

DVD PLAYER DVD-C996 DV-C6280

SERVICE MANUAL

IMPORTANT NOTICE

This manual has been provided for the use of authorized YAMAHA Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically YAMAHA Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components, and failure of the product to perform as specified. For these reasons, we advise all YAMAHA product owners that any service required should be performed by an authorized YAMAHA Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of YAMAHA are continually striving to improve YAMAHA products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and part replacement. Recheck all work before you apply power to the unit.

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This Service Manual uses recycled paper.



■ TO SERVICE PERSONNEL

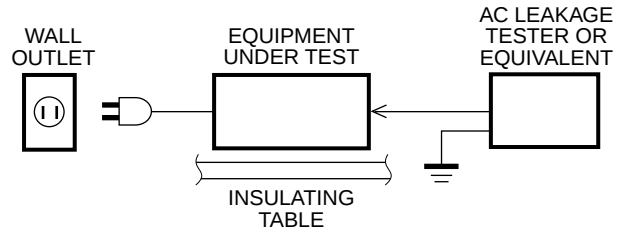
1. Critical Components Information

Components having special characteristics are marked  and must be replaced with parts having specifications equal to those originally installed.

2. Leakage Current Measurement (For 120V Models Only)

When service has been completed, it is imperative to verify that all exposed conductive surfaces are properly insulated from supply circuits.

- Meter impedance should be equivalent to 1500 ohm shunted by 0.15 μ F.



- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in both polarities.

WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and/or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHATSOEVER!

Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

WARNING: Laser Safety

This product contains a laser beam component. This component may emit invisible, as well as visible radiation, which may cause eye damage. To protect your eyes and skin from laser radiation, the following precautions must be used during servicing of the unit.

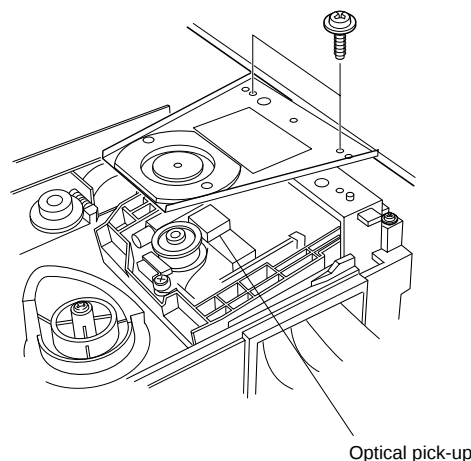
- 1) When testing and/or repairing any component within the product, keep your eyes and skin more than 30 cm away from the laser pick-up unit at all times. Do not stare at the laser beam at any time.
- 2) Do not attempt readjustment, disassembly or repair of the laser pick-up, unless noted elsewhere in this manual.
- 3) CAUTION : Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Laser Emitting conditions:

- 1) When the Top Cover is removed, and the POWER SW is turned to the "ON" position, the laser component will emit a beam for several seconds to detect if a disc is present. During this time (5-10 sec.) the laser may radiate through the lens of the laser pick-up unit. Do not attempt any servicing during this period!
If no disc is detected, the laser will stop emitting the beam. When a disc is set, you will not be exposed to any laser emissions.
- 2) The laser power level can be adjusted with the VR on the pick-up PWB, however, this level has been set by the factory prior to shipping from the factory. Do not adjust this laser level control unless instruction is provided elsewhere in this manual. Adjustment of this control can increase the laser emission level from the device.

Laser Diode Properties

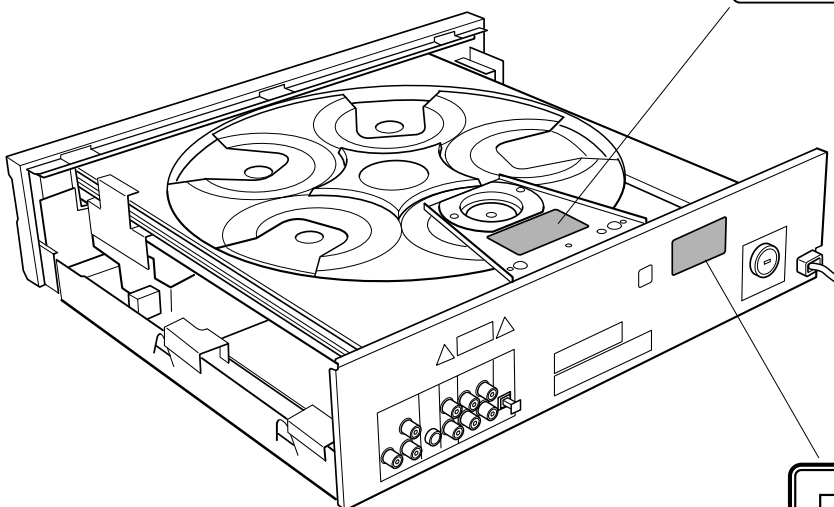
Wave length : 665 nm
 Laser power : CLASS II
 Laser output : Max. 1.0mW (Continuous)
 Output value determined by 21 CFR CHAPTER1,
 SUBCHAPTER J



VARO! : AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASER-SÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

VARNING! : OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

CAUTION	- VISIBLE AND / OR INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
VARNING	- SYNLIG OCH / ELLER OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. STRÅLEN ÄR FARLIG.
VARO !	AVATTAESSA OLET ALTTIINA NÄKYVÄLLE JA / TAI NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING	- SYNLIG OCH / ELLER OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. BETRAKTA EJ STRÅLEN.
VORSICHT !	SICHTBARE UND / ODER UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.



A, B, G, R models

CLASS 1 LASER PRODUCT
 LASER KLASSE 1 PRODUKT
 LUOKAN 1 LASERLAITE
 KLASSE 1 LASER APPARAT

■ PREVENTION OF ELECTRO STATIC DISCHARGE (ESD) TO ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electro static discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
 2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
 3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
 4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static (ESD protected)" can generate electrical charge sufficient to damage ES devices.
 5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
 6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
 7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
- CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

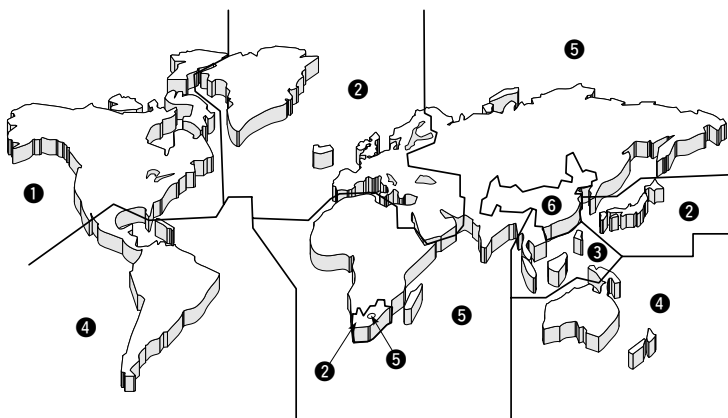
IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked $\triangle$ by in the schematic diagrams, exploded views and replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

LOCALE MANAGEMENT INFORMATION

Locale Management Information : This DVD player is designed and manufactured to respond to the Locale Management Information that is recorded on a DVD disc. If the Locale number described on the DVD disc does not correspond to the Locale number of this DVD player, this DVD player cannot play this disc.

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.



■ PRECAUTION, LASER DIODE

CAUTION:

This unit utilizes a class II laser. Visible laser radiation is emitted from the optical pickup lens when the unit is turned on:

1. Do not look directly into the pickup lens.
2. Do not use optical instruments to look at the pickup lens.
3. Do not adjust the preset variable resistor on the optical pickup.
4. Do not disassemble the optical pickup unit.
5. If the optical pickup is replaced, use the manufactures specified replacement pickup only.
6. Use of control or adjustment or performance of procedures other than those specified herein may result in hazardous radiation exposure.

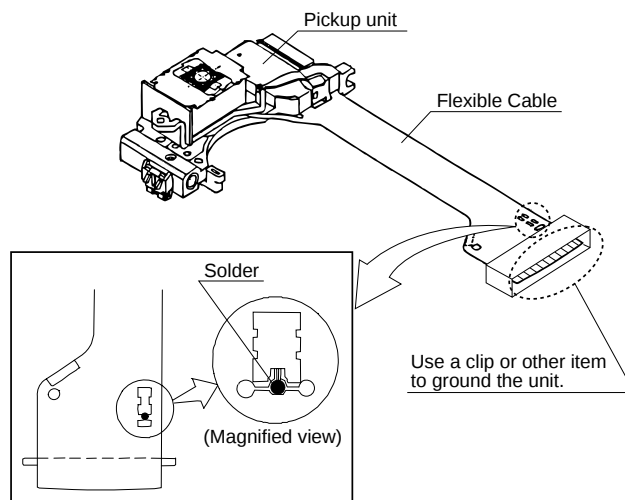
■ HANDLING PRECAUTIONS FOR TRAVERSE DECK

The laser diode in the 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 optical pickup.

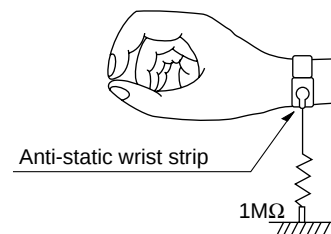
Handling of optical pickup

1. Do not subject the optical pickup to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an antistatic shorting bridge is soldered into the flexible board (FPC Board).
When removing or connecting the shorting bridge, finish the job in as short times as possible.
3. Be careful not to apply excessive stress to the flexible board (FPC Board).
4. Do not turn the variable resistor (Laser power adjustment). It has already been adjusted.



Grounding for electrostatic breakdown prevention

1. Human body grounding.
Use the antistatic wrist strap to discharge the static electricity from your body.
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:

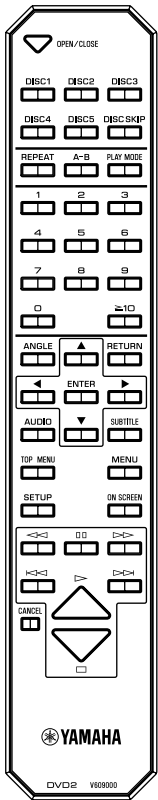
The static electricity of your clothes will not be grounded through the wrist strap. So take care not to let your clothes touch the optical pickup.

FRONT PANELS

DVD-C996



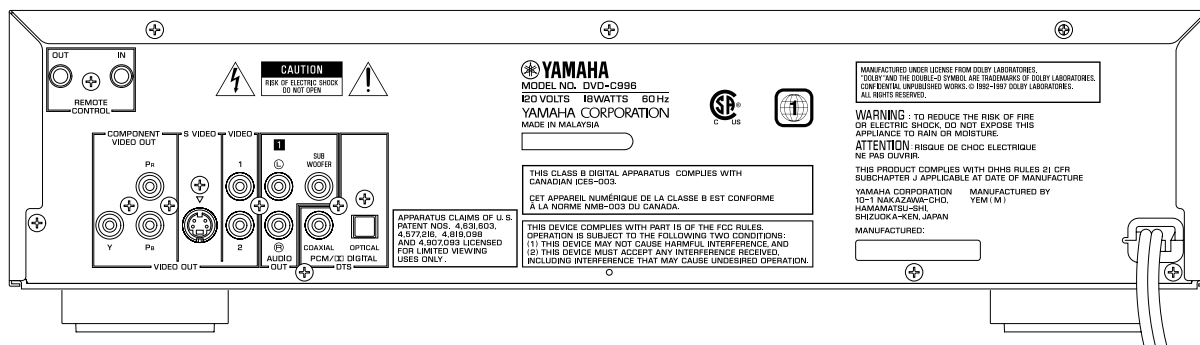
DV-C6280



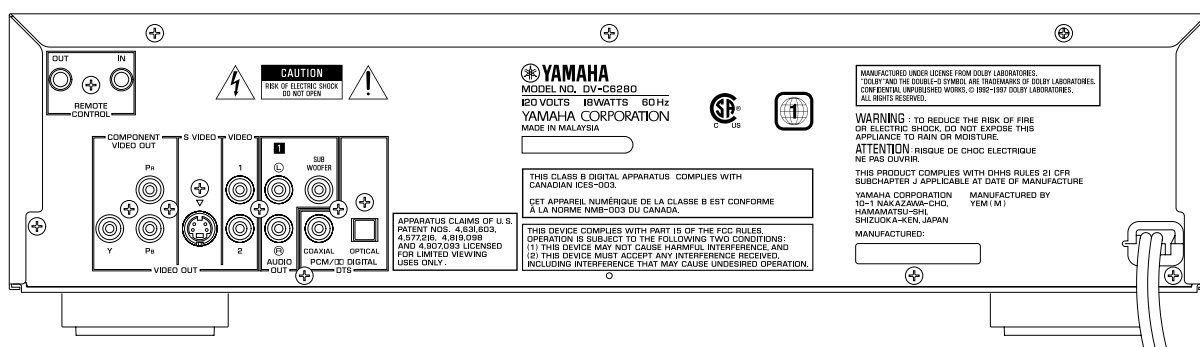
DVD-C996
DV-C6280

REAR PANELS

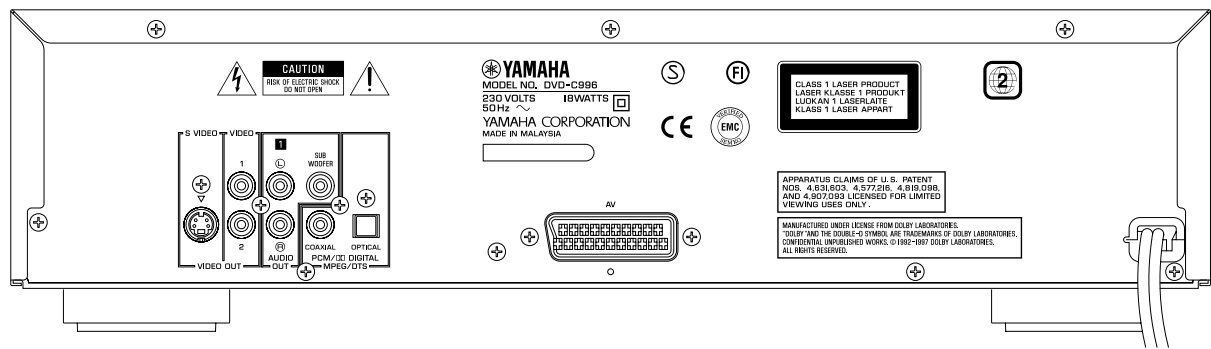
▼ DVD-C996 U, C models



▼ DV-C6280 U model



▼ DVD-C996 B, G models



■ SPECIFICATIONS

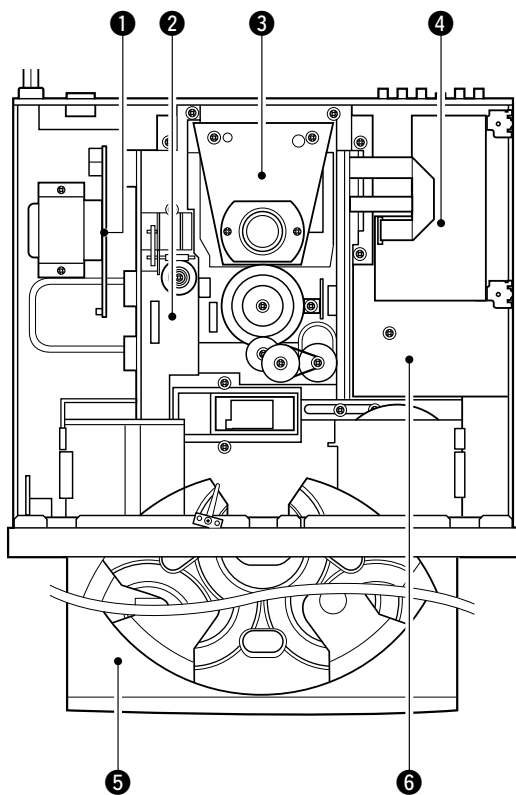
■ AUDIO SECTION

Frequency Response	
DVD (48kHz Sampling)	2 Hz to 22 kHz
DVD (96kHz Sampling)	2 Hz to 44 kHz
CD, Video CD	2 Hz to 20 kHz
Harmonic Distortion+Noise (1kHz)	0.002%
S/N Ratio	115 dB (Weighted)
Dynamic Range	
DVD (48kHz, 24 bit)	103 dB
CD, Video CD	99 dB
Output Voltage (1 kHz, 0 dB)	2.0 V

■ VIDEO SECTION

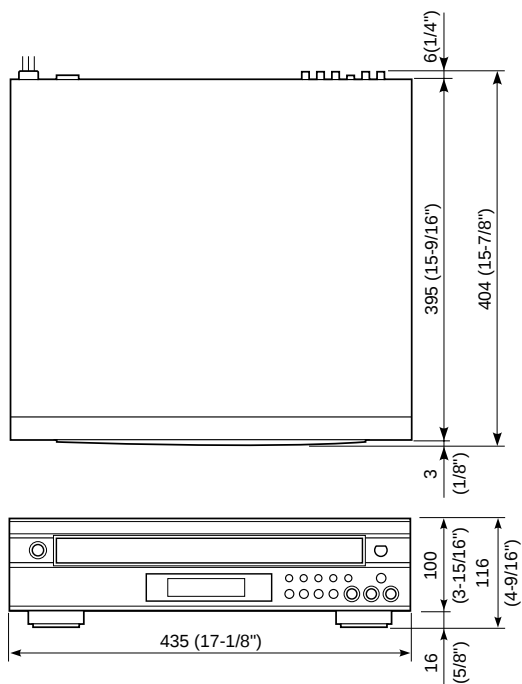
VIDEO output	1 Vp-p (75 ohms)
S VIDEO output	

INTERNAL VIEW



- ① MAIN (3) P.C.B.
- ② CM-220 UNIT
- ③ CLAMPER ASS'Y
- ④ DVD MODULE P.C.B.
- ⑤ TRAY ASS'Y
- ⑥ MAIN (1) P.C.B.

DIMENSION



Unit : mm (inch)

■ OPTICAL PICKUP SELF-DIAGNOSIS AND REPLACEMENT PROCEDURE

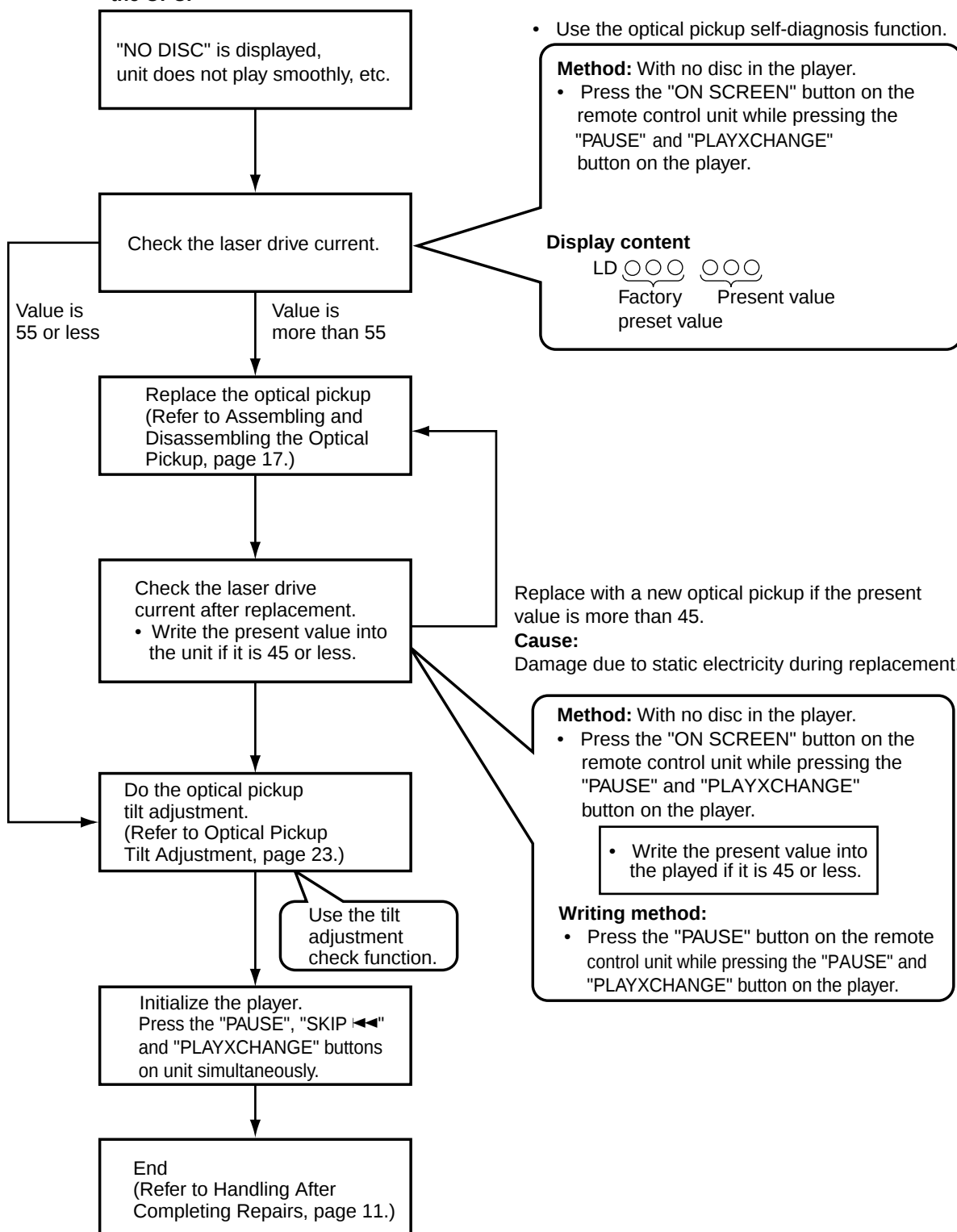
The optical pickup self-diagnosis function and tilt adjustment check function have been newly added to this player. When repairing, use the following procedure for effective Self-diagnosis and tilt adjustment.

Be sure to use the self-diagnosis function before replacing the optical pickup when "NO DISC" is displayed. As a guideline, you should replace the optical pickup when the value of the laser drive current is more than 55.

Note

Press the power button to turn on the power, and check the value before the unit warms up (within three minutes).

- Use the self diagnosis function below when "NO DISC" is displayed or unit doesn't read a disc, before replacing the OPU.



■ SELF-DIAGNOSIS FUNCTION AND SERVICE MODES

1. Service Mode Table

The service mode can be activated by pressing various button combinations on the player and remote control unit.

Player buttons	Remote control unit button	Application	Note
PAUSE + PLAYXCHANGE	0	Displaying the UHF display F _ _ _	Refer to Self-Diagnosis Function (UHF Display), in page 10.
	5	Tilt adjustment and jitter check	Refer to Optical Pickup Tilt Adjustment, in page 23.
	6	Checking the region numbers and broadcast system	
	7	Checking the program version	Check the IC6302 FLASH ROM program.
	9	Lighting Confirmation Function of Display Tube	
	ON SCREEN	Checking the laser drive current	Refer to Optical Pickup Self-Diagnosis and Replacement, in page 9.
	PAUSE	Writing the laser drive current value after replacing the optical pickup (do not use for anything other than optical pickup replacement)	Procedure.
PAUSE SKIP ◀◀ PLAYXCHANGE	—	Initializing the DVD player (restoring factory preset settings) Use when replacing a microprocessor, microprocessor peripheral parts, or P.C.B.	Refer to Initializing the DVD Player, in page 11.

2. Self-Diagnosis Function (UHF Display)

This unit incorporates a convenient self-diagnosis function for use in troubleshooting.

Display method	Display	Diagnosis	Checkpoints
Service numbers displayed during use.	U11	Focus error	IC2001, IC2511, IC5201, pickup
	H01	Tray loading error	
	H02	Spindle servo error	
	H03	Traverse error	
	H04	Tracking servo error	
	H05	Seek error	
	H06	Power supply error	
Press the "0" button on the remote control unit while pressing the "PAUSE" and "PLAYXCHANGE" button on the player.	F0**	Disc format error	If this type of error occurs, refer to Examples of Repairs Using Error Codes, in page 11.
	F1**	Disc code error	

3. Examples of Repairs Using Error Code

Refer to this section when carrying out repairs.

Error display	Malfunction example
F0**	Disc, IC7001
F103	Disc, IC7001
F4FF	IC351
F500	Optical pickup, IC2001, IC5201, IC2511, IC2501
F501	IC2001, IC6201
F502	IC2501, IC2511, IC2001, IC5201
F504	IC5201, IC2001
F505	Disc, IC2501, IC2511, IC5201, IC2001
F506	Disc, Optical pickup, IC2001
F600	Disc, IC7001, IC5201, IC2001
F601	Disc, IC7001
F602	Disc, IC5201, IC2001
F603	Disc, IC5201, IC2001
F610	IC7001
F611	IC7001, IC5201, IC2001
F612	IC7001, IC5201, IC2001
F620	Laser drive circuit
F621	Laser drive circuit
F700	IC6201
F701	IC6201
F702	IC6201
F880	IC6201
F890	IC6201
F891	IC6201
F8A0	IC6201
F893	IC6302
F894	IC6303

■ SERVICE PRECAUTIONS

1. Initializing the DVD Player

Initialize the DVD player whenever you replace a microprocessor, microprocessor peripheral parts, module P.C.B. or main P.C.B.

1-1. Precautions

The customer settings will return to factory preset settings when the player is initialized. Make a note of the settings and reset them after initializing.

- When resetting, see the Initial Setting in the Operating Instructions.

1-2. Initialization Method

The player

■ SERVICE TOOLS AND EQUIPMENT

1. Service Tools and Equipment Table

Application	Name	Number
General	DVD test disc	DVDT-S15 (AAX07320) or DVDT-S01 (TX946080)
Tilt adjustment	Hex wrench	JZS0100 (TX946380) , 1.2mm
Inspection	Extension cable (module P.C.B. to main P.C.B.)	JGS0116 (AAX16610)
	Extension cable (module P.C.B. to main P.C.B.)	VUC8026 (AAX16590)
Others	Screw lock	RZZ0L01 (TX946400)
	Grease	JGS0091 (TX946260) JGS0092 (TX946270)
	Lubricant	JZS0648 (TX946410)
	Grease	JGS0101 (TX946390)
Confirmation	CD test disc	PVCD_K06 (TX946090)
	VCD test disc	PVCD_K06 (TX946090)
Electrical adjustment	Oscilloscope	
	Probe	
	AV cable	VJA0658 (MX605190)
	TV monitor	
General	General tools (Screwdriver, etc.)	
Static electricity countermeasures	Soldering iron (with ESD countermeasure)	
	Anti-static wrist strap	
	Conductive material (conductive sheet)	

2. Storing and Handling Test Discs

Surface precision is vital for DVD test discs. Be sure to store and handle them carefully.

1. Do not place discs directly onto the workbench, etc., after use.
2. Handle discs carefully in order to maintain their flatness.
Place them into their case after use and store them vertically. Store discs in a cool place where they are not exposed to direct sunlight or air from air conditioners.
3. Accurate adjustment will not be possible if the disc is warped from being placed on a surface made of glass, etc. If this happens, use a new test disc to make optical adjustments.
4. If adjustment is done using a warped disc, the adjustment will be incorrect and some discs will not be playable.

■ DISASSEMBLY PROCEDURES (Remove parts in the order as numbered.)

1. Removal of Top Cover

- a. Remove 4 screws (①) and also 3 screws (②) in Fig. 1.

2. Removal of Tray Ass'y

- a. Remove 1 screw (③) in Fig. 1.
b. Turn Gear/L0 as shown in Fig. 2 counter clockwise gradually till immediately before the tray starts to move and stop it there.

CAUTION: Gear/L0, if turned counter clockwise continuously, will mesh with the gear of the tray and the tray will come out. When removing the tray, use care so that Gear/L0 will not mesh with the gear of the tray.

- c. Pull out the Tray Ass'y.

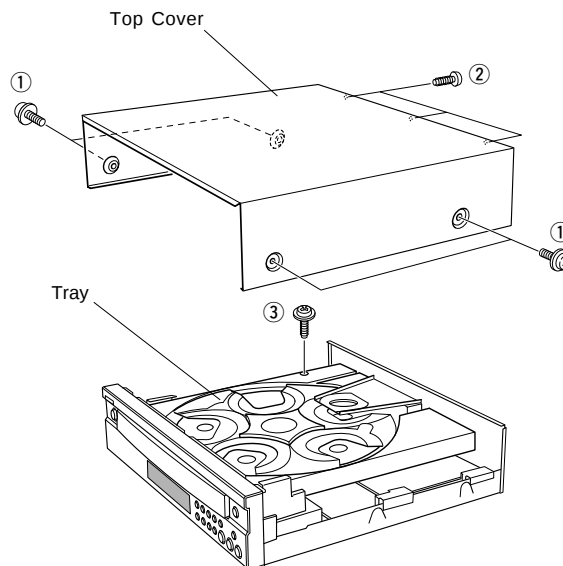


Fig. 1

● Precaution for installation of the Tray Ass'y.

On Tray Ass'y setting.

Check the Direction of marking "▲" on gear according to this drawing.

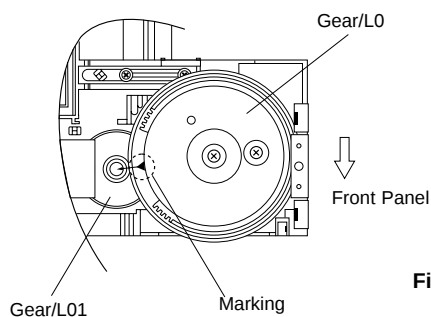


Fig. A

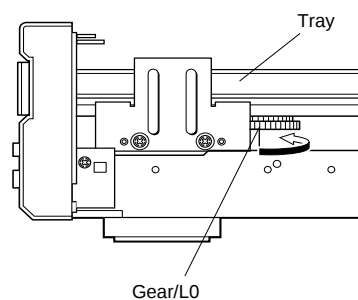
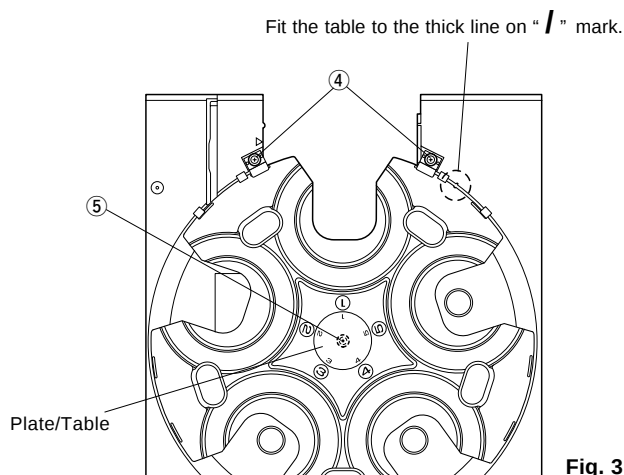


Fig. 2

3. Removal of Table

- a. Remove 2 screws (④) and then remove the Roller Ass'y in Fig. 3.
b. Remove the Plate/Table in Fig. 3.
c. Remove 1 screw (⑤) and then take off the Table in Fig. 3.



4. Removal of CM-220 Unit

- Remove 5 screws (⑥) in Fig. 4.
- Disconnect 2 flexible cables (#501, #503) on the Module P.C.B.

CAUTION

The flexible cable #501 is used to connect the traverse unit (laser pickup). Its terminal must not be touched. (The laser pickup is easily damaged.)

- Disconnect 1 flexible cable (#201) on the Main P.C.B.
- Take the CM-220 Unit out slowly.

5. Removal of Module P.C.B.

- Remove screw (⑦) and then remove the Main (6) P.C.B. in Fig. 5.
- Remove 4 screws (⑧) and then remove the Support P.C.B. in Fig. 4.
- Release 2 hooks (⑨) in Fig. 4.
- Pull out the Module P.C.B. vertically in Fig. 4.

Note

There is a danger of damaging the connectors.

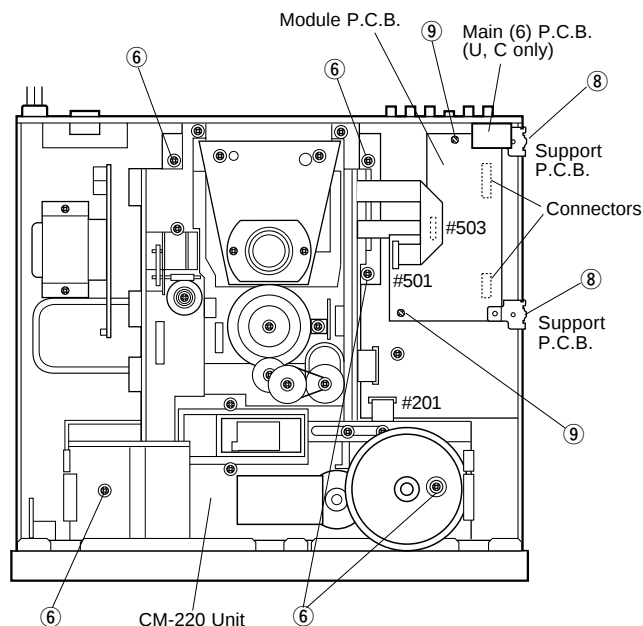


Fig. 4

6. Removal of Main (1) P.C.B.

- Remove 6 screws (⑩) in Fig. 5.
- Remove 4 screws (⑪) in Fig. 6.
- Pull out the Main (1) P.C.B.

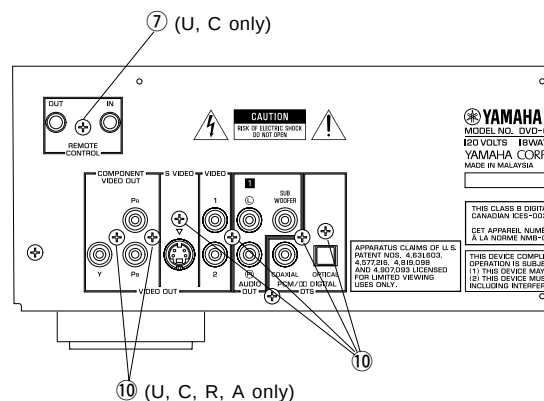
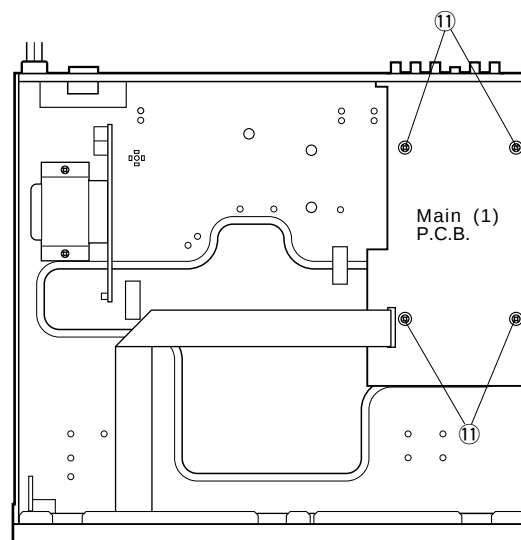


Fig. 5



7. Removal of Clamper Ass'y

Remove 2 screws (⑫) in Fig. 7.

8. Removal of PU Ass'y

- Remove 2 screws (⑬) in Fig. 7.
- Take the PU Ass'y out slowly.

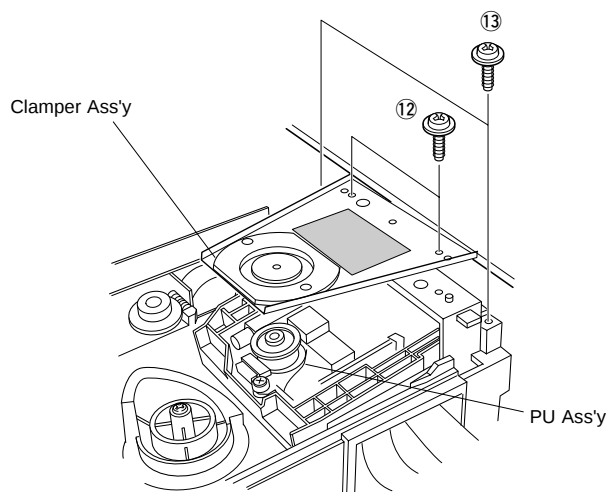


Fig. 7

9. Removal of Traverse Unit

- Remove 3 screws (⑭) in Fig. 8.

Note: Be sure to take static electricity countermeasures before disconnecting the flexible cable. (Refer to page 18, Static Electricity Countermeasures.)

- Disconnect 2 flexible cables (#502, #503)

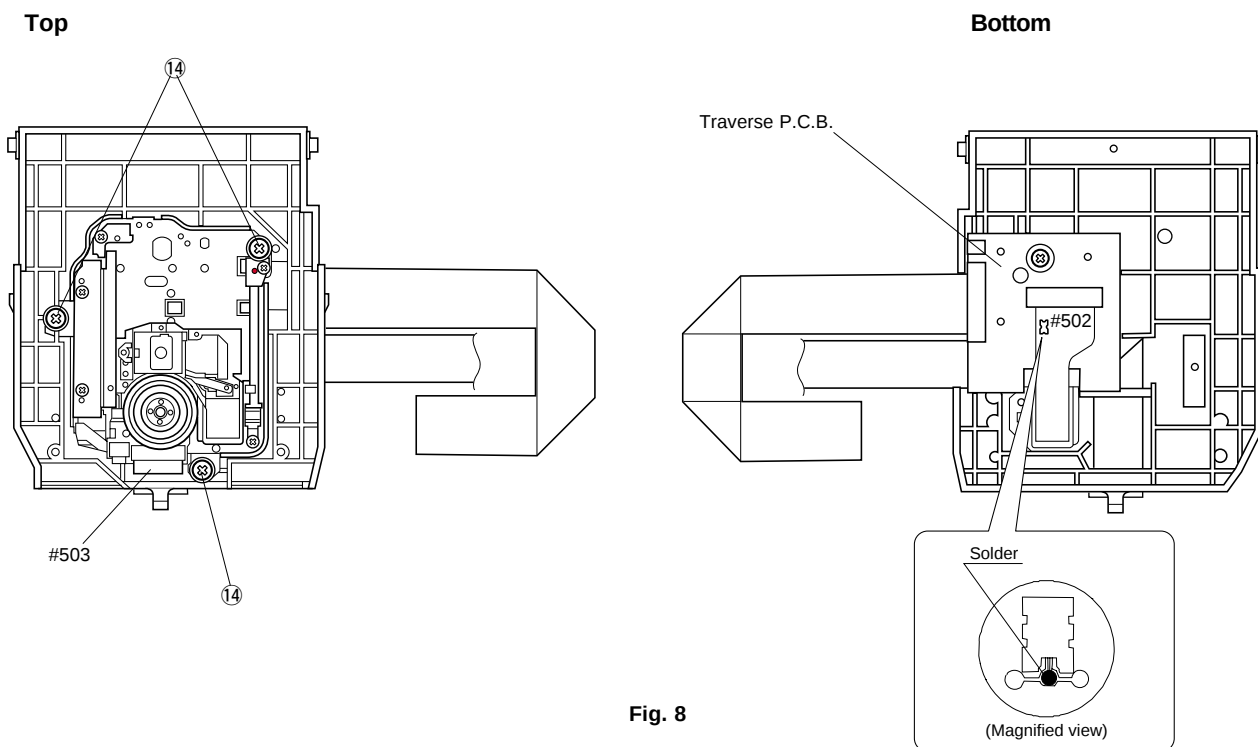


Fig. 8

● Service Position

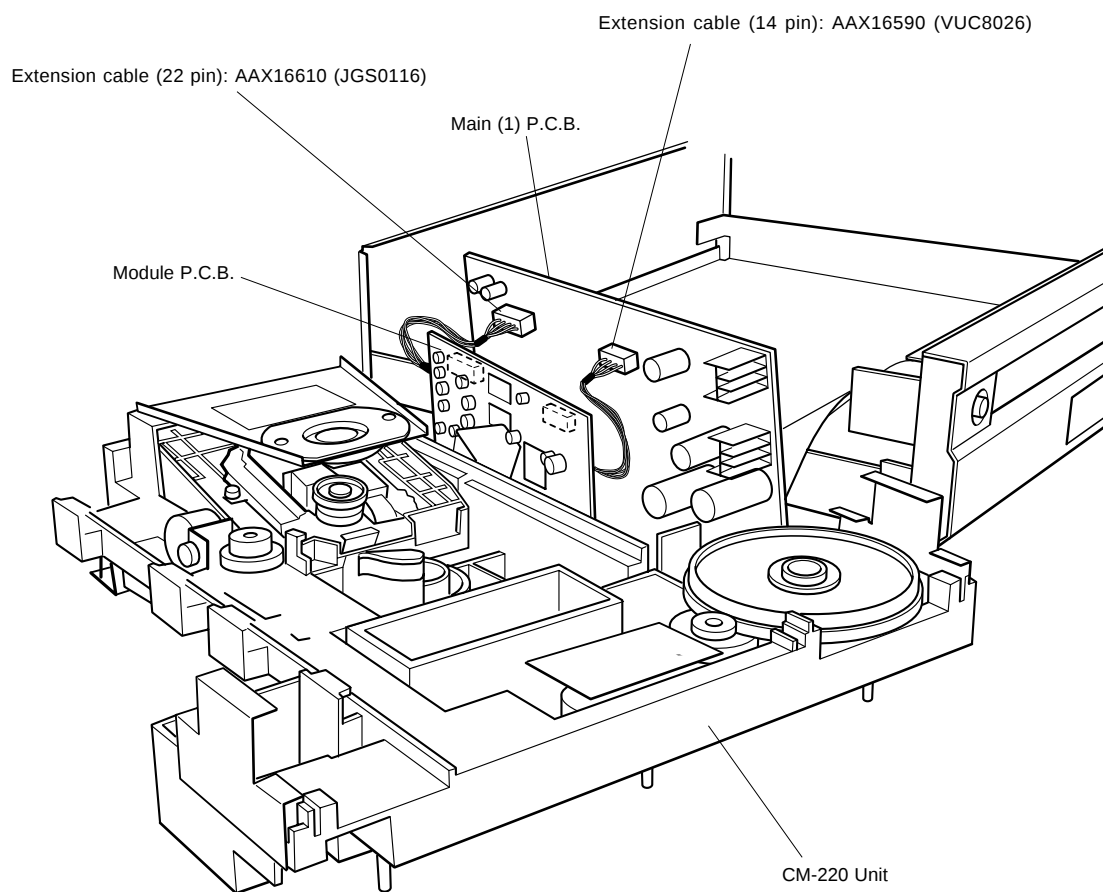
Checked by connecting the Module P.C.B. and the Main P.C.B. with the extension cables.

Extension cable (14 pin): AAX16590 (VUC8026)

Extension cable (22 pin): AAX16610 (JGS0116)

CAUTION

- As the grounding becomes loose when the Main P.C.B. is removed from the chassis, ground the board to the chassis.
- Do not allow anything like cloth (insulating material) to enter and contact between the Module P.C.B. and the Main P.C.B.



■ ASSEMBLING AND DISASSEMBLING THE OPTICAL PICKUP (MECHANICAL PARTS)

The optical pickup can be damaged by static electricity from your body. Be sure to take static electricity countermeasures when working around the optical pickup.

1. Handling the Optical Pickup

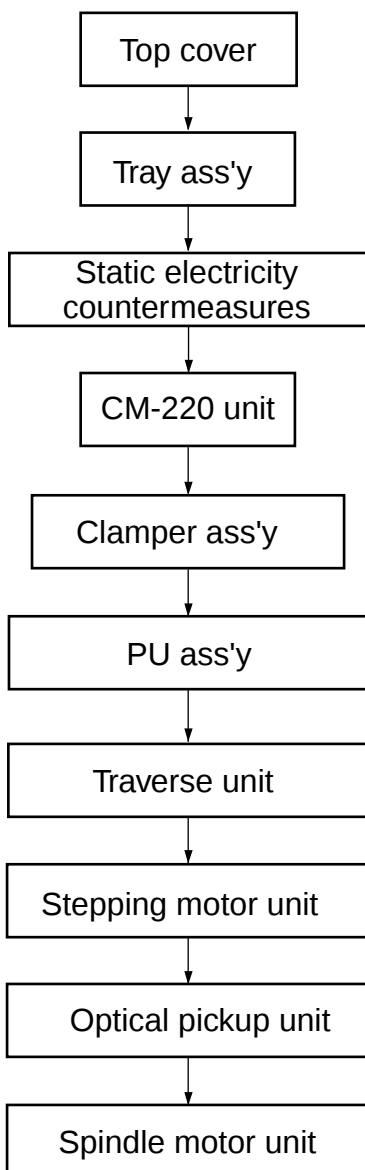
The optical pickup can be damaged by static electricity from your body. Be sure to take static electricity countermeasures when working around the optical pickup.

1. The optical pickup is an extremely high-precision mechanism. Do not subject it to strong impact.
2. To preserve the quality of the optical pickup replacement parts during transport and installation, the terminals of the laser diode are short-circuited. After replacing the parts, use the proper procedure to return the laser diode to its original condition. (Refer to page 22, Assembling the Optical Pickup.)
3. Testers cannot be used to check the laser diode of the optical pickup. The power supply inside the tester can easily damage the laser diode.
4. Take care when handling the flexible cable because excessive force can cause it to break.
5. You cannot adjust the semifixed resistor for laser power adjustment. Do not turn it.

2. Disassembly Procedure

Use the following procedure to replace major parts.

For the assembly procedure, follow the flow chart in reverse.

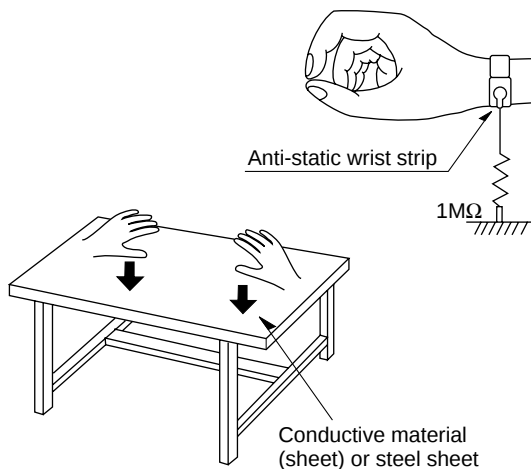


3. Static Electricity Countermeasures

The laser diode inside the traverse unit (optical pickup) can be damaged by static electricity from your body. Be sure to take static electricity countermeasures when working around the optical pickup.

3-1. Static Electricity Countermeasure Methods

1. Ground yourself
Use an anti-static wrist strap to discharge static electricity from your body.
2. Ground the workbench
Lay a conductive material (sheet) or steel sheet on the surface where the traverse unit (optical pickup) is to be placed, then ground the sheet.

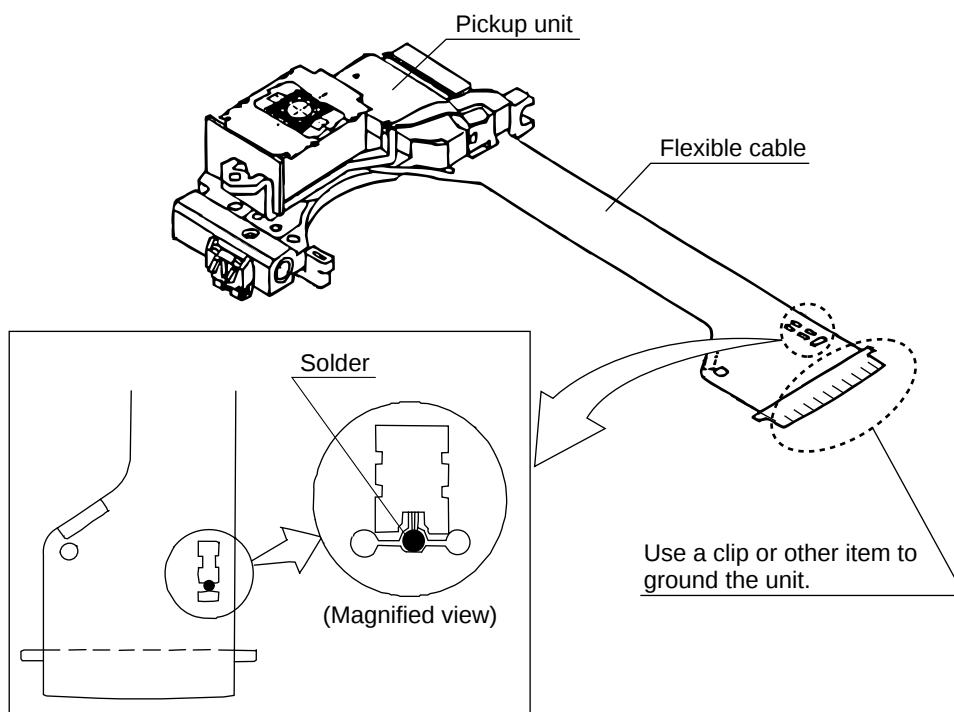


3-2. Short-circuit the laser diode

Solder the land in the flexible cable of the optical pickup.

Notes

- Be sure to do this before disconnecting the flexible cable of the optical pickup from the traverse P.C.B.
- Use an anti-static soldering iron to short-circuit and unshort-circuit laser diode.
(Recommended soldering iron: Hakko with ESD countermeasure)
- After you have finished repairing the laser diode, follow the correct procedure to remove the solder from the short-circuit location.

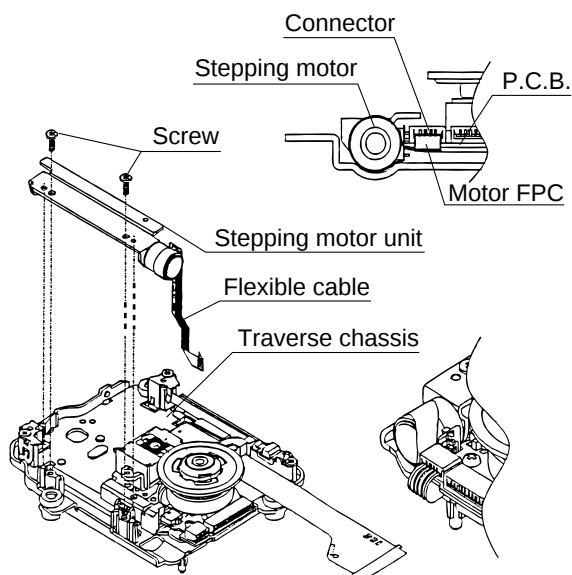


4. Disassembling the Stepping Motor Unit

1. Disconnect the flexible cable.
2. Remove the 2 screws.

Note

Take care when handling the flexible cable because it can be broken by excessive force.



5. Disassembling the Optical Pickup Unit

1. Remove the screw.
2. Release the tab, then remove spring holder 1.

Note

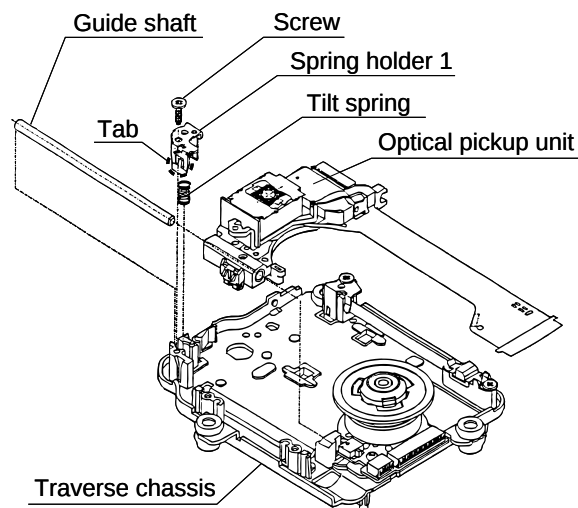
Be sure not to lose the spring.

3. Remove the guide shaft.

Note

Be sure to adjust the optical pickup tilt after replacing the optical pickup.

(Refer to page 23, Optical Pickup Tilt Adjustment.)

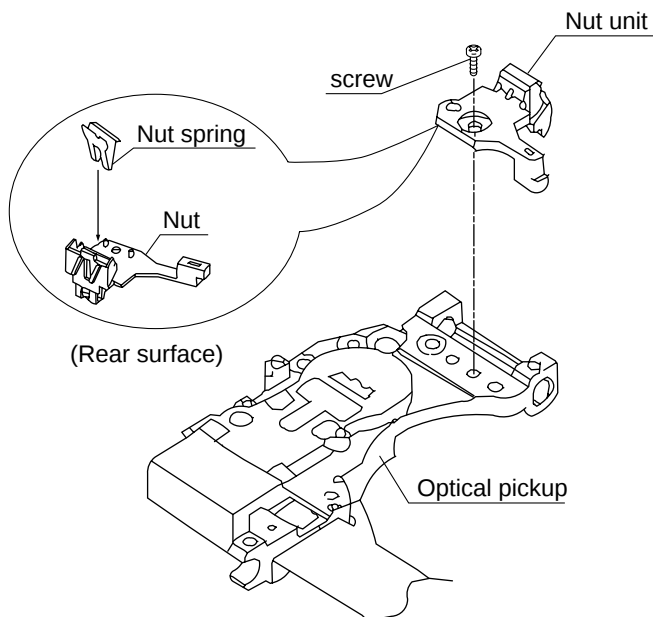


6. Disassembling the Nut Unit

Remove the screw.

Notes

- The nut unit is not part of the optical pickup.
- Before replacing the optical pickup, remove the nut unit for use with the new optical pickup.
- After installation, use screw lock to lock the screw in position.

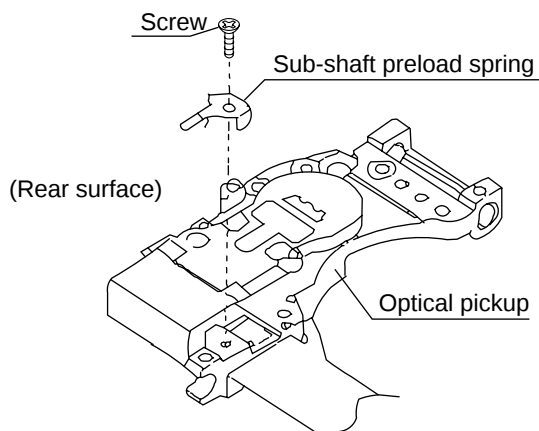


7. Disassembling the Sub-Shaft Preload Spring

Remove the screw.

Notes

- Handle the sub-shaft preload spring carefully because the shape of the tip is easily deformed.
- The sub-shaft preload spring is not part of the optical pickup. Before replacing the optical pickup, remove the sub-shaft preload spring for use with the new optical pickup.
- After installation, use screw lock to lock the screw in position.

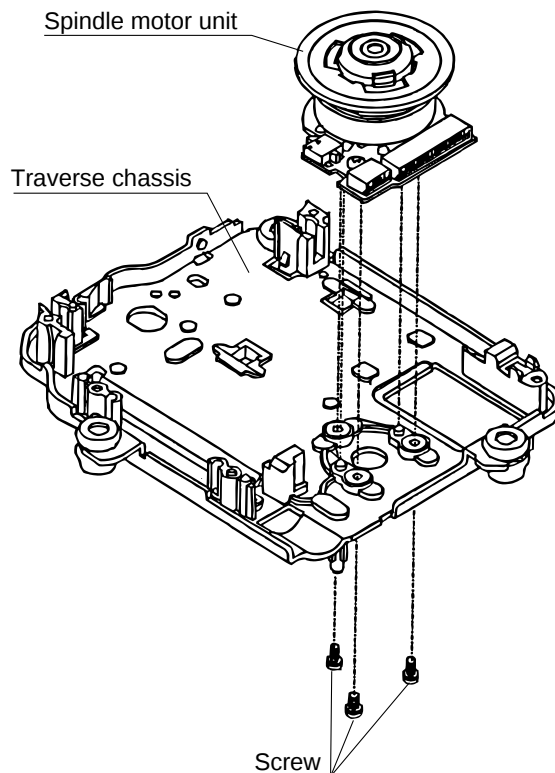


8. Disassembling the Spindle Motor Unit

Remove the three screws.

Note

Be sure to adjust the optical pickup tilt after replacing the spindle motor unit.

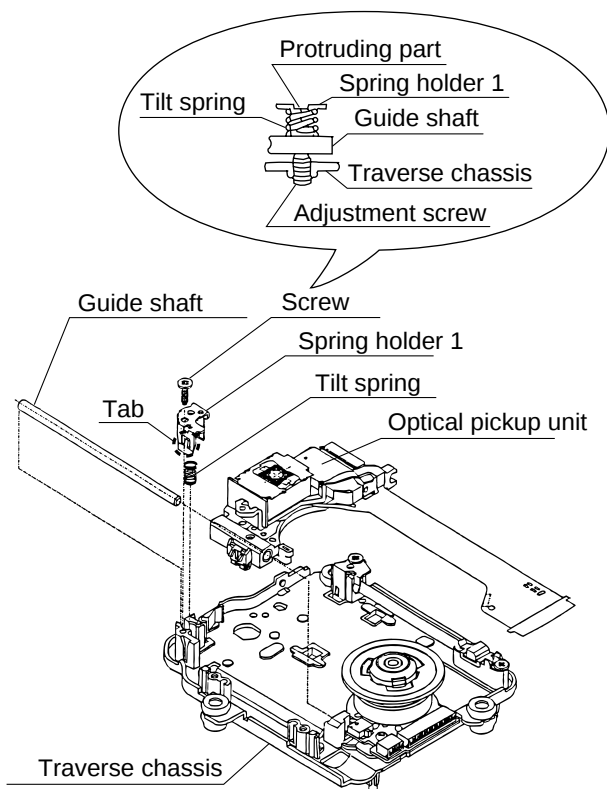


9. Assembling the Optical Pickup

1. Install the optical pickup.

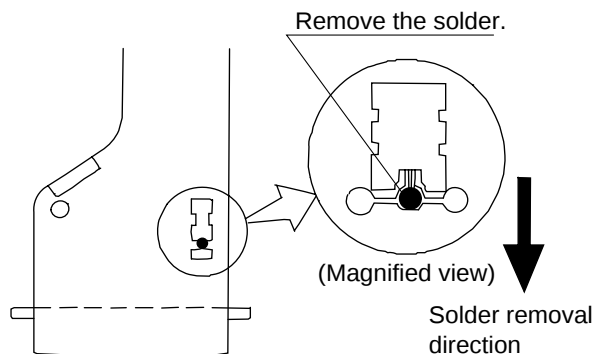
Note

Take care not to attach the tilt spring and guide shaft in the wrong order.



2. Insert the pickup FPC into connector CB502 on the traverse P.C.B.

3. Remove the protective solder-bridge from the pickup.

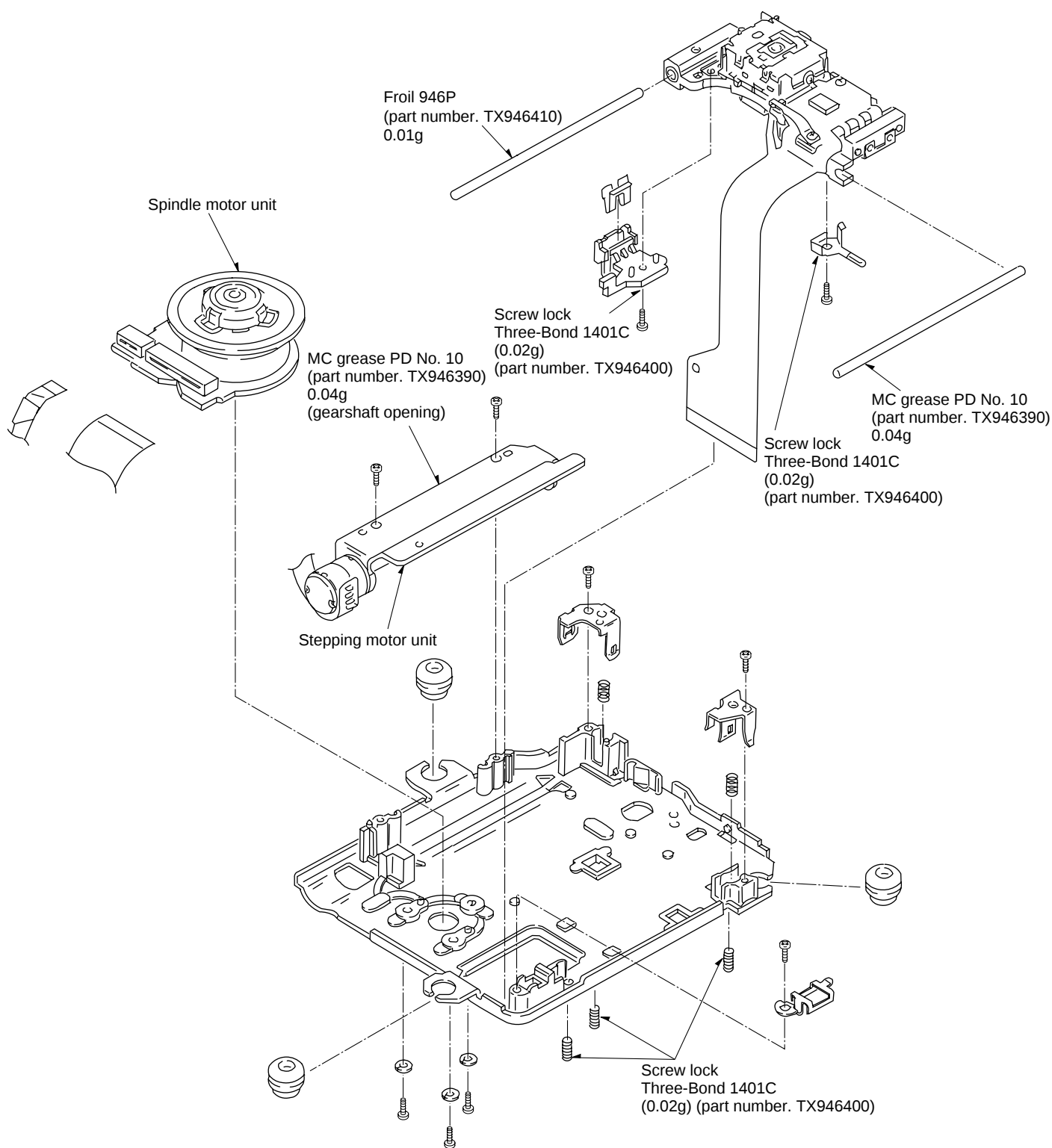


Open the circuit after short-circuiting it.

4. If installing a new pickup, write the new head current into memory as shown on page 9.
Do this first after turning on the unit with NO disc and while the unit is cold (within the first 3 minutes of power ON), or the jitter reading will not be accurate for the new pickup head.
5. Adjust the optical pickup tilt after removing the solder.
(Refer to page 23, Optical Pickup Tilt Adjustment.)

10. Lubricating the Optical Pickup and Peripheral Parts

When replacing parts, lubricate the parts marked “xxx” in the diagram.

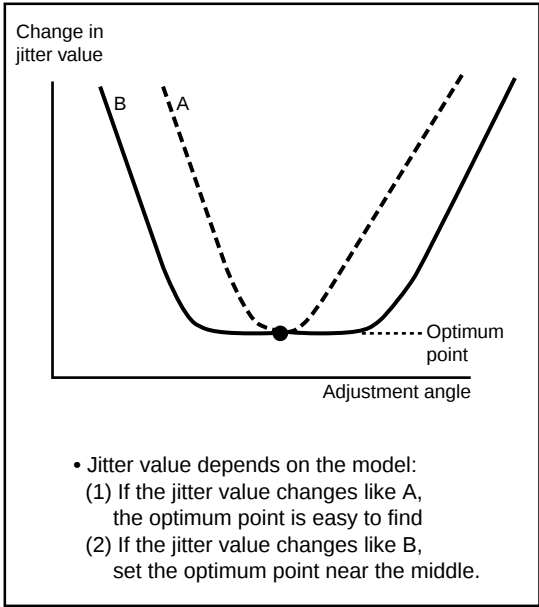
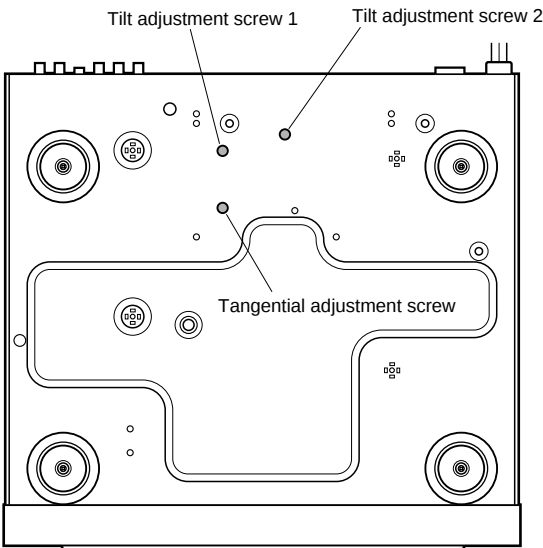
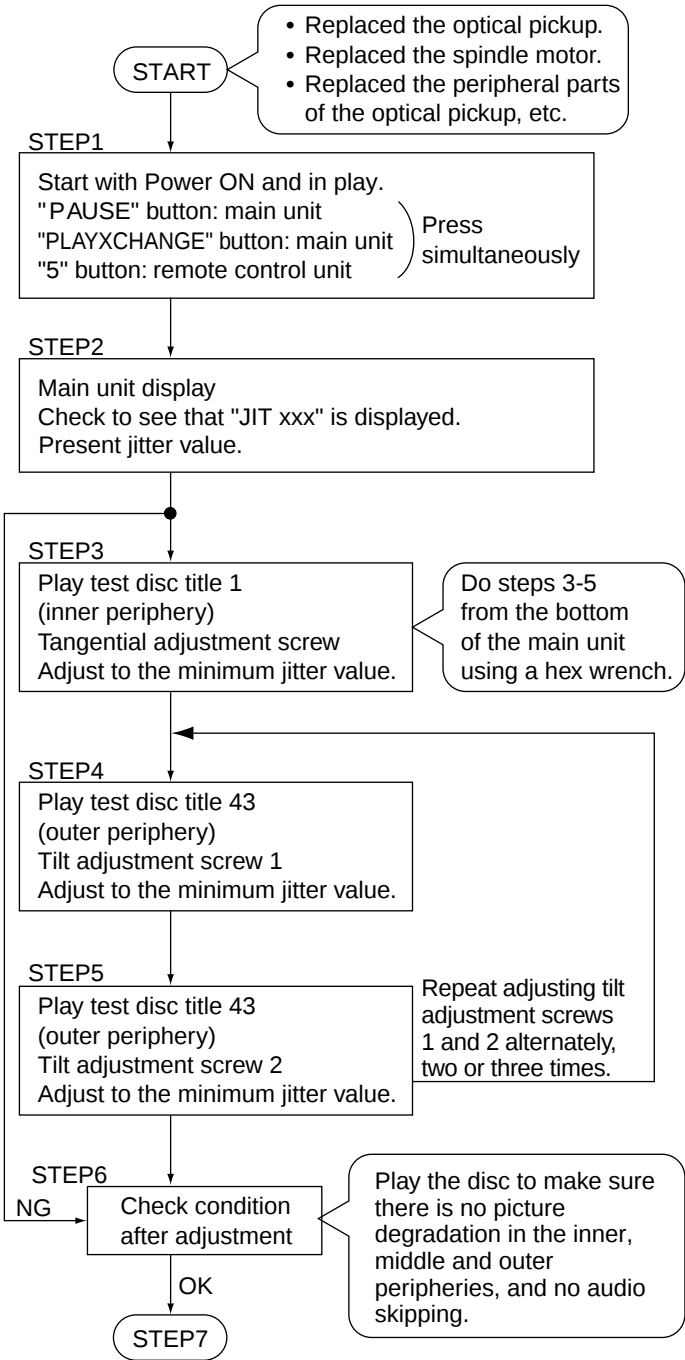


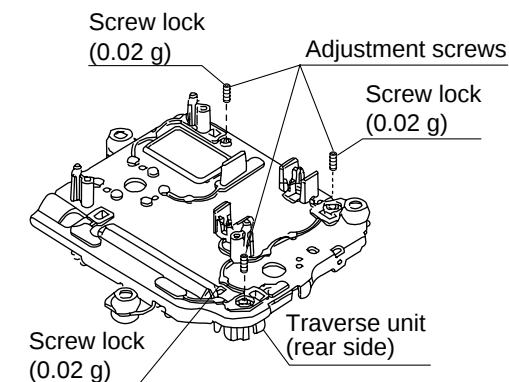
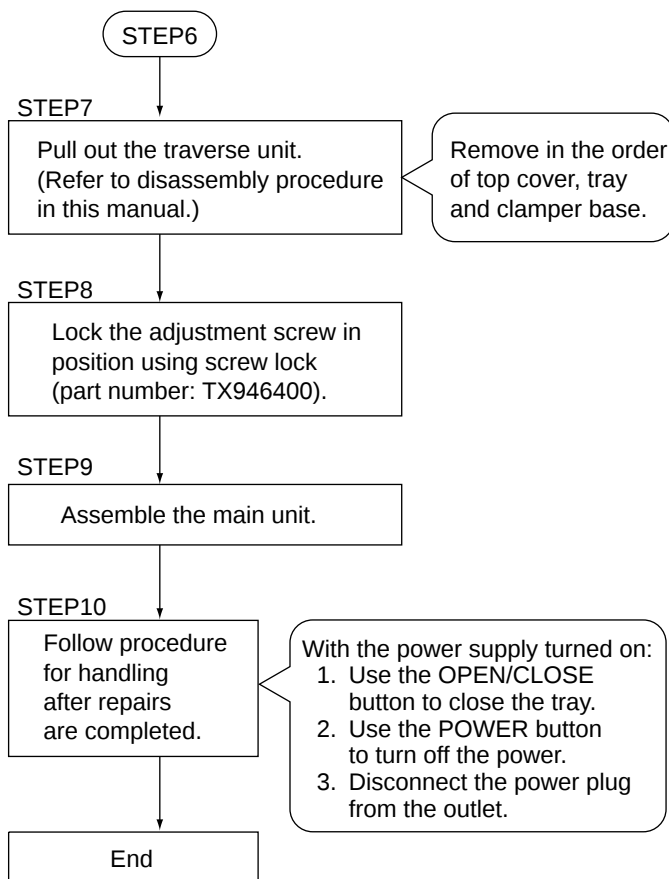
ADJUSTMENT

Optical Pickup Tilt Adjustment

Measurement point	Adjustment point	Mode	Disc
Main unit service display	Tangential adjustment screw Tilt adjustment screw	T1 (inner periphery) play T2 (outer periphery) play	DVDT-S15 (AAX07320) or DVDT-S01 (TX946080)
Measuring equipment, tools		Adjustment value	
Hex wrench (part number: TX946380), 1.2mm Screw lock (part number: TX946400)		Adjust to the minimum jitter value.	

(070 = 7% and 090 = 9% jitter.)





Notes

- Adjustment is generally unnecessary after replacing other parts of the traverse unit. However, adjust if there is a noticeable degradation in picture quality.
- Optical adjustments cannot be made inside the optical pickup.
- Adjustment is generally unnecessary after replacing the traverse unit.

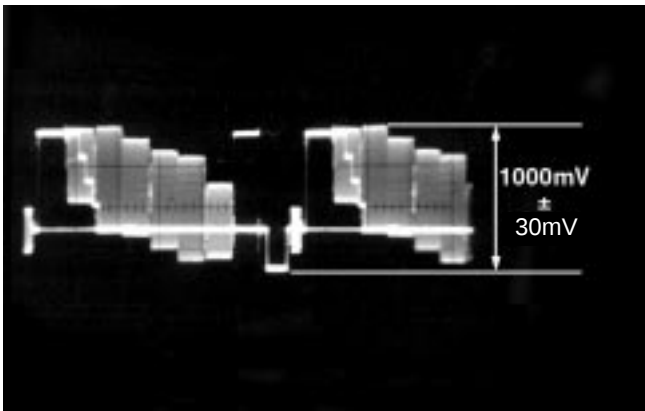
ELECTRICAL CONFIRMATION

1. Video Output (Luminance Signal) Confirmation

Do this confirmation after replacing a P.C.B

Measurement point	Mode	Disc
Video output terminal	Color bar 75% PLAY (Title 46): DVD-T-S15 PLAY (Title 10): DVD-T-S01	DVDT-S15 (AAX07320) or DVDT-S01 (TX946080)
Measuring equipment, tools	Confirmation value	
Screwdriver, Oscilloscope 200mV/div, 10 usec/div	1000mVp-p±30mV	

- Purpose:** To maintain video signal output compatibility.
1. Connect the oscilloscope to the video output terminal and terminate at 75 ohms.
 2. Confirm that the luminance signal (Y+S) level is 1000 mVp-p ±30 mV.

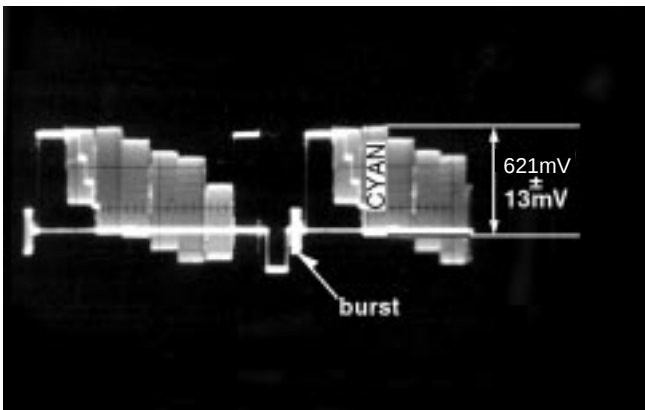


2. Video Output (Chrominance Signal) Confirmation

Do this confirmation after replacing a P.C.B.

Measurement point	Mode	Disc
Video output terminal	Color bar 75% PLAY (Title 46): DVD-T-S15 PLAY (Title 10): DVD-T-S01	DVDT-S15 (AAX07320) or DVDT-S01 (TX946080)
Measuring equipment, tools	Confirmation value	
Screwdriver, Oscilloscope 200mV/div, 10 usec/div	621mVp-p±13mV	

- Purpose:** To maintain video signal output compatibility.
1. Connect the oscilloscope to the video output terminal and terminate at 75 ohms.
 2. Confirm that the chrominance signal (C) level is 621 mVp-p ±13 mV.



3. Video Component Signal (CB) Output Confirmation

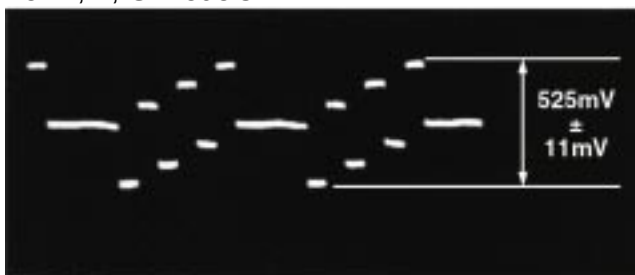
Do this confirmation after replacing a P.C.B.

Measurement point	Mode	Disc
Video output terminal (Y) (CB) Output terminal	Color bar 75% PLAY (Title 46): DVDT-S15 PLAY (Title 10): DVDT-S01	DVDT-S15 (AAX07320) or DVDT-S01 (TX946080)
Measuring equipment, tools	Confirmation value	
Screwdriver, Oscilloscope 100mV/div, 10 usec/div	525mVp-p $\pm$ 11mV (B, A, G Models) 486mVp-p $\pm$ 10mV (U, C, R Models)	

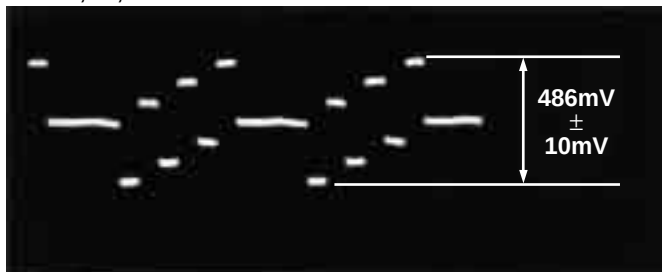
Purpose: To maintain video signal output compatibility.

1. Connect the oscilloscope to the video output terminal and terminate at 75 ohms.
2. Apply the trigger at the Y output terminal signal.
3. Confirm that the video component signal (CB) level is 525 mVp-p $\pm$ 11 mV (B, A, G Models) /486mVp-p $\pm$ 10 mV(U, C, R Models).

For B, A, G Models



For U, C, R Models



■ SPECIAL FUNCTIONS FOR MAINTENANCE

1. Panel microprocessor test mode

● How to enter the test mode

- 1) If the power has been turned on, press the "PLAY" button of the remote controller while pressing the "PAUSE" and "SEARCH ◀◀" buttons on the player.
- 2) If the power has not been turned on, turn on the power while pressing the "PAUSE" and "SEARCH ◀◀" buttons on the player.
- 3) The entire display lights up and then the panel program version appears.
- 4) Select the test mode 1 or 2 by using the OPEN/CLOSE button.

● Test mode 1 ("DVD" segment of FL turned off)

No.	Player button	Action	Remarks
1	DISC 1	Moves the table to DISC1.	The tray must be closed and the clamp set down.
2	DISC 2	Moves the table to DISC2.	Same as above.
3	DISC 3	Moves the table to DISC3.	Same as above.
4	DISC 4	Moves the table to DISC4.	Same as above.
5	DISC 5	Moves the table to DISC5.	Same as above.
6	SEARCH ◀◀	Sets down the clamp.	
7	SEARCH ▶▶	Sets up the clamp.	
8	SKIP ◀◀	Closes the tray.	
9	SKIP ▶▶	Opens the tray.	
10	PLAY	Displays the panel program version.	
11	PAUSE	Returns to the production mode by using the mechanism simulation mode.	
12	STOP	Turns off all FL segments and stops the mechanism.	
13	PLAYXCHANGE	Moves the table to the home position.	The tray must be closed and the clamp set down.
14	OPEN/CLOSE	Enters Test mode 2.	

● Test mode 2 ("DVD" segment of FL turned on)

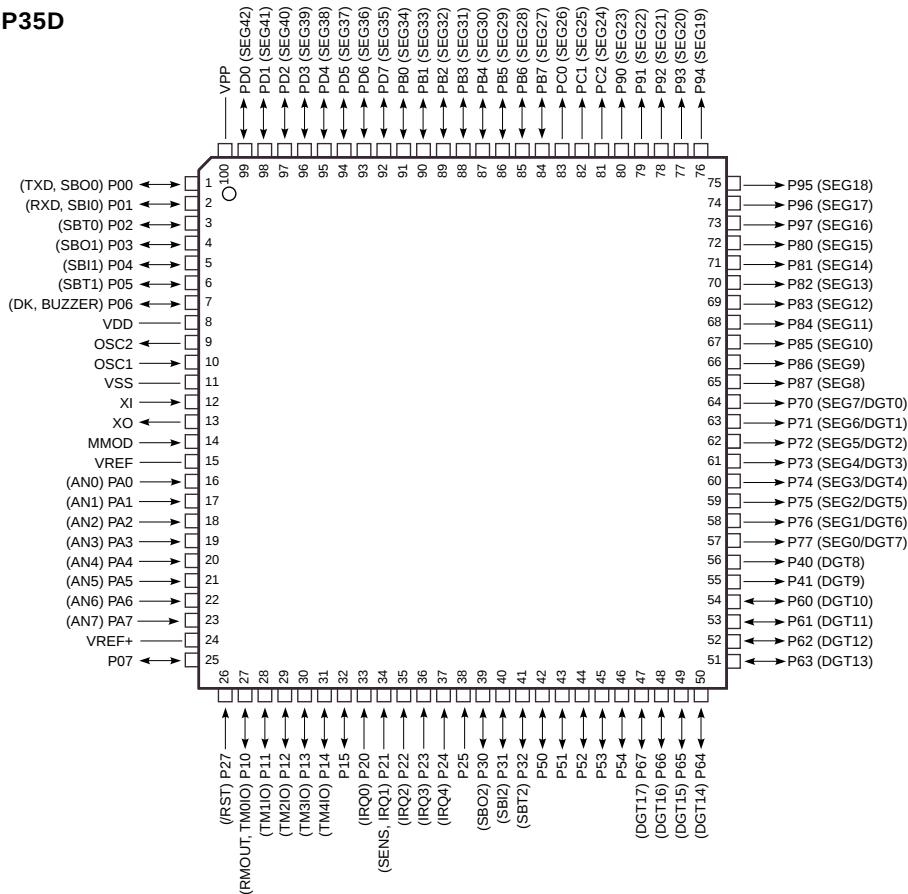
Not used (Do not use this function as it is not for servicing)

No.	Player button	Action
1	DISC 1	Changes the current table parameter to "Braking when making a left turn". The numeric value is displayed as "BL-xx" on FL.
2	DISC 2	Changes the current table parameter to "Braking when making a right turn". The numeric value is displayed as "BR-xx" on FL.
3	DISC 3	Changes the current table parameter to "Duty when making a left turn

MEMO

IC DATA

IC351 : MN101CP35D
Panel CPU



IC351 : MN101CP35D

Panel CPU

No.	Port	Name	Function
27	P10 (RMOUT, TM0IO)	OPSW	Tray Open switch signal input (L: active)
28	P11 (TM1IO)	CLSW	Tray Close switch signal input (L: active)
29	P12 (TM2IO)	PWM	Motor drive signal output
30	P13 (TM3IO)	CL_DOWN	Clamp down control output
31	P14 (TM4IO)	CL_UP	Clamp up control output
32	P15	SCLOCK	Clock signal output for SCART multiplexer
33	P20 (IRQ0)	/IR	Remote control signal input
34	P21 (SENS, IRQ1)	P21	NC
35	P22 (IRQ2)	P22	NC
36	P23 (IRQ3)	P23	NC
37	P24 (IRQ4)	P24	NC
38	P25	P25	NC
39	P30 (SBO2)	SEL0	Motor select signal output Bit 0
40	P31 (SBI2)	SWOFF	Control signal output to cut off subwoofer output
41	P32 (SBT2)	SEL1	Motor select signal output Bit 1
42	P50	P50	NC
43	P51	P51	NC
44	P52	P52	NC
45	P53	P53	Model setting terminal
46	P54	P54	Model setting terminal
47	P67 (DGT17)	P67	Model setting terminal
48	P66 (DGT16)	P66	Model setting terminal
49	P65 (DGT15)	P65	Model setting terminal
50	P64 (DGT14)	P64	NC
51	P63 (DGT13)	1G	Grid signal output for FL display
52	P62 (DGT12)	2G	Grid signal output for FL display
53	P61 (DGT11)	3G	Grid signal output for FL display
54	P60 (DGT10)	4G	Grid signal output for FL display
55	P41 (DGT9)	5G	Grid signal output for FL display
5			

IC351 : MN101CP35D

Panel CPU

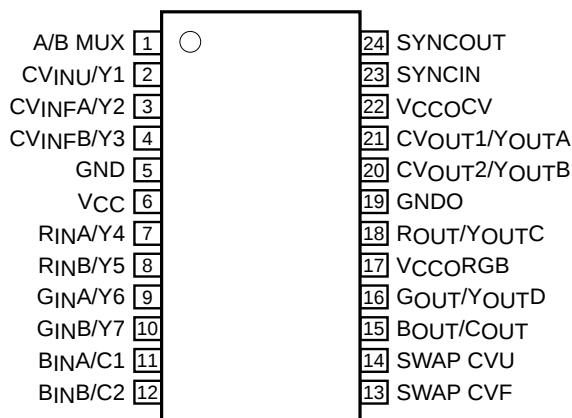
No.	Port	Name	Function
81	PC2 (SEG24)	PC2	NC
82	PC1 (SEG25)	PC1	NC
83	PC0 (SEG26)	PC0	NC
84	PB7 (SEG27)	PB7	NC
85	PB6 (SEG28)	PB6	NC
86	PB5 (SEG29)	PB5	NC
87	PB4 (SEG30)	PB4	NC
88	PB3 (SEG31)	PB3	NC
89	PB2 (SEG32)	PB2	NC
90	PB1 (SEG33)	PB1	NC
91	PB0 (SEG34)	PB0	NC
92	PD7 (SEG35)	PD7	NC
93	PD6 (SEG36)	PD6	NC
94	PD5 (SEG37)	PD5	NC
95	PD4 (SEG38)	PD4	NC
96	PD3 (SEG39)	PD3	NC
97	PD2 (SEG40)	PD2	NC
98	PD1 (SEG41)	PD1	NC
99	PD0 (SEG42)	PD0	NC
100	VPP	VPP	-25V

● KEY INPUT

Voltage	0.38	0.77	1.16	1.56	2.23	2.65	3.08	3.48	3.88	4.26	4.63
PA0	STOP	PAUSE	PLAY	OPEN/CLOSE	DISC1	DISC2	DISC3	DISC4	DISC5	—	—
PA1	—	—	—	—	—	—	—	—	—	SKIP ◀◀	SKIP ▶▶
PA2	—	PLAY/XCHANGE	—	—	—	—	—	—	SEARCH ◀◀	SEARCH ▶▶	—

IC5 : ML6427CS

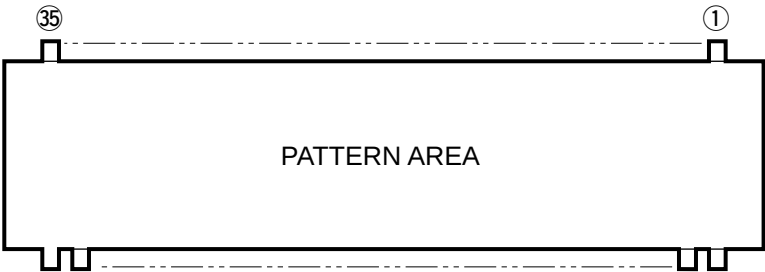
Lowpass Video Filter



Pin No.	Pin Name	Function
1	A/B MUX	Logic input pin to select between Bank <A> or of the CV, RGB, or Y/C inputs. Internally pulled high.
2	CVINU/Y1	Unfiltered analog composite video or luma video input. Internally pulled high. A composite or luma or green signal must be present on either the CVINF A/Y2 or the CVINF B/Y3 input to provide necessary sync signals to other channels (R, G, B, Y, C). Otherwise, sync must be provided at SYNCIN. For RGB applications the green channel with sync can be used as an input to this pin.
3	CVINF A/Y2	Filtered analog composite video or luma video input for Bank <A>. Note that SYNC is stripped from this signal for the other channels. A composite or luma or green signal must be present on either the CVINF A/Y2 or the CVINF B/Y3 input to provide necessary sync signals to other channels (R, G, B, Y, C). Otherwise, sync must be provided at SYNCIN. For RGB applications the green channel with sync can be used as an input to this pin.
4	CVINF B/Y3	Filtered analog composite video or luma video input for Bank . Note that SYNC is stripped from this signal for the other channels.
5	GND	Analog ground
6	VCC	Analog 5V supply
7	RINA/Y4	Filtered analog RED video or luma video input for Bank <A>.
8	RINB/Y5	Filtered analog RED video or luma video

■ DISPLAY DATA

● V351 : 13-BT-178GNK (V6267400)



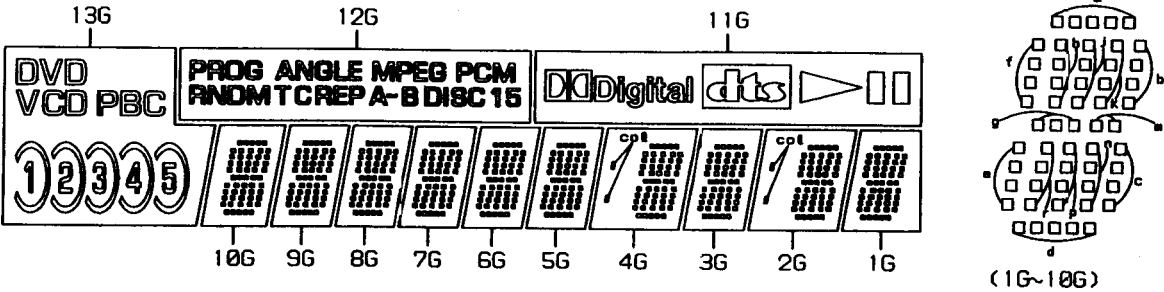
● PIN CONNECTION

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Connection	F1	F1	NP	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	NC	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G

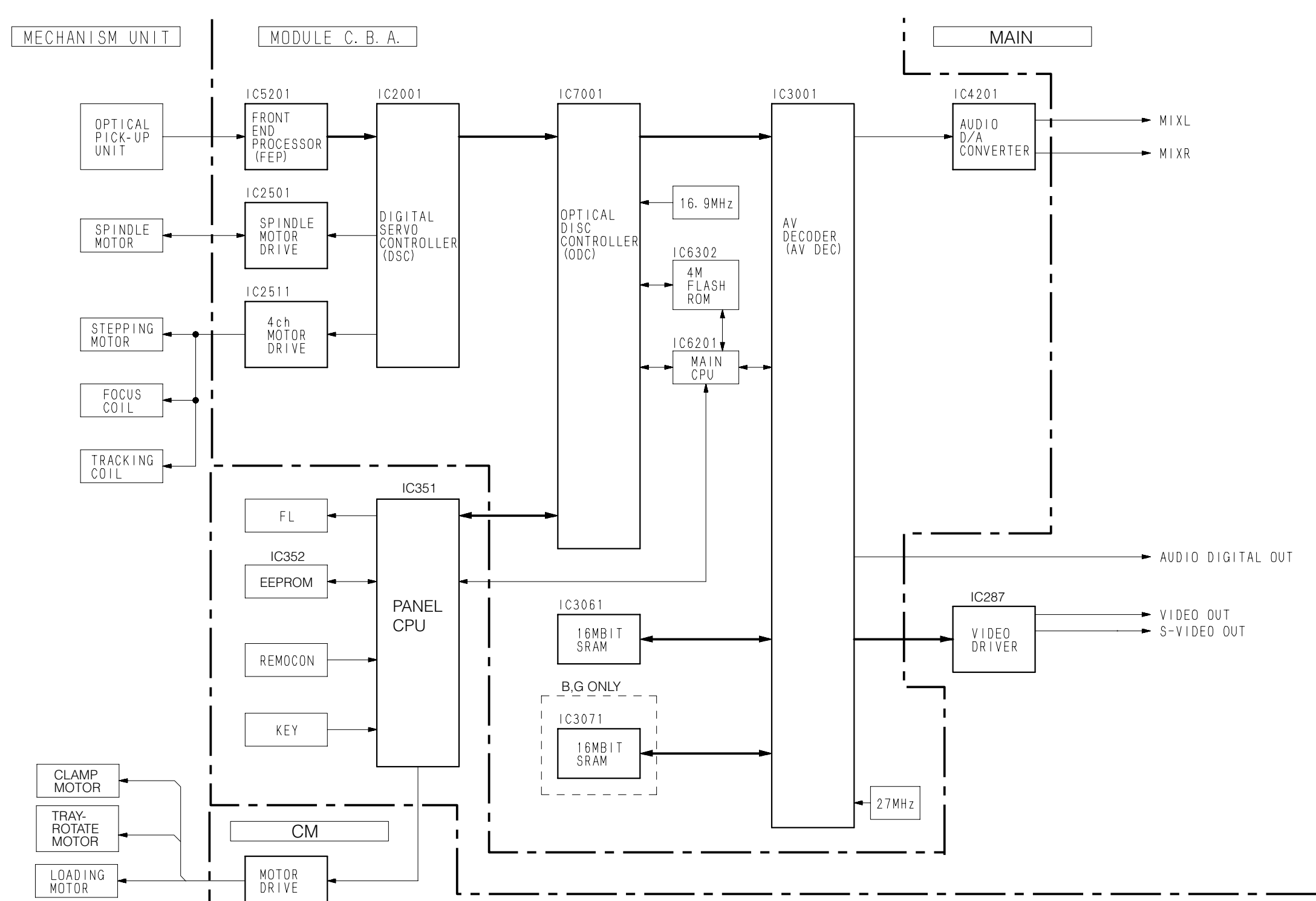
Pin No.	31	32	33	34	35																									
Connection	2G	1G	NP	F2	F2																									

Note 1) F1, F2 Filament 3) NC No Connection 5) 1G-13G Grid
2) NP No Pin 4) P1-P15 Datum Line

● GRID ASSIGNMENT



■ BLOCK DIAGRAM (MODULE BLOCK)



1

REMOTE CONTROL TRANSMITTER

■ SCHEMATIC DIAGRAM

2

3

4

5

6

7

