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Service Manual

Turntable System

SL-D21/(K)

[E], [EK], [XL], [EG], [EB],
[EF], [XA], [XM], [EH], [Ei], [EC]

- * The colors of this model include silver and black.
- * The black type model is provided with (K) in the Service Manual.

Areas

- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [XL] is available in Australia.
- * [EG] is available in F.R. Germany.
- * [EB] is available in Belgium.
- * [EF] is available in France.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XM] is available in Central South America.
- * [EH] is available in Holland.
- * [Ei] is available in Italy.
- * [EC] is available in Czechoslovakia.

English

Specifications

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

General

Power supply:	220V, 50 or 60 Hz
Power consumption:	7 W
Dimensions: (W×H×D)	43 × 11 × 37.5 cm (16-5/16" × 4-11/32" × 14-3/4") Maximum height when top (dust cover) is open. 43 × 37 × 42.5 cm (16-15/16" × 14-9/16" × 16-23/32")
Weight:	4.4 kg

Turntable section

Type:	Automatic turntable Auto return Auto stop
Drive method:	Direct drive
Motor:	Brushless DC Servo
Drive control method:	F-G servo control
Turntable platter:	Aluminum die-cast Diameter 31.2 cm
Turntable speeds:	33-1/3 rpm and 45 rpm
Wow and flutter:	0.012% WRMS* 0.025% WRMS (JIS C5521) ±0.035% peak (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.

Rumble:	-56 dB (IEC 98A Unweighted) -78 dB (IEC 98A Weighted)
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Tonearm section

Type:	Statically-balanced straight tonearm Plug-in connector cartridge
Effective length:	230 mm (9-1/16")
Overhang:	15 mm (19/32")
Tracking error angle:	Within 2°32' at the outer groove of 30 cm (12") record Within 0°32' at the inner groove of 30 cm (12") record
Effective mass:	7.5 g (without cartridge)
Stylus pressure adjustment range:	1.25 ± 0.25 g
Applicable cartridge weight range:	6 g

Cartridge section

Type:	Moving magnet stereo cartridge
Magnetic circuit:	All laminated core
Frequency response:	10 Hz ~ 30 kHz 20 Hz ~ 10 kHz ± 1 dB
Output voltage:	2.5 mV at 1 kHz, 5 cm/s. zero to peak lateral velocity (7 mV at 1 kHz, 10 cm/s. zero to peak 45° velocity [DIN 45 500])
Channel separation:	22 dB at 1 kHz
Channel balance:	Within 2 dB at 1 kHz
Recommended load impedance:	47 kΩ ~ 100 kΩ
Compliance (dynamic):	12 × 10 ⁻⁸ cm/dyne at 100 Hz
Stylus pressure range:	1.25 ± 0.25 g (12.5 ± 2.5 mN)
Weight:	6 g (cartridge only)
Replacement stylus:	EPS-24CS

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

TECHNISCHE DATEN

Änderungen der technischen Daten vorbehalten.

Die angegebenen Gewichts- und Abmessungsdaten sind ungefähre Werte.

■ Allgemeine Daten

Stromversorgung:	220V, 50 oder 60 Hz Wechselstrom
Leistungsaufnahme:	7 W
Abmessungen (B×H×T):	43 × 11 × 37,5 cm Maximale Höhe bei geöffnetem Oberteil (Staubabdeckung). 43 × 37 × 42,5 cm
Gewicht:	3,8 kg

■ Plattenspieler

Typ:	Automatischer Plattenspieler Rückführautomatik Stopautomatik
Antrieb:	Direktantrieb
Motor:	Kollektorloser Gleichstrommotor-Servo-Motor
Antriebsregel-Methode:	FG-Servo-Steuerung
Plattenteller:	Durchmesser 31,2 cm
Plattenteller-Drehzahlen:	33-1/3 und 45 U/min
Gleichlaufschwankungen:	0,012% WRMS* 0,025% WRMS (JIS C5521) ±0,035% Spitze (IEC 98A bewertet)
* Diese Nennleistung bezieht sich auf das Laufwerk-Bauteil allein, ausschließlich Einflüsse von Schallplatte, Tonabnehmer oder Tonarm, aber einschließlich Plattenteller. Gemessen anhand von Signalen vom eingebauten Frequenzgenerator des Motorbauteils.	
Rumpel-Fremdspannungsabstand:	-56 dB (IEC 98A unbewertet)
Rumpel-Geräuschspannungsabstand:	-78 dB (IEC 98A bewertet)

■ Tonarm

Typ:	Statischbalancierter, gerader Tonarm Tonabnehmersystem vom Einsteck-Typ
Effektive Länge:	230 mm
Überhang:	15 mm
Spurfehlwinkel:	2°32' bei der Einlaufrille einer 30 cm-Platte 0°32' bei der Auslaufrille einer 30 cm-Platte
Effektive Masse:	7,5 g (ohne Tonabnehmer)
Auflagekraft-Einstellbereich:	1,25 ± 0,25 g
Zulässiger Tonabnehmer-Gewichtsbereich:	6 g

■ Tonabnehmer

Typ:	Stereo-Magnet-Tonabnehmer mit Einpunkt-Aufhängungssystem Ganzlamellenkern
Magnetkreis:	10 Hz bis 30 kHz
Frequenzgang:	20 Hz bis 10 kHz ±1 dB
Ausgangsspannung:	2,5 mV bei 1 kHz 5 cm/s. Null-zu-Spitze, lateral [7 mV bei 1 kHz 10 cm/s. Null-zu-Spitze, 45° (DIN 45 500)]
Kanaltrennung:	22 dB bei 1 kHz
Kanalabweichung:	Innerhalb 2 dB bei 1 kHz
Empfohlene Endimpedanz:	47 kΩ~100 kΩ
Nachgiebigkeit (dynamisch):	12 × 10 ⁻⁶ cm/dyn bei 100 Hz
Auflagekraft-Einstellbereich:	1,25 ± 0,25 g (12,5 ± 2,5 mN)
Gewicht:	6 g (nur Tonabnehmer)
Ersatznadel:	EPS-24CS

CARACTERISTIQUES

Les spécifications sont susceptibles d'être modifiées sans préavis.

Le poids et les dimensions donnés sont approximatifs.

■ Généralités

Alimentation:	Alternatif 220V, 50 ou 60 Hz
Consommation:	7 W
Dimensions (L×H×P):	43 × 11 × 37,5 cm Hauteur maximum lorsque le dessus (couvercle protège-poussière) est ouvert. 43 × 37 × 42,5 cm
Poids:	4,4 kg

■ Platine de lecture

Type:	Platine automatique Retour automatique Arrêt automatique
Système d'entraînement:	Entraînement direct
Moteur:	Servomoteur C.C. sans balai

Groupe de réglage:	Servocommande du générateur de fréquences
Plateau de lecture:	Diamètre 31,2 cm
Vitesses de rotation:	33-1/3 et 45 t/p.m
Pleurage et scintillement:	0,012% de valeur efficace* 0,025% de valeur efficace (JIS C5521) ±0,035% de crête (IEC 98A Pondéré)

*Ce régime nominal se rapporte à l'ensemble du tourne-disque 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 incorporé de l'ensemble du moteur.

Ronflement:	-56 dB (IEC 98A Non pondéré) -78 dB (IEC 98A Pondéré)
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■ Bras de lecture

Type:	Bras de lecture rectiligne statiquement équilibré. Système de cellule de lecture à connecteur enfichable.
Longueur effective:	230 mm
Porte-à-faux:	15 mm
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.
Masse réelle:	7,5 g (sans la cellule pick-up)
Plage de réglage de la pression d'appui:	1,25 ±0,25 g
Gamme du poids des cellules pick-up utilisables:	6 g

■ Cellule pick-up

Type:	Cellule pick-up stéréo à aimant mobile
Circuit magnétique:	Noyau entièrement feuilleté
Réponse en fréquence:	10 Hz à 30 kHz 20 Hz à 10 kHz ±1 dB
Tension de sortie:	2,5 mV à 1 kHz; 5 cm/s., zéro à vitesse latérale de crête (7 mV à 1 kHz, 10 cm/s., zéro à vitesse 45° de crête [DIN 45 500])
Séparation des canaux:	22 dB à 1 kHz
Équilibrage des canaux:	En deçà de 2 dB à 1 kHz
Impédance de charge recommandée:	47 kΩ~100 kΩ
Elasticité (dynamique):	12 × 10 ⁻⁶ cm/dyne à 100 Hz
Plage de la force verticale d'appui:	1,25±0,25 g (12,5±2,5 mN)
Poids:	6 g (cellule seule)
Pointe de lecture de remplacement:	EPS-24CS

Español

ESPECIFICACIONES

Las especificaciones quedan sujetas a cambios sin aviso previo.
El peso y las dimensiones indicados son aproximados.

■ En general

Alimentación de corriente:	220V, 50 ó 60 Hz
Consumo de corriente:	7 W
Dimensiones: (Ancho×Alto×Prof.)	43 × 11 × 37,5 cm Altura máxima cuando la parte de arriba (tapa contra el polvo) está abierta. 43 × 37 × 42,5 cm
Peso:	4,4 kg

■ Sección del plato giratorio

Tipo:	Plato giratorio automático Retorno automático Parada automática
Método de acciona- miento:	Accionamiento directo
Motor:	Motor de corriente continua sin escobillas
Método de control de accionamiento:	Servocontrol por generador de frecuencias
Platillo del plato giratorio:	De aluminio fundido Diámetro 31,2 cm
Velocidades del plato giratorio:	33-1/3 y 45 rpm
Ululaciones y trémolo:	0,012% WRMS* 0,025% WRMS (JIS C5521) ±0,035% cresta (IEC 98A Ponderado)

*Estas características se refieren únicamente al conjunto del plato giratorio, con exclusión de los efectos provenientes del disco, cartucho o del brazo sonoro, incluyendo, empero, el platillo. La medida fue tomada por medio de la señal obtenida del generador de frecuencia incorporado del conjunto del motor.

Ruido de rodadura:	-56 dB (IEC 98A No ponderado) -78 dB (IEC 98A Ponderado)
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■ Sección del brazo sonoro

Tipo:	Brazo sonoro recto equilibrado estáticamente Sistema de cartucho con conector enchufable
Longitud efectiva:	230 mm
Proyección:	15 mm
Angulo de error de seguimiento:	Inferior a 2°32' en el surco exterior de un disco de 30 cm Inferior a 0°32' en el surco interior de un disco de 30 cm
Masa efectiva:	7,5 g (sin cartucho)
Radio de ajuste de la presión de la aguja:	1,25 ±0,25 g
Radio de peso de cartucho utilizable:	6 g

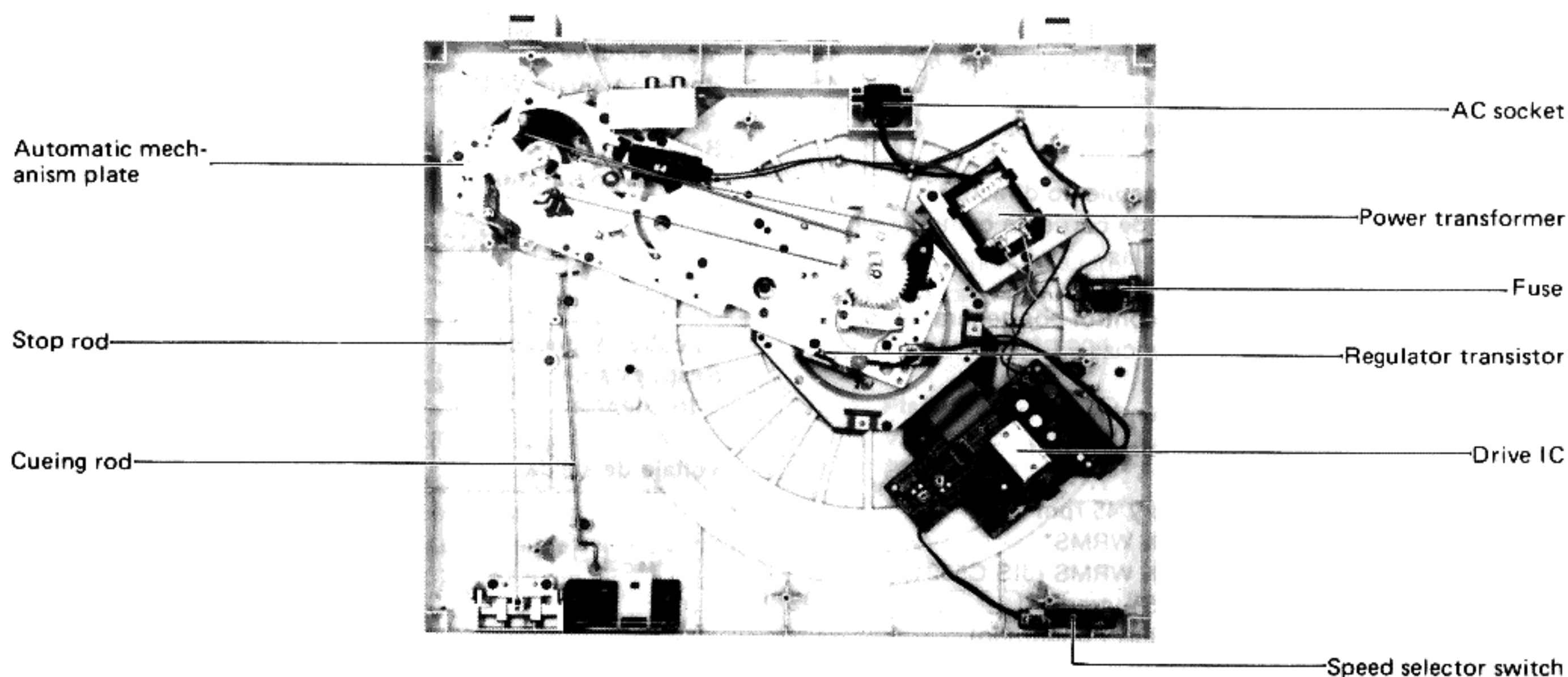
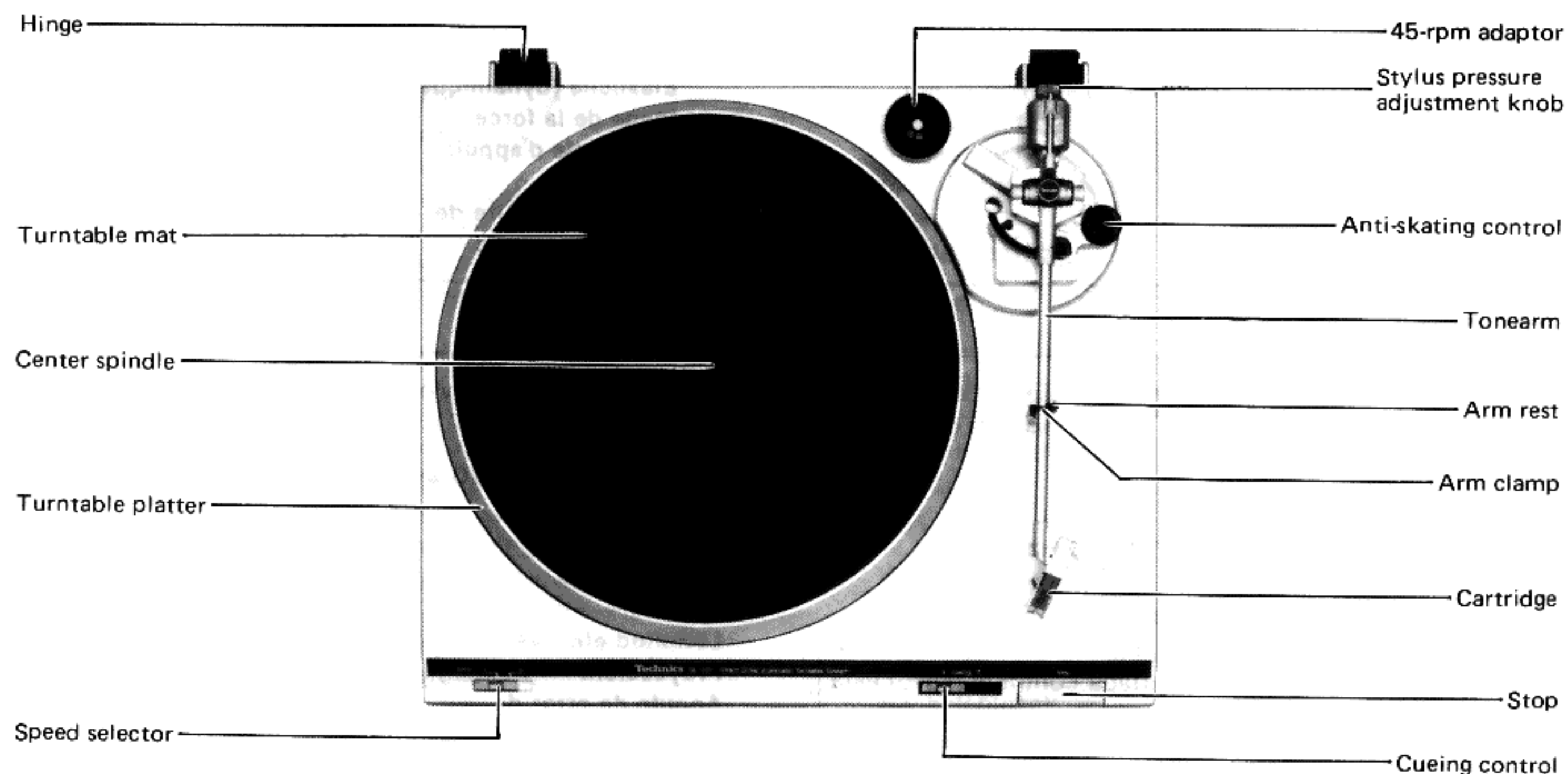
■ Sección del cartucho

Tipo:	Cartucho estereofónico de imán móvil
Circuito magnético:	Núcleo totalmente laminado
Respuesta de frecuencia:	10 Hz a 30 kHz 20 Hz a 10 kHz ±1 dB
Voltaje de salida:	2,5 mV a 1 kHz velocidad lateral de cero a cresta de 5 cm/s [7 mV a 1 kHz Velocidad de 45° de cero a cresta de 10 cm/s (DIN 45 500)]
Separación de canales:	22 dB a 1 kHz
Equilibrio de canales:	Inferior a 2 dB a 1 kHz
Impedancia de carga recomendada:	47 kΩ a 100 kΩ
Elasticidad (dinámica):	12 × 10 ⁻⁶ cm/dina a 100 Hz
Radio de presión de la aguja:	1,25 ±0,25 g (12,5 ±2,5 mN)
Peso:	6 g (cartucho solamente)
Aguja de recambio:	EPS-24CS

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■ LOCATION OF CONTROLS



- The power supply for this unit varies depending upon the areas. Also, the parts used for power supply are different. So, refer to the circuit diagram and the replacement parts list.
 - ★ 220V (50/60 Hz) for Continental Europe.
 - ★ 240V (50/60 Hz) for United Kingdom and Australia.
 - ★ 110V/120V/220V/240V (50/60 Hz) for other areas.
 - [XA and XM areas] for other areas is provided with voltage selector.

■ DISASSEMBLY INSTRUCTIONS

● How to remove the bottom board

1. Fix the tonearm on the rest.
2. Remove the turntable.
3. Close the dust cover, and turn over the unit, taking care not to scratch it.
4. Remove the 6 setscrews (Fig. 1: ① ~ ⑥) on the bottom board.

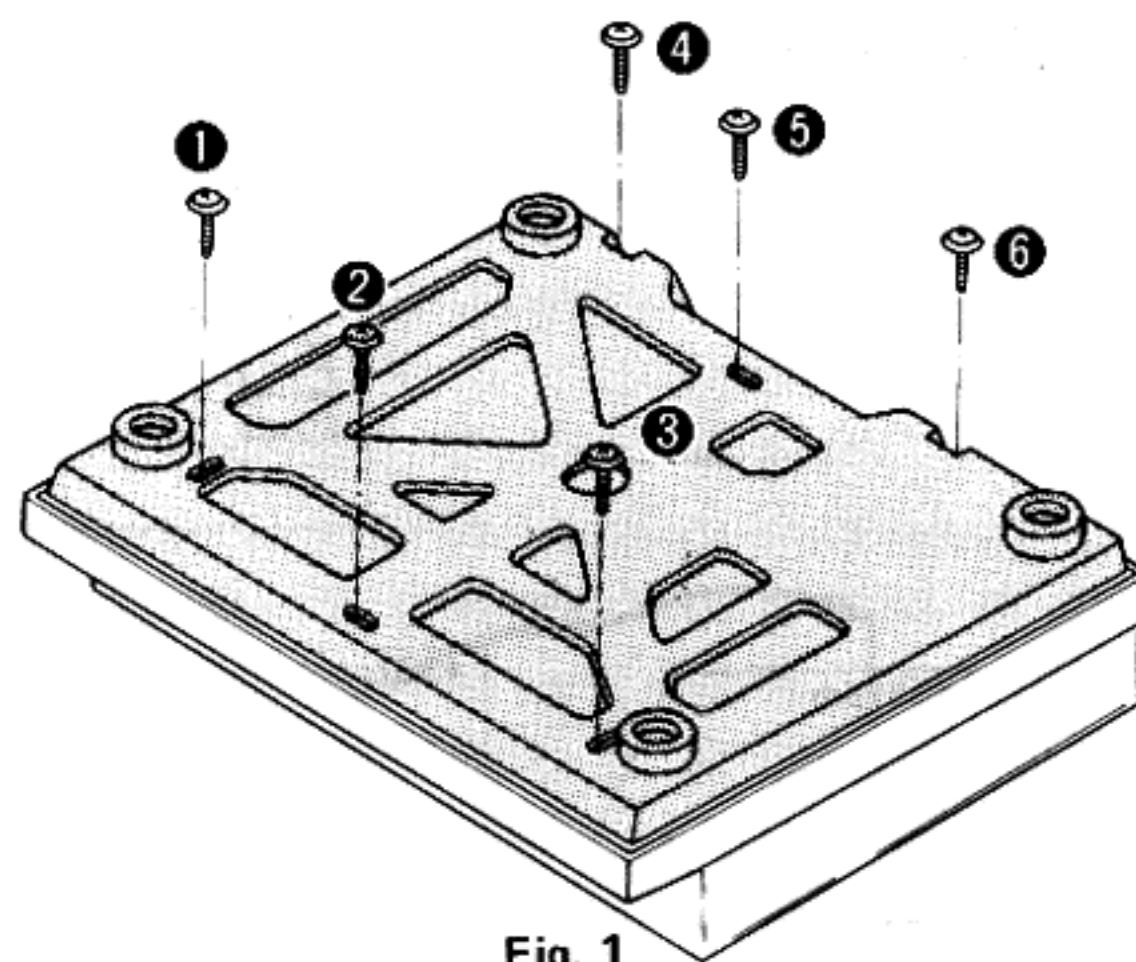


Fig. 1

● How to remove the drive circuit P.C.B.

1. Remove the bottom board.
2. Open the "lead holder" of the lead connector and pull out the lead wire. (Fig. 2)
3. Remove the drive circuit P.C.B. setscrews ⑦ ~ ⑨. Then the drive circuit P.C.B. can be removed. (Fig. 2)

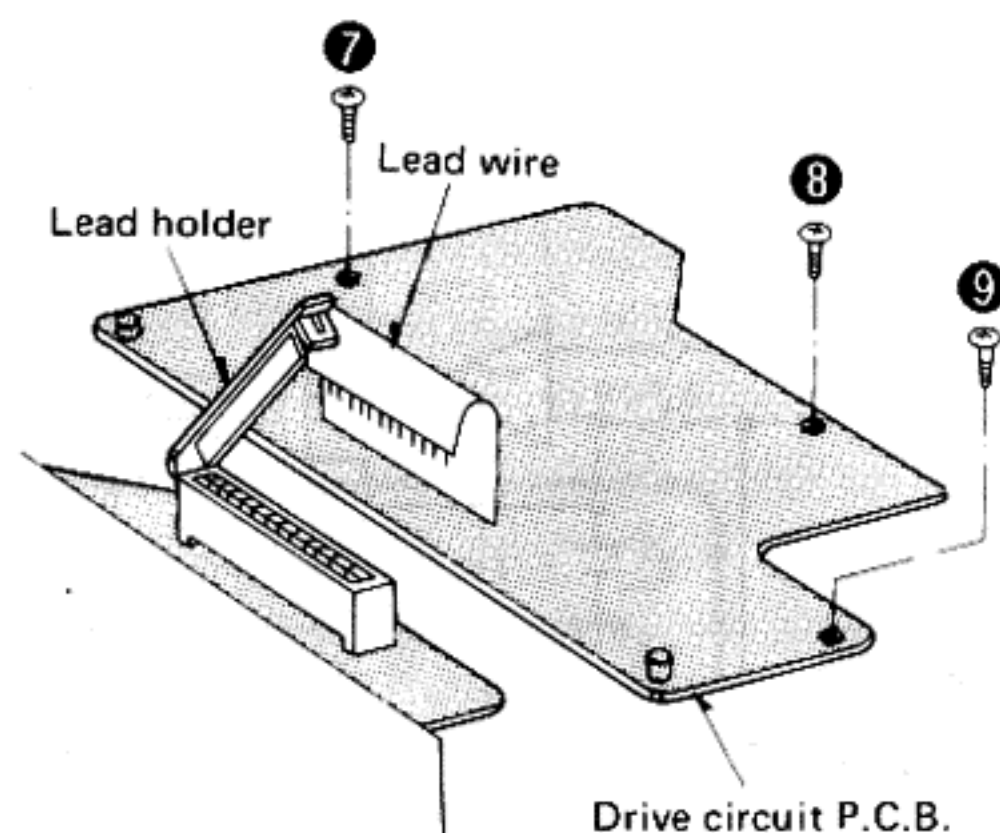


Fig. 2

● How to remove the automatic mechanism plate

1. Remove the bottom board.
2. Remove the 6 setscrews (Fig. 3: ⑩ ~ ⑮) of the automatic mechanism plate, the setscrew ⑯ of the output terminal shielding plate, the setscrew ⑰ of the earth terminal, the setscrew ⑱ of the regulator transistor P.C.B. and ⑲ of the earth circuit P.C.B. (Fig. 3).
3. Remove the stop rod and lift the mechanism plate.
4. When mounting the mechanism plate, check the following points.
 - (1) Turn the shaft to rotate the main gear until no remaining of the gear.
 - (2) The brake lever boss of the lift base should be inside the brake plate (cueing up). (Fig. 4)

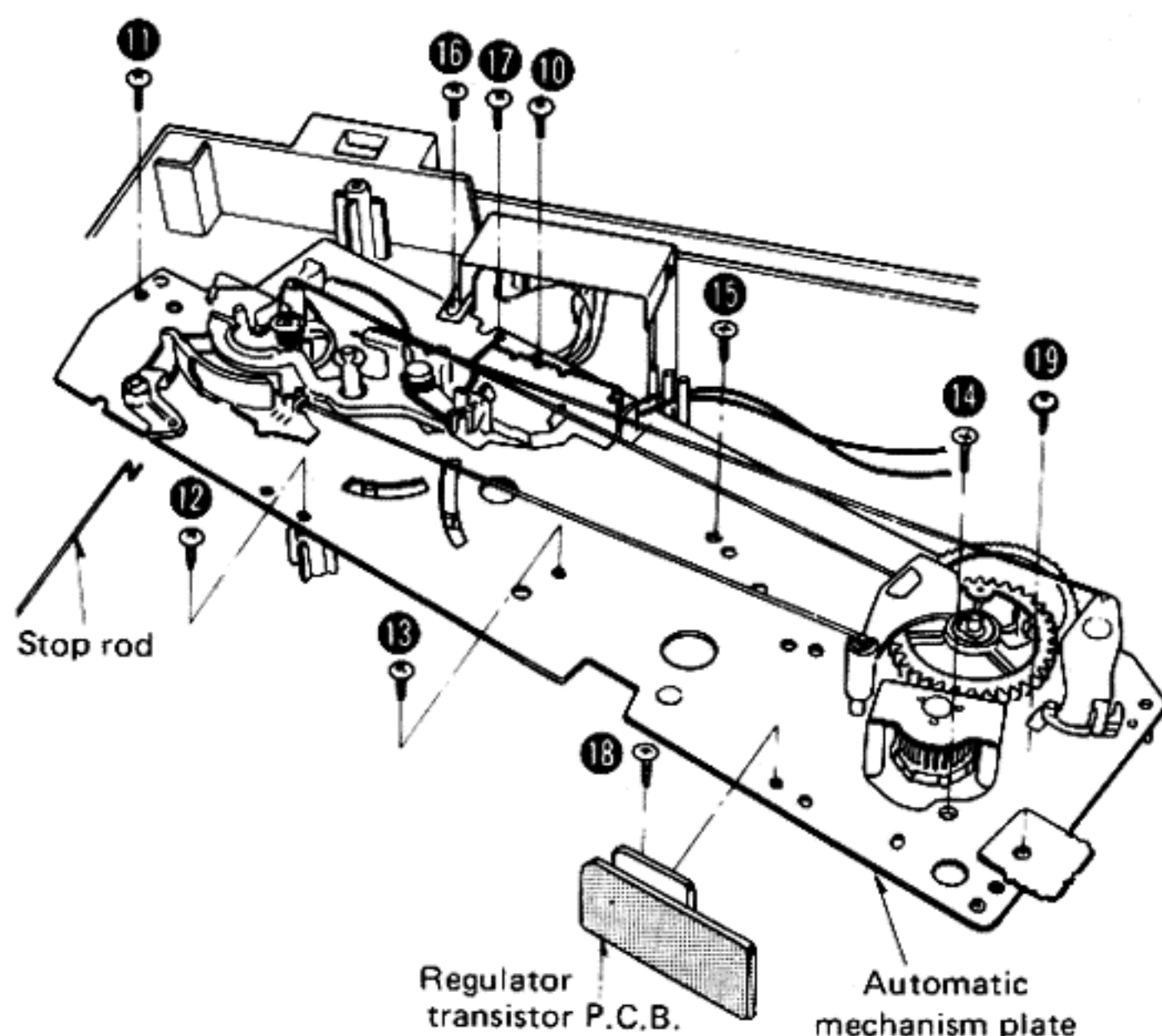


Fig. 3

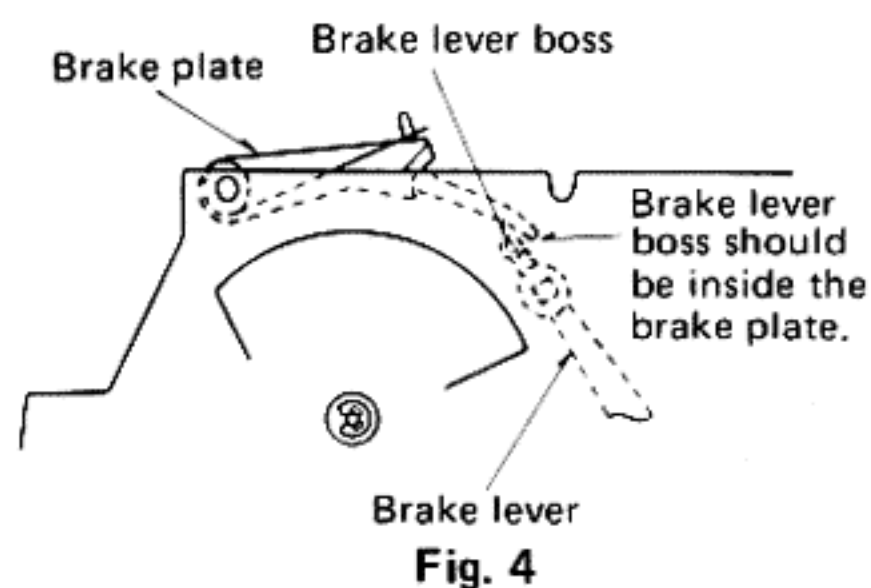


Fig. 4

● How to remove the stator frame

1. Remove the bottom board.
2. Open the "lead holder" of the lead connector and pull out the lead wire. (Fig. 2)
3. Remove the stator frame setscrews ⑳ ~ ㉒. Then, the stator frame can be removed. (Fig. 5)

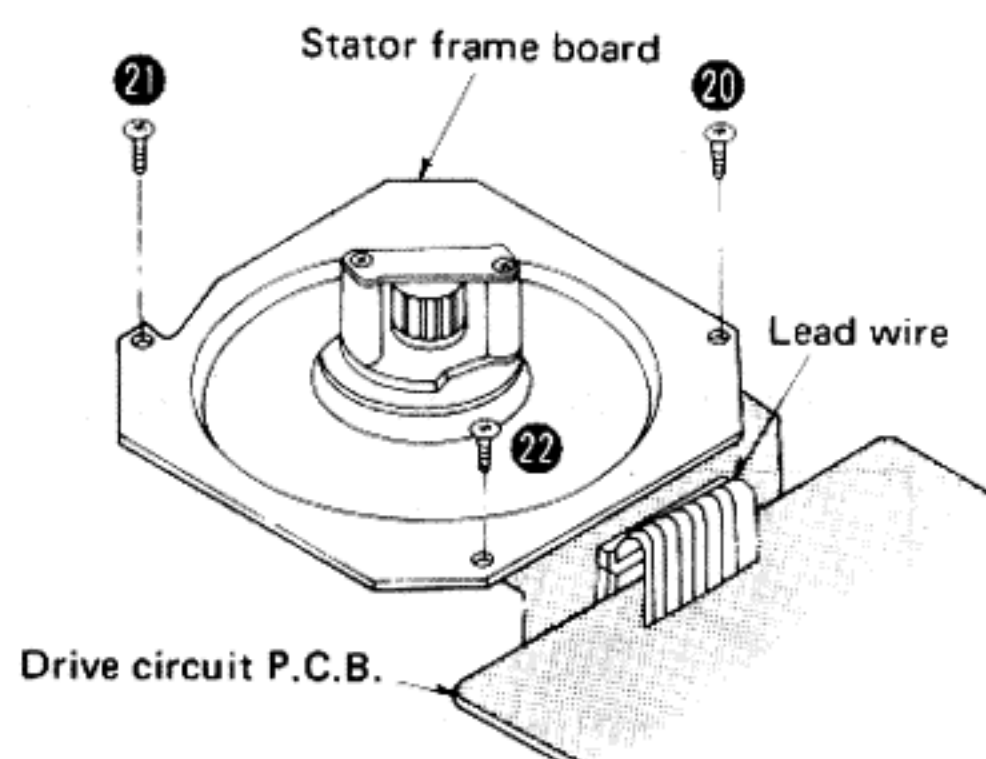


Fig. 5

● How to remove the PU fixing plate

1. Remove the bottom board and automatic mechanism plate.
2. Remove the canceller spring from the PU fixing plate. (Fig. 6)
3. Remove the PU fixing plate setscrew 23. Then the PU fixing plate can be removed.

● How to remove the tonearm

1. Remove the bottom board and automatic mechanism plate.
2. Remove the PU fixing plate.
3. Unsolder the 5 lead wires of the output terminals.
4. Remove the tonearm setscrews 24 25. Then the tonearm can be removed.

● How to remove the lift base

1. Remove the anti-skating control knob. (Fig. 7)
2. Remove the arm lift setscrew and springs (Fig. 8 26, 27) to detach the arm lift.
3. Remove the PU fixing plate.
4. Remove the lift base setscrews 28 ~ 30. Then the lift base can be removed.

Notes:

After fitting the lift base and PU fixing plate, check the following points.

- (1) With the anti-skating control knob at "0" and the tonearm moved to the innermost periphery, the clearance between the canceller spring and canceller operating plate should be 0 – 0.3 mm.
- (2) With cueing down, the clearance between the brake lever and PU fixing plate should be about 2 mm.

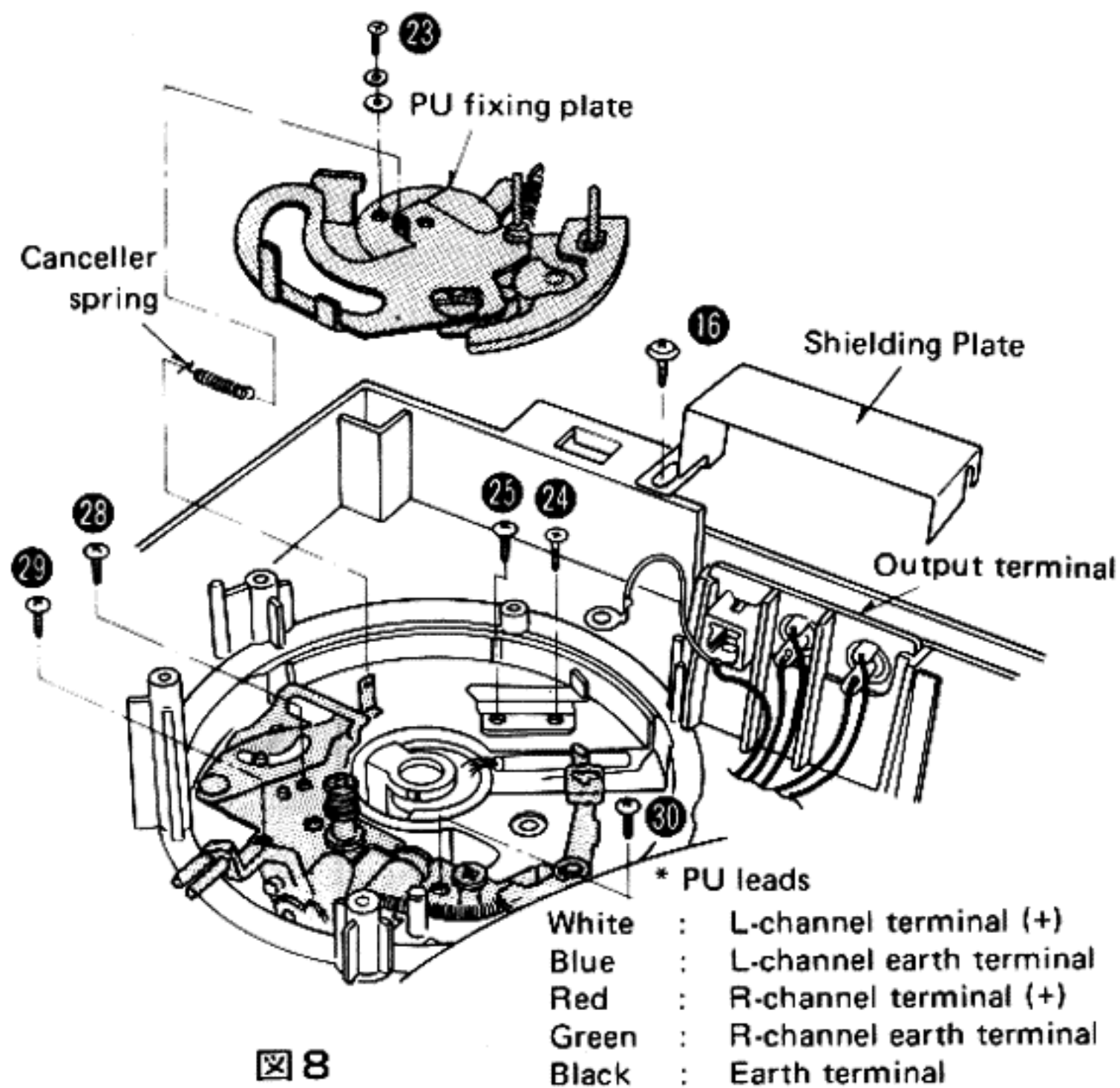


Fig. 6

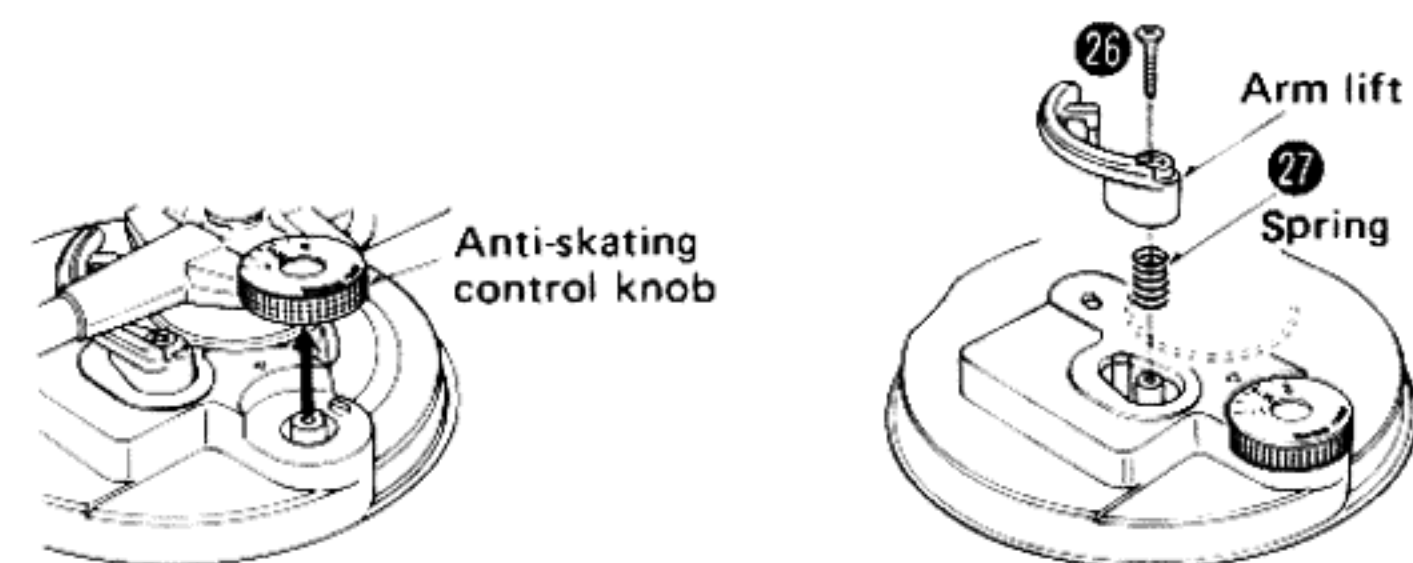


Fig. 7

Fig. 8

● How to remove the Hall element

1. Remove the turntable mat and turntable platter.
 2. Unsolder the Hall element.
- * The Hall element should be installed with the marking side up as in Fig. 10.
With the marking side up, no problem will occur even when the leg is reversed in position.

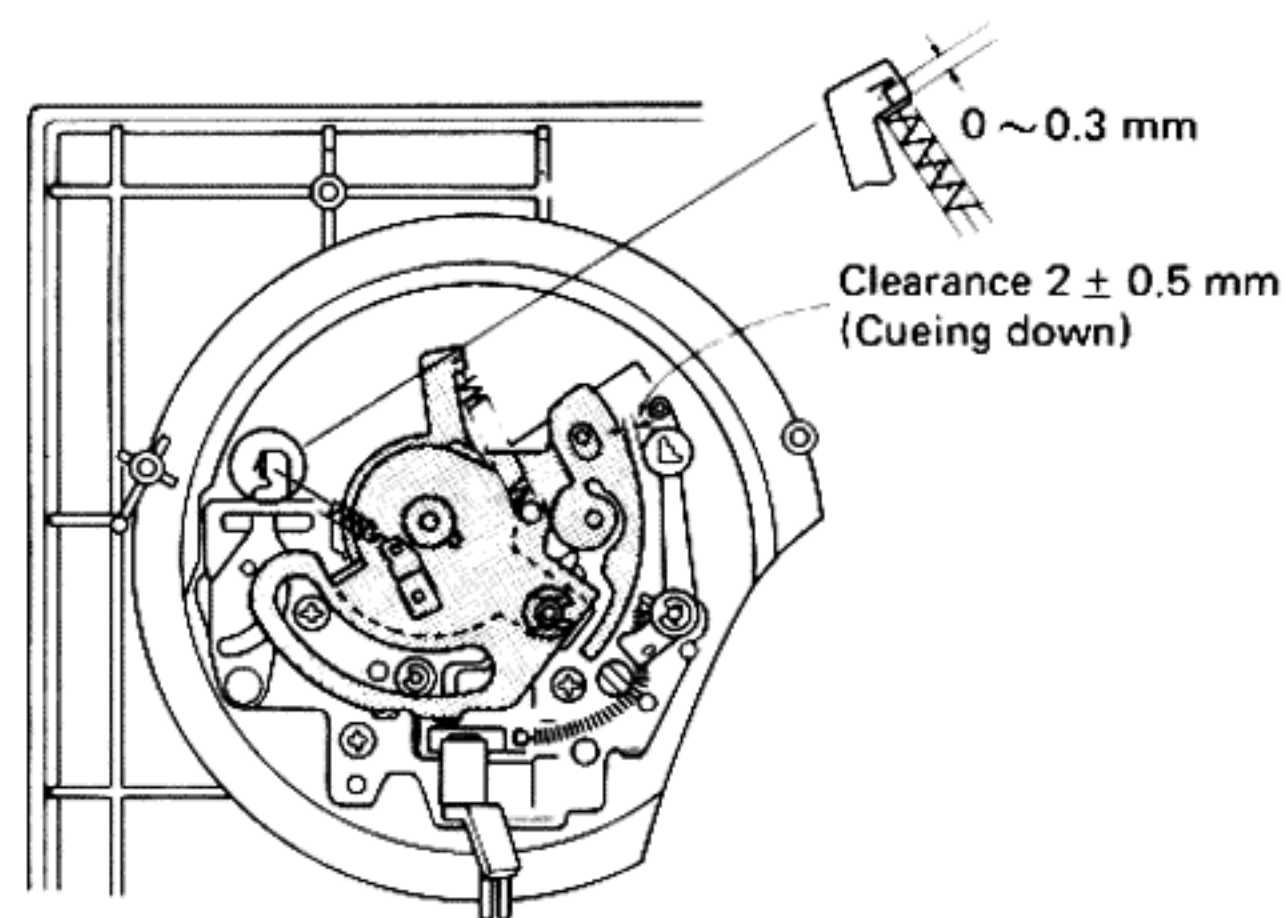


Fig. 9

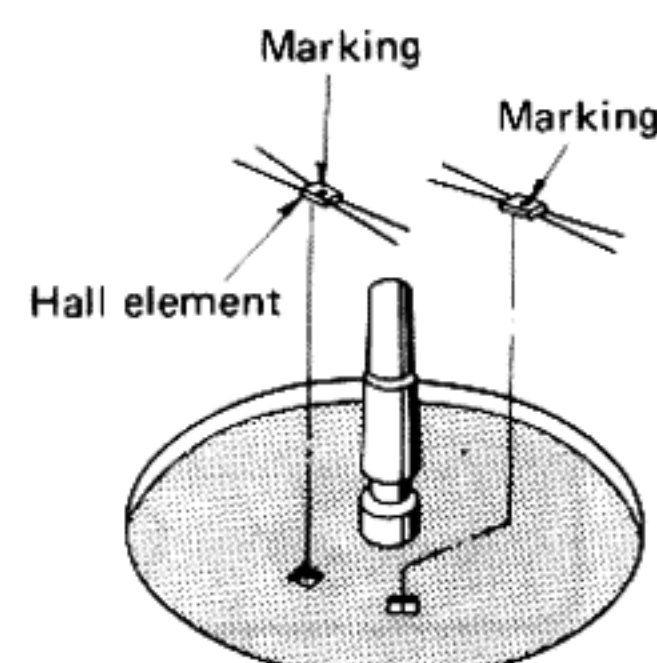


Fig. 10

■ HOW TO APPLY SILICON OIL (CUEING)

1. Remove the lift base.
2. Remove the brake cam spring (Fig. 11), pressing it in the direction of the arrow.
3. Move the brake cam in the direction of the arrow A. (Fig. 12)
4. Apply silicon oil (SH097) to the outer surface and groove of the brake cam shaft. (Fig. 12)
5. Apply grease (Grease 320, Part No. Grease 1) to the lift rod.

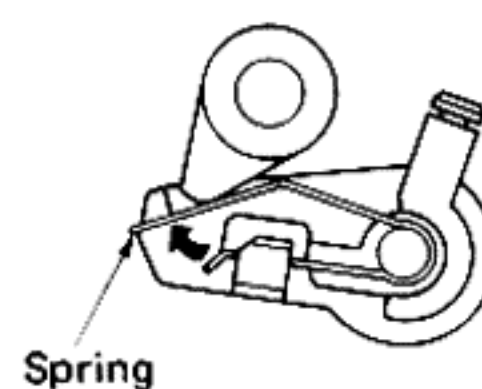


Fig. 11

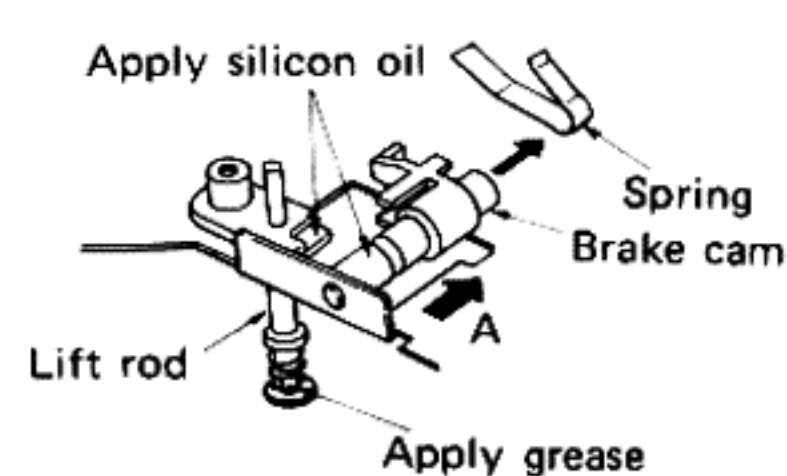
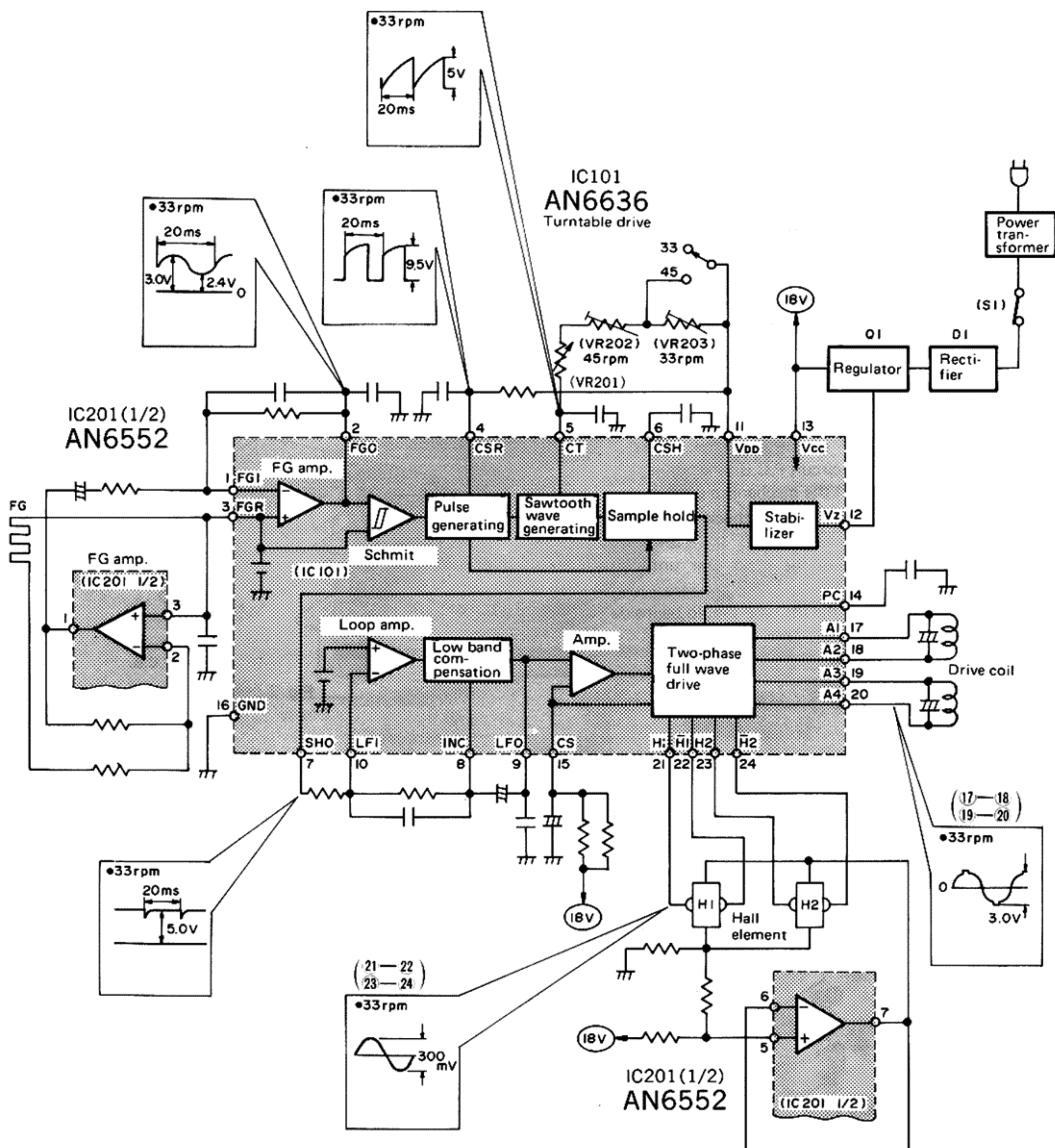


Fig. 12

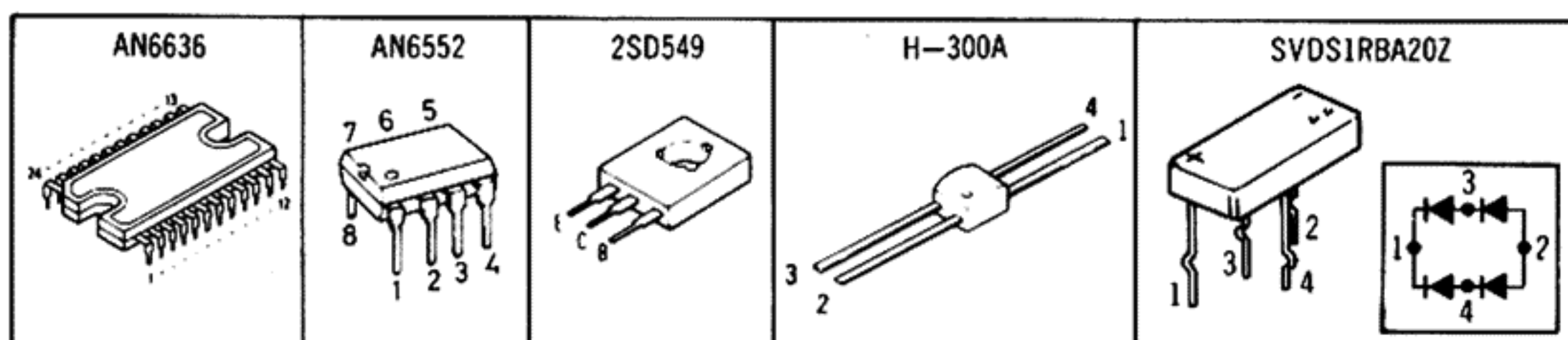
Ground (Earth) lines



■ BLOCK DIAGRAM



• Terminal guide of IC, transistor, hall element and diode



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

- Notes:
1. **S1** : Power (Arm) switch in "on" position.
 2. **S201** : Speed selector switch in "33 rpm" position.
 3. The value and waveform in are of the reference voltage for the turntable rotation (33-1/3 rpm) of this unit, measured by DC voltmeter (high impedance) and oscilloscope on the basis of chassis. Therefore the measured value may include some error depending on the internal impedance of DC circuit tester and other conditions.
 4. Important safety notice: Components identifier by ▲ make have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
 5. — Positive voltage lines.

A

B

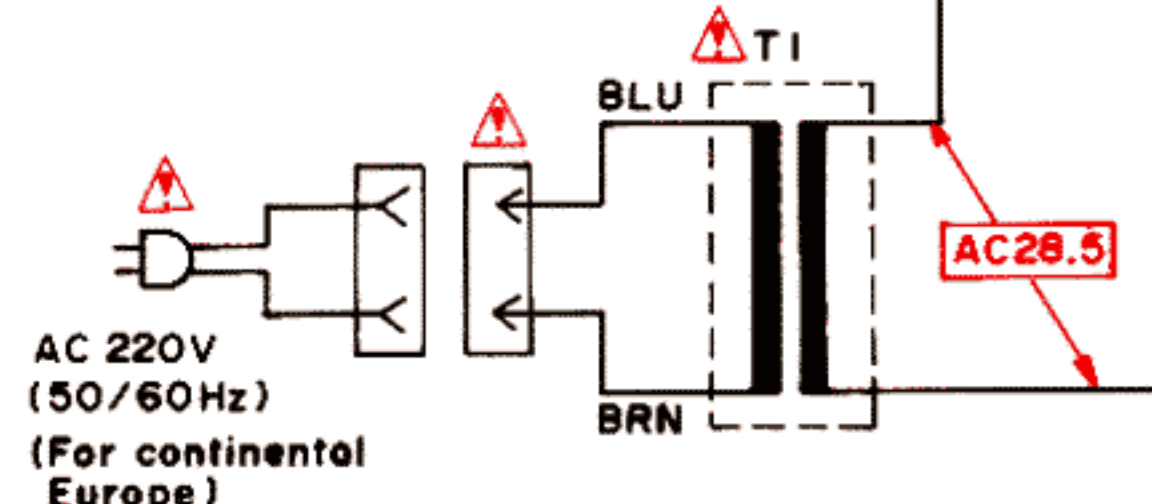
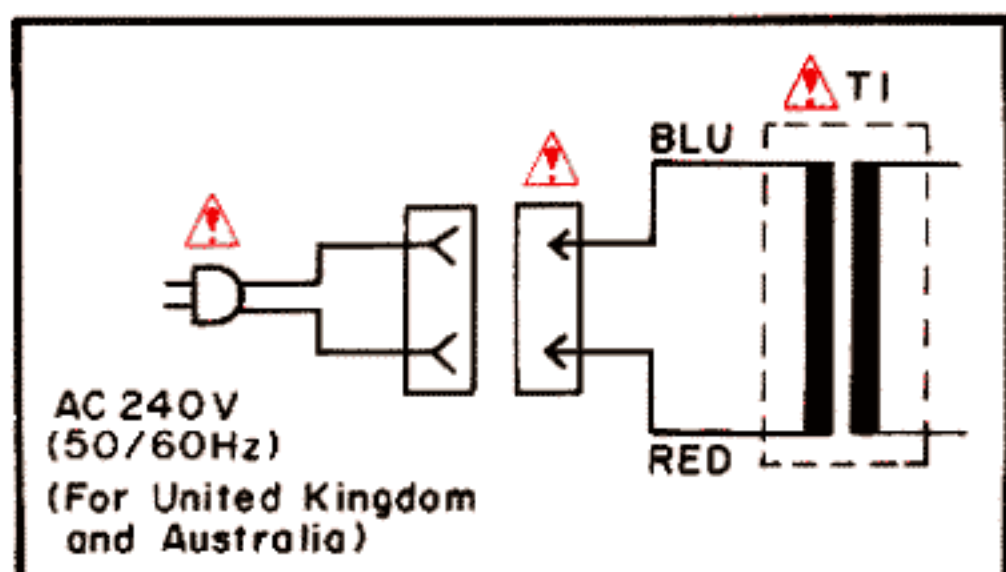
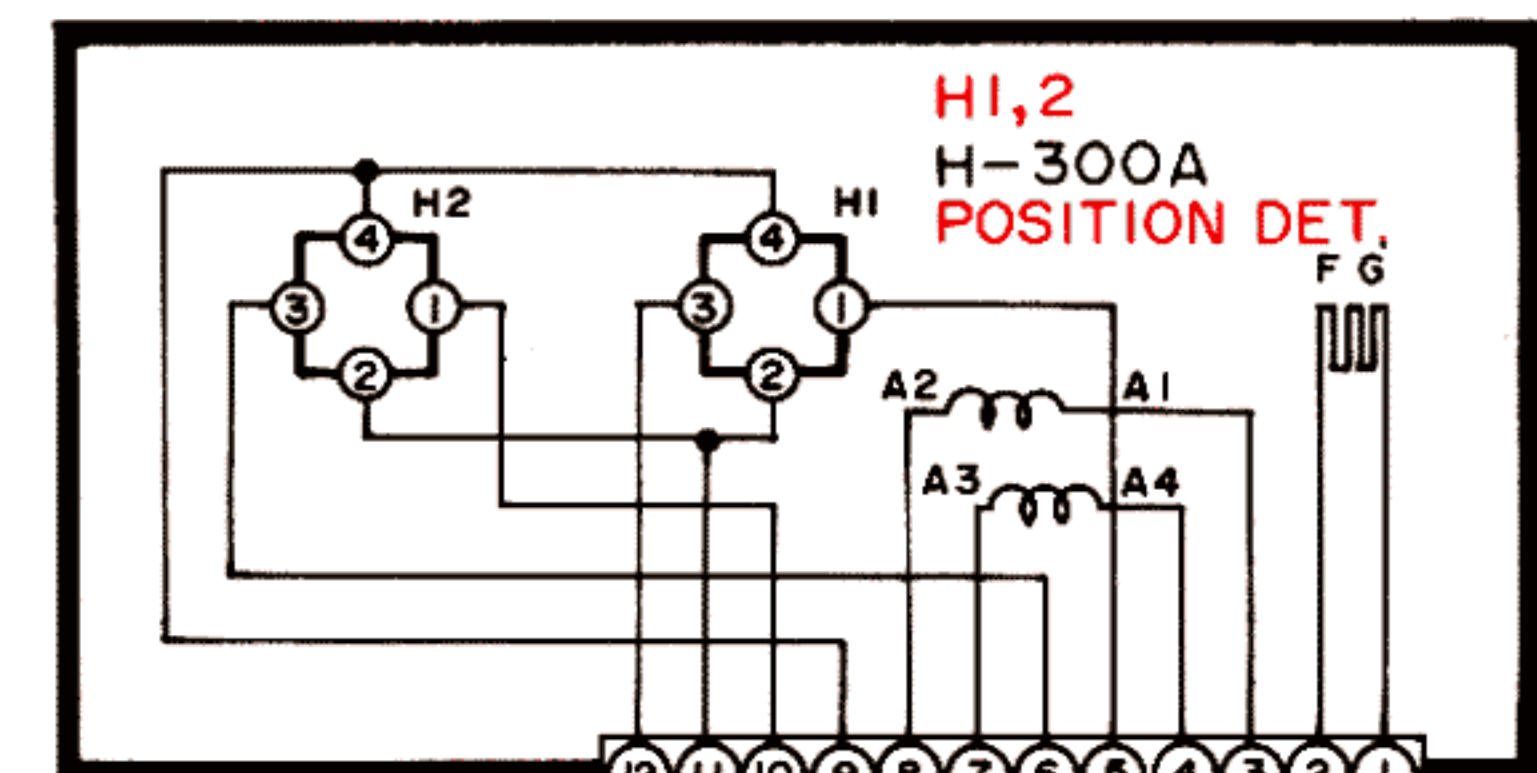
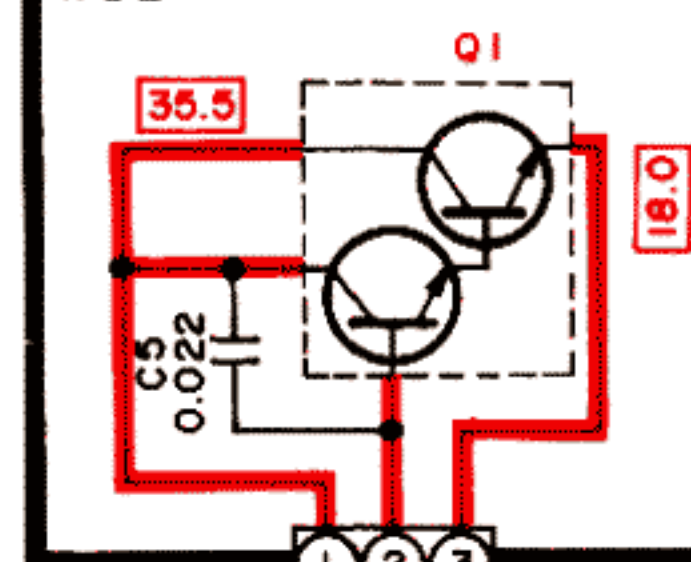
C

D

E

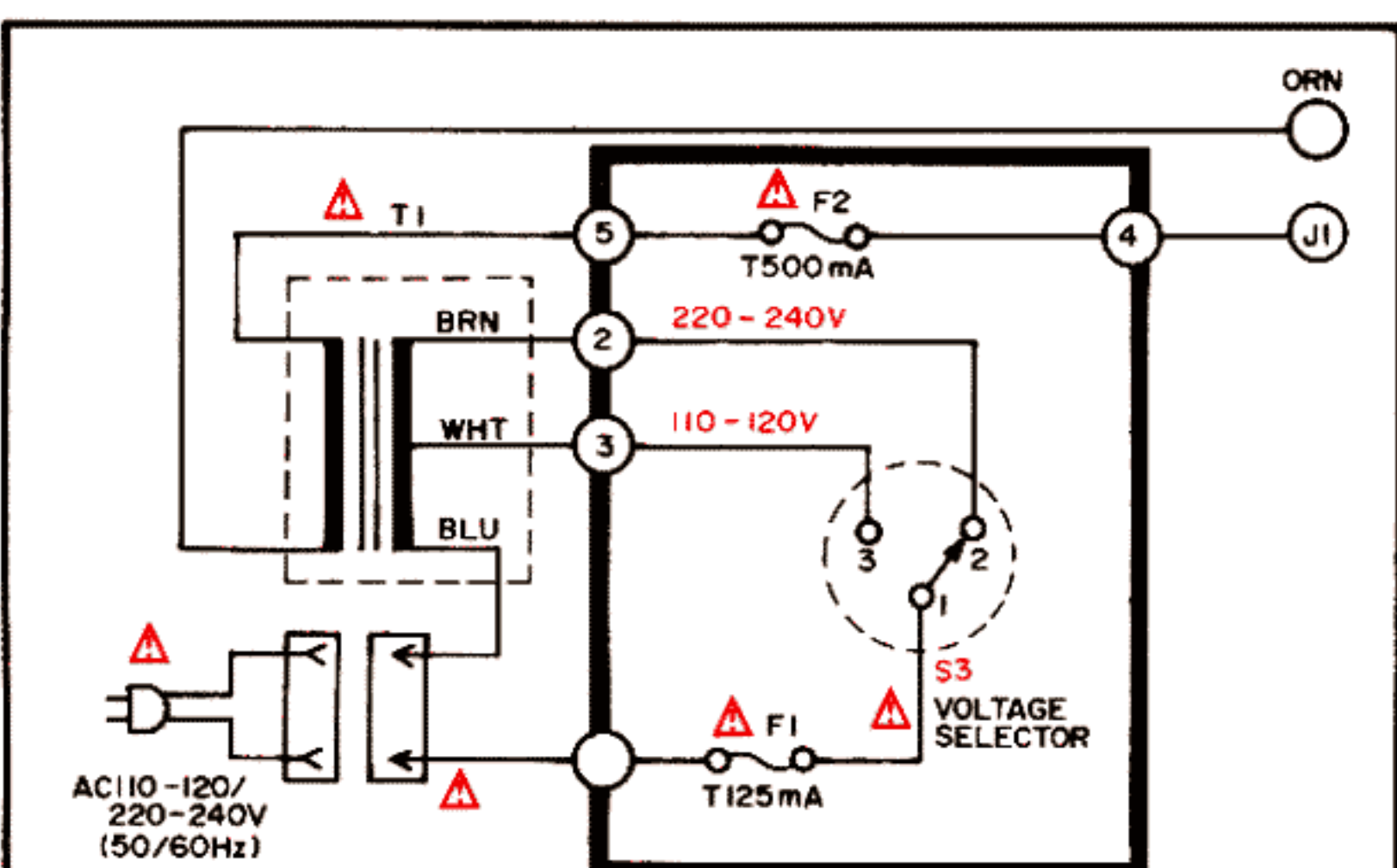
F

2SD549 REGULATOR

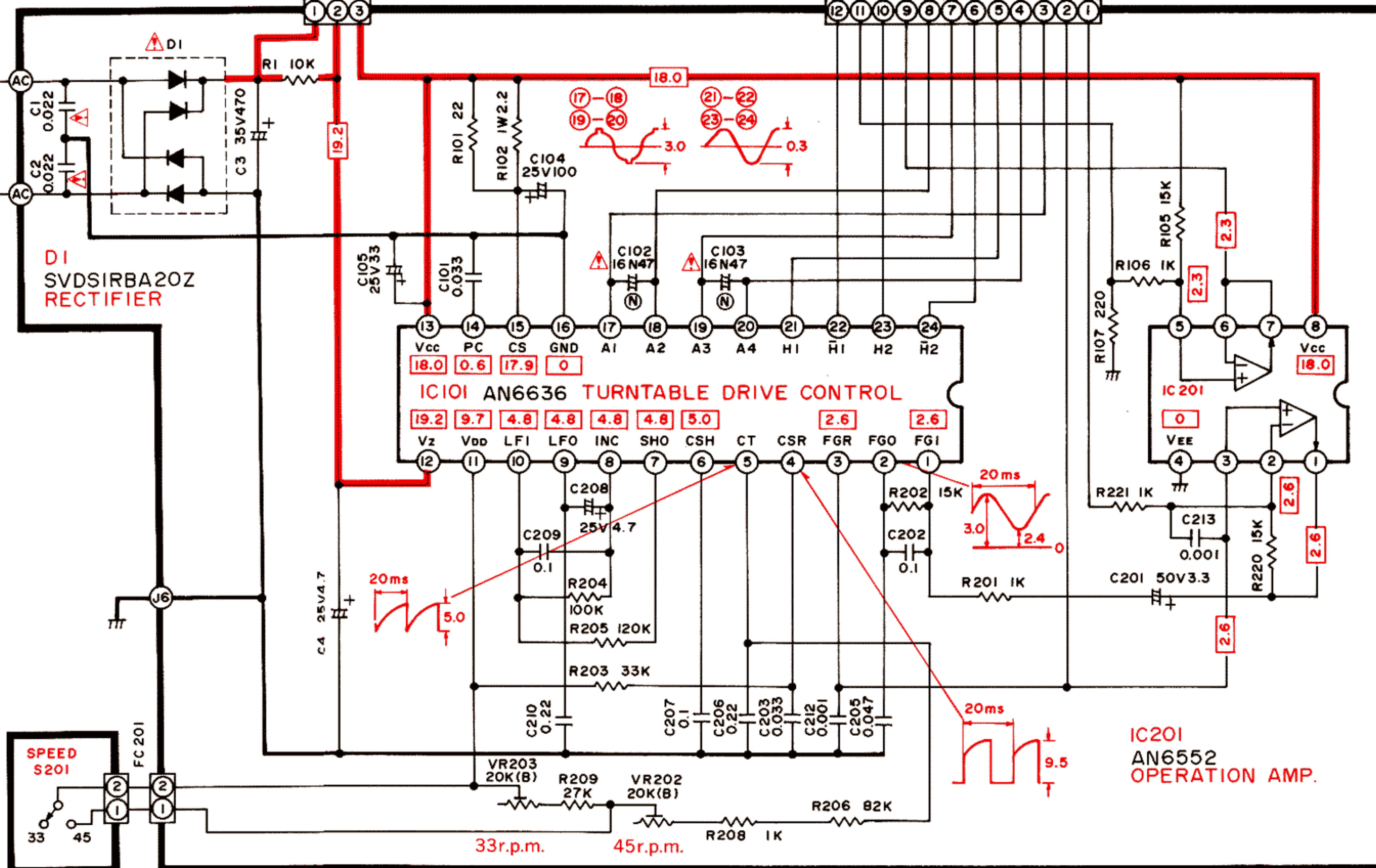


Power supply circuit

For Southeast Asia, Oceania, Africa, Middle Near East and Central South America. ([XA] and [XM] areas)



S3 : Voltage selector in "220 - 240V" position.



● Arm-lift height adjustment

The arm-lift height (distance between the stylus tip and the record surface when the cueing control is at the "▼" position) has been adjusted at the factory to approximately 5 to 8 mm (3/16" ~ 5/16"). (Fig. 13)

If the clearance is too narrow or too wide, turn the adjustment screw clockwise or counterclockwise. (Fig. 14)

Clockwise rotation

– distance between the record and stylus tip is decreased.

Counterclockwise rotation

– distance between the record and stylus tip is increased.

● Adjustment of automatic return position (Fig. 15)

(Remove the rubber cap.)

1. Put the stylus protector on the cartridge.
2. Remove the tonearm toward the center of the record.

Then, the auto-return adjustment screw will appear.

If the tonearm tends to return to the arm rest before the play has finished,
– turn counterclockwise.

If the tonearm fails to return after the final groove,
– turn clockwise.

● Adjustment of rotational speed (Fig. 16, 17)

1. Place the set on the player repair table.
2. Put on the record and play.
3. Set the speed selector switch to "45 r.p.m.".
4. Adjust VR202 by the screwdriver from under the set until the rated speed (45 r.p.m.) is obtained while checking it through the stroboscope.
5. Set the speed selector switch to "33 r.p.m.".
6. Adjust VR203 by the screwdriver until the rated speed (33-1/3 r.p.m.) is obtained while checking it through the stroboscope.

Note: Be sure to perform the adjustment of 45 r.p.m. first.

As a simple method, it is also possible to adjust VR202 and VR203, removing the turntable. (See Fig. 17)

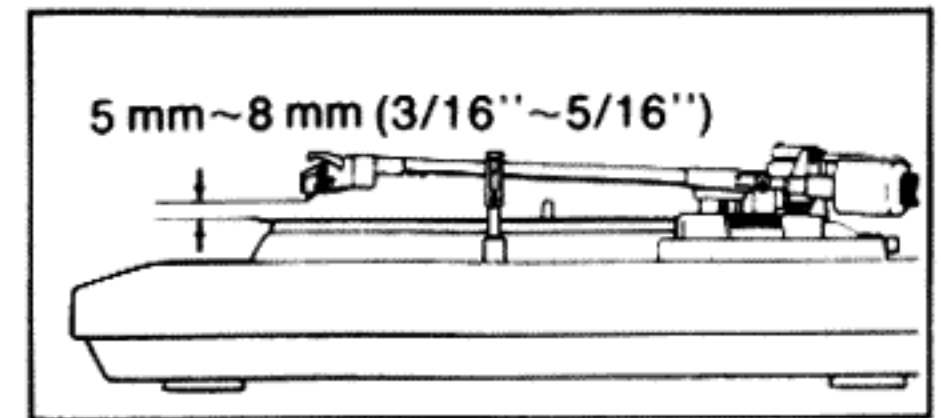


Fig. 13

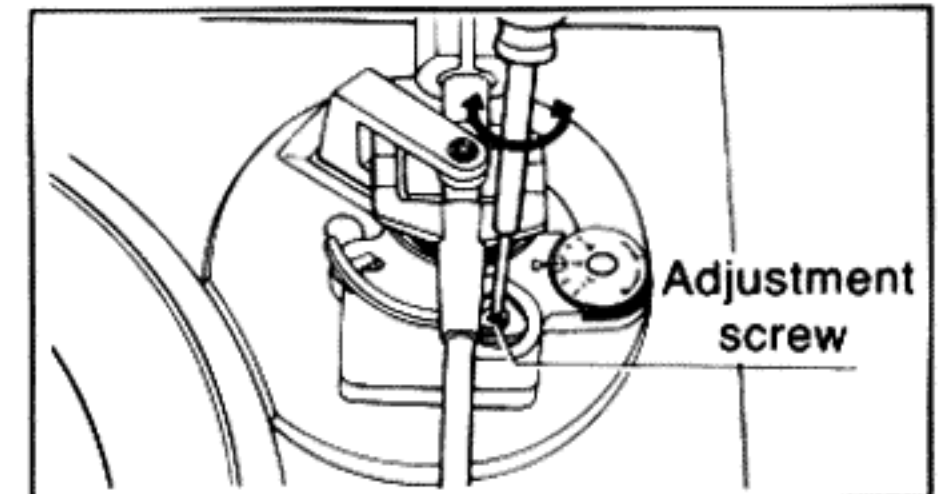


Fig. 14

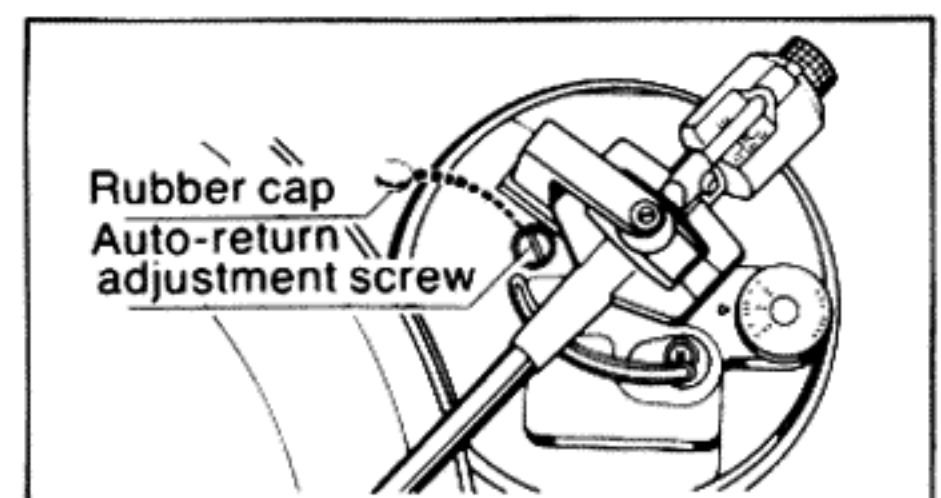


Fig. 15

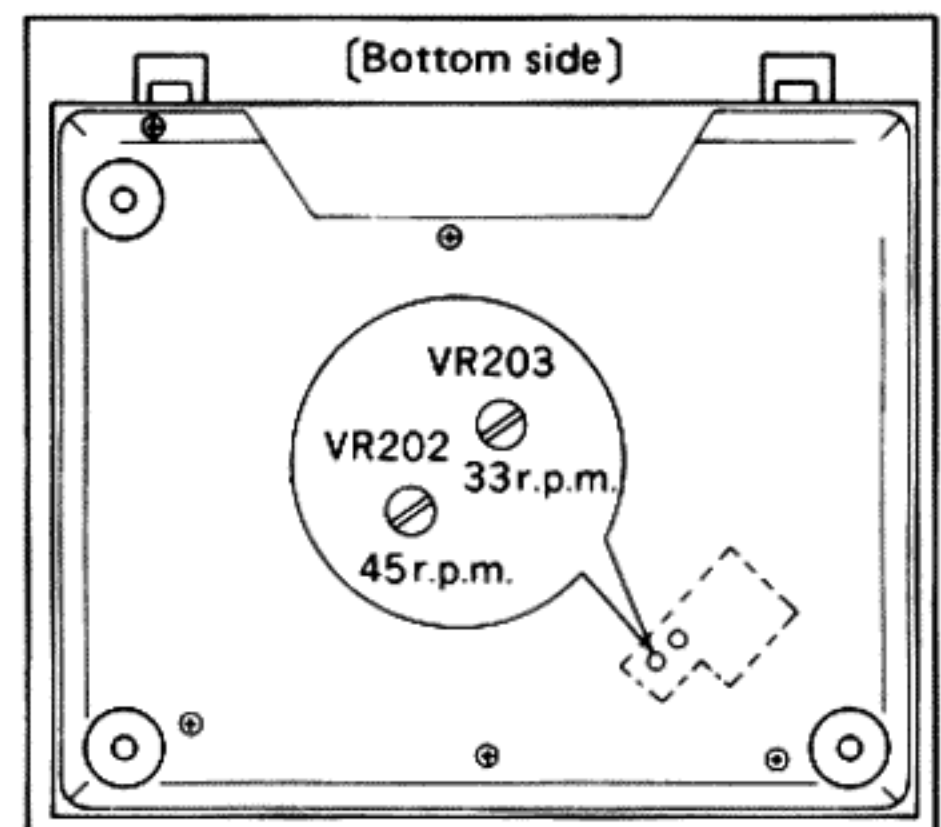


Fig. 16

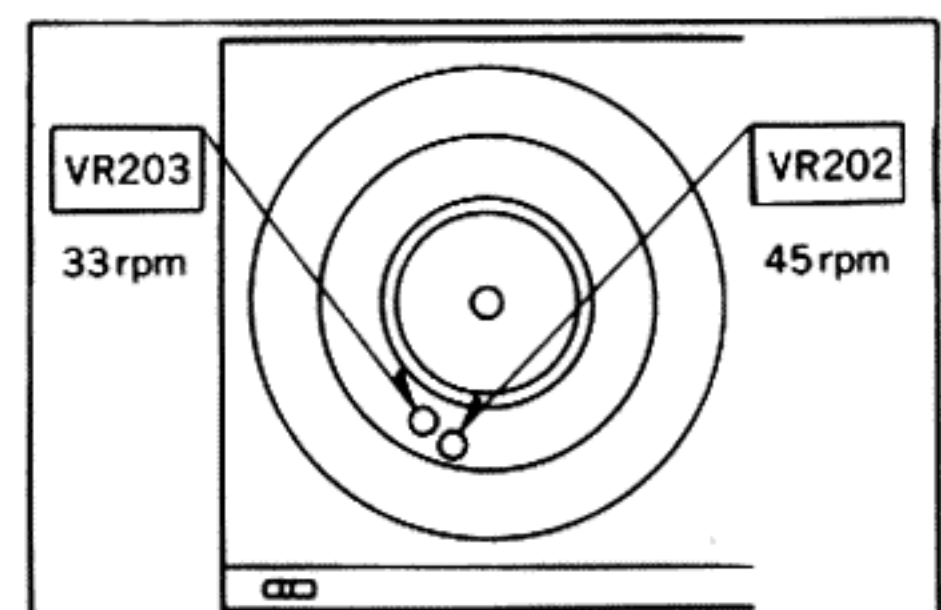


Fig. 17

■ MESSUNGEN UND JUSTIERUNGEN ■ Deutsch ■

● Justierung der Tonarmliftheöhe

Die Tonarmliftheöhe, d.h. der Abstand zwischen Nadelspitze und Schallplattenoberfläche bei Liftsteuerungs-Position "▼", wurde werkseitig auf ca. 5 mm eingestellt. (Abb. 13)

Falls der Abstand zu klein oder zu groß ist (z.B. wegen der unterschiedlichen Tonabnehmer-Abmessungen, drehen Sie die Justierschraube im Uhrzeigersinn oder entgegen dem Uhrzeigersinn. (Abb. 14)

Drehung im Uhrzeigersinn

– Der Abstand zwischen der Platte und der Nadelspitze wird kleiner.

Drehung entgegen dem Uhrzeigersinn

– Der Abstand zwischen der Platte und der Nadelspitze wird größer.

● Justierung des Abschaltpunktes der Automatik (Abb. 15)

1. Setzen Sie zuerst den Nadelschutz auf.

2. Die Gummikappe abnehmen.

3. Führen Sie den Tonarm gegen die Plattenmitte.

Die Justierschraube für den Abschaltpunkt der Automatik wird dann sichtbar.

Falls der Tonarm zu früh zurückkehrt.

– Entgegen dem Uhrzeigersinn drehen.

Falls der Tonarm nach Erreichen der Auslaufrille nicht zurückkehrt.

– Im Uhrzeigersinn drehen.

● Justierung der Drehzahl (Abb. 16, 17)

1. Das Gerät auf den Plattenspieler-Reparaturtisch stellen.

2. Eine Platte auflegen und abspielen.

3. Stellen Sie den Drehzahl-Wahlschalter in die "45"-Position.

4. VR202 mit einem Schraubenzieher von der Unterseite des Gerätes her drehen, bis die Nenndrehzahl (45 U/min) erreicht ist, und gleichzeitig auf dem Stroboskop überprüfen.

5. Stellen Sie den Drehzahl-Wahlschalter in die "33"-Position.

6. VR203 mit einem Schraubenzieher drehen, bis die Nenndrehzahl (33-1/3 U/min) erreicht ist, und gleichzeitig auf dem Stroboskop überprüfen.

Anmerkung: Die Justierung für 45 U/min muß unbedingt zuerst durchgeführt werden.

Eine einfache mögliche Methode besteht darin, VR202 und VR203 nach Entfernen des Plattentellers zu justieren.

(Siehe Abb. 17)

■ MESURAGES ET RÉGLAGES ■ Français ■

● Mise au point de la hauteur de l'élévateur du bras

La hauteur de l'élévateur du bras (distance entre l'extrémité de la pointe de lecture et la surface du disque, lorsque la commande de pose et de relevage est à la position "▼") a été réglée en usine sur approximativement 5 à 8 mm. (Fig. 13)

Si l'écartement est trop étroit ou trop large, tourner la vis de réglage dans le sens des aiguilles d'une montre ou dans le sens contraire. (Fig. 14)

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.

● Mise au point de la position de retour automatique (Fig. 15)

(Retirer le tapis du plateau de lecture.)

1. Placer le capot protecteur de la pointe de lecture sur la cellule pick-up.

2. Déplacer le bras de lecture vers le centre du disque. Alors, la vis de réglage du retour automatique apparaîtra.

Si le bras de lecture tend à revenir vers le support du bras avant que l'audition ne soit terminée.

– tourner dans le sens contraire des aiguilles d'un montre,

Si le bras de lecture ne peut revenir en arrière après le dernier sillon,

– tourner dans le sens des aiguilles d'une montre.

- **Réglage de la vitesse rotationnelle (Fig. 16, 17)**

1. Placer l'appareil sur la table de dépannage pour électrophones.
2. Placer un disque et faire jouer.
3. Régler le sélecteur de vitesse sur la position "45".
4. Ajuster VR202 avec un tournevis à partir du dessous de l'appareil jusqu'à ce que la vitesse nominale de rotation (45 t/p.m.) soit obtenue tout en la vérifiant par l'intermédiaire du stroboscope.
5. Régler le sélecteur de vitesse sur la position "33".
6. Ajuster VR203 avec un tournevis jusqu'à ce que la vitesse nominale de rotation (33-1/3 t/p.m.) soit obtenue tout en la vérifiant par l'intermédiaire du stroboscope.

Nota: S'assurer d'effectuer tout d'abord la mise au point de 45 t/p.m.

Comme méthode plus simplifiée, il est possible aussi d'ajuster VR202 et VR203 en retirant la platine.

(Voir Fig. 17)

■ MEDICIONES Y AJUSTES **Español**

- **Ajuste de la altura de elevación del brazo**

La altura de elevación del brazo (o sea, la distancia entre la punta de la aguja y la superficie del disco cuando el control de colocación está en la posición "▼") ha sido regulada en la fábrica aproximadamente entre 5 y 8 mm. (Fig. 13)

En caso que la distancia fuese demasiado abundante o demasiado escasa, girar el tornillo de ajuste hacia la derecha o hacia la izquierda. (Fig. 14)

Rotación hacia la derecha

— reduce la distancia entre el disco y la punta de la aguja.

Rotación hacia la izquierda

— aumenta la distancia entre el disco y la punta de la aguja.

- **Ajuste de la posición para retorno automático (Fig. 15)**

(Quitar la aimohadilla del plato giratorio.)

1. Colocar la protección de la aguja en el cartucho.
2. Mover el brazo sonoro hacia el centro del disco.

Con ello, aparecerá el tornillo de ajuste del retorno automático.

Cuando el brazo sonoro tienda a volver a su apoyo antes de terminal la ejecución:

— **Girar hacia la izquierda.**

En caso que el brazo sonoro no vuelva después de haber tocado el último surco del disco.

— **Girar hacia la derecha.**

- **Ajuste de velocidad rotacional (Fig. 16, 17)**

1. Coloque el aparato sobre el banco de reparaciones para tocadiscos.
2. Ponga el disco y toque.
3. Poner el selector de velocidad en la posición marcada "45".
4. Ajuste VR202 mediante el destornillador por debajo del aparato hasta que se obtenga la velocidad nominal (45 r.p.m.) mientras la verifica a través del estroboscopio.
5. Poner el selector de velocidad en la posición marcada "33".
6. Ajuste VR203 mediante el destornillador hasta que se obtenga la velocidad nominal (33-1/3 r.p.m.) mientras la verifica a través del estroboscopio.

Nota: Asegúrese de ajustar a 45 r.p.m. primero.

Como un método más simple, es posible también ajustar VR202 y VR203 removiendo el plato giradiscos. (Vea la Fig. 17)

REPLACEMENT PARTS LIST

- Notes:**
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
 2. 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.
 3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
 4. The "S" mark is service standard parts and may differ from production parts.
 5. Δ -marked parts are used for black only, while $\circ$ -marked parts are for silver type only.
 6. Parts other than Δ and $\circ$ -marked are used for both black and silver types.

Black type model No. : SL-D21 (K)

Areas

- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [XL] is available in Australia.
- * [EG] is available in F.R. Germany.
- * [EB] is available in Belgium.
- * [EF] is available in France.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XM] is available in Central South America.
- * [EH] is available in Holland.
- * [Ei] is available in Italy.
- * [EC] is available in Czechoslovakia.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
INTEGRATED CIRCUITS			HALL ELEMENT			FUSES		
IC101	AN6636	Drive	H1, 2	H-300A	Turntable Position	F1 [XA, XM]	Δ XBAS2C012T1A	125mA, 250V
IC201	AN6552F	Operation			Detector	F1 [Other Areas]	Δ XBA2C04TR0	400mA, 250V
TRANSISTORS			VARIABLE RESISTORS			F2 [XA, XM]	Δ XBA2C05TR0	500mA, 250V
Q1	2SD549	Regulator	VR202, 203	EVNM6AA00B24	Speed Adjustment	only		
DIODE					20K Ω (B)	POWER TRANSFORMERS		
D1	Δ SVDS1RBA20Z	Rectifier	SWITCHES			T1 [EK, XL]	Δ SLT48DT8E	Power Source
			S1	Δ SFDSS5GLP1	Power Source	T1 [XA, XM]	Δ SLT57DT6E	Power Source
			S3 [XA, XM]	Δ SFD5HXW13312	Voltage Selector	T1 [Other Areas]	Δ SLT48DT6E	Power Source
			S201	EVAH32S10ABK	Speed Selector			

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
RESISTORS			RESISTORS			CAPACITORS			CAPACITORS		
R1	S ERD25FJ103	10K	R204	S ERD25TJ104	100K	C1, 2	Δ S ECKD1H223PF	0.022	C201	S ECEA50Z3R3	3.3
R101	S ERD25FJ220	22	R205	S ERD25TJ124	120K	C3	S ECEB1HS471	470	C202	S ECQM1H104JZ	0.1
R102	S ERX1ANJ2R2	2.2	R206	S ERO25CKF8202	82K	C4	S ECEA25Z4R7	4.7	C203	S ECQM1H333JZ	0.033
R105	S ERD25TJ153	15K	R208	S ERD25FJ102	1K	C5	S ECKD1H223PF	0.022	C205	S ECQM1H473JZ	0.047
R106	S ERD25FJ102	1K	R209	S ERO25CKF2702	27K	C6	Δ S ECQM1393KZ	0.039	C206	S ECQM1H224JZ	0.22
R107	S ERD25FJ221	220	R220	S ERD25TJ153	15K	C101	S ECQM1H333JZ	0.033	C207	S ECQM1H104JZ	0.1
R201	S ERD25FJ102	1K	R221	S ERD25FJ102	1K	C102, 103	Δ S ECEA1CN470S	47	C208	S ECEA25Z4R7	4.7
R202	S ERD25TJ153	15K				C104	S ECEA1ES101	100	C209	S ECQM1H104JZ	0.1
R203	S ERD25TJ333	33K				C105	S ECEA1VS330	33	C210	S ECQV05224JZ	0.22
									C212	S ECKD2H102KB	0.001
									C213	S ECKD2H102KB	0.001

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value
ERX	2	AN	J	2R2
Type	Wattage	Shape	Tolerance	Value

Numbering System of Capacitor

Example

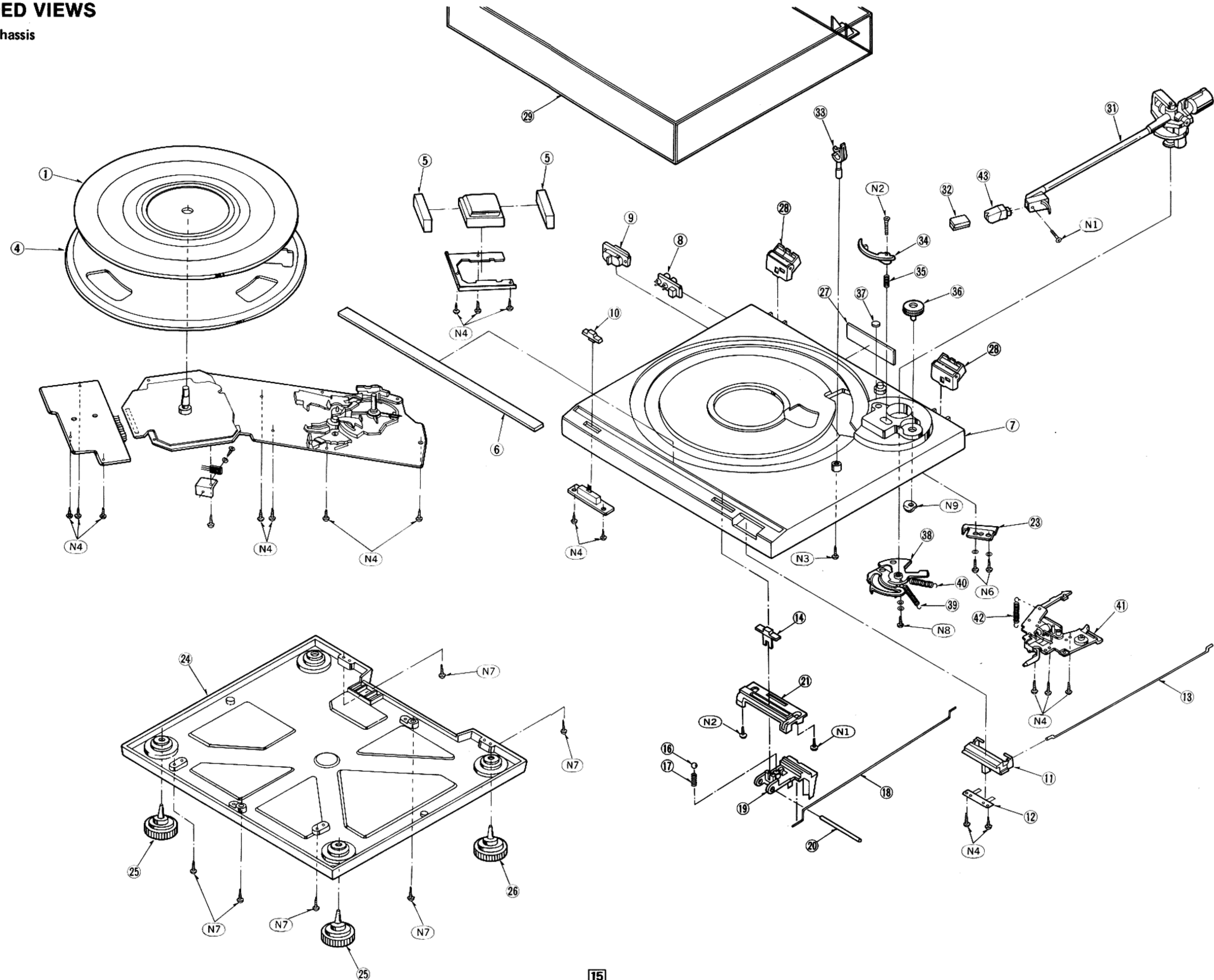
ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity
ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Resistor Type	Wattage	Tolerance
ERD : Carbon	25 : 1/4W	J : $\pm 5\%$
ERX : Metal Film	1 : 1W	F : $\pm 1\%$
ERO : Metal Film		

Capacitor Type	Voltage	Tolerance
ECEA Type	Others	J : $\pm 5\%$ K : $\pm 10\%$ Z : $+80\%, -20\%$ P : $+100\%, -0\%$ M : $\pm 20\%$
ECEA : Electrolytic	0J : 6.3V	
ECEA...N : Non Polar Electrolytic	1A : 10V	
ECKD : Ceramic	1C : 16V	
ECQM : Polyester	1E : 25V	
ECEB : Electrolytic	1H : 50V	
ECQV : Polyester	1J : 63V	
ECKF : Ceramic	50 : 50V	
	25 : 25V	

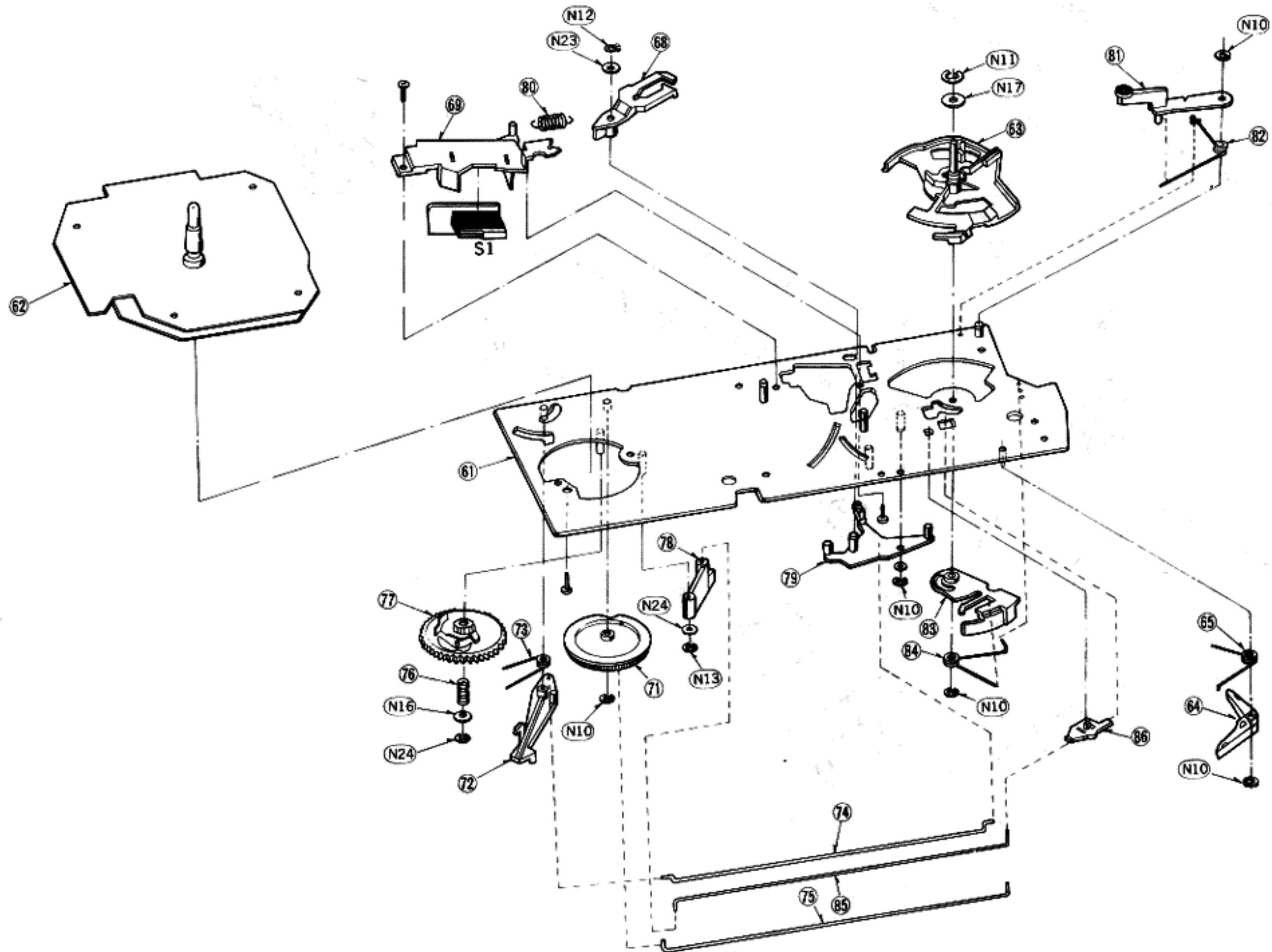
■ EXPLODED VIEWS

● Cabinet and Chassis



EXPLODED VIEWS

Automatic mechanism plate



Ref. No.	Part No.	Description
CABINET and CHASSIS PARTS		
1	SFTGB21S01	Turntable Mat (1)
4	SFTED21S51E	Turntable (1)
5 [Other Areas]	SFGCC05N02	Rubber Cushion (2)
5 [XA, XM]	SFGCC05X01	Transformer
6	SFKKD21S51	Rubber Cushion (2)
7	SFACD31S01	Transformer
7	SFACD31S21	Surface Plate (1)
8	SFDJDP3N02	Cabinet (Silver) (1)
8	SFDJDP3N02	Cabinet (Black) (1)
9 [Other Areas]	SFDJHSC0492	Socket, Phono Cord (1)
9 [XA, XM, XL]	SFDJHSC0491	Socket, AC Cord (1)
10	SFKTDP3N03	Socket, AC Cord (1)
11	SFKTDP3N02	Knob, Speed Selector (1)
12	SFQPD3N01	Knob, Start, Stop (1)
13	SFUZDP3N02	Spring, Start, Stop Knob (1)
14	SFKTDP3N01	Rod, Start, Stop (1)
16	SFYB-5-32	Knob, Cueing (1)
17	SFQA130-11	Ball, Cueing (1)
18	SFUZB31S01	Spring, Cueing (1)
19	SFUMB31S02	Rod, Cueing (1)
20	SFXJQ34N01	Slider, Cueing (1)
21	SFUMB31S01	Shaft, Cueing (A) (1)
23	SFUPBP3N02	Base, Cueing (1)
24	SFAUDP3N01	Bracket (1)
25	SFGAD31S01	Bottom Board (1)
26	SFGAD31S02	Audio Insulator (Front) (2)
27 [E, EC]	SFNND21S51	Audio Insulator (Rear) (2)
27 [EK, XL]	SFNND21G51	Name Plate (1)
27 [XA, XM]	SFNND21X51	Name Plate (1)
27 [Other Areas]	SFNND21R51	Name Plate (1)
28	SFATB33N01A	Hinge (2)
29	SFADB31S01E	Dust Cover (1)

Ref. No.	Part No.	Description
TONE ARM PARTS		
31	SFPAM0P201A	Tonearm (Silver) (1)
31	SFPAM0P202A	Tonearm (Black) (1)
32	SFCNC02301	Cover, Stylus (1)
33	SFKUDP3N01E	Arm Rest (1)
34	SFPRT30302E	Arm Lift (1)
35	SFPSP30304	Spring, Arm Lift (1)
36	SFPJK0P301	Knob, Anti-Skating (1)
36-1	SFPJK30302	Cam, Anti-Skating (1)
37	SFGK170-01	Rubber Cap (Silver) (1)
37	SFGK171F01	Rubber Cap (Black) (1)
38	SFUPBP3N01A	Plate, Tone Arm (1)
39	SFQHD3N01	Spring, Anti-Skating (1)
40	SFPSP30306	Spring (1)
41	SFUPB31S01A	Plate, Lift Ass'y (1)
42	SFPSP30305	Spring, Plate Lift Ass'y (1)
43	EPC-P24S	* Cartridge (1)
44	EPS-24CS	* Stylus (1)
AUTOMATIC MECHANISM ASS'Y		
61	SFUKD21S51E	Plate Automatic Mechanism (1)
62	SFMZD34N01Z	Stator Frame Ass'y (1)
63	SFUMQ22N03E	Cam Drive (1)
64	SFUMB33N01	Lever, Start (1)
65	SFQSB33N02	Spring, Start Lever (1)
68	SFUMQ34N38	Stop Lever (1)
69	SFUMQ34N36	Case, Switch (1)
71	SFUGQ34N22	Gear, Drive (1)
72	SFUMQ34N31	Plate, Stop Gear (1)
73	SFQSQ34N21	Spring, Gear Stop Plate (1)
74	SFQSQ34N30	Rod, Switch (1)
75	SFQSQ34N22	Rod, Drive (1)

Ref. No.	Part No.	Description
76	SFQAQ34N21	Spring, Stop Gear (1)
77	SFUGQ34N21E	Main Gear Ass'y (1)
78	SFUMQ34N42	Connector, Actuating (1)
79	SFUMQ34N46A	Switch Lever Ass'y (1)
80	SFQHQ34N22	Spring, Stop Lever (1)
81	SFUMQ34N43	Plate, Brake (1)
82	SFQSQ34N28	Spring, Brake (1)
83	SFUMQ22N02E	Cam, Start (1)
85	SFQSQ34N23	Rod, Actuating (1)
86	SFUMQ34N32	Support, Actuating Rod (1)
SCREWS, WASHERS and CIRCLIPS		
N1	SFPEV0P301	Screw, Cartridge (1)
N2	XTS3+16BFZ	Tapping, $\varnothing 3 \times 16$ (1)
N3	XTW3+10Q	Tapping, $\varnothing 3 \times 8$ (1)
N4	XTV3+8BFN	Tapping, $\varnothing 3 \times 8$ (21)
N5	SFXGD20-01	$\varnothing 3$ (5)
N6	XYN3+C12S	Tapping, $\varnothing 3 \times 12$ (2)
N7	XTW3+14QFYR	Tapping, $\varnothing 3 \times 4$ (6)
N8	SFXGQ34N02	(1)
N9	SFPEW13005	(1)
N10	XUC3FT	$\varnothing 3$ (6)
N11	XUC5FT	$\varnothing 5$ (1)
N12	XUC4FT	$\varnothing 4$ (2)
N13	XUC2FT	$\varnothing 2$ (1)
N14	XUC25FT	$\varnothing 2.5$ (1)
N15	SFXWQ34N25	(1)
N16	XWE4	$\varnothing 4$ (1)
N17	SFXWQ30-11	(1)
N18	SFXWQ34N24	(1)

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
ACCESSORIES			PACKING PARTS					
A1 [EK, XL]	SFNUD21G51	Instructions Book (1)	A4	SFDHC05N01	Phono Cord (1)	P5	SFHZD21S51	Pad, Cartridge (1)
A1 [EG]	SFNUD21R51	Instructions Book (1)	A5	SFDLC05N01	Ground Wire (1)	P6	SFHZ144X02	Sheet, Dust Cover (1)
A1 [EF]	SFNUD21F51	Instructions Book (1)	A6 [XA, Δ, XM]	SFDK119118	2P Plug (1)	P7	SFYH60X60	Polyethylene Bag (2)
A1 [Ei]	SFNUD21i51	Instructions Book (1)				P8	SFYH40X45	Polyethylene Bag (1)
A1 [XA]	SFNUD21X51	Instructions Book (1)	P1 [EF] ○	SFHPD21F51	Carton Box (Silver) (1)	P9	SFYH15X20	Polyethylene Bag (1)
A1 [Other Areas]	SFNUD21S51	Instructions Book (1)	P1 [EF] ⊠	SFHPD21F71	Carton Box (Black) (1)	P10	SFYF09A15	Polyethylene Bag (1)
A2	SFWE212-01	45 Adaptor (1)	P1 [Other ○ Areas]	SFHPD21S51	Carton Box (Silver) (1)	P11 [XA, XM] only	SFHDQ34X02	45 Adaptor Pad, Rear (1)
A3 [EK] Δ S	RJA43Z	AC Cord (1)	P1 [Other ⊠ Areas]	SFHPD21S71	Carton Box (Black) (1)			
A3 [XL] Δ S	RJA26Z	AC Cord (1)						
A3 [XA, Δ S XM]	QFC1103	AC Cord (1)	P2	SFHHD31S01	Pad, Front (1)			
A3 [Other S Areas]	RJA20Z	AC Cord (1)	P3	SFHHD31S02	Pad, Rear (1)			
			P4	SFHDQ34N01	Pad, Turntable (1)			

■ PACKINGS

