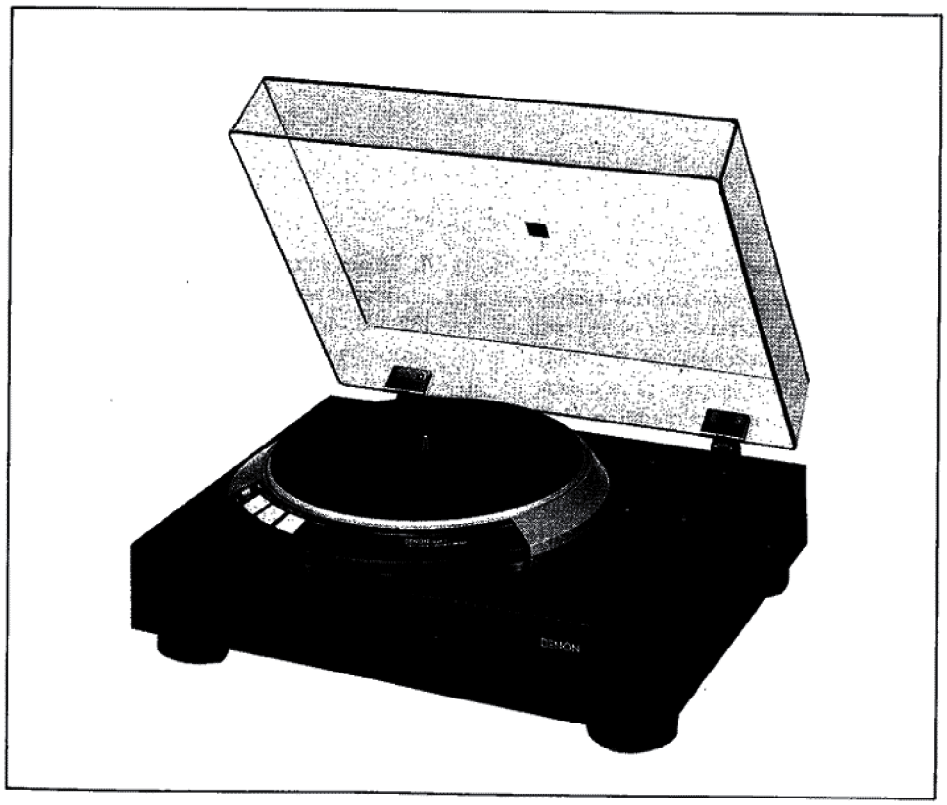
DENON

Hi Fi Component/Turntable

SERVICE MANUAL

SERVO-CONTROLLED DIRECT DRIVE TURNTABLE

MODEL DP-55K



Model DP-55K

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FEATURES

1. Magnetic recording for speed detection

DENON originated this unique motor control system, which uses a magnetic recording method for speed and phase detection. 1000 pulses are recorded on the inside rim of the platter with the highest degree of accuracy. This creates a high detecting frequency eliminating phase lagging of the servo system, and accordingly over-shoot, wow and flutter.

2. 99.998 % accurate speed: Phase-controlled by quartz oscillation

The rotation speed is highly stabilized by a timing clock based on quartz oscillation. This is very stable against changes of temperature or time. By the use of the Phase-locked loop method, the speed is virtually unaffected by load or supply voltage fluctuations.

3. Bidirectional servo and electronic brake

The bidirectional servo delivers quick, smooth starts and speed changes. Smooth stopping is accomplished by the electronic brake.

4. Strobe scope lit synchronously to quartz oscillation

Regardless of the difference of the rotational speed (33-1/3, 45) or the power frequency (50 Hz, 60 Hz), the strobe lamps are lit by an accurate frequency of quartz crystal oscillator. Only one strobe pattern is required and is, therefore, easier to read.

5. Replaceable tonearm board

The tonearm board can be detached by removing 4 screws. It is convenient not only for installation but for changing tonearms mounted on extra boards.

6. Turntable mat designed to damp vibration

The turntable mat has been developed through vibration analysis through laser holography. It damps the vibration of the disc to improve clear sound reproduction.

SPECIFICATIONS

• Phono motor

Drive system:	Direct drive AC motor
Speeds:	33-1/3 rpm, 45 rpm.
Wow and flutter:	0.015 % wrms (see note)
S/N:	More than 78 dB (DIN-B)
Rise time:	Less than 2.0 sec. (33-1/3 rpm)
Platter:	Diecast aluminium 300 mm diameter Moment of inertia, 200 kg-cm^2 (0.2 Nm^2) including turntable mat
Motor:	AC servo motor
Speed control system:	Speed servo control by frequency detection system combined with phase control system with reference to quartz crystal oscillator.
Load influence:	0 % at out-most groove with tracking force of 100 g (0.98 N)
Speed deviation:	Less than 0.002 %
Brake system:	Electronic brake

Note: Measured by DENON's method using magnetic pulse wheel.

• General

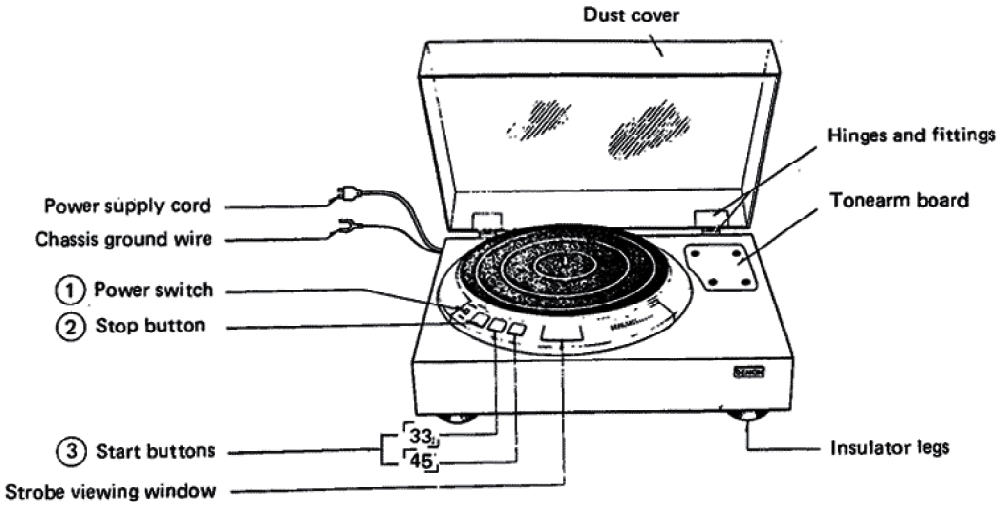
Power supply:	Rated voltage and frequency are shown on the rating label at the back of cabinet and/or on the label attached to the power supply cord.
Power consumption:	Approx. 18 W
Dimensions:	510 W x 425 D x 185 H mm (Dust cover closed)
Weight:	Approx. 13 kg
Tonearm board:	Replaceable

* All specifications and outward appearance are subject to alteration for improvement without notice.

Changing the rated frequency

This turntable can be used compatibly on power supply frequencies of 50 Hz and 60 Hz.

NAMES OF PARTS AND OPERATION



① Power switch

Use to turn the power on (▬) and off (▮). The power is turned on when the switch is pressed. The lamps in the stop button and in the strobe scope light. When pressed again, the power is turned off and the lamps are turned off.

② Stop button

Use to stop turntable platter rotation. When pressed, the lamp in the stop button lights and the platter stops.

③ Start buttons

Use to start turntable platter rotation. When one of the buttons is pressed, the lamp in the button lights and the platter starts rotating at the specified speed.

Press:

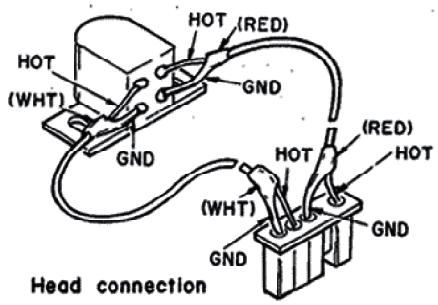
33 for a 33-1/3 rpm record, and
45 for a 45 rpm record.

ADJUSTMENT

1. **Adjustment of spacing between detection head and platter:**
   Adjust the spacing so that it may represent abt. 0.15 mm between the magnet-coated surface of platter and detection head. Depending upon the degree of the spacing, the condition of stop will vary. Consequently, adjustment should be made in such a way that the platter without the turntable sheet on glides slightly forward when stopping.

NOTE:

When the magnetic head is replaced, make sure that the terminal connection is as shown in the figure below. Otherwise, the platter may turn reversely.



Head connection

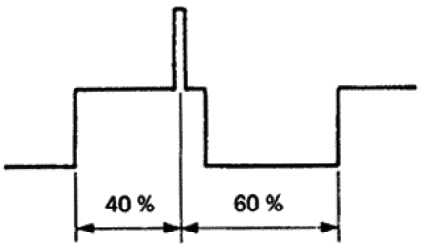
2. **Confirming the regulator voltage:**
   Since the power source employs a fixed voltage 3-terminal IC, confirm that the output voltage of IC5 and represents 5V±0.2V. (No adjustment is feasible.)

3. **RPM Adjustment:**
   (1) Pull out the lead wire through test points 39 and 41 (3P connecting pin) on motor servo P.C. Board KU-385 and connect 39 to positive side of the oscilloscope while 41, earth side.

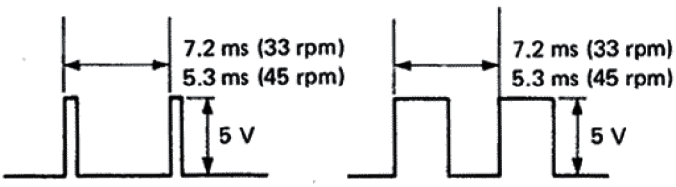
   (2) Adjust the speed to 45 RPM; observing the waveform by means of an oscilloscope, Adjust VR2 so that the pulse may occur at the 40% position from the left of the pulse side of the half-cycle in a cycle of a square wave as shown in the figures below.

   (3) Subsequently adjust VR1 for 33 RPM in the same manner as in the case of 45 RPM so that the pulse may be positioned at 40% of the square wave cycle.

   (Reference)
   Following are the waveforms of test points 39—40 and 41—40: (Test Point 40 is grownd.)



(Reference)
Following are the waveforms of test points 39—40 and 41—40:



39—40 41—40

PARTS LIST

PS-150 POWER SUPPLY UNIT

Ref. No.	Part No.	Part Name	Remark
SEMI CONDUCTOR GROUP			
TR1	2710141008	2SA768	
D1	2760218017	HZ-9A-2	
D2	2760049008	1S2076	
RESISTOR GROUP			
			Carbon film
R1	2412078000	RD14B2E271J	270Ω ¼W
R2	2412100004	RD14B2E222J	2.2KΩ ¼W
R3	2410161003	RD14B2H101J	100Ω ½W
⚠ R4	2410163001	RD14B2H121J	120Ω ½W
CAPACITOR GROUP			
			Ceramic
C1	2531026001	CK45F1H473Z	0.047μF 50V
			Oil
⚠ C2, C3	2518001023	CP05C-AC473MC	0.047μF 125/250VAC
OTHER PARTS GROUP			
⚠	2228356000	POWER SUPPLY P.C.B.	
⚠	2398001007	LINE FILTER COIL	
	2050082034	3P WRAPPING TERMINAL	
⚠	2061036008	FUSE	0.63A

PS-154 (Canadian model only)

Ref. No.	Part No.	Part Name	Remarks
SEMI CONDUCTOR GROUP			
TR1	2710141008	2SA768	
D1	2760218017	HZ-9A-2	
D2	2760049008	IS2076	
RESISTOR GROUP			
			Carbon film
R1	2412078000	RD14B2E271J	270Ω ¼W
R2	2412100004	RD14B2E222J	2.2KΩ ¼W
R3	2410161003	RD14B2H101J	100Ω ½W
⚠ R4	2410163001	RD14B2H121J	120Ω ½W
CAPACITOR GROUP			
			Ceramic film
C1	2531026001	CK45F1H473Z	0.047μF 50V
⚠ C2, C3	2518019010	CF93B2BAC473M	0.047μF 125VAC
OTHER PARTS GROUP			
⚠	2228356000	POWER SUPPLY P.C.B.	
⚠	2398001007	LINE FILTER COIL	
	2050082034	3P WRAPPING TERMINAL	
⚠	ER-72651	FUSE	630mA 250V

KU-385 MOTOR SERVO AMP UNIT

Ref. No.	Part. No.	Part Name	Remark
SEMI CONDUCTOR GROUP			
IC3	2620186001	SC3120A	
IC4	2630075005	HA17902P	
IC1, 2	2630094028	TA7122BP (C)	
IC5	2680009005	FS-7805M	
IC7	2620089001	HD7426P	
⚠ TR7, 12	2710100010	2SA879 © (R)	
TR8, 11, 15	2710113007	2SA999 (F)	
TR17	2720025004	2SB562 (C)	
TR16, 18	2720046009	2SB561 (C)	
TR1~6, 14	2730021043	2SC458 (D)	
⚠ TR10, 13	2730196004	2SC2023 (Z)	
TR19	2730111021	2SC1213 (C)	
⚠ D24, 27	2760280003	RB154	
⚠ D23, 26	2760057029	V06E	
D1~22, 41~44	2760049008	1S2076	
D29~32	2760291005	V06A	
D45	2760002003	1N60	
D37~40	3939041001	LN81RP (HL)	LED
RESISTOR GROUP			
			Carbon film
R67, 69	2410266005	RD14B2E100J	10ΩJ ¼W
R105	2410270004	RD14B2E150J	15ΩJ ¼W
R101, 102	2410280007	RD14B2E390J	39ΩJ ¼W
R66, 77	2410286001	RD14B2E680J	68ΩJ ¼W
R68,78,106	2410290000	RD14B2E101J	100ΩJ ¼W
R85	2410300000	RD14B2E271J	270ΩJ ¼W
R72	2410302008	RD14B2E331J	330ΩJ ¼W
R92~94	2410304006	RD14B2E391J	390ΩJ ¼W
R86	2410306004	RD14B2E471J	470ΩJ ¼W
R5, 13	2410308002	RD14B2E561J	560ΩJ ¼W
R88	2410314009	RD14B2E102J	1KΩJ ¼W
R82~84	2410318005	RD14B2E152J	1.5KΩJ ¼W
R18, 25, 32, 41, 42, 64, 76, 79, 80,	2410322004	RD14B2E222J	2.2KΩJ ¼W
R19, 23, 24, 28, 70, 71	2410326005	RD14B2E332J	3.3KΩJ ¼W
R20, 45, 48, 51	2410328008	RD14B2E392J	3.9KΩJ ¼W
R1, 9, 54, 58, 89, 90, 91	2410330009	RD14B2E472J	4.7KΩJ ¼W
R6, 14	2410332007	RD14B2E562J	5.6KΩJ ¼W
R22	2410334005	RD14B2E682J	6.8KΩJ ¼W
R26, 39, 43, 46, 47, 49, 50, 52, 53, 55, 65, 75	2410338001	RD14B2E103J	10KΩJ ¼W
R95, 96	2410342000	RD14B2E153J	15KΩJ ¼W
R27	2410344008	RD14B2E183J	18KΩJ ¼W
R29, 35, 37,	2410346006	RD14B2E223J	22KΩJ ¼W
R2, 7, 10, 15, 38, 103, 104	2410354001	RD14B2E473J	47KΩJ ¼W
R3, 11, 33, 34, 40	2410362006	RD14B2E104J	100KΩJ ¼W
R36, 87	2410366002	RD14B2E154J	150KΩJ ¼W
R56	2410370001	RD14B2E224J	220KΩJ ¼W
R4, 12, 57	2410378003	RD14B2E474J	470KΩJ ¼W
R21	2410759004	RD14B2E564J	560KΩJ ¼W
R62	2410761005	RD14B2E684J	680KΩJ ¼W
R63, 73	2410765001	RD14B2E105J	1MΩJ ¼W
			Metal film
R60	2452180000	RN14K2E821F	820ΩF ¼W
R97	2452199004	RN14K2E472F	4.7KΩF ¼W
R98	2452214002	RN14K2E203F	20KΩF ¼W
R61	2452221008	RN14K2E393F	39KΩF ¼W
R59	2452225004	RN14K2E563F	56KΩF ¼W
			Metal oxide
⚠ R74, 81	2440005029	RS14B3A010JNBF	1ΩJ 1W
			Variable resistor
VR1, 2	EP-5462-13	SOLID VOLUME	10KΩB
CAPACITOR GROUP			
			Electrolitic
C2, 7, 45	2544009002	CE04W1A470=	47μF 10V
C4, 5, 9, 10, 17	2544015009	CE04W1C100=	10μF 16V
C28	2544054002	CE04W1C220=	22μF 16V
C27, 29	2544018006	CE04W1C101=	100μF 16V
C31	2544086009	CE04W1E222=	2.200μF 25V
C1, 6, 22, 46	2544043000	CE04W1HR47=	0.47μF 50V
C25, 26	2544044009	CE04W1H010=	1μF 50V
			Film
C18	2551062003	CQ93M1H152K	0.0015μF 50V
C50	2551064001	CQ93M1H222K	0.0022μF 50V
C14, 15	2551070008	CQ93M1H682K	0.0068μF 50V
C16	2551121038	CQ93M1H123K	0.012μF 50V
C40, 41	2551076002	CQ93M1H223K	0.022μF 50V
C13	2551122011	CQ93M1H563J	0.056μF 50V
C19	2551084007	CQ93M1H104K	0.1μF 50V
			Ceramic
C20,21,48,49	2531004007	CK45B1H102K	0.001μF 50V
C42~43	2531009002	CK45B1H682K	0.0068μF 50V
C23, 24	2531024003	CK45F1H103Z	0.01μF 50V
C30,	2531027000	CK45F1H104Z	0.1μF 50V
C11, 12	2533619005	CC45SL1H470J	47PF 50V
			Metalized Film
⚠ C35	2568013029	CF99=2DAC305J	3μF AC200V
OTHER PARTS GROUP			
	2228179203	SERVO AMP P.C.B	
	4178020400	HEAT SINK	
	4178050001	HEAT SINK	FS-7805M
⚠ SK2	FEP0429K	SPARK KILLER	
	2618007008	CRYSTAL	9MHz
	2050087026	2P WRAPPING TERMINAL	TRANS Pri.
	2050082047	4P WRAPPING TERMINAL	MAIN P.C.B ↔ S.W P.C.B
	2058010008	6P WRAPPING TERMINAL	33/45, STOP LAMP
	2035622008	3P MINI CONNE PIN	TEST POINT
	FEP12802	3P MINI CONNE PIN	MOTOR
	FEP12803	4P MINI CONNE PIN	HEAD

⚠WARNING: Shaded aprts are important to SAFETY. Replace always with same type, same rating.

PS-152 FUSE UNIT

Ref. No.	Part No.	Part Name	Remarks
	2228374105	FUSE P.C.B.	

PS-155 FUSE UNIT (Canadian model only)

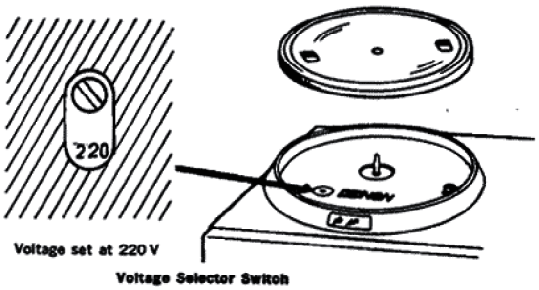
Ref. No.	Part No.	Part Name	Remarks
	2228374105	FUSE P.C.B.	

TO CHANGE THE OPERATIONAL VOLTAGES

A. Model whose voltage selector is accessible by the user: (Multi-voltage model)

This equipment has been preset for a line voltage of 220V. Before inserting the power plug, please check if this voltage corresponds with the line voltage in your area. If it does not, be sure to adjust the voltage selector switch to the proper setting before operating this equipment. The voltage selector switch is located on the base surface below the turntable platter. Simply insert a screw driver into the voltage selector switch and turn it in either direction so that the desired voltage marked on the switch is positioned in the window.

Damage of equipment because of missetting of voltage selector is not within the limit of **DENON** liability.



Set the voltage selector in accordance with the nominal power supply voltage as shown in the table.

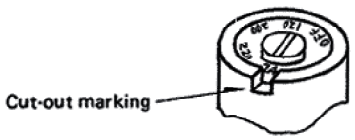
ACTUAL (nominal) VOLTAGE (volt)	VOLTAGE SETTING
110 115 120	120
200	200
210 220	220
230 240	240

Table 1. Voltage Setting

B. Models whose voltage selector is not accessible by the user: (Australian, UK and Canadian models)

1 Australian and UK models

Although these models are provided with the voltage selector being preset to 240V, it cannot be operated by the user since it is blinded by the shield cover. However, in case the change of voltage setting is necessary, insert a screw driver into the voltage selector and turn it in either direction so that the desired voltage indicated on the selector is positioned at the cut-out marking as shown in figure below.



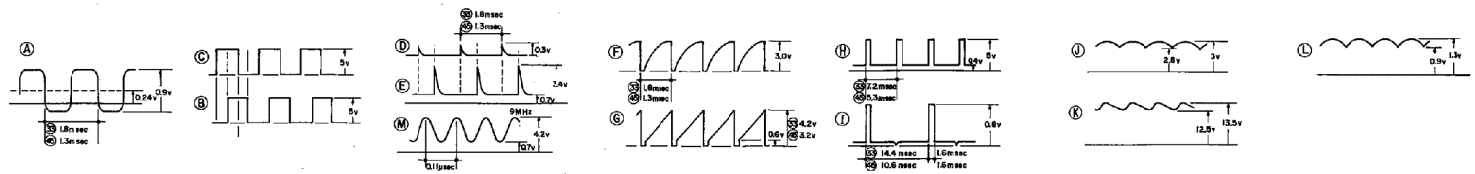
2 Canadian model

Although this model is provided with the voltage selector being preset to 120V, it cannot be operated by the user since it is blinded by the shield cover.

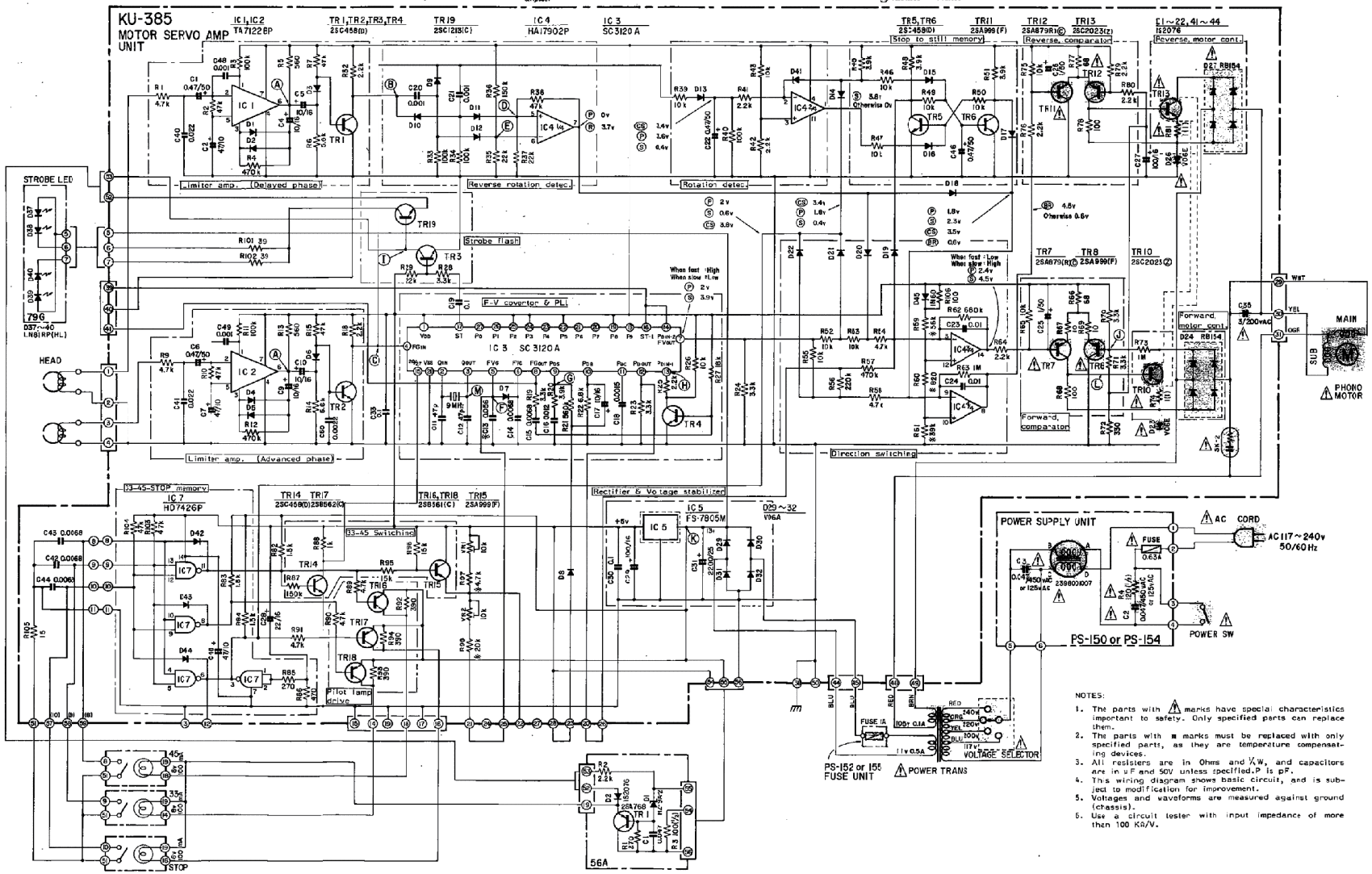
Since the Canadian model must comply with the CSA standards, the components directly connected to the power line are CSA recognized having 125VAC rating. Therefore, DO NOT change the voltage setting.

MOTOR DRIVE CIRCUIT DIAGRAM

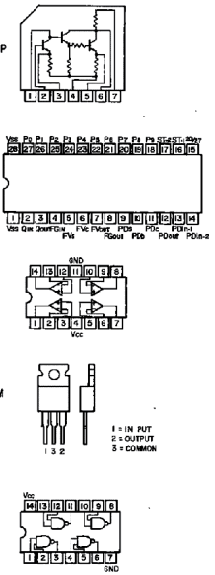
DP-55 K
WIRING DIAGRAM



Symbols for voltage indication are as follows:
- (P) Normal rotation at 33 or 45rpm.
- (S) Platter standing still by stop button operation
- (R) Reversely rotated forcibly
- (BR) Brake being engaged
- (CS) Stalled during normal rotation
- 33 Normal rotation at 33rpm.
- 45 Normal rotation at 45rpm.

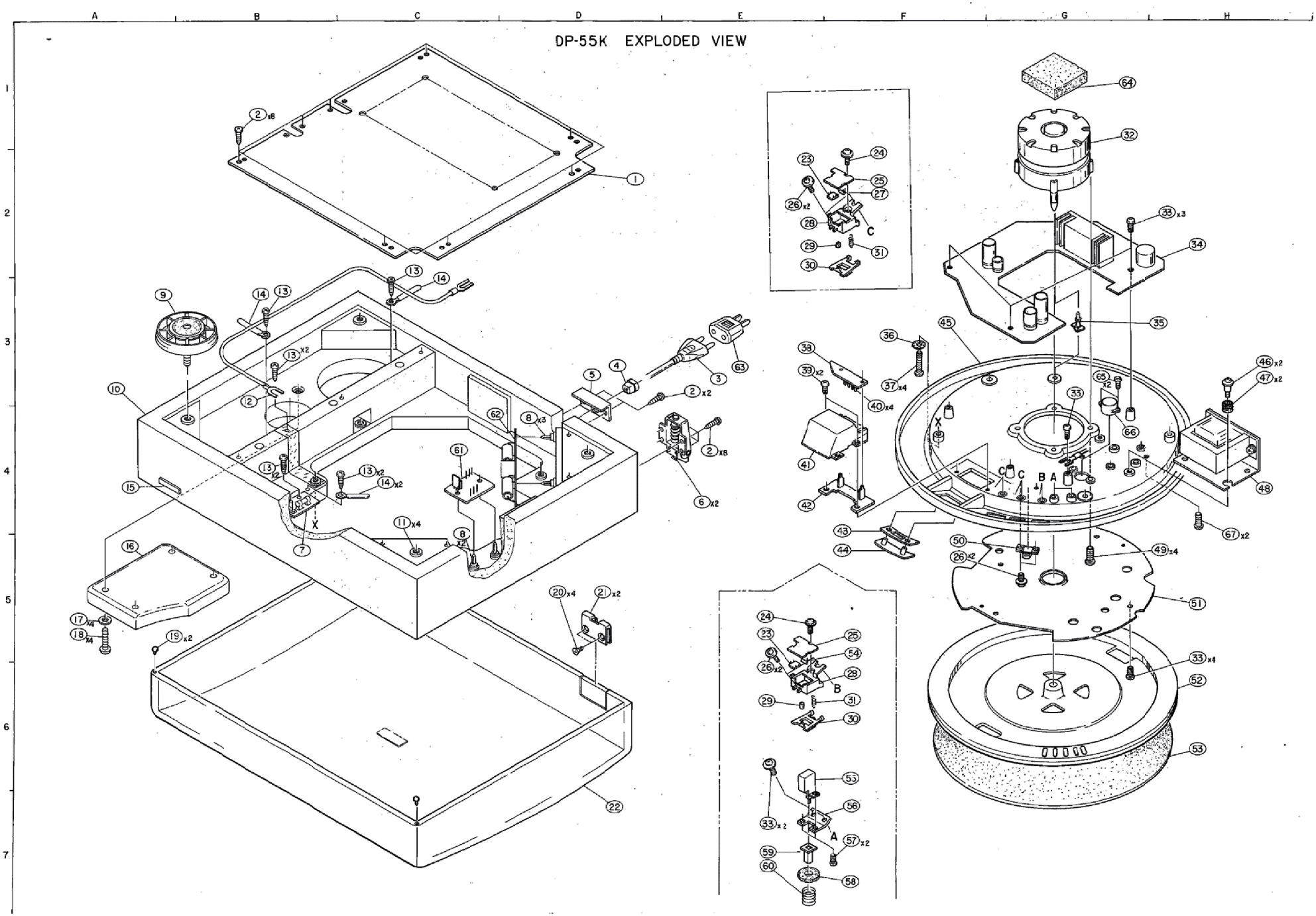


Semiconductor Pin Connection

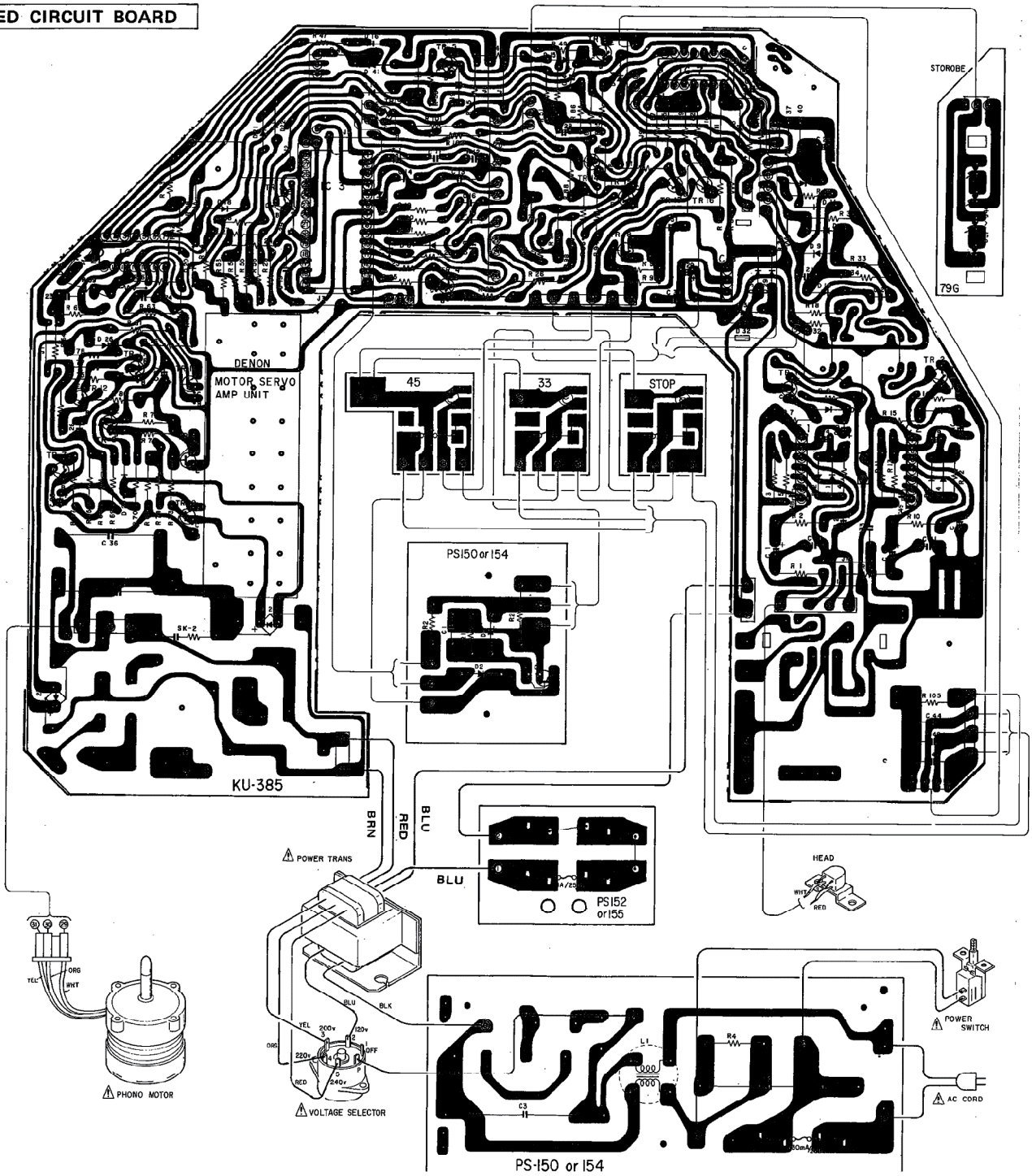


NOTES:
1. The parts with ⚠ marks have special characteristics important to safety. Only specified parts can replace them.
2. The parts with ■ marks must be replaced with only specified parts, as they are temperature compensating devices.
3. All resisters are in Ohms and ¼W, and capacitors are in μF and 50V unless specified.P is pF.
4. This wiring diagram shows basic circuit, and is subject to modification for improvement.
5. Voltages and waveforms are measured against ground (chassis).
6. Use a circuit tester with input impedance of more then 100 KΩ/V.

EXPLODED VIEW OF MAIN PARTS



PRINTED CIRCUIT BOARD



PARTS LIST OF EXPLODED VIEW

Ref. No.	Part No.	Part Name	Remarks
1	1058062002	BOTTOM PLATE	
2	4733309032	3x16 CBTS (1)	
⚠ 3	2006019307	AC POWER CORD	Australian model
"	2062019008	AC POWER CORD	Canadian model
"	2062026006	AC POWER CORD	U.K. model
"	2062002031	AC POWER CORD	Other models
⚠ 4	MD-2982H	BUSHING	Australian model
"	MD-3802	BUSHING	Canadian model
"	4460020005	BUSHING	Other models
⚠ 5	4418561008	BUSHING PLATE (F)	Canadian model
"	4418552007	BUSHING PLATE (G)	Other models
6	FTS0700H	HINGE	
⚠ 7	PS-155	FUSE UNIT	Canadian model
"	PS-152	FUSE UNIT	Other models
8	4498041004	C.B. LOCKING SUPPORT	
9	1048024403	INSULATOR	
10	1018225203	CABINET SUB ASS'Y	
11	FSC0102	SPECIAL NUT (A)	
12	FEP1206	EARTH WIRE	
13	4730406019	3x12 CBRTS (1)	
14	EP-4772	CORD HOLDER	
15	FPR04641	DENON MARK	
16	1018227007	ARM BOARD	
17	FWA0061	WASHER	
18	4714414030	4x35CTS	
19	4628006107	BUSHING	
20	4712404055	4x8 CFS	
21	FIS0701	HINGE PLATE	
22	FMD0526J	DUST COVER ASS'Y	
23	2129059008	PUSH SWITCH	
24	4700026005	3x8 CBRTS W	
25	KU-390	SWITCH UNIT	
26	4700010011	3x8 CPS W	
27	3930047033	PILOT LAMP (GREEN)	
28	4498037102	SW, HOLDER	
29	1298014108	BUTTON CUSHION	
30	1138101100	PUSH BUTTON	
31	4638009000	2F, COIL SPRING	
⚠ 32	2178018210	MOTOR	
33	4733800010	3x8 CBTS	
34	KU-385	MOTOR SERVO AMP UNIT	
35	4498046009	C.B.L. SUPPORT	
36	4753202009	4-TW	
37	4713411018	4x25 CBS	
38	KU-385	STROBE LED P.C. BOARD	A part of KU-385
39	4733800023	3x10 CBTS	
40	3939041001	LED	
41	1468058208	MIRROR CASE ASS.	
42	4498038004	LED. HOLDER	
43	4148022001	BLIND	
44	1468051001	STROBO, WINDOW	
45	4468078104	MOTOR BOARD ASS'Y	
46	4770192008	SPECIAL SCREW	
47	4620027003	RUBBER BUSH	
⚠ 48	2339037205	POWER TRANS	
49	4713406010	4x12 CBS	
50	3918425004	MAGNETIC HEAD ASS.	
51	4148126004	SHIELD PLATE	Multi-voltage model
	4148102109	SHIELD PLATE	Other models
52	4218074206	RECORDED TURNTABLE	
53	4218094040	RUBBER SHEET	
54	3930047046	PILOT LAMP (WHITE)	

Ref. No.	Part No.	Part Name	Remarks
⚠ 55	2129136028	POWER SWITCH	Canadian model
"	2129136015	POWER SWITCH	Other models
56	4418532108	PUSH SW. BRACKET	
57	4713303016	3x6 CBS	
58	4618094006	CUSHION	
59	1138100101	PUSH KNOB	
60	4638606005	SPRING	
61	PS-150	REGULATOR P.C. BOARD	A part of PS-150 or 154
⚠ 62	PS-154	POWER SUPPLY UNIT	Canadian model
"	PS-150	POWER SUPPLY UNIT	Other models
63	2033902005	PLUG ADAPTOR	
64	4618067004	PAD	
65	4713203019	2.6x6 CBS	
⚠ 66	2123315010	VOLTAGE SELECTOR	
67	4770031020	4x20 CBS (R)	

⚠ WARNING: Shaded parts are important to SAFETY. Replace always with same type, same rating.

ACCESSORIES GROUP

	Part No.	Part Name	Remark
	5298006002	45 ADAPTOR	
	4218094040	RUBBER SHEET	
	2033902005	PLUG ADAPTOR	
	5158017005	CABINET TAG	
	5118152007	INSTRUCTION MANUAL	
	5138146006	RATING SHEET	
	5158036109	CAUTION SHEET	
	5158030008	PRESET LABEL	

CARTON CASE GROUP

	Part No.	Part Name	Remark
	5018174004	CARTON CASE ASS'Y	
	FPC0302H	PACKING	
	5058092007	LAMINATE ENVELOPE	600x700mm
	5058006019	ENVELOPE	255x380mm 0.03t
	5058023018	ENVELOPE	350x640mm 0.05t

DENON

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