SONY

HD ELECTRONIC VIEWFINDER

HDVF-EL70
HDVF-EL75

OUTDOOR HOOD
VFH-790

SERVICE MANUAL
1st Edition
Serial No. 120001 and Higher

⚠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.

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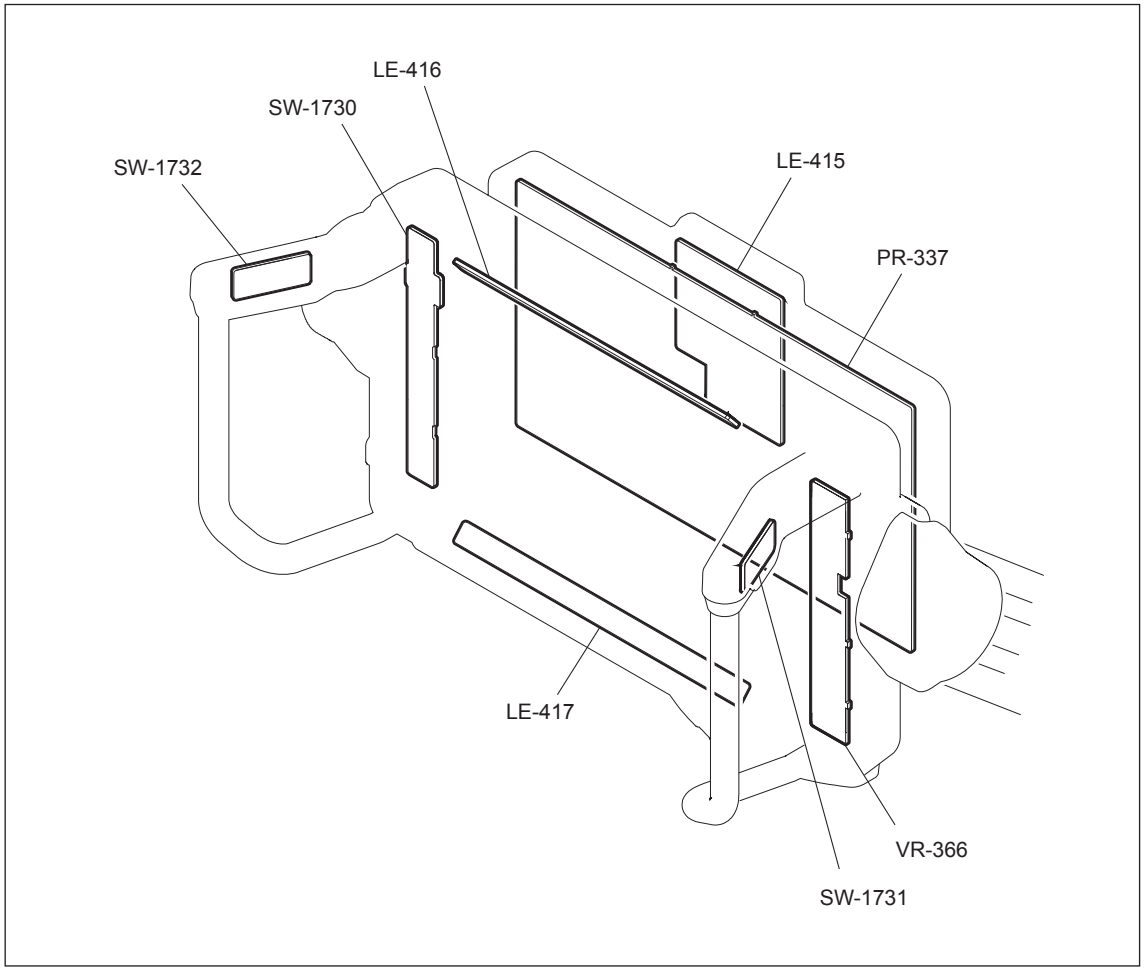
Revision History

Section 1
Service Overview

1-1. Board Location

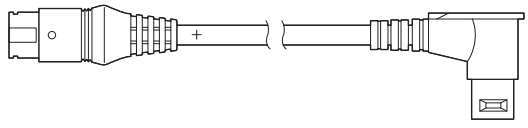


1-2. Connector Input/Output Signals

1-2-1. Conforming Cable

When connecting the HDVF-EL75 to a camera at the time of installation or service, use the supplied VF cable.

Sony part No.: 1-838-608-11



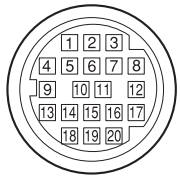
VF side CAMERA side

1-2-2. External Connectors

HDVF-EL75

The following lists input signals and output signals of the VF cable.

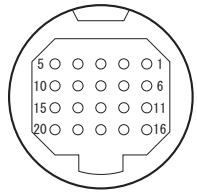
CAMERA (20P, MALE)



(External view)

No.	Signal	I/O	Specifications
1	SDA	IN/OUT	TTL level
2	Y TALLY	IN	ON: +5 V OFF: GND
3	POWER OFF	IN	ON: OPEN OFF: GND
4	SCK	IN	TTL level
5	COLOR/MONO	OUT	MONO: GND COLOR: OPEN
6	NC	–	No connection
7	NC	–	No connection
8	G TALLY	IN	ON: +5 V OFF: GND
9	PEAKING CTL	OUT	0 V to +5 V 0 V: PEAKING OFF +5 V: PEAKING MAX
10	NC	–	No connection
11	NC	–	No connection
12	Y VIDEO (X)	IN	1.0 Vp-p, Zi = 75 Ω
13	VIDEO GND	–	GND for VIDEO
14	Pb VIDEO (X)	IN	0.7 Vp-p, Zi = 75 Ω
15	Pr VIDEO (X)	IN	0.7 Vp-p, Zi = 75 Ω
16	REC (L)	IN	ON: +5 V OFF: GND
17	R TALLY	IN	ON: +5 V OFF: GND
18	NC	–	No connection
19	UNREG GND	–	GND for UNREG
20	UNREG	IN	+10.5 V to 17 V

VF (20P, MALE)

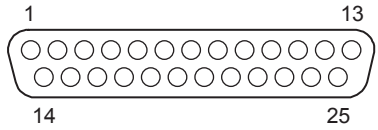


(External view)

No.	Signal	I/O	Specifications
1	SDA	IN/OUT	TTL level
2	Y TALLY	IN	ON: +5 V OFF: GND
3	POWER OFF	IN	ON: OPEN OFF: GND
4	SCK	IN	TTL level
5	COLOR/MONO	OUT	MONO: GND COLOR: OPEN
6	NC	–	No connection
7	UNREG	IN	+10.5 V to 17 V
8	G TALLY	IN	ON: +5 V OFF: GND
9	PEAKING CTL	OUT	0 V to +5 V 0 V: PEAKING OFF +5 V: PEAKING MAX
10	NC	–	No connection
11	UNREG GND	–	GND for UNREG
12	Y VIDEO (X)	IN	1.0 Vp-p, Zi = 75 Ω
13	VIDEO GND	–	GND for VIDEO
14	Pb VIDEO (X)	IN	0.7 Vp-p, Zi = 75 Ω
15	Pr VIDEO (X)	IN	0.7 Vp-p, Zi = 75 Ω
16	REC (L)	IN	ON: +5 V OFF: GND
17	R TALLY	IN	ON: +5 V OFF: GND
18	NC	–	No connection
19	UNREG GND	–	GND for UNREG
20	UNREG	IN	+10.5 V to 17 V

HDVF-EL70

D-SUB (25P, MALE)

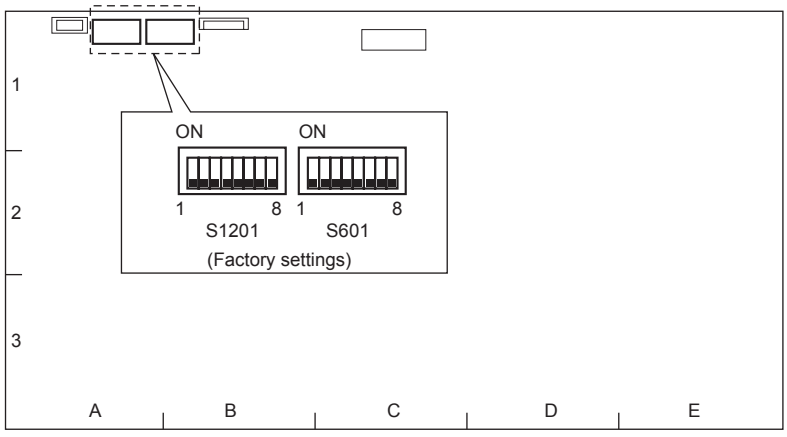


(External view)

No.	Signal	I/O	Specifications
1	Y VIDEO (X)	IN	1.0 Vp-p, Zi = 75 Ω
2	Pr VIDEO GND	–	GND for Pr VIDEO
3	Pr VIDEO (X)	IN	0.7 Vp-p, Zi = 75 Ω
4	Pb VIDEO GND	–	GND for Pb VIDEO
5	Pb VIDEO (X)	IN	0.7 Vp-p, Zi = 75 Ω
6	PEAKING CTL	OUT	ON: +5 V OFF: GND
7	UNREG	IN	+10.5 V to 17 V
8	UNREG	IN	+10.5 V to 17 V
9	UP TALLY	IN	ON: +5 V OFF: GND
10	SDA	IN/OUT	TTL level
11	R TALLY	IN	ON: +5 V OFF: GND
12	NC	–	No connection
13	NC	–	No connection
14	Y VIDEO GND	–	GND for Y VIDEO
15	SCK	IN	TTL level
16	NC	–	No connection
17	CHASSIS GND	–	GND for CHASSIS
18	G TALLY	IN	ON: +5 V OFF: GND
19	UNREG GND	–	GND for UNREG
20	UNREG GND	–	GND for UNREG
21	COLOR/MONO	OUT	COLOR: OPEN MONO: GND
22	NC	–	No connection
23	Y TALLY	IN	ON: +5 V OFF: GND
24	NC	–	No connection
25	NC	–	No connection

1-3. Onboard Switches

PR-337 board



PR-337 board (Side A)

Ref. No.	Name	Bit	Description	Factory setting
S601	TEST SIGNAL	1, 2	Selection of output signal (type) to TP501/PR-337 (For details, refer to “2-3. Internal Test Signal”.)	All OFF
	TEST POINT	3 to 5	Selection of output signal (location) to TP501/PR-337 (For details, refer to “2-3. Internal Test Signal”.)	All OFF
	–	6 to 8	Not used	All OFF
S1201	MODEL	1	Selection of model OFF: HDVF-EL75 ON: HDVF-EL70	Depending on model∗1
	IND SEL 2		Selection of function of upper-right indicator OFF: BATT IND (HDVF-EL75) ON: SECRET IND (HDVF-EL70)	Depending on model∗1
	–	3 to 6	Not used	All OFF
	VERSION UP	7	OFF: Normal	OFF
	–	8	Not used	OFF

∗1: These bits are set to OFF when the board was purchased. Change the setting according to the model that contains this board.

1-4. Circuit Description

PR-337 Board

The PR-337 board consists of a power supply circuit, video amplifier circuit, low-pass filter (LPF), A/D converter circuit, video signal processing circuit, clock generator circuit, tally control circuit, and microprocessor.

(1) Video signal processing

The analog HD Y/Pb/Pr signal input from CN1 is passed through a video amplifier (IC201, IC202, and IC203) and LPF (IC204). After that, the signal is converted into a 10-bit digital signal of 74 Mbps using an A/D converter (IC301) and output to FPGA (IC401).
FPGA discriminates the format of an input signal using the H/V sync signal generated by a sync separator IC (IC206), and outputs the H/V sync signal (by adding PLL to the sync signal) to the A/D converter.
FPGA also distributes the input HD Y/Pb/Pr digital signal input from the A/D converter to two lines. The distributed digital signal is peaked respectively and output to an image processing IC (IC801).
The image processing IC converts image size and IP and also converts the input HD Y/Pb/Pr digital signal into a Quarter HD RGB digital signal. It also sets brightness and contrast and synthesizes two screens.
The qHD RGB digital signal output from the image processing IC is input into FPGA again. FPGA knee-corrects an input signal, superimposes an OSD signal, and outputs it to an LVDS transmitter (IC1101).
The LVDS transmitter converts each 10-bit digital signal of RGB and sync signal into an LVDS signal and outputs it to CN8.

(2) Internal test signal generation

The FPGA (IC401) has internal test signal generator circuits (two in the first-half part and one in the second-half part) and performs switching with a main-line signal.

(3) Control system

CPU (IC1201) mutually communicates with FPGA, and image processing IC by serial communication. It also sets the parameters of the LPF, A/D converter, and clock generator IC (IC481) by I^2C communication. Moreover, the CPU controls a panel module.
The brightness, contrast, and peaking volume level signal lines are connected to the A/D input port of the CPU so as to control them.
The D/A output port of the CPU controls the luminance of the up-tally lamp.
The FPGA (IC401) controls the luminance of a tally and indicator using the PWM control and performs I2C communication with the connected camera.

(4) EEPROM

The setting data and the current conduction duration of this unit are recorded in EEPROM (IC1302) on the PR-337 board. The model information such as the serial number of this unit is recorded in EEPROM (IC1305).

(5) Power supply circuit

The power supply circuit of the unit operates in the proper input voltage range and has 14 outputs including one circuit directly connected to the UNREG power supply.

- Inrush current/reverse connection/backflow/transient burst prevention circuit
  The circuit consisting of an FET (Q1402) immediately after UNREG_IN, a transistor (Q1401), and peripheral parts prevents inrush current, reverse connection, backflow, and transient burst.
  Inrush current is reduced by gradually activating the gate by the current flowing through the Q1402 body diode.

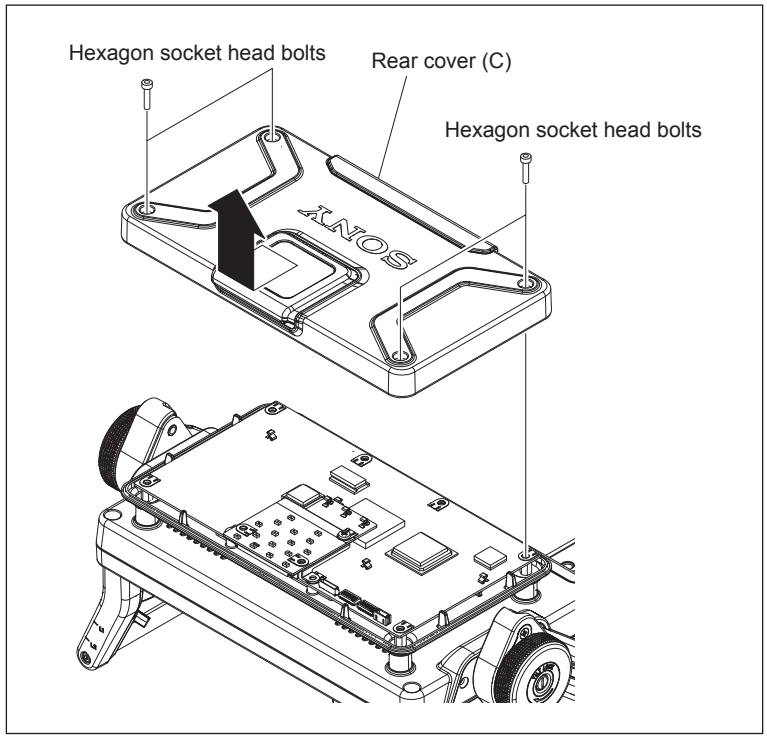
If signals are connected reversely, Q1402 is not activated and no current flows, preventing damage to the unit.
If the UNREG_IN voltage drops about 1 V lower than the lower-limit operating voltage of this power supply, the base of Q1401 turns low and Q1402 is turned off, preventing backflow.
To prevent transient burst and connection to a high-voltage battery outside the proper input voltage range, the zener diode (TVS diode) D1402 prevents an overvoltage of up to about +24 V to be transferred to the subsequent circuit. If a voltage above +24 is input, the fuse F1401 is blown due to short-circuit of the zener diode, activating the protection circuit.

- Input voltage monitoring circuit
  The input voltage monitoring circuit in IC1403 supplies power to the DC/DC converters (IC1501, IC1551, IC1601, IC1751, and IC1801) when the input voltage is in the proper range.
  Power operates within an input voltage range of +9.5 V to +19.0 V when the rated input voltage range of the unit is +10.5 V to +17.0 V. Once the power operates, the operating range extends to an input voltage range of +8.5 V to +19.0 V. When the input voltage drops below +8.5 V or rises above +19.0 V, Q1404 is turned off and the supply of UNREG_IN power voltage is shut off. The power voltage is not supplied to UNREG_SW until it enters the proper voltage range.
- Power control circuit
  A step-down switching regulator consisting of IC1501, IC1551, IC1601, IC1751, and IC1801 generates voltages +5.0V_D0, +8.5V_P, +1.8V_D, +5.0V_A, and FAN_POWER based on the UNREG_SW voltage supplied from the external circuit.
  The +5.0V_D0 voltage is used for the digital circuit (+5.0V_D) and OLED (+5.0V_P), and is also used as the first power voltage for the digital circuit. Based on this voltage, voltages +3.3V_D1 (+3.3V_D), +1.0V_D, and +1.2V_D are generated by the step-down switching regulator (IC1651, IC451, and IC802).
  The +8.5V_P voltage is used for the OLED. The +8.5V_P and +5.0V_P voltages are supplied to the OLED and are turned on and off by the control from the CPU through IC1452. These voltages are monitored by IC1451. In the case of an abnormality, an alarm detection signal is sent through IC1452 to the CPU.
  The +1.8V_D digital voltage is used for the FPGA (IC401), Scaler (IC801), and DDR (IC1001, IC1003). The DDR termination regulator IC1002 generates a VTT bus termination voltage of the DDR memory.
  The +5.0V_A voltage is used for the first-stage of the analog circuit. Based on this voltage, voltages −5.0V_A, +3.3V_A, and +1.8V_A are generated for other analog circuits.
  The −5.0V_A voltage is generated by the charge pump (IC1703) that outputs a negative voltage.
  The +3.3V_A voltage is generated by the LDO (IC1702). Based on this voltage, a +1.8V_A voltage is generated by the LDO (IC1704).
  In addition, a +1.8V_AD voltage is generated based on the +3.3V_D1 voltage.
- Fan control
  The FAN_POWER voltage for the fan is generated by IC1801. A fan mode is set from three modes (fan stop, fan low, and fan high) by the control from the CPU through IC1452. In the case of a fan failure, an alarm detection signal is sent to the CPU. IC1802 monitors the output voltage. When an abnormal output voltage is detected, an alarm detection signal is sent to the CPU through IC1452. Upon receiving this alarm signal, the CPU outputs a fan stop signal through IC1452 to deactivate IC1801.
  To observe the predetermined startup sequence, each power voltage becomes active in the specified sequence using the EN pin of each IC and load switches IC452, IC1502, and IC1602.

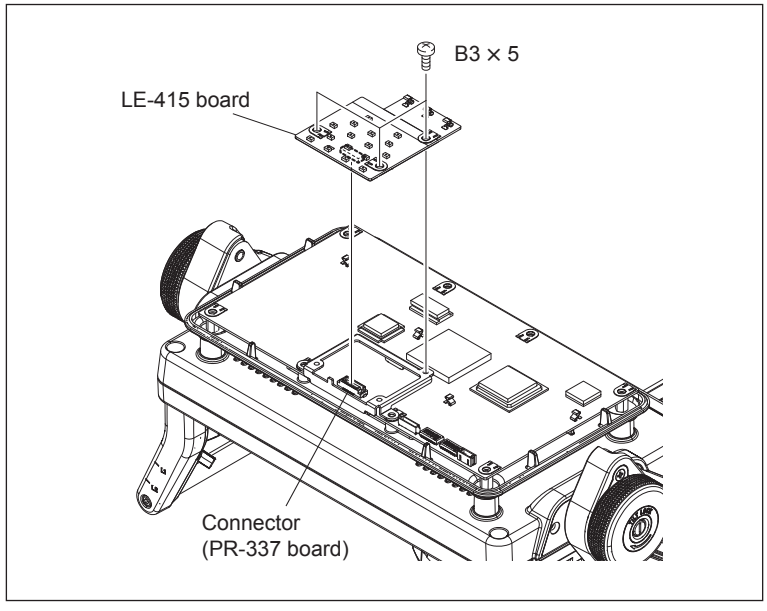
1-5. Removing/Installing Boards

1-5-1. LE-415 Board

1. Remove the four hexagon socket head bolts to detach the rear cover (C) in the arrow direction.



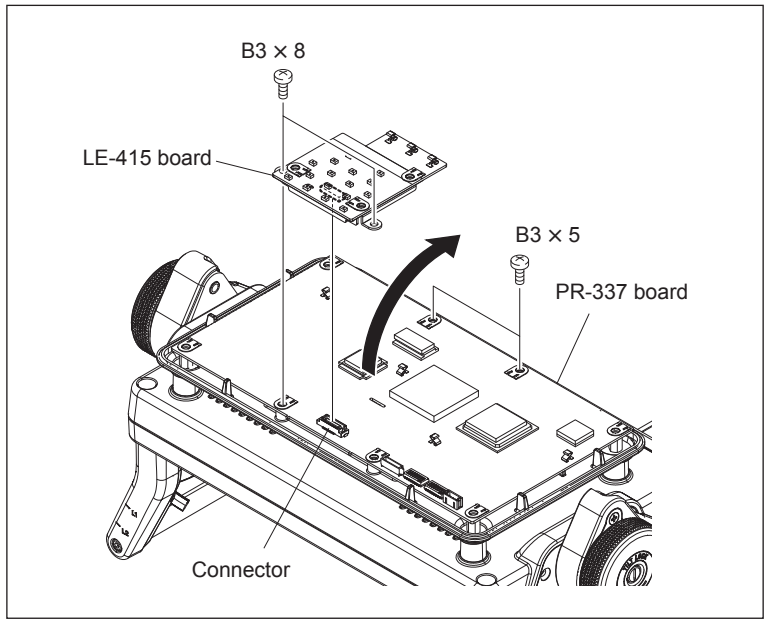
2. Remove the three screws.
3. Remove the LE-415 board from the connector on the PR-337 board.



4. Install the removed parts by reversing the steps of removal.

1-5-2. PR-337 Board

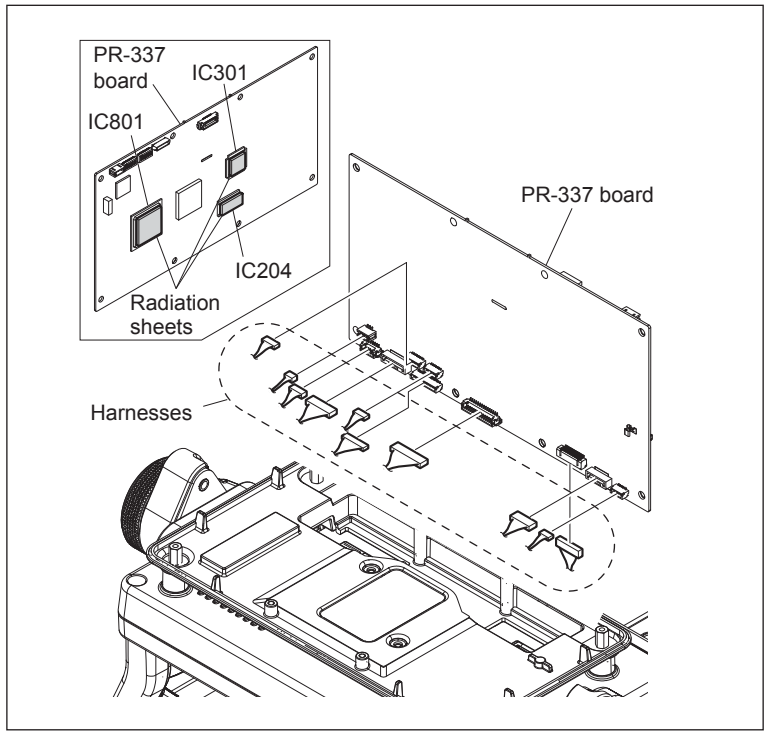
1. Remove the two screws.
2. Remove the LE-415 board from the connector on the PR-337 board with the bracket.
3. Remove the two screws and open the PR-337 board in the arrow direction.



4. Disconnect the 10 harnesses from the connectors on the PR-337 board, and remove the PR-337 board.

Note

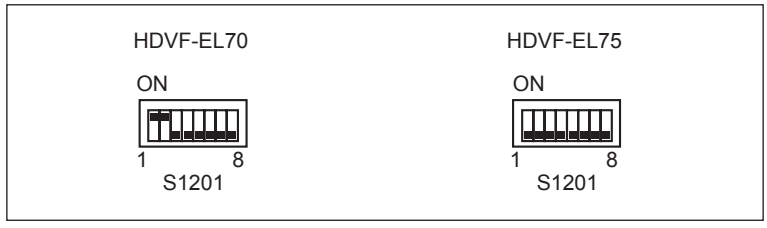
Remove the radiation sheets from IC204, IC301, and IC801, and then reattach them to the same ICs on the new PR-337 board.



5. Make settings of the DIP switch (S1201) on the new PR-337 board. (Refer to Section 1-3.)
6. Install the removed parts by reversing the steps of removal.

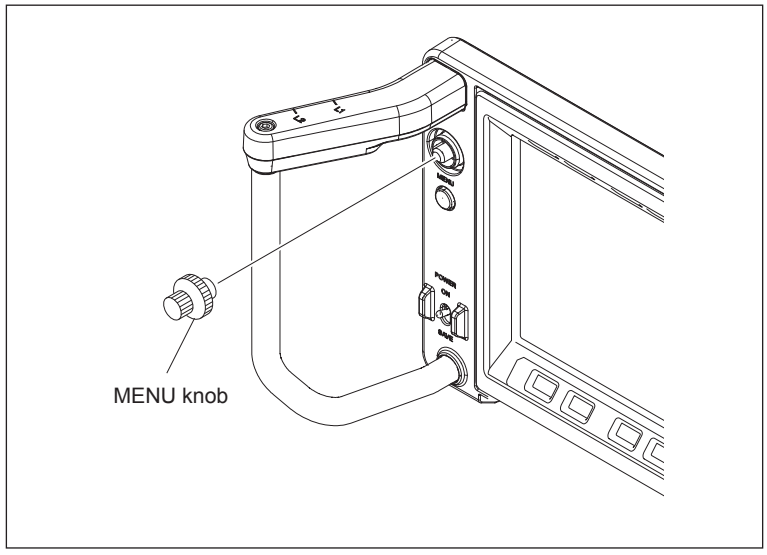
Note

After the PR-337 board is replaced, set the serial number in “S10 SERIAL NO.” of the SERVICE menu. (Refer to Section 3-4.)

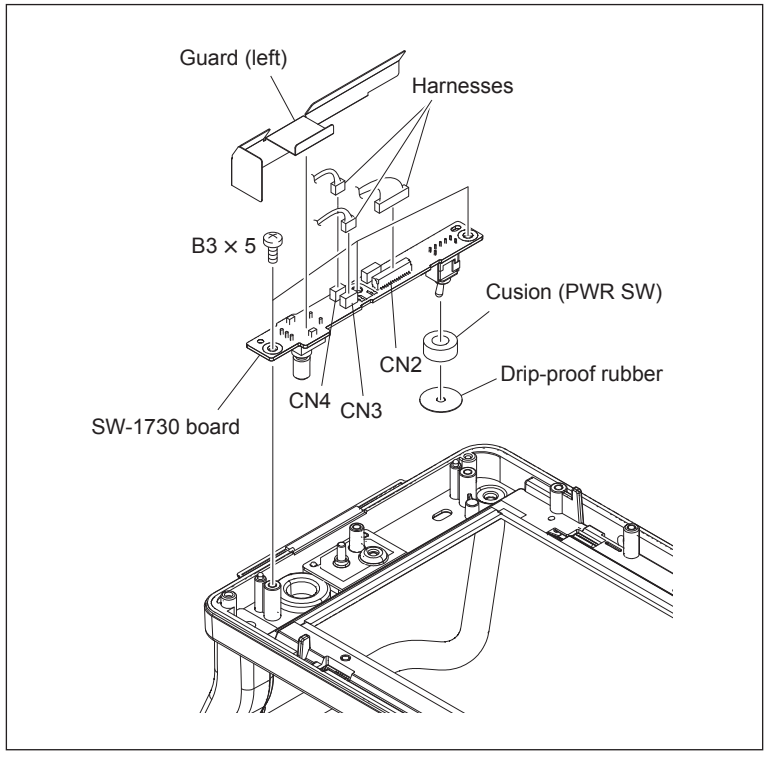


1-5-3. SW-1730 Board

1. Remove the PR-337 board. (Refer to Section 1-5-2.)
2. Remove the OLED panel. (Refer to Section 1-7.)
3. Remove the MENU knob.



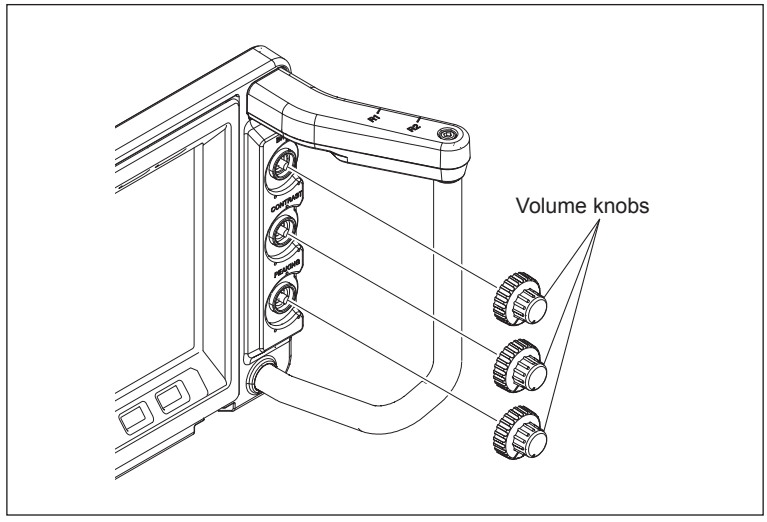
4. Remove the guard (left).
5. Disconnect the three harnesses from the connectors on the SW-1730 board.
6. Remove the three screws and remove the SW-1730 board.
7. Remove the drip-proof rubber and the cushion (PWR SW) from the power switch on the SW-1730 board.



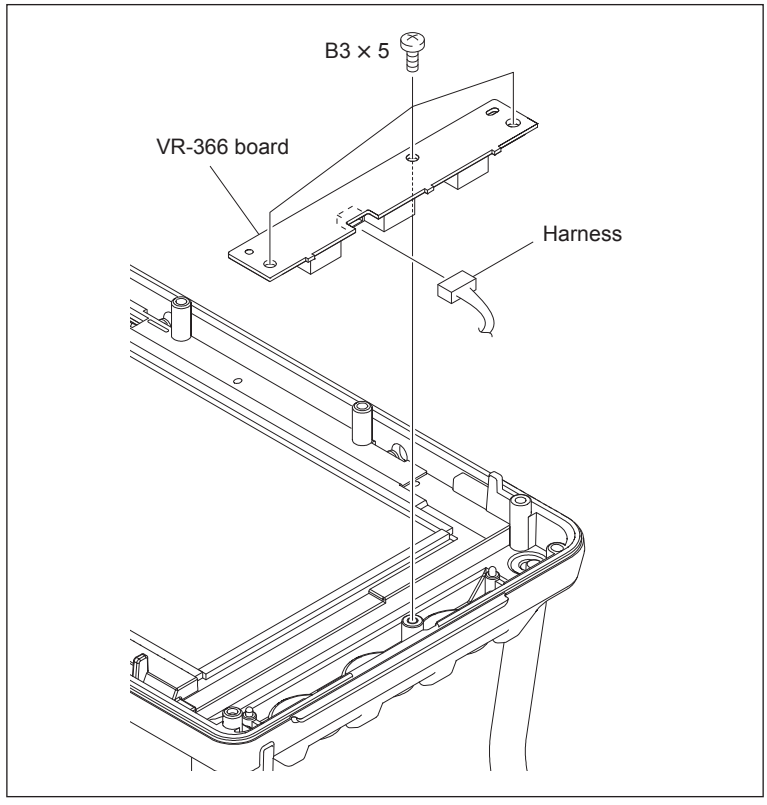
8. Install the removed parts by reversing the steps of removal.

1-5-4. VR-366 Board

1. Remove the PR-337 board. (Refer to Section 1-5-2.)
2. Remove the OLED panel. (Refer to Section 1-7.)
3. Remove the three volume knobs.



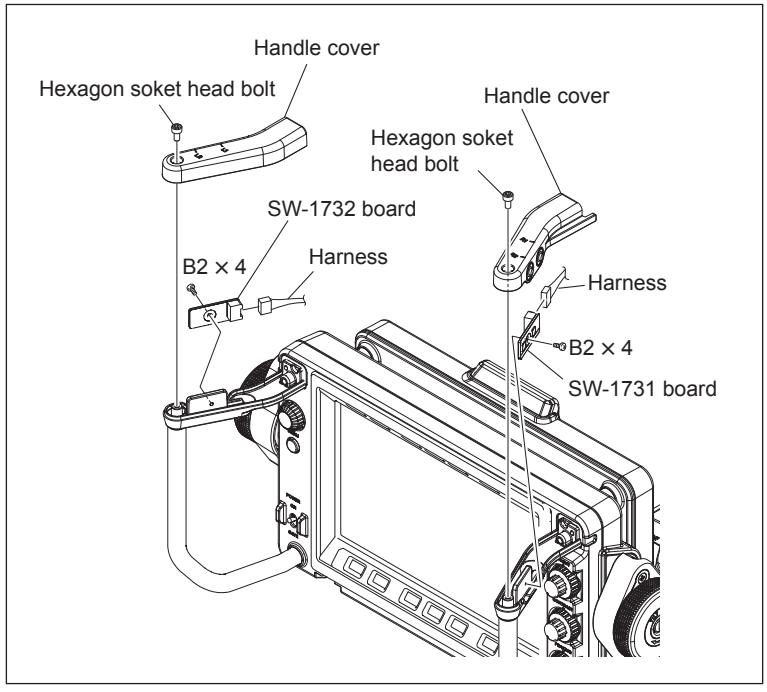
4. Disconnect the harness from the connector on the VR-366 board.
5. Remove the three screws and remove the VR-366 board.



6. Install the removed parts by reversing the steps of removal.

1-5-5. SW-1731 Board/SW-1732 Board

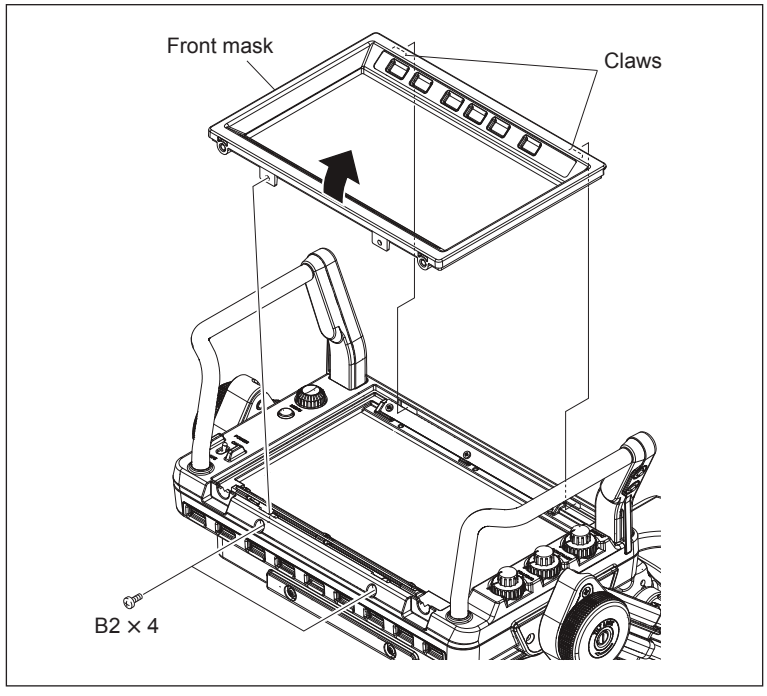
1. Remove the hexagon socket head bolts to detach the handle covers.
2. Disconnect the harness from the connector on the SW-1731 board (or SW-1732 board).
3. Remove the screw to detach the SW-1731 board (or SW-1732 board).



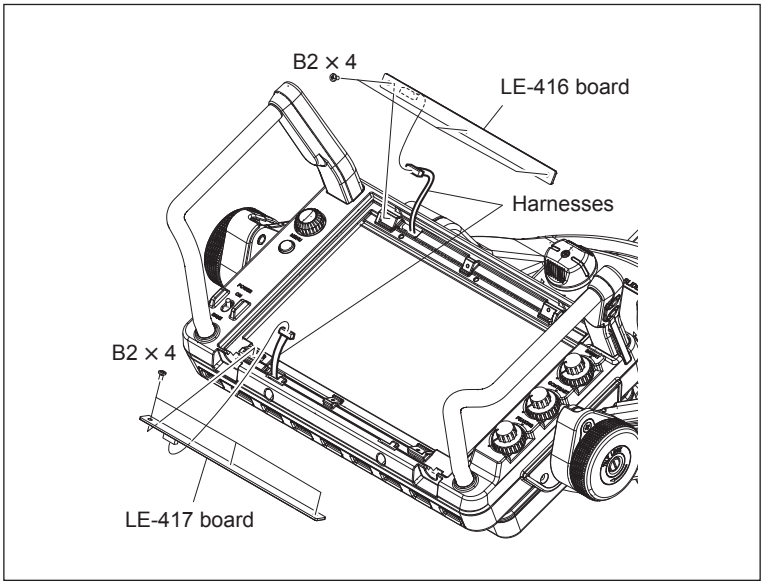
4. Install the removed parts by reversing the steps of removal.

1-5-6. LE-416 Board/LE-417 Board

1. Remove the two screws and detach the front mask while releasing the two claws.



2. Remove the three screws and remove the LE-416 board (or LE-417 board).
3. Disconnect the harness from the connector on the LE-416 board (or LE-417 board).



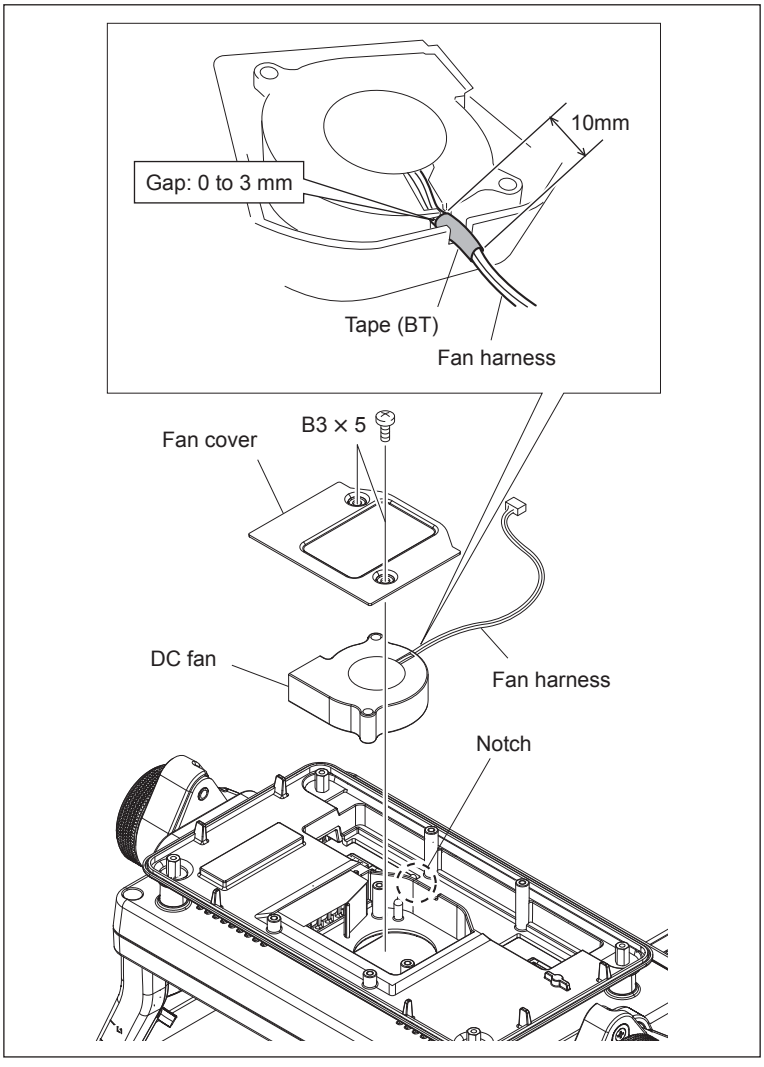
4. Install the removed parts by reversing the steps of removal.

1-6. Replacing the DC Fan

1. Remove the PR-337 board. (Refer to Section 1-5-2.)
2. Remove the two screws to detach the fan cover.
3. Remove the DC fan.
4. Stick tape (BT) at the position (shown in the figure) of the new DC fan.
5. Install the removed parts by reversing steps 1 to 3 of removal.

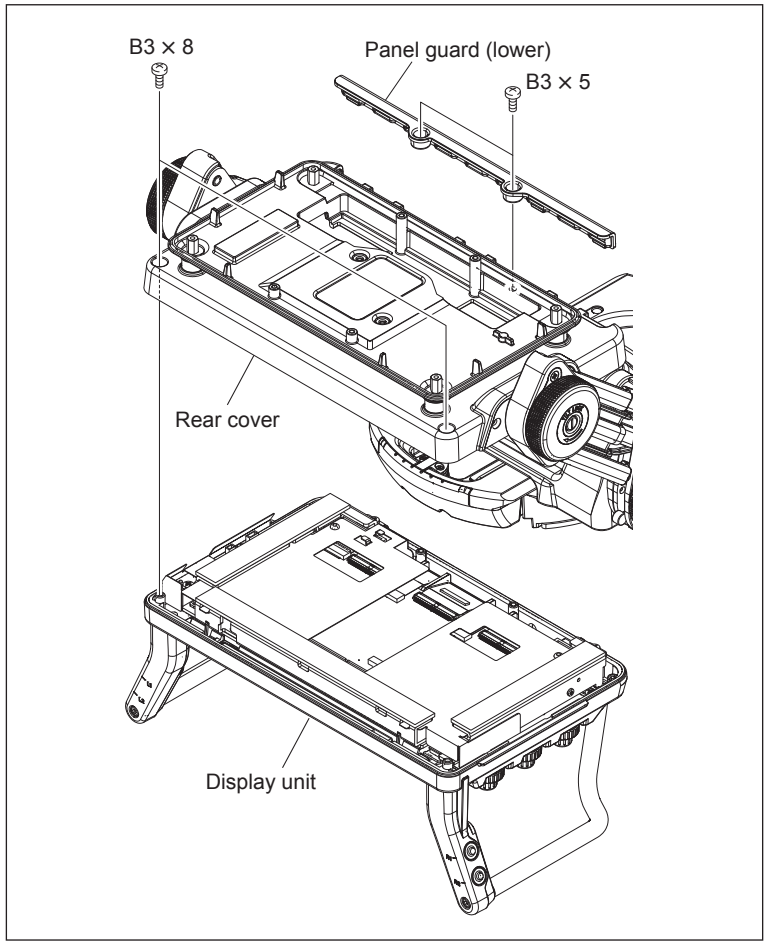
Note

Attach the fan cover carefully so that the fan harness is not caught by the fan cover and check that the fan harness passes through the notch of the chassis.



1-7. Replacing the OLED Panel

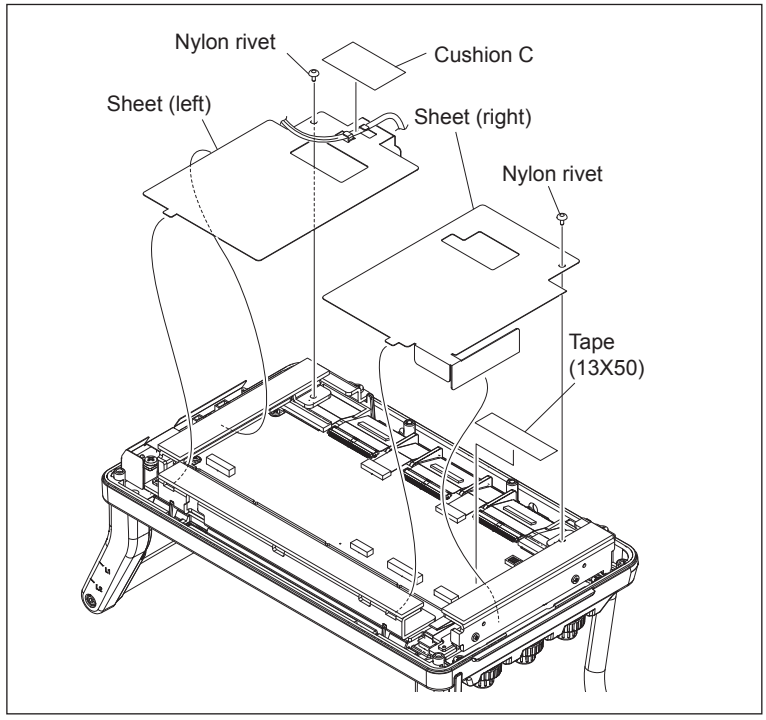
1. Remove the PR-337 board. (Refer to Section 1-5-2.)
2. Remove the two screws to detach the panel guard (lower).
3. Remove the two screws and remove the display unit from the rear cover.

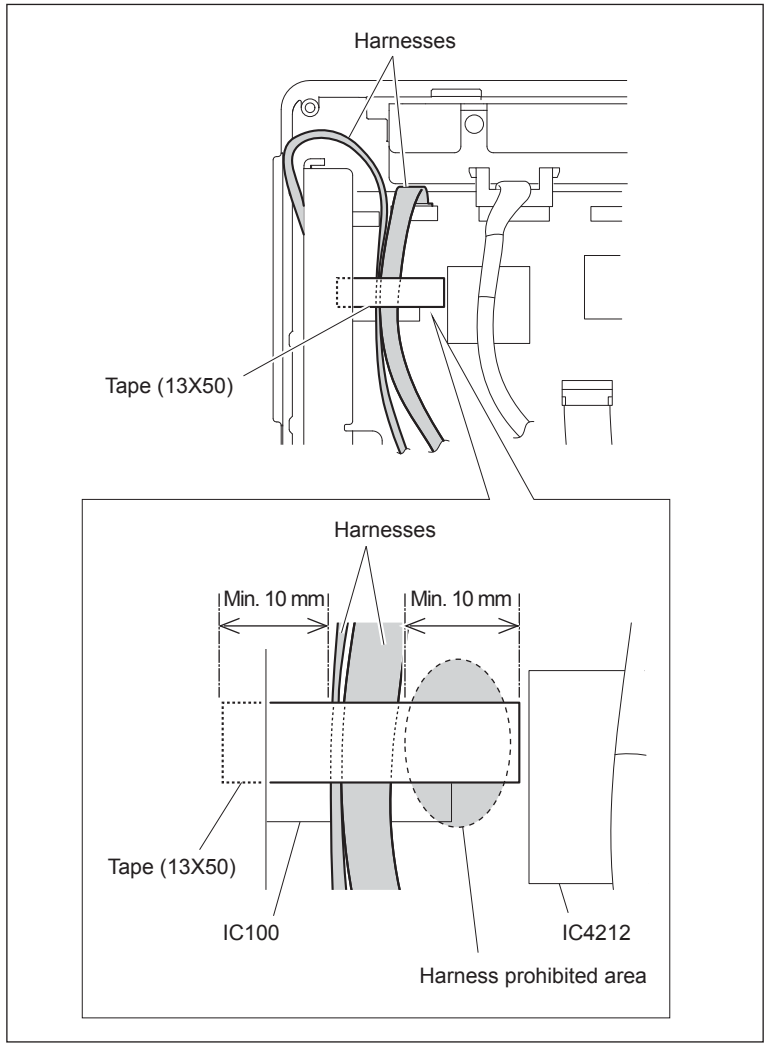


4. Remove the cushion C.
5. Remove the two nylon rivets to detach the sheet (right) and the sheet (left).
6. Remove the tape (13X50).

Note

When sticking tape (13X50), clamp the two harnesses as shown in the figure.

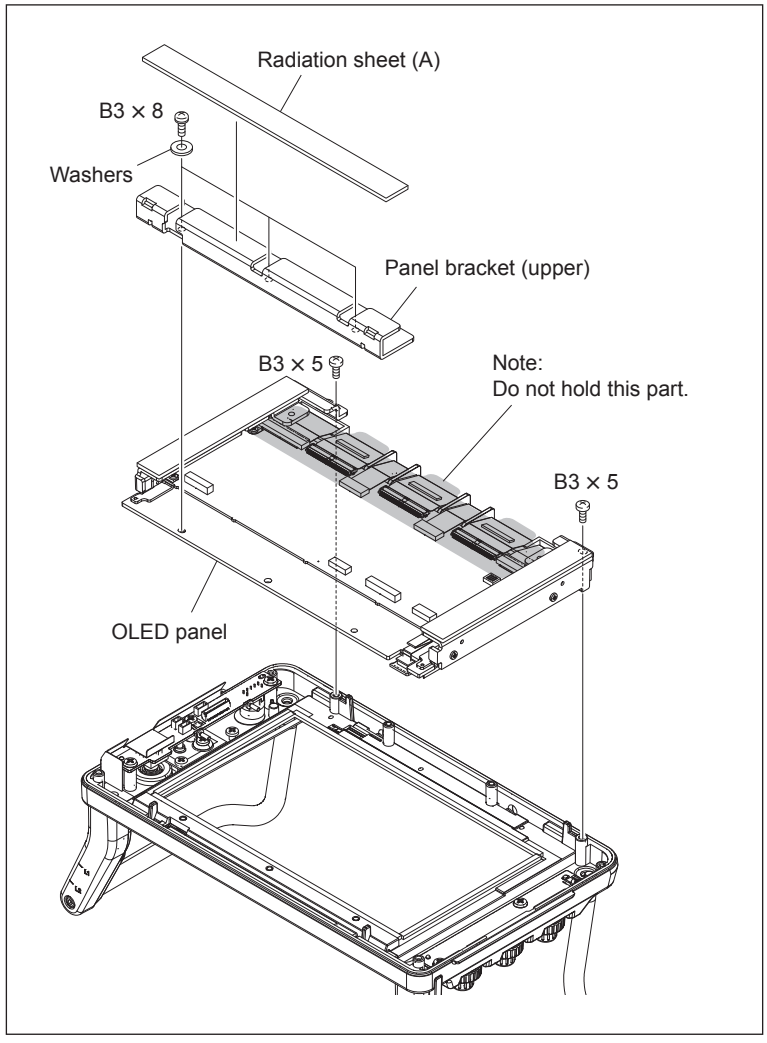




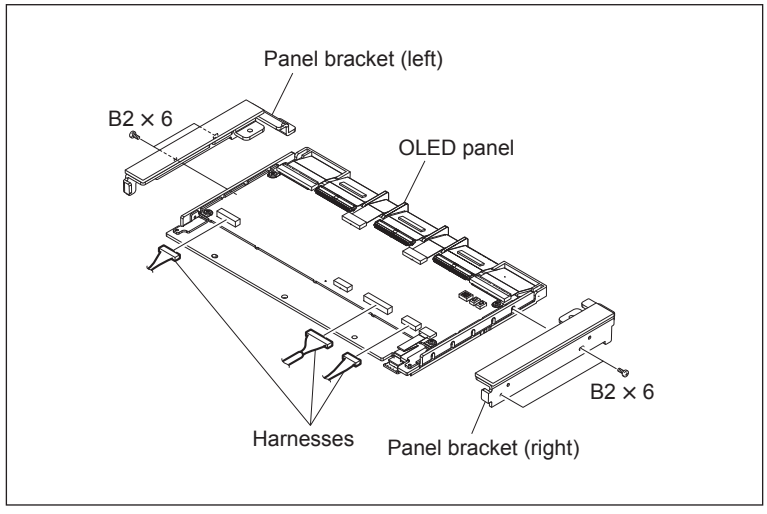
7. Remove the radiation sheet (A).
8. Remove the three screws (B3 × 8) and three washers to detach the panel bracket (upper).
9. Remove the two screws (B3 × 5) and detach the OLED panel paying attention not to catch the harnesses.

Note

Do not hold the area shown in the figure when detaching the OLED panel.



10. Remove the two screws to detach the panel bracket (right).
11. Remove the two screws to detach the panel bracket (left).
12. Disconnect the three harnesses from the connectors.



13. Install a new OLED panel by reversing the steps of removal.

1-8. Replacing VF Holder Unit Components

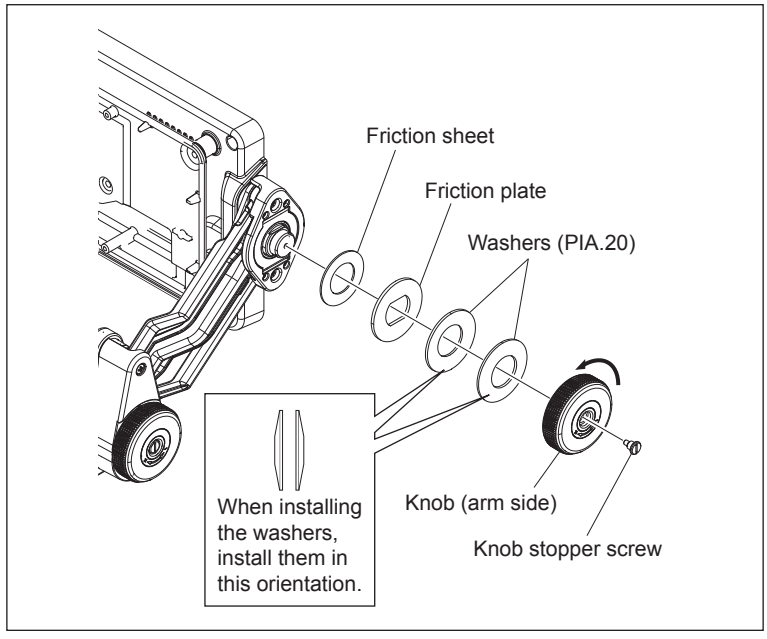
Note

Tighten screws of the VF holder unit to the following tightening torques.
Setscrew (M3 WP): 0.8 ± 0.12 N•m
M3 : 0.8 ± 0.12 N•m
M2.6 : 0.4 ± 0.10 N•m
M2 : 0.2 ± 0.03 N•m

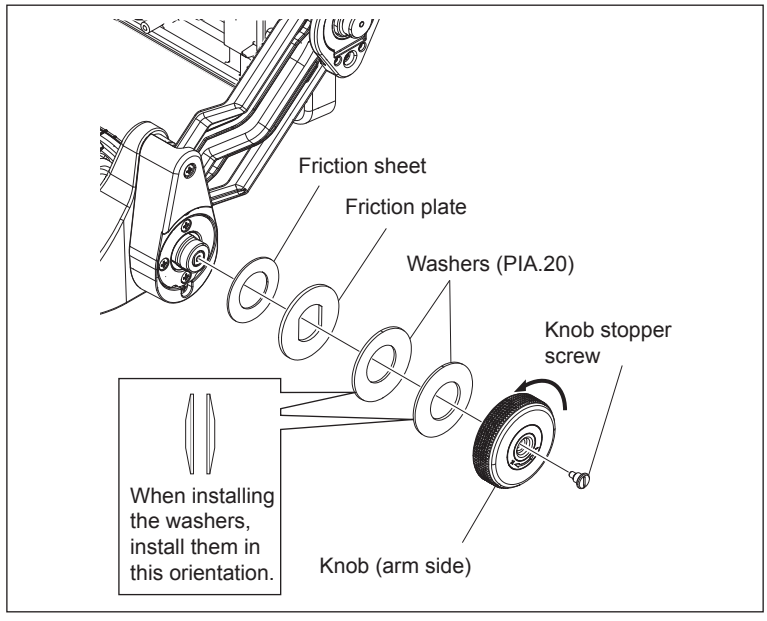
1-8-1. Harness (VF Connection 1) (HDVF-EL70)

Removal

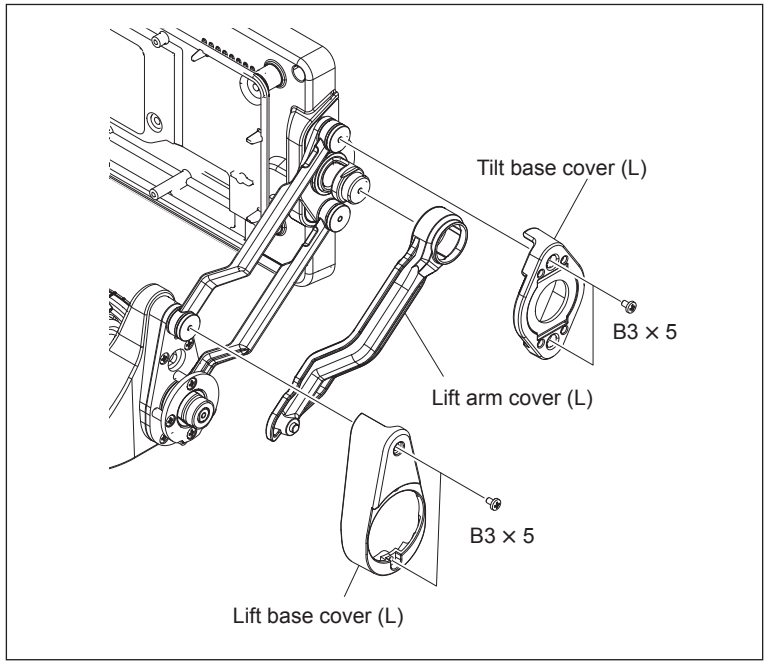
1. Remove the PR-337 board. (Refer to Section 1-5-2.)
2. Perform steps 1 to 3 in "Replacing the OLED Panel" to remove the display unit from the rear panel. (Refer to Section 1-7.)
3. Remove the knob stopper screw.
4. Turn the knob (arm side) counterclockwise to detach it.
5. Remove the two washers (PIA.20), friction plate, and friction sheet.



6. Remove the knob stopper screw.
7. Turn the knob (arm side) counterclockwise to detach it.
8. Remove the two washers (PIA.20), friction plate, and friction sheet.



9. Remove the two screws to detach the tilt base cover (L).
10. Remove the two screws to detach the lift base cover (L).
11. Remove the lift arm cover (L).

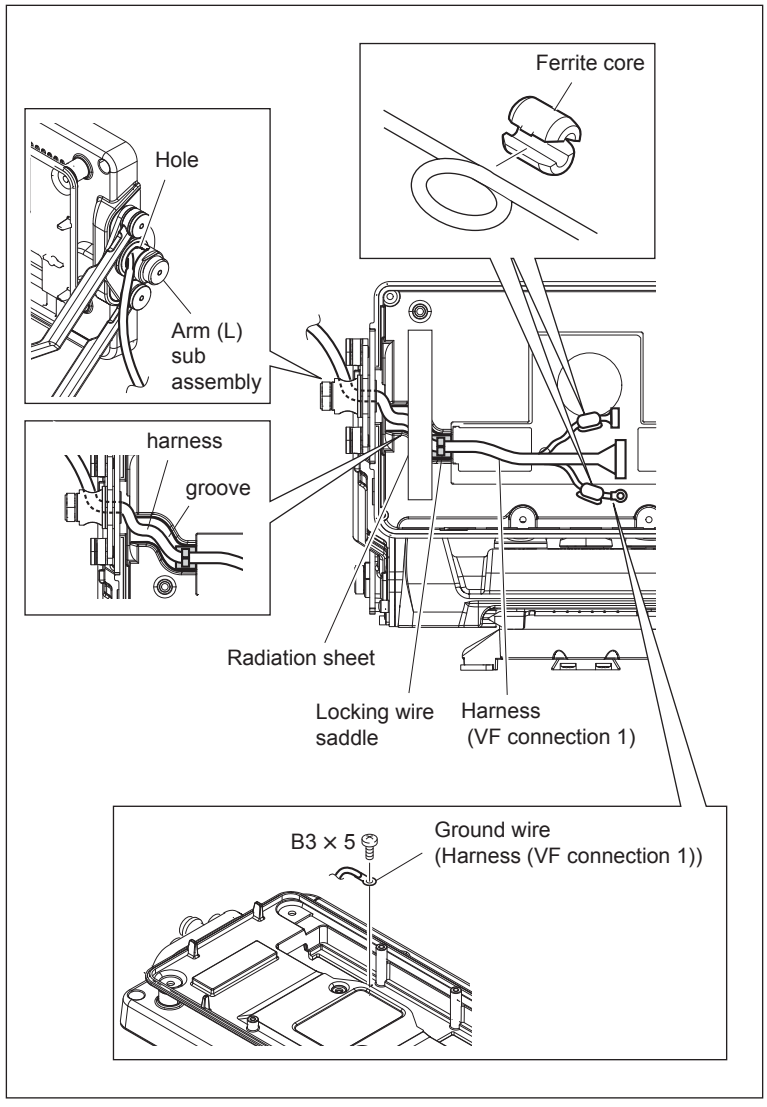


12. Remove the screw to disconnect the ground wire of the harness (VF Connection 1).
13. Remove the radiation sheet.

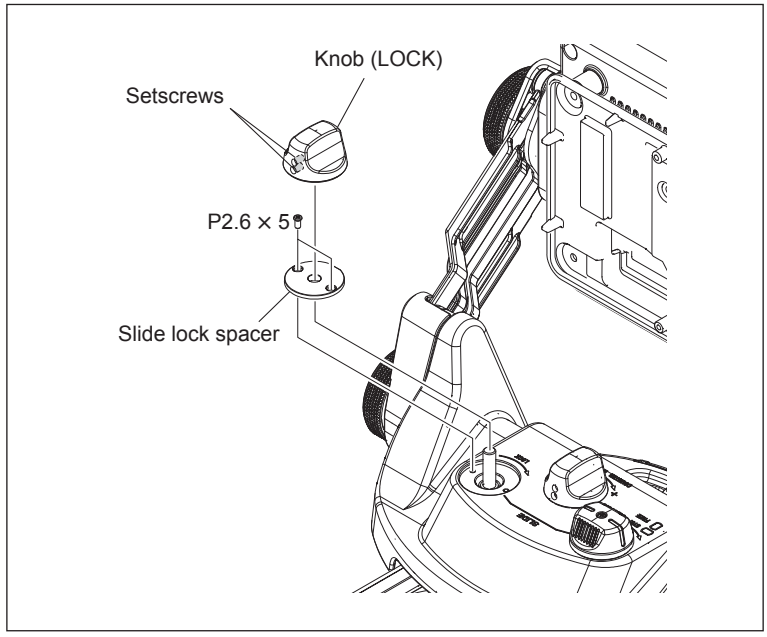
Note

When sticking the radiation sheet, confirm that the harness is fit in the groove.

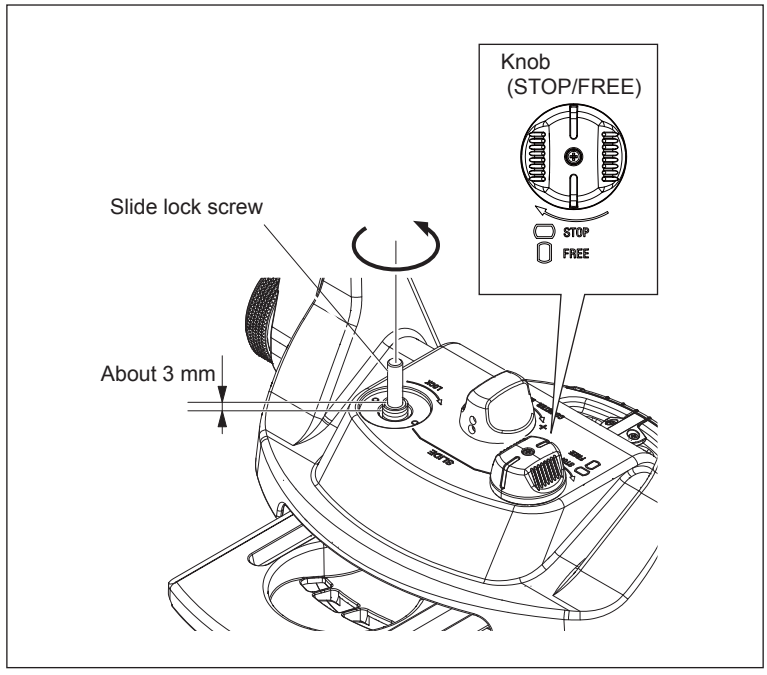
14. Release the harness (VF Connection 1) from the locking wire saddle.
15. Remove the two ferrite cores from the harness (VF Connection 1).
16. Pull the harness (VF Connection 1) out of the hole in the arm (L) sub assembly.



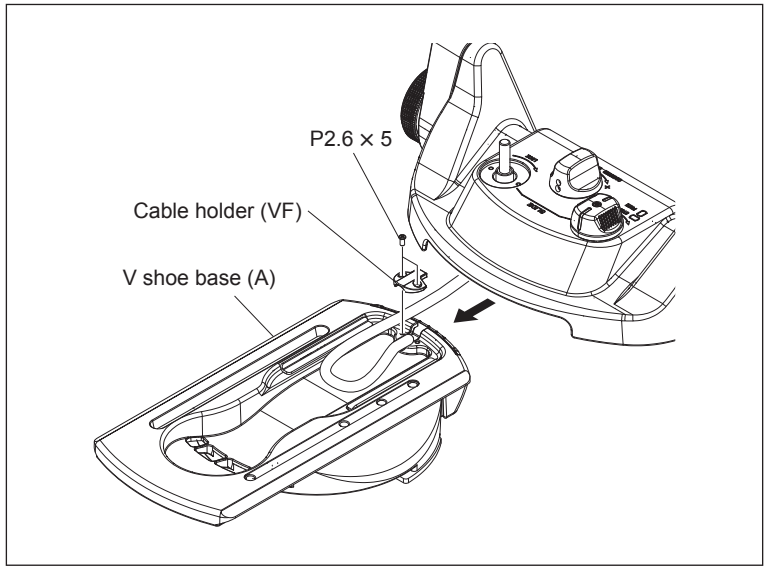
17. Loosen the two setscrews to detach the knob (LOCK).
18. Remove the two screws to detach the slide lock spacer.



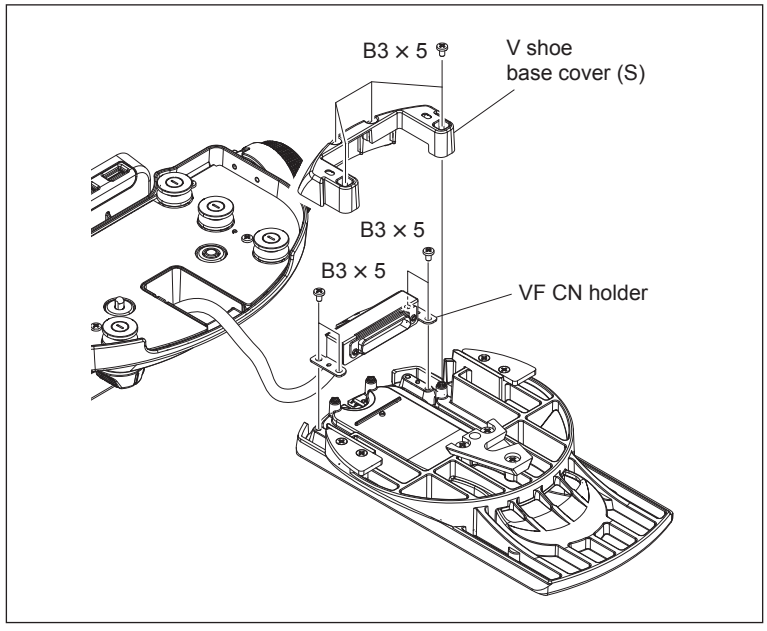
19. Set the knob (STOP/FREE) to “FREE.”
20. Turn the slide lock screw counterclockwise to a position where screw threads of about 3 mm are visible.



21. Slide the V shoe base (A) in the arrow direction to remove it.
22. Remove the two screws to detach the cable holder (VF).



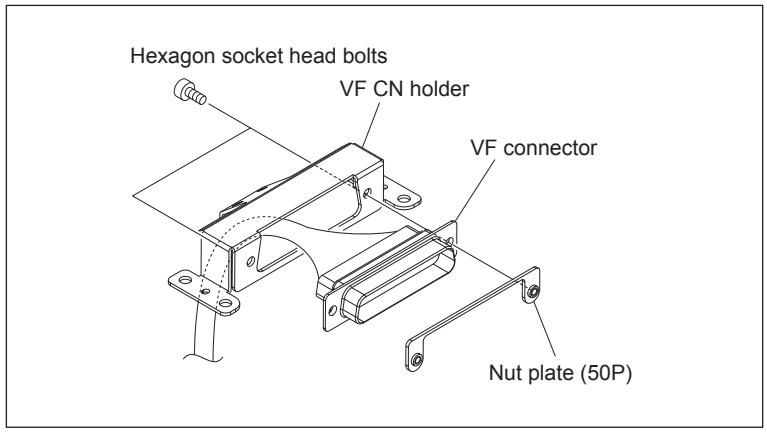
23. Remove the four screws to detach the V shoe base cover (S).
24. Remove the four screws to detach the VF CN holder.



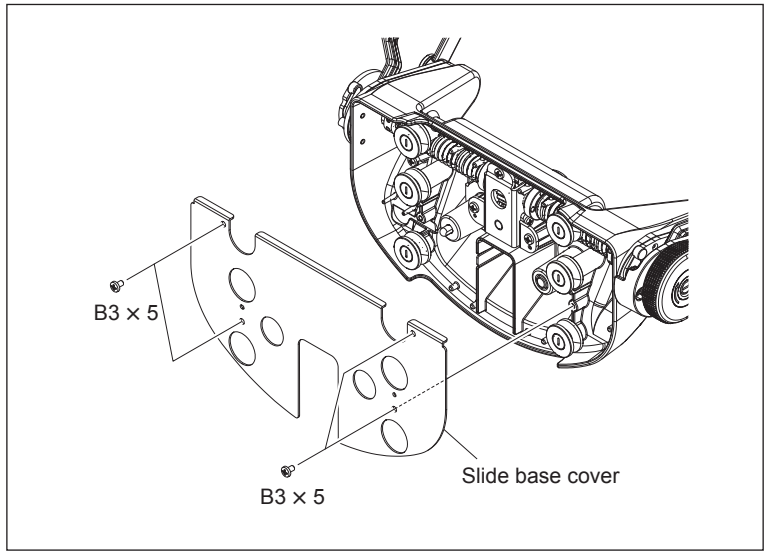
25. Remove the two hexagon socket head bolts and remove the VF connector from the VF CN holder.

Note

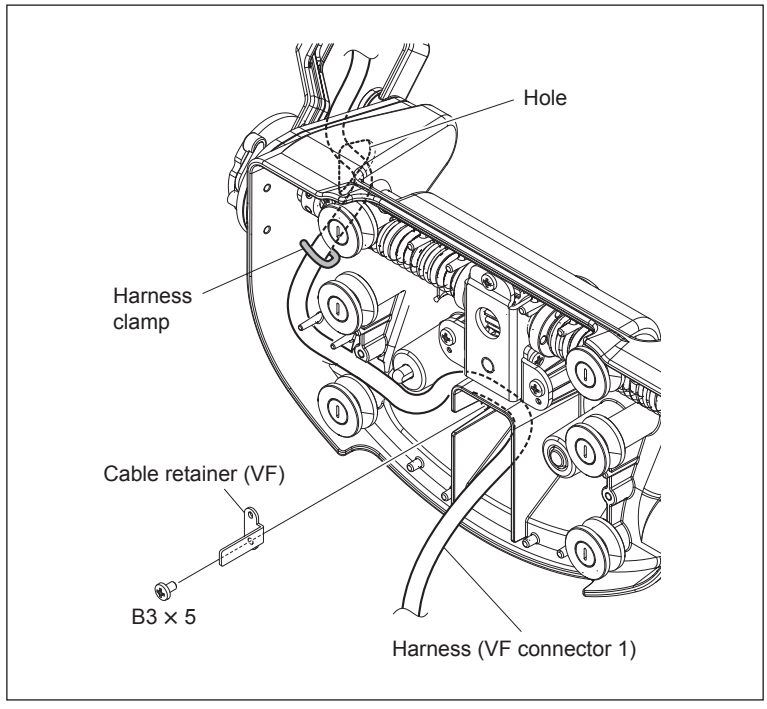
When assembling, install the VF CN holder first, VF connector, and then nut plate.



26. Remove the four screws to detach the slide base cover.



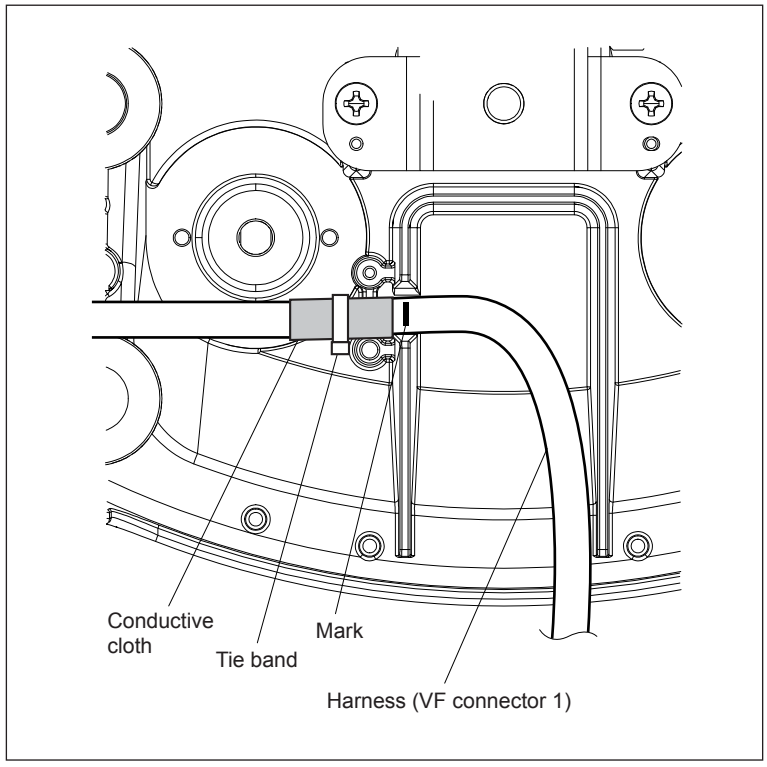
27. Release the harness (VF Connection 1) from the harness clamp.
28. Remove the screw to detach the cable retainer (VF).
29. Pull the harness (VF Connection 1) out of the hole in the slide base.



Installation

1. Pass a new harness (VF Connection 1) through the hole in the slide base.

2. Set the mark on the harness (VF Connection 1) at the position shown in the figure, and secure the cable retainer (VF) with a screw.



3. Install the removed parts by reversing steps 1 to 27 of removal.

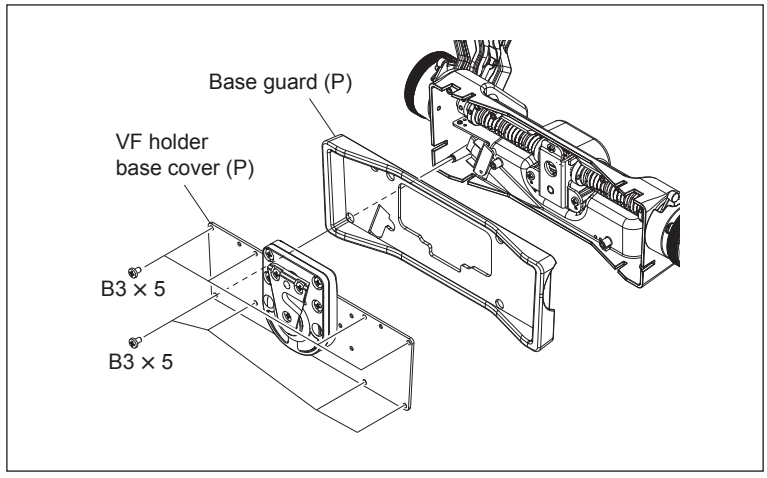
Note

- When installing the VF connector, pay attention to the installation order. (Refer to step 25 of removal.)
- When sticking the radiation sheet, pay attention to the arrangement of the harness. (Refer to step 13 of removal.)

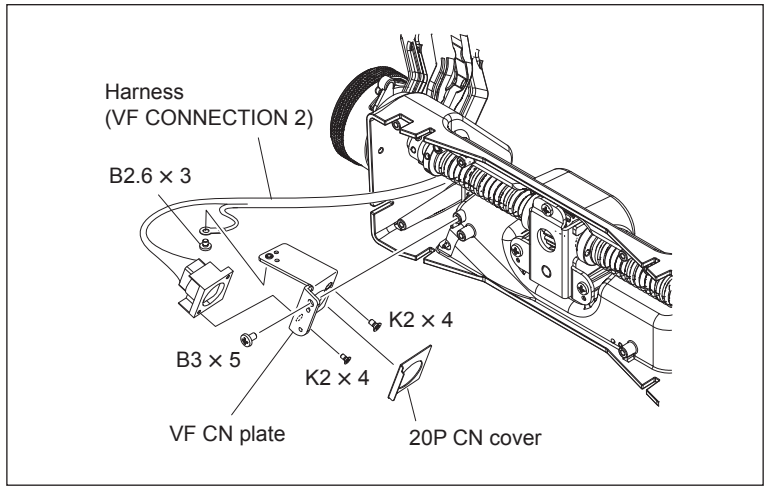
1-8-2. Harness (VF Connection 2) (HDVF-EL75)

1. Perform steps 1 to 16 in “1-8-1. Harness (VF Connection 1)” to pull the harness (VF Connection 2) out of the hole in the arm (L) sub assembly.

2. Remove the eight screws to detach the VF holder base cover (P).
3. Detach the base guard (P).



4. Remove the screw (B3 × 5).
5. Remove the screw (B2.6 × 3).
6. Detach the 20P CN cover.
7. Remove the two screws (K2 × 4) and disconnect the harness (VF CONNECTION 2) from the VF CN plate.
8. Pull the harness (VF CONNECTION 2) out of the hole in the VF holder.

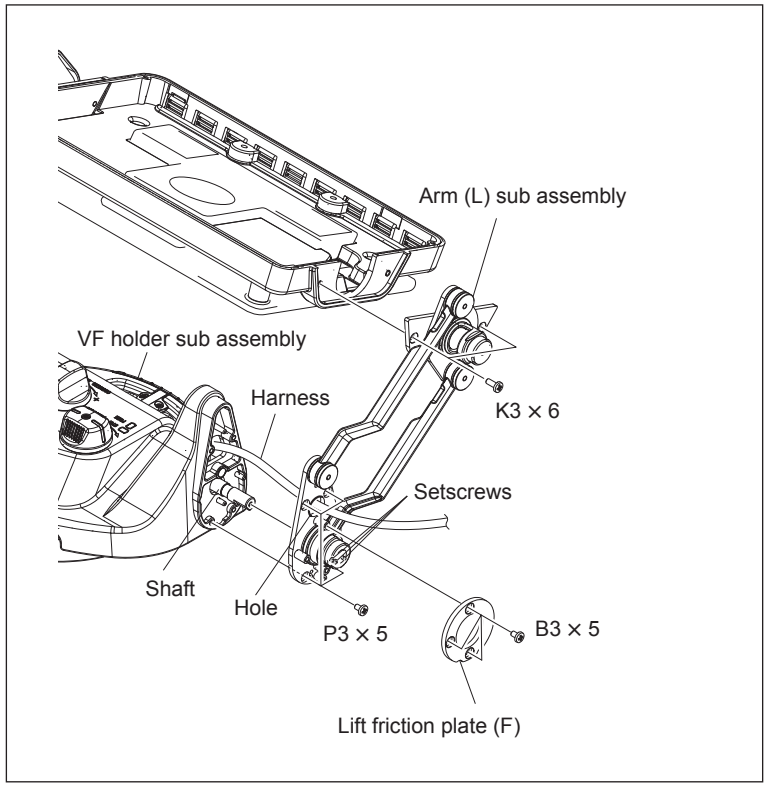


9. Install the removed parts by reversing the steps of removal.

1-8-3. Arm (L) Sub Assembly

1. Perform steps 1 to 16 in "1-8-1. Harness (VF Connection 1)" to pull the harness (VF Connection 1 or VF Connection 2) out of the hole in the arm (L) sub assembly.

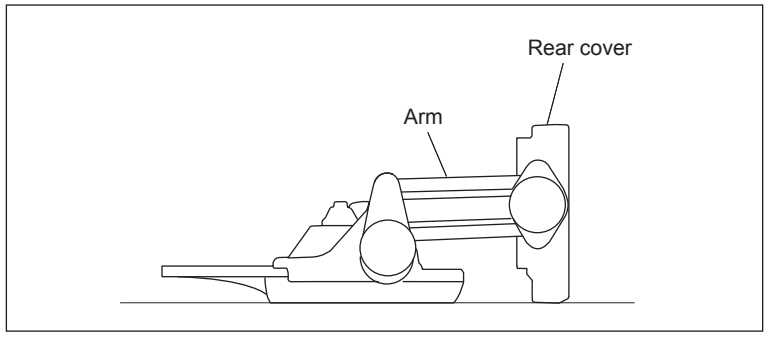
2. Remove the three screws (B3 × 5) to detach the lift friction plate (F).
3. Loosen the three setscrews.
4. Remove the two screws (K3 × 6) of the arm (L) sub assembly.
5. Remove the four screws (P3 × 5) of the arm (L) sub assembly.
6. While pulling the harness out of the hole in the arm (L) sub assembly, remove the arm (L) sub assembly from the shaft of the VF holder sub assembly.



7. Install the removed parts by reversing the steps of removal.

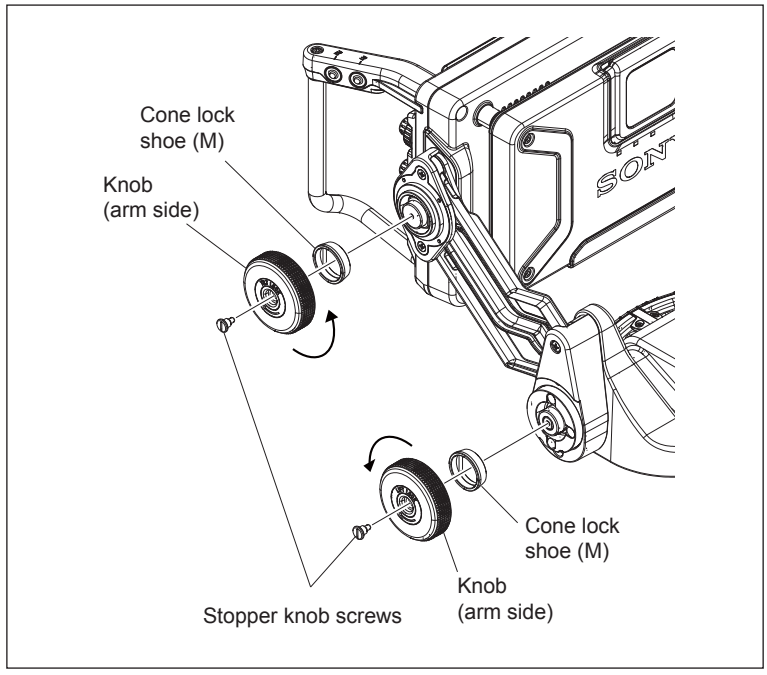
Note

- Install the right and left arms of the arm assembly in parallel. Otherwise, the rear cover (screen) may tilt.
- To make the right and left arms parallel, it is recommended that you put the rear cover vertically on a level object (such as desk) and tighten setscrews to place the arms on the horizontal surface.

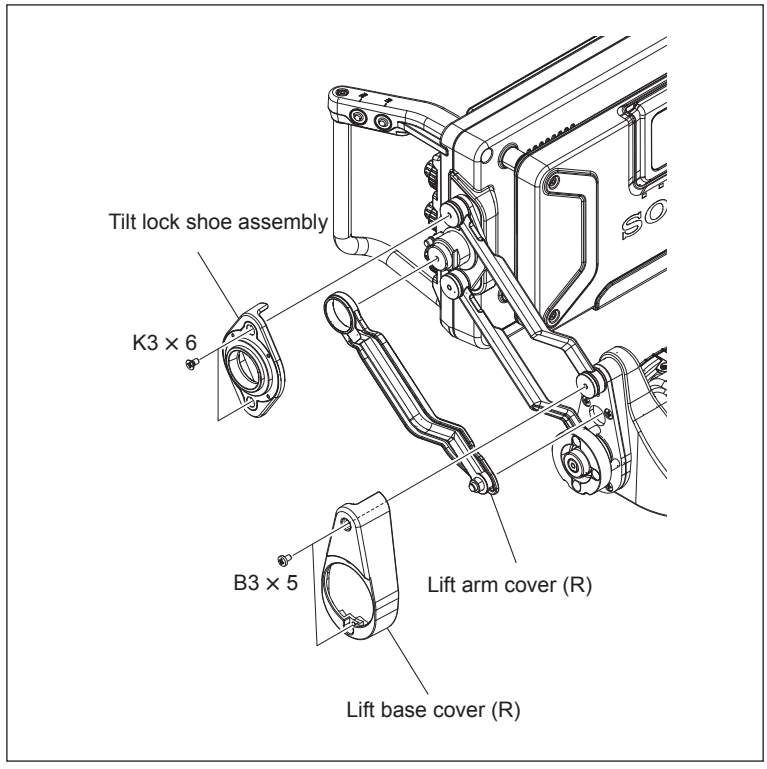


1-8-4. Arm (R) Sub Assembly

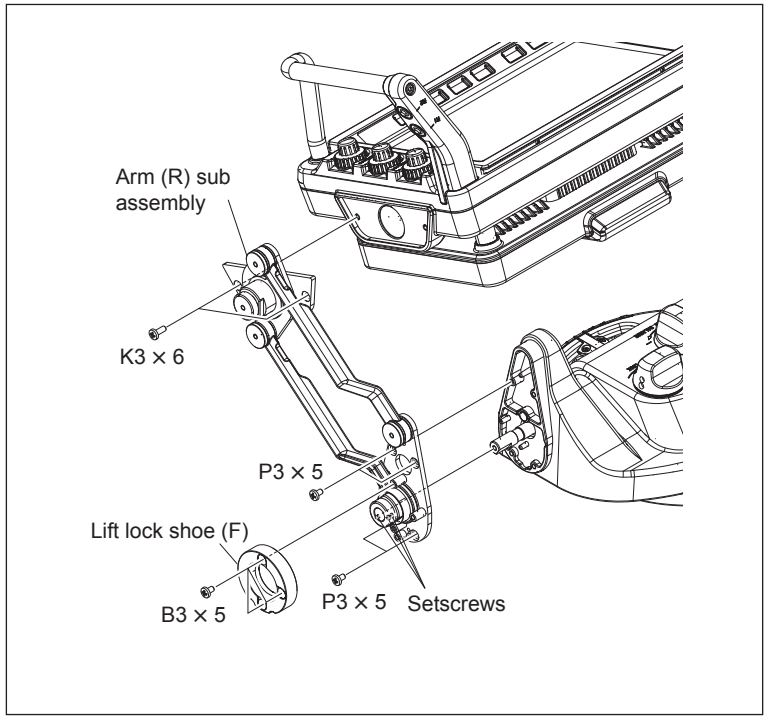
1. Remove the two stopper knob screws and turn the two knobs (arm side) counterclockwise to detach them.
2. Detach the two cone lock shoes (M).



3. Remove the two screws (K3 × 6) to detach the tilt lock shoe assembly.
4. Remove the two screws (B3 × 5) to detach the lift base cover (R).
5. Detach the lift arm cover (R).



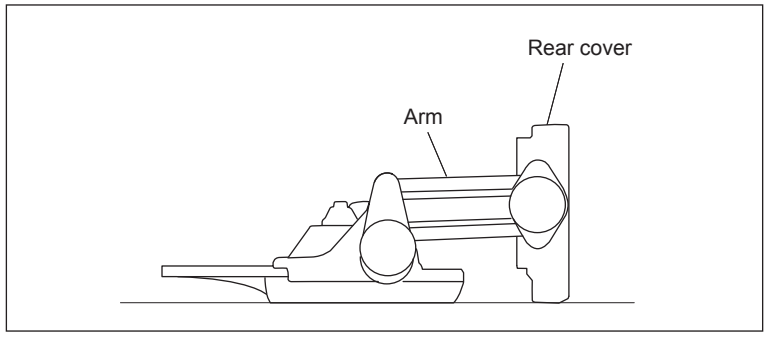
6. Remove the three screws (B3 × 5) to detach the lift lock shoe (F).
7. Loosen the three setscrews.
8. Remove the two screws (K3 × 6) of the arm (R) sub assembly.
9. Remove the four screws (P3 × 5) of the arm (R) sub assembly.
10. Remove the arm (R) sub assembly from the shaft of the VF holder sub assembly.



11. Install the removed parts by reversing the steps of removal.

Note

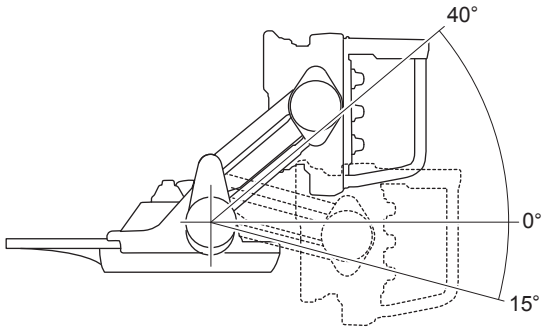
- Install the right and left arms of the arm assembly in parallel. Otherwise, the rear cover (screen) may tilt.
- To make the right and left arms parallel, it is recommended that you put the rear cover vertically on a level object (such as desk) and tighten setscrews to place the arms on the horizontal surface.



1-8-5. Adjusting the Arm Lift Angle

The arm lift angle is set as shown in the figure.
Check and adjust the lift angle as needed.

Lift angle range of the arm



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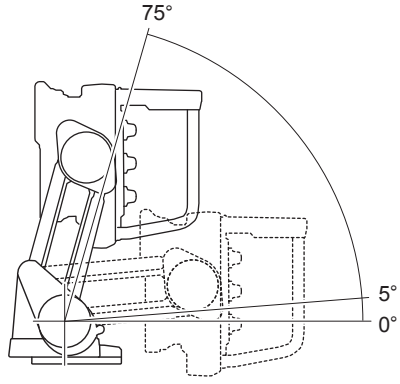
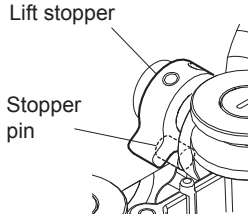


HDVF-EL75

Lift stopper
(lower-limit setting)

1. Set the arm angle to 15 degrees downward and contact the arm with the stopper pin from the other side of the arm.
2. Apply locking compound to the two setscrews (WP3 × 4) and tighten them to the specified torque.

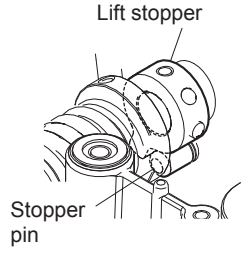
Tightening torque:
0.8 ± 0.12 N±m



Lift stopper
(upper-limit setting)

1. Set the arm angle to 40 degrees upward and contact the arm with the stopper pin from the arm side.
2. Apply locking compound to the two setscrews (WP3 × 4) and tighten them to the specified torque.

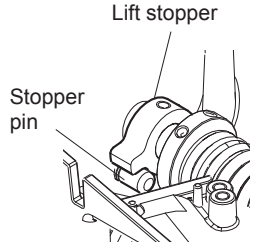
Tightening torque:
0.8 ± 0.12 N•m



Lift stopper
(lower-limit setting)

1. Set the arm angle to 5 degrees upward and contact the arm with the stopper pin from the other side of the arm.
2. Apply locking compound to the two setscrews (WP3 × 4) and tighten them to the specified torque.

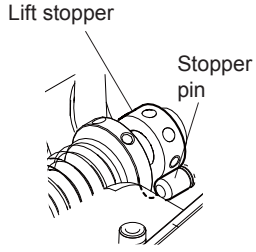
Tightening torque:
0.8 ± 0.12 N•m

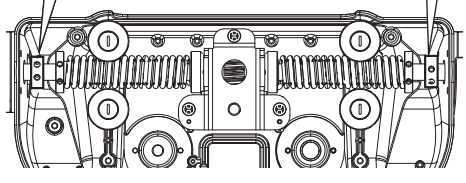


Lift stopper
(upper-limit setting)

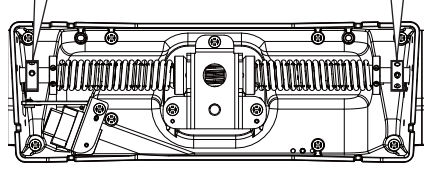
1. Set the arm angle to 75 degrees upward and contact the arm with the stopper pin from the arm side.
2. Apply locking compound to the two setscrews (WP3 × 4) and tighten them to the specified torque.

Tightening torque:
0.8 ± 0.12 N•m





HDVF-EL70



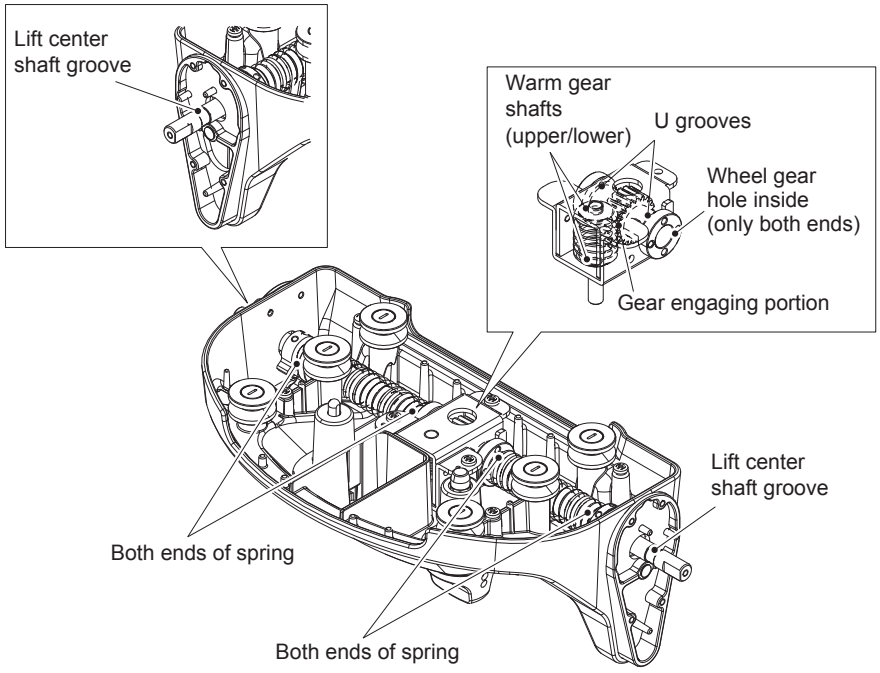
HDVF-EL75

1-9. Notes on Replacing Parts

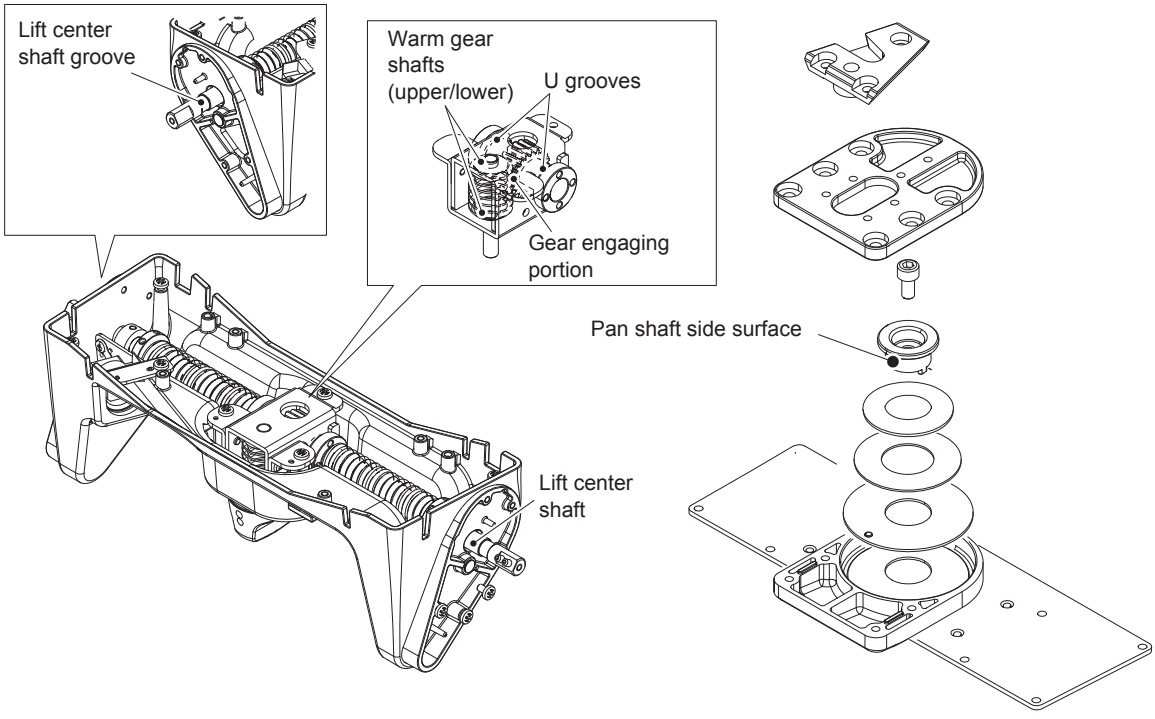
1-9-1. Greasing

The following figures show locations that require greasing. Apply grease to these locations as needed.

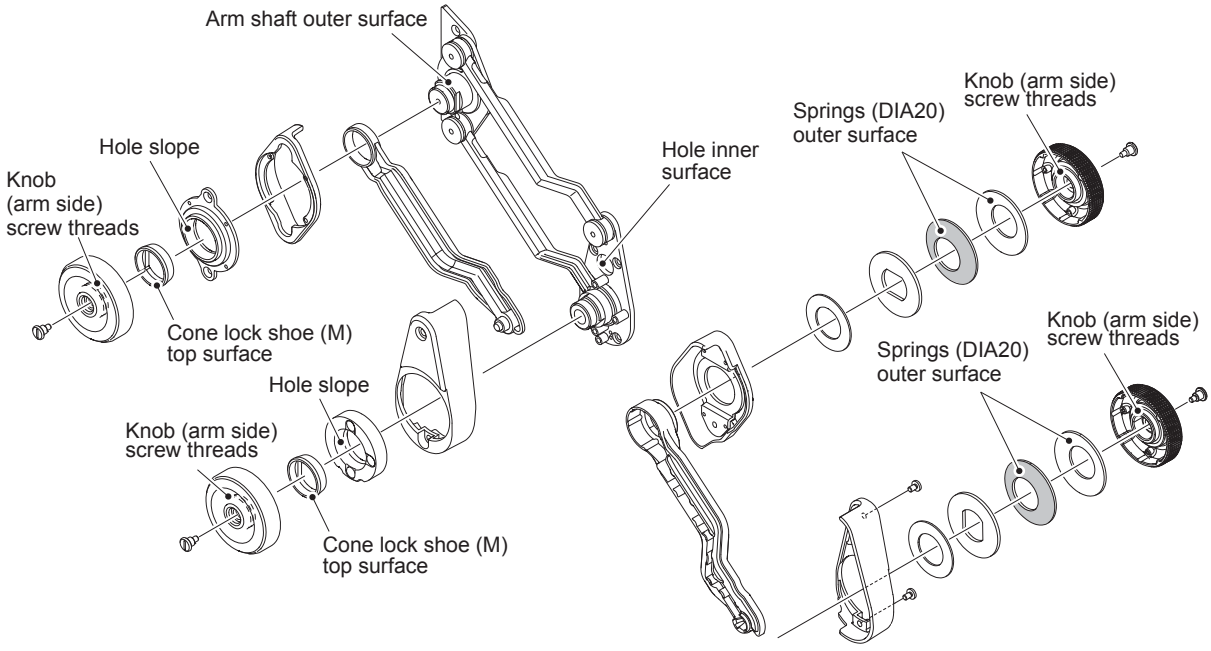
Slide base (S)



Slide base (P)



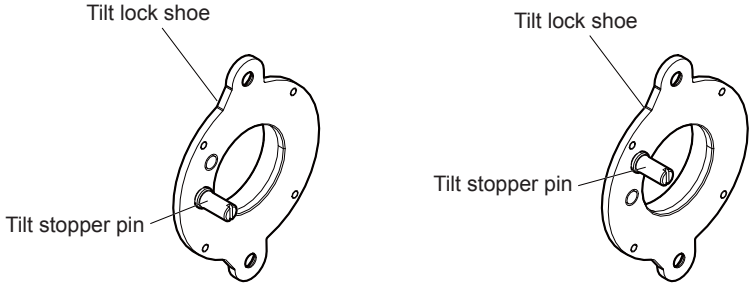
Arm (R), Arm (L)



1-9-2. Tilt Lock Shoe

The tilt stopper pin position of the tilt lock shoe of the HDVF-EL70 is different from that of the HDVF-EL75.

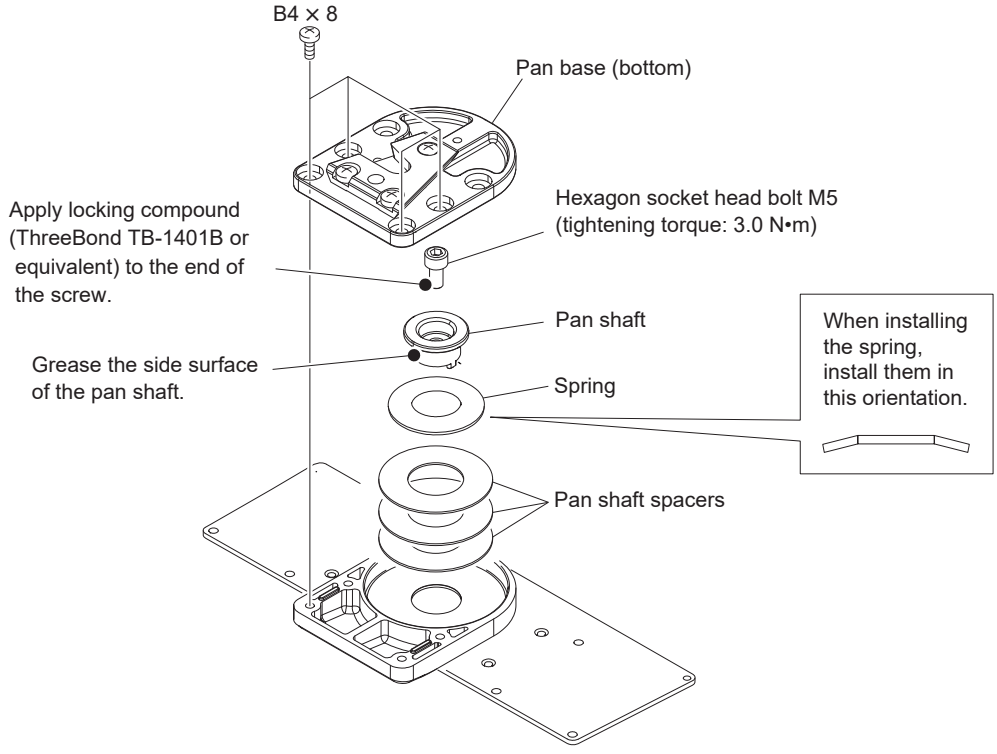
Attach the tilt stopper pin at the correct position referring to the figure below.



HDVF-EL70 HDVF-EL75

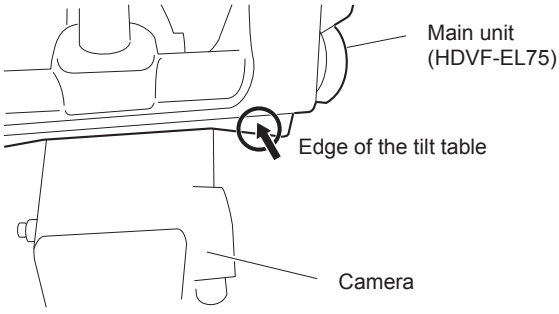
1-9-3. Checking Friction in the Panning Direction (HDVF-EL75)

The number of pan shaft spacers varies depending on unit. When replacing pan shaft spacers, install the same number of pan shaft spacers as the number before the replacement.
After the pan shaft spacers have been replaced, assemble the main unit according to the figure below and check the friction in the panning direction.



Checking and adjusting friction in the panning direction

1. Attach the main unit to the camera.
2. Push the edge of the tilt table and check that the friction is the typical value.
   Typical value: 20•Nm



3. If the friction is not the typical value, increase or decrease the number of pan shaft spacers to make the friction equal to the typical value.
   When the friction is lower than the typical value, increase the number of pan shaft spacers.
   When the friction is higher than the typical value, decrease the number of pan shaft spacers.
   Note
   Up to five pan shaft spacers are installable.

1-10. List of Tool, Required Equipment, and Adjustment Equipment

Tool

Parts No.	Name	Application
J-6510-120-A	RS232 interface cable	Used for software downloading
J-7120-250-A	IPS conversion cable 2	Used for PLD data downloading
Commercially available	Xilinx Platform Cable USB II	Used for PLD data downloading
J-6323-430-A	Torque screwdriver's bit (M3)	Screw tightening
J-6325-380-A	Torque screwdriver's bit (M2)	Screw tightening
J-6325-400-A	Torque screwdriver (3 kg•cm) (0.3 N•m)	Screw tightening
J-6252-510-A	Torque screwdriver (6 kg•cm) (0.6 N•m)	Screw tightening
J-6252-520-A	Torque screwdriver (12 kg•cm) (1.2 N•m)	Screw tightening
Commercially available	Hexagonal wrench (Width across: 2 mm)	Screw tightening
Commercially available	Hexagonal wrench (Width across: 2.5 mm)	Screw tightening
Commercially available	Hexagonal wrench (Width across: 4 mm)	Screw tightening

Required Equipment

Equipment	Model name
HD camera	The HD camera described in related products in the operation manual.
A general-purpose personal computer	–

Adjustment Equipment

Adjuster	Model name
Display color analyzer	Konica Minolta sensing CA-310 or the equivalent

1-11. Firmware and PLD Upgrading

Note

Do not version down the ROM. Equipment may not operate normally.

ROMs are mounted on the PR-337 board of this unit.

Board	Ref. No.	Address
PR-337	IC402	C-1/side A
	IC1201	A-1/side A

1-11-1. ROM and Software Versions Check

1. Display the TOP menu. (Refer to “3-1. Top Menu”.)
2. Display the VERSION screen in the SERVICE menu.
3. Confirm the version of the software and ROM

1-11-2. Writing and Rewriting Software Data

When you need to upgrade the software data, contact your local Sony Sales Office/Service Center.

1-11-3. Writing and Rewriting PLD Internal Data

When you need to upgrade the PLD internal data, contact your local Sony Sales Office/Service Center.

1-12. Replacing Fuses

WARNING

The fuse is important components for maintaining safety.
Do not replace them with any components other than those specified. This may cause a fire and electric shock. Be sure to use the components specified in a manual.

CAUTION

Do not replace a fuse with the power connected. This may cause an electric shock.
Do not only turn off the power switch, but also remove this unit from a camera when replacing a fuse.

The fuse is mounted on the PR-337 board.
These parts are blown when abnormality occurs in equipment and when an overcurrent flows. In this case, turn off the power of the main unit once, inspect the inside of equipment, and remove the cause of an overcurrent. After that, replace parts.

Board	Ref. No.	Name	Parts No.
PR-337	F1401	Fuse (4 A/125 V)	⚠ 1-576-270-21
	F101, F1801	Fuse (1 A/36 V)	⚠ 1-576-596-21

1-13. Lead-free Solder

Boards requiring use of lead-free solder are printed with a 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.)

: LEAD FREE MARK

Note

- Be sure to use the lead-free solder for the printed circuit board printed with the lead free mark.
- 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
Diagnostics

This unit has a diagnostics function for internal errors and multiple internal test signal generator circuits. This section describes troubleshooting.

2-1. STATUS Indicator

This unit has a warning system based on lamp display. The STATUS indicator lights or blinks when an error occurs.

Display	Description	Remedy
Blinking in intervals of 0.5 seconds for two times, followed by going off for 2 seconds.	The internal temperature increased.	Turn off the power once or move the unit to a cool place. The error messages below may be displayed. VF TEMP HIGH: Temperature error
Blinking in intervals of 2 seconds.	IBAC* (screen saver) is in the start state.	To cancel the IBAC* (screen saver), operate a camera or this unit so that an image changes.
Lights.	A fan is in the forced stop state.	The indicator goes off about five minutes after the fan is forcibly stopped, and the fan is switched to automatic control.
Blinking in intervals of 0.5 seconds.	A failure was detected during self-diagnosis.	Check the contents of a failure in “S08 DIAGNOSIS” of a SERVICE menu. (Refer to Section 3-4.) The error messages below may be displayed. BACKUP ERROR: The backup data of EEPROM does not coincide in checksum. VF TEMP HIGH: Temperature error DEVICE ERROR: Device errors other than those described above

*: IBAC (Intelligent Brightness Ambient Control)
This unit has an IBAC function to mitigate burn-in of the screen. When a predetermined time period has passed with an almost still picture displayed, this function is activated automatically to lower the brightness of the screen.

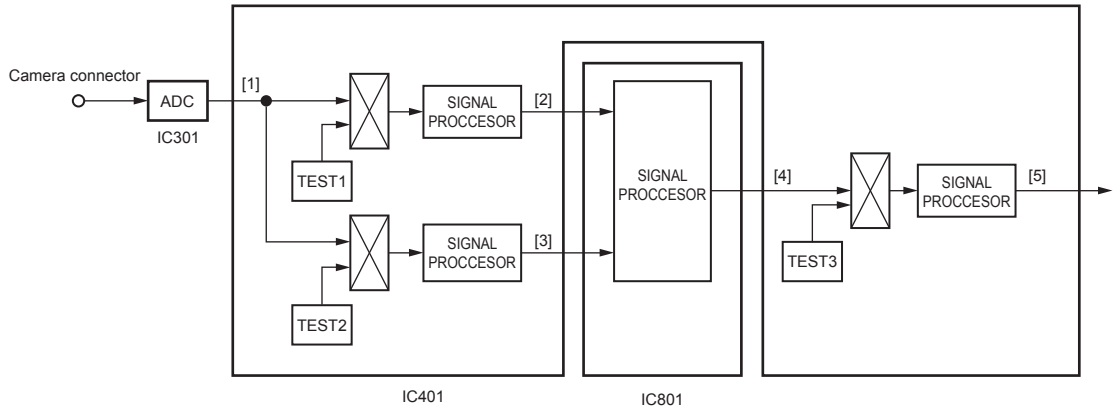
2-2. Device Check

This unit has a self-diagnosis function that checks the communication function of each device.
The result of diagnosis is displayed in “S08 DIAGNOSIS” of a SERVICE menu.
(For more details, refer to Section 3-4.)

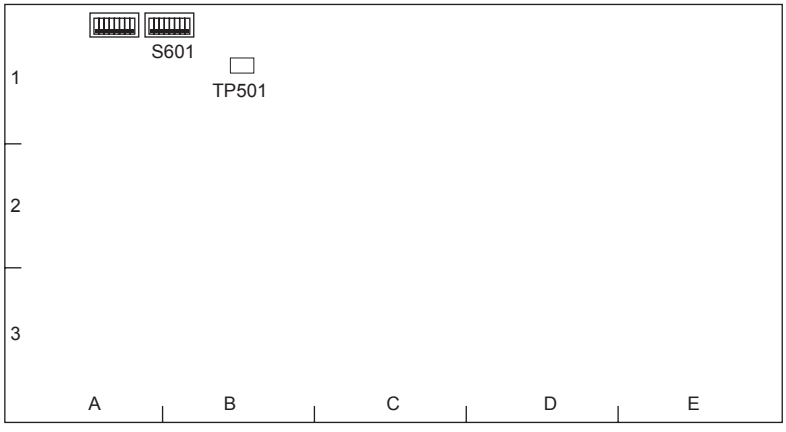
2-3. Internal Test Signal

The PR-337 board contains an internal test signal generator circuit and a test pin (TP501) for checking waveforms.
An internal test signal (TEST1, TEST2, or TEST3) is selectable from the SERVICE menu and can be output. (For details, refer to Section 3 “Setting Menu” and “3-4. SERVICE Menu”.)

Waveform test points
Signal waveforms at test points [1] to [5] can be output to the test pin (TP501) on the PR-337 board.
Checking waveforms makes it possible to identify the failure location.



Test signal setting switch and test pin



PR-337 board (Side A)

TEST SIGNAL

To change the signal type to be output to the test pin (TP501/PR-337 board), change the settings of bit1 and bit2 of S601 (PR-337 board).

Output signals	S601 on the PR-337 board settings	
	Bit 1	Bit 2
——— (Not output)	OFF	OFF
Y or G	ON	OFF
Pb or B	OFF	ON
Pr or R	ON	ON

TEST POINT

To change the signal point to be output to the test pin (TP501/PR-337 board), change the settings of bit3 to bit5 of S601 (PR-337 board).

Output signals	S601 on the PR-337 board settings		
	Bit 3	Bit 4	Bit 5
[1]	OFF	OFF	OFF
——— ([1])	ON	OFF	OFF
[2]	OFF	ON	OFF
[3]	ON	ON	OFF
[4]	OFF	OFF	ON
——— ([4])	ON	OFF	ON
[5]	OFF	ON	ON
——— ([5])	ON	ON	ON

Section 3
Setting Menu

3-1. Setting Menu

The setting menu is used for selection or adjustment of various setting values.

Setting menu configuration

The setting menu consists of the menus below.

- OPERATION menu
- SERVICE menu

Note

The TOP menu screen is available as another screen that displays the whole configuration of menu items. To display the TOP menu, refer to “3-2. TOP Menu”.

Description of switches

MENU control

This control selects a menu item or changes a setting value.

Turn: Shifts a page or item and changes a setting value.

Press: Determines a page or item and determines a setting value.

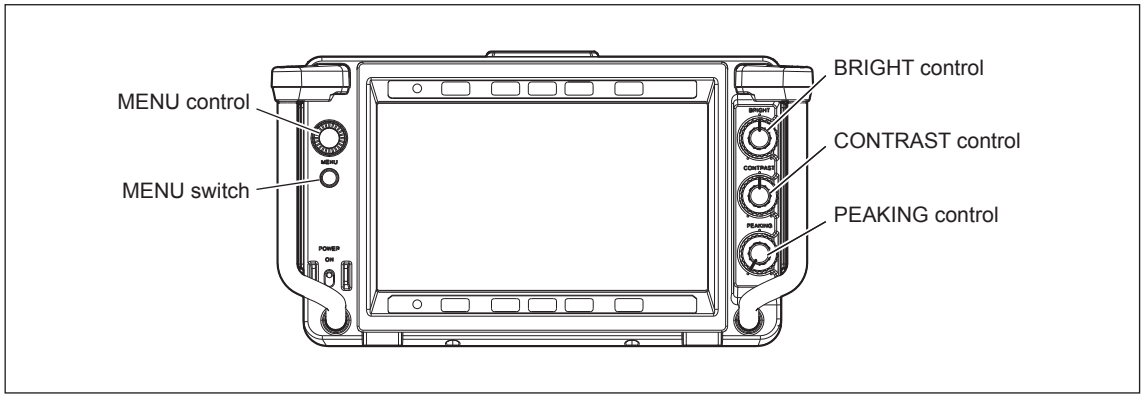
MENU switch

This switch displays a setting menu.

The MENU switch is used when canceling the contents of setting in progress and returning to the page selection mode or TOP menu.

BRIGHT control
CONTRAST control
PEAKING control

This control setting is required when entering a TOP menu.



Basic operations

1. Display the menu.
   The OPERATION menu is displayed when you press the MENU switch.

2. Select the menu page.
   Turn the MENU control with the "?" mark displayed before the page number (in the page selection mode), display the desired page, and press the MENU control.

3. Select the item.
   Turn the MENU control with the "→" mark displayed in the setting item of the selected page (in the item selection mode), move the "→" mark to the item to be changed, and press the MENU control.

4. Change the setting value.
   Turn the MENU control with the "?" mark displayed in a setting value (in the setting value change mode) and change the setting value.
   For a setting value consisting of numeric characters, the numeric value increases when you turn the MENU control clockwise (↻). It decreases when you turn the MENU control counterclockwise (↺). The numeric value much changes when you rapidly turn the MENU control. It can be fine-adjusted when you slowly turn the MENU control.

5. Determine the setting value.
   Press the MENU control.
   The setting value is determined, and the current state is returned to the item selection mode.
   Note
   When you press the MENU switch before pressing the MENU control, the setting value is returned to the value before change and the current state is returned to the item selection mode.

6. Exit the menu display.
   The screen is returned to the item selection mode, page selection mode, and then TOP menu* whenever you press the MENU switch. After that, the menu display disappears when you press the MENU switch.

7. Return the setting value to the factory-setting value.
   Press the MENU control for two seconds or more with the "?" mark displayed in the setting value to be returned to the factory setting (in the setting value change mode).

*: The operation above is applied to only the operation from a TOP menu. Refer to "3-2. TOP Menu".

3-2. TOP Menu

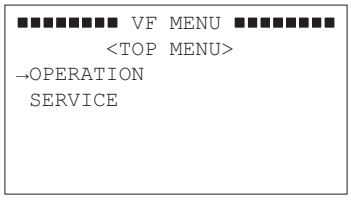
The TOP menu is a screen that displays the whole configuration of menu items.

How to display the TOP menu

1. Set the three controls as described below.
   BRIGHT control: 99 (Fully clockwise (↻))
   CONTRAST control: −99 (Fully counterclockwise (↺))
   PEAKING control: 100 (Fully clockwise (↻))

2. Press the MENU switch while holding down the MENU control.
   The TOP menu is displayed.

TOP MENU screen



Menu item	Description
OPERATION	The setting items required for operation of this unit are summarized.
SERVICE	The items required for maintenance of this unit such as the electrical adjustment, hours meter, or self-diagnosis function of this unit are summarized.

3-3. OPERATION Menu

The setting items required for operation of this unit are summarized in this OPERATION menu.
For more details, refer to the Operation Manual supplied for this unit.

3-4. SERVICE Menu

The items required for maintenance of this unit such as the electrical adjustment, hours meter, or self-diagnosis function of this unit are summarized in this SERVICE menu.

Note

- The item may be not able to be selected in the menu item below by the current menu item setting.
- For the item that cannot be selected, "– – –" is displayed in the setting value.

Page	Menu	Item	Setting (□ is a factory-setting value.)	Function
S01	FUNCTION 2	MAG REL TIME	1 to [5] to 10	Sets the time required until returning from the expanded display to the ordinary display when MAGNIFICATION AUTO RELEASE is set to AUTO*1.
		VF ASSIGN SW	LEFT, [RIGHT]	Switches combination of switches that are settable for the camera ASSIGNABLE switch*2. LEFT: ASSIGN.SW L1/L2 of the left handle is assigned. RIGHT: ASSIGN.SW R1/R2 of the right handle is assigned.
		MENU DISPLAY	[AUTO] , MANUAL	Sets menu display erasing method. AUTO: Menu display is erased automatically if no menu operation is performed for about one minute after the menu is displayed.*3 MANUAL: Menu display is not erased automatically
		AJC MODE	[MODE1] , MODE2	Sets brightness correction mode of the panel module. MODE1 is used normally.
		SECRET IND	[OFF] , ON	Enables or disables the secret indicator.*4 OFF: Disabled ON: Enabled
S02	TEST	TEST1	[OFF] , BARS, SAW, RASTER, WINDOW	Sets the internal test signal on the input 1 side before scaling*5. OFF: Outputs no test signal. BARS: Outputs a color bars signal. SAW: Outputs the test signal of a sawtooth waveform. RASTER: Outputs a rectangular test signal. WINDOW: Outputs a window test signal.
		COLOR SELECT	[W] , R, G, B, YL, CY, MG	Sets the display color during selection of RASTER or WINDOW in TEST1.
		TEST LEVEL	0% to [100%] to 109%, MAX	Sets the signal level during selection of RASTER or WINDOW in TEST1.
		TEST2	[OFF] , BARS, SAW, RASTER, WINDOW	Sets the internal test signal on the input 2 side before scaling*5. OFF: Outputs no test signal. BARS: Outputs a color bars signal. SAW: Outputs the test signal of a sawtooth waveform. RASTER: Outputs a rectangular test signal. WINDOW: Outputs a window test signal.
		COLOR SELECT	[W] , R, G, B, YL, CY, MG	Sets the display color during selection of RASTER or WINDOW in TEST2.
		TEST LEVEL	0% to [100%] to 109%, MAX	Sets the signal level during selection of RASTER or WINDOW in TEST2.
		TEST3	[OFF] , BARS, SAW, RASTER, WINDOW	Sets the internal test signal after scaling*5. OFF: Outputs no test signal. BARS: Outputs a color bars signal. SAW: Outputs the test signal of a sawtooth waveform. RASTER: Outputs a rectangular test signal. WINDOW: Outputs a window test signal.

(Continued)

∗1: Refer to AUTO RELEASE of OPERATION MENU 03 MAGNIFICATION.
∗2: Check whether the camera to be connected supports VF ASSIGNABLE SW.
∗3: While the SERVICE menu is displayed, this item is disabled (menu display is not erased automatically).
∗4: This item is available only for HDVF-EL70 and only when S800-2 on the PR-326 board is set to ON. (Refer to Section 1-3.)
∗5: Necessarily operates in the OFF state when the power is turned on.

Page	Menu	Item	Setting (□ is a factory-setting value.)	Function
S02	TEST	COLOR SELECT	[W] , R, G, B, YL, CY, MG	Sets the display color during selection of RASTER or WINDOW in TEST3.
		TEST LEVEL	0% to [100%] to 109%, MAX	Sets the signal level during selection of RASTER or WINDODW in TEST3.
S03	COLOR TEMP	ADJUST ITEM	[OFF] , BIAS, GAIN	Switches the display when adjusting the color temperature of a screen.*5 OFF: Displays an ordinary screen. BIAS: Displays a BIAS adjustment screen. GAIN: Displays a GAIN adjustment screen.
		ADJUST BIAS R	–512 to [0] to 511	Adjusts the color balance (bias).
		ADJUST BIAS G	–512 to [0] to 511	
		ADJUST BIAS B	–512 to [0] to 511	
		ADJUST GAIN R	0 to [256] to 1023	Adjusts the color balance (gain).
		ADJUST GAIN G	0 to [256] to 1023	
		ADJUST GAIN B	0 to [256] to 1023	
		COLOR TEMP	[LOW] , HIGH	Switches the color temperature. LOW: D65 HIGH: D93
S04	KNEE	KNEE	[OFF] , ON	Sets a knee correction circuit to ON and OFF. OFF: Invalid ON: Valid
		KNEE POINT	0 to [180] to 255	Sets a knee point level.
		KNEE SLOPE	1/2, 1/3, [1/4]	Sets a knee slope level.
S05	PEAKING 1	PEAKING MODE	[STD] , PLUS	Select a PEAKING mode. STD: Ordinary mode PLUS: PEAKING PLUS mode
		COLOR/AREA SEL	[COLOR] , AREA, BOTH	In the PEAKING mode, select the mode during selection of PLUS. COLOR: Emphasizes the contour of only the selected color. AREA: Emphasizes the contour of only the selected area. BOTH: Emphasizes the contour of only the selected color and area.
		POSITION	[CENTER] , UPPER, RIGHT, LOWER, LEFT	Select the contour correction target area when AREA or BOTH is selected in COLOR/AREA SEL. CENTER: The center is emphasized in contour. UPPER: The upper part is emphasized in contour. RIGHT: The right is emphasized in contour. LOWER: The lower part is emphasized in contour. LEFT: The left is emphasized in contour.

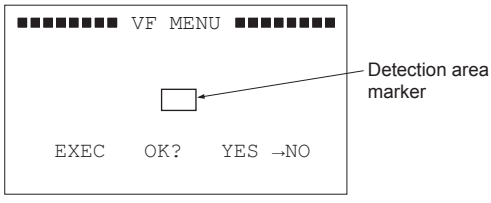
(Continued)

*5: Necessarily operates in the OFF state when the power is turned on.

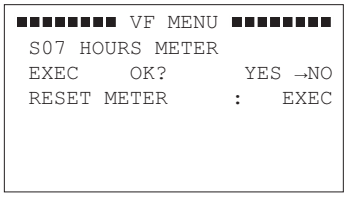
Page	Menu	Item	Setting (□ is a factory-setting value.)	Function
S05	PEAKING 1	COLOR DETECT	EXEC	Automatic color detection function **Note** These functions only when COLOR or BOTH is selected. The current display is shifted to the execution screen when moving the marker to the color of the desired subject and pressing the MENU control*6.
		LUMINANCE	0 to [512] to 1023	Sets the center value of the luminance to be peaked.
		HUE	0 to [512] to 1023	Sets the center phase of the hue to be peaked.
		SATURATION	0 to [512] to 1023	Sets the center value of the saturation to be peaked.
		LUMI WIDTH	0 to [1023]	Sets the range of the luminance to be peaked.
		HUE WIDTH	1 to [64] to 511	Sets the range of the hue to be peaked.
		SAT WIDTH	0 to [128] to 255	Sets the range of the saturation to be peaked.
S06	PEAKING 2	FREQUENCY	L, [M] , MH, H	Sets the center frequency of a peaking signal.
		RANGE	1 to [2] to 4	Sets variable peaking amount.
		CRISPENING	0 to [12] to 63	Sets the level in which a peaking is crispened.
S07	HOURS METER	RESET METER	EXEC	Resets operation time. The current display is shifted to the execution screen when you press the MENU control*7.
		OPERATION	Only display	Total power-on time (resettable)
		PANEL	Only display	Total power-on time of panel
		TOTAL	Only display	Total power-on time

(Continued)

∗6: The current display is shifted to the execution screen below by moving a "→" mark to EXEC and pressing the MENU control.
Place the detection area marker at the color you want to correct.
This function is executed by moving the "→" mark to "YES" and pressing the MENU control.



∗7: The current display is shifted to the execution screen below when moving a "→" mark to EXEC and pressing the MENU control.
This function is executed when moving the "→" mark to "YES" and pressing the MENU control.



Page	Menu	Item	Setting (□ is a factory-setting value.)	Function
S08	DIAGNOSIS	EEPROM	Only display	Displays the self-diagnosis result of EEPROM (IC1302) on the PR-337 board. OK: Normal NG: A problem exists in communication or saved data.
		SCALER	Only display	Displays the self-diagnosis result of an image processing IC (IC801) on the PR-337 board. OK: Normal NG: A problem exists in communication.
		FPGA	Only display	Displays the self-diagnosis result of FPGA (IC401) on the PR-337 board. OK: Normal NG: A problem exists in communication.
		CLOCK	Only display	Displays the self-diagnosis result of a clock generation circuit (IC481) on the PR-337 board. OK: Normal NG: A problem exists in communication.
		LPF	Only display	Displays the self-diagnosis result of an LPF (IC204) on the PR-337 board. OK: Normal NG: A problem exists in communication.
		ADC	Only display	Displays the self-diagnosis result of ADC (IC301) on the PR-337 board. OK: Normal NG: A problem exists in communication.
		I/O	Only display	Displays the self-diagnosis result of I/O EXPANDER (IC1452) on the PR-337 board. OK: Normal NG: A problem exists in communication.
		TEMP	Only display	Displays the self-diagnosis result of a temperature sensor (IC1306) on the PR-337 board. OK: Normal NG: A problem exists in communication.
		IIC	Only display	Displays the self-diagnosis result of communication with the panel module. OK: Normal NG: A problem exists in communication.
		CC	Only display	Displays the self-diagnosis result of chromaticity correction of the panel module. OK: Normal NG: A problem exists in chromaticity correction.
		POWER	Only display	Displays the self-diagnosis result of power supply to the panel module. OK: Normal NG: A problem exists in power supply.
		FAN	Only display	Displays the fan self-diagnosis result. OK: Normal NG: Failure ——: Undefined

(Continued)

Page	Menu	Item	Setting (□ is a factory-setting value.)	Function
S09	VERSION	SOFTWARE	Only display	Displays the software version of IC1201 on the PR-337 board.
		FPGA	Only display	Displays the FPGA version of IC401 on the PR-337 board.
		PANEL		
		SOFTWARE	Only display	Displays the software version of the panel module.
		FPGA	Only display	Displays the FPGA version of the panel module.
		NVM	Only display	Displays the NVM version of the panel module.
S10	SERIAL NO.	STORE	EXEC	Writes the serial number of this unit into EEPROM (IC1305) on the PR-337 board. The current display is shifted to the execution screen when you press the MENU control*7.
		NO.	xxxxxx	Displays and sets the serial number of this unit.
		MODEL	Only display	Displays the model name of this unit.
S11	RESET	MENU RESET	EXEC	Returns the setting values in a menu to the factory-setting values*8. The current display is shifted to the execution screen when you press the MENU control*7.

*7: The current display is shifted to the execution screen below when moving a "→" mark to EXEC and pressing the MENU control.
This function is executed when moving the "→" mark to "YES" and pressing the MENU control.

```
■■■■■■■■ VF MENU ■■■■■■■■
 S11 RESET
 EXEC     OK?       YES →NO
 MENU RESET     :     EXEC
```

*8: The items on page S03 in the SERVICE menu is adjusted during factory setting. They are not reset even if MENU RESET is executed. For the adjustment, refer to "Section 4 Electrical Alignment".

Section 4
Electrical Alignment

Note

This unit is adjusted in the factory shipping process. Adjustment values are saved in IC1302 on the PR-337 board.
Perform this adjustment when the PR-337 board or IC1302 is replaced.
Also perform this adjustment if a secular change in color temperature occurs after operation of the unit.

4-1. Preparation

4-1-1. Setting of Switches, Volume Controls, and Menus

Note

Set the switches, volume controls, and menus used for adjustment as described below unless otherwise specified.

① POWER switch: ON
② BRIGHT volume control: 0 (Center)
③ CONTRAST volume control: 0 (Center)
④ PEAKING volume control: 0 (Fully counterclockwise (↺))

⑤ MENU: OPERATION
PAGE: 01 FUNCTION
ITEM: KNEE → OFF
MONOCHROME → OFF
CHROMA → 0
MATRIX → ITU709

⑥ MENU: OPERATION
PAGE: 03 PEAKING
ITEM: PEAKING MODE → STD

⑦ MENU: OPERATION
PAGE: 04 MAGNIFICATION
ITEM: MAGNIFICATION → OFF

⑧ MENU: OPERATION
PAGE: 05 PRESET
ITEM: PRESET → OFF

4-1-2. Required Equipment

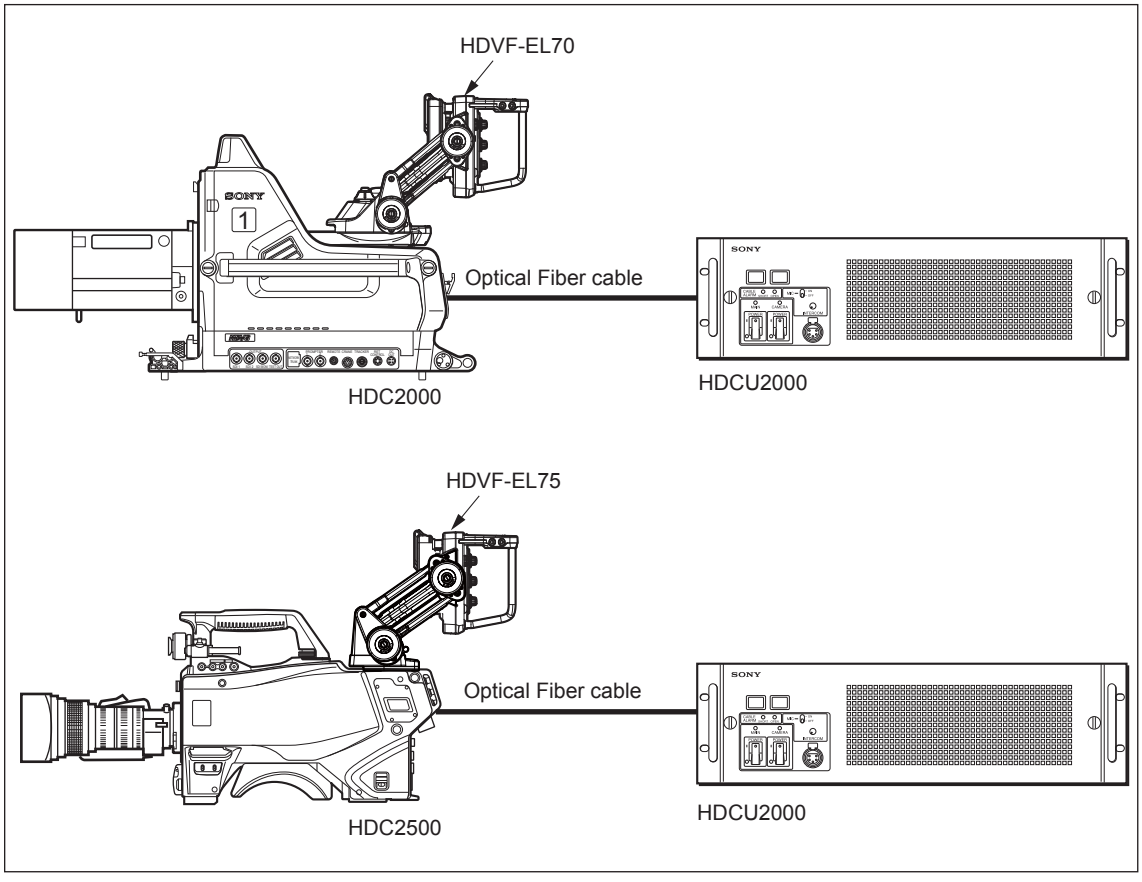
Measuring equipment

- Display color analyzer: Konica Minolta sensing CA-310 or the equivalent

Related equipment

- Color camera: HDC4800/4300
  HD color camera: HDC2100/2000
  HDC2600/2500/2400/1700 series
  HSC300R/HSC100R series
  HDCU2000/2500/1700
- Optical fiber cable

4-1-3. Connection



4-1-4. Setting Format

Make adjustments in the 1080/59.94i mode.
For switching format, refer to the operation manual of the camera to be connected.

4-2. Color Temperature Adjustment

Note

Apply an electric current for about 30 minutes and perform adjustment after luminance is stabilized.

1. Set COLOR TEMP to LOW.
   Setting MENU: SERVICE
   PAGE: S03 COLOR TEMP
   ITEM: COLOR TEMP → LOW
2. Execute steps (1) and (2) below and perform ADJUST GAIN adjustment.
   (1) Set ADJUST ITEM to GAIN.
   Setting MENU: SERVICE
   PAGE: S03 COLOR TEMP
   ITEM: ADJUST ITEM → GAIN
   (2) Switch ADJUST GAIN R, G, and B for adjustment so that the color temperature in the center of a screen satisfies specifications.
   Note
   Fix the gain of either R, G, or B to 256, and adjust the gain so that the gain of other two colors does not exceed 256.
   Setting MENU: SERVICE
   PAGE: S03 COLOR TEMP
   ITEM: ADJUST GAIN R
   ADJUST GAIN G
   ADJUST GAIN B
   Measuring equipment: Display color analyzer
   Measurement point: Center of screen
   Specifications: x = 0.313 ±0.005
   y = 0.329 ±0.005
3. Execute steps (1) to (3) below and perform ADJUST BIAS adjustment.
   (1) Set ADJUST ITEM to BIAS.
   Setting MENU: SERVICE
   PAGE: S03 COLOR TEMP
   ITEM: ADJUST ITEM → BIAS
   (2) Set ADJUST BIAS G data to “0”. (ADJUST BIAS G = Fixed to “0”.)
   (3) Adjust ADJUST BIAS R and B so that the color temperature in the center of a screen satisfies specifications.
   Setting MENU: SERVICE
   PAGE: S03 COLOR TEMP
   ITEM: ADJUST BIAS R
   ADJUST BIAS B
   Measuring equipment: Display color analyzer
   Measurement point: Center of screen
   Specifications: x = 0.313 ±0.005
   y = 0.329 ±0.005
4. Repeat steps 2 and 3 so that each specification is satisfied.
5. Set ADJUST ITEM to OFF.
   Setting MENU: SERVICE
   PAGE: S03 COLOR TEMP
   ITEM: ADJUST ITEM → OFF

Section 5
Spare Parts

5-1. 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.

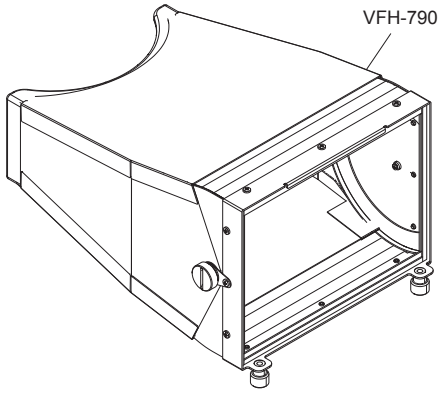
3. Stock of Parts

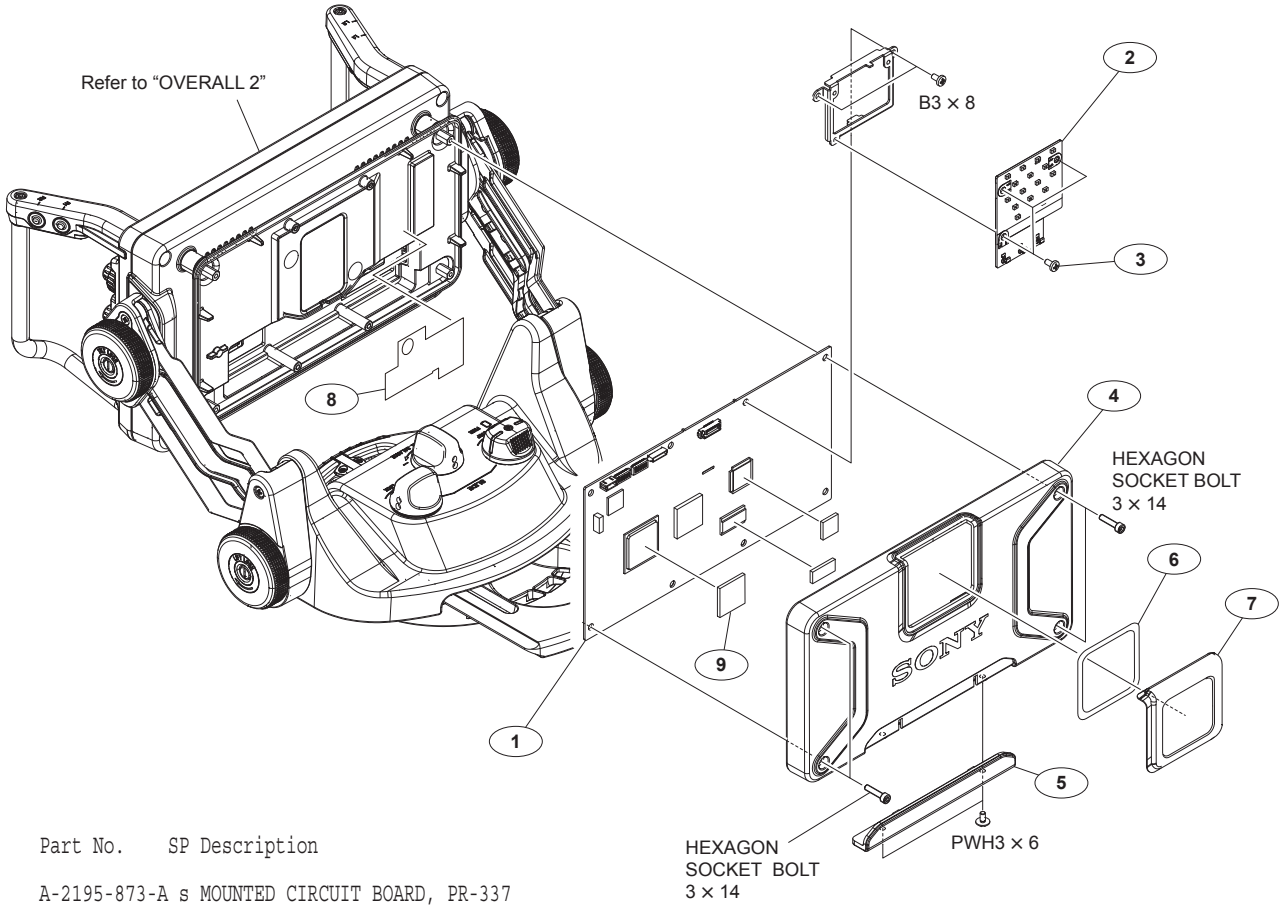
Parts marked with “o” at SP (Supply Code) column of the spare parts list may not be stocked. Therefore, the delivery date will be delayed.

4. Harness

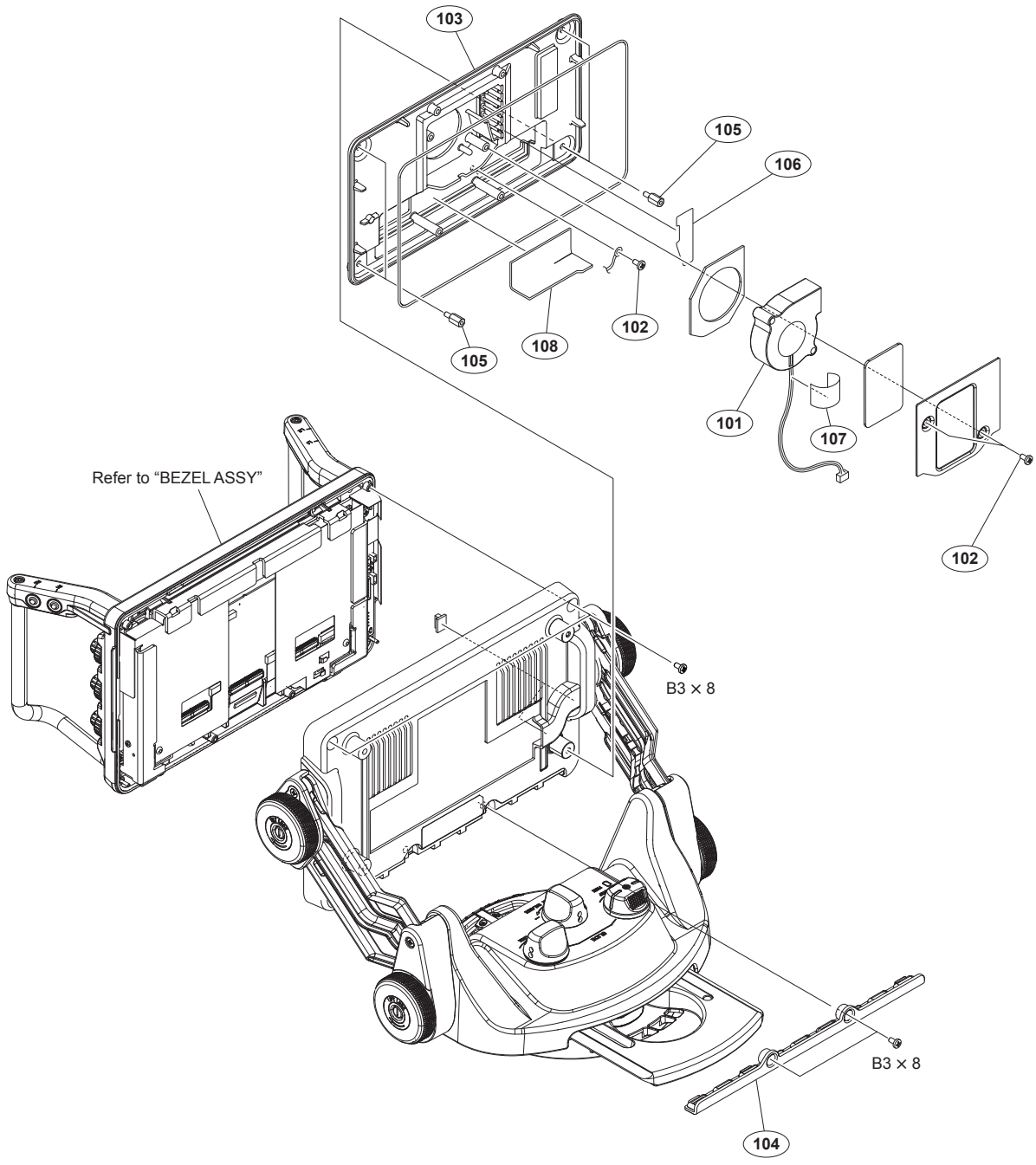
Harnesses with no part number are not registered as spare parts.

5-2. Exploded Views



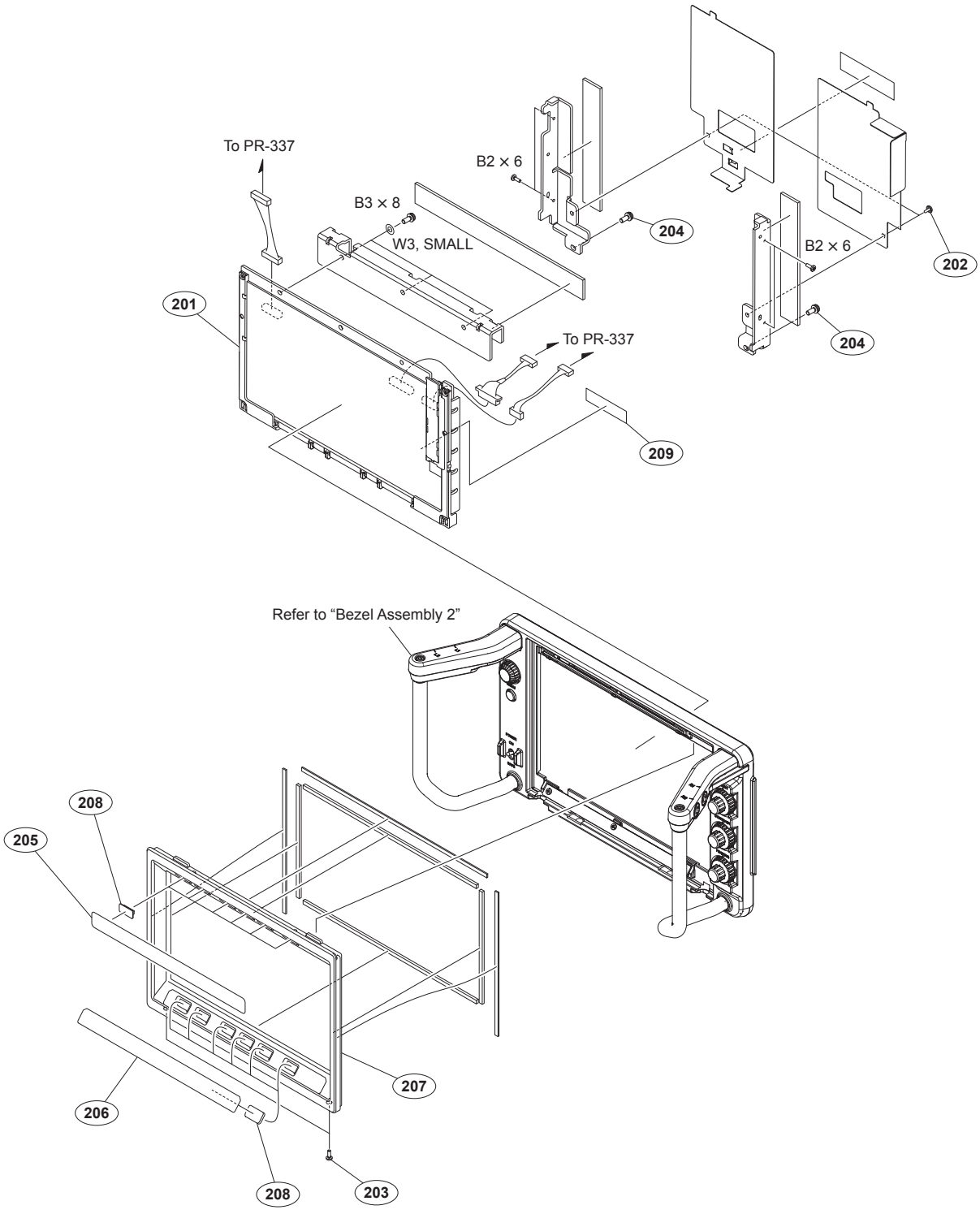


No.	Part No.	SP	Description
1	A-2195-873-A	s	MOUNTED CIRCUIT BOARD, PR-337
2	A-2195-874-A	s	MOUNTED CIRCUIT BOARD, LE-415
3	4-150-565-01	s	SCREW +B 3X5 NI (SCOTCH GRIP)
4	4-558-935-01	s	COVER (C), REAR
5	4-195-862-02	s	PAD, REAR
6	4-195-869-03	s	ADHESIVE(TALLY)
7	4-195-870-02	s	COVER, TALLY
8	4-262-515-02	s	SHEET (FERRITE CORE)
9	4-196-297-02	s	SHEET(D),RADIATION
	7-682-548-04	s	SCREW +B 3X8
	7-682-903-19	s	SCREW +PWH 3X6
	7-683-407-04	s	BOLT,HEXAGON SOCKET 3X14

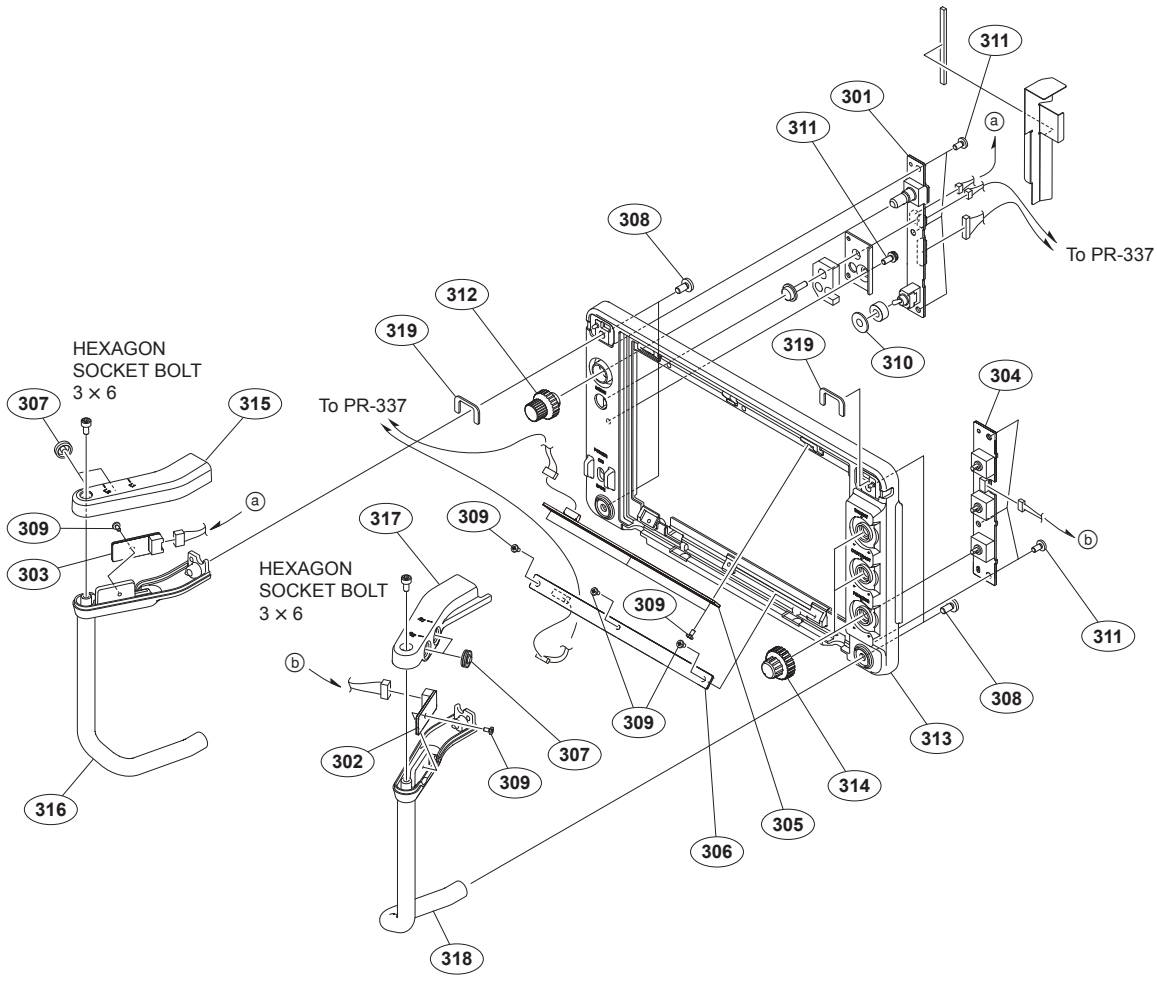


No.	Part No.	SP	Description
101	1-787-656-11	s	D.C.FAN
102	4-150-565-01	s	SCREW +B 3X5 NI (SCOTCH GRIP)
103	4-558-936-01	s	FRAME (B), REAR
104	4-195-861-01	s	GUARD(LOWER),PANEL
105	4-198-669-01	s	SUPPORT (L=9)
106	4-262-514-01	s	SHEET (FAN), SEALING
107	3-278-255-01	s	TAPE (BT)
108	4-736-184-01	s	SHEET, HARNESS GUARD
	7-682-548-09	s	SCREW +B 3X8

Bezel Assembly 1

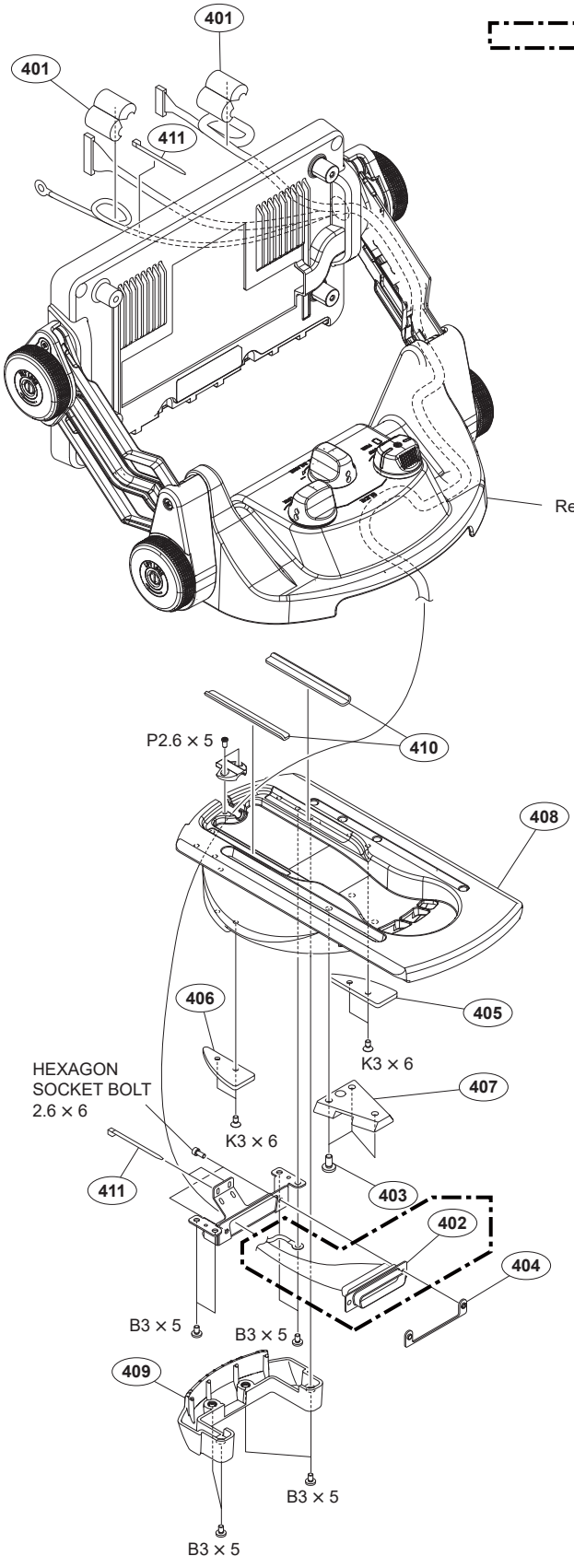


No.	Part No.	SP	Description
201	⚠ A-1796-939-C	s	PANEL ASSY (HDVF), SERVICE
202	2-279-715-01	s	RIVET, NYLON
203	3-729-076-11	s	SCREW (+B) (2X4)
204	4-150-565-01	s	SCREW +B 3X5 NI (SCOTCH GRIP)
205	4-196-225-01	s	SHEET (UPPER) S, TALLY (EL70) (for HDVF-EL70)
	4-195-839-01	s	SHEET (UPPER) P, TALLY (EL75) (for HDVF-EL75)
206	4-195-851-01	s	SHEET (LOWER), TALLY
207	4-558-934-01	s	MASK, FRONT
208	4-195-865-01	s	GUIDE,LIGHT
209	4-488-383-01	s	TAPE (13X50) //C
	7-621-772-38	s	SCREW +B 2X6
	7-682-548-04	s	SCREW +B 3X8
	7-688-003-01	s	W 3, SMALL

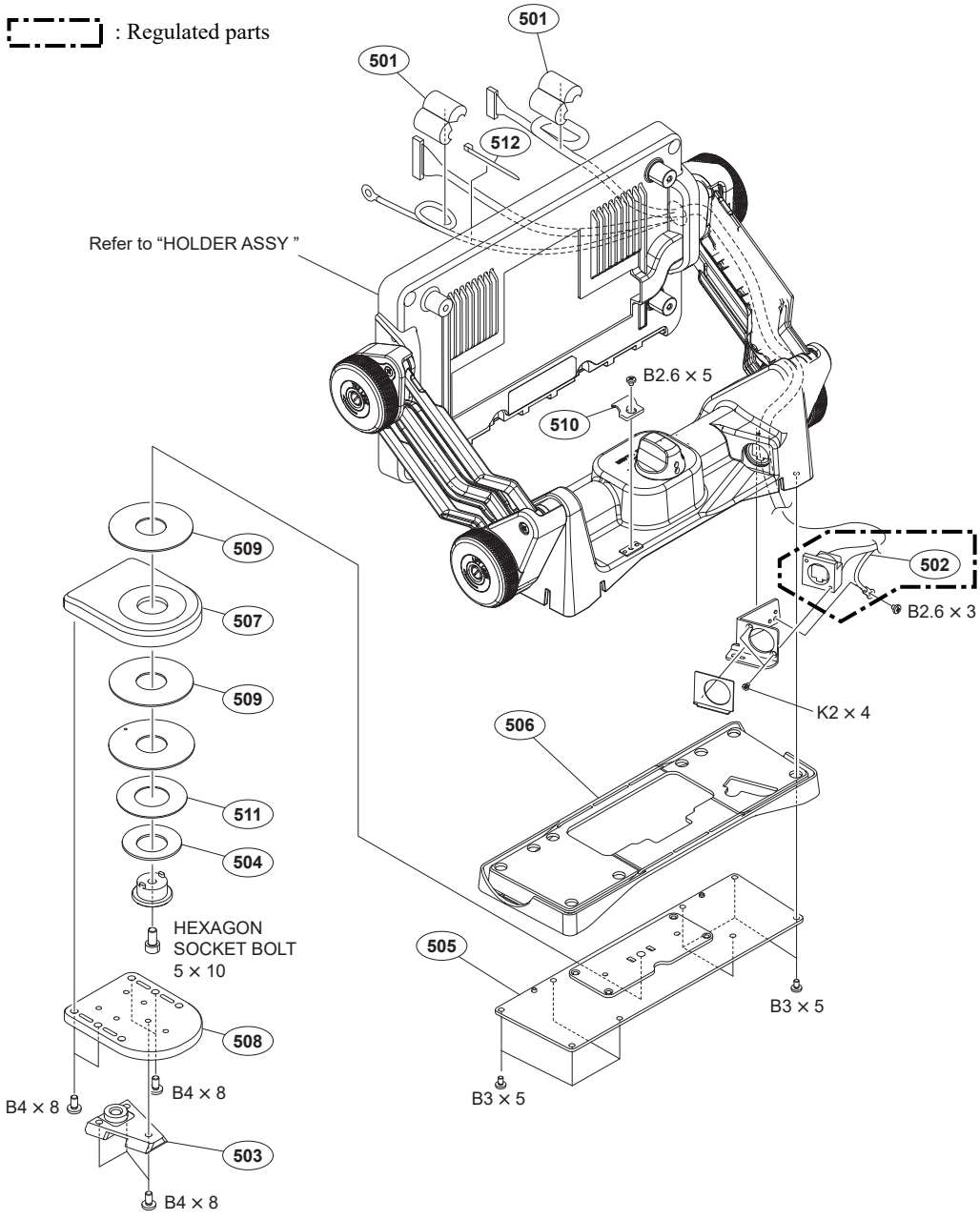


No.	Part No.	SP	Description
301	A-2195-869-A	s	MOUNTED CIRCUIT BOARD, SW-1730
302	A-2195-870-A	s	MOUNTED CIRCUIT BOARD, SW-1731
303	A-2195-871-A	s	MOUNTED CIRCUIT BOARD, SW-1732
304	A-2195-872-A	s	MOUNTED CIRCUIT BOARD, VR-366
305	A-2195-875-A	s	MOUNTED CIRCUIT BOARD, LE-416
306	A-2195-876-A	s	MOUNTED CIRCUIT BOARD, LE-417
307	3-676-244-04	s	COVER, SWITCH
308	3-685-694-02	s	NYLOCK +PSW M4
309	3-729-076-11	s	SCREW (+B) (2X4)
310	3-869-883-01	s	RUBER,DROP PROTECTION
311	4-150-565-01	s	SCREW +B 3X5 NI (SCOTCH GRIP)
312	4-183-519-01	s	KNOB(B),RE
313	4-558-933-01	s	BEZEL
314	4-195-859-04	s	KNOB, VOLUME
315	4-195-863-01	s	COVER (LEFT), HANDLE
316	4-558-248-01	s	BASE (LEFT), HANDLE
317	4-195-867-01	s	COVER (RIGHT), HANDLE
318	4-558-249-01	s	BASE (RIGHT), HANDLE
319	4-196-282-01	s	SHEET(HANDLE),SEALING
	7-683-403-04	s	BOLT,HEXAGON SOCKET 3X6

VF Holder Unit (S) (HDVF-EL70)



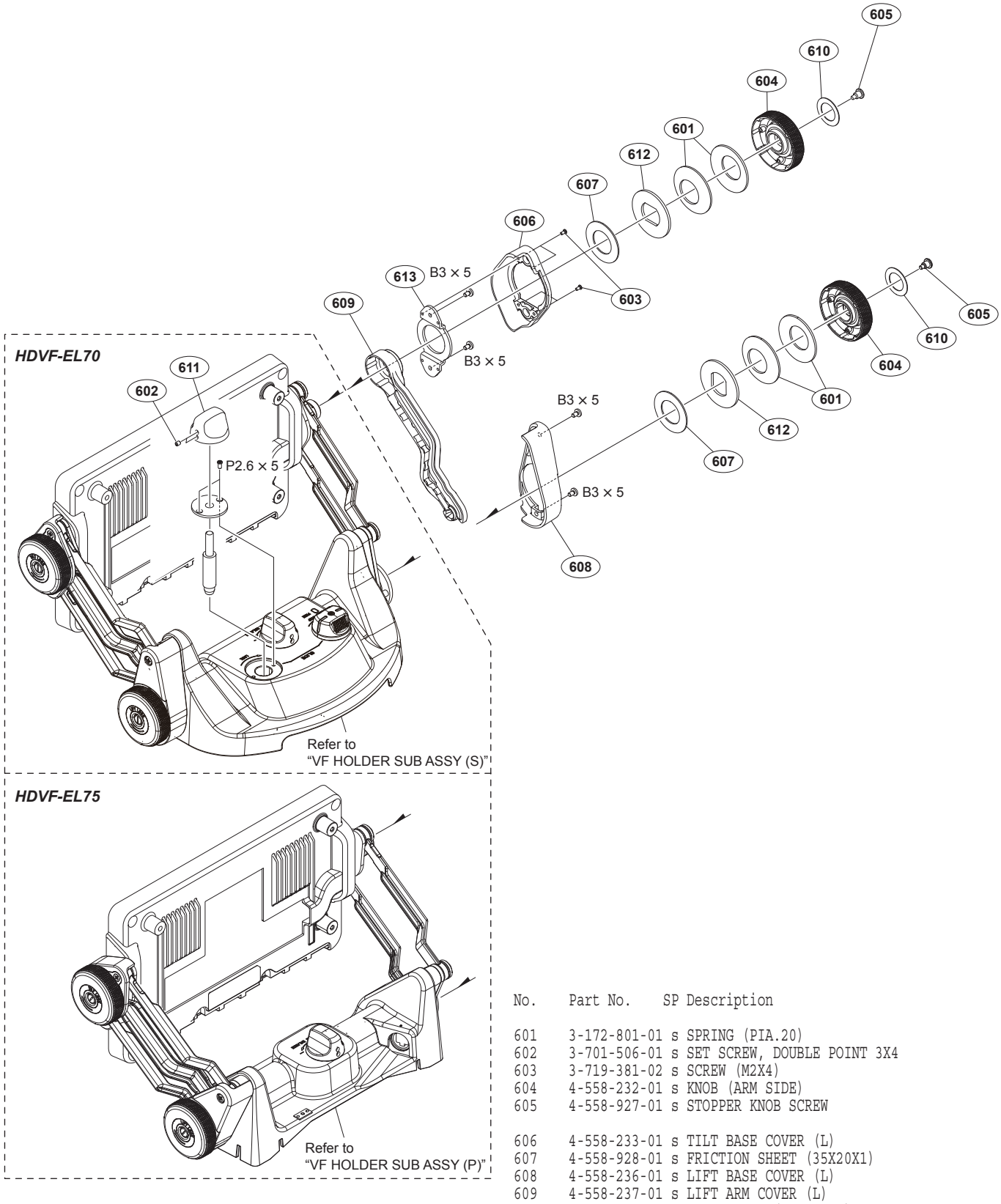
No.	Part No.	SP	Description
401	1-482-025-11	s	BEAD, FERRITE (CASE)
402	1-967-456-14	s	HARNESS, SUB (VF CONNECTION1)
403	3-604-479-02	s	ALOCK +B4X8
404	3-675-929-02	s	NUT (50P), PLATE
405	3-692-333-01	o	PLATE (LEFT)
406	3-692-334-01	o	PLATE (RIGHT)
407	3-716-391-02	o	WEDGE, MOUNTING
408	4-558-915-01	s	V-SHOE BASE (A)
409	4-195-345-01	s	V-SHOE BASE COVER (S)
410	4-559-953-01	s	CARRY CUSHION
411	3-746-631-01	s	BAND, BINDING
	7-627-556-58	s	SCREW +P 2.6X5
	7-682-247-04	s	SCREW +K 3X6
	7-682-546-09	s	SCREW +B 3X5
	7-683-412-05	s	BOLT,HEXAGON SOCKET 2.6X6



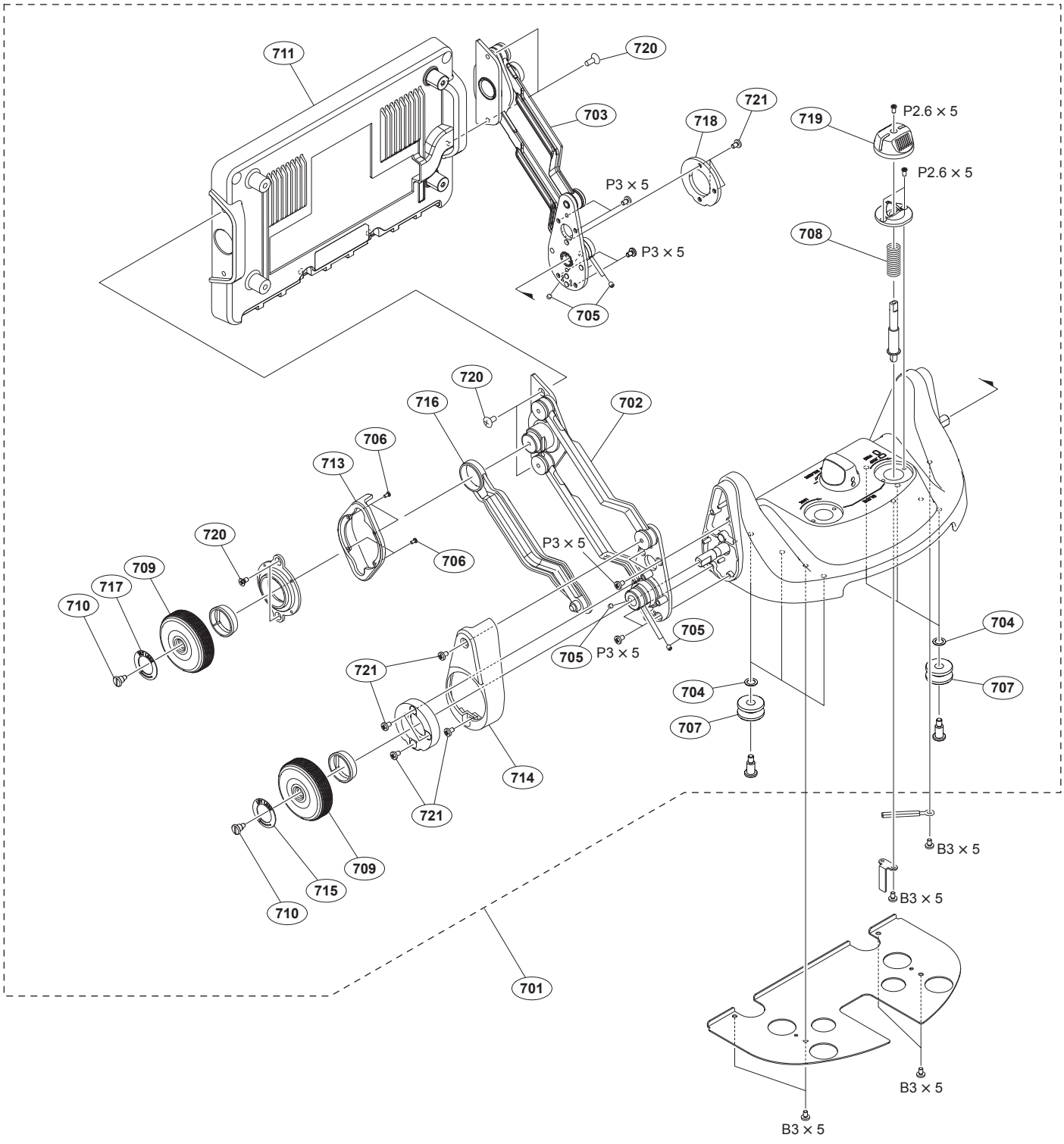
No.	Part No.	SP	Description
501	1-482-025-11	s	BEAD, FERRITE (CASE)
502	1-967-457-13	s	HARNESS, SUB (VF CONNECTION2)
503	3-854-770-02	s	WEDGE(D),MOUNTING
504	4-027-627-01	o	SPRING (DIA. 18)
505	4-558-241-01	s	VF HOLDER BASE CONER (P)
506	4-195-519-01	s	BASE GUARD (P)
507	4-558-243-01	s	BASE (TOP), PAN
508	4-558-244-01	s	BASE (BOTTOM), PAN
509	4-558-246-01	s	SHEET, PAN
510	4-197-161-01	s	HOLDER, CABLE
511	4-577-013-01	s	SPACER, PAN SHAFT
512	3-746-631-01	s	BAND, BINDING

No.	Part No.	SP	Description
	7-621-591-00	s	SCREW +K 2X4
	7-621-775-08	s	SCREW +B 2.6X3
	7-621-775-20	s	SCREW +B 2.6X5
	7-682-546-09	s	SCREW +B 3X5
	7-682-561-04	s	SCREW +B 4X8
	7-683-435-04	s	BOLT,HEXAGON SOCKET 5X10

Holder Assembly



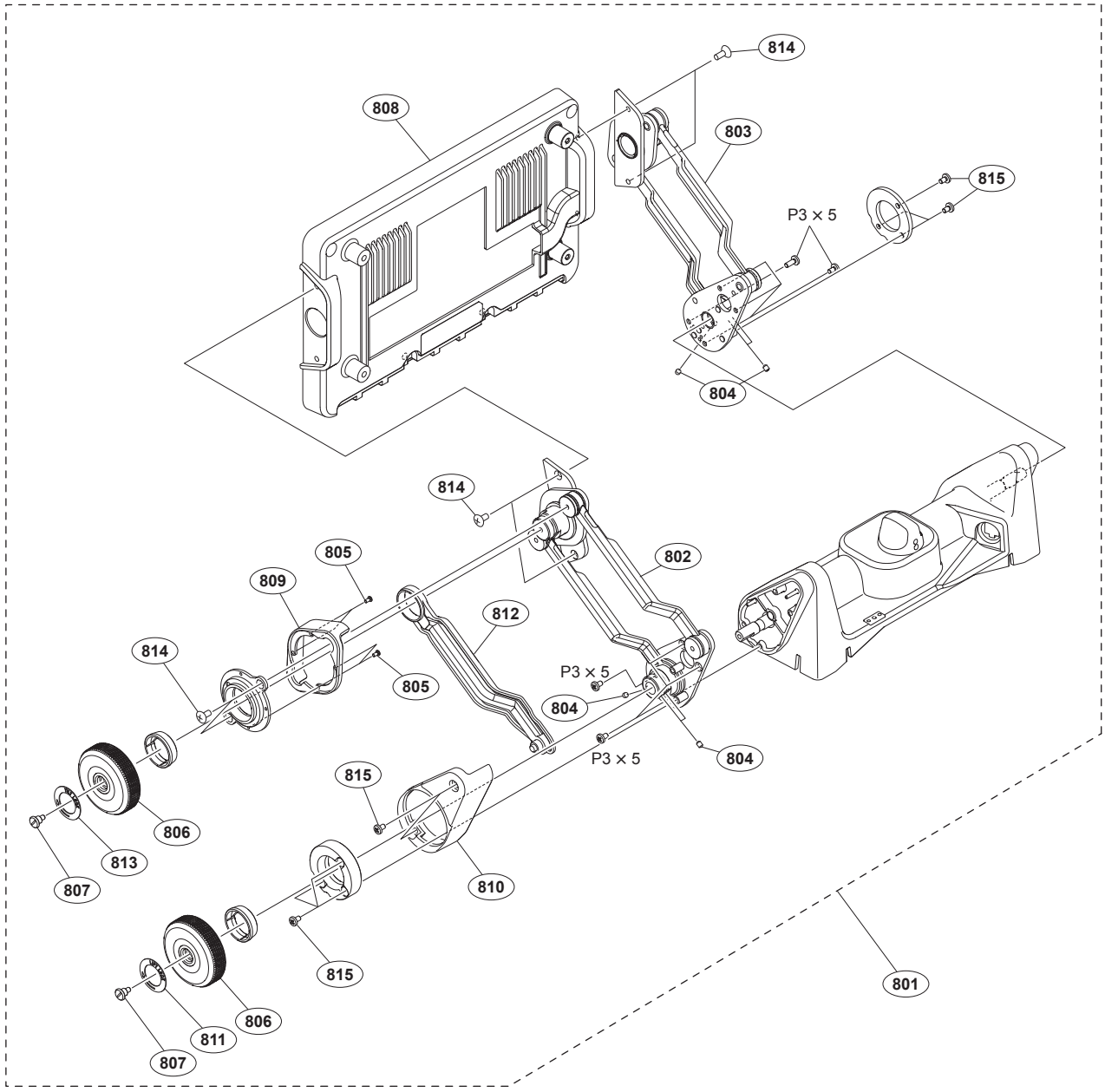
No.	Part No.	SP	Description
601	3-172-801-01	s	SPRING (PIA.20)
602	3-701-506-01	s	SET SCREW, DOUBLE POINT 3X4
603	3-719-381-02	s	SCREW (M2X4)
604	4-558-232-01	s	KNOB (ARM SIDE)
605	4-558-927-01	s	STOPPER KNOB SCREW
606	4-558-233-01	s	TILT BASE COVER (L)
607	4-558-928-01	s	FRICTION SHEET (35X20X1)
608	4-558-236-01	s	LIFT BASE COVER (L)
609	4-558-237-01	s	LIFT ARM COVER (L)
610	4-558-238-01	s	NAME PLATE (+- ARROW)
611	4-558-221-01	s	KNOB (STAGE)
612	4-558-234-01	s	FRICTION PLATE (M)
613	4-558-239-01	s	TILT COVER PLATE
	7-627-556-58	s	SCREW +P 2.6X5
	7-682-546-09	s	SCREW +B 3X5



No.	Part No.	SP	Description
701	A-2066-482-B	s	VF HOLDER SUB ASSY (S)
702	X-2590-749-1	s	ARM(R) SUB ASSY
703	X-2590-751-1	s	ARM(LS) SUB ASSY
704	3-701-444-21	s	WASHER, 6
705	3-701-506-01	s	SET SCREW, DOUBLE POINT 3X4
706	3-719-381-02	s	SCREW (M2X4)
707	4-559-075-01	s	GUIDE ROLLER (M)
708	4-558-919-01	s	CLICK SPRING
709	4-558-232-01	s	KNOB (ARM SIDE)
710	4-558-927-01	s	STOPPER KNOB SCREW

No.	Part No.	SP	Description
711	4-558-932-01	s	COVER, REAR
713	4-558-226-01	s	TILT BASE COVER (R)
714	4-558-228-01	s	LIFT BASE COVER (R)
715	4-558-229-01	s	NAME PLATE (LIFT LOCK)
716	4-558-230-01	s	LIFT ARM COVER (R)
717	4-558-231-01	s	NAME PLATE (TILT LOCK)
718	4-559-076-01	s	CLICK SPACER
719	4-559-077-01	s	CLICK KNOB
720	4-146-663-01	s	SCREW +K 3X6 (SCOTCH GRIP)
721	4-477-967-01	s	SCREW, +B M3X5
	7-627-556-58	s	SCREW +P 2.6X5
	7-682-146-09	s	SCREW +P 3X5
	7-682-546-09	s	SCREW +B 3X5

VF Holder Sub Assembly (P) (HDVF-EL75)



No.	Part No.	SP	Description
801	A-2066-481-B	s	VF HOLDER SUB ASSY (P)
802	X-2590-749-1	s	ARM(R) SUB ASSY
803	X-2590-750-1	s	ARM(L) SUB ASSY
804	3-701-506-01	s	SET SCREW, DOUBLE POINT 3X4
805	3-719-381-02	s	SCREW (M2X4)
806	4-558-232-01	s	KNOB (ARM SIDE)
807	4-558-927-01	s	STOPPER KNOB SCREW
808	4-558-932-01	s	COVER, REAR
809	4-558-226-01	s	TILT BASE COVER (R)
810	4-558-228-01	s	LIFT BASE COVER (R)
811	4-558-229-01	s	NAME PLATE (LIFT LOCK)
812	4-558-230-01	s	LIFT ARM COVER (R)
813	4-558-231-01	s	NAME PLATE (TILT LOCK)
814	4-146-663-01	s	SCREW +K 3X6 (SCOTCH GRIP)
815	4-477-967-01	s	SCREW, +B M3X5
	7-682-146-09	s	SCREW +P 3X5

5-3. Supplied Accessories

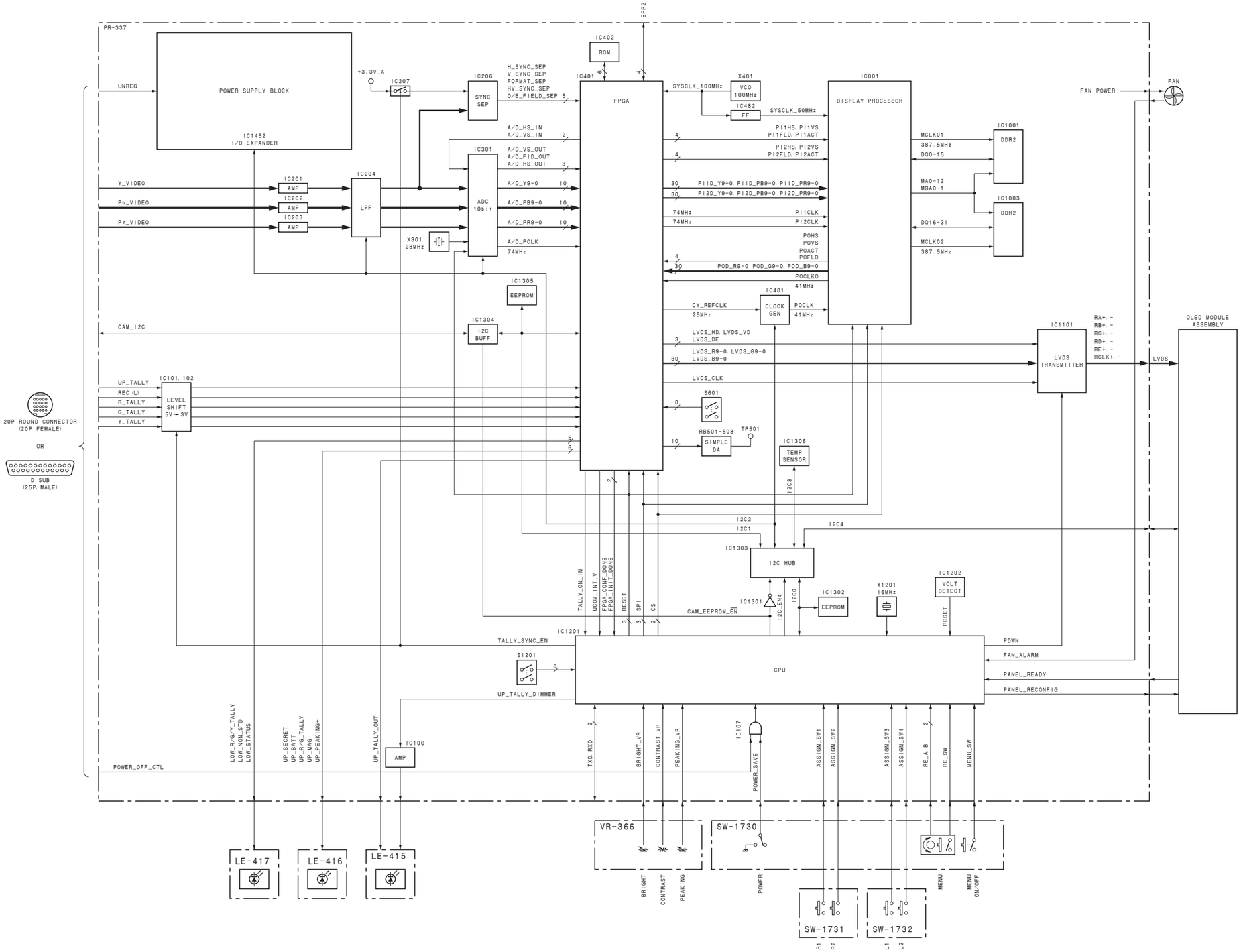
HDVF-EL70

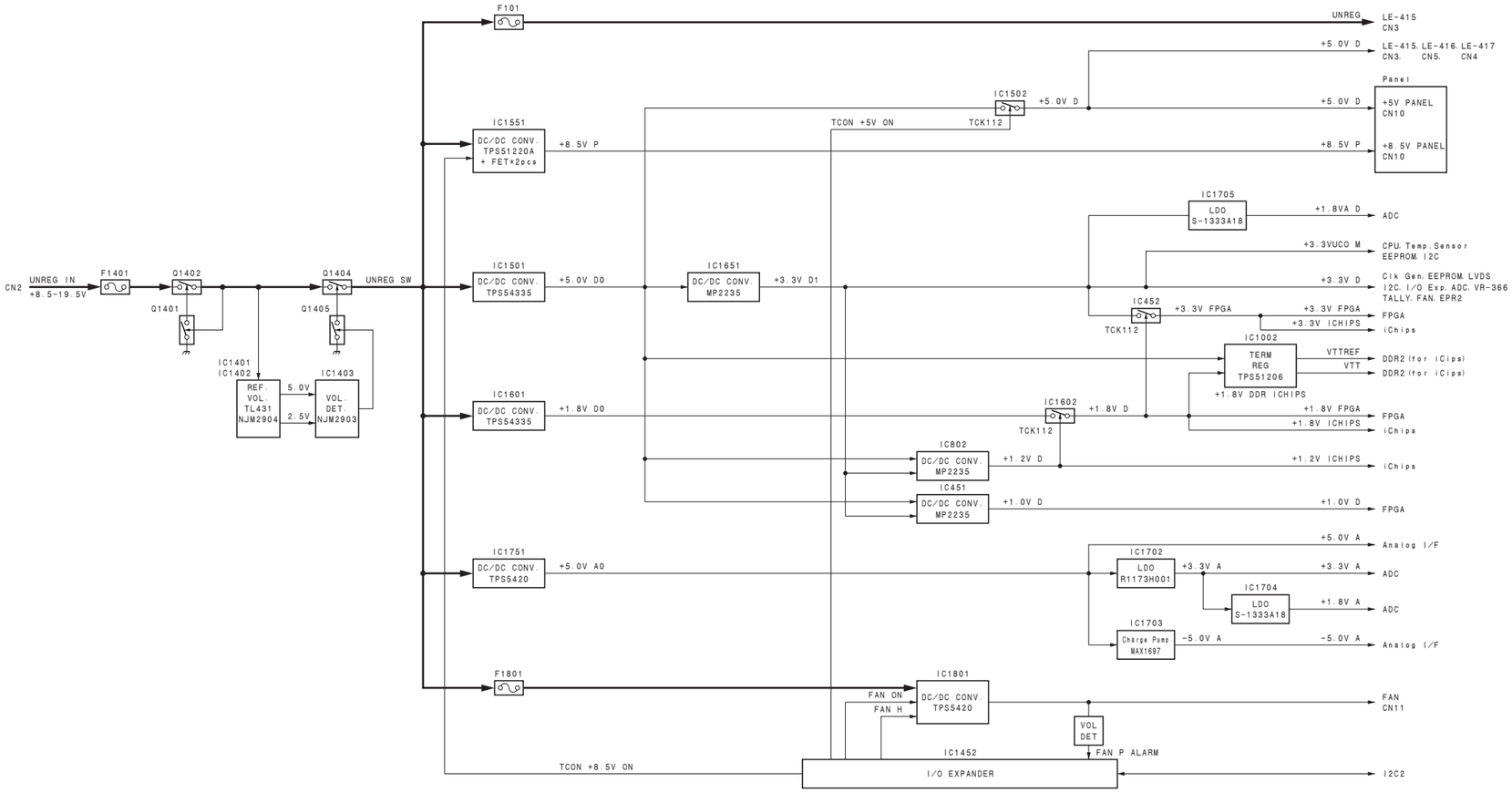
Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-1793-995-B	s	HOOD ASSY, INDOOR
1pc	X-2025-305-2	s	CLOTH ASSY, CLEANING
1pc	3-992-267-01	s	PLATE,NUMBER
1pc	⚠ 4-258-596-02	s	OPERATION MANUAL

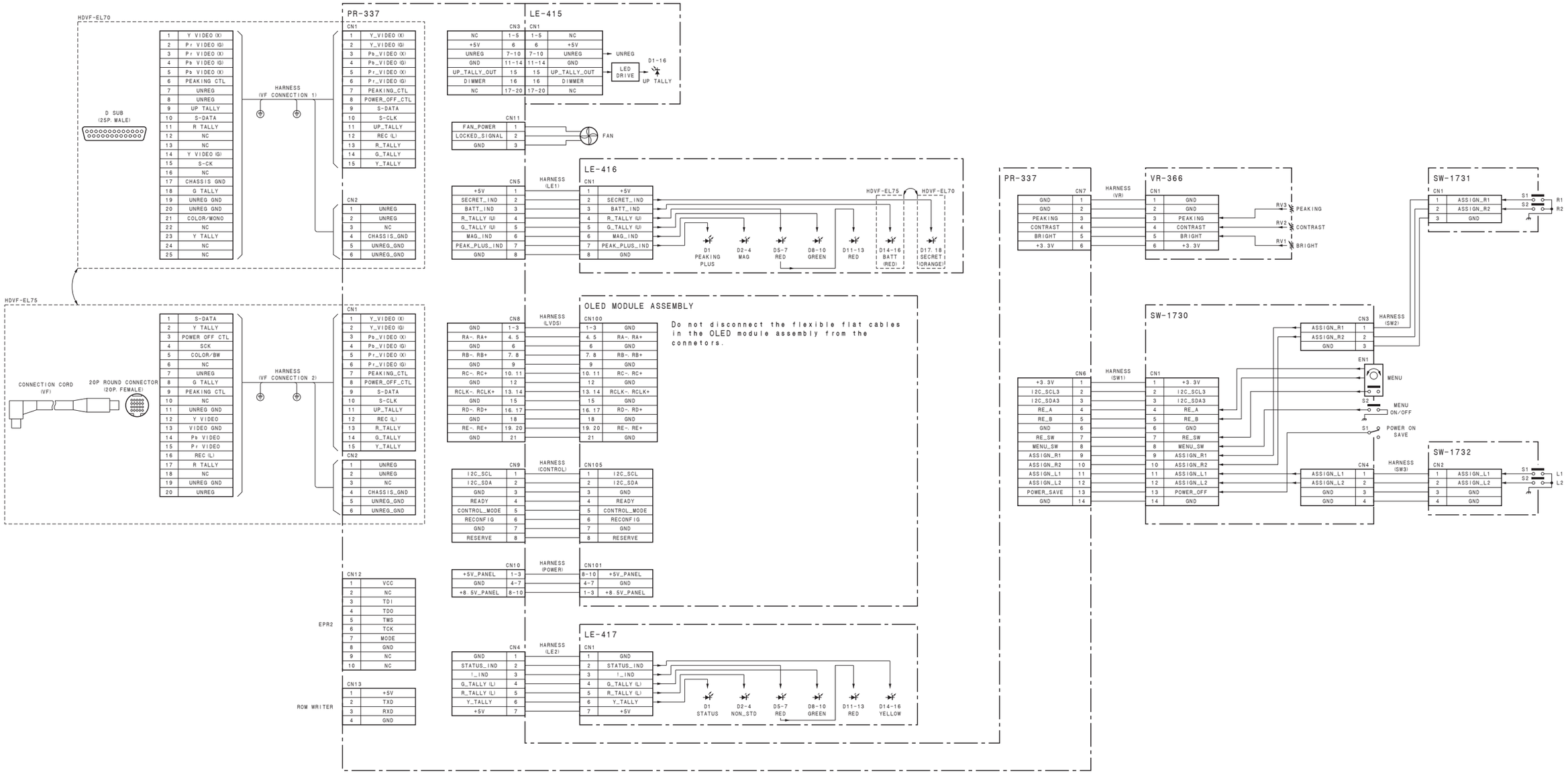
HDVF-EL75

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-1793-995-B	s	HOOD ASSY, INDOOR
1pc	A-2066-089-B	s	SHOE ASSY, V EDGE
1pc	X-2025-305-2	s	CLOTH ASSY, CLEANING
1pc	1-838-608-11	s	CORD, CONNECTION (VF)
1pc	3-992-267-01	s	PLATE,NUMBER
1pc	⚠ 4-258-602-02	s	OPERATION MANUAL
4pcs	7-683-421-04	o	BOLT,HEXAGON SOCKET 4X12
1pc	7-721-140-60	s	WRENCH, L (3.0MM)

Section 6
Diagrams




CN2
UNREG IN
+8.5~19.5V
F1401
Q1402
Q1401
Q1404
Q1405
UNREG SW
IC1401
IC1402
REF.
VOL.
TL431
NJM2904
5.0V
2.5V
IC1403
VOL.
DET.
NJM2903
F101
IC1551
DC/DC CONV.
TPS51220A
+ FET×2pcs
+8.5V P
IC1501
DC/DC CONV.
TPS54335
+5.0V D0
IC1651
DC/DC CONV.
MP2235
+3.3V D1
IC1601
DC/DC CONV.
TPS54335
+1.8V D0
IC1751
DC/DC CONV.
TPS5420
+5.0V A0
F1801
IC1801
DC/DC CONV.
TPS5420
FAN ON
FAN H
IC1502
+5.0V D
TCK112
TCON +5V ON
IC1705
LDO
S-1333A18
+1.8VA D
+3.3VUCO M
+3.3V D
IC452
+3.3V FPGA
TCK112
+3.3V ICHIPS
IC1002
TERM
REG
TPS51206
VTTREF
VTT
+1.8V DDR ICHIPS
IC1602
+1.8V D
TCK112
+1.8V FPGA
+1.8V ICHIPS
IC802
DC/DC CONV.
MP2235
+1.2V D
+1.2V ICHIPS
IC451
DC/DC CONV.
MP2235
+1.0V D
+1.0V D
IC1702
LDO
R1173H001
+3.3V A
IC1704
LDO
S-1333A18
+1.8V A
IC1703
Charge Pump
MAX1697
-5.0V A
-5.0V A
+5.0V A
VOL
DET
FAN P ALARM
IC1452
I/O EXPANDER
TCON +8.5V ON
UNREG
LE-415
CN3
+5.0V D
LE-415, LE-416, LE-417
CN3, CN5, CN4
Panel
+5V PANEL
CN10
+8.5V PANEL
CN10
+5.0V D
+8.5V P
ADC
CPU, Temp Sensor
EEPROM, I2C
Clk Gen, EEPROM, LVDS
I2C, I/O Exp, ADC, VR-366
TALLY, FAN, EPR2
+3.3V FPGA
+3.3V ICHIPS
FPGA
iChips
DDR2 (for iCips)
DDR2 (for iCips)
+1.8V FPGA
+1.8V ICHIPS
FPGA
iChips
+1.2V ICHIPS
iChips
+1.0V D
FPGA
+5.0V A
Analog I/F
+3.3V A
ADC
+1.8V A
ADC
-5.0V A
Analog I/F
FAN
CN11
I2C2



Frame Wiring

Revision History

Date	History	Contents
2021. 1	1st Edition 9-932-773-01	–

HDVF-EL70 (SY)
HDVF-EL75 (SY) E
9-932-773-01

Sony Corporation

Printed in Japan
2021. 1 08