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DENON

Hi Fi Component / Record Player

SERVICE MANUAL

**SERVO-CONTROLLED
DIRECT DRIVE AUTO-LIFT
RECORD PLAYER**

MODEL DP-30L SERIES



Model DP-30L


NIPPON COLUMBIA CO., LTD.

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SAFETY PRECAUTIONS

Model DP-30L is designed and manufactured with careful consideration about product safety. For continued product safety, read following precautions and practice proper servicing.

1. Since the printed circuit board of 120V version of Model DP-30L have high voltage potential from the metal chassis regardless of the polarity of the AC supply, use an isolating transformer (1:1) for servicing
2. Replace always with correct parts having correct rating, shape and material, etc. Especially the component with shading and  mark must be replaced only by the specified component for safety reasons.
3. For setting up the record player:
 - A) Do not damage the power cord by placing a heavy object on it, or by pinching it between angular objects. Do not fix the power cord by nails, etc. on wall.
 - B) Make sure any metal objects such as needle, hair pin or coin are not remaining inside the appliance.
 - C) Give sufficient clearance for ventilation holes at bottom. Allow more than 10cm clearance between the rear of cabinet and wall.

MODEL GROUP

The DP-30L series can be divided into two groups, the American models (including U.S.A. and Canadian models) and the European models (including continental European, U.K., Australian and Asian models).

Main difference between the above groups are whether the platter motor is directly connected to mains supply or isolated from mains by the secondary winding of power transformer, as well as different supply voltage.

The platter motor of the American models is directly connected to the mains supply. However, the major parts of

the motor control circuit is isolated from the mains supply and the final motor drive circuit by a small insulating transformer and a photo-coupler respectively.

Difference between the DP-30L and DP-30L(S) is the difference of base color, whether dark brown or silver painting.

FEATURES

- Stylus and record are free from unnecessary load of the automatic arm lift mechanism owing to the non-contact record-end sensor.
- Newly developed angular control motor enables sure and smooth tonearm cuing.
- Innovative material makes the base effective for acoustic feedback prevention.

- Operation buttons and controls are arranged outside the dust cover providing easier and more flexible operation.
- Highly accomplished magnetic recording detection system with direct drive AC motor assures wow-less, flutter-less, smooth and silent... oft-talked-about DENON quality.

NAMES OF PARTS AND FUNCTIONS

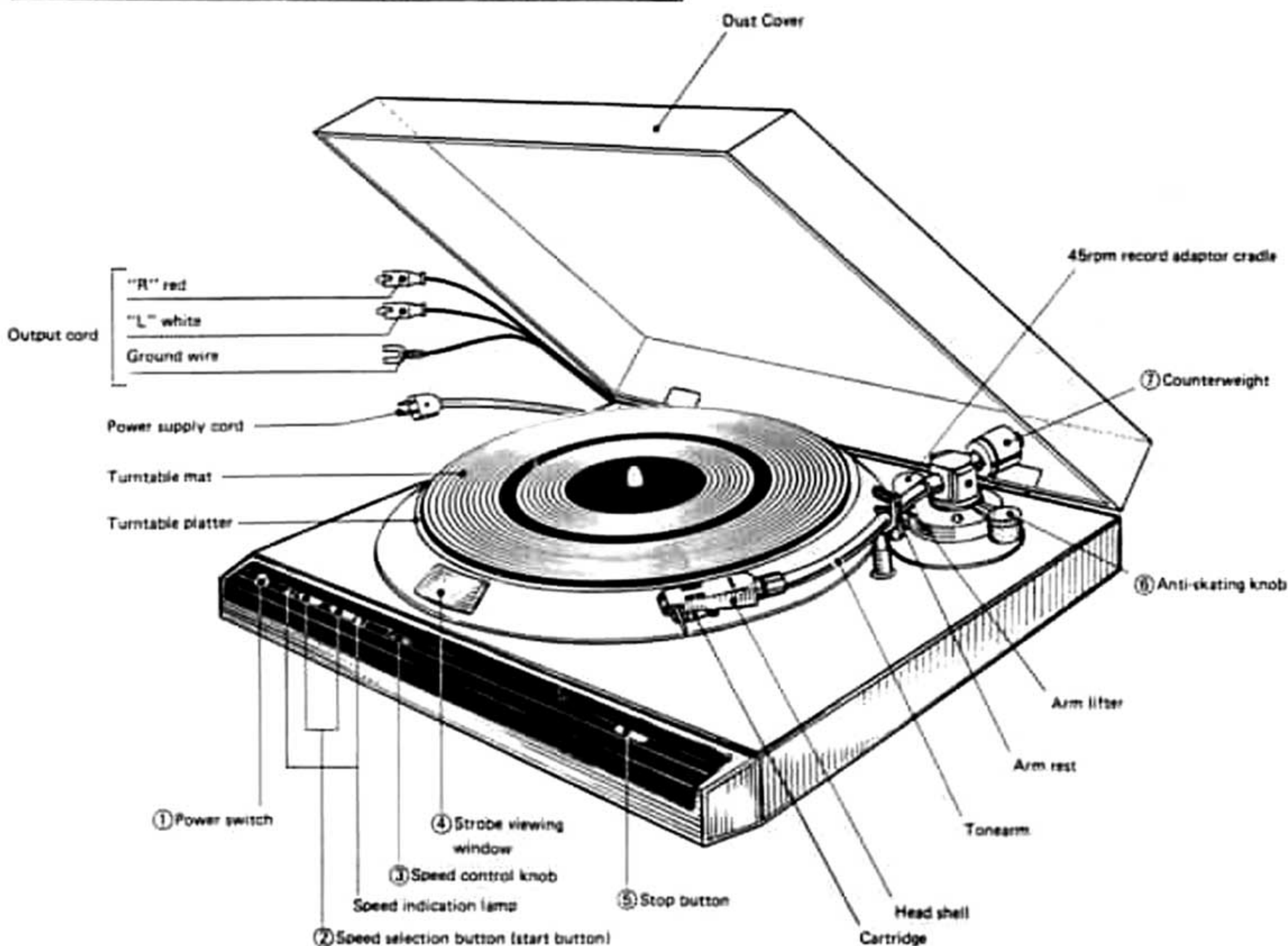



Fig. 1 Names of parts and function

(1) Power switch

Turns the power ON () and OFF ().

(2) Speed selection button (Start button at the same time)

When this button is pressed, the speed is selected, the platter starts rotation and at the same time the arm lifter lowers. Press buttons;
 "33" for record at 33-1/3 rpm
 "45" for record at 45 rpm.

(3) Speed control knob

Turn this knob left or right to vary speed.

(4) Strobe viewing window

Monitor flow of strobe pattern while adjusting the speed.

(5) Stop button

Press this button, and the arm lifter ascends and the motor is off. The platter continues rotation for a while before it stops.

(6) Anti-skating knob

In playback of record, an attraction force toward inside of record is introduced at the stylus. This force is varied by adjustment of this knob. Refer to Owner's manual (P. 14) for adjustment.

(7) Counterweight

The stylus force applied to the cartridge is adjusted by this weight. Refer to Owner's manual (P. 14) for adjustment.

THEORY OF OPERATION

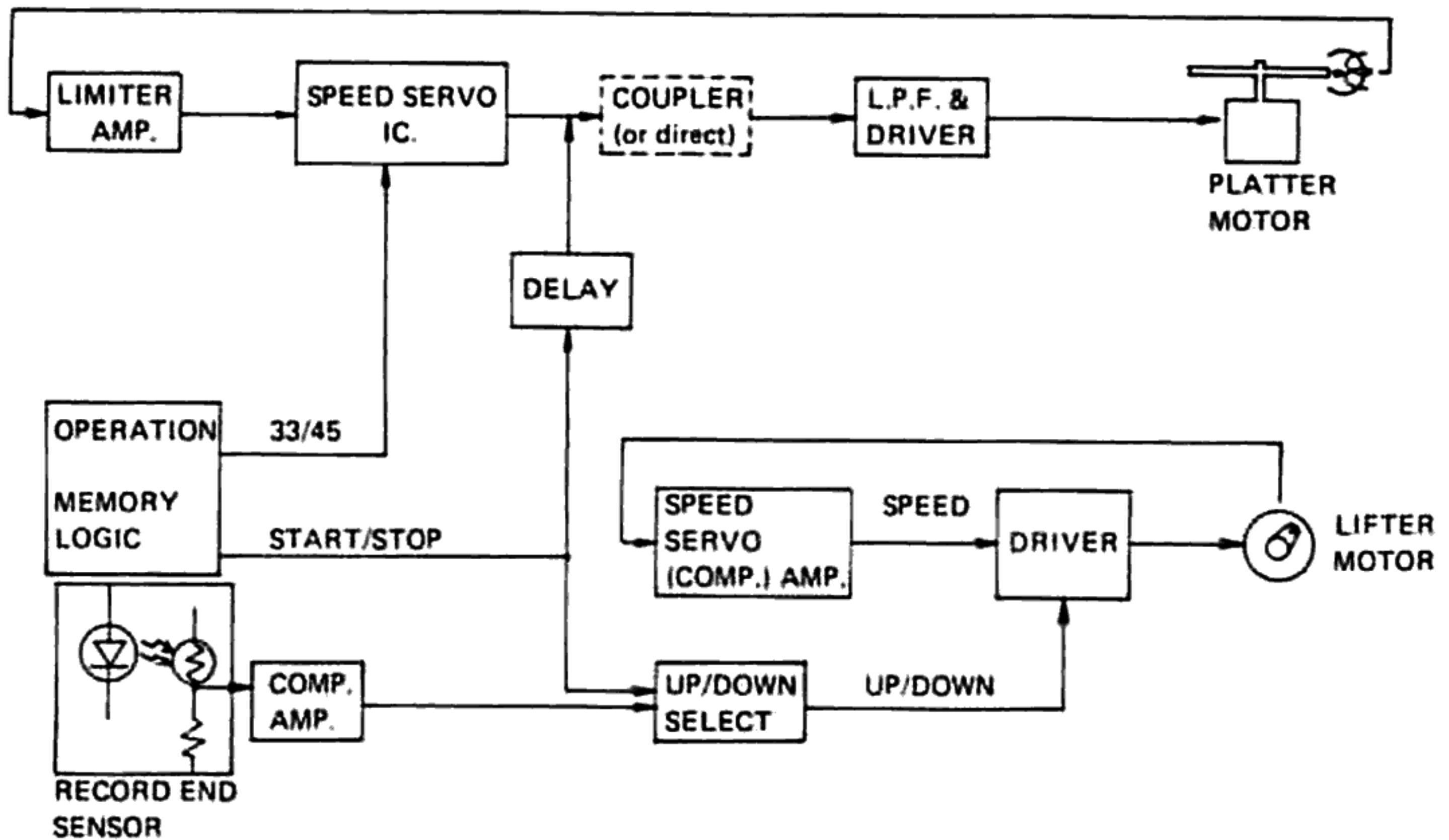


Fig. 2 Block diagram of the DP-30L

The block diagram is shown in Fig. 2.

Read the theory of operation in the service manual for the DP-1200 (Code No. 7503-043) for details of speed servo control since that of the DP-30L is in a close similarity. Main difference of the DP-30L series from the DP-1200 are as follows:

1. Photo coupler (American models only)

Photo coupler is a combination of an LED and photo transistor which are optically coupled but isolated electrically. It is useful to isolate low potential (non-hazardous) circuit from the mains supply. Of course, strict high voltage withstand is required in view point of safety.

When current (DC or pulse) flows in the LED, the photo transistor is turned on allowing signal to pass to the motor drive stage (L. P. F.).

The photo coupler is not used but by-passed in the European models since the whole control circuit including the motor is isolated from mains supply by the insulating power transformer.

2. Logic circuit

33/45 speed select (start button at the same time) and stop memory circuits consist of 4 NAND gates (HD7401P or equiv. SN7401 Texas).

3. Memory delay circuit

If the motor drive circuit is disabled when the stop button is pressed to lift up the arm in the middle of music, the platter speed slows down while the stylus is still remaining on the sound groove. This is a sort of annoyance. The time delay circuit (C16, R15, TR11) maintains platter servo control with a time constant of the circuit (approx. 2 sec. at 33 rpm.) after the stop button is pressed. Time delay for 45 rpm is held also by C15 for approx. 1 sec.

Note 1: Production models of early stage have a small and separate P.C. board for delay circuit.

Note 2: Also adjustment of the arm lifter height is important.

The gap between the arm lifter and arm tube at play decides the time for the stylus to remain on the disc groove until the arm lifter actually lifts the arm tube. Always adjust the gap to 0.5 mm when the cartridge is replaced in accordance to Page 6.

4. Automatic arm lift mechanism by the non-contact end detection

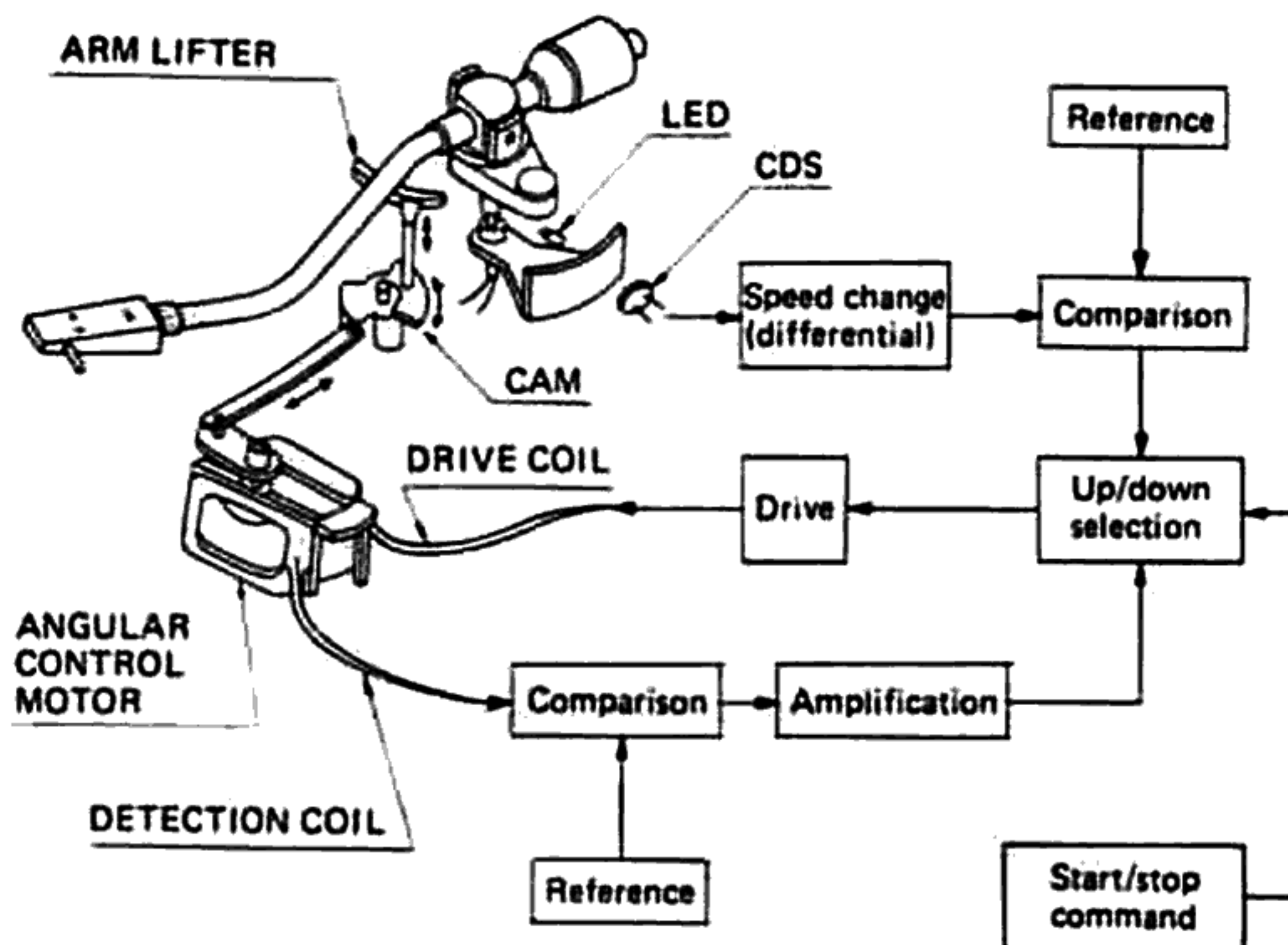


Fig. 3 Auto lift mechanism block diagram

1) End Detection

Improved version of that of the DP-1200 is employed for the end detection system.

As shown in the above Fig., a shutter is provided between LED and CDS, and the shutter moves in conformity with the movement of the tonearm. When the stylus is at the position other than the lead-out groove on the record disc, the beam of LED is intercepted by the shutter. The beam of LED gradually comes to hit CDS as the stylus moves closer to the lead-out groove and the moving speed of the tonearm is detected. In this structure, the movement of the tonearm is completely independent and not contact with any other parts at all, therefore the performance of the tonearm will not be deteriorated as no influence is caused on the horizontal sensitivity of the tonearm or the stylus force.

2) Lift Mechanism

The drive mechanism to move the arm lifter up and down is composed of the angular control motor and cam which are of the same type as those employed for DP-40F.

A speed detection coil is newly wound around the angular motor and performs the servo control by detecting the revolution speed of the motor. Consequently, the speed of the up/down movement of the arm lifter is determined by the reference voltage of the servo circuit (up speed; drop voltage of R29, down speed; drop voltage of R28) and it operates smoothly at a constant speed without being affected by the tonearm position, stylus force of the cartridge or the ambient temperature.

ADJUSTMENT POINTS

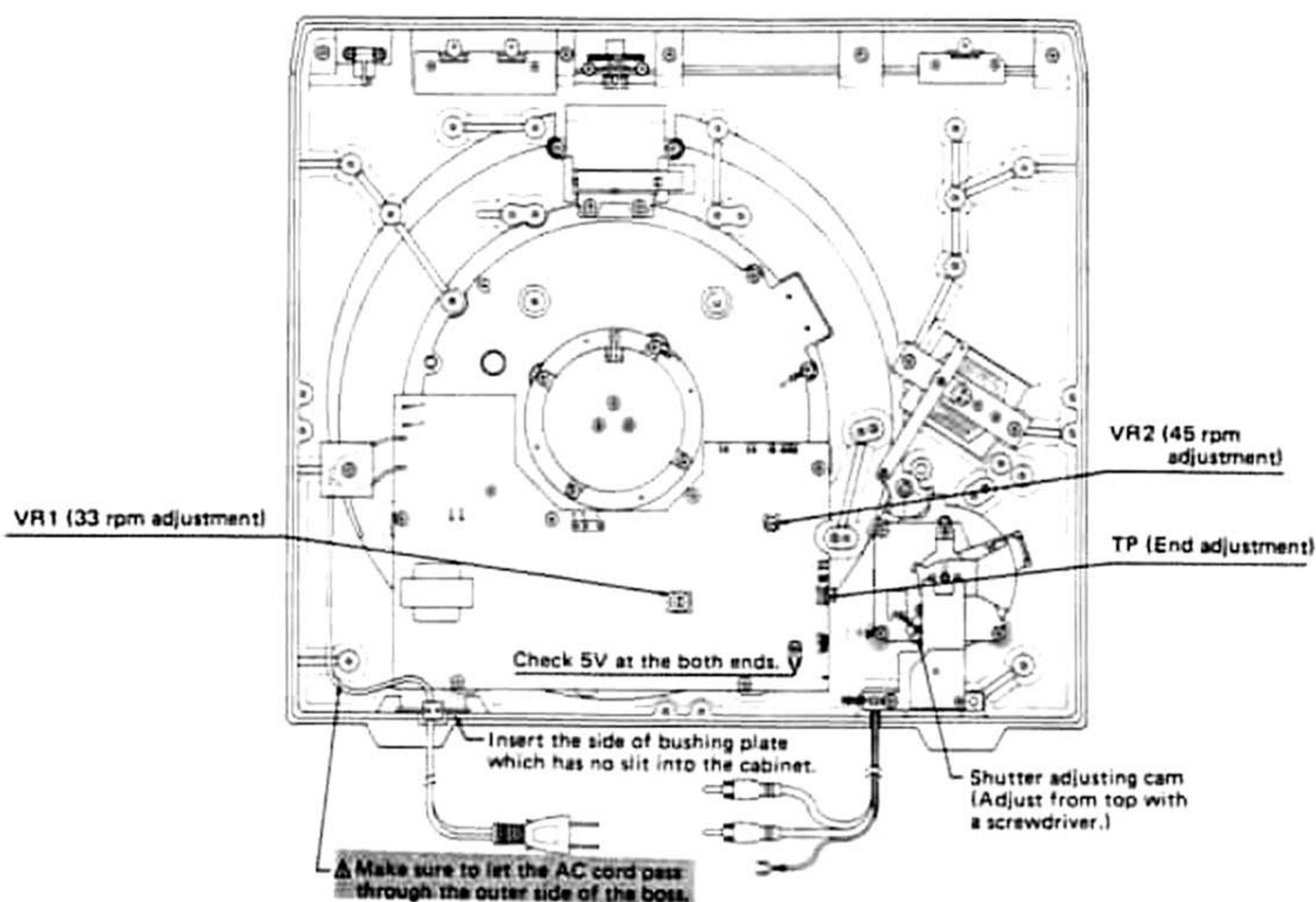


Fig. 4 Bottom view (American models)

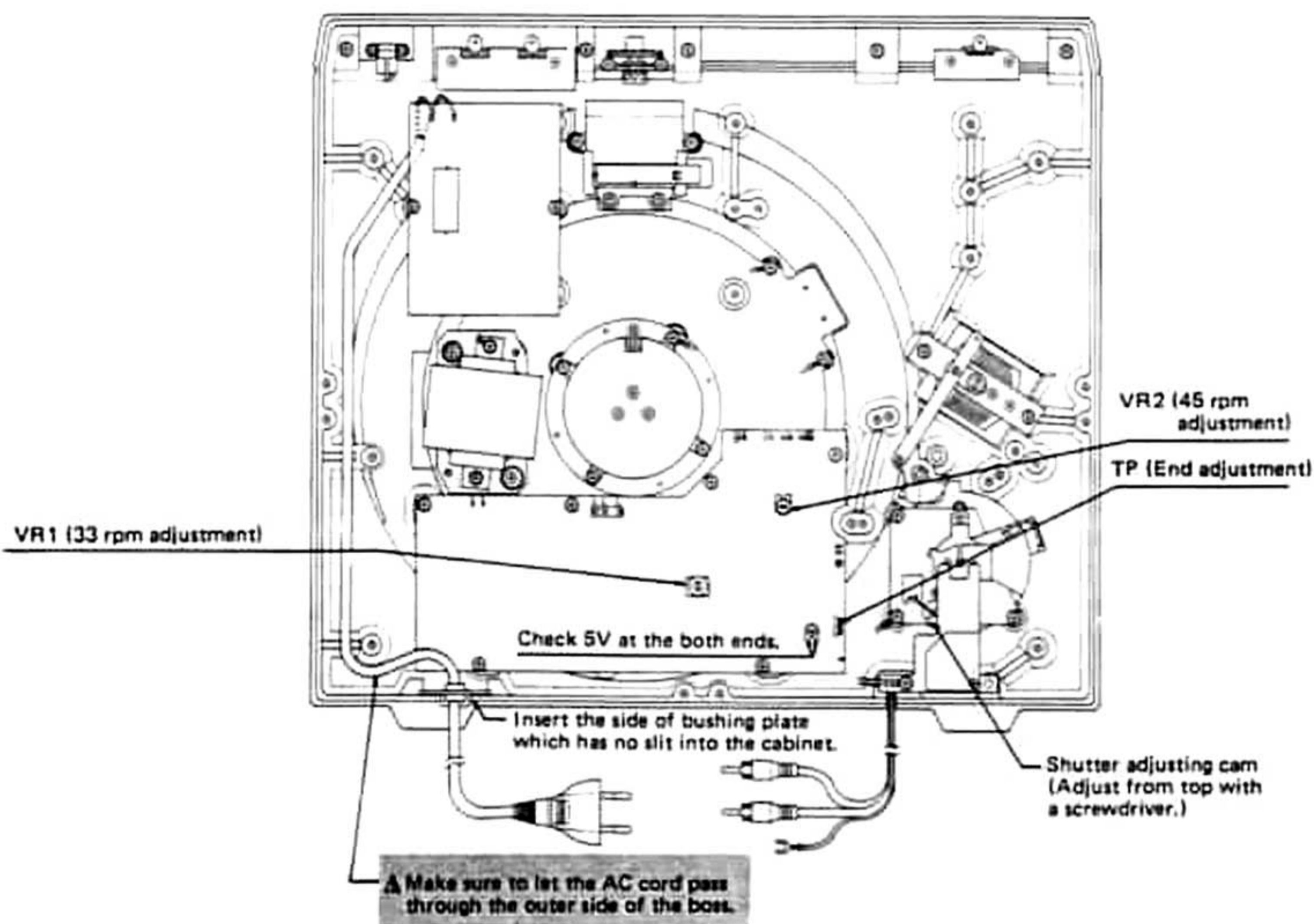


Fig. 5 Bottom view (European models)

SEQUENCE OF ADJUSTMENT

1. Checking the Line Voltage



Circuits of this model except the drive circuit of the phono motor are fed by the stabilized power source IC. Check if the respective voltage is 5V.

2. Checking the Detection Head Space

The space (clearance) between the detection head and magnet-coated surface of turntable is preadjusted to approximately 0.2 mm, however, if readjustment is required, loosen the two fitting screws for the head and adjust the space between the magnet-coated surface of the turntable and the detection head surface to approximately 0.2 mm.

3. Adjustment of the Arm Lifter Height (Fig. 6)

The height of the arm lifter must be adjusted when different cartridges are used. Carry out the adjustment in the following manner:

- 1) Turn the power switch ON (), and press the speed selector switch, "33" or "45", and then turn the power switch OFF () after confirming that the arm lifter is lowered.
- 2) Loosen the set screw fixing the arm lifter height and bring the arm lifter to the lowest position.
- 3) Remove the stylus cover and arm clamp, then place the tonearm on the record disc.
- 4) Adjust the height of the arm lifter in this state to obtain the clearance of approx. 0.5 mm between the arm lifter and arm tube, and properly tighten the screws which have been loosened for adjustment.

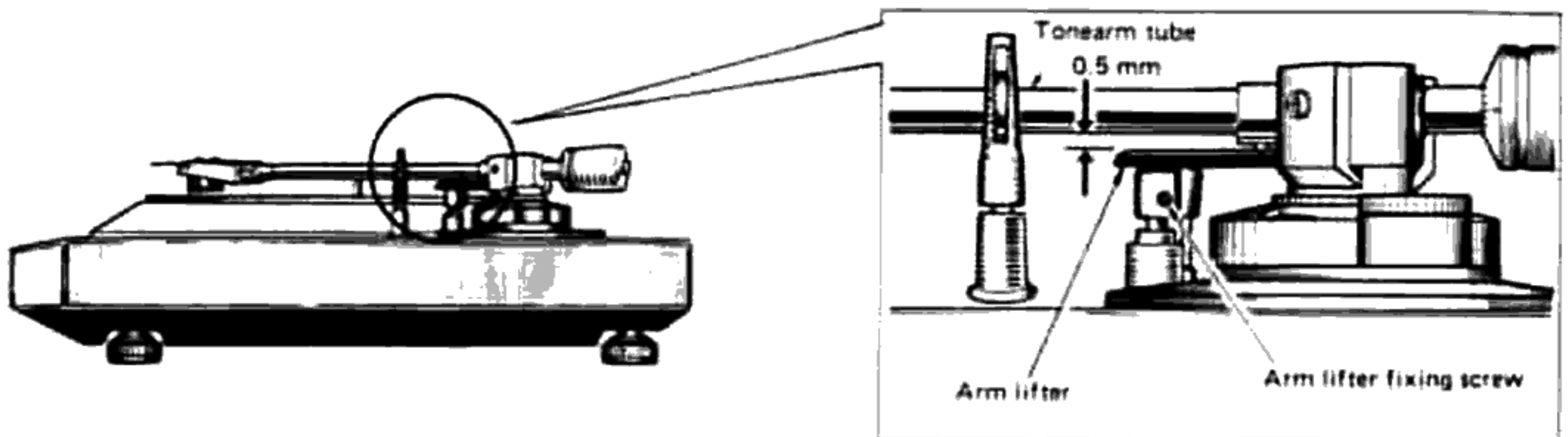


Fig. 6 Arm lifter height

4. Speed Adjustment

45 r.p.m. (make sure to adjust 45 r.p.m. first) (Fig. 7):

Turn the speed control knob on panel fully leftward, and move the point P on the extreme left end where the control knob is projected out of the front panel from A to B. Repeat this operation twice and set the VR to approximately the center position. While observing the strobe of 45

r.p.m., turn the preset VR2 and make adjustment to have the strobe stripe stand still.

33-1/3 r.p.m.:

Leave the speed control knob at the position set in 45 r.p.m. adjustment, and turn the preset VR1 while observing 33-1/3 r.p.m. strobe and make adjustment to have the strobe stripe stand still.

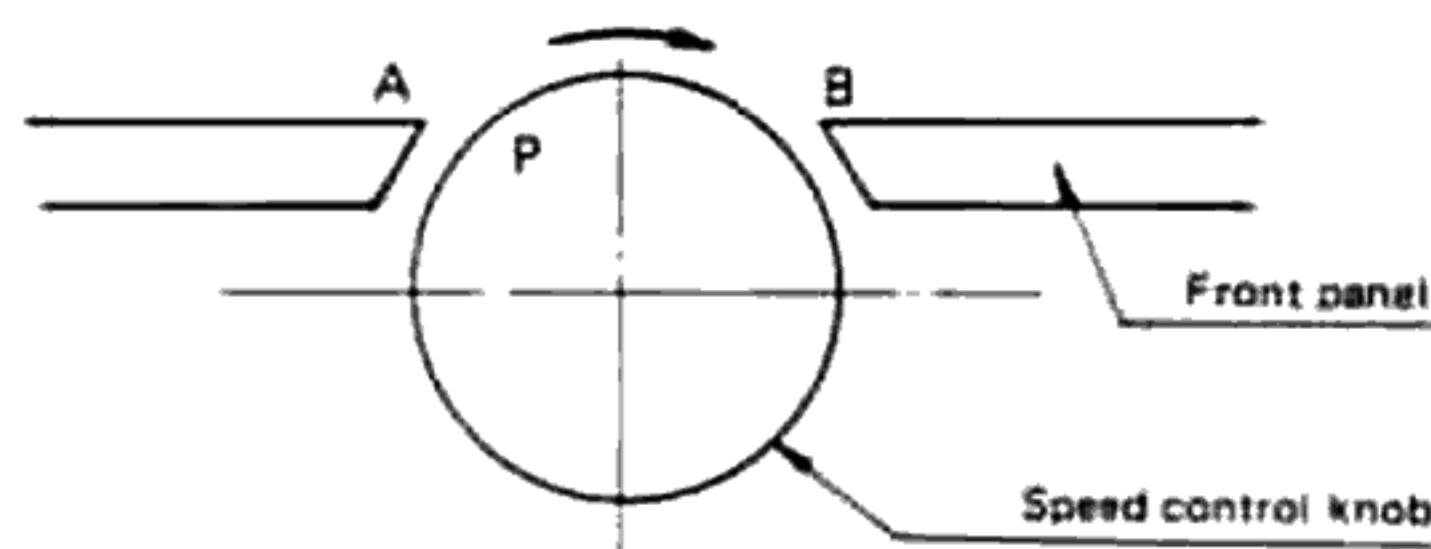


Fig. 7 Speed control knob

5. End Adjustment

Pull out the lead wire from the test points (T.P. 3P mini-connector pin) of p.c. board, and close the bottom lid again so that any light to the sensor unit other than that from LED will not hit the CDS. Place 30 cm or 25 cm record disc on the turntable. Hold the turntable still with the hand and press 33 r.p.m. or 45 r.p.m. button. Set the cartridge stylus to the last groove position (53 mm from the center spindle of the motor). Then turn the inside cam with a flat head screwdriver through the shutter adjusting hole of the arm base to adjust the voltage of the test point to

be $1.3V \pm 0.1V$.

It must be noted if the turntable is stalled by hand for too long, thermal fuse of the motor may be blown, therefore, make adjustment quickly (within 5 minutes).

6. Offset Adjustment (Make adjustment when replacing IC5)

Short-circuit between two ends of R28, TR4 base and ground, and TR7 base and ground. Adjust the preset VR3 to obtain the voltage of $1.4V \pm 0.1V$ at No.14 terminal of IC5.

EXPLODED VIEW OF MAIN PARTS (American models)

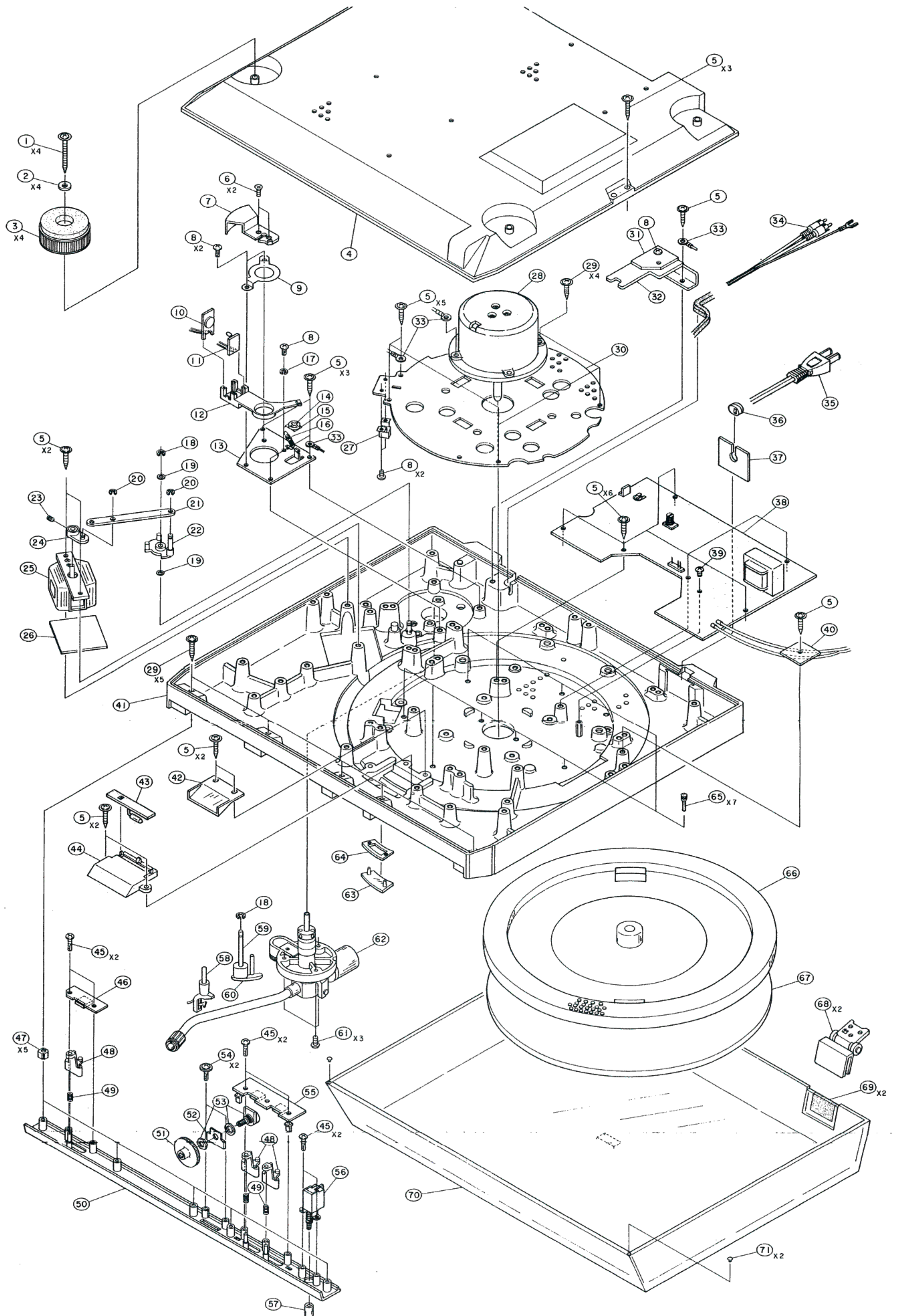
Ref. No.	Part No.	Part Name	Remarks
1	4731803022	3 x 25 CPTS (4)W	
2	WA-01074	WASHER	
3	1048013317	INSULATOR	
4	1058034001	BOTTOM COVER ASSY	
5	4731803006	3 x 12 CPTS (4)W	
6	4712303017	3 x 6 CFS	
7	4118027308	SHUTTER	
8	4733800007	3 x 6 CBTS (2)	
9	4418213003	PUSH PLATE	
10	KU-325 (58D)	CDS. CIRCUIT BOARD	
11	KU-325 (58C)	LED CIRCUIT BOARD	
12	4218115301	SENER HOLDER	
13	4418312205	SENER BASE	
14	4248004107	ADJUST CAM	
15	4418214109	ADJUST PLATE	
16	4638073007	SHUTTER SPRING	
17	4752003005	3 SW	
18	4761003009	3E RING	
19	4770090058	WASHER	
20	4761001001	2E RING	
21	4418220203	CONNECTION PLATE	
22	4248007007	CAM	
23	4744200007	3 x 3 BSS	
24	4218121104	MOTOR ARM	
25	2178038203	MOTOR (C) ASSY	
26	4418323100	M. SHIELD PLATE	
27	3918423006	MAGNETIC HEAD	
△ 28	2178038206	MOTOR ASSY	
29	4731803019	3 x 16 CPTS (4)W	
30	4148054309	SHIELD PLATE	
31	KU-325 (F)	ARM WIRE BOARD	
32	4418311303	SHIELD COVER	
33	2098093001	EARTH WIRE	
34	2033642103	OUTPUT CORD ASSY	
△ 35	2062019008	AC CORD	
△ 36	MD-3802	BUSHING	
△ 37	4418314009	BUSH PLATE	
△ 38	KU-325	CONTROL CIRCUIT UNIT	

Ref. No.	Part No.	Part Name	Remarks
39	4713309010	3 x 16 CBS	
40	KU-325 (58G)	CORD STOPPER	
41	1038085108 ⁴	CABI. ASSY	
42	1468037009	ACRYL COVER	
△ 43	KU-325 (58E)	NEON LAMP BOARD	
44	1468082106	MIRROR CASE ASSY	
45	4730305013	3 x 10 CBRTS (1)	
46	KU-325 (58B)	STOP BOARD	
47	4038001006	CAP	
48	1138077205	PUSH SWITCH KNOB	
49	4638100103	SPRING	
50	1038067412	FRONT PANEL	
51	1138078217	VOLUME KNOB	
52	4418307100	VOLUME SUPPORT	
53	2118036003	V16N15KB502	
54	4700026005	3 x 8 CRTS (2)W	
55	KU-325 (58A)	33-45 BOARD	
△ 56	2129088011	POWER SWITCH	
57	1138076206	SWITCH KNOB	
58	315-8273100	ARM REST ASSY	
59	3158265105	LIFTER SHAFT	
60	3158272101	ARM LIFTER ASSY	
61	4713303029	3 x 6 CBS	
62	FPU-830	TONE ARM UNIT	
63	1468051001	STROBO WINDOW	
64	4148022001	BLIND	
65	4690012006	RUBBER CUSHION (B)	
66	4218080106	RECORDED TURNTABLE	
67	4218141113	RUBBER SHEET	
68	4018009109	HINGE	
69	1228017104	SHEET	
70	1468081301	DUST COVER ASSY	
71	4628006107	BUSHING	

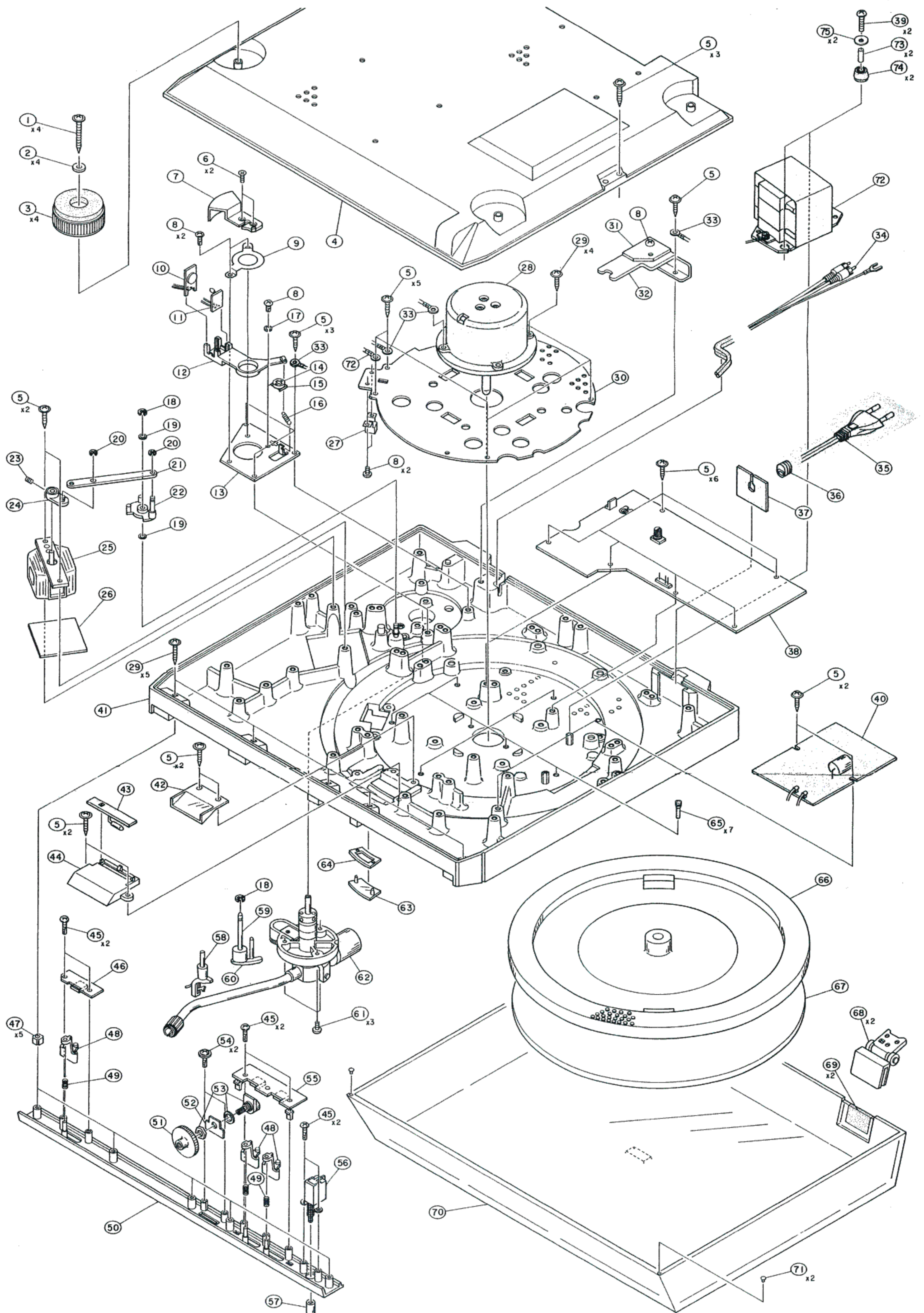
WARNING:

△ Components with △ marks and shading have special characteristics important to safety.

They must be replaced only by specified components.



NOTE:
 Special tap-in screws with frange are used to prevent loosening. Be sure to use specified screws.
 These special screws with frange can be tightened with relatively high torque. Therefore, take note that the screw holes on the cabinet may be destroyed disabling fixture, if the screws are tightened excessively.
 In case the screw hole is dulled, it can be of service again by inserting a small piece of vinyl tip, etc. when tightening screw.



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EXPLODED VIEW OF MAIN PARTS (European models)

Ref. No.	Part No.	Part Name	Remarks
1	4731803022	3 x 25 CPTS (4)W	
2	WA-01074	WASHER	
3	1048013304	INSULATOR	
4	1058034001	BOTTOM COVER ASSY	
5	4731803006	3 x 12 CPTS (4)W	
6	4712303017	3 x 6 CFS	
7	4118027308	SHUTTER	
8	4733800007	3 x 6 CBTS (2)	
9	4418213003	PUSH PLATE	
10	KU-326 (59D)	CDS. CIRCUIT BOARD	
11	KU-326 (59C)	LED CIRCUIT BOARD	
12	41281153001	SENER HOLDER	
13	4418312205	SENER BASE	
14	4248004107	ADJUST CAM	
15	4418214109	ADJUST PLATE	
16	4638073007	SHUTTER SPRING	
17	4752003005	3 SW	
18	4761003009	3E RING	
19	4770090058	WASHER	
20	4761001001	2E RING	
21	4418220203	CONNECTION PLATE	
22	4248007007	CAM	
23	4744200007	3 x 3 BSS	
24	4218121104	MOTOR ARM	
25	2178038203	MOTOR (C) ASSY	
26	4418323100	M. SHIELD PLATE	
27	3918423006	MAGNETIC HEAD	
△ 28	2178028404	MOTOR ASSY	
29	4731803019	3 x 16 CPTS (4)W	
30	4148054309	SHIELD PLATE	
31	KU-326 (59F)	ARM WIRE BOARD	
32	4418311303	SHIELD COVER	
33	2098093001	EARTH WIRE	
34	2033642103	OUTPUT CORD ASSY	
△ 35	2062002031	AC CORD	
△ 36	4450020005	BUSHING	
△ 37	4418321005	BUSH PLATE	
38	KU326	CONTROL CIRCUIT UNIT	

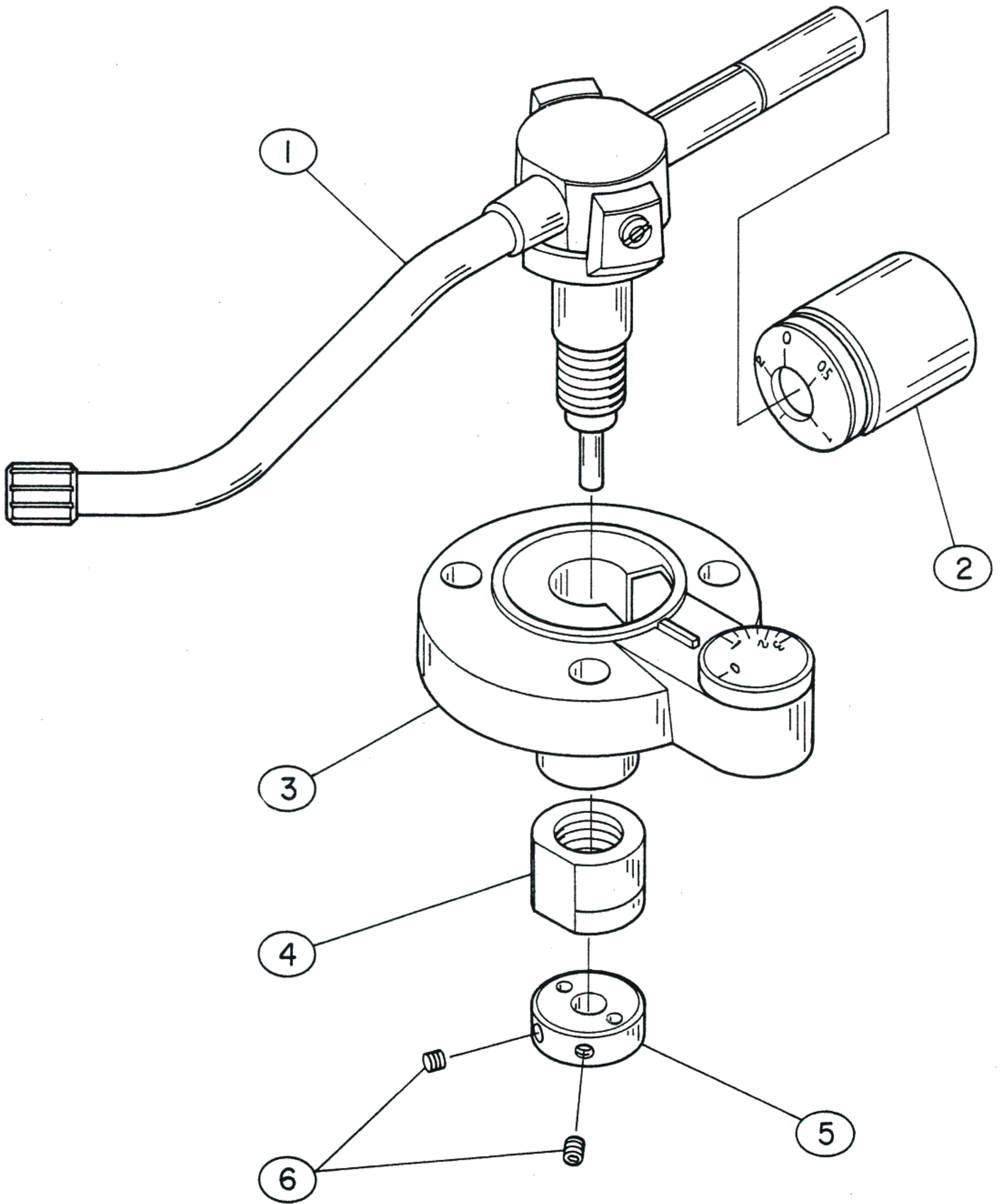
Ref. No.	Part No.	Part Name	Remarks
39	4713309010	3 x 16 CBS	
△ 40	PS-142	POWER SUPPLY UNIT	
41	1038085009	CABI. ASSY	
42	1468037009	ACRYL COVER	
△ 43	KU-326 (59E)	NEON LAMP BOARD	
44	1468082106	MIRROR CASE ASSY	
45	4730305013	3 x 10 CBRTS (1)	
46	KU-326 (59B)	STOP BOARD	
47	4038001006	CAP	
48	1138077205	PUSH SWITCH KNOB	
49	4638100103	SPRING	
50	1038067212	FRONT PANEL	
51	1138078217	VOLUME KNOB	
52	4418307100	VOLUME SUPPORT	
53	2118036003	V16N15 KB502	
54	4700026005	3 x 8 CRTS (2)W	
55	KU-326 (59A)	33-45 BOARD	
△ 56	2129088024	POWER SWITCH	
57	1138076206	SWITCH KNOB	
58	3158273100	ARM REST ASSY	
59	3158265105	LIFTER SHAFT	
60	3158272101	ARM LIFTER ASSY	
61	4713303029	3 x 6 CBS	
62	FPU-830	TONE ARM UNIT	
63	1468051001	STROBO WINDOW	
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65	4690012006	RUBBER CUSHION (B)	
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67	4218141113	RUBBER SHEET	
68	4018009109	HINGE	
69	1228017104	SHEET	
70	1468081301	DUST COVER ASSY	
71	4628006107	BUSHING	
△ 72	2339023109	POWER TRANS	
73	4438156108	SPACER	
74	1298010005	CUSHION RUBBER	
75	4751106042	WASHER	

WARNING:

△ Components with △ marks and shading have special characteristics important to safety.

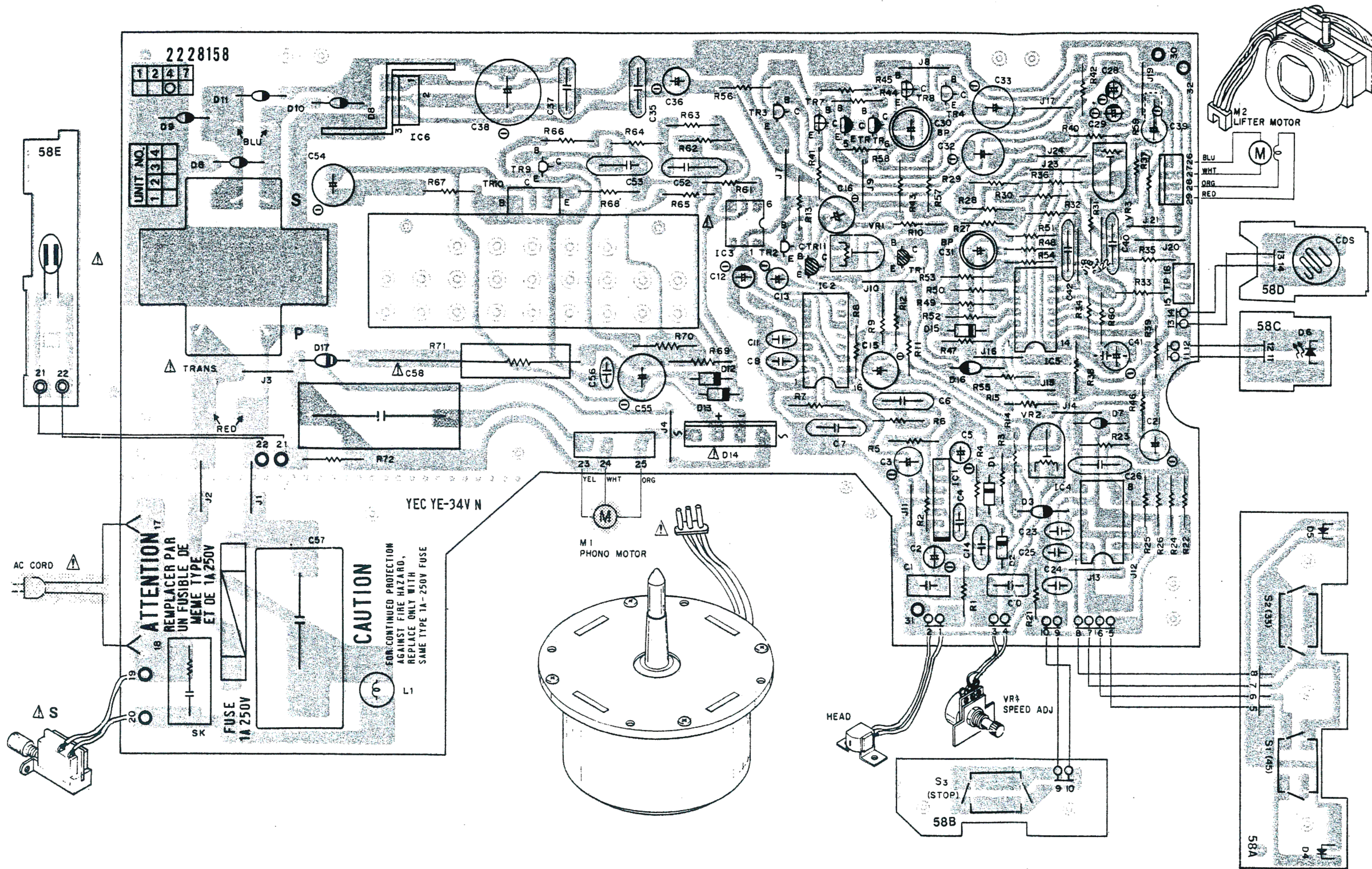
They must be replaced only by specified components.

EXPLODED VIEW OF TONEARM



No.	Part No.	Part Name	Remarks
1	3158267006	MAIN BODY ASS	
2	3158269004	BALANCE WEIGHT ASS	
3	3158271005	ARM BASE ASS	
4	3158279104	BASE NUT	
5	3158278105	SHAFT RING	
6	4744200007	3 x 3 BSS (A)	

PRINTED CIRCUIT BOARD (American models)



Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTOR GROUP			
IC1	2630094028	TA7122BP (C)	or (A) or (B)
IC2	2688002004	TCA955	
IC3	▲3939027009	PC613	
IC4	2620079008	HD7401P	
IC5	2630076004	HA17901P	
IC6	2680009005	FS-7805M	
TR1,11	2710102005	2SA1015 (Y)	or 2SA999(F)
TR2,3,4	2730204019	2SC2320 (F)	or (G)
TR5,6	2720046009	2SB561 (C)	
TR7,8	2740038000	2SD467 (C)	
TR9	2730198027	2SC1815 (GR)	
TR10	2730196017	2SC2023	
D1,2,15	2760049008	1S2076	
D3,7,8,9	2760179004	RV06	
10,11,16	↑	↑	
D4,5	3939037031	LED (LN217RP)	
D6	3939023003	LED (SEL 101W)	
D12,13	2760179004	MZ307B	or HZ7B
D14	▲2760246005	RB152	
D17	▲2760057029	V06E	
	3939019101	CDS	

Ref. No.	Part No.	Part Name	Remarks
RESISTER GROUP			
R9*	FEP1011-25	RN1/4PS27KΩG	27K ±2%
R10*	FEP1011-26	RN1/4PS7.5KΩG	7.5K ±2%
R68	2440005029	RS14B3A010JNBF	1Ω 1W
R69	2440046020	RS14B3A272JNBF	2.7K 1W
R70	2410193000	RD14B2H222J	2.2 K 1/2W
R71	▲2442014005	RS98-3H222JNB	2.2K 5W
R72	▲2440054025	RS14B3A123JNBF	12K 1W
VR1	2116019019	K08PB103	10K B
VR2	2116019022	K08PB153	15K B
VR3	2116000015	V08PB103	10K B

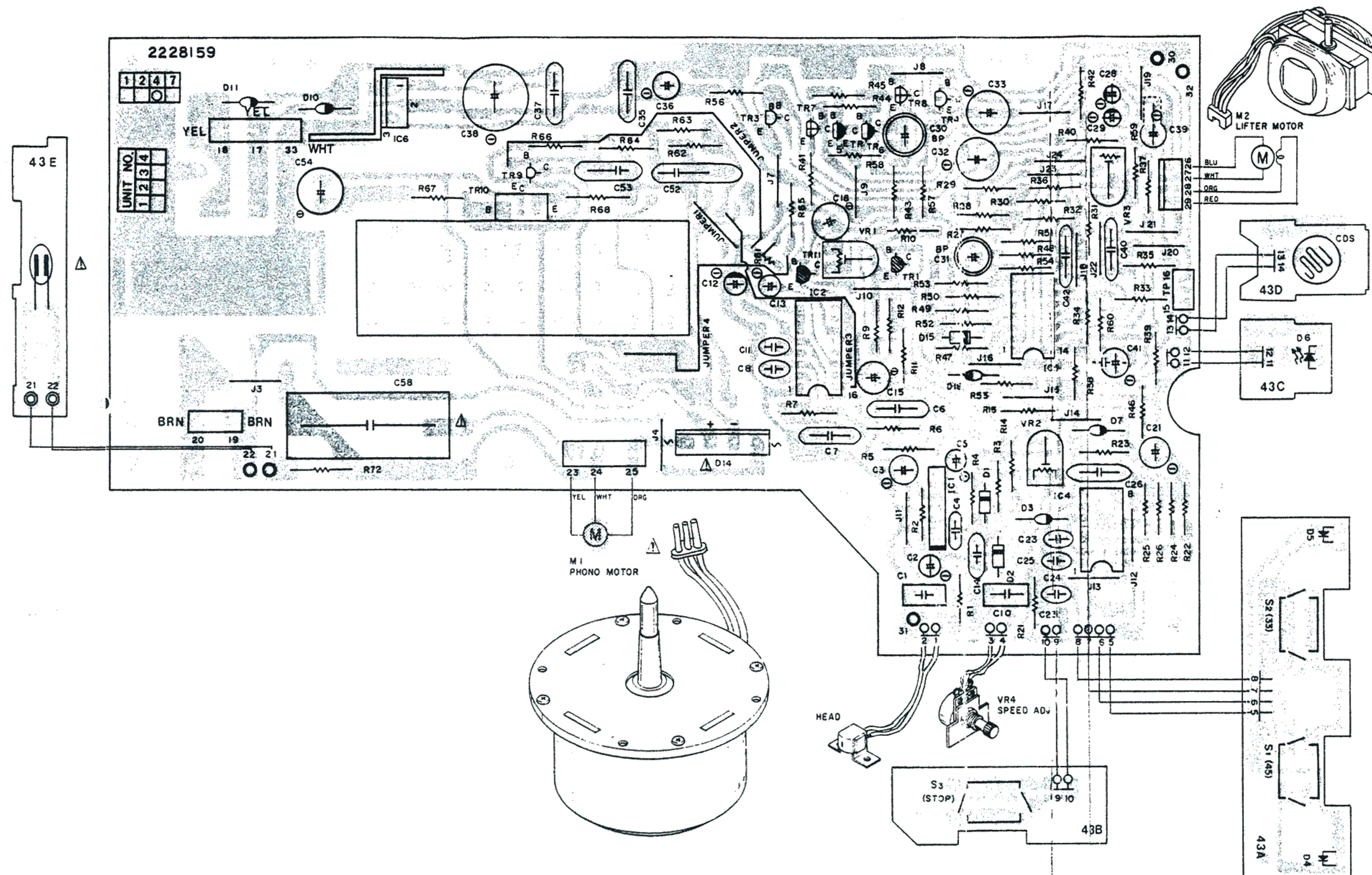
Note: Resistors other than listed herein are all carbon film resistors of ± 5% and 1/4W.

Ref. No.	Part No.	Part Name	Remarks
CAPACITOR GROUP			
C1	2551076002	CQ93M1H223K	0.022μF 50V
C2,5,39,41	2544043000	CE04W1HR47	0.47μF 50V
C3	2544009002	CE04W1A470	47μF 10V
C4,56	2531001000	CK45B1H331K	330pF 50V
C6,7,26,35,37,40,42,52,53	2531027000	CK45F1H104Z	0.1μF 50V
↑	↑	↑	↑
C8,11,14,23,24,25	2531004007	CK45B1H102K	1000pF 50V
↑	↑	↑	↑
C10*	2551121025	CQ93M1H103J	0.01μF ±5% 50V
C12	2541047009	CS45E1VR68K	0.68μF 35V tantal
↑	↑	↑	↑
C13,36	2544015009	CE04W1C100	10μF 16V
C15,16,33	2544003008	CE04W0J101	100μF 6.3V
C21	2544054002	CE04W1C220	22μF 16V
C28*,29*	2541003001	CS45E0J100M	10μF 6.3V tantal
↑	↑	↑	↑
C30,31	2543014043	CE04D1C220MBP	2.2μF 16V bipolar
↑	↑	↑	↑
C32	2544006005	CE04W0J471	470μF 6.3V
C38	2544032008	CE04W1E102	1000μF 25V
C54	2544070015	CE04W2CR47	0.47μF 160V
C55	2544049004	CE04W1H470	47μF 50V
C57	▲2568017012	CF99B2BAC104MW	0.1μF 125VAC
C58	▲2668013058	CF99-2DAC405J	4μF ±5% 200VAC

Ref. No.	Part No.	Part Name	Remarks
OTHER PARTS GROUP			
L1	2228158402	P.C. BOARD	
SK	▲2328008106	INDUCTOR	
F	▲2618006009	SPARK KILLER	
	▲EP-72663	FUSE (1A/250V)	
	▲3933011118	NEON LAMP ASSY	
	2129059008	PUSH SWITCH	33, 45, STOP
	4178020413	HEAT SINK	TR10
	4178046002	HEAT SINK (S)	IC6
T	▲2339022003	POWER TRANS	
	4733800007	3 x 6 CBTS (2)	
	2033625010	MINI CONNE PIN ASSY	
	2035622008	3P MINI CONNE PIN	
	2035622024	4P MINI CONNE PIN	

WARNING:
 ▲ Components with ▲ marks and shading have special characteristics important to safety. They must be replaced only by specified components.
 * Components with * marks are temperature compensating devices.

PRINTED CIRCUIT BOARD (European models)



Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTOR GROUP			
IC1	2630094028	TA7122BP (C)	or (A) or (B)
IC2	2688002004	TC955	
IC4	2620079008	HD7401P	
IC5	2630076004	HA17901P	
IC6	2680009005	FS-7805M	
TR1,11	2710102005	2SA1015 (Y)	or 2SA999 (F)
TR3,4	2730204019	2SC2320 (F)	or (G)
TR5,6	2720046009	2SB561 (C)	
TR7,8	2740038000	2SD467 (C)	
TR9	2730115001	2SC1344 (E)	
TR10	2730196017	2SC2023	
D1,2,15	2760049008	1S2076	
D3,7,10,11,16	2760237001	RV06	
D4,5	3939037031	LED (LN217RP)	
D6	3939023003	LED (SEL101W)	
D14	▲ 2760246005	RB152	
	3939019101	CDS	

Ref. No.	Part No.	Part Name	Remarks
RESISTOR GROUP			
R9*	FEP1011-31	RN1/4PS30KΩG	30K ±2%
R10*	FEP1011-38	RN1/4PS8.2KΩG	8.2K ±2%
R68	2440005029	RS14B3A010JNBF	1Ω 1W
R72	2440052027	RS14B3A822JNBF	8.2K 1W
VR1	2116019019	K08PB103	10K B
VR2	2116019022	K08PB153	15K B
VR3	2116000015	V08PB103	10K B

Note: Resistors other than listed herein are all carbon film resistors of ± 5% and 1/4W.

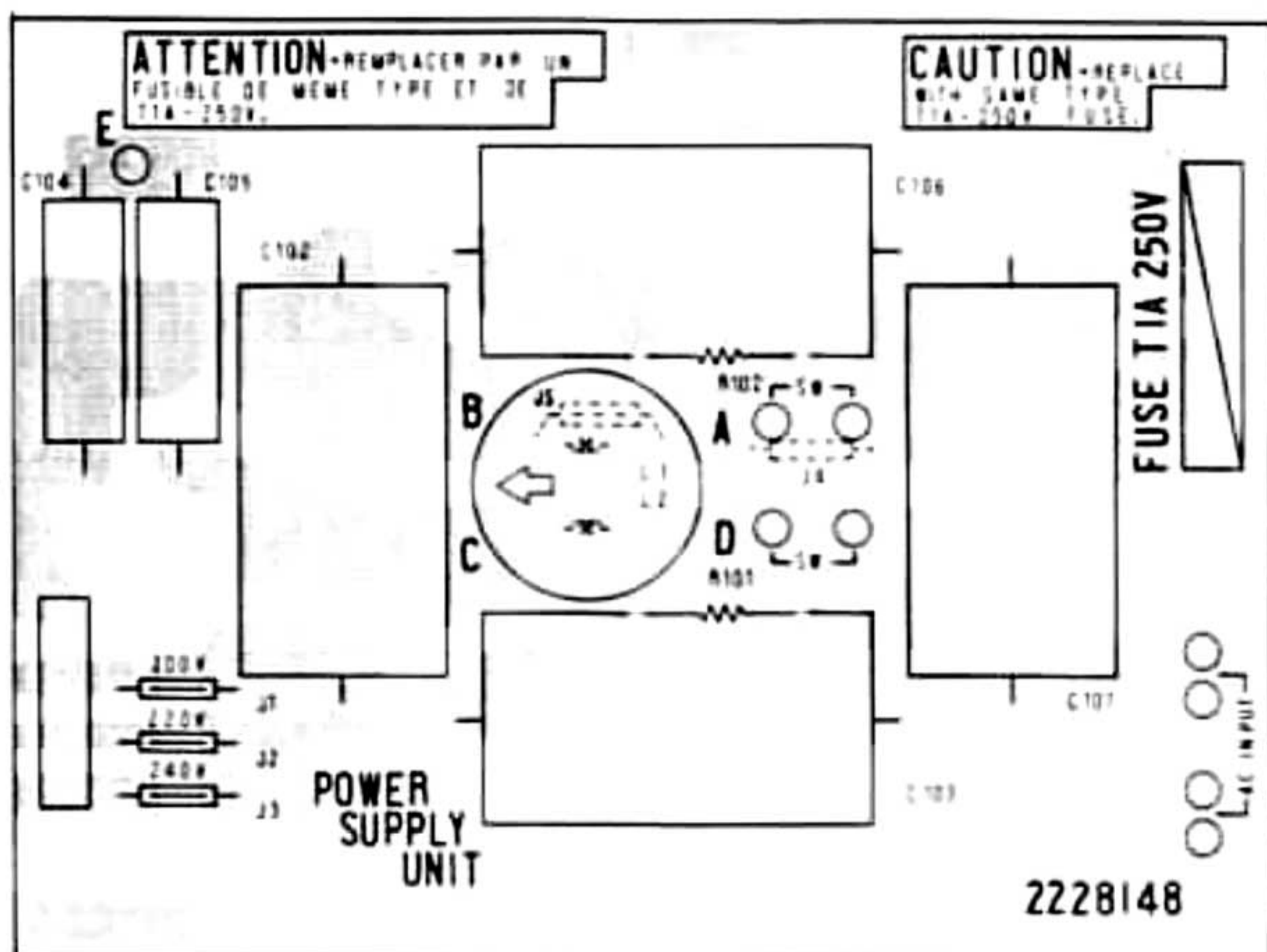
Ref. No.	Part No.	Part Name	Remarks
CAPACITOR GROUP			
C1	2551076002	CQ93M1H223K	0.022μF 50V
C2,5,39,41	2544043000	CE04W1HR47	0.47μF 50V
C3	2544009002	CE04W1A470	4.7μF 10V
C4	2531001000	CK45B1H331K	330pF 50V
C6,7,26,35,37,40,42,53	2531027000	CK45F1H104Z	0.1μF 50V
C8,11,14,23,24,25	2531004007	CK45B1H102K	1000pF 50V
C10*	2551121012	CQ93M1H822J	0.082μF ±5%50V
C12	2541047009	CS45E1VR68K	0.68μF 35V tantal
C13,36	2544015009	CE04W1C100	10μF 16V
C15,16,33	2544003008	CE04W0J101	100μF 6.3V
C21	2544054002	CE04W1C220	22μF 16V
C28*,29*	2541003001	CS45E0J100M	10μF 6.3V tantal
C30,31	2543014043	CE04D1C220MBP	22μF 16V bipolar
C32	2544006005	CE04W0J471	470μF 6.3V
C38	2544032008	CE04W1E102	1000μF 25V
C52	2551088003	CQ93M1H224K	0.22μF 50V
C54	2544070015	CE04W2CR47	0.47μF 160V
C58	▲ 2568013058	CF99=2DAC405J	4μF ±5% 200VAC

Ref. No.	Part No.	Part Name	Remarks
OTHER PARTS GROUP			
	2228159401	P.C. BOARD	
	▲ 3933011118	NEON LAMP ASSY	
	2129059008	PUSH SWITCH	33, 45, STOP
	4178020413	HEAT SINK	TR10
		3 x 6 CBTS	
	4178046002	HEAT SINK (S)	
	4733800007	3 x 6 CBTS (2)	IC6
	2033625010	MINI CONNE PIN ASSY	
	2035622008	3P MINI CONNE PIN	
	2035622024	4P MINI CONNE PIN	
	2050087026	2P WRAPPING TERMINAL	
	2050087039	3P WRAPPING TERMINAL	

WARNING:
 ▲ Components with ▲ marks and shading have special characteristics important to safety. They must be replaced only by specified components.
 * Components with * marks are temperature compensating devices.

NOTE:
 ● C10 must be placed away from the power transistor heat sink for temperature compensation. Some early production of European models have this C10 capacitor soldered at the copper foil side of P.C. board although the C10 marking is printed on the component side near the heat sink. Do not move the C10 (0.082 μF) returning near the heat sink. C9 is not used either.

PRINTED CIRCUIT BOARD (European models)



PS-142 (Continental European and Asian models)

Ref. No.	Part No.	Part Name	Remarks
RESISTER GROUP			
R102	2410163001	RD1482H121N	
CAPACITOR GROUP			
C102	Δ 2518001036	CP05C==AC103M	
C103	Δ 2518001007	CP05C==AC103M	
OTHER PARTS GROUP			
	2228148108 Δ 2328008106 Δ 2061015029 FEP1287 2050087042	P.C. BOARD INDICATOR FUSE (T1A 250V) FUSE HOLDER 4P WRAPPING TERMINAL	P=7.5 mm

NOTE

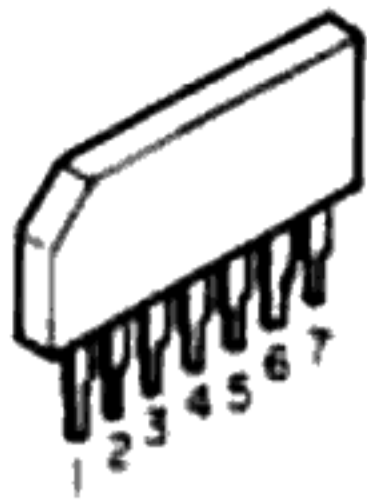
- In order that the indication lamps will not light during the power off state, the capacitances are changed to change voltage delivery. Some early production of European models have, on PS-142, two 0.1μF capacitors connected in parallel in place of C104 and one 0.047μF in place of C103. The revised production models and the schematic diagram have one 0.1μF for C104 and one 0.01μF for C103 respectively.

PS-144 (U.K. and Australian models)

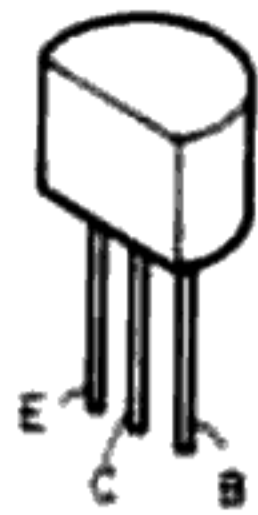
Ref. No.	Part No.	Part Name	Remarks
RESISTER GROUP			
R101,102	2410163001	RD1482H121J	
CAPACITOR GROUP			
C102	Δ 2518001036	CP05C==AC104M	
C103,106	Δ 2518001007	CP05C==AC103M	
OTHER PARTS GROUP			
L1,2	2228148108 Δ 2328008106 Δ 2061015029 FEP1287 2050087042	P.C. BOARD INDUCTOR FUSE (T1A 250V) FUSE HOLDER 4P WRAPPING TERMINAL	P=7.5 mm

LEAD CONNECTION OF SEMICONDUCTORS

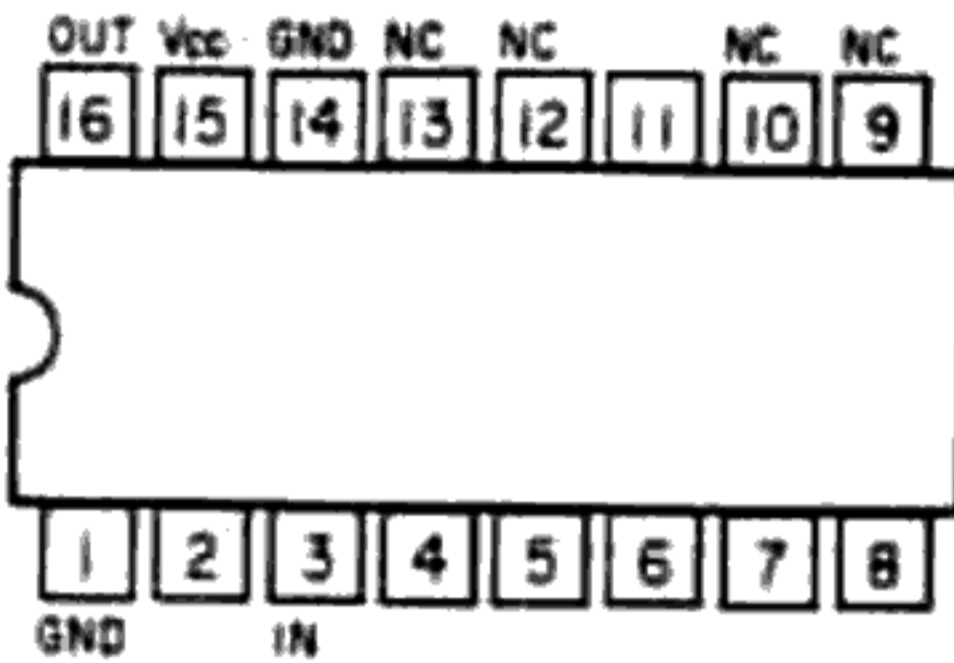
IC 1
TA7122BP



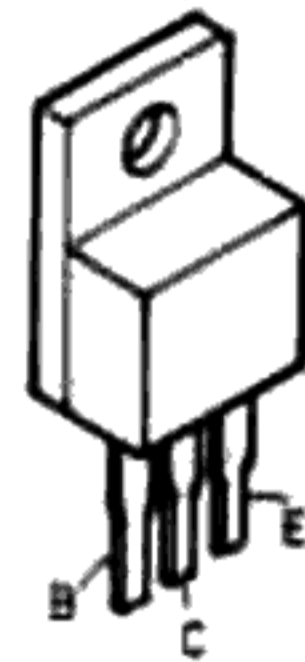
TR
2SA1015(Y)
2SB561(C)
2SC2320(F)
2SD467(C)
2SC1815(GR)



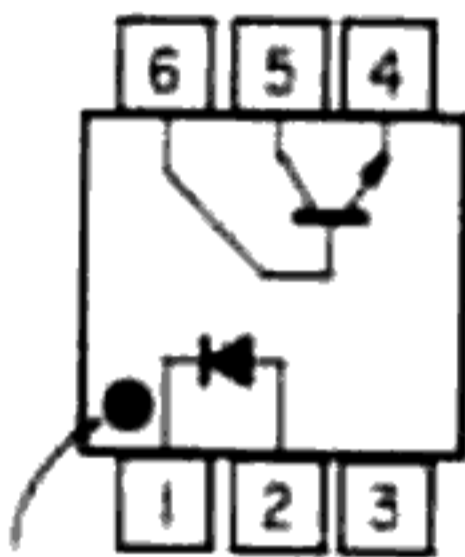
IC 2
TCA955



TR 10
2SC2023



IC 3
PC613

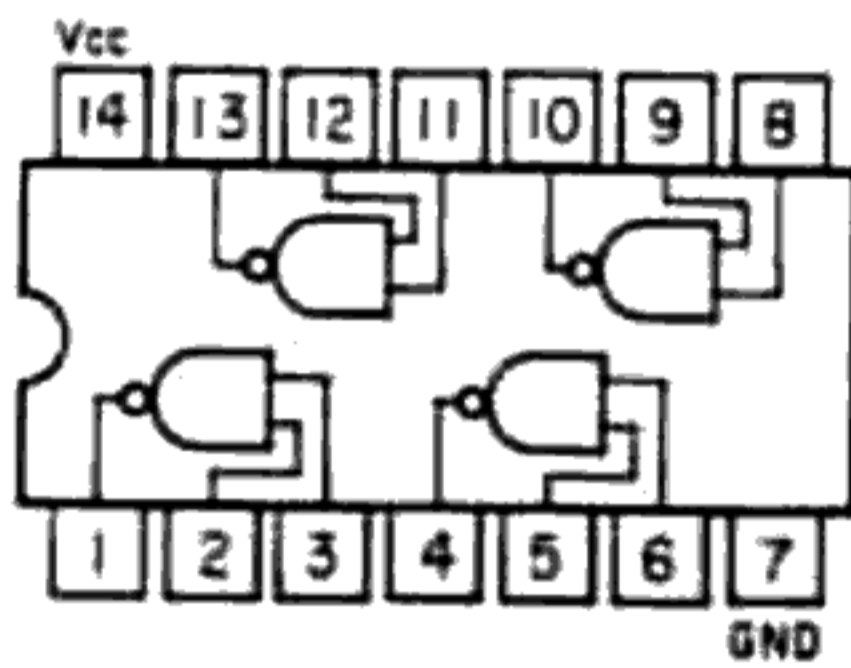


Package mark

IS2076



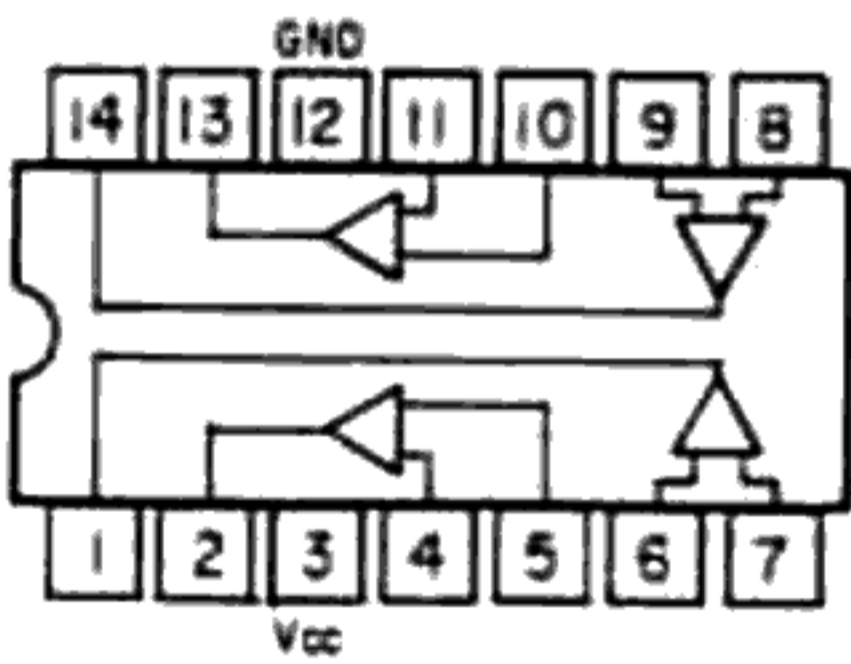
IC 4
HD7401



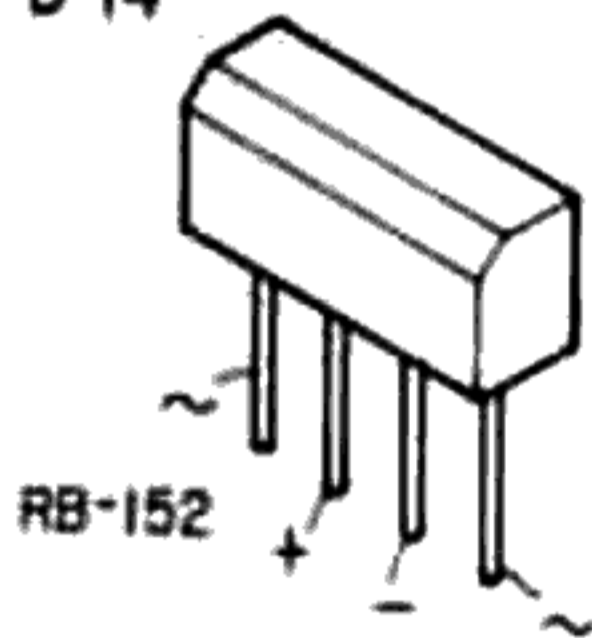
Green mark



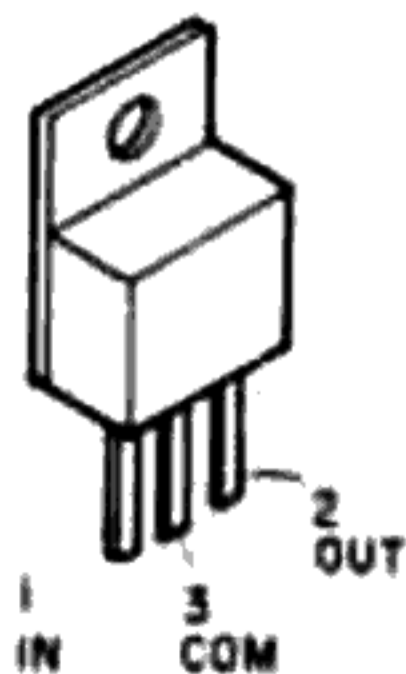
IC 5
HA17901P



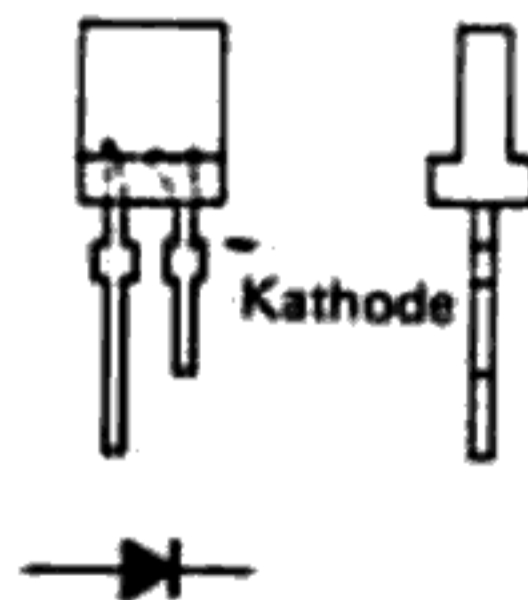
D 14



IC 6
FS-7805M



D4,5
LN 217RP



D 6
SEL 101W



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