

MHC-V90W

SA-V90W/SS-V90W

SERVICE MANUAL

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Note:

Make sure that the your PC used for repair is not infected with a computer virus before using it.

MHC-V90W

SA-V90W/SS-V90W

SERVICE MANUAL

US Model



Photo: SA-V90W



Photo: SS-V90W

- All of the units included in the MHC-V90W (SA-V90W/SS-V90W/Remote control) are required to confirming operation of MHC-V90W. Check in advance that you have all of the units.

Note: This photo may differ slightly from the actual MHC-V90W(SA-V90W/SS-90W).

COMPONENT MODEL NAME (MHC-V90W)

Active Subwoofer (Compact Disc Receiver)	SA-V90W
Speaker System	SS-V90W

Model Name Using Similar Mechanism	MHC-V77DW
DVD Mechanism Type	CDM90-DVBU204
Optical Pick-up Block Name	CMS-S76RFS7G1 or CMS-S76RFS7GP

AUDIO POWER SPECIFICATIONS

POWER OUTPUT AND TOTAL HARMONIC DISTORTION:
With 8 ohm loads, both channels driven, from 250 Hz – 20,000 Hz; rated 95 watts per channel minimum RMS power, with no more than 0.7% total harmonic distortion from 250 milliwatts to rated output.

Satellite unit (Speaker System SS-V90W)

Speaker system:
Tweeter + Midrange speaker
Speaker unit:
Tweeter: 50 mm (2 in) × 4, cone type
Midrange: 130 mm (5 in) × 4, cone type
Rated impedance:
8 ohm

Subwoofer unit (Compact Disc Receiver SA-V90W)

Speaker system:
Subwoofer, bass reflex
Speaker unit:
250 mm (10 in) × 2, cone type
Rated impedance:
8 ohm

Inputs

AUDIO/PARTY CHAIN IN L/R:
Voltage 2 V, impedance 47 kilohms
MIC1:
Sensitivity 1 mV, impedance 10 kilohms
MIC2/GUITAR:
Sensitivity 1 mV, impedance 10 kilohms (When guitar mode is turned off.)
Sensitivity 200 mV, impedance 1 Megaohm (When guitar mode is turned on.)

Outputs

AUDIO/PARTY CHAIN OUT L/R:
Voltage 2 V, impedance 1 kilohm

Disc player section

System:
Compact disc and digital audio
Laser Diode Properties
Emission Duration: Continuous
Laser Output*: Less than 44.6 μW
* This output is the value measurement at a distance of 200 mm (8 in) from the objective lens surface on the Optical Pick-up Block with 7 mm (9/32 in) aperture.
Frequency response:
20 Hz – 20 kHz

USB section

Supported USB device:
Mass Storage Class
Maximum current:
1A
ψ (USB) port:
Type A

FM tuner section

FM stereo, FM superheterodyne tuner
Antenna:
FM lead antenna
Tuning range:
87.5 MHz – 108.0 MHz (100 kHz step)

BLUETOOTH section

Communication system:
BLUETOOTH Standard version 4.2
Output:
BLUETOOTH Standard Power Class 1
Maximum communication range:
Line of sight approx. 30 m (98.4 feet)¹⁾
Operating frequency:
2,400 – 2,483.5 MHz
Maximum output power:
< 20.0 dBm
Modulation method:
FHSS (Freq Hopping Spread Spectrum)
Compatible BLUETOOTH profiles²⁾:
A2DP (Advanced Audio Distribution Profile)
AVRCP (Audio Video Remote Control Profile)
SPP (Serial Port Profile)
Supported codecs:
SBC (Subband Codec)
AAC (Advanced Audio Coding)
LDAC

SPECIFICATIONS

¹⁾ The actual range will vary depending on factors such as obstacles between devices, magnetic fields around a microwave oven, static electricity, reception sensitivity, antenna's performance, operating system, software application, etc.
²⁾ BLUETOOTH standard profiles indicate the purpose of BLUETOOTH communication between devices.

Network section

Ethernet LAN:
100BASE-TX
Wireless LAN:
Compatible standards:
IEEE 802.11 a/b/g/n
Security:
WPA/WPA2-PSK, WEP
Radio frequency:
2.4 GHz, 5 GHz

NFC section

Operating frequency:
13.56 MHz
Maximum output power:
< 60 dBμA/m at 10 m (33 feet)

Supported audio formats
Supported bit rate and sampling frequencies:

MIPS:
16/22.05/24/32/44.1/48 kHz,
16 kbps – 320 kbps (CBR/VBR)
AAC:
16/22.05/24/32/44.1/48/88.2/
96/176.4/192 kHz (16/24 bit)
VBR)
WMA:
32/44.1/48 kHz, 16 kbps –
320 kbps (CBR/VBR)
WAV:
16/22.05/24/32/44.1/48/88.2/
96/176.4/192 kHz (16/24 bit)
AIFF:
32/44.1/48/88.2/96/176.4/
192 kHz (16/24 bit)
FLAC:
16/22.05/24/32/44.1/48/88.2/
96/176.4/192 kHz (16/24 bit)
ALAC:
16/22.05/24/32/44.1/48/88.2/
96/176.4/192 kHz (16/24 bit)
DSD (DSF/DFP):
2.8 MHz (1 bit)

General

Power requirements:
AC 120 V, 60 Hz
Power consumption:
320 W
Dimensions (W/H/D) (Approx.):
Assembled unit:
532 mm × 1,706 mm ×
494 mm
(21 in × 67 in × 19 in)
Satellite unit:
429 mm × 830 mm × 344 mm
(17 in × 33 in × 14 in)
Subwoofer unit:
532 mm × 1,080 mm ×
494 mm
(21 in × 43 in × 19 in)
Mass (Approx.):
Assembled unit:
50.5 kg (1,781 oz)
Satellite unit:
13.5 kg (476 oz)
Subwoofer unit:
37 kg (1,305 oz)

Unpacking

- This unit (MHC-V90W) (1)
(composed of the satellite unit and the subwoofer unit)
- Mounting screws (M5 × 30) (4)
- Remote control (1)
- R03 (size AAA) batteries (2)
- FM lead antenna (1)
- AC power cord (mains lead) (1)

Design and specifications are subject to change without notice.

MHC-V90W
HOME AUDIO SYSTEM
SA-V90W
COMPACT DISC RECEIVER
SS-V90W
SPEAKER SYSTEM

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SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check:

Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage.

Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes.). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

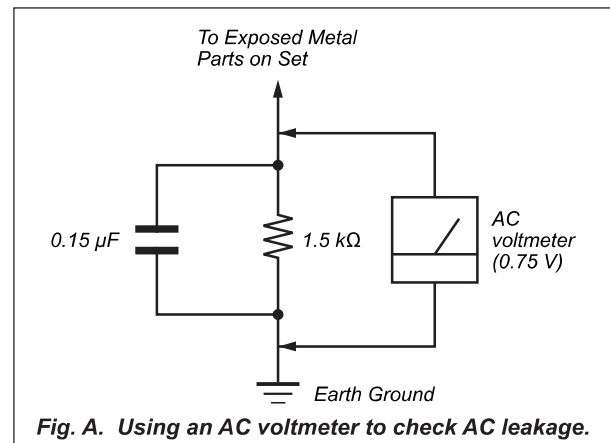


Fig. A. Using an AC voltmeter to check AC leakage.

CAUTION

The use of optical instruments with this product will increase eye hazard.



This appliance is classified as a CLASS 1 LASER product under IEC 60825-1:2007. This marking is located on the rear exterior.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

SAFETY-RELATED COMPONENT WARNING!

COMPONENTS IDENTIFIED BY MARK \triangle OR DOTTED LINE WITH MARK \triangle IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION.

REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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SECTION 1 SERVICING NOTES

The **SERVICING NOTES** contains important information for servicing. Be sure to read this section before repairing the unit.

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic break-down because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body. During repair, pay attention to electrostatic break-down and also use the procedure in the printed matter which is included in the repair parts.

The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pickup block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

UNLEADED SOLDER

Boards requiring use of unleaded solder are printed with the lead-free mark (LF) indicating the solder contains no lead.

(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size)



LF : LEAD FREE MARK

Unleaded solder has the following characteristics.

- Unleaded solder melts at a temperature about 40 °C higher than ordinary solder.
Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.
Soldering irons using a temperature regulator should be set to about 350 °C.
Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity
Unleaded solder is more viscous (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder
It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

ADVANCE PREPARATION WHEN CONFIRMING OPERATION

All of the units included in the MHC-V90W (SA-V90W/SS-V90W/ Remote control) are required to confirming operation of MHC-V90W. Check in advance that you have all of the units.

IMPORTANT NOTE OF PERFORMING THE OPERATION CHECK

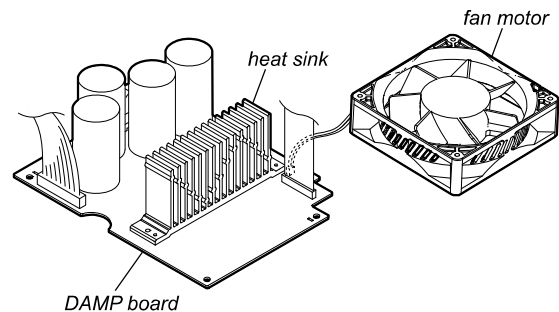
When performing the operation check of this unit, be sure to perform the operation check in the state that following.

- Heat sink is installed to DAMP board
- Fan motor is connected to DAMP board

Note: If turn the power on in the state that heat sink is not installed, there is a possibility of damage.

Also, be sure to perform the operation check in the connect the fan motor to the DAMP board, and the fan motor is rotating state.

If it is necessary to the operation check with the heat sink removed or the fan motor removed, set the volume to 10 or less and check the operation within 1 minute.



IF "PROTECTX CHECK MANUAL" (X is a number) APPEARS ON THE DISPLAY

Immediately unplug the AC power cord (mains lead), and check if anything is blocking the ventilation openings of the unit.

After you have checked and found no problems, reconnect the AC power cord (mains lead), and turn on the system.

Protect Type Description:

Protect No.	Contents
1	There is possibility of over current happen at speaker output. or Unusual heat up of AMP IC by improper assembly of heat sink.
2	Defect of thermistor IC or charging circuit used by SPM (Sound Pressure Management) system.
3	Power supply over current.
4	DC appears in SP terminal by defect of AMP IC.
6	Defect of DC FAN and DC FAN driver circuit.

MHC-V90W

CAUTION

Touching the terminals of the switching regulator without discharging the electricity is extremely dangerous. After operating this device, be sure to refer below and discharge the electricity before proceeding. Also, be careful of electric shock when discharging.

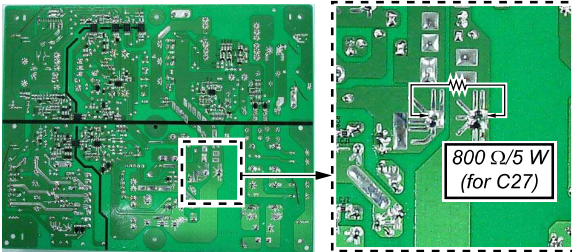
CAPACITOR ELECTRICAL DISCHARGE PROCESSING

Immediately after operating this unit for the electric shock prevention do not touch the board, leave it for about 2 to 3 minutes with the power off state.

Also, before checking the operation of the boards, perform the discharge processing by connecting the resistor at both ends of capacitor with referring to the figure below.

Note: Be sure to discharge using a resistor of 800 Ω or higher.

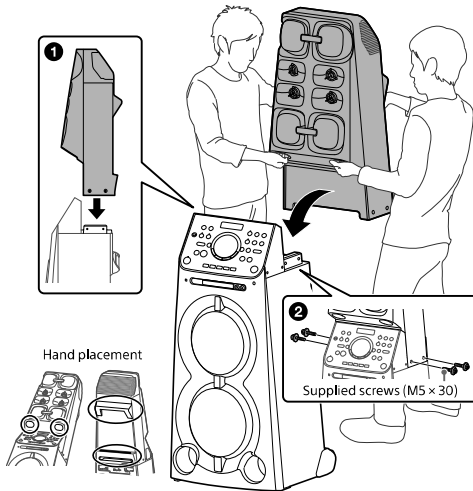
– SWITCHING REGULATOR (Conductor Side) –



ASSEMBLING THE UNIT

Make sure that two people handle the unit when mounting it. Dropping the unit may cause personal injury and/or property damage.

Mount the satellite unit on the subwoofer unit, then secure firmly by tightening the supplied screws (M5 × 30).



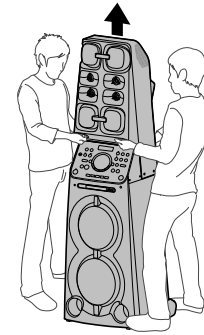
Note

- Be sure to use the supplied screws (M5 × 30) to assemble the unit.
- Be careful not to pinch your fingers or speaker cords while mounting the satellite unit.
- After assembling the unit, make sure the satellite unit is securely fixed to the subwoofer unit with the supplied screws.
- When using an electric screwdriver to tighten the screws, make the torque setting to approximately 1 N·m (10 kgf·cm).
- Do not place the unit on unstable surfaces. Be sure to place the unit on flat surfaces.
- Be sure to retighten the screws when they become loose by using this unit.

CARRYING THE UNIT

The unit has caster wheels so that you can roll it easily. Before carrying the unit, disconnect the AC power cord (mains lead).

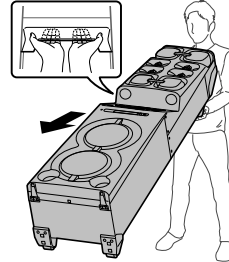
—on uneven surfaces:



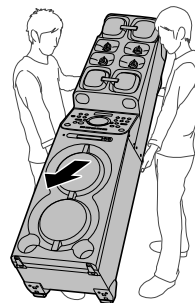
Carrying the unit by this method is recommended:

—on flat surfaces:

When carrying alone



When carrying with two people



Note

- The caster wheels can be used only on flat surfaces. Lift the unit by two people on uneven surfaces. Correct hand placement while carrying the unit is very important to avoid personal injury and/or property damage. Be sure to use the handle when lifting the unit.



- Exercise extreme caution when carrying the unit on a slope.
- Do not carry the unit with a person, luggage, etc., on it.
- Do not let children or infants be near when carrying the unit.

For children

- Do not allow children to climb on the unit.
- Warning: Keep small accessories out of the reach of children, so that they are not mistakenly swallowed (e.g., AC plug adaptor, batteries, screws, etc.).



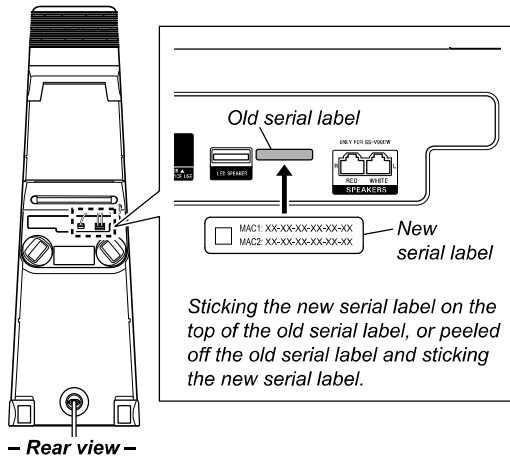
IMPORTANT NOTE OF REPLACING THE BENTEN-MOTHER BOARD

When the BENTEN-MOTHER board is replaced, be sure to perform the following work.

1. The MAC address of this unit will be changed. Refer to the figure below, stick the new serial label on the rear side of this unit.

Note 1: The MAC address is indicated on the serial label.

Note 2: The serial label indicated the changed MAC address is enclosed with in the new BENTEN-MOTHER board.



2. Perform the connection check of NFC.
(Refer to “NFC CONNECTION CHECKING METHOD” on the right)
3. Perform the connection check of network (wireless/wired LAN).
(Refer to “NETWORK CONNECTION CHECKING METHOD (WIRELESS/WIRED LAN)” on page 8)
4. Since the MAC address of this unit has been changed, set it again when it is using the MAC address filtering function of access point device of connection destination.
When registration of client devices to the DLNA server device is not automatic, it is necessary to register this unit into a server again.
The changed MAC address is indicated on the serial label enclosed with in the new BENTEN-MOTHER board.
MAC1: MAC address of wired LAN
MAC2: MAC address of wireless LAN

NFC CONNECTION CHECKING METHOD

When the BENTEN-MOTHER board or NFC module (RC-S730) are replaced, it is necessary to check that pairing is normally performed.

Perform the operation check according to the following procedure.

1. Necessary Equipment

- NFC-compatible smartphone

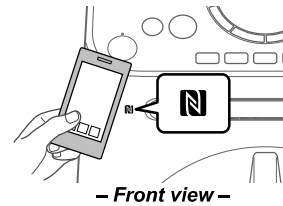
Note 1: Smartphones with a built-in NFC function (OS: Android 2.3.3 or later, excluding Android 3.x).

Note 2: If the NFC-compatible smartphone has an OS version that is older than Android 4.1.x, download and install the “NFC Easy Connect” application.

2. Connection Method

Procedure:

1. Turn on the NFC function of the smartphone.
If the NFC-compatible smartphone has an OS version that is older than Android 4.1.x, start the “NFC Easy Connect” application.
2. Press the [⏻] button to turn the power on.
3. Touch the smartphone to the N-Mark on this unit.



4. When the NFC connection is completed, connected smartphone name is displayed on the liquid crystal display.
5. Start the playback of an audio source on the smartphone.
Note 3: For details, refer to the operating instructions of smartphone.

3. Connection Releasing Method

Touch the smartphone to the N-Mark on this unit again.

MHC-V90W

NETWORK CONNECTION CHECKING METHOD (WIRELESS/WIRED LAN)

When the BENTEN-MOTHER board or dual-band dipole antenna are replaced, be sure to perform the connection check of network (wireless/wired LAN).

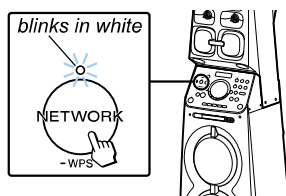
1. Checking Method of Wireless LAN Connection

Necessary Equipment:

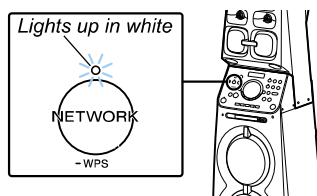
- Wireless router with the Wi-Fi Protected Setup™ (WPS) button

Procedure:

1. Press the [⏻] button to turn the power on.
2. Touch and hold [NETWORK ➔WPS] button until the NETWORK indicator blinks in white, and “WPS” blinks on the liquid crystal display.



3. Press the [WPS] button on the access point.
4. When wireless LAN connection is completed, “COMPLETE” is blinked a few seconds on the liquid crystal display, and the NETWORK indicator lights up in white.



Note 1: Refer to “Operating Instructions” or “Wi-Fi Startup Guide” of this unit’s accessories for details.

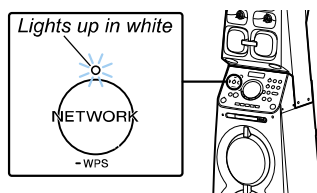
2. Checking Method of Wired LAN Connection

Necessary equipment:

- Router
- Network LAN cable

Procedure:

1. Press the [⏻] button to turn the power off.
2. Connect this unit to the router with the network LAN cable.
3. Press the [⏻] button to turn the power on.
4. When wired LAN connection is completed, the NETWORK indicator lights up in white.



Note 2: Refer to “Help Guide” of this unit for details.

CHECKING THE OPERATION AFTER REPAIR

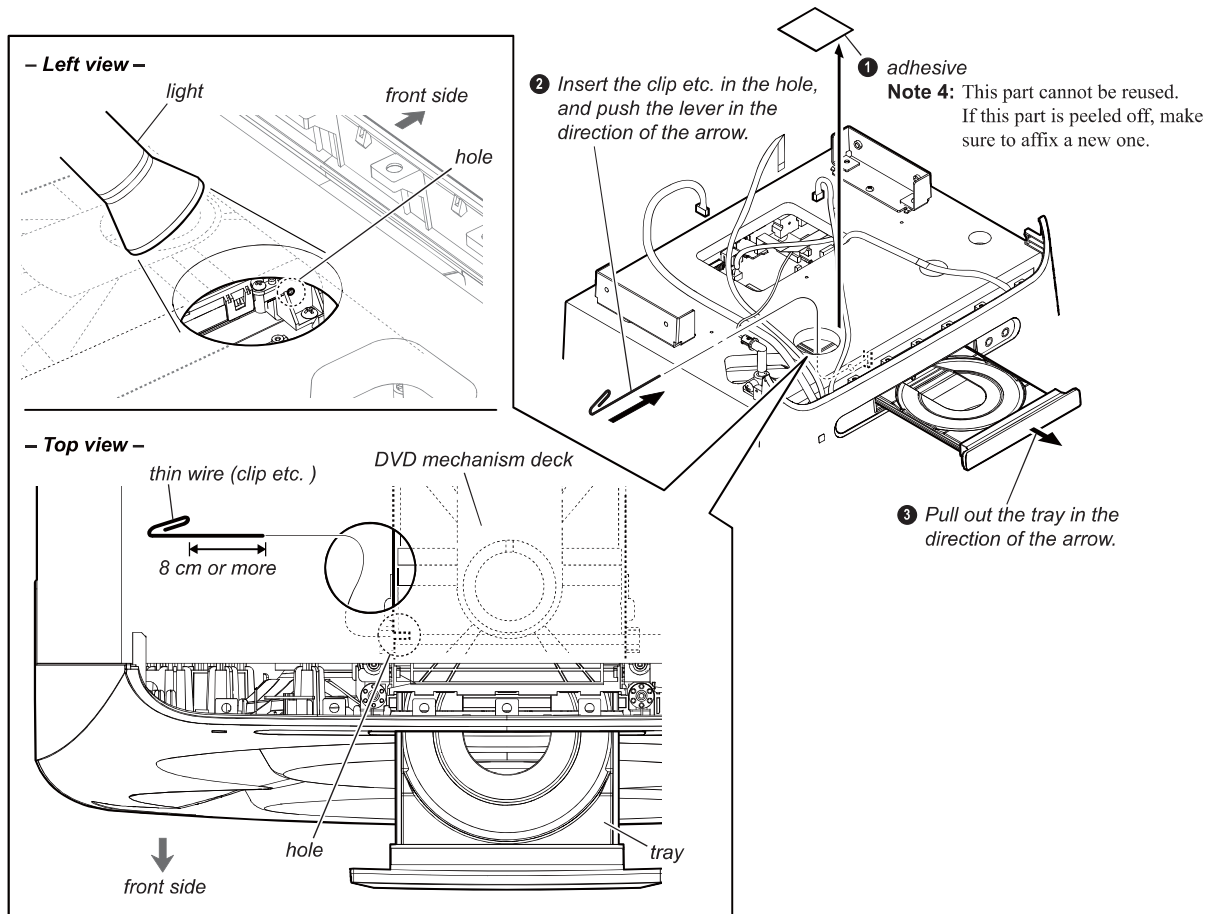
After repair completion, connect the “iPod/iPhone”, “Walkman”, “smartphone” etc. corresponding to this unit, and check the operation of playback, recording, charge, etc.

HOW TO OPEN THE TRAY WHEN POWER SWITCH TURN OFF

Note 1: After the top panel are removed, this work is done.

Note 2: Please prepare the thin wire (clip etc. processed to the length of 8 cm or more).

Note 3: Please prepare a light to check inside the hole.

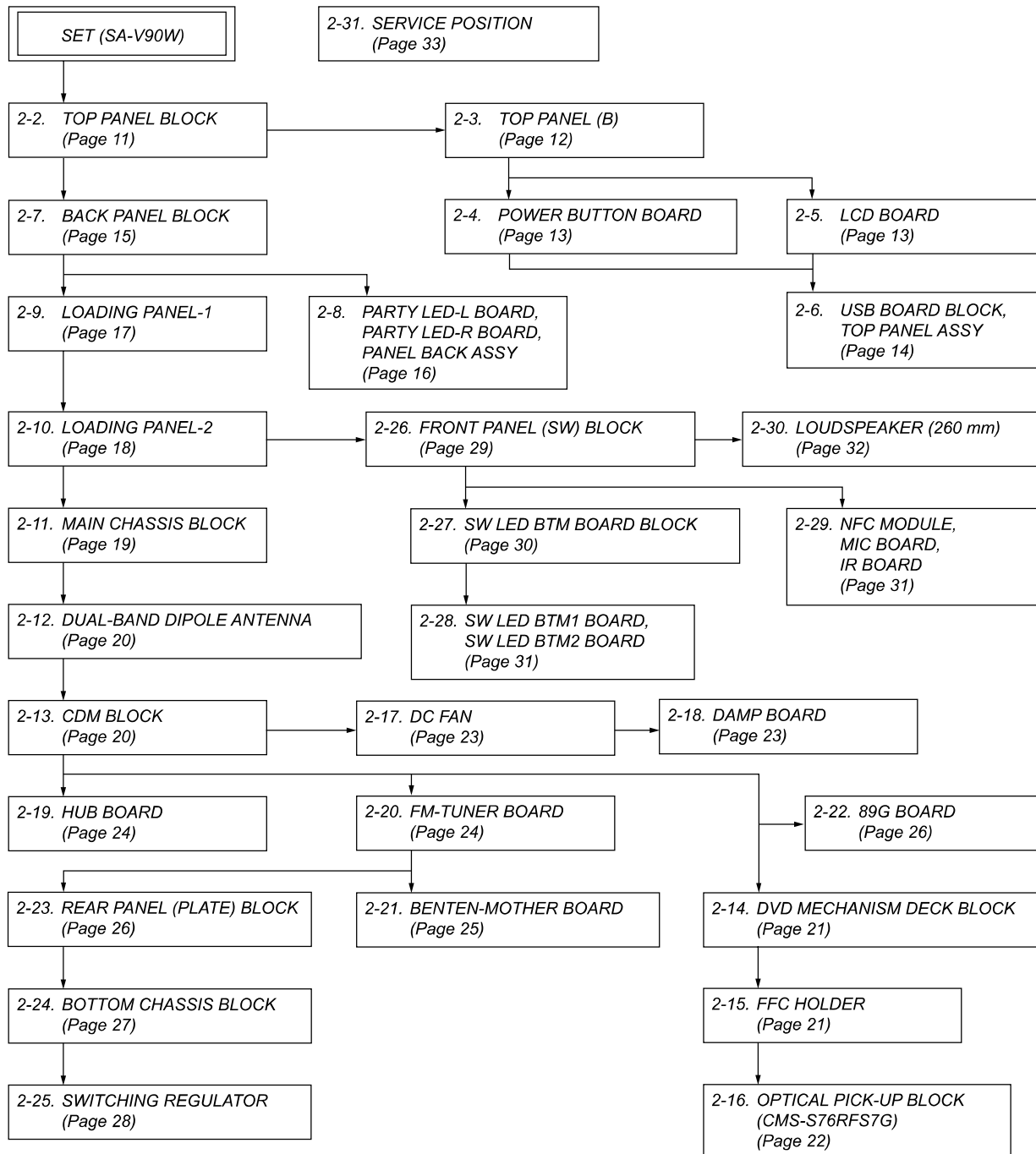


MHC-V90W**SECTION 2
DISASSEMBLY**

- This set can be disassembled in the order shown below.

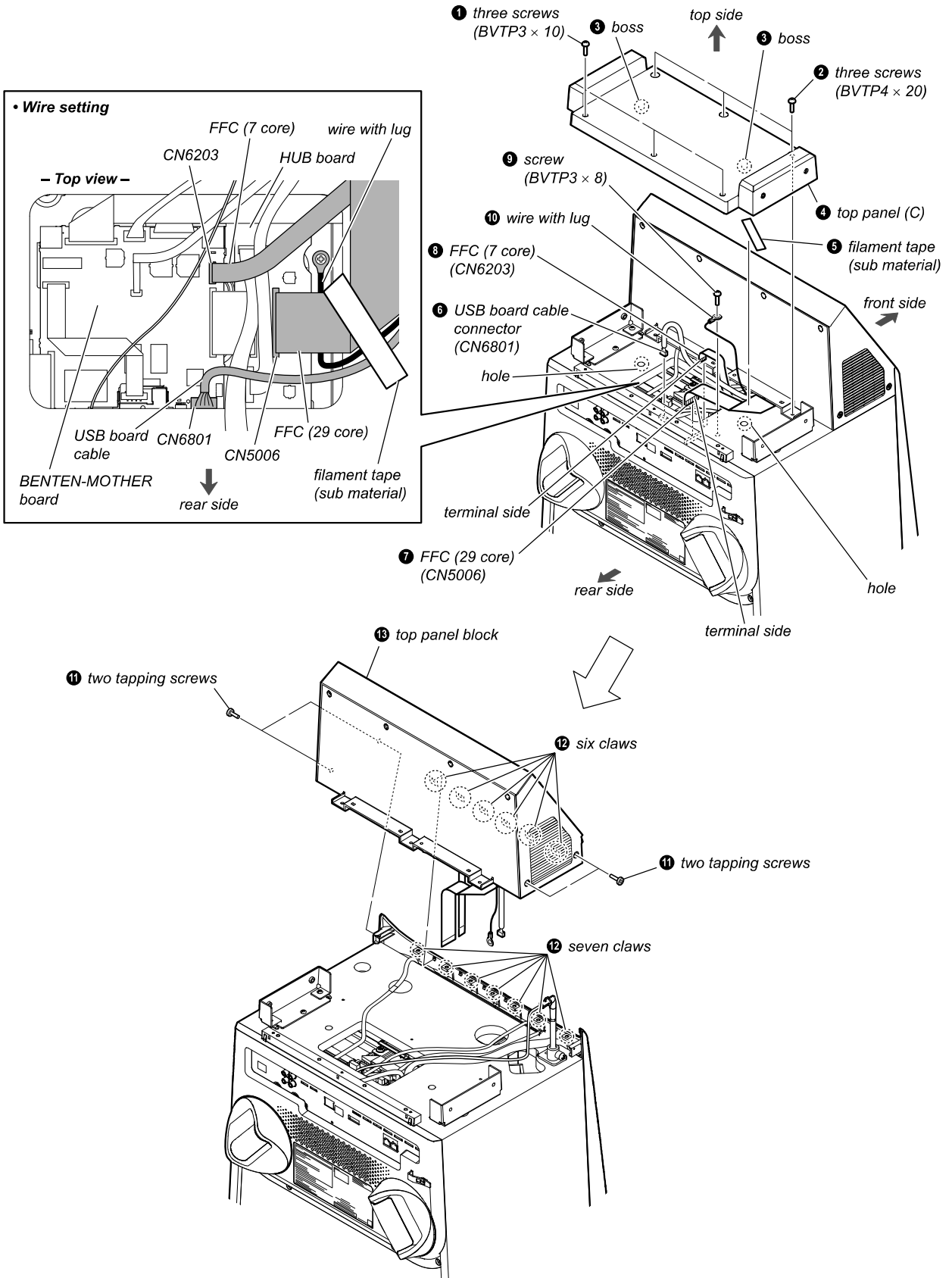
2-1. DISASSEMBLY FLOW (SA-V90W)

Note: Refer to page 34 for the SS-V90W.



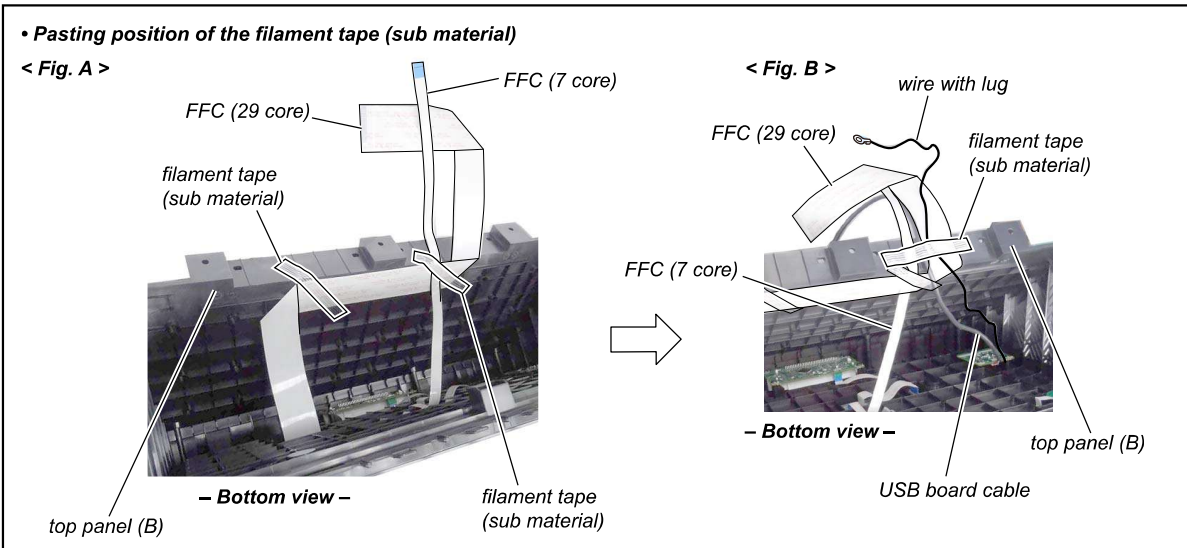
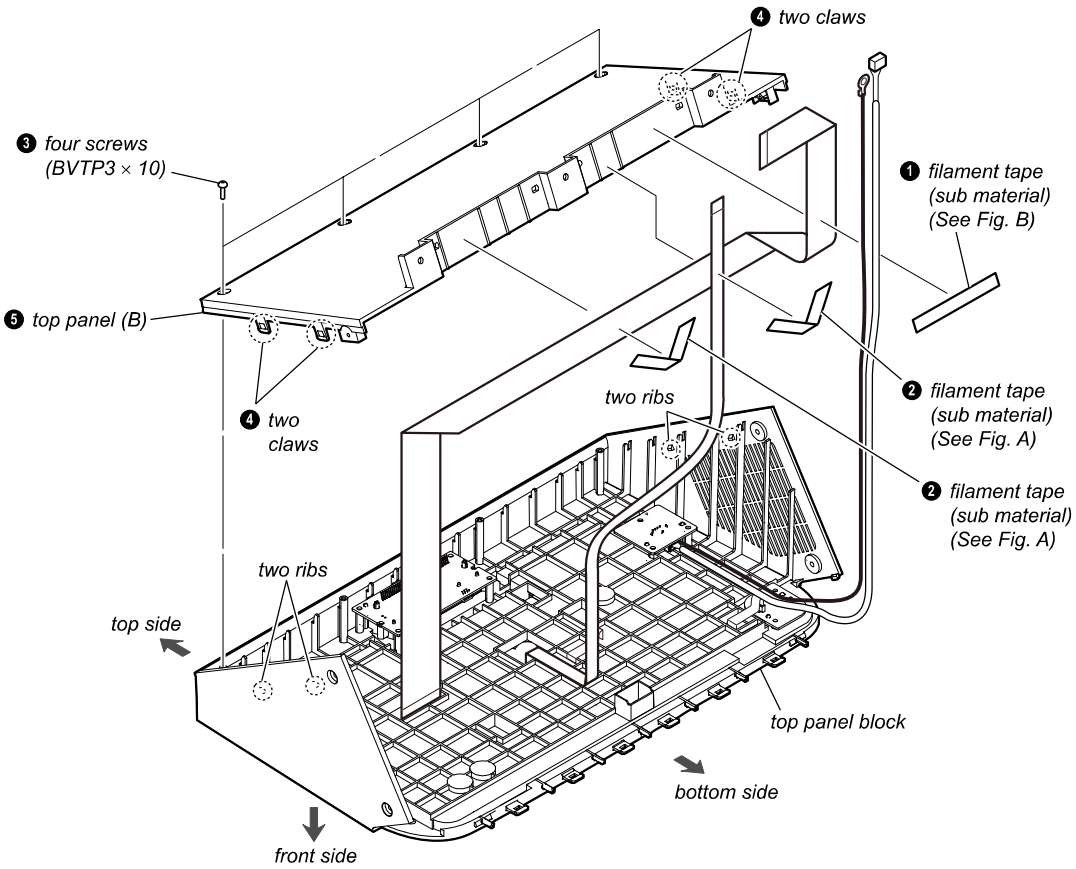
Note: Follow the disassembly procedure in the numerical order given.

2-2. TOP PANEL BLOCK

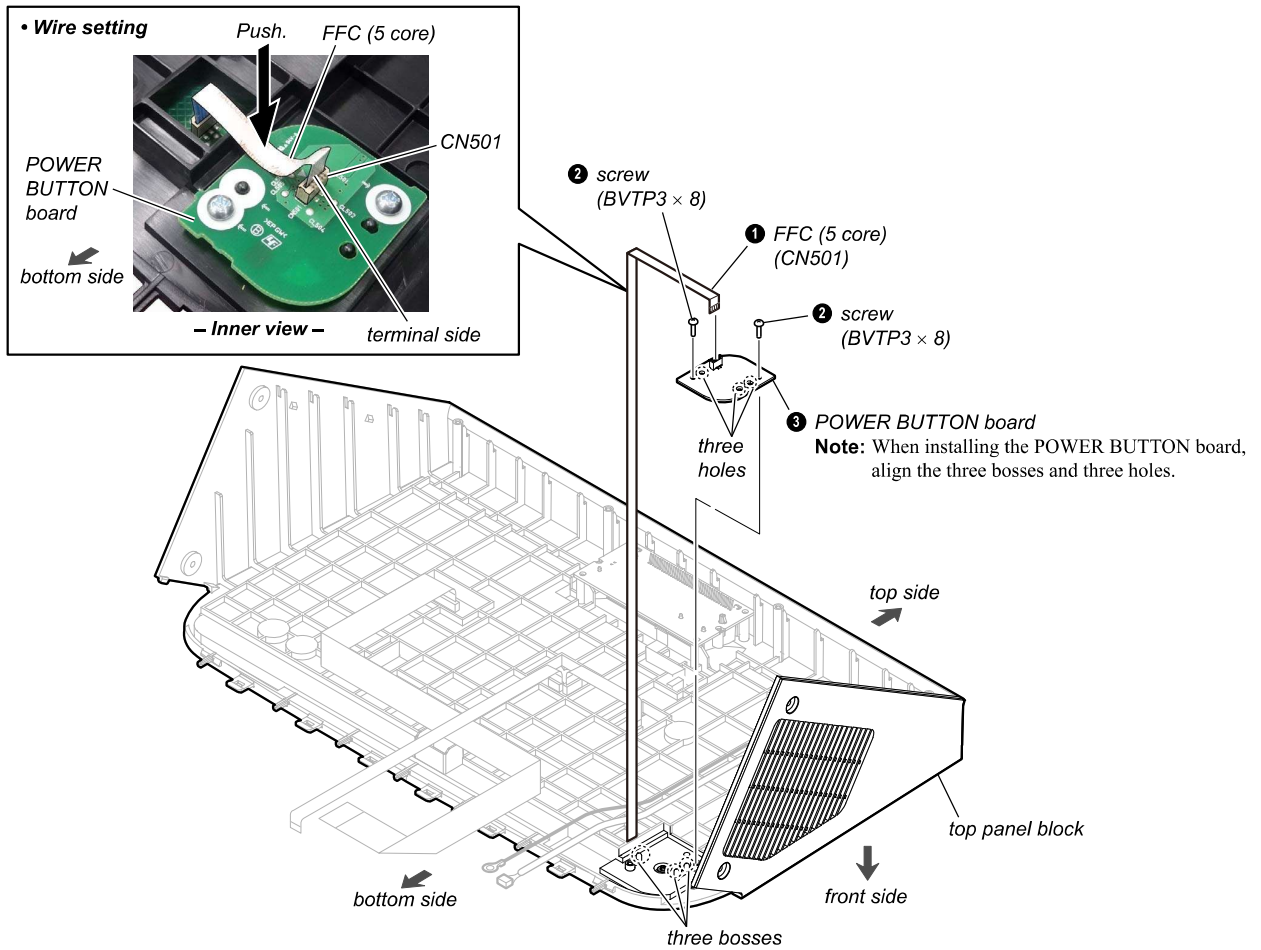


MHC-V90W

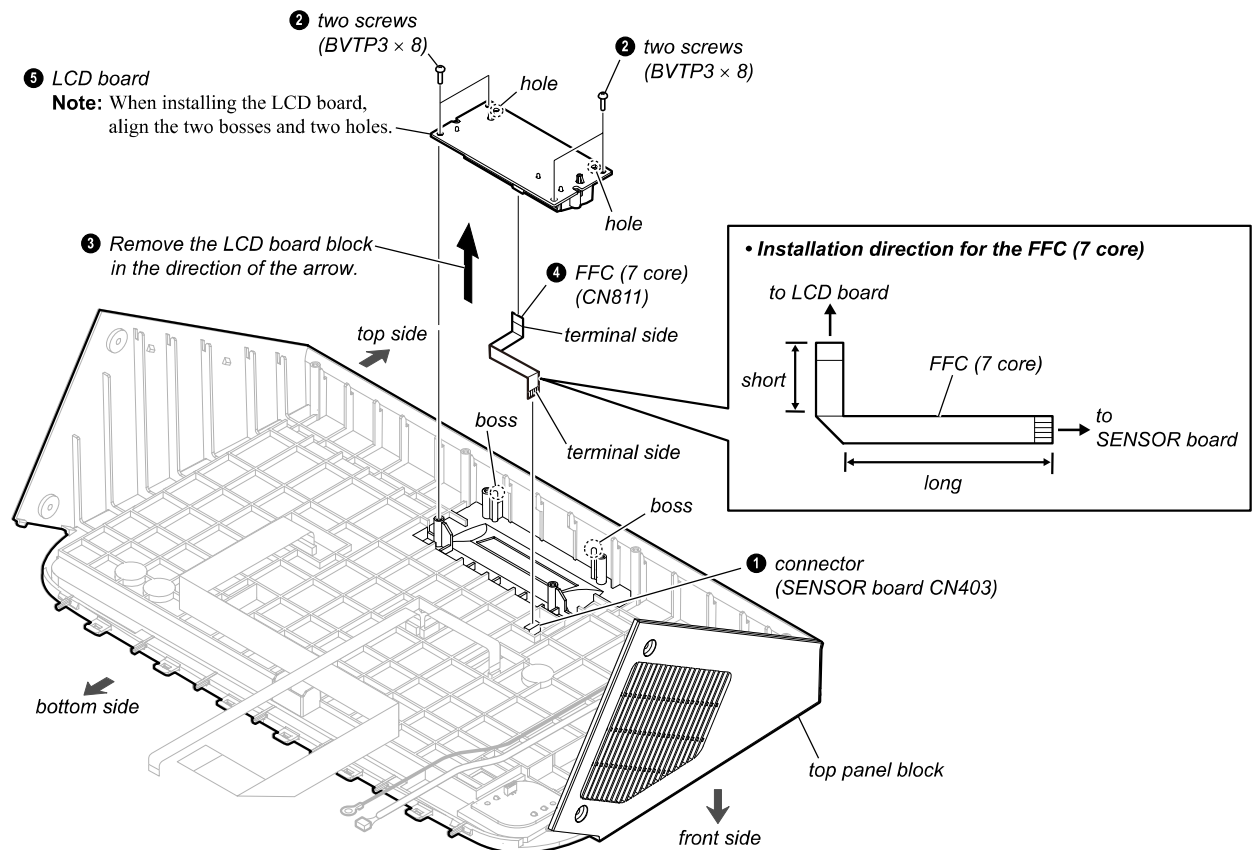
2-3. TOP PANEL (B)



2-4. POWER BUTTON BOARD

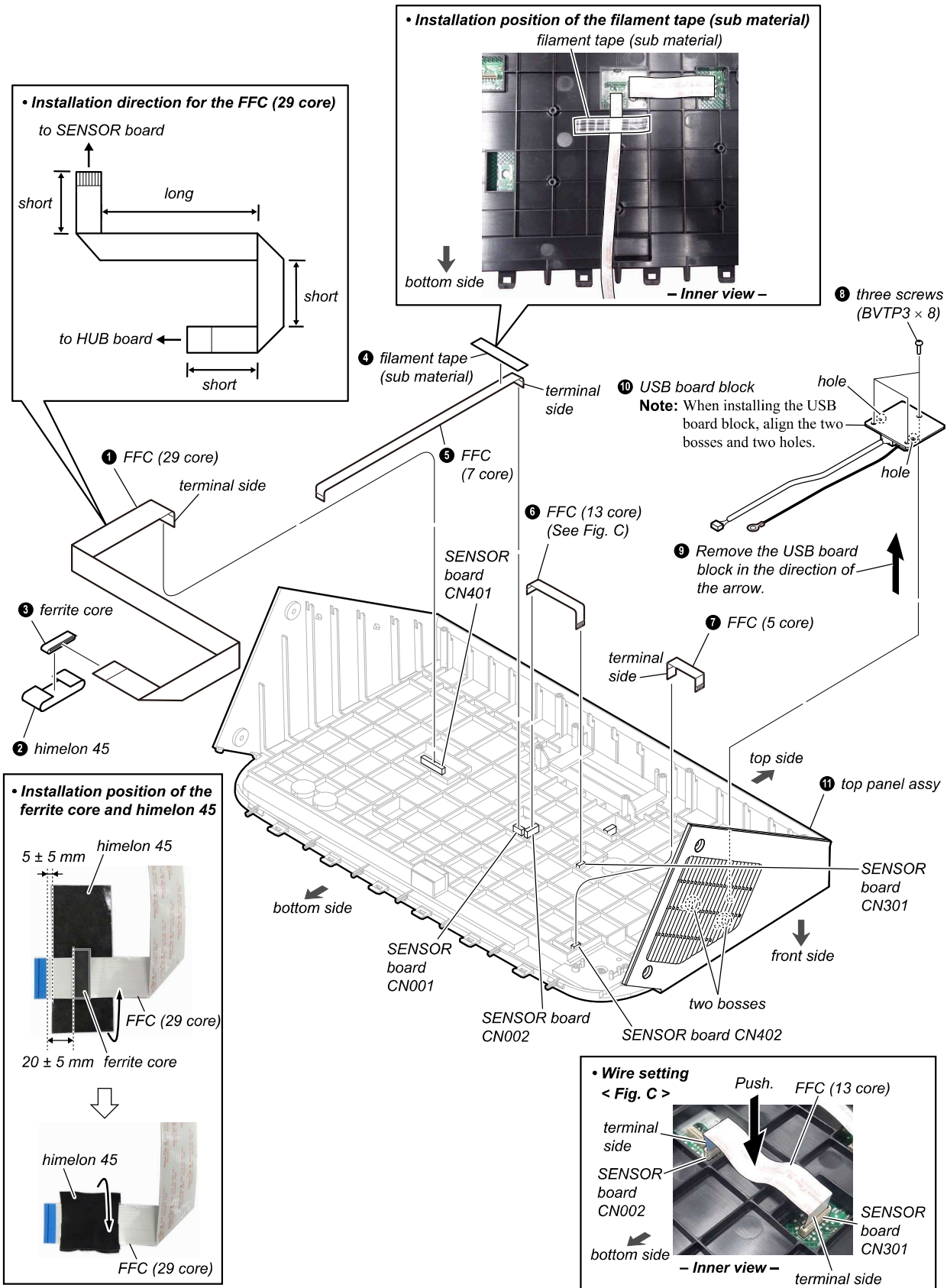


2-5. LCD BOARD

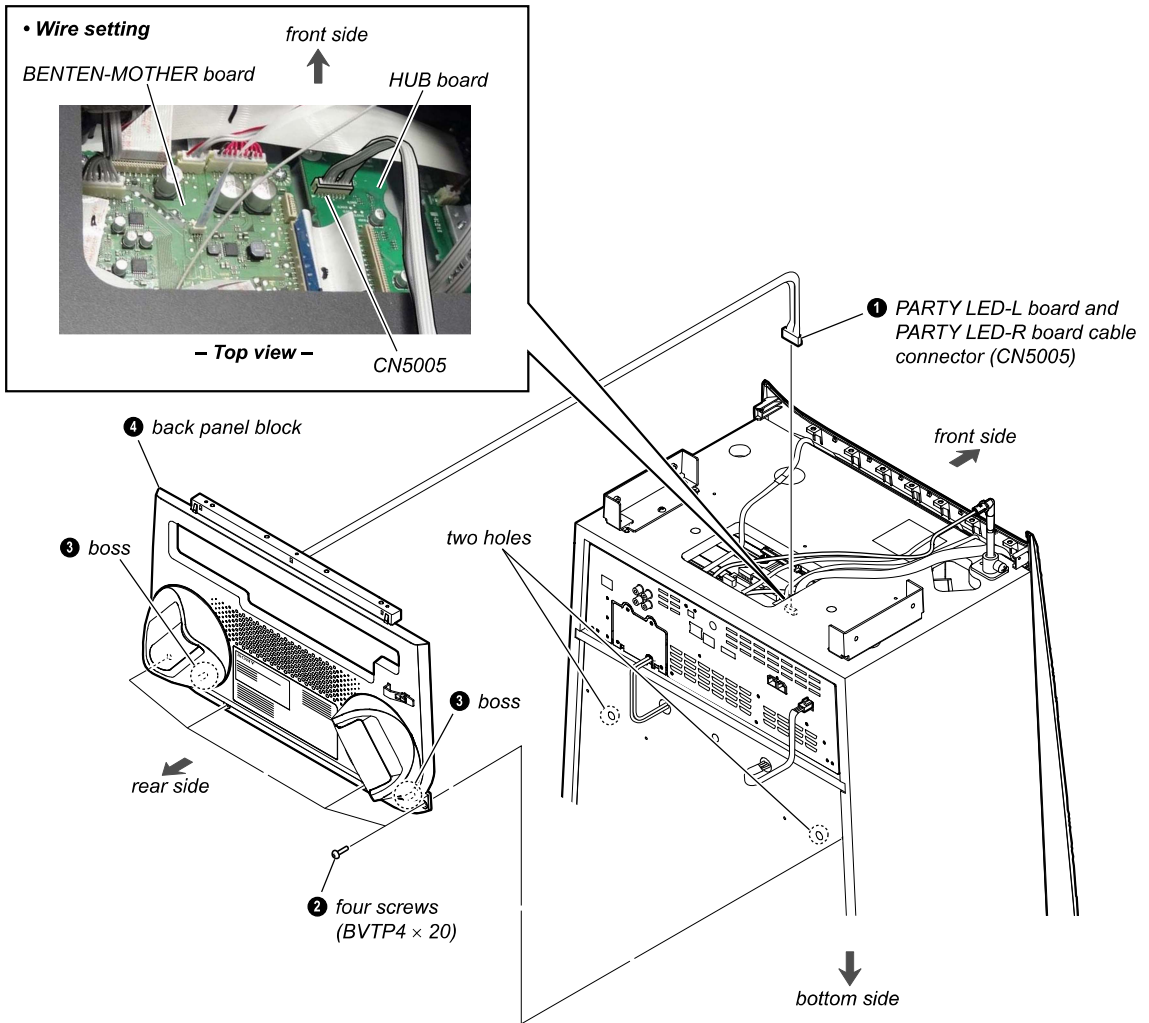


MHC-V90W

2-6. USB BOARD BLOCK, TOP PANEL ASSY

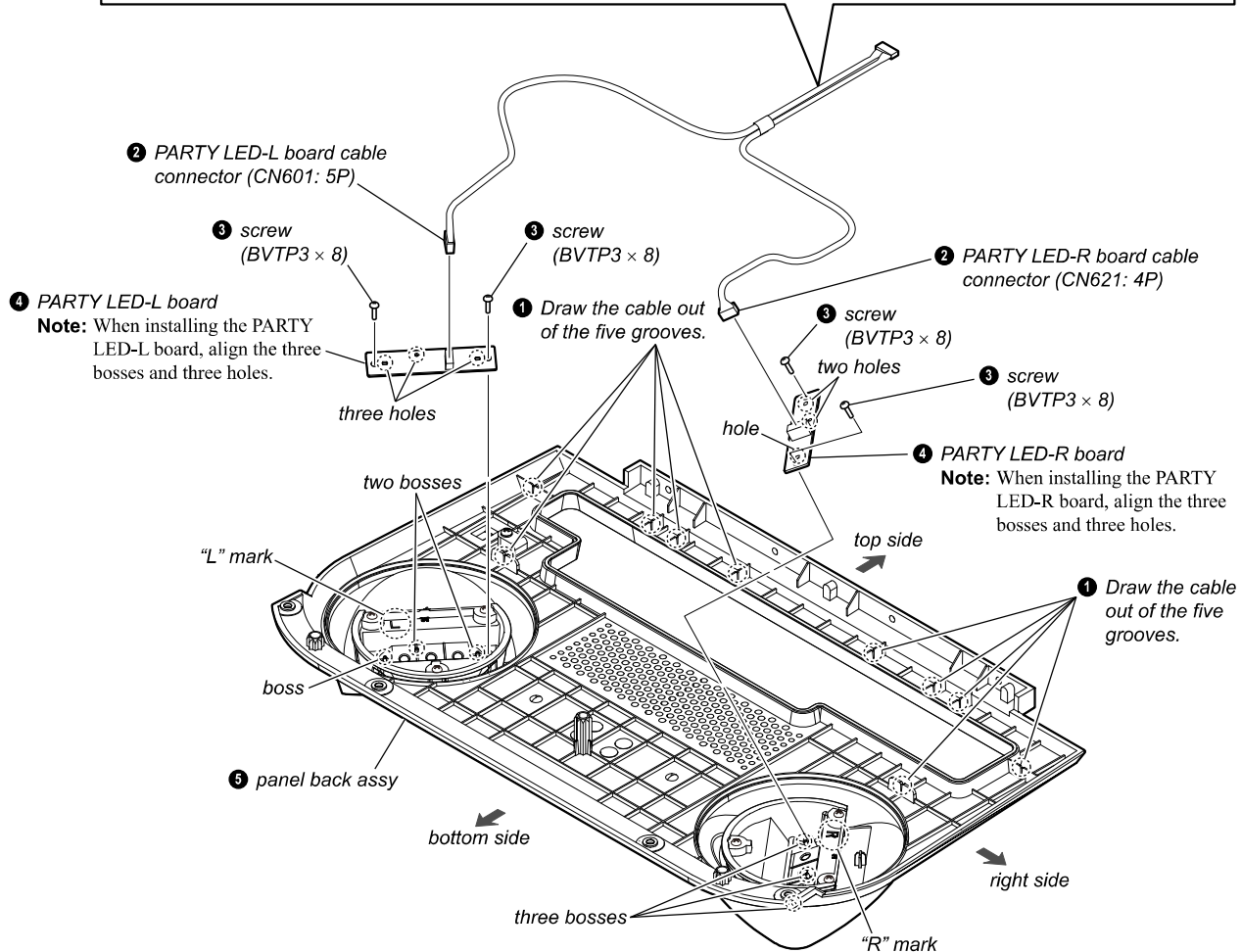
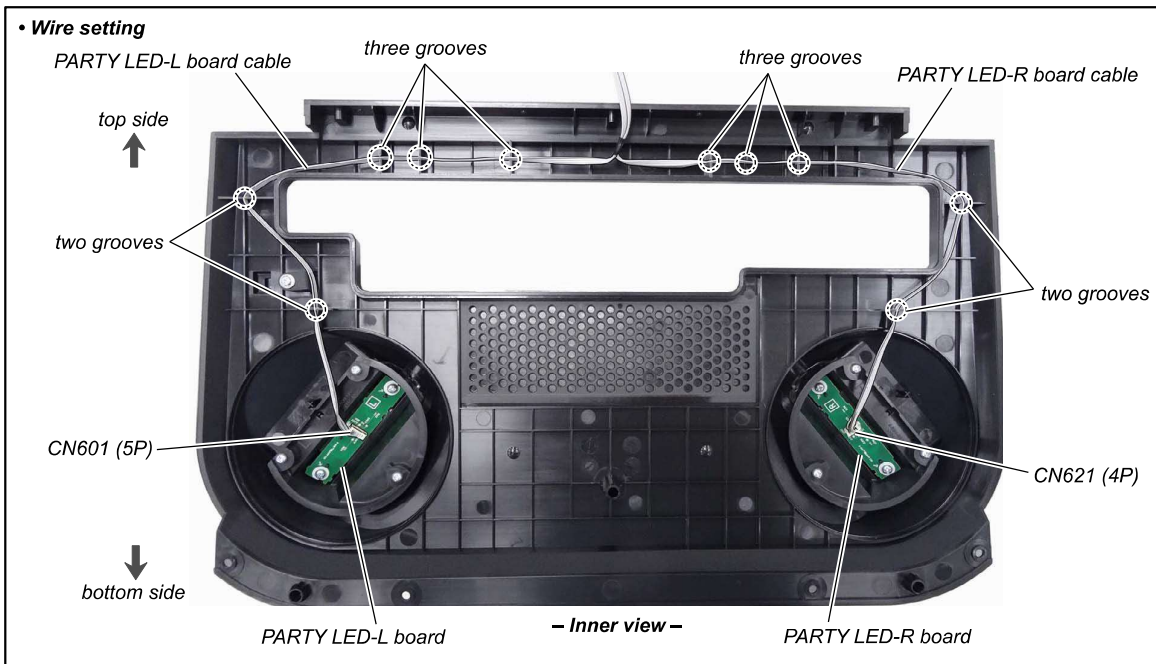


2-7. BACK PANEL BLOCK



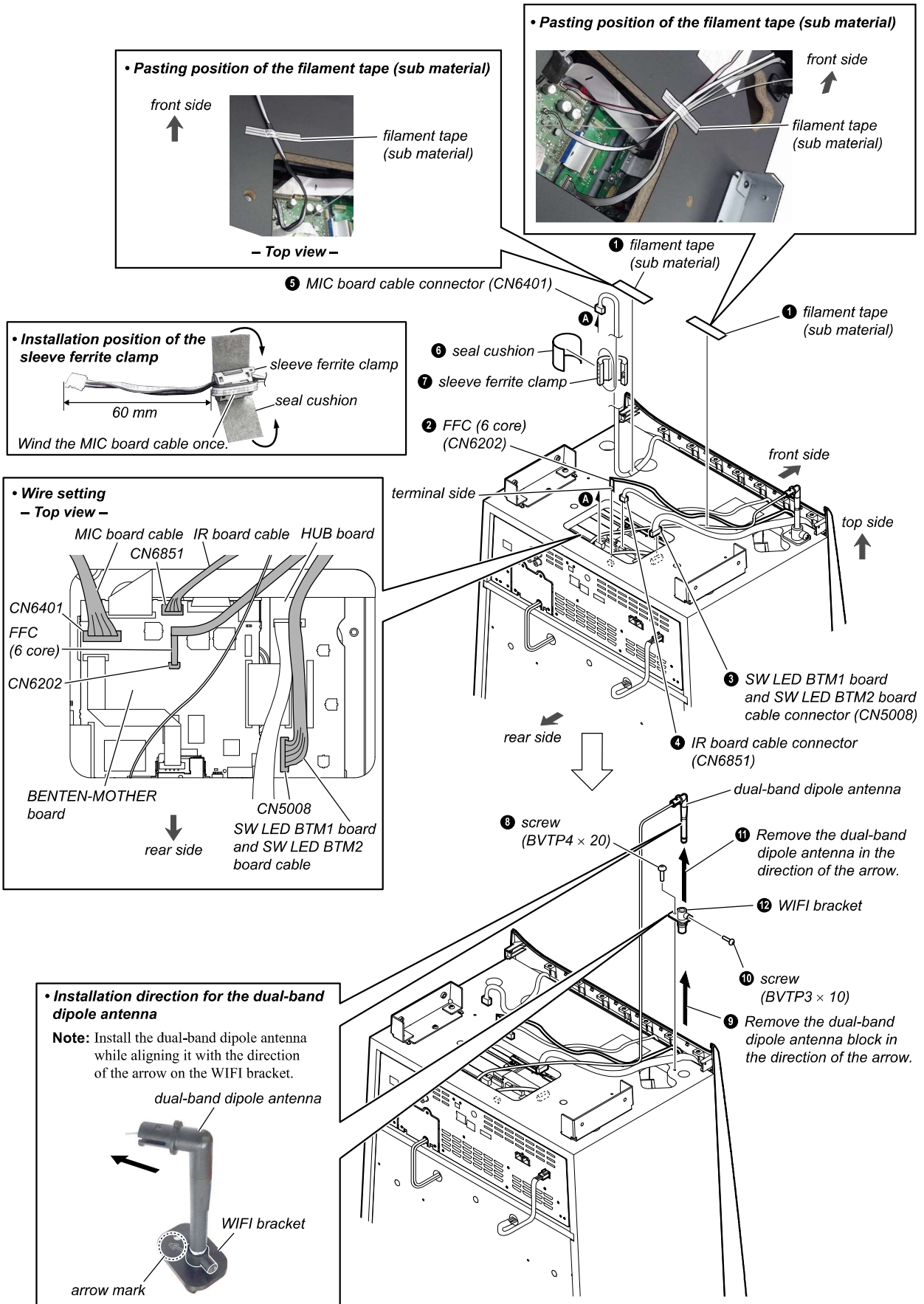
MHC-V90W

2-8. PARTY LED-L BOARD, PARTY LED-R BOARD, PANEL BACK ASSY



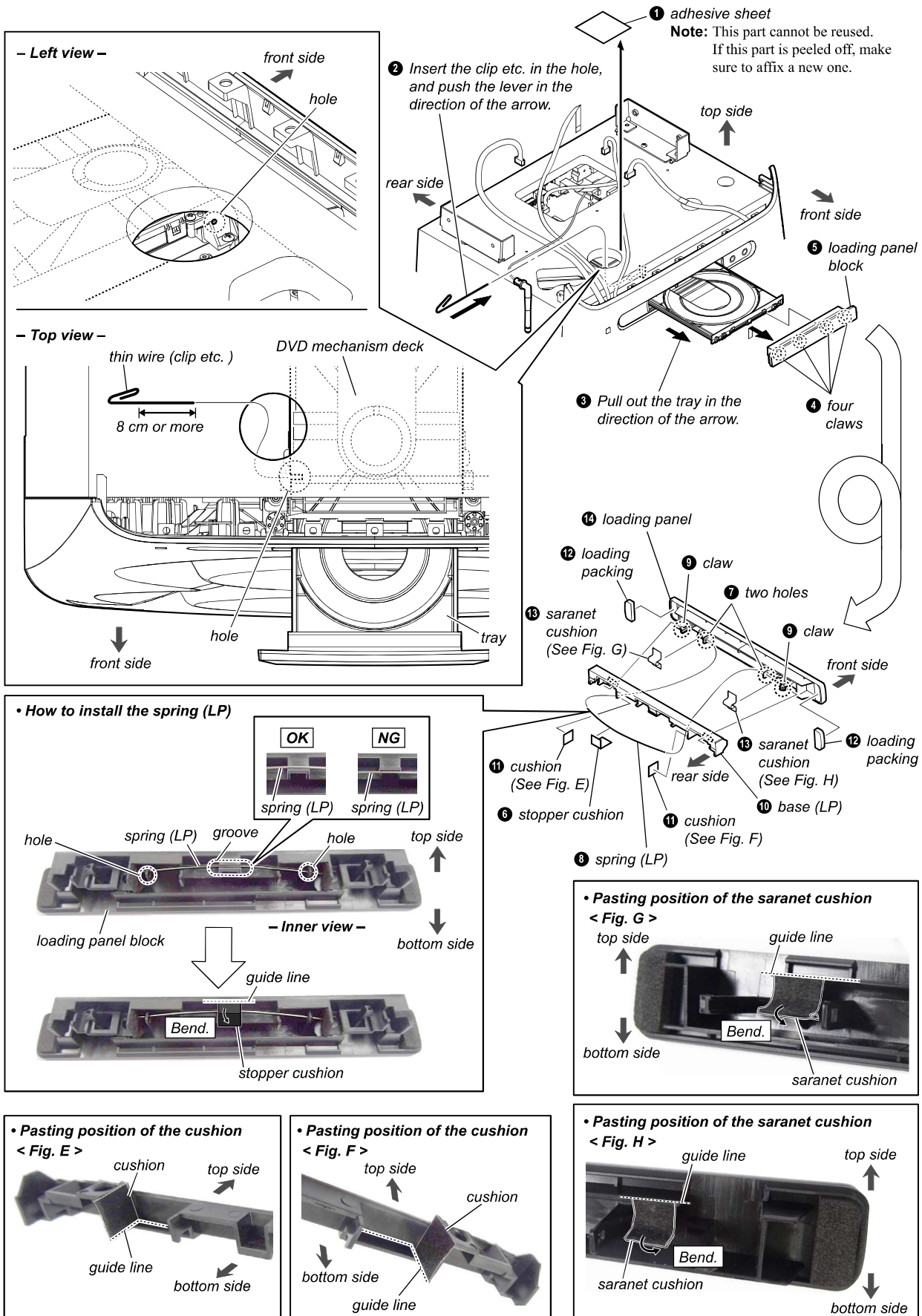
2-9. LOADING PANEL-1

• Continued on 2-10 (page 18).



MHC-V90W

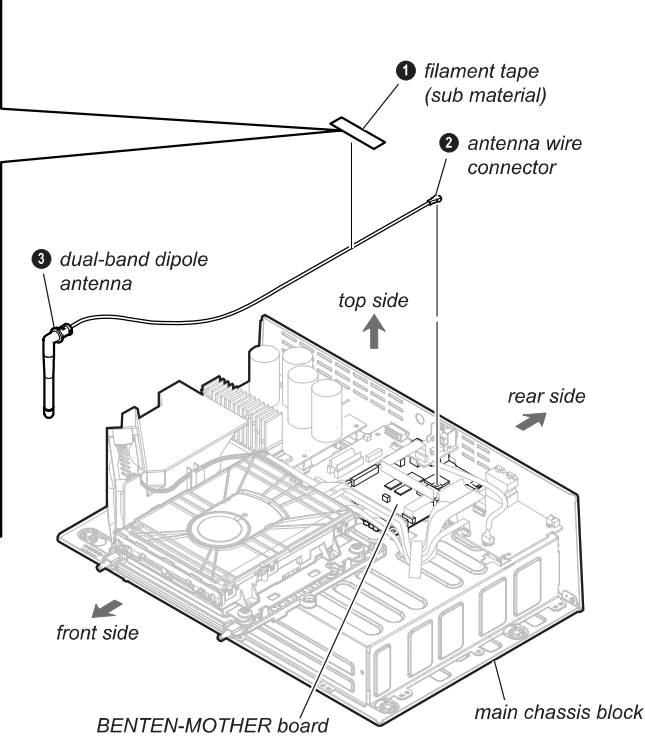
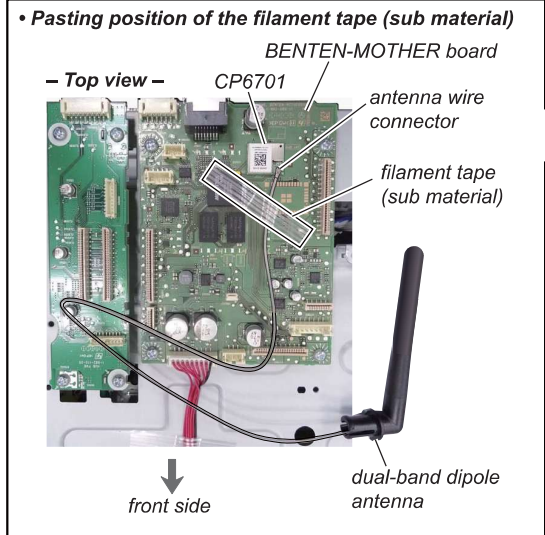
2-10. LOADING PANEL-2



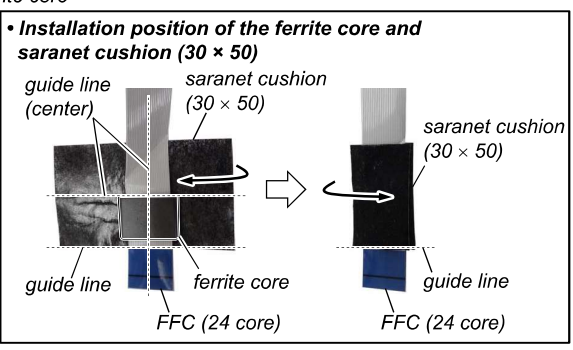
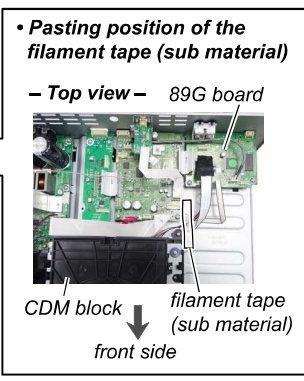
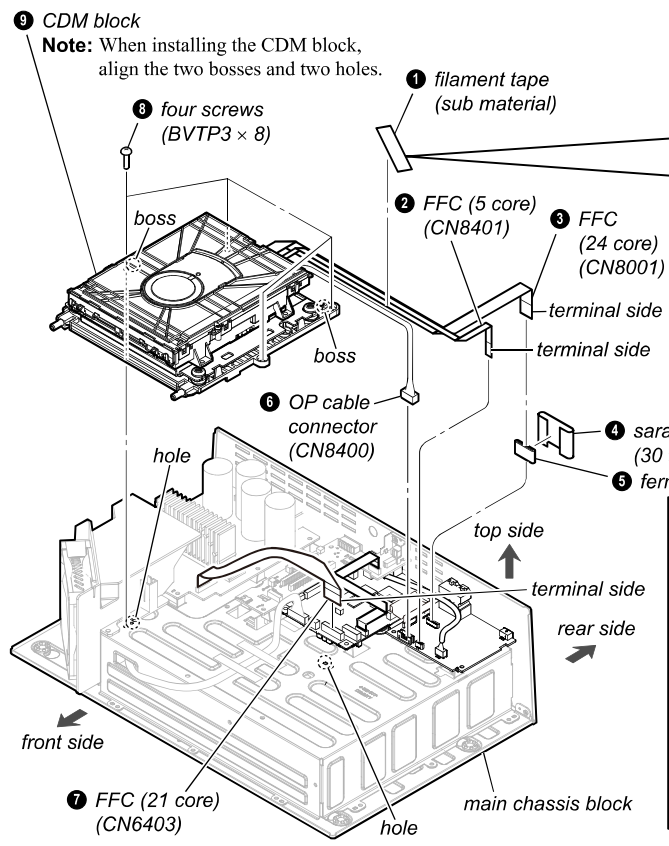
MHC-V90W

2-12. DUAL-BAND DIPOLE ANTENNA

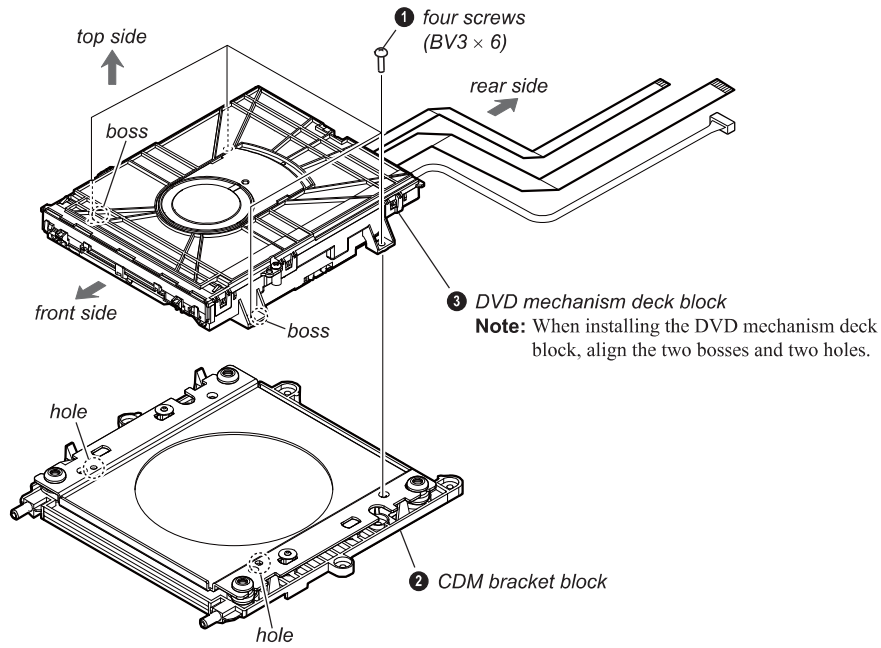
Note: When the dual-band dipole antenna is replaced, refer to “NETWORK CONNECTION CHECKING METHOD (WIRELESS/WIRED LAN)” on page 8.



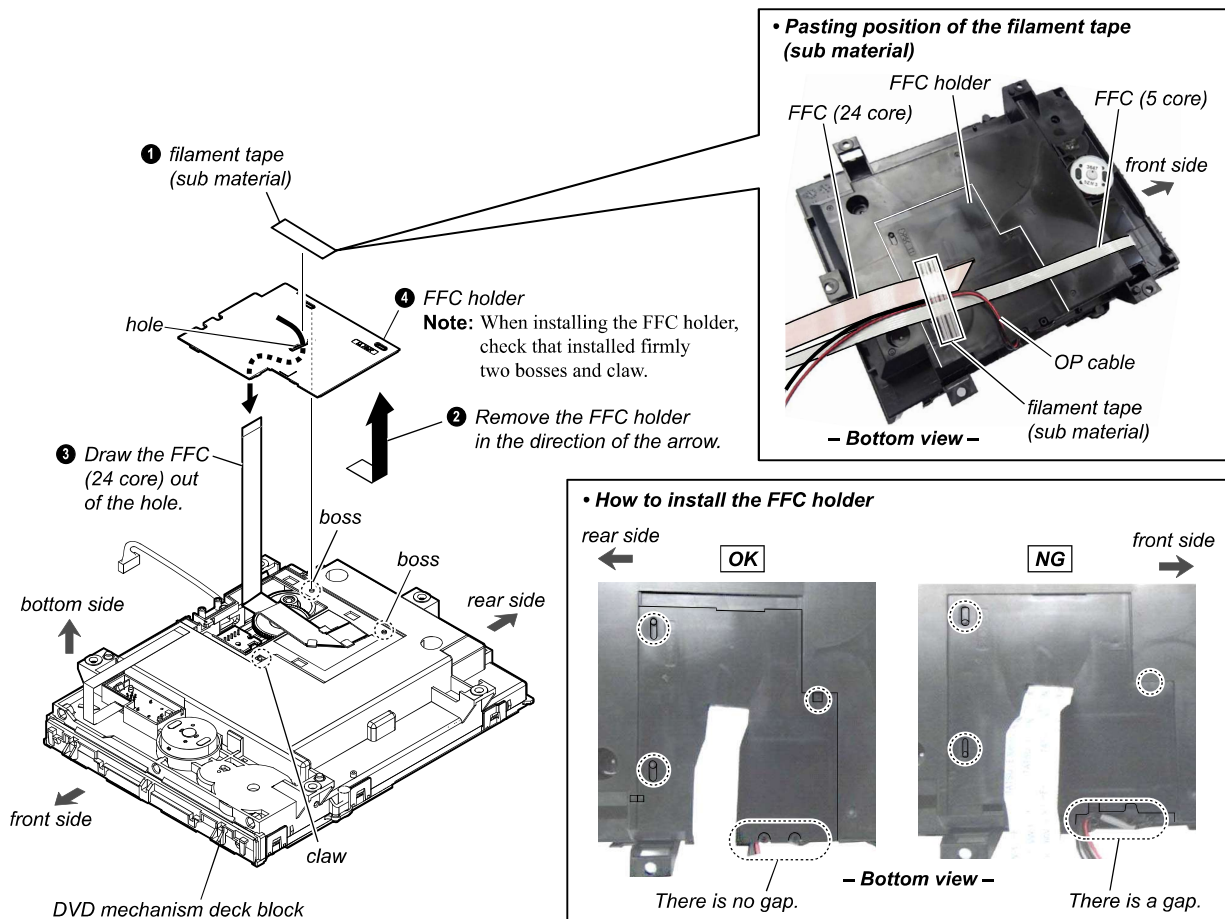
2-13. CDM BLOCK



2-14. DVD MECHANISM DECK BLOCK

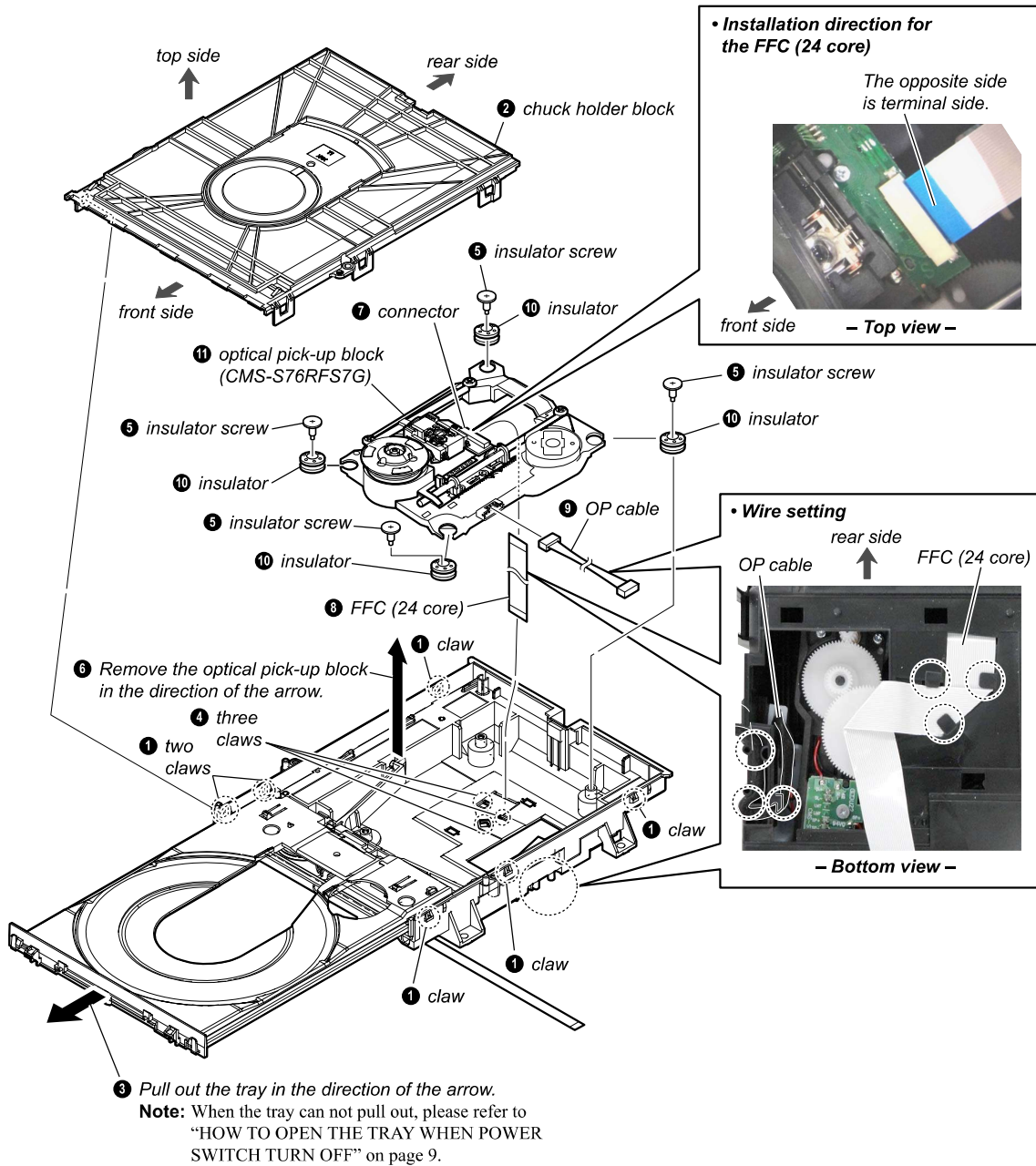


2-15. FFC HOLDER

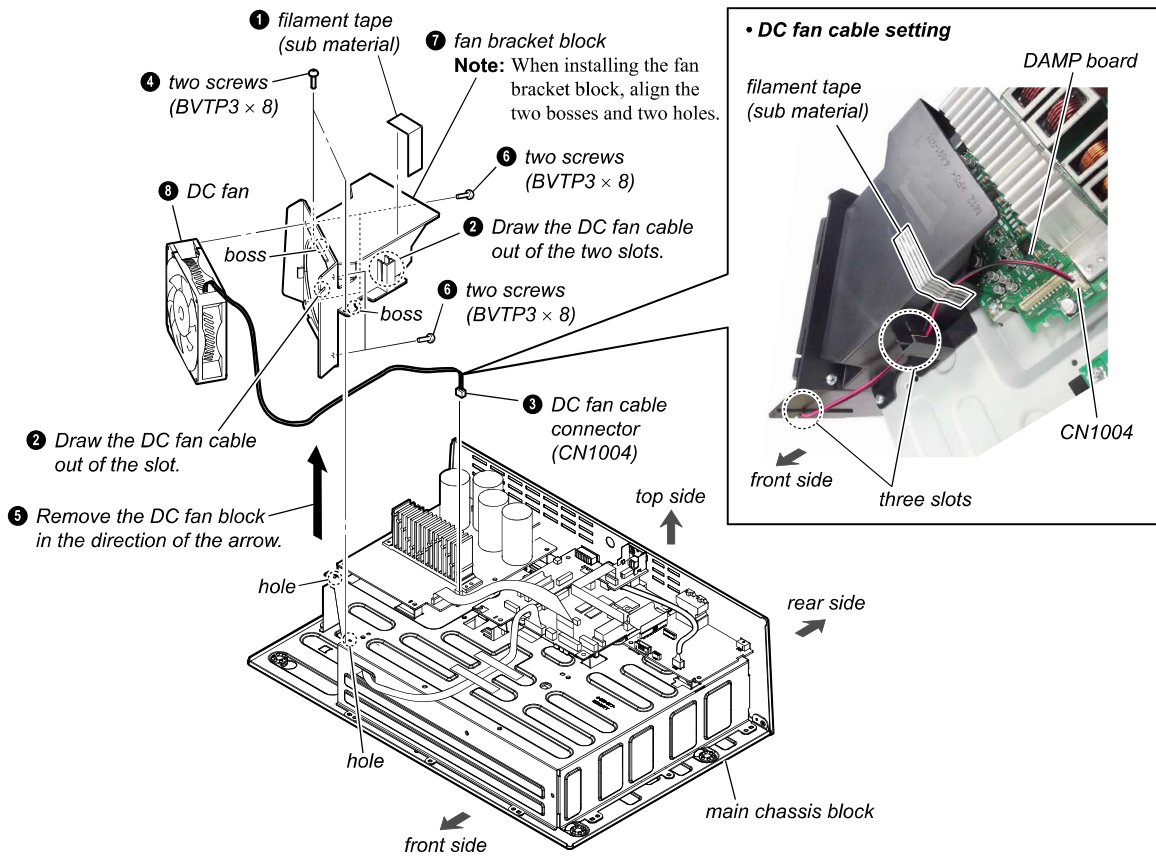


MHC-V90W

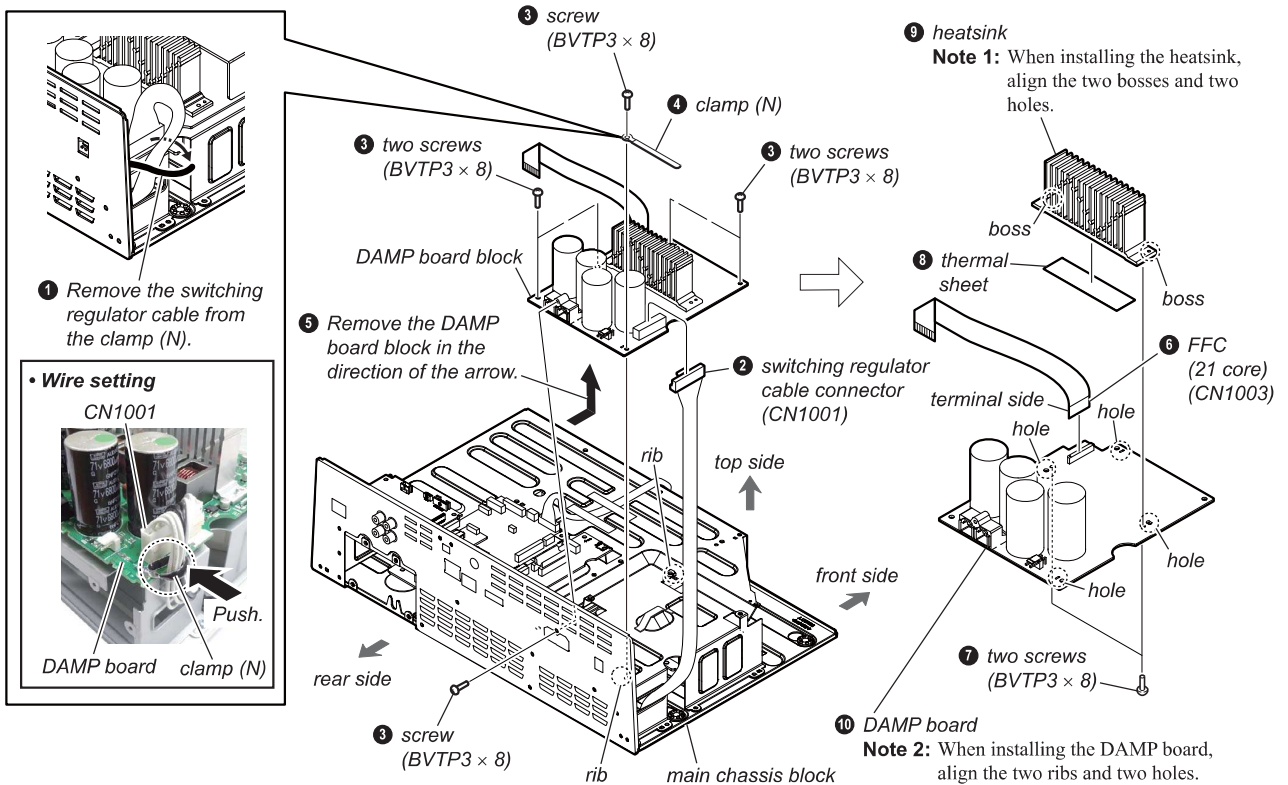
2-16. OPTICAL PICK-UP BLOCK (CMS-S76RFS7G)



2-17. DC FAN

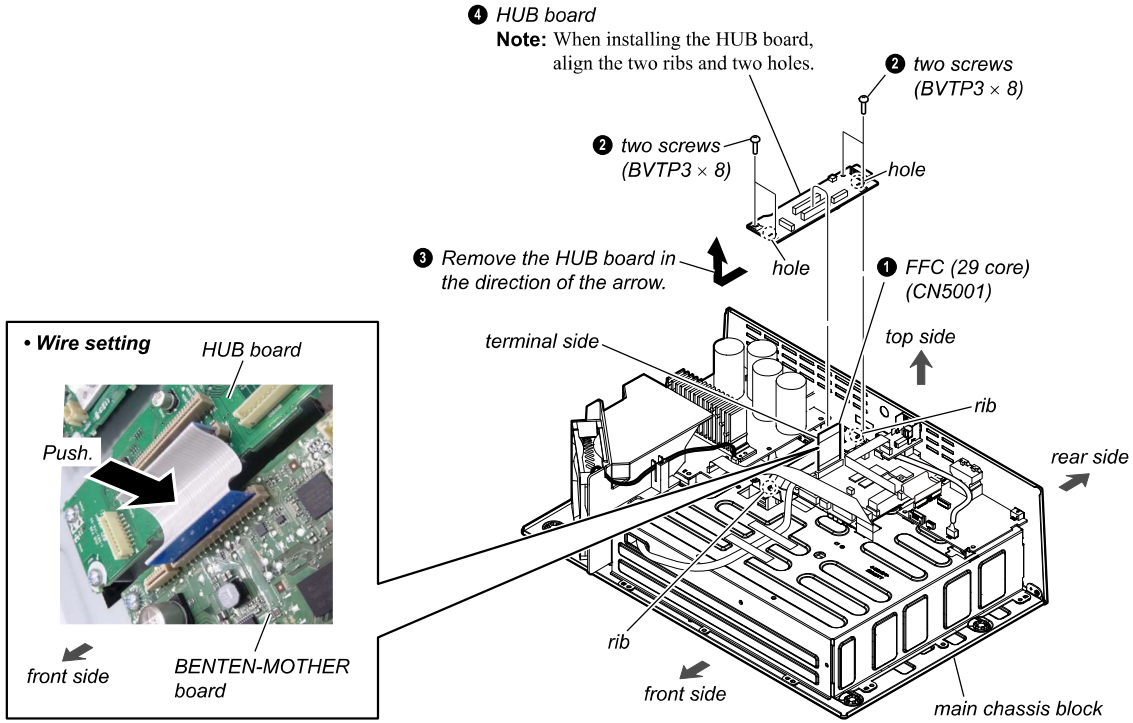


2-18. DAMP BOARD

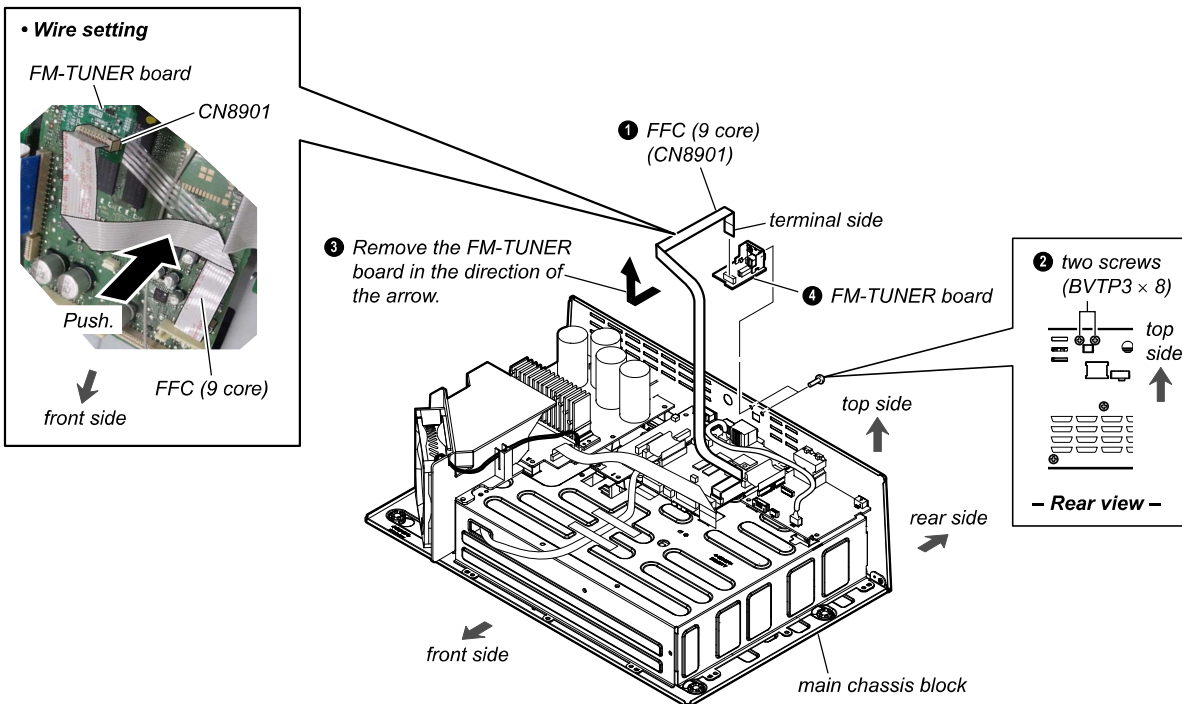


MHC-V90W

2-19. HUB BOARD

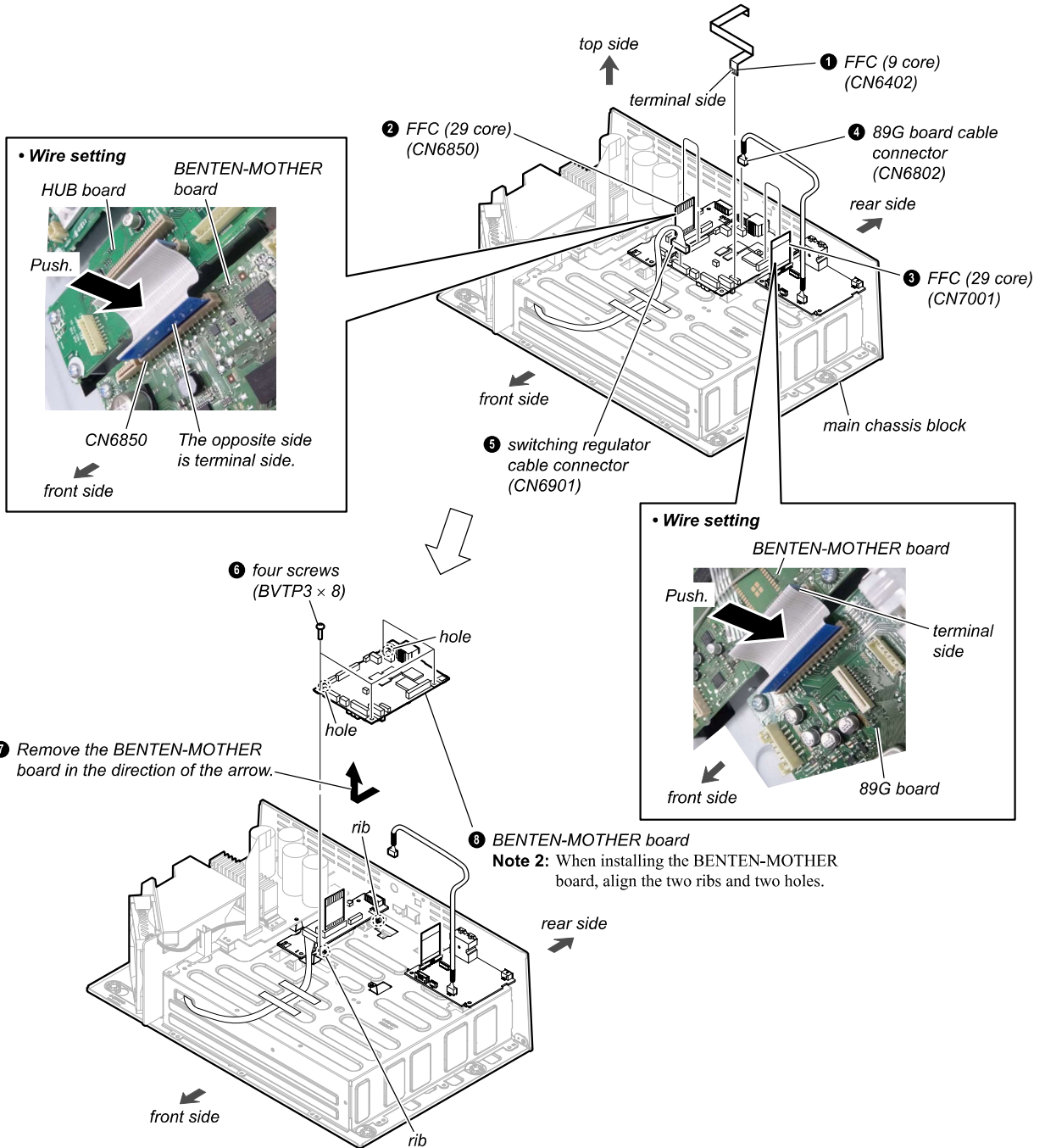


2-20. FM-TUNER BOARD



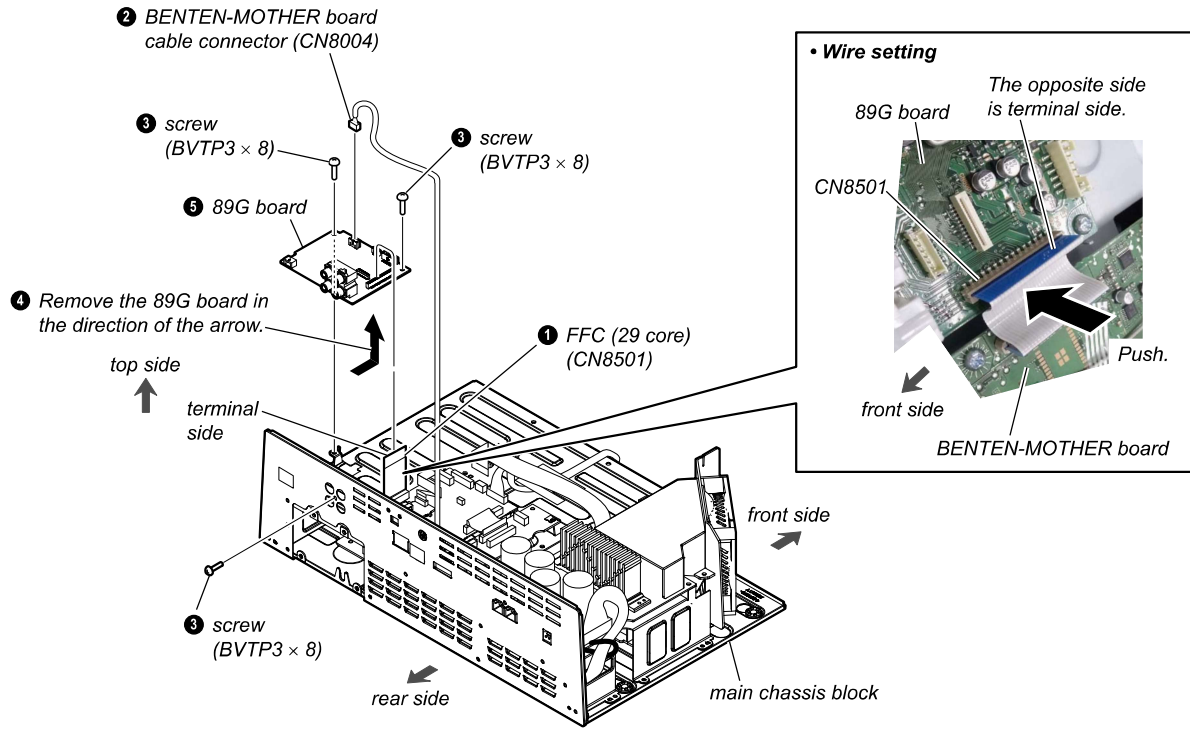
2-21. BENTEN-MOTHER BOARD

Note 1: When the BENTEN-MOTHER board is replaced, refer to "IMPORTANT NOTE OF REPLACING THE BENTEN-MOTHER BOARD" on page 7.

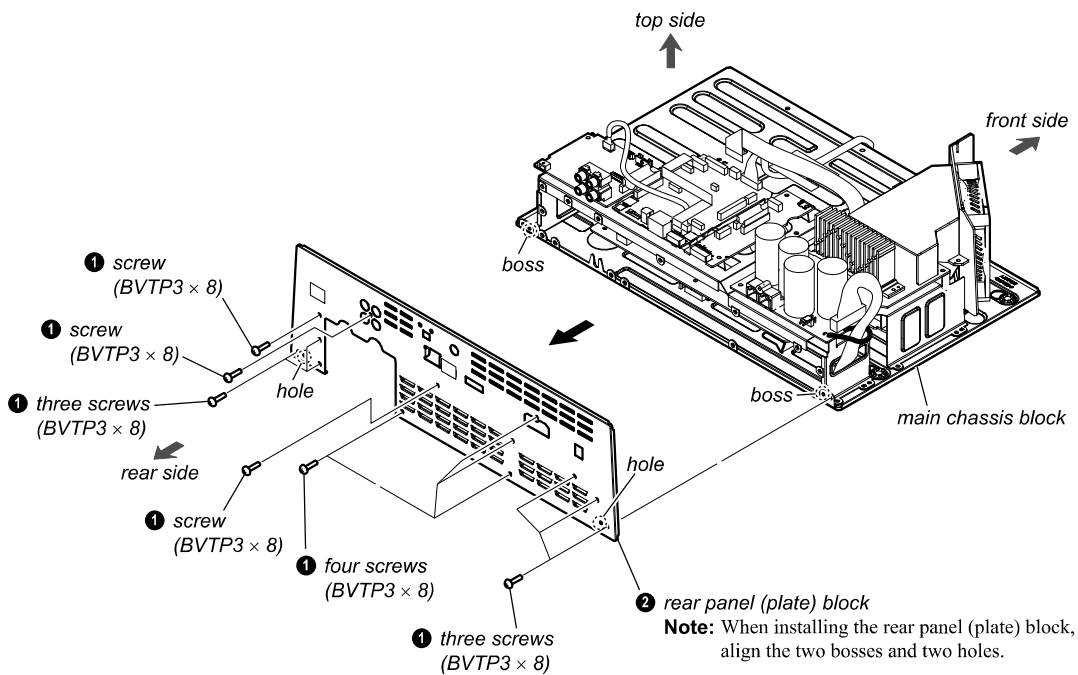


MHC-V90W

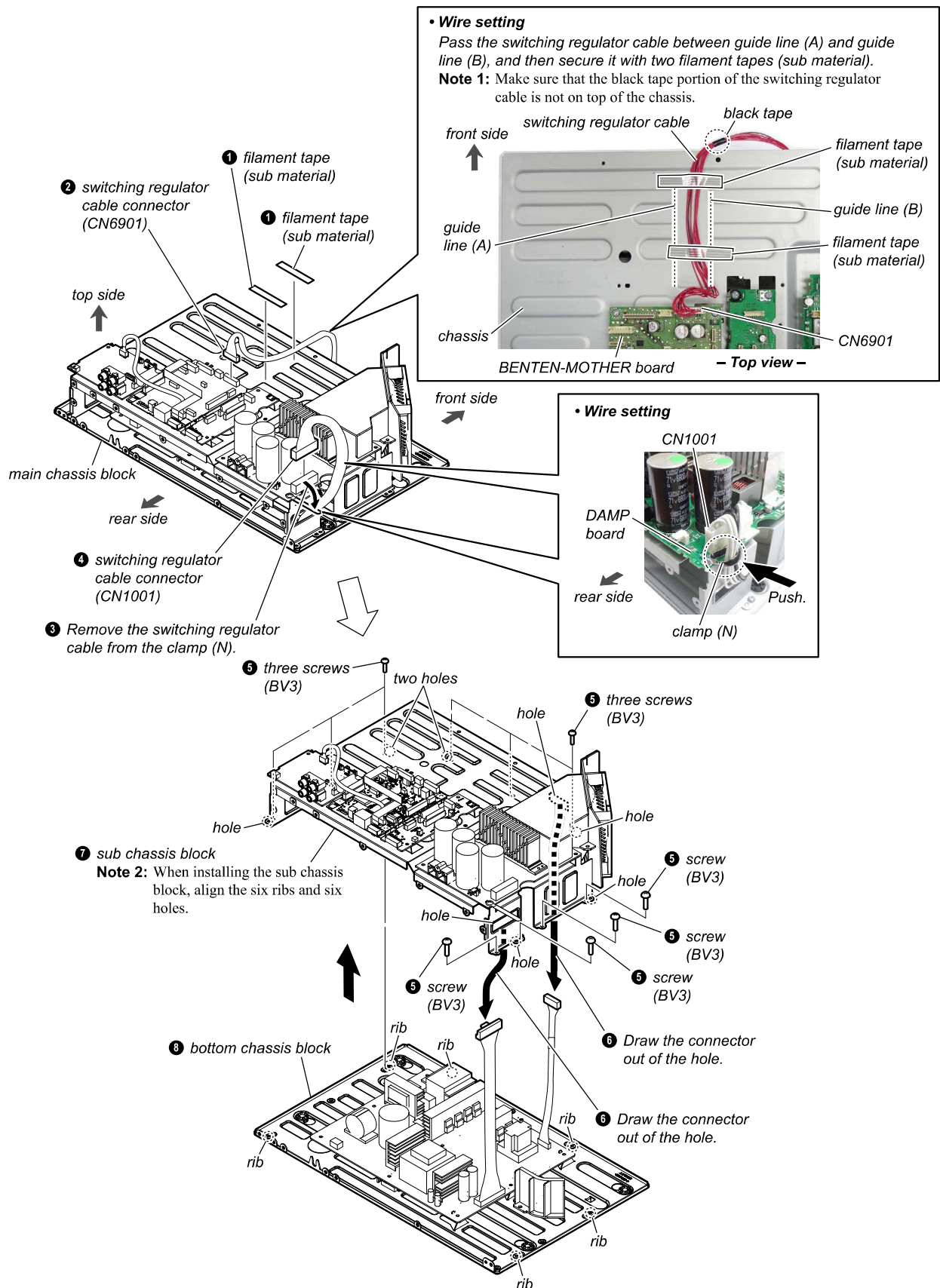
2-22. 89G BOARD



2-23. REAR PANEL (PLATE) BLOCK

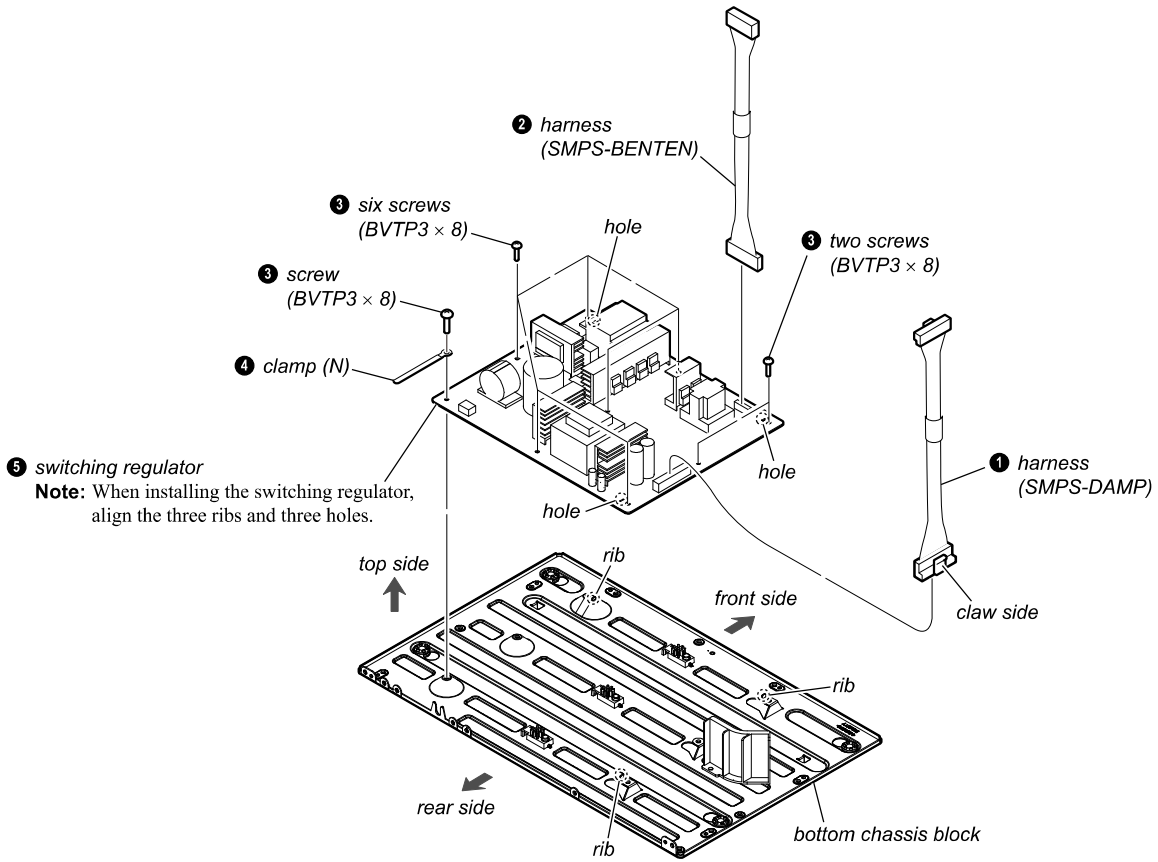


2-24. BOTTOM CHASSIS BLOCK



MHC-V90W

2-25. SWITCHING REGULATOR



2-26. FRONT PANEL (SW) BLOCK

2 Insert the tool into the space and slowly remove the front panel (SW) block.

Note 1: When using a tool, please work carefully so as not to damage the front panel (SW) block and speaker cabinet.

3 While moving the tool in the direction of the arrow, remove all bosses and the front panel (SW) block.

7 Insert the tool into the space and slowly remove the front panel (SW) block.

Note 1: When using a tool, please work carefully so as not to damage the front panel (SW) block and speaker cabinet.

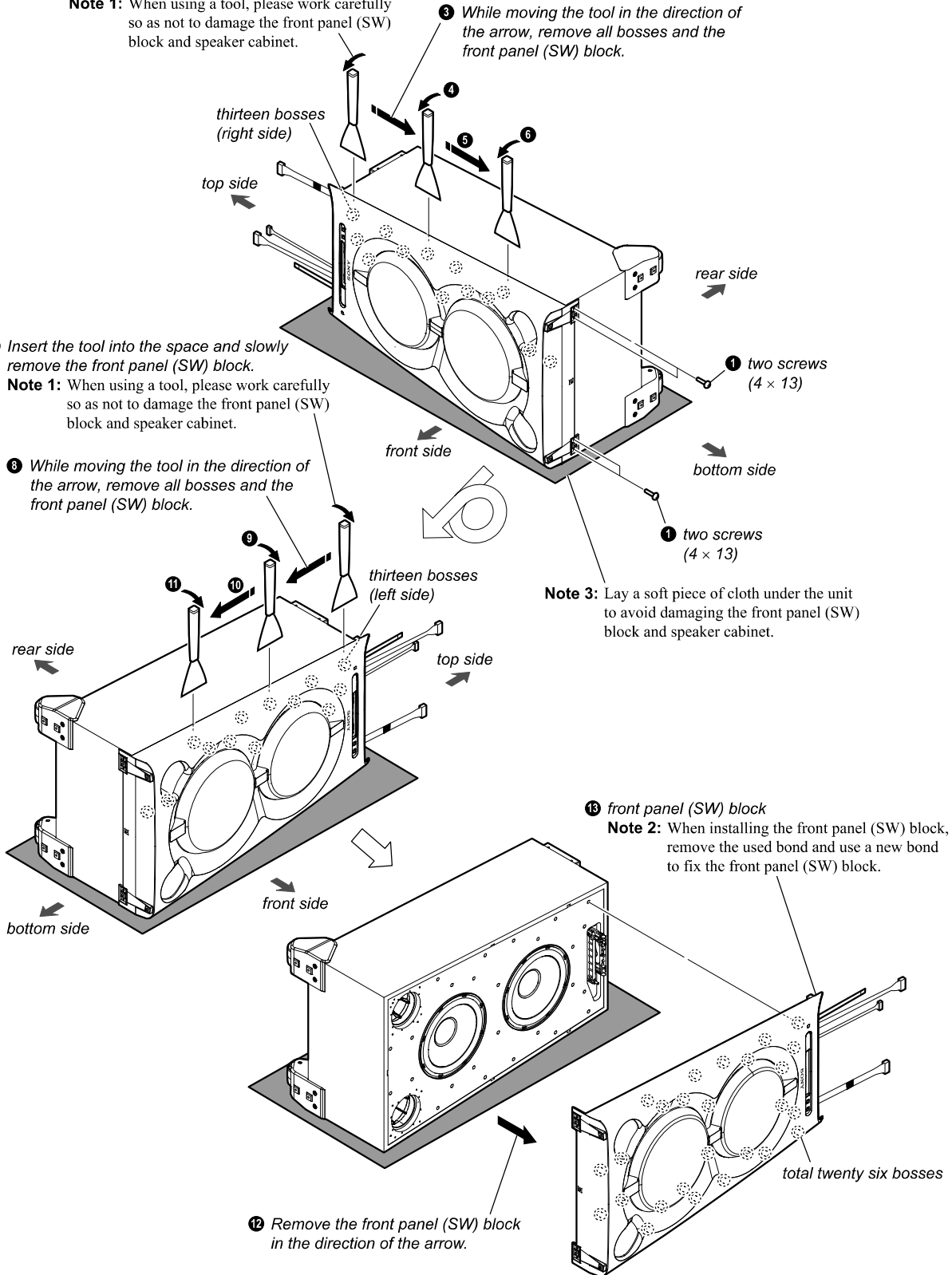
8 While moving the tool in the direction of the arrow, remove all bosses and the front panel (SW) block.

Note 3: Lay a soft piece of cloth under the unit to avoid damaging the front panel (SW) block and speaker cabinet.

13 front panel (SW) block

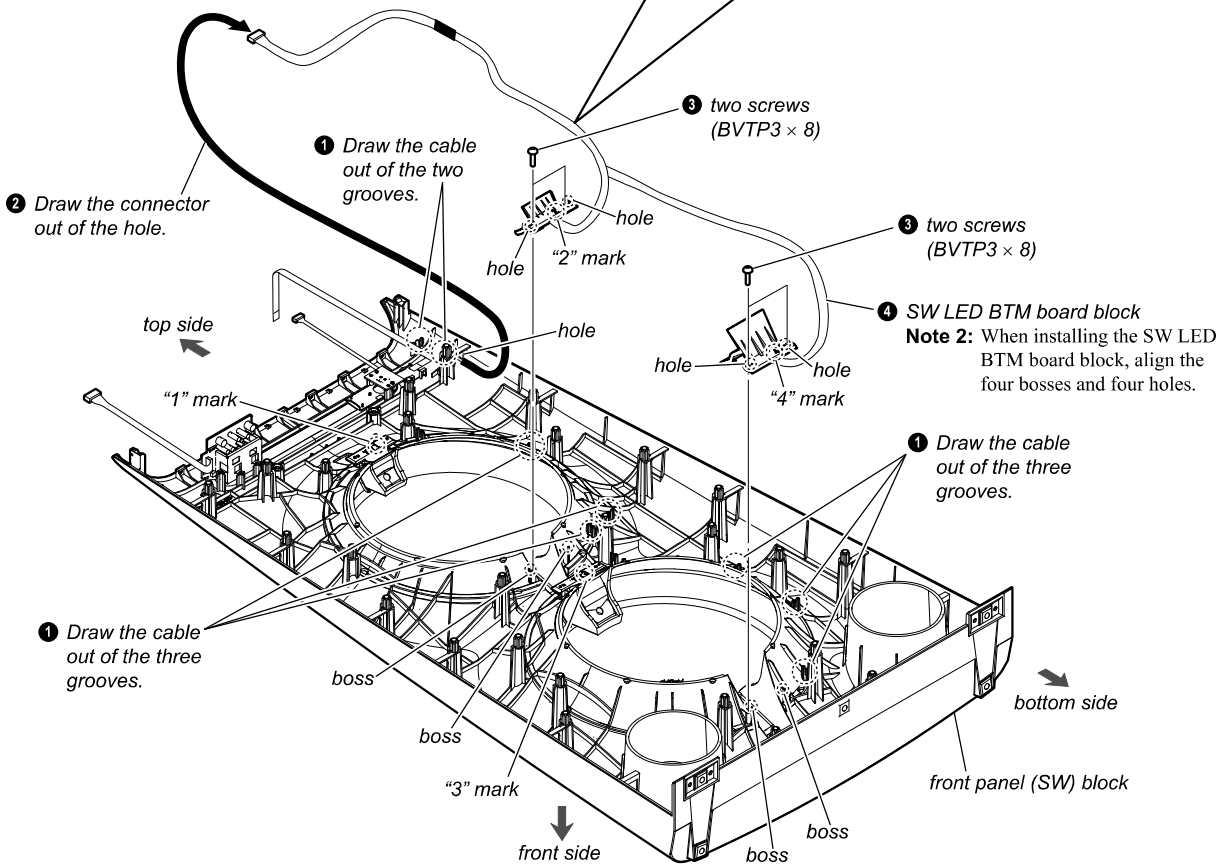
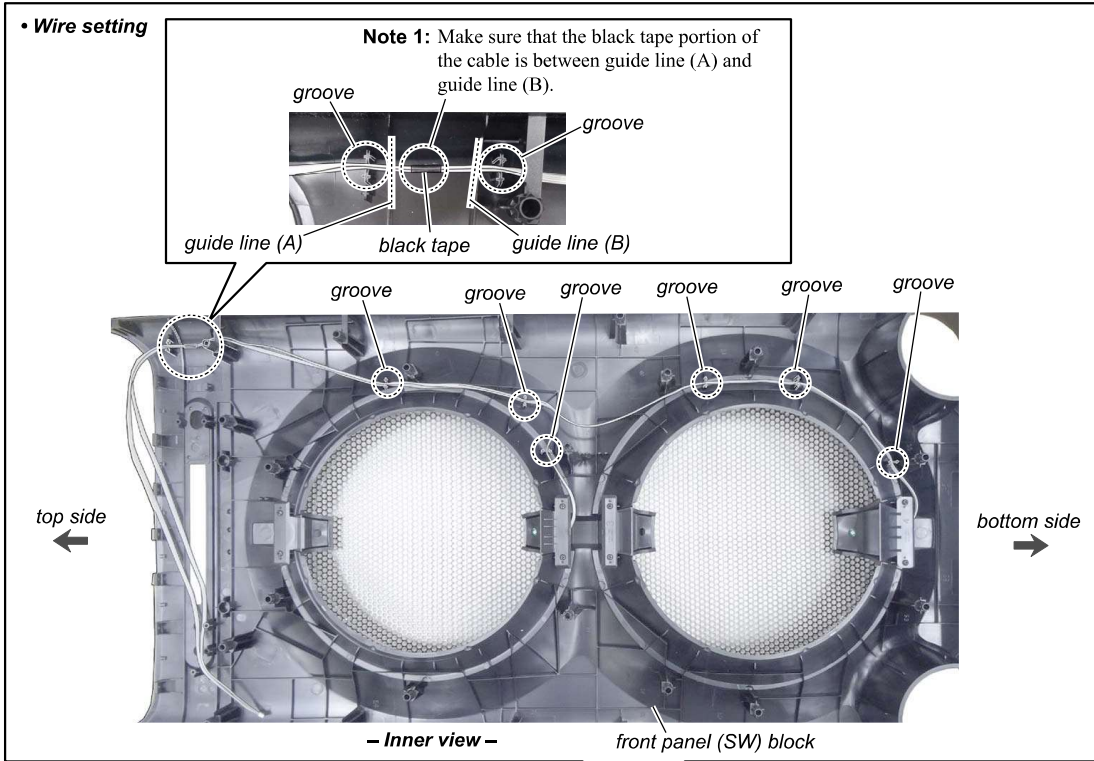
Note 2: When installing the front panel (SW) block, remove the used bond and use a new bond to fix the front panel (SW) block.

12 Remove the front panel (SW) block in the direction of the arrow.

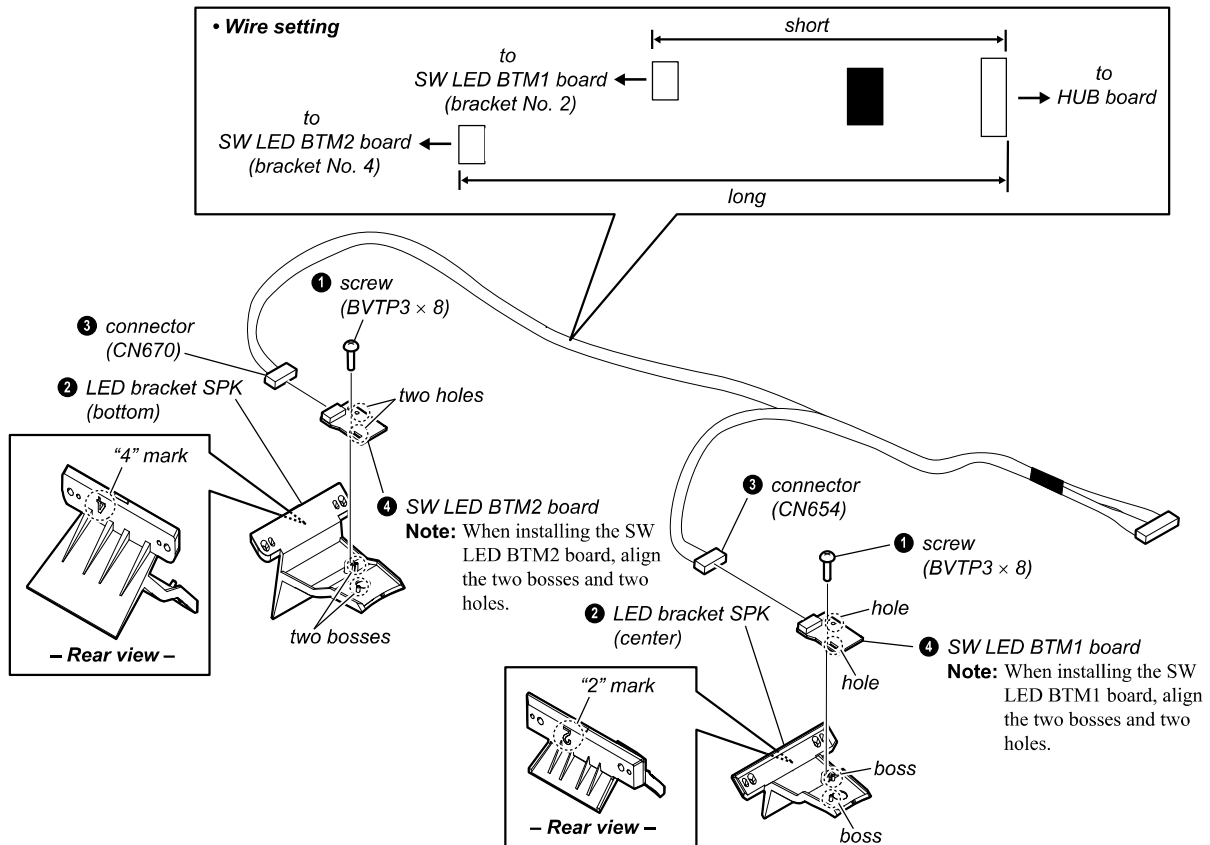


MHC-V90W

2-27. SW LED BTM BOARD BLOCK

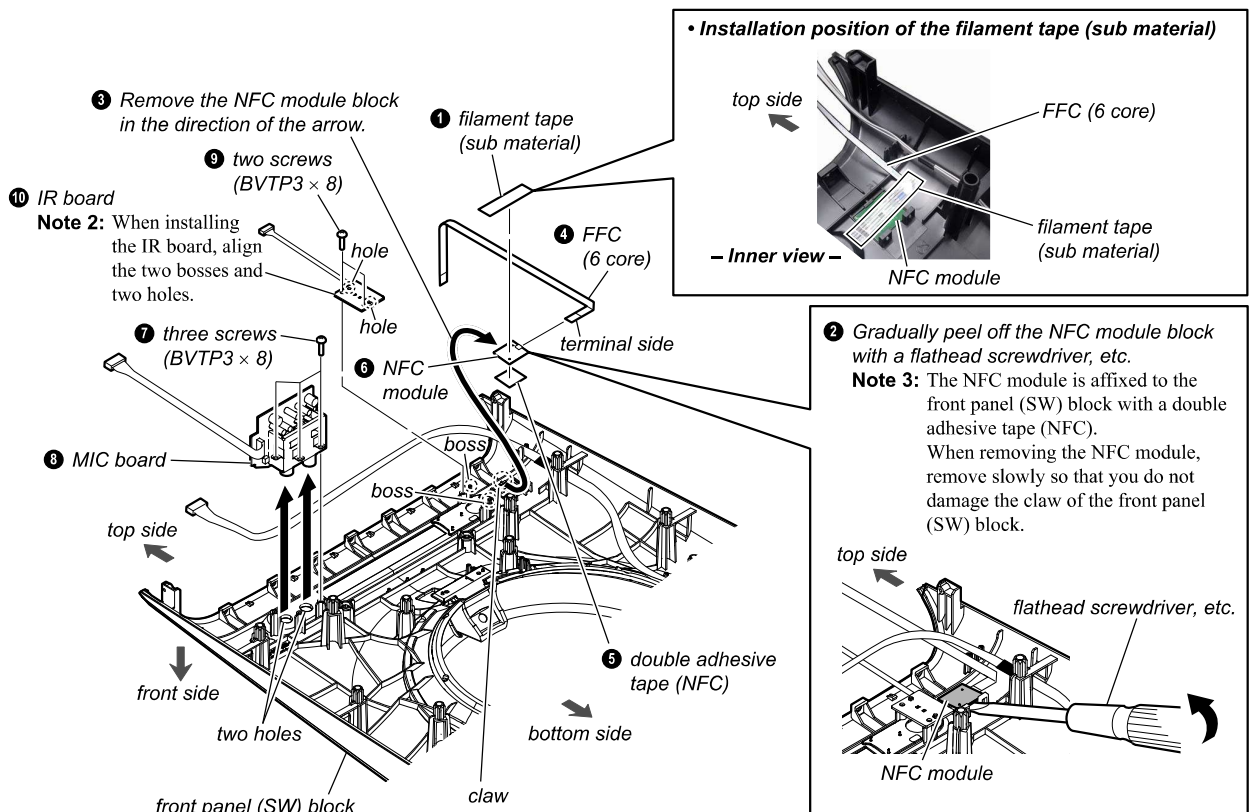


2-28. SW LED BTM1 BOARD, SW LED BTM2 BOARD



2-29. NFC MODULE, MIC BOARD, IR BOARD

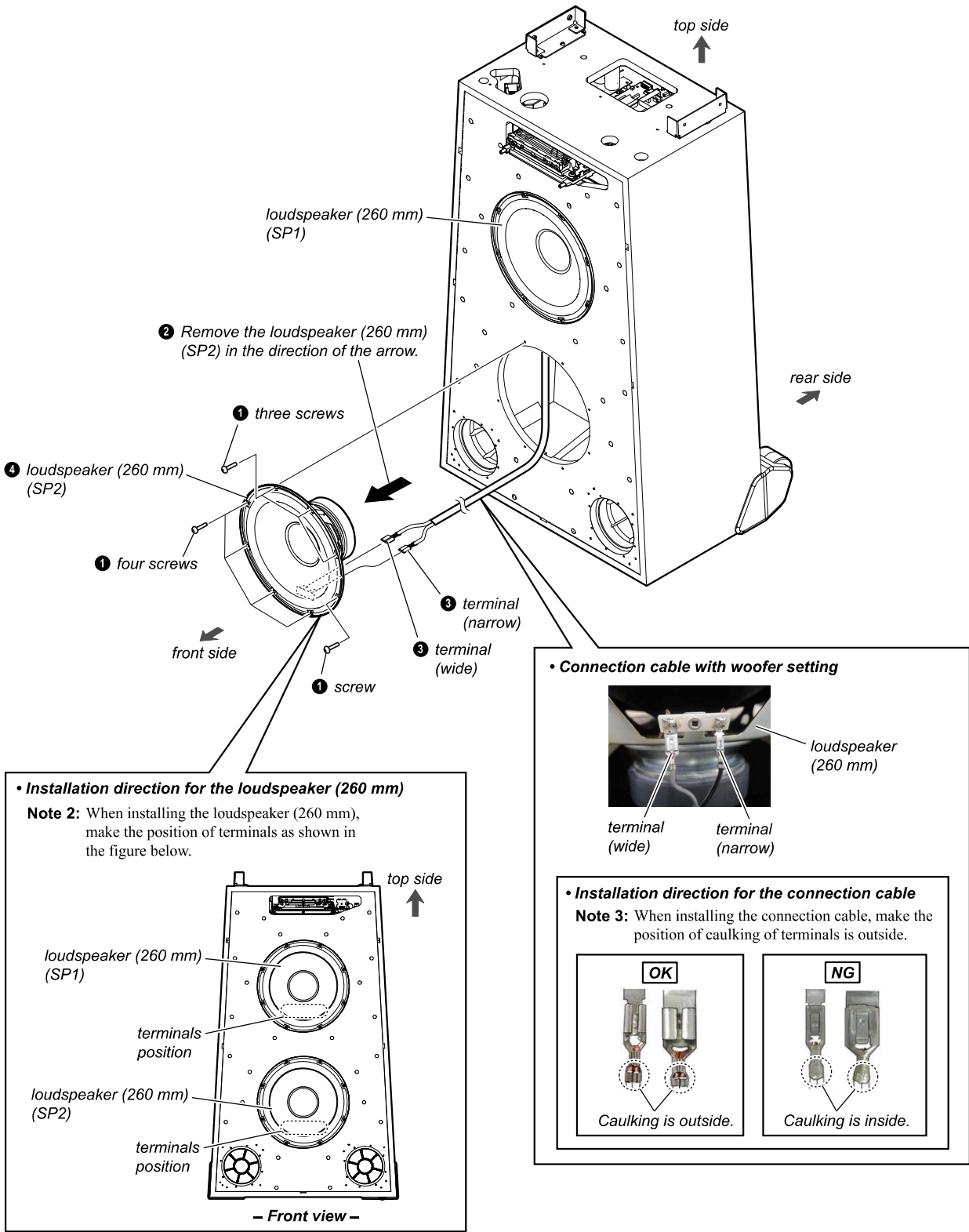
Note 1: When the NFC module is replaced, refer to "NFC CONNECTION CHECKING METHOD" on page 7.



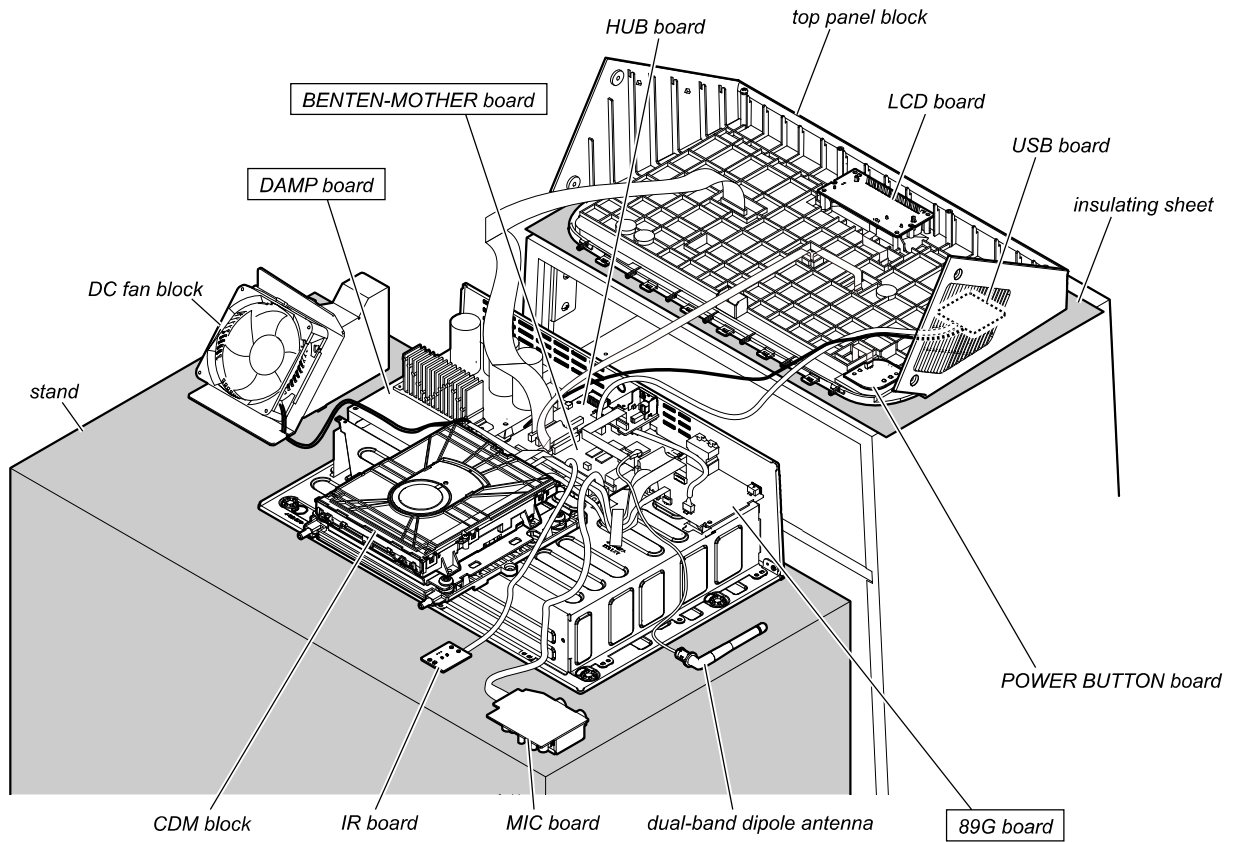
MHC-V90W

2-30. LOUDSPEAKER (260 mm)

Note 1: SP1 and SP2 can be similarly disassembled.



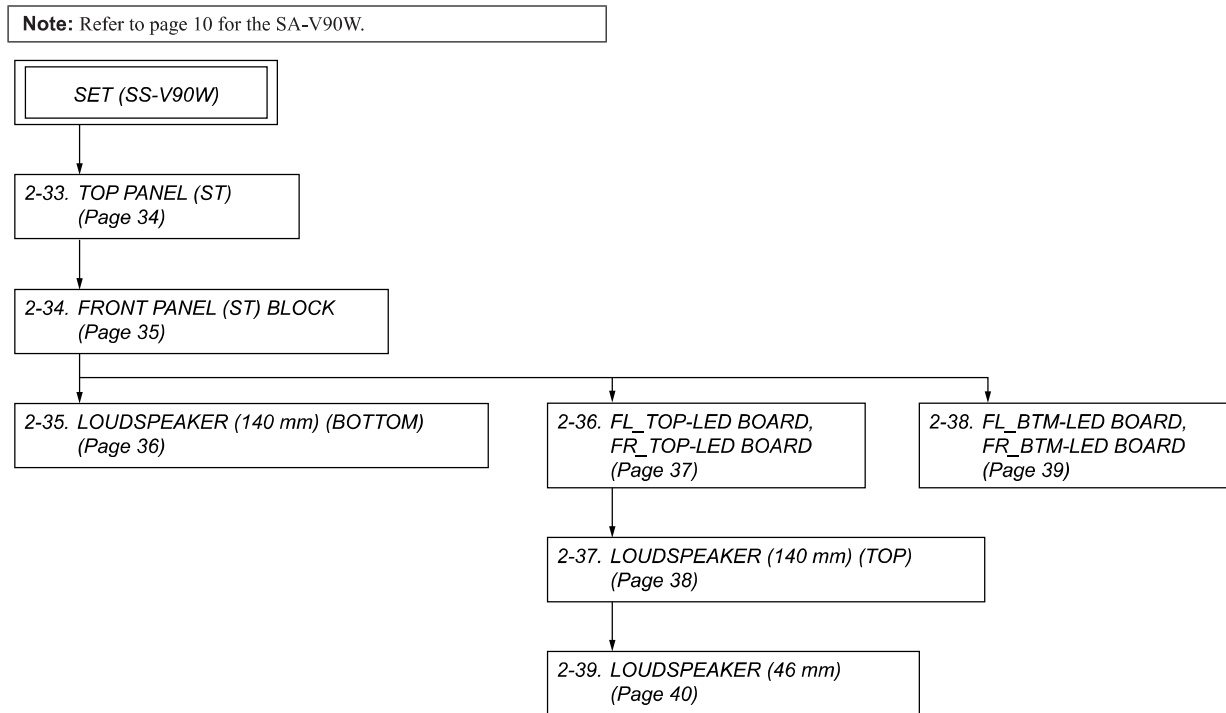
2-31. SERVICE POSITION



MHC-V90W

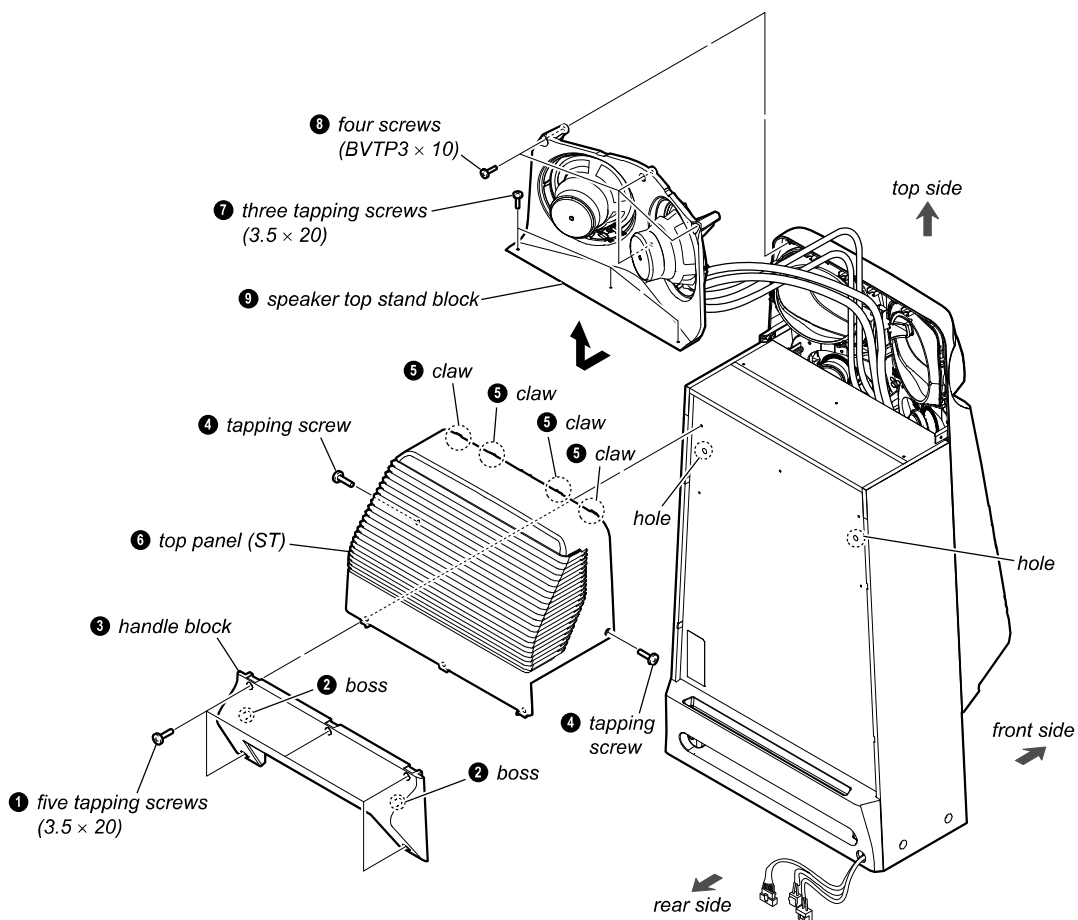
- This set can be disassembled in the order shown below.

2-32. DISASSEMBLY FLOW (SS-V90W)

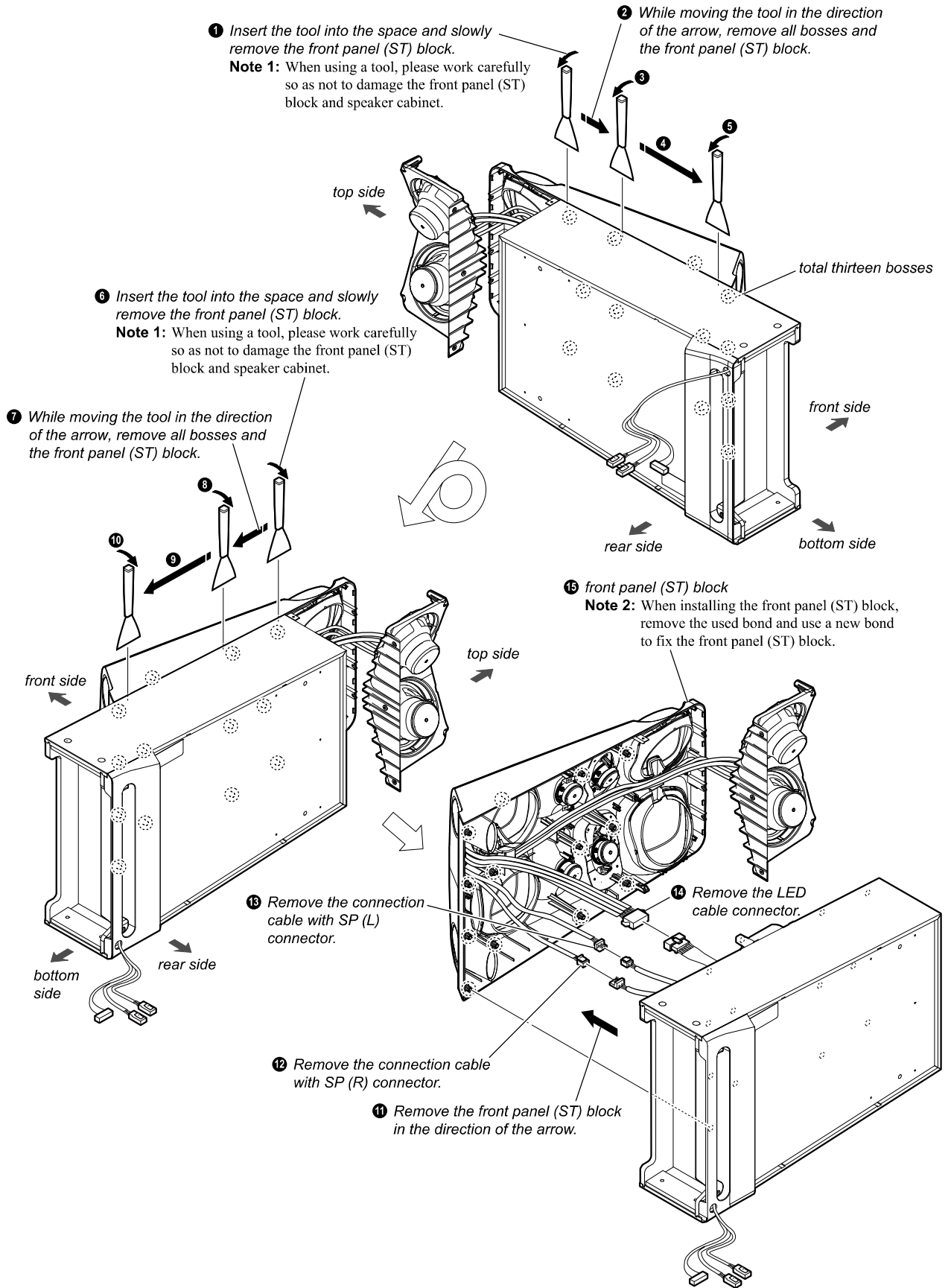


Note: Follow the disassembly procedure in the numerical order given.

2-33. TOP PANEL (ST)



2-34. FRONT PANEL (ST) BLOCK



MHC-V90W

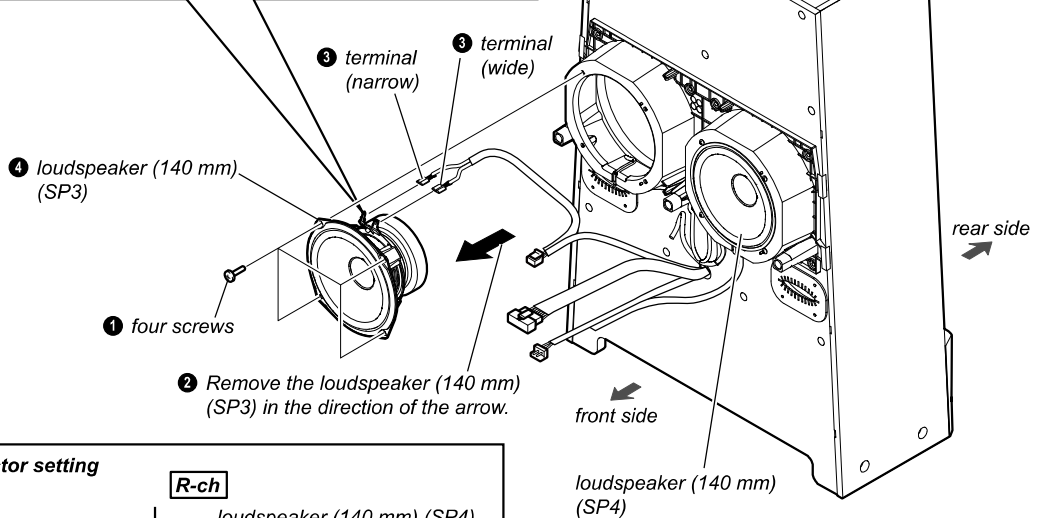
2-35. LOUDSPEAKER (140 mm) (BOTTOM)

Note 1: SP3 and SP4 can be similarly disassembled.

• Installation direction for the loudspeaker (140 mm)

Note 2: When installing the loudspeaker (140 mm), make the position of terminals as shown in the figure below.

– Front view –



• Cable with connector setting

L-ch

loudspeaker (140 mm) (SP3)

terminal (narrow) [gray/black] terminal (wide) [gray]

R-ch

loudspeaker (140 mm) (SP4)

terminal (narrow) [red/black] terminal (wide) [red]

Note 3: When installing the connection cable, make the position of caulking of terminals is outside.

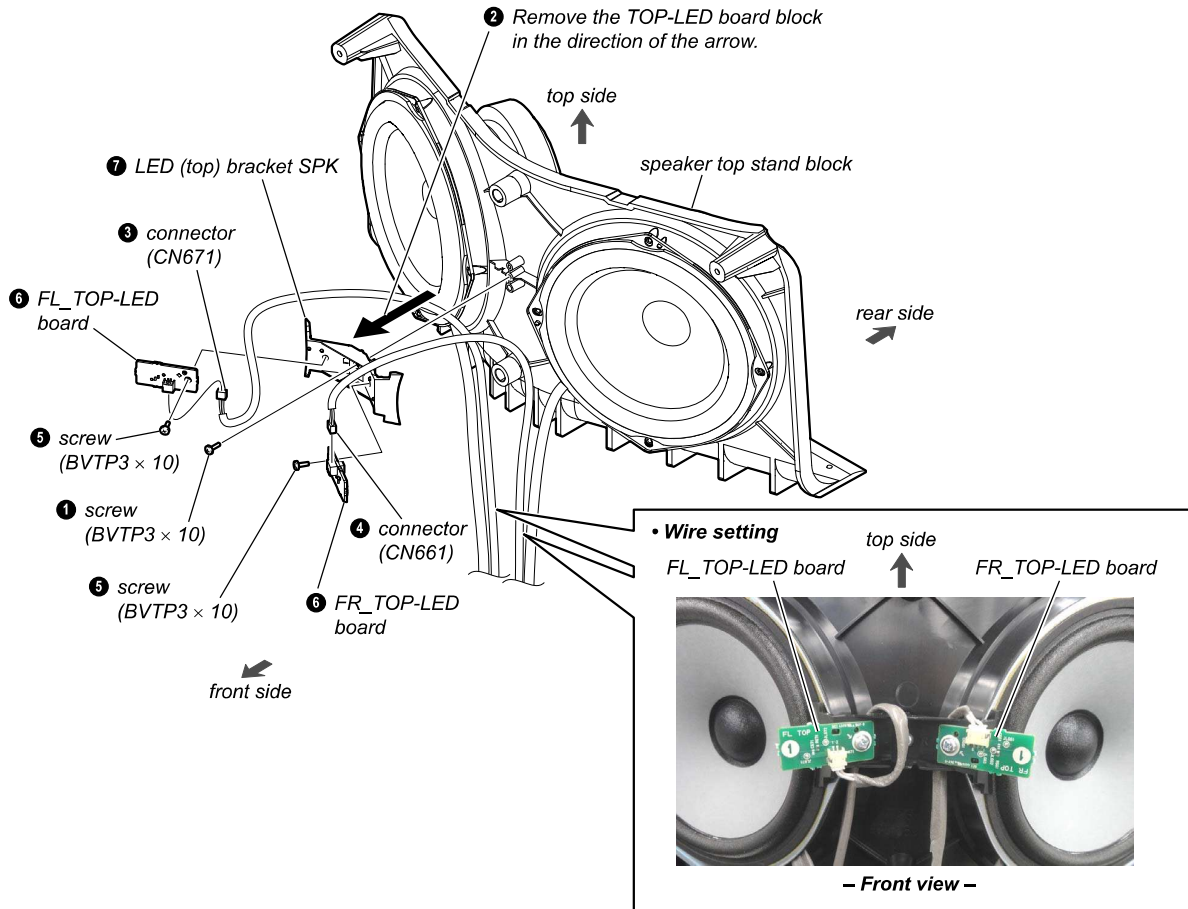
OK

Caulking is outside.

NG

Caulking is inside.

2-36. FL_TOP-LED BOARD, FR_TOP-LED BOARD



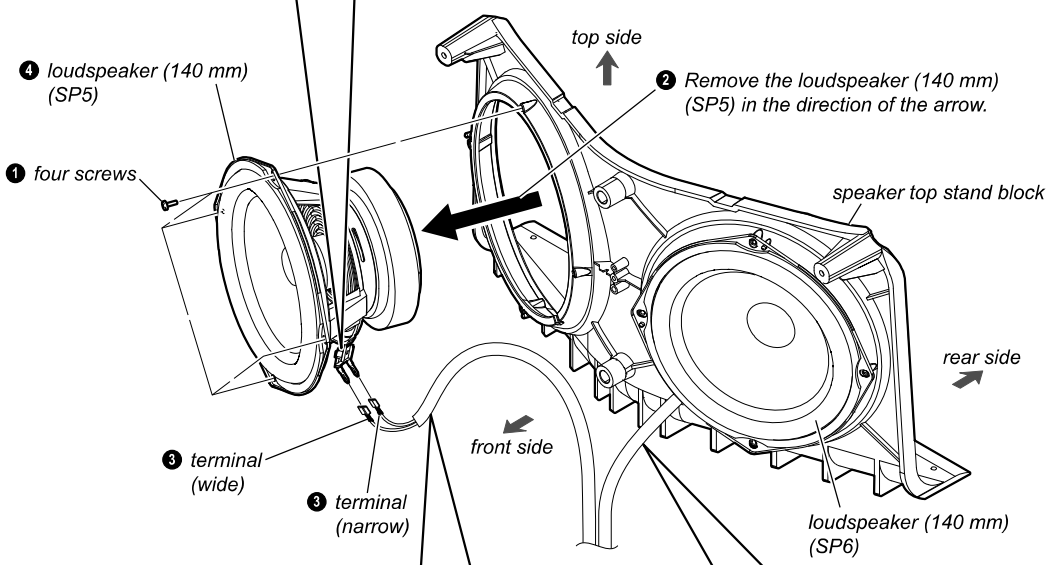
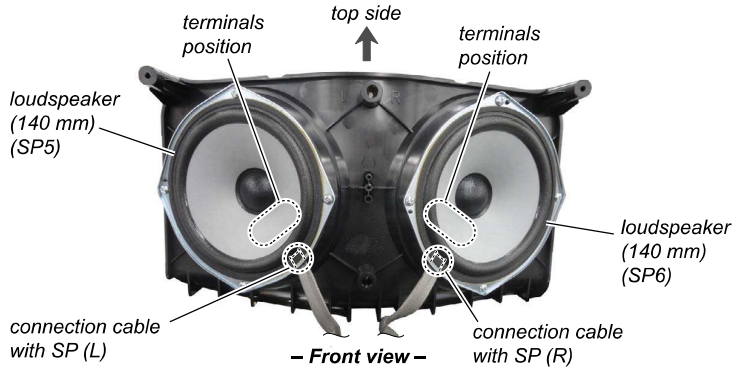
MHC-V90W

2-37. LOUDSPEAKER (140 mm) (TOP)

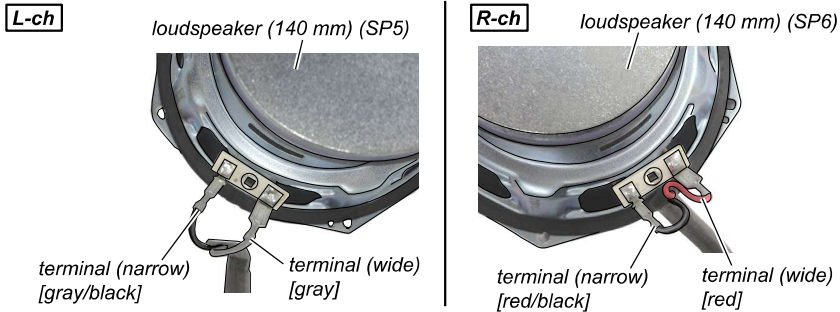
Note 1: SP5 and SP6 can be similarly disassembled.

• Installation direction for the loudspeaker (140 mm)

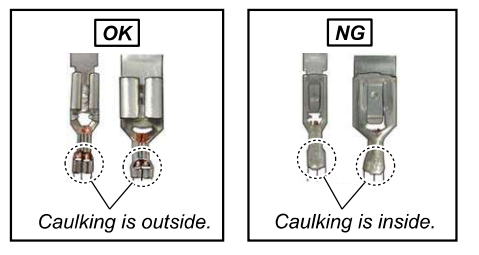
Note 2: When installing the loudspeaker (140 mm), make the position of terminals as shown in the figure below.



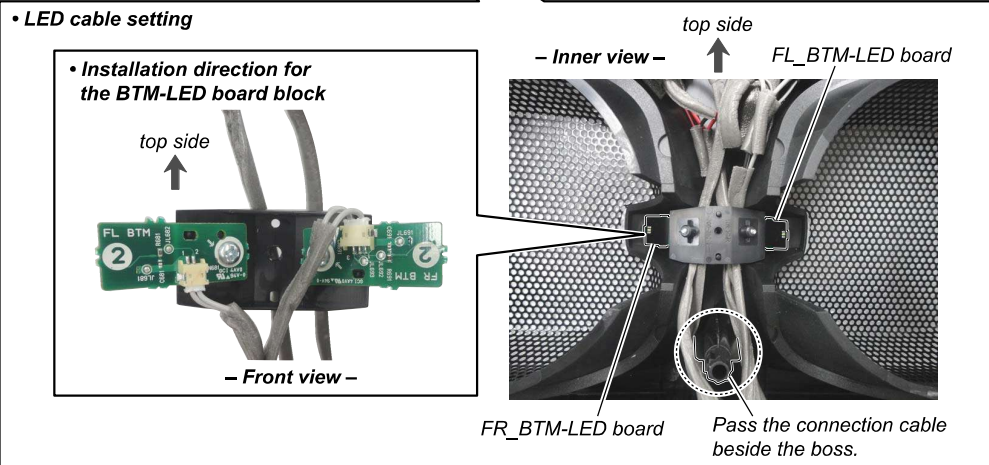
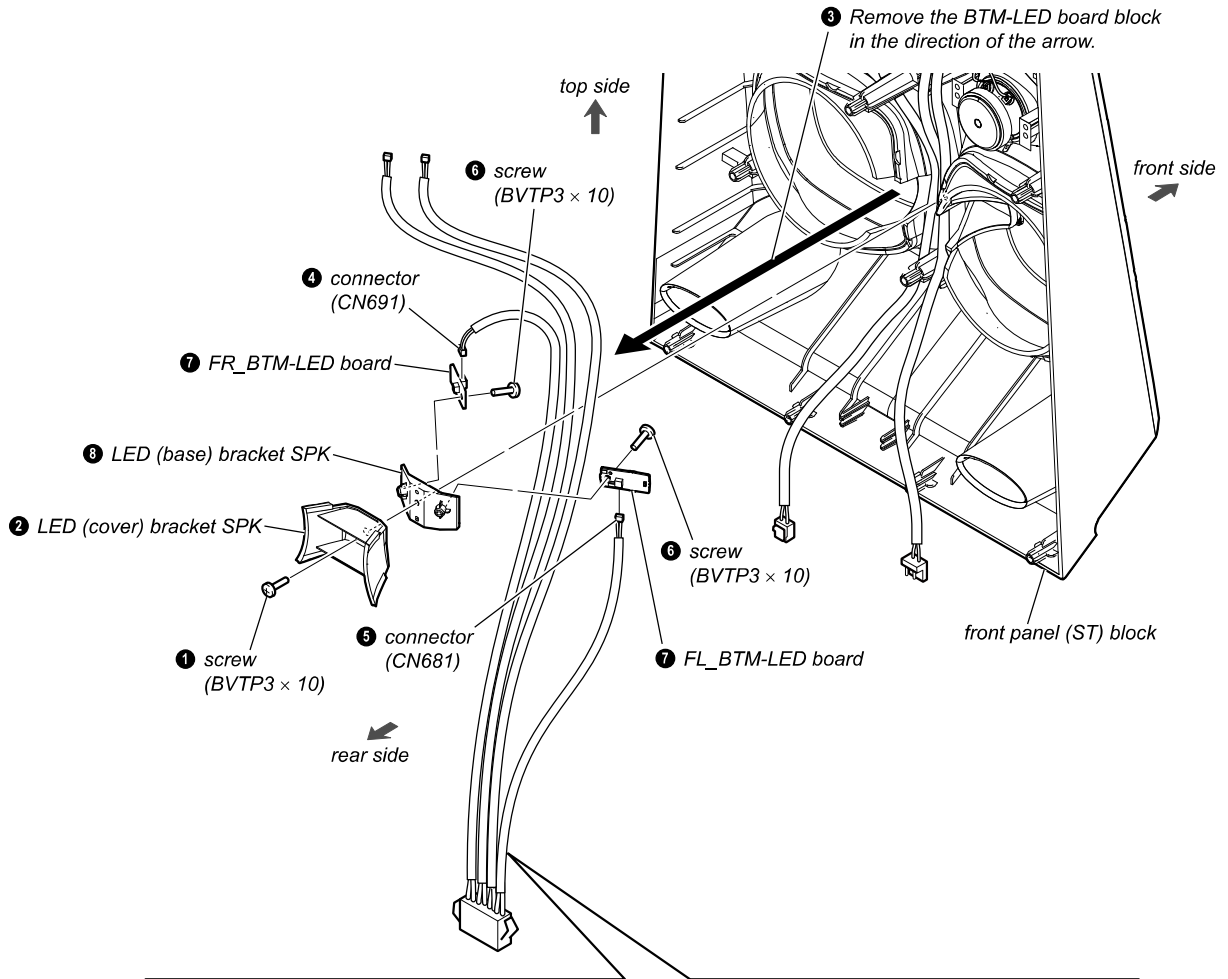
• Connection cable with SP (L) or connection cable with SP (R) setting



Note 3: When installing the connection cable, make the position of caulking of terminals is outside.



2-38. FL_BTM-LED BOARD, FR_BTM-LED BOARD



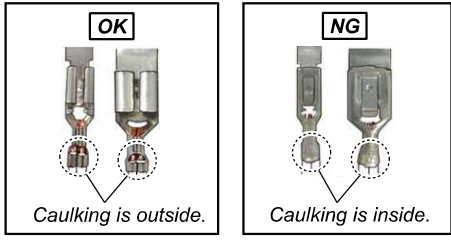
MHC-V90W

2-39. LOUDSPEAKER (46 mm)

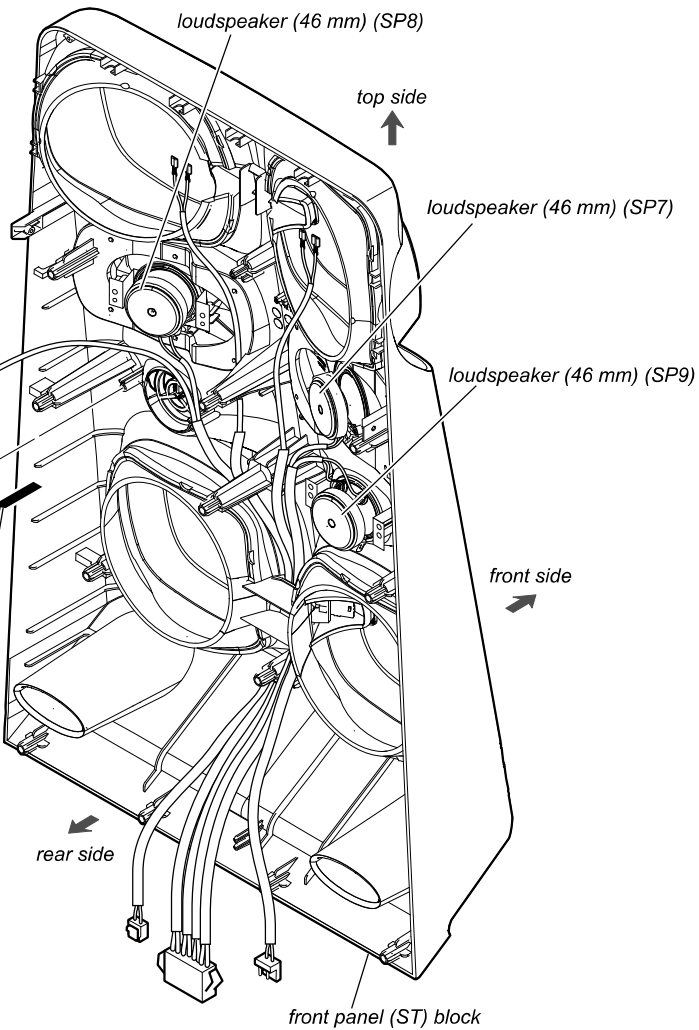
Note 1: SP7, SP8, SP9 and SP10 can be similarly disassembled.

• Installation direction for the connection cable

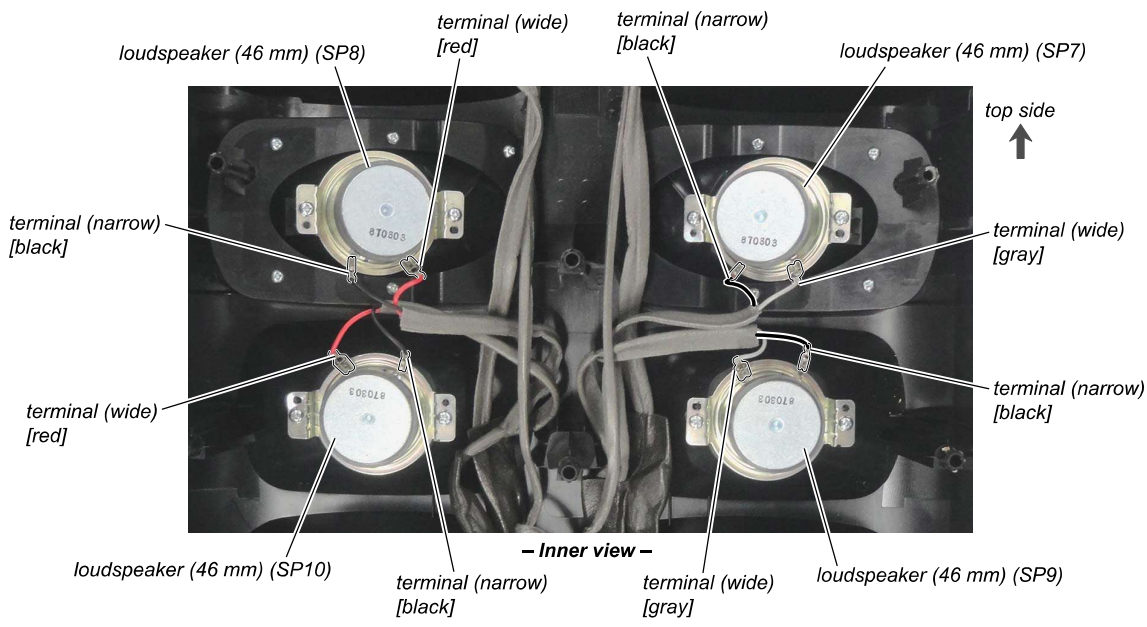
Note 2: When installing the connection cable, make the position of caulking of terminals is outside.



- ③ terminal (wide)
- ③ terminal (narrow)
- ④ loudspeaker (46 mm) (SP10)
- ① two screws
- ② Remove the loudspeaker (46 mm) (SP10) in the direction of the arrow.



• Installation position of the loudspeaker (46 mm)



SECTION 3 TROUBLESHOOTING

1. Switching Regulator (SWR1) Diagnosis Flow

CAUTION

Touching the terminals of the switching regulator without discharging the electricity is extremely dangerous. After operating this device, be sure to refer to "CAPACITOR ELECTRICAL DISCHARGE PROCESSING" on page 6 and discharge the electricity before proceeding. Also, be careful of electric shock when discharging.

Connect the power supply cord.

The output voltage from the switching regulator is the following standard value.

	Standby	Demo mode	Power on
CN4: Between pin 1 (Audio) and pin 2 (Audio (GND)) Between pin 3, 4 (LED) and pin 5, 6 (LED (GND))	13.5 V ± 0.5 V	13.5 V ± 0.5 V	13.5 V ± 0.5 V
CN2: Between pin 1, 2 (+PVDD) and pin 4 to 6 (GND)	0 V	0 V	62.5 V ± 5 %
CN2: Between pin 8, 9 (-PVDD) and pin 4 to 6 (GND)	0 V	0 V	-62.5 V ± 5 %
CN2: Between pin 3 (+VL) and pin 4 to 6 (GND)	0 V	0 V	24 V ± 5 %
CN2: Between pin 7 (-VL) and pin 4 to 6 (GND)	0 V	0 V	-24 V ± 5 %
CN2: Between pin 10 (SPV) and pin 4 to 6 (GND)	0 V	0 V	-46 V ± 5 %

No

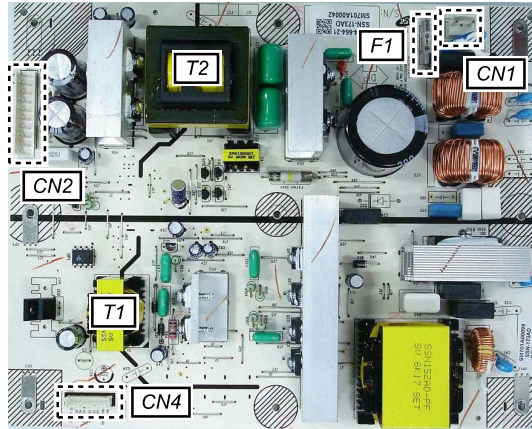
Replace the switching regulator.

Yes

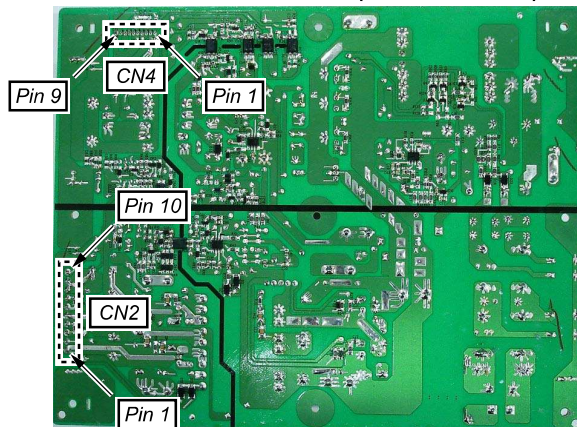
End

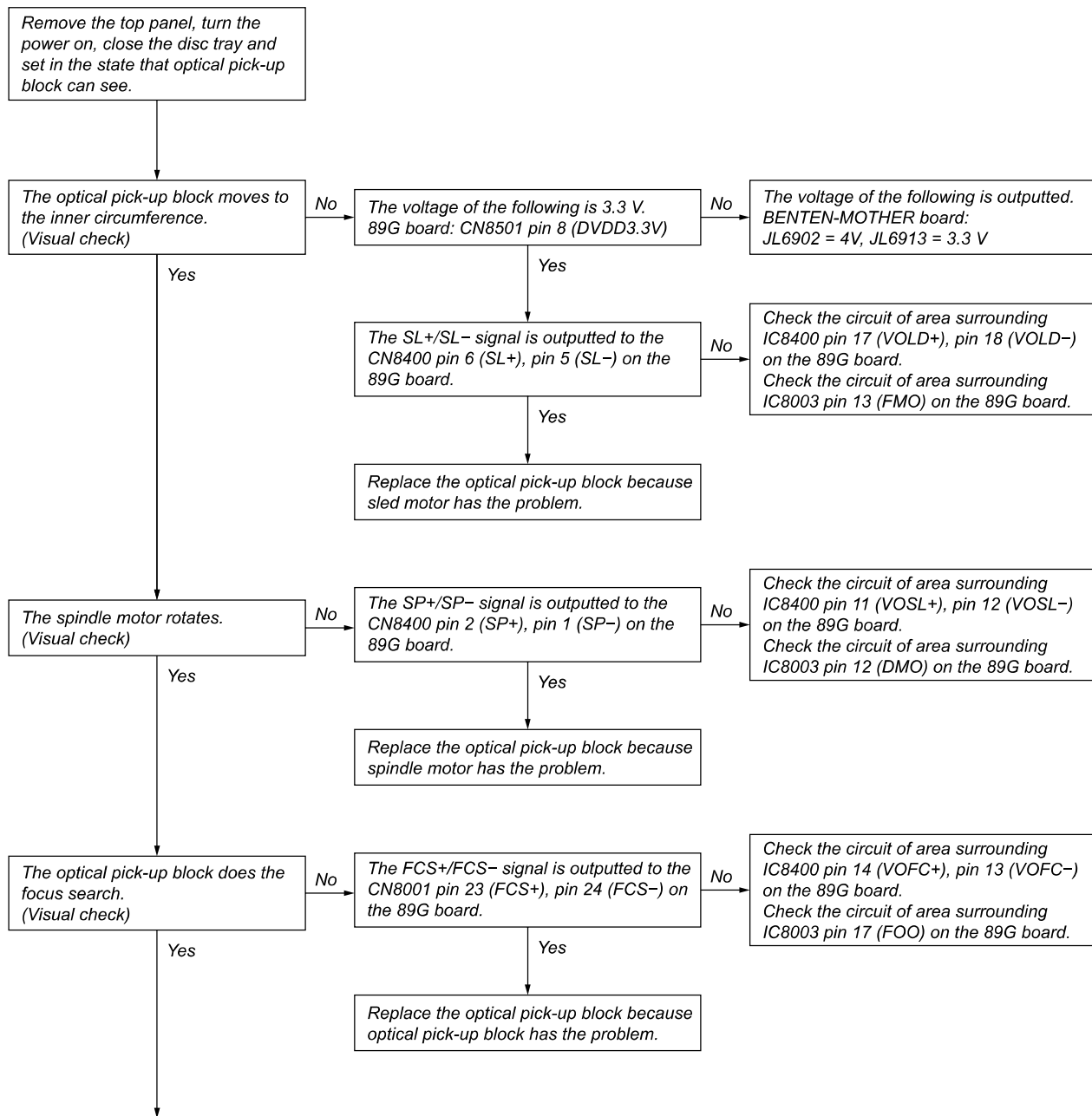
- ① CN1 (Power supply cord connector)
- ② F1 (Main Fuse)
- ③ T1 (Sub power transformer)
- ④ CN4 (Main power connector)
 - Pin 1 : Audio
 - Pin 2 : Audio (GND)
 - Pin 3 : LED
 - Pin 4 : LED
 - Pin 5 : LED (GND)
 - Pin 6 : LED (GND)
 - Pin 7 : AC-Det
 - Pin 8 : PCON
 - Pin 9 : LOW AC
- ⑤ T2 (Main power transformer)
- ⑥ CN2 (Amplifier power connector)
 - Pin 1 : +PVDD
 - Pin 2 : +PVDD
 - Pin 3 : +VL
 - Pin 4 : GND
 - Pin 5 : GND
 - Pin 6 : GND
 - Pin 7 : -VL
 - Pin 8 : -PVDD
 - Pin 9 : -PVDD
 - Pin 10 : SPV

- SWITCHING REGULATOR (Component Side) -

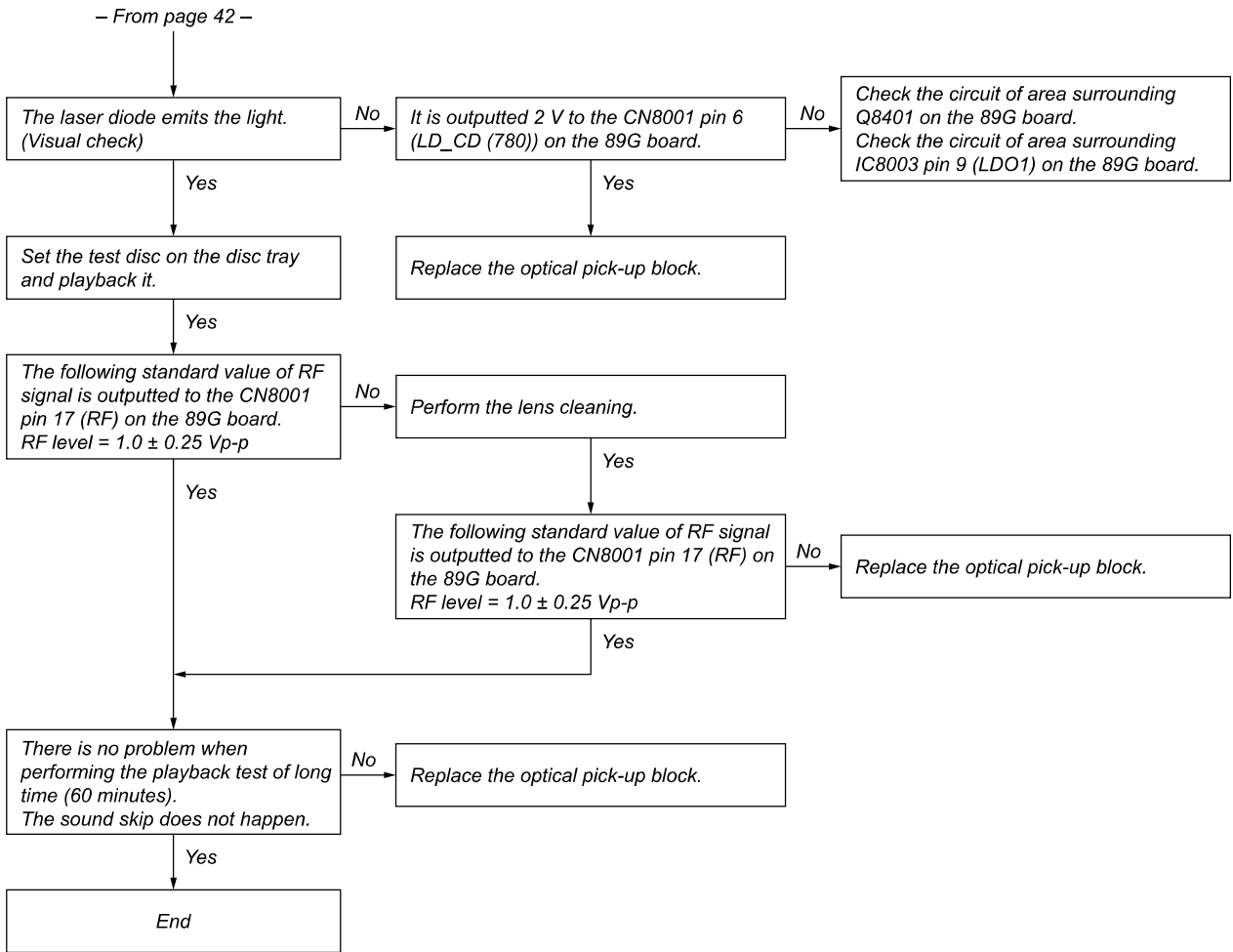


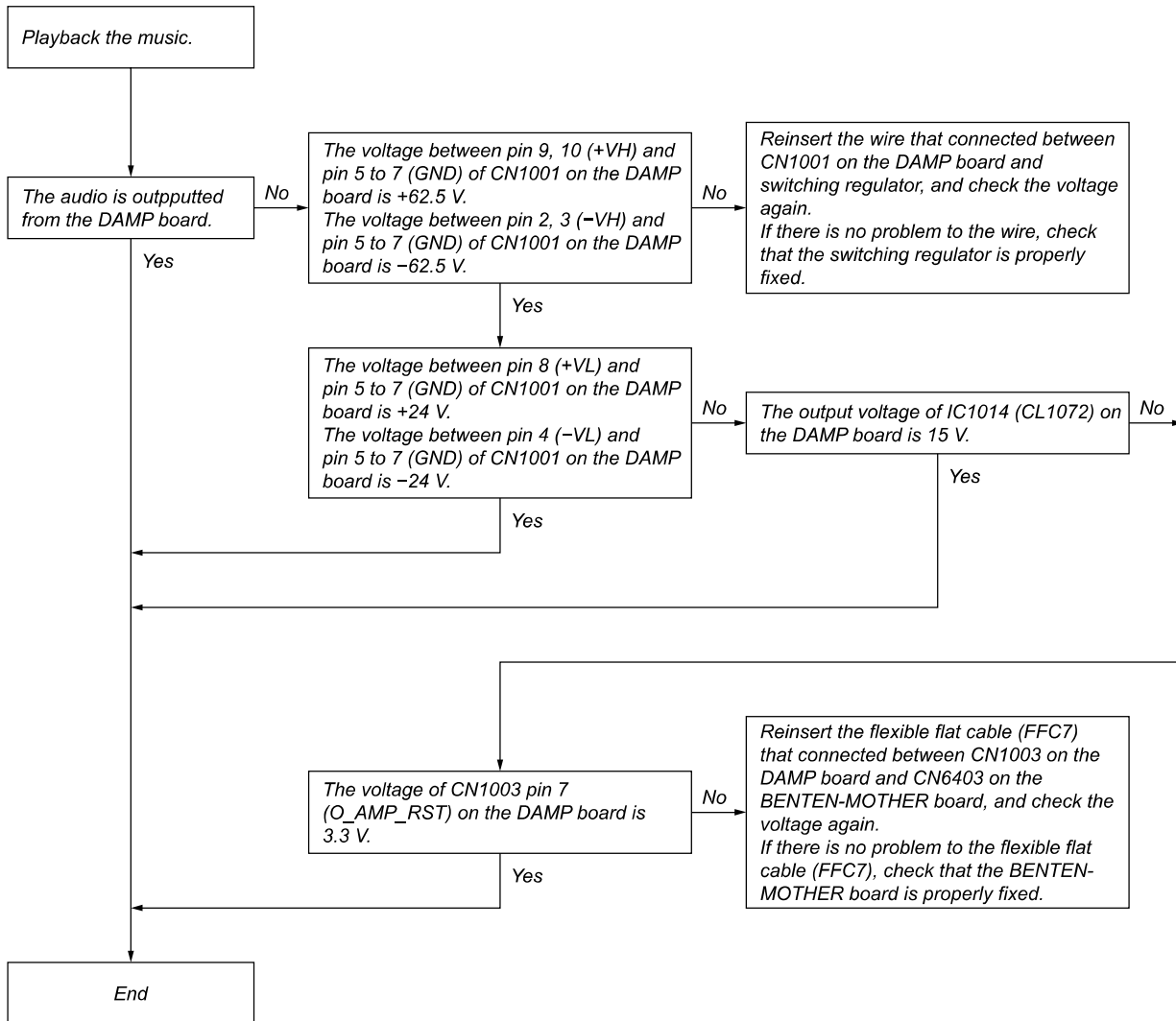
- SWITCHING REGULATOR (Conductor Side) -



MHC-V90W**2. Optical Pick-up Block (CMS-S76RFS7G1/S76RFS7GP) (OP1) Diagnosis Flow**

- Continued on page 43 -




MHC-V90W**3. DAMP Board Mount Diagnosis Flow**



SECTION 4 EXPLODED VIEWS

Note:

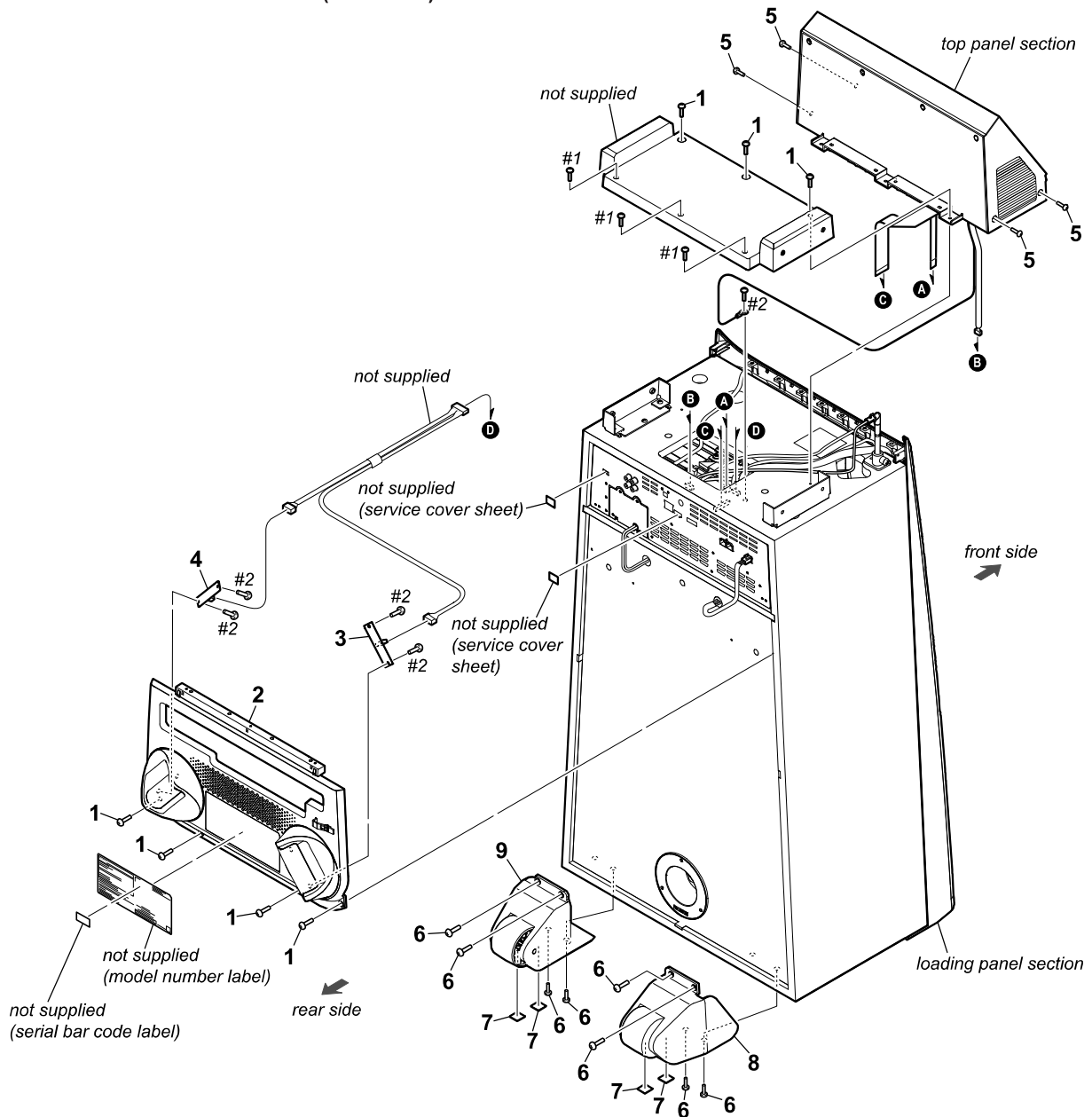
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

- Color Indication of Appearance Parts Example:
KNOB, BALANCE (WHITE) . . . (RED)
↑ ↑
Parts Color Cabinet's Color

The components identified by mark  contain confidential information. Strictly follow the instructions whenever the components are repaired and/or replaced.

The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

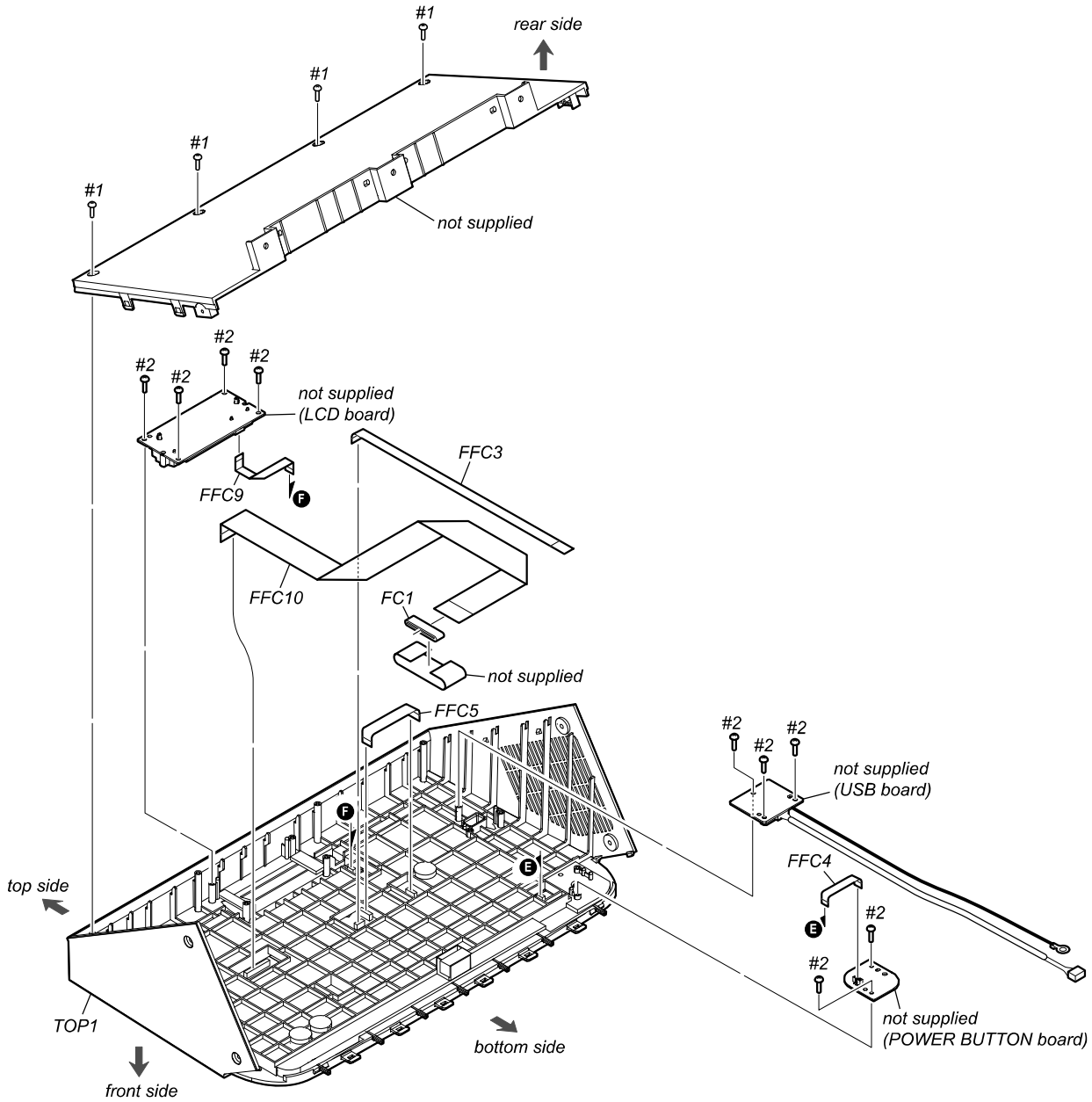
4-1. BACK PANEL SECTION (SA-V90W)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	4-238-407-12	SCREW (1) (4X20), +BV TAPPING		7	4-578-508-01	FOOT	
2	A-2189-752-A	SERVICE, PANEL BACK ASSY (without Model number label)		8	A-2179-015-A	CASTER, ASSY (L) (for Left)	
3	A-2199-023-A	PARTY LED-L BOARD, COMPLETE		9	A-2179-016-A	CASTER, ASSY (R) (for Right)	
4	A-2199-024-A	PARTY LED-R BOARD, COMPLETE		#1	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3	
5	4-699-872-01	SCREW, TAPPING (+)		#2	7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3	
6	4-532-593-02	SCREW (4X13) (TR-184A)					

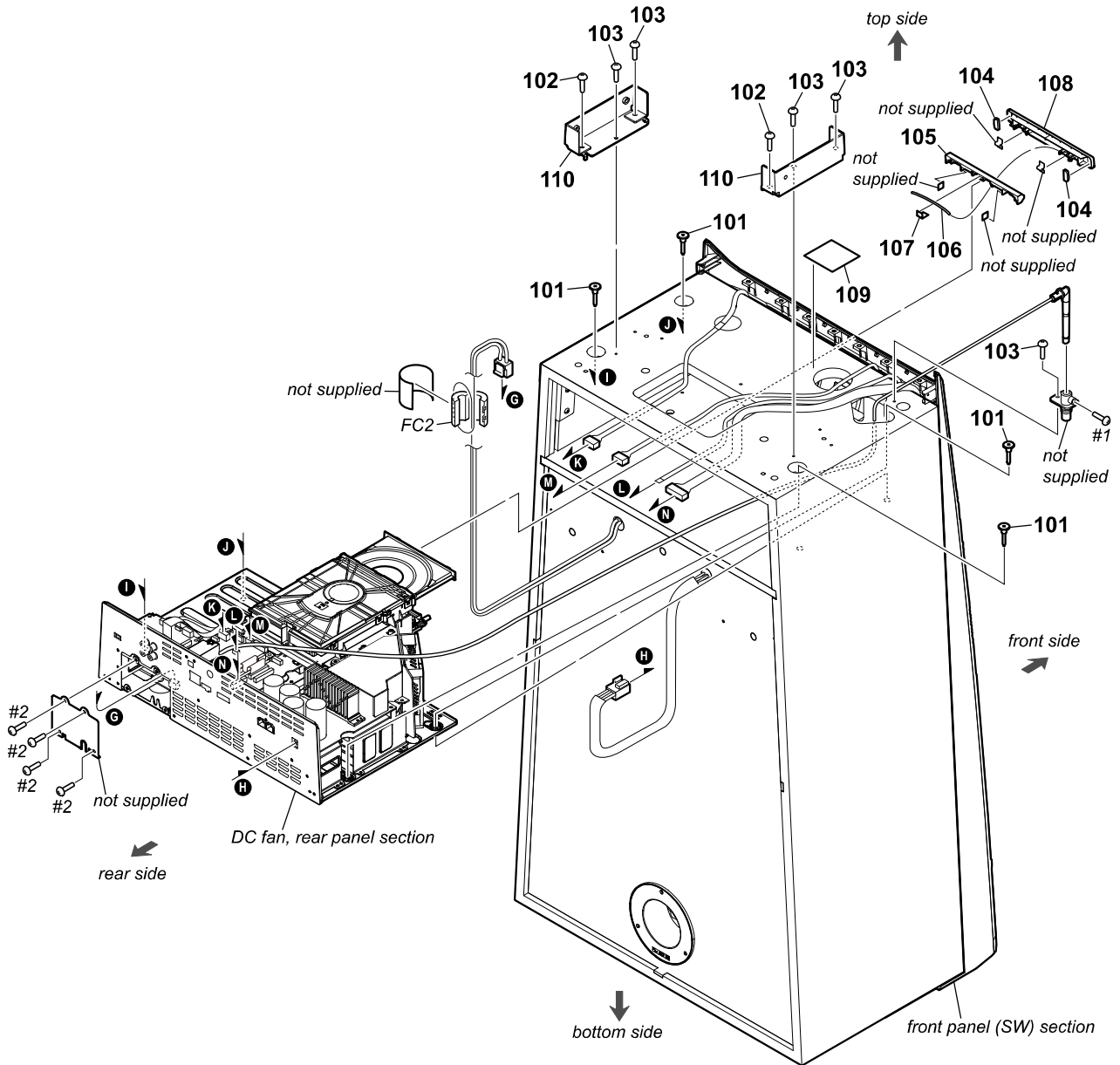
MHC-V90W

4-2. TOP PANEL SECTION (SA-V90W)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
FC1	1-469-854-11	CORE, FERRITE		FFC10	1-912-277-11	FLEXIBLE FLAT CABLE (29 CORE) (L = 515 mm)	
FFC3	1-912-270-11	FLEXIBLE FLAT CABLE (7 CORE) (L = 340 mm)		TOP1	A-2198-679-A	SERVICE,PANEL TOP ASSY (Including SENSOR board)	
FFC4	1-912-271-11	FLEXIBLE FLAT CABLE (5 CORE) (L = 65 mm)		#1	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3	
FFC5	1-912-272-11	FLEXIBLE FLAT CABLE (13 CORE) (L = 85 mm)		#2	7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3	
FFC9	1-912-276-11	FLEXIBLE FLAT CABLE (7 CORE) (L = 85 mm)					

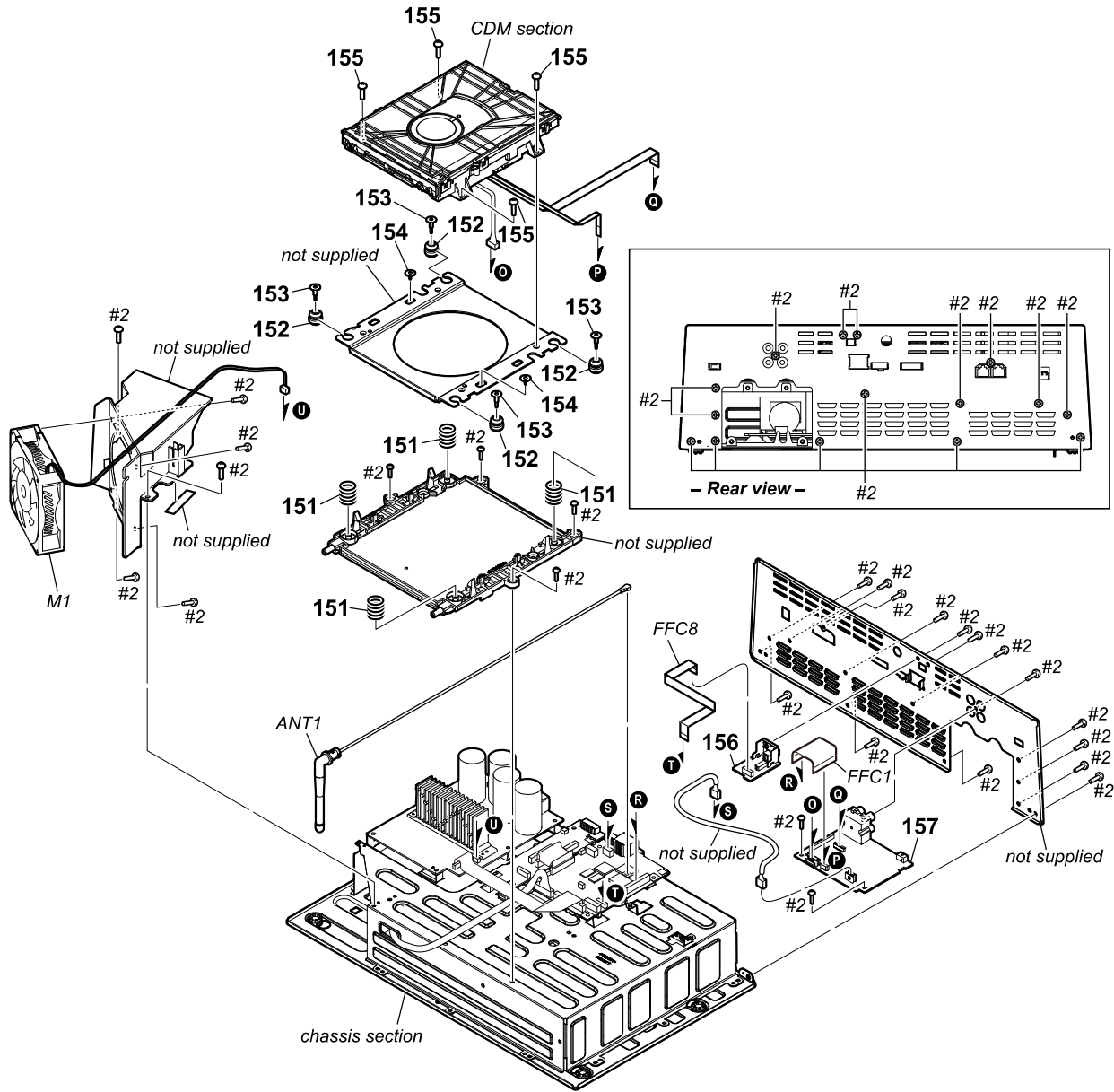
4-3. LOADING PANEL SECTION (SA-V90W)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	4-566-197-01	STEP SCREW		108	4-691-984-01	PANEL, LOADING	
102	4-698-434-01	SCREW (MOUNTING)		109	4-727-333-01	ADHESIVE, SHEET (V0-V2)	
103	4-238-407-12	SCREW (1) (4X20), +BV TAPPING		110	4-692-799-01	BRACKET, JOINT	
104	4-691-958-01	PACKING, LOADING		FC2	1-457-369-12	CORE, FERRITE	
105	4-484-668-01	BASE (LP)		#1	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3	
106	4-536-754-01	SPRING (LP)		#2	7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3	
107	3-559-407-21	CUSHION, STOPPER					

MHC-V90W

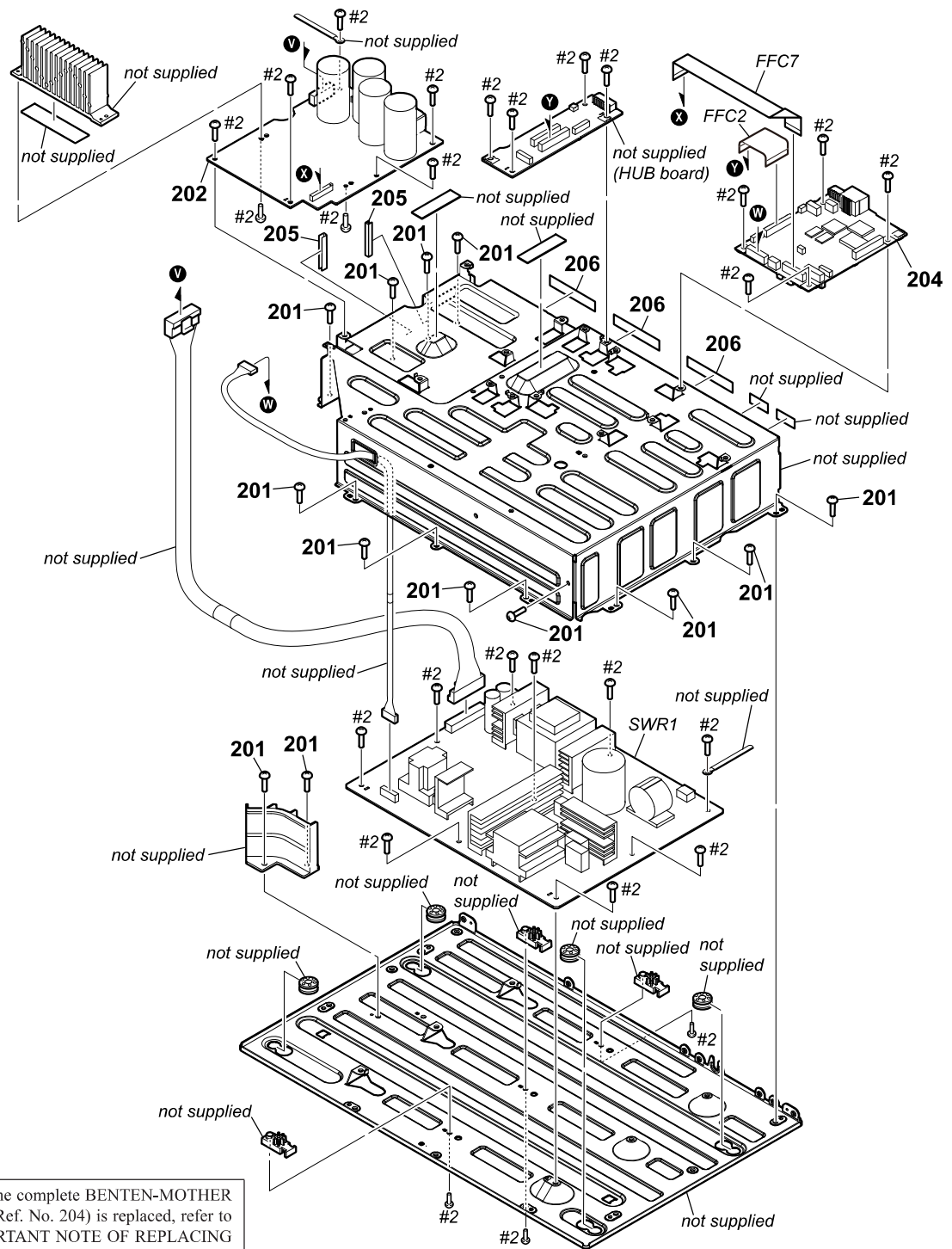
4-4. DC FAN, REAR PANEL SECTION (SA-V90W)



Note: When the dual-band dipole antenna (Ref. No. ANT1) is replaced, refer to "NETWORK CONNECTION CHECKING METHOD (WIRELESS/WIRED LAN)" on page 8.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
151	4-590-159-01	SPRING, INSULATOR		157	A-2193-684-A	89G BOARD, COMPLETE (SV)	
152	4-533-382-01	INSULATOR		ANT1	1-754-993-11	DUAL-BAND DIPOLE ANTENNA (See Note)	
153	4-535-577-01	STEP SCREW M2.6		FFC1	1-912-269-11	FLEXIBLE FLAT CABLE (29 CORE) (L = 60 mm)	
154	2-345-115-01	SCREW (S), FLOAT		FFC8	1-912-275-11	FLEXIBLE FLAT CABLE (9 CORE) (L = 130 mm)	
155	3-077-331-21	+BV3 (3-CR) (L = 6.0 mm)		M1	1-855-340-11	DC FAN	
156	A-2116-541-A	FM-TUNER BOARD, COMPLETE		#2	7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3	

4-5. CHASSIS SECTION (SA-V90W)

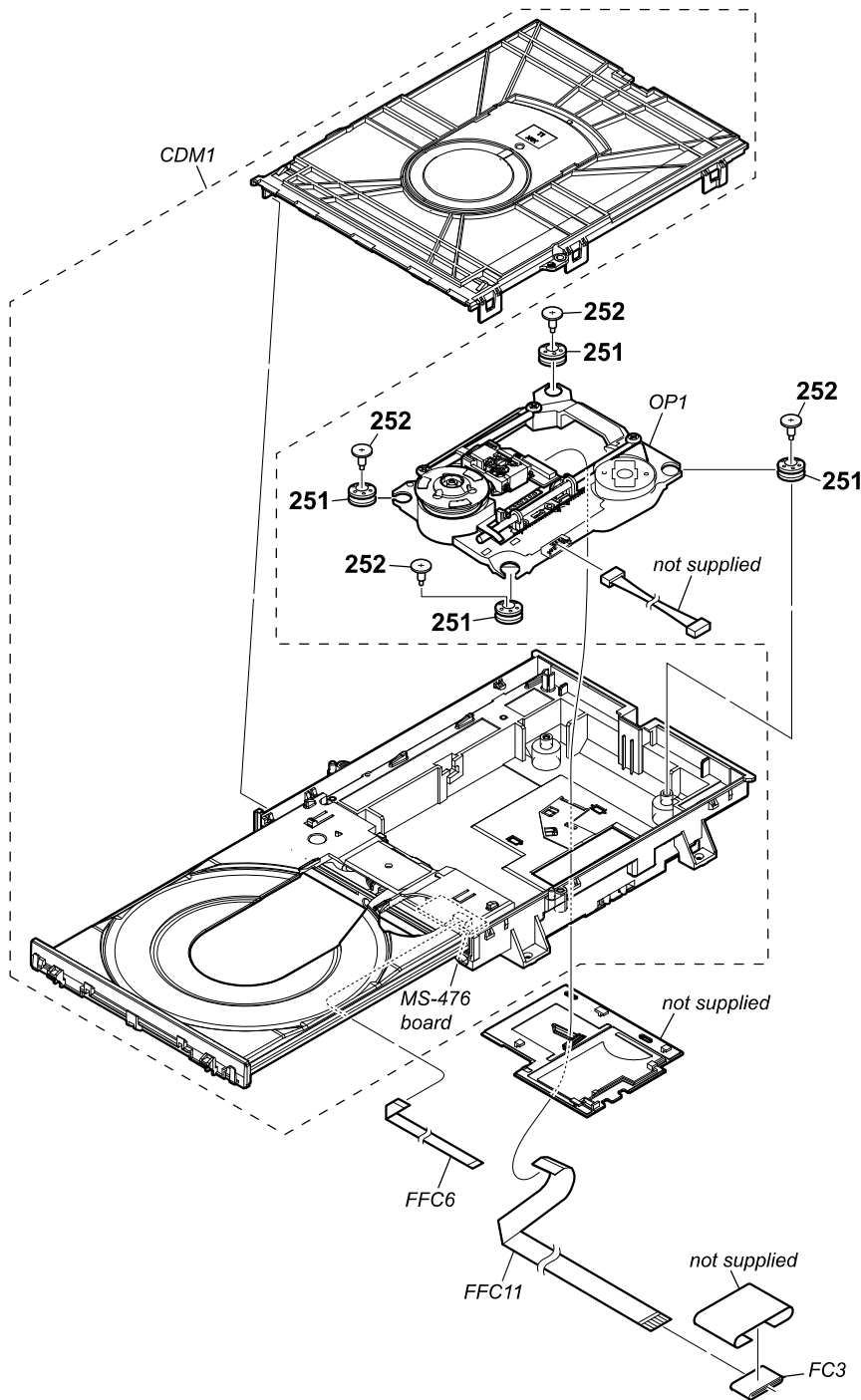


Note: When the complete BENTEN-MOTHER board (Ref. No. 204) is replaced, refer to "IMPORTANT NOTE OF REPLACING THE BENTEN-MOTHER BOARD" on page 7.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
201	3-077-331-21	+BV3 (3-CR) (L = 6.0 mm)		FFC2	1-912-269-11	FLEXIBLE FLAT CABLE (29 CORE) (L = 60 mm)	
202	A-2189-139-A	DAMP BOARD, COMPLETE		FFC7	1-912-274-11	FLEXIBLE FLAT CABLE (21 CORE) (L = 182 mm)	
204	A-2193-683-A	BENTEN-MOTHER BOARD, COMPLETE (SV) (Including Serial label) (See Note)		△ SWR1	1-474-702-11	REGULATOR, SWITCHING (SSN-173AD)	
205	3-287-010-01	SHEET (B)		#2	7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3	
* 206	3-378-109-01	CUSHION, SARANET					

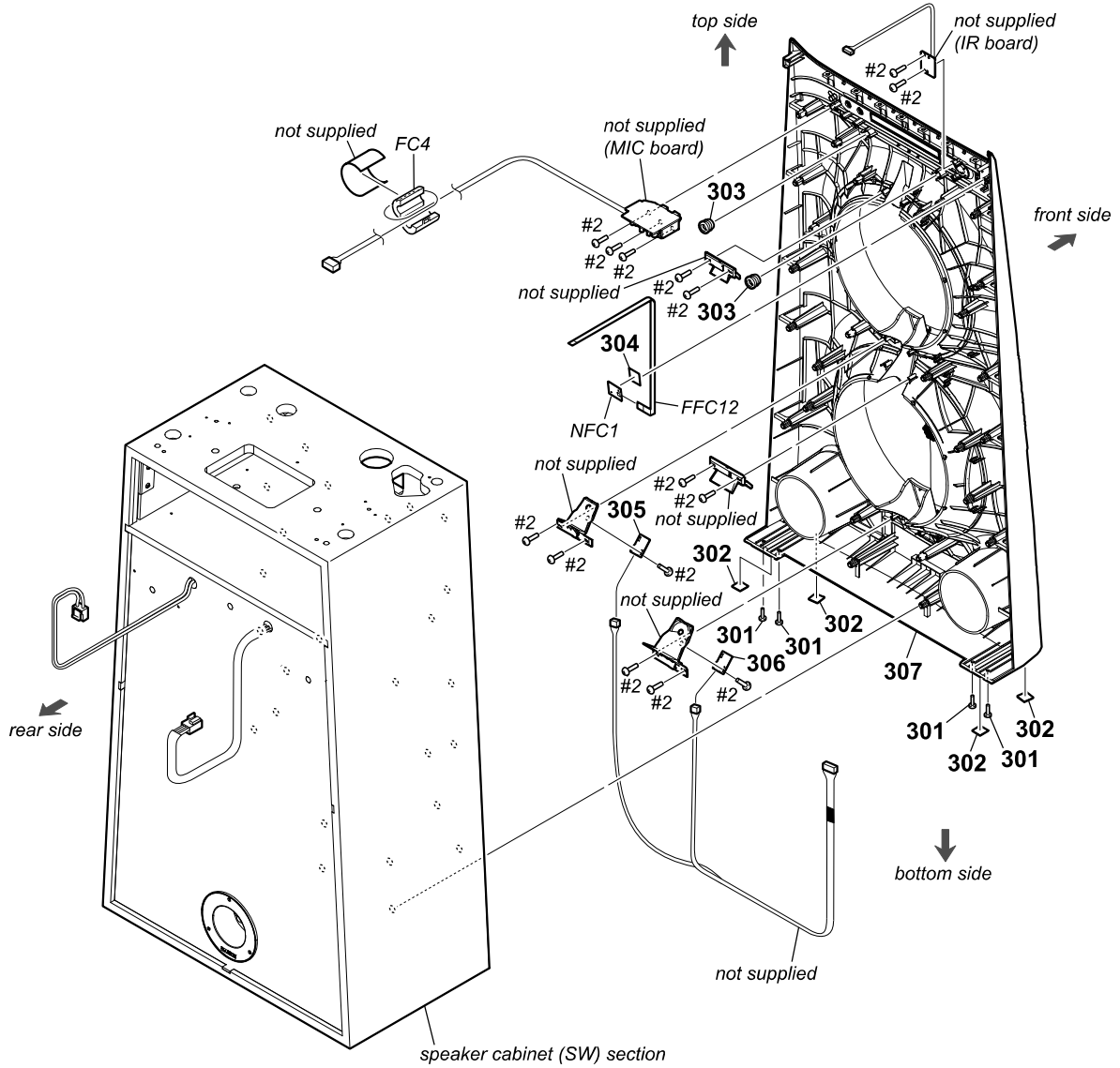
MHC-V90W

4-6. CDM SECTION (CDM90-DVBU204) (SA-V90W)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
251	2-634-618-21	INSULATOR		FFC6	1-912-273-11	FLEXIBLE FLAT CABLE (5 CORE) (L = 350 mm)	
252	3-087-599-01	INSULATOR SCREW		FFC11	1-912-278-11	FLEXIBLE FLAT CABLE (24 CORE) (L = 355 mm)	
CDM1	A-1896-391-B	LOADING COMPLETE ASSY (T)	(Including MS-476 board)	△ OP1	A-2046-956-A	SERVICE, OPTICAL DEVICE (7G) (CMS-S76RFS7G) (Including Sheet (S76))	
FC3	1-469-829-11	CORE, FERRITE					

4-7. FRONT PANEL (SW) SECTION (SA-V90W)

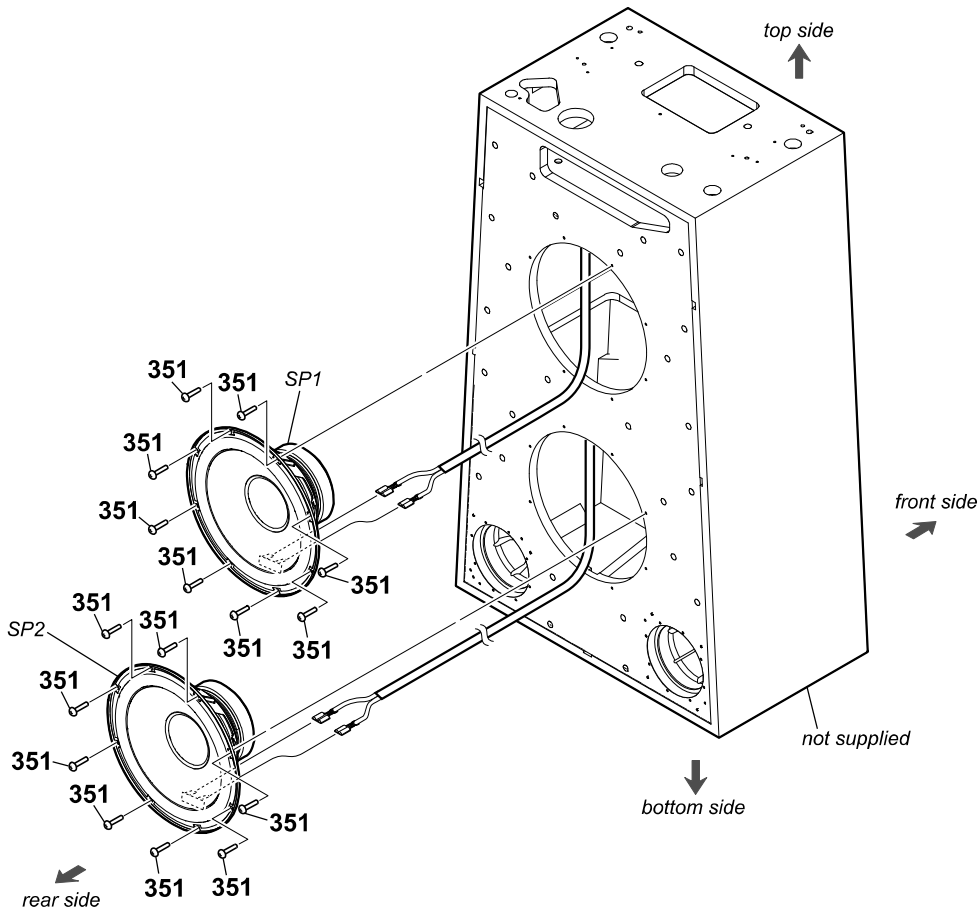


Note: When the NFC module (Ref. No. NFC1) is replaced, refer to “NFC CONNECTION CHECKING METHOD” on page 7.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
301	4-532-593-02	SCREW (4X13) (TR-184A)		307	X-2594-537-2	PANEL, FRONT ASSY (SW)	
302	4-578-508-01	FOOT		* FC4	1-500-082-11	CLAMP, SLEEVE FERRITE	
303	4-912-253-01	CATCHER		FFC12	1-912-279-11	FLEXIBLE FLAT CABLE (6 CORE) (L = 450 mm)	
304	4-459-006-01	DOUBLE ADHESIVE TAPE (NFC)		NFC1	8-989-602-00	RC-S730 (NFC module) (See Note)	
305	A-2199-027-A	SW LED BTM1 BOARD, COMPLETE		#2	7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3	
306	A-2199-028-A	SW LED BTM2 BOARD, COMPLETE					

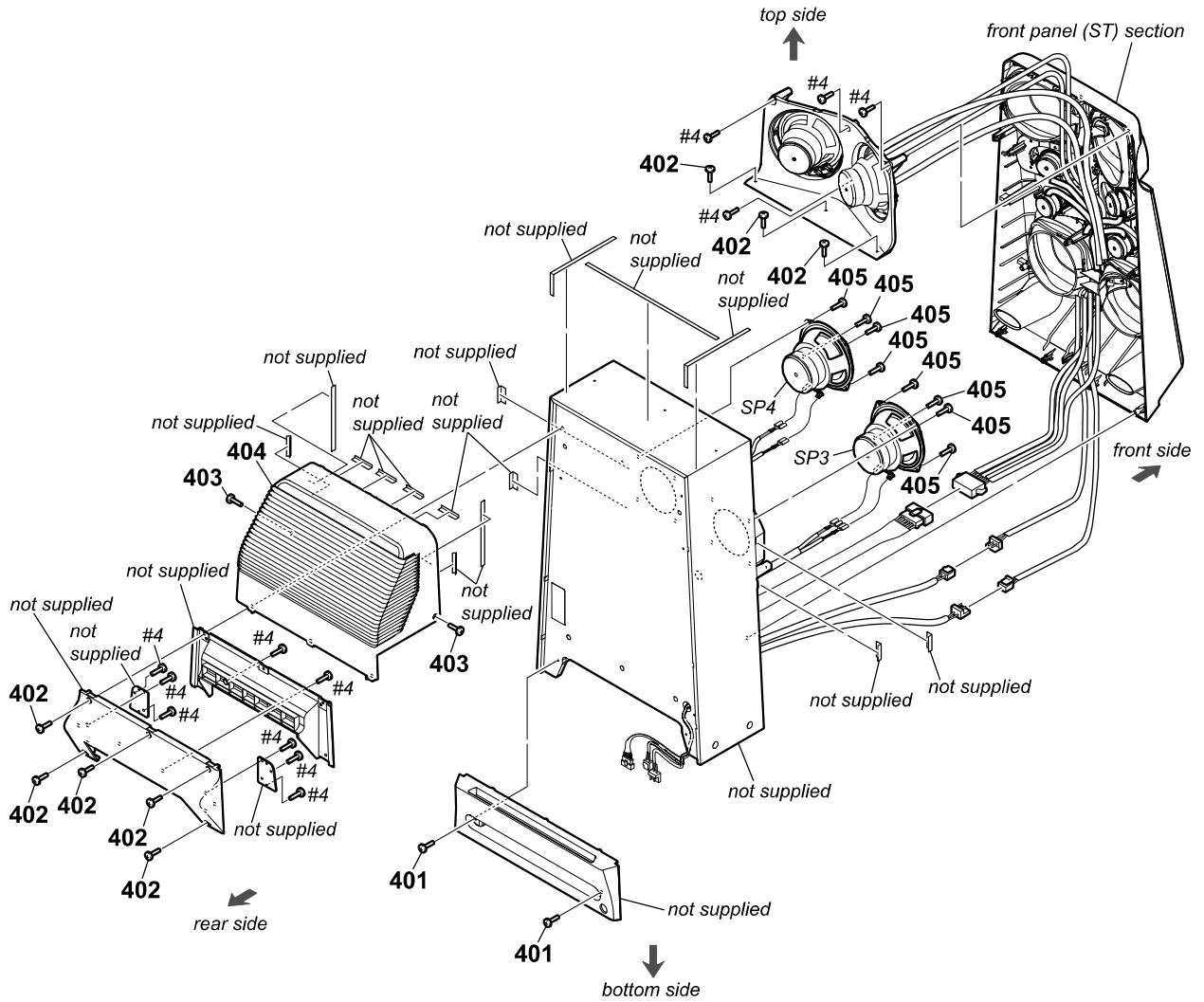
MHC-V90W

4-8. SPEAKER CABINET (SW) SECTION (SA-V90W)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
351	4-569-090-01	SCR TPBV +4 (SW/W10) (HR)-3B ZN		SP2	1-859-232-11	LOUDSPEAKER (260 mm) (Subwoofer: Lower)	
SP1	1-859-232-11	LOUDSPEAKER (260 mm) (Subwoofer: Top)					

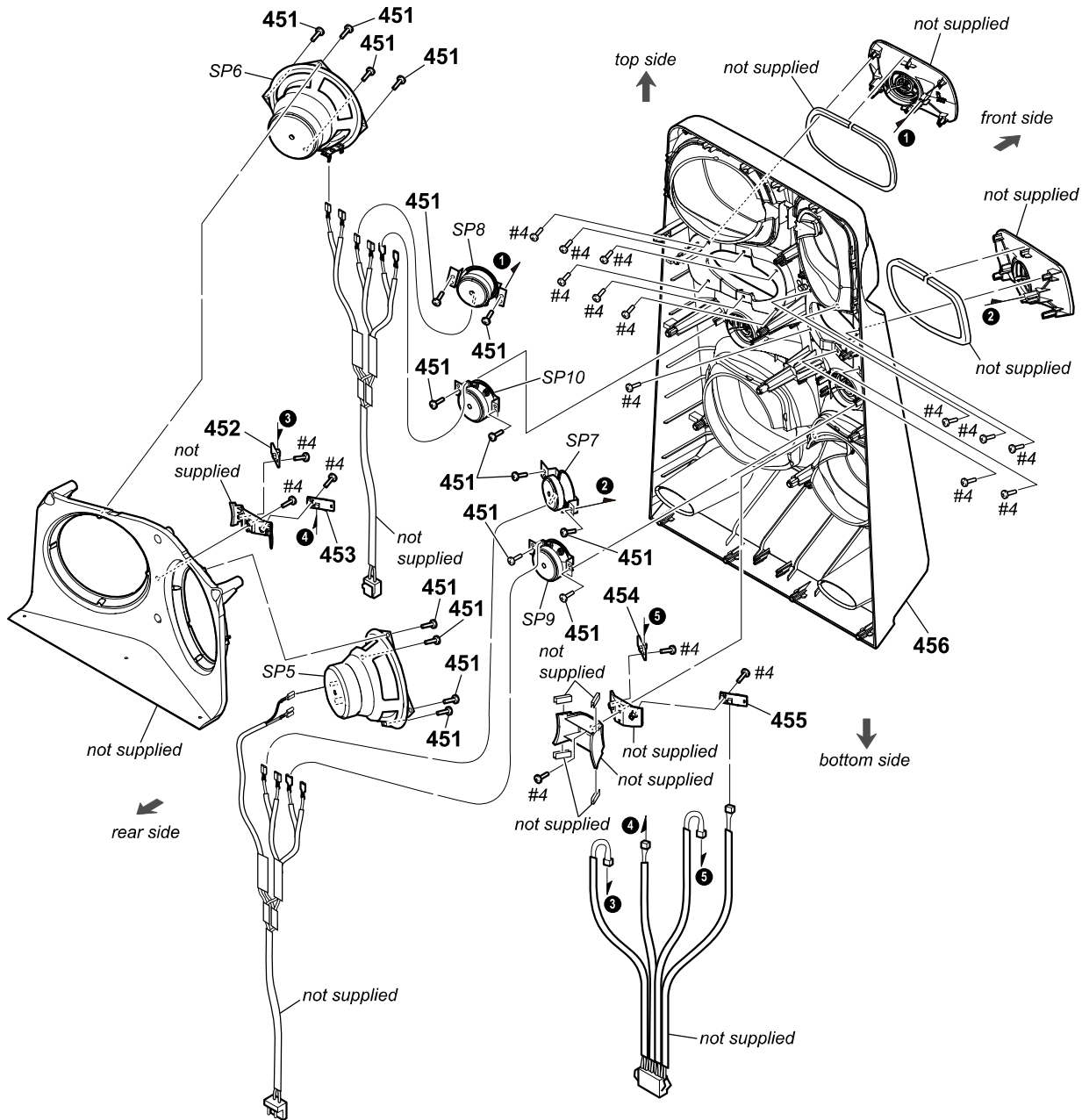
4-9. SPEAKER CABINET (ST) SECTION (SS-V90W)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
401	4-874-614-12	SCREW (1) (3,5X14), TAPPING		SP3	1-859-231-11	LOUDSPEAKER (140 mm) (Midrange: Lower L-ch)	
402	4-874-614-52	SCREW (1) (3,5X20), TAPPING		SP4	1-859-231-11	LOUDSPEAKER (140 mm) (Midrange: Lower R-ch)	
403	4-699-872-01	SCREW, TAPPING (+)		#4	7-685-647-71	SCREW +BVTP 3X10 TYPE2 IT-3	
404	4-692-784-01	TOP PANEL (ST)					
405	4-874-614-72	SCREW (3,5X12)					

MHC-V90W

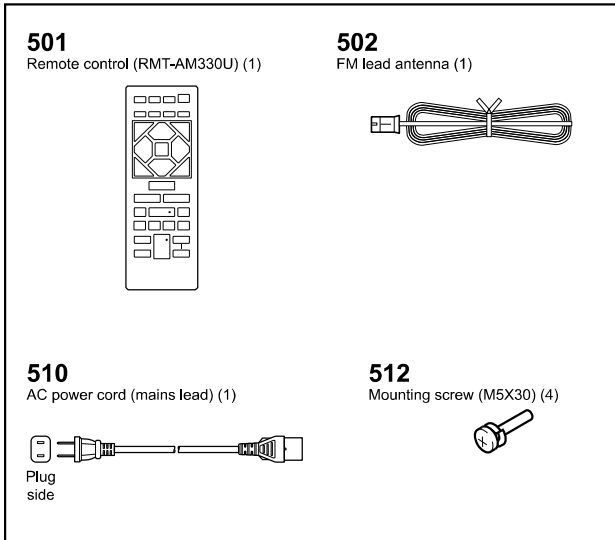
4-10. FRONT PANEL (ST) SECTION (SS-V90W)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
451	4-874-614-72	SCREW (3.5X12)		SP6	1-859-230-11	LOUDSPEAKER (140 mm) (Midrange: Top R-ch)	
452	A-2179-849-A	FR_TOP-LED BOARD, COMPLETE		SP7	1-859-229-11	LOUDSPEAKER (46 mm) (Tweeter: Top L-ch)	
453	A-2182-475-A	FL_TOP-LED BOARD, COMPLETE		SP8	1-859-229-11	LOUDSPEAKER (46 mm) (Tweeter: Top R-ch)	
454	A-2183-570-A	FR_BTM-LED BOARD, COMPLETE		SP9	1-859-229-11	LOUDSPEAKER (46 mm) (Tweeter: Lower L-ch)	
455	A-2183-571-A	FL_BTM-LED BOARD, COMPLETE		SP10	1-859-229-11	LOUDSPEAKER (46 mm) (Tweeter: Lower R-ch)	
456	X-2594-541-1	PANEL, FRONT ASSY (ST)		#4	7-685-647-71	SCREW +BVTP 3X10 TYPE2 IT-3	
SP5	1-859-230-11	LOUDSPEAKER (140 mm) (Midrange: Top L-ch)					

SECTION 5 ACCESSORIES

Ref. No.	Part No.	Description	Remark
	4-728-217-12	MANUAL, INSTRUCTION (ENGLISH)	
	4-728-217-22	MANUAL, INSTRUCTION (FRENCH)	
	4-728-217-32	MANUAL, INSTRUCTION (SPANISH)	
501	1-493-294-12	REMOTE COMMANDER (RMT-AM330U)	(Remote control)
502	1-754-852-11	ANTENNA (FM) (FM lead antenna)	
△ 510	1-848-909-12	POWER-SUPPLY CORD	(AC power cord (mains lead))
512	4-698-434-02	SCREW (MOUNTING)	(Mounting screw (M5X30)) (1 piece)



The components identified by mark △ or dotted line with mark △ are critical for safety.
Replace only with part number specified.