 4071P
 4085P → 4101P
 4112P, 4116P
 4130P, 4131P

EX-4000P SWITCHING RECTIFIER CIRCUIT DIAGRAM

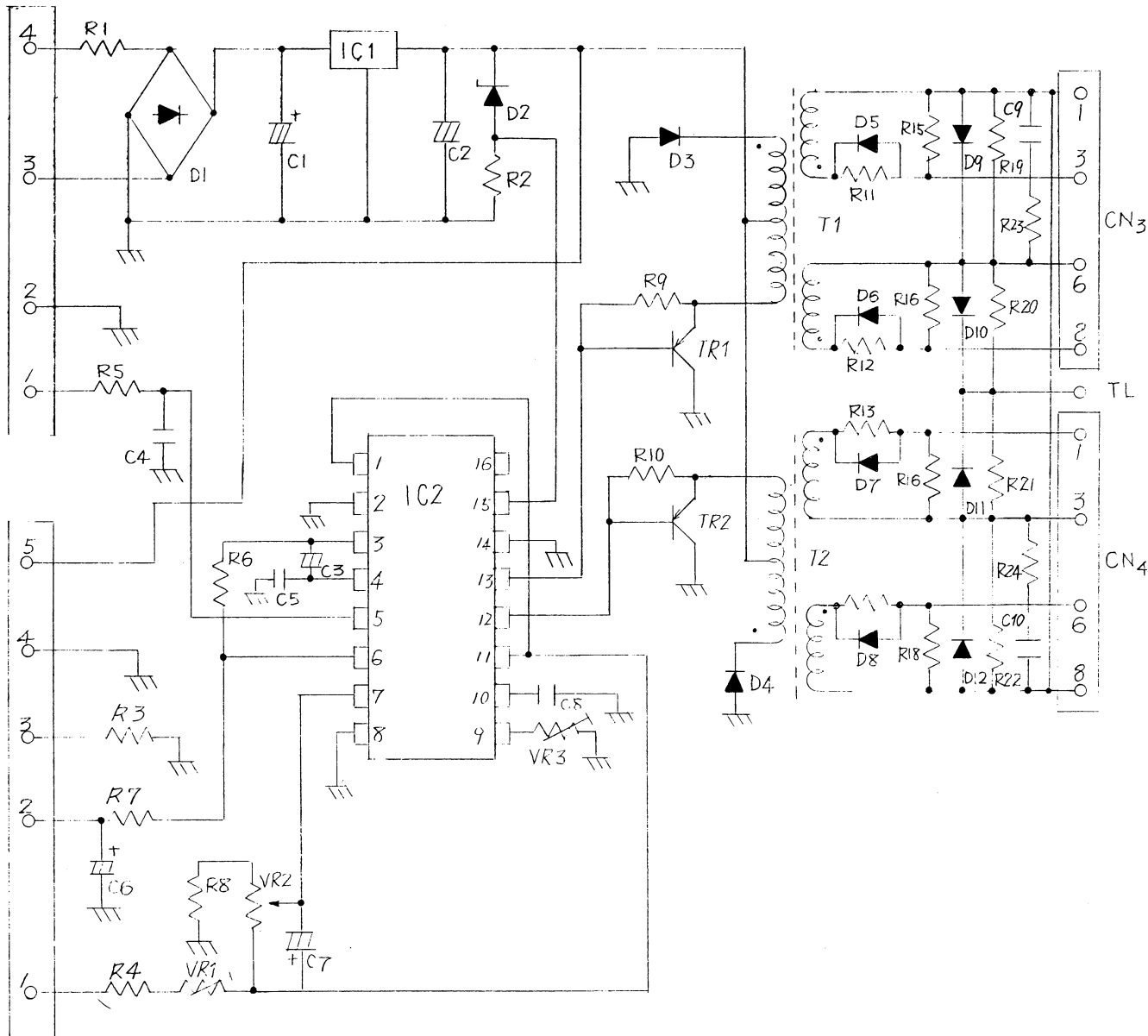


PARTS LIST

INDEX NO	DESCRIPTION	QTY
TR1-4	TRANSISTOR 2SC2139	4
D1	DIODE VL84B	1
D2	DIODE 40C2520	1
D3	DIODE S4VB40	1
C1	CONDENSOR CM251605(250V)	1
C2	CONDENSOR CE101471(250V)	1
C3-5	CONDENSOR CC101103(250V)	3
C6	CONDENSOR CE101221(250V)	1
R1	RESISTOR RE5R0100(5W)	1
R2	RESISTOR RE200R03K(20W)	1
R3	RESISTOR RE200 501(20W)	1
R4	RESISTOR RA2R0 621(20W)	1
VR	VOLUME RV247G205B5000	1
S1	SWITCH SW-3006A	1
S2	SWITCH SL-210ND	1
S3	SWITCH S-J2111	1
RY1-2	RELAY MM2-U1	2
RY3	RELAY MY2FAC100V	1
CN1	INPUT CONNECTOR NJC-203RM	1
CN2	OUTPUT CONNECTOR BIS-28P3	1
CN3	CONTROL CONNECTOR NCS-307P	1
FAN	EXHAUST FAN 109-04-UL	1
NF	NOISE FILTER NF-270-15-1	1
F	FUSE 200V, 100V F105032.156030	1
PL	PILOT LAMP PL-406 24V	1
T	TORANS FORMER	1
L	REACTOR	1
R5	RESISTOR RA2R0 470(470)	1
R6	RESISTOR RA2R0 621(620)	1

SERIAL.NO
4126P→4129P
4132P→4165P

PB-0031-A P.C. BOARD DIAGRM

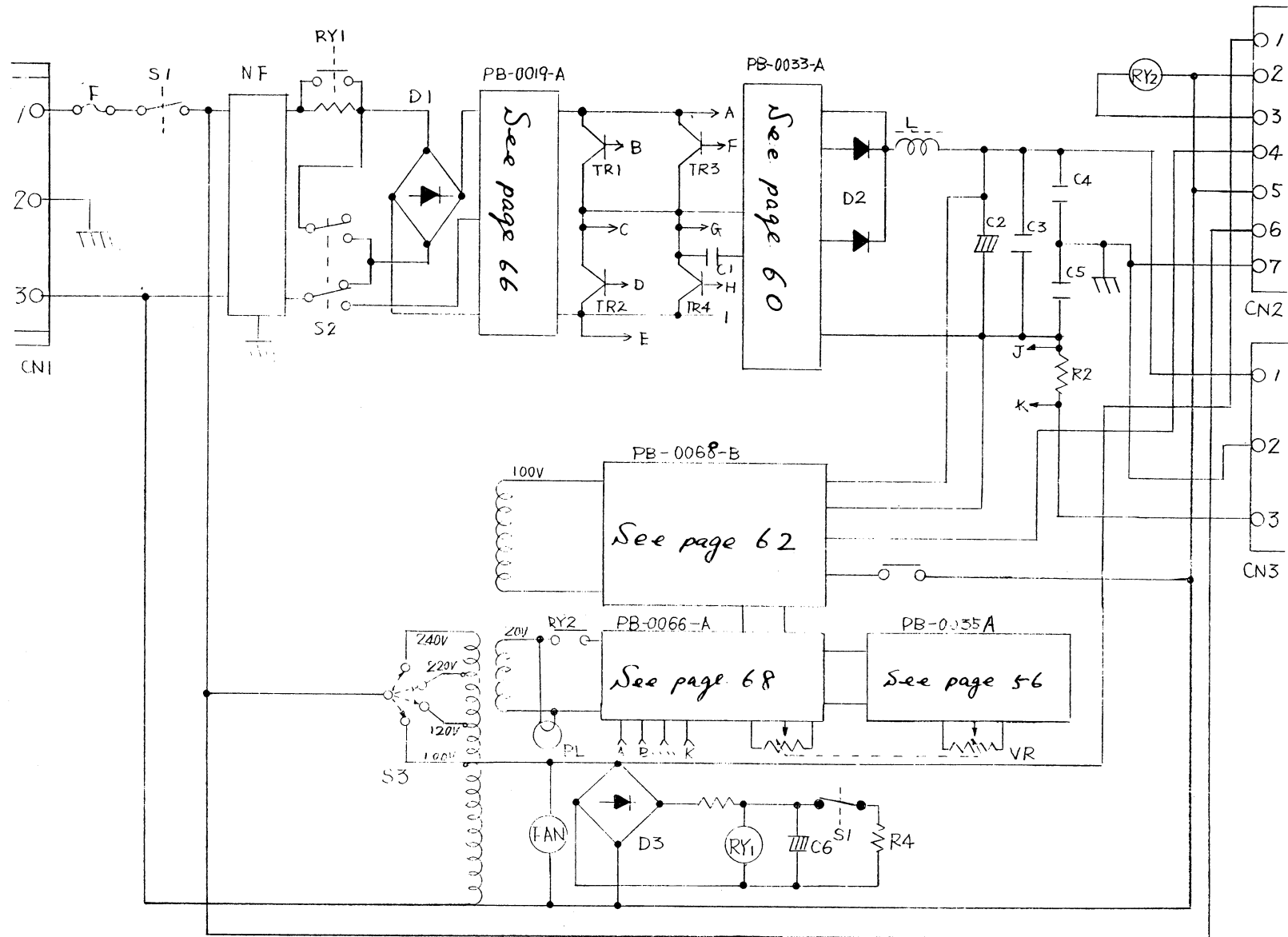


PARTS LIST

IND. NO	DESCRIPTION	QTY
TR1-2	TRANSISTOR 2SA965-0	2
IC-1	IC TA78015P	1
IC-2	IC MPC1042	1
D-1	DIODE RB 151	1
D-2	DIODE 05Z51L	1
D3-8	DIODE 1S1834	6
C1	CONDENSOR CF 350102 (350V 1000P)	1
C2	CONDENSOR CE 250101 (250V 1000P)	1
C3	CONDENSOR CE 5001P0 (500V 1000P)	1
C4-5	CONDENSOR CM500 103 (500V 1000P)	1
C6	CONDENSOR CE 160100 (160V 1000P)	2
C7	CONDENSOR CE 2504R7 (250V 4700P)	1
C8	CONDENSOR CC 500102 (500V 1000P)	1
C9-10	CONDENSOR CC401103 (400V 1000P)	2
R1	RESISTOR RA1R0470 (1W470Ω)	1
R2	RESISTOR RA25102 (1/4W10Ω)	1
R3	RESISTOR RA25661 (1/4W680Ω)	1
R4-5-7	RESISTOR RA25103 (1/4W10KΩ)	3
R6	RESISTOR RA25105 (1/4W1MΩ)	1
R8	RESISTOR RA25622 (1/4W62KΩ)	1
R9-10	RESISTOR RA25471 (1/4W470Ω)	2
R11-14	RESISTOR RA3R03P7 (3V39Ω)	4
R15-18	RESISTOR RA1P0 101 (1W10Ω)	4
R19-22	RESISTOR RA25274 (1/4W270KΩ)	4
R23-24	RESISTOR RA7R06800W68Ω	2
VR1-2	VOLUME JFP061CKΩ	1
VR3	VOLUME GTP065KΩ	1
T1-2	TRANSFORMER	2
CN1	5P CONNECTOR IL-5P-S3EN2	1
CN2	4P " IL-4P-S3EN2	1
CN3-4	6P " IL-6P-S3EN2	2
TL	1P " R62-3	1
D4-12	DIODE 1S1835	7

SERIAL. NO 4126P→4129P, 4132P→4165P

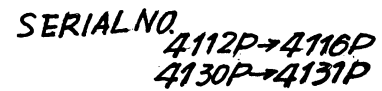
EX-4000P SWITCHING RECTIFIER CIRCUIT DIAGRAM



You can find diagram of each P.C. Board Assy on each page shown above.

SERIAL NO
4166P → 4232P

- 74 -



EX-4000P PROJECTOR HEAD MACHINE ELECTRICAL CIRCUIT DIAGRAM

