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Service Manual

Quartz Direct Drive Fully Automatic Turntable System

SL-J2

[M], [MC]



is the standard mark for the "P-mount" plug-in-connector system. Products carrying this mark are inter-changeable and compatible with each other.

* The cartridge shown here is an option.

Areas

- * [M] is available in U.S.A.
- * [MC] is available in Canada.

Specifications

Specifications are subject to change without notice further improvement.
Weight and dimensions shown are approximate.
Downloaded from www.vinylengine.com

■ General

Power supply: 120 V AC, 60 Hz
Power consumption: 10 W
Dimensions: 31.5 × 8.8 × 31.5 cm
 (W × H × D) (12-1/2" × 3-1/2" × 12-1/2")
 (Maximum height when dust cover is open.)
 39 cm (15-23/64")
Weight: 4.3 kg (9.5lb.)

■ Turntable section

Type: Quartz direct drive
 Fully automatic turntable
Features: Auto start/Auto lead-in
 Auto return
 Auto stop
 Repeat play
 Direct music select play
 Forward and backward skip play
 Forward and backward search play
 Auto size select
 Record presence detection
Drive method: Direct drive
Motor: Brushless DC motor
Drive control method: Quartz-phase-locked control

Turntable platter: Aluminum die-cast
 Diameter 30 cm (12")
Turntable speeds: 33-1/3 rpm and 45 rpm
 Auto speed select
 (Manual selection possible)
Wow and flutter: 0.012% WRMS*
 0.025% WRMS (JIS C5521)
 ±0.035% peak
 (IEC 98A Weighted)
 *Measured by obtaining signal from built-in frequency generator of motor assembly.
Rumble: -56 dB (IEC 98A Unweighted)
 -78 dB (IEC 98A Weighted)

■ Tonearm section

Type: Linear tracking tonearm
 4-pivot gimbal suspension
Effective length: 10.5 cm (4-1/8")
Tracking error angle: Within ±0.1°
Effective mass: 9 g (including cartridge)
Resonance frequency: 12 Hz
Tonearm drive motor: DC motor
Phono cable capacitance: 150 pF

Technics

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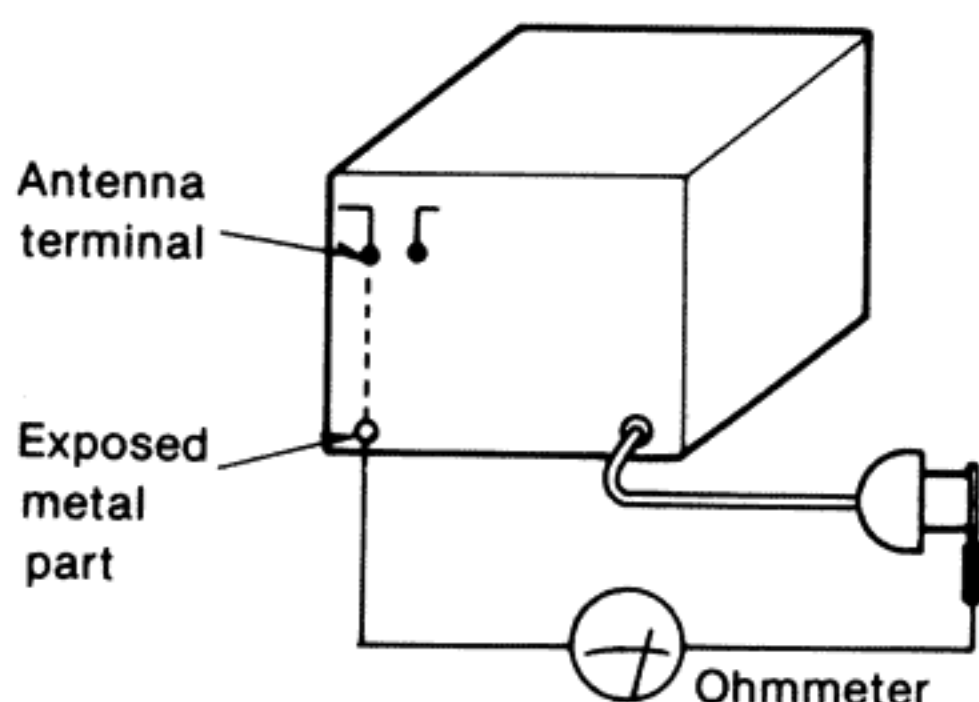
■ SAFETY PRECAUTION

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

● INSULATION RESISTANCE TEST

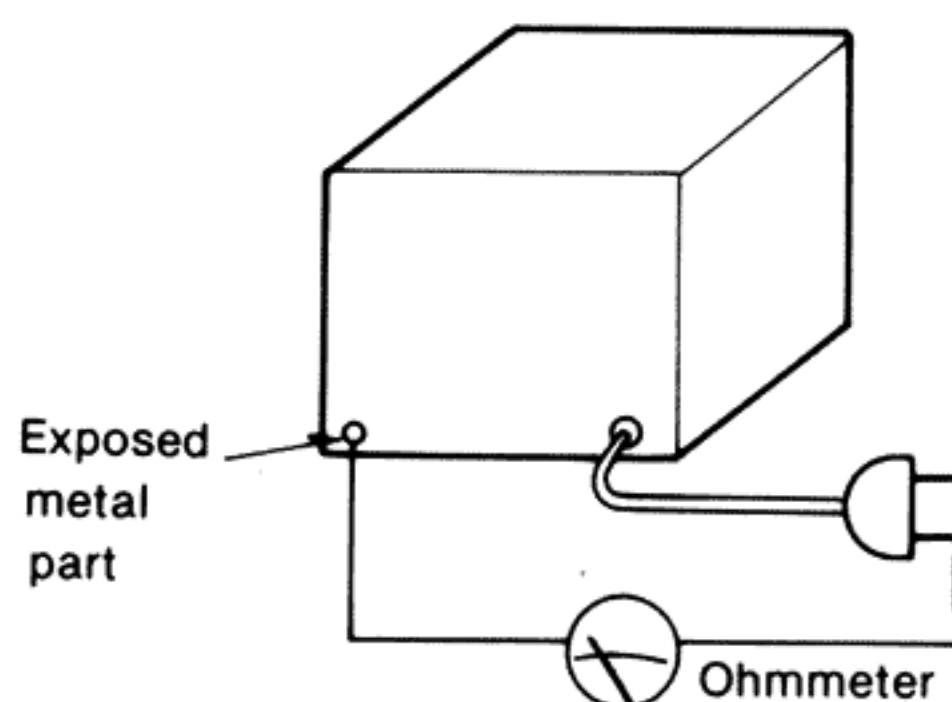
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between $3\text{M}\Omega$ and $5.2\text{M}\Omega$ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = $3\text{M}\Omega$ — $5.2\text{M}\Omega$

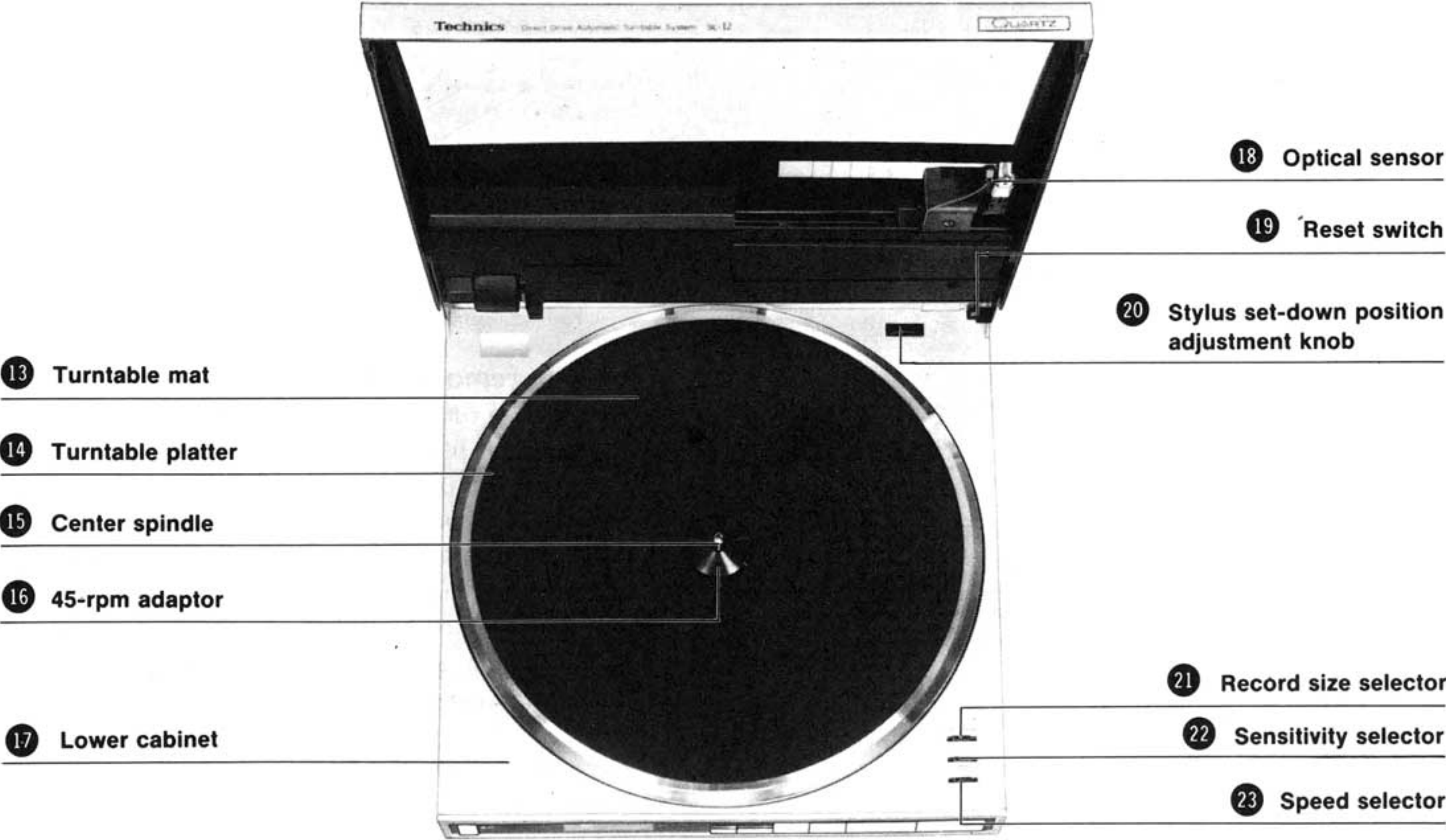
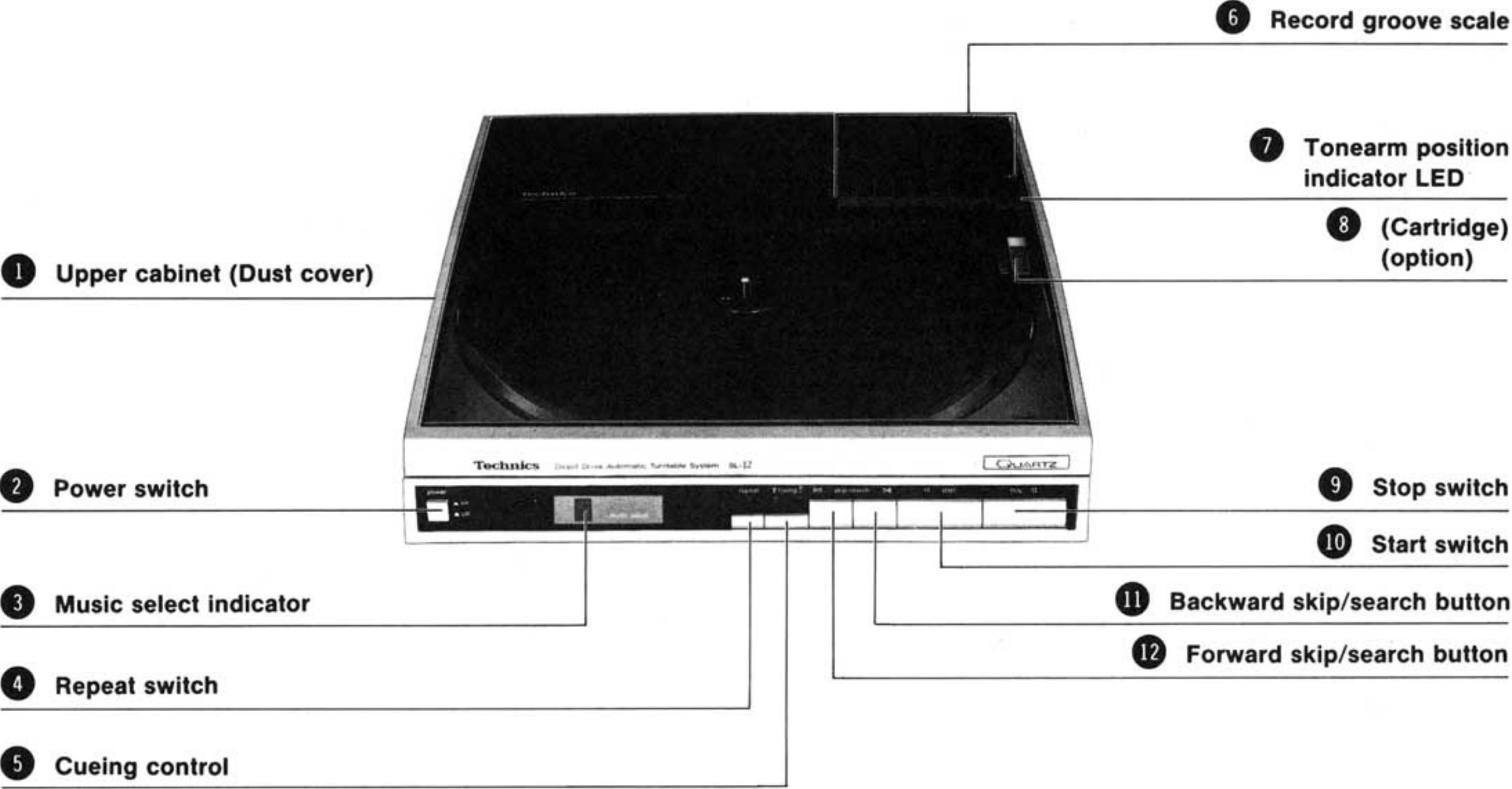


(Fig. B)

Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ LOCATION OF CONTROLS



■ DISASSEMBLY INSTRUCTIONS

● How to remove the cartridge

1. Open the upper cabinet.
2. Down the tonearm by finger in order to make cueing down position.
3. Remove the cartridge setscrew (Fig. 1: ①), and pull out the cartridge.

Note: When attaching the cartridge again, match the tonearm connector with the cartridge pins, then completely insert it and tighten the screw.

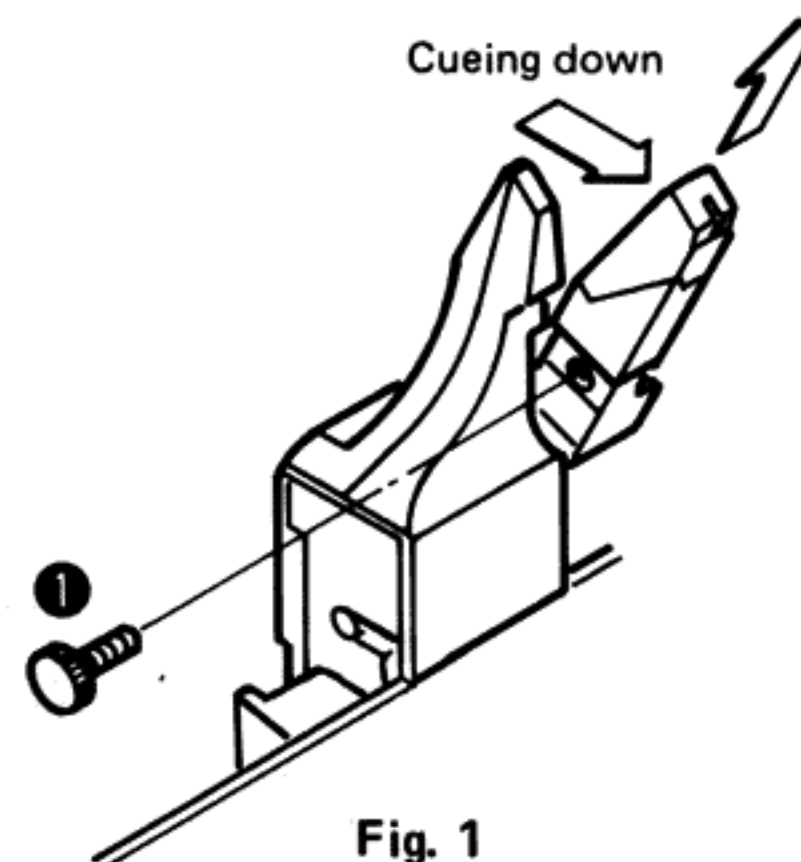


Fig. 1

● How to remove the turntable platter

1. Open the upper cabinet.
2. Remove the turntable mat, and lift the turntable platter. (Fig. 2)

Note:

- (1) When removing the turntable platter, it is not necessary to remove the 45 r.p.m. adaptor.
- (2) The turntable platter is tight fitted on to the center spindle. When removing the turntable platter, take care not to give damage to the upper cabinet, arm motor cover and tonearm cover.

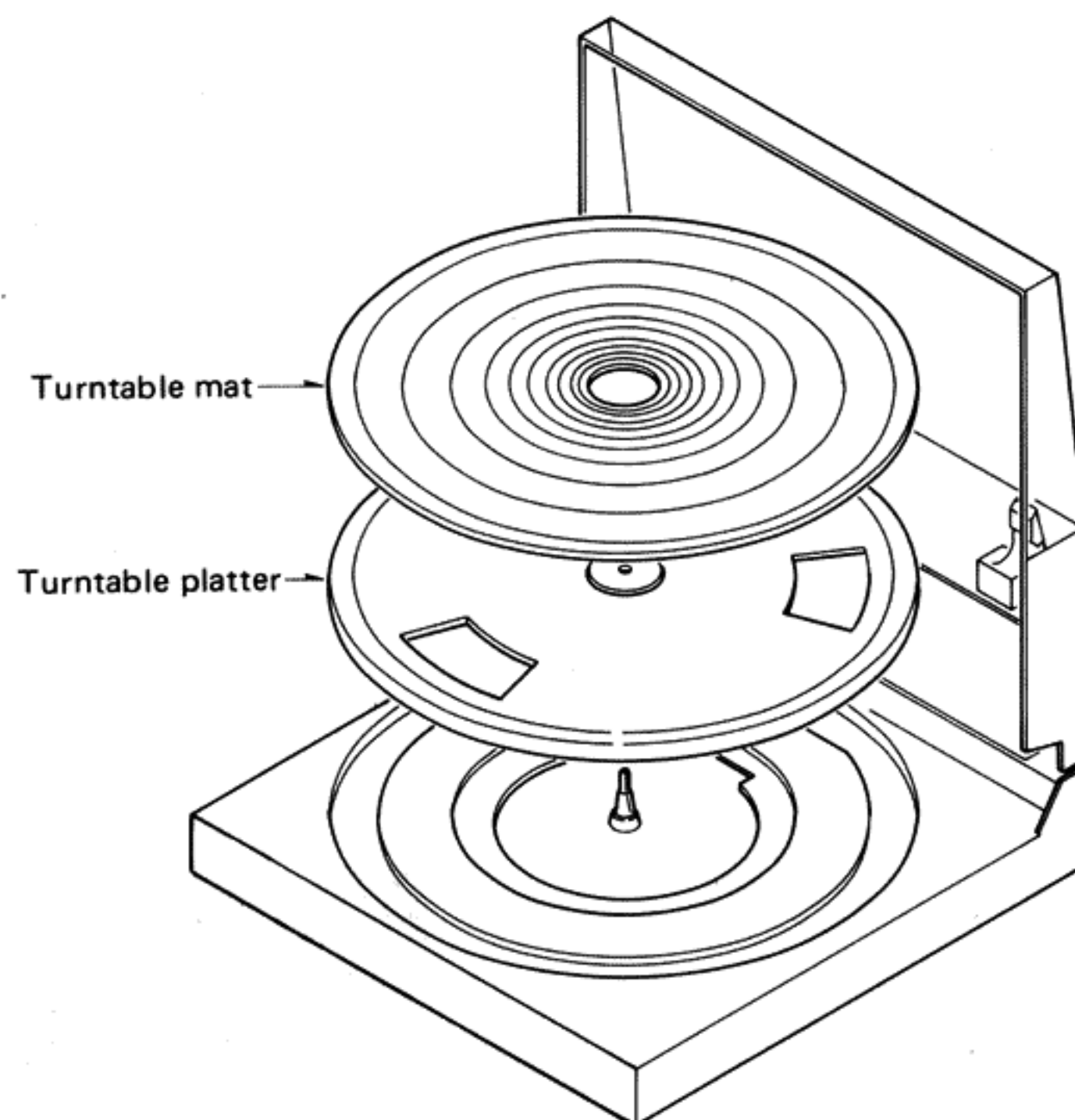


Fig. 2

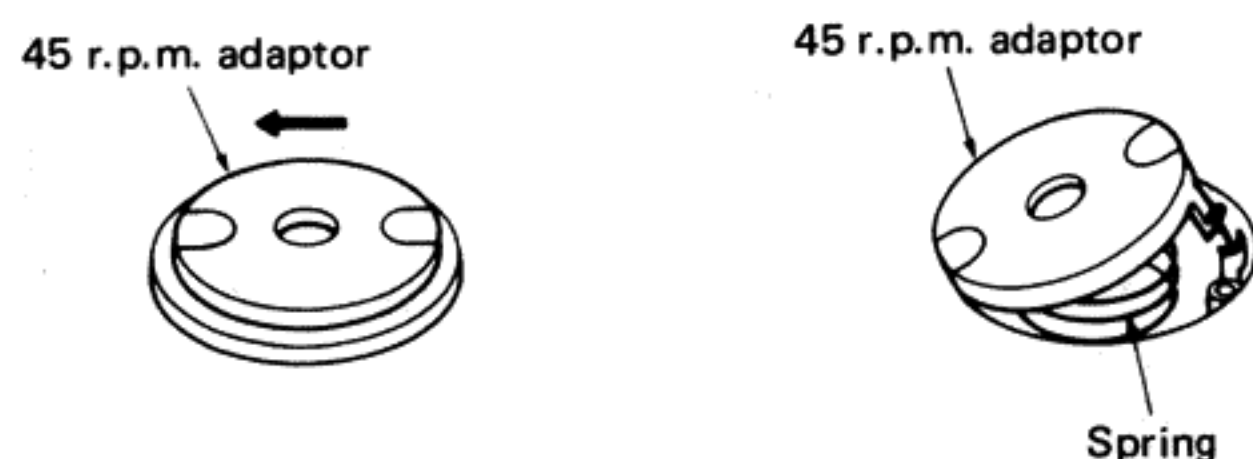


Fig. 3

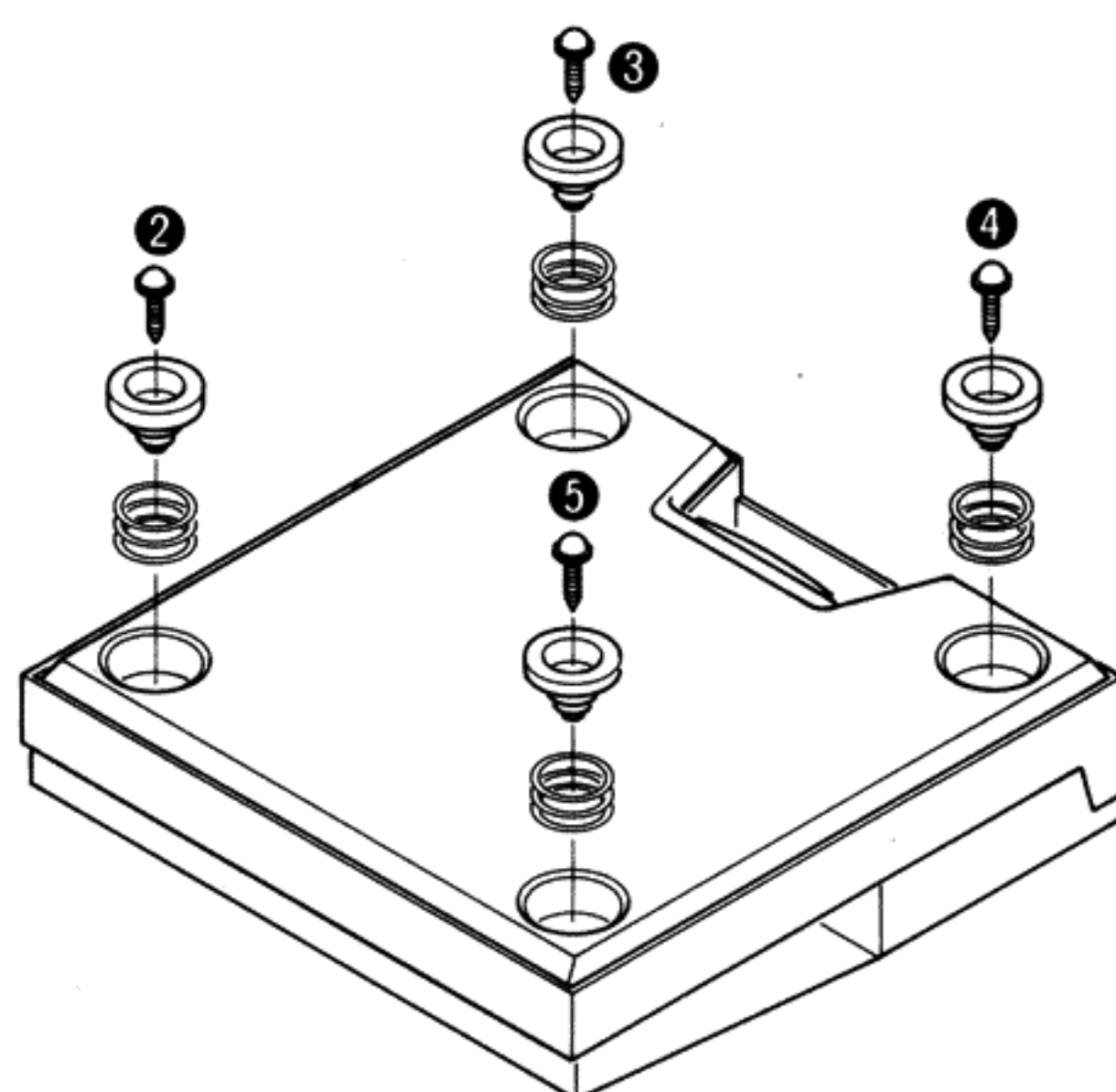


Fig. 4

● How to remove the 45 r.p.m. adaptor (Fig. 3)

1. Remove the turntable platter. (Refer to "How to remove the turntable platter".)
2. Turn the 45 r.p.m. adaptor counter clockwise to raise it from the turntable platter surface.
3. Push the claw by the blade screwdriver in the direction of the arrow, then remove the 45 r.p.m. adaptor.

Note: When removing the 45 r.p.m. adaptor, remove the turntable platter, otherwise the 45 r.p.m. adaptor claws will be broken.

● How to remove the bottom board

1. Remove the turntable platter. (Refer to "How to remove the turntable platter".)
2. Close the upper cabinet and turn over the unit on a soft cloth taking care not to damage the upper cabinet.
3. Remove the 4 bottom board setscrews. (Fig. 4: ② ~ ⑤).

● How to remove the main circuit board

1. Remove the bottom board. (Refer to "How to remove the bottom board.")
2. Remove the select switch holder setscrew (Fig. 5 : ⑥) and the select switch holder. (Fig. 5)
3. Remove the 4 main circuit board setscrews (Fig. 6 : ⑦ ~ ⑩)
4. Pull out the power switch rod from the power switch in the direction of the arrow. Then, lift the main circuit board in the direction of the arrow.

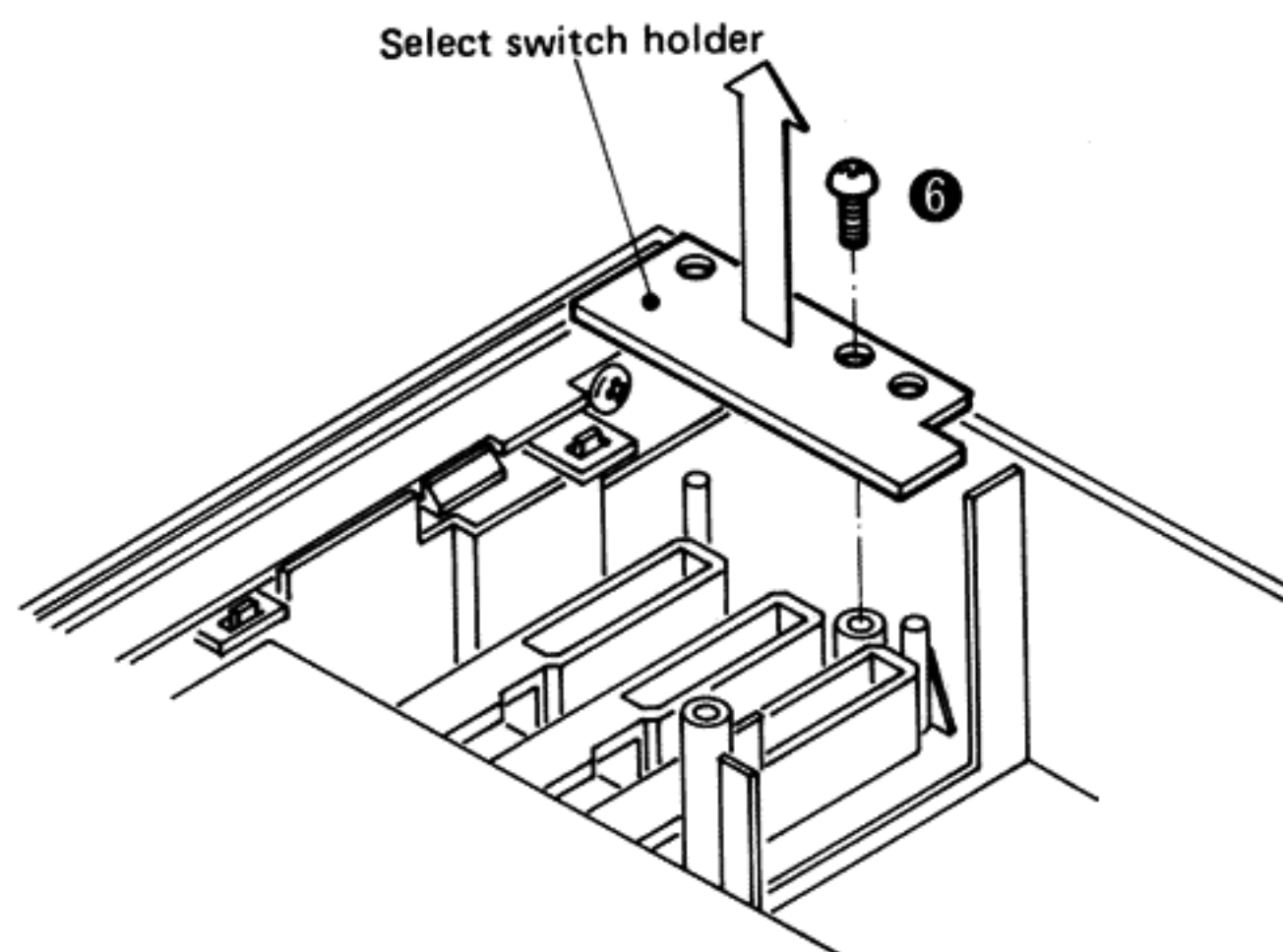


Fig. 5

● How to remove the operation button

1. Remove the main circuit board. (Refer to "How to remove the main circuit board.")
2. Remove the 2 connectors (Fig. 6 : CN302 and CN304), and then, lift the front panel. (Fig. 6)
3. Remove the 3 operation circuit board setscrews (Fig. 7 : ⑪ ~ ⑬).
4. Release the 5 claws, then the operation circuit board can be removed. (Fig. 7)
5. Release the 4 claws and gently pull the operation button. (Fig. 7)

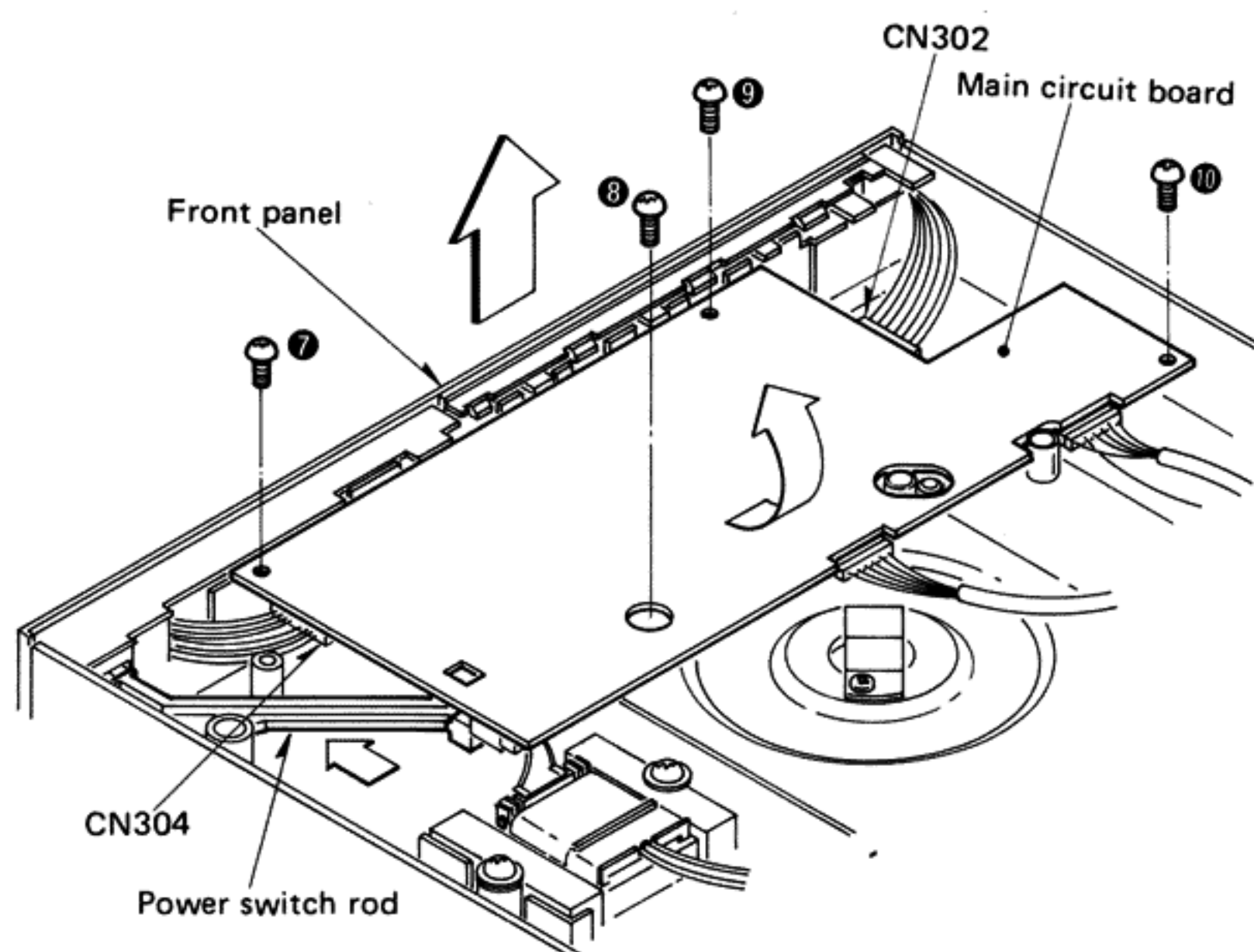


Fig. 6

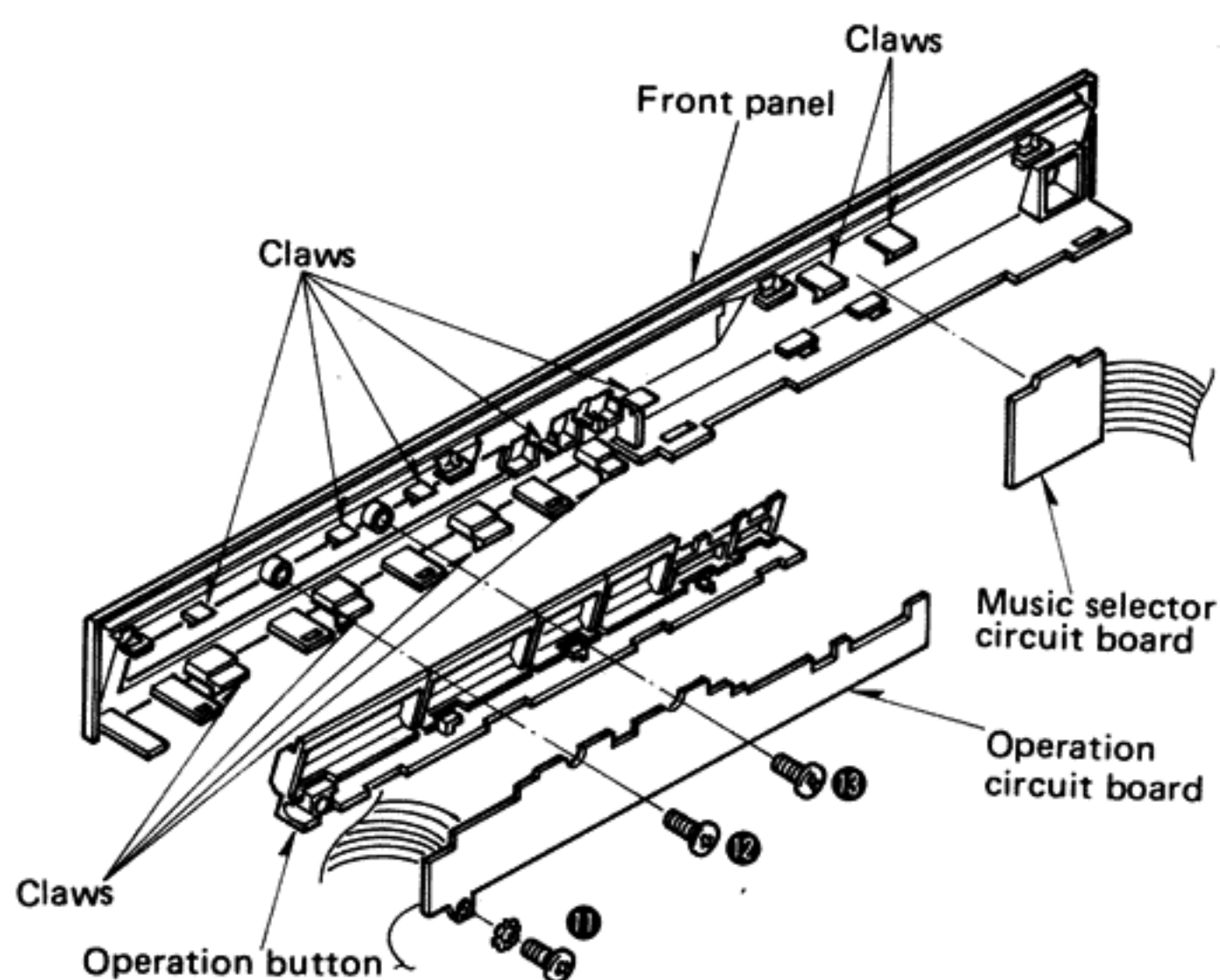


Fig. 7

● How to remove the music select circuit board

1. Remove the front panel. (Refer to "How to remove the operation button", item 2.)
2. Release the 2 claws, then the music select circuit board can be removed. (Fig. 7)

● How to remove the stator frame and drive circuit board

1. Remove the main circuit board. (Refer to "How to remove the main circuit board.")
2. Remove the 3 stator frame setscrews (Fig. 8: ⑯ ~ ⑰) and the 2 drive circuit board setscrews (Fig. 8: ⑱, ⑳).
3. Cut off the stopper by nippers and remove the 4 setscrews (Fig. 9: ㉑ ~ ㉔) to separate the stator frame and drive circuit board.

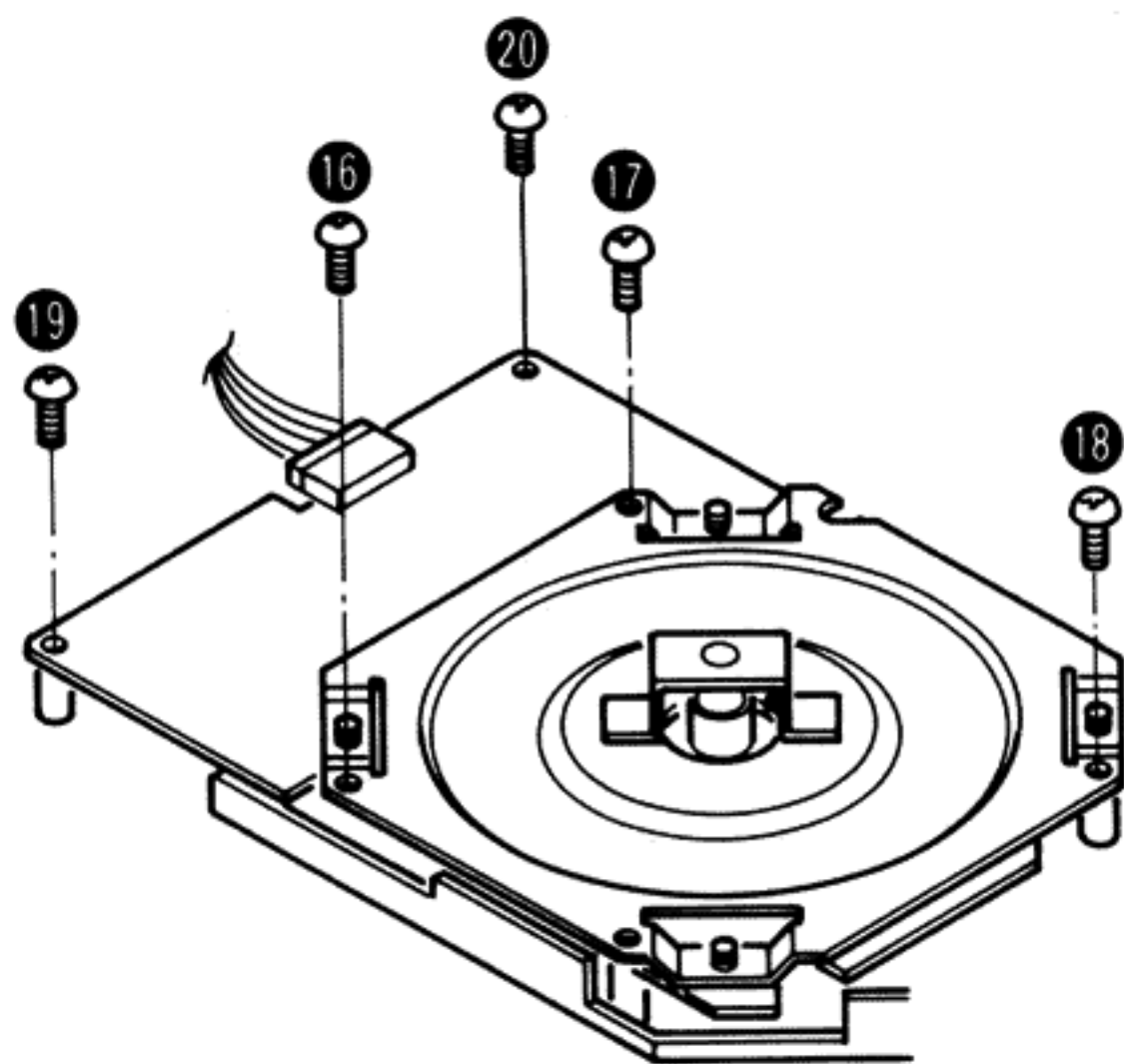


Fig. 8

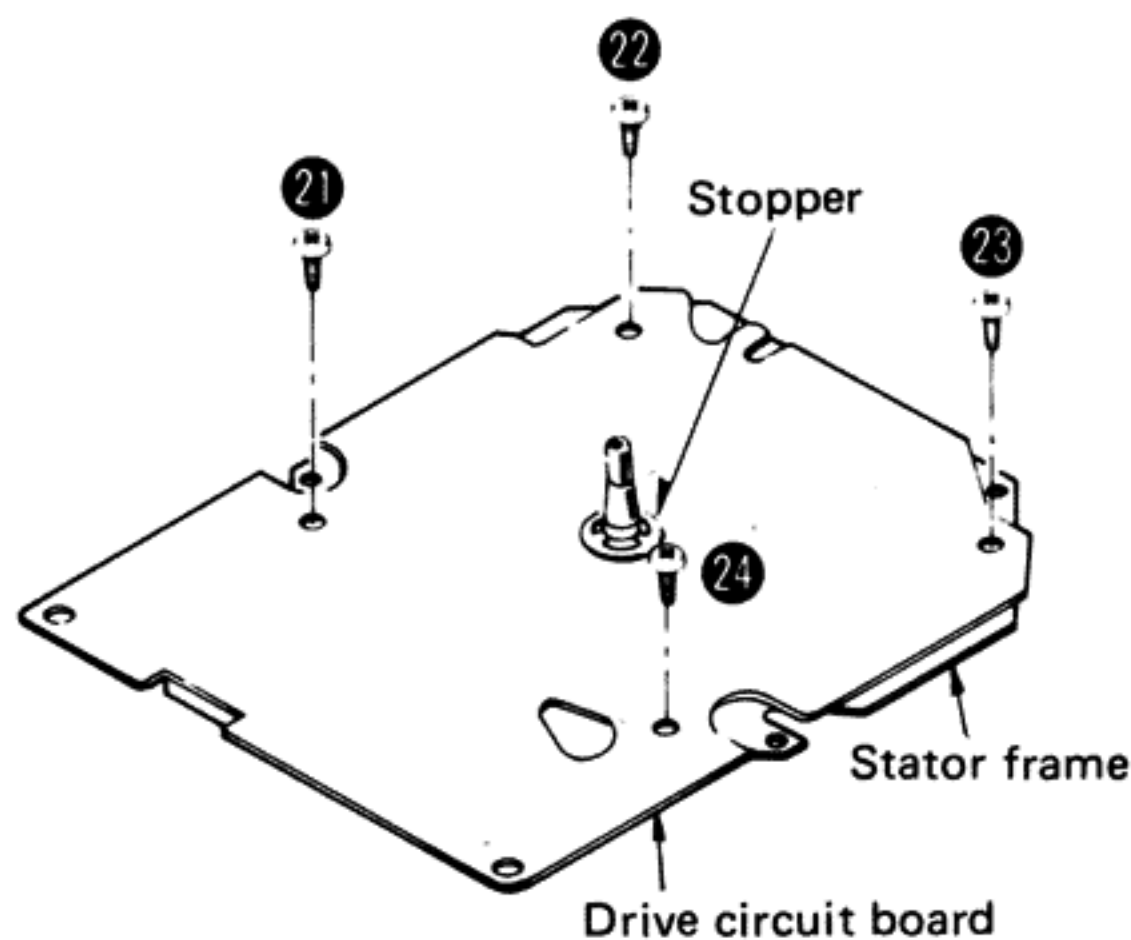


Fig. 9

• How to remove the reset switch

1. Remove the bottom board. (Refer to "How to remove the bottom board")
2. Remove the switch holder setscrew (Fig. 10: 25).
3. Release the 2 claws of switch holder and remove the reset switch circuit board.
4. Unsolder the 2 switch terminals, then the reset switch can be removed.

Note: When replacing the reset switch, be sure to open the upper cabinet.

• How to remove the Hall element

1. Remove the turntable platter.
2. Remove the terminal solder by use of solder sucker.
3. Hold the Hall element with a tweezers and remove it while touching the soldering iron to the terminal. (Fig. 11)

• How to remove the dust cover

1. Pull out the 4 right and left rivets and 2 right and left rivet holders. (Fig. 12)
2. Lift the dust cover in the direction of the arrow. (Fig. 12) Then the dust cover can be removed.

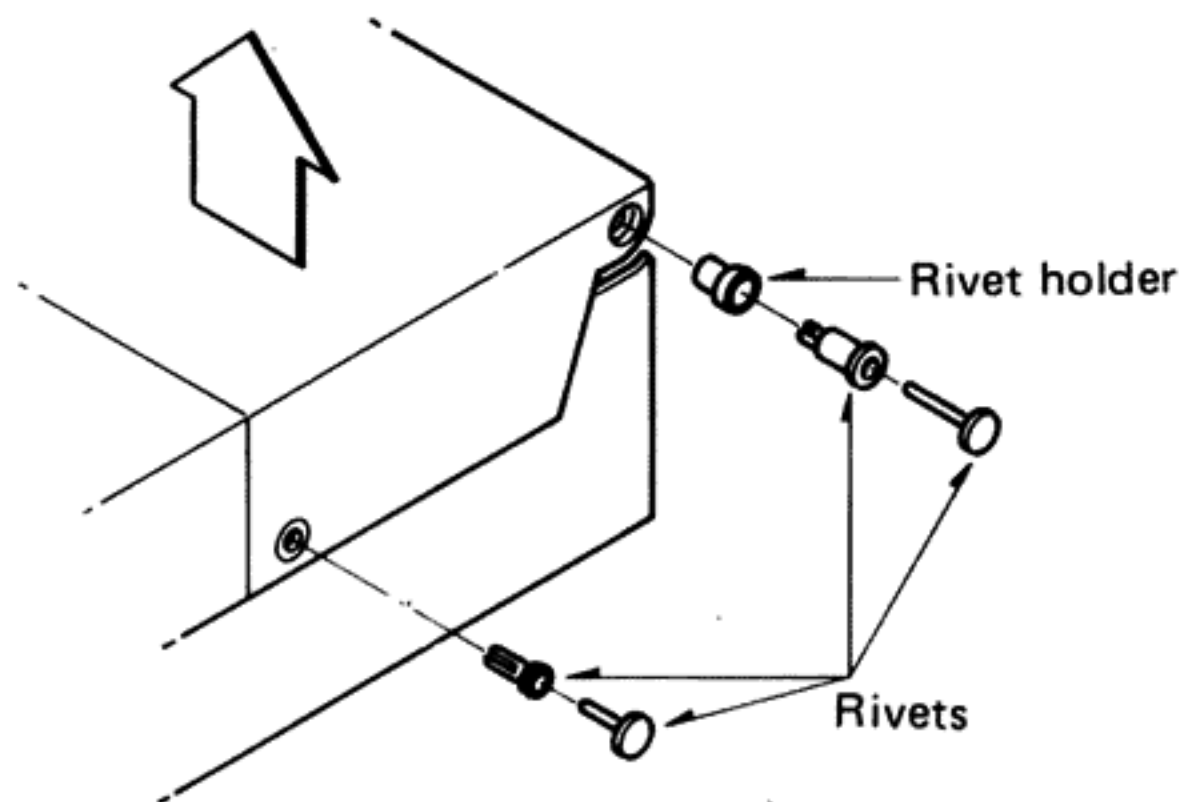


Fig. 12

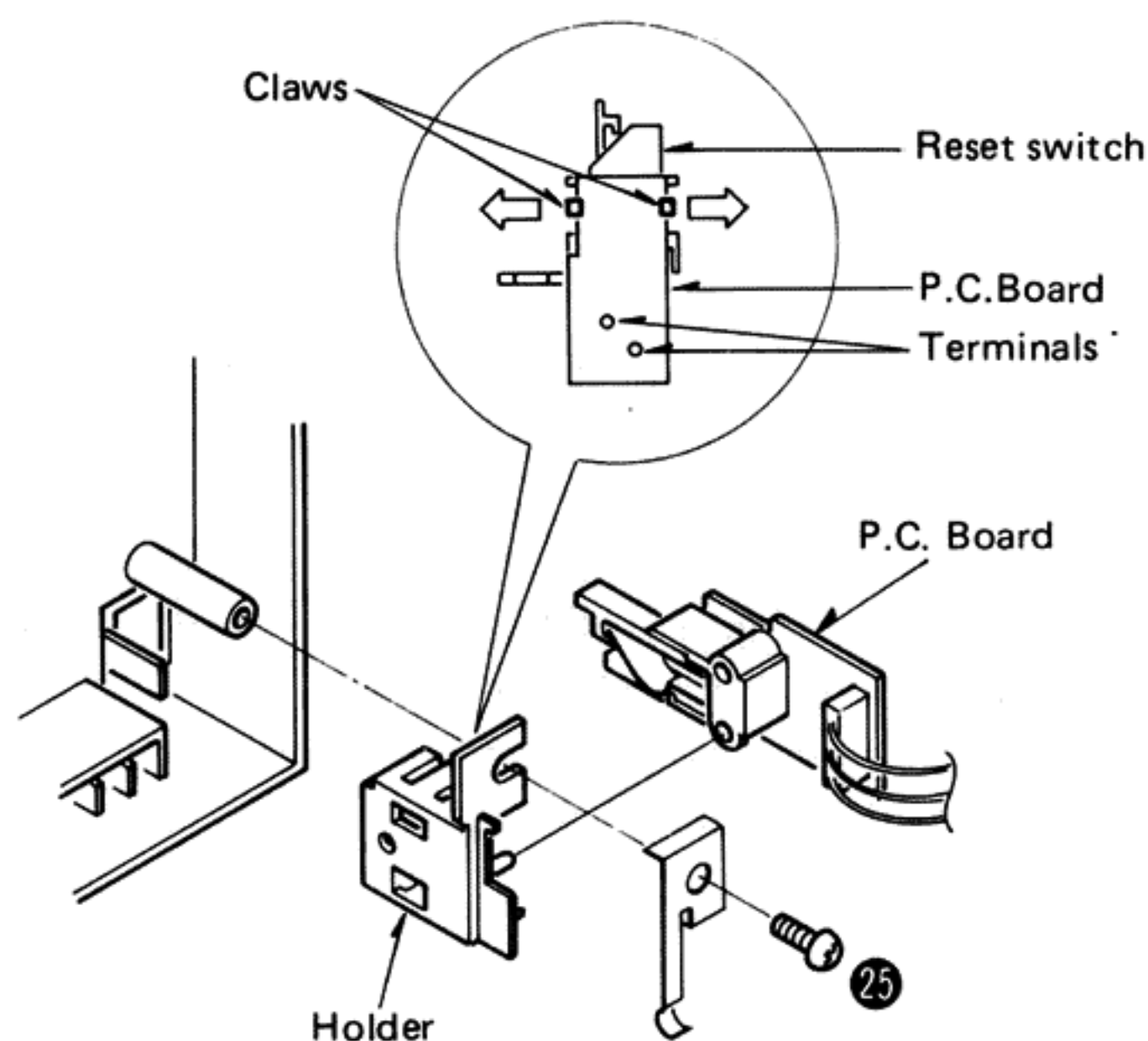


Fig. 10

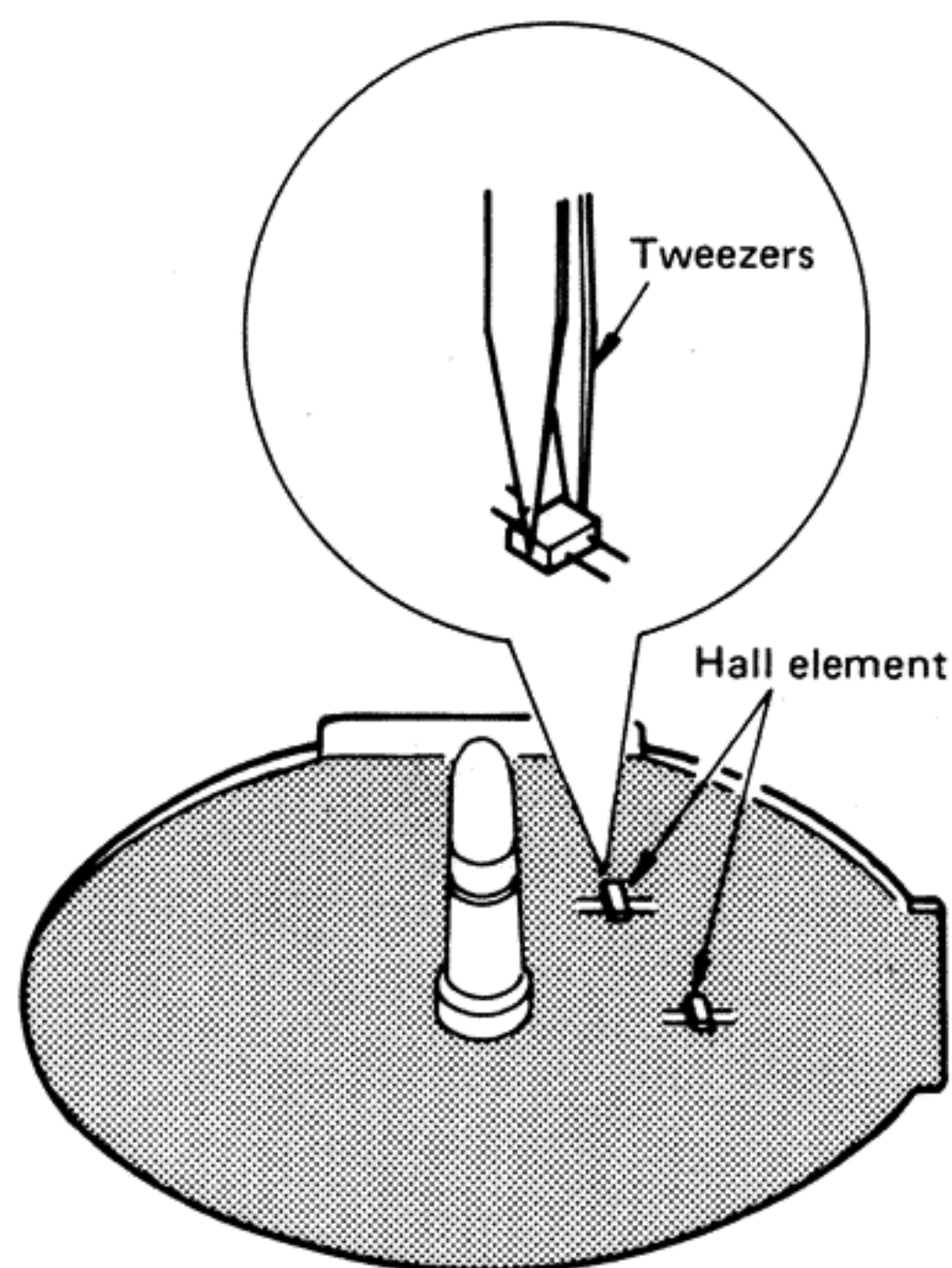


Fig. 11

● How to remove the tonearm

1. Remove the dust cover. (Refer to "How to remove the dust cover.")
2. Remove the shield cover setscrew (Fig. 13 : 26) and shield cover.
3. Unsolder the 5 lead wires from Tonearm.
4. Turn the worm gear by finger to move the tonearm center inward.
5. Remove the tonearm setscrew. (Fig. 14 : 27)
6. Remove the guide rail clamber, and pull out the guide rail, the remove the tonearm in the direction of the arrow A.

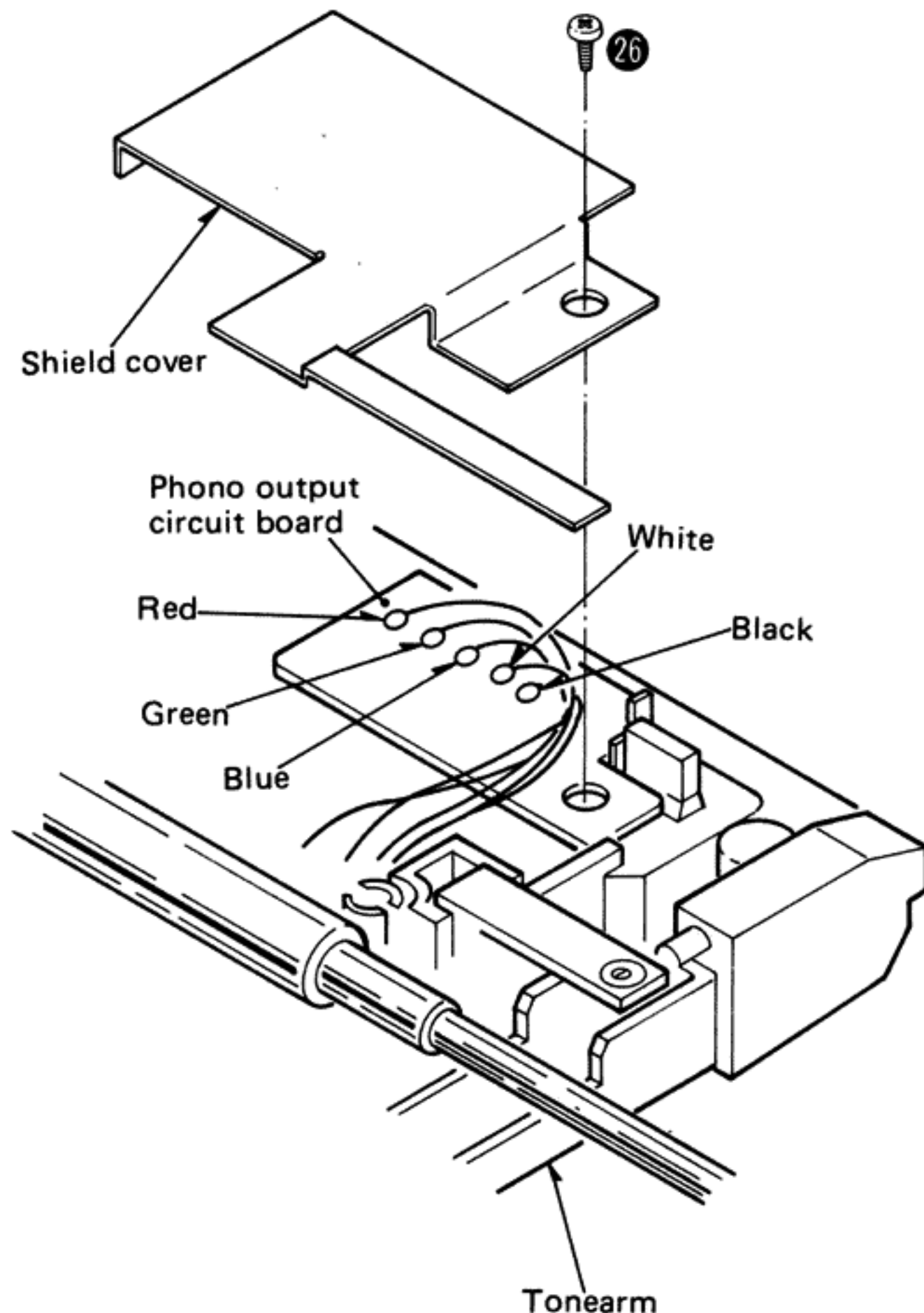


Fig. 13

● How to remove the offset angle detection circuit board

1. Remove the dust cover. (Refer to "How to remove the dust cover.")
2. Remove the indicator cover setscrew (Fig. 14: 28) and the indicator cover in the direction of the arrow B . (Fig. 14)
3. Remove the offset angle detection circuit board adjustment screw (Fig. 14: 29), then the offset angle detection circuit board can be removed.

Note: When replacing the offset angle detection circuit board, be sure to adjust the servo gain and offset voltage.

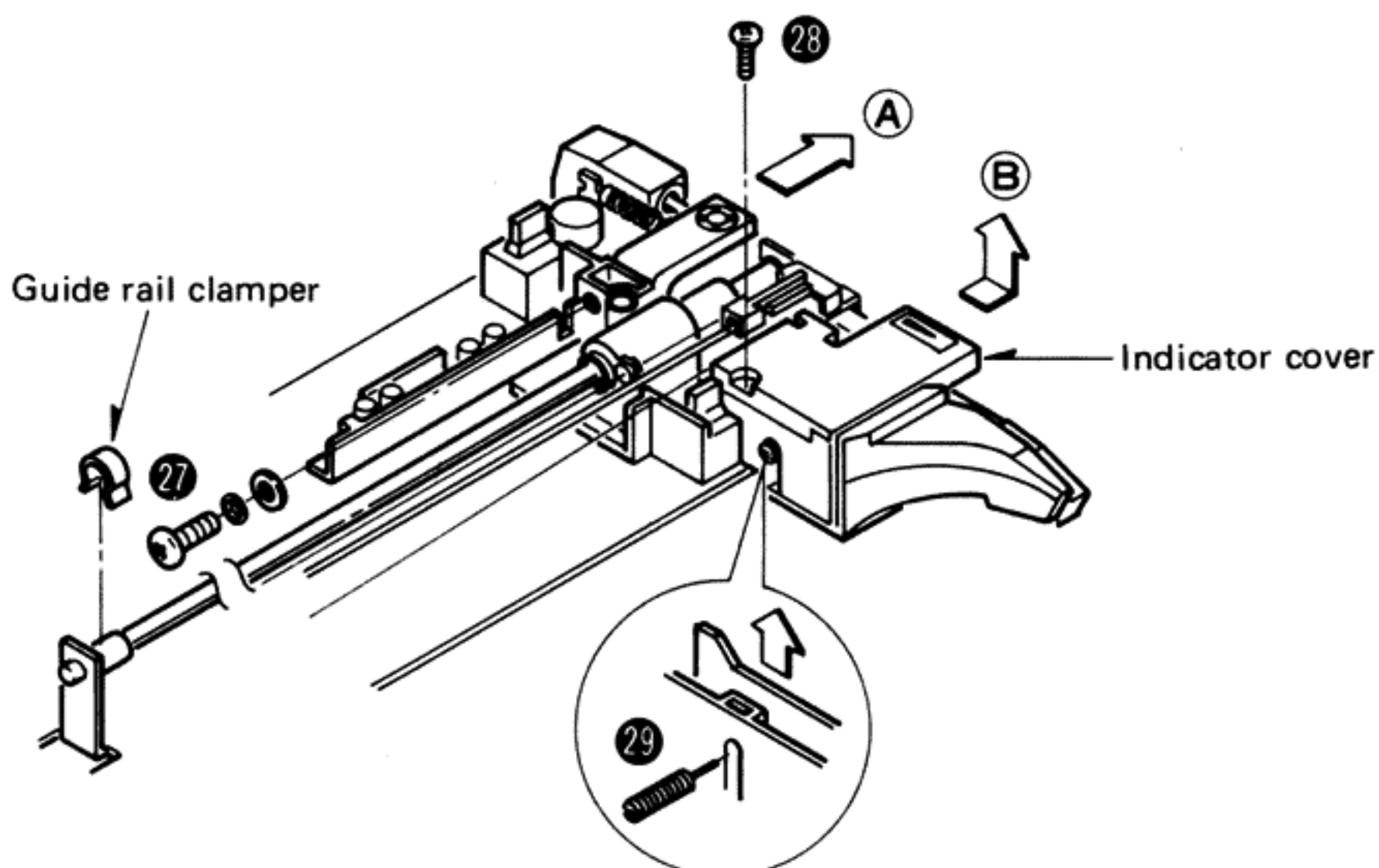


Fig. 14

■ MEASUREMENTS AND ADJUSTMENT

● Equipment used and condition of the set

1. Oscilloscope
2. DC voltmeter
3. Record (SFTR007) for adjustment
4. Set the optical sensor sensitivity selector to "M".

Step	Item	Preparations for adjustment	Adjusting portion	Adjusting method
1	Start position	<ol style="list-style-type: none"> 1. Open the upper cabinet and put on the record. 2. Turn the power switch on. 3. Push the "start" switch. 	Start position adjusting screw (Fig. 15)	<ol style="list-style-type: none"> 1. Turn the start position adjusting screw. If it descends between turns, turn the screw counter clockwise.
2	Clock frequency	<ol style="list-style-type: none"> 1. Connect lead wire with clip to IC301 29-pin and 1-pin of operation circuit board. 2. Connect the oscilloscope to IC301 8-pin. 	VR301 (Fig. 16)	<ol style="list-style-type: none"> 1. Turn the power switch on. 2. Adjust VR301 so that the cycle of output waveform is 1.36msec. \pm 0.07msec. (Fig. 17)
3	Sensor gain	<ol style="list-style-type: none"> 1. Connect the DC voltmeter to CN301 3-pin (+) and 2-pin (-). 2. Put on the record for adjustment with side A up. 	VR401 (Fig. 16)	<ol style="list-style-type: none"> 1. Turn the power switch on. 2. Tonearm is on the rest position. (Blank area of the record.) 3. Adjust VR401 so that the output voltage is $8V \pm 0.4V$.
4	Sensor resolution	<ol style="list-style-type: none"> 1. Connect the oscilloscope to IC401 9-pin (+) and 14-pin (-). 2. Put on the record for adjustment with side A up. 	VR402 (Fig. 16)	<ol style="list-style-type: none"> 1. Turn the power switch on. 2. Keep the F skip switch depressed to move the tonearm. (Output is delivered between the turns.) 3. Adjust VR402 so that the peak output between tunes is $3V \pm 0.3V$. (Fig. 18)
5	Stylus cue-down position	<ol style="list-style-type: none"> 1. Open the upper cabinet and hold the cabinet switch with tape. 2. Put on the record for adjustment with side B up. 3. Close the upper cabinet. 4. Connect the unit to the amplifier. (Connect the speakers to the speaker terminals.) 	VR302 (Fig. 16)	<ol style="list-style-type: none"> 1. Turn the power switch on. 2. Press the F skip switch twice and then press the start switch. 3. After completion of cueing, again press the B skip switch for the purpose of cueing down as previously mentioned. 4. Make sure that descending position is at count "18 ~ 19". 5. Adjust VR302 so that the descending position is at count "18 ~ 19".
6	Tonearm offset angle	<ol style="list-style-type: none"> 1. Remove the dust cover. (Refer to "DISASSEMBLY INSTRUCTION") 2. Open the upper cabinet and hold the cabinet switch with tape. 3. Close the upper cabinet. 4. Put on the record. 	Adjusting screw (Fig. 19)	<ol style="list-style-type: none"> 1. Turn the power switch on. 2. Keep the F skip switch depressed to move the tonearm. 3. Turn the adjusting screw so that the arm center matches the V-groove of the of the lift bar.
7	Servo gain and offset voltage	<ol style="list-style-type: none"> 1. Remove the dust cover. (Refer to "DISASSEMBLY INSTRUCTION") 2. Open the upper cabinet and hold the cabinet switch with tape. 3. Connect the DC voltmeter to CN301 5-pin (+) and 2-pin (-). 4. Remove the sensor cover. 	VR501 (Servo gain) Screw (Offset voltage) (Fig. 20)	<ol style="list-style-type: none"> 1. Turn the power switch on. 2. Keep the F skip switch depressed to move the tonearm. 3. Open the upper cabinet. 4. Completely shift the tonearm to the left. Then, adjust VR501 so that the voltage is 3.6V (Servo gain) 6. If the voltage is not 1.8V, adjust screw so that the output voltage is 1.8V. (Offset voltage)

• Adjustment points

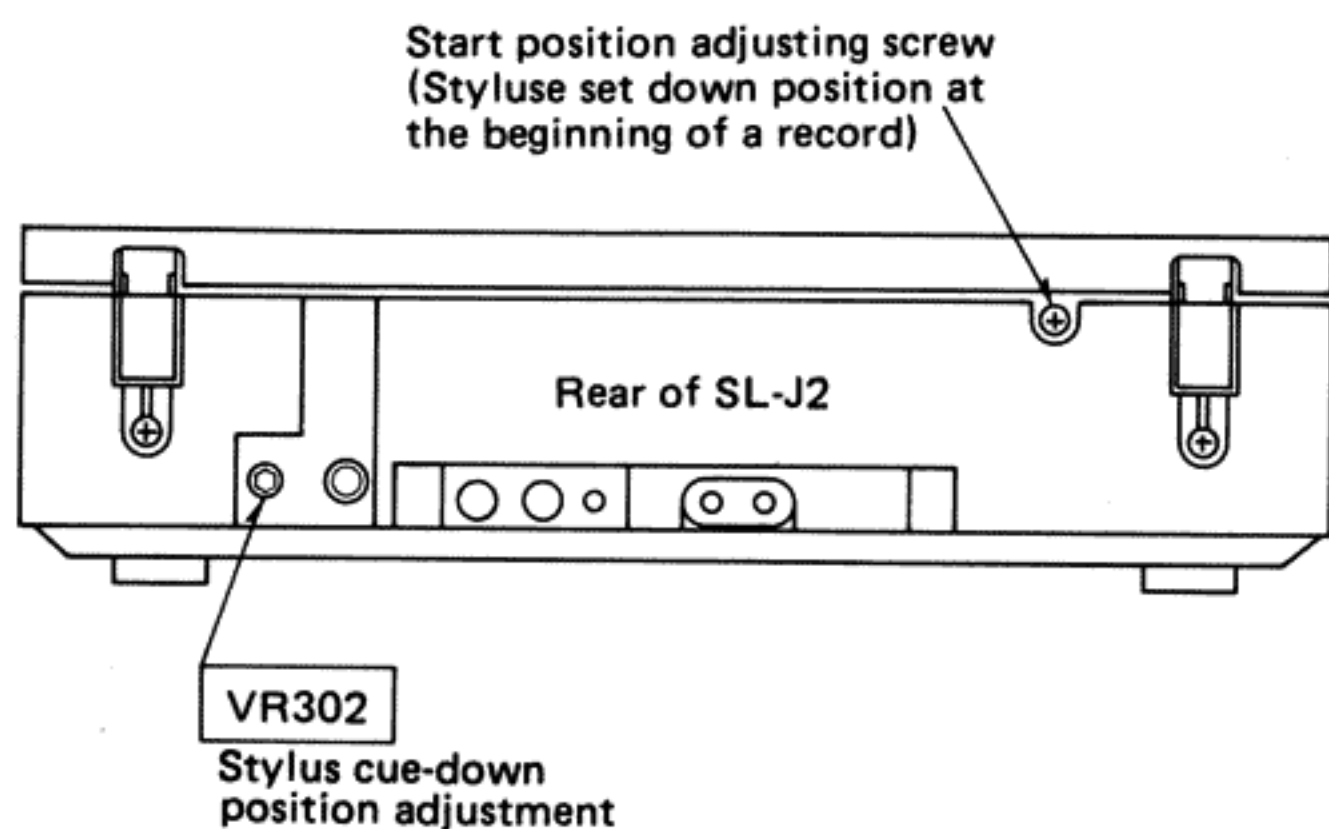


Fig. 15

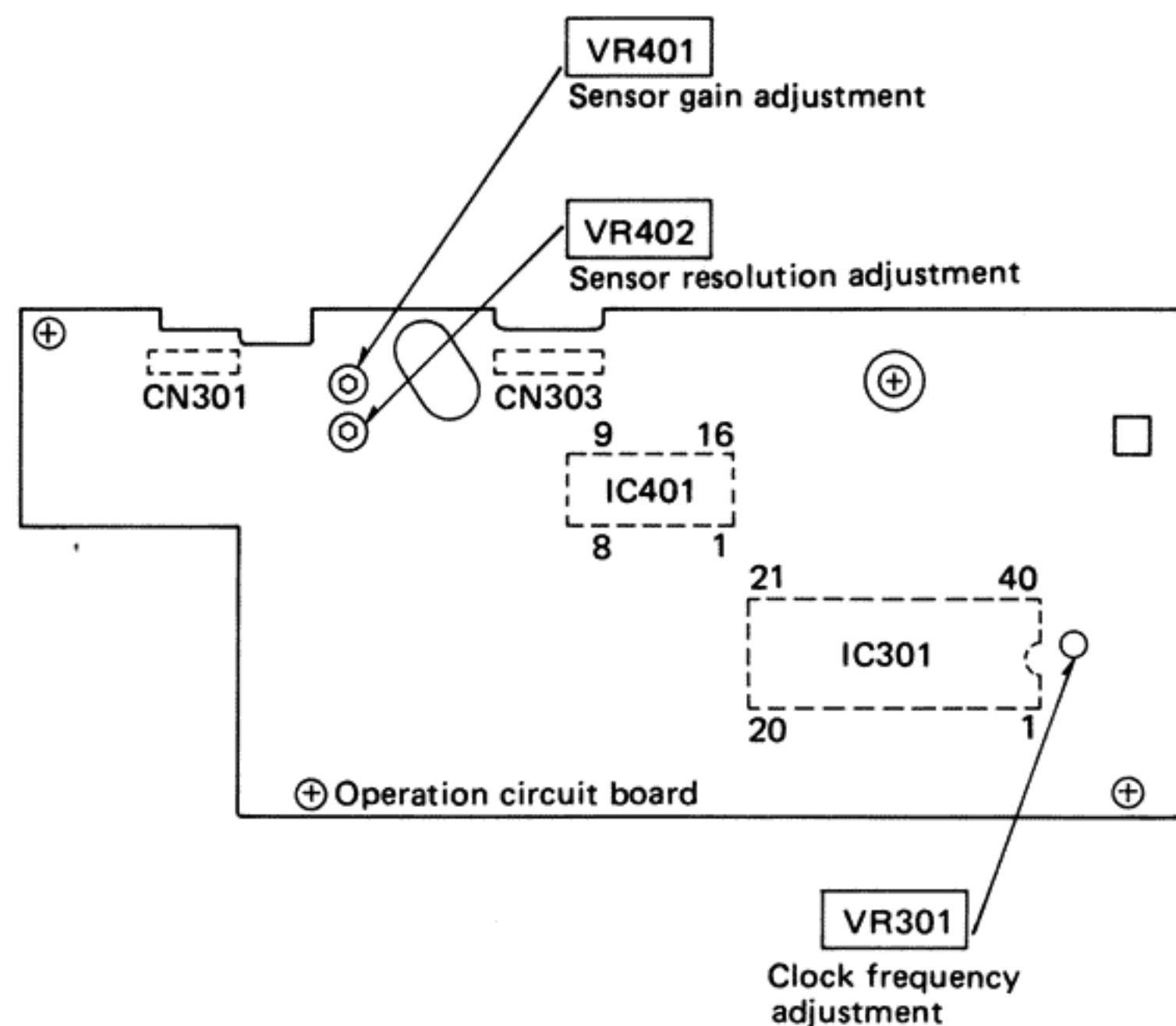


Fig. 16

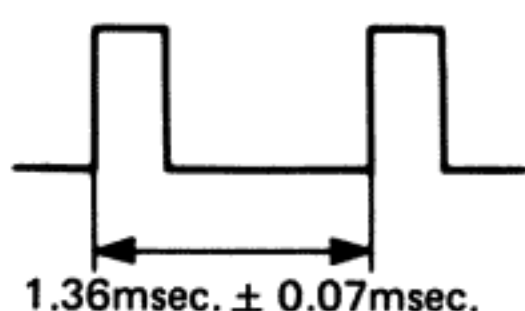


Fig. 17

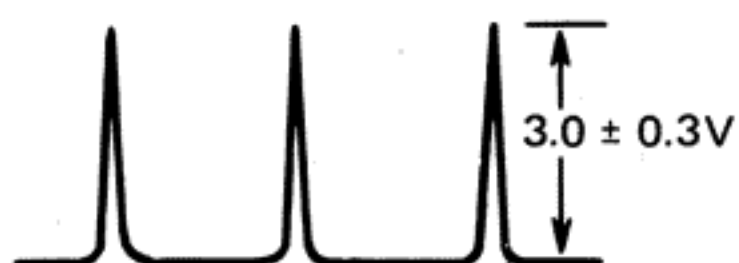


Fig. 18

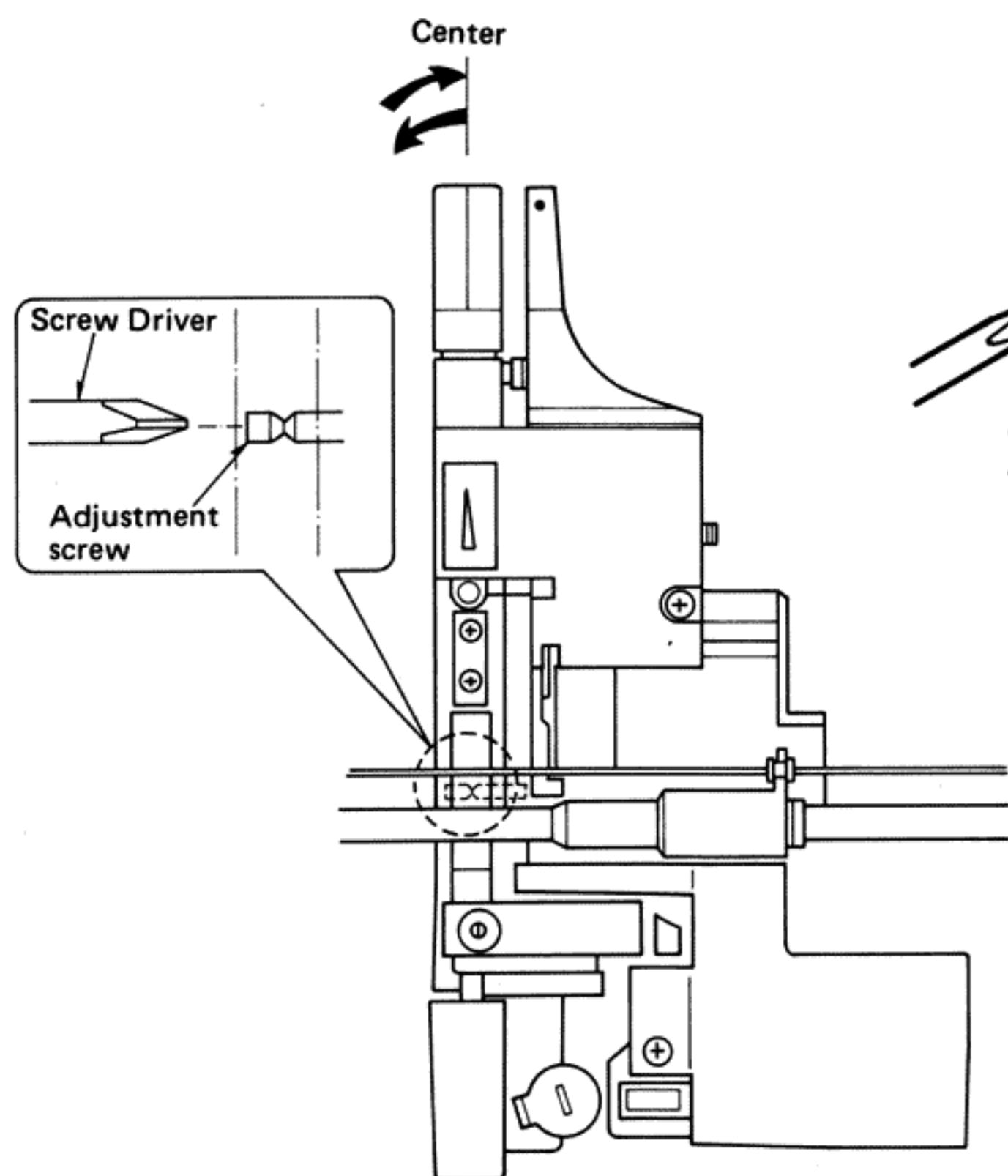


Fig. 19

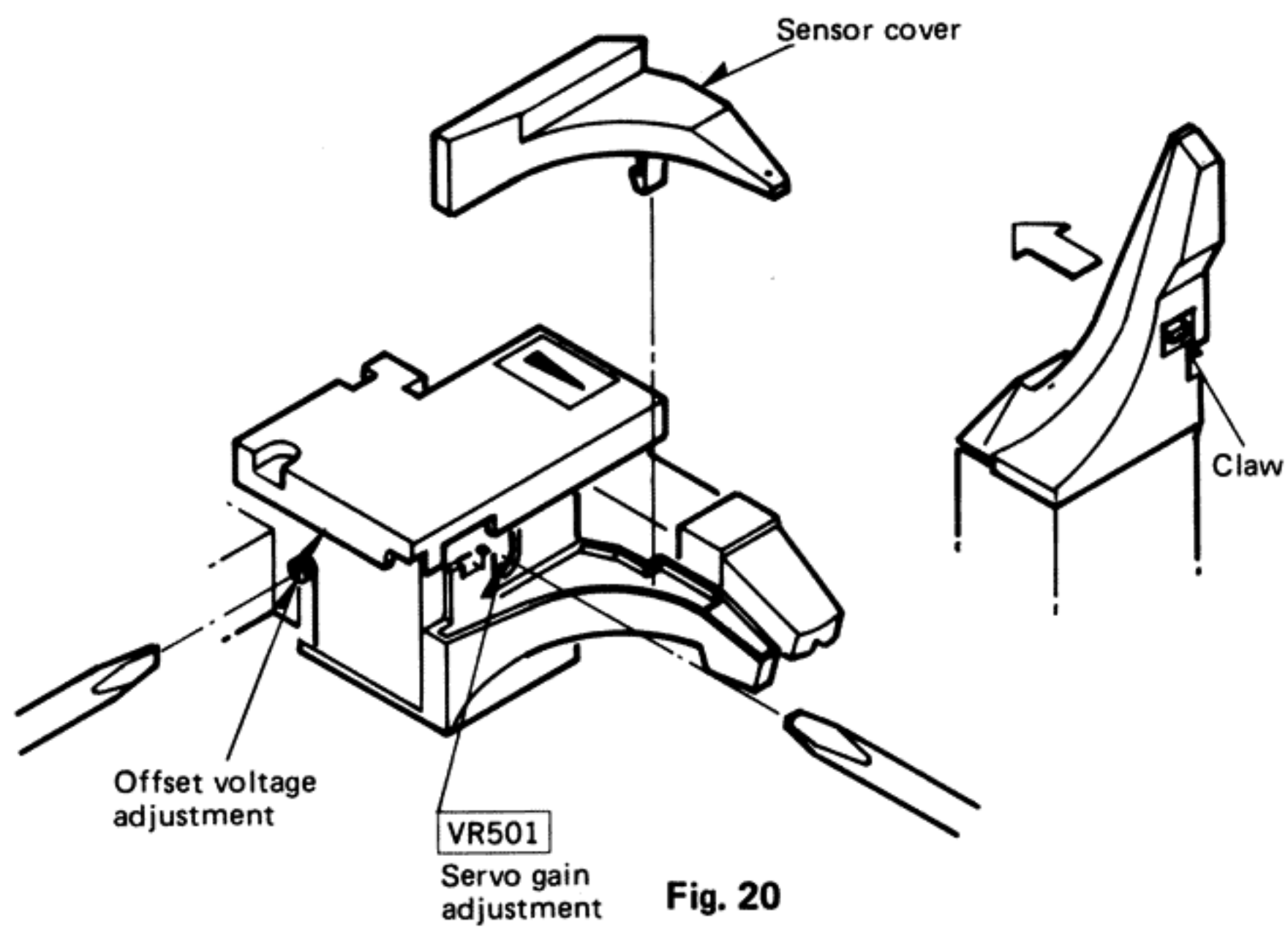


Fig. 20

■ TROUBLE SHOOTING

1. How to use the repair table (Fig. 21)

- ① Remove the bottom board.
- ② Remove the main circuit board and connect the P.C.B. ground terminal to the chassis (Stator frame).
- ③ Put the unit on the repair table.
- ④ Fit the turntable platter and put on the turntable mat.
- ⑤ Put on the record and check the circuits from under the unit.

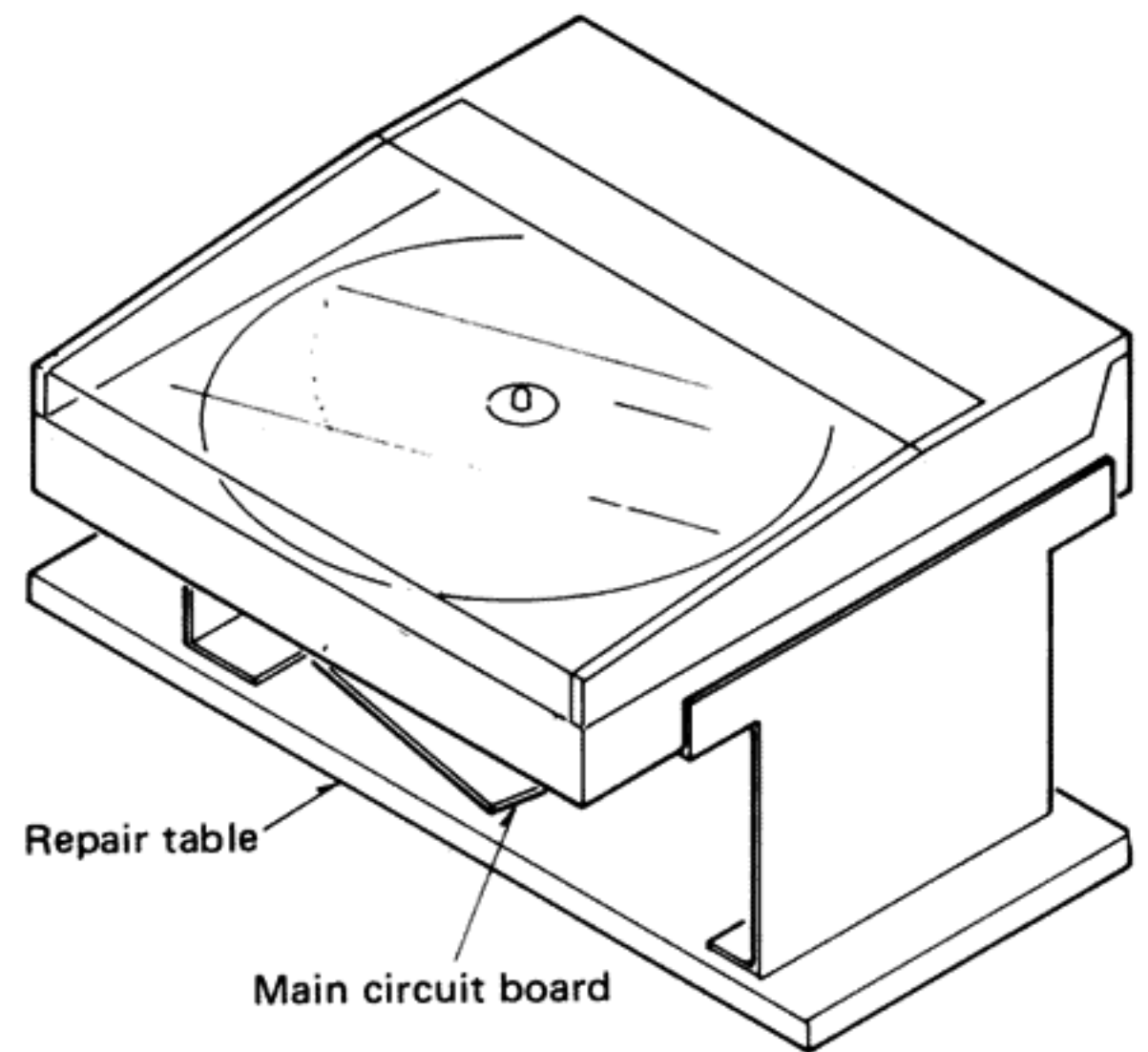


Fig. 21

2. How to raise the unit (Fig. 22)

Note: Turntable platter is not fixed on the center spindle. Take care so that the turntable platter will not come loose. Also, take care allow the set to fall down.

- ① Remove the bottom board.
- ② Completely open the upper cabinet.
- ③ Hold the cabinet (Reset) switch with tape.
- ④ Fit the turntable platter.
- ⑤ Raise the unit and check the circuits.

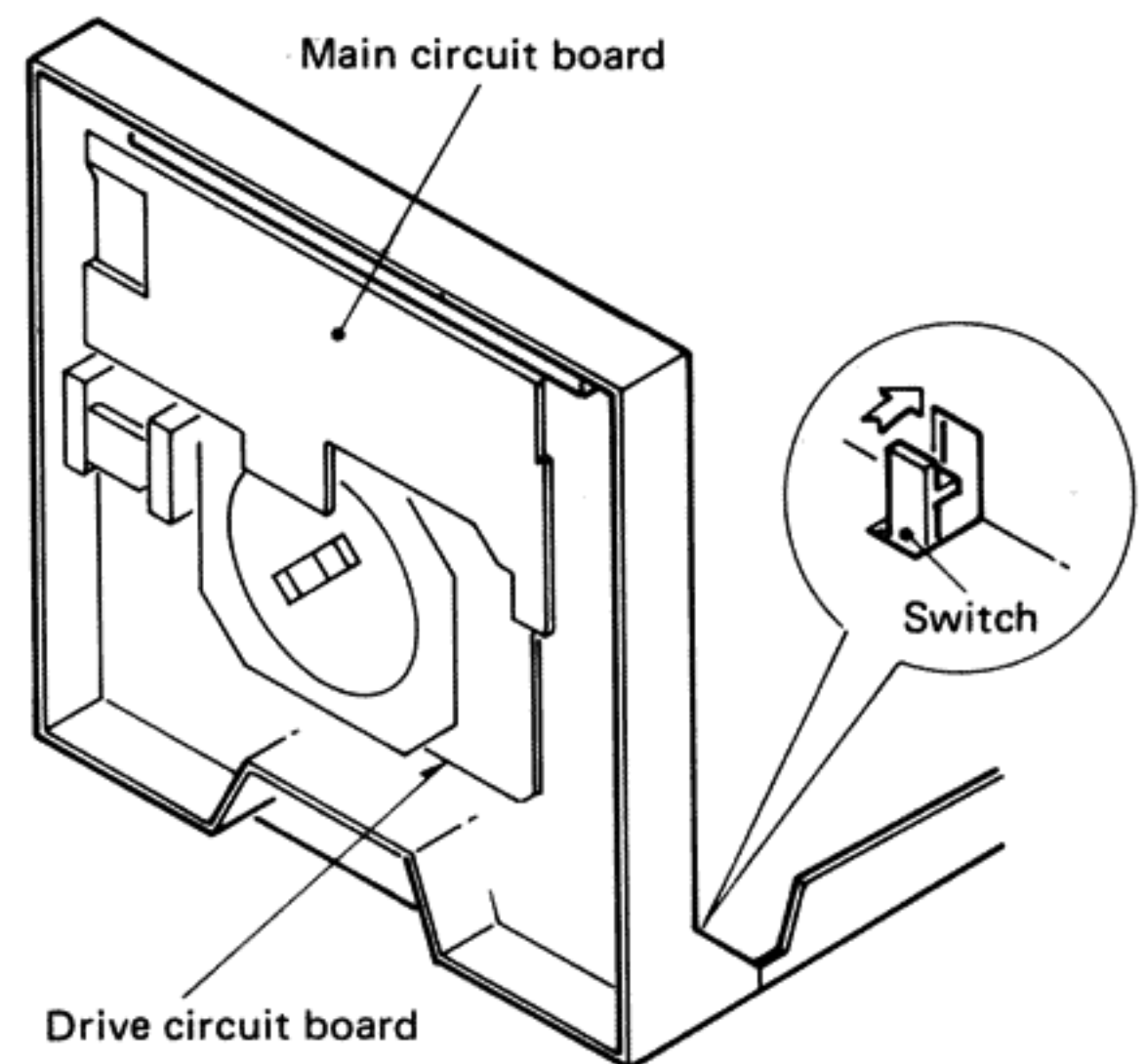


Fig. 22

3. How to turn over the unit (Fig. 23)

Note: This purpose is to check the voltage of each circuit during stop of the turntable.

- ① Remove the turntable platter and turn over the unit.
- ② Remove the bottom board.
- ③ Turn the power switch "on" and check the voltage.

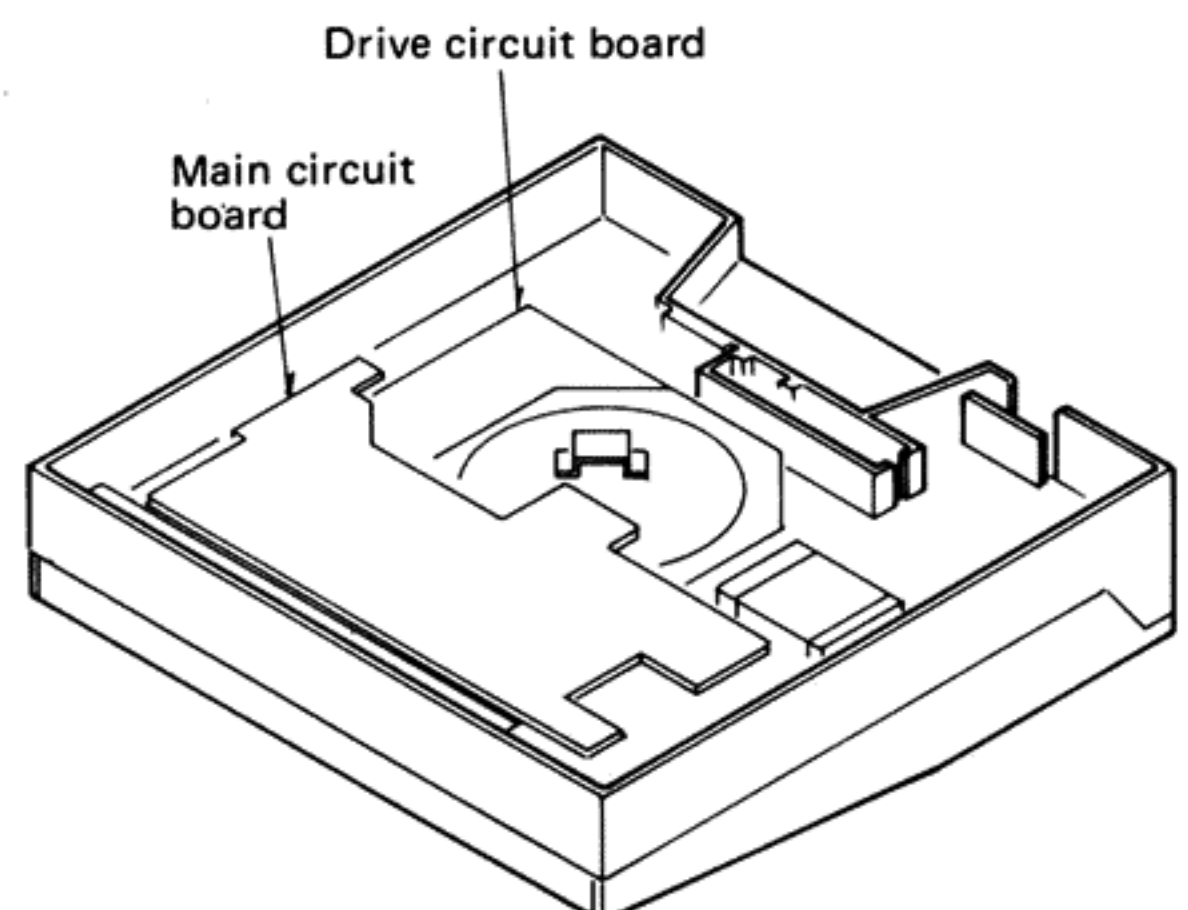


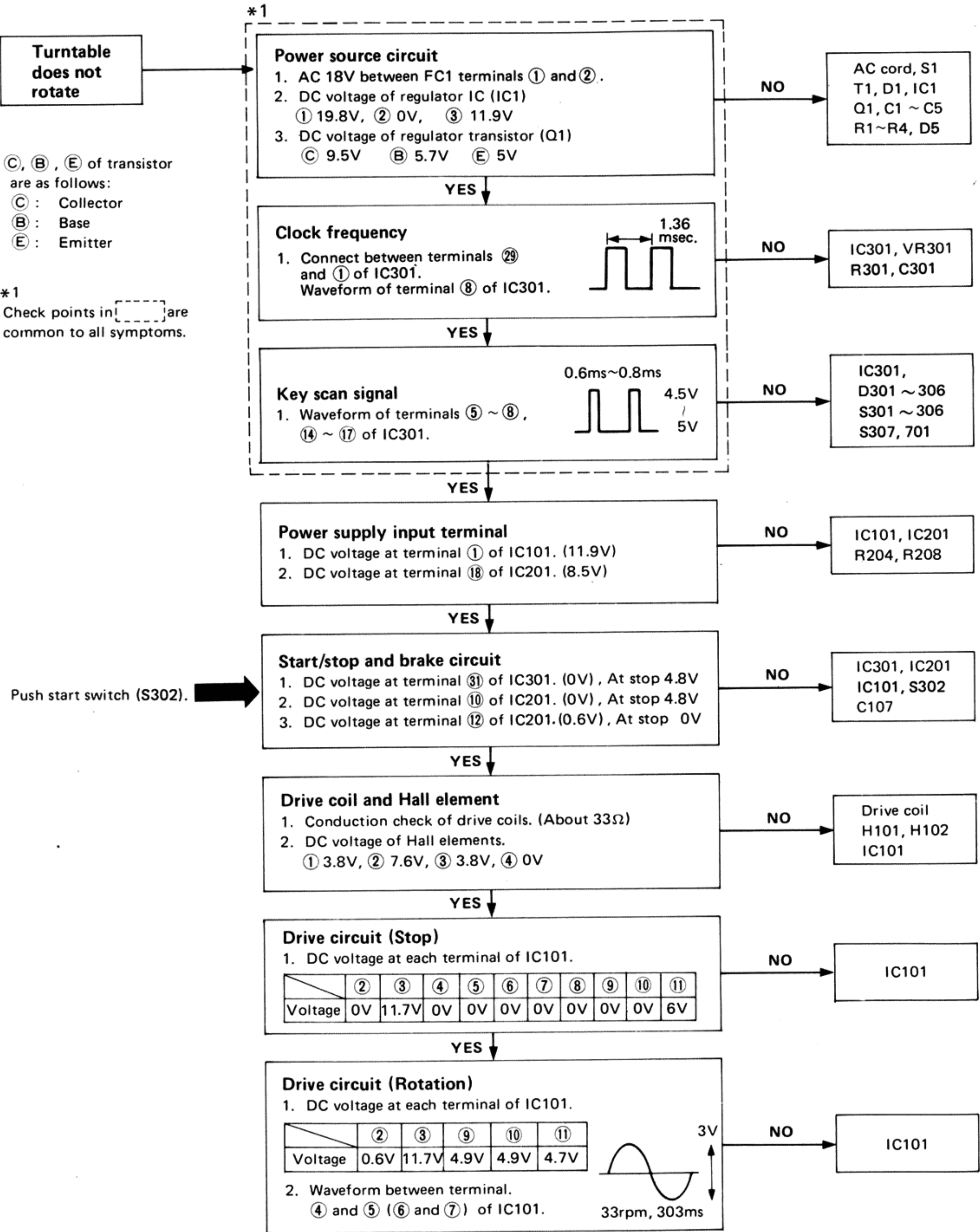
Fig. 23

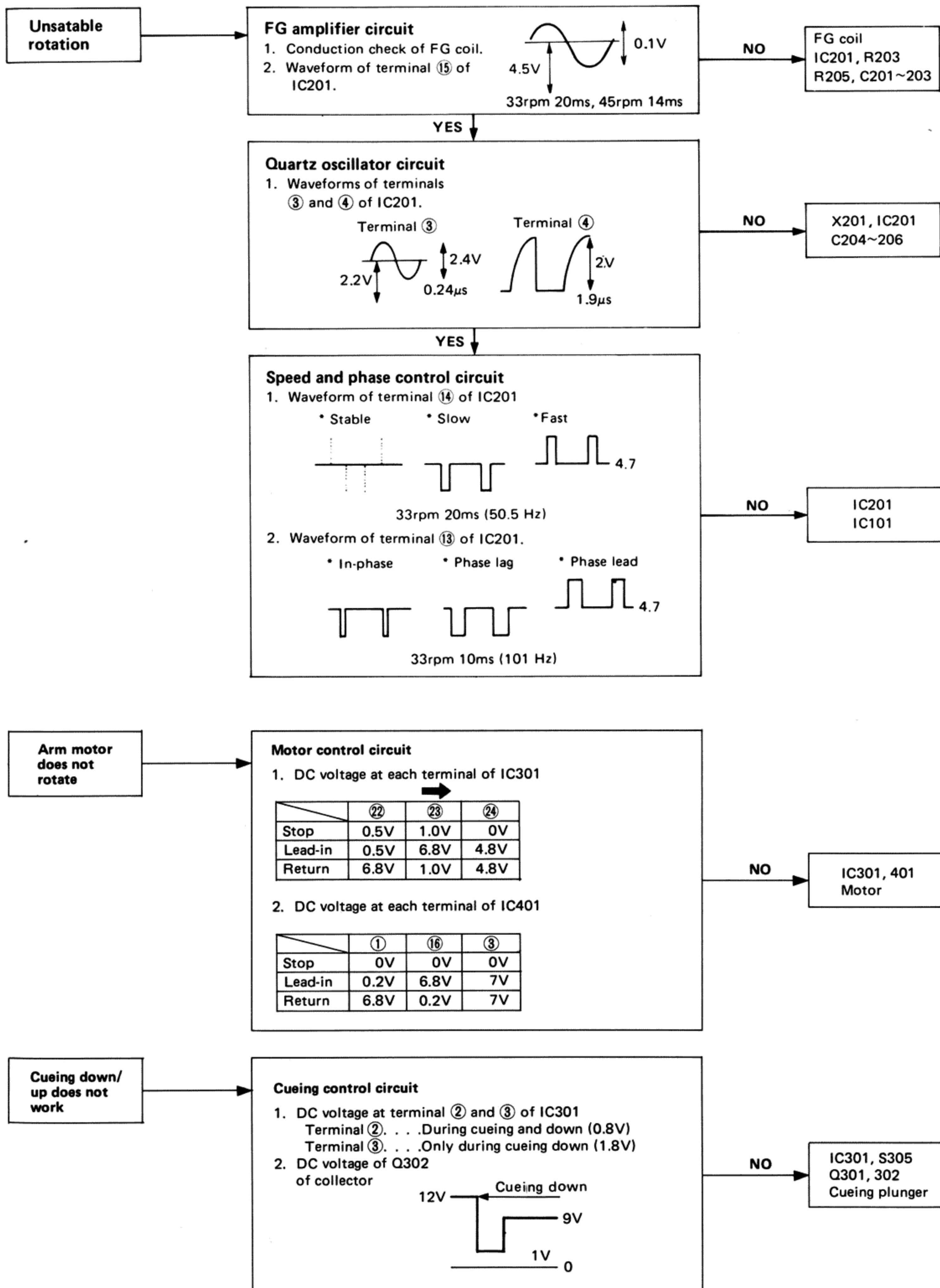
Turntable
does not
rotate

③, ⑤, ⑥ of transistor
are as follows:
③ : Collector
⑤ : Base
⑥ : Emitter

*1
Check points in [] are
common to all symptoms.

Push start switch (S302).





■ HOW TO SET THE TONEARM DRIVE ROPE

When setting the rope, follow the procedure given below.

1. Remove the dust cover and tonearm cover. (Refer to "How to remove the dust cover.")
2. Remove the roller cover. (Fig. 24)
3. Set the rope in the order of 1 ~ 5 (Fig. 24)
4. Fit the rope connector to the tonearm.
5. Set the roller cover and turn the worm gear by hand to see that the tonearm moves.

Note: The arm drive wheel is not fixed. So, take care not to let it come loose during servicing. (Stop it with C-ring to prevent its removal.)

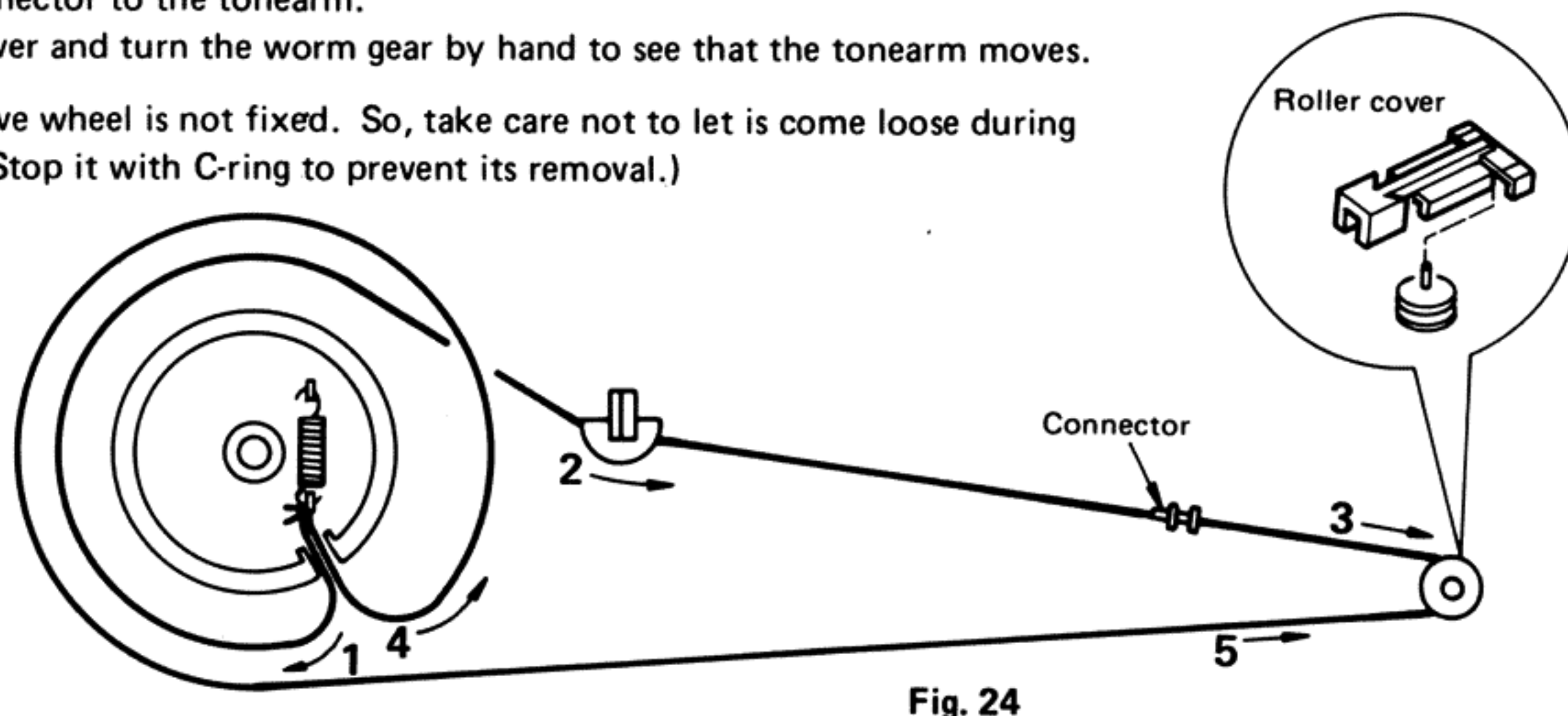


Fig. 24

■ RESISTORS AND CAPACITORS

- 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. This "S" mark is service standard parts and may differ from production parts.
 4. Unless otherwise specified.
All resistors are in OHMS (Ω) K = 1000 Ω , M = 1000k Ω
All capacitors are in MICROFARADS (μ F), P = 10⁻⁶ μ F.

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value
ERG	1	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	F : $\pm 1\%$
ERG : Metal Oxide	1 : 1W	J : $\pm 5\%$
ERX : Metal Film	2 : 2W	G : $\pm 2\%$

ERD2FCG□□□ → Fuse type carbon (1/4W)
 ERD10TLJ□□□ → Chip type carbon (1/8W)
 ERDS2TJ□□□ → Small type carbon (1/4W)
 ECUV1H□□□ → Chip type ceramic capacitor

Capacitor Type	Voltage		Tolerance
	ECEA Type	Others	
ECEA : Electrolytic	1A : 10V	1H : 50V DC	J : $\pm 5\%$
ECKD : Ceramic	1C : 16V	2H : 500V DC	K : $\pm 10\%$
ECQM : Polyester	1E : 25V	1 : 100V	Z : +80%, -20%
ECCD : Ceramic	1V : 35V		P : +100%, -0%
ECKF : Ceramic	1H : 50V		M : $\pm 20\%$
ECEB : Electrolytic	1J : 63V		
	50 : 50V		

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
RESISTORS			R315	ERDS2TJ101	100K	R347, 348	ERDS2TJ681	680	C203	ECQM1H683JZ	0.0068
R1	ERDS2TJ101	100	R316	ERDS2TJ394	390K	R349, 350	ERDS2TJ681	680	C204	ECUV1H121JCM	120P
R2	ERDS2TJ221	220	R317	ERDS2TJ333	33K	R351	ERDS2TJ103	10K	C205	ECUV1H330JCM	33P
R3	ERG2SJ330	33	R318	ERDS2TJ103	10K	R353A	ERDS2TJ333	33K	C206	ECUV1H121JCM	120P
R4	ERDS2TJ221	220	R319	ERDS2TJ223	22K	R353B	ERDS2TJ331	330	C207	ECEA1AU470	47
R103	ERD10TLJ104U	100K	R320	ERDS2TJ392	3.9K	R401	ERDS2TJ563	56K	C208	ECEA1AU470	47
R104	ERX1ANJ2R7	2.7	R321	ERDS2TJ272	2.7K	R402, 403	ERDS2TJ123	12K	C301	ECCD1H101K	100P
R105	ERD10TLJ270U	27	R322	ERDS2TJ332	3.3K	R404, 405	ERDS2TJ474	470K	C302	ECFR1H104ZF	0.1
R201	ERD10TLJ273U	27K	R323, 324	ERDS2TJ103	10K	R406	ERDS2TJ104	100K	C303	ECEA1CU330	33
R202	ERD10TLJ394U	390K	R325, 326	ERDS2TJ332	3.3K	R407	ERDS2TJ563	56K	C304	ECFR1H104ZF	0.1
R203	ERD10TLJ680U	68	R327	ERDS2TJ472	4.7K	R408	ERDS2TJ154	150K	C305	ECEA50M1R	1
R204	ERD10TLJ151U	150	R328	ERDS2TJ471	470	R501	ERD25FJ271	270	C306	ECQM1H104JZ	0.1
R205	ERD10TLJ223U	22K	R329, 330	ERDS2TJ103	10K	R502	ERD25FJ391	390	C307	ECEA1HU4R7	4.7
R207	ERD10TLJ102U	1K	R331, 332	ERDS2TJ272	2.7K	R503	ERD25FJ561	560	C308	ECFR1H104ZF	0.1
R208	ERD10TLJ680U	68	R333	ERDS2TJ332	3.3K	CAPACITORS			C309, 310	ECKD1H681KB	680P
R301	ERDS2TJ562	5.6K	R334	ERDS2TJ271	270	C1, 2, 3	ECQM1223KZ	0.022	C311	ECCD1H101J	100P
R302, 303	ERDS2TJ102	1K	R335	ERDS2TJ821	820	C4	ECEB1EU222	2200	C312, 313	ECFR1H10ZF	0.1
R304, 305	ERDS2TJ331	330	R336	ERDS2TJ103	10K	C5	ECEA1CU330	33	C401	ECEA1HUR47	0.47
R306	ERDS2TJ333	33K	R337	ERDS2TJ472	4.7K	C101	ECEA1CU330	33	C402	ECEA1CN100S	10
R307	ERDS2TJ681	680	R338	ERDS2TJ563	56K	C102	ECEA50ZR22	0.22	C403, 404	ECQM1H473JZ	0.047
R309	ERDS2TJ152	1.5K	R339	ERDS2TJ103	10K	C103	ECQV05274JZ	0.27	C405	ECEA1HU2R2	2.2
R310	ERDS2TJ272	2.7K	R340	ERDS2TJ333	33K	C105, 106	ECEA1CN470S	47	C601	ECFB1B104ZM	0.1
R311	ERDS2TJ562	5.6K	R341	ERDS2TJ683	68K	C107	ECEA50Z1	1	C701	ECEA1CU101	100
R312, 313	ERDS2TJ103	10K	R342	ERDS2TJ563	56K	C201	ECEA1AU470	47			
R314	ERDS2TJ332	3.3K	R343, 344	ERDS2TJ681	680	C202	ECEA50ZR22	0.22			
			R345, 346	ERDS2TJ681	680						

REPLACEMENT PARTS LIST

- Notes:**
- Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
 - Important safety notice:
Components identified by  mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
 - Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

- The "Ⓢ" mark is service standard parts and may differ from production parts.
- The parenthesized numbers in the columns of description stand for the quantity per set.

Areas

- * [M] is available in U.S.A.
- * [MC] is available Canada.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
INTEGRATED CIRCUITS			SWITCHES			PHOTO INTERRUPTERS		
IC1	AN7812	Regulator, 12V	S1	SFDSC02N02	Power	PC501	ON1186	Offset Angle Sensor
IC101	AN6638	Turntable Drive	S301~306	EVQQS405K	Stop, Start, Skip-Search, Cueing & Repeat	PC502	SFPABJ0204A	Blank Groove Sensor
IC201	AN6683	Turntable Control	S307	SFDSC05N01	Reset	PC601	ON1161	Tonearm Position Sensor
IC301	MN1420FPL	Micro Computer	S308, 309	SFDSHSW0699	Size Selector & Speed Selector	POWER TRANSFORMER		
IC302	AN6914	Computer	S401	SFDSHSW0699	Sensor Gain Selector	T1[M]	SLT48DTL3A	Power Source
IC401	AN6690	Arm Motor Drive & Blank Groove Detection	S601	SFDSC02N03	Reset	T1[MC]	SLT48DT11C	Power Source
TRANSISTORS			VARIABLE RESISTORS			FUSE		
Q1	2SC1383	Regulator, 5V	VR301	EVN61AA00B54	Clock Frequency Adj. 50KΩ(B)	F1[MC] only	XBA2F08NU100	250V, 800mA
Q301	2SD636	LED Drive	VR302	EVJE1AF20B54	Stylus Cue-down Position Adj. 50KΩ(B)	COMPONENT COMBINATION		
Q302	2SD892	Cueing Control	VR401	EVN61AA00B55	Sensor Gain Adj. 500KΩ(B)	RX301	EXBP87681J	680Ω X7
Q303, 304	2SD636	Speed Selector & Synchro Rec Drive	VR402	EVN61AA00B25	Sensor Resolution Adj. 200KΩ(B)			
Q305~307	2SB641	Switching	VR501	EVNM0AA00B14	Servo Gain Adj. 10KΩ(B)			
Q308	2SD636	Relay Drive	RELAY					
Q309, 310	2SB641	Shaping	RL701	SFDYQ11N02	Muting Relay			
Q311	2SD636	LED Drive	RL701	SFDYG5A237P	Muting Relay			
Q312	2SB641	Switching	CRYSTAL					
DIODES			X201	SVQSH41TR	4.193MHz			
D1	SVDS1RBA20F	Rectifier	HALL ELEMENTS					
D5	MA4056	Zener, 5.6V	H101, 102	OH-002	Turntable Position Det.			
D301~306	MA165	Switching						
D307	SVDZJ02N02	Repeat Indicator						
D308	MA4075	Zener, 7.5V						
D309	SVDZJ02N03	Cue-down Indicator						
D310	SVDZJ02N02	Cue-up Indicator						
D311~317	MA165	Switching						
D311B	LN513RA	Music Select Indicator						
D401	MA4068	Zener, 6.8V						
D501	MA162A	Switching						
D502	SVDEBR3432S	Tonearm Position Indicator						
D701	MA162A	Switching						

Caution:

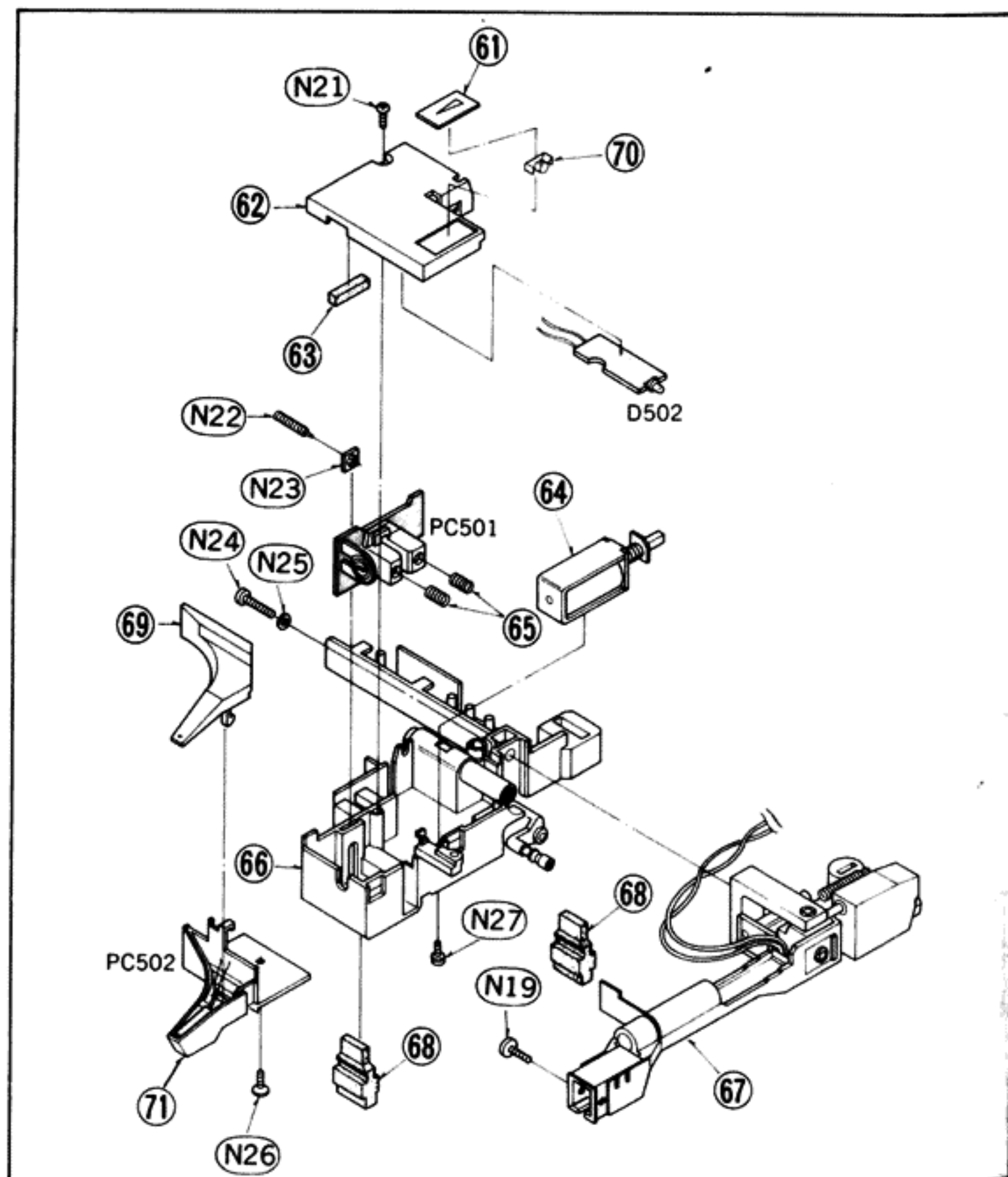
Two types of muting relay (RL701) are used. When placing an order, confirm the caution mentioned in the explosion view on page 17.

Ref. No.	Part No.	Description
CABINET AND CHASSIS PARTS		
1	SFADJ02M01E	Dust Cover Ass'y (1)
1-1	SFKBJ02M01	Badge,Dust Cover (1)
1-2	SFGZJ02N01	Cushion Rubber (1)
2	SFUMQ06N08	Dust Cover (2)
3	SFUMD04N07	Lutch,Dust Cover (2)
4	SFGZQ06N01	Rubber,Lutch (2)
5	SFTGQ06N01	Turntable Mat (1)
6	SFWEC06N01	Adaptor,45r.p.m (1)
7	SFQAC06N01	Spring,45r.p.m (1)
8	SFTEQ05N01	Adaptor (1)
9	SFTMC07-01E	Turntable Platter (1)
10	SFAUJ02N01	Rotate Magnet (1)
11	SFQCC05N01	Bottom Board (1)
12	SFGAC05N02	Spring,Insulator (4)
13	SFUMJ02N02	Insulator (4)
14	SFUMJ02N03	Rod,Power Switch (1)
15	SFKKJ02N01	Filter,Front Panel (1)
16	SFUMJ02N01	Ornament Plate (1)
17	SFKTC06N04	Front Panel (1)
18	SFACJ02N01	Button,Power Switch (1)
19	SFKTJ02N01	Cabinet (1)
20	SFKTJ02N02	Button,Operation (1)
21	SFDJC01N01	Knob,Selectors (3)
22	SFGCQ06N02	Jack,Synchro Rec (1)
23	SFDJHSC0491	Cushion Rubber, (2)
24	SFATQ06N01E	Power Transformer (2)
25(M)	SFNNJ02M01	AC Socket (1)
25(MC)	SFNNJ02C01	Hinge (2)
26	SFGKQ06N01	Name Plate (1)
27	SFUML11R03	Name Plate (1)
28	SFUZC05N02E	Rubber Cap (1)
29	SFUMV05N23	Wheel,Tonearm Drive (1)
30	SFUMC05N22	Rope Ass'y, (1)
31	SFGBC10-01	Tonearm Drive (1)
32	SFMHJ02N01E	Cap,Pulley (1)
33	SFUMQ06N06A	Pulley (1)
34	SFUZC02N01	Belt,Tonearm (1)
35	SFUMC02N05	Drive Motor (1)
36	SFQHQ34N22	Motor Ass'y, (1)
37	SFUMC02N06	Tonearm Drive (1)
38	SFUMQ06N09	Worm Gear Ass'y (1)
39	SFUPBL3N11E	Rod,Rest Switch (1)
40	SFUMC02N10	Lever,Rest Switch (1)
41	SFQA913-01	Spring,Rest (1)
42	SFUMQ06N07	Switch Lever (1)
43	SFGCQ06N01	Base,Rest Switch (1)
44	SFXJQ06N01	Holder,Rest Switch (1)
45	SFGCC05N05	Base,Tonearm (1)
46	SFUMC02N12	Drive Motor (1)
47	SFGCQ06N04	Rope Guide (1)
48	SFGZBL3N02	Spring,Adjustment Screw (1)
49	SFUMC05N15	Clamper,Guide Rail (1)
50	SFQPC05N01	Cushion Rubber, (1)
51	SFACJ02N013	Guide Rail (1)
52	SFKTQ06N02	Guide Rail,Tonearm (1)
53	SFDJJ02N04E	Cushion Rubber, (1)
54	SFUKQ06N02E	Guide Rail (1)
55	SFMGQ34N01	Clamper,Lead Wires (1)
56	SFMZC06N01R	Cushion Rubber, (2)
57	SFACJ02N012	Dust Cover (1)
		Spacer (1)
		Holder,Reset Switch (1)
		Spring,Reset Switch (1)
		Cover,Lead Wires (1)
		Knob,Cueing (1)
		Down Position Control (1)
		Jack,Phono Output (1)
		Base Ass'y,Tonearm (1)
		Cover, Stator Coil (1)
		Stator Frame Ass'y (1)
		Cover, Cabinet (1)

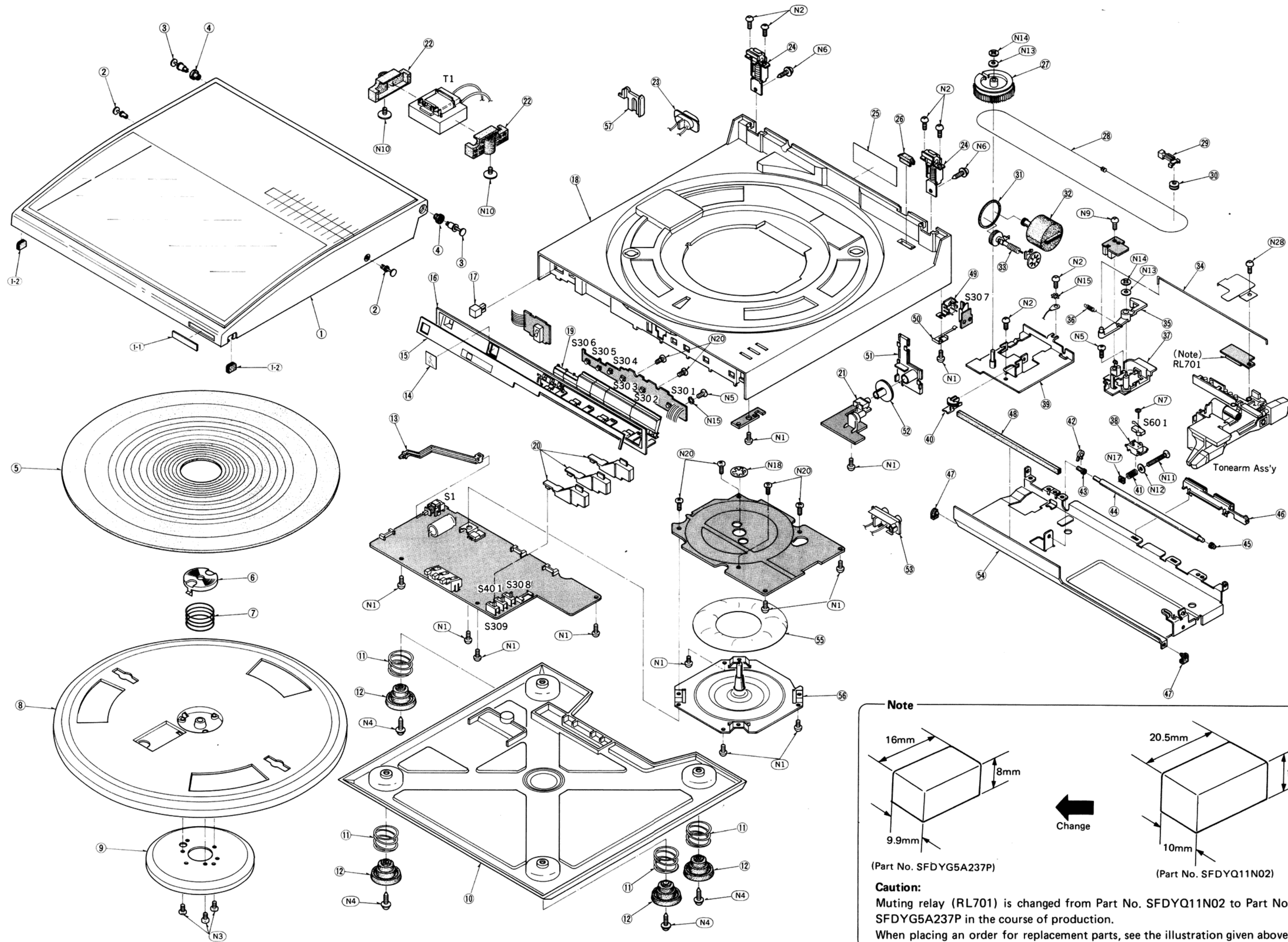
Ref. No.	Part No.	Description
TONEARM PARTS		
61	SFPAK0Q601	Indicator Plate (1)
62	SFPCS0Q601	Indicator Cover (1)
63	SFPGM0Q601	Rubber (1)
64	SFDZC05N01E	Solenoid Ass'y (1)
65	SFPSP00302	Spring,Adjustment (1)
66	SFPKD0J301R	Base,Tonearm (1)
67	SFPAMJ0201A	Tonearm Ass'y (1)
68	SFPGML1101	Cushion Rubber (2)
69	SFPABJ0205R	Cover,Sesor Case (1)
70	SFPCS00502	Light Concentrator (1)
71	SFPABJ0204A	Blank Groove Sensor A'ssy (PC502) (1)
SCREWS,WASHERS AND NUT		
N1	Ⓢ XTV3+8BFN	Screw,⊕3×8 (12)
N2	Ⓢ XTV3+6BFZ	Screw,⊕3×6 (6)
N3	Ⓢ XSN3+5S	Screw,⊕3×5 (3)
N4	XTWS3+14QFYR	Screw,⊕3×14 (4)
N5	Ⓢ XTN3+6B	Screw,⊕3×6 (2)
N6	XTWS3+14TFZ	Screw,⊕3×14 (2)
N7	XTN16+10G	Screw,⊕1.6×10 (1)
N9	XTV3+20J	Screw,⊕3×20 (1)
N10	SFXGQ06N01	Screw (1)
N11	XSN3+30S	Screw,⊕3×30 (1)
N12	Ⓢ XWE3D10	Washer, φ 3 (1)
N13	Ⓢ XWE3A8BW	Washer, φ 3 (2)
N14	CSTW3	Washer (2)
N15	Ⓢ XWC3B	Washer, φ 3 (2)
N17	XNC3HS	Nut, φ 3 (1)
N18	SFXWC06N02	Washer (1)
N19	SFPEV0Q601	Screw,Cartridge (1)
N20	Ⓢ XTV3+6BFN	Screw,⊕3×6 (6)
N21	XTN23+6JFZ	Screw,⊕2.3×6 (1)
N22	SFPTN00301	Screw,Offset Adj. (1)
N23	SFXN623-1	Nut (1)
N24	Ⓢ XSN3+12S	Screw,⊕3×12 (1)
N25	Ⓢ XWA3B	Washer, φ 3 (1)
N26	XTS26+6JFZ	Screw,⊕2.6×6 (1)
N27	XYN2+C4FZ	Screw,⊕2×4 (1)
N28	XTN2+8B	Screw,⊕2×8 (1)

Ref. No.	Part No.	Description
ACCESSORIES		
AI(M)	SFNUJ02M01	Instruction Book (1)
AI(MC)	SFNUJ02C01E	Instruction Book (1)
A2	SFDHC05N01	Phono Output Cord (1)
A3	SFDLJ02N01	Ground Wire (1)
A4	SFDAC05M01	AC Cord (1)
PACKING PARTS		
P1(M)	SFHPJ02M01	Carton Box (1)
P1(MC)	SFHPJ02C01	Carton Box (1)
P2	SFHHJ02N01	Pad,Front (1)
P3	SFHHJ02N02	Pad,Rear (1)
P4	SFHKC05N01	Clamper,Turntable Platter (2)
P5	SFHKQ06N01	Spacer,Tonearm (1)
P6	SFHSC06N01	Spacer,Dust Cover (1)
P7	SFYH45×60	Polyethylene Bag,Unit (1)
P8	SFHDN05M01	Sheet (1)
P9	SFYF33B35	Polyethylene Bag, Turntable Mat (1)
P10	SFHDD04N01	Pad,Turntable Mat (1)
P11	SFYH17×16	Polyethylene Bag, Accessories (1)

• Tonearm Part



EXPLODED VIEW



Note

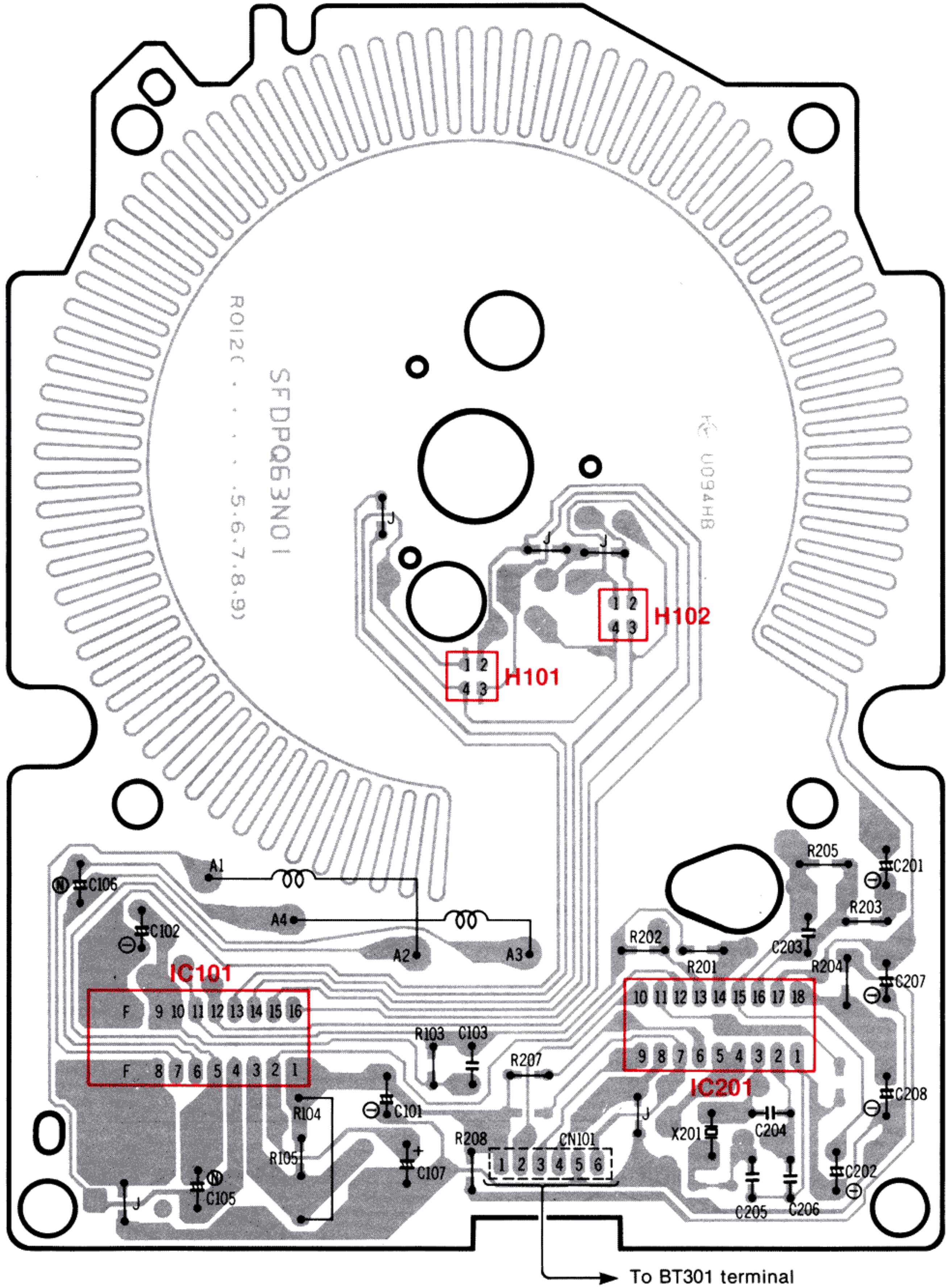
(Part No. SFDYG5A237P)

Change

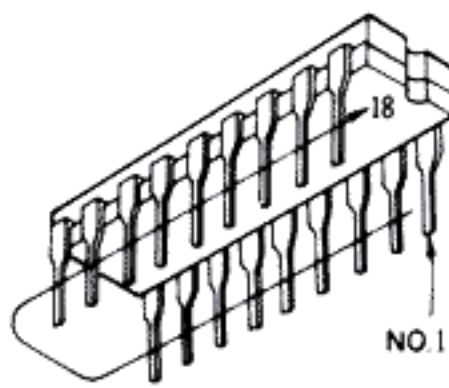
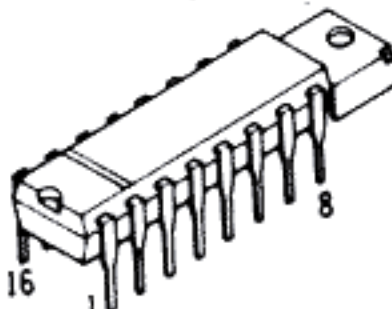
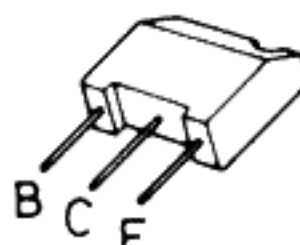
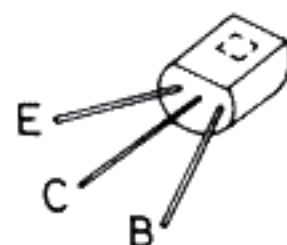
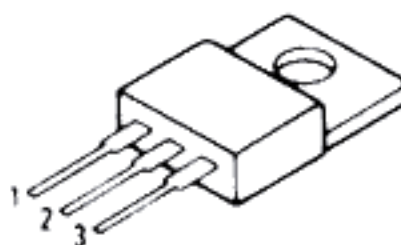
(Part No. SFDYQ11N02)

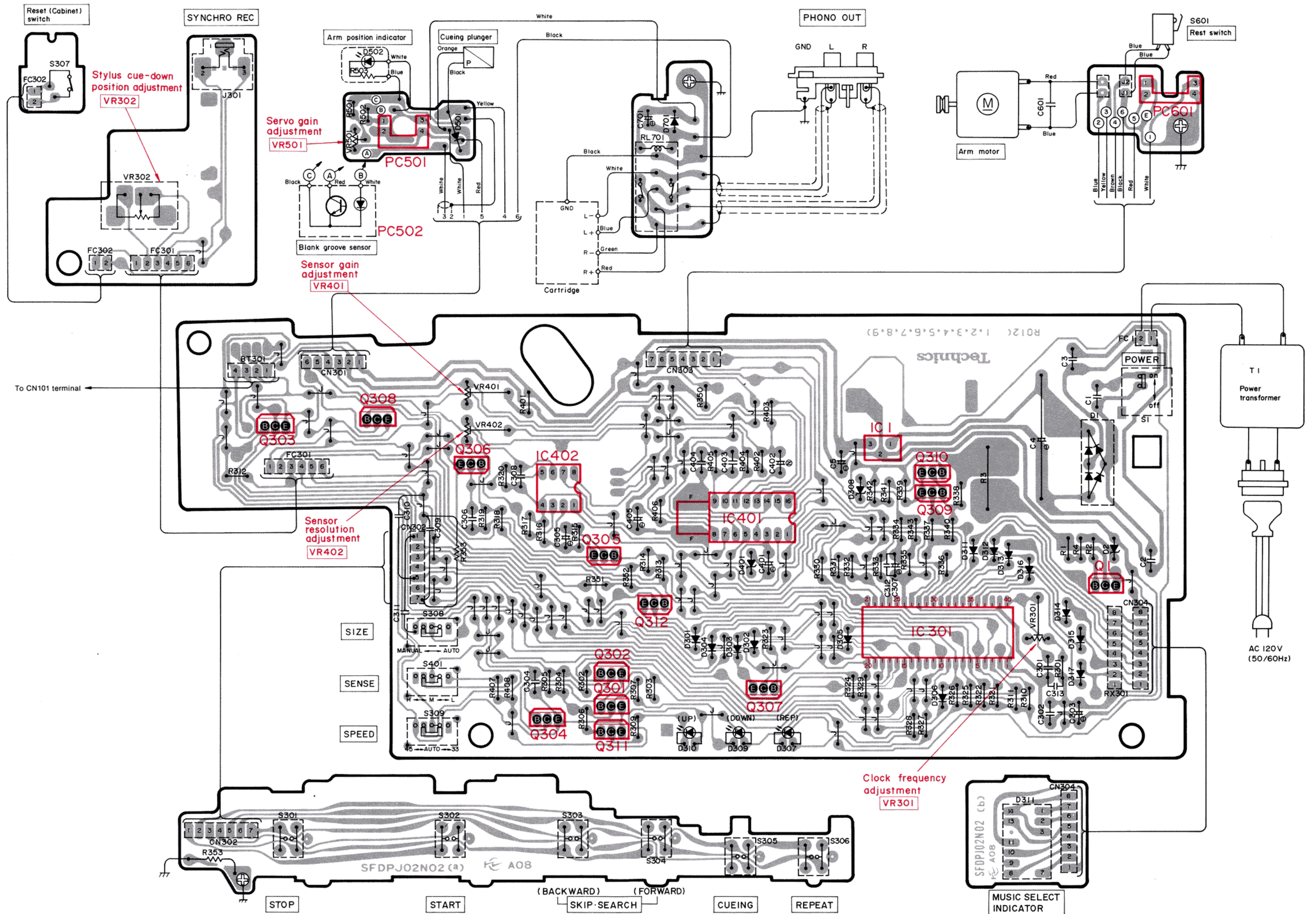
Caution:
Muting relay (RL701) is changed from Part No. SFDYQ11N02 to Part No. SFDYG5A237P in the course of production.
When placing an order for replacement parts, see the illustration given above.

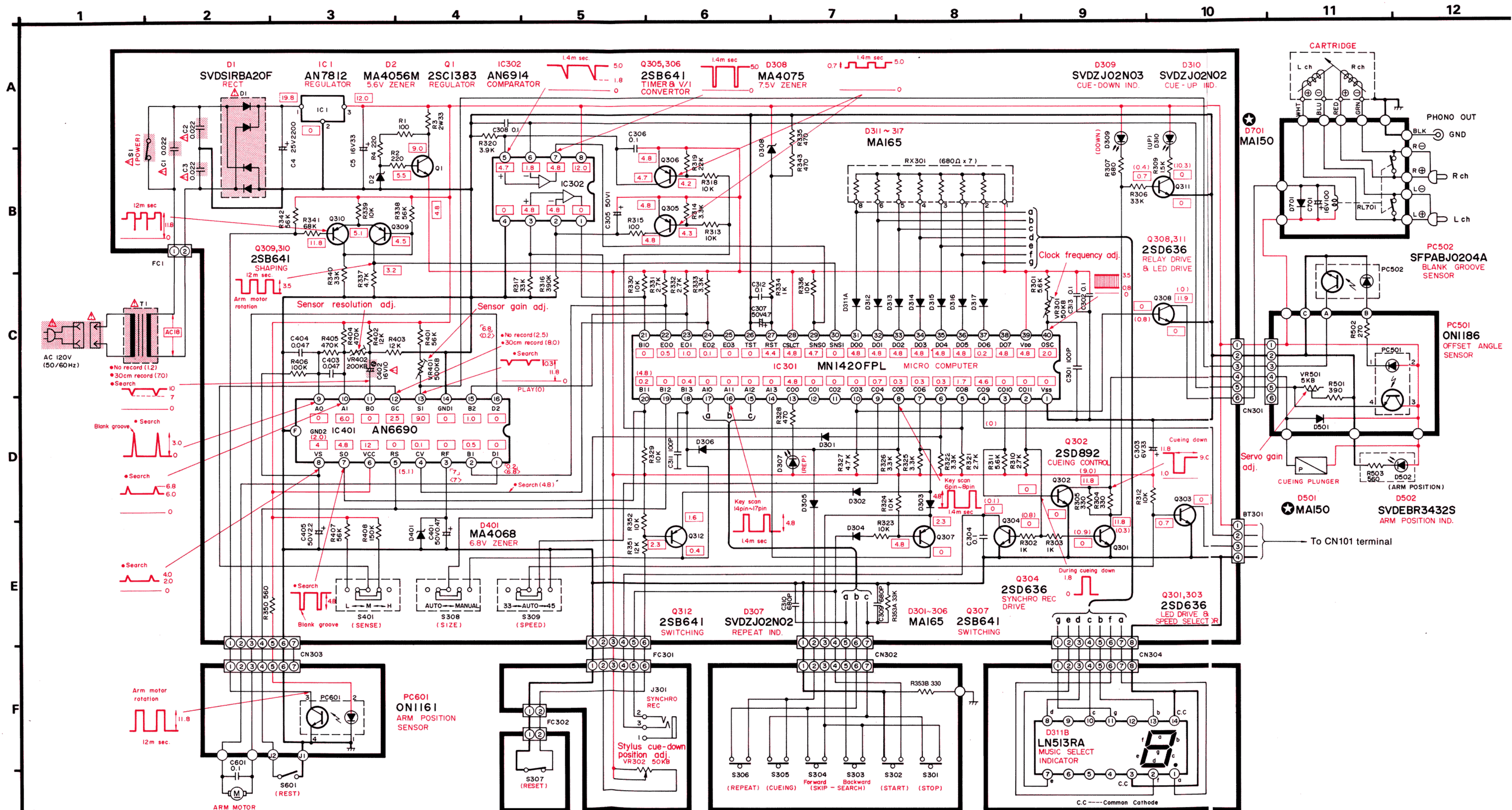
■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM



● Terminal guide of transistors, and IC's

 <table><tr><td>AN6914</td><td>8 pin</td></tr><tr><td>MN1420</td><td>40 pin</td></tr><tr><td>AN6683</td><td>18 pin</td></tr></table>	AN6914	8 pin	MN1420	40 pin	AN6683	18 pin	 <p>AN6638, AN6690</p>	 <p>2SB641, 2SD636</p>	 <p>2SD8921, 2SC1383</p>	 <p>AN7812</p>
AN6914	8 pin									
MN1420	40 pin									
AN6683	18 pin									





■ SCHEMATIC DIAGRAM

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

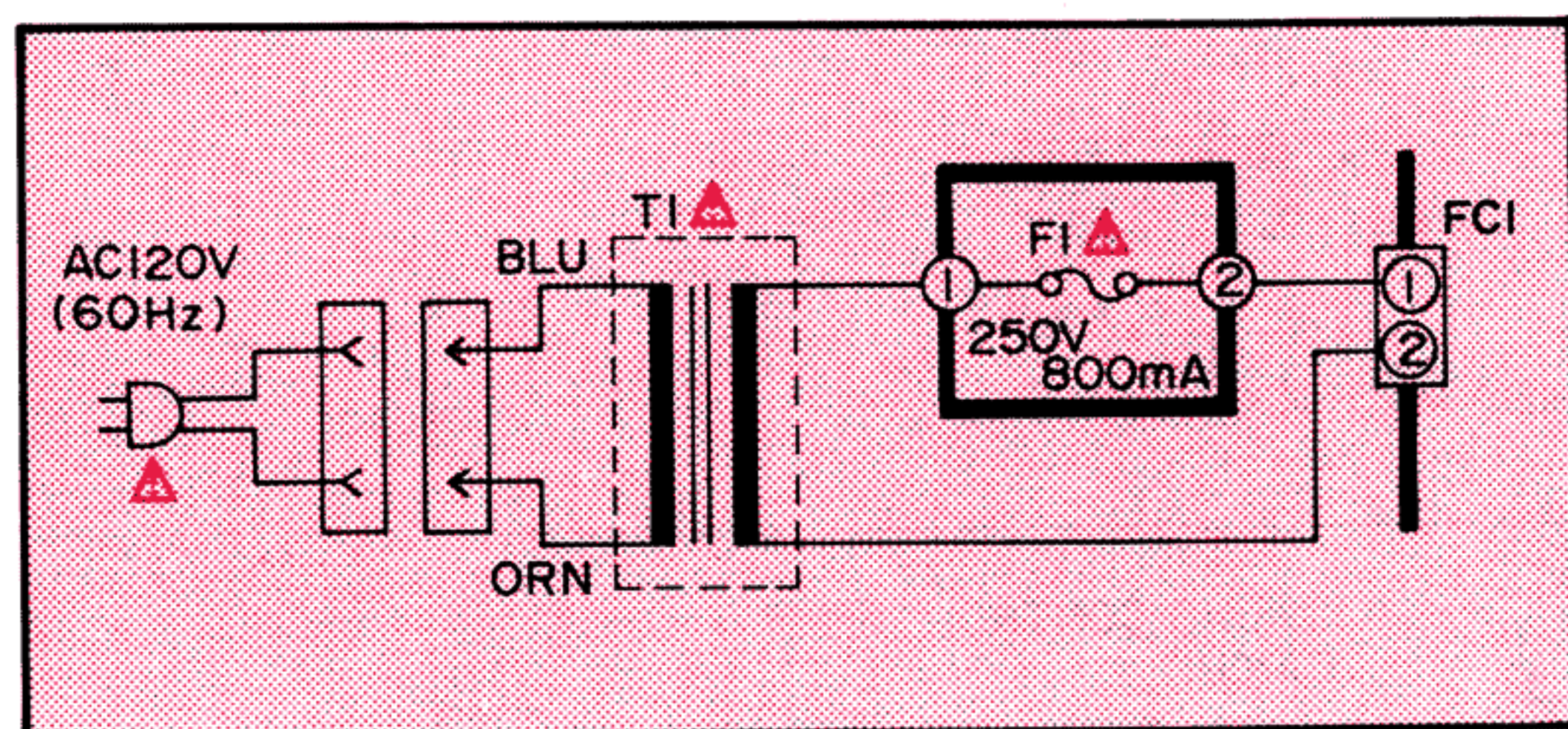
IMPORTANT SAFETY NOTICE

The shaded area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

Notes:

1. **S1** : Power switch in "on" position.
2. **S301** : Stop switch.
3. **S302** : Start switch.
4. **S303** : Backward skip/search switch.
5. **S304** : Forward skip/search switch.
6. **S305** : Cueing control switch.
7. **S306** : Repeat switch.
8. **S307** : Cabinet (Reset) switch in "on" position. (Upper cabinet is closed)
9. **S308** : Record size selector switch in "auto" position.
10. **S309** : Speed selector switch in "auto" position.
11. **S401** : Sensitivity selector switch in "M" position.
12. **S601** : Rest switch in "off" position. (Presently tonearm is on rest.)
13. The voltage value and waveform are the standard values of this measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Therefore, the voltage value and waveform may include some error due to the internal impedance of the tester or the measuring unit.
 - * is the voltage when turntable is stop.
 - * is the voltage when turntable is in rotation.
 - * is the voltage when tonearm is in lead-in mode.
 - * is the voltage when tonearm is in return mode.
 - * is the voltage at 45 rpm.
14. Positive voltage lines.
15. Important safety notice: Components identified by mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

- Power source circuit
Product for [MC] only.



• Product for MC only

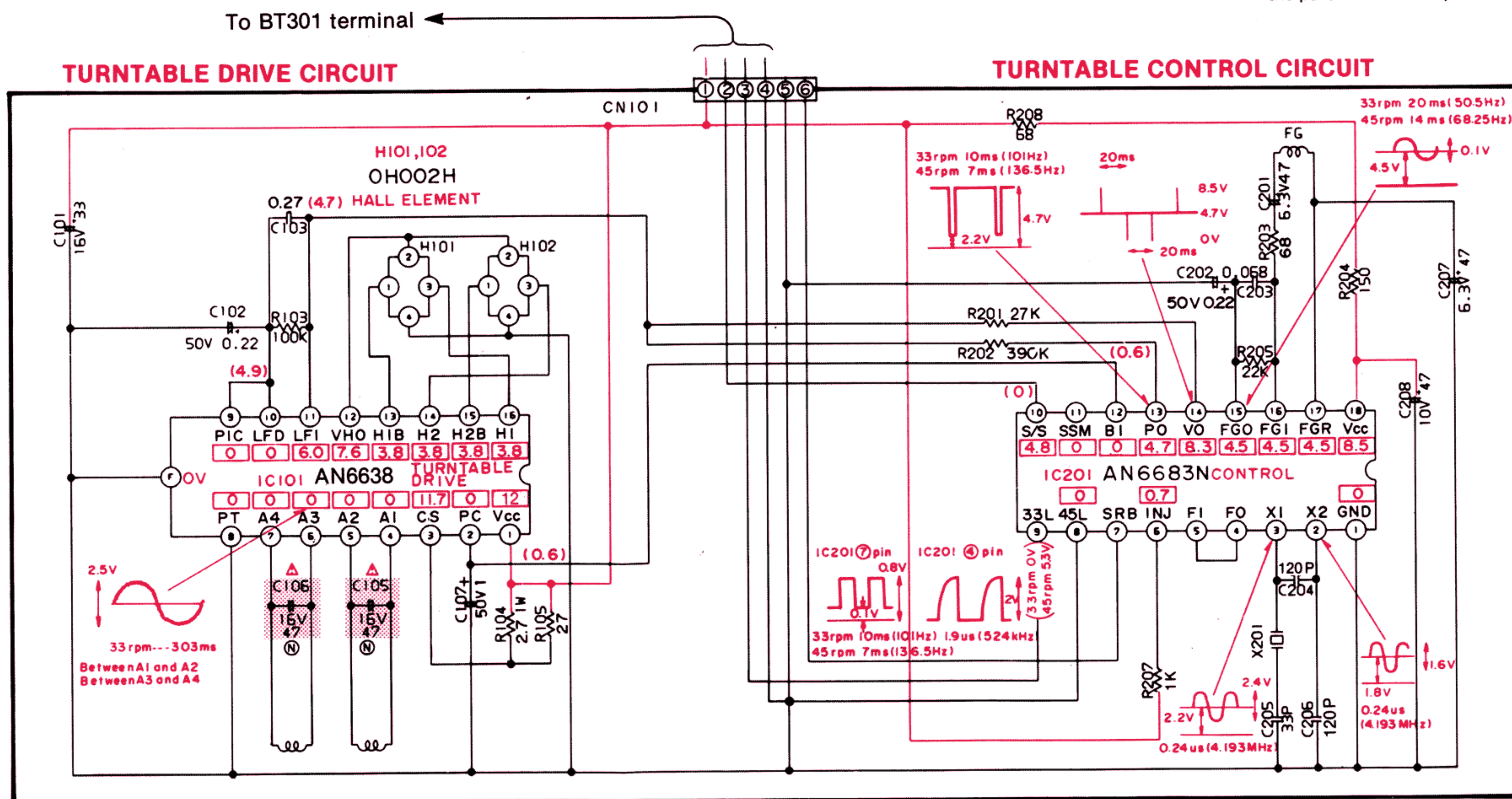
FUSE REPLACEMENT

Symbol located near the fuse indicates fast operating type. For continued protection against fire hazard, replace with same type fuse. Refer to the symbol for fuse rating.

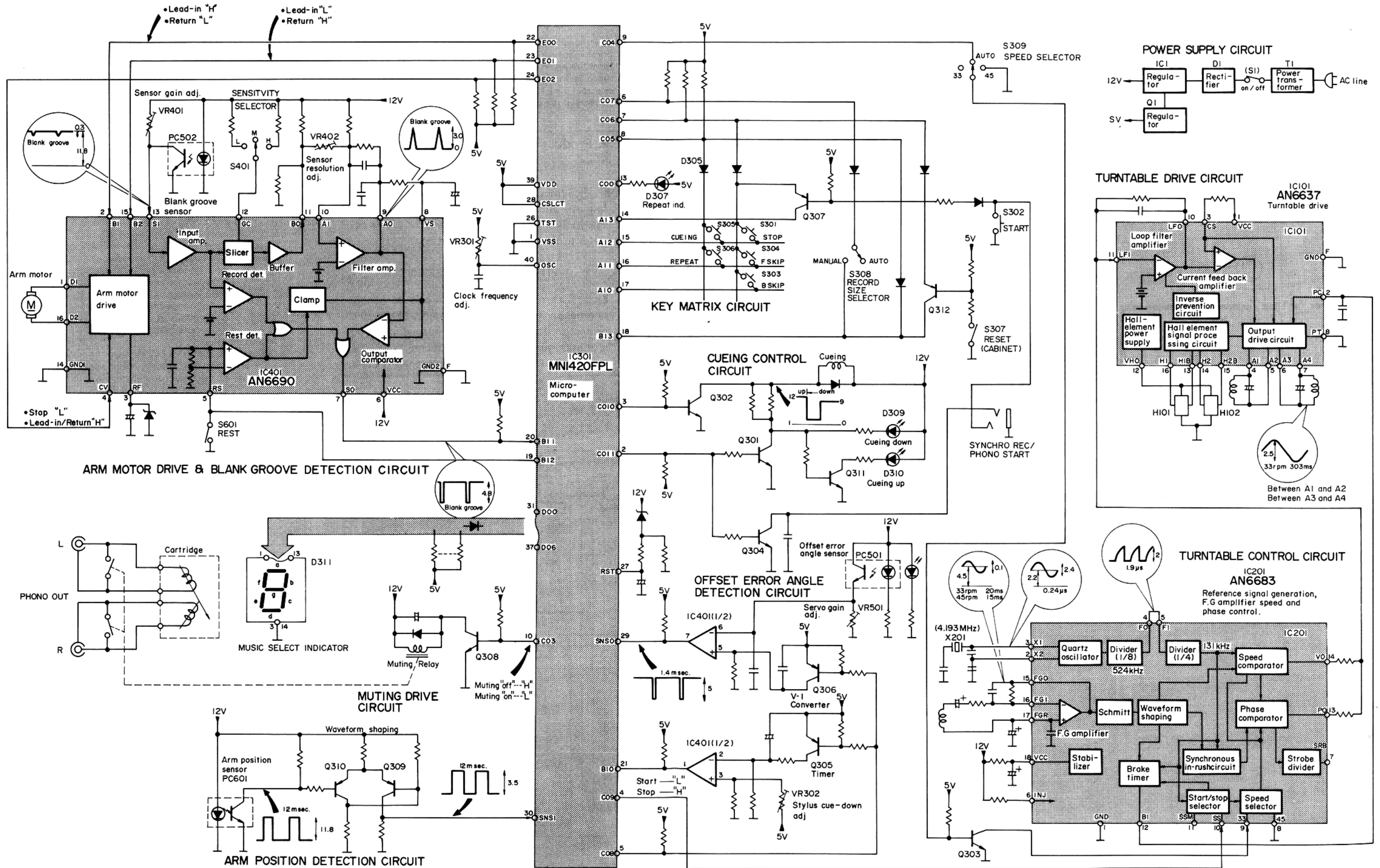
FUSIBLE REMPLACEMENT

Le symbole qui se trouve près du fusible signifie un fusible à action rapide. Pour une protection continue contre les risques d'incendie, n'utiliser que des fusibles du même type. Se rapporter au symbole pour la valeur des fusibles.

*The part No. of diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. with mark the production part No. are different from the replacement part No. Therefore, when placing an order for replacement part, please use the part No. in the replacement parts list.

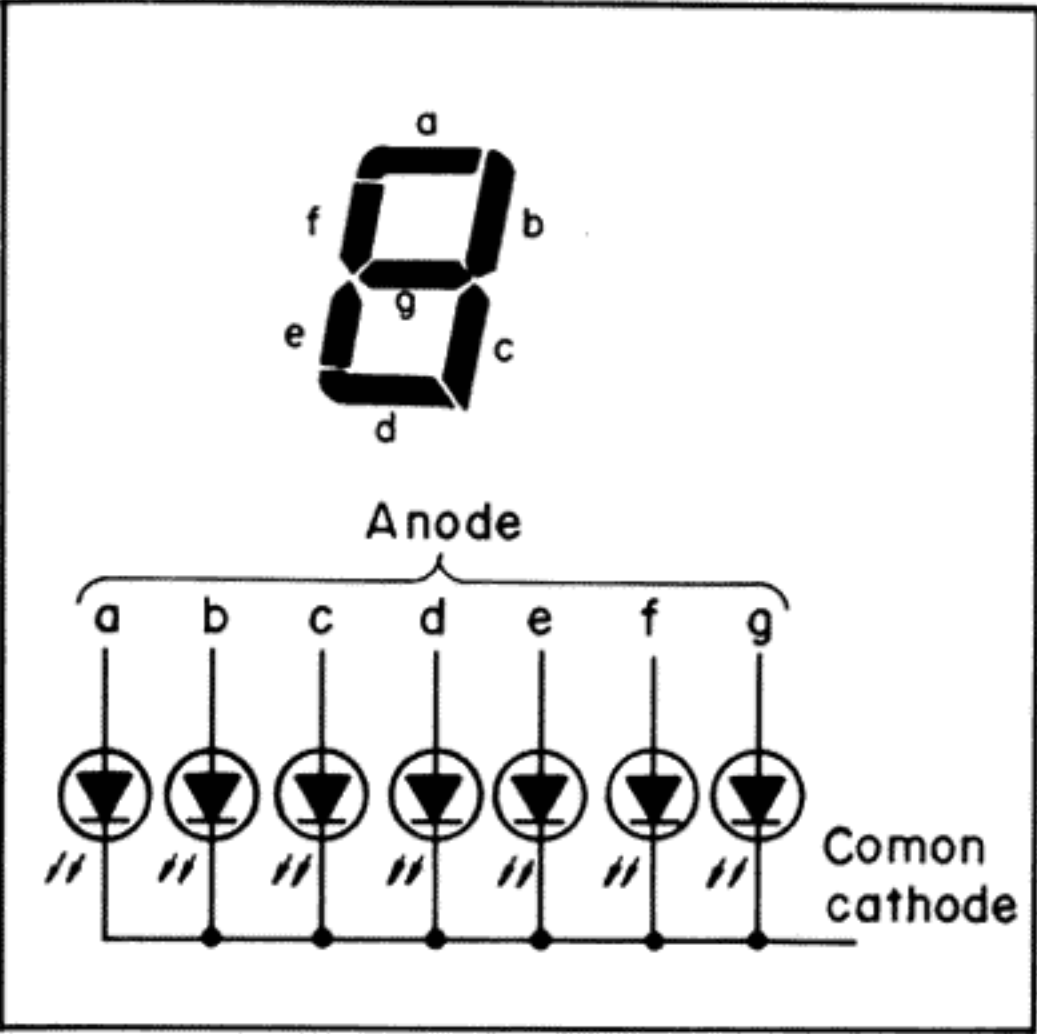


■ BLOCK DIAGRAM



- Music selector indicator (D311) and microcomputer (IC301) terminal voltage

D311 (LN513RA)



IC301 (MN1420FPL)

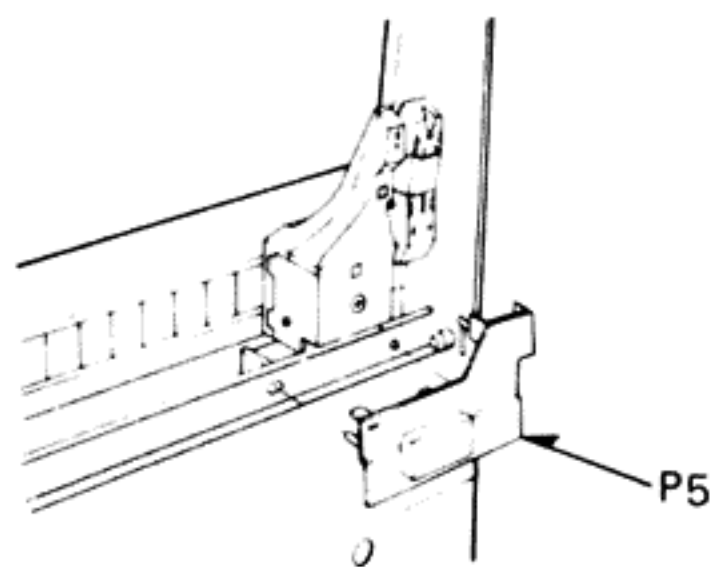
Pin No.	31 (DO0)	32 (DO1)	33 (DO2)	34 (DO3)	35 (DO4)	36 (DO5)	37 (DO6)
Display	a	b	c	d	e	f	g
0	H	H	H	H	H	H	L
1	L	H	H	L	L	L	L
2	H	H	L	H	H	L	H
3	H	H	H	H	L	L	H
4	L	H	H	L	L	H	H
5	H	L	H	H	L	H	H
6	H	L	H	H	H	H	H
7	H	H	H	L	L	H	L
8	H	H	H	H	H	H	H
9	H	H	H	H	L	H	H

■ FUNCTION OF TERMINAL (MN1420FPL)

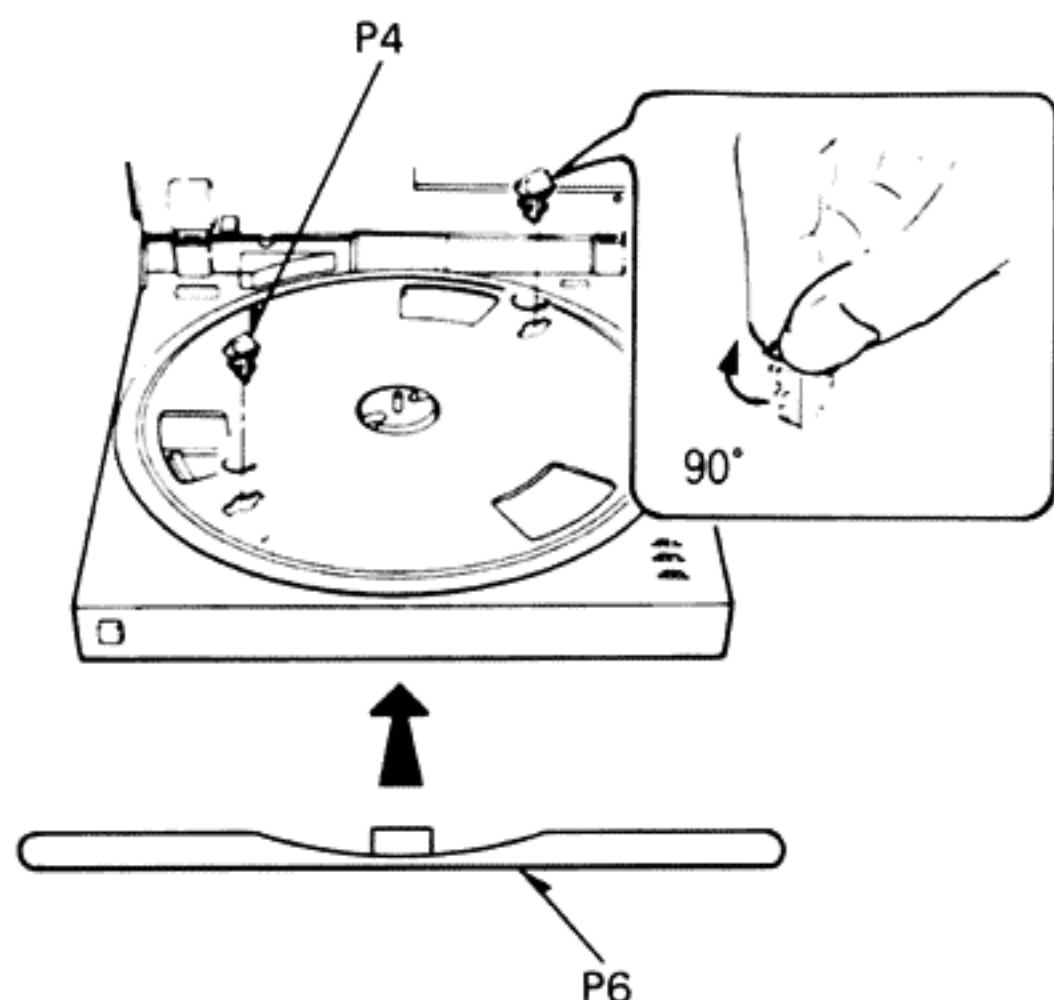
Pin No.	Symbol	Description
1	VSS	Ground terminal
2	CO11	Cueing control terminal ("H" during cueing and cueing down)
3	CO10	Cueing control terminal ("H" only cueing down)
4	CO9	Turntable start/stop select terminal (Start at "L", stop at "H")
5	CO8	Key scan output terminal (Each key is read in through key scan with A-port)
6	CO7	
7	CO6	
8	CO5	
9	CO4	Turntable speed select output terminal (45 rpm "L", 33 rpm "H")
10	CO3	Muting control terminal (Muting on "L", Muting off "H")
11	CO2	Not used in this unit
12	CO1	
13	CO0	Repeat indicator output terminal (Indicator ON at "L")
14	AI3	Key scan input terminal (Each key is read in through key scan with C-port)
15	AI2	
16	AI1	
17	AI0	
18	BI3	Record size selector input terminal (Read in through key scan with C-port)
19	BI2	Rest position detection input terminal ("L" when tonearm is on rest)
20	BI1	Blank detection and record detection terminals (Blank pulse is active at "L"; 30 cm record is present with "H" at rest position; 30 cm record is not present with "L". When it is at "L" outside the rest position, 17 cm is present; and no record is present at "H".)
21	BI0	Cueing time read input terminal
22	EO0	Arm motor drive control terminal
23	EO1	
24	EO2	
25	EO3	Not used in this unit
26	TST	Test terminal
27	RST	Reset terminal (Micom is reset at "L")
28	CSLCT	Select terminal
29	SNS0	Offset angle detection signal input terminal
30	SNS1	Arm position detection signal input terminal
31	DO0	Segment display output terminal (Lights up at "H")
32	DO1	
33	DO2	
34	DO3	
35	DO4	
36	DO5	
37	DO6	
38	DO7	Not used in this unit
39	VDD	Power supply terminal
40	OSC	Oscillation circuit (Clock frequency is adjusted to 1.36ms)

■ PACKING

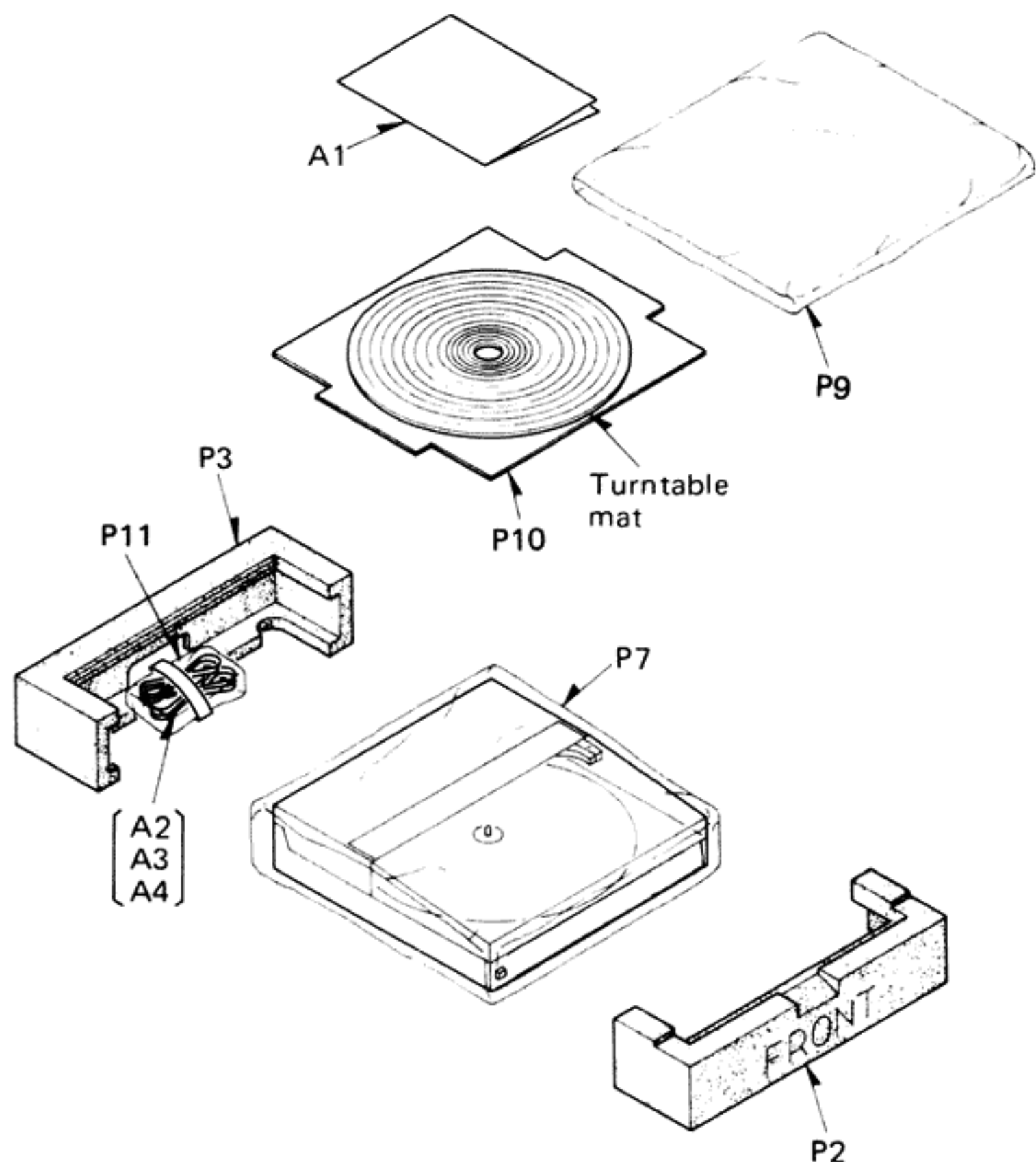
1. Open the upper cabinet and fit the spacer in place.



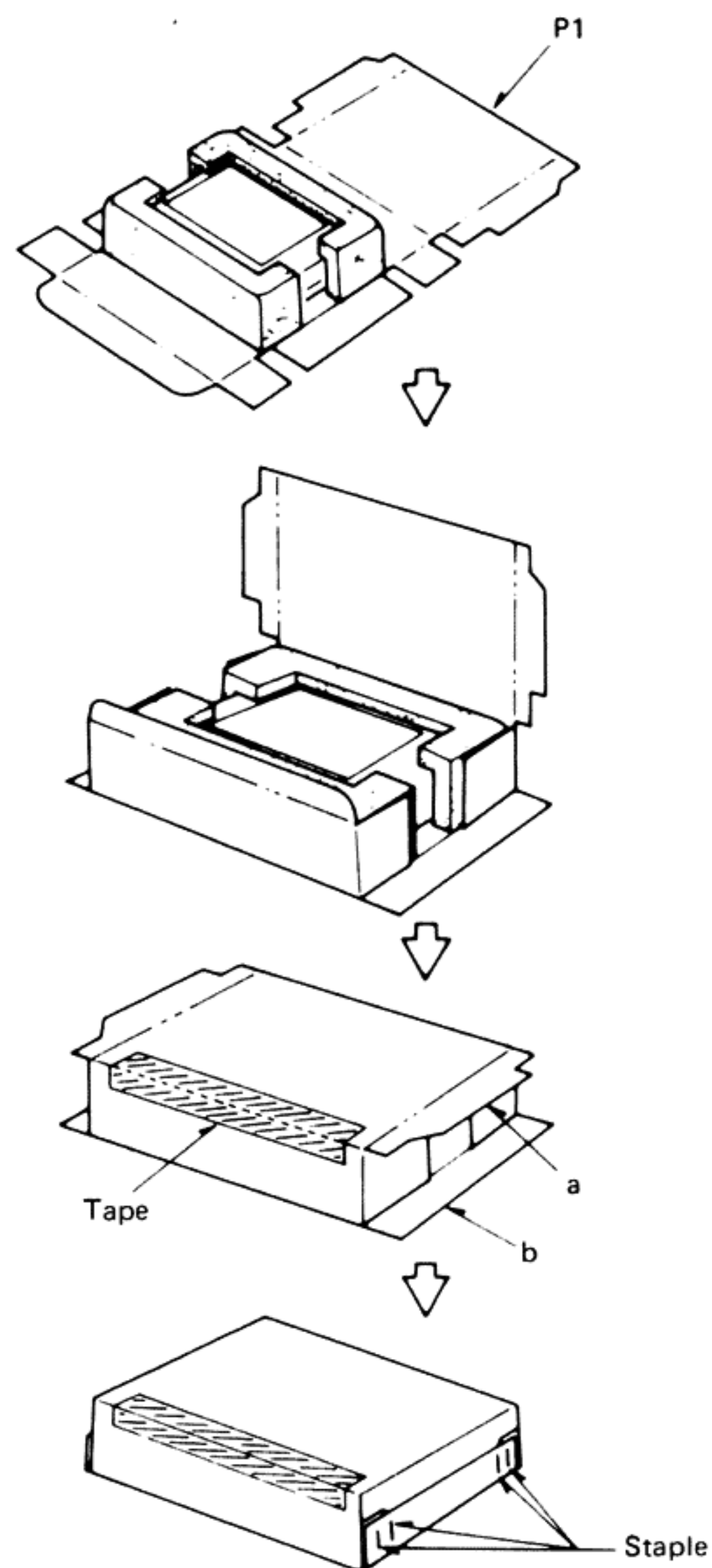
2. Fit the turntable platter clumper and dust cover spacer in place.



3. Put the into polyethylene bag, and make the package as shown below.



4. Place the unit (with cushions attached) as illustrated.
5. Fold the flaps according to the line marks.
6. Seal the top with adhesive tape.
*Use gum tape or adhesive cloth tape of 50mm wide at least.
7. For the edges, first fold the flap "a" and then flap "b", and staple. Remember to staple only flap "b". (Use 15 or 16mm staple)



*Stapling positions are shown below.

