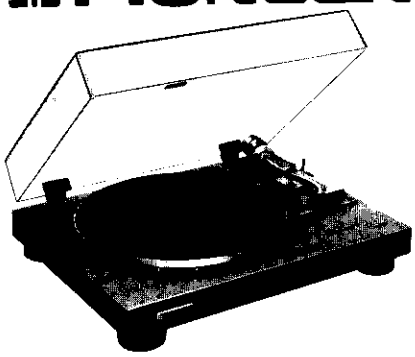
PIONEER

Service Manual



STEREO TURNTABLE

PL-516 KCT, KUT, HG, HGT

MODEL PL-516 COMES IN FOUR VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KCT	120V only	Canada model (without cartridge)
KUT	120V only	U.S.A. model (without cartridge)
HG	220V and 240V (Switchable)	Europe or Oceania model
HGT	220V and 240V (Switchable)	Europe or Oceania model (without cartridge)

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
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<ART-261-0>
 Printed in Japan <77K01Y8K01>

CONTENTS

1. SPECIFICATIONS

Motor and Turntable

Drive System:	Belt-drive
Motor:	FG-servo DC motor
Turntable Platter:	320mm diam. aluminum alloy die-cast
Speeds:	33-1/3 and 45rpm
Speeds Control Range:	±2%
Wow and Flutter:	Less than 0.045% (WRMS)
Signal-to-Noise Ratio:	More than 68dB (DIN-B) (with Pioneer cartridge model PC-135)

Tonearm

Type:	Static-balance type, S-shaped pipe arm
Effective Arm Length:	221mm
Overhang:	15.5mm
Tracking Error:	0.525 deg./in, 0.21 deg./cm
Usable Cartridge Weight:	4g (min.) to 10g (max.)

Other Features

Auto-return mechanism, Anti-skating control
40mm-thick particle board cabinet, Cueing device, Strobe light
Fine speed adjuster, Insulator feet, Plug-in type headshell

Miscellaneous

KCT, KUT

Power Requirements:	AC120V, 50/60Hz

HG, HGT

Power Requirements:	220V/240V ~(switchable)/ 50/60Hz

Power Consumption:	2.3W
Dimensions:	440(W) x 140(H) x 365(D)mm 17-5/16(W) x 5-1/2(H) x 14-3/8(D) in
Weight:	7.2kg/15lb 14oz

PC-135 Specifications (HG type only)

Type:	Induced magnet type
Stylus:	0.5mil diamond (PN-135)
Output Voltage:	3mV (1kHz, 50mm/s Peak velocity, LAT)
Tracking Force:	1.5g to 2.3g (proper 2g)
Frequency Response:	10 to 25,000Hz

Accessories

EP adaptor 1
Screwdriver 1

KCT, KUT, HGT

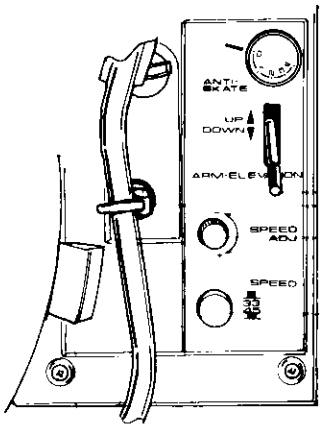
Cartridge mounting screws 6
Cartridge mounting washers 2
Cartridge mounting nuts 2

Operating instructions (HG, HGT) 2
Operating instructions (KCT, KUT) 1

NOTES:

- *Specifications and design subject to possible modification without notice, due to improvements.*
- *The PL-516 (with the accessory PC-135 cartridge) does not come with cartridge mounting screws, nuts or washers.*

2. PANEL FACILITIES AND OPERATION



STROBE LIGHT

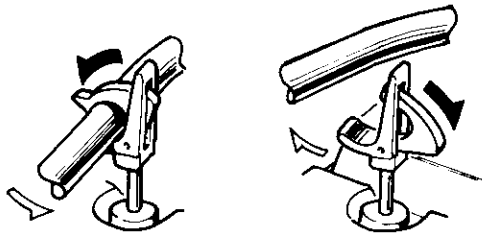
This light comes on when the platter starts to rotate and it lights stroboscopically (Refer to "HOW TO FINELY ADJUST THE PLATTER SPEED" on page 7).

ARM-ELEVATION LEVER (ARM-ELEVATION)

This lever controls the ascent and descent of the tonearm.

ARM REST

Set the tonearm on its rest when it is not playing records.



Closing the clamp Releasing the clamp

SPEED ADJUSTMENT KNOB (SPEED ADJ.)

Perform fine adjustment of the speed of a record being played with this knob, while looking at the strip of strobe calibration dots on the platter edge.

SPEED SELECT SWITCH (SPEED)

Push this switch to set the platter to 45rpm and release for 33-1/3rpm.

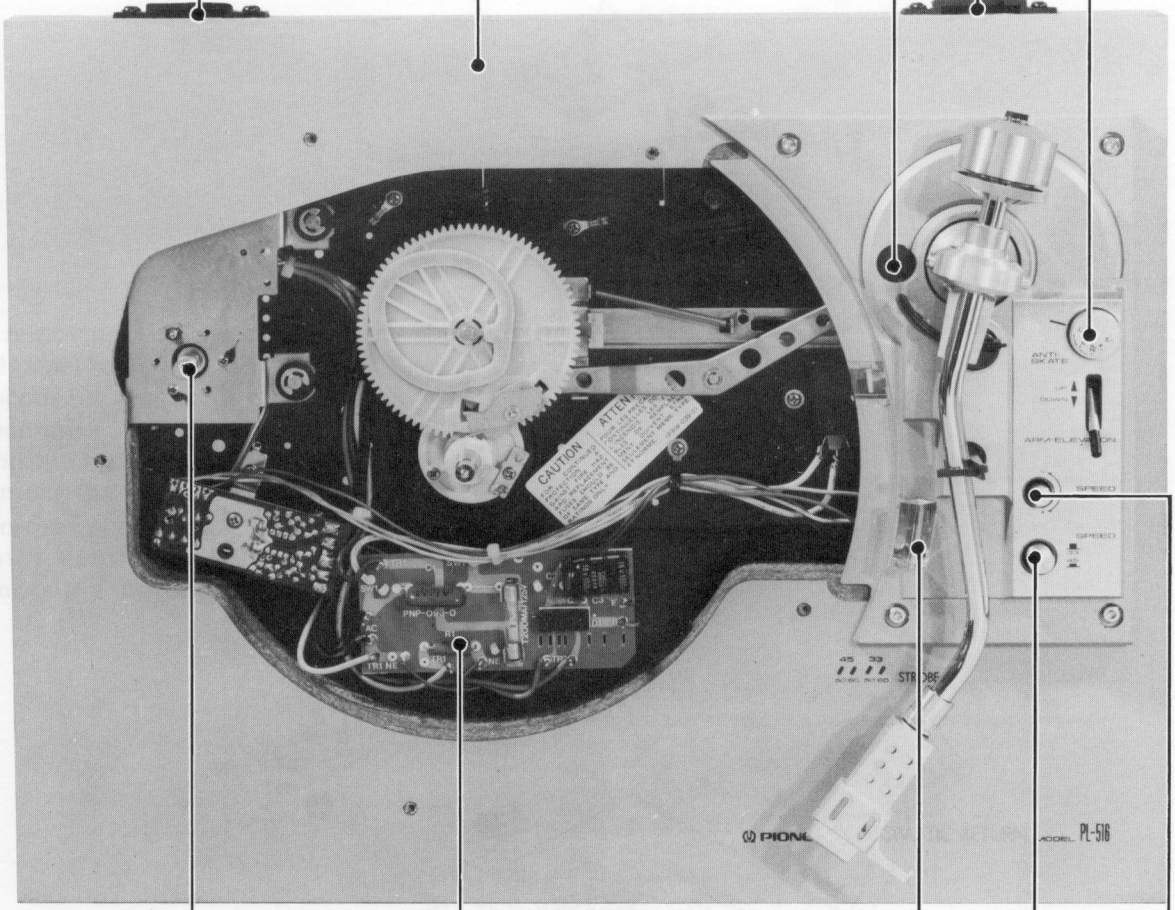
OPERATION

1. Place the record to be played on the platter.
2. Set the SPEED select switch to the speed at which the record is to be played.
3. Set the ARM-ELEVATION lever to the UP ▲ position.
4. Remove the stylus cover and release the arm clamp.
5. Hold the headshell by the finger lift and move the stylus across the record to the track you want played. The platter will begin to rotate.
6. Observe the appropriate strip of strobe calibration dots on the platter edge. If the strobe dot is not stationery, finely adjust the platter speed with the SPEED ADJ. knob according to "HOW TO FINELY ADJUST THE PLATTER SPEED" on page 7.
7. Set the ARM-ELEVATION lever to the DOWN ▼ position.
   The stylus will descend slowly to the record and play will begin.
8. Adjust the volume and tone controls on the amplifier to the preferred levels, and then sit back and enjoy your record.
9. After the record has been played, the auto-return mechanism is actuated and the tonearm returns to the arm rest. At the same time, the platter stops rotating and the power to the turntable is turned off.
10. Secure the tonearm to the arm rest with the clamp and attach the stylus cover to protect the stylus.

OPERATION PRECAUTIONS

- Never obstruct the turntable with the hand while it is rotating. This may cause damage.
- Do not force the tonearm closer than 40mm to the center shaft or outward from the arm rest. If this distance is exceeded, you may damage the internal mechanisms and render automatic operation ineffective.
- Be careful not to make the turntable vibrate while a record is playing since this can result in damage to the stylus and record.
- Place only one record at a time on the platter. If two or more records are stacked on the platter, the stylus will not make proper contact with the grooves, and this will impair the quality of reproduction.
- Do not disconnect the power cord while the stylus is still in a record groove as this may result in damage to the stylus and record.

3. PART LOCATION (KCT type) e)

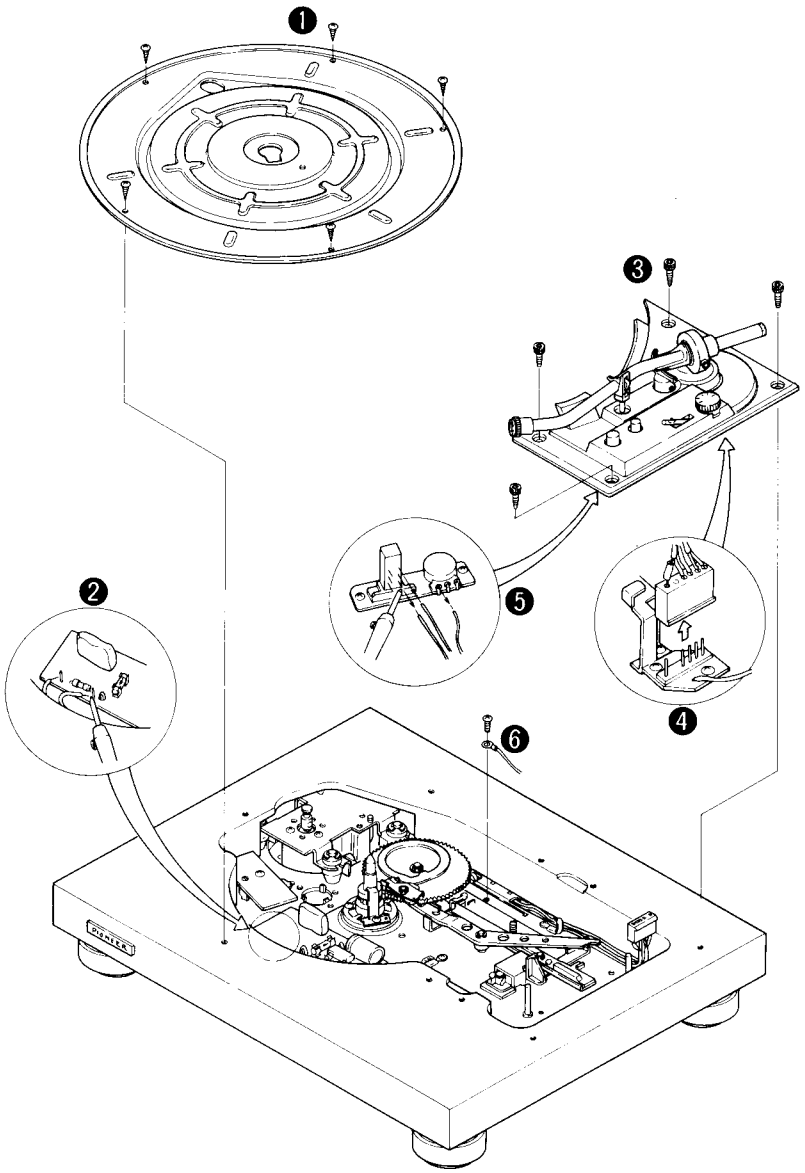


4. DISASSEMBLY

Control Panel

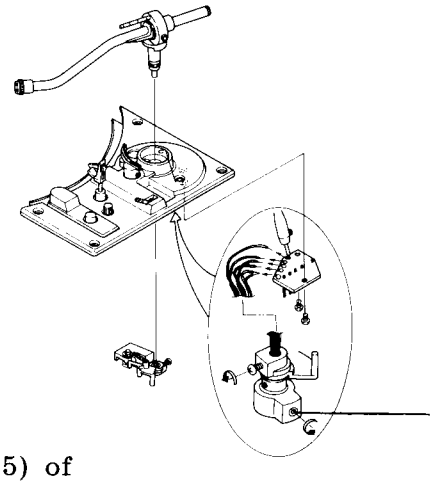
To remove the control panel, proceed as follows:

(1) Remove the 5 wood screws, and remove the cover.
(2) Disconnect the white wire connected to the NE terminal of the power supply board.
(3) Remove the 4 allen head wood screws.
(4) Disconnect the PU cord (OUTPUT cord) connector.
(5) Disconnect the SPEED selector switch wiring.
(6) Disconnect the ground wire.



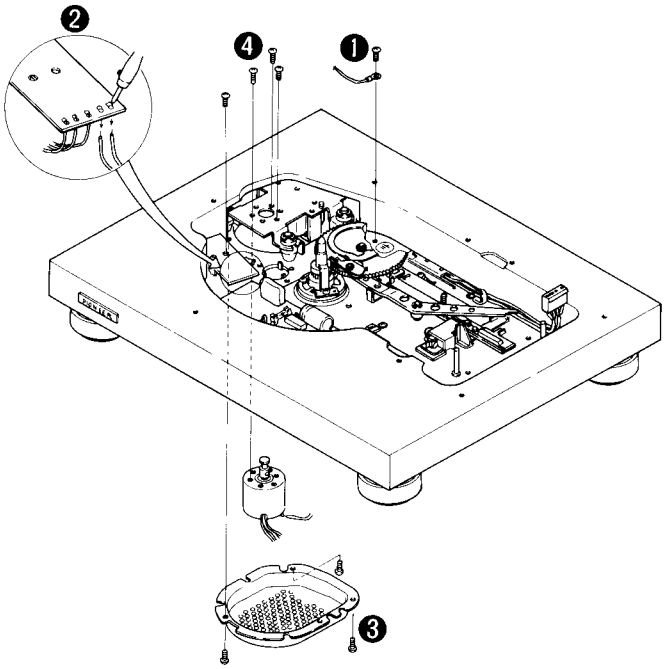
Tone Arm

(1) Remove the 2 screws from the PU board.
(2) Disconnect the PU lead from the PU board.
(3) Loosen the PU plate screws and remove PU plates A and B from the arm.
(4) Loosen the allen head set screw fastening the arm to the stand base, and remove the arm.



Motor

When removing the motor, perform step (5) of control panel removal.
(1) Disconnect the motor ground wire.
(2) Disconnect the +B cord and E (ground) cord from the motor control board.
(3) Remove the motor cover.
(4) Remove the motor mounting screws and motor control board mounting screws, and remove the motor and motor control board.



5. MECHANISM OPERATION AND ADJUSTMENT

5.1 START OF PERFORMANCE

1. The tonearm is moved from the arm rest to above the turntable.
2. Lever A, connected to the tonearm, unlocks lever B, and the microswitch is turned ON (Fig. 1).
3. When the microswitch is turned ON, the motor is started and the turntable begins to rotate.

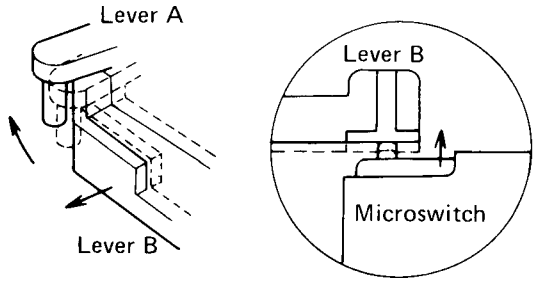


Fig. 1

5.2 AUTO-RETURN DETECTION

1. When the stylus nears the center shaft, lever A contacts lever C (Fig. 2).

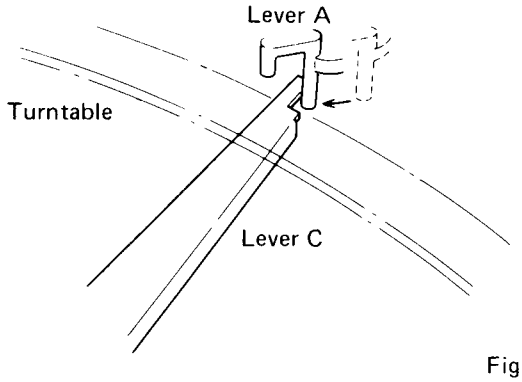


Fig. 2

2. Lever C pushes plate A by an amount directly proportional to the amount of movement of the tonearm (Fig. 3).

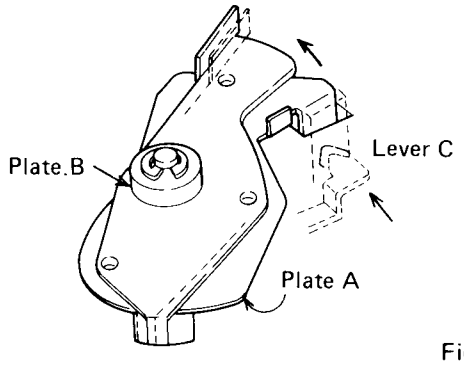


Fig. 3

3. Plate B atop plate A is moved toward gear A by the movement of plate A.
4. The front end of plate B moves approximately 0.1mm when the stylus is advanced 1mm toward the center shaft by one revolution of the record.
5. The tooth of gear A has the dimensional difference shown in Fig. 4-a.
6. Plate B is pushed back by this dimensional difference at a stylus movement of within 1mm per revolution of the record.
7. When the stylus enters the lead-out groove in the record at the end of the performance, it is moved 4mm toward the center shaft by one revolution of the record.
8. The end of plate B contacts the tooth of gear A (Fig. 4-b).
9. Gear A and gear B are engaged, and gear B is turned by rotation of the turntable.

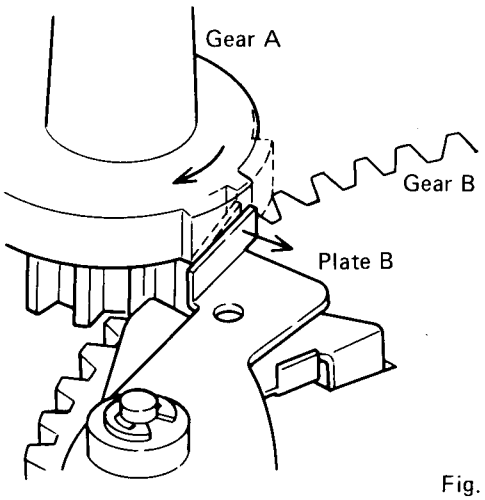


Fig. 4-a

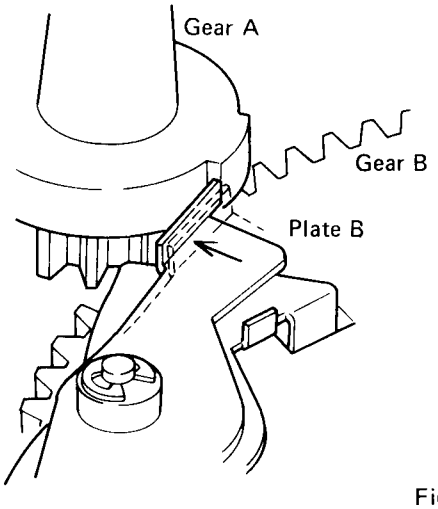


Fig. 4-b

5.3 AUTO-RETURN OPERATION

1. Gear B is rotated by detection of auto-return.
2. Lever D moves along the groove of gear B, and the tone arm is lifted (Fig. 5).

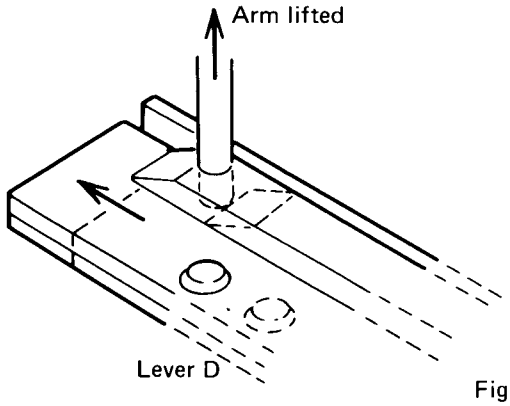


Fig. 5

3. Lever A is pushed and the tonearm is returned to the arm rest by lever D (Fig. 6).

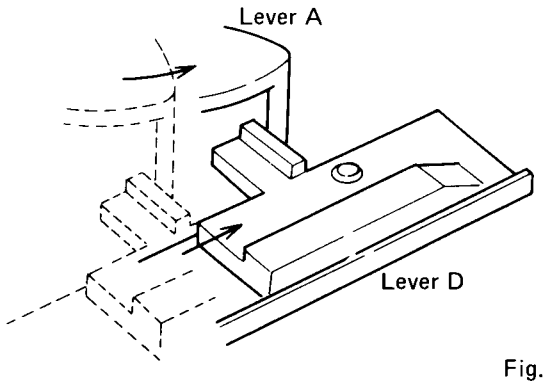


Fig. 6

4. When gear B has rotated one revolution, lever D is returned to its original position.
5. When lever D has returned to its original position, lever B is pushed by lever A and the microswitch is turned OFF (Fig. 7).
6. When the microswitch is turned OFF, the motor is stopped, and the turntable also stops.

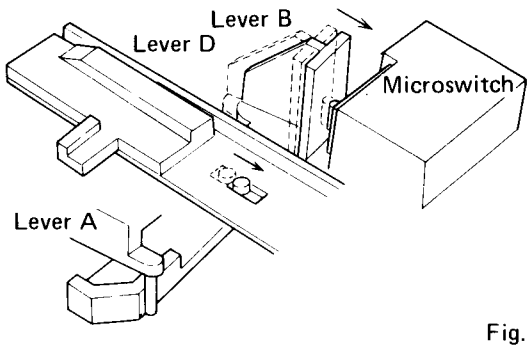


Fig. 7

5.4 ADJUSTMENT

5.4.1 Auto-return Detection Position

1. Plate B contacts the tooth of gear A, the turntable is rotated, and the auto-return detector is reset.

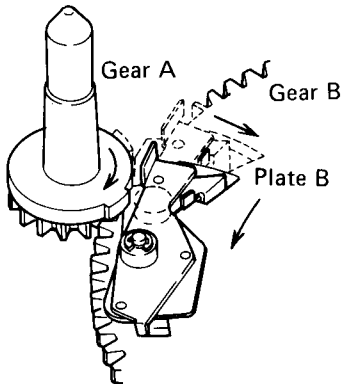


Fig. 8

2. Adjust the adjusting screw so that plate B contacts the tooth of gear A when the stylus has reached a point 62mm from the center shaft.

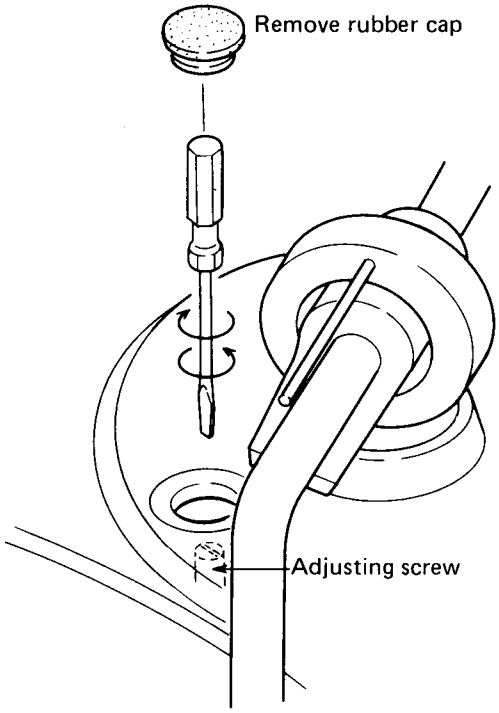


Fig. 9

5.4.2 Microswitch ON Timing

1. Adjust at the adjusting point shown in Fig. 10-b so that lever A and lever B become as shown in Fig. 10-a when the tonearm is fastened to the arm rest.
2. Adjust the adjusting screw (Fig. 10-c) so that lever B and the microswitch are positioned as shown in Fig. 10-c when the tonearm is fastened to the arm rest.
3. Since this adjustment will adversely effect the auto-return detection position, the auto-return detection position must be readjusted.

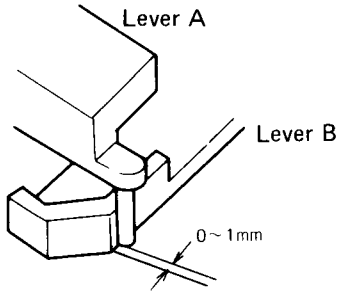


Fig. 10-a

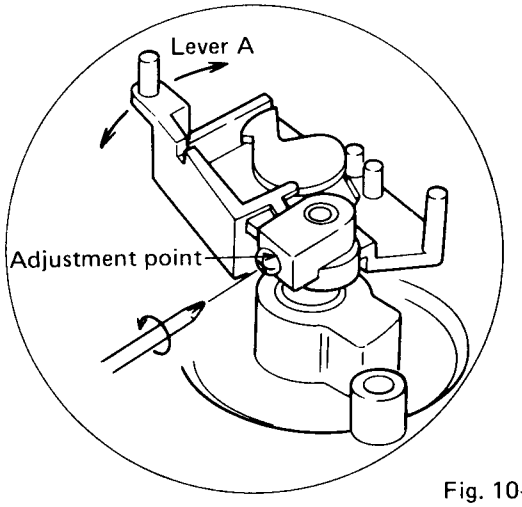


Fig. 10-b

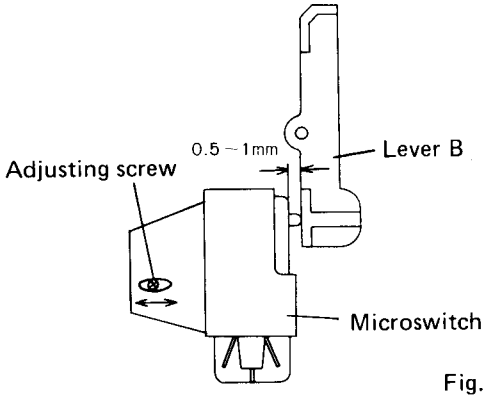


Fig. 10-c

5.4.3 Speed Adjustment

1. Set the SPEED ADJ knob on the control panel to its mechanical center when adjusting the speed.
2. Adjust the speed with the semi-fixed resistor on the motor control board (Fig. 11).

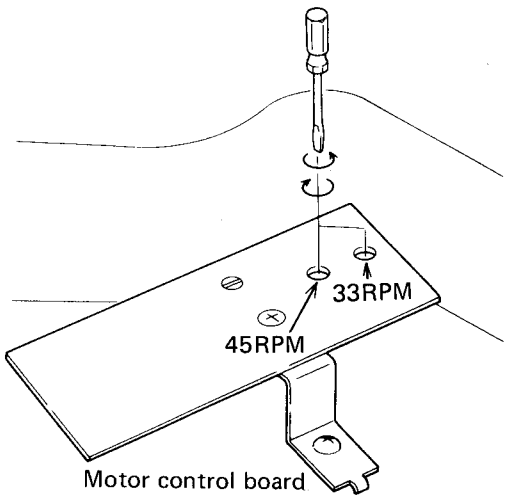
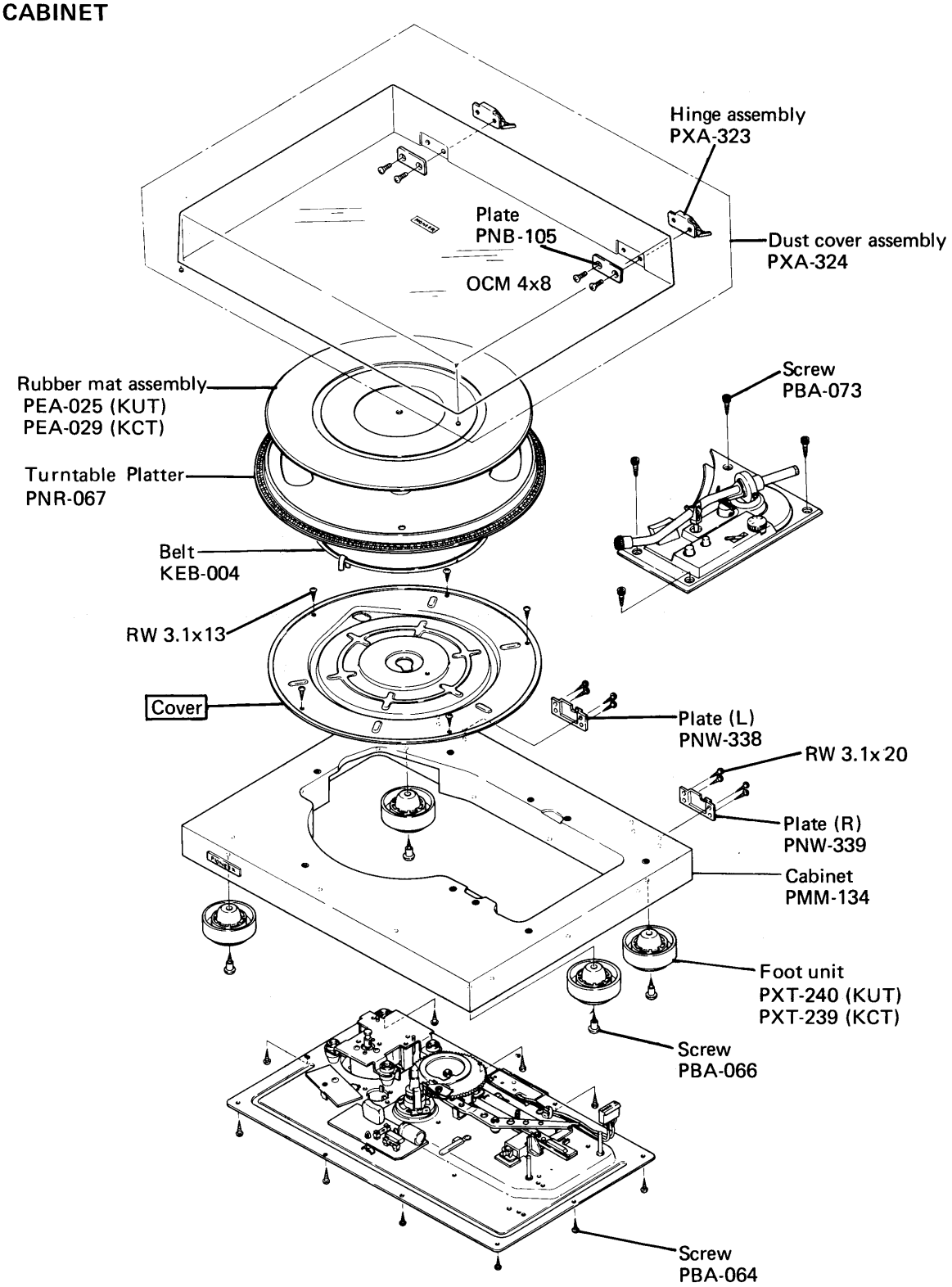


Fig. 11

6. KCT, KUT type EXPLODED VIEWS

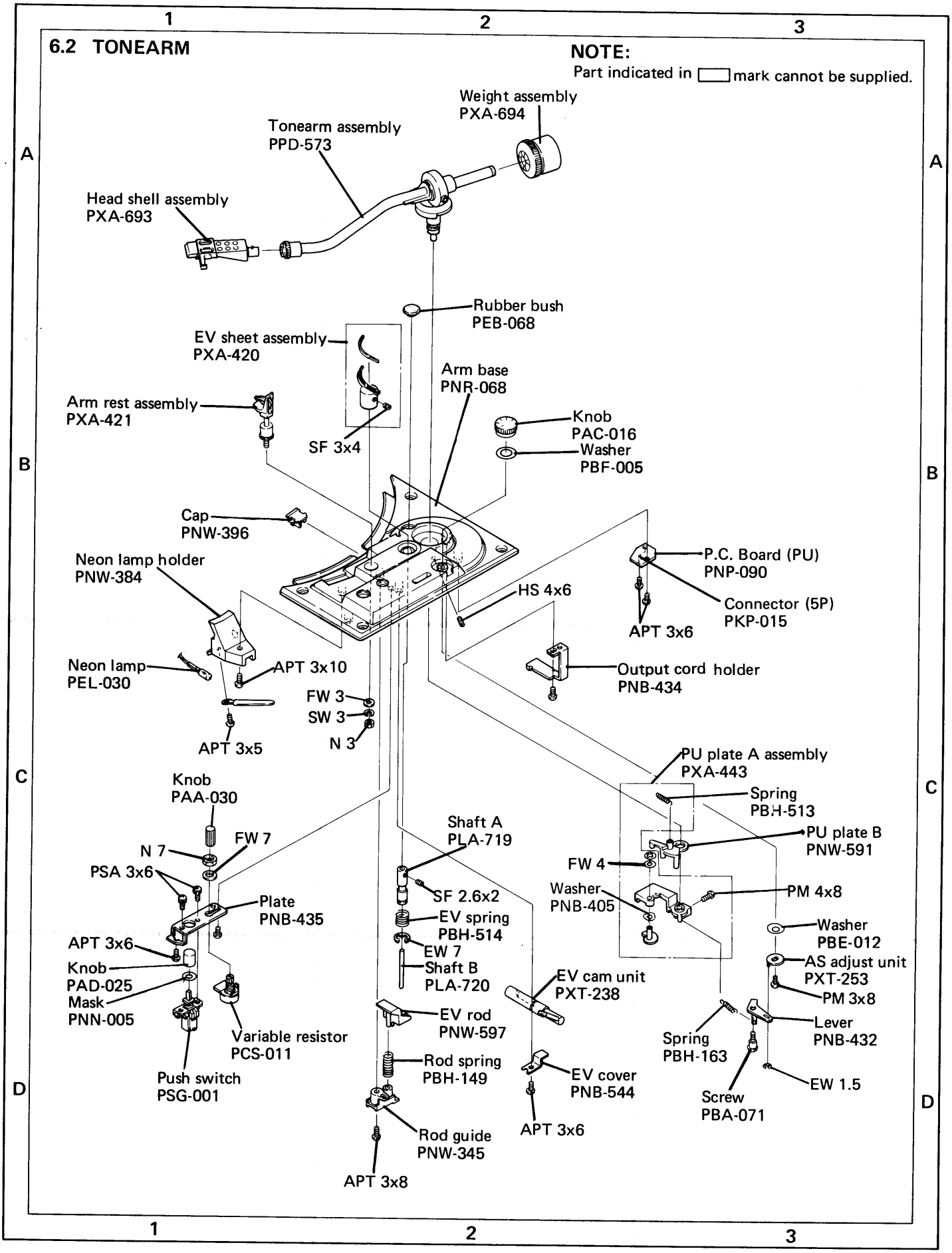
NOTE:
Parts indicated in ☐ mark cannot be supplied.

6.1 CABINET



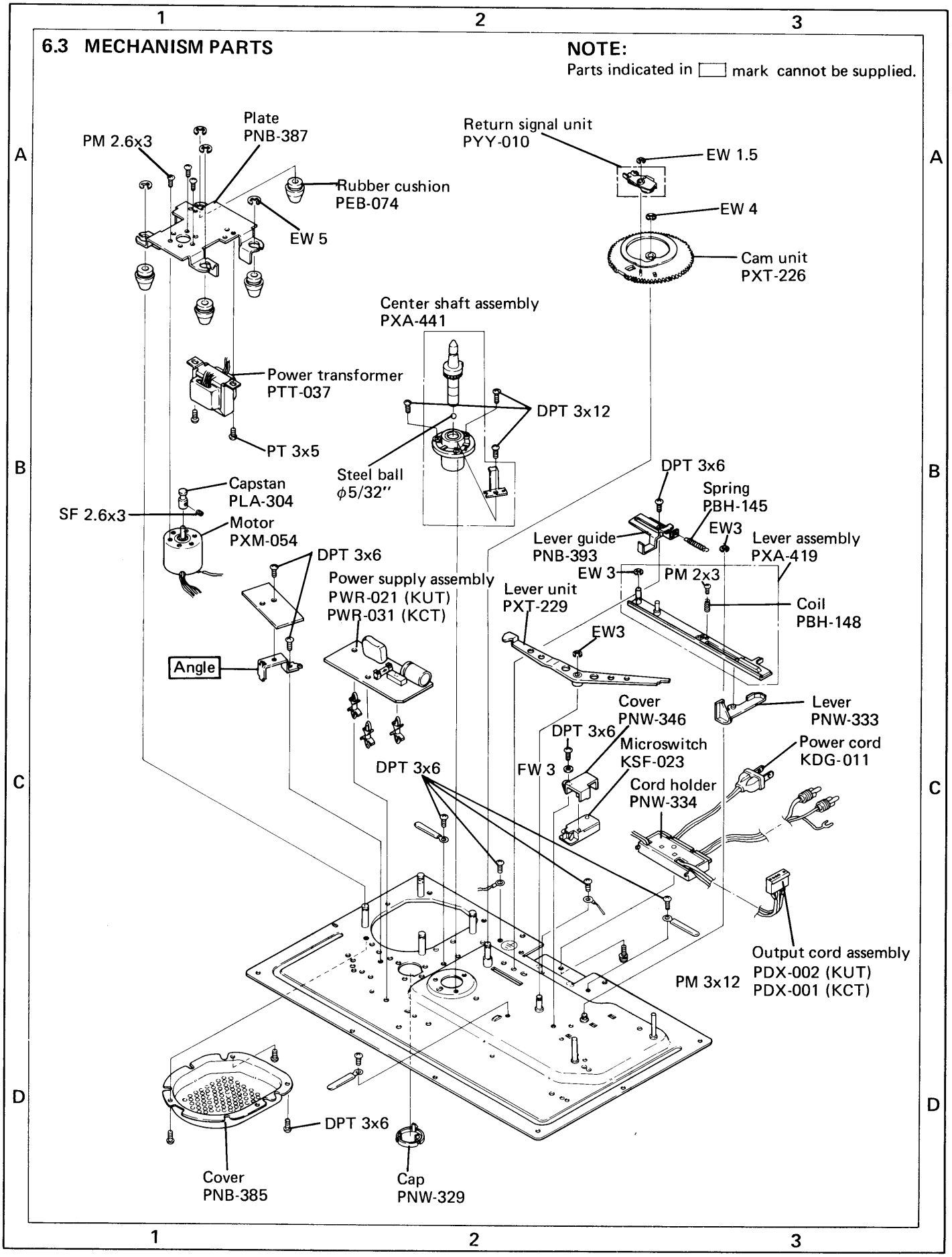
6.2 TONEARM

NOTE:
Part indicated in ☐ mark cannot be supplied.

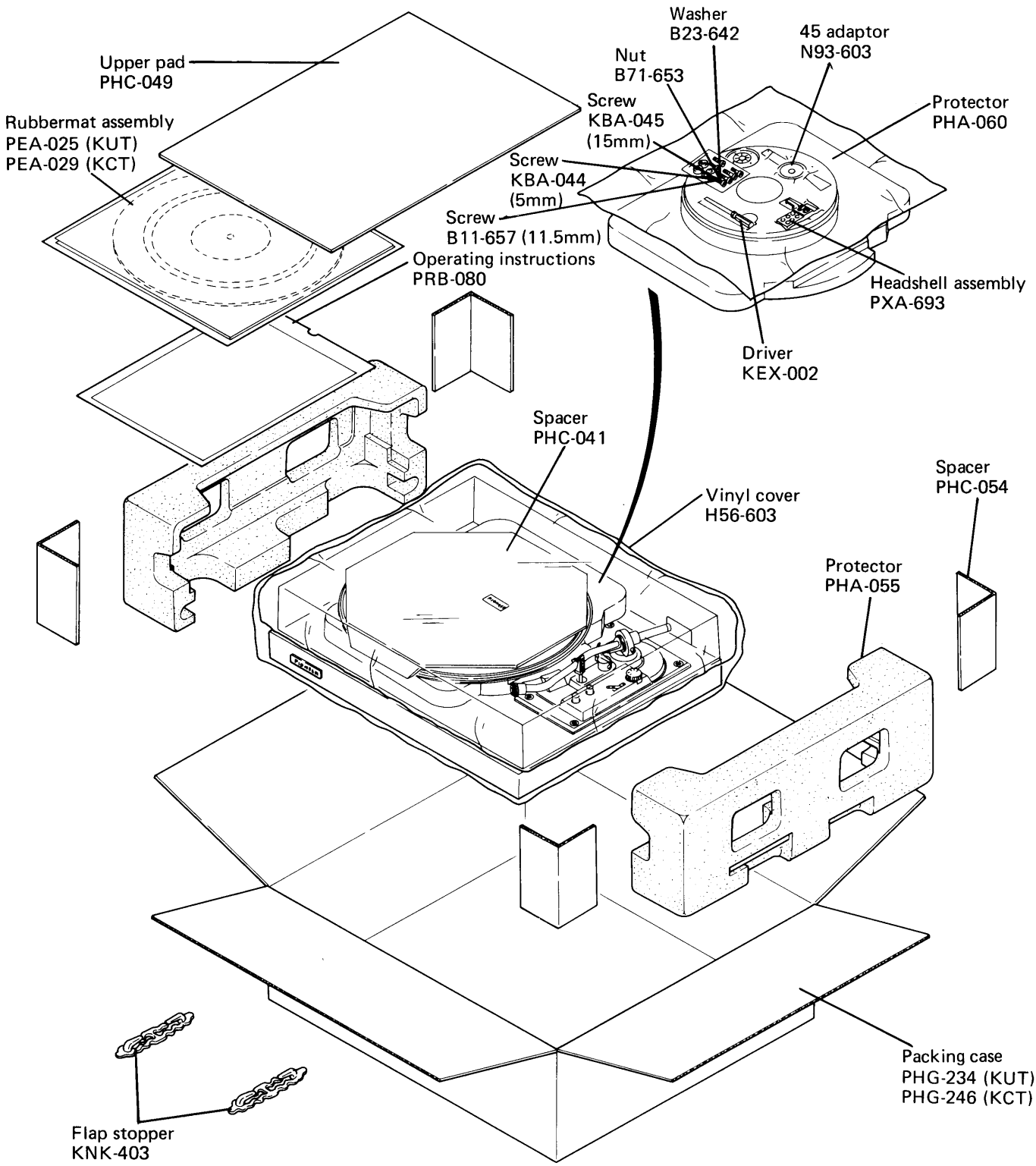


6.3 MECHANISM PARTS

NOTE:
Parts indicated in ☐ mark cannot be supplied.



6.4 PACKING


Upper pad
PHC-049
Rubbermat assembly
PEA-025 (KUT)
PEA-029 (KCT)
Washer
B23-642
Nut
B71-653
45 adaptor
N93-603
Screw
KBA-045
(15mm)
Protector
PHA-060
Screw
KBA-044
(5mm)
Screw
B11-657 (11.5mm)
Operating instructions
PRB-080
Headshell assembly
PXA-693
Driver
KEX-002
Spacer
PHC-041
Spacer
PHC-054
Vinyl cover
H56-603
Protector
PHA-055
Packing case
PHG-234 (KUT)
PHG-246 (KCT)
Flap stopper
KNK-403

7. NOMENCLATURE OF SCREW, WASHERS AND NUT

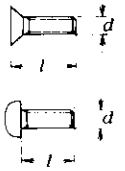
The following symbols stand for screws, washers and nuts as shown in exploded view.

Symbol	Description	Shape
RT	Brazier head tapping screw	
PT	Pan head tapping screw	
BT	Binding head tapping screw	
DPT	Delta tight pan head tapping screw	
APT	Aluminum pan head tapping screw	
OCT	Oval countersunk head tapping screw	
PM	Pan head machine screw	
CM	Countersunk head machine screw	
OCM	Oval countersunk head machine screw	
TM	Truss head machine screw	
BM	Binding head machine screw	
PSA	Pan head screw with spring lock washer	
PSB	Pan head screw with spring lock washer and flat washer	
PSF	Pan head screw with flat washer	

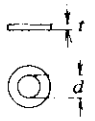
Symbol	Description	Shape
EW	E type washer	
FW	Flat washer	
SW	Spring lock washer	
N	Nut	
WN	Washer faced nut	
ITW	Internal toothed lock washer	
OTW	Outernal toothed lock washer	
SC	Slotted set screw (Cone point)	
SF	Slotted set screw (Flat point)	
HS	Hexagon socket headless set screw	
OCW	Oval countersunk head wood screw	
CW	Countersunk head wood screw	
RW	Round head wood screw	
CS·TW	Stopper washer	

EXAMPLE

PM · 3x8
- length in mm (l)
- diameter in mm (d)
- Symbol

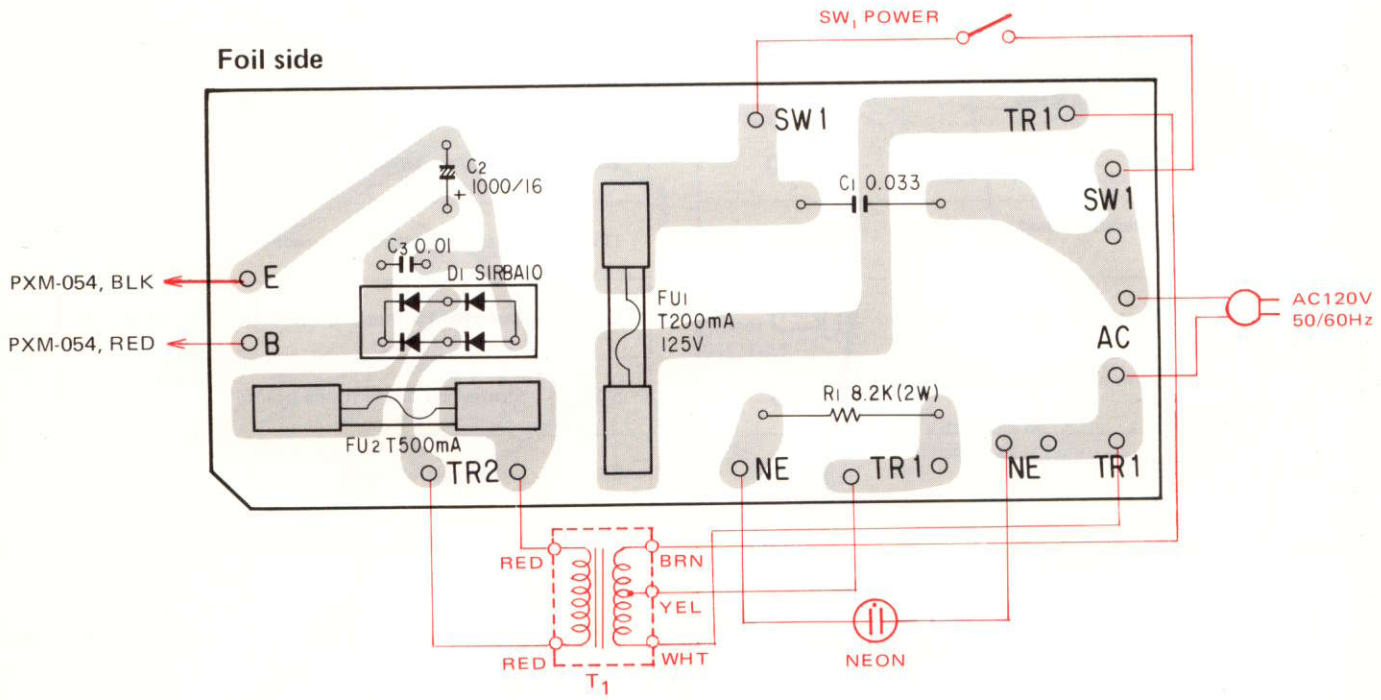


FW · 9ϕ x 1^t
- thickness in mm (t)
- diameter in mm (d)
- Symbol



8. KCT type SCHEMATIC DIAGRAMS, P.C. BOARD PATTERN AND PARTS LIST.

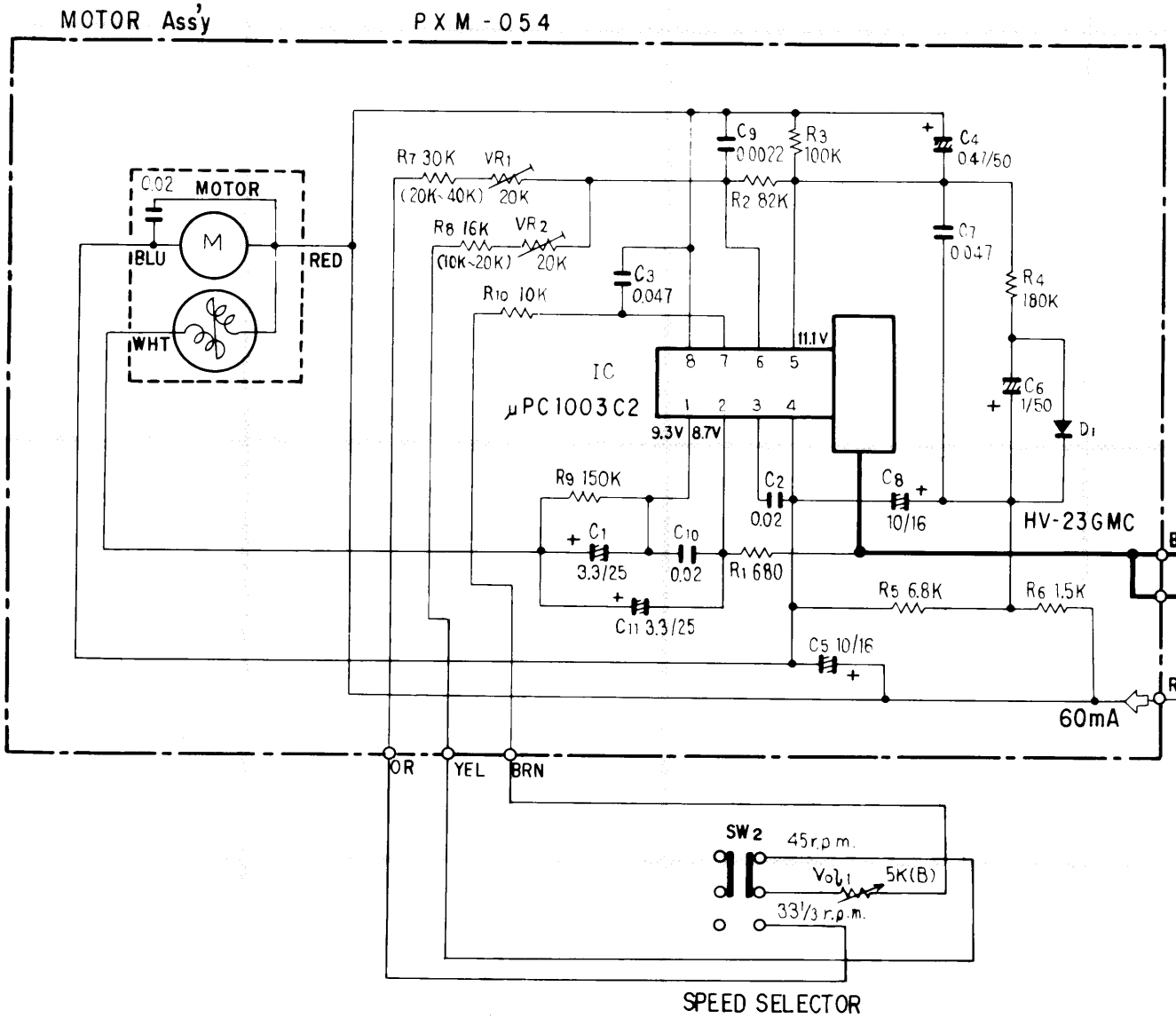
8.1 POWER SUPPLY ASSEMBLY (PWR-031)

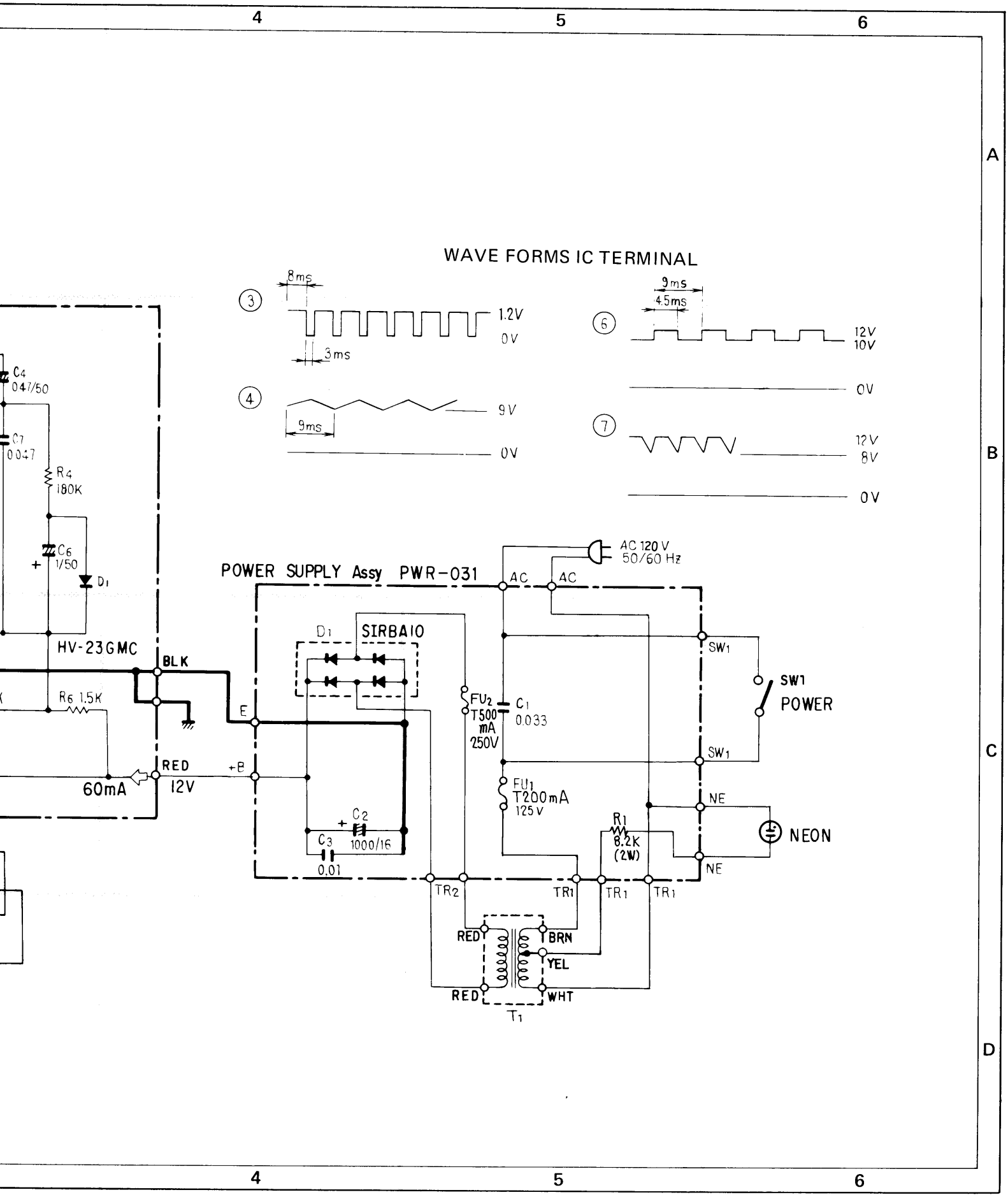


Parts List of Power Supply Assembly (PWR-031)

Symbol	Part No.	Description
C1	PCL-018	Ceramic
C2	CEA 102P 16	Electrolytic
C3	CKDYF 103Z 50	Ceramic
R1	RS2P 822J	Metal oxide
D1	PCX-010	
FU1	PEK-002	Fuse (200mA)
FU2	PEK-004	Fuse (500mA)
	K91-006	Fuse holder

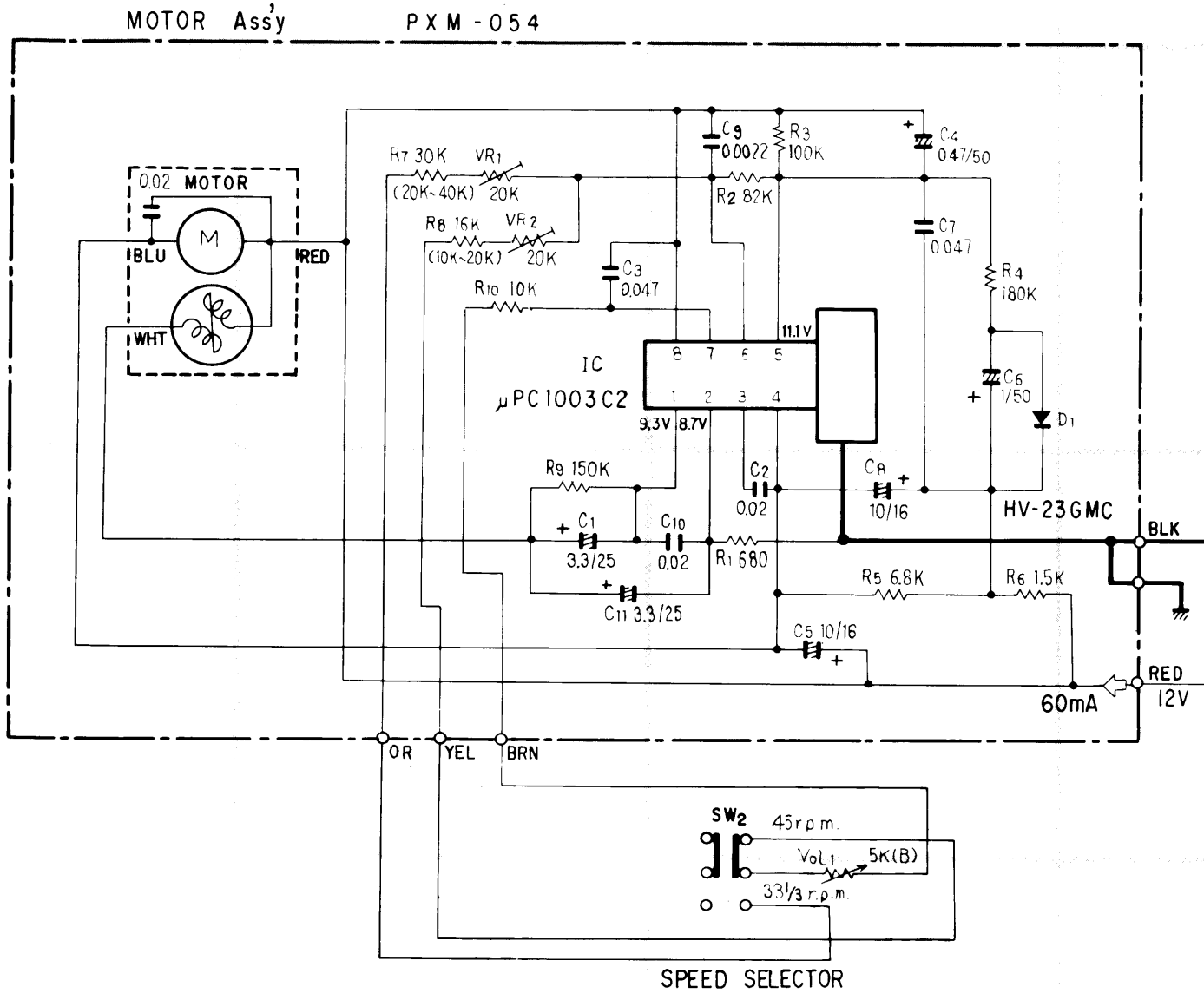
8.2 SCHEMATIC DIAGRAM



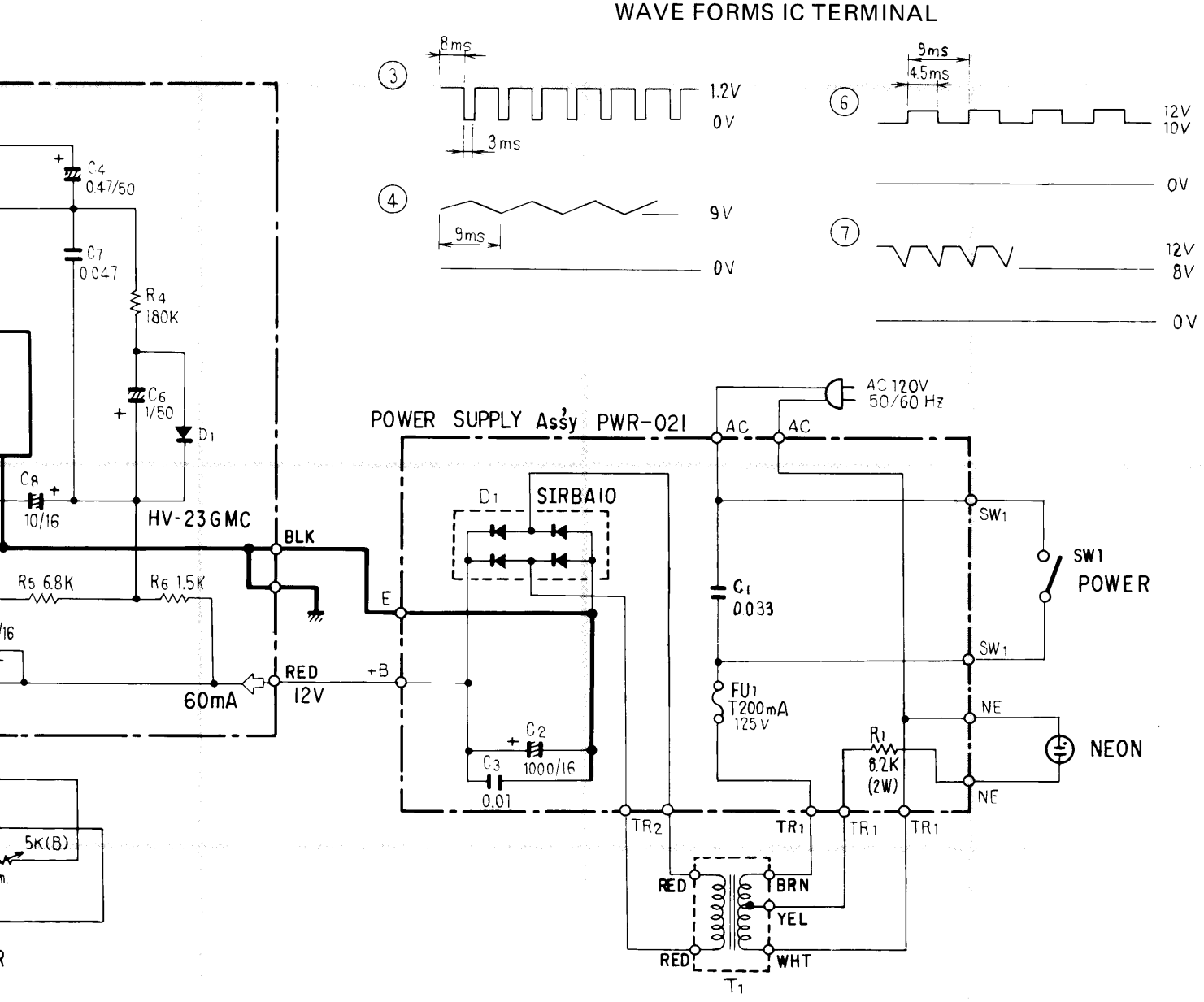

4
5
6
A
B
C
D
WAVE FORMS IC TERMINAL
③
8ms
3ms
1.2V
0V
④
9ms
9V
0V
⑥
9ms
4.5ms
12V
10V
0V
⑦
12V
8V
0V
C4
047/50
C7
0.047
R4
180K
C6
1/50
D1
HV-23GMC
BLK
R6 1.5K
RED
60mA
12V
+B
E
POWER SUPPLY Assy PWR-031
AC 120V
50/60 Hz
AC
AC
D1
SIRBA10
FU2
T500
mA
250V
C1
0.033
SW1
SW1
POWER
SW1
FU1
T200mA
125V
NE
R1
8.2K
(2W)
NEON
NE
C2
C3
1000/16
0.01
TR2
TR1
TR1
TR1
RED
BRN
YEL
RED
WHT
T1

9. KUT type SCHEMATIC DIAGRAMS, P.C. BOARD PATTERN AND PARTS LIST.

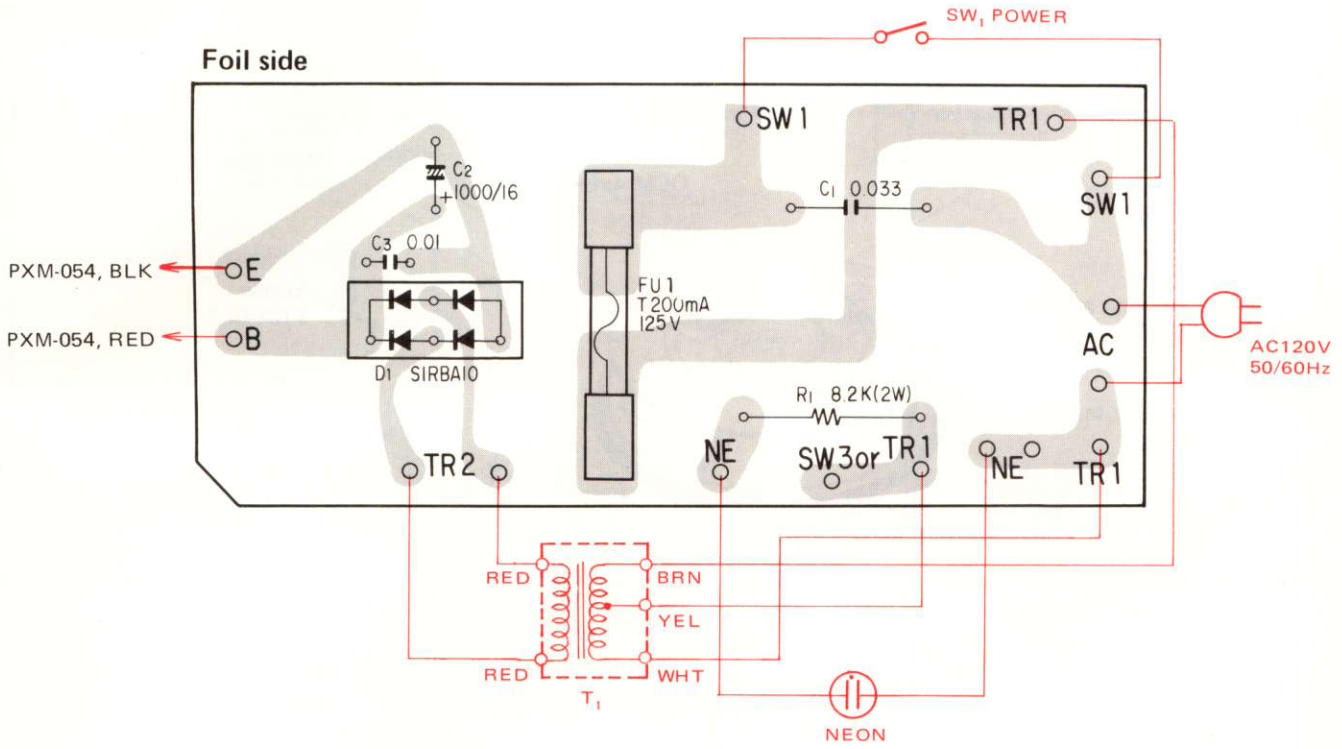
9.1 SCHEMATIC DIAGRAM



BOARD


WAVE FORMS IC TERMINAL
8ms
3ms
1.2V
0V
9ms
9V
0V
9ms
4.5ms
12V
10V
0V
12V
8V
0V
C4 0.47/50
C7 0.047
R4 180K
C6 1/50
D1
C8 10/16
HV-23GMC
BLK
R5 6.8K
R6 1.5K
RED
60mA
12V
+B
E
5K(B)
POWER SUPPLY Assy PWR-021
AC 120V 50/60 Hz
AC
AC
D1 SIRBA10
C1 0.033
C2 1000/16
C3 0.01
FU1 T200mA 125V
SW1
SW1
POWER
SW1
NE
NEON
NE
R1 8.2K (2W)
TR2
TR1
TR1
TR1
RED
BRN
YEL
RED
WHT
T1

9.2 POWER SUPPLY ASSEMBLY (PWR-021)



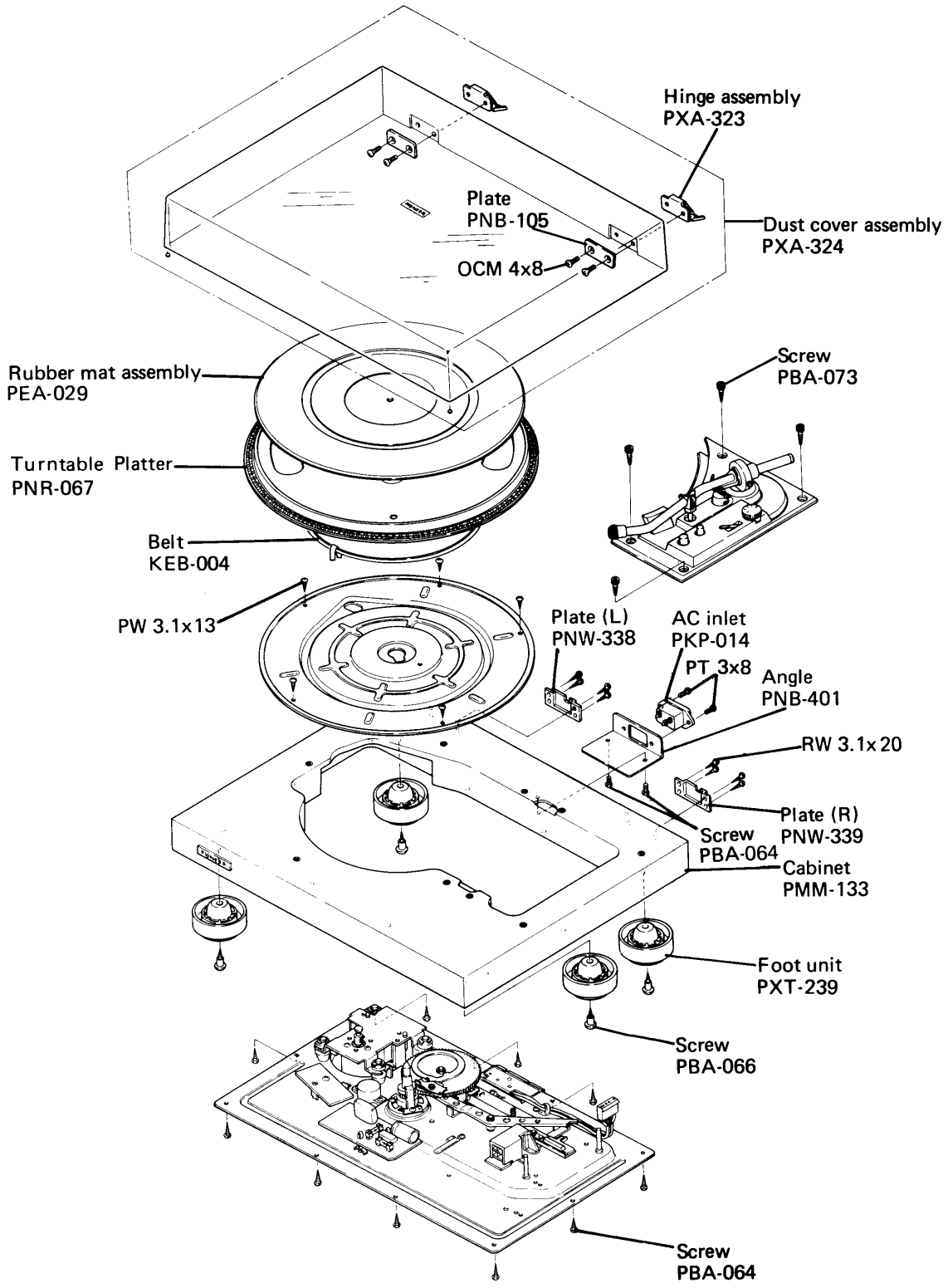
Parts List of Power Supply Assembly (PWR-021)

Symbol	Part No.	D Description
C1	KCE-009	Ceramic
C2	CEA 102P 16	Electrolytic
C3	CKDYF 103Z 50	Ceramic
R1	RS2P 822J	Metal oxide
D1	PCX-010	
FU1	PEK-002	Fuse (200mA)
	K91-006	Fuse holder

10. HG, HGT type EXPLODED VIEWS

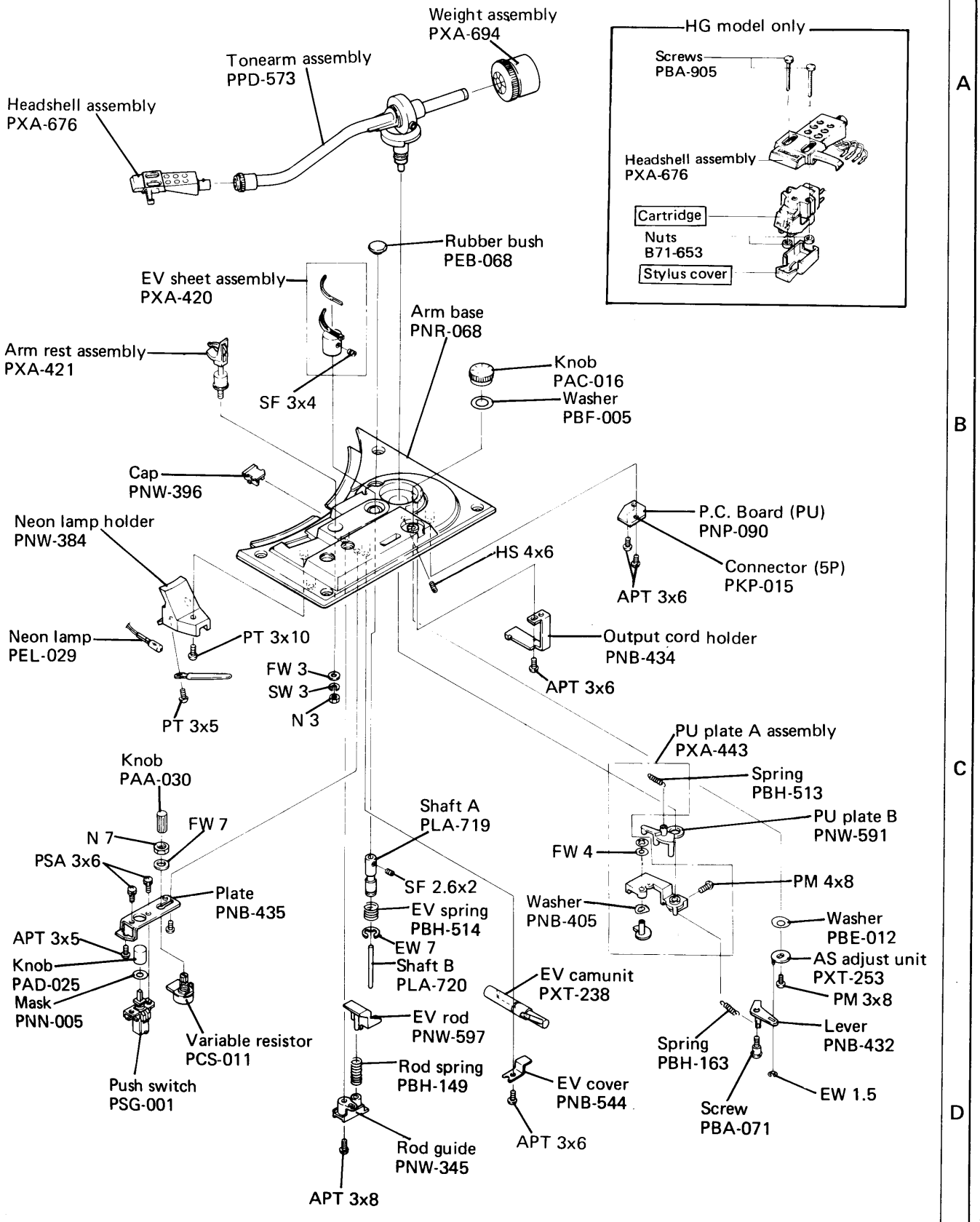
NOTE:
Parts indicated in ☐ mark cannot be supplied.

10.1 CABINET



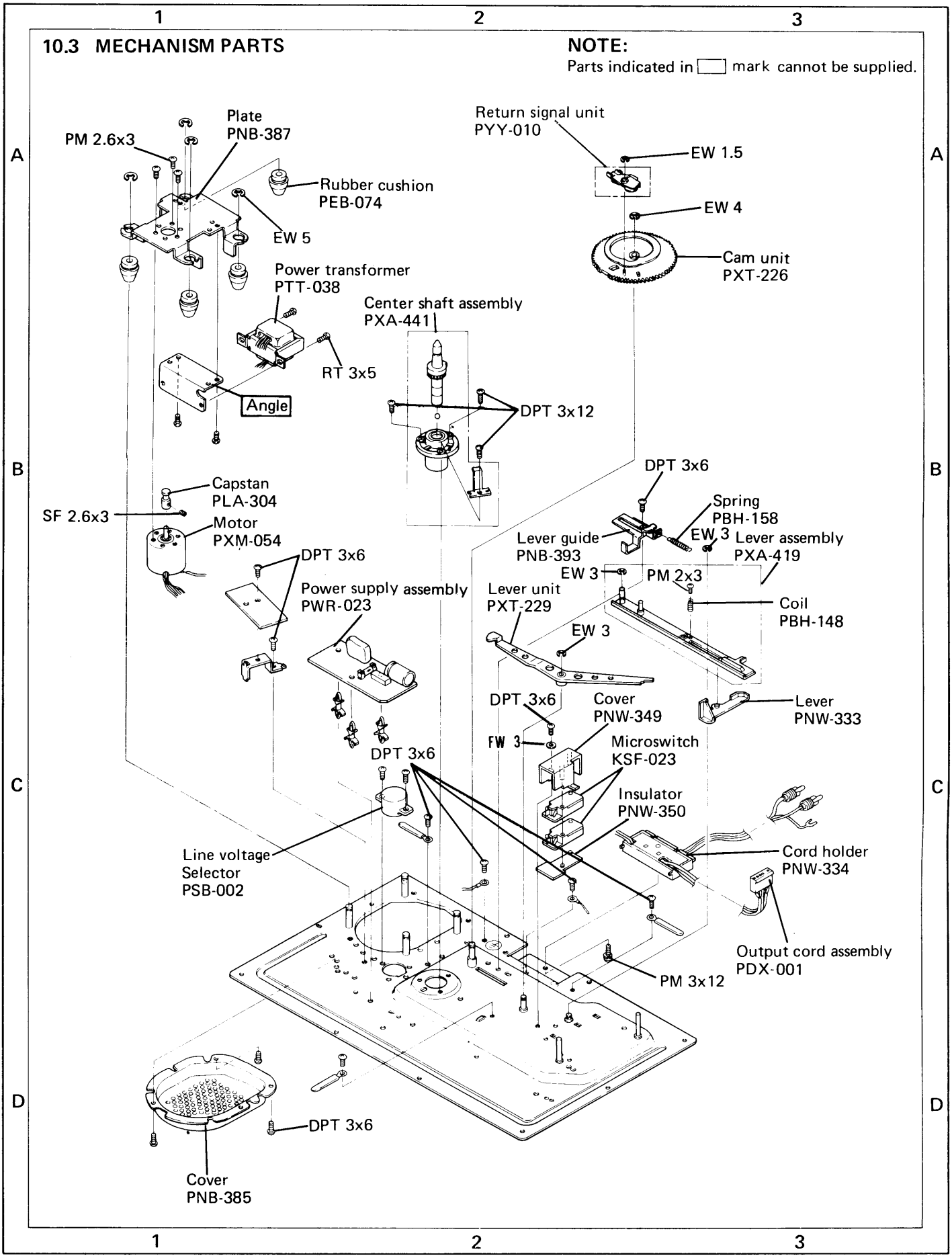
10.2 TONEARM

NOTE:
Parts indicated in ☐ mark cannot be supplied.

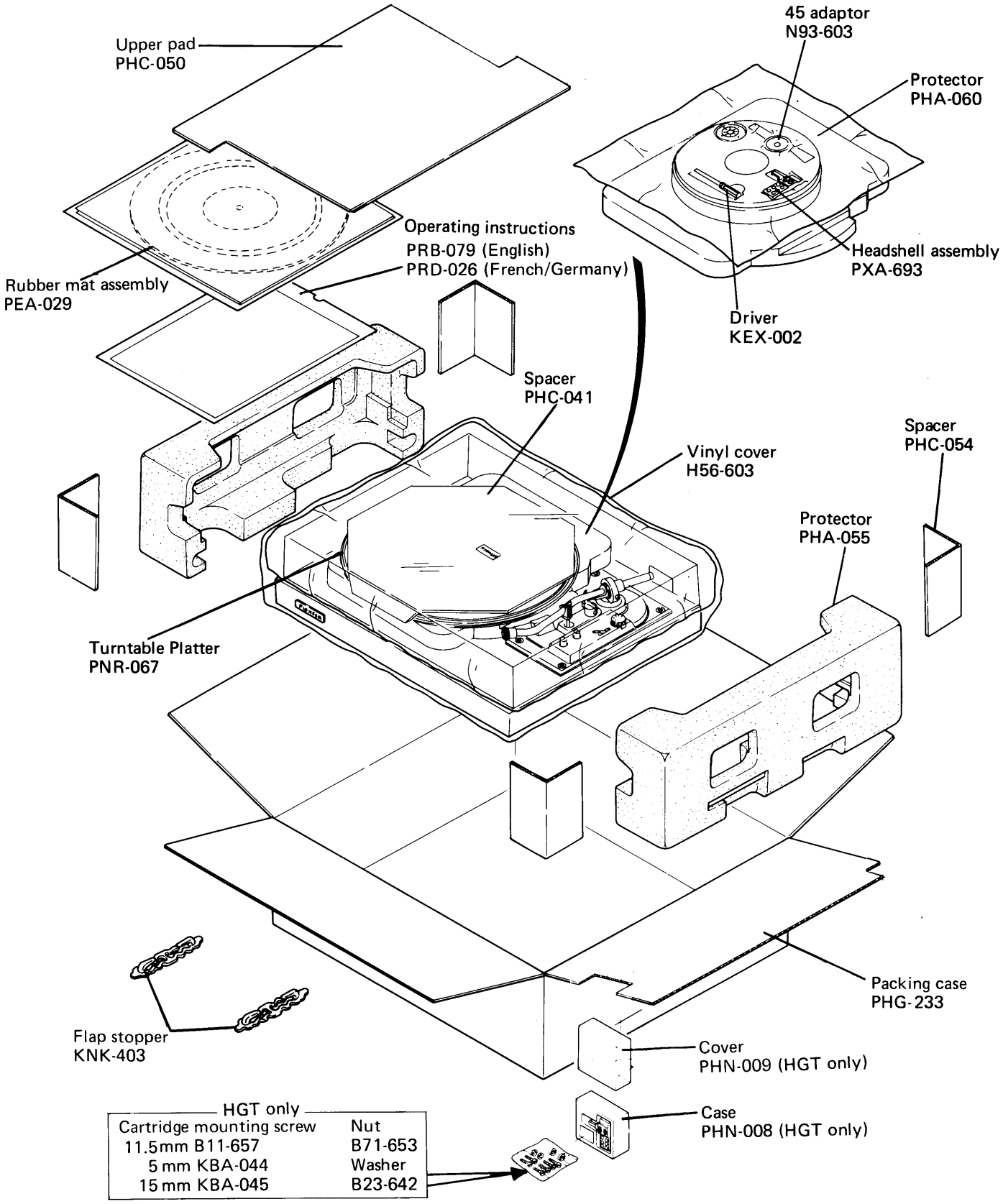


10.3 MECHANISM PARTS

NOTE:
Parts indicated in [ ] mark cannot be supplied.



10.4 PACKING

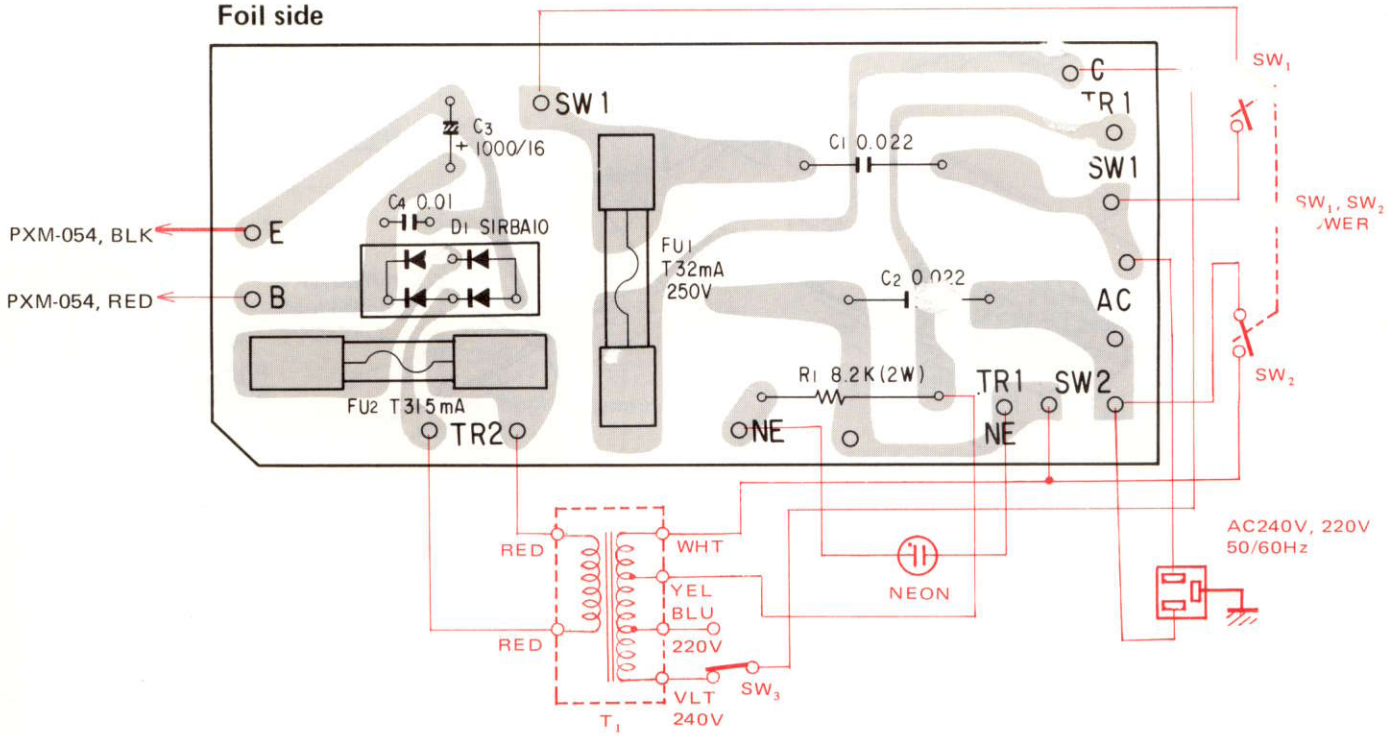


HGT only

Cartridge mounting screw	Nut
11.5mm B11-657	B71-653
5 mm KBA-044	Washer
15 mm KBA-045	B23-642

11. HG, HGT type SCHEMATIC DIAGRAMS, P.C. BOARD PATTERN AND PARTS LIST.

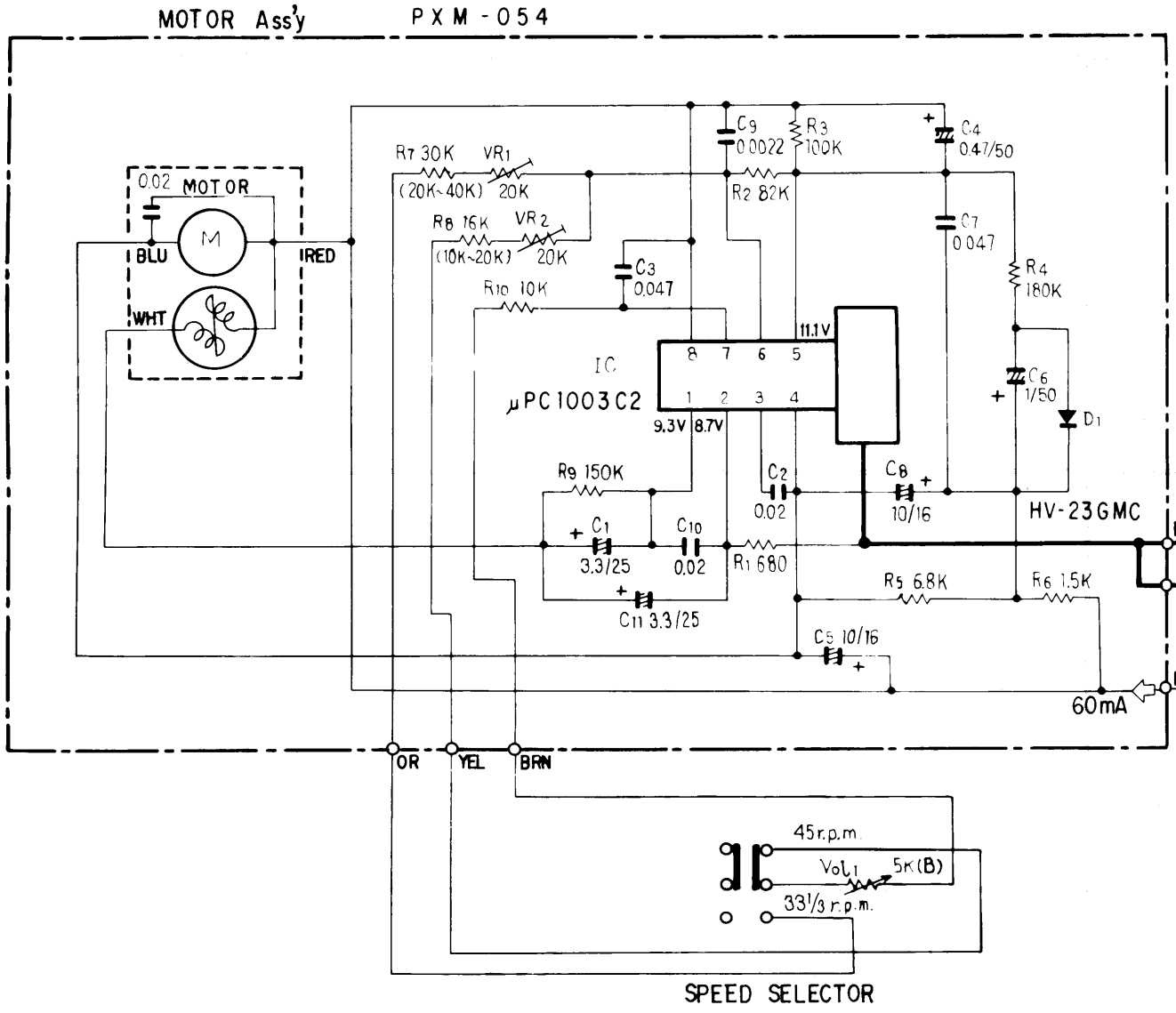
11.1 POWER SUPPLY ASSEMBLY (PWR-023)

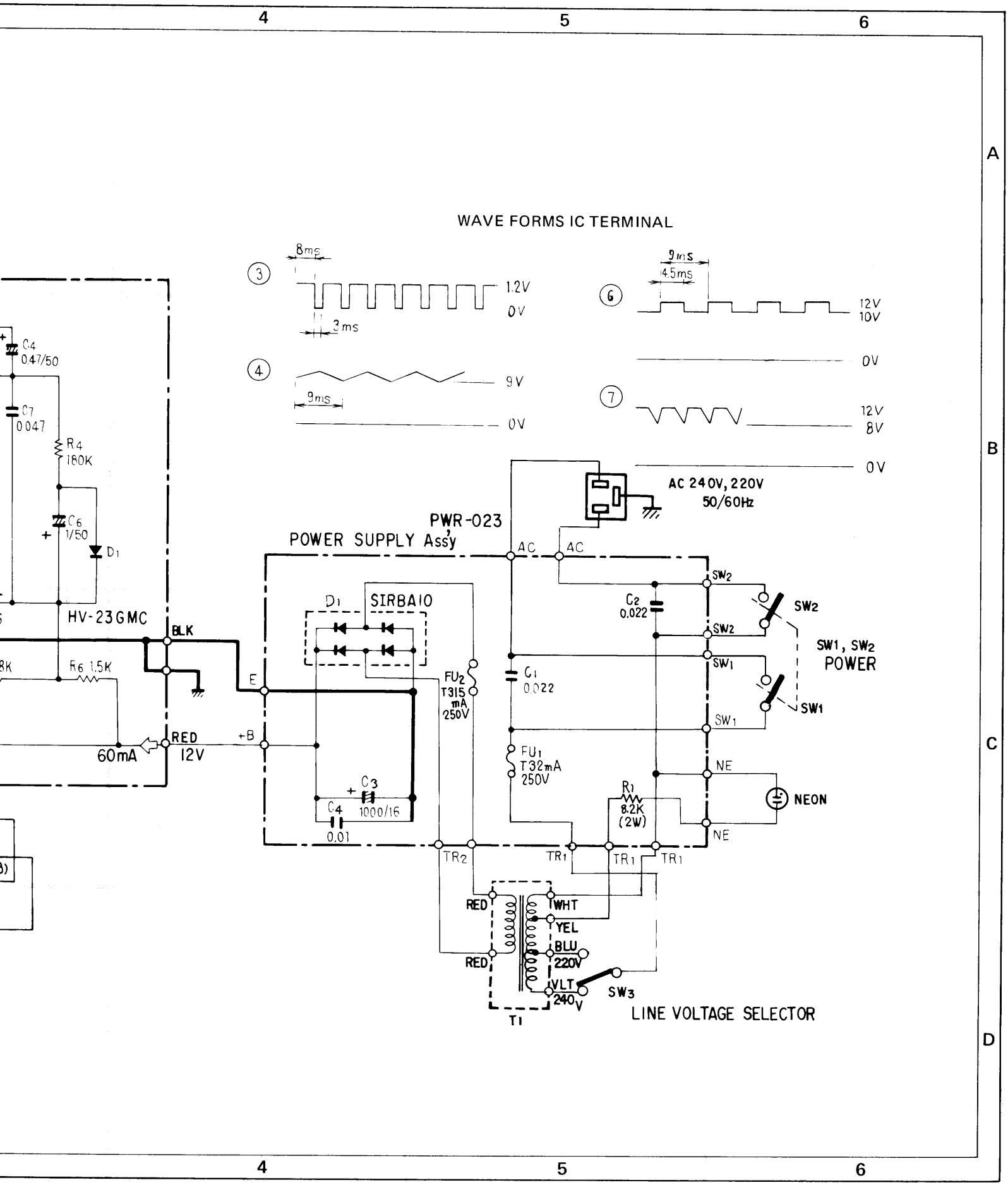


Parts List of Power Supply Assembly (PWR-023)

Symbol	Part No.	Description
C1	PCL-026	Ceramic
C2	PCL-026	Ceramic
C3	CEA 102P 16	Electrolytic
C4	CKDYF 103Z 50	Ceramic
R1	RS2P 822J	Metal oxide
D1	PCX-010	
FU1	PEK-019	Fuse (32mA)
FU2	KEK-008	Fuse (315mA)
	KKR-001	Fuse holder

11.2 SCHEMATIC DIAGRAM




4
5
6
A
B
C
D
WAVE FORMS IC TERMINAL
③
8ms
1.2V
0V
3ms
④
9V
9ms
0V
⑥
9ms
4.5ms
12V
10V
0V
⑦
12V
8V
0V
AC 240V, 220V
50/60Hz
PWR-023
POWER SUPPLY Ass'y
AC
AC
SW2
SW2
SW2
SW1, SW2
POWER
SW1
SW1
SW1
C2
0.022
C1
0.022
D1
SIRBA10
FU2
T315
mA
250V
FU1
T32mA
250V
R1
8.2K
(2W)
NE
NEON
NE
C3
1000/16
C4
0.01
E
+B
BLK
RED
12V
60mA
TR2
TR1
TR1
TR1
RED
WHT
YEL
BLU
220V
VLT
240V
RED
SW3
T1
LINE VOLTAGE SELECTOR
C4
0.47/50
C7
0.047
R4
180K
C6
1/50
D1
HV-23GMC
R6 1.5K