Film-Tech

The information contained in this Adobe Acrobat pdf file is provided at your own risk and good judgment.

These manuals are designed to facilitate the exchange of information related to cinema projection and film handling, with no warranties nor obligations from the authors, for qualified field service engineers.

If you are not a qualified technician, please make no adjustments to anything you may read about in these Adobe manual downloads.

www.film-tech.com

ELMO

16mm XENON ARC SOUND PROJECTOR

ELMO
XP-350

INSTRUCTION MANUAL

IMPORTANT SAFEGUARDS

When using your photographic equipment, basic safety pre cautions should always be followed, including the followin

1. Read and understand all instructions.
2. Close supervision is necessary when any appliance is use by or near children. Do not leave appliance unattende while in use.
3. Care must be taken as burns can occur from touching ho parts.
4. Do not operate appliance with a damaged cord or if th appliance has been dropped or damaged — until it has bee examined by a qualified serviceman.
5. Do not let cord hang over edge of table or counter o touch hot surfaces.
6. If an extension cord is necessary, a cord with a suitabl current rating should be used. Cords rated for less amper age than the appliance may overheat. Care should be take to arrange the cord so that it will not be tripped over o pulled.
7. Always unplug appliance from electrical outlet when no in use. Never yank cord to pull plug from outlet. Gras plug and pull to disconnect.
8. Let appliance cool completely before putting away. Loo cord loosely around appliance when storing.
9. To protect against electrical shock hazards, do not immers this appliance in water or other liquids.
10. To avoid electric shock hazard, do not disassemble thi appliance, but take it to a qualified serviceman when som service or repair work is required. Incorrect reassembl can cause electric shock hazard when the appliance is use subsequently.

SAVE THESE INSTRUCTIONS

CONTENTS

INTRODUCTION

The XP-350 projector incorporates a special Xenon Arc projection lamp which produces light by electrical discharge through xenon gas compressed in the lamp.

This unique light source ensures extremely high luminosity, pure white light just like sunlight and excellent color reproduction, which are efficient for both color and monochrome projection.

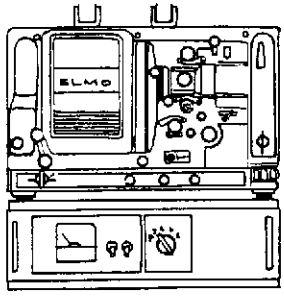
As the XP-350 is equipped with an actuating mechanism for the xenon are light source, operating procedures for this projector are slightly different from conventional 16mm projectors with an incandescent lamp. While the motor is first started to transport a film before lighting when operating the conventional projectors, the light source is first actuated before transporting a film when operating the XP-350. The captive xenon gas in the lamp is always kept compressed under a high pressure, and therefore the following precautions must be strictly observed before lighting the lamp and while the lamp is on.

(1) Never give a shock to the lamp.
(2) Keep the lamp housing closed and do not look into the lamp housing unnecessarily.
(3) Do not give current in excess of the rated value of the lamp.
(4) Never remove or touch the high-voltage circuit of the lamp which generates tens of thousands volts.
(5) Do not replace the lamp alone but replace it as a unit with the housing.

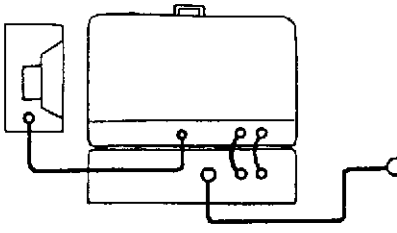
The XP-350 consists of the following parts:

1 ..... Projector
1 ..... Dust cover
1 ..... Speaker cabinet
1 ..... Power source unit
1 ..... Power cord ft)
1 ..... Speaker cord 20m (65.5ft)
2 ..... Connection cords
1 ..... 480m (1600ft) reel
2 ..... Cleaning brushes

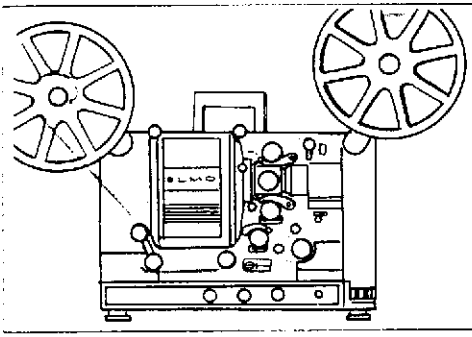
CONDENSED OPERATING INSTRUCTIONS



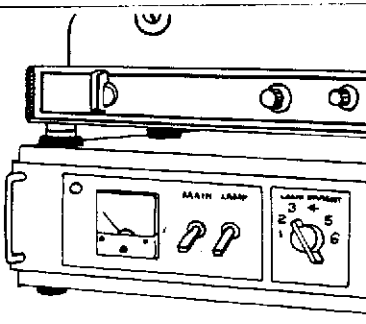
1 Place the projector on the power source unit ㉛ and the speaker cabinet beside the screen.



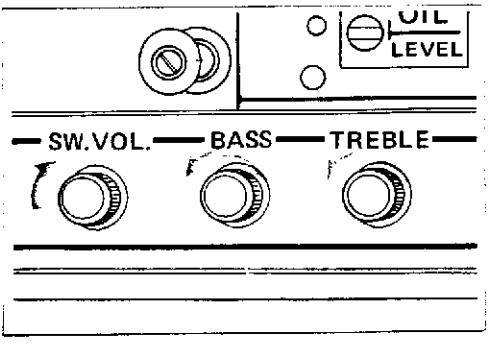
2 Connect the power cord, connection and speaker cord.



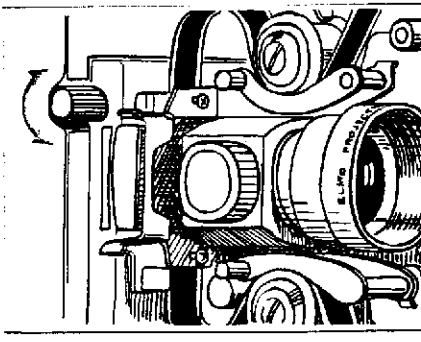
5 Thread the film leader through the film path and put the end of the leader on the take-up reel.



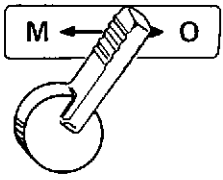
6 Put on the main switch ㊱ and the lamp switch ㉟



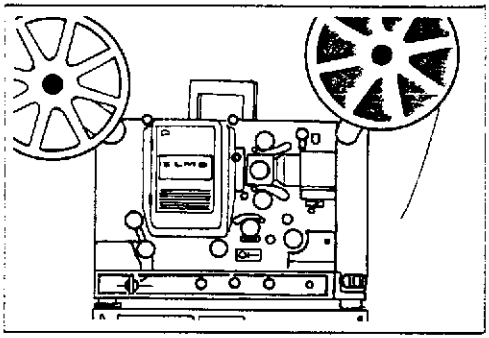
9 Adjust volume and tone by turning the volume control knob (amplifier switch) ⑮ and the treble and bass tone control knobs ⑫ ⑭.



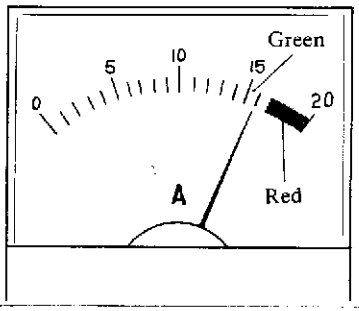
10 Align the image on the screen by loo the elevation control knob ⑩. Foc image by turning the focusing knob eliminate the frame line by turni framing knob ⑥.



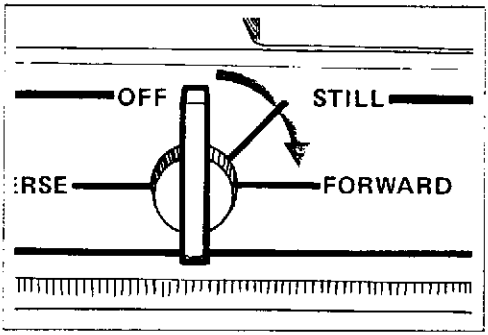
3 Set the M-0 lever ⑦ to "M" when using magnetic sound film or "O" when using optical sound film.



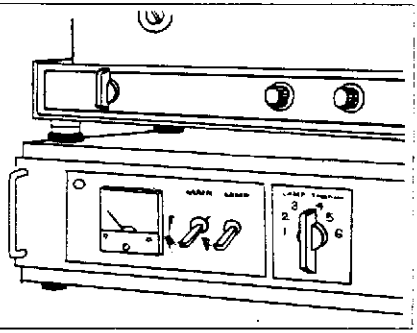
4 Set up the feed and take-up reel arms. Put the feed and take-up reels on their reel spindles. Pull out about 1m (3ft) of film to use as a leader for threading.



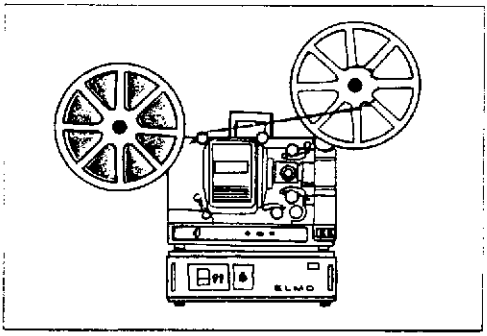
7 Turn the lamp current adjusting knob ㉞ until the needle of the ammeter ㊲ is positioned in the green range.



8 Turn the motor switch ⑯ to "FORWARD"

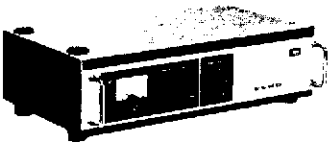


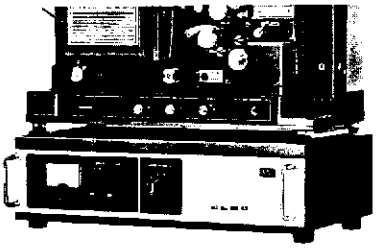
11 When projection is completed, turn off the lamp switch ㉟ first, then the motor switch ⑯ and then the amplifier switch ⑮.



12 Turn the motor switch ⑯ to "REVERSE". Pull out the high speed rewinding knob ③, and the film is rewound at high speed. After rewinding, turn off the motor switch and push the release knob for high speed rewinding knob ②.

PREPARATION FOR PROJECTION



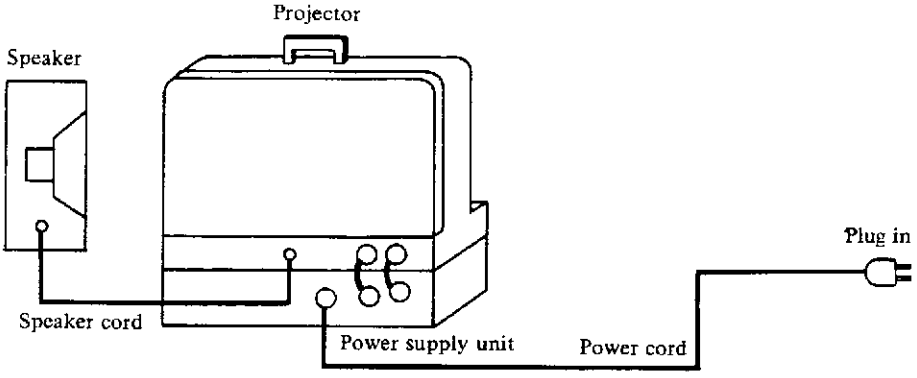


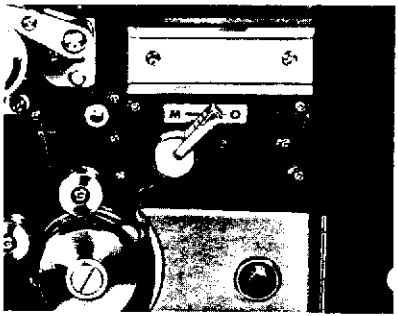
Setting up the projector

1. Take out the power source unit (31) an all the cords from the speaker cabine
2. Place the projector on the power sourc unit which serves as a pedestal, and positio the rear legs (17) of the projector on th projector shoes (38) of the power sourc unit.
3. Place the speaker cabinet beside the scree at a height of 1m (3ft) to 2m (6ft).

Connecting cords

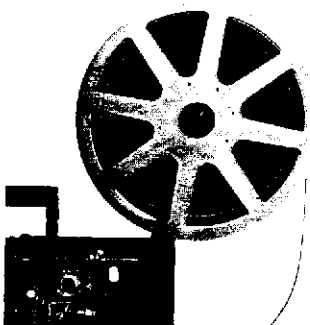
1. Before connecting the cords, make sure tha the main switch (36), lamp switch (35) motor switch (16) and volume control knol (amplifier switch) (15) are all set at "OFF"
2. Connect the speaker cord, 2-pin and 4-pi connection cords and power cord to thei receptacles as shown in the illustration As the receptacles differ from each other there is no fear of erroneous connections
3. Plug the power cord into the AC outlet finally.





Switching the M-O lever

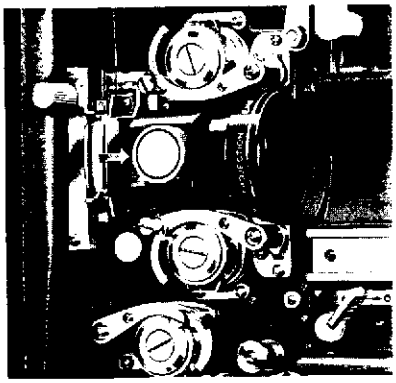
1. When using magnetic sound film, set the M-O lever ⑦ to "M" for magnetic sound reproduction.
2. When using optical sound film, set the M-O lever ⑦ to "O" for optical sound reproduction.

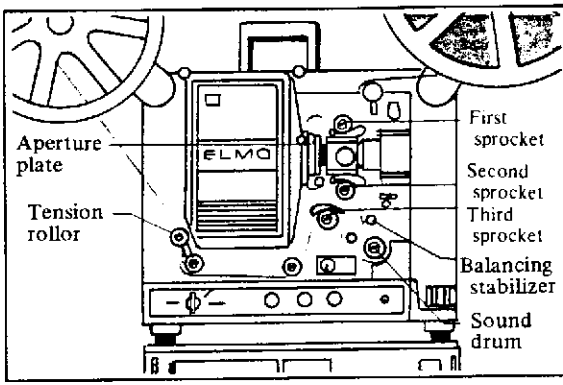


Attaching the reels

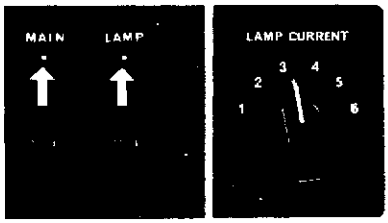
1. Attach the empty reel on the take-up reel arm ⑲ and the reel of film on the feed reel arm ⑧.
2. Lock the feed and take-up reels into position by turning their reel locks ⑨ and ⑱.
3. Pull out about 1m (3ft) of film to use as a leader for threading.

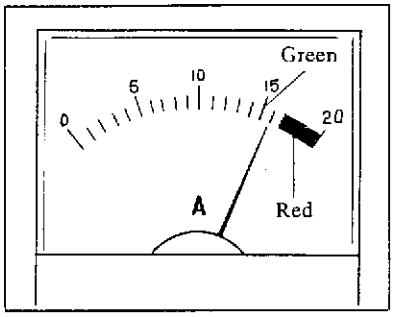
THREADING THE FILM





1. Open the sprocket shoe of the first sprocket and fit the film perforations onto the sprocket teeth. Then close the sprocket shoe.
2. Push the film gate release lever to the right and open the film gate. Then close the release lever while forming a loop. In this case, be sure to insert the film straight down the aperture plate.
3. Mount the film on the second sprocket in the same manner as mentioned above. In this case, form a loop just under the film gate.
4. Thread the film between the sound drum and sound lens, making sure the film is tight, and then to the third sprocket around the left side of the balancing stabilizer.
5. Mount the film on the third sprocket carefully. Sometimes the film perforations may not engage with the sprocket teeth properly, and pulling the film too hard will damage the perforations. The film should be loosened by one perforation and then fitted to the sprocket teeth. However if the film is too loose and its contact with the sound drum is not correct the sound will be uneven. Caution is necessary on this point.
6. Lead the film to the take-up reel through the guide roller and tension roller.
7. To check whether or not the film is threaded correctly, turn the threading knob (24) clockwise.
8. Finally, place the end of the leader on the take-up reel hub. Wind in any surplus film by turning the take-up reel clockwise. Film threading is now completed.





Adjusting the lamp current

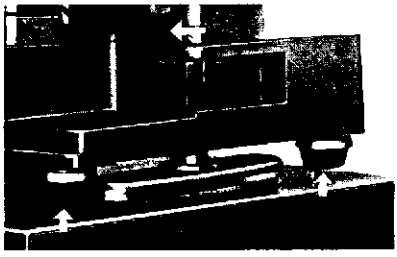
1. Position the white index of the lamp current adjusting knob (34) at the reading "3".
2. Turn on the main switch (36) first and then the lamp switch (35).
3. Observing the ammeter (37), turn the lamp current adjusting knob (34) until the needle of the ammeter is positioned in the green range. If the needle goes up to the red range, be sure to return the needle to the green range.

After the lamp current is adjusted, turn the motor switch (16) to "FORWARD", and the projected image will appear on the screen.

When the projected image appears on the screen, check the following points:

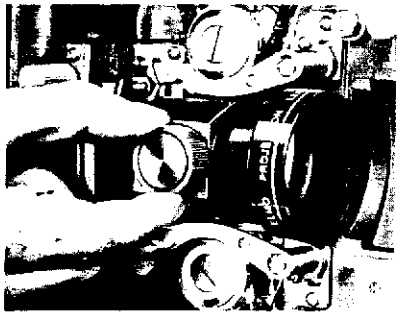
1. Volume and tone control

Adjust volume and tone by turning the volume control knob (amplifier switch) (15) and the treble and bass tone control knobs (12) & (14).



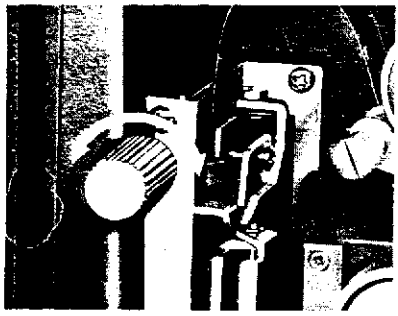
2. Image alignment

If the projected image is not centered vertically on the screen, loosen the elevation control knob (10) and adjust the height of the image by raising or lowering the front of the projector.
Then tighten the elevation control knob.



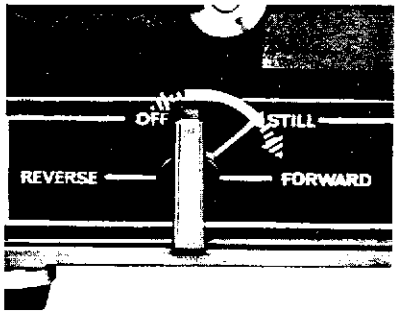
3. Focusing

Turn the focusing knob ⑤ to bring the projected image into focus.



4. Framing

If the frame line appears on the screen turn the framing knob ⑥ to eliminate it



Still picture projection

Still picture projection during projection can be achieved by turning the motor switch ⑯ to "STILL". Sometimes the film will stop in the middle of a frame or when the aperture is closed. When this happens, turn the threading knob ㉔ until the full frame is projected.

Reverse projection

Reverse projection can be achieved by turning the motor switch ⑯ to "REVERSE".

of the following points:

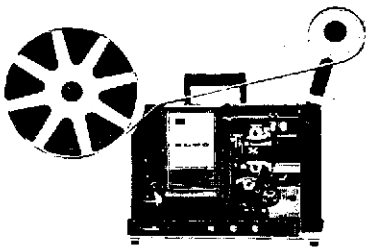
1. Do not move the projector nor give a shock to the lamp when the lamp is on.
2. Do not allow the needle of the ammeter to exceed the green range.

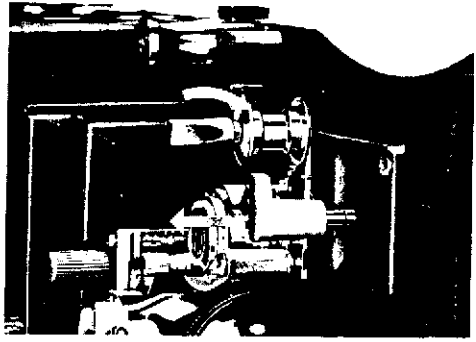
WHEN PROJECTION IS COMPLETED

When projection is completed, first turn off the lamp switch ㉟ and then the amplifier by turning the volume control knob (amplifier switch) ⑮ fully counterclockwise. After the film has been wound completely onto the take-up reel, turn the motor switch ⑯ to "OFF".

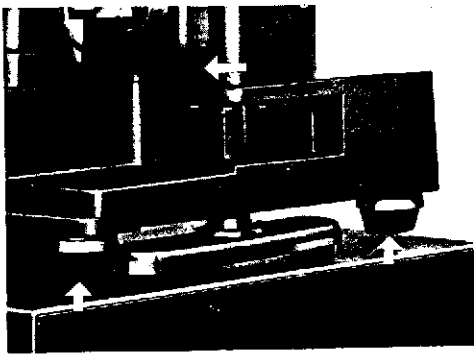
Rewinding the film

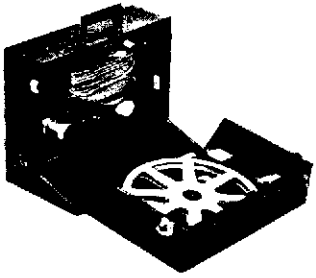
1. Put the end of the film on the feed reel hub.
2. Turn the motor switch to "REVERSE", and the film will be rewound.
3. Pull out the high speed rewinding knob ③ as indicated by the arrow Ⓐ in the illustration, and the film will be rewound at high speed. The high speed rewinding knob can be released by pushing the release knob ② to the right as indicated by the arrow Ⓑ in the illustration.
4. When rewinding has been completed, turn off the motor switch and the main switch ㊱

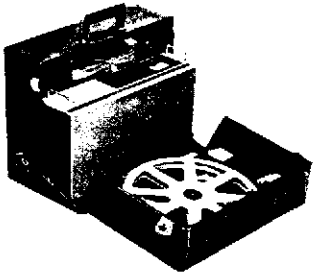




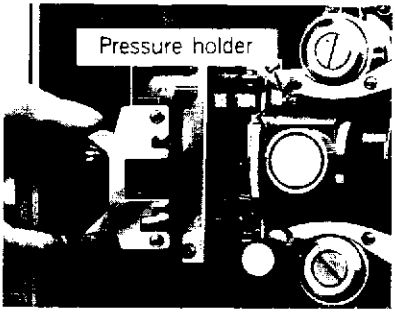
STORING

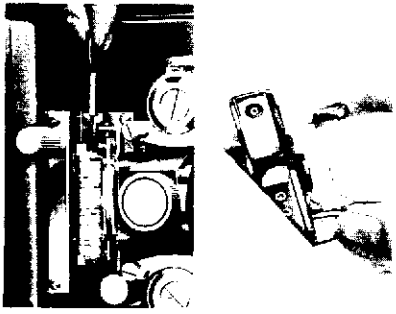






1. Disconnect the power cord first, and then the connection cords and speaker cord. Detach the reels by raising the reel locks. Return all the cords and take-up reel to their storing places inside the speaker cabinet.
2. Lower the feed and take-up reel arms by depressing their respective buttons (1) and (21) at the base of the reel arms as illustrated.
3. Loosen the elevation control knob (10), return the elevation leg to its retracted position and retighten the knob. Remove the projector from the power source unit and put the dust cover on the projector.
4. Return the power source unit to the speaker cabinet with its top facing toward you and its switch side upward as shown.

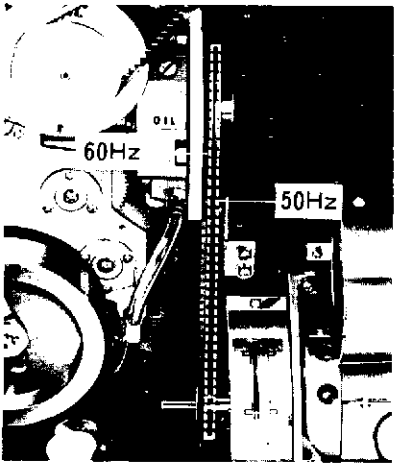




1. Pressure plate/aperture plate:
   The film gate, which is in continuous contact with the film, is precisely machined to prevent damage to the film. When dust or other matter adheres to the gate, it may scratch or damage the film. From time to time, therefore, especially after heavy use, the film gate and surrounding area should be cleaned with the small brush provided or a soft cloth. To clean the film path, turn the threading knob (24) until the film sending claw, if it is visible, is recessed, and open the film gate and pull out the pressure plate holder toward you. Then clean the film path. Never attempt to clean the film gate with anything made of metal.
2. Remove the projection lens by pulling straight out. Clean both the front and rear surfaces gently with a soft hair brush or soft cloth. Do not blow on the lens surfaces or touch with bare fingers.

pull out the projection lens, while pulling the focusing knob towards you.

UENCY CYCLE



When changing frequency from 50Hz to 60Hz and vice versa, shift the frequency changing belt as shown in the picture.

This instruction is not applicable for intermittent feeding mechanism of oi pregnant system.

Oiling for intermittent feeding mechanism

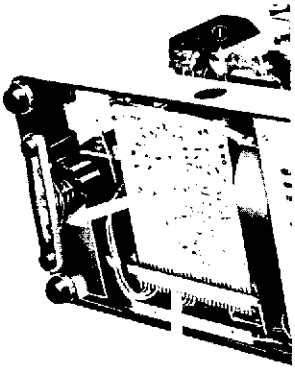
The intermittent feeding mechanism is lubri cated by the oil circulation system. The oi level should be kept between the two lines or the oil level gauge ⑬ . If there is insuf ficient oil after frequent use, add exclusive Elmo Special Oil through the oil inlet while observing the oil level gauge.

Changing oil

It is recommended to change the oil afte a few years of use, though it depends on th frequency of using the projector.

To change the oil:

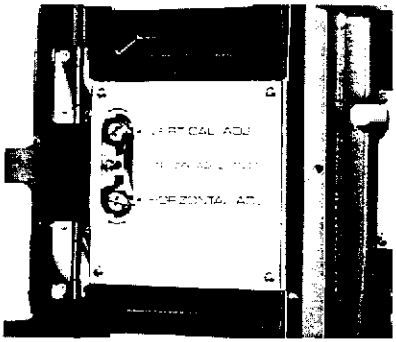
1. Disconnect the power cord and remove the back cover.
2. Take out the amplifier unit from the bottom of the projector by removing the chassis retaining screws and detaching the connectors as shown in the picture
3. Place a suitable receptacle beneath the oi pump, remove the oil outlet screw and drain the oil.
4. Operate the projector and drain all the oi in the oil feed pipe. Do not operat the projector over one minute after the o has been fully drained.
5. Tighten the oil outlet screw and pou Elmo Special Oil into the oil inlet while observing the oil level gauge.



Oiling for bearings

All the bearings are ball bearings or special oilles types. Although frequen oiling of the bearings is not necessary, it is recommended to apply one or two drops of oil to the rotating parts other than the ball bearings packed with grease after about a year of use. Never put the oil on the rubber rollers and belts

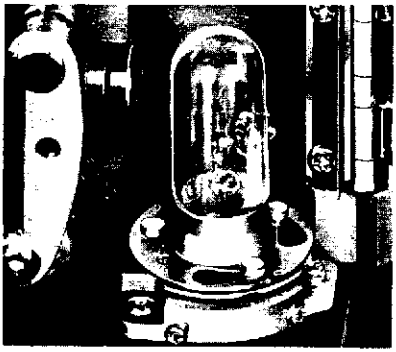
Be sure to disconnect the power cord before replacing the lamps.



Xenon arc lamp

Open the lamp housing cover by loosening its retaining screw. Pull out the lamp housing and insert a new lamp housing. Do not replace the lamp alone but replace as a unit with the housing.

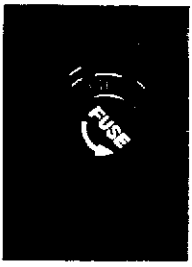
Do not touch the reflecting mirror adjusting knob unless, after replacing the lamp housing, luminosity is obviously uneven at the center and corners of the screen. Then turn the adjusting knob as shown in the picture to correct this unevenness.



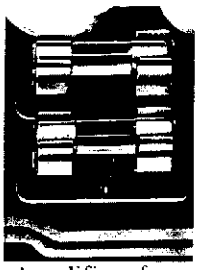
Exciter lamp

1. Remove the exciter lamp cover by pulling its release lever toward you.
2. Grasp the top of the lamp, and while depressing the lamp slightly, turn it counterclockwise. Then lift the lamp and take it out.
3. When installing a new lamp, align the three guide pinds with the holes of the lamp base flange arranged at intervals so that the lamp can be positioned correctly in the socket. Then depress the lamp and turn it clockwise as far as it will go.

Be sure to disconnect the power cord before replacing the fuses.



Power fuse



Amplifier fuse

Power fuse

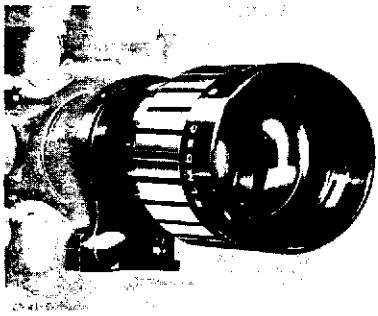
Take out the power fuse by turning the fuse holder (42) which is located at the rear of the power source unit.

Amplifier fuse

Remove the back cover of the projector and take out the amplifier fuse, which is located on the printed circuit board, by picking up with fingers.

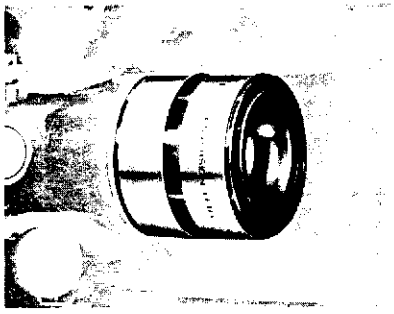
WHEN THE FOLLOWING HAPPEN

1. **When the motor does not run:**
   * Check if the power cord is properly plugged in.
   * Check if the connection cords are properly connected.
   * Check if the main switch of the power source unit switched on.
   * Check if the power fuse is not broken.
2. **When the projection lamp does not light:**
   * Check the same points as mentioned in the paragraph
   * Check if the lamp housing is properly inserted.
3. **When the film does not thread:**
   * Check if the film is properly positioned on the sprocke and film gate.
   * Check if the film perforations are not damaged.
   * Check if the motor switch is not positioned at "STILL".
4. **When the sound is not reproduced:**
   * Check if the M-O switch is properly positioned.
   * Check if the amplifier fuse is not broken.
   * Check if the volume control knob (amplifier switch) turned on.
   * Check if the speaker cord is properly connected.
   * Check if the exciter lamp is lit in case of optic reproduction.
5. **When the sound is uneven:**
   * Check if the film is properly positioned around the sou drum.



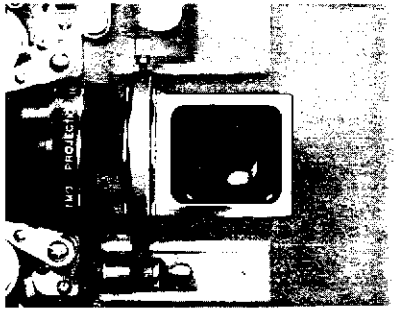
Elmo Scope Lens

This lens is used for projecting Cinemascope movies. It can be put in front of the projection lens simply by mounting it on the accessory shoe of the projector. The projected image is horizontally magnified twice.



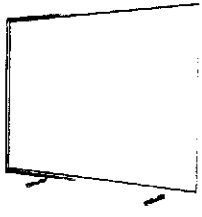
Conversion Lens

This attachment lens converts the focal length of the projection lens to either x0.8 or x1.25, i.e., the standard 50mm lens plus this accessory serves as a 40mm wide-angle lens or, by reversing it, a 63mm telephoto lens. You can make use of it when the projected image is too small or large.



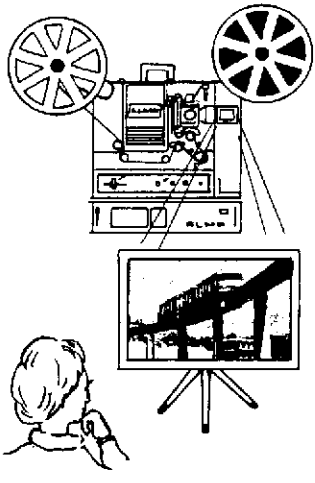
Daylight Rear Projection Device

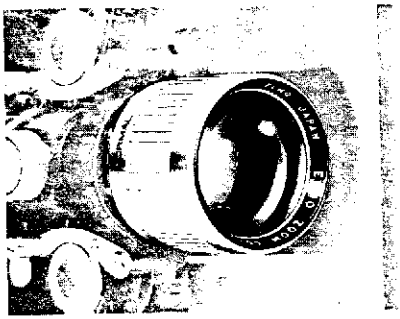
This accessory prism, which can be put on the accessory shoe of the projector, provides a clear projection image for daylight viewing when used with a special translucent screen.



Translucent Screen
60cm X 80cm
(23.6" X 31.5")

39cm X 52cm
(15.4" X 20.5")



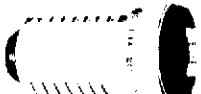


Zoom Converter

When this converter is used with the projection lens, the focal length is converted continuously from x0.8 to x1.25, i.e., the standard 50mm lens plus this accessory serves as a 40mm - 63mm zoom lens. Using it, you can vary the size of the projected image without changing the projector-to-screen distance.

Telephoto Projection Lens (F/1.8, 75mm

This telephoto lens is for projection in a large auditorium.



Wide-angle Projection Lens (F/1.4, 20mm)

This wide-angle lens is for projection in a small room.

PROJECTION DISTANCE AND IMAGE SIZE

The projection distance refers to the distance between the film plane and the screen.

In meter.

		3	5	7	10	15	20	25	30	40	50	60
Standard lens F1.2 50mm)	Length	0.4	0.7	1.0	1.4	2.1	2.9	3.6	4.3	5.8		
	Width	0.6	0.9	1.3	1.9	2.9	3.8	4.8	5.8	7.7		
Standard lens with Conversion lens (x 0.8)	Length	0.5	0.9	1.2	1.8	2.7	3.6	4.5	5.4			
	Width	0.7	1.2	1.7	2.4	3.6	4.8	6.0	7.2			
Standard lens with Conversion lens (x 1.25)	Length	0.3	0.6	0.8	1.1	1.7	2.3	2.9	3.4	4.6	5.6	
	Width	0.4	0.8	1.1	1.5	2.3	3.1	3.8	4.6	6.2	7.5	
Standard lens with Elmo scope lens	Length	0.4	0.7	9.9	1.4	2.1	2.9	3.6	4.3	5.8		
	Width	1.1	1.9	2.7	3.8	5.8	7.7	9.6	11.5	15.4		
Telephoto lens (F/1.8, 75mm)	Length	0.3	0.5	0.7	0.9	1.4	1.9	2.4	2.9	3.8	4.8	5.8
	Width	0.4	0.6	0.9	1.3	1.9	2.6	3.2	3.8	5.1	6.4	7.7
Wide-angle lens (F/1.4, 20mm)	Length	1.1	1.8	2.5	3.6	5.4						
	Width	1.5	2.4	3.4	4.8	7.2						

In feet.

		10	15	20	30	50	70	90	110	130	160	190
Standard lens F1.2 50mm)	Length	1.4	2.1	2.9	4.3	7.2	10.1	13.0	15.8	18.7		
	Width	1.9	2.9	3.8	5.8	9.6	13.5	17.4	21.2	25.1		
Standard lens with Conversional lens (x 0.8)	Length	1.8	2.7	3.6	5.4	9.0	12.6	16.2	19.8			
	Width	2.4	3.6	4.8	7.2	12.0	16.9	21.7	26.5			
Standard lens with Conversion lens (x 1.25)	Length	1.1	1.7	2.3	3.4	5.8	8.1	10.4	12.7	15.0	18.4	
	Width	1.5	2.3	3.1	4.6	7.7	10.8	13.9	17.0	20.1	24.7	
Standard lens with Elmo scope lens	Length	1.4	2.1	2.9	4.3	7.2	10.0	13.0	15.8	18.7		
	Width	3.8	5.8	7.7	11.5	19.3	27.0	34.7	42.4	50.1		
Telephoto lens (F/1.8, 75mm)	Length	0.9	1.4	1.9	2.9	4.8	6.7	8.6	10.6	12.5	15.4	18.3
	Width	1.3	1.9	2.6	3.8	6.4	9.0	11.6	14.1	16.7	20.6	24.4
Wide-angle lens (F/1.4, 20mm)	Length	3.6	5.4	7.2	10.8	18.0						
	Width	4.8	7.2	19.3	14.5	24.1						

SPECIFICATIONS

<Projector>

Power supply	:	AC Single phase, 50/60Hz.
Projection speed	:	24 frames per second.
Motor	:	Induction motor.
Reel capacity	:	Max. 600m (2000ft). Projector is equipped with 480m (1600ft) reel.
Loop restoring	:	Automatic.
Reverse projection	:	Possible.
Still projection	:	Possible.
Rewinding	:	High speed rewinding without changing over reels.

<Light source>

Projection lamp	:	350W xenon arc lamp. Lamp current 16A.
Projection lens		F1.2 50mm lens is standard. F1.4 20mm lens, F1.8 75mm lens, Conversion lens (x0.8 & x1.25), Zoom converter (x0.8 - x1.25) and Elmo scope len are available as accessories.

<Sound mechanism>

Sound system	:	Magnetic and optical sound reproduction.
Amplifier	:	All IC. Music power output : 25W 8Ω Continuous power output (5%) : 20W 8Ω Microphone and recorder are usable.
Tone control	:	Treble/Bass separate control.
Photo electric cell	:	Silicon photo-diode.
Exciter lamp	:	4V-0.7A. DC system.
Speaker	:	2 built-in 20cm (8") dynamic speakers.
High voltage circuit	:	Safety device is provided.

<Others>

Weight (Projector)	:	19 kgs. (42 lbs.)
Dimensions (Projector)	:	45 x 24 x 36 cm (17.7" x 9.4" x 14.2")

ELMO CO., LTD.

Nagoya, Japan

OVERSEAS SUBSIDIARY COMPANIES

West Germany Elmo (Europe) G.m.b.H.
Elmo-Haus, Steinstr. 23,
4000 Düsseldorf
Tel. (0211) 326867, 326870, 326895

Canada Elmo Canada Mfg Corp.
44 West Drive Brampton, Ontario L6T 3T6
Tel. (416) 453-7880

U.S.A. Elmo Mfg Corp.
32-10 57th Street Woodside, NY11377
Tel. (212) 626-0150
21220 Erwin Street, Woodland Hills, CA 91367
Tel. (213) 346-4500

Printed in Japan

SERVICE MANUAL

XP-350
XP-350AV

The chapter of "II. DISASSEMBLY & REASSEMBLY" is edited as follows.

At first ... how to remove the unit assembly from the projector.
Next ..... how to take out a small assembly or a single part from the unit assembly in order.

In this chapter the adjustment points are described, so reassemble the projector with care not to skip the adjustment.

ELMO CO.,LTD.

Nagoya, Japan

C O N T E N T S

I. EXAMPLE OF MALFUNCTION

	Trouble	Page
FILM THANSPORTATION	Picture is unsteady.	5, 9
	Picture is unsteady (Claw tip does not get out of film perforation correctly).	9
	Film flows.	9
	Shutter flows (Image trails).	9
	Film gets away from sprocket.	13
	Upper film loop gets lost.	15
	Lower film loop gets lost.	15
	A part of image is hidden.	5
	Light leaks out.	5
	Loop setter is not workable.	15, 17
	Loop setter often does not operate.	17
	Film curls up.	5
	Film is scratched.	5, 13
	Film burns.	43,51,53
	Framing is not adjustable.	5
	Film running noise is loud.	9
	Revolution of projector is unsteady.	3, 9
SOUND	Optical playback is impossible.	19, 29
	Sound quality of optical playback is poor.	19
	Magnetic playback is impossible.	19, 30
	Sound quality of magnetic playback is poor.	19
	Both playback of M-O are impossible.	27,31,55

	Trouble	Page
SOUND	Exciter lamp does not light up.	27
	Buzz adjustment is impossible.	17
	Hum is terrible.	17, 19
	Wow/Flutter is terrible.	13,15,19
TAKE-UP/REWIND	Film in front reel gets loose during projection.	3, 39
	Film in rear reel gets loose during reverse projection.	3
	Power of take-up is insufficient.	3
	Power of rewinding is insufficient.	3
	Film is not taken up.	37
	Film is not rewound.	39
MOTOR	Movement of motor switch knob is heavy.	51
	Motor running direction is not changeable.	55, 57
	Motor does not run.	55, 57
LAMP	Projection lamp does not light up.	43, 49
	Illuminance of lamp is uneven.	43
	Coating of mirror comes off.	43
OTHERS	Solenoide does not operate.	57
	Solenoide seizes up.	53
	Solenoide roars.	53
	Douser does not operate.	53
	Running noise is loud.	15, 25

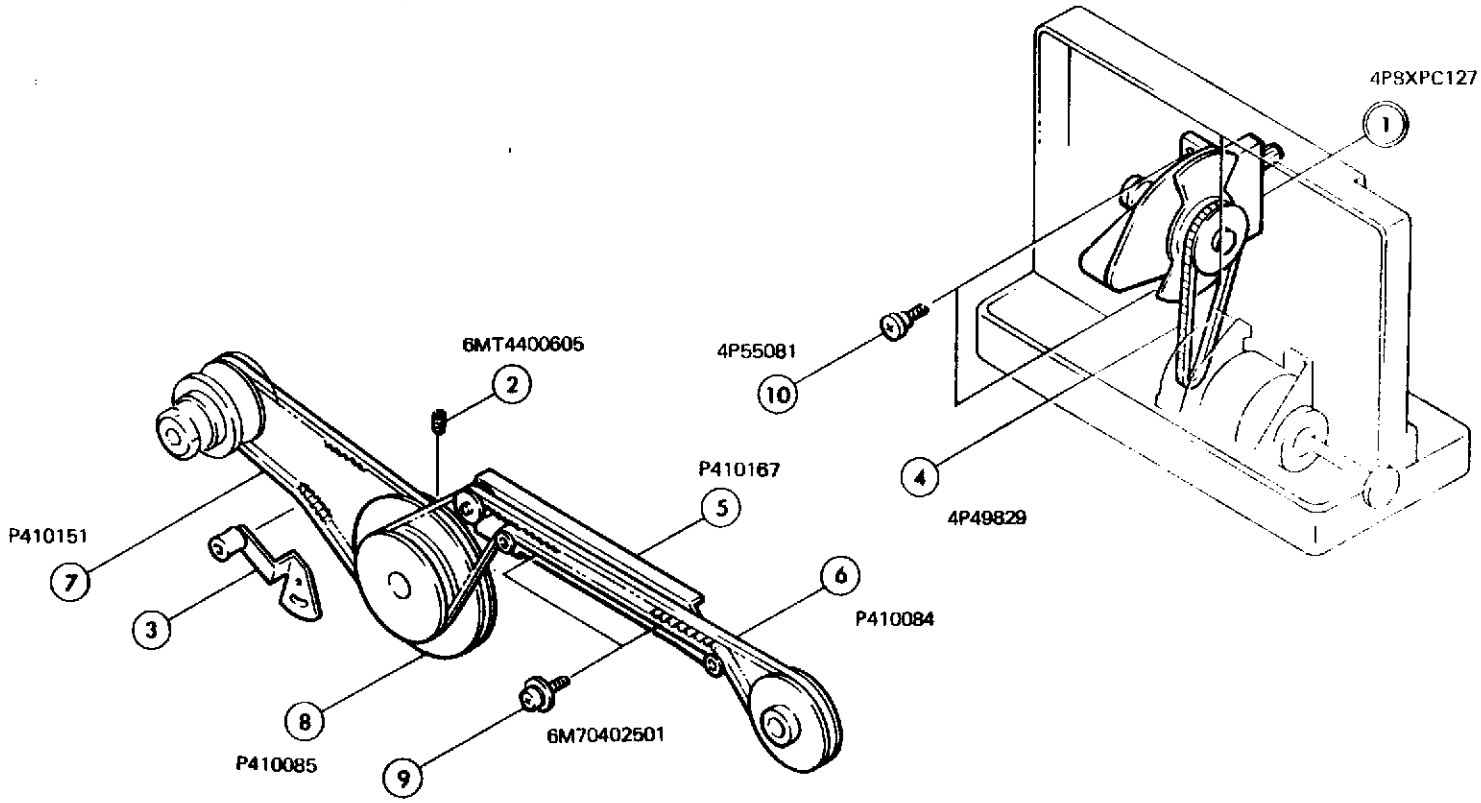

4P8XPC127
1
6MT4400605
2
4P55081
10
P410167
5
P410151
7
3
4
4P49829
6
P410084
8
P410085
9
6M70402501

Fig.1

II. DISASSEMBLY & REASSEMBLY

1. CLAW SECTION

A. Frame Assembly of Claw Section (Fig. 1-1)

TROUBLESHOOTING: Refer to Fig. 1.

Trouble	Cause
Film in front reel gets loose during projection.	(7) is overstrained.
Power of take-up is insufficient.	(6) is not stretched firmly.
Film in rear reel gets loose during reverse projection.	(6) is overstrained.
Power of rewinding is insufficient.	(7) is not stretched firmly.
Revolution of projector is unsteady.	(4) is worn-out or oily.

DISASSEMBLY:

1. Loosen (9) x 2 and move (5) to remove (6).
2. Move (3) to remove (7).
3. Unscrew (2) x 2 to remove (8).
4. Unscrew (10) x 2 to remove (1).

REASSEMBLY:

1. Wipe or replace if (4) is oily or worn-out.
2. Install (1) with (10) x 2.
3. Adjust the position of (3) so that (7) is stretched firmly without overstrain.
4. Adjust the position of (5) so that (6) is stretched firmly without overstrain.

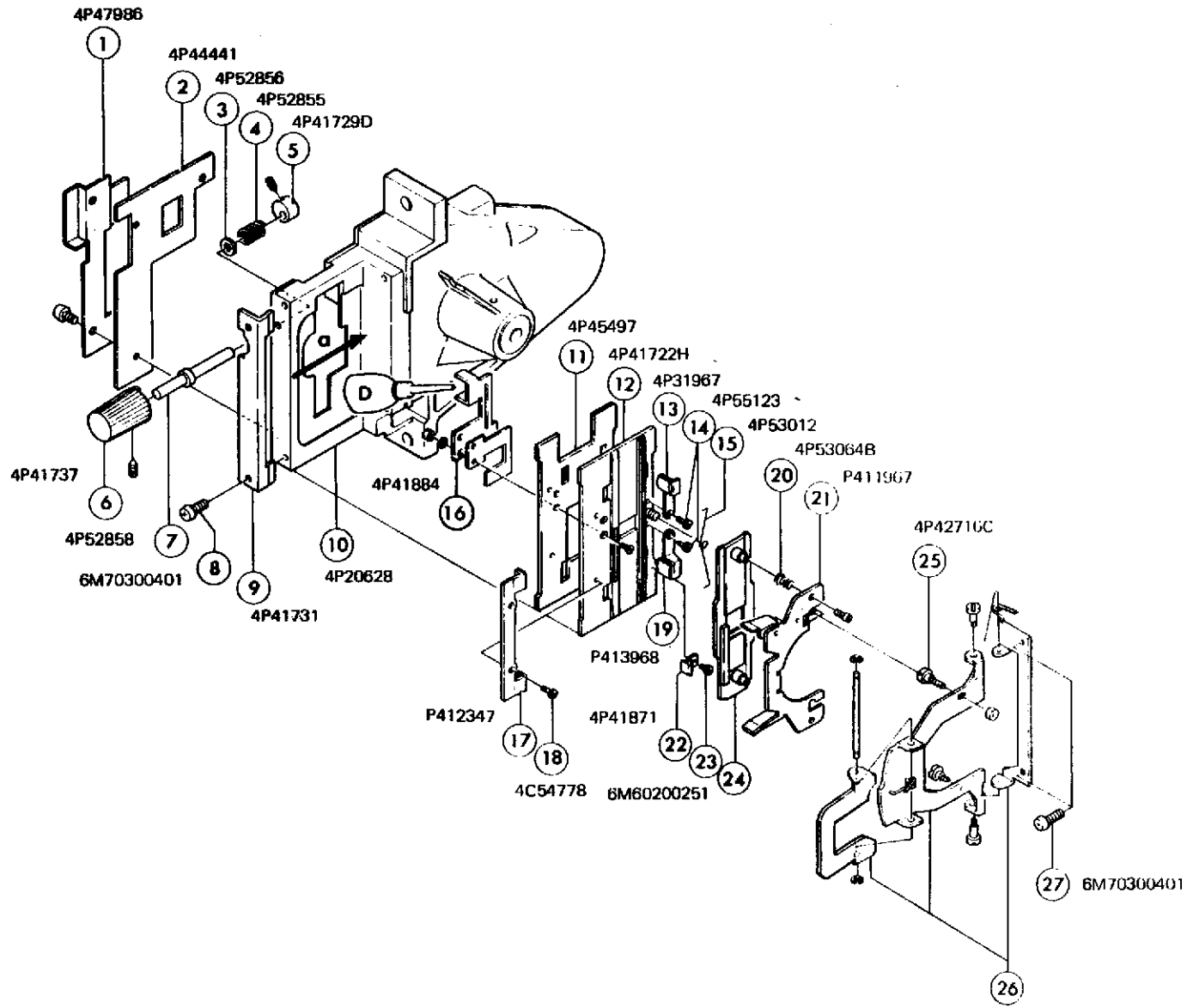

4P47986
1
4P44441
2
4P52856
3
4P52855
4
4P41729D
5
4P41737
6
4P52858
7
6M70300401
8
9
4P41731
10
4P20628
a
D
4P41884
16
4P45497
11
4P41722H
12
4P31967
13
4P55123
14
4P53012
15
4P53064B
20
P411967
21
4P42716C
25
P413968
19
P412347
17
18
4C54778
4P41871
22
23
24
6M60200251
27
6M70300401
26

Fig.2

B. Aperture Plate (Fig. 2-12) & Pressure Plate (Fig. 2-24)

TROUBLESHOOTING: Refer to Fig. 2.

Trouble	Cause	
Picture is unsteady.	(13)(19) are worn-out. Pressure of (15) is weak. Position of (17) is out of adjustment. Position of (22) is out of adjustment.	Refer to page 7.
Film curls up.	Pressure of (15) is too strong.	Refer to page 7.
Film is scratched.	There are burrs or scratch on (12)(24).	Refer to page 7.
A part of image is hidden.	Position of (24) is out of adjustment.	Refer to page 7.
Light leaks out.		
Framing is not adjustable.	Position of (6) is out of adjustment.	Refer to page 7.

DISASSEMBLY:

1. Unscrew (27) x 2 to remove an assembly of (26).
2. Unscrew (8) x 2 to remove (9) and an assembly of (11) to (23).
3. Refer to Fig. 2 to disassemble the above assemblies.

- to be continued -

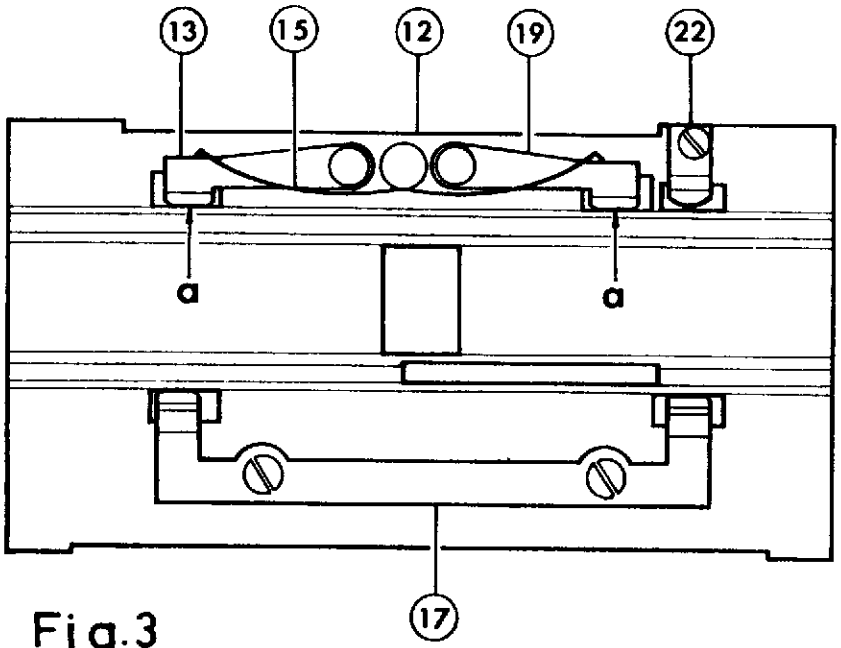


Fig.3

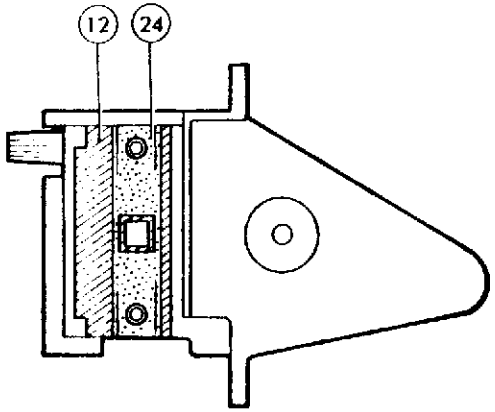


Fig.4

B. (Cont'd)

REASSEMBLY: Refer to Fig. 3.

1. Check (12) for no scratch or no burrs. If found, replace and attach it.
2. Attach (17) putting the lateral guide attaching gauge P087 on (12).
3. Attach (22) putting the fixing guide attaching gauge P088 on (12).
4. Replace (13)(19) if they are worn-out.
5. Measure the pressure of (15).

   How to measure ..... push the "a" part with the dial tension gauge C063.

   Tolerance ..... 40g - 50g.

   Adjustment..... bend (15).
6. Assemblé (11) and (12) in Fig. 2 temporarily. Pushing it in the arrow direction of "a" in Fig. 2, attach it. Then make sure that it can move smoothly.
7. After attaching the assembly of (26), make sure again (12) can move smoothly.
8. Attach (16) in Fig. 2 to the assembly of (11)(12).
9. Refer to Fig. 4. Adjust with (25) in Fig. 2 so that both masks of (12)(24) are positioned as shown in Fig. 4. After installing (1) in Fig. 1 in the projector, check if a part of image is hidden or if light leaks.
10. As the mask of (12) is narrow than the mask of (24), widths are made by both masks upside and downside as shown in Fig. 4. Turning (7) clockwise and counterclockwise, adjust with (6) so that the upper width and lower width are the ratio of 7 : 3.

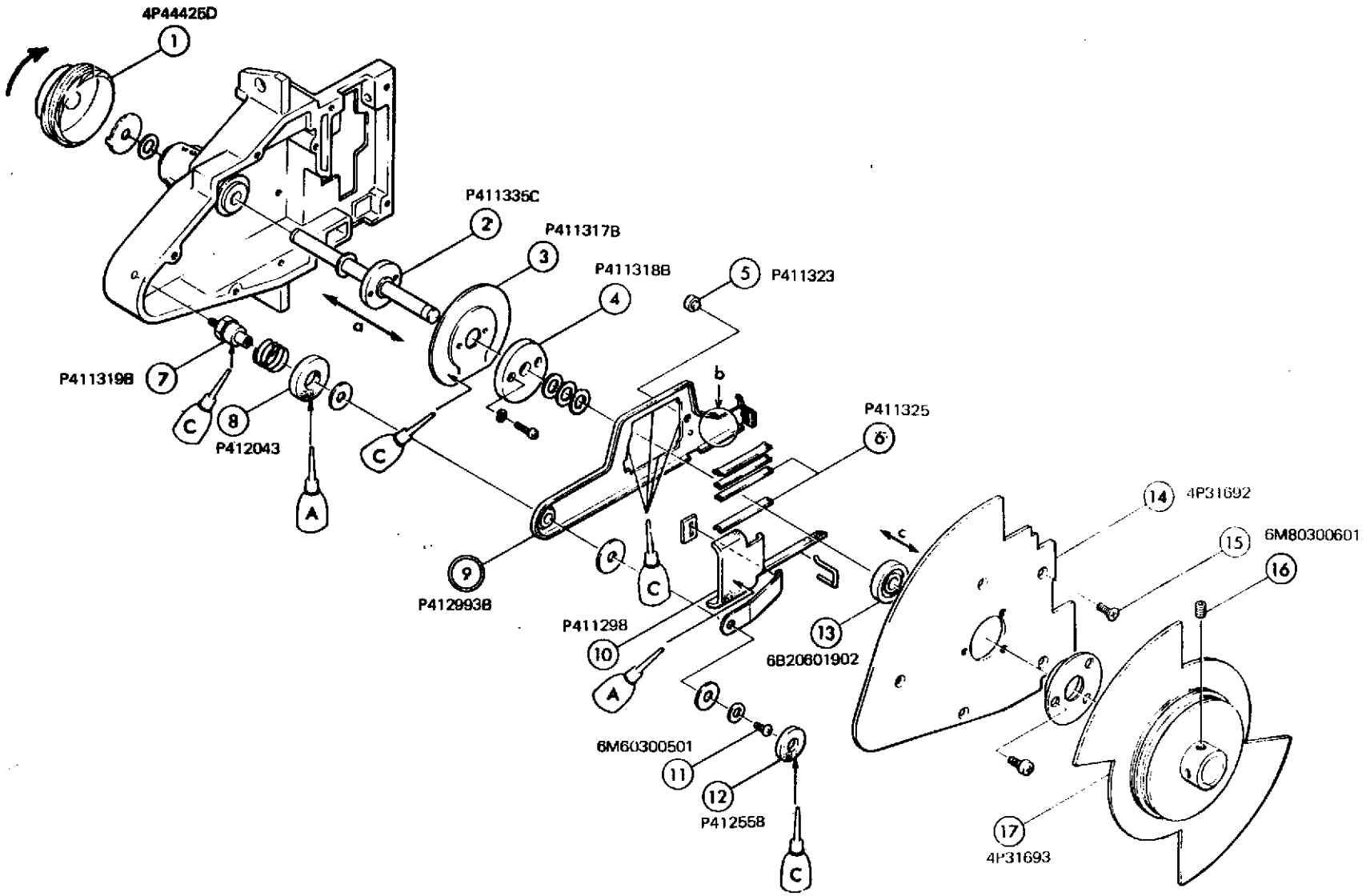

4P44426D
1
P411335C
2
P411317B
3
P411318B
4
5
P411323
P4113198
7
8
P412043
P411325
6
14
4P31692
15
6M80300601
16
9
P4129938
P411298
10
13
6B20601902
6M60300501
11
12
P412558
17
4P31693
A
B
C
a
b
c

Fig.5

C. Claw Assembly (Fig. 5-9)

TROUBLESHOOTING: Refer to Fig. 5.

Trouble	Cause	
Picture is unsteady.	Position of (1) is out of adjustment. (6) is worn-out.	Refer to page 11.
Picture is unsteady (Claw tip does not get out of film perforation correctly).	Claw tip overprotrudes from aperture plate. (5) is worn-out.	Refer to page 11.
Film flows.	Claw tip does not protrude enough to regulate the film transportation.	Refer to page 11.
Shutter flows (Image trails).	Position of (17) is out of adjustment.	Refer to page 11.
Revolution of projector is unsteady.	Position of (1) is out of adjustment.	Refer to page 11.
Film running noise is loud.	Position of (1) is out of adjustment. (6) is worn-out. Grease is lacking in (3)(4)(7)(9). Oil is lacking in (8)(10)(12).	Refer to page 11.

DISASSEMBLY:

1. Unscrew (16) x 2 to remove (17).
2. Unscrew (15) x 5 to remove (14).
3. Unscrew (11) to remove (9).
4. Refer to Fig. 5 to disassemble further.

- to be continued -

C. (Cont'd)

REASSEMBLY: Refer to Figs. 5, 6 and 7.

1. Attach (1) in place (2) can turn smoothly without rattling in the arrow direction "a" in Fig. 5.
2. Attach (3) after checking the surface of (3) for no burrs or no scratch.
3. If there is a play between (4) and (6), (6) is worn-out. If so, replace it.
4. If (5) is worn-out, replace and fix it with "ARON ALPHA".
5. Apply a washer between (4) and (13) so that (13) can turn smoothly without rattling in the arrow direction "c" in Fig. 5.
6. Adjust by bending "b" part of (9) so that the claw tip can protrude by 1.0mm from a rail face of aperture plate (Fig. 4-12).
7. Adjust a claw stroke in the following manner.

   Put a film on the aperture plate. Turn (1) in the arrow direction and after one frame of film is sent, the tip should slip out from film perforation without touching with the edges of perforation as well as tip should enter it without touching.

   If the claw stroke is large, enlarge a hole of (4) slightly in the arrow direction "a" in Fig. 6 and change the position of (4). And if small, do in the arrow direction "b" as well.
8. Make sure that oil does not adhere to (16).
9. Attach (16) in place it hides the aperture mask while claw is transporting the film. Refer to Fig. 7.

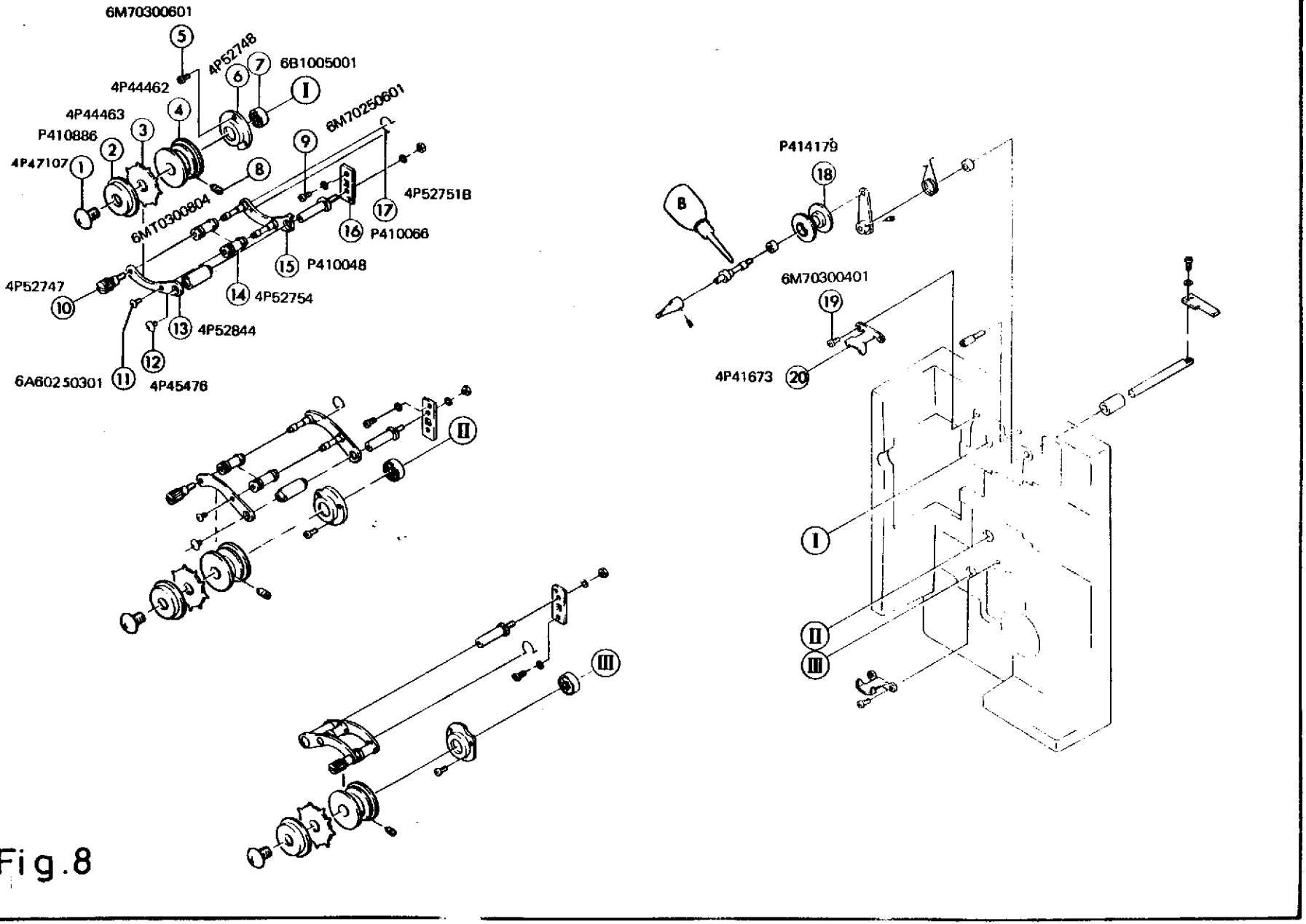

6M70300601
5
4P52748
6
7
6B1005001
I
4P44462
4P44463
4
6M70250601
P410886
3
9
2
4P47107
1
8
4P52751B
17
6MT0300804
16
P410066
15
P410048
4P52747
14
4P52754
10
13
4P52844
12
11
6A60250301
4P45476
II
III
P414179
18
B
6M70300401
19
4P41673
20
I
II
III

Fig.8

II - 2. MACHINE FRAME SECTION

A. Sprocket (Fig. 8-3) & Upper Guide Roller (Fig. 8-26)

TROUBLESHOOTING: Refer to Fig. 8.

Trouble	Cause
Wow/Flutter is terrible.	(3) is damaged. (7) is defective.
Film is scratched.	There are burrs or scratch on (3)(4). Position of (16) is out of adjustment. There are burrs or scratch on (14)(18).
Film gets away from sprocket.	Position of (16) is out of adjustment.

DISASSEMBLY:

1. Unscrew (19) x 2 to remove (20).
2. Unscrew (1), (8) x 2 to remove (2)(3)(4).
3. Unscrew (5) x 3 to remove (6)(7).
4. Unscrew (12) to remove an assembly of (10) to (15).
5. Refer to Fig. 8 to disassemble further.

REASSEMBLY:

1. Attach (6)(7) in place there is backlash at gear on back of (6)(7).
2. Inspect (3)(4) for no burrs or no scratch.
3. Inspect (14)(18) for no burrs or no scratch.
4. Adjust the position of (16) so that there is clearance of 0.3mm - 0.5mm between (14) and the bottom land of (3) as shown in Fig. 9.

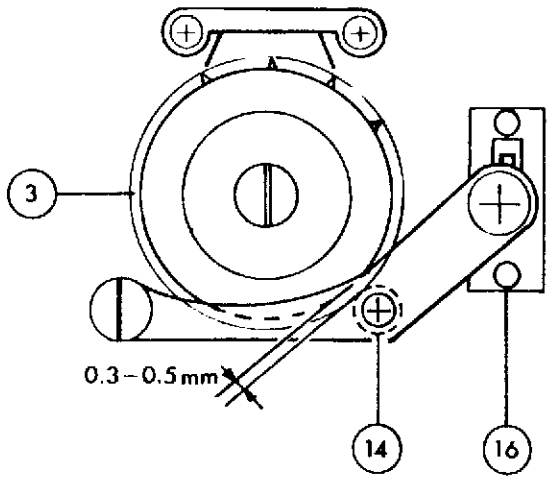


Fig.9

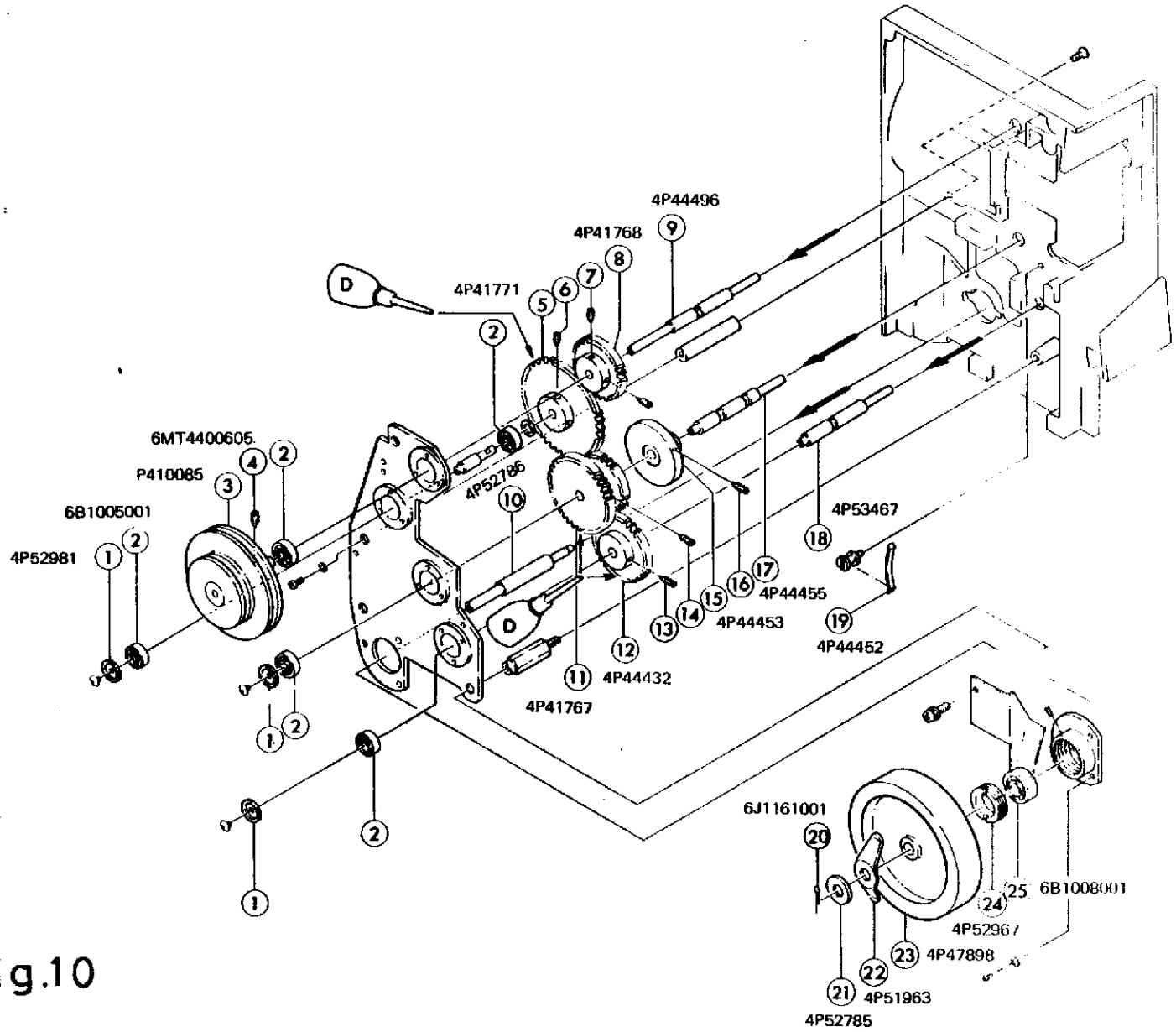

4P44496
9
4P41768
8
7
6
5
4P41771
D
2
6MT4400605
4
2
P410085
3
6B1005001
2
4P52981
1
4P52786
10
4P53467
18
17
16
15
14
13
12
11
4P44455
4P44453
4P44432
4P41767
D
19
4P44452
1
2
2
1
6J1161001
20
24
25
6B1008001
4P52967
23
4P47898
22
21
4P51963
4P52785

Fig.10

B. Middle Gear (Fig. 10-5), Gear I (Fig. 10-8), Worm Gear (Fig. 10-11), Gear II (Fig. 10-12) & Loop Setter Friction Wheel II (Fig. 10-15)

TROUBLESHOOTING: Refer to Fig. 10.

Trouble	Cause
Loop setter is not workable.	(15) is worn-out or oil adheres to it. (19) is out of adjustment.
Wow/Flutter is terrible.	(2)(25) are defective. (5)(8)(11)(12) are damaged.
Upper film loop gets lost.	(8) is damaged.
Lower film loop gets lost.	(11) is damaged.
Running noise is loud.	(2)(25) are defective. (5)(8)(11)(12) are damaged.

DISASSEMBLY:

1. Remove the sprocket assembly referring to page 13.
2. Unscrew (4) x 2 to remove (3).
3. Unscrew (7) x 2. Push (9) in the arrow direction and pull (2)(9) out. Then remove (8).
4. Unscrew (14) x 2. Push (17) in the arrow direction and pull out a set of (1)(2)(17). Then remove (11)(15).
5. Unscrew (13) x 2. Push (18) in the arrow direction and pull out a set of (1)(2)(18). Then remove (12).
6. Unscrew (6) x 2 to remove (5).
7. Remove (20)(21)(23).
8. Unscrew (24) to remove (25).

REASSEMBLY:

1. Install the parts in the reverse manner of the disassembly.
2. Replace or wipe (15) if worn-out or oily.
3. Replace (5)(8)(11)(12) if defective.
4. After attaching (24), make sure that (23) can turn without rattling.
5. After performing to assemble, adjust the pressure of (19) to see when operating the loop setter, film loop can be formed within the operation of three times.

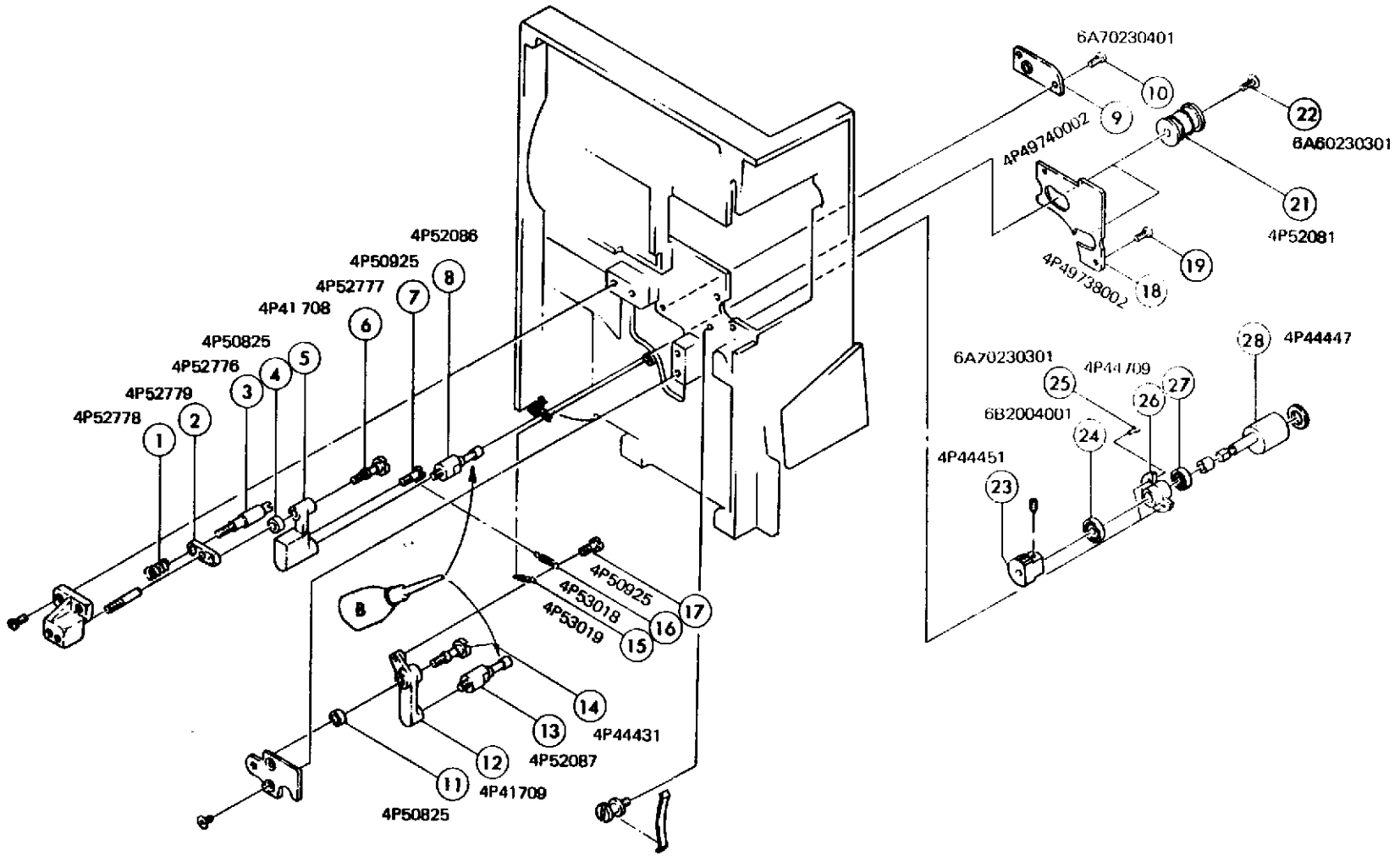

6A70230401
10
9
4P4974002
22
6A60230301
21
4P52081
19
4P4973800 2
18
4P52086
4P50925
4P52777
4P41 708
4P50825
4P52776
4P52779
4P52778
1
2
3
4
5
6
7
8
28
4P44447
6A70230301
4P44709
25
26
27
6B2004001
24
4P44451
23
4P50925
4P53018
4P53019
17
16
15
14
13
4P44431
12
4P52087
11
4P41709
4P50825

Fig.11

C. Lever III (Fig. 11-2) & Loop Setter Eccentric Roller (Fig. 11-28)

TROUBLESHOOTING : Refer to Fig. 11.

Trouble	Cause
Loop setter is not workable.	(28) is oily. Position of (26) is out of adjustment.
Loop setter often does not operate.	(24)(27) are defective.
Hum is terrible.	(3) is out of adjustment.
Buzz adjustment is impossible.	(1) is defective.

DISASSEMBLY:

a. Removal of Lever III
   1. Unscrew (22) x 2, (10) x 2, (19) x 2 to remove (21) x 2, (9), (18) respectively.
   2. Unscrew (14)(17) to remove (12)(13). Note that (11) will drop.
   3. Unscrew (6) to remove (5)(8). Note that (4) will drop.
   4. Unscrew (3) to remove (1)(2).

b. Removal of Loop Setter Eccentric Roller
   Unscrew (25) x 3 to remove an assembly of (23) to (28). Disassemble further referring to Fig. 11.

REASSEMBLY:

a. Assemblage of Lever III
   After installing, run the optical buzz track film P032 and adjust buzz by tightening (3).

b. Assemblage of Loop Setter Eccentric Roller
   1. Wipe (28) if oily.
   2. Position (26) in place (28) can turn immediately a worm gear (Fig. 10-11) starts to turn.
   3. Running the film, make sure when operating the loop setter, the setter performs its operation within three times. Readjust the position of (26) if loop setter continues to operate more than four times.

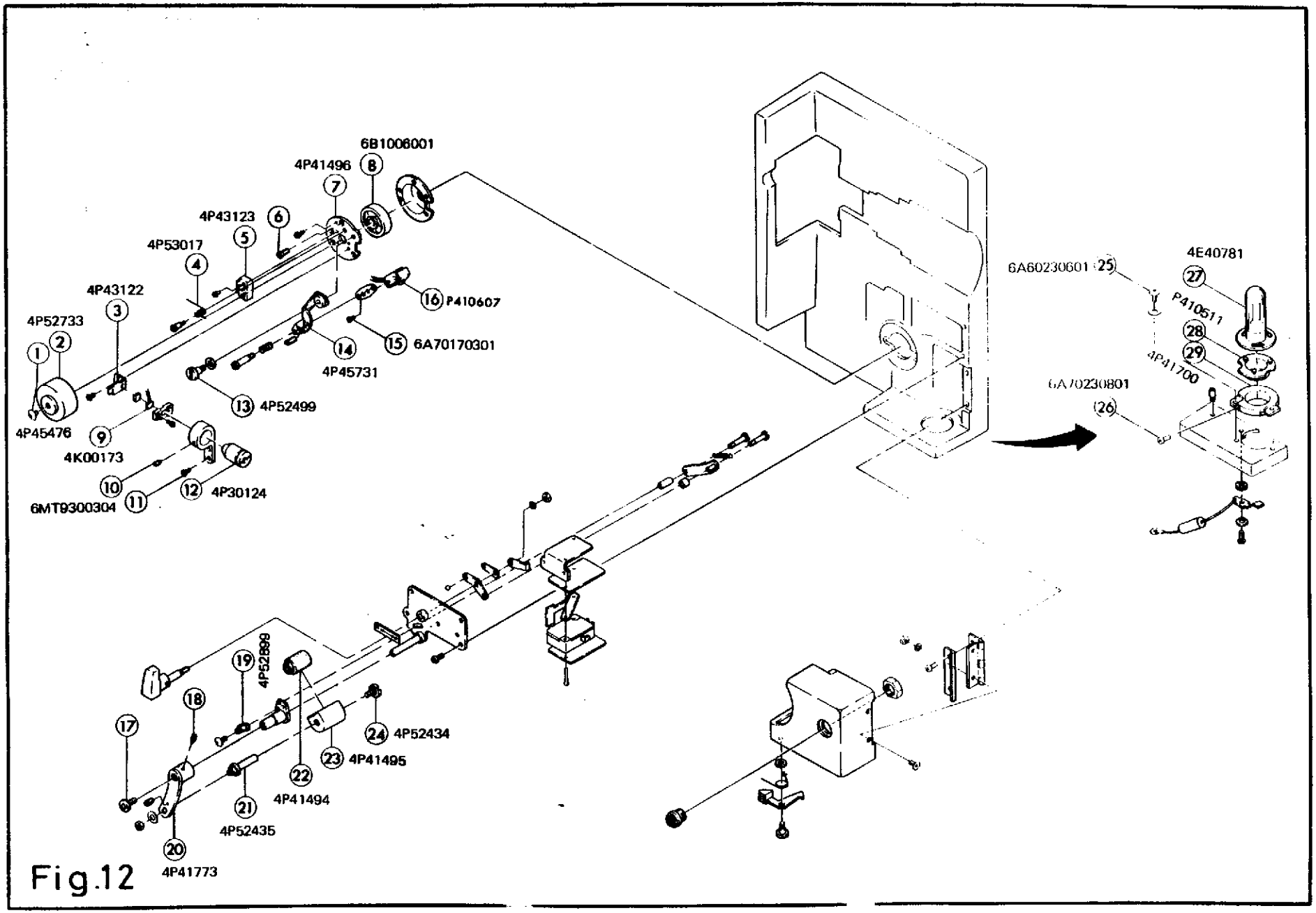

6B1006001
4P41496
8
7
4P43123
6
5
4P53017
4
4P43122
3
4P52733
2
1
16 P410607
15 6A70170301
14
4P45731
13 4P52499
4P45476
9
4K00173
10
11
12 4P30124
6MT9300304
6A60230601
25
4E40781
27
P410511
28
29
4P41700
6A70230801
26
19
4P52898
18
17
24 4P52434
23 4P41495
22
4P41494
21
4P52435
20
4P41773

Fig.12

II - 3. MAGNETIC HEAD SECTION

A. Pad Roller (Fig. 12-22), Playback Head (Fig. 12-16) & Silicon Photodiode (=Solar Battery) (Fig. 12-9)

TROUBLESHOOTING: Refer to Fig. 12.

Trouble	Cause
Wow/Flutter is terrible.	(8) is defective. (22) does not turn smoothly.
Optical playback is impossible.	(9) is defective. (27) is broken.
Sound quality of optical playback is poor.	(9) is dirty. Positions of (12)(21) are out of adjustment. (Page 21
Magnetic playback is impossible.	(16) is broken.
Sound quality of magnetic playback is poor.	(16) is out of adjustment. Position of (20) is out of adjustment. (Page 21 (22) does not turn smoothly.
Hum is terrible.	(23) is out of adjustment.

DISASSEMBLY:

a. Removal of Pad Roller
   1. Unscrew (18) x 2, (17) to remove an assembly of (20) to (24).
   2. Unscrew (24) to remove (22)(23).

b. Removal of Playback Head
   1. Unscrew (1) to remove (2).
   2. Unsolder two wires connected with (5). Unscrew (15) x 2 to remove (16).

c. Removal of Silicon Photodiode
   1. Unscrew (13) to remove (14).
   2. Unsolder two wires connected with (5) to remove an assembly of (3).
   3. Disassemble further referring to Fig. 12.

d. Refer to Fig. 12 to remove the parts relative to the exciter lamp socket.

- to be continued -

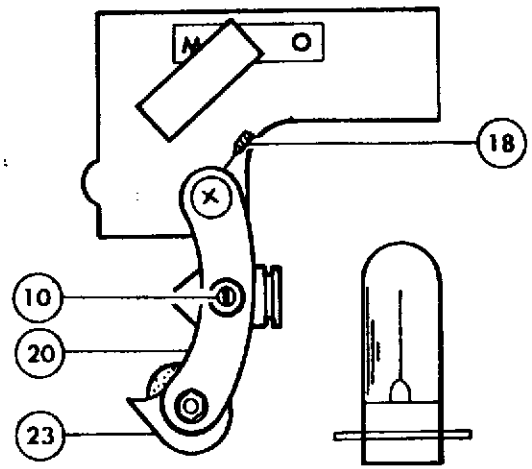


Fig.13

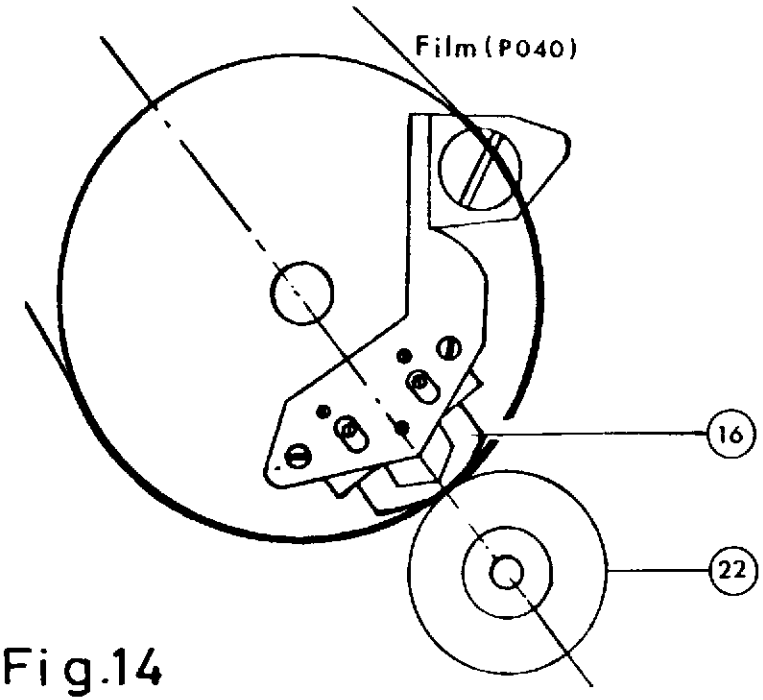


Fig.14

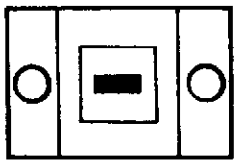


Fig.15

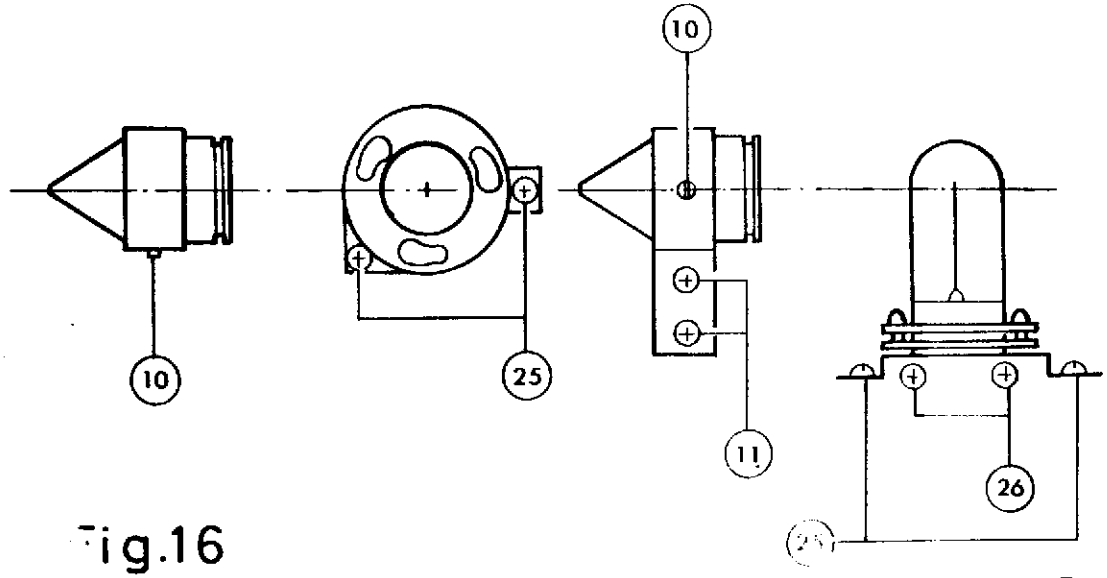


Fig.16

II - 3. MAGNETIC HEAD SECTION

A. (Cont'd)

REASSEMBLY:

a. Assemblage of Pad Roller

1. Install the parts in the reverse manner of the disassembly.
2. Make sure that (22) has no scratch and can turn smoothly.
3. Refer to Fig. 13. Fix (20) with (18) x 2 in place when switching M-O lever to "O" side, the sound lens adjustment hole of (20) aligns with (10).
4. Adjust an angle of (23) to see that hum is minimum when switching M-O lever to "M" side.

b. Assemblage of Playback Head

1. Install it in the reverse manner of the disassembly.
2. Refer to Fig. 14. Adjust the position of (21) in Fig. 12 where a gap of (16) aligns with a center line of (22).
3. After the above adjustment, running a magnetic azimuth alignment film P040, the volume gets maximum.

c. Assemblage of Silicon Photodiode and Sound Lens (Fig. 12-12)

1. After checking (9)(2) for no oily, attach them in the reverse manner of the disassembly.
2. Turn on an exciter lamp. Adjust with (11) in Fig. 16 so that a solar battery (silicon photodiode) can receive the beam of (12) exactly as shown in Fig. 15.
3. After the above adjustment, attach (2). Adjust with (25) x 2, (26) x 2 to see that the filament of exciter lamp aligns with the sound lens as shown in Fig. 16.
4. After the above adjustment, running a sound focus film P035, adjust the position of (12) slightly up and down, right and left so that volume gets maximum.
5. Running a buzz track film P032, adjust buzz.

II - 3. MAGNETIC HEAD SECTION

B. Measurement of Sound Quality

Item	Tolerance	Test Film	Instrument	Measuring Condition
Distortion Factor	Max. 5%	P033/P037	P084	Tone control knob is at the middle position. Volume position is where the output is equal to the rated output of 20W-12.8V (Distortion Range).
S/N Ratio	Min. 45dB	P033/P037	P084	Tone control knob is at the middle position. Volume position is where the output is -2dB less than the rated output. After this adjustment, run the projector without film (Level Range).
Wow/Flutter	Max. 0.4%	P034/P038	P083	(JIS WEIGHTED)
Frequency Response	See Fig. 17	P036/P039	P084	Tone control knob is at the middle position. Volume position is where the indication on the meter (Level Range) comes to 4V during playback of 400Hz signal. Basing on this level, read other signals.

P033: Optical Signal Level Film, 400Hz
P034: Optical Flutter Film
P036: Optical Multifrequency Film
P037: Magnetic Signal Level Film, 400Hz
P038: Magnetic Flutter Film
P039: Magnetic Multifrequency Film

P083: Wow/Flutter Meter
P084: Distortion Meter

II - 3. MAGNETIC HEAD SECTION

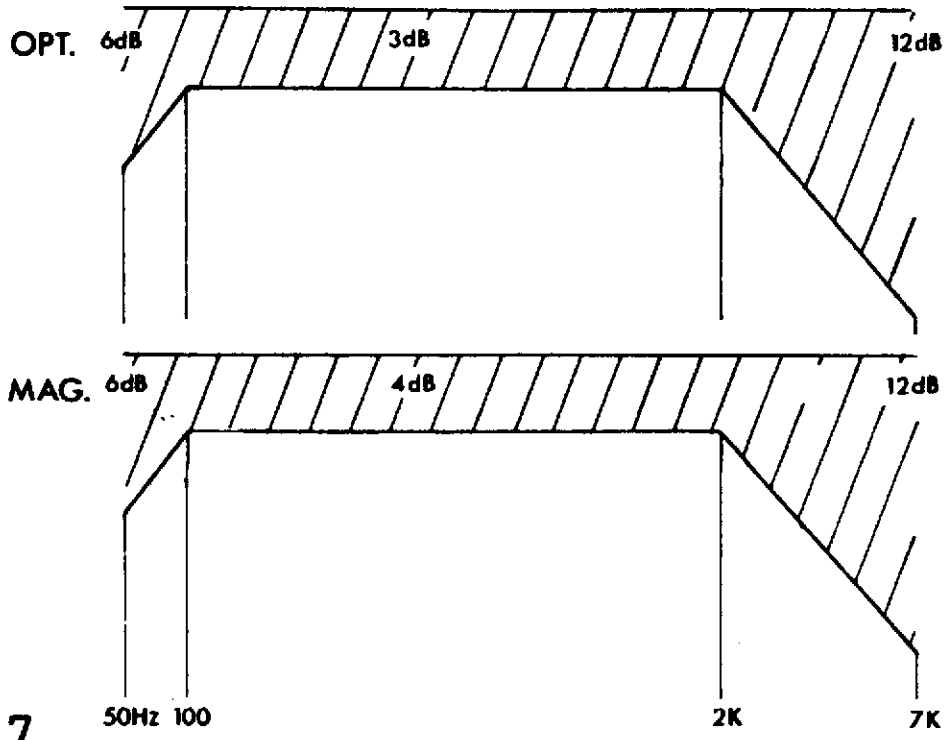


Fig.17

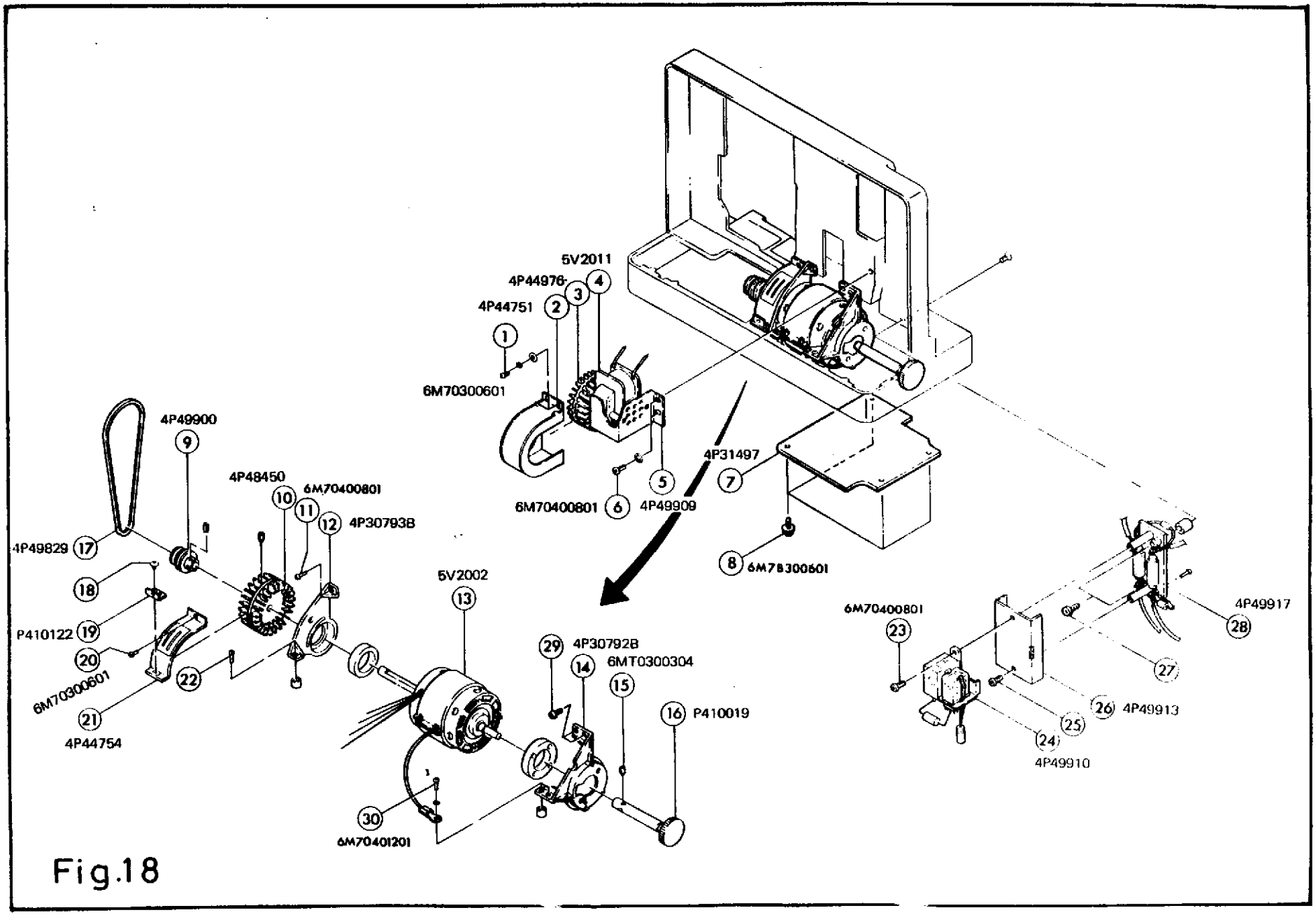

5V2011
4P44976
4P44751
1
2
3
4
6M70300601
6M70400801
6
5
4P49909
4P31497
7
8
6M78300601
4P49900
9
4P48450
10
6M70400801
11
12
4P30793B
4P49829
17
18
P410122
19
20
6M70300601
21
4P44754
22
5V2002
13
29
4P30792B
14
6MT0300304
15
16
P410019
30
6M70401201
6M70400801
23
4P49917
28
27
26
4P49913
25
24
4P49910

Fig.18

II - 4. MOTOR SECTION

Motor 2KC-40AL (Fig. 18-13)

TROUBLESHOOTING: Refer to Fig. 18.

Trouble	Cause
Running noise is loud.	Position of (2) or (10) is out of adjustment.

DISASSEMBLY:

1. Unscrew (1) x 2 to remove (2).
2. Unscrew (6) x 2 to loosen (5).
3. Unscrew (23) to remove (24).
4. Unscrew (25) to remove (26).
5. Unscrew (27) x 2 to remove (28). Unsolder four wires (White, Red).
6. Unscrew (8) x 4 to remove (7).
7. Remove (17). Unscrew (18)(20) to remove (21).
8. Unscrew (11)(22), (29) x 2, (30) x 2 to remove an assembly of (9) to (16). Unsolder wires (Black, Red, Orange, Blue) connected with (13) from other ends.
9. Disassemble further referring to Fig. 18.

REASSEMBLY:

1. Attach (13) with (12)(14). In this case, close (12)(14) to (13) in order that (13) is attached firmly.
2. Position (10) where (10) is not touch with (12) and base frame.
3. Position (2) where it is not touch with (3).

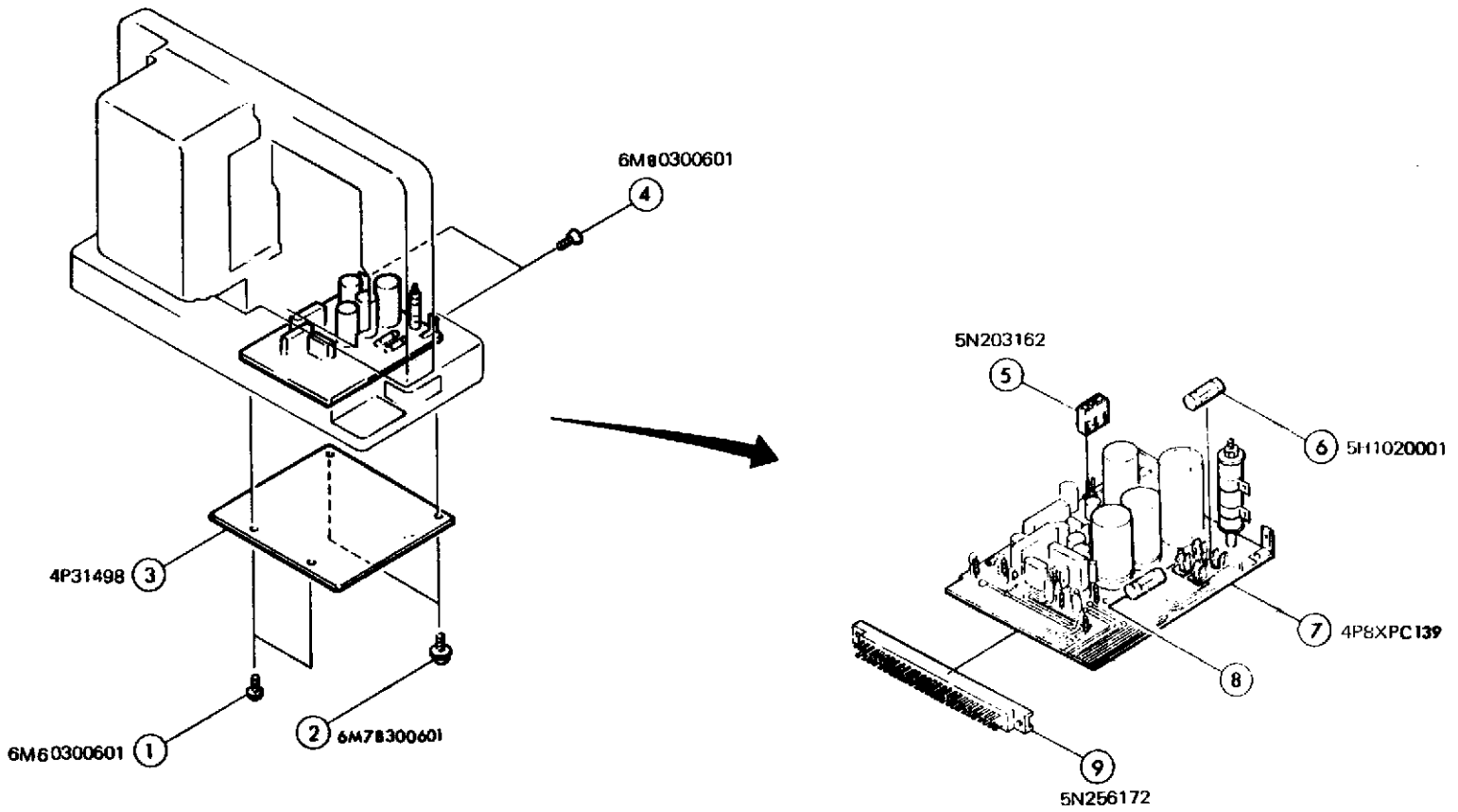

6M80300601
4
5N203162
5
6
5H1020001
4P31498
3
7
4P8XPC139
8
6M60300601
1
2
6M78300601
9
5N256172

Fig.19

II - 5. AMPLIFIER SECTION

A. Amplifier (Fig. 19-7)

TROUBLESHOOTING: Refer to Fig. 19.

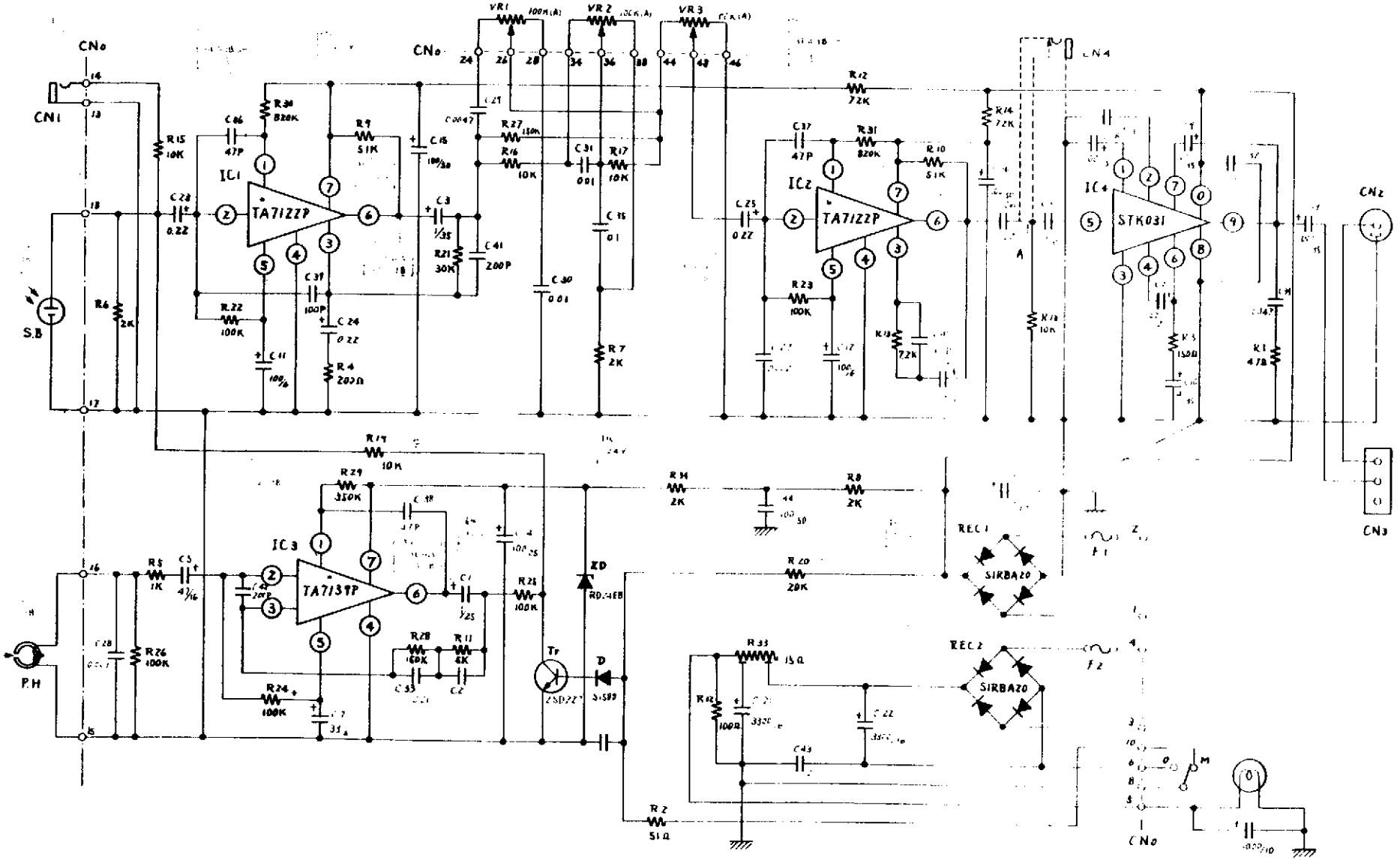
Trouble	Cause
Both playback of M-O are impossible.	(5) is not connected firmly. (6) is broken. (9) is not connected firmly.
Exciter lamp does not light up.	(8) is broken.

DISASSEMBLY:

1. Unscrew (1) x 2, (2) x 2 to remove (3).
2. Disconnect (5)(9).
3. Unscrew (4) x 2 to remove (7). Note that when removed (4), nuts of M4.0mm will drop.

REASSEMBLY:

Install the amplifier in the reverse manner of the disassembly.

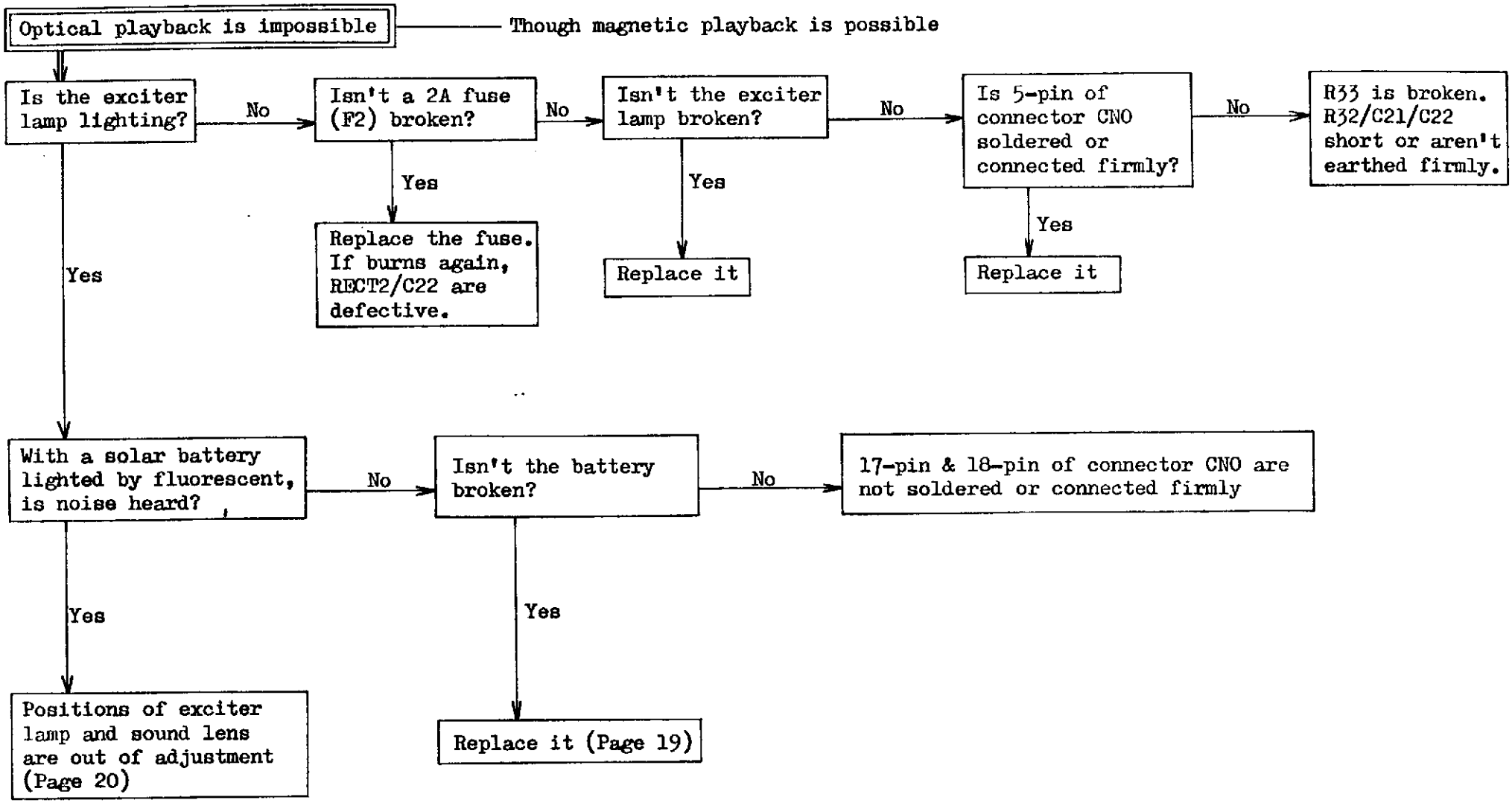


For AV model, cut "A" part and connect a jack (CN4) additionally.

Schematic biagram for amplifier for —350No.74751以後 E31163 E31164

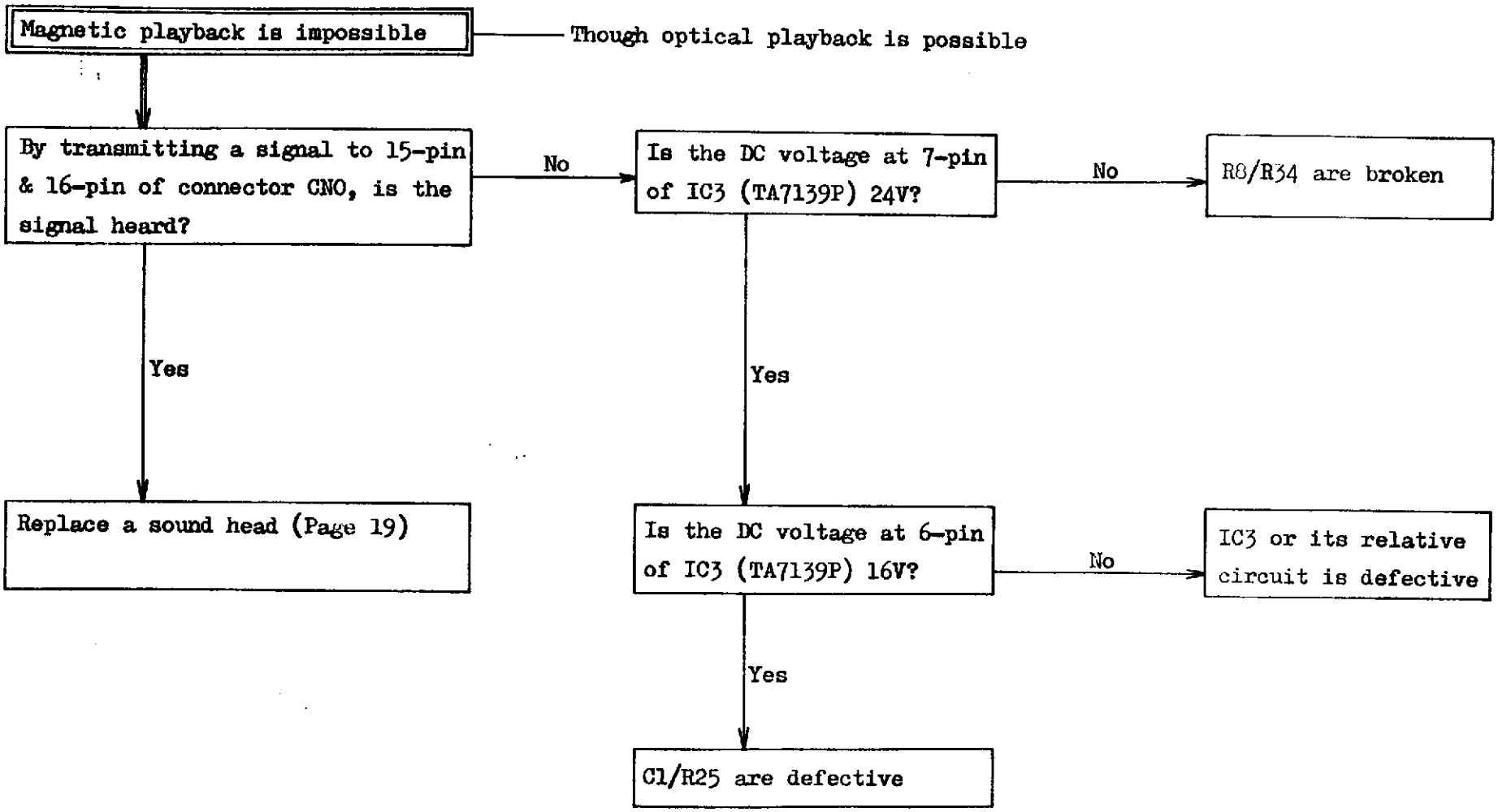
II - 5. AMPLIFIER SECTION

B. Troubleshooting (Flow Chart)

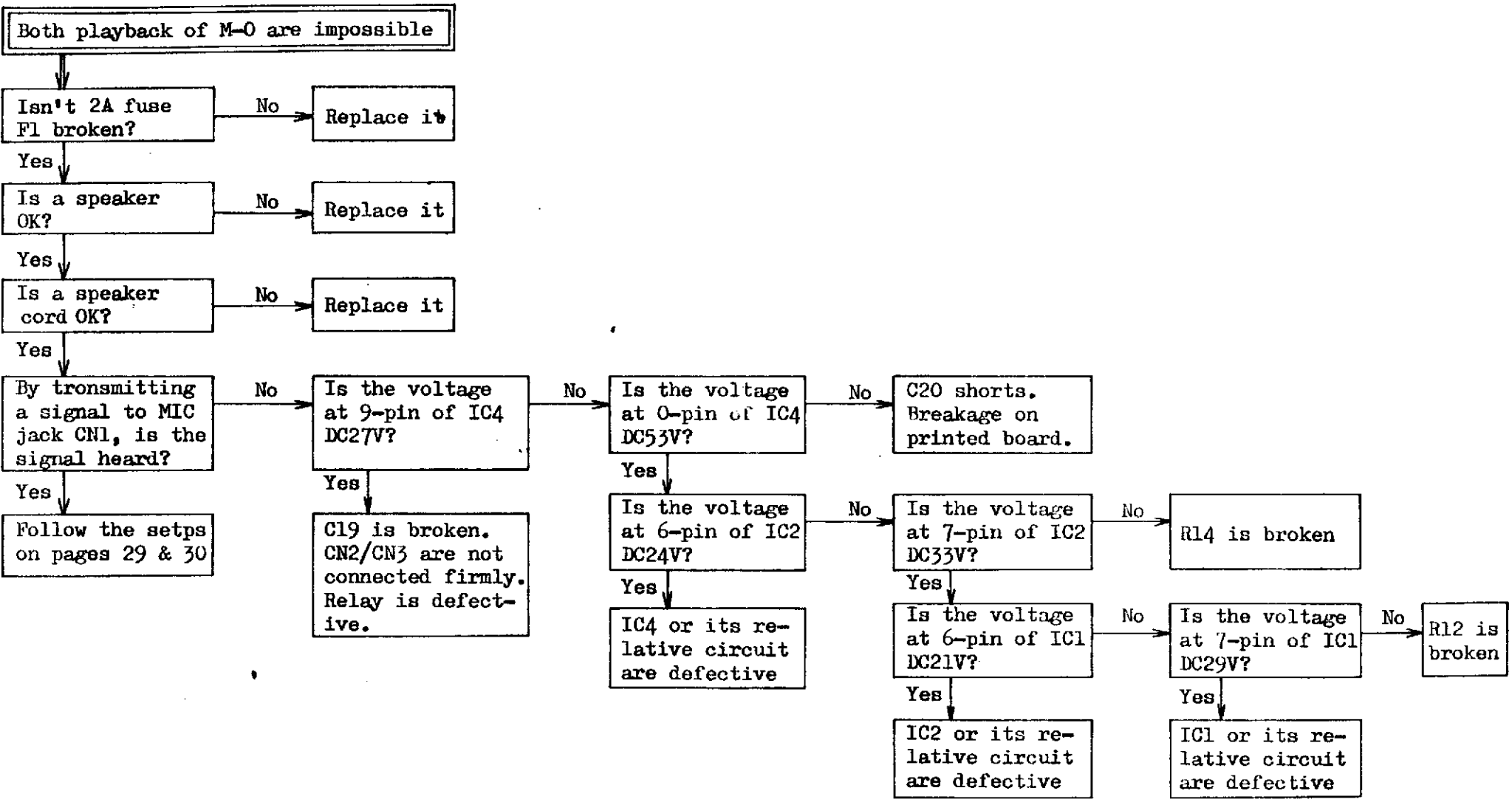


II - 5. AMPLIFIER SECTION

B. (Cont'd)



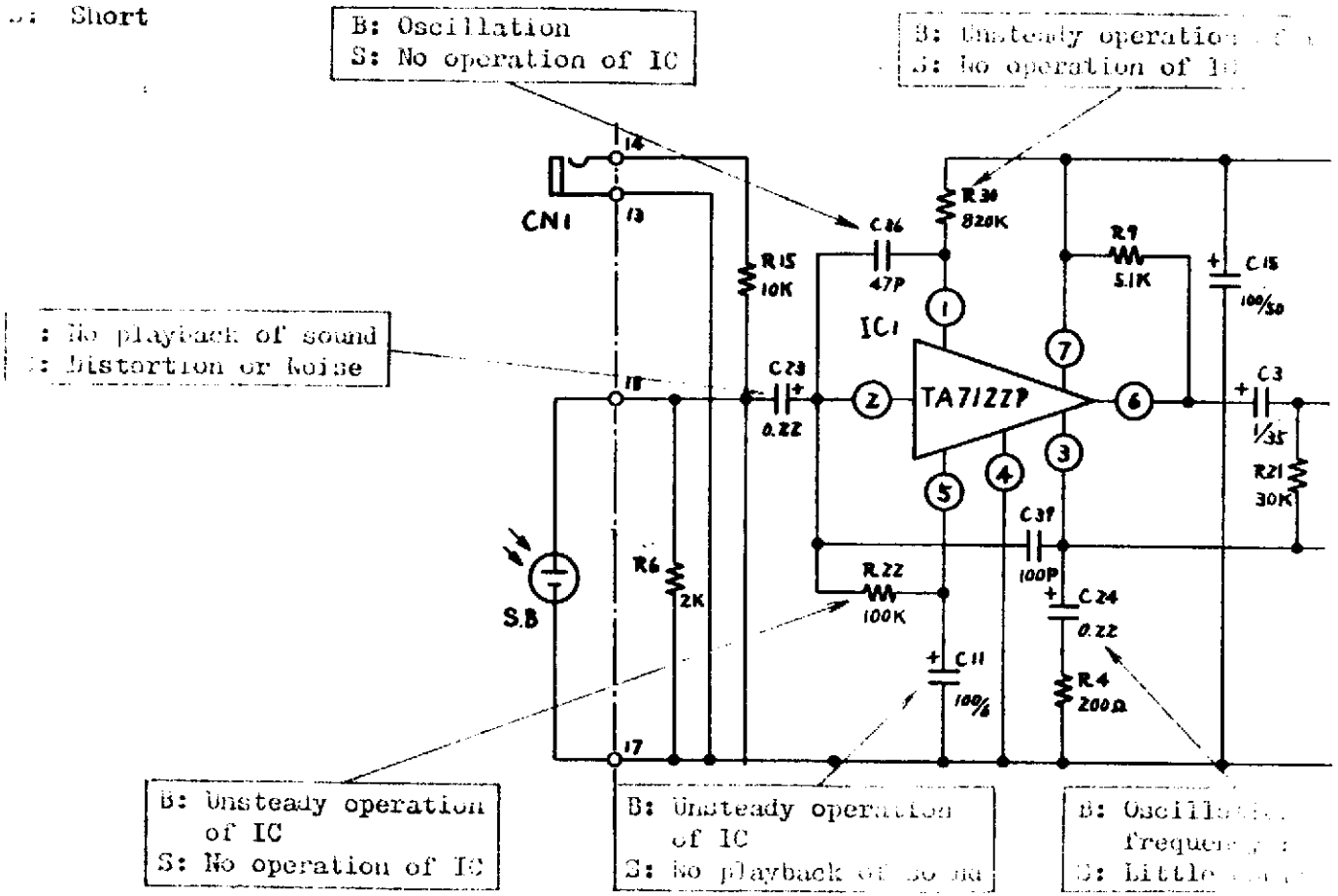
B. (Cont'd)


Both playback of M-O are impossible
Isn't 2A fuse F1 broken?
No
Replace it
Yes
Is a speaker OK?
No
Replace it
Yes
Is a speaker cord OK?
No
Replace it
Yes
By tronsmitting a signal to MIC jack CN1, is the signal heard?
No
Is the voltage at 9-pin of IC4 DC27V?
No
Is the voltage at O-pin of IC4 DC53V?
No
C20 shorts. Breakage on printed board.
Yes
Follow the setps on pages 29 & 30
Yes
C19 is broken. CN2/CN3 are not connected firmly. Relay is defect-ive.
Yes
Is the voltage at 6-pin of IC2 DC24V?
No
Is the voltage at 7-pin of IC2 DC33V?
No
R14 is broken
Yes
IC4 or its re-lative circuit are defective
Yes
Is the voltage at 6-pin of IC1 DC21V?
No
Is the voltage at 7-pin of IC1 DC29V?
No
R12 is broken
Yes
IC2 or its re-lative circuit are defective
Yes
IC1 or its re-lative circuit are defective

II - 5. AMPLIFIER SECTION

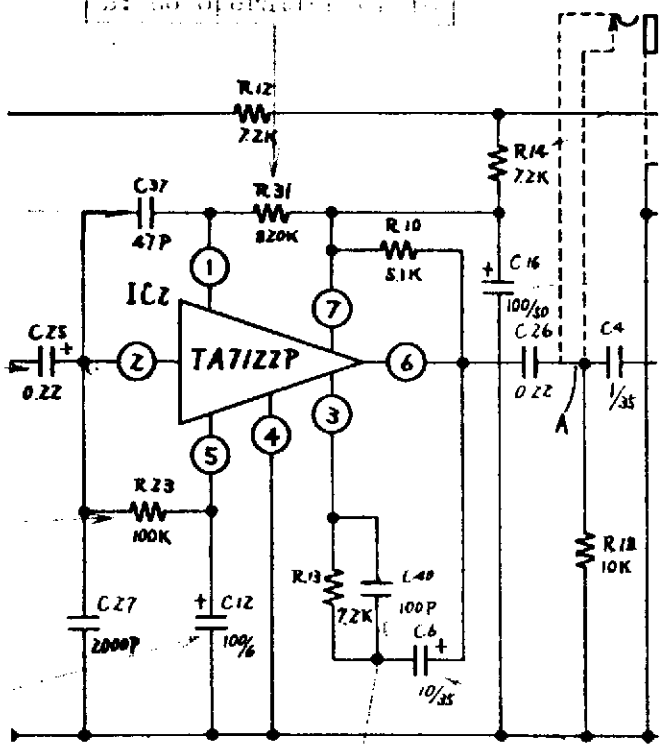
Relative Circuit to IC1 (TA7122P)

: Broken
: Short



II - 5. AMPLIFIER SECTION

Relative Circuit to IC2 (TA7122P)



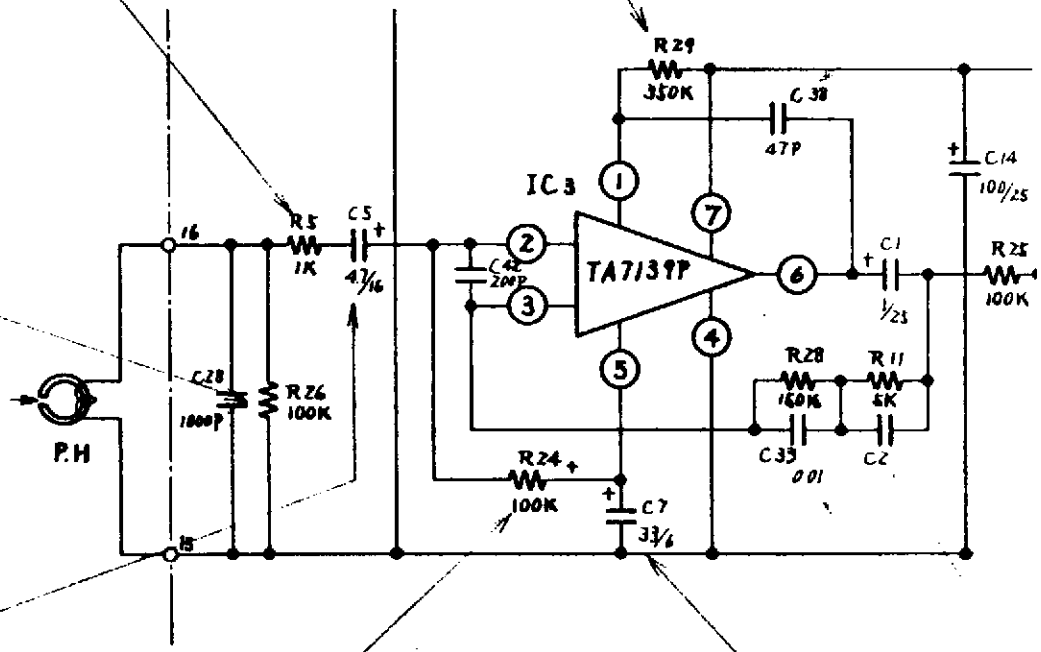
II - 5. AMPLIFIER SECTION

Relative Circuit to IC3 (TA7139P)

B: No playback of sound

B: Unsteady operation of IC
S: No operation of IC

S: Oscillation
S: No playback of sound



B: No playback of sound
S: Distortion or Noise

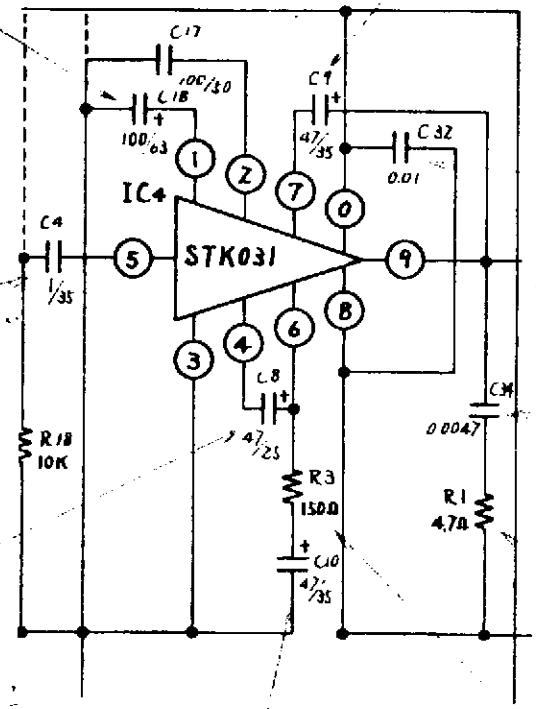
B: Unsteady operation of IC
S: No operation of IC

Relative Circuit to IC4 (STK-031)

B: Broken
S: Short

B: Oscillation at low-frequency range
S: No playback of sound

B: Over path
S: No playback of sound



B: Battery bias
S: No playback of sound

B: Over path
S: No playback of sound

S: No playback of sound
B: Unsteady operation at low-frequency range

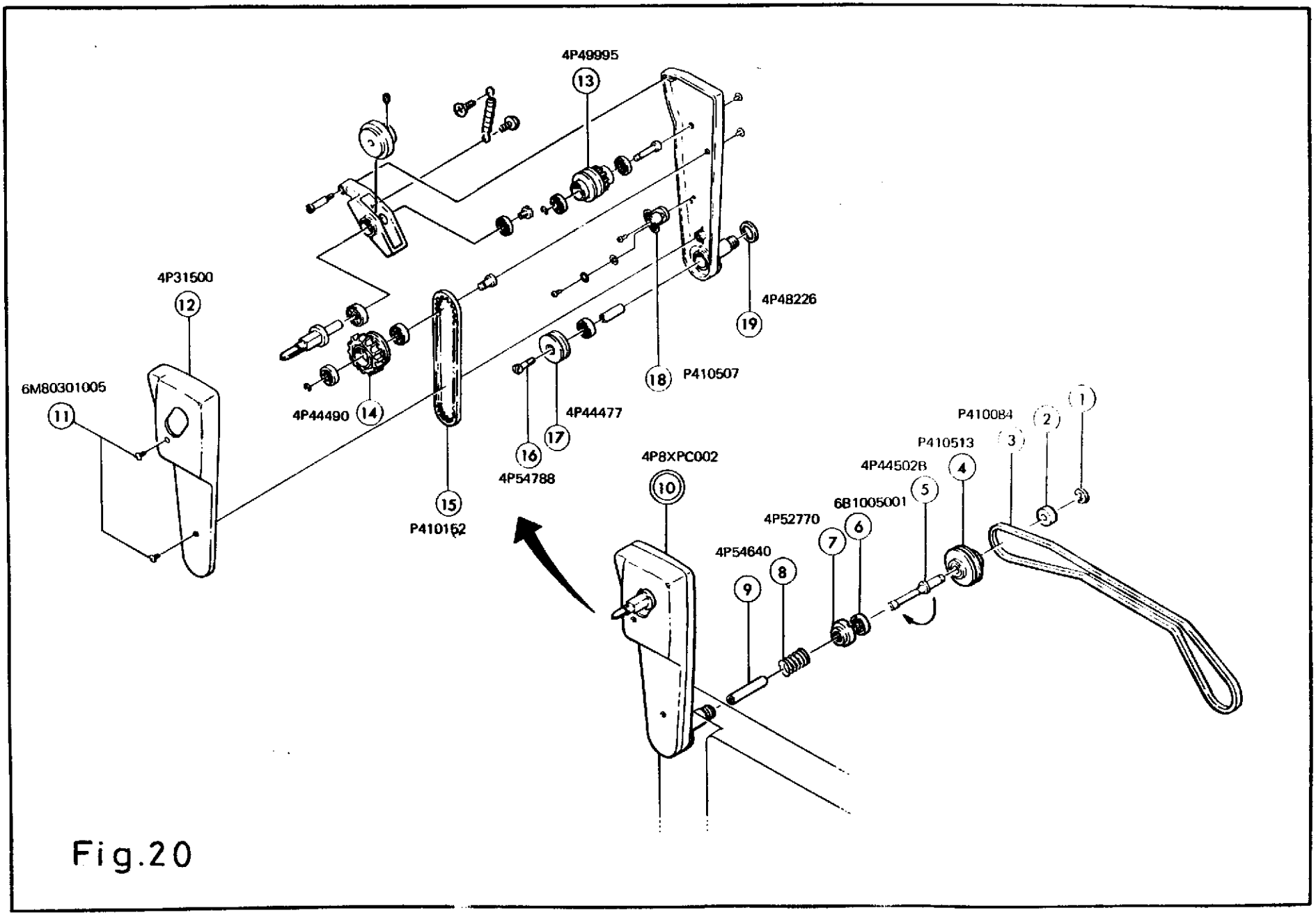

4P49995
13
4P31500
12
6M80301005
11
4P44490
14
15
P410152
4P48226
19
18
P410507
4P44477
17
16
4P54788
4P8XPC002
10
4P54640
9
8
4P52770
7
6
6B1005001
5
4P44502B
4
P410513
3
P410084
2
1

Fig.20

II - 6. TAKE-UP & REWIND SECTION

A. Rear Arm (Fig. 20-10) & Rear Arm Free-Wheel (Fig. 20-4)

TROUBLESHOOTING: Refer to Fig. 20.

Trouble	Cause
Film is not taken up.	(4) is defective. (13)(14) are damaged. (15) is not stretched firmly.

DISASSEMBLY:

1. Remove (3). Refer to page 3.
2. Remove (1) to take (2)(4) off.
3. Unscrew (11) x 2 to remove (12).
4. Unscrew (16) to remove (17)(5)(6).
5. Remove (7) with use of arm-outer-shaft nut dirver P016 to take (10) off.
6. Refer to Fig. 20 to disassemble further.

REASSEMBLY:

1. Replace (13)(14) if damaged.
2. Position (18) where (15) does not slip.
3. When (5) turns in the arrow direction, (4) should turn together with (5).
4. Measure the take-up tension.

   Measurement ..... Turn the motor switch knob to FORWARD. Pulling a bar spring scale P048 in the arrow direction as shown in Fig. 21.

   Tolerance ..... 200g - 250g

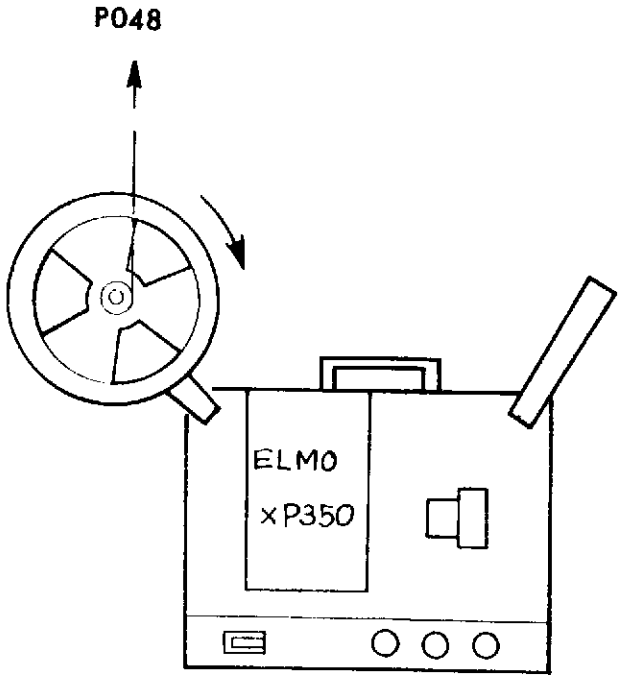


Fig.21

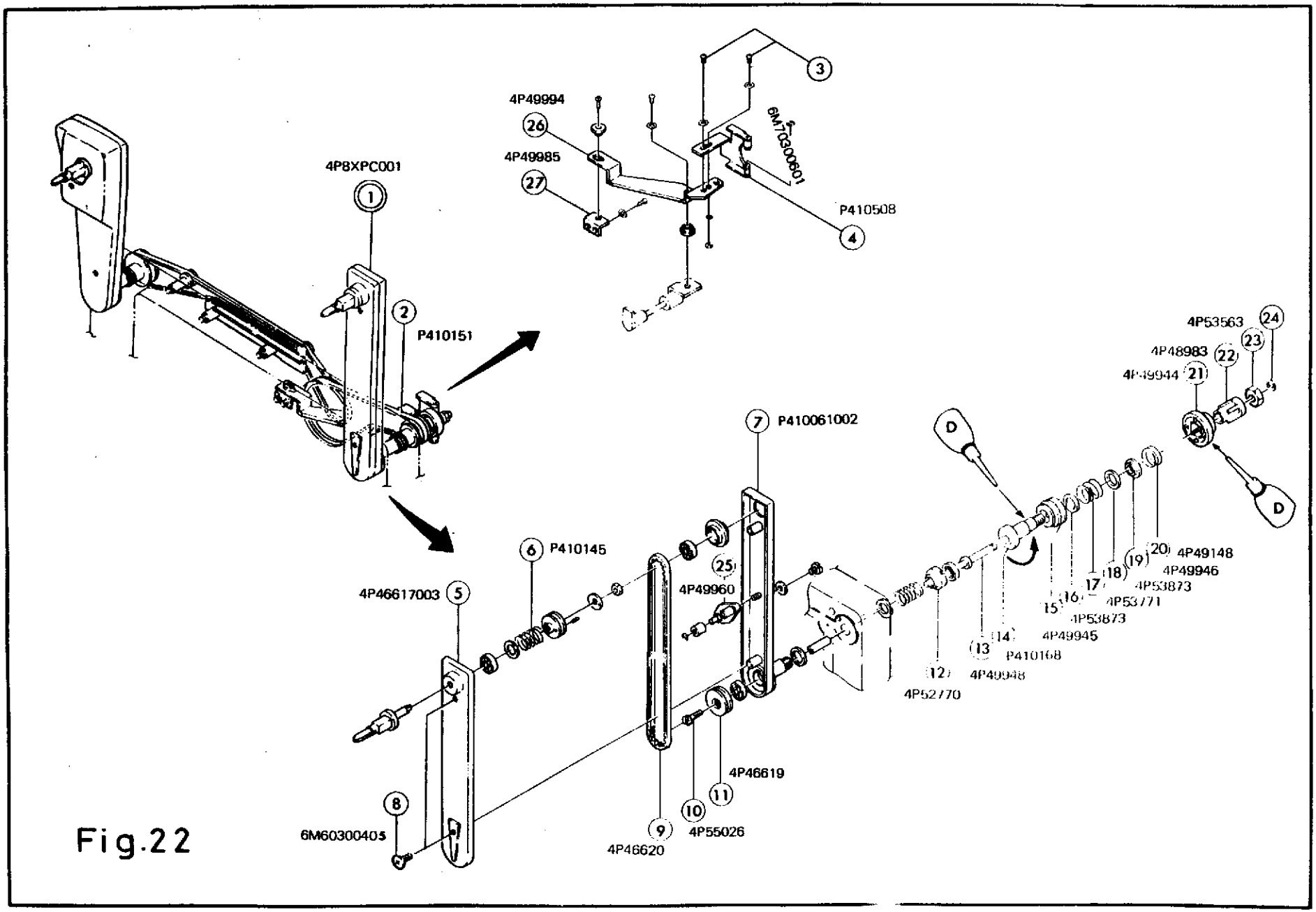

4P8XPC001
1
2
P410151
3
4P49994
26
4P49985
27
6M70300601
P410508
4
7
P410061002
6
P410145
4P46617003
5
25
4P49960
8
6M60300405
9
4P46620
10
4P55026
11
4P46619
12
4P52770
13
4P49948
14
P410168
15
4P49945
16
4P53873
17
4P53771
18
4P53873
19
20
4P49946
4P49148
4P49944
21
4P48983
22
23
4P53563
24
D
D

Fig.22

II - 6. TAKE-UP & REWIND SECTION

B. Front Arm (Fig. 22-1) & Rewind Boss (Fig. 22-14)

TROUBLESHOOTING: Refer to Fig. 22.

Trouble	Cause
Film is not rewound.	(9) is not stretched firmly. (14) is defective. (Page 41) The engagement of (15)(21) is out of adjustment. (Page 41) Pressure of (17) is weak. (Page 41)
Film in front arm gets loose during projectinn.	Pressure of (6) is out of adjustment.

DISASSEMBLY:

1. Unscrew (3) x 2 to remove (4).
2. Take (24) off to remove an assembly of (14) to (23).
   Referring to Fig. 22, disassemble the above assembly.
3. Unscrew (8) x 2 to remove (5).
4. Unscrew 910) to remove (13).
   Remove (12) with use of arm-outer-shaft nut driver P016.
   Now you can remove (1).

- to be continued -

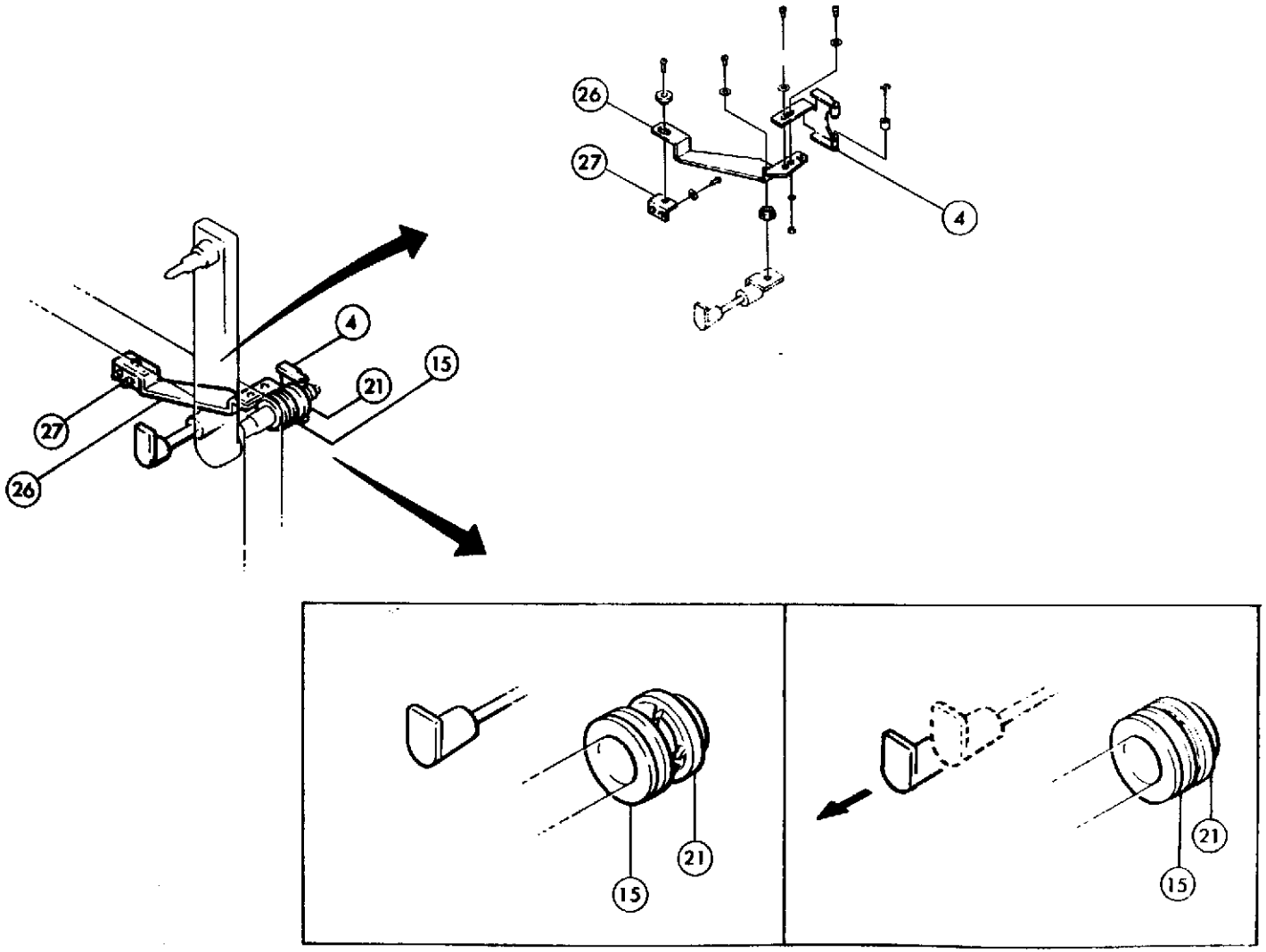


Fig.23

B. (Cont'd)

REASSEMBLY:

1. Make sure that (13) turns together with (14) when turning (14) in the arrow direction (Fig. 22).
2. Adjust the position of (25) where (9) does not slip.
3. Adjust the positions of (4)(26)(27) where (15) engages with (21) while a high speed rewind knob is pulled out.
4. Measure the rewind tension.

Measurement ..... Turn the motor switch knob to REVERSE. Pulling a bar spring scale P048 in the arrow direction as shwon in Fig. 24.

Tolerance ..... 180g - 220g

Adjustment ..... Adjust the pressure of (17) by moving (22).

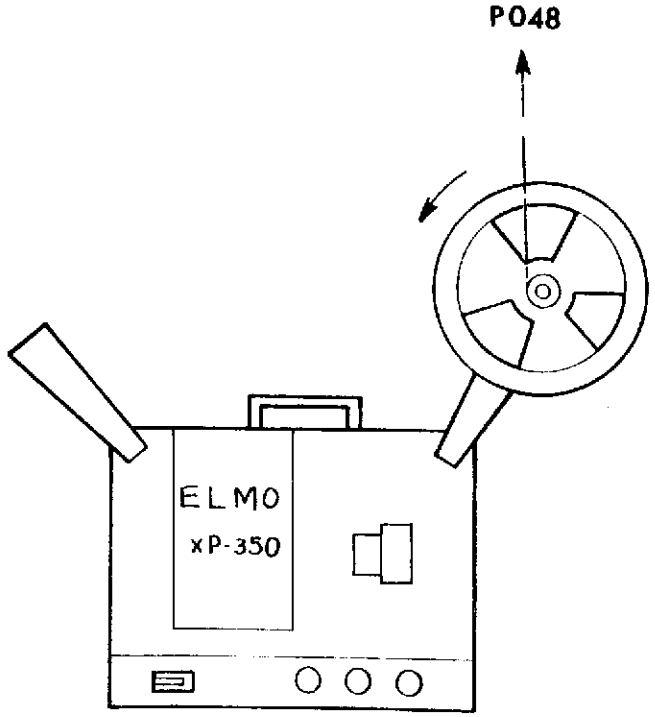


Fig.24

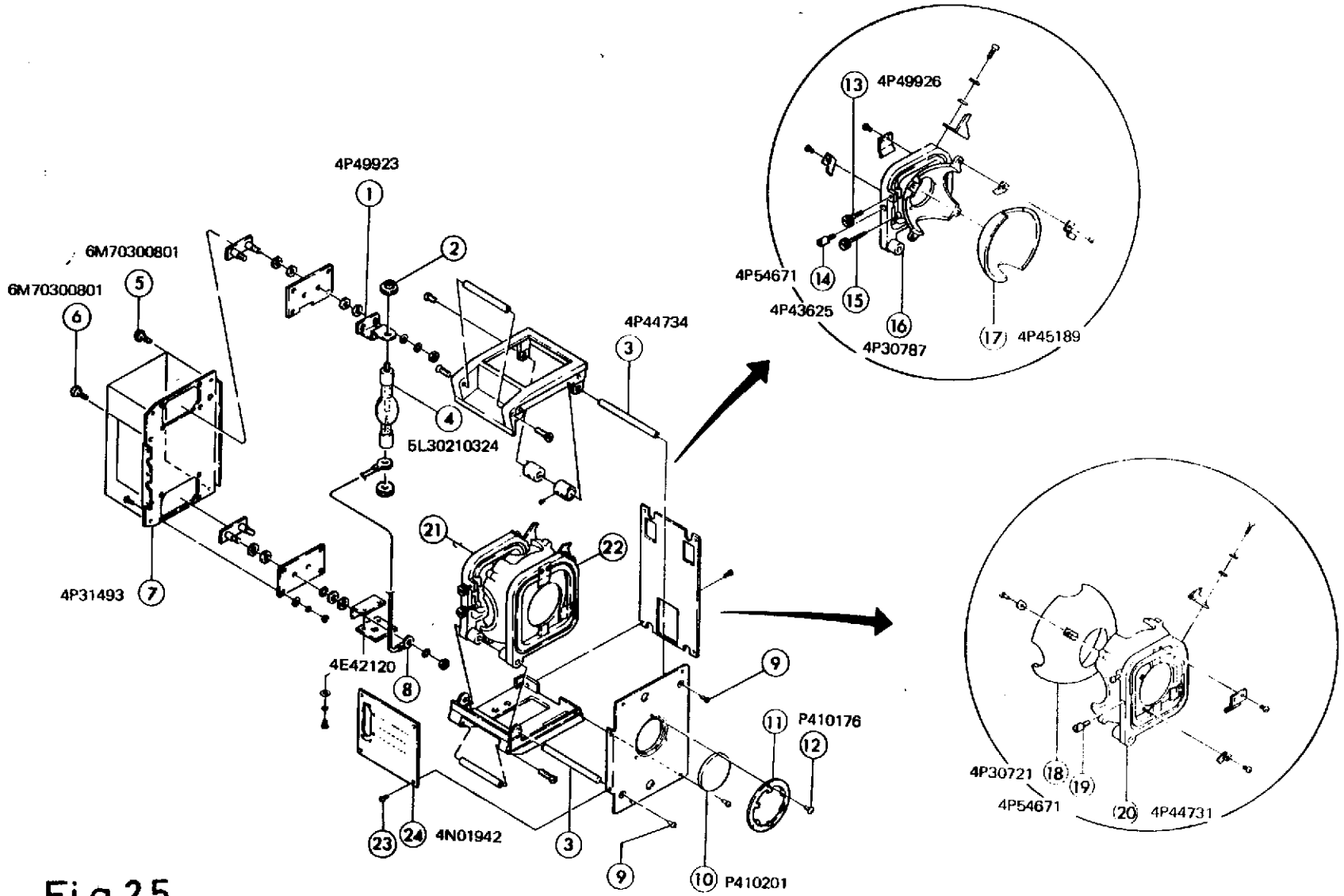

4P49923
1
2
6M70300801
6M70300801
5
6
4P44734
3
4
5L30210324
4P31493
7
21
22
4E42120
8
9
11
P410176
12
23
24
4N01942
3
9
10
P410201
13
4P49926
4P54671
14
15
4P43625
16
4P30787
17
4P45189
4P30721
18
19
4P54671
20
4P44731

Fig.25

II - 7. LIGHT SECTION

A. Xenon Lamp (Fig. 25-4), Ellipse Mirror (Fig. 25-17) & Sub-Mirror (Fig. 25-18)

TROUBLESHOOTING: Refer to Fig. 25.

Trouble	Cause
Film burns.	(10) is defective or is not attached correctly. (Page 45)
Illuminance of the lamp is uneven.	(4) is out of adjustment (Page 45). (17)(18) are defective.
Projection lamp does not light up.	(4) is defective. (8) is broken.
Coating of mirror comes off.	Position of (8) is out of adjustment.

DISASSEMBLY:

1. Take a lamp case off from the body.
2. Remove (8).
3. Unscrew (2) to remove (4).
4. Unscrew (23) x 4 to remove (24).
5. Unscrew (5) x 4, (6) x 2 to remove (7).
6. Unscrew (9) x 2. Pull (3) x 2 out to remove (21)(22).
7. Referring to Fig. 25, disassemble further.

- to be continued -

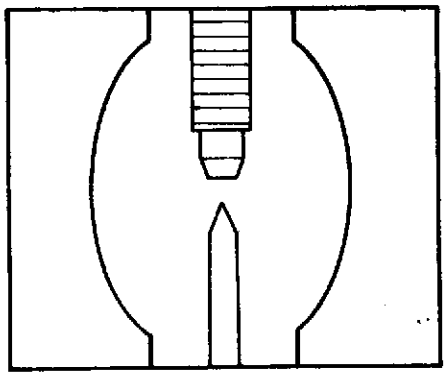


Fig.26

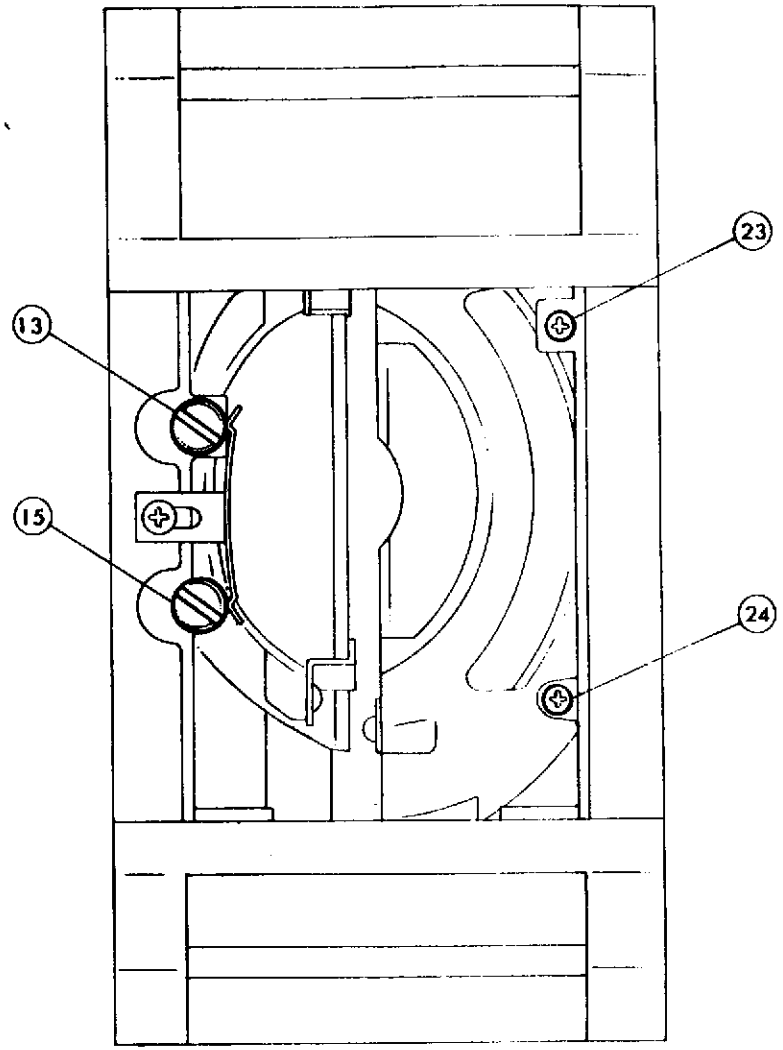


Fig.27

A. (Cont'd)

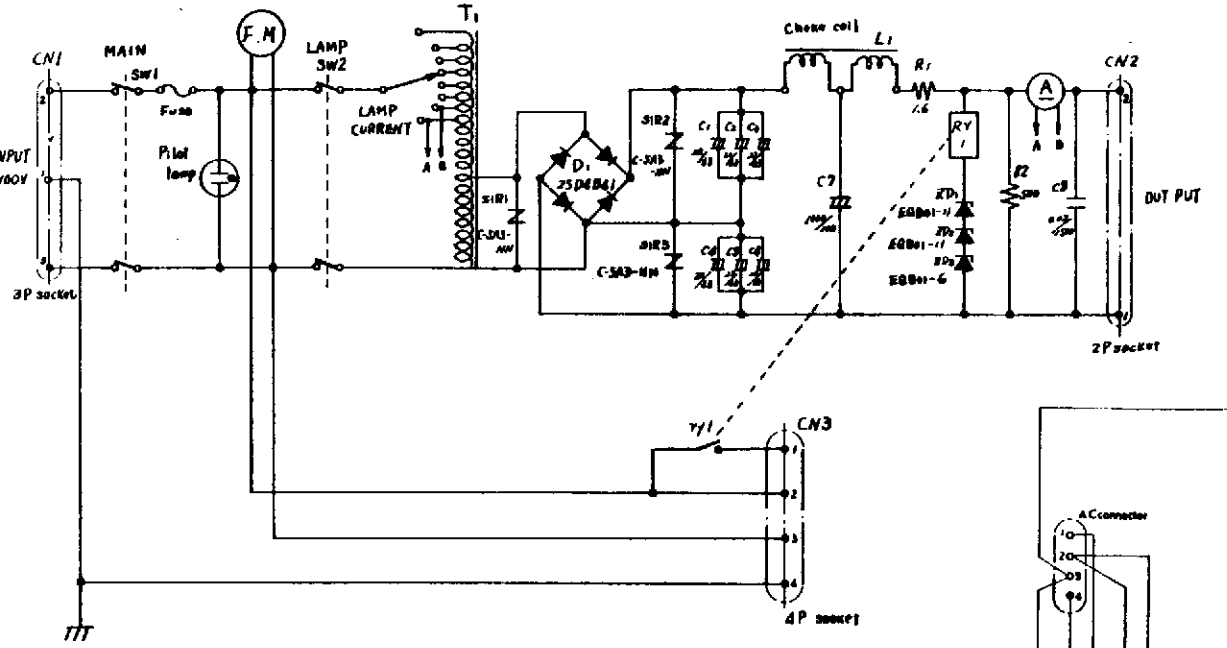
REASSEMBLY:

1. Install the parts in the reverse manner of the disassembly.
2. Replace (17)(18) if their coatings come off.
3. (21)(22) should move smoothly on the shaft, (3).
4. Attach (10), facing a coated face at the lamp.
5. Adjust the illuminance as follows.

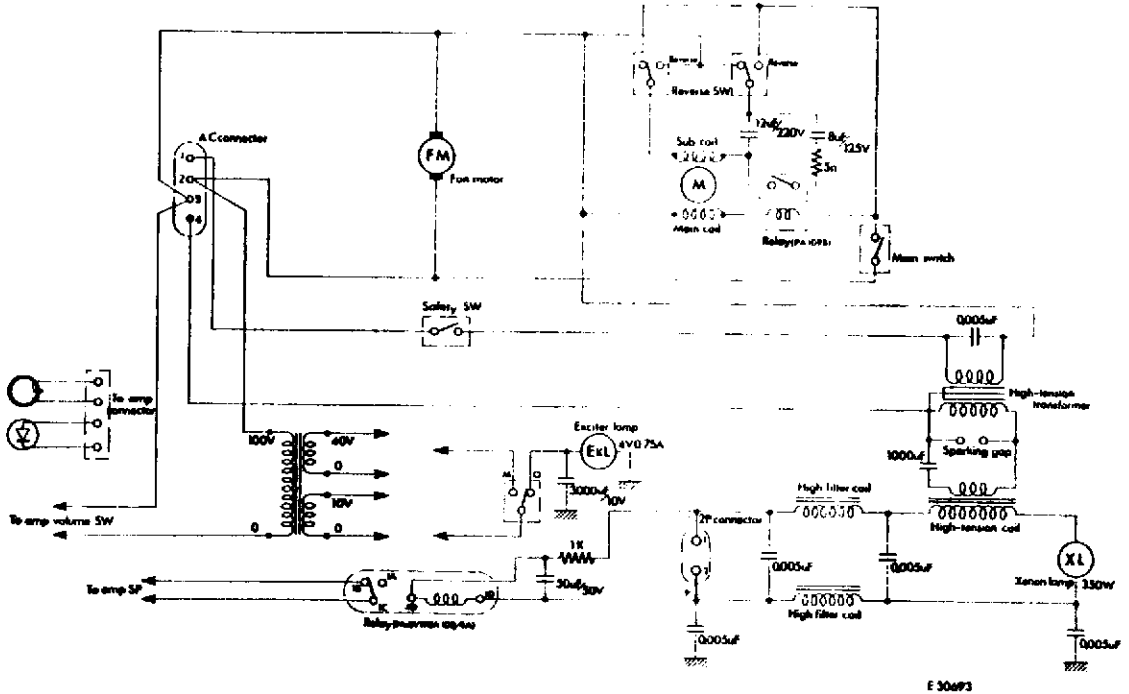
a. Lamp Adjustment
   1) Don't touch the glass directly by your finger. If touched, wipe it with lens cleaner. If fingerprint remains, it is printed by heat and gets impossible to remove. It will cause insufficient illuminance.
   2) Turn the positive side up and install the lamp.
   3) Turn the operation switch to FORWARD. Observing the lamp from the projection lens holder, adjust with (1)(2) so that a space between poles is located at a center of aperture mask as shown in Fig. 26.

b. Ellipse Mirror Adjustment
   1) Move the sub-mirror fully toward the projection lens.
   2) Move the ellopse mirror back and forth until the screen is lighted most brightly and tighten it.
   3) Turn the knob (Fig. 27-15) and the knob (Fig. 27-13) until a brilliant point appears on the screen.
   4) Move the ellipse mirror back and forth until the brilliant point is minimum.
   5) Turn the knob (Fig. 27-15) and the knob (Fig. 27-13) until the brilliant point is located at the middle and bottom on the screen. Move the ellipse mirror back and forth to eliminate the brilliant point and uneven illuminance.

c. Sub-Mirror Adjustment
   1) Move the sub-mirror back and forth until the brilliant point appears on the screen.
   2) Move the sub-mirror right and left (Fig. 27-24), up and down (Fig. 27-23) until the brilliant point is located at the middle and upside on the screen.
   3) Move the sub-mirror back and forth to eliminate the brilliant point and uneven illuminance.



Schematic diagram for Power unit for XP-350



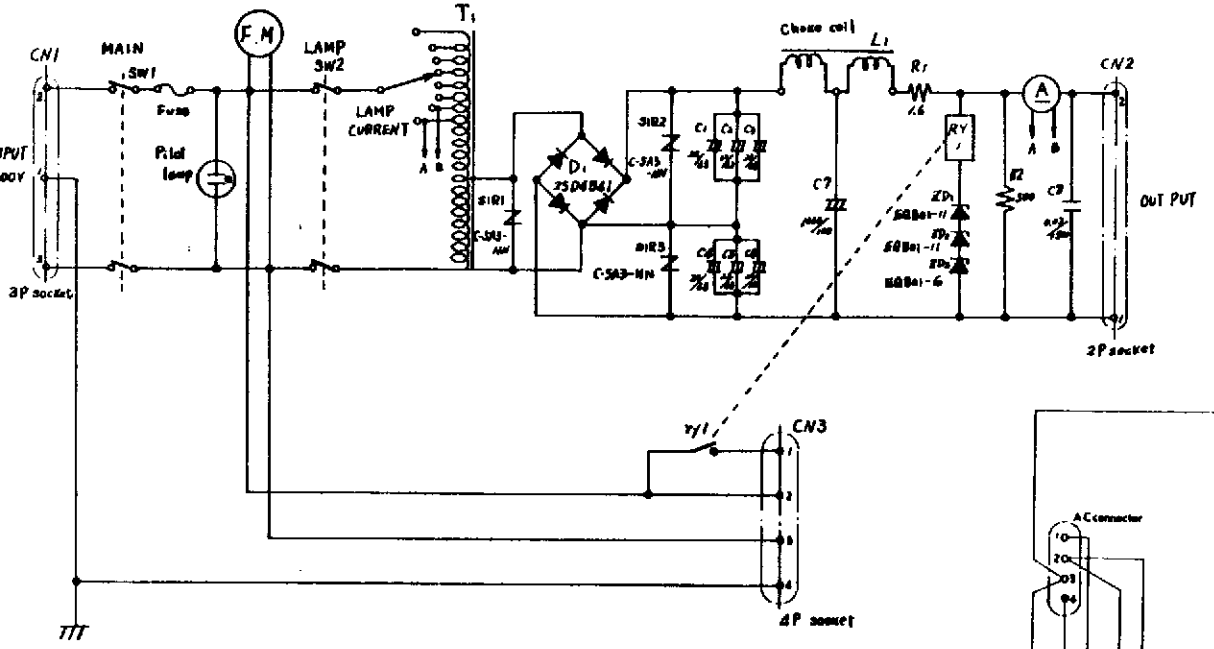
Schematic diagram for machine for XP-350

Fig.28

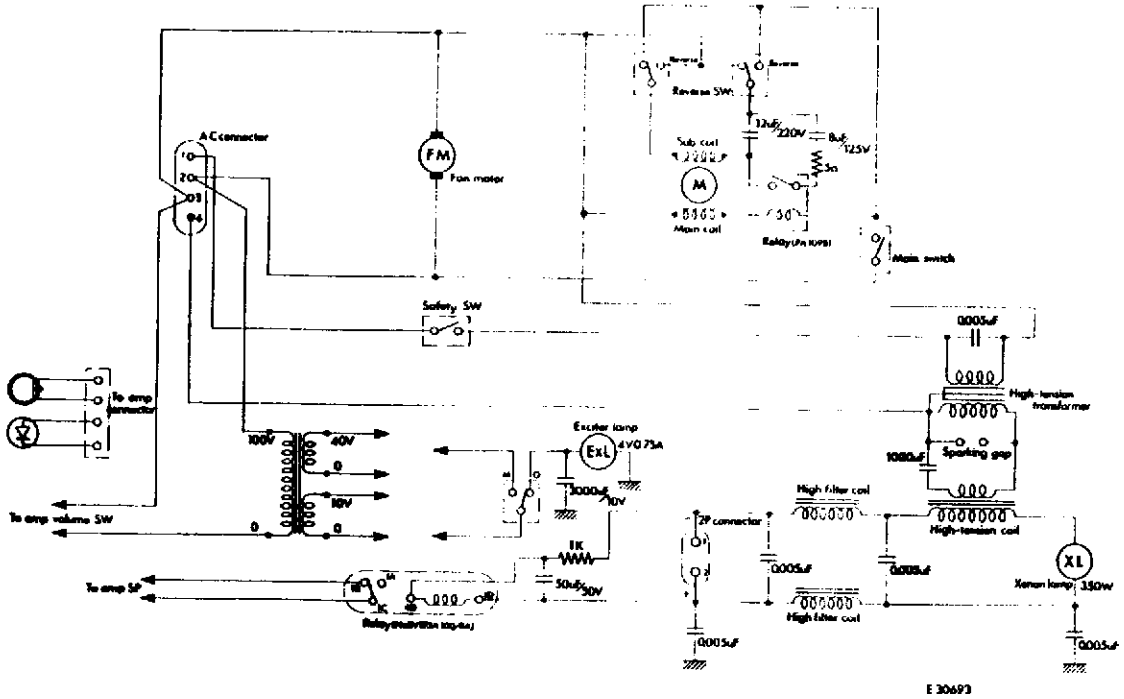
II - 7. LIGHT SECTION

B. Lamp Ignition Circuit (Refer to Fig. 28)

1. By turning on the main switch of power unit, an AC100V is applied to 2-pin and 3-pin of 4P socket and the fan motor (FM) starts to run.
2. By turning on the lamp switch, input is rectified thru rotary switch (SW3)/power transformer (T1)/rectifier (D1). Under this condition, circuit is a doubler-voltage circuit because of no load. The voltage across C7 is generated to over DC80V. This voltage is applied to the lamp thru 2P socket. At the same time this voltage is applied to the relay NaBv193A100/4A) and the relay turns on. This cuts the click noise caused by sparking of the lamp because the amplifier switch is turned off.
3. 47V (= 80V - Voltage of Zener Diode) is applied to RY1 of power unit and the RY1 turns on. The ry1 closes accordingly. AC100V is applied to the high-tension transformer thru a safety switch (SW4) and a 4000V is generated at the secondary coil. With this voltage, a spark gap starts to spark. With spark gap, capacitor 1000PF and inductance of the primary coil of high-tension coil, high-frequency of a several megacycle is generated. High-tension of about 30KV - 40KV and high-frequency of a several megacycle are generated at the secondary coil of high-tension coil, and are applied to the xenon lamp.
4. Once the lamp lights, the voltage across the lamp drops to 22V and relay (NaBv193A100/4A) turns off. In result, high-tension generating circuit becomes open.
5. Adjust current to 16A (350W) by turning the rotary switch (SW3).



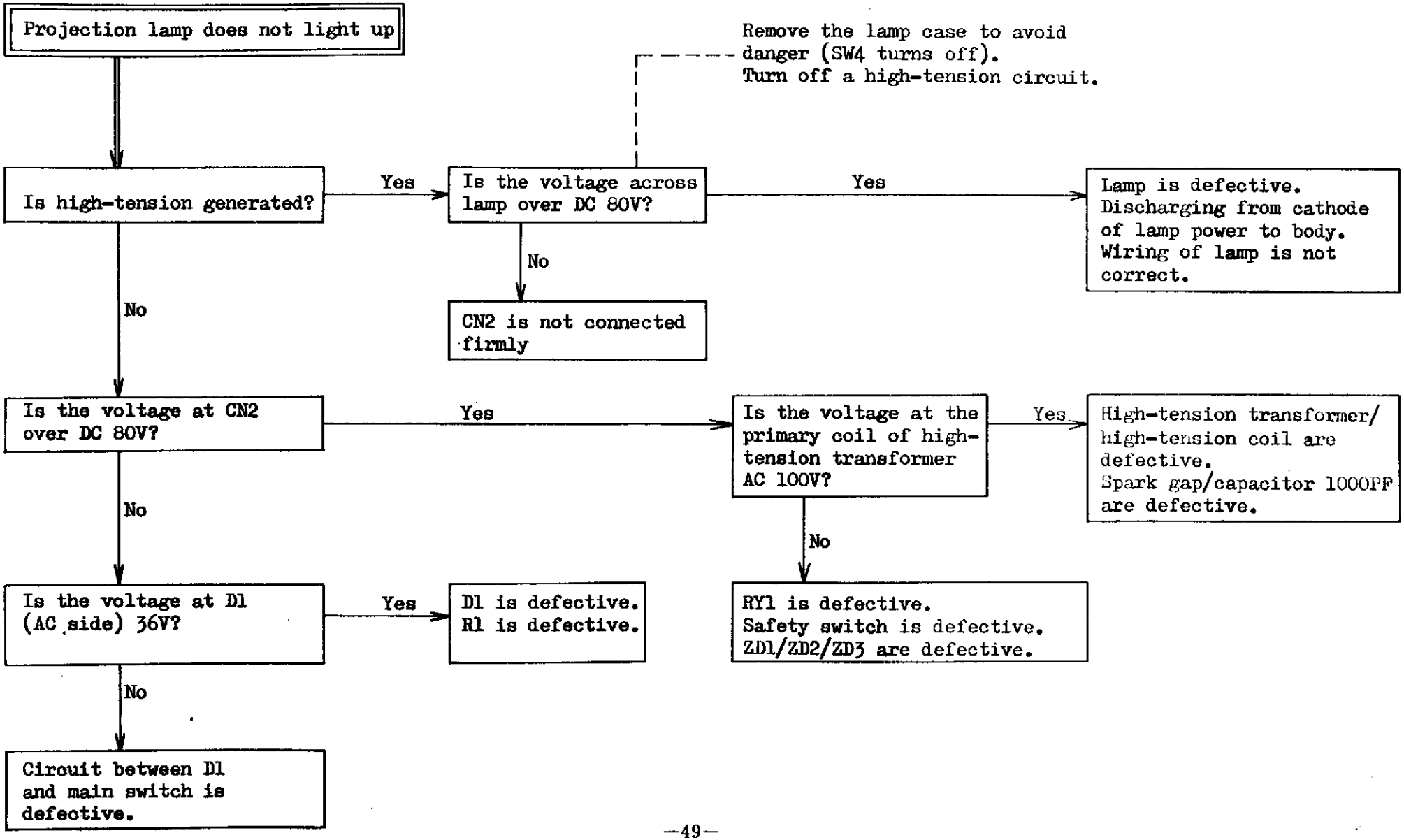
Schematic diagram for Power unit for XP-350



Schematic diagram for machine for XP-350

Fig.28

II - 7. LIGHT SECTION



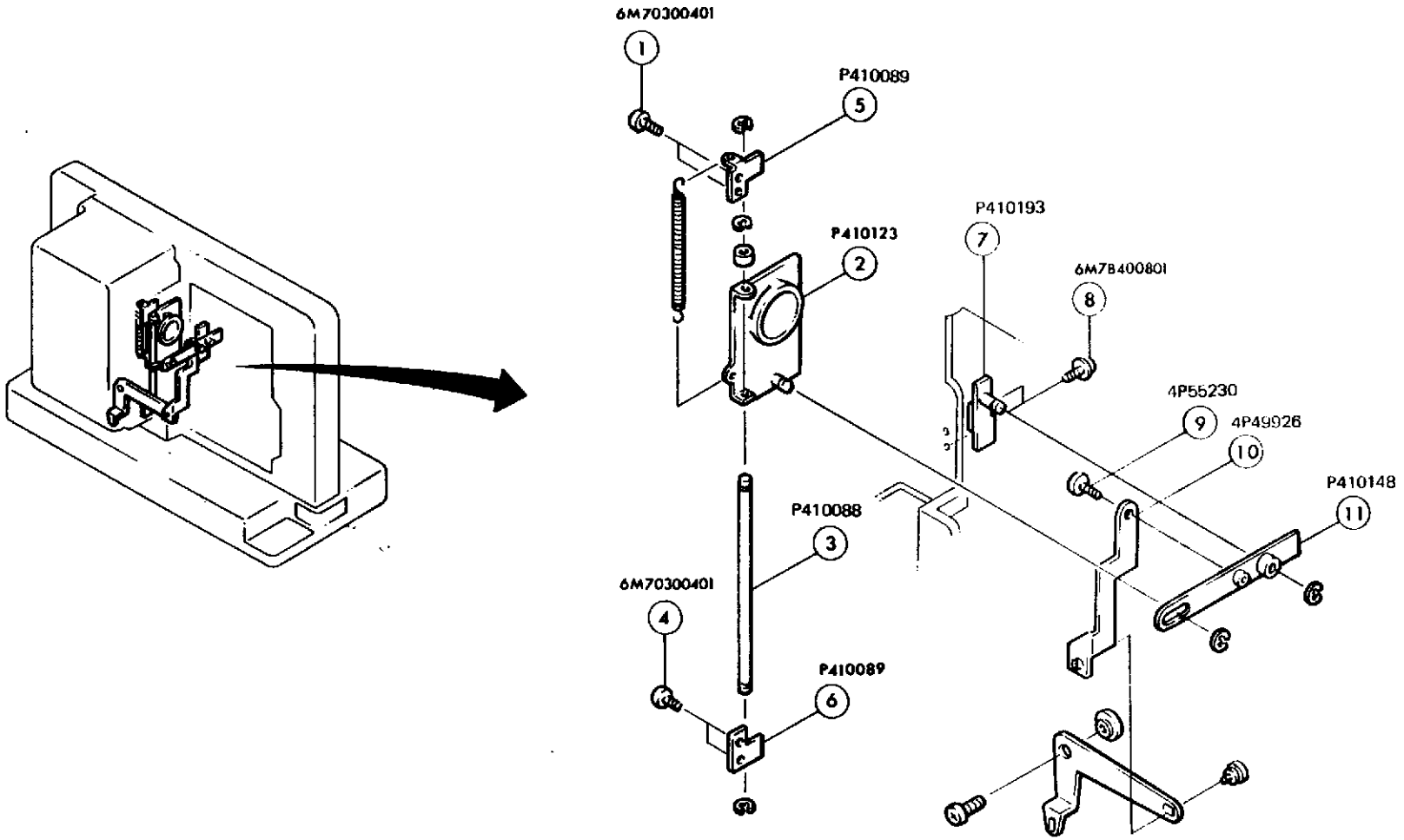

6M70300401
1
P410089
5
P410123
2
P410193
7
6M7B400801
8
4P55230
9
4P49926
10
P410148
11
P410088
3
6M70300401
4
P410089
6

Fig.29

C. Douser of Standard Model (Fig. 29-2)

TROUBLESHOOTING: Refer to Fig. 29.

Trouble	Cause
Film burns.	(2) is out of adjustment or defective.
Movement of motor switch knob is heavy.	(3) is distorted. (2) does not move smoothly.

DISASSEMBLY:

1. Take off the lamp case.
2. Unscrew (1) x 2, (4) x 2 to remove (5)(6) respectively.
3. Unscrew (8) x 2, (9) to remove (2).

REASSEMBLY:

1. Replace the heat-proof glass of (2) if broken or dim.
2. Make sure that (2) can move smoothly.
3. Attach (2) without inclination where it does not touch with the lamp case in operation.
4. Adjust the positions of (10) and the switch assembly where a clearance between (2) and (5) is 1.0mm when the operation knob is at OFF as shown in Fig. 30.

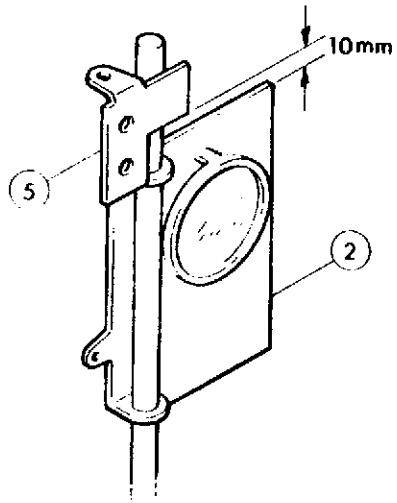


Fig.30

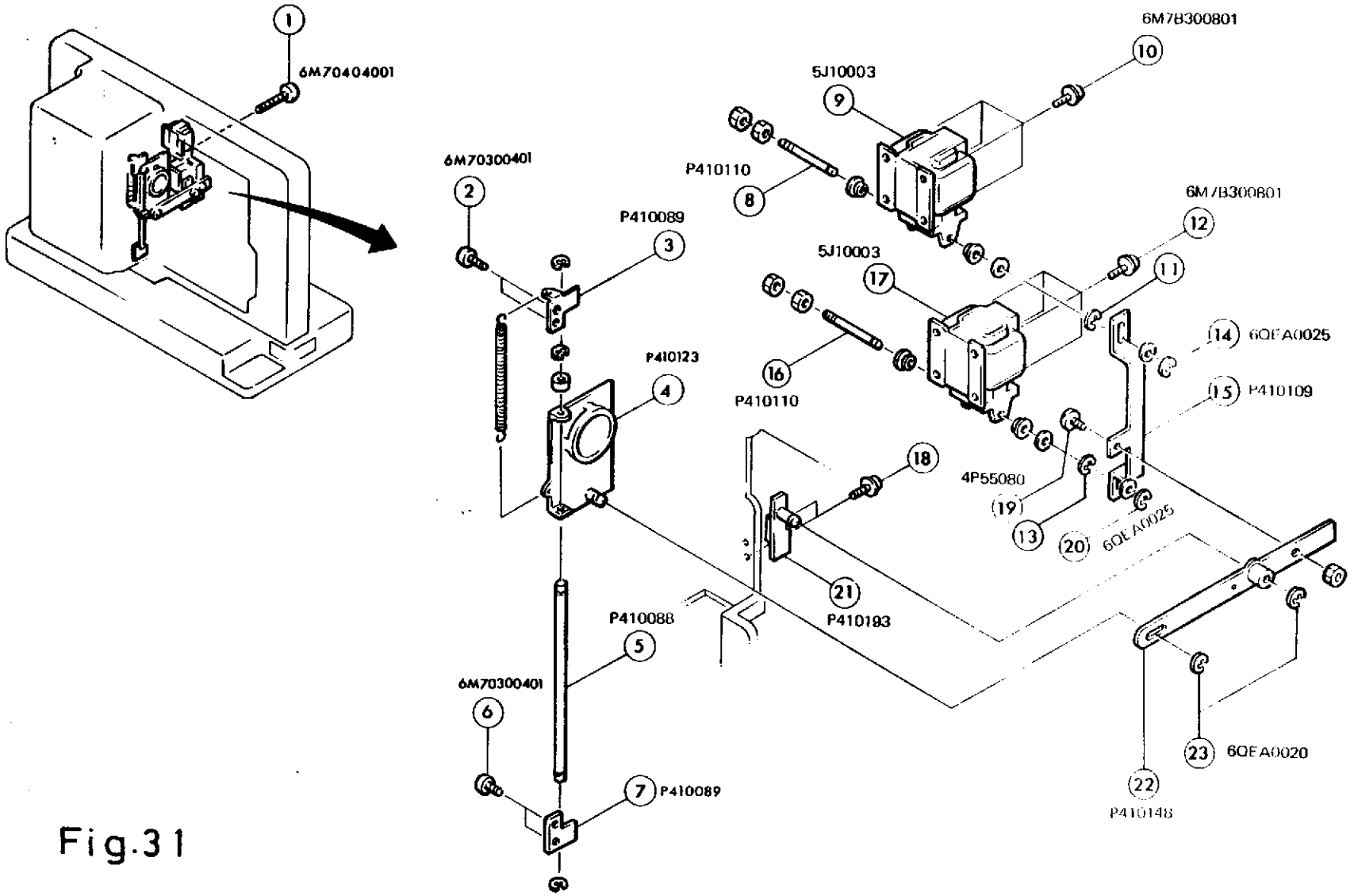

1
6M70404001
6M70300401
2
P410089
3
P410123
4
P410088
5
6M70300401
6
7
P410089
6M7B300801
10
5J10003
9
P410110
8
6M7B300801
12
11
5J10003
17
16
P410110
14
6QEA0025
15
P410109
18
4P55080
19
13
20
6QEA0025
21
P410193
23
6QEA0020
22
P410148

Fig.31

D. Douser (Fig. 31-4) & Solenoid AS-41051 (Fig. 31-9 & 17)

TROUBLESHOOTING: Refer to Fig. 31.

Trouble	Cause
Film burns.	(4) is out of adjustment.
Solenoid seizes up.	(4)(5) do not move smoothly.
Douser does not operate.	(9)(17) are defective.
Solenoid roars.	Positions of (21)(17) are out of adjustment.

DISASSEMBLY:

1. Take off the lamp case.
2. Unscrew (2) x 2, (6) x 2 to remove (3)(7) respectively.
3. Unscrew (18) x 2, (19) and remove (23) x 2 to take (4)(22) off respectively.
4. Remove (2) and unscrew (12) x 4 to take (17) off.
5. Remove (14) and unscrew (10) x 4 to take (9) off.

REASSEMBLY:

1. Make sure that (4) can move smoothly.
2. Attach (4) without inclination where it does not touch with the lamp case in operation.,
3. Adjust the operation area of (17) by bending (1) so that a clearance between (3) and (4) is 1.0mm when the operation knob is at OFF as shown in Fig. 32.
4. Adjust the position of (21)(9) where light pases thru a heat-proof glass when the operation knob is at STILL.
5. Adjust the position of (17) where a clearance between (4) and (7) is within 1.0mm when the operation knob is at FORWARD as shown in Fig. 32.

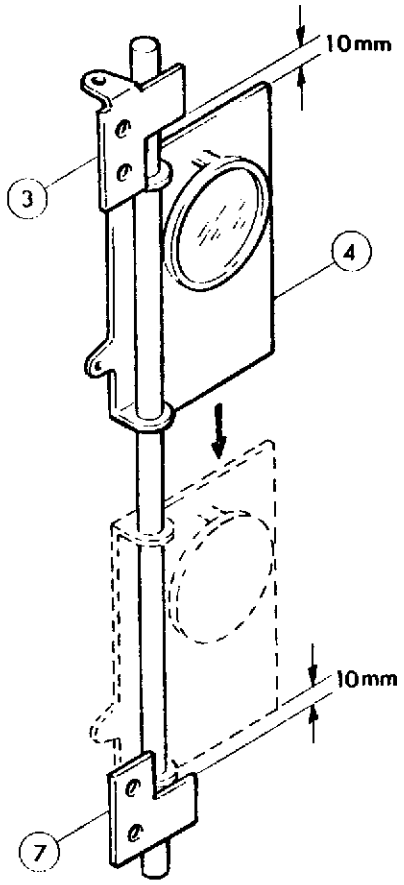


Fig.32

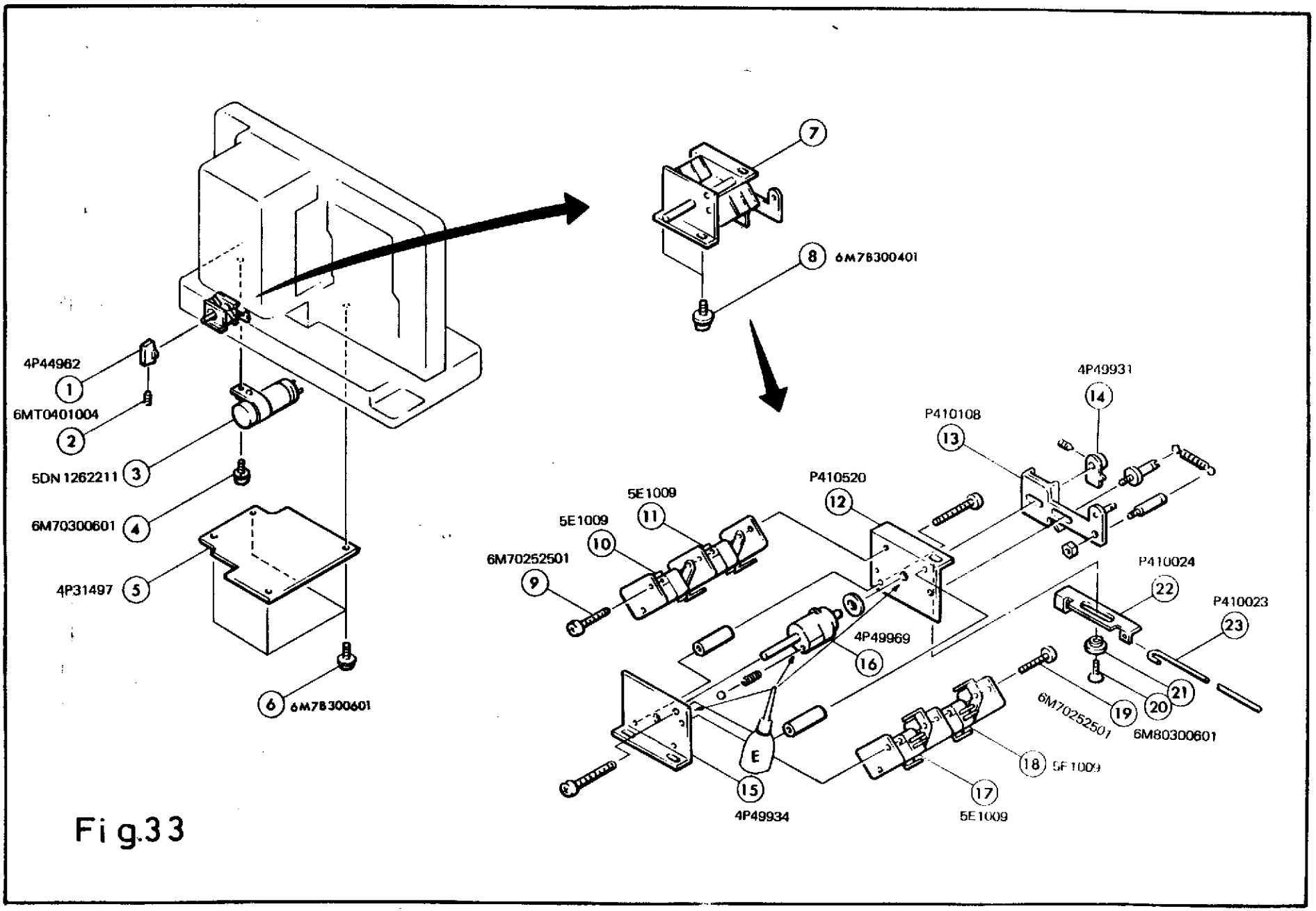

4P44962
1
6MT0401004
2
5DN1262211
3
6M70300601
4
4P31497
5
6
6M78300601
7
8
6M78300401
4P49931
14
P410108
13
P410520
12
5E1009
11
5E1009
10
6M70252501
9
P410024
22
P410023
23
4P49969
16
E
15
4P49934
6M70252501
19
20
21
6M80300601
18
5E1009
17
5E1009

Fig.33

D. Douser (Fig. 31-4) & Solenoid AS-41051 (Fig. 31-9 & 17)

TROUBLESHOOTING: Refer to Fig. 31.

Trouble	Cause
Film burns.	(4) is out of adjustment.
Solenoid seizes up.	(4)(5) do not move smoothly.
Douser does not operate.	(9)(17) are defective.
Solenoid roars.	Positions of (21)(17) are out of adjustment.

DISASSEMBLY:

1. Take off the lamp case.
2. Unscrew (2) x 2, (6) x 2 to remove (3)(7) respectively.
3. Unscrew (18) x 2, (19) and remove (23) x 2 to take (4)(22) off respectively.
4. Remove (2) and unscrew (12) x 4 to take (17) off.
5. Remove (14) and unscrew (10) x 4 to take (9) off.

REASSEMBLY:

1. Make sure that (4) can move smoothly.
2. Attach (4) without inclination where it does not touch with the lamp case in operation.,
3. Adjust the operation area of (17) by bending (1) so that a clearance between (3) and (4) is 1.0mm when the operation knob is at OFF as shown in Fig. 32.
4. Adjust the position of (21)(9) where light pases thru a heat-proof glass when the operation knob is at STILL.
5. Adjust the position of (17) where a clearance between (4) and (7) is within 1.0mm when the operation knob is at FORWARD as shown in Fig. 32.

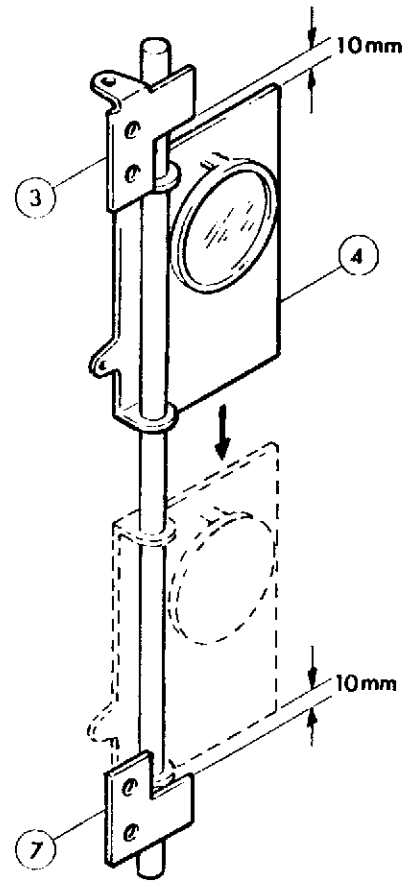


Fig.32

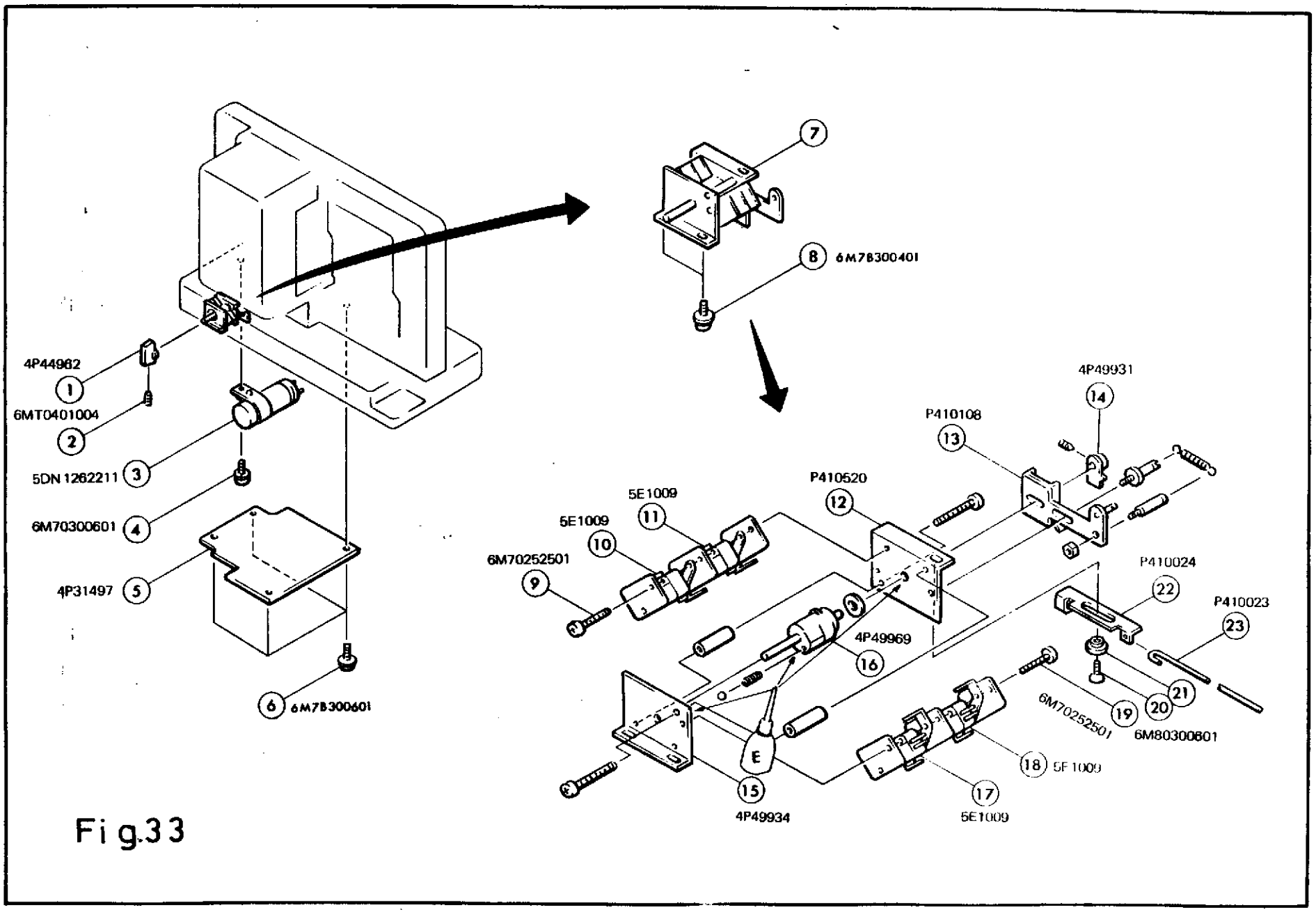

4P44962
1
6MT0401004
2
5DN1262211
3
6M70300601
4
4P31497
5
6
6M78300601
7
8
6M78300401
4P49931
14
P410108
13
P410520
12
5E1009
11
5E1009
10
6M70252501
9
4P49969
16
P410024
22
P410023
23
21
19
20
6M70252501
6M80300601
18
5E1009
17
5E1009
15
4P49934
E

Fig.33

II - 8. SWITCH SECTION

A. Switch (Fig. 33-7) of Standard Model

TROUBLESHOOTING: Refer to Fig. 33.

Trouble	Cause
Motor running direction is not changeable.	(17) or (18) is defective.
Motor does not run.	(11), (17) or (18) is defective.
Magnetic playback is impossible.	(10) is defective.

DISASSEMBLY:

1. Unscrew (2) to remove (1).
2. Unscrew (6) x 4 to remove (5).
3. Unscrew (4) to remove (3).
4. Unscrew (8) x 2, (20) to remove (7). Note that with (14) removed, (21)(22)(23) will drop.
5. Referring to Fig. 33, disassemble further.

REASSEMBLY:

1. Apply a touch of "Aluminum Grease" to the contact faces of (15)-(16) and (16)-(12).
2. Adjust the positions of (10)(11)(17)(18) with (9) x 2, (19) x 2 respectively so that they are pushed by (16) as follows.
   FORWARD position ..... (11)(17)(18) are pushed.
   REVERSE position ..... (10)(11) are pushed.
3. Referring to page 62, solder the wires to each micro-switch correctly.
4. Install (7) after arranging the wires in place.
5. Readjust the douser (Page 51).

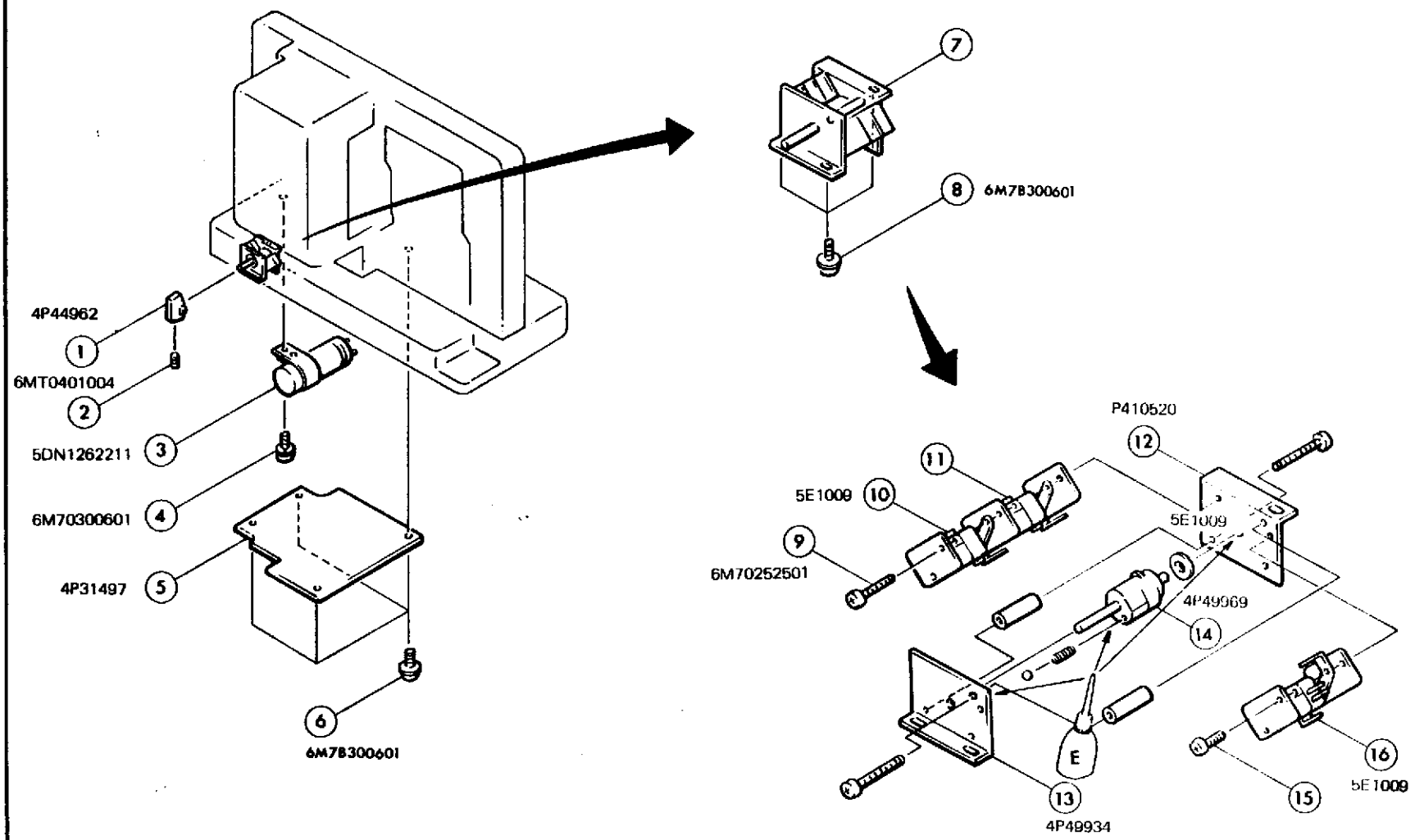

4P44962
1
6MT0401004
2
5DN1262211
3
6M70300601
4
4P31497
5
6
6M7B300601
7
8
6M7B300601
P410520
12
11
5E1009
10
5E1009
9
6M70252501
3
4P49969
14
E
13
4P49934
16
5E1009
15

Fig.34

B. Switch Assembly (Fig. 34-7) of AV Model

TROUBLESHOOTING: Refer to Fig. 34.

Trouble	Cause
Motor running direction is not changeable.	(10) is defective.
Motor does not run.	(11) is defective.
Solenoide does not operate.	(11) or (16) is defective.

DISASSEMBLY:

1. Unscrew (2) to remove (1).
2. Unscrew (4) to remove (3).
3. Unscrew (6) x 4 to remove (5).
4. Unscrew (8) x 3 to remove (7).
5. Referring to Fig. 34, disassemble further.

REASSEMBLY:

1. Apply a touch of "Aluminum Grease" to the contact faces of (13)-(14) and (14)-(12).
2. Adjust the positions of the micro-switches with (9) x 2, (15) x 2 so that the micro-switches are pushed by (14) as follows.

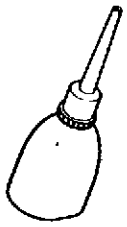
   STILL position ..... (16) is pushed. FORWARD position ..... (16) and (11) are pushed.

   REVERSE position ... (10), (16) and (11) are pushed.
3. Referring to Fig. 63, solder the wires to each micro-switch correctly.
4. Install (7) after arranging the wires in place.

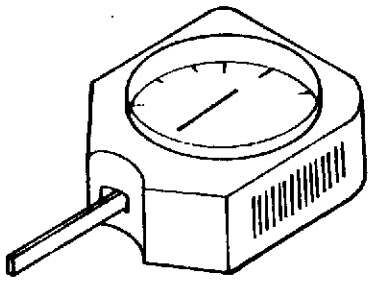
IV. TEST FILM & OIL/GREASE

Code No.	Film Name	Page
P032	Optical buzz track film	17, 21
P033	Optical signal level film, 400Hz	22
P034	Optical flutter film	22
P035	Optical sound focus film	21
P036	Optical multifrequency film	22
P037	Magnetic signal level film, 400Hz	22
P038	Magnetic flutter film	22
P039	Magnetic multifrequency film	22
P040	Magnetic azimuth alignment film	21
P086	Resigtration film	58

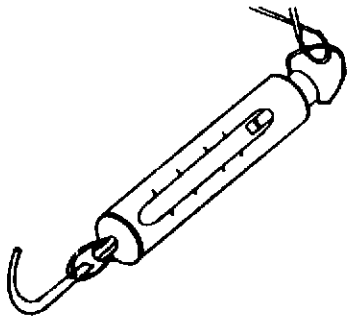
In the figure, there is the mark  (Ex. Fig. 5) which shows the point to be lubricated and the kind of oil/grease by letters, A, B, C, D and E in the mark.

Mark		Brand Name
	A	SILICONE OIL TSF433
	B	VEEDOL 20 - 40
	C	SILICONE GREASE YG6080
	D	ALVANIA GREASE 2
	E	ALUMI GREASE 1

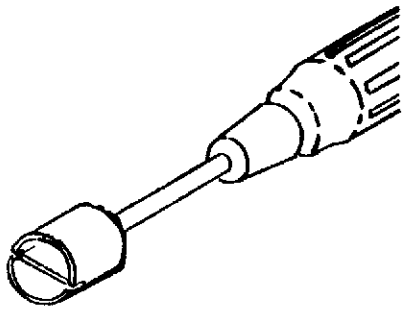
V. TESTING INSTRUMENTS & TOOLS



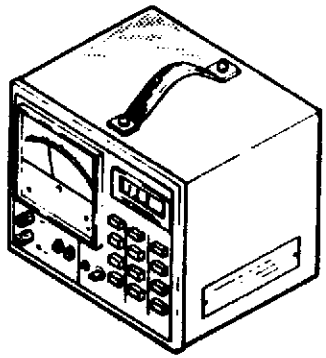
Code No. : C063
Name : Dial Tension Gauge 100g
Use : to measure the spring pressure
Page : 7
Weight : 60g
Dimensions : 20 x 48 x 90mm



Code No. : P048
Name : Bar Spring Scale 1Kg
Use : to measure the spring pressure
Page : 37, 41
Weight : 110g
Dimensions : 37 dia. x 180mm

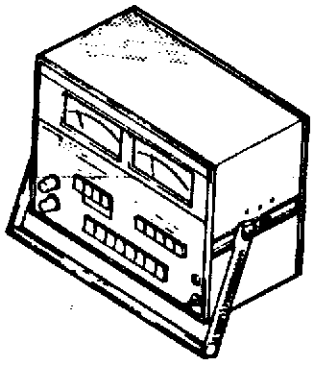
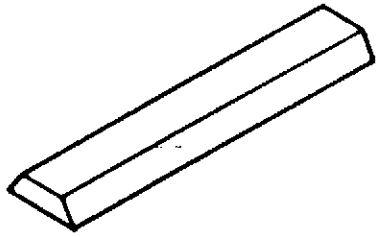
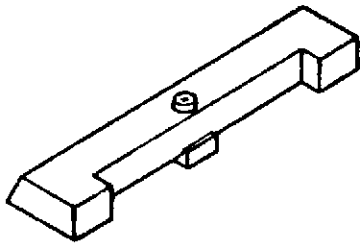


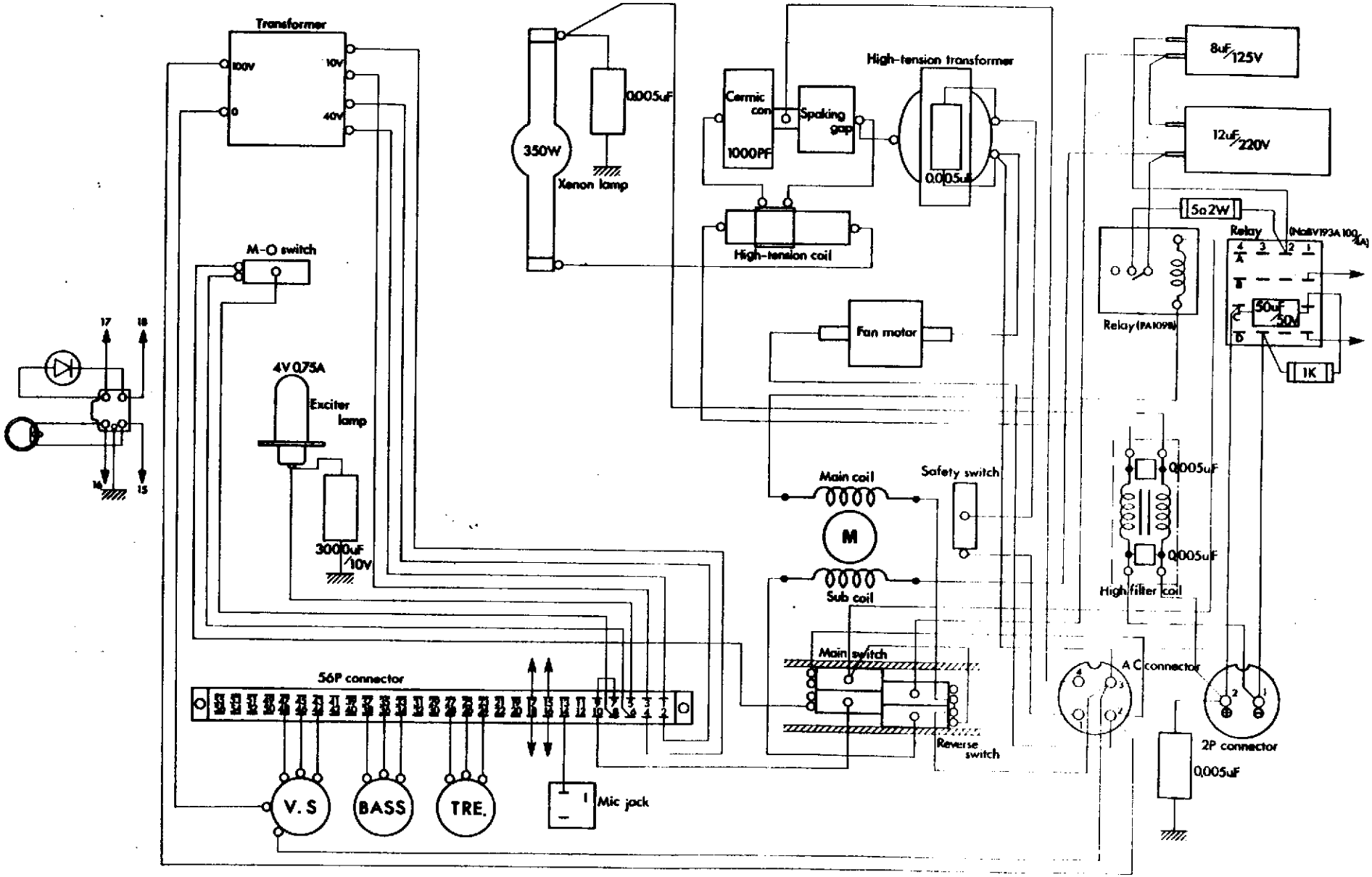
Code No. : P016
Name : Arm-Outer-Shaft Nut Driver
Use : to remove the arm
Page : 39
Weight : 100g
Dimensions : 22 dia. x 165mm



Code No. : P083
Name : Wow/Flutter Meter
Use : to measure wow and flutter
Page : 22
Weight : 5.5Kg
Dimensions : 200 x 160 x 140mm

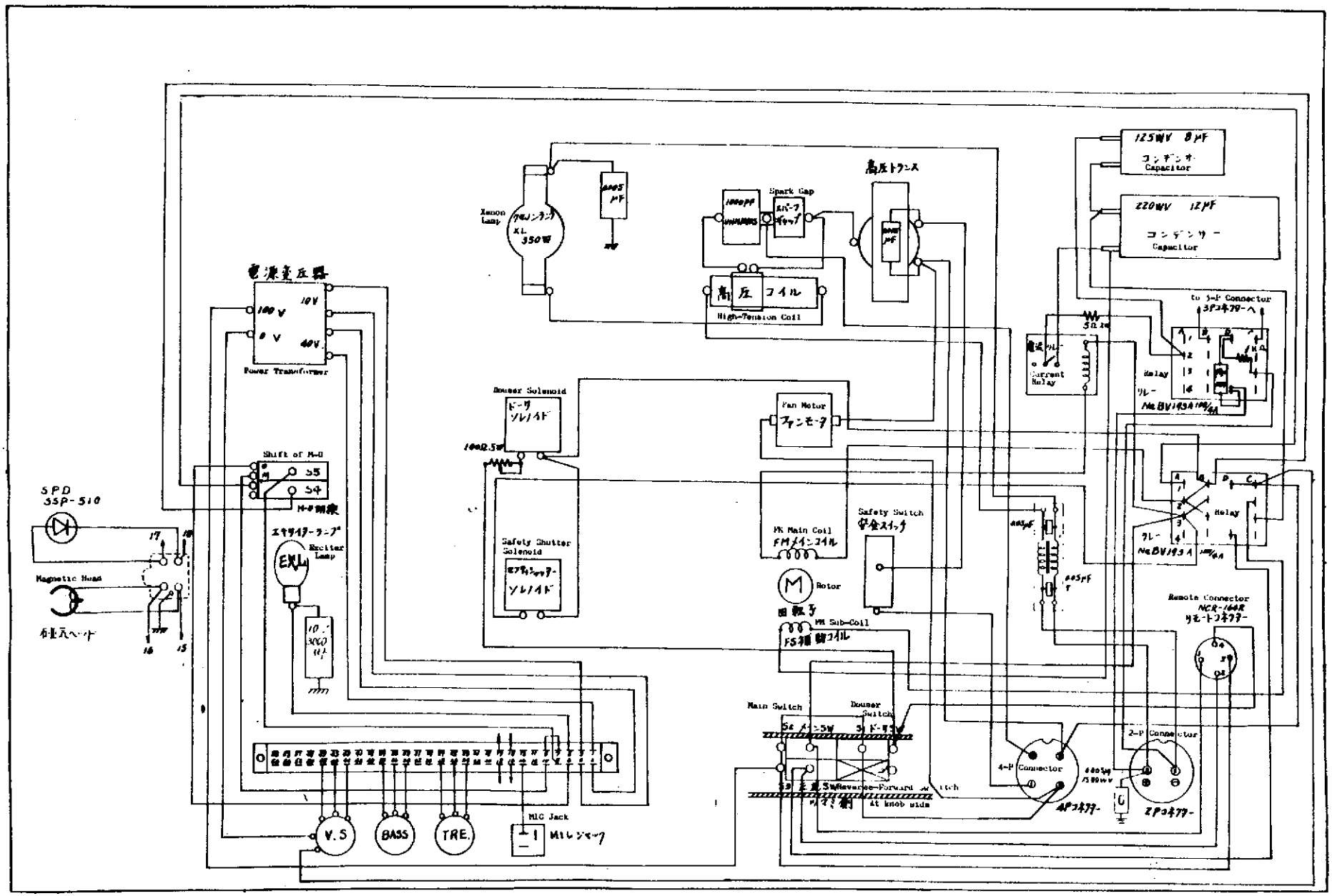
V. TESTING INSTRUMENTS & TOOLS

	Code No. : P084 Name : Distortion Meter Use : to measure the distortion factor Page : 22 Weight : 6Kg Dimensions : 270 x 200 x 250mm		Code No. : P088 Name : Fixed Guide Attach Gauge Use : to attach the fixed guide Page : 7 Weight : 60g Dimensions : 71 x 16 x 4.5mm
	Code No. : P087 Name : Lateral Guide Attach Gauge Use : to attach the film guide (1) Page : 7 Weight : 35g Dimensions : 65 x 15.5 x 6.5mm		

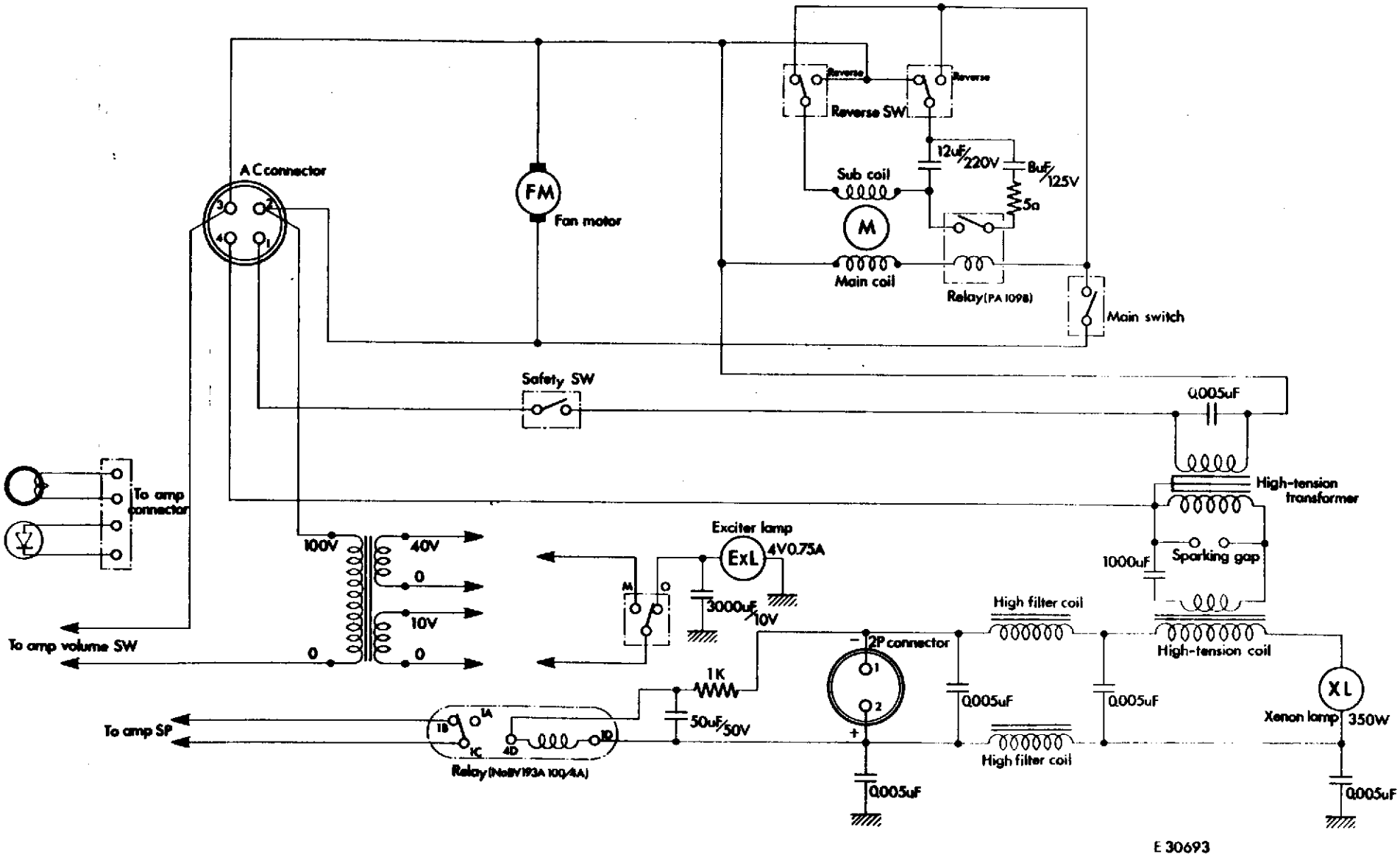


E20329

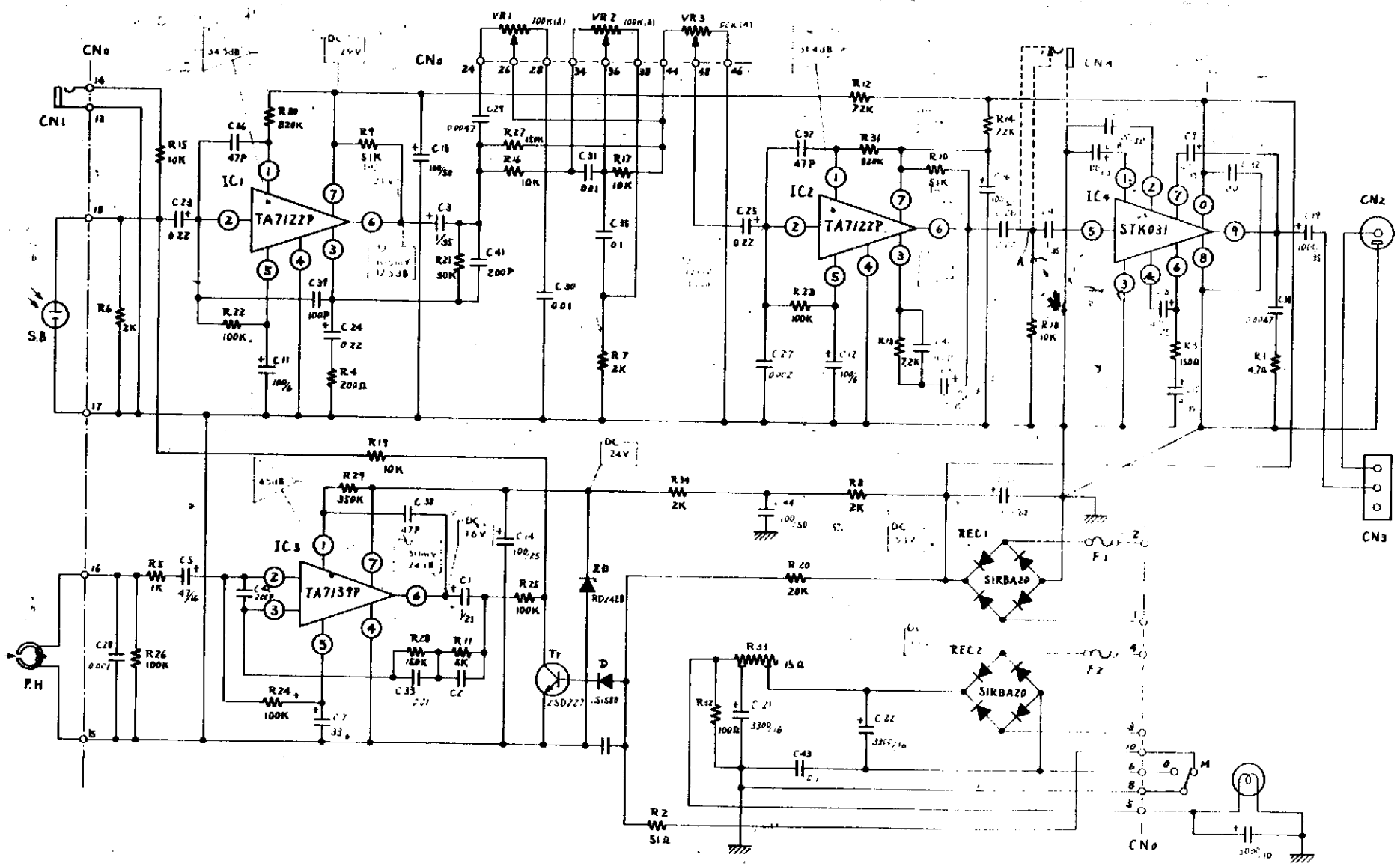
Connecting diagram for machine for XP-350



WIRING DIAGRAM OF MACHINE FOR THE KIMO KP-550AV 820328

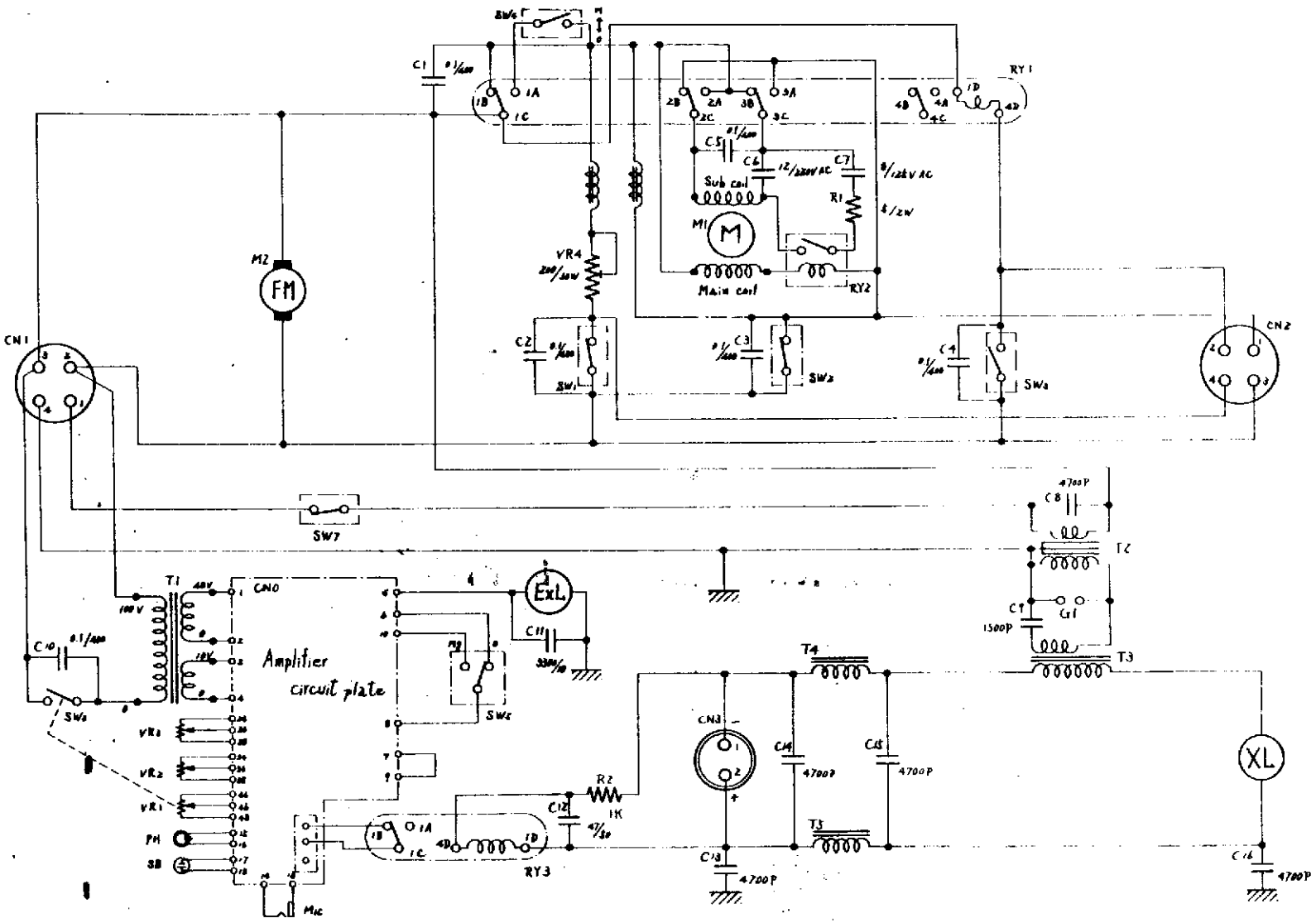


Schematic diagram for amplifier for XP-350

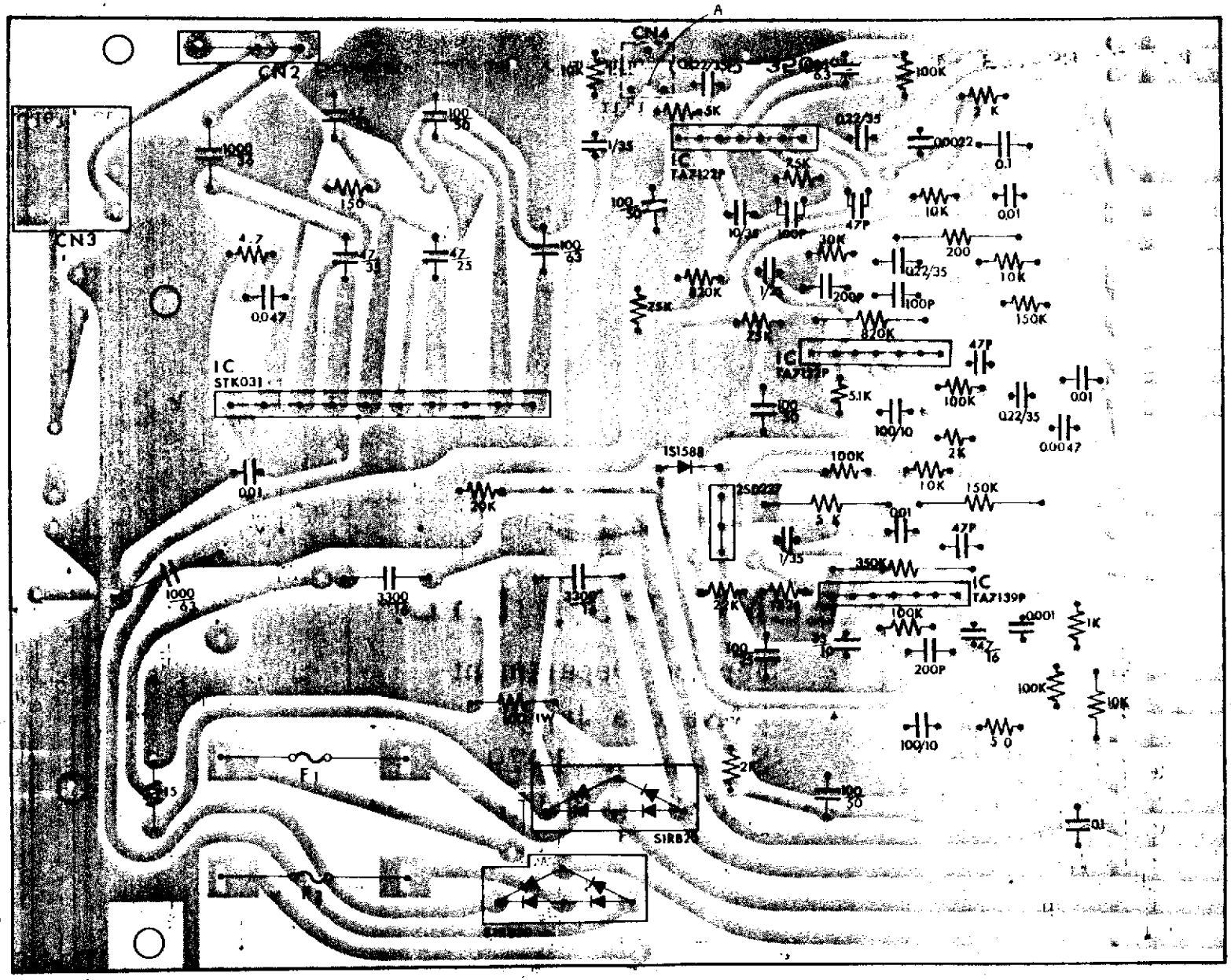


For AV model, cut "A" part and connect a jack (CN4) additionally.

Schematic biagram for amplifier for XP—350No.7475以後 E31163 E31164



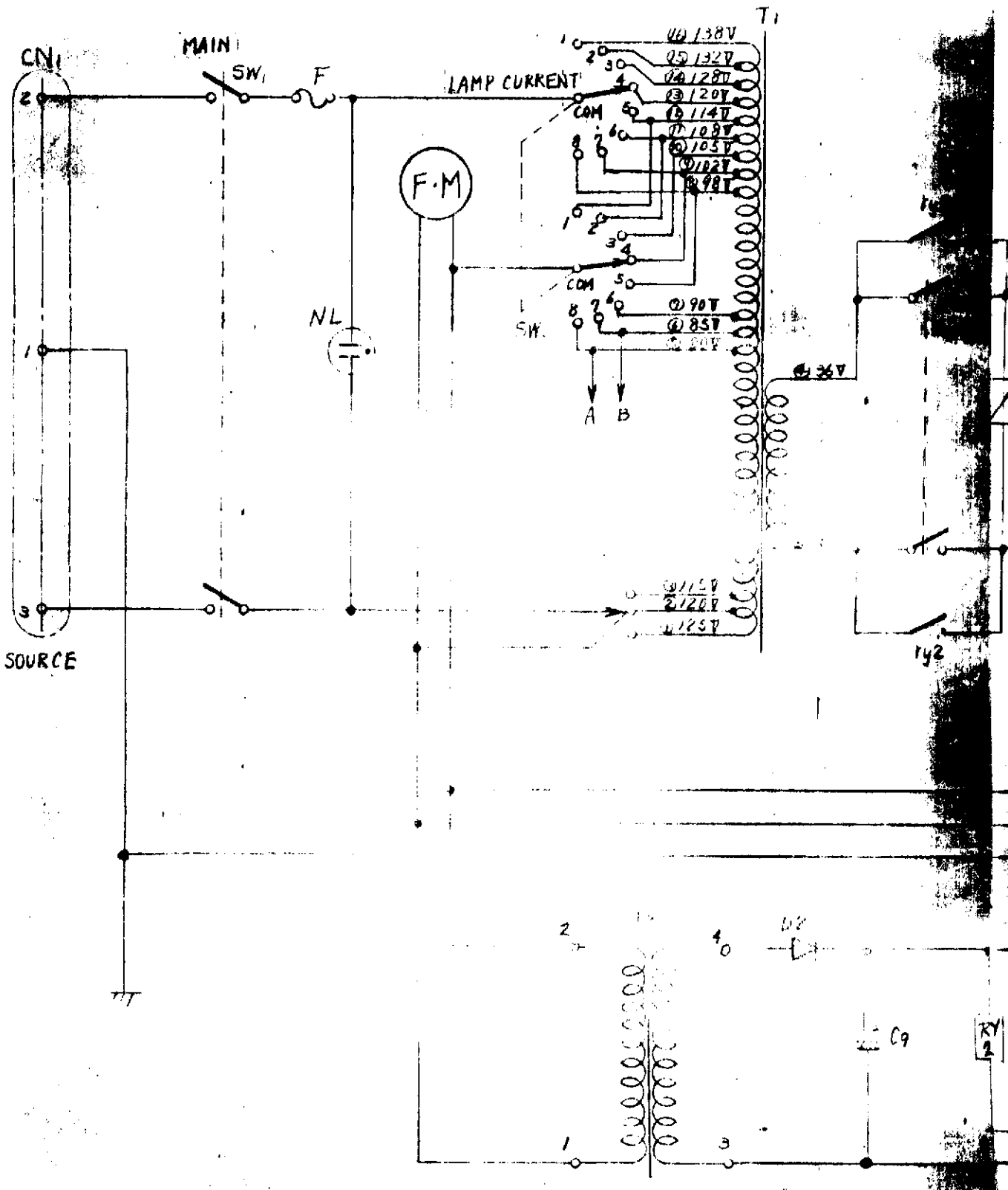
Schmatic diagram for machine for XP—350 (AV) E30692



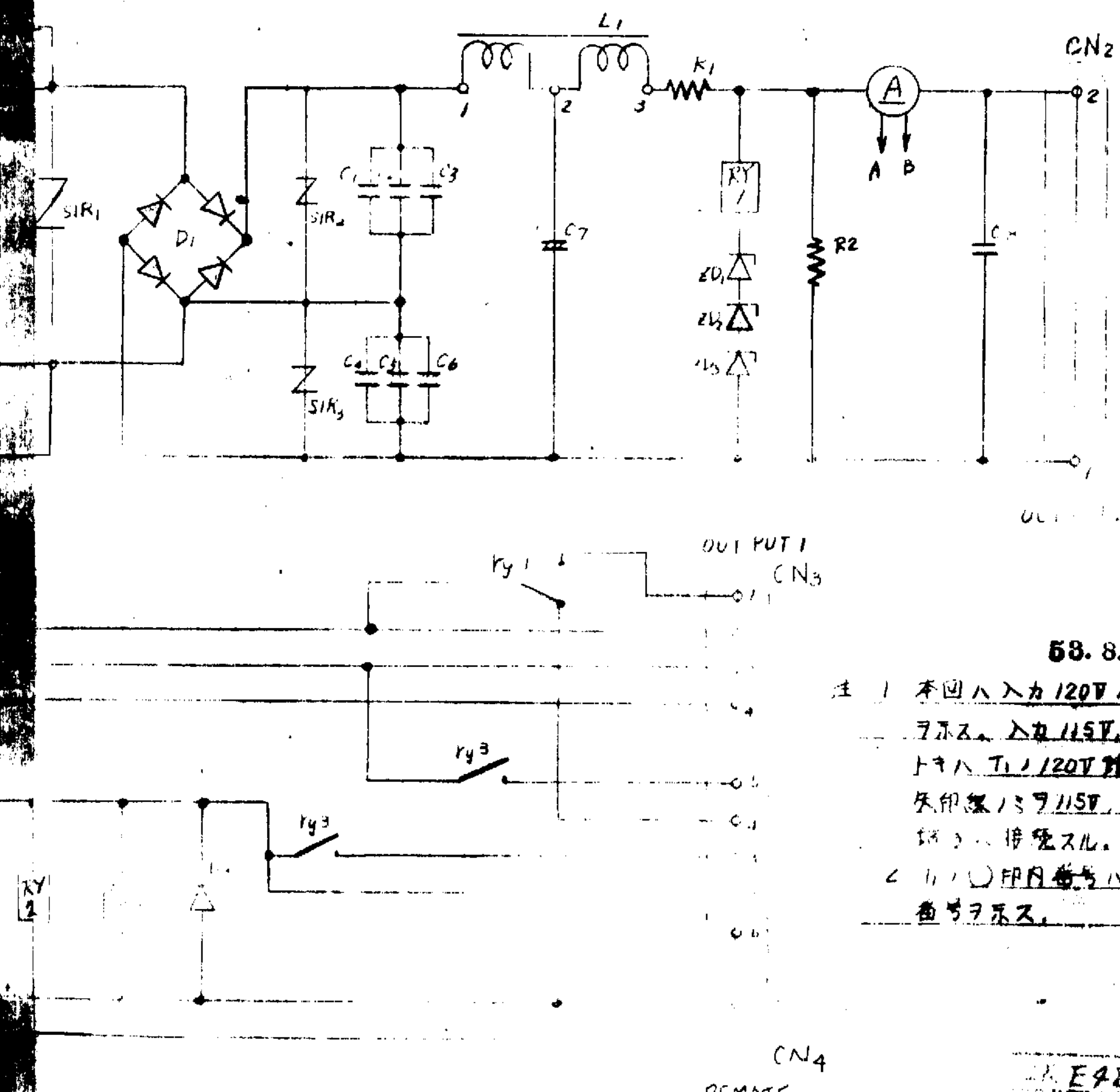
For AV model, cut "A" part and connect a jack (CN4) additionally.

E20527

Amplifier circuit plate for XP—350 New



改訂 A



58. 8. 23

注 1 本図ハ入力120Vノ場合ヲ示ス。入力115V,125VノトキハT1ノ120V端子ノ矢印線ノミヲ115V,125Vノ端子ニ接続スル。

2 ( )印内番号ハ端子番号ヲ示ス。

E42863

XP-350<AV7
115V 120V 125V

電源装置