

# JVC

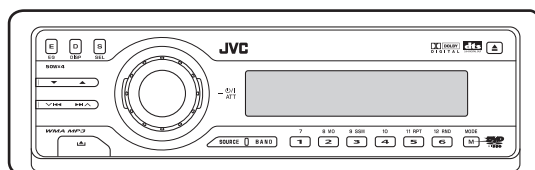
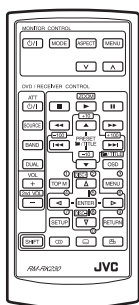
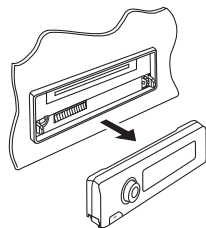
## SERVICE MANUAL

### DVD/CD RECEIVER

# KD-DV5104, KD-DV5103

Area suffix

UI ----- India



WMA MP3



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# SPECIFICATION

## AUDIO AMPLIFIER SECTION

Maximum Power Output	Front	50 W per channel
	Rear	50 W per channel
Continuous Power Output (RMS)	Front	19 W per channel into 4 $\Omega$ , 40 Hz to 20 000 Hz at no more than 0.8% total harmonic distortion.
	Rear	19 W per channel into 4 $\Omega$ , 40 Hz to 20 000 Hz at no more than 0.8% total harmonic distortion.
Load Impedance	4 $\Omega$ (4 $\Omega$ to 8 $\Omega$ allowance)	
Equalizer Control Range	Frequencies	60 Hz, 150 Hz, 400 Hz, 1 kHz, 2.4 kHz, 6 kHz, 15 kHz
	Level	$\pm 10$ dB
Signal-to-Noise Ratio	70 dB	
Audio Output Level	Digital (DIGITAL OUT: Optical)	Signal wave length : 660 nm Output level : -21 dBm to -15 dBm
	Line-Out Level/Impedance	2.5 V/20 k $\Omega$ load (full scale)
	Output Impedance	1 k $\Omega$
Color System	PAL/NTSC	
Video Output (composite)	1 V <sub>p-p</sub> /75 $\Omega$	
Other Terminals	LINE IN, 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 $\mu$ V/75 $\Omega$ )
	50 dB Quieting Sensitivity	16.3 dBf (1.8 $\mu$ V/75 $\Omega$ )
	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 $\mu$ V
	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/96 kHz	16 Hz to 22 000 Hz
	VCD, CD, MP3, WMA	16 Hz to 20 000 Hz
Dynamic Range	96 dB	
Signal-to-Noise Ratio	98 dB	
Wow and Flutter	Less than measurable limit	
MP3 (MPEG Audio Layer 3)	Max. Bit Rate: 320 kbps	
WMA (Windows Media Audio)	Max. Bit Rate: 192 kbps	


## 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 $\times$ H $\times$ D)	Installation Size (approx.)	182 mm $\times$ 52 mm $\times$ 158 mm
	Panel Size (approx.)	188 mm $\times$ 58 mm $\times$ 11 mm
Mass (approx.)	1.7 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 performing 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.

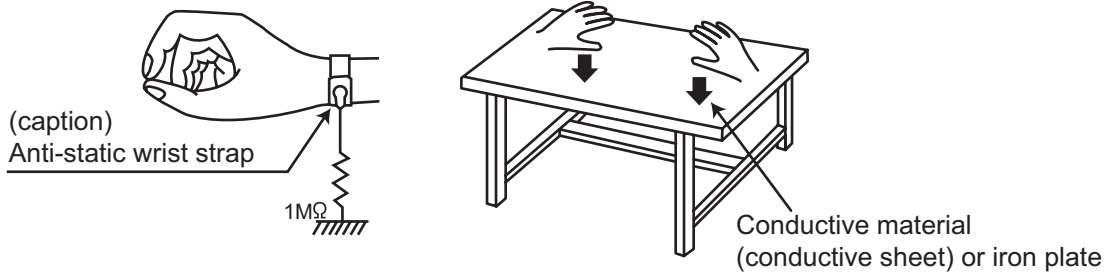
Be careful to use proper grounding in the area where repairs are being performed.

(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.

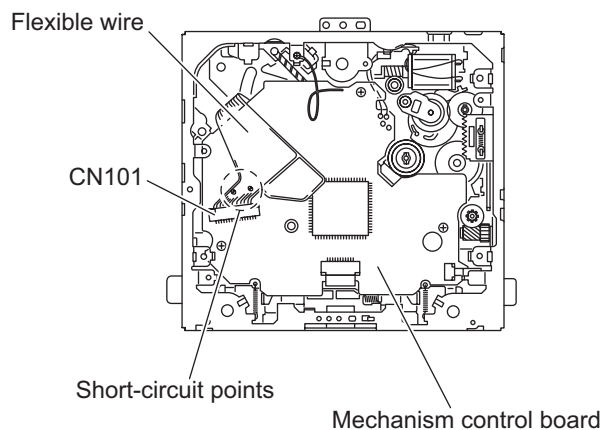
## 1.3 Handling the traverse unit (optical pickup)

- (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 interlock 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 EXPOSURE TO BEAM.

**ADVARSEL** : Synlig og usynlig laserstråling når maskinen er åben eller interlocken fejler. Undgå direkte eksponering til stråling.

**VARNING** : Synlig och osynlig laserstråling när den öppnas och spärren är urkopplad. Betrakta ej strålen.

**VARO** : Avattaessa ja suojalukitus ohitettuna tai viallisena olet alttiina näkyvälle ja näkymättömälle 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 fejler. Undgå direkte eksponering til stråling. (d)

**VARNING** : Synlig och osynlig laserstråling 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 front panel assembly (See Fig.1)

Push the detach button in the lower left part of the front panel assembly and remove the front panel assembly.

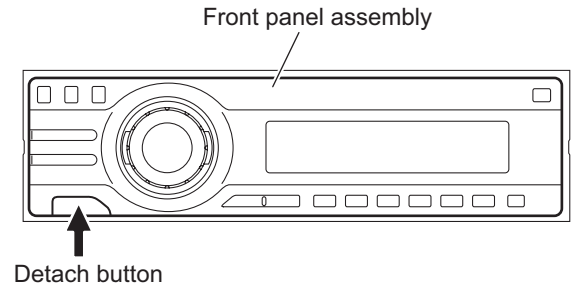


Fig.1

#### 3.1.2 Removing the bottom cover (See Fig.2)

**Reference:**

Remove the front panel assembly as required.

- (1) Release the two joints **a**, two joints **b** and joint **c**.
- (2) Remove the bottom cover from the main body.

**Caution:**

Do not damage the main board when releasing the joints using a screwdriver or a similar tool.

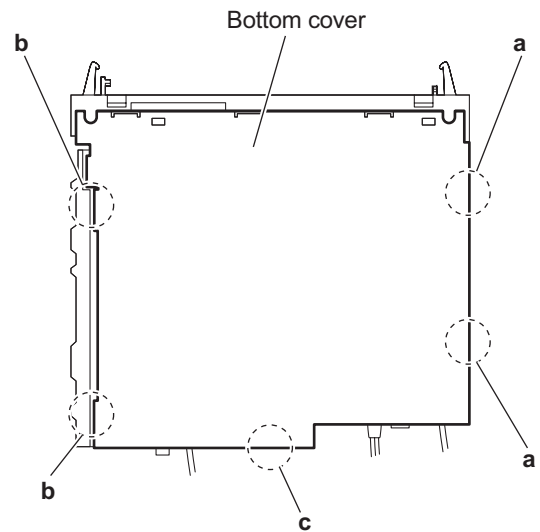


Fig.2

### 3.1.3 Removing the front chassis assembly (See Figs.3 and 4)

- Remove the front panel assembly and bottom cover.
  - From the front side of the main body, remove the two screws **A** attaching the front chassis assembly. (See Fig.3.)
  - From the both sides of the main body, remove the two screws **B** attaching the front chassis assembly. (See Fig.4.)
  - Release the two joints **d** and two joints **e**. (See Fig.4.)

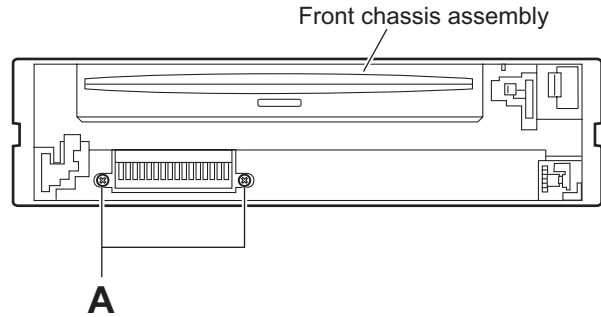


Fig.3

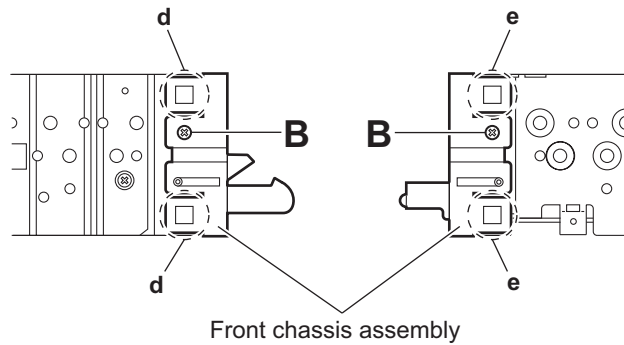


Fig.4

### 3.1.4 Removing the side heat sink (See Fig.5)

#### Reference:

Remove the front panel and front chassis assemblies as required.

From the left side of the main body, remove the two screws **C** and three screws **D** attaching the side heat sink.

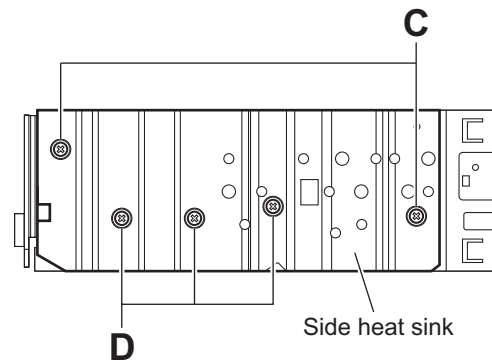


Fig.5



### 3.1.5 Removing the rear bracket (See Fig.6)

- Remove the bottom cover.
  - From the back side of the main body, remove the two screws **E**, two screws **E'**, screw **F**, two screws **G** and three screws **H** attaching the rear bracket.
  - Remove the LINE IN cable from the rear bracket in the direction of the arrow.

#### Reference:

- When attaching the LINE IN cable, insert it in a slot of the rear bracket and hang it on a wire holder.
- When attaching the screws **E'**, attach the cable holders with them.

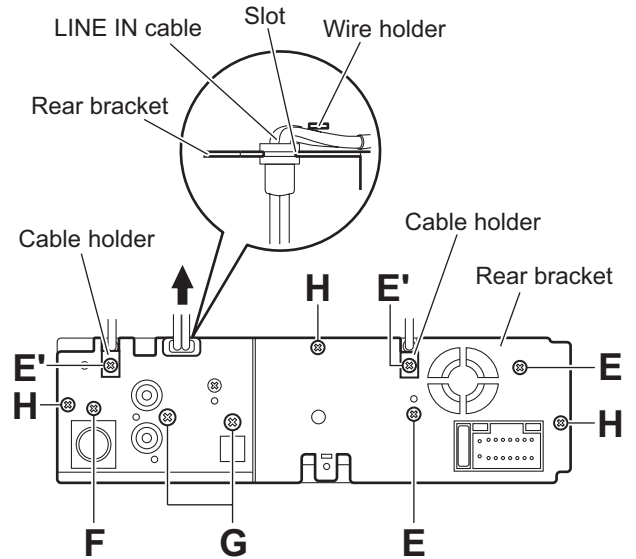


Fig.6

### 3.1.6 Removing the main board (See Figs.6 and 7)

- Remove the front panel assembly, bottom cover, front chassis assembly and side heat sink.

#### Reference:

Remove the rear bracket as required.

- From the back side of the main body, remove the three screws **H** attaching the main board. (See Fig.6.)
- From the bottom side of the main body, remove the three screws **J** attaching the main board. (See Fig.7.)
- Disconnect the connector **CN961** on the main board from the DVD mechanism assembly and take out the main board from the main body. (See Fig.7.)

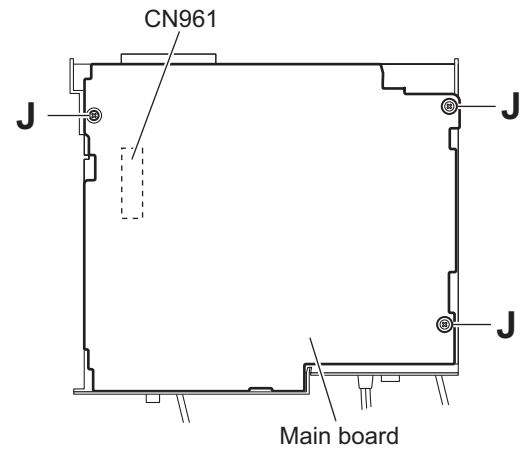


Fig.7

### 3.1.7 Removing the DVD mechanism assembly (See Fig.8)

- Remove the front panel assembly, bottom cover, front chassis assembly, side heat sink and main board.
  - From the inside of the top chassis, remove the three screws **K** attaching the DVD mechanism assembly.
  - Take out the DVD mechanism assembly from the top chassis.

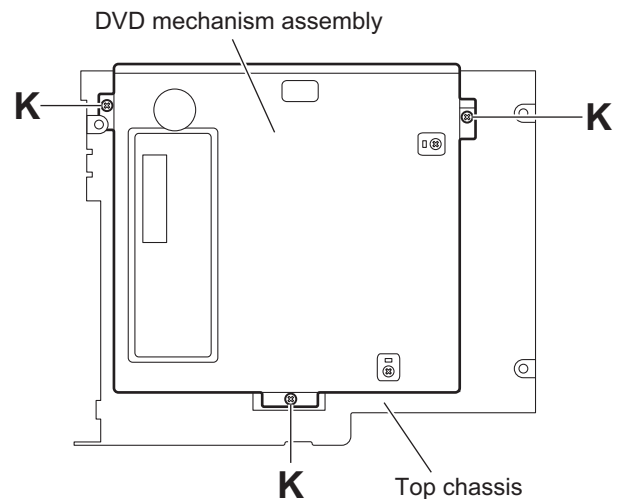


Fig.8

### 3.1.8 Removing the main sub board (See Figs.9 to 11)

- Remove the front panel assembly, bottom cover, front chassis assembly, side heat sink, main board and DVD mechanism assembly.

- From the top side of the DVD mechanism assembly, remove the two screws **L** attaching the dust cover. (See Fig.9.)
- Remove the dust cover from the DVD mechanism assembly. (See Fig.9.)

**Reference:**

When attaching the dust cover, align the joints **f** in the holes of the dust cover before attaching the screws **L**. (See Fig.9.)

- Release the lock of the connector **CN962** on the main sub board and disconnect the card wire. (See Fig.10.)
- Bend the joint **g** in the direction of the arrow. (See Fig.10.)
- Remove the two screws **M** attaching the main sub board and remove the main sub board from the DVD mechanism assembly. (See Fig.10.)

**Reference:**

- When attaching the main sub board, align the joints **h** in the holes of the main sub board before attaching the screws **M**. (See Fig.10.)
- When the resolution of DVD mechanism assembly is done sequentially, remove the two screws **N** attaching the support bracket. (See Fig.11.)
- Remove the card wire from the connector **CN401** as required. (See Fig.11.)

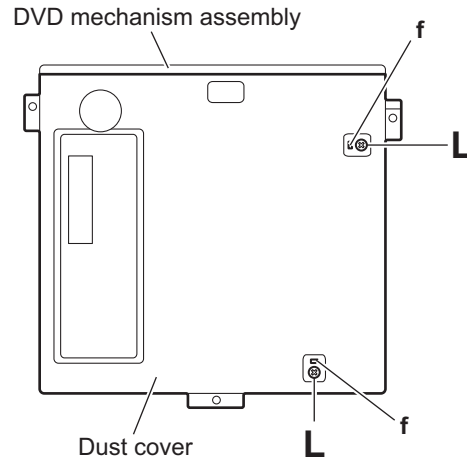


Fig.9

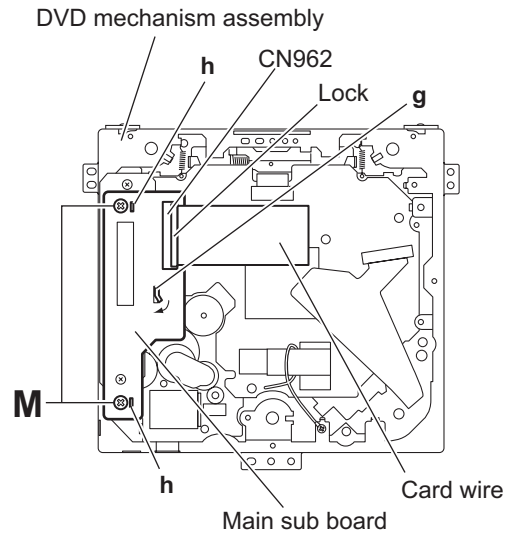


Fig.10

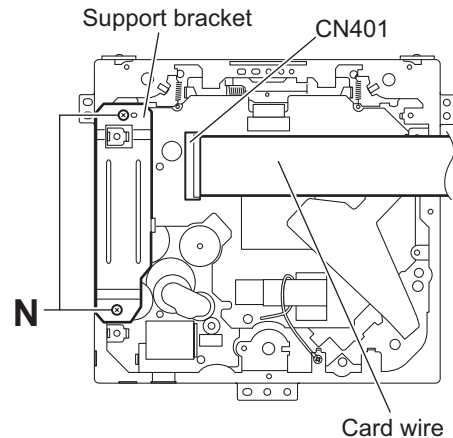


Fig.11

### 3.1.9 Removing the switch board (See Figs. 12 to 14)

- Remove the front panel assembly.
  - From the back side of the front panel assembly, remove the five screws **P** attaching the rear cover. (See Fig.12.)
  - Release the ten joints **i** attaching the rear cover to the front panel assembly. (See Fig.13.)
  - Take out the switch board while lifting the switch board from the front panel assembly little by little. (See Fig.14.)

**Reference:**

Remove the volume knob from the front side of the front panel assembly at the same time.

**Note:**

Do not lose the compression springs when removing the switch board. (See Fig.14.)

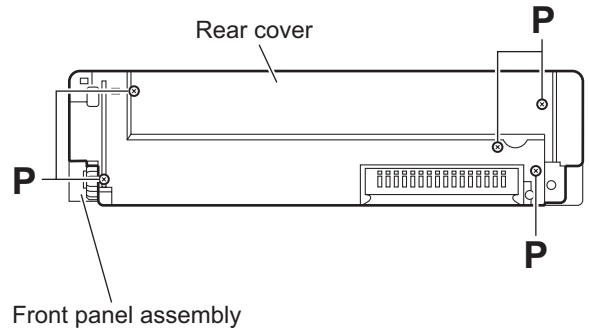


Fig.12

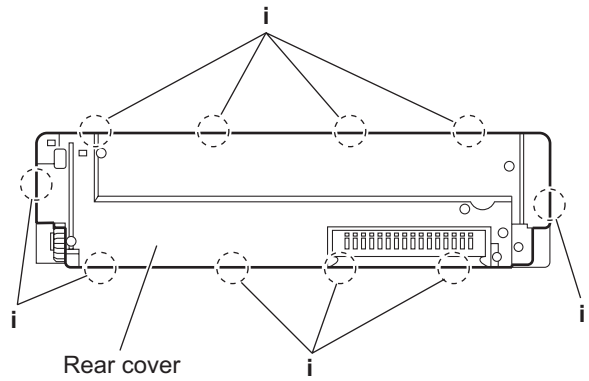


Fig.13

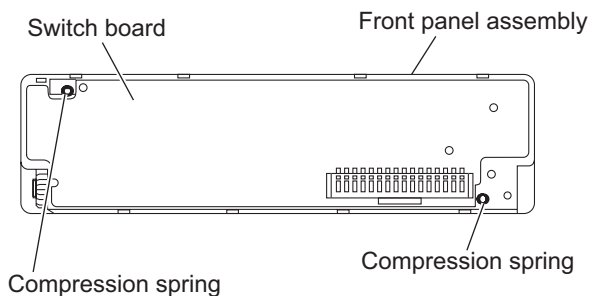


Fig.14

## 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.

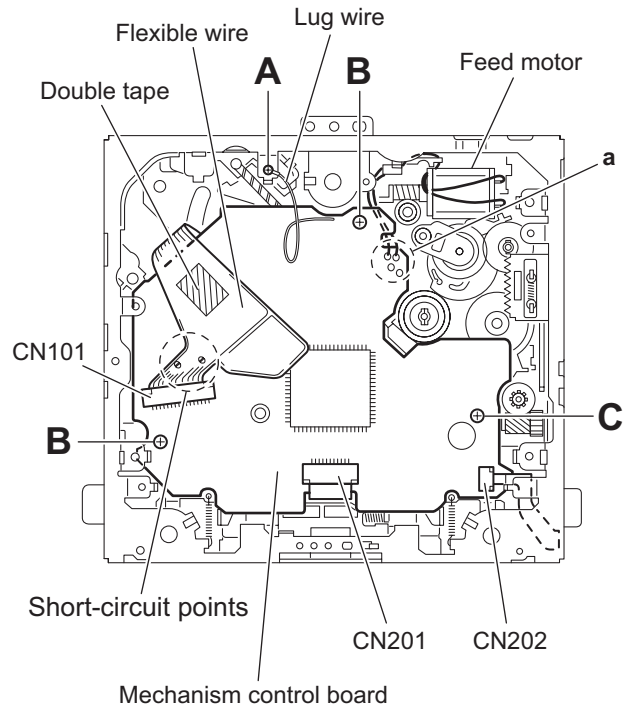


Fig.1

### 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)

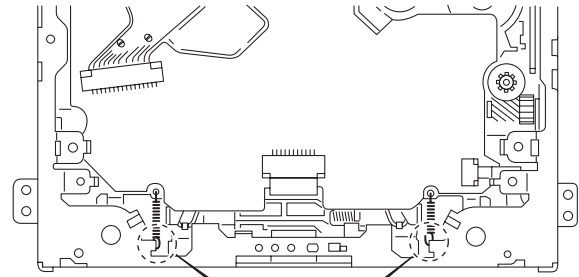
- Remove the top cover.
  - (1) From the bottom of the body, remove the screw **E** attaching the lug wire. (See Fig.2.)
  - (2) Remove the two screws **F** attaching the right and left stoppers on the front side. (See Fig.2.)
  - (3) Remove the two floating springs on the bottom of the body. (See Fig.3.)
  - (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.



Floating spring

Fig.3

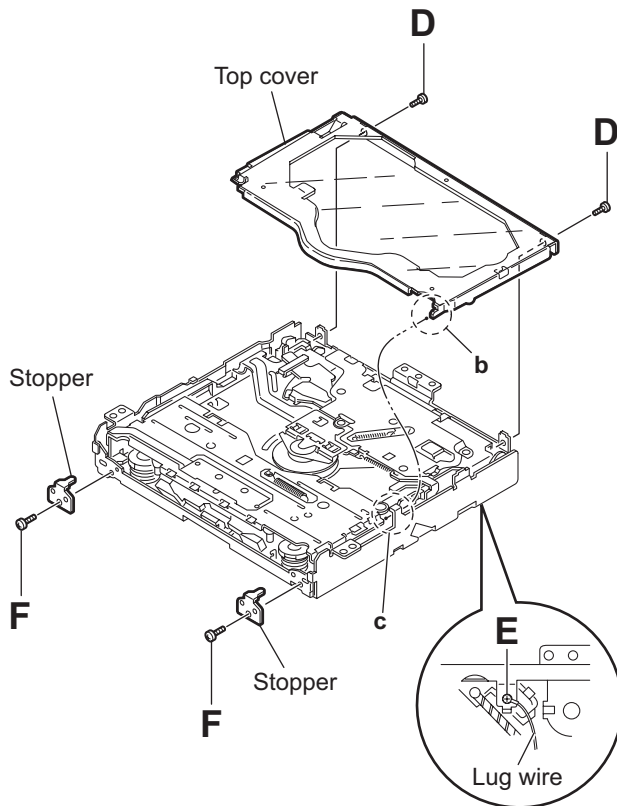


Fig.2

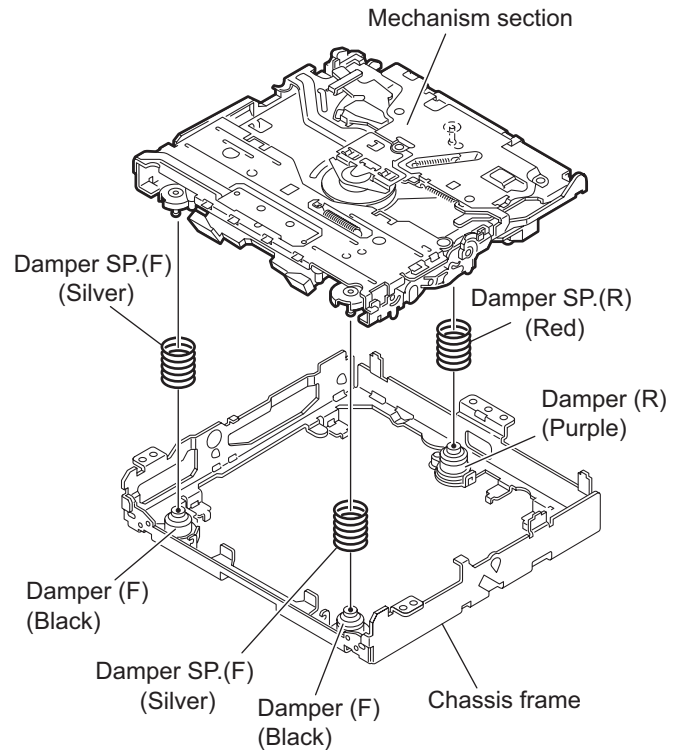


Fig.4

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

- Remove the top cover and the mechanism section.
  - Remove the clamper2 spring on the bottom of the mechanism section. (See Figs.5.and 6.)
  - Release the part **d** of the clamper spring from the bending part of the chassis base assembly. (See Fig.7.)
  - 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)

- Attach the clamper spring to the clamper unit. (See Fig.8.)
- 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.)
- Move the part **d** of the clamper spring to the outside of the bending part of the chassis base assembly. (See Fig.7.)
- 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.)

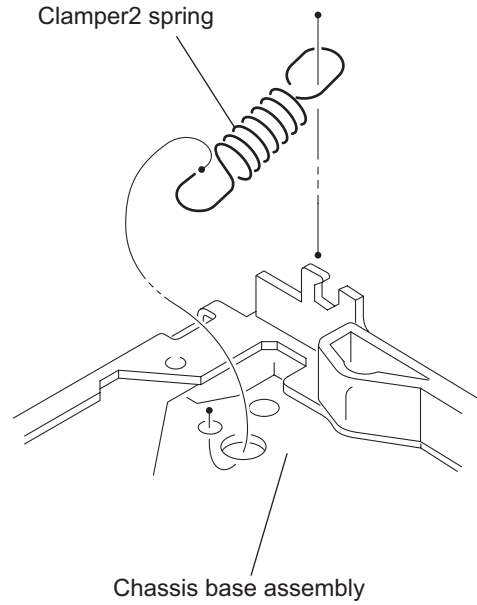


Fig.6

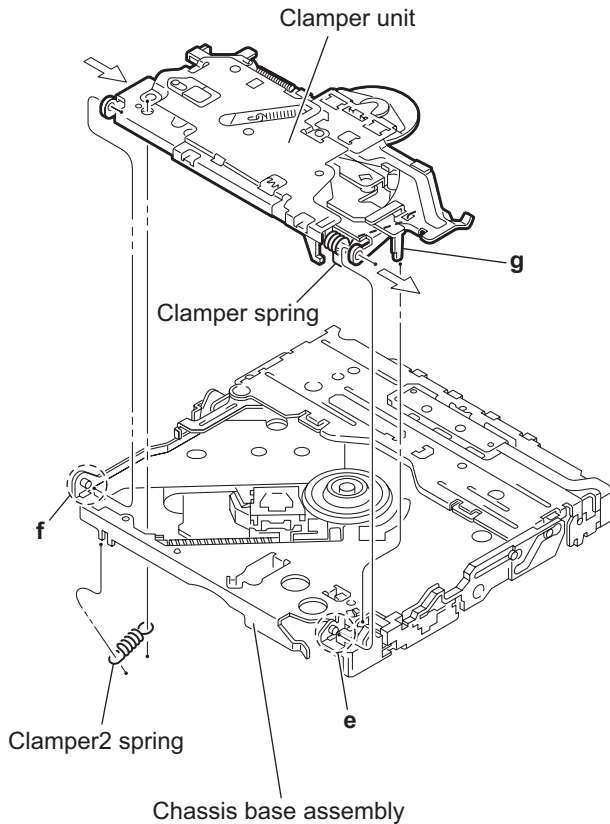


Fig.5

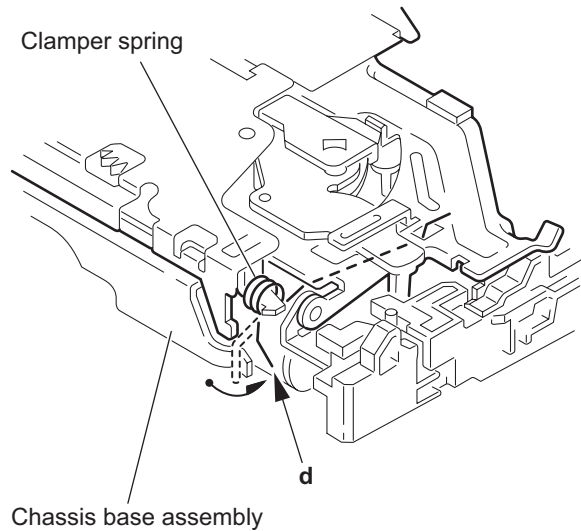


Fig.7

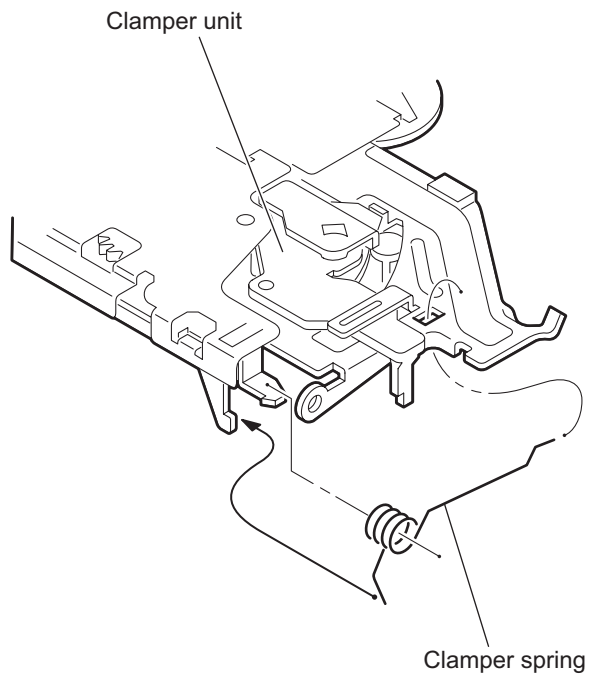


Fig.8

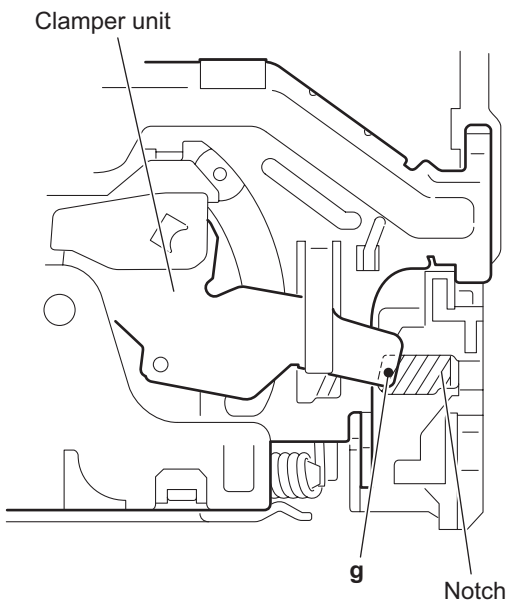


Fig.9

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

- Remove the top cover and the mechanism section.
  - Disconnect the flexible wire from connector **CN202** on the mechanism control board at the bottom of the body. (See Fig.10.)
  - Remove the screw **G** attaching the front unit on the top of the body. (See Fig.11.)
  - 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.)
  - 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.)

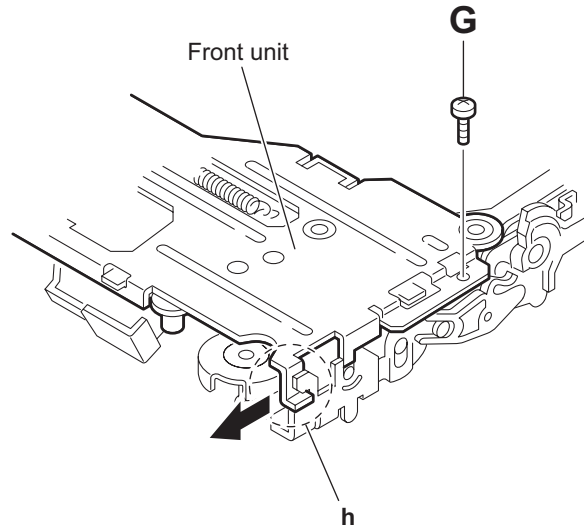


Fig.11

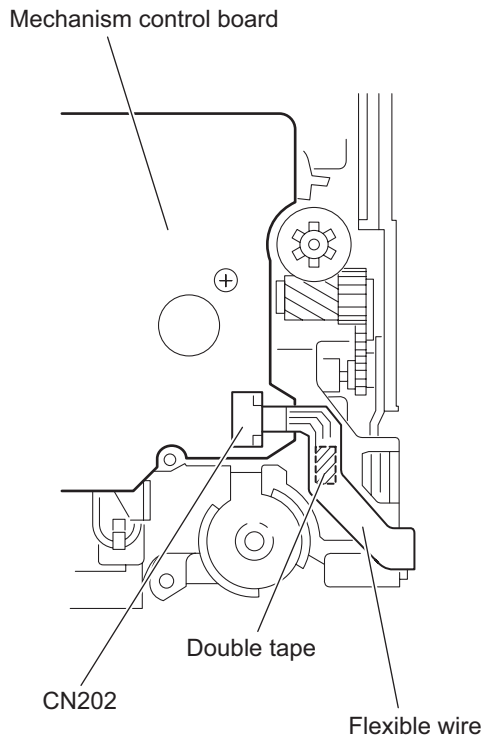


Fig.10

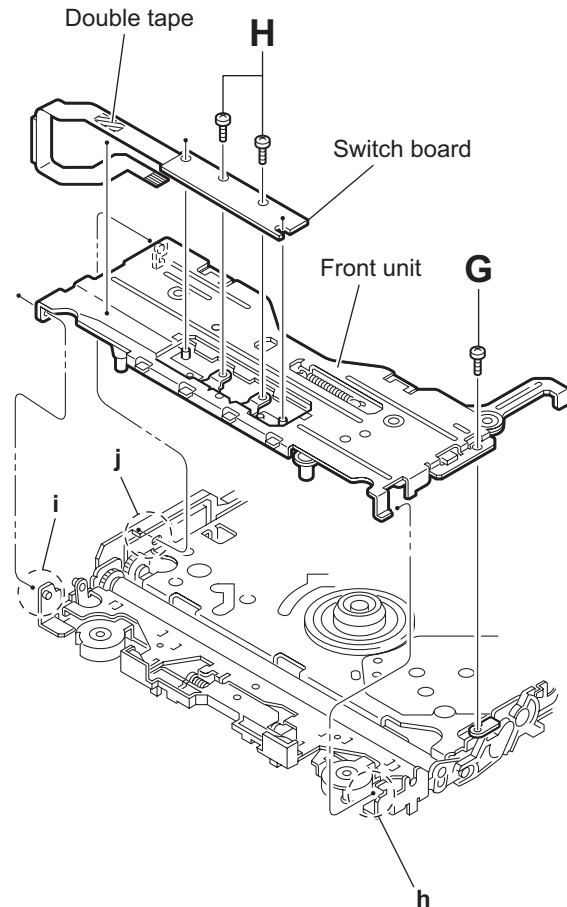


Fig.12



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

- Remove the top cover, the mechanism section and the front unit.
  - 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.
  - 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.

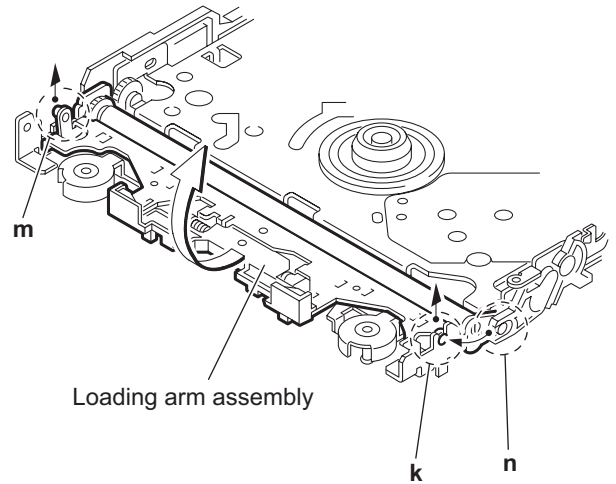


Fig.13

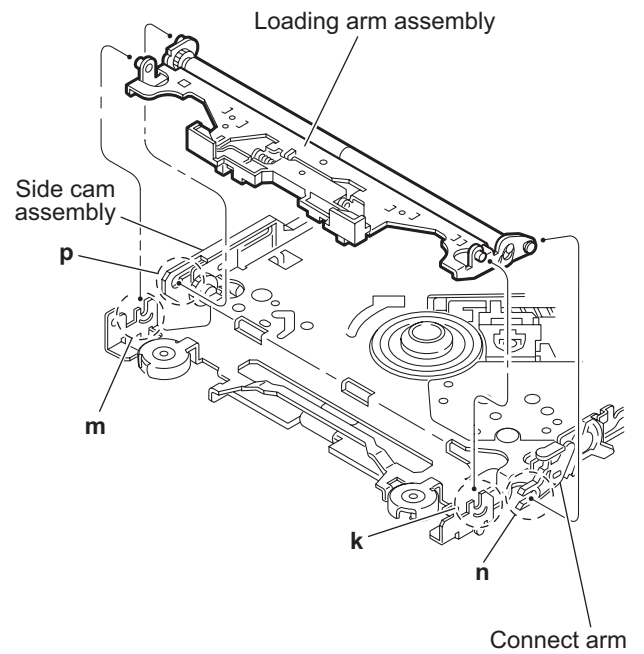


Fig.14

### 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.
  - Release the rod (L) and (R) from the joints **q** at the bottom of the loading arm assembly (See Fig.15.)
  - Remove the roller assembly from the loading arm assembly. (See Fig.16.)
  - 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.

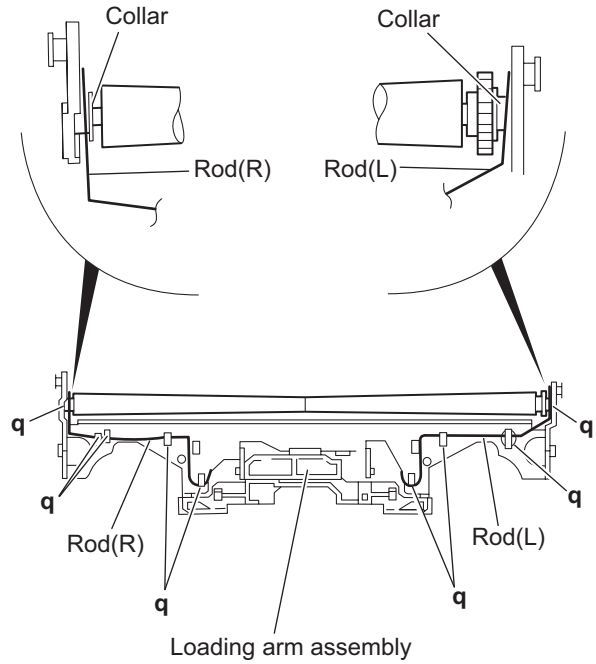


Fig.15

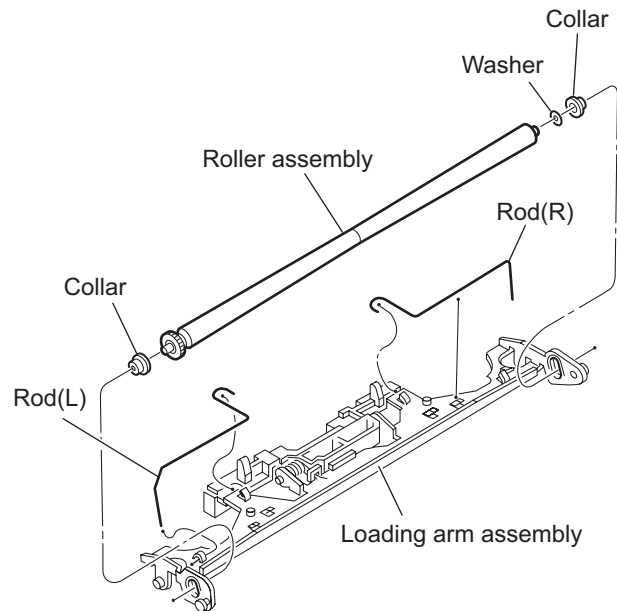


Fig.16

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

- Remove the mechanism control board.

- 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.)
- Remove the screw **J** attaching the thrust spring. (See Fig.17.)
- 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.)
- Remove the screw **K** attaching the rack spring/ rack plate on the DVD pickup. (See Fig.19.)
  - Pull out the lead screw. (See Fig.19.)

**Caution:**

Perform adjustment after replacing the pickup.

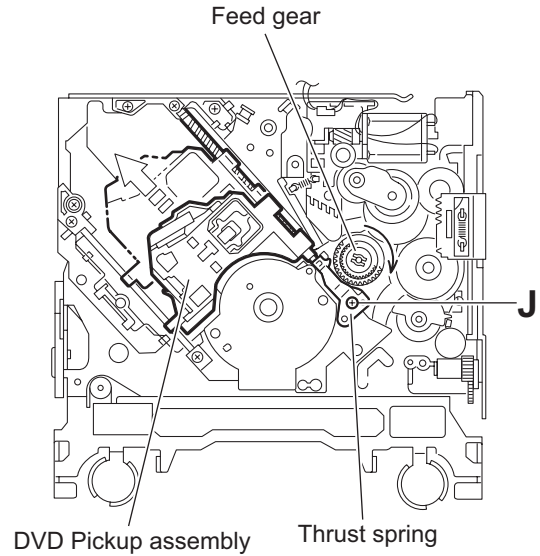


Fig.17

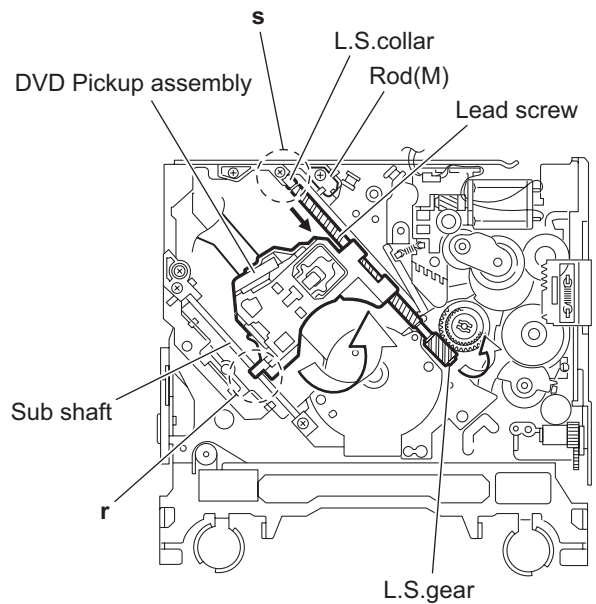


Fig.18

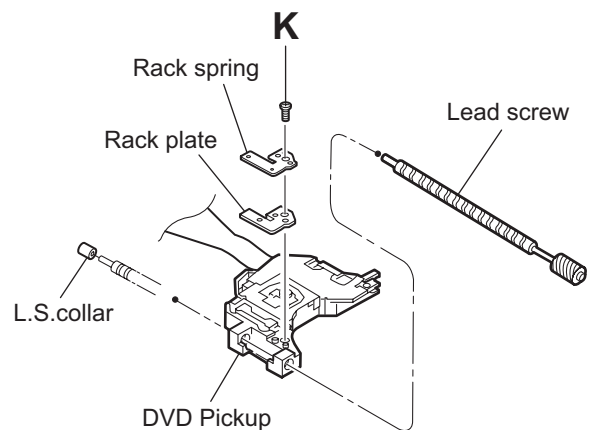


Fig.19

### 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.

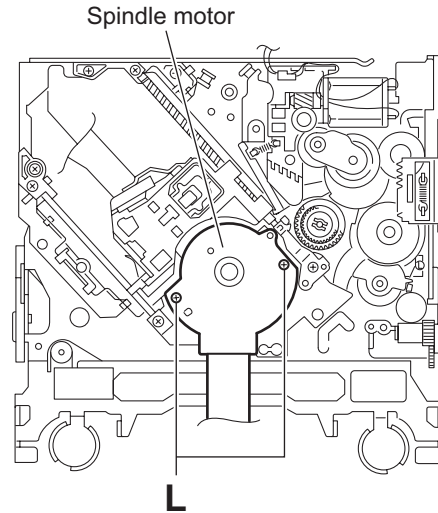


Fig.20

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

- Remove the mechanism control board.
  - Remove the feed TRI. spring on the bottom of the body. (See Fig.21.)
  - Remove the two screws **M** attaching the feed motor assembly. (See Fig.21.)
  - 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.)

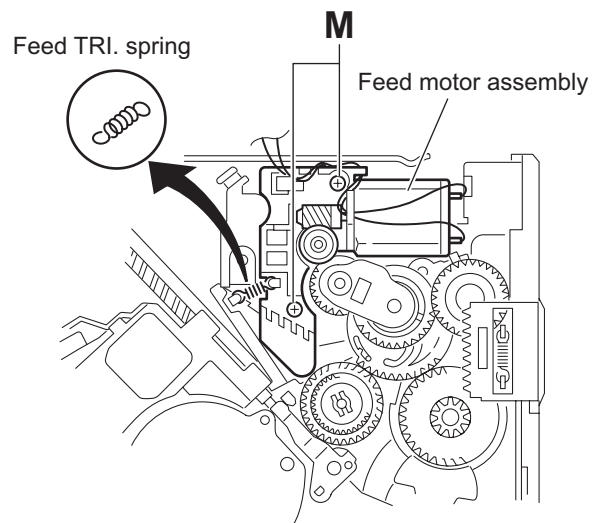


Fig.21

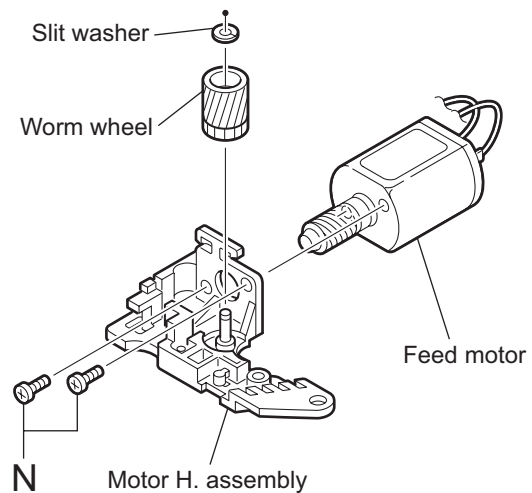


Fig.22

## 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

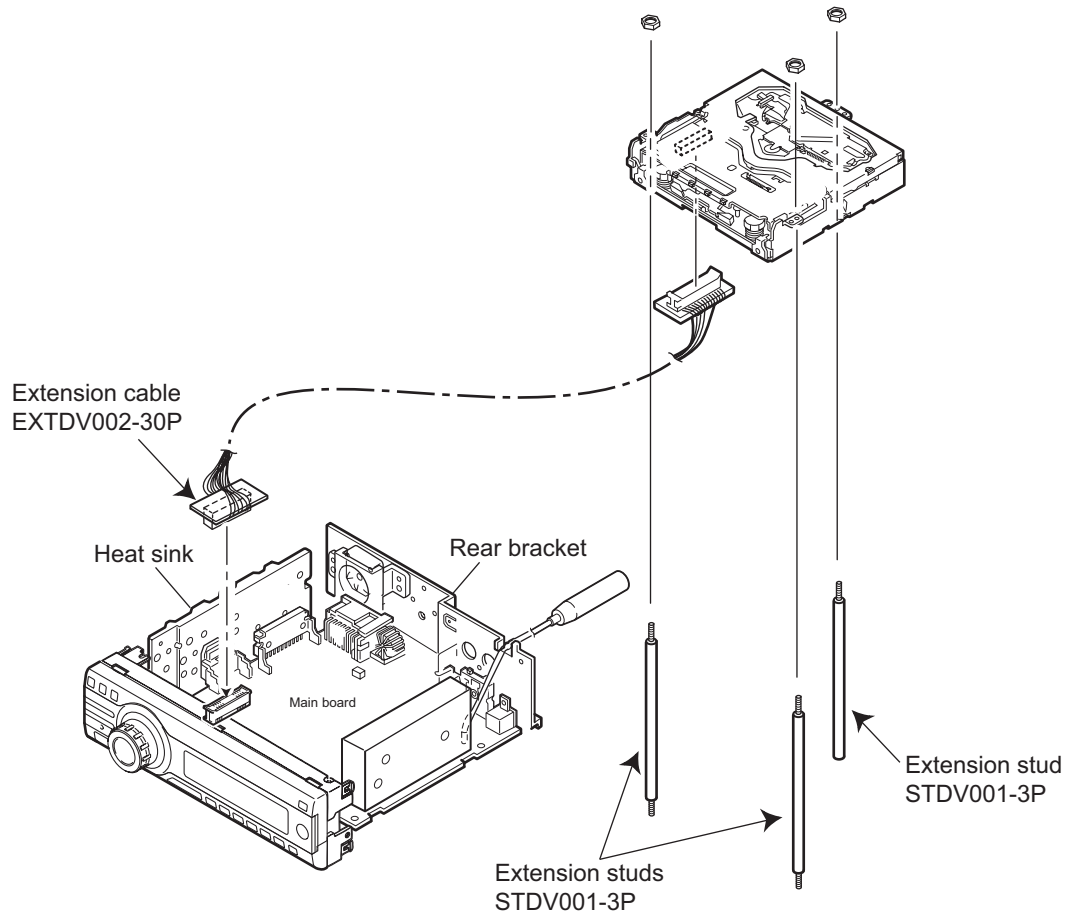
#### Caution:

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

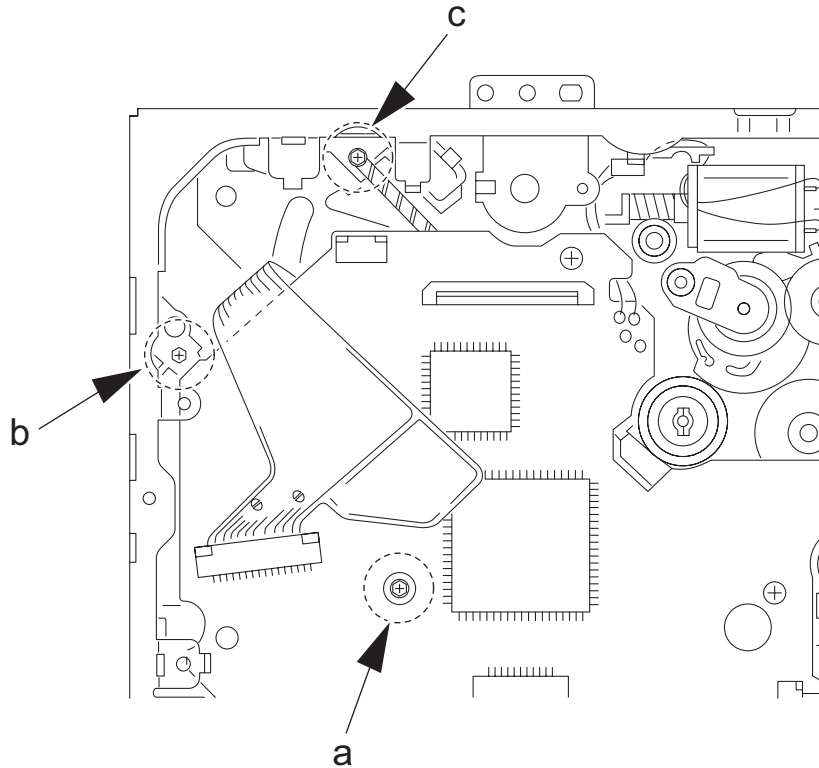
- (1) Attach the front chassis assembly to the main board.
- (2) Connect the front panel assembly to the main board.
- (3) Attach the heat sink and rear bracket to the main board.
- (4) Attach the extension studs to the DVD mechanism assembly.
- (5) Connect the DVD mechanism assembly and the main board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



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. Please note that a jitter value displayed on the LCD is hex data. Refer to the corresponding decimal notation value using the Jitter Conversion Table and confirm it with the measured value.

Fix the screws "a", "b" and "c" with screw lock paint.

If the measured jitter value is outside the 12% tolerance range, perform the following adjustments.



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.)

3 mm wrench



- (1) Set the unit to the service mode and display a jitter value (hex data) on the LCD.
- (2) 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** → **d** → **a**.)
- (3) After completing the adjustment, secure the screws with screw lock paint.

#### 4.4 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	JIT OUT	Jitter value (%)		Indicated on the LCD	JIT OUT	Jitter value (%)		Indicated on the LCD	JIT OUT	Jitter value (%)	
20A7	1957.98	4.7	3818	18C2	1856.9	8.5	3A11	10DC	1755.82	12.3	3C0A
2072	1955.32	4.8	3825	188C	1854.24	8.6	3A1E	10A7	1753.16	12.4	3C18
203D	1952.66	4.9	3832	1857	1851.58	8.7	3A2C	1072	1750.5	12.5	3C25
2008	1950	5.0	3840	1822	1848.92	8.8	3A39	103C	1747.84	12.6	3C32
1FD2	1947.34	5.1	384D	17ED	1846.26	8.9	3A46	1007	1745.18	12.7	3C40
1F9D	1944.68	5.2	385A	17B8	1843.6	9.0	3A54	FD2	1742.52	12.8	3C4D
1F68	1942.02	5.3	3867	1782	1840.94	9.1	3A61	F9D	1739.86	12.9	3C5A
1F33	1939.36	5.4	3875	174D	1838.28	9.2	3A6E	F68	1737.2	13.0	3C68
1EFE	1936.7	5.5	3882	1718	1835.62	9.3	3A7B	F32	1734.54	13.1	3C75
1EC8	1934.04	5.6	388F	16E3	1832.96	9.4	3A89	EFD	1731.88	13.2	3C82
1E93	1931.38	5.7	389D	16AE	1830.3	9.5	3A96	EC8	1729.22	13.3	3C8F
1E5E	1928.72	5.8	38AA	1678	1827.64	9.6	3AA3	E93	1726.56	13.4	3C9D
1E29	1926.06	5.9	38B7	1643	1824.98	9.7	3AB1	E5E	1723.9	13.5	3CAA
1DF4	1923.4	6.0	38C5	160E	1822.32	9.8	3ABE	E28	1721.24	13.6	3CB7
1DBE	1920.74	6.1	38D2	15D9	1819.66	9.9	3ACB	DF3	1718.58	13.7	3CC5
1D89	1918.08	6.2	38DF	15A4	1817	10.0	3AD9	DBE	1715.92	13.8	3CD2
1D54	1915.42	6.3	38EC	156E	1814.34	10.1	3AE6	D89	1713.26	13.9	3CDF
1D1F	1912.76	6.4	38FA	1539	1811.68	10.2	3AF3	D54	1710.6	14.0	3CED
1CEA	1910.1	6.5	3907	1504	1809.02	10.3	3B00	D1E	1707.94	14.1	3CFA
1CB4	1907.44	6.6	3914	14CF	1806.36	10.4	3B0E	CE9	1705.28	14.2	3D07
1C7F	1904.78	6.7	3922	149A	1803.7	10.5	3B1B	CB4	1702.62	14.3	3D14
1C4A	1902.12	6.8	392F	1464	1801.04	10.6	3B28	C7F	1699.96	14.4	3D22
1C15	1899.46	6.9	393C	142F	1798.38	10.7	3B36	C4A	1697.3	14.5	3D2F
1BE0	1896.8	7.0	394A	13FA	1795.72	10.8	3B43	C14	1694.64	14.6	3D3C
1BAA	1894.14	7.1	3957	13C5	1793.06	10.9	3B50	BDF	1691.98	14.7	3D4A
1B75	1891.48	7.2	3964	1390	1790.4	11.0	3B5E	BAA	1689.32	14.8	3D57
1B40	1888.82	7.3	3971	135A	1787.74	11.1	3B6B	B75	1686.66	14.9	3D64
1B0B	1886.16	7.4	397F	1325	1785.08	11.2	3B78	B40	1684	15.0	3D72
1AD6	1883.5	7.5	398C	12F0	1782.42	11.3	3B85	B0A	1681.34	15.1	3D7F
1AA0	1880.84	7.6	3999	12BB	1779.76	11.4	3B93	AD5	1678.68	15.2	3D8C
1A6B	1878.18	7.7	39A7	1286	1777.1	11.5	3BA0	AA0	1676.02	15.3	3D99
1A36	1875.52	7.8	39B4	1250	1774.44	11.6	3BAD	A6B	1673.36	15.4	3DA7
1A01	1872.86	7.9	39C1	121B	1771.78	11.7	3BBB	A36	1670.7	15.5	3DB4
19CC	1870.2	8.0	39CF	11E6	1769.12	11.8	3BC8	A00	1668.04	15.6	3DC1
1996	1867.54	8.1	39DC	11B1	1766.46	11.9	3BD5	9CB	1665.38	15.7	3DCF
1961	1864.88	8.2	39E9	117C	1763.8	12.0	3BE3	996	1662.72	15.8	3DDC
192C	1862.22	8.3	39F6	1146	1761.14	12.1	3BF0	961	1660.06	15.9	3DE9
18F7	1859.56	8.4	3A04	1111	1758.48	12.2	3BFD	92C	1657.4	16.0	3DF7

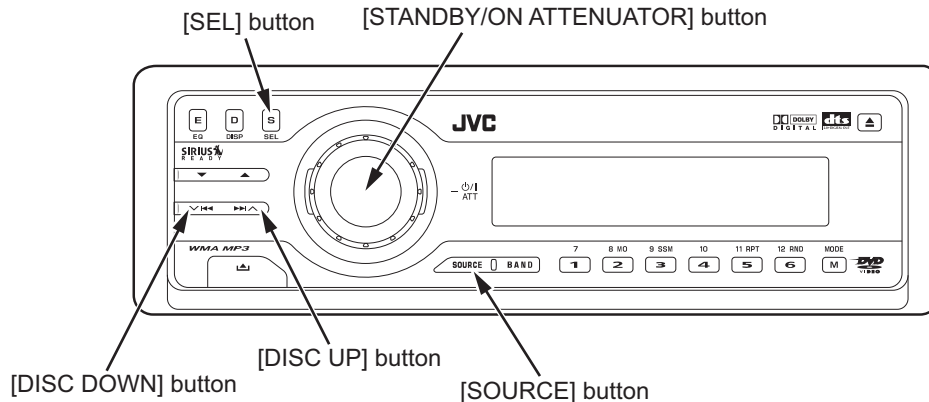
## 4.5 Service mode

### 4.5.1 Standard input/output conditions

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

### 4.5.2 Service mode setting procedure

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

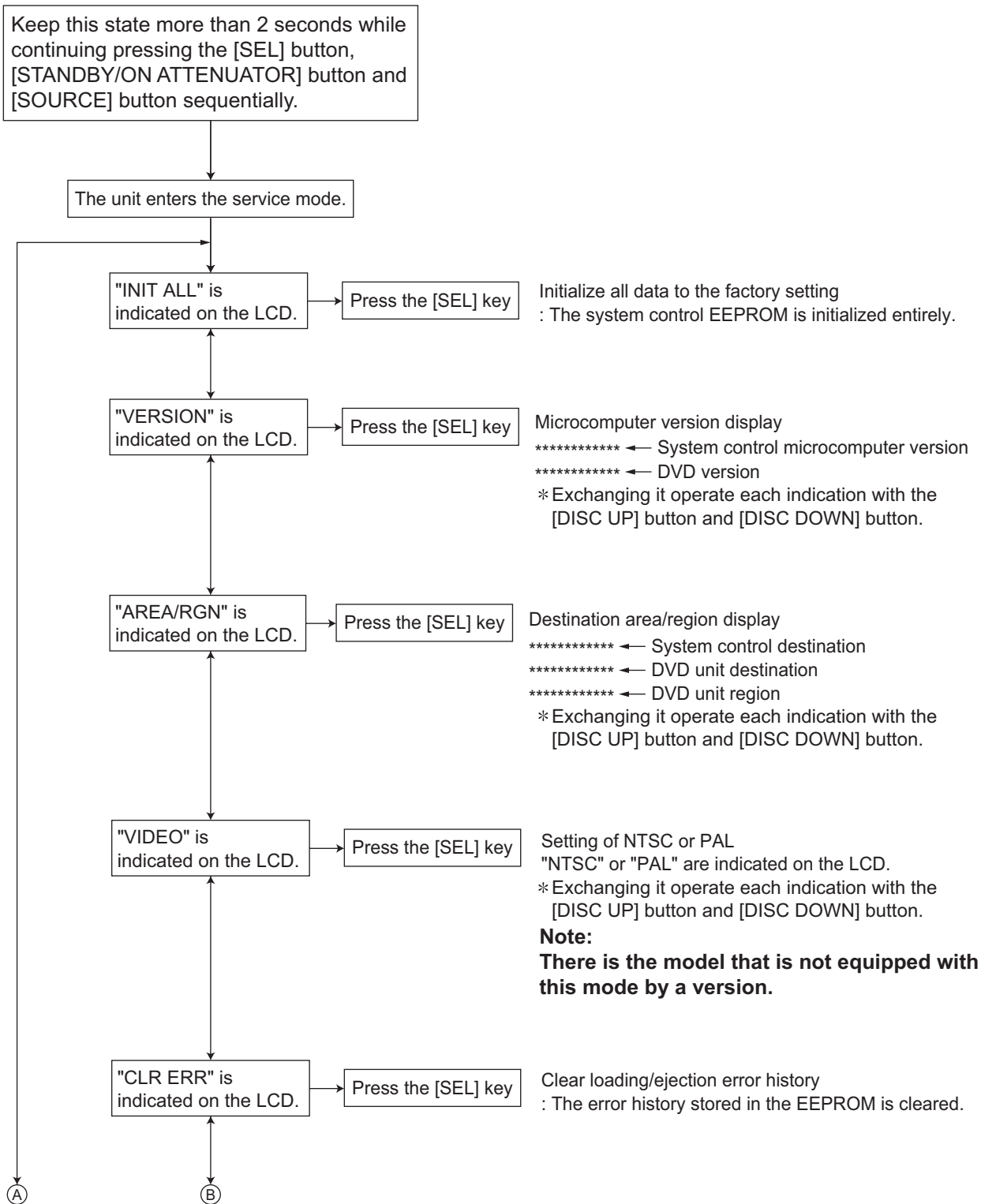


- (1) Press a [STANDBY/ON ATTENUATOR] button on a main unit and switch it on.
- (2) Keep this state more than 2 seconds while continuing pressing the [SEL] button, [STANDBY/ON ATTENUATOR] button and [SOURCE] button sequentially.
- (3) This unit is set by a service mode.

\*Exchanging it operate a menu of a service mode with the [DISC UP] button and [DISC DOWN] button.  
Operate choice of a menu with a [SEL] button.



### 4.5.3 Operation procedures



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"CD ERROR" is indicated on the LCD.

Press the [SEL] key

Read loading and ejection error history : The error history saved in the system control is read and displayed.

TOT-xxxx : Total error count.

Total error count  
(A figure between 0 and 9999 is displayed. 10000 or more is also displayed as 9999.)

Enyyzzzz : Latest three error codes.

Detailed error code  
Error code  
Counter

Onyyzzzz : First five error codes

Detailed error code  
Error code  
Counter

\* Exchanging it operate each indication with the [DISC UP] button and [DISC DOWN] button.

**Error code (1 byte)**

First byte	[01] Eject error [09] Loading error
------------	--

**Detailed error codes (2 bytes)**

\* Displayed with loading/ejection errors only.

First byte	Higher 4 bits . . . . Route No. (Process of error occurrence) → Refer to charts 1.1 and 1.2. Lower 4 bits . . . . Error type [1] Time out [2] Switch status error [3] Swinging error
Second byte	bit7 . . . . Disc type (0: 12 cm. 1: 8 cm) bit6,5 . . . . Fixed at 0 bit4 . . . . SW1 status bit3 . . . . SW2 status bit2 . . . . SW3 status bit1 . . . . SW4 status bit0 . . . . REST SW status

(Example) When a switch status error occurs during loading route 3 and the switch status is L/L/H/H/H (00111B = 07H), the error code and detailed error code become: [09 3207].

Route No. (EJECT route No.)	SW1/2/3/4	[Rest SW]	Loading	Eject	Reload
-	1,1,1,1	[0]	No Disc	No Disc	Disc push in
1(2)	0,1,1,1	[0]	Disc insert detection	↑	Disc push in
1(2)	0,0,1,1	[0]	↓	Eject completion	
2(2)	0,0,0,1	[0]		Reload start	
2(2)	0,0,1,1	[0]		↑	Reload start
2(2)	0,1,1,1	[0]			
2(2)	1,1,1,1	[0]	↓	Load completion	
3(1)	1,1,1,0	[0]			
3(1)	1,1,1,0	[1]	Load completion	Eject start	Load completion

Chart 1.1 12cm Disc switch status transition

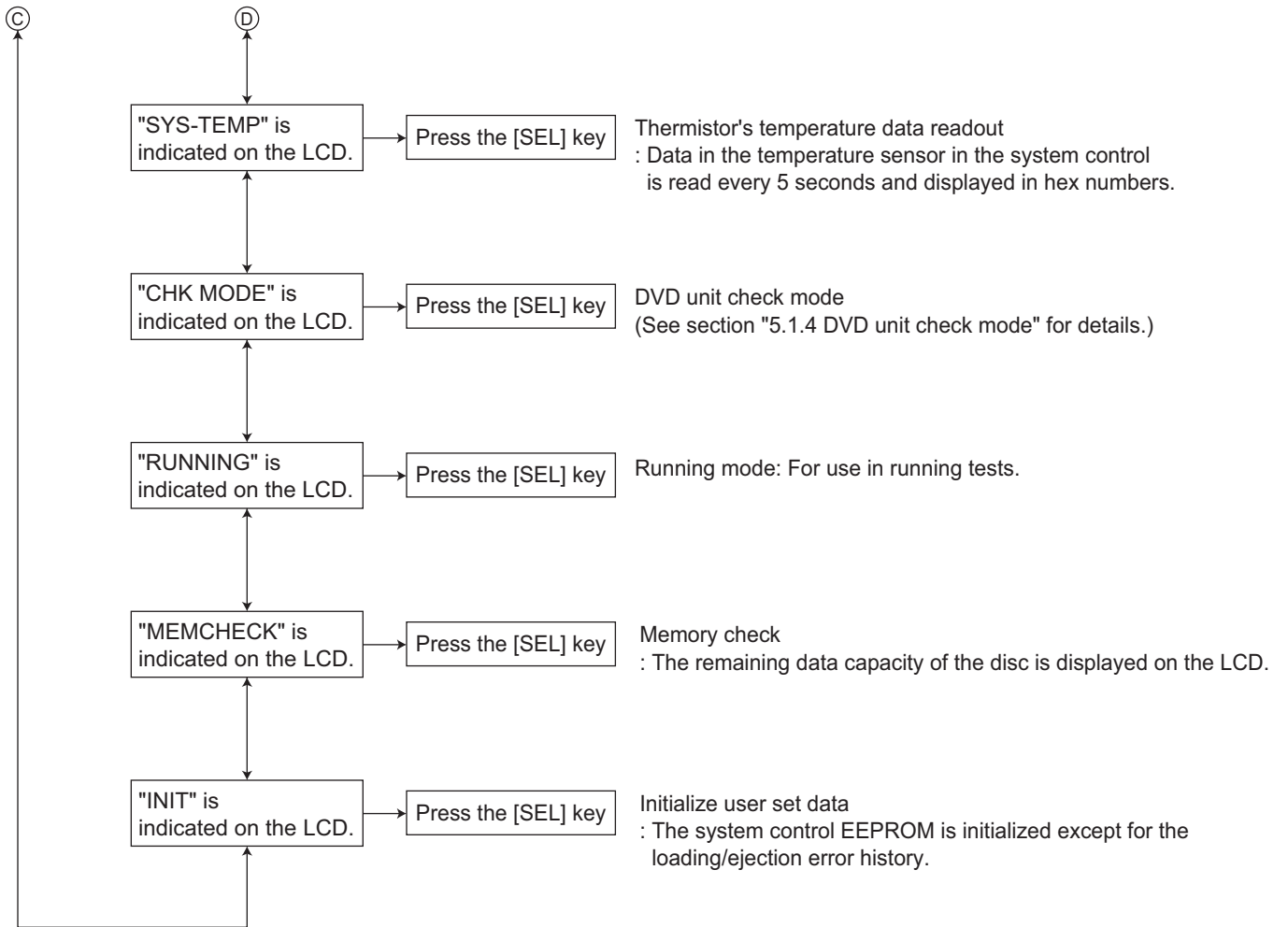
Route No. (EJECT route No.)	SW1/2/3/4	[Rest SW]	Loading*	Eject	Reload
-	1,1,1,1	[0]	No Disc	No Disc	Disc push in
1(2)	0,1,1,1	[0]	Disc insert detection	↑	Disc push in
1(2)	0,0,1,1	[0]	↓	Eject completion	
2(2)	0,0,0,1	[0]		Reload start	
2(2)	0,1,1,1	[0]		↑	Reload start
2(2)	1,1,1,1	[0]			
3(1)	1,1,1,0	[0]	↓	Load completion	
3(1)	1,1,1,0	[1]			
3(1)	1,1,1,0	[1]	Load completion	Eject start	Load completion

\* Transition in the center loading (Similar to 12cm in the side loading)

Chart 1.2 8cm Disc switch status transition

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#### 4.5.4 DVD unit check mode

Change LCD indication with a [FF ►►] button and a [REW ◀◀] button.

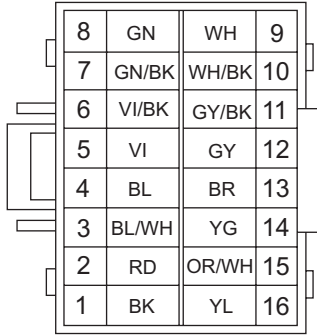
##### Check item list

No.	A/D key	DVD unit operation	Example of LCD indication	Indication contents
1	[1]	Start at normal speed (After start, it is measured JITTER on the internal position)	NORMPLAY CUR **** JIT ****	Laser current value Jitter value
2	[2]	Tracking off on the outermost position of CD	EF-BAL OUTRKOFF	For EF phase error
3	[3]	Tracking off on the innermost position of CD	EF-BAL INTRKOFF	For EF phase error
4	[4]	CD_LD lights and laser current is displayed	CDLD ON CUR **** JIT ****	Laser current value Jitter value
5	[5]	DVD_LD lights and laser current is displayed	DVDLD ON CUR **** JIT ****	Laser current value Jitter value
6	[6]	DVD x1 jitter measuring mode (for use in mechanism measurement)	DVD JTR CUR **** JIT ****	Laser current value Jitter value
7	[DISP]	Indication of EEPROM contents	ROM DATA ADDR **** DATA ****	EEPROM address EEPROM contents
8	[SOURCE]	Initialization of EEPROM contents	ROMCLEAR	
9	[SEL]	Indication of temperature	JD4-TEMP TEM ****	Temperature
10	[MODE]	Search & jitter measurement to an appointed position of DVD	DVD-DL PLC **** JIT ****	(Position measured with VT-501) Jitter value
11	[BAND]	Setting of MONITOR terminal	MONITOR M1 **** M2 ****	
12	[DISC UP ▲]	DVDx1 double speed start (After start, it is measured JITTER on the internal position)	PLAY CUR **** JIT ****	Laser current value Jitter value
13	[DISC DW ▼]	Disc stopped & LD-OFF	STOP	
14	[EJECT]	OPEN	DSC OPEN	

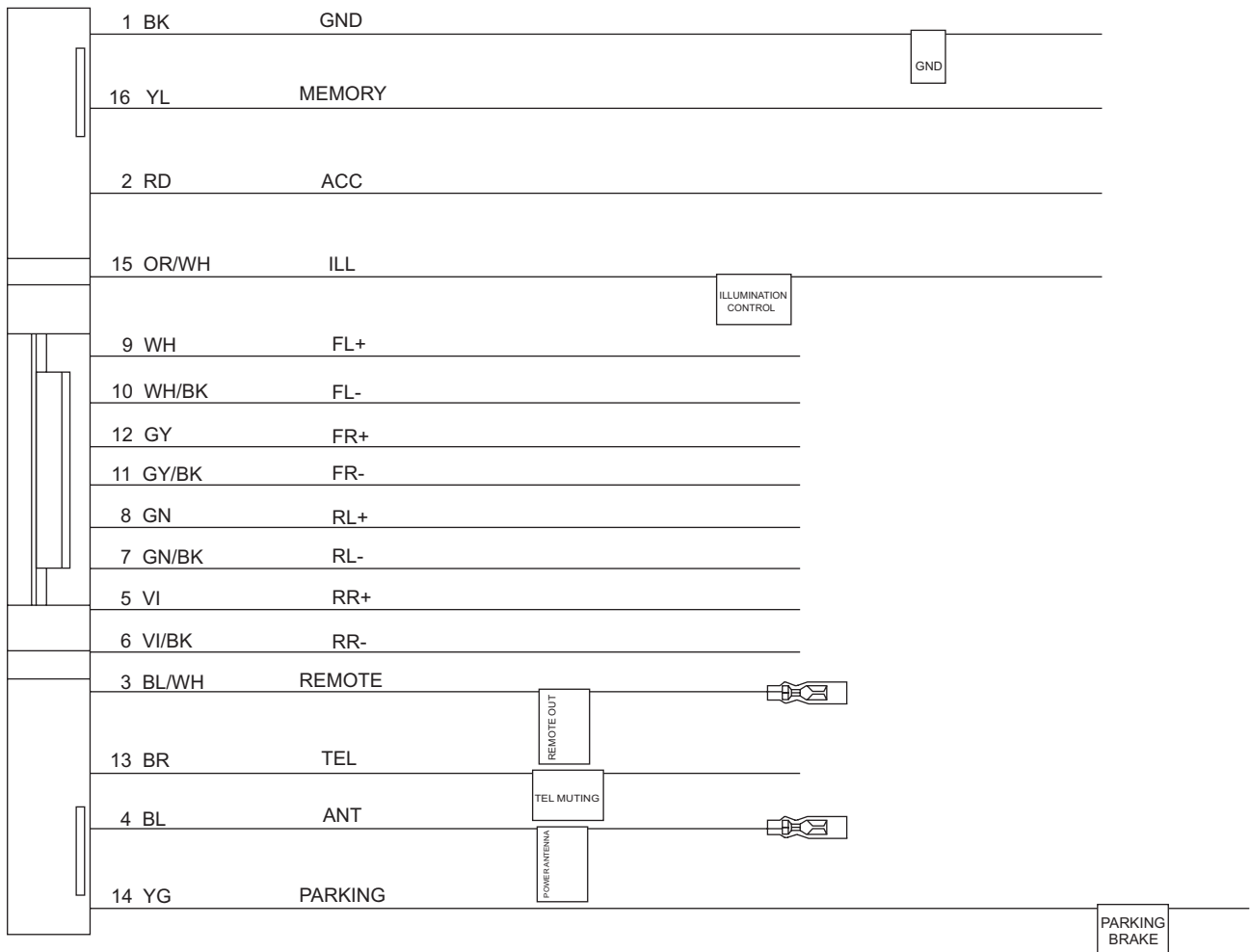
- Note
- Press key [1] of No.1 before an item in which the No.2 or 3 key is pressed.
  - Press key [1] of No.1 or key [12] of No.12 before an item in which the No. 10 key is pressed and confirm the indication of jitter value on the LCD.
  - No.6 starts only a DVD1 layer disk. Even other disks start DVD1 layer.
  - When No.1 and No.12 are pushed after jitter indication, a focus jump is executed. (only DVD2 layer)
  - Stop a disk before OPEN, CLOSE by all means. (OPEN and CLOSE are not executed in a disk turn.)
  - The check mode can be exited either by pressing the [POWER] key or by resetting the unit.

# SECTION 5 TROUBLESHOOTING

## 5.1 16 PIN CORD DIAGRAM



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



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



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