JVC

SERVICE MANUAL

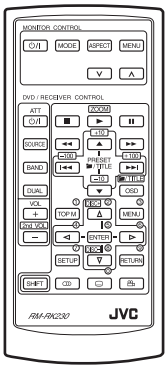
DVD/CD RECEIVER

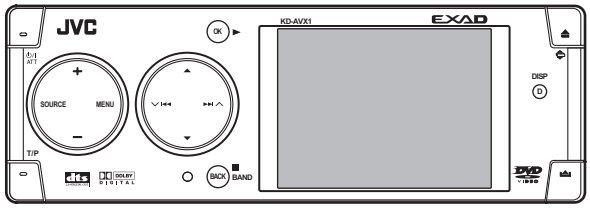
KD-AVX1

Area suffix

J ---------- Northern America
E ---------- Southern Europe
A ---------- Australia
UT ---------- Taiwan
UN ---------- Indonesia
U ---------- Other Areas

Detachable





R·D·S COMPACT disc DIGITAL VIDEO DVD VIDEO dts 2.0+DIGITAL OUT DOLBY DIGITAL

Lead free solder used in the board (material : Sn-Ag-Cu, melting point : 219 Centigrade)

TABLE OF CONTENTS

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No.MA165
2005/5

SPECIFICATION

for NORTHERN AMERICA version

AUDIO AMPLIFIER SECTION		
Power Output		20 W RMS × 4 Channels at 4 Ω and [< or =] 1% THD+N
Signal to Noise Ratio		80 dBA (reference: 1 W into 4 Ω)
Load Impedance		4 Ω (4 Ω to 8 Ω allowance)
Equalizer Control Range	Frequencies	60 Hz, 150 Hz, 400 Hz, 1 kHz, 2.5 kHz, 6.3 kHz, 15 kHz
	Level	±10 dB
Line-In Level/Impedance		1.5 V/20 kΩ load
Line-Out Level/Impedance		5.0 V/20 kΩ load (full scale)
Output Impedance		1 kΩ
Subwoofer-Out Level/Impedance		2.0 V/20 kΩ load (full scale)
Color System		NTSC
Video Input (composite)		1 Vp-p/75 Ω
Video Output (composite)		1 Vp-p/75 Ω
Other Terminals		2nd AUDIO OUT, DIGITAL OUT (optical), CD changer, Steering wheel remote input (OE REMOTE)
TUNER SECTION		
Frequency Range	FM	87.5 MHz to 107.9 MHz (with channel interval set to 200 kHz) 87.5 MHz to 108.0 MHz (with channel interval set to 50 kHz)
	AM	530 kHz to 1 710 kHz (with channel interval set to 10 kHz) 531 kHz to 1 602 kHz (with channel interval set to 9 kHz)
FM Tuner	Usable Sensitivity	11.3 dBf (1.0 μV/75 Ω)
	50 dB Quieting Sensitivity	16.3 dBf (1.8 μV/75 Ω)
	Alternate Channel Selectivity (400 kHz)	65 dB
	Frequency Response	40 Hz to 15 000 Hz
	Stereo Separation	35 dB
	Capture Ratio	1.5 dB
AM Tuner	Sensitivity	20 μV
	Selectivity	35 dB
DVD/CD PLAYER SECTION		
Signal Detection System		Non-contact optical pickup (semiconductor laser)
Number of Channels		2 channels (stereo)
Frequency Response	DVD fs=48 kHz	16 Hz to 22 000 Hz
	DVD fs=96 kHz	16 Hz to 44 000 Hz
	VCD, CD, MP3, WMA	16 Hz to 20 000 Hz
Dynamic Range		93 dB
Signal-to-Noise Ratio		95 dB
Wow and Flutter		Less than measurable limit
MP3	Max. Bit Rate	320 kbps
WMA (Windows Media Audio)	Max. Bit Rate	192 kbps
MONITOR SECTION		
Screen		3-inch liquid crystal panel
Number of Pixels		123 200 pixels
Drive Method		TFT (Thin Film Transistor) active matrix format
Color system		NTSC
GENERAL		
Power Requirement	Operating Voltage	DC 14.4 V (11 V to 16 V allowance)
Grounding System		Negative ground
Allowable Operating Temperature		0° C to +40° C (32° F to 104° F)
Dimensions (W × H × D)	Installation Size (approx.)	182 mm × 52 mm × 160 mm (7-3/16" × 2-1/16" × 6-5/16")
	Panel Size (approx.)	188 mm × 58 mm × 18 mm (7-7/16" × 2-5/16" × 3/4")
Mass (approx.)		2.0 kg (4.5 lbs) (excluding accessories)

for EUROPE version

AUDIO AMPLIFIER SECTION		
Maximum Power Output	Front	50 W per channel
	Rear	50 W per channel
Continuous Power Output (RMS)	Front	20 W per channel into 4 Ω, 40 Hz to 20 000 Hz at no more than 0.8% total harmonic distortion.
	Rear	20 W per channel into 4 Ω, 40 Hz to 20 000 Hz at no more than 0.8% total harmonic distortion.
Load Impedance		4 Ω (4 Ω to 8 Ω allowance)
Equalizer Control Range	Frequencies	60 Hz, 150 Hz, 400 Hz, 1 kHz, 2.5 kHz, 6.3 kHz, 15 kHz
	Level	±10 dB
Signal-to-Noise Ratio		70 dB
Line-In Level/Impedance		1.5 V/20 kΩ load
Line-Out Level/Impedance		5.0 V/20 kΩ load (full scale)
Output Impedance		1 kΩ
Subwoofer-Out Level/Impedance		2.0 V/20 kΩ load (full scale)
Color System		PAL
Video Input (composite)		1 Vp-p/75 Ω
Video Output (composite)		1 Vp-p/75 Ω
Other Terminals		2nd AUDIO OUT, DIGITAL OUT (optical), CD changer, Steering wheel remote input (OE REMOTE)
TUNER SECTION		
Frequency Range	FM	87.5 MHz to 108.0 MHz
	AM	(MW) 522 kHz to 1 620 kHz (LW) 144 kHz to 279 kHz
FM Tuner	Usable Sensitivity	11.3 dBf (1.0 µV/75 Ω)
	50 dB Quieting Sensitivity	16.3 dBf (1.8 µV/75 Ω)
	Alternate Channel Selectivity (400 kHz)	65 dB
	Frequency Response	40 Hz to 15 000 Hz
	Stereo Separation	35 dB
	Capture Ratio	1.5 dB
MW Tuner	Sensitivity	20 µV
	Selectivity	35 dB
LW Tuner	Sensitivity	50 µV
DVD/CD PLAYER SECTION		
Signal Detection System		Non-contact optical pickup (semiconductor laser)
Number of Channels		2 channels (stereo)
Frequency Response	DVD fs=48 kHz	16 Hz to 22 000 Hz
	DVD fs=96 kHz	16 Hz to 44 000 Hz
	VCD, CD	16 Hz to 20 000 Hz
Dynamic Range		93 dB
Signal-to-Noise Ratio		95 dB
Wow and Flutter		Less than measurable limit
MP3	Max. Bit Rate	320 kbps
WMA (Windows Media Audio)	Max. Bit Rate	192 kbps
MONITOR SECTION		
Screen		3-inch liquid crystal panel
Number of Pixels		123 200 pixels
Drive Method		TFT (Thin Film Transistor) active matrix format
Color System		PAL
GENERAL		
Power Requirement	Operating Voltage	DC 14.4 V (11 V to 16 V allowance)
Grounding System		Negative ground
Allowable Operating Temperature		0°C to +40°C
Dimensions (W × H × D)	Installation Size (approx.)	182 mm × 52 mm × 160 mm
	Panel Size (approx.)	188 mm × 58 mm × 18 mm
Mass (approx.)		2.0 kg (excluding accessories)

for ASIA & AUSTRALIA version

AUDIO AMPLIFIER SECTION		
Maximum Power Output	Front	50 W per channel
	Rear	50 W per channel
Continuous Power Output (RMS)	Front	20 W per channel into 4 Ω, 40 Hz to 20 000 Hz at no more than 0.8% total harmonic distortion.
	Rear	20 W per channel into 4 Ω, 40 Hz to 20 000 Hz at no more than 0.8% total harmonic distortion.
Load Impedance		4 Ω (4 Ω to 8 Ω allowance)
Equalizer Control Range	Frequencies	60 Hz, 150 Hz, 400 Hz, 1 kHz, 2.5 kHz, 6.3 kHz, 15 kHz
	Level	±10 dB
Signal-to-Noise Ratio		70 dB
Line-In Level/Impedance		1.5 V/20 kΩ load
Line-Out Level/Impedance		5.0 V/20 kΩ load (full scale)
Output Impedance		1 kΩ
Subwoofer-Out Level/Impedance		2.0 V/20 kΩ load (full scale)
Color System		NTSC/PAL
Video Input (composite)		1 Vp-p/75 Ω
Video Output (composite)		1 Vp-p/75 Ω
Other Terminals		2nd AUDIO OUT, DIGITAL OUT (optical), CD changer
TUNER SECTION		
Frequency Range	FM	87.5 MHz to 108.0 MHz
	AM	531 kHz to 1 602 kHz
FM Tuner	Usable Sensitivity	11.3 dBf (1.0 μV/75 Ω)
	50 dB Quieting Sensitivity	16.3 dBf (1.8 μV/75 Ω)
	Alternate Channel Selectivity (400 kHz)	65 dB
	Frequency Response	40 Hz to 15 000 Hz
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	Capture Ratio	1.5 dB
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Signal Detection System		Non-contact optical pickup (semiconductor laser)
Number of Channels		2 channels (stereo)
Frequency Response	DVD fs=48 kHz	16 Hz to 22 000 Hz
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Dynamic Range		93 dB
Signal-to-Noise Ratio		95 dB
Wow and Flutter		Less than measurable limit
MP3		Max. Bit Rate: 320 kbps
WMA (Windows Media Audio)	Max. Bit Rate	192 kbps
MONITOR SECTION		
Screen		3-inch liquid crystal panel
Number of Pixels		123 200 pixels
Drive Method		TFT (Thin Film Transistor) active matrix format
Color system		NTSC/PAL
GENERAL		
Power Requirement	Operating Voltage	DC 14.4 V (11 V to 16 V allowance)
Grounding System		Negative ground
Allowable Operating Temperature		0°C to +40°C
Dimensions (W × H × D)	Installation Size (approx.)	182 mm × 52 mm × 160 mm
	Panel Size (approx.)	188 mm × 58 mm × 18 mm
Mass (approx.)		2.0 kg (excluding accessories)

Design and specifications are subject to change without notice.

SECTION 1
PRECAUTIONS

1.1 Safety Precautions

> ⚠ ***CAUTION*** **Burrs formed during molding may be left over on some parts of the chassis. Therefore, pay attention to such burrs in the case of preforming repair of this system.**

> ⚠ ***CAUTION*** **Please use enough caution not to see the beam directly or touch it in case of an adjustment or operation check.**

1.2 Preventing static electricity

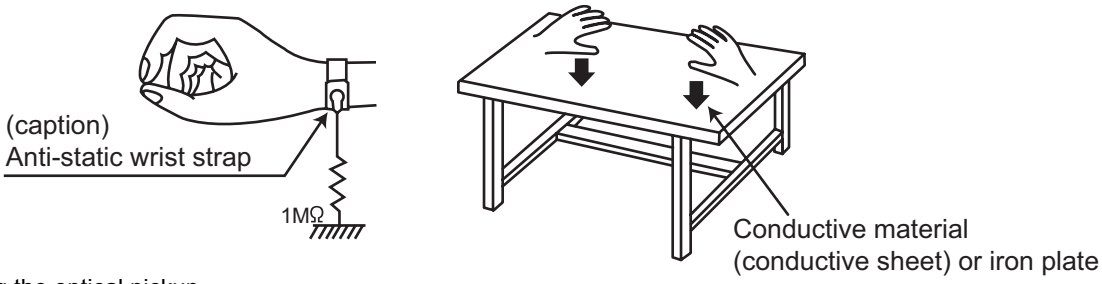
Electrostatic discharge (ESD), which occurs when static electricity stored in the body, fabric, etc. is discharged, can destroy the laser diode in the traverse unit (optical pickup). Take care to prevent this when performing repairs.

1.2.1 Grounding to prevent damage by static electricity

Static electricity in the work area can destroy the optical pickup (laser diode) in devices such as CD players.
Be careful to use proper grounding in the area where repairs are being performed.

(1) Ground the workbench
Ground the workbench by laying conductive material (such as a conductive sheet) or an iron plate over it before placing the traverse unit (optical pickup) on it.

(2) Ground yourself
Use an anti-static wrist strap to release any static electricity built up in your body.



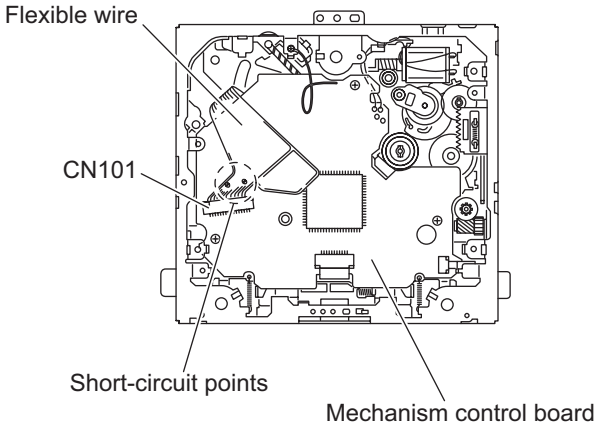
(3) Handling the optical pickup
- In order to maintain quality during transport and before installation, both sides of the laser diode on the replacement optical pickup are shorted. After replacement, return the shorted parts to their original condition.
(Refer to the text.)
- Do not use a tester to check the condition of the laser diode in the optical pickup. The tester's internal power source can easily destroy the laser diode.

1.3 Handling the traverse unit (optical pickup)

(1) Before disconnecting the flexible wire from the connector CN101 on the mechanism control board, solder the short-circuit points on the flexible wire.

Caution:
If you do not follow this instruction, the DVD pickup may be damaged.

(2) Disconnect the flexible wire from the connector CN101 on the mechanism control board.
(3) Remove the solders from the short-circuit points on the flexible wire after replacing the DVD pickup.
(4) Connect the flexible wire to the connector CN101 on the mechanism control board.



1.4 Important for laser products

1.CLASS 1 LASER PRODUCT

2.DANGER : Invisible laser radiation when open and inter lock failed or defeated. Avoid direct exposure to beam.

3.CAUTION : There are no serviceable parts inside the Laser Unit. Do not disassemble the Laser Unit. Replace the complete Laser Unit if it malfunctions.

4.CAUTION : The CD,MD and DVD player uses invisible laser radiation and is equipped with safety switches which prevent emission of radiation when the drawer is open and the safety interlocks have failed or are defeated. It is dangerous to defeat the safety switches.

5.CAUTION : If safety switches malfunction, the laser is able to function.

6.CAUTION : Use of controls, adjustments or performance of procedures other than those specified here in may result in hazardous radiation exposure.

⚠ ***CAUTION*** **Please use enough caution not to see the beam directly or touch it in case of an adjustment or operation check.**

CAUTION : Visible and invisible laser radiation when open and interlock failed or defeated. AVOID DIRECT EXPOSUREBTO BEAM.	**VARNING :** Synlig och osynlig laserstråling när den öppnas och spärren är urkopplad. Betrakta ej strålen.
ADVARSEL : Synlig og usynlig laserstråling når maskinen er åben eller interlocken fejler. Undgå direkte eksponering til stråling.	**VARO :** Avattaessa ja suojalukitus ohitettuna tai viallisena olet alttiina näkyvälle ja näkymätttömälle lasersäteilylle. Vältä säteen kohdistumista suoraan itseesi.

REPRODUCTION AND POSITION OF LABELS

WARNING LABEL

CLASS 1
LASER PRODUCT

CAUTION : Visible and Invisible laser radiation when open and interlock failed or defeated. AVOID DIRECT EXPOSURE TO BEAM. (e)	**ADVARSEL** : Synlig og usynlig laserstråling når maskinen er åben eller interlocken fejeler. Undgå direkte eksponering til stråling. (d)	**VARNING** : Synlig och osynling laserstrålning när den öppnas och spärren är urkopplad. Betrakta ej strålen. (s)	**VARO**: Avattaessa ja suojalukitus ohitettuna tai viallisena olet alttiina näkyvälle ja näkymättömälle lasersäteilylle. Vältä säteen kohdistumista suoraan itseesi. (f)

SECTION 2
SPECIFIC SERVICE INSTRUCTIONS

This service manual does not describe SPECIFIC SERVICE INSTRUCTIONS.

SECTION 3
DISASSEMBLY

3.1 Main body section

3.1.1 Removing the panel assembly (See Fig.1)

(1) Push the button(detach) in the lower right part of the panel assembly.
(2) Remove the panel assembly.

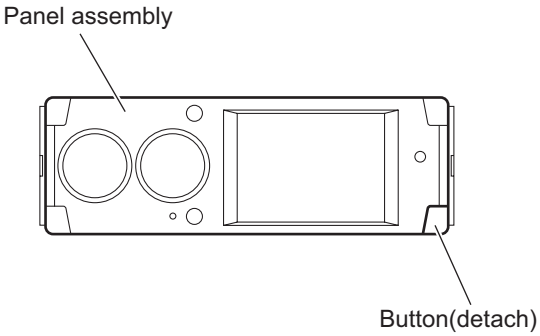


Fig.1

3.1.2 Removing the side heat sink (See Fig.2)

Reference:
Remove the panel assembly as required.

(1) From the left side of the main body, remove the two screws **A** and three screws **B** attaching the side heat sink.
(2) Remove the side heat sink from the main body.

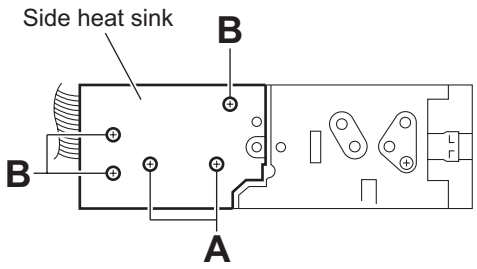


Fig.2

3.1.3 Removing the top chassis assembly (See Figs.3 to 6)

- Remove the panel assembly and side heat sink.
  (1) From the top side of the main body, remove the two screws **C** attaching the top chassis assembly. (See Fig.3.)
  (2) From the back side of the main body, remove the two screws **C** attaching the top chassis assembly. (See Fig.4.)
  (3) From the both sides of the main body, remove the two screws **C** and screw **D** attaching the top chassis assembly. (See Figs.5 and 6.)
  (4) Lift the top chassis assembly in the direction of the arrow and disconnect the connector CN966 on the main sub board from the connector CN961 on the main board. (See Fig.6.)
  (5) Take out the top chassis assembly from the main body.

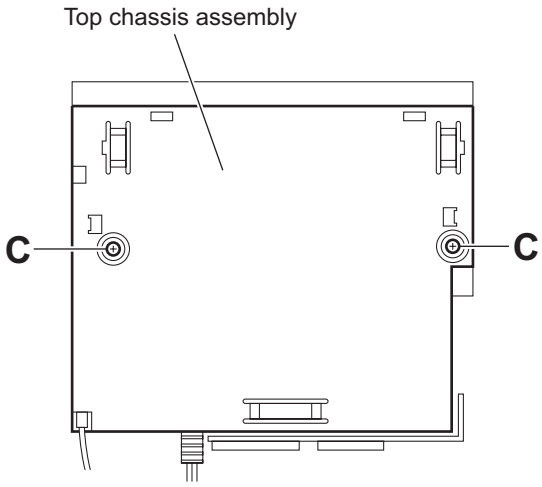


Fig.3

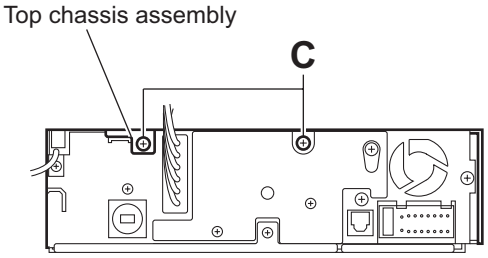


Fig.4

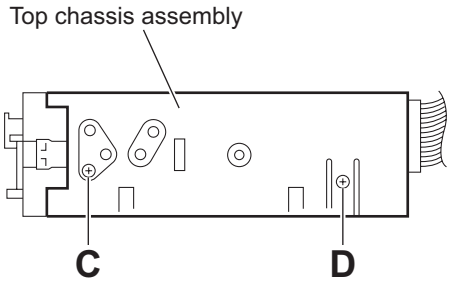


Fig.5

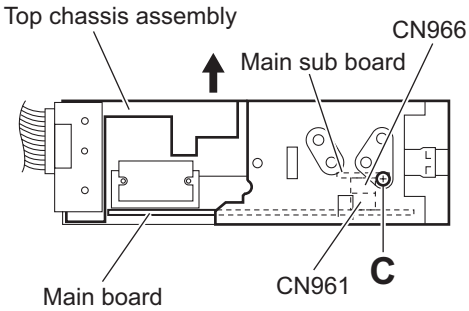


Fig.6

3.1.4 Removing the front chassis assembly (See Fig.7)

- Remove the panel assembly, side heat sink and top chassis assembly.
  (1) From the both sides of the top chassis assembly, remove the two screws **E** attaching the front chassis assembly.
  (2) Remove the front chassis assembly from the top chassis assembly.

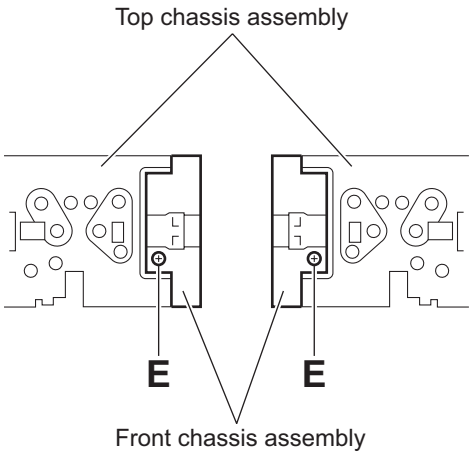


Fig.7

3.1.5 Removing the DVD mechanism assembly (See Figs.8 and 9)

- Remove the panel assembly, side heat sink and top chassis assembly.

Reference:

Remove the front chassis assembly as required.

(1) From the inside of the top chassis assembly, remove the three screws **F** attaching the DVD mechanism assembly and take out the DVD mechanism assembly. (See Fig.8.)
(2) From the side of the DVD mechanism assembly, remove the double-stick tape fixing the insulator. (See Fig.9.)
(3) From the top side of the DVD mechanism assembly, remove the spacer attaching the insulator. (See Fig.9.)
(4) Remove the insulator from the top chassis assembly.

Reference:

When the resolution of DVD mechanism assembly is done sequentially, remove the main sub board. (See next Fig.10.)

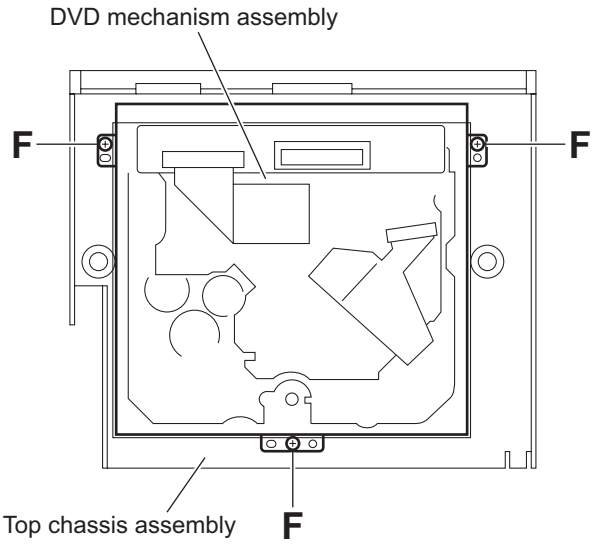


Fig.8

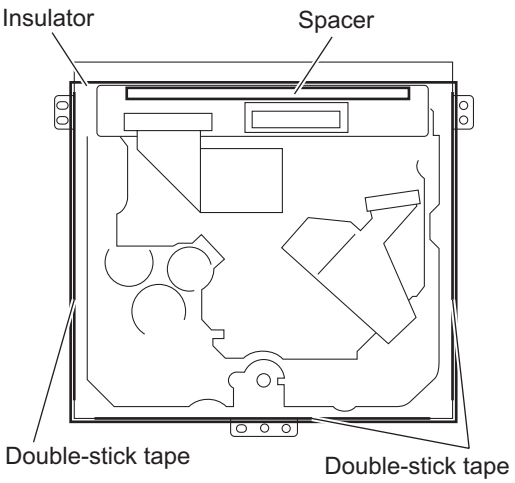


Fig.9

3.1.6 Removing the main sub board (See Fig.10)

- Remove the panel assembly, side heat sink, top chassis assembly and DVD mechanism assembly.
  (1) From the top side of the DVD mechanism assembly, release the lock of the connector CN965 on the main sub board and disconnect the card wire.
  (2) Remove the two screws **G** attaching the main sub board on the DVD mechanism assembly and remove the main sub board.

Reference:

When attaching the main sub board, align the projections **a** in the holes of the main sub board before attaching the screws **G**.

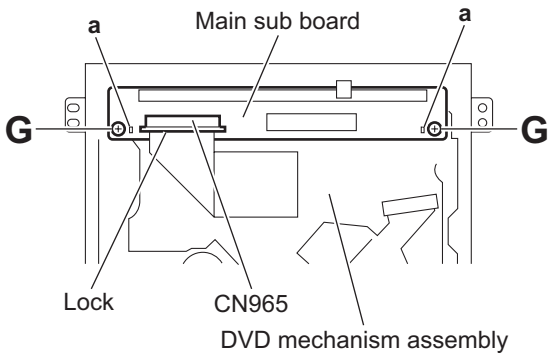


Fig.10

3.1.7 Removing the loading unit assembly (See Fig.11)

- Remove the panel assembly, side heat sink and top chassis assembly.
  (1) From the inside of the main body, disconnect the wire from the connector CN881 on the main board.
  (2) Remove the two screws **H** attaching the loading unit assembly.
  (3) Remove the tension spring and take out the loading unit assembly.

Note:

When disassembling, do not lose the tension spring.

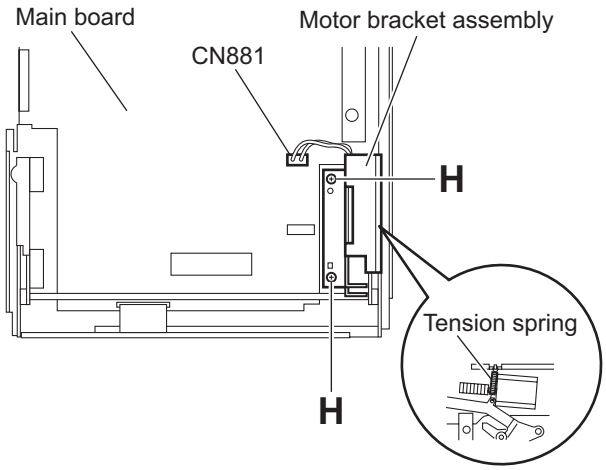


Fig.11

3.1.8 Removing the arm bracket assemblies (L)/(R) (See Fig.12)

- Remove the panel assembly, side heat sink, top chassis assembly and loading unit assembly.
  (1) Remove the two screws **J** and screw **K** attaching the arm bracket assembly (L).
  (2) Take out the arm bracket assembly (L).
  (3) Remove the two screws **J** and screw **K** attaching the arm bracket assembly (R).
  (4) Take out the arm bracket assembly (R).

3.1.9 Removing the front bracket assembly (See Fig.12.)

- Remove the panel assembly, side heat sink and top chassis assembly.
  (1) Release the lock of the connector CN962 on the main board in an upward direction and disconnect the flexible wire.
  (2) Remove the four screws **K** attaching the front bracket assembly and take out the front bracket assembly.

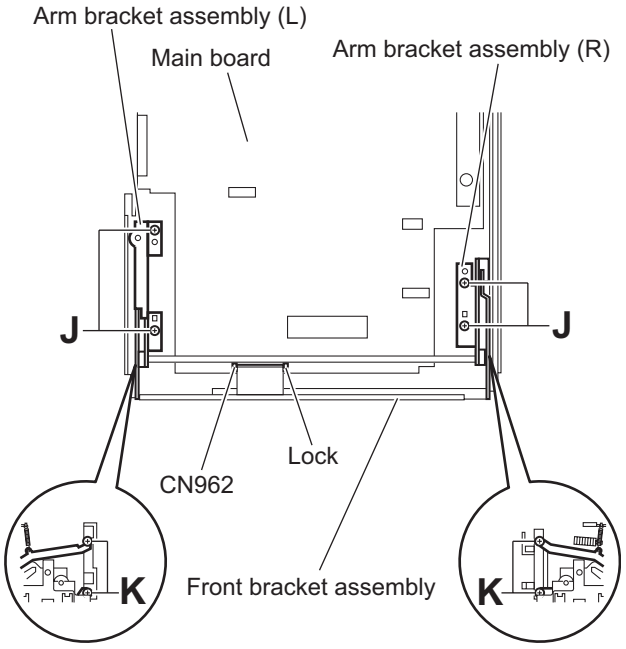


Fig.12

3.1.10 Removing the connector board (See Figs.13 to 15)

- Remove the panel assembly, side heat sink, top chassis assembly and front bracket assembly.
  (1) From the front side of the front bracket assembly, remove the two screws **M**. (See Fig.13.)
  (2) Remove the joints **b** and remove the detach lever from the front bracket assembly. (See Fig.13.)

  Reference:

  When attaching the detach lever, insert the end of the torsion spring in the hole **c** of the front bracket assembly. (See Fig.13.)
  (3) From the back side of the front bracket assembly, remove the screw **N** attaching the connector cover. (See Fig.14.)
  (4) Remove the connector cover in the direction of the arrow while releasing the tabs **d** in an upward direction. (See Fig.14.)
  (5) Remove the reinforce plate and take out the connector board from the front bracket assembly. (See Fig.15.)

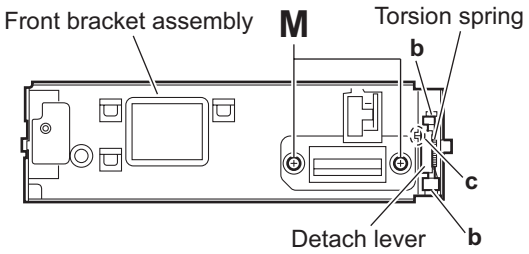


Fig.13

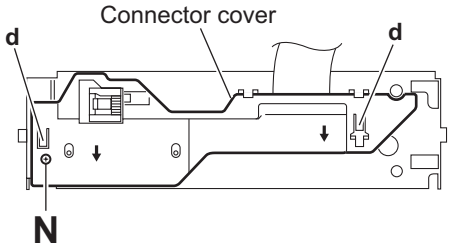


Fig.14

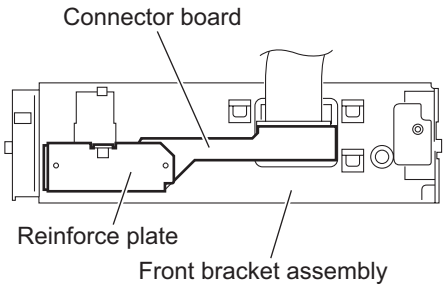


Fig.15

3.1.11 Removing the main board (See Figs.16 and 17)

- Remove the panel assembly, side heat sink, top chassis assembly, loading unit assembly and arm bracket assemblies (L)/(R).
  (1) From the back side of the main body, remove the screw **P** attaching the rear bracket. (See Fig.16.)
  (2) From the top side of the main body, take out the rod gear. (See Fig.17.)

  Reference:
  When attaching the rod gear, attach the washers with it as before. (See Fig.17.)
  (3) Release the lock of the connector CN962 on the main board in an upward direction and disconnect the flexible wire. (See Fig.17.)
  (4) Release the lock of the connector CN891 and disconnect the card wire. (See Fig.17.)
  (5) Remove the three screws **P** attaching the main board to the bottom chassis assembly. (See Fig.17.)
  (6) Take out the main board from the bottom chassis assembly.

Reference:
When attaching the main board, attach the main board under the sections **e** of the bottom chassis assembly as before. (See Fig.17.)

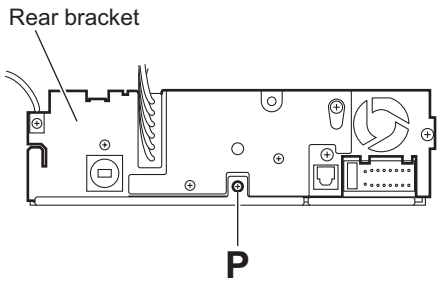


Fig.16

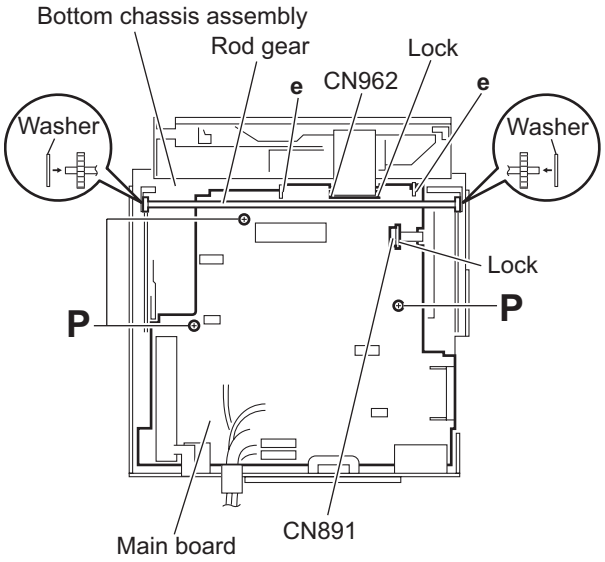


Fig.17

3.1.12 Removing the rear bracket
(See Fig.18)

- Remove the panel assembly, side heat sink, top chassis assembly, loading unit assembly, arm bracket assemblies (L)/(R) and main board.
  (1) From the back side of the main board, remove the two screws **Q** attaching the rear heat sink.
  (2) Remove the three screws **R**, screw **R'** and screw **S** attaching the rear bracket.

  Reference:
  When attaching the screw **R'**, attach the wire holder with it as before.
  (3) Remove the joints **f** of the rear bracket in the direction of the arrow.
  (4) Remove the car cable in the direction of the arrow from the rear bracket.

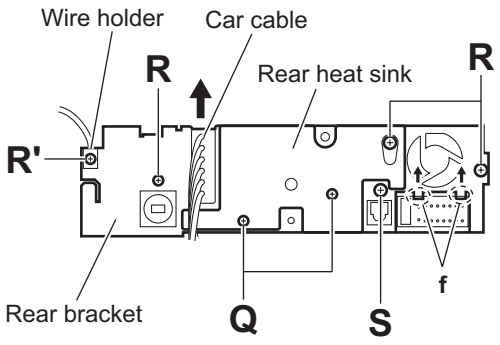


Fig.18

3.1.13 Removing the panel switch board
(See Fig.19)

- Remove the panel assembly, side heat sink, top chassis assembly, loading unit assembly, arm bracket assemblies (L)/(R) and main board.
  (1) From the inside of the bottom chassis assembly, take out the insulator.
  (2) Remove the two screws **T** attaching the panel switch board.
  (3) Take out the panel switch board from the bottom chassis assembly.

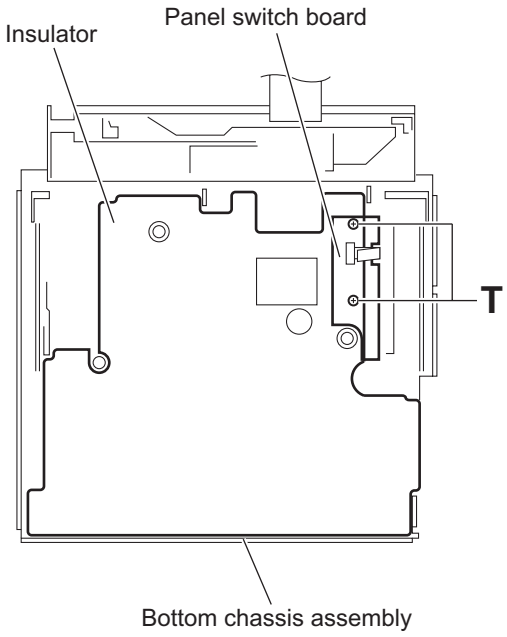


Fig.19

3.1.14 Removing the panel board (See Figs.20 and 21)

- Remove the panel assembly.
  (1) From the back side of the panel assembly, remove the seven screws **U** attaching the rear cover to the panel assembly. (See Fig.20.)
  (2) From the inside of the rear cover, release the lock of the connector CN582 on the panel board and disconnect the card wire. (See Fig.21.)
  (3) Remove the five screws **V** attaching the panel board and take out the panel board from the rear cover. (See Fig.21.)

3.1.15 Removing the switch board (See Figs.20 and 22)

- Remove the panel assembly.
  (1) From the back side of the panel assembly, remove the seven screws **U** attaching the rear cover to the panel assembly. (See Fig.20.)
  (2) From the inside of the panel assembly, release the lock of the connector CN583 on the switch board and disconnect the card wire. (See Fig.22.)
  (3) Take out the switch board from the panel assembly.Take out the switch board from the panel assembly.

Note:

Do not lose the compression spring when taking out the switch board. (See Fig.22.)

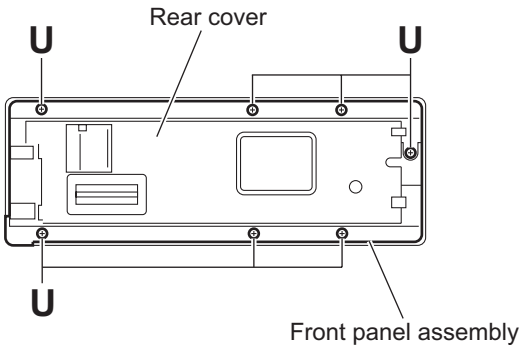


Fig.20

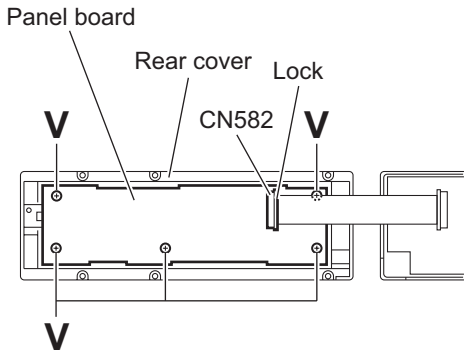


Fig.21

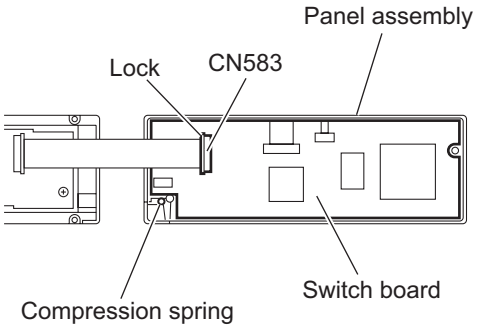


Fig.22

3.2 DVD mechanism assembly

3.2.1 Removing the mechanism control board (See Fig.1)

Caution:

Before disconnecting the flexible wire extending from the DVD pickup, solder the short-circuit point on the flexible wire using a grounding soldering iron. If you do not follow this instruction, the DVD pickup may be damaged.

(1) Turn over the body, and solder the short-circuit points on the flexible wire extending from the DVD pickup.
(2) Disconnect the flexible wire from connector CN101 on the mechanism control board.
(3) Disconnect the card wire from connector CN201 on the mechanism control board.
(4) Disconnect the flexible wire from connector CN202 on the mechanism control board.
(5) Unsolder two soldered points **a** on the mechanism control board and remove the wire extending from the feed motor.
(6) Remove the screw **A** attaching the lug wire.
(7) Remove the two screws **B** and screw **C** attaching the mechanism control board.

Caution:

- As the flexible wire to be connected to CN101, make sure to attach it to the mechanism control board using a double tape.
- After reassembling, unsolder the short-circuit points.

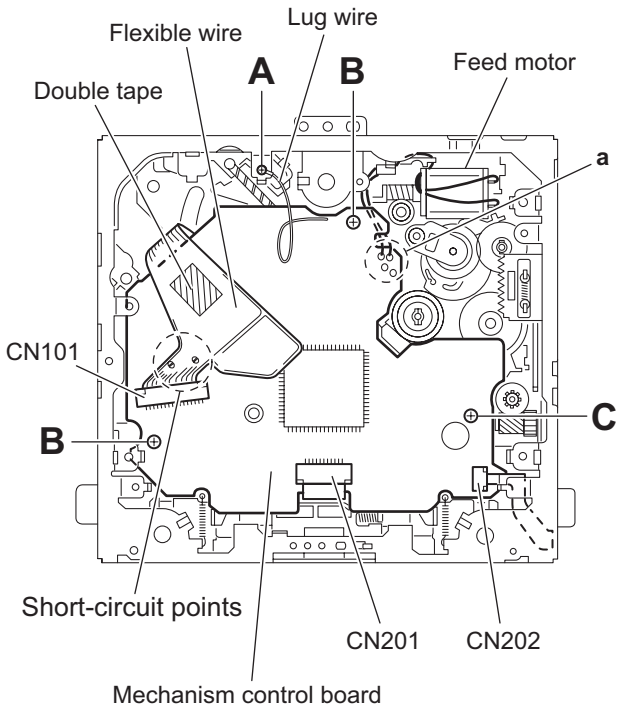


Fig.1

3.2.2 Removing the top cover (See Fig.2)

(1) Remove the two screws **D** attaching the top cover on the back of the body.
(2) Remove the top cover upward.

Reference:

When reassembling, set part **b** of the top cover under the bending part **c** of the chassis frame.

3.2.3 Removing the mechanism section (See Fig.2 to 4)

• Remove the top cover.
(1) From the bottom of the body, remove the screw **E** attaching the lug wire. (See Fig.2.)
(2) Remove the two screws **F** attaching the right and left stoppers on the front side. (See Fig.2.)
(3) Remove the two floating springs on the bottom of the body. (See Fig.3.)
(4) Move the mechanism section upward and remove from the chassis frame.
The three damper springs come off from the dampers. (See Fig.4.)

Caution:

- When reassembling, reattach the damper spring to the damper respectively and insert the three shafts on the bottom of the mechanism to the dampers.
- Before inserting the shaft to the dampers, apply IPA to the hole of damper.

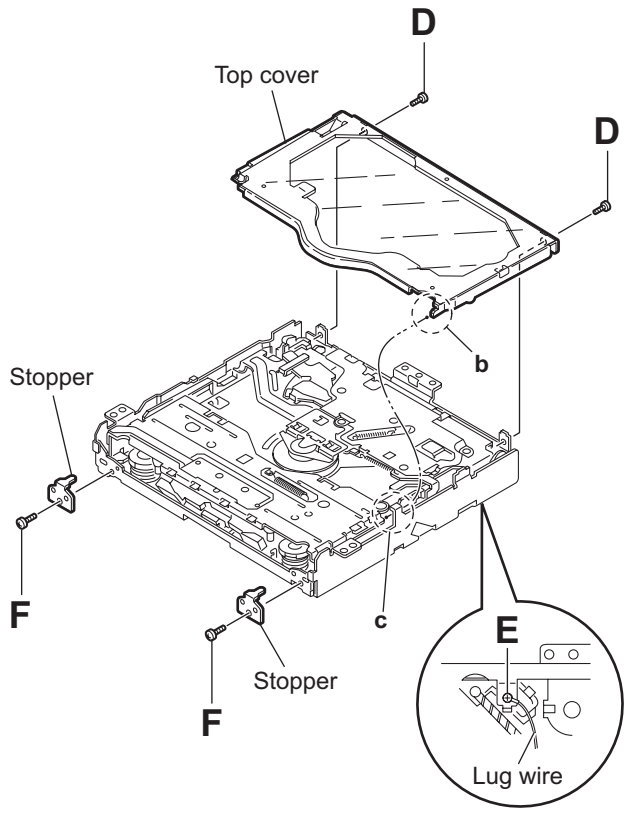


Fig.2

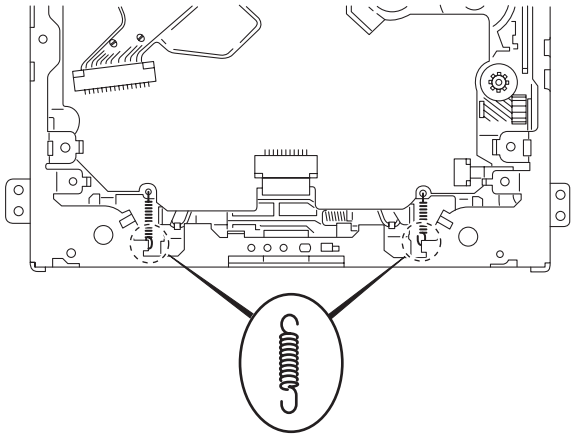


Fig.3

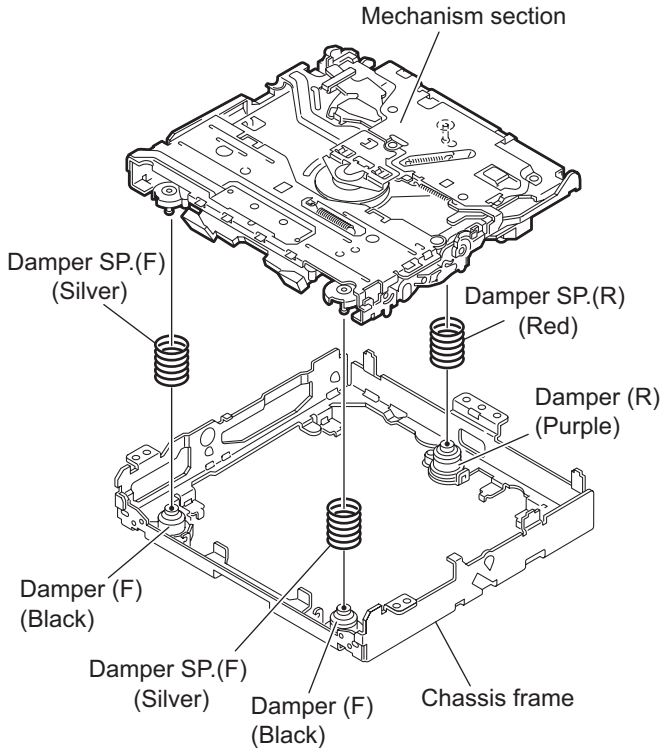


Fig.4

3.2.4 Removing the clamper unit (See Fig.5 to 7)

- Remove the top cover and the mechanism section.
  (1) Remove the clamper2 spring on the bottom of the mechanism section. (See Figs.5.and 6.)
  (2) Release the part **d** of the clamper spring from the bending part of the chassis base assembly. (See Fig.7.)
  (3) Move the clamper unit in the direction of the arrow and turn. Release the two joints **e** and **f**, then remove the clamper unit upward. (See Fig.6.)

3.2.5 Reattaching the clamper unit (See Fig.5 to 9)

(1) Attach the clamper spring to the clamper unit. (See Fig.8.)
(2) Move the clamper unit to set the side joints **e** and f to each boss of the chassis base assembly. Make sure that part **g** is inserted to the notch of the chassis base assembly. (See Figs.5 and 9.)
(3) Move the part **d** of the clamper spring to the outside of the bending part of the chassis base assembly. (See Fig.7.)
(4) Attach the clamper2 spring to the chassis base assembly. (See Figs.5 and 6.)

Caution:

When reattaching, temporarily hook the end of the clamper spring as shown in the figure to make the work easy. (See Fig.8.)

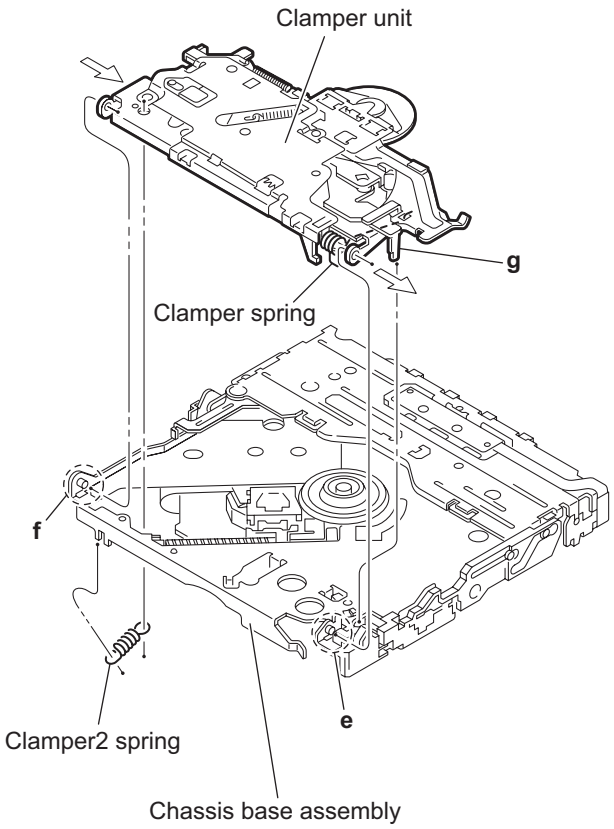


Fig.5

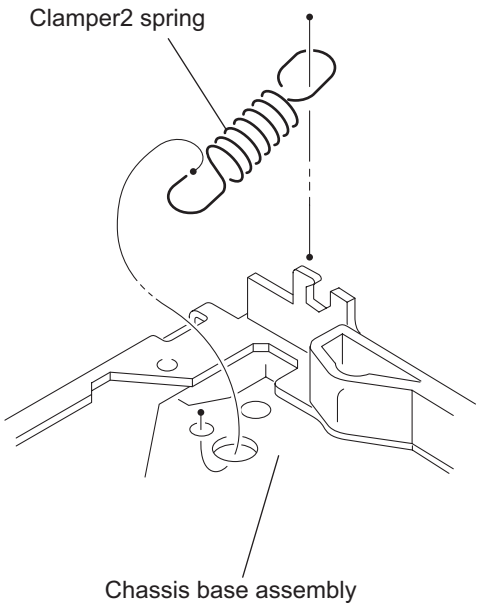


Fig.6

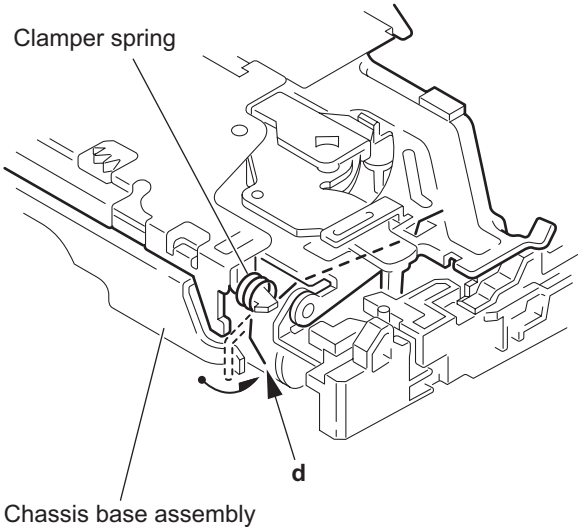


Fig.7

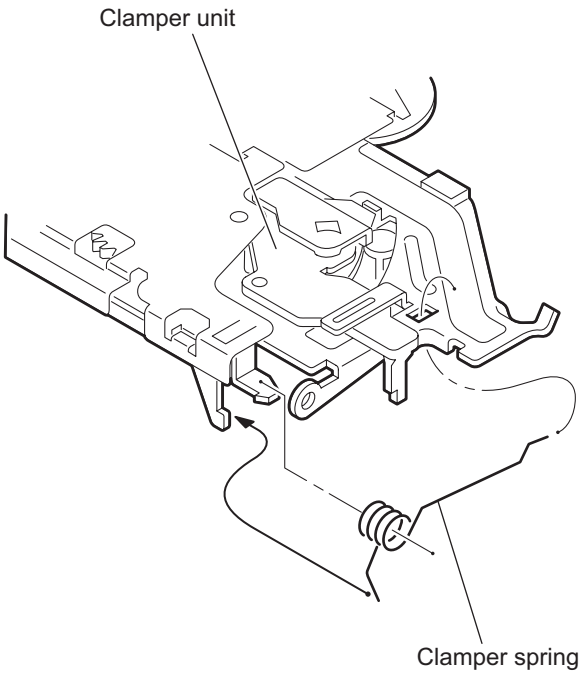


Fig.8

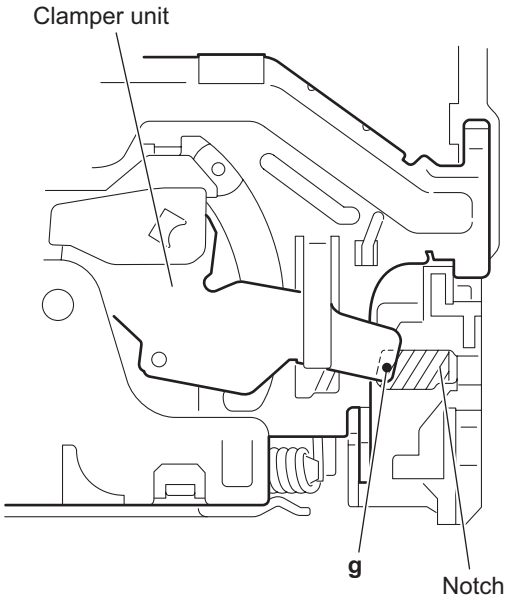


Fig.9

3.2.6 Removing the front unit (See Fig.10 to 12)

- Remove the top cover and the mechanism section.
  (1) Disconnect the flexible wire from connector CN202 on the mechanism control board at the bottom of the body. (See Fig.10.)
  (2) Remove the screw **G** attaching the front unit on the top of the body. (See Fig.11.)
  (3) Move the front unit toward the front to release joint **h**, and release two joints **i** and **j** on the right side of the chassis base assembly. Then remove the front unit upward. (See Figs.11 and 12.)
  (4) Remove the two screws **H** attaching the switch board. (See Fig.12.)

Reference:

You can remove the switch board only without removing the front unit.

Caution:

When reassembling, attach the flexible wire extending from the switch board using the double tape. (See Figs.10 and 12.)

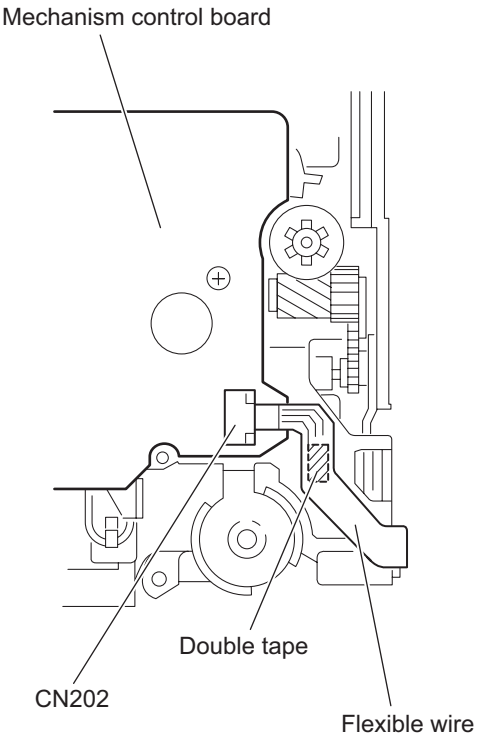


Fig.10

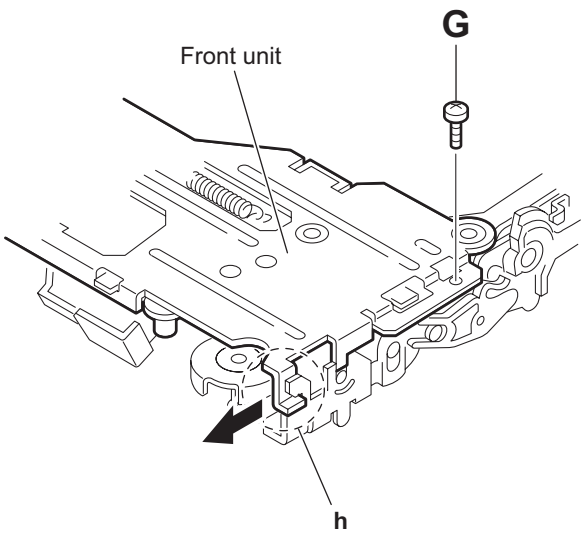


Fig.11

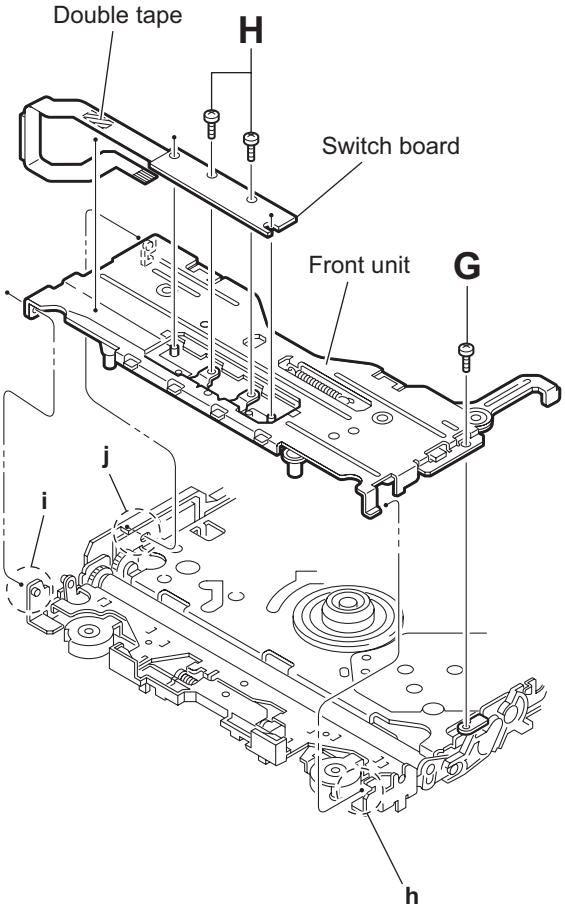


Fig.12

3.2.7 Removing the loading arm assembly (See Fig.13 , 14)

- Remove the top cover, the mechanism section and the front unit.
  (1) From the top of the body, move the loading arm assembly from the front side upward, and release the bosses from the right and left joints **k** and m of the chassis base assembly.
  (2) Release the boss from notch **n** of the connect arm on the right side of the body, and release the boss from notch **p** of the slide cam assembly on the left side.

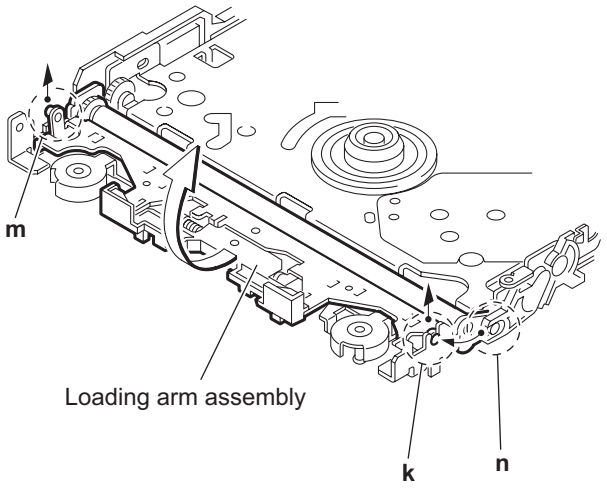


Fig.13

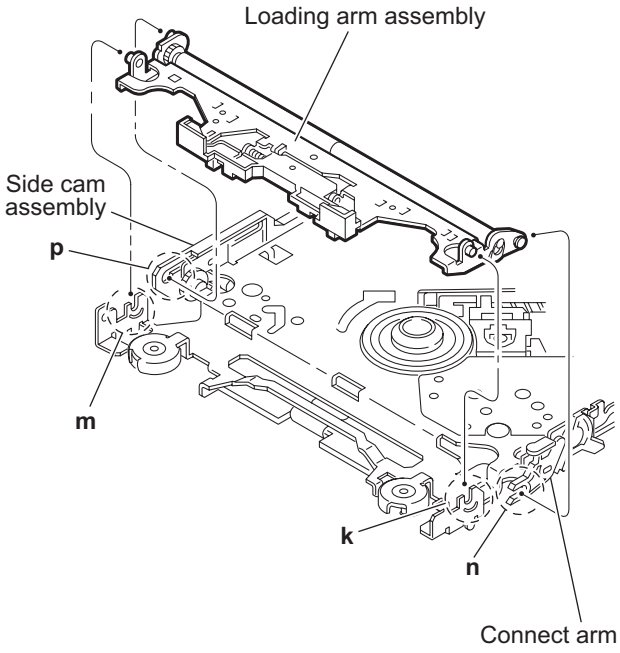


Fig.14

3.2.8 Removing the rod (L)(R)/roller assembly (See Fig.15 and 16)

- Remove the top cover, the mechanism section, the front unit and the loading arm assembly.
  (1) Release the rod (L) and (R) from the joints **q** at the bottom of the loading arm assembly (See Fig.15.)
  (2) Remove the roller assembly from the loading arm assembly. (See Fig.16.)
  (3) Remove the two collars and washer from the roller assembly. (See Fig.16.)

Caution:

After attaching the loading arm assembly to the roller assembly, attach the rod (L) and (R). Attach the rods to the right and left collars of the roller. (See Fig.15.)

When reattaching the rod (L) and (R) to the loading arm assembly, engage each joint as shown in Fig.15. As joints **q** of the rod (L), let the rod through **q** before reattaching it.

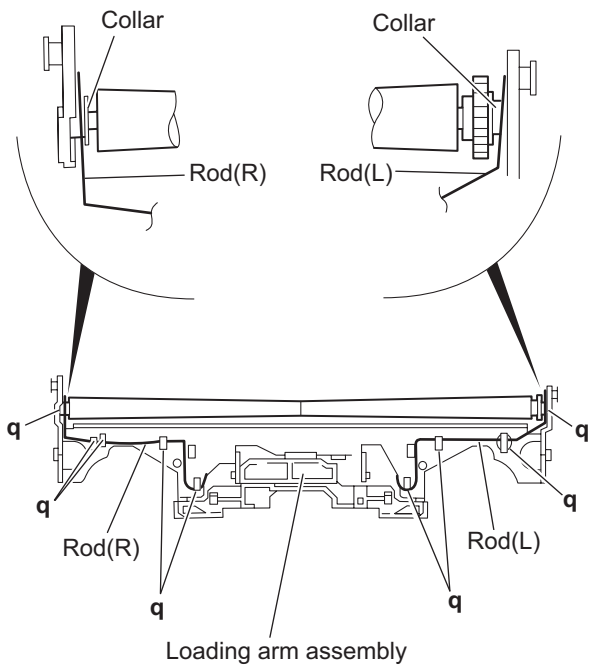


Fig.15

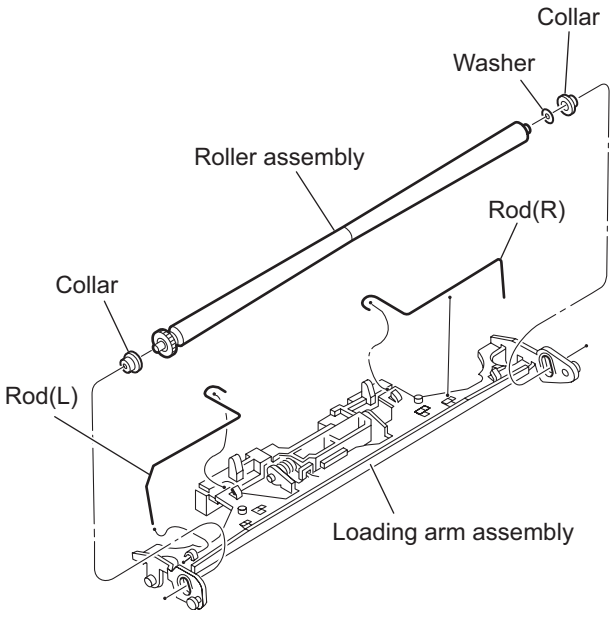


Fig.16

3.2.9 Removing the DVD pickup assembly (See Fig.17 to 19)

- Remove the mechanism control board.
  (1) From the bottom of the body, turn the feed gear in the direction of the arrow to move the DVD pickup outwards. (See Fig.17.)
  (2) Remove the screw **J** attaching the thrust spring. (See Fig.17.)
  (3) Remove the DVD pickup assembly upward on the L.S.gear side and release from sub shaft at joint **r**. Move the lead screw of the DVD pickup assembly in the direction of the arrow to release from joint **s**. (See Fig.18.)

  Caution:
  - When releasing the lead screw at joint **s**, the L.S.collar comes off at the end of the lead screw. When reassembling, reattach the L.S.collar to the lead screw and engage joint **s**. (See Fig.18.)
  - When reattaching the L.S.collar, reattach it to the point **s** of the lead screw, and to the rod (M). Make sure that the L.S.collar is set on the rod (M) spring. (See Fig.18.)

  (4) Remove the screw **K** attaching the rack spring/ rack plate on the DVD pickup. (See Fig.19.)
  (5) Pull out the lead screw. (See Fig.19.)

Caution:
Perform adjustment after replacing the pickup.

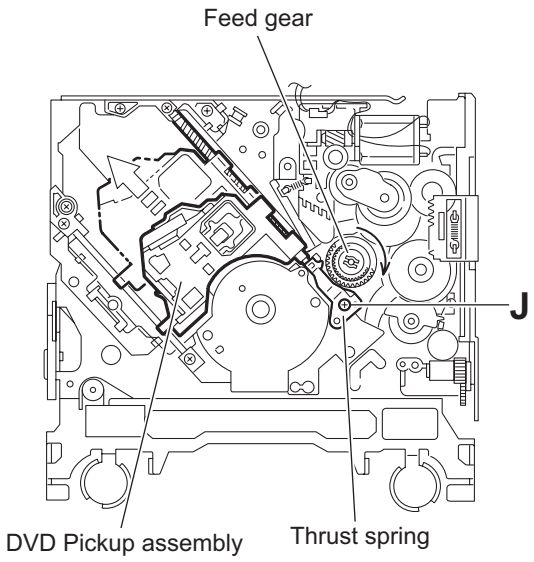


Fig.17

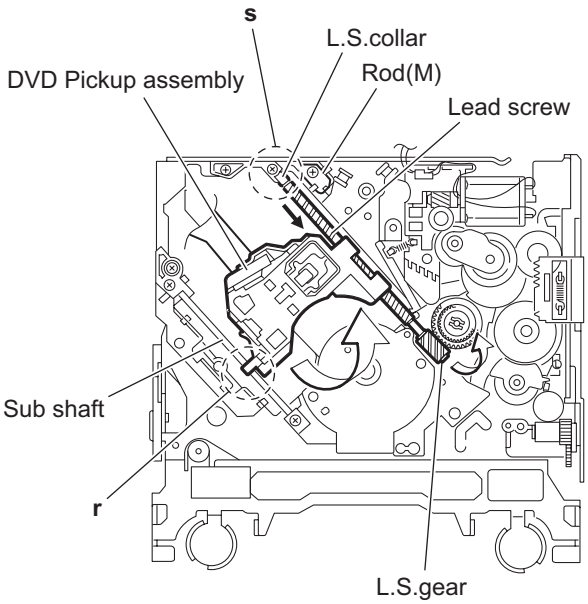


Fig.18

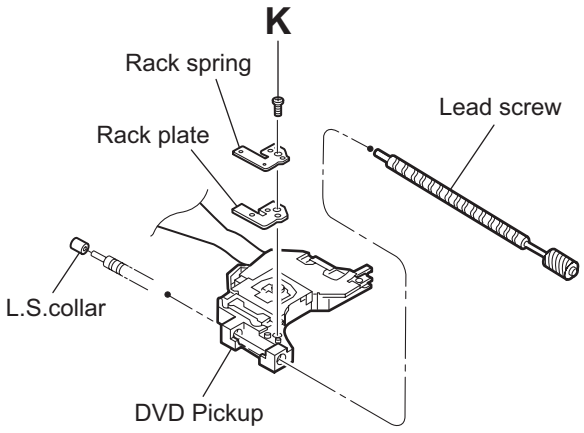


Fig.19

3.2.10 Removing the spindle motor (See Fig.20)

- Remove the mechanism control board.
  Remove the two screws **L** attaching the spindle motor on the bottom of the body.

Caution:
Perform adjustment when reattaching the spindle motor.

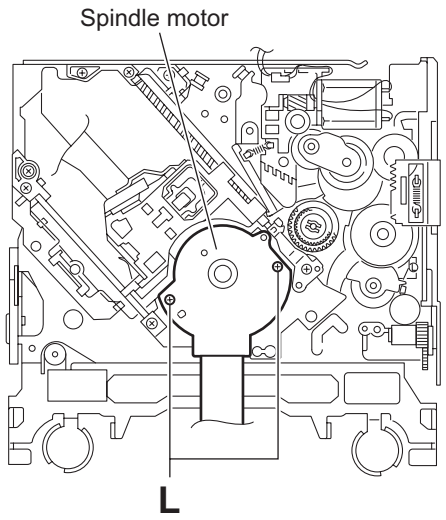


Fig.20

3.2.11 Removing the feed motor assembly (See Fig.21 and 22)

- Remove the mechanism control board.
  (1) Remove the feed TRI. spring on the bottom of the body. (See Fig.21.)
  (2) Remove the two screws **M** attaching the feed motor assembly. (See Fig.21.)
  (3) Remove the slit washer from the motor H. assembly and pull out the worm wheel. (See Fig.22.)

Remove the two screws **N** attaching the feed motor. (See Fig.22.)

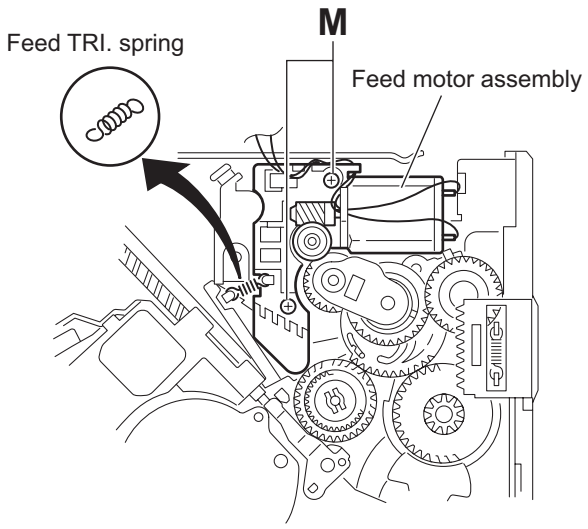


Fig.21

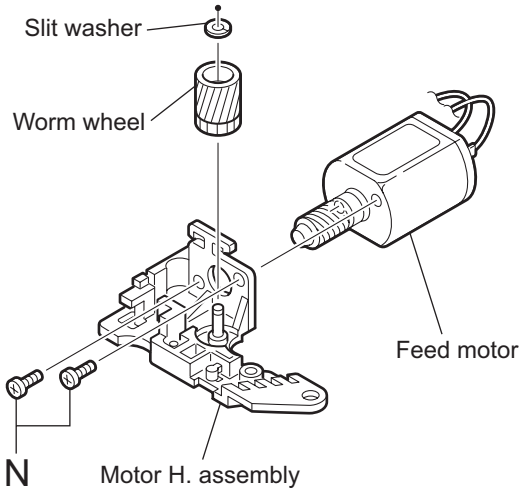


Fig.22

SECTION 4
ADJUSTMENT

4.1 Test instruments required for adjustment

(1) Digital oscilloscope (100MHz)
(2) Jitter meter
(3) Digital tester
(4) Electric voltmeter
(5) Tracking offset meter
(6) Test Disc : VT501 or VT502
(7) Extension studs : STDV001-3P
(8) Extension cable : EXTDV002-30P

4.2 Standard measuring conditions

Power supply voltage	DC14.4V(11 to 16V)
Load impedance	4Ω(2 Speakers connection)
Line Output	20KΩ

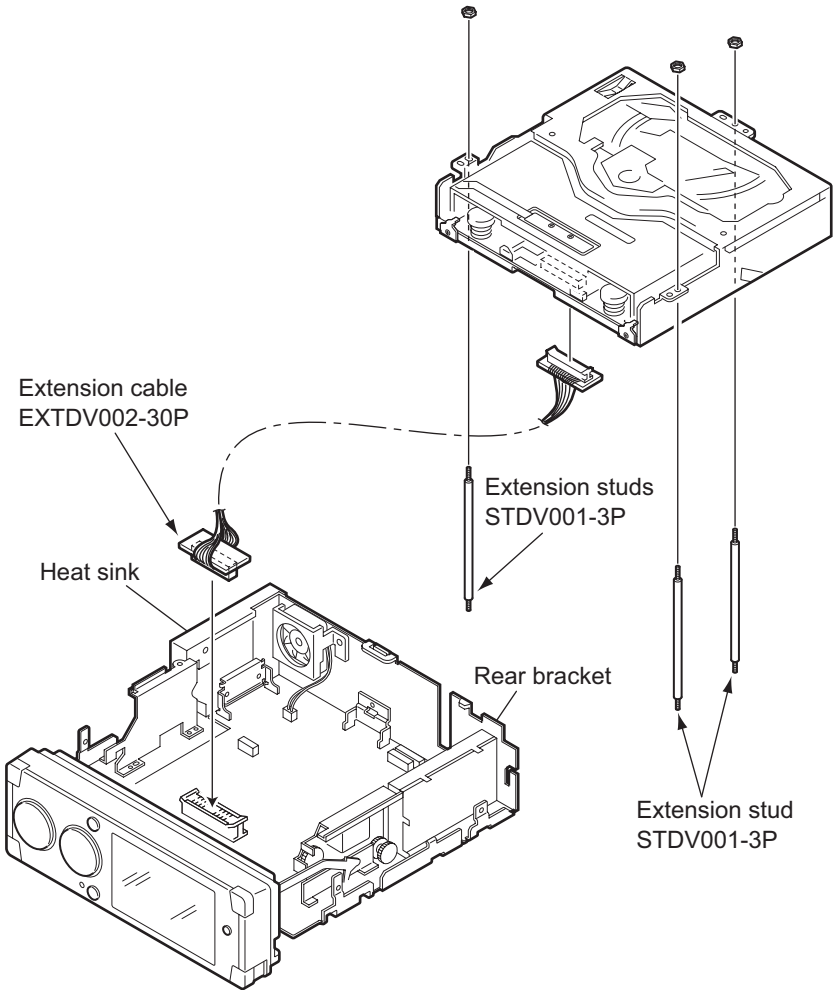
Caution:

Be sure to attach the heat sink and rear bracket onto the power amplifier IC and regulator IC respectively, before supply the power. If voltage is applied without attaching these parts, the power amplifier IC and regulator IC will be destroyed by heat.

4.3 Connection method

Connection procedure

(1) Attach the front chassis assembly to the main board.
(2) Attach the heat sink and rear bracket to the main board.
(3) Attach the extension studs to the DVD mechanism assembly.
(4) Connect the DVD mechanism assembly and the main board with a extension cable.

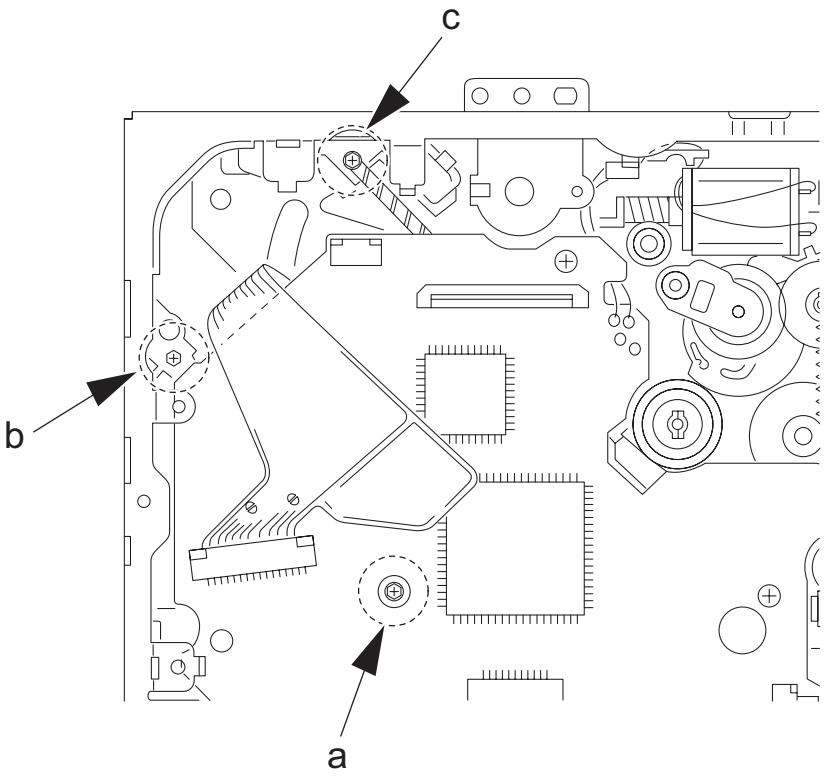


4.4 Adjustment method for jitter

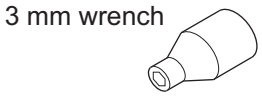
After replacing the pickup, set the unit in the service mode to display a jitter value on the LCD.
Confirm that the jitter value measured with a jitter meter is within 12% of the jitter value displayed on the LCD. If it is within 12%, then adjustment is not necessary.
If the measured jitter value is outside the 12% tolerance range, perform the following adjustments.

4.4.1 Adjustment procedure

(1) Connect each unit shown in Fig.1.
(2) Set the unit to the service mode and display a jitter value (hex data) on the LCD.
(3) Turn each of the screws a, b and c, by a half-turn per step, in the direction that reduces the jitter value in order to minimize it . (Do not turn a screw more than a half turn at a time, but adjust the screws in the cycle of **a** → **b** → **c** → **a**.)
(4) After completing the adjustment, secure the screws with screw lock paint.



Jitter value adjustment procedure (Pickup horizontal level adjustment relative to the DVD recording surface)
(For the adjustment tool use a 3 mm wrench and not a screwdriver, this procedure will make the adjustment easier.)



4.5 Jitter value conversion table

Load the test DVD and set the unit to the service mode. A jitter value converted to the hex value is displayed on the LCD. Refer to the corresponding decimal notation value shown in the following Jitter Conversion Table.
The adjustment is OK if the jitter value measured with a jitter meter is within 12% of the jitter value displayed on the LCD.
If the measured jitter value is outside the 12% tolerance range, adjust it to minimize the difference between the measured value and the displayed value.

Indicated on the LCD	Jitter value (%)	Indicated on the LCD	Jitter value (%)	Indicated on the LCD	Jitter value (%)
EF56	4.7	E79E	8.5	DFE6	12.3
EF22	4.8	E76A	8.6	DFB2	12.4
EEEE	4.9	E736	8.7	DF7E	12.5
EEBA	5.0	E702	8.8	DF4A	12.6
EE86	5.1	E6CE	8.9	DF16	12.7
EE52	5.2	E69A	9.0	DEE2	12.8
EE1E	5.3	E666	9.1	DEAE	12.9
EDEA	5.4	E632	9.2	DE7A	13.0
EDB6	5.5	E5FE	9.3	DE46	13.1
ED82	5.6	E5CA	9.4	DE12	13.2
ED4E	5.7	E596	9.5	DDDE	13.3
ED1A	5.8	E562	9.6	DDAA	13.4
ECE6	5.9	E52E	9.7	DD76	13.5
ECB2	6.0	E4FA	9.8	DD42	13.6
EC7E	6.1	E4C6	9.9	DD0E	13.7
EC4A	6.2	E492	10.0	DCDA	13.8
EC16	6.3	E45E	10.1	DCA6	13.9
EBE2	6.4	E42A	10.2	DC72	14.0
EBAE	6.5	E3F6	10.3	DC3E	14.1
EB7A	6.6	E3C2	10.4	DC0A	14.2
EB46	6.7	E38E	10.5	DBD6	14.3
EB12	6.8	E35A	10.6	DBA2	14.4
EADE	6.9	E326	10.7	DB6E	14.5
EAAA	7.0	E2F2	10.8	DB3A	14.6
EA76	7.1	E2BE	10.9	DB06	14.7
EA42	7.2	E28A	11.0	DAD2	14.8
EA0E	7.3	E256	11.1	DA9E	14.9
E9DA	7.4	E222	11.2	DA6A	15.0
E9A6	7.5	E1EE	11.3	DA36	15.1
E972	7.6	E1BA	11.4	DA02	15.2
E93E	7.7	E186	11.5	D9CE	15.3
E90A	7.8	E152	11.6	D99A	15.4
E8D6	7.9	E11E	11.7	D966	15.5
E8A2	8.0	E0EA	11.8	D932	15.6
E86E	8.1	E0B6	11.9	D8FE	15.7
E83A	8.2	E082	12.0	D8CA	15.8
E806	8.3	E04E	12.1	D896	15.9
E7D2	8.4	E01A	12.2	D862	16.0

Calculation

Indicated on the LCD	Jitter (%)
E9A6	7.5

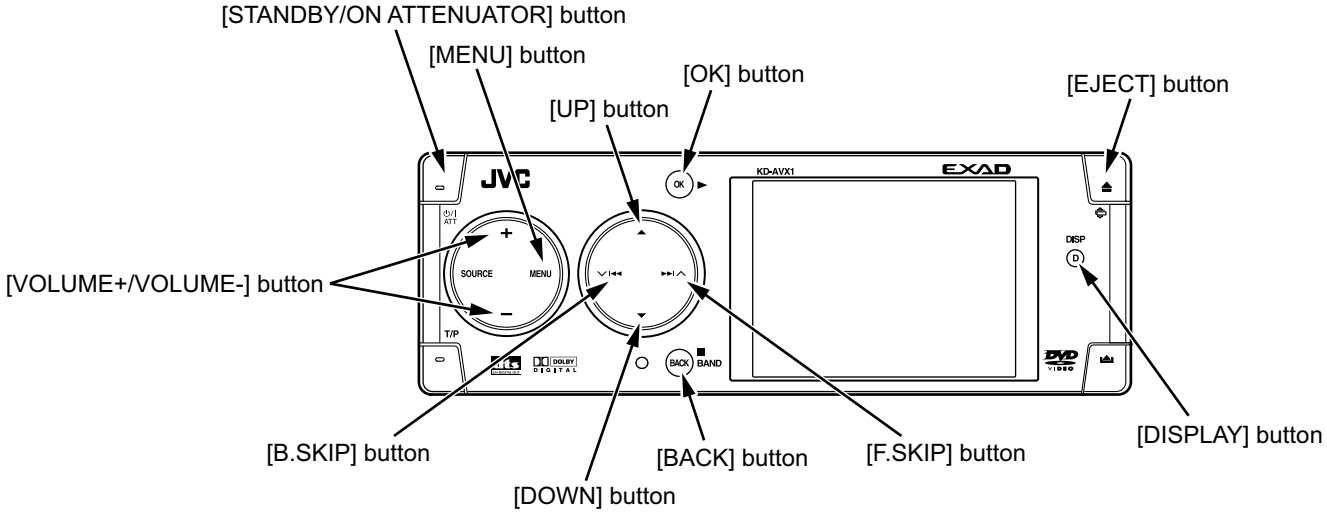
4.6 Service mode

4.6.1 Standard input/output conditions

Power supply voltage	DC14.4V(11 to 16V)
Load impedance	4Ω(2 Speakers connection)
Line Output	20KΩ

4.6.2 Service mode setting procedure

(The DVD does not need to be loaded before starting the following procedure.)



4.6.3 Operation procedures

1. Service mode 1 (Indication is displayed in SERVICE MODE.)

Keep this state more than 2 seconds while continuing pressing the [STANDBY/ON ATTENUATOR] button and [EJECT] button sequentially.

Screen indication

```
SERVICE MODE
  NO  EJECT            *1
  EMERGENCY  EJECT     *2
```

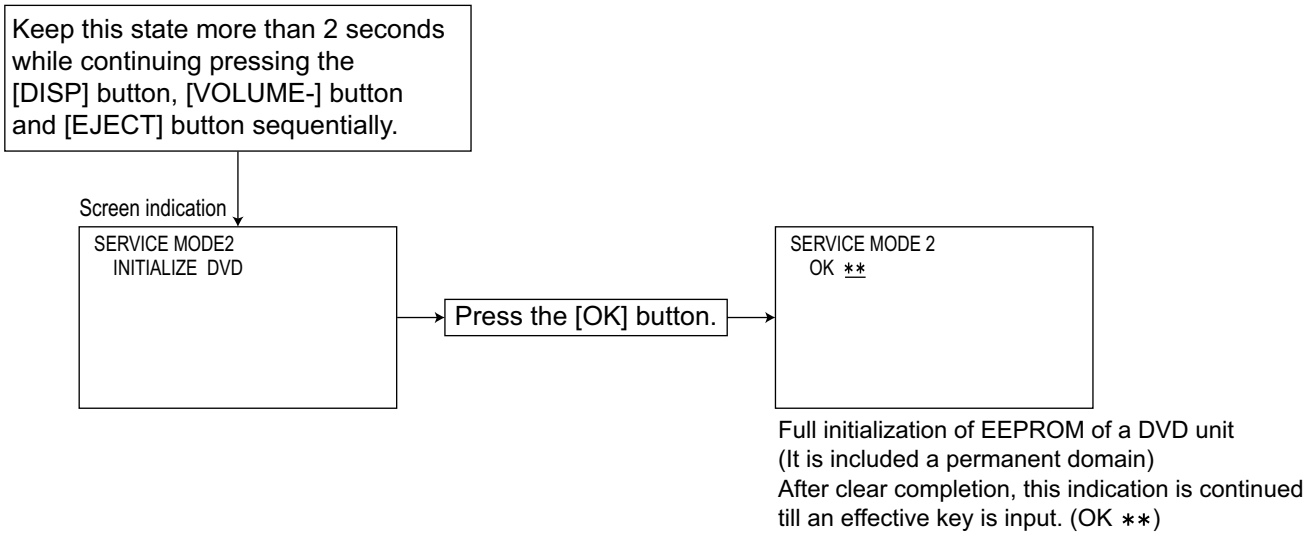
Exchanging it operate a menu of a service mode with the [UP] button and [DOWN] button. Operate choice of a menu with a [OK] button.

*1 : When an [OK] button is pushed in NO EJECT indication, it is set by an EJECT prohibition mode.
When an [OK] button is pushed in EJECT OK indication, it is set by a normal mode.

*2 : Forced EJECT movement

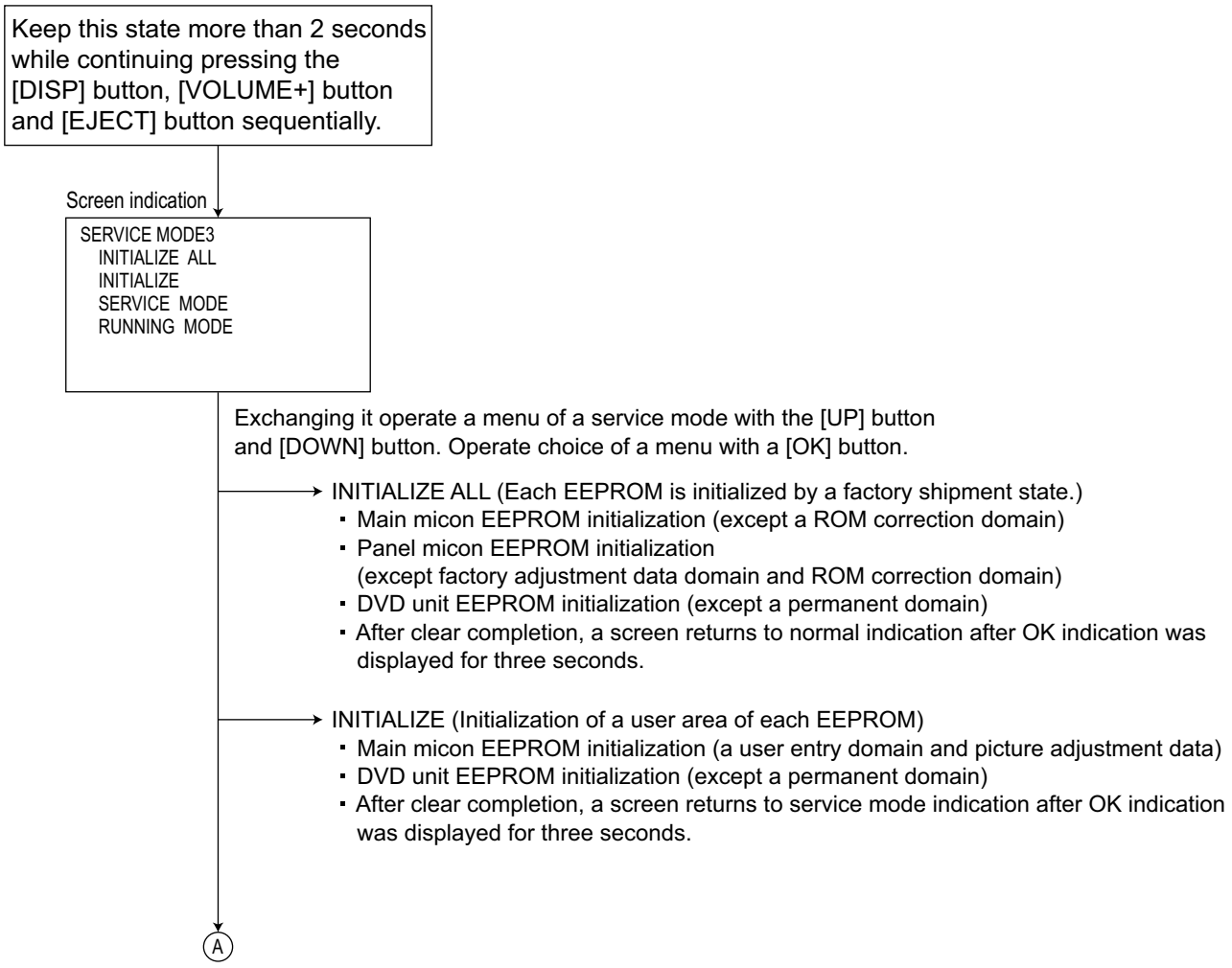
A screen becomes normal indication after an OK button was pushed.

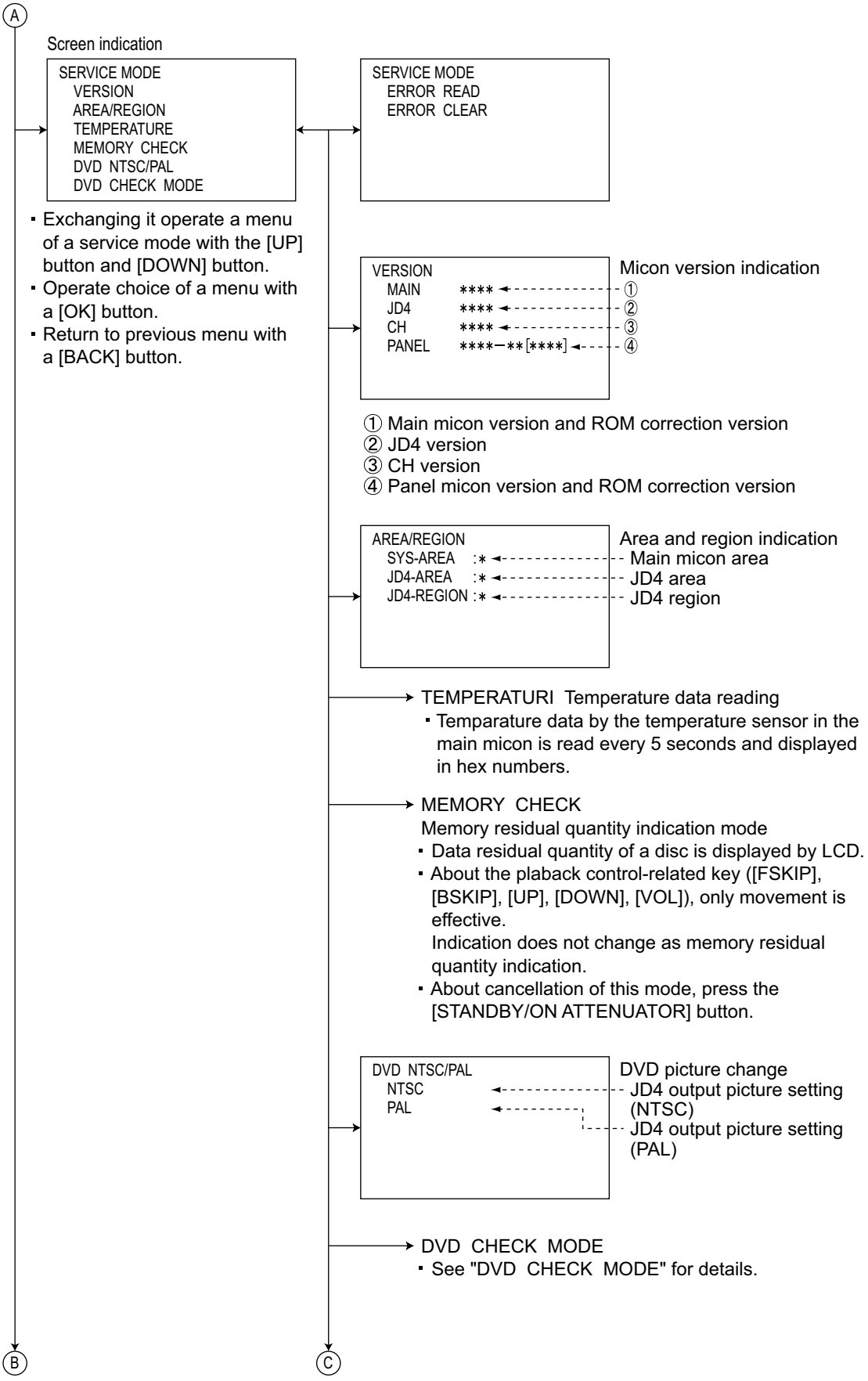
2. Service mode 2

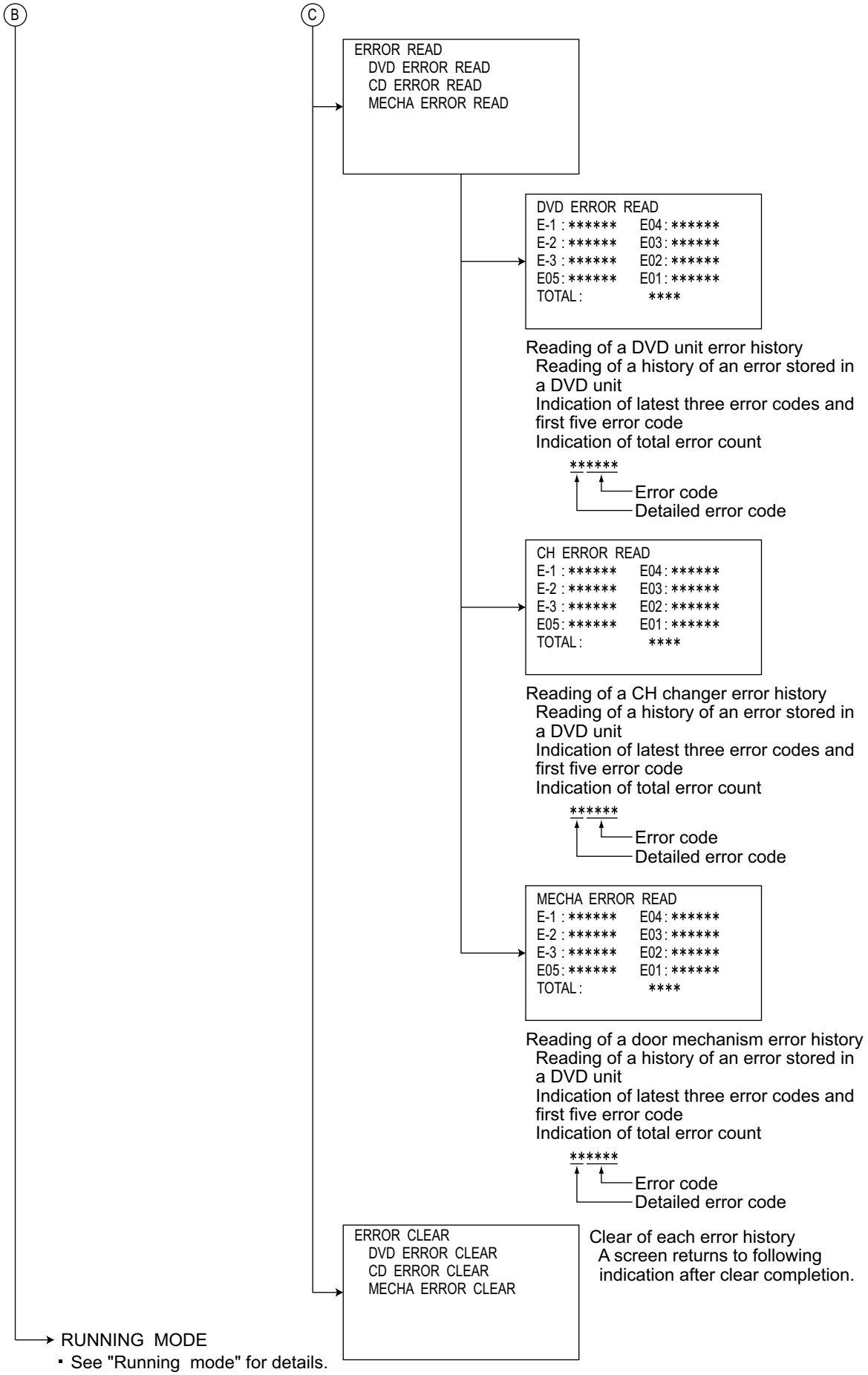


Full initialization of EEPROM of a DVD unit
(It is included a permanent domain)
After clear completion, this indication is continued till an effective key is input. (OK ∗∗)

3. Service mode 3




A
Screen indication
SERVICE MODE
VERSION
AREA/REGION
TEMPERATURE
MEMORY CHECK
DVD NTSC/PAL
DVD CHECK MODE
SERVICE MODE
ERROR READ
ERROR CLEAR
▪ Exchanging it operate a menu of a service mode with the [UP] button and [DOWN] button.
▪ Operate choice of a menu with a [OK] button.
▪ Return to previous menu with a [BACK] button.
VERSION
MAIN **** ①
JD4 **** ②
CH **** ③
PANEL ****-**[****] ④
Micon version indication
① Main micon version and ROM correction version
② JD4 version
③ CH version
④ Panel micon version and ROM correction version
AREA/REGION
SYS-AREA :*
JD4-AREA :*
JD4-REGION :*
Area and region indication
Main micon area
JD4 area
JD4 region
TEMPERATURI Temperature data reading
▪ Temparature data by the temperature sensor in the main micon is read every 5 seconds and displayed in hex numbers.
MEMORY CHECK
Memory residual quantity indication mode
▪ Data residual quantity of a disc is displayed by LCD.
▪ About the plaback control-related key ([FSKIP], [BSKIP], [UP], [DOWN], [VOL]), only movement is effective.
Indication does not change as memory residual quantity indication.
▪ About cancellation of this mode, press the [STANDBY/ON ATTENUATOR] button.
DVD NTSC/PAL
NTSC
PAL
DVD picture change
JD4 output picture setting (NTSC)
JD4 output picture setting (PAL)
DVD CHECK MODE
▪ See "DVD CHECK MODE" for details.
B
C


B
C
ERROR READ
DVD ERROR READ
CD ERROR READ
MECHA ERROR READ
DVD ERROR READ
E-1 : ******
E-2 : ******
E-3 : ******
E05 : ******
TOTAL :
E04 : ******
E03 : ******
E02 : ******
E01 : ******
****
Reading of a DVD unit error history
Reading of a history of an error stored in a DVD unit
Indication of latest three error codes and first five error code
Indication of total error count
******
Error code
Detailed error code
CH ERROR READ
E-1 : ******
E-2 : ******
E-3 : ******
E05 : ******
TOTAL :
E04 : ******
E03 : ******
E02 : ******
E01 : ******
****
Reading of a CH changer error history
Reading of a history of an error stored in a DVD unit
Indication of latest three error codes and first five error code
Indication of total error count
******
Error code
Detailed error code
MECHA ERROR READ
E-1 : ******
E-2 : ******
E-3 : ******
E05 : ******
TOTAL :
E04 : ******
E03 : ******
E02 : ******
E01 : ******
****
Reading of a door mechanism error history
Reading of a history of an error stored in a DVD unit
Indication of latest three error codes and first five error code
Indication of total error count
******
Error code
Detailed error code
ERROR CLEAR
DVD ERROR CLEAR
CD ERROR CLEAR
MECHA ERROR CLEAR
Clear of each error history
A screen returns to following indication after clear completion.
RUNNING MODE
▪ See "Running mode" for details.

4. Service mode 4

Keep this state more than 2 seconds while continuing pressing the [DISP] button, [BACK] button and [EJECT] button sequentially.

Screen indication

```
SERVICE MODE4
   RDS  S  MODE
   MONITOR  S  MODE
```

Exchanging it operate a menu of a service mode with the [UP] button and [DOWN] button. Operate choice of a menu with a [OK] button.

```
RDS  S  MODE
VER=V*****    PTY=*****
SPI=*****     SM = *****
PI  = *****   SQ = *****
TP = *        TA = *
MS =*         PI = *
```

RDS service mode
Only RDS model

```
MONITOR  S  MODE
   R/W  CHROMA 1
   R/W  CHROMA 2
   DATA  CLEAR
```

* See "Monitor adjustment" for details.
CHROMA DATA read/write of NTSC/PAL signal processing IC
CHROMA DATA read/write of TFT driver IC
Clear of CHROMA DATA of 1,2 (return to an initial value)

4.6.4 DVD check mode

```
DVD  CHECK  MODE
   NORMAL  PLAY
   EF  OUT-TRACKING  OFF
   EF  IN-TRACKING  OFF
   CD-LASER  ON
   DVD-LASER  ON
   DVDx1  JITTER  MODE
```

<->

```
DVD  CHECK  MODE
   EEPROM  DATA  DISP
   EEPROM  DATA  CLEAR
   TEMPERATURE
   SEARCH & JITTER
   MONITOR
   PLAY
```

<->

```
DVD  CHECK  MODE
   STOP
   OPEN
   CLOSE
```

Exchanging it operate a menu of a service mode with the [UP] button and [DOWN] button. Operate choice of a menu with a [OK] button.

Command	Mechanism unit operation	Indication contents
NORMAL PLAY	Start at normal speed (After start, jitter is measured by an inner position.)	Laser current value, jitter value
EF OUT-TRACKING OFF	Tracking off the outermost position of CD	For EF phase error
EF IN-TRACKING OFF	Tracking off the innermost position of CD	For EF phase error
CD-LASER ON	CD_LD lights and laser current is displayed.	Laser current value, jitter value
DVD-LASER ON	DVD_LD lights and laser current is displayed.	Laser current value, jitter value
DVDx1 JITTER MODE	DVD x1 jitter measuring mode (for use in mechanism adjustment)	Laser current value, jitter value
EEPROM DATA DISP	Contents of EEPROM is displayed.	EEPROM address EEPROM contents
EEPROM DATA CLEAR	Contents of EEPROM is initialized.	EEPROM address EEPROM contents
TEMPERATURE	Temperature indication	Temperature is displayed in hex numbers.
SEARCH & JITTER	The search and jitter measurement to an appointed position of DVD.	Position measured with VT-501 Jitter value
MONITOR	Monitor terminal setting	
PLAY	DVDx1 speed start (After start, jitter is measured by an inner position.)	Not displayed.
STOP	Disc stopped, LD-OFF	Not displayed.
OPEN	OPEN	Not displayed.
CLOSE	CLOSE	Not displayed.

4.6.5 Error code tables

Mechanism error code

Error contents	Details	Error code	Detailed error code
Disc loading error			
① B1 time out		0x99	0x0011
② C1 time out		0x99	0x0012
③ D1 time out		0x99	0x0013
④ C2 time out		0x99	0x0014
⑤ B2 time out		0x99	0x0015
⑥ A2 time out		0x99	0x0016
⑦ F1 time out		0x99	0x0017
⑧ A0 (Switch state without existence)		0x99	0x0018
⑨ G1 time out		0x99	0x0019
Eject error			
① F2 time out		0x01	0x0021
② A1 time out		0x01	0x0022
③ B1 time out		0x01	0x0023
④ C1 time out		0x01	0x0024
⑤ D1 time out		0x01	0x0025
⑥ C2 time out		0x01	0x0026
⑦ B2 time out		0x01	0x0027
⑧ A0 (Switch state without existence)		0x01	0x0028
⑨ G2 time out		0x01	0x0029
Error in loading wait	Loading of a running mode Disc was pulled out in a wait.	0x09	0x0031
Loading re-execution → NG → Eject	Running mode error	0x09	0x0032
Eject re-execution → NG → Loading	Running mode error	0x01	0x0033

Disc error code

Error contents	Details	Error code	Detailed error code
TOC read error	TOC lead movement of a CD is not completed.	0x84	0x0059
First track access error	Even if TOC reading passes after the end with CD running mode for 30 seconds, the first track access is not finished.	0x80	0x0060
Last track access error	Even if first track passes after the end with CD running mode for 30 seconds, the last track access is not finished.	0x80	0x0061
T1 access error	Even if T1 access passes in a DVD running mode for 30 seconds, it is not finished.	0x80	0x0069
T12 access error	Even if T12 access passes in a DVD running mode for 30 seconds, it is not finished.	0x80	0x0070
T24 access error	Even if T24 access passes in a DVD running mode for 30 seconds, it is not finished.	0x80	0x0071
Read-in area read error	Read-in area read operation of DVD is not completed.	0x84	0x0072
SDRAM read/write error	Read/write to SDRAM is not normal.	0x80	0x0073
DVD L1 layer adjustment error	Adjustment of L1 layer of DVD is not finished normally. (including focus jump failure)	0x80	0x0074
NODISC judgment	Judgment without disc	0x80	0x0090
It is NODISC by start failure.	Start is impossible.	0x80	0x0091
It is stopped by playback inability.	Stop in running mode playback	0x80	0x0093

4.6.6 Running mode

Indication	Explanation	Operation contents of 1 cycle	In mecha error	In disc error	SDRAM inspection
RUNNING1 MECHA	Door mecha running1	Panel close→Panel open	-	-	-
RUNNING2 MECHA	Door mecha running1	Panel close→Panel open→Panel detach position→ Panel angle 3 position→Panel angle 1 position→ Panel angle 2 position	-	-	-
RUNNING3 DVD	DVD+Door mecha running1	Loading→Eject→Wait for 5 seconds+Door open/close	Stop	-	-
RUNNING4 DVD	DVD+Door mecha running2	Loading→Eject→Wait for 5 seconds+Door open/close	Retry	-	-
RUNNING5 DVD	DVD+Door mecha running3	Loading→Playback→Eject→Wait for 5 seconds+Door open/close	Stop	Stop	Execution
RUNNING6 DVD	DVD+Door mecha running4	Loading→Playback→Eject→Wait for 5 seconds+Door open/close	Retry	Stop	Execution
RUNNING7 DVD	DVD+Door mecha running5	Loading→Playback→Eject→Wait for 5 seconds+Door open/close	Stop	Retry	Non-execution
RUNNING8 DVD	DVD+Door mecha running6	Loading→Playback→Eject→Wait for 5 seconds+Door open/close	Retry	Retry	Non-execution

∗ Cancellation of running1,2 : Press the [EJECT] key
∗ In running 1,2 cancellation, a door does not stop at the position and moves to a panel open position.
∗ Cancellation of running3 to 8 : Press the [POWER] key
∗ The number of count and an error cord are displayed in running.

Playback contents in a running mode
・CD
The first track is played for 30 seconds.→The last track is played for 30 seconds.
(The last truck is played in the case of less than till the last for 30 seconds.)
・DVD
2layer disc
Title 1 (the L0 layer internal circumference) is played for 30 seconds.→Title 12 (L0 layer circumference) is played for 30 seconds.
→Title 24 (L1 layer internal circumference) is played for 30 seconds.
1layer disc
First chapter of title 1 is played for 30 seconds.→The last chapter of title 1 is played for 30 seconds.

4.6.7 Writing method for micon ROM correction

∗ For main ROM correction and panel ROM correction, prepare two pieces of disc.
(Do not put both data in one piece of disk.)

・ Insert the disc which ROM correction data were written in at.

・Folder name : ROM Correction
・File name : Please Wait
↓
・Folder name : ROM Correction
・File name : OK 1940 (Indication is different by ROM correction IC.)

・ If OK is displayed, ROM correction is completion. Disc is ejected automatically.

・ Pull the power supply cord and wait more than 30 seconds. (Even reset is possible.)

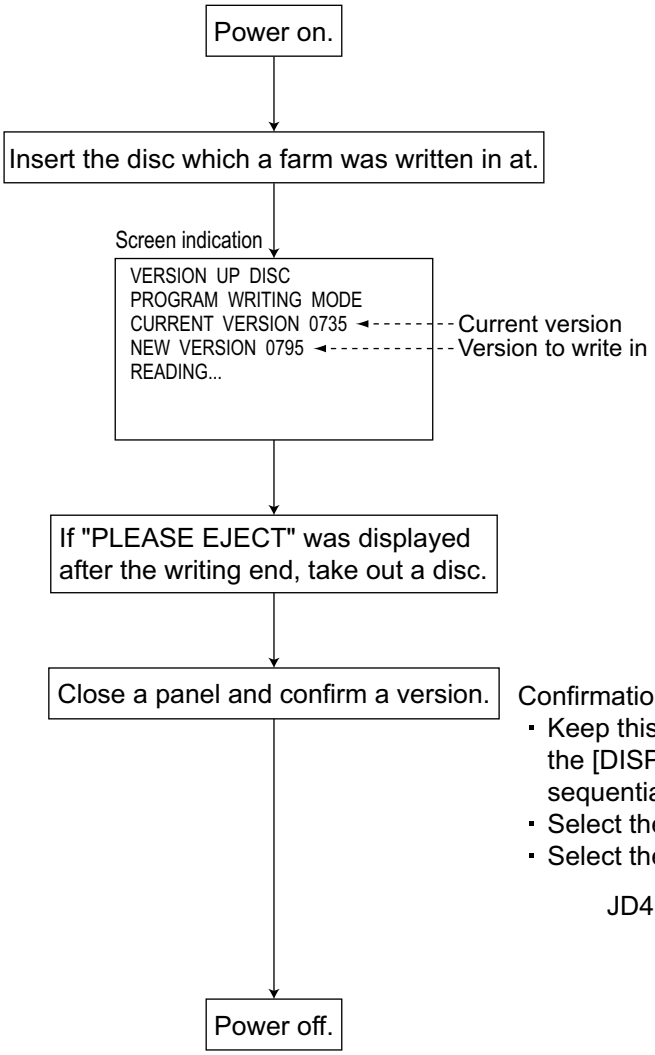
・ Switch on the main body again and confirm a version.

Confirmation method of a version
・ Keep this state more than 2 seconds while continuing pressing the [DISP] button, [VOLUME+] button and [EJECT] button sequentially to enter this set in service mode 3.
・ Select the service mode and press the [OK] button.
・ Select the version and press the [OK] button.
・ ROM correction is completion if displayed on a screen as follows.

PANEL V∗∗∗−∗∗ [V001]
PANEL : panel ROM correction
MAIN : main ROM correction
ROM correction version

∗ When it was confirmed a version without reset, a part of [V001] is displayed in [E001].
When a ROM collection is not completed even if writing of EEPROM is completed, this indication appears.
Movement of this case is movement before the ROM collection.

4.6.8 Update method of firm ware



Confirmation method of a version

- Keep this state more than 2 seconds while continuing pressing the [DISP] button, [VOLUME+] button and [EJECT] button sequentially to enter this set in service mode 3.
- Select the service mode and press the [OK] button.
- Select the version and press the [OK] button.

JD4****

It is a version written in.

4.6.9 Monitor adjustment

∗When adjusting, switch on the main unit and insert a test disc (VT-501). And play the test disc and pause it. (Exit for VCO FREE-RUN adjustment)

R/W CHROMA 1

1. Set the service mode 4.
2. Exchanging it operate a menu of a service mode with the [UP] button and [DOWN] button.
3. Change data with the [B.SKIP]/[F.SKIP] buttons.
4. Write data with a [OK] button.

∗When performing the VCO FREE-RUN N adjustment, set the NTSC mode (Service mode 3→Service mode→ DVD NTSC/PAL) and turn the input into the no input. Connect the frequency counter to the point (TP661 or TP681-GND) on the panel board and set the frequency into 15.62±0.01 (kHz).

∗When performing the VCO FREE-RUN P adjustment, set the PAL mode (Service mode 3→Service mode→ DVD NTSC/PAL) and turn the input into the no input. Connect the frequency counter to the point (TP661 or TP681-GND) on the panel board and set the frequency into 15.73±0.01 (kHz).

Indication	Minimum value	Maximum value	Initial value	Production jig initial value	Reference register value		
COM AMPLITUDE	0x00	0xFF	0x80	0x80	0x80	Fix	
BRIGHT GAIN	0x00	0xFF	0x80	0x80	0x80	Fix	
COLOR GAIN N	0x00	0xFF	0x80	0x5F	0x60	Adjust	
COLOR GAIN P	0x00	0xFF	0x80	0x62	0x62	Adjust	
TINT N	0x00	0xFF	0x80	0x82	0x6D	Adjust	
TINT P	0x00	0xFF	0x80	0x80	0x80	Adjust	
BLACK LIMITER	0x00	0x7F	0x40	0x5E	0x5E	Fix	
BRIGHT	0x00	0xFF	0x80	0xA3	0xA3	Adjust	
APERTURE	0x00	0x7F	0x40	0x40	0x40	Fix	
R SUB BRIGHT	0x00	0xFF	0x80	0x88	0x88	Adjust	
B SUB BRIGHT	0x00	0xFF	0x80	0x88	0x89	Adjust	
W PEAK LIMITER	0x00	0x7F	0x40	0x7F	0x7F	Fix	
GAMMA1	0x00	0xFF	0x80	0x80	0x80	Fix	
GAMMA2	0x00	0xFF	0x80	0xFF	0xFF	Fix	
CONTRAST	0x00	0xFF	0x80	0x64	0x65	Adjust	
R SUB CONTRAST	0x00	0xFF	0x80	0x74	0x71	Adjust	
B SUB CONTRAST	0x00	0xFF	0x80	0x78	0x74	Adjust	
∗VCO FREE RUN N	0x00	0xFF	0x80	0x8C	0x8F	Adjust	15.62 kHz
∗VCO FREE RUN P	0x00	0xFF	0x80	0x89	0x8B	Adjust	15.73 kHz
PLL STOP POS	0x00	0x0F	0x00	0x08	0x08	Fix	
V POSITION	0x00	0x07	0x00	0x02	0x02	Fix	
H POSITION	0x00	0x1F	0x00	0x1F	0x1F	Fix	
PWM FREQUENCY	0x00	0x0F	0x08	0x08	0x08	Fix	
BRST CLN PLS POS	0x00	0x07	0x00	0x03	0x03	Fix	
PWM DUTY	0x00	0xFF	0x80	0xFF	0xFF	Fix	
COM DC	0x00	0xFF	0x80	0x80	0x80	Fix	
DC OUTPUT	0x00	0xFF	0x80	0x65	0x43	Adjust	

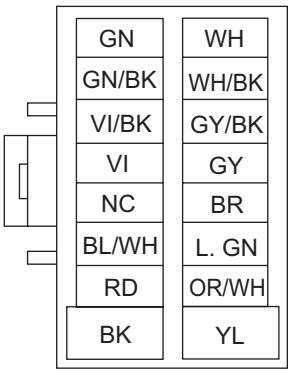
R/W CHROMA 2

1. Set the service mode 4.
2. Exchanging it operate a menu of a service mode with the [UP] button and [DOWN] button.
3. Change data with the [B.SKIP]/[F.SKIP] buttons.
4. Write data with a [OK] button.

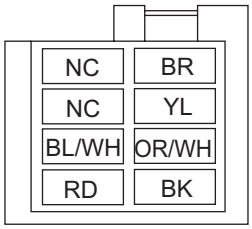
Indication	Minimum value	Maximum value	Initial value	Production jig initial value	Reference register value	
H POSITION	0x00	0x1F	0x10	0x12	0x13	Adjust
V POSITION	0x00	0x0F	0x08	0x08	0x08	Adjust
HDO POSITION	0x00	0x1F	0x00	0x02	0x02	Fix
BRIGHT	0x00	0x7F	0x40	0x4D	0x4E	Adjust
R BRIGHT	0x00	0x7F	0x40	0x3E	0x3E	Adjust
B BRIGHT	0x00	0x7F	0x40	0x40	0x41	Adjust
COMLEVEL M	0x00	0x1F	0x10	0x09	0x08	Adjust
COMLEVEL E	0x00	0x1F	0x10	0x10	0x10	Fix
COMDC M	0x00	0x3F	0x29	0x33	0x31	Adjust
COMDC E	0x00	0x3F	0x32	0x32	0x32	Fix
VCO N	0x00	0xFF	0x80	0x70	0x61	Adjust
VCO P	0x00	0xFF	0x80	0x76	0x69	Adjust

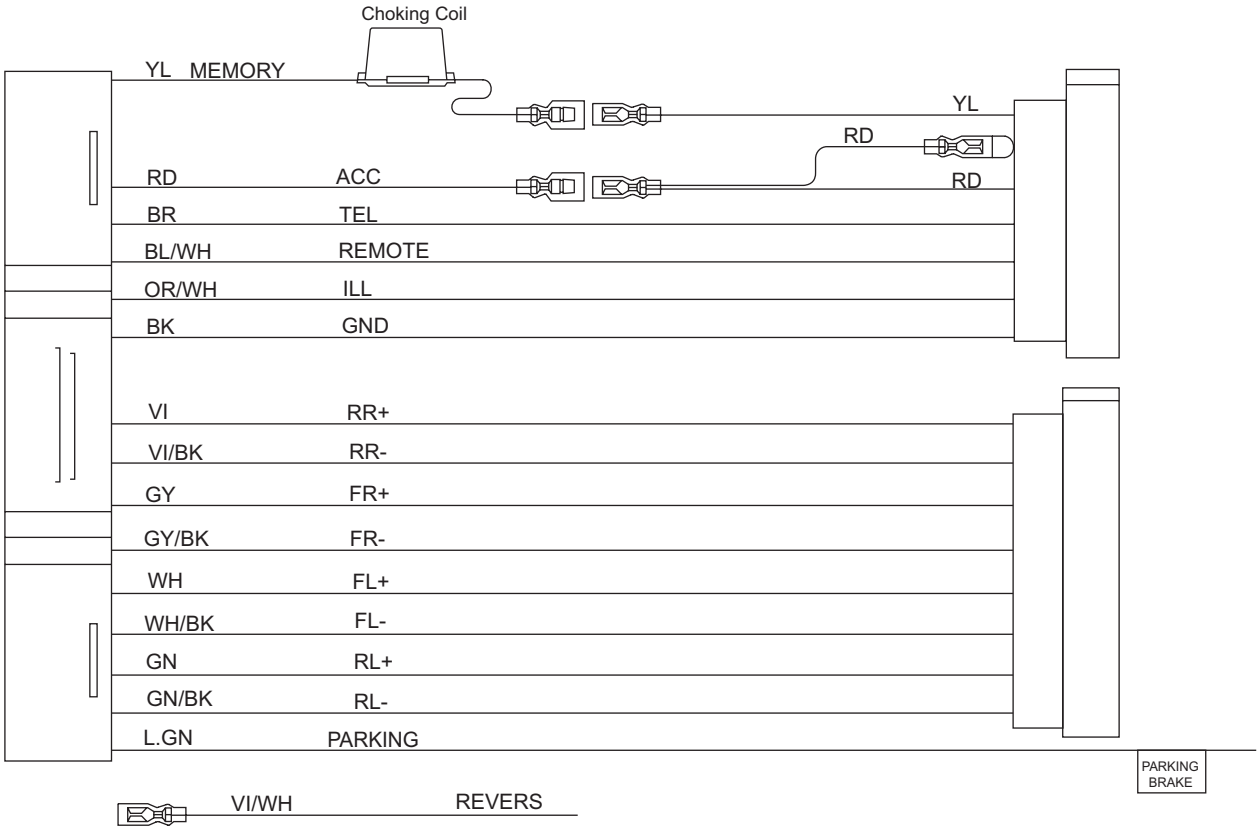
SECTION 5
TROUBLESHOOTING

5.1 16 PIN CORD DIAGRAM [for E version]

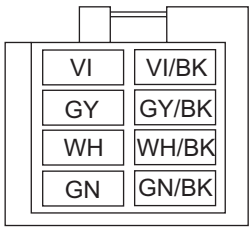


BK	Black	GN	Green
RD	Red	VI	Violet
BL	Blue	GY	Gray
WH	White	YL	Yellow
BR	Brown	OR	Orange
L.GN	Light Green		

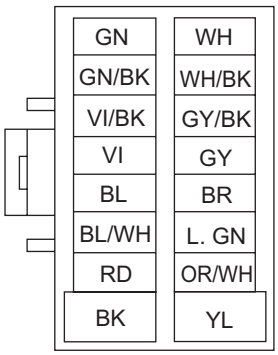




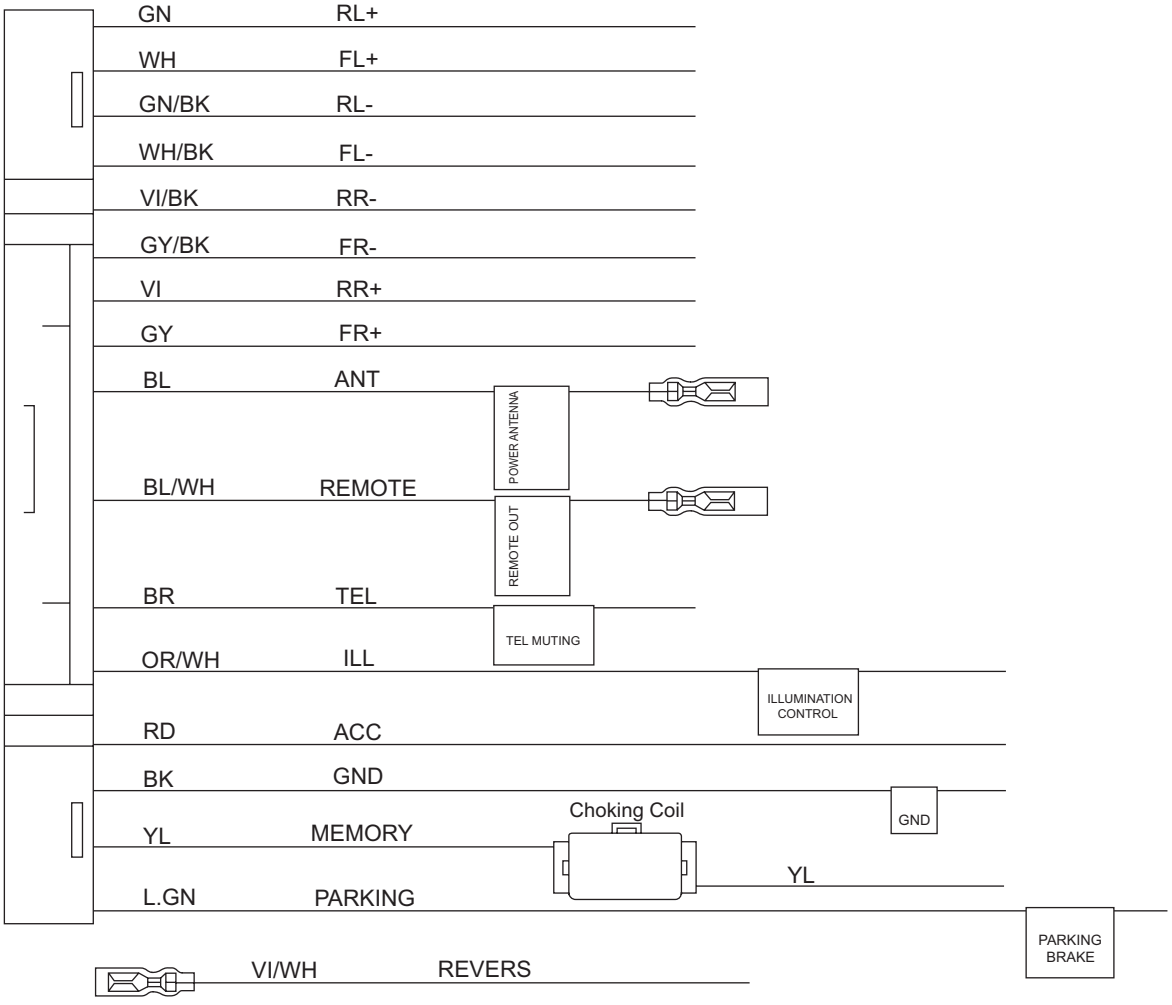
RR	Rear Right	ACC	ACC Line
FR	Front Right	TEL	Telephone Muting
FL	Front Left	GND	Ground
RL	Rear Left	MEMORY	Memory Backup Battery+
REMOTE	Remote	PARKING	Parking Brake
ILL	Illuminations Control	ANT	Auto Antenna
REVERS	Revers Gear Signal		



5.2 16 PIN CORD DIAGRAM [for A, J, U, UN, UT version]



BK	Black	GN	Green
RD	Red	VI	Violet
BL	Blue	GY	Gray
WH	White	YL	Yellow
BR	Brown	OR	Orange
L.GN	Light Green		



RR	Rear Right	ACC	ACC Line
FR	Front Right	TEL	Telephone Muting
FL	Front Left	GND	Ground
RL	Rear Left	MEMORY	Memory Backup Battery+
REMOTE	Remote	PARKING	Parking Brake
ILL	Illuminations Control	ANT	Auto Antenna
REVERS	Revers Gear Signal		

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Victor Company of Japan, Limited
AV & MULTIMEDIA COMPANY CAR ELECTRONICS CATEGORY 10-1,1chome,Ohwatari-machi,Maebashi-city,371-8543,Japan

(No.MA165)

Printed in Japan
VPT