SONY

PROFESSIONAL VIDEO MONITOR

LMD-A240
LMD-A220
LMD-A170

PROTECTION KIT
BKM-PL17

HDMI

SERVICE MANUAL
1st Edition (Revised 2)

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

Serial No. 7000001 to 7100000: LMD-A240 (SY)
7200001 to 7300000: LMD-A240 (CN)
7000001 and Higher: LMD-A220 (SY)
7200001 and Higher: LMD-A220 (CN)
7000001 to 7100000: LMD-A170 (SY)
7200001 to 7300000: LMD-A170 (CN)

本機をラックに設置するとき
熱の適切な排気・発散を得るために，ラックと本機の間には，以下の空間を確保してください。
・上下 4 cm 以上
・左右両側面 4 cm 以上
・後面 10 cm 以上

Attention-when the product is installed in Rack:

1. **Prevention against overloading of branch circuit**
   When this product is installed in a rack and is supplied power from an outlet on the rack, please make sure that the rack does not overload the supply circuit.

2. **Providing protective earth**
   When this product is installed in a rack and is supplied power from an outlet on the rack, please confirm that the outlet is provided with a suitable protective earth connection.

3. **Internal air ambient temperature of the rack**
   When this product is installed in a rack, please make sure that the internal air ambient temperature of the rack is within the specified limit of this product.

4. **Prevention against achieving hazardous condition due to uneven mechanical loading**
   When this product is installed in a rack, please make sure that the rack does not achieve hazardous condition due to uneven mechanical loading.

5. **Install the equipment while taking the operating temperature of the equipment into consideration**
   For the operating temperature of the equipment, refer to the specifications of the Operating Instructions.

6. **When performing the installation, keep the following space away from walls in order to obtain proper exhaust and radiation of heat.**
   Lower, Upper: 4 cm (1 5/8 inches) or more
   Right, Left: 4 cm (1 5/8 inches) or more
   Rear: 10 cm (4 inches) or more

警告

万一，異常が起きた際に，お客様が電源を切ることができるように，設置の際には，機器近くの固定配線内に専用遮断装置を設けるか，機器使用中に，容易に抜き差しできるコンセントに電源プラグを接続してください。

WARNING
When installing the unit, incorporate a readily accessible disconnect device in the fixed wiring, or connect the power cord to a socket-outlet which must be provided near the unit and easily accessible, so that the user can turn off the power in case a fault should occur.

WARNUNG
Beim Einbau des Geräts ist daher im Festkabel ein leicht zugänglicher Unterbrecher einzufügen, oder das Netzkabel mu*ß* mit einer in der Nähe des Geräts befindlichen, leicht zugänglichen Wandsteckdose verbunden werden, damit sich bei einer Funktionsstörung die Stromversorgung zum Gerät jederzeit unterbrechen lä*ß*t.

安全のために，周辺機器を接続する際は，過大電圧を持つ可能性があるコネクターを以下のポートに接続しないでください。
: SERIAL REMOTE コネクター
: PARALLEL REMOTE コネクター
上記のポートについては本書の指示に従ってください。

For safety, do not connect the connector for peripheral device wiring that might have excessive voltage to the following ports.
: SERIAL REMOTE connector
: PARALLEL REMOTE connector
Follow the instructions for the above ports.

Table of Contents

Manual Structure

1. Service Overview

2. Circuit Description

3. Troubleshooting

4. Spare Parts

5. Diagrams

Revision History

Manual Structure

Purpose of this manual

This manual is the Service Manual of the Professional Video Monitor LMD-A240/A220/A170.
This manual describes the information (such as service overview, circuit description, troubleshooting, spare parts, and block diagrams) on the premise of replacing the board. However, for some key parts, the information on repairing or replacing those parts is described. Also, the parts information of the protection kit BKM-PL17 exclusive for LMD-A170 is described.

Related manuals

The following manual is provided for this unit in addition to this “Service Manual”.

- **“Operating Instructions” (supplied with this unit)**
  This manual is necessary for application and operation of this unit.

Trademarks

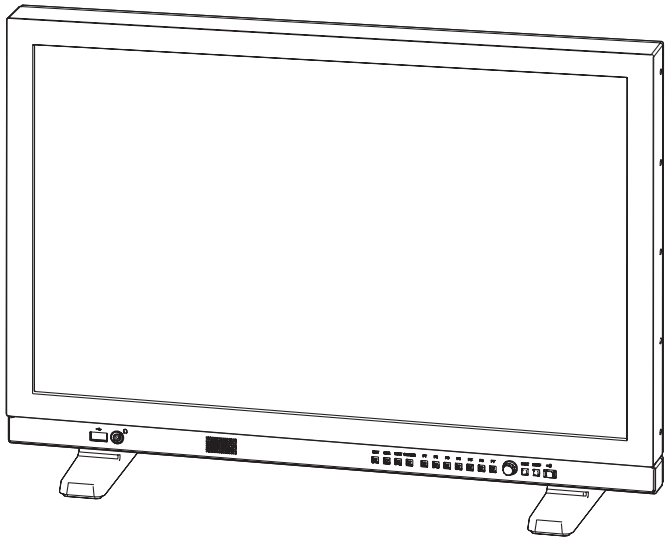
Trademarks and registered trademarks used in this manual are as follows.

- Windows and Windows Vista are the registered trademarks of Microsoft Corporation in the United States and Other countries.

Other system names, product names, and company names appearing in this manual are trademarks or registered trademarks of their respective holders.

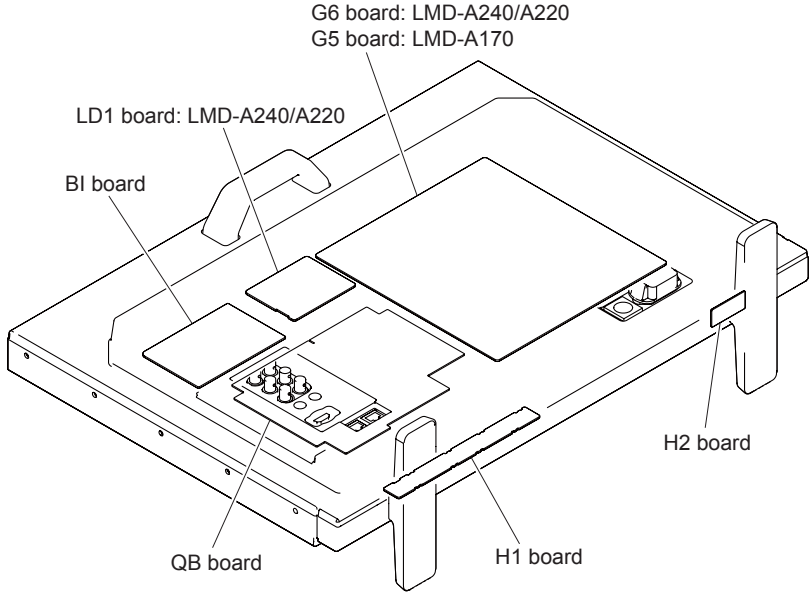
Section 1
Service Overview

1-1. Appearance Figure



This illustration shows LMD-A240.

1-2. Board Location



This illustration shows LMD-A240.

1-3. Tightening Torque

Tighten the each screw with the torque below.

Note

- The screw (BVTP3 × 10) of this unit has two types of the tighten torque. Be careful not to confuse.
- The screw (PSW3 × 6) of this unit has three types of the tighten torque. Be careful not to confuse.

∗1: Serial No. 7000001 to 7100000 (LMD-A220 (SY))
Serial No. 7200001 to 7300000 (LMD-A220 (CN))
∗2: Serial No. 7100001 and Higher (LMD-A220 (SY))
Serial No. 7300001 and Higher (LMD-A220 (CN))

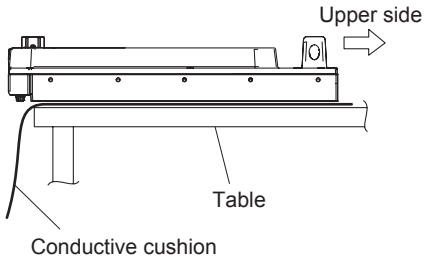
- BVTP3 × 10 (DC fan): 0.40 ±0.05 N•m (4.0 ±0.5 kgf•cm)
- BVTP3 × 10 (for excluding DC fan): 0.60 ±0.10 N•m (6.1 ±1.0 kgf•cm)
- BVTP4 × 12: 1.20 ±0.10 N•m (12.0 ±1.0 kgf•cm)
- B3 × 5: 0.40 ±0.10 N•m (4.0 ±1.0 kgf•cm)
- M2.6 × 6: 0.60 ±0.10 N•m (6.1 ±1.0 kgf•cm)
- NUT (M6 × 0.5): 0.40 ±0.05 N•m (4.0 ±0.5 kgf•cm)
- PSW3 × 6 (LCD panel of LMD-A220)[*1]: 0.35 ±0.05 N•m (3.5 ±0.5 kgf•cm)
- PSW3 × 6 (LCD panel of LMD-A170): 0.25 ±0.05 N•m (2.5 ±0.5 kgf•cm)
- PSW3 × 6 (for excluding LCD panel): 0.60 ±0.10 N•m (6.1 ±1.0 kgf•cm)
- PSW3 × 10: 0.60 ±0.10 N•m (6.1 ±1.0 kgf•cm)
- PSW4 × 8: 1.20 ±0.10 N•m (12.0 ±1.0 kgf•cm)
- PSW4 × 12: 1.20 ±0.10 N•m (12.0 ±1.0 kgf•cm)
- UG-EL (B3 × 3) (LCD panel of LMD-A240): 0.35 ±0.05 N•m (3.5 ±0.5 kgf•cm)
- UG-EL (B3 × 3) (LCD panel of LMD-A220)[*2]: 0.35 ±0.05 N•m (3.5 ±0.5 kgf•cm)

When using the torque driver with the notation of cN•m, interpret it as follows.
Example: 0.8 N•m = 80 cN•m

1-4. Disassembly

Note

- When removing/installing the cabinet and replacing the board, place the display on the conductive cushion as shown in the figure.

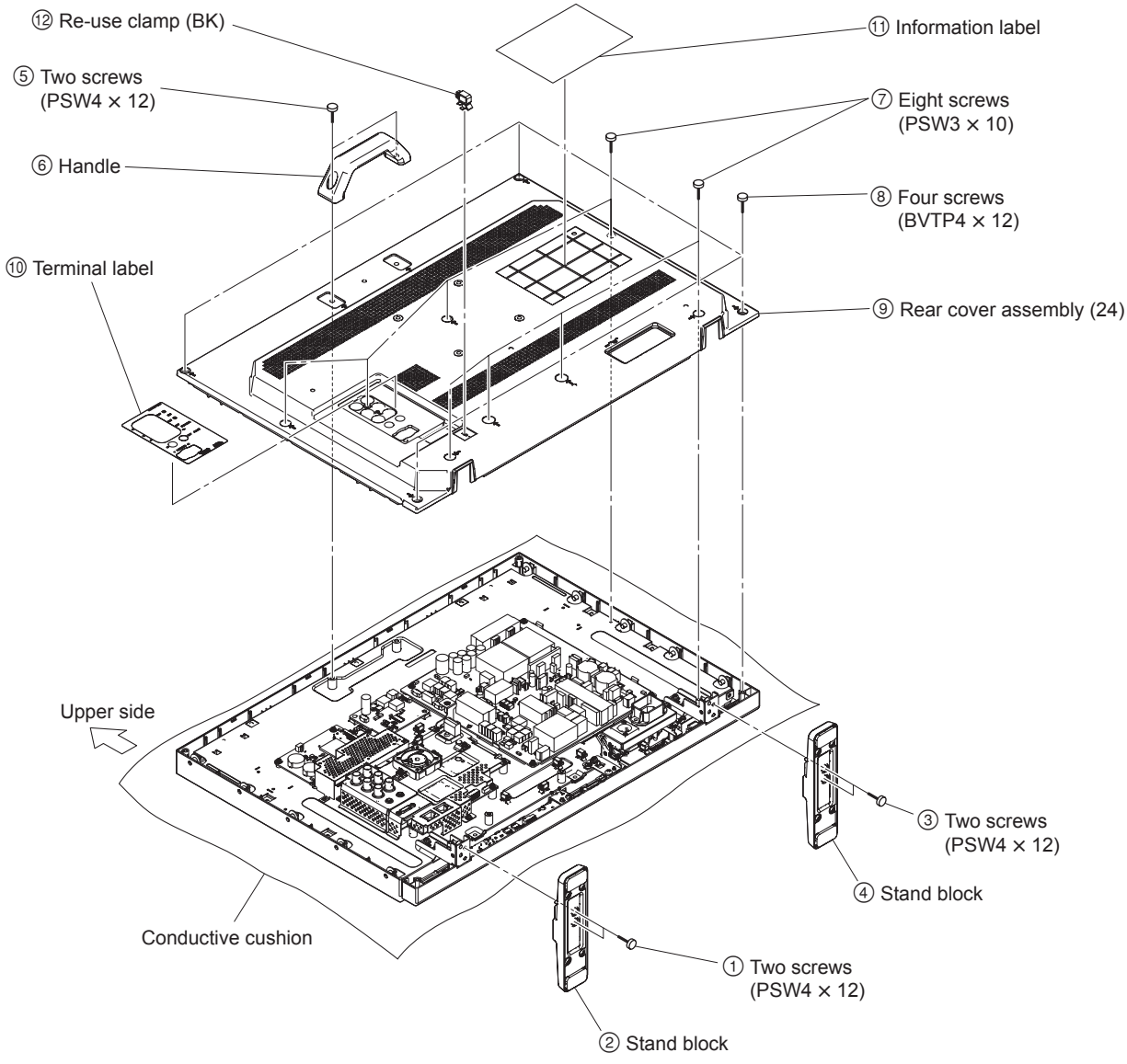


This illustration shows LMD-A240.

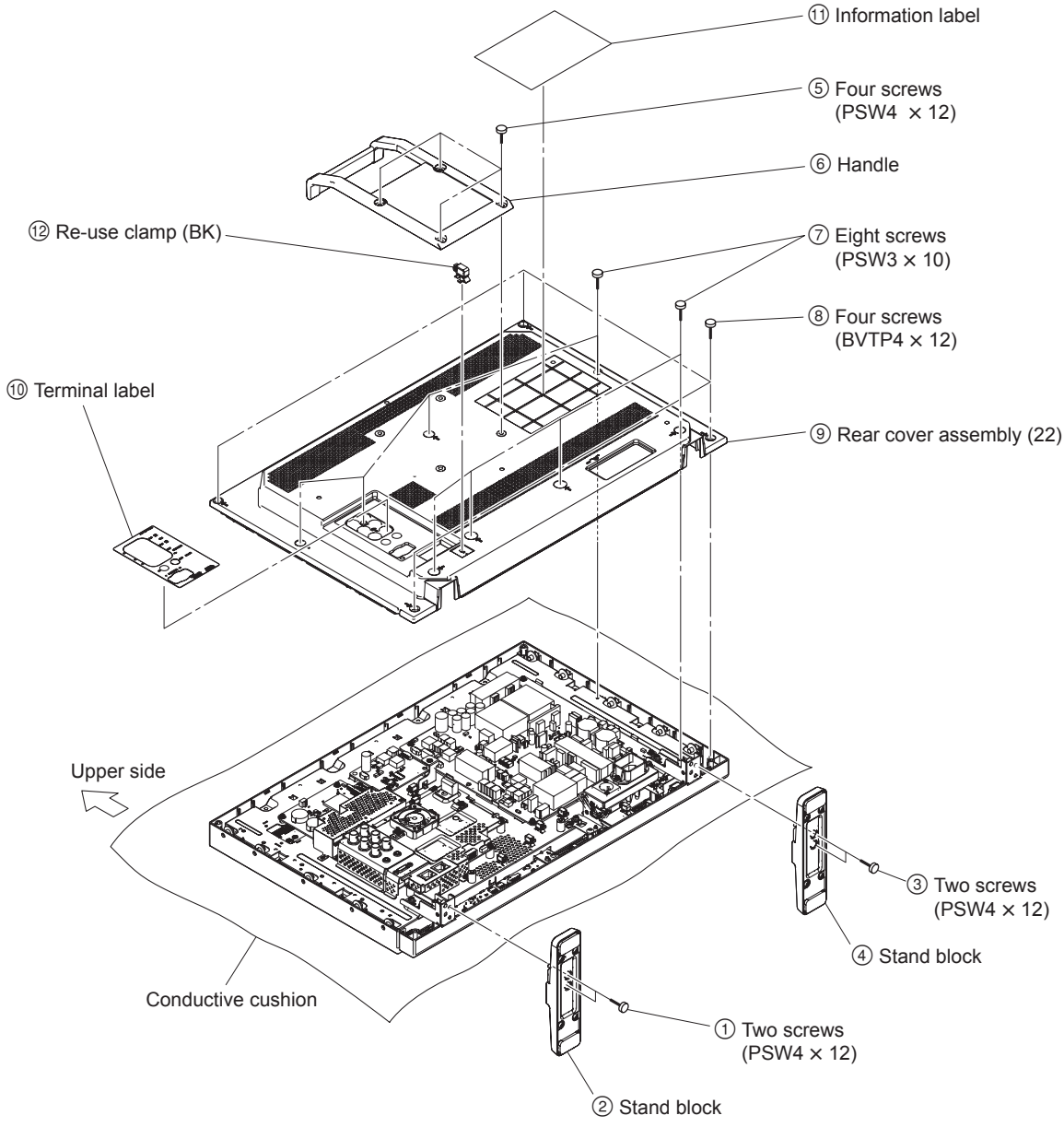
- Remove the parts in the order of numbers shown in the figure, in this section.

1-4-1. Rear Cover Assembly

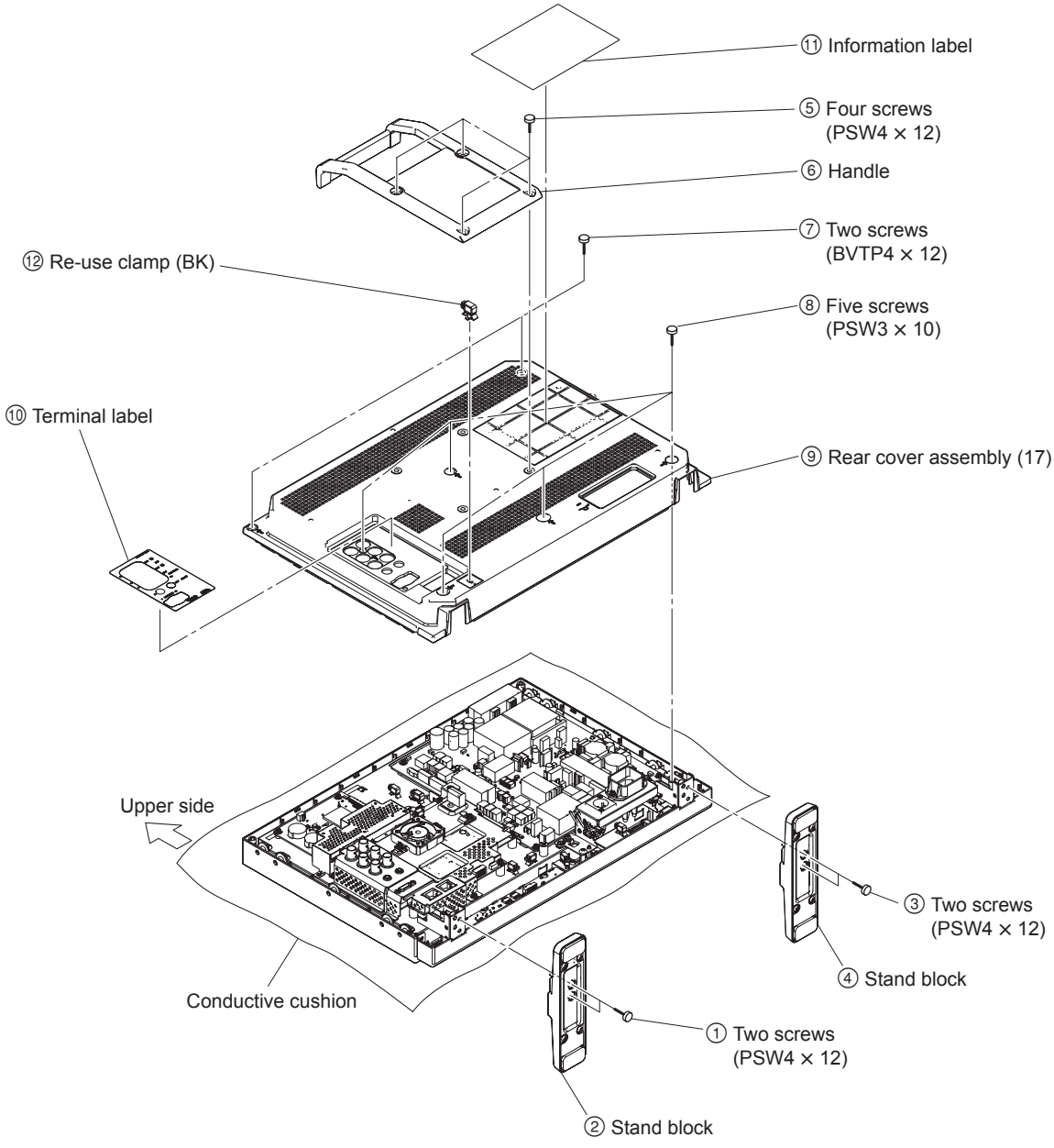
LMD-A240



LMD-A220

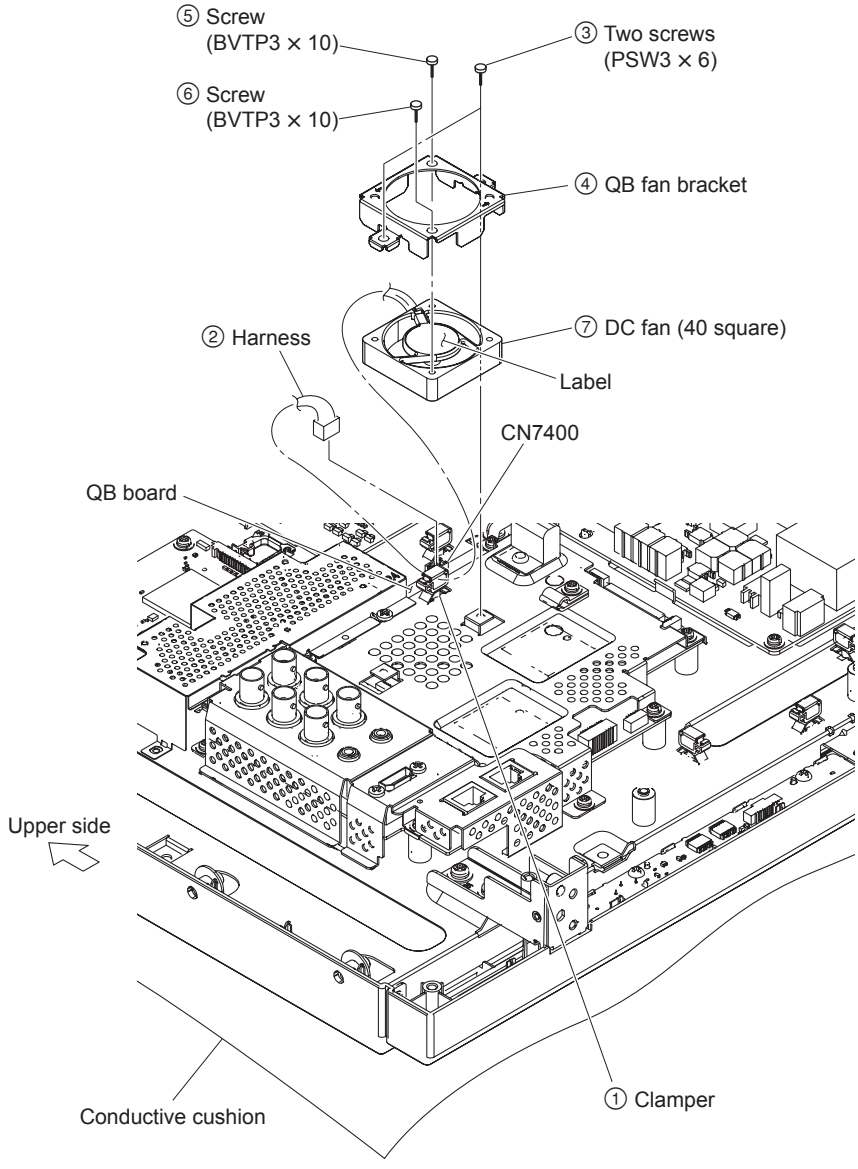

⑪ Information label
⑤ Four screws
(PSW4 × 12)
⑥ Handle
⑫ Re-use clamp (BK)
⑦ Eight screws
(PSW3 × 10)
⑧ Four screws
(BVTP4 × 12)
⑩ Terminal label
⑨ Rear cover assembly (22)
Upper side
③ Two screws
(PSW4 × 12)
④ Stand block
Conductive cushion
① Two screws
(PSW4 × 12)
② Stand block

LMD-A170


⑪ Information label
⑤ Four screws
(PSW4 × 12)
⑥ Handle
⑦ Two screws
(BVTP4 × 12)
⑫ Re-use clamp (BK)
⑧ Five screws
(PSW3 × 10)
⑩ Terminal label
⑨ Rear cover assembly (17)
Upper side
③ Two screws
(PSW4 × 12)
④ Stand block
Conductive cushion
① Two screws
(PSW4 × 12)
② Stand block

1-4-2. DC Fan (40 Square)

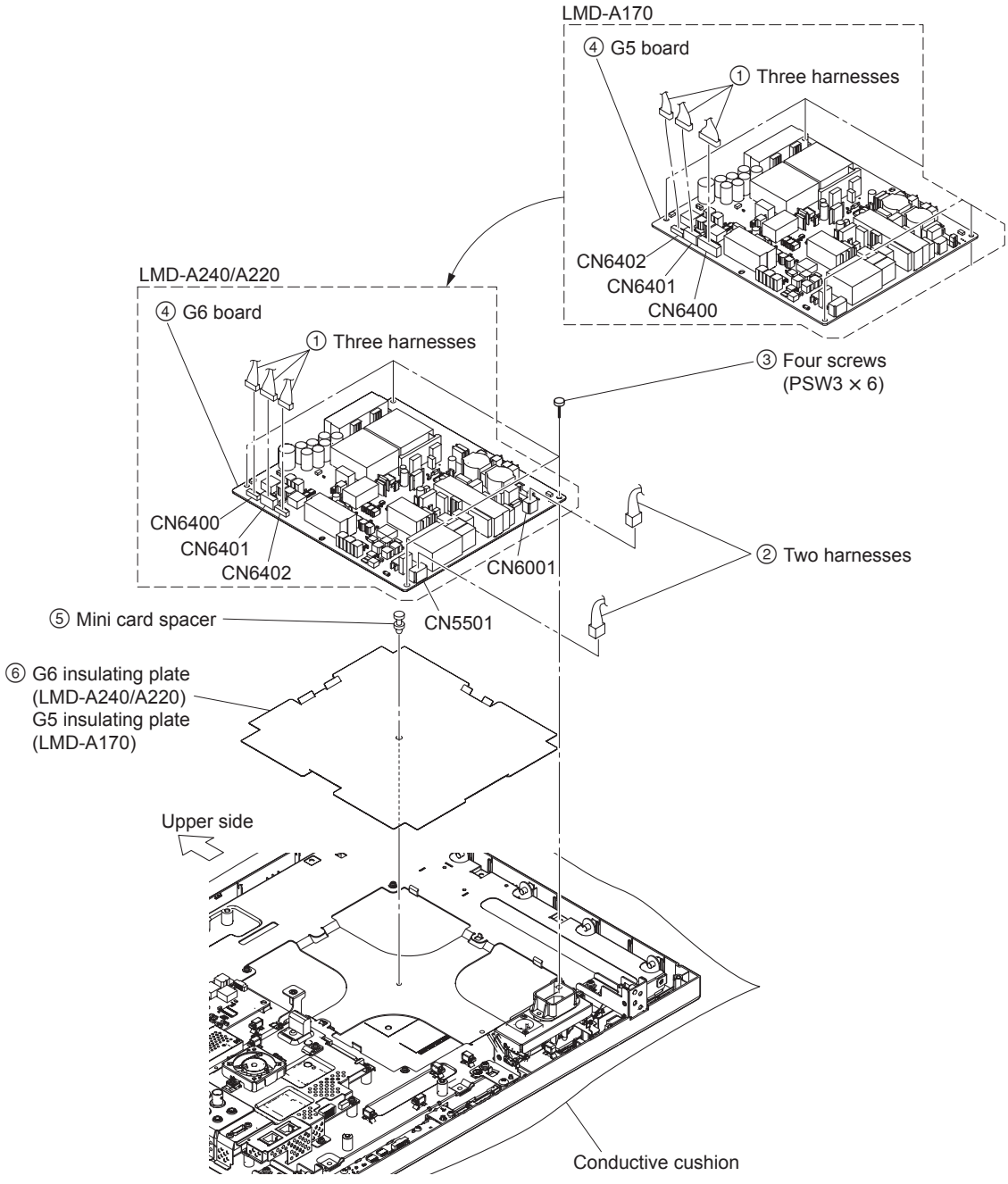
• Remove the rear cover assembly. (Refer to Section 1-4-1.)



This illustration shows LMD-A240.

1-4-3. G6 Board (LMD-A240/A220)
G5 Board (LMD-A170)

• Remove the rear cover assembly. (Refer to Section 1-4-1.)



This illustration shows LMD-A240.

1-4-4. QB Board

Procedure before replacement

Check the backlight operation time before replacing the QB board and write down it. And set the backlight operation time after replacing the QB board. When the backlight operation time cannot be checked, set the backlight operation time to 0.
Check the backlight operation time by using commands input.

Acquire the backlight operation time by using commands input

Required equipment

- Personal computer (PC)
  OS: Windows 7 and Windows 8
- LAN cable (cross cable or straight cable)
- Terminal software: Tera Term, etc.
  The terminal software Tera Term (open source software) is used in this section.

Preparations

1. Prepare a PC. (Refer to Section 1-5-3.)
2. Connect this unit and PC using the LAN cable.

Procedure

1. Turn on the [ON/STANDBY] switch on the unit.
2. Run the Tera Term and perform the MR6 command connection from the PC. (Refer to Section 1-5-4.)
3. On the Tera Term screen, execute the following MR6 command and acquire the backlight operation time.
   (1) `> get_panel_on_time` ⏎
   (2) Write down the shown backlight operation time.

4. Disconnect the unit from the PC by using the Tera Term.
5. Turn off the [ON/STANDBY] switch on the unit.

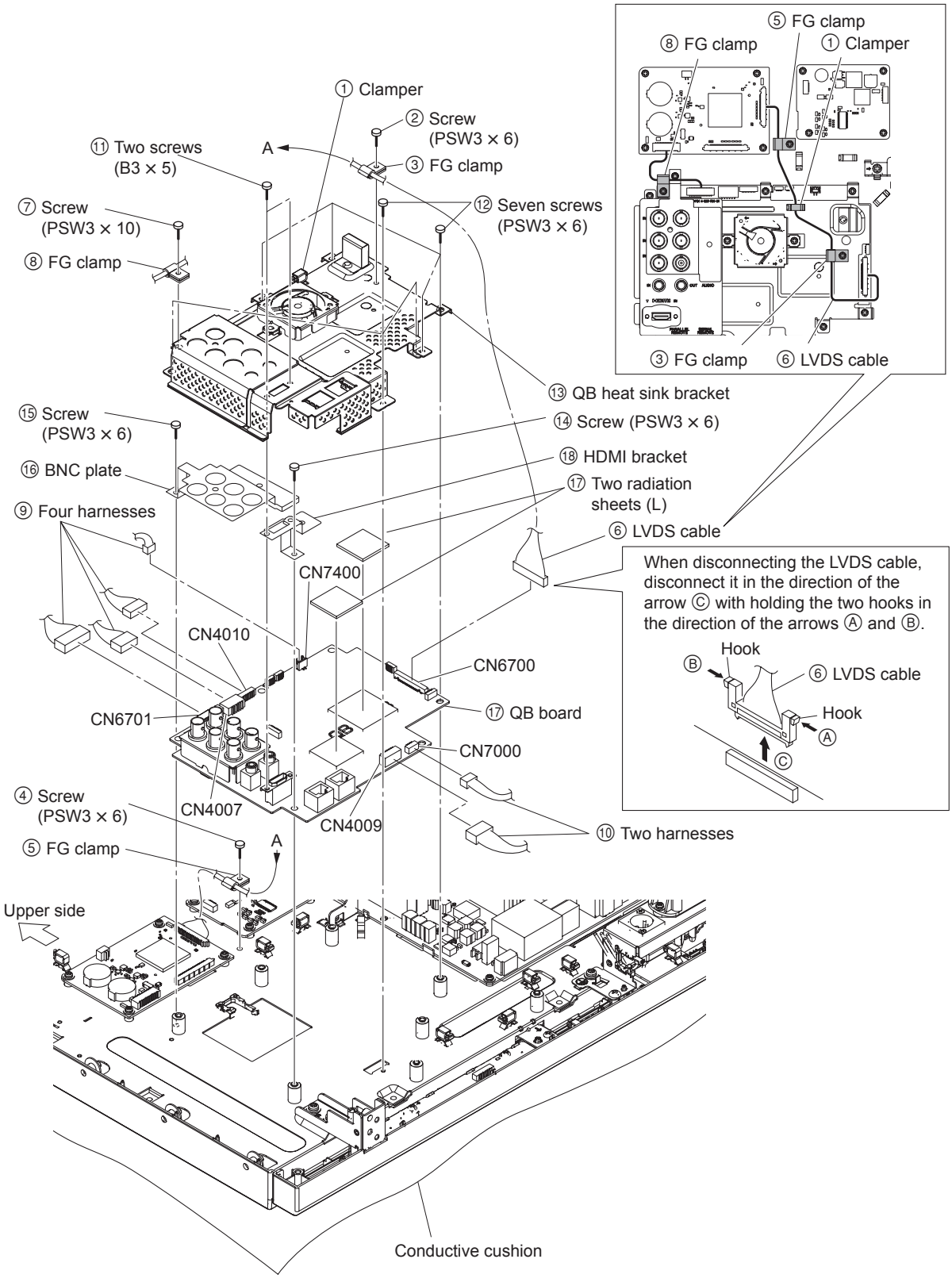
Note

For the procedure after replacement of the QB board, refer to Section 1-6-2.

LMD-A240

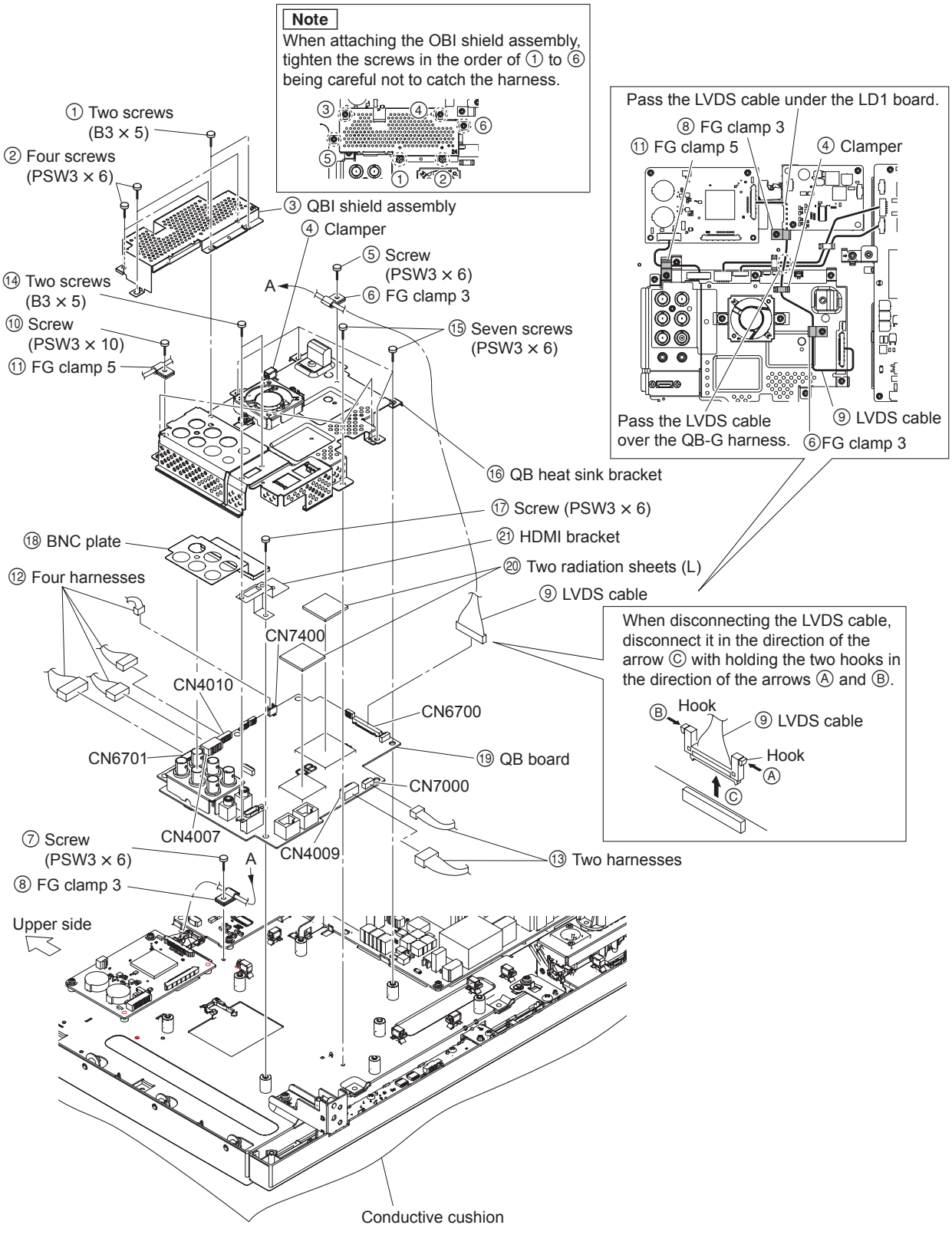
SY: Serial No. 7000001 to 7000400

• Remove the rear cover assembly. (Refer to Section 1-4-1.)



SY: Serial No. 7000401 to 7100000
CN: Serial No. 7200001 to 7300000

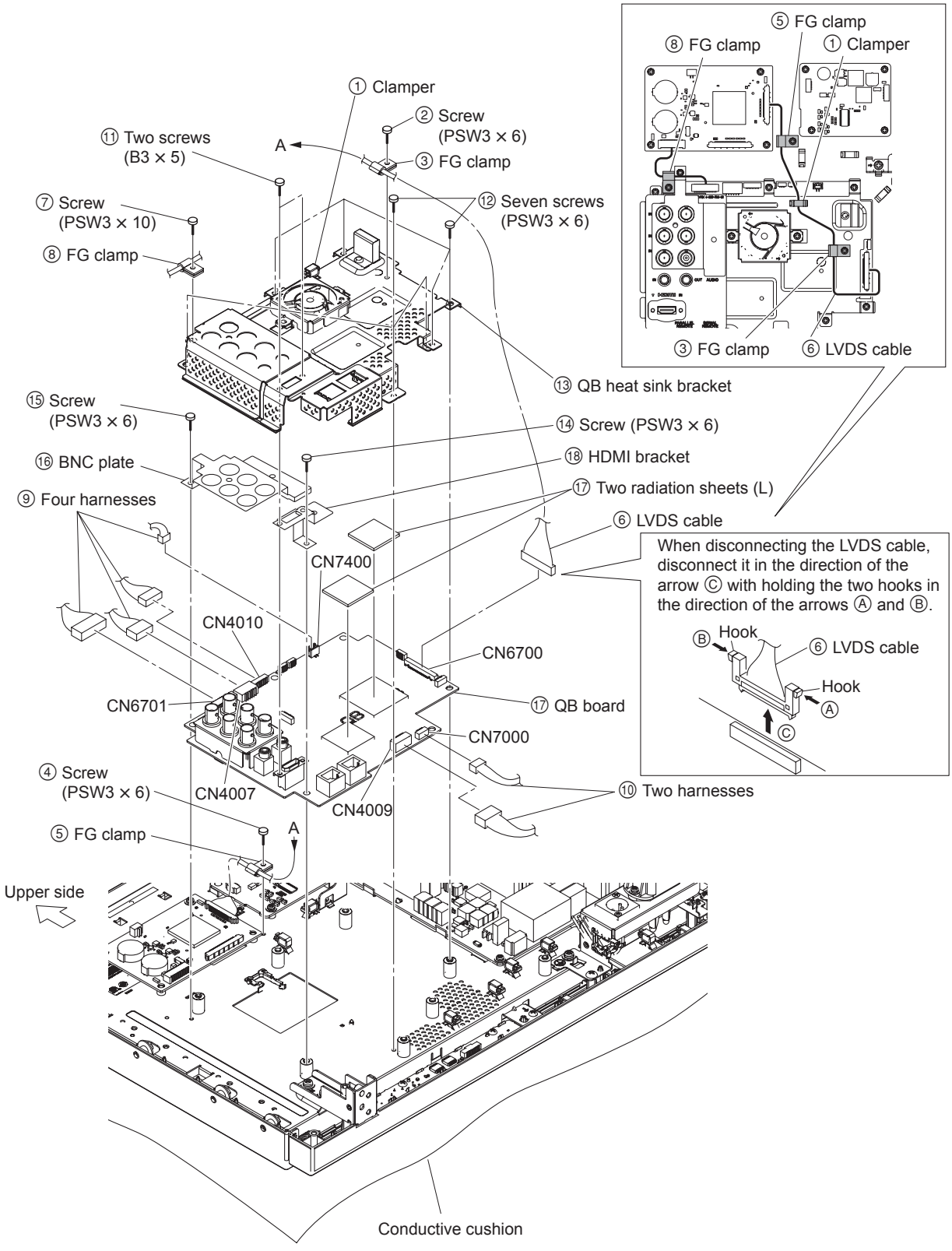
• Remove the rear cover assembly. (Refer to Section 1-4-1.)



LMD-A220

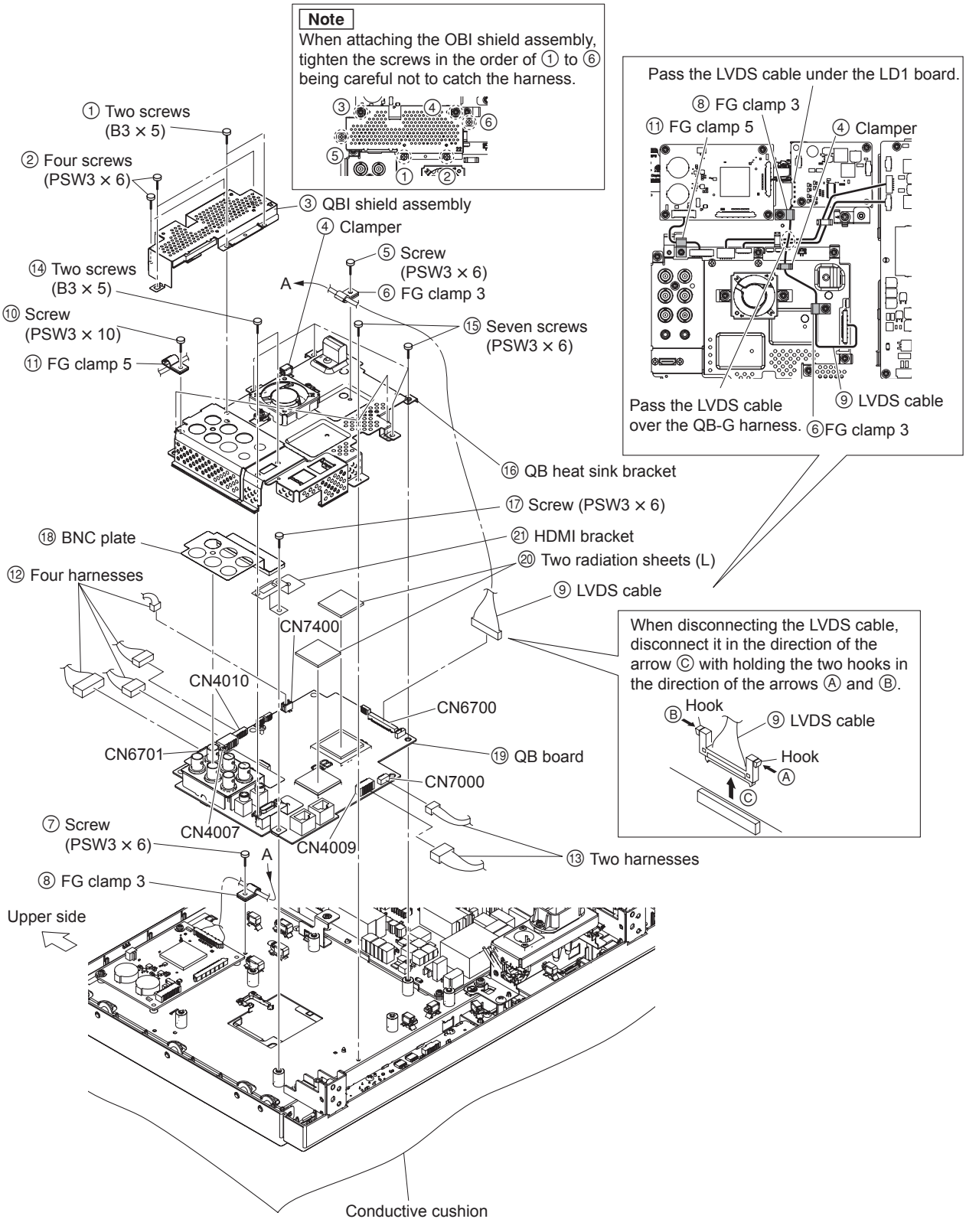
SY: Serial No. 7000001 to 7000180

• Remove the rear cover assembly. (Refer to Section 1-4-1.)



SY: Serial No. 7000181 and Higher
CN: Serial No. 7200001 and Higher

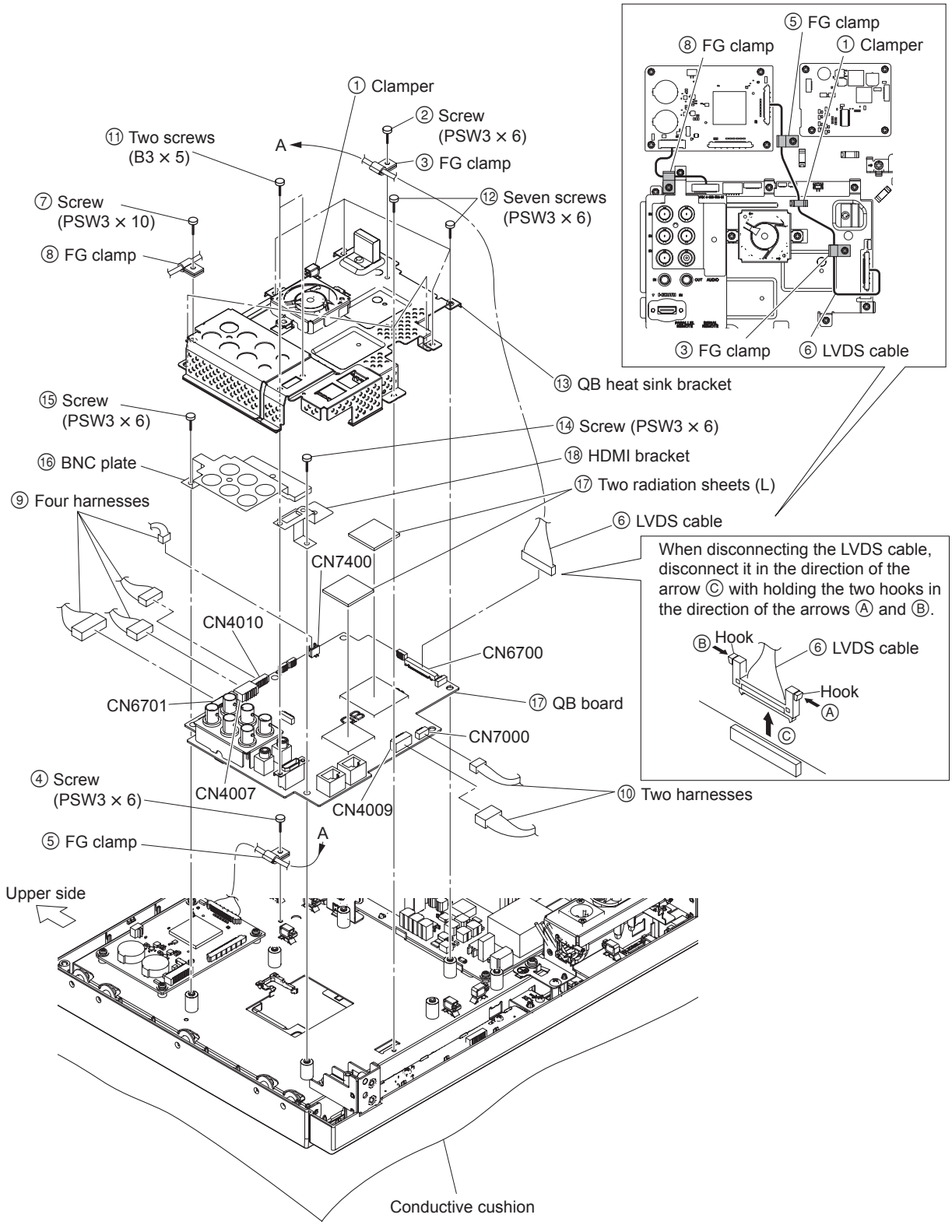
• Remove the rear cover assembly. (Refer to Section 1-4-1.)



LMD-A170

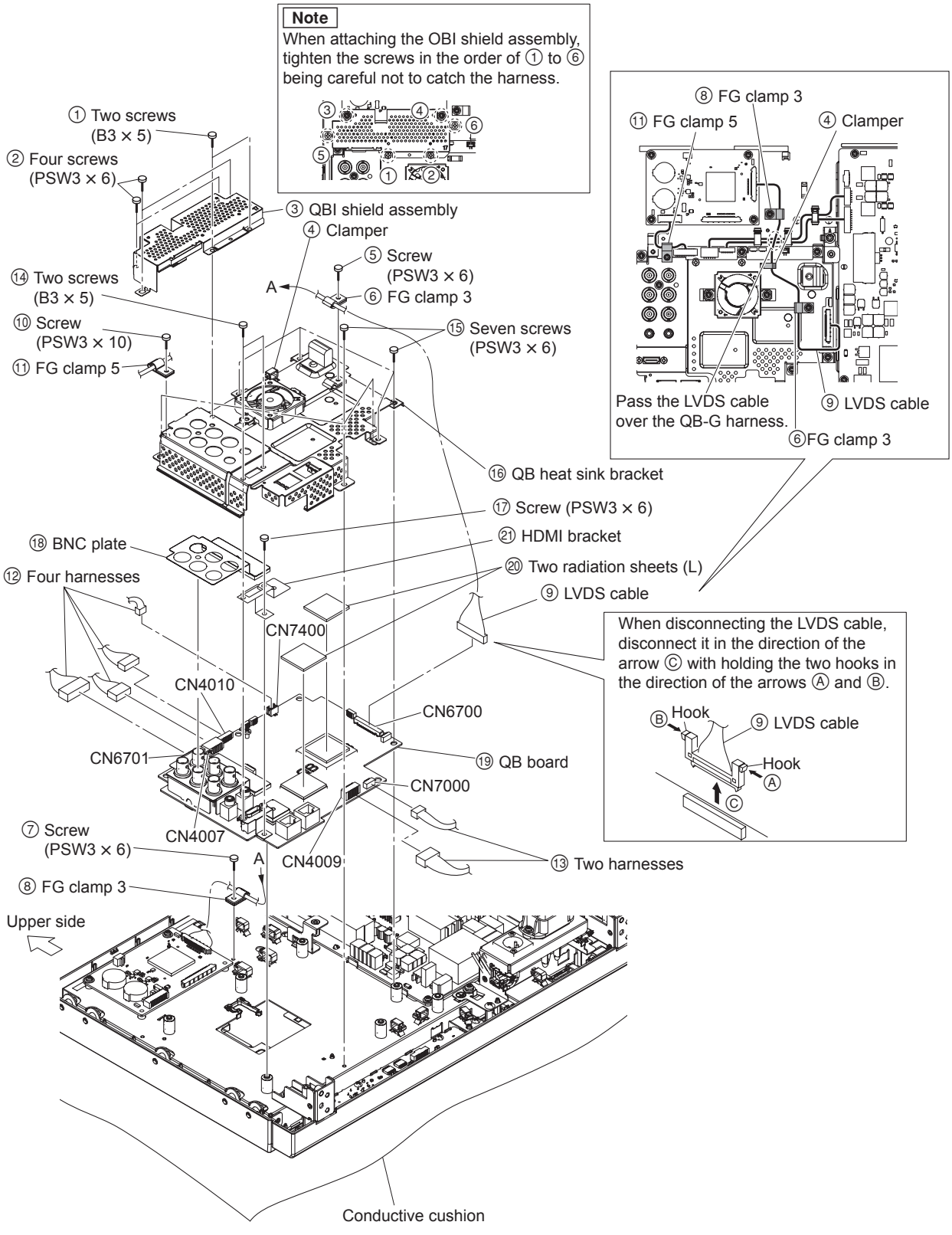
SY: Serial No. 7000001 to 7000915

• Remove the rear cover assembly. (Refer to Section 1-4-1.)



SY: Serial No. 7000916 and Higher
CN: Serial No. 7200001 and Higher

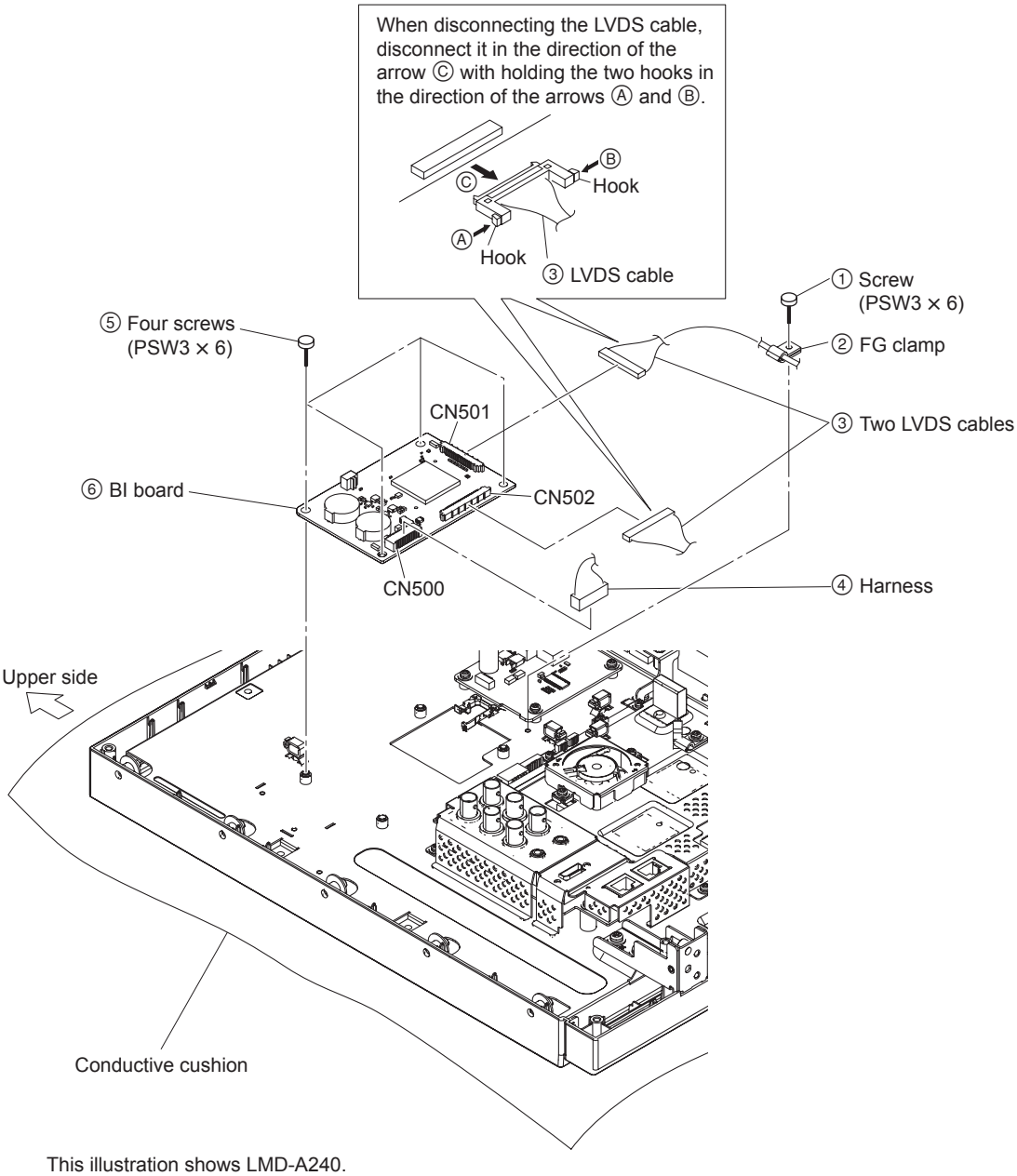
• Remove the rear cover assembly. (Refer to Section 1-4-1.)



1-4-5. BI Board

LMD-A240 (SY): Serial No. 7000001 to 7000400
LMD-A220 (SY): Serial No. 7000001 to 7000180
LMD-A170 (SY): Serial No. 7000001 to 7000915

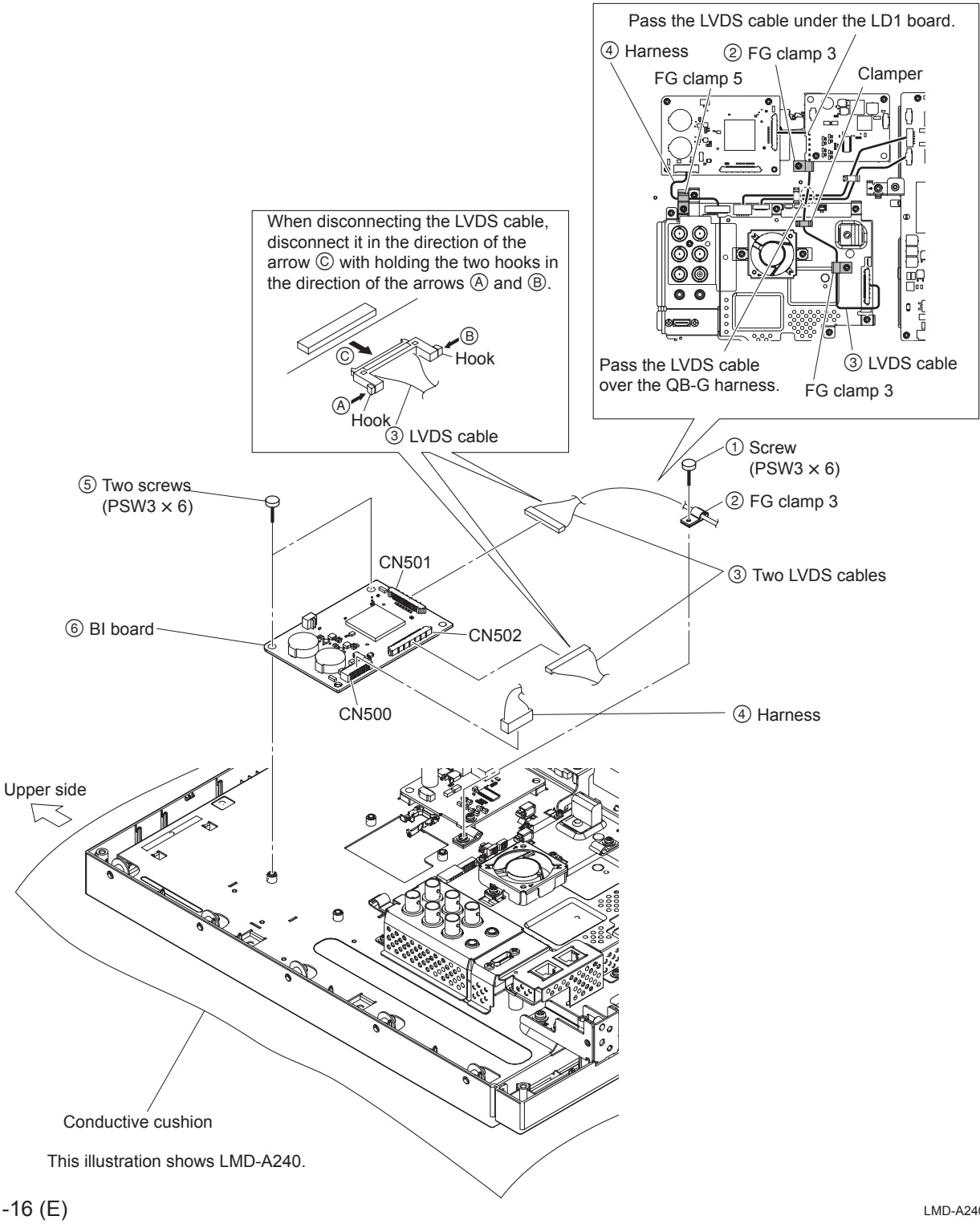
• Remove the rear cover assembly. (Refer to Section 1-4-1.)



This illustration shows LMD-A240.

LMD-A240 (SY): Serial No. 7000401 to 7100000
LMD-A240 (CN): Serial No. 7200001 to 7300000
LMD-A220 (SY): Serial No. 7000181 and Higher
LMD-A220 (CN): Serial No. 7200001 and Higher
LMD-A170 (SY): Serial No. 7000916 and Higher
LMD-A170 (CN): Serial No. 7200001 and Higher

- Remove the rear cover assembly. (Refer to Section 1-4-1.)
- Remove the QBI shield assembly. (Refer to steps ① to ③ in Section 1-4-4.)



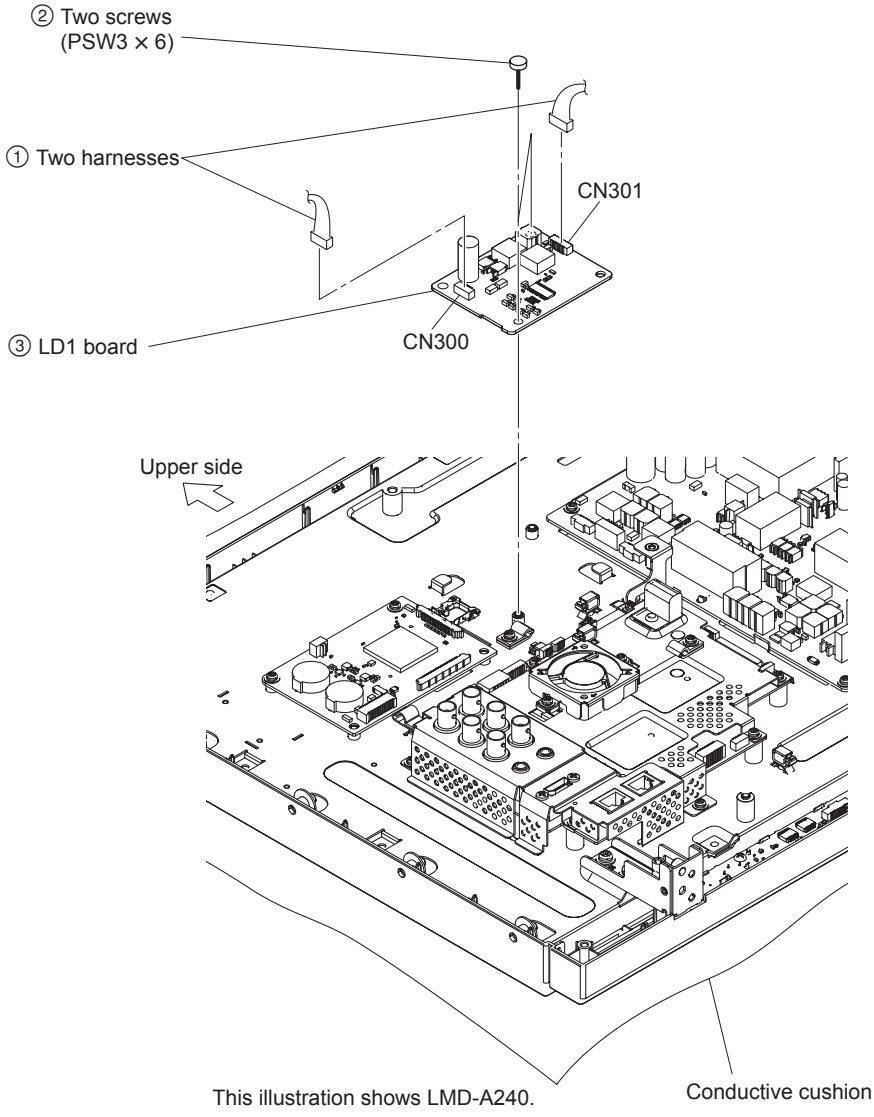
This illustration shows LMD-A240.

1-4-6. LD1 Board (LMD-A240/A220 Only)

- Remove the rear cover assembly. (Refer to Section 1-4-1.)
- Remove the QBI shield assembly. (Refer to steps ① to ③ in Section 1-4-4.)

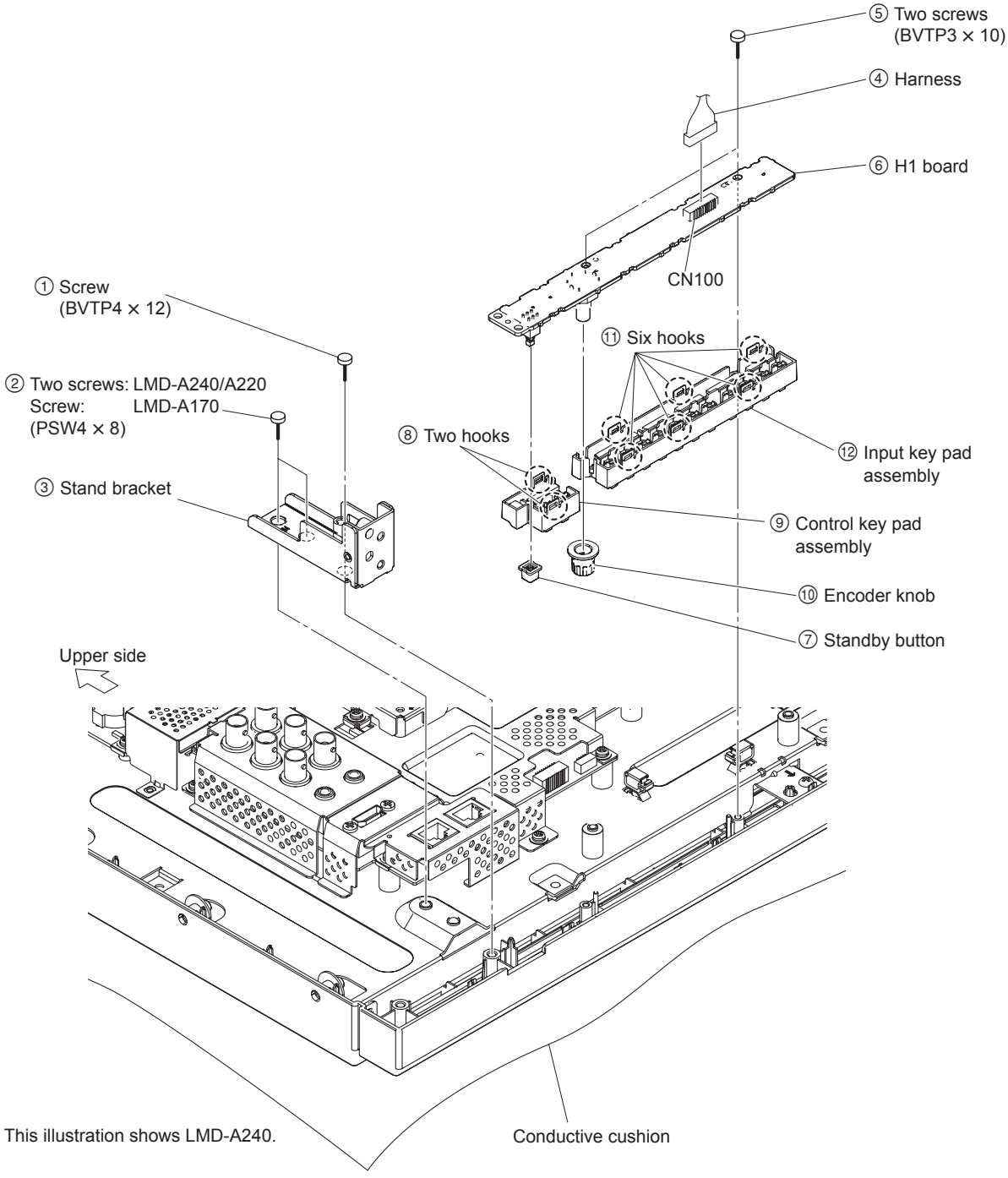
Note

This procedure is not required for the models with the following serial numbers, because the OBI shield assembly is not installed in them.
LMD-A240 (SY): Serial No. 7000001 to 7000400
LMD-A220 (SY): Serial No. 7000001 to 7000180



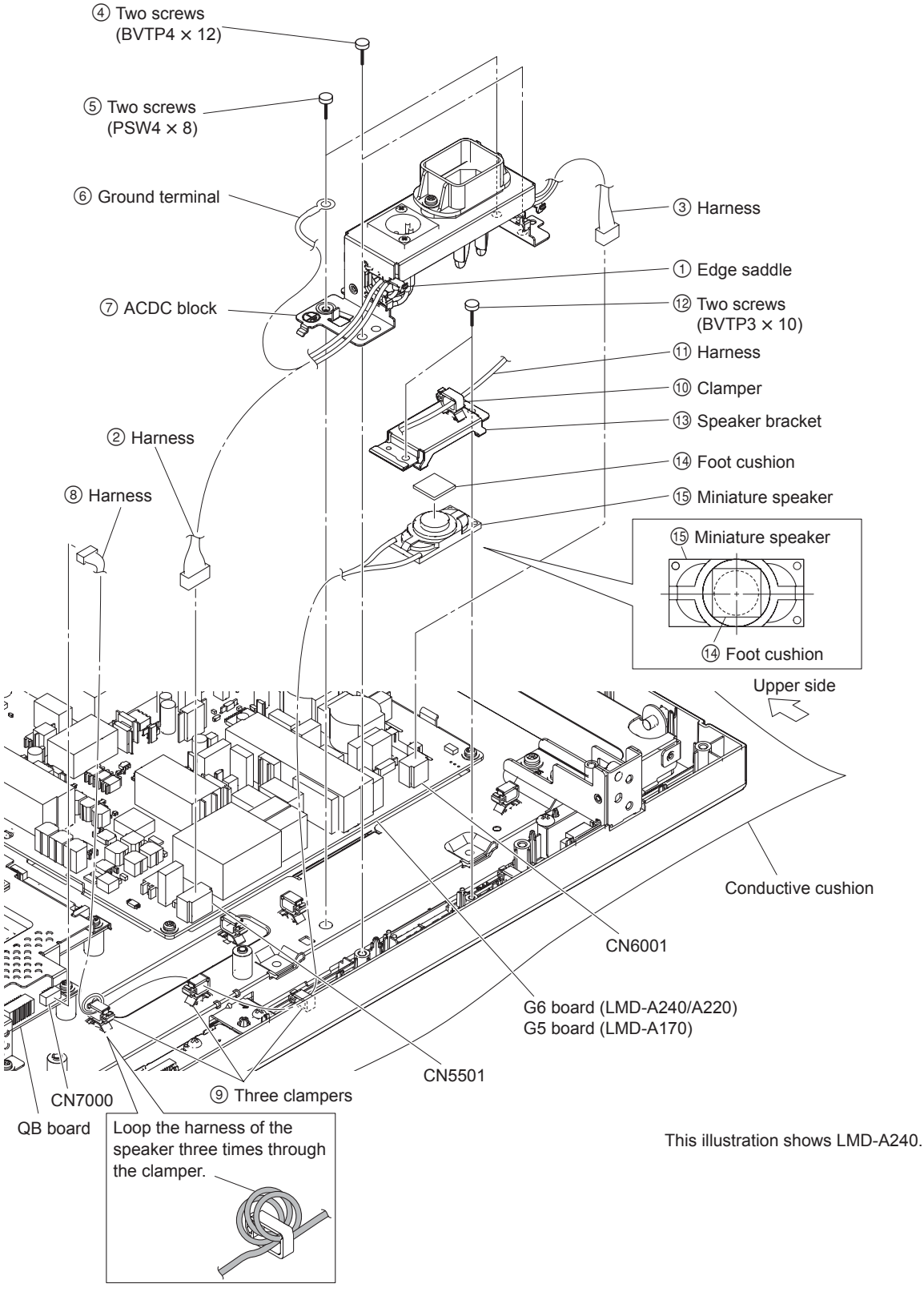
1-4-7. H1 Board

- Remove the rear cover assembly. (Refer to Section 1-4-1.)
- Remove the QB board. (Refer to Section 1-4-4.) (LMD-A170 only)



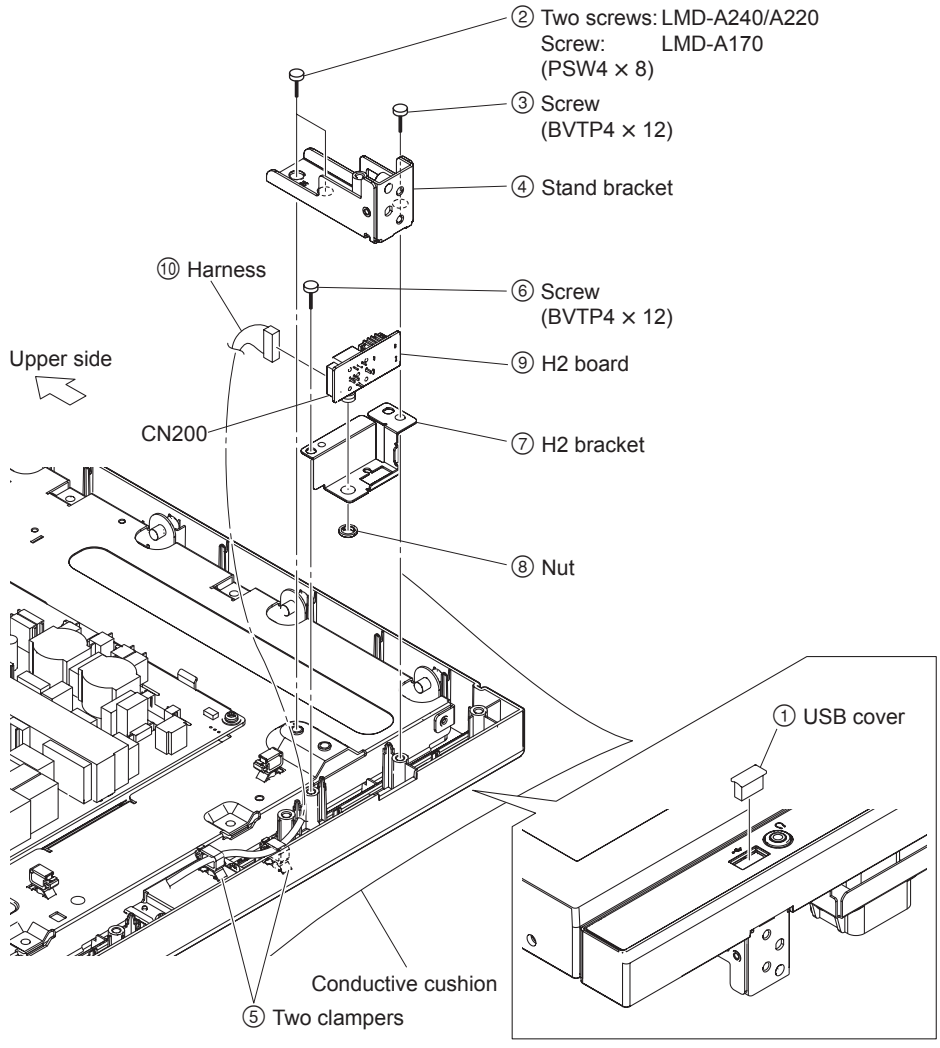
1-4-8. Speaker

• Remove the rear cover assembly. (Refer to Section 1-4-1.)



1-4-9. H2 Board

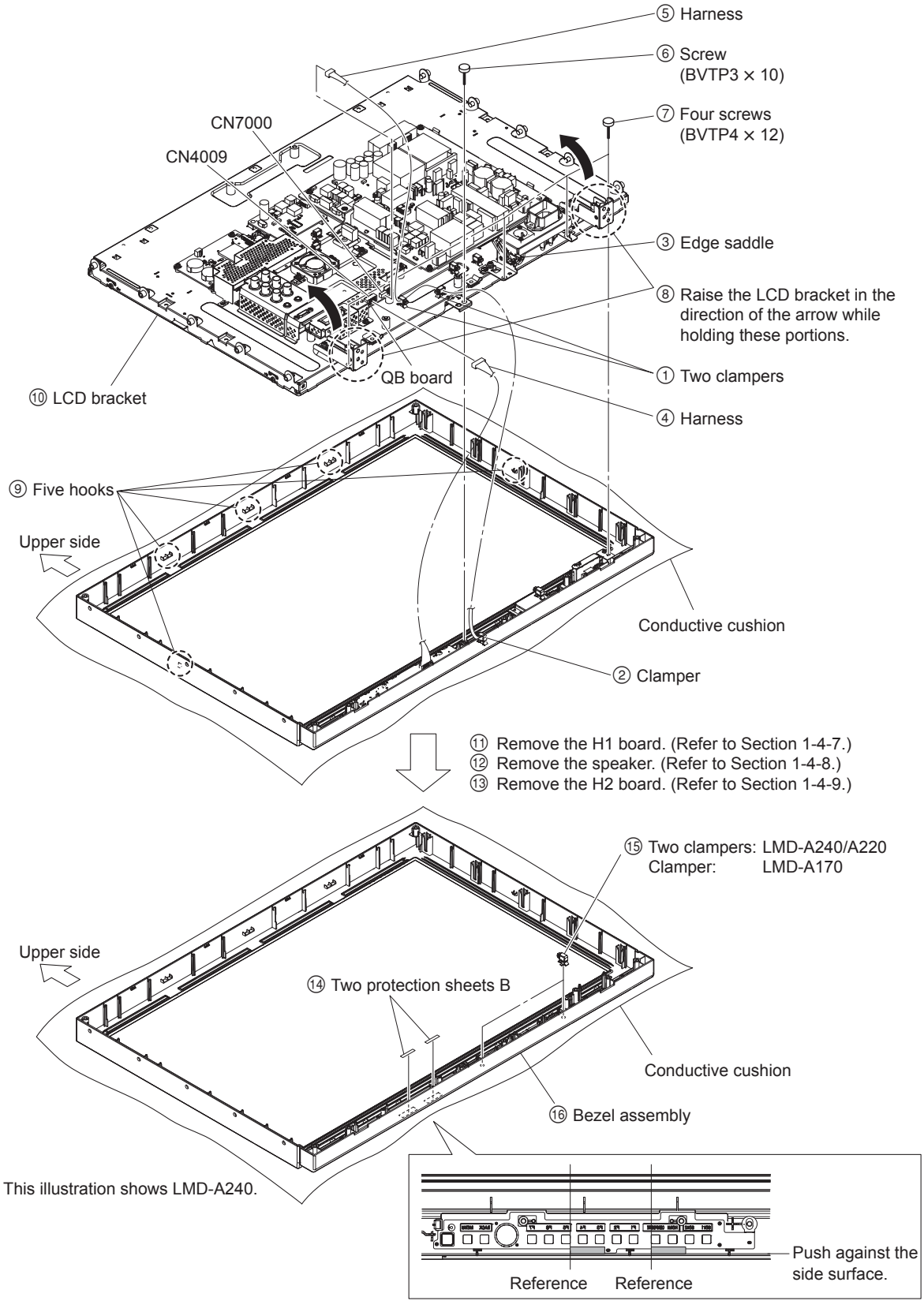
- Remove the rear cover assembly. (Refer to Section 1-4-1.)
- Remove the ACDC block. (Refer to steps ① to ⑦ in Section 1-4-8.)



This illustration shows LMD-A240.

1-4-10. Bezel Assembly

• Remove the rear cover assembly. (Refer to Section 1-4-1.)



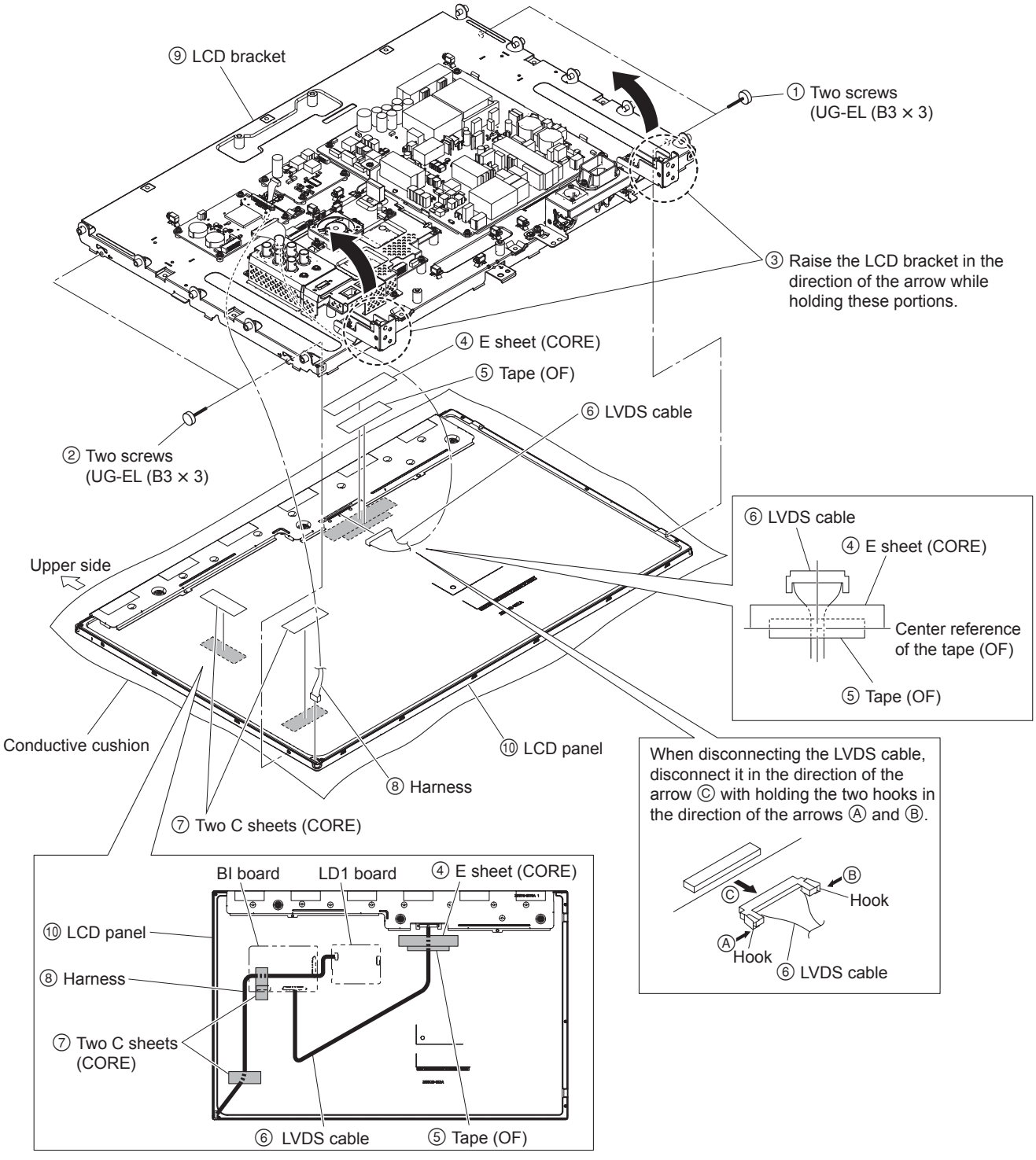
1-4-11. LCD Panel

When replacing the LCD panel, perfotm the operation in Section 1-6-1.

LMD-A240

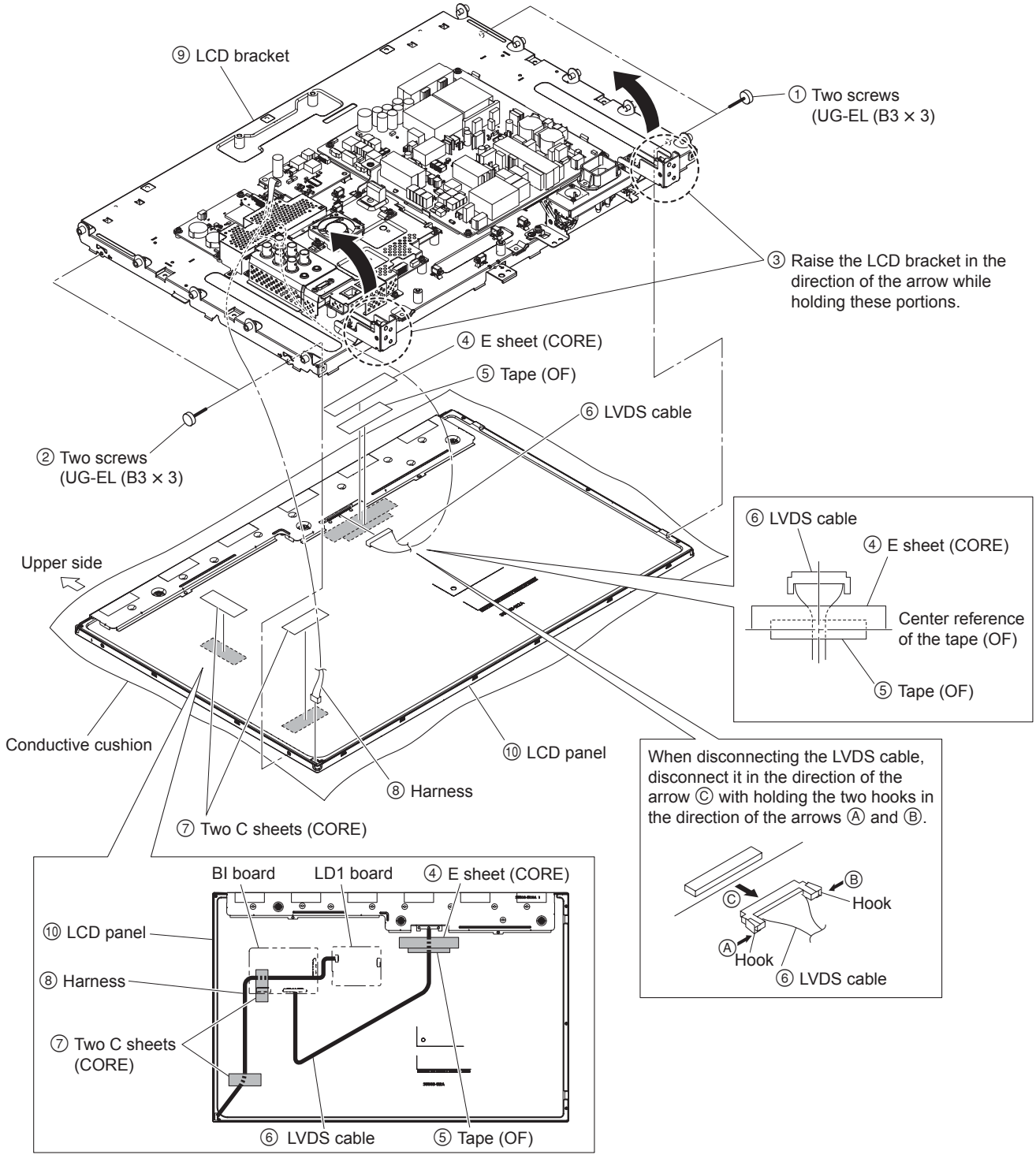
SY: Serial No. 7000001 to 7000400

- Remove the rear cover assembly. (Refer to Section 1-4-1.)
- Remove the bezel assembly. (Refer to Section 1-4-10.)



SY: Serial No. 7000401 to 7100000
CN: Serial No. 7200001 to 7300000

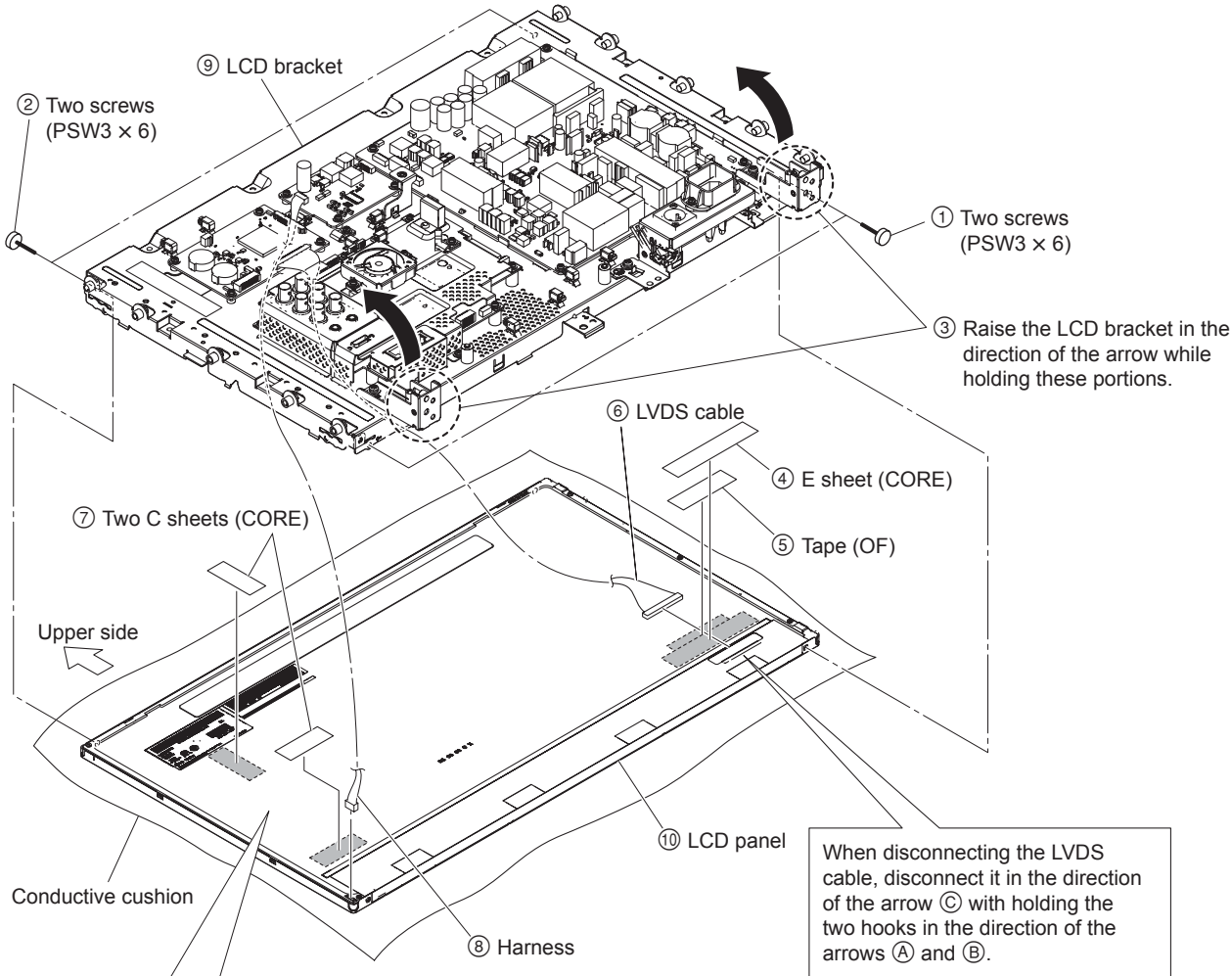
- Remove the rear cover assembly. (Refer to Section 1-4-1.)
- Remove the bezel assembly. (Refer to Section 1-4-10.)

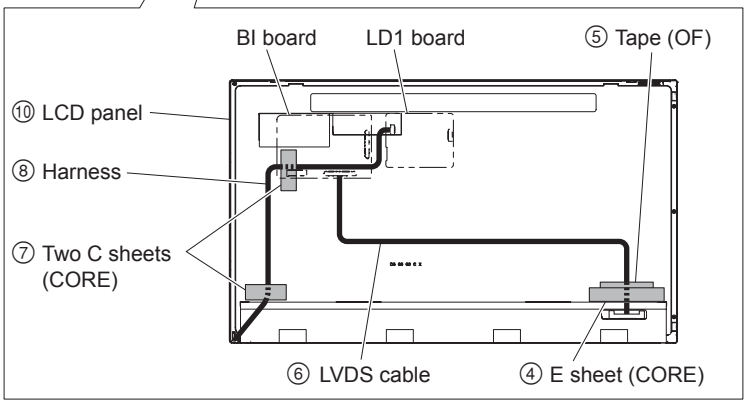


LMD-A220

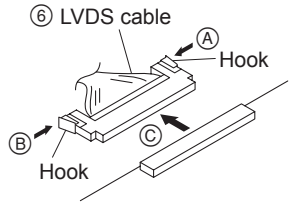
SY: Serial No. 7000001 to 7000180

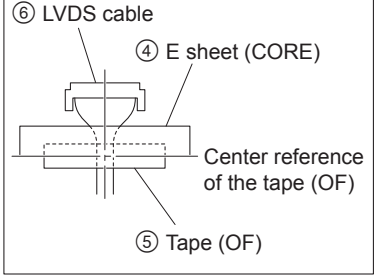
- Remove the rear cover assembly. (Refer to Section 1-4-1.)
- Remove the bezel assembly. (Refer to Section 1-4-10.)





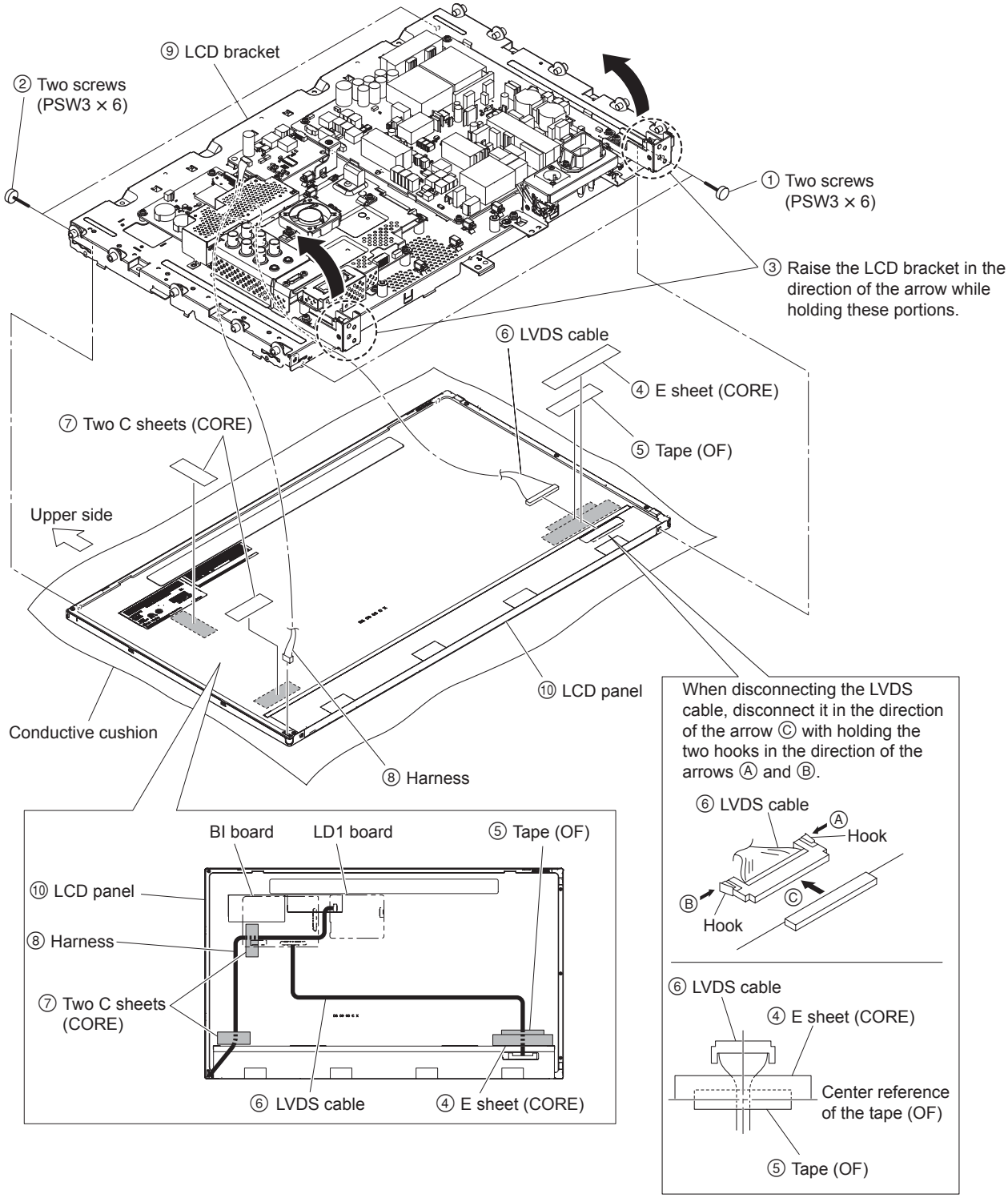
When disconnecting the LVDS cable, disconnect it in the direction of the arrow Ⓒ with holding the two hooks in the direction of the arrows Ⓐ and Ⓑ.





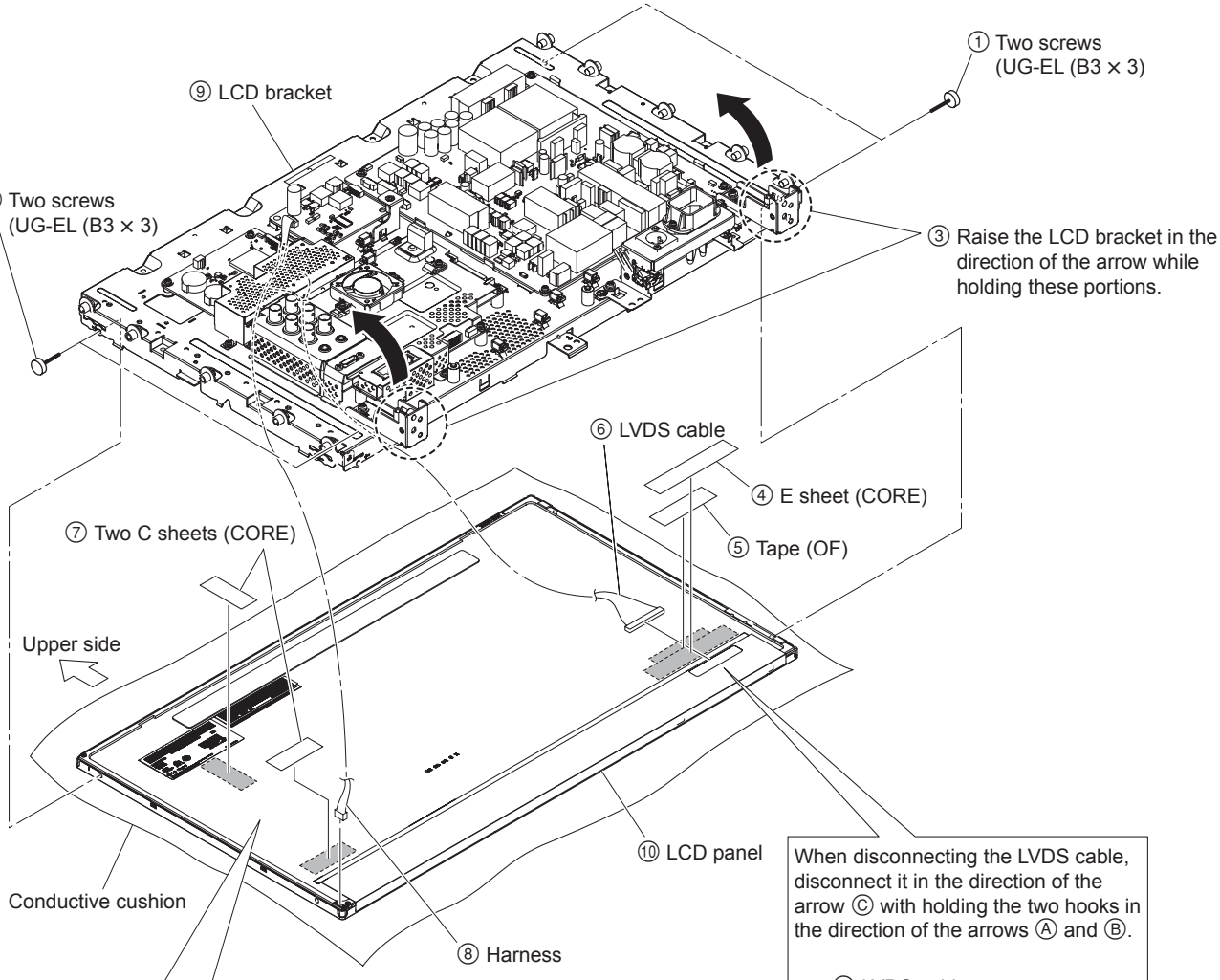
SY: Serial No. 7000181 to 7100000
CN: Serial No. 7200001 to 7300000

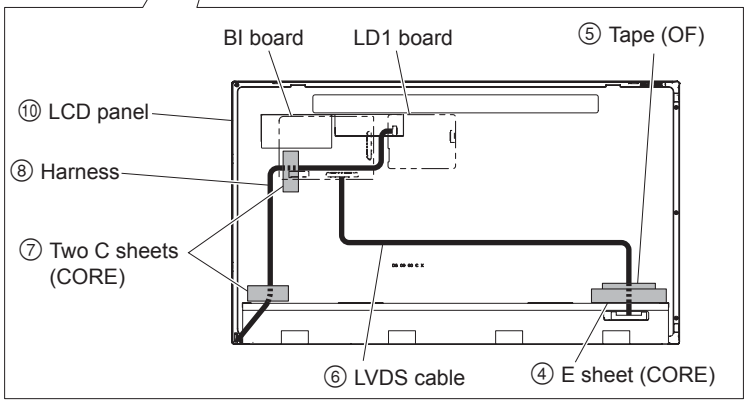
- Remove the rear cover assembly. (Refer to Section 1-4-1.)
- Remove the bezel assembly. (Refer to Section 1-4-10.)



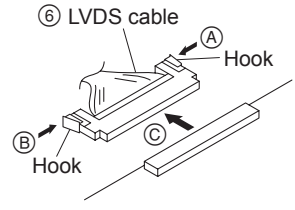
SY: Serial No. 71000001 and Higher
CN: Serial No. 73000001 and Higher

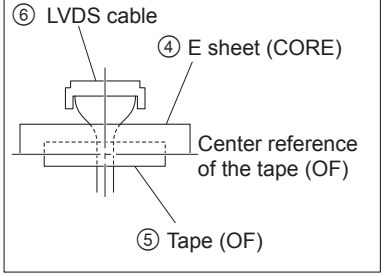
- Remove the rear cover assembly. (Refer to Section 1-4-1.)
- Remove the bezel assembly. (Refer to Section 1-4-10.)





When disconnecting the LVDS cable, disconnect it in the direction of the arrow Ⓒ with holding the two hooks in the direction of the arrows Ⓐ and Ⓑ.





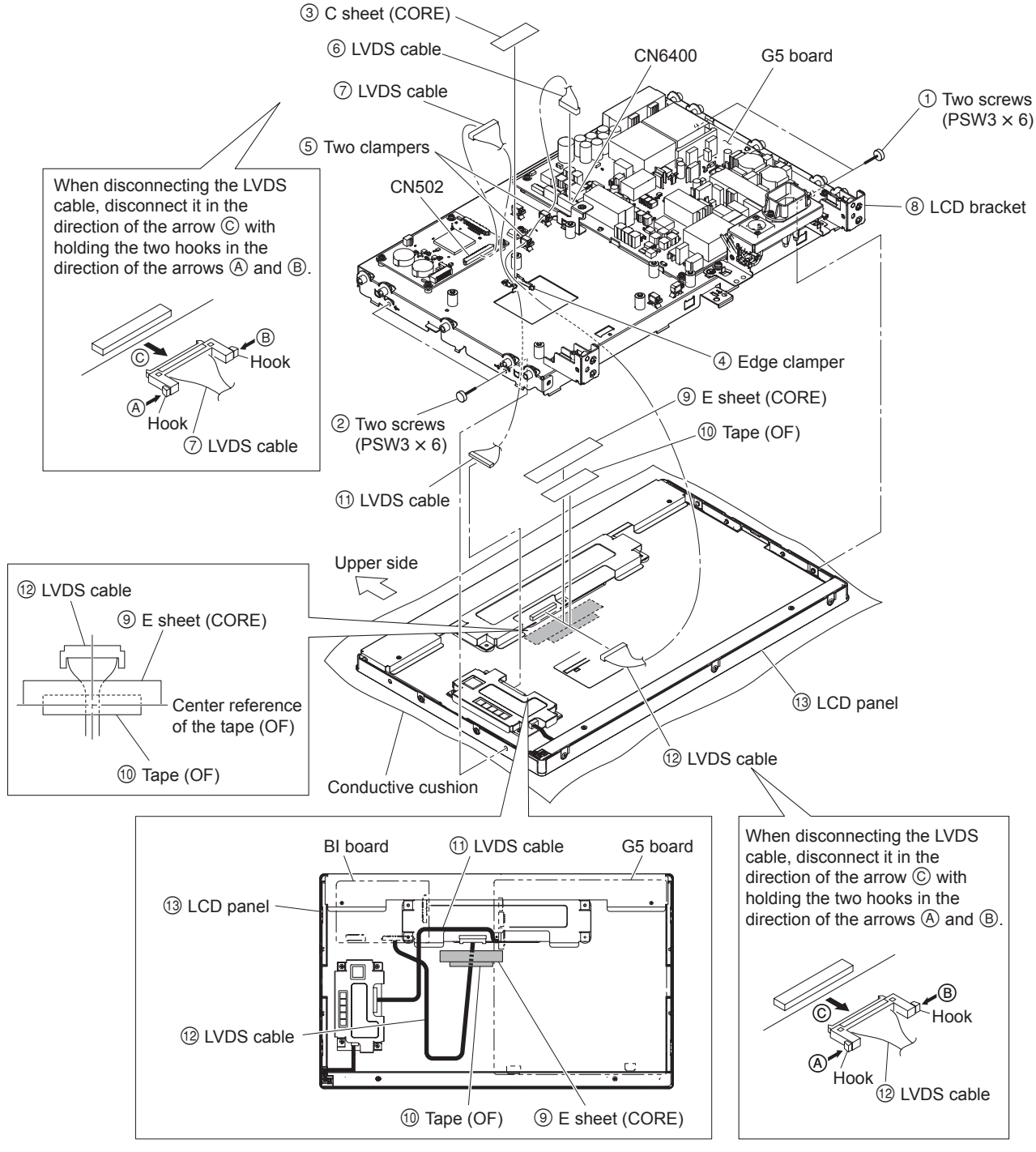
LMD-A170

SY: Serial No. 7000001 to 7000915

- Remove the rear cover assembly. (Refer to Section 1-4-1.)
- Remove the QB board. (Refer to Section 1-4-4.)
- Remove the bezel assembly. (Refer to Section 1-4-10.)

Tip

When attaching the LCD panel, align the screw holes to check that there is no lifting of the LCD bracket, then tighten the screws.

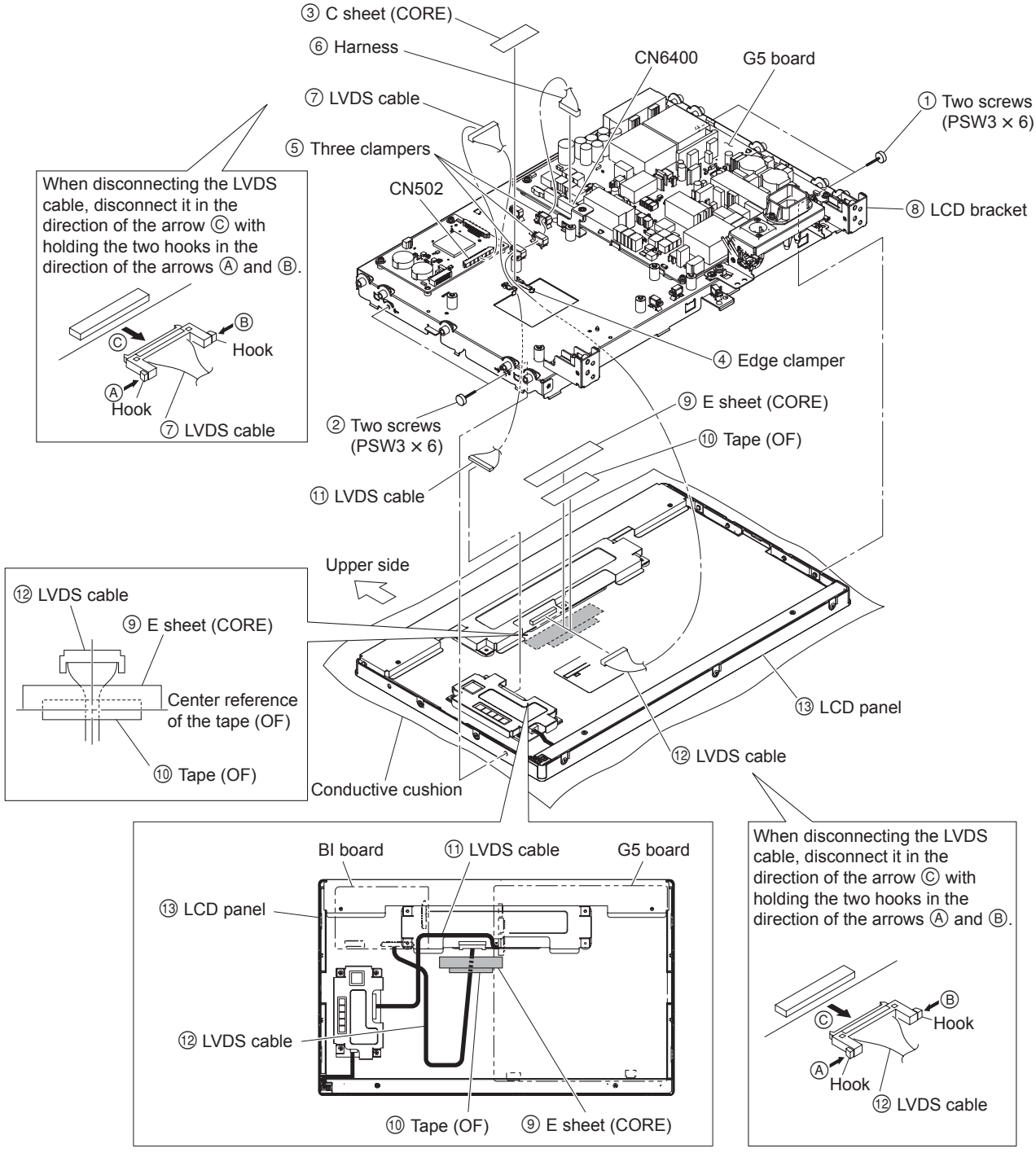


SY: Serial No. 7000916 and Higher
CN: Serial No. 7200001 and Higher

- Remove the rear cover assembly. (Refer to Section 1-4-1.)
- Remove the QB board. (Refer to Section 1-4-4.)
- Remove the bezel assembly. (Refer to Section 1-4-10.)

Tip

When attaching the LCD panel, align the screw holes to check that there is no lifting of the LCD bracket, then tighten the screws.



1-5. Preparation for Service

1-5-1. Showing/Hiding the Service Menu

The unit is provided with the [Service] menu only for service, in addition to the [MENU] selecting screen for general users to use.
(For details of the [MENU] selecting screen, refer to Instructions for Use.)
The [Service] menu consists of [Maintenance Menu 1] tab and [Maintenance Menu 2] tab.
The following items are included in the [Service] menu.

[Maintenance Menu 1] tab:

- OSD Menu Timer
- Password Reset
- Restore Factory

[Maintenance Menu 2] tab:

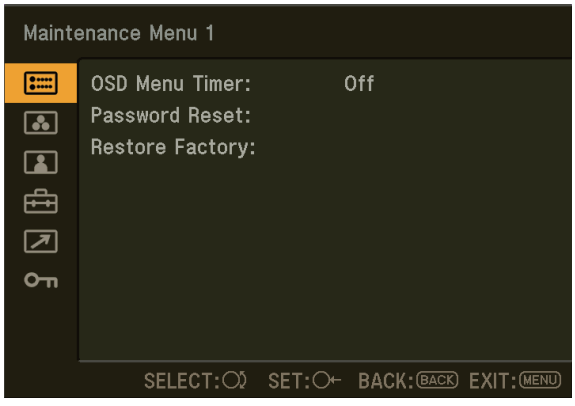
- R Gain Offset
- G Gain Offset
- B Gain Offset

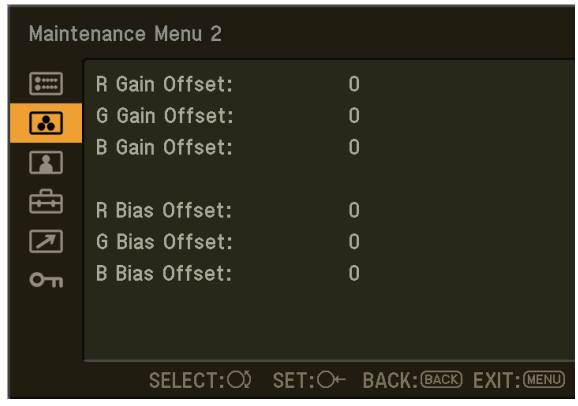
Show or hide the [Service] menu according to the following procedures.

Showing the service menu

Procedure

1. Turn on the [ON/STANDBY] switch.
2. Press the [MENU] button.
   The [MENU] selecting screen opens.
3. Press the [F6] button while pressing the [BACK] button.
   The [Service] menu is displayed.





4. Turn the menu selection control to select a setting item.
   Press the [BACK] button to return the display to the previous screen.

Hiding the service menu

Procedure

1. Press the [MENU] button.
   The [Service] menu closes.
   Tip
   The [Service] menu closes automatically if a button is not pressed for one minute.

1-5-2. How to Find the Versions

Check the software and FPGA versions by using the menu.

Procedure

1. Turn on the [ON/STANDBY] switch.
2. Display the [Menu] screen and select page 4 of [Status] tab. (Refer to Operating Instructions.)
3. Check the software and FPGA versions.
4. Press the [MENU] button.
   The [Menu] screen closes.

1-5-3. PC Setting

Required Equipment

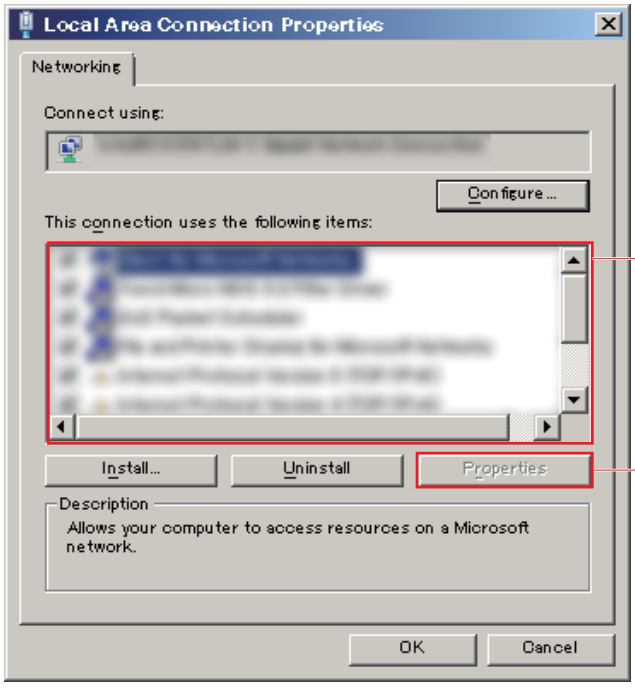
- Personal computer (PC)
  OS: Windows 7 and Windows 8
- LAN cable (cross cable or straight cable)
- Terminal software: Tera Term, etc.
  The terminal software Tera Term (open source software) is used in this section.

PC Setting

Tip

The procedure in this section is described using Windows 7. The procedure and term may vary depending on the environment of OS used.

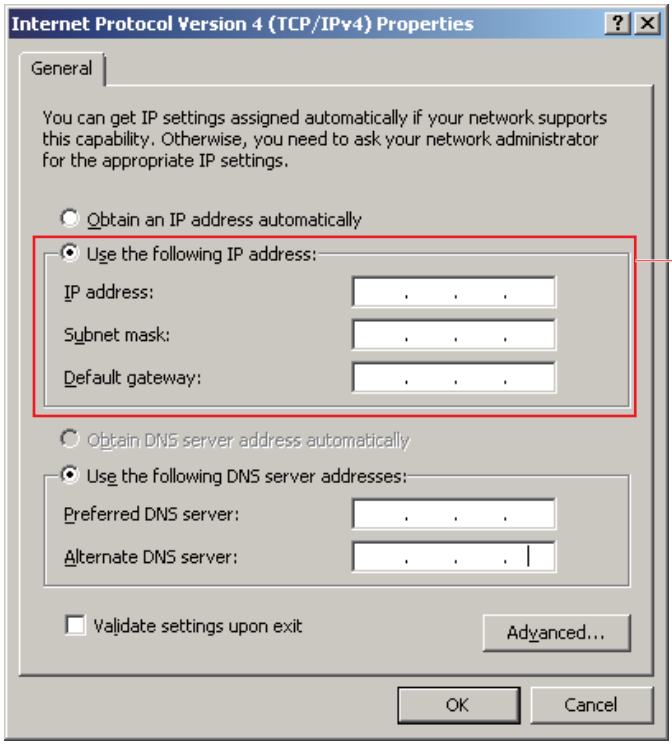
1. Start PC.
2. Click Start → Setting → Control panel → Network connection.
3. Right-click the Local Area Connection.
   A Local Area Connection Properties screen is displayed.



Select internet protocol version 4 (TCP/IPv4).

[Properties]

4. Select internet protocol version 4 (TCP/IPv4) and click the [Properties].



Enter the IP address and Subnet mask.

5. Enter 192.168.0.10 in the IP address field, enter 255.255.255.0 in the subnet mask field, and click the [OK].
6. Close the Local area connection property screen.

1-5-4. Connecting Commands from the PC

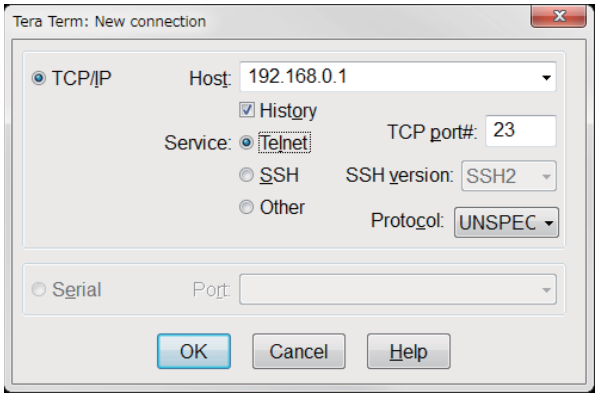
The terminal software Tera Term (open source software) is used in this section.
Refer to the following websites about Tera Term.
Japanese: http://ttssh2.sourceforge.jp/index.html.ja
English: http://ttssh2.sourceforge.jp/index.html.en

Required Equipment

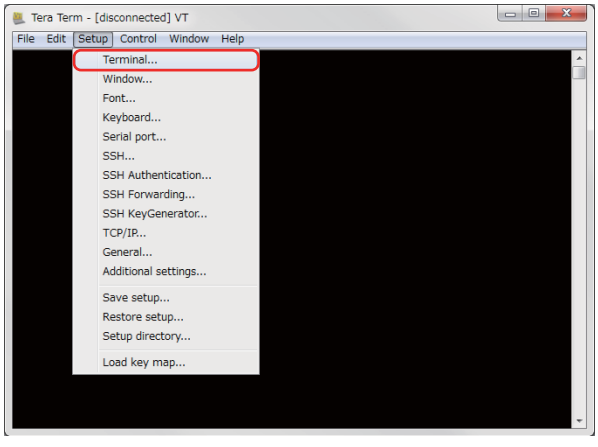
- Personal computer (PC)
  OS: Windows 7 and Windows 8
- LAN cable (cross cable or straight cable)
- Terminal software: Tera Term, etc.
  The terminal software Tera Term (open source software) is used in this section.

Procedure

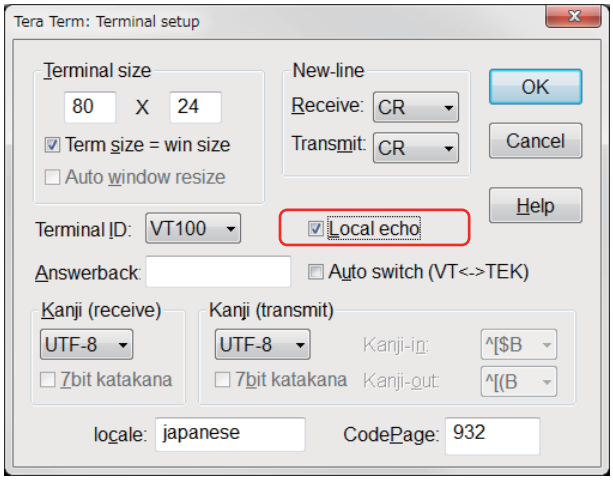
1. Run the Tera Term.
2. Make the following settings for connection to the unit.
   - Protocol: TCP/IP
   - Destination host IP address: 192.168.0.1
   - Port number: 23
   - Service: Telnet



3. Click [OK]. When the connection has been successfully completed, [login:] appears.
4. Select [Setup] and then [Terminal] from the menu. The [Terminal setup] menu appears.



5. Select the [Local echo] checkbox.



6. Click [OK].
   `[login:]` appears.
7. Log in to the unit.

Note

Commands for the command connection are two types (MR6 and DgTerm). User name and password are different for MR6 commands and DgTerm commands. Log in using each of the user name and password to select the type of commands.
For user name and password, contact your local Sony Sales Office/Service Center.

(1) Enter user name and press the [Enter] key.
`[pass:]` appears.

(2) Enter password and press the [Enter] key.
[>] appears to allow you to enter a command.

Tip

Example of notation for commands input:

- ␣ : Space for one character
- ⏎ : Enter key

After each command has been entered, check the return value and then enter the next command or perform the following procedure.

- Several seconds are required until “ok” appears in some cases.
- If “ng” appears, re-enter the command.

1-6. Procedures after Replacing the Boards and Parts

After any of the following boards or parts is replaced, perform the procedure in this section to take necessary actions.

- LCD panel (Refer to Section 1-6-1.)
- QB2 board (Refer to Section 1-6-2.)

1-6-1. LCD Panel

Required equipment

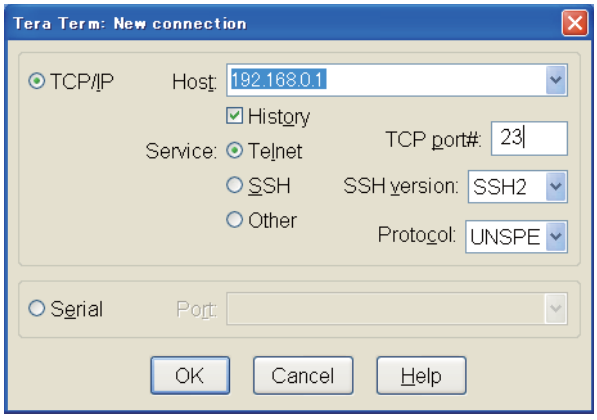
- Personal computer (PC)
  OS: Windows 7 and Windows 8
- LAN cable (cross cable or straight cable)
- Luminance meter: Konica Minolta CA310 or the equivalent
  If the above device is not available, perform the adjustment by visually comparing with the LCD monitor which has already been adjusted.
- Signal generator: Astrodesign VG-873 or the equivalent
- Terminal software: Tera Term, etc.
  The terminal software Tera Term (open source software) is used in this section.

Preparations

1. Prepare PC. (Refer to Section 1-5-3.)
2. Connect this unit and each device.
3. Input the following signals in this unit.
   - SDI or HDMI (HD, 10bit signal)
   - 1080/60P, 4:4:4 (YCbCr) or 1080/60P, 4:4:4 (RGB)

Software Reset

1. Run the Tera Term.
2. Connect it to this unit with the following setting.
   Protocol: TCP/IP
   Destination IP address: 192.168.0.1
   Port No.: 23
   Service: Telnet



3. When it is connected correctly, "`login:`" is displayed. Then, enter the user name and press the [Enter] key.
4. Then, "`pass:`" is displayed. Enter the password and press the [Enter] key.
   ">" is displayed, and then you can enter the command.

   Tip

   • When you enter the password, no characters are displayed on the screen.
   • For the user name and password, contact your local Sony Sales Office/Service Center.
5. Enter the following commands individually, and then press the [Enter] key.
   After typing each command, check that "OK" is displayed. ("␣" represents half-size space.)
   (1) `restore_factory_init_data␣4`
   ⇨ Check that "OK" is displayed
   (2) `restore_factory_init_data2␣5`
   ⇨ Check that "OK" is displayed
6. Turn the power of this unit off and on again.
7. Adjust the white balance. (Refer to Section 1-6-3.)

1-6-2. QB Board

The various adjustment data, serial number, and operation time are stored in the QB board. When replacing the QB board, it is required to transfer these data to the QB board after replacement.
When replacing the QB board, remove the following ICs from the QB board before replacement, then mount them on the QB board after replacement.
For the mounting location of each IC, refer to Section 5-3.

Ref No.	Stored data
IC6002 (FLASH)	Program, adjustment data
IC6201 (EEPROM)	Data specific to the model, adjustment data
IC6202 (EEPROM)	Data specific to the model, adjustment data

If the above ICs cannot be replaced, replace the QB board and perform “Procedure after replacing the QB board”.
If you can replace IC, “Procedure after replacing the QB board” is not required.

Procedures after replacing the QB board

Required equipment

- Personal computer (PC)
  OS: Windows 7 and Windows 8
- LAN cable (cross cable or straight cable)
- Luminance meter: Konica Minolta CA310 or the equivalent
  If the above device is not available, perform the adjustment by visually comparing with the LCD monitor which has already been adjusted.
- Signal generator: Astrodesign VG-873 or the equivalent
- Terminal software: Tera Term, etc.
  The terminal software Tera Term (open source software) is used in this section.

Preparation

1. Prepare PC. (Refer to Section 1-5-3.)
2. Connect this unit and each device.

Note

When upgrading, connect only the AC power (or DC power) and the LAN cable to the unit.
If the following procedure is performed with any other device connected, FPGA may not be upgraded correctly.

Procedure

1. Turn on the [ON/STANDBY] switch on the unit.
2. Check the version of software and FPGA. (Refer to Section 1-5-2.)
   If the versions are not the latest, upgrade the versions. (Refer to Section 1-7.)
3. Run the Tera Term and perform the MR6 command connection from the PC. (Refer to Section 1-5-4.)
4. On the Tera Term screen, execute the following MR6 commands sequentially.
   After each command has been executed, confirm that "ok" appears.
   - `restore_factory_init_data␣2` ⏎
   - `restore_factory_init_data2␣5` ⏎
   - `set_serial_number_set␣xxxxxxx` ⏎
   (Enter the 7-digit serial number of the unit in xxxxxxx.)
   - `set_panel_on_time␣xxxxxxx` ⏎
   (Enter the back light operation time obtained in the procedure before replacement of the QB board in xxxxxx.)

5. Disconnect the unit from the PC by using the Tera Term.
6. Turn off and on the power of the unit.
7. Adjust the white balance. (Refer to Section 1-6-3.)
8. Turn off the [ON/STANDBY] switch on the unit.

Checking after Work

1. Turn on the [ON/STANDBY] switch on the unit.
2. Display the [Menu] screen and confirm the serial number from page 4 of [Status] tab. (Refer to Operating Instructions.)
3. Input the primary video signals, confirm that an image displays correctly on the monitor.
4. Turn off the [ON/STANDBY] switch on the unit.

1-6-3. White Balance Adjustment

1. Input the full white signal from SDI or HDMI to this unit.
2. Set the color temperature to the level used by the user. (Refer to the operating instructions.)
   (1) Select "Main menu → Color temperature/color space/gamma".
   (2) Select D93 or D65 in the color temperature.
3. Press the [MENU] button on the front of this unit to display the menu.
4. Press the [F6] button while holding down the [BACK] button on the front of this unit to enter the service mode.
   To exit the service mode, press the [MENU] button.
5. Select Maintenance Menu 2.

Gain offset	**Bias offset**
• R: 512	• R: 0
• G: 512 (fixed value)	• G: 0 (fixed value)
• B: 512	• B: 0

6. Adjust the white balance.
   Specifications (error: ±0.05)
   D93: x = 0.283, y = 0.298
   D65: x = 0.313, y = 0.329
   (1) Measure the center of screen using the luminance sensor.
   (2) Adjust the white balance so that the specifications are met by changing Gain on the high-light side (equivalent to 80IRE) and Bias on the low-light side (equivalent to 22IRE).
   When adjusting "x", change R Gain/Bias, and when adjusting "y", change B Gain/Bias.
   (3) Repeat this twice respectively (Gain → Bias → Gain → Bias).
   Check that the specifications are met in both luminance values. (Completed)
   (4) Turn the power of this unit off and on again, and check that the specifications are met.

7. In case that the specifications are not met in steps 1 to 6, perform the following procedure.
   (1) Write down the user setting.
   Be sure to write it down because when you perform steps (2) to (4), the user setting is reset.
   (2) Enter the service mode, and then select Restore Factory from Maintenance Menu 1.
   (3) Select "confirm" to determine.
   (4) Select the language in "Select Language", and then select "confirm".
   (5) Perform the steps 1 to 6 again.
   (6) Return the setting to the user setting written down in step (1).

1-7. Software Update

If it is required to update the software or FPGA, perform the update by referring to the operating instructions supplied with each update software.
For details on how to obtain the software, contact your local Sony Sales Office/Service Center.

1-8. Lead-free Solder

All boards mounted in this unit use lead-free solder. Be sure to use lead-free solder when repairing the boards of this unit. A lead free mark (LF) indicating that the solder contains no lead is printed on each board.
(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size.)

 : LEAD FREE MARK

Note

- The lead-free solder melts at a temperature about 40 °C higher than the ordinary solder, therefore, it is recommended to use the soldering iron having a temperature regulator.
- The ordinary soldering iron can be used but the iron tip has to be applied to the solder joint for a slightly longer time. The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful.

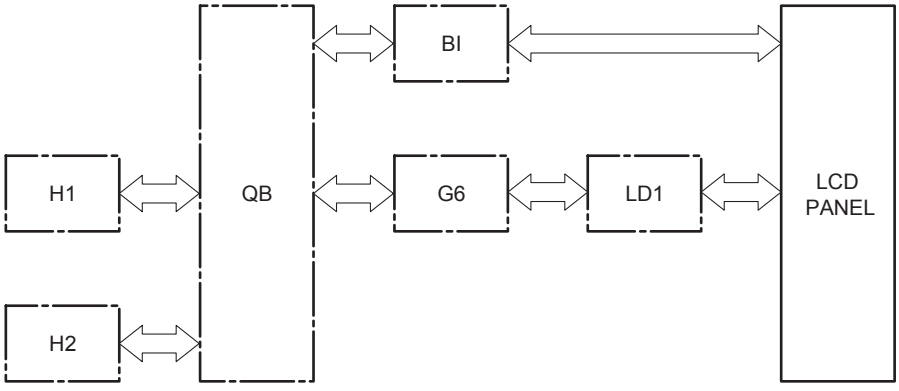
Section 2
Circuit Description

2-1. Board Configuration

The whole block and board configuration of this unit are as follows.

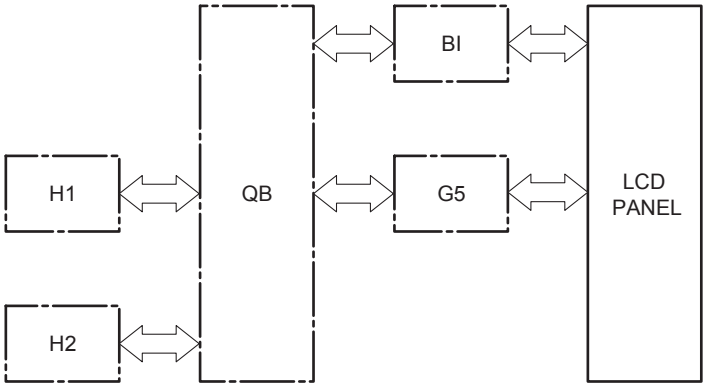
2-1-1. LMD-A240/A220

- G6 board: Power board
- H1 board: User control interface board
- H2 board: Headphone/USB terminal-mounted board
- LD1 board: Backlight lighting board
- QB board: Video/audio/communication input/output and LCD panel control board
- BI board: Video signal output board to the LCD panel



2-1-2. LMD-A170

- G5 board: Power board
- H1 board: User control interface board
- H2 board: Headphone/USB terminal-mounted board
- QB board: Video/audio/communication input/output and LCD panel control board
- BI board: Video signal output board to the LCD panel



2-2. G6/G5 Board

2-2-1. G6 Board (LMD-A240)

The G6 board is used for AC and DC inputs. It generates the power used in a monitor.
During AC input, the G6 board generates 28 V through a power-factor improvement regulator using an insulating converter and outputs it to an LD1 board. The G6 board also generates 12 V in two channels from 28 V using a step-down DC/DC converter and outputs it to a QB board and LCD panel.
During DC input, the G6 board generates 28 V using a step-up DC/DC converter and outputs it to the LD1 board. It also generates 12 V in two channels from 28 V using a step-down DC/DC converter and outputs it to the QB board and LCD panel.

2-2-2. G6 Board (LMD-A220)

The G6 board is used for AC and DC inputs. It generates the power used in a monitor.
During AC input, the G6 board generates 28 V through a power-factor improvement regulator using an insulating converter and outputs it to an LD1 board. The G6 board also generates 12 V and 5 V from 28 V using a step-down DC/DC converter and outputs them to a QB board and LCD panel.
During DC input, the G6 board generates 28 V using a step-up DC/DC converter and outputs it to the LD1 board. It also generates 12 V and 5 V from 28 V using a step-down DC/DC converter and outputs them to the QB board and LCD panel.

2-2-3. G5 Board (LMD-A170)

The G5 board is used for AC and DC inputs. It generates the power used in a monitor.
During AC input, the G5 board generates 28 V through a power-factor improvement regulator using an insulating converter. The G5 board also generates 12 V in three channels from 28 V using a step-down DC/DC converter and outputs it to a QB board and LCD panel.
During DC input, the G6 board generates 28 V using a step-up DC/DC converter. It also generates 12 V in three channels from 28 V using a step-down DC/DC converter and outputs it to the QB board and LCD panel.

2-3. H1 Board

The H1 board mounts a power switch, input selector button, function button, and rotary encoder.

2-4. H2 Board

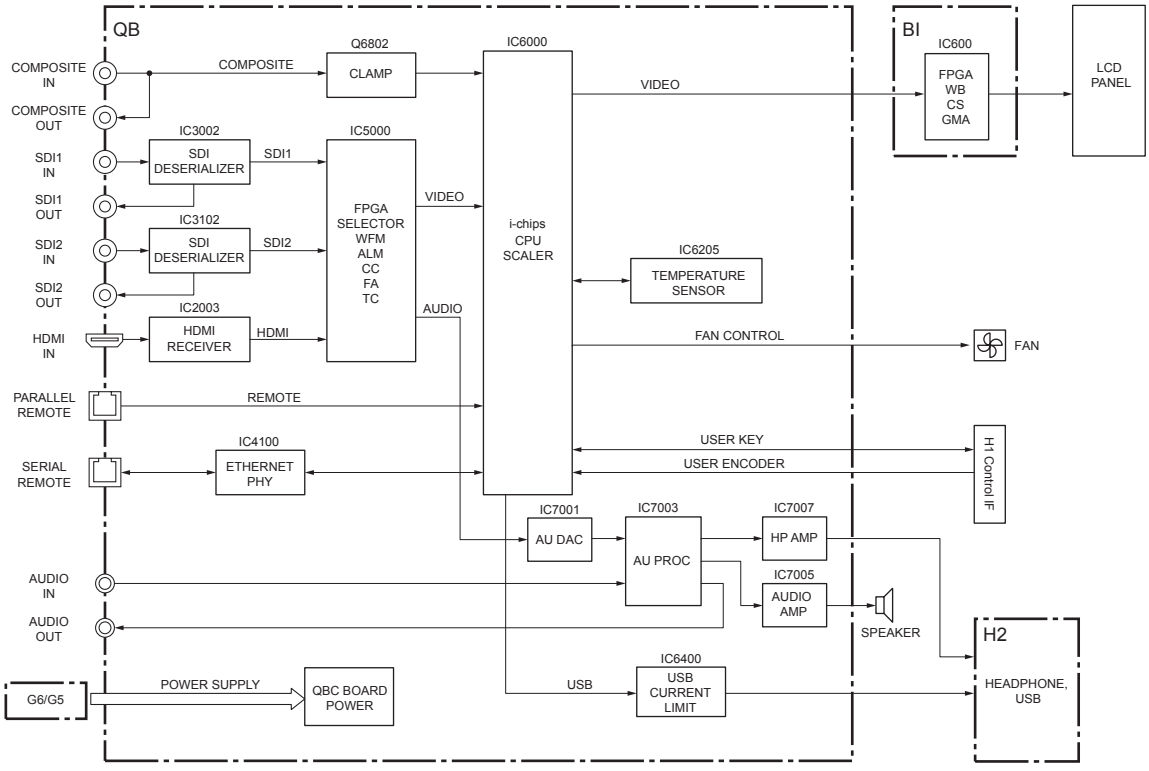
The H2 board mounts a headphone terminal and USB terminal (for function extension in future).

2-5. LD1 Board (LMD-A240/A220 Only)

The LD1 board is used to make backlight bright.
The LD1 board controls an LED current using a constant-current driver and makes the LED light at a fixed luminance. An LED voltage steps up from 28 V to the voltage suitable for LED specifications using a step-up circuit. For LMD-A240, the LED voltage is approximately 41 V. For LMD-A220, it is approximately 50 V.

2-6. QB Board

The QB board performs video/audio signal processing, LCD panel control, and CPU and network processing. The details of each block are as shown below.



1. Video signal processing

For a video signal, an SDI signal (2 channel), HDMI signal (1 channel), and analog composite signal (1 channel) can be input.

After a serial signal is cable-compensated using equalizers (IC3000 and IC3100), the SDI signal is converted into a parallel signal using deserializers (IC3002 and IC3102) and sent to selector FPGA (IC5000). In the active throughout terminal of the SDI signal, the signal re-clocked in the deserializers is output through driver circuits (IC3001 and IC3101).

The HDMI signal is converted into a parallel signal using a receiver (IC2003) and sent to selector FPGA (IC5000). The selector FPGA extracts AVI Info superimposed on a signal and performs the processing based on AVI Info. EDID data is stored in EEPROM (IC2000). The EDID data is also used for the contents protected by HDCP. It is authenticated for decoding using a receiver.

The analog composite signal is clamped using Q6802 and then sent to the main signal processing circuit (IC6000) incorporated into a decoder. YC separation and color demodulation are all processed in IC6000.

IC5000 realizes two-channel SDI and HDMI signal selection, sub-screen functions (WFM: Wave-Form Monitor, ALM: Audio Level Meter, and VS: Vector Scope), the camera focus assist (FA: Focus Assist) superimposed on a video signal, time code display (TC: Time Code), and closed caption display (CC: Close Caption).

IC6000 performs the IP conversion of a video signal's interlacing signal, image scaling processing, and sub-screen superimposition.

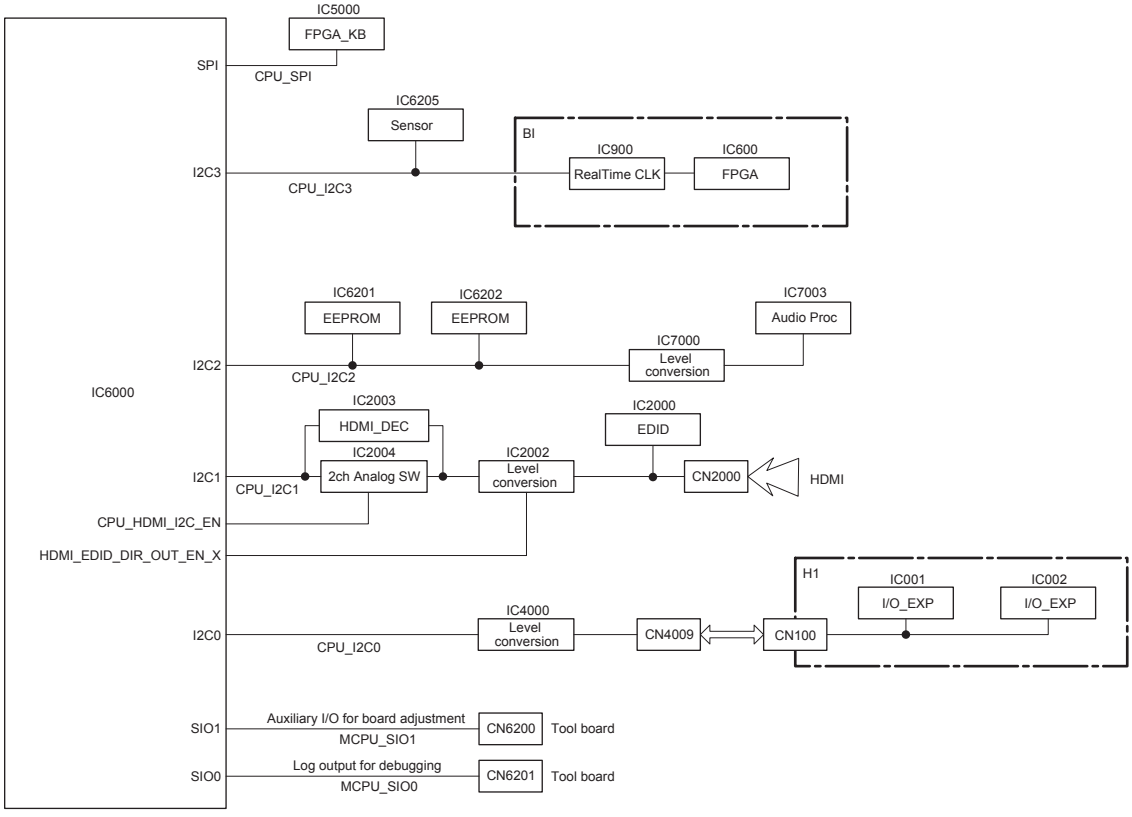
2. Audio signal processing

The audio signal embedded into an SDI signal is decoded using IC5000. The audio signal embedded into an HDMI signal is decoded using IC2003. One signal is selected out of these two kinds of digital signals and an analog audio signal from AUDIO IN terminal, and sent to an analog output terminal, speaker output terminal, and then headphone output terminal.

3. CPU

The CPU of this unit is mounted in IC6000. Each device is set and controlled by the user control and parallel remote control from an H1 board, the control from LAN, and the value that a panel temperature sensor detects.

Connection buses are as shown below.



2-7. BI Board

The BI board mounts FPGA for video signal processing and RTC (Real Time Clock).
FPGA (IC600) switches gamma correction, white balance, and color space and superimposes an on-screen tally and IMD (In Monitor Display). The image-adjusted signal is output to an LCD panel

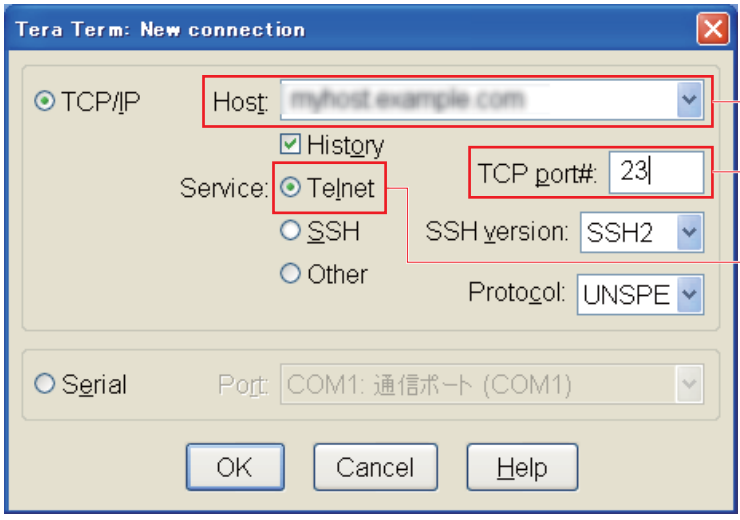
Section 3
Troubleshooting

3-1. LED (Power Switch) on the Front Panel Blinks in Red

Connect this unit and terminal PC to confirm the device and register in this unit and perform the processing corresponding to the value.

3-1-1. Connection with Monitor

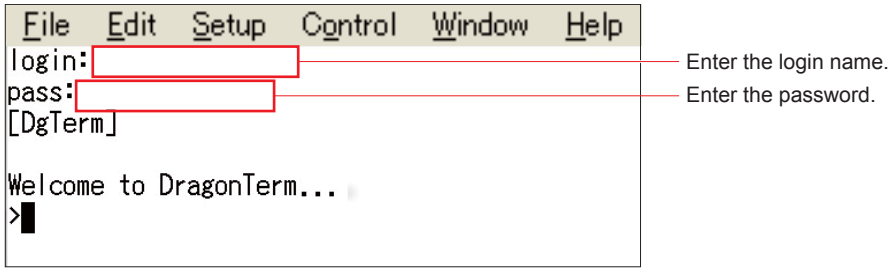
1. Prepare PC. (Refer to Section 1-5-3.)
2. Run the Tera Term.
3. Set the connection destination to the IP address of a monitor and set the TCP port to 23.



4. Check the Telnet radio button in the Service column.
5. Enter the login name and password.
   "Welcome to Dragon Term…" is displayed. (Connection is completed.)

Tip

- When you enter the password, no characters are displayed on the screen.
- For the login name and password, contact your local Sony Sales Office/Service Center.



3-1-2. Reading the Register

Abnormal temperature check method

1. Enter “cd lm75_qb” on the terminal software (Tera Term) and press the [Enter] key.
   “>lm75_qb>” is displayed.
2. Enter “ra 0 1” and press the [Enter] key.
3. Check the value of Bit 15-8 in address 0h.
   0 2680 // read OK
   └Bit15 to 8

<Display example>

```
Welcom to DragonTerm..
>cd lm75_qb
>lm75_qb>
>lm75_qb>ra 0 1
0 2680 // read OK
```

Backlight board check method

1. Enter “cd C812_master” on the terminal software (Tera Term) and press the [Enter] key.
   “>C812_master” is displayed.
2. Enter “ra 23 22 1” and press the [Enter] key.
3. Check the value of 23 22.
   23 22 9e //read OK

<Display example>

```
Welcom to DragonTerm..
>cd C812_master
>C812_master>
>C812_master>ra 23 22 1
23 22 9e //read OK
```

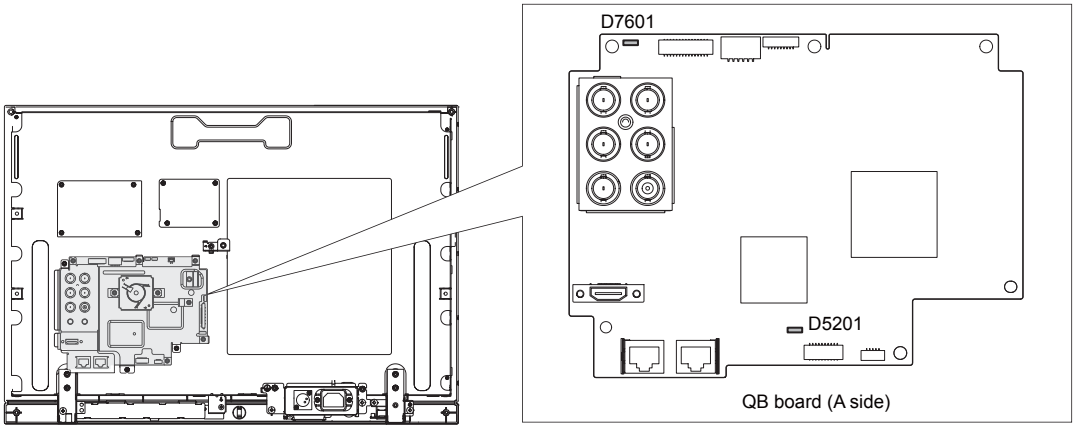
3-1-3. Check Method and Remedy

Check item	Reference device	Address	Read data in a normal state	Check method	Remedy
Temperature failure	lm75_qb	0h Bit15-8	Value less than 41h	Read data value is 41h or more. Any communication is impossible.	When the value is 41h or more ⇨ Replace the QB board or LCD panel. (Refer to Section 1-4-4 or 1-4-11.) When any communication is impossible ⇨ Replace the QB board. (Refer to Section 1-4-4.) **Note** This failure does not appear as symptoms when a fixed time does not pass. In this case, the LED display below appears. Power ON → LED blinking in orange (every other second) → LED blinking in red
Backlight board (LMD-A240/A220)	C812_master	23 22h	16h: When the backlight error is detected 9Eh: When the backlight is lit normally 1Eh: During the power saving operation	Read data is 16h.	Check the LD1 board. When the LD1 board CL302 (CN301, 8-pin) is Lo, check the power supply of the LD1 board. (CN301, 1-pin: 28 V) ⇨ If there is no problem with the input voltage, replace the LD1 board or LCD panel. (Refer to Section 1-4-6 or 1-4-11.)
During DC input					• Confirm whether the supplied DC voltage is the prescribed voltage (12 V to 17 V). • Replace the G6 or G5 board. (Refer to Section 1-4-3.)

3-2. LED on a QB Board Lights

Tip

Check the (lighting and blinking) state of LED on a QB board with only the rear cover and QBI shield removed with reference to the parts location shown in the figure below.



1. State in which D5201 was turned on

A failure occurs in FPGA on a QB board. If the problem is improved by installing the BI board (works properly), replace the BI board. If the problem persists, replace the QB board.

2. State in which D7601 was turned on

A failure occurs in the power supply below. Replace the board corresponding to the defective power supply.

QB board

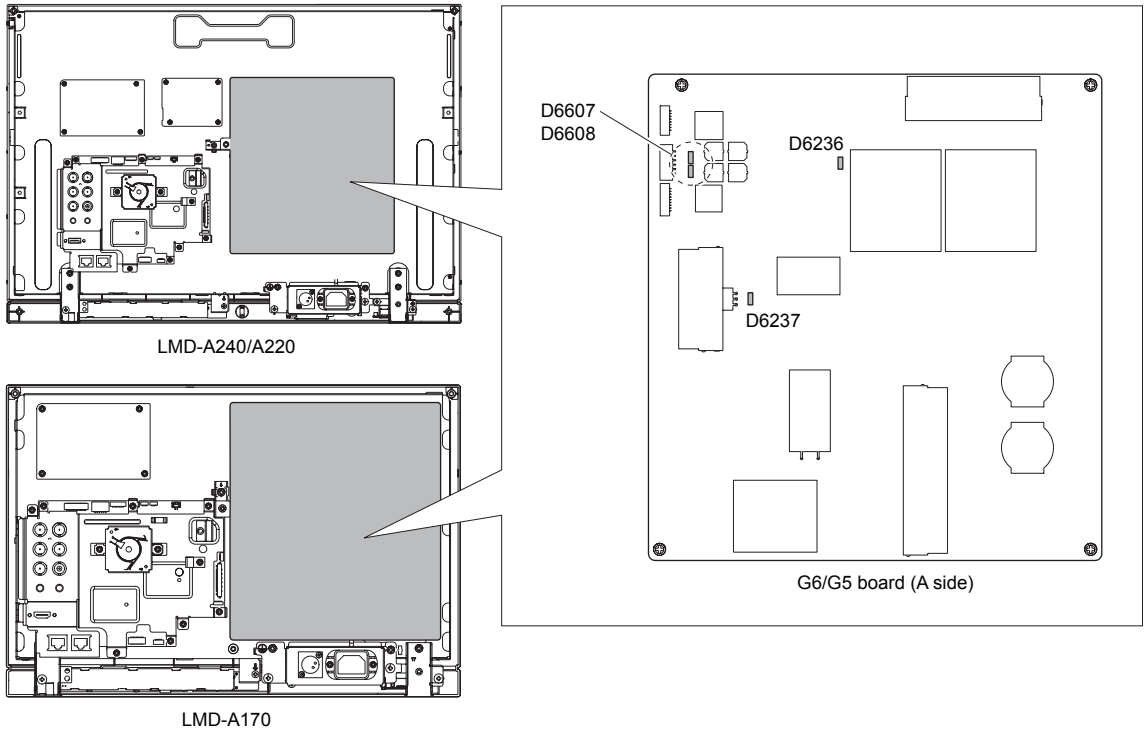
- +3.3V_STB
- +1.5V_STB
- +1.2V_STB
- +3.3V_QBI

BI board

- +3.3V
- +1.2V

3-3. LED on a G6/G5 Board Lights

- G6 board (LMD-A240): Refer to Section 3-3-1.
- G6 board (LMD-A220): Refer to Section 3-3-2.
- G5 board (LMD-A170): Refer to Section 3-3-3.



Note

Pay careful attention to an electric shock when measuring a G6 or G5 board using a tester.

3-3-1. G6 Board (LMD-A240)

- D6236: 28 V output display (Green)
- D6608: 12 V (For LCD panel) output display (Green)
- D6607: 12 V (For QB board) output display (Green)
- D6237: AC_OFF_DET output display and AC input monitoring (Red)

How to deal with the status during AC input

D6236, D6607 and D6608 turn on. D6237 normally operates with the light turned off. 28 V, 12 V (QB) and 12 V (T-CON) become output state. Also, 12 V generates the power with the step-down converter from 28 V.

D6236	D6608/D6607	D6237	Status	Remedy ("⇨" indicates remedy.)
Turn on	Turn on	Turn off	Normal	–
Turn off	Turn off	Turn off	28 V failure	28 V is not output. When 28 V is not output, 12 V is not also output and all LEDs are turned off. A primary power circuit (AC input to 28 V insulating converter) is judged to be abnormal. ⇨ Replace the G6 board. (Refer to Section 1-4-3.)
Turn on	Turn off	Turn off	12 V failure	12 V is not output. A secondary DC/DC converter is judged to be abnormal. . ⇨ Replace the G6 board. (Refer to Section 1-4-3.)
Turn on	Turn on	Turn oN	AC detection circuit failure	Abnormality is found in an AC voltage or AC detection circuit (AC OFF DET circuit). Confirm the item below using a tester. ⇨ Confirm whether an AC input voltage is 70 V or more. Yes (70 V or more): If the problem is improved by replacing with the G6 board (works properly), replace the G6 board. (Refer to Section 1-4-3.) If the problem persists, replace the QB board. (Refer to Section 1-4-4.) No: Set the AC voltage to the normal value (77 V or more), and then check the state of LED. If the problem persists, replace the G6 board. (Refer to Section 1-4-3.)

How to deal with the status during DC input

D6236, D6607 and D6608 light up. D6237 normally operates with the light turned off. 28 V, 12 V (QB) and 12 V (T-CON) become output state.

D6236	D6608/D6607	D6237	Status	Remedy ("⇨" indicates remedy.)
Turn on	Turn on	Turn off	Normal	–
Turn off	Turn off	Turn off	28 V failure	28 V is not output. When 28 V is not output, 12 V is not also output and all LEDs are turned off. ⇨ Replace the G6 board. (Refer to Section 1-4-3.)
Turn on	Turn off	Turn off	12 V failure	12 V is not output. ⇨ Replace the G6 board. (Refer to Section 1-4-3.)

3-3-2. G6 Board (LMD-A220)

- D6236: 28 V output display (Green)
- D6608: 5 V (For LCD panel) output display (Green)
- D6607: 12 V (For QB board) output display (Green)
- D6237: AC_OFF_DET output display and AC input monitoring (Red)

How to deal with the status during AC input

D6236, D6607 and D6608 turn on. D6237 normally operates with the light turned off. 28 V, 12 V (QB) and 5 V (T-CON) become output state. Also, 12 V generates the power with the step-down converter from 28 V.

D6236	D6608/D6607	D6237	Status	Remedy ("⇨" indicates remedy.)
Turn on	Turn on	Turn off	Normal	–
Turn off	Turn off	Turn off	28 V failure	28 V is not output. When 28 V is not output, 12 V is not also output and all LEDs are turned off. A primary power circuit (AC input to 28 V insulating converter) is judged to be abnormal. ⇨ Replace the G6 board. (Refer to Section 1-4-3.)
Turn on	Turn off	Turn off	12 V/5 V failure	12 V and 5 V are not output. A secondary DC/DC converter is judged to be abnormal. . ⇨ Replace the G6 board. (Refer to Section 1-4-3.)
Turn on	Turn on	Turn on	AC detection circuit failure	Abnormality is found in an AC voltage or AC detection circuit (AC OFF DET circuit). Confirm the item below using a tester. ⇨ Confirm whether an AC input voltage is 70 V or more. Yes (70 V or more): If the problem is improved by replacing with the G6 board (works properly), replace the G6 board. (Refer to Section 1-4-3.) If the problem persists, replace the QB board. (Refer to Section 1-4-4.) No: Set the AC voltage to the normal value (77 V or more), and then check the state of LED. If the problem persists, replace the G6 board. (Refer to Section 1-4-3.)

How to deal with the status during DC input

D6236, D6607 and D6608 light up. D6237 normally operates with the light turned off. 28 V, 12 V (QB) and 5 V (T-CON) become output state.

D6236	D6608/D6607	D6237	Status	Remedy ("⇨" indicates remedy.)
Turn on	Turn on	Turn off	Normal	–
Turn off	Turn off	Turn off	28 V failure	28 V is not output. When 28 V is not output, 12 V and 5 V are not also output and all LEDs are turned off. ⇨ Replace the G6 board. (Refer to Section 1-4-3.)
Turn on	Turn off	Turn off	12 V/5 V failure	12 V and 5 V are not output. ⇨ Replace the G6 board. (Refer to Section 1-4-3.)

3-3-3. G5 Board (LMD-A170)

- D6236: 28 V output display (Green)
- D6608: 12 V (For LCD panel: Two types) output display (Green)
- D6607: 12 V (For QB board) output display (Green)
- D6237: AC_OFF_DET output display and AC input monitoring (Red)

How to deal with the status during AC input

D6236, D6607 and D6608 turn on. D6237 normally operates with the light turned off. 28 V, 12 V (QB), 12 V (T-CON) and 12 V (B/L) become output state. Also, 12 V generates the power with the step-down converter from 28 V.

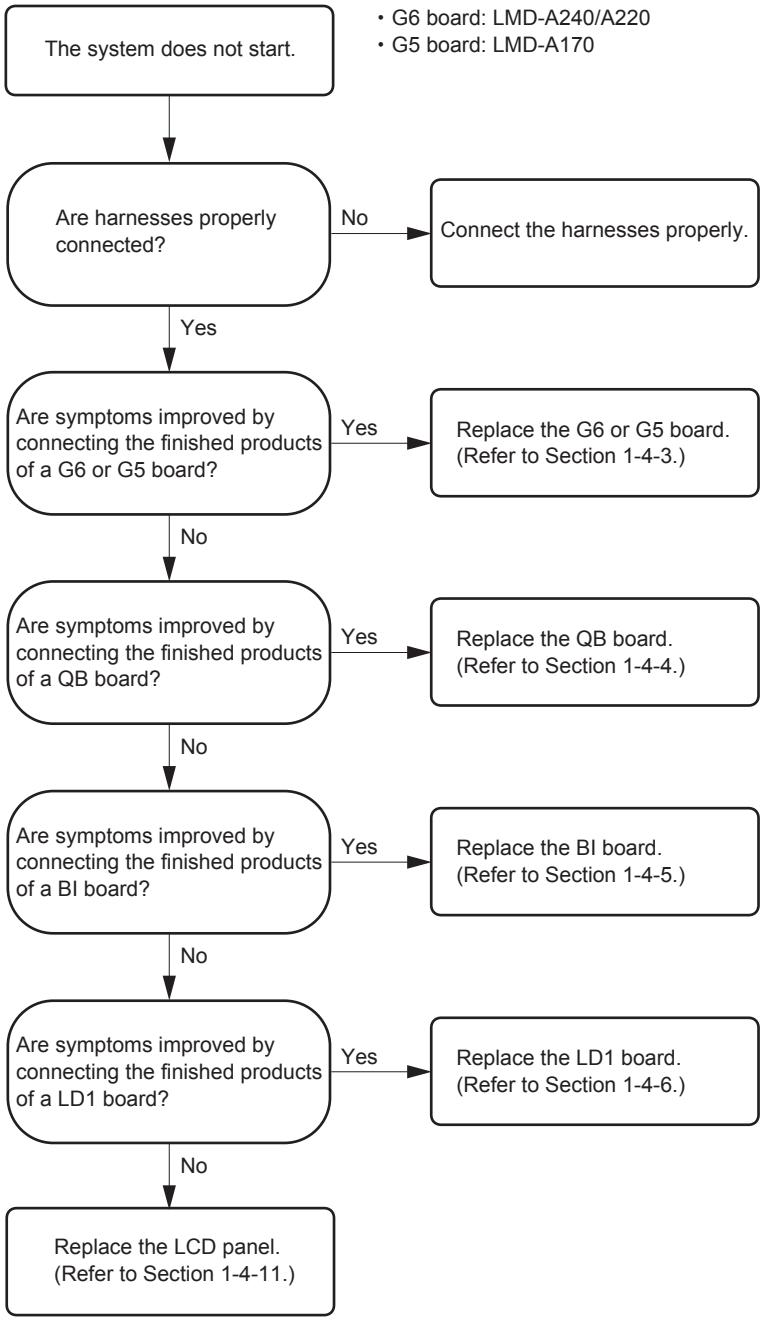
D6236	D6608/D6607	D6237	Status	Remedy ("⇨" indicates remedy.)
Turn on	Turn on	Turn off	Normal	–
Turn off	Turn off	Turn off	28 V failure	28 V is not output. When 28 V is not output, 12 V is not also output and all LEDs are turned off. A primary power circuit (AC input to 28 V insulating converter) is judged to be abnormal. ⇨ Replace the G6 board. (Refer to Section 1-4-3.)
Turn on	Turn off	Turn off	12 V failure	12 V is not output. A secondary DC/DC converter is judged to be abnormal. . ⇨ Replace the G6 board. (Refer to Section 1-4-3.)
Turn on	Turn on	Turn on	AC detection circuit failure	Abnormality is found in an AC voltage or AC detection circuit (AC OFF DET circuit). Confirm the item below using a tester. ⇨ Confirm whether an AC input voltage is 70 V or more. Yes (70 V or more): If the problem is improved by replacing with the G6 board (works properly), replace the G6 board. (Refer to Section 1-4-3.) If the problem persists, replace the QB board. (Refer to Section 1-4-4.) No: Set the AC voltage to the normal value (77 V or more), and then check the state of LED. If the problem persists, replace the G6 board. (Refer to Section 1-4-3.)

How to deal with the status during DC input

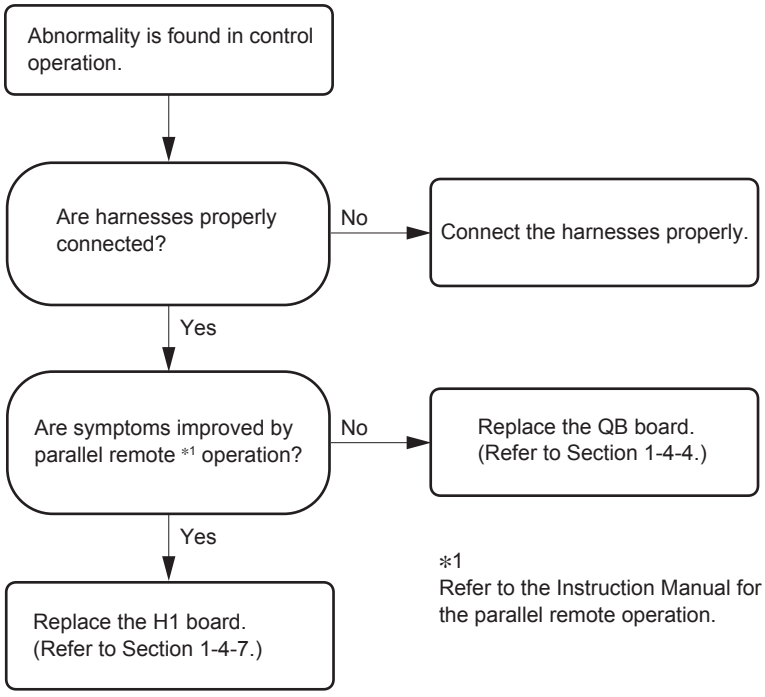
D6236, D6607 and D6608 light up. D6237 normally operates with the light turned off. 28 V, 12 V (QB), 12 V (T-CON) and 12 V (B/L) become output state.

D6236	D6608/D6607	D6237	Status	Remedy ("⇨" indicates remedy.)
Turn on	Turn on	Turn off	Normal	–
Turn off	Turn off	Turn off	28 V failure	28 V is not output. When 28 V is not output, 12 V is not also output and all LEDs are turned off. ⇨ Replace the G5 board. (Refer to Section 1-4-3.)
Turn on	Turn off	Turn off	12 V failure	12 V is not output. ⇨ Replace the G5 board. (Refer to Section 1-4-3.)

3-4. System Does Not Start



3-5. Abnormality Is Found in Control Operation



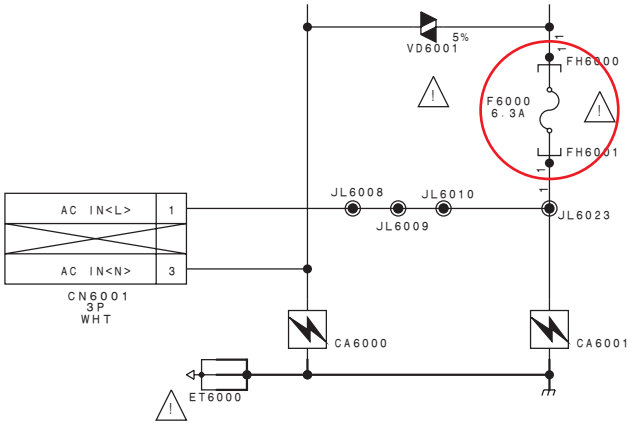
3-6. When No Image Is Output, and Front POWER LED Does Not Light Up

3-6-1. Check of the G5/G6 Boards

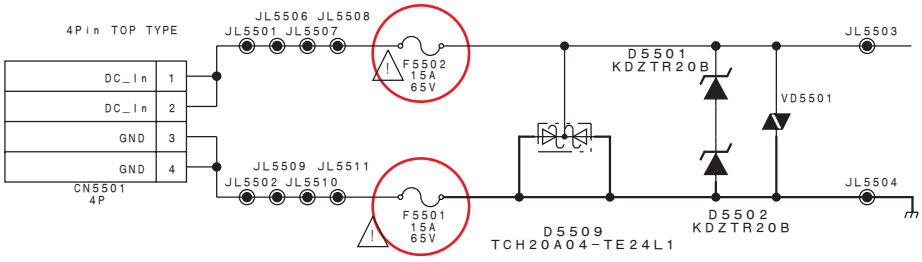
Tip

- Check the boards in the procedure from step 1 to 4.
- For LMD-A240/A220, check the G6 board, and for LMD-A170, check the G5 board.

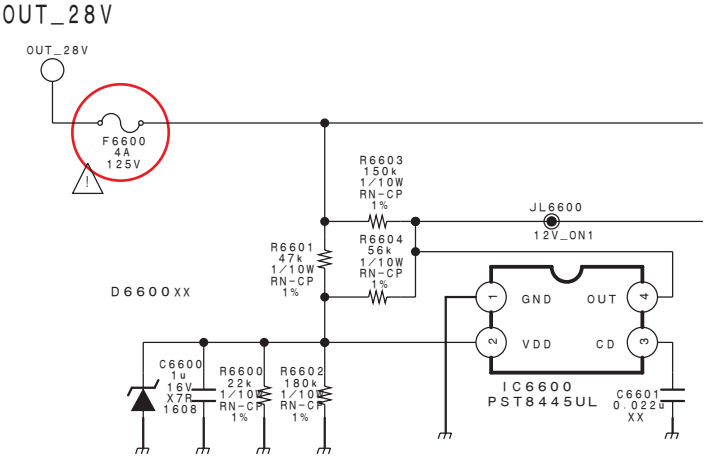
1. Check if F6000 is not disconnected. (Check of AC input)
   If disconnected, replace F6000. (Refer to Sections 4-3 and 5-3.)



2. Check if F5501 or F5502 is not disconnected. (Check of DC input)
   If disconnected, replace F5501 or F5502. (Refer to Sections 4-3 and 5-3.)



3. Check if F6600 is not disconnected.
   If disconnected, replace F6600. (Refer to Sections 4-3 and 5-3.)



4. Turn on the power of this unit and check if the following voltage is output to TP6600 and TP6601.

Model name	TP6600	TP6601
LMD-A240	12 V	12 V
LMD-A220	5 V	12 V
LMD-A170	12 V	12 V

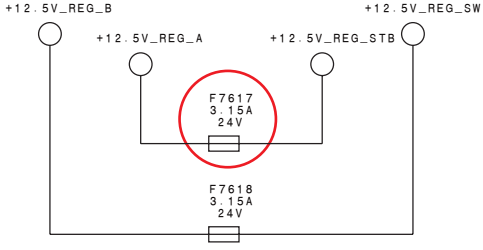
If not output, replace G5 or G6 board. (Refer to Section 1-4-3.)

3-6-2. Check of the QB Board

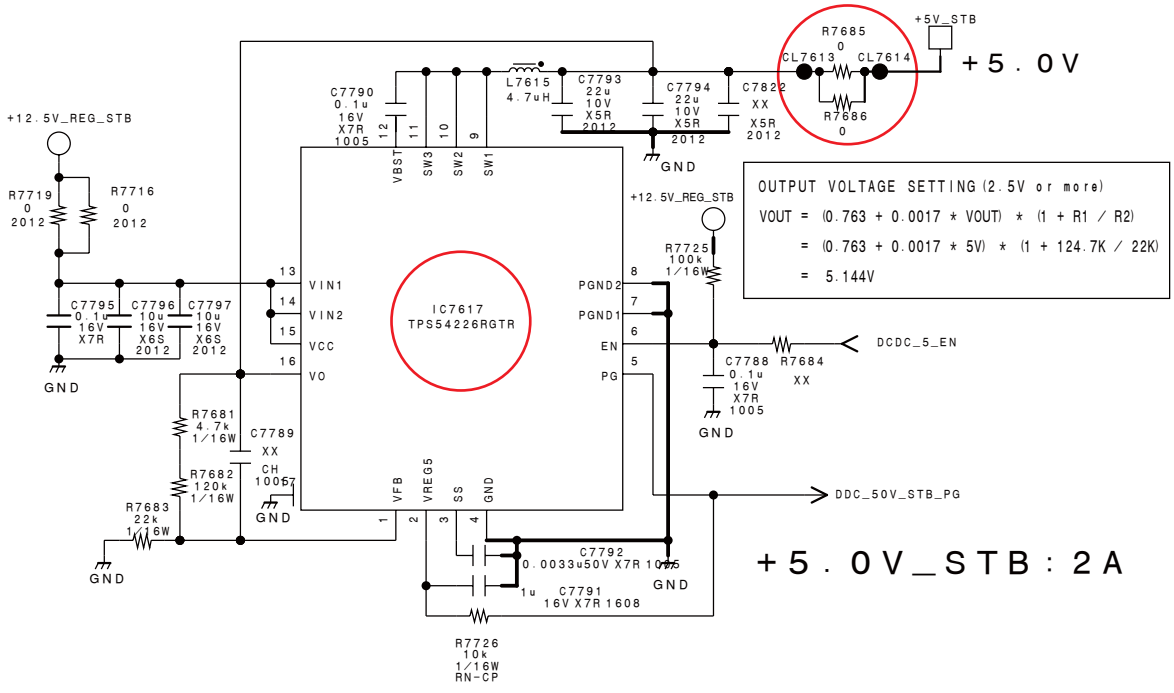
Tip

Check the board in the procedure from step 1 to 4.

1. Check if F7617 is not disconnected. (Check of standby power system)
   If disconnected, replace F7617. (Refer to Sections 4-3 and 5-3.)

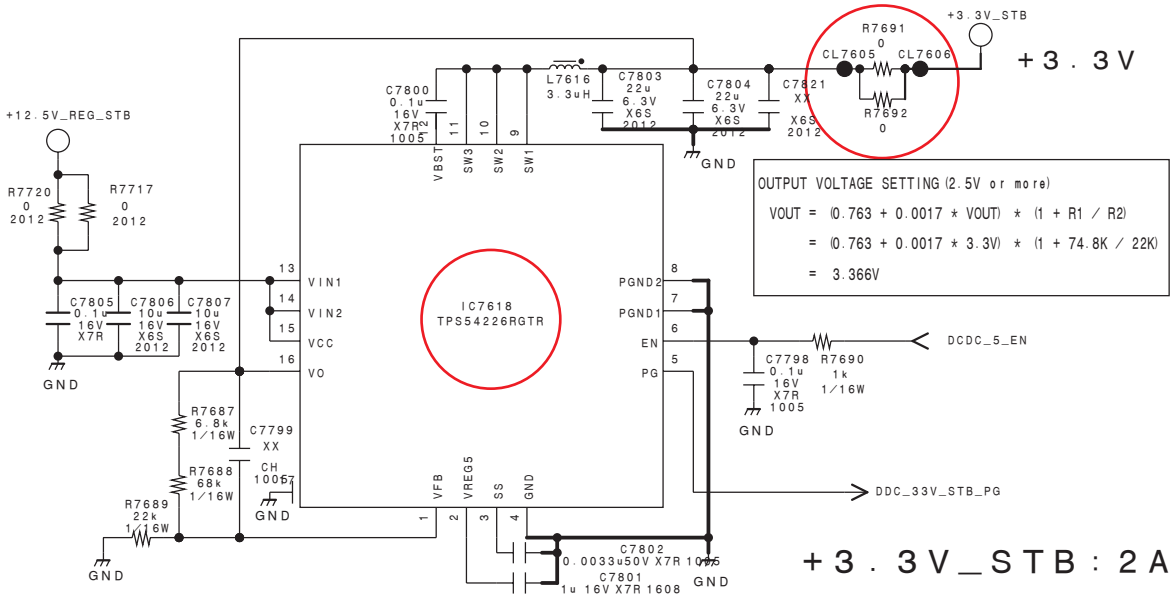


2. Check if a voltage of +5V is output from IC7617 to CL7613 and CL7614.
   If not output, replace IC7617. (Refer to Sections 4-3 and 5-3.)
   If the symptom persists after replacing IC7617, replace the QB board. (Refer to Section 1-4-4.)

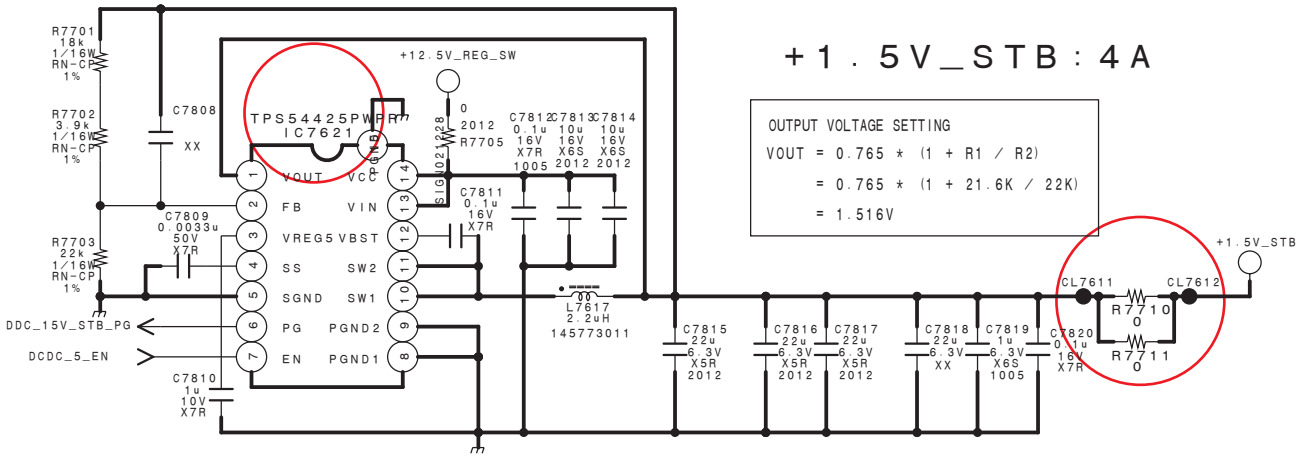


3. Check that D7601 is lit. After checking, check the output of the following three ICs.
   If D7601 is not lit, replace the QB board. (Refer to Section 1-4-4.)

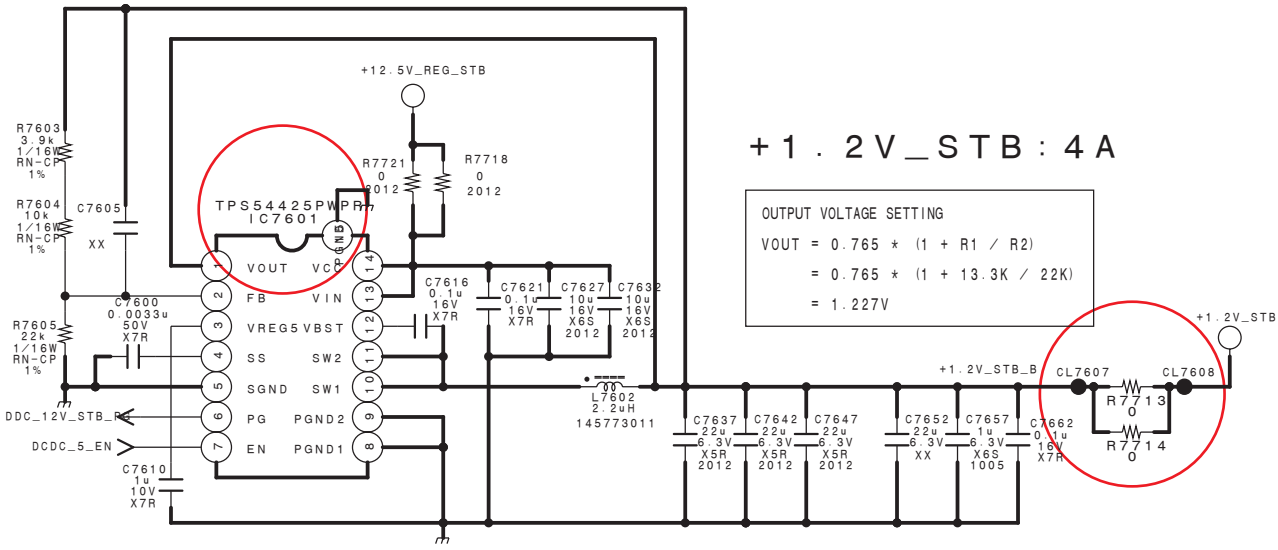
   (1) Check if a voltage of +3.3V is output from IC7618 to CL7605 or CL7606.
   If not output, replace IC7618. (Refer to Sections 4-3 and 5-3.)
   If the symptom persists after replacing IC7618, replace the QB board. (Refer to Section 1-4-4.)



   (2) Check if a voltage of +1.5V is output from IC7621 to CL7611 or CL7612.
   If not output, replace IC7621. (Refer to Sections 4-3 and 5-3.)
   If the symptom persists after replacing IC7621, replace the QB board. (Refer to Section 1-4-4.)



(3) Check if a voltage of +1.2V is output from IC7601 to CL7607 or CL7608.
If not output, replace IC7601. (Refer to Sections 4-3 and 5-3.)
If the symptom persists after replacing IC7601, replace the QB board. (Refer to Section 1-4-4.)

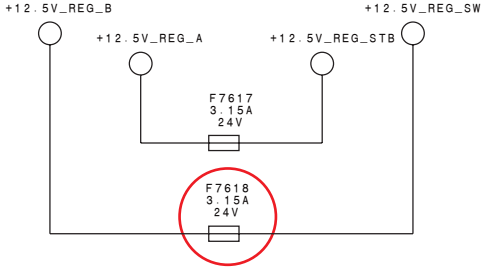


3-7. When No Image Is Output by Any Input, and MENU Cannot Be Displayed

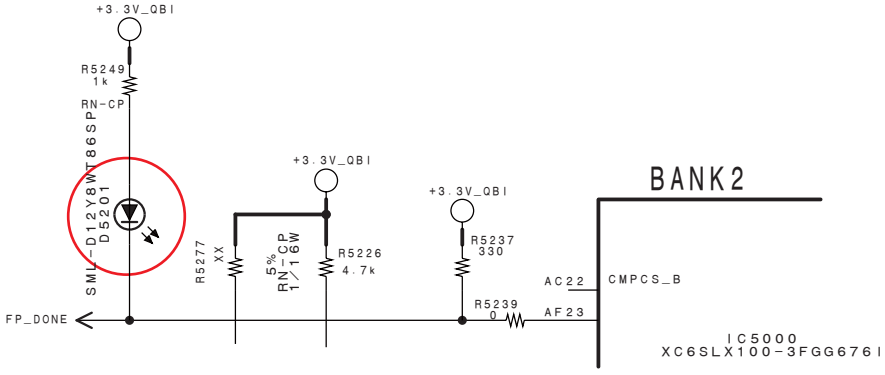
Tip

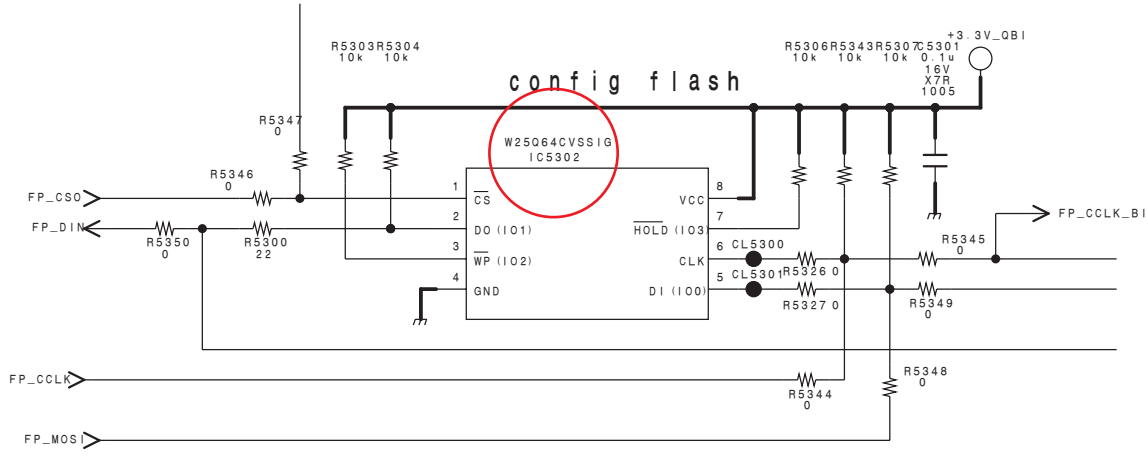
Check the board in the procedure from step 1 to 2.

1. Check if F7618 on the QB board is not disconnected. (Check of main power system)
If disconnected, replace F7618. (Refer to Sections 4-3 and 5-3.)



2. Check if D5201 on the QB board is lit with the power turned on.
   If D5201 is lit, replace IC5302 (refer to Sections 4-3 and 5-3). Then, write the FPGA data in IC5302.
   For details on how to write the FPGA data, contact your local Sony Sales Office/Service Center.
   If D5201 is not lit, replace the QB board. (Refer to Section 1-4-4.)

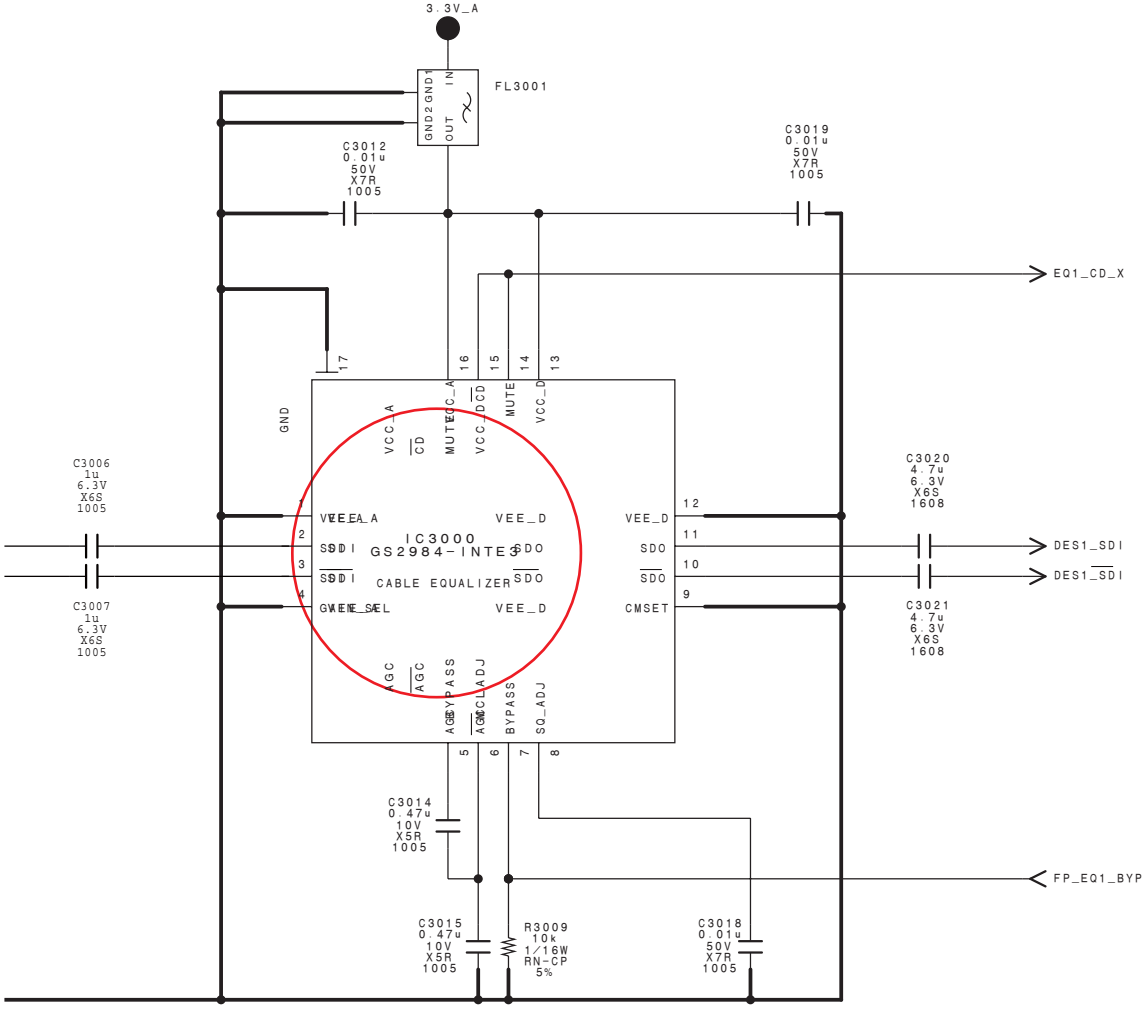




3-8. When the SDI Signal Does Not Output Image

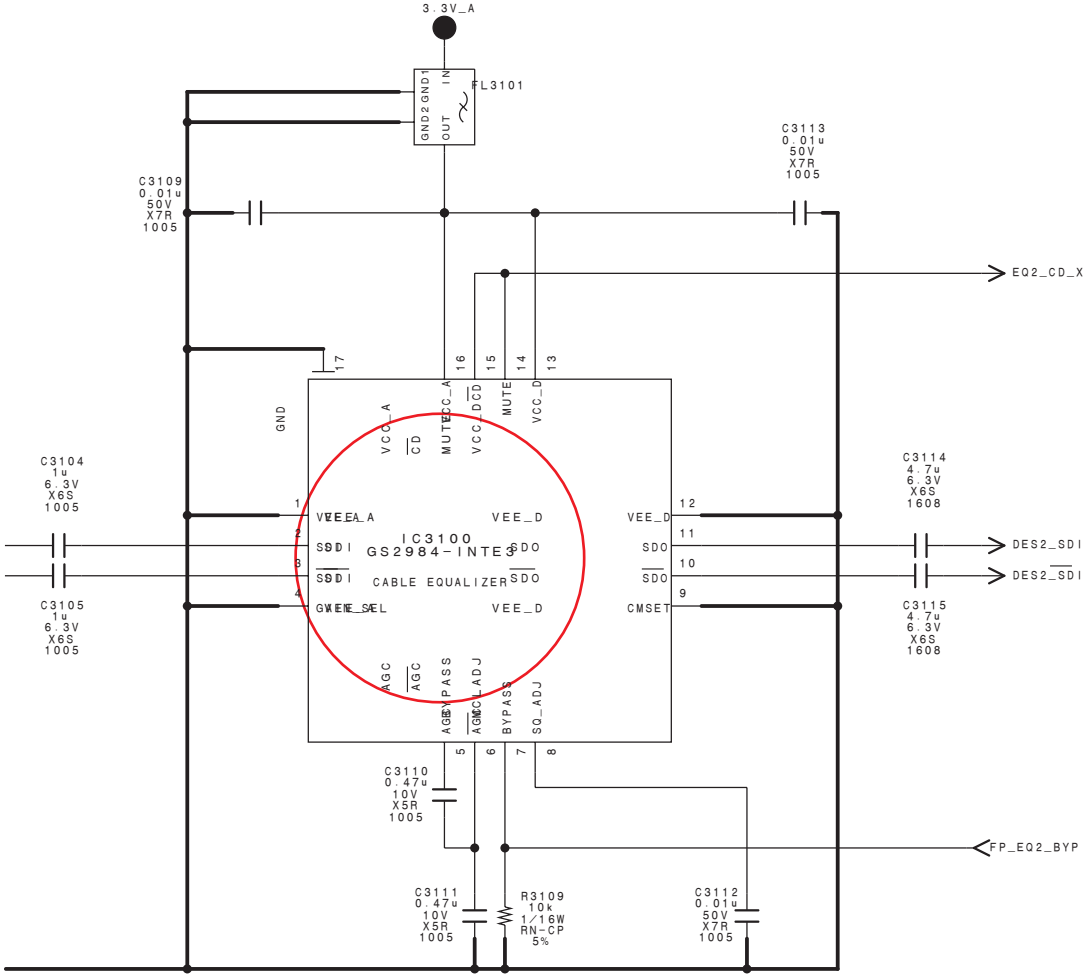
3-8-1. Only SDI1 Does Not Output Image (SDI2, HDMI and COMPOSITE Output Image)

Replace IC3000 on the QB board. (Refer to Sections 4-3 and 5-3.)



3-8-2. Only SDI2 Does Not Output Image (SDI1, HDMI and COMPOSITE Output Image)

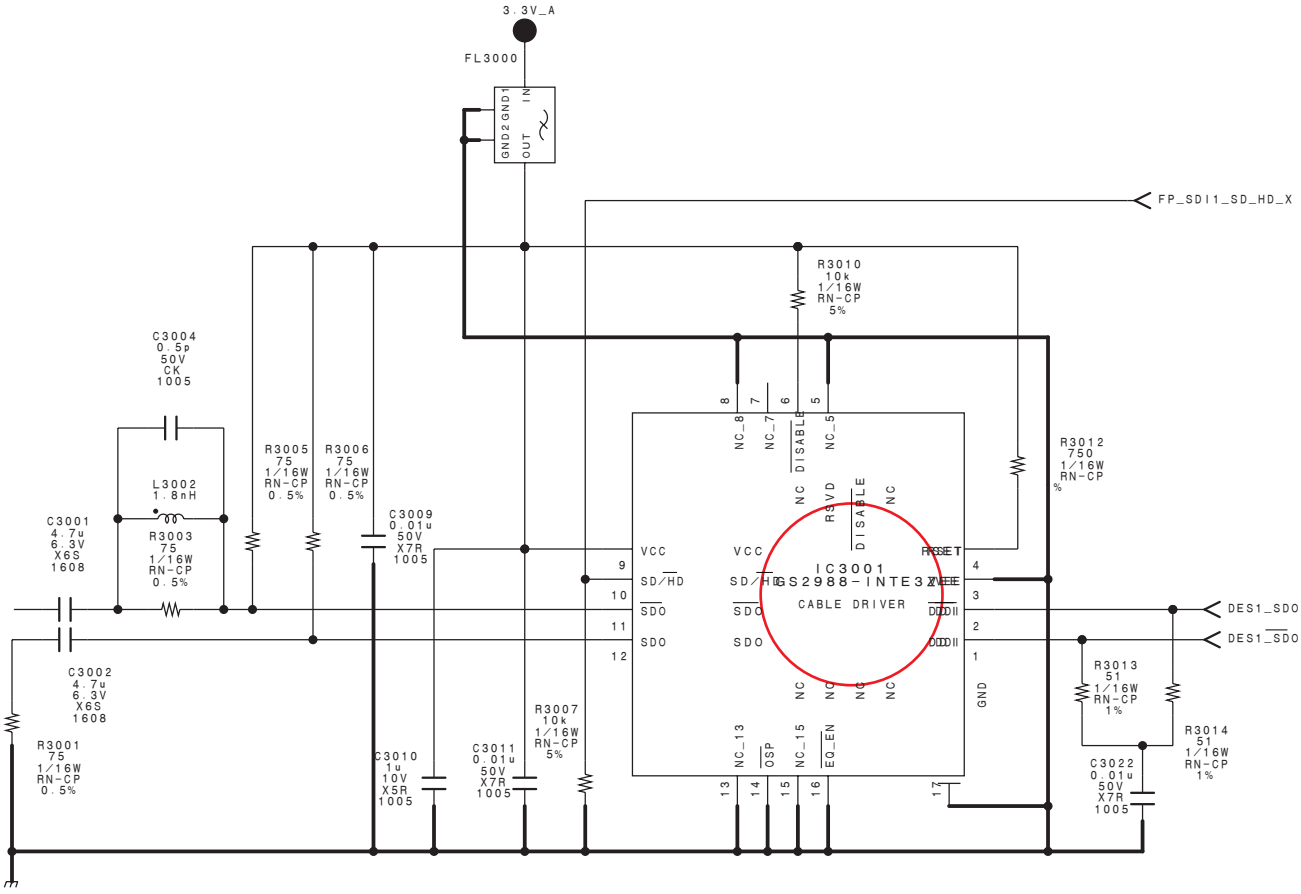
Replace IC3100 on the QB board. (Refer to Sections 4-3 and 5-3.)



3-9. When SDI OUT Does Not Output Image

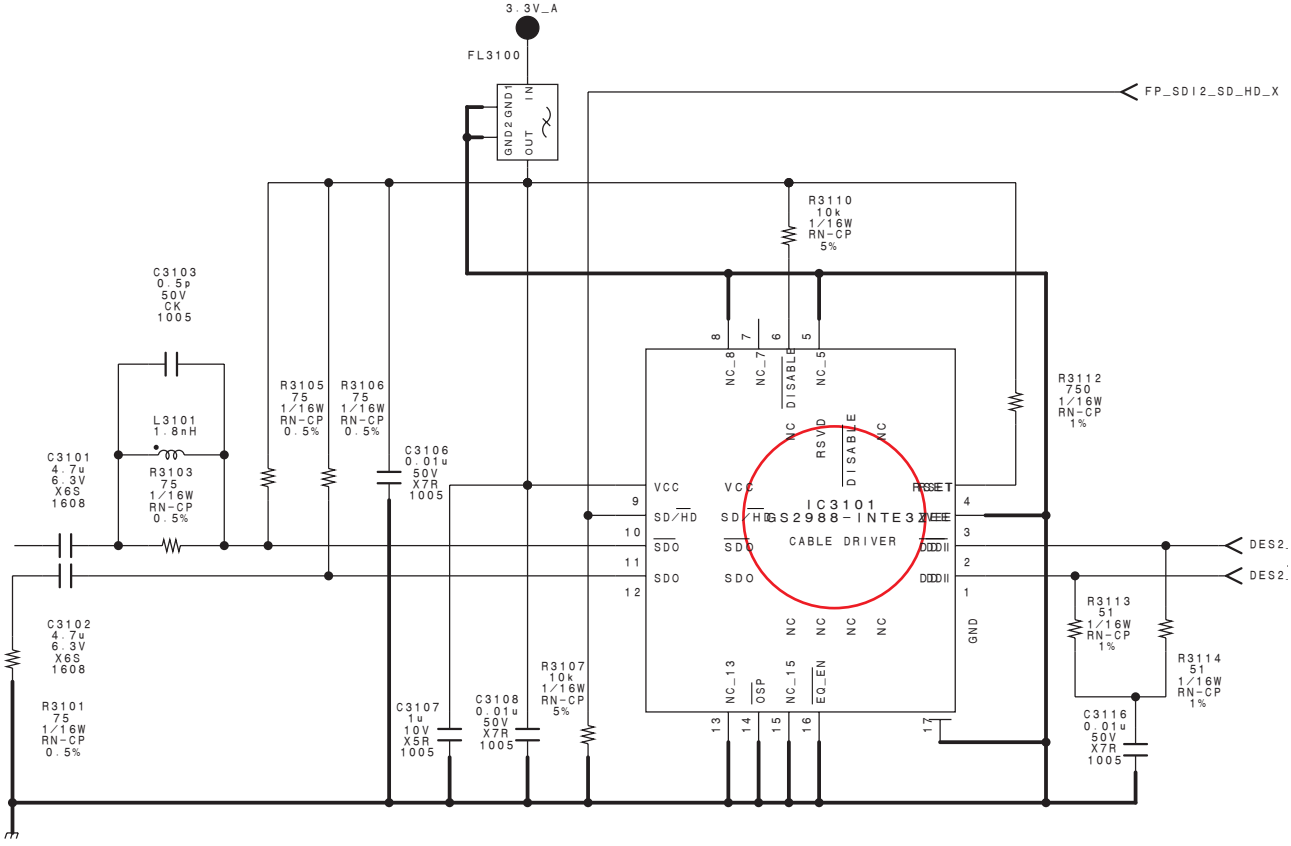
3-9-1. SDI1 OUT Does Not Output Image (SDI1 Outputs Image)

Replace IC3001 on the QB board. (Refer to Sections 4-3 and 5-3.)



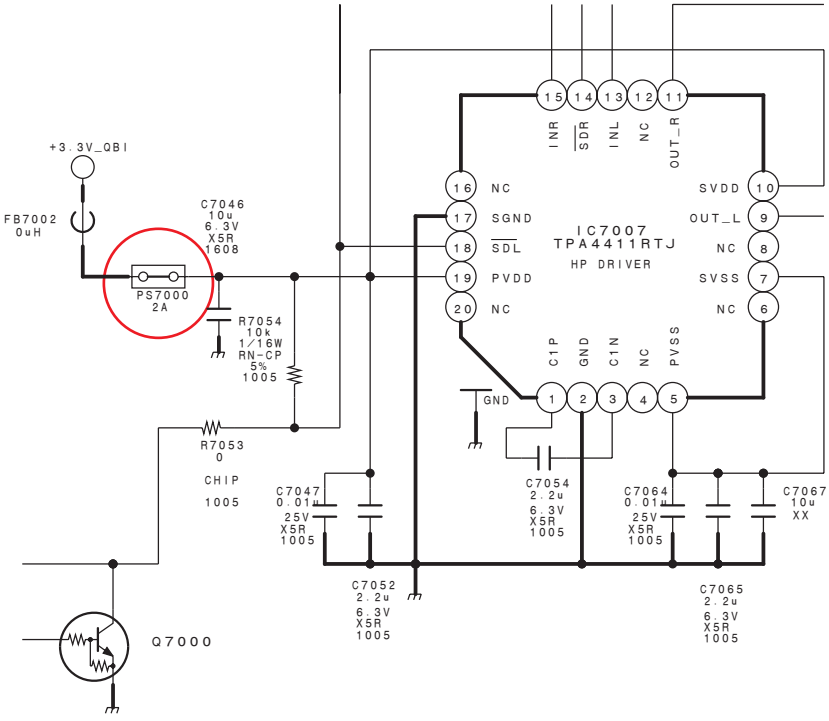
3-9-2. SDI2 OUT Does Not Output Image (SDI2 Outputs Image)

Replace IC3101 on the QB board. (Refer to Sections 4-3 and 5-3.)



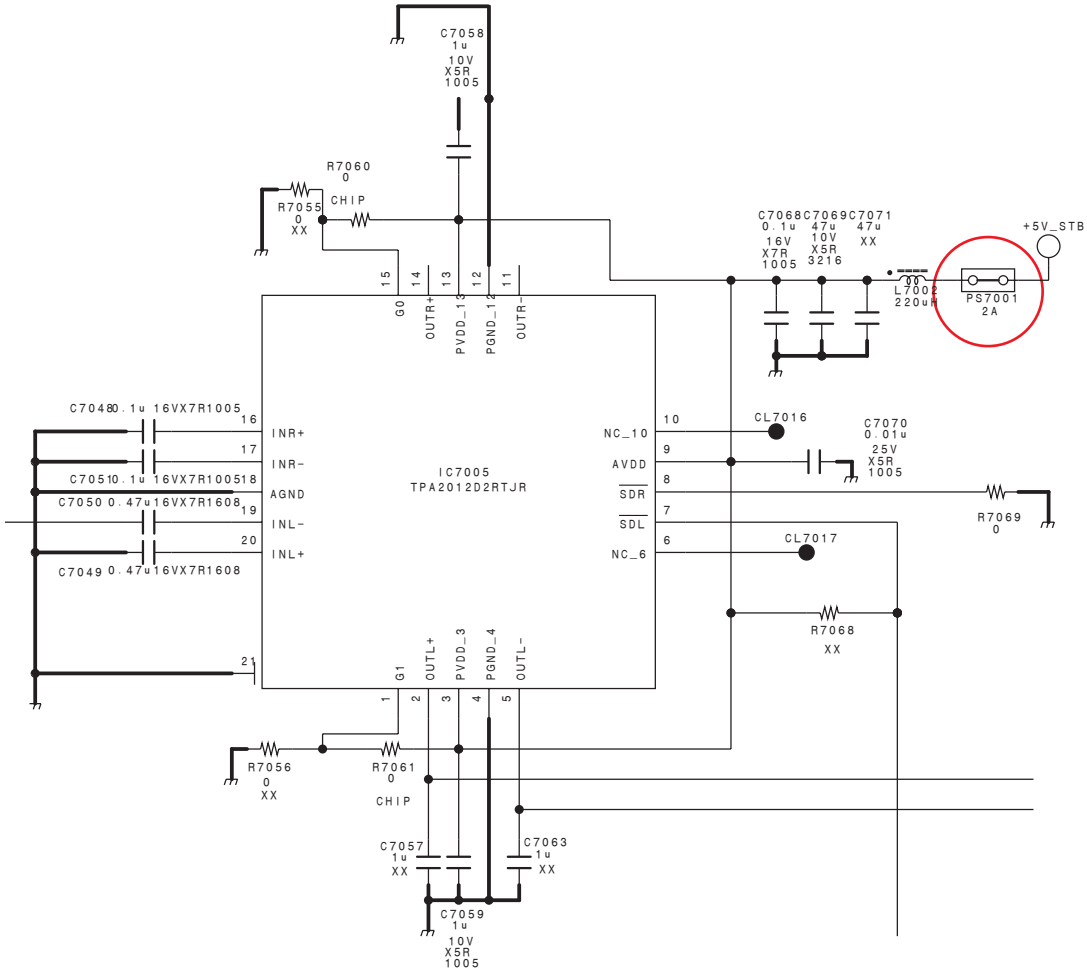
3-10. When No Sound Is Output from the HP Terminal

Check if PS7000 on the QB board is not disconnected.
If disconnected, replace PS7000. (Refer to Sections 4-3 and 5-3.)



3-11. When No Sound Is Output from the Speaker

Check if PS7001 on the QB board is not disconnected.
If disconnected, replace PS7001. (Refer to Sections 4-3 and 5-3.)



Section 4
Spare Parts

4-1. Notes on Repair Parts

1. Safety Related Components Warning

WARNING

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.

3. Stock of Parts

Parts marked with “o” at SP (Supply Code) column of the spare parts list may not be stocked. Therefore, the delivery date will be delayed.

4. Harness

Harnesses with no part number are not registered as spare parts.

4-1. 補修部品注意事項

1. 安全重要部品

⚠警告

⚠印のついた部品は安全性を維持するために重要な部品です。したがって，交換する時は必ず指定の部品を使ってください。

2. 部品の共通化

ソニーから供給する補修用部品は，セットに使われているものと異なることがあります。
これは部品の共通化，改良等によるものです。

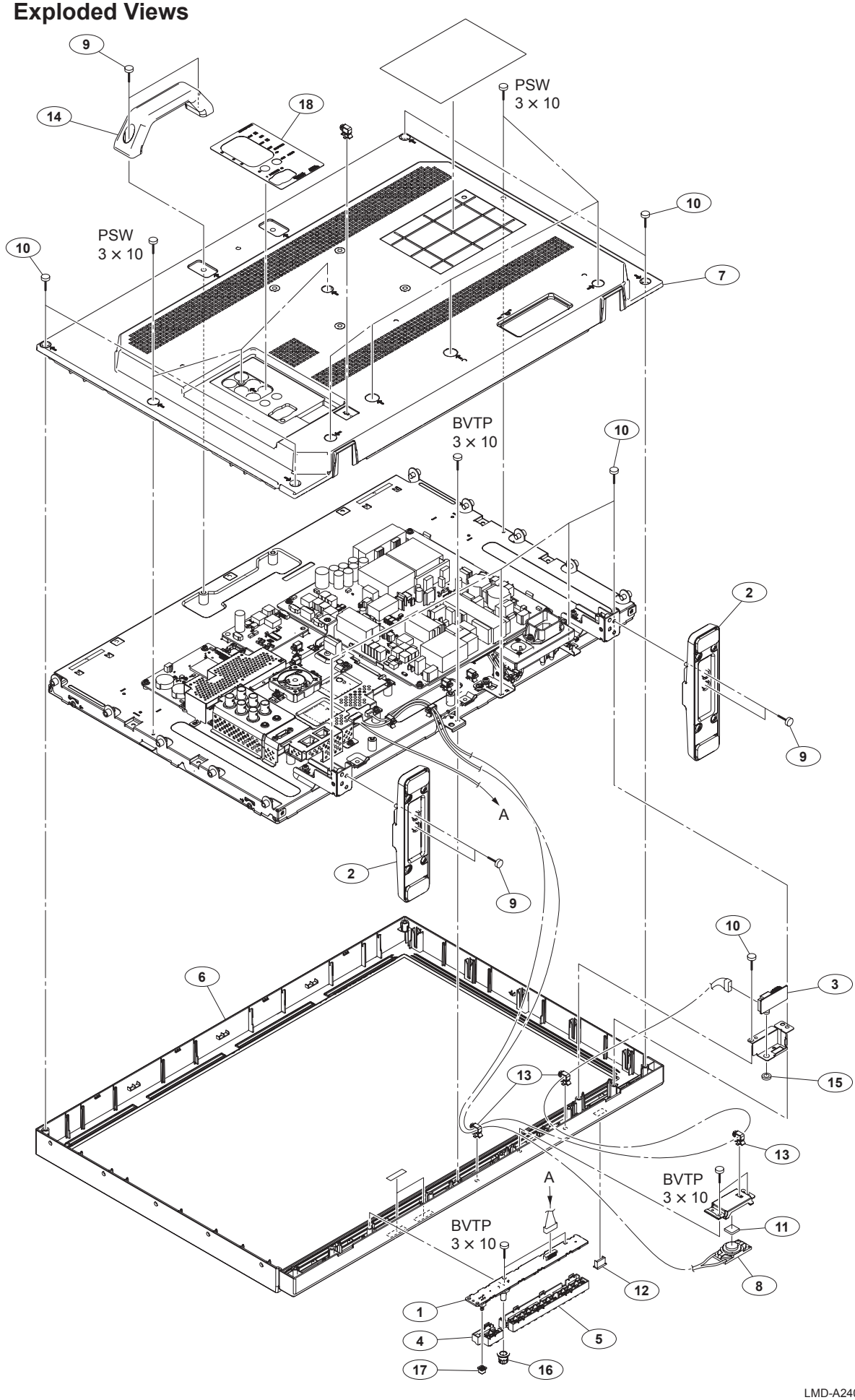
3. 部品の在庫

部品表の SP（Supply code）欄に “o” で示される部品は在庫していないことがあり，納期が長くなることがあります。

4. ハーネス

部品番号の記載されていないハーネスは，サービス部品として登録されていません。

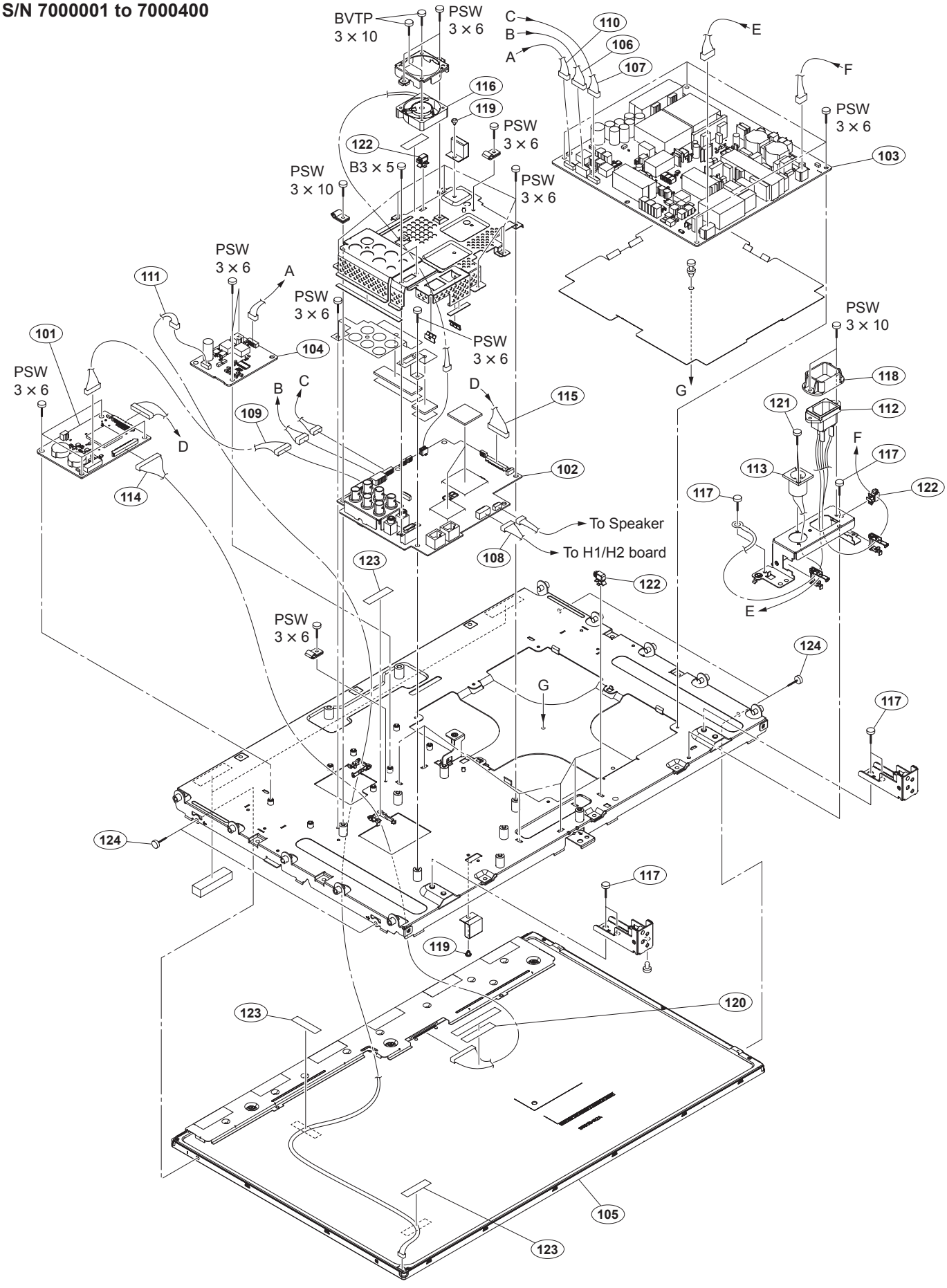
4-2. Exploded Views



No.	Part No.	SP	Description
1	A-2015-470-A	s	MOUNTED CIRCUIT BOARD, H1
2	A-2015-476-A	s	BLOCK, STAND
3	A-2015-478-A	s	MOUNTED CIRCUIT BOARD, H2
4	X-2588-938-2	s	KEYPAD ASSY, CONTROL
5	X-2588-939-1	s	KEYPAD ASSY, INPUT
6	X-2589-226-2	s	BEZEL ASSY (24)
7	X-2589-229-2	s	REAR COVER ASSY (24)
8	1-859-036-13	s	MINIATURE SPEAKER (WITH HARNESS)
9	2-580-602-01	s	SCREW, +PSW M4X12
10	2-580-639-01	s	SCREW, +BVTP 4X12 TYPE2 IT-3
11	3-087-319-01	o	CUSHION, FOOT
12	3-275-891-11	s	COVER, USB
13	4-098-147-41	s	CLAMP
14	4-264-182-01	s	HANDLE
15	4-487-558-01	s	NUT (M6X0.5)
16	4-488-286-01	s	KNOB, ROTARY ENCODER
17	4-488-287-01	s	BUTTON, STANDBY
18	4-529-786-01	s	TERMINAL LABEL
	7-682-949-09	s	SCREW +PSW 3X10
	7-685-647-71	s	SCREW +BVTP 3X10 TYPE2 IT-3

Board and LCD Block (LMD-A240)

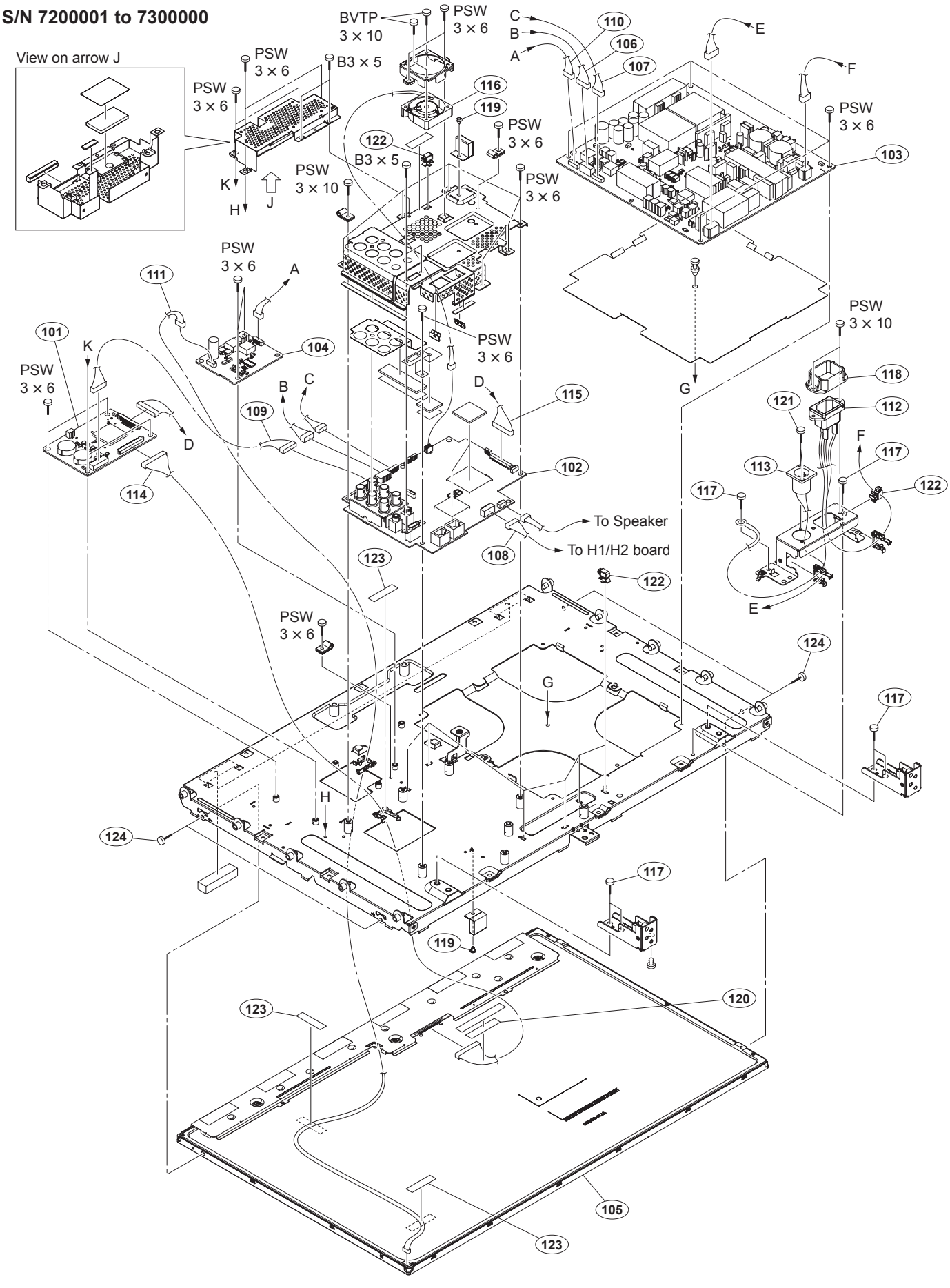
SY: S/N 7000001 to 7000400



No.		Part No.	SP	Description
101		A-2015-480-A	s	MOUNTED CIRCUIT BOARD, BI
102		A-2015-649-A	s	MOUNTED CIRCUIT BOARD, QB
103		A-2015-652-A	s	MOUNTED CIRCUIT BOARD, G6(24)
104		A-2015-654-A	s	MOUNTED CIRCUIT BOARD, LD1(24)
105	⚠	1-811-994-11	s	LCD PANEL
106		1-848-245-11	s	CONNECTOR ASSY (6P)
107		1-848-246-11	s	CONNECTOR ASSY (9P)
108		1-848-249-11	s	CONNECTOR ASSY (20P)
109		1-848-250-11	s	CONNECTOR ASSY (6P)
110		1-848-251-11	s	CONNECTOR ASSY (8P)
111		1-848-252-11	s	CONNECTOR ASSY (6P)
112	⚠	1-848-254-11	s	AC CONNECTOR ASSY (3P)
113	⚠	1-848-256-11	s	CONNECTOR ASSY (4P)
114		1-848-257-11	s	CONNECTOR ASSY (LVDS30P)
115		1-848-259-11	s	CONNECTOR ASSY (LVDS41P)
116	⚠	1-855-048-11	s	DC FAN 40MM
117		2-434-609-02	s	SCREW (M4X8)
118		2-990-241-02	s	HOLDER (A), PLUG
119		3-531-576-01	s	RIVET
120		4-000-499-01	s	TAPE (OF)
121		4-035-802-01	s	SCREW (M2.6X.6)
122		4-098-147-41	s	CLAMP
123		4-100-136-01	s	SHEET (CORE), C
124		4-531-506-01	s	SCREW UG-EL (+B M3)
		7-682-546-09	s	SCREW +B 3X5
		7-682-947-01	s	SCREW +PSW 3X6
		7-682-949-09	s	SCREW +PSW 3X10
		7-685-647-71	s	SCREW +BVTP 3X10 TYPE2 IT-3

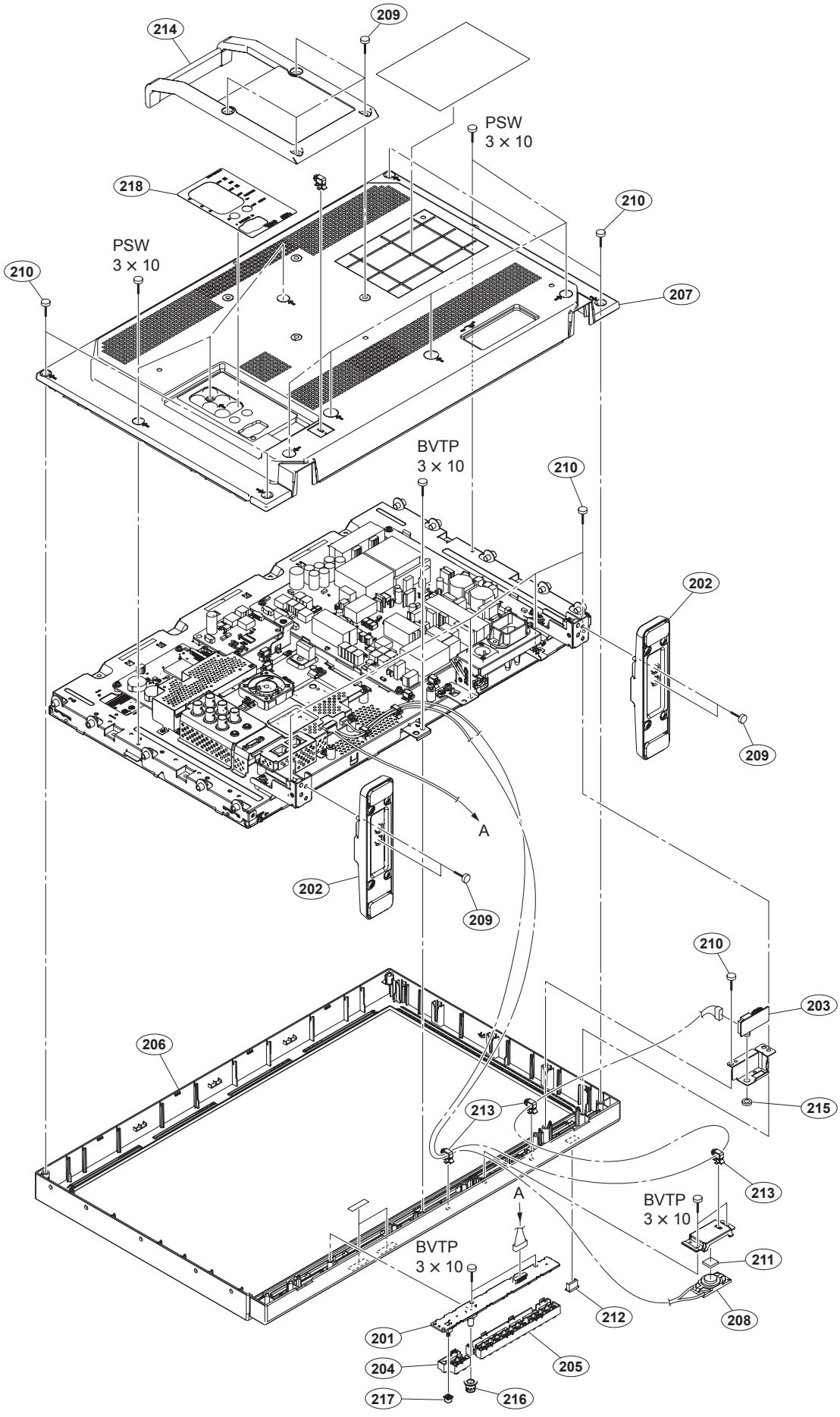
Board and LCD Block (LMD-A240)

SY: S/N 7000401 to 7100000
CN: S/N 7200001 to 7300000



No.	Part No.	SP	Description
101	A-2015-480-A	s	MOUNTED CIRCUIT BOARD, BI
102	A-2015-649-B	s	MOUNTED CIRCUIT BOARD, QB
103	A-2015-652-A	s	MOUNTED CIRCUIT BOARD, G6(24)
104	A-2015-654-A	s	MOUNTED CIRCUIT BOARD, LD1(24)
105 ⚠	1-811-994-11	s	LCD PANEL
106	1-848-245-12	s	CONNECTOR ASSY (6P)
107	1-848-246-12	s	CONNECTOR ASSY (9P)
108	1-848-249-11	s	CONNECTOR ASSY (20P)
109	1-848-250-11	s	CONNECTOR ASSY (6P)
110	1-848-251-11	s	CONNECTOR ASSY (8P)
111	1-848-252-11	s	CONNECTOR ASSY (6P)
112 ⚠	1-848-254-11	s	AC CONNECTOR ASSY (3P)
113 ⚠	1-848-256-12	s	CONNECTOR ASSY (4P)
114	1-848-257-11	s	CONNECTOR ASSY (LVDS30P)
115	1-848-259-11	s	CONNECTOR ASSY (LVDS41P)
116 ⚠	1-855-048-11	s	DC FAN 40MM
117	2-434-609-02	s	SCREW (M4X8)
118	2-990-241-02	s	HOLDER (A), PLUG
119	3-531-576-01	s	RIVET
120	4-000-499-01	s	TAPE (OF)
121	4-035-802-01	s	SCREW (M2.6X.6)
122	4-098-147-41	s	CLAMP
123	4-100-136-01	s	SHEET (CORE), C
124	4-531-506-01	s	SCREW UG-EL (+B M3)
	7-682-546-09	s	SCREW +B 3X5
	7-682-947-01	s	SCREW +PSW 3X6
	7-682-949-09	s	SCREW +PSW 3X10
	7-685-647-71	s	SCREW +BVTP 3X10 TYPE2 IT-3

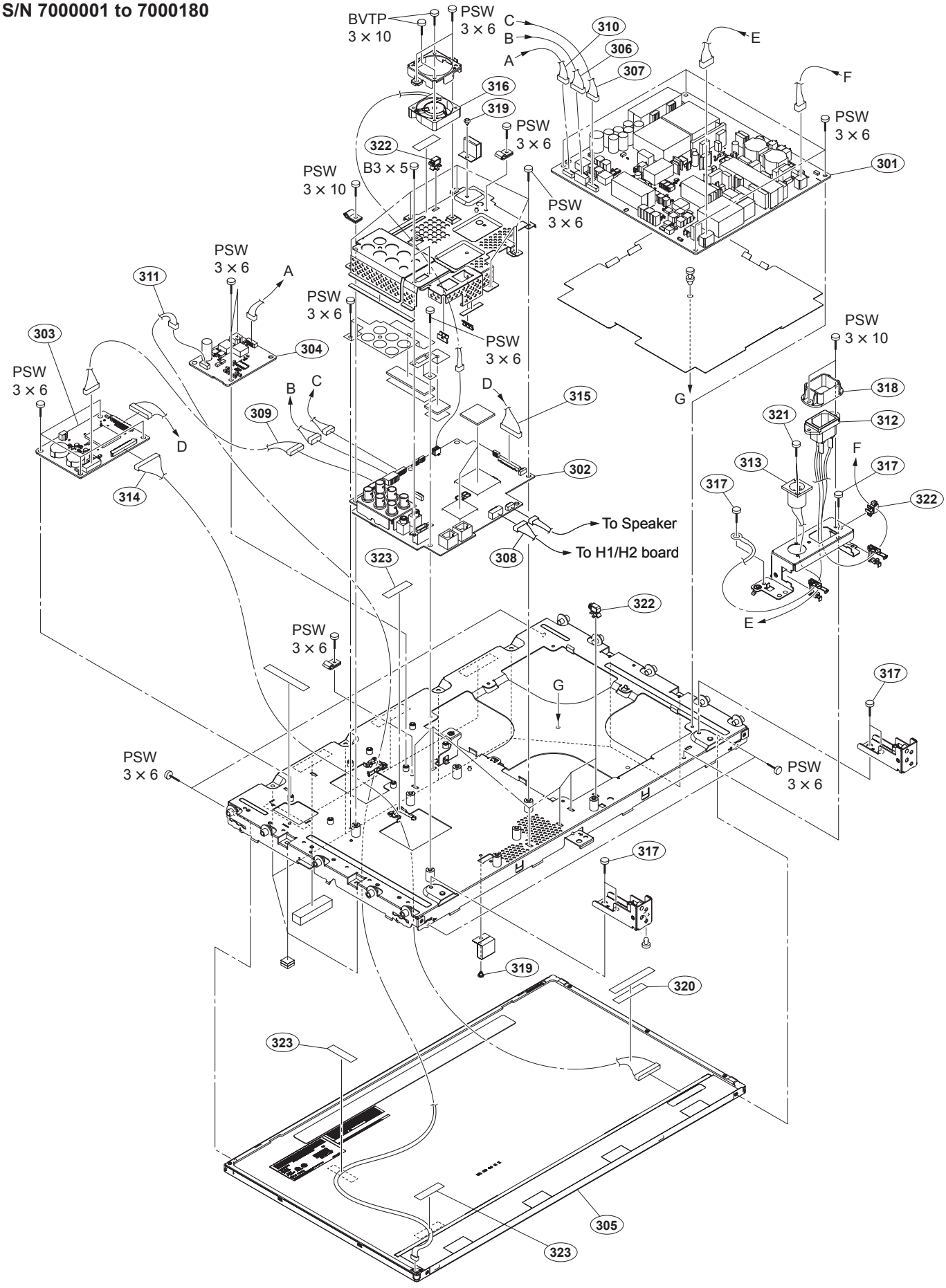
Cover Block (LMD-A220)



No.	Part No.	SP	Description
201	A-2015-470-A	s	MOUNTED CIRCUIT BOARD, H1
202	A-2015-476-A	s	BLOCK, STAND
203	A-2015-478-A	s	MOUNTED CIRCUIT BOARD, H2
204	X-2588-938-2	s	KEYPAD ASSY, CONTROL
205	X-2588-939-1	s	KEYPAD ASSY, INPUT
206	X-2589-227-2	s	BEZEL ASSY (22)
207	X-2589-230-1	s	REAR COVER ASSY (22)
208	1-859-036-13	s	MINIATURE SPEAKER (WITH HARNESS)
209	2-580-602-01	s	SCREW, +PSW M4X12
210	2-580-639-01	s	SCREW, +BVTP 4X12 TYPE2 IT-3
211	3-087-319-01	o	CUSHION, FOOT
212	3-275-891-11	s	COVER, USB
213	4-098-147-41	s	CLAMP
214	4-484-602-03	s	HANDLE
215	4-487-558-01	s	NUT (M6X0.5)
216	4-488-286-01	s	KNOB, ROTARY ENCODER
217	4-488-287-01	s	BUTTON, STANDBY
218	4-529-786-01	s	TERMINAL LABEL
	7-682-949-09	s	SCREW +PSW 3X10
	7-685-647-71	s	SCREW +BVTP 3X10 TYPE2 IT-3

Board and LCD Block (LMD-A220)

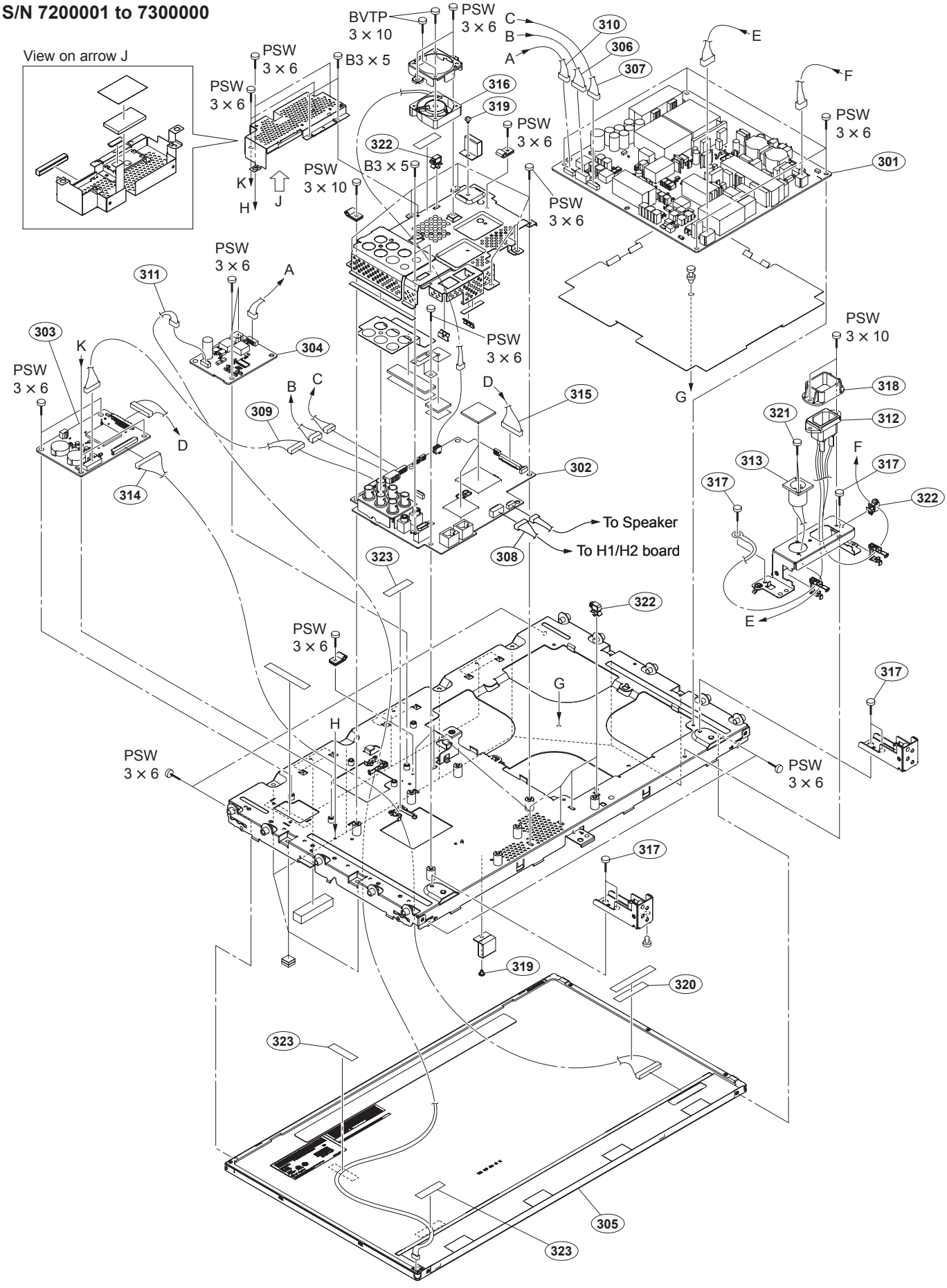
SY: S/N 7000001 to 7000180



No.		Part No.	SP	Description
301		A-2015-471-A	s	MOUNTED CIRCUIT BOARD, G6(22)
302		A-2015-473-A	s	MOUNTED CIRCUIT BOARD, QB
303		A-2015-480-A	s	MOUNTED CIRCUIT BOARD, BI
304		A-2015-481-A	s	MOUNTED CIRCUIT BOARD, LD1(22)
305	⚠	A-2070-645-A	s	LCD UNIT (SERVICE)
306		1-848-245-11	s	CONNECTOR ASSY (6P)
307		1-848-246-11	s	CONNECTOR ASSY (9P)
308		1-848-248-11	s	CONNECTOR ASSY (20P)
309		1-848-250-11	s	CONNECTOR ASSY (6P)
310		1-848-251-11	s	CONNECTOR ASSY (8P)
311		1-848-252-11	s	CONNECTOR ASSY (6P)
312	⚠	1-848-254-11	s	AC CONNECTOR ASSY (3P)
313	⚠	1-848-256-11	s	CONNECTOR ASSY (4P)
314		1-848-257-11	s	CONNECTOR ASSY (LVDS30P)
315		1-848-259-11	s	CONNECTOR ASSY (LVDS41P)
316	⚠	1-855-048-11	s	DC FAN 40MM
317		2-434-609-02	s	SCREW (M4X8)
318		2-990-241-02	s	HOLDER (A), PLUG
319		3-531-576-01	s	RIVET
320		4-000-499-01	s	TAPE (OF)
321		4-035-802-01	s	SCREW (M2.6X.6)
322		4-098-147-41	s	CLAMP
323		4-100-136-01	s	SHEET (CORE), C
		7-682-546-09	s	SCREW +B 3X5
		7-682-947-01	s	SCREW +PSW 3X6
		7-682-949-09	s	SCREW +PSW 3X10
		7-685-647-71	s	SCREW +BVTP 3X10 TYPE2 IT-3

Board and LCD Block (LMD-A220)

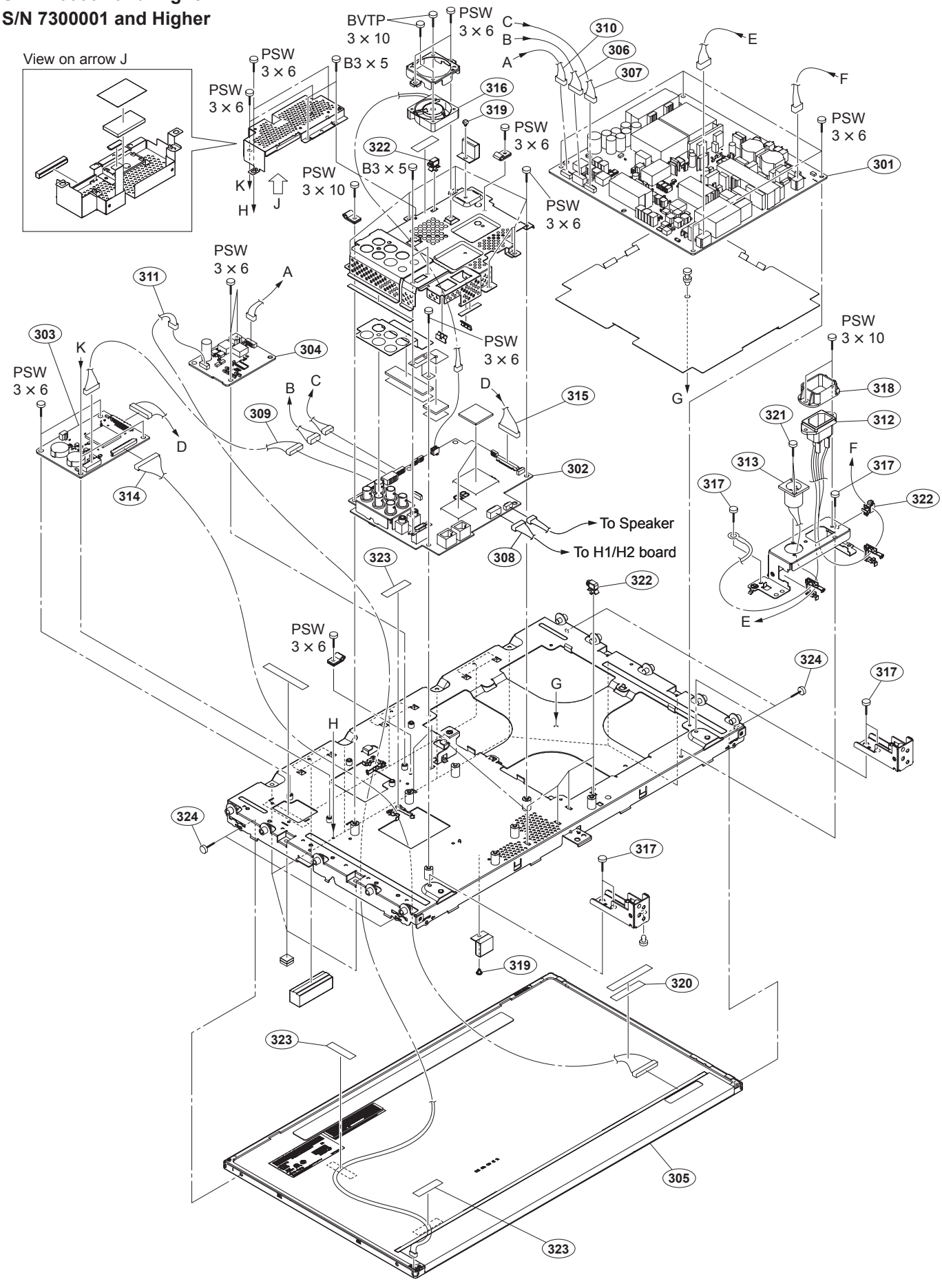
SY: S/N 7000181 to 7100000
CN: S/N 7200001 to 7300000



No.		Part No.	SP	Description
301		A-2015-471-A	s	MOUNTED CIRCUIT BOARD, G6(22)
302		A-2015-473-B	s	MOUNTED CIRCUIT BOARD, QB
303		A-2015-480-A	s	MOUNTED CIRCUIT BOARD, BI
304		A-2015-481-B	s	MOUNTED CIRCUIT BOARD, LD1(22)
305	⚠	A-2070-645-A	s	LCD UNIT (SERVICE)
306		1-848-245-12	s	CONNECTOR ASSY (6P)
307		1-848-246-12	s	CONNECTOR ASSY (9P)
308		1-848-248-11	s	CONNECTOR ASSY (20P)
309		1-848-250-11	s	CONNECTOR ASSY (6P)
310		1-848-251-11	s	CONNECTOR ASSY (8P)
311		1-848-252-11	s	CONNECTOR ASSY (6P)
312	⚠	1-848-254-11	s	AC CONNECTOR ASSY (3P)
313	⚠	1-848-256-12	s	CONNECTOR ASSY (4P)
314		1-848-257-11	s	CONNECTOR ASSY (LVDS30P)
315		1-848-259-11	s	CONNECTOR ASSY (LVDS41P)
316	⚠	1-855-048-11	s	DC FAN 40MM
317		2-434-609-02	s	SCREW (M4X8)
318		2-990-241-02	s	HOLDER (A), PLUG
319		3-531-576-01	s	RIVET
320		4-000-499-01	s	TAPE (OF)
321		4-035-802-01	s	SCREW (M2.6X.6)
322		4-098-147-41	s	CLAMP
323		4-100-136-01	s	SHEET (CORE), C
		7-682-546-09	s	SCREW +B 3X5
		7-682-947-01	s	SCREW +PSW 3X6
		7-682-949-09	s	SCREW +PSW 3X10
		7-685-647-71	s	SCREW +BVTP 3X10 TYPE2 IT-3

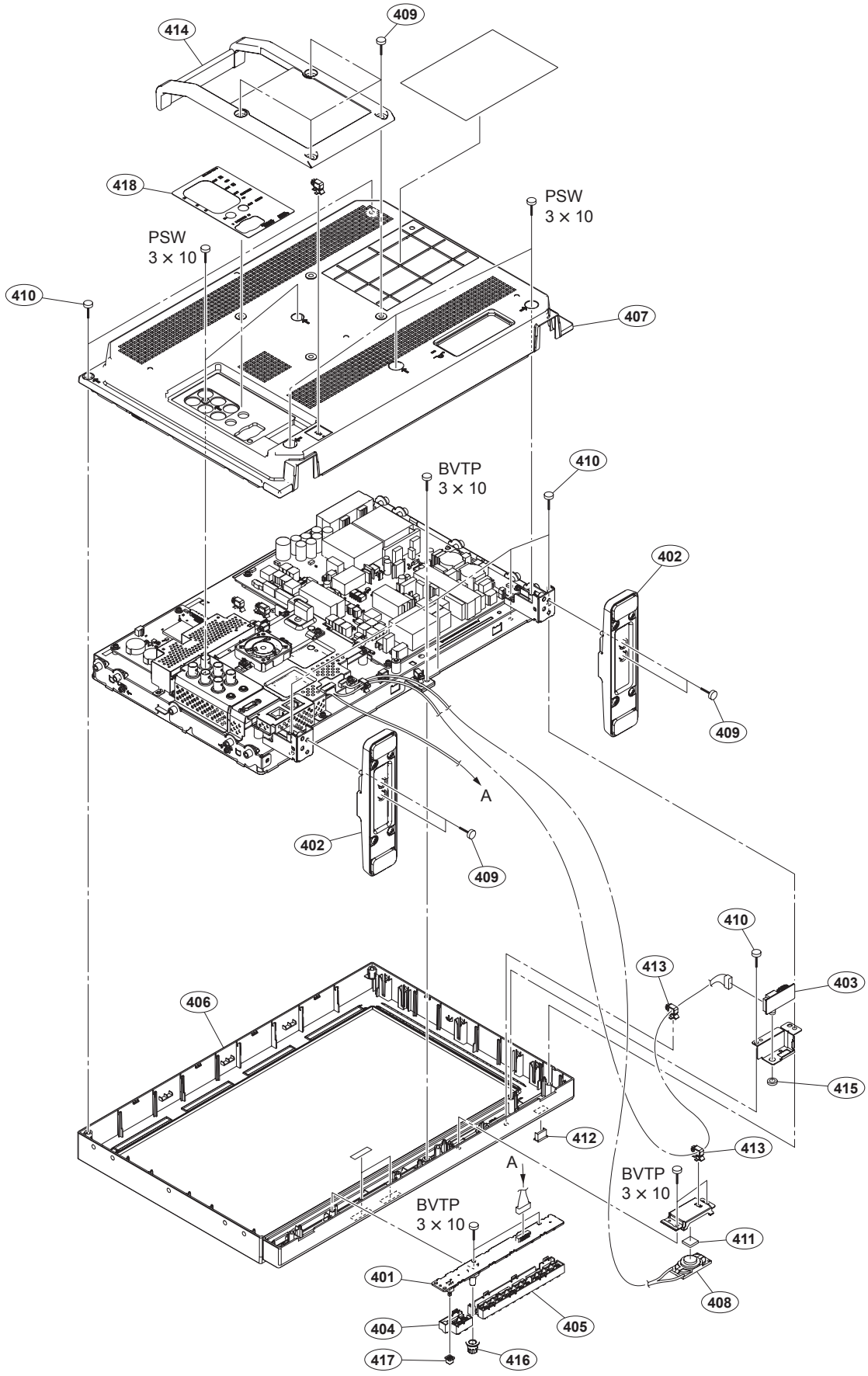
Board and LCD Block (LMD-A220)

SY: S/N 7100001 and Higher
CN: S/N 7300001 and Higher



No.		Part No.	SP	Description
301		A-2015-471-A	s	MOUNTED CIRCUIT BOARD, G6(22)
302		A-2015-473-C	s	MOUNTED CIRCUIT BOARD, QB
303		A-2015-480-A	s	MOUNTED CIRCUIT BOARD, BI
304		A-2015-481-B	s	MOUNTED CIRCUIT BOARD, LD1(22)
305	⚠	1-812-201-11	s	LCD PANEL
306		1-848-245-12	s	CONNECTOR ASSY (6P)
307		1-848-246-12	s	CONNECTOR ASSY (9P)
308		1-848-248-11	s	CONNECTOR ASSY (20P)
309		1-848-250-11	s	CONNECTOR ASSY (6P)
310		1-848-251-11	s	CONNECTOR ASSY (8P)
311		1-848-252-11	s	CONNECTOR ASSY (6P)
312	⚠	1-848-254-11	s	AC CONNECTOR ASSY (3P)
313	⚠	1-848-256-12	s	CONNECTOR ASSY (4P)
314		1-848-257-11	s	CONNECTOR ASSY (LVDS30P)
315		1-848-259-11	s	CONNECTOR ASSY (LVDS41P)
316	⚠	1-855-048-11	s	DC FAN 40MM
317		2-434-609-02	s	SCREW (M4X8)
318		2-990-241-02	s	HOLDER (A), PLUG
319		3-531-576-01	s	RIVET
320		4-000-499-01	s	TAPE (OF)
321		4-035-802-01	s	SCREW (M2.6X.6)
322		4-098-147-41	s	CLAMP
323		4-100-136-01	s	SHEET (CORE), C
324		4-531-506-01	s	SCREW UG-EL (+B M3)
		7-682-546-09	s	SCREW +B 3X5
		7-682-947-01	s	SCREW +PSW 3X6
		7-682-949-09	s	SCREW +PSW 3X10
		7-685-647-71	s	SCREW +BVTP 3X10 TYPE2 IT-3

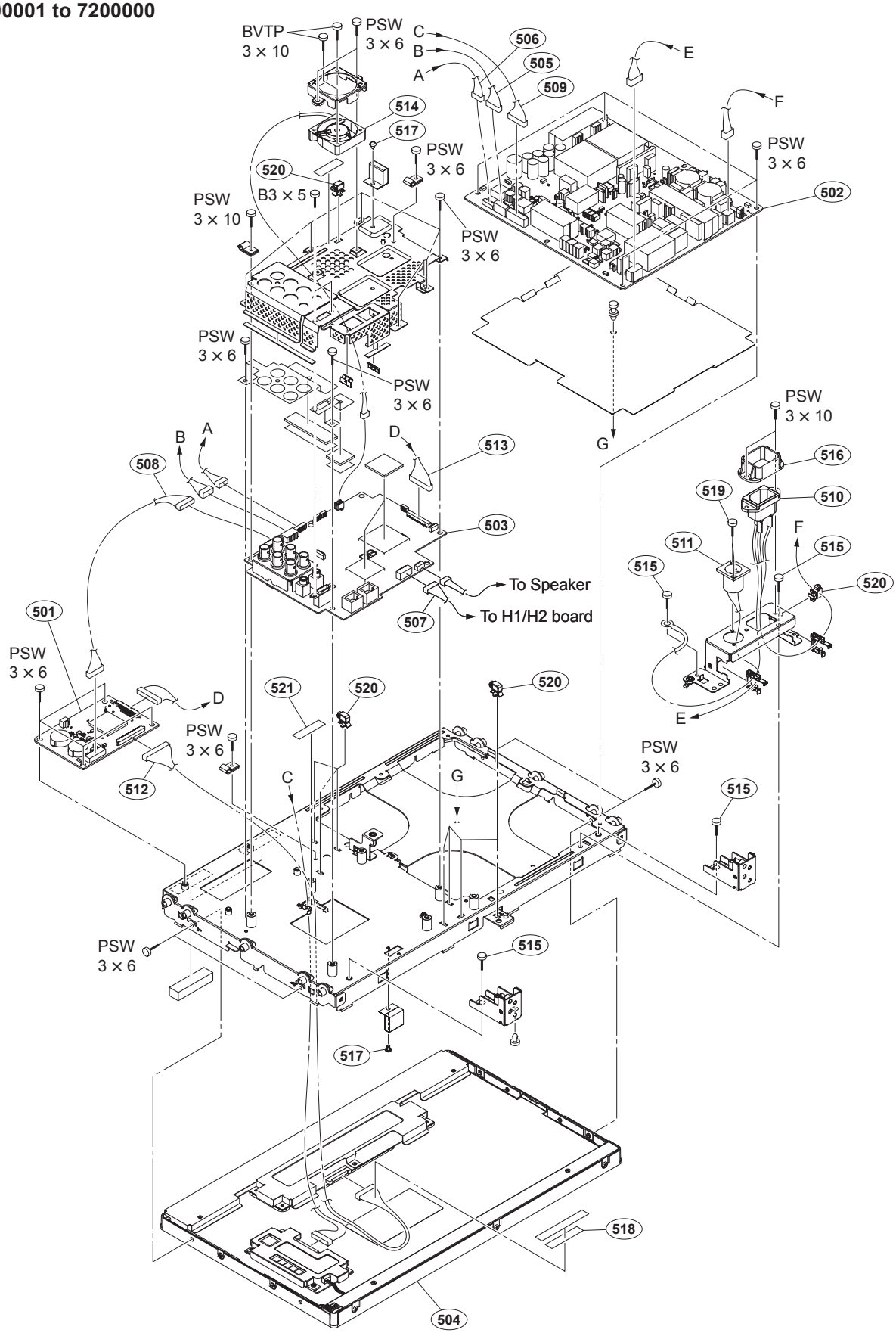
Cover Block (LMD-A170)



No.	Part No.	SP	Description
401	A-2015-470-A	s	MOUNTED CIRCUIT BOARD, H1
402	A-2015-476-A	s	BLOCK, STAND
403	A-2015-478-A	s	MOUNTED CIRCUIT BOARD, H2
404	X-2588-938-2	s	KEYPAD ASSY, CONTROL
405	X-2588-939-1	s	KEYPAD ASSY, INPUT
406	X-2589-228-2	s	BEZEL ASSY (17)
407	X-2589-231-1	s	REAR COVER ASSY (17)
408	1-859-036-13	s	MINIATURE SPEAKER (WITH HARNESS)
409	2-580-602-01	s	SCREW, +PSW M4X12
410	2-580-639-01	s	SCREW, +BVTP 4X12 TYPE2 IT-3
411	3-087-319-01	o	CUSHION, FOOT
412	3-275-891-11	s	COVER, USB
413	4-098-147-41	s	CLAMP
414	4-484-602-03	s	HANDLE
415	4-487-558-01	s	NUT (M6X0.5)
416	4-488-286-01	s	KNOB, ROTARY ENCODER
417	4-488-287-01	s	BUTTON, STANDBY
418	4-529-786-01	s	TERMINAL LABEL
	7-682-949-09	s	SCREW +PSW 3X10
	7-685-647-71	s	SCREW +BVTP 3X10 TYPE2 IT-3

Board and LCD Block (LMD-A170)

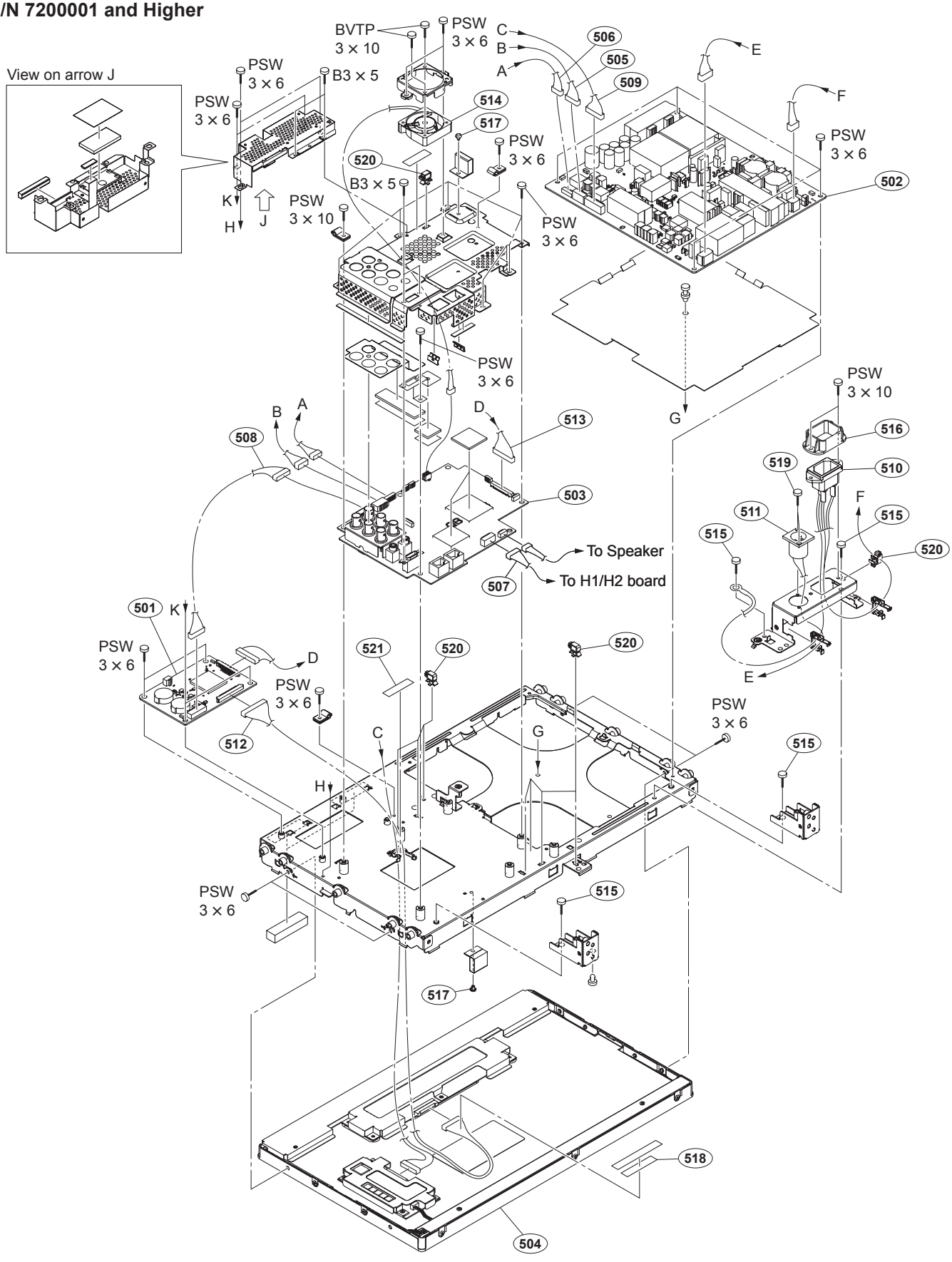
SY: S/N 7000001 to 7000915
CN: S/N 7000001 to 7200000



No.		Part No.	SP	Description
501		A-2015-480-A	s	MOUNTED CIRCUIT BOARD, BI
502		A-2015-637-A	s	MOUNTED CIRCUIT BOARD, G5
503		A-2015-639-A	s	MOUNTED CIRCUIT BOARD, QB
504	⚠	1-811-993-11	s	LCD PANEL
505		1-848-245-11	s	CONNECTOR ASSY (6P)
506		1-848-246-11	s	CONNECTOR ASSY (9P)
507		1-848-247-11	s	CONNECTOR ASSY (20P)
508		1-848-250-11	s	CONNECTOR ASSY (6P)
509		1-848-253-11	s	CONNECTOR ASSY (10P)
510	⚠	1-848-255-11	s	AC CONNECTOR ASSY (3P)
511	⚠	1-848-256-11	s	CONNECTOR ASSY (4P)
512		1-848-258-11	s	CONNECTOR ASSY (LVDS41P)
513		1-848-259-11	s	CONNECTOR ASSY (LVDS41P)
514	⚠	1-855-048-11	s	DC FAN 40MM
515		2-434-609-02	s	SCREW (M4X8)
516		2-990-241-02	s	HOLDER (A), PLUG
517		3-531-576-01	s	RIVET
518		4-000-499-01	s	TAPE (OF)
519		4-035-802-01	s	SCREW (M2.6X.6)
520		4-098-147-41	s	CLAMP
521		4-100-136-01	s	SHEET (CORE), C
		7-682-546-09	s	SCREW +B 3X5
		7-682-947-01	s	SCREW +PSW 3X6
		7-682-949-09	s	SCREW +PSW 3X10
		7-685-647-71	s	SCREW +BVTP 3X10 TYPE2 IT-3

Board and LCD Block (LMD-A170)

SY: S/N 7000916 and Higher
CN: S/N 7200001 and Higher



No.		Part No.	SP	Description
501		A-2015-480-A	s	MOUNTED CIRCUIT BOARD, BI
502		A-2015-637-A	s	MOUNTED CIRCUIT BOARD, G5
503		A-2015-639-B	s	MOUNTED CIRCUIT BOARD, QB
504	⚠	1-811-993-11	s	LCD PANEL
505		1-848-245-12	s	CONNECTOR ASSY (6P)
506		1-848-246-12	s	CONNECTOR ASSY (9P)
507		1-848-247-11	s	CONNECTOR ASSY (20P)
508		1-848-250-11	s	CONNECTOR ASSY (6P)
509		1-848-253-12	s	CONNECTOR ASSY (10P)
510	⚠	1-848-255-11	s	AC CONNECTOR ASSY (3P)
511	⚠	1-848-256-12	s	CONNECTOR ASSY (4P)
512		1-848-258-11	s	CONNECTOR ASSY (LVDS41P)
513		1-848-259-11	s	CONNECTOR ASSY (LVDS41P)
514	⚠	1-855-048-11	s	DC FAN 40MM
515		2-434-609-02	s	SCREW (M4X8)
516		2-990-241-02	s	HOLDER (A), PLUG
517		3-531-576-01	s	RIVET
518		4-000-499-01	s	TAPE (OF)
519		4-035-802-01	s	SCREW (M2.6X.6)
520		4-098-147-41	s	CLAMP
521		4-100-136-01	s	SHEET (CORE), C
		7-682-546-09	s	SCREW +B 3X5
		7-682-947-01	s	SCREW +PSW 3X6
		7-682-949-09	s	SCREW +PSW 3X10
		7-685-647-71	s	SCREW +BVTP 3X10 TYPE2 IT-3

4-3. Electrical Parts List

```
------------------
G5 BOARD (LMD-A170)
------------------
 Ref. No.
 or Q'ty  Part No.    SP Description

 F5501  ⚠ 1-576-566-21 s FUSE (15A/65V)
 F5502  ⚠ 1-576-566-21 s FUSE (15A/65V)
 F6000  ⚠ 1-576-233-51 s FUSE (6.3A/250V)
 F6600  ⚠ 1-576-270-21 s FUSE (4A/125V)
```

```
-----------------------
G6 BOARD (LMD-A240/A220)
-----------------------
 Ref. No.
 or Q'ty  Part No.    SP Description

 F5501    1-576-566-21 s FUSE (15A/65V)
 F5502    1-576-566-21 s FUSE (15A/65V)
 F6000    1-576-233-51 s FUSE (6.3A/250V)
 F6600    1-576-270-21 s FUSE (4A/125V)
```

```
--------
QB BOARD
--------
 Ref. No.
 or Q'ty  Part No.    SP Description

 F7617  ⚠ 1-576-850-31 s FUSE (3.15A/24V)
 F7618  ⚠ 1-576-850-31 s FUSE (3.15A/24V)

 IC3000   6-714-240-01 s IC GS2984-INTE3
 IC3001   6-717-047-01 s IC GS2988-INTE3Z
 IC3100   6-714-240-01 s IC GS2984-INTE3
 IC3101   6-717-047-01 s IC GS2988-INTE3Z
 IC5302   6-721-463-01 s IC W25Q64FVSSIG

 IC7601   6-716-852-01 s IC TPS54425PWPR
 IC7617   6-717-068-01 s IC TPS54226RGTR
 IC7618   6-717-068-01 s IC TPS54226RGTR
 IC7621   6-716-852-01 s IC TPS54425PWPR

 PS7000 ⚠ 1-533-282-21 s IC LINK (2A/72V)
 PS7001 ⚠ 1-533-282-21 s IC LINK (2A/72V)
```

4-4. Packing Materials & Supplied Accessories

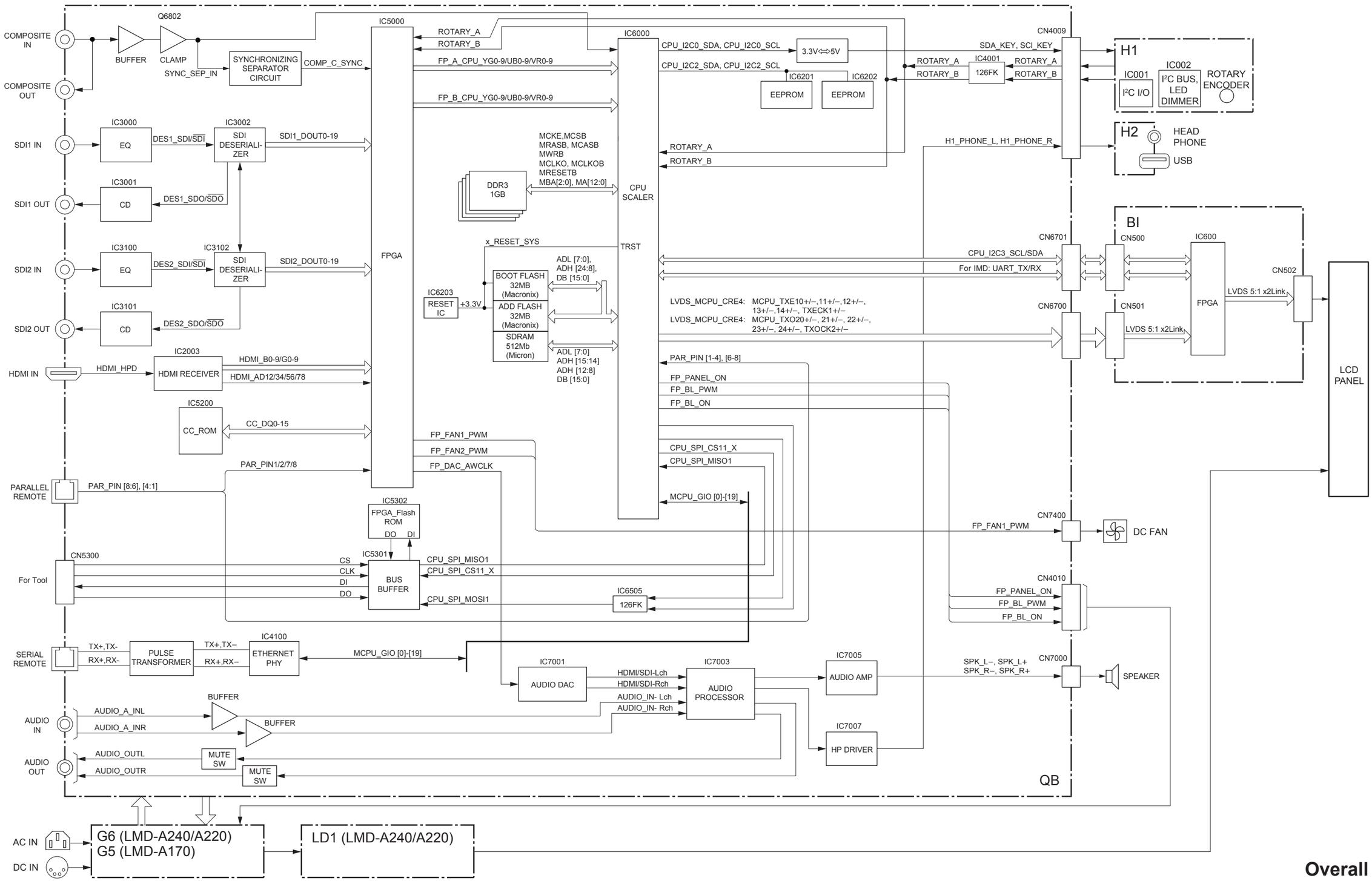
```
---------------------------------------
PACKING MATERIALS & SUPPLIED ACCESSORIES
---------------------------------------

 *1:[For SY]
 *2:[For CN]

 Ref. No.
 or Q'ty  Part No.    SP Description

 1pc *1 ⚠ 1-791-041-33 s CORD SET, POWER (For J)
 1pc *1 ⚠ 1-793-461-12 s PLUG, CONVERSION (3P-2P) (For J)
 1pc *2 ⚠ 1-830-860-12 s AC POWER-SUPPLY CORD
 1pc      2-990-242-01 s HOLDER (B), PLUG
 1pc *1 ⚠ 4-527-033-05 s CD-ROM
                         OPERATING INSTRUCTIONS (PDF)
                         (JAPANESE, ENGLISH, FRENCH, GERMAN,
                          ITALIAN, SPANISH, SIMPLIFIED CHINESE,
                          TRADITIONAL CHINESE, KOREAN)
```

4-5. BKM-PL17 (For LMD-A170)

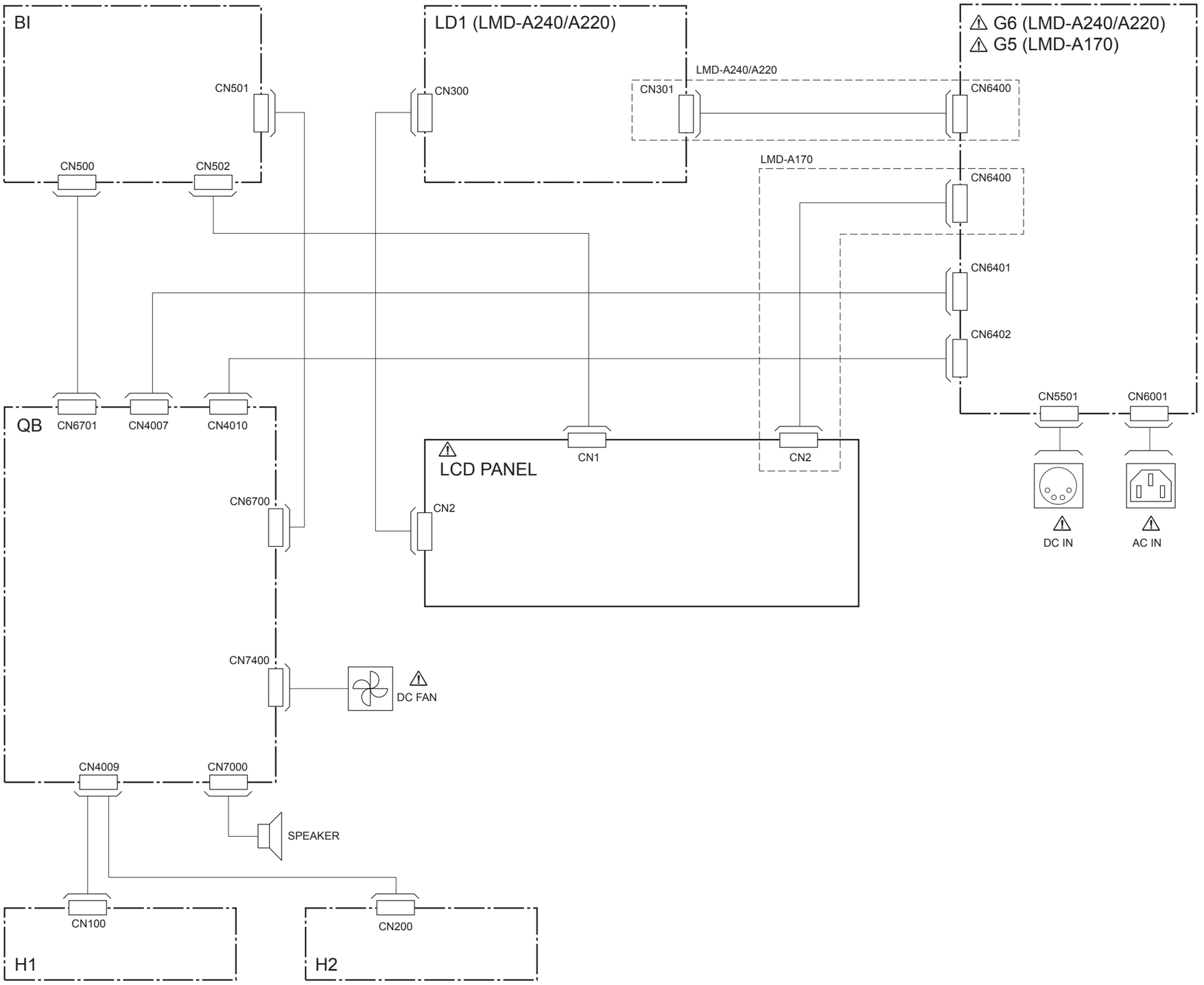
```
 Ref. No.
 or Q'ty  Part No.    SP Description

 1pc      X-2025-305-1 s CLOTH ASSY, CLEANING
 1pc      X-2589-442-1 s HOLDER ASSY (TR), PROTECTION
 1pc      X-2589-443-1 s HOLDER ASSY (BR), PROTECTION
 1pc      X-2589-444-1 s HOLDER ASSY (TL), PROTECTION
 1pc      X-2589-445-1 s HOLDER ASSY (BL), PROTECTION

 1pc      4-532-332-01 s PLATE (L17), PROTECTION
```

Section 5
Diagrams

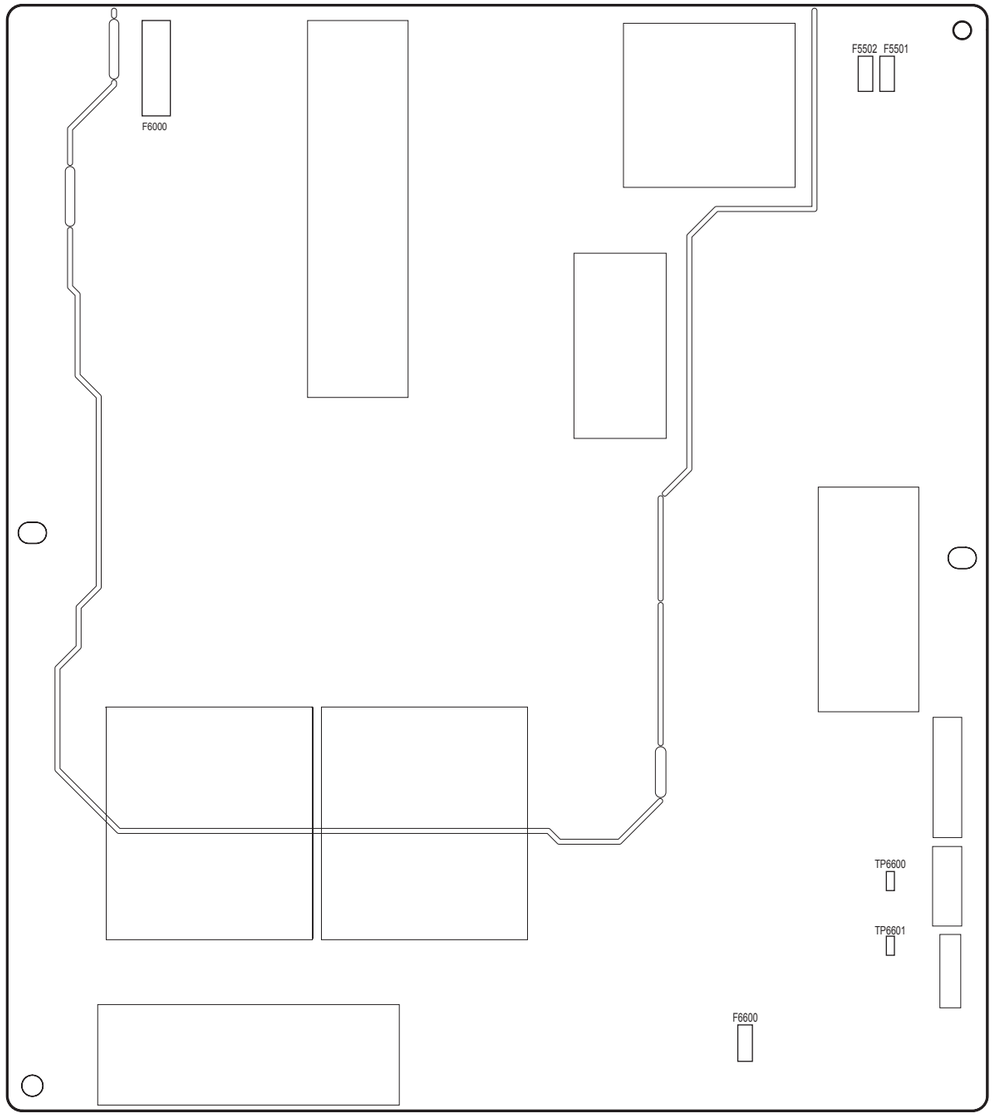
5-1. Overall Block Diagram



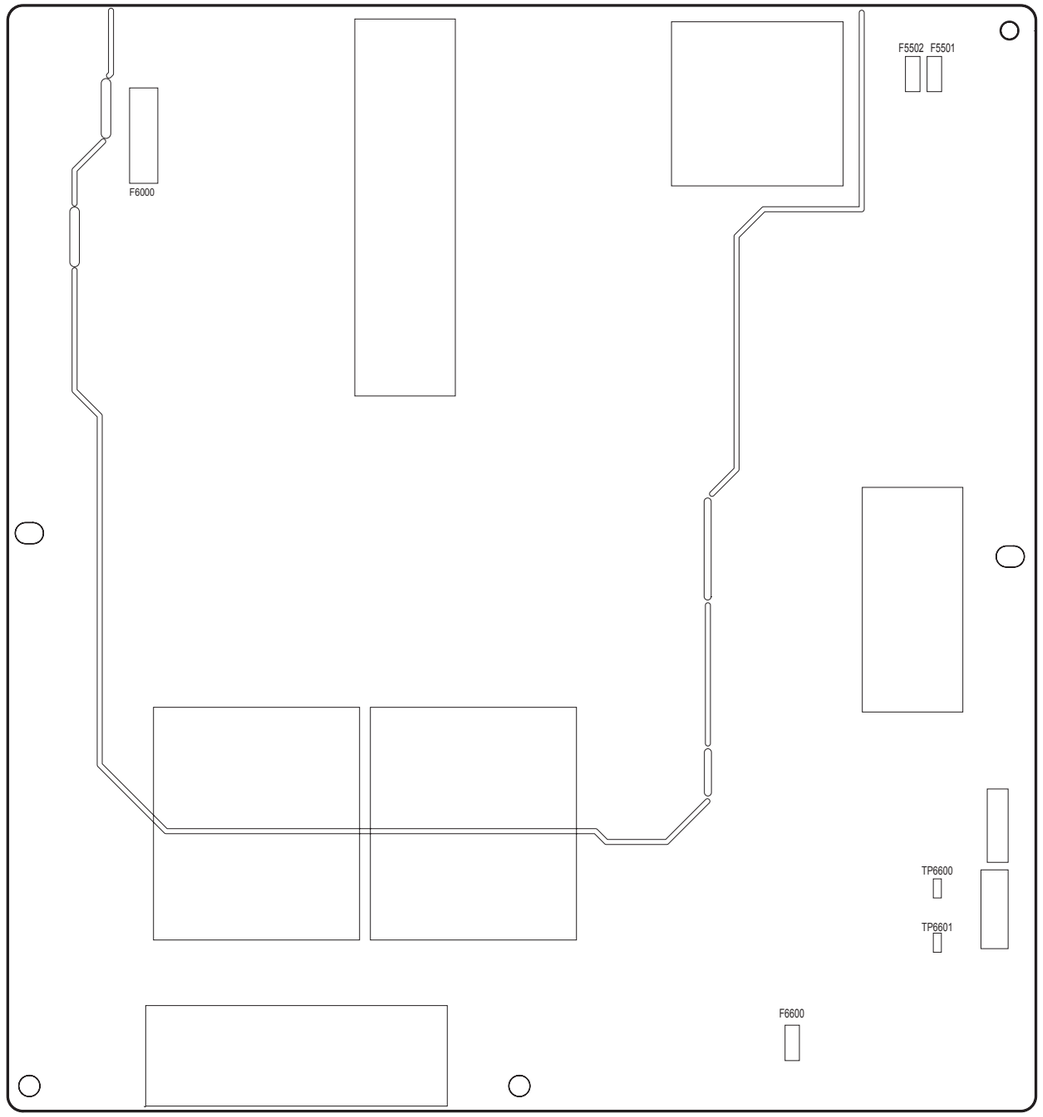
5-2. Frame Wiring



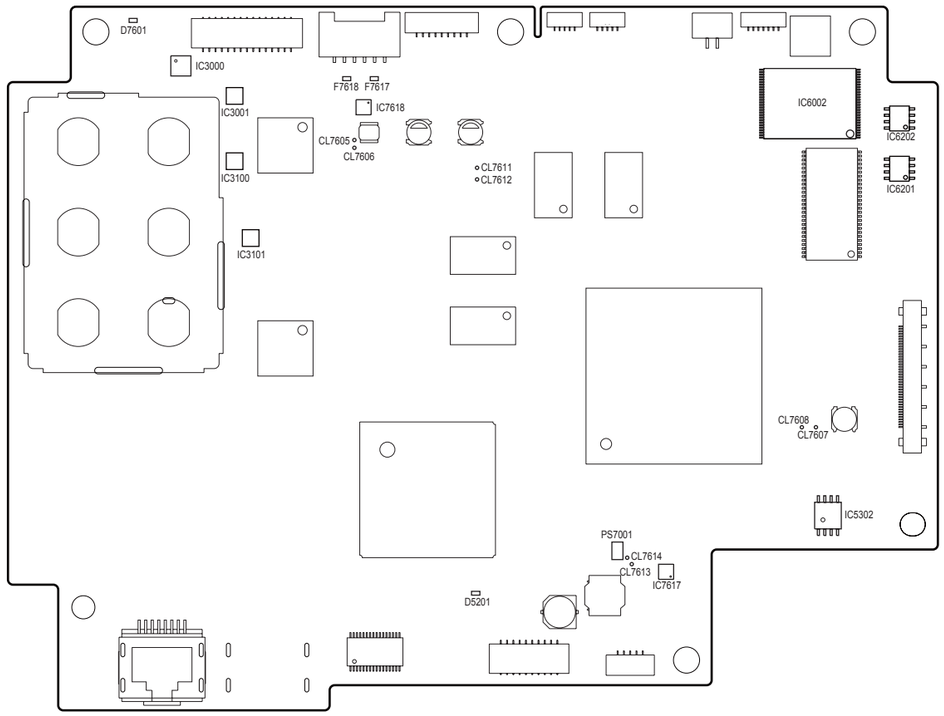
5-3. Board Layouts



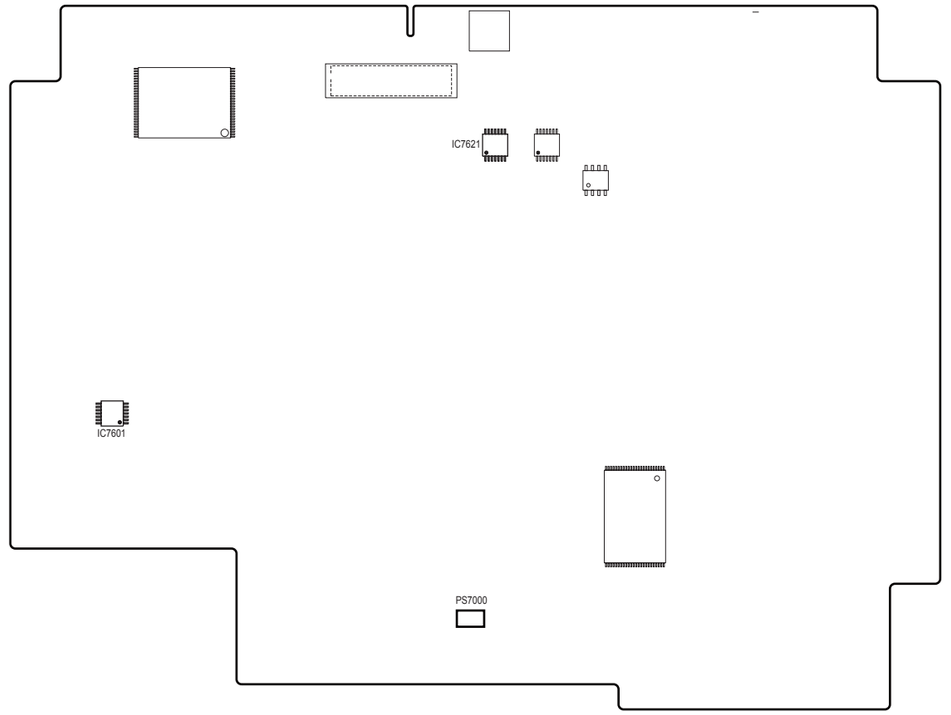
LMD-A170
G5 -A SIDE-
SUFFIX: -11



LMD-A240/A220
G6 -A SIDE-
SUFFIX: -11



QB -A SIDE-
SUFFIX: -11



QB -B SIDE-
SUFFIX: -11

Revision History

Date	History	Contents
2014. 1	1st Edition 9-878-545-01	—
2015. 12	Revised-1 9-878-545-02	New bracket, gaskets, and noise absorption sheet are added, and wiring of the harnesses are changed. • **Modifications:** 1-3. Tightening Torque, 1-4-1. Rear Cover Assembly, 1-4-7. H1 Board, 1-4-10. Bezel Assembly, 1-4-11. LCD Panel, 3-2. LED on a QB Board Lights, 4-4. BKM-PL17 (For LMD-A170) • **Modifications of the exploded view:** Cover Block (LMD-A240), Board and LCD Block (LMD-A240), Cover Block (LMD-A220), Board and LCD Block (LMD-A220), Cover Block (LMD-A170), Board and LCD Block (LMD-A170)
2016. 9	Revised-2 9-878-545-03	• **Modifications:** 1-4. Disassembly, 1-6. Procedures after Replacing the Boards and Parts, 1-7. Software Update, 3-1. LED (Power Switch) on the Front Panel Blinks in Red, 5-4. Top Panel Assembly • **Additions:** 1-5. Preparation for Service, 3-6. When no image is output, and front POWER LED does not light up, 4-3. Electrical Parts List, 5-3. Board Layouts

BKM-PL17 (WW)
LMD-A240 (CN)
LMD-A240 (SY)
LMD-A220 (CN)
LMD-A220 (SY)
LMD-A170 (CN)
LMD-A170 (SY) J, E
9-878-545-03

Sony Corporation

Printed in Japan
2016. 9 32