

Service Manual

DIRECT DRIVE
Turntable System

Turntable System

SL-1200LTD

Colour

(K)... Black Type



Area

Suffix for Model No.	Area	Colour
(E)	Europe.	(K)
(EB)	Great Britain.	
(EG)	Germany and Italy.	

SPECIFICATIONS

■ General

Power supply:	110-120/220-240 V, 50 or 60 Hz
Power consumption:	16 W
Dimensions:	453x162x360 mm
(WxHxD)	
Weight:	12.5 kg

■ Turntable section

Type:	Quartz direct drive Manual turntable
Drive method:	Direct drive
Motor:	Brushless DC motor
Turntable platter:	Aluminum diecast Diameter 332 mm Weight 2 kg
Turntable speeds:	33-1/3 r/min and 45 r/min
Starting torque:	1.5 kg·cm
Build-up characteristics:	0.7 s. from standstill to 33-1/3 r/min
Braking system:	Electronic brake
Wow and flutter:	0.01% W.R.M.S.* 0.025% W.R.M.S. (JIS C5521) ±0.035% peak (IEC 98A Weighted)
Rumble:	-56 dB (IEC 98A Unweighted) -78 dB (IEC 98A Weighted)

*This rating refers to turntable assembly alone, excluding effects of record, cartridge or tonearm, but including platter. Measured by obtaining signal from built-in frequency generator of motor assembly.

■ Tonearm section

Type:	Universal
Effective length:	230 mm
Arm height adjustment range:	31.8-37.8 mm
Overhang:	15 mm
Effective mass:	12 g (without cartridge)
Offset angle:	22°
Friction:	Less than 7 mg (lateral, vertical)
Tracking error angle:	Within 2°32' (at the outer groove of 30 cm record) Within 0°32' (at the inner groove of 30 cm record)
Stylus pressure adjustment range:	0-2.5 g
Applicable cartridge weight range:	6-10 g 13.5-17.5 g (including headshell)
(with auxiliary weight):	9.5-13 g 17-20.5 g (including headshell)
(with shell weight)	3.5-6.5 g 11-14 g (including headshell)
Headshell weight:	7.5 g

Note:

Specifications are subject to change without notice.
Weight and dimensions are approximate.

⚠ WARNING

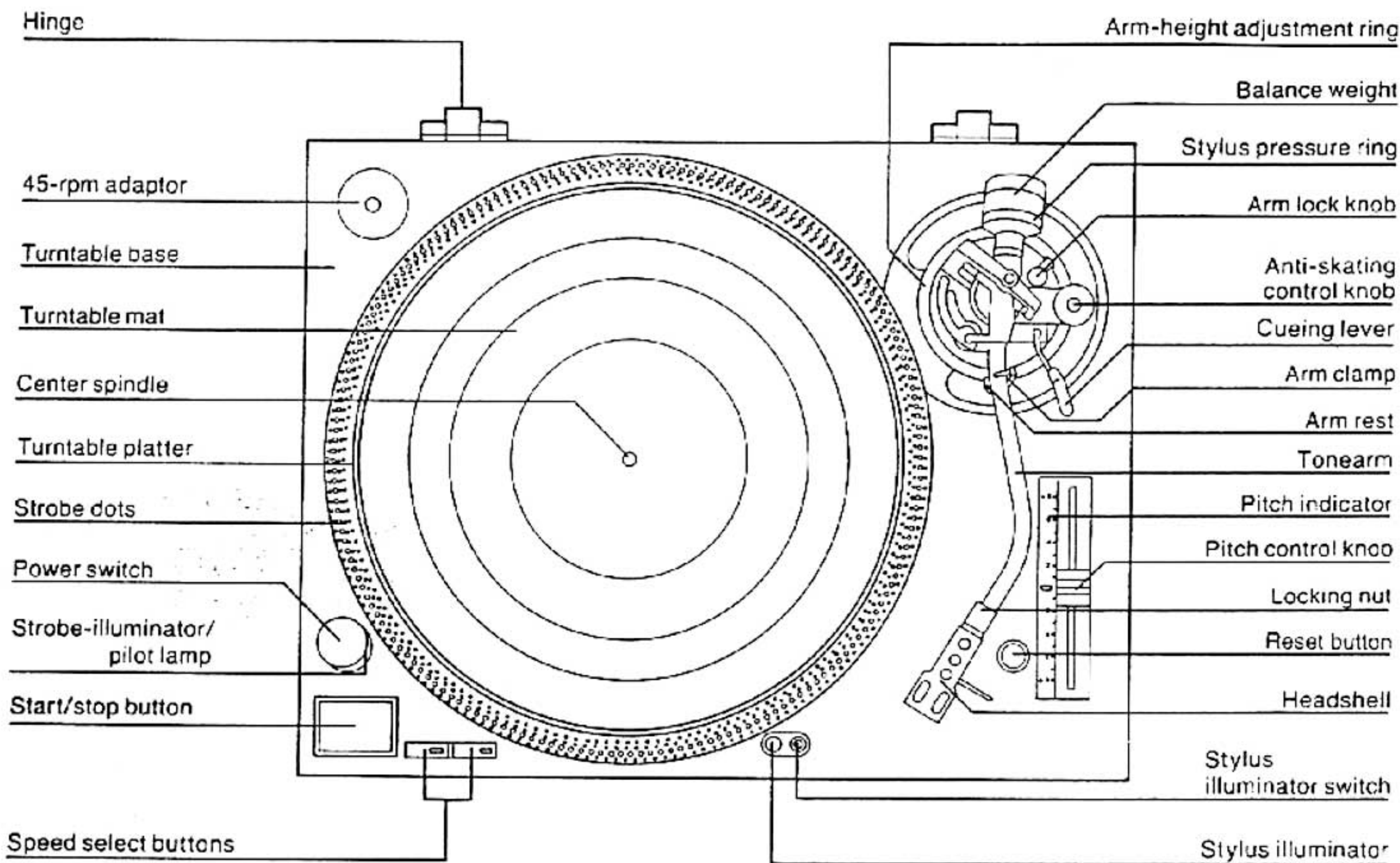
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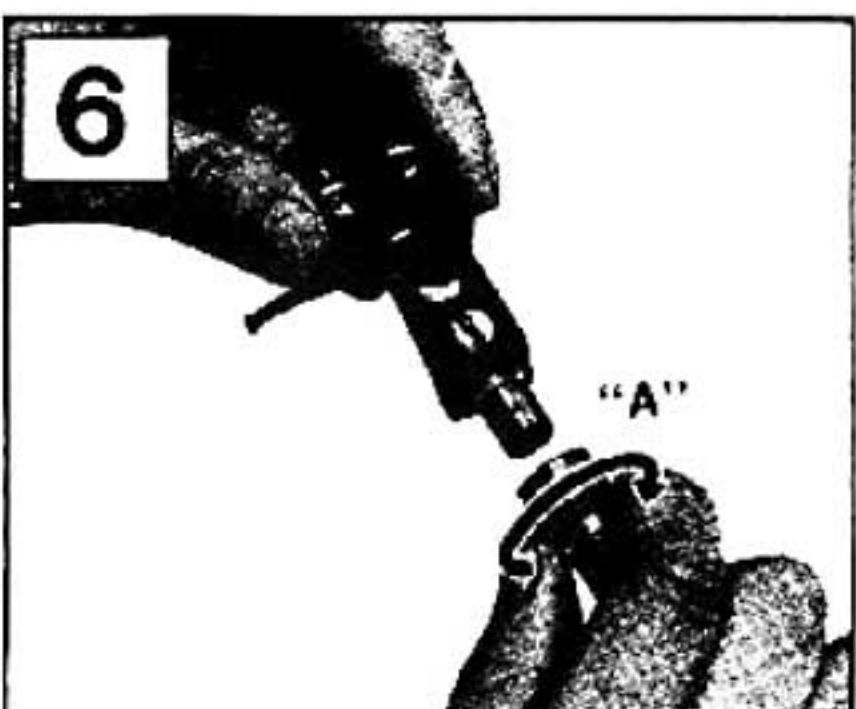
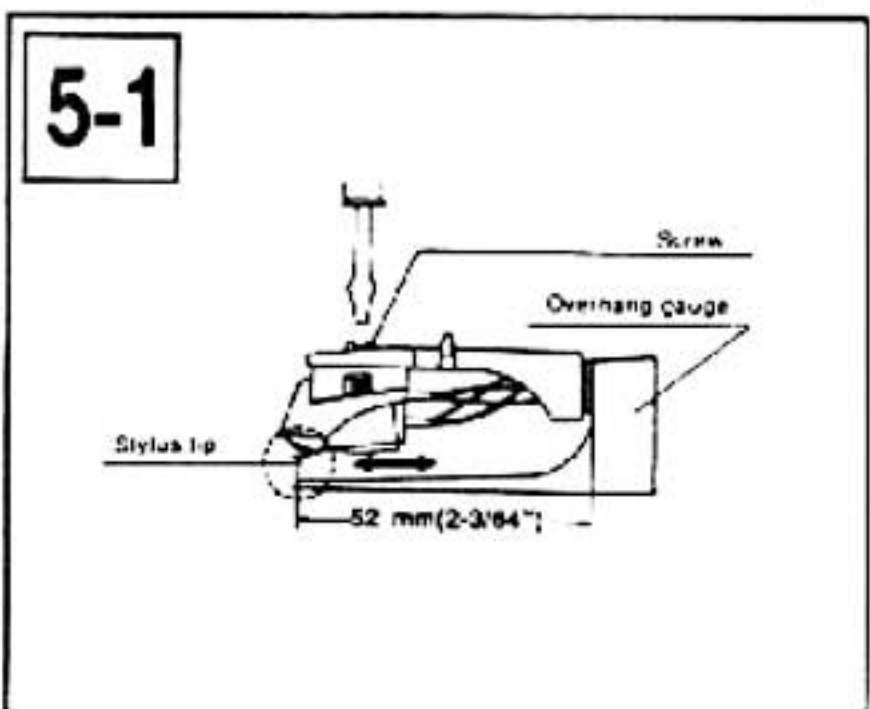
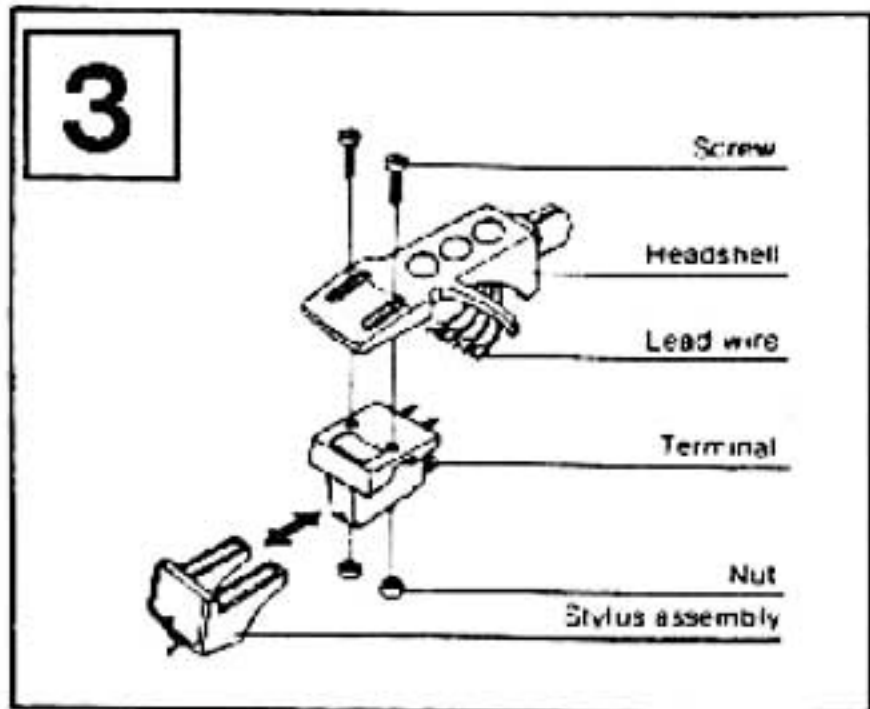
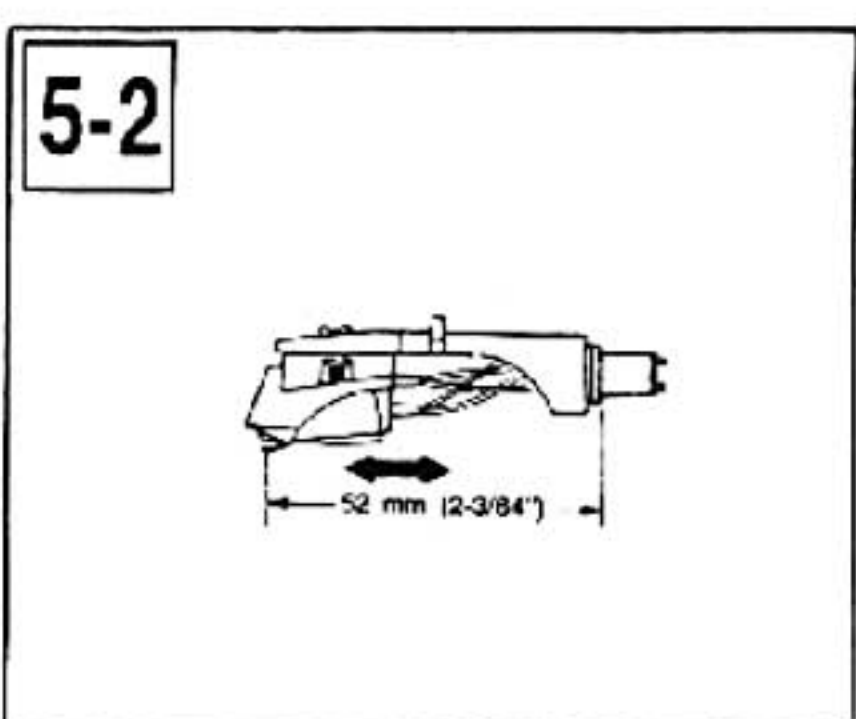
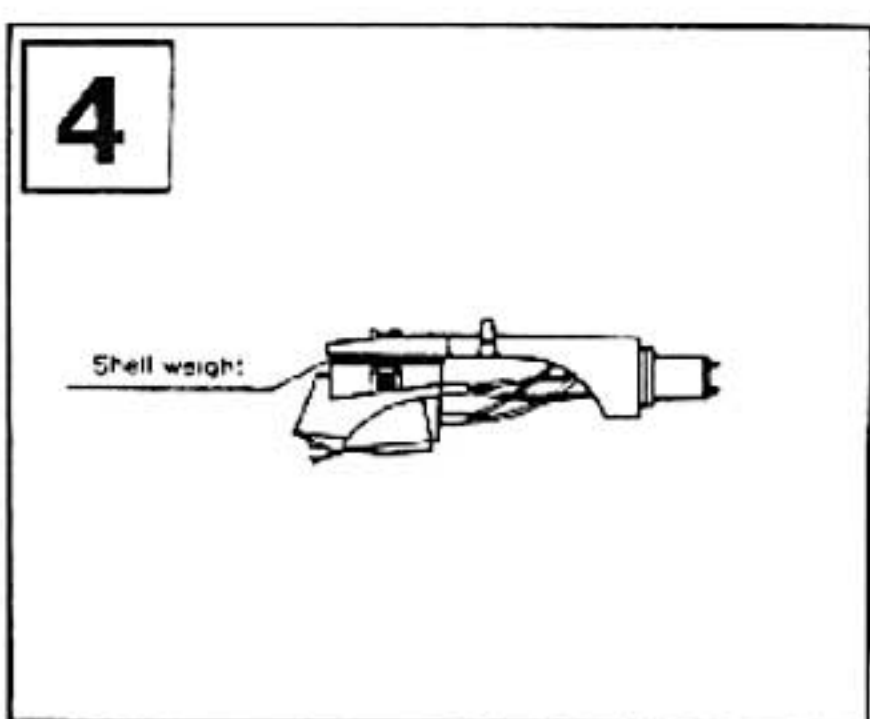
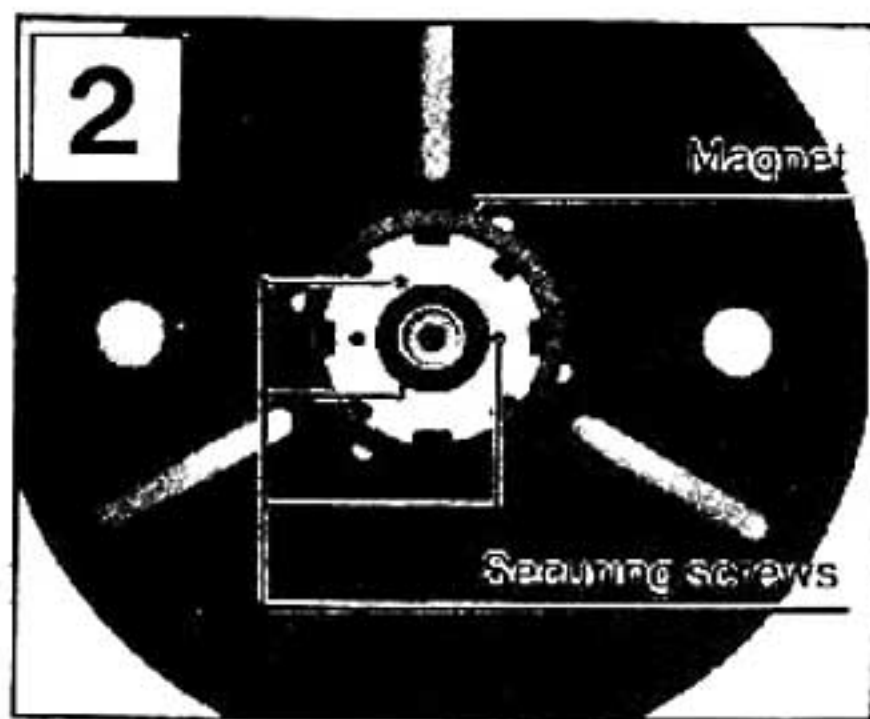
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■ PARTS IDENTIFICATION

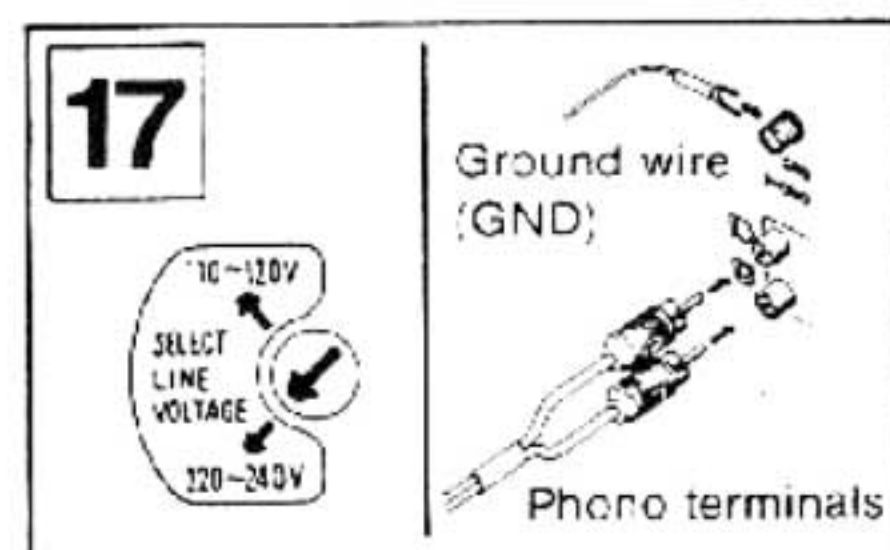
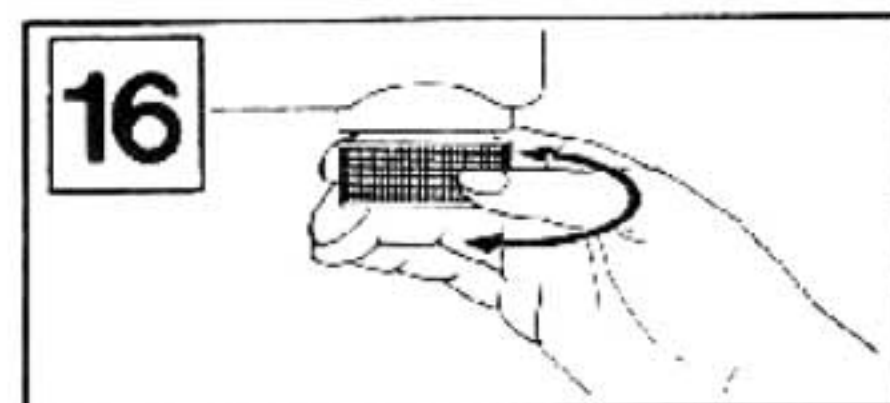
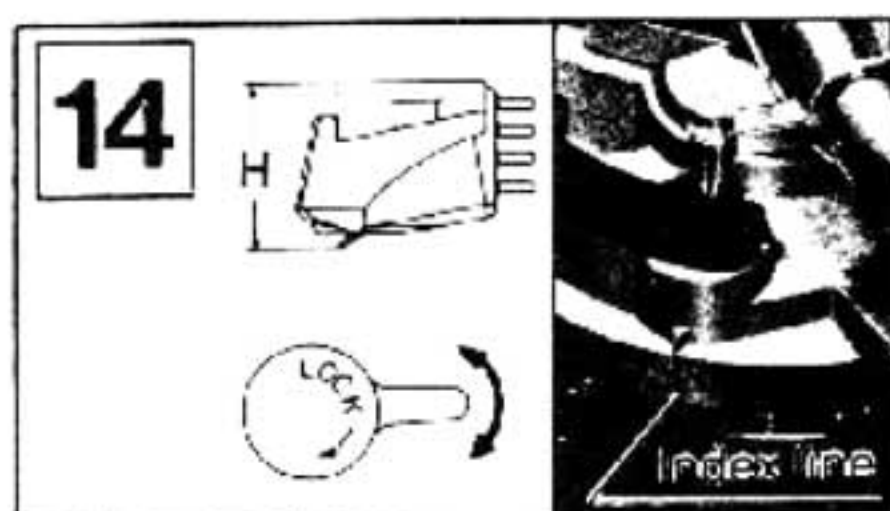
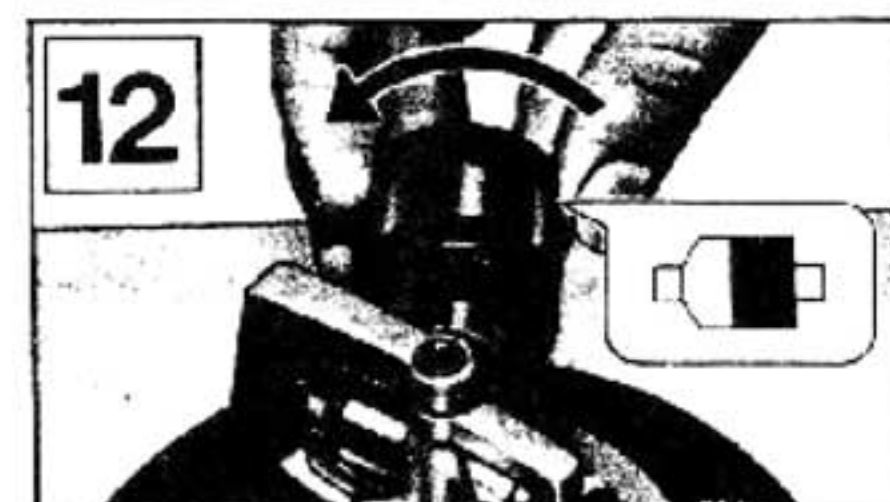
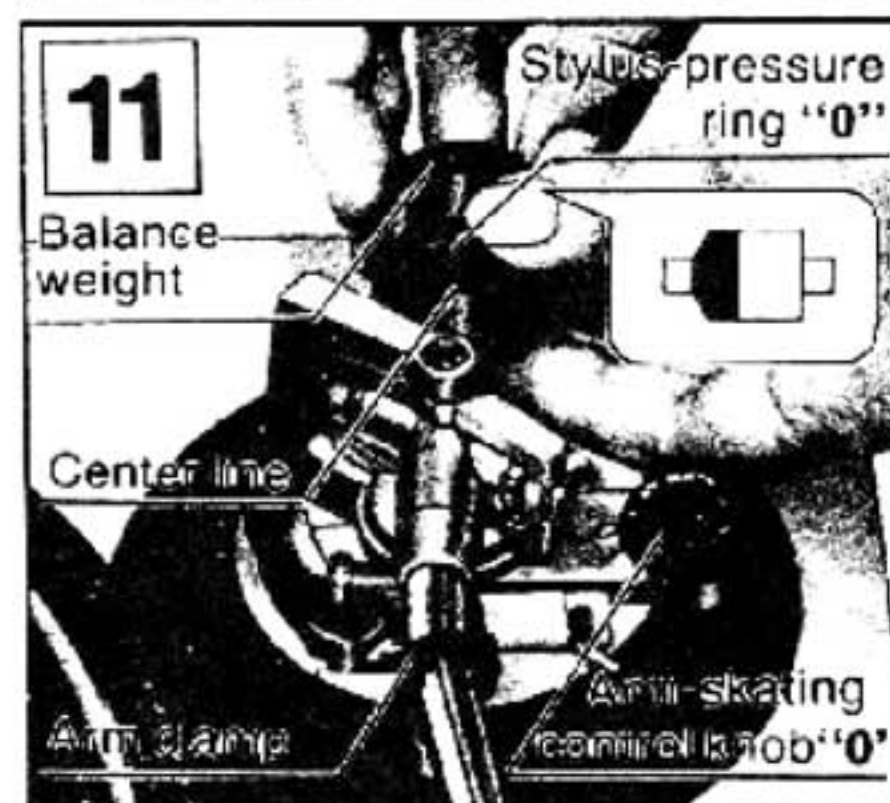
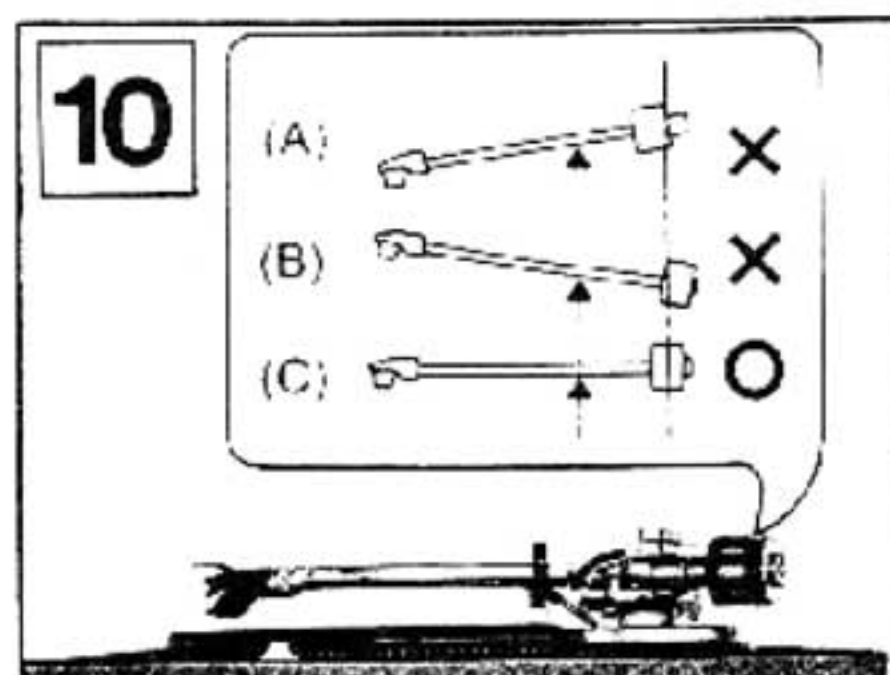
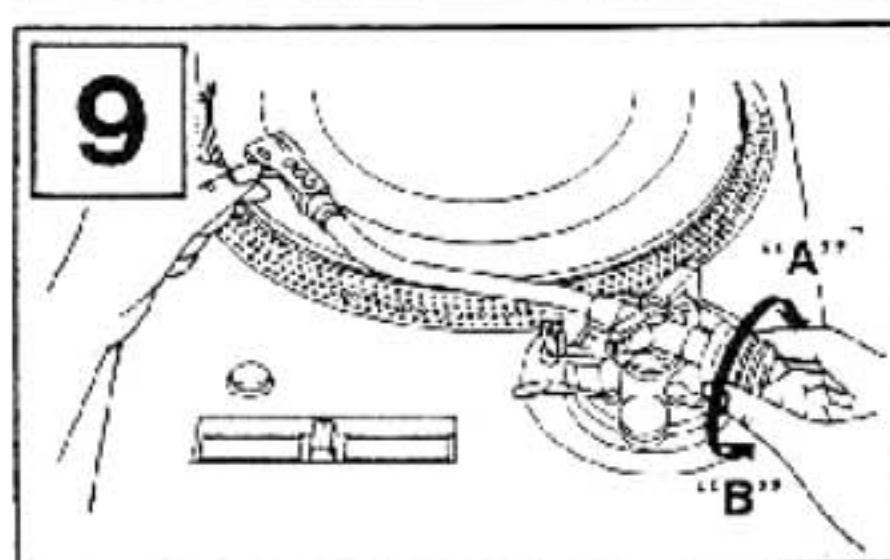
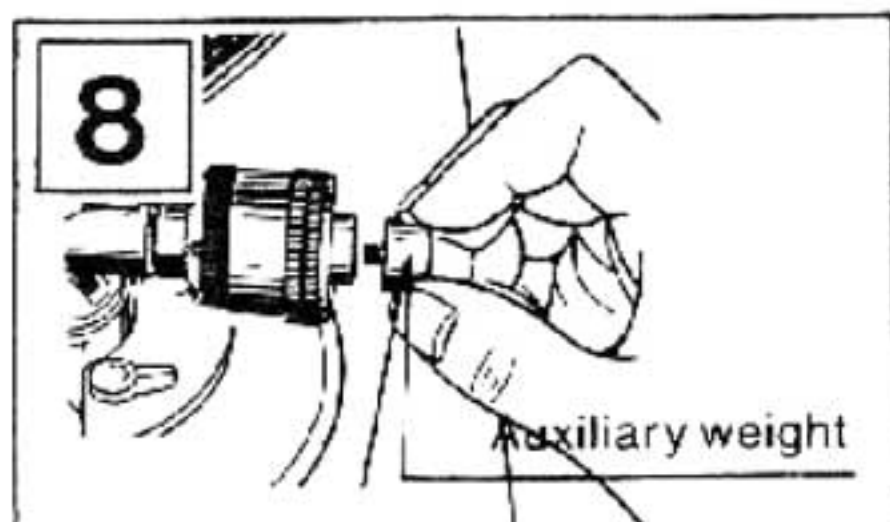
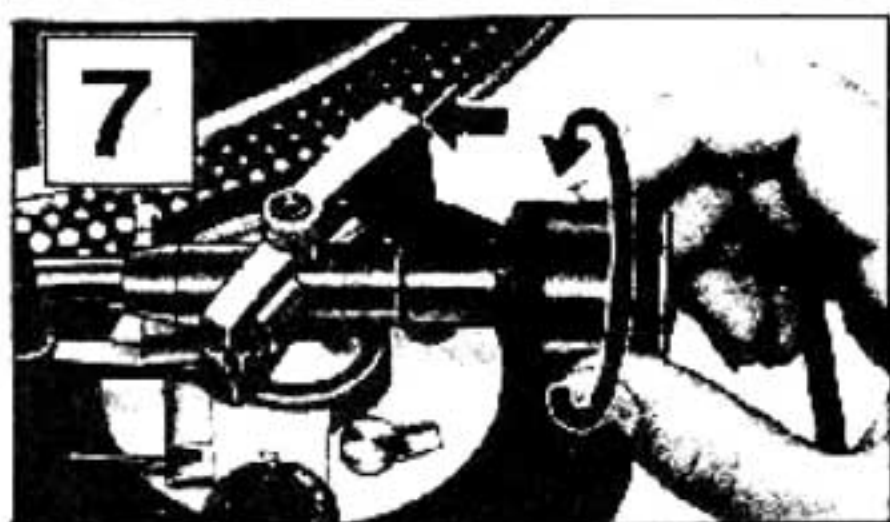
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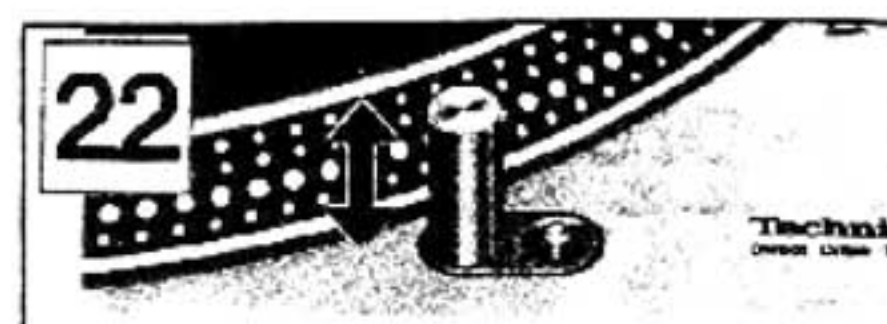
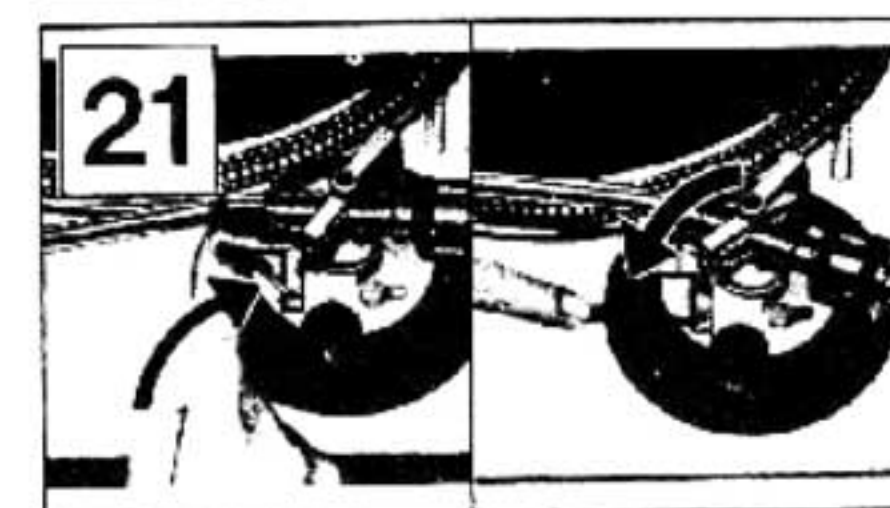
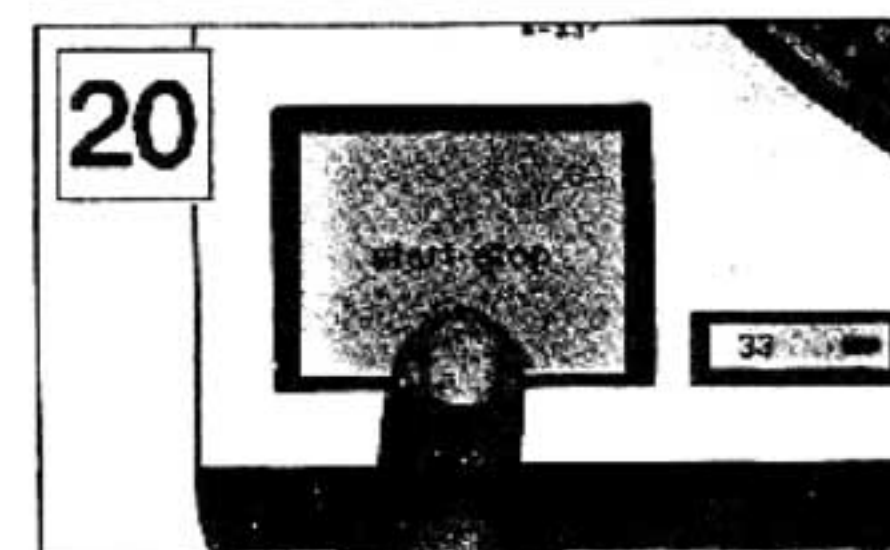
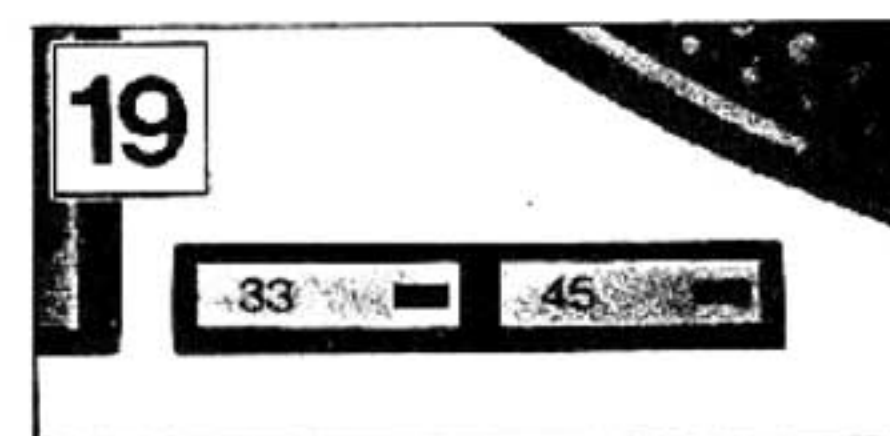
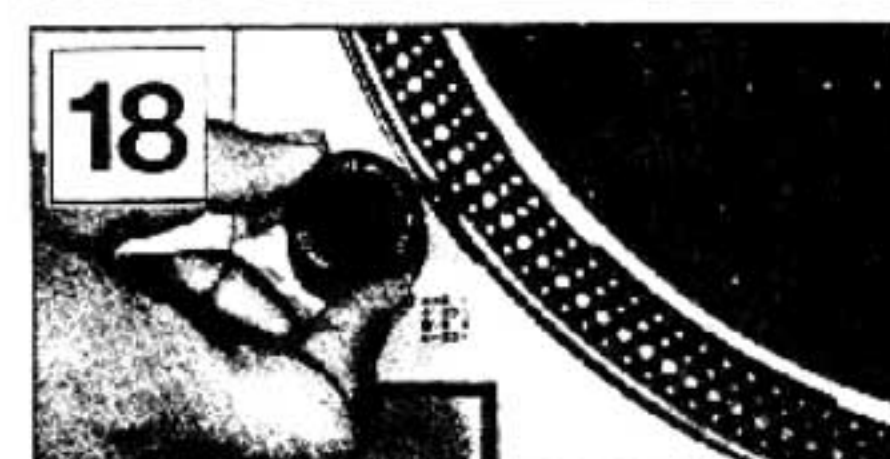
■ ASSEMBLY AND SET-UP



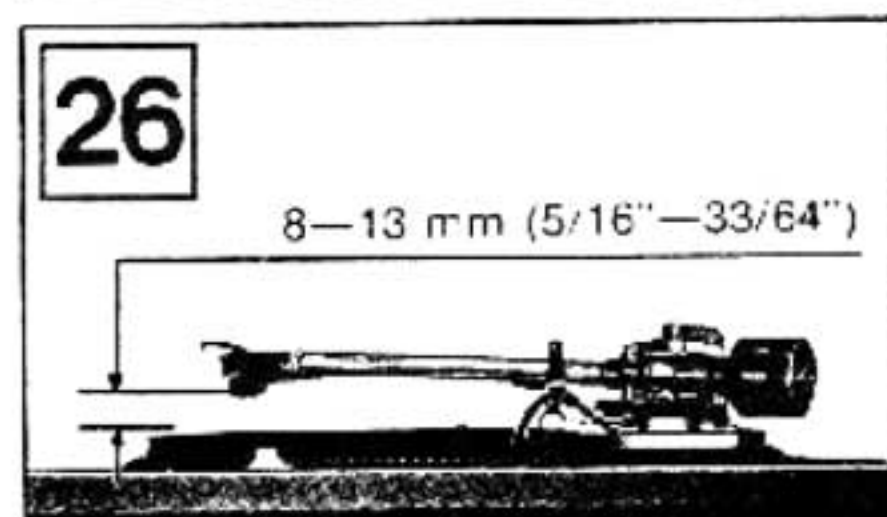
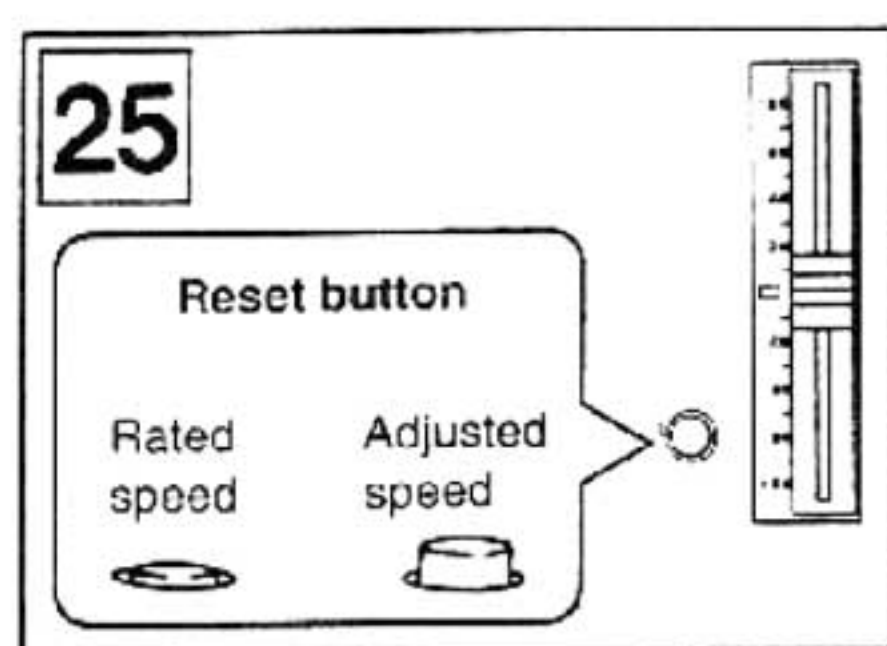
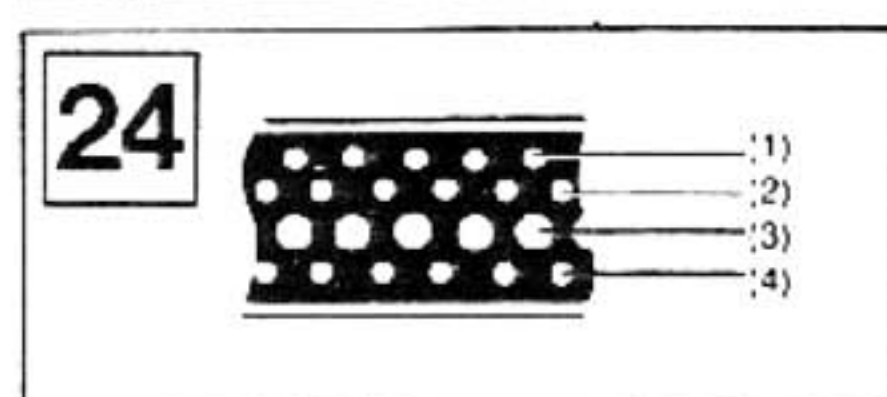
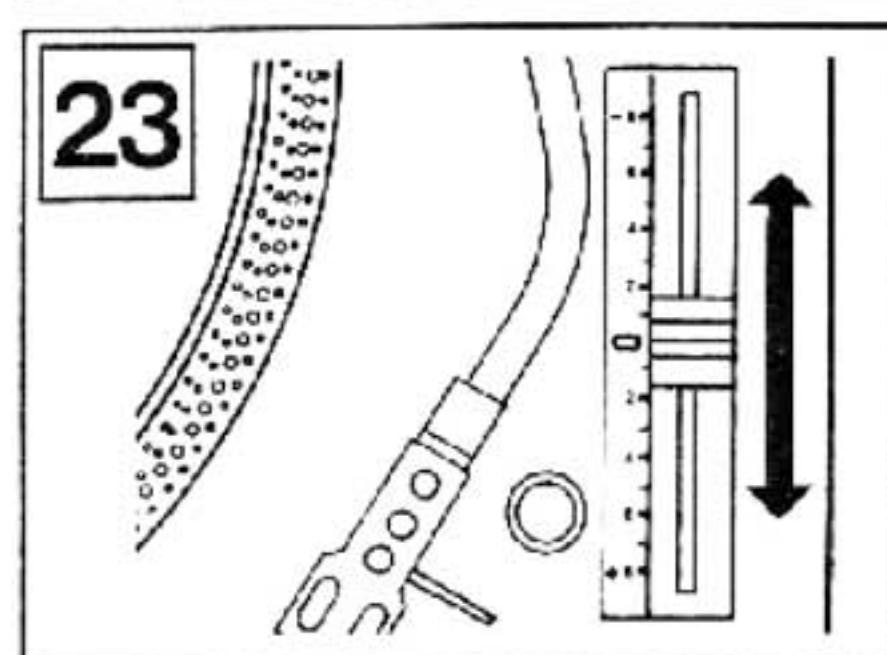
Assembly and set-up



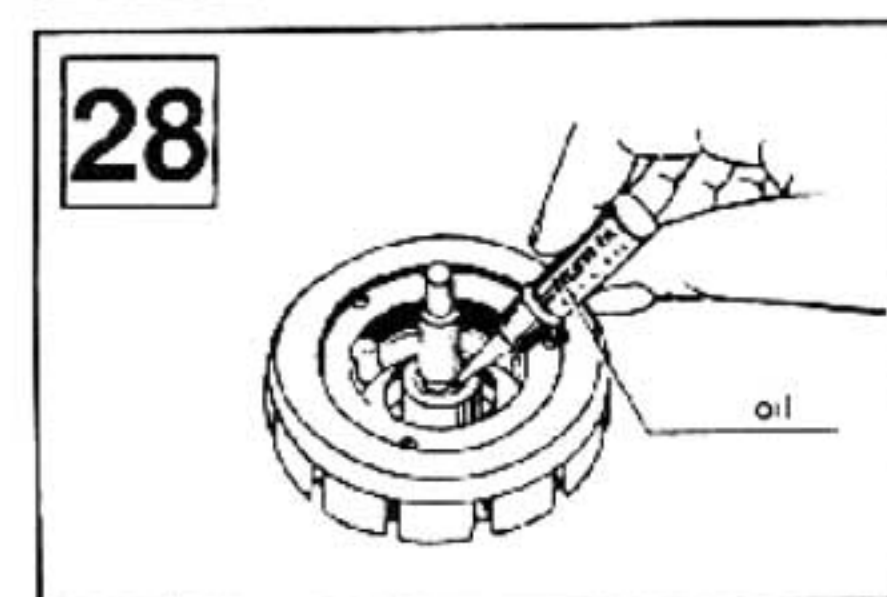
How to operate



Adjustments



Notes and maintenance



Before use

Caution:

Never connect the AC power plug before assembly has been completed.

Attach the dust cover last, so that assembly and adjustments can be made most conveniently.

Note:

The operating instructions are commonly applicable to units with cartridge and without cartridge, and also to those of different colors.

For the units without cartridge, the cartridge section of the specifications may be neglected.

■ Checklist of parts

Turntable unit	1
Turntable platter	1
Turntable mat	1
Dust cover	1
45-rpm adaptor	1
Balance weight	1
Auxiliary weight	1
Headshell	1
Shell weight	1
Overhang gauge (for the unit without cartridge)	1

Assembly and set-up

■ Installation of turntable platter

1. Place the turntable platter on the center spindle.

Note:

The rotor is connected to the underside of the turntable platter. (The magnet of the motor is attached to the turntable platter.) To maintain optimum performance, extra care should be taken to prevent adhesion of dust or iron filings to the magnet and not to damage the magnet by dropping it.

Do not remove or loosen the screws. Should the position of the fixed magnet be altered by loosening the securing screws, the rated performance of the unit cannot be guaranteed. (See Fig. 2.)

2. Place the turntable mat on the platter.

■ Installation of cartridge (See Fig. 3.)

(For the unit without Cartridge)

When you install a cartridge, refer to the operation instructions of that cartridge.

During installation, attach the stylus protector to guard the stylus tip from damage.

1. Connect the lead wires to the cartridge terminals.
The terminals of most cartridges are color coded. Connect each lead wire to the terminal of the same color.
White (L+) Left channel+
Blue (L-) Left channel-
Red (R+) Right channel+
Green (R-) Right channel-

2. Install a cartridge to the headshell, and tighten it with screws provided with the cartridge.

Note:

Use the shell weight only for a lightweight cartridge (less than 6.0 g). (See Fig. 4.)

■ Adjustment of overhang (See Fig. 5-1.)

(For the unit with overhang gauge)

1. Insert the headshell into the gauge.
2. Loosen the mounting screws and move the cartridge forward or backward until the stylus tip lines up with the edge of the gauge.

3. Tighten the mounting screws without moving the cartridge.

Note:

Your cartridge is now adjusted for lowest tracking error and minimum distortion.

This gauge is exclusively designed for this tonearm.

■ Adjustment of overhang (See Fig. 5-2.)

(For the unit without overhang gauge)

The overhang of this unit is 15 mm.

Loosen the mounting screw and move the cartridge forward or backward until the distance between the stylus tip and the plug becomes 52 mm as shown in the picture.

Tighten the mounting screws without moving the cartridge. Adjust horizontal zero balance, stylus pressure and arm-lift height whenever you change the cartridge.

■ Installation of headshell (See Fig. 6.)

Insert the headshell into the front end of the tubular arm, and turn the locking nut clockwise (in the direction shown by the arrow "A"), with the headshell firmly held horizontally.

■ Installation of balance weight (See Fig. 7.)

Place the balance weight on the rear shaft of the tonearm.

Note:

In case the cartridge weight exceeds 10 g, it is necessary to fix the attached auxiliary weight over the rear shaft of the arm.

With this auxiliary weight in use, it is possible to use any cartridge whose weight is in the range of 9.5–13 g. (See Fig. 8.)

■ Adjustments of horizontal zero (0) balance and stylus pressure

1. Remove the stylus protector, if your cartridge has a detachable one. Be careful not to touch your fingers to the stylus tip.
2. Release the arm clamp and lift the tonearm from the arm rest to free it.
3. Turn the entire balance weight clockwise (indicated by the arrow "A") or counterclockwise (indicated by the arrow "B") until the tonearm is approximately balanced horizontally (floats freely). (See Figs. 9 and 10.)

Note:

(A)

Excessive forward advancement of the balance weight causes the cartridge side to be lowered.

(B)

Excessive backward retreatment of the balance weight causes the cartridge side to be raised.

(C)

Upon balancing between the balance weight and cartridge, the tonearm is held horizontal.

During the adjustment of the horizontal zero (0) balance, be careful that the stylus tip of the cartridge does not contact the turntable mat or turntable base.

4. After the tonearm is horizontally zero (0) balanced, temporarily refasten the tonearm with the arm clamp.
5. Hold the balance weight stationary with one hand as shown in the picture, and rotate only the stylus-pressure ring to bring the numeral "0" of the ring into alignment with the center line on the tonearm rear shaft. (See Fig. 11.)
The adjustment of the horizontal zero (0) balance is now completed.
6. After adjusting the horizontal zero (0) balance, turn the balance weight clockwise in the direction of the arrow and align to the correct stylus pressure. (See Fig. 12.) (Follow the cartridge manufacturer's recommendation.) As the stylus-pressure ring moves in step with the balance weight, proper stylus pressure can be selected by directly reading the graduated ring.

■ Adjustment of anti-skating control

Set the anti-skating control knob to the same value as the stylus pressure. (See Fig. 13.)

■ Adjustment of tonearm height (See Fig. 14.)

The height of the tonearm can be adjusted up to 6 mm and a scale is provided on the adjust ring in 0.5 mm increments. Be sure to set the proper arm height using the adjust scale and referring to the table below.

Before adjusting the tonearm height, unlock the tonearm by turning the arm lock knob.

Height of cartridge (mm) (H)	Scale reading on the arm-height adjust ring
15	0
16	1
17	2
18	3
19	4
20	5
21	6

For example, if the cartridge height is 17.5 mm, the arm-height adjust ring should be positioned at the intermediate location between 2 and 3 on the scale. (See Fig. 14.)

Caution:

Be sure to lock the tonearm by turning the arm lock knob in the direction indicated by the arrow after finishing the height adjustment for the tonearm.

The height adjust ring should be used within a scale range of 0~6.

■ Installation of dust cover (See Fig. 15.)

Place the dust cover in position from directly above, holding it at both sides. For detaching the dust cover, be certain first to raise it as illustrated before removal.

Note:

Opening or closing of the dust cover during play should be avoided. This may not only cause undesired vibrations, but also result in skipping of the stylus.

If you must open the dust cover during play, do so as gently as possible.

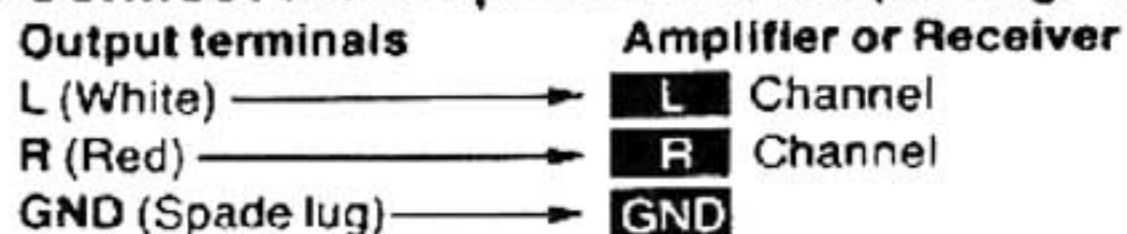
- The legs/insulators also have functions for adjusting the height of the turntable unit itself. After installing the unit in the place for use, adjust the legs to stabilize the main body horizontally. (See Fig. 16.)

Placement

- Place the unit in a stable and horizontal position, where there is little or no vibration.
- Locate the unit as far away from the speakers as possible and isolate the unit from sound radiation from them.
- Do not place the unit where it is exposed to direct sun, dust, moisture or heat.
- Keep it in a well ventilated place.
- When a radio is placed too close to the turntable and is played while the turntable is in operation, interference to AM/FM reception may result.

Connections

■ Connect the output terminals (See Fig. 17.)



Note:

Be sure to connect the ground terminal firmly to the amplifier or receiver. If this connection is not made or is loose, a power source "HUM" will result.

■ Connect the AC power plug

Connect the AC power plug to an AC wall socket.

Caution:

Make sure that the turntable's AC line-voltage selector is matched to your local voltage before connecting the AC power plug.

Never connect to a DC socket.

If the pre-selected voltage is different from your local voltage, turn the AC line-voltage selector with a screwdriver so that it corresponds to your local voltage.

The AC line-voltage selector is located under the turntable platter. (See Fig. 17.)

How to operate

1. Place a record on the turntable mat.
2. Turn the power switch to the "on" position. (See Fig. 18.)
The speed indicator for 33-1/3 rpm and the strobe-illuminator will all light up.
Note:
Since the unit has been designed to select 33-1/3 rpm automatically each time you push the power switch to "on", push the 45 rpm speed select button if you play a 45 rpm record (See Fig. 19.)
3. Remove the stylus protector, if your cartridge has a detachable one.
4. Release the arm clamp.
5. Push the start • stop button. (See Fig. 20.)
The turntable platter will start to rotate.
6. Set the cueing lever to the up position. (See Fig. 21.)
7. Move the tonearm over the desired groove.
8. Set the cueing lever to the down position. (See Fig. 21.)
The tonearm will descend slowly onto the record and play will begin.
9. When play is finished, move the tonearm to the arm rest; secure the tonearm with the arm clamp.
10. Push the start • stop button.
After the turntable is brought to a stop by means of the electronic brake, turn off the power.
Note:
The electronic brake does not function if the power switch is turned off before the start • stop button is pushed.

■ How to suspend play

Set the cueing lever to the "up" position.

The stylus tip of the cartridge will be lifted from the record.

■ When you play a 45-rpm record with a large center hole

Place the 45-rpm adaptor on the center spindle. Push the 45 speed select button.

■ Stylus illuminator (See Fig. 22.)

This unit is provided with a stylus illuminator for illuminating the stylus tip during play.

By pressing the stylus illuminator switch, the stylus illuminator is raised into position for illuminating the stylus tip. When not in use, keep the stylus illuminator lowered through depression.

Note:

The switch must be firmly engaged.

Incomplete depression of the switch will not raise the illuminator even though the lamp is lit.

Adjustments

■ Pitch control (fine adjustment of speed) (See Figs. 23 and 24.)

When the pitch control knob is located at the center of the position after turning on the power, the green LED indicator is lit showing the operating condition for the predetermined speed (either 33-1/3 or 45 rpm). The pitch control is variable in a range of about $\pm 8\%$.

Figures on the indicator show approximate percentages for variable pitch control.

When the strobe dots in 4 stages marked at the peripheral edge of the turntable appear to be stationary, variation of individual pitches is shown. (See Fig. 24.)

When (1) appears stationary, it shows a +6% pitch variation.

When (2) appears stationary, it shows a +3.3% pitch variation.

When (3) appears stationary, it shows normal turntable speed, 33-1/3 or 45 rpm.

When (4) appears stationary, it shows a -3.3% pitch variation.

Note:

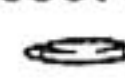
The strobe-illumination of this unit employs a strobe-illuminator LED synchronized with the precise quartz frequency.

For fine adjustment of the turntable speed, be sure to effect the adjustment according to the LED illumination.

Also keep the reset button released.

The LED illumination is not synchronized using fluorescent lamps.

■ Reset button (See Fig. 25.)

 : The turntable rotates at the rated speed (33-1/3 or 45 rpm) no matter where the pitch control knob is positioned, and the green LED indicator is illuminated.

 : The turntable rotates at the speed which has been adjusted by the pitch control knob.

■ Adjustment of arm-lift height (See Figs. 26 and 27.)

The arm-lift height (distance between the stylus tip and record surface when the cueing lever is raised) has been adjusted at the factory before shipping to approximately 8~13 mm.

If the clearance becomes too narrow or too wide, turn the adjustment screw clockwise or counterclockwise while pushing the arm lift down.

Clockwise rotation

—distance between the record and stylus tip is decreased.

Counterclockwise rotation

—distance between the record and stylus tip is increased.

Note:

As the adjusting screw has a hexagonal head, be sure to make the adjustment while depressing the arm lift, or the screw will not move freely.

Also be sure that the hexagonal head retracts correctly into the arm lift when the latter is released.

Notes and maintenance

■ Use utmost care when handling the platter and when placing it on the motor shaft to prevent possible damage to the magnet.

■ Do not turn "on" the power supply, with the turntable platter detached.

■ Before detaching or attaching the headshell, be sure to turn the power of the amplifier or receiver off. Detaching or attaching of the headshell with the volume control turned up may cause damage to the speakers.

■ When play is finished, be sure to secure the tonearm with the arm clamp. After play is finished, if the unit is not to be used for some time, care should be taken to secure the tonearm to protect the stylus tip. For the same reason, the stylus protector should also be attached.

■ Dust and dirt should be carefully removed from stylus tip or records. Dust and dirt on the stylus tip or record may not only result in deterioration of tone quality, but also cause undue wear of the record and the stylus tip itself. Special stylus tip brushes and record cleaners can be purchased in most electronic supply houses.

■ Wipe the headshell terminals from time to time. Dust and dirt at the headshell terminals may result in increased "HUM" noise or intermittent sound. Use a soft dry cloth to clean the headshell terminals.

■ Wipe the dust cover and turntable base with a soft, dry cloth. Never use any cleaners containing alcohol, benzine or thinner. Use of a chemical dust cloth should also be avoided. Be sure that the dust cover is not exposed to insecticide spray. To remove stubborn fingerprints or grease spots, detach the dust cover and disconnect the AC power plug. Use a soft cloth slightly moistened with a mild soap and water solution. Do not wipe the dust cover during play, or the tonearm may be attracted toward the dust cover due to the generation of static electricity.

■ Lubrication (See Fig. 28.) Apply 2 or 3 drops of oil once after every 2000 hours of operation. The time interval is much longer than that for conventional type motors (200~500 hours). Please purchase original oil. (Part number is SFWO 010.)

■ Transportation of the unit to distant places for removal and the like. Pack up the unit in the reverse order to that for unpacking, using the packing materials furnished when the unit was purchased. Should there be no such packing materials, be sure to take the following steps.

- Remove the turntable platter together with the turntable mat, and wrap it up to prevent any damage to them.
- Return the tonearm to the arm rest, and affix it with tape or the like.
- Remove the balance weight and the headshell/cartridge from the tonearm and then wrap them up to avoid any damage to them.
- Wrap up the turntable base with a blanket or soft paper also to prevent any possible damage to it.

For longer and safer use of this unit

In order to receive the best service from this unit, and for the safest operation, carefully read the following information.

■ Power source

It is very dangerous to use this unit at a voltage which is different from the rated voltage.

There is danger of combustion if the unit is connected to a power source which is different from the rated voltage.

Be very careful concerning this point.

Direct current cannot be used.

There are some places, such as ships, where direct current is used as the power source. Before connecting the unit, confirm the power source.

■ Connection of power cord

Be sure to never touch the power cord with wet hands because there is danger of electric shock. This is true, of course, of all electric equipment.

Do not pull the power cord.

Never pull the power cord to disconnect it. Always pull the plug only.

■ Location of unit

Choose a place which is not in direct sunlight.

Select a place which will assure good ventilation.

■ Never place heating equipment nearby.

Be sure to keep stoves and other sources of heat away from this unit, because heat radiated by such equipment may cause deformation of plastic parts or damage the cabinet, or, at worst, cause a fire.

■ Especially for families with children

Take care that no small items, such as metal objects, are put inside this unit.

In addition, children should be especially warned not to put anything into the ventilation holes, such as toys or a screw-driver, because these things may cause an electric shock or result in a malfunction of the unit.

■ If water spills on the unit.

If water should happen to spill on the unit, from an overturned vase for example, there is danger of fire or electric shock. Disconnect the power plug from the electric outlet immediately, and contact the store from which the unit was purchased.

■ Reconstruction can cause accidents.

Absolutely never try to remodel, reconstruct or repair this unit yourself. Do not attempt to touch any internal parts because to do so may result in an electric shock or other accident.

■ Be sure the power is off.

After you have finished using this unit, check once more to be sure that the power is off. If the unit is left with the power on for a long period of time, it may not only be damaged, thus shortening its useful life, but may also lead to a dangerous accident.

Features

■ Total quartz locked continuous pitch adjustment about $\pm 8\%$

Quartz-phase-locked control means almost perfect accuracy of turntable rotation.

But with most quartz turntables, this accurate control circuit must be cut out when the pitch control is employed.

With the SL-1200LTD, however, pitch is variable continuously (analogically) by up to approximately $\pm 8\%$ under total quartz-locked control. The pitch is controlled with a large sliding lever, located to the right of the turntable platter.

Four lines of platter markings are also provided indicating $+6\%$, $+3.3\%$, 0% (exact rated speed) and -3.3% change from rated speed.

■ Aluminum diecast cabinet and special heavy rubber base material provide acoustic isolation

The effects of external vibrations are dramatically reduced in the turntable by this new turntable construction.

The turntable base is precision-made aluminum diecast. And the underside of the main base is made of a heavy rubber material which has excellent vibration resistance and absorbing characteristics. The turntable platter is also vibration-damped with specially fabricated rubber matting in the underside along with the thick turntable sheet (rubber mat). Four large-size insulating feet also help to absorb unwanted vibrations.

These features make the SL-1200LTD ideal for use with extra-high sound pressure levels.

■ High torque for fast starts

The integral rotor/platter motor delivers $1.5 \text{ kg}\cdot\text{cm}$ ($1.3 \text{ lb}\cdot\text{in}$) starting torque. This high torque gives very quick starts enabling the platter to reach $33\frac{1}{3} \text{ rpm}$ within 0.7 s . (a quarter of a turn). This is a big advantage in many professional applications where fast cueing is a necessity.

■ Stylus illuminator for low-light conditions

■ High sensitivity, low mass, gimbal suspension tonearm

The highly sensitive tonearm features a genuine gimbal suspension, the rotational center of which is precisely defined at one point. Bearings are finished to a tolerance of $\pm 0.5 \text{ microns}$. This, and the extra-closeness of pivot center to the bearings, result in the minimal friction of 7 mg (0.007 g) for both horizontal and vertical movement. Add to this the low 12-gram effective tonearm mass (including headshell, without cartridge) and you have a tonearm compatible with the wide range of compliances found in today's cartridges. If you choose a popular high compliance MM cartridge, the low range resonance frequency will appear in the correct area to avoid warp frequencies of records, but without entering the low end of the audio spectrum. This tonearm is provided with a computer designed, light-weight, high-rigidity headshell made of single-piece diecast aluminum to resist partial vibration. The universal design allows headshell interchangeability. Contacts are gold-plated.

■ Helicoid tonearm height adjustment

Arm height is adjustable within a range of 6 mm to accommodate varying cartridge dimensions. Adjustments are done with a precision-made helicoid.

■ Other fine features

- Quick stops are achieved with a fully electronic braking system.
- A strobe illuminator is provided. The stroboscope is controlled by the extremely stable quartz oscillator, rather than potentially unstable AC line frequency.
- Power on/off control built-into strobe illuminator for ease of operation.
- Soft-touch start • stop switch allowing precision control capability without the annoyance of accidental operation.
- Technics integral rotor/platter motor construction with full cycle detection FG.

■ OPERATION CHECKS AND MAIN COMPONENT REPLACEMENT PROCEDURES

- NOTE**
1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
 2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.
 3. Select items from the following index when checks or replacement are required.
 4. Illustrated screws are equivalent to actual size.
 5. Refer the parts No. on the page of "Main Component Replacement Procedures", if necessary.

● Contents

•Checking Procedures for each P.C.B.

- | | |
|---|-------------|
| 1. Checking for the drive control P.C.B. and power supply P.C.B. | Page. 9,10. |
|---|-------------|

•Main Component Replacement Procedures

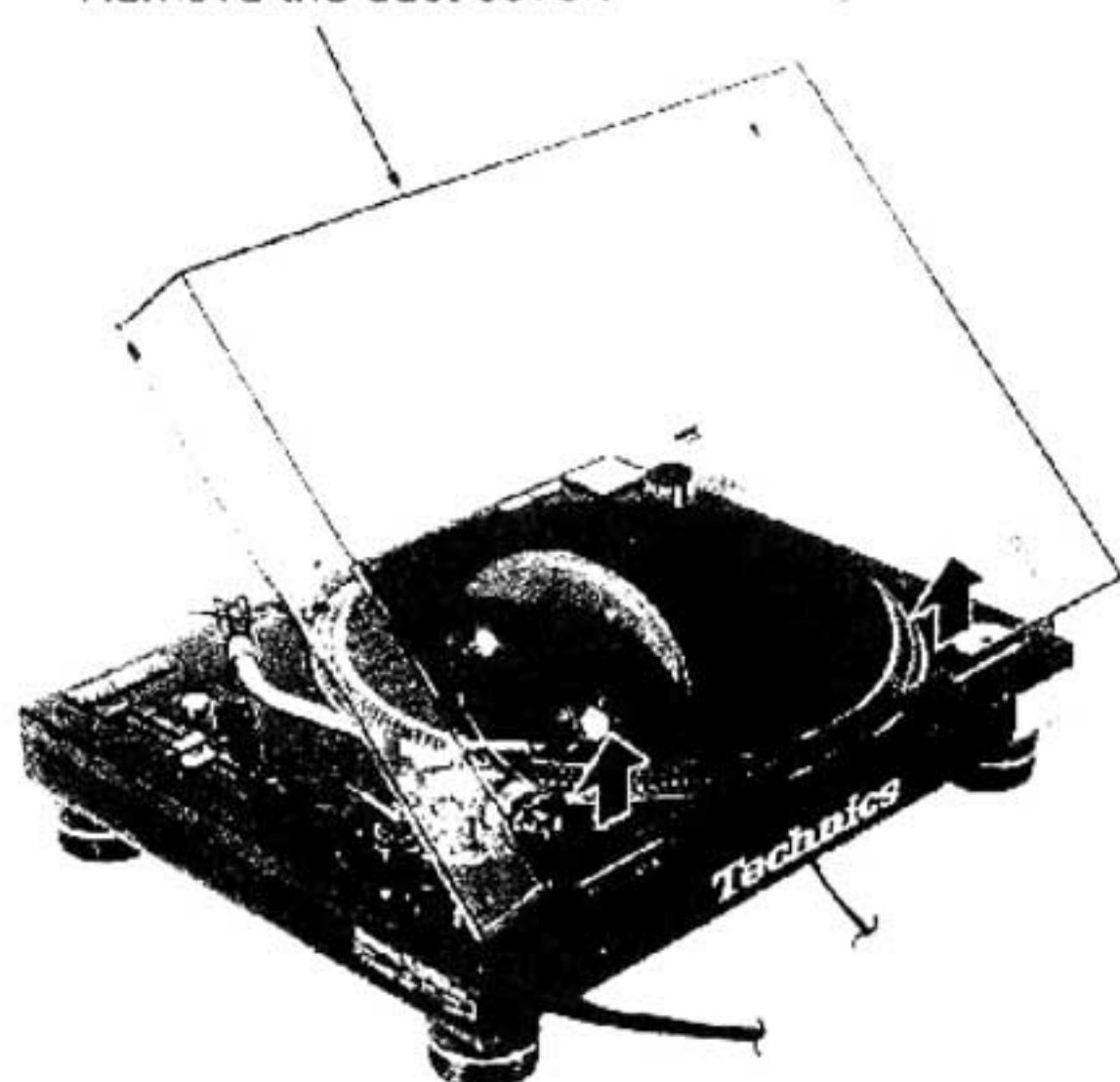
- | | |
|--|--------|
| 1. Replacement for the drive coil cover and drive coil ass'y. | 10,11. |
| 2. Replacement for the tonearm unit. | 11~14. |
| 3. Replacement for the lamp and stylus illuminator switch. | 15. |
| 4. Replacement for the parts mounted on speed selector P.C.B. and power switch. | 15. |

■ Checking Procedure for each P.C.B.

1. Checking for the drive control P.C.B. and power supply P.C.B.

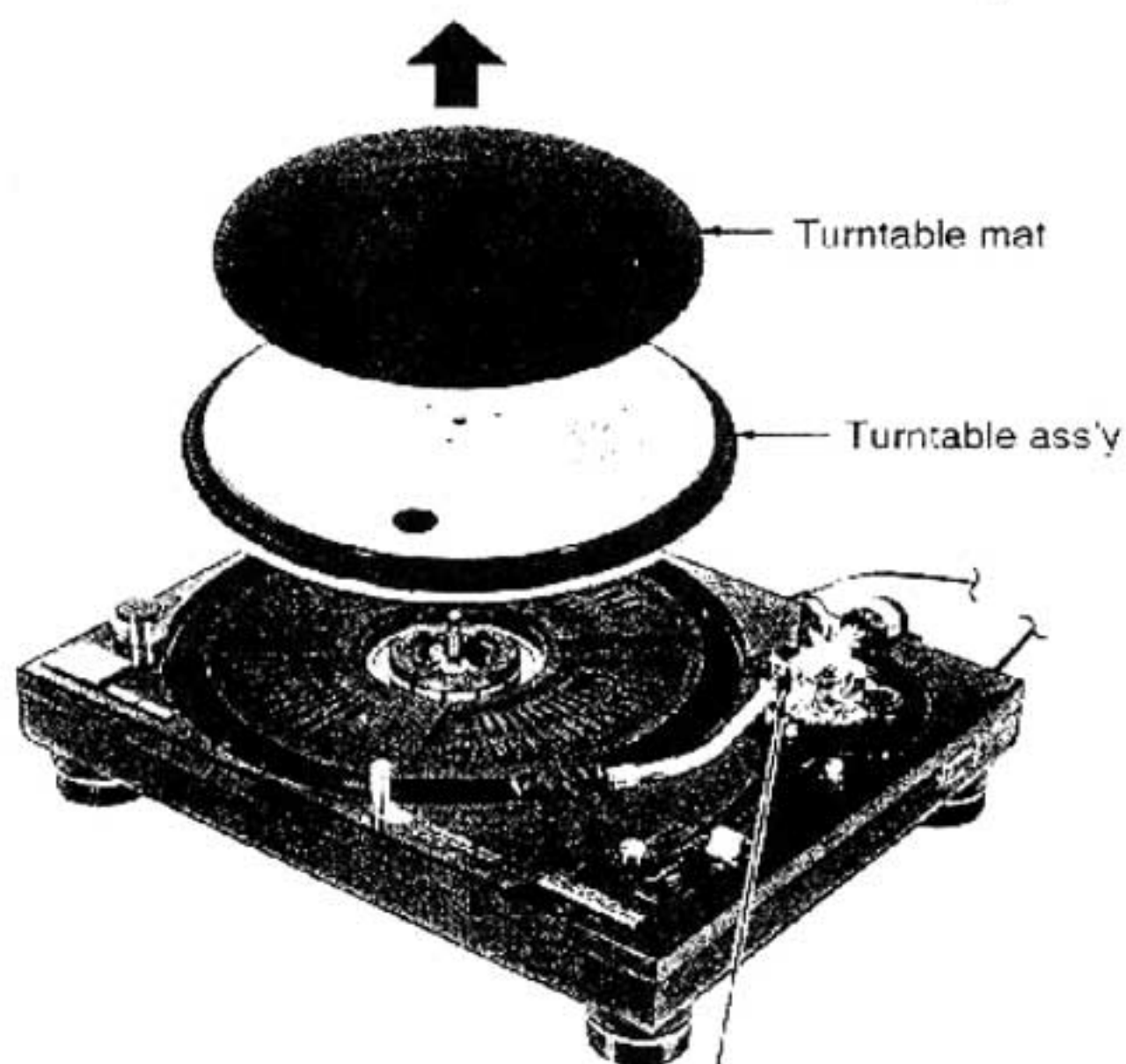
Step 1

Remove the dust cover.



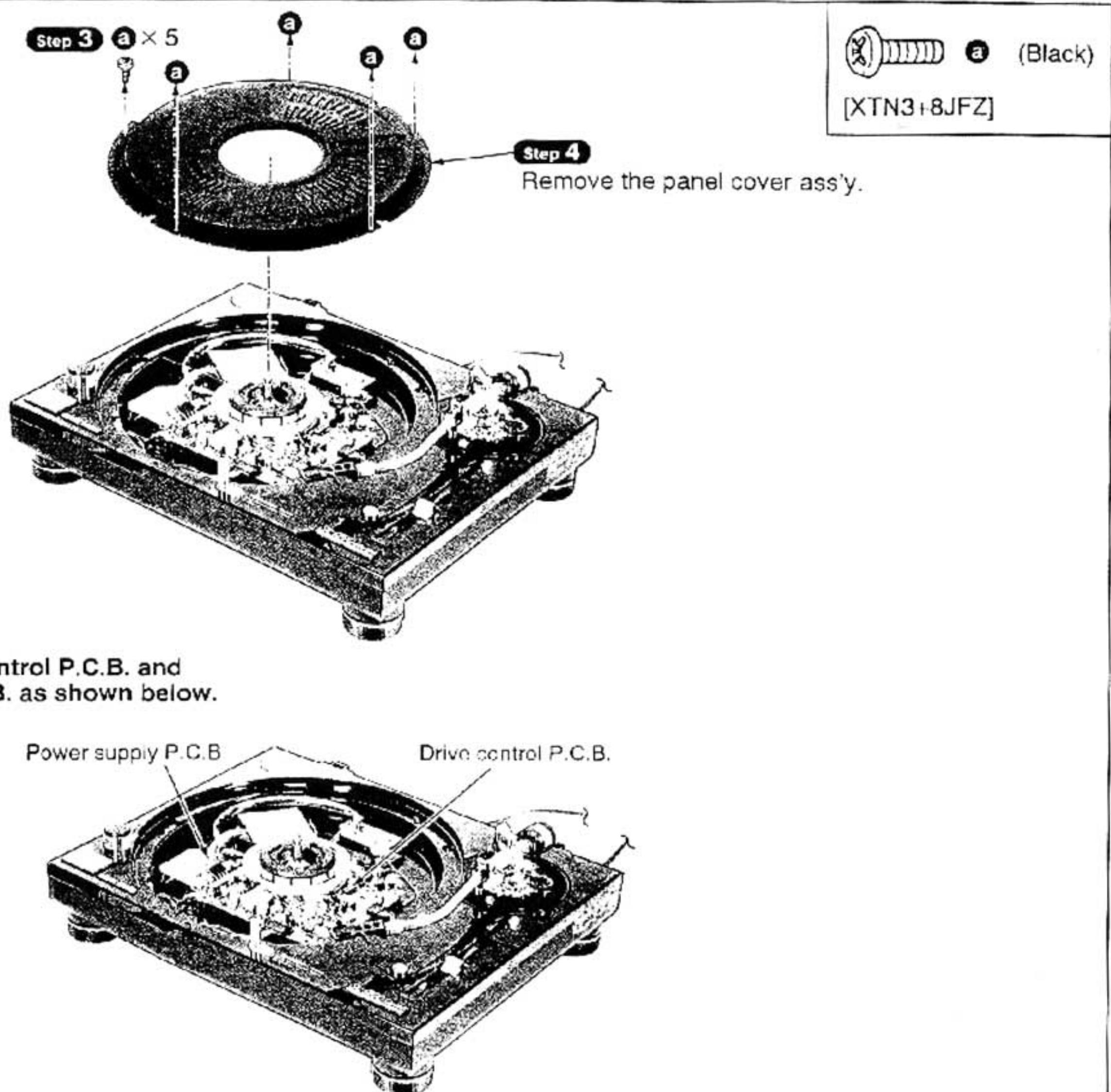
Step 2

Remove the turntable mat and turntable ass'y.



NOTE

The tonearm ass'y should be supported by arm rest.



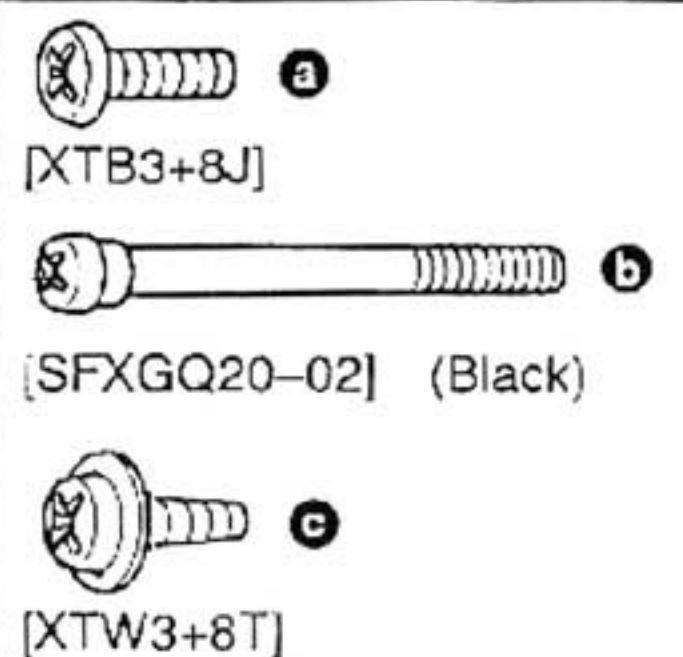
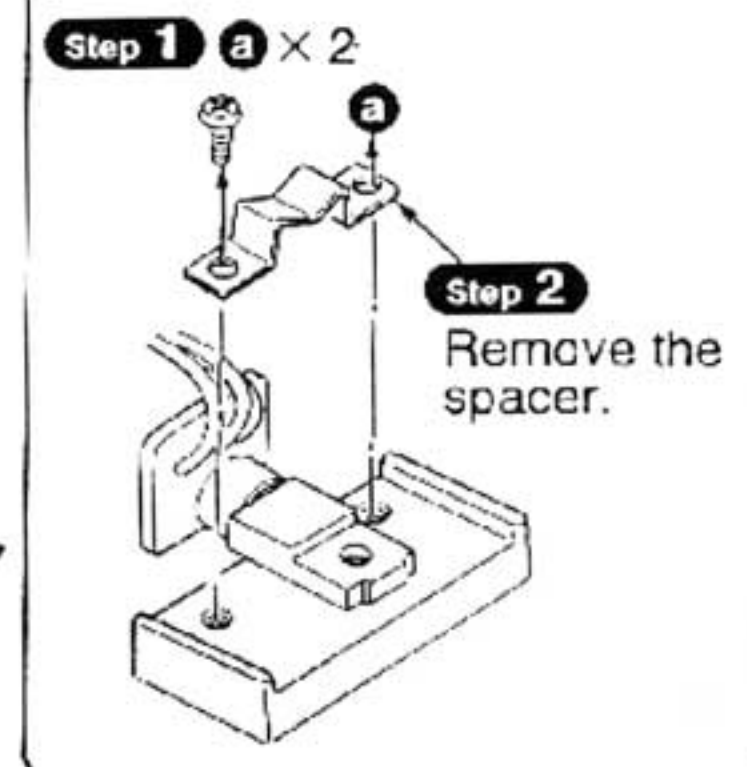
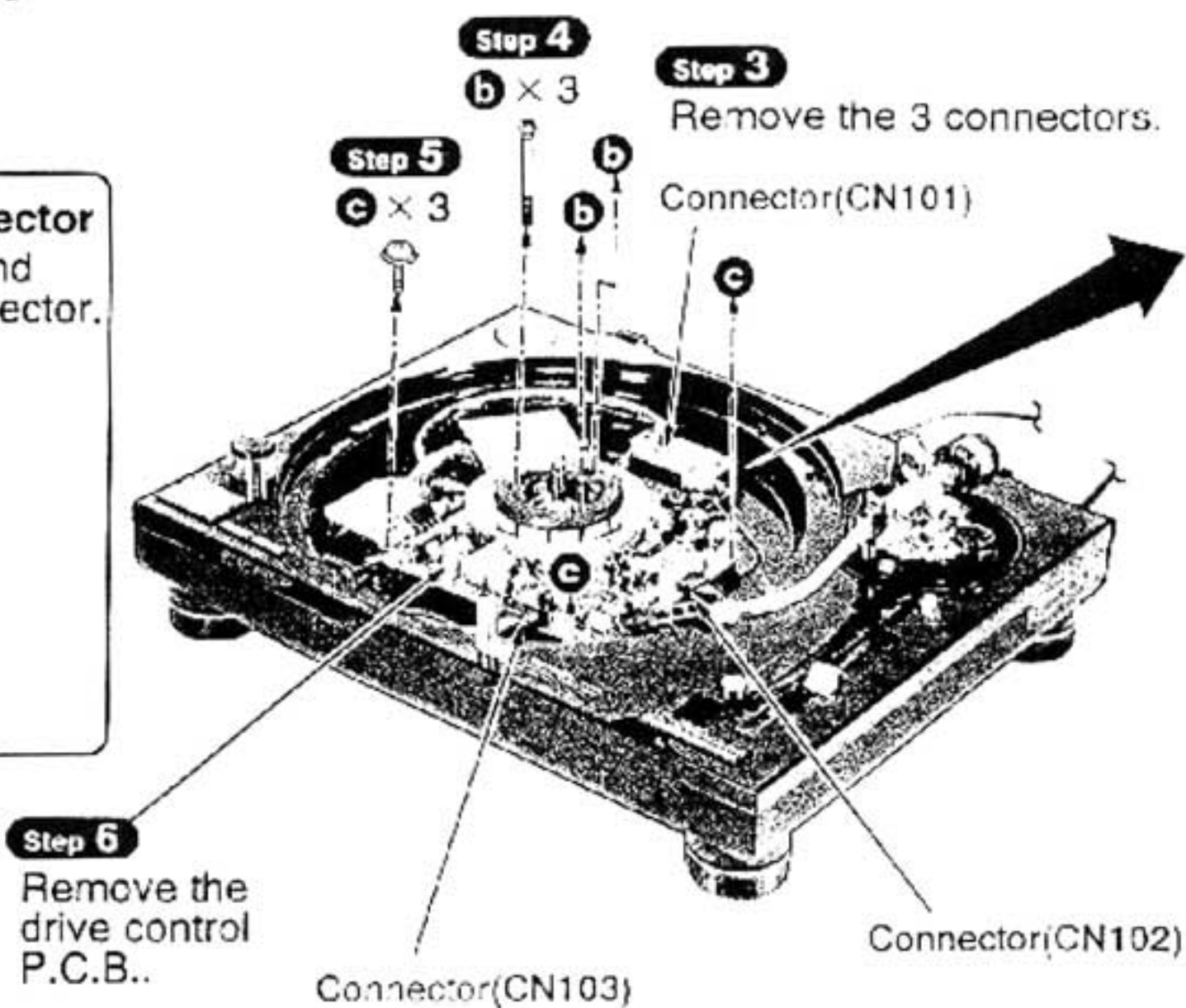
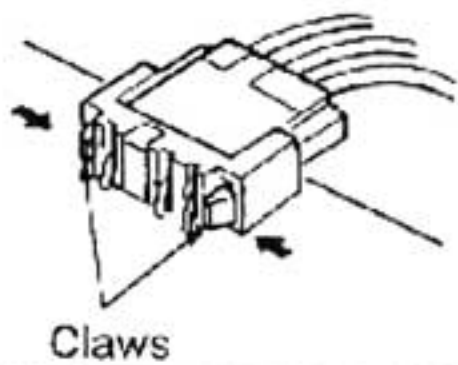
■ Main Component Replacement Procedures

1. Replacement for the drive coil cover and drive coil ass'y

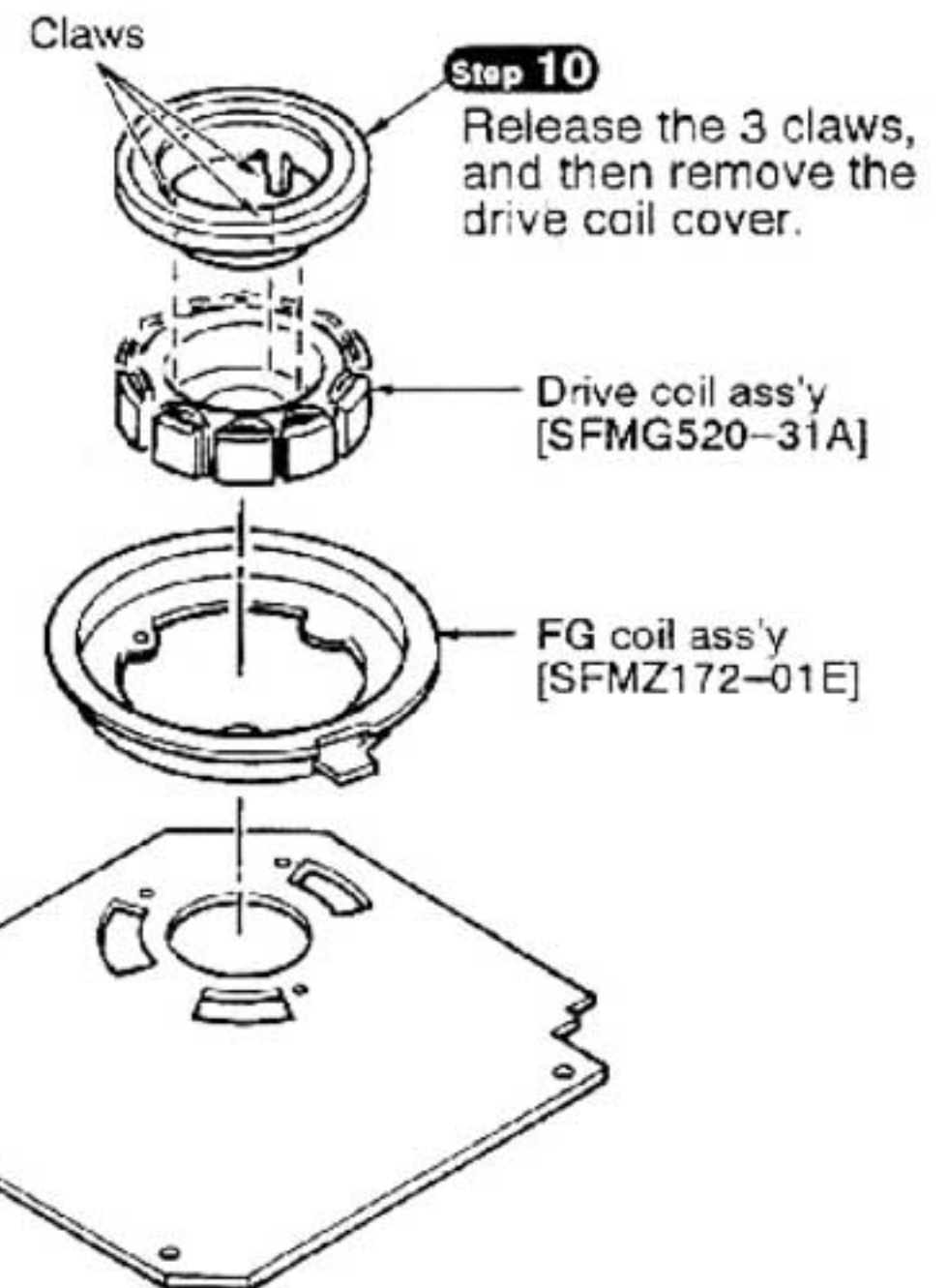
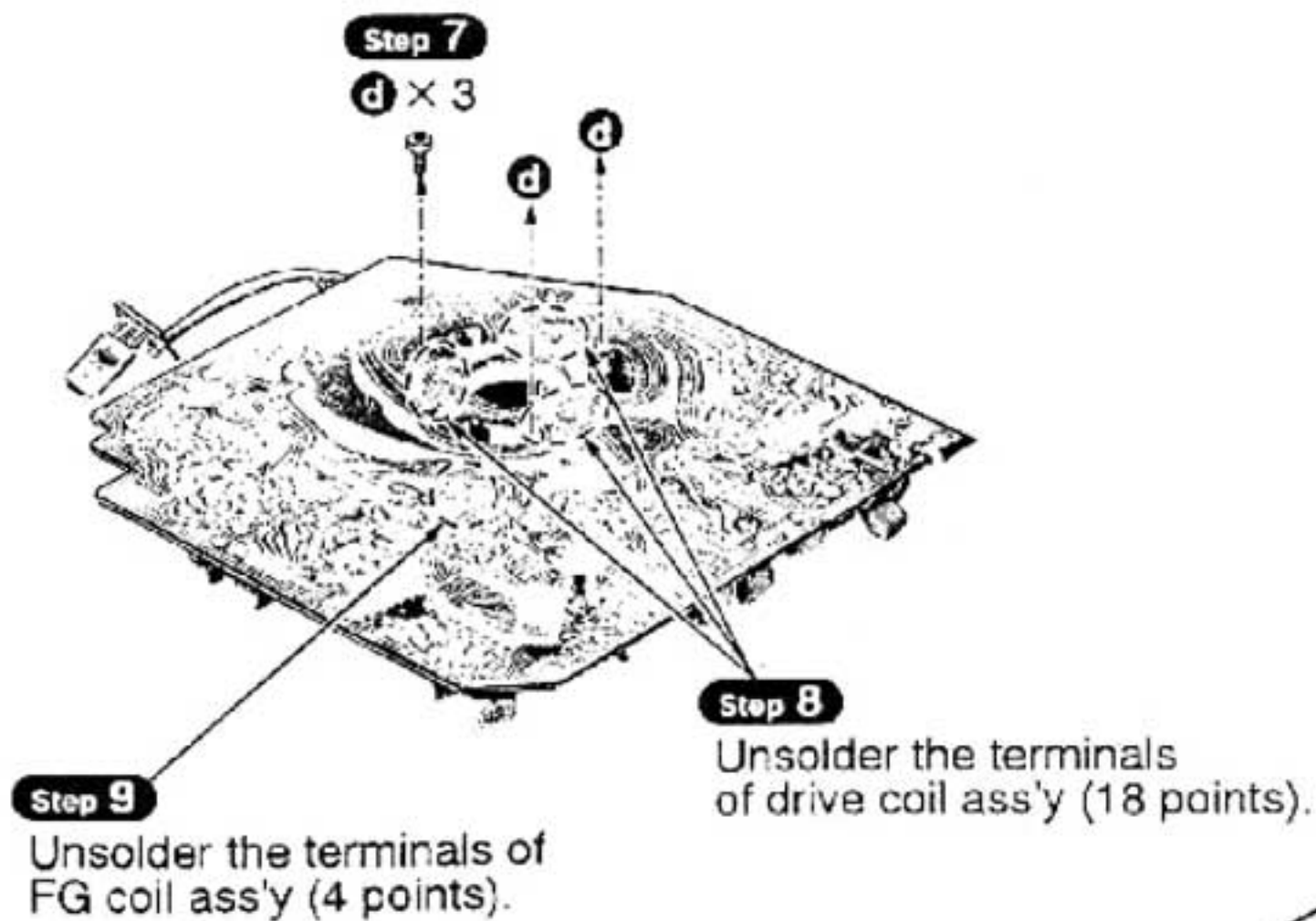
- Follow the **Step 1** - **Step 4** of the item 1 in checking procedure for each P.C.B. on page 10.

Removal of the connector

- Release the claws, and then pull out the connector.

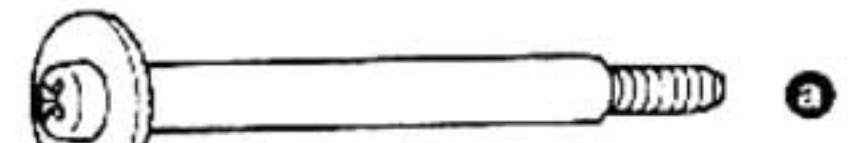


[Foil side of drive control P.C.B.]

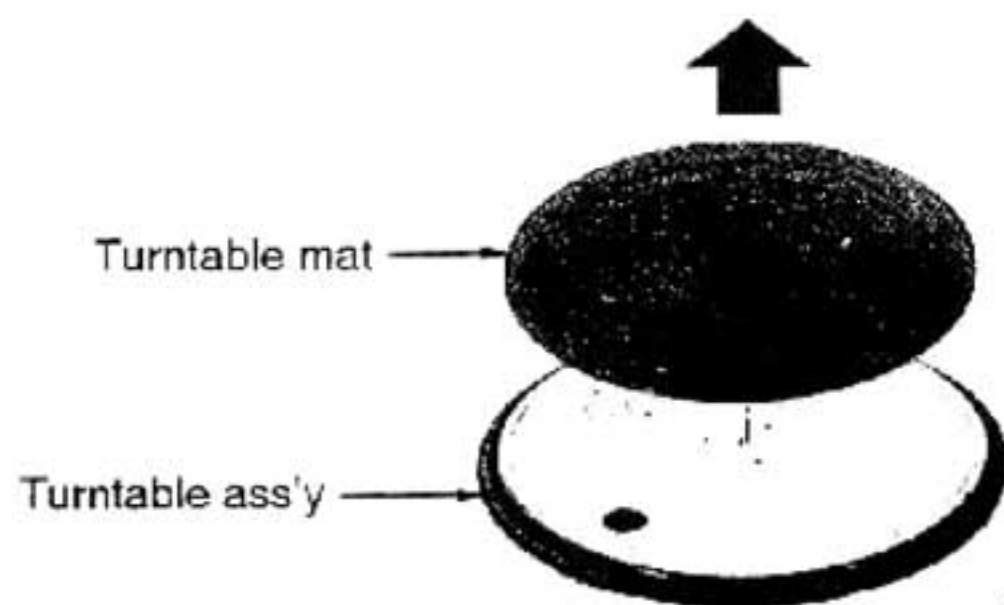


[XTN26+6J]

2. Replacement for the tonearm unit



[SFXG122-01]



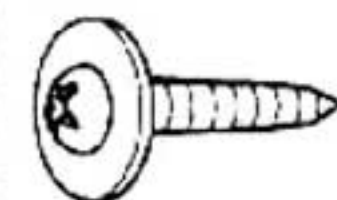
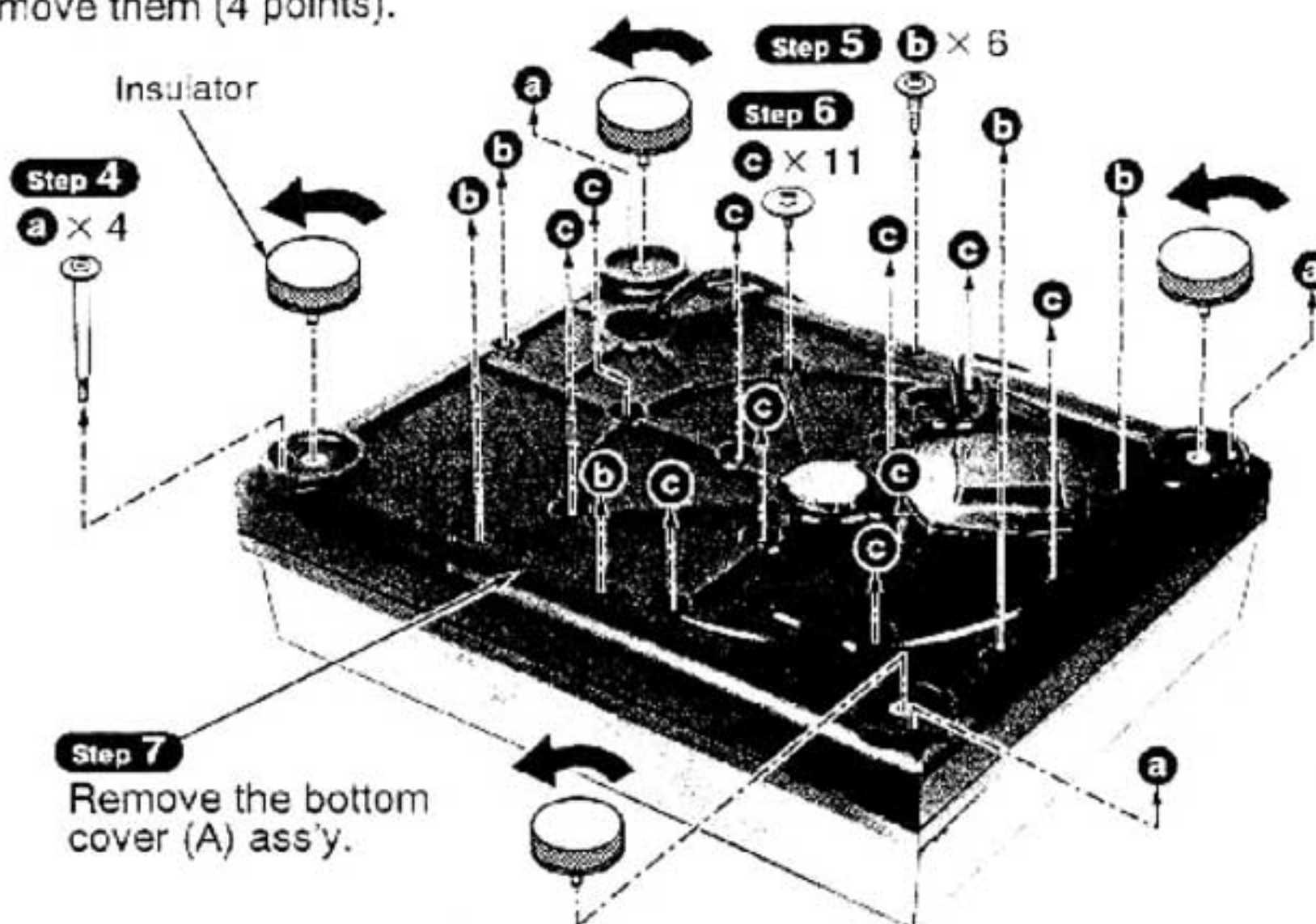
Step 1
Remove the turntable mat and turntable ass'y.



NOTE

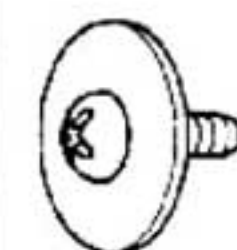
Use the soft cloth under the unit to prevent damage the dust cover when servicing.

Step 3
Turn the insulators in the direction of arrow, and then remove them (4 points).



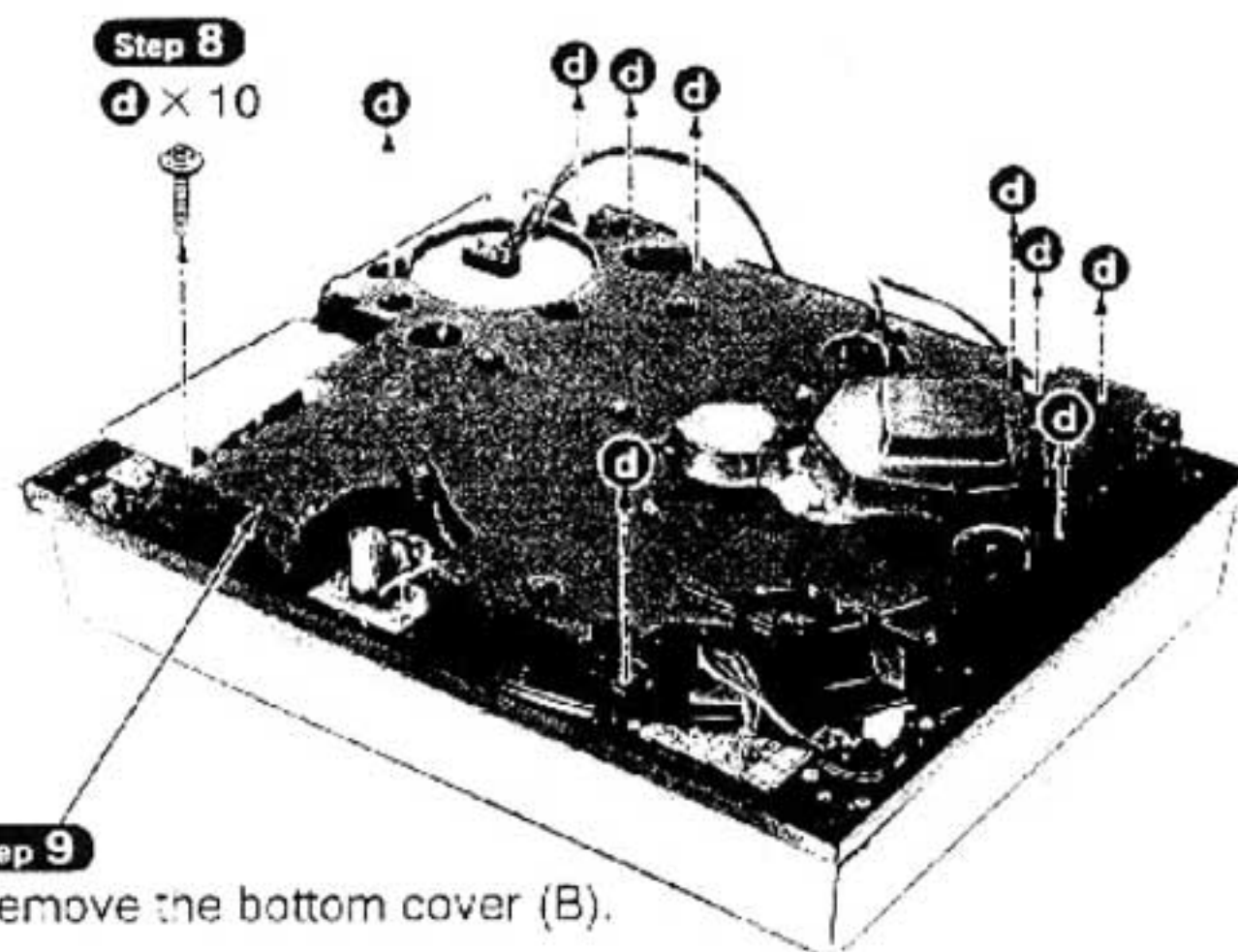
(b) (Black)

[SNSB9]



(c) (Black)

[SFXG122-02]



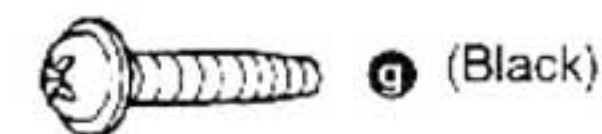
[XTW3+15T]



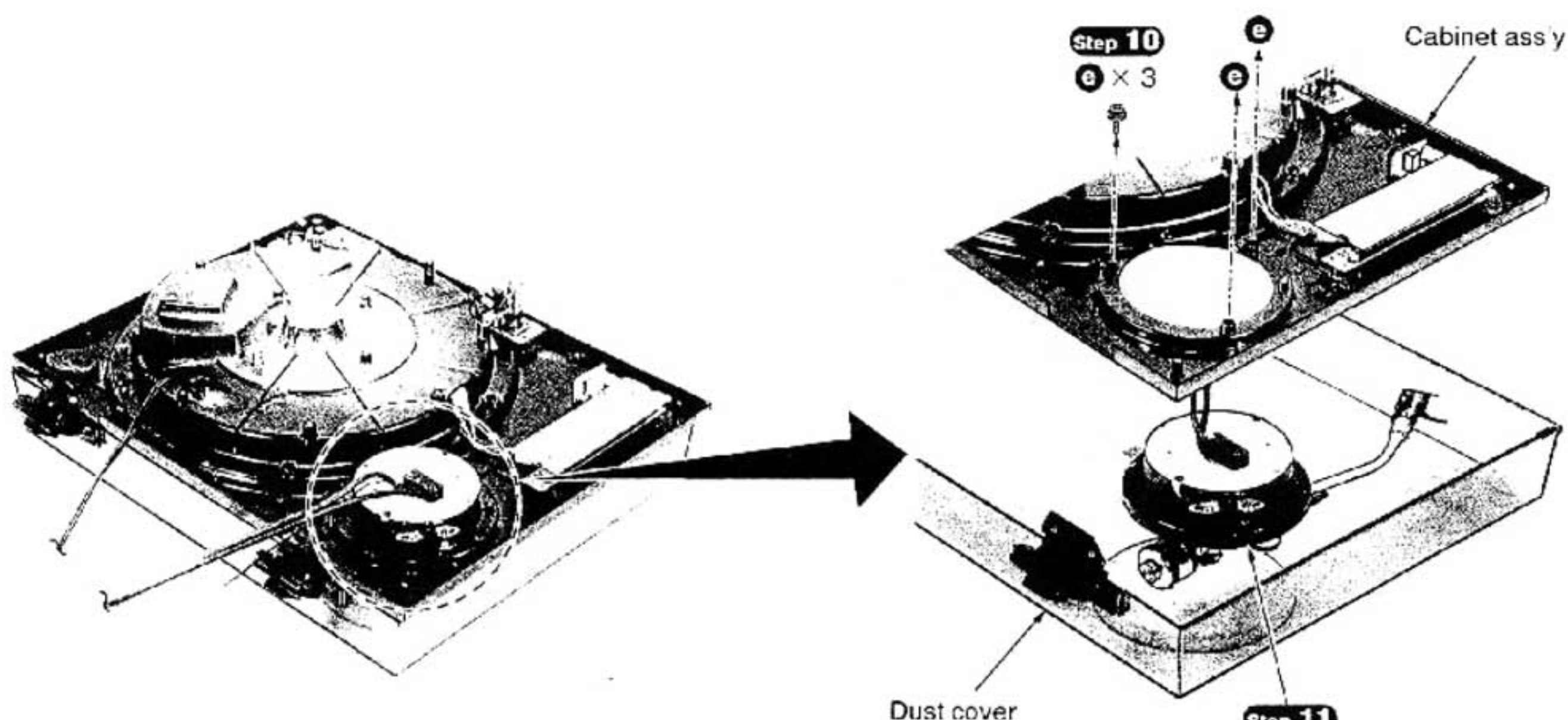
[SNSB10]



[XTB3+6JFZ]



[XTW3+12TFZ]

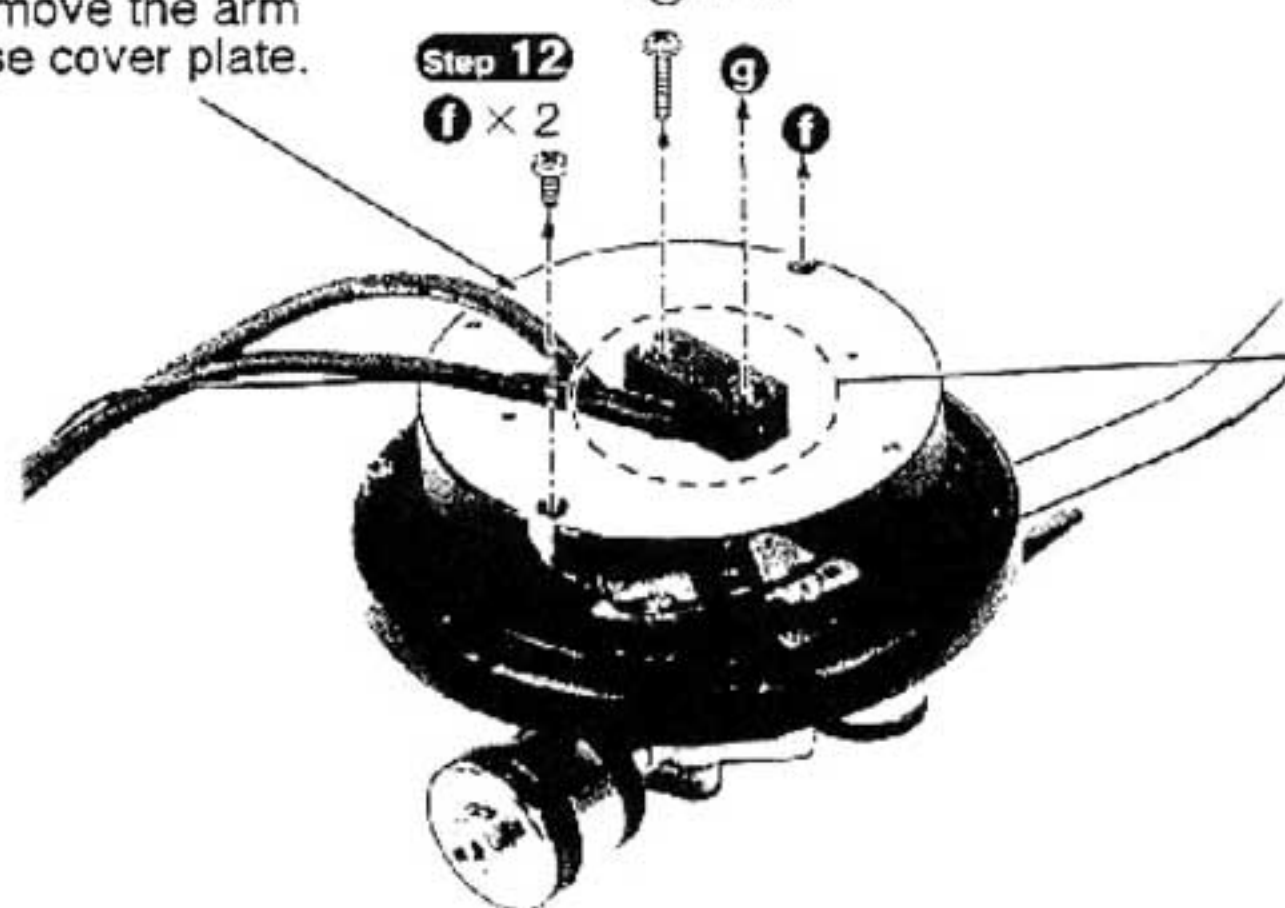


Step 11
Separate the dust cover and the cabinet ass'y, and then remove the tonearm ass'y.

Step 15
Remove the arm base cover plate.

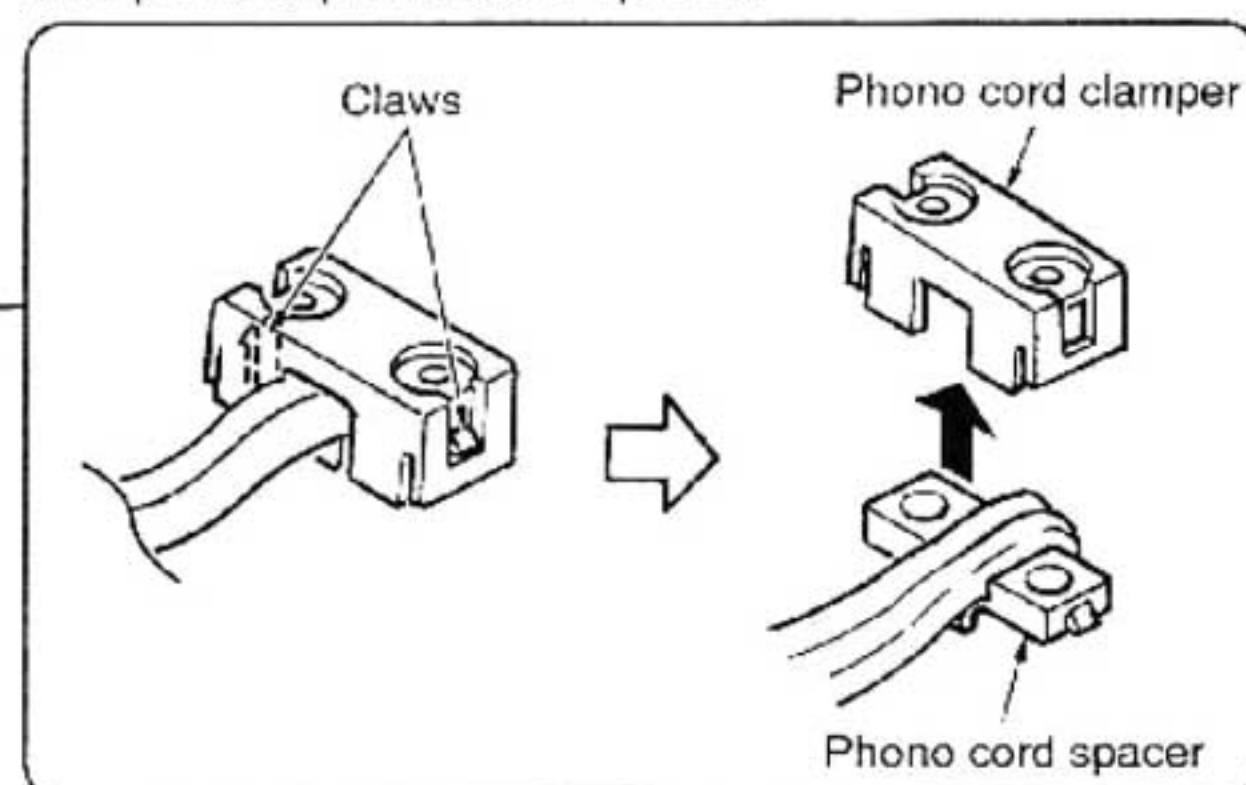
Step 12
f × 2

Step 13
g × 2



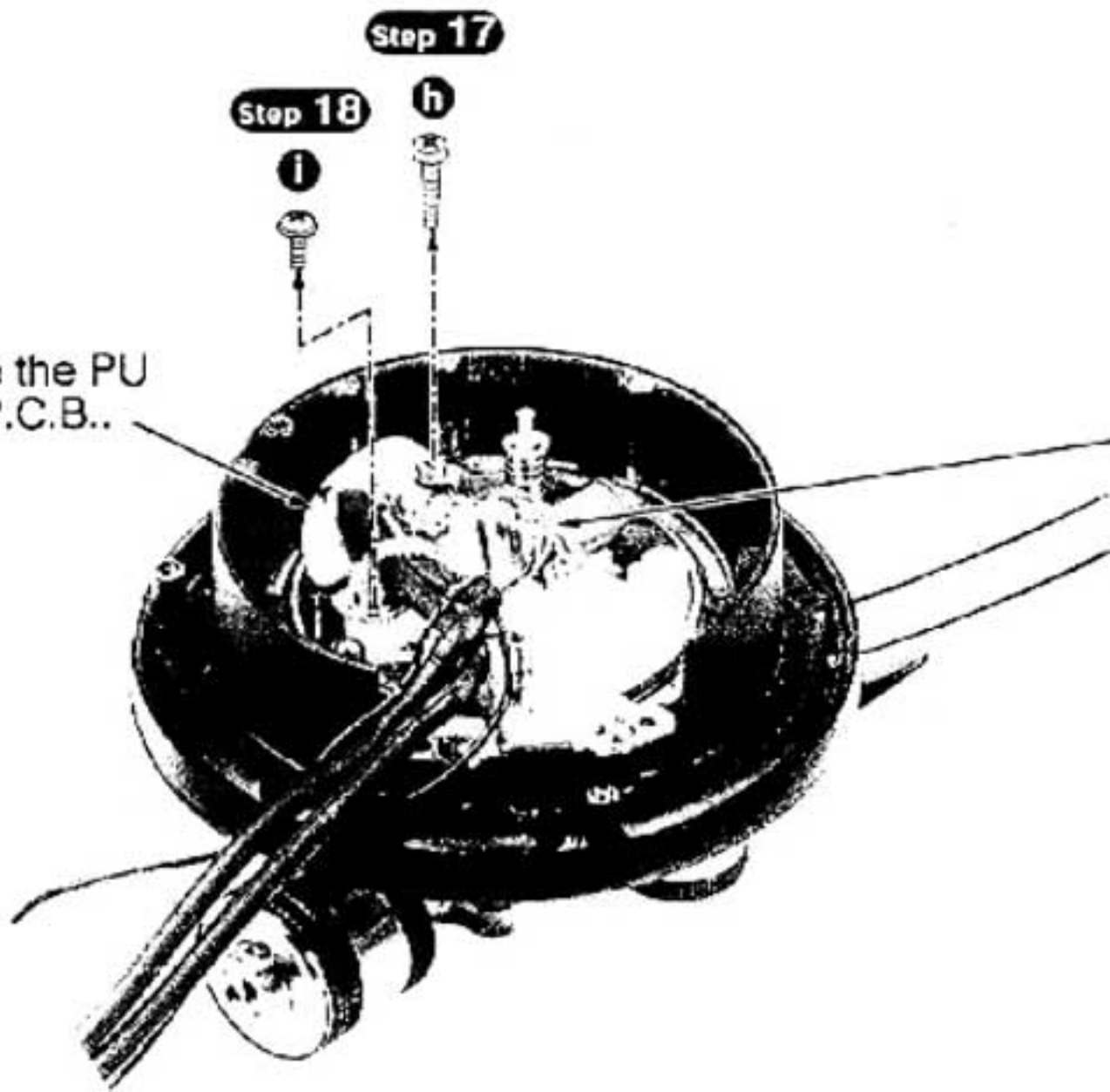
Step 14

Release the 2 claws, and then remove the phono cord clamber and phono cord spacer.



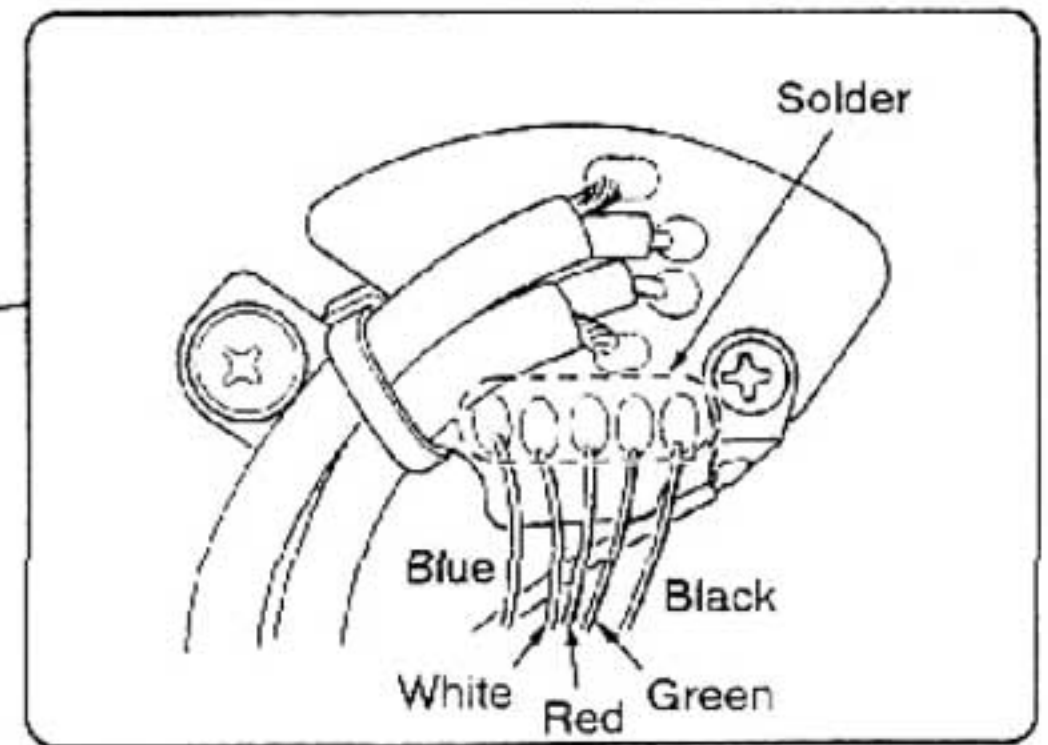
Step 19

Remove the PU output P.C.B..



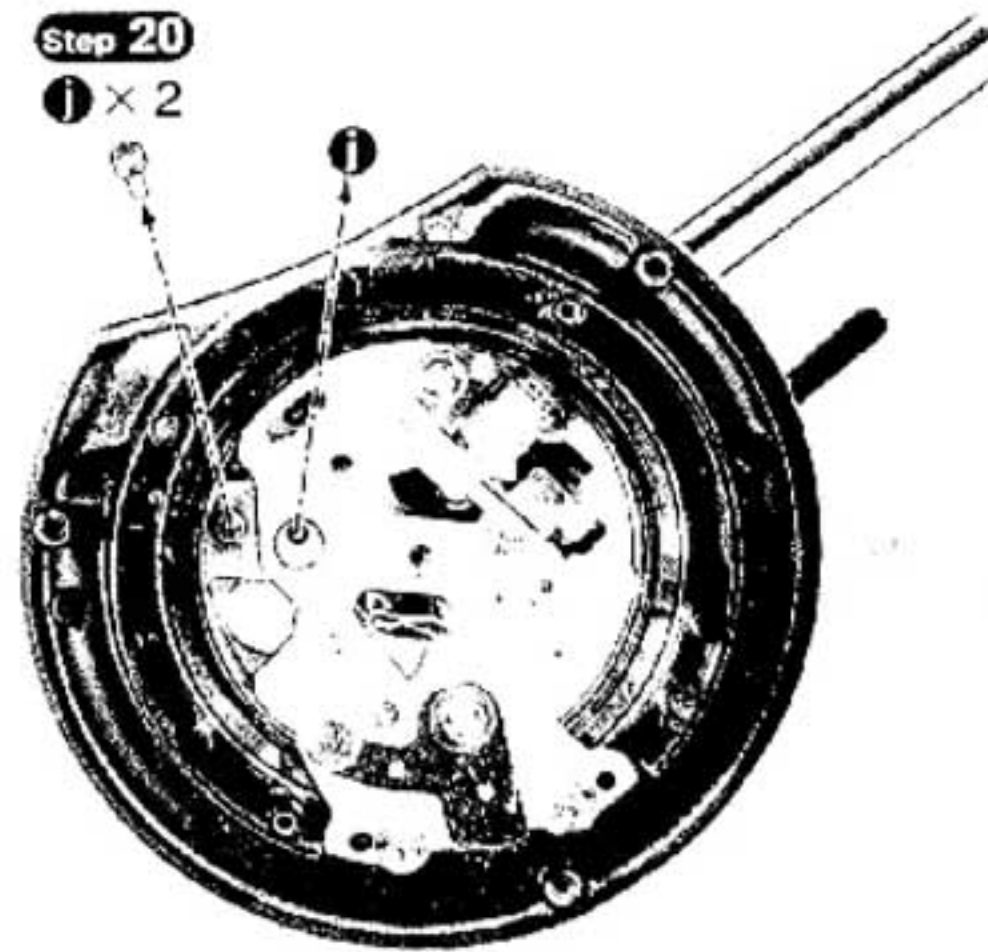
Step 16

Unsolder the terminals (5 points).

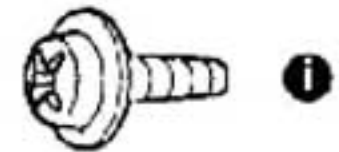


Step 20

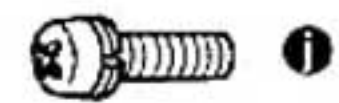
i × 2



[XTN3+25J]

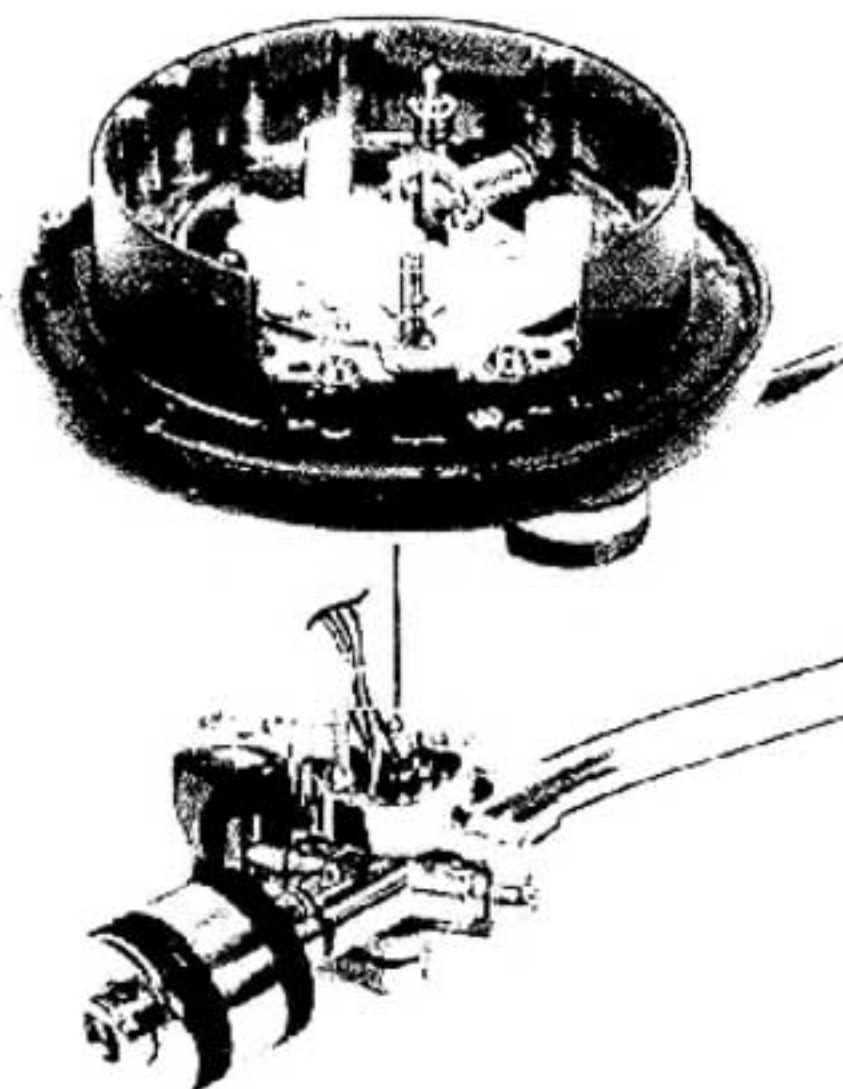


[XTW3+8T]



[XYN3+C10S]

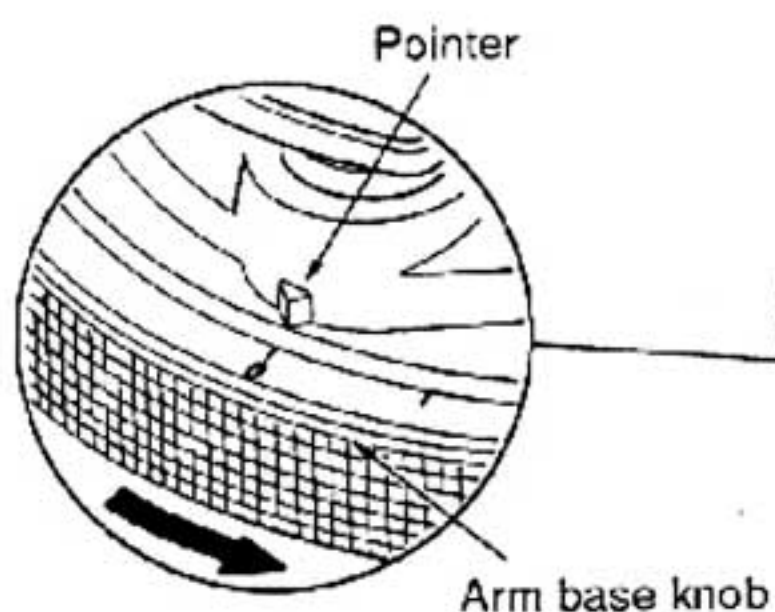
Armbase



Step 21

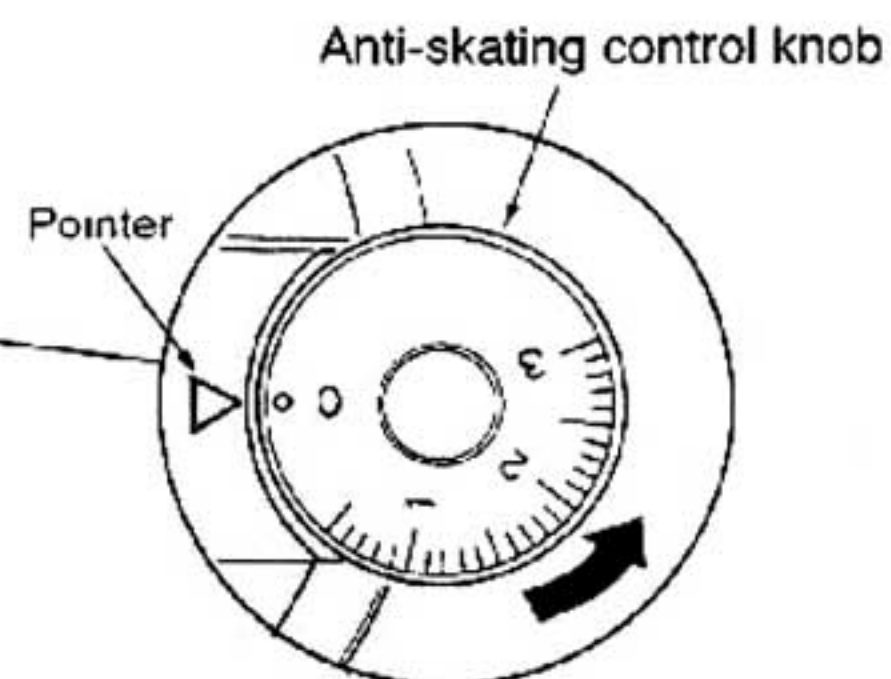
Remove the tonearm unit.

Reassembly procedures for tonearm ass'y



Step 1

Rotate the arm base knob in the direction of arrow, and then align the pointer with the scale "0".



Step 2

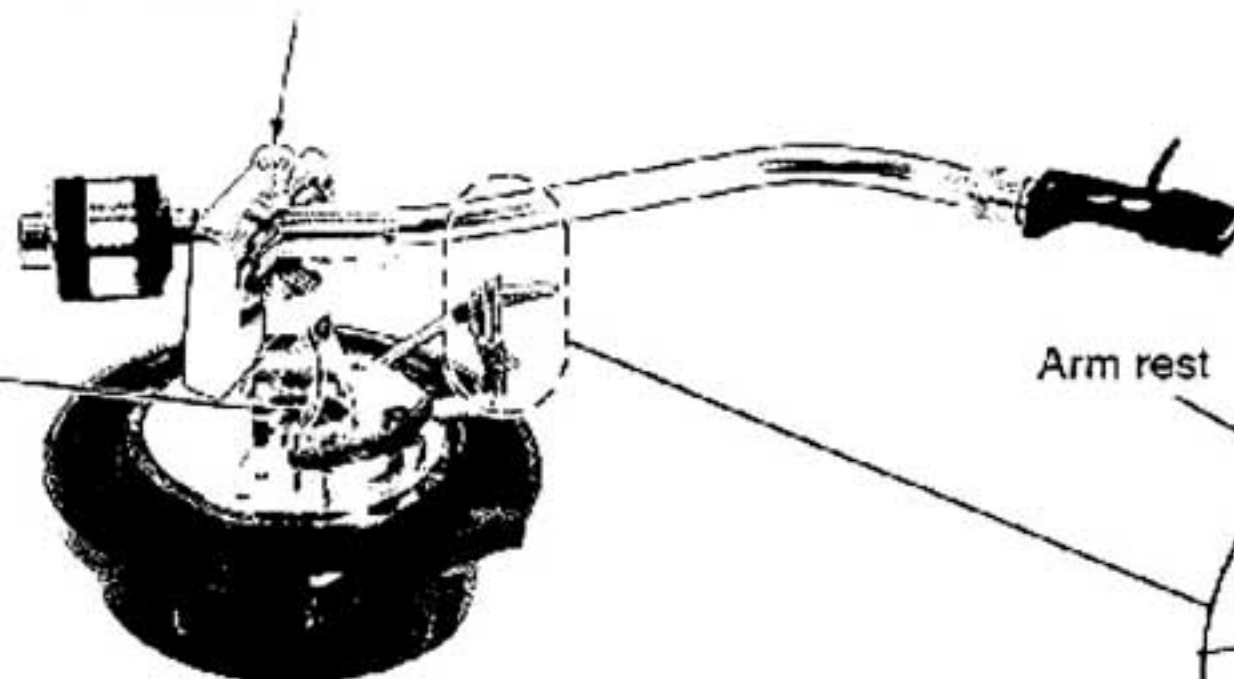
Rotate the Anti-skating control knob in the direction of arrow, and then align the pointer with the scale "0".

Step 4

Install the tonearm unit.

Step 3

Pass the 5 lead wires through the hole of arm base.



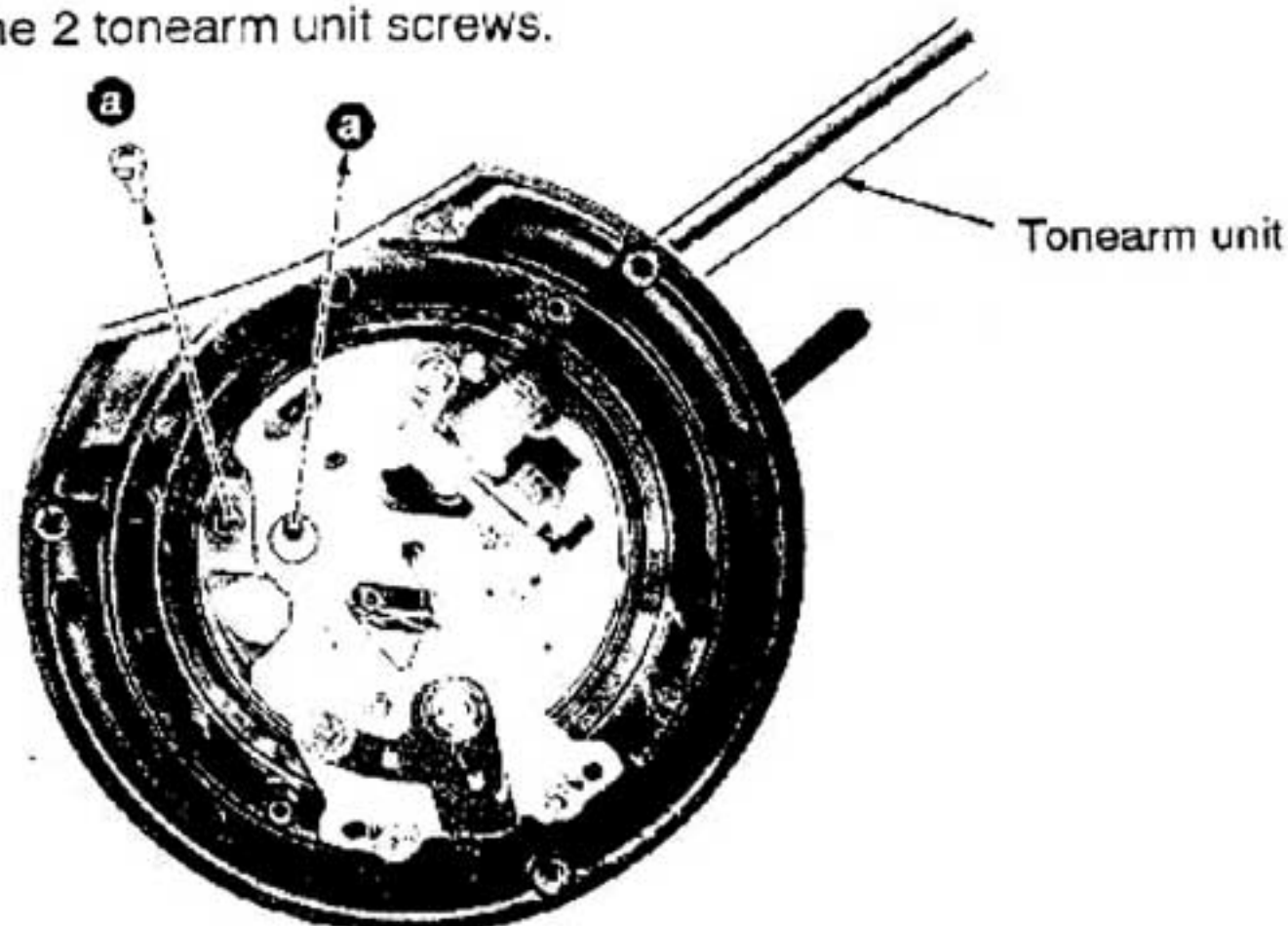
Step 5

Support the tonearm unit with arm rest.



Step 6

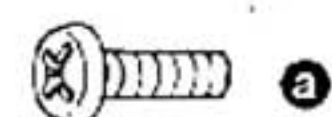
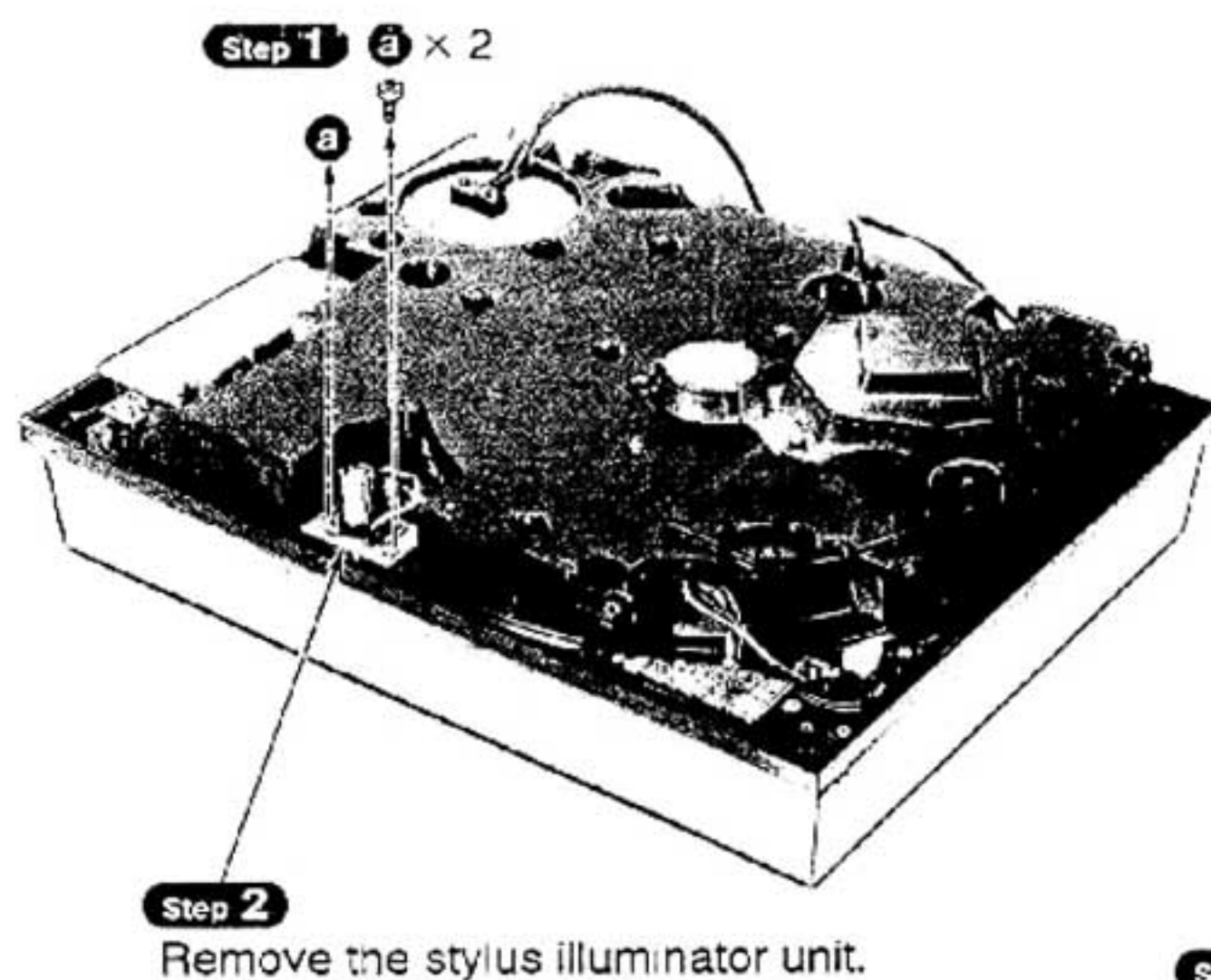
Tighten the 2 tonearm unit screws.



[XYN3+C10S]

3. Replacement for the lamp and stylus illuminator switch

- Follow the **Step 1** ~ **Step 7** of the item 2 in main component replacement procedures on page 11.



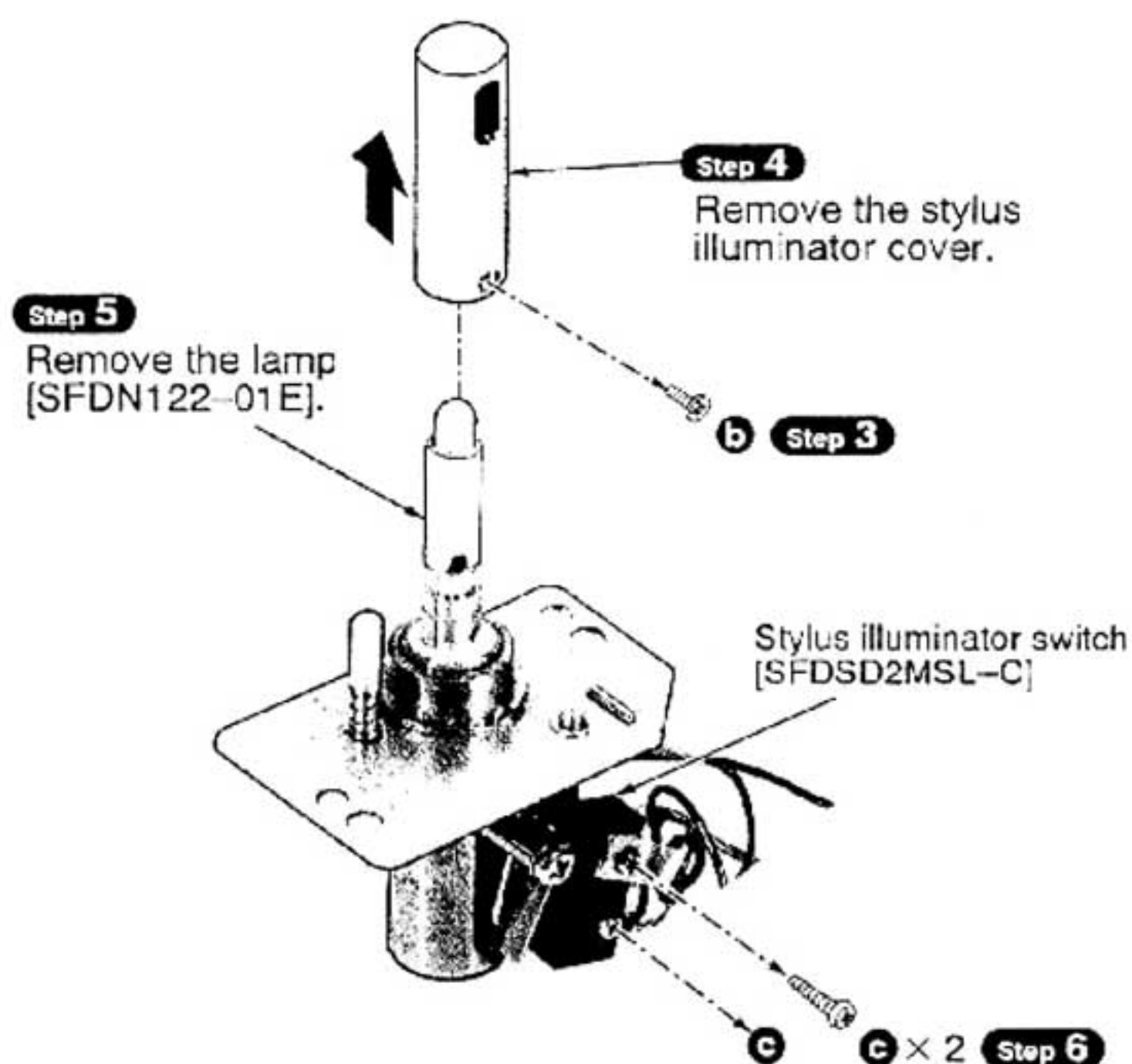
[XTB3+8J]



[XSN17+3FY]

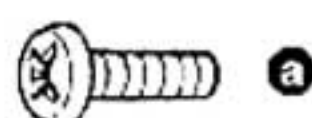
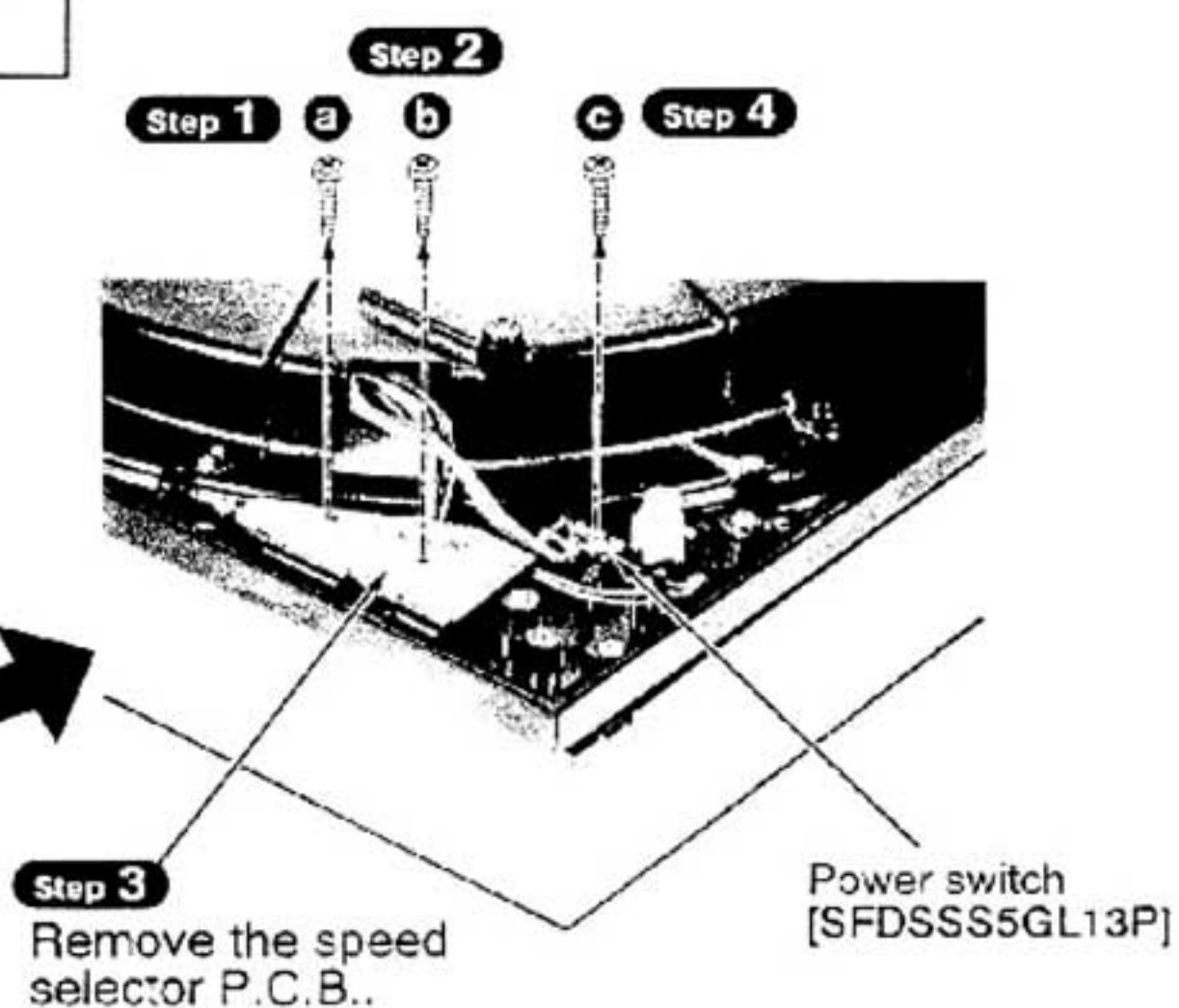
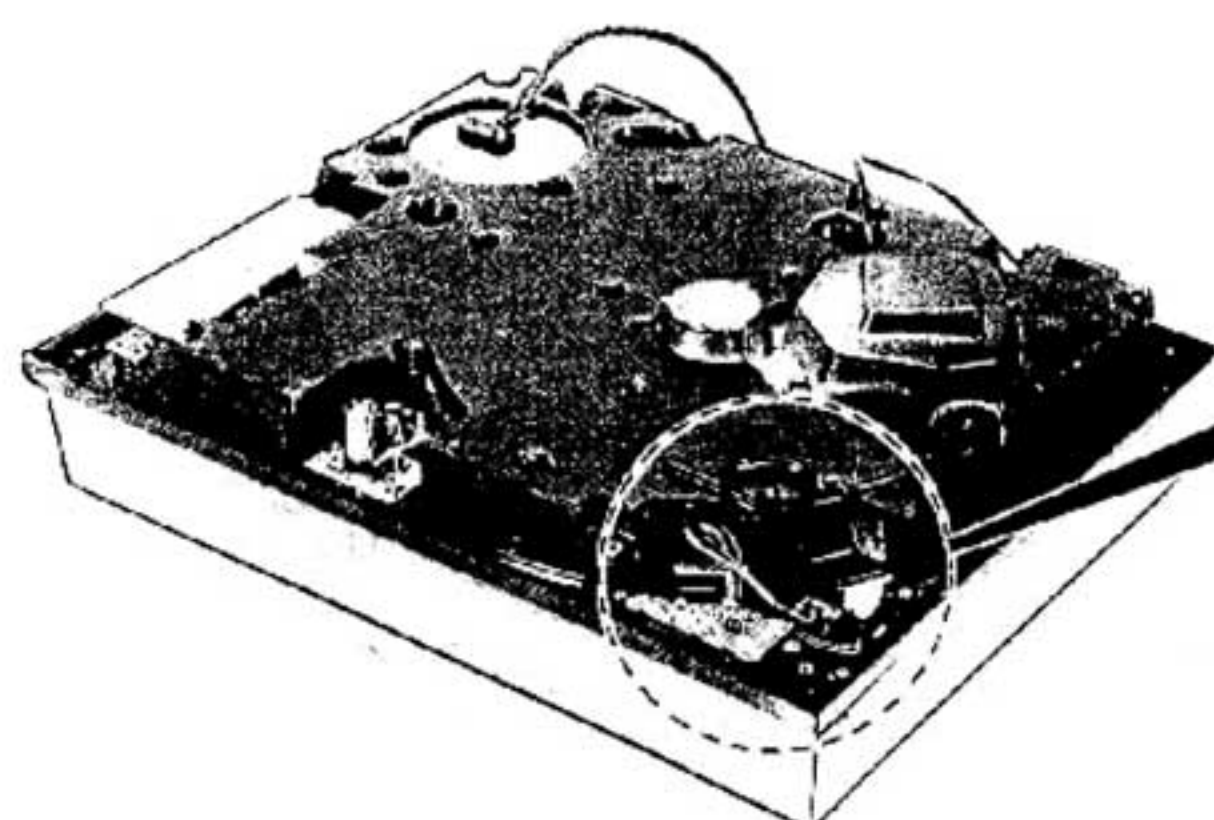


[XSN2+10]



4. Replacement for the parts mounted on speed selector P.C.B. and power switch

- Follow the **Step 1** ~ **Step 7** of the item 2 in main component replacement procedures on page 11.



[XTV3+8G]



[XTB3-10JFZ]



[XTV23-10G]

■ SCHEMATIC DIAGRAM

- Note:**
- S201 : SPEED SELECTOR (33 rpm) switch.
 - S202 : SPEED SELECTOR (45 rpm) switch.
 - S203 : START/STOP switch.
 - S301 : PITCH CONTROL RESET switch in "OFF" position. (Interlocked with VR303)
 - S302 : PITCH RESET switch in "OFF" position.
 - S401 : STYLUS ILLUMINATOR switch in "ON" position.
 - S601 : POWER switch in "ON" position.
 - S602 : VOLTAGE SELECTOR switch.
 - VR201 : BRAKE ADJUSTMENT VR.
 - VR301 : PITCH CONTROL $\pm 0\%$ ADJUSTMENT VR.
 - VR302 : PITCH CONTROL GAIN ADJUSTMENT VR.
 - VR303 : PITCH CONTROL ADJUSTMENT VR. (Interlocked with S301)
 - The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high-impedance) and oscilloscope on the basis of chassis.
Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
 - Important safety notice:
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
NO MARK : Voltage when at a stop
() : Voltage during rotation
● $\longrightarrow$: +B Line
 - The supply part number is described alone in the replacement parts.

Ref. No.	Production Part No.	Supply Part No.
Q1	2SD1265-0PQ	2SD1265-0
D204A	MA165TA	MA165

- This schematic diagram may be modified at any time with the development of new technology.

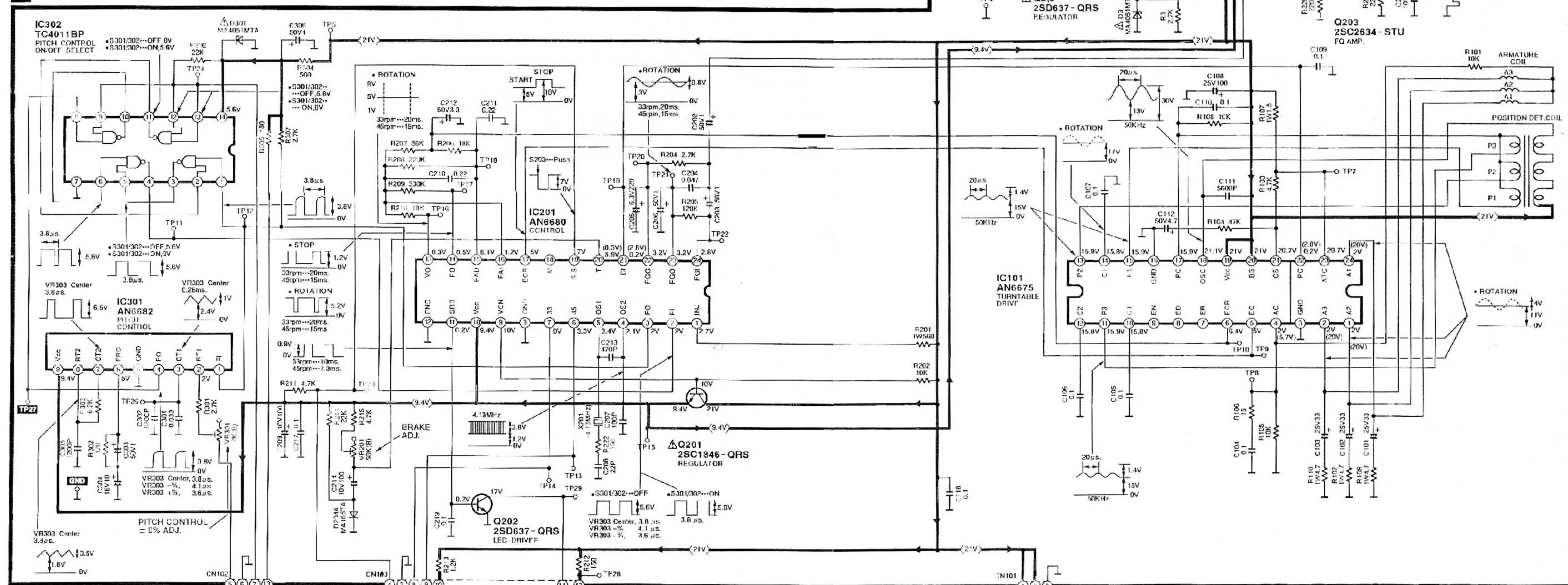
● Terminal guide of IC'S, transistors and diodes

TC4011BP 	AN6682 	AN6680 	AN6675 	2SC2634-STU 	2SD1265-0PQ
2SC1846-QRS 	2SD637 QRS 	MA4051MTA 	MA165TA 	GL8EG21 	SVDEBR5505S
D2SBA20 	SVDPR39C2S-9 				

F POWER SUPPLY CIRCUIT (P.C.Board; on page 21)

G **REGULATOR CIRCUIT**
(P.C.Board: on page 21)

▶ DRIVE CIRCUIT (P.C.Board: on page 20)



B PITCH RESET
SWITCH
CIRCUIT
(P.C.Board:
on page 21)

C PITCH CONTROL
CIRCUIT
(P.C.Board: on page 20)

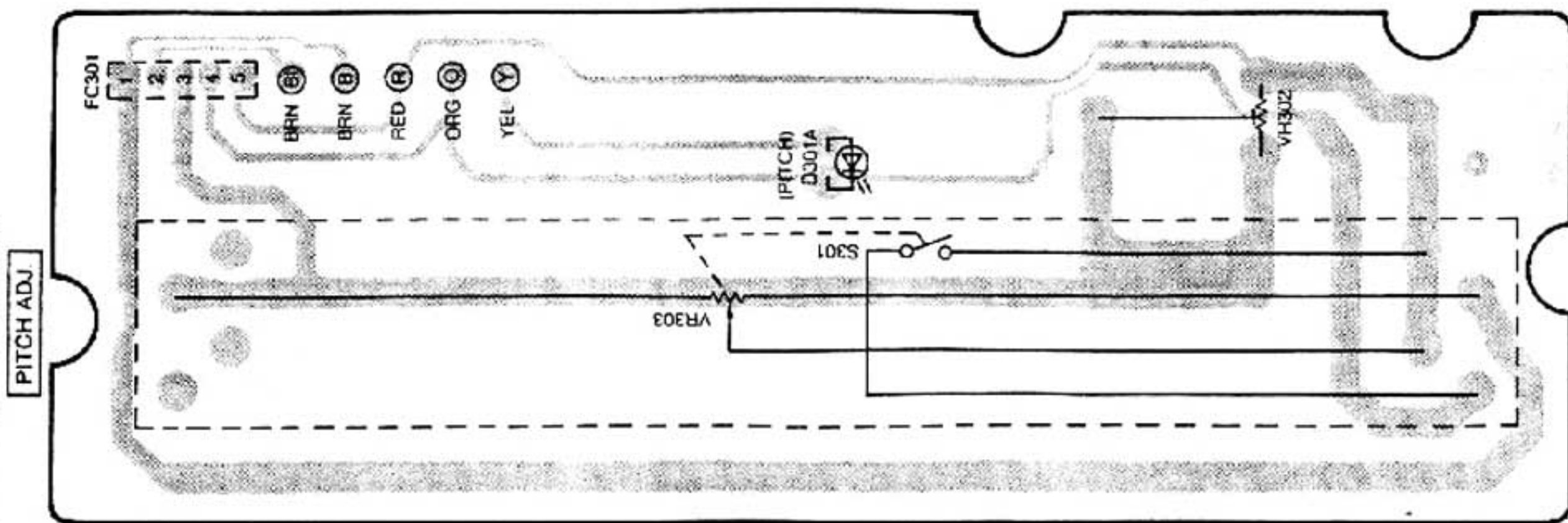
D SPEED SELECTOR
CIRCUIT
(P.C. Board on page 21)

E STROBE ILLUMINATOR
CIRCUIT
(P.C.Board: on page 21)

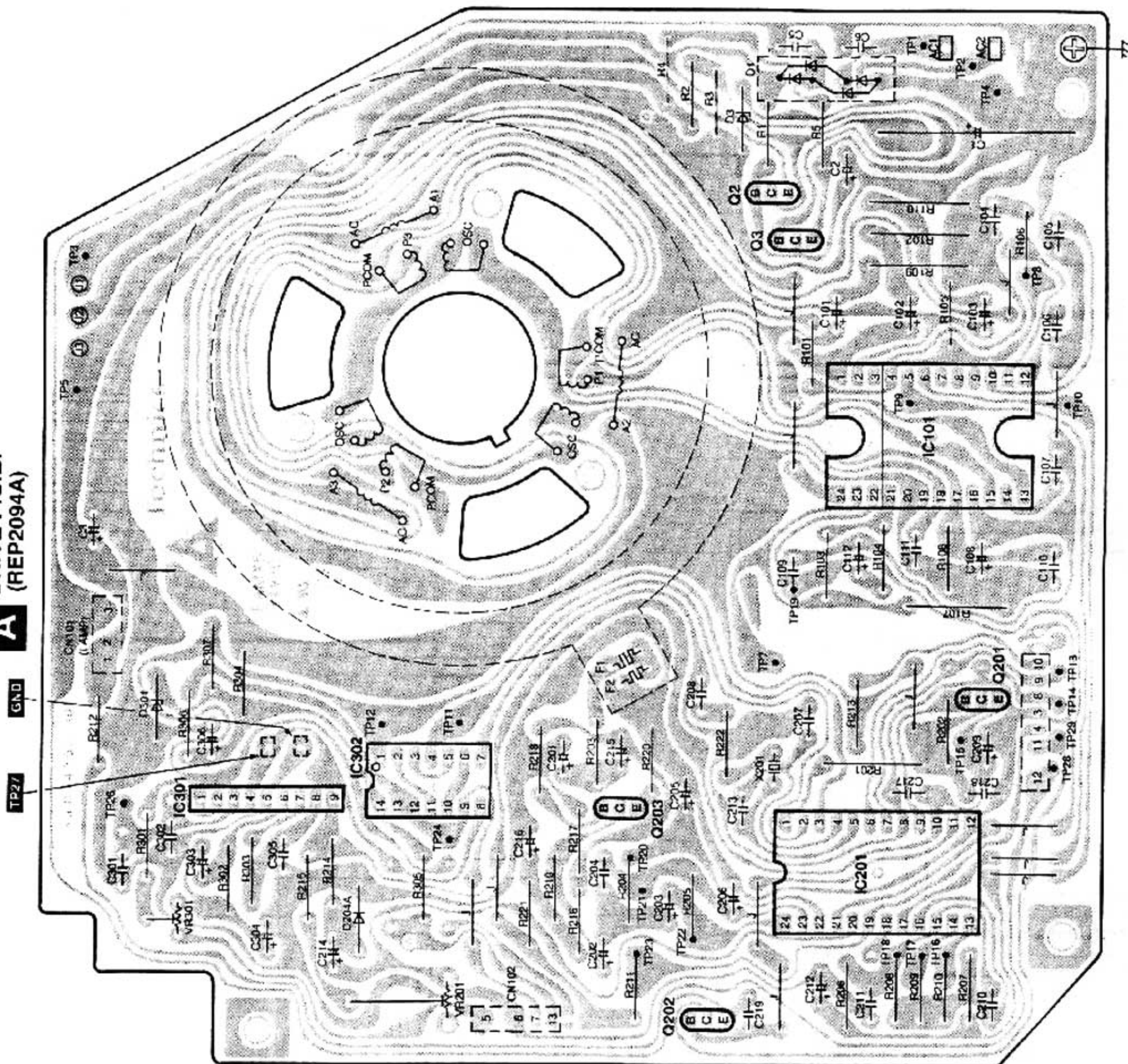
CARTRIDGE **H** PU OUTPUT CIRCUIT
(P.C. Board on page 21)

PRINTED CIRCUIT BORDS

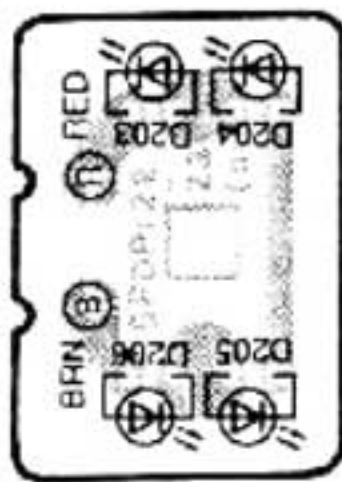
C PITCH CONTROL P.C.B.
(REP2221A)



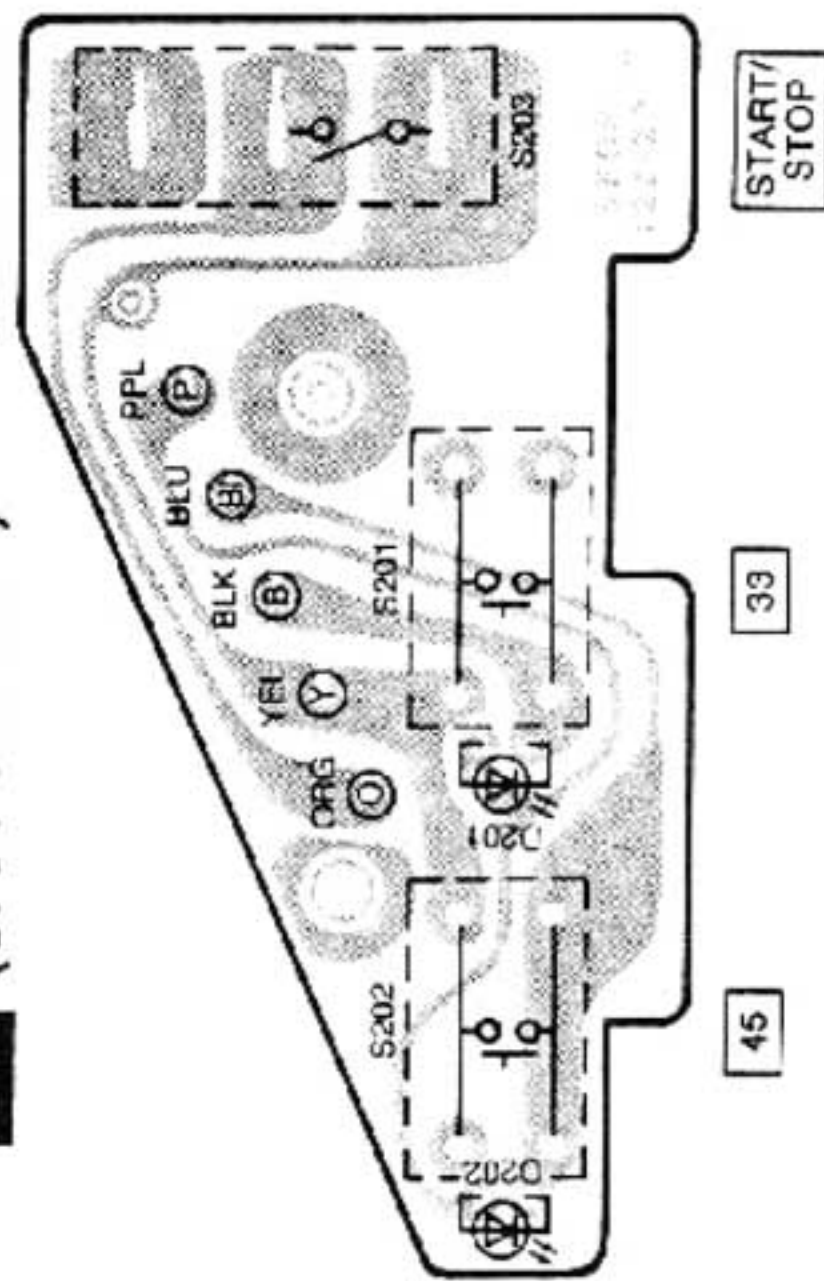
A DRIVE P.C.B.
(REP2094A)



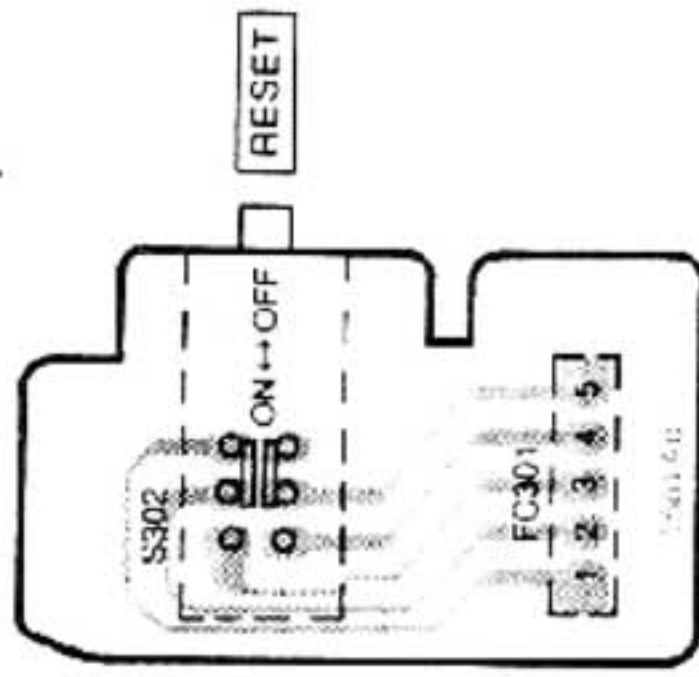
E STROBE ILLUMINATOR P.C.B.
(SFDP122N12A)



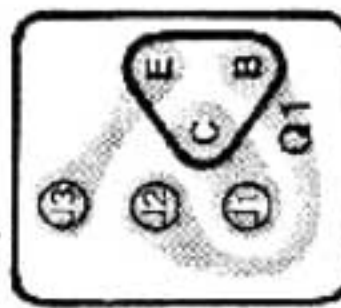
D SPEED SELECTOR P.C.B.
(SFDP122N12A)



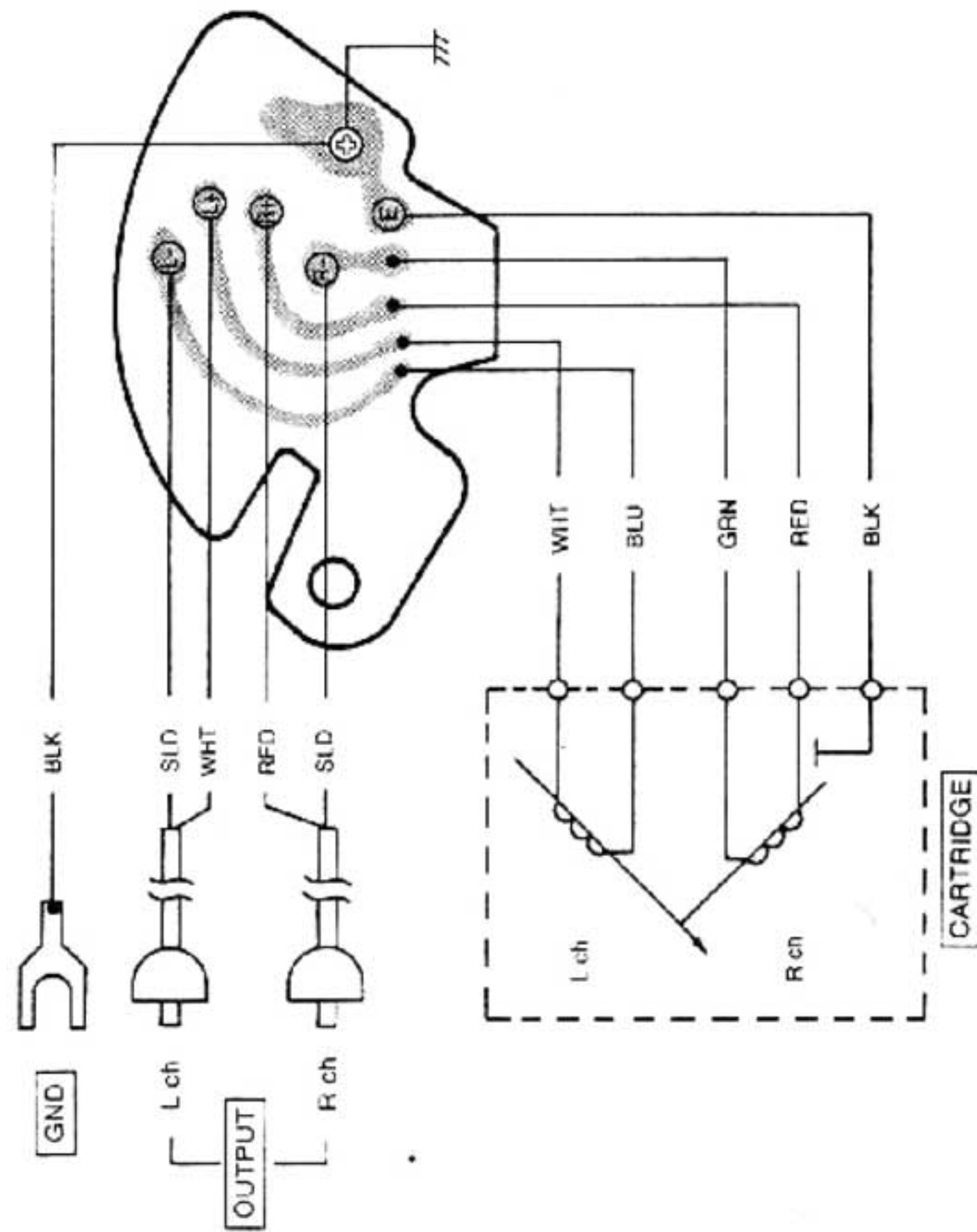
B PITCH RESET SWITCH P.C.B.
(REP2221A)



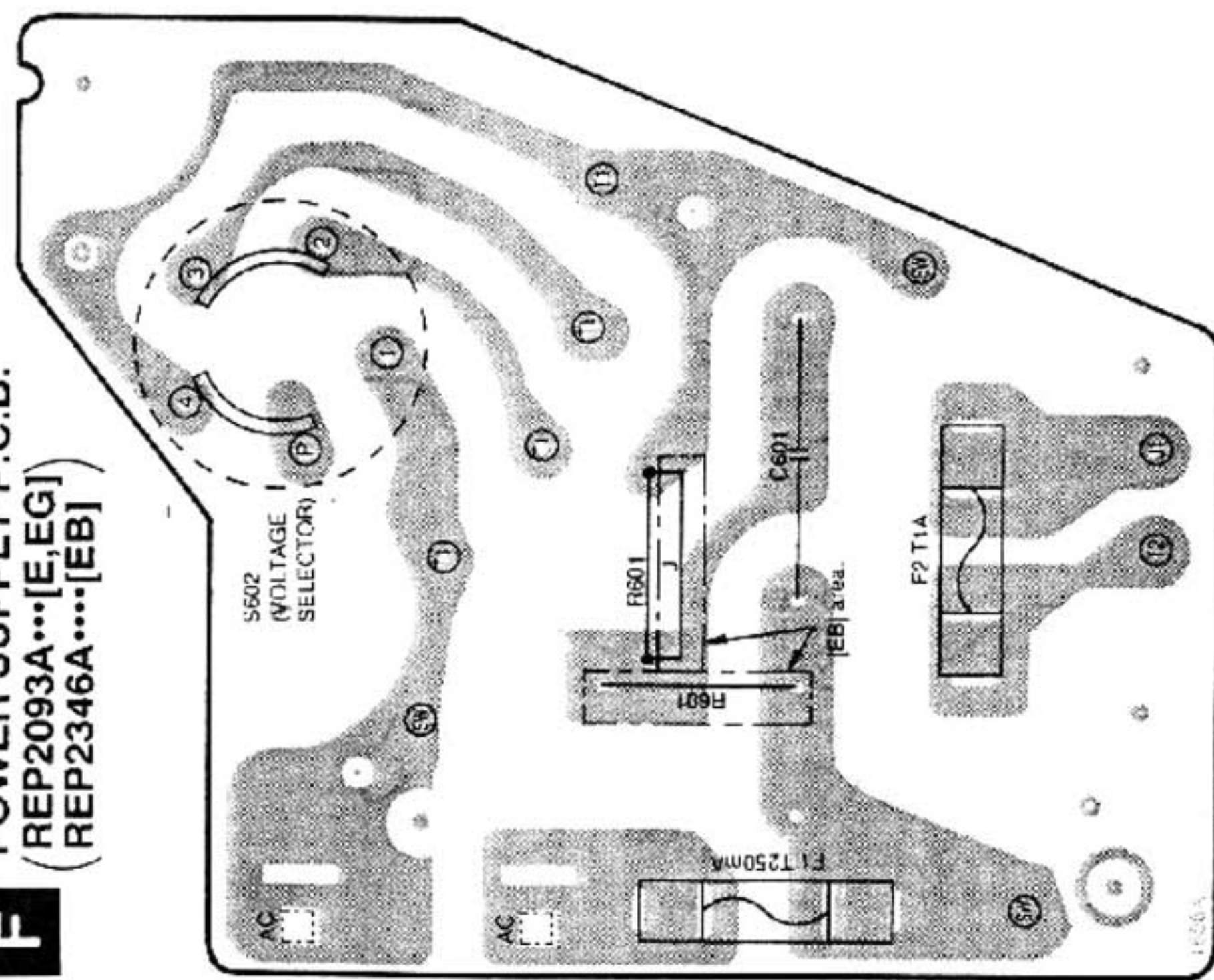
G REGULATOR P.C.B.
(REP2094A)



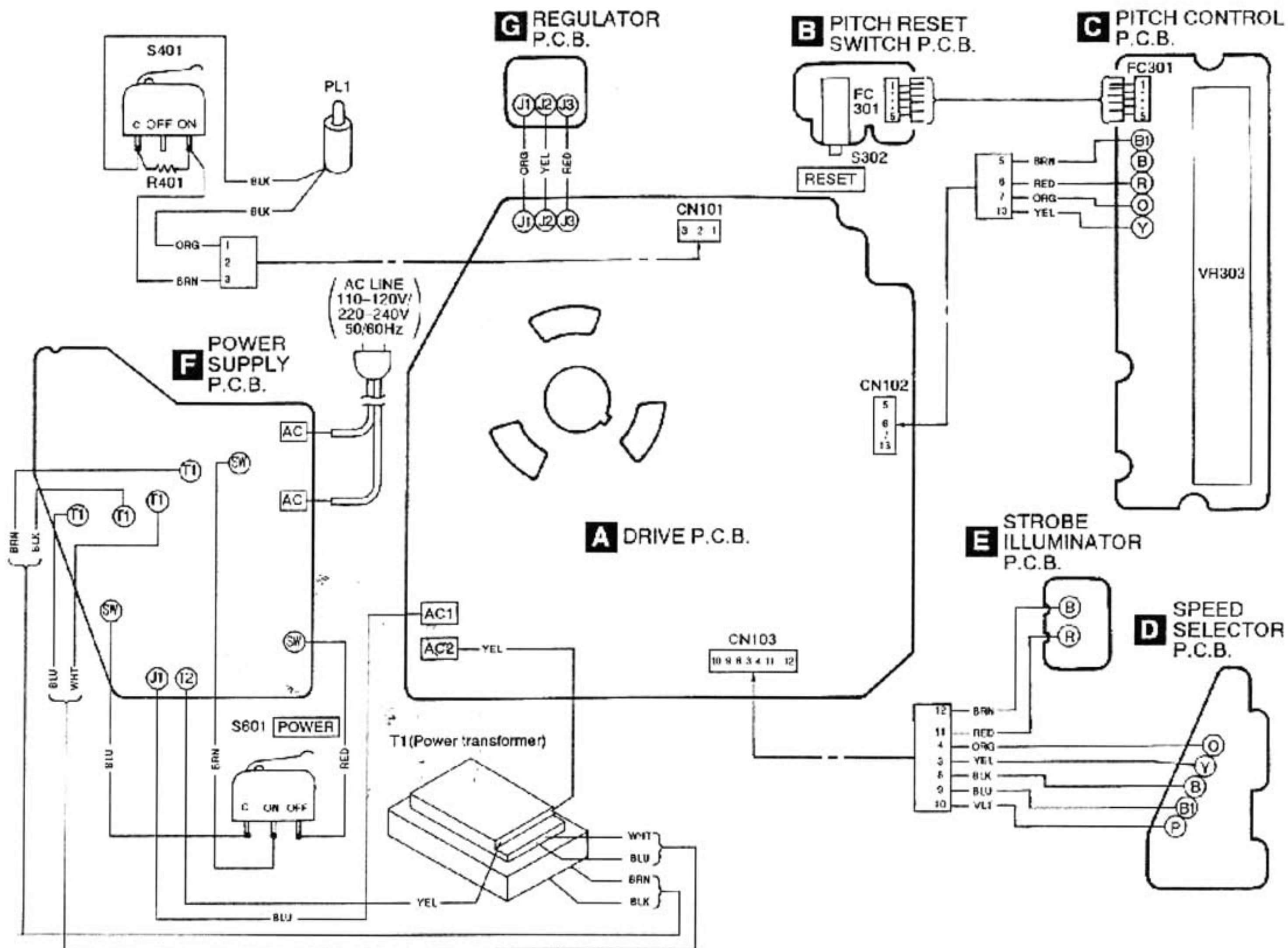
H PU OUTPUT P.C.B. (Except CARTRIDGE)
(SFDH122-04E)



F POWER SUPPLY P.C.B.
(REP2093A...[E,EG]
REP2346A...[EB])



WIRING CONNECTION DIAGRAM



Note:
 BLK Black RED Red
 BLU Blue VLT Violet
 BRN Brown YEL Yellow
 ORG Orange

■ MEASUREMENTS AND ADJUSTMENTS

- Notes: ● Make the following adjustments after replacing parts such as IC's, transistors, diodes, etc.
- Condition of the set.
 1. Power switch ON
 2. Pitch control..... Center position
 3. Speed selector switch 33 r.p.m.
 - Instruments to be used
 1. Tester
 2. Frequency counter

	Adjustment	Connection	Parts adjusted	Procedure
1	Pitch control ± 0% adjustment	Frequency counter (+) — TP27 (-) — Earth point	VR301 (Fig. 1)	1. Connect the frequency counter and turn the power supply ON. 2. Set the pitch control knob to "0". (Indicator lights up.) 3. Adjust VR301 so that the frequency is 262.08 kHz ± 0.05 kHz.
2	Pitch control gain adjustment	Tester (+) — CN102 terminal ⑤ (-) — CN102 terminal ⑥	VR302 (Fig. 2)	1. Set the pitch control knob to "0". 2. Pull out the connector CN102 of drive P.C.B. 3. Connect the tester to terminals, ⑤ and ⑥ of connector CN102 on the pitch control P.C.B. side. 4. Adjust VR302 so that the resistance value of the tester is 2.85 k Ω ~ 2.90k Ω .
3	Brake adjustment	_____	VR201 (Fig. 1)	1. Adjust VR201 so that the rotation at 33 r.p.m. stops within the angle of 30° ~ 210° after depressing the stop position.

■ ALIGNMENT POINTS

Please refer to Printed Circuit Board Diagram for test point locations.

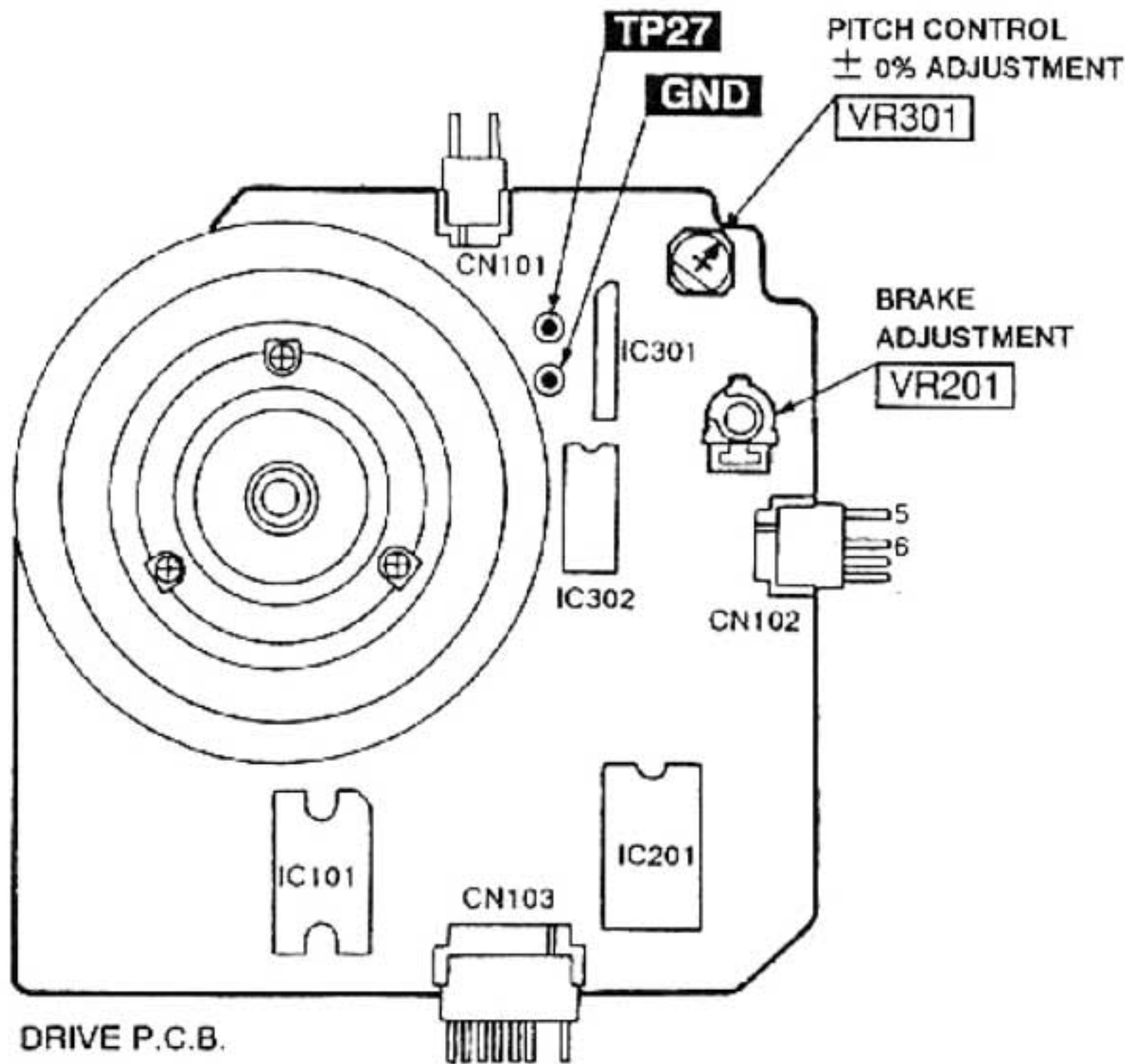


Fig. 1

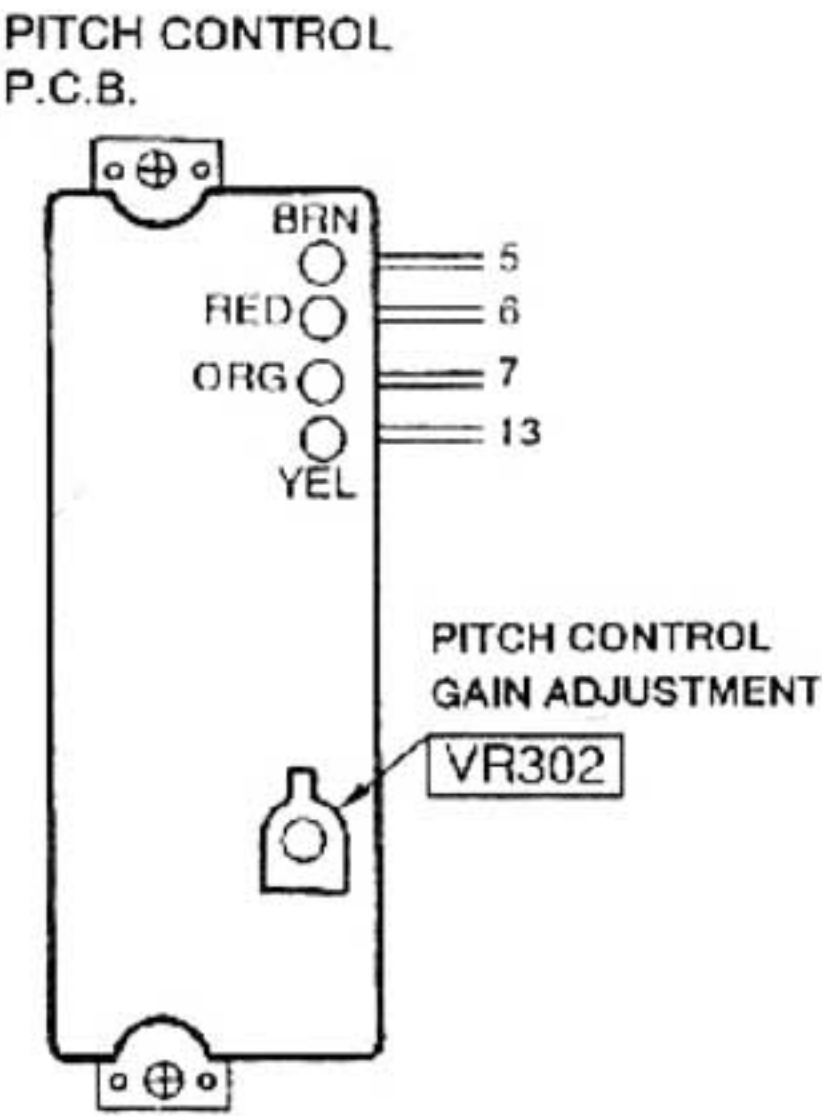
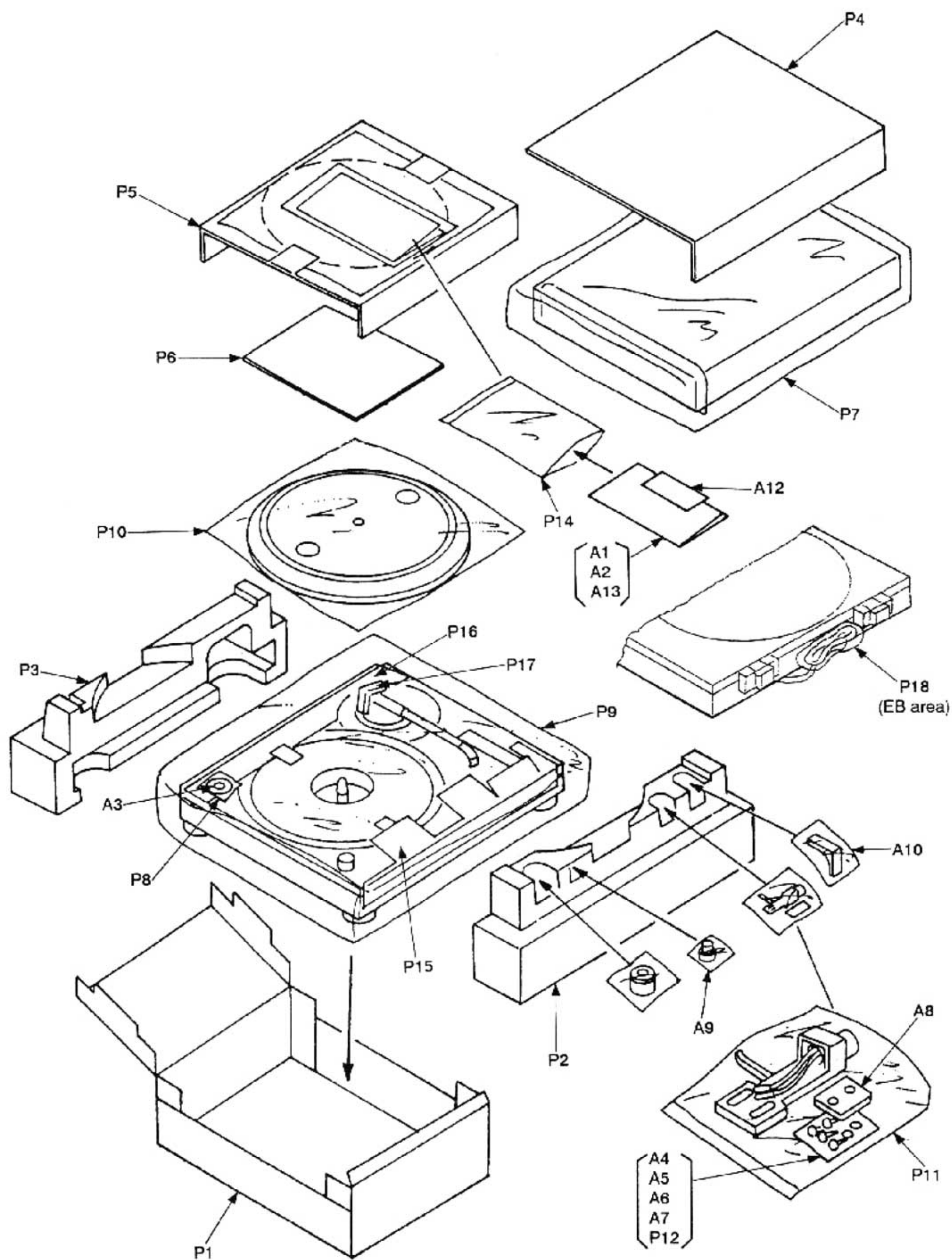


Fig. 2

PACKAGING



REPRACEMENT PARTS LIST

Notes: *Important safety notice:

Components identified by Δ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)

Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT				FUSE(S)	
IC101	AN6675	IC, TURNTABLE DRIVE		F1 Δ	XBA2C025TB0	FUSE, 250V T250mA	
IC201	AN6680	IC, CONTROL		F2 Δ	XBA2C10TB0S	FUSE, 250V T1A	
IC301	AN6682	IC, PITCH CONTROL				SWITCH(ES)	
IC302	TC4011BP	IC, P. CONTROL ON/OFF SELECT					
		TRANSISTOR(S)		S201	EVQPR04K	SW, SPEED SELECTOR (33)	
				S202	EVQPR04K	SW, SPEED SELECTOR (45)	
Q1 Δ	2SD1265-0	TRANSISTOR		S203	SFDSS01GL13	SW, START/STOP	
Q2, 3 Δ	2SD637-QRS	TRANSISTOR		S302	RSP2B010-1J	SW, PITCH CONTROL RESET	
Q201 Δ	2SC1846-QRS	TRANSISTOR		S401	SFDS02MSL-C	SW, STYLUS ILLUMINATOR	
Q202	2SD637-QRS	TRANSISTOR		S601 Δ	SFDSS05GL13P	SW, POWER	
Q203	2SC2534-STU	TRANSISTOR		S602 Δ	SFD0HW01317	SW, VOLTAGE SELECTOR	
		DIODE(S)				CONNECTOR(S)	
D1 Δ	D2SBA20	DIODE		CN101	EMCS0360L	CONNECTOR (3P)	
D3 Δ	MA4051MTA	DIODE		CN102	EMCS0460L	CONNECTOR (4P)	
D201, 202	SVDP03902S-9	LED		CN103	EMCS0760L	CONNECTOR (7P)	
D203, 204	SVDEBR5505S	LED					
D204A	MA165	DIODE					
D205, 206	SVDEBR5505S	LED					
D301 Δ	MA4051MTA	DIODE					
D301A	GL8EG21	LED					
		VARIABLE RESISTOR(S)					
VR201	EVTS3MA00B54	VR, BRAKE ADJ.					
VR301	EVMH1GAD0B23	VR, PITCH CONTROL 0% ADJ.					
VR302	EVTS3MA00B54	VR, PITCH CONTROL GAIN ADJ.					
VR303	SFDZ122N11	VR, PITCH CONTROL ADJ. (S301)					
		TRANSFORMER(S)					
T1 Δ	SFDZ122S01E	POWER TRANSFORMER ASS'Y					
		OSCILLATOR(S)					
X201	RSXB4M13J01	CRISTAL OSCILLATOR (4.13MHZ)					
		LAMP(S)					
PL1	SFDN122-01E	LAMP					

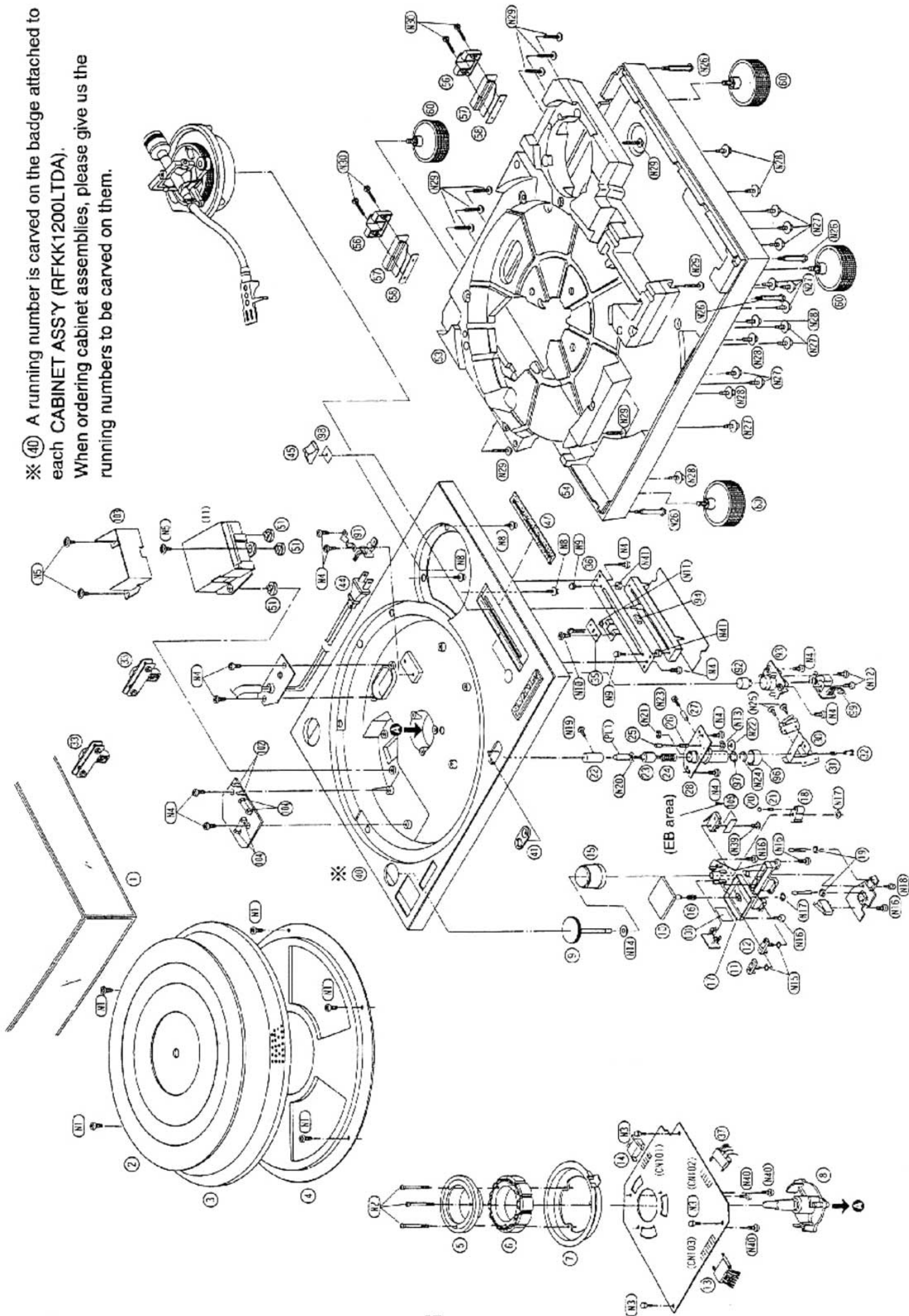
RESISTORS AND CAPACITORS

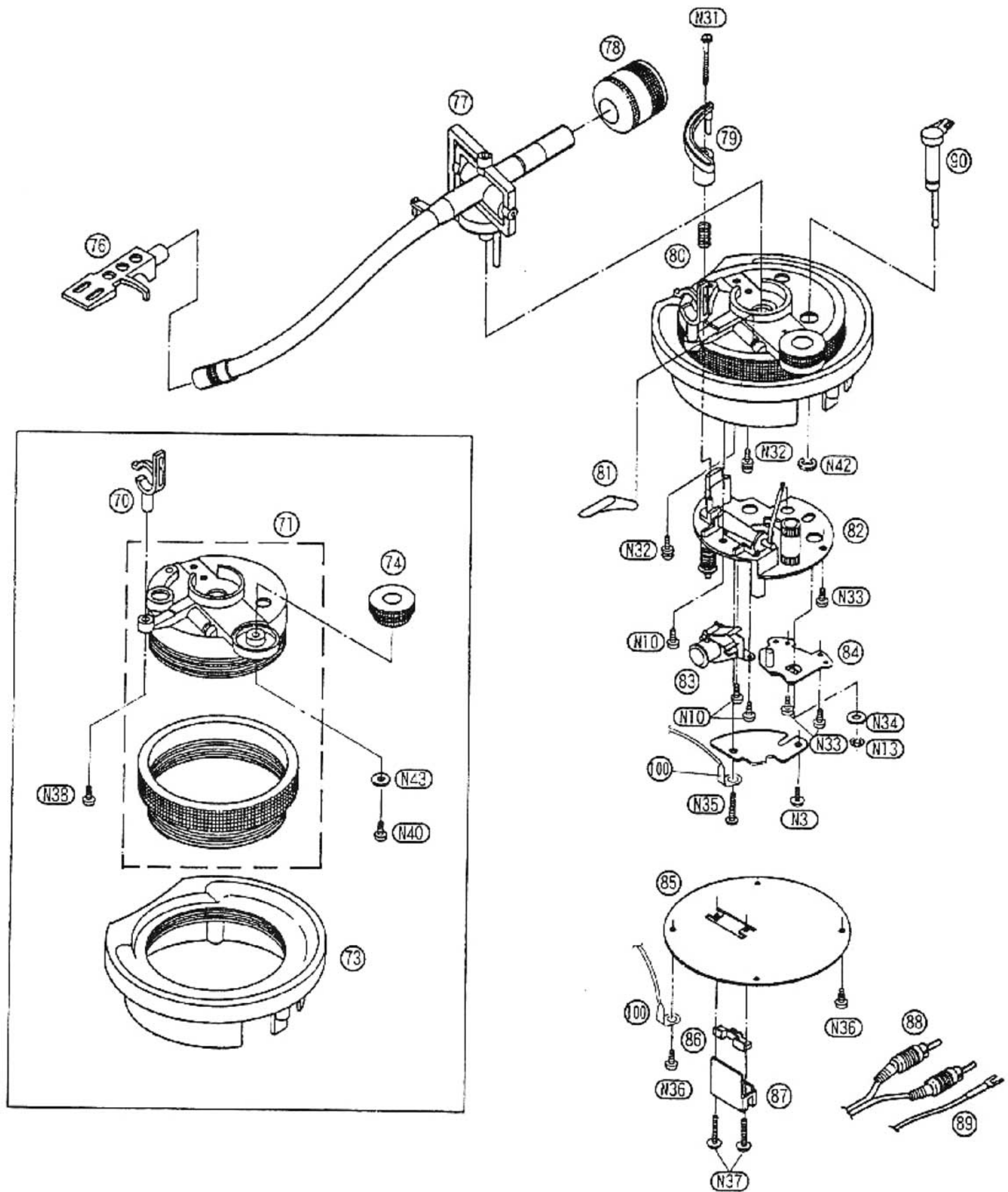
Notes : - Capacity values are in microfarads (uF) unless specified otherwise, P= Pico-farads (pF) F=Farads (F)
- Resistance values are in ohms, unless specified otherwise, 1 K=1,000 (OHM), 1 M=1,000k (OHM)

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks			
		RESISTORS			CAPACITORS			
R1	ERDS2TJ562	1/4W 5.6K	C1△	ECEB1HJ471	50V 470U			
R2	ERDS2TJ682T	1/4W 6.8K	C2	RCE1EU330BV	25V 33U			
R3	ERDS2TJ272T	1/4W 2.7K	C3	ECEA1EKA220B	25V 22U			
R4, 5	ERDS2TJ471	1/4W 470	C5, 6△	ECQM1223KZ3	125V 0.022U			
R101	ERDS2TJ103	1/4W 10K	C101-103	RCE1EU330BV	25V 33U			
R102	ERX1ANJ4R7H	1W 4.7	C104-107	ECQV1H104JM3	50V 0.1U			
R103	ERDS2TJ472	1/4W 4.7K	C108	ECA1EM101B	25V 100U			
R104	ERDS2TJ473	1/4W 47K	C109, 110	ECQV1H104JM3	50V 0.1U			
R105	ERDS2TJ103	1/4W 10K	C111	ECQ81H562JF3	50V 5600P			
R106	ERDS2TJ150T	1/4W 15	C112	RCE1HKA4R7BG	50V 4.7U			
R107	ERX1ANJ1R5H	1W 1.5	C201	RCE1AKA330BG	10V 33U			
R108	ERDS2TJ103	1/4W 10K	C202, 203	ECEA1HKA010B	50V 1U			
R109, 110	ERX1ANJ4R7H	1W 4.7	C204	ECQV1H473JM3	50V 0.047U			
R201	ERGIANJ561H	1W 560	C205	ECEA0JU221	6.3V 220U			
R202	ERDS2TJ103	1/4W 10K	C206	ECEA1HKA010B	50V 1U			
R203	ERDS2TJ470	1/4W 47	C207	ECGR1H101K5	50V 100P			
R204	ERDS2TJ272T	1/4W 2.7K	C208	ECGR1H220K5	50V 22P			
R205	ERDS2TJ124T	1/4W 120K	C209	RCE1AU101BV	10V 100U			
R206	ERDS2TJ183T	1/4W 18K	C210, 211	ECQV1H224JM3	50V 0.22U			
R207	ERDS2TJ563	1/4W 56K	C212	RCE1HKA3R3BG	50V 3.3U			
R208	ERDS2TJ224T	1/4W 220K	C213	ECGR1H471K5	50V 470P			
R209	ERDS2TJ334	1/4W 330K	C214	RCE1AU101BV	10V 100U			
R210	ERDS2TJ183T	1/4W 18K	C215	ECEA1HKA010B	50V 1U			
R211	ERDS2TJ472	1/4W 4.7K	C216	RCE1AKA470BG	10V 47U			
R212	ERDS2TJ151	1/4W 150	C217-219	ECFR1H1042F	50V 0.1U			
R213	ERDS2TJ122	1/4W 1.2K	C301	ECQK1333G2	125V 0.033U			
R214	ERDS2TJ223	1/4W 22K	C302	ECQK1682G2	125V 6800P			
R215	ERDS2TJ472	1/4W 4.7K	C303	ECEA1HKA010B	50V 1U			
R216	ERDS2TJ154	1/4W 150K	C304	RCE1CKA1033G	16V 10U			
R217	ERDS2TJ223	1/4W 22K	C305	ECQB1H122JF3	50V 1200P			
R218	ERDS2TJ102	1/4W 1K	C306	ECEA1HKA010B	50V 1U			
R219	ERDS2TJ332	1/4W 3.3K	C601△	ECQU2A473MY	100V 0.047U			
R220	ERDS2TJ221	1/4W 220						
R221	ERDS2TJ471	1/4W 470						
R222	ERDS2TJ391	1/4W 390						
R301	ERDS2TKG2701	1/4W 2.7K						
R302	ERDS2TJ471	1/4W 470						
R303	ERDS2TJ822	1/4W 8.2K						
R304	ERDS2TJ561	1/4W 560						
R305	ERDS2TJ181T	1/4W 180						
R306	ERDS2TJ223	1/4W 22K						
R307	ERDS2TJ272T	1/4W 2.7K						
R401△	ERC50FJ152	1/2W 1.5K						
R601△	ERD50FJ4R7	1/2W 4.7 (E, EG)						
R601△	ERC12UCK335D	1/2W 3.3M (EB)						

CABINET PARTS LOCATION

※ (40) A running number is carved on the badge attached to each CABINET ASS'Y (RFKK1200LTDA).
When ordering cabinet assemblies, please give us the running numbers to be carved on them.





Notes: *Important safety notice:

Components identified by Δ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)

Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS		54	RFKJ1200LTD A	BOTTOM COVER (A) ASS'Y	(E)
				54	RFKJ1200LTD B	BOTTOM COVER (A) ASS'Y	(E, EG)
1	RYF0370-T	DUST COVER		56	SFUM02N04	CASE, HINGE	
2	SFTG172-01	TURNTABLE MAT		57	SFUP122-23	SUPPORTER (A)	
3	RFKN1200LTD I	TURNTABLE ASS'Y		58	SFUP122-24	SUPPORTER (B)	
4	RFKN1200LTD J	PANEL COVER ASS'Y	(E, EG)	60	RYQ0160-N	INSULATOR	
4	RFKN1200LTD K	PANEL COVER ASS'Y	(EB)	70	SFPRT17201K	ARM REST	
5	SFMGQ20-01	DRIVE COIL COVER		71	RFKN1200LTD H	ARM BASE ASS'Y	
6	SFMG520-31A	DRIVE COIL ASS'Y		73	SFPKD12201	BRACKET, ARM BASE	
7	SFMZ172-01E	FG COIL ASS'Y		74	RMHD042	KNOB, ANTI-SKATING CONTROL	
8	SFMZQ20-01A	SHAFT ASS'Y		76	RYQ0153-K	HEAD SHELL	
9	RFKN1200LTD F	KNOB, POWER SWITCH		77	RYQ0154-N	TO NEARM ASS'Y	
10	RGXD023-N	BUTTON, START/STOP		78	RYQ0156-N	BALANCE WEIGHT	
11	RFKN1200LTD C	BUTTON, SPEED SELECTOR (33)		79	SFPRT18201K	ARM LIFT	
12	RFKN1200LTD D	BUTTON, SPEED SELECTOR (45)		80	SFQA829-03	SPRING	
13	SFDJ122-02E	WIRE ASS'Y		81	SFPAB13202	KNOB, LIFT	
14	SFDJ122-06E	WIRE ASS'Y		82	SFPAB18201K	TO NEARM FIXING PLATE	
15	RFKN1200LTD G	COVER, STROBE ILLUMINATOR		83	SFPJL18202K	OIL DAMPER	
16	SFQA122-01	SPRING		84	SFPZB12201K	PLATE	
17	SFUM122-011	BASE, OPERATION		85	SFPZB12203	PLATE, ARM BASE COVER	
18	SFUM122-03	CAM, POWER SWITCH		86	SFUM170-06	SPACER, PHONO CORD	
19	SFUM015-11	SPACER, LED		87	SFPZB12204	CLAMPER, PHONO CORD	
20	SFYB5-32	BALL		88	RJL4P002S12	PHONO CORD	
21	SFQA520-01	SPRING		89	SFELD26-01E	GROUND WIRE	
22	RGKD776-N	COVER, STYLUS ILLUMINATOR		90	RMHD045	KNOB, ARM LOCK	
23	SFXB122-06	DRIVE BOSS		91	N092	SPACER	
24	SFQA172-01	SPRING		92	RGU0611-N	BUTTON, PITCH CONTROL RESET	
25	RMS0513	PIN, LOCK CANCELER		93	RMRO945-K	PLATE, PITCH CONTROL RESET	
26	SFQA520-011	SPRING		94	RMX0124	SPACER	
27	SFX0172-01-1	PIN, GUIDE		96	SFGZ122-02	RUBBER	
28	SFUP122-02E	BRACKET, STYLUS ILLUMINATOR		97	SFUP122-15-1	STOPPER, SPRING	
30	SFUP122-03	PLATE, LOOK OPERATION		98	SFXW172-032	SPACER, PITCH CONTROL	
31	SFQA122-02	SPRING		99	REZ0836	FLAT CABLE	
32	SFXJ172-05	PIN		100	SFERIC	LOG TERMINAL	
33	SFATM02N01A	HINGE		101	SFUZ122-04	SHEET	
35	SFUP122-09	HOLDER, LED		102	SFER190-01	LOG TERMINAL	
36	SFUP122-01	BRACKET, PITCH CONTROL		103	SFUP122-21	SHIELD PLATE	
37	SFDJ122-04E	WIRE ASS'Y		104	SJT347	FUSE HOLDER	
40	RFKK1200LTD A	CABINET ASS'Y		105	SMXB5	COVER, SWITCH	(EB)
41	RGKD775-N	ORNAMENT, STYLUS ILLUMINATOR				SCREW AND WASHER	
44 Δ	SFUP122N11E	AC CORD ASS'Y	(E, EG)				
44 Δ	SFUP122G11E	AC CORD ASS'Y	(EB)	N1	XTN3+8JFZ	SCREW	
45	RGXD024-N	KNOB, PITCH CONTROL		N2	SFXGQ20-02	SCREW	
47	SFUZ122-01	FELT		N3	XTW3+8T	SCREW	
51	SFGC122-01	CUSHION		N4	XTB3+8J	SCREW	
53	SFAU122-031	BOTTOM COVER (B)		N5	SFXG172-01	SCREW	

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
N8	SNSB10	SCREW		P11	SPB1083	PROTECTION BAG	
N9	XYN3+C6S	SCREW		P12	XZB05X06C03	PROTECTION BAG	
N10	XTN3+6J	SCREW		P14	XZB25X34C03X	PROTECTION BAG	
N11	XWE4D10BW	WASHER		P15	RPQ0606	SPACER(A)	
N12	XTBS26+8J	SCREW		P16	RPQ0607	SPACER(B)	
N13	XUC25FY-V	WASHER		P17	RPQ0608	PAD, TONEARM	
N14	SFXW910J02	WASHER		P18	XZB10X30C03	PROTECTION BAG	(EB)
N15	RHW26006	WASHER					
N16	XTB3+10JFZ	SCREW				ACCESSORIES	
N17	XUC3FY	WASHER					
N18	XTV3+8G	SCREW		A1	RQT3461-E	INSTRUCTION MANUAL	(E)
N19	XSN17+3FY	SCREW		A1	RQT3463-B	INSTRUCTION MANUAL	(EB)
N20	SFXW122-03	WASHER		A1	RQT3462-D	INSTRUCTION MANUAL	(EG)
N21	XUC2FT	WASHER		A2	RQAD117	WARRANTY CARD	
N22	XWF3D8	WASHER		A3	RFE0025	45-rpm ADAPTOR	
N23	XYN3+C15S	SCREW		A4	SFPEN3302	NUT	
N24	RTW-12	WASHER		A5	SFCZV8801	SCREW	
N25	XSN2+10	SCREW		A6	SFPEV9801	SCREW	
N26	SFXG122-01	SCREW		A7	SFPEW9601	WASHER	
N27	SFXG122-02	SCREW		A8	SFPZB3501	SHELL WEIGHT	
N28	SNSB9	SCREW		A9	RFE0024	AUXILIARY WEIGHT	
N29	XTW3+15T	SCREW		A10	SFKD135-01	OVERHANG GAUGE	
N30	XYN3+C14FZS	SCREW		A12	RQLC0111-1	TECHNICS LABEL	
N31	SFXG829-1	SCREW		A13	RQCB0169	SERVICENTER LIST	
N32	XYN3+C10S	SCREW					
N33	XTW3+6T	SCREW					
N34	XWE4A10BW	WASHER					
N35	XTN3+25J	SCREW					
N36	XTB3+6JFZ	SCREW					
N37	XTW3+12TFZ	SCREW					
N38	XTN3+8J	SCREW					
N39	XTV23-10G	SCREW					
N40	XTN26+6J	SCREW					
N41	XWE3F6	WASHER					
N42	XUC5FY-V	WASHER					
N43	SFPEW17201	WASHER					
		PACKING MATERIALS					
P1	RPG2945	PACKING CASE	(E, EG)				
P1	RPG2946	PACKING CASE	(EB)				
P2	SFHH122-011	CUSHION, FRONT					
P3	SFHH122-02	CUSHION, REAR	(E, EG)				
P3	RPND710	CUSHION, REAR	(EB)				
P4	SFHD122N05	PAD, TOP	(E, EG)				
P4	RPQ0365	PAD, TOP	(EB)				
P5	SFHD122-02	PAD(A)					
P6	SFHD122N06	PAD(B)					
P7	RPHD133	PROTECTION SHEET					
P8	SFHZ122-01	PROTECTION SHEET					
P9	XZB60X65A01X	PROTECTION BAG					
P10	XZB45X50A01X	PROTECTION BAG					