PIONEER®

Service Manual

CIRCUIT & MECHANISM DESCRIPTIONS
REPAIR & ADJUSTMENTS

ORDER NO.
ARP1260-A

LASERVISION PLAYER

LD-V4200

LaserVision

- **This service manual is applicable to the KUC type.**
- **As to the circuit and mechanism descriptions, please refer to the LD-707 service manual (VRT-060).**
- **As to the remote control unit (RU-V101), please refer to the RU-V101 service manual (ARP1258).**

CONTENTS

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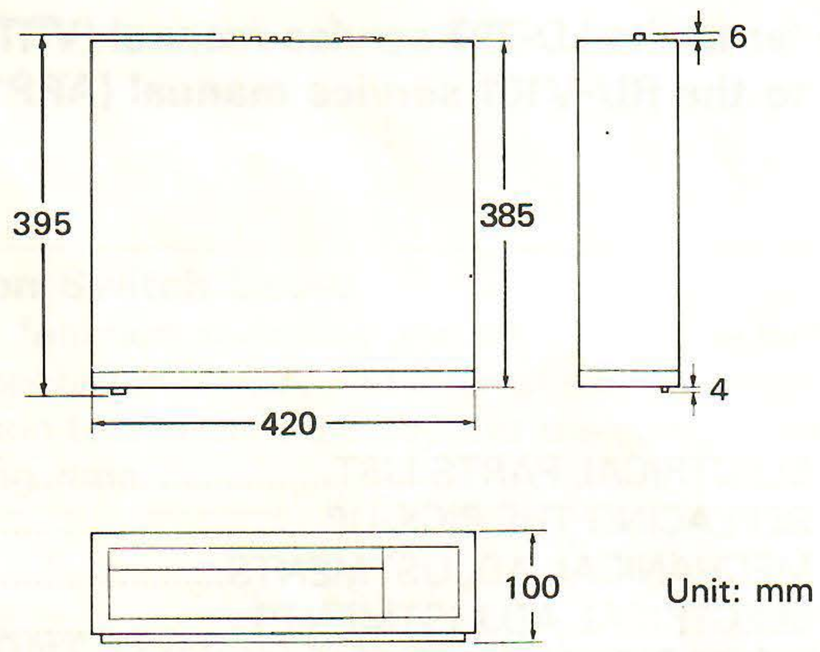
1. SPECIFICATIONS

1. General

System and Disc specifications .... LaserVision Videodisc system

*Maximum playing time
12-inch standard play (CAV) disc .... 30 min/side
12-inch extended play (CLV) disc .... 60 min/side
8-inch standard play (CAV) disc ..... 14 min/side
8-inch extended play (CLV) disc ..... 20 min/side

Spindle motor speed .....
Standard play disc 1800 rpm
Extended play disc 1800-600 rpm
(When 12-inch disc is used.)
Power requirements ..... AC 120V, 50/60 Hz
Max. power consumption ..... 75 W
Net weight (without package) ..... 9.2 kg (20.4 lb)
Dimensions ..... 420(W) × 395(D) × 100(H) mm
16-9/16(W) × 15-9/16(D) × 3-15/16(H) in



Unit: mm

Operating temperature ..... +5°C to +35°C
Operating humidity ..... 5% to 90%
(There should be no condensation)

2. Video Output

Level ..... 1 Vp-p nominal
(75 Ω terminated, sync negative)
Terminal ..... Pin jack

3. Audio Output

Level ..... 650 mV nominal
(1 kHz 100% modulation, 50 kΩ terminated)
Terminals ..... Pin jacks
Channels ..... 2 Channels
(Selected by a separately sold remote control unit.)

4. Functions

[Operations provided by player front panel function keys]

Function	Standard play (CAV) disc	Extended play (CLV) disc
PLAY	YES	YES
REJECT	YES	YES
SCAN FWD·REV	YES	YES
STILL/STEP FWD·REV	YES	NO
DISPLAY ON/OFF	YES	YES

[Operations by a separately sold remote control unit]

PLAY	YES	YES
REJECT, OPEN	YES	YES
STILL/STEP FWD·REV, STILL	YES	NO
MULTI-SPEED FWD·REV	YES	NO
SCAN FWD·REV	YES	YES
AUDIO SELECT	YES	YES
VIDEO ON/OFF	YES	YES
DISPLAY ON/OFF	YES	YES
START	YES	YES
FRAME NUMBER SEARCH	YES	NO
TIME NUMBER SEARCH	NO	YES
CHAPTER NUMBER SEARCH	YES*	YES*

* Enabled when a disc with recorded chapter numbers is played back.

[Other Functions]
- CX system ..... Auto selection operation when a disc with recorded CX auto selection codes is played back.

5. Other Terminals

- EXT CONT (front panel) .... Stereo miniature phone jack
- INTERFACE CONNECTOR ..... 15 pin, D-SUB connector (rear panel)
- EFM OUT (rear panel) ..... 5 pin, DIN connector

6. Accessories

- Operating instructions 1

NOTE:
The playback time depends on the content of a disc.
Specifications and design subject to possible modifications without notice, due to improvements.

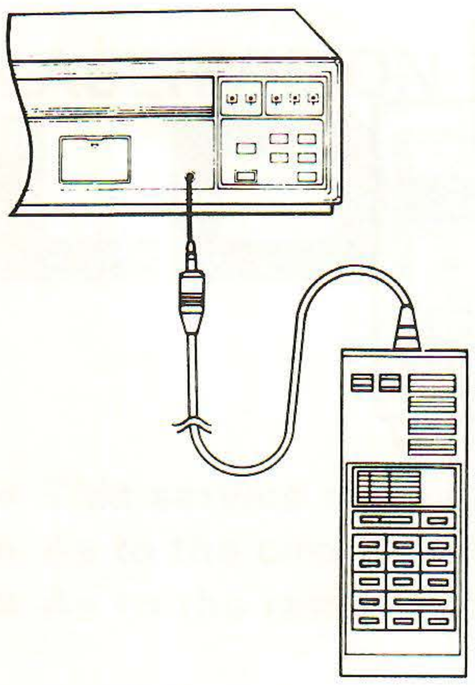
2. OPERATION OF REMOTE CONTROL UNIT (OPTION)

The RU-V101 Remote Control Unit (separately sold) can be used with this player. Please contact the dealer for this player.

PREPARATION

Make sure the player is turned off when performing this.

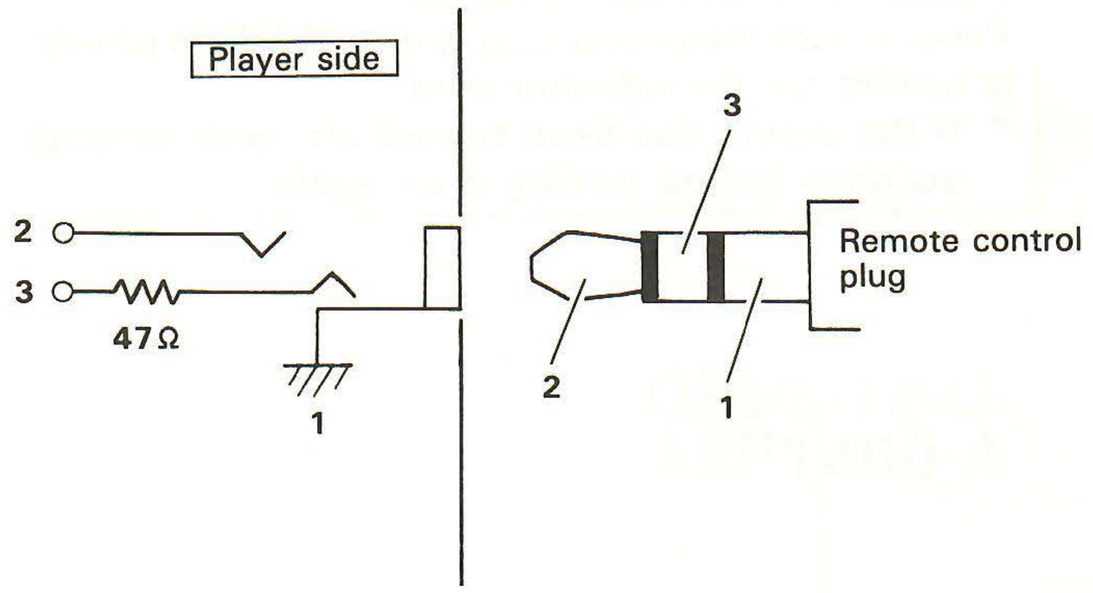
1. Set the player front panel switch SW7 to OFF (4800 bits/second).
2. Connect the RU-V101 Remote Control Unit cable to the player front panel EXT CONT terminal.



* Do not use the EXT CONT terminal and the rear panel INTERFACE CONNECTOR RxD input (pin No. 3, 10) at the same time, as a signal conflict will occur and disturb normal operation.
* During Key Lock (front panel KEY LOCK indicator is lit), remote control input is not accepted.

Plugging and unplugging should be performed after power is turned off.

EXT CONT Terminal Shape, Function
Shape: 3 pin, stereo miniature phone jack



Pin No.	Terminal	I/O	Function
1	GND	—	Ground
2	RxD	Input	Serial command input
3	+VC	Output	Power supply output +5 V, 47 Ω series resistance (Cannot be used for any purpose other than as the remote control unit power supply.)

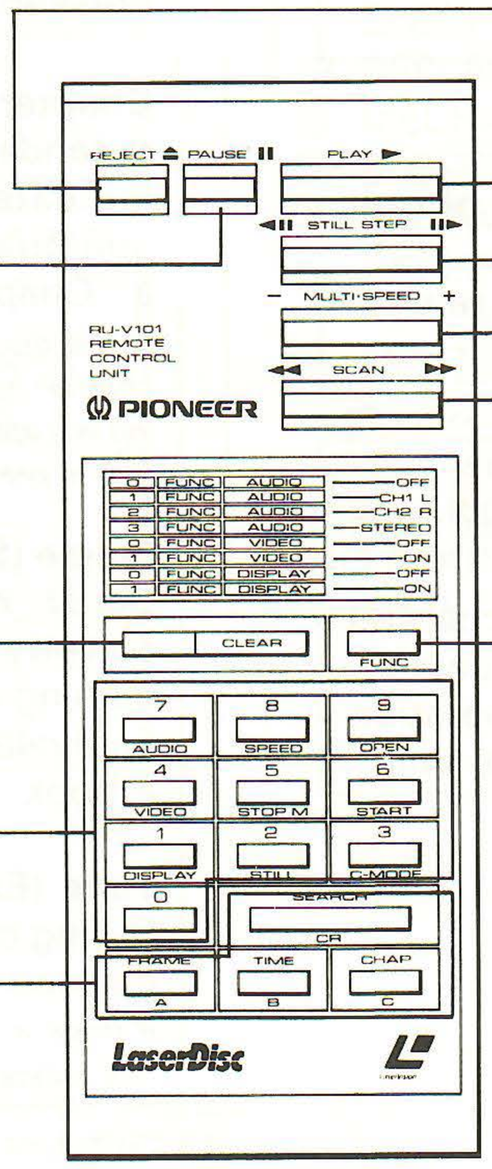
KEY FUNCTIONS

PAUSE Key
When this key is pressed, temporary playback pause occurs. It can be released by PLAY, SCAN, MULTI-SPEED (standard play disc only), STILL/STEP (standard play disc only) key operation.
*The Pause mode is not released by pressing the PAUSE key during pause status.

CLEAR Key
Used for numeral input correction, search mode release, stop marker release.

DIGIT (0—9) Keys

SEARCH Key,
FRAME Key,
TIME Key,
CHAPTER Key
Used for search operation.



REJECT Key,
PLAY Key,
STILL/STEP Key,
SCAN Key
Same function as those of each key on the front panel.

MULTI-SPEED Key
Functions only during standard play (CAV) disc playback. When the + side is pressed, forward direction playback starts, and when the − side is pressed, reverse direction playback starts.
When power is supplied, it is set to normal speed. See Function Key Operation for speed selection.
*During multi-speed playback, there is no audio output.

FUNC Key
Used when the function indicated below each key is used.

3. PANEL FACILITIES

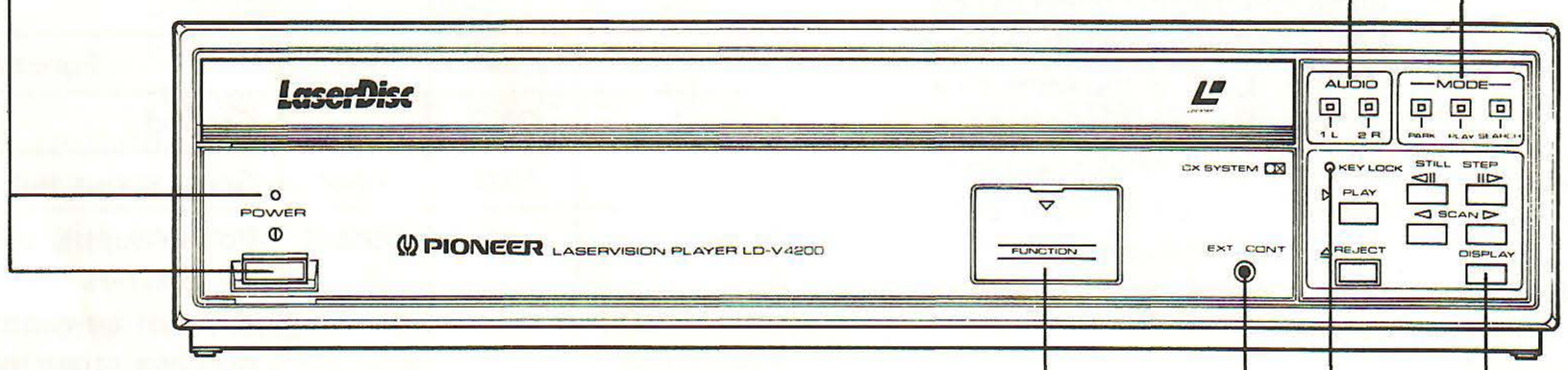
FRONT PANEL

Power Switch and Indicator
Press to turn the power supply on/off. When power is turned on, an indicator is lit.
* **If the power has been turned off, wait several seconds before turning it on again.**

Function Switch Cover
Internal function switches are provided to select player operation modes and interface initialization in addition to a meter that displays the cumulative operating time.

EXT CONT Terminal (Stereo miniature phone jack)
A terminal for connecting a separately sold remote control unit RU-V101.

KEY LOCK Indicator
Lit when the KEY LOCK command is entered from the external control unit.
When this indicator is lit, entries are not accepted from operation keys other than the power switch. Also, entries are not accepted from the operation keys of the separately sold remote control unit.



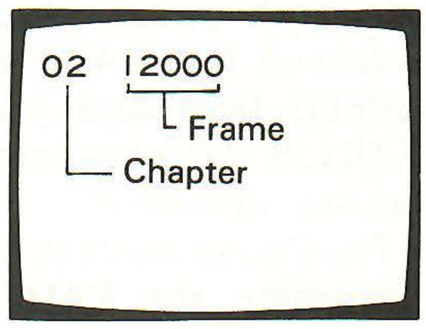
AUDIO Indicator
Indicates audio channel output.

MODE Indicator
- **PARK** — Indicates that the pickup is at the park position (extreme disc internal circumference) and has a standby status.
- **PLAY** — Lit during playback.
- **SEARCH** — Lit during search execution.

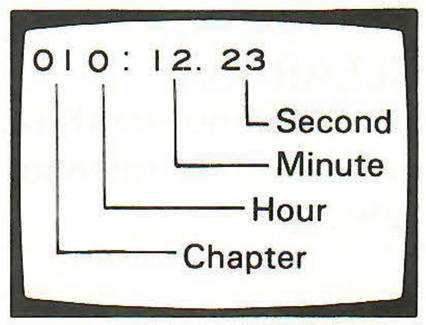
DISPLAY Key
Press to display a chapter number and frame number (standard play disc) or time number (extended play disc). Press it once again to turn off the display. (Display is maintained until the key is pressed again.)

Chapter (Standard play, extended play disc)
Indicates disc program punctuation. Equivalent to a "Chapter" No. in a book.
If the disc is not equipped with chapter number recording, nothing will appear when the DISPLAY key is pressed.

Standard play disc

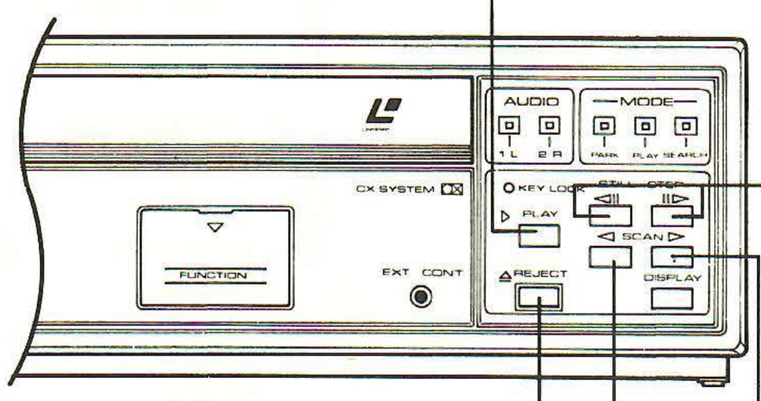


Extended play disc



Frame (Standard play disc)
Serial number for each screen starting from the beginning of a disc program. Equivalent to a "page" in a book.

Time (Extended play disc)
During disc playback in the play mode, displays the elapsed time from the beginning of a disc.
If there is no second recording on the disc, the second display will indicate "00".



PLAY Key
Used to start playback or to return to ordinary playback from still image or pause.

STILL/STEP Keys
Effective only during standard play disc playback. After one of the following keys is pressed, still image playback occurs. After this, when one of these keys is pressed, the following occurs.
- ⏭ : Step forward
- ⏮ : Step reverse

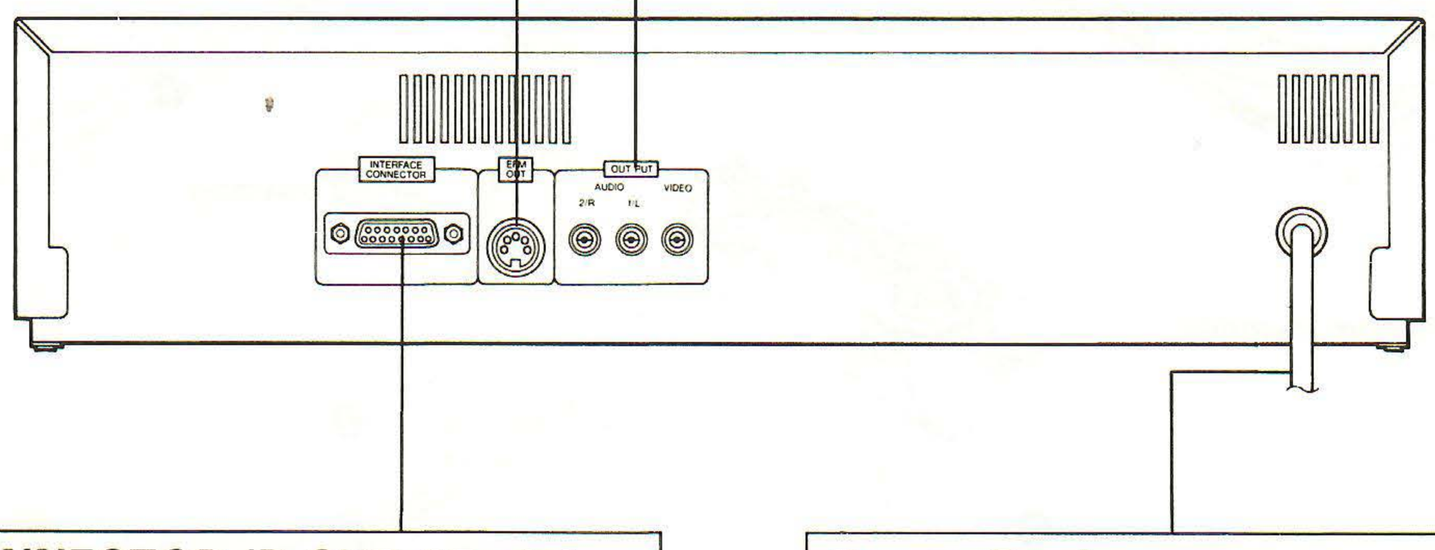
REJECT Key
When this key is pressed while the "PARK" mode indicator is lit, the disc table comes out to a prescribed position. Also, when this key is pressed during playback, playback is suspended to stop disc rotation.
When it is pressed twice during playback, disc rotation stops and the disc table comes out.

SCAN Keys
Function only when one of the following keys is pressed.
- ▶: Forward direction
- ◀: Reverse direction

REAR PANEL

EFM OUT Terminal
Outputs EFM signals.

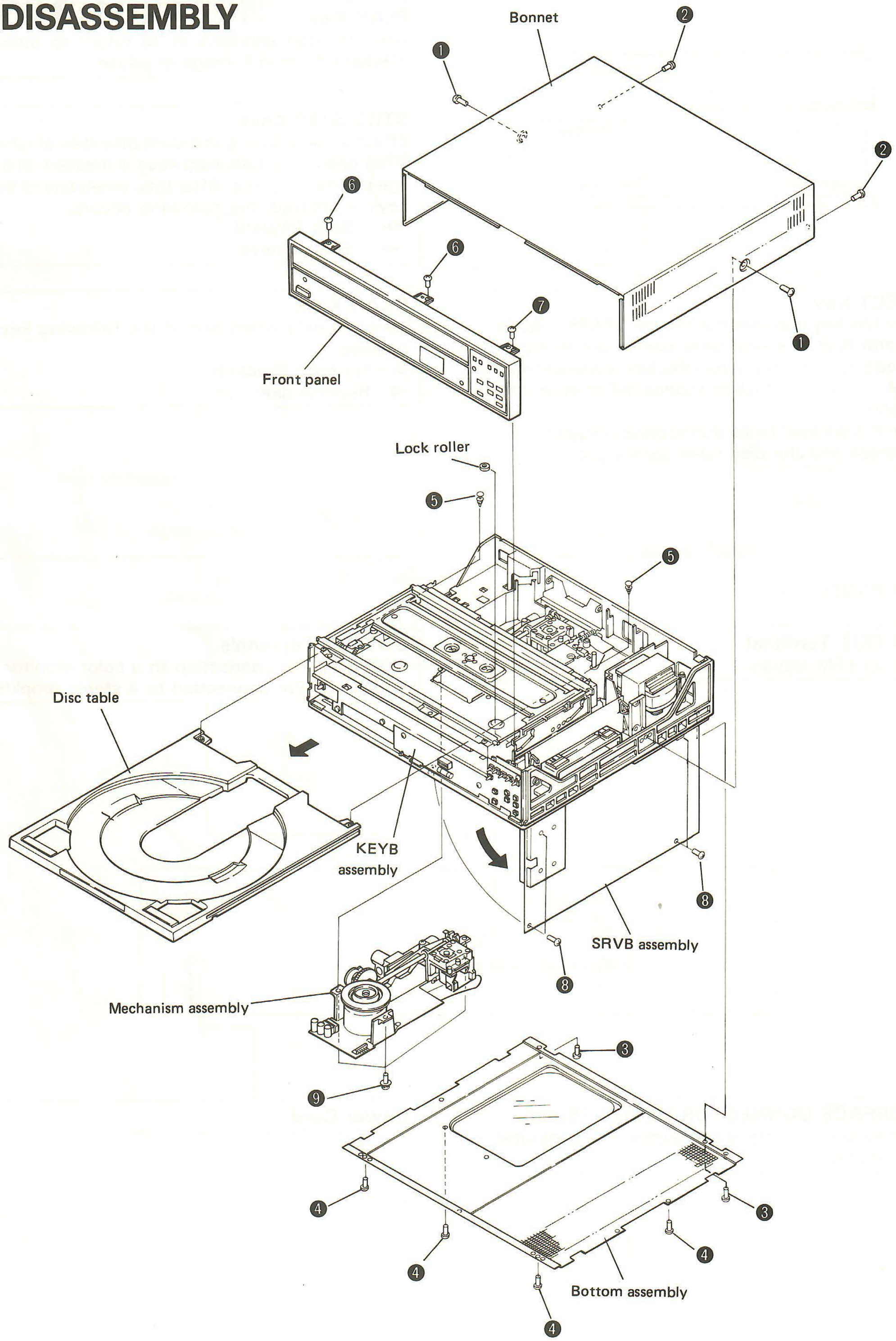
OUTPUT Terminals
- VIDEO: For connection to a color monitor.
- AUDIO: For connection to a stereo amplifier.



INTERFACE CONNECTOR (D-SUB 15 pin)
Used for serial interface connection to a computer or controller.

Power Cord

4. DISASSEMBLY



[Bonnet]

1. Remove the 2 screws ❶ from the sides.
2. Remove the 2 screws ❷ from the back.

[Bottom Plate]

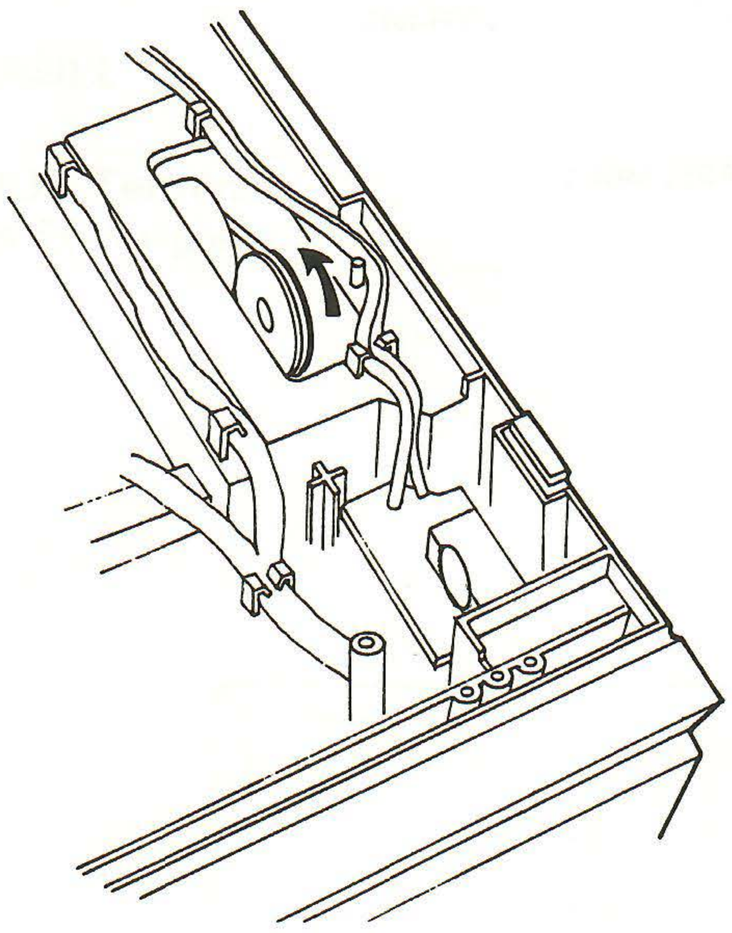
1. Remove the 2 screws ❸.
2. Remove the 4 screws ❹.

[Disc Table]

1. Remove the bonnet.
2. Turn on the Power Switch, press the key to remove disc to open the disc table.
3. Remove the 2 rivets ❺.

Note:

1) Remove the lock roller to prevent its loss.
2) To pull out the disc table without pressing the key, remove the bottom plate and turn the pulley connected by a belt to the loading motor 20 turns.



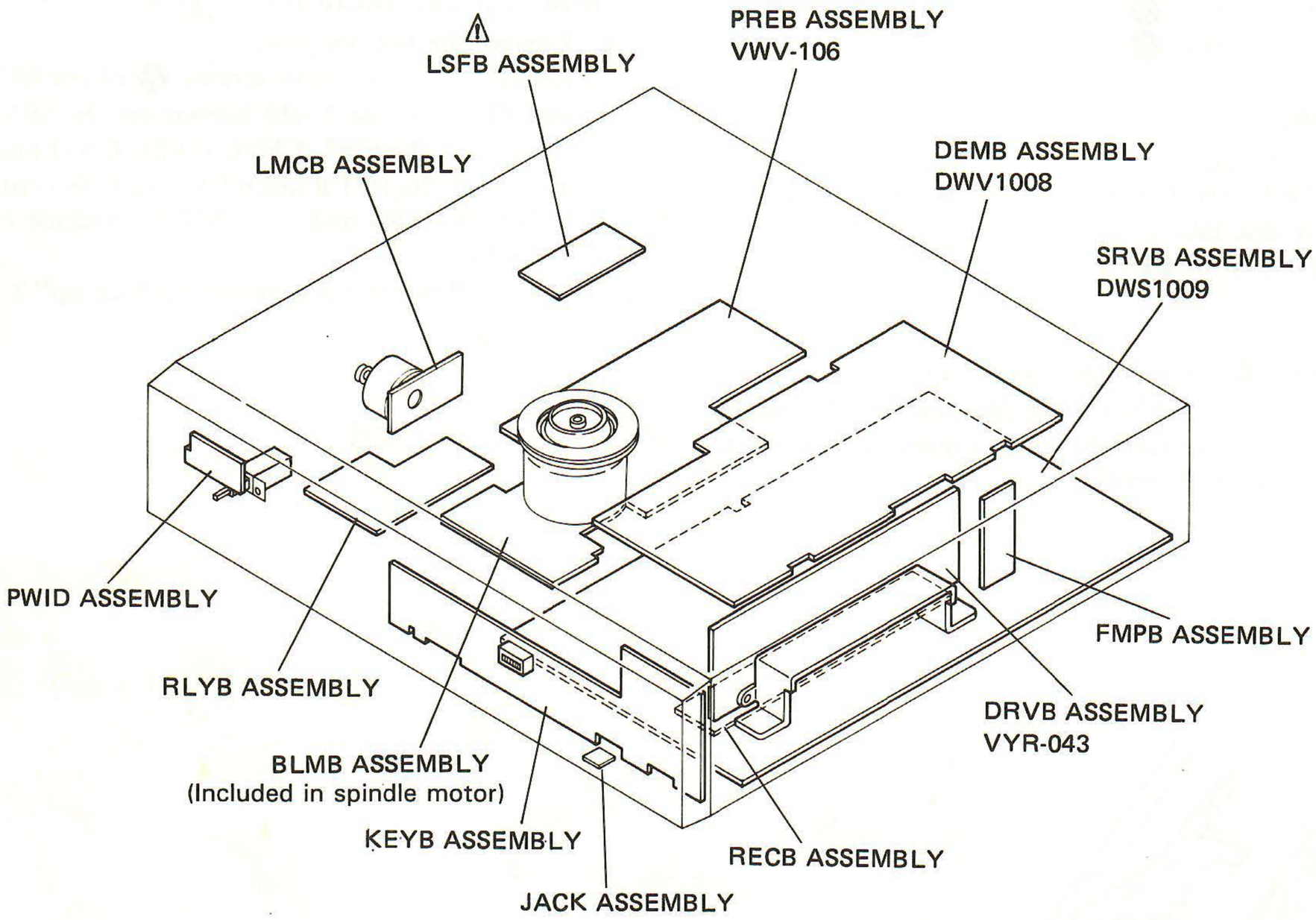
[Front Panel]

1. Remove the bonnet.
2. Remove the 2 screws ❻ and screw ❼
3. Disconnect the KEYB assembly connectors CN28 and CN45.

[Mechanical Section]

1. Remove the bottom plate.
2. Remove the 4 mounting screws ❽ of the SRVB assembly and disengage the 3 tabs supporting the SRVB assembly.
3. Disconnect the CN2, CN14, CN24, CN33 and CN37 connectors of the PREB assembly, the CN8 connector of the BLMB assembly and the CN105 connector of the RLYB assembly.
   Note: Refer to "Replacing the Pick-up" (→ P44).

5. P.C.B. LOCATIONS



8. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

A

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

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

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

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

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

B

Miscellaneous Parts

P.C.B. ASSEMBLIES

Mark	Symbol & Description	Part No.
⚠	LSFB assembly	
	KEYB assembly	
	DRVB assembly	VYR-043
	PREB assembly	VWV-106
	DEMB assembly	DWV1008
	SRVB assembly	DWS1009
	FMPB assembly	
	RECB assembly	
	PWID assembly	
	JACK assembly	
	RLYB assembly	
	LMCB assembly	
	Pick-up assembly	VWY1005

C

OTHERS

Mark	Symbol & Description		Part No.
⚠ ★	T1	Power transformer	DTT1002
⚠		AC Power cord	DDG1001
⚠ ★★	FU1-FU4	Fuse (3A)	VEK-018
★★	IC201	(SRVB assembly)	PD5050
⚠ ★★	SI	Power switch	DSA1003
★★	S2	Leaf switch (TABLE POSITION)	PSN-003
★★	S3	Slide switch (DISC CLAMP)	VSK-010
★★	S4	Slide switch (DRAW-IN)	VSK-011
★★	S5	Leaf switch (TILT LIMIT)	PSN-003 (VSK-015)
★★	S6	Slide switch (DOOR)	VSK-012

D

⚠	C1, C2	Ceramic capacitor	RCG-009 (VCG-044)
		Ceramic capacitor (TILT MOTOR)	CKDYF473Z50
		Thru type capacitor (1000p) (SLIDER MOTOR)	VCG-005
★★		Tilt motor	VXM-060
★★		Slider motor	VXM-074
★★		Spindle motor (incorporated in BLMB assembly)	VXM-075
		Loading motor	VXM-054
		Potentio meter	VCS-017

LSFB Assembly

FILTER

Mark	Symbol & Description		Part No.
⚠	LI	Line filter	VTL-004

CAPACITORS

Mark	Symbol & Description		Part No.
⚠	C1, C2	(0.01μF)	RCG-009 (VCG-044)

KEYB Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC1	PD0012A
★★	IC2	HD74LS145P
★★	Q1	2SC1740S
★	D1	SLH-56VC3H
★	D2—D6	SLH-56MC3H
★	D7	1SS254

SWITCHES

Mark	Symbol & Description		Part No.
★★	S1	Tact switch (REJECT)	DSG1001
★★	S2—S7	Tact switch (PLAY, DISPLAY, SCAN, STILL/STEP)	VSC-012
★★	FSW	8P DIP switch	DSX1001

CAPACITORS

Mark	Symbol & Description	Part No.
	C1	CCDSL331J50
	C2	CEASR47M50
	C3	CEAS470M25
	C4, C5	CKDYF103Z50

RESISTORS

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

Mark	Symbol & Description	Part No.
	R1—R17	RD1/6PM□□□J

DRVB Assembly (VYR-043)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC3	MB3763
★★	IC1	M5218P
★★	IC2	NJM4556DE
★★	Q6	2SA1096
★★	Q16	2SA1283
★★	Q14	2SA886
★★	Q1, Q7	2SA933S
★★	Q4	2SB1016
★★	Q12	2SB910M
★★	Q9	2SC1627
★★	Q2, Q8	2SC1740S
★★	Q15	2SC3243
★★	Q13	2SC1847
★★	Q5	2SC2497
★★	Q11	2SD1226M
★★	Q10	2SD1267
★★	Q3	2SD1407
★	D10, D11	1SR35-100AVL
★	D1, D2, D5	1SS254
★	D8	HZ11B2
★	D6	HZ4C3
★	D3, D4	HZ5C1
★	D7	HZ6C3
★	D9	S2K20
★	D12	MTZ10B

COIL

Mark	Symbol & Description		Part No.
	L1	Choke coil (1.2mH)	VTT-070

CAPACITORS

Mark	Symbol & Description	Part No.
	C22	CCDSL331J50
	C20	CCDSL471J50
	C1, C21	CEAS100M50
	C2, C7, C9, C10, C15, C16, C24-C26	CEAS220M50
	C3, C6	CEHAQ220M50
	C12	CEAS221M16
	C32	CEHAQ101M50
	C19	CKDYB102K50
	C4, C5, C8, C13, C14, C17, C18, C29	CKDYF103Z50
	C30, C31	CKDYX473M16
	C33	CEAS101M25
	C11	CEHAQ221M25

RESISTORS

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

Mark	Symbol & Description		Part No.
	R10		RD1/4VM331J
	R20, R22—R24		RN1/6PQ2202F
	R21	(1.2Ω/3W)	VCN-092
	R48	(4.7Ω/1W)	VCN-099
	R19	(2.7Ω/1W)	VCN-100
	R50		RD1/4PM181J
	R37		RD1/2PMF□□□J
	R51	4.7Ω	DCN1001
	R31, R44	47Ω	DCN1003
	Other resistors		RD1/6PM□□□J

OTHER

Mark	Symbol & Description	Part No.
	Transistor holder	VBK-023

PREB Assembly (VWV-106)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC5	AN6581P
★★	IC1—IC4	NJM4558S
★★	IC6	μPC339C
★★	Q10	DTA124ES
★★	Q11, Q14—Q16	DTC124ES
★★	Q6	2SA933S
★★	Q8	2SB909M
★★	Q1—Q3	2SC1674
★★	Q4, Q5, Q12	2SC1740S
★★	Q7, Q13	2SD1225M
★★	Q9	2SK30ATM
★	D14	HZ5C2
★	D7, D8	MTZ 3.6A
★	D9	MTZ 5.6C
★	D12	TLR123
★	D1—D6, D10, D11	1SS254
★	D13	1S2473
★	TH1	D33A

CAPACITORS

Mark	Symbol & Description	Part No.
	C5, C8, C10, C20, C32	CEAL010M50
	C12, C18, C23, C26	CEAL100M16
	C36	CEAL2R2M50
	C15, C16	CEAL470M16
	C3, C14	CEANPR47M50
	C1, C17, C31	CEANP4R7M35
	C27—C29	CKPUYB102K50
	C2, C4, C6, C7, C11, C19, C21, C22, C24, C25, C30, C33—C35, C38	CKDYF103Z50
	C37	CKDYX473M25
	C13	CQMA273J50

RESISTORS

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

Mark	Symbol & Description		Part No.
★	VR7	Semi-fixed 100k	VRTB6VS104
★	VR8	Semi-fixed 2.2k	VRTB6VS222
★	VR2	Semi-fixed 22k	VRTB6VS223
★	VR1, VR5, VR9	Semi-fixed 4.7k	VRTB6VS472
★	VR4	Semi-fixed 47 k	VRTB6VS473
★	VR6	Semi-fixed 1k	VRTB6VS102
★	VR3, VR10	Semi-fixed 10k	VRTB6VS103
	R79, R80		RN1/6PQ□□□□F
	R47		RD1/4PM□□□J
	R96		RD1/2PMF3R3J
	Other resistors		RD1/6PM□□□J

DEMB Assembly (DWV1008)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC2	HA12043
★★	IC201	PA0023
★★	IC202	PA3018
★★	IC1	PA3020
★★	IC203	PM0001
★★	IC3	μPC4558C
★★	IC204	DYY1001
★★	Q101, Q302	UN4112
★★	Q301, Q303, Q304	UN4212
★★	Q102, Q103, Q203	2SA933S
★★	Q201	2SC1674
★★	Q1, Q2, Q202, Q204—Q213, Q305, Q306, Q401—Q404	2SC1740S
★	D1, D2, D101—D104, D201, D202	1SS254

COILS AND FILTERS

Mark	Symbol & Description		Part No.
	L1	Coil (56μH)	LAU560J
	L2, L4	Coil (7.5mH)	VTL-268
	L3, L206, L301	Coil (39μH)	LAU390J
	L201	Coil (27μH)	LAU270J
	L202—L205	Coil (18μH)	LAU180J
	L207	Coil (43μH)	LAU430J
	L208	Coil (22μH)	VTL-239
	L209, L210	Coil (390μH)	VTL-252
	L211	Coil (100μH)	LAU101J
	L212	Coil (220μH)	VTL-249
	L213, D214	Coil (47μH)	LAU470J
	L302, L303	Coil (10μH)	LAU100J
	F1	B.P.F. (2.3MHz)	VTF-051
	F2	B.P.F. (2.8MHz)	VTF-052
	F401	Low pass filter	VTF-060

CAPACITORS

Mark	Symbol & Description	Part No.
	C207, C209, C221, C234, C265	CCCCH080D50
	C225	CCCCH100D50
	C23, C301	CCCCH101J50
	C5, C13, C31	CCCCH111J50
	C224, C235	CCCCH150J50
	C257, C263	CCCCH180J50
	C208, C256, C262, C266	CCCCH220J50
	C14, C32, C238	CCCCH221J50
	C4, C22	CCCCH270J50
	C223	CCCCH330J50
	C237, C302, C303	CCCCH390J50
	C25, C205, C206, C264	CCCCH560J50
	C219	CCCCH680J50
	C7	CCCCH820J50
	C258	CCCSL121J50
	C210, C242—C244	CCCSL181J50
	C260, C261	CCCSL241J50
	C211	CCCSL271J50
	C227	CCCSL330J50
	C40	CEANLR47K50
	C42	CEANL220K16
	C273, C278	CEANP100M16
	C255	CEANP3R3M50
	C259	CEANP4R7M25
	C11, C18, C29, C35, C50, C230, C401, C404	CEAS100M50
	C274, C277, C279, C281, C282	CEAS101M10
	C231	CEAS220M50
	C36, C37, C43, C44	CEAS221M10
	C245, C403, C406	CEAS3R3M50
	C16, C45, C226	CEAS4R7M50
	C214, C215, C220, C228, C241, C250, C252, C271, C275, C276, C54, C272, C283	CEAS470M25
	C232, C233	CEAS471M6R3
	C15, C33	CKCYB102K50
	C1-C3, C6, C19-C21, C24, C52, C53, C201, C203, C212, C213, C216-C218, C229, C236, C239, C240, C249, C251, C254, C267—C270, C280, C304, C305, C307, C405	CKCYB472K50
		CKCYF103Z50

JACK Assembly

OTHER

Mark	Symbol & Description	Part No.
	Stereo mini jack (EXT CONT)	DKN1001

RLYB Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q101	DTC124ES
★★	Q102	2SD1225M
★★	Q103	2SC3243
★	D101, D102	1S2473

RELAY

Mark	Symbol & Description	Part No.
★★	RY1 Relay	VSR-005

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, C2	CKDYF103Z50
	C101	CEAS100M50
	C102	CEANP100M16

RESISTORS

Mark	Symbol & Description	Part No.
	R101	RD1/4VM102J
	R102	RD1/4VM331J

LMCB Assembly

No electrical parts are supplied for this assembly.

PWID Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D101 (POWER)	SLH-56VC3H

RESISTORS

Mark	Symbol & Description	Part No.
	R101	RD1/6PM271J

9. REPLACING THE PICK-UP

1. Disconnect the connectors for the PREB assembly (5), BLMB assembly (1) and RLYB assembly (1).

PREB CN2, CN14, CN24, CN37, CN33
BLMB CN8
RLYB CN105

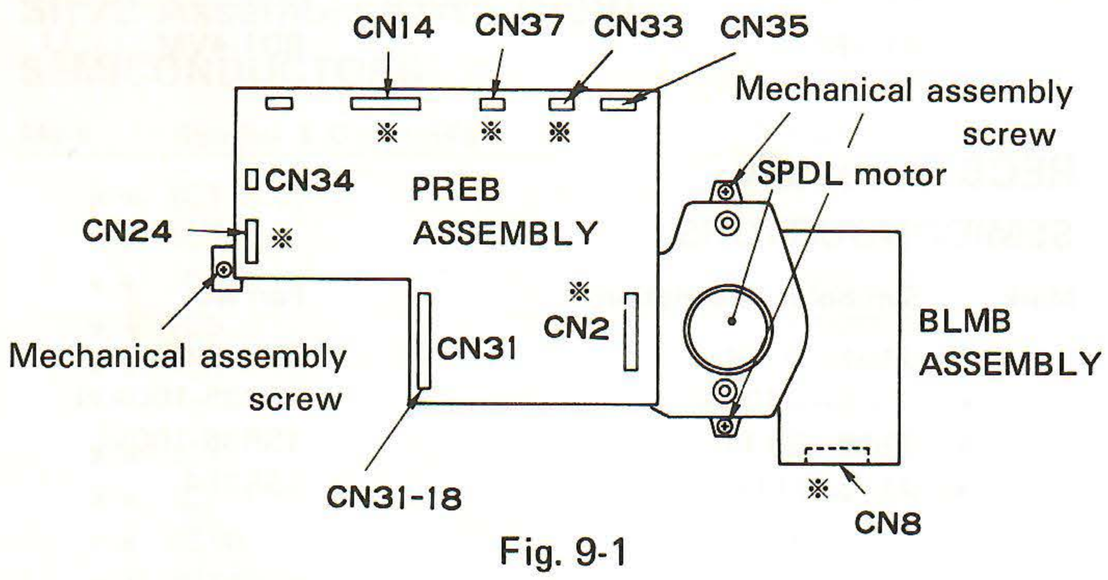


Fig. 9-1

2. Remove the 3 Mechanical assembly screws, disconnect the PREB assembly ground and remove the Mechanical assembly from the chassis. Confirm that the structure around the pick-up is as shown in the diagram below. (Fig. 9-2).

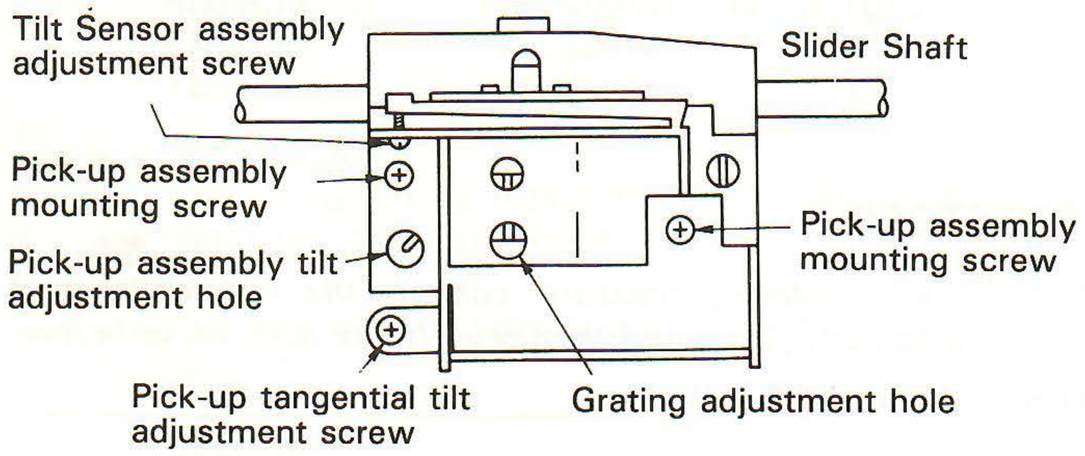


Fig. 9-2

3. Move the Pick-up assembly to the center of the Slider Shaft and remove the Pick-up assembly mounting screws.
4. Disconnect connector CN31 on the PREB assembly end of the flexible cable connecting the PREB assembly and Pick-up assembly.

   Note: Use care not to damage the connectors of the flexible cable. Do not touch the connectors of the flexible cable or the solder joints of the Pick-up assembly with the hands in order to avoid damaging the laser diode with static electricity.
5. Connect the flexible cable of the new Pick-up assembly to CN31 of the PREB assembly and mount the Pick-up assembly on the slider. Adjust the angle of the Pick-up assembly so that it is parallel with the Slider Shaft and lightly tighten the mounting screw. This completes the replacement of the Pick-up assembly.

   Note: Fully tightening the mounting screw of the Pick-up assembly makes it difficult to adjust the tilt later; therefore, do not tighten until the spring washer is completely flat.

   Note: After replacing the Pick-up assembly, make the following adjustments.
   - Mechanical adjustments
   - Electrical adjustments

Mark	Symbol & Description	Part No.
	C170	CEAS101M10
	C114, C122	CEAS221M10
	C31, C32, C90, C118, C120, C121, C130, C154, C166, C167, C207, C215, C324, C326	CEAS470M25
	C23	CEJANP470M10
	C2	CEJAR47M50
	C15, C52, C57, C80	CEJA100M16
	C4, C7, C9, C10, C45, C51, C58, C111, C112, C116, C171, C314, C316	CEJA220M16
	C11—C14, C53—C56, C103	CEJA4R7M50
	C25, C26, C124, C127, C132, C164, C165	CEJA470M16
	C131, C217—C219, C312	CKDYB102K50
	C41, C42, C99	CKDYB681K50
	C6, C30, C44, C48, C63, C78, C89, C105, C117, C157, C205, C206, C301, C302, C313, C315, C323, C325	CKDYF103Z50
	C88, C133, C169	CKDYF223Z50
	C3, C8, C16, C19, C46, C49, C59, C115, C119, C125, C126, C152, C153, C156, C161, C198, C220, C333, C334	CKDYX473M25
	C102, C308	CQMA102J50
	C162, C210	CQMA103J50
	C5, C29, C47, C109, C311, C340	CQMA104J50
	C92, C95, C97, C98	CQMA122J50
	C83, C85	CQMA123J50
	C67	CQMA124J50
	C209	CQMA152J50
	C35, C36, C320	CQMA153J50
	C82	CQMA183J50
	C79, C322	CQMA223J50
	C305	CQMA392J50
	C108	CQMA393J50
	C304	CQMA473J50
	C107	CQMA563J50
	C91, C94, C306	CQMA682J50
	C201, C310	CQMA683J50
	C303, C321	CQMA822J50
	C40	CQMA823J50
	C93	CQSA122J50
	C66	CQSA271J50
	C75, C76	CKDYB222K50
	C96, C139	CQMA222J50

RESISTORS

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

Mark	Symbol & Description		Part No.
★	VR12	Semi-fixed 1k	VRTG6VS102
★	VR3	Semi-fixed 2.2k	VRTB6VS222
★	VR4	Semi-fixed 22k	VRTB6VS223
★	VR9, VR10	Semi-fixed 47k	VRTB6VS472
★	VR5, VR6, VR8	Semi-fixed 4.7k	VRTB6VS473
★	VR11	Semi-fixed 4.7k	VRTG6VS472
	R102—R104		RN1/6PQ□□□□F
		Other resisters	RD1/6PM□□□J

OTHERS

Mark	Symbol & Description		Part No.
★	X201	Crystal resonator	DSS1001
★	X202	Crystal resonator	VSS-043
	64P	IC socket	VKH-029

FMPB Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q1	2SK117
★	D1, D2	HZ3B3
★	D3	IS2473

CAPACITORS

Mark	Symbol & Description	Part No.
	C1	CQMA102J50
	C2	CEA010M50
	C3	CEANP4R7M35

RESISTORS

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

Mark	Symbol & Description	Part No.
	R1—R6	RD1/4VM□□□J

RECB Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D101—D104	SM1.5-02
★	D105—D108	1SR35-100AVL
★	D109—D112	1SR35-100VL
★	D113, D114	1SS254

CAPACITORS

Mark	Symbol & Description		Part No.
	C107		CEAS3R3M50
	C108, C109		CKDYF103Z50
	C101—C104	(2200μ/25V)	VCH-039
	C106	(4700μ/10V)	VCH-040
	C105	(6800μ/10V)	VCH-041

RESISTORS

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

Mark	Symbol & Description	Part No.
	R101, R102	RD1/6PM□□□J

Mark	Symbol & Description	Part No.
	C248, C306, C308	CKCYF223Z50
	C51	CQMA102J50
	C41	CQMA104J50
	C8, C9, C12, C26, C27, C30	CQMA152J50
	C17, C34	CQMA333J50
	C10, C28	CQMA562J50
	C38, C39	CQMA683J50
	C402	CQSA821J50
	C202	CCCSL151J50
	C46, C47	CEASR47M50

RESISTORS

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

Mark	Symbol & Description		Part No.
★	VR1, VR2	Semi-fixed 22kΩ-B	VRTB6VS223
★	VR201, VR202	Semi-fixed 1kΩ-B	VRTB6VS102
	R252	4.7Ω	DCN1001
	R36		RD1/4VM475J
	R3, R13, R14, R19		RN1/6PQ□□□□F
		Other resistors	RD1/6PM□□□J

OTHERS

Mark	Symbol & Description		Part No.
		15P D-SUB socket assembly	DXX1031
		3P terminal	VKB-015
		5P DIN socket	VKN-165
	DL201	220nS D.L.	VTF-061

SRVB Assembly (DWS1009)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC1, IC2	TL8614P
★★	IC3	PA0017
★★	IC4	PA0009
★★	IC5	PA9003
★★	IC6	PA0018
★★	IC7	PA5009
★★	IC8, IC9	NJM4558S
★★	IC10	PM2001
★★	IC11	μPC4558C
★★	IC202	PD0011
★★	IC203	MB89011P-102
★★	IC204	SN74LS123N
★★	IC205	SN74LS04N
★★	IC206	μPC393C
★★	IC301	PM4001
★★	IC302, IC303	NJM 4558D
★★	Q1, Q3—Q14, Q19, Q24, Q26, Q29,	2SC1740S
★★	Q30, Q32, Q33, Q204, Q303—Q306,	
★★	Q309	
★★	Q2, Q18, Q21, Q27, Q34	2SA933S
★★	Q20, Q22, Q31, Q35, Q201, Q206,	UN4212
★★	Q307, Q308	
★★	Q23, Q36, Q302	2SK184
★★	Q25	2SC1627
★★	Q202, Q203, Q205, Q301	UN4112
★	D1	HZ12A3
★	D6	HZ3B3
★	D2	HZ9B1
★	D301	MTZ7.5B
★	D26	SVC321SP
★	D4, D5, D7—D10, D13—D15,	1SS254
★	D17—D25, D201—D203,	
★	D302—D307, D310	
★	TH303	D33A

COILS AND FILTERS

Mark	Symbol & Description		Part No.
	L202	Coil (22μH)	LAU220J
	L2	Coil (68mH)	LAU680K
	L1, L5	Coil (22μH)	VTL-239
	L9	Coil (27μH)	VTL-240
	L6	Coil (68μH)	VTL-243
	L10, L11	Coil (100μH)	VTL-245
	L3	Coil (120μH)	VTL-246
	L201	Coil (220μH)	VTL-249
	L4	Coil (6.8μH)	VTL-233
	F1-F4, F201, F202	3 terminal filter	VTH-005

CAPACITORS

Mark	Symbol & Description		Part No.
	VC201	Ceramic trimmer (45p)	VCM-003
	VC202	Ceramic trimmer (20p)	VCM-008
	C77, C208		CCDCH100D50
	C211, C212		CCDCH180J50
	C213		CCDCH270J50
	C203, C204		CCDCH150J50
	C110		CCDCH330J50
	C43, C101, C128		CCDSL101J50
	C22, C62		CCDSL120J50
	C81		CCDSL221J50
	C34		CCDSL241J50
	C27, C38, C39, C64, C202		CCDSL331J50
	C1, C20, C60		CCDSL390J50
	C33		CCDSL470J50
	C86, C100		CCDSL680J50
	C21, C61		CCDSL750J50
	C28, C37, C307		CEANPR47M50
	C216, C317, C319		CEANP010M50
	C129, C172		CEANP100M16
	C106, C318		CEANP2R2M50
	C160, C163, C335		CEANP3R3M50
	C84		CEANP330M25
	C65, C309		CEANP4R7M25
	C87		CEANP470M16
	C68		CEAS010M50

10. MECHANICAL ADJUSTMENTS

10.1 TOOLS AND JIGS REQUIRED FOR ADJUSTMENT

- Dual trace oscilloscope
- AF oscillator and frequency counter
- Video monitor and connecting cord
- Remote control unit (option)
- LD test disc
- Eccentric screwdriver I (GGV-129)

10.2 ADJUSTMENT PRECAUTIONS

1) Handling the Test Disc

- When loading or unloading a disc, always return the player to a nearly level position. When function key 2 is turned on and the disc table is pushed in about 4 cm, playback will start automatically. When this happens, press the [REJECT] key of the remote control unit to stop the player; then stand the player vertically after the disc stops turning.
- Do not press the [REJECT] key (⏏) on the front panel with the player standing on end. Press only the [REJECT] key of the remote control unit after the disc stops turning.

2) TRKG servo and SLDR servo open

- To open the TRKG servo, short between pins (20) and (22) (+5V) of IC301 of the SRVB assembly (FTS section). If the Pick-up assembly starts to move when the TRKG servo is opened, the SLDR servo must also be opened. This can be done by disconnecting the CN33 connector of the PREB assembly.

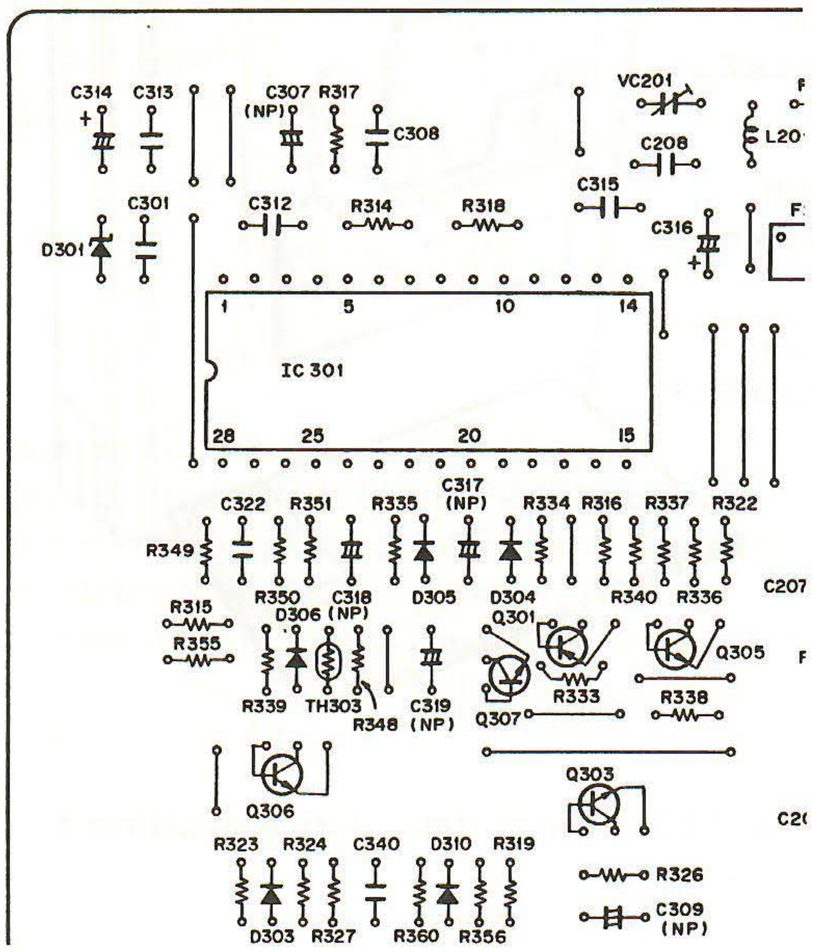


Fig. 10-1 The area around IC301 of the SRVB assembly

- If an attempt is made to search with the TRKG servo opened and the tracking servo will not close for some reason, the Pick-up assembly will move close to the target area but the search will not be completed so the image will not appear. If this happens, press the [CLEAR] key to end the search operation so that the image can be output.
  When playback is started with the tracking servo open, the [CLEAR] key must also be pressed to output the image after the disc reaches the correct speed (1800 rpm).

3) The test mode

- This device is equipped with a test mode for adjusting inside and outside position detection.
  Turn off the power switch with the disc table closed; then open the door in the front panel by hand and turn on the power.
  The test mode can be entered by the above operation (it is all right if the door closes when the power switch is turned on).
  If a disc goes past the inside or outside position when played by pressing the [DISPLAY] key with the player in the test mode, an asterisk (*) will be displayed in the upper left corner of the monitor screen. This display will not appear if within the playback area of the disc.
- In addition to the above, the test mode can also be used as follows.

1. Start-up
   Turn on (down) function switch no. 8 (KEYB assembly) and turn on the power.

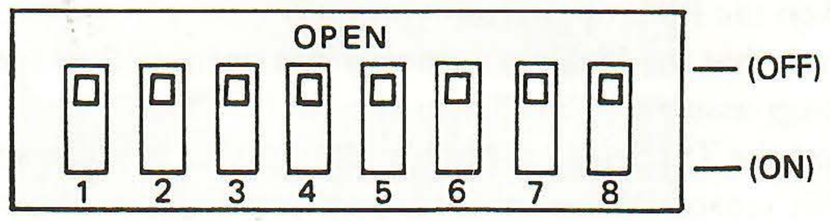
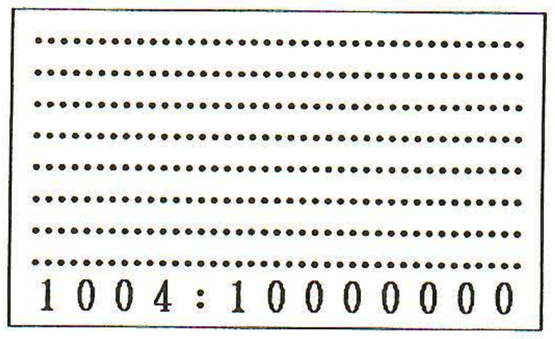


Fig. 10-2

2. Start-up operations
   ① The LED indicators will light in the following sequence only once when the power is turned on.
   PARK → PLAY → SEARCH → AUDIO (2/R) → AUDIO (1/L) → KEY LOCK
   ② All of the characters will be displayed repeatedly on the monitor in a 20 character x 9 column format.
   ③ The contents of the ROM of the MPU are checked. If there is no problem, the ROM version and function key status will be displayed in the 9th column on the monitor screen.

Typical display



3. Additional functions

① When either the inside or outside limit switch is on, an asterisk (*) will be displayed on the screen to the right of the frame number.

② When a disc has not been loaded, the 3 MHz oscillator output appears at pin (3) the decoder IC202 (PD0011) of the SRVB assembly. (Refer to "PD0011 (IC202) Logic Frequency Adjustment", page 57.)

③ The 1-minute reject backup is disabled when either the spindle or focus is not locked.

④ The following operations are possible using remote control.

Remote Control Key Input	Operation
"0", "FUNC", "0"	PD0011 oscillates (oscillation disabled by "0", "FUNC", "0" due to toggle operation).
"1", "FUNC", "0"	Opens the tracking servo. (Released by "SCAN")
"2", "FUNC", "0"	Checks PD0011 and MB89011P-102.

4. When leaving the test mode, always turn off (up) function switch no. 8.

10.3 PREPARATIONS FOR ADJUSTMENT

1. Remove the mechanical assembly of each PREB assembly.
2. Loosen the Pick-up assembly mounting screw by hand just enough that the Pick-up assembly can be moved and set the Pick-up assembly parallel to the shaft.
3. Adjust the Tilt Sensor assembly tilt adjustment screw so that the tilt sensor PC board is roughly parallel with the board mount. (Fig. 10-3)

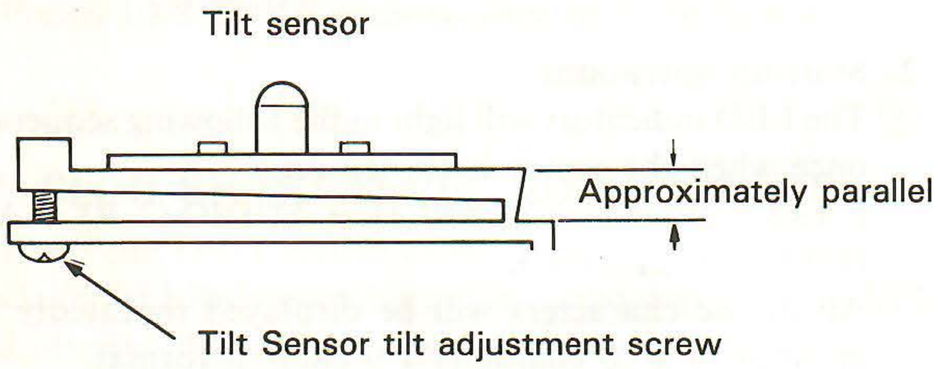


Fig. 10-3

4. Disconnect the CN34 connector of the PREB assembly.
5. Turn the end of the tilt motor worm gear by hand until the rib section of the mechanism chassis is parallel with the bottom of the tilt base. (Fig. 10-4)

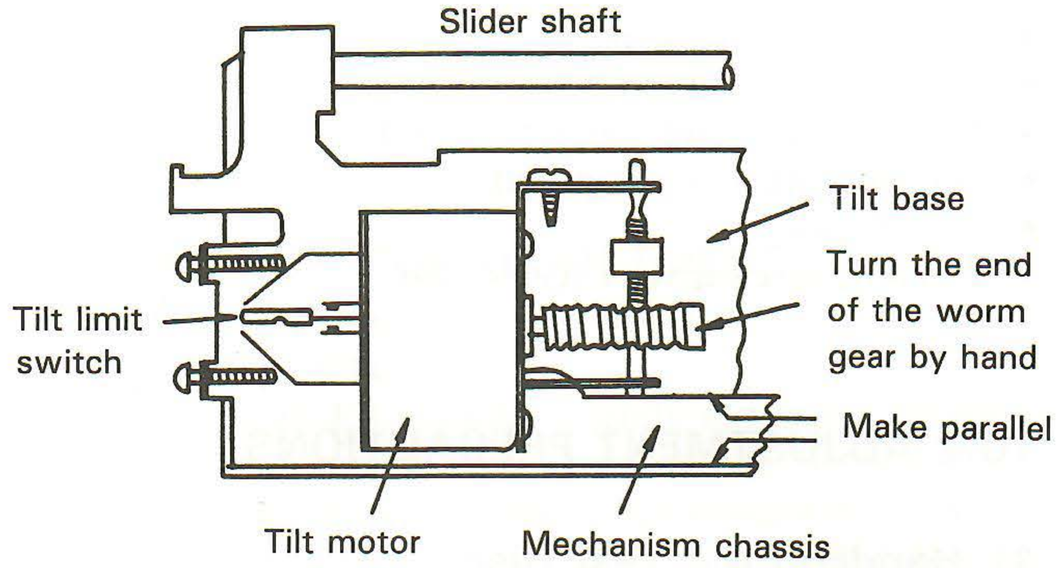


Fig. 10-4

6. Mount the Mechanical assembly in the player and connect the PREB assembly and BLMB assembly connectors. Leave the CN34 connector of the PREB assembly disconnected. (Refer to Fig. 9-1.)
   Note: If CN34 is not left disconnected, the Pick-up assembly tilt adjustment will not be possible later.
7. Load the LD test disc with the player in the status shown in Fig. 10-5.

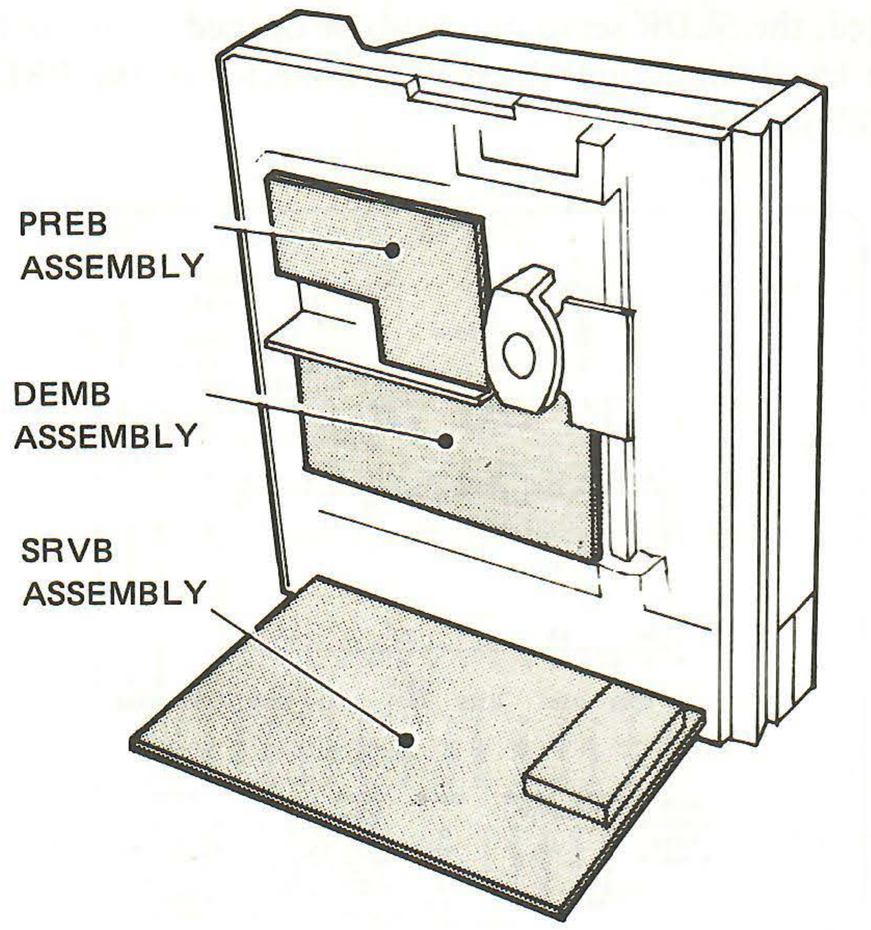


Fig. 10-5 Player status during adjustment

10.4 FOCS OFFSET ADJUSTMENT (VR1)

1. Turn on the power with no disc in the disc table.
2. Adjust VR1 so that the voltage at TP2 (FOCS error signal) is 0V.

10.5 GRATING COARSE ADJUSTMENT

1. Remove the 3 mounting screws of the PREB assembly.
2. Load and play the test disc. If the grating is greatly out of adjustment at this time, playback cannot be started if only the PLAY lamp on the front panel is flashing. In such cases, perform a coarse adjustment on the grating.
3. Press the [PLAY] key.
4. The TRKG servo will open when the spindle accelerates. (Refer to "Adjustment Precautions.")
5. Press the [CLEAR] key of the remote control.
6. Press the [DISPLAY] key of the front panel to display the frame number on the monitor screen.
7. Move the Pick-up assembly to frame #15,000 using the [SCAN] (▶▶) key of the remote control.
8. Insert Eccentric Screwdriver I into the grating, as shown in the diagram.

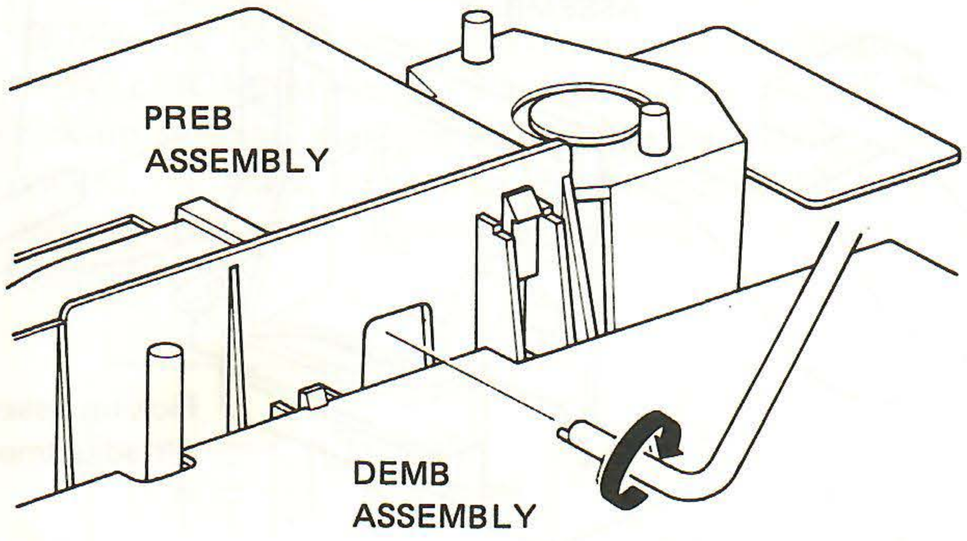


Fig. 10-6 Grating adjustment

Note: Inserting Eccentric Screwdriver I.
The grating adjustment hole of the Pick-up assembly cannot be seen directly when making an adjustment; therefore, when inserting Eccentric Screwdriver I, it may be difficult to find the correct position in some cases. There is danger of damaging the laser diode, so please use the following procedure to insert Eccentric Screwdriver I into the grating adjustment hole.

Procedure

① Place Eccentric Screwdriver I in the position shown in Fig. 10-7(a).
② From this position, move Eccentric Screwdriver I along the surface on the right side until it contacts the top. (Fig. 10-7(b))
③ From that position, move Eccentric Screwdriver I along the underside of the top and to the left for approximately 5mm until it enters the grating adjustment hole. (Fig. 10- 7(c))

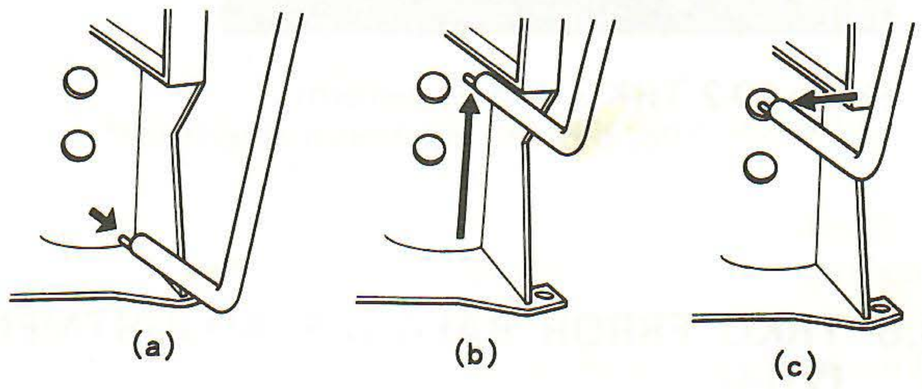


Fig. 10-7 Inserting Eccentric Screwdriver I

9. Connect an oscilloscope to TP4 on the PREB assembly and observe the tracking error signal. Use Eccentric Screwdriver I to adjust the tracking so that amplitude is minimum and the waveform envelope is smooth. (Photo 10-1)

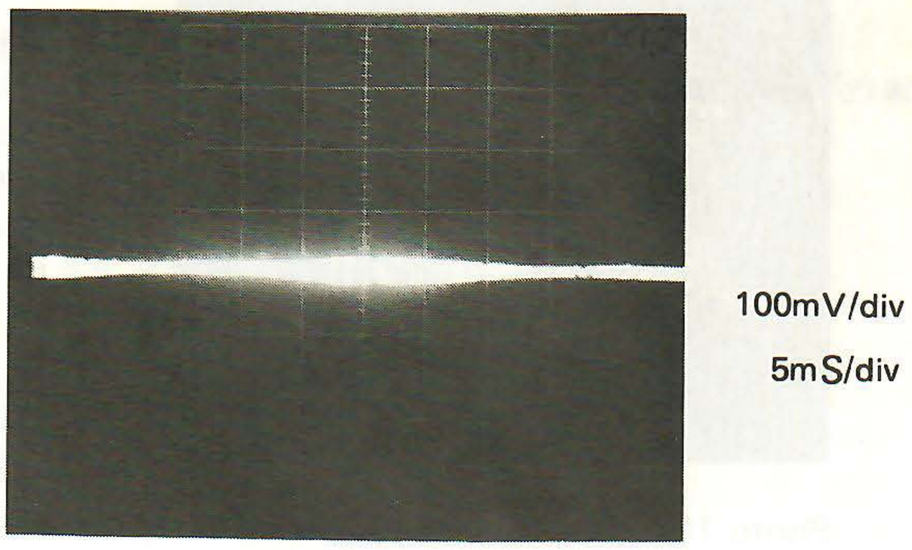
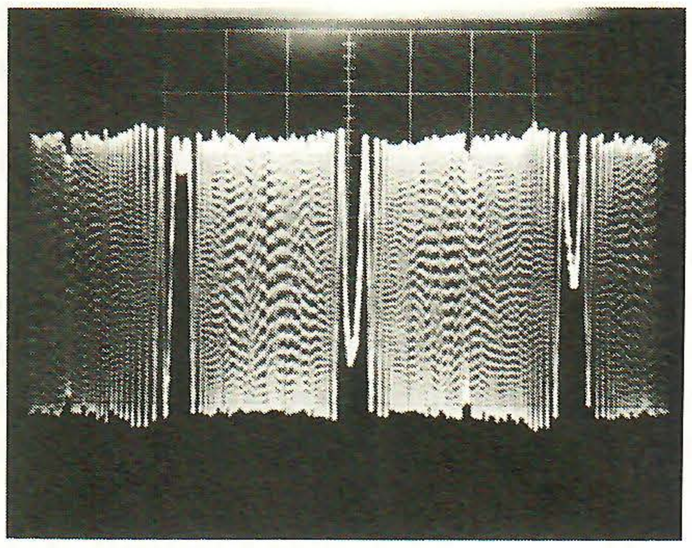


Photo 10-1 TRKG error waveform
(loop open, minimum amplitude)

From that position, slowly rotate the screwdriver in the direction shown by the arrow in Fig. 10-6 to adjust the grating so that the amplitude of the initial error signal is maximum. (Photo 10-2)



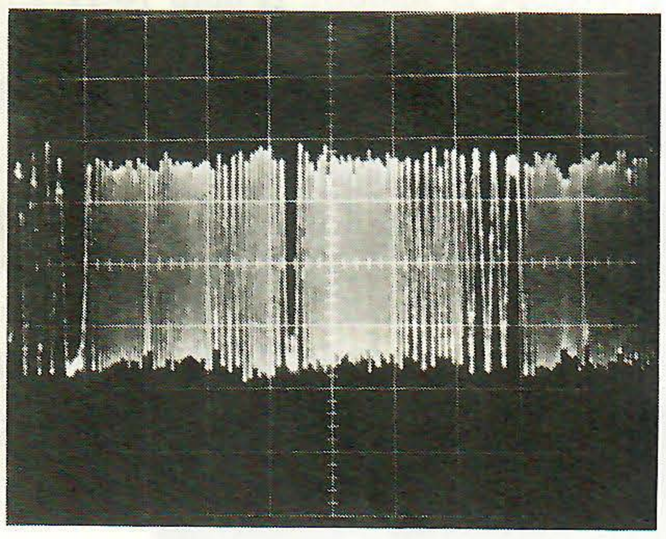
100mV/div
5mS/div

Photo 10-2 TRKG error waveform
(loop open, maximum amplitude)

10.6 TRKG ERROR BALANCE ADJUSTMENT (VR4)

- Open the TRKG servo. (Refer to "Adjustment Precautions.")

1. Use fast forward to move to the area near frame #15,000 and observe the TRKGA (A-C) signal (TRKG error signal) at TP4. Adjust VR4 so that the center of the waveform amplitude is at DC0V. (Photo 10-3)
2. Remove the connection which opens the TRKG servo.



PREB. TP4

200mV/div
5mS/div

Photo 10-3 TRKG error waveform (loop open)

10.7 SLDR SHAFT LEVEL ADJUSTMENT

1. Connect pin (18) (flexible cable, FOCS coil) of connector CN31 of the PREB assembly to the oscilloscope through LPF and observe the voltage flowing in the focus coil.

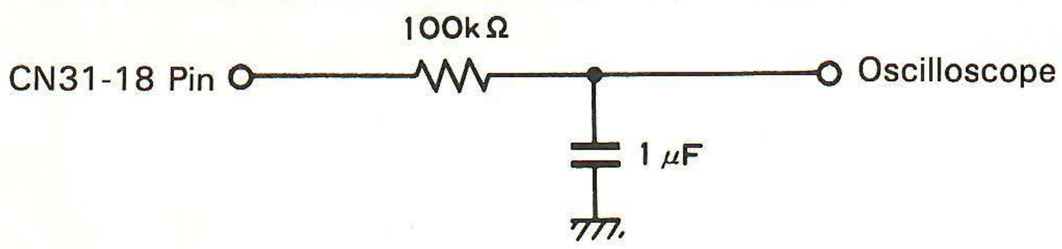


Fig. 10-8 L.P.F

2. Search frame #17,000 and measure the DC voltage being supplied to the FOCS coil.
3. Search frame #100 and measure the DC voltage in the same way to make sure that it is within ±90mV of the DC voltage measured in the item above.
4. When this rating is not satisfied, rotate the tilt motor by hand until the DC voltages for frames #100 and #17,000 are the same.

10.8 PICK-UP TILT ADJUSTMENT

1. Close the TRKG servo.
2. Search frame #18,914.
3. Lift up the PREB assembly slightly and insert Eccentric Screwdriver I into the tilt adjustment hole of the Pick-up assembly. Slowly turn the screwdriver toward the rear panel side and adjust until the crosstalk is minimum and the same for both the left and right.
4. Search frames #104 and #18,914 and make sure that crosstalk is minimum at both. If excessive crosstalk appears on the screen even after adjusting the tilt of the Pick-up assembly, fine adjust using the Pick-up assembly tangential tilt adjustment screw shown in Fig. 10-9 to minimize the crosstalk.

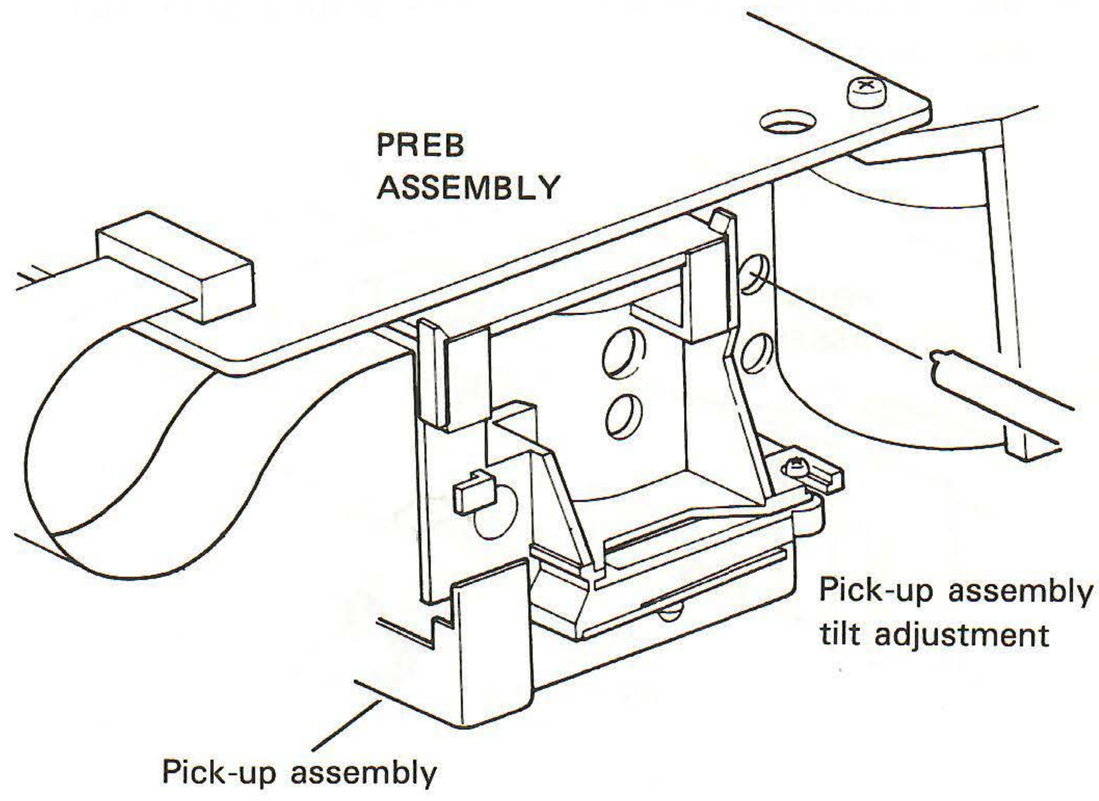


Fig. 10-9 Pick-up assembly adjustment location

10.9 FOCS ERROR BALANCE ADJUSTMENT (VR2)

1. Search frame #104.
2. Adjust VR2 so that the crosstalk striped pattern on the left and right sides of the monitor screen are not visible. (Fig. 10-10)

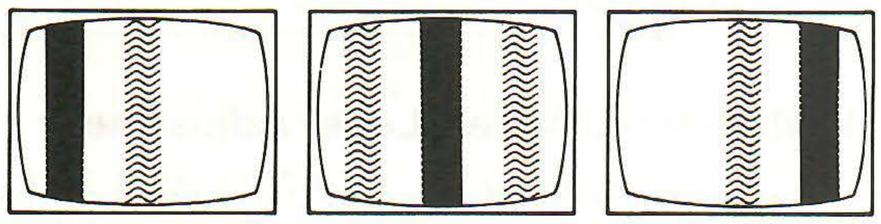


Fig. 10-10 The influence of crosstalk

10.10 TILT SENSOR TILT ADJUSTMENT

1. Search frame #104.
2. Turn the tilt sensor tilt adjustment screw until the voltage at TP7 of the PREB assembly is 0 – 50mV. (Use care to prevent external light reaching the sensor.)
3. Again remove the Mechanical assembly from the chassis and fully tighten the Pick-up assembly mounting screws.
4. Mount the Mechanical assembly in the chassis and connect the CN34 connector of the REPB assembly.
5. If there is crosstalk at frames #104 and #18,914, readjust the tilt of the Pick-up assembly from the beginning.

10.11 GRATING FINE ADJUSTMENT

- Connecter CN34 of PREB assembly must be connected.

1. Open the TRKG servo.
2. Set the oscilloscope to the X-Y mode, and adjust the X and Y zero points. (Set the beam spot of the oscilloscope in the center of the CRT scale.)
   Connect TP4 to the X input and pin (5) (TRKG (A + B) of connector CN24 to the Y input.
3. Press the fast forward key of the remote control and move to the area near frame #15,000.

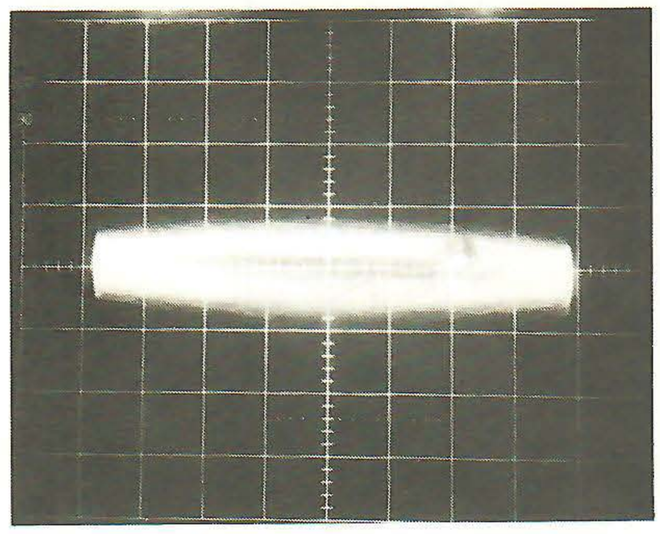
- Adjust the grating until the Lissajous figure is horizontal.

10.12 TRKG LOOP GAIN ADJUSTMENT (VR5)

① Connect the oscilloscope to the oscillator, as shown in Fig. 10-11(a), and set the oscilloscope to the X-Y mode.
② Search the area near frame #15,000.
③ Set the oscillator output as shown in Table 10-1.
④ Adjust VR5 so that the Lissajous figure is horizontal. (Photo 10-4)

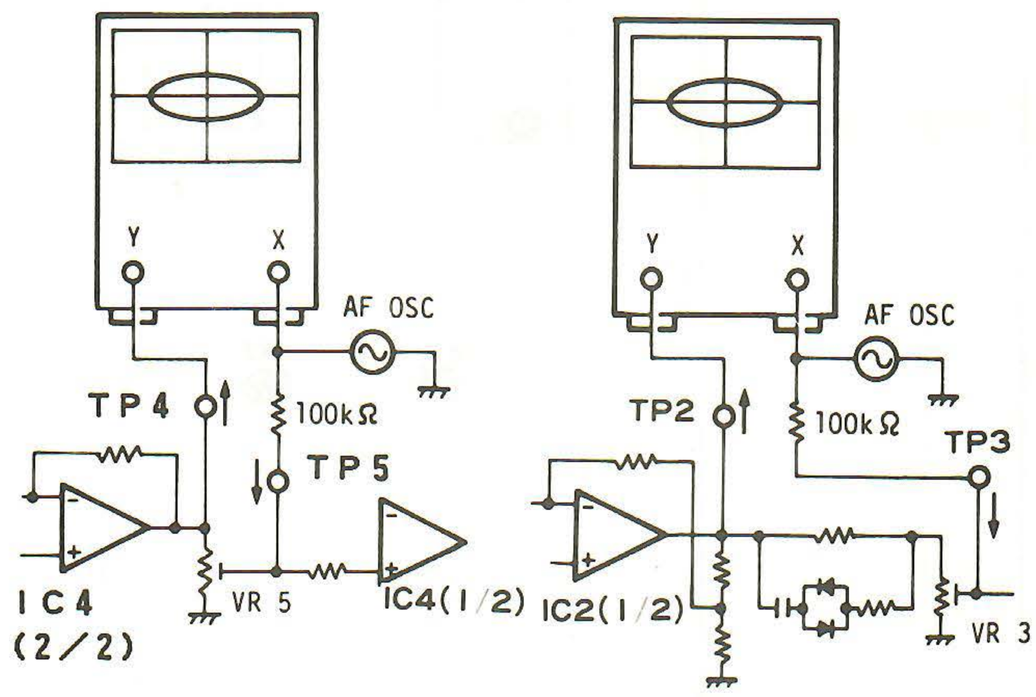
Test Disc	F1	F2	F3	F4	F5
Frequency (kHz)	3.0	3.7	3.3	3.3	3.3
Output (Vp-p)	1.2	1.2	1.2	1.2	1.2

Table 10-1 Oscillator output set values



X: 100mV/div
Y: 200mV/div
X: oscillator output
Y: TRKG (A–C) signal

Photo 10-4 Lissajous figure
(TRKG loop gain adjustment)



(a) TRKG LOOP (b) FOCS LOOP

Fig. 10-11 Servo loop gain adjustment

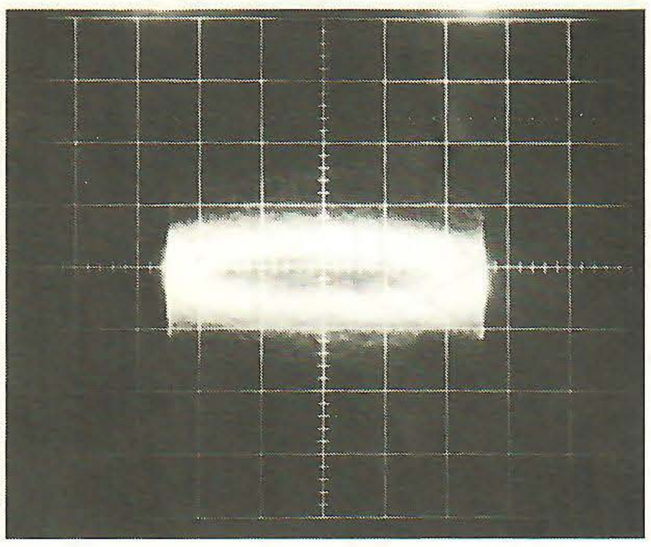
10.13 FOCS LOOP GAIN ADJUSTMENT (VR3)

Note: Connector CN100 of the FMPB assembly must be disconnected when making this adjustment; otherwise, the FOCS coil may be burned.

1. Connect the oscilloscope to the oscillator, as shown in Fig. 10-11(b).
2. Search the area near frame #15,000.
3. Set the oscillator output as shown in Table 10-2.
4. Adjust VR3 so that the Lissajous figure is horizontal.
5. Return the FMPB assembly connection as it was.

Test Disc	F1	F2	F3	F4	F5
Frequency (kHz)	2.1	1.7	1.7	2.0	1.7
Output (Vp-p)	4.0	4.0	4.0	4.0	4.0

Table 10-2 Oscillator output set values



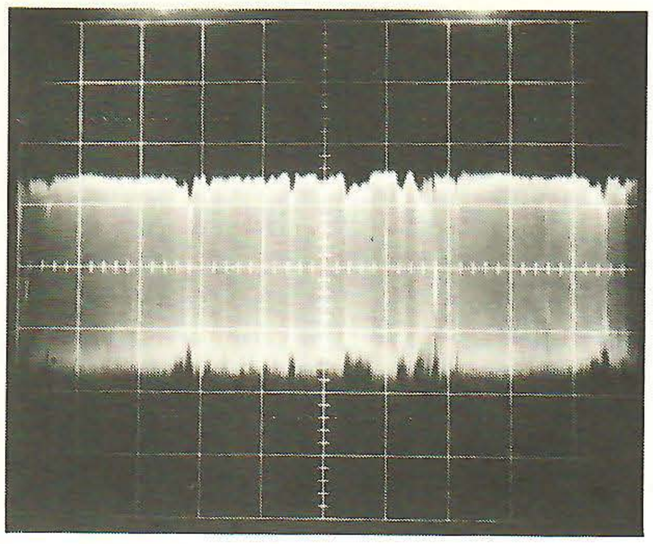
X: 100mV/div
Y: 200mV/div

X: oscillstor output
Y: FOCS error signal (PREB, TP2)

Photo 10-5 Lissajous waveform (FOCS loop gain adjustment)

10.14 RF LEVEL ADJUSTMENT (VR6)

1. Search the area near frame #15,000.
2. Observe the RF signal at TP6 and adjust VR6 so that the amplitude is 300mVp-p.



RF signal

100mV/div
5mS/div

Photo 10-6 FR signal waveform

10.15 INSIDE POSITION DETECTION ADJUSTMENT (VR8)

1. Turn VR8 fully clockwise.
2. Put the player in the test mode and start playing (refer to "Adjustment Precautions").
3. Press the [DISPLAY] key of the main unit and check whether or not an asterisk (*) appears in the upper right corner of the monitor screen.
4. Search frame #1,500.
5. Slowly turn VR8 counterclockwise and stop at the position where an asterisk (*) appears in the 1st column of the display.
6. Enter the SCAN mode and make sure that this point is between frame #1,000 and #2,000.

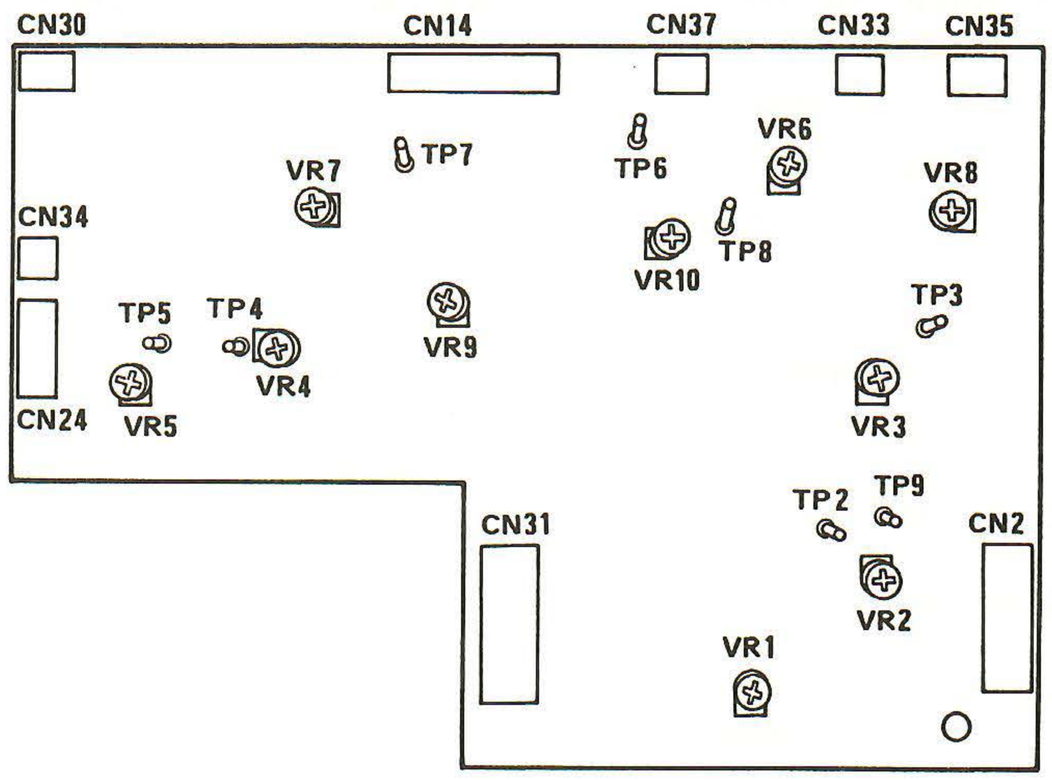


Fig. 10-12 PREB assembly adjustment location

10.16 8-, 12-INCH OUTSIDE POSITION DETECTION ADJUSTMENT

Note: Perform this adjustment after completing the VR8 adjustment.

1) 12-inch (VR9)

1. Search frame #46,500 in the test mode.
2. Adjust VR9 so that an asterisk (*) appears to the right of the frame no. display on the screen.

2) 8-inch (VR10)

1. Load the 8-inch test disc.
2. Search frame #19,500 in the test mode.
3. Adjust VR10 so that an asterisk (*) appears to the right of the frame no. display on the screen.

10.17 OTHER ADJUSTMENTS

Disc Clamp Switch Position Adjustment

When the disc clamp switch cannot be depressed even though the disc is clamped, the disc table will be ejected immediately. In such cases, try adjusting the switch position as described below.

The disc clamp switch is on the left side of the front panel.

1. Remove the bonnet.
2. Insert a screwdriver into the adjustment slit and increase the height of the switch by turning very slightly clockwise. (Fig. 10-13)
3. Push in the disc table with a disc loaded and check whether or not the disc rotates normally.

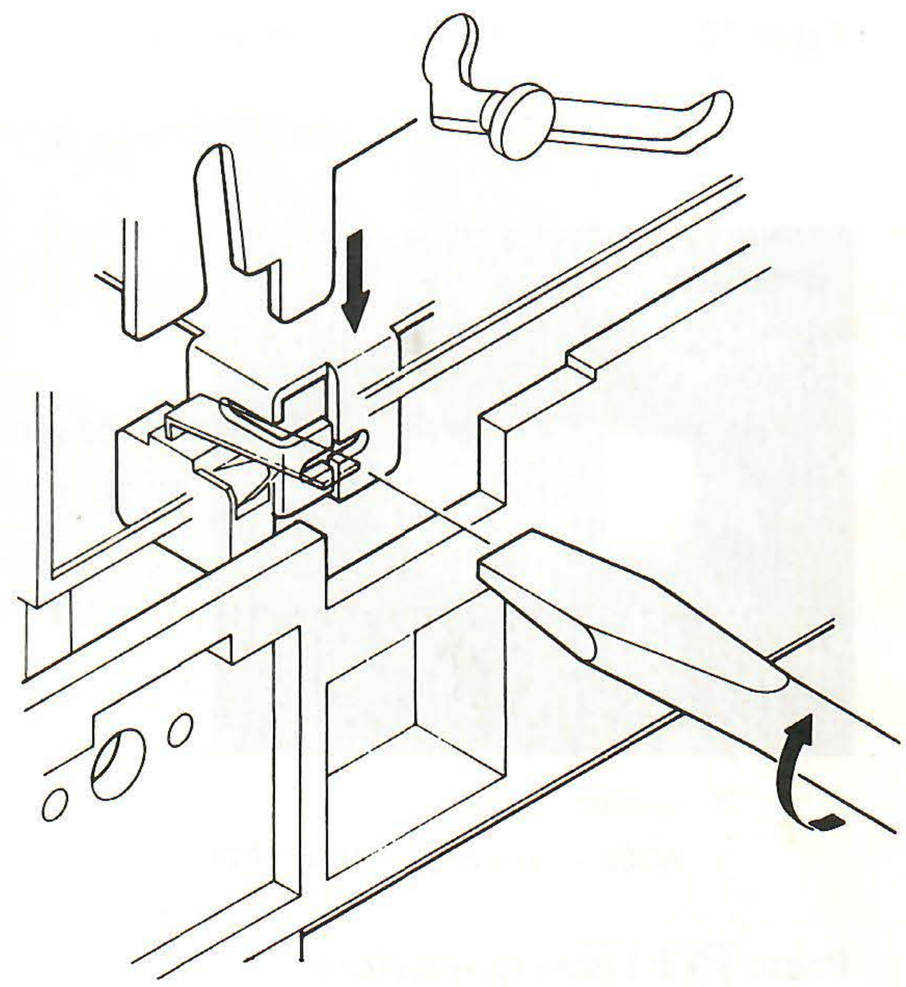


Fig. 10-13 Disc clamp switch position adjustment

11. ELECTRICAL ADJUSTMENTS

11.1 DEMB ASSEMBLY ADJUSTMENT

Step No.	Oscilloscope position V	Oscilloscope position H	Test points	Adjustment positions	Check items/ Adjustment specifications
			Q208 emitter	VR201	2Vp-p
			IC202, pin (11)	VR202	Same as pin (13)
	200mV/div	10μS/div	IC2 (HA12043), pin (11)	VR1	Noto: 70mVrms
			IC2 (HA12043), pin (10)	VR2	Noto: 72mVrms

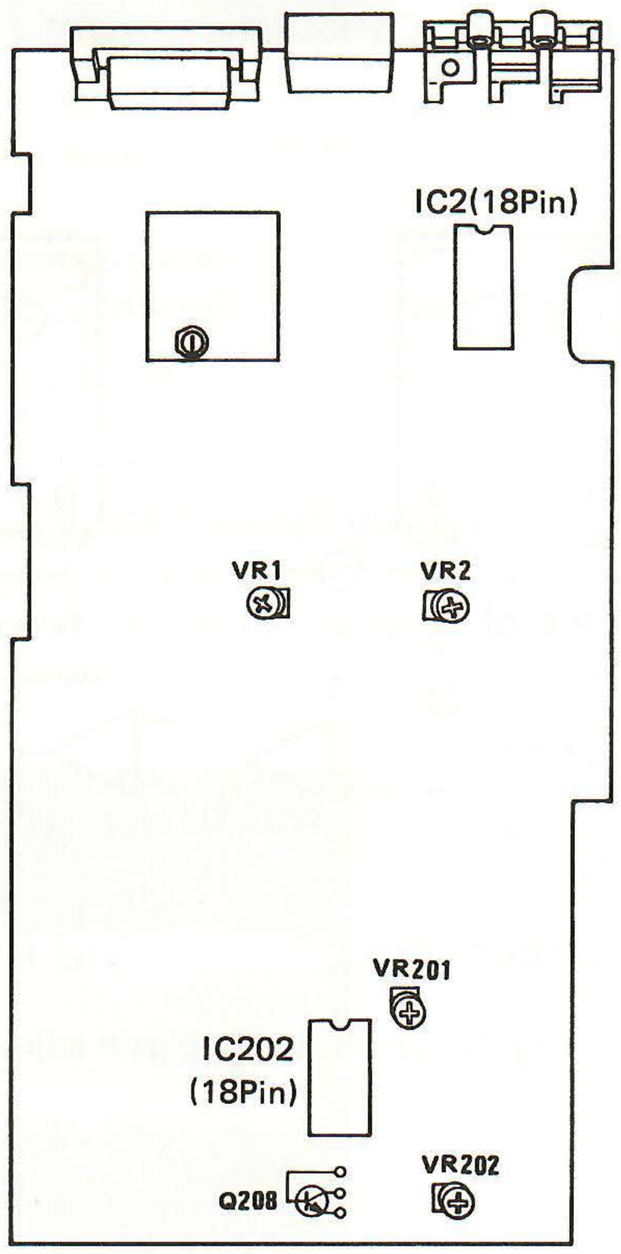


Fig. 11-1 DEMB assembly adjustment location

11-1 DEMB Assembly Adjustment Location

1) Modulated Video Level Adjustment

- Search frame #19,801.
- Adjust VR201 so that the white peak from the sync chip of the Q208 emitter video signal is 2Vp-p.

2) 1H Delay Video Signal Adjustment

- Adjust VR202 so that the amplitude of the video signal at pin (11) of IC202 is the same as that at pin (13).

3) Audio Signal Level Adjustment

- Search frame #7,201 (1/L channel, 1kHz, 40% modulation) and play.
- Adjust VR1 so that the level at pin (11) of IC2 (HA120443) is 70mVrms (see note).
- Search frame #8,101 (12/R channel, 1kHz, 40% modulation) and play.
- Adjust VR2 so that the level at pin (10) of IC2 (HA120443) is 72mVrms (see note).

Note:

Test Disc	Pin (11)	Pin (10)
F1	70mVrms	72mVrms
F2 and following	65mVrms	65mVmrs

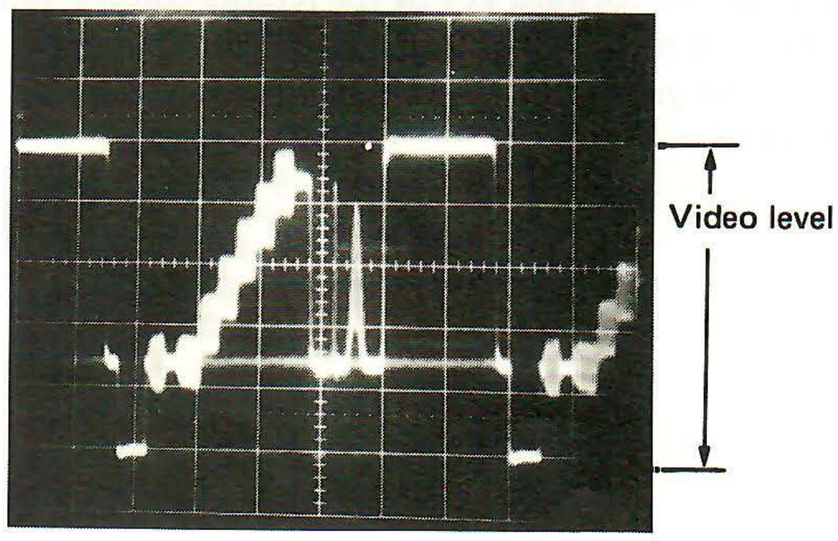


Photo 11-1 Composite test signal waveform

11.2 SRVB ASSEMBLY

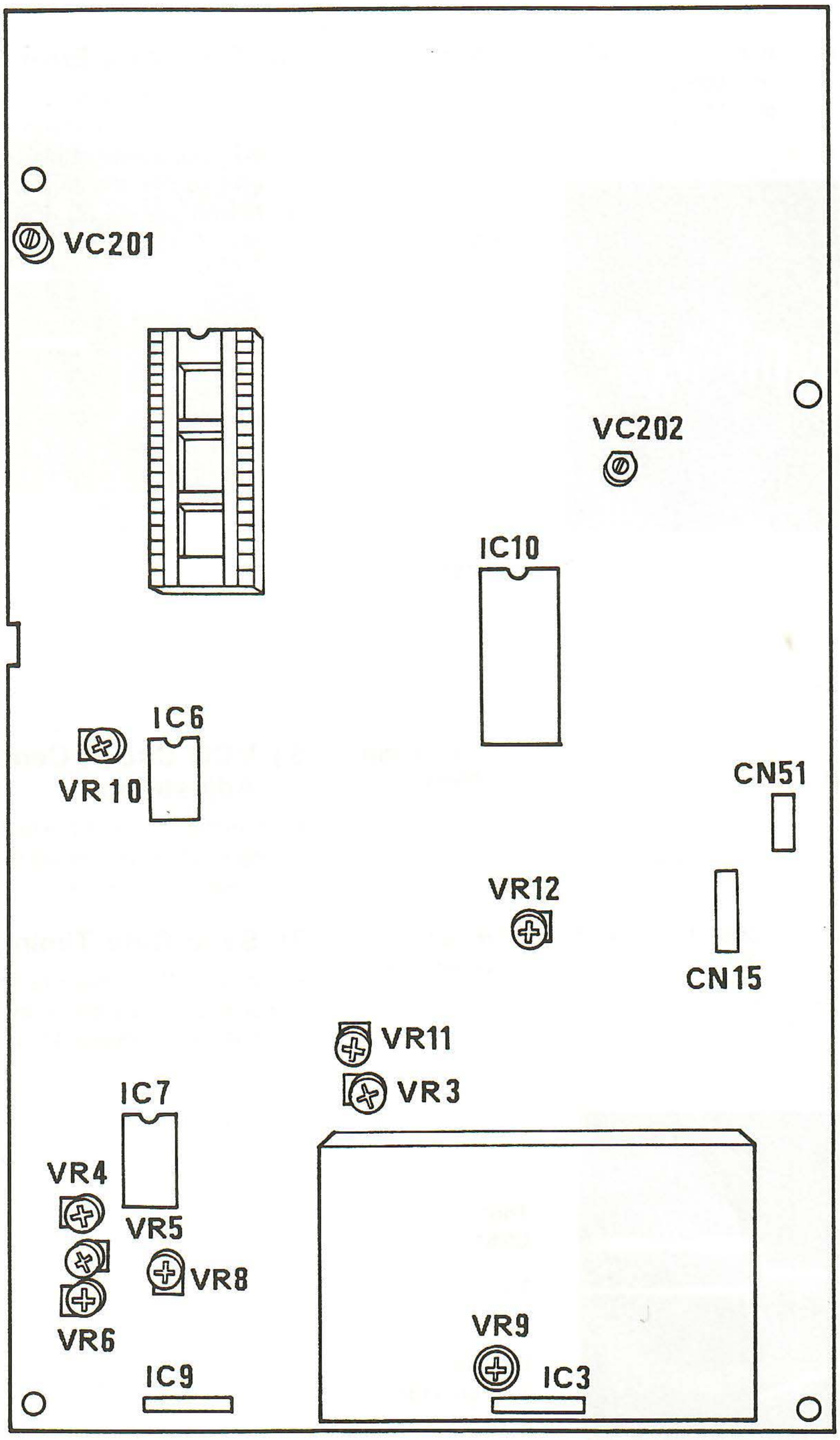


Fig. 11-2 SRVB assembly adjustment location

VR3: TBC video level adjustment
VR4: time axis error detection adjustment
VR5: sync gate timing adjustment
VR6: burst gate timing adjustment
VR8: TBC offset adjustment
VR9: VCO center frequency adjustment
VR10: VCO circuit center frequency adjustment
VR11: color phase correction circuit adjustment
VR12: color phase correction circuit adjustment
VR201: clock frequency adjustment
VR202: starting oscillation frequency adjustment

Step No.	Oscilloscope position V	Oscilloscope position H	Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
			IC9, pin (2)	VR8	DC0V	
			CN51-1	VR3	2Vp-p	
			VIDEO OUTPUT terminal	(DEMB Assembly VR201)	1Vp-p	
			IC10, pin (27)	VC202	3.579545MHz	

11-2 SRVB Assembly Adjustment

Note: The SRVB assembly adjustment can be made without removing the shield case.

1) TBC offset adjustment

- Turn on the power switch and adjust VR8 so that there is DC0V at pin (2) of IC9 (NJM4558S) when not playing back.

Note: When the DC voltage cannot be checked due to noise, connect L.P.F. and measure as shown in the diagram.

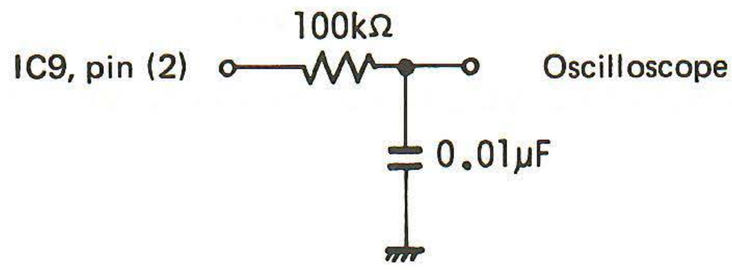


Fig. 11-3 L.P.F. for eliminating noise

2) TBC Video Level Adjustment

Note: The ''1) Demodulated video level adjustment'' for the DEMB assembly must be completed first.

- Search frame #19,801.
- Adjust VR3 so that the amplitude of the CN51-1 video signal (from the sync chip to the white peak) is 2Vp-p.
- Check whether the video signal at the VIDEO OUTPUT terminal on the rear panel is 1Vp-p. (A 75-ohm terminator is used when a video monitor is connected.) Use DEMB Assembly VR201 to make the adjustment.

3) Starting Oscillation Frequency Adjustment

- Connect a frequency counter to pin (27) of IC10 (PM2001) and adjust to 3.579545MHz ± 5Hz using VR202.

Step No.	Oscilloscope position V	Oscilloscope position H	Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
	1V/div	10μS/div	CN51-1 CN15-7	VR9	70.7 μsec. delay	

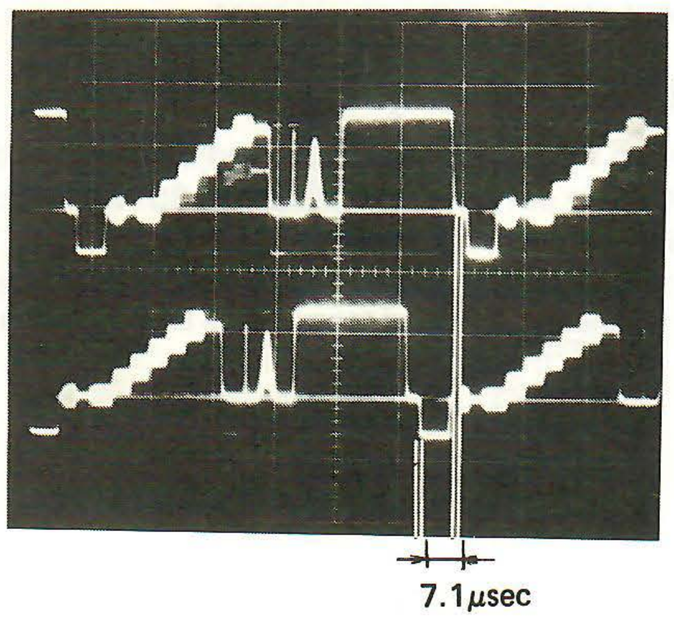


Photo 11-2 VCO center frequency adjustment

4) VCO Center Frequency Adjustment

- Connect pin (9) of IC3 (PA0017) to GND.
  → Time axis error is made 0 compulsorily.
  → This connection can be made at the notched section (indicated by the arrow in the diagram) of the shield case at the back of the PC board.
- Adjust VR9 so that the CN51-1 video signal is delayed 70.7 μsec. (1H + 7.1 μsec.) longer than the CN15-7 video signal.

→ The video signal input from CN15-7 is delayed by the CCD circuit and is then output to CN51-1. 70.7 μsec. is the delay time when the time axis error is 0.

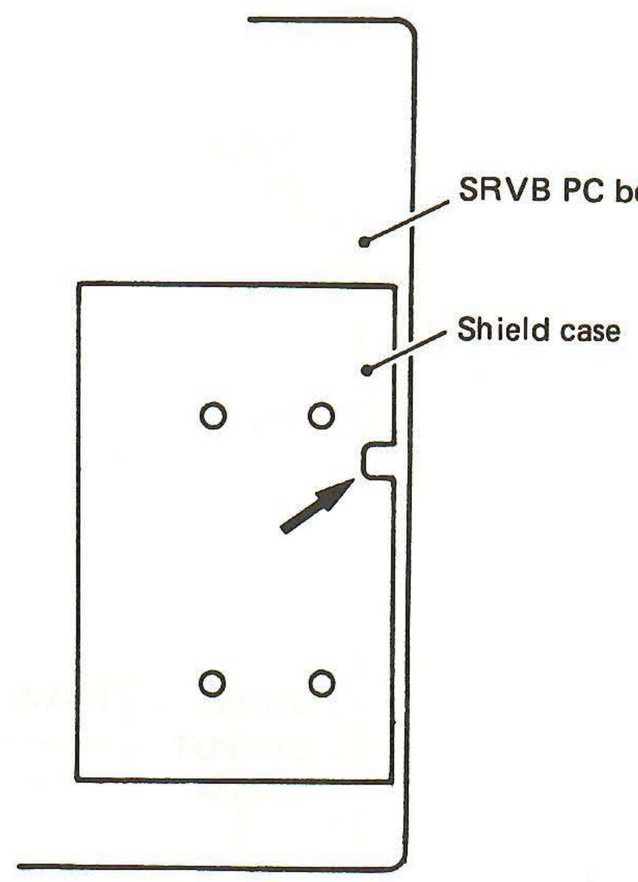
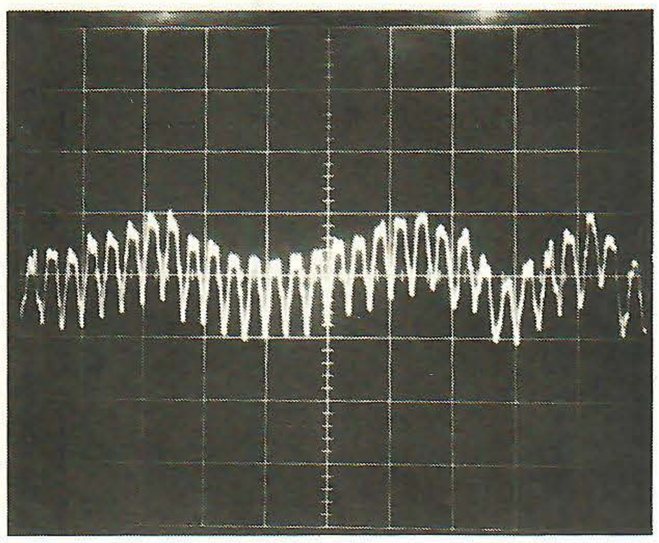


Fig. 11-4 Shield case at the rear of the SRVB PC board

Step No.	Oscilloscope position V	Oscilloscope position H	Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
	200mV/div	0.1S/div	IC7 (PA5009), pin (11)	VR4	Amplitude center is 0V	



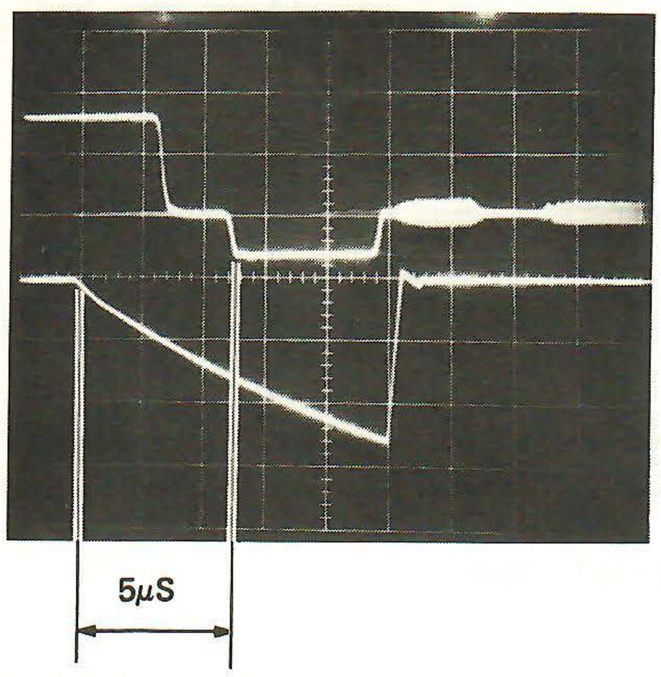
SRVB
IC7, pin(11)

200mV/div

0.1S/div

Photo 11-3 Time axis error detection adjustment

IC6, pins (2) and (6)		VR10	Pin (6) voltage +100mV	
1V/div	2μS/div	CN51-1 IC7, pin (15)	VR5	Timing for 2 waveforms



Top:
CN51-1

1V/div

Bottom:
IC7, pin (15)

1V/div

2μS/div

Photo 11-4 Sync gate timing adjustment

5) Time Axis Error Detection Adjustment

- Connect pin (9) to GND.
- Observe the waveform (time error signal detected from the sync signal) at pin (11) of IC7 (PA5009) and adjust VR4 so that the center of the amplitude is DC0V.
- Disconnect pin (9) of IC3.

6) VCO Circuit Center Frequency Adjustment

- With the PLL locked (with SPDL locked in the play mode), adjust VR10 so that pin (6) of IC6 (PA0018) is +100mV in relation to pin (2).

7) Sync Gate Timing Adjustment

- Adjust VR5 so that the timing of the CN51-1 video signal and the waveform at pin (15) of IC7 (PA5009) are as shown in Photo 11-4.

Step No.	Oscilloscope V	Oscilloscope H	Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
			CN51-1 IC7, pin (22)	VR6	Waveform timing	
			CN51-1 video signal	VR12	Waveform stable	
			Monitor screen	VR11	Minimum color unevenness	
			IC202, pin (3)	VR201	3.00MHz	

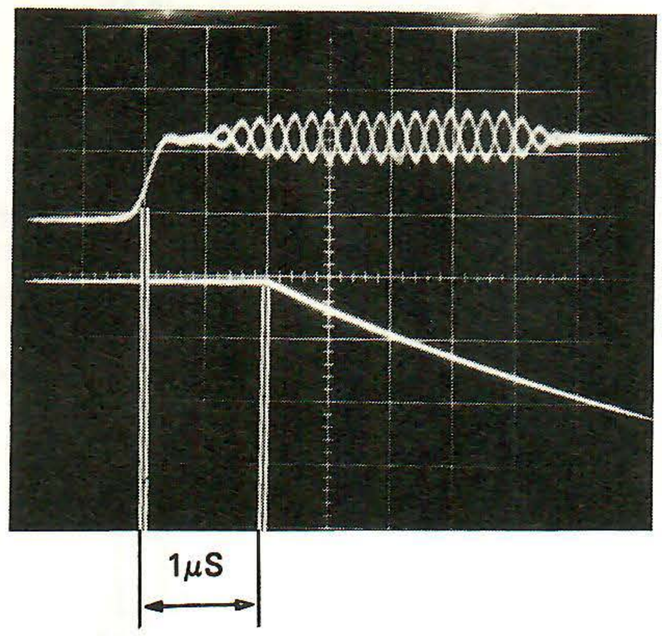


Photo 11-5 Burst gate timing adjustment

8) Burst Gate Timing Adjustment

- Adjust VR6 so that the timing of the CN51-1 video signal and the waveform at pin (22) of IC7 are as shown in the photo 11-5.

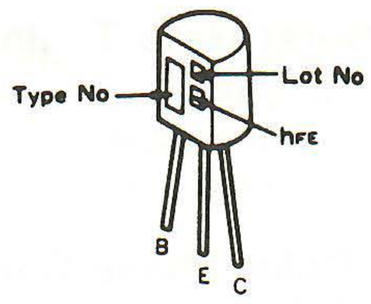
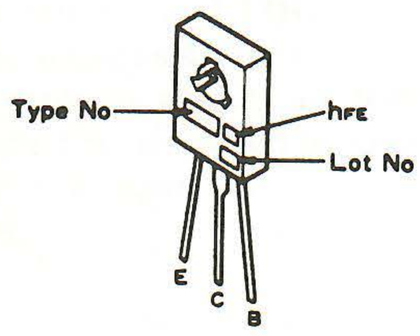
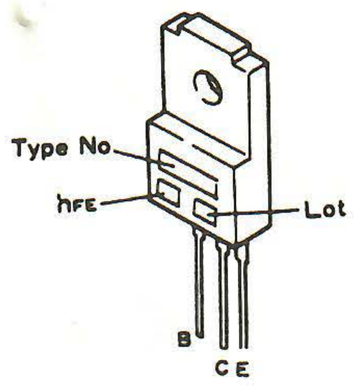
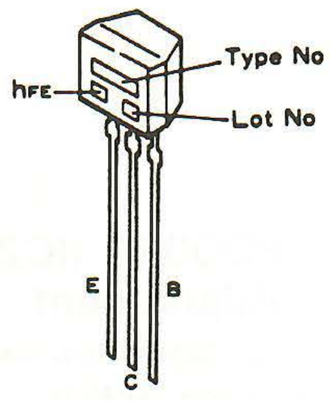
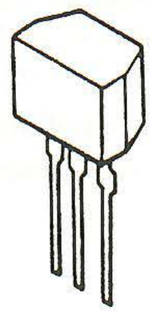
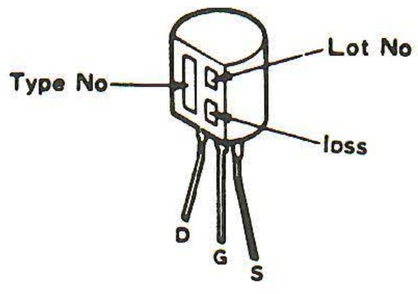
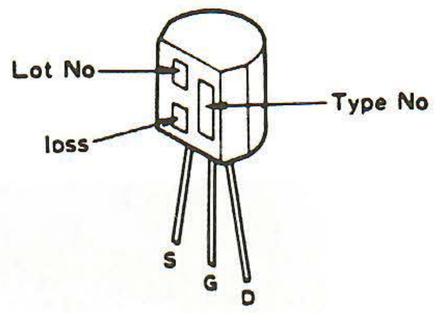
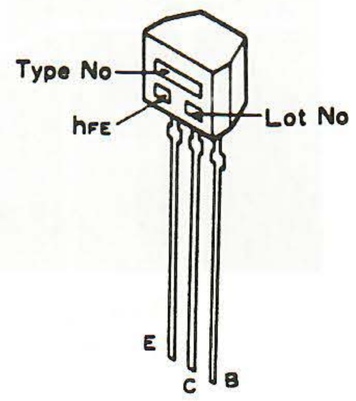
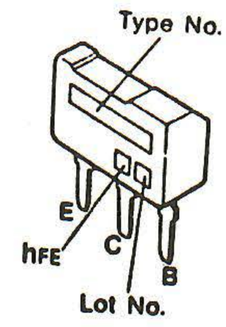
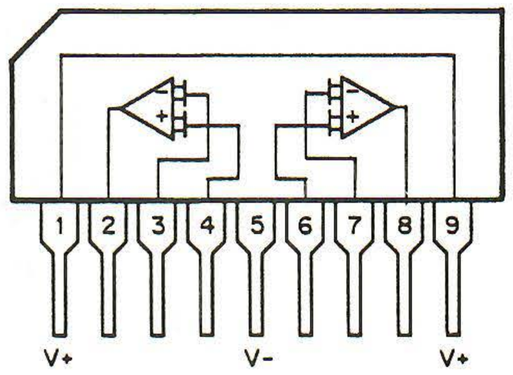
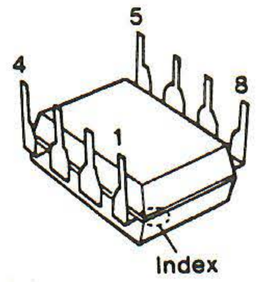
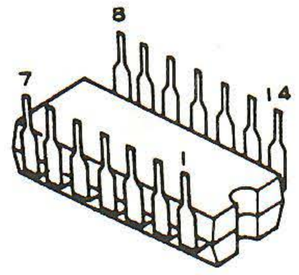
9) Color Phase Correction Circuit Adjustment

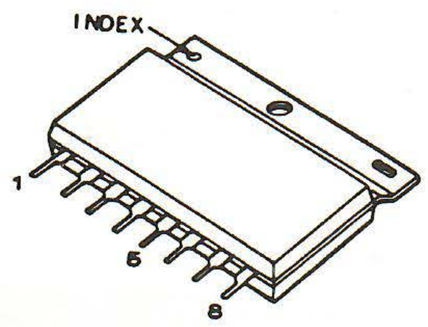
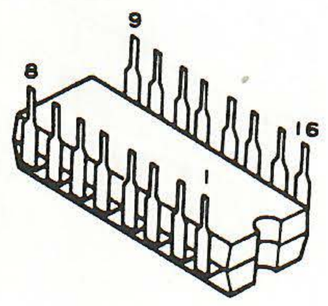
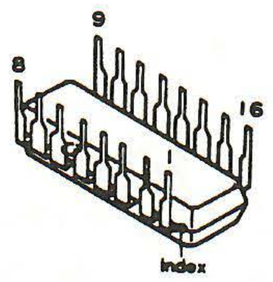
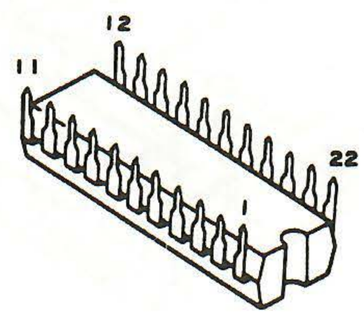
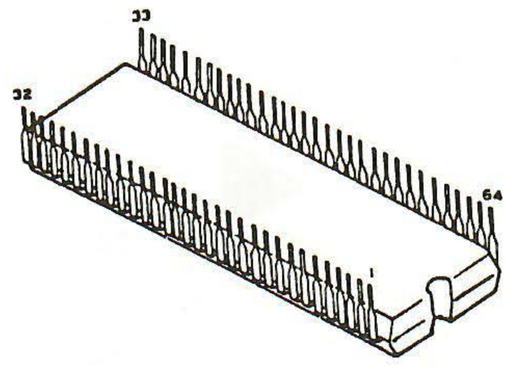
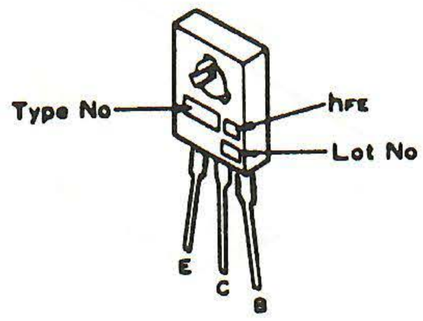
- Use the still mode starting at frame #26,101 where the magenta signal section starts. (Search frame #26,101.)
- Turn VR11 fully counter clockwise.
- Observe the video signal at CN51-1 and adjust VR12 so that the chroma envelope is smooth.
- Look at the screen and adjust VR11 so that the color of the magenta image is most even.

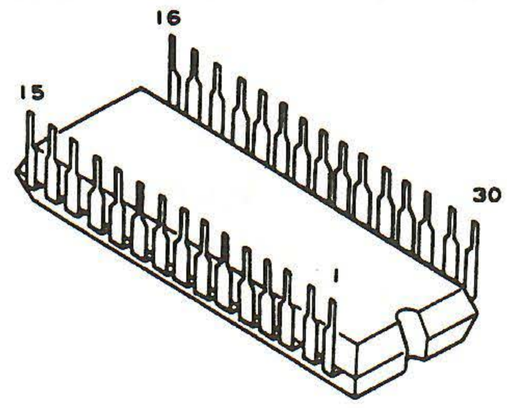
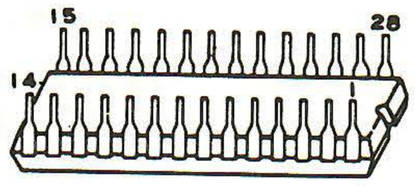
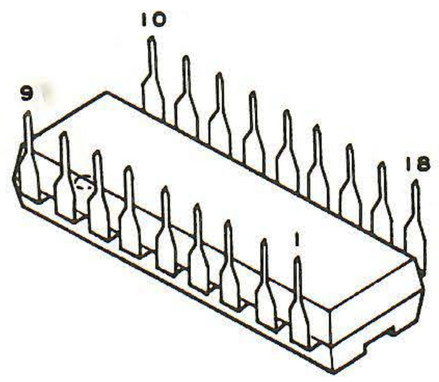
10) PD0011 (IC202) Clock Frequency Adjustment

- Turn on (down) function switch no. 8 and turn on the power. (Test mode (→P45.))
- Pull up IC202, pin (3) to 5V using 10kohms.
- Key-in ''0'', ''FUNC'', ''0'' using the remote control.
- Use the frequency counter and adjust VR201 so that IC202, pin (3) is 3MHz ± 50kHz.
- Key-in ''0'', ''FUNC'', ''0'' using the remote control to cancel the oscillation mode.
- Turn off (up) function switch no. 8 to cancel the test mode.

12. ICS AND TRANSISTORS

2SC1627 2SC1674	
2SA886 2SA1096 2SC1847 2SC2497	
2SB1016 2SD1267 2SD1407	
2SA933S 2SC1740S UN4112 UN4212	
2SK184	
2SK117	
2SK30ATM	
DTA124ES DTC124ES	
2SB910M 2SB909M 2SD1225M 2SD1226M	
NJM4558S PA0017	
PM0001 M5218P NJM4556DE NJM4558D μPC4558C μPC393C	
μPC339C PA0018 SN74LS04N	

MB3763	
PA0009 HD74LS145P SN74LS123N	
PA9003	
PD0011 MB89011P-102	
PD5050	
2SC2497	

PM2001 PA3020 PA5009	
PM4001 TL8614P	
HA12043 PA3018 PD0012A	
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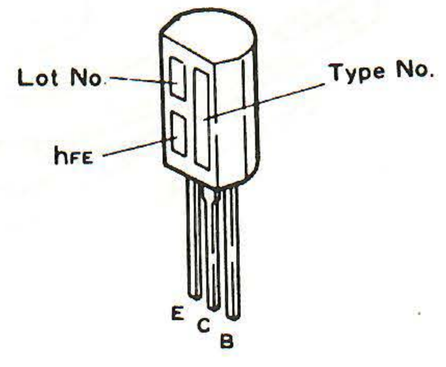
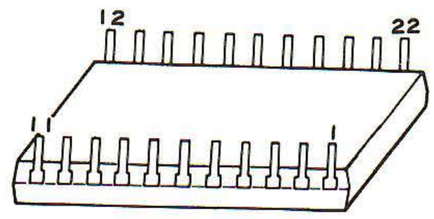
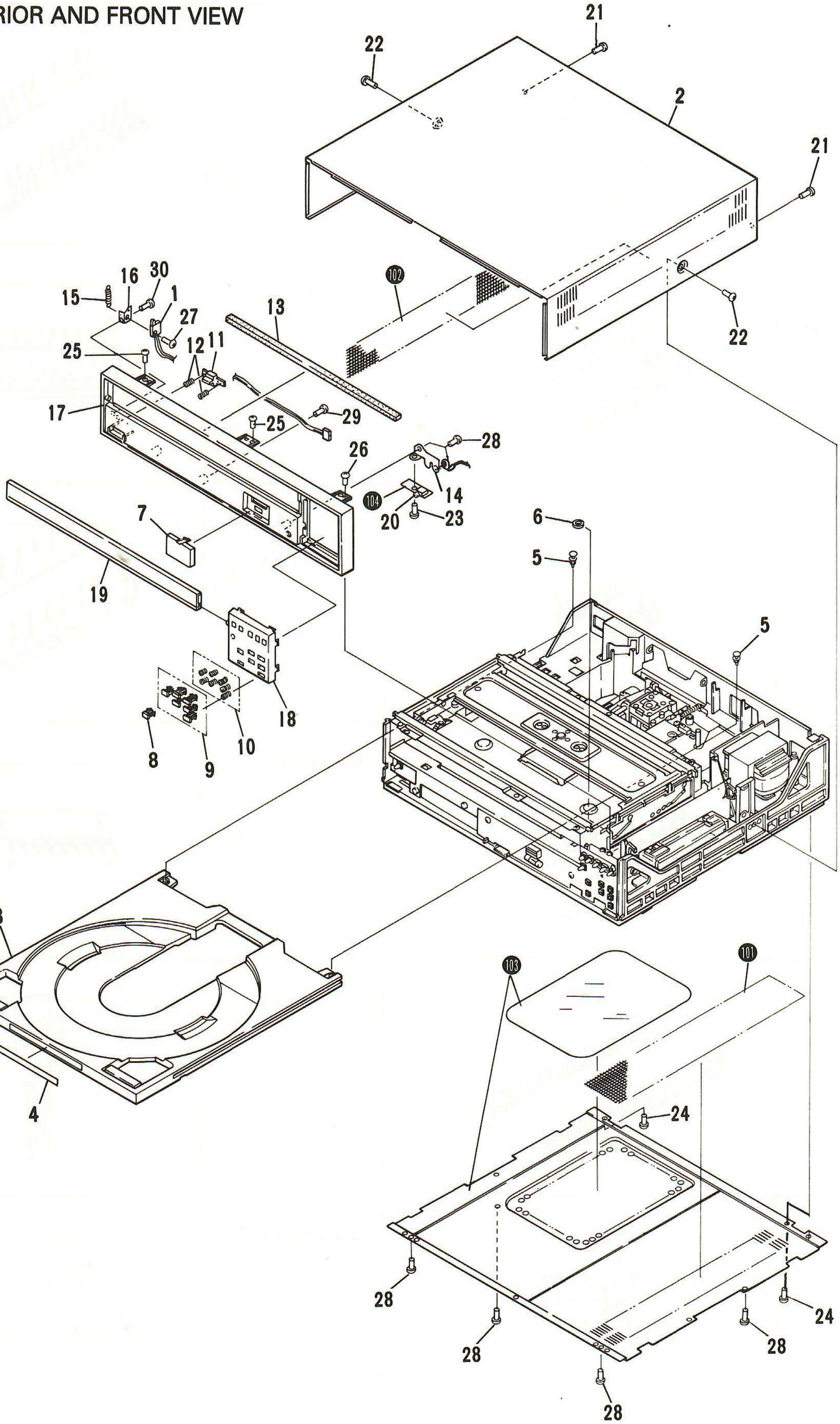
2SC3243	
DYY1001	

13. EXPLODED VIEWS AND PARTS LIST

13.1 EXTERIOR AND FRONT VIEW



NOTES:

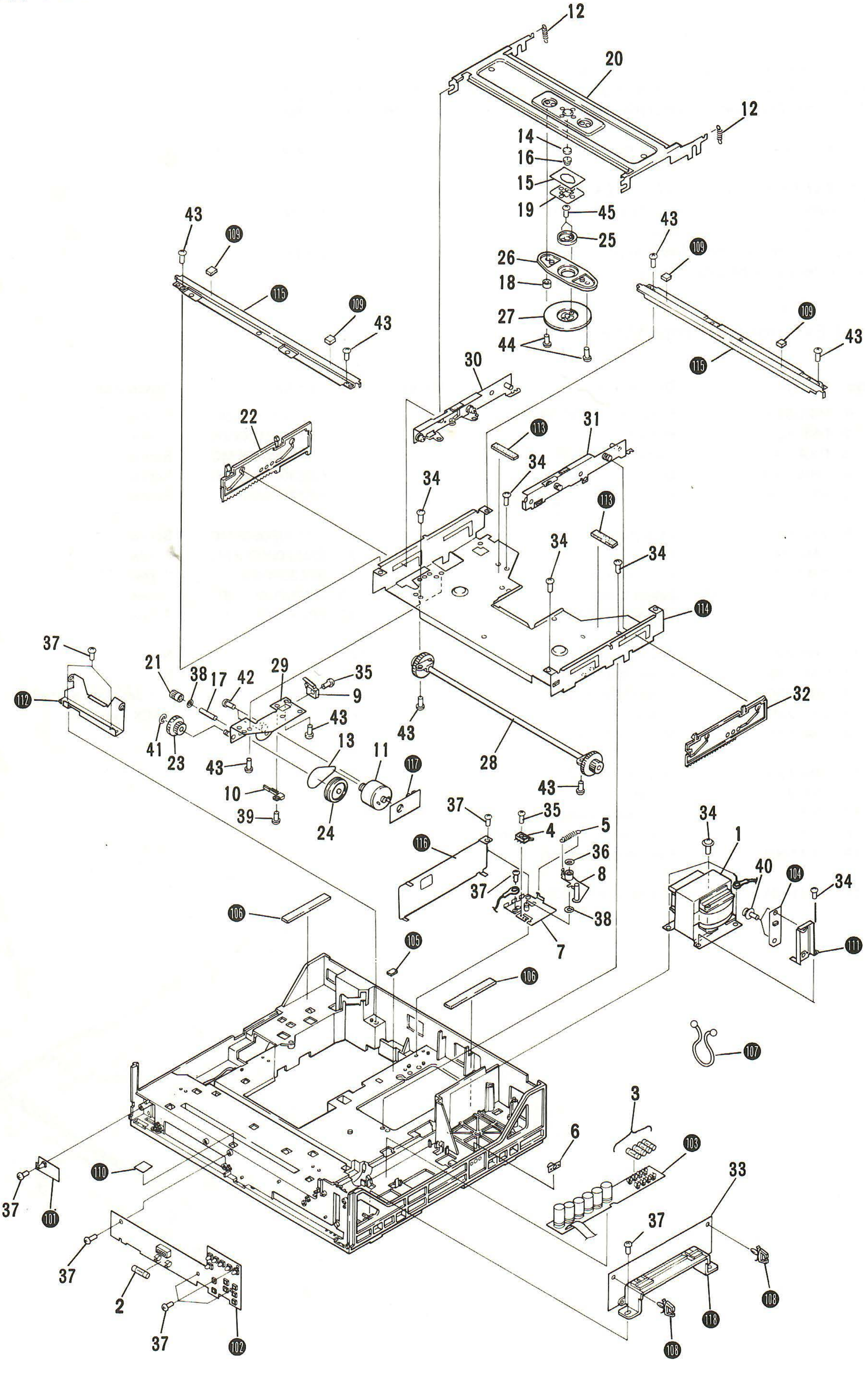
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with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

Parts List of Exterior and Front View

Mark	No.	Part No.	Description
★★	1	VSK-012	Slide switch (DOOR)(S6)
	2	DNE-121	Bonnet
	3	DXA-142	Carry assembly
	4	DRW-114	Carry label
	5	VEC-219	Plastic rivet
	6	VNL-493	Lock Roller
	7	DMA-217	F cover
	8	DMA-218	Button (REJECT)
	9	VAC-156	Select button (PLAY,STILL/STEP, SCAN, DISPLAY)
	10	VBH-090	Key spring (B)
	11	VAC-299	Power button
	12	VBH-150	Power button spring
	13	VEC-226	Cushion
	14	VNE-576	Mini jack holder
	15	DBH-129	Door spring
	16	VNE-718	Holder
	17	DXX1029	Front panel assembly
	18	DXX-114	Front control panel assembly
	19	DXX1001	Front door assembly
	20	DKN1001	Mini jack (EXT CONT)

Mark	No.	Part No.	Description
	21	BBT30P060FZK	Screw
	22	BMZ40P100FZK	Screw
	23	BBZ30P060FMC	Screw
	24	BBZ30P080FMC	Screw
	25	BBZ30P050FMC	Screw
	26	APZ30P080FMC	Screw
	27	BMZ20P080FMC	Screw
	28	BPZ30P080FZK	Screw
	29	IPZ30P060FMC	Screw
	30	BPZ30P060FUC	Screw
	101		Net
	102		Net
	103		Bottom plate assembly
	104		JACK assembly

13.2 TOP VIEW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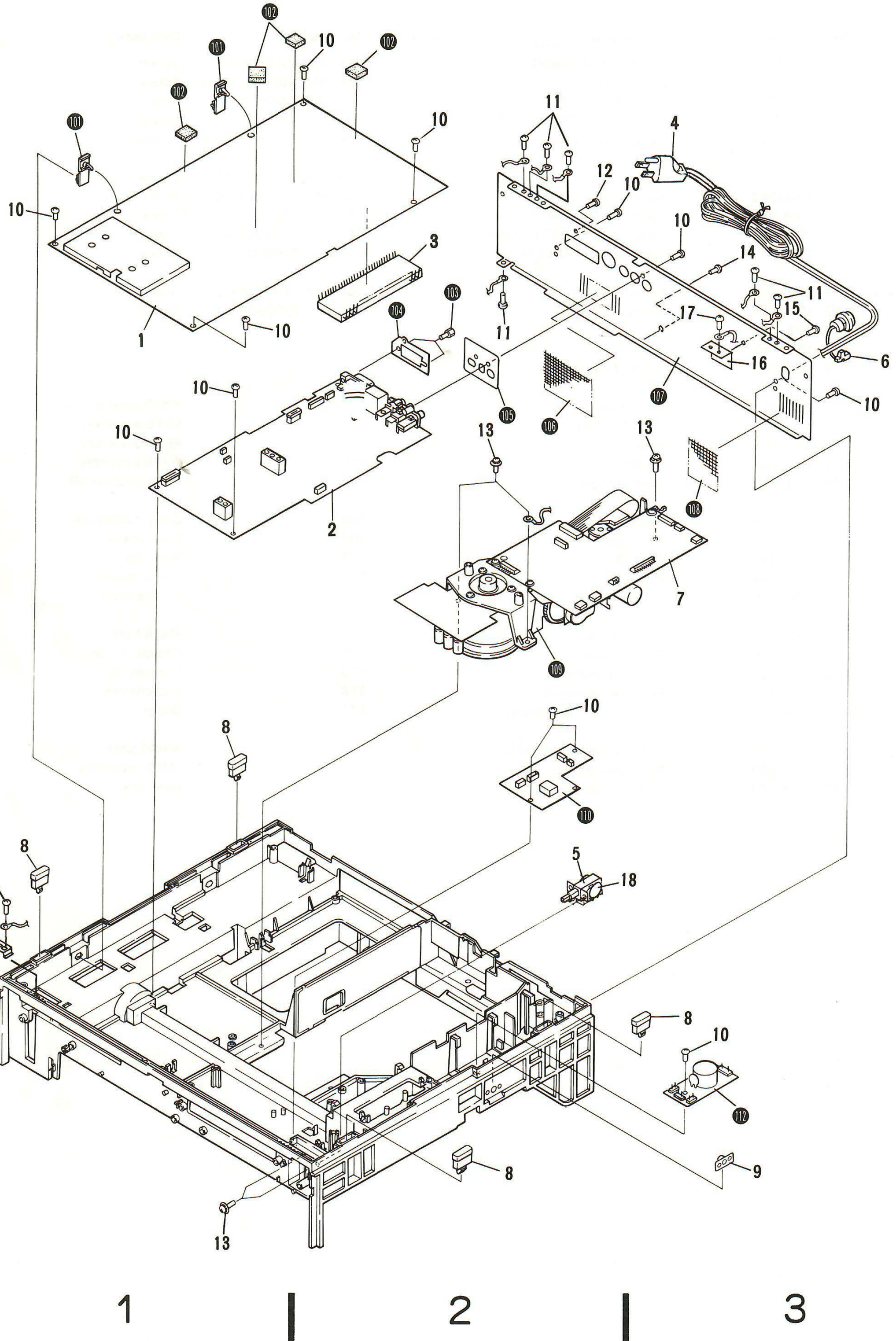
Parts List of Top View

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
⚠ ★	1	DTT1002	Power transformer(T1)		34	APZ30P080FMC	Screw
	2	VCX-006	Hour meter		35	BMZ20P080FMC	Screw
⚠ ★★	3	VEK-018	Fuse (3A)(FU1-FU4)		36	WT26D060D025	Screw
★★	4	VSK-011	Slide switch (DRAW-IN)(S4)		37	BPZ30P080FZK	Screw
	5	DBH-130	Switch lever spring		38	WA32D060D025	Screw
	6	VBN-005	Nut		39	PMZ20P050FMC	Screw
	7	VXA-342	Switch base assembly		40	PMB30P060FMC	Screw
	8	VXA-343	Switch lever assembly		41	YE30FUC	Screw
★★	9	VSK-010	Slide switch (DISC CLAMP)(S3)		42	PMA26P040FMC	Screw
★★	10	PSN-003	Leaf switch (TABLE POSITION)(S2)		43	BBZ30P060FCC	Screw
★★	11	VXM-054	Loading motor		44	PMB30P060FCC	Screw
	12	VBH-186	Clamper spring		45	PPZ20P050FMC	Screw
	13	VEB-112	Belt				
	14	VEB-129	Rubber mat				
	15	VEC-262	Holder fixing tape				
	16	VLL1018	Ball holder		101		PWID assembly
	17	VLL-303	Gear(A) shaft		102		KEYB assembly
	18	VLL-345	Spacer		103		RECB assembly
	19	VNE-689	Holder		104		FMPB assembly
	20	VNE-837	Clamper holder		105		Carry cushion (B)
	21	VNL-149	Gear (A)		106		Carry cushion (A)
	22	VNL-489	Rack gear (L)		107		Wire binder
	23	VNL-496	Gear (B)		108		Wire clip
	24	VNL-494	Pulley		109		Dump cushion
	25	VNL-500	Clamper head		110		Harnss blind
	26	VNL-612	Clamper base		111		FMPB holder
	27	VNL-626	Disc clamper		112		Chassis holder
	28	VXA-327	Synchro gear assembly		113		Cushion (B)
	29	VXA-427	M holder assembly		114		Sub chassis
	30	VXA-487	Roller plate (L) assembly		115		Bridge
	31	VXA-488	Roller plate (R) assembly		116		Shield plate
	32	VNL-490	Rack gear (R)		117		LMCB assembly
	33	VYR-043	DRVB assembly		118		Heat sink

13.3 BOTTOM VIEW



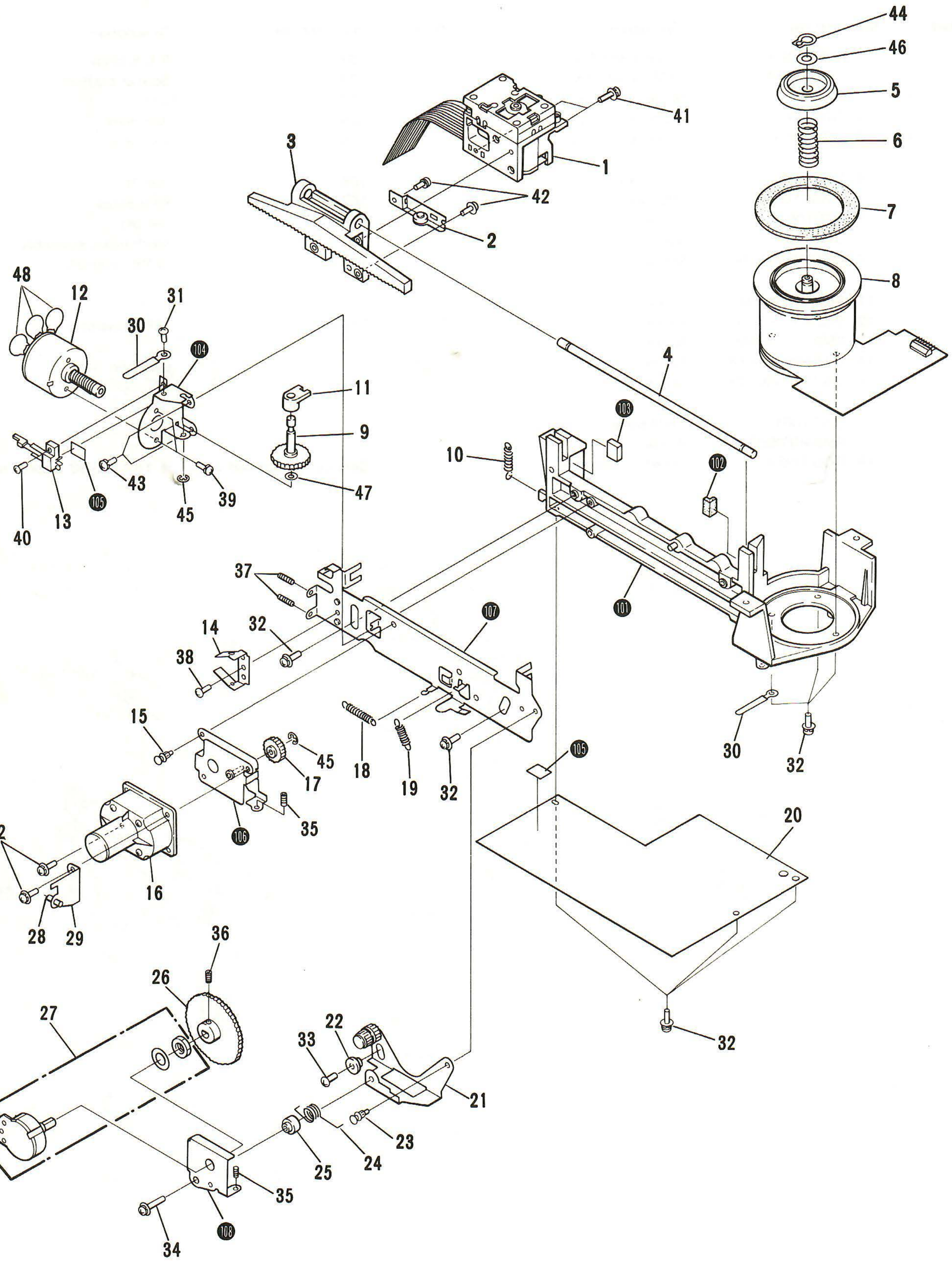
Parts List of Bottom View

Mark	No.	Part No.	Description
	1	DWS1009	SRVB assembly
	2	DWV1008	DEMB assembly
★★	3	PD5050	Micro computer IC (IC201)
⚠	4	DDG1001	AC power cord
⚠ ★★	5	DSA1003	Power switch (S1)
	6	VEC-201	Strain relief
	7	VWV-106	PREB assembly
	8	VEB1001	Rubber foot
	9	VBN-005	Nut
	10	BPZ30P080FZK	Screw
	11	BBZ30P060FMC	Screw
	12	VBZ30P080FZK	Screw
	13	PMB30P080FMC	Screw
	14	BBT30P060FZK	Screw
	15	VBZ30P080FZK	Screw
	16	DNF1001	GND plate
	17	PMB40P080FMC	Screw
	18	RCG-009-B	Ceramic capacitor

Mark	No.	Part No.	Description
	101		P.C.B hinge
	102		Spacer cushion
	103		*Bolt
	104		Sub plate
	105		AV plate
	106		Net (B)
	107		Rear panel
	108		Net (A)
	109		Mechanism assembly
	110		RLYB assembly
	111		. . .
⚠	112		LSFB assembly
	113		. . .
	114		GND clip

* Service is supplied with the 15P D-SUB socket attached.

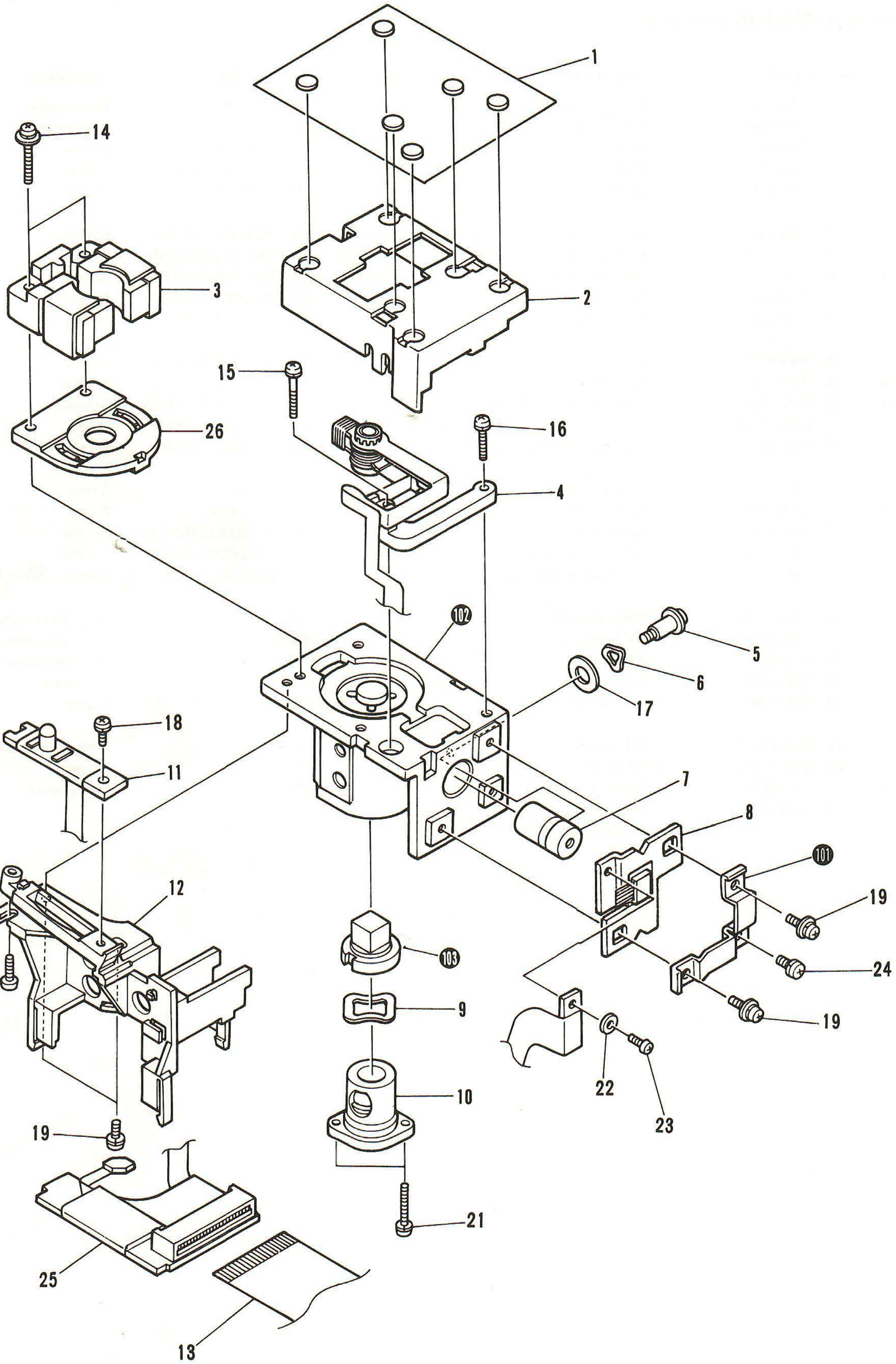
13.4 MECHANISM VIEW



Parts List of Mechanism View

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1	VWY1005	Pick-up assembly		29	VNE-807	Filter holder
	2	VXA-394	Roller arm assembly		30	VNF-069	Cord retainer
	3	DMA1001	Slider		31	BBZ30P060FCC	Screw
	4	DLA1001	Shaft		32	PMB30P080FCU	Screw
	5	VNV-041	Centering hub		33	PMB30P080FMC	Screw
	6	VBH-185	Centering spring		34	PMB30P100FMC	Screw
	7	VEB1008	Rubber spacer		35	ZMD30H080FBT	Srew
★★	8	VXM-075	Spindle motor		36	ZMD30H060FBT	Screw
	9	VXA-481	Tilt shaft assembly		37	ZMD30H120FBT	Screw
	10	VBH-142	Tilt spring		38	BBZ30P060FMC	Screw
	11	VNV-036	Tilt nut		39	PMA26P040FMC	Screw
★★	12	VXM-060	Tilt motor		40	PMZ20P050FMC	Screw
★★	13	PSM-003 (VSK-015)	Leaf switch (TILT LIMIT)(S5)		41	PMB26P060FMC	Screw
					42	AMZ26P070FMC	Screw
	14	VNE-701	Switch adjustment board		43	PMA30P080FCU	Screw
	15	VEC-143	Plastic rivet		44	YC60FBT	C ring
★★	16	VXM-074	Slider motor		45	YE20FUC	E ring
	17	VNL-623	Slider pinion		46	WA62N120W020	Washer
	18	VBH-138	Slider motor spring		47	WA26D047050	Washer
	19	VBH-175	Potention motor spring		48	CKDYF473Z50	Ceramic capacitor (TILT MOTOR)
	20	VWV-106	PREB assembly		101		Mechanism chassis assembly
	21	VXA-439	PM holder assembly		102		Cushion rubber (A)
	22	VLL-311	Washer		103		Cushion rubber (B)
	23	VEC-143	Plastic rivet		104		Tilt holder
	24	VBH-140	Torsion spring		105		Spacer
	25	VLL-310	PM washer		106		Motor holder assembly
	26	VNL-508	Pinion B		107		Tilt base
★	27	VCS-017	Potentiometer		108		PM support
	28	VCG-005	Thru type capacitor (SLIDER MOTOR)(1000pF)				

13.5 PICK-UP VIEW



Parts List of Pick-up View

Mark	No.	Part No.	Description
	1	VED-034	Pad
	2	VNH-057	Actuator cover
	3	VGX-063	Magnetic circuit assembly
	4	VGX-069	Objective lens assembly
	5	VLL-292	Screw 5
	6	PBE-020	Washer (A)
	7	VGX-064	Multi lens assembly
	8	VGX-065	PD assembly
	9	PBE-022	Washer (8)
	10	VGX-066	LD assembly
	11	VEX-022	Sensor assembly
	12	VNH-056	Sensor stay
	13	VDA-108	Card
	14	PBM20P120FMC	Screw
	15	PMA20P140FMC	Screw
	16	PMA20P080FMC	Screw
	17	WA40F100M050	Washer
	18	PPZ20P050FMC	Screw
	19	PMB20P050FMC	Screw
	20	PBZ20P080FMC	Screw
	21	PMA26P080FMC	Screw
	22	WA20W050R050	Washer
	23	PMA20P040FMC	Screw
	24	PMA26P060FMC	Screw
	25	VWV-079	HEAD assembly
	26	VGX1005	Wave length plate assembly
	101		PD spring
	102		Optical body
	103		Prism assembly

INSTALLING THE HEAD ASSEMBLY

The Head assembly is supplied with the flexible parts not bent; therefore, use the following procedure to process.

1. Bend as shown by the arrow in Fig. 1 and fasten using double-sided tape and adhesive.
2. With the flexible parts bent as shown in Fig. 1, mount on the pick-up.
3. Mount the flex strip that connects the disc tilt detection PCB and the TRKG and FOCS coils on the Head assembly as shown in Fig. 2.

Note:

The copper foil of the flex strip has little resistance to heat; therefore, soldering should be performed as quickly as possible. Apply the soldering iron to the Head assembly, not to the flex strip.

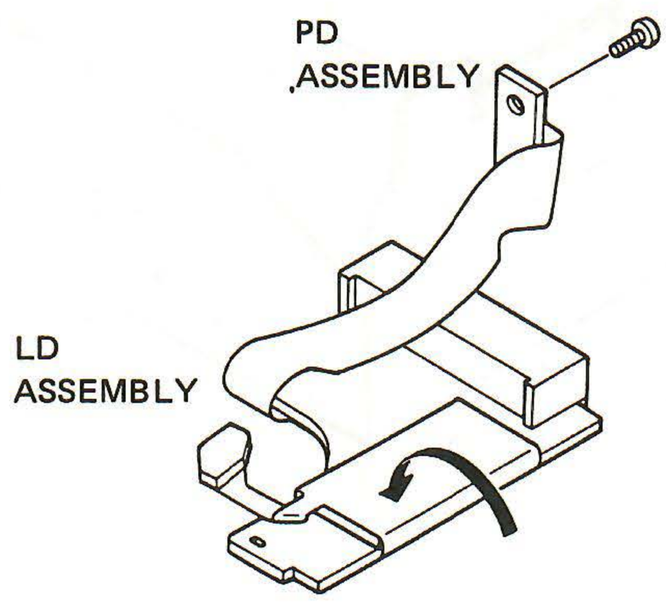


Fig. 1

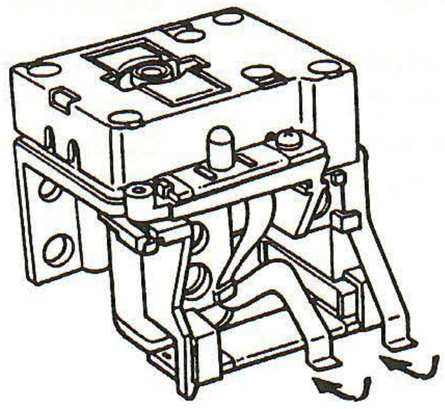
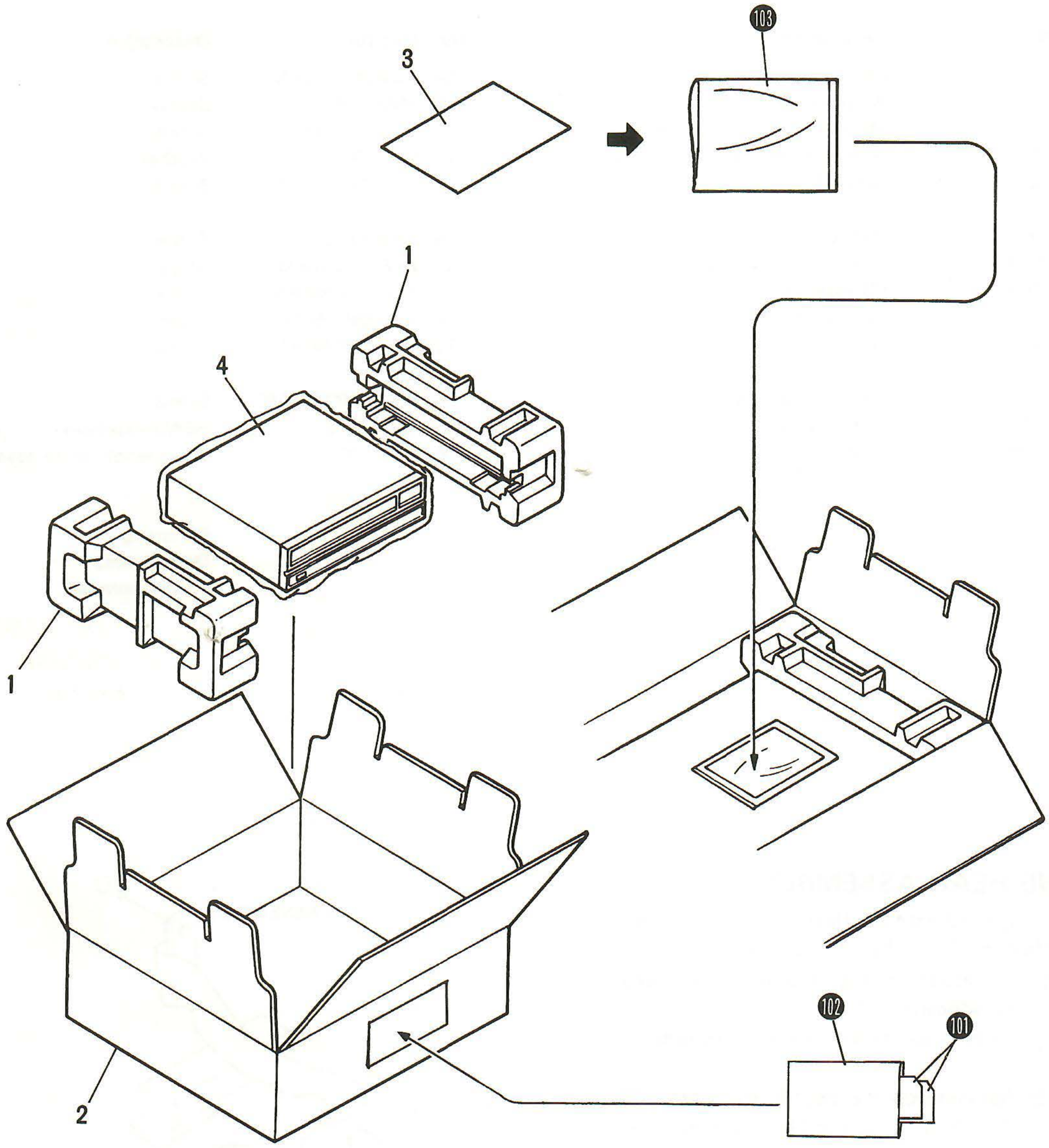


Fig. 2

14. PACKING



Parts List of Packing

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1	VHA1001	Pad		101		Punch card
	2	DHG1023	Packing case		102		Punch card bag
	3	DRB1003	Operating instructions		103		Polyethylene bag
	4	Z23-017	Mirror mat				

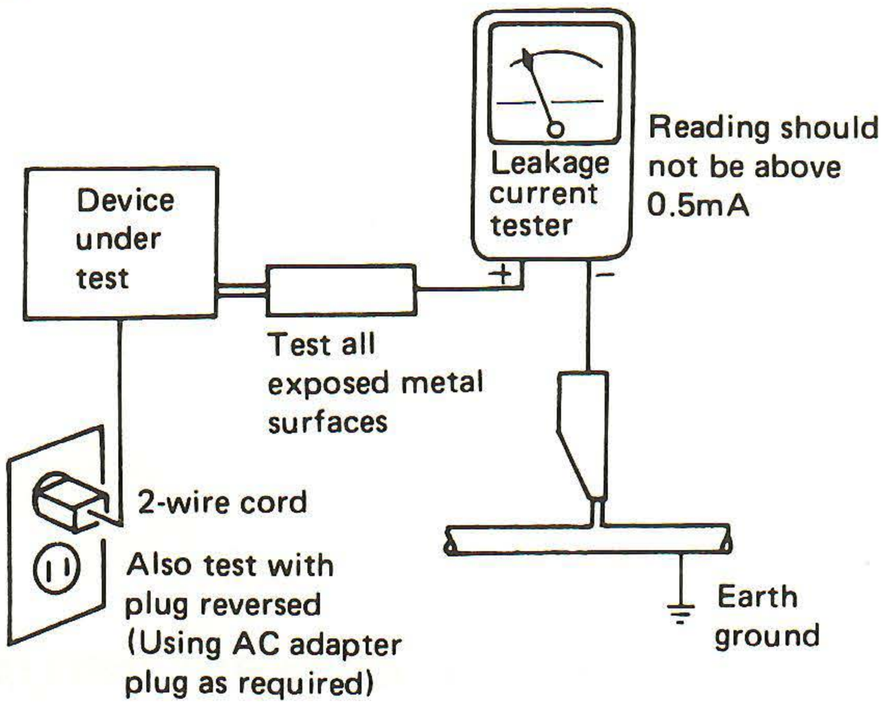
15. SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of PIONEER Service Manual may be obtained at a nominal charge from PIONEER.