

ORDER No.AD9907180C2

Service Manual

Mini Disc Deck



SJ-HD501

Mechanism unit: MR3A (RAJ3402)

Mechanism Series

Colour

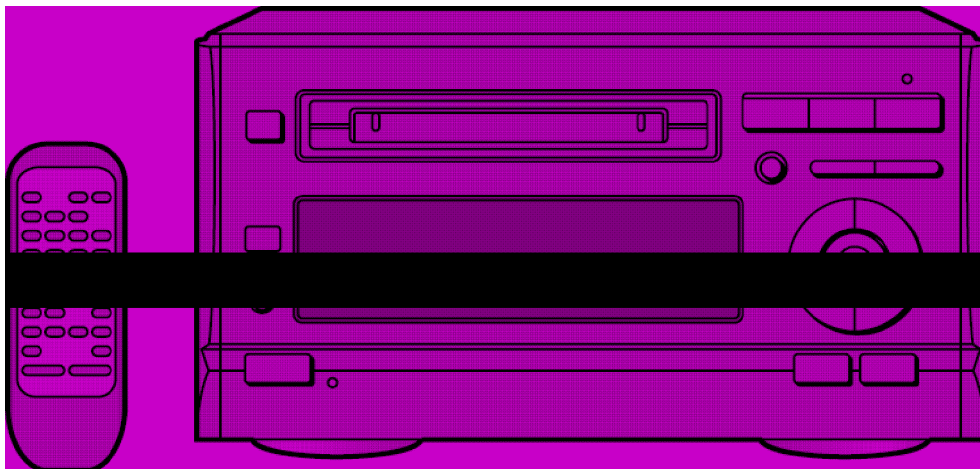
(N).....Gold Type

Areas

EG.....Europe.

EB.....Great Britain.

This product is option for systems of SC-HD301 and SC-HD501.



SPECIFICATIONS

Specifications

•System	Minidisc digital audio system
Recording	Magnetic field modulation direct overwrite
Reading	Non-contact optical system with Semiconductor laser (=780nm)
Sampling frequency:	44.1 kHz
Cording system:	ATRAC
Channel:	2channel, stereo
Frequency response:	10-20000Hz (± 0.3 dB)
S/N Ratio (PLAY):	90dB
Wow and flutter:	Below measurable limit

•Input

Analog input
(Level/impedance): 500mV/47k Ω

Digital input
(Optical in 1,
Optical in 2) 660nm
Wavelength:

•Output

Analog output
(Level/impedance): 2.0V/600 Ω

•General

Dimensions 196x104x237mm
(WxHxD):
Weight: 2.0kg
Power supply: AC230-240V, 50Hz
Power 12W
consumption:

Notes:

- 1.Design and specifications are subject to change without notice.
- 2.Dimensions and weight are approximate.
- 3.Total harmonic distortion is measured by the digital spectrum analyzer.

⚠ WARNING

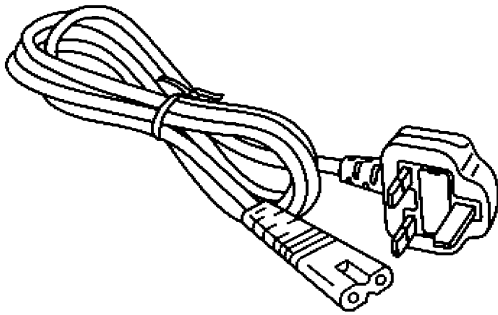
This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.



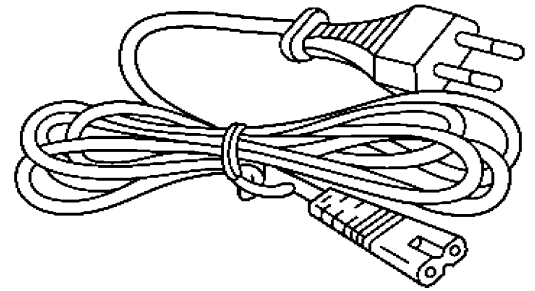
1. Accessories

- AC power supply cord.....1pc.

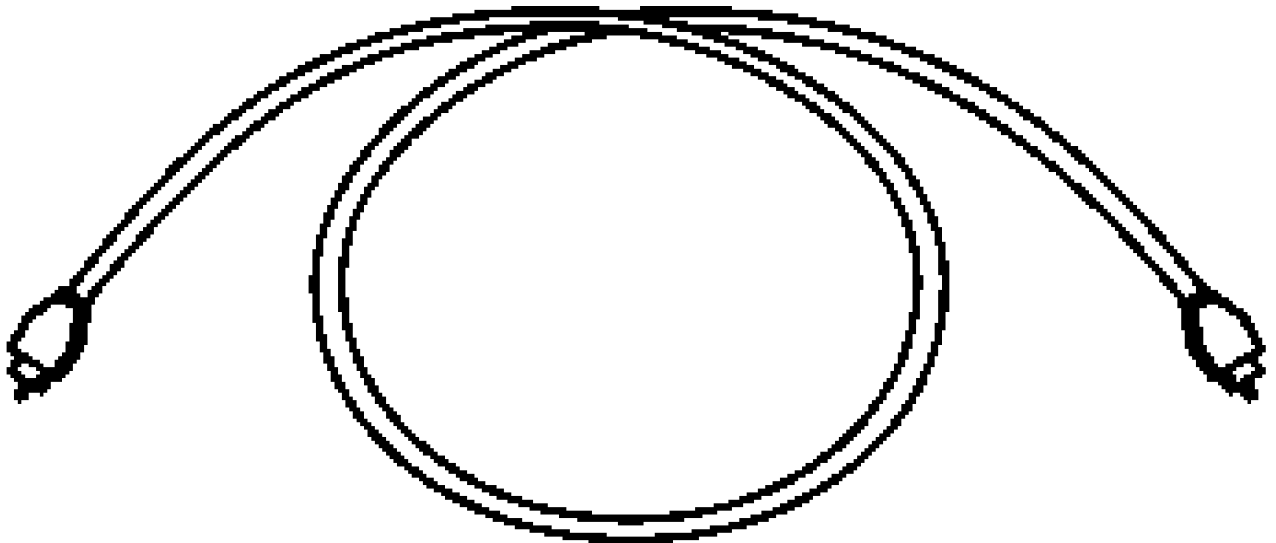
For (EB) area:
(RJA0044-C)



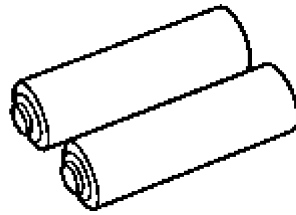
For (EG) area:
(RJA0043-C)



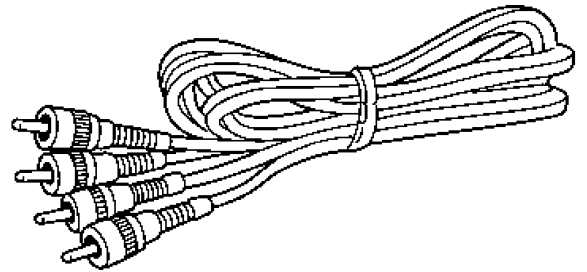
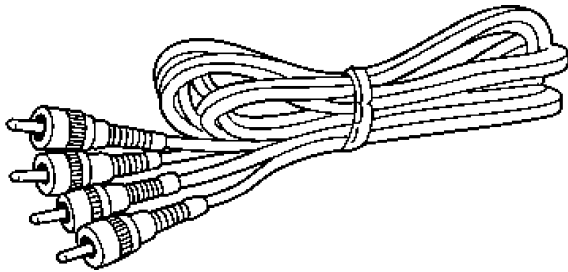
- Optical cable.....1pc.
(RJL1X001B05D)



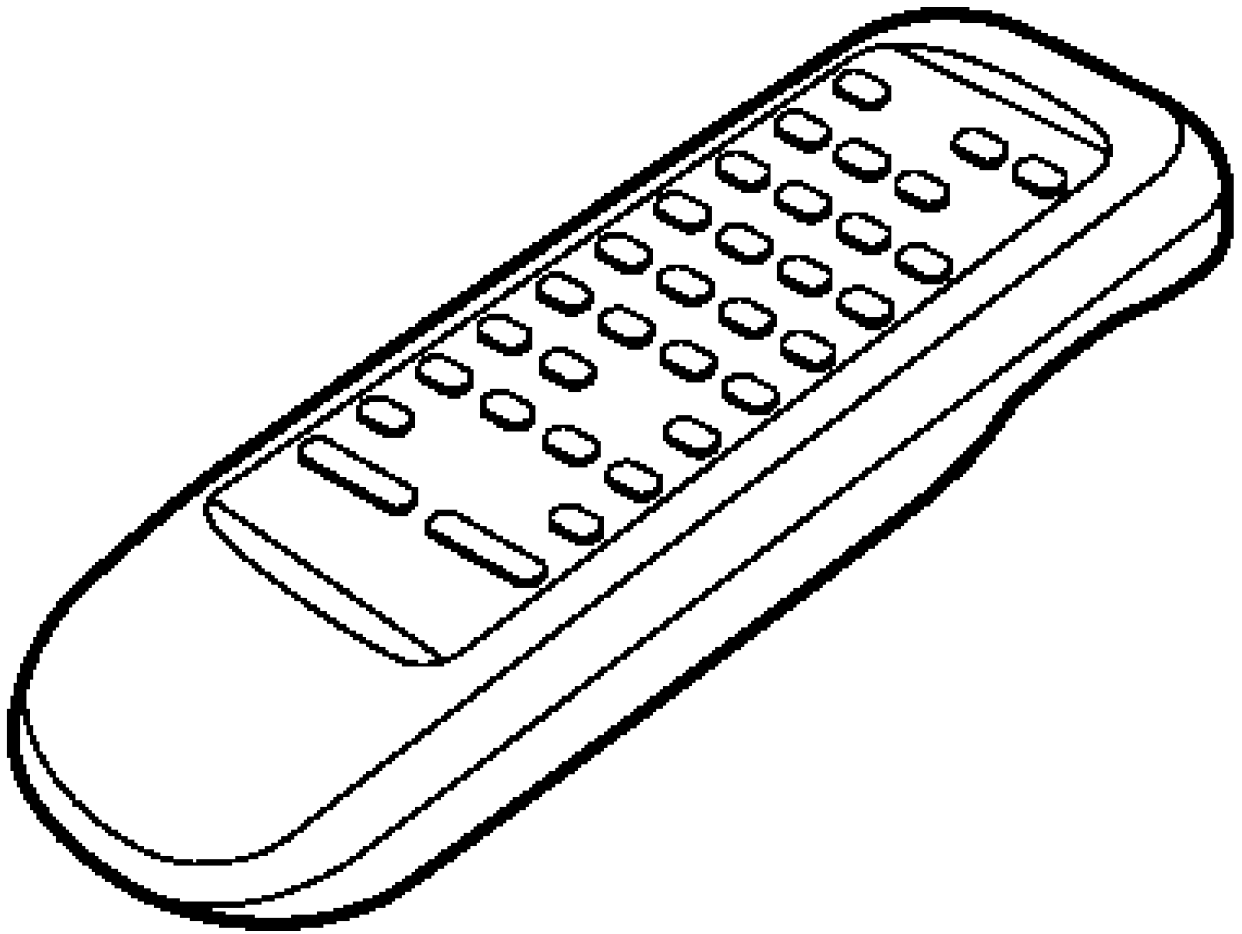
- Remote control batteries.....2pcs.
[R6/LR6 (AA, UM-3)]
Note:These are available on sales route.



- Stereo phono cables.....2pcs.
(RJL2P004B08)



- Remote control transmitter.....1pc.
(EUR645272)



2. Precaution of Laser Diode

CAUTION:

This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.

Wave length: 780 nm

Maximum output radiation power from pickup: 100 μ W/VDE

Laser radiation from the pickup lens is safety level, but be sure the followings:

1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.

ACHTUNG:

Dieses Produkt enthält eine Laserdiode. Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Laserinheit abgestrahlt.

Wellenlänge: 780 nm

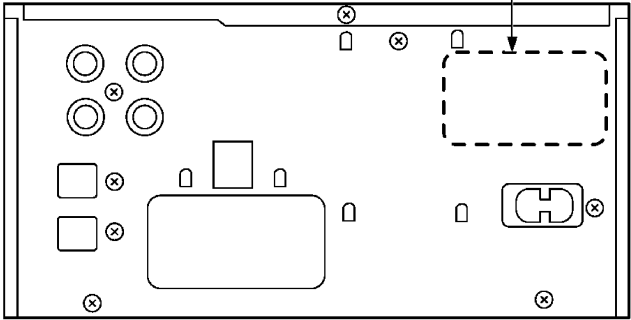
Maximale Strahlungsleistung der Laserinheit: 100 μ W/VDE

Die Strahlung der Laserinheit ungefährlich, wenn folgende Punkte beachtet werden:

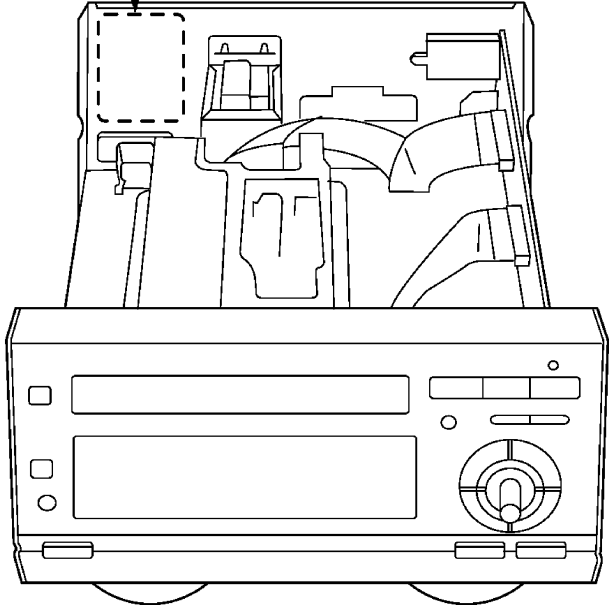
1. Die Laserinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig justierten Einstellregler der Laserinheit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlinie blicken.
4. Nicht über längere Zeit in die Fokussierlinie blicken.

**CLASS 1
LASER PRODUCT**

**LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT**



DANGER	INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
ADVARSEL	USYNLIG LASERSTRÅLING VED ÅBNING. NÅR SIKKERHEDSABRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO!	AVATTAESSA JA SUOJALUKITUS OHITETTÄESSÄ OLET ALTIINA NÄKYMÄTÖNTÄ LASERSÄTEILLYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING	OSYNLIG LASERSTRÅLNING NÅR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR UPPKOPPLAD. BETRÄKTA EJ STRÅLEN.
ADVARSEL	USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS SPYTES. UNDGÅ EKSPONERING FOR STRÅLEN.
VORSICHT	UNSIICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.



CAUTION!
THIS PRODUCT UTILIZES A LASER.
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

3. Caution for AC Main Lead



4. Operating Instructions



5. Handling Precautions for Traverse Deck (MD Unit)

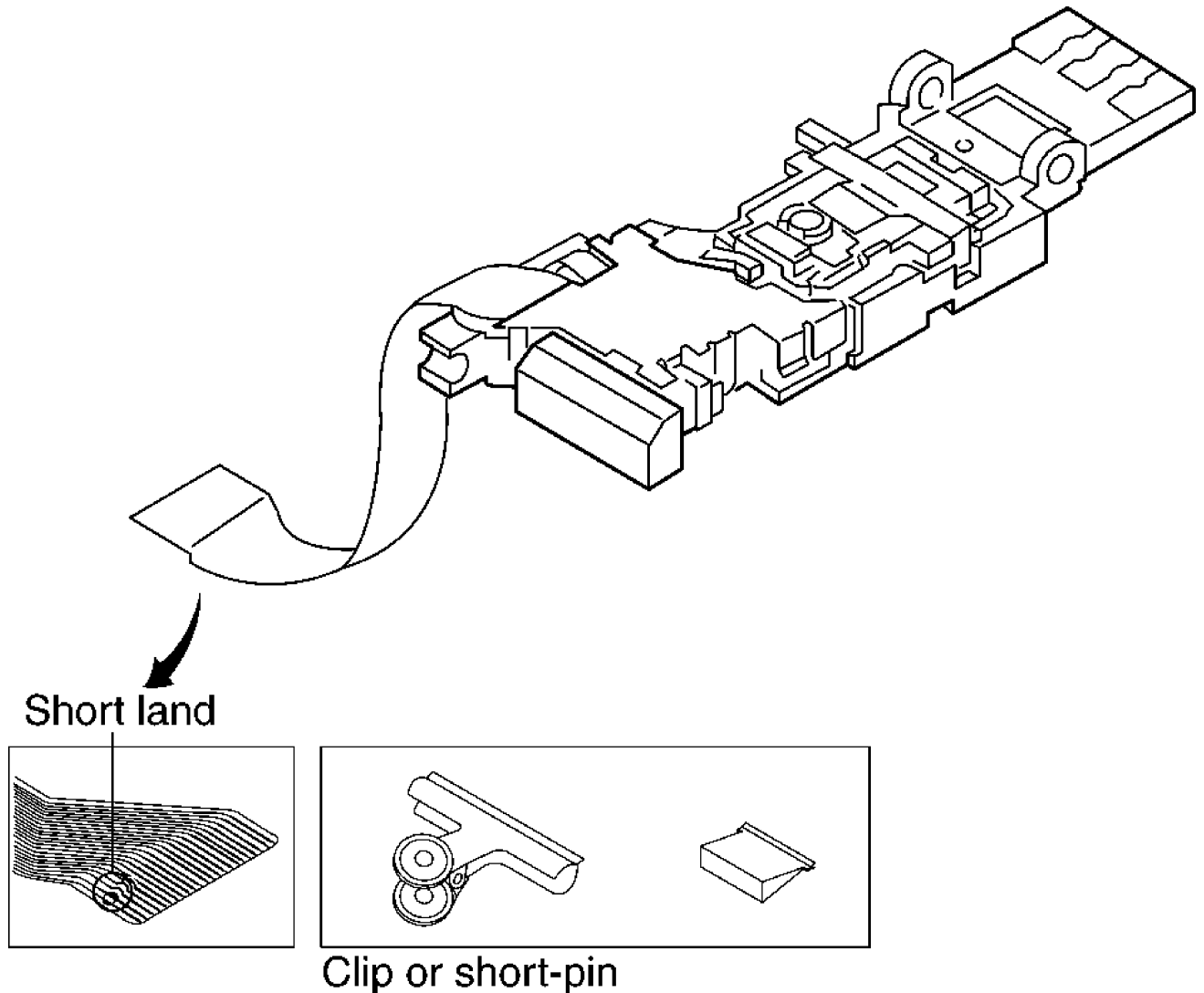
The laser diode in the MD unit (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body. So, be careful of

electrostatic breakdown during repair of the MD unit (optical pickup).

5.1. Handling of MD Unit (optical pickup)

1. Do not subject the MD unit (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. The short land between the No. 25 (LD-GND) and No. 24 (LD) pins on the flexible board is shorted with a solder build-up to prevent damage to the laser diode. (As shown in [Fig. 1](#).)
To connect to the PC board, be sure to open by removing the solder build-up, and finish the work quickly.
3. Take care not to apply excessive stress to the flexible board (FFC).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

Fig. 1



5.2. Grounding for electrostatic breakdown prevention

1. Human body grounding

Use the anti-static wrist strap to discharge the static electricity from your body.
(As shown in **Fig. 2.**)

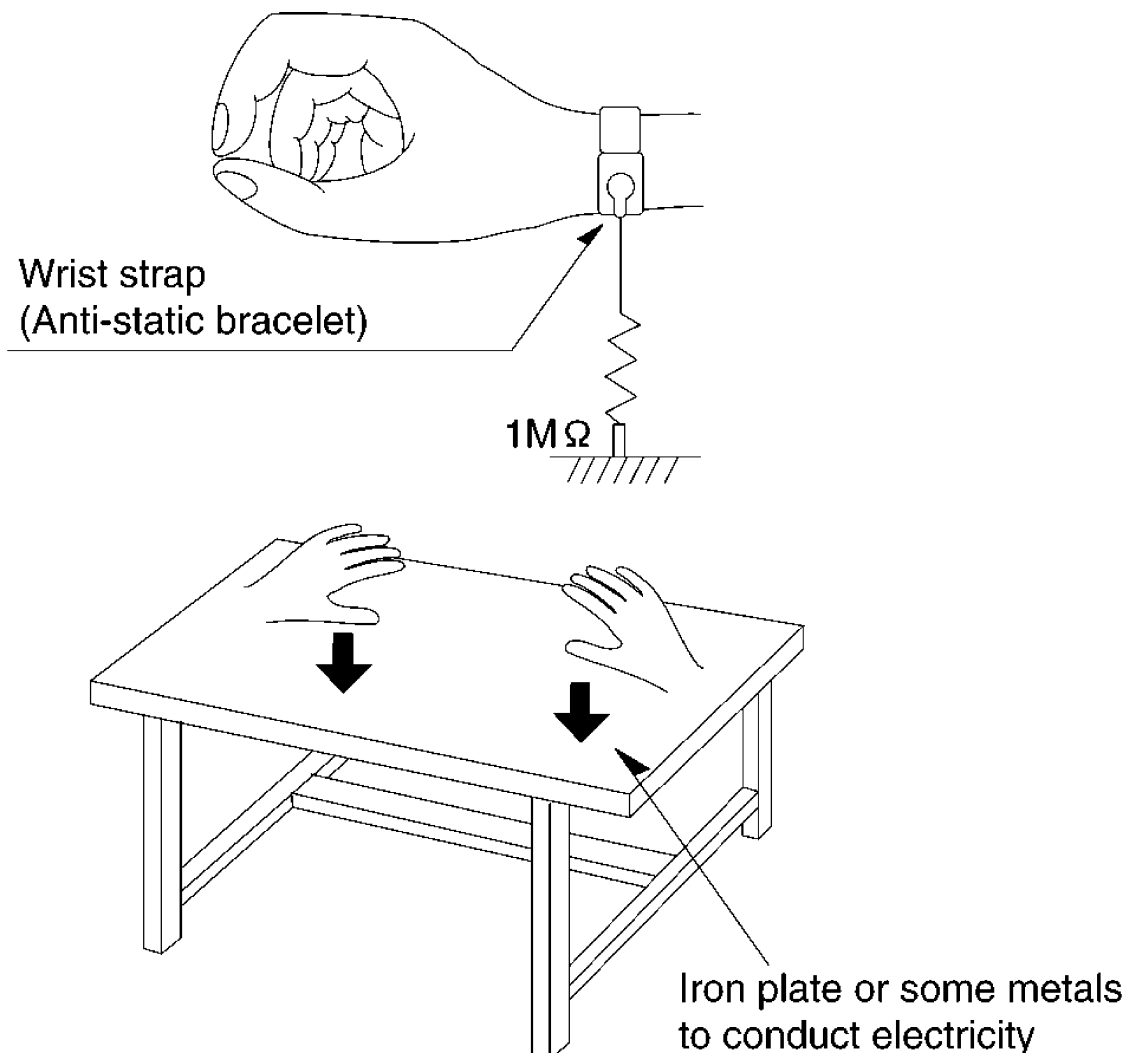
2. Work table grounding

Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:

The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the traverse deck (optical pickup).

Fig. 2

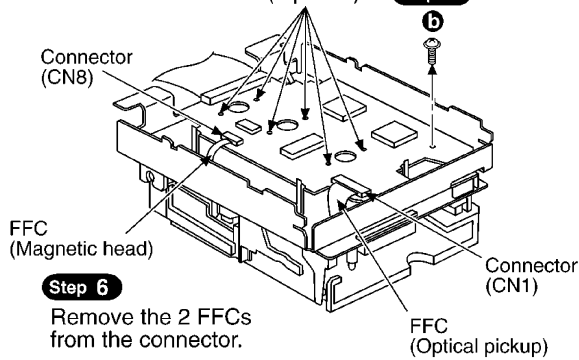


6. Operation Checks and Main Component Replacement

Procedures

Step 5
Unsolder the motor terminals (6 points).

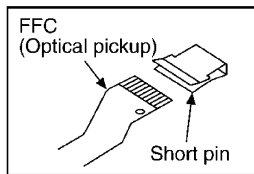
Step 4



Step 6
Remove the 2 FFCs from the connector.

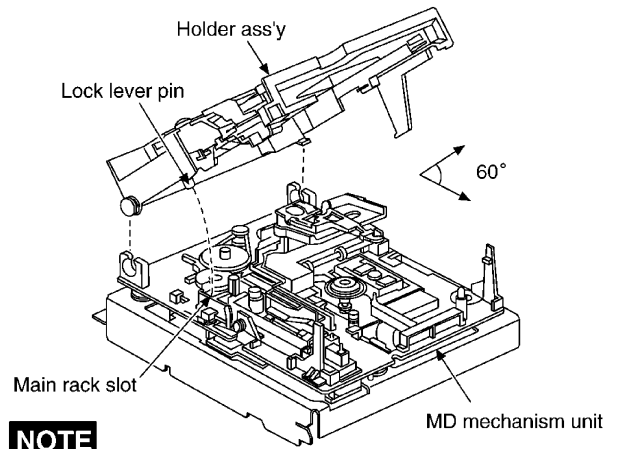
NOTE

Insert a short pin into the traverse unit FFC board.
(Refer to "Handling Precautions for Traverse deck".)



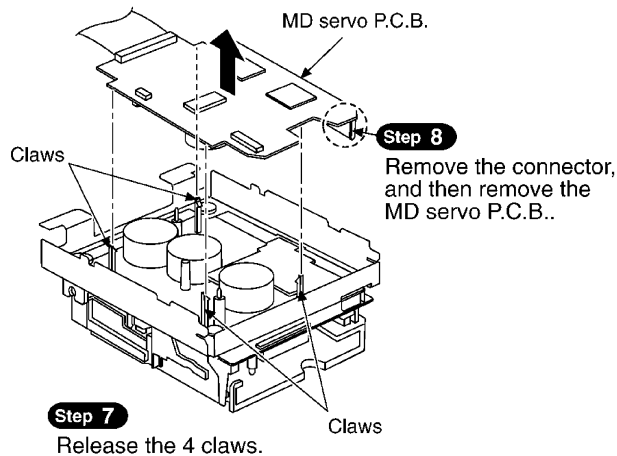
Step 11

Set the holder ass'y and MD mechanism unit at a 60 degree angle, and then pull out the holder ass'y.



NOTE

When installing the holder ass'y, align the lock lever pin with the main rack slot.

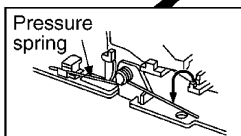


Step 7
Release the 4 claws.

Step 8
Remove the connector, and then remove the MD servo P.C.B..

Step 10
Release the 2 claws, and then lift up the holder ass'y.

Step 9
Remove the pressure spring from latch.

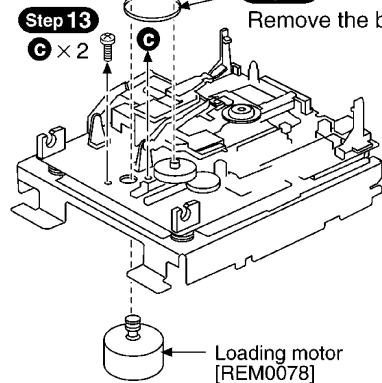


NOTE

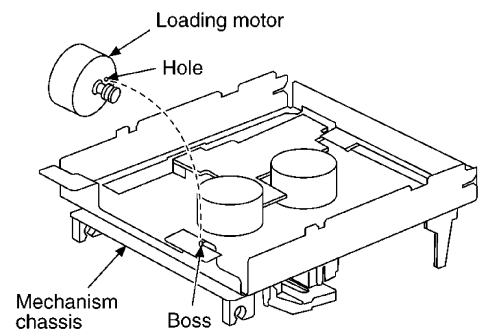
When installing the holder ass'y, the pressure spring should be latched correctly.

Step 12

Remove the belt [RDV0055].



Notice for installing the loading motor



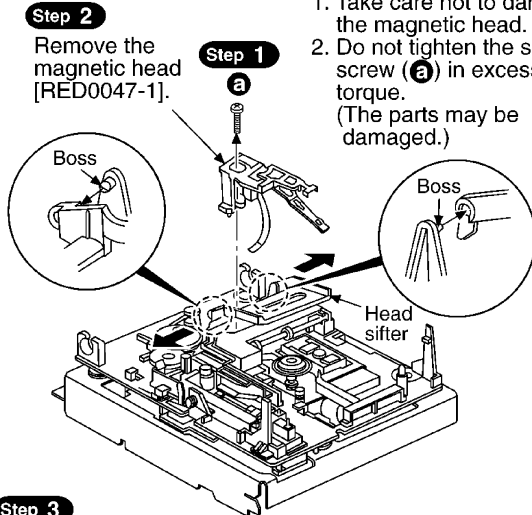
• Align the hole of loading motor with the boss of mechanism chassis, and then install the loading motor.

3. Replacement for the traverse motor ass'y

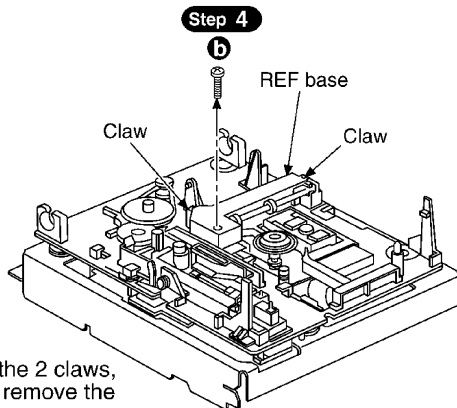
- Follow the **Step 1** ~ **Step 3** of the item 1 in checking procedure for each P.C.B..
- Follow the **Step 1** ~ **Step 11** of the item 2 in main component replacement procedures.

NOTE

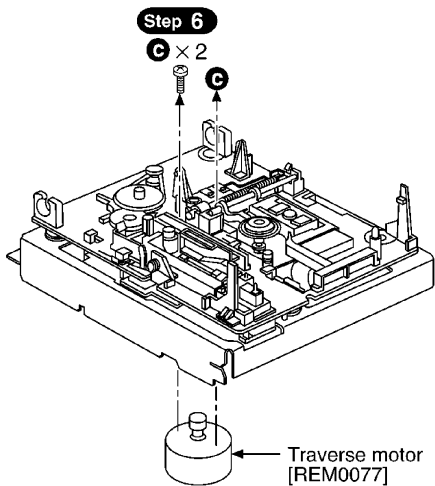
1. Take care not to damage the magnetic head.
2. Do not tighten the set screw (a) in excessive torque. (The parts may be damaged.)



- Step 3**
Spread the lugs of head shifter, and then release the lugs from boss.

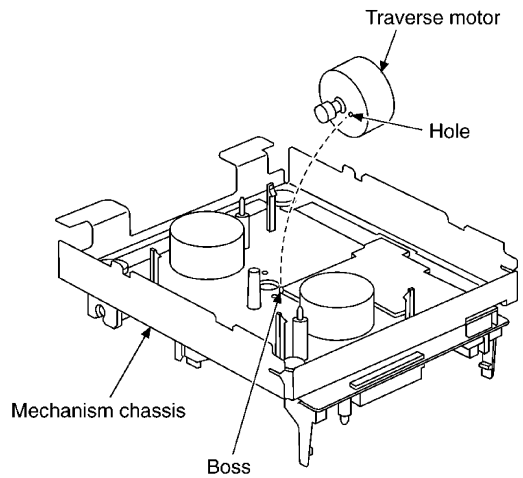


- Step 5**
Release the 2 claws, and then remove the REF base.



Notice for installing the traverse motor

- Align the hole of traverse motor with the boss of mechanism chassis, and then install the traverse motor.



7. Self-Diagnostic Function

This unit is equipped with a self-diagnostic function which, in the event of a malfunction, automatically display a code indicating the nature of the malfunction. Use this self-diagnostic function when servicing the unit.

7.1. Switching to the Self-Diagnostic Mode

1. Turn the power on.
2. Press and hold the STOP button for at least 2 seconds, and while still pressing the STOP button, press the FWD SEARCH button for at least 2 seconds. (Refer to [Fig.1](#).) The unit enters Self-Diagnostic Mode and is displayed “MD TEST”. Then an error code is displayed, if any. For details of the error codes, refer to [Fig.2](#). In the

case of no errors, “*********----” is displayed on FL.

3. If more than one error exists, the display will sequentially show the respective error codes each time the FWD SEARCH button is pressed.

7.2. Canceling the Self-Diagnostic Mode

1. The Self-Diagnostic Mode can be canceled by pressing the POWER button (POWER) to turn the system off. And then pressing the power button again to turn it again.

7.3. Clearing the Self-Diagnostic Mode

1. The contents of abnormality display are stored in memory. In order to clear the memory, continue to press the STOP button for at least 5 seconds while in the Self-Diagnostic Mode. The memory will clear. Always be sure to clear this memory after completing repair.

Fig.1

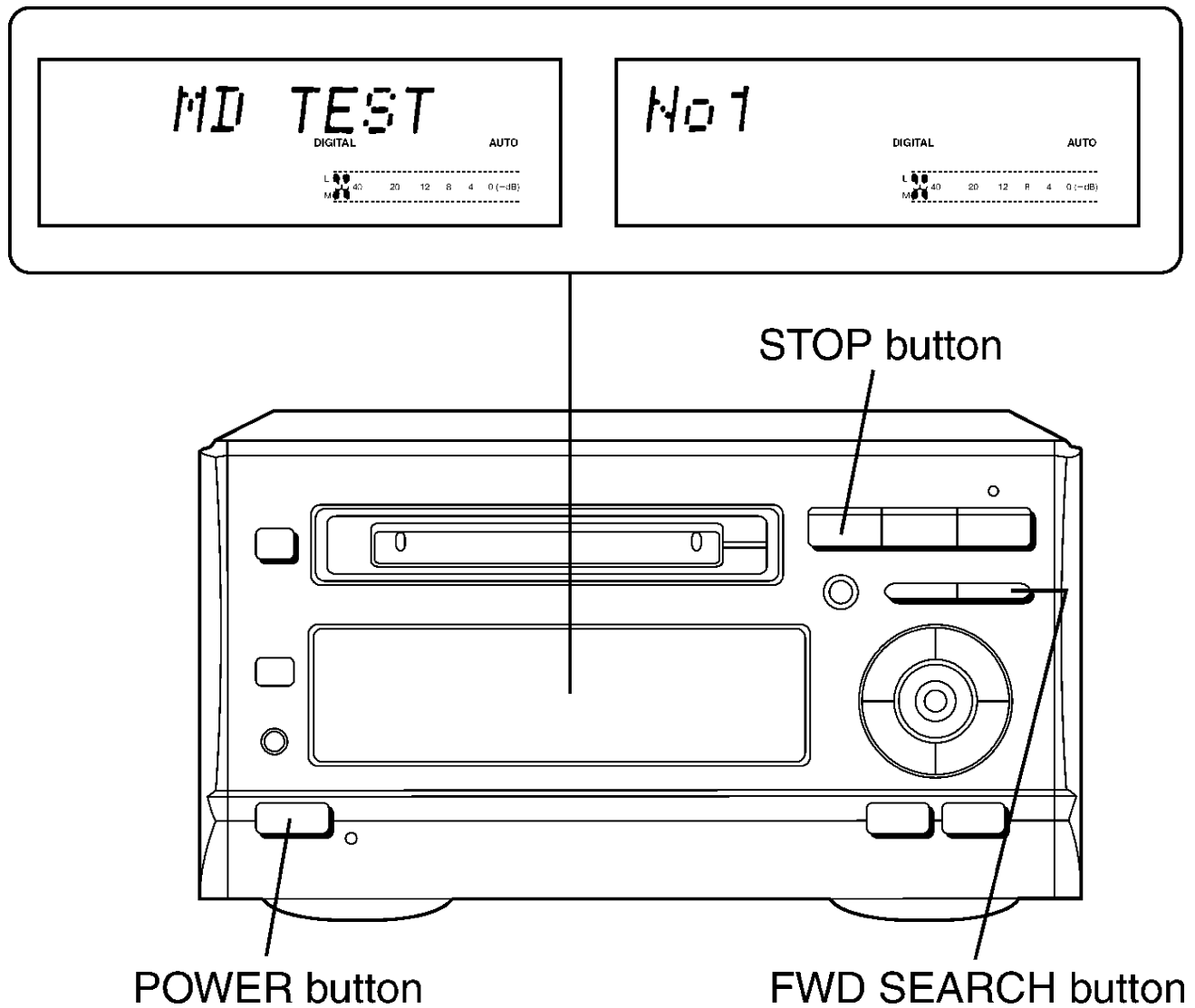


Fig.2

Error	Symptom	Possible Cause
F15	Interval till MD starts playing is too long.	<ul style="list-style-type: none"> Pickup home position sense switch (S8) is defective; check and replace if necessary.
F26	MD is loaded but cannot be played.	<ul style="list-style-type: none"> Communications error between the servoprocessor IC and the micro-processor IC (system control). Check if the flexible circuit board is disconnected. Displayed when the disc is scratched too.
F28	MD cannot be loaded.	<ul style="list-style-type: none"> Confirm that the disc is not catching on anything. The connection (flexible circuit board or connector cable) between the MD unit and the MD servo circuit board is disconnected or damaged; check and replace if necessary. The MD unit may be malfunctioning; replace it.
F29	MD cannot be ejected.	<ul style="list-style-type: none"> Confirm that the disc is not catching on anything. The connection (flexible circuit board or connector cable) between the MD unit and the MD servo circuit board is disconnected or damaged; check and replace if necessary. The MD unit may be malfunctioning; replace it.

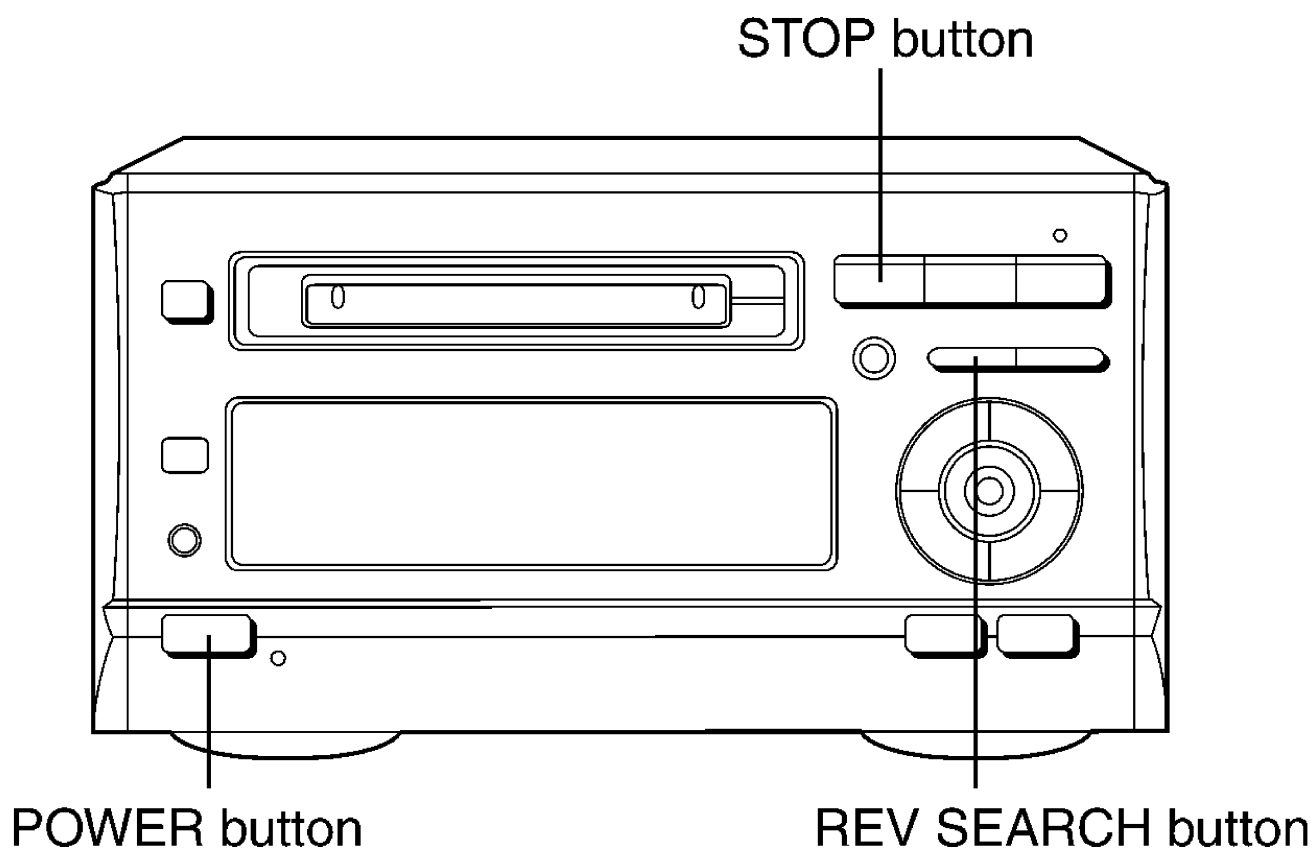
8. Self Check Function

This unit is equipped with a self check function which can detect a part of malfunction. Use this function before servicing the unit and check the item as shown below.

8.1. Setting to the Self Check Function

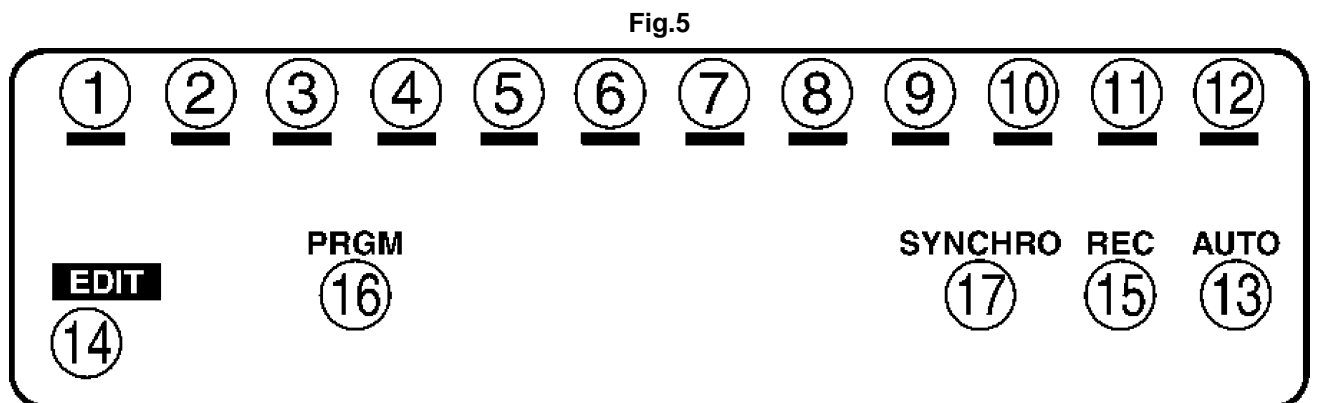
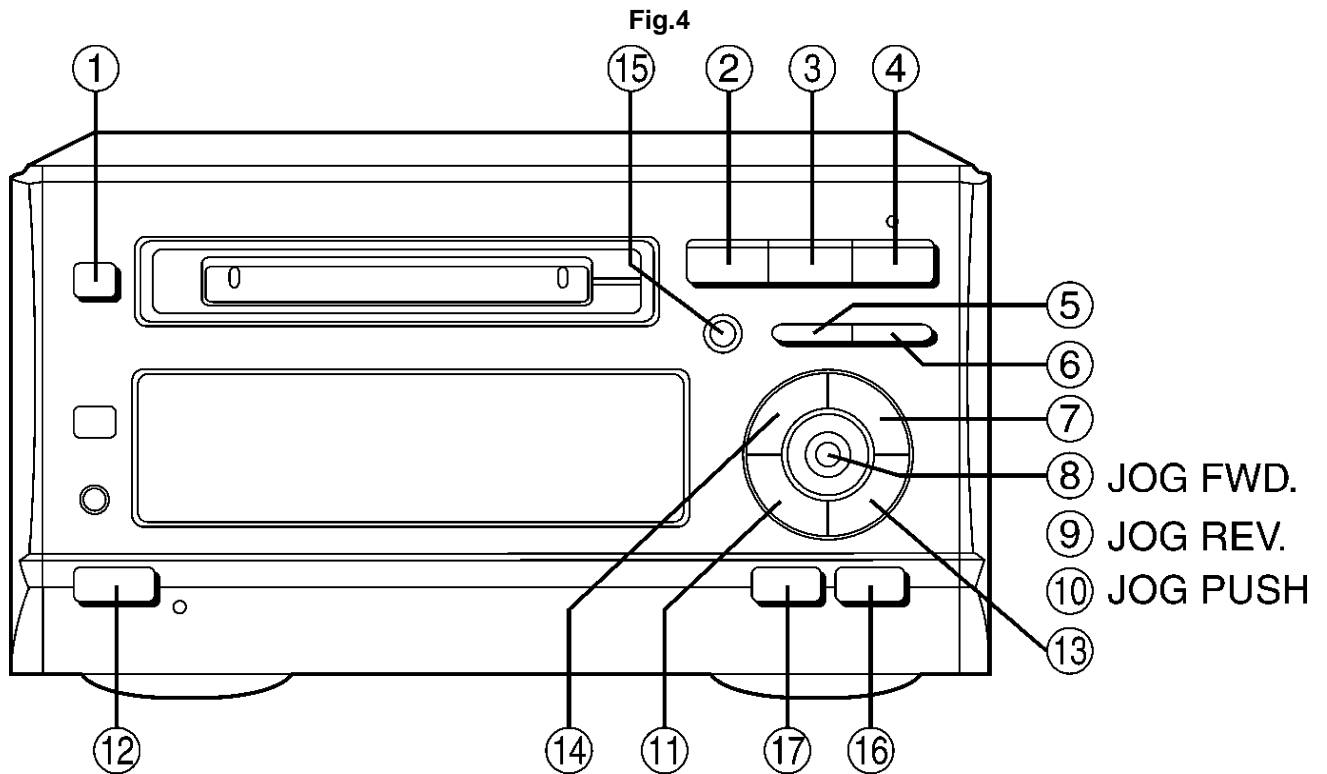
1. Turn the power on.
2. Press and hold the STOP button for at least 2 seconds, and while still pressing the STOP button, press the REV. SEARCH button for at least 2 seconds. Then the unit enters Self Check Function. (Refer to **Fig.3.**)

Fig.3



8.2. Checking the operation switches

1. When the unit enters the Self Check Function, the FL display turn off.
2. Press the buttons on the unit except the INPUT SELECTOR button, it displays “-” mark adapted each buttons. (**Fig.4** and **Fig.5** is shown about a allotment.)



8.3. Checking the FL display

1. Press the INPUT SELECTOR button.
2. All buttons works normally except the POWER button, FL display and LED turns on and off at 0.5 second interval.
(Refer to [Fig.6](#) and [Fig.7.](#))

Fig.6

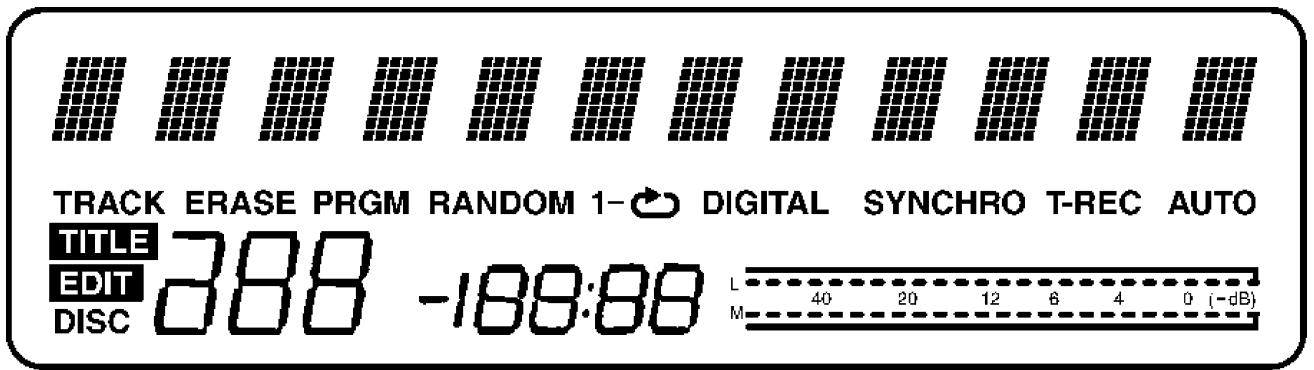
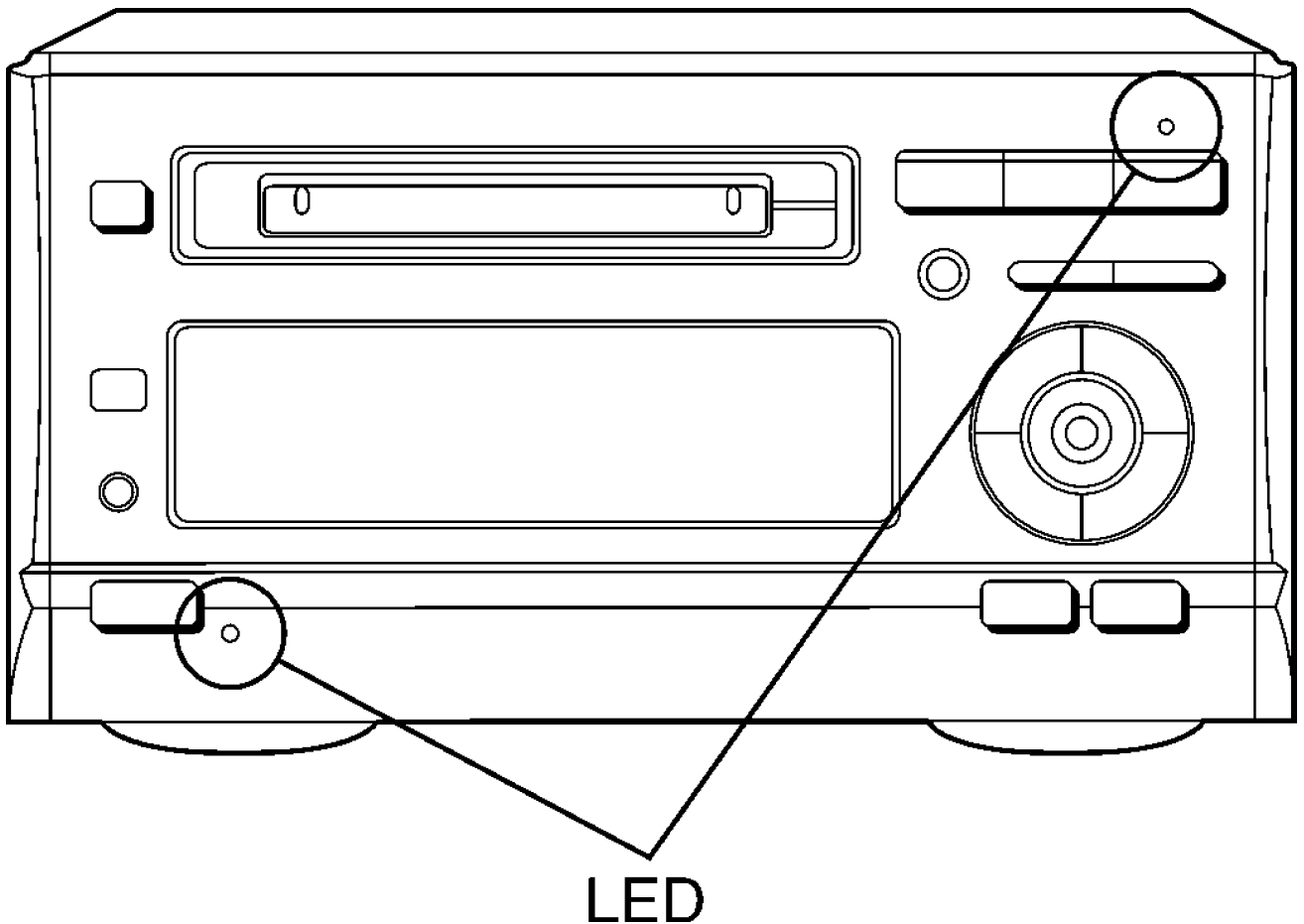


Fig.7



The Self Check Function can be canceled by pressing and holding the STOP button for at least 2 seconds.

9. Measurements and Adjustments (Laser Power Adjustment)

Note:

- If you exchange parts of MD unit when you repair, you must perform the Laser Power adjustment.

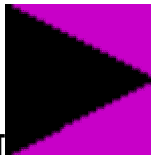
- Because this unit uses the optical magnetic recording, the unit outputs over 10 times more laser than a CD player does. In the adjustment mode, the laser is always being output. Therefore, be especially careful not to look laser beam directly or to touch the laser beam when adjusting the unit and checking its operation.

9.1. Necessary Instruments

- Laser power meter (LE8010) or cartridge type laser power meter
- Test disc (Pre-mastered disc RFKV0006 or RFKV0014)
- Recordable disc available on sales route (with music recorded)
- Insulated driver for adjustment such as a ceramic driver
- Remote control transmitter

9.2. Set the Unit to the Adjustmint Mode

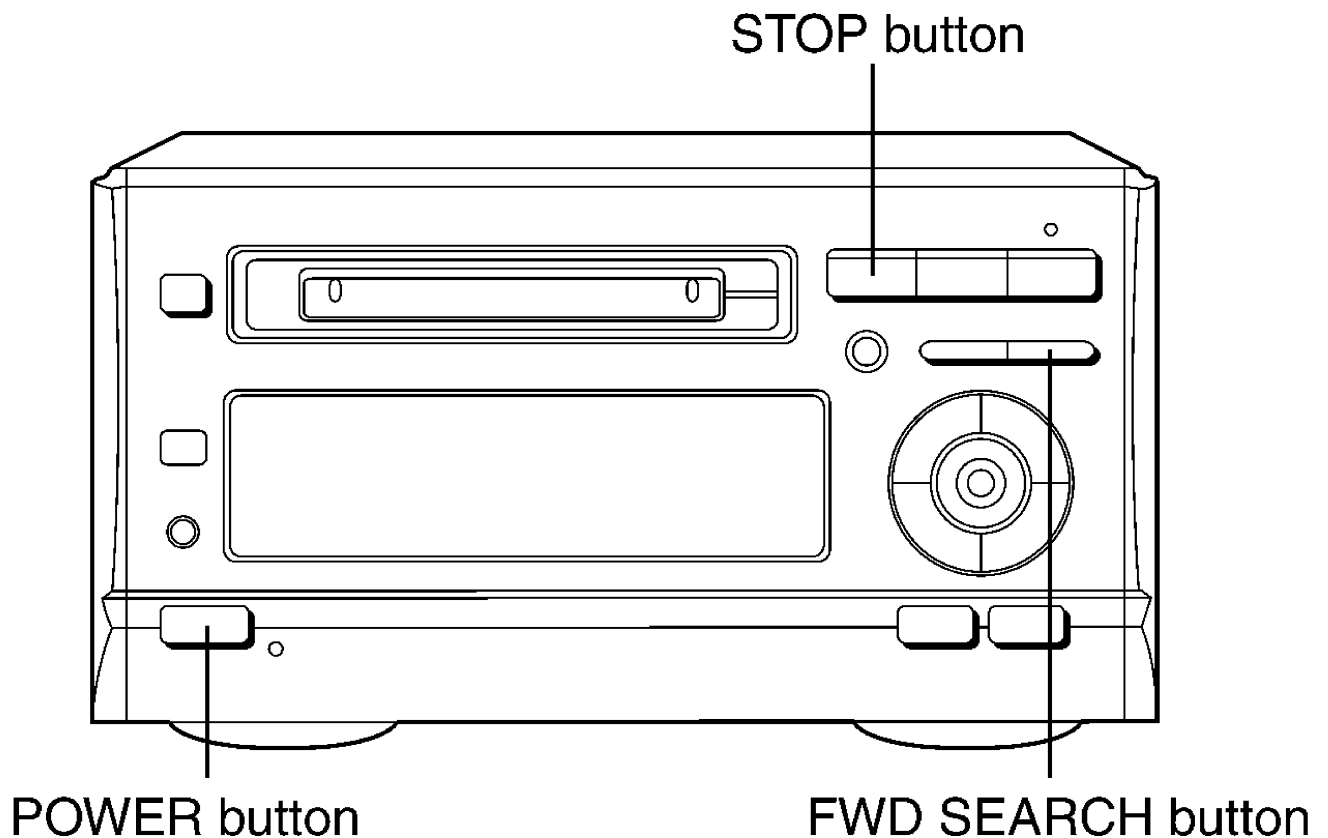
1. Supply power to the unit.
2. With no MD loaded in the player, simultaneously press the [■ STOP] button and the



[FWD. SEARCH] button and hold them both pressed for at least 2 seconds until “MD TEST” appears in the display. (Refer to [Fig.8](#).)

3. At the Self-Diagnostic Mode, press “1” on the player’s remote control. “RAM LASER” will be displayed to indicate the read power adjustment mode.

Fig.8



Cautions

1. About handling the MD unit

- The magnetic head is a precision unit and is very fragile. Do not deform it.
- Laser diode in the optical pickup may be destroyed by the static electricity generated in your clothes or body. Be especially careful with the static electricity.
- The optical pickup is structured extremely precisely. Do not subject to the strong impact or shock. Do not touch the lens.

2. About handling the magnetic head

When replacing the magnetic head, do not tighten the mounting screw (RHD17022) too firmly. If the screw is tightened too much to deform the resin, the position of the head is moved, and this affects its recording operation.

Recommended torque for mounting screw: 700 g cm +/- 100 g cm

Reference: This is the same force as using a screwdriver with a 15-mm diameter grip, you fasten the screw naturally with your thumb and index finger.

3. About the driver for adjusting laser power

Use only insulated driver such as a ceramic driver. With the metal driver, it is not possible to adjust properly because of the induction noise. Also, if it short-circuits with the chassis, it may destroy or damage the laser diode.

Recommended driver: VESSEL 9000 1.8 -30 (Ceramic driver)

Cautions on optical pickup:

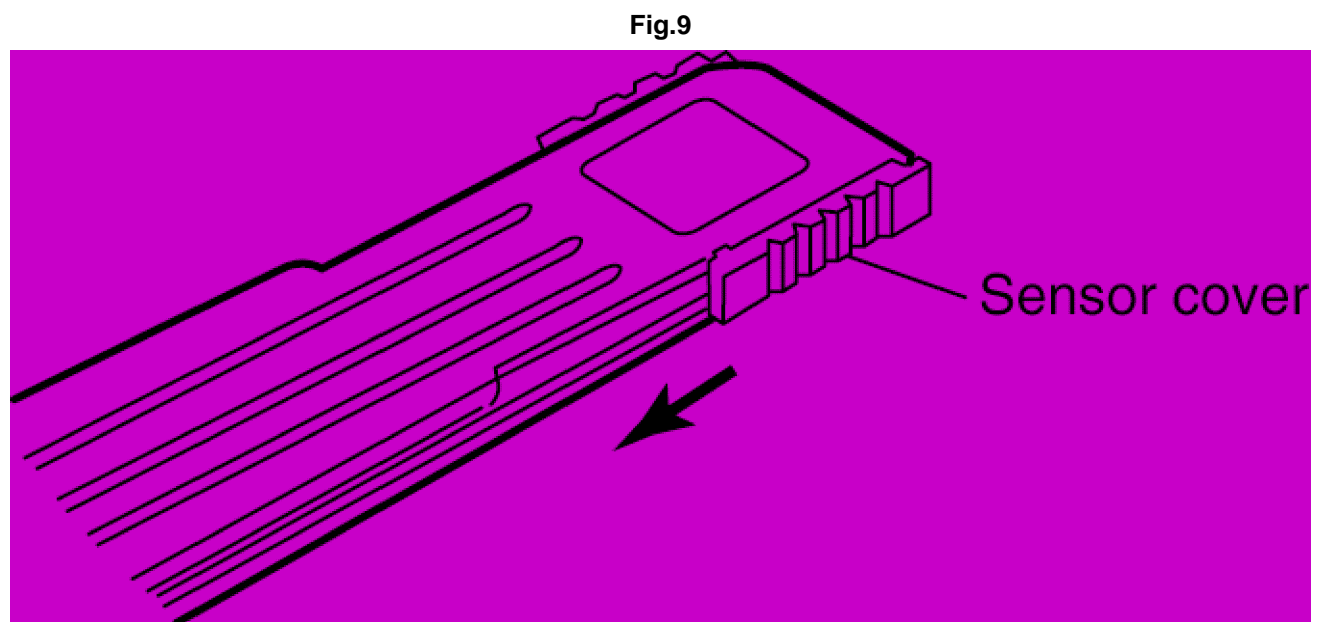
- The optical pickup and the magnetic head are structured precisely; therefore, they are very fragile. Be careful not to touch them with the edge of the laser power meter.
- The sensor of the laser power meter is a very fine part. Be careful not to touch it to the optical pickup lens.
- The focus point of the laser reaches to 356°F. Therefore, avoid adjusting using laser power for a long time because the sensor of the laser power meter may be burned.
- Do not allow the write power to even momentarily reach or exceed 5.5 mW. Doing so will result in damage to the optical pickup.
- Do not set the unit to the laser power adjustment mode with the MD loaded. Doing so may result in damage to the MD.

9.3. Adjustment Procedure

Note:

There are two methods of adjusting the player, either by using a laser power meter or by using a cartridge type laser power meter.

1. Enter the Adjustment Mode.
2. If using a laser power meter, slide open the sensor cover. (Refer to [Fig.9.](#))



3. If using a laser power meter, position the sensor directly above the optical pickup. (Refer to [Fig.10.](#))
If using a cartridge type laser power meter, load the cartridge into the MD

mechanism. (Refer to [Fig.11.](#))

Caution:

Do not allow the laser power meter to come in contact with either the optical pickup or the magnetic head.

Fig.10

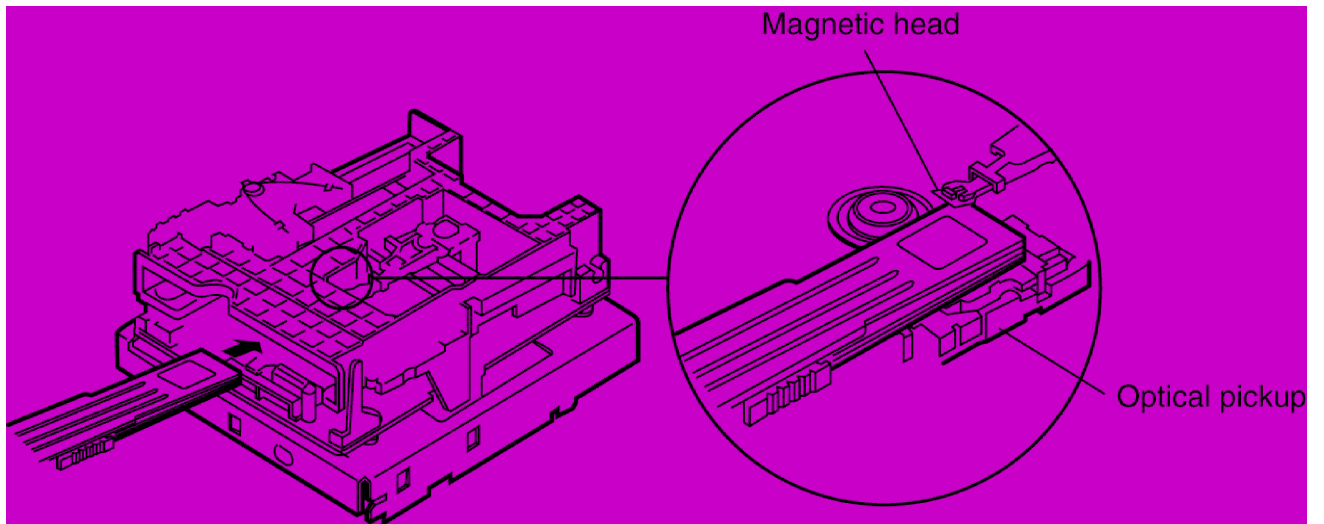
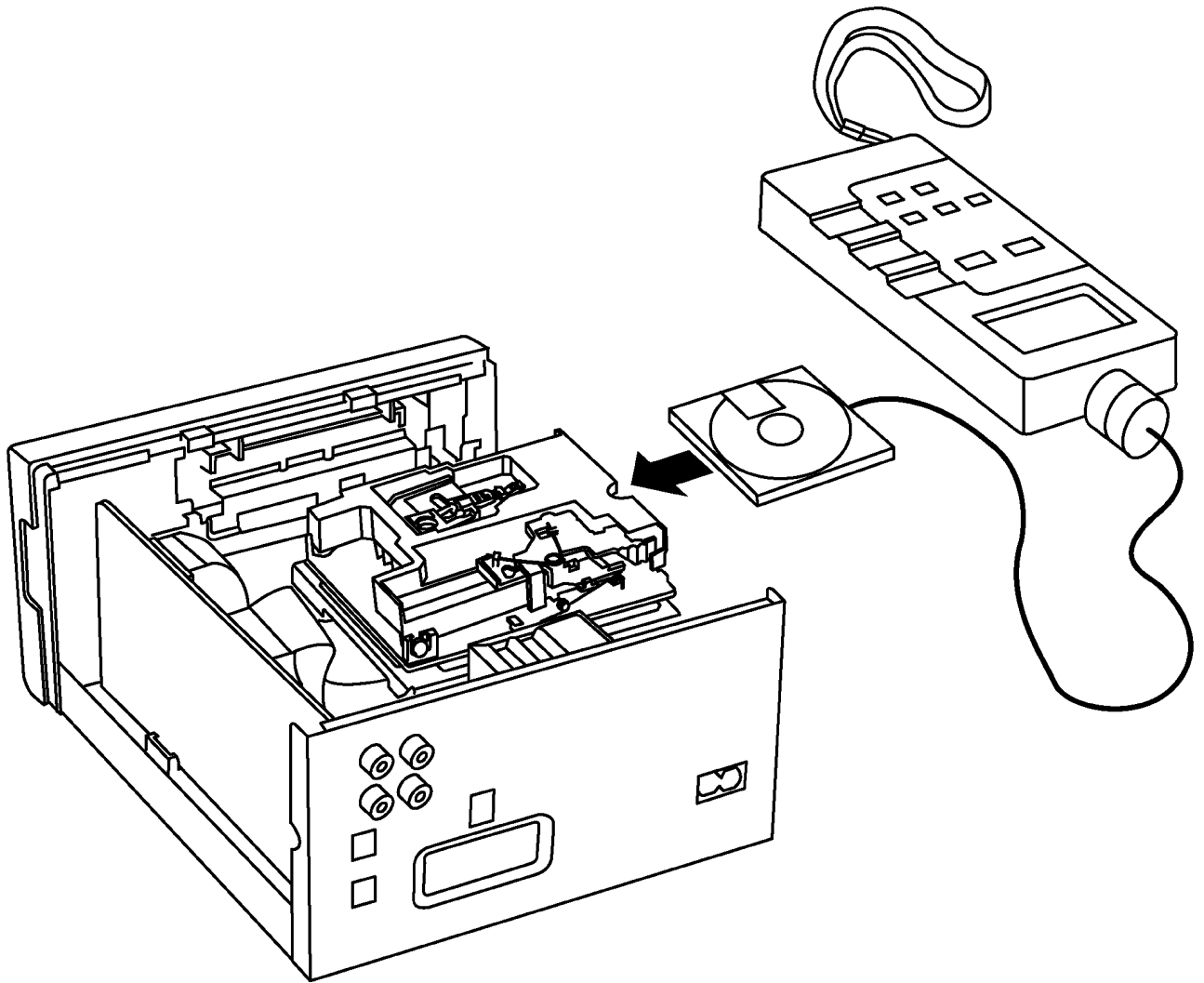
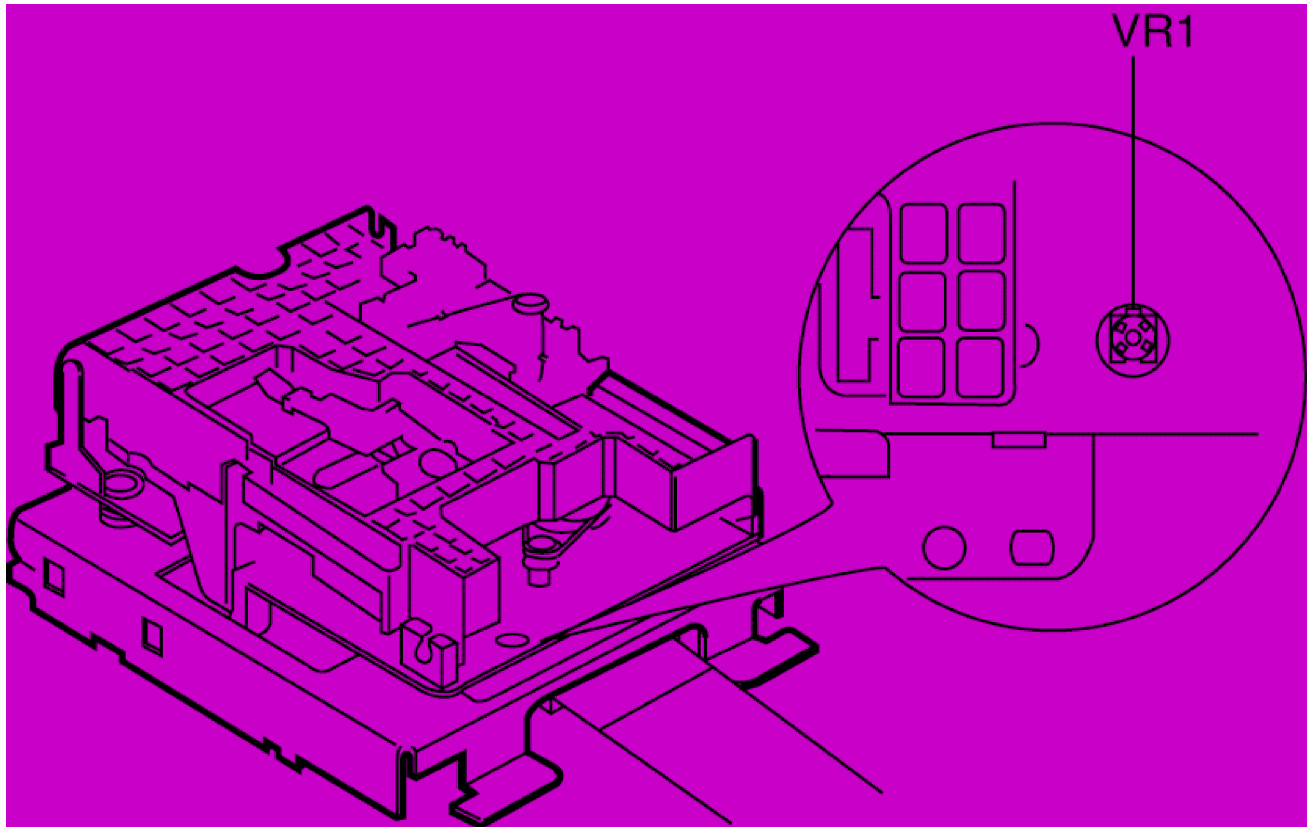


Fig.11



4. Confirm that the reading of the laser power meter or cartridge type laser power meter is within the specified. If it is not within the specified range, adjust by turning VR1. (Refer to **Fig.12.**)
Specified range (read power): 600 μ W or lower

Fig.12



Caution:

- Proceeding on to the subsequent adjustment procedure with the read power exceeding $680\mu\text{W}$ will result in damage to the optical pickup.

5. Press “2” on the player’s remote control.

“WRITE LASER” will be displayed to indicate the write power adjustment mode.

6. Confirm that the reading of the laser power meter or cartridge type laser power meter is within the specified range. If it is not within the specified range, adjust by turning VR1. (Refer to [Fig.12.](#))

Specified range (write power): $4.8\pm 0.1\text{mW}$

Caution:

- Do not allow the write power to even momentarily reach or exceed 5.5mW . Doing so will result in damage to the optical pickup.

7. Press “3” on the player’s remote control.

“ROM LASER” will be displayed to indicate the ROM data confirmation mode.

8. Confirm that the reading of the laser power meter or cartridge type laser power meter is within the specified range.

Specified range (ROM data laser power): $540\text{-}660\mu\text{W}$

9. Press “1” on the player’s remote control.

“RAM LASER” will be displayed to indicate the RAM data confirmation.

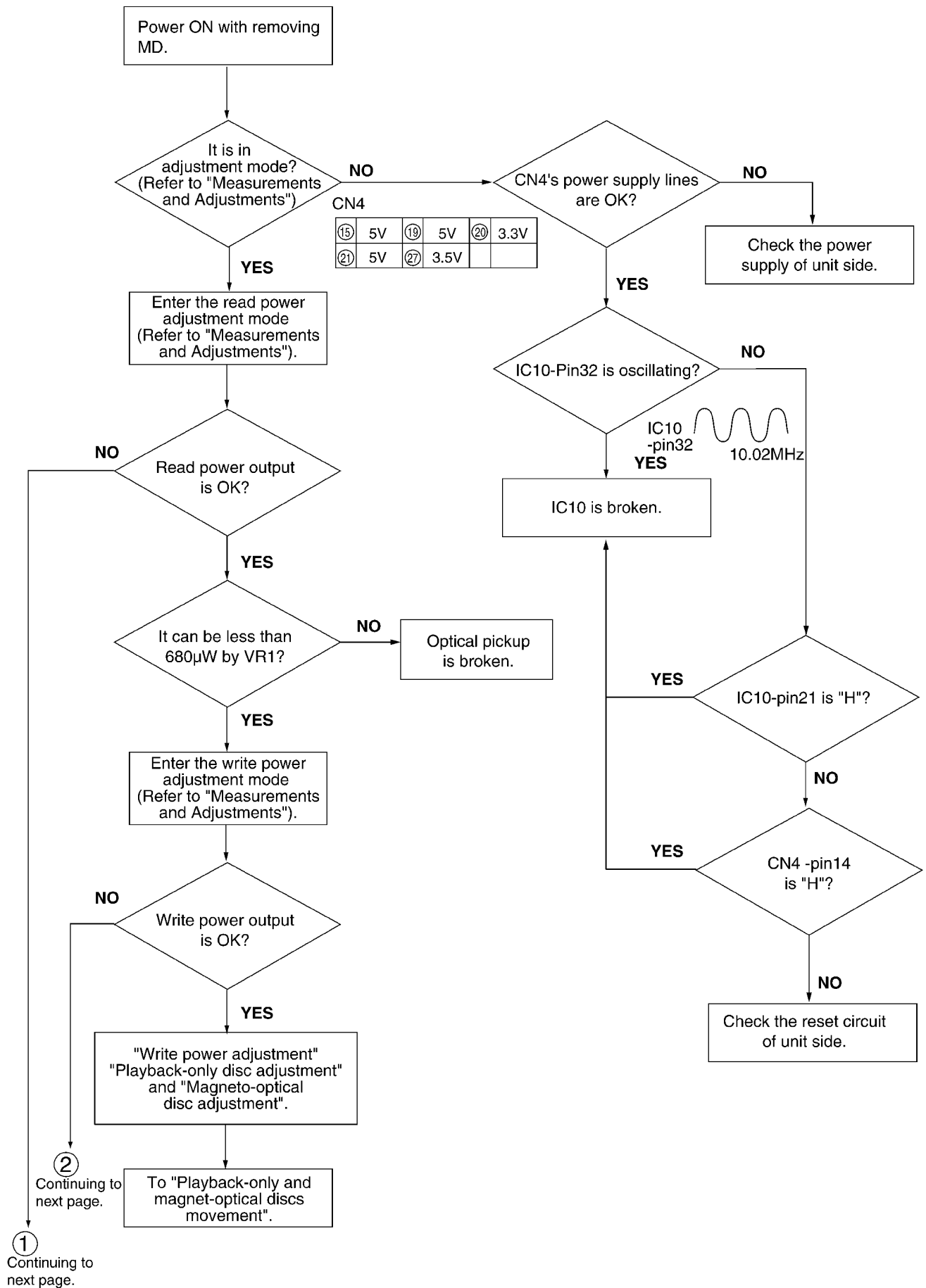
10. Confirm that the reading of the laser power meter or cartridge type laser meter is within the specified range.

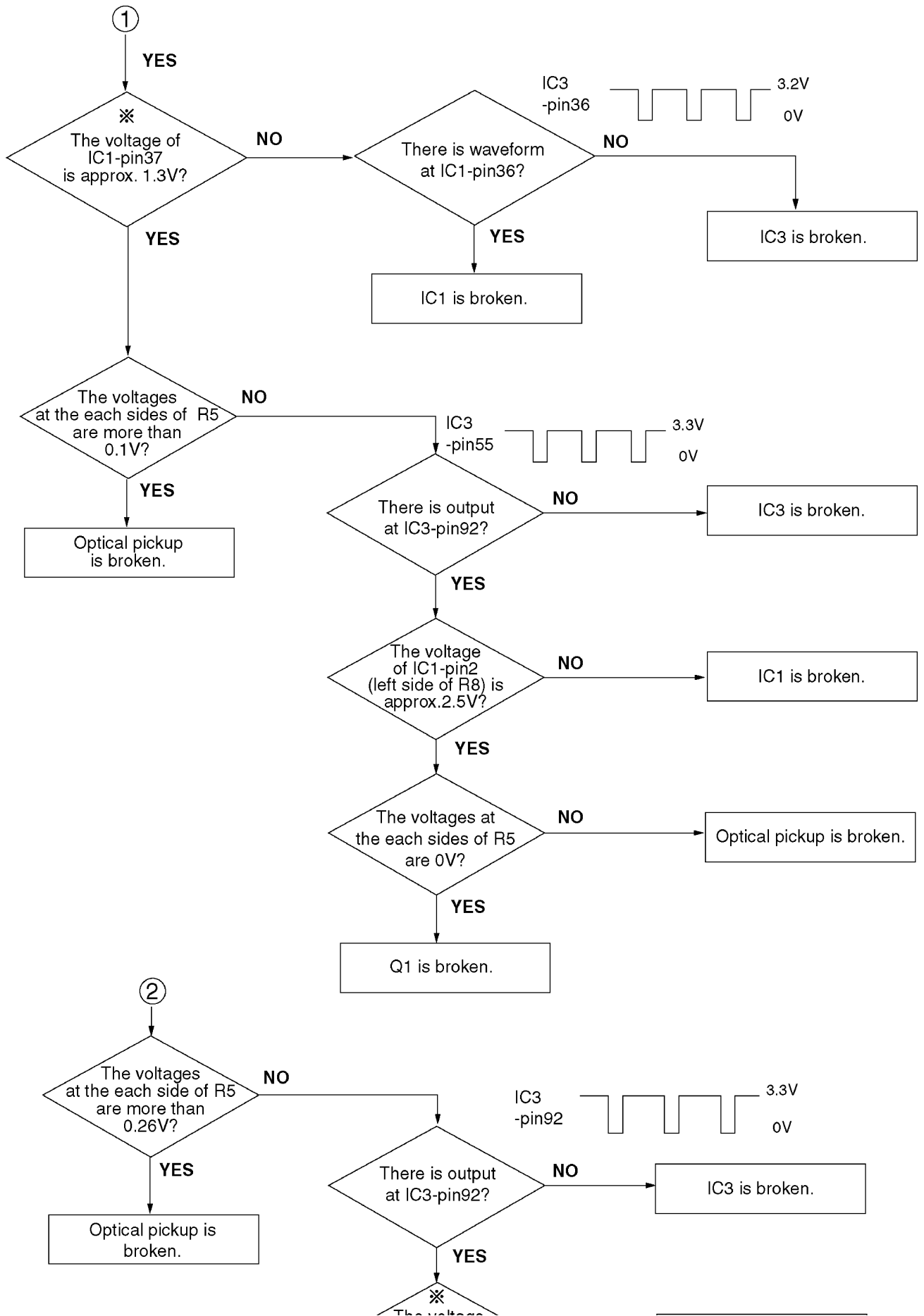
Specified range (RAM data laser power): $540\text{-}660\mu\text{W}$

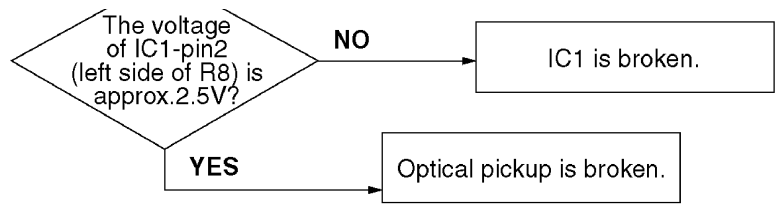
- If the reading in either step 8 or 10 above is not within the specified range, first switch off the power, and then reset the unit to the adjustment mode and repeat the adjustment procedure.

10. Troubleshooting Guide

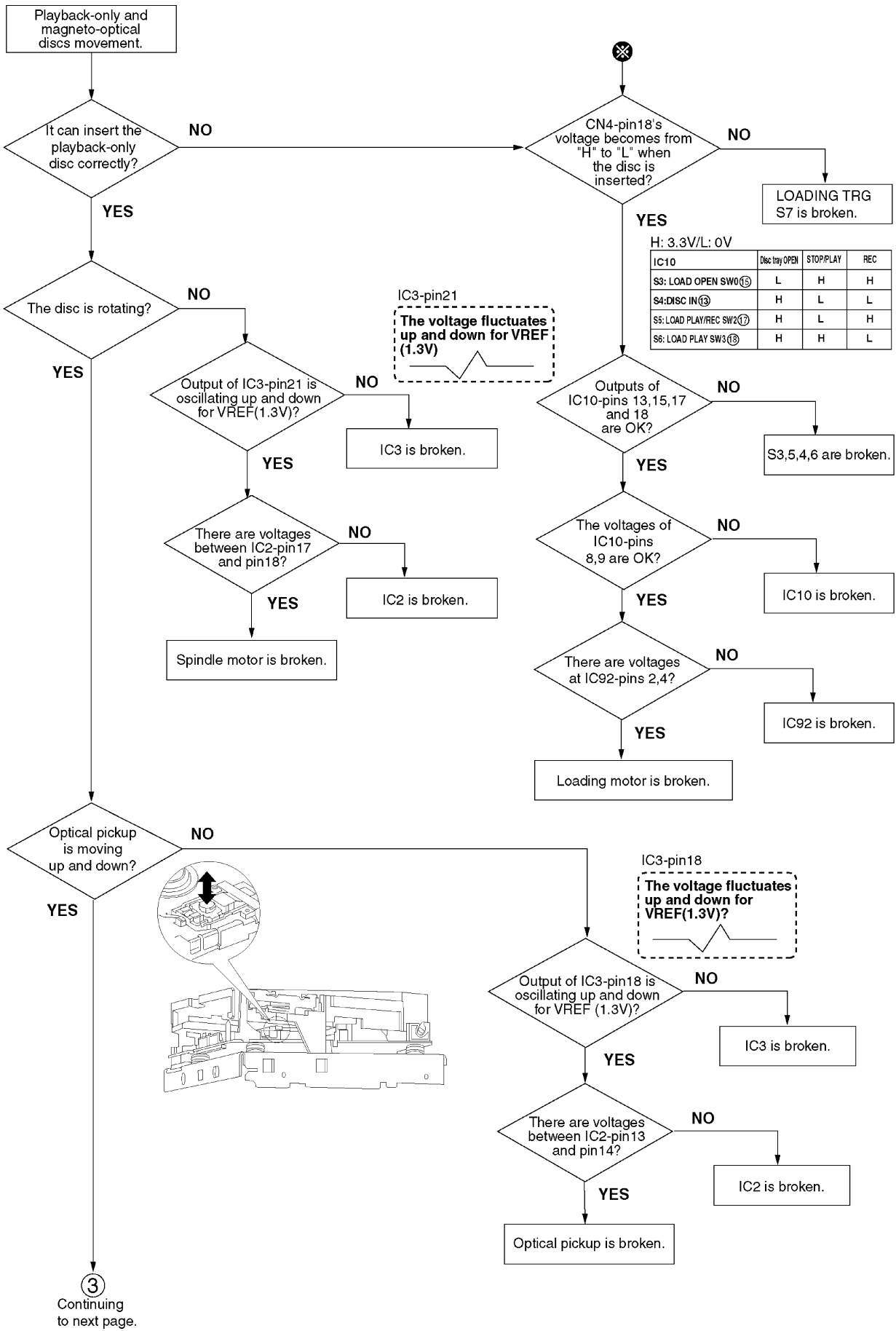
Please refer to this Troubleshooting Guide when you repair for any troubles of this unit.

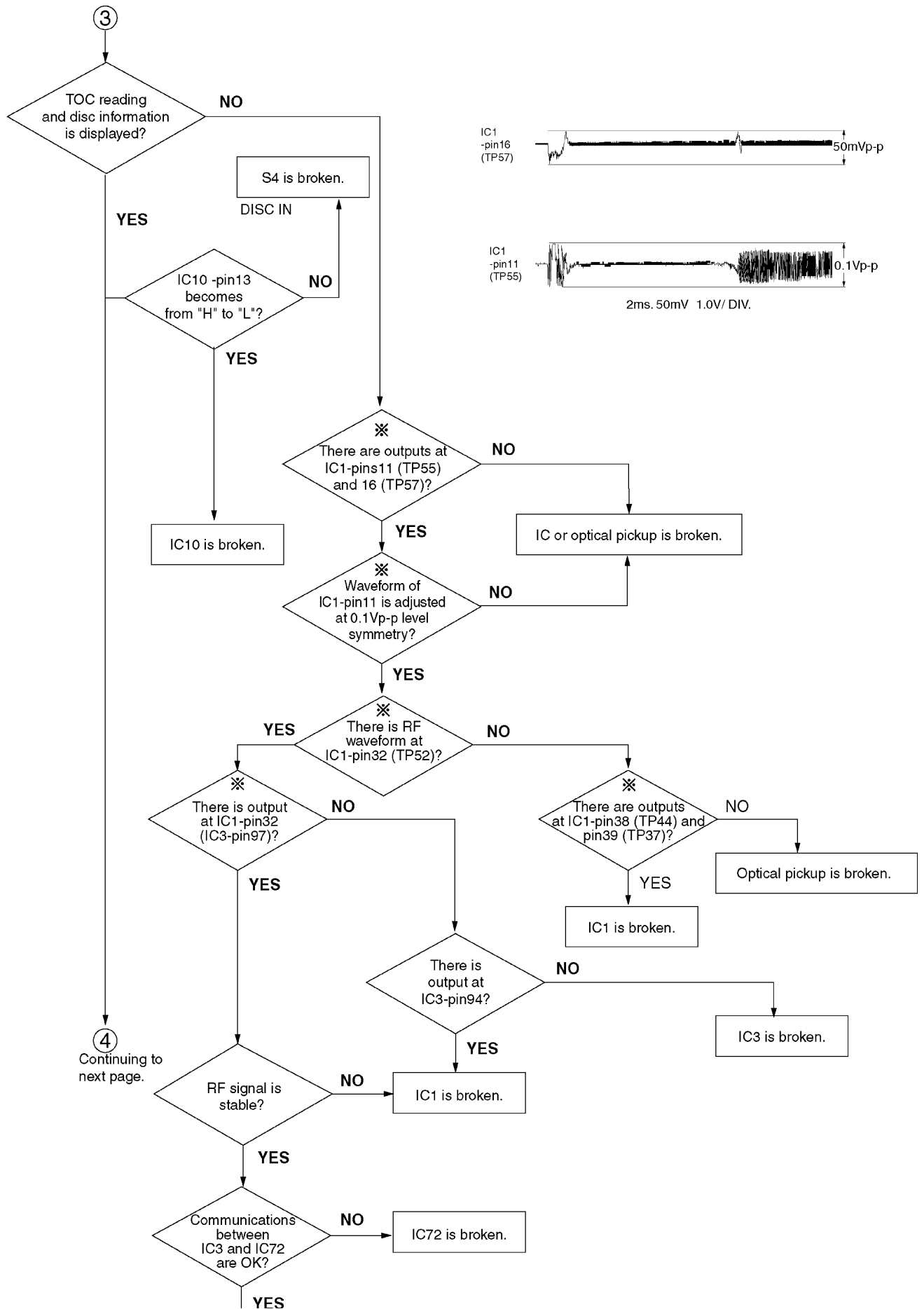


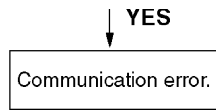




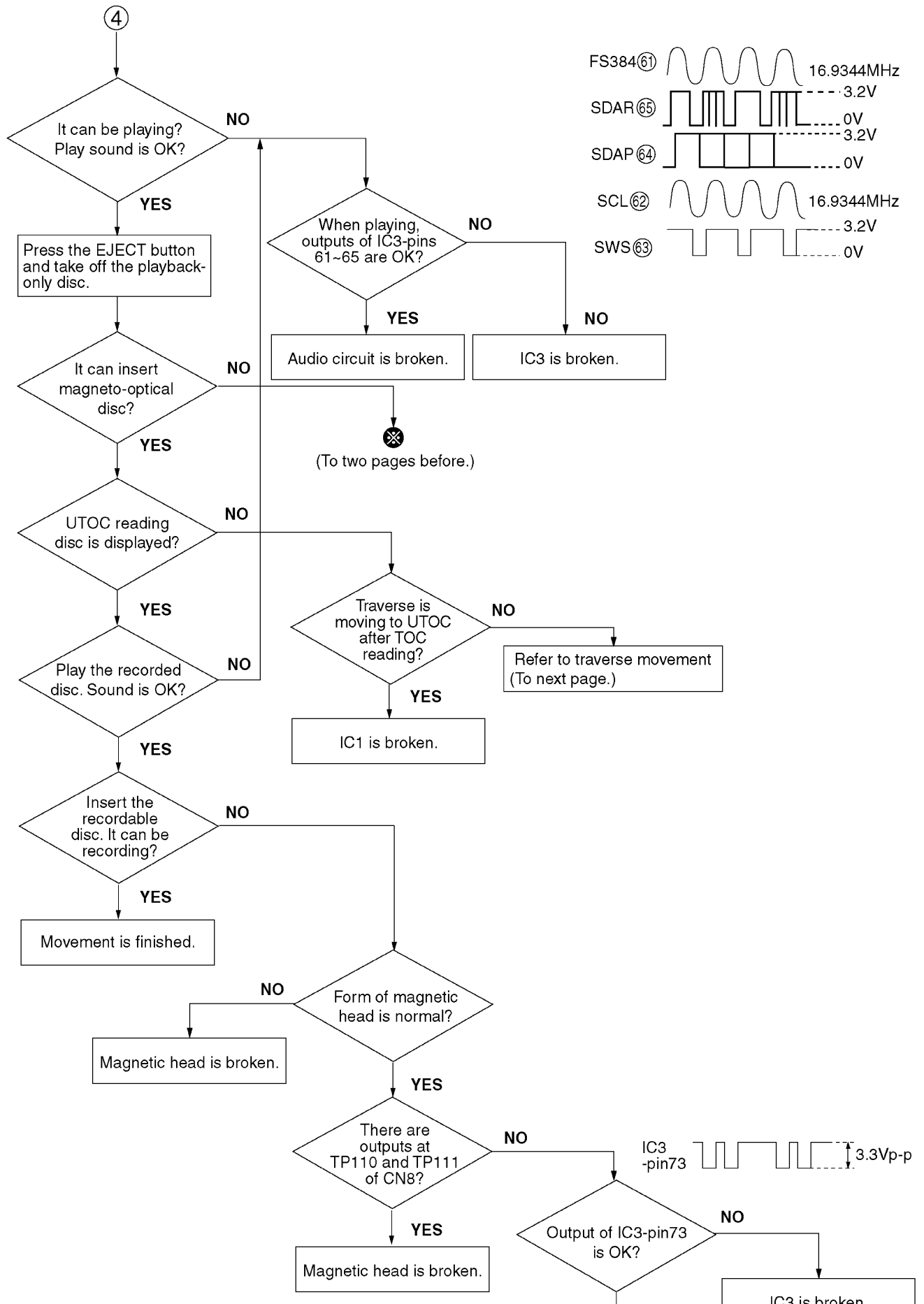
※ When you measure for IC1, refer to "Operation Checks and Component Replacement Procedures".

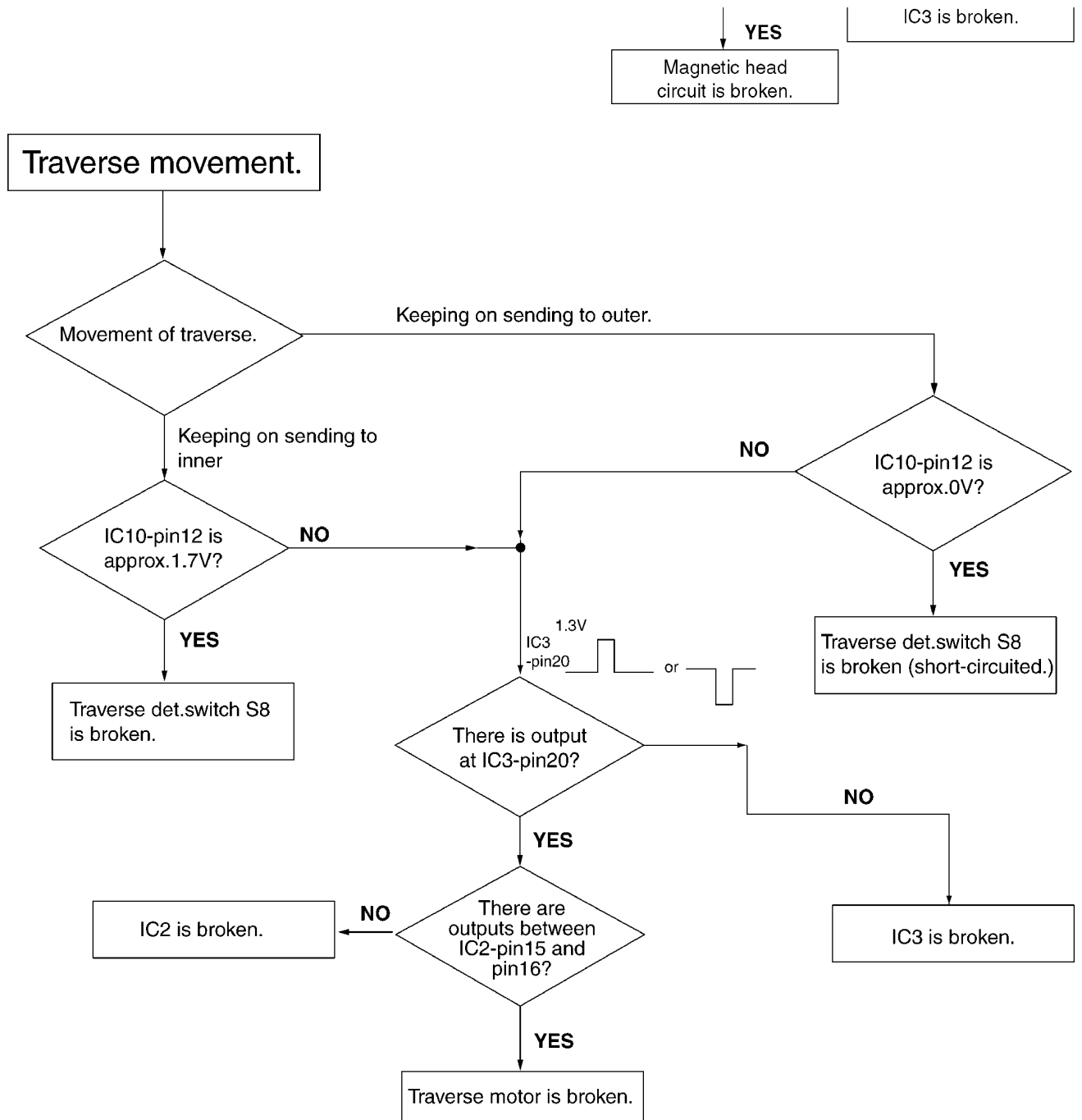






※ When you measure for IC1, refer to "Operation Checks and Component Replacement Procedures".










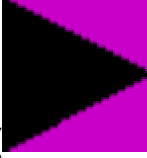
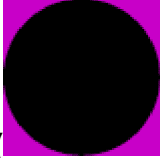

11. Schematic Diagram Notes

11.1. Schematic Diagram Notes

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

Notes:

- S1 : PROTECT det. switch.

- S2 : REFLECT det. switch.
- S3 : LOAD OPEN det. switch.
- S4 : DISC IN det. switch.
- S5 : LOAD PLAY/REC det. switch.
- S6 : LOAD PLAY det. switch.
- S7 : LOAD TRG det. switch.
- S8 : Traverse det. switch.
- S901 : Standby/on () switch.
- S902 : Input selector (INPUT SELECTOR) switch.
- S903 : Skip/Search () switch.
- S904 : Skip/Search () switch.
- S905 : Edit (EDIT) switch.
- S906 : Enter (ENTER) switch.
- S907 : Track mark mode select/character skip (TRACK MARKING/CHARA SKIP).
- S908 : Display mode select/character (DISP/CHARA).
- S909 : Eject () EJECT) switch.
- S910 : Stop () switch.
- S911 : Playback/Recording start () switch.
- S912 : Record () REC) switch.
- S913 : Pause () switch.
- S914 : Synchro-record (SYNCHRO REC) switch.
- S915 : Playback mode (PLAY MODE) switch.


- VR1: Laser power adj. V.R..
- VR901 : Input level/Jog push set V.R..
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

No mark: MD STOP

(): MD play [1kHz, L+R, 0dB]

<>: MD rec. [1kHz, L+R, 0dB]

Important safety notice:

Components identified by  mark have special characteristics important for safety. Furthermore, special parts which have purpose of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.

Caution!

IC and LSI are sensitive to static electricity.

Secondary trouble can be prevented by taking care during repair.

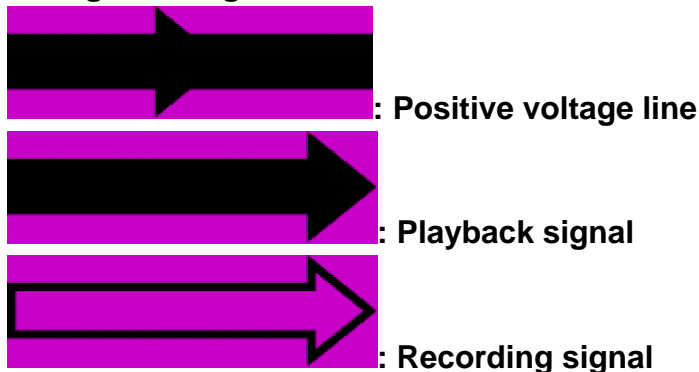
Cover the parts boxes made of plastics with aluminum foil.

Ground the soldering iron.

Put a conductive mat on the work table.

Do not touch the legs of IC or LSI with the fingers directly.

Voltage and signal lines



11.2. Type Illustration of IC's, Transistors and Diodes



12. Schematic Diagram



13. Printed Circuit Board



14. Block Diagram



15. Wiring Connection Diagram



16. Terminal Function of IC's

16.1. IC1 (AN8772FHQ) : RF AMP

Pin No.	Mark	I/O Division	Function
1	CENVD	—	D signal det. capacitor connection terminal
2	LDO	O	Laser amp output terminal
3	APCPD	I	Photo diode light quantity det. input terminal
4	LD IN	I	Laser amp reverse input terminal
5	APC REF	I	APC amp criterion voltage input terminal
6	TEMP IN	I	Temperature sensor amp input terminal
7	TEMP	O	Temperature sensor amp output terminal
8	ADIP	O	ADIP signal output terminal
9	TOFS	I	Tracking error offset adjustment terminal
10	TBAL	I	Tracking ballance adjustment terminal
11	TE	O	Tracking error signal output terminal
12	CRS IN	I	Track cross input terminal
13	TGAIN	I	Tracking gain adjustment input terminal
14	LNP	O	Lens position signal output terminal
15	AB GAIN	I	APP compensation signal gain adjustment terminal
16	FE	O	Focus error signal output terminal
17	AS GAIN	I	AS gain adjustment terminal
18	FBAL	I	Focus ballance adjustment terminal
19	AS/ MON3T	O	AS/3TMON signal output terminal
20	CEA	I	3T envelope det. capacitor connection terminal
21	BDO/ TRCRS	O	BDO/Track cross signal output terminal
22	CBD O	O	BDO detection capacitor connection terminal
23	OFT O	O	Off track detection signal output terminal
24	GND	—	GND terminal
25	OFT IN	I	Off track detection signal input terminal

Pin No.	Mark	I/O Division	Function
26	VCC	I	Power supply terminal (+3V)
27	NRFDET/ OFTR	O	NRFDET/off track signal output terminal
28	NRFLD	I	Serial command latch signal input terminal
29	RF DATA	I	Serial command data signal input terminal
30	RFCK	I	Serial command clock input terminal
31	NRFSTBY	I	Standby control signal input terminal
32	OUT RF	O	EFM signal output terminal
33	CRF AGC	—	RFAGC capacitor connection terminal
34	EQ IN	I	EQ input terminal
35	ARFO	O	RF amp. output terminal
36	SVREF	I	Reference voltage input terminal
37	VREF	O	Reference voltage output terminal
38	RF1	I	RF1 signal input terminal
39	RF2	I	RF2 signal input terminal
40	F1	I	F1 signal input terminal
41	F2	I	F2 signal input terminal
42	CLPF1	—	APP compensation LPF capacitor connection terminal
43	CLPF2	—	RF equalizer adjustment resistor connection terminal
44 ~47	A ~D	I	Beam A~D signal input terminal
48	CENVC	—	Beam E signal detection capacitor connection terminal

16.2. IC2 (AN8814SB-E1) : FOCUS/TRACKING COIL, SPINDLE/TRVERSE MOTOR DRIVE

Pin No.	Mark	I/O Division	Function
1	REG B	—	3.3V external transistor control terminal (Not used, open)
2	REG M	—	3.3V regular output monitor terminal (Not used, connected to GND)
3	NC	—	Not used, open
4	OPO	O	Op-amp output terminal
5	OP-	O	Op-amp invert output terminal
6	OP+	O	Op-amp non-invert output terminal (Not used, connected to GND)
7	Vcc	I	Power supply terminal
8	1/2 PVcc2	O	1/2 PVcc output terminal 1 (Connected to GND through capacitor)
9	PVcc2	I	Power supply terminal for driver
10	PGND2	—	GND terminal
11	VO4-	O	Tracking coil driver output terminal
12	VO4+	O	Tracking coil driver output terminal
13	VO3-	O	Focus coil driver output terminal
14	VO3+	O	Focus coil driver output terminal
15	VO2-	O	Traverse motor drive output terminal
16	VO2+	O	Traverse motor drive output terminal
17	VO1-	O	Spindle motor drive output terminal
18	VO+	O	Spindle motor drive output terminal
19	PGND	—	GND terminal
20	PVcc1	I	Power supply terminal
21	1/2 PVcc	O	1/2 PVcc output terminal 1 (Connected to GND through capacitor)
22	VREF	I	Reference voltage input
23	IN1	I	Spindle motor drive input terminal
24	PC1	I	Power cut 1 input terminal
25	IN2	I	Traverse motor drive input terminal

Pin No.	Mark	I/O Division	Function
26	PC2	I	Power cut 2 input terminal
27	IN3	I	Focus drive input terminal
28	IN4	I	Tracking drive input terminal

16.3. IC3 (M6616RA1) : ATRAC ENCODER/DECORDER, SERVO SIGNAL PROCESSOR

Pin No.	Mark	I/O Division	Function
1	ADIP	I	ADIP FM signal input terminal
2	LNP	I	Lens position signal input terminal
3	FE	I	Focus error signal input terminal
4	TE	I	Tracking error signal input terminal
5	AS	I	AS signal input terminal
6	DRMONI	I	Drive voltage monitor input terminal
7	BAT	I	Battery power supply terminal (Not used, connected to GND)
8	AMONI	—	Servo analog monitor signal output (Not used, open)
9	VREFI	I	Reference voltage input terminal
10	TOFS	O	Tracking off-set adjustment output terminal
11	FBAL	O	Focus balance adjustment output terminal
12	TBAL	O	Tracking balance adjustment output terminal
13	TGAIN	O	TE error gain adjustment output terminal
14	ASGAIN	O	Main beam amp gain adjustment output terminal
15	ABGAIN	O	APP adjustment output terminal
16	AVDD1	I	Power supply terminal
17	AVSS1	—	GND terminal

Pin No.	Mark	I/O Division	Function
18	FOD	O	Focus drive signal output terminal
19	TRD	O	Tracking drive signal output terminal
20	TVD	O	Traverse motor drive signal output terminal
21	SPD	O	Spindle motor drive signal output terminal
22	SPON	O	Drive IC spindle ON signal output terminal
23	TVON	O	Drive IC traverse ON signal output terminal
24	DVDD0	I	Power supply terminal
25	FG	I	FG input terminal
26	NRECT	O	Rec/Play switching signal output terminal
27	IVDD2	—	Power supply terminal for I/O pad
28	IVDD0	—	Power supply terminal for I/O pad
29	DVss0	—	GND terminal
30 ~32	RAD12 ~RAD10	—	DRAM address output terminal (Not used, open)
33 ~42	RAD9 ~RAD0	O	DRAM address output terminal
43 ~46	RDT3 ~RDT0	I/O	DRAM data input/output terminal
47	NRAS	O	DRAM row address strobe output terminal
48	NCAS	O	DRAM column address strobe output terminal
49	NWE	O	DRAM write enable output terminal
50	NRST	I	Reset signal input terminal
51	SELAD	I	MSP/MDA,I/F address select input terminal (“H” Address)
52	SSCK	I	MSP/MDA,I/F clock input terminal
53	SSDW	I	MSP/MDA,I/F write data input terminal
54	SSDR	O	MSP/MDA,I/F read data output terminal
55	MDISY	O	Leader synchronous signal output
56	SCTSY	O	ADIP synchronous noise output terminal

Pin No.	Mark	I/O Division	Function
57	SGSYNC	O	Frame synchronous signal output terminal
58	DVDD1	I	Power supply terminal
59	IVDD1	—	Power supply terminal for I/O pad
60	DVss1	—	GND terminal
61	FS384	O	384 Fs output terminal
62	SCL	O	Bit clock output terminal
63	SWS	O	Word clock output terminal
64	SDAP	O	Audio data output terminal
65	SDAR	I	Audio data input terminal
66	LRCK	I	CD word clock input terminal (Connected to GND)
67	BCK	I	CD bit clock input terminal (Connected to GND)
68	DATA	I	CD data input terminal (Connected to GND)
69	TX	O	Digital audio interface signal output terminal (Not used, open)
70	RX1	I	Digital audio interface signal 1 input terminal
71	RX2	I	Digital audio interface signal 2 input terminal
72	NREFM	—	EFM modulation inverted output (Not used, open)
73	REFM	O	EFM modulation output terminal
74	MONI3	—	Monitor signal output (Not used, open)
75	MONI2	—	Monitor signal output (Not used, open)
76	MONI1	—	Monitor signal output (Not used, open)
77	MONI0	—	Monitor signal output (Not used, open)
78	TS3	—	Not used, connected to GND
79	TS2	—	Not used, connected to GND
80	TS1	—	Not used, connected to GND
81	TS0	—	Not used, connected to GND

Pin No.	Mark	I/O Division	Function
82	EXSYSCK	—	External system clock input terminal (Not used, connected to GND)
83	DVDD2	I	Power supply terminal
84	XI	I	Crystal oscillator input terminal (F=16.9344MHz)
85	XO	O	Crystal oscillator output terminal (F=16.9344MHz)
86	VDss2	—	GND terminal
87	RFDAT	O	RF serial data output terminal
88	RFCK	O	RF serial clock output terminal
89	NRFLD	O	RF serial load output terminal
90	TRCRS	I	Track cross input terminal
91	OFTR	I	Off-track signal input terminal
92	APCD	O	Laser power PWM output terminal
93	EXEFMCK	I	External FM clock input terminal (Not used, connected to GND through resistor)
94	PEFM1	O	EFM loop filter output terminal
95	EFMIREF	I	EFM PLL reference current input terminal
96	EFMPLL	O	EFM PLL filter output terminal
97	PEFMS	I	EFM signal input terminal
98	AVDD0	I	Power supply terminal
99	AVss0	—	GND terminal
100	TEFSEL	—	Not used, open

16.4. IC10 (MN101D03DAA) : SYSTEM CONTROL

Pin No.	Mark	I/O Division	Function
1	DACRST	O	DAC reset signal output terminal to IC4 (“L”:Reset)
2	DEO	O	DE emphasis signal output terminal to IC4 (“L”:DE emphases)
3	MUTE	—	AD-DA mute output terminal (Not used, open)
4	AD RST	O	Reset signal output terminal
5	NRFSTBY	O	Standby control signal output terminal (“L”:Standby)
6	PC	O	Transistor drive signal output terminal (“H”:Power ON)
7	MSP RST	O	MSP reset signal output terminal (“L”:Reset)
8	LOAD1	O	Loading motor drive 1 output terminal
9	LOAD0	O	Loading motor drive 0 output terminal
10	NEFMON	O	Magnetic head current output terminal
11	TEST01	O	Test signal output terminal (Not used, open)
12	TVSW	I	Traverse innermost detection switch signal input terminal
13	DISC IN	I	Disc detection switch signal input terminal
14	REFLECT	I	Reflection rate switch signal input terminal
15	LOAD SW0 (OPEN)	I	Loading mechanism position det. Switch 0 signal input terminal
16	LOAD SW1 (TRG)	I	Loading mechanism position det. Switch 1 signal input terminal
17	LOAD SW2 (PLAY/REC)	I	Loading mechanism position det. Switch 2 signal input terminal.
18	LOAD SW3 (PLAY)	I	Loading mechanism position det. Switch 3 signal input terminal
19	PROTECT	I	Erase prevention switch signal input terminal
20	MMOD	—	Connected to GND

20	MMOD	—	CONNECTED TO GND
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Pin No.	Mark	I/O Division	Function
21	RST	I	Reset signal input terminal ("L":Reset)
22	UNIT TEST	I	Test signal input terminal (Open)
23	CS2	I	Test signal input terminal (Open)
24	SCTSY	I	Micro computer interrupt signal input terminal (SUBQ/ADIP simultaneous signal)
25	MDISY	I	Micro computer interrupt signal input terminal (MD simultaneous signal)
26	PANEL REQ	I	Panel I/F request signal input terminal
27 ~29	LED OUT1 ~LED OUT3	O	Drive signal output terminal to LED DRIVE ("H":LED ON)
30	TEST02	O	Test signal output terminal (Not used, open)
31	VDD2(3V)	I	Power supply terminal (+3V)
32	OSC1	I	Crystal oscillator input terminal (f=10MHz)
33	OSC2	O	Crystal oscillator output terminal (f=10MHz)
34	VSS	—	GND terminal
35	XI	I	Not used, connected to GND
36	XO	O	Not used, open
37	VSS	—	GND terminal
38	TEST03	O	Test signal output terminal (Not used, open)
39	EEPCS	O	EEPROM chip select signal output terminal (Not used, open)
40	EEPCK	O	EEPROM clock signal output terminal (Not used, open)
41	EEPDATA	I/O	EEPROM data in/output terminal (Connected to GND through resistor)
42	TEST04	O	Test signal output terminal (Not used, open)
43	TEST05		
44	CFSYNC	I	ATRACK management frame simultaneous signal input terminal

Pin No.	Mark	I/O Division	Function
45	TEST06	O	Test signal output terminal (Not used, open)
46	TEST07	I	Connected to rec/play switch signal
47	TOK OK	O	Not used, open
48	HF ON	—	Drive signal output terminal to Q3 (POWER SUPPLY CONTROL)
49	PANEL CLK	I	Panel I/F clock input terminal
50	PANEL DATA I	I	Panel I/F data input terminal
51	PANEL DATA 0	O	Panel I/F data output terminal
52	PANEL CS	O	Panel I/F chip select output terminal
53	SELAD	O	Micro computer I/F address select output terminal
54	SSCLK	O	Micro computer I/F clock output terminal
55	SSDR	I	Micro computer I/F reading data input terminal
56	SSDW	O	Micro computer I/F writing data output terminal
57	LCDCK	O	LCD clock test signal output terminal (Connected to power supply through resistor)
58	ADRS TEST RXD	O	Test signal output terminal (Connected to power supply through resistor)
59	LCD DATA TXD	O	Test signal output terminal (Not used, open)
60	VREF-	—	Connected to GND
61	TEMP	I	Temperature sensor amp input terminal
62	KEY1	I	Key input 1 terminal
63	KEY2	I	Key input 2 terminal
64	NO LOAD	I	Test signal input terminal ("L":Without loading mechanism) (Open)
65	SRVTEST	I	Test signal input terminal ("L":Servo test mode) (Open)
66	LOAD P	I	Test signal input terminal (Open)

Pin No.	Mark	I/O Division	Function
67	TEST KEY IN	I	Test signal input terminal ("L":Unit key mode) (Open)
68	SRV LOAD	I	Test signal input terminal ("L":Using for servo primary values EEPROM)
69	VCC 3V	I	Power supply terminal (+3V)
70	VCC 5V	I	Power supply terminal (+5V)
71	SELADDA	I	AD/DA converter select signal input terminal (Open)
72	SLOCK	O	Spindle lock test signal output terminal (Not used, open)
73	TLOCK	O	Tracking lock signal output terminal ("H":lock) (Not used, open)
74	FLOCK	O	Focus lock test signal output terminal ("H":lock) (Not used, open)
75	ERROR	O	Servo error test signal output terminal (Not used, open)
76	BUSY	O	Servo busy test signal output terminal (Not used, open)
77	SBPRETRY	O	Signal management retry test signal output terminal (Not used, open)
78	SRVRETRY	O	Servo retry test signal output terminal (Not used, open)
79	ARDSKIP	O	Address skip test signal output terminal (Not used, open)
80	SPMWE	O	SPM take in test signal output terminal (Not used, open)

16.5. IC72 (MNV4400-T8T) : 4M DRAM

Pin No.	Mark	I/O Division	Function
1	DO1	I/O	DRAM data 1 in/output terminal
2	DO2	I/O	DRAM data 2 in/output terminal
3	WE	I	DRAM light enable input terminal
4	RAS	I	DRAM low address strobe input terminal
5	A9	I	DRAM address 9 input terminal
9	A0	I	DRAM address 0 input terminal
10 ~12	A1 ~A3	I	DRAM address 1~3 input terminal
13	VCC	I	Power supply terminal
14 ~18	A4 ~A8	I	DRAM address 4~8 input terminal
22	OE	I	DRAM output enable input terminal (Not used, connected to GND)
23	CAS	I	DRAM calam address strobe input terminal
24	DO3	I/O	DRAM data 3 in/output terminal
25	DO4	I/O	DRAM data 4 in/output terminal
26	VSS	—	GND terminal

16.6. IC901 (M30218MAA106): FL DRIVE/SYSTEM CONTROL

Pin No.	Mark	I/O Division	Function
1	P97	O	VR control clock output terminal
2	P96	O	VR control data output terminal
3	P95	O	VR control STB output terminal
4	P94	O	Digital in 1/2 select signal output terminal (“H”: in 1)
5	P93	I	Not used, connected to GND
6	P92	I	Chip select input terminal
7	P91	O	Request signal output terminal
8	P90	O	Reset signal output terminal
9	CNVSS	—	Flash write signal voltage (Connected to GND through resistor)
10	P87	O	Power on/off control signal output terminal
11	P86	—	Not used, connected to GND
12	RESET	I	Reset signal input terminal
13	XOUT	O	Clock ceramic oscillator output terminal (f=10MHz)
14	VSS	—	GND terminal
15	XIN	I	Clock ceramic oscillator output terminal (f=10MHz)
16	VCC	I	Power supply terminal
17	P85	I	AC detect terminal
18	P84	I	Remote control data input terminal
19	P83	I	Unit load switch signal input terminal
20	P82	O	Audio mute signal output terminal
21	P81	O	Play LED drive signal output terminal (“L”: LED on)
22	P80		
23	P77	I	Not used, connected to power supply through resistor
24	P76	O	Communication clock output terminal
25	P75	I	Data input terminal
26	P74	O	Data output terminal


Pin No.	Mark	I/O Division	Function
27 ~30	P73 ~P70	I	Not used, connected to power supply through resistor
31 ~34	P47 ~P44	—	Not used, connected to power supply through resistor
35	P43	—	Not used, connected to GND
36	P42	I	Model select terminal
37	P41	O	FL segment control signal output terminal
38	P40		
39 ~46	P37 ~P30		
47 ~62	P27 ~P10		
63	VCC	I	Power supply input terminal
64	P07	O	FL segment control signal output terminal
65	VSS	—	GND terminal
66 ~72	P06 ~P00	O	FL segment control signal output terminal
73	P57		
74	P56	O	Q905 drive signal output terminal
75	P55		Q904 drive signal output terminal
76	P54		Q903 drive signal output terminal
77 ~80	P53 ~P50	O	FL grid control signal output terminal
81 ~88	P67 ~60		
89	-VP	I	Power supply input terminal
90	P107/ AN7	I	Not used, connected to GND
91	P106/ AN6		
92	P105/ AN5	I	Key switch input terminal
93	P104/ AN4		
94 ~96	P103/ AN3 ~P101/ AN1	—	Not used, connected to GND

Pin No.	Mark	I/O Division	Function
97	AVSS	—	GND terminal
98	P100/ AN0	—	Not used, connected to GND
99	VREF	I	Reference voltage input terminal
100	AVCC	I	Power supply input terminal

17. Replacement Parts List

Notes:

*Important safety notice:

Components identified by  mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.

*Warning: This product uses a laser diode. Refer to caution statements.

***ACHTUNG:**Die lasereinheit nicht zerlegen.Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

*Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)


*Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000K (OHM)

*[MAVD] indicates in Remarks column parts that are supplied by MAVD.

*The marking <RTL> indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.













*"<IA>", "<IB>", "<IC>", marks in Remarks indicate languages of instruction manuals. [<IA> : English, <IB> : German / Italian / French, <IC> : Netherlands / Danish / Spanish / Swedish / Polish]








Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
<u>1</u>	RGK1148-M	SIDE PANEL(L)	1	
<u>2</u>	RGK1149-M	SIDE PANEL(R)	1	
<u>3</u>	RHD30073-K	SCREW	4	
<u>4</u>	RKM0326G-S	CABINET	1	[MAVD]
<u>5</u>	XTBS3+8JFZ1	SCREW	1	
<u>6</u>	REZ1250	FFC(30P)	1	[MAVD]
<u>7</u>	REZ1251	FFC(20P)	1	[MAVD]
<u>8</u>	RKA0076-N3	FOOT	4	
<u>8-1</u>	RKA0083-K	CUSHION	4	
<u>9</u>	XTB3+6G	SCREW	4	
<u>10</u>	RGK0810-N3	SIDE ORNAMENT(L)	1	
<u>11</u>	RGK0811-N3	SIDE ORNAMENT(R)	1	
<u>12</u>	RGK0886-1H	MD LID	1	
<u>13</u>	RGL0345-Q	LED INDICATOR	1	
<u>14</u>	GG0139C-S	FRONT PANEL	1	[MAVD]
<u>15</u>	RGL0455-Q	INDICATOR	1	[MAVD]
<u>16</u>	RGP0573A-S1	SUB PANEL	1	[MAVD]
<u>17</u>	RGU1471A-S	BUTTON POWER	1	[MAVD]
<u>18</u>	RGU1472-S	BUTTON PLAY	1	
<u>19</u>	RGU1473-S	BUTTON ENTER	1	
<u>20</u>	RGU1474A-S	BUTTON DISPLAY MODE	1	[MAVD]
<u>21</u>	RGU1475-S	BUTTON EJECT	1	
<u>22</u>	RGW0254-S	KNOB JOG	1	
<u>23</u>	RHD20010	SCREW	2	
<u>24</u>	RHD26021	SCREW	5	
<u>25</u>	RHN70002	NUT	1	
<u>26</u>	RKW0482A-Y	FL WINDOW	1	
<u>27</u>	RKW0483-Q	REMOTE SENSOR WINDOW	1	
<u>28</u>	RMB0495	SPRING	1	
<u>29</u>	RMG0387A-K	RUBBER	1	
<u>30</u>	XTBR3+20JFZ	SCREW	2	
<u>31</u>	XTBS3+8JFZ1	SCREW	12	
<u>100</u>	RED0047-1	MAGNETIC HEAD	1	
<u>101</u>	RHD17021	SCREW	1	
<u>102</u>	RHD17022	SCREW	1	
<u>103</u>	RMC0348	THRUST SPRING	1	
<u>104</u>	RMC0349	NUT PLATE SPRING	1	
<u>105</u>	RML0515	HEAD SIFTER	1	
<u>106</u>	RMQ0750	REF BASE	1	
<u>107</u>	RMQ0751	NUT PLATE	1	
<u>108</u>	RMS0611	MAIN SHAFT	1	
<u>109</u>	RXJ0021	DRIVE SHAFT	1	
<u>110</u>	RXK0249	MECHANISM CHASSIS	1	
<u>110-1</u>	RDV0055	BELT	1	
<u>110-2</u>	REM0077	TRAVERSE MOTOR	1	
<u>110-3</u>	REM0078	LOADING MOTOR	1	
<u>110-4</u>	RMB0548	PRESSURE SPRING	1	
<u>110-5</u>	RMQ0752	DETECTOR PIN(1)	1	
<u>110-6</u>	RMQ0753	DETECTOR PIN(2)	2	
<u>110-7</u>	XQN17+C25FZ	SCREW	6	
<u>110-8</u>	XYC2+FF105	SCREW	1	
<u>111</u>	RAF1700A	OPTICAL PICKUP	1	
<u>112</u>	XTW2+6S	SCREW	1	
<u>113</u>	RHD20053	SCREW	4	
<u>114</u>	RMB0504	SPRING	4	
<u>115</u>	RMG0447-K	DAMPER	4	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
116	XTN17+6GFZ	SCREW	1	
117	RMR1118-K2	HOLDER	1	
A1	EUR645272	REMOTE CONTROLLER	1	[MAVD]
A1-1	UR64EC1987B	BATT.COVER(REMOTE CONT.)	1	
A2	RJA0044-C	AC POWER SUPPLY CORD	1	(EB)[MAVD] 
A2	RJA0043-C	AC POWER SUPPLY CORD	1	(EG) 
A3	RJL1X001B05D	OPTICAL CABLE	1	
A4	RJL2P004B08A	RCA PIN CORD	2	
A5	RQA0117	WARRANTY CARD	1	
A6	RQCB0169	SERVICENTER LIST	1	
A7	RQT5092-1B	INSTRUCTION MANUAL	1	<IA>[MAVD]
A7	RQT5093-D	INSTRUCTION MANUAL	1	(EG)<IB>[MAVD]
A7	RQT5094-E	INSTRUCTION MANUAL	1	(EG)<IC>[MAVD]
C1	ECUV1H221KBV	50V 220P	1	
C4	ECUVNA105ZFV	10V 1U	1	
C5	ECUVNA224KBV	10V 0.22U	1	
C6	ECUVNA105ZFV	10V 1U	1	
C7,8	ECUVNA224KBV	10V 0.22U	2	
C11	ECUVNE223KBV	25V 0.022U	1	
C12	ECUV0J474KBV	6.3V 0.47U	1	
C13	ECUV1C393KBV	16V 0.039U	1	
C14	ECUV1H102KBV	50V 1000P	1	
C15	ECST0GY106RR	4V 10U	1	
C16	ECUV1H181KV	50V 180P	1	
C17	ECUV1H332KBV	50V 3300P	1	
C18	ECUV1H562KBV	50V 5600P	1	
C19	ECUVNC104ZFV	16V 0.1U	1	
C20	ECST0GY106RR	4V 10U	1	
C21	ECUV1H822KBV	50V 8200P	1	
C22	ECUV1H102KBV	50V 1000P	1	
C23	ECUVNC104ZFV	16V 0.1U	1	
C24	ECUV1H102KBV	50V 1000P	1	
C25	ECUV1C393KBV	16V 0.039U	1	
C26	ECUV1H472KBV	16V 4700P	1	
C28	ECST0GY226RR	4V 22U	1	
C29	ECUV1H332KBV	50V 3300P	1	
C30	ECUV1E123KBV	25V 0.012U	1	
C31,32	ECUV1H102KBV	50V 1000P	2	
C33	ECST0GY106RR	4V 10U	1	
C34,35	ECUV1H102KBV	50V 1000P	2	
C37	ECUV1H181KV	50V 180P	1	
C40	ECUVNC104ZFV	16V 0.1U	1	
C41	ECEV0JA331P	6.3V 330U	1	
C42	ECST0GY106RR	4V 10U	1	
C45	ECST0GY106RR	4V 10U	1	
C46	ECUVNC104ZFV	16V 0.1U	1	
C47	ECUVNA105ZFV	10V 1U	1	
C48	ECUVNC104ZFV	16V 0.1U	1	
C50	ECUVNC104ZFV	16V 0.1U	1	
C51,52	ECUVNA105ZFV	10V 1U	2	
C53	ECUV1H332KBV	50V 3300P	1	
C55-58	ECUV1H102KBV	50V 1000P	4	





Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C59	ECUV1C823KBV	16V 0.082U	1	
C60	ECEV1CA100NR	16V 10U	1	
C61	ECUVNJ334KBV	63V 0.33U	1	
C62	ECUV1H221KBV	50V 220P	1	
C64	ECUVNE153KBV	25V 0.015U	1	
C65	ECUVNC104KBV	16V 0.1U	1	
C66	ECUV1C823KBV	16V 0.082U	1	
C67	ECUV1H392KBV	50V 3900P	1	
C70	ECUV1E123KBV	25V 0.012U	1	
C71-76	ECUVNC104ZFV	16V 0.1U	6	
C79,80	ECUVNC104ZFV	16V 0.1U	2	
C81	ECUV1H560JCV	50V 56P	1	
C82	ECUVNC473KBV	16V 0.047U	1	
C83,84	ECUVNC104ZFV	16V 0.1U	2	
C85	ECST0GY106RR	4V 10U	1	
C86	ECUVNE153KBV	25V 0.015U	1	
C87	ECUVNC104ZFV	16V 0.1U	1	
C88,89	ECUV1H331KBV	50V 330P	2	
C90,91	ECUV1H080DCV	50V 8P	2	
C92,93	ECUVNC104ZFV	16V 0.1U	2	
C94	ECST0GY475RR	4V 4.7U	1	
C95	ECUVNC104ZFV	16V 0.1U	1	
C96,97	ECST0GY475RR	4V 4.7U	2	
C98	ECUVNC104ZFV	16V 0.1U	1	
C99	ECUV1H102KBV	50V 1000P	1	
C100	ECUVNC104ZFV	16V 0.1U	1	
C101	ECST0GY106RR	4V 10U	1	
C102	ECUVNC104ZFV	16V 0.1U	1	
C103	ECST0GY106RR	4V 10U	1	
C106	ECUV1H102KBV	50V 1000P	1	
C110	ECUVNC104ZFV	16V 0.1U	1	
C111	ECST0GY106RR	4V 10U	1	
C112	ECEV1CA100NR	16V 10U	1	
C113	ECUVNC104ZFV	16V 0.1U	1	
C114,15	ECUV1H561KBV	50V 560P	2	
C117	ECEV0JA331P	6.3V 330U	1	
C118	ECUVNA105KBN	10V 1U	1	
C119	ECUV1H102KBV	50V 1000P	1	
C120	ECUV1H560JCV	50V 56P	1	
C121	ECUV1H102KBV	50V 1000P	1	
C122	ECUVNA105ZFV	10V 1U	1	
C123	ECUVNC104ZFV	16V 0.1U	1	
C128	ECUVNC104ZFV	16V 0.1U	1	
C129	ECUV1H101JCV	50V 100P	1	
C133	ECUVNA105ZFV	10V 1U	1	
C134	ECUV1H331KBV	50V 330P	1	
C138	ECEV0JA470SR	6.3V 47U	1	
C139-42	ECUVNC104ZFV	16V 0.1U	4	
C143	ECST0GY106RR	4V 10U	1	
C144	ECUVNH103KBV	50V 0.01U	1	
C147-49	ECUVNH103KBV	50V 0.01U	3	
C154,55	ECUV1H330GCV	50V 33P	2	
C301	ECBT1H104ZF5	50V 0.1U	1	
C302	ECA1CM103E	16V 1000U	1	
C303	ECBT1H104ZF5	50V 0.1U	1	
C304-06	ECA1HM101	50V 100U	3	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C307	ECUV1H102KCN	50V 1000P	1	
C308	ECEA1HKA220B	50V 22U	1	
C309	ECBT1H104ZF5	50V 0.1U	1	
C311,12	ECA1EM471	25V 470U	2	
C313,14	ECUVNE104ZFN	25V 0.1U	2	
C315,16	ECEA1AKS470	10V 47U	2	
C317,18	ECA1AM221B	10V 220U	2	
C321	ECUV1E104KBN	25V 0.1U	1	
C322	ECEA0JKS101	6.3V 100U	1	
C324,25	ECEA0JKS470	6.3V 47U	2	
C326	ECUV1E104KBN	25V 0.1U	1	
C327	ECEA0JKS101	6.3V 100U	1	
C328	ECUV1H103KBN	50V 0.01U	1	
C329	ECEA1CKA470B	16V 47U	1	
C330	ECEA0JKS101	6.3V 100U	1	
C331	ECUV1H103KBN	50V 0.01U	1	
C332	ECEA0JKS220	6.3V 22	1	
C333	ECEA0JKS101	6.3V 100U	1	
C334	ECA0JM102	6.3V 1000U	1	
C335	ECEA0JKS470	6.3V 47U	1	
C336	ECUVNE104ZFN	25V 0.1U	1	
C337	ECUV1H103KBN	50V 0.01U	1	
C338,39	ECUVNE104ZFN	25V 0.1U	2	
C401,02	ECUVNE104ZFN	25V 0.1U	2	
C709-12	ECEA1CKA470B	16V 47U	4	
C713,14	ECUV1H102KCN	50V 1000P	2	
C715-18	ECUV1H391KCN	50V 390P	4	
C719,20	ECEA1CKA470B	16V 47U	2	
C721,22	ECUV1H102KCN	50V 1000P	2	
C723-26	ECUV1E223ZFN	25V 0.022U	4	
C739-42	ECEA1CKA470B	16V 47U	4	
C745,46	ECEA1HKS3R3	50V 3.3U	2	
C749,50	ECUV1H101JCN	50V 100P	2	
C757,58	ECUV1H151JCN	50V 150P	2	
C759	ECUVNE104ZFN	25V 0.1U	1	
C764,65	ECUVNE104ZFN	25V 0.1U	2	
C766,67	ECEA1EKS4R7	25V 4.7U	2	
C771-73	ECUV1H101JCN	50V 100P	3	
C908	ECEA1AKS221	6.3V 220U	1	
C909,10	ECUVNE104ZFN	25V 0.1U	2	
C911	ECEA1HKS2R2	50V 2.2U	1	
C912,13	ECUVNE104ZFN	25V 0.1U	2	
CN1	RJS2A4526T	CONNECTOR (26P)	1	
CN4	RJS2A4830T	CONNECTOR (30P)	1	
CN6	RJU113W10M	SOCKET(10P)	1	
CN8	RJS2A4506T	CONNECTOR (6P)	1	
CN201-08	RJS1A1101T1	CONNECTOR(1P)	8	
CN401	RJS1A6820	CONNECTOR(20P)	1	
CN402	RJS2A3330M	CONNECTOR(30P)	1	
CN403	RJT057W012-1	CONNECTOR(12P)	1	
CN404	RJT057W007-1	CONNECTOR(7P)	1	
CN901	RJS1A6220-1	CONNECTOR(20P)	1	
CP6	RJT113W10M	CONNECTOR (10P)	1	
CP403	RJU057W012	CONNECTOR(12P)	1	


Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
CP404	RJU057W007	CONNECTOR(7P)	1	
D5,6	SC80209TE12R	DIODE	2	
D9	MA728TX	DIODE	1	
D301-07	1D3-E	DIODE	7	
D308	MA4270H	DIODE	1	
D309,10	1D3-E	DIODE	2	
D311,12	MA4091M	DIODE	2	
D313,14	MA4051M	DIODE	2	
D315	MA4062M	DIODE	1	
D316	MA4056M	DIODE	1	
D317,18	1SS291TA	DIODE	2	
D319,20	MA110TX	DIODE	2	
D321	MA4051M	DIODE	1	
D325,26	MA110TX	DIODE	2	
D451,52	MA110TX	DIODE	2	
D711-14	MA110TX	DIODE	4	
D901	MA110TX	DIODE	1	
D902	SPR-305MDTF	L.E.D.	1	
D903	SLR-325VC	L.E.D.	1	
D904	MA110TX	DIODE	1	
FL901	RSL0227-F	FL DISPLAY	1	
IC1	AN8772FHQ	IC	1	
IC2	AN8814SB-E1	IC	1	
IC3	MN66616RA3	IC	1	
IC4	AK4518VF-E2	IC	1	
IC5	RN5RG33AA-TL	IC	1	
IC6	TC7W04FTE12L	IC	1	
IC9	RN5RZ26BA-TR	IC	1	
IC10	MN101D03DAA1	IC	1	
IC11	TC74HCT00AFL	IC	1	
IC72	MNV4400-T8T	IC	1	
IC92	LB1830MS-TLM	IC	1	
IC301,02	BA05ST-V5	IC	2	
IC304	S81233SGY-Z	IC	1	
IC401	TC74HCT7007A	IC	1	
IC402	TC74HC4050EL	IC	1	
IC707	BA4560FE2	IC	1	
IC709	TC9413AP	IC	1	[MAVD]
IC711	BA4560FE2	IC	1	
IC901	M30218MAA106	IC	1	[MAVD]
ICP301	SRUN10	IC PROTECTOR	1	
JK201	SJS9236	JACK AC INLET	1	
JK701	SJF3069-4N	JACK LINE PLAY/REC	1	
JK703,04	GP1F32R	JACK OPTICAL INPUT	2	
L1	RLQU100KT-W	COIL	1	
L2,3	RLQU101KT-W	COIL	2	
L4-8	RLQU2R2MT-W	COIL	5	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
L9-12	RLQU100KT-W	COIL	4	
L13,14	RLQU2R2MT-W	COIL	2	
L15	RLQU100KT-W	COIL	1	
L16	RLQU2R2MT-W	COIL	1	
L17,18	RLQP1R8KT2-Y	COIL	2	
L201,02	SLQX400-D	COIL	2	
P1	RPF0139	PROTECTION BAG(F.B.)	1	
P2	RPG4525	PACKING CASE	1	[MAVD]
P3	RPN1008	CUSHION	1	
P4	RPQ0981	PAD	1	[MAVD]
PCB1	REP2878AB-S	POWER P.C.B.	1	<RTL>[MAVD]
PCB2	REP2878AA-S	MAIN P.C.B.	1	<RTL>[MAVD]
PCB3	REP2878AC-S	OPERATION P.C.B.	1	<RTL>[MAVD]
PCB4	REP2761A-T	MD SERVO P.C.B.	1	<RTL>
Q1	2SB1295-6-TB	TRANSISTOR	1	
Q2	DTC114YETL	TRANSISTOR	1	
Q3	2SB1462STX	TRANSISTOR	1	
Q5	2SB1295-6-TB	TRANSISTOR	1	
Q6	DTC114YETL	TRANSISTOR	1	
Q10	2SJ278MYTR	TRANSISTOR	1	
Q11	2SK1764KYTR	TRANSISTOR	1	
Q13	2SB1121ST-TD	TRANSISTOR	1	 Q301,02 2SD1450S TRANSISTOR 2
Q303	2SA1048GR	TRANSISTOR	1	
Q304	DTA114EUT106	TRANSISTOR	1	
Q305	2SD1862QRTV6	TRANSISTOR	1	
Q306	2SB1240-P	TRANSISTOR	1	
Q307	2SD1862QRTV6	TRANSISTOR	1	
Q308	2SD2037EFTA	TRANSISTOR	1	
Q309	DTA114EUT106	TRANSISTOR	1	
Q310	DTC114EUT106	TRANSISTOR	1	
Q451,52	DTC114EUT106	TRANSISTOR	2	
Q453	DTA114EUT106	TRANSISTOR	1	
Q454,55	DTA143EUT106	TRANSISTOR	2	
Q456	DTC114EUT106	TRANSISTOR	1	
Q703-06	2SD1328QRSTX	TRANSISTOR	4	
Q901	DTA114EUT106	TRANSISTOR	1	
Q902-05	DTC114EUT106	TRANSISTOR	4	
Q906,07	DTA114EUT106	TRANSISTOR	2	
Q913	DTC114EUT106	TRANSISTOR	1	
R1	ERJ3GEYJ472V	1/16W 4.7K	1	
R2	ERJ3GEYJ102Z	1/16W 1K	1	
R3	ERJ3GEYJ472V	1/16W 4.7K	1	
R5	ERJ3GEYJ1R0V	1/16W 1	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R6	ERJ3GEYJ472V	1/16W 4.7K	1	
R8	ERJ3GEYJ271V	1/16W 270	1	
R10	ERJ3GEYJ474V	1/16W 470K	1	
R11	ERJ3GEYJ101V	1/16W 100	1	
R12	ERJ3GEYJ223V	1/16W 22K	1	
R13	ERJ6GEYJ3R3V	1/8W 3.3	1	
R14	ERJ3GEYD103V	1/16W 10K	1	
R15	ERJ3GEYJ223V	1/16W 22K	1	
R16	ERJ3GEYJ104Z	1/16W 100K	1	
R17	ERJ3GEYJ223V	1/16W 22K	1	
R18	ERJ3GEYJ103Z	1/16W 10K	1	
R19	ERJ3GEYJ102Z	1/16W 1K	1	
R20	ERJ3GEYJ473V	1/16W 47K	1	
R21	ERJ3GEYJ223V	1/16W 22K	1	
R22	ERJ3GEY0R00V	1/16W 0	1	
R23	ERJ3GEYJ272V	1/16W 2.7K	1	
R24	ERJ3GEYJ473V	1/16W 47K	1	
R25	ERJ3GEYJ104Z	1/16W 100K	1	
R26	ERJ3GEYJ473V	1/16W 47K	1	
R28,29	ERJ3GEYJ473V	1/16W 47K	2	
R30	ERJ3GEYJ102Z	1/16W 1K	1	
R31	ERJ3GEYJ223V	1/16W 22K	1	
R32	ERJ3GEYJ473V	1/16W 47K	1	
R34	ERJ3GEYJ272V	1/16W 2.7K	1	
R35	ERJ3GEYJ183V	1/16W 18K	1	
R36	ERJ3GEYJ273V	1/16W 27K	1	
R37	ERJ3GEYJ333V	1/16W 33K	1	
R38	ERJ3GEYJ223V	1/16W 22K	1	
R42	ERJ3GEYJ102Z	1/16W 1K	1	
R43	ERJ3GEYJ222V	1/16W 2.2K	1	
R44	ERJ3GEYJ223V	1/16W 22K	1	
R45	ERJ3GEYJ333V	1/16W 33K	1	
R46	ERJ3GEYJ222V	1/16W 2.2K	1	
R47	ERJ3GEYJ473V	1/16W 47K	1	
R50	ERJ3GEYJ102Z	1/16W 1K	1	
R55	ERJ3GEYJ332V	1/16W 3.3K	1	
R56	ERJ3GEYJ223V	1/16W 22K	1	
R58	ERJ3GEYJ682V	1/16W 6.8K	1	
R59	ERJ3GEYJ683V	1/16W 68K	1	
R60	ERJ3GEYJ332V	1/16W 3.3K	1	
R61,62	ERJ3GEYJ223V	1/16W 22K	2	
R63	ERJ3GEYJ103Z	1/16W 10K	1	
R64-66	ERJ3GEYJ471V	1/16W 470	3	
R67	ERJ3GEYJ102Z	1/16W 1K	1	
R70	ERJ3GEYJ102Z	1/16W 1K	1	
R71,72	ERJ3GEYJ220V	1/16W 22	2	
R73	ERJ3GEYJ393V	1/16W 39K	1	
R74	ERJ3GEYJ822V	1/16W 8.2K	1	
R75	ERJ3GEYJ223V	1/16W 22K	1	
R76	ERJ3GEYJ100V	1/16W 10	1	
R77	ERJ3GEYJ223V	1/16W 22K	1	
R78-80	ERJ3GEYJ102Z	1/16W 1K	3	
R81	ERJ3GEYJ223V	1/16W 22K	1	
R82	ERJ3GEYJ473V	1/16W 47K	1	
R83	ERJ3GEYJ105V	1/16W 1M	1	
R84	ERJ3GEYJ153V	1/16W 15K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R85	ERJ3GEYJ223V	1/16W 22K	1	
R86,87	ERJ3GEYJ102Z	1/16W 1K	2	
R89,90	ERJ3GEYJ102Z	1/16W 1K	2	
R93	ERJ3GEYJ102Z	1/16W 1K	1	
R95	ERJ3GEYJ222V	1/16W 2.2K	1	
R98,99	ERJ3GEYJ102Z	1/16W 1K	2	
R100	ERJ3GEYJ473V	1/16W 47K	1	
R103	ERJ3GEYJ102Z	1/16W 1K	1	
R104,05	ERJ3GEYJ272V	1/16W 2.7K	2	
R107-10	ERJ3GEYJ102Z	1/16W 1K	4	
R111,12	ERJ3GEYJ221V	1/16W 220	2	
R114,15	ERJ3GEYJ103Z	1/16W 10K	2	
R116,17	ERJ3GEYJ101V	1/16W 100	2	
R118	ERJ3GEYJ102Z	1/16W 1K	1	
R119,20	ERJ3GEYJ101V	1/16W 100	2	
R121,22	ERJ3GEYJ272V	1/16W 2.7K	2	
R123	ERJ3GEYJ102Z	1/16W 1K	1	
R124,25	ERJ3GEYJ473V	1/16W 47K	2	
R130	ERJ3GEYJ272V	1/16W 2.7K	1	
R131	ERJ3GEYJ101V	1/16W 100	1	
R132	ERJ3GEYJ272V	1/16W 2.7K	1	
R134,35	ERJ3GEYJ272V	1/16W 2.7K	2	
R137	ERJ3GEYJ103Z	1/16W 10K	1	
R145,46	ERJ3GEYJ221V	1/16W 220	2	
R147	ERJ3GEYJ102Z	1/16W 1K	1	
R174	ERJ3GEYJ103Z	1/16W 10K	1	
R201	ERQ16NKWR10E	1/6W 0.1	1	
R301,02	ERJ6GEYJ183V	1/10W 18K	2	
R303	ERDS2FJ1R2	1/4W 1.2	1	
R304,05	ERDS2FJ681	1/4W 680	2	
R306	ERD2FCG100	1/4W 10	1	
R307	ERDS2FJ332	1/4W 3.3K	1	
R308	ERDS2FJ221	1/4W 220	1	
R309,10	ERJ6GEYJ103V	1/10W 10K	2	
R311,12	ERD2FCJ4R7	1/4W 4.7	2	
R313,14	ERDS2FJ681	1/4W 680	2	
R315,16	ERDS2FJ271	1/4W 270	2	
R317,18	ERDS2FJ102	1/4W 1K	2	
R319	ERDS2FJ152	1/4W 1.5K	1	
R320	ERDS2FJ101	1/4W 100	1	
R321	ERDS2FJ221	1/4W 220	1	
R322	ERDS2FJ101	1/4W 100	1	
R323,24	ERJ6GEYJ222V	1/10W 2.2K	2	
R325	ERJ6GEYJ103V	1/10W 10K	1	
R326	ERDS2FJ103	1/4W 10K	1	
R327	ERDS2FJ1R2	1/4W 1.2	1	
R328	ERJ6GEYJ102Z	1/10W 1K	1	
R405	ERJ6GEYJ103V	1/10W 10K	1	
R406	ERJ6GEYJ681V	1/10W 680	1	
R407	ERJ6GEYJ102Z	1/10W 1K	1	
R408	ERJ6GEYJ271V	1/10W 270	1	
R409	ERJ6GEYJ681V	1/10W 680	1	
R451	ERDS2FJ102	1/4W 1K	1	
R452	ERJ6GEYJ103V	1/10W 10K	1	
R453	ERJ6GEYJ222V	1/10W 2.2K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R711,12	ERJ6GEYJ561V	1/10W 560	2	
R713,14	ERJ6GEYJ473V	1/10W 47K	2	
R715,16	ERJ6GEYJ472V	1/10W 4.7K	2	
R717,18	ERJ6GEYJ682V	1/10W 6.8K	2	
R719,20	ERJ6GEYJ333V	1/10W 33K	2	
R721,22	ERJ6GEYJ683V	1/10W 68K	2	
R723,24	ERJ6GEYJ154V	1/10W 150K	2	
R725,26	ERJ6GEYJ331V	1/10W 330	2	
R727-30	ERJ6GEYJ151V	1/10W 150	4	
R731-34	ERJ6GEYJ102Z	1/10W 1K	4	
R735,36	ERJ6GEYJ103V	1/10W 10K	2	
R737,38	ERJ6GEYJ123V	1/10W 12K	2	
R741,42	ERJ6GEYJ273V	1/10W 27K	2	
R743-46	ERJ6GEYJ104V	1/10W 100K	4	
R749,50	ERJ6GEYJ331V	1/10W 330	2	
R751,52	ERJ6GEYJ563V	1/10W 56K	2	
R753,54	ERJ6GEYJ103V	1/10W 10K	2	
R755,56	ERJ6GEYJ104V	1/10W 100K	2	
R757,58	ERJ6GEYJ102Z	1/10W 1K	2	
R771-73	ERJ6GEYJ102Z	1/10W 1K	3	
R902	ERJ6GEYJ103V	1/10W 10K	1	
R903-05	ERJ6GEYJ104V	1/10W 100K	3	
R906	ERJ6GEYJ472V	1/10W 4.7K	1	
R907	ERJ6GEYJ222V	1/10W 2.2K	1	
R908	ERJ6GEYJ332V	1/10W 3.3K	1	
R909	ERJ6GEYJ472V	1/10W 4.7K	1	
R910,11	ERJ6GEYJ181V	1/19W 180	2	
R913	ERJ6GEYJ821V	1/10W 820	1	
R914	ERJ6GEYJ102Z	1/10W 1K	1	
R915	ERJ6GEYJ122V	1/10W 1.2K	1	
R916	ERJ6GEYJ152V	1/10W 1.5K	1	
R917	ERJ6GEYJ182V	1/10W 1.8K	1	
R918	ERJ6GEYJ821V	1/10W 820	1	
R919	ERJ6GEYJ102Z	1/10W 1K	1	
R920	ERJ6GEYJ122V	1/10W 1.2K	1	
R921	ERJ6GEYJ152V	1/10W 1.5K	1	
R922	ERJ6GEYJ182V	1/10W 1.8K	1	
R923	ERJ6GEYJ222V	1/10W 2.2K	1	
R925	ERJ6GEYJ332V	1/10W 3.3K	1	
R928,29	ERJ6GEYJ103V	1/10W 10K	2	
R932	ERJ6GEYJ104V	1/10W 100K	1	
R933	ERJ6GEYJ101V	1/10W 100	1	
R934	ERJ6GEYJ562V	1/10W 5.6K	1	
R938	ERJ6GEYJ471V	1/10W 470	1	
R941-49	ERJ6GEYJ103V	1/10W 10K	9	
R950	ERJ6GEYJ271V	1/10W 270	1	
RJ1,2	ERJ6GEY0R00	1/10W 0	2	
RJ5-9	ERJ6GEY0R00	1/10W 0	5	
RJ31	ERJ6GEY0R00	1/10W 0	1	
RJ91-102	ERJ6GEY0R00	1/10W 0	12	
S1,2	RSH1A91ZA-A	SW PROTECT/REFLECT	2	
S3	RSH1A044-1A	SW.LOAD OPEN	1	
S4	RSH1A91ZA-A	SW DISC IN	1	
S5,6	RSH1A044-1A	SW LOAD PLAY/REC	2	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
S7	RSH1A045-A	SW LOAD TRG	1	
S8	RSP1A023-A	SW,TV	1	
S901-15	EVQ21405R	SW PUSH	15	
T201	RTP1K4B034-V	POWER TRANSFORMER	1	[MAVD] 
TH1	RRSP33J103CW	THERMISTOR	1	
VR1	EVM3YSX50B14	VR LASER POWER ADJ.	1	
VR901	RRV11B152A-A	VR ENCODER	1	
X1	RSXY10M0M02T	OSCILLATOR	1	
X2	RSXC16M9S03T	OSCILLATOR	1	
X901	EF0MC1005L4	CERALOCK ELEMENT	1	[MAVD]
Z901	RCDGP1U26XD	REMOTE SENSOR	1	
Z902	EXBZ12E104J	COMPONENT COMBINATION	1	
Z903	EXBZ8E104J	COMPONENT COMBINATION	1	

18. Cabinet Parts Location



19. MD Mechanism Parts Location



20. Packaging



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(For United Kingdom)

("EB" area code model only)

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.

A 5-ampere fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362.

Check for the ASTA mark  or the BSI mark  on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local dealer.

CAUTION!

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.

THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt please consult a qualified electrician.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Blue: Neutral, Brown: Live.

As these colours may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured Blue must be connected to the terminal which is marked with the letter N or coloured Black or Blue.

The wire which is coloured Brown must be connected to the terminal which is marked with the letter L or coloured Brown or Red.

WARNING: DO NOT CONNECT EITHER WIRE TO THE EARTH TERMINAL WHICH IS MARKED WITH THE LETTER E, BY THE EARTH SYMBOL \perp OR COLOURED GREEN OR GREEN/YELLOW.

THIS PLUG IS NOT WATERPROOF & KEEP DRY.

Before use

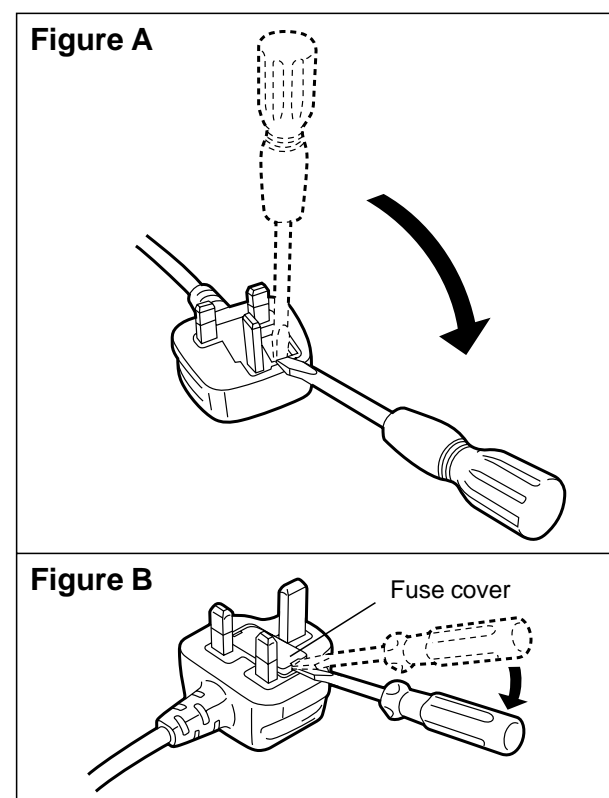
Remove the connector cover.

How to replace the fuse

The location of the fuse differ according to the type of AC mains plug (figures A and B). Confirm the AC mains plug fitted and follow the instructions below.

Illustrations may differ from actual AC mains plug.

1. Open the fuse cover with a screwdriver.



2. Replace the fuse and close or attach the fuse cover.

