

Service Manual

SL-D3/K



Turntable System

SL-D3

(XA), (XAL), (XGE), (E)

(XG), (XGF), (XGB)

SL-D3K

(XAL), (E), (XG)

- * The model SL-D3 (XA) is available in Asia, Latin America, Middle East and Africa only.
- * The models SL-D3 (XAL) and SL-D3K (XAL) are available in Australia only.

- * The model SL-D3 (XGE) is available in United Kingdom only.
- * The models SL-D3 (E) and SL-D3K (E) are available in Scandinavia and European only.
- * The models SL-D3 (XG) and SL-D3K (XG) are available in European only.
- * The model SL-D3 (XGF) is available in France only.
- * The model SL-D3 (XGB) is available in Belgium only.
- * SL-D3 is of silver finish.
- * SL-D3 is of black finish.

SPECIFICATIONS

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

General

Power supply: ~110-120/220-240V, 50 or 60 Hz
Power consumption: 4.5 W
Dimensions: 43.0 x 13.0 x 37.5 cm
 (W x H x D)
 (16-59/64" x 5-7/64" x 14-49/64")
Weight: 7.0 kg (15.4 lb.)

Turntable section

Type: Automatic turntable
 Auto start
 Auto return
 Auto stop
 Repeat play
 Direct drive
Drive method: Brushless DC motor
Motor: B-FG servo control
Drive control method: Aluminum die-cast, 31.2cm (12-9/32")
Turntable platter: 33-1/3 rpm and 45 rpm
 10% adjustment range
Wow and flutter: 0.014% WRMS*
 0.03% WRMS (JIS C5521)
 ±0.042% peak
 (IEC 98A Weighted)

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

Rumble: -53dB (IEC 98A Unweighted)
 -75dB (IEC 98A weighted)

Tonearm section

Type: Universal tonearm
Effective length: 230 mm (9-1/16")

Overhang:

Friction: 15 mm (19/32")
 Less than 7mg (lateral, vertical)
Effective mass: 12g (without cartridge)
Tracking error angle: Within 2°32' at the outer groove of 30cm (12") record
 Within 0°32' at the inner groove of 30cm (12") record
 22°

Offset angle:

Stylus pressure adjustment range: 0-2.5 g

Applicable cartridge

weight range: 6-9.5 g
 13.5-17 g (including headshell)
 3-6.5 g
(with shellweight): 10.5-14 g (including headshell)
 7.5 g

Headshell weight:

Cartridge section

Model No. EPC-270C
Type: Moving magnet
Frequency response: 20 Hz to 25 kHz
 20 Hz to 15 kHz ±2 dB
 3.2 mV at 1 kHz
Output voltage: 5 cm/s. zero to peak lateral velocity
 [9 mV at 1 kHz 10 cm/s. zero to peak 45° velocity (DIN 45 500)]

Output voltage:

Channel separation:

Channel balance: 25 dB at 1 kHz
 Within 2 dB at 1 kHz
Compliance (dynamic): 10x10⁻⁶ cm/dyne at 100 Hz
Stylus pressure: 1.75 ±0.25g (17.5 ±2.5mN)
Load impedance: 47 kΩ to 100 kΩ
Weight: 6.0 g (cartridge only)
Replacement stylus: EPS-270SD

TECHNISCHE DATEN

Änderungen der technischen Daten vorbehalten.

Die angegebenen Gewichts- und Abmessungsdaten sind ungefähre Werte.

Allgemeine Daten

Stromversorgung:	~110-120/220-240 V, 50/60 Hz Wechselstrom
Leistungsaufnahme:	4,5 W
Abmessungen (B x H x T):	43,0 x 13,0 x 37,5 cm
Gewicht:	7,0 kg
Plattenspieler	
Typ:	Automatischer Plattenspieler Startautomatik Rückführautomatik Stopautomatik Wiederhol-Betrieb Direktantrieb Kollektorloser Gleichstrommotor
Antrieb:	
Motor:	
Antriebsregel-Methode:	Gegen-EMK-FG-Servo-Steuerung
Plattenteller:	Aluminium-Spritzguß, 31,2cmφ
Plattenteller-Drehzahlen:	33-1/3 und 45 U/min
Drehzahl-Feinregulierung:	10% Einstellbereich
Gleichlaufschwankungen:	0,014% WRMS* 0,03% WRMS (JIS C5521) ±0,042% Spitze (IEC 98A bewertet)

* Diese Auslegung bezieht sich auf das Laufwerk-Bauteil allein, ausschließlich Einflüsse von Schallplatte, Tonabnehmer oder Tonarm, aber einschließlich Plattenteller.
Gemessen anhand von Signalen vom Frequenzgenerator, der an das Motorbauteil angebaut ist.

Rumpel-Geräuschspannungsabstand:	-53 dB (IEC 98A unbewertet)
Rumpel-Fremdspannungsabstand:	-75 dB (IEC 98A bewertet)

Tonarm

Typ:	Universal-Tonarm
Effektive Länge:	230 mm
Überhang:	15 mm

Lagerreibung:	Weniger als 7 mg (horizontal, vertikal)
Effective Masse:	12 g (ohne Tonabnehmer)
Spurfehlwinkel:	2°32' bei der Einlaufrille einer 30 cm-Platte 0°32' bei der Auslaufrille einer 30 cm-Platte
Kröpfungswinkel:	22°
Auflagekraft:	
Einstellbereich:	0-2,5 g
Zulässiger Tonabnehmer-Gewichtsbereich:	6-9,5 g 13,5-17 g (einschließlich Tonarmkopf)
(mit Zusatzgewicht):	3-6,5 g 10,5-14 g (einschließlich Tonarmkopf)
Tonarmkopf-Gewicht:	7,5 g
Tonabnehmer	
Modell-Nummer:	EPC-270C
Typ:	Magnetischer Tonabnehmer
Frequenzgang:	20 Hz bis 25 kHz 20 Hz bis 15 kHz ±2 dB 3,2 mV bei 1 kHz 5 cm/s. Null-zu-Spitze, lateral [9 mV bei 1 kHz 10 cm/s. Null-zu-Spitze, 45° (DIN 45 500)]
Ausgangsspannung:	25 dB bei 1 kHz Innerhalb 2 dB bei 1 kHz
Kanaltrennung:	
Kanalabweichung:	
Nachgiebigkeit (dynamisch):	10 x 10 ⁻⁶ cm/dyn bei 100 Hz
Auflagekraft:	1,75 ± 0,25 g (17,5 ± 2,5 mN)
Impedanz:	47 kΩ bis 100 kΩ
Gewicht:	6,0 g (ohne Tonarmkopf)
Ersatznadel:	EPS-270SD

CAPACITRISTIQUES TECHNIQUES

Les spécifications sont susceptibles d'être modifiées sans préavis.

Généralités

Les poids et les dimensions donnés sont approximatifs.

Alimentation:	Alternatif 110-120/220-240V, 50 ou 60 Hz
Consommation:	4,5 W
Dimensions (L x H x P):	43,0 x 13,0 x 37,5 cm
Poids:	7,0 kg
Platine de lecture	
Type:	Platine automatique Démarrage automatique Retour automatique Arrêt automatique Audition répétée
Système d'entraînement:	Entrainement direct
Moteur:	Moteur C.C. sans balai
Groupe de réglage:	Servocommande du générateur de fréquence de force contre-électromotrice
Plateau de lecture:	Aluminium moulé sous pression, 31,2 cm
Vitesses de rotation:	33-1/3 et 45 t.p.m
Réglage d'écart:	Plage de réglage de 10%
Pleurage et scintillement:	0,014% WRMS* 0,03% de valeur efficace (JIS C5521) ±0,042% de crête (IEC 98A Pondéré)

* Ce régime nominal se rapporte à l'ensemble du tournedisque seul, excluant les effets du disque, de la cellule pick-up ou du bras de lecture, mais comprenant le plateau. Mesuré par l'obtention d'un signal provenant du générateur de fréquences fixé à l'assemblage du moteur.

Ronflement:	-53 dB (IEC 98A Non pondéré) -75 dB (IEC 98A Pondéré)
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Bras de lecture

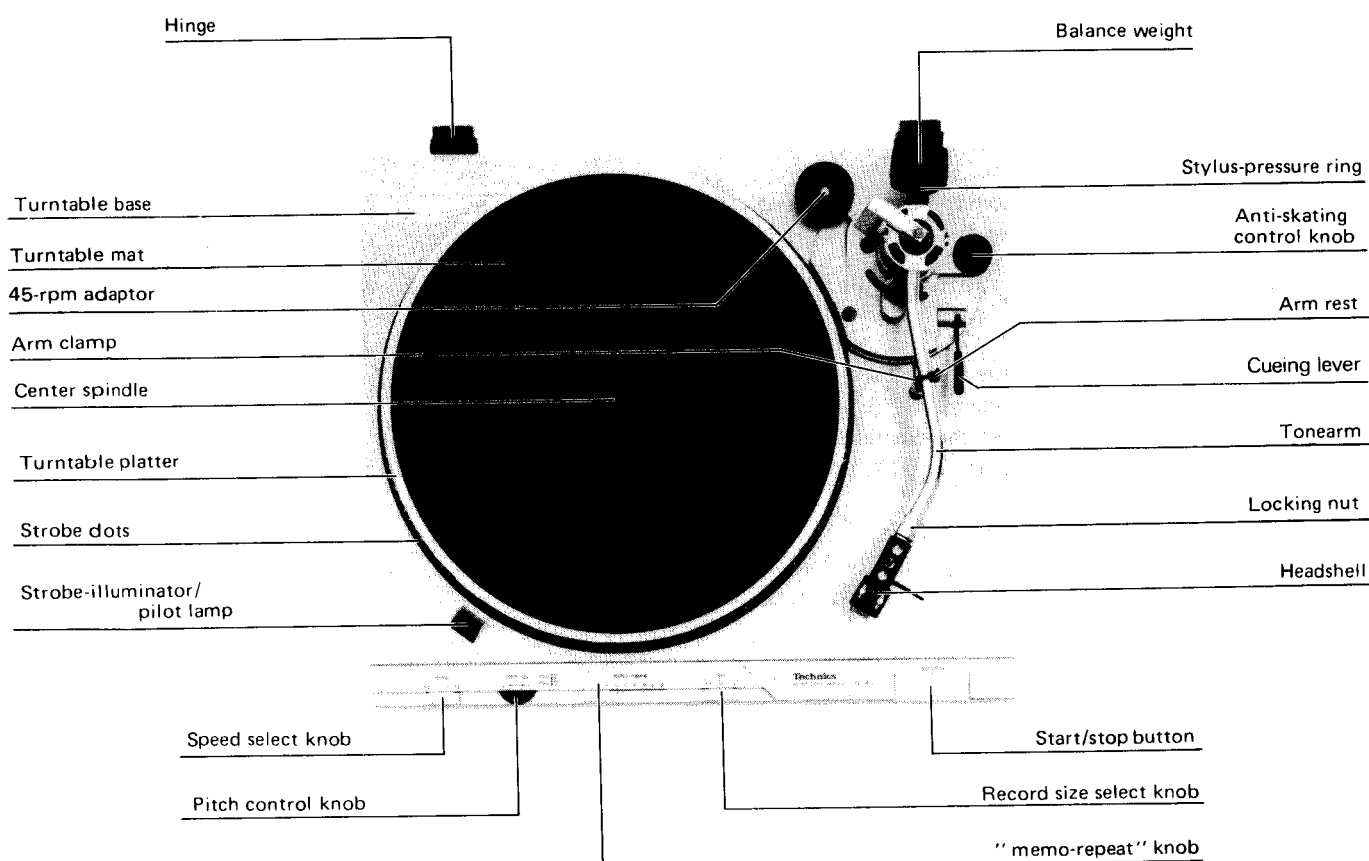
Type:	Bras de lecture universel
Longueur effective:	230 mm
Porte-à-faux:	15 mm
Frottement:	Moins de 7 mg (latéral et vertical)

Masse réelle:	12 g (sans la cellule pick-up)
Angle d'erreur de piste:	En deçà de 2°32' au sillon extérieur d'un disque de 30 cm En deçà de 0°32' au sillon intérieur d'un disque de 30 cm
Angle de décalage:	22°
Plage de réglage de la pression d'appui:	0-2,5 g
Gamme du poids de la cellule pick-up utilisable:	6-9,5 g 13,5-17 g (y compris la coque porte-cellule)
(avec contrepoids de la cellule):	3-6,5 g 10,5-14 g (y compris la coque porte-cellule)
Poids de la cellule:	7,5 g
Cellule pick-up	
No. du modèle:	EPC-270C
Type:	Aliment mobile
Réponse en fréquence:	20 Hz à 25 kHz 20 Hz à 15 kHz ±2 dB 3,2 mV à 1 kHz; 5 cm/s., zéro à vitesse latérale de crête (9 m V à 1 kHz 10 cm/s., zéro à vitesse 45° de crête [DIN 45 500])
Tension de sortie:	25 dB à 1 kHz En deçà de 2 dB à 1 kHz 10 x 10 ⁻⁶ cm/dyne à 100 Hz
Séparation de canal:	
Équilibrage des canaux:	
Elasticité (dynamique):	
Pression de la pointe de lecture:	1,75 ± 0,25 gramme (17,5 ± 2,5 mN)
Impédance de charge:	47 kΩ to 100 kΩ
Poids:	6,0 grammes (cellule seule)
Pointe de lecture de remplacement:	EPS-270SD

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■ PARTS IDENTIFICATIONS



■ FEATURES

- Front panel controls provide exceptional convenience
- Integral rotor/platter structure for stable rotation
- "TNRC"* base material provides an acoustic shield
"TNRC" Technics Non-Resonance Compound
- Low-mass, low-friction gimbal suspension tonearm
- Pitch control with illuminated stroboscope
- Viscous-damped cueing
- Anti-skating control
- Hinged, detachable dust cover
- Automatic tonearm return
- Auto-start, auto-stop, auto-return and programmable repeat play make the SL-D3 a pleasure to use.

■ HOW TO OPERATE

Manual play of a record

1. Place a record on the turntable mat.
2. Set the speed select knob to the desired record speed. (See Fig. 1.)
3. Remove the stylus protector, if your cartridge has a detachable one.
4. Release the arm clamp.
5. Set the cueing lever to the up position. (See Fig. 2.)
6. Move the tonearm over the desired groove.

The strobe-illuminator/pilot lamp will light up and the turntable platter will start rotating.

7. Set the cueing lever to the down position. (See Fig. 3.)
The tonearm will descend slowly onto the record and play will begin.

8. When play is finished, the tonearm will automatically return to the arm rest (auto-return), and the turntable platter will stop rotation.

If the unit is not to be used for some time, set the speed select knob to the neutral "•" position.

Attach the stylus protector again, if you have one, to guard the stylus tip from damage.

Automatic play

1. Set the speed select knob in the same manner as in manual play and release the arm clamp.
2. Set the record size select knob to the diameter of the record (7" [17 cm], 10" [25 cm], or 12" [30 cm]) you wish to play. (See Fig. 4.)
3. Push the start/stop button. (See Fig. 5.)
The tonearm will move automatically over the lead-in groove and descend slowly onto the record (auto-start). Play will begin.
4. When play has finished, the tonearm will automatically return to the arm rest (auto-return).

Repeat play of a record

1. Set the "memo-repeat" knob to the desired number of times you wish to play. (See Fig. 6.)
"R" position enables you to repeat play continuously.

Note:

The "memo-repeat" knob may be turned either clockwise or counterclockwise, except during automatic start or automatic return cycle.

2. Start play in the same way as for automatic play.

How to stop play

Push the start/stop button.

The tonearm automatically returns to the arm rest, and the turntable stops rotating.

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. Set the speed select knob to the "45" position.

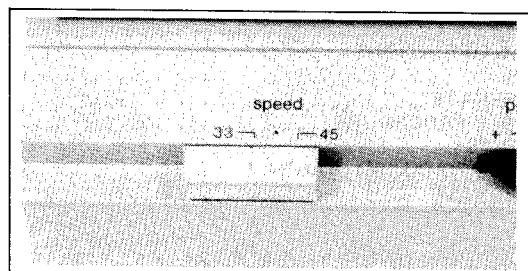


Fig. 1

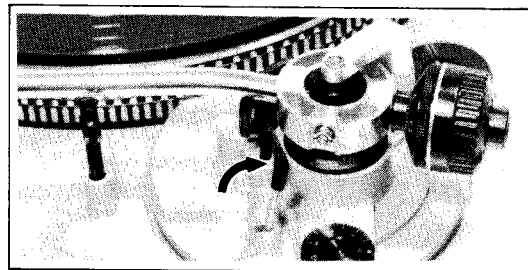


Fig. 2

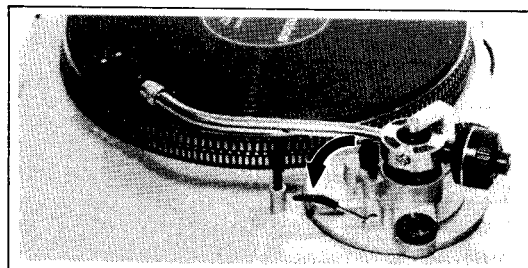


Fig. 3

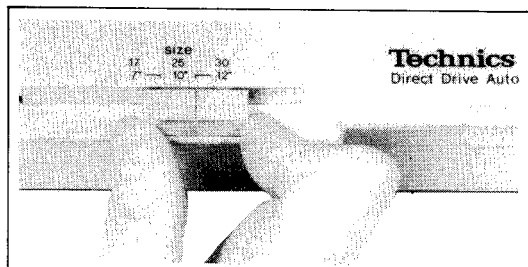


Fig. 4

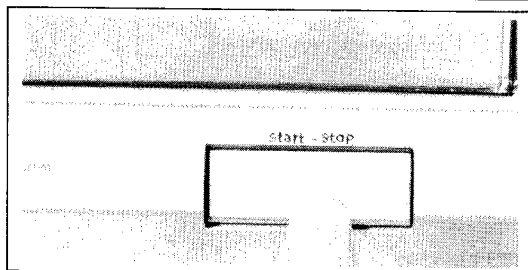


Fig. 5

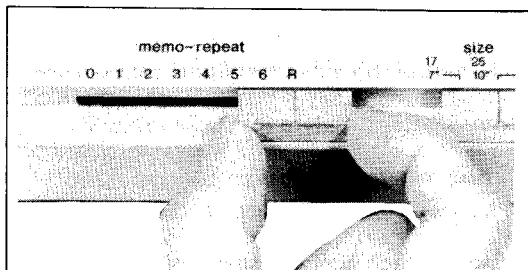


Fig. 6

■ DISASSEMBLY PROCEDURE

How to remove the bottom plate (See Fig. 7.)

- 1) Remove the head shell and turntable.
- 2) Secure the tone arm with the arm clasper.
- 3) Turn over the set taking care not to damage the dust cover.
- 4) Remove the 7 bottom plate setscrews **A**.

Note) Be careful not to lose the boss cap attached to the insulator on the cabinet side.

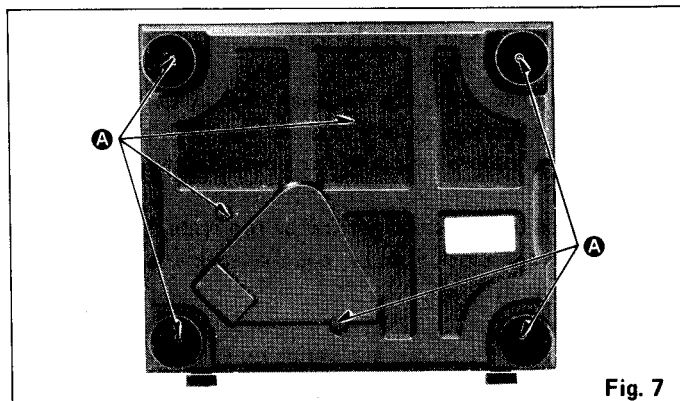


Fig. 7

How to remove the radiating fin (See Fig. 8.)

- 1) Remove the bottom board as explained above.
- 2) Remove the 4 setscrews **B** of the radiating fin.
- 3) Remove the 2 setscrews **C** of the top radiating fin.

Removal of drive P.C.B. and automatic mechanism ass'y (See Fig. 8.)

- 1) Remove the bottom board.
- 2) Remove the speed change knob.
- 3) Remove the 4 setscrews **D** of the automatic mechanism ass'y.
- 4) Remove the 4 setscrews **E** of the drive P.C.B..
- 5) Pull out the boards in the direction of the arrow **1** as illustrated.

Note) 1. Pull the start plate in the direction of the arrow **2** because it may otherwise come in touch with the tone arm fixing plate ass'y.
2. Since the neon cover is fixed being in contact with the drive P.C.B. take care not to lose the neon cover when removing the base plate.

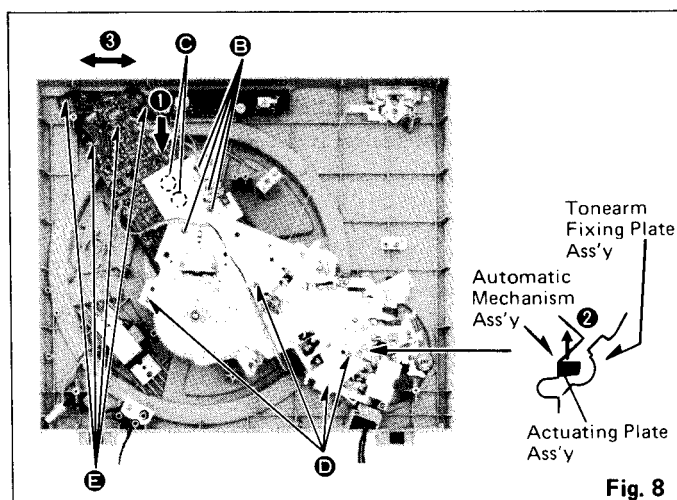


Fig. 8

Removal of stator coil (See Fig. 9.)

- 1) Remove the 3 setscrews of the stator cover of the removed drive P.C.B..
- 2) Disconnect the 18 soldered parts of the stator coil.
- 3) Remove the 3 setscrews **F** of the stator coil and P.C.B. board.

Then, the stator coil can be removed. When installing, position the stator coil as shown by the arrow **4**.

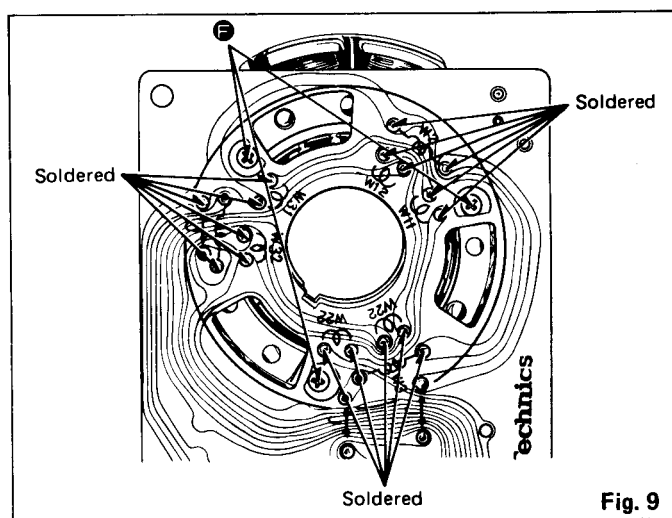


Fig. 9

Precautions for assembly

Note) When assembling the mechanical and drive P.C.B., follow the procedure below. (See Fig. 13.)

- 1) Temporarily secure the 3 setscrews of the stator coil.
- 2) Secure the automatic mechanism ass'y with 4 setscrews. (Pull the actuating plate ass'y in the direction of the arrow 2 or otherwise it may touch the tone arm fixing plate ass'y.)
- 3) There is some clearance between the drive P.C.B. and automatic mechanism ass'y in the direction of the arrow 3. Find a position where the pitch control knob doesn't touch the cabinet, and then install the drive base plate with 4 setscrews.

■ ADJUSTMENTS

Adjustment of the arm-lift height (See Figs. 10 and 11.)

The arm-lift height (distance between the stylus tip and record surface when cueing lever is raised) has been adjusted at the factory before shipping to approximately 5 to 10 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.

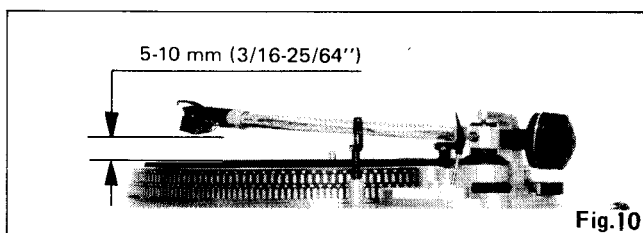


Fig. 10

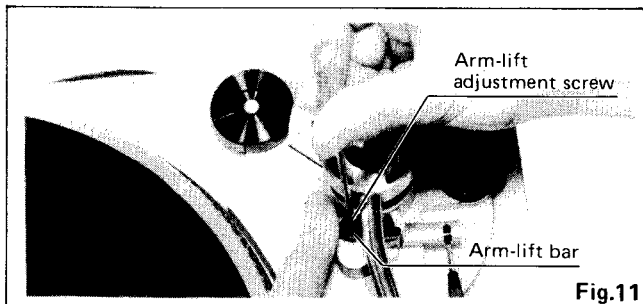


Fig. 11

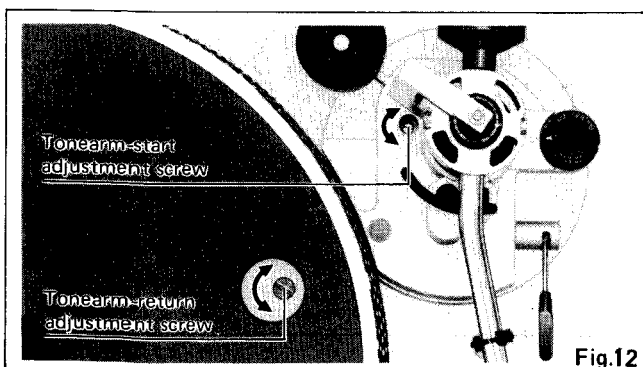


Fig. 12

Adjustment for automatic start position (See Fig. 12.) (Remove the rubber cap.)

In cases where the stylus tip sets down outside of the record.

—rotate clockwise.

In cases where the stylus tip sets down too far in the recorded groove

—rotate counterclockwise.

Adjustment for automatic return position (See Fig. 12.)

(Remove the turntable mat.)

In cases where the tonearm tends to return before the playing has finished.

—rotate clockwise

In cases where the tonearm fails to return after the last groove of the record has been played.

—rotate counterclockwise

Speed adjustment (with pitch-control knob) (See Fig. 13.)

Strobe dots are set on the rim of the turntable platter according to the power-line frequency and the speed of the records. Make adjustment, referring to the strobe-dot indication.

1. Set the speed select knob to the speed to be adjusted.

2. Release the arm clamp and move the tonearm toward the record.

The strobe-illuminator/pilot lamp will light up and the turntable platter will rotate.

3. While turning the pitch-control knob either to the "+" side or "-" side, adjust so that the strobe dots of the turntable platter look as if they were stationary. This represents the correct speed.

"+" direction

The speed of the turntable platter will increase. Turn the knob in this direction if the strobe dots seem to be "falling back", i.e. seem to be moving counterclockwise. When the dots appear to be stationary, turntable speed is accurate.

"-" direction

The speed of the turntable platter will decrease. Turn the knob in this direction if the dots seem to be "running ahead", i.e. seem to be moving clockwise, until they appear stationary.

Moreover, the speed fine control knob can be used for both 33-1/3 rpm and 45 rpm.

Adjustment is to be made according to the selected speed (33-1/3 rpm or 45 rpm).

Note:

Strobe dot pattern

The strobe-illuminator/pilot lamp of this unit employs the standard commercial power source. The frequency of such power source, when actually measured, has a fluctuation of about 0.2%.

As such a fluctuation of the power source affects the strobe illuminator, the strobe dot pattern also seems to fluctuate to a certain extent. But the unit is not affected by these fluctuations of the power source, since a DC motor is employed.

In other words, rotation of the platter will be constant, and slight shifts in the movement of the dots simply reflect normal drift in the power-source frequency.

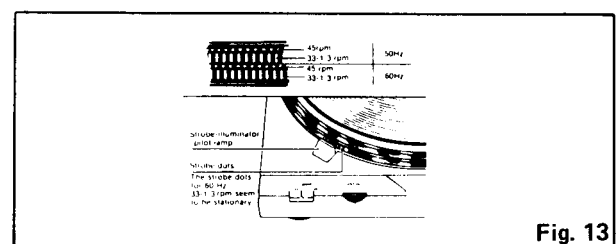


Fig. 13

■ JUSTIERUNGEN

Justierung der Tonarmlifthöhe (Vgl. Abb. 10 und 11.)

Die Tonarmlifthöhe, d.h. der Abstand zwischen Nadelspitze und Schallplattenoberfläche, wenn der Lift-Hebel angehoben ist, ist werkseitig auf ungefähr 10 mm eingestellt worden.

Falls der Abstand zu groß oder zu klein wird, drehen Sie die Justierschraube im Uhrzeigersinn oder Gegenurzeigersinn während Sie die Tonarmlifthöhe nach unten drücken.

Drehung im Uhrzeigersinn

—Der Abstand wird kleiner.

Drehung im Gegenurzeigersinn

—Der Abstand wird größer.

Anmerkung:

Da die Justierschraube einen Sechskantkopf hat, muß die Tonarmlifthöhe während des Justierens unbedingt gedrückt gehalten werden, damit sich die Schraube leicht drehen läßt.

Vergewissern Sie sich, daß der Sechskantkopf in die Tonarmlifthöhe zurückkehrt, wenn diese losgelassen wird.

Justierung des Tonarmaufsetzpunktes der Automatik (Vgl. Abb. 12.)

(Die Gummikappe abnehmen)

Falls der Aufsetzpunkt außerhalb der Platte liegt.

—Im Uhrzeigersinn drehen.

Falls der Aufsetzpunkt im Wiedergabeteil der Schallplatte liegt.

—Im Gegenurzeigersinn drehen.

Justierung des Abschaltpunktes der Automatik (Vgl. Abb. 12.)

(Die Plattentellerauflage abnehmen.)

Falls der Tonarm zu früh zurückkehrt.

—Im Uhrzeigersinn drehen.

Falls der Tonarm nach Erreichen der Auslaufrille nicht zurückkehrt.

—Im Gegenurzeigersinn drehen.

Drehzahl-Feineinstellung (mit dem Drehzahl-Feineinsteller) (Vgl. Abb. 13.)

Die Stroboskoppunkte sind auf dem Plattentellerrand entsprechend der Stromfrequenz und der Drehzahl der Schallplatten angebracht.

Richten Sie sich bei der Drehzahl-Feineinstellung nach dem Stroboskopbild.

1. Stellen Sie den Drehzahl-Wahlschieber auf die zu regulierende Drehzahl ein.
2. Lösen Sie die Tonarm-Arretierklammer, und schwenken Sie den Tonarm zur Schallplatte.
Die Stroboskoplampe/Einschaltkontrolle leuchtet auf, und der Plattenteller dreht sich.
3. Regulieren Sie durch Drehen des Einstellknopfes in "+" oder "-" Richtung solange, bis die Stroboskoppunkte den Anschein vermitteln, daß sie stillstehen. Dieser Zustand stellt die korrekte Drehzahl dar.

"+" Richtung

Die Drehzahl des Plattentellers erhöht sich. Drehen Sie den Knopf in diese Richtung, wenn die Stroboskoppunkte "zurückzufallen", d.h. im Gegenurzeigersinn zu fließen scheinen. Wenn die Punkte stillzustehen scheinen, ist die Geschwindigkeit korrekt.

"-" Richtung

Die Drehzahl des Plattentellers verringert sich. Drehen Sie den Knopf in diese Richtung, wenn die Stroboskoppunkte "vorauszufließen", d.h. im Uhrzeigersinn zu fließen scheinen. Regulieren Sie, bis sie stillzustehen scheinen.

Anmerkung:

Stroboskoppunktemuster

Die Stroboskoplampe/Kontrolllampe dieses Gerätes arbeitet mit normalem Netzstrom. Die Netzfrequenzschwankungen liegen in einem Bereich von ungefähr $\pm 0.2\%$.

Da eine solche Netzschwankung die Stroboskoplampe beeinflusst, scheint das Punktemuster auch zu einem gewissen Grad zu fließen. Die Drehzahl des Plattentellers wird jedoch durch diese Schwankung nicht beeinflusst, da ein Gleichstrommotor den Plattenteller antreibt. Anders ausgedrückt, die Umdrehungsgeschwindigkeit des Plattentellers bleibt konstant, und die geringfügige Bewegung der Stroboskoppunkte entspricht lediglich der normalen Schwankung der Netzfrequenz.

Einstellung der Drehzahl (vgl. Eig. 14)

Falls die Drehzahl durch Auswechseln von IC oder anderen Teilen sowie durch Drehen des Knopfes für Drehzahlfeinverstellung (VR3) sich nicht richtig einstellen läßt, die Nacheinstellung gemäß dem folgenden Verfahren vornehmen.

1. Den Knopf für Drehzahlfeinverstellung auf die Mitte stellen.
2. In Betriebsart 33-1/3 U/min VR1 (33) so drehen, daß die Drehzahl an Hand des Stroboskops auf den vorgeschriebenen Punkt eingestellt wird.
3. Anschließend in Betriebsart 45 U/min VR2 (45) so drehen, daß die Drehzahl an Hand des Stroboskops auf den vorgeschriebenen Punkt eingestellt wird.
4. Nach der Einstellung den Drehzahlwechschalter umstellen und sich vertewissern, daß die Drehzahlen in den Betriebsarten von 33-1/3 und 45 U/min mit der jeweils vorgeschriebenen übereinstimmt.

Anmerkung:

Für die o.g. Einstellung erfolgt das Demontageverfahren. Die Bodenplatte entfernen und das Gerät zur Reparatur auf einen Tisch setzen, um Zugang von unten her zu gewinnen.

Es ist auch möglich, nur durch Entfernen der Drehscheibe das Gerät einzustellen.

Die Drehscheibe wie unten dargestellt entfernen, und durch das dann erscheinende Loch läßt sich ein Schraubenzieher einstecken, um VR1 und VR2 zu drehen.

■ REGLAGES

Mise au point de la hauteur de l'élévateur du bras (Voir Figs. 10 et 11.)

La hauteur de l'élévateur du bras (distance entre l'extrémité de la pointe de lecture et la surface du disque lorsque le levier de relevage du bras est soulevé) a été réglée en usine avant son départ sur une valeur approximative de 10 mm. Si l'écartement devient trop étroit ou trop large, tourner la vis de réglage dans le sens des aiguilles d'une montre ou en sens inverse, tout en abaissant l'élévateur du bras.

Rotation dans le sens des aiguilles d'une montre.

—La distance entre la surface du disque et l'extrémité de la pointe de lecture diminue.

Rotation dans le sens contraire des aiguilles d'une montre.

—La distance entre la surface du disque et l'extrémité de la pointe de lecture augmente.

Nota:

Comme la vis de réglage possède une tête hexagonale, s'assurer d'effectuer la mise au point tout en abaissant l'élévateur du bras, sinon la vis ne bougera pas librement. Vérifier aussi que la tête hexagonale se retire correctement dans l'élévateur du bras quand ce dernier est libéré.

Mise au point pour une position de marche automatique. (Voir Fig. 12.)

(Retirer le capuchon en caoutchouc.)

Dans le cas où la tête de la pointe de lecture s'abaisse en dehors du disque.

—Déplacer dans le sens des aiguilles d'une montre.

Dans le cas où la tête de la pointe de lecture s'abaisse trop loin du sillon enregistré.

—Déplacer dans le sens contraire des aiguilles d'une montre.

Mise au point pour une position de retour automatique (Voir Fig. 12.)

(Retirer le tapis du plateau de lecture.)

Dans le cas où le bras de lecture tend à revenir avant que l'audition ne soit terminée.

—Déplacer dans le sens des aiguilles d'une montre.

Dans le cas où le bras de lecture ne peut revenir en arrière après que le dernier sillon du disque ait été joué.

—Déplacer dans le sens contraire des aiguilles d'une montre.

Réglage de la vitesse (avec la manette de réglage de précision) (Voir Fig. 13.)

Les points du stroboscope sont réglés sur le bord du plateau du tourne-disque en fonction de la fréquence de réseau et de la vitesse des disques.

Il faut effectuer le réglage de la vitesse en se référant aux indications des points du stroboscope.

1. Régler la manette sélectrice de vitesse sur la vitesse devant être mise au point.
2. Libérer le clip de retenue du bras et déplacer le bras de lecture vers le disque.

La lampe-témoin/illuminomètre stroboscopique s'éclairera et le plateau commencera à tourner.

3. Tout en tournant la manette de réglage de précision

suffisamment, soit dans le sens "+" soit dans le sens "-", ajuster de façon à ce que les points du stroboscope du plateau paraissent stationnaires.

Cet état représente la vitesse correcte.

Sens "+"

La vitesse du plateau augmentera. Tourner la manette dans cette direction si les points stroboscopiques semblent "reculer", c.-à-d. se déplacer dans le sens inverse des aiguilles d'une montre. Lorsque les points paraissent immobiles, la vitesse du plateau est exacte.

Sens "-"

La vitesse du plateau diminuera. Tourner la manette dans cette direction si les points stroboscopiques semblent "s'écouler vers l'avant", c.-à-d. se déplacer dans le sens des aiguilles d'une montre, jusqu'à ce qu'ils paraissent stationnaires.

Nota:

Image des points stroboscopiques.

La lampe-témoin/illuminomètre stroboscopique de cet appareil utilise une alimentation commerciale standard. La fréquence d'une pareille source d'énergie, lorsqu'elle est effectivement mesurée, montre une variation d'à peu près 0.2%.

Comme une telle variation de la source d'énergie affecte l'illuminomètre stroboscopique, l'image des points stroboscopiques semble varier aussi sur une certaine étendue. Mais l'appareil n'est pas affecté par ces variations de la source d'énergie, étant donné qu'un moteur à courant continu est utilisé.

En d'autres mots, la rotation du plateau restera constante et les légers déplacements dans le mouvement des points ne reflètent simplement qu'une déviation normale dans la fréquence de la source d'énergie.

Réglage de la vitesse (Voir la Fig. 14.)

Si la vitesse de rotation ne peut pas être correctement réglée par le remplacement du C.I. ou d'autres éléments et en tournant le bouton (VR3) de réglage fin de la vitesse, refaire le réglage en suivant le procédé suivant.

1. Placer le bouton de réglage fin de la vitesse, sur la position centrale.
2. Dans le mode 33-1/3 t/pm, tourner le VR1 (33) de telle sorte que la vitesse soit réglée sur le point spécifié par l'utilisation du stroboscope.
3. Puis, dans le mode 45 tours, tourner le VR2 (45) de telle sorte que la vitesse soit réglée sur la point spécifié, par l'utilisation du stroboscope.
4. Après ce réglage, déplacer le commutateur de changement de vitesse et s'assurer que les vitesses sont celles qui ont été spécifiées dans les modes 33-1/3 et 45 tours.

Note:

Pour les réglages suivants, suivre les procédés de dépose. Pour les travaux de réparation, enlever la plaque de base et placer l'appareil sur une table et accéder à l'appareil par dessous.

Il est aussi possible de régler l'appareil après avoir seulement enlevé son tourne-disques.

Enlever le tourne-disques comme le montre l'illustration ci-dessous, puis un orifice apparaîtra par lequel un tournevis peut être introduit pour tourner les VR1 et VR2.

ADJUSTMENT PROCEDURE

Adjustment of Speed (See Fig. 14.)

If the number of revolutions cannot be correctly adjusted by replacing IC or other parts and turning the fine speed adjusting knob (VR3), make the re-adjustment according to the following procedure.

Set the fine speed adjusting knob to the central position. In 33-1/3 r.p.m. mode, turn VR1 (33) so that the speed is adjusted to the specified point by using a stroboscope. Next, in 45 r.p.m. mode, turn VR2 (45) so that the speed is adjusted to the specified point by using a stroboscope.

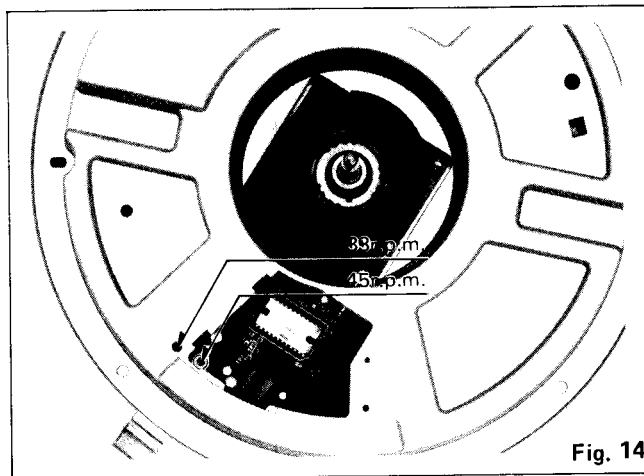
After the adjustment, shift the speed change switch and make sure that the speeds in 33-1/3 r.p.m. and 45 r.p.m. modes are as specified.

Note:

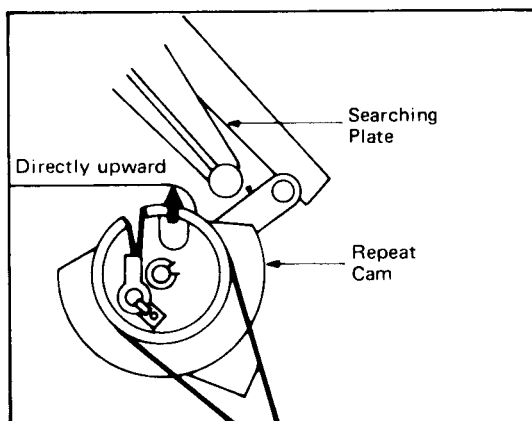
For the above adjustments, follow the disassembly procedure. Remove the bottom plate and put the set on a table for repair work and gain access to it from underneath.

It is also possible to adjust the set only with its turntable removed.

Remove the turntable as illustrated below, then a hole will be revealed from which a screwdriver can be inserted to turn VR1 and VR2.



DIAL DRIVE MECHANISM DIAGRAM

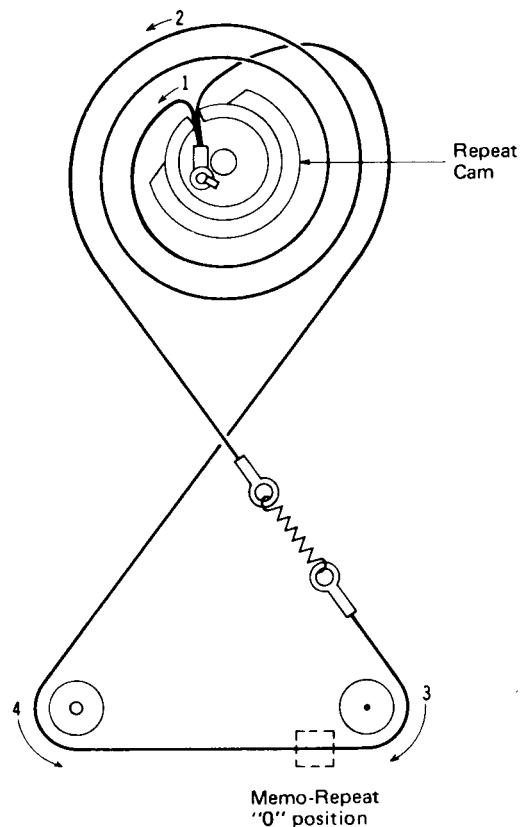


Set the cord according to following procedure.

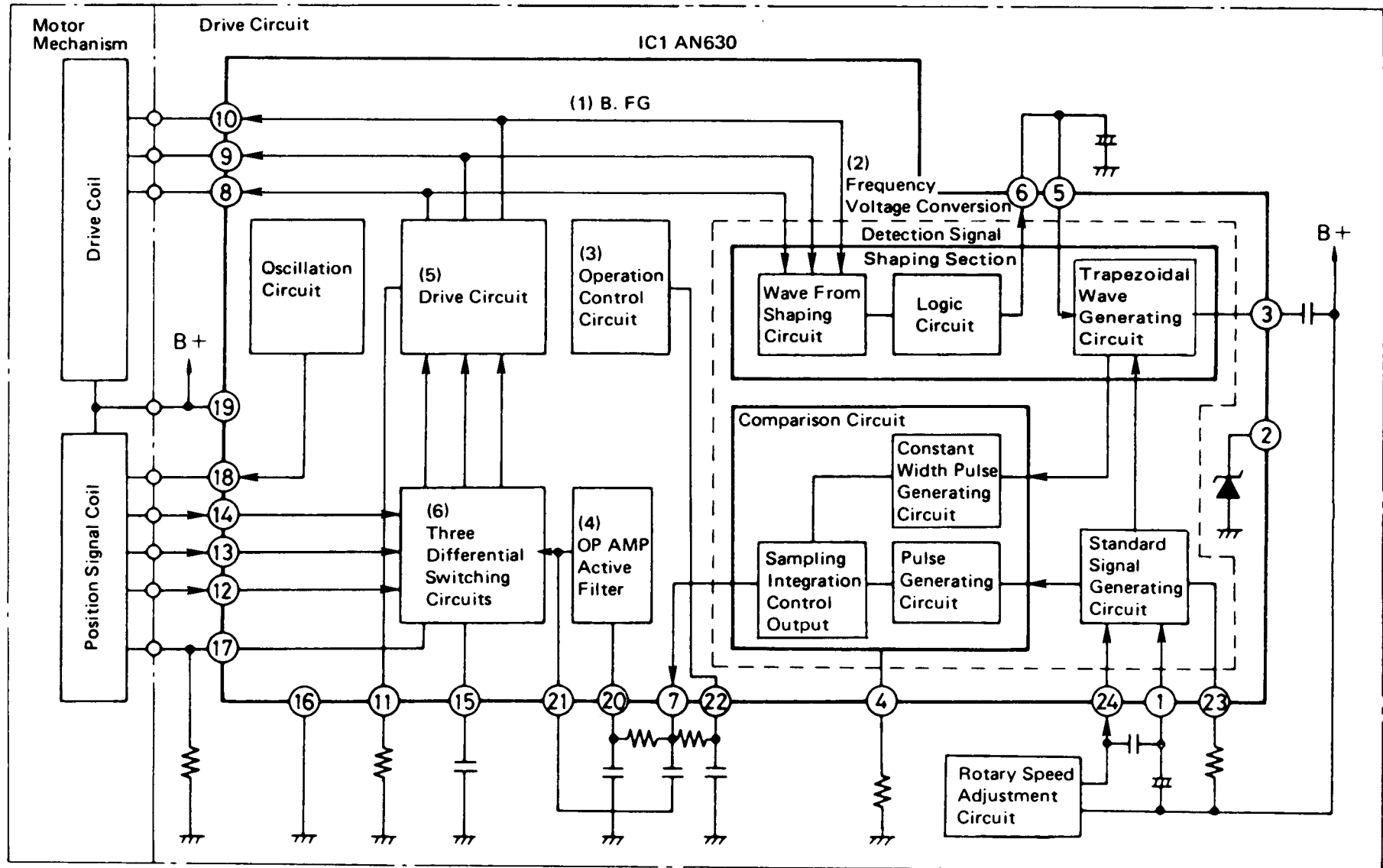
Link the hook of the cord onto the projection of the cam.

Hold the spring-attached side of the cord with the right hand, and wind it around the repeat cam twice, and then set the cord in accordance with steps 1 – 4.

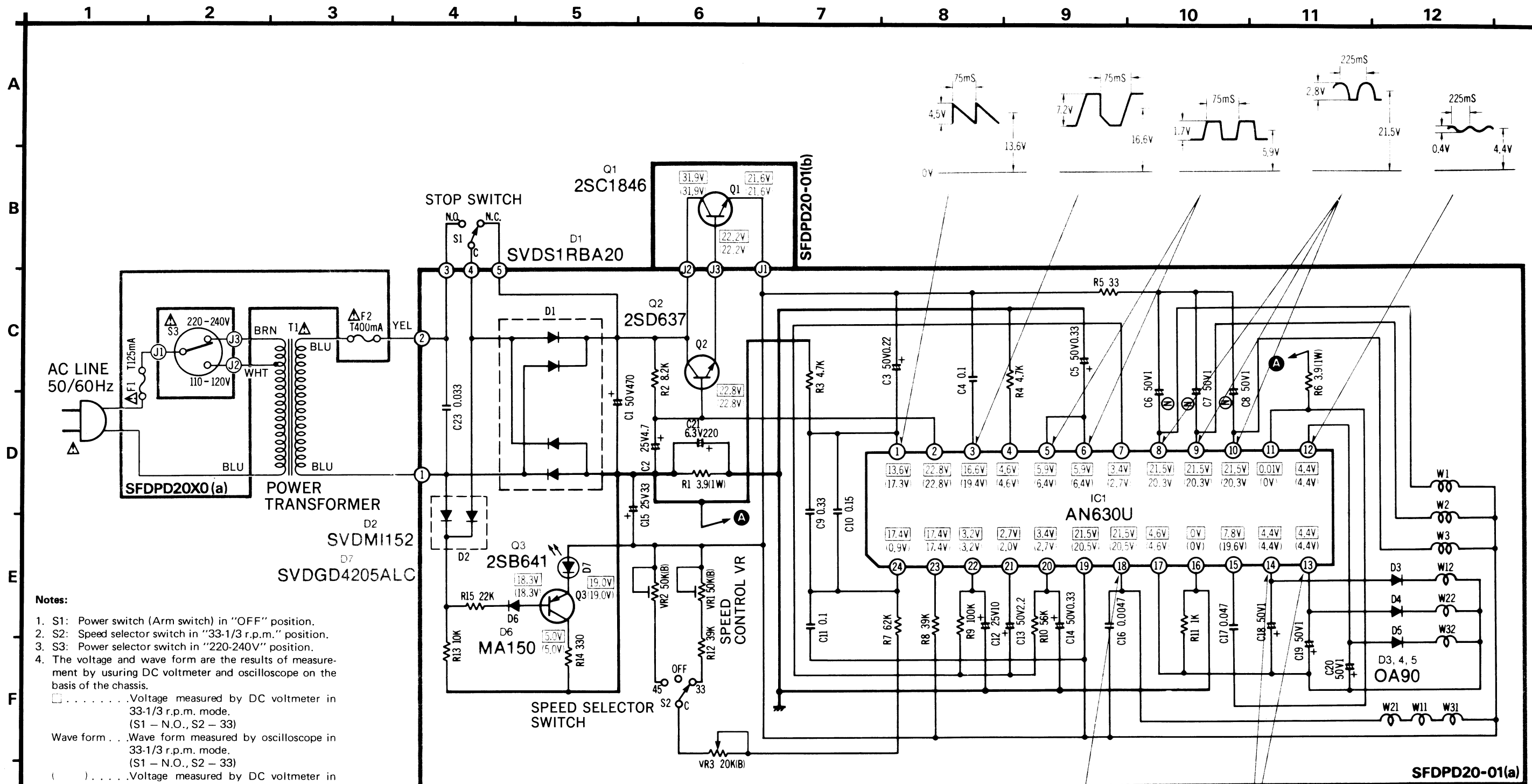
Adjust so that the repeat cam and searching plate are positioned as illustrated. Set the memo-repeat knob to the "0" position and secure it there.



10 ■ BLOCK DIAGRAM



Schematic Diagram (This schematic diagram may be modified at any time with the development of new technology.)



Notes:

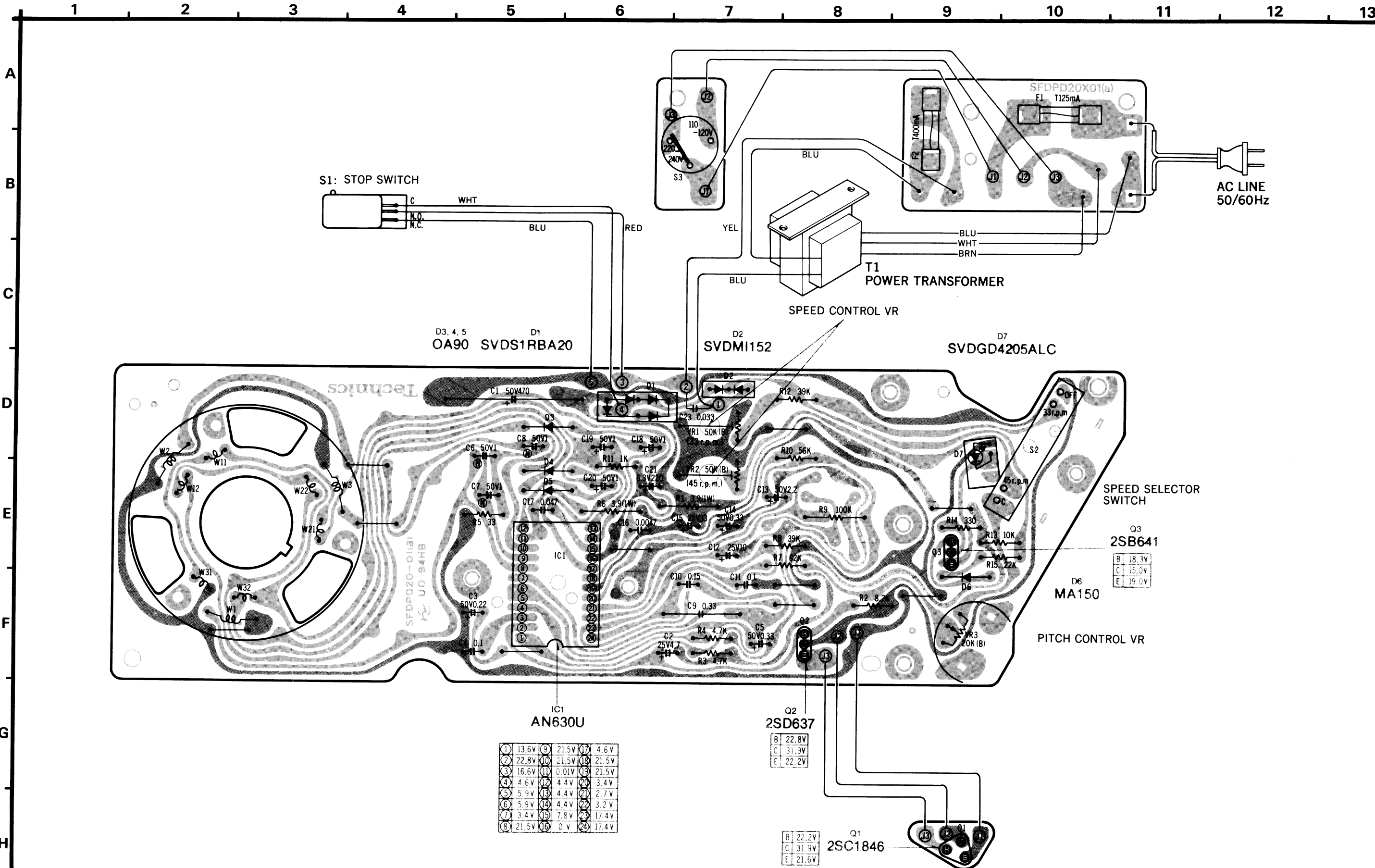
1. S1: Power switch (Arm switch) in "OFF" position.
 2. S2: Speed selector switch in "33-1/3 r.p.m." position.
 3. S3: Power selector switch in "220-240V" position.
 4. The voltage and wave form are the results of measurement by using DC voltmeter and oscilloscope on the basis of the chassis.
- Voltage measured by DC voltmeter in 33-1/3 r.p.m. mode.
(S1 - N.O., S2 - 33)
- Wave form . . . Wave form measured by oscilloscope in 33-1/3 r.p.m. mode.
(S1 - N.O., S2 - 33)
- () Voltage measured by DC voltmeter in stop mode.
(S1 - N.O., S2 - OFF)

■ TERMINAL GUIDE OF TRANSISTOR AND IC

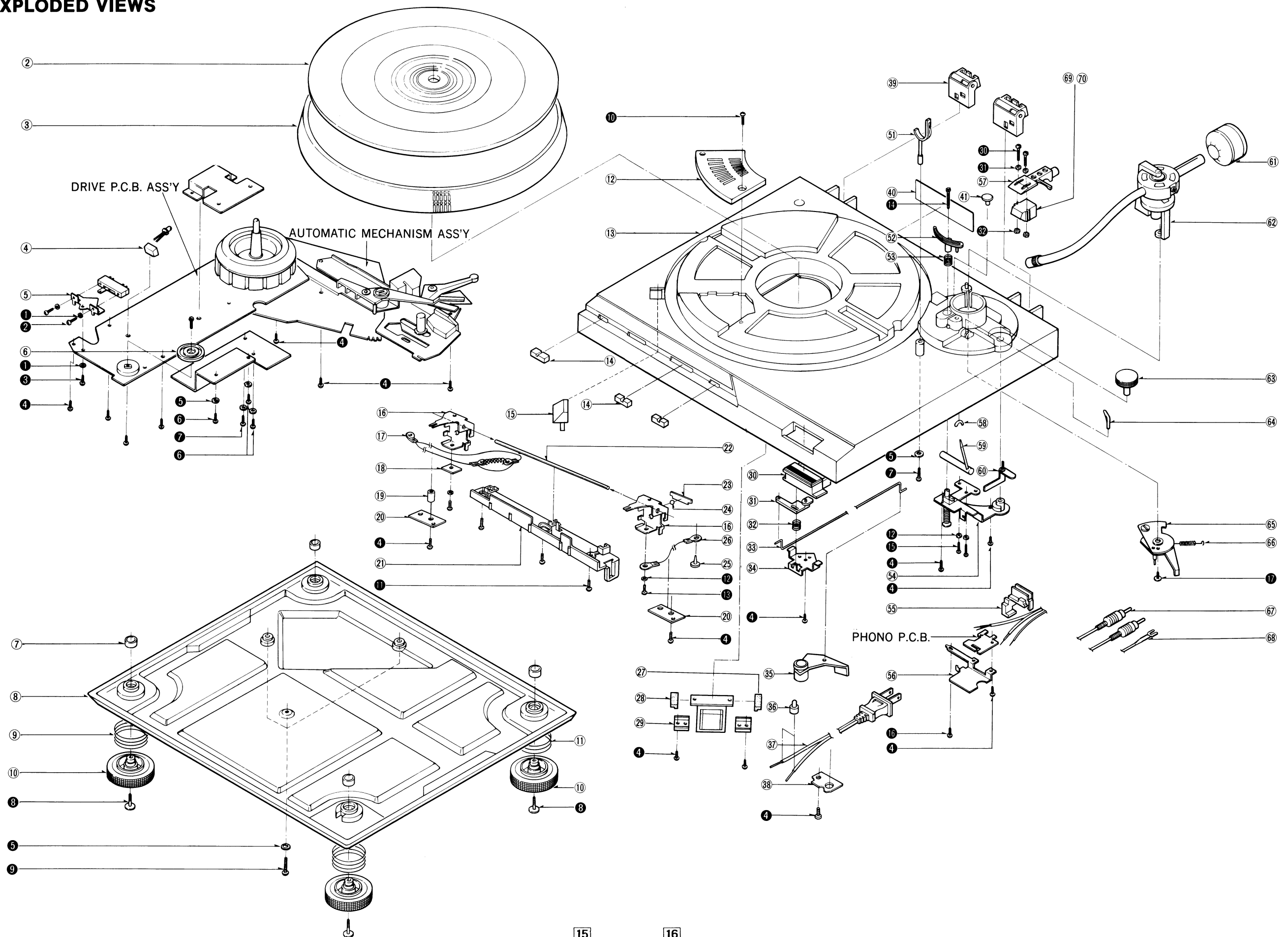
2SC1846	2SD637 2SB641	AN630U

Printed Circuit Board

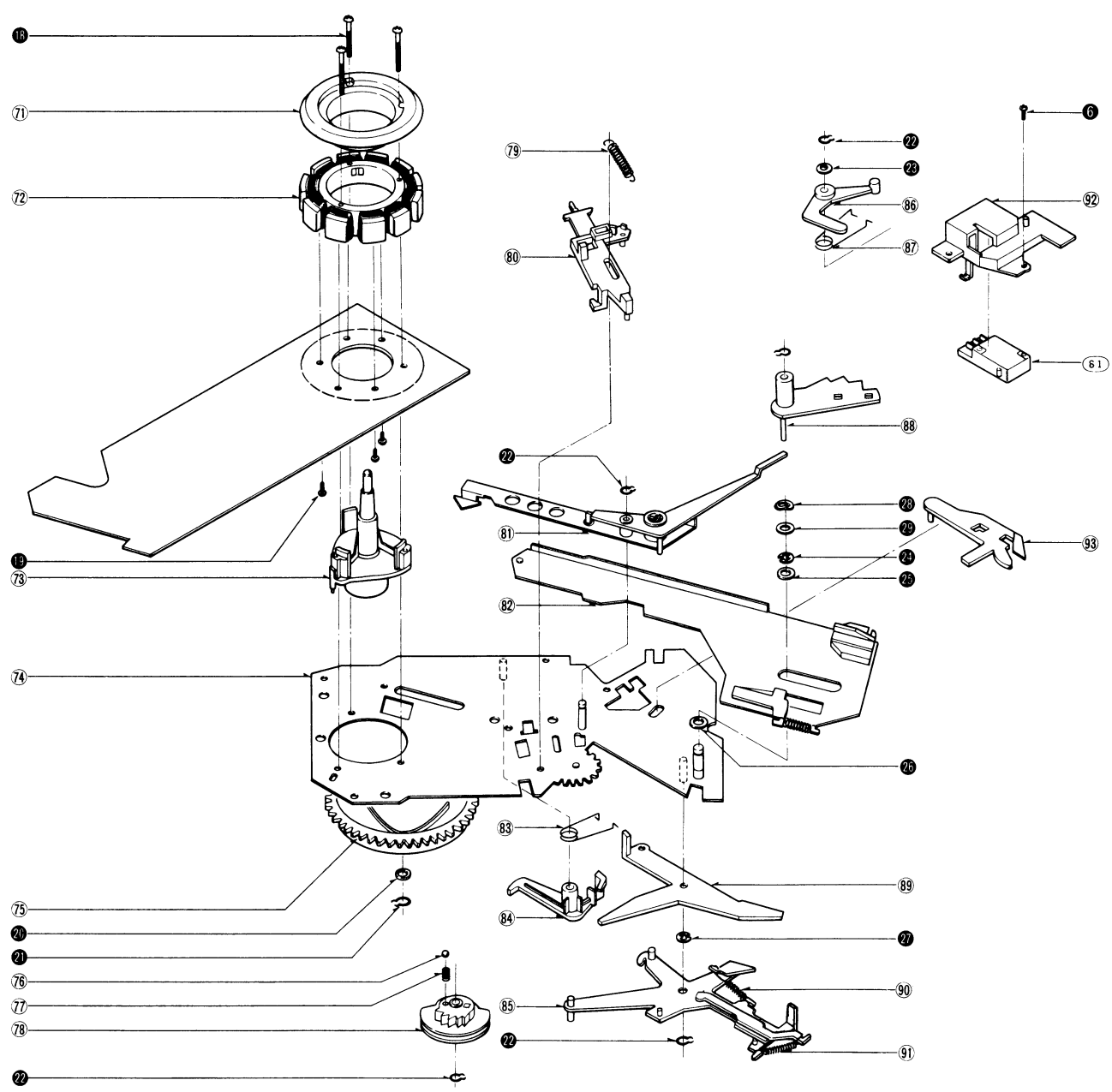
Earth (Ground) lines
B lines



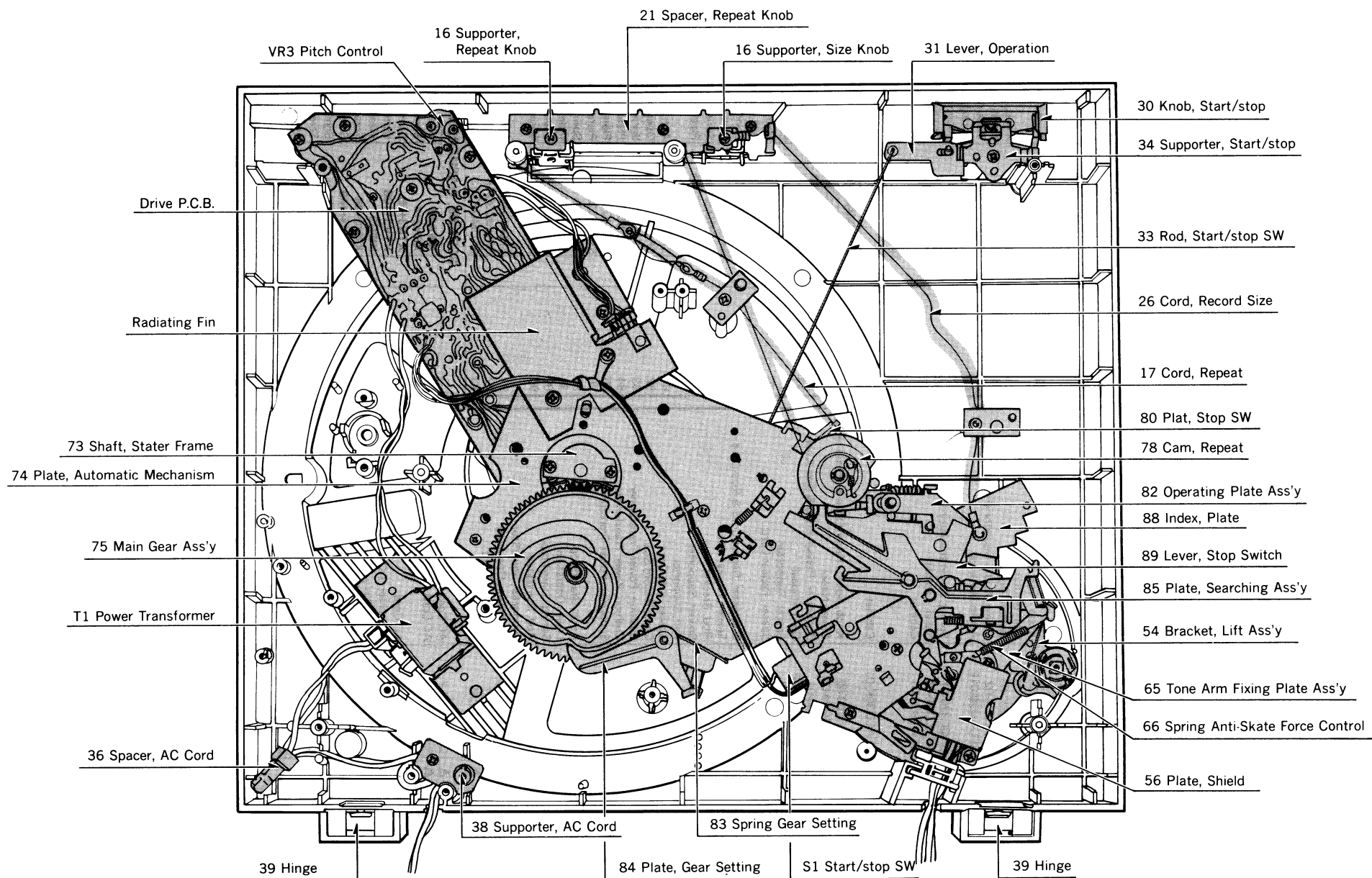
■ EXPLODED VIEWS



■ EXPLODED VIEWS



81 ■ PARTS ARRANGEMENT DIAGRAM



■ REPLACEMENT PARTS LIST

- Notes: 1. Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.
2. Δ indicates that only parts specified by the manufacturer be used for safety.
3. SL-D3 (XA) $\rightarrow$ [XA], SL-D3 (XAL) $\rightarrow$ [XAL], SL-D3 (XGE) $\rightarrow$ [XGE],
SL-D3 (E) $\rightarrow$ [E], SL-D3 (XG) $\rightarrow$ [XG], SL-D3 (XGF) $\rightarrow$ [XGF], SL-D3 (XGB) $\rightarrow$ [XGB]
SL-D3K (XAL) $\rightarrow$ [KXAL], SL-D3K (E) $\rightarrow$ [KE], SL-D3K (XG) $\rightarrow$ [KXG]

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
CABINET and CHASSIS PARTS					
1	SFADD20-01E	Dust Cover	60	SFXJQ20-03E	Plate, Anti-skate Force Control
2	SFTG320-01	Turntable Mat	61	SFPWG31101K	Balance Weight
3	SFTED20-01A	Turntable	62 [XA, XAL, XGE, E, XG, XGF, XGB]	SFPAM31101K	Tone Arm
4	SFUMD20-02	Spacer, LED	62 [KXAL, KE, KXG]	SFPAM31102K	Tone Arm
5	SFUPD20-04	Plat, Speed Select Switch	63	SFPJK13101	Knob, Anti-skate Force Control
6	SFKTD20-03	Knob, Pitch Control	64	SFPAB13202	Knob, Cueing Lever
7	SFXWD20-01	Cap, Bottom Board	65	SFUPQ20-03A	Tone Arm Fixing Plate Ass'y
8	SFAUQ20-01	Bottom Board	66	SFPSP00101	Spring, Anti-skate Force Control
9	SFQC200-02	Spring, Audio Insulator (Front)	67	SFDH212-01	Phono Cord
10	SFGAQ20-01E	Audio Insulator	68	SFKU212-01E	Ground Wire
11	SFQC320-01	Spring, Audio Insulator (Rear)	69	EPC270CK2-K-X	Cartridge
12	SFKCD20-01	Panel, Cabinet	70	EPS270ED	Stylus
13 [XA, XAL, XGE, E, XG, XGF, XGB]	SFACD30-01	Cabinet	AUTOMATIC MECHANISM ASS'Y		
13 [KXAL, KE, KXG]	SFACD30K-01	Cabinet	71	SFMGQ20-01	Cover, Stater Frame Ass'y
14	SFKTD20-02	Knob, Speed, Record Size & Memo-repeat	72	SFMG170-01A	Stater Frame
15	SFUMQ20-05	Cover, Neon	73	SFMZQ20-01A	Shaft, Stater Frame Ass'y
16	SFUPD30-01	Supporter, Repeat Knob & Size Knob	74	SFUKD30-11E	Plate, Automatic Mechanism
17	SFUZD30-02E	Cord, Repeat	75	SFUG190-22E	Main Gear Ass'y
18	SFUPD30-02	Spacer, Supporter	76	SFYB-5-32	Ball, Repeat Cam
19	SFXOD30-01	Spacer, Repeat Cord	77	SFQAQ30-01	Spring, Repeat Cam
20	SFUPD30-03	Supporter, Repeat Cord & Size Cord	78	SFUMQ30-13	Cam, Repeat
21	SFUMD30-01E	Spacer, Repeat Knob	79	SFQHD30-01	Spring, Stop SW Plate
22	SFXJD30-01	Rod, Bracket	80	SFUMQ30-14E	Plate, Stop SW
23	SFQPD30-01	Spacer, Supporter	81	SFUCQ20-11E	Actuating Plate Ass'y
24	SFYB-5-32	Ball, Supporter	82	SFUBQ30-11A	Operating Plate Ass'y
25	SFUZQ30-04	Spacer, Size Cord	83	SFQS222-11	Spring, Gear Setting
26	SFUZD30-01E	Cord, Record Size	84	SFUM222-11	Plate, Gear Setting
27	SFGCD20X02	Cushion, Power Transformer	85	SFUMQ30-11E	Plate, Searching Ass'y
28	SFGCD20X01	Cushion, Power Transformer	86	SFUMQ20-19	Plate, Brake
29	SFUPD20-02	Supporter, Power Transformer	87	SFQSQ20-13	Spring, Brake Plate
30	SFKTD20-01	Knob, Start/Stop	88	SFUMQ30-12	Index, Plate
31	SFUMD20-01	Lever, Operation	89	SFUMQ20-17	Lever, Stop Switch
32	SFQAD20-01	Spring, Start/Stop	90	SFQHQ30-14	Spring, Searching Plate
33	SFUZD30-01	Rod, Start/Stop	91	SFQHQ30-13	Spring, Searching Plate
34	SFUPD20-03	Supporter, Start/Stop	92	SFUMQ30-18	Cover, Stop Switch
35	SFUMD30-02	Supporter, Operating	93	SFUMQ20-16	Supporter, Stop Switch
36	SJE41	Spacer, AC Cord	SCREWS, WASHERS and CIRCLIPS		
37 [XA, XG, KXG, XGF, XGB]	Δ RJA23ZC-K	AC Cord	①	XWA2B	Washer
37 [XAL, KXAL]	Δ QFC1208M-P	AC Cord	②	XSN2+4	Screw
37 [XGE] only	Δ RJA45ZC-K	AC Cord	③	XTN3+6B	Screw
37 [E, KE]	Δ RJA23C-K	AC Cord	④	XTV3+10B	Screw
38	SFUP202-03	Supporter, AC Cord	⑤	XWG3	Washer
39	SFAT301-01A	Hinge Ass'y	⑥	XTV3+8B	Screw
40 [XA, XG, XGF, XGB]	SFNN230X01	Name Plate	⑦	XTV3+14B	Screw
40 [XAL, KXAL, XGE]	SFNN230G01	Name Plate	⑧	SFXGD20-01	Screw
40 [E, KE]	SFNN230S01	Name Plate	⑨	XTV3+20B	Screw
40 [KXG] only	SFNN230K03	Name Plate	⑩	XTV3+10BFZ	Screw
41 [XA, XAL, XGE, E, XG, XGF, XGB]	SFGK170-01	Cap, Rubber	⑪	XTV3+14BFN	Screw
41 [KXAL, KE, KXG]	SFGK171F01	Cap, Rubber	⑫	XWA3B	Washer
STONE ARM and ARM BASE			⑬	XSN3+8S	Screw
51	SFKU212-01E	Arm Rest	⑭	SFXG829-1	Screw
52	SFPRT13004K	Lift Ass'y	⑮	XSN3+12S	Screw
53	SFQA829-03	Spring, Lift Ass'y	⑯	XTN3+8B	Screw
54	SFUPD20-01A	Bracket, Lift Ass'y	⑰	SFPEV13204	Screw
55	SFUM212-08	Clamper, Cord	⑱	SFXGQ20-02	Screw
56	SFUP683R04	Plate, Shield	⑲	XTN26+6B	Screw
57	SFPCC31001K	Headshell	⑳	SFXW890B01	Washer
58	SFGZD20-02	Supporter, Cueing	㉑	XUB6FT	Circlip
59	SFPJL00101K	Lever, Cueing	㉒	XUB4FT	Circlip
			㉓	XWA4A10BW	Washer
			㉔	XUC5FT	Circlip
			㉕	SFXW623-2	Washer
			㉖	SFXW130-13	Washer
			㉗	XUC3FT	Circlip

REPLACEMENT PARTS LIST

- Notes:**
- Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.
 - Δ indicates that only parts specified by the manufacture be used safety.
 - SL-D3 (XA) $\rightarrow$ [XA], SL-D3 (XAL) $\rightarrow$ [XAL], SL-D3 (XGE) $\rightarrow$ [XGE],
SL-D3 (E) $\rightarrow$ [E], SL-D3 (XG) $\rightarrow$ [XG], SL-D3 (XGF) $\rightarrow$ [XGF], SL-D3 (XGB) $\rightarrow$ [XGB]
SL-D3K (XAL) $\rightarrow$ [KXAL], SL-D3K (E) $\rightarrow$ [KE], SL-D3K (XG) $\rightarrow$ [KXG]

Ref. No.	Part No.	Part Name & Description
    	SFPEW13005	Washer
	SFXW230-11	Washer
	SFPEV9801	Screw
	SFPEN3302	Nut
	SFPEW9601	Washer
ACCESSORIES		
A1 [XA, XAL, KXAL, XG, KXG, XGF, XGB]	SFNUD30X01	Instruction Book
A1 [XGE] only	SFNUD30G01	Instruction Book
A1 [E, KE]	SFNUD30S01	Instruction Book
A2	SFWE212-01	Adaptor, 45 r.p.m.
A3	SFYF05A06	Polyethylene Bag
A4	SFPZB3501	Shell Weight

Ref. No.	Part No.	Part Name & Description
PACKING PARTS		
P1 [XA, XAL, XGE, E, XG, XGB]	SFHDP30M01	Carton
P1 [KXAL, KE, KXG]	SFHDP30K01	Carton
P1 [XGF] only	SFHDP30C01	Carton
P2	SFHHD20-01	Pad, Front
P3	SFHHD20-02	Pad, Rear
P4	SFHD230-01	Pad, Top
P5	SFHDD20-02	Pad, Turntable
P6	SFYH60X60	Polyethylene Cover, Player Unit
P7	SFYH60X60	Polyethylene Cover, Dust Cover
P8	SFYH40X45	Polyethylene Cover, Turntable

Ref. No.	Part No.	Part Name & Description
INTEGRATED CIRCUIT		
IC1	AN630U	Integrated Circuit
TRANSISTORS		
Q1	2SC1846-R	Transistor
Q2	2SD637	Transistor
Q3	2SB641	Transistor
DIODES		
D1	Δ SVDSIRBA40	Rectifier
D2	Δ SVDMI152	Rectifier
D3, 4, 5	20A90	Diode
D6	MA161	Diode
D7, 9	SVDGD4205ALC	Light Emitting Diode
TRANSFORMER		
T1	Δ SLT5352B	Power Transformer
FUSE		
F1	Δ XBA2C012TRO	125mA, Fuse
F2	Δ XBA2C04TRO	400mA, Fuse
SWITCHES		
S1	Δ SFDSA74403	Switch, Power
S2	Δ EVAH27SBCAAY	Switch, Speed Selector
S3	Δ SFDSHXW13312	Switch, Power Selector
VARIABLE RESISTORS		
VR1, 2	EVLS6AA00B54	50k Ω (B), Speed Control (33 r.p.m. & 45 r.p.m.)
VR3	EVJ61AT12B24	20k Ω (B), Pitch Control

Ref. No.	Part No.	Part Name & Description
RESISTORS		
R1	ERX1ANJ3R9	Metallic, 3.9 Ω , 1W, $\pm$ 5%
R2	ERD25FJ822	Carbon, 8.2k Ω , 1/4W, $\pm$ 5%
R3, 4	ERD25FJ472	Carbon, 4.7k Ω , 1/4W, $\pm$ 5%
R5	ERD25FJ330	Carbon, 33 Ω , 1/4W, $\pm$ 5%
R6	ERX1ANJ3R9	Metallic, 3.9k Ω , 1W, $\pm$ 5%
R7	ERO25CKF6202	Metal Film, 62k Ω , 1/4W, $\pm$ 1%
R8	ERD25TJ393	Carbon, 39k Ω , 1/4W, $\pm$ 5%
R9	ERD25TJ104	Carbon, 100k Ω , 1/4W, $\pm$ 5%
R10	ERD25TJ563	Carbon, 56k Ω , 1/4W, $\pm$ 5%
R11	ERD25FJ102	Carbon, 1k Ω , 1/4W, $\pm$ 5%
R12	ERO25CKF3902	Metal Film, 39k Ω , 1/4W, $\pm$ 2%
R13	ERD25FJ103	Carbon, 10k Ω , 1/4W, $\pm$ 5%
R14	ERD25FJ331	Carbon, 330 Ω , 1/4W, $\pm$ 5%
R15	ERD25TJ223	Carbon, 22k Ω , 1/4W, $\pm$ 5%
CAPACITORS		
C1	ECEB1HS471	Electrolytic, 470 μ F, 50V
C2	ECEA25Z4R7	Electrolytic, 4.7 μ F, 25V
C3	ECEA50ZR22	Electrolytic, 0.22 μ F, 50V
C4	ECQM1H104KS	Polyester, 0.1 μ F, 50V, $\pm$ 10%
C5	ECEA50ZR33	Electrolytic, 0.33 μ F, 50V
C6, 7	ECEA50N1	Non-polar Electrolytic, 1 μ F, 50V
C8	ECEA50N1	Non-polar Electrolytic, 1 μ F, 50V
C9	ECQF2334KZ	Polypropylene, 0.33 μ F, 200V, $\pm$ 10%
C10	ECQM1H154KZ	Polyester, 0.15 μ F, 50V, $\pm$ 10%
C11	ECQM1H104KS	Polyester, 0.1 μ F, 50V, $\pm$ 10%
C12	ECEA25M10R	Electrolytic, 10 μ F, 25V
C13	ECEA50M2R2R	Electrolytic, 2.2 μ F, 50V
C14	ECEA50MR33R	Electrolytic, 0.33 μ F, 50V
C15	ECEA1VS330	Electrolytic, 33 μ F, 25V
C16	ECQM1H472KZ	Polyester, 0.0047 μ F, 50V, $\pm$ 10%
C17	ECQM1H473KZ	Polyester, 0.0047 μ F, 50V, $\pm$ 10%
C18, 19	ECEA50Z1	Electrolytic, 1 μ F, 50V
C20	ECEA50Z1	Electrolytic, 1 μ F, 50V
C21	ECEA1AS221	Electrolytic, 220 μ F, 10V
C23	ECQM1H333KZ	Polyester, 0.0033 μ F, 50V, $\pm$ 10%

Service Manual

Turntable System SL-D3

(XFE), (ES)

SL-D3

- * The model SL-D3 (XFE) is available in East PX only.
- * The model SL-D3 (ES) is available in European Military only.

For additional information, please refer to the service manual for Model No. SL-D3/K (ORDER NO. SD7906-1581)

- Notes:**
- * This service manual includes only the changes of the **SL-D3/K** service manual (ORDER NO. SD7906-1581)
 - * When servicing models **SL-D3 (XFE, ES)** this service manual and **SL-D3/K (ORDER NO. SD7906-1581)** service manual should be used together.

MODIFICATIONS-1

■ SPECIFICATIONS (Page 1)

Cartridge section

Model No. EPC-270C
Type: Moving magnet
Frequency response: 20 Hz to 25 kHz
 20 Hz to 15 kHz ± 2 dB
Output voltage: 3.2 mV at 1 kHz
 5 cm/s. zero to peak lateral velocity
Output voltage: [9 mV at 1 kHz 10 cm/s. zero to peak 45° velocity (DIN 45 500)]
Channel separation: 25 dB at 1 kHz
Channel balance: Within 2 dB at 1 kHz
Compliance (dynamic): 10×10^{-6} cm/dyne at 100 Hz
Stylus pressure: 1.75 ± 0.25 g (17.5 ± 2.5 mN)
Load impedance: 47 k Ω to 100 k Ω
Weight: 6.0 g (cartridge only)
Replacement stylus: EPS-270SD



Cartridge section

Type: Moving magnetic stereo cartridge
Frequency response: 20 Hz to 25 kHz
Output voltage: 2.5 mV 1 kHz, 5 cm/s.
 zero to peak lateral velocity
 (7 mV 1 kHz, 10 cma/s.
 zero to peak 45° velocity)
Channel separation: 22 dB at 1 kHz
Channel balance: Within 2 dB at 1 kHz
Load impedance: 47 k Ω to 100 k Ω
Stylus pressure: 1.75 ± 0.25 g
Replacement stylus: EPS-74STSD (ATN71)

Technics

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MODIFICATIONS-2

■ REPLACEMENT PARTS LIST (Page 19, 20)

Ref. No.	Change of Part No.		Part Name & Description
	SD7906-1581	SL-D3 (XFE, ES)	
POWER TRANSFORMER			
T1	SLTF5352B	SLTF5352A	Power Transformer
CABINET and CHASSIS PARTS			
13	SFACD30-01	SFACD30-01	Cabinet
	SFACD30K01		
36	SJE41	Deletion	-----
37	RJA23ZC	SJA89	AC Cord
	QFC1208M		
	RJA45ZC		
40	SFNND30X01	SFNND30E01	Name Plate
	SFNND30G01		
	SNFFD30S01		
	SFNND30K03		
41	SFGK170-01	SFGK171-01	Cap, Rubber
	SFGK171F01		
TONE ARM and ARM BASE			
62	SFPAM31101K	SFPAM31101K	Tone Arm
	SFPAM31102K		
69	EPC270CK	EPC74SMAD	Cartridge
70	EPS270ED	EPS74STSD	Stylus
SCREWS, WASHERS and CIRCLIPS			
30	SFPEV9801	SFPEV7803	Screw
ACCESSORIES			
A1	SFNUD30X01	SFNUD30P01	Instruction Book
	SFNUD30G01		
	SFNUD30S01		
A5	Addition	QJP0603S	Adaptor, Gimens
PACKING PARTS			
P1	SFHPD30M01	SFHPD30M01	Carton
	SFHPD30K01		
	SFHPD30C01		