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Service Manual

ORDER NO.
ARP1550

STEREO TURNTABLE

PL-443

PL-443-S

- **This manual is applicable to the PL-443/WEM and PL-443-S/WEM types.**
- **PL-443 is Black versions of PL-443-S.**
- **Ce manual pour le servise comprend les explications en français de réglage.**
- **Este manual de servicio trata del método ajuste escrito en español.**

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1. SPECIFICATIONS

PHONOGRAPH MOTOR AND PLATTER

Motor type ..... Quartz PLL Hall motor
Drive system ..... Direct drive system
Speed of rotation ..... 2 speeds: 33-1/3, 45 rpm
Wow and Flutter ..... Less than* 0.012% (WRMS)
0.025% (WRMS)
±0.035% WTD Peak (DIN)

Values marked with an "" designate the wow and flutter for the motor, and do not include the cartridge or tonearm load.*

S/N ratio ..... More than 78 dB (DIN-B)
Platter ..... Diameter ø304 mm, aluminium die-cast

TONE ARM

Type ..... Static balance straight pipe arm

SUPPLIED CARTRIDGE

Type ..... MM type
Replacement stylus PN-305T
Stylus ..... 0.6 mil diamond
Output voltage ..... 2.5 mV (1 kHz, 5 cm/s LAT Peak)
Suitable stylus pressure ..... 1—1.5 g (Optimum value 1.25 g)
Frequency response ..... 10 Hz—33,000 Hz
Head shell type ..... Integrated
Cartridge weight ..... 6 g

POWER SUPPLY, OTHER

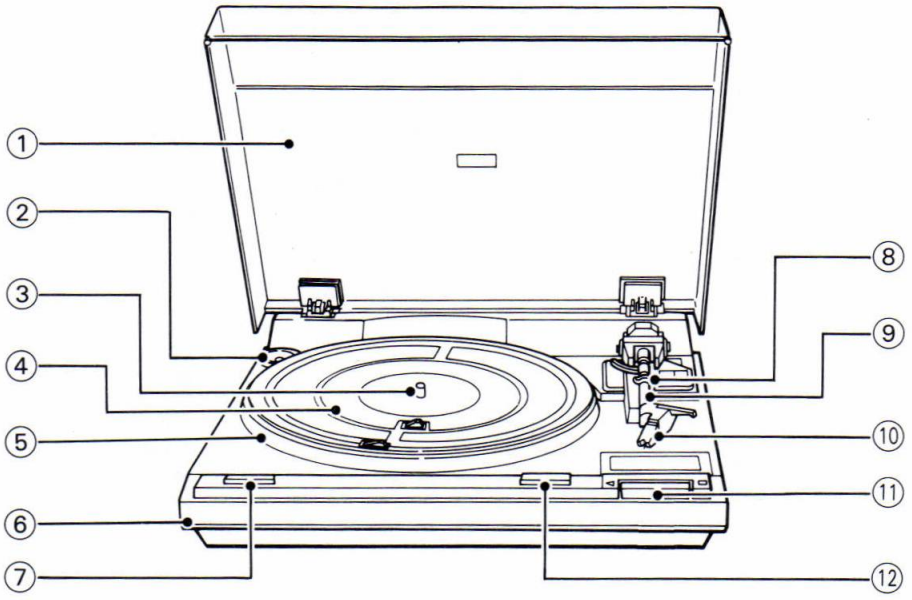
Power requirements ..... a.c. 220—240 Volts ~, 50/60 Hz
Power consumption ..... 9 W
External dimensions ..... 420 (W) x 118 (H) x 365 (D) mm
16-9/16 (W) x 4-5/8 (H) x 14-3/8 (D) in
Netweight ..... 4.7 kg (10 lb 6 oz)

SUPPLIED ACCESSORIES

EP adaptor 1
Operating instructions 1

NOTE:
Specifications and design subject to possible modification without notice, due to improvements.

2. PANEL FACILITIES



① **Dust Cover**

② **EP Adaptor**
Place over spindle to play 45 rpm singles.

③ **Spindle**

④ **Platter Mat**

⑤ **Platter**

⑥ **Cabinet**

⑦ **SPEED Selector**
Set to 45 for 45 rpm records
Set to 33 for 33-1/3 rpm records

⑧ **Armrest**

⑨ **Tonearm**

⑩ **Cartridge/Stylus**

⑪ **START/STOP Button**
Press to start automatic play and to stop play.

⑫ **ARM-ELEVATION Control**
Moves tonearm up and down.

3. EXPLODED VIEWS AND PARTS LIST

3.1 EXTERIOR

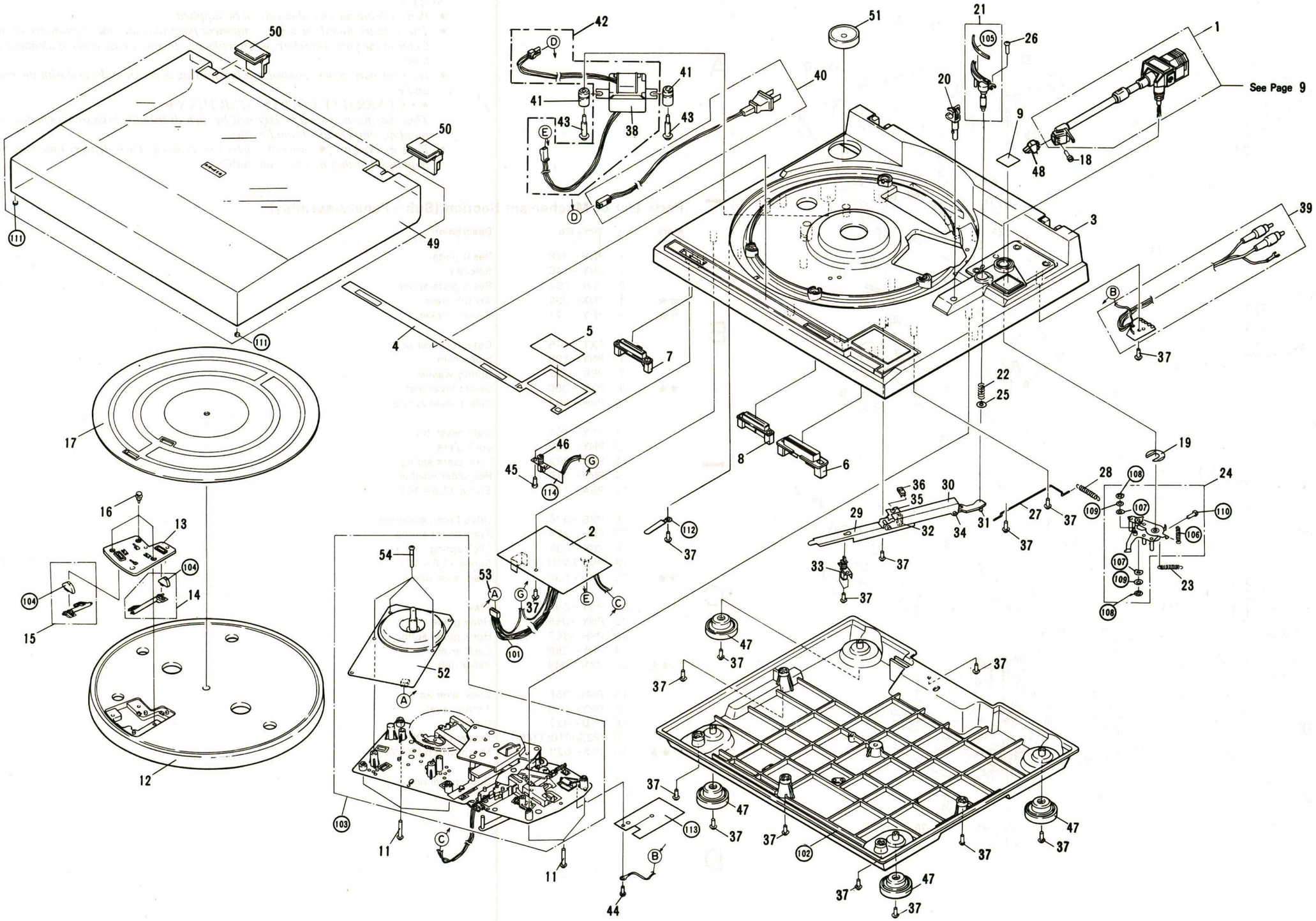
NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ *GENERALLY MOVES FASTER THAN* ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

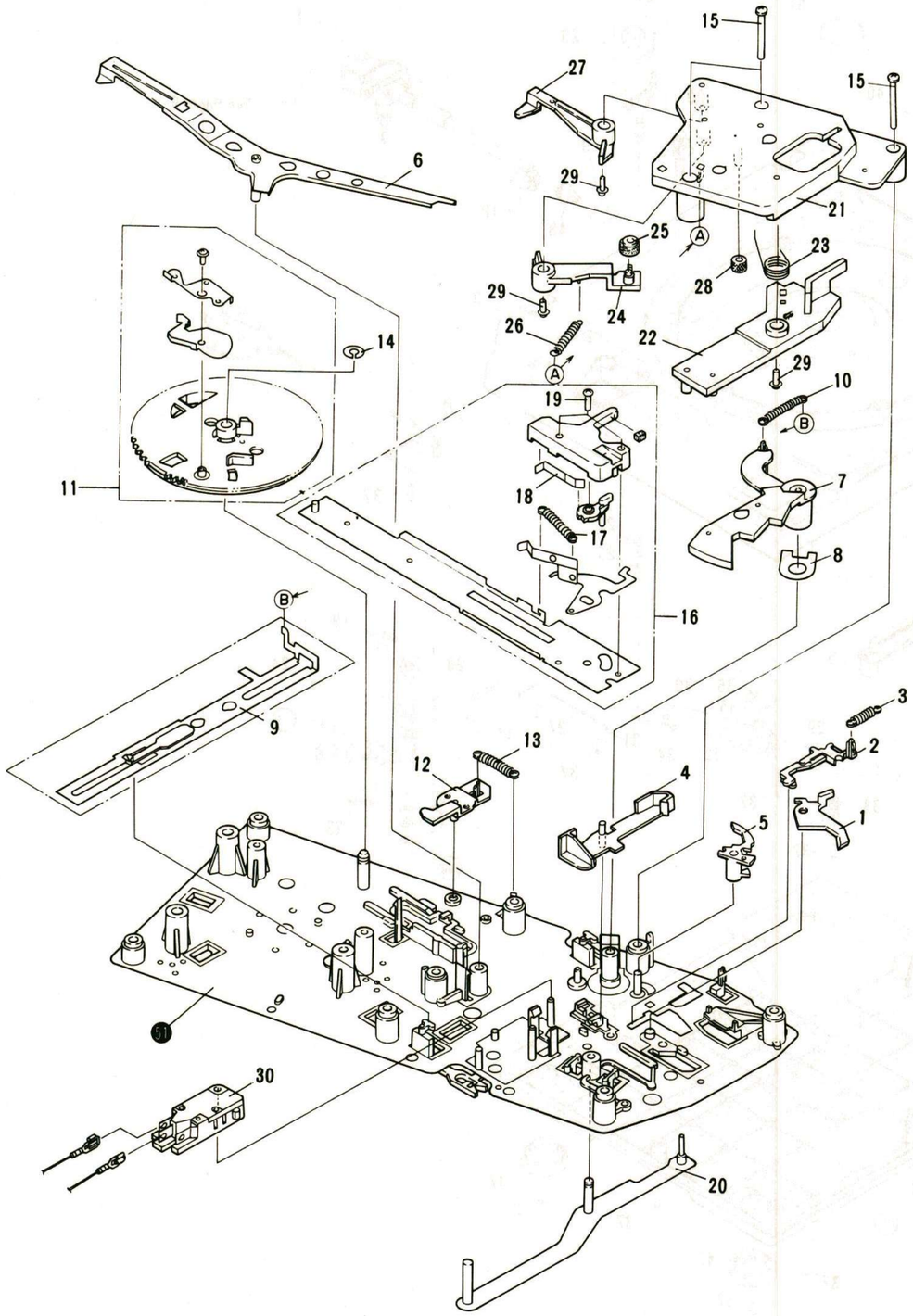
Parts List of Exterior

Mark	No.	Parts No.	Description
	1	PPD1021	Arm assembly
⚠	2	PWR-084	Power supply P.C. board assembly
	3	PNW1399	Panel (BLACK)
		PNW1400	Panel (SILVER)
	4	PAM1216	Screen (BLACK)
		PAM1217	Screen (SILVER)
	5	PAN1108	Panel board (BLACK)
		PAN1109	Panel board (SILVER)
	6	PAC1127	S/S button
	7	PAC1131	SP button
	8	PAC1130	EV button
	9	PAM1073	AS board
	10	.....	.....
	11	IPC30P290FMC	Screw (3 × 29)
	12	PNR-219	Turntable platter
	13	PNY-059	Hook holder
★★	14	PXV-037	Record detector unit
★★	15	PXV-038	Size detector unit
	16	PBM-011	Plastic rivet
	17	PEA-066	Rubber sheet assembly
	18	PBA-170	Cartridge mounting screw
	19	PBK-059	R clip
★	20	PXB-332	Arm rest assembly
★★	21	PXV-068	EV sheet unit
	22	PBH-355	EV spring
	23	PBH-425	AS spring
	24	PXB-323	PU plate assembly
	25	PBF-020	Washer
	26	BPZ26P120FZK	Screw (2.6 × 12)
	27	PBH-421	S/S rod
	28	PBH1007	S/S rod spring
	29	PNC-311	EV lever (A)
	30	PNC-312	EV lever (B)
	31	PNY-130	EV lever (C)
	32	PBH-375	EV lever spring
★★	33	PSG-048	Push switch
	34	PLB-210	EV lever shaft
	35	TMZ30P120FMC	Screw (3 × 12)
	36	YU30FUC	Nut
	37	IPC30P100FMC	Screw (3 × 10)
⚠ ★	38	PTT-181	Power transformer
	39	PXB-333	PU cord assembly
⚠ ★	40	PDF1017	Power cord assembly
	41	PEB-250	Damper rubber
⚠ ★	42	PTX1002	Power transformer assembly
	43	PBA-144	Clamp screw
	44	PSZ30P060FMC	Screw (3 × 6)
	45	PPZ30P080FMC	Screw (3 × 8)
★★	46	PSG-050	Push switch
	47	PEB-251	Insulater
	48	PXV-973	Cartridge (without stylus)
★★	49	PNV1003	Dust cover (BLACK)
★★		PNV1004	Dust cover (SILVER)
★	50	PXB-321	Hinge assembly
	51	N93-603	45 adaptor
★★	52	PXM-141	Motor assembly
	53	PDE-308	Connector assembly
	54	IPZ30P100FMC	Screw
	101		Lead wire assembly
	102		Under base
	103		Sub panel assembly
	104		Rubber guard
	105		Rubber sheet
	106		PU plate spring
	107		PU spring
	108		Washer
	109		Washer
	110		Screw
	111		Rubber foot
	112		Cord stopper
	113		Shield plate
	114		SW P.C. board assembly

Exterior



3.2 MECHANISM SECTION (SUB-PANEL ASSEMBLY)



NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Parts List of Mechanism Section (Sub−Panel Assembly)

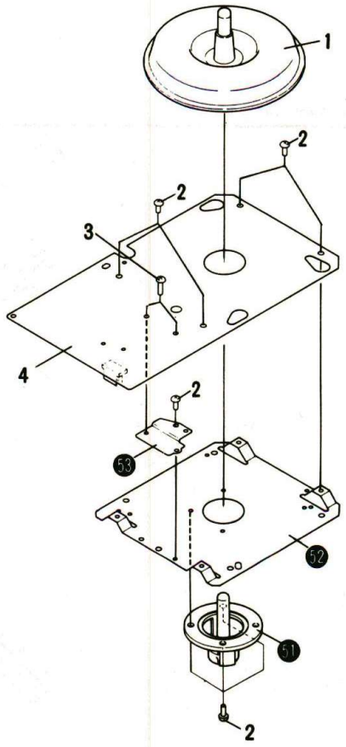
Mark	No.	Parts No.	Description
	1	PNY−028	Reset plate
	2	PNY−140	Selector
	3	PBH−394	Reset plate spring
★★	4	PNX−030	Switch lever
★★	5	PNY−141	Switch locker
	6	PXT−446	Detector lever unit
	7	PNY−138	Index cam
	8	PBK−039	Spring washer
★★	9	PXV−060	Select lever unit
	10	PBH−393	Select lever spring
	11	PYY−164	Cam assembly
	12	PNY−139	Lock plate
	13	PBH−392	Lock plate spring
	14	PBH−018	Polyslider washer
	15	PBA−172	Screw (2.6×10)
	16	PXB−376	Drive board assembly
	17	PBH−224	Start board spring
	18	PBK−038	Click spring
	19	PMZ26P100FMC	Screw (2.6×10)
★★	20	PXV−036	Start lever unit
	21	PNY−054	Stay
	22	PNY−055	Hook guide
	23	PBH−357	Hook guide spring
	24	PNY−056	Click lever
⚠★★	25	PXV−044	Roller unit
	26	PBH−358	Click lever spring
	27	PNY−058	Timing lever
	28	PED−027	Cushion
	29	IPZ30P100FMC	Screw (3×10)
⚠★★	30	PSF−023	Microswitch (POWER)
	51		Sub−panel unit

3.3 MOTOR ASSEMBLY (PXM-141)

Parts List of Motor Assembly

Mark	No.	Parts No.	Description
	1	PXV−107	Rotor unit
	2	PSZ30P050FMC	Screw (3×5)
	3	PBZ30P100FMC	Screw (3×10)
	4	PWM−197	Motor P.C.board assembly
	51		Spindle base unit
	52		Base
	53		Heat sink

Motor Assembly

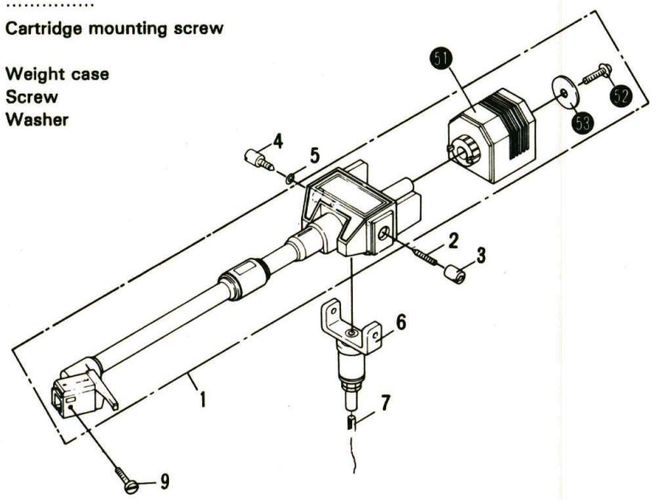


3.4 ARM ASSEMBLY (PPD1021)

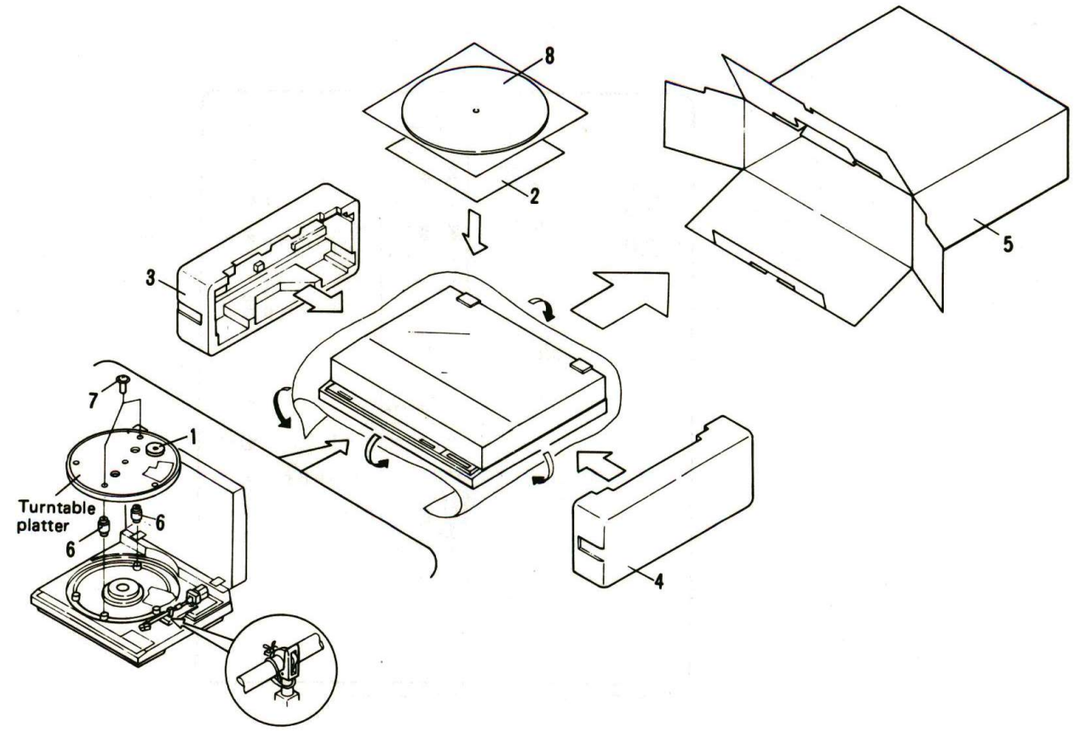
Parts List of Tonearm Section

Mark	No.	Parts No.	Description
	1	PXA1158	Pipe holder assembly
	2	PLB−654	Pivot
	3	PLB−655	Pivot lock nut
	4	PLB−653	Pivot screw
	5	WS30FMC	Washer
	6	PXB−622	Inside holder assembly
	7	PDF−514	Ground lug unit
	8	.....	.....
	9	PBA−170	Cartridge mounting screw
	51		Weight case
	52		Screw
	53		Washer

Tone Arm Assembly



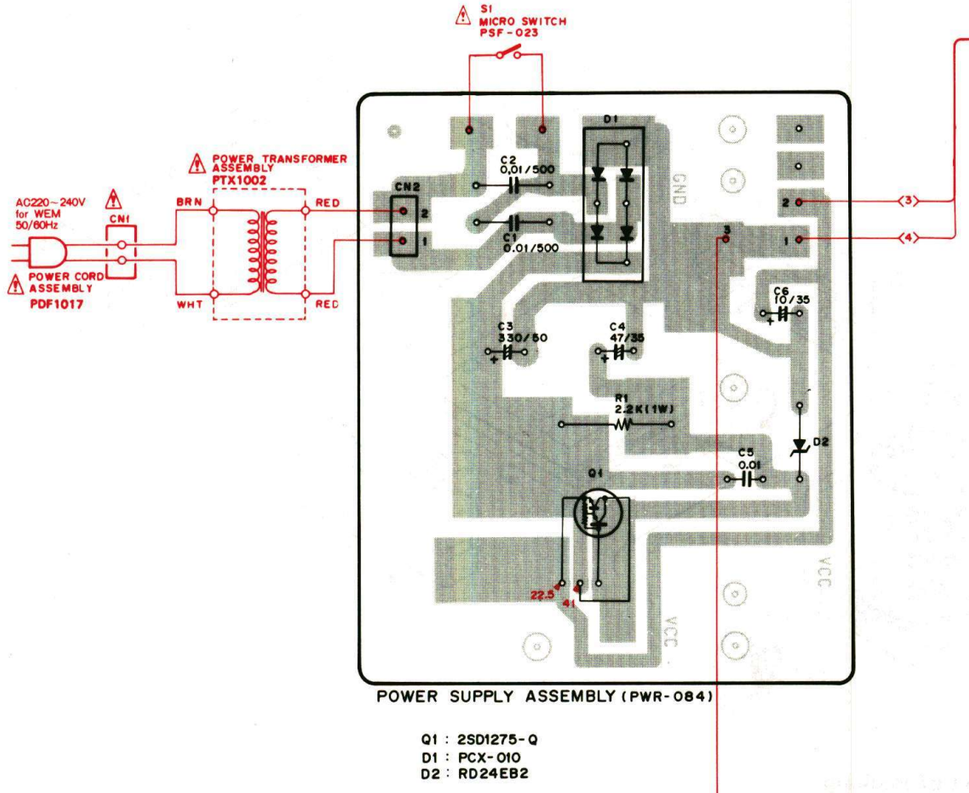
4. PACKING



Parts List of Packing

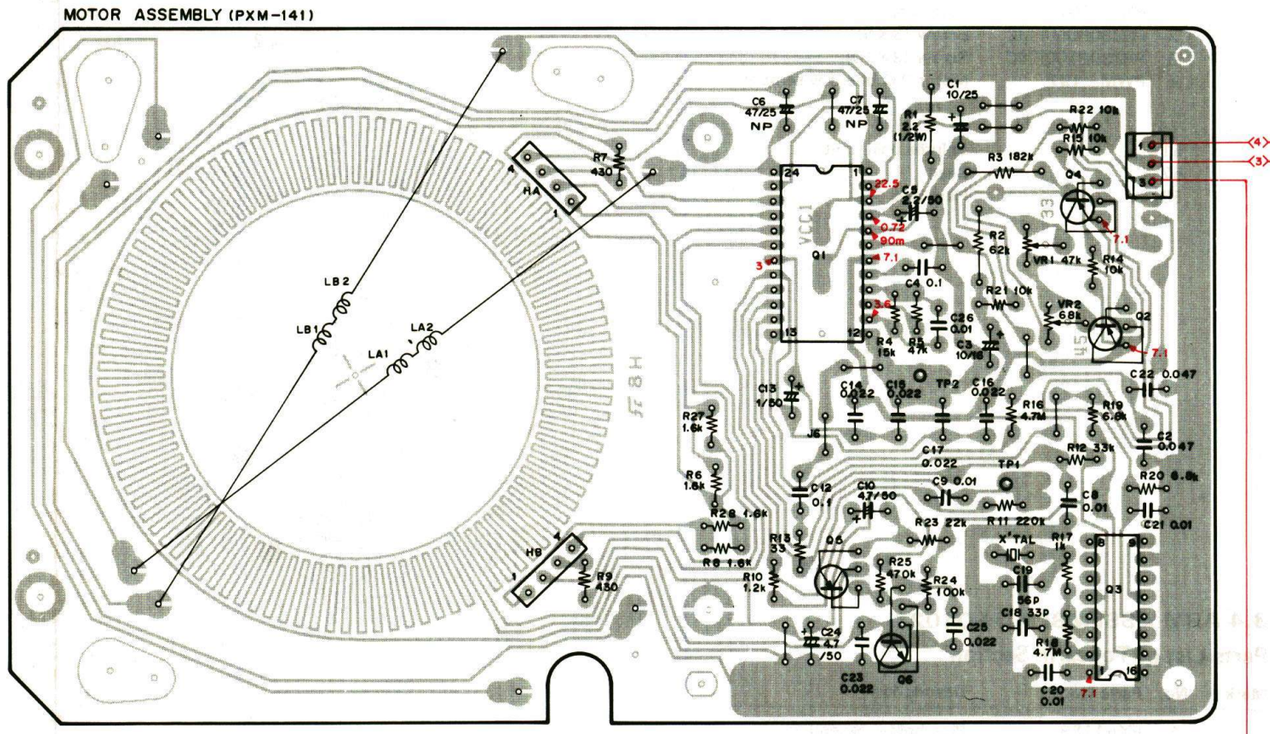
Mark	No.	Parts No.	Description
	1	N93−603	45 adaptor
	2	PRE1061	Operating Instructions (English,German,French,Italian)
	3	PHA−173	Protector (L)
	4	PHA−174	Protector (R)
	5	PHG1223	Packing case (BLACK)
		PHG1224	Packing case (SILVER)
	6	PNY−198	Packing
	7	PBA−178	Screw
	8	PEA−066	Rubber sheet assembly

5. P.C.BOARDS CONNECTION DIAGRAM



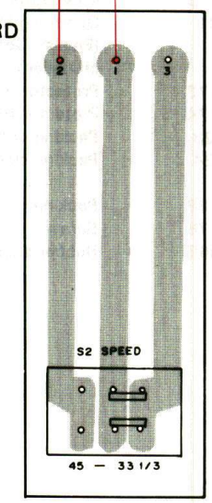
POWER SUPPLY ASSEMBLY (PWR-084)

Q1 : 2SD1275-Q
D1 : PCX-010
D2 : RD24EB2

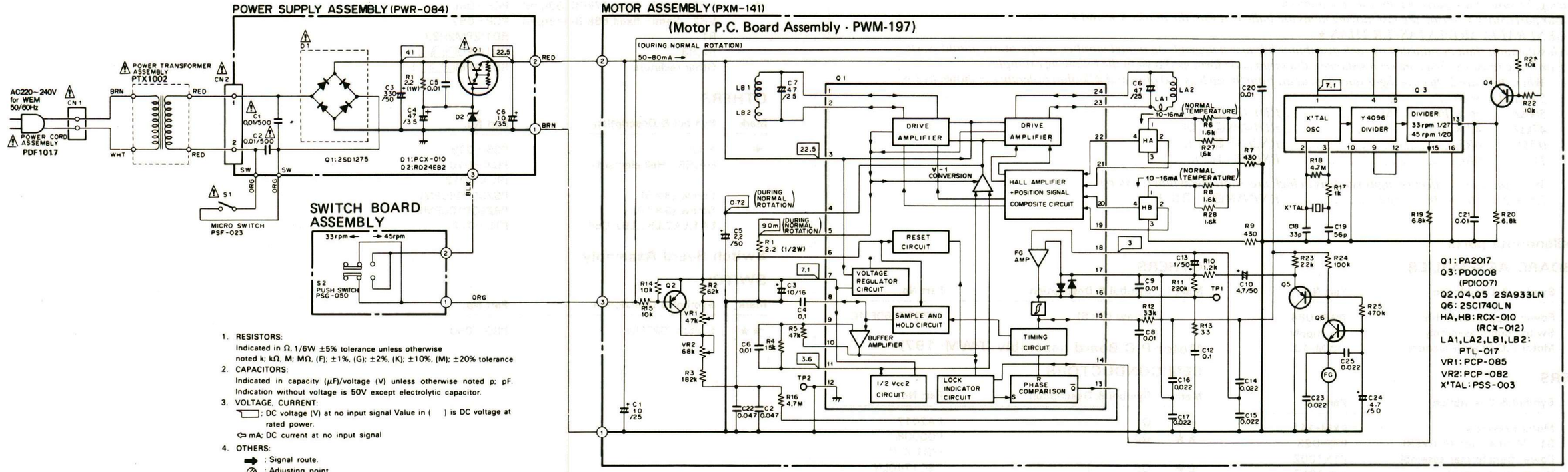


Q1 : PA2017
Q3 : PD0008
(PD1007)
Q2,Q4,Q5 2SA933LN
Q6 : 2SC1740LN-R
HA,HB : RCX-010
(RCX-012)
LA1,LA2,LB1,LB2 :
PTL-017
VR1 : PCP-085
VR2 : PCP-082
X'TAL : PSS-003

SWITCH BOARD
ASSEMBLY



6. SCHEMATIC DIAGRAM



1. RESISTORS:
   Indicated in Ω, 1/6W ±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K); ±10%, (M); ±20% tolerance
2. CAPACITORS:
   Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.
3. VOLTAGE, CURRENT:
   ▭ ; DC voltage (V) at no input signal Value in ( ) is DC voltage at rated power.
   ⇦ mA; DC current at no input signal
4. OTHERS:
   ➡ ; Signal route.
   ⊘ ; Adjusting point.

The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
✕ marked capacitors and resistors have parts unmbers.
The underlined indicates the switch position.

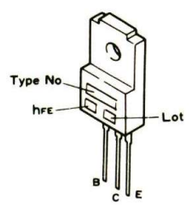
This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. SWITCHES:
   S1 : POWER ON – OFF
   S2 : SPEED 33 1/3rpm – 45rpm

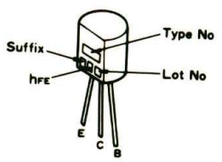
THE UNDERLINED INDICATES THE SWITCH POSITION

External Appearance of Transistor and ICs

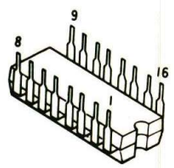
2SD1275



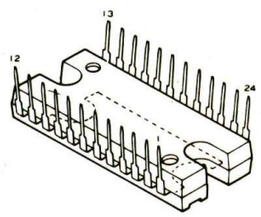
2SA933LN
2SC1740LN
2SA933S



PD0008
PD1007



PA2017



7. ELECTRICAL PARTS LIST

NOTES:

- *Parts without part number cannot be supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56 × 10¹*	*561*	*RD1/4PS 5 6 1 J*
47kΩ	*47 × 10³*	*473*	*RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621*	*RN1/4SR 5 6 2 1 F*

Miscellaneouts parts

P.C.BOARD ASSEMBLIES

Mark	Symbol & Description	Part No.
	Power supply assembly	PWR-084
	Switch board assembly	No supply
	Motor P.C.board assembly	PWM-197

OTHERS

Mark	Symbol & Description	Part No.
★★	Motor assembly	PXM-141
★★	S1 Microswitch (POWER)	PSF-023
⚠★	Power transformer assembly	PTX1002
⚠	Power cord assembly	PDF1017
	PU cord assembly	PXB-333

Power Supply Assembly (PWR-084)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
⚠★★	Q1	2SD1275
⚠★	D1	PCX-010
★	D2	RD24EB2 (RD24EB1)

CAPACITORS

Mark	Symbol & Description	Part No.
	C3	CEA331M50L
	C4	CEA470M35
	C6	CEA100M35
⚠	C1 (0.01/500V)	CKDYE103P500
⚠	C2 (0.01/500V)	CKDYE103P500
	C5	CKDYF103Z50
	R1	RS1PMF222J

OTHERS

Mark	Symbol & Description	Part No.
	Screw (3×6)	PZZ30P060FMC

Motor P.C.Board assembly (PWM-197)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q1	PA2017
★★	Q3	PD0008 (PD1007)
★★	Q6	2SC1740LN
★★	Q2,Q4,Q5	2SA933LN (2SA933S)

CAPACITORS

Mark	Symbol & Description	Part No.
	C2	CQPA473J50
	C8,C9	CQMA103K50
	C4,C12	CKDYX104M25 (PCL-046)
	C22	PCL-052
	C18	CCDCH330J50
	C19	CCDCH560J50
	C20,C21,C26	CKDYF103Z50
	C14-C17,C23,C25	CKDYF223Z50
	C1	CEA100M50
	C6,C7	CEANP470M25
	C3	CEA100M16
	C13	CEA010M50
	C5	CEA2R2M50
	C10,C24	CEA4R7M50

RESISTORS

NOTE:
When ordering resistors,convert the resistance value into code from,and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
★	VR1 Semi-fixed 47k(B) (33rpm)	PCP-085
	VR2 Semi-fixed 68k(B) (45rpm)	PCP-082
	R1	RD1/2PM2R2J
	R2,R3	RN1/4PQ□□□F
	Other resistors	RD1/6PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
★	X'tal	PSS-003
	HA,HB Hall element	PCX-010 (RCX-012)
	Screw (3×5)	PSZ30P050FMC
	Screw (3×10)	PBZ30P100FMC
	LA1,LA2,LB1,LB2 Coil	PTL-017

Switch Board Assembly

SWITCH

Mark	Symbol & Description	Part No.
★★	Switch (SPEED)	PSG-050

8. ADJUSTMENTS

8.1 MOTOR OPERATION ADJUSTMENT

1. Remove the underbase.
2. Connect the Ach of a dual trace oscilloscope to the circuit board unit, Q3 (PD0008) pin 15, and GND. Adjust the time axis so that 1 period of the output waveform is equal to 8 divisions in the 33 rpm mode. Fig. 8−2 (a).
3. Connect the Bch of a dual trace oscilloscope to Q1 (PA2017) pin 15, and GND. Adjust VR2 (45 rpm) so that the relation between the Ach and Bch waveforms in the 45 rpm mode is as shown in Fig. 8−2 (b).
4. Set the turntable to 33 rpm and adjust VR1 (33 rpm) until the relation between the Ach and Bch waveforms are as shown in Fig. 8−2 (c).
5. Always make motor operation adjustments starting with 45 rpm and ending with 33 rpm.

8.2 MECHANISM ADJUSTMENT

- **Stylus Landing Position Adjustment**

When the tone arm doesn't land in the correct position during automatic playback, adjust according to the following procedure.

1. Place a 30 cm record on the platter.
2. Press the START/STOP switch and start automatic playback. Note the direction and amount if the landing point is off. (How many mm to the inside or outside from the record grooves.)
3. Depress the START/STOP switch to return the tone arm to its rest.
4. Press the arm elevation switch to raise the stylus.
5. Move the tone arm to the outside edge of the record by hand.
6. Turn the adjustment screw with a small screwdriver according to the direction and amount checked at item 2 as follows:
   - When the stylus lands at the outside of the record, turn the adjustment screw in the ↻ direction.
   - When the stylus lands at the inside of the record, turn the adjustment screw in the ↺ direction.

   One half turn of the adjustment screws moves the tone arm about 12 mm.
7. After adjustment, press the START/STOP switch and check if the stylus landing point was correctly adjusted.

   If adjustment is incorrect, repeat items 3 to 6.

Be careful not to damage the record and stylus when making this adjustment.

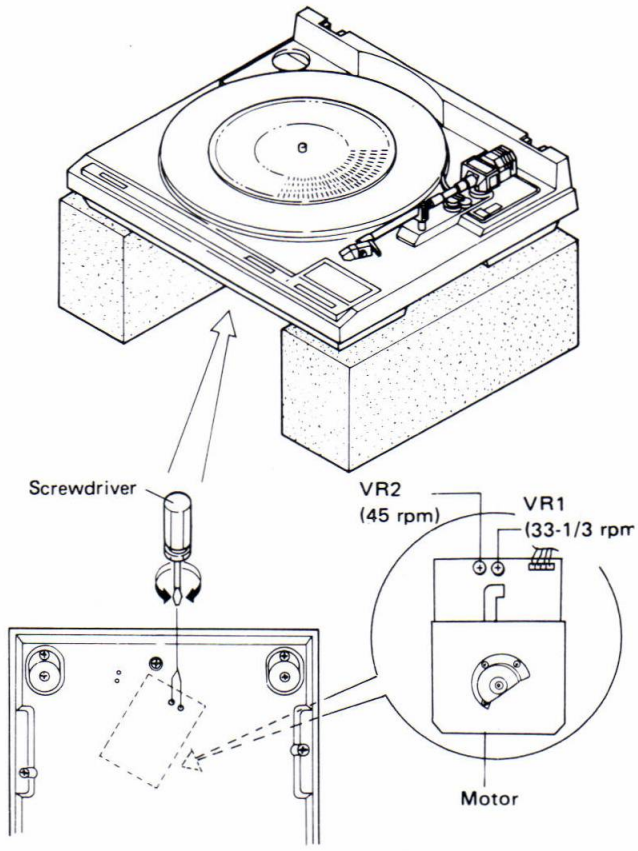
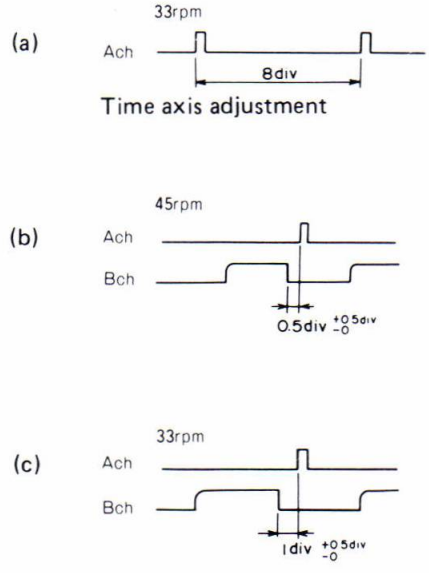


Fig. 8-1 Motor adjustment



Time axis adjustment

Fig. 8-2 Motor Operation Adjustment Waveforms

Adjustment using a test record

(Lowering position adjustment is made with the tone arm on the outside edge of the record.)

30 cm landing point . . . Lands between count 306 and 313.

17 cm landing point . . . Lands between count 175 and 183.

• Auto-Return Position Adjustment

When auto-return occurs too early or too late, make the following adjustments.

1. Check the stylus landing position. If the stylus does not land at the correct position, adjust the landing position.
2. Set the arm elevation switch to UP and turn the auto-return adjustment screw fully counter-clockwise.
3. Move the tone arm as far as it will go toward the inside.
4. When the auto-return adjustment screws is turned slowly clockwise, the tone arm will begin to move toward the inside.
5. Stop turning the adjustment screw at the point at which there is a space of 32 mm between the cartridge stylus and the center shaft. (Fig. 8−3)
6. After adjustment, check is auto-return is performed correctly and that the stylus landing position is correct.

• Arm Elevation Height Adjustment

1. Depress the arm elevation switch to lower the arm.
2. Adjust the screw under the turntable so the stylus is 11 mm above the panel. When the adjustment screw is turned counterclockwise, the stylus rises. (Fig. 8−3)
3. Depress the arm elevation switch to raise the tone arm.
4. Adjust the screws next to the arm elevation switch so the stylus is 25.5 mm above the panel. (Fig. 8−3)

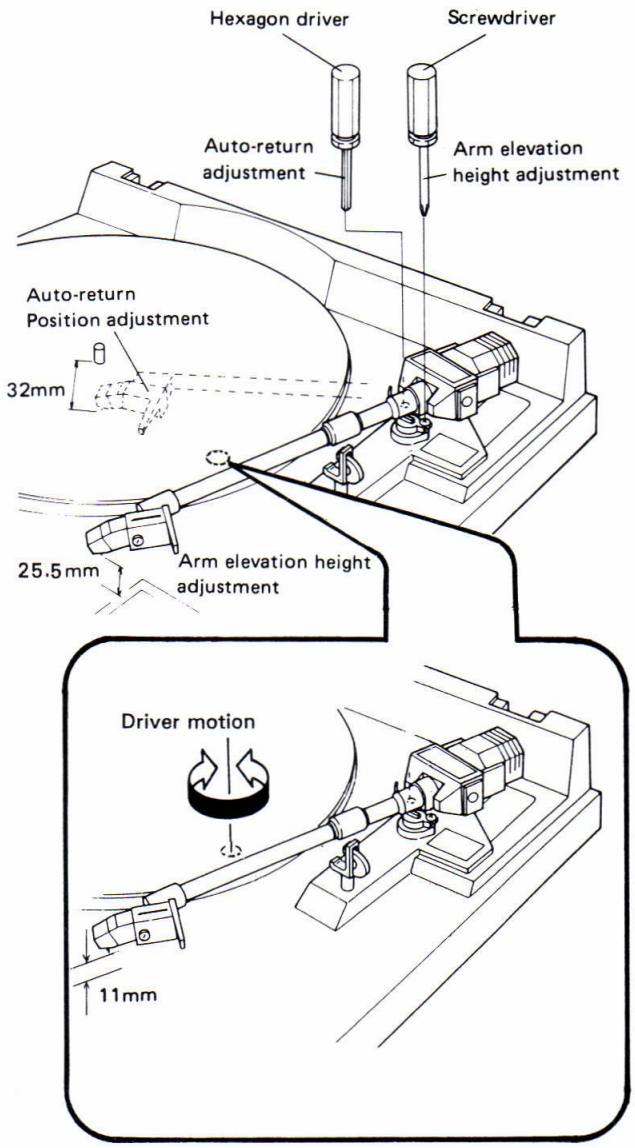


Fig. 8-3 Arm elevation height adjustment and auto-return adjustment

8. RÉGLAGE

8.1 RÉGLAGE DU FONCTIONNEMENT DU MOTEUR

1. Déposer la base inférieure.
2. Connecter le Ach de lóscilloscope à deux traces, au bloc de la plaquette de circuit, à la broche No. 15 de Q3 (PD0008), et GND. Régler l´axe de temps de telle maniére quúne période de la forme d´onde de sortie soit égale à 8 divisions en mode de 33 tours/minute. Fig. 8−2 (a).
3. Connecter le Bch de l´oscilloscope à deux traces à la broche No. 15 de Q1 (PA2017), et GND. Régler VR2 (45 tours/minute) de telle manière que le rapport entre les formes d´onde Ach et Bch en mode de 45 tours/minute soit celui indiqué par la Fig. 8−2 (b).
4. Régler le plateau sur 33 tours/minute et régler VR1 (33 tours/minute) jusqu´à ce que le rapport entre les formes d´onde de Ach et Bch soit celui indiqué par la Fig. 8−2 (c).
5. Toujours effectuer les réglages de fonctionnement du moteur en commençant avec le mode de 45 tours/minute et en terminant avec celui 33 tours/minute.

8.2 RÉGLAGE DE LA POSITION DE DESCENTE DE LA POINTE DE LECTURE

Lorsque le bras de lecture ne descend pas sur la position correcte lors de la lecture automatique, réaliser le réglage en suivant la procédure suivante.

1. Placer un disque de 30cm sur le plateau.
2. Appuyer sur la touche de marche/arrêt (START/STOP) et faire débuter la lecture automatique. Noter la direction et la grandeur de l'écart du point de descente. (Nombre de mm vers l'intérieur ou vers l'extérieur du sillon.)
3. Appuyer sur la touche START/STOP pour faire retourner le bras de lecture sur son support.
4. Appuyer sur la touche de relevage du bras pour soulever la pointe de lecture.
5. Déplacer à la main le bras de lecture vers la périphérie du disque.
6. Tourner la vis de réglage à l'aide d'un petit tournevis, en fonction de la direction et de la quantité mesurées lors du point 2, comme suit:

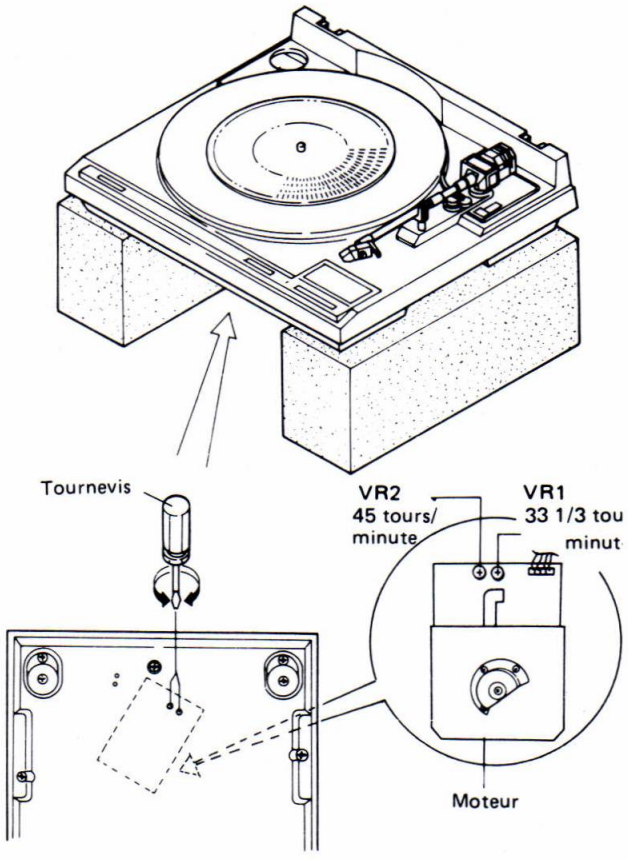


Fig. 8 -1 Réglage du moteur

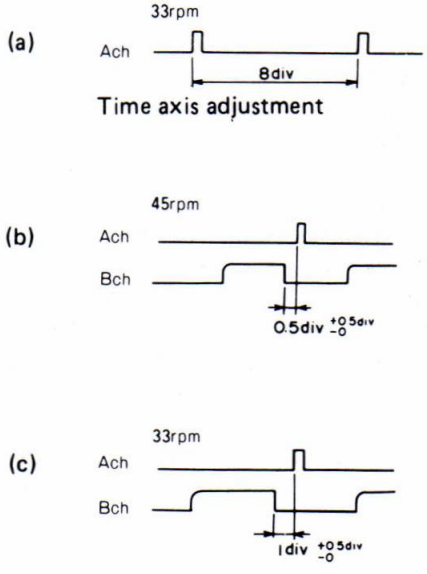


Fig. 8 -2 Formes d´onde de réglage du fonctionnement du moteur

- Lorsque la pointe de lecture descend vers l'extérieur du disque, tourner la vis de réglage dans le sens
- Lorsque la pointe de lecture descend vers l'intérieur du disque, tourner la vis de réglage dans le sens
  Un demi-tour de la vis de réglage correspond à un déplacement d'environ 12mm du bras de lecture.

7. Après le réglage, appuyer sur la touche START/STOP et vérifier si le réglage de la position de descente a été correctement effectué.
   Si le réglage n'est pas correct, répéter les étapes 3 à 6.

Prendre soin de ne pas endommager le disque ni la pointe de lecture en réalisant ce réglage.

Réglage au moyen d'un disque d'essai

(Le réglage de la position d'abaissement est réalisé avec le bras de lecture placé sur la périphérie du disque.

Point de descente
pour 30cm ..... Descente entre les valeurs 306 et 313.

Point de descente
pour 17cm ..... Descente entre les valeurs 175 et 183.

- **Réglage de la position de retour automatique**

Réaliser les réglages suivants lorsque le retour automatique se produit tôt ou trop tard.

1. **Contrôler la position de descente de la pointe de lecture. Si la pointe de lecture ne descend pas sur la position correcte, ajuster la position de descente.**
2. **Régler la touche de relevage du bras sur la position "UP" et tourner la vis de réglage du retour automatique à fond dans le sens contraire des aiguilles d'une montre.**
3. **Déplacer le bras de lecture le plus possible vers l'intérieur.**
4. **Lorsque la vis de réglage du retour automatique est tournée lentement dans le sens des aiguilles d'une montre, le bras de lecture commence à se déplacer vers l'intérieur.**
5. **Arrêter de tourner la vis de réglage sur le point pour lequel il y a un écart de 32mm entre la pointe de lecture et l'axe central. (Fig. 8−3)**
6. **Après le réglage, vérifier que le retour automatique se réalise correctement et que la position de descente de la pointe est correcte.**

- **Réglage de la Hauteur D'élévation du Bras Acoustique**

1. Presser l'interrupteur d'élévation du bras acoustique pour abaisser le bras acoustique.
2. Régler la vis en dessous de la platine de lecture de telle manière que la hauteur de la pointe de lecture soit de 11 mm au-dessus du panneau. La pointe de lecture se lève lorsque l'on tourne la vis de réglage dans le sens contraire des aiguilles d'une montre. (Fig. 8−3)
3. Presser l'interrupteur d'élévation du bras acoustique pour soulever le bras acoustique.
4. Régler les vis du côté de l'interrupteur d'élévation du bras acoustique de telle manière que la hauteur de la pointe de lecture soit de 25,5 mm au-dessus du panneau. **(Fig. 8−3)**

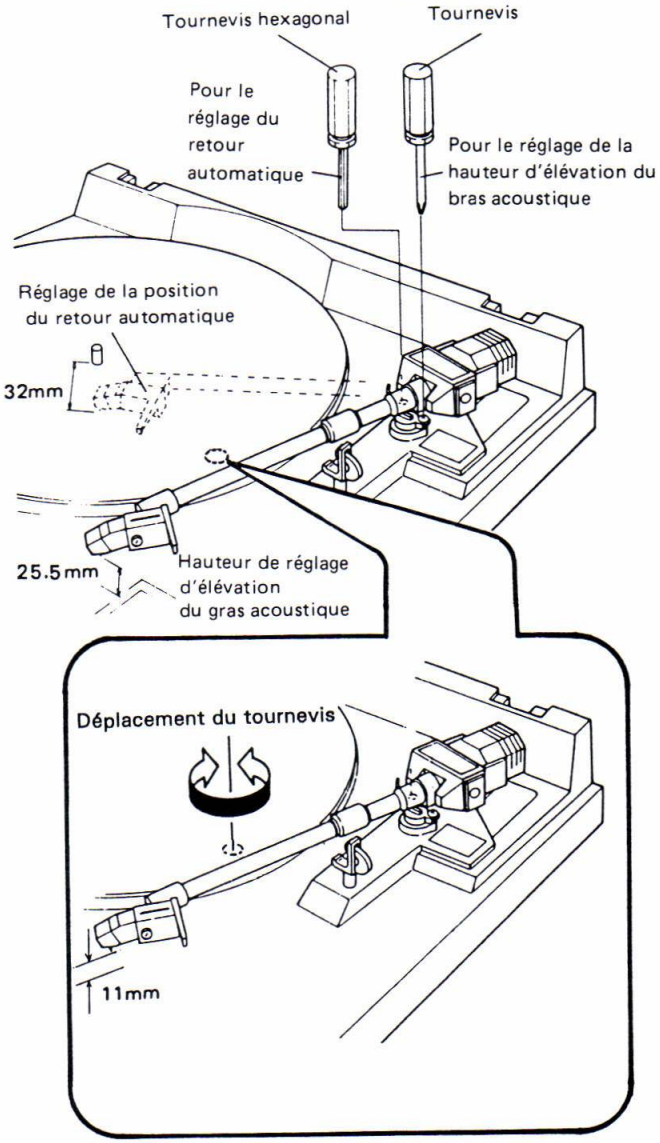


Fig. 8-3 Réglages de la hauteur d'élévation du bras acoustique et du retour automatique

8. AJUSTE

8.1 AJUSTE DE LA OPERACIÓN DEL MOTOR

1. Sacar la sub-base.
2. Conectar el Ach del osciloscopio de trazas dobles a la unidad de tablero de circuito, al pasador No. 15 de Q3 (PD0008) y GND. Ajustar el eje de tiempo, de manera que la forma de onda de salida sea igual a 8 divisiones en el modo de 33 rpm. Figura 8−2(a).
3. Conectar el Bch del osciloscopio de trazas dobles a Q1 (PA2017) pasador No. 15, y GND. Ajustar el VR2 (45 rpm) de manera que la relación entre las formas de onda de Ach y Bch en el modo de 45 rpm sea como se muestra en la **Figura 8−2 (b).**
4. Fijar el disco giratorio a 33 rpm y ajustar el VR1 (33 rpm) hasta que la relación entre las formas de onda Ach y Bch sea como se muestra en la **Figura 8−2 (c).**
5. Siempre efectúe los ajustes de la operación del motor comenzando por 45 rpm y terminando con 33 rpm.

8.2 AJUSTE DE LA POSICIÓN DE DESCENSO DE LA AGUJA

Cuando el brazo fonocaptor no desciende en la posición correcta durante la reproducción automática, ajustar de acuerdo con el procedimiento siguiente.

1. Poner un disco de 30cm sobre el plato.
2. Presionar el interruptor de inicio/parada (START/STOP) e iniciar la reproducción automática. Notar la dirección y cantidad si el punto de descenso es incorrecto. (Cuántos mm hacia el interior o exterior de los surcos del disco.)
3. Presionar el interruptor de inicio/parada (START/STOP) para hacer volver el brazo fonocaptor a su posición de apoyo.
4. Presionar el interruptor de elecación del brazo para hacer ascender la aguja.
5. Desplazar el brazo fonocaptor hacia el borde exterior del disco con la mano.
6. Girar el tornillo de ajuste con un destornillador pequeño de acuerdo con la dirección y cantidad comprobadas en el item 2 del modo siguiente:
   - Cuando la aguja desciende fuera del disco, girar el tornillo de ajuste en la dirección
   - Cuando la aguja desciende en el interior del disco, girar el tornillo de ajuste en la dirección

   Media vuelta de los tornillos de ajuste desplaza el brazo fonocaptor unos 10mm.

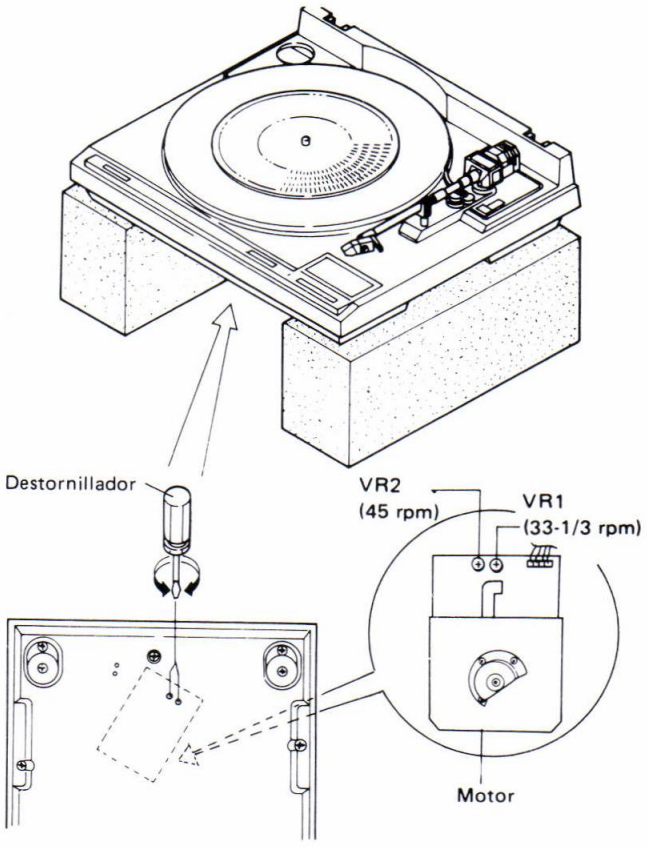


Figura 8-1 Ajuste del motor.

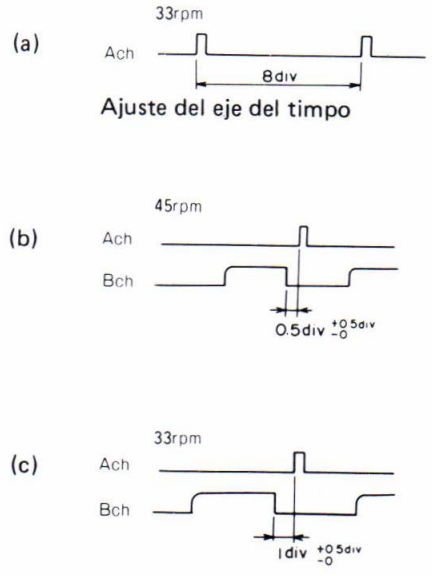


Figura 8-2 Formas de onda de ajuste de la operación del motor

7. Después del ajuste, presionar el interruptor de reproducción/parada (START/STOP) y comprobar si el punto de descenso de la aguja se ha ajustado correctamente.
   Si el ajuste es incorrecto, repetir los items 3 al 6.

Tener cuidado de no dañar el disco ni la aguja al efectuar este ajuste.

Ajuste empleando un disco de prueba

(El ajuste de la posición de descenso se efectúa con el brazo fonocaptor sobre su borde exterior del disco.)

Punto de descenso
para 30cm ..... Desciende entre el cómputo 306 y 313.

Punto de descenso
para 17cm ..... Desciende entre el cómputo 175 y 183.

- **Ajuste de la posición de retorno automático**

Cuando el retorno automático se produce demasiado rápido o demasiado tarde, efectuar los ajustes siguientes.

1. Comprobar la posición de descenso de la aguja. Si la aguja no desciende en la posición correcta, ajustar la posición de descenso.
2. Ajustar el interruptor de elevación del brazo en la posición UP y girar el tornillo de ajuste de retorno automático completamente hacia la izquierda.
3. Desplazar el brazo fonocaptor hacia el interior al máximo.
4. Cuando se giran lentamente los tornillos de ajuste de retorno automático hacia la derecha, el brazo fonocaptor emplezará a moverse hacia el interior.
5. Dejar de girar el tornillo de ajuste en el punto en el que haya un espacio de 32mm entre la aguja de la cápsula y el eje central. (Figura 8–3)
6. Después del ajuste, compronar que la operación de retorno automático se efectúe correctamente y que la posición de descenso de la aguja sea la correcta.

- **Ajuste de la Altura de Elevación del Brazo Sonoro**

1. Presionar el interruptor de elevación del brazo sonoro para bajar el brazo.
2. Ajustar el tornillo bajo el tocadiscos de modo que la altura de la aguja sea de 11 mm sobre el panel. La aguja se levanta cuando se gira el tornillo de ajuste en el sentido contrario al de las agujas del reloj. (Figura 8–3)
3. Presionar el interruptor de elevación del brazo sonoro para levantar el brazo.
4. Ajustar los tornillos al lado del interruptor de elevación del brazo sonoro de modo que la altura de la aguja sea de 25.5 mm sobre el panel. (Figura 8–3)

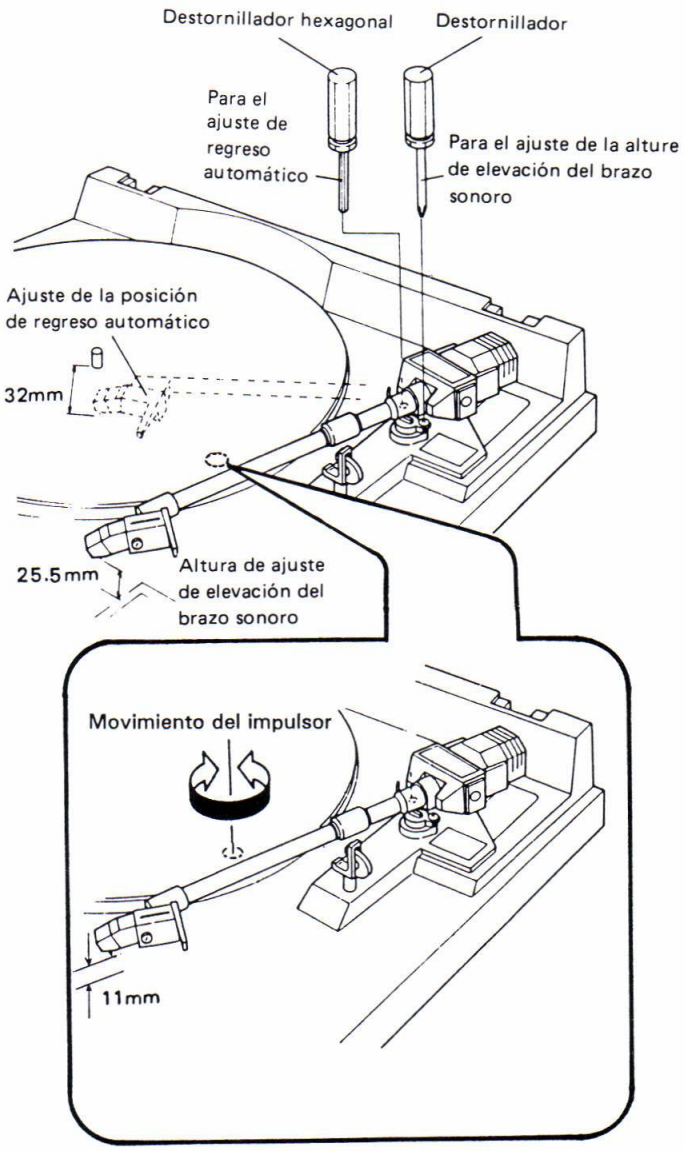


Figura 8-3 Ajustes de la altura de elevación del brazo sonoro y de regreso automático;