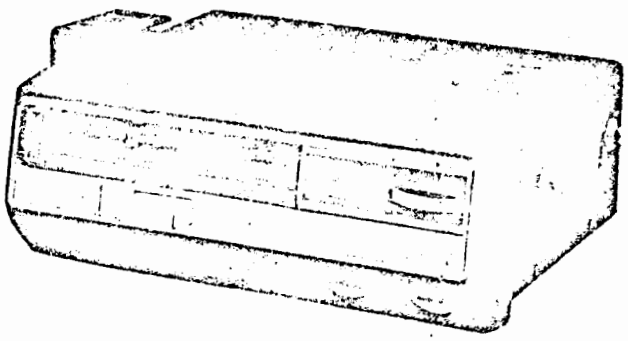


HITACHI
Hitachi, Ltd. Tokyo Japan

CASSETTE CAR STEREO PLAYER

MOEDL CS-204

SERVICE MANUAL

No. 272 1969

SPECIFICATIONS

TRANSISTORS ..... 2SC281×9, 2SC458×2, 2SB337×5, 2SB77×1, 2SB367×1, 2SB370×1
DIODES ..... TR-9S×1, HR-5A×1
THERMISTORS ..... D-1B×2
TAPE SPEED ..... 1⅞ ips (4.75cm/s)
CARTRIDGE ..... Compact cassette (C-30, C-60 and C-90)
TRACK SYSTEM ..... 4-track stereo
PLAYING TIME ..... 30 min. (used "C-30")
60 min. ("C-60")
90 min. ("C-90")
FREQUENCY RANGE ..... 50~10,000Hz

AUDIO OUTPUT ..... integrate 10W (4 speakers, 1 channel 4 ohms)
integrate 6W (2 speakers, 1 channel 8 ohms)
OUTPUT IMPEDANCE ... 4~8 ohms
POWER SUPPLY ..... DC 12V, negative ground
CURRENT CONSUMPTION 0.5A
MOTOR ..... Micromotor with governor
DIMENSIONS ..... 2¾"(H)×7 7/8"(W)×6¾"(D) (7×20×17cm)
WEIGHT ..... 6 lbs. 3 oz. (2.8kg)

ACCESSORIES

Connecting cord 1
Installation parts ..... 1 set
Fuse 1

CONTROLS

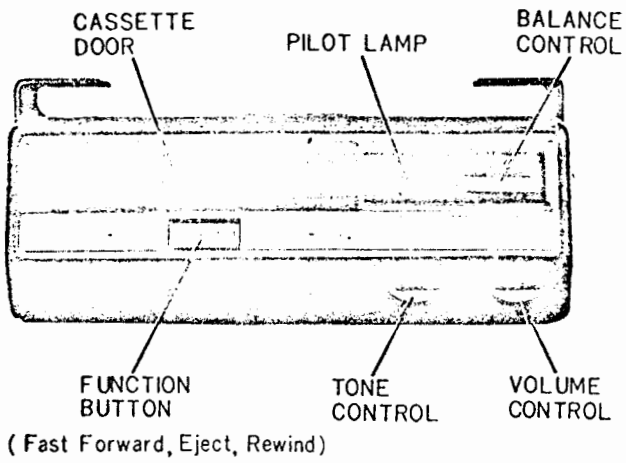


Fig. 1

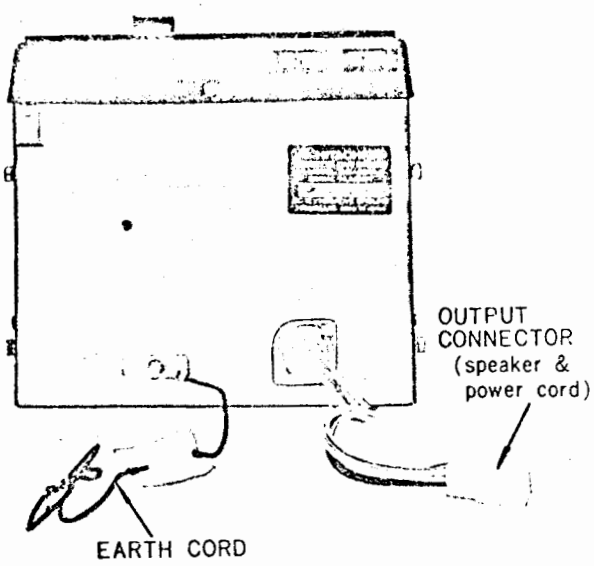


Fig. 2

BLOCK DIAGRAM

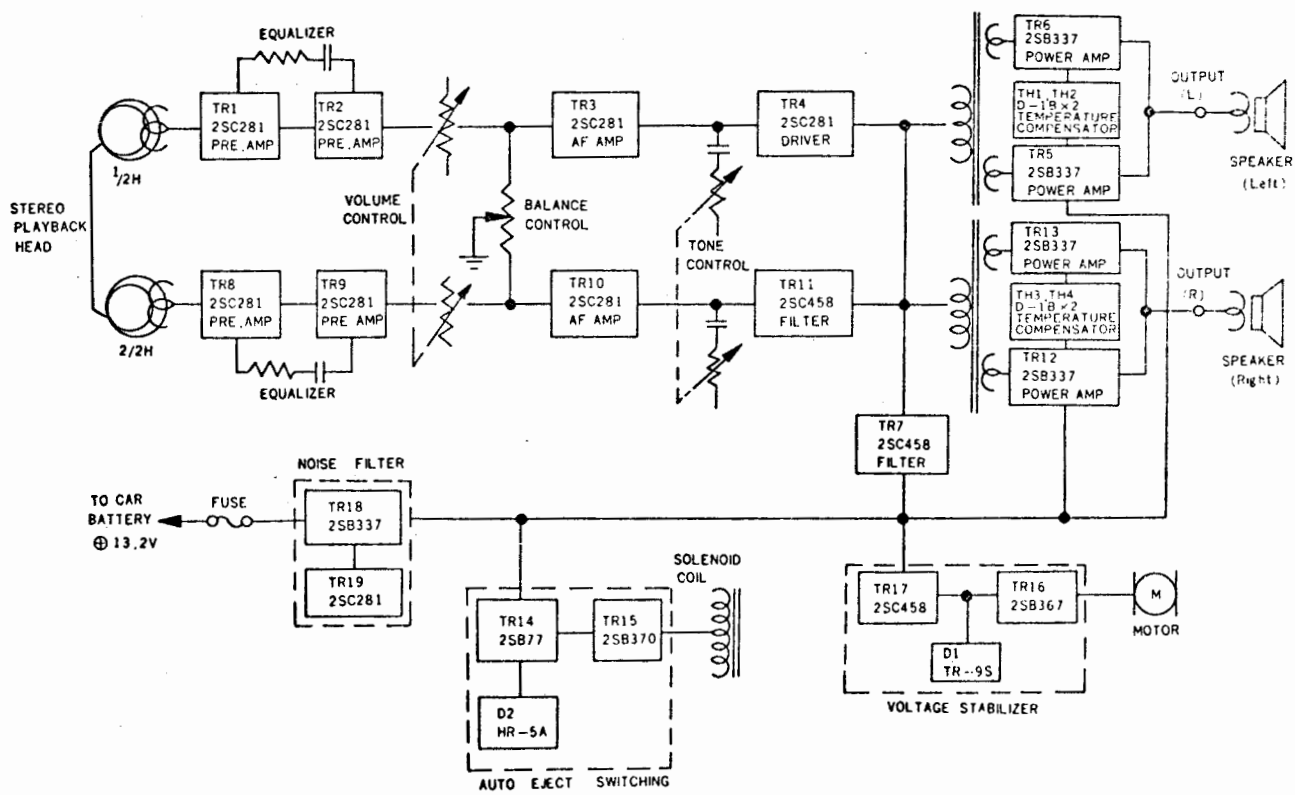


Fig. 3

DISASSEMBLY

To check, repair and lubricate, disassemble the player in the following manner.

1. Removal of front panel
   Remove three screws holding front panel shown in Fig.4.
2. Removal of upper cover
   Remove six screws holding upper cover shown in Figs. 4 and 5.
3. Removal of under cover
   Remove three screws holding under cover shown in Fig.6.

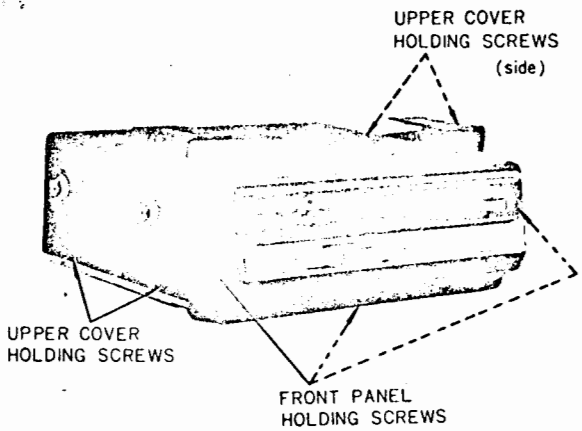


Fig. 4

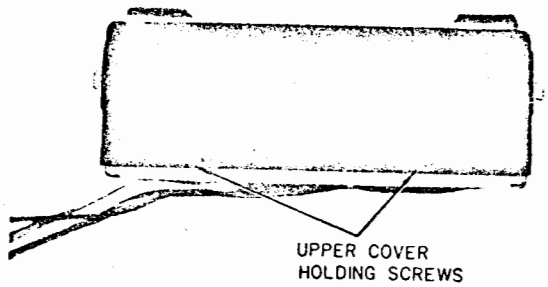


Fig. 5

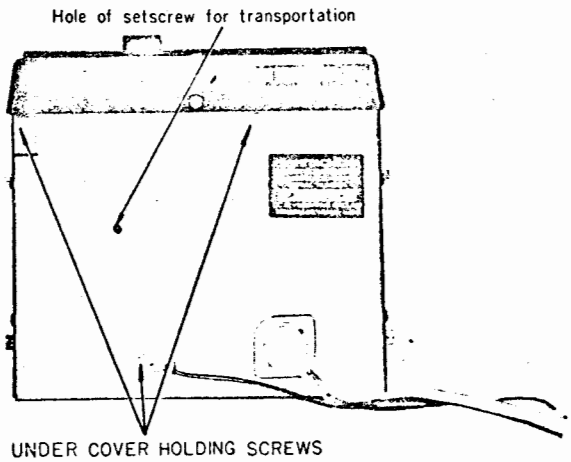


Fig. 6

LUBRICATION

Apply oil as shown in Figs. 7 and 8.

Caution
Belt, capstan and pinch roller may slip when they catch oil. Wipe them away with alcohol.

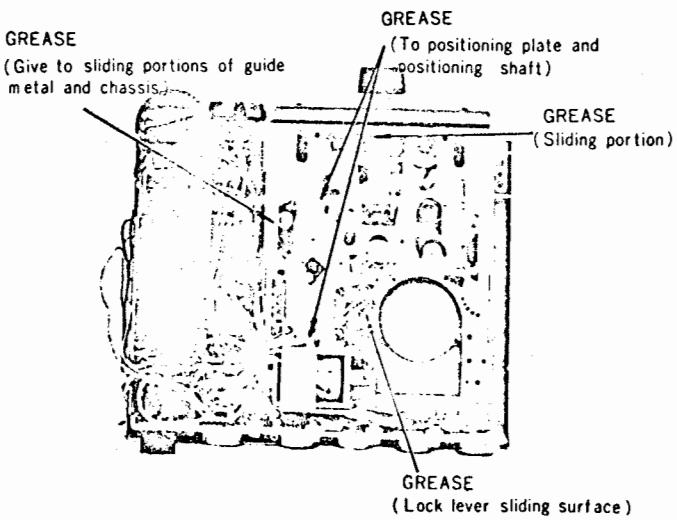


Fig. 7

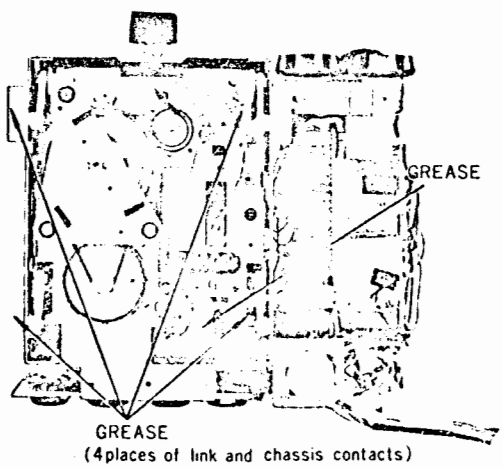


Fig. 8

INTERNAL VIEW

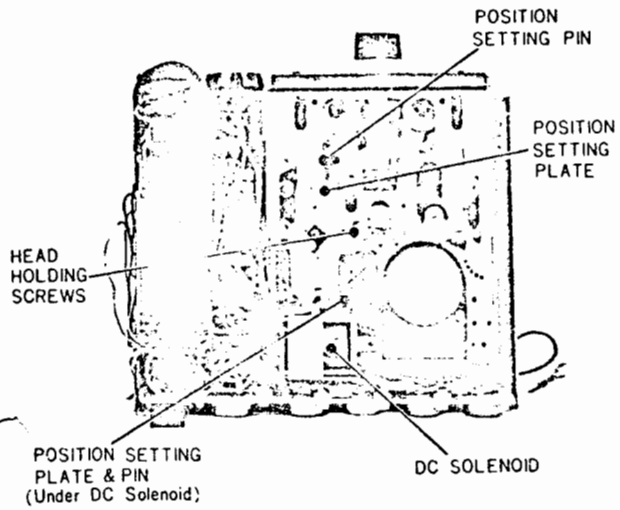


Fig. 9

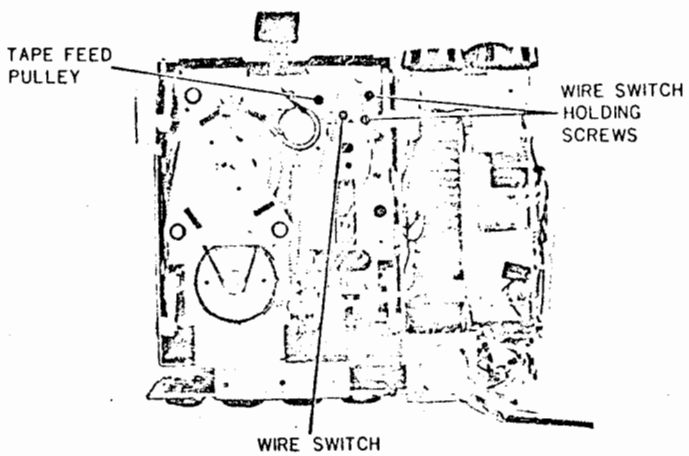


Fig. 10

CIRCUIT ADJUSTMENT

1. Adjustment of Wire Switch

Adjust the wire switch so that it operates by the rotation of the feed pulley as illustrated below. When mounting the wire switch to the movable chassis, clamp two set-screws shown in Fig. 11 carefully, taking into consideration that the mouning holes have some looseness.

Fig. 12····· ①-② ON, ①-③ OFF
Fig. 13····· ①-③ ON, ①-② OFF
} Make sure that the fixed wire bends in a constant amount when the player is set to ON.

In adjustment take care so as to prevent the wire part of switch from deformation.

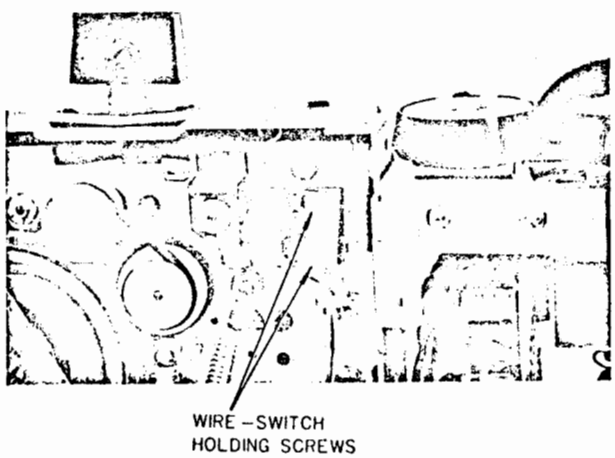


Fig. 11

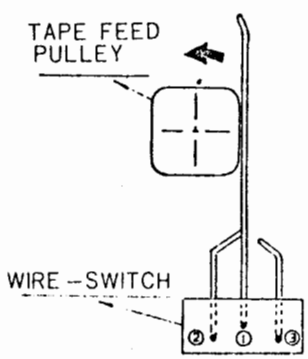


Fig. 12

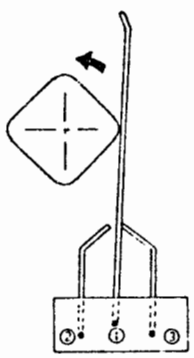


Fig. 13

2. Adjustment of Magnetic Head

(1) Remove the upper cover.

(2) Connect a vacuum tube voltmeter in parallel to either right or left speaker.

(3) Play the angle adjusting tape.

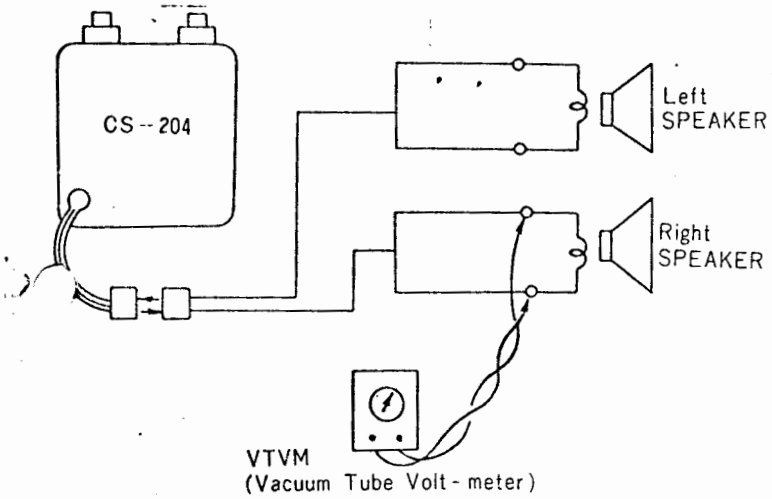


Fig. 14

(4) Set TONE CONTROL and VOLUME CONTROL to the maximum, and also BALANCE CONTROL to the medium position.

(5) By turning the head mounting screw shown in Fig. 15, adjust the head angle to the position, where the angle adjusting tape produces maximum output.

(6) After adjustment fix the mounting screw portion with "white paint".

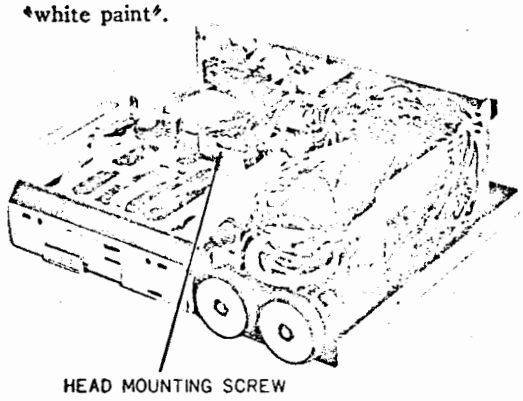
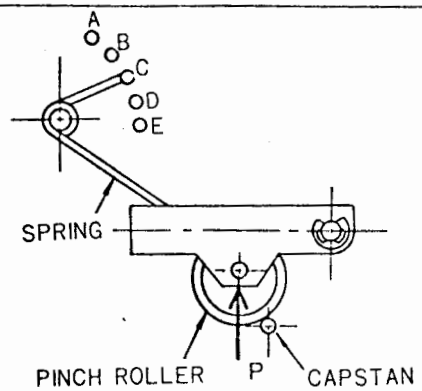
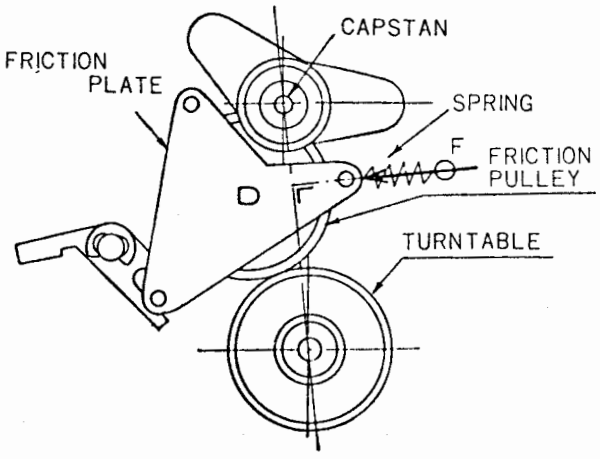
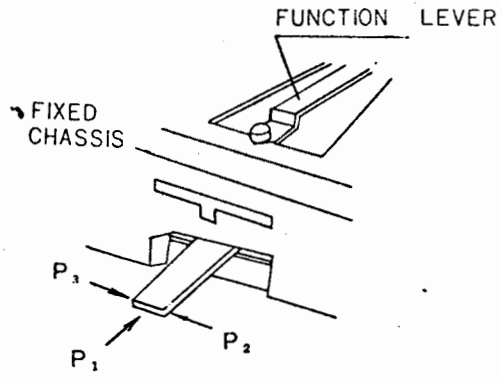
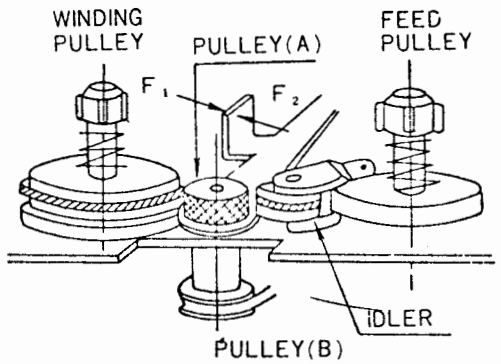


Fig. 15

MECHANISM CHECK POINTS

Item NO.	Measurement Item	Reference Value	Measuring or Adjusting Method	Reference
1	Pinch roller pressing force	P=550gr±80gr	Insert the spring into a hole satisfying the load indicated in left.	 Fig. 16
2	Friction pulley pressing force	F=50-90gr	Measure at the tip of friction plate when the turntable starts to rotate. Pressing force is measured at right angle to the line between centers of turntable and capstan.	 Fig. 17

3	Winding torque	50-90 gr-*cm*	Measure on the turntable.	
4	Back tension torque of winding and feeding sides	Not more than 10gr-*cm*	Measure on the turntable.	
5	Fast forwarding torque	Not less than 50gr-*cm*	Measure on the turntable.	
6	Rewinding torque	Not less than 50gr-*cm*	Measure on the turntable.	
7	Operating force	Each operating force less than 2.5*kg*	Measure in PLAY condition	 Fig. 18
	Pulley pressing force at the time of fast forwarding and rewinding	90-140 gr	Measure at the oscillation lever lug when the turn table starts to rotate. Fast forwarding: F1 Rewinding: F2	 Fig. 19
9	Cassette inserting	Less than 3.5*kg*	At the center of cassette	

MECHANISM ADJUSTMENT

1. Adiustment of Positioning Pin (Fig. 20)
The positioning pin is adjusted in PLAY condition so that the pin head contacts with both shoulders of the positioning plate, and also the positioning plate is raised within 1.0-1.5㎜ from the upper surface of fixed chassis. The positioning pin is locked with nuts (at two places).

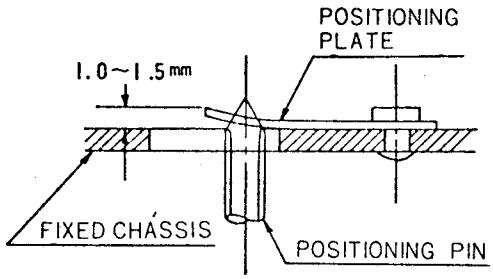


Fig. 20

2. Adjustment of Current Consumption at Upper Metal Holder (Fig. 21)
Fix the upper metal holder at the position where the current consumption reaches the minimum.

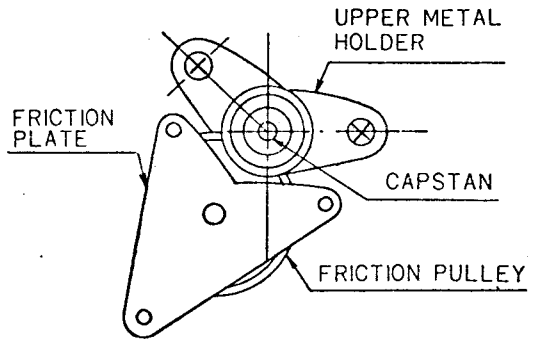


Fig. 21

3. Mounting of Locking Leaf Spring (Fig. 22)
As illustrated right, insert the pin attached to function lever to the 90° groove carry out positioning, mount the locking leaf spring so that the locking roller meets the 90° angled portion of fast forwarding lever and adjust the balance of left and right movement of function lever.
Move the function lever left and right several times in PLAY condition after the movable chassis is mounted in, and thus if anything is found abnormal, perform adjustment with the aid of locking leaf spring holding screw.

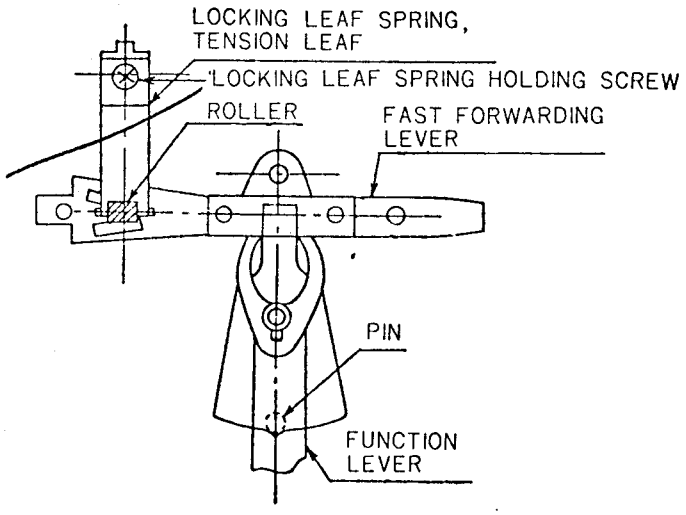


Fig. 22

4. Adjustment of Thrusting Play at Flywheel Mounting Portion. Adjust the thrusting play of flywheel section by means of clamping the thrust adjusting screw to regulate electric current, that is, turn back the adjusting screw for a little amount (about 90°) from the position where the motor load current increases rapidly, then fix it with a nut. Optimal thrusting play--0.1±0.05㎜.

5. Performance Check

Item No.	Check Point	Measuring Method and Reference Value
1	Unstable motor rotation	WMS should be not more than 0.35% at the winding end of standard tape.
2	Table speed	Should be within $^{+3}_{-1}$% at the winding end of standard tape.
3	Current consumption	Not more than 300 mA at the winding end of cassette at PLAY time.

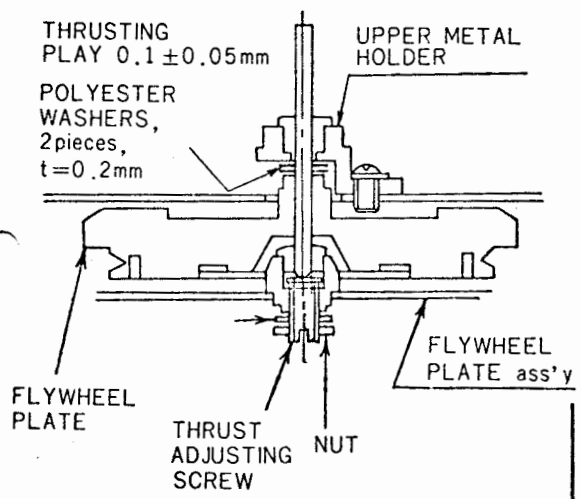


Fig. 23

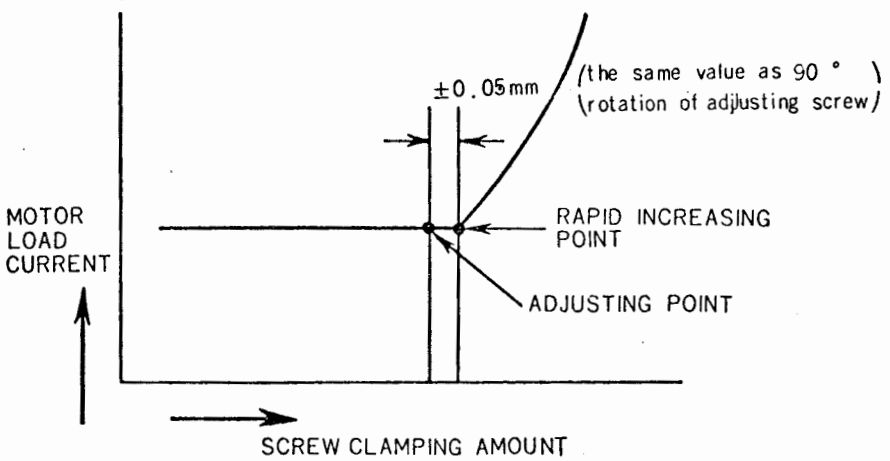
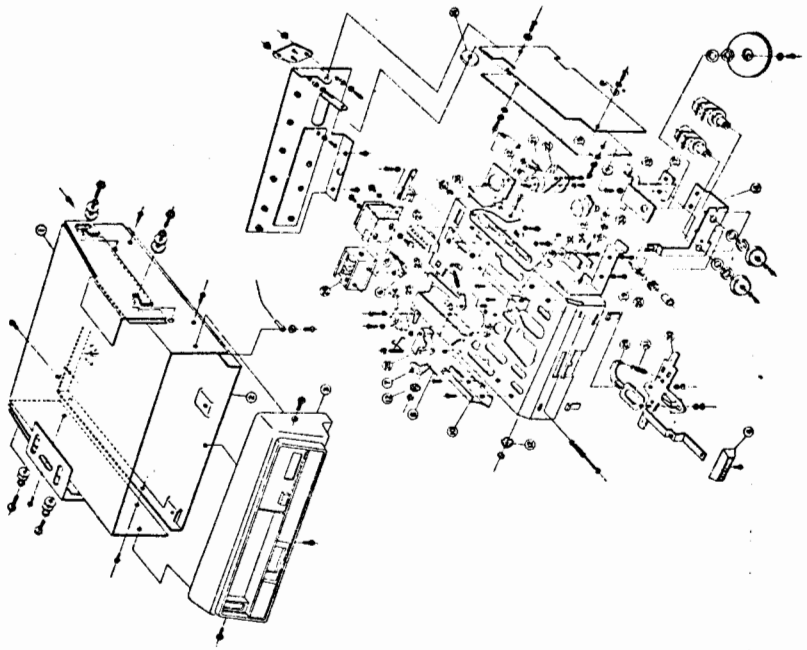
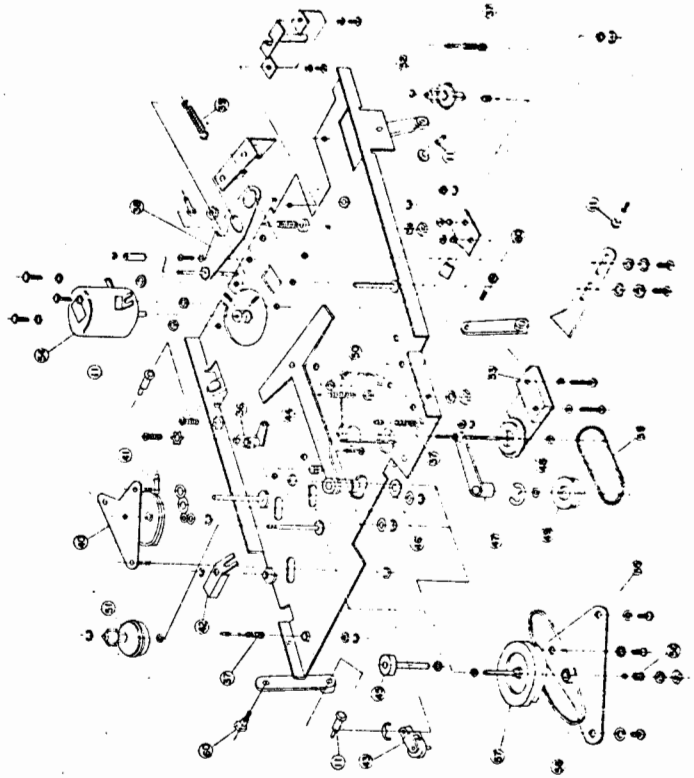


Fig. 24

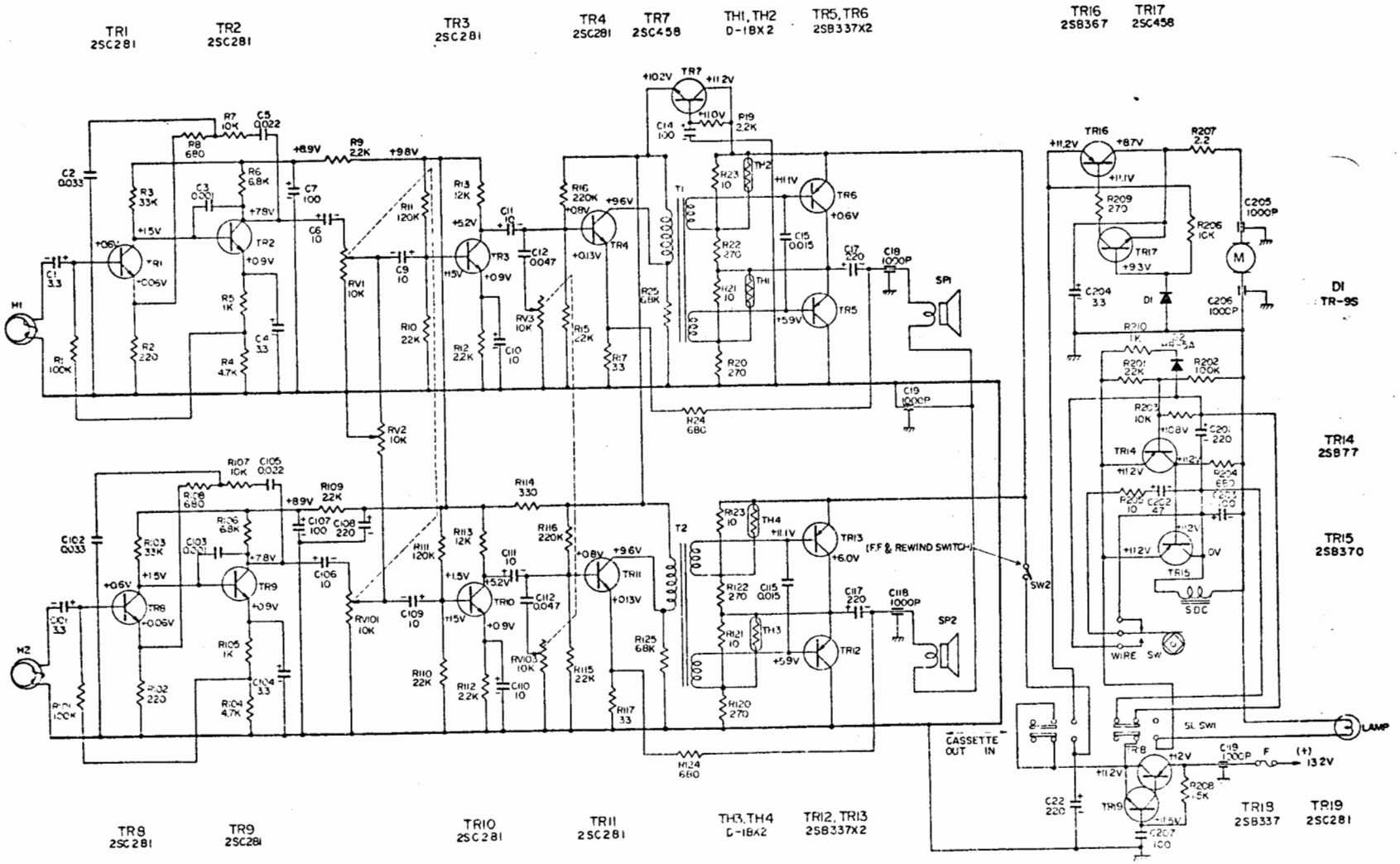
DISASSEMBLED DIAGRAM



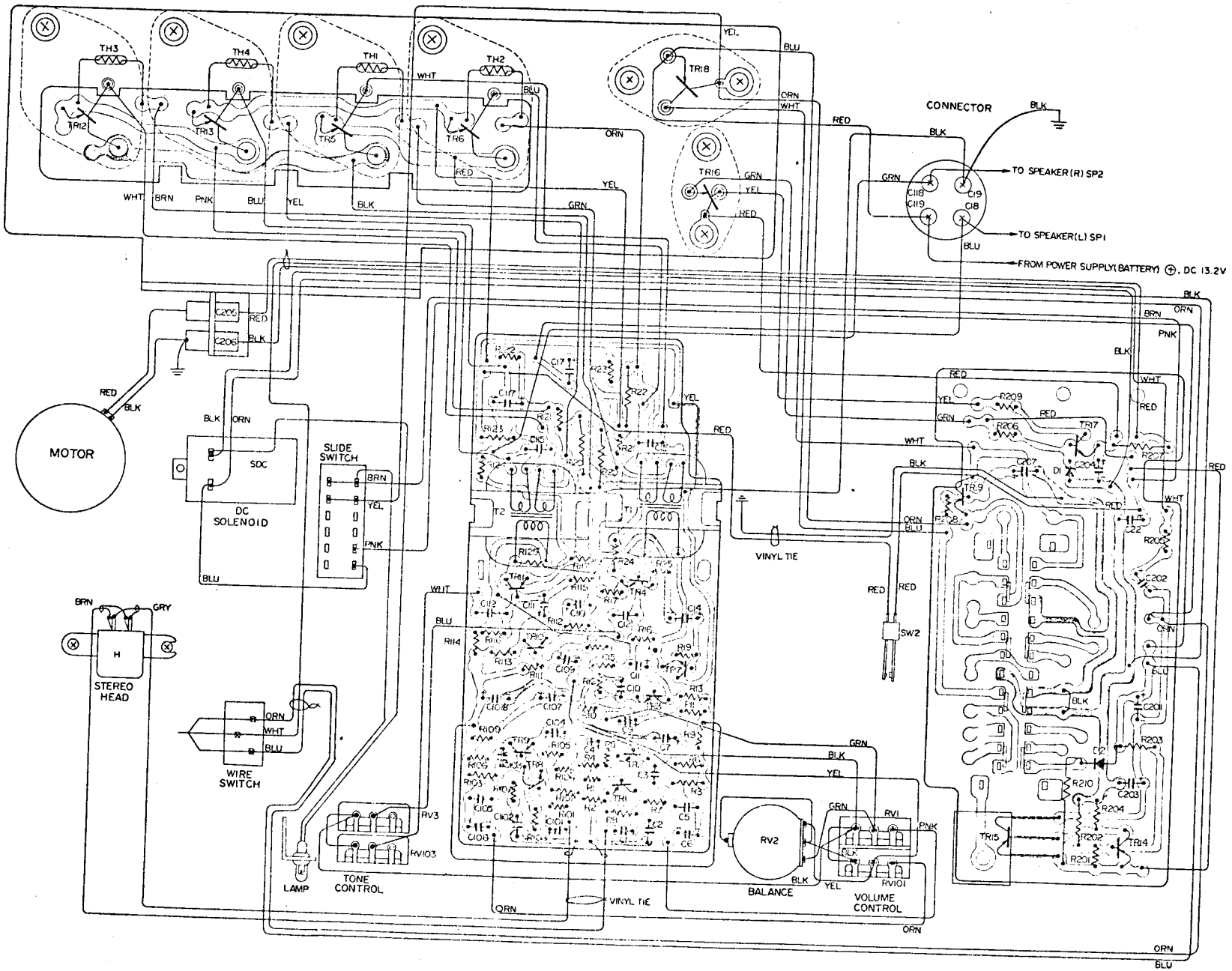


MODEL CS-204 SERVICE MANUAL

CIRCUIT DIAGRAM



IRCUIT BOARD DIAGRAM



REPLACEMENT PARTS

Symbol No.	Stock No.	Description		
		CAPACITORS:		
C1,101	0252513	Electrolytic	3.3μF	16WV
C2,102	0275014	Mylar	0.033μF±10%	50V
C3,103	0274111	Mylar	0.001μF±20%	50V
C4,104	0252513	Same as C1		
C5,105	0275113	Mylar	0.022μF±10%	50V
C6,106	0252521	Electrolytic	10μF	16WV
C7,107	0252531	Electrolytic	100μF	16WV
C 108	0252532	Electrolytic	220μF	16WV
C9,109	0252521	Same as C6		
C10,110	0252521	Same as C6		
C11,111	0252521	Same as C6		
C12,112	0275115	Mylar	0.047μF±20%	50V
C 14	0252531	Same as C7		
C15,115	0275012	Mylar	0.015μF±10%	50V
C17,117	0252532	Electrolytic	220μF	16WV
C18,118	——	included in		
C19,119	——	connector(A)ass'y		
22	0252532	Same as C17		
201	0252532	Same as C17		
C 202	0252525	Electrolytic	47μF	16WV
C 203	0252531	Electrolytic	100μF	16WV
C 204	0252513	Electrolytic	3.3μF	16WV
C 205	——	included in		
C 206	——	capacitor ass'y(M)	1000pF	
C 207	0252531	Same as C203		
C 210	0252531	Electrolytic	100μF	16WV
		RESISTORS:		
R1,101	0137951	Carbon film	100KΩ±10%	SRD¼SD
R2,102	0137805	Carbon film	220Ω±10%	SRD¼SD
R3,103	0137907	Carbon film	33KΩ±10%	SRD¼SD
R4,104	0137859	Carbon film	4.7KΩ±10%	SRD¼SD
R5,105	0137851	Carbon film	1KΩ±10%	SRD¼SD
R6,106	0137861	Carbon film	6.8KΩ±10%	SRD¼SD
R7,107	0137901	Carbon film	10KΩ±10%	SRD¼SD
R8,108	0137811	Carbon film	680Ω±10%	SRD¼SD
R9,109	0137855	Carbon film	2.2KΩ±10%	SRD¼SD
R10,110	0137905	Carbon film	22KΩ±10%	SRD¼SD
R11,111	0137952	Carbon film	120KΩ±10%	SRD¼SD
R12,112	0137855	Same as R9		
R13,113	0137902	Carbon film	12KΩ±10%	SRD¼SD
R14,114	0137807	Carbon film	330Ω±10%	SRD¼SD
R15,115	0137905	Same as R10		
R16,116	0137955	Carbon film	220KΩ±10%	SRD¼SD
117	0137765	Carbon film	33Ω±10%	SRD¼SD
R 19	0137855	Same as R9		
R20,120	0134366	Composition	270Ω±10%	RC½GF
R21,121	0137759	Carbon film	10Ω±10%	SRD¼SD
R22,122	0134366	Same as R20		
R23,123	0137759	Same as R21		
R24,124	0137811	Same as R8		
R 201	0137905	Carbon film	22KΩ±10%	SRD¼SD
R 202	0137951	Carbon film	100KΩ±10%	SRD¼SD
R 203	0137901	Carbon film	10KΩ±10%	SRD¼SD
R 204	0137811	Carbon film	680Ω±10%	SRD¼SD
R 205	0137759	Carbon film	10Ω±10%	SRD¼SD
R 206	0137901	Same as R203		
R 207	0134281	Composition	2.2Ω±10%	RC½GF
R 208	0137853	Carbon film	1.5KΩ±10%	SRD¼SD
R 209	0137806	Carbon film	270Ω±10%	SRD¼SD
RV1,101	0151370	Variable	10KΩ(C)×2	
RV 2	0151369	Variable	20KΩ(W)	
RV3,103	0151370	Same as RV1		
		TRANSISTORS:		
TR 1	0573066		2SC281(C)	
TR 2	0573066	Same as TR1		
TR 3	0573469		2SC281(C)	
TR 4	0573469	Same as TR3		
TR 5	0573040		2SB337(B)P	
TR 6	0573040	Same as TR5		
TR 7	0573479		2SC458(A)	

Symbol No.	Stock No.	Description	
TR 8	0573066	Same as TR1	
TR 9	0573066	Same as TR1	
TR 10	0573169	Same as TR3	
TR 11	0573469	Same as TR3	
TR 12	0573040	Same as TR5	
TR 13	0573040	Same as TR5	
TR 14	0573119		2SB77(C)
TR 15	0573022		2SB370(A)
TR 16	0573030		2SB367(A)
TR 17	0573479		2SC458(A)
TR 18	0573040	Same as TR5	
TR 19	0573469		2SC281(C)
D 1	5330011	Zener diode	TR-9S
TH 1	0576028	Thermistor	D-1B
TH 2	0576028	Same as TH1	
TH 3	0576028	Same as TH1	
TH 4	0576028	Same as TH1	
		TRANSFORMERS:	
T 1	0441058	Driver	
T 2	0441058	Same as T1	
		MISCELLANEOUS:	
		for Final assembly	
①	6116471	Upper cover	
	8832110	Belt-5mmϕ×10mm	
	8811117	Washer-5mmϕ	
	8813127	Washer-5mmϕ spring washer	
	7661222	Rubber plate	
	8815127	Washer-5mmϕ lock washer	
	8821117	Nut-5mmϕ	
②	6116481	Case	
	5740661	Earth cord	
	7771884	Screw-3mmϕ×8mm set lock washer	
	7771873	Screw-3mmϕ×6mm set spring washer	
	8744306	Screw-3mmϕ×6mm bind (5 req'd)	
③	6212841	Escutchion ass'y	
	0642588	Support strap	
	0645587	Washer-special washer	
	8813124	Washer-3mmϕ spring washer	
	8745408	Screw-3mmϕ×8mm bind	
	0519138	Fuse (2A)	
	0549041	Connector (B)	
	8813127	Washer-5mmϕ spring washer (4 req'd)	
	8811117	Washer-5mmϕ (4 req'd)	
	7771622	Accessory ass'y	
		for Chassis assembly	
	6261782	Control knob ass'y	
④	6263501	Eject button ass'y	
	7771801	Washer-rubber washer (2 req'd)	for amplifier circuit board mounting
	0711308	Screw-2.6mmϕ×8mm pan head	for amp. circuit board mounting
⑭	7771801	Washer-rubber	
⑮	7710291	Spacer	
	8715112	Screw-2mmϕ×12mm pan head	
	7711601	Washer-2.5mmϕ (2 req'd)	
	8811113	Washer-2.6mmϕ (2 req'd)	for moving circuit board mounting
	0711308	Screw-2.6mmϕ×8mm pan head (2 req'd)	
	0821233	Nut-2.6mmϕ	
	8781336	Screw-2.6mmϕ×6mm tapping for radiator plate mounting	

Symbol No.	Stock No.	Description
⑰	7184531	Balance holder
	6263071	Knob
⑱	7177023	Volume holder B(2)
⑲	0594112	Pilot lamp
	6311751	Eject spring
㉑	5740211	Connector (A) ass'y (including C18,118,19,119)
㉒	0941648	Cord cover
	7771872	Screw-3㎜φ×5㎜ set spring washer (5 req'd) for cord cover, balance holder, volume holder, mounting
		for Fixed chassis assembly
	7660551	Cushion for movable chassis
	5630561	Lever switch
	7771833	Screw-2㎜φ×5㎜ set spring washer
	0940949	Staple
	7771841	Screw-2㎜φ×3㎜ set lock washer
㉓	7172612	Lock lever
	6310941	Spring
	0941258	'E' ring-3㎜φ
㉔	5440071	Playback head
㉕	6310421	Head spring
	8715108	Screw-2㎜φ×8㎜ pan head
	8811231	Washer-2㎜φ (3 req'd)
	8715105	Screw-2㎜φ×6㎜ pan head
	7164192	Plunger plate
㉖	5640012	DC Solenoid
	8781336	Screw-2.6㎜φ×5㎜ tapping (2 req'd)
	7771871	Screw-3㎜φ×4㎜ set spring washer (4 req'd)
	7175754	Lock lever holder
㉗	5620411	Slide switch 4
	7662041	Cushion for switch
㉘	7172621	Pressure roller arm ass'y
	0941257	'E' ring-2㎜φ
	6310652	Pressure roller spring
㉙	7181061	Function lever ass'y
㉚	0662175	Spring for function lever
㉛	7172663	Fast forward lever ass'y
	6704123	Thrust spacer
	8811231	Washer-2㎜φ
	0638551	Fiber washer
㉜	6311928	Plate spring
㉝	7505751	Adjusting roller
㉞	0942042	Shaft-roller shaft
	6312235	Spring for press plate
㉟	7179512	Switch plate
	7771854	Screw-2.6㎜φ×6㎜ set spring washer
		for Movable chassis assembly
㊱	6705031	Metal holder ass'y
	7771852	Screw-2.6㎜φ×4㎜ set spring washer (2req'd) for metal holder mounting
	6701391	Cassette holder
㊲	6310472	Spring-for cassette holder
	6704121	Thrust spacer
	7176062	Function shaft holder ass'y
㊳	7172762	Lock roller plate ass'y
㊴	6311252	Spring for movable chassis
㊵	7172792	Friction plate ass'y
㊶	6312161	Friction spring (2)
㊷	7178512	Friction lever
㊸	6704142	Fast forward idler ass'y
	7771431	Washer-1.2㎜φ nylon
	6311281	Spring-FF idler spring
㊹	7172821	Fast forward/rewind operating arm ass'y
	0638551	Washer-3.2㎜φ fiber washer
㊺	6340371	Pulley ass'y
㊻	7771461	Washer 6.1㎜φ
	0941561	'E'-ring-5㎜φ
㊼	6704162	Arm ass'y
㊽	6340392	Relay pulley
㊾	6340402	Pulley (B)
㊿	6350212	Belt-23.6㎜φ
(51)	6311981	Spring
(52)	6410402	Takeup pulley ass'y
(53)	6410422	Function pulley ass'y
	0662220	Back tension spring
(54)	5630172	Wire switch
	8715110	Screw 2㎜φ×10㎜ pan head 2 req'd
(55)	5570261	Motor pulley ass'y
	7771631	Washer-2.8㎜φ (3req'd)
(56)	7172841	Flywheel piate ass'y
	7167101	Thrust supporter
	0630561	Flywheel supportor
	7771832	Screw-2㎜φ×4㎜ set spring washer (2req'd)
	0239905	Capacitor ass'y (M) (including C205, 206)
	7771843	Screw-2㎜φ×5㎜ set lock washer
(57)	6370182	Flywheel ass'y
	7771873	Screw-3㎜φ×6㎜ set spring washer (3req'd)
(58)	6350021	Belt-1.2㎜□×56φ㎜
	6701381	Link
(60)	7504701	Pin link pin (B)
	0940949	Staple
	7771843	Screw-2㎜φ×5㎜ set lock washer (2req'd)
		for Printed circuit board assembly
	7176972	Radiator
	0015135	Insulating washer
	0015134	Insulating plate
	8711408	Screw-3㎜φ×8㎜ pan head (4req'd)
	8711410	Screw-3㎜φ×10㎜ pan head (4req'd)
	8815124	Washer-3㎜φ lock
	8821114	Nut-3㎜φ
	0666058	Dial bracket
	5511641	Moving circuit board ass'y
	5590112	Cassette ass'y

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