

Service Manual

High Definition Video Camera

Model No. **HC-MDH3PP**

HC-MDH3E

HC-MDH3GC

HC-MDH3GK

HC-MDH3GW

Colour

(K).....Black Type

AVCHD™
Progressive

HDMI

SD
XC

DOLBY AUDIO™



WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

© Panasonic Corporation 2018 Unauthorized copying and distribution is a violation of law.

1 Safety Precautions

1.1 General Guidelines

1. IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by  in the Schematic Diagrams, Circuit Board Layout, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent X-RADIATION, shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

2. An Isolation Transformer should always be used during the servicing of AC Adaptor whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect AC Adaptor from being damaged by accidental shorting that may occur during servicing.
3. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
4. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

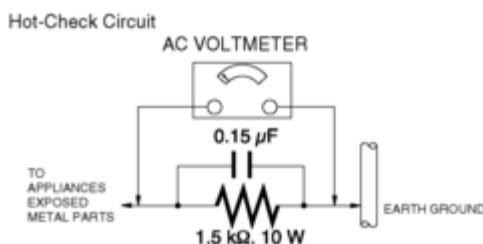
1.2 Leakage Current Cold Check

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1 M Ω and 5.2 M Ω . When the exposed metal does not have a return path to the chassis, the reading must be infinity.

1.3 Leakage Current Hot Check (See Figure. 1)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5 k Ω , 10 W resistor, in parallel with a 0.15 μ F capacitor, between each exposed metallic part on the set and a good earth ground, as shown in Figure. 1.
3. Use an AC voltmeter, with 1 k Ω /V or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 V RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 mA. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

Figure. 1



2 Warning

2.1 Prevention of Electrostatic Discharge (ESD) to Electrostatically

Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an antistatic solder removal device. Some solder removal devices not classified as "antistatic (ESD protected)" can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION :

Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

2.2 How to Recycle the Lithium Ion Battery (U.S. Only)

ENGLISH		A lithium ion battery that is recyclable powers the product you have purchased. Please call 1-800-8-BATTERY for information on how to recycle this battery.
FRANÇAIS		L'appareil que vous vous êtes procuré est alimenté par une batterie au lithium-ion recyclable. Pour des renseignements sur le recyclage de la batterie, veuillez composer le 1-800-8-BATTERY.

2.3 Caution for AC Cord

(For E/GC)

2.3.1 Information for Your Safety

IMPORTANT

Your attention is drawn to the fact that recording of pre-recorded tapes or discs or other published or broadcast material may infringe copyright laws.

WARNING

To reduce the risk of fire or shock hazard, do not expose this equipment to rain or moisture.

CAUTION

To reduce the risk of fire or shock hazard and annoying interference, use the recommended accessories only.

FOR YOUR SAFETY

DO NOT REMOVE THE OUTER COVER

To prevent electric shock, do not remove the cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

2.3.2 Caution for AC Mains Lead

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three-pin mains plug for your safety and convenience.

A 5-ampere fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amperes and it is approved by ASTA or BSI to BS1362

Check for the ASTA mark or the BSI mark on the body of the fuse.



If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover, the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local Panasonic Dealer.

If the fitted moulded plug is unsuitable for the socket outlet in your home then the fuse should be removed and the plug cut off and disposed of safely.

There is a danger of severe electrical shock if the cut off plug is inserted into any 13-ampere socket.

If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt, please consult a qualified electrician.

2.3.2.1 Important

The wires in this mains lead are coloured in accordance with the following code:

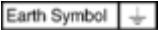
Blue	Neutral
Brown	Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

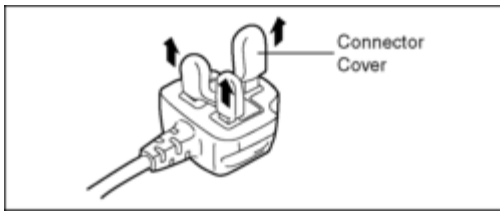
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol.



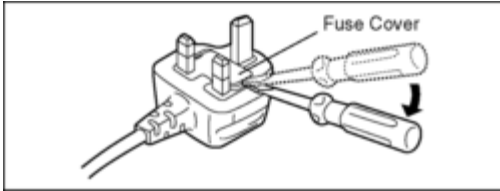
2.3.2.2 Before Use

Remove the Connector Cover as follows.

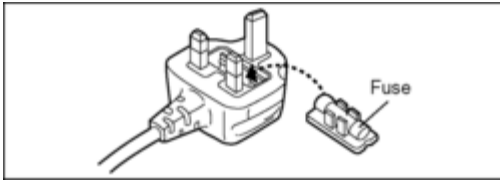


2.3.2.3 How to Replace the Fuse

1. Remove the Fuse Cover with a screwdriver.



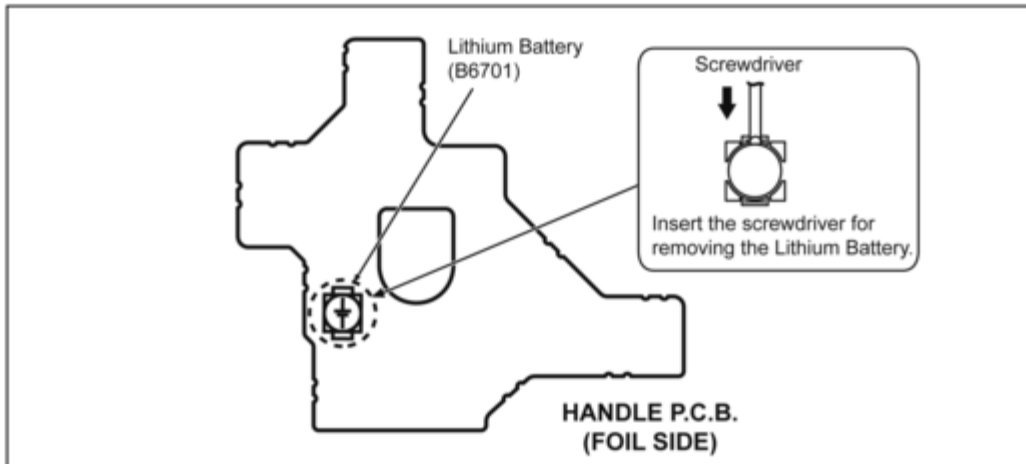
2. Replace the fuse and attach the Fuse cover.



2.4 How to Replace the Lithium Battery

2.4.1 Replacement Procedure

1. Remove the HANDLE P.C.B.. (Refer to Disassembly Procedures.)
2. Remove the Lithium battery (Ref. No. "B6701" at foil side of HANDLE P.C.B.) and then replace it into new one.



NOTE:

This Lithium battery is a critical component.

It must never be subjected to excessive heat or discharge.

It must therefore only be fitted in requirement designed specifically for its use.

Replacement batteries must be of same type and manufacture.

They must be fitted in the same manner and location as the original battery, with the correct polarity contacts observed.

Do not attempt to re-charge the old battery or re-use it for any other purpose.

It should be disposed of in waste products destined for burial rather than incineration.

(For English)

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

(For German)

ACHTUNG

Explosionsgefahr bei falschem Anbringen der Batterie. Ersetzen Sie nur mit einem äquivalentem vom Hersteller empfohlenem Typ.
Behandeln Sie gebrauchte Batterien nach den Anweisungen des Herstellers.

(For French)

MISE EN GARDE

Une batterie de remplacement inappropriée peut exploser. Ne remplacez qu'avec une batterie identique ou d'un type recommandé par le fabricant. L'élimination des batteries usées doit être faite conformément aux instructions du fabricant.

NOTE:

Above caution is applicable for a battery pack which is for HC-MDH3.

3 Service Navigation

3.1 Introduction

This service manual contains technical information, which allow service personnel's to understand and service this model.

Please place orders using the parts list and not the drawing reference numbers.

If the circuit is changed or modified, the information will be followed by service manual to be controlled with original service manual.

3.2 How to Define the Model Suffix (NTSC or PAL model)

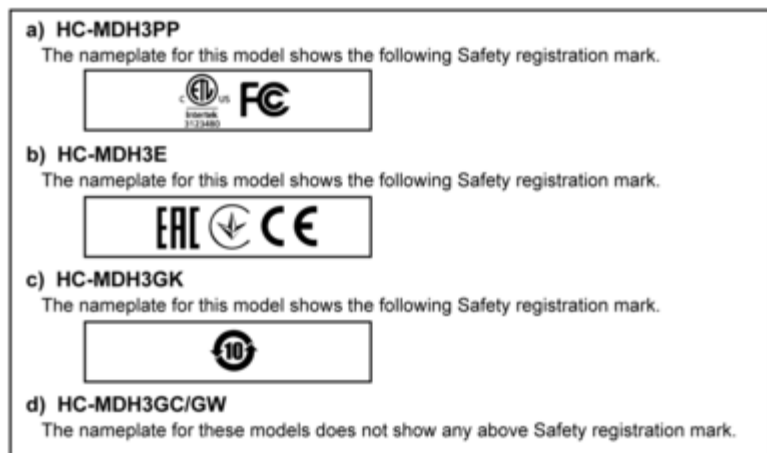
There are four kinds of HC-MDH3.

- a) HC-MDH3PP
- b) HC-MDH3E
- c) HC-MDH3GK
- d) HC-MDH3GC/GW

What is the difference is that the "INITIAL SETTING" data which is stored in Flash ROM mounted on Main P.C.B..

3.2.1 Defining methods:

To define the model suffix to be serviced, refer to the rating label and caution label which are putted on the Unit.



NOTE:

After replacing the MAIN P.C.B., be sure to achieve adjustment.

4 Specifications

The following specification is for HC-MDH3 (E/GC/GW).

Some specifications may differ depending on model suffix.

The page number in this chapter does not show the page number of this service manual.

High Definition Video Camera

Power source:
7.2 V ~ (When using battery)
12 V ~ (When using AC adaptor)
Power consumption:
27.4 W (During recording: 9.2 W; during charging: 27.4 W)

indicates safety information

Recording format:
[MOV]/[MP4]
AVCHD version 2.0
(AVCHD Progressive)
Motion picture compression:
MPEG-4 AVC/H.264
Audio compression:
[MOV]/[MP4]: Linear PCM
[AVCHD]: Dolby Audio
Motion picture recording:
Recording method: MOV, MP4, AVCHD
Recording format:
• When [REC MODE] = [MOV], [MP4]
[FHD 1080/50.00p 50M]/
[FHD 1080/25.00p 50M]/
[FHD 1080/50.00i 50M]:
Average 50 Mbps (VBR)
• When [REC MODE] = [AVCHD]
[PS 1080/50.00p]: Maximum 28 Mbps (VBR)
[PH 1080/50.00i]: Maximum 24 Mbps (VBR)
[HA 1080/50.00i]: Average 17 Mbps (VBR)
[HE 1080/50.00i]: Average 5 Mbps (VBR)
[PM 720/50.00p]: Average 8 Mbps (VBR)
[SA 576/50.00i]
(When [ASPECT CONVERT] = [SIDE CROP], [SQUEEZE]):
Average 9 Mbps (VBR)
Refer to "Operating Instructions" (PDF format) for the picture size and recordable time of a motion picture.
Still picture recording:
Recording method: JPEG corresponding (Design rule for Camera File system, based on Exif 2.2 standard)
Refer to "Operating Instructions" (PDF format) for picture size of a still picture and number of recordable pictures.

Recording media:
SDHC Memory Card (4 GB to 32 GB)
SDXC Memory Card (48 GB to 128 GB)
Refer to page 22 for details on SD cards usable in this unit.
Recording slots:
2 slots
2 Slot function:
Relay, simultaneous
System frequency:
50.00 Hz
Image sensor:
1/3.1 type (1/3.1") MOS image sensor
Effective pixels:
Motion picture/Still picture;
Approx. 6030 K (16.9)
Lens:
Auto Iris optical zoom (Full range AF)
F value (focal length)
F1.8 to F3.6 (Focal length; 4.08 mm to 81.6 mm)
35 mm equivalent;
Motion picture/Still picture;
29.5 mm to 612.0 mm (16.9)
Minimum focus distance;
Approx. 3 cm (Wide)/
Approx. 1.5 m (Tele)
Filter diameter:
49 mm
Zoom:
20× optical zoom, 40× i.Zoom,
2×/5×/10× digital zoom
White balance adjustment:
[ATW], [ATW LOCK], [Ach], [Bch],
preset 3200K, preset 5600K, VAR (2000K to 15000K)
Shutter speed:
1/6 to 1/8000
1/100 to 1/8000 (During Super Slow Recording)
Super Slow Recording:
Recording frame rate; FHD 100 fps
Slow motion effect; 1/2 or 1/4 the normal speed
Image stabilizer function:
Optical (with 5-Axis Hybrid O.I.S.)

Level Shot Function:
[ON]/[OFF]
Monitor:
7.5 cm (3") wide LCD monitor
(Approx. 460 K dots)
Viewfinder:
0.6 cm (0.24") wide EVF
(Approx. 1555 K dots equivalent)
Microphone:
Stereo microphone
Minimum required illumination:
Approx. 1.2 lx (at a Super Gain value of 36 dB and a shutter speed of 1/25)
Built-in LED light:
Illumination level: Approx. 300 lx (1.0 m)
With the diffusion filter; Approx. 70 lx (1.0 m)
Illuminating angle: Approx. 30°
Color temperature: Approx. 5000 K
Video output:
HDMI Type A connector video output level:
1080/50.00p/25.00p/50.00i,
720/50.00p, 576/50.00p,
VIERA Link not supported
AV connector video output level:
1.0 Vp-p, 75 Ω
Audio output:
HDMI Type A connector audio output level:
Linear PCM
AV connector audio output level (Line):
2 ch
Headphone output:
3.5 mm stereo mini jack
Camera remote terminal:
2.5 mm super mini jack × 1 (ZOOM S/S)
3.5 mm mini jack × 1 (FOCUS/IRIS)
MIC input:
−60 dBV (Mic sensitivity −40 dB equivalent,
0 dB=1 V/Pa, 1 kHz)
Input impedance; 5600 Ω
(Stereo mini jack)
USB:
USB terminal Type A
Hi-Speed USB (USB 2.0), (for external media device connection*), bus power supported
* External media device with a capacity of 32 GB or below or a capacity above 2 TB cannot be used.
Dimensions:
205 mm (W)×217 mm (H)×494 mm (D)
Mass:
Approx. 2330 g
[without the battery (supplied) and SD cards (optional)]

Mass in operation:
Approx. 2450 g
[with the battery (supplied) and two SD cards (optional)]
Operating temperature:
0 °C to 40 °C
Operating humidity:
10%RH to 80%RH
Battery operation time:
See page 21.

AC adaptor

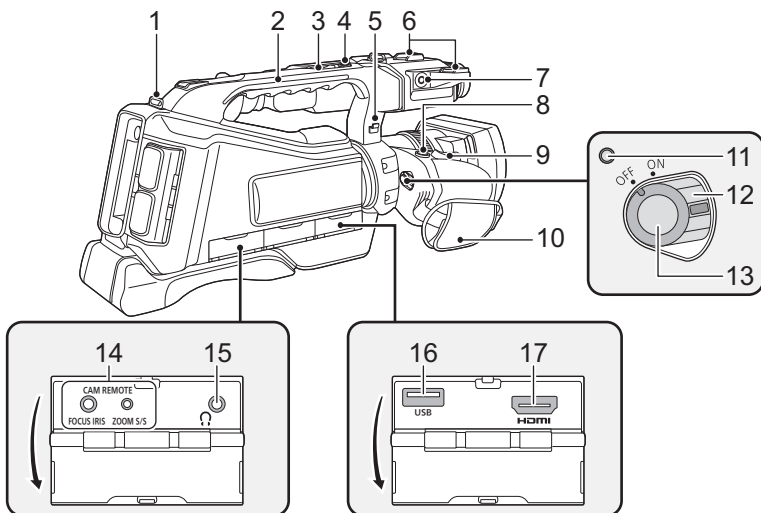
Power source:
100 V to 240 V ~, 50 Hz/60 Hz, 1.2 A
79 VA (for 100 V ~)
99 VA (for 240 V ~)
Power output:
12 V ~, 3.0 A, 36 W

indicates safety information

Ambient operating temperature:
0 °C to 40 °C
Ambient operating humidity:
10%RH to 90%RH (no condensation)
Mass:
Approx. 225 g
Dimensions (W×H×D):
115 mm×37 mm×57 mm
(Excluding the DC cord portion)

The symbols on this product (including the accessories) represent the following:

~ AC
~ DC
 Class II equipment (The construction of the product is double-insulated.)



1 Shoulder strap fixture

2 Handle

3 Sub zoom lever (→ 30)

- This lever functions in the same manner as the zoom lever.
- The zoom speed is controlled with this lever in a way different from the way it is controlled with the zoom lever.

4 Sub recording start/stop button

- This button functions in the same manner as the recording start/stop button.

5 Microphone cable holder

- You can fasten the excess cable by tucking it into the cable holder.

6 Accessory shoe

7 External microphone terminal [EXT MIC]

- A compatible plug-in powered microphone can be used as an external microphone.
- When the unit is connected with the AC adaptor, sometimes noise may be heard depending on the microphone type. In this case, please switch to the battery for the power supply and the noise will stop.

- Check that the unit is turned off. Connecting or removing the microphone while the unit is turned on may cause malfunction.

8 User 3 button [FOCUS ASSIST] (→ 35)

9 Zoom lever [T/W] (In Recording Mode) (→ 30)

Volume lever [+VOL-]/

Thumbnail display switch [Q/] (In Playback Mode)

10 Grip belt (→ 17)

11 Status indicator (→ 24)

12 Power switch (→ 24)

13 Recording start/stop button (→ 28)

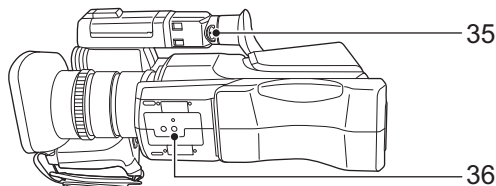
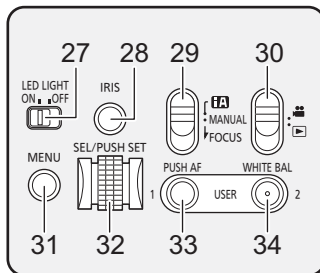
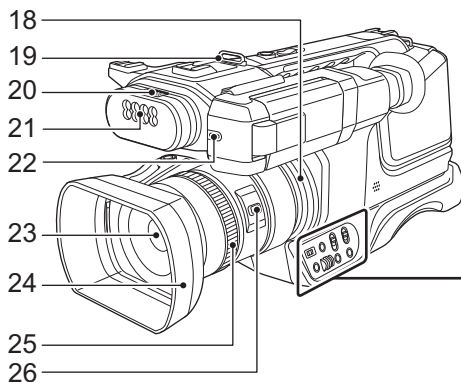
14 Camera remote terminal [CAM REMOTE]

- FOCUS IRIS terminal (3.5 mm diameter mini jack)
- ZOOM S/S terminal (2.5 mm diameter super mini jack)

15 Headphone terminal []

16 USB terminal

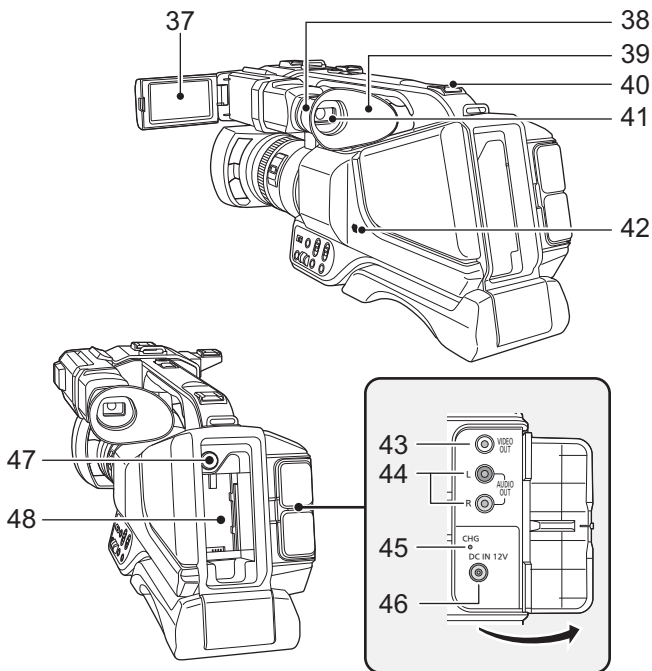
17 HDMI out terminal [HDMI]



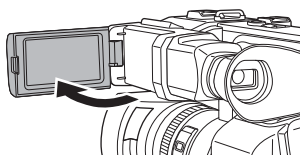
- 18 Ring LED
- 19 Shoulder strap fixture
- 20 Built-in microphone
- 21 Built-in LED light
- 22 Recording lamp
- 23 Lens
- 24 Lens hood
- 25 Multi-manual ring (→ 31)
- 26 Camera function button
[CAMERA FUNCTION] (→ 31)
- 27 LED LIGHT switch
- 28 Iris button [IRIS] (→ 32)
- 29 Intelligent auto/Manual/Focus switch
[iA/MANUAL/FOCUS] (→ 29)
- 30 Mode switch []
- 31 Menu button [MENU] (→ 39)
- 32 Jog dial [SEL/PUSH SET] (→ 31, 32, 33, 34)
- 33 USER1 button [PUSH AF] (→ 35)
- 34 USER2 button [WHITE BAL] (→ 35)
- 35 Eyepiece corrector lever (→ 25)
- 36 Tripod receptacle

- Attaching a tripod with a screw length of 5.5 mm or more may damage the unit.

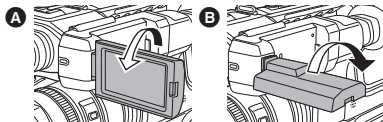
- There are tripod receptacle that are compatible with 1/4-20UNC screws.



37 LCD monitor (Touch screen) (→ 24)



- It can open up to 90°.



- It can rotate up to 180° **A** towards the lens or 90° **B** towards the opposite direction.

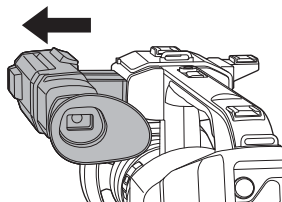
38 Eyecup mount (→ 18)

39 Eyecup (→ 18)

40 Accessory shoe

41 Viewfinder (→ 25)

- Extend the viewfinder before use.



42 Speaker

43 VIDEO OUT terminal

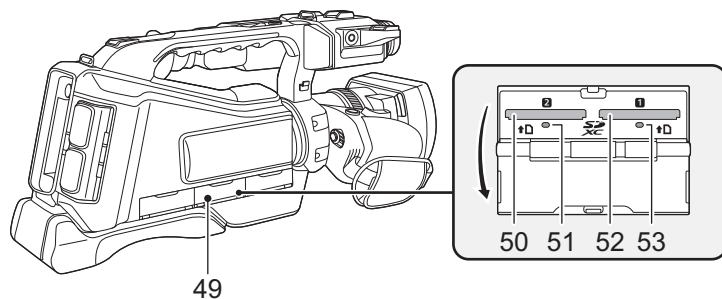
44 AUDIO OUT terminal

45 Charging lamp [CHG] (→ 20)

46 DC input terminal [DC IN] (→ 20)

47 Battery release button [PUSH] (→ 19)

48 Battery holder (→ 19)



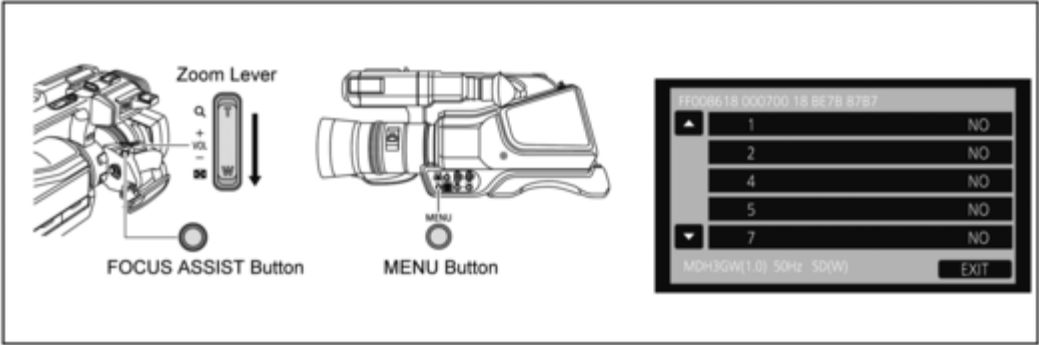
- 49 SD Card slot cover (→ 23)
- 50 Card slot 2 (→ 23)
- 51 Access lamp (card 2) (→ 23)

- 52 Card slot 1 (→ 23)
- 53 Access lamp (card 1) (→ 23)

6 Service Mode

Indication method of the service menu

- 1. Set the power switch to ON, and turn to ON.
- 2. Keep pressing the “FOCUS ASSIST” button, “MENU” button and “Zoom Lever” to W side for more than 3 seconds until the top screen of the Service Mode Menu being displayed.



Service mode menu

Screen display	Contents	Function
1	Factory settings	Function to throw a product up in a factory shipment state.
2	Model/Destination settings	Change the Model/Destination. (Selectable models and destinations are displayed.)
4	Lock search history indication	Display the camera system error cord for three histories saved in EEPROM.
5	Power ON self check result display	Power ON self check (function to diagnose correct function of the device and interface between devices) result display.
14	Adjutment function for the service	The service adjustment do setup and adjustment of the following items required in the field service.
15	Restore the backed up adjustment data	Restore the adjustment data to new or repaired Main P.C.B. from SD card that the data backed up from original Main P.C.B. before repairs or replacement.
16	Touch panel calibration	Calibrate the touch positions of the touch panel.

NOTE:

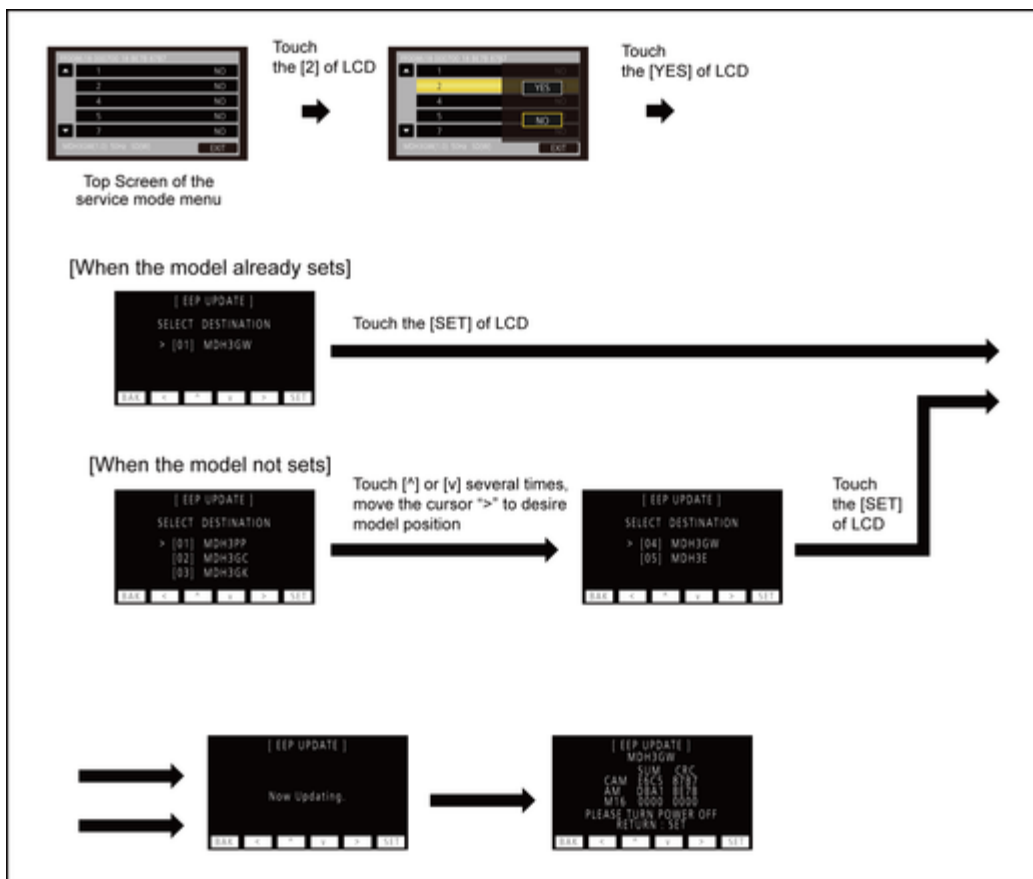
Do not using service mode except above table of Service mode menu.

- 3. End method of the top screen of the service mode menu
- Touch the [EXIT] of LCD to end the service mode, and then POWER OFF.

6.1 Model/Destination Settings

Touch the [2] of LCD, select model/destination.

Operation specifications



Function description

- Change the Model/Destination

Display the lists of model/distination which the unit can be changed.

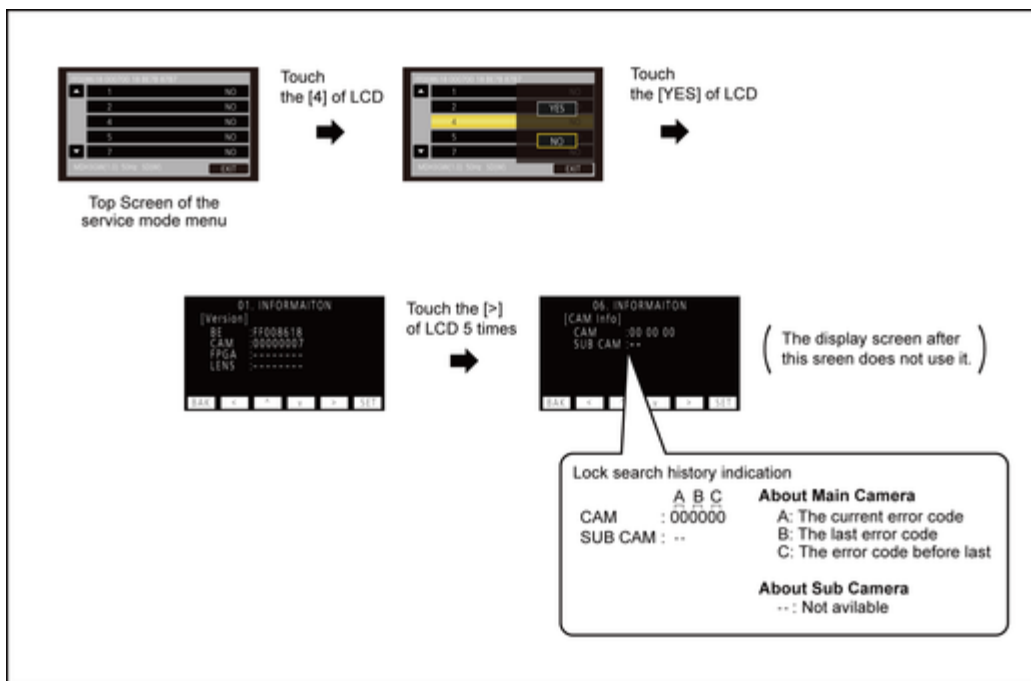
Therefore in some cases, the model/destination that is currently set is only displayed.

Touch the [BAK] of LCD to end the service mode, and then POWER OFF.

6.2 Lock Search History Indication

Touch the [4] of LCD, select lock search history indication.

Operation specifications



Indication contents

- Lock search history indication
Display the camera system error cord for three histories saved in EEPROM.
- The error cord contents which are displayed

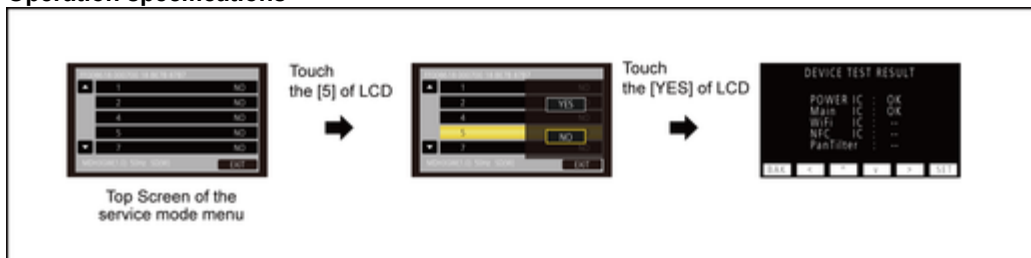
Error code	Description	Problematic Parts
51	Focus control is abnormal	Camera Lens Unit
52	Zoom control is abnormal	2nd Stepping Motor / Camera Lens Unit
53	OIS lens control is abnormal	Camera Lens Unit
54	Zoom control is abnormal (2)	3rd Stepping Motor / Camera Lens Unit
55	Zoom control is abnormal (3)	4th Stepping Motor / Camera Lens Unit

Touch the [BAK] of LCD to end the service mode, and then POWER OFF.

6.3 Power ON Self Check Result Display

Touch the [5] of LCD, select Power ON self check result display.

Operation specifications



Indication contents

- Power ON self check result display
Function to diagnose correct function of the device and interface between devices result display.
Display the following communication test result.
 - Power IC : Communication test between VENUS and power IC

- o Main IC : DDR. Communication test between VENUS and popped memory
- o WiFi IC : (Excluded)
- o NFC IC : (Excluded)

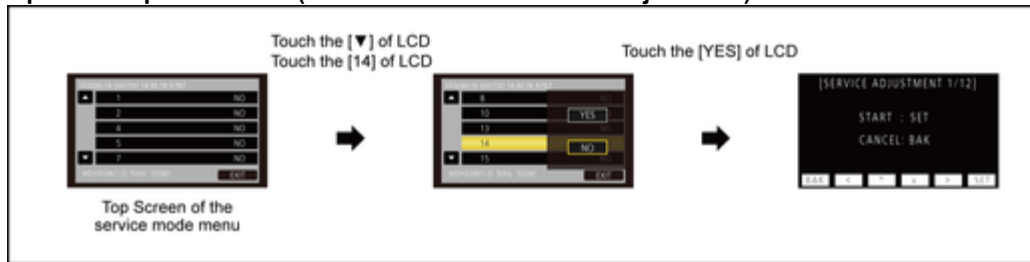
Display other than “OK” are abnormalities of each lines.

Touch the [BAK] of LCD to end the service mode, and then POWER OFF.

6.4 Adjustment function for the Service

Touch the [14] of LCD, select the adjustment function for the service.

Operation Specifications (until before the start of the adjustment)



Function description

The service adjustment do setup and adjustment of the following items required in the field service.

For a detailed content, such as the adjustment procedure, refer to “9 Measurements and Adjustments”.

- Model setting
- Setting of the file name for adjustment data backup to SD card.
- Execution of adjustment data backup to SD card
- Checking of Switches
- Zoom Lever adjustment
- Camera adjustment (Iris, Gyro, OIS and Missing pixels)
- Zoom Tracking adjustments
- Indoor White Balance Adjustment (CH-GAIN, PWM, WB)
- Outdoor White Balance Adjustment (PWM, WB)
- Level shot adjustment

Set the power switch to OFF and turn the unit off.

6.5 Restore the backed up adjustment data

Touch the [15] of LCD, select restoring the backed up adjustment data from SD card to the unit.

Operation Specifications



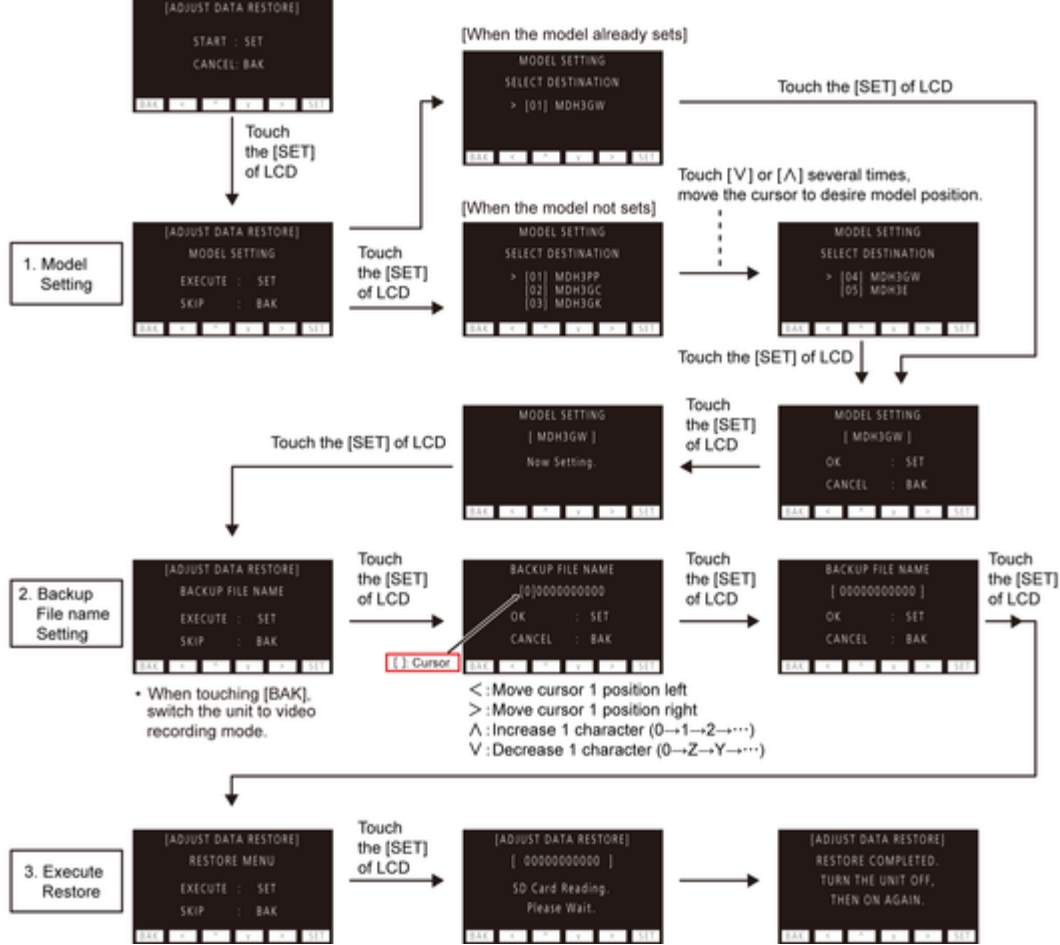
Function description

Restore the adjustment data to new or repaired Main P.C.B. from SD card that the data backed up from original Main P.C.B. before repairs or

replacement.

To backup the adjustment data, use “6.4. Adjustment function for the Service”.

Restoring procedure

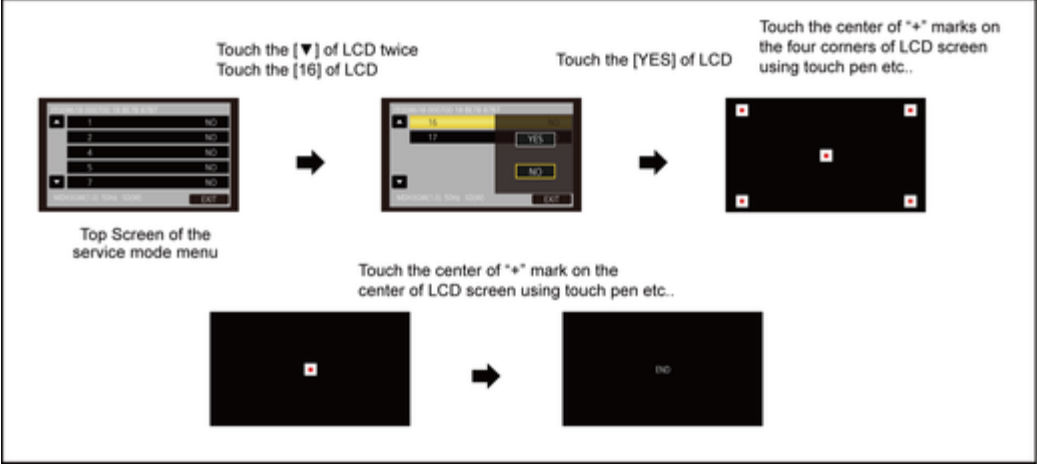


Set the power switch to OFF and turn the unit off.

6.6 Touch Panel Calibration

Touch the [16] of LCD, select the calibration of touch panel.

Operation Specifications



Function description

Calibrate the touch positions of the touch panel.

Set the power switch to OFF and turn the unit off.

7 Service Fixture & Tools

7.1 When Replacing the Main P.C.B.

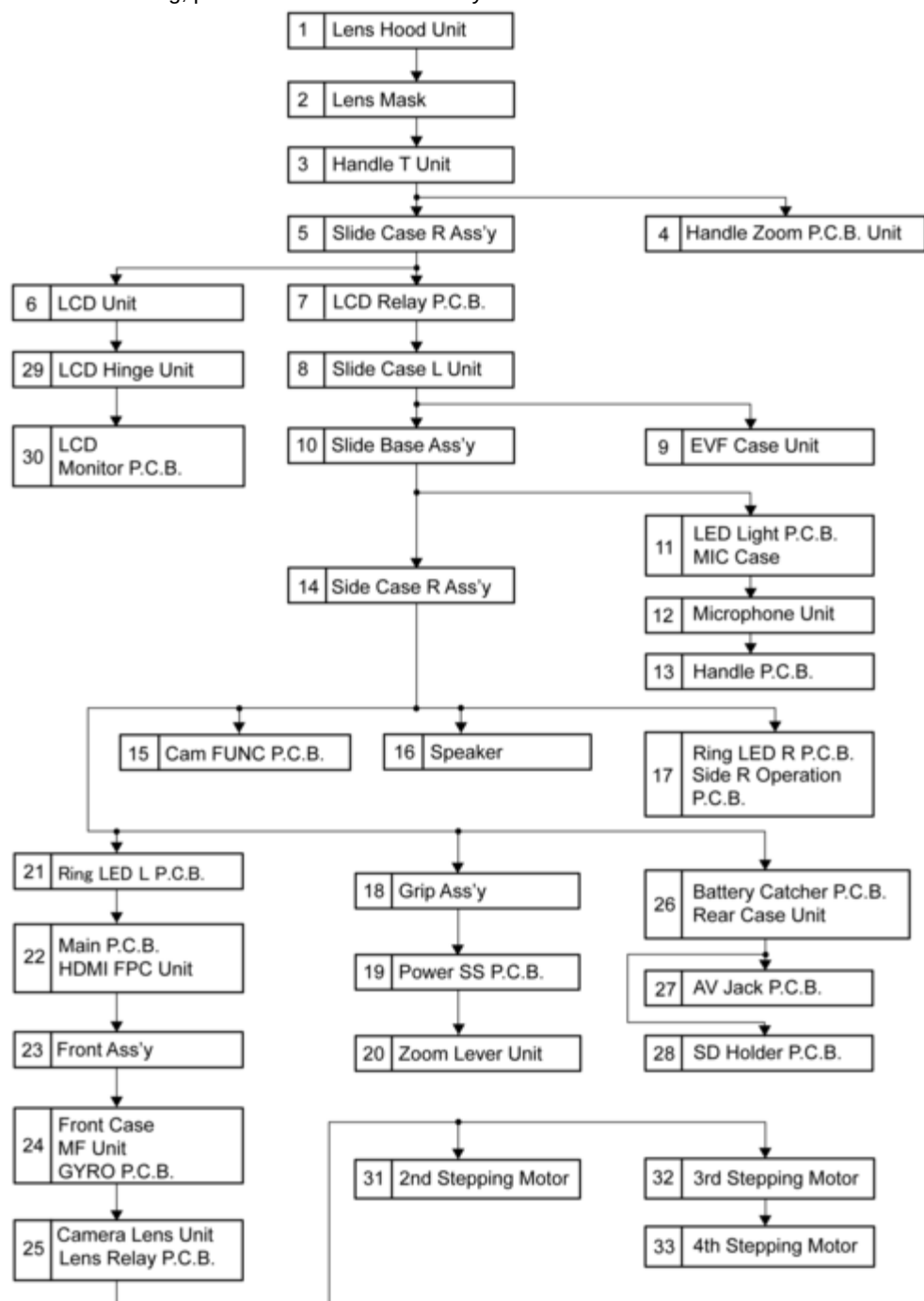
After replacing the MAIN P.C.B., be sure to achieve adjustment.

8 Disassembly and Assembly Instructions

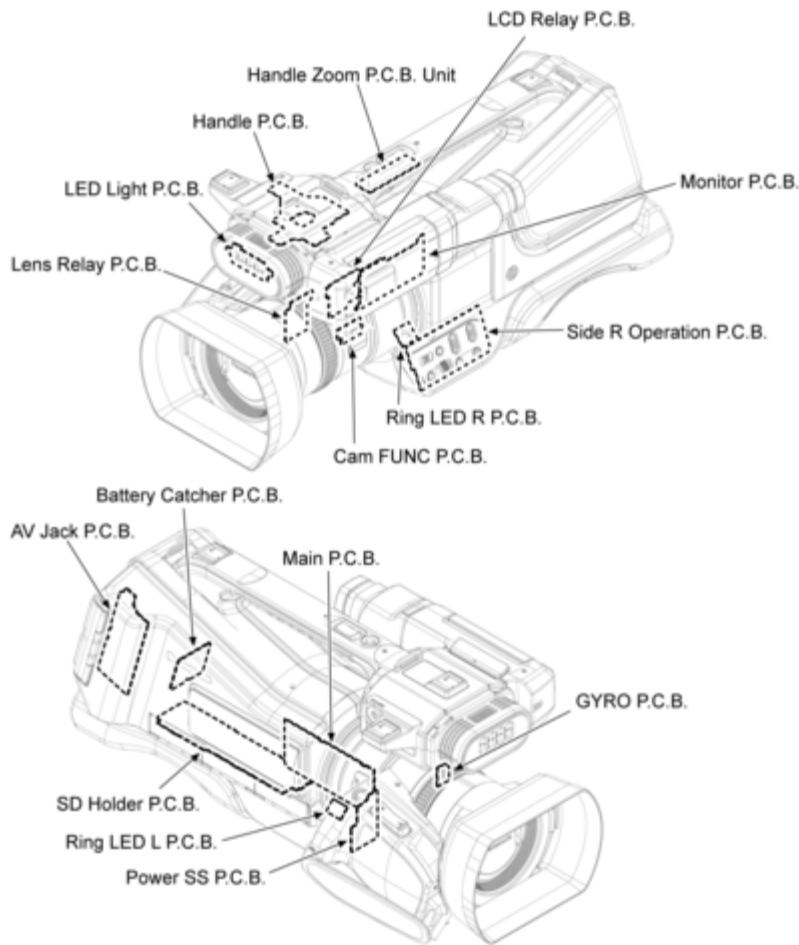
8.1 Disassembly Flow Chart for the Unit

This is a disassembling chart.

When assembling, perform this chart conversely.



8.2 P.C.B. Location



8.3 Disassembly Procedure for the Unit

No.	Item	Fig.	Removal
1	Lens Hood Unit	(Fig. D1)	Screw (A) × 1
			Lens Hood Unit
		(Fig. D2)	NOTE: (When Installing)
2	Lens Mask	(Fig. D3)	Screw (B) × 3
			Lens Mask
3	Handle T Unit	(Fig. D4)	Screw (C) × 6
			Screw (D) × 2
			Hooking part × 2
			Handle T Unit
4	Handle Zoom P.C.B. Unit	(Fig. D5)	Screw (E) × 4
			Shoulder Belt Angle Frame
			FP6751 (Flex)
			Screw (F) × 2
			Handle Zoom P.C.B. Unit
5	Slide Case R Ass'y	(Fig. D6)	Screw (G) × 2
			Slide Case F Unit
			Screw (H) × 1

			Screw (I) × 5
		(Fig. D7)	Locking tab × 2
			FP6802 (Flex)
			Slide Case R Ass'y
6	LCD Unit	(Fig. D8)	Screw (J) × 1
			Locking tab × 2
			Hooking part × 2
			LCD Hinge Angle
			LCD SW Lever
			LCD SW Spring
			Convex × 2
		(Fig. D9)	Convex × 2
7	LCD Relay P.C.B.		LCD Unit
		(Fig. D10)	FS6801 (Connector)
			FS6802 (Connector)
			Screw (K) × 1
			LCD Relay P.C.B.
			Hooking part × 1
8	Slide Case L Unit		Convex × 2
		(Fig. D11)	Screw (L) × 5
			Slide Case L Unit
			Convex × 2
9	EVF Case Unit	(Fig. D12)	Screw (M) × 1
			Locking tab × 2
			Hinge Cover
			Convex × 1
			Screw (N) × 1
		(Fig. D13)	Convex × 1
			EVF Case Unit
10	Slide Base Ass'y	(Fig. D14)	Screw (O) × 6
			Screw (P) × 1
			FP6701 (Flex)
		(Fig. D15)	Slide Base Ass'y
11	LED Light P.C.B., MIC Case	(Fig. D16)	FP6705 (Flex)
			Locking tab × 1
		(Fig. D17)	Screw (Q) × 2
			Convex × 4
			LED Light Angle
			LED Light P.C.B.
			LED Light Lens

			MIC Case
12	Microphone Unit	(Fig. D18)	FP6702 (Flex)
			Locking tab × 2
			MIC Case B
			MIC Cushion A
			MIC Cushion B
			MIC Cushion C
			Microphone Unit
13	Handle P.C.B.	(Fig. D19)	Screw (R) × 2
			Convex × 2
			Mic Base Unit
			Screw (S) × 2
			Convex × 2
			FP6703 (Flex)
			Handle P.C.B.
14	Side Case R Ass'y	(Fig. D20)	Screw (T) × 6
			Screw (U) × 3
			Screw (V) × 6
		(Fig. D21)	Locking tab × 4
			FP6007 (Flex)
			Side Case R Ass'y
15	Cam FUNC P.C.B.	(Fig. D22)	P6942 (Connector)
			Screw (W) × 2
			Cam FUNC P.C.B
16	Speaker	(Fig. D23)	Screw (X) × 2
			Convex × 4
			SP Angle
			P6901 (Connector)
			Speaker
17	Ring LED R P.C.B.	(Fig. D24)	Screw (Y) × 3
			Tripod Frame Unit
	Side R Operation P.C.B.	(Fig. D25)	Screw (Z) × 1
			Convex × 2
			FP6251 (Flex)
			Ring LED R P.C.B.
			FP6901 (Flex)
			P6901 (Connector)
			P6902 (Connector)
			Screw (a) × 6
			FP6902 (Flex)

		(Fig. D26)	Screw (b) × 2
			Convex × 2
			Kurupon Stopper Angle
			Kurupon Unit
			Screw (c) × 5
			Convex × 2
			Side R Operation P.C.B.
		(Fig. D27)	NOTE: (When Replacing the Side Case R Unit)
		(Fig. D28)	NOTE: (When Installing)
18	Grip Ass'y	(Fig. D29)	Screw (d) × 3
		(Fig. D30)	Screw (e) × 5
			FP6601 (Flex)
			Grip Ass'y
19	Power SS P.C.B.	(Fig. D31)	Screw (f) × 2
			FP6602 (Flex)
			Screw (g) × 3
			Convex × 2
			Power SS P.C.B.
			PW Panelight
			Power SS Unit
20	Zoom Lever Unit	(Fig. D32)	Screw (h) × 2
			Convex × 3
			Screw (i) × 1
			Convex × 1
			Photo Shot Button
			Convex × 2
			Hooking part × 2
			Zoom Lever Unit
			Zoom SW Hold Frame
21	Ring LED L P.C.B.	(Fig. D33)	FP6201 (Flex)
			Screw (j) × 1
			Convex × 2
			Ring LED L P.C.B.
22	Main P.C.B., HDMI FPC Unit	(Fig. D34)	Screw (k) × 2
			Screw (l) × 2
			Convex × 2
			Convex × 1
			Main Earth Plate A
			Main Earth Plate B Unit
		(Fig. D35)	FP301 (Flex)

			FP6001 (Flex)
			FP6003 (Flex)
			FP6004 (Flex)
			FP6005 (Flex)
			FP6006 (Flex)
			FP6010 (Flex)
			FP6013 (Flex)
			P6003 (Connector)
			PS6002 (Connector)
			P6002 (Connector)
			Handle FFC Unit
			Handle Slim Wire
			Screw (m) × 2
		(Fig. D36)	Screw (n) × 3
			Screw (o) × 1
			Convex × 2
			FP6012 (Flex)
		(Fig. D37)	Screw (p) × 2
			Locking tab × 3
			Convex × 1
			Main P.C.B.
			FP6002 (Flex)
			HDMI FPC Unit
23	Front Ass'y	(Fig. D38)	Screw (q) × 1
		(Fig. D39)	Screw (r) × 2
			Front Ass'y
24	Front Case, MF Unit, GYRO P.C.B.	(Fig. D40)	Hooking part × 2
			Front Case
		(Fig. D41)	Screw (s) × 1
			MF Unit
			Screw (t) × 1
			Convex × 1
			GYRO P.C.B.
25	Camera Lens Unit Lens Relay P.C.B.	(Fig. D42)	Locking tab × 2
			Convex × 2
			Lens Frame R Unit
			Camera Lens Unit
			FP6402 (Flex)
			Lens Frame L Ass'y
			Dust Pretecter Ring

		(Fig. D43)	Screw (u) × 2
			Convex × 3
			Earth Plate S
			Lens Relay P.C.B.
26	Battery Catcher P.C.B. Rear Case Unit	(Fig. D44)	Screw (v) × 4
			Screw (w) × 1
			P6301 (Connector)
			FP6301 (Flex)
		(Fig. D45)	Locking tab × 2
			Convex × 2
			Screw (x) × 2
			Convex × 2
			Rear Earth Plate Unit
			Battery Catcher P.C.B.
			Rear Case Unit
27	AV Jack P.C.B.	(Fig. D46)	Screw (y) × 4
			P4001 (Connector)
			FP4001 (Flex)
			FP4002 (Flex)
			Convex × 2
			AV Jack P.C.B.
28	SD Holder P.C.B.	(Fig. D47)	Screw (z) × 2
			Screw (A') × 1
			Convex × 2
			USB AV FPC × 1
			SD FPC × 1
			Wired Remote FFC × 1
			Screw (B') × 3
			Hooking part × 1
			HDMI Earth Plate
			Hooking part × 3
			Convex × 1
			SD Holder P.C.B.
			SD Frame
29	LCD Hinge Unit	(Fig. D48)	Screw (C') × 2
			Locking tab × 8
			LCD Case T
		(Fig. D49)	FP901 (Flex)
			LCD Hinge Unit
30	LCD,	(Fig. D50)	Screw (D') × 1

	Monitor P.C.B.		LCD Frame A
			Convex × 3
			FP904 (Flex)
			FP905 (Flex)
		(Fig. D51)	Locking tab × 4
			LCD
			TP Spacer
			Locking tab × 1
			LCD Frame B
			LCD Case B Unit
			Locking tab × 1
			Hooking part × 1
			Monitor P.C.B.
		(Fig. D52)	Reflection Sheet
			Light Guide Plate
			Diffusion Sheet
			Prism Sheet B
			Prism Sheet A
			LGP Holder
31	2nd Stepping Motor	(Fig. D53)	Solder × 4 points
			Screw (E') × 2
			2nd Stepping Motor
32	3rd Stepping Motor	(Fig. D54)	Solder × 4 points
			Screw (F') × 2
			3rd Stepping Motor
33	4th Stepping Motor	(Fig. D55)	Solder × 4
			Screw (G') × 3
			Convex × 1
			4th Stepping Motor

NOTE:

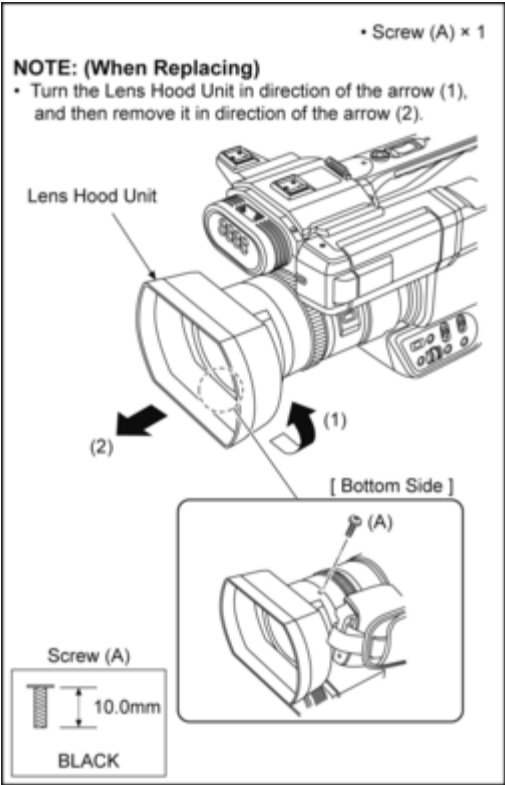
When servicing and reassembling, remove the memory card and battery pack from the unit.

- Memory Card
- Battery Pack

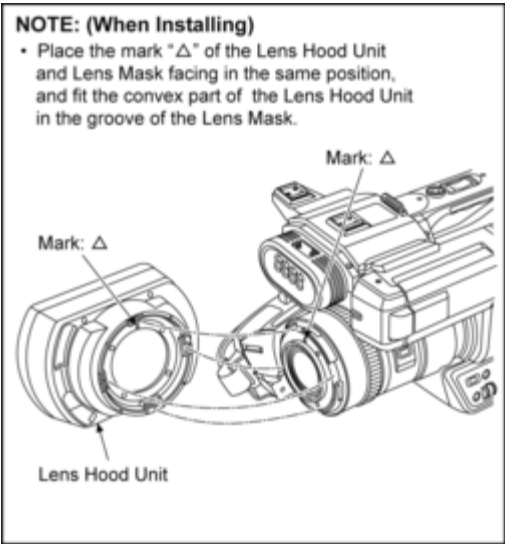
The diagram shows a handheld electronic device with a screen and various buttons. A battery pack is shown being removed from the back of the device, and a memory card is shown being removed from a slot on the side. Arrows point from the labels 'Battery Pack' and 'Memory Card' to their respective components in the diagram.

8.3.1 Removal of the Lens Hood Unit

(Fig. D1)

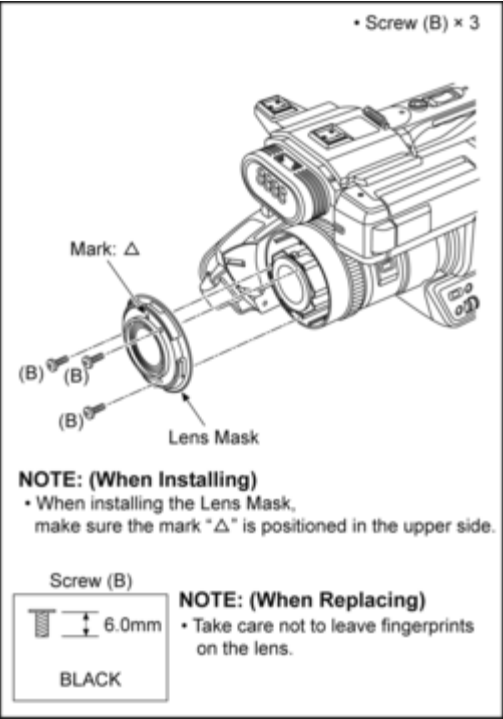


(Fig. D2)



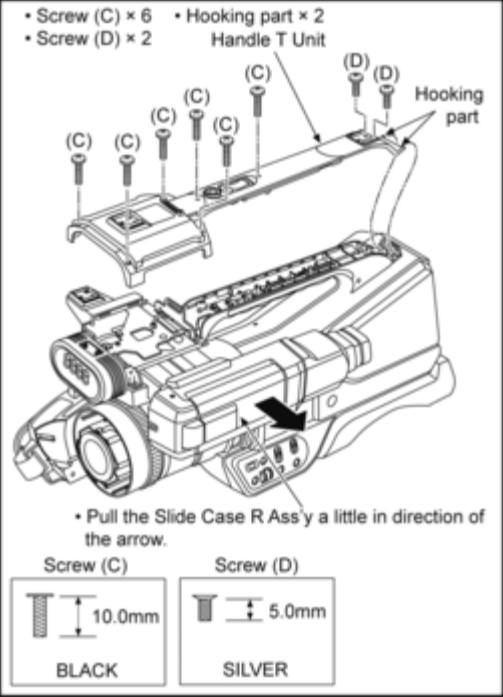
8.3.2 Removal of the Lens Mask

(Fig. D3)



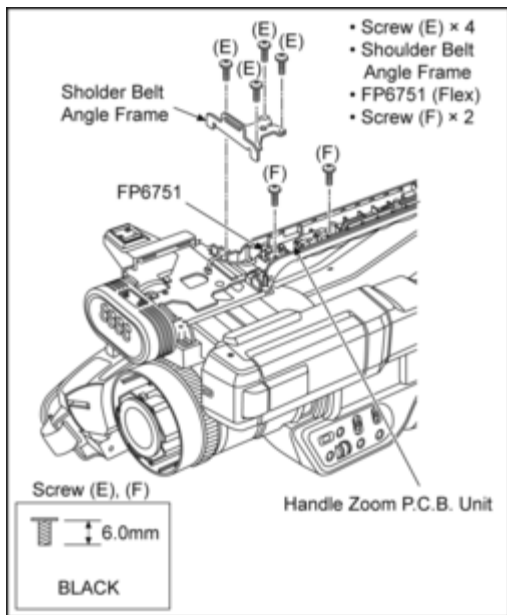
8.3.3 Removal of the Handle T Unit

(Fig. D4)



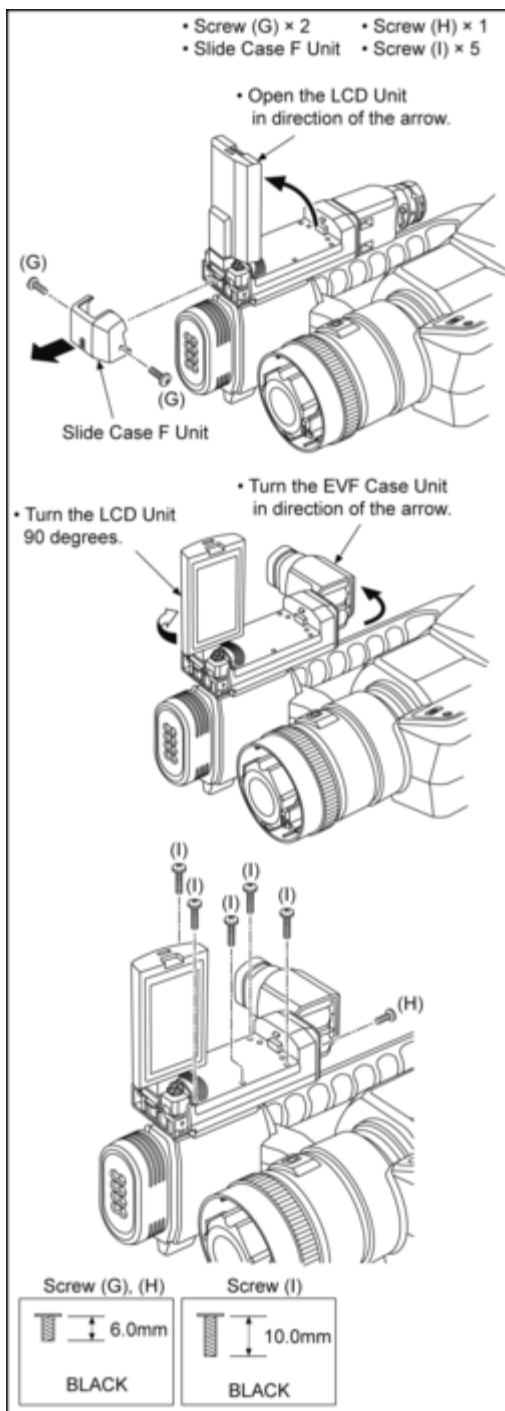
8.3.4 Removal of the Handle Zoom P.C.B. Unit

(Fig. D5)

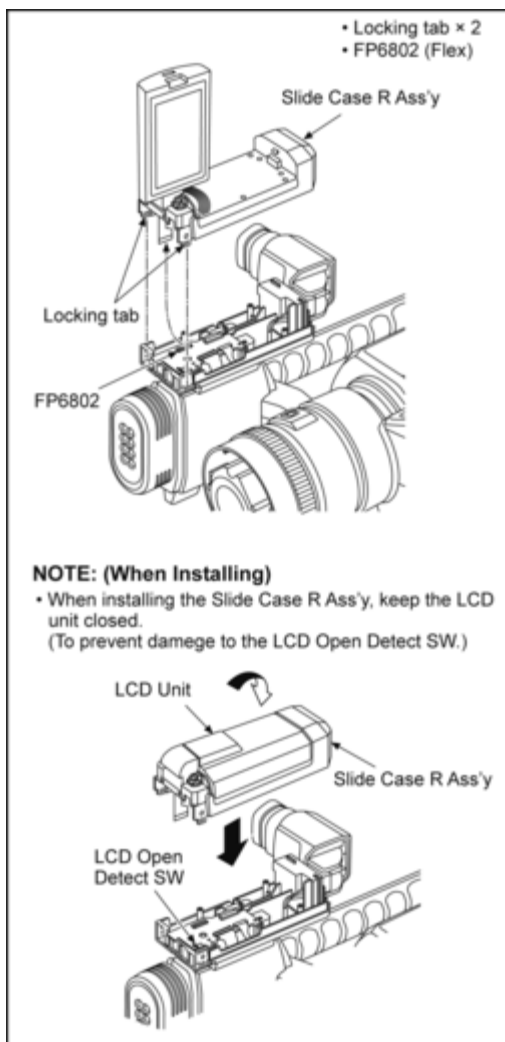


8.3.5 Removal of the Slide Case R Ass'y

(Fig. D6)

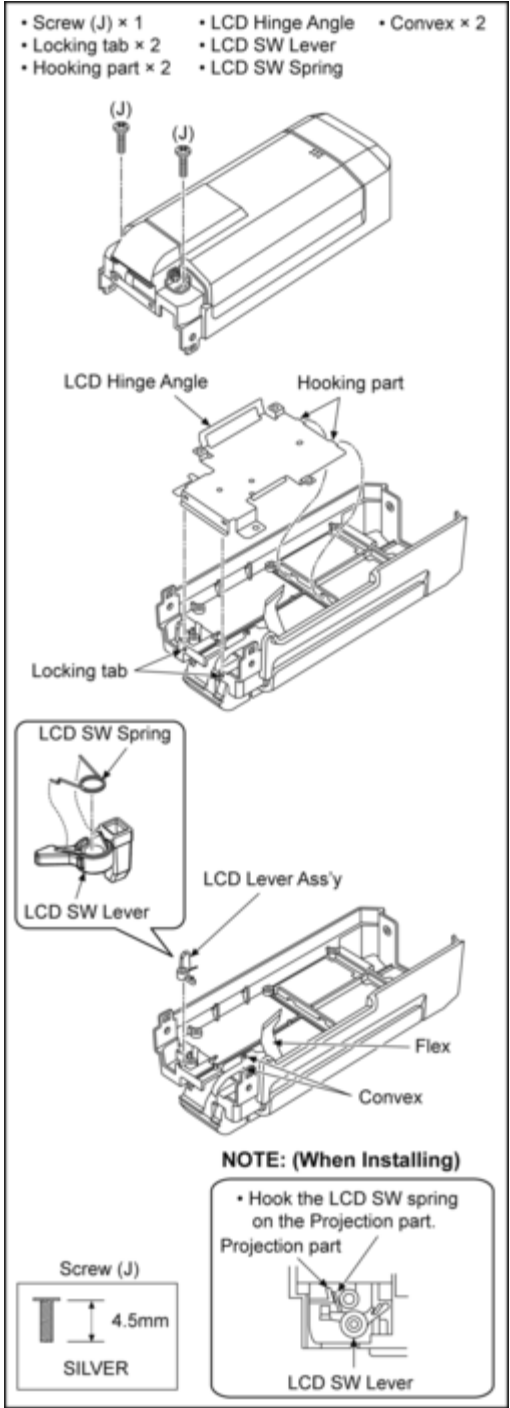


(Fig. D7)

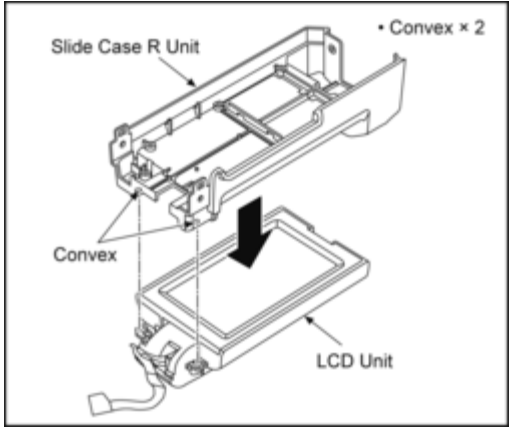


8.3.6 Removal of the LCD Unit

(Fig. D8)

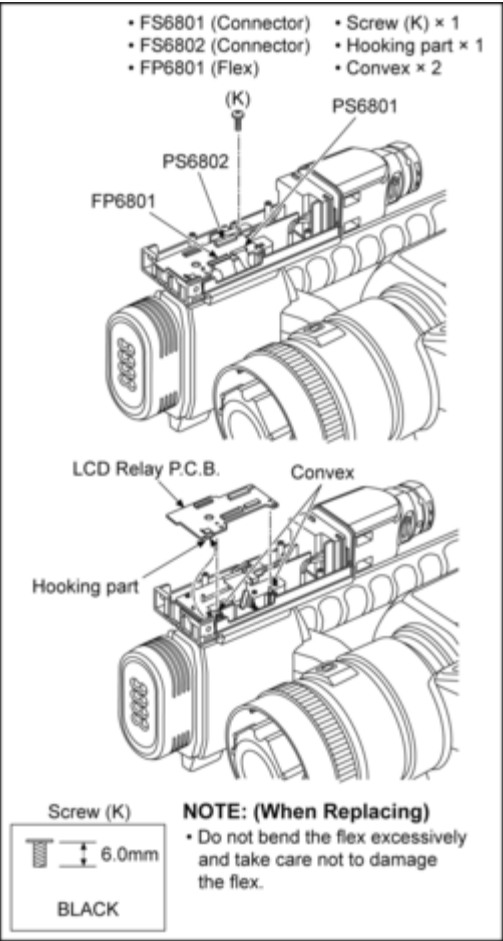


(Fig. D9)



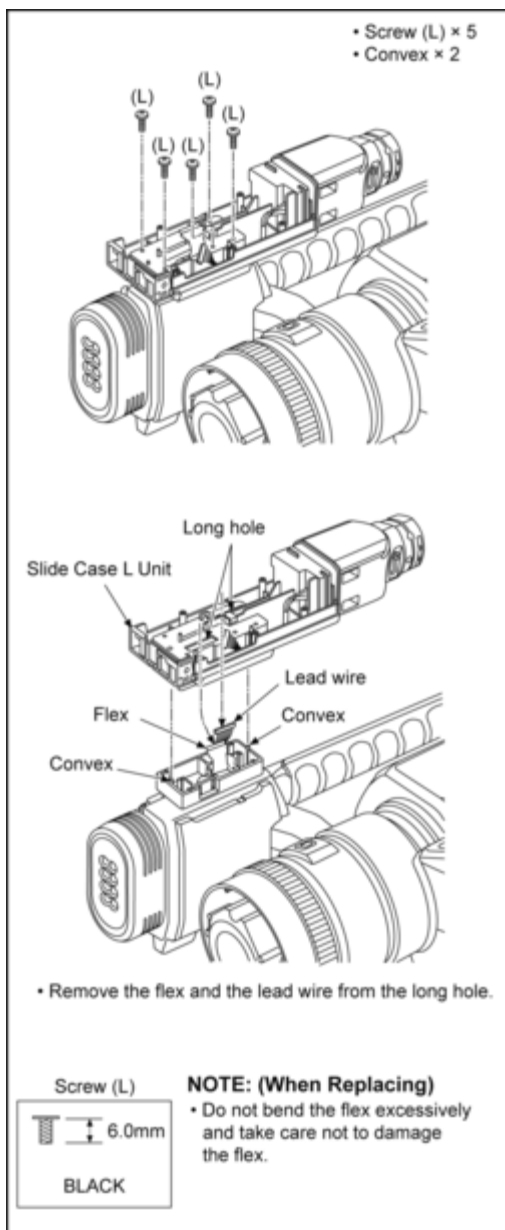
8.3.7 Removal of the LCD Relay P.C.B.

(Fig. D10)



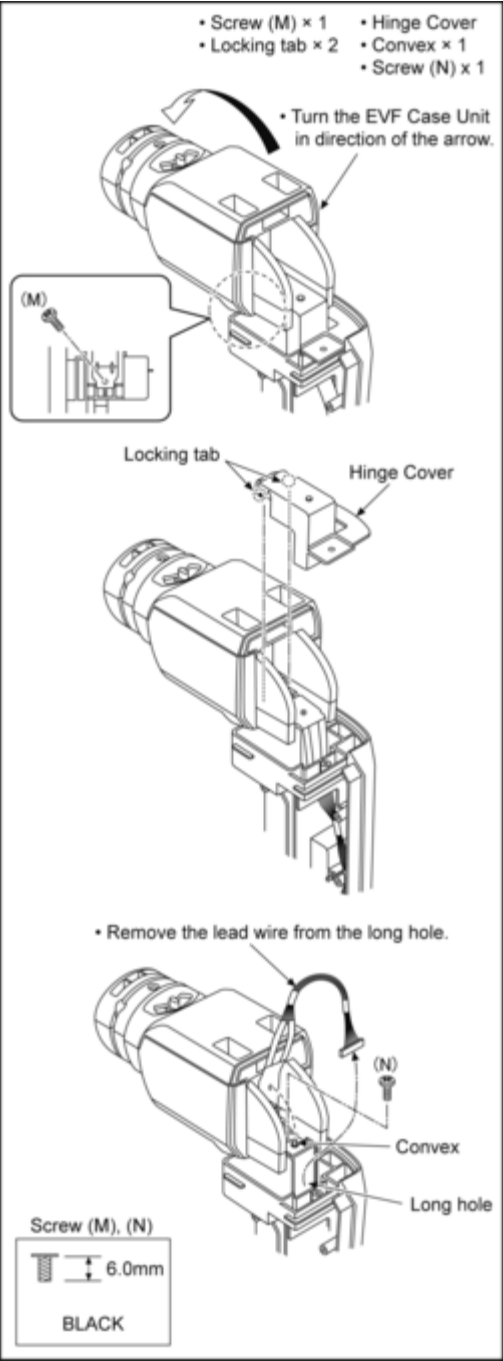
8.3.8 Removal of the Slide Case L Unit

(Fig. D11)

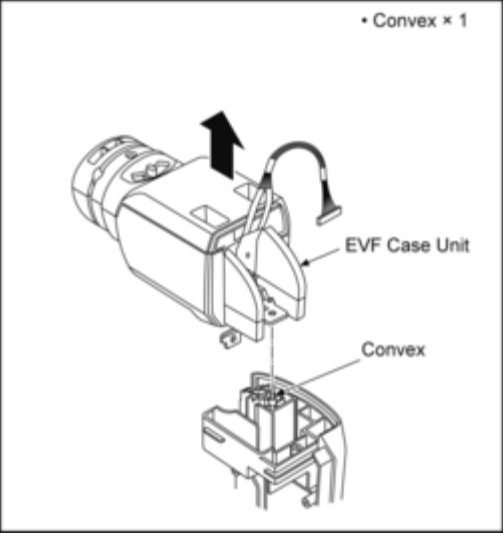


8.3.9 Removal of the EVF Case Unit

(Fig. D12)

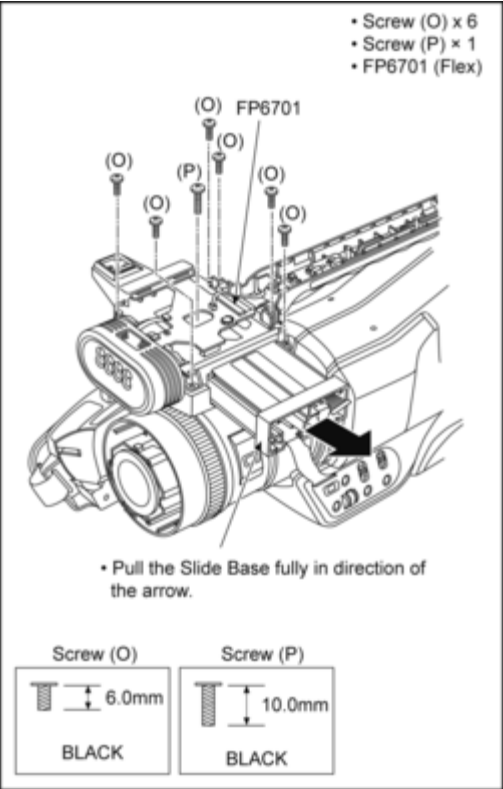


(Fig. D13)

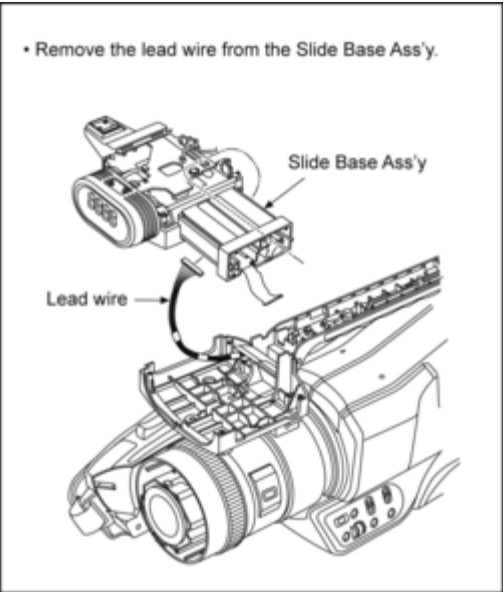


8.3.10 Removal of the Slide Base Ass'y

(Fig. D14)

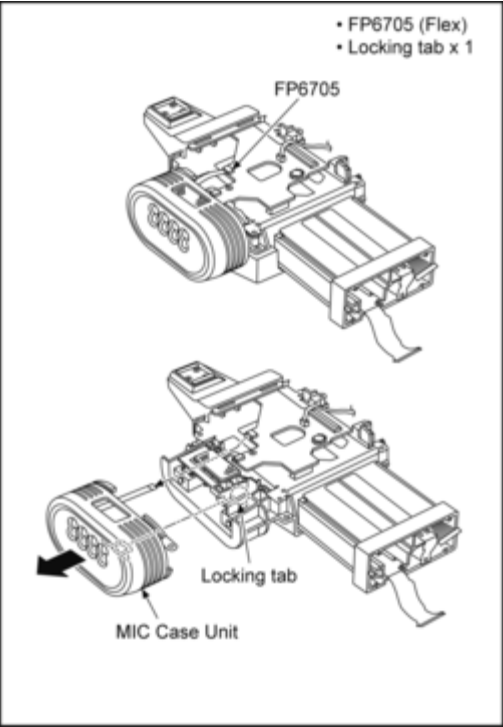


(Fig. D15)

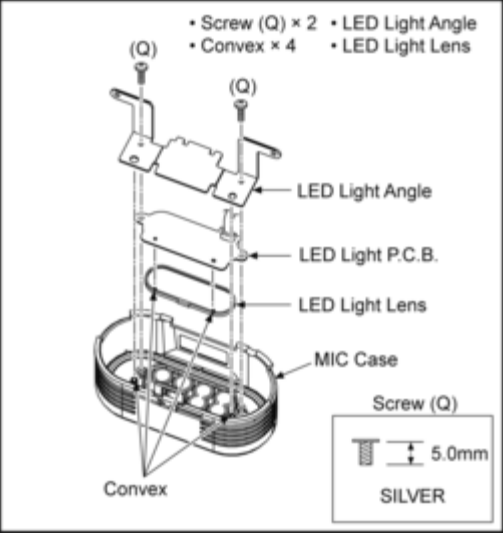


8.3.11 Removal of the LED Light P.C.B. and MIC Case

(Fig. D16)

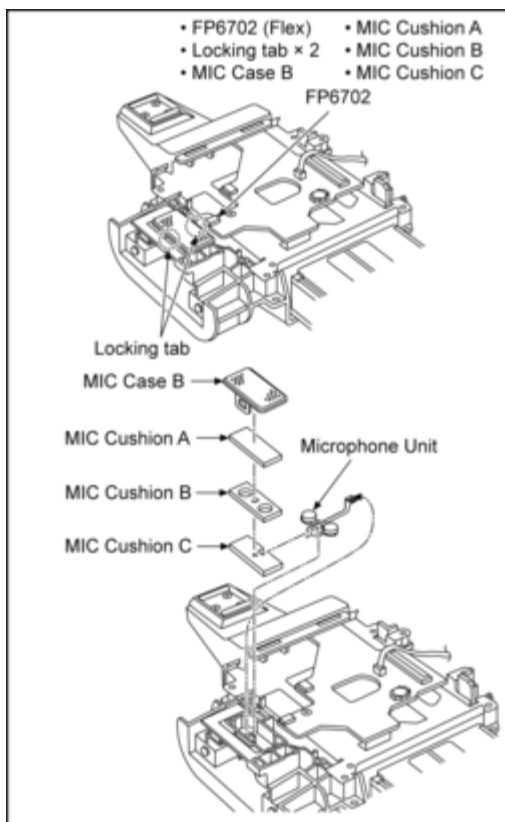


(Fig. D17)



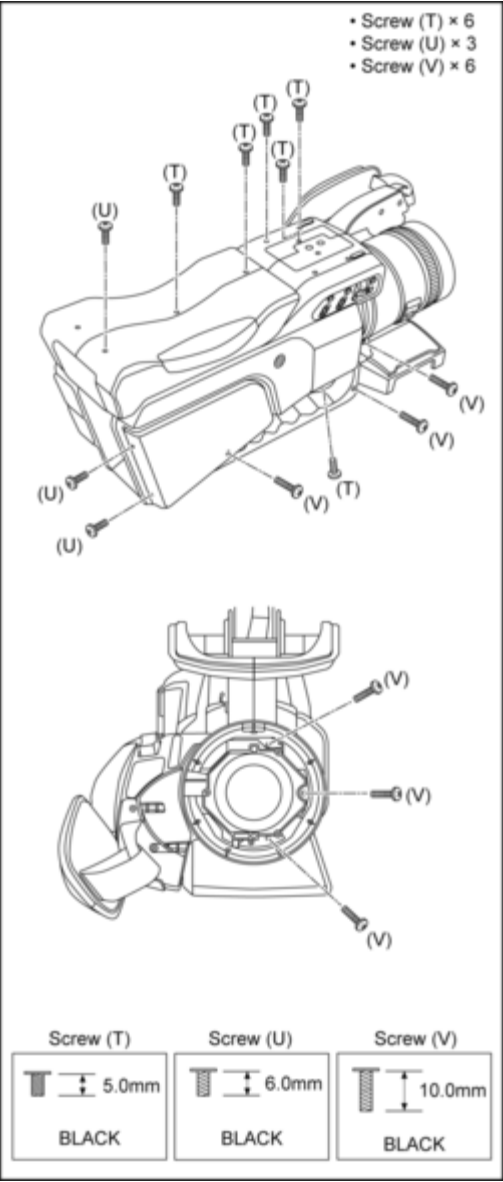
8.3.12 Removal of the Microphone Unit

(Fig. D18)

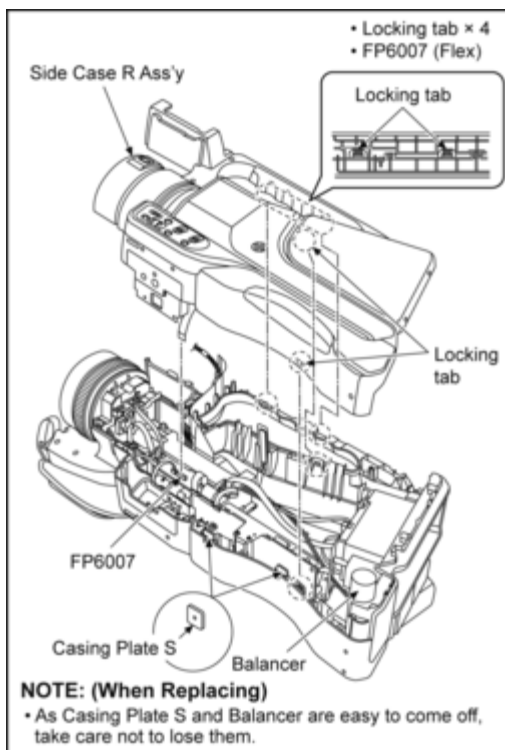


8.3.13 Removal of the Handle P.C.B.

(Fig. D19)

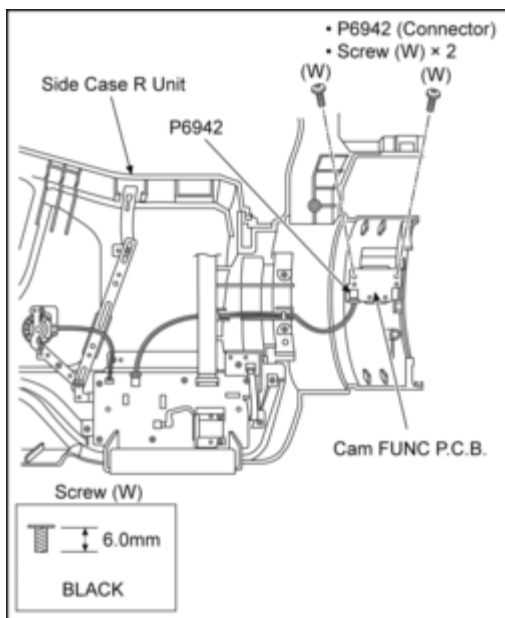


(Fig. D21)



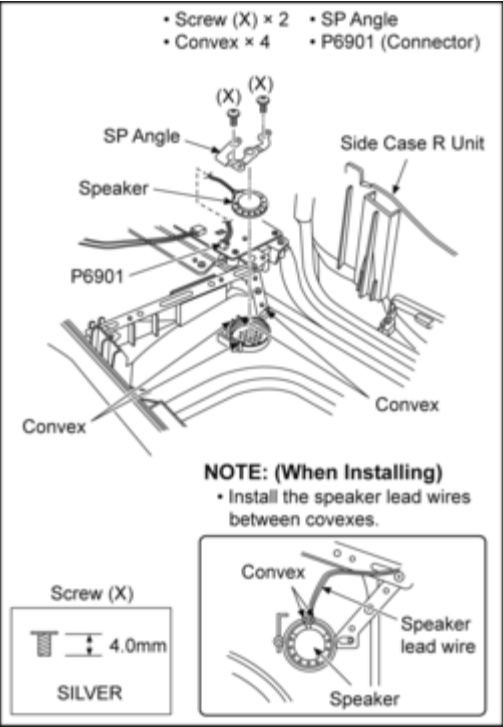
8.3.15 Removal of the Cam FUNC P.C.B.

(Fig. D22)



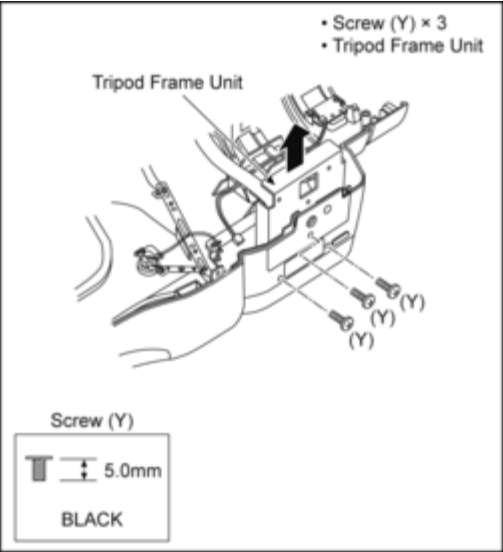
8.3.16 Removal of the Speaker

(Fig. D23)



8.3.17 Removal of the Ring LED R P.C.B. and Side R Operation P.C.B.

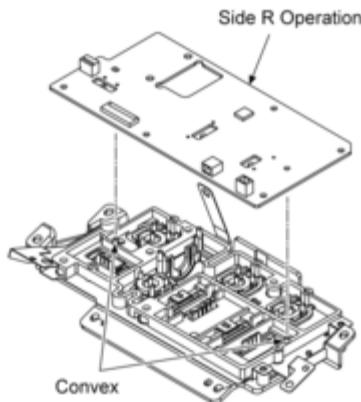
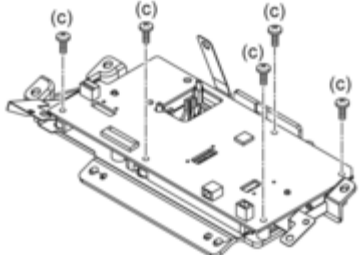
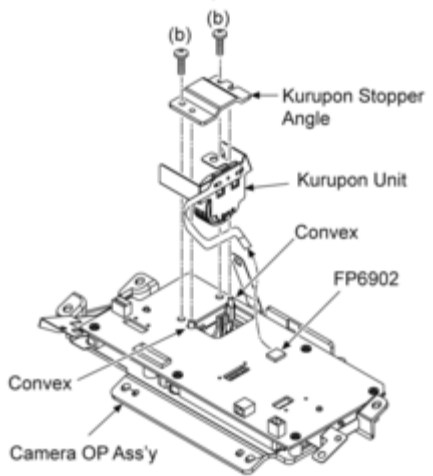
(Fig. D24)



(Fig. D25)

- Screw (Z), (a)
-  6.0mm
- BLACK

- FP6902 (Flex)
- Screw (b) × 2
- Convex × 2
- Kurupon Stopper Angle
- Kurupon Unit
- Screw (c) × 5
- Convex × 2

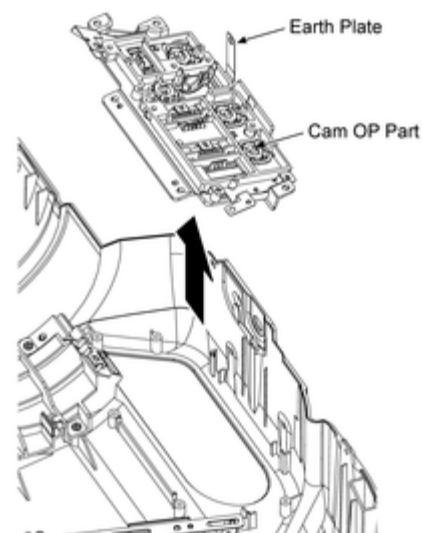
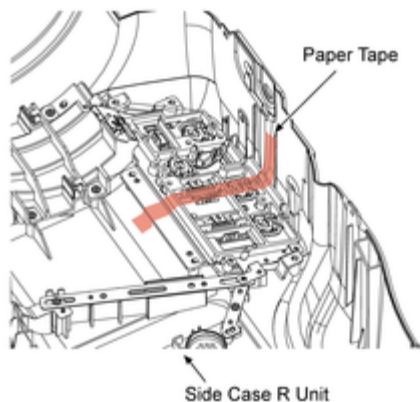


Screw (b)	Screw (c)
 7.0mm	 5.0mm
SILVER	SILVER

(Fig. D27)

NOTE: (When Replacing the Side Case R Unit)

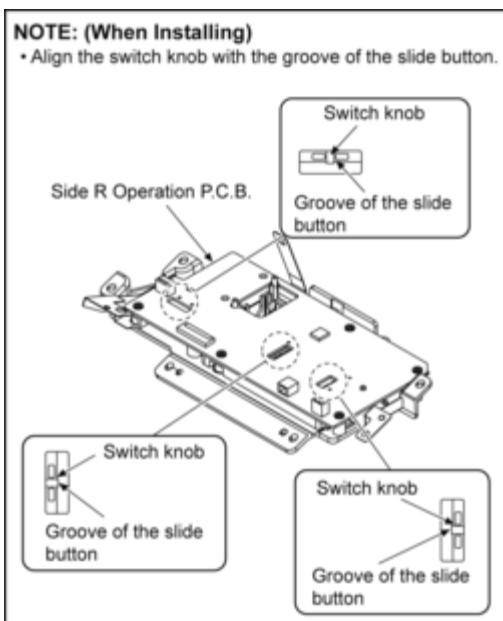
- When the Side Case R Unit is ordered, the Cam OP Part will be shipped with the paper tape attached. Remove the paper tape by following the procedures below, and then install the Ring LED R P.C.B. and Side R Operation P.C.B..



1. Remove the Paper Tape.
2. Remove the Cam OP Part from the Side Case R Unit.

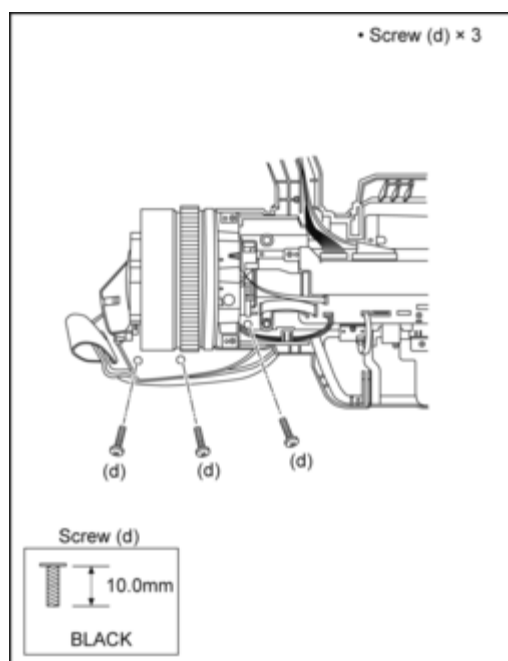
- Take care not to deform the Earth Plate.

(Fig. D28)

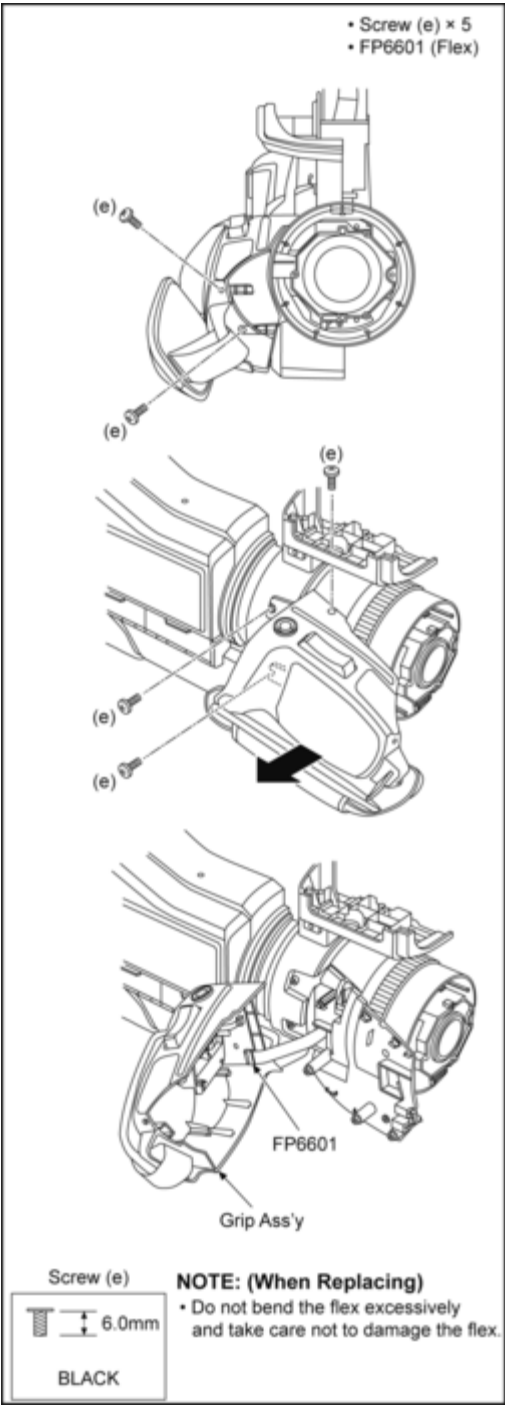


8.3.18 Removal of the Grip Ass'y

(Fig. D29)

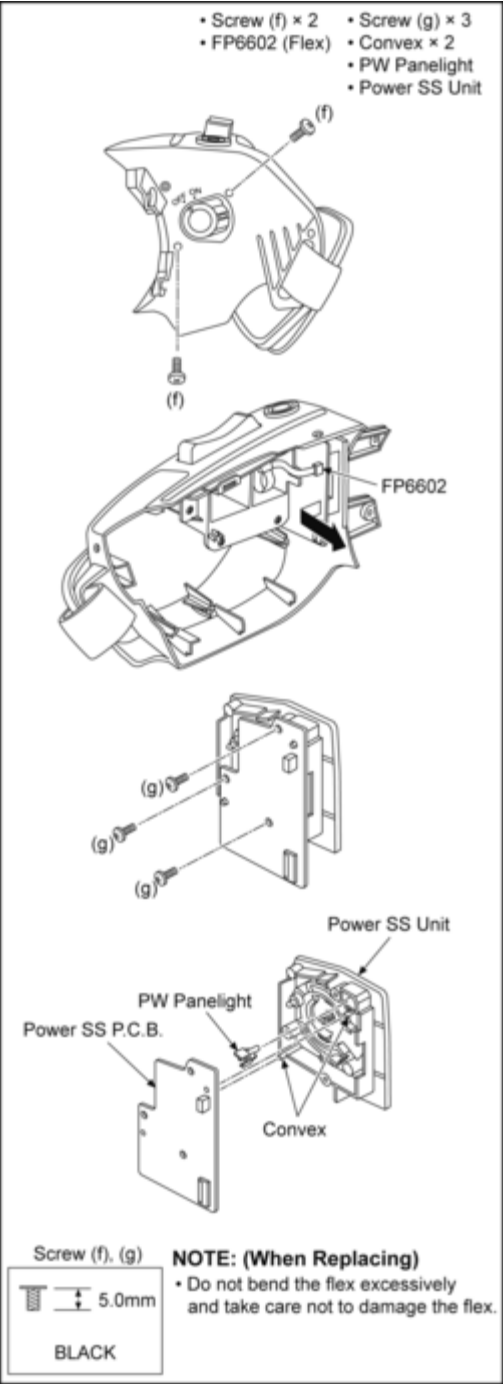


(Fig. D30)



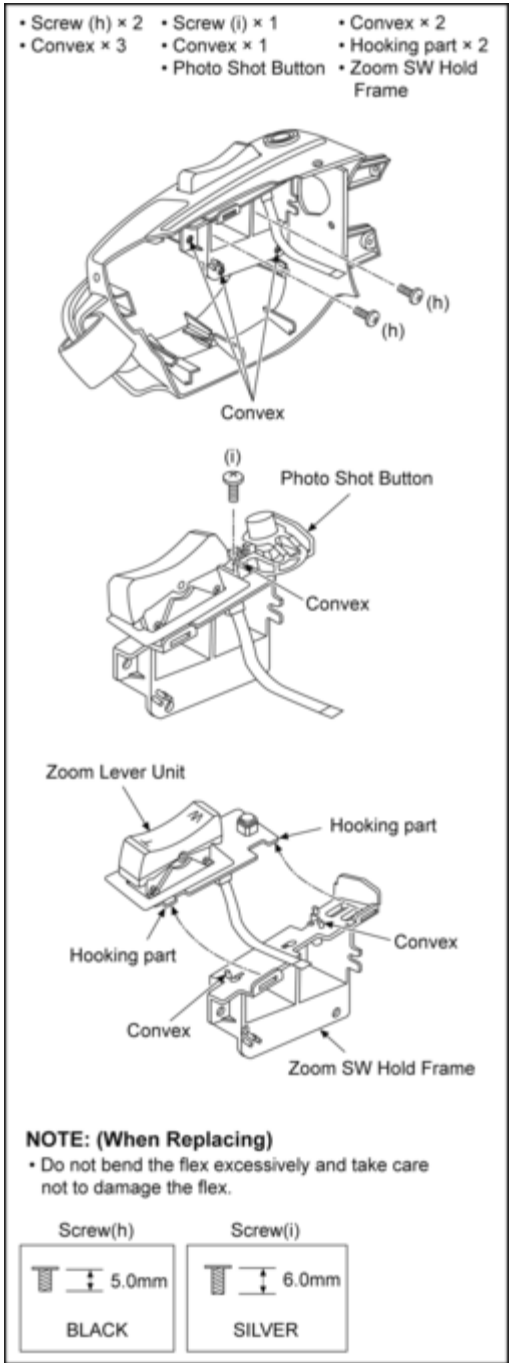
8.3.19 Removal of the Power SS P.C.B.

(Fig. D31)



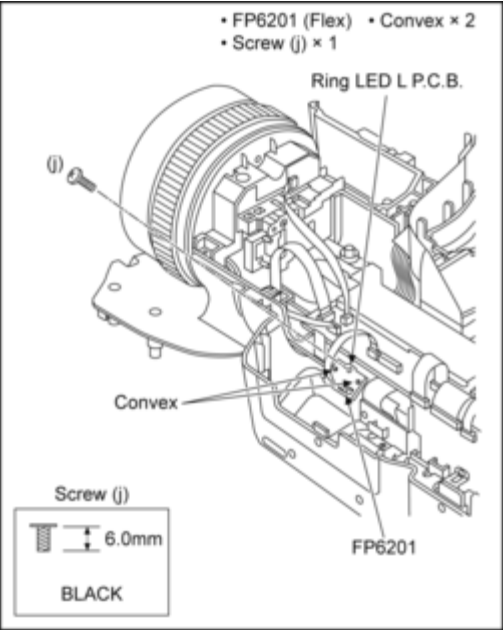
8.3.20 Removal of the Zoom Lever Unit

(Fig. D32)



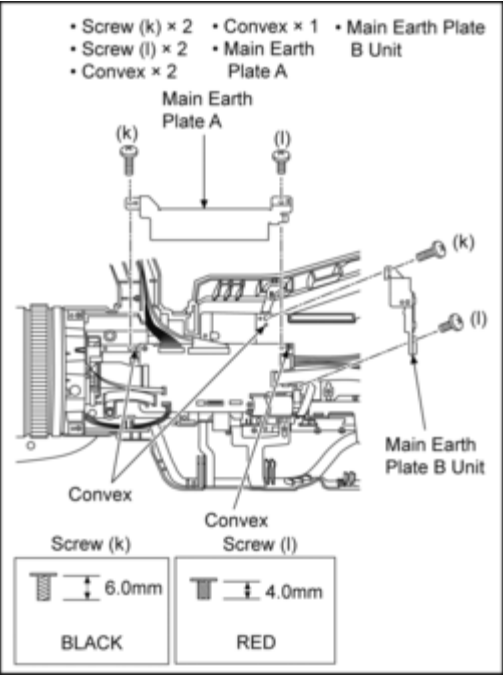
8.3.21 Removal of the Ring LED L P.C.B.

(Fig. D33)



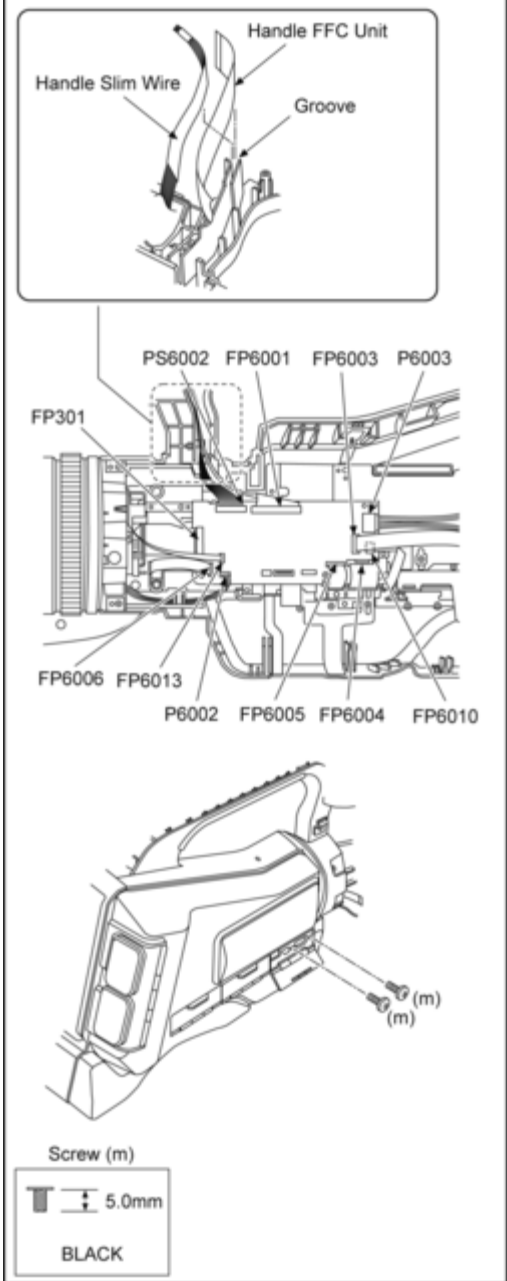
8.3.22 Removal of the Main P.C.B. and HDMI FPC Unit

(Fig. D34)



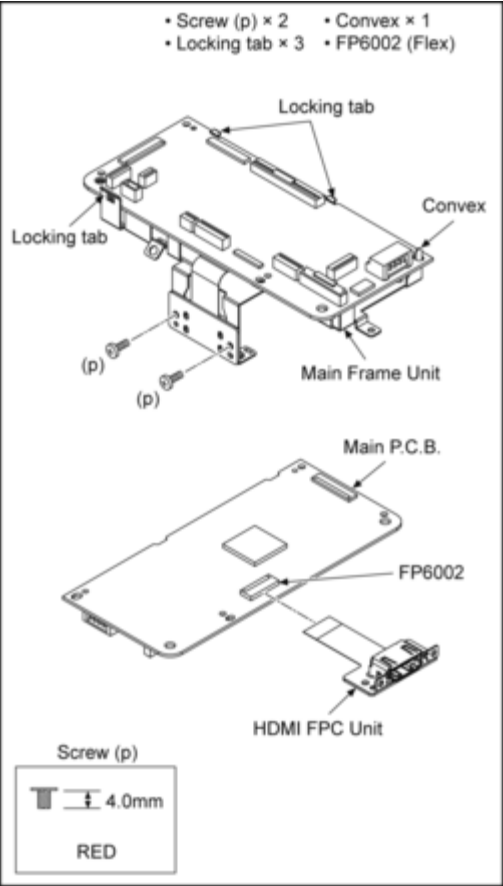
(Fig. D35)

- FP301 (Flex) • FP6006 (Flex) • P6002 (Connector)
- FP6001 (Flex) • FP6010 (Flex) • Handle FFC Unit
- FP6003 (Flex) • FP6013 (Flex) • Handle Slim Wire
- FP6004 (Flex) • P6003 (Connector) • Screw (m) × 2
- FP6005 (Flex) • PS6002 (Connector)



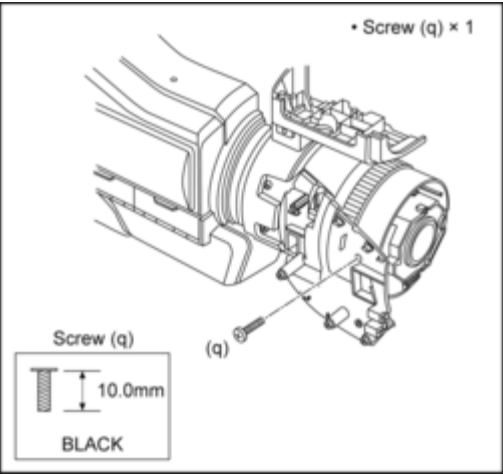
(Fig. D36)

- RED

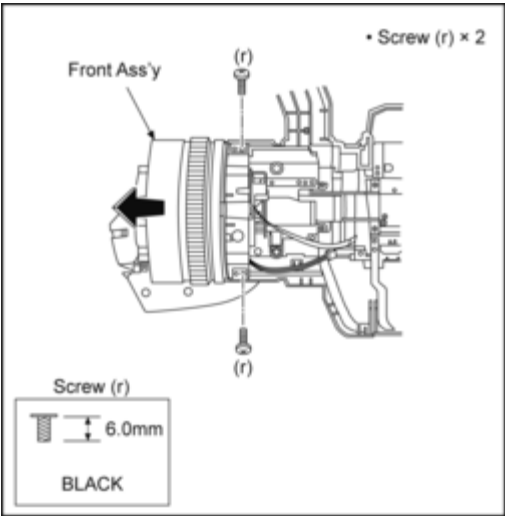


8.3.23 Removal of the Front Ass'y

(Fig. D38)

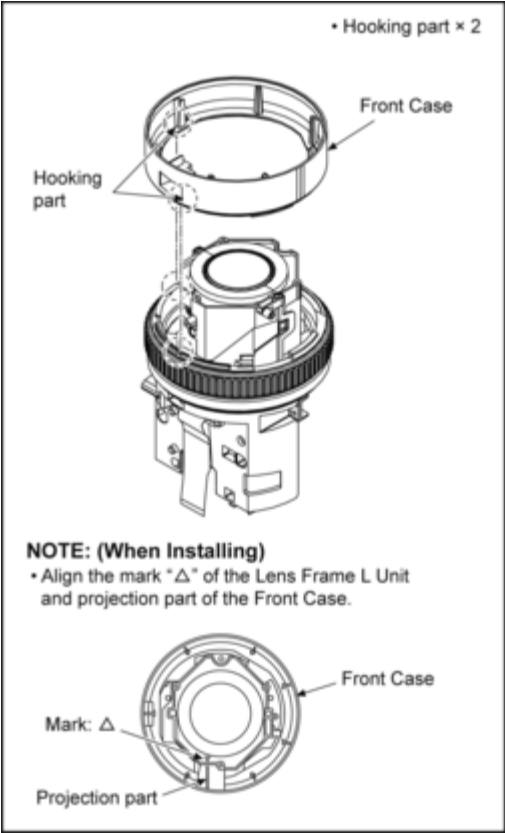


(Fig. D39)

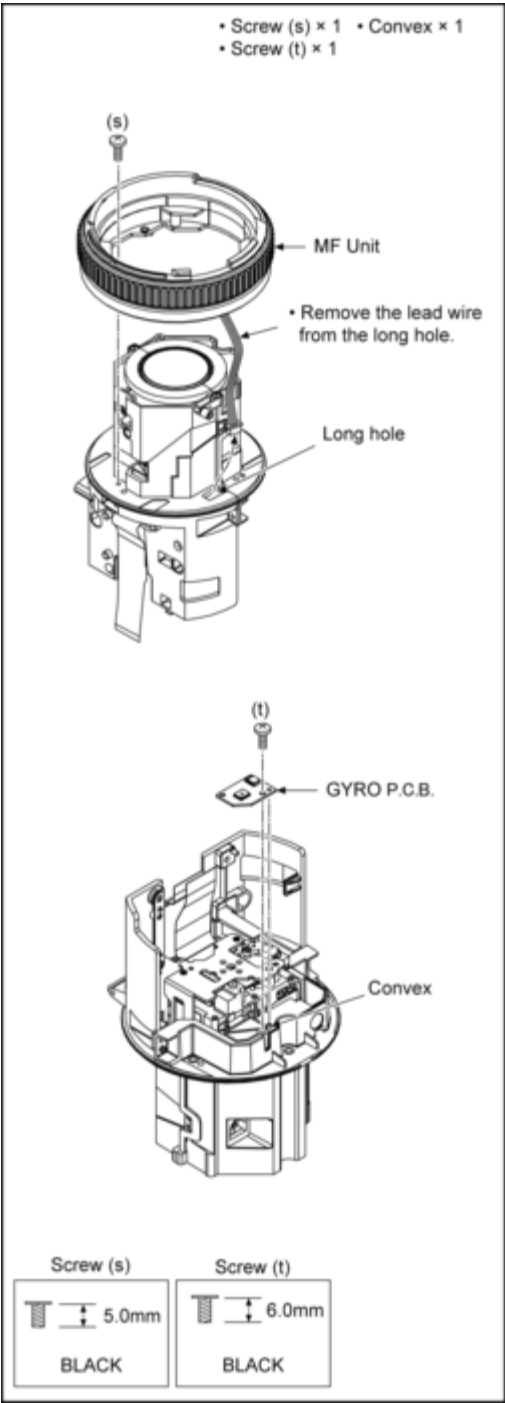


8.3.24 Removal of the Front Case, MF Unit and GYRO P.C.B.

(Fig. D40)

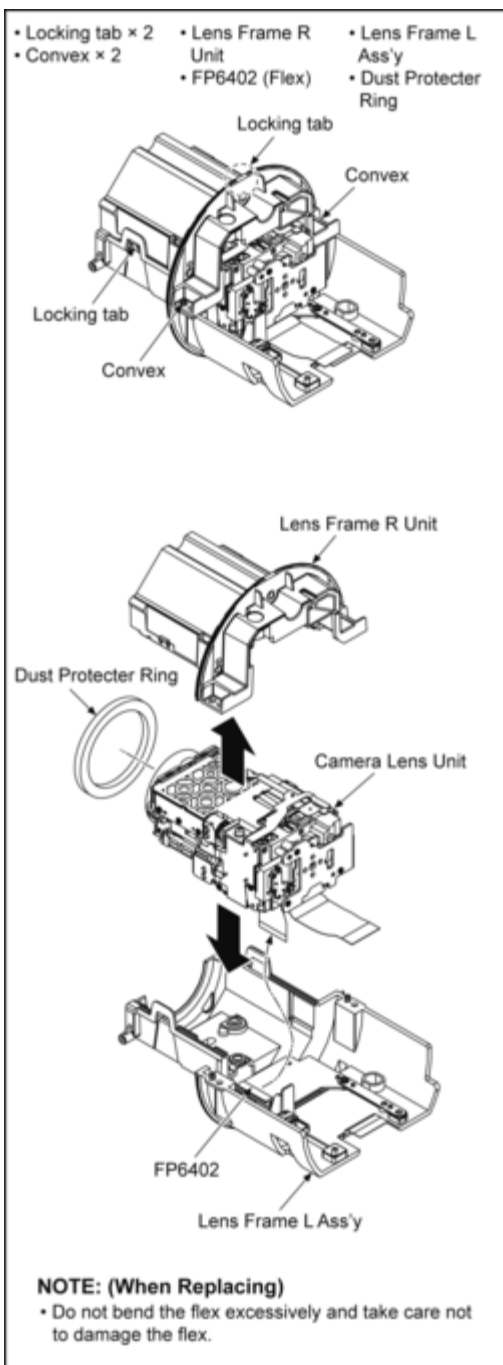


(Fig. D41)

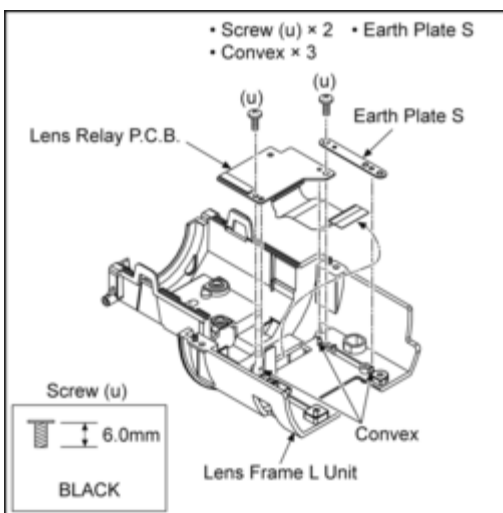


8.3.25 Removal of the Camera Lens Unit and Lens Relay P.C.B.

(Fig. D42)

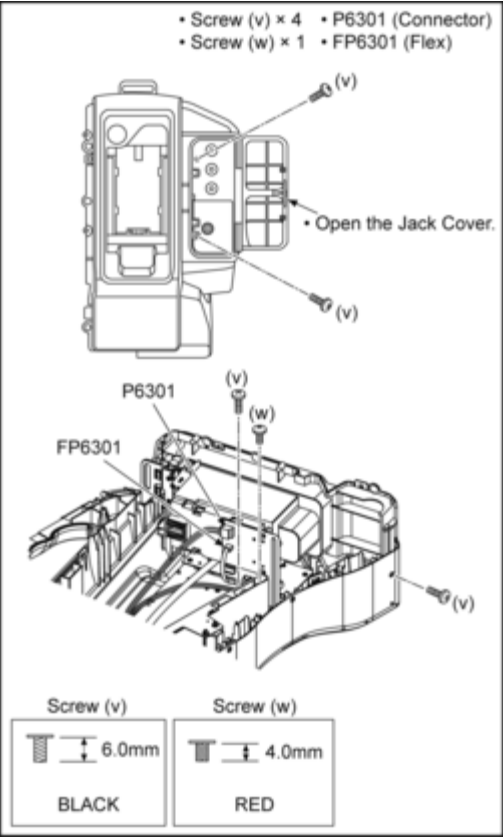


(Fig. D43)

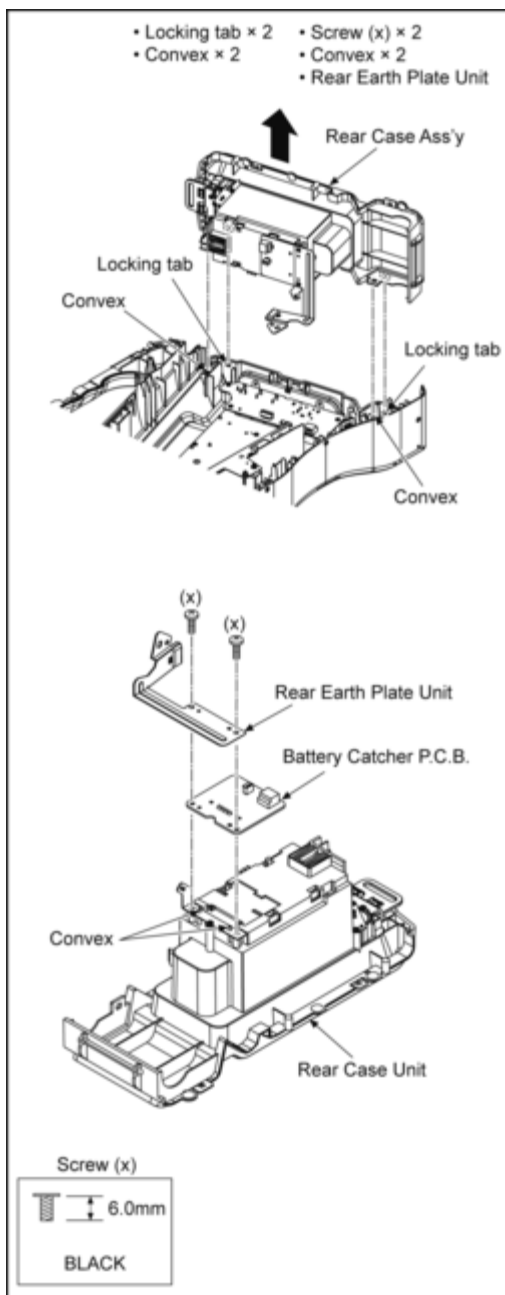


8.3.26 Removal of the Battery Catcher P.C.B. and Rear Case Unit

(Fig. D44)

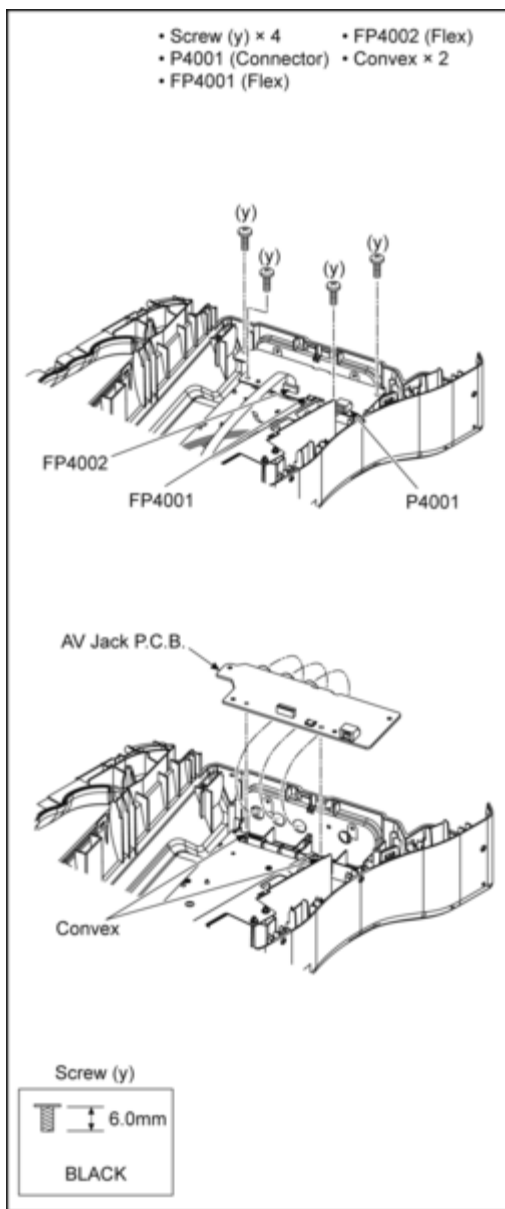


(Fig. D45)



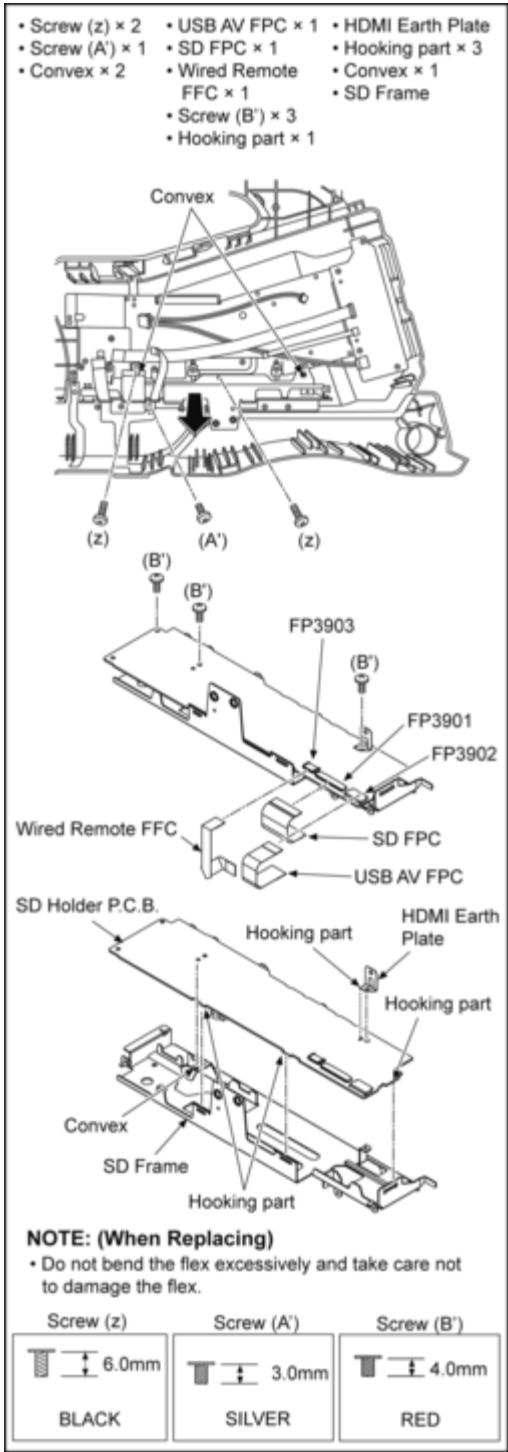
8.3.27 Removal of the AV Jack P.C.B.

(Fig. D46)



8.3.28 Removal of the SD Holder P.C.B.

(Fig. D47)

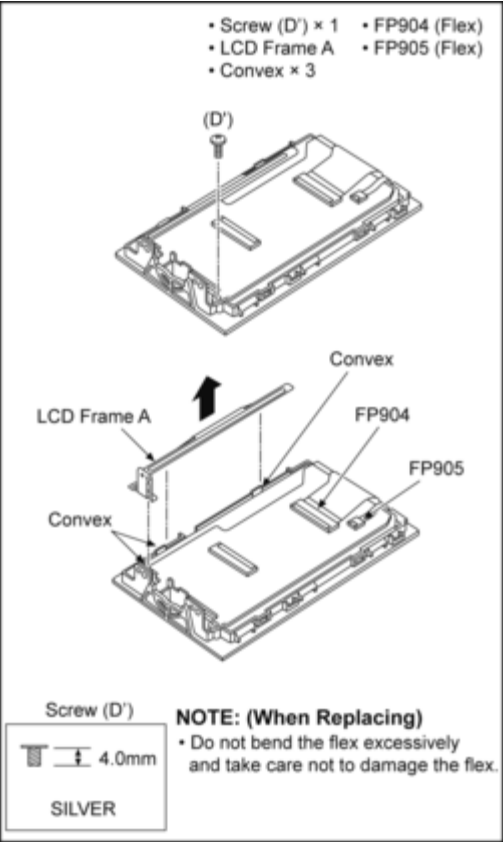


8.3.29 Removal of the LCD Hinge Unit

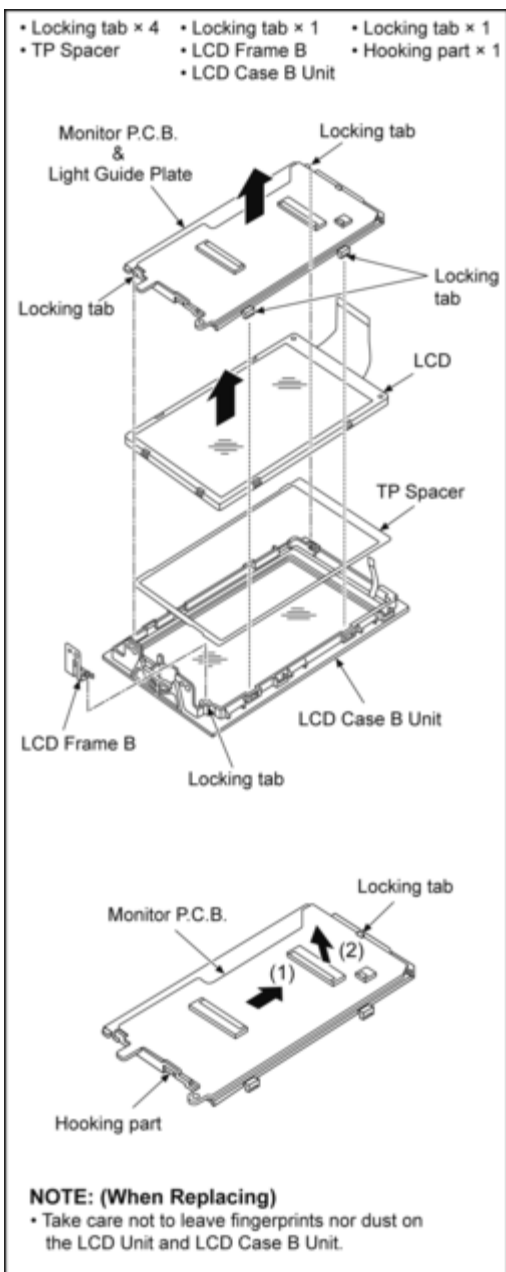
(Fig. D48)

8.3.30 Removal of the LCD and Monitor P.C.B.

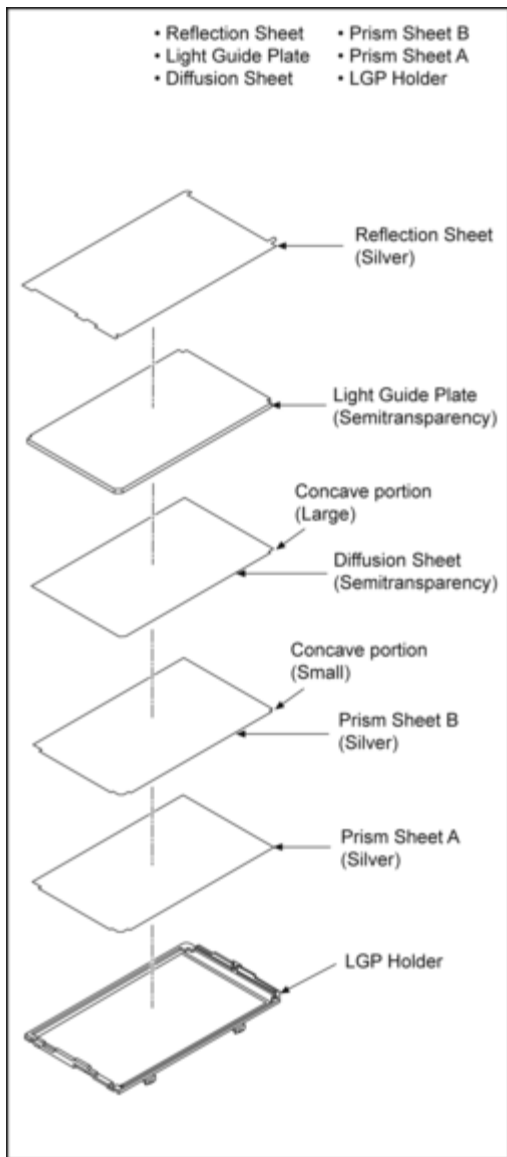
(Fig. D50)



(Fig. D51)

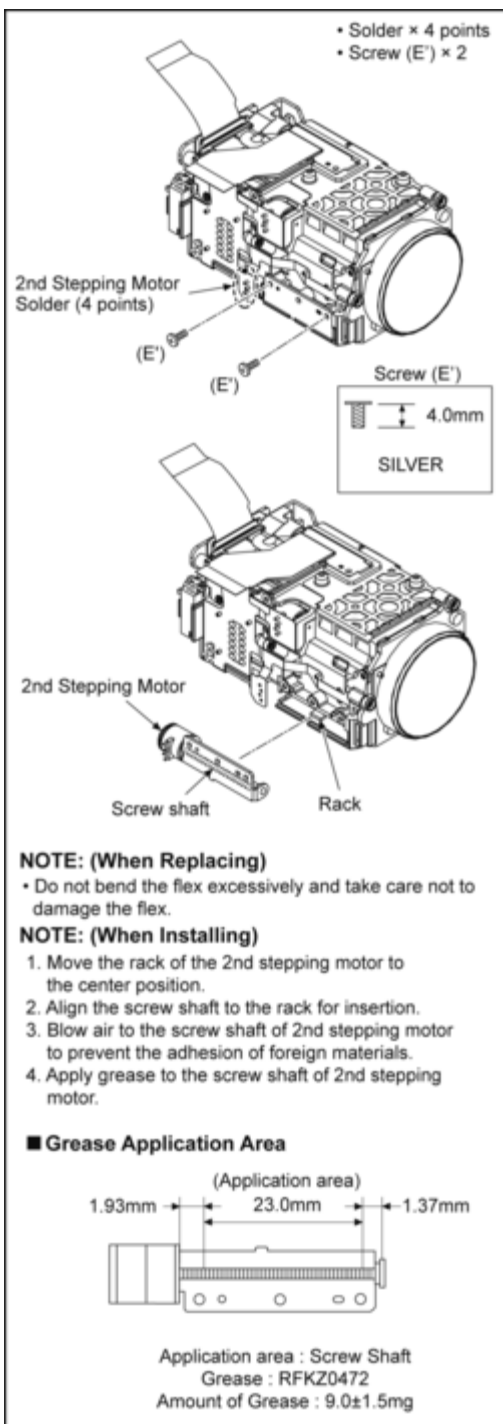


(Fig. D52)



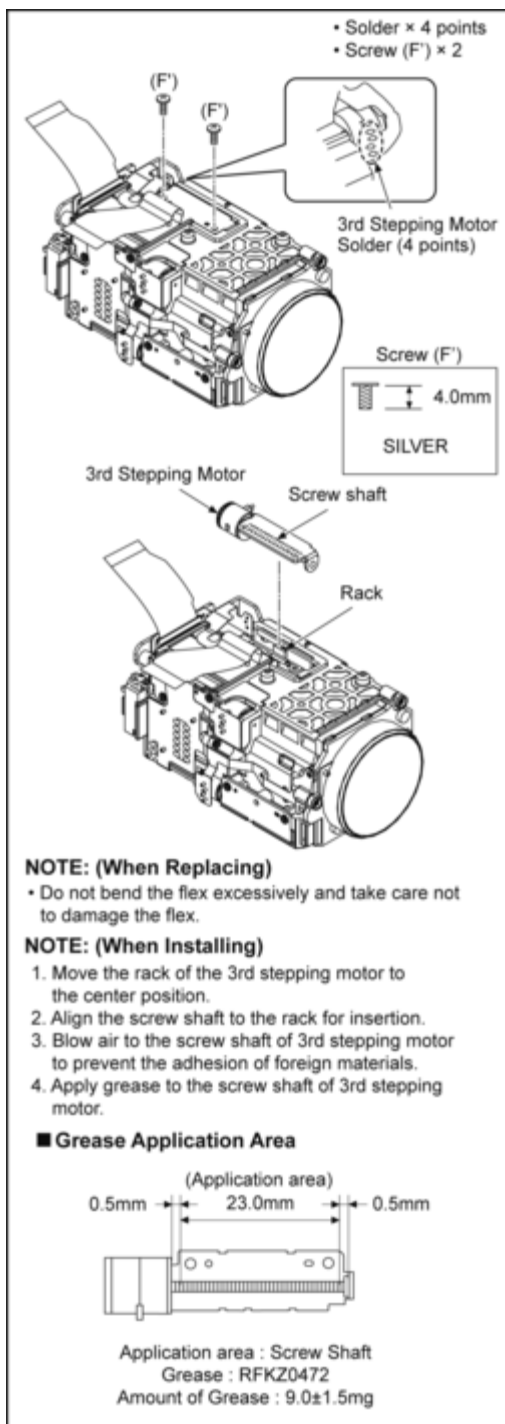
8.3.31 Removal of the 2nd Stepping Motor

(Fig. D53)



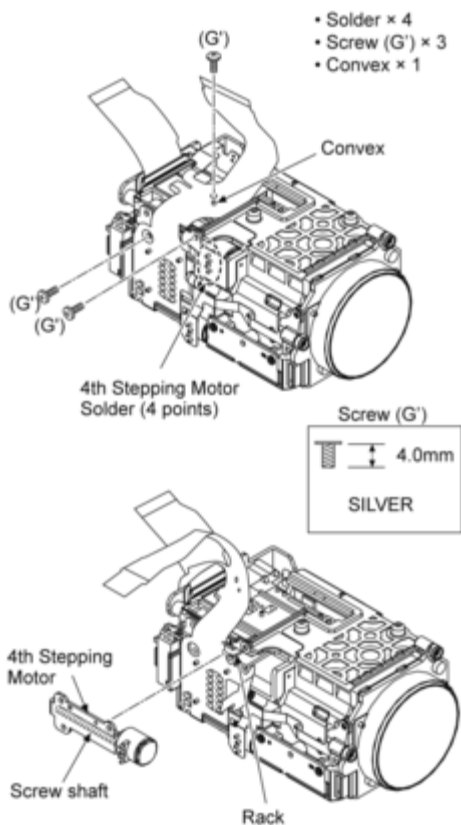
8.3.32 Removal of the 3rd Stepping Motor

(Fig. D54)



8.3.33 Removal of the 4th Stepping Motor

(Fig. D55)



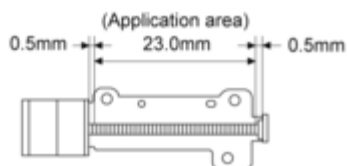
NOTE: (When Replacing)

- Do not bend the flex excessively and take care not to damage the flex.

NOTE: (When Installing)

1. Move the rack of the 4th stepping motor to the center position.
2. Align the screw shaft to the rack for insertion.
3. Blow air to the screw shaft of 4th stepping motor to prevent the adhesion of foreign materials.
4. Apply grease to the screw shaft of 4th stepping motor.

■ Grease Application Area



Application area : Screw Shaft
Grease : RFKZ0472
Amount of Grease : 9.0±1.5mg

9 Measurements and Adjustments

9.1 Electric Adjustment

- An exclusive jig are necessary for electric adjustment.
- Connection method of the main unit and an exclusive adjustment jig as follows.

Figure of connection

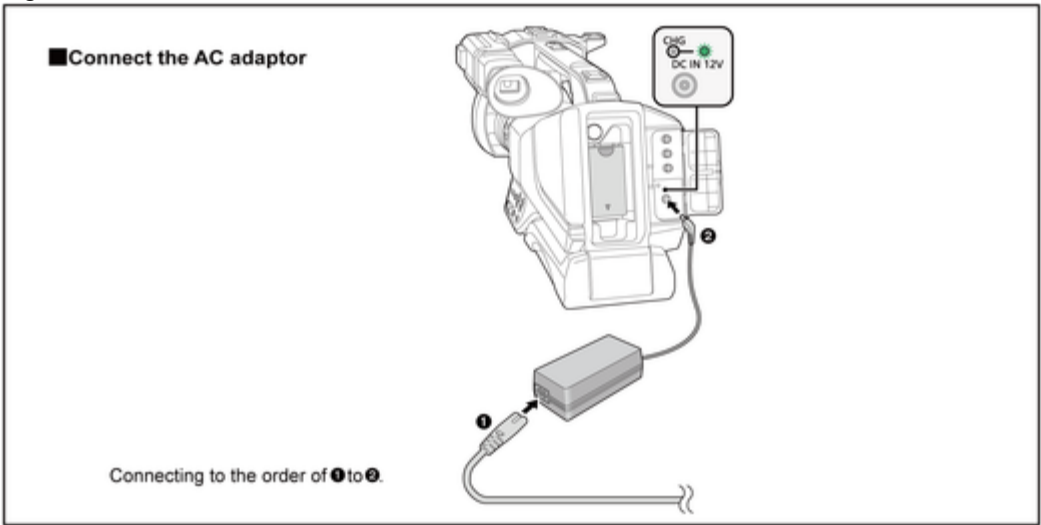
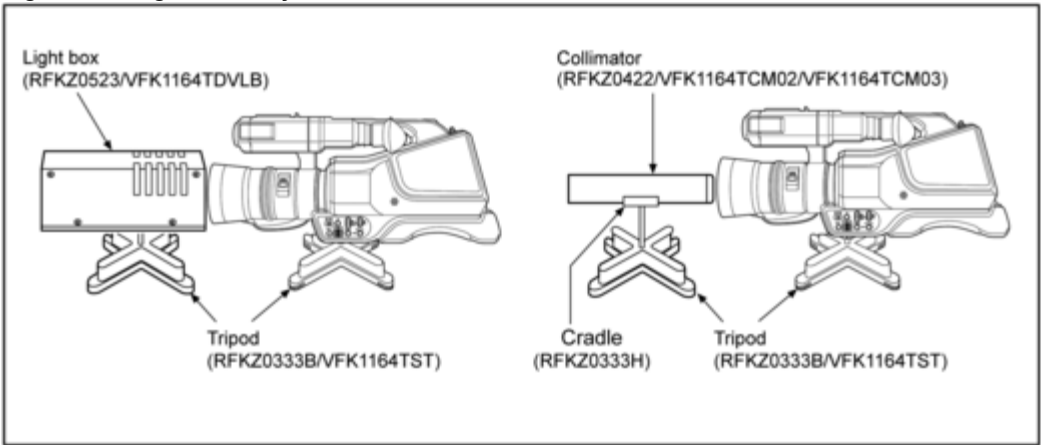


Figure of image when adjustment



Part Number of jig

1. Basic Jig

Item	Contents
AC adaptor	Banded with camcorder
DC Cable	Banded with camcorder

2. Optical Jig for Camera Adjustment

Item	Part number	Remarks
Light box	VFK1164TDVLB/RFKZ0523*	Need external power supply: 12V ± 0.1V /1.8A or over

Collimator with focus chart		VFK1164TCM02/VFK1164TCM03, RFKZ0422*	Same as DSC
CC filter	3100K/5100K	VFK1164CC10G	Need 2 set. For indoor/outdoor white balance adjutment
C2 Filter	5100K	VFK1164LBB2	For outdoor white balance adjustment
C8 Filter	5100K	VFK1164LBB8	For outdoor white balance adjustment
ND Filter 0.1	3100K	VFK1164ND01	For indoor white balance adjustment
ND Filter 0.6	3100K	VFK1164ND06	For indoor white balance adjustment
Adjustment chart for Level Shot		Banded with this Manual	For Level shot adjustment

* RFKZ0523 and RFKZ0422 (same as DSC) are recommended.

[Level Shot Adjutment Chart]

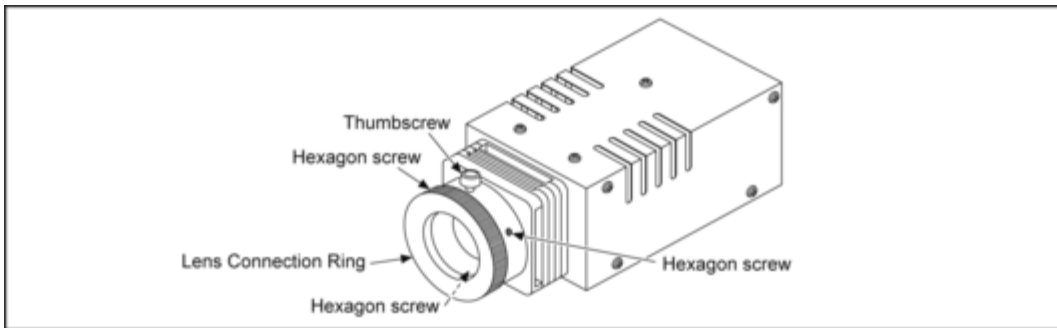


9.1.1 About Light Box

When using VFK1164TDVLB Light Box

If using VFK1164TDVLB Light Box, remove the lens connection ring by loosing thumbscrew and three hexagon screws.

* RFKZ0523 Light Box has no lens connection ring.



How to remove the Front Hood

In order to utilize maximum of the diffusing surface of light box, some adjustment items need the distance between diffusing surface of light box and camera body becomes several cent-meters.

Before the adjustments, remove the front hood of light box following steps below.

[For VFK1164TDVLB Light Box]



(1) Unscrew the 8 screws.
Slide the body case, then lift it up.



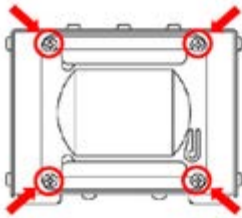
(2) Unscrew the 4 screws.



(3) Remove the front hood. Install the body case, then tighten the 8 screws.



[For RFKZ0523 Light Box]



Unscrew the 4 screws, then remove the front hood.

9.1.2 Adjustment Items

Adjustment item as follows.

Replacement Part	Adjustments							Setting	
	Zoom Lever Adjustments	Camera Adjustments*1	Zoom / Tracking Adjustments	Indoor White Balance Adjustments	Outdoor White Balance Adjustments	Level Shot Adjustments*2	Touch Panel Calibration	Model Setting	Factory Setting
MAIN P.C.B.	○	○	○	○	○	○	-	○	○
GYRO P.C.B.	-	○	-	-	-	○	-	-	-
POWER SS P.C.B.	-	-	-	-	-	○	-	-	-
CAMERA LENS UNIT	-	○	○	○	○	○	-	-	-
LCD CASE(B) UNIT	-	-	-	-	-	○	○	-	-

*1...IRIS adjustment, OIS hall amp adjustment, Missing pixels compensation, OIS gyro adjustment, AGS adjustment

*2...When parts are exchanged, this adjustment is indispensable.

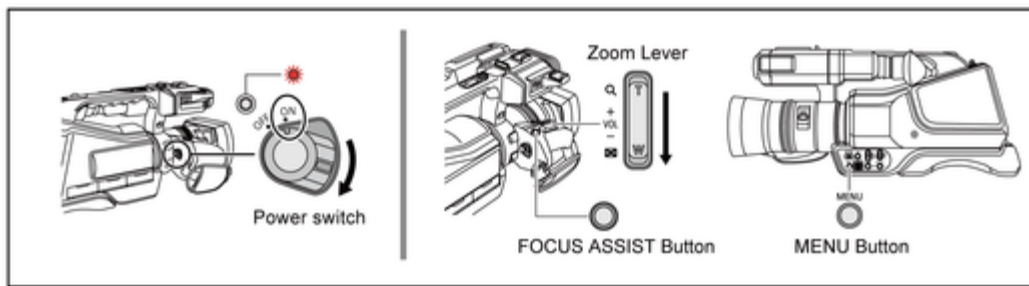
9.1.3 Adjustment Procedure

All adjustments except "Touch Panel Calibration" and "Factory Setting" performs using "14 Adjustment function for the service" in service mode menu.

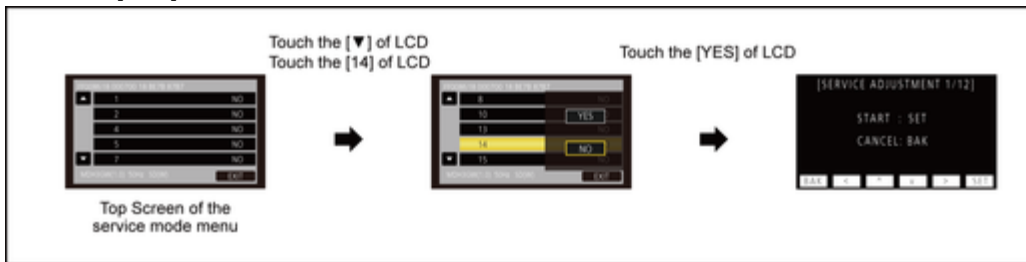
"Touch Panel Calibration" is performed using 16 of service mode menu and "Factory Setting" is performed using 1, of service mode menu. Refer to "6 Service mode" and "10 Factory Setting".

[Execute adjustment function for service]

1. Set the power switch to ON, and turn to ON.
2. Keep pressing the "FOCUS ASSIST" button, "MENU" button and "Zoom Lever" to W side for more than 3 seconds until the top screen of the Service Mode Menu being displayed.



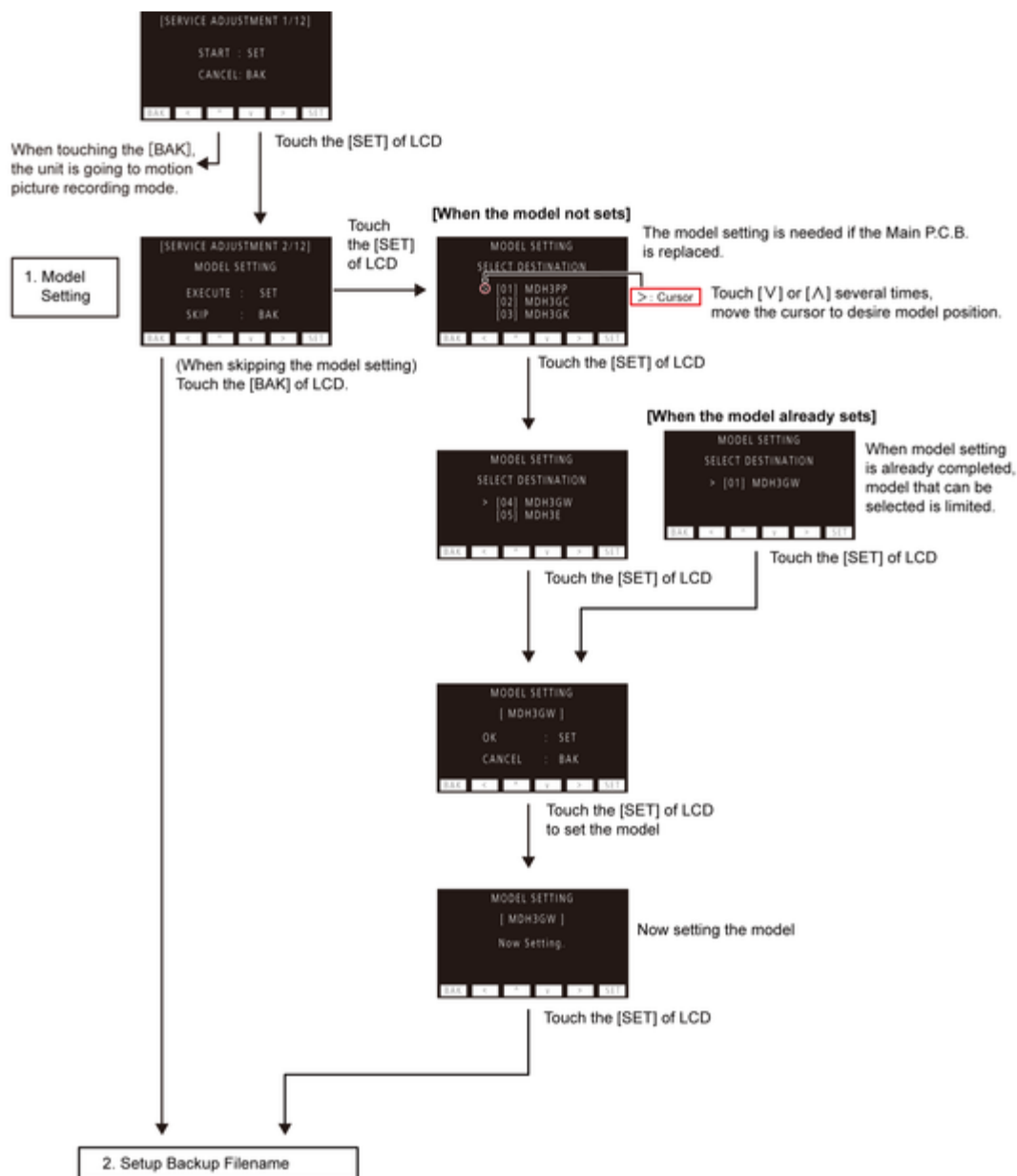
3. Touch the ▼ then touch the [14] of LCD.
4. Touch the [YES] of LCD.

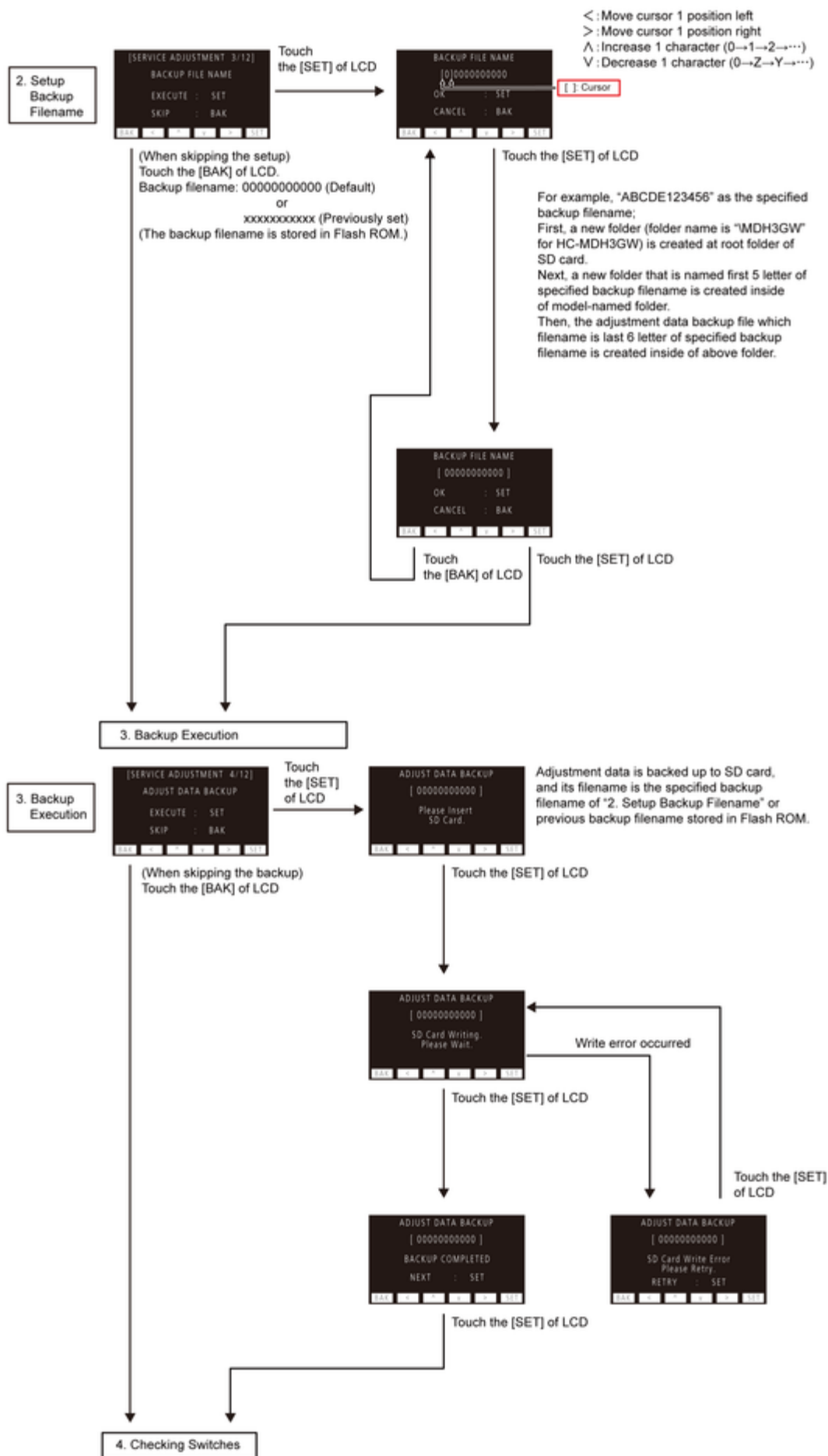


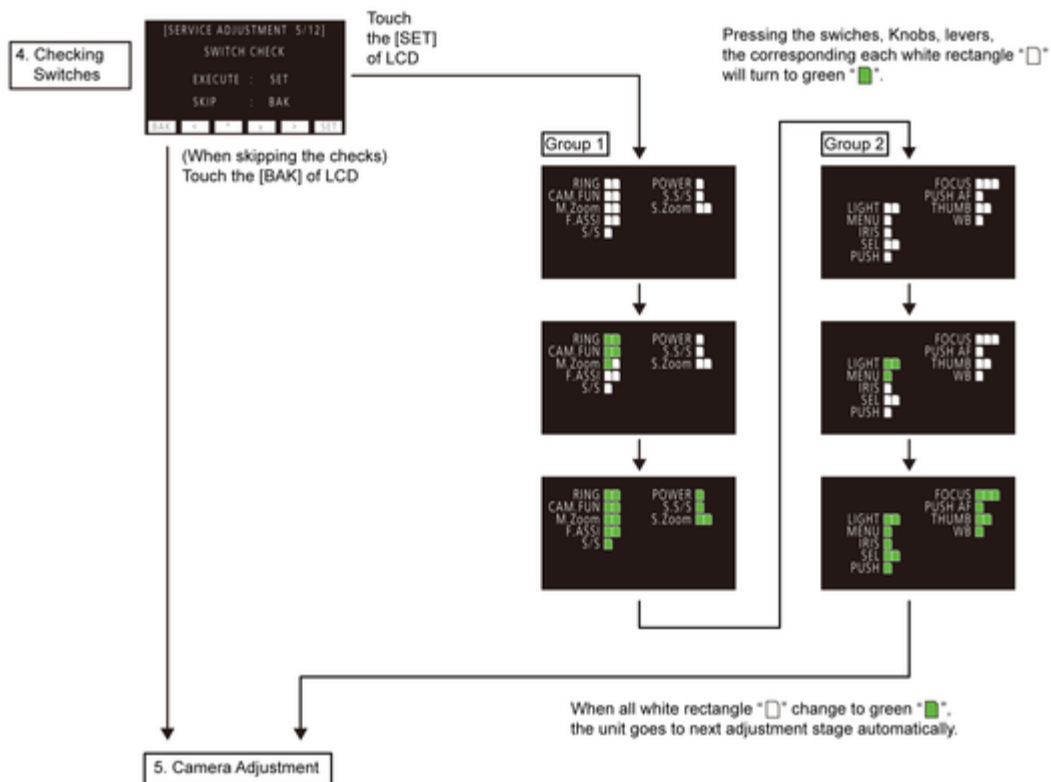
[Adjustment Procedure]

Adjustments and settings are performed following order:

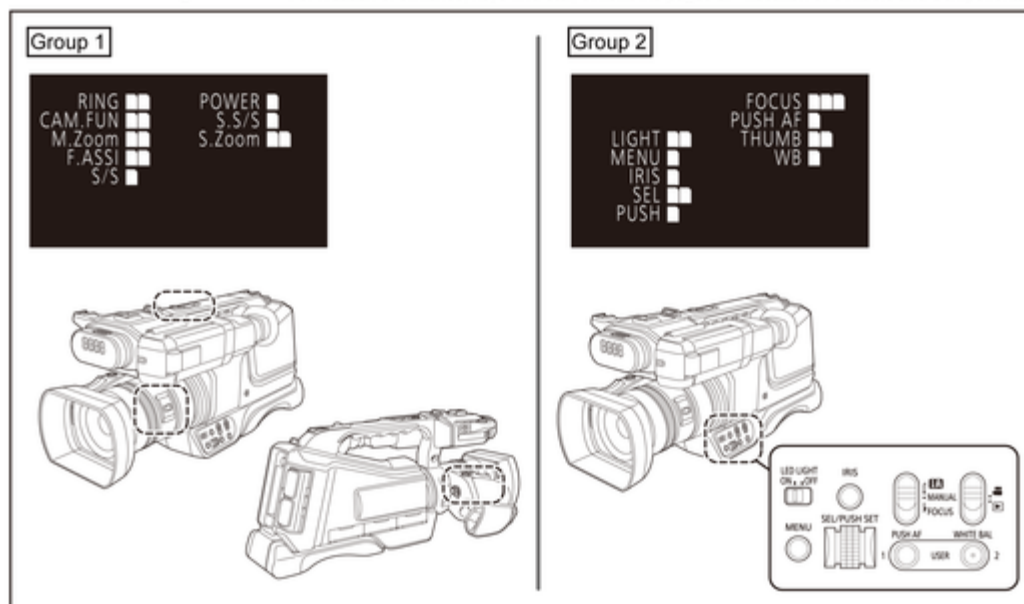
1. Model setting
2. Filename setting for backup to SD card
3. Backing up adjustment data to SD card
4. Checking switches
5. Zoom lever adjustment
6. Camera adjustment (Iris, Gyro, OIS, Missing pixels compensation)
7. Zoom/tracking adjustment
8. Indoor white balance adjustment (CH GAIN, PWM, WB)
9. Outdoor white balance adjustment (PWM, WB)
10. Level shot adjustment

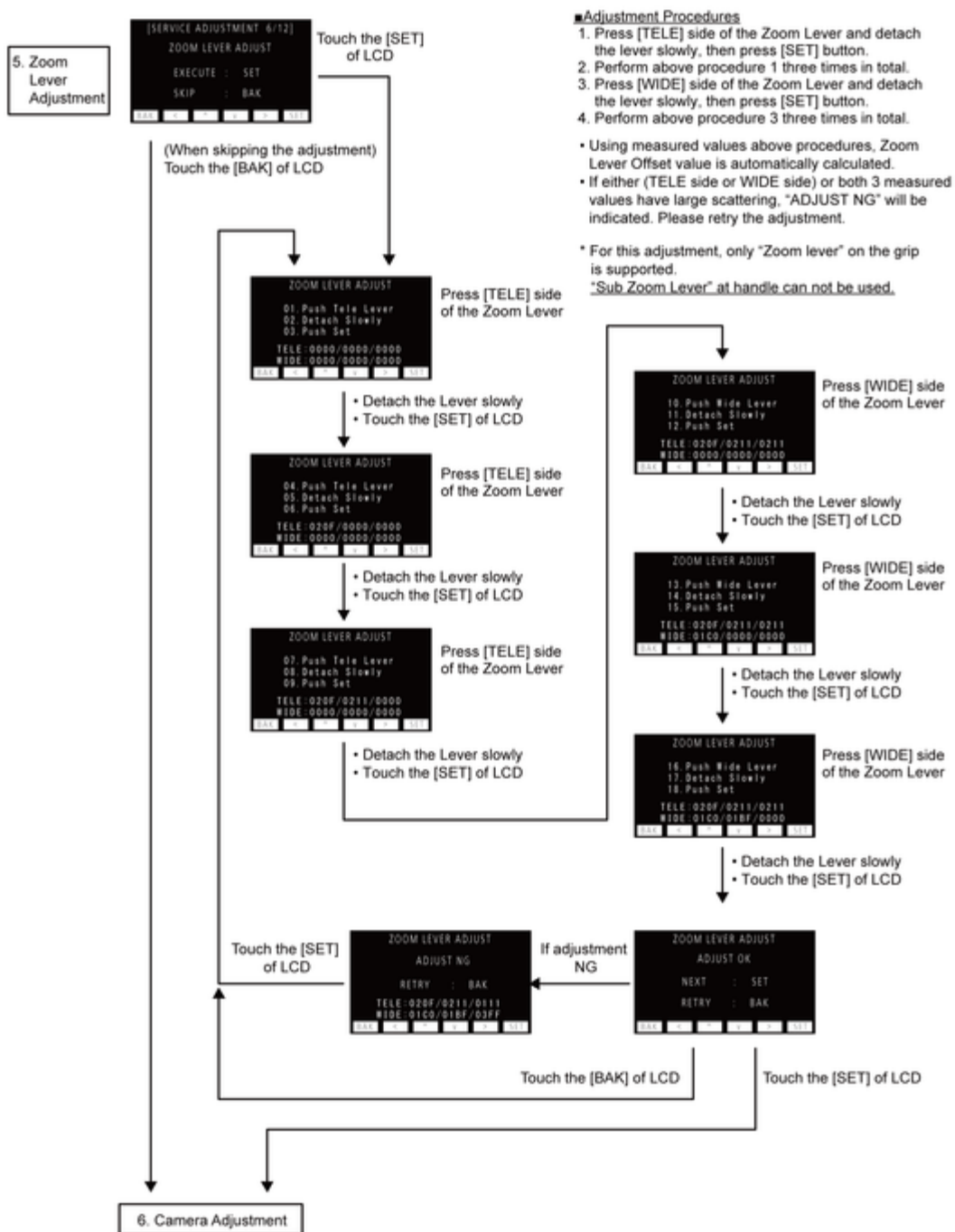


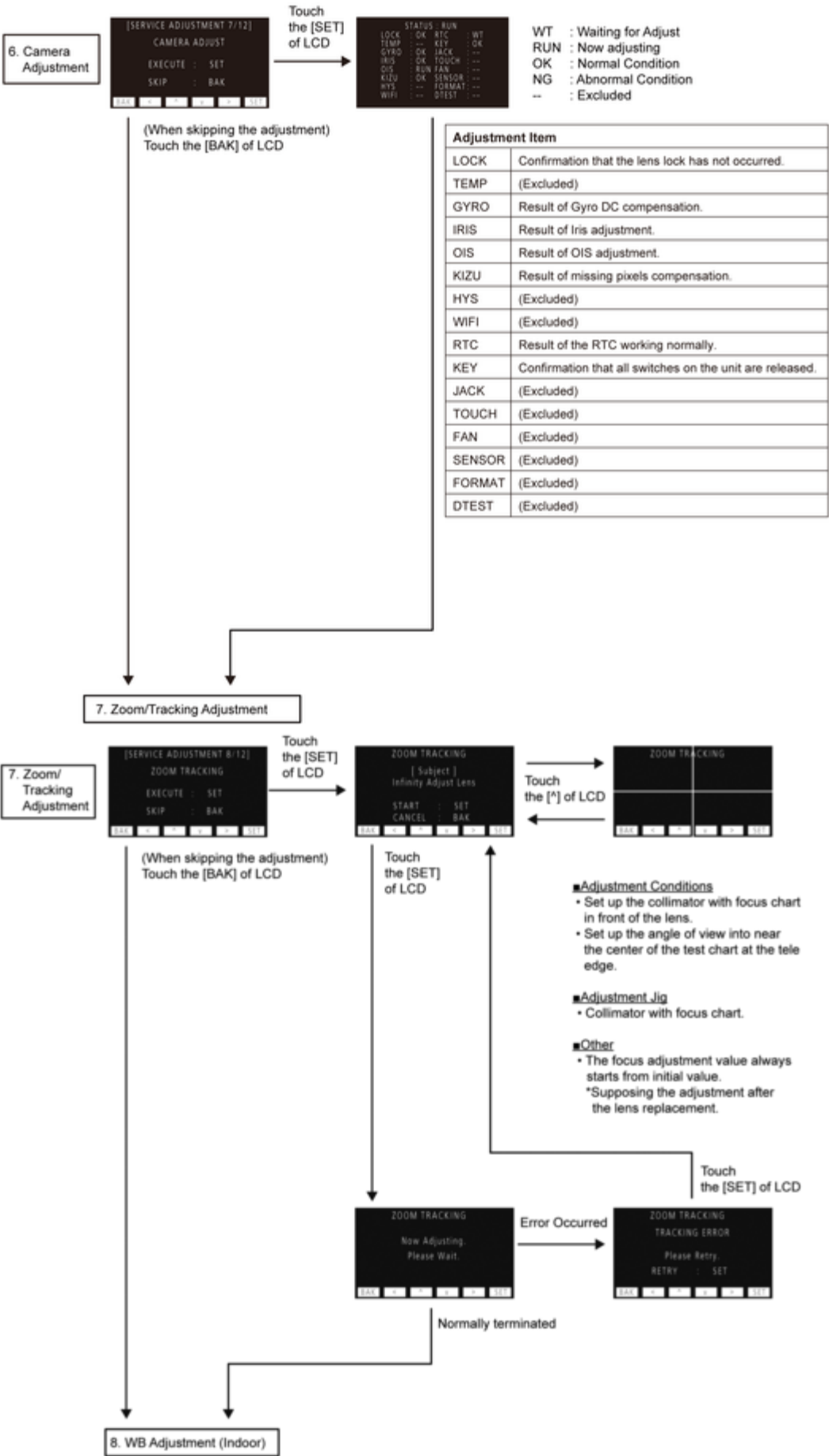


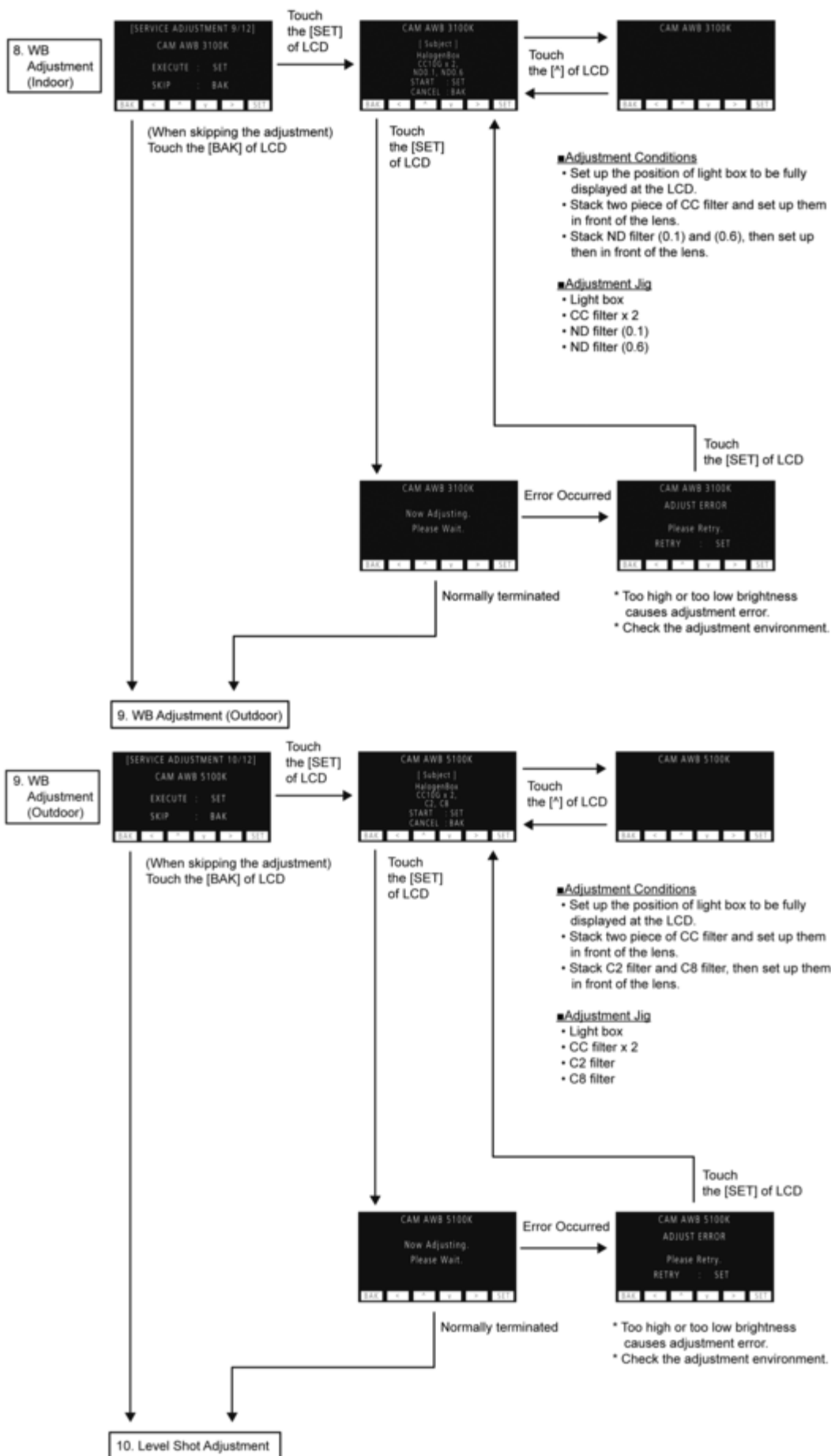


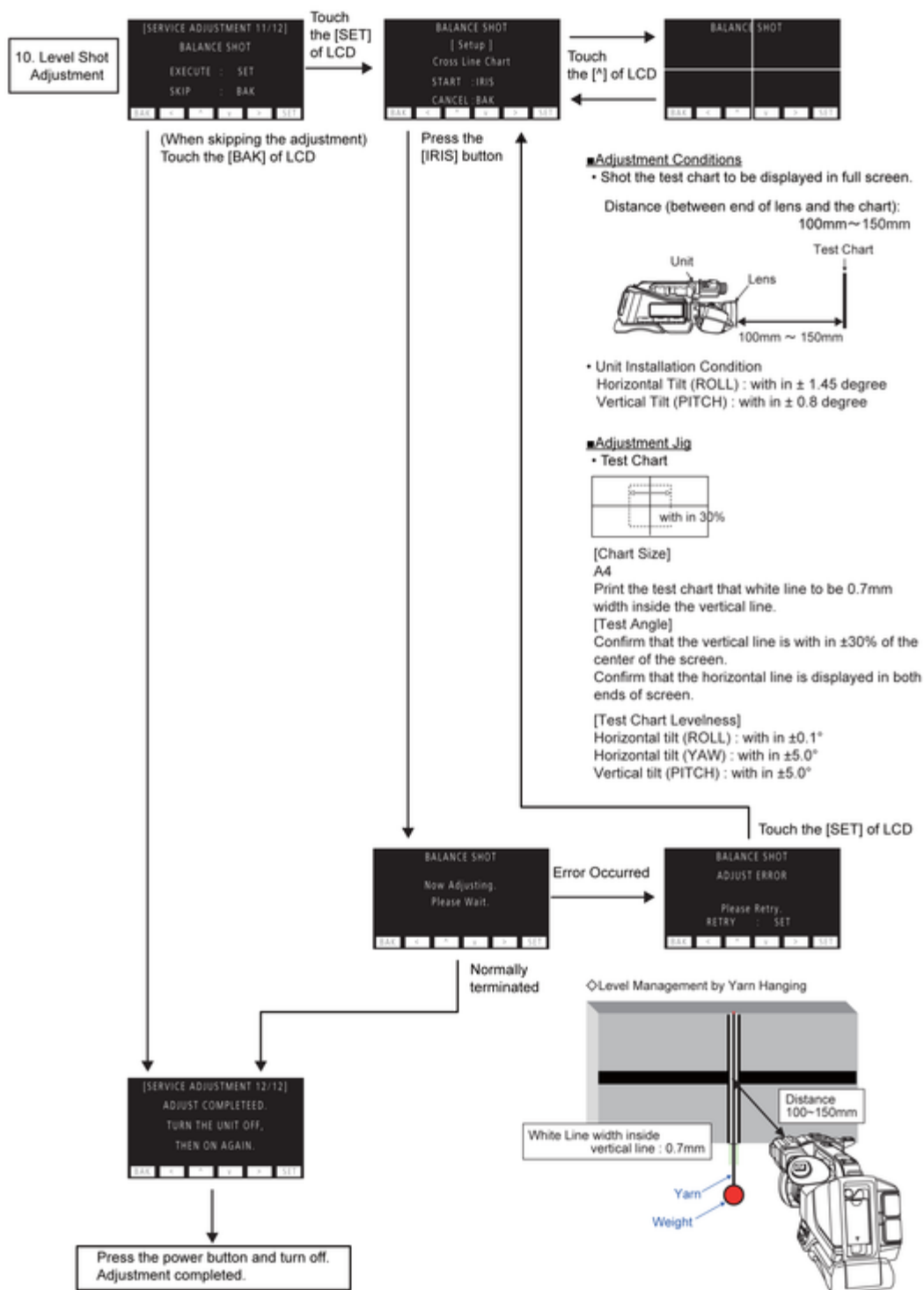
< Switches arrangement > * For location of switches, keys and etc., consult the pages of "Location of Controls and Components".







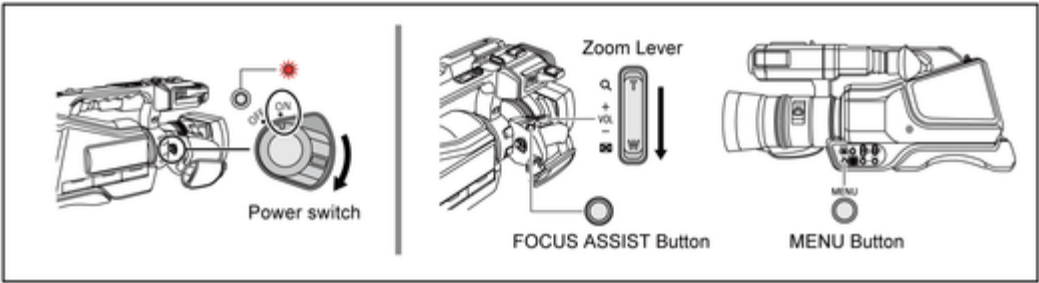




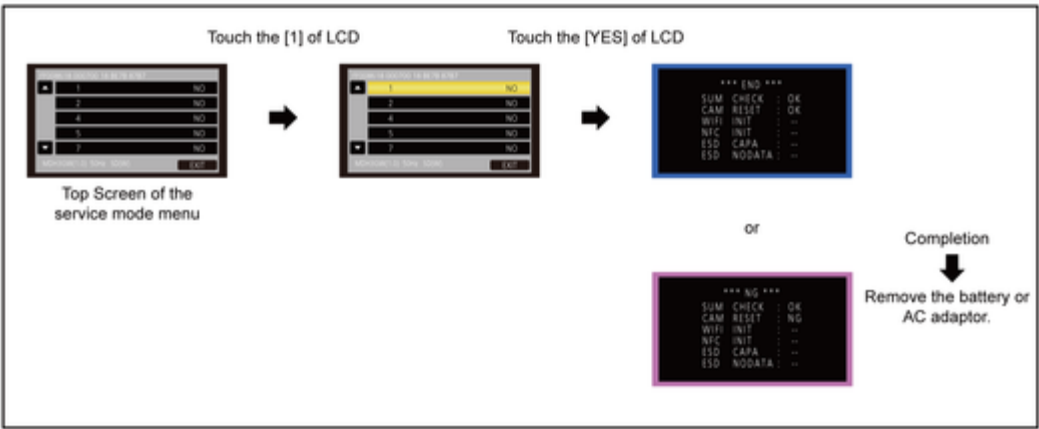
10 Factory Setting

10.1 How To Turn On The Factory Settings?

- 1. Set the power switch to ON, and turn to ON.
- 2. Keep pressing the “FOCUS ASSIST” button, “MENU” button and “Zoom Lever” to W side for more than 3 seconds until the top screen of the Service Mode Menu being displayed.



- 3. Touch the [1] of LCD.
- 4. Touch the [YES] of LCD.
- 5. After few seconds “END” is displayed on LCD monitor. Cutting of battery connection or AC power supply connection as a completion of the “FACTORY SETTINGS”.



10.2 What Is The Factory Settings?

The factory settings clean up and/or refresh the following settings.

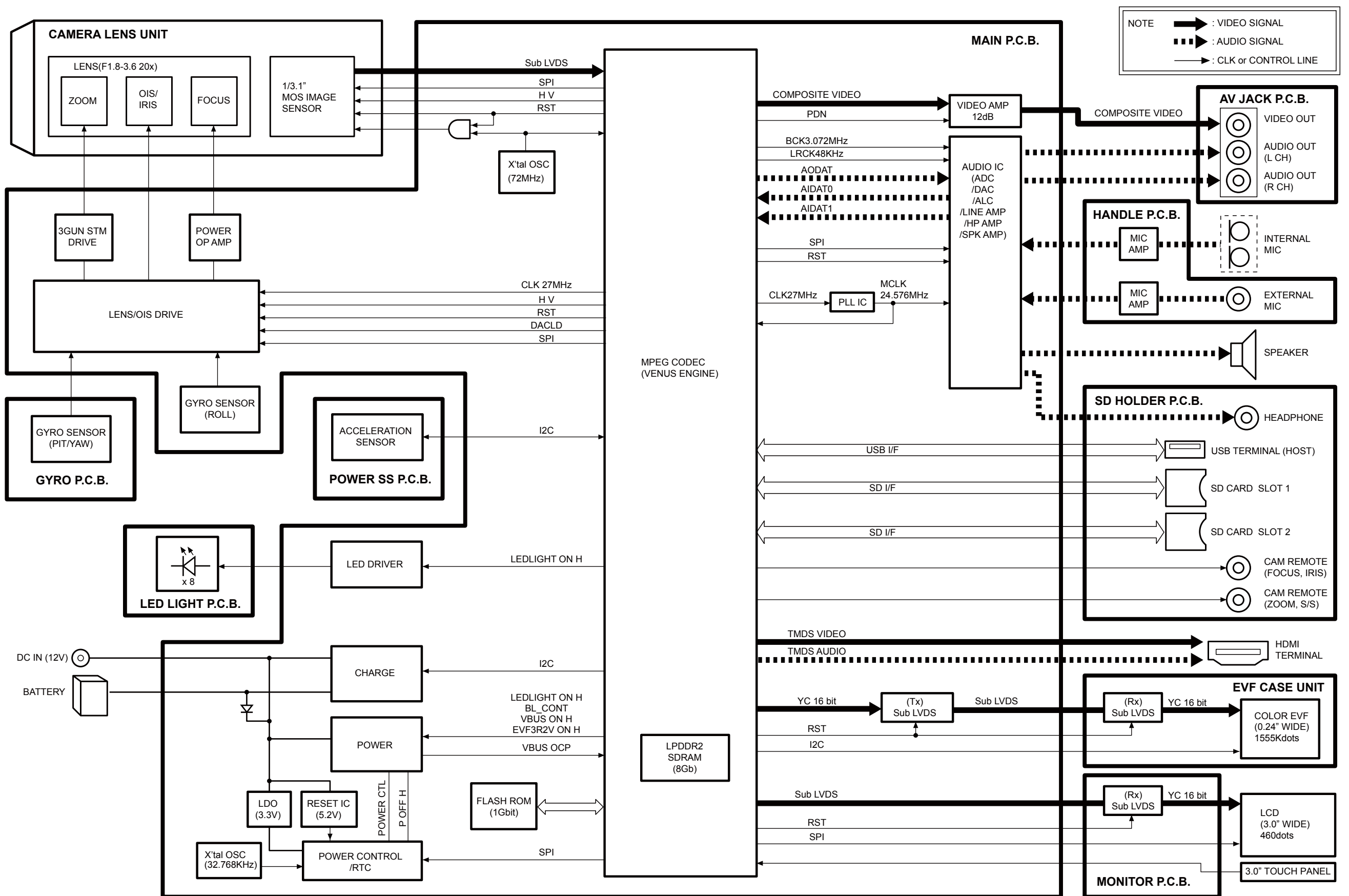
- 1. MENU, MODE, ADJUSTMENT VALUE.
- 2. Reset the folder number and file number of still pictures.
(Setting the folder number is 100, and file number is 0.)
- 3. Clear the time and date setting.

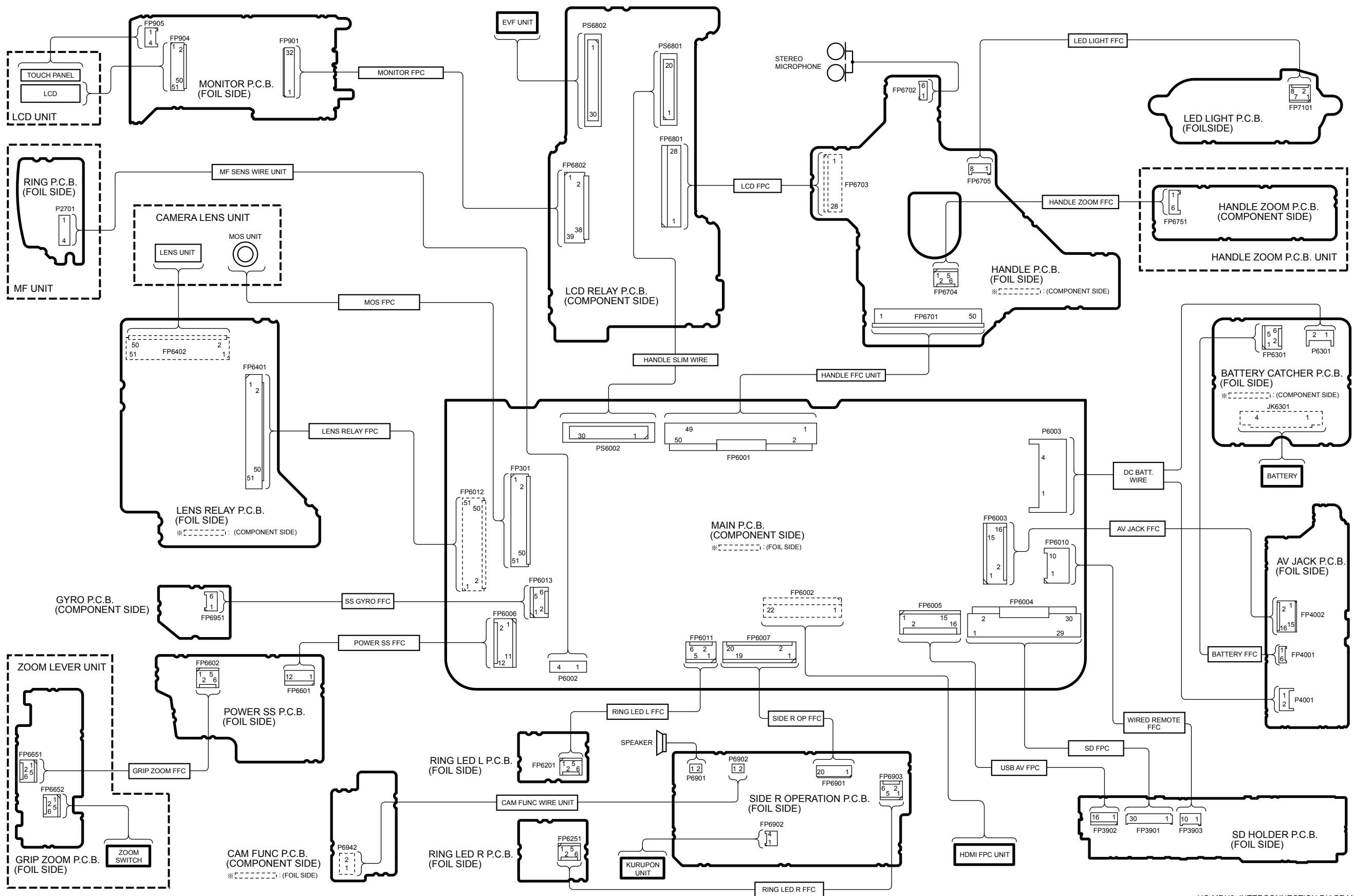
The shipment setting position of switches and lever:

(After the factory settings, set the switches and lever as following table.)

Name	Setting position
Mode switch	Recording mode
iA/MANUAL/FOCUS	[iA] position

switch	
Power switch	[Off] position
LED LIGHT switch	[Off] position
Eyepiece corrector lever	[Shortsighted End] position





Model No. : HC-MDH3 Parts List Note

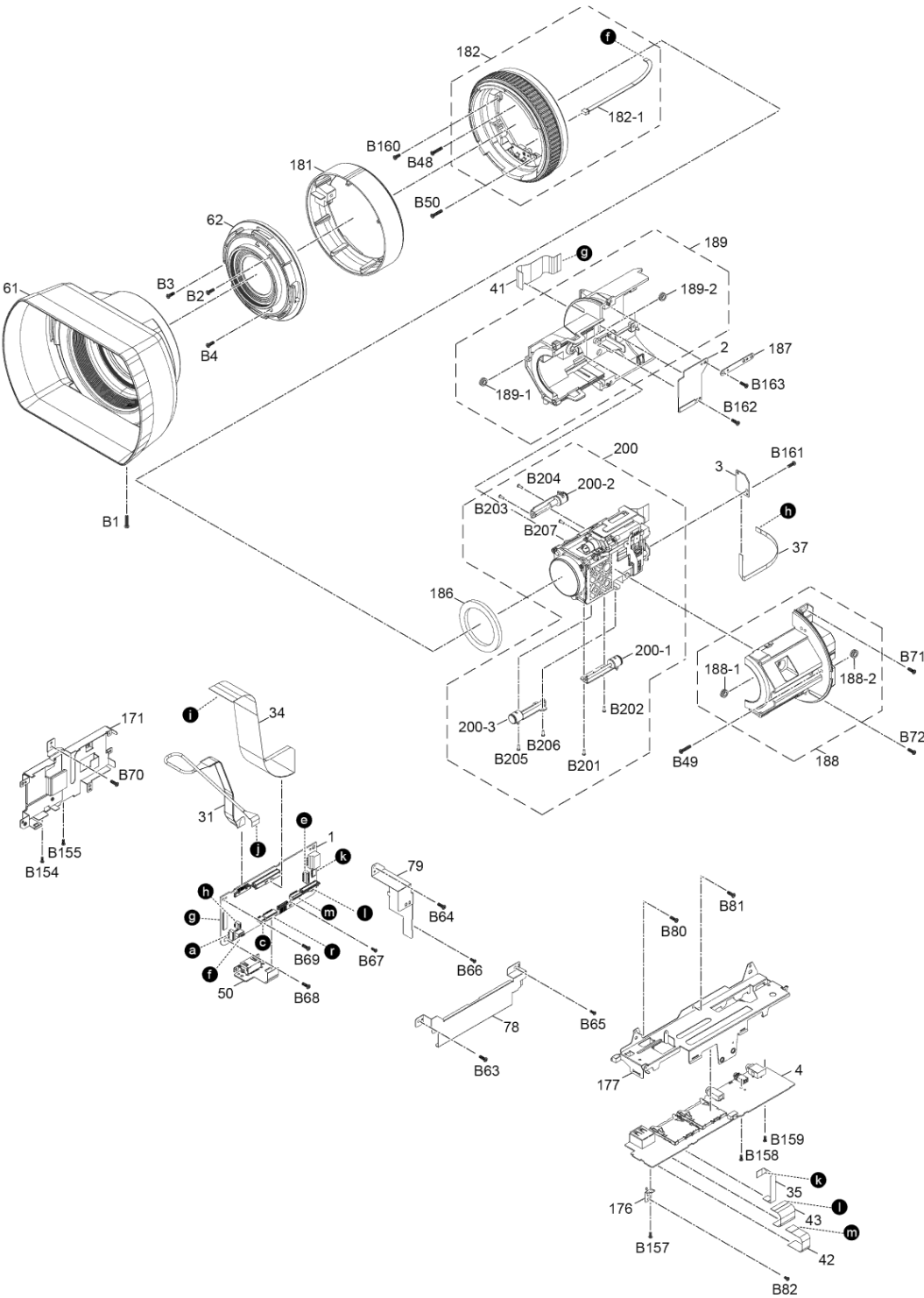
- Note:

 - 1. * Be sure to make your orders of replacement parts according to this list.
 - 2. IMPORTANT SAFETY NOTICE
Components identified with the mark  have the special characteristics for safety.
When replacing any of these components, use only the same type.
 - 3. Unless otherwise specified,
All resistors are in OHMS, K=1,000 OHMS. All capacitors are in MICRO-FARADS (uf), P=uuF.
 - 4. The marking (RTL) indicates the retention time is limited for this item. After the discontinuation of this assembly in production, it will no longer be available.

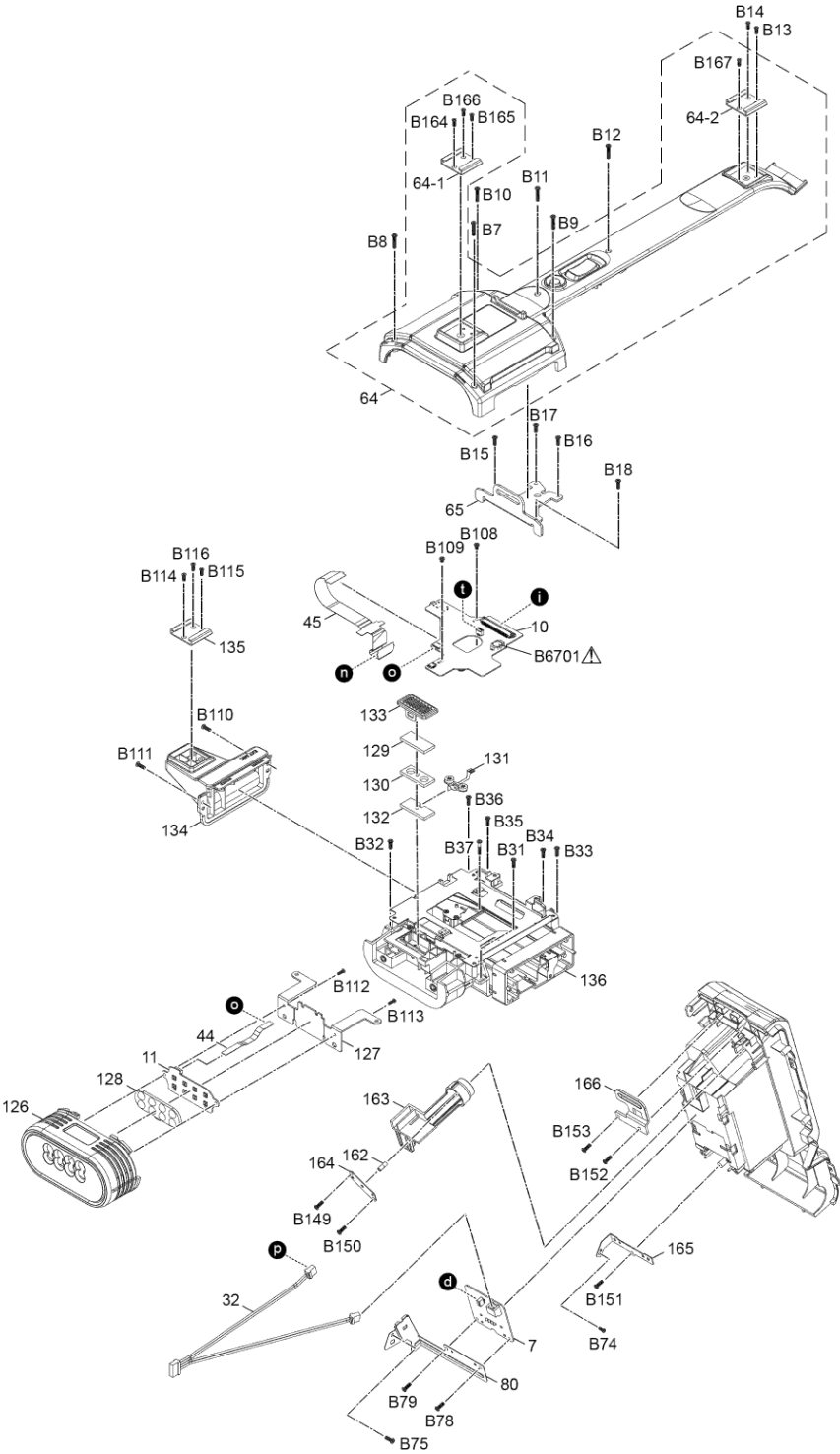
E.S.D. standards for Electrostatically Sensitive Devices, refer to PREVENTION OF ELECTROSTATIC DISCHARGE (ESD) TO ELECTROSTATICALLY SENSITIVE (ES) DEVICES section.

Definition of Parts supplier:
All parts are supplied from AP-INBD.

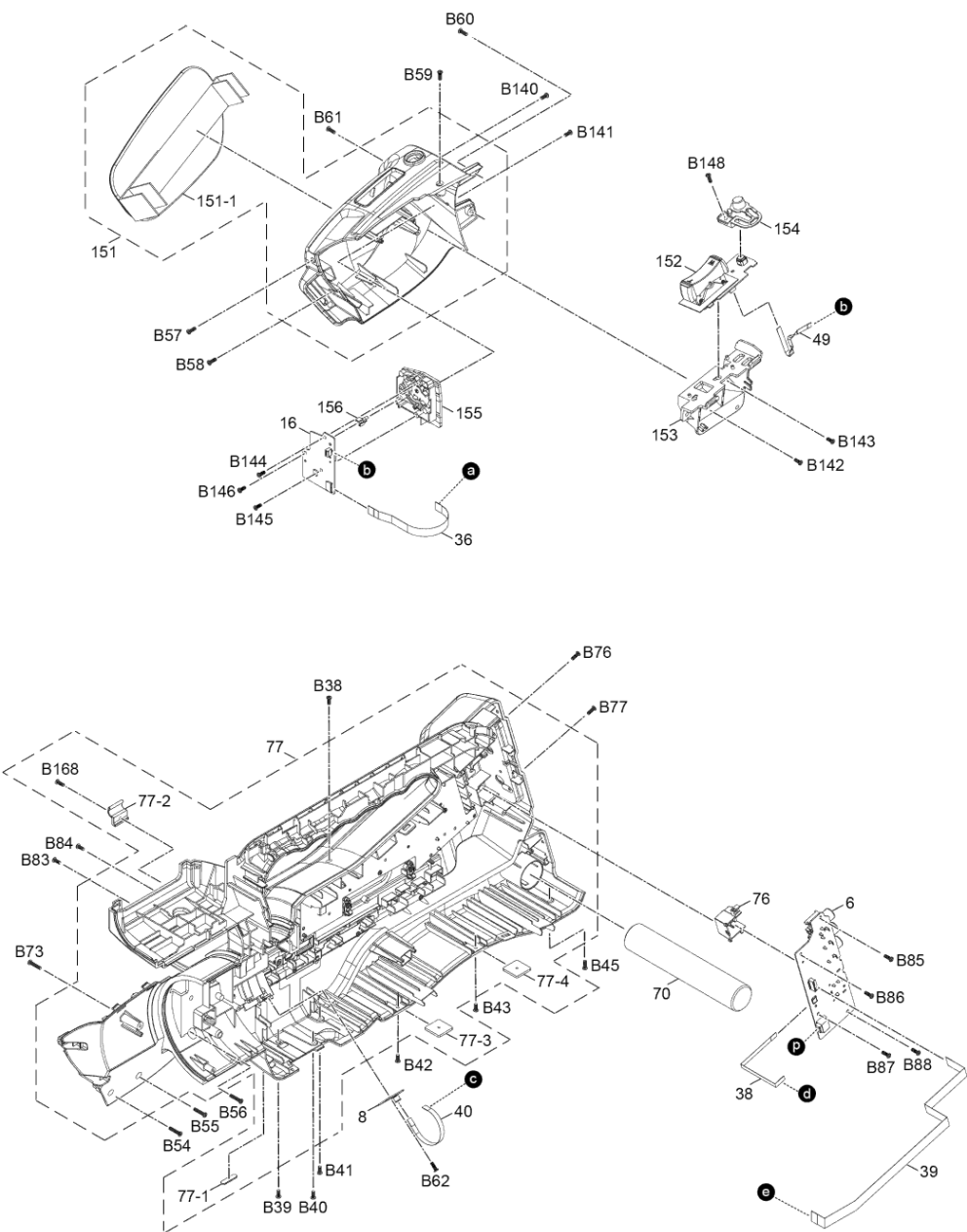
Model No. : HC-MDH3 Frame and Casing Section (1)



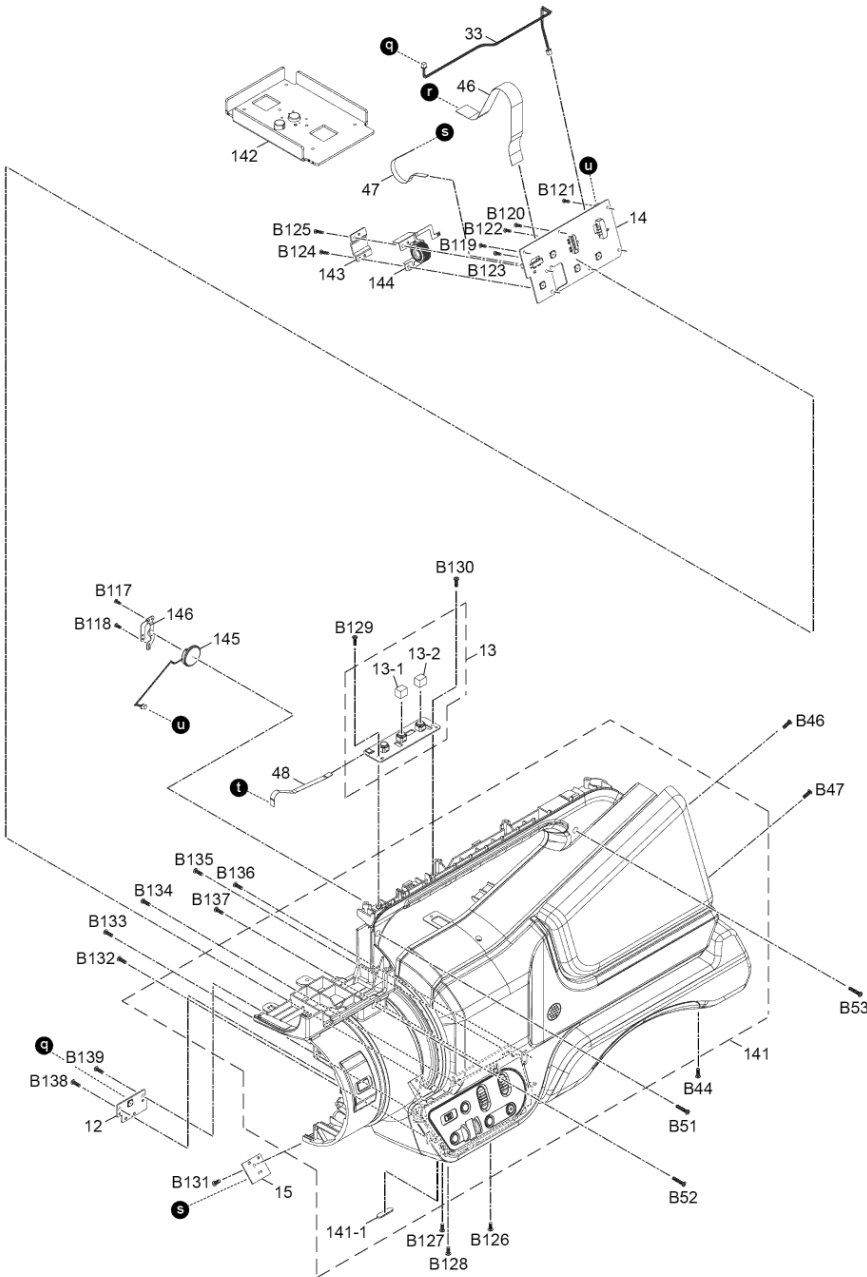
Model No. : HC-MDH3 Frame and Casing Section (2)



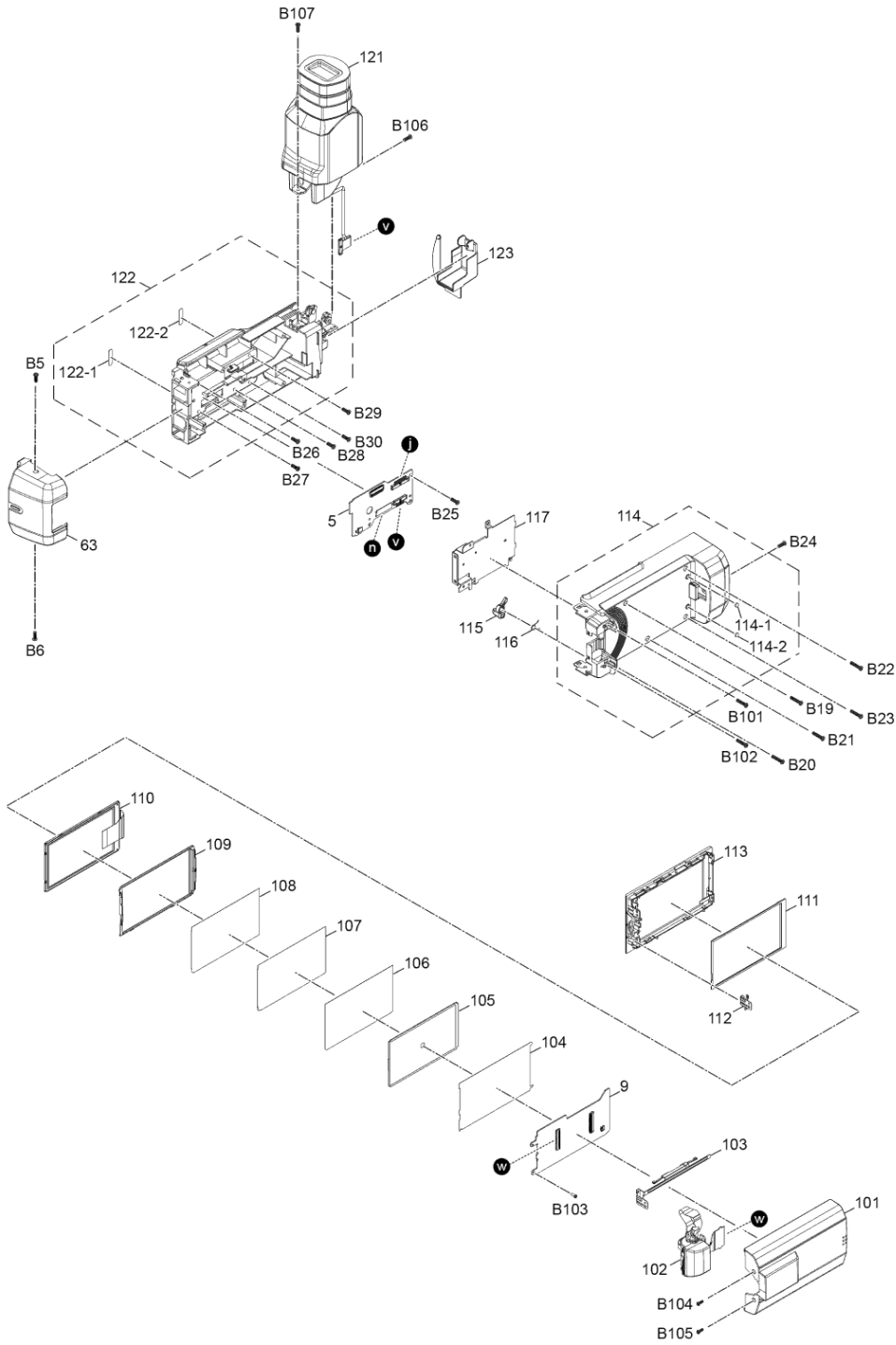
Model No. : HC-MDH3 Frame and Casing Section (3)



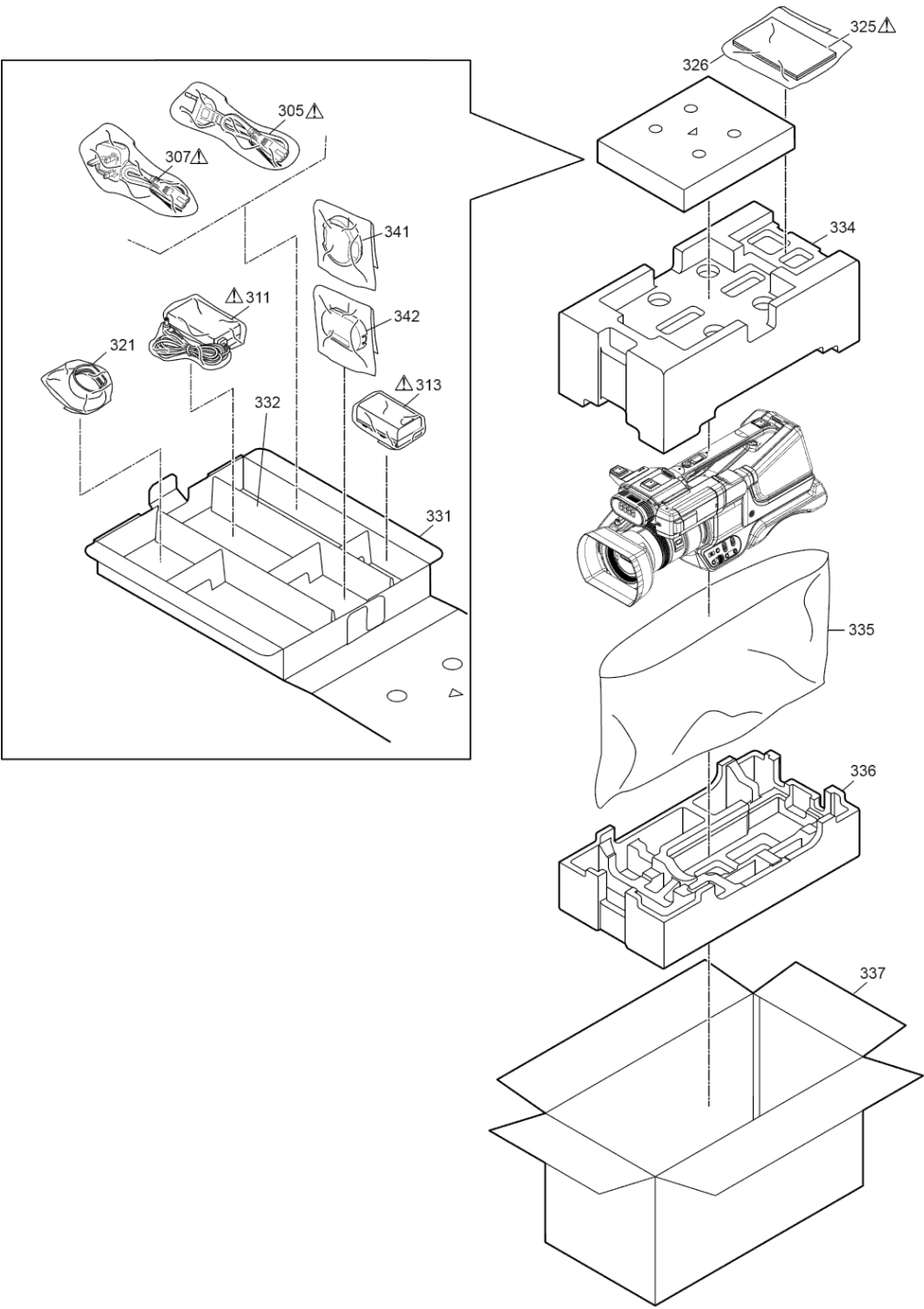
Model No. : HC-MDH3 Frame and Casing Section (4)



Model No. : HC-MDH3 Frame and Casing Section (5)



Model No. : HC-MDH3 Packing Parts and Accessories Section



Model No. : HC-MDH3 Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		1	1PB1DVLB1243Z	MAIN P.C.B.	1	E.S.D.
		2	1PB1DVLB1245Z	LENS RELAY P.C.B.	1	
		3	1PB1DVLB1257Z	GYRO P.C.B.	1	E.S.D.
		4	1PB1DVLB1244Z	SD HOLDER P.C.B.	1	E.S.D.
		5	1PB1DVLB1248Z	LCD RELAY P.C.B.	1	E.S.D.

		6	1PB1DVLB1251Z	AV JACK P.C.B.	1	E.S.D.
		7	1PB1DVLB1252Z	BATTERY CATCHER P.C.B.	1	
		8	1PB1DVLB1258Z	RING LED L P.C.B.	1	E.S.D.
		9	1PB1DVLB1260Z	MONITOR P.C.B.	1	E.S.D.
		10	1PB1DVLB1247Z	HANDLE P.C.B.	1	E.S.D.
		B6701	ML-614S/ZTK	BATTERY	1	
		11	1PB1DVLB1246Z	LED LIGHT P.C.B.	1	E.S.D.
		12	1PB1DVLB1250Z	CAM FUNC P.C.B.	1	
		13	5KM3HCMDH3GCZ	HANDLE ZOOM P.C.B. UNIT	1	
		13-1	VGQ1S50	SUB ZOOM CUSHION	1	
		13-2	VGQ1S50	SUB ZOOM CUSHION	1	
		14	1PB1DVLB1256Z	SIDE R OPERATION P.C.B.	1	
		15	1PB1DVLB1259Z	RING LED R P.C.B.	1	E.S.D.
		16	1PB1DVLB1253Z	POWER SS P.C.B.	1	E.S.D.
		31	DVWD1047Z	HANDLE SLIM WIRE	1	
		32	DVWD1049Z	DC BATT. WIRE	1	
		33	VEE1P65	CAM FUNC WIRE UNIT	1	
		34	1JE1HCMDH3GCZ	HANDLE FFC UNIT	1	
		35	DVJE1016Z	WIRED REMOTE FFC	1	
		36	DVJE1021Z	POWER SS FFC	1	
		37	VWJ2289	SS GYRO FFC	1	
		38	VWJ2289	BATTERY FFC	1	
		39	VWJ2441	AV JACK FFC	1	
		40	VWJ2449	RING LED L FFC	1	
		41	DVLD1099Z	LENS RELAY FPC	1	
		42	VWJ2302	USB AV FPC	1	
		43	VWJ2306	SD FPC	1	
		44	DVJE1019Z	LED LIGHT FFC	1	
		45	VWJ2431	LCD FPC	1	
		46	VWJ2440	SIDE R OP FFC	1	
		47	VWJ2449	RING LED R FFC	1	
		48	VWJ2449	HANDLE ZOOM FFC	1	
		49	VWJ2449	GRIP ZOOM FFC	1	
		50	VEP03J95A	HDMI FPC UNIT	1	
		61	1KE1HCMDH3GCZ	LENS HOOD UNIT	1	
		62	DVKM1087Z	LENS MASK	1	
		63	VYK6P39	SLIDE CASE F UNIT	1	
		64	9KM1HCMDH3GCZ	HANDLE T UNIT	1	
		64-1	VMP8492	SHOE ANGLE	1	
		64-2	VMP8492	SHOE ANGLE	1	
		65	VMP0H14	SHOLDER BELT ANGLE FRAME	1	
		70	VMS8410	BALANCER	1	
		76	1HR1HCMDH3GCZ	DC JACK PIECE	1	
		77	1KM1HCMDH3GCZ	SIDE CASE L UNIT	1	
		77-1	VKA0397	SET LEG CUSHION	1	
		77-2	VJF0804	CABLE CLAMPER	1	
		77-3	VMP0H18	CASING PLATE S	1	
		77-4	VMP0H18	CASING PLATE S	1	
		78	DVMC1117Z	MAIN EARTH PLATE A	1	
		79	1MC1HCMDH3GCZ	MAIN EARTH PLATE B UNIT	1	
		80	2MC1HCMDH3GCZ	REAR EARTH PLATE UNIT	1	
		101	DVKM1094Z	LCD CASE T	1	
		102	VXD0673	LCD HINGE UNIT	1	
		103	VMP0H25	LCD FRAME A	1	
		104	VGL1449	REFLECTION SHEET	1	
		105	VKW3518	LIGHT GUIDE PLATE	1	
		106	VGL1384	DIFFUSION SHEET	1	

Model No. : HC-MDH3 Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		107	VGL1460	PRISM SHEET B	1	
		108	SGQ0313	PRISM SHEET A	1	
		109	SGQ0002	LGP HOLDER	1	
		110	L5BDDYY00205	LCD	1	
		111	SGQ0759	TP SPACER	1	

		112	VMP0H26	LCD FRAME B	1	
		113	8KM1HCMDH3GCZ	LCD CASE B UNIT	1	*With a touch panel
		114	8KM3HCMDH3GCZ	SLIDE CASE R UNIT	1	
		114-1	VMG1822	LCD CUSHION	1	
		114-2	VMG1822	LCD CUSHION	1	
		115	VML4052	LCD SW LEVER	1	
		116	VMB4761	LCD SW SPRING	1	
		117	VMP0H24	LCD HINGE ANGLE	1	
		121	7KM2HCMDH3GCZ	EVF CASE UNIT	1	
		122	7KM3HCMDH3GCZ	SLIDE CASE L UNIT	1	
		122-1	VKA0397	SET LEG CUSHION	1	
		122-2	VKA0397	SET LEG CUSHION	1	
		123	DVKM1090Z	HINGE COVER	1	
		126	DVKM1083Z	MIC CASE	1	
		127	DVME1170Z	LED LIGHT ANGLE	1	
		128	SGL0040	LED LIGHT LENS	1	
		129	SGQ0215	MIC CUSHION A	1	
		130	SGQ0216	MIC CUSHION B	1	
		131	L0CBAY000243	MICROPHONE UNIT	1	
		132	SGQ0262	MIC CUSHION C	1	
		133	SKK0111K	MIC CASE B	1	
		134	VGQ1R06	MIC SHOE ATTACH	1	
		135	VMP8492	SHOE ANGLE	1	
		136	6KM2HCMDH3GCZ	SLIDE BASE UNIT	1	
		141	5KM1HCMDH3GCZ	SIDE CASE R UNIT	1	
		141-1	VKA0397	SET LEG CUSHION	1	
		142	VYK6P22	TRIPOD FRAME UNIT	1	
		143	DVME1165Z	KURUPON STOPPER ANGLE	1	
		144	K0RE00300046	KURUPON UNIT	1	
		145	L0AA01A00161	SPEAKER	1	
		146	VMP9589	SP ANGLE	1	
		151	4KM4HCMDH3GCZ	GRIP UNIT	1	
		151-1	VYC1127	GRIP BELT	1	
		152	4KM1HCMDH3GCZ	ZOOM LEVER UNIT	1	
		153	VGQ1S47	ZOOM SW HOLD FRAME	1	
		154	VGU0R30	PHOTO SHOT BUTTON	1	
		155	VYK6P26	POWER SS UNIT	1	
		156	VGL1404-M	PW PANELIGHT	1	
		162	VMB4781	BATTERY LOCK SPRING	1	
		163	VML4051	BATTERY LOCK LEVER	1	
		164	VMP0H20	BATTERY EARTH PLATE	1	
		165	VMP0H50	BATTERY LOCK PLATE	1	
		166	VMP8450	SHOULDER BELT PLATE F	1	
		171	2UA2HCMDH3GCZ	MAIN FRAME UNIT	1	
		176	DVMC1080Z	HDMI EARTH PLATE	1	
		177	DVME1167Z	SD FRAME	1	
		181	VKM0J06	FRONT CASE	1	
		182	3KM4HCMDH3GCZ	MF UNIT	1	
		182-1	VEE1P67	MF SENS WIRE UNIT	1	
		186	SGQ0130	DUST PROTECTOR RING	1	
		187	VMP0H17	EARTH PLATE S	1	
		188	3KM1HCMDH3GCZ	LENS FRAME R UNIT	1	
		188-1	VMG1925	DAMPER RUBBER	1	
		188-2	VMG1925	DAMPER RUBBER	1	
		189	3KM2HCMDH3GCZ	LENS FRAME L UNIT	1	
		189-1	VMG1925	DAMPER RUBBER	1	
		189-2	VMG1925	DAMPER RUBBER	1	

Model No. : HC-MDH3 Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		200	LOU2Z198K7Z	CAMERA LENS UNIT	1	
		200-1	L6HAYYYD0095	2ND STEPPING MOTOR	1	
		200-2	L6HAYYYC0056	3RD STEPPING MOTOR	1	
		200-3	L6HAYYYB0012	4TH STEPPING MOTOR	1	
		B1	XQN2+BJ10FJK	SCREW	1	

		B2	XQN2+BJ6FJK	SCREW	1	
		B3	XQN2+BJ6FJK	SCREW	1	
		B4	XQN2+BJ6FJK	SCREW	1	
		B5	XQN2+BJ6FJK	SCREW	1	
		B6	XQN2+BJ6FJK	SCREW	1	
		B7	XQN2+BJ10FJK	SCREW	1	
		B8	XQN2+BJ10FJK	SCREW	1	
		B9	XQN2+BJ10FJK	SCREW	1	
		B10	XQN2+BJ10FJK	SCREW	1	
		B11	XQN2+BJ10FJK	SCREW	1	
		B12	XQN2+BJ10FJK	SCREW	1	
		B13	XQS2+AJ5FN	SCREW	1	
		B14	XQS2+AJ5FN	SCREW	1	
		B15	XQN2+BJ6FJK	SCREW	1	
		B16	XQN2+BJ6FJK	SCREW	1	
		B17	XQN2+BJ6FJK	SCREW	1	
		B18	XQN2+BJ6FJK	SCREW	1	
		B19	XQN2+BJ10FJK	SCREW	1	
		B20	XQN2+BJ10FJK	SCREW	1	
		B21	XQN2+BJ10FJK	SCREW	1	
		B22	XQN2+BJ10FJK	SCREW	1	
		B23	XQN2+BJ10FJK	SCREW	1	
		B24	XQN2+BJ6FJK	SCREW	1	
		B25	XQN2+BJ6FJK	SCREW	1	
		B26	XQN2+BJ6FJK	SCREW	1	
		B27	XQN2+BJ6FJK	SCREW	1	
		B28	XQN2+BJ6FJK	SCREW	1	
		B29	XQN2+BJ6FJK	SCREW	1	
		B30	XQN2+BJ6FJK	SCREW	1	
		B31	XQN2+BJ6FJK	SCREW	1	
		B32	XQN2+BJ6FJK	SCREW	1	
		B33	XQN2+BJ6FJK	SCREW	1	
		B34	XQN2+BJ6FJK	SCREW	1	
		B35	XQN2+BJ6FJK	SCREW	1	
		B36	XQN2+BJ6FJK	SCREW	1	
		B37	XQN2+BJ10FJK	SCREW	1	
		B38	XQN2+B5FJK	SCREW	1	
		B39	XQN2+B5FJK	SCREW	1	
		B40	XQN2+B5FJK	SCREW	1	
		B41	XQN2+B5FJK	SCREW	1	
		B42	XQN2+B5FJK	SCREW	1	
		B43	XQN2+B5FJK	SCREW	1	
		B44	XQN2+BJ6FJK	SCREW	1	
		B45	XQN2+BJ6FJK	SCREW	1	
		B46	XQN2+BJ6FJK	SCREW	1	
		B47	XQN2+BJ6FJK	SCREW	1	
		B48	XQN2+BJ10FJK	SCREW	1	
		B49	XQN2+BJ10FJK	SCREW	1	
		B50	XQN2+BJ10FJK	SCREW	1	
		B51	XQN2+BJ10FJK	SCREW	1	
		B52	XQN2+BJ10FJK	SCREW	1	
		B53	XQN2+BJ10FJK	SCREW	1	
		B54	XQN2+BJ10FJK	SCREW	1	
		B55	XQN2+BJ10FJK	SCREW	1	
		B56	XQN2+BJ10FJK	SCREW	1	
		B57	XQN2+BJ6FJK	SCREW	1	
		B58	XQN2+BJ6FJK	SCREW	1	

Model No. : HC-MDH3 Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		B59	XQN2+BJ6FJK	SCREW	1	
		B60	XQN2+BJ6FJK	SCREW	1	
		B61	XQN2+BJ6FJK	SCREW	1	
		B62	XQN2+BJ6FJK	SCREW	1	
		B63	XQN2+BJ6FJK	SCREW	1	

		B64	XQN2+BJ6FJK	SCREW	1	
		B65	VHD1907	SCREW	1	
		B66	VHD1907	SCREW	1	
		B67	VHD1907	SCREW	1	
		B68	XQN2+BJ6FJK	SCREW	1	
		B69	XQN2+BJ6FJK	SCREW	1	
		B70	XQN2+BJ6FJK	SCREW	1	
		B71	XQN2+BJ6FJK	SCREW	1	
		B72	XQN2+BJ6FJK	SCREW	1	
		B73	XQN2+BJ10FJK	SCREW	1	
		B74	VHD1907	SCREW	1	
		B75	XQN2+BJ6FJK	SCREW	1	
		B76	XQN2+BJ6FJK	SCREW	1	
		B77	XQN2+BJ6FJK	SCREW	1	
		B78	XQN2+BJ6FJK	SCREW	1	
		B79	XQN2+BJ6FJK	SCREW	1	
		B80	XQN2+BJ6FJK	SCREW	1	
		B81	XQN2+BJ6FJK	SCREW	1	
		B82	VHD2061	SCREW	1	
		B83	XQN2+B5FJK	SCREW	1	
		B84	XQN2+B5FJK	SCREW	1	
		B85	XQN2+BJ6FJK	SCREW	1	
		B86	XQN2+BJ6FJK	SCREW	1	
		B87	XQN2+BJ6FJK	SCREW	1	
		B88	XQN2+BJ6FJK	SCREW	1	
		B101	VHD1448	SCREW	1	
		B102	VHD1448	SCREW	1	
		B103	XQN14+BJ4FN	SCREW	1	
		B104	VHD1688	SCREW	1	
		B105	VHD1688	SCREW	1	
		B106	XQN2+BJ6FJK	SCREW	1	
		B107	XQN2+BJ6FJK	SCREW	1	
		B108	XQN2+B3FN	SCREW	1	
		B109	XQN2+B3FN	SCREW	1	
		B110	XQN2+BJ6FJK	SCREW	1	
		B111	XQN2+BJ6FJK	SCREW	1	
		B112	XQN16+BJ5FN	SCREW	1	
		B113	XQN16+BJ5FN	SCREW	1	
		B114	XQS2+AJ5FN	SCREW	1	
		B115	XQS2+AJ5FN	SCREW	1	
		B116	XQS2+AJ5FN	SCREW	1	
		B117	XQN16+BJ4FN	SCREW	1	
		B118	XQN16+BJ4FN	SCREW	1	
		B119	XQN16+BJ5FN	SCREW	1	
		B120	XQN16+BJ5FN	SCREW	1	
		B121	XQN16+BJ5FN	SCREW	1	
		B122	XQN16+BJ5FN	SCREW	1	
		B123	XQN16+BJ5FN	SCREW	1	
		B124	XQN16+BJ7FJK	SCREW	1	
		B125	XQN16+BJ7FJK	SCREW	1	
		B126	XQN2+B5FJK	SCREW	1	
		B127	XQN2+B5FJK	SCREW	1	
		B128	XQN2+B5FJK	SCREW	1	
		B129	XQN2+BJ6FJK	SCREW	1	
		B130	XQN2+BJ6FJK	SCREW	1	
		B131	XQN2+BJ6FJK	SCREW	1	
		B132	XQN2+BJ6FJK	SCREW	1	

Model No. : HC-MDH3 Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		B133	XQN2+BJ6FJK	SCREW	1	
		B134	XQN2+BJ6FJK	SCREW	1	
		B135	XQN2+BJ6FJK	SCREW	1	
		B136	XQN2+BJ6FJK	SCREW	1	
		B137	XQN2+BJ6FJK	SCREW	1	

		B138	XQN2+BJ6FJK	SCREW	1	
		B139	XQN2+BJ6FJK	SCREW	1	
		B140	XQN2+BJ5FJK	SCREW	1	
		B141	XQN2+BJ5FJK	SCREW	1	
		B142	XQN2+BJ5FJK	SCREW	1	
		B143	XQN2+BJ5FJK	SCREW	1	
		B144	XQN2+BJ5FJK	SCREW	1	
		B145	XQN2+BJ5FJK	SCREW	1	
		B146	XQN2+BJ5FJK	SCREW	1	
		B148	XQN2+BJ6FN	SCREW	1	
		B149	XQN2+BJ6FJK	SCREW	1	
		B150	XQN2+BJ6FJK	SCREW	1	
		B151	XQN2+BJ6FJK	SCREW	1	
		B152	XQN2+BJ6FJK	SCREW	1	
		B153	XQN2+BJ6FJK	SCREW	1	
		B154	VHD1907	SCREW	1	
		B155	VHD1907	SCREW	1	
		B157	VHD1907	SCREW	1	
		B158	VHD1907	SCREW	1	
		B159	VHD1907	SCREW	1	
		B160	XQN2+BJ5FJK	SCREW	1	
		B161	XQN2+BJ6FJK	SCREW	1	
		B162	XQN2+BJ6FJK	SCREW	1	
		B163	XQN2+BJ6FJK	SCREW	1	
		B164	XQS2+AJ5FN	SCREW	1	
		B165	XQS2+AJ5FN	SCREW	1	
		B166	XQS2+AJ5FN	SCREW	1	
		B167	XQS2+AJ5FN	SCREW	1	
		B168	XQN2+BJ6FJK	SCREW	1	
		B201	VHD2072	SCREW	1	
		B202	VHD2072	SCREW	1	
		B203	VHD2072	SCREW	1	
		B204	VHD2072	SCREW	1	
		B205	VHD2072	SCREW	1	
		B206	VHD2072	SCREW	1	
		B207	VHD2072	SCREW	1	
	⚠	305	K2CA2YY00259	AC CABLE	1	PP
	⚠	305	K2CQ2YY00117	AC CABLE	1	E, GC
	⚠	305	K2CP2YY00083	AC CABLE	1	GW
	⚠	305	K2CA2YY00130	AC CABLE	1	GK
	⚠	307	K2CT2YY00095	AC CABLE	1	E, GC
	⚠	311	SAE0011AG	AC ADAPTOR	1	
	⚠	313	-----	BATTERY PACK	1	PP
	⚠	313	-----	BATTERY PACK	1	E, GC, GW
	⚠	313	-----	BATTERY PACK	1	GK
		321	VYC1080	EYE CUP	1	
	⚠	325	DVQX1481Z	OPRRATING INSTRUCTIONS(ENGLISH)	1	PP
	⚠	325	DVQX1482Z	OPRRATING INSTRUCTIONS(FRENCH/SPANISH)	1	PP
	⚠	325	DVQX1483Z	OPRRATING INSTRUCTIONS(ENGLISH)	1	E, GC, GW
	⚠	325	DVQX1484Z	OPRRATING INSTRUCTIONS(GERMAN/ITALIAN)	1	E
	⚠	325	DVQX1485Z	OPRRATING INSTRUCTIONS(FRENCH/SPANISH)	1	E
	⚠	325	DVQX1486Z	OPRRATING INSTRUCTIONS(RUSSIAN/UKRAINIAN)	1	E
	⚠	325	DVQX1487Z	OPRRATING INSTRUCTIONS(ARABIC)	1	GC

Model No. : HC-MDH3 Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
	⚠	325	DVQX1488Z	OPRRATING INSTRUCTIONS(CHINESE)	1	GK
		326	VPF1545	BAG.POLYETHYLENE	1	
		331	VPK5717	ACCESSORY BOX	1	
		332	VPN7699	PARTITION	1	
		334	DVPN1205Z	CUSHION(TOP)	1	
		335	DVPM1002Z	PROTECTION BAG	1	

		336	DVPN1206Z	CUSHION(BOTTOM)	1	
		337	DVPG1202001Z	PACKING CASE	1	PP, E, GC, GW
		337	DVPG1203001Z	PACKING CASE	1	GK
		341	SYA0073	LENS CAP	1	
		342	1ZE1HCMDH3GCZ	DIFFUSION FILTER	1	