PS-3750

US Model
AEP Model

Cartridge is not supplied with this turntable system.

TURNTABLE SYSTEM

SPECIFICATIONS

GENERAL

Power Requirements:	120V ac, 60Hz (US model) 110, 127, 220 or 240V ac adjustable, 50/60Hz (AEP model)
Power Consumption:	10W (US model) 13W (AEP model)
Dimensions:	445 (w) x 150 (h) x 365 (d) mm 17 5/8 (w) x 5 7/8 (h) x 14 3/8 (d) inches
Weight:	9 kg, 19 lb 13 oz (net) 10.5 kg, 23 lb 2 oz (in shipping carton) (US model) 9.3 kg, 20 lb 8 oz (net) 10.8 kg, 23 lb 13 oz (in shipping carton) (AEP model)

TURNTABLE

Platter:	31.4 cm (12 3/8 inches), aluminum-alloy diecast
Motor:	DC servo-controlled motor (brushless)
Drive System:	Direct drive
Speed:	33 1/3, 45 rpm
Pitch Control Range:	±4%
Wow and Flutter:	Less than 0.03% (WRMS) ±0.045% (DIN) (AEP model)
S/N Ratio:	Better than 70dB (DIN-B)

TONEARM

Type:	Statically balanced, universal
Pivot to Stylus Length:	216.5 mm (8 1/2 inches)
Overall Arm Length:	300 mm (11 7/8 inches)
Overhang:	16.5 mm (21/32 inches)
Tracking Error:	Within +3°, -1°
Tracking-force Adjustment Range:	0–3 g
Shell Weight:	7.5 g
Cartridge Weight Range:	4–10 g (without extra weight) 10–15.5 g (with extra weight)

SAFETY-RELATED COMPONENT WARNING!!

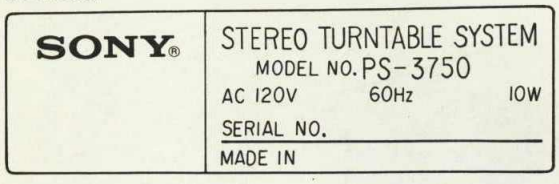
COMPONENTS IDENTIFIED BY SHADING ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SONY®
SERVICE MANUAL

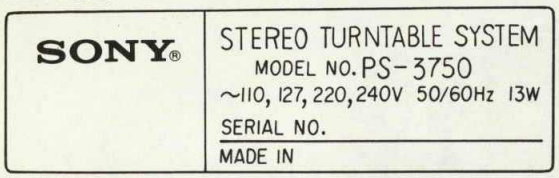
MODEL IDENTIFICATION

- Specification Labels

US model



AEP model



SECTION 1
OUTLINE

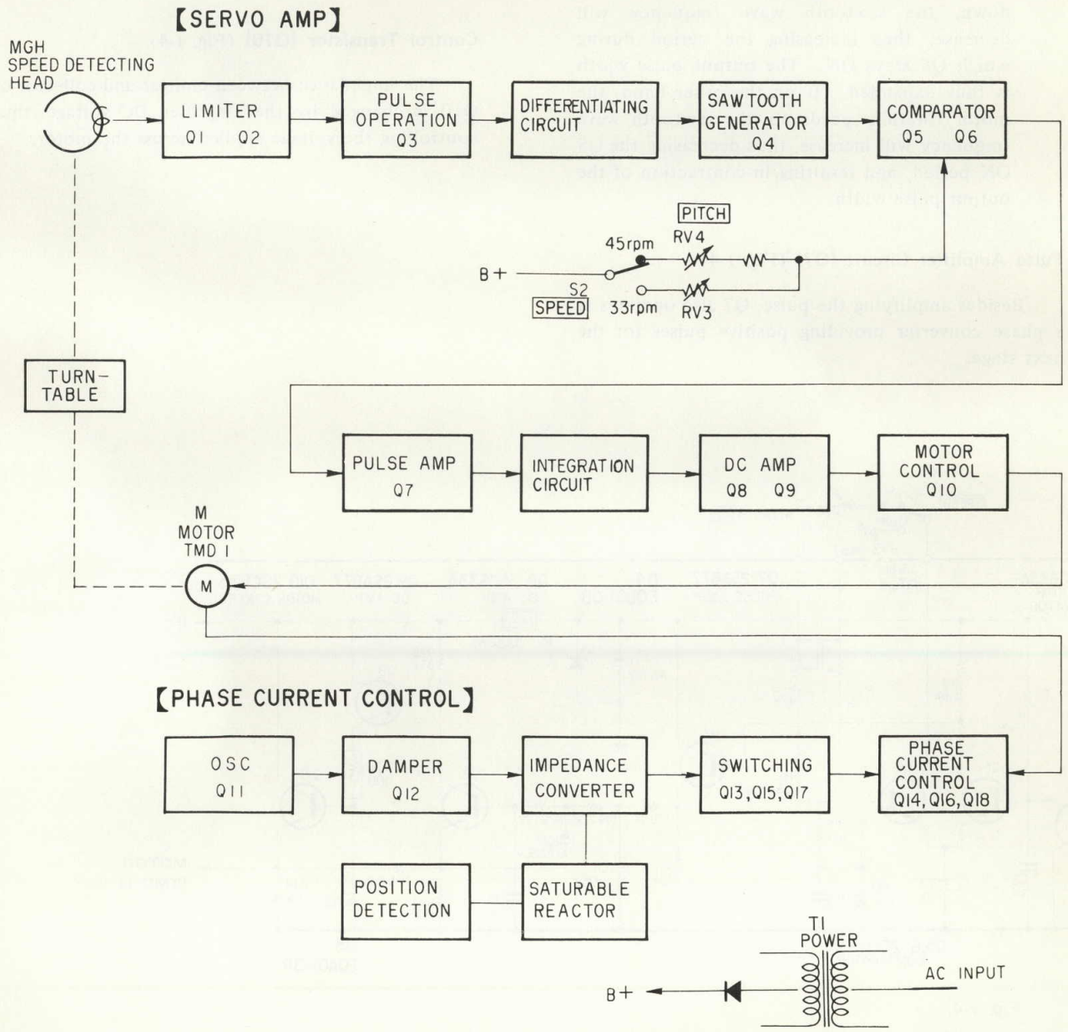
1-1. FEATURES

- A newly developed brushless DC motor is used in the servo controlled drive mechanism of the PS-3750.

By eliminating the brushes and commutator of a conventional motor, the turntable speed variations are greatly reduced, and the motor life is greatly increased.

- The Frequency Generator (F.G.) is composed of a magnetic coating inside the platter.
- The cabinet, is made from the new acoustic material SBMC (Sony Bulk Mould Compound), minimizes resonance, vibration and inferior tone quality.

1-2. BLOCK DIAGRAM



1-3. CIRCUIT DESCRIPTION

The PS-3750 employs a DC servo circuit to maintain constant turntable rotation. The principles of this circuit are outlined in Fig. 1-1.

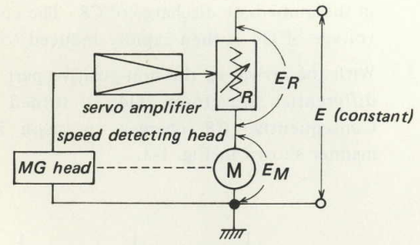


Fig. 1-1.

The rotational speed of the motor is determined by the voltage E_M applied across the motor. Since E (constant) = $E_M + E_R$, motor speed will be changed by the value of E_R, i.e., the changing value of R.

If the motor speed varies from a fixed central value due to external influences, corresponding changes in the value of R will maintain motor speed at a constant rate. Speed changes in the PS-3750 are detected by the MG head mounted in the turntable frame. (Opposing S-N magnets mounted with high degree of precision in the outer circumference of the turntable platter). Frequencies detected by this head are 284 Hz at 33 rpm, and 384 Hz at 45 rpm. Changes in these frequencies are converted into electrical changes, which then change the value of R, by the servo amplifier.

As Fig. 1-2 shows, R is not an actual resistor; the changes in impedance between the collector and emitter of a transistor are utilized instead. And since this impedance Z, is changed by the voltage applied to the base of the transistor, all that is required to maintain constant motor speed, is a means of varying base voltage in proportion to speed changes.

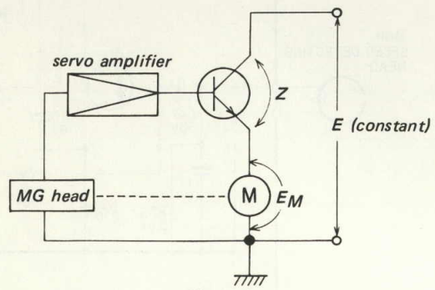


Fig. 1-2.

When Motor is Started Up (see Fig. 1-4)

1. When the power switch is turned ON, Q4 is still OFF since no MG head output has yet arrived at Q1. C8 is charged up via R11.
2. Q5 is turned ON when the charging voltage (Q5 base voltage) exceeds $+V_{BE}$ (Q5 emitter voltage).
3. Consequently, Q7 ~ Q10 are all turned ON, the motor power supply voltage is applied directly, and the motor commences to rotate immediately.
4. If ripple voltage is allowed to flow to the motor at this time, hum would occur, but this is prevented by D5.

Limiter Circuit (Q1 and Q2) (see Fig. 1-4)

1. Once the turntable starts to rotate, the MG head produces an output signal.
2. Although the MG head output is almost a perfect sine wave, some level variations do occur. If these exceed a certain level, the sine wave is passed through the circuit consisting of Q2 and Q1, the diodes D1 and D2, and C4, where it is changed into a constant level square waveform.

Waveform Shaping Circuit (Q3 and D3) (Fig. 1-4)

1. Since the Q2 output waveform is still not perfectly square, it is amplified again at Q3 to produce a perfect square wave. The purpose of D3 is to keep the base voltage of Q3 at ±0.6Vp-p.
2. Insertion of the Q1 ~ Q3 limiter circuit is to prevent accidental detection of AM fluctuations as speed changes (FM fluctuations).

Differential Circuit (C7, R8, R9) (Fig. 1-4)

In order for the square waveform appearing at the collector of Q3 to trigger the sawtooth wave generator transistor Q4 in the next stage, it has to be changed to a differential waveform. This occurs in the differential circuit (C7, R8, R9).

Sawtooth Wave Generator Circuit (Q4, C8, R11) (Fig. 1-4)

1. When Q4 is OFF, C8 is charged up via R11. The ⊕ part of the differential waveform from the differential circuit turns Q4 ON, resulting in the immediate discharge of C8. The collector voltage of Q4 is then capidly reduced to 0.
2. With the arrival of the non-positive part of the differential waveform, Q4 is turned OFF. Consequently, C8 charges up again in the manner shown in Fig. 1-3.

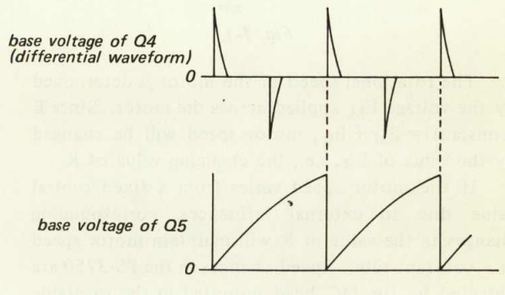


Fig. 1-3.

Comparator Circuit (Q5, Q6) (Fig. 1-4)

1. The sawtooth waveform then arrives at the comparator circuit (Q5 plus Q6). The base of Q6 is biased by a basic voltage (which has be divided into B⊕ by means of RV3, RV1 (or RV4, RV2 at 45 rpm), R14 and R15. The emitter voltage of Q5 is consequently held fixed by this basic voltage, so Q5 will turn ON when the base voltage (sawtooth wave) exceeds the emitter voltage $+V_{BE}$. So during the period when the basic voltage (emitter voltage) $+V_{BE}$ is exceeded, a negative plus appears on the collector side of Q5.
2. Consequently, if the motor rotation slows down, the sawtooth wave frequency will decrease, thus increasing the period during which Q5 stays ON. The output pulse width is thus expanded. If on the other hand, the motor rotation speeds up, the sawtooth wave frequency will increase, thus decreasing the Q5 ON period, and resulting in contraction of the output pulse width.

Pulse Amplifier Circuit (Q7) (Fig. 1-4)

Besides amplifying the pulse, Q7 also operates as a phase converter providing positive pulses for the next stage.

Smoothing Circuit (Low-pass Filter) (Q8, R18, C11, R19, R20, C12, C13) (Fig. 1-4)

These two filters, one formed by R18 and C11, and the other by Q8, R19, R20, C12, and C13, act as a differential circuit converting the input signal arriving at this stage, into a DC voltage in proportion to pulse width.

DC Amplifier Circuit (Q8, Q9) (Fig. 1-4)

Q8 and Q9 make up the DC amplifier circuit which amplifies the DC output signal from the previous low-pass filter. (Q8 also forms part of the low-pass filter).

Control Transistor (Q10) (Fig. 1-4)

The impedance between emitter and collector of Q10 is changed by the amplified DC voltage, thus controlling the voltage applied across the motor.

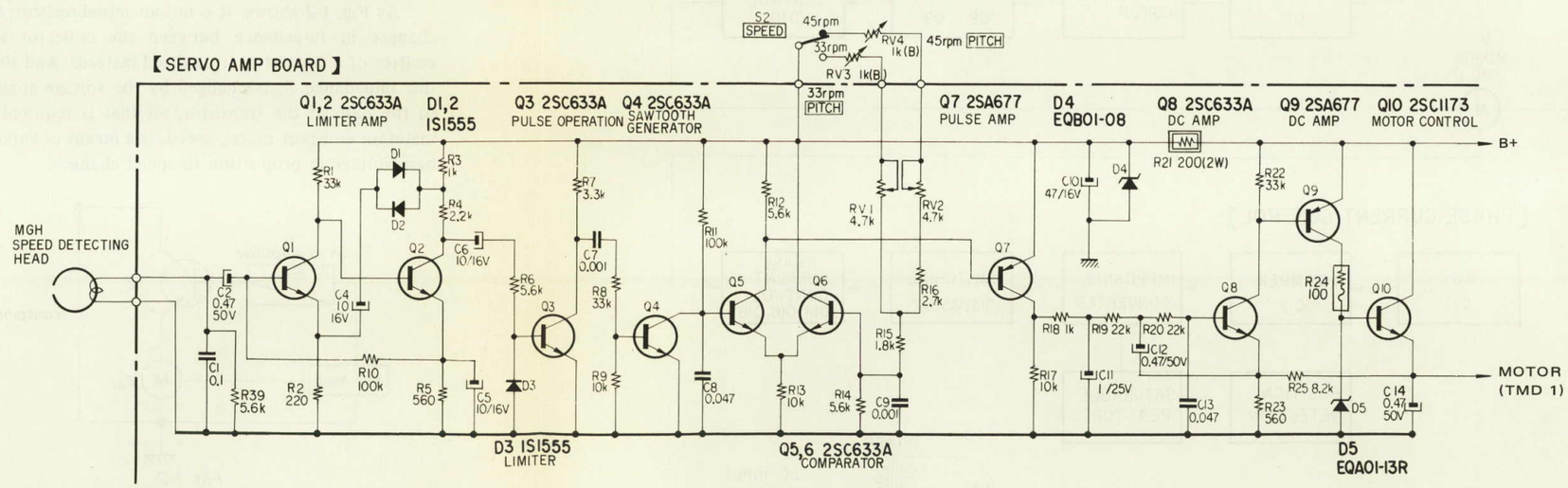


Fig. 1-4.

Operation of Servo Mechanism (Fig. 1-4)

If the motor speed is increased, or decreased, by even the slightest amount, above or below a specific value, the servo circuit is activated in the following manner in order to restore motor speed to the specific value.

1. When motor speed is increased, the frequency of the signal produced by the MG head becomes high, resulting in a reduction of the Q4 ON period, and contraction of the Q7 collector output pulse width.
2. The DC output signal from the low-pass filter consequently decreases, and the collector – emitter impedance of the control transistor increases, thus reducing the voltage across the motor terminals. Motor speed is therefore returned to normal speed.
3. When motor speed decreases, exactly the opposite process results in corrective speed up action.

Speed Selector Switch (Fig. 1-4)

1. The switching action is achieved by changing the basic voltage by means of a voltage divider resistor connected to the Q6 base circuit.
2. This basic voltage has been set lower for 45 rpm than for 33 rpm.
3. Therefore, when switching from 33 rpm to 45 rpm, the Q7 collector output pulse width is widened, thus increasing the low-pass filter output level. The Q10 collector – emitter impedance is consequently decreased, and the motor speed increased. When the speed increases to a certain level, the servo circuit is re-activated to stabilized motor speed again.
4. When switching from 45 rpm back to 33 rpm, motor speed is slowed down by the reverse process.

Phase Switching Circuit (Fig. 1-5)

Since the PS-3750 incorporates the BSL (brushless and slotless) motor, switching elements are required in place of the brushes. And since it is also a bi-polar 3-phase motor, use is made of the rotor magnet's N pole edge leakage flux. Consequently, motor saturation inductance (1, 2, 3) is saturated by this flux at every 120° of rotation.

A signal of approximately 500 kHz is produced by the Colpits oscillator (Q11), and then applied via the damper emitter – follower (Q12) to the resistor plus saturation inductance series circuit (R29 and 1, R32 and 2, R35 and 3). Inductance consequently varies in level by about 5 times during the saturation/non-saturation period. This means that the voltage across both ends of the saturation inductance also varies in level by about 5 times.

If voltage is set to above 0.6V during the non-saturated period, but below 0.6V during the saturated period, and the saturation inductance connected to the bases of Q13, Q15, and Q17, these transistors will be turned OFF during 120° of rotation, but turned ON for the remaining 240°.

If the phase switching transistors Q14, Q16, and Q18 are driven by the collector voltage, each of the phases will be turned ON in turn with each successive 120° of rotation, thus rotating the motor.

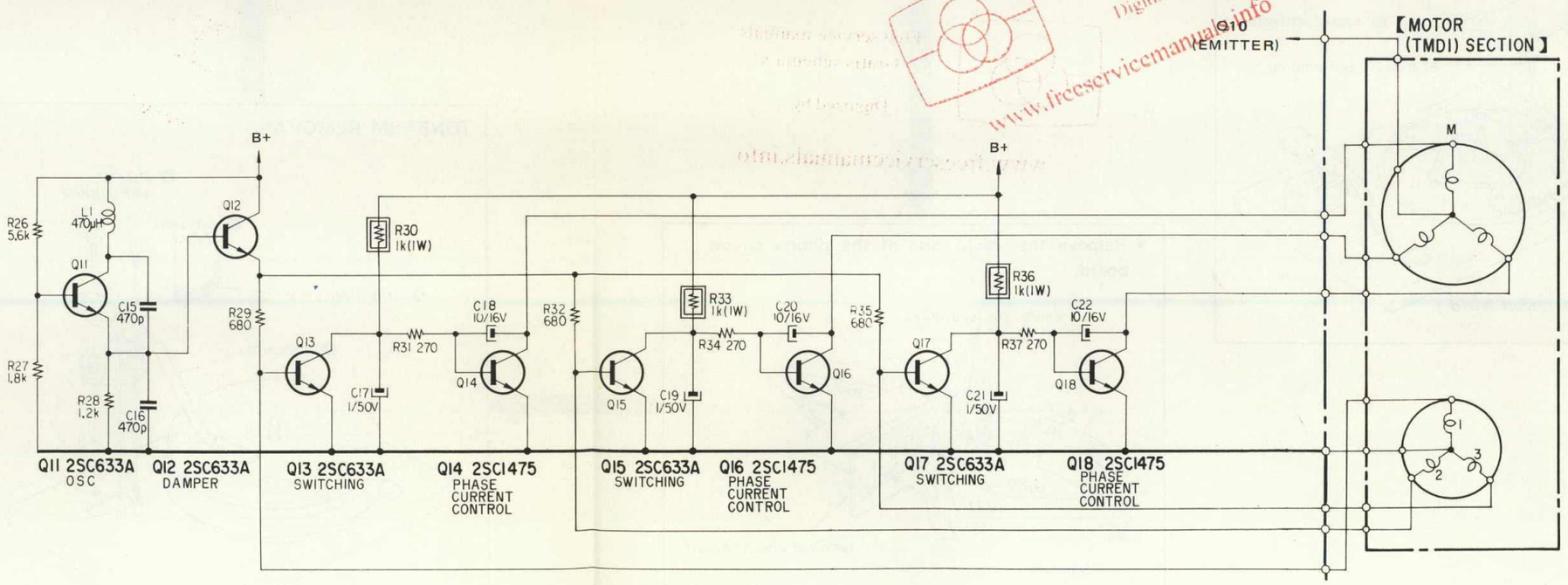


Fig. 1-5.

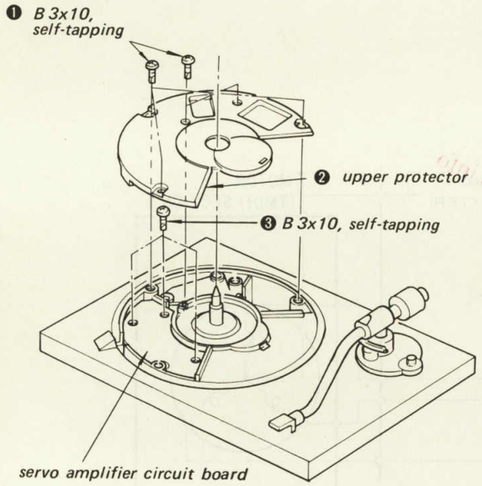
SECTION 2
DISASSEMBLY

WARNING

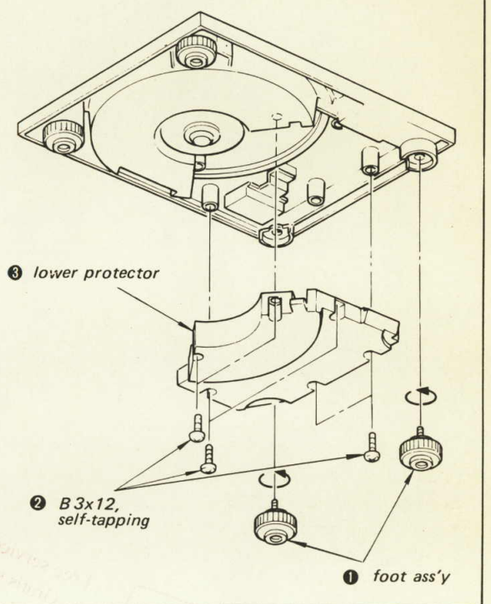
The tonearm body is a very important assembly to influence the performance of the tonearm.
When performing the following replacement, never take the tonearm body assembly to pieces.

TURNTABLE PLATTER REMOVAL

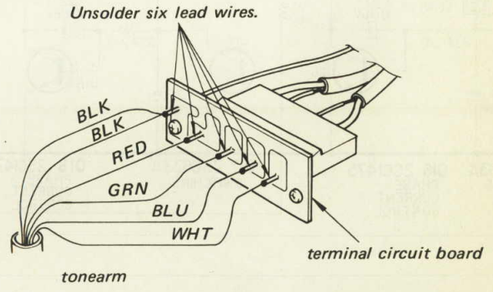
UPPER PROTECTOR AND SERVO AMPLIFIER CIRCUIT BOARD REMOVAL



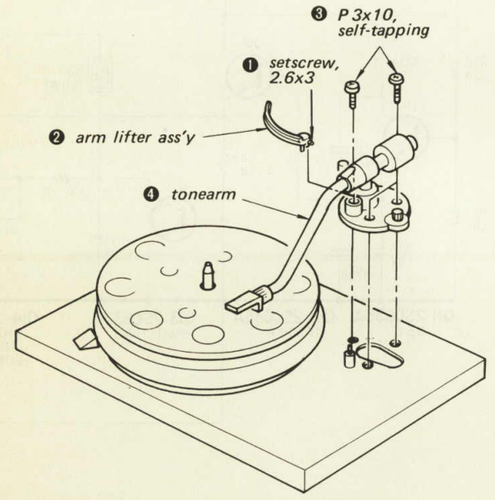
LOWER PROECTOR REMOVAL



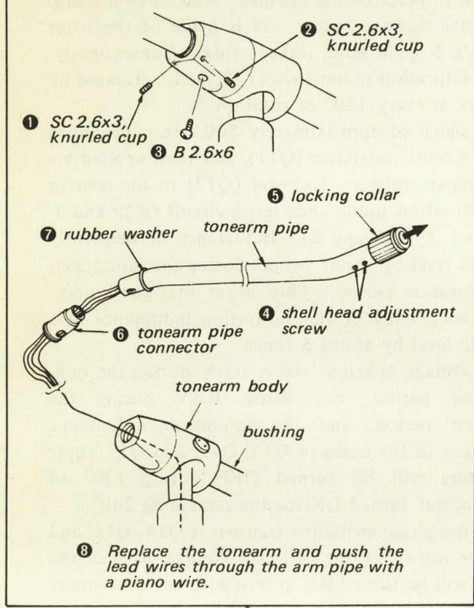
- **Remove the shield case of the phono circuit board.**



TONEARM REMOVAL

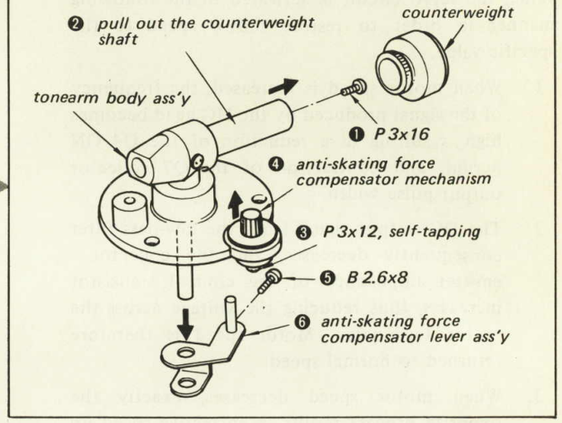


TONEARM PIPE REMOVAL AND REPLACEMENT



❽ Replace the tonearm and push the lead wires through the arm pipe with a piano wire.

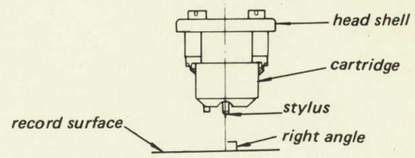
TONEARM BODY ASS'Y REMOVAL



TONEARM PIPE CONNECTOR REPLACEMENT

Installation

Note: Install the head shell and the cartridge as shown below and tighten two head shell adjustment screws (❶).



SECTION 3
ADJUSTMENTS

3-1. FOOT HEIGHT ADJUSTMENT

Float the turntable horizontally by turning the feet counterclockwise.

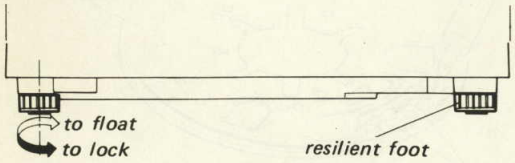


Fig. 3-1.

3-2. TONEARM HEIGHT ADJUSTMENT

1. Remove the lower protector (see page 9).
2. Set the cueing lever to up (▼) position and adjust by turning the adjustment screw so that the height of the stylus above the record is 6 mm.

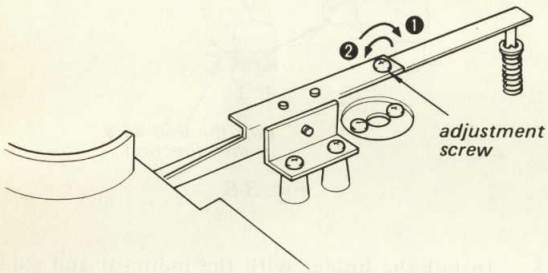


Fig. 3-2.

Turning direction of adjustment screw	Height of the stylus above the record
❶	becomes high
❷	becomes low

3-3. TURNTABLE SPEED ADJUSTMENT

1. Turn the two pitch control knobs to the mechanical-mid position.
2. Turn the turntable slowly so that the hole comes to the front center position.
   Insert a small screwdriver through the adjustment hole and turn the adjustment screw as shown in Fig. 3-3.
3. Turn on the power switch again and confirm that the stroboscope pattern for your power line frequency remains stationary.

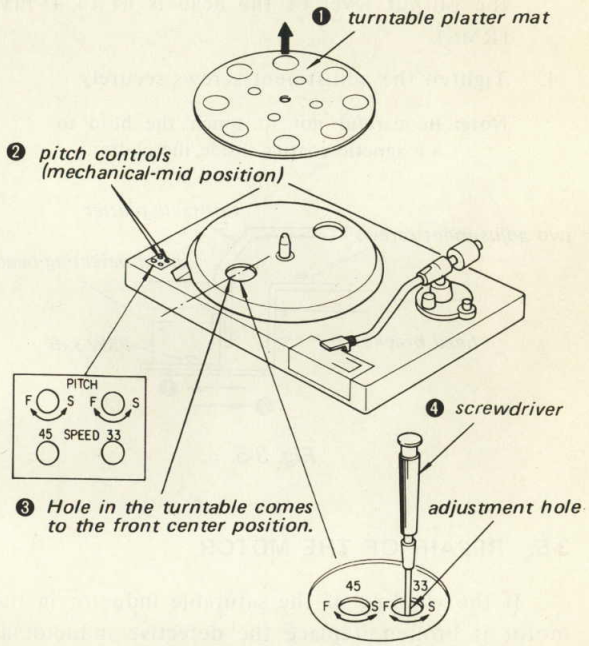


Fig. 3-3.

3-4. SPEED DETECTING HEAD POSITION ADJUSTMENT

When replacing the turntable platter or speed detecting head, perform this adjustment.

1. Install the speed detecting head on the head bracket with two PSW 3x6 screws as shown in Fig. 3-4.

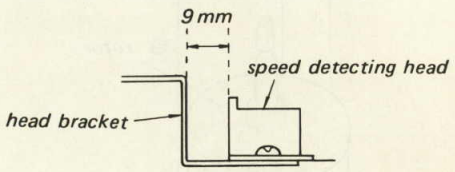


Fig. 3-4.

2. Shift the head bracket in the arrow direction ❶ and do not tighten the adjustment screws at this time.
3. Shift the head bracket in the arrow direction ❷ and adjust the position of the head so that the output level of the head is 14 to 48 mV (RMS).
4. Tighten the adjustment screws securely.

Note: Be careful not to touch the head to a magnetic coating inside the platter.

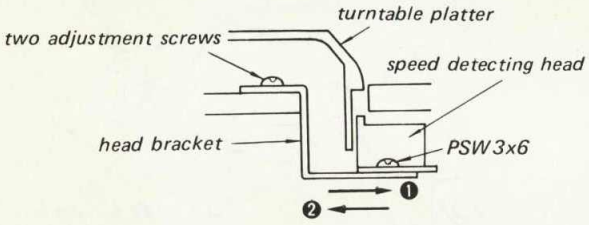


Fig. 3-5.

3-5. REPAIR OF THE MOTOR

If the winding of the saturable inductor in the motor is broken, replace the defective inductor as follows.

1. Remove the upper protector (see page 9).
2. Remove the motor cover, rotor and mounted circuit board as shown in Fig. 3-6.

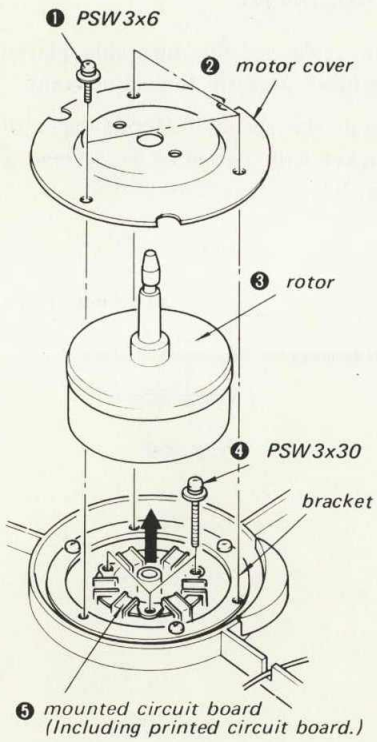


Fig. 3-6.

3. Remove the saturable inductor and the holder as shown in Fig. 3-7.

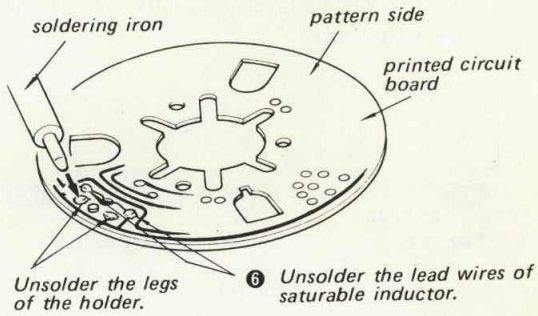


Fig. 3-7.

4. Put a new saturable inductor in a new holder as shown in Fig. 3-8.

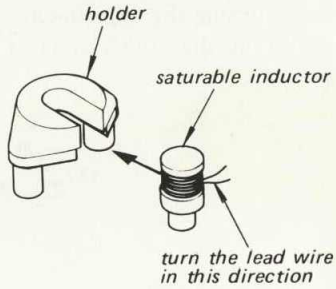


Fig. 3-8.

5. Install the holder with the inductor and solder the legs to the printed circuit board as shown in Fig. 3-9.

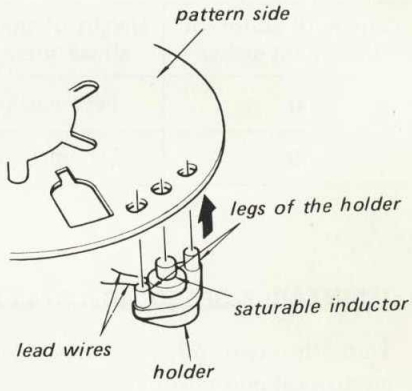


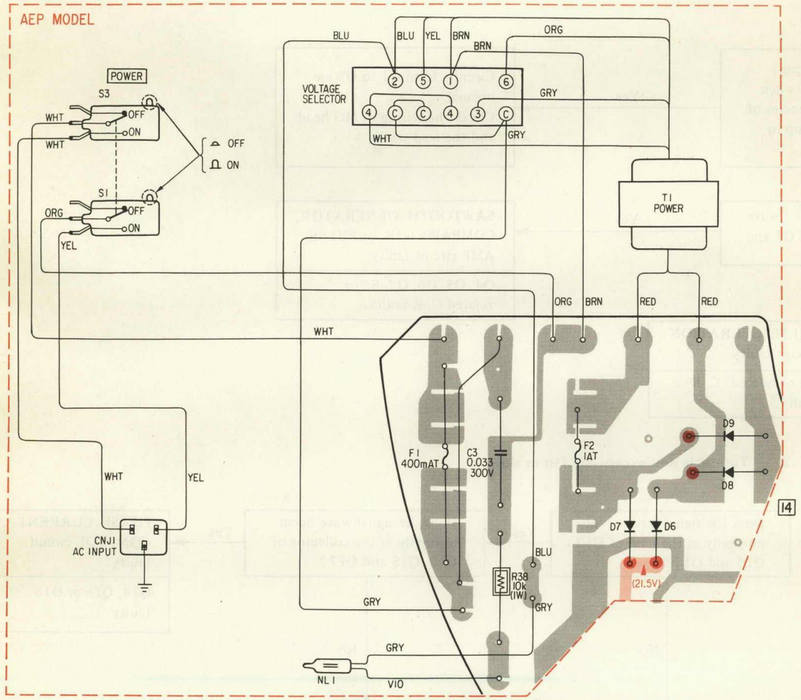
Fig. 3-9.

6. Confirm that the motor rotates without noise. If noise occurs, adjust the position of the motor cover by loosening three PSW 3x6 screws.

SECTION 4
DIAGRAM

4-1. MOUNTING DIAGRAM

— Conductor Side —



Note: ( ) : Replacement Semiconductor.

Q1–6, 8 / Q11–13, 15 / Q17: 2SC633A (2SC634A)

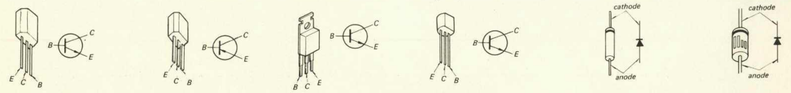
Q7, 9: 2SA677 (2SA678)

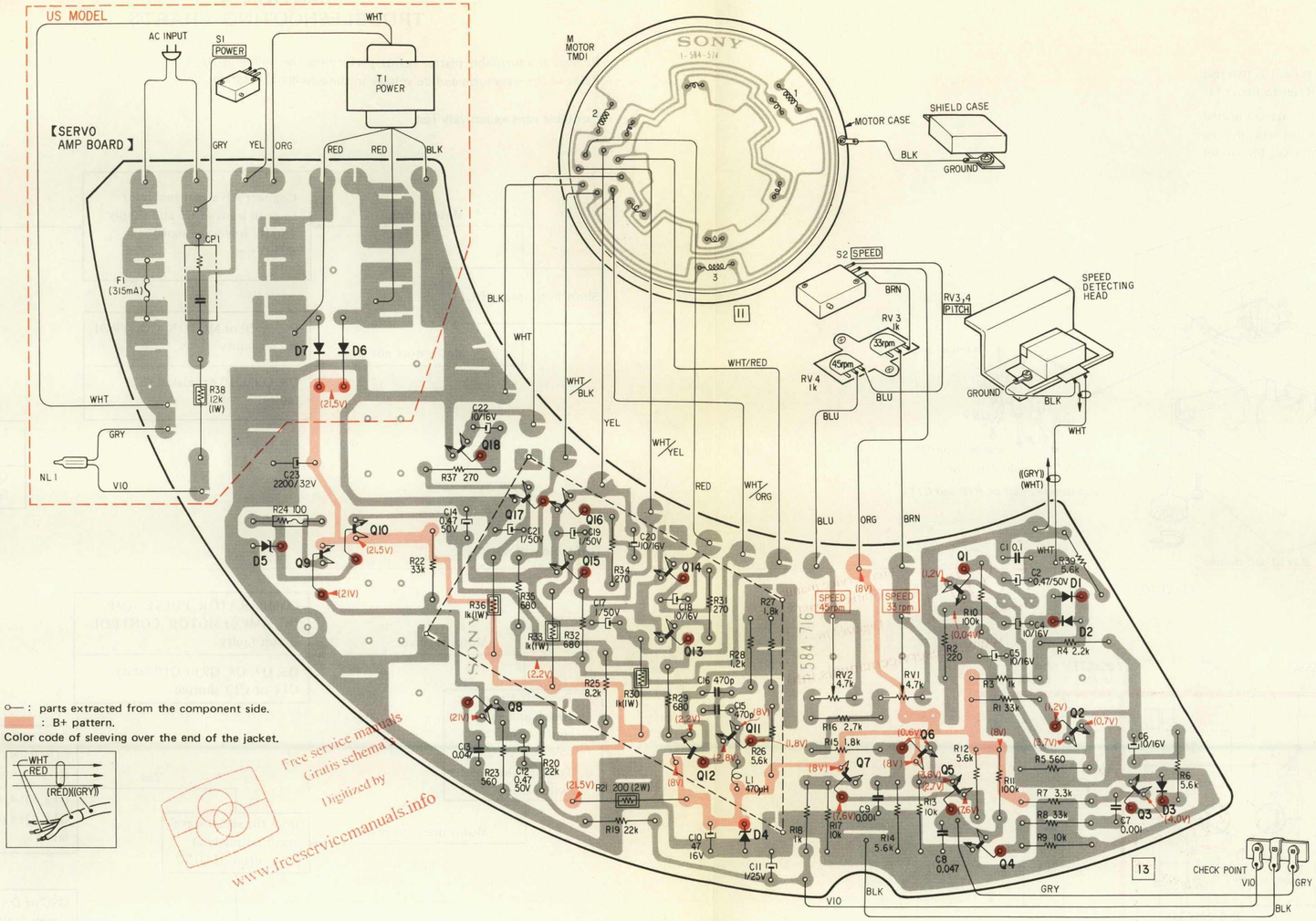
Q10: 2SC1173

Q14, 16, 18: 2SC1475

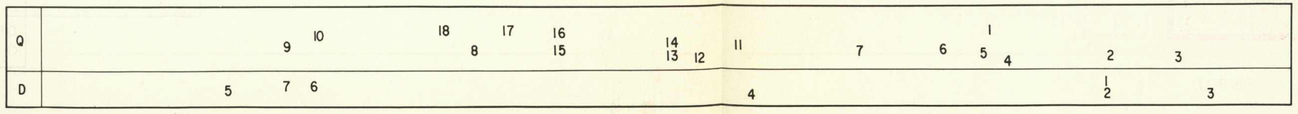
D1–3: 1S1555
D6–9: 10E2

D4: EQB01-08
D5: EQA01-13R (EQB01-13R)





Note:
- ○— : parts extracted from the component side.
- ▭ : B+ pattern.
- Color code of sleeving over the end of the jacket.



3-6. TEST POINTS

The terminal strip in Fig. 3-10 is used as two test points to connect an oscilloscope. Refer to Fig. 3-11.

Since sufficiently long lead wires are connected to this terminal strip, the lead wires can also be connected to the other desired point on the circuit board.

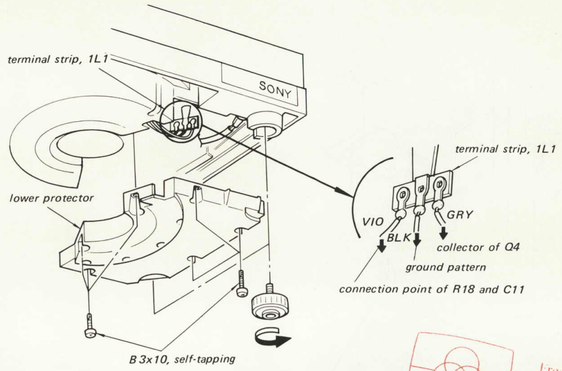


Fig. 3-10.

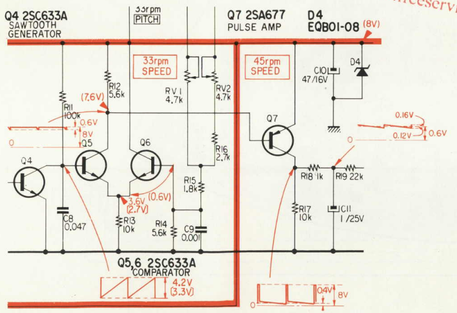
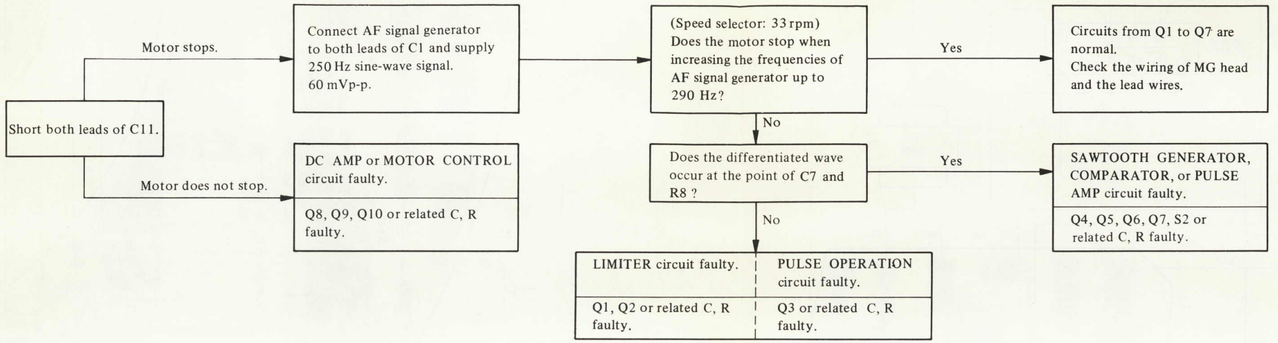


Fig. 3-11.

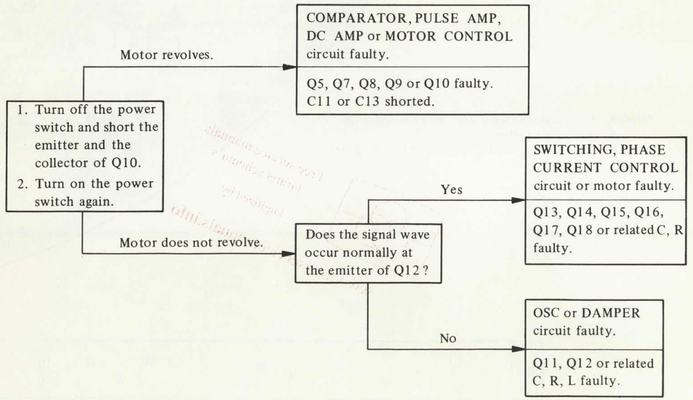
SECTION 4
TROUBLESHOOTING CHARTS

Remove the turntable platter before performing the following steps.
Refer to the waveform and dc voltage in the schematic diagram.

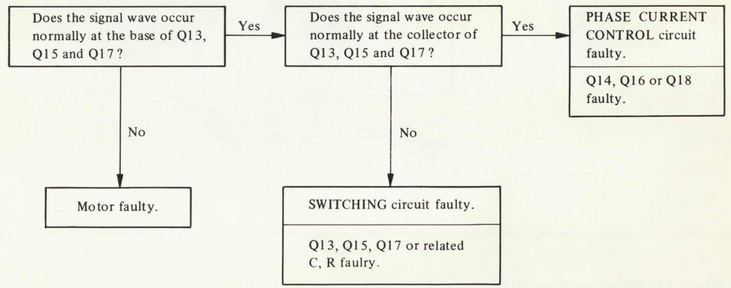
1. Turntable runs excessively fast.



2. Turntable will not start.

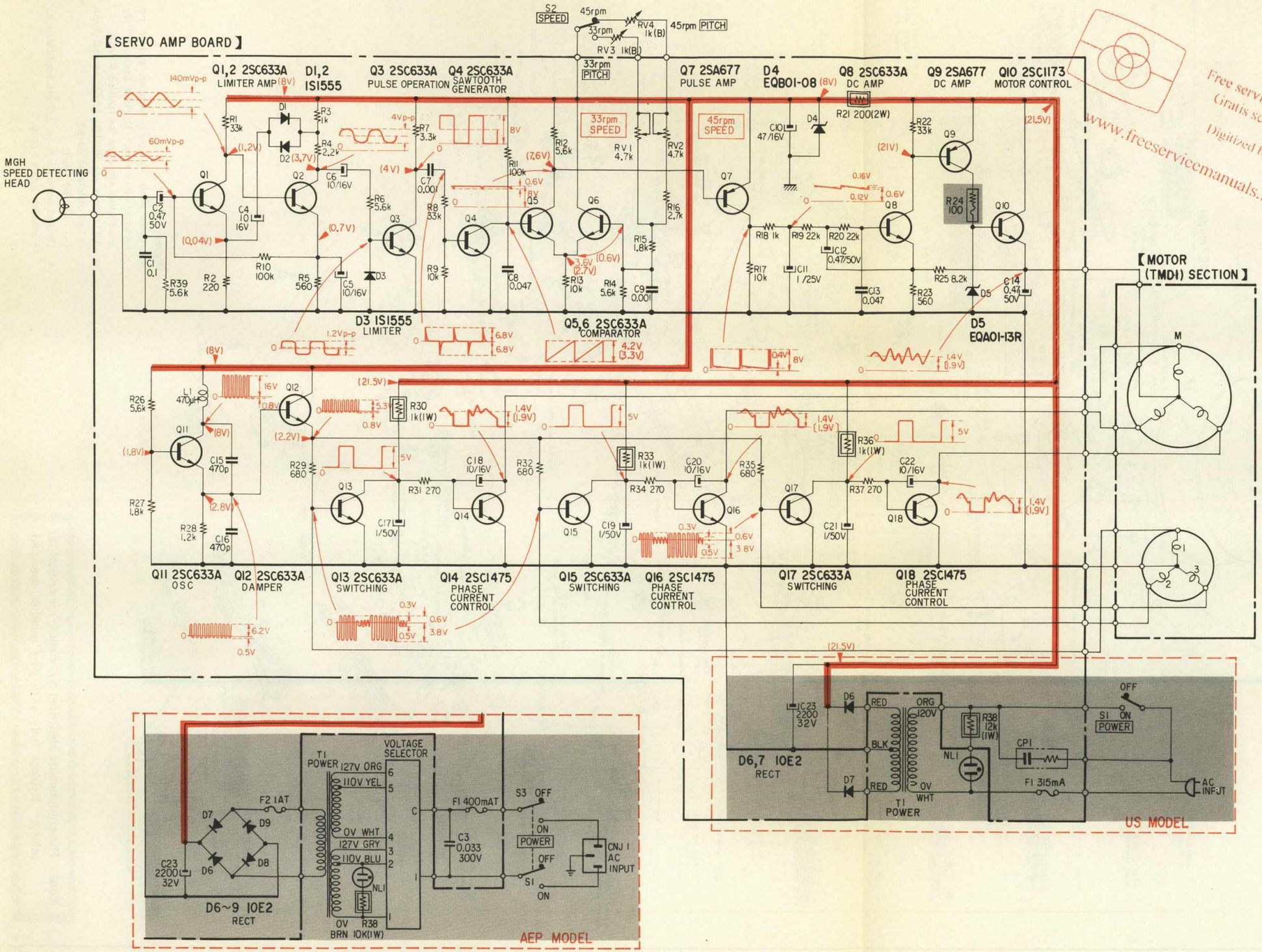


3. Turntable runs excessively fast or slow.



Note: The components identified by shading are critical for safety. Replace only with part number specified.

4-2. SCHEMATIC DIAGRAM

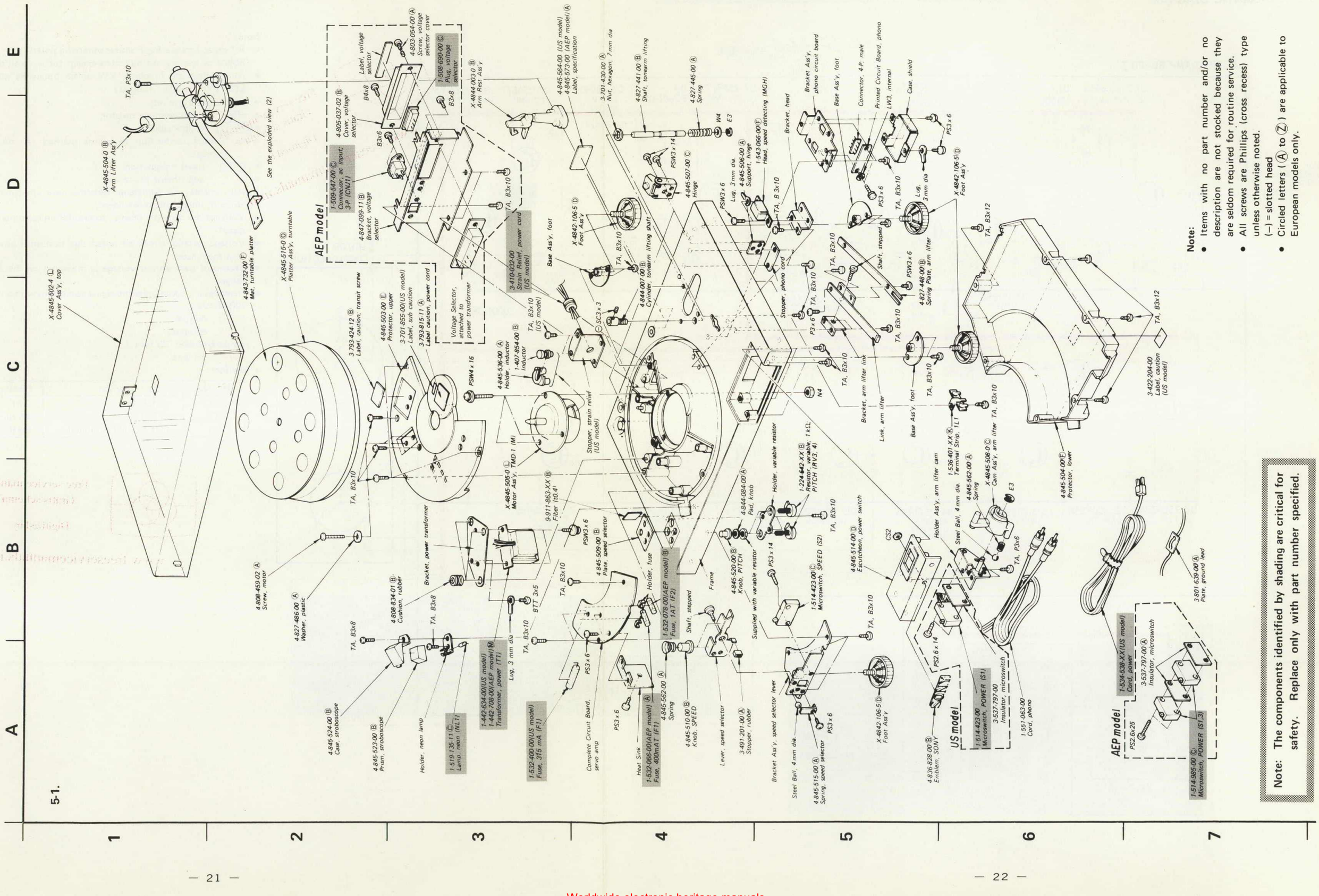


Note:

- All capacitors are in μF unless otherwise noted. pF = μμF 50WV or less are not indicated except for electrolytics.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ = 1000Ω; MΩ = 1000 kΩ
- ⏚ : chassis ground.
- : nonflammable resistor.
- : fusible resistor.
- : direct connection to points marked ⏚ on the chassis.
- : panel designation.
- : adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- Transistor base-emitter voltage is measured on the 2.5V range.
- Readings are taken under no-signal conditions with a VOM (20 kΩ/V).
  [ ] : 45 rpm
  ( ) : common
  no parentheses: 33 rpm
- ——— : B+ bus.
- Switch:

Ref. No.	Switch	Position
S1	POWER	OFF
S2	SPEED	45 rpm
S3	POWER (AEP model)	OFF

SECTION 5
EXPLODED VIEWS



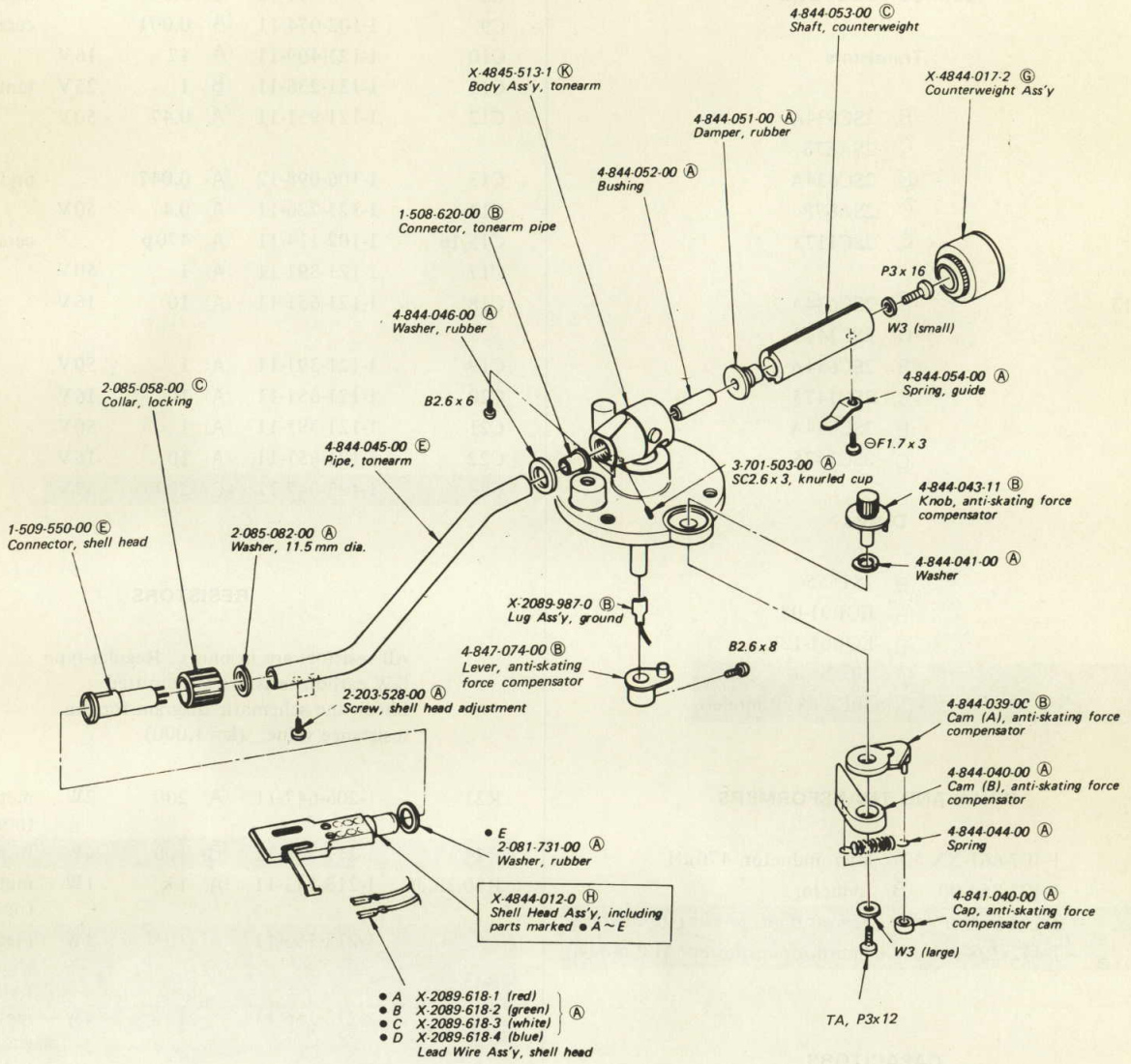
Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Note: The components identified by shading are critical for safety. Replace only with part number specified.

5-1.

5-2.



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

SECTION 6
ELECTRICAL PARTS LIST

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.		Description
SEMICONDUCTORS			
Transistors			
⇒ Q1~6		Ⓑ	2SC634A
⇒ Q7		Ⓒ	2SA678
⇒ Q8		Ⓑ	2SC634A
⇒ Q9		Ⓒ	2SA678
Q10		Ⓒ	2SC1173
⇒ Q11~13		Ⓑ	2SC634A
Q14		Ⓒ	2SC1475
⇒ Q15		Ⓑ	2SC634A
Q16		Ⓒ	2SC1475
⇒ Q17		Ⓑ	2SC634A
Q18		Ⓒ	2SC1475
Diodes			
D1~3		Ⓑ	1S1555
D4		Ⓑ	EQB01-08
⇒ D5		Ⓑ	EQB01-13R
D6,7		Ⓑ	10E2
D8,9		Ⓑ	10E2 (AEP model)
COILS AND TRANSFORMERS			
L1	1-407-661-XX	Ⓐ	Microinductor, 470μH
	1-407-854-00	Ⓑ	Inductor
T1	1-442-634-00		Transformer, power (US model)
	1-442-708-00	Ⓜ	Transformer, power (AEP model)
CAPACITORS			

All capacitors are in μF and of electrolytic unless otherwise noted. (p = μμF)
50 or less working voltages are not indicated except for electrolytic type.

C1	1-108-251-12	Ⓐ	0.1		mylar
C2	1-121-726-11	Ⓐ	0.47	50V	
C3	1-108-750-12	Ⓐ	0.033 (AEP model)	300V	mylar
C4~6	1-121-651-11	Ⓐ	10	16V	
C7	1-102-074-11	Ⓐ	0.001		ceramic
C8	1-106-041-12	Ⓐ	0.047		mylar
C9	1-102-074-11	Ⓐ	0.001		ceramic
C10	1-121-409-11	Ⓐ	47	16V	
C11	1-131-236-11	Ⓑ	1	25V	tantalum
C12	1-121-951-11	Ⓐ	0.47	50V	
C13	1-106-098-12	Ⓐ	0.047		mylar
C14	1-121-726-11	Ⓐ	0.47	50V	
C15,16	1-102-114-11	Ⓐ	470p		ceramic
C17	1-121-391-11	Ⓐ	1	50V	
C18	1-121-651-11	Ⓐ	10	16V	
C19	1-121-391-11	Ⓐ	1	50V	
C20	1-121-651-11	Ⓐ	10	16V	
C21	1-121-391-11	Ⓐ	1	50V	
C22	1-121-651-11	Ⓐ	10	16V	
C23	1-123-047-11	Ⓒ	2200	32V	

RESISTORS

All resistors are in ohms. Regular-type ¼W carbon resistors are omitted. Check the schematic diagram for the resistance value. (k = 1,000)

R21	1-206-647-11	Ⓐ	200	2W	metal-oxide (nonflammable)
R24	1-217-399-11	Ⓑ	100	¼W	fusible
R30,33,36	1-213-143-11	Ⓐ	1k	1W	metal-oxide (nonflammable)
R38	1-213-155-11	Ⓐ	10k	1W	metal-oxide (nonflammable) (AEP model)
	1-213-156-11		12k	1W	metal-oxide (nonflammable) (US model)
RV1,2	1-224-644-XX	Ⓑ	4.7k, adjustable		
RV3,4	1-224-642-XX	Ⓑ	1k, variable; PITCH		
MICROSWITCHES					
S1	1-514-423-00		POWER (US model)		
	1-514-985-00	Ⓒ	POWER (AEP model)		
S2	1-514-423-00	Ⓒ	SPEED		
S3	1-514-985-00	Ⓒ	POWER (AEP model)		

⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Note: The components identified by shading are critical for safety. Replace only with part number specified.

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

MISCELLANEOUS

Ref. No.	Part No.		Description
CNJ1	1-509-547-00	Ⓒ	Connector, ac input; 3-p (AEP model)
CP1	1-231-057-31		Encapsulated Component (US model)
F1	1-532-066-00	Ⓑ	Fuse, 400 mAT (AEP model)
	1-532-400-00		Fuse, 315 mA (US model)
F2	1-532-078-00	Ⓑ	Fuse, 1AT (AEP model)
M	X-4845-505-0	Ⓛ	Motor Ass'y, TMD-1
MGH	1-543-066-00	Ⓕ	Head, speed detecting
NL1	1-519-135-11	Ⓒ	Lamp, neon
	1-508-620-00	Ⓑ	Connector, tonearm pipe
	1-508-690-00	Ⓒ	Plug, voltage selector (AEP model)
	1-509-550-00	Ⓕ	Connector, shell head
	1-534-538-XX		Cord, power (US model)
	1-536-401-XX	Ⓐ	Terminal Strip, 1L1
	1-551-063-00	Ⓕ	Cord, phono

ACCESSORIES

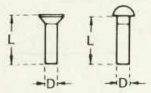
Part No.		Description
X-4845-514-2	Ⓔ	Subweight Ass'y, tonearm
2-054-619-00	Ⓐ	Spacer, cartridge
2-054-624-00	Ⓑ	Screw (B), cartridge
2-054-625-00	Ⓐ	Screw (C), cartridge
2-227-313-00	Ⓐ	Spacer
3-701-438-21	Ⓐ	Washer, plastic; 2.5 mm dia.
3-701-806-01	Ⓐ	Adaptor, manual; 45 rpm
3-780-890-11	Ⓔ	Manual, instruction (AEP model)
3-780-890-23		Manual, instruction (US model)
3-793-395-13	Ⓑ	Gauge, overhang adjustment
3-849-790-00	Ⓑ	Bag, plastic
4-815-655-01	Ⓐ	Nut, cartridge
4-838-319-00	Ⓐ	Screw (A), cartridge
4-844-060-00	Ⓒ	Bag, plastic; set
4-845-557-00	Ⓒ	Cushion
4-845-560-00	Ⓐ	Protection Seat
4-845-571-00	Ⓕ	Carton
4-848-005-00	Ⓒ	Holder (A), accessories
4-848-006-00	Ⓑ	Holder (B), accessories

Note: The components identified by shading are critical for safety. Replace only with part number specified.

HARDWARE NOMENCLATURE

Screw:

P 3 x 10
- *L: Length in mm*
- *D: Diameter in mm*
- *Type of head*
- *Indicated slotted-head only.*
- *Unless otherwise indicated, it means cross-recessed head (Phillips type).*



Nut, Washer, Retaining ring:

N 3
- *Diameter of usable screw or shaft*
- *Reference designation*

Reference Designation	Shape	Description	Remarks
		SCREWS	
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Reference Designation	Shape	Description	Remarks
		SELF-TAPPING SCREWS	
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
		SET SCREWS	
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
		NUT	
N		nut	
		WASHERS	
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
		RETAINING RINGS	
E		retaining ring	
G		grip-type retaining ring	

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