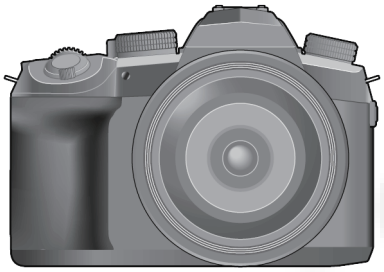
ORDER NO. DSC1903003CE
B26

Service Manual

Digital Camera

Model No. DC-FZ1000M2P
DC-FZ10002EB
DC-FZ10002EE
DC-FZ10002EF
DC-FZ10002EG
DC-FZ10002EP
DC-FZ10002GA
DC-FZ10002GH
DC-FZ10002GK
DC-FZ10002GN
DC-FZ10002GT
DC-FZ10002GW



Colour
Black Type

⚠ 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

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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 MΩ and 5.2 MΩ. 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 kΩ, 10 W resistor, in parallel with a 0.15 μF 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 kΩ/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.

Hot-Check Circuit

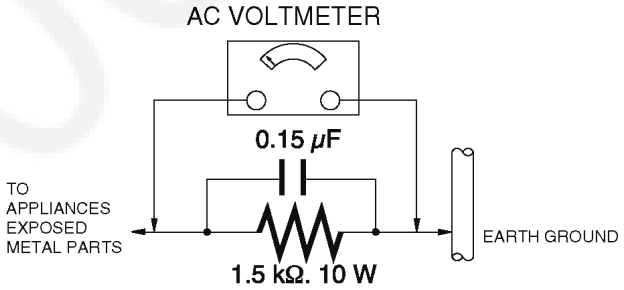


Figure. 1

1.4. How to Discharge the E.Capacitor on Flash P.C.B. (With WIFI ANT)

CAUTION:

- **Be sure to discharge the E.Capacitor on Flash P.C.B. (With WIFI ANT) before disassembling.**
- **Be careful of the high voltage circuit on Flash P.C.B. (With WIFI ANT) when servicing.**

[Discharging Procedure]

1. Put the insulation tube on the lead part of resistor (ERG5SJ102:1kΩ /5W).
   (An equivalent type of resistor may be used.)
2. Put the resistor between both terminals of E.Capacitor on the Flash P.C.B. (With WIFI ANT) for approx. 5 seconds.
3. After discharging, confirm that the E.Capacitor voltage is lower than 10V by using a voltmeter.

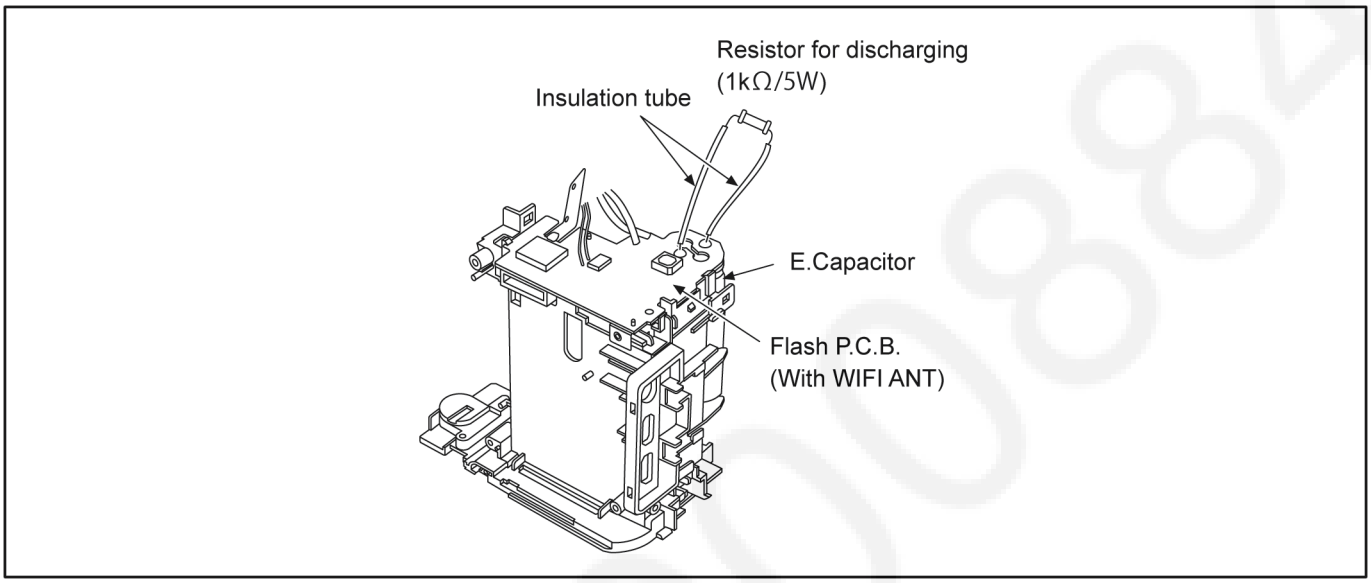


Fig. F1

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 CMOS image sensor, IC (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.

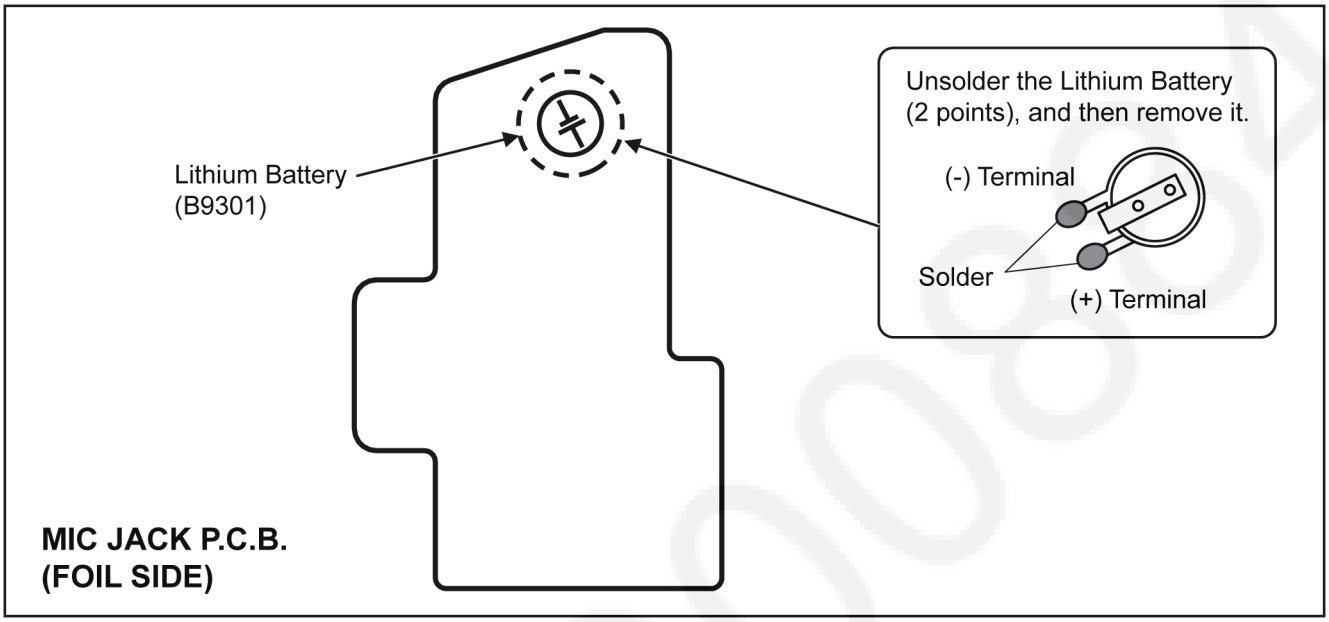
2.3. How to Replace the Lithium Battery

2.3.1. Replacement Procedure

1. Remove the Mic Jack P.C.B.. (Refer to Disassembly Procedures.)
2. Unsolder the each soldering point of electric lead terminal for Lithium battery (Ref. No. “B9301” at Foil side of Mic Jack P.C.B.) and remove the Lithium battery together with electric lead terminal. Then replace it into new one.

NOTE:

The Lithium battery includes electric lead terminals.



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 manufacturier.

NOTE:

Above caution is applicable for a battery pack which is for DC-FZ1000M2 and DC-FZ10002 series, as well.

3 Service Navigation

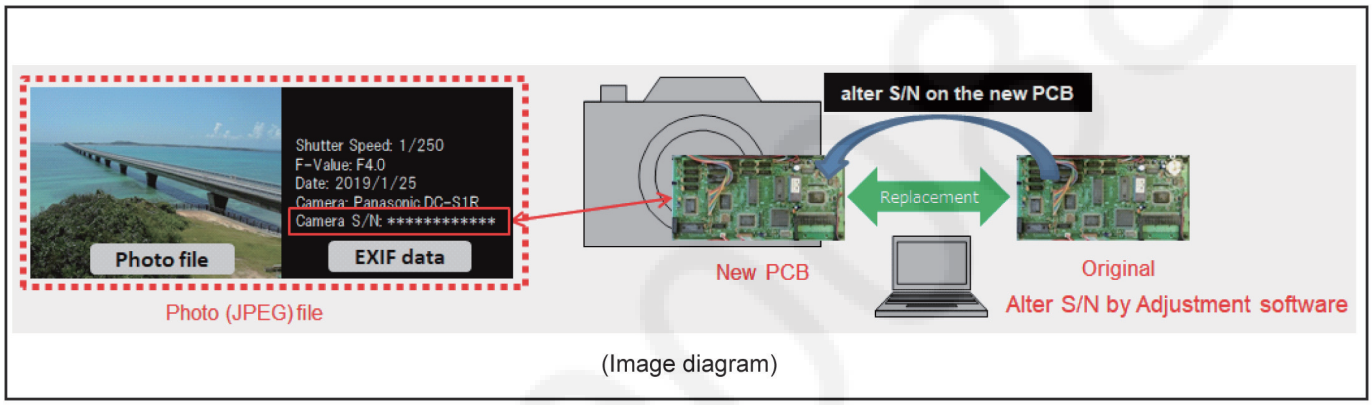
3.1. Introduction

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. Important Notice

3.2.1. About Main P.C.B. (Addition of the operation of rewriting Serial number)

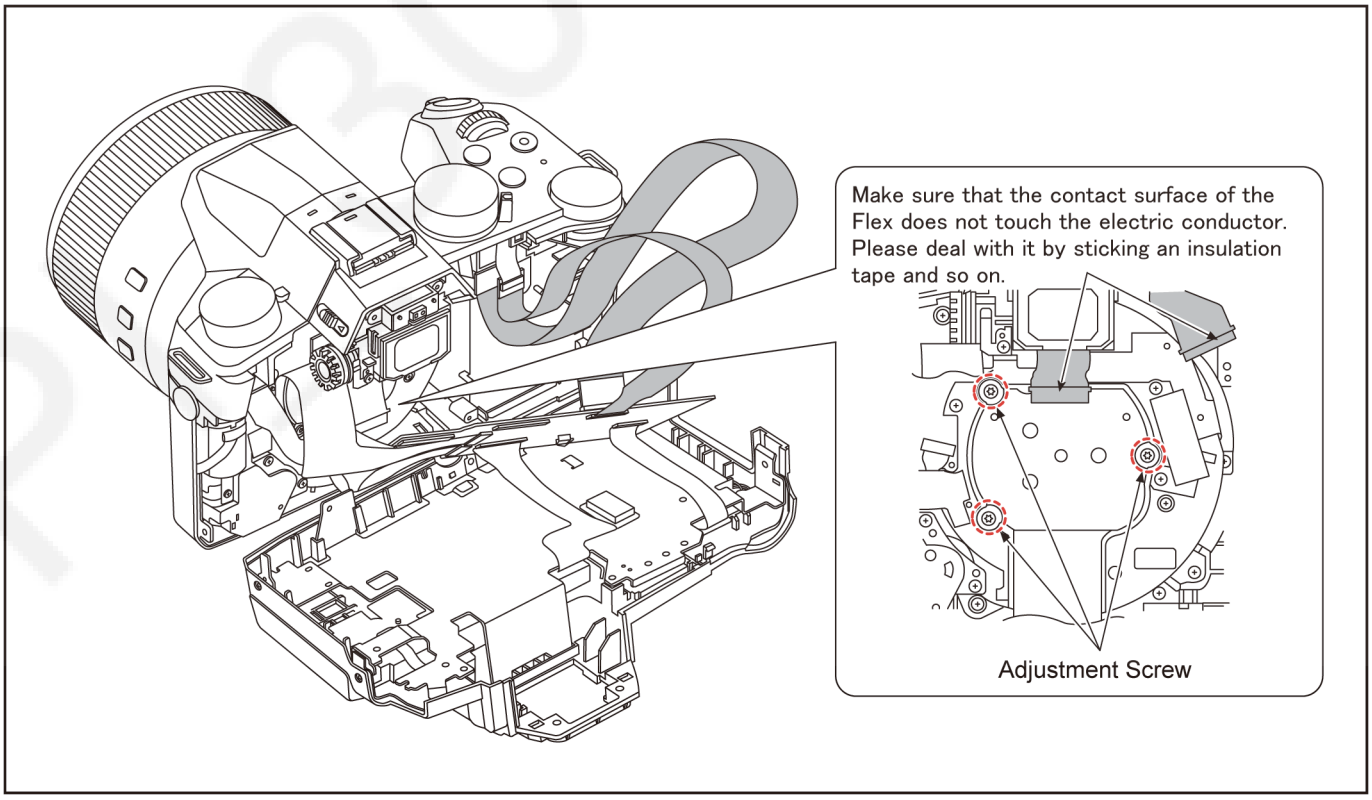
As this unit's specification, the Serial number of camera body is stored to EXIF date of picture image. So that, the Serial number of camera body is memoried in the Flash-ROM (IP2951) of Main P.C.B..
Therefore when replacing the Main P.C.B. and/or Flash-ROM (IP2951), it is necessary rewriting to its original Serial number.
For the details of rewriting procedures, please confirm the contents of "Write S/N" in "10.3.2. Adjustment Specifications" and carry out the procedures.



(Image diagram)

3.2.2. About Lens Block

The CMOS Unit is adjusted to the Lens Unit (w/o mos) with 3 screws, after performing the optical tilt adjustment.
During servicing, if one of CMOS Unit fixing screws are loosened, the optical tilt adjustment must be performed.
(About the optical tilt adjustment, refer to the "10.3.2. Adjustment Specifications" for details.)



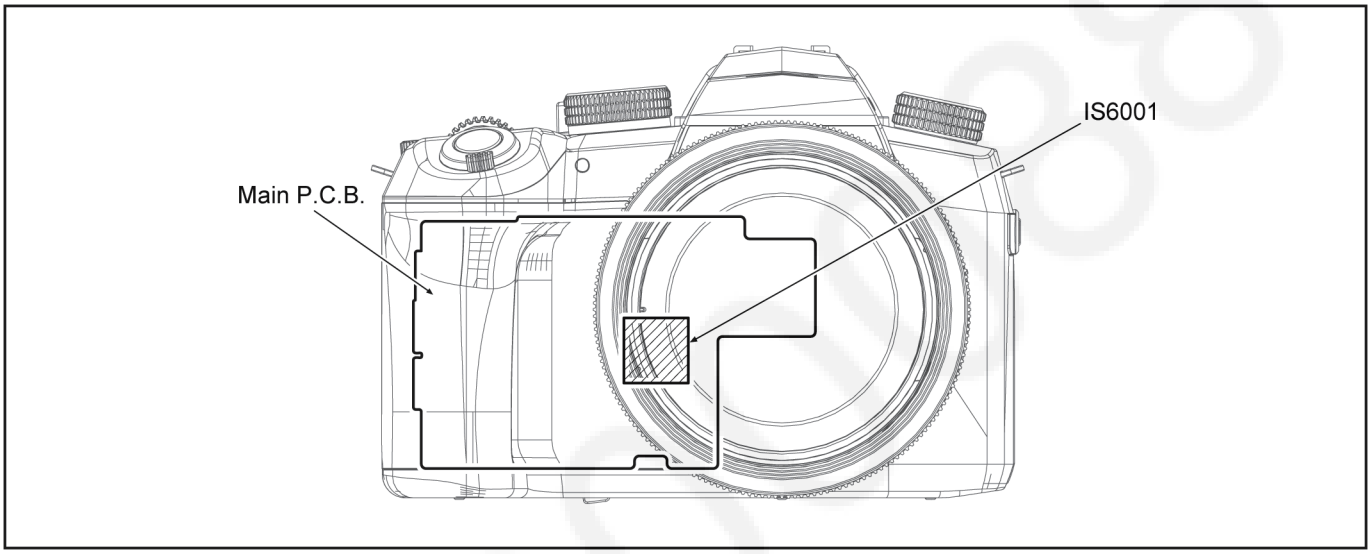
3.2.3. About Flash-ROM (IP2951) and Charging Control Microcomputer (IC1502)

When the Flash-Rom or Charging Control Microcomputer is replaced, it is need to adjust the firmware of the Charging Control Microcomputer to the one of the Flash-ROM.
For details, refer to "10.3.2. Adjustment Specifications".
It may takes about 10 seconds. While doing the adjustment, don't turn the power off forcibly.
(It cause the Charging Control Microcomputer crush, then the camera can not turn on.)

3.2.4. About Venus Engine (IS6001) [Located on the Main P.C.B.]:

The Venus Engine (IS6001) consists of two IC chips (DRAM and Venus), which are fixed together with solder.
(It's called, "Package On Package" type IC.)
When replacing, always replace in pairs. (Units of service parts: integrated (one pair) state.)
NOTE:

- During servicing, do not press down hard on the surface of IS6001.
- Paste the pad pasted on surface of IS6001 on surface of the IS6001 without fail after the replacement.



3.2.5. About Flexible Cable and Connector

Do not touch carelessly so that the foreign body should not adhere to the terminal part of flexible cable and connector.
Wipe off with a clean cloth and the cotton bud, etc. when the terminal part is dirty.

3.3. Service Notes

3.3.1. About Wi-Fi / Bluetooth Function

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

What you can do with the Wi-Fi®/Bluetooth® function

Operating the camera by connecting it to a smartphone

- Operating the shutter button of the camera using a smartphone (remote recording) (→73)
- Playing back or saving images stored on the camera, or uploading them on social media sites (→74)
- Combining motion pictures recorded with Snap Movie according to your preference on a smartphone

Expanding the scope of applications by connecting the camera to a smartphone compatible with Bluetooth Low Energy

- Pairing (connection setup) (→69)
- Turning on/off the camera with a smartphone (→72)
- [B] (Bulb) recording
- Transferring recorded images to a smartphone automatically
- Writing location information of a smartphone on a recorded image (→74)
- Synchronising the camera's clock with a smartphone

● This manual uses the term "smartphone" for both smartphones and tablets unless it is necessary to distinguish between them.
● For details, refer to "Operating Instructions for advanced features (PDF format)".

3.3.2. Important Notice of Servicing

This camera unit has the personal information of wireless LAN connection the customer has registered.
For the protection of private information, please erase the personal information after the completion of repair by "Initial Settings".
In addition, **please print out the following documents, and pass to the customer with the camera unit.**

Printing Material [Leaflet for Customer]

[For The Customer]

Before using your camera please check the Wi-Fi settings.
Depending on what was serviced, the settings may have been reset to the factory defaults.

1. If the settings were reset you will need to reenter your Lumix Club login ID and password.

If you have forgotten the login ID and/or Password, please connect to the Lumix Club web site and create a new ones.

2.You may also have to reenter the settings for your local Wi-Fi network settings.

We recommend consulting the operating manual if you have any questions.

3.4. General Description About Lead Free Solder (PbF)

The lead free solder has been used in the mounting process of all electrical components on the printed circuit boards used for this equipment in considering the globally environmental conservation.

The normal solder is the alloy of tin (Sn) and lead (Pb). On the other hand, the lead free solder is the alloy mainly consists of tin (Sn), silver (Ag) and copper (Cu), and the melting point of the lead free solder is higher approx.30°C (86°F) more than that of the normal solder.

Distinction of P.C.B. Lead Free Solder being used

The letter of “PbF” is printed either foil side or components side on the P.C.B. using the lead free solder.(See right figure)	PbF

Service caution for repair work using Lead Free Solder (PbF)

- The lead free solder has to be used when repairing the equipment for which the lead free solder is used. (Definition: The letter of “PbF” is printed on the P.C.B. using the lead free solder.)
- To put lead free solder, it should be well molten and mixed with the original lead free solder.
- Remove the remaining lead free solder on the P.C.B. cleanly for soldering of the new IC.
- Since the melting point of the lead free solder is higher than that of the normal lead solder, it takes the longer time to melt the lead free solder.
- Use the soldering iron (more than 70W) equipped with the temperature control after setting the temperature at 350±30°C (662±86°F).

Recommended Lead Free Solder (Service Parts Route.)

- The following 3 types of lead free solder are available through the service parts route.
  SVKZ000001----------(0.3mm 100g Reel)
  SVKZ000002----------(0.6mm 100g Reel)
  SVKZ000003----------(1.0mm 100g Reel)

Note

* Ingredient: Tin (Sn) 96.5%, Silver (Ag) 3.0%, Copper (Cu) 0.5%. (Flux cored)

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

There are several types of DC-FZ1000M2 and DC-FZ10002 regardless of the colours.

- a) DC-FZ1000M2 (Japan domestic model)
- b) DC-FZ1000M2P
- c) DC-FZ10002EG/EP/EF/EB
- d) DC-FZ10002EE
- e) DC-FZ10002GT
- f) DC-FZ10002GK
- g) DC-FZ10002GN
- h) DC-FZ10002GA/GW/GH

What is the difference is that the “Initial Settings” data which is stored in Flash-ROM mounted on Main P.C.B..

3.5.1. Defining methods:

To define the model suffix to be serviced, refer to the nameplate which is putted on the bottom side of the unit.

a) DC-FZ1000M2 (Japan domestic model)

The nameplate for this model shows the following Safety registration mark.

b) DC-FZ1000M2P

The nameplate for this model shows the following Safety registration mark.

c) DC-FZ10002EG/EP/EF/EB

The nameplate for these models show the following Safety registration mark.

d) DC-FZ10002EE

The nameplate for this model shows the following Safety registration mark.

e) DC-FZ10002GT

The nameplate for this model shows the following Safety registration mark.

f) DC-FZ10002GK

The nameplate for this model shows the following Safety registration mark.

g) DC-FZ10002GN

The nameplate for this model shows the following Safety registration mark.

h) DC-FZ10002GA/GW/GH

The nameplate for these models does not show any above Safety registration mark.

NOTE:

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

Refer to the adjustment instruction in the adjustment software for details.

3.5.2. Initial Settings:

After replacing the Main P.C.B. and/or Flash-ROM, make sure to perform the initial settings after achieving the adjustment by ordering the following procedure in accordance with model suffix of the unit.

1. Important Notice:

Before proceeding Initial settings, make sure to read the following CAUTION.

CAUTION:(Initial Settings)

---After Replacing the Main P.C.B. and/or Flash-ROM ---

[Except "EB/EF/EG and EP" models]

*. The model suffix can be chosen **JUST ONE TIME.**
(Effective model suffix : "P/EE/GA/GH/GK/GN/GT/GW and JPC domestic model)")

*. Once one of the model suffix has been chosen, the model suffix lists will not be displayed, thus, it can not be changed.

2. Procedures:

- Precautions: Read the above "CAUTION" carefully.
- Preparation:
  Attach the fully charged Battery, and insert the memory card (32MB or more).
  Remove the lens cap.

- **Step 1. The Temporary Cancellation of "Initial Settings":**
  Set the [Mode dial] to "[P](Program AE mode)" and [Drive mode dial] to "Single".
  While pressing [DISP.] button and [AF/AE LOCK] button simultaneously, turn the power on.

- **Step 2. The Cancellation of "Initial Settings":**
  Press the [Playback] button in order to enter the [Playback] mode.
  Press [AF/AE LOCK] button and "[UP] of Cursor buttons" simultaneously, then turn the power off.

  The LCD displays the " ! " mark before the unit powers down.

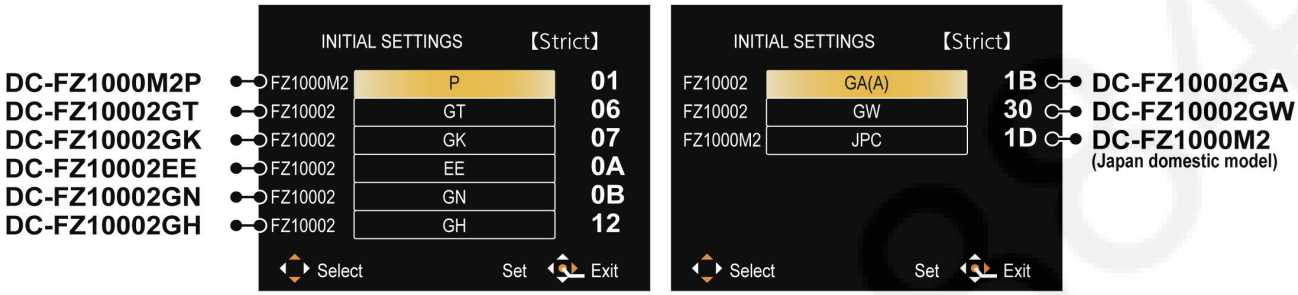
- **Step 3. Turn the Power on:**
  Set the mode dial to "[P] (Program AE mode)", then turn the power on.

• **Step 4. Display the Initial Settings:**

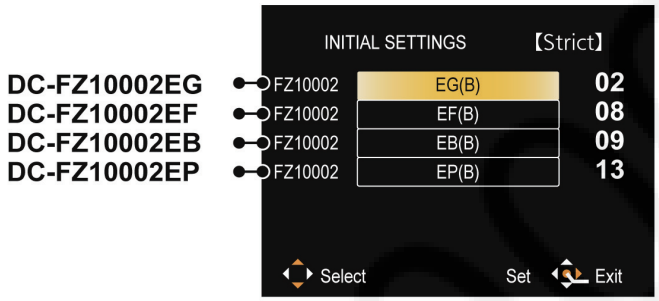
While pressing [MENU/SET] button and “[RIGHT] of Cursor buttons” simultaneously, turn the power off.
The “Initial Settings” menu is displayed.
There are two kinds of “Initial Settings” menu form as follows:

[CASE 1. After replacing Main P.C.B. and/or Flash-ROM]

[Except “EB/EF/EG/EP” models: (1PB1DVLB1450Z is used as a Main P.C.B.)]
When Main P.C.B. has just been replaced, 9 model suffixes are displayed as follows. (Two pages in total)

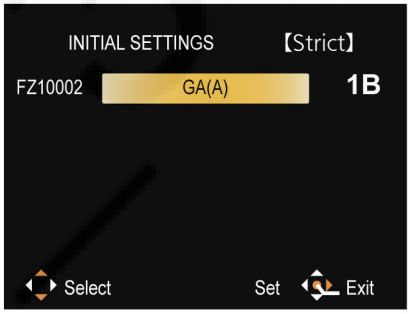


[Only “EB/EF/EG/EP” models: 1PB1DVLB1450Y is used as a Main P.C.B.]
When Main P.C.B. has just been replaced, only 4 model suffixes are displayed as follows. (One page in total)

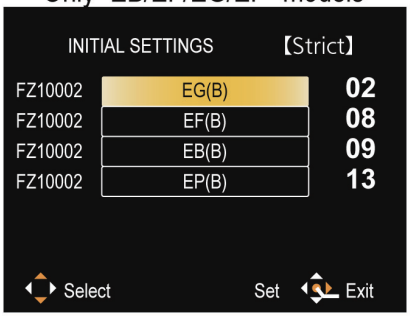


[CASE 2. Other than “After replacing Main P.C.B. and/or Flash-ROM”]

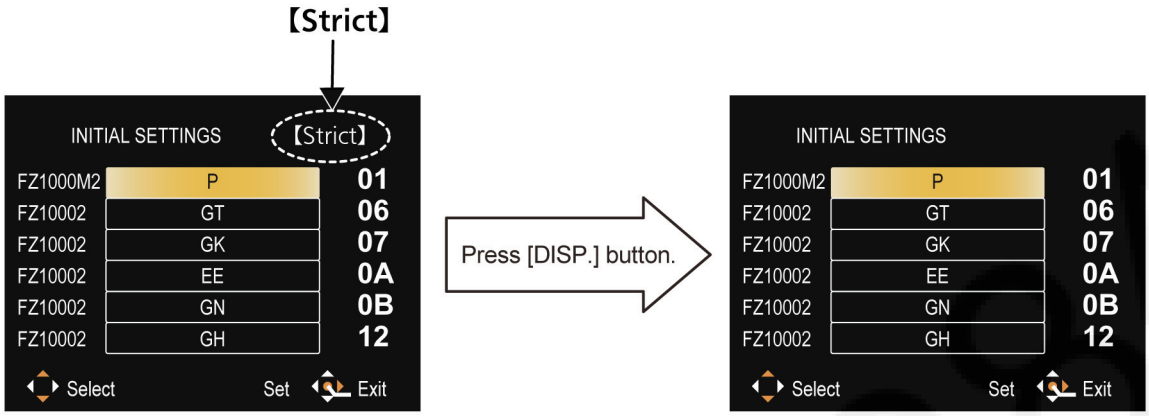
<Other than “EB/EF/EG/EP” models>



<Only “EB/EF/EG/EP” models>

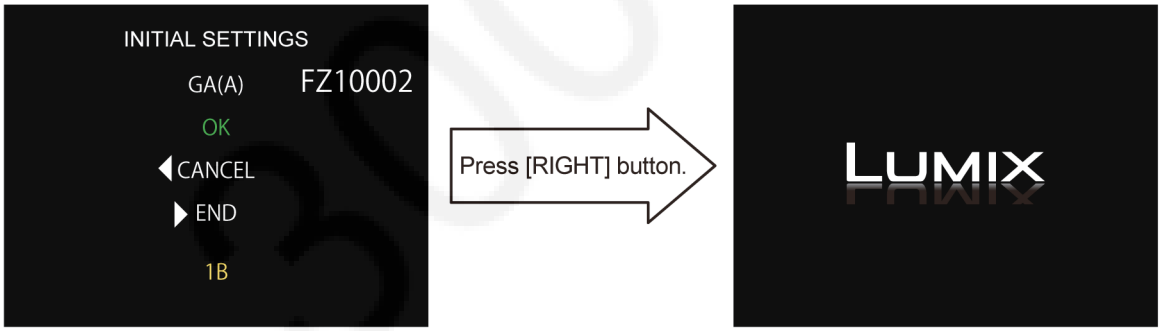


• **Step 5. Cancel “Strict” mode:**
Press the [DISP.] button to cancel “Strict” mode. (Confirm the “Strict” is disappeared.)

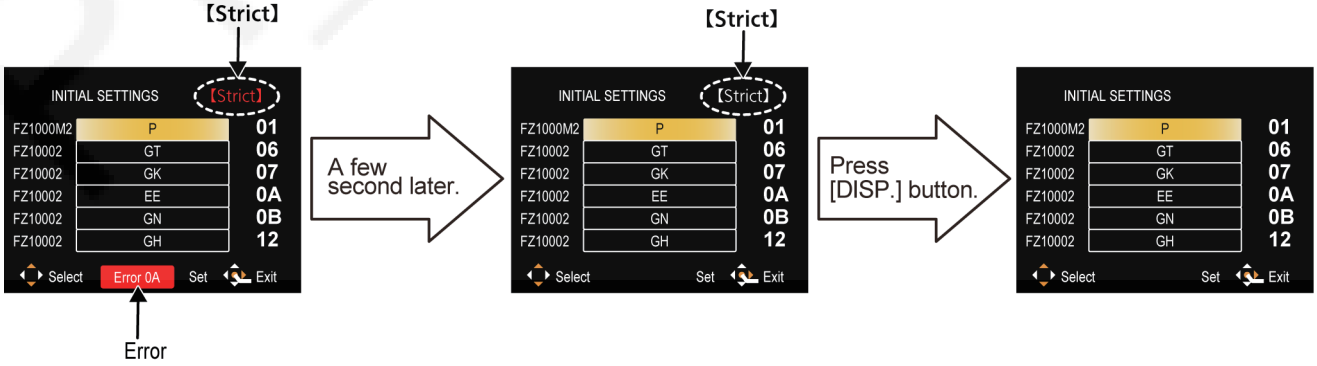


• **Step 6. Choose the model suffix in “Initial Settings”: (Refer to “CAUTION”)**
[Caution: After replacing Main P.C.B. and/or Flash-ROM]
The model suffix can been chosen, **JUST ONE TIME**.
Once one of the model suffix have been chosen, the model suffix lists will not be displayed, thus, it can not be changed.
Therefore, select the area carefully.
Select the area with pressing “[UP] / [DOWN] of Cursor buttons”.

• **Step 7. Set the model suffix in “Initial Settings”:**
Press the “[RIGHT] of Cursor buttons”.
The only set area is displayed, and then press the “[RIGHT] of Cursor buttons” after confirmation.
(The unit is powered off automatically.)



NOTE:
When the error message such as the following is displayed, cancel “Strict” mode.
Press [DISP.] button to clear the “Strict” display at the upper right corner of screen.



• **Step 8. Confirmation:**

Confirm the display of “PLEASE SET THE CLOCK” in concerned language when the unit is turned on again.
When the unit is connected to PC with USB cable, it is detected as removable media.
(When the “GK” or “GT” model suffix is selected, the display shows “PLEASE SET THE CLOCK” in Chinese.)

As for your reference, major default setting condition is as shown in the following table.

• **Default setting (After “Initial Settings”)**

	MODEL	VIDEO OUTPUT	LANGUAGE	DATE	REMARKS
a)	DC-FZ1000M2P	NTSC	English	Month/Date/Year	
b)	DC-FZ10002EB	PAL	English	Date/Month/Year	
c)	DC-FZ10002EE	PAL	Russian	Date/Month/Year	
d)	DC-FZ10002EF	PAL	English	Date/Month/Year	
e)	DC-FZ10002EG	PAL	English	Date/Month/Year	
f)	DC-FZ10002EP	PAL	English	Date/Month/Year	
g)	DC-FZ10002GA	PAL	English	Date/Month/Year	
h)	DC-FZ10002GH	PAL	English	Date/Month/Year	
i)	DC-FZ10002GK	PAL	Chinese (simplified)	Year/Month/Date	
j)	DC-FZ10002GN	PAL	English	Date/Month/Year	
k)	DC-FZ10002GT	NTSC	Chinese (traditional)	Year/Month/Date	
l)	DC-FZ10002GW	PAL	English	Date/Month/Year	
m)	DC-FZ1000M2JPC(Japan domestic model)	NTSC	Japanese	Year/Month/Date	

4 Specifications

The following specification is for DC-FZ10002EB.
Some specifications may differ depending on model suffix.

Digital Camera: Information for your safety

Power Source	DC 8.4 V (8.4 V ⎓)
Power Consumption	1.9 W (When recording with monitor) 2.9 W (When recording with viewfinder) 1.5 W (When playing back with monitor) 1.5 W (When playing back with viewfinder)

Camera effective pixels	20,100,000 pixels
Image sensor	1″ MOS sensor, total pixel number 20,900,000 pixels Primary colour filter
Lens	Optical 16x zoom f=9.1 mm to 146 mm (35 mm film camera equivalent: 25 mm to 400 mm) Max. Wide: F2.8 to F11 Max. Tele: F4.0 to F11
Image Stabiliser	Optical method
Focus range	AF: 30 cm (0.98 feet) (Max. Wide)/1 m (3.3 feet) (Max. Tele) to ∞ AF Macro/MF/Intelligent Auto/Motion picture: 3 cm (0.098 feet) (Max. Wide)/1 m (3.3 feet) (Max. Tele) to ∞
Shutter system	Electronic shutter + Mechanical shutter
Minimum Illumination	Approx. 9 lx (when i-Low light is used, the shutter speed is 1/25th of a second)
Shutter speed	Still picture: B (Bulb) (Max. approx. 120 seconds), 60 seconds to 1/4000th of a second (When the mechanical shutter is used), 1 second to 1/16000th of a second (When the electronic shutter is used) Motion picture: 1/2 second to 1/16000th of a second (When [Exposure Mode] is set to [M] in Creative Video Mode and [MF] is selected), 1/25th of a second to 1/16000th of a second (Other than the above)
Exposure (AE)	Programme AE (P)/Aperture-priority AE (A)/ Shutter-priority AE (S)/Manual exposure (M) Exposure Compensation (1/3 EV steps, -5 EV to +5 EV)

Metering Mode	Multiple/Centre weighted/Spot
Monitor	3.0″ TFT LCD (3:2) (Approx. 1,240,000 dots) (field of view ratio about 100%) Touch screen
Viewfinder	0.39″ OLED Live Viewfinder (4:3) (Approx. 2,360,000 dots) (field of view ratio about 100%) [Approx. 0.74x (35 mm film camera equivalent), with 50 mm lens at infinity; -1.0 m^{-1}] (with dioptre adjustment -4 to +4 dioptre)
Flash	Built-in pop up flash AUTO, AUTO/Red-Eye Reduction, Forced ON, Forced ON/Red-Eye Reduction, Slow Sync., Slow Sync./Red-Eye Reduction, Forced OFF
Microphones	Stereo
Speaker	Monaural
Recording media	SD Memory Card/SDHC Memory Card*/SDXC Memory Card* * UHS-I UHS Speed Class 3
Recording file format	
Still picture	RAW/JPEG (based on Design rule for Camera File system, based on Exif 2.31 standard)
4K Photo	MP4
Motion picture	AVCHD Progressive/AVCHD/MP4
Audio compression format	AVCHD: Dolby Audio™ (2 ch) MP4: AAC (2 ch)
Interface	
[MIC]	Ø3.5 mm jack
[REMOTE]	Ø2.5 mm jack
[HDMI]	Micro HDMI Type D
[USB/CHARGE]	USB 2.0 (High Speed)/USB 2.0 Micro-B Data from the PC cannot be written to the camera using the USB connection cable.
Dimensions	Approx. 136.2 mm (W) × 97.2 mm (H) × 131.5 mm (D) [5.36″ (W) × 3.83″ (H) × 5.18″ (D)] (excluding the projection part)
Mass	With card and battery: Approx. 810 g (1.79 lb) Excluding card and battery: Approx. 758 g (1.67 lb)
Operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Operating humidity	10%RH to 80%RH

■ **Wireless transmitter**

Wireless LAN

Compliance standard	IEEE 802.11b/g/n (standard wireless LAN protocol)
Frequency range used (central frequency)	2412 MHz to 2462 MHz (1 to 11 ch)
Encryption method	Wi-Fi compliant WPA™/WPA2™
Access method	Infrastructure mode

Bluetooth function

Compliance standard	Bluetooth Ver. 4.2 (Bluetooth Low Energy (BLE))
Frequency range used (central frequency)	2402 MHz to 2480 MHz

■ **AC adaptor**

(Panasonic VSK0815L): Information for your safety

Input:	110 V – 240 V~ 50/60 Hz 0.25 A
Output:	5.0 V ⎓ 1.8 A

■ **Battery pack (lithium-ion)**

(Panasonic DMW-BLC12E): Information for your safety

Voltage/capacity:	7.2 V/1200 mAh

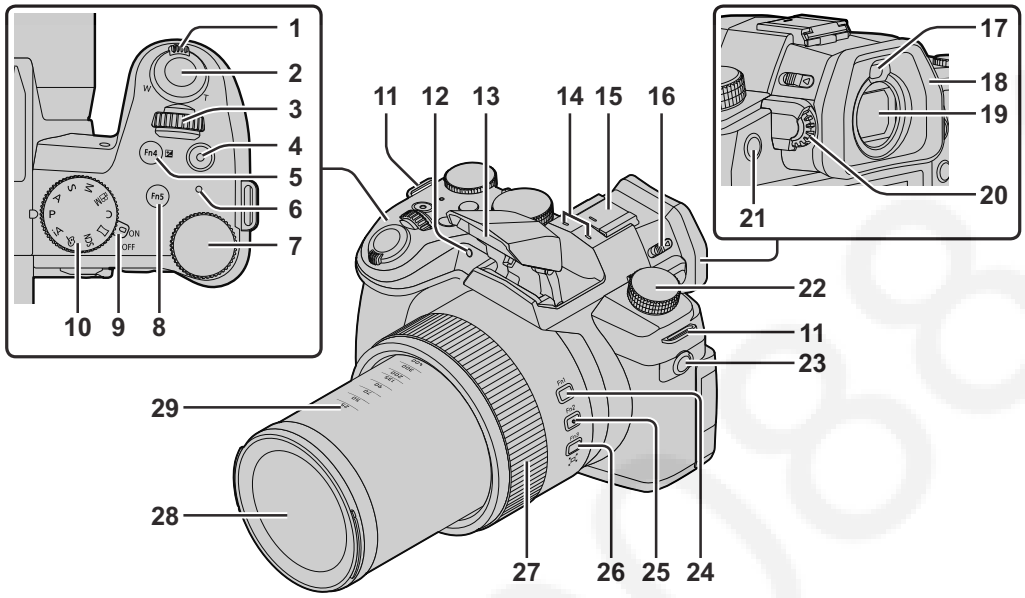
The symbols on this product (including the accessories) represent the following:

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

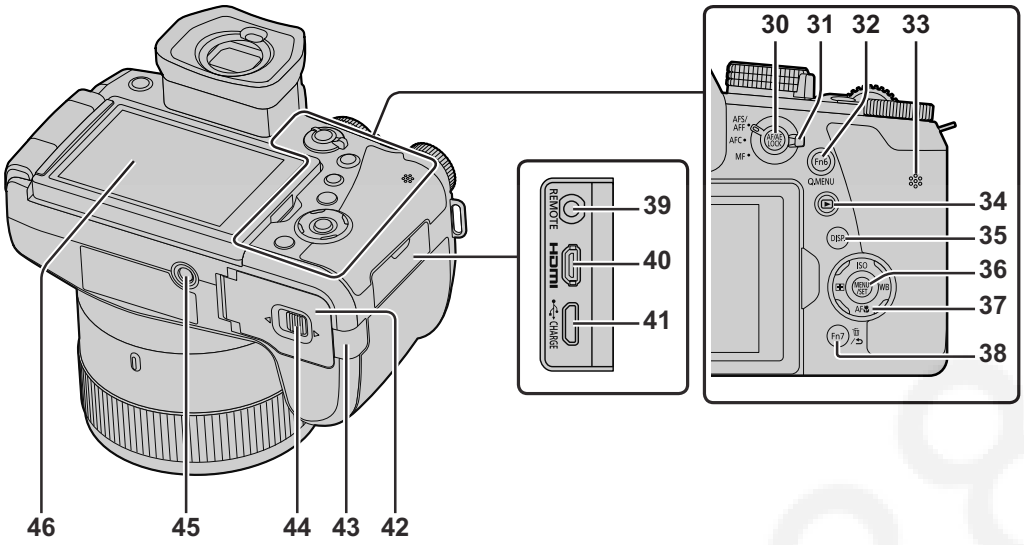
Specifications are subject to change without notice.

5 Location of Controls and Components

The following description is for DC-FZ10002EB.
Some descriptions may differ depending on model suffix.
The page number in this chapter does not show the page number of this service manual.



1	**Zoom lever (→21)**
2	**Shutter button (→20)**
3	**Front dial (→23)**
4	**Motion picture button (→49)**
5	**[Fn4] button (→28) / [⊡] (Exposure Compensation) button (→34)**
6	**Charging lamp (→17) / WIRELESS connection lamp (→68)**
7	**Rear dial (→23)**
8	**[Fn5] button (→28)**
9	**Camera [ON/OFF] switch (→18)**
10	**Mode dial (→22)**
11	**Shoulder strap eyelet (→13)**
12	**Self-timer indicator / AF Assist Lamp**
13	**Flash (→48)**
14	**Stereo microphone**
15	**Hot shoe (Hot shoe cover) (→8)** Keep the hot shoe cover out of reach of children to prevent swallowing.
16	**Flash open lever (→48)**
17	**Eye sensor (→19)**
18	**Eyecup**
19	**Viewfinder (→19)**
20	**Dioptre adjustment dial (→19)**
21	**[Fn8] button (→28) / [LVF] button (→19)**
22	**Drive mode dial (→38)**
23	**[MIC] socket**
24	**[Fn1] button (→28)**
25	**[Fn2] button (→28)**
26	**[Fn3] button (→28) / [⛶] ([Zoom Compose Assist]) button (→21)**
27	**Control ring (→23)**
28	**Lens**
29	**Focal distance indication (as with a 35 mm film camera)** Values assume an aspect ratio of [3:2]. (When recording motion pictures, refer to the focal length displayed on the screen.)



30 **[AF/AE LOCK] button (→34)**

31 **Focus mode lever (→31, 33)**

32 **[Fn6] button (→28) /**
[Q.MENU] button (→28)

33 **Speaker**

34 **[▶] (Playback) button (→53)**

35 **[DISP.] button (→24)**

36 **[MENU/SET] button (→24)**

37 **Cursor button (→24)**
[ISO] (ISO sensitivity) (▲) (→35)
[WB] (White balance) (▶) (→36)
[AF] ([Macro Mode]) (▼) (→32)
[] ([AF Mode]) (◀) (→32)

38 **[Fn7] button (→28) /**
[] (Delete) button (→55) /
[] (Cancel) button (→27)

39 **[REMOTE] socket**

40 **[HDMI] socket**
You can view pictures on a TV screen by connecting your camera to your TV with the HDMI micro cable.

41 **[USB/CHARGE] socket (→16)**

42 **Card/Battery door (→15)**

43 **DC coupler cover (→9)**
- Always use a genuine Panasonic AC adaptor (DMW-AC10E: optional). (→9)
- When using an AC adaptor, ensure that the Panasonic DC coupler (DMW-DCC8: optional) and AC adaptor (DMW-AC10E: optional) are used.

44 **Release lever (→15)**

45 **Tripod mount**
Do not attach this unit to tripods that have screws with a length of 5.5 mm (0.22 inch) or more. Doing so may damage this unit or the unit may not be secured properly on the tripod.

46 **Touch screen (→26) / monitor (→76)**

Function buttons [Fn9] to [Fn13] are touch icons.
They can be displayed by touching the [Fn] tab on the recording screen.

6 Service Mode

6.1. Error Code Memory Function

1. **General description**

   This unit is equipped with history of error code memory function, and can be memorized 16 error codes in sequence from the latest. When the error is occurred more than 16, the oldest error is overwritten in sequence.
   The error code is not memorized when the power supply is shut down forcibly.
   The error code is memorized to Flash-ROM when the unit has just before powered off.

2. **How to display**

   The error code can be displayed by ordering the following procedure:

   • **Preparation**

   Attach the fully charged Battery, and insert the memory card (32MB or more).
   Remove the lens cap.

   • **Step 1. The Temporary Cancellation of "Initial Settings":**

   Set the [Mode dial] to "[P](Program AE mode)" and [Drive mode dial] to "Single".
   While pressing [DISP.] button and [AF/AE LOCK] button simultaneously, turn the power on.

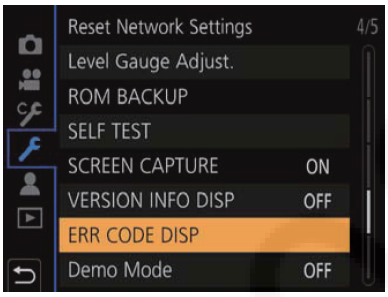
   • **Step 2. Execute the Error Code Display Mode:**

   [Display method by pressing the buttons simultaneously]

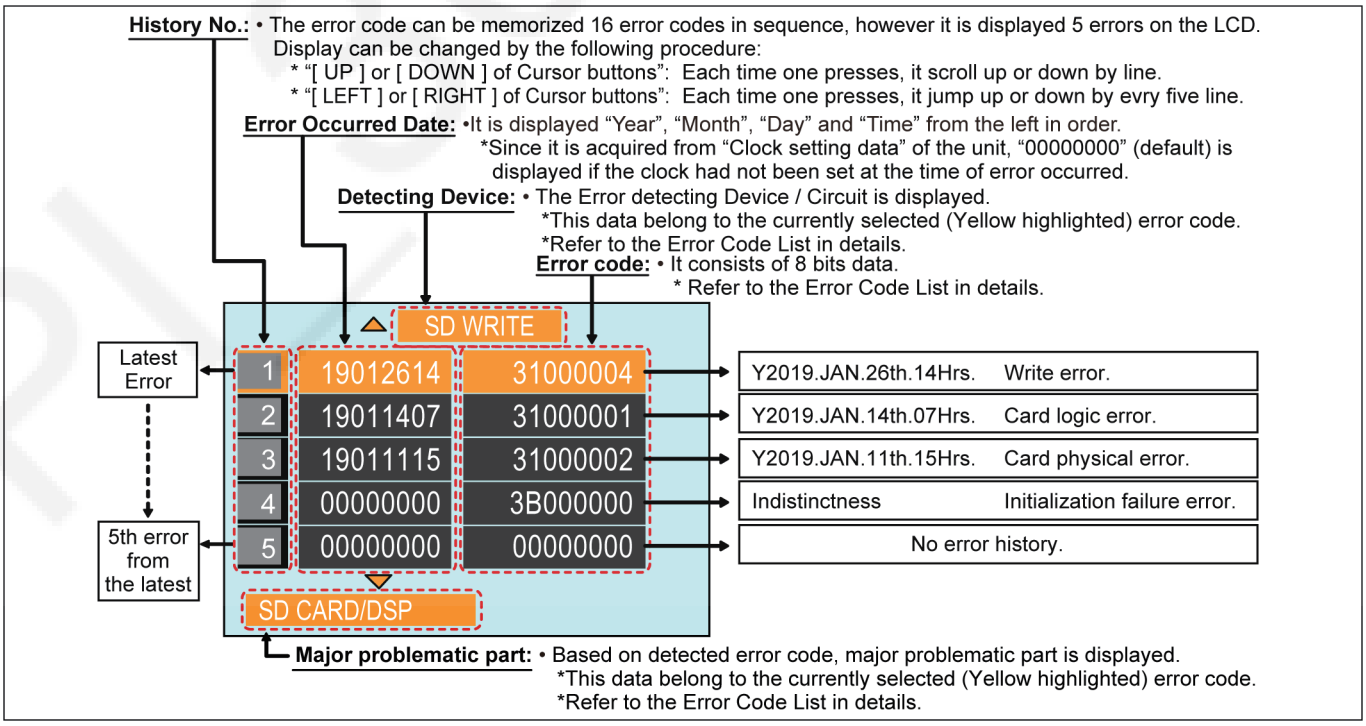
   Press [MENU/SET] button, "[LEFT] of Cursor buttons" and [AF/AE LOCK] button simultaneously under the step 1 condition.
   The display is changed as shown below when the above buttons are pressed simultaneously.
   Normal display → Error code display → Camera information display → Normal display → .....

   [Display method from the menu display]

   Select [ERR CODE DISP] from the setup menu and then press [MENU/SET] button under the step 1 condition.



*The display is changed as shown below when [MENU/SET] button is pressed.
Menu display → Error code display → Camera information display → Menu display → .....



Example of Error Code Display

Error Code List

The error code consists of 8 bits data and it shows the following information.

Attribute	Main item	Sub item	Error code		Contents	Error Indication	
			High 4 bits	Low 4 bits		Detecting device	Problematic Part/Circuit
LENS	Lens drive	OIS	1C*0	1000	OIS Position sensor (X) error	OIS POS X	LENSu/LENS FPC
				2000	OIS Position sensor (Y) error	OIS POS Y	
				3000	OIS GYRO sensor (X) error	OIS GYRO X	GYRO
				4000	OIS GYRO sensor (Y) error	OIS GYRO Y	
				5000	OIS GYRO sensor (R) error	OIS GYRO R	
				6000	OIS drive voltage (X) error	OIS DRIVE X	LENSu/LENS FPC
				7000	OIS drive voltage (Y) error	OIS DRIVE Y	
				8000	OIS GYRO-Digital communication error	OIS GYRO COMM	GYRO
		Zoom		0?10	Collapsible barrel Low detect error	ZOOM L	ZOOMm/LENSu
				0?20	Collapsible barrel High detect error	ZOOM H	
				0?30	Collapsible barrel encoder detect error (Initialization or termination)	ZOOM ENC	
				0?40	Collapsible barrel encoder detect error (During monitor mode.)		
				0?50	Collapsible barrel encoder detect error (During monitor mode with slow speed.)		
				0?60	Zoom step-out detect error	ZOOM STEPOUT	
		Focus		0?01	Focus encoder Low detect error	FOCUS L	LENS FPC/DSP
				0?02	Focus encoder High detect error	FOCUS H	
				0?03	Focus MR sensor phase A output voltage error	FOCUS MRA	
				0?04	Focus MR sensor phase B output voltage error	FOCUS MRB	
				0?05	Focus lock error	FOCUS LOCK	
				0?06	Focus MR sensor phase A comparator signal error	FOCUS CMPA	
				0?07	Focus MR sensor phase B comparator signal error	FOCUS CMPB	
				0?08	Focus reference voltage error	FOCUS REF	
		Lens	18*1	0000	Lens Power On timeout error	LENS DRV	LENSu
			18*2	0000	Lens Power Off timeout error		
		Zoom	38*0	0001	Zoom operation timeout error	ZOOM	ZOOMm/LENSu
	Adj. History	OIS	1D*0	2000	OIS adj. Yaw direction amplitude error (small)	OIS ADJ	OIS ADJ
				3000	OIS adj. Pitch direction amplitude error (small)		
				4000	OIS adj. Yaw direction amplitude error (large)		
				5000	OIS adj. Pitch direction amplitude error (large)		
				8000	OIS adj. Yaw direction off set error		
				9000	OIS adj. Pitch direction off set error		
				A000	OIS adj. Yaw direction gain error		
				B000	OIS adj. Pitch direction gain error		
				C000	OIS adj. Yaw direction position sensor error		
				D000	OIS adj. Pitch direction position sensor error		
				E000	OIS adj. other error		
HARD	Flash	Flash	28*0	0000	Flash charge timeout error (system error indicated)	STRB CHG	STRB PCB/FPC
				0001	EEPROM of External Flash is damaged.	EST EEP	E.STRB
				0002	ZOOM function of External Flash is damaged.	EST	
				0003	Other function of External Flash is damaged.	EST	
	BIS	In Body Image Stabilization	28*0	0010	BIS HP encorder (X) Low detect error	BIS HPL X	BIS
				0020	BIS HP encorder (X) High detect error	BIS HPH X	
				0030	BIS HP encorder (Y) Low detect error	BIS HPL Y	
				0040	BIS HP encorder (Y) High detect error	BIS HPH Y	
				0050	BIS GYRO (X) error	BIS GYRO X	
				0060	BIS GYRO (Y) error	BIS GYRO Y	
				0070	BIS GYRO communication error	BIS GY DIF	
				0080	BIS GYRO (R) error	BIS GYRO R	
				0090	BIS APU timeout error	BIS APU	
				0100	BIS Position sensor (X1) error	BIS POS X1	
				0200	BIS Position sensor (X2) error	BIS POS X2	
				0300	BIS Position sensor (Y) error	BIS POS Y	
				0400	BIS Drive Voltage (X1) error	BIS DRIVE X1	
				0500	BIS Drive Voltage (X2) error	BIS DRIVE X2	
				0600	BIS Drive Voltage (Y) error	BIS DRIVE Y	
				0700	BIS DIFF Signal (X1) error	BIS DIFF X1	
				0800	BIS DIFF Signal (X2) error	BIS DIFF X2	
				0900	BIS DIFF Signal (Y) error	BIS DIFF Y	
	Flash-ROM	Data Area	2B*0	0001	EEPROM data error (During read out)	FROM RE	FROM
				0002	EEPROM data error (During write in)	FROM WR	
		Program Area		0005	Firmware update error	FIRMUP FAIL	
				0006	Firmware update error (USB Micon)	USBFWUP FAIL	USB
				000C	LENS-FPGA firmware update error	FIRMUP FAIL	FPGA
				000D	IMAGE-FPGA firmware update error		
				000E	TC-FPGA firmware update error		

Attribute	Main item	Sub item	Error code		Contents	Error Indication	
			High 4 bits	Low 4 bits		Detecting device	Problematic Part/Circuit
SOFT	CPU	Reset	30*0	0000	System error (NMI reset)	NMI RST	MAIN PCB
				0010	Sub micon communication error	VENUS SUB	
				0020	Sub micon model ID error		
	Recording Media	Memory card	31*0	0002	Memory card physical error	SD CARD	SD CARD/DSP
				0004	Memory card writing error	SD WRITE	
	Lens	Communication	3C11 | 3CF0	****	Lens communication error	LENS COMM	SOFT
	Camera	System	37*0	0001	Activation: Electronic signature hash value mismatch	VLOG	VLOG
				0002	Activation: Serial number mismatch		
				0003	Activation: Model name mismatch		
				0004	Activation: Origin countory mismatch		
				0005	Activation: Firmware version down		
				0006	Activation: Activaton code mismatch		
				0007	Activation: Old firmware		
			3B*0	0000	EEPROM writing during camera initialization	FROM	SOFT
			3D*0	0000	Assert occurrence	ASSERT	SOFT
			3E*0	0001	Exposure charging operation failure	MSHUT	MSHUT
				0002	Failure of the returning operation to the home position		
				0003	Failure of the mecha shutter sensor		
				0004	Failure of the mecha shutter sensor		
				0005	Failure of the mecha shutter sensor		
				0006	Exposure charging recovery operation failure		
				0011	Failure of the mecha shutter sensor		
				0012	Failure of the mecha shutter sensor		
				0013	Failure of the mecha shutter sensor		
				0014	Abnormal current of shutter drive motor		
				0101	Failure of the electromagnetic front curtain open		
				0102	Failure of the electromagnetic front curtain open		
				0111	Failure of the electromagnetic front curtain open		
				0112	Failure of the electromagnetic front curtain open		
				0201	Shutter PI circuit operation failure		
				0202	Failure of current adjustment of single curtain shutter		
				0301	PI1 detection failure of the returning operation to the home position		
				0302	PI2 detection failure of the returning operation to the home position		
				0303	PI3 detection failure of the returning operation to the home position		
				0304	PI4 detection failure of the returning operation to the home position		
				1102	Mechanical shutter front curtain set PI1 detection failure		
				1103	Mechanical shutter front curtain set PI1 detection failure		
				1104	Mechanical shutter front curtain set PI2 detection failure		
				1105	Mechanical shutter front curtain set PI2 detection failure		
				1106	Mechanical shutter front curtain set PI3 detection failure		
				1107	Mechanical shutter front curtain set PI3 detection failure		
				1108	Mechanical shutter front curtain set PI4 detection failure		
				1109	Mechanical shutter front curtain set PI4 detection failure		
				1202	Mechanical shutter exposure control PI1 detection failure		
				1203	Mechanical shutter exposure control PI1 detection failure		
				1204	Mechanical shutter exposure control PI2 detection failure		
				1205	Mechanical shutter exposure control PI2 detection failure		
				1206	Mechanical shutter exposure control PI3 detection failure		
				1207	Mechanical shutter exposure control PI3 detection failure		
				1208	Mechanical shutter exposure control PI4 detection failure		

Attribute	Main item	Sub item	Error code		Contents	Error Indication	
			High 4 bits	Low 4 bits		Detecting device	Problematic Part/Circuit
SOFT	Camera	System	3E*0	1209	Mechanical shutter exposure control PI4 detection failure	MSHUT	MSHUT
				1302	Mechanical shutter release control 1 PI1 detection failure		
				1303	Mechanical shutter release control 1 PI1 detection failure		
				1304	Mechanical shutter release control 1 PI2 detection failure		
				1305	Mechanical shutter release control 1 PI2 detection failure		
				1306	Mechanical shutter release control 1 PI3 detection failure		
				1307	Mechanical shutter release control 1 PI3 detection failure		
				1308	Mechanical shutter release control 1 PI4 detection failure		
				1309	Mechanical shutter release control 1 PI4 detection failure		
				1402	Mechanical shutter release control 2 PI1 detection failure		
				1403	Mechanical shutter release control 2 PI1 detection failure		
				1404	Mechanical shutter release control 2 PI2 detection failure		
				1405	Mechanical shutter release control 2 PI2 detection failure		
				1406	Mechanical shutter release control 2 PI3 detection failure		
				1407	Mechanical shutter release control 2 PI3 detection failure		
				1408	Mechanical shutter release control 2 PI4 detection failure		
				1409	Mechanical shutter release control 2 PI4 detection failure		
				140A	Mechanical shutter release control 2 home position failure		
			3E*1	5010	Abnormal position after mechanical shutter front curtain setting		
				5020	Abnormal position after mechanical shutter front curtain setting		
				5030	Abnormal position after mechanical shutter front curtain setting		
	Recording	Motion Image Recording	3F*0	0001	File time out error in recording motion image	MOVR T.O.	SOFT
				0002	File data cue send error in recording motion image	MOVR FILE	MOVR T.O.
Wi-Fi			3211	****	Wi-Fi/Bluetooth error (Initial Setting error of Wi-Fi.Bluetooth)	WiFi	WiFi
			3A11	0000			
				0001	Wi-Fi's destination setting error		

Important notice about “Error Code List”

1) About “*” indication:

The third digit from the left is different as follows.

- In case of 0 (example: 18**0**01000)
  When the third digit from the left shows “0”, this error occurred under the condition of Initial Settings has been completed.
  It means that this error is occurred basically at user side.
- In case of 8 (example: 18**8**01000)
  When the third digit from the left shows “8”, this error occurred under the condition of Initial Settings has been released. (Example; Factory assembling-line before unit shipment, Service mode etc.)
  It means that this error is occurred at service side.

2) About “?” indication: (“18*0 0?01” to “18*0 0?60”):

The third digit from the right shows one of the hexadecimal (“0” to “F”) character.

- **Step 3. How to exit from Error Code display mode:**

Simply, turn the power off. (Since Error code display mode is executed under the condition of temporary cancellation of “Initial Settings”, it wake up with normal condition when turn off the power.)

NOTE:

The error code can not be initialized.

7 Troubleshooting Guide

7.1. Wi-Fi Module (Flash P.C.B. (With WIFI ANT))

7.1.1. How to Remove Wi-Fi Password Protection

To prevent incorrect operation or use of the Wi-Fi function by a third party and to protect saved personal information, this unit protects the Wi-Fi function with a password.
It is unable to service with password locked condition. When accepting for repair, the unit has been set the Wi-Fi password by customer, run the [Reset Network Settings] for removing Wi-Fi password, then check the operation.

[Reset Procedure of Wi-Fi Settings]

1) Press the [MENU/SET] button, and select the [SETUP] mode by Cursor buttons, then press the [MENU/SET] button.
2) Select [Reset Network Settings] by Cursor buttons, then press the [MENU/SET] button.
3) Select [YES] and press the [MENU/SET] button.

(The [Reset Network Settings] performs not only resetting Wi-Fi Password but also resetting other all Wi-Fi Settings.)

7.1.2. Checking of Trouble Caused by Wi-Fi Module or Not

The Wi-Fi Circuit works properly if the wireless access point (broadband router) name (SSID) in use is displayed on a screen of [Manual Connection].

(Primary Confirmation)
Confirm that the wireless access point (broadband router) works properly.

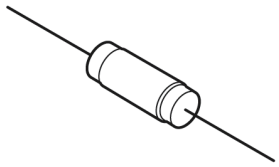
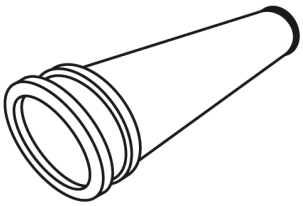
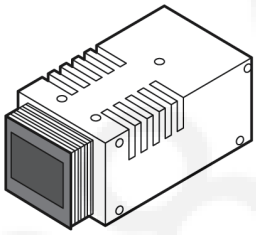
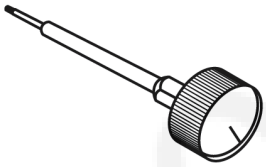
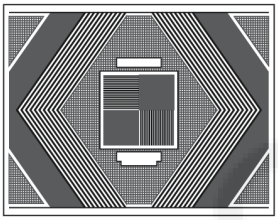
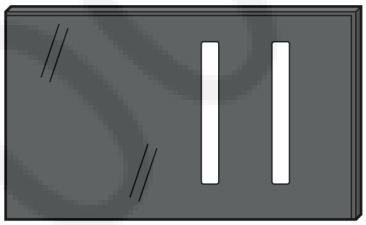
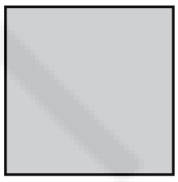
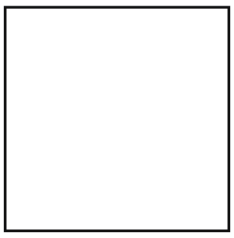
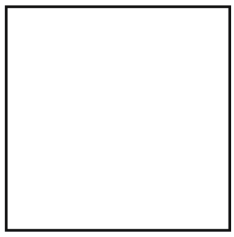
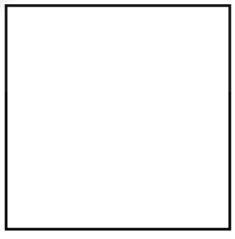
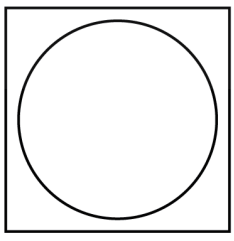
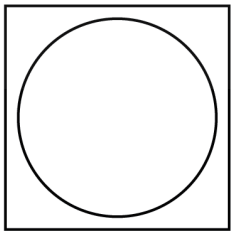
(Procedure)
1) Select [Wi-Fi] in [Setup] menu.
2) Select [Wi-Fi Function] in [Wi-Fi] menu.
3) Select [New Connection] in [Wi-Fi] menu.
4) Select [Send Images While Recording] menu.
5) Select optional destination in [Select the destination] menu, then select [Via Network] in [Select connection method] menu.
6) Select [From List] in [Select connection method] menu.
7) The Wi-Fi Circuit works properly if the wireless access point (broadband router) name (SSID) in use is displayed.

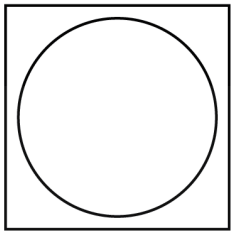
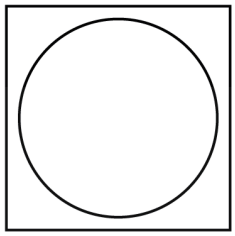
*Change the Flash P.C.B.(With WIFI ANT), when the above checking detected the abnormal of Wi-Fi module.

8 Service Fixture & Tools

8.1. Service Fixture and Tools

The following Service Fixture and tools are used for checking and servicing this unit.

Resistor for Discharging (1kΩ/5W) **ERG5SJ102**	Collimator (built-in Focus Chart) **RFKZ0422**	Light Box (with DC Cable) **RFKZ0523**
 ∗ An equivalent type of resistor may be used.		
Lens Cleaning Kit (BK) **VFK1900BK**	Driver (for Optical Tilt Adjustment) **RFKZ0569**	Torque Driver **RFKZ0542**
 ∗ Only supplied 10 set/box.	 ∗ T4 Torx type	
Optical Tilt Adjustment Chart **RFKZ0570**	Camera Stand **RFKZ0333J**	Gray Card **RFKZ0506**
		
Gray Chart **RFKZ0612**	ND Filter (ND 0.3) **RFKZ0513**	ND Filter (ND 0.6) **VFK1164ND06**
		
ND Filter (ND 0.9) **VFK1164ND09**	CC Filter (CC-C7.5) **RFKZ0511**	CC Filter (CC-Y10) **RFKZ0512**
		

LB Filter (LBB2) **RFKZ0520**	LB Filter (LBB8) **RFKZ0521**	
		

8.2. When Replacing the Main P.C.B.

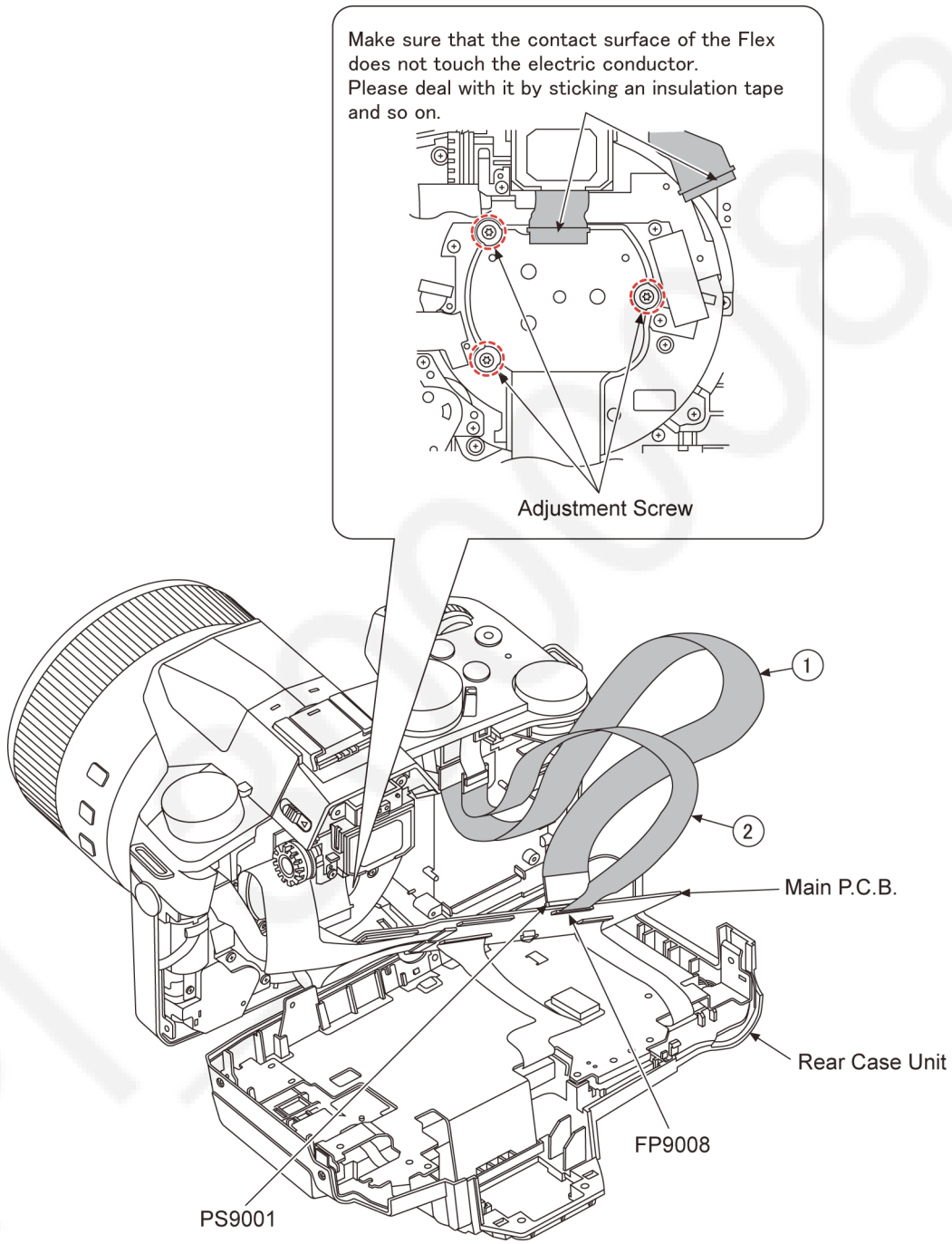
After replacing the Main P.C.B., be sure to achieve adjustment.

8.3. Service Position

This Service Position is used for checking and replacing parts. Use the following Extension cables for servicing.

Table S1 Extension Cable List

No.	Parts No.	Connection	Form
1	VFK0379	PS9001(MAIN P.C.B.)←→FLASH P.C.B. (With WIFI ANT)	40 pin B to B
2	RFKZ0466	FP9008(MAIN P.C.B.)←→TOP CASE UNIT	29 pin / 0.3 FFC



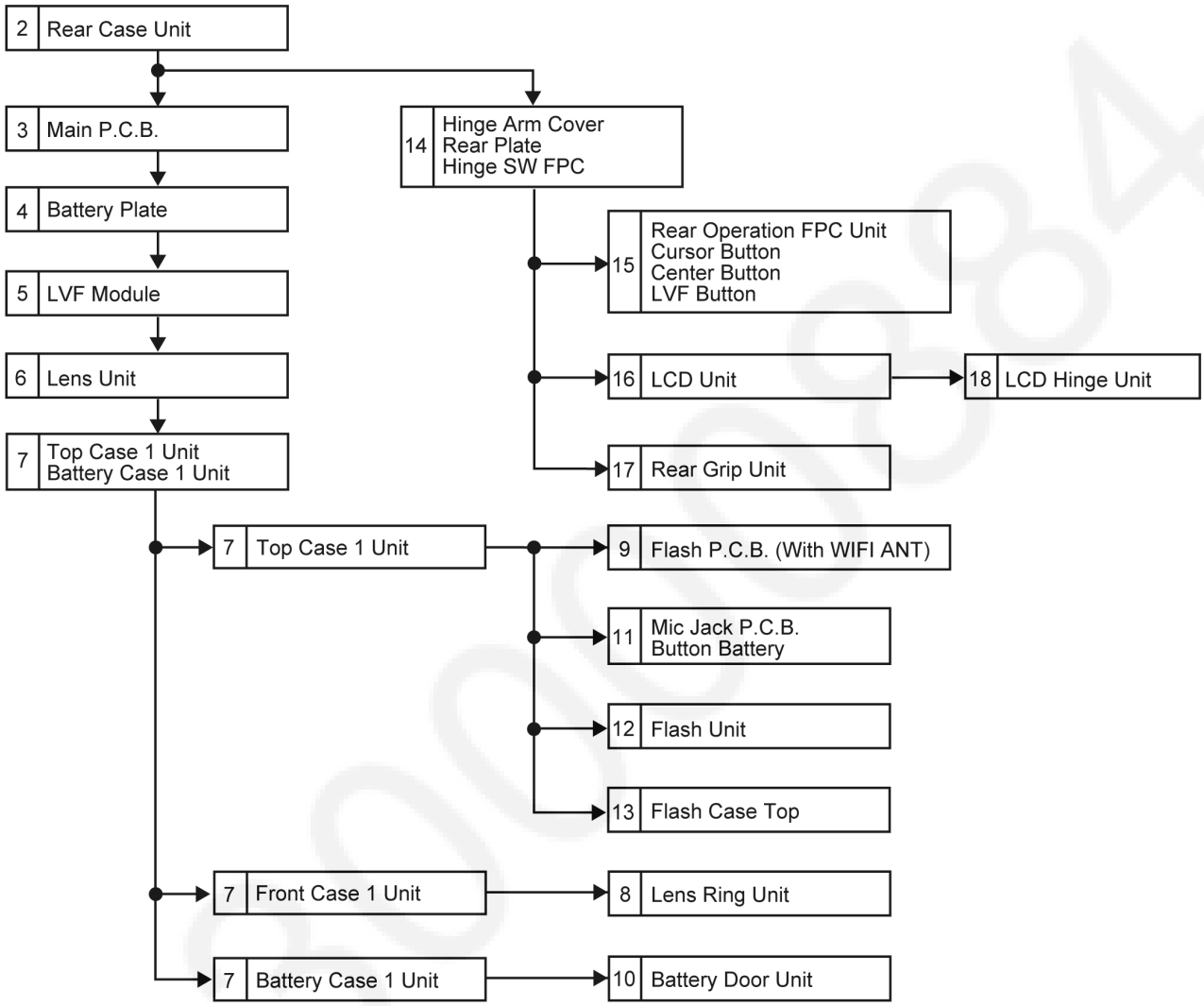
CAUTION (When servicing Flash P.C.B. (With WIFI ANT))

1. Be sure to discharge the E.Capacitor on Flash P.C.B. (With WIFI ANT).
   Refer to “How to Discharge the E.Capacitor on Flash P.C.B. (With WIFI ANT).
   The E.Capacitor voltage is not lowered soon even if the AC Cord is unplugged or the battery is removed.
2. Be careful of the high voltage circuit on Flash P.C.B. (With WIFI ANT).
3. DO NOT allow other parts to touch the high voltage circuit on Flash P.C.B. (With WIFI ANT).

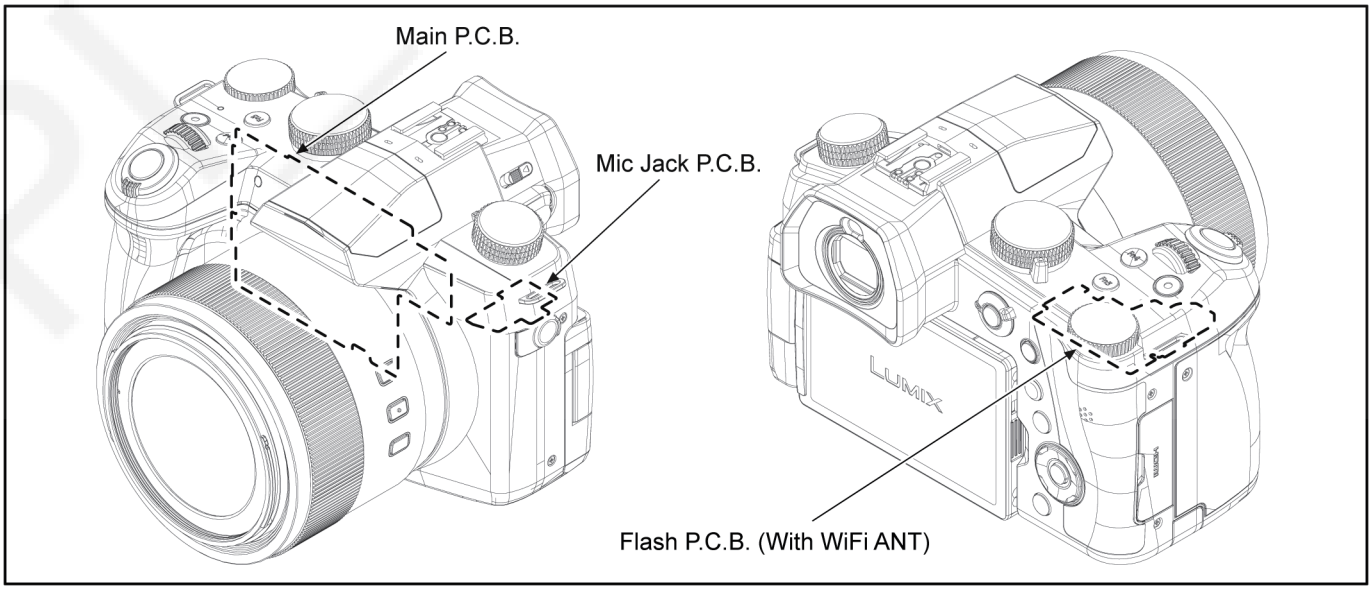
9 Disassembly and Assembly Instructions

9.1. Disassembly Flow Chart

This is a disassembling chart.
When assembling, perform this chart conversely.



9.2. P.C.B. Location



9.3. Disassembly Procedure

No.	Item	Fig.	Removal
2	Rear Case Unit	(Fig. D1)	Screw (A) x 4
			Screw (B) x 3
			Screw (C) x 2
		(Fig. D2)	Locking tab x 2
			Eye Cup Unit
			Eye Cushion
			Screw (D) x 2
		(Fig. D3)	FP4001 (Flex)
			FP9007 (Flex)
			Rear Case Unit
3	Main P.C.B.	(Fig. D4)	FP4002 (Flex)
			FP9001 (Flex)
			FP9004 (Flex)
			FP9005 (Flex)
			FP9006 (Flex)
			FP9008 (Flex)
			Screw (E) x 3
			Convex x 2
			PS9001-PP8001 (B to B)
			Heat Radiation Sheet
			Main P.C.B.
4	Battery Plate	(Fig. D6)	Convex x 2
			Battery Plate
5	LVF Module	(Fig. D7)	Screw (F) x 1
			Convex x 2
			Locking tab x 1
		(Fig. D8)	Locking tab x 3
			Heat Radiation Pad
			LVF Heat Plate
			LVF Module
6	Lens Unit	(Fig. D9)	Screw (G) x 4
			Lens Unit
7	Top Case 1 Unit & Battery Case 1 Unit	(Fig. D10)	Screw (H) x 1
			Convex x 1
			Front Earth Plate
			Screw (I) x 2
			Screw (J) x 2
		(Fig. D11)	Mic Jack Cover
			Jack Cover
			Coupler Cover
			Locking tab x 1
			Top Case 1 Unit
			Battery Case 1 Unit
8	Lens Ring Unit	(Fig. D13)	Screw (K) x 4
			Convex x 2
			Lens Holder Plate
			Front Case Unit
			Lens Ring Unit
9	Flash P.C.B. (With WIFI ANT)	(Fig. D14)	Convex x 1
			Hooking part x 1
			Screw (L) x 1
			Locking tab x 2
			Condensor Cover
		(Fig. D15)	Locking tab x 3
			Convex x 2
			Barttery Earth Plate
			Flash P.C.B. (With WIFI ANT)
		(Fig. D16)	Solder (4 points)
10	Battery Door Unit	(Fig. D17)	Battery Door Shaft
			Battery Door Spring
			Battery Case Unit
			Battery Door Unit

No.	Item	Fig.	Removal
11	Mic Jack P.C.B. Button Battery	(Fig. D18)	FP9302 (Flex)
			Screw (M) x 2
			Convex x 2
			Solder (2 points)
			Mic Jack P.C.B.
			Button Battery
12	Flash Unit	(Fig. D19)	Screw (N) x 2
			Screw (O) x 1
			Convex x 2
			Flash Earth Plate
		(Fig. D20)	Locking tab x 2
			Flash Lock Knob
			Screw (P) x 4
		(Fig. D21)	Top Case Unit
			Flash Unit
13	Flash Case Top	(Fig. D22)	Screw (Q) x 2
			Locking tab x 2
			Flash Case Top
14	Hinge Arm Cover Rear Plate Hinge SW FPC	(Fig. D23)	Heat Radiation Pad S
			Screw (R) x 2
			Hinge Arm Cover
		(Fig. D24)	Screw (S) x 9
			Solder (6 points)
			Convex x 4
			Locking tab x 2
			Rear Plate & Hinge SW FPC
		(Fig. D25)	Rear Plate
			Hinge SW FPC
15	Rear Operation FPC Unit Cursor Button Center Button LVF Button	(Fig. D26)	Convex x 4
			Rear Operation FPC Unit
			Center Button
			Cursor Button
			Rear Earth Plate
			LVF Button
16	LCD Unit	(Fig. D28)	Convex x 4
		(Fig. D29)	Screw (T) x 2
			Spacer
			Hinge Earth
			LCD Lock Piece Parts
			LCD Unit
17	Rear Grip Unit	(Fig. D30)	Locking tab x 2
			Rear Grip Unit
18	LCD Hinge Unit	(Fig. D31)	Screw (U) x 4
			Locking tab x 8
		(Fig. D32)	FP4101 (Flex)
			FP4104 (Flex)
			LCD Case Bottom Unit
			LCD Hinge Unit

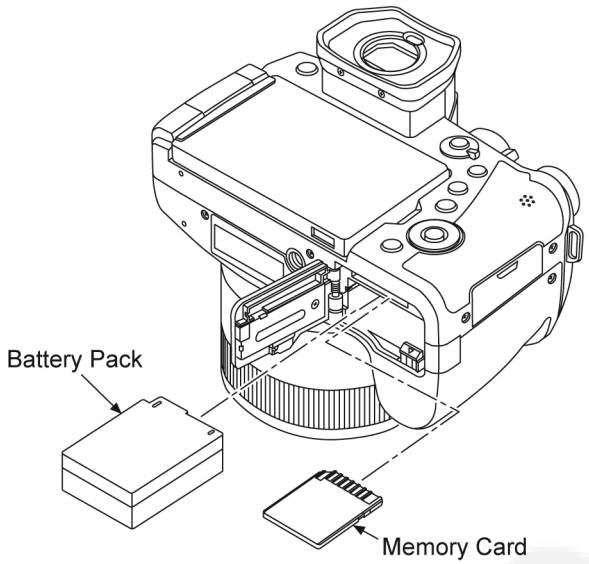
9.3.1. Precautions when disassembling

- Install the body cap to prevent garbage and dust except when it is necessary.
- Do not reuse the screws tightened to metal materials. Use new screws.

<Preparation>

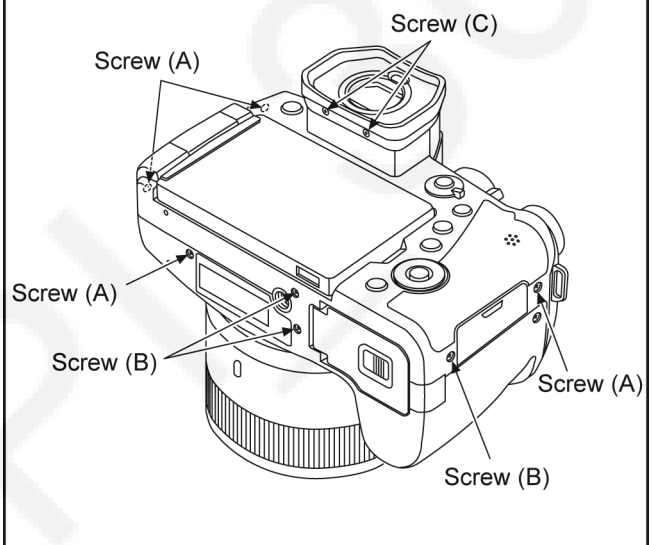
- When servicing and reassembling, remove the memory card and battery pack from the unit.

• Memory Card
• Battery Pack



9.3.2. Removal of the Rear Case Unit

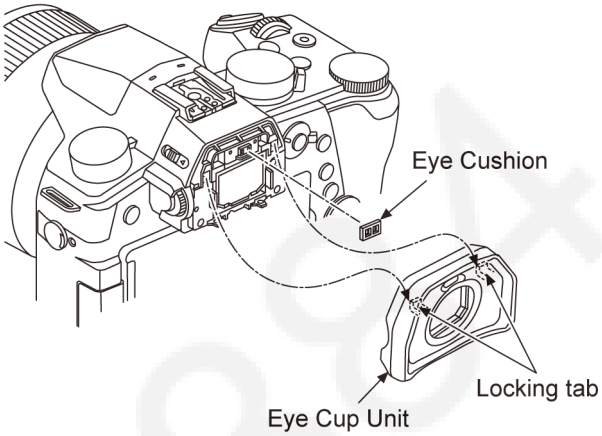
• Screw (A) x 4
• Screw (B) x 3
• Screw (C) x 2



Screw (A)	Screw (B)	Screw (C)
6.0mm	6.5mm	3.5mm
BLACK	BLACK	BLACK

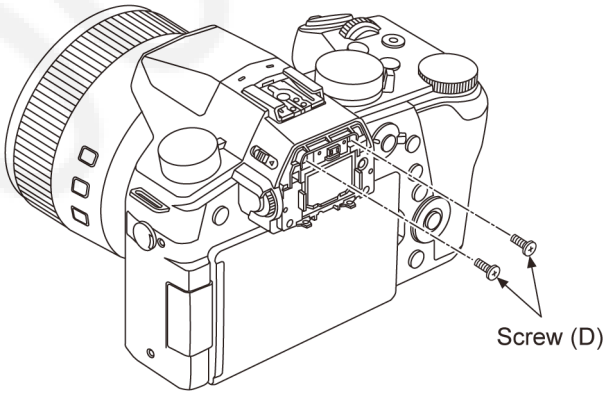
(Fig. D1)

• Locking tab x 2
• Eye Cup Unit
• Eye Cushion
• Screw (D) x 2

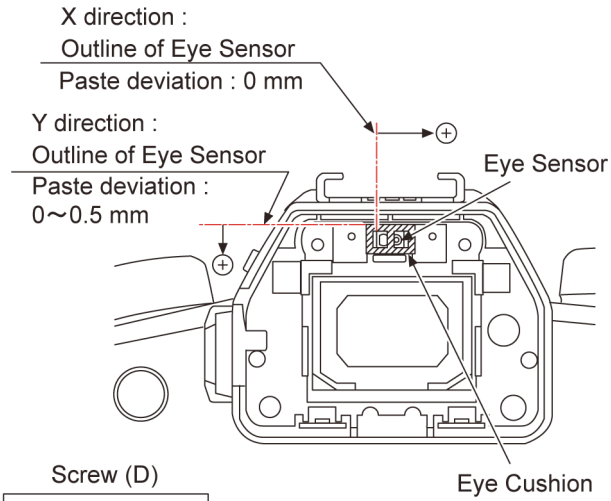


NOTE: (When Replacing)

- When removing the Eye Cup Unit, take care not to lose the Eye Cushion.



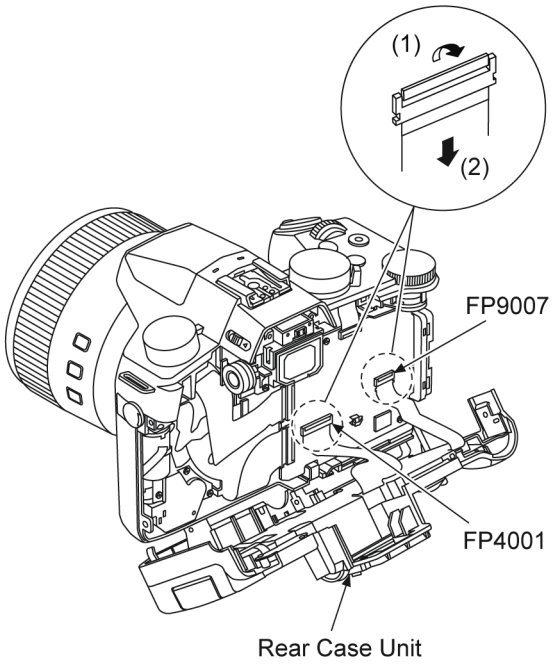
Pasting position srandard



Screw (D)
5.0mm
SILVER

(Fig. D2)

• FP4001 (Flex)
• FP9007 (Flex)



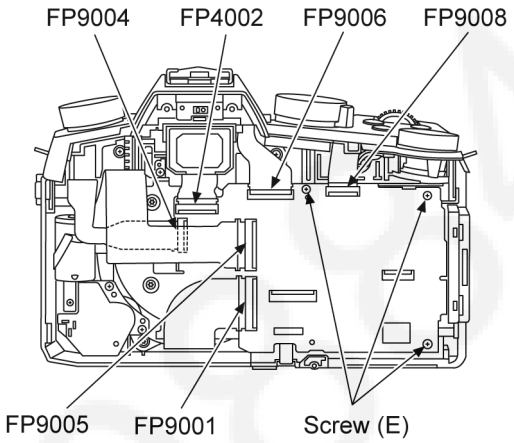
NOTE: (When Replacing)

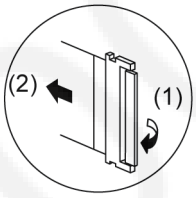
- When removing the flex, pull up the locking tab in direction of the arrow (1), and then remove the flex in direction of the arrow (2).
- Do not bend the flex excessively and take care not to damage the flex.

(Fig. D3)

9.3.3. Removal of the Main P.C.B.

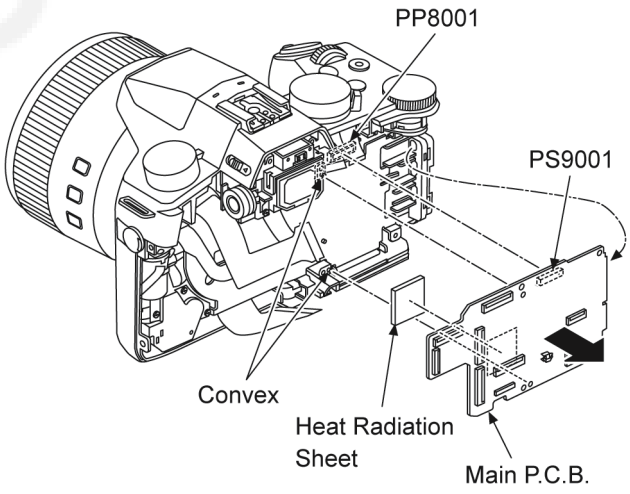
- FP4002 (Flex)
- FP9001 (Flex)
- FP9004 (Flex)
- FP9005 (Flex)
- FP9006 (Flex)
- FP9008 (Flex)
- Screw (E) x 3
- Convex x 2
- PS9001-PP8001 (B to B)
- Heat Radiation Sheet



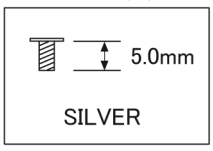


NOTE: (When Replacing)

- When removing the flex, pull up the locking tab in direction of the arrow (1), and then remove the flex in direction of the arrow (2).
- Do not bend the flex excessively and take care not to damage the flex.

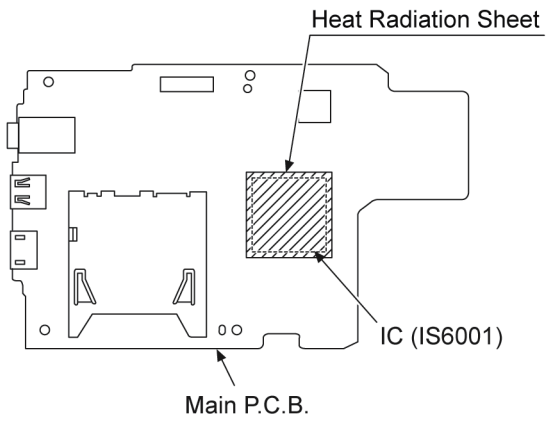


Screw (E)



(Fig. D4)

Pasting position srandard

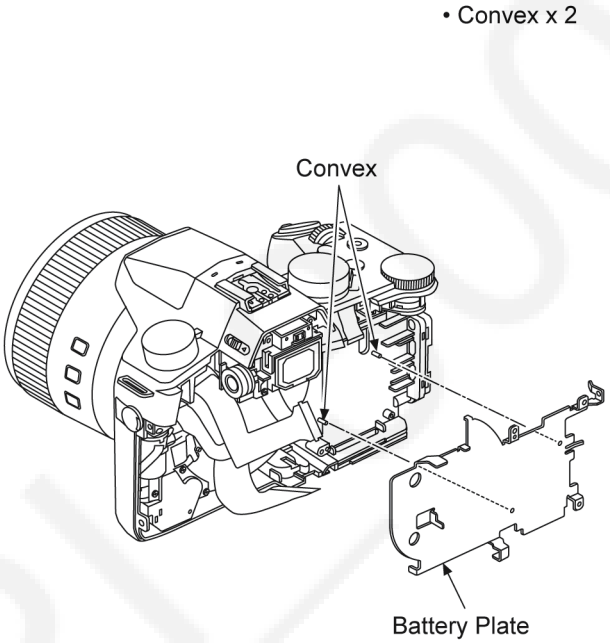


NOTE:

- When pasting the Heat Radiation Sheet, do not press hard on it.
  (It could cause the damage of IC.)

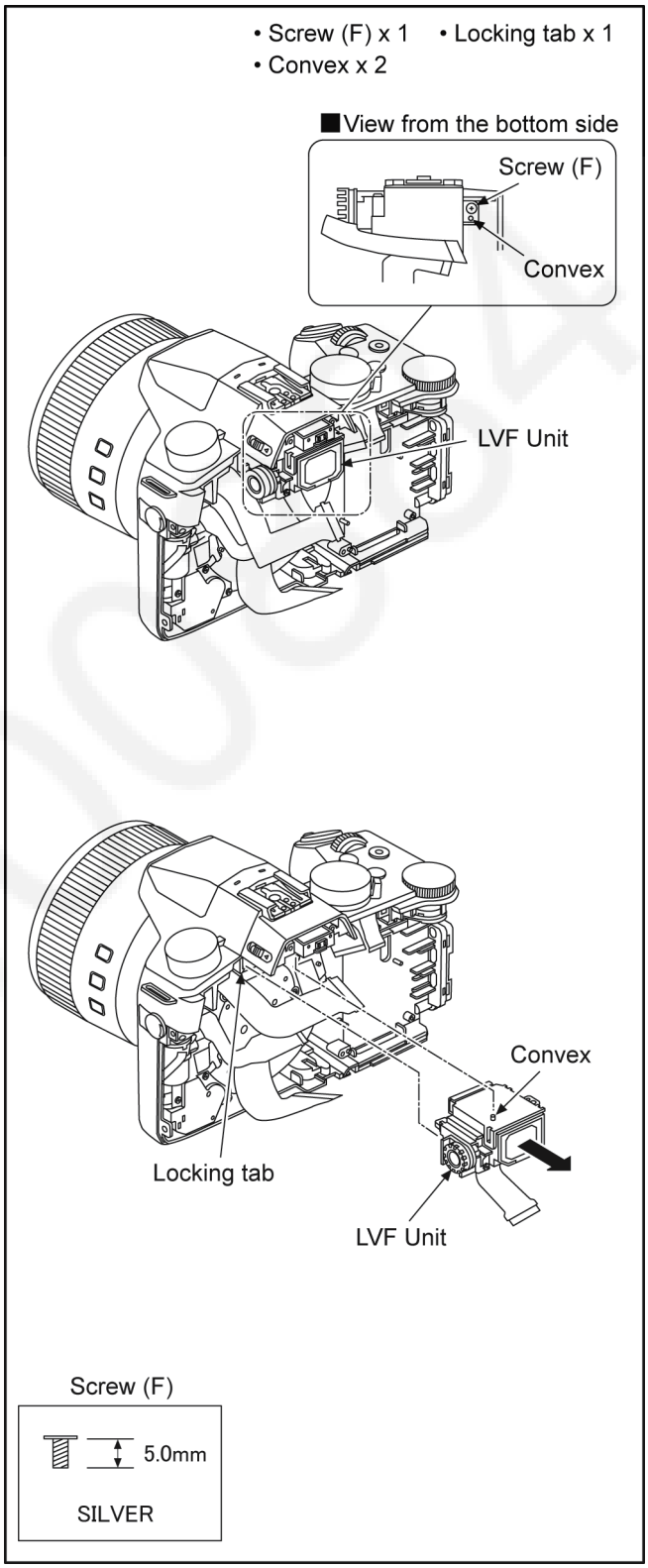
(Fig. D5)

9.3.4. Removal of the Battery Plate



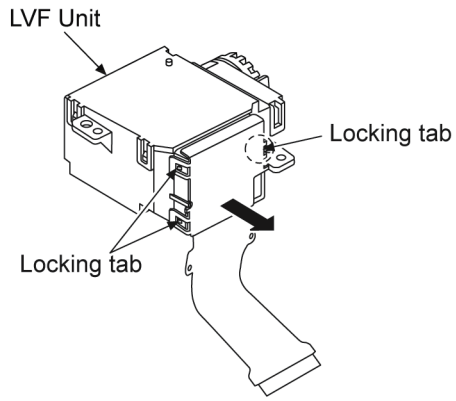
(Fig. D6)

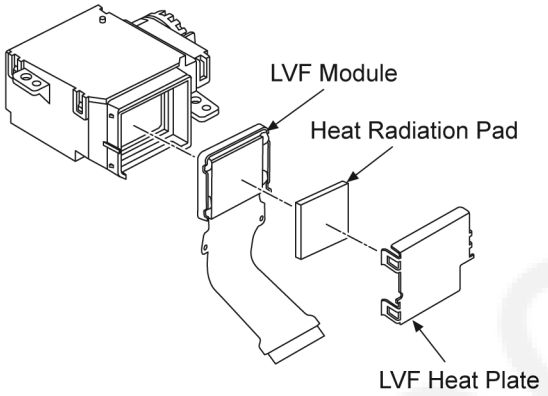
9.3.5. Removal of the LVF Module



(Fig. D7)

• Locking tab x 3
• Heat Radiation Pad
• LVF Heat Plate



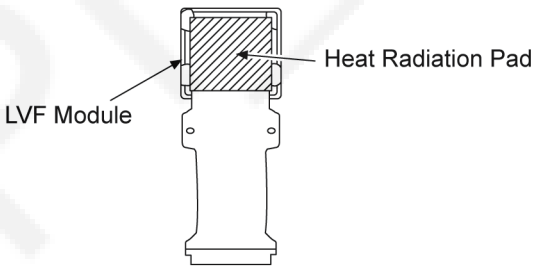


NOTE: (When Replacing)

- Do not bend the flex excessively and take care not to damage the flex.
- Take care not to put any fingerprints on the finder part of the LVF Unit.

Pasting position srandard

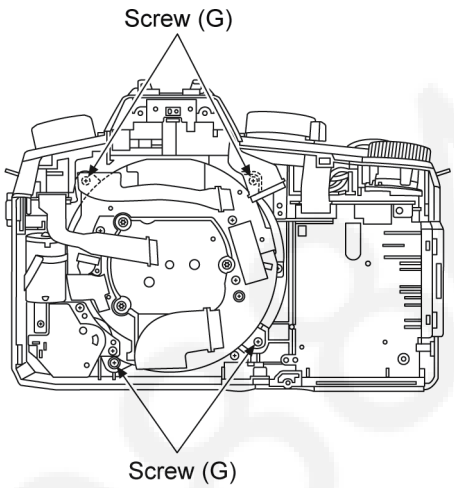
- Make sure that the Heat Radiation Pad fits in the display part of the LVF Module.



(Fig. D8)

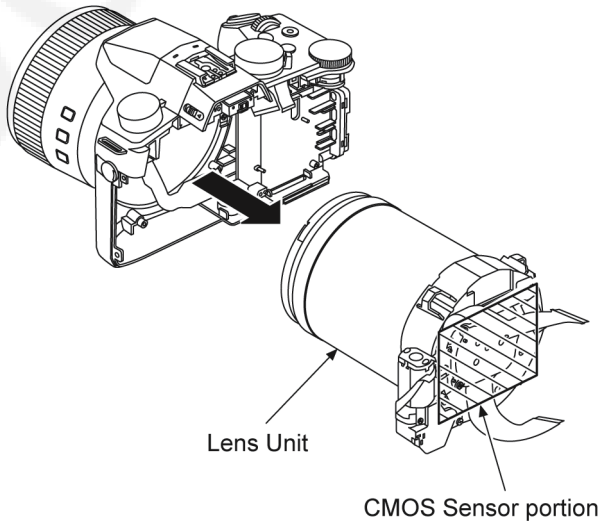
9.3.6. Removal of the Lens Unit

• Screw (G) x 4



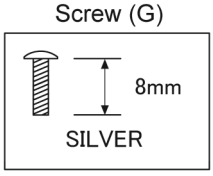
IMPORTANT NOTICE:

- Be careful not to touch the shaded portion of the CMOS Sensor.



NOTE: (When Replacing)

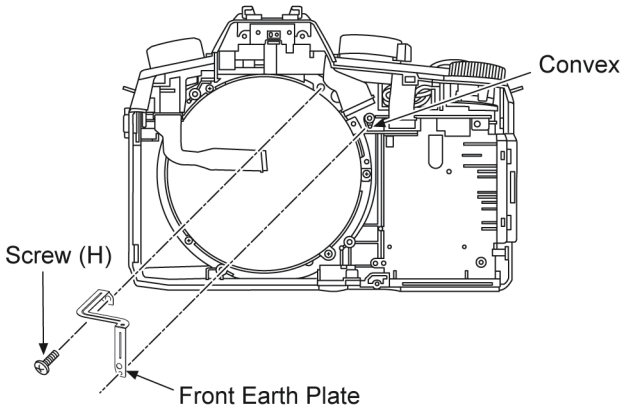
- Do not bend the flex excessively and take care not to damage the flex.

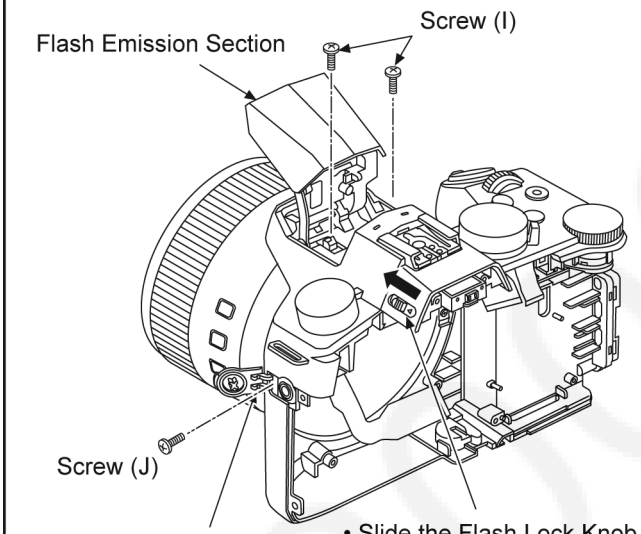


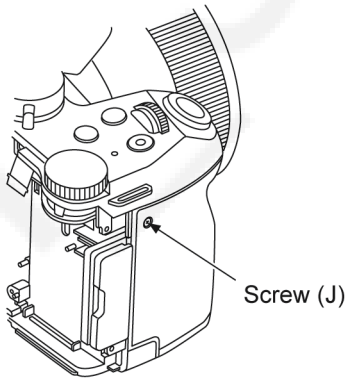
(Fig. D9)

9.3.7. Removal of the Top Case 1 Unit and Battery Case 1 Unit

• Screw (H) x 1 • Front Earth Plate • Screw (I) x 2
• Convex x 1 • Screw (J) x 2



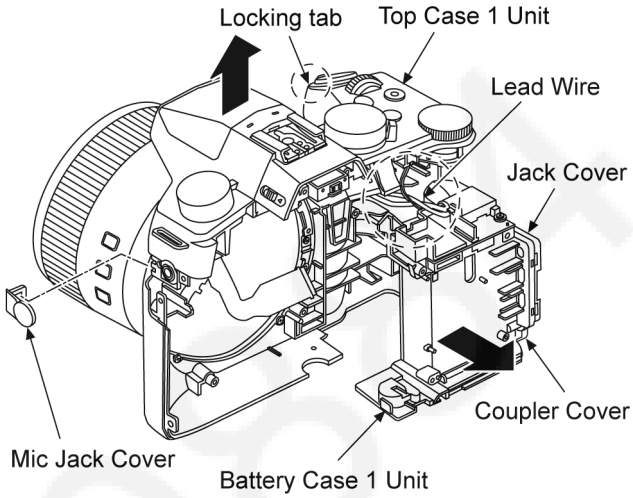




Screw (H)	Screw (I)	Screw (J)
5.0mm	5.0mm	6.0mm
SILVER	BLACK	BLACK

(Fig. D10)

• Mic Jack Cover • Coupler Cover
• Jack Cover • Locking tab x 1

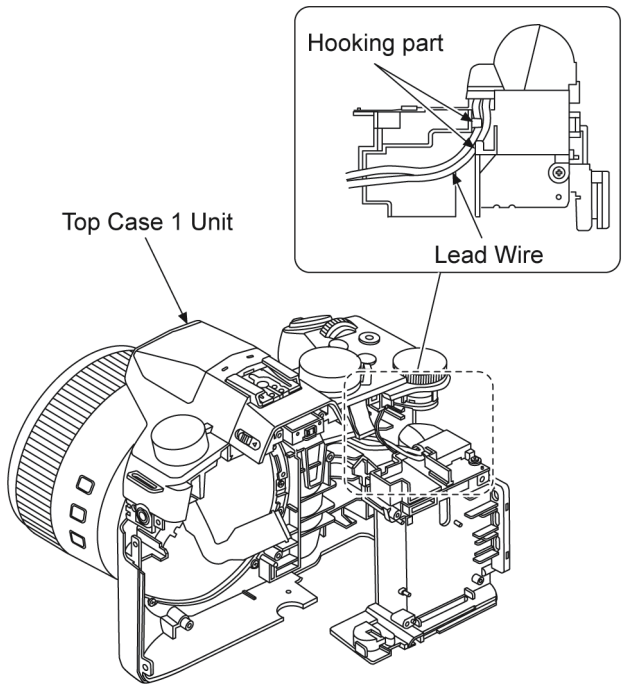


NOTE: (When Replacing)

- Take care not to damage the Lead Wires.
- Undo the Locking tab and pull out the Top Case 1 Unit and Battery Case 1 Unit together in direction of the arrows.
- Take care not to lose the Mic Jack Cover, Jack Cover, and Coupler Cover.

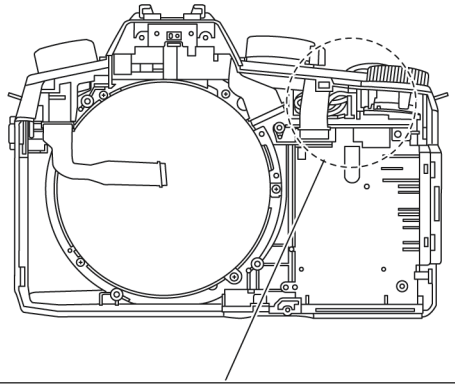
Line Processing

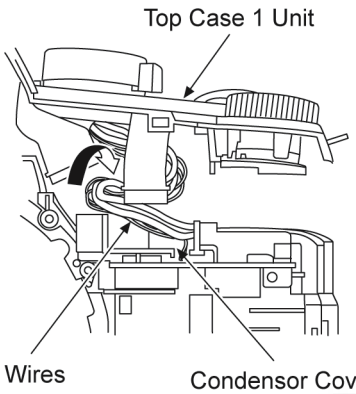
- Arrange the lead wires under the hooking part.

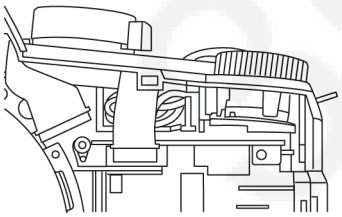


(Fig. D11)

Line Processing





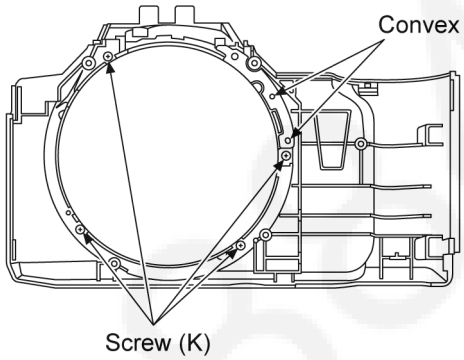


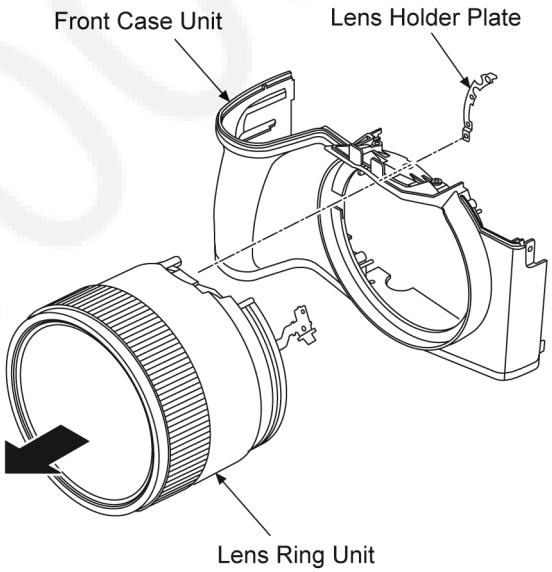
• Arrange the Lead Wires into inner side of the Condensor Cover.

(Fig. D12)

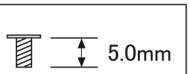
9.3.8. Removal of the Lens Ring Unit

• Screw (K) x 4
• Convex x 2
• Lens Holder Plate
• Front Case Unit





Screw (K)



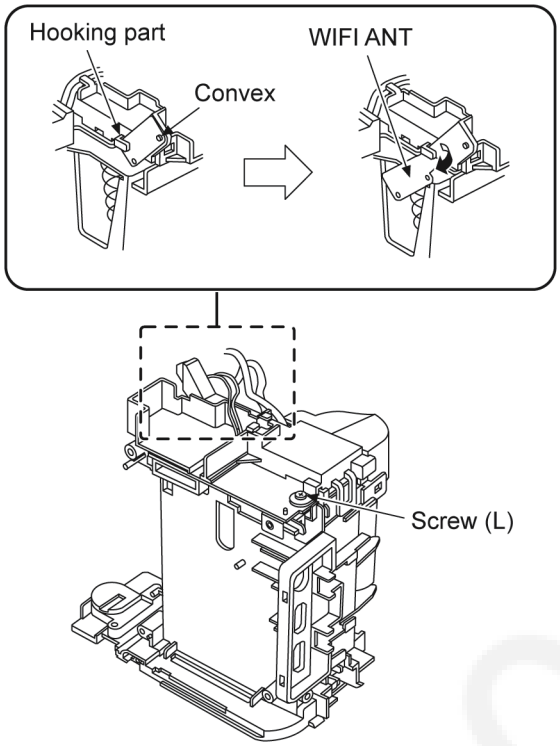
SILVER

(Fig. D13)

9.3.9. Removal of the Flash P.C.B. (With WIFI ANT)

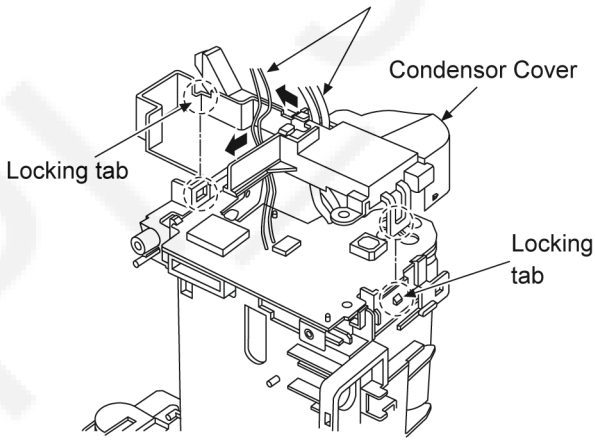
• Convex x 1 • Screw (L) x 1 • Condensor Cover
• Hooking part x 1 • Locking tab x 2

• Peel the WIFI ANT in direction of the arrow.
(WIFI ANT is pasted with the double-sided tape.)

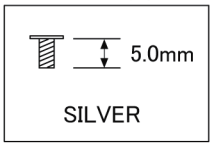


NOTE: (When Replacing)
• Do not bend the flex excessively and take care not to damage the flex.

• Take the lead wires out from the groove of the Condensor Cover.

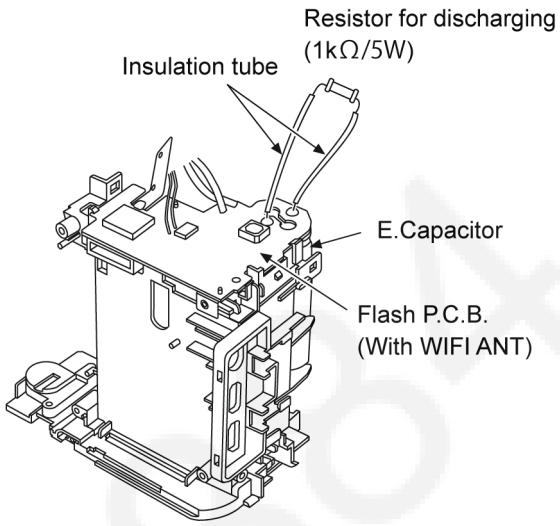


Screw (L)



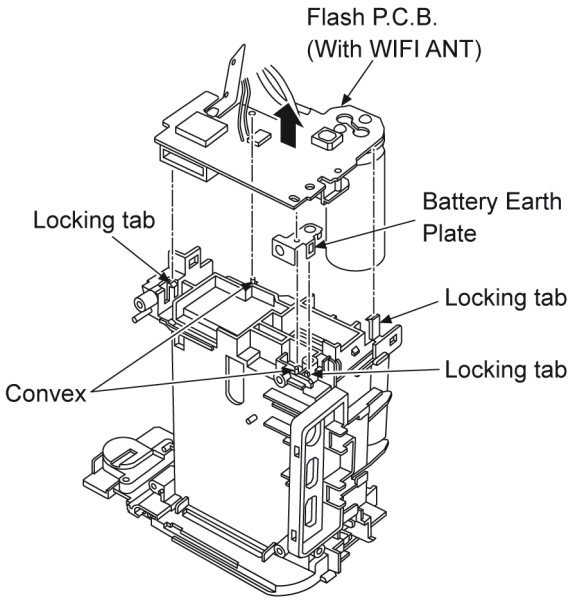
NOTE: (When Replacing)
• Take care not to damage the lead wires.

(Fig. D14)



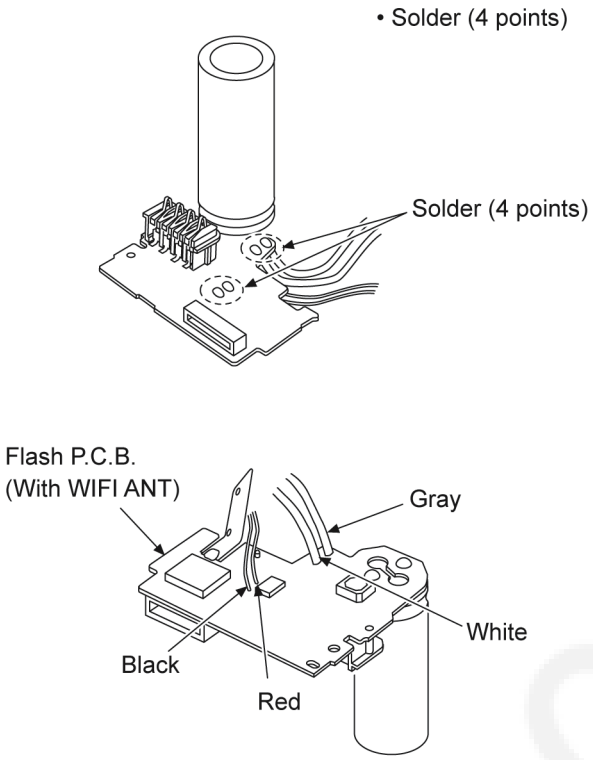
⚠ CAUTION
Be sure to discharge the E.Capacitor on Flash P.C.B. (With WIFI ANT) before disassembling.
Be careful of the high voltage circuit on Flash P.C.B. (With WIFI ANT) when servicing.
1. Put the insulation tube on the lead part of resistor (ERG5SJ102: 1kΩ / 5W). (An equivalent type of resistor may be used.)
2. Put the resistor between both terminals of E.Capacitor on Flash P.C.B. (With WIFI ANT) for approx. 5 seconds.
3. After discharging, confirm that the E.Capacitor voltage is lower than 10V by using a voltmeter.

• Locking tab x 3
• Convex x 2
• Barttery Earth Plate



(Fig. D15)

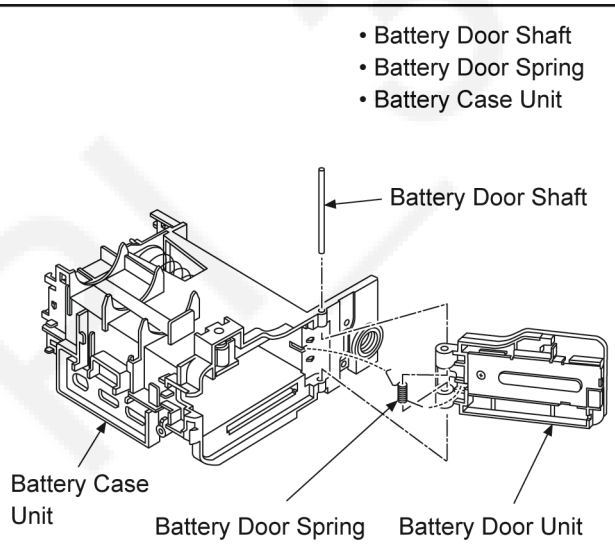
IMPORTANT NOTICE:
- Take care not to apply any bending load to the charging E.Capacitor.
  It brings about the possibility of Flash P.C.B. (With WIFI ANT) and/or component damage on the Flash P.C.B. (With WIFI ANT).



NOTE: (When Installing)
- When soldering, take care not to make mistakes on the colours of the lead wires.

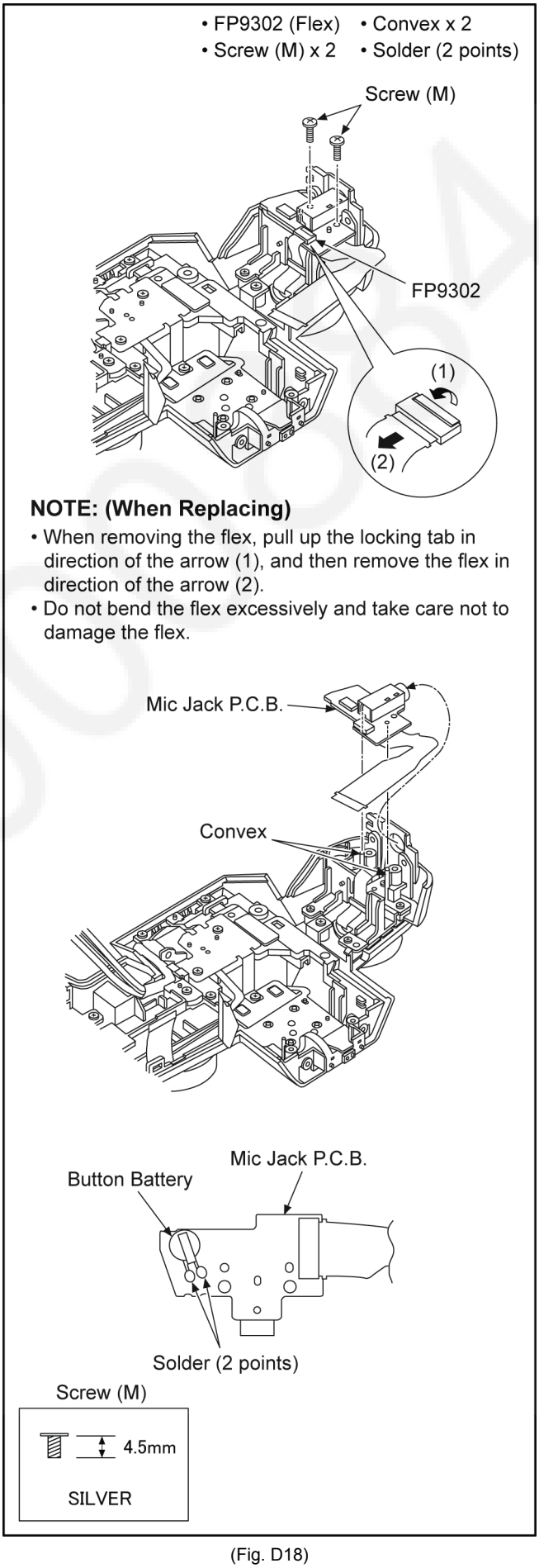
(Fig. D16)

9.3.10. Removal of the Battery Door Unit



(Fig. D17)

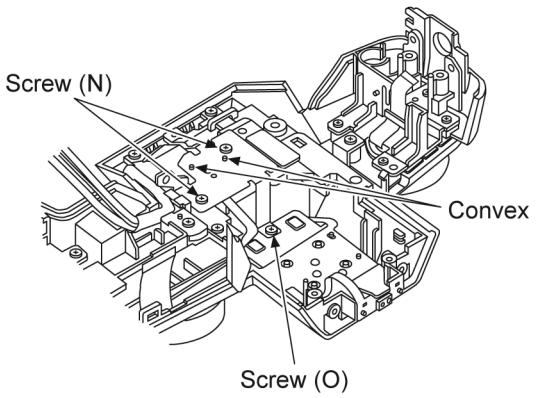
9.3.11. Removal of the Mic Jack P.C.B. and Button Battery

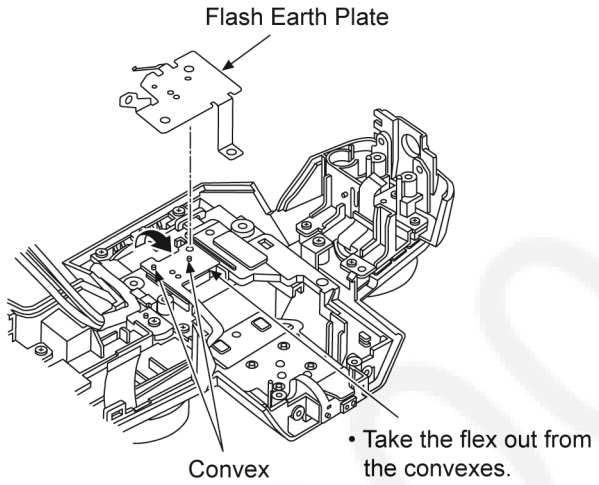


(Fig. D18)

9.3.12. Removal of the Flash Unit

• Screw (N) x 2 • Convex x 2
• Screw (O) x 1 • Flash Earth Plate





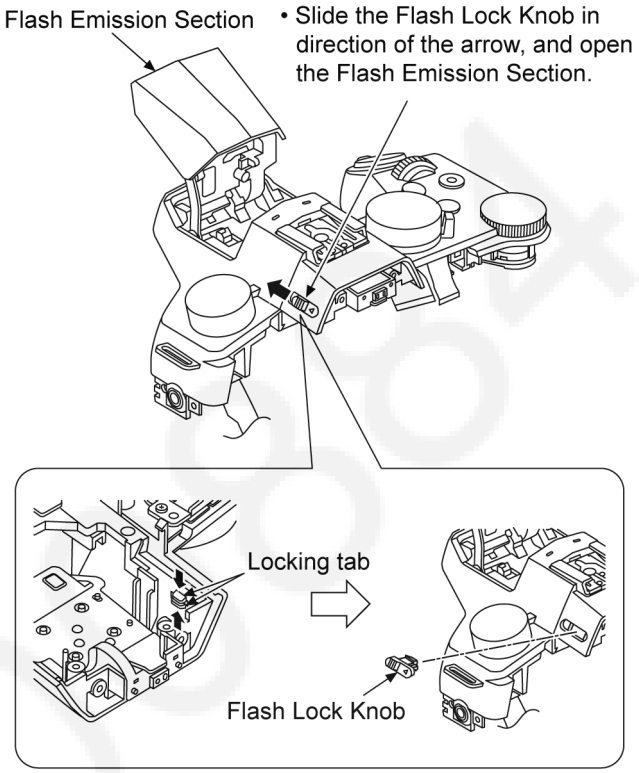
NOTE: (When Replacing)

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

Screw (N)	Screw (O)
3.5mm	5.0mm
SILVER	BLACK

(Fig. D19)

• Locking tab x 2
• Flash Lock Knob
• Screw (P) x 4

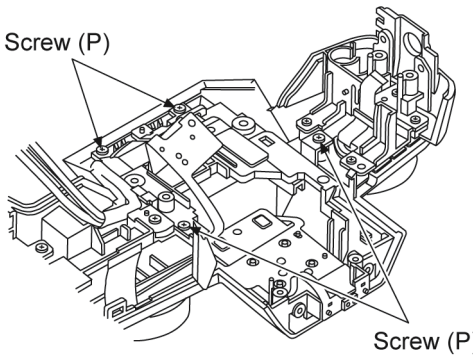


NOTE: (When Replacing)

• Pull out the Flash Lock Knob after narrowing the interval of its locking tabs by pressing the tabs of the top and bottom inward.

NOTE: (When Installing)

• When installing the Flash Lock Knob, take care on its installing direction.

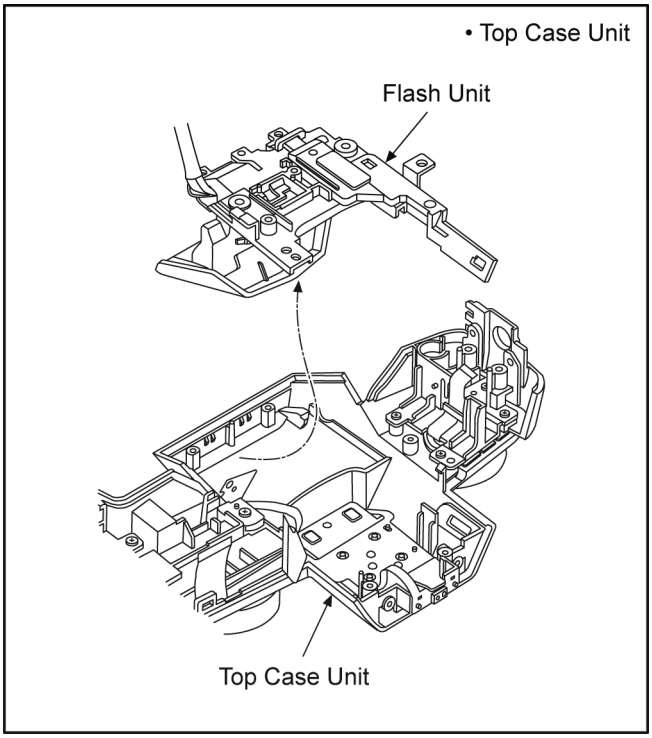


NOTE: (When Replacing)

• Open the Flash Emission Section in advance and remove the Flash Unit.
• Do not bend the flex excessively and take care not to damage the flex.

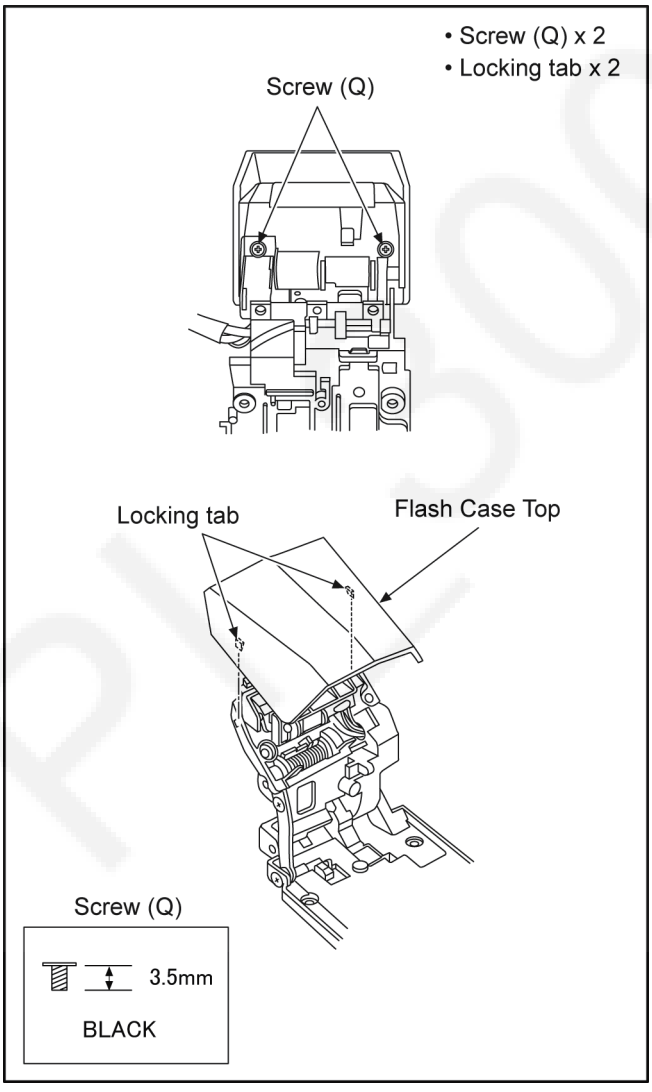
Screw (P)
5.0mm
BLACK

(Fig. D20)



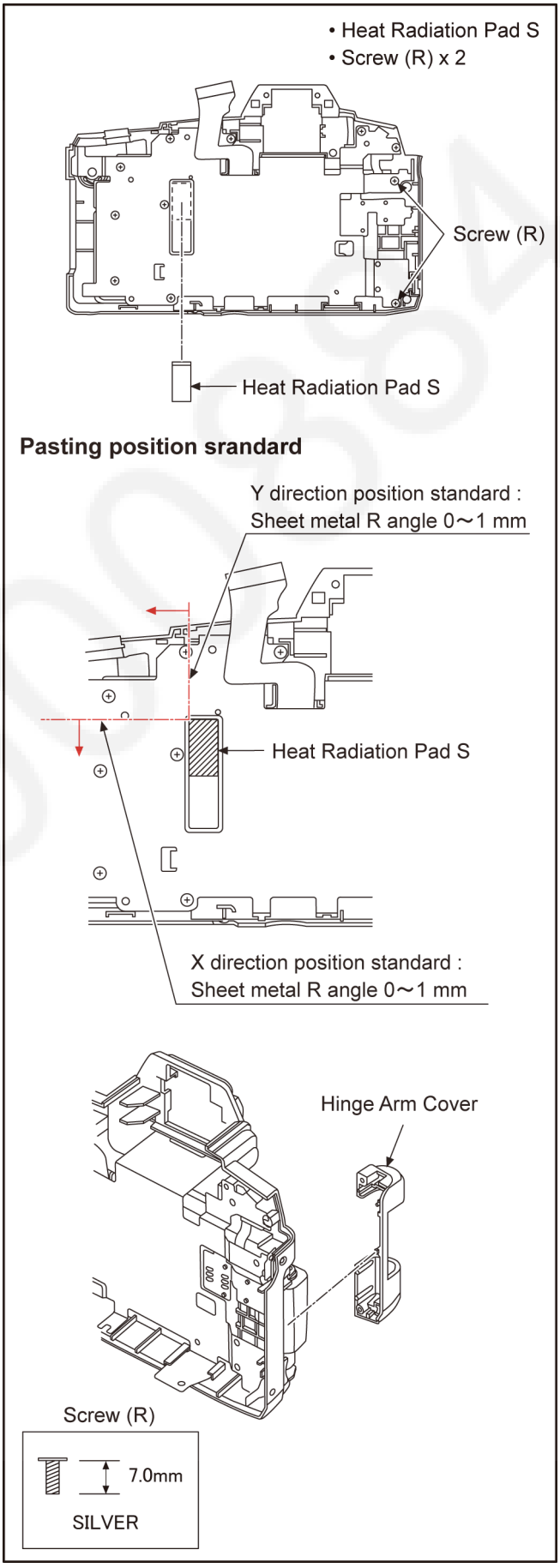
(Fig. D21)

9.3.13. Removal of the Flash Case Top

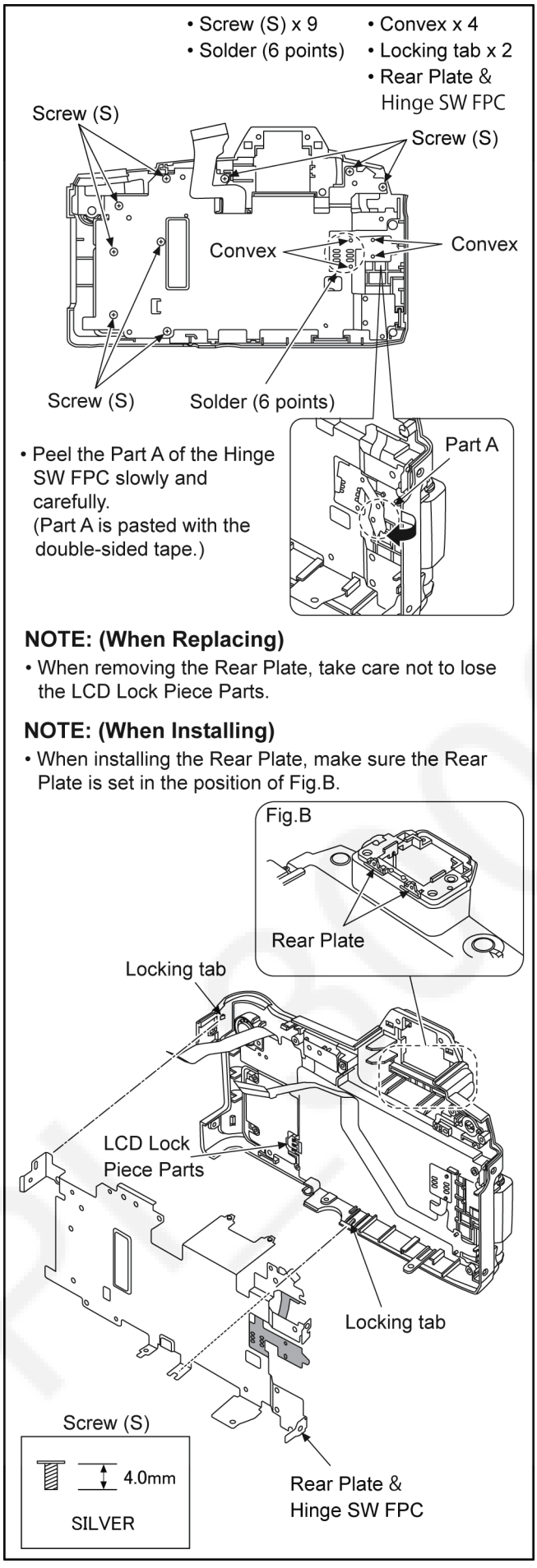


(Fig. D22)

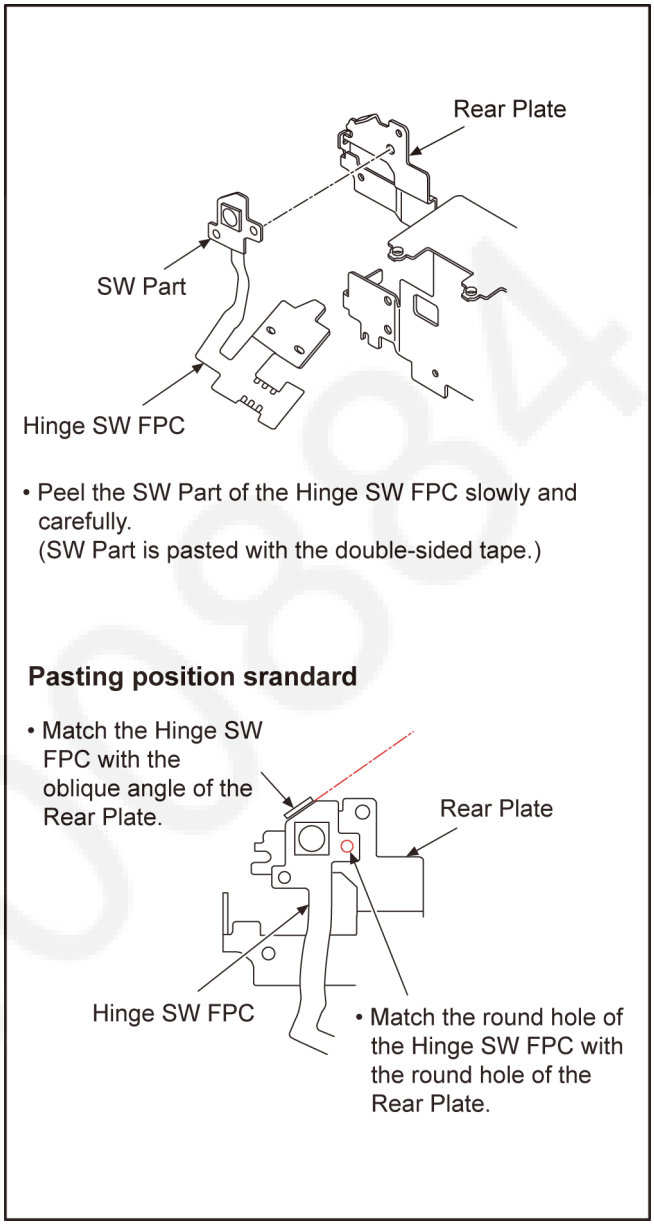
9.3.14. Removal of the Hinge Arm Cover, Rear Plate, and Hinge SW FPC



(Fig. D23)

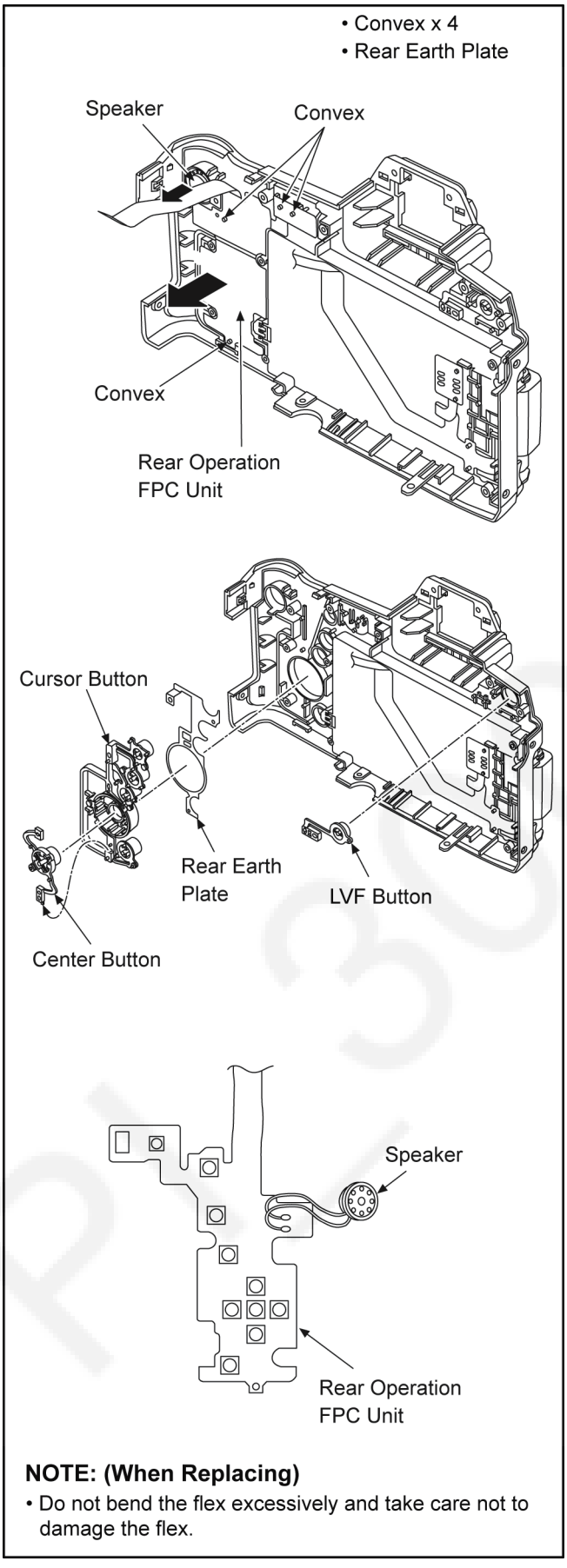


(Fig. D24)



(Fig. D25)

9.3.15. Removal of the Rear Operation FPC Unit, Cursor Button, Center Button, and LVF Button



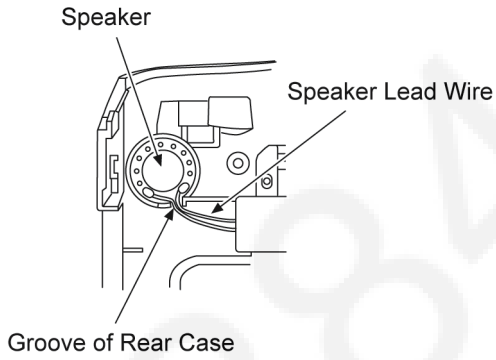
NOTE: (When Replacing)

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

(Fig. D26)

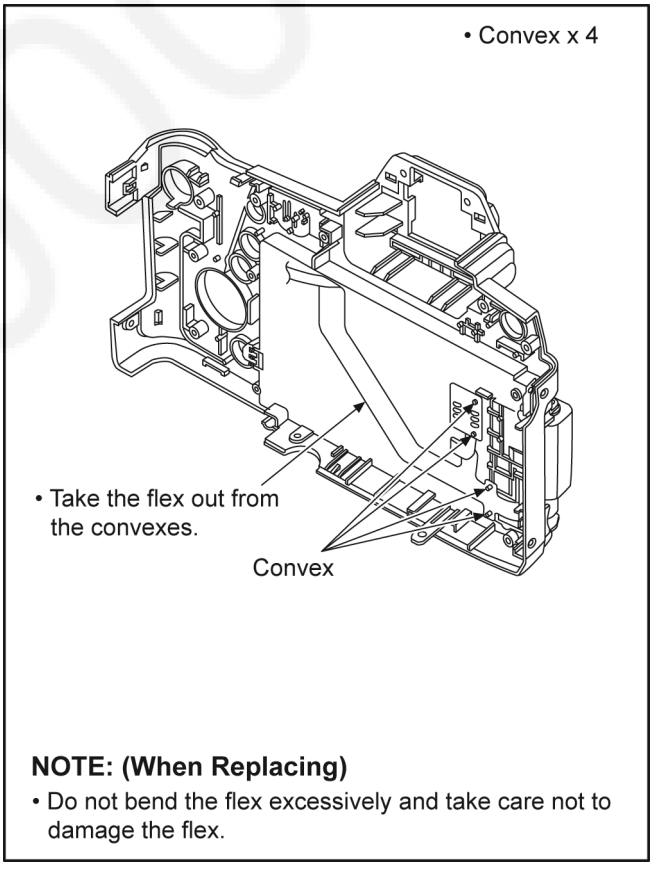
Line Processing

• When installing Speaker, Insert the Speker Lead Wire in the Groove of Rear Case.



(Fig. D27)

9.3.16. Removal of the LCD Unit

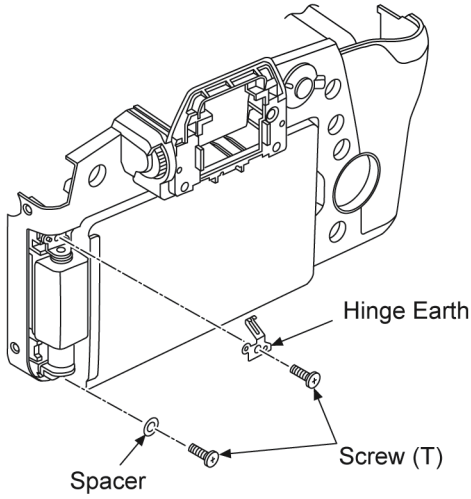


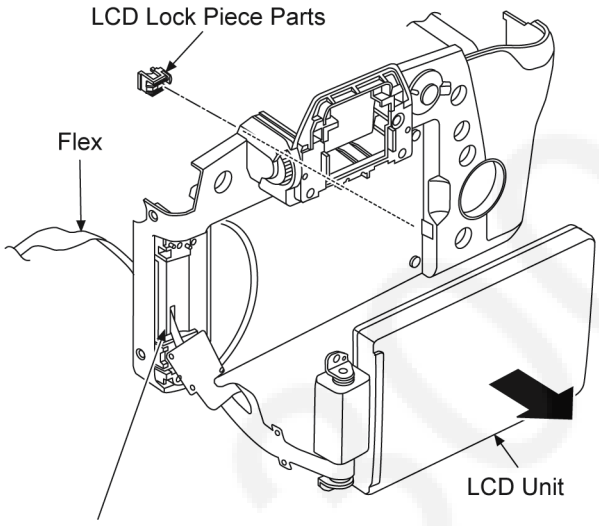
NOTE: (When Replacing)

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

(Fig. D28)

• Screw (T) x 2 • Hinge Earth
• Spacer • LCD Lock Piece Parts



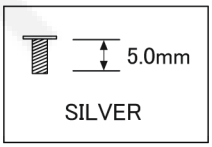


• Pull out the Flex through the elongated hole.

NOTE: (When Replacing)

- When removing the LCD Unit, take care not to lose the LCD Lock Piece Parts.
- Do not bend the flex excessively and take care not to damage the flex.

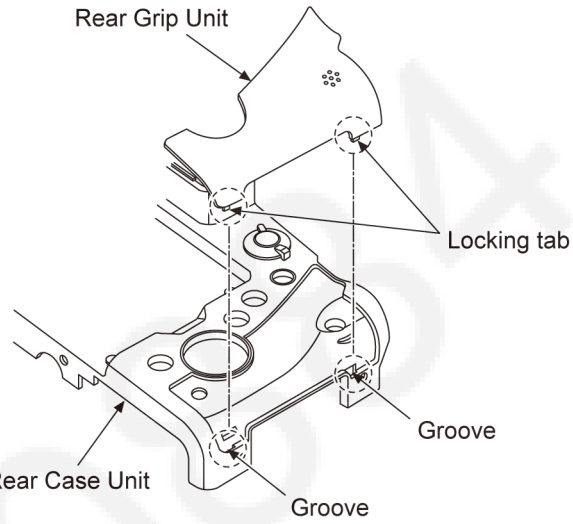
Screw (T)



(Fig. D29)

9.3.17. Removal of the Rear Grip Unit

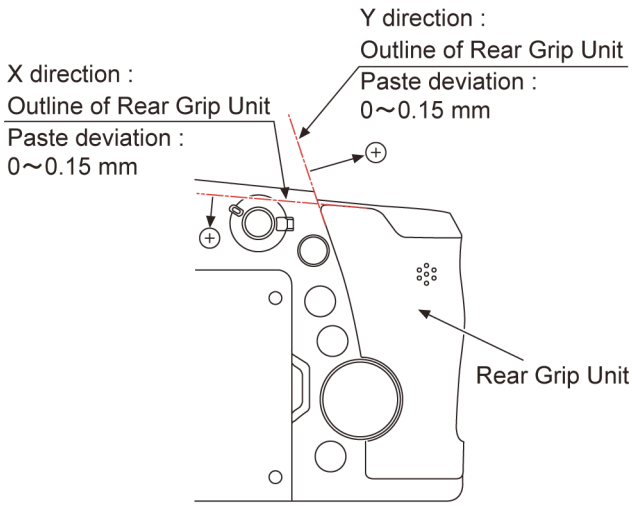
• Locking tab x 2



NOTE: (When Installing)

- When installing the Rear Grip Unit, fit the 2 Locking tabs in the grooves of the Rear Case Unit.

Pasting position srandard

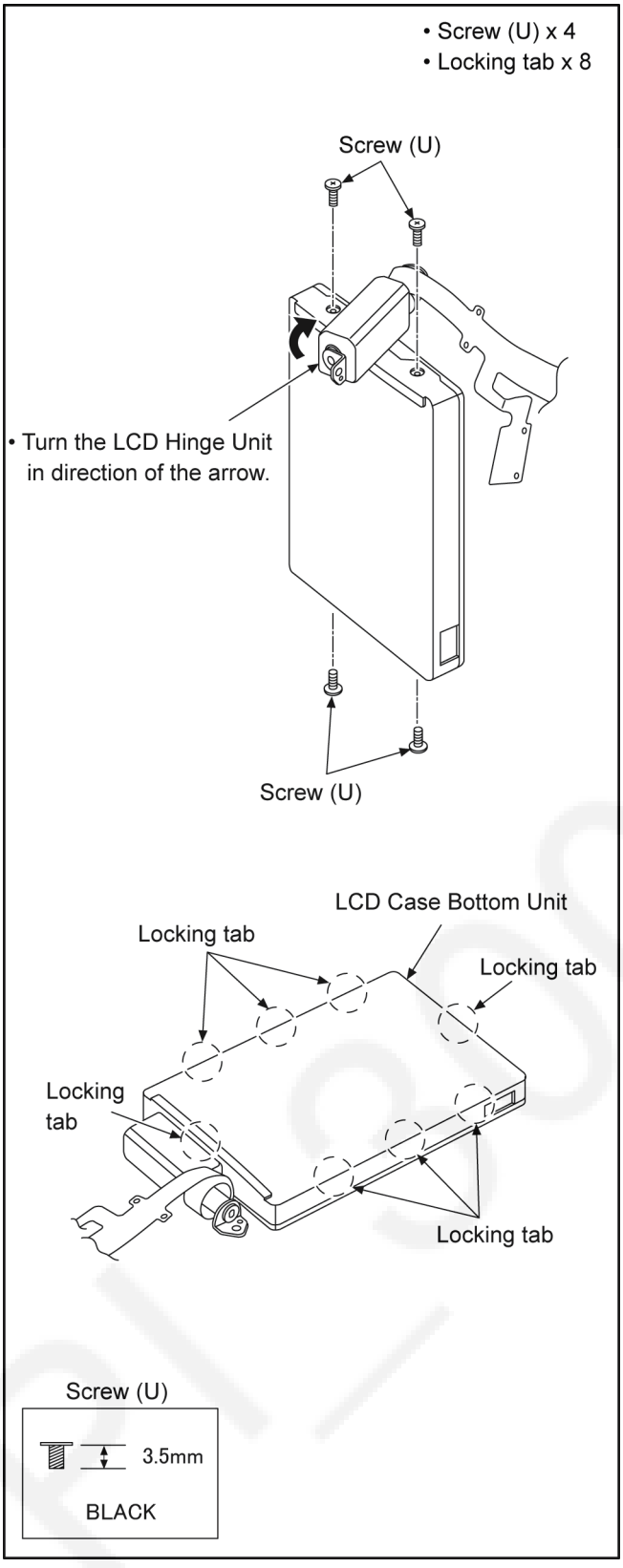


NOTE: (When Installing)

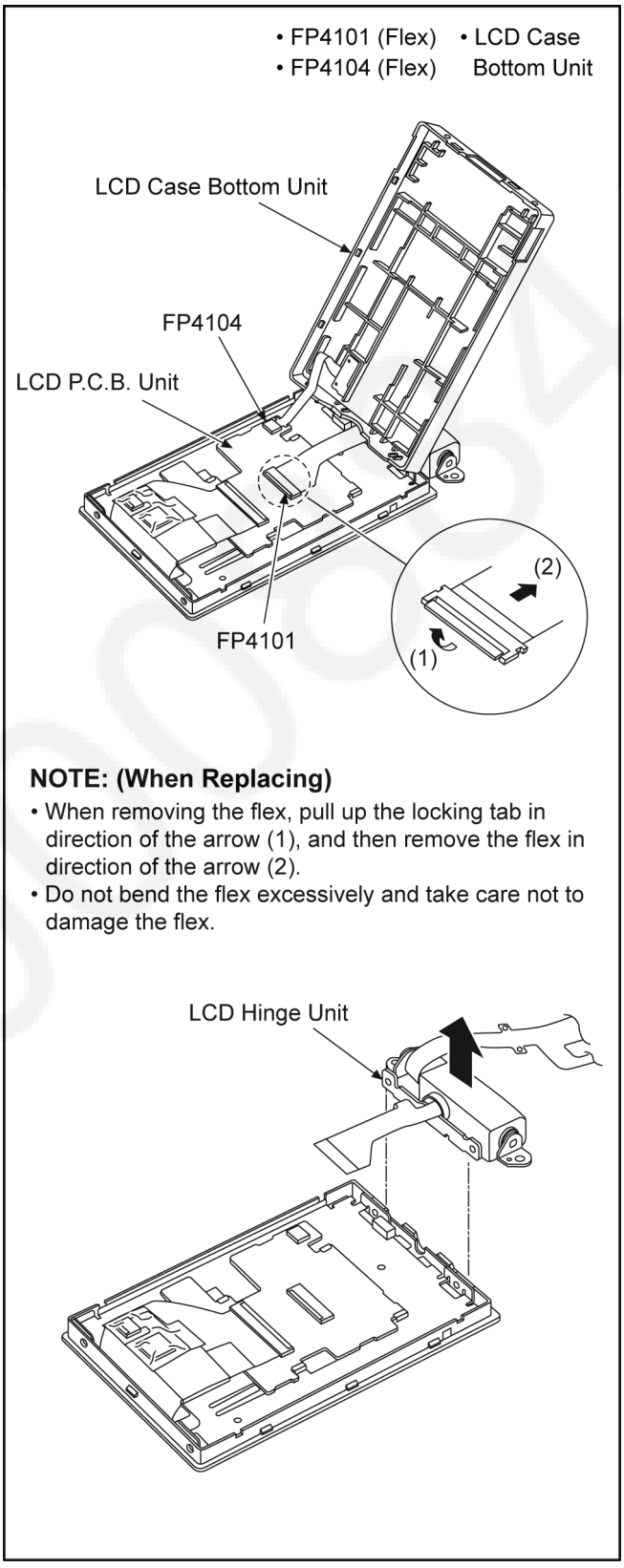
- Install the Rear Grip Unit properly without deviation.
- Replace a new Rear Grip Unit when adhesive force is reduced.

(Fig. D30)

9.3.18. Removal of the LCD Hinge Unit



(Fig. D31)



(Fig. D32)

NOTE: (After Assembling)

Make sure to confirm the following points after assembling.

- The screw is tightened enough.
- Installing conditions are fine. (No distortion, no abnormal-space.)
- No dust and/or dirt on lens surfaces.
- LCD image is fine. (No dust and/or dirt on it, and no gradient images.)

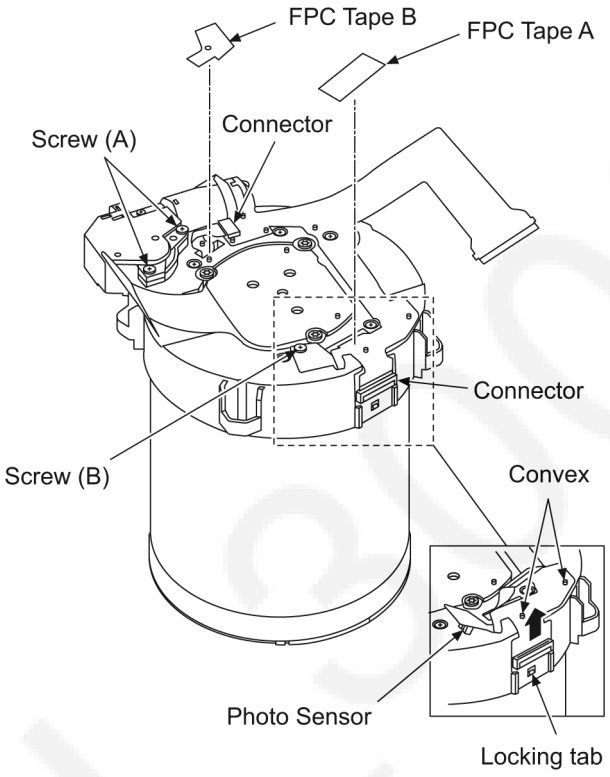
9.4. Lens Disassembly Procedure

Precaution:

1. Do not remove the CMOS Unit when disassembling or reassembling the lens in order to maintain it clean. When remove it, refer to item “9.6.”.
2. Keep dust or dirt away from the lens. To remove dirt or dust from the lens, blow with dry air.
3. Do not touch the lens surface.
4. Use Lens Cleaning Kit (VFK1900BK).

9.4.1. Removal of the Zoom Motor and Lens FPC Unit

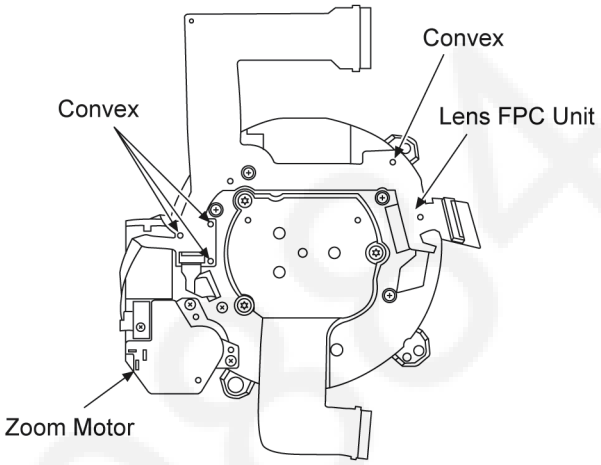
1. Peel the FPC Tape A and FPC Tape B.
2. Unscrew the 2 screws (A).
3. Unscrew the screw (B).
4. Remove the Photo Sensor.
5. Disconnect 2 connectors.
6. Unlock the locking tab and remove connector portion.
7. Remove the 2 convexes.
8. Remove the 4 convexes.
9. Remove the Zoom Motor and Lens FPC Unit.
10. Unscrew the 2 screws (C).
11. Unsolder the 2 soldering points.
12. Remove the Lens FPC Unit from the Zoom Motor.

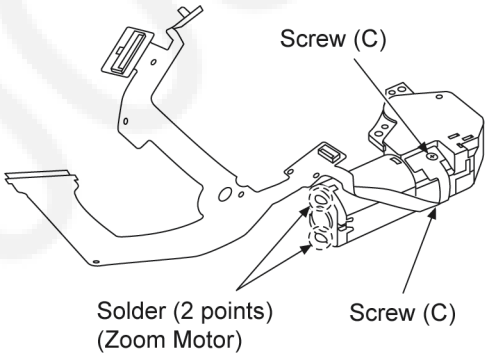


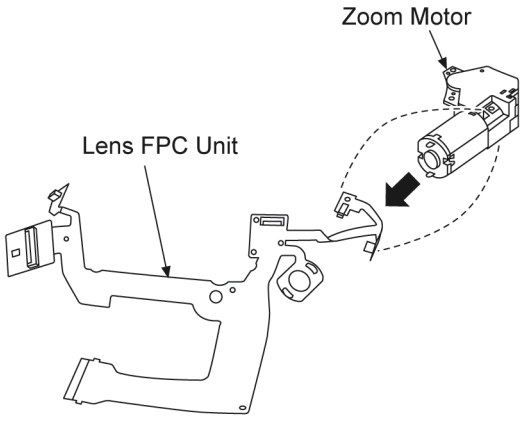
NOTE: (When Replacing)

• Take care not to apply excessive force to the flex.

Screw (A)	Screw (B)
5mm	3.5mm
SILVER	BLACK







NOTE: (When Replacing)

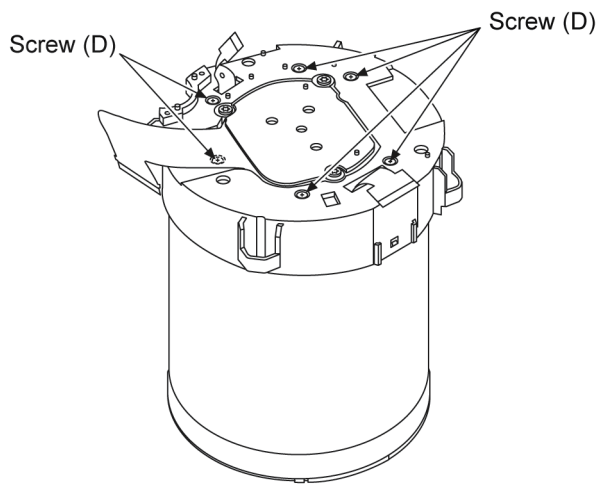
• Take care not to apply excessive force to the flex.

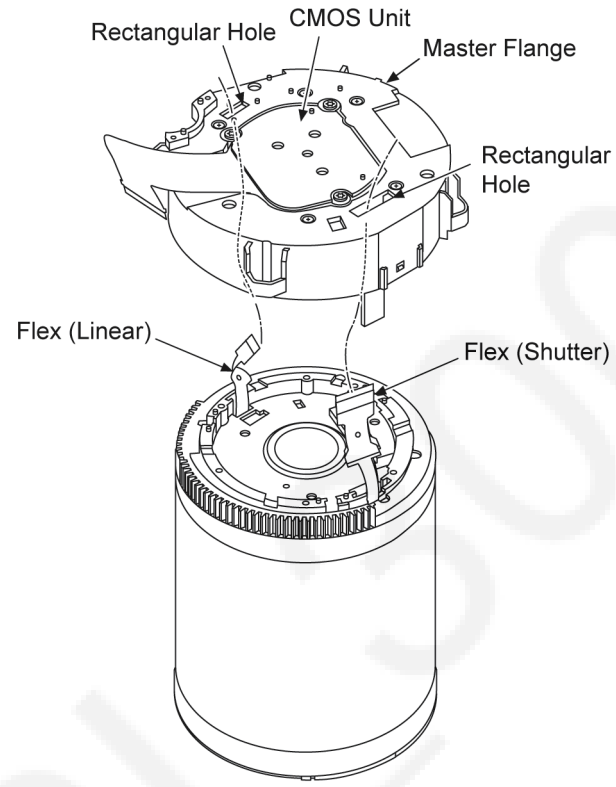
• Do not bend the flex excessively and take care not to damage the flex.

Screw (C)
2mm
SILVER

9.4.2. Removal of the Master Flange

1. Unscrew the 6 screws (D).
2. Put the 2 flexes (for shutter and linear) out through each rectangular hole, then remove the Master Flange.

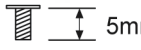




NOTE: (When Replacing)

- Take care not to apply excessive force to the flex.
- Do not bend the flex excessively and take care not to damage the flex.
- Take care not to put fingerprint on the lens.

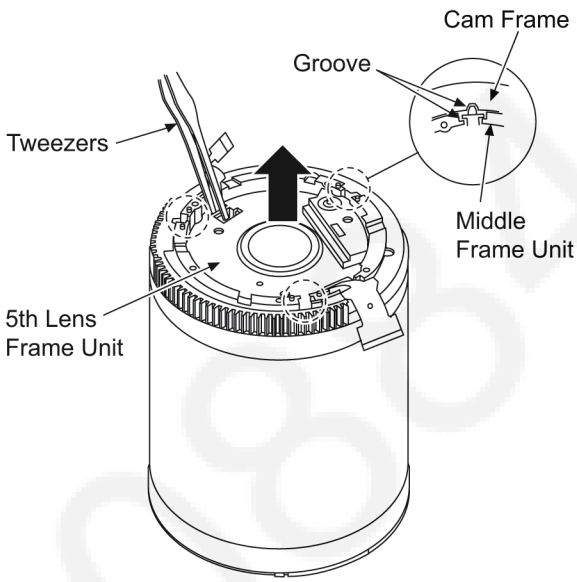
Screw (D)



SILVER

9.4.3. Removal of the 5th Lens Frame Unit

1. Confirm that the groove of Middle Frame Unit and groove of Cam Frame are aligned. (Phase alignment)
2. Remove the 5th Lens Frame Unit by using tweezers, etc..

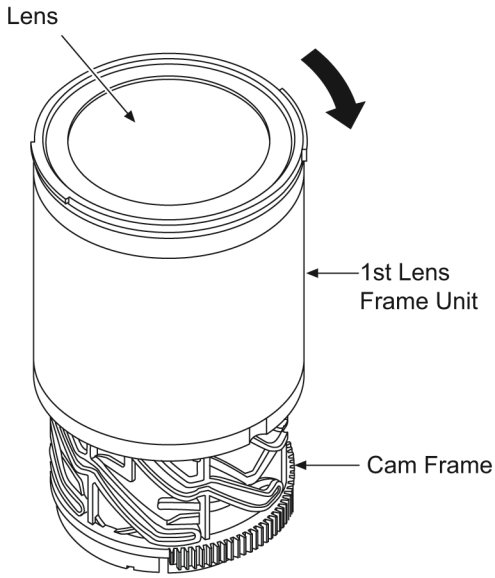


NOTE: (When Replacing)

- Take care not to put fingerprint on the lens.

9.4.4. Removal of the 1st Lens Frame Unit

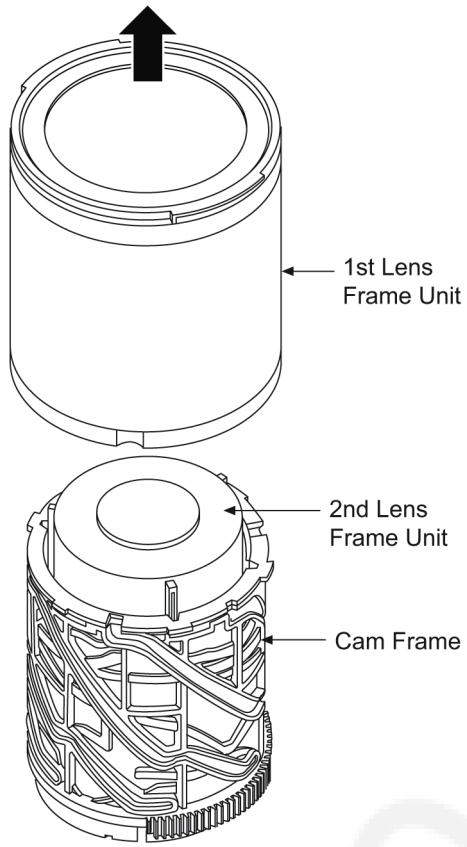
1. Put the lens side up of 1st Lens Frame Unit. (To prevent dropping of the 2nd Lens Frame Unit)
2. Rotate the 1st Lens Frame Unit clockwise fully.



NOTE: (When Replacing)

- Take care not to put fingerprint on the lens.

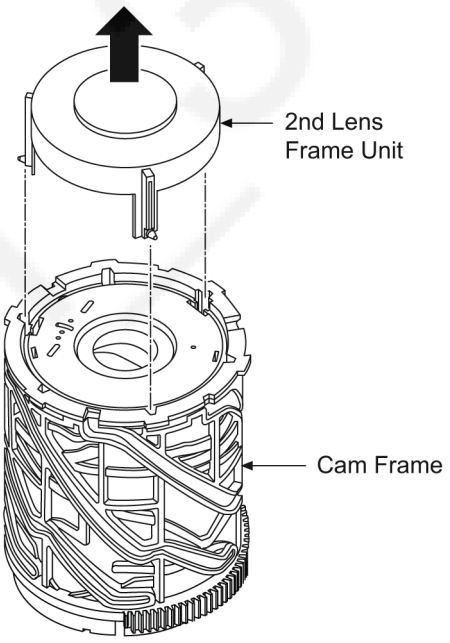
3. Pull up the 1st Lens Frame Unit in direction of arrow, then remove it.



NOTE: (When Replacing)
• Take care not to put fingerprint on the lens.

9.4.5. Removal of the 2nd Lens Frame Unit

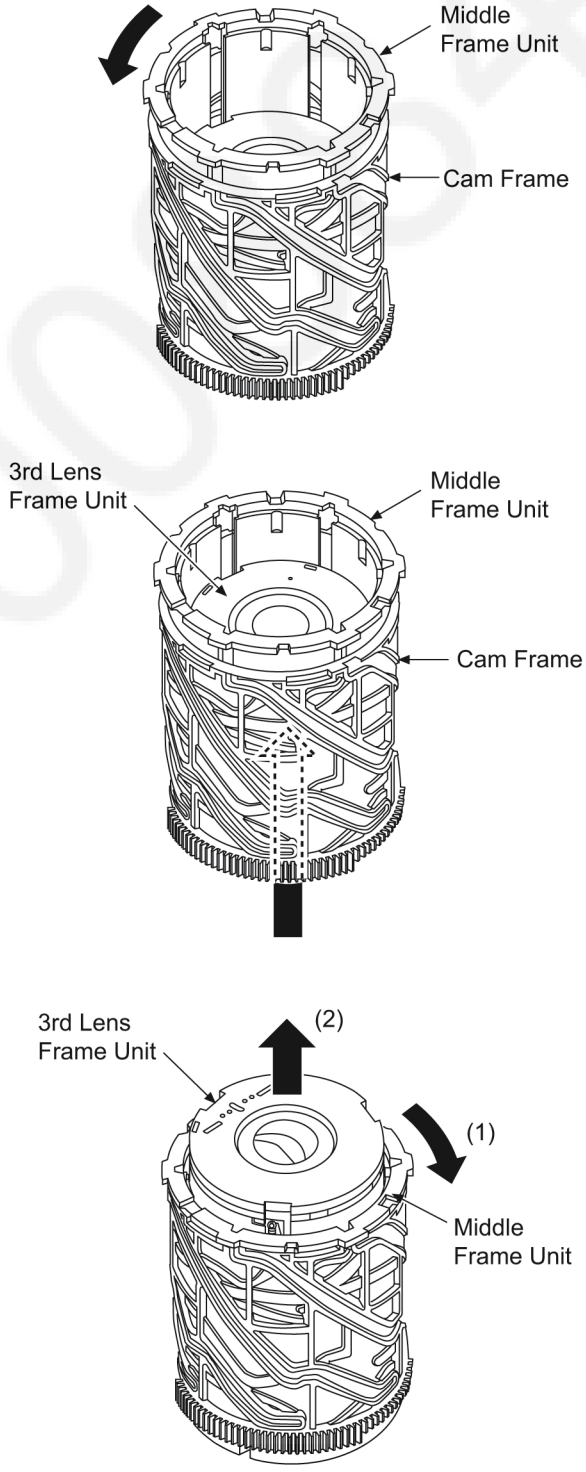
1. Pull up the 2nd Lens Frame Unit in direction of arrow, then remove it.



NOTE: (When Replacing)
• Take care not to put fingerprint on the lens.

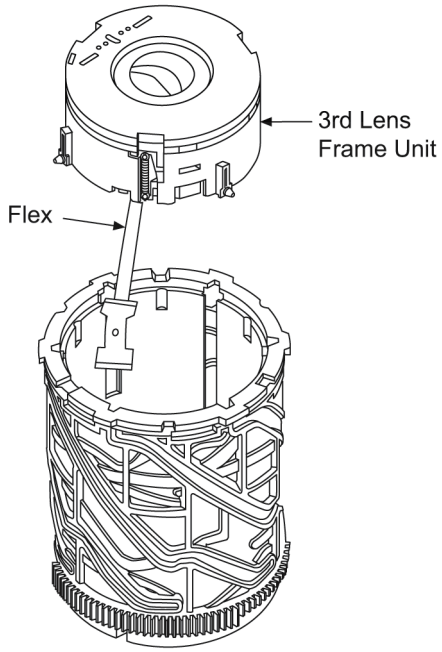
9.4.6. Removal of the 3rd Lens Frame Unit

1. Rotate the Middle Frame Unit counterclockwise fully. (Until the 3rd Lens Frame Unit stops.)
2. Push up the 3rd Lens Frame Unit fully from the lower side.
3. Rotate the Middle Frame Unit clockwise until the 3rd Lens Frame Unit is automatically little lifted and sounds “click”, then lift up the 3rd Lens Frame Unit.



NOTE: (When Replacing)
• Take care not to put fingerprint on the lens.

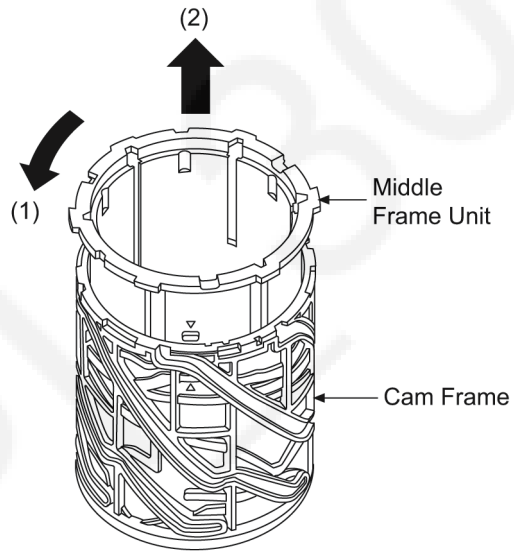
4. Remove the 3rd Lens Frame Unit with care to flex.



NOTE: (When Replacing)
- Take care not to apply excessive force to the flex.
- Do not bend the flex excessively and take care not to damage the flex.

9.4.7. Removal of the Middle Frame Unit

1. Rotate the Middle Frame Unit fully counterclockwise, and remove it upward.

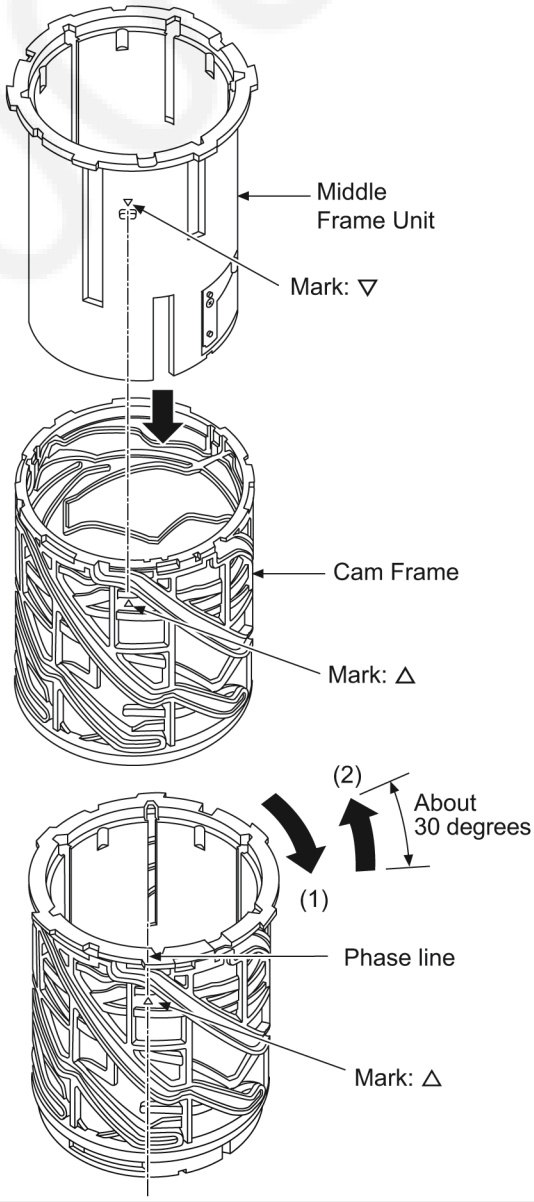


9.5. Assembly Procedure for the Lens (Phase Alignment)

Precaution:
1. Do not remove the CMOS Unit when disassembling or reassembling the lens in order to maintain it clean. When remove it, refer to item “9.6.”.
2. Keep dust or dirt away from the lens. To remove dirt or dust from the lens, blow with dry air.
3. Do not touch the lens surface.
4. Use lens cleaning KIT (VFK1900BK).

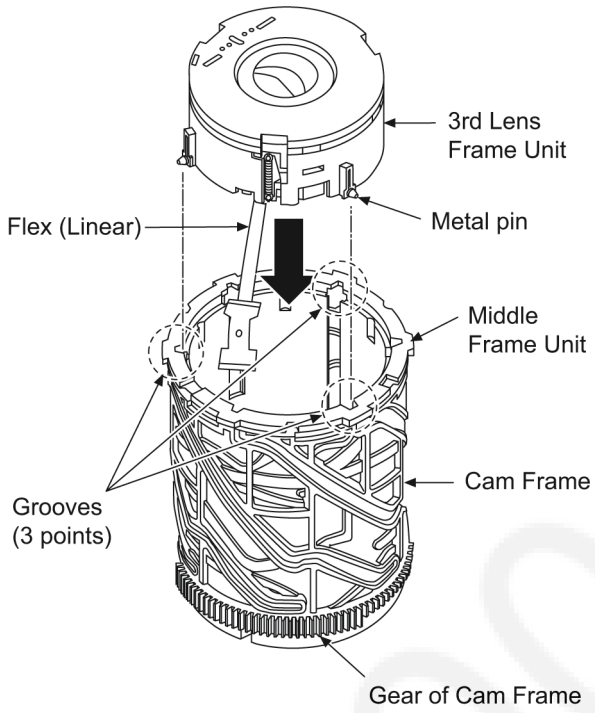
9.5.1. Assembly of the Middle Frame Unit and Cam Frame

1. Align the mark “▽” of Middle Frame Unit and mark “△” of Cam Frame, and then insert Middle Frame Unit into Cam Frame.
2. Rotate the Middle Frame Unit clockwise fully, then put back until the phase line of Middle Frame Unit and the mark “△” of Cam Frame has aligned. (About 30 degrees)

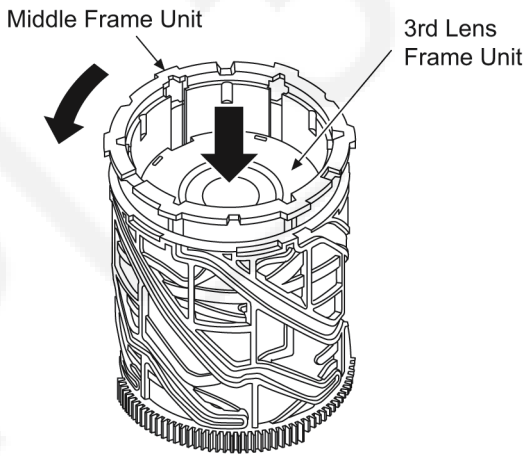


9.5.2. Assembly of the 3rd Lens Frame Unit

1. Align the Middle Frame Unit and 3 grooves of Cam Frame (Phase Alignment).
2. Keep the flex (linear) passed through the Middle Frame Unit.
3. In a state in which the gear of Cam Frame comes to the front, insert the metal pin of the 3rd Lens Frame Unit into the groove of Middle Frame Unit.

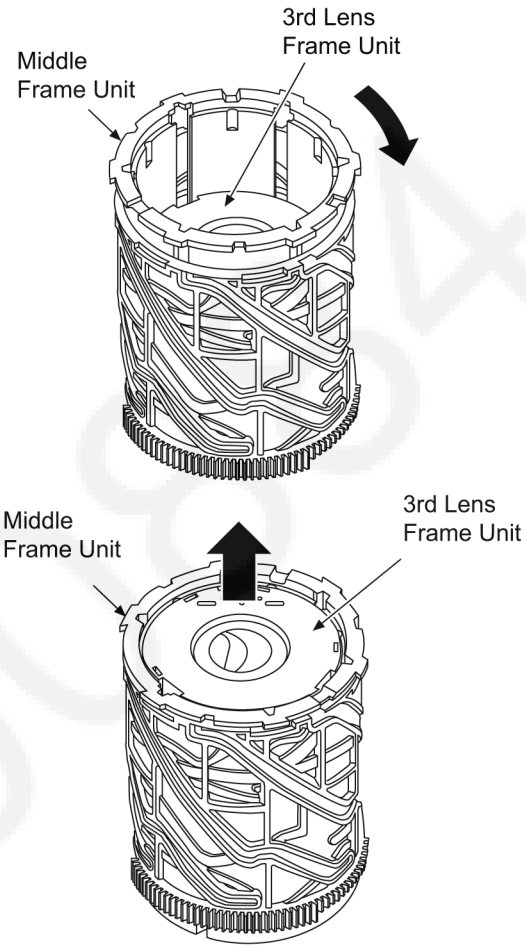


4. Rotate the Middle Frame Unit counterclockwise until the moves of 3rd Lens Frame Unit is stopped, then push down the 3rd Lens Frame Unit.



NOTE: (When Replacing)
- Take care not to apply excessive force to the flex.
- Do not bend the flex excessively and take care not to damage the flex.

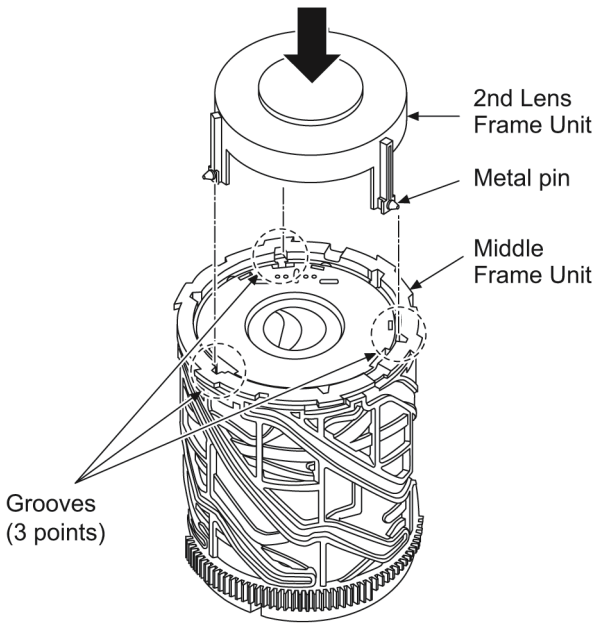
5. Rotate the Middle Frame Unit clockwise fully.
(3rd Lens Frame Unit sunken is lifted.)



NOTE: (When Replacing)
- Take care not to put fingerprint on the lens.

9.5.3. Assembly of the 2nd Lens Frame Unit

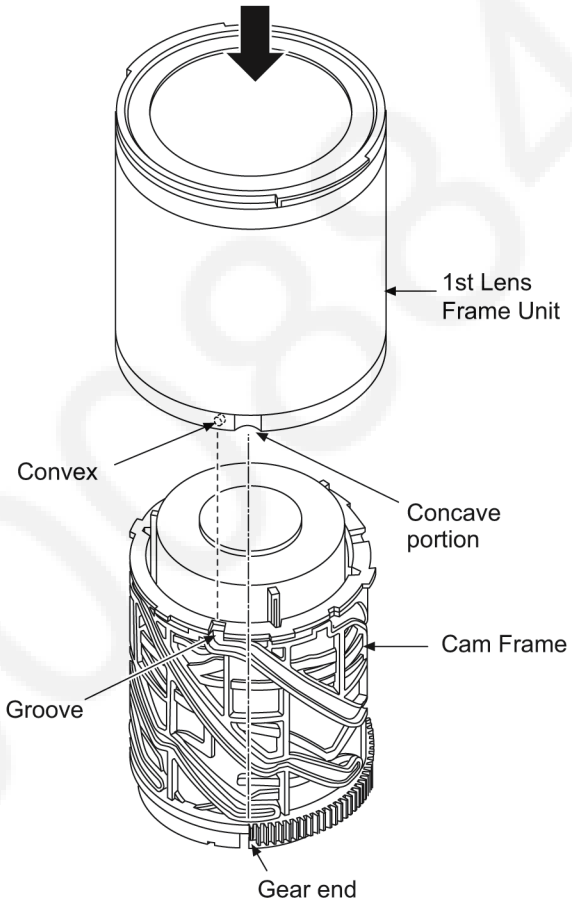
1. In a state in which the gear of Cam Frame comes to the front, insert the metal pin of the 2nd Lens Frame Unit into the groove of Middle Frame Unit.



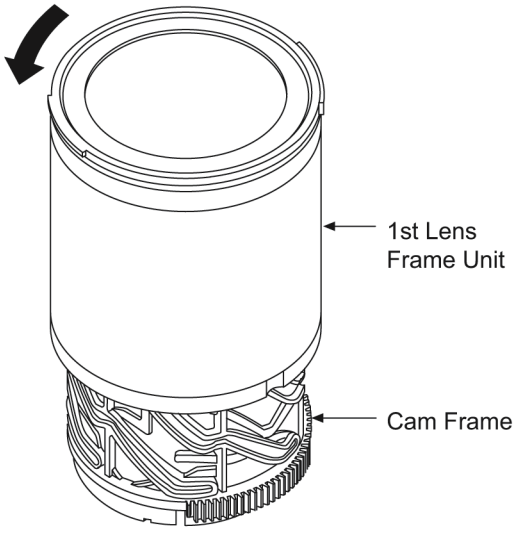
NOTE: (When Replacing)
- Take care not to put fingerprint on the lens.

9.5.4. Assembly of the 1st Lens Frame Unit

1. Align the concave portion of 1st Lens Frame Unit and the gear end of Cam Frame.
   Then align the convex of 1st Lens Frame Unit and the groove of Cam Frame, and insert 1st Lens Frame Unit.



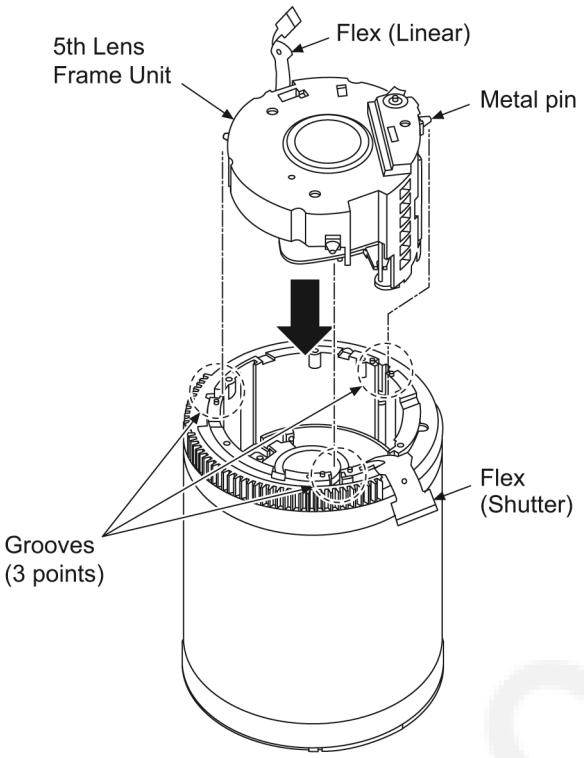
2. Rotate the 1st Lens Frame Unit counterclockwise fully.



NOTE: (When Replacing)
- Take care not to put fingerprint on the lens.

9.5.5. Assembly of the 5th Lens Frame Unit

1. In a state in which the gear of Cam Frame comes to the front, insert the metal pin of the 5th Lens Frame Unit into the groove of Middle Frame Unit.

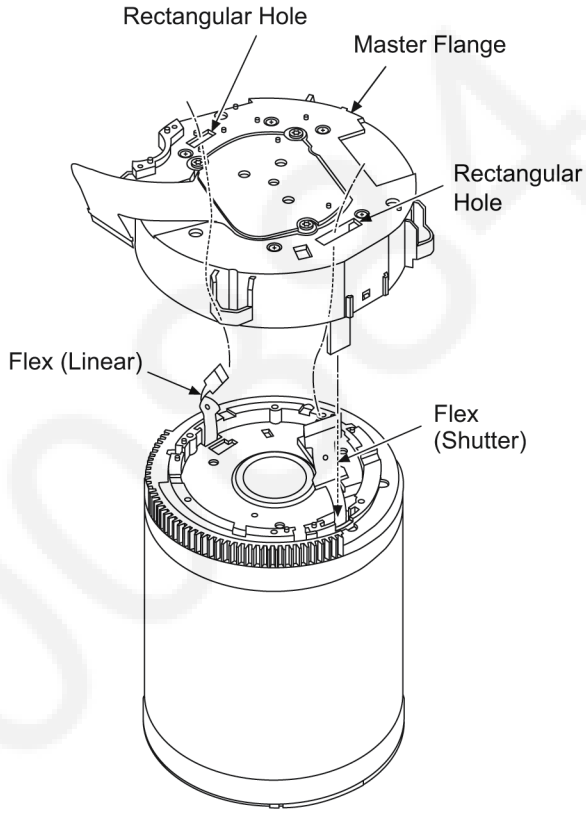


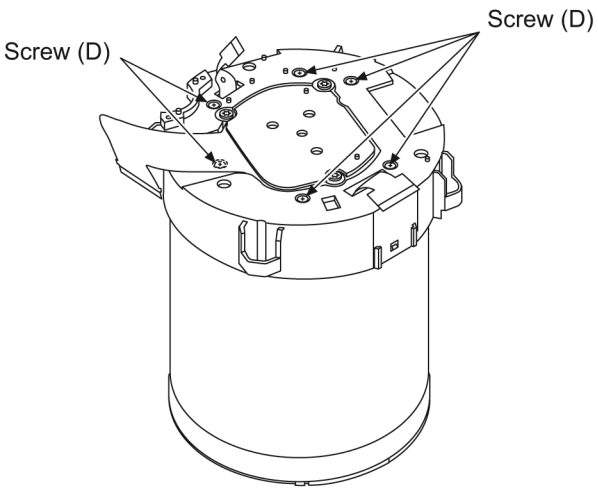
NOTE: (When Replacing)

- Take care not to put fingerprint on the lens.
- Take care not to pinch the flex.

9.5.6. Assembly of the Master Flange

1. Put the 2 flexes (for shutter and linear) out through each rectangular hole.
2. Install the Master Flange.
3. Tighten the 6 Screws (D).

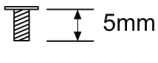




NOTE: (When Replacing)

- Take care not to pinch the flex.
- Do not bend the flex excessively and take care not to damage the flex.
- Take care not to put fingerprint on the lens.

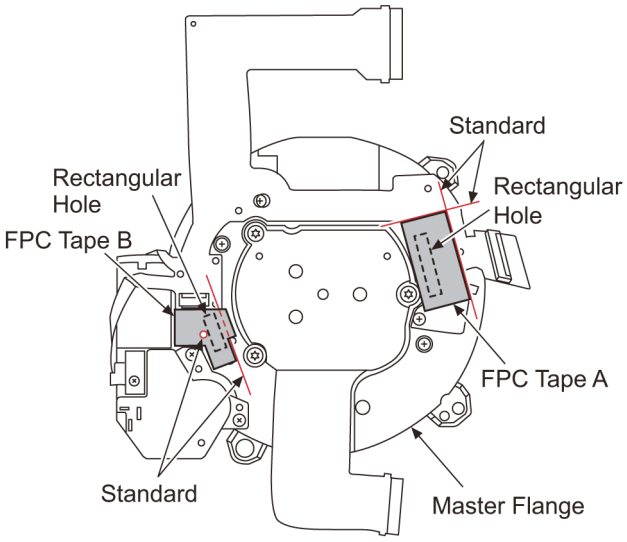
Screw (D)



SILVER

NOTE: (When Replacing)

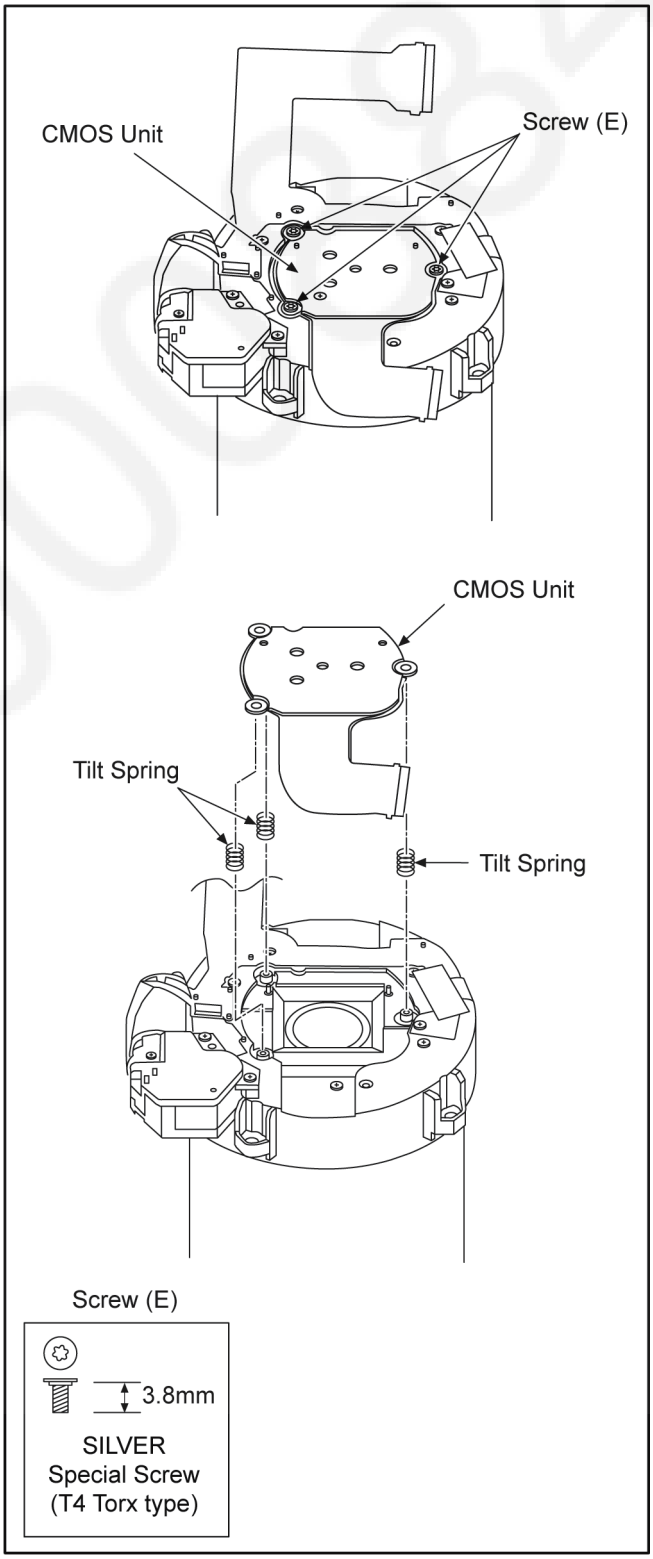
- When pasting the FPC Tape A and B, make sure the paste standard.
- When pasting the FPC Tape A and B, cover the rectangular hole of Master Flange.



9.6. Removal of the CMOS Unit

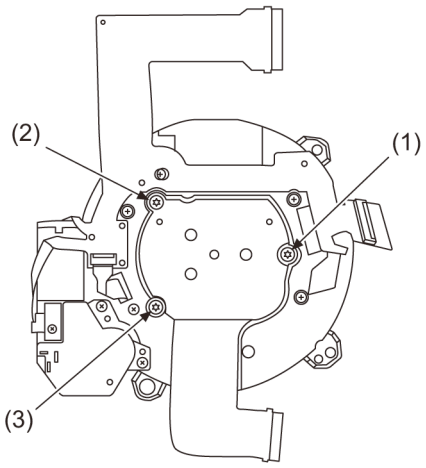
When remove the CMOS Unit once (the screw (E) is loosened even a little), the optical tilt adjustment is required.
When loosen the screw (E), necessary the optical tilt adjustment at the end of assembling. (Refer to item “10.3.2.”)
To prevent the CMOS Unit from catching the dust and dirt, do not remove the CMOS Unit except for replacing.

1. Unscrew the 3 screws (E).
2. Remove the CMOS Unit.
3. Remove the 3 Tilt Springs.



NOTE: (When Installing)

- Take new screw.
  (Don't reuse the screw)
- Tighten the 3 special screws according to the following.
  * Set the bit of optical tilt adjustment driver (RFKZ0569) to the torque driver (RFKZ0542).
  [Screw order]: (1)→(2)→(3).
  [Screw torque]: 10 ± 1 N•cm.



10 Measurements and Adjustments

10.1. Introduction

When servicing this unit, make sure to perform the adjustments necessary based on the part (s) replaced.
Before disassembling the unit, it is recommended to back up the camera data stored in Flash-ROM as a data file.

NOTE: (When replacing the Lens unit, Master Flange and CMOS Unit)

- When the CMOS Unit is unavoidably removed for Lens Unit, Master Flange and CMOS Unit replaced, an optical tilt adjustment is necessary after parts are exchanged.
- The adjustment software (DSC_Tilt) is necessary to execute an optical tilt adjustment.
- The adjustment software “DSC_Tilt” is available at “TSN Website”.

NOTE: (When replacing the Flash-ROM (IP2951) or Charging Control Microcomputer (IC1502))

When the Flash-Rom or Charging Control Microcomputer is replaced, it is need to adjust the firmware of the Charging Control Microcomputer to the one of the Flash-ROM.
For details, refer to "10.3.2. Adjustment Specifications".
It may takes about 10 seconds. While doing the adjustment, don't turn the power off forcibly.
(It cause the Charging Control Microcomputer crush, then the camera can not turn on.)

NOTE: (When replacing the Main P.C.B.)

- Number of necessary adjustment items decreases by copying the backup data to new Main P.C.B. when adjustment data in old Main P.C.B. can be read by ROM_BACKUP “DSC→SD” in “10.2.2. Flash-ROM Data Backup”.
  For more details, please refer an item “Main P.C.B. (to which the backup data was copied)” in the table of “10.3.2. Adjustment Specifications”.

10.2. Before Disassembling the unit

10.2.1. Initial Setting Release

The cameras specification are initially set in accordance with model suffix (such as EB/EG/GN and so on.).
Unless the initial setting is not released, an automatic alignment software in the camera is not able to be executed when the alignment is carried out.

Note:

The initial setting should be again done after completing the alignment. Otherwise, the camera may not work properly.
Therefore as a warning, the camera display a warning symbol “ ! ” on the LCD monitor every time the camera is turned off.
Refer to the procedure described in “3.5.2. Initial Settings” for details.

[How to Release the camera initial setting]

- Preparation:
  Attach the fully charged Battery, and insert the memory card (32MB or more).
  Remove the lens cap.

- **Step 1. The temporary cancellation of “Initial Settings”:**
  Set the [Mode dial] to “[P](Program AE mode)” and [Drive mode dial] to “Single”.
  While pressing [DISP.] button and [AF/AE LOCK] button simultaneously, turn the power on.

- **Step 2. The cancellation of “Initial Settings”:**
  Press the [Playback] button in order to enter the [Playback] mode.
  Press [AF/AE LOCK] button and “[UP] of Cursor buttons” simultaneously, then turn the power off.

  The LCD displays the “ ! ” mark before the unit powers down.

10.2.2. Flash-ROM Data Backup

Number of necessary adjustment items decreases by copying the backup data to new Main P.C.B. when adjustment data in old Main P.C.B. is usually read by ROM_BACKUP “DSC→SD”.

It is recommended to backup the Flash-ROM data as the way of return when trouble occurs before disassembling the unit depending on each case.

[ROM_BACKUP (Method of Non-PC backup)]

1. Insert the memory card into the camera.
2. Set the camera to “Temporary cancellation of the initial settings”.
3. Select the “SETUP” menu.
   From the “SETUP” menu, select “ROM_BACKUP”.
   NOTE:
   This item is not listed on the customer’s “SETUP” menu.
4. When this “ROM_BACKUP” item is selected, the following submenus are displayed.

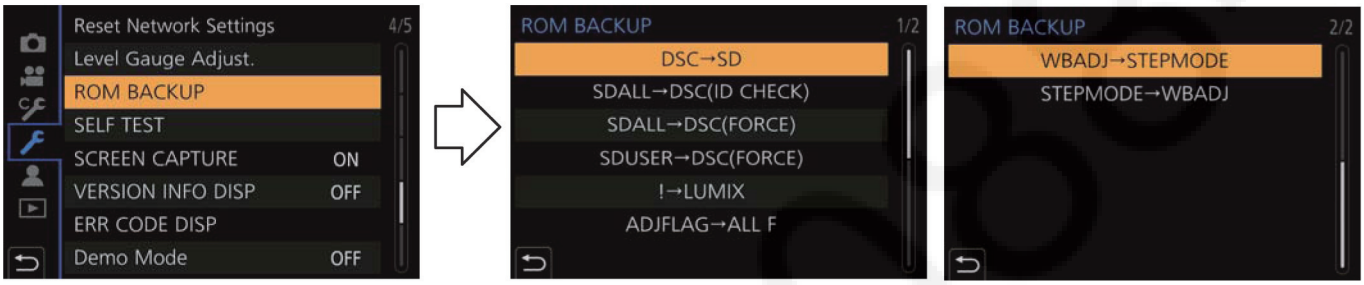


Fig. 2-1

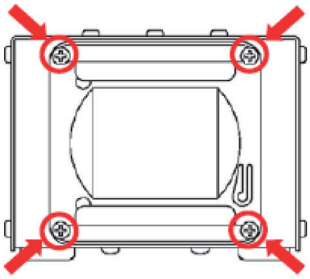
Item	Function	Details
DSC → SD	Save all the DSC's Flash-ROM data to Memory Card	・DSC's Flash-ROM data is saved to the Memory Card as a data file. (DATA BACKUP) - File location: ROOT DIRECTORY in Memory Card. - File Name: 1) User Setup Information data:<Model No.>U.TXT [Depending on the model, more than one file may be generated (e.g. <Model No.>U.TXT and <Model No.>U3.TXT).] 2) Electrical Adjustment data:<Model No.>F.TXT [Depending on the model, more than one file may be generated (e.g. <Model No.>F.TXT and <Model No.>F3.TXT).] ・If the concerned file already exists, "OVERWRITE?" message is displayed.
SDALL → DSC (ID CHECK)	Write the all data to DSC's Flash-ROM from Memory Card	・The backup data stored in the Memory Card is transferred to DSC unit. - ID CHECK: When the model ID is different, data is not transferred. - FORCE: Even if the model ID is different, data is transferred. * If the Main P.C.B. is replaced, select "SDALL→DSC(FORCE)".
SDALL → DSC (FORCE)	Write the all data to DSC's Flash-ROM from Memory Card	
SDUSER → DSC (FORCE)	Only "User setup information" is written from the saved file in the Memory Card to DSC's Flash-ROM	・Only the user's "setup" setting condition is transferred to DSC unit. ・FORCE: Even if the model ID is different, the data is not transferred.
! → LUMIX	Shipping set without initializing "User setup information"	・Initial setting is executed without initializing the user's set up setting condition. * The initial setting must be performed while the Self-timer LED is blinking. * The picture data stored in the built-in memory of the DSC is not erased, with this operation.
ADJFLAG → ALL F	Set all adjustment flags completion	・Status of the all adjustment flags are changed to "F" (completion).
WBADJ → STEPMODE	ISO: Adjustment WBL, WBM: Setting	・ISO: Sensitivity adjustment. ・WBL: Setting up the white in low color temperature. ・WBM: Setting up the white in high color temperature.
STEPMODE → WBADJ	Cancel "STEPMODE"	・Cancel the "STEPMODE" mode.

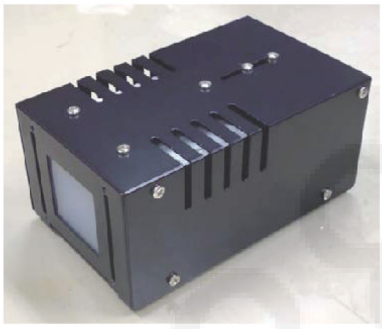
10.2.3. About Light Box

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 RFKZ0523 Light Box]





Unscrew the 4 screws, then remove the front hood.

10.3. Details of Electrical Adjustment

10.3.1. How to execute the Electrical Adjustment

It is not necessary to connect the camera to a PC to perform adjustments.
“Flag reset operation” and “Initial setting operation” are required when carrying out the alignment, follow the procedure below.

10.3.1.1. Startup Electrical Adjustment mode

1. Release the initial settings.
2. Insert a recordable memory card (32MB or more).
   (Without a memory card, the automatic adjustment can not be executed.)
3. Procedure to set the camera into adjustment mode:
   a. Set the mode dial to “[P](Program AE mode)”.
   b. Turn the Power on pressing [Q.MENU/Fn6] button, [(Delete/Cancel)/Fn7] button and [Motion picture] button simultaneously.
   LCD monitor displays “SERVICE MODE”. (Refer to Fig. 3-1)

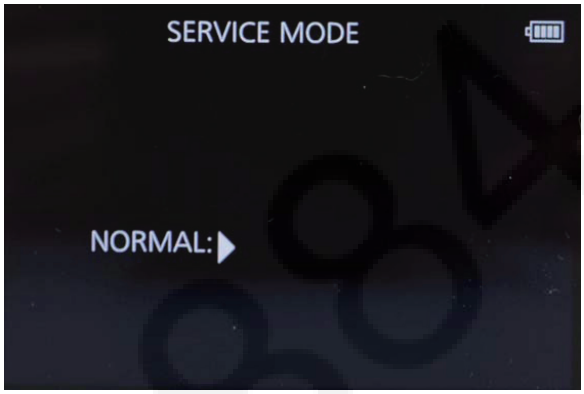


Fig. 3-1

10.3.1.2. Status Adjustment Flag Setting

Reset (Not yet adjusted) the status flag condition.

1. After pressing the [DISP.] button, the LCD monitor displays the Flag status screen. (Refer to Fig.3-2)
2. Select item by pressing the Cursor buttons. (Gray cursor is moved accordingly.)
3. Press the [(Delete/Cancel)/Fn7] button.

NOTE:
The selected item’s flag has been changed from “F (green)” to “0 (yellow)”.

*Flag conditions:
F (green)
means that the alignment has been completed and the status flag condition is set. In this case, the flag condition should be reset, if you try to carry out the automatic alignment.
0 (yellow)
means that the alignment has been not “completed” and the status flag condition is “reset”. In this case, automatic alignment is available.

Fig. 3-2

- In case of setting the status flag into set condition again without completion of the alignment, the status flag should be UNDONE by using ROM BACKUP function.

10.3.1.3. Execute Adjustment (In case of “OIS Adjustment”)

1. Perform step “10.3.1.1.” to “10.3.1.2.”, to reset the OIS flag status “F” (Set) to “0” (Reset)
2. Press [DISP.] button after Flag reset.
   OIS Adjustment screen is displayed on the LCD panel. (Refer to Fig.3-3)
3. Press the [Shutter] button.
   The adjustment will start automatically.

Fig. 3-3

4. When the adjustment is completed successfully, adjustment report menu appears with Green OK on the LCD monitor. (Refer to Fig.3-4)

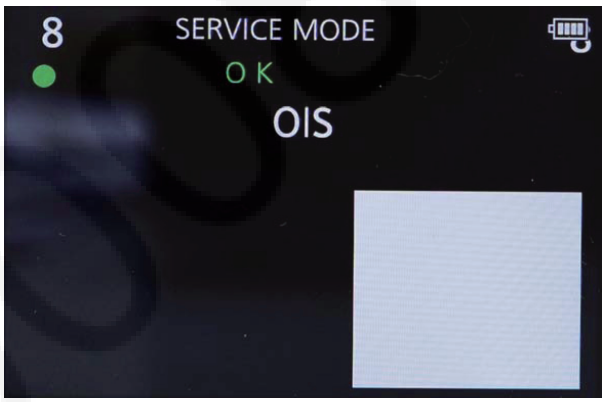


Fig. 3-4

10.3.1.4. Attention point during Adjustment

1. Step “10.3.1.3.” procedure shows OIS adjustment as an example. To perform the adjustment, refer to the “10.3.2. Adjustment Specifications” table which shows key point for each adjustment.
2. Do not move the light box, the camera or the chart while adjusting. If one of these is moved accidentally, start the adjustment again.
3. Do not press any buttons/keys until the default menu (Refer to Fig.3-5) is displayed on the LCD monitor. Otherwise, adjustment data may not be stored properly.
4. If the adjustment is interrupted accidentally, the alignment data may not be properly saved in the Flash-ROM.

NOTE:

- If the power turns off during adjustment, please re-adjust it from the beginning.

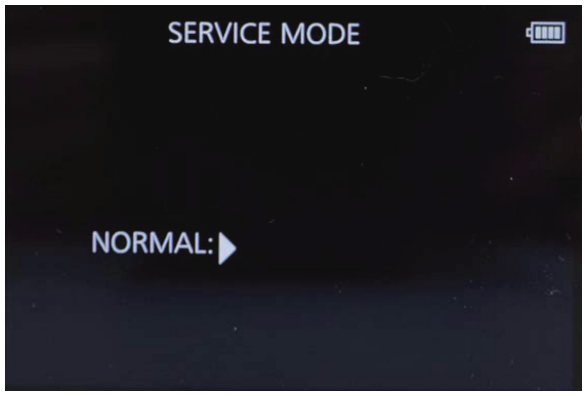


Fig. 3-5

10.3.1.5. Finalizing the Adjustment

1. Several adjustment flags can be reset (“F” into “0”) at the same time. In this case, when the adjustment has been completed, the screen will change showing the adjustment for the next item until all reset items are completed.
   Also, when the [Shutter] button is pressed, the screen jump to the next adjustment item.
2. To cancel the adjustment mode while in the process of performing the adjustment, follow this procedures.
3. Operate the following, when escaping the Electrical Adjustment mode on the way.
   (1) Press “[DISP.] button”.
   (2) Press “[RIGHT] of Cursor buttons”.

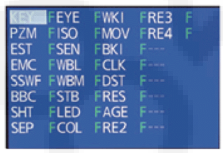
NOTE:

- If adjustment is cancelled with above procedure, adjustment is not completed. Make sure to adjust it later.

10.3.2. Adjustment Specifications

The following matrix table shows the relation between the replaced part and the Necessary Adjustment.
When a part is replaced, make sure to perform the necessary adjustment(s) in the order indicated.
The table below shows all the information necessary to perform each adjustment.

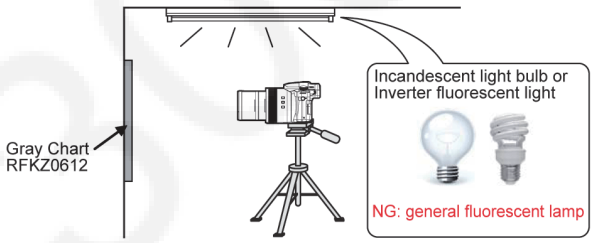
Adjustment order	Adjustment Item	FLAG	Purpose	Replacing Parts										JIG/TOOLS	SETUP	How to Operate
				MAIN P.C.B./VENUS ENGINE	MAIN P.C.B. (When written the Backup data)	Flash-ROM (IP2951)	Charging Control Microcomputer (IC1502)	Lens Part (Excluding Image Sensor)	Image Sensor (CMOS)	Microphone	FLash Part	Eye Sensor (Rear Case Unit)	Electronic Level (IC6201)			
1	Synchronization of Flash-ROM with the charge control microcomputer	–	Executing synchronization (optimization) of Flash-ROM with the charge control microcomputer (Upgrading the software version)	–	–	○	○	–	–	–	–	–	–	• Do adjust the firmware of the Charging Control Microcomputer to the firmware of the one of the Flash-ROM by the following procedure. 1) Release the camera initial setting. 2) Insert a memory card (32MB or more). 3) Turn the power off. The camera check the firmware of both the Flosh-ROM and Charging Control Microcomputer. If they are not match, the firmware of the Charging Control Microcomputer is updated and the camera is turned the power off automatically *While doing adjustment, don't turn the power off forcibly. It takes about 10 seconds to update the firmware of the Charging Control Microcomputer. While updating, the camera is displaying a warning symbol "!" on the LCD and lighting the AF Assist Lamp. (If the firmware of the camera (Flash-ROM) is old, the AF Assist Lamp does not light.)		
2	Optical Tilt	–	Adjustment of CMOS Unit installation angle to the Lens	–	–	–	–	○	○	–	–	–	–	NOTE: It is necessary to adjustment the optical tilt adjustment before the optical adjustment, when disassemble and repair the lens and image pickup device. It is necessary to use the "DSC_Tilt" software to allow the "Optical tilt adjustment". The Adjustment software "DSC_Tilt" is available at "TSN Website". • Optical Tilt Adjustment Driver RFKZ0569 : T4 • Optical Tilt Adjustment Chart RFKZ0570 • Camera Stand RFKZ0333J • Torque Driver RFKZ0542 * Tightening torques : 10N•cm ± 1 N•cm * It is necessary to adjustment the 3 screws. * Back angle (Default) : 360 degree * The screw locking glue is unnecessary, after adjustment.		
3	Zoom Home Position	ZHP	Zoom Home Position Adjustment	○	–	○	–	○	○	–	–	–	–	NONE	NONE	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
4	Venus Zoom	PZM	Venus Zoom Inspection	○	○	○	–	–	–	–	–	–	–	NONE	NONE	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
5	OIS sensor	OIS	OIS sensor output level adjustment	○	–	○	–	○	○	–	–	–	–	NONE	NONE	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
5	Iris	IRS	Iris adjustment	○	–	○	–	–	○	–	–	–	–	• Light Box RFKZ0523	1) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes close-up shooting (*A).	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Set the camera angle so that the diffusing surface of light box is displayed on the full of LCD monitor, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
6	Shutter	SHTc	Shutter speed adjustment	○	–	○	–	○	○	–	–	–	–	• Light Box RFKZ0523	1) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes close-up shooting (*A).	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Set the camera angle so that the diffusing surface of light box is displayed on the center of LCD monitor, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
7	Incident angle dependence WB adjustment	IAD	Incident angle dependence WB adjustment	○	–	○	–	○	○	–	–	–	–	• Light Box RFKZ0523	1) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes close-up shooting (*A).	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Set the camera angle so that the diffusing surface of light box is displayed on the full of LCD monitor, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)

Adjustment order	Adjustment Item	FLAG	Purpose	Replacing Parts: MAIN P.C.B./VENUS ENGINE	MAIN P.C.B. (When written the Backup data)	Flash-ROM (IP2951)	Charging Control Microcomputer (IC1502)	Lens Part (Excluding Image Sensor)	Image Sensor (CMOS)	Microphone	FLash Part	Eye Sensor (Rear Case Unit)	Electronic Level (IC6201)	JIG/TOOLS	SETUP	How to Operate
• Set "STEPMODE" to adjust ISO, WBL, WBM. < How to switch to "STEPMODE" > 1) Perform "10.2.2. Flash-ROM Data Backup", and select "WBADJ → STEPMODE" for ROM_BACKUP. 2) Press "MENU/SET", and mode to flag setting screen at "STEPMODE". ⇒ The screen appears on the LCD. (See Fig. on the right.)															Normal flag setting screen 	「STEPMODE」 flag setting screen 
8	ISO	ISO	ISO sensitivity adjustment	○	–	○	–	○	○	–	–	–	–	• Light Box RFKZ0523 • ND 0.3 Filter RFKZ0513	1) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes close-up shooting (*A).	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Set the camera angle so that the diffusing surface of light box is displayed on the center of LCD monitor, and press the shutter button fully. (When adjustment is started, the lens tube is not extended.) (When a result is OK, it is the completion of an inspection.)
9	White balance (Low color temp.)	WBL	Setting up the white in low color temperature	○	–	○	–	○	○	–	–	–	–	• Light Box RFKZ0523 • ND 0.9 Filter VFK1164ND09 • ND 0.3 Filter RFKZ0513 • CC-C7.5 Filter RFKZ0511	1) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes close-up shooting (*A).	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Set the camera angle so that the diffusing surface of light box is displayed on the center of LCD monitor, and press the shutter button fully. (When adjustment is started, the lens tube is not extended.) (When a result is OK, it is the completion of an inspection.)
10	White balance (High color temp.)	WBM	Setting up the white in high color temperature	○	–	○	–	○	○	–	–	–	–	• Light Box RFKZ0523 • ND 0.9 Filter VFK1164ND09 • ND 0.3 Filter RFKZ0513 • CC-C7.5 Filter RFKZ0511 • CC-Y10 Filter RFKZ0512 • LBB2 Filter RFKZ0520 • LBB8 Filter RFKZ0521	1) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes close-up shooting (*A).	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Set the camera angle so that the diffusing surface of light box is displayed on the center of LCD monitor, and press the shutter button fully. (When adjustment is started, the lens tube is not extended.) (When a result is OK, it is the completion of an inspection.) • After adjusting ISO, WBL, WBM, perform Initial Settings once. Then, cancel "STEPMODE". < How to release of "STEPMODE" > • Perform "10.2.2. Flash-ROM Data Backup", and select "STEPMODE → WBADJ" for ROM_BACKUP. Press "MENU/SET". Then again, cancel the Initial Settings. Move to servicing mode, and continue the subsequent adjustment.
11	Offset gain	SAT	Setting up the offset gain.	○	–	○	–	○	○	–	–	–	–	• Light Box RFKZ0523 • ND 0.6 Filter VFZ1164ND06	1) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes close-up shooting (*A).	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Set the camera angle so that the LCD monitor is white displayed on the full, and press the shutter button fully. (When adjustment is started, the lens tube is not extended.) (When a result is OK, it is the completion of an inspection.)
12	Backfocus / GYRO	BF	To have the focus tracking curve be appropriate shape and GYRO sensor adjustment	○	○	○	–	○	○ *1	–	–	–	○	• Collimator RFKZ0422	1) Set the camera in front of collimator so that the distance between collimator and camera body becomes close-up shooting (*A). * Set the camera on a tripod to prevent it from falling down.	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Set the camera angle so that the star chart is displayed to the center, and press the shutter button fully. (The lens starts zooming and stops automatically, then green ● mark is displayed on LCD.) 3) Sutter button fully. (When a result is OK, it is the completion of an inspection.)
		SHD	Do not use "SHD" adjustment flag for this unit. Use "BK2" adjustment flag, instead.													

Adjustment order	Adjustment Item	FLAG	Purpose	Replacing Parts										JIG/TOOLS	SETUP	How to Operate
				MAIN P.C.B./VENUS ENGINE	MAIN P.C.B. (When written the Backup data)	Flash-ROM (IP2951)	Charging Control Microcomputer (IC1502)	Lens Part (Excluding Image Sensor)	Image Sensor (CMOS)	Microphone	FLash Part	Eye Sensor (Rear Case Unit)	Electronic Level (IC6201)			
13	Eye sensor	EYE	Inspecting sensitivity of eye sensor	○	–	○	–	–	–	–	–	○	–	• Gray Card RFKZ0506	1) Set the camera in front of gray card so that the distance between gray card and eye sensor of camera body becomes 4.5 cm (*B).	1) Change the flag into the “0”, and then proceed to the adjustment mode. 2) Set the camera so that the attachment side of eye sensor and center of the gray card is perpendicular, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
14	Flash adjustment	STB	Flash adjustment	○	○	○	–	–	–	–	○	–	–	NONE	NONE	1) Change the flag into the “0”, and then proceed to the adjustment mode. 2) Slide the Flash Open Lever, and open the Flash. 3) Press the shutter button fully. 4) Check the flash shines and the light the AF Assist Lamp. (It is different for every model how many times it shines.) * When a flash does not shine, there is a possibility that the flash unit is out of order. 5) Check a test result. * Results of the tests are usually NG. (When a result is OK, it is the completion of an inspection.) 6) When a result is NG, rewrite STB flag to an adjustment using ADJFLG - ALL F of ROM BACKUP. * The flag “STB” is an item which checks shines operation of a flash automatically at a Manufacturing facility. For this reason, except environment for exclusive use, a result will be NG, but it is no problem if shines operation can be checked visually.
15	CMOS sensor Temp. white missing pixels *2	SKI	Registration of the Temp. white missing pixels and address recording	○	–	○	–	○	○	–	–	–	–	NONE	NONE	1) Change the flag into the “0”, and then proceed to the adjustment mode. 2) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
16	CMOS sensor FD white missing pixels *2	WKI	Registration of the FD (floating diffusion) white missing pixels and address recording	○	–	○	–	○	○ *1	–	–	–	–	NONE	NONE	1) Change the flag into the “0”, and then proceed to the adjustment mode. 2) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
		BKI	Do not use "BKI" adjustment flag for this unit. Use "BK2" adjustment flag, instead. (In case of most DSC models, the adjustment flag for CMOS SENSOR Missing Pixcels is "BKI". But, in this model, "BK2" the adjustment flag for CMOS SENSOR Missing Pixcels.)													
17	Color reproduction inspection and Microphone check	COL	Color reproduction inspection and Microphone check	○	–	○	–	○	○	○	–	–	–	NONE	NONE	1) Change the flag into the “0”, and then proceed to the adjustment mode. 2) Press the shutter button fully. 3) Utter the voice for about 5 seconds into the microphone, just before pushing a shutter release. * Utter the voice at the above the microphone. * Comparatively high voice is Ideal. (Standard:about 1KHz) (When a result is OK, it is the completion of an inspection.)

Adjustment order	Adjustment Item	FLAG	Purpose	Replacing Parts										JIG/TOOLS	SETUP	How to Operate
				MAIN P.C.B./VENUS ENGINE	MAIN P.C.B. (When written the Backup data)	Flash-ROM (IP2951)	Charging Control Microcomputer (IC1502)	Lens Part (Excluding Image Sensor)	Image Sensor (CMOS)	Microphone	FLash Part	Eye Sensor (Rear Case Unit)	Electronic Level (IC6201)			
18	Shading Compensation and CMOS SENSOR Missing Pixels (Black) *3	BK2	Compensation of Shading and Compensation of CMOS SENSOR Missing Pixels (Black)	○	–	○	–	○	○ *1	–	–	–	–	• Gray Chart RFKZ0612	Adjustment environment: The room of Incandescent light bulb or Inverter fluorescent light. Definitely single light room. Brightness: General room light level. 1) Paste the gray chart for flat wall. Take care the gray chart is illuminated on the full of room light. 2) Set the camera toward the gray chart. Check the LCD monitor is uniform brightness. * Set the camera on a tripod to prevent it from falling down.	1) Change the flag into the "0", and then proceed to the adjustment mode. (BK2 flag is 2nd pages.) 2) Press the shutter button fully. → Green ● mark is displayed on LCD. 3) Set the camera angle so that the gray chart is displayed to the full, and press the shutter button fully. → The 1st adjustment is executed, and then green ● mark is displayed on LCD. 4) Press the shutter button fully. → The lens starts zooming and stops automatically, then green ● mark is displayed on LCD. 5) Set the camera angle so that the gray chart is displayed to the full, and press the shutter button fully. → The 2nd adjustment is executed, and then green ● mark is displayed on LCD. 6) Press the shutter button fully. → The lens starts zooming and stops automatically, then green ● mark is displayed on LCD. 7) Set the camera angle so that the gray chart is displayed to the full, and press the shutter button fully. → The 3rd adjustment is executed, and then green ● mark is displayed on LCD. 8) Set the camera angle so that the gray chart is displayed to the full, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)

Installation when adjustment



Adjustment order	Adjustment Item	FLAG	Purpose	Replacing Parts: MAIN P.C.B./VENUS ENGINE	MAIN P.C.B. (When written the Backup data)	Flash-ROM (IP2951)	Charging Control Microcomputer (IC1502)	Lens Part (Excluding Image Sensor)	Image Sensor (CMOS)	Microphone	FLash Part	Eye Sensor (Rear Case Unit)	Electronic Level (IC6201)	JIG/TOOLS	SETUP	How to Operate
19	Electronic Level	AA2 + AA3	Electronic Level adjustment	○	○	○	–	–	–	–	–	–	○	• ACC Adjustment Chart	1) Download the “ACC Adjustment chart. pdf” and print it to A3 size (or equivalent size) paper. (“ACC Adjustment chart.pdf” is available at “TSN Website”. To download, click on “Support Information from NWBG/ VDBG-AVC”.) 2) Hang in the string with weight, then put the printed ACC adjustment chart on the wall or panel horizontally. (Fig. 1) * After putting the adjustment chart horizontally, remove the string with weight. * Attach the camera to tripod. <Setup procedures> 3-1) Adjust the height of tripod to match the lens of camera and center of the adjustment chart. 3-2) Apply the triangle (or equivalent) in center of the chart, then adjust center of the lens of camera on the vertical extension. 3-3) Confirm that the chart is displayed on the LCD monitor fully. 3-4) Fine adjust the camera angle so that the horizontal bar of chart is displayed horizontally on the LCD monitor and matches the cross guide line of the LCD monitor. (Fig.2.)	1) Change the flag “AA2” and “AA3” into the “0”, and then press DISP. button and proceed to the adjustment mode. <Offset adjustment> 2) Set the camera to the horizontal position. Then set the distance between adjustment chart and camera body becomes 25 cm (*A). (Fig. 3) 3) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.) <Tilt adjustment> 4) Rotate the camera to the 90 degrees, so that the grip side down, and press the shutter button.(Fig. 4) 5) Set the camera to the horizontal position, and press the shutter button.(Fig. 5) 6) Rotate the camera to the 90 degrees, so that the grip side up, and press the shutter button.(Fig. 6) (When a result is OK, it is the completion of an inspection.)
20	Write S/N	-	Write S/N	○	–	○	–	–	–	–	–	–	–	The adjustment software"Write S/N (Serial Number Writer)" is available at "DSC soft ware of TSN website"		
	Wi-Fi check	WiFi	Do not use "WiFi" adjustment flag for servicing. This adjustment is for factory procedure. (For confirmation of Wi-Fi function, use the reception level of Wi-Fi access point as usual.)													

Fig.1:
Setting of the adjustment chart horizontally

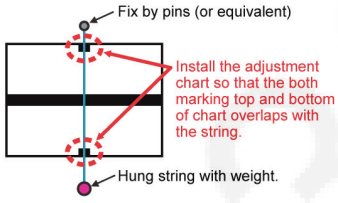


Fig.2:
Setting of the camera to the front of adjustment chart

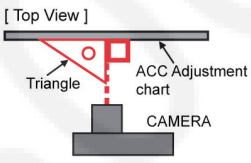


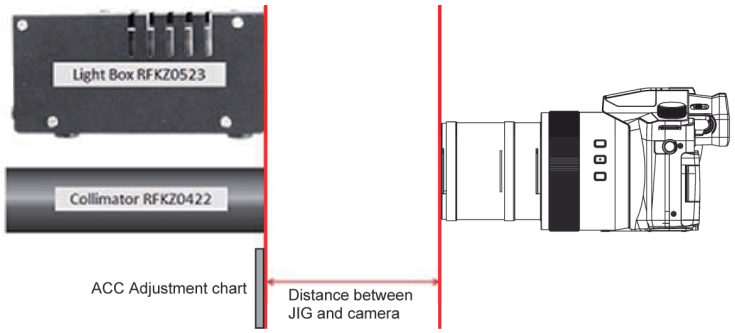
Fig.3:
[Offset]
(Horizontal Position)

Fig.4:
[Vertical Position]
(Grip side Down)

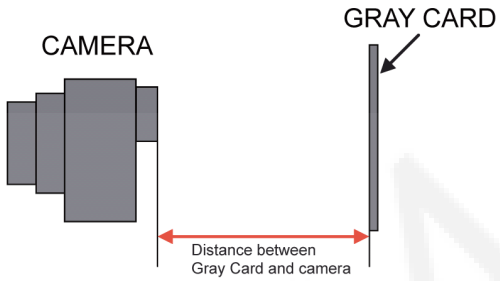
Fig.5:
[Horizontal Position]

Fig.6:
[Vertical Position]
(Grip side Up)

***A Installation distance during adjustment**



***B Distance between Gray Card and Camera**



* 1: This adjustment must be performed not only replacing the CMOS Unit, but also simply removing the CMOS Unit.
* 2: The pixel that always lights while shaded is called a white wound.
* 3: The pixel that does not light while complete exposed is called a black wound.

IMPORTANT NOTICE: (After replacing the Main P.C.B. (Venus Engine is included) or Venus Engine)
After replacing the Main P.C.B. (Venus Engine is included) or Venus Engine, make sure to perform the "Initial Settings" first, then release the "Initial Settings" in order to proceed the electrical adjustment.
NOTE:
1) If electrical adjustment or data re-writing is executed before "Initial Settings", suffix code list is never displayed, and it cannot be chosen suitable suffix code.
2) Never remove the battery during initial setting in process.

10.4. After Adjustment

10.4.1. Initial Setting

Since the initial setting has been released to execute the built-in adjustment software, it should be set up again before shipping the camera to the customer.
Refer to the procedure described in “3.5.2. Initial Settings” for details.

[IMPORTANT]

1. The initial setting should be done again after completing the alignment. Otherwise, the camera will not work properly. Therefore as a warning, the camera display a warning symbol “ ! ” on the LCD monitor every time the camera is turned off.
2. Confirm that status of all adjustment flag show “F”. Even if one of the adjustment flag shows “0”, initial setting programmed is never executed.

11 Maintenance

11.1. Cleaning Lens, Viewfinder and LCD Panel

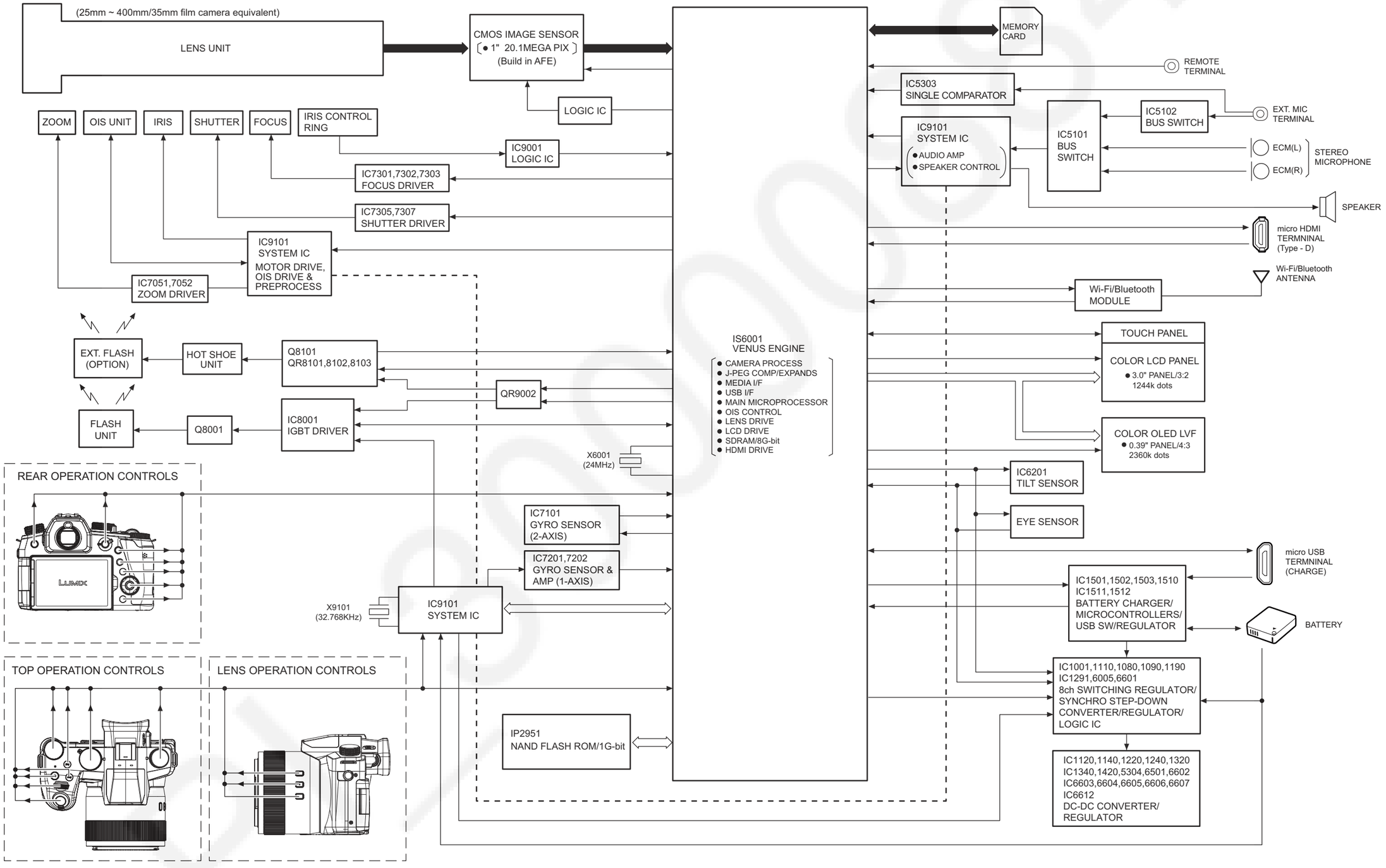
Do not touch the surface of lens, Viewfinder and LCD Panel with your hand.
When cleaning the lens, use air-blower to blow off the dust.
When cleaning the LCD Panel, dampen the lens cleaning paper with lens cleaner, and the gently wipe the its surface.

Note:

The Lens Cleaning Kit ; VFK1900BK (Only supplied as 10 set/Box) is available as Service Aid.

12 Block Diagram

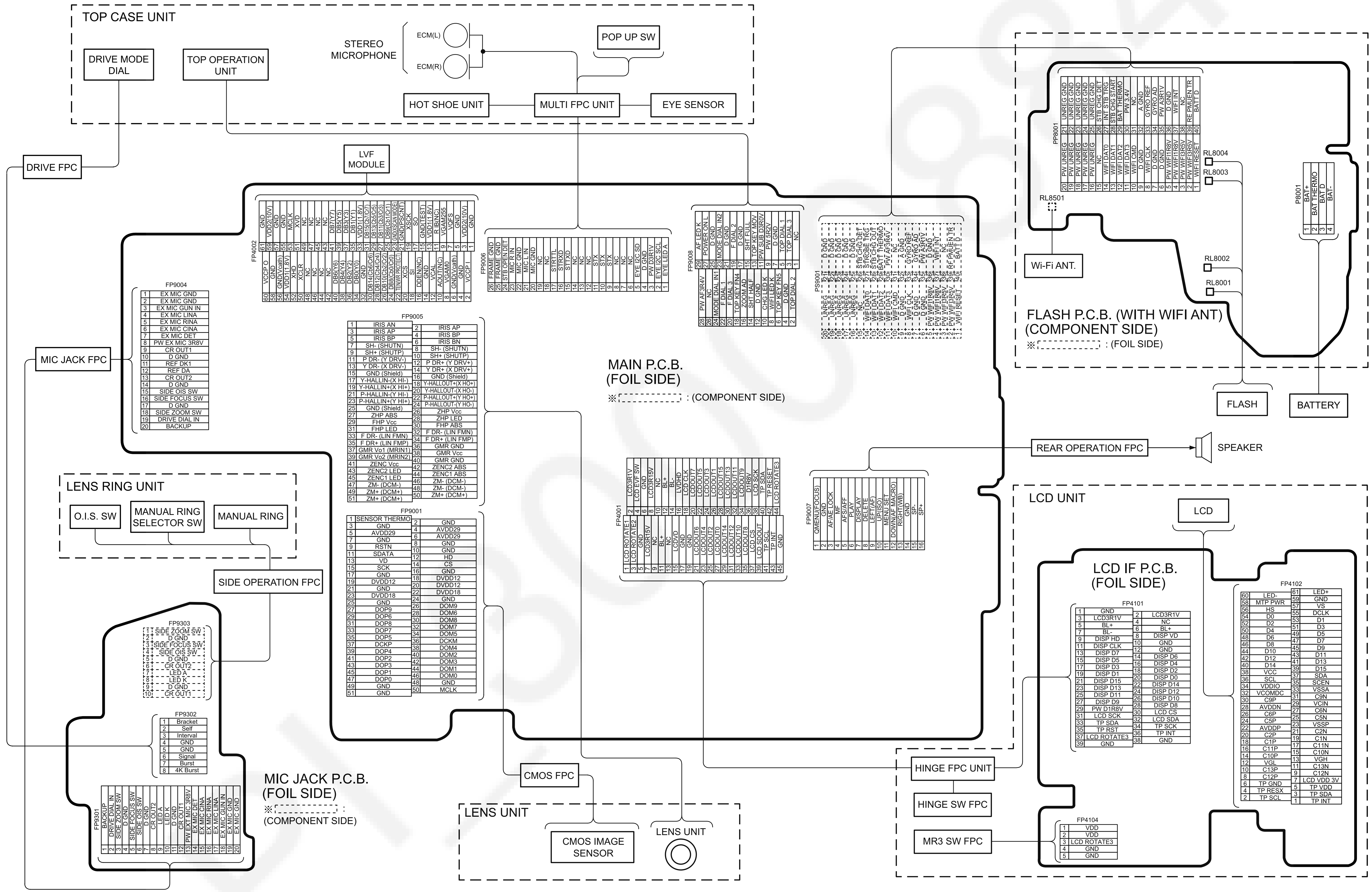
12.1. Overall Block Diagram



DC-FZ1000M2/FZ10002 OVERALL BLOCK DIAGRAM

13 Wiring Connection Diagram

13.1. Interconnection Diagram



DC-FZ1000M2/FZ10002 INTERCONNECTION DIAGRAM

14 Schematic Diagram

Please click the radio button for “Diagrams II / Parts List” on the menu bar in XML Service Manual.
If you want to print, please click the icon button for “Print” on the icon bar and select the item.

15 Printed Circuit Board

Please click the radio button for “Diagrams II / Parts List” on the menu bar in XML Service Manual.
If you want to print, please click the icon button for “Print” on the icon bar and select the item.

16 Exploded View and Replacement Parts List

Please click the radio button for “Diagrams II / Parts List” on the menu bar in XML Service Manual.
If you want to print, please click the icon button for “Print” on the icon bar and select the item.