

Service Manual

Digital Camera/Lens Kit/Body

LUMIX



Model No. **DMC-GF1CPP**

DMC-GF1CEB

DMC-GF1CEC

DMC-GF1CEG

DMC-GF1CGC

DMC-GF1CGH

DMC-GF1CGK

DMC-GF1CGN

DMC-GF1KPP

DMC-GF1KEB

DMC-GF1KEC

DMC-GF1KEG

DMC-GF1KGC

DMC-GF1KGH

DMC-GF1K GK

DMC-GF1KGN

DMC-GF1PP

DMC-GF1EB

DMC-GF1EC

DMC-GF1EG

DMC-GF1GC

DMC-GF1GH

Panasonic®

⚠ 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.

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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 $1\text{ M}\Omega$ and $5.2\text{ M}\Omega$. 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 $1.5\text{ k}\Omega$, 10 W resistor, in parallel with a $0.15\text{ }\mu\text{F}$ capacitor, between each exposed metallic part on the set and a good earth ground, as shown in Figure 1.
3. Use an AC voltmeter, with $1\text{ k}\Omega/\text{V}$ 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 $1/2\text{ mA}$. 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 Sub P.C.B.

CAUTION:

1. Be sure to discharge the E. Capacitor on FLASH SUB P.C.B..
2. Be careful of the high voltage circuit on FLASH SUB P.C.B. when servicing.

[Discharging Procedure]

1. Refer to the disassemble procedure and remove the necessary parts/unit.
2. Put the insulation tube onto the lead part of Resistor (ERG5SJ102:1k Ω /5W).
(An equivalent type of resistor may be used.)
3. Put the resistor between both terminals of E. Capacitor on FLASH SUB P.C.B. for approx. 5 seconds.
4. After discharging confirm that the E. Capacitor voltage is lower than 10V using a voltmeter.

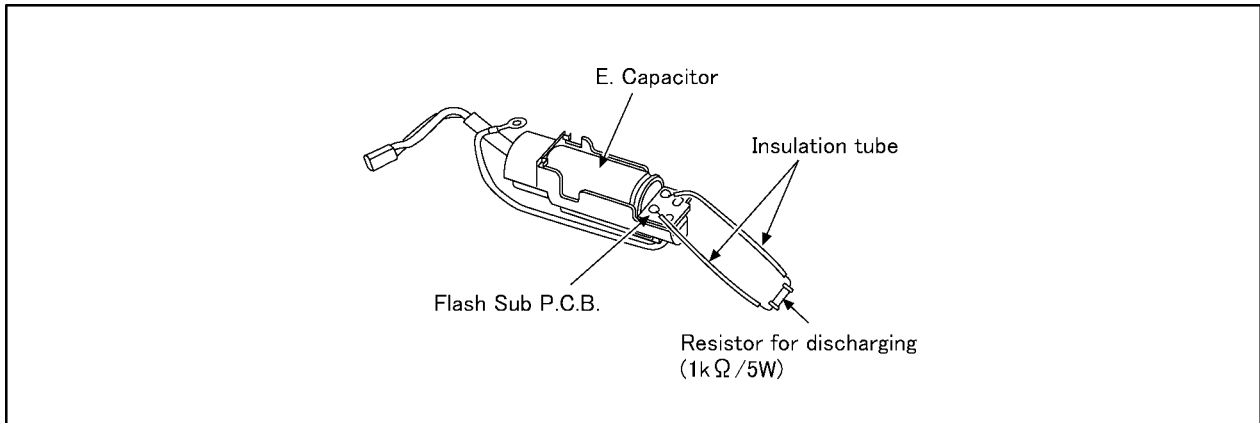


Fig. F1

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 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. Caution for AC Cord (For EB/GC/GH)

2.3.1. Information for Your Safety

IMPORTANT

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

WARNING

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

CAUTION

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

FOR YOUR SAFETY

DO NOT REMOVE THE OUTER COVER

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

2.3.2. Caution for AC Mains Lead

For your safety, please read the following text carefully.

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

A 5-ampere fuse is fitted in this plug.

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

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



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

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

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

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

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

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

If in any doubt, please consult a qualified electrician.

2.3.2.1. Important

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

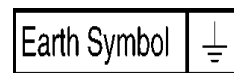
Blue	Neutral
Brown	Live

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

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

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

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



2.3.2.2. Before Use

Remove the Connector Cover as follows.



2.3.2.3. How to Replace the Fuse

1. Remove the Fuse Cover with a screwdriver.



2. Replace the fuse and attach the Fuse cover.



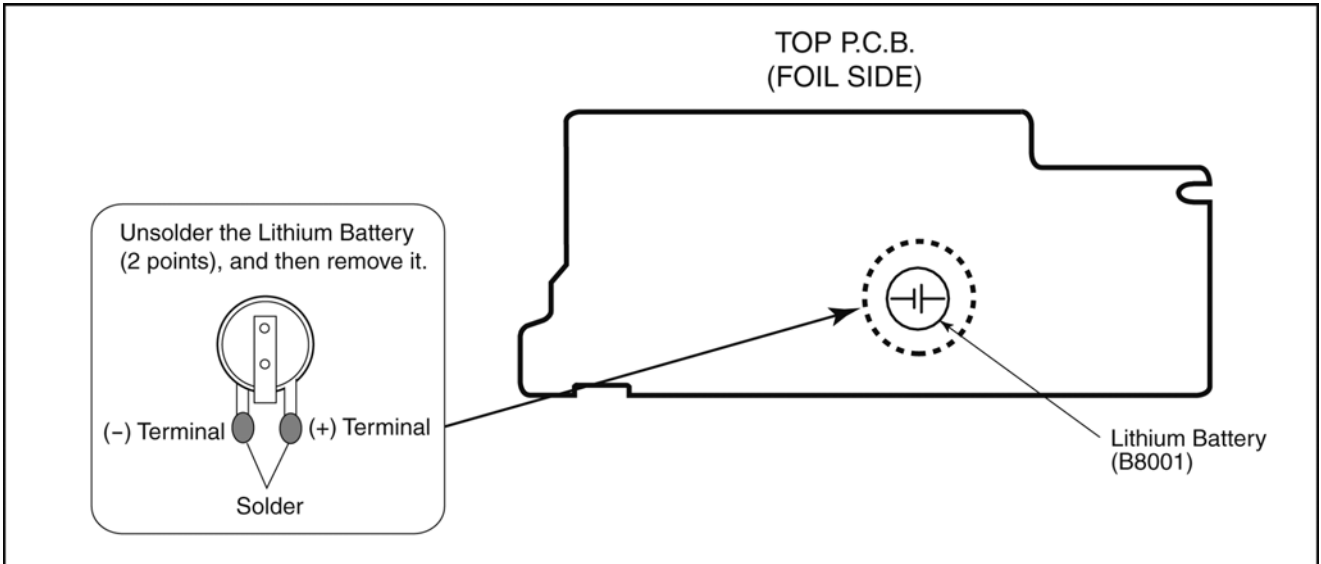
2.4. How to Replace the Lithium Battery

2.4.1. Replacement Procedure

1. Remove the TOP P.C.B.. (Refer to Disassembly Procedures.)
2. Unsolder the each soldering point of electric lead terminal for Lithium battery (Ref. No. "B8001" at foil side of TOP P.C.B.) and remove the Lithium battery together with electric lead terminal. Then replace it into new one.

NOTE:

The Type No. ML-421S/DN includes electric lead terminals.



NOTE:

This Lithium battery is a critical component.

(Type No.: ML-421S/DN **Manufactured by Energy Company, Panasonic Corporation.**)

It must never be subjected to excessive heat or discharge.

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

Replacement batteries must be of same type and manufacture.

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

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

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

(For English)

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the manufacturer's instructions.

(For German)

ACHTUNG

Explosionsgefahr bei falschem Anbringen der Batterie. Ersetzen Sie nur mit einem äquivalentem vom Hersteller empfohlenem Typ.

Behandeln Sie gebrauchte Batterien nach den Anweisungen des Herstellers.

(For French)

MISE EN GARDE

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

NOTE:

Above caution is applicable for a battery pack which is for DMC-GF1C/GF1K/GF1 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

*When servicing, it is recommended dealing with Clean box. (Refer to "8.2. Clean Box" section of this service manual for details.)

3.2.1. Camera Body Unit

3.2.1.1. About Mount Box Unit (Ref. 3)

1. This Service Manual does not contain the repair service information for "MOUNT BOX UNIT"(Ref.3), because it requires special facilities and equipment.
 - a. Schematic diagram, Block diagram and P.C.B. layout of "MOUNT BOX UNIT".
 - b. Parts list for individual parts of "MOUNT BOX UNIT".
2. If the "MOUNT BOX UNIT" is confirmed as defective, exchange the "MOUNT BOX UNIT" as a unit (supplied as service parts size).
3. Before exchange the "MOUNT BOX UNIT", the performances must be carefully checked, by following the "7.Troubleshooting Guide" section of this service manual.

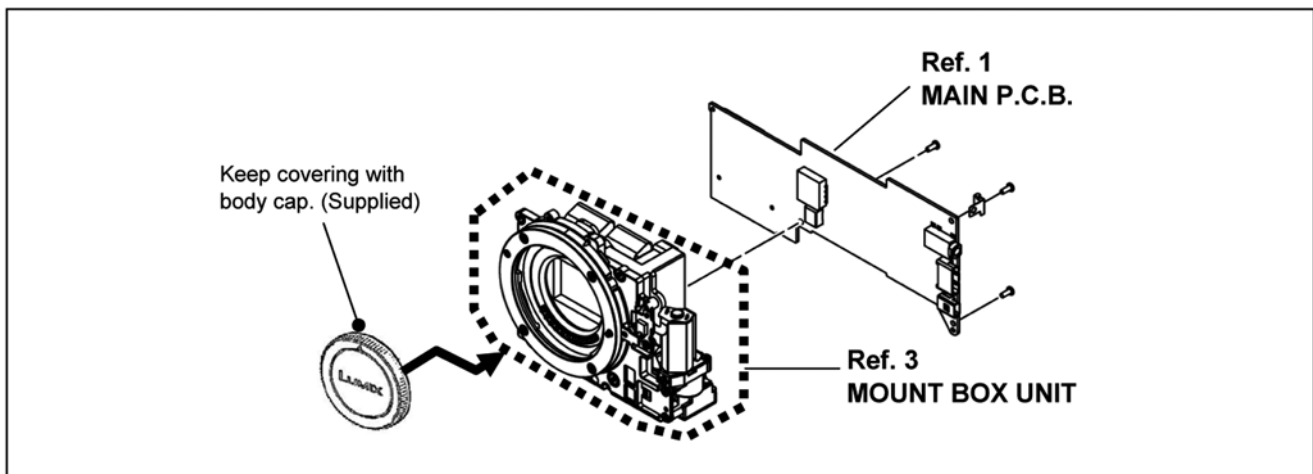


Fig. S1

Important:

1. After replacing the MOUNT BOX UNIT, the mount box data has to be stored to the unit. When the serial number of the mount box unit which is put on the shield plate of mount box unit is entered to the adjustment unit, the applicable data is stored into the MAIN P.C.B.. Refer to the adjustment instruction in the adjustment software for details.

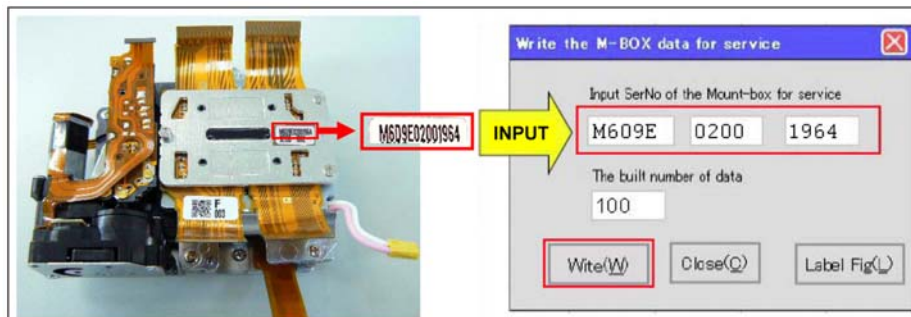


Fig. S2

2. The full adjustment must be performed after replacing the "MOUNT BOX UNIT", otherwise picture quality can not be meet with specification.

3.2.1.2. About Main P.C.B. (Ref. 1) / Power P.C.B. (Ref. 9)

1. This Service Manual does not contain the repair service information for "MAIN P.C.B."(Ref.1) and "POWER P.C.B."(Ref.9), because it requires special facilities and equipment.
 - a. Schematic diagram, Block diagram and P.C.B. layout of "MAIN P.C.B." / "POWER P.C.B.".
 - b. Parts list for individual parts of "MAIN P.C.B." / "POWER P.C.B.".
2. When a part replacement is required for repairing "MAIN P.C.B." and "POWER P.C.B.", replace as an assembled P.C.B. parts and send it/them to Central Repair Center.
3. The following category is recycle module part. Please send it/them to Central Repair Center.
 - *MAIN P.C.B. (VEP56094A: PP/GC/GH/GK/GN)
 - *MAIN P.C.B. (VEP56094B: EB/EC/EG)
 - *POWER P.C.B. (VEP51025A)

Important (About Main P.C.B.):

1. Before exchange the "MAIN P.C.B.", the performances must be carefully checked, by following the "7.Troubleshooting Guide" section of this service manual.
2. Before replacing the "MAIN P.C.B.", proceed the EEPROM data backup from the unit. After replacing the MAIN P.C.B., overwrite the EEPROM data with backup data from the unit first, then proceed the adjustment /inspection.

If it is impossible to make a data backup due to the unit does not turns on the power and so on, additional adjustment (using the light box) is required.

Refer to the adjustment instruction in the adjustment software for details.
3. The full adjustment must be performed after replacing the "MAIN P.C.B.", otherwise Picture quality can not be meet with specification.

3.2.2. Lens Unit (Interchangeable Lens: H-H020)

3.2.2.1. About Lens Main Block Unit (Ref. 215)

1. This Service Manual does not contain the repair service information for "LENS MAIN BLOCK UNIT"(Ref.215), because it requires special facilities and equipment.
2. The "LENS MAIN BLOCK UNIT"(Ref.215) performance must be confirmed.
3. In case of the "LENS MAIN BLOCK UNIT"(Ref.215) defect, contact to the service department of sales company.

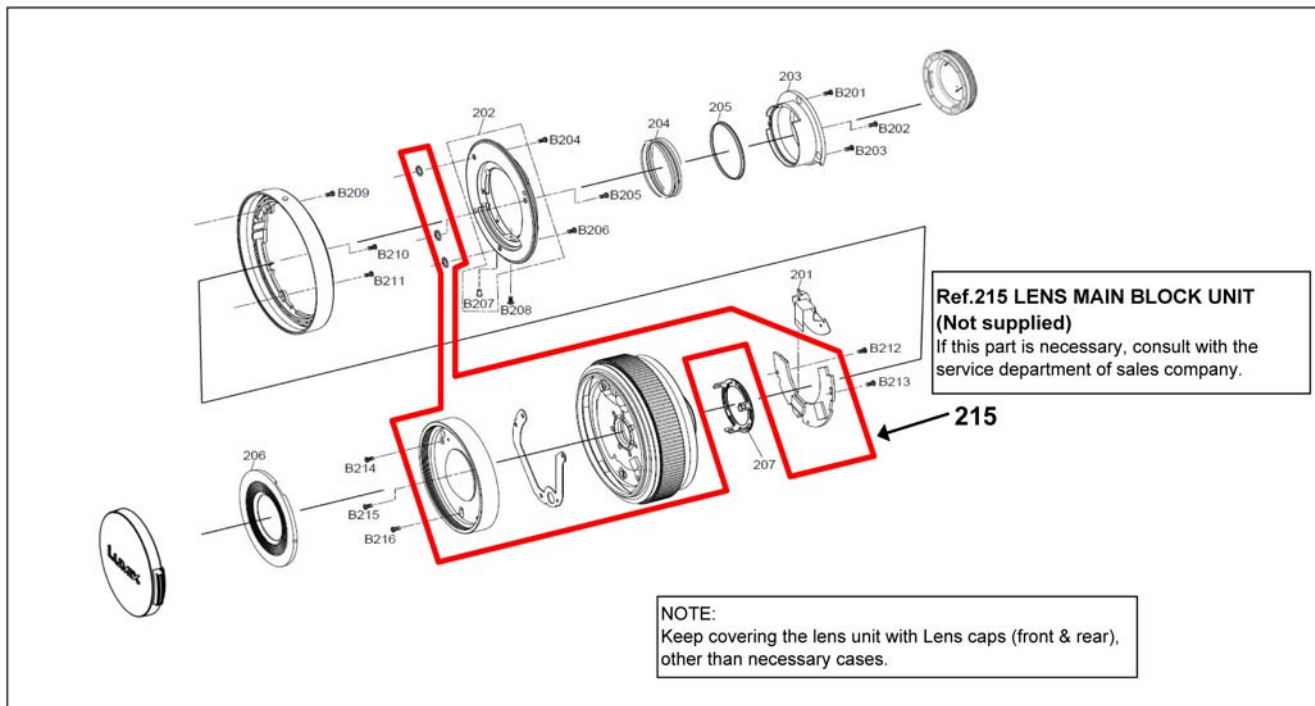


Fig. S3

3.2.3. Lens Unit (Interchangeable Lens: H-FS014045)

3.2.3.1. About Lens Main Block Unit (Ref. 308)

1. This Service Manual does not contain the repair service information for "LENS MAIN BLOCK UNIT"(Ref.308), because it requires special facilities and equipment.
2. The "LENS MAIN BLOCK UNIT"(Ref.308) performance must be confirmed.
3. In case of the "LENS MAIN BLOCK UNIT"(Ref.308) defect, contact to the service department of sales company.

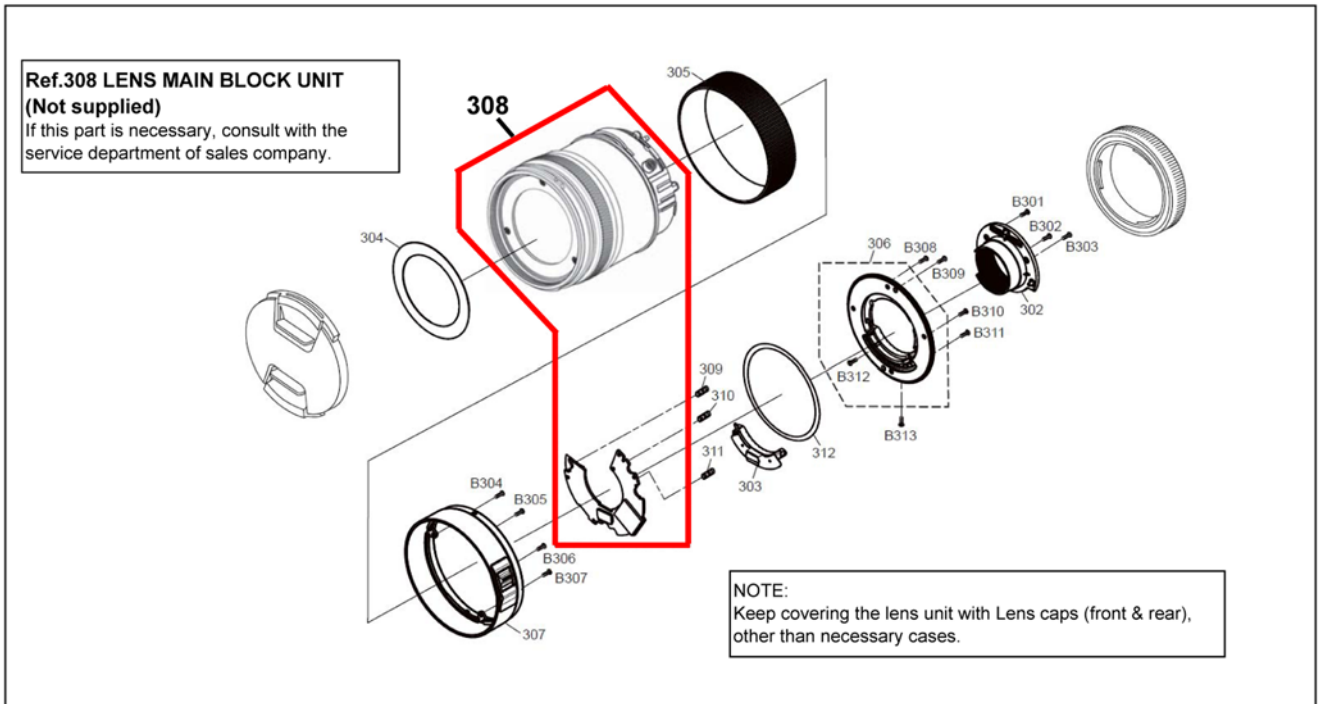


Fig. S4

3.2.4. 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. 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.
RFKZ03D01KS------(0.3mm 100g Reel)
RFKZ06D01KS------(0.6mm 100g Reel)
RFKZ10D01KS------(1.0mm 100g Reel)

Note

* Ingredient: tin (Sn) 96.5%, silver (Ag) 3.0%, Copper (Cu) 0.5%, Cobalt (Co) / Germanium (Ge) 0.1 to 0.3%

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






There are five kinds of DMC-GF1 (Camera body unit), regardless of the colours.

- a) DMC-GF1 (Japan domestic model)
- b) DMC-GF1PP
- c) DMC-GF1EB/EC/EG/GH/GN
- d) DMC-GF1GC
- e) DMC-GF1GK

What is the difference is that the "INITIAL SETTINGS" data which is stored in Flash-ROM mounted on MAIN P.C.B..

3.4.1. Defining methods:

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

<p>a) DMC-GF1 (Japan domestic model) The nameplate for this model show the following Safety registration mark.</p> 
<p>b) DMC-GF1PP The nameplate for this model show the following Safety registration mark.</p> 
<p>c) DMC-GF1EB/EC/EG/GH/GN The nameplate for these models show the following Safety registration mark.</p> 
<p>d) DMC-GF1GC The nameplate for this model show the following Safety registration mark.</p> 
<p>e) DMC-GF1GK The nameplate for this model show the following Safety registration mark.</p> 

NOTE:

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

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

3.4.2. INITIAL SETTINGS:

After replacing the MAIN P.C.B., be 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, be sure to read the following CAUTION.

CAUTION:(INITIAL SETTINGS)

---AFTER REPLACING THE MAIN P.C.B. ---

[Except "EG, EB and EC" models : (VEP56094A is used as a Main P.C.B.)]

*.The model suffix can be chosen JUST ONE TIME.
(Effective model suffix : " PP/GC/GK/GN/GH and NONE(JAPAN)")

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

[Only for "EG, EB and EC" models : (VEP56094B is used as a Main P.C.B.)]

*.From the beginning, only "EG, EB and EC" are displayed as model suffix lists, and these are displayed from the second times as well.

2. PROCEDURES:

- **Precautions:** Read the above "CAUTION" carefully.

- **Preparation:**

Attach the Battery or Battery Charger/AC Adaptor which is connected the DC cable, and insert the SD memory card.

- **Step 1. The temporary cancellation of "INITIAL SETTINGS":**

Set the Drive mode lever to [SINGLE].

While keep pressing [DISPLAY] and [AF/AE LOCK] buttons simultaneously, turn the Power on.

- **Step 2. The cancellation of "INITIAL SETTINGS":**

Press the [PLAYBACK] button, then playback the picture.

Press [AF/AE LOCK] and "[UP] of Cursor buttons" simultaneously, then turn the Power off.

- **Step 3. Turn the Power on:**

Set the mode dial to [P], and then turn the Power on.

- **Step 4. Display the INITIAL SETTING:**

While keep pressing [MENU/SET] 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.]

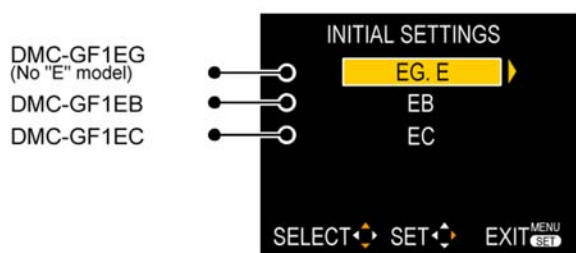
[Except "EG, EB and EC" models : (VEP56094A is used as a Main P.C.B.)]

When MAIN P.C.B. has just been replaced, all of the model suffix are displayed as follows. (two pages in total)



[Only for "EG, EB and EC" models : (VEP56094B is used as a Main P.C.B.)]

When MAIN P.C.B. has just been replaced, only 4 model suffix are displayed as follows.



[CASE 2. Other than "After replacing MAIN P.C.B."]



• Step 5. Choose the model suffix in "INITIAL SETTINGS": (Refer to "CAUTION")

[Caution: After replacing MAIN P.C.B.]

The model suffix can be chosen, **JUST ONE TIME**.

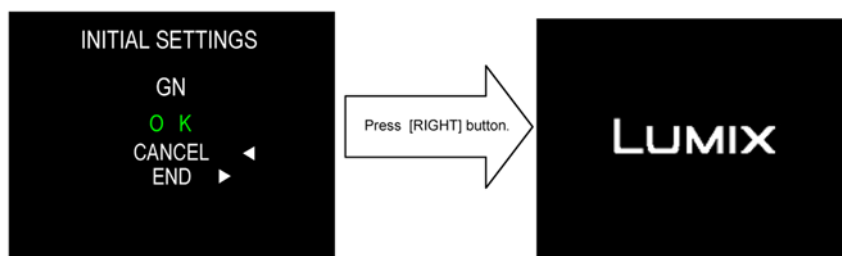
Once one of the model suffix have been chosen, the model suffix lists will not be displayed, thus, it can be changed.

Therefore, select the area carefully.

Select the area with pressing "[UP] / [DOWN] of Cursor buttons".

• Step 6. 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.)



• Step 7. 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.

1) 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)	DMC-GF1 (Japan domestic model)	NTSC	Japanese	Year/Month/Date	
b)	DMC-GF1PP	NTSC	English	Month/Date/Year	
c)	DMC-GF1EG	PAL	English	Date/Month/Year	
d)	DMC-GF1GC	PAL	English	Date/Month/Year	
e)	DMC-GF1GK	PAL	Chinese (simplified)	Year/Month/Date	
f)	DMC-GF1EB	PAL	English	Date/Month/Year	
g)	DMC-GF1GN	PAL	English	Date/Month/Year	
h)	DMC-GF1EC	PAL	English	Date/Month/Year	
i)	DMC-GF1GH	PAL	English	Date/Month/Year	

4 Specifications

Digital Camera Body (DMC-GF1):

Information for your safety

Power Source:	DC 9.3 V
Power Consumption:	2.4 W (When recording with LCD Monitor) [When 20 mm/F1.7 lens included in DMC-GF1C is used] 2.7 W (When recording with LCD Monitor) [When 14–45 mm/F3.5–5.6 lens included in DMC-GF1K is used] 1.5 W (When playing back with LCD Monitor) [When the 20 mm/F1.7 lens included in DMC-GF1C is used] 1.8 W (When playing back with LCD Monitor) [When 14–45 mm/F3.5–5.6 lens included in DMC-GF1K is used]

Camera effective pixels:	12,100,000 pixels
Image sensor:	4/3" Live MOS sensor, total pixel number 13,060,000 pixels, Primary color filter
Digital zoom:	Max. 4×
Extended Optical Zoom: (Except for the maximum picture size for each aspect ratio)	ON/OFF simple enlargement (compatible with lenses from other manufacturers)
Focus:	Auto focus/Manual Focus, Face detection/AF Tracking/ 23-area-focusing/1-area-focusing
Shutter system:	Focal-plane shutter
Burst recording	
Burst speed:	3 pictures/second (High speed), 2 pictures/second (Low speed)
Number of recordable pictures:	Max. 7 pictures (when there are RAW files) Depends on the capacity of the card (when there are no RAW files)
ISO sensitivity (Standard Output Sensitivity):	AUTO/[ISO]100/200/400/800/1600/3200
Shutter speed:	B (Bulb) (max. 4 minutes), 60 seconds to 1/4000th of a second
Metering range:	EV 0 to EV 18
White balance:	Auto white balance/Daylight/Cloudy/Shade/Incandescent lights/ Flash/White set1/White set2/White balance K set
Exposure (AE):	Program AE (P)/Aperture-priority AE (A)/Shutter-priority AE (S)/ Manual exposure (M)/AUTO Exposure Compensation (1/3 EV Step, -3 EV to +3 EV)
Metering mode:	Multiple/Center weighted/Spot
LCD monitor:	3.0" TFT LCD (Approx. 460,000 dots) (field of view ratio about 100%)
Flash:	Built-in pop up flash GN 6 equivalent (ISO100·m) Flash range: Approx. 40 cm (1.32 feet) to 7.0 m (23.0 feet) (When the 20 mm/F1.7 lens included in DMC-GF1C is mounted, [ISO AUTO] is set) Flash range: Approx. 1.0 m (3.28 feet) to 3.4 m (11.2 feet) (When the 14–45 mm/F3.5–5.6 lens included in DMC-GF1K is mounted, WIDE, [ISO AUTO] is set) AUTO, AUTO/Red-eye reduction, Forced ON, Forced ON/ Red-eye reduction, Slow sync., Slow sync./Red-eye reduction, Forced OFF
Flash synchronization speed:	Equal to or smaller than 1/160th of a second
Microphone:	Monaural
Speaker:	Monaural
Recording media:	SD Memory Card/SDHC Memory Card
Picture size	
Still picture:	When the aspect ratio setting is [4:3] 4000×3000 pixels, 2816×2112 pixels, 2048×1536 pixels When the aspect ratio setting is [3:2] 4000×2672 pixels, 2816×1880 pixels, 2048×1360 pixels When the aspect ratio setting is [16:9] 4000×2248 pixels, 2816×1584 pixels, 1920×1080 pixels When the aspect ratio setting is [1:1] 2992×2992 pixels, 2112×2112 pixels, 1504×1504 pixels
Recording quality	
Motion pictures:	[AVCHD Lite] (With audio) [Only for "PP" model] When set to [SH]: 1280×720 pixels (60p recording*/17 Mbps)/ When set to [H]: 1280×720 pixels (60p recording*/13 Mbps)/ When set to [L]: 1280×720 pixels (60p recording*/9 Mbps) (*Sensor output is 30 frames/sec.) [Except for "PP" model] When set to [SH]: 1280×720 pixels (50p recording*/17 Mbps)/ When set to [H]: 1280×720 pixels (50p recording*/13 Mbps)/ When set to [L]: 1280×720 pixels (50p recording*/9 Mbps) (*Sensor output is 25 frames/sec.) [MOTION JPEG] (With audio) When set to [HD]: 1280×720 pixels (30 frames/sec.)/ When set to [WVGA]: 848×480 pixels (30 frames/sec.)/ When set to [VGA]: 640×480 pixels (30 frames/sec.)/ When set to [QVGA]: 320×240 pixels (30 frames/sec.) RAW/RAW+Fine/RAW+Standard/Fine/Standard
Quality:	
Recording file format	
Still Picture:	JPEG (based on "Design rule for Camera File system", based on "Exif 2.21" standard)/DPOF corresponding
Pictures with audio:	JPEG (based on "Design rule for Camera File system", based on "Exif 2.21" standard)+QuickTime* (pictures with audio)
Motion pictures with audio:	AVCHD Lite/QuickTime Motion JPEG
Interface	
Digital:	"USB 2.0" (High Speed)
Analog video/audio:	[Only for "PP" model] NTSC [Except for "PP" model] NTSC/PAL Composite (Switched by menu), Audio line output (monaural)

Terminal

[REMOTE]:	φ 2.5 mm jack
[AV OUT/DIGITAL]:	Dedicated jack (8 pin)
[HDMI]:	MiniHDMI TypeC (1.3a corresponding)
[DC IN]:	None (when using an AC adaptor, use optional DC cable)
[External viewfinder]:	Dedicated connector
[External microphone]:	None

Dimensions: Approx. 119 mm (W)×71 mm (H)×36.3 mm (D)
[4 11/16" (W)×2 13/16" (H)×1 7/16" (D)] (excluding the projecting parts)

Mass (weight): Approx. 285 g/10.1 oz (camera body),
Approx. 442 g/15.6 oz,
(with the 20 mm/F1.7 lens included in DMC-GF1C, card and battery)
Approx. 537 g/18.9 oz,
(with the 14–45 mm/F3.5–5.6 lens included in DMC-GF1K, card and battery)

Operating temperature: 0 °C to 40 °C (32 °F to 104 °F)

Operating humidity: 10% to 80%

AC Adaptor (Panasonic DE-A49*):

Information for your safety

Input:	110 V to 240 V~50/60 Hz, 0.3 A
Output:	DIGITAL CAMERA 9.3 V==1.2 A CHARGE 8.4 V==0.65 A

Battery Pack (lithium-ion) (Panasonic DMW-BL13*):

Information for your safety

Voltage/capacity :	7.2 V/1250 mAh
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Interchangeable Lens (H-H020)

"LUMIX G 20 mm/F1.7 ASPH."

Focal length:	f=20 mm (35 mm film camera equivalent: 40 mm)
Aperture type:	7 leaf shutters/iris diaphragm/circular diaphragm
Aperture range:	F1.7
Minimum aperture value:	F16
Lens construction:	7 elements in 5 groups (2 non-spherical lenses)
In focus distance:	20 cm (0.66 feet) to ∞ (from the focus distance reference line)
Maximum image magnification:	0.13× (35 mm film camera equivalent: 0.25×)
Stabilizer:	None
Mount:	"Micro Four Thirds Mount"
Angle of view:	57°
Filter diameter:	46 mm (1.81 inch)
Max. diameter:	Approx. 63 mm (2.48 inch)
Overall length:	Approx. 25.5 mm (1.00 inch) (from the tip of the lens to the base side of the lens mount)
Mass (weight):	Approx. 100 g (3.53 oz)

Interchangeable Lens (H-FS014045)

"LUMIX G VARIO 14–45 mm/F3.5–5.6 ASPH./MEGA O.I.S."

Focal length:	f=14 mm to 45 mm (35 mm film camera equivalent: 28 mm to 90 mm)
Aperture type:	7 leaf shutters/iris diaphragm/circular diaphragm
Aperture range:	F3.5 (Wide) to F5.6 (Tele)
Minimum aperture value:	F22
Lens construction:	12 elements in 9 groups (1 non-spherical lenses)
In focus distance:	30 cm (0.99 feet) to ∞ (from the focus distance reference line)
Maximum image magnification:	0.17× (35 mm film camera equivalent: 0.34×)
Optical Image Stabilizer:	Available
Mount:	"Micro Four Thirds Mount"
Angle of view:	75° (Wide) to 27° (Tele)
Filter diameter:	52 mm (2.05 inch)
Max. diameter:	Approx. 60 mm (2.36 inch)
Overall length:	Approx. 60 mm (2.36 inch) (from the tip of the lens to the base side of the lens mount)
Mass (weight):	Approx. 195 g (6.88 oz)

NOTE:(Only for "EB/EC/EG" models)

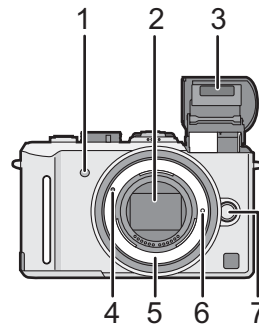
- Data from the PC can not be written to the camera using the USB connection cable.
- Motion pictures can be recorded continuously for up to 29 minutes 59 seconds.

5 Location of Controls and Components

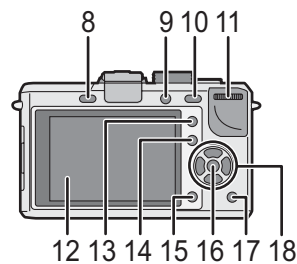
Names of the Components

■ Camera body

- 1 Self-timer indicator
- 2 AF assist lamp
- 3 Sensor
- 4 Flash
- 5 Lens fitting mark
- 6 Mount
- 7 Lens lock pin
- 8 Lens release button

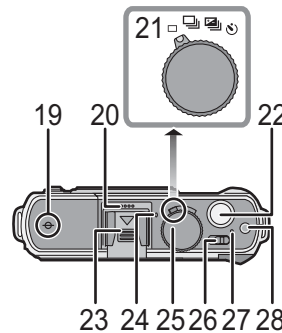


- 8 Flash open button
- 9 Playback button
- 10 [AF/AE LOCK] button
- 11 Rear dial
- 12 LCD monitor
- 13 [AF/MF] button
- 14 [Q.MENU] button
- 15 [DISPLAY] button
- 16 [MENU/SET] button
- 17 Delete button/
Preview button/
Flicker reduction function
- 18 Cursor buttons
 - ▲/ISO
 - ◀/AF mode
 - ▼/Function button

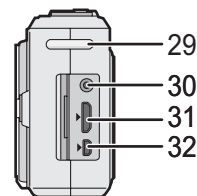


Assign Menu to ▼ button. It is convenient to register a Menu that is used often.
 [FILM MODE]/[ASPECT RATIO]/[QUALITY]/[METERING MODE]/[I.EXPOSURE]/
 [GUIDE LINE]/[REC AREA]/[REMAINING DISP.]
 ▶/WB (White balance)

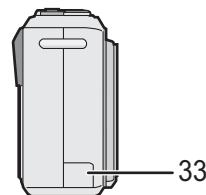
- 19 Focus distance reference mark
- 20 Speaker
- 21 Drive mode lever
 - Single:
 - Burst:
 - Auto Bracket:
 - Self-timer:
- 22 Shutter button
- 23 Hot shoe cover
- 24 Microphone
- 25 Mode dial
- 26 Camera ON/OFF switch
- 27 Status indicator
- 28 Motion picture button



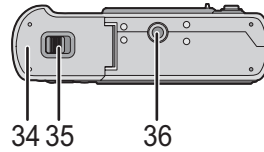
- 29 Shoulder strap eyelet
 - Be sure to attach the shoulder strap when using the camera to ensure that you will not drop it.
- 30 [REMOTE] socket
- 31 [HDMI] socket
- 32 [AV OUT/DIGITAL] socket



- 33 DC cable cover



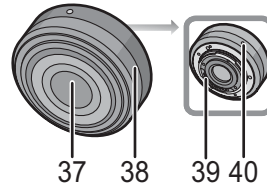
- 34 Card/Battery door
- 35 Release lever
- 36 Tripod receptacle
 - When you use a tripod, make sure the tripod is stable when the camera is attached to it.



■ **Lens**

H-H020 (LUMIX G 20 mm/F1.7 ASPH.)

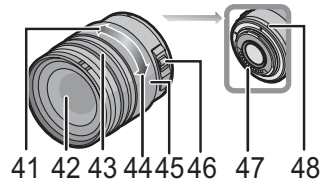
- 37 Lens surface
- 38 Focus ring
- 39 Contact point
- 40 Lens fitting mark



- The 20 mm/F1.7 interchangeable lens included in the DMC-GF1C utilises a lens drive system to realise a compact and bright F1.7 lens. As a result, sound and vibration may occur during focus operation, but this is not a malfunction.
- Operating sounds will be recorded when auto focus is performed during motion picture recording. It is recommended to record with [CONTINUOUS AF] set to [OFF], if the sound of operation bothers you. Also, it is not possible to set the Focus mode to [AFC].

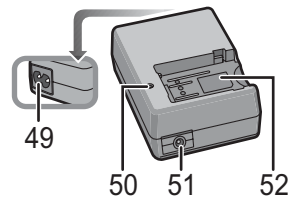
H-FS014045 (LUMIX G VARIO 14–45 mm/F3.5–5.6 ASPH./MEGA O.I.S.)

- 41 Tele
- 42 Lens surface
- 43 Focus ring
- 44 Wide
- 45 Zoom ring
- 46 [O.I.S.] switch
- 47 Contact point
- 48 Lens fitting mark



■ **Battery charger/AC adaptor**

- 49 Power input socket [AC IN]
- 50 [CHARGE] indicator
- 51 Power output socket [DC OUT]
- 52 Battery holder

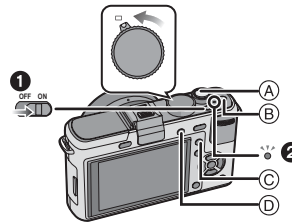


Selecting the [REC] mode

1 Turn the camera on.

- (A) Shutter button
- (B) Motion picture button
- (C) [AF/MF] button
- (D) [] button

- The status indicator ② lights when you turn this unit on ①.
- Make sure the drive mode lever is set to [].



2 Switching the mode by rotating the mode dial.

Align a desired mode with part (E).

- Rotate the mode dial slowly and surely to adjust to each mode. (The mode dial rotates 360°)



Basic

iA Intelligent Auto Mode

The subjects are recorded using settings automatically selected by the camera.

P Program AE mode

The subjects are recorded using your own settings.

Advanced

A Aperture-Priority AE mode

The shutter speed is automatically determined by the aperture value you set.

S Shutter-Priority AE mode

The aperture value is automatically determined by the shutter speed you set.

M Manual Exposure mode

The exposure is adjusted by the aperture value and the shutter speed which are manually adjusted.

MOTION PICTURE P Motion Picture P mode

Use this mode to record motion pictures with the desired settings.

C1 C2 Custom mode

Use this mode to take pictures with previously registered settings.

SCN Scene mode

This allows you to take pictures that match the scene being recorded.

My Color My Color mode

Use this mode to check coloring effects, select a color mode from among eight color modes, and then take pictures.

About the Lens

This unit can use the dedicated lenses compatible with the Micro Four Thirds™ System lens mount specification (Micro Four Thirds mount).

Select a lens that matches the scene being recorded and your use of the pictures.

■ “Micro Four Thirds Mount”

This is the lens mount standard for the “Micro Four Thirds System”. This was newly developed as interchangeable lens mount dedicated for digital cameras.



■ About the functions of your lens

- Depending on the type of lens, you may not be able to use some functions such as the direction detection function, [STABILIZER], Quick AF and Continuous AF.
- The available flash range etc. differs depending on the aperture value of the lens you are using.
- Take some test pictures with the lens you are using.
- Lens with the Four Thirds™ mount specification can be used by using the mount adaptor (DMW-MA1; optional). Because of its structure, Micro Four Thirds mount specification lenses cannot be used on the Four Thirds mount specification cameras. It can only be used on the Micro Four Thirds mount specification cameras.
- When you use the M mount adaptor or R mount adaptor (DMW-MA2M, DMW-MA3R; optional), you can use Leica M Mount or Leica R Mount interchangeable lenses.
 - The focal distance of the employed lens is effectively doubled. (A 50 mm lens is equivalent to a 100 mm lens)
 - For certain lenses, the actual distance at which the subject is in focus may differ slightly from the rated distance.



Interchangeable lenses that can be used with this unit and Auto focus / Auto Aperture Operation (As of September 2009)

(○: Usable, ●: Some functions/features limited, —: Not usable)

Lens type		when recording still pictures		while recording motion pictures	
		Auto focus	Auto aperture setting	Auto focus	Auto aperture setting
Micro Four Thirds mount specification lens	Lens included in the DMC-GF1C. (H-H020)	● ([AFS])	○	● * 4, 5	● * 7
	Lens included in the DMC-GF1K. (H-FS014045)	○ ([AFS], [AFC])	○	● * 4, 5	● * 7
	Other Micro Four Thirds mount specification lens *3				
	Micro Four Thirds mount specification lens compatible to HD motion pictures (LUMIX G VARIO HD)	○ ([AFS], [AFC])	○	○ * 4	○
Four Thirds mount specification lens *1	Four Thirds mount specification lens compatible to contrast AF	● ([AFS])	○	● * 6	● * 7
	Four Thirds mount specification lens not compatible to contrast AF	—	○	—	● * 7
Leica mount specification lens *2	Interchangeable lens for Leica	—	—	—	—

* 1 Mount adaptor (DMW-MA1; optional) is necessary to use with this unit.

* 2 A Leica lens mount adaptor (DMW-MA2M or DMW-MA3R; optional) is necessary.

* 3 This function is not supported by some Micro Four Thirds mount specification lenses
For lens operations, please see our website.

* 4 When recording motion pictures, the focus is continuously adjusted for both [AFS] and [AFC].

* 5 AF tracking is slower than the HD motion picture compatible lens (LUMIX G VARIO HD

lens), also the sound of auto focus operation may be recorded.

(The auto focus is activated by pressing the shutter button halfway.)



* 6 Auto focus is activated only when the shutter button is pressed halfway. The sound of Auto Focus Operation may be recorded at this time.

* 7 The sound of aperture operation may be recorded.






Refer to catalogues/Web pages for most current information regarding compatible lenses.
<http://panasonic.jp/support/global/cs/dsc/> (This Site is English only.)

About Motion Pictures (AVCHD Lite/Motion JPEG)






General description

Recording format	Effect
 [AVCHD Lite]	Select this format to record HD (high definition) video for playback on your HDTV using an HDMI connection.
 [MOTION JPEG]	Select this format to record standard definition video for playback on your PC. It can be recorded using less storage when there is not much space left on the memory card or when you want to attach the motion picture to an e-mail.

When [AVCHD Lite] is selected [Only for "PP" model]

	Item	Quality (bit rate) *1	fps	Aspect ratio
High quality   Longer time	 ([SH])	1280×720 pixels 17 Mbps*2	60p (Sensor output is 30 fps)	16:9
	 ([H])	1280×720 pixels 13 Mbps*2		
	 ([L])	1280×720 pixels 9 Mbps*2		

[Except for "PP" model]

	Item	Quality (bit rate) *1	fps	Aspect ratio
High quality   Longer time	 ([SH])	1280×720 pixels 17 Mbps*2	50p (Sensor output is 25 fps)	16:9
	 ([H])	1280×720 pixels 13 Mbps*2		
	 ([L])	1280×720 pixels 9 Mbps*2		

* 1 What is bit rate

This is the volume of data for definite period of time, and the quality becomes higher when the number gets bigger. This unit is using the "VBR" recording method. "VBR" is an abbreviation of "Variable Bit Rate", and the bit rate (volume of data for definite period of time) is changed automatically depending on the subject to record. Therefore, the recording time is shortened when a subject with fast movement is recorded.

* 2 What is Mbps

This is an abbreviation of "Megabit Per Second", and it represents the speed of transmission.

When [MOTION JPEG] is selected

	Item	Picture size	fps	Aspect ratio
<p>High quality</p> <p>↑</p> <p>↓</p> <p>Longer time</p>	([HD])	1280×720 pixels	30	16:9
	*3 ([WVGA])	848×480 pixels		
	([VGA])	640×480 pixels		
	([QVGA])	320×240 pixels		4:3

* 3 This item cannot be set in the Intelligent Auto Mode.

- With the [AVCHD Lite] or for [MOTION JPEG], high quality motion picture can be enjoyed on the TV by using the HDMI mini cable (optional).

Note

- It is recommended to use a card with SD Speed Class *1 with "Class 6" or higher when recording motion pictures.
- * 1 The SD Speed Class Rating is the speed standard for successive writes.
- When you set the picture quality to , , or , we recommend using a high-speed card with "10MB/s" or greater displayed on the package.
- The motion picture recording may stop in the middle when any of the following cards are used.
 - Cards on which recording and deleting have been repeated many times
 - Cards which have been formatted using a PC or other equipment
 Before taking pictures, format the card in the unit. Because formatting will delete all data recorded on the card, save important data beforehand on the computer.
- **Motion pictures recorded in [AVCHD Lite] or [MOTION JPEG] may be played back with poor picture or sound quality or playback may not be possible even when played back with equipment compatible with these formats. Also, the recording information may not be displayed properly. In this case, use this unit.**
 For details on AVCHD compatible devices, refer to the support sites below.
<http://panasonic.jp/support/global/cs/dsc/>
 (This Site is English only.)
- Motion picture recorded in [AVCHD Lite] cannot be played back on the equipment that is not compatible to the AVCHD (conventional DVD recorder, etc.), so read the instruction manual for the equipment in use for the action.
- Motion picture recorded in [AVCHD Lite] does not comply with the "DCF/Exif", so some information will not display while playback.
- **Sound from motion pictures (When [REC MODE] is set to [MOTION JPEG]) or pictures with audio recorded by this camera cannot be played back by older models of Panasonic digital cameras (LUMIX) launched before July 2008.**

Cautions for Use

Optimal use of the camera

Take care not to drop or knock the unit or put a lot of pressure on it.

- Take care not to knock or drop the bag/case that you inserted the camera in as the shock may cause damage to the camera, lens or LCD monitor.
- Do not use a paper bag as it can easily rip causing the camera to fall and be damaged.
- We strongly recommend you purchase a good camera bag/case from your local dealer to protect your camera.

Keep the camera as far away as possible from electromagnetic equipment (such as microwave ovens, TVs, video games etc.).

- If you use the camera on top of or near a TV, the pictures and sound on the camera may be disrupted by electromagnetic wave radiation.
- Do not use the camera near cell phones because doing so may result in noise adversely affecting the pictures and sound.
- Recorded data may be damaged, or pictures may be distorted, by strong magnetic fields created by speakers or large motors.
- Electromagnetic wave radiation generated by microprocessors may adversely affect the camera, disturbing the pictures and sound.
- If the camera is adversely affected by electromagnetic equipment and stops functioning properly, turn the camera off and remove the battery or disconnect AC adaptor. Then reinsert the battery or reconnect AC adaptor and turn the camera on.

Do not use the camera near radio transmitters or high-voltage lines.

- If you record near radio transmitters or high-voltage lines, the recorded pictures and sound may be adversely affected.

Always use the supplied cords and cables. If you use optional accessories, use the cords and the cables supplied with them.

Do not extend the cords or the cables.

Do not spray the camera with insecticides or volatile chemicals.

- If the camera is sprayed with such chemicals, the body of the camera may be damaged and the surface finish may peel off.
- Do not keep rubber or plastic products in contact with the camera for a long period of time.

Cleaning

Before cleaning the camera, remove the battery or disconnect the power plug from the outlet. Then wipe the camera with a dry soft cloth.

- When the camera is soiled badly, it can be cleaned by wiping the dirt off with a wrung wet cloth, and then with a dry cloth.
- Wipe off any dirt or dust on the zoom ring and the focus ring with a dry, dustless cloth.
- Do not use solvents such as benzine, thinner, alcohol, kitchen detergents, etc., to clean the camera, since it may deteriorate the external case or the coating may peel off.
- When using a chemical cloth, be sure to follow the accompanying instructions.

■ About dirt on the image sensor

This camera features an interchangeable lens system so dirt may get inside the camera body when changing lenses. Depending on the recording conditions, dirt on the image sensor may appear on the recorded picture.

Do not change lenses where there is a lot of dust, and always attach the body cap when a lens is not attached to the camera, so that dirt or dust does not get inside the camera body. Remove any dirt on the body cap before attaching it.

Dust reduction function

This unit has a dust reduction function that will blow off the debris and dust that have affixed to the front of the imaging device. This function will function automatically when the camera is turned on, but if you see dust, perform the [SENSOR CLEANING] in the [CUSTOM MENU] menu.

Removing dirt on the image sensor

The image sensor is very precise and delicate, so be sure to observe the following when you do have to clean it yourself.

- Blow off the dust on the surface of the image sensor with a commercially available blower brush. Be careful not to blow too strongly.
- Do not put the blower brush further inside than the lens mount.
- Do not let the blower brush touch the image sensor as the image sensor may get scratched.
- Do not use any objects except a blower brush to clean the image sensor.

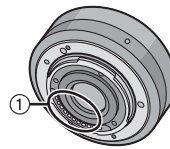
About the LCD monitor/Optional external viewfinder

- Do not press the LCD monitor with excessive force. Uneven colors may appear on the LCD monitor and it may malfunction.
- If the camera is cold when you turn it on, the picture on the LCD monitor/Optional external viewfinder will be slightly darker than usual at first. However, the picture will return to normal brightness when the internal temperature of the camera increases.

Extremely high precision technology is employed to produce the LCD monitor/Optional external viewfinder screen. However there may be some dark or bright spots (red, blue or green) on the screen. This is not a malfunction. The LCD monitor/Optional external viewfinder screen has more than 99.99% effective pixels with a mere 0.01% of the pixels inactive or always lit. The spots will not be recorded on pictures on a card.

About the Lens

- Do not press the lens with excessive force.
- Do not leave the camera with the lens facing the sun as rays of light from the sun may cause it to malfunction. Also, be careful when placing the camera outside or near a window.
- When there is dirt (water, oil, and fingerprints, etc.) on the surface of the lens, the picture may be affected. Lightly wipe the surface of the lens with a soft, dry cloth before and after taking pictures.
- Do not place the lens mount facing downwards. Do not allow the lens mount contacts ① to become dirty.



Battery

The battery is a rechargeable lithium ion battery. Its ability to generate power comes from the chemical reaction that takes place inside it. This reaction is susceptible to the surrounding temperature and humidity. If the temperature is too high or too low, the operating time of the battery will become shorter.

Always remove the battery after use.

If you drop the battery accidentally, check to see if the body of the battery and the terminals are damaged.

- Inserting a damaged battery in the camera will damage the camera.

Bring charged spare batteries when going out.

- Be aware that the operating time of the battery becomes shorter in low temperature conditions such as at a ski resort.
- When you travel, do not forget to bring the battery charger (supplied) and the AC cable (supplied) so that you can charge the battery in the country that you are traveling in.

Dispose of unusable battery.

- The battery has a limited life.
- Do not throw the battery into fire because it may cause an explosion.
- The unusable battery should be discarded in accordance with battery recycling laws. Call the RBRC hotline at 1-800-822-8837 for information.

Do not allow battery terminals to come into contact with metal objects (such as necklaces, hairpins etc.).

- This can cause short circuiting or heat generation and you may be badly burned if you touch a battery.

Charger

- If you use the battery charger near a radio, the radio reception may be disturbed.
- Keep the charger 1 m (3.28 feet) or more away from radios.
- The charger may generate whirring sounds when it is being used. This is not a malfunction.
- After use, be sure to disconnect the power supply device from the electrical outlet. (A very small amount of current is consumed if it is left connected.)
- Keep the terminals of the charger and battery clean.

Card

Do not leave the card where the temperature is high, where electromagnetic waves or static electricity are easily generated or exposed to direct sunlight.

Do not bend or drop the card.

- The card may be damaged or the recorded content may be damaged or deleted.
- Put the card in the card case or the storage bag after use and when storing or carrying the card.
- Do not allow dirt, dust or water to get into the terminals on the back of the card and do not touch the terminals with your fingers.

Notice for when transferring to another party, or disposing of the memory card

- “Format” or “delete” using the camera or a PC will only modify the file management information, and it will not erase the data in the memory card completely.

It is recommended to physically destroy the memory card or use the commercially available computer data deletion software to completely erase the data in the memory card before transferring to another party or disposing.

Management of data in the memory card is the responsibility of the user.

About the personal information

If a name or birthday is set for [BABY1]/[BABY2]/face recognition function, this personal information is kept in the camera and included in the recorded image.

Disclaimer

- Information including personal information may be altered or vanish due to erroneous operation, effect of static electricity, accident, malfunction, repair, or other handlings. Please note in advance that Panasonic is not liable in any way for any direct or indirect damage from the alteration or vanishing of information or personal information.

When requesting a repair, transferring to another party or disposing

- Reset the settings to protect the personal information.
- Remove the memory card from the camera when requesting a repair.
- Settings may return to factory default when camera is repaired.

When transferring to another party, or disposing of the memory card, please refer to “Notice for when transferring to another party, or disposing of the memory card”.

When not using the camera for a long period of time

- Store the battery in a cool and dry place with a relatively stable temperature: [Recommended temperature: 15 °C to 25 °C (59 °F to 77 °F), Recommended humidity: 40% to 60%]
- Always remove the battery and the card from the camera.
- If the battery is left inserted in the camera, it will discharge even if the camera is turned off. If the battery continues to be left in the camera, it will discharge excessively and may become unusable even if charged.
- When storing the battery for a long period of time, we recommend charging it once a year. Remove the battery from the camera and store it again after it has completely discharged.
- We recommend storing the camera with a desiccant (silica gel) when you keep it in a closet or a cabinet.
- **Check all the parts before taking pictures when you have not used the camera for a long period of time.**

About the picture data

- Recorded data may be damaged or lost if the camera breaks down due to inappropriate handling. Panasonic will not be liable for any damage suffered due to loss of recorded data.

About tripods or unipods

- When you use a tripod, make sure the tripod is stable when this unit is attached to it.
- You may not be able to remove the card or the battery when using a tripod or unipod.
- Make sure that the screw on the tripod or unipod is not at an angle when attaching or detaching the camera. You may damage the screw on the camera if you use excessive force when turning it. Also, the camera body and the rating label may be damaged or scratched if the camera is attached too tightly to the tripod or unipod.
- When a large-diameter lens is attached to the camera, certain tripods/unipods may make contact with the lens. There is a risk that such tripods/unipods will damage the camera or lens so their use should be avoided.
- Read the operating instructions for the tripod or unipod carefully.

About the shoulder strap

- If you attach a heavy interchangeable lens (more than about 1 kg) to the camera body, do not carry the camera by the shoulder strap. Hold the camera and the lens when carrying them.

Message Display

Confirmation messages or error messages will be displayed on the screen/optional external viewfinder in some cases.

The major messages are described below as examples.

[THIS MEMORY CARD IS LOCKED]

- The Write-Protect switch on the SD Memory Card and the SDHC Memory Card are moved to [LOCK]. Move the switch back to unlock it.

[NO VALID PICTURE TO PLAY]

- Record a picture or insert a card with a recorded picture and then play it.

[THIS PICTURE IS PROTECTED]

- Delete the picture after canceling the protect setting.

[THIS PICTURE CANNOT BE DELETED]/[SOME PICTURES CANNOT BE DELETED]

- Pictures not based on the DCF standard cannot be deleted.
 - If you want to delete some pictures, format the card after saving necessary data on a PC etc.

[NO ADDITIONAL SELECTIONS CAN BE MADE]

- The number of pictures, which can be set at one time when [MULTI] has been selected for [DELETEMULTI], [FAVORITE], [TITLE EDIT], [TEXT STAMP] or [RESIZE] has been exceeded.
 - Reduce the number of pictures set, and then repeat the operation.
- More than 999 favorites have been set.

[CANNOT BE SET ON THIS PICTURE]

- [TITLE EDIT], [TEXT STAMP] or [PRINT SET] cannot be set for pictures not based on the DCF standard.

[MEMORY CARD ERROR FORMAT THIS CARD?]

- This card has a format which is not recognized by the camera.
 - Format the card again with the camera after saving necessary data on a PC etc.

[PLEASE CHECK THAT THE LENS IS ATTACHED CORRECTLY]/[PLEASE CHECK THE STATUS OF A LENS.]

- Do not press the lens release button.
- Check that the lens is attached correctly and then turn the camera off and on.
- When using a Leica lens mount adaptor (DMW-MA2M or DMW-MA3R; optional), set [SHOOT W/O LENS] to [ON] in the custom menu.

[THE LENS IS NOT ATTACHED PROPERLY.]

- Detach the lens and then attach it again.

[MEMORY CARD PARAMETER ERROR]/[THIS MEMORY CARD CANNOT BE USED]

- Use a card compatible with this unit.
- You can only use an SDHC Memory Card if using cards with 4 GB or more capacity.

[INSERT SD CARD AGAIN]/[TRY ANOTHER CARD]

- An error has occurred accessing the card.
 - Insert the card again.
 - Insert a different card.

[READ ERROR/WRITE ERROR PLEASE CHECK THE CARD]

- It has failed to read or write data.
 - Remove the card after turning the power [OFF]. Insert the card again, turn the power on, and try to read or write the data again.
- The card may be broken.
 - Insert a different card.

[CANNOT RECORD DUE TO INCOMPATIBLE FORMAT (NTSC/PAL) DATA ON THIS CARD.]

- If you want to delete some pictures, format the card after saving necessary data on a PC etc.
- Insert a different card.

[MOTION RECORDING WAS CANCELLED DUE TO THE LIMITATION OF THE WRITING SPEED OF THE CARD]

- It is recommended to use a card with SD Speed Class* with "Class 6" or higher when recording motion pictures.
 - * SD speed class is the speed standard regarding continuous writing.
- When you set the picture quality to [Hi], [Full] or [L], we recommend using a high-speed card with "10MB/s" or greater displayed on the package.
- In the event that it stops even after using a "10MB/s" card or higher, the data writing speed has deteriorated so it is recommended to make a backup and then format.
- Depending on the type of SD Memory Card or SDHC Memory Card, motion picture recording may stop in the middle.

[THIS CARD IS NOT FORMATTED WITH THIS CAMERA, AND NOT SUITABLE FOR MOVIE RECORDING.]

- The writing speed is lower if the card has been formatted using a PC or other equipment. As a consequence, motion picture recording may stop in the middle. If this happens, make a backup of the data and format the card in this unit.

[A FOLDER CANNOT BE CREATED]

- A folder cannot be created because there are no remaining folder numbers that can be used.
 - Format the card after saving necessary data on a PC etc. If you execute [NO.RESET] in the [SETUP] menu after formatting, the folder number is reset to 100.

[PICTURE IS DISPLAYED FOR 16:9 TV]/[PICTURE IS DISPLAYED FOR 4:3 TV]

- The AV cable is connected to the camera.
 - Press [MENU/SET] if you want to delete this message at once.
 - Select [TV ASPECT] in the [SETUP] menu if you want to change the TV aspect.
- This message also appears when the USB connection cable is connected to the camera only. In this case, connect the other end of the USB connection cable to a PC or a printer.

[PRINTER BUSY]/[PLEASE CHECK THE PRINTER]

- The printer cannot print.
 - Check the printer.

[NO BATTERY POWER REMAINS]

- The remaining battery power is low.
 - Charge the battery.

[THIS BATTERY CANNOT BE USED]

- The battery cannot be recognized by the camera.
 - Use a genuine Panasonic battery. If this message is displayed even when a genuine
- The battery cannot be recognized as its terminal is dirty.
 - Remove any dirt etc. from the terminal.

Troubleshooting

First, try out the following procedures.

If the problem is not resolved, it may be improved by selecting **[RESET]** on the **[SETUP]** menu.

Battery and power source

The camera cannot be operated even when it is turned on.

- The battery is not inserted correctly.
- The battery is exhausted.
- Charge the battery.
- AC adaptor is not connected properly.

The LCD monitor turns off while the camera is turned on.

- Is the display set to optional external viewfinder?
→ Switch to LCD monitor display by pressing [LVF/LCD] on the optional external viewfinder
- Is [AUTO LCD OFF] of the [ECONOMY] mode active?
→ Press the shutter button halfway to cancel these modes.
- Is the LCD monitor switched off?
→ Switch the display by pressing [DISPLAY].
- The battery is exhausted.
- Charge the battery.

The camera turns off immediately after it is turned on.

- The battery is exhausted.
- Charge the battery.
- If you leave the camera on, the battery will be exhausted.
→ Turn the camera off frequently by using the [ECONOMY] mode etc.

This unit is turned off automatically.

- If you connect to a TV compatible with VIERA Link with a HDMI mini cable (optional) and turn off the power on the TV with the remote control for the TV, the power on this unit also turns off.
→ If you are not using VIERA Link, set [VIERA Link] to [OFF].

The [CHARGE] lamp flashes.

- Is the temperature of the battery excessively high or low? If it is, it will take longer than usual to charge the battery or charging may remain incomplete.
- Are the terminals of the charger or battery dirty?
→ Wipe off the dirt using a dry cloth.

Recording

The picture cannot be recorded.

- Is the Mode Dial correctly set?
- Is the card inserted?
- Is there any memory remaining on the card?
→ Delete the pictures which are not necessary to increase the available memory.

The shutter will not operate immediately when the shutter button is pressed.

- Is the subject focused?
→ [FOCUS PRIORITY] is set to [ON] at the time of purchase, and so you cannot take pictures until the subject is in focus. If you want to be able to take a picture when you press the shutter button fully even if the subject is not focused, set [FOCUS PRIORITY] in the [CUSTOM MENU] menu to [OFF].

The recorded picture is whitish.

- Picture might look whitish when lens or image sensor gets dirty with finger print or similar.
→ If the lens is dirty turn the camera off and then gently wipe the lens surface with a soft dry cloth.
→ Refer to "About dirt on the image sensor".

The recorded picture is too bright or dark.

- Check that the exposure is correctly compensated.
- Is the AE Lock applied incorrectly?

2 or 3 pictures are taken at one time.

- Unset the settings of White Balance Bracket.

The subject is not focused properly.

- The subject is beyond the focus range of the camera.
- There is camera shake (jitter) or the subject is moving slightly.
- Is [FOCUS PRIORITY] in the [CUSTOM MENU] menu set to [OFF]?
In this case, the picture may not be properly focused even if [AFS] or [AFC] in Focus Mode is set.
- Is the AF Lock applied incorrectly?

**The recorded picture is blurred.
The Optical Image Stabilizer is not effective.**

- The shutter speed will become slower and the Optical Image Stabilizer function may not work properly when taking pictures especially in dark places.
 - We recommend holding the camera firmly with both hands when taking pictures.
 - We recommend using a tripod and the self-timer when taking pictures with a slow shutter speed.
- Are you using a lens which supports the Stabilizer function?

Taking pictures using White Balance Bracket is not possible.

- Is the number of recordable pictures 2 or less?

**The recorded picture looks rough.
Noise appears on the picture.**

- Is the ISO sensitivity high or the shutter speed slow?
(ISO sensitivity is set to [AUTO] when the camera is shipped. Therefore, when taking pictures indoors etc. noise will appear.)
 - Decrease the ISO sensitivity.
 - Increase the setting for [NOISE REDUCTION] in [FILM MODE] or lower the setting for each of the items other than [NOISE REDUCTION].
 - Take pictures in bright places.
 - Set the [LONG SHTR NR] to [ON].

The brightness or the hue of the recorded picture is different from the actual scene.

- If recording under fluorescent light, the brightness or the hue may change slightly when the shutter speed becomes fast. This occurs due to the characteristics of fluorescent light. It is not a malfunction.

Reddish horizontal streaks appear on the LCD monitor during recording.

- This is characteristic of MOS sensors which serve as the camera's pickup sensors. It appears when the subject has a bright part. Some unevenness may occur in the surrounding areas, but this is not a malfunction.
It is recorded in motion pictures but is not recorded on still pictures.
- It is recommended that you take pictures while taking care not to expose the screen to sunlight or any other source of strong light.

Bright spot not in subject is recorded.

- This could be an inactive pixel. Perform the [PIXEL REFRESH] in the [CUSTOM MENU].

You cannot compensate the exposure.




- Are you in Exposure Compensation operation?
 - Press the rear dial to switch to Exposure Compensation operation.

**Subject cannot be locked.
(AF tracking not possible)**

- Set the AF area to the distinctive color of the subject if there is a part that is different from the surrounding color.

Motion pictures

Motion picture recording stops in the middle.

- It is recommended to use a card with SD Speed Class* with "Class 6" or higher when recording motion pictures.
- * SD speed class is the speed standard regarding continuous writing.
- Depending on the type of the card, recording may stop in the middle.
 - When you set the picture quality to [], [] or [], we recommend using a high-speed card with "10MB/s" or greater displayed on the package.
 - If motion picture recording stops during use of a card of at least "10MB/s" or if you use a card that has been formatted on a PC or other equipment, the data-writing speed is lower. In such cases, we recommend that you make a backup of the data and then format the card in this unit.

Object seems to be warped.

- Object seems to be warped slightly when the object moves across the image very fast, but this is because the unit is using MOS for the image sensor. This is not a malfunction.

Under fluorescent lighting, flicker or horizontal bars may be seen.

- This is characteristic of MOS sensors which serve as the camera's pickup sensors. This is not a malfunction.
- If there is marked flicker or striping when recording motion pictures in regions with a 50 Hz mains supply, set the Flicker Reduction Function to [ON]. The Flicker Reduction Function will then activate, automatically adjusting the shutter speed to 1/100.

A clicking sound or the sound of the auto focus operation is recorded in motion pictures.

- This unit automatically adjusts the aperture during motion picture recording. A clicking sound may occur at this time depending on the lens, and this sound may be recorded on the motion pictures. This is not a malfunction.
- With certain lenses, the sound of the Auto Focus Operation is recorded when recording motion pictures. In this case, we recommend setting [CONTINUOUS AF] to [OFF].
- Operating sounds may be recorded when the zoom or buttons are operated etc. while recording motion pictures. Also, the operating sound of the dial may be recorded when the rear dial is operated.


Lens

Recorded image may be warped, or nonexistent color is surrounding the subject.

- Depending on the lens used, picture may be warped slightly or you may see colors along the edge depending on the zoom factor, due to the characteristics of the lens. Also, the peripherals of the image might look warped because the perspective is enhanced when the wide angle is used. This is not a malfunction.

Flash

The flash is not activated.

- Is the flash closed?
 - Press the [ OPEN] button to open the flash.

The flash is activated 2 times.

- The flash is activated 2 times. The interval between the first and second flash is longer when Red-eye Reduction is set so the subject should not move until the second flash is activated.

LCD monitor/optional external viewfinder

The LCD monitor turns off although the camera is turned on.

- The LCD monitor turns off when [AUTO LCD OFF] is selected for the [ECONOMY] mode.
[This does not happen when using the AC adaptor.]
If the remaining battery power is low, it may take longer for the flash to be charged, and the time during which the LCD monitor is turned off may become longer.

The LCD monitor/optional external viewfinder is too bright or dark.

- Adjust the brightness of the LCD monitor/Optional External Viewfinder to a proper level.
- [POWER LCD] is activated.

The picture is not displayed on the LCD monitor.

- Is the LCD monitor switched off?
→ Switch the display by pressing [DISPLAY].
- Does the picture appear on the Optional External Viewfinder?
→ Switch to LCD monitor display by pressing [LVF/LCD] on the Optional External Viewfinder.

The picture does not switch between LCD monitor and optional external viewfinder when [LVF/LCD] is pressed on the optional external viewfinder.

- It is only displayed on the LCD monitor when the camera is connected to a PC or printer.

Black, red, blue and green dots appear on the LCD monitor.

- This is not a malfunction.
These pixels do not affect the recorded pictures.

Noise appears on the LCD monitor.

- In dark places, noise may appear to maintain the brightness of the LCD monitor.

You see red, green, or blue flashes when you move your eyes in the optional external viewfinder, or when the camera is moved rapidly.

- This is a characteristic of the drive system of the Optional External Viewfinder of this unit, and it is not a malfunction. There will be no problem with the recorded image.

Playback

The picture being played back is not rotated, or is rotated in an unexpected direction, when displayed.

- You can display the pictures without being rotated when [ROTATE DISP.] is set to [OFF].
- You can rotate pictures with the [ROTATE] function.
- You can only display the pictures rotated if you use a lens that supports the Direction Detection Function and [ROTATE DISP.] is set to [ON].

The picture is not played back.

- Did you press [▶]?
- Is the card inserted?
- Is there a picture on the card?
- Is this a picture whose file name has been changed in the PC? If it is, it cannot be played back by this unit.

The recorded pictures are not displayed.

- Has [PLAYBACK MODE] been set for playback?
→ Change to [NORMAL PLAY].

The folder number and the file number are displayed as [—] and the screen turns black.

- Is this a non-standard picture, a picture which has been edited using a PC or a picture which was taken by another make of digital camera?
- Did you remove the battery immediately after picture-taking or did you take the picture using a battery with a low remaining charge?
→ Format the data to delete the pictures mentioned above.
(Other pictures will be deleted as well and it will not be possible to restore them. Therefore, check well before formatting.)

Images with different date as recorded date are played back in the Calendar Playback.

- Is the clock in the camera set properly?
- Images edited on a PC or images recorded on other cameras might display a different date to the recorded date during the Calendar Playback.

White round spots like soap bubbles appear on the recorded picture.







- If you take a picture with the flash in a dark place or indoors, white round spots may appear on the picture caused by the flash reflecting of particles of dust in the air. This is not a malfunction.
A characteristic of this is that the number of round spots and their position differ in every picture.



[THUMBNAIL IS DISPLAYED] appears on the screen.

- Is it a picture that has been recorded with other equipment? In such cases, these pictures may be displayed with a deteriorated picture quality.

Red part of the recorded image has changed color to black.

- When Digital Red-Eye Reduction ([, [, []) is in operation, if you take a picture of subject with red color surrounded by a skin tone color, that red part may be corrected to black by the Digital Red-Eye Reduction Function.
→ It is recommend to take picture with Flash Mode set to [, [] or [, or [RED-EYE REMOVAL] on the [REC] Mode menu set to [OFF].

TV, PC and printer

The picture does not appear on the television.

- Is the camera connected to the TV correctly?
 - Set the TV input to external input mode.
- Output from the [HDMI] socket is not possible when it is connected to the PC or the printer.
 - Connect it only to the TV.

The display areas on the TV screen and the camera's LCD monitor are different.

- Depending on the TV model, the pictures may be extended horizontally or vertically or they may be displayed with their edges cut off.

The motion pictures cannot be played back on a TV.

- Are you trying to play back the motion pictures by directly inserting the card in the card slot of the TV?
 - Connect the camera to the TV with the AV cable (supplied), or with the HDMI mini cable (optional), and then play back the motion pictures on the camera.
 - Motion pictures recorded in [AVCHD Lite] can be played back on Panasonic televisions (VIERA) with the AVCHD logo.

The picture is not displayed fully on the TV.

- Check [TV ASPECT] setting.

VIERA Link does not work.

- Is it connected properly with the HDMI mini cable (optional)?
 - Confirm that the HDMI mini-cable (optional) is firmly fitted.
 - Press [▶] on this unit.
- Is the [VIERA Link] on this unit set to [ON]?
 - Depending on HDMI terminal of the TV, the input channel may not switch automatically. In this case, use the remote control for the TV to switch input. (For details on how to switch input, please read the operating instructions for the TV.)
 - Check the VIERA Link setting on the connected device.
 - Turn the power to the unit off and then back on again.
 - Set [VIERA Link] to [Off] on the TV and then turn it back to [On]. (Refer to the operating instructions of the TV for details.)

The picture cannot be transferred when the camera is connected to a PC.

- Is the camera connected to the PC correctly?
- Is the camera recognized by the PC correctly?
 - Set to [PC] in [USB MODE].

The card is not recognized by the PC.

- Disconnect the USB connection cable. Connect it again while the card is inserted in the camera.

The picture cannot be printed when the camera is connected to a printer.

- Pictures cannot be printed using a printer which does not support PictBridge.
 - Set to [PictBridge(PTP)] in [USB MODE].

The ends of the pictures are cut at printing.



- When using a printer with a trimming or borderless printing function, cancel this function before printing. (For details, refer to the operating instructions for the printer.)
- When you order photo studios to print pictures, ask the photo studio if the pictures can be printed with both ends.

Others

There is a sound from lens unit.

- It is a sound of lens movement or aperture operation when the power is turned [ON] or [OFF], and it is not a malfunction.
- You may hear a sound from the lens and image in the LCD monitor may suddenly change when the brightness has changed by zoom operation or moving the camera, but there is no effect on recording.
The sound is caused by the automatic adjustment of the aperture. This is not a malfunction.

An unreadable language was selected by mistake.

- Press [MENU/SET], select the [SETUP] menu icon [] and then select the [] icon to set the desired language.

Part of the picture is flashing in black and white.

- This is a highlight function showing the white saturated area.
- Is the [HIGHLIGHT] set to [ON]?

A red lamp sometimes turns on when the shutter button is pressed halfway.

- In dark places, the AF assist lamp lights red to make it easier to focus on a subject.

The AF assist lamp does not turn on.

- Is [AF ASSIST LAMP] on the [CUSTOM MENU] menu set to [ON]?
- The AF assist lamp does not turn on in bright places.

The camera becomes warm.

- The surface of the camera may become warm during use. This does not affect the performance or quality of the camera.

The clock is reset.

- If you do not use the camera for a long time, the clock may be reset.
→ When the message [PLEASE SET THE CLOCK] appears, set the clock again. When you take a picture before setting the clock, [AM12:00 0. 0. 0] is recorded.

The file numbers are not recorded consecutively.

- When you perform an operation after taking a certain action, the pictures may be recorded in folders with different numbers from the ones used prior to the operation.

The file numbers are recorded in ascending order.

- If the battery was inserted or removed without first turning the camera's power off, the folder and file numbers for the pictures taken will not be stored in the memory. When the power is then turned back on and pictures are taken, they may be stored under file numbers which should have been assigned to previous pictures.

Age is not displayed correctly.

- Check the clock and birthday settings.

About the Battery

- The camera has a function for distinguishing batteries which can be used safely. The dedicated battery supports this function. The only batteries suitable for use with this unit are genuine Panasonic products and batteries manufactured by other companies and certified by Panasonic. (Batteries which do not support this function cannot be used). Panasonic cannot in any way guarantee the quality, performance or safety of batteries which have been manufactured by other companies and are not genuine Panasonic products.

It has been found that counterfeit battery packs which look very similar to the genuine product are made available to purchase in some markets. Some of these battery packs are not adequately protected with internal protection to meet the requirements of appropriate safety standards. There is a possibility that these battery packs may lead to fire or explosion. Please be advised that we are not liable for any accident or failure occurring as a result of use of a counterfeit battery pack. To ensure that safe products are used we would recommend that a genuine Panasonic battery pack is used.

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.

(i.e., when the unit is powered on by the battery, the battery is pulled out)

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 Battery or Battery Charger/AC Adaptor which is connected the DC Cable, and insert the SD memory card.

• Step 1. The temporary cancellation of "INITIAL SETTINGS":

Set the Drive mode lever to [SINGLE].

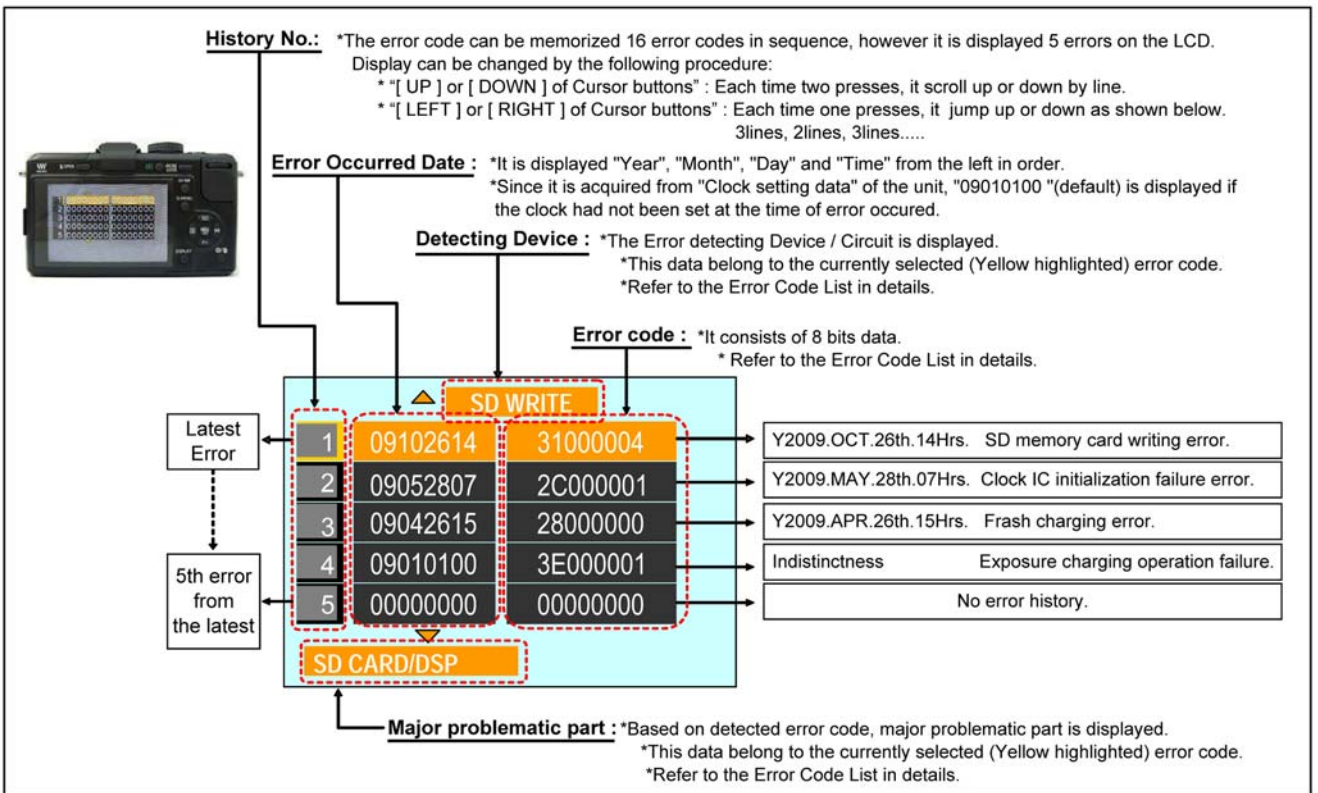
While keep pressing [DISPLAY] and [AF/AE LOCK] buttons simultaneously, turn the Power on.

• Step 2. Execute the error code display mode:

Press [DISPLAY], [MENU/SET] and "[LEFT] of Cursor buttons" simultaneously with 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 →



Example of Error Code Display

• **Error Code List:**

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

Attribute	Main item	Sub item	Error code		Contents (Upper line)	Error Indication	
			High 4 bits	Low 4 bits		Detecting device	Problematic Part/Circuit
HARD	VENUS A/D	Flash	28*0	0000	Flash charging capacitor did not been fully charged within 20 seconds.	STRB CHG	STRB PCB/FPC
	FLASH ROM	Data Area	2B*0	0001	Flash ROM data reading error is detected when the unit turns ON.	FROM RE	FROM
				0002	Flash ROM data writing error is detected when the unit turns OFF.	FROM WR	FROM
		Program Area		0005	Firmware update error.	(No indication)	(No indication)
SYSTEM IC	Initialization	2C*0	0001	Clock IC initialization failure error.	SYS INIT	MAIN PCB	
SOFT	CPU	Reset	30*0	0001	System error (NMI reset).	NMI RST	MAIN PCB
				 0007			
	Recording Media	SD Memory Card	31*0	0001	SD memory card logic error. SD memory card format error. When it is detected, [MEMORY CARD ERROR FORMAT THIS CARD?] is displayed on the screen.	SD CARD	SD CARD/DSP
				0002	SD memory card physical error. During formatting the SD memory card, there is no response from the card. If the mini-SD memory card is used, check the SD memory card adaptor.		SD CARD/DSP
				0004	SD memory card writing error. Check the SD memory card. It might be damage one.	SD WRITE	SD CARD/DSP
	Lens	Communication	3C*0	0001 000E	Lens communication error.	(No indication)	(No indication)
	Camera	System	3B*0 3E*0	0000	Initialization failure error.	INIT	(No indication)
0001				Exposure charging operation failure. (Mount Box Unit)	(No indication)	(No indication)	
0002				Failure of the returning operation to the home position. (Mount Box Unit)			
Recording	Motion Image Recording	3F*0	0001	File time out error in recording motion image.	(No indication)	(No indication)	
			0002	File data cue send error in recording motion image.			

Important notice about “Error Code List”

About "*" indication:

The third digit from the left is different as follows.

- In case of 0 (example: 2B**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: 2B**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.

• **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. Checking Method of Body and Interchangeable Lens

1. INITIAL (DEFAULT) STATUS OF THE LENS UNIT

The Lens unit which is supplied as a standard accessory for this camera unit (H-H020, H-FS015045) shows the following status when the Lens is detached from the Camera unit.

NOTE: Although the lens unit is attached it shows the same condition when the Camera turns off.

H-H020 (Included in DMC-GF1C):

[1]. FOCUS RING The Focus condition does not change although Focus ring is rotated. (Free rotation.)

<Points of concern>
About H-H020:
1. This lens utilizes a lens drive system to realize a compact and bright F1.7 lens.
As a result, sound and vibration may occur during focus operation.
2. It is not possible to set the Focus mode to [AFC].
3. The STABILIZER is not installed.
4. The Direction Detection Function is not installed.
5. The focus range is fixation by f=20mm. (There is no optical zoom.)
* The 1st lens frame moves when the lens installs in the camera body, the AF mode is set to [MF] in the state of turning power the on, and the focus ring is rotated.

H-FS014045 (Included in DMC-GF1K):

[1]. ZOOM RING When the Zoom ring is rotated, Zoom condition is changing accordingly.
(The 1st lens frame moves.)

[Focal length : 14mm to 45mm [35mm film camera equivalent: 28mm to 90mm]]

[2]. FOCUS RING The Focus condition does not change although Focus ring is rotated. (Free rotation.)

2. INITIAL INSPECTION TIPS (BEFORE DETERMINE THE UNIT BEING FAULTY/DEFECTIVE) :

Since this unit is equipped with various functions/settings, some phenomenon/effect might be caused by miss usage of function and/or settings. It might be made a miss-judgement caused by miss usage of function & settings although the unit is working properly without fault.



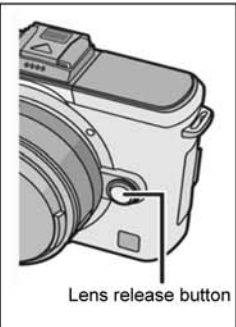

Therefore, check/confirm the followings before concluding/determine the unit being faulty/defective.

NOTE: Refer to the Operating Instructions carefully.

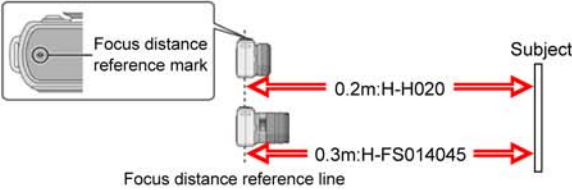

Also, useful hint/tips for this unit is available at following URL, and is updated frequently.
<http://panasonic.jp/support/global/cs/dsc/>


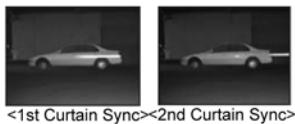

If it is hard to determine whether the resolution is out of specification or not, proceed the "RESOLUTION INSPECTION", before replacing the LENS MAIN BLOCK UNIT and/or MOUNT BOX UNIT. (The unit might be mishandling, dropping or others.)

[1]. [LENS RELATIVES]

TITLE	ITEMS	DESCRIPTION
LENS	Aperture size does not change. (Although aperture value is changed, the physical size of aperture is never changed.)	*Although aperture value is changed, the physical size of aperture is never changed (It keeps the maximum aperture condition) until the shutter release button is fully released. (There is no "aperture stopping down" button and/or function. But instead, there is a shutter speed preview mode.) !! [CUSTOM MENU] (2/5) ----- [PREVIEW HOLD] (ON/OFF)
	The Aperture condition does not change. (Aperture value shows "A0.0")	*The Lens & Body are communicating (serial communication) through mount contacts (11 pins). *Confirm that lens & body mount contacts are not dirty. *While keep pressing the [Lens release] button, it makes same situation that Lens does not attached. *Although lens is attached to the body, the Aperture value shows "A0.0" when the communication error is occurred. Also, when the firmware version confirmation mode is executed, the [- -] is displayed as Lens firmware version.  Aperture value is fixed at [A0.0]  Firmware version shows [LENS FIRMWARE : - -]  Lens release button
	Although the Focus ring is rotating, it does not change the Focus condition.	*The Focus condition is never changed although focus ring is rotated when the Focus mode dial is positioned at AFS or AFC. (* The focus mode cannot be set to [AFC] by H-H020.) (When the [AF + MF] is set to [ON], it is able to fine adjust the focus manually by rotating the focus ring while AF lock.) !! [CUSTOM MENU] (3/5) ----- [AF + MF] (ON/OFF)
	No released without lens attachment.	*It is able to release the shutter button without attaching the lens unit. !! [CUSTOM MENU] (5/5) ----- [SHOOT W/O LENS] (ON/OFF)
	The Dusty and/or dirty of the Lens	*Define the location of the dirt / dust of the lens first, whether it is outside surface of the lens or not. If it is outside surface of the lens, order the following procedure in steps. STEP-1. Blow off the dust certainly with Hand Blower. STEP-2. Clean and wipe up the Lens surface by using the Lens cleaning Kit (VFK1900BK). *Refer to the "11 Maintenance" of this manual.  [Wiping up the lens surface] Like drawing the circle, wipe up the lens surface centre towards to outside slowly.
It does not become the Shutter speed [B] (Bulb) mode.	*It is only able to select the shutter speed to [B](Bulb) when mode dial is set to [M] (Manual) and drive mode lever is [SINGLE] position. ([B] mode: the shutter stays open while the shutter button is pressed fully (up to about 4 minutes). The shutter closes if you release the shutter button.)	








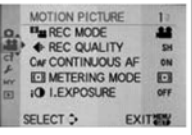






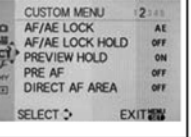
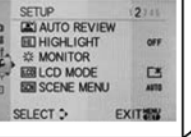


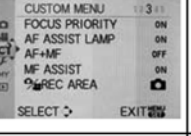
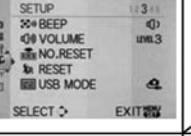
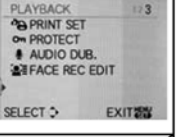

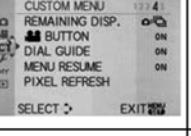
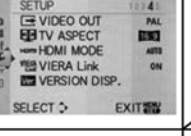

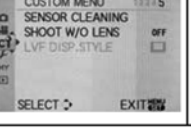
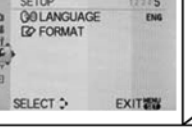
[2]. [BODY RELATIVES]

TITLE	ITEMS	DESCRIPTION
FOCUS	The picture is out of focus although the focus is adjusted in MF mode at once.	<p>*In the following conditions, the focus may be out of focus, no matter the kind of subject. Therefore, adjust the focus again by rotating the Focus ring.</p> <p>*After "in-focus" condition, Zoom condition has been changed.</p> <p>*Power switch is turned OFF and ON again.</p> <p>*After releasing the Power save.</p>
	Focus does not become in focus condition.	<p>*If the shooting distance is less than the Minimum requirement distance for focus, the focus may not be brought into focus, no matter the kind of subject.</p>  <p>The diagram illustrates the minimum focus distance for two camera models. A 'Focus distance reference mark' is shown on the left, pointing to a 'Focus distance reference line'. Two red double-headed arrows indicate distances to a 'Subject' on the right. The top arrow is labeled '0.2m:H-H020' and the bottom arrow is labeled '0.3m:H-FS014045'.</p>
	MF(Manual Focus)ASSIST does not work.	<p>*The MF assist function is that the certain area image is able to enlarge 5 times to make easier to focus. (It is enlarged from 5times to 10 times when the front dial is rotated clockwise.)</p> <p>*It does not activated if the [Focus Mode Dial] is positioned other than [MF] position.</p> <p>*It does not activated when using the Digital Zoom.</p> <p>*It does not activated if [MF ASSIST] is set to OFF.</p> <p>!! [CUSTOM MENU] (3/5) ----- [MF ASSIST] (ON/OFF)</p> <p>(To display the MF assist, press Left cursor button then press [MENU/SET].)</p>
	Face detection does not work.	<p>*Select AF mode to face detection. (In [IA]mode, it is automatically assigned according with scene.) (Press the left side cursor button to display the AF mode menu.)</p> <p>*It does not activated when using the Digital Zoom.</p> <p>*It does not activated if the focus mode dial set to MF.</p>
	The subject is not focused properly.	<p>*When get a fingerprint, dirt on the lens surface, resulting in the subject being out of focus.</p> <p>*The subject is beyond the focus range of the camera.</p> <p>*There is camera shake (jitter) or the subject is moving slightly.</p> <p>*The focus indication green mark is lights at the top right hand corner on the LCD when the subject is focused.</p> <p>*The shutter speed will become slower and the optical image stabilizer function may not work properly when taking pictures especially in dark places.</p>
	Focus does not change.	<p>*Focus & Exposure condition is locked when the [AF / AE LOCK] button is pressed under the condition of [AF/AE LOCK HOLD] is "On".</p> <p>!! [CUSTOM MENU] (2/5) ----- [AF/AE LOCK HOLD] (ON/OFF)</p> <p>*It can be reset when [AF / AE LOCK] button is pressed again.</p>
	Although [AF/AE LOCK] button is pressed, it does not hold the Focus, only Exposure is locked.	<p>*Focus does not hold even if [AF/AE LOCK] button is pressed if the [AF/AE LOCK] is selected [AE].</p> <p>!! [CUSTOM MENU] (2/5) ----- [AF/AE LOCK] (AE, AF, AF/AE)</p> <p>*In the Manual Focus condition, It is only worked as [AE lock] function.</p>
	It does not turn to the "AFC" mode. (Motion prediction does not work.)	<p>*Confirm the setting position of the focus mode dial (AFS / AFC / MF).</p> <p>(* The focus mode cannot be set to [AFC] by H-H020.)</p> <p>*Although AFC is effective with burst mode, the focus is fixed on the first picture when subject is dark.</p>
Flash	GN (Guide Number) of the Built in Flash (Specification GN6.0)	<p>*By referring the specification of the built-in flash is GN6.0 (equivalent)</p> <p>*There is a formula : F value X Flash reachable distance = GN [ISO100]</p> <p>(In case of: H-FS014045)</p> <p>ISO100 / Wide edge Aperture is F3.5 / Flash reachable distance is 1.7m [3.5 X Approx 1.7 = 5.95 ----- "GN6"]</p> <p>ISO100 / Tele edge Aperture is F5.6 / Flash reachable distance is 1.0m [5.6 X Approx 1.0 = 5.6 ----- "GN6"]</p>
	Some of the Flash setting(s) are not able to select.	<p>*In accordance with the [REC] mode and [FLASH SYNCHRO] mode, selectable flash settings may be differ.</p>
	[AUTO BRACKET] does not work.	<p>*Only one picture can be taken when the Flash is fired.</p>
	The subject is too bright / too dark with Flash.	<p>*Confirm that the picture is taken within Flash range or not.</p> <p>*Confirm that flash output settings.</p> <p>!! [REC] (2/5) ----- [FLASH ADJUST.] (1/3 EV Step, -2EV to +2EV)</p>
	The Flash adjustment does not effect.	<p>*Confirm that the picture is taken within Flash range or not.</p>
White round spots appear on the recording picture	<p>*If you take a picture with flash in a dark place or indoors, white round spots may be appear on the picture caused by the flash reflecting of particles of dust in air. This is not a malfunction.</p> <p>*A characteristic of this is that the number of round spots and their position differ in every picture.</p> 	

TITLE	ITEMS	DESCRIPTION
Flash	Colour is strange when the Flash is fired.	<p>*The colour of the subject which is other than Flash reachable distance is not coverage of white balance.</p> <p>*Confirm that [WB Adjustment] setting condition. (Press the cursor [RIGHT] (WB) button, then press the cursor [DOWN] button, in order to execute the [WB ADJUST.] screen.)</p> <p>*It also effects to the Flash recording mode as well.</p> 
	The appearance of the light source is strange. (The light source appears ahead the subject.)	<p>*Normally, the light source appears ahead the subject. (This is the effect of the 1st curtain synchro.)</p> <p>*The Flash synchro mode can be selected. !! [REC] (2/5) ----- [FLASH SYNCHRO] (1ST / 2ND)</p>  <p><1st Curtain Sync><2nd Curtain Sync></p>
EXPOSURE	The Exposure condition can not be changed	<p>*Focus & Exposure condition is locked when the [AF/AE LOCK] button is pressed under the condition of [AF / AE LOCK HOLD] is "On". !! [CUSTOM MENU] (2/5) ----- [AF / AE LOCK HOLD] (ON/OFF)</p> <p>*It can be reset when [AF/AE LOCK] button is pressed again.</p>
	Although [AF/AE LOCK] button is pressed, only focus is locked. (AE is not locked)	<p>*Focus does not hold even if [AF/AE LOCK] button is pressed if the [AF/AE LOCK] is set to [AF]. !! [CUSTOM MENU] (2/5) ----- [AF/AE LOCK] (AE, AF, AF/AE)</p> <p>*In the Manual Focus condition, It is only worked as [AE lock] function, regardless any settings.</p>
	The pictures recorded with [AUTO BRACKET] function are too dark/bright.	<p>*The [AUTO BRACKET] is selected after setting the [EXPOSURE COMPENSATION], the compensated value is effected for its reference value.</p>
	The Exposure condition is changed extremely.	<p>*Spot metering mode is measuring only the limited narrow area on the centre of the screen.</p> <p>*Confirm the setting condition of [EXPOSURE COMPENSATION] (1/3 EV Step, -3EV to +3EV)</p>
CAPTURING	Although shutter is released, no picture is captured.	<p>*Although the shutter button is fully pressed, it can not take a picture until the subject is not focused. (It is able to take a picture when the Focus Priority turns [OFF] although focus condition does not perfect.) OFF is gives priority to the best time to take a picture.</p> <p>*A picture is not taken until the subject is brought into focus, because [FOCUS PRIORITY] is fixed to [ON] in Intelligent Auto Mode. !! [CUSTOM MENU] (3/5) ----- [FOCUS PRIORITY] (ON/OFF)</p>
	[AUTO BRACKET] does not work.	<p>*Only single picture is able to captured when flash is fired.</p> <p>*It can not be used in My colour mode.</p> <p>*The exposure may not be compensated with auto bracket depending on the brightness of the subject.</p>
COLOUR REPRODUCTION	Colour is strange.	<p>*There is a possibility that [Finely adjusting the white balance] is selected/shifted.</p> <p>*Confirm that [WB Adjustment] setting condition. (Press the cursor [RIGHT] (WB) button, then after choosing the WB mode press the cursor [DOWN] button, in order to execute the [WB ADJUST.] screen.)</p> <p>*It is resumed/memorized although power turns off/on.</p> <p>*Confirm that Film mode, especially, [MY FILM1 & 2] settings.</p> 
	Colour is strange. (With Flash)	<p>*The flash light does not reach enough to the subject due to the over than flash reachable distance. In this case, white balance may be other than its coverage.</p>
	The colour is strange (On PC monitor/ Printout image.)	<p>*There is a possibility that the picture is captured with [AdobeRGB] setting. !! [REC] (5/5) ----- [COLOR SPACE] (sRGB/AdobeRGB)</p> <p>*To proceed proper colour reproduction for AdobeRGB, the AdobeRGB capable PC and Printer are necessary.</p> <p>*In accordance with PC environment, it may not be displayed properly when the picture is re-sized with business software.</p>
POWER	The Power is turned off.	<p>*Confirm that the setting condition of [POWER SAVE]. (If the camera has not been used for the time selected on the setting, the power turns off automatically.) !! [SETUP] (1/5) ----- [ECONOMY] [POWER SAVE] (OFF/1MIN./2 MIN./5 MIN./10 MIN.)</p>
DISPLAY	Abnormal Picture Effect. Certain part of the picture is flashing in Black & White.	<p>*Confirm that the setting condition of [HIGHLIGHT]. !! [SETUP] (2/5) ----- [HIGH LIGHT] (ON/OFF)</p> <p>The white saturated areas appear blinking in Black and White.</p>
	Firmware version	<p>*Confirm that the firmware versions of the camera and lens to be checked. !! [SETUP] (4/5) ----- [VERSION DISP.]</p>

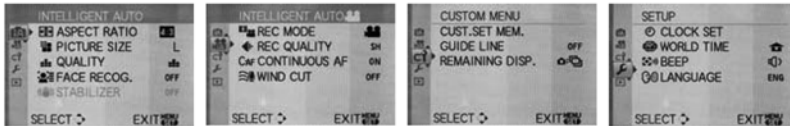
MENU LIST (Quick Reference)

The following menu items are displayed on the LCD monitor.

	 [REC]	 [MOTION PICTURE]	 [CUSTOM MENU]	 [SETUP]	 [MY MENU]	 [PLAYBACK]
1st Page						
2nd Page					/	
3rd Page		/			/	
4th Page		/			/	/
5th Page		/			/	/

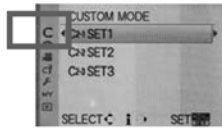
REMARKS:

*When the mode dial is set to [Intelligent Auto Mode], as for [REC], [MOTION PICTURE], [CUSTOM MENU] and [SETUP], only the basic item is displayed.

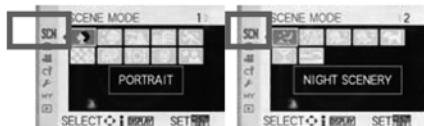


*When the mode dial is set to [Motion Picture P mode], [PLAYBACK] alone is not displayed.

*When the mode dial is set to [Custom mode(C2)], extra-menu group is displayed.



*When the mode dial is set to [Scene mode], extra-menu groups are displayed.



NOTE:

*When set [MENU RESUME] in the [CUSTOM MENU] menu to [ON], the screen shows the last selected menu item when the camera is turned off.

!! [CUSTOM MENU] (4/5) ----- [MENU RESUME] (ON/OFF)

7.2. Checking Method of Drive Circuit for Live view finder (DMW-LVF1):

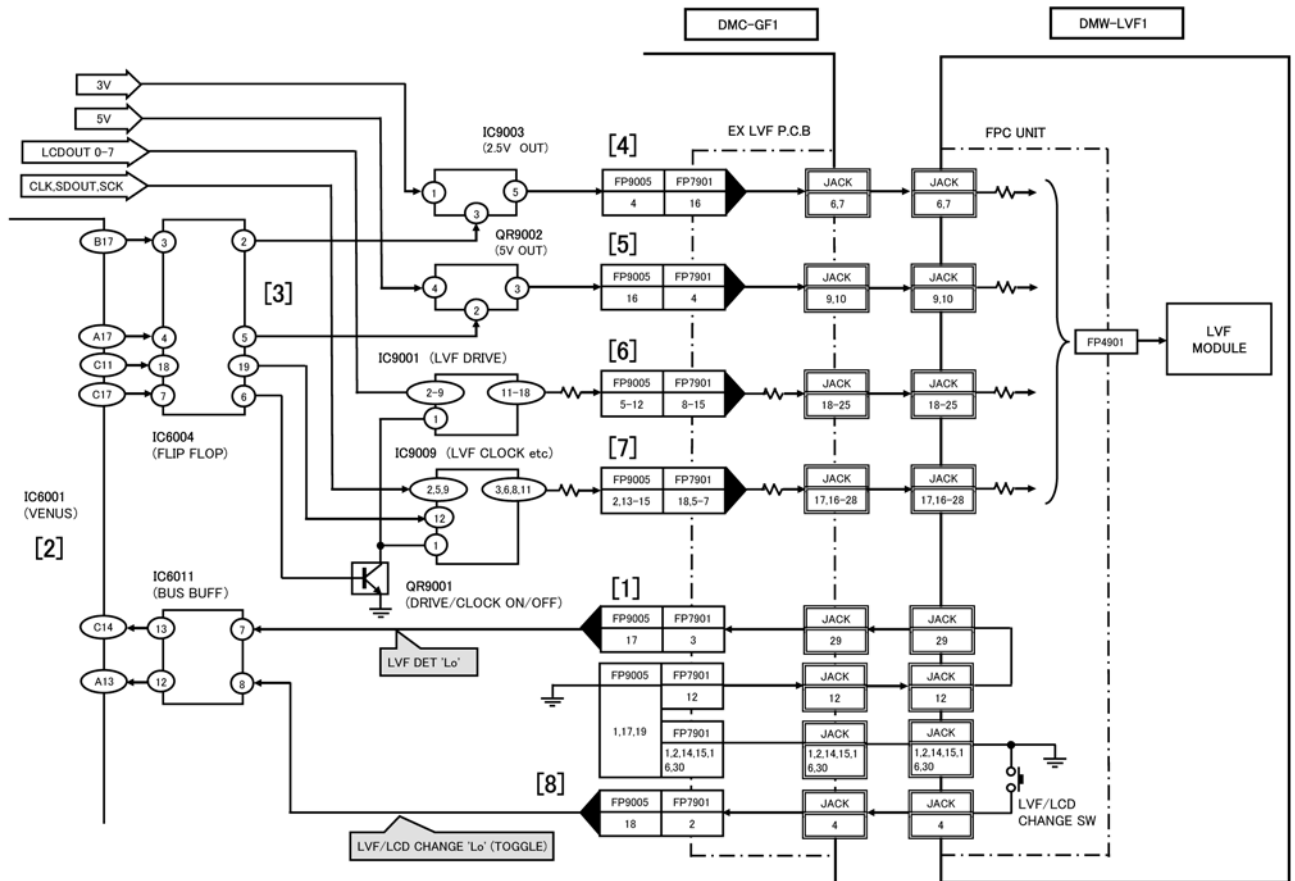
*The circuit operation and checking methods are as shown below:

[Circuit Operation]

*When DMW-LVF1 is attached, DMC-GF1 starts to supply the signals (such as a power, drive and clock signals) to DMW-LVF1.

1. When DMW-LVF1 is attached, 17pin of FP9005 becomes 'Lo' (GND). ----- [1]
2. IC6001(VENUS) detects the attachment condition of DMW-LVF1 through IC6011(BUS BUFF). ----- [2]
3. When the DMW-LVF1 is display mode, 2, 5, 19, and 6 pin of IC6004 become 'Hi' which is controlled by IC6001. ----- [3]
4. 2.5V is outputted from 5pin of IC9003. ----- [4]
5. 5V is outputted from 3pin of QR9002. ----- [5]
6. The drive signal is outputted from 11-18pin of IC9001. ----- [6]
7. Clock signals etc. are outputted from 3, 6, 8, and 11pin of IC9009. ----- [7]
8. The display changes whenever the [LVF/LCD] switch button of DMW-LVF1 is pressed. ----- [8]

*The switching condition of the [LVF/LCD] button is maintained, even if the DMC-GF1 turns off.

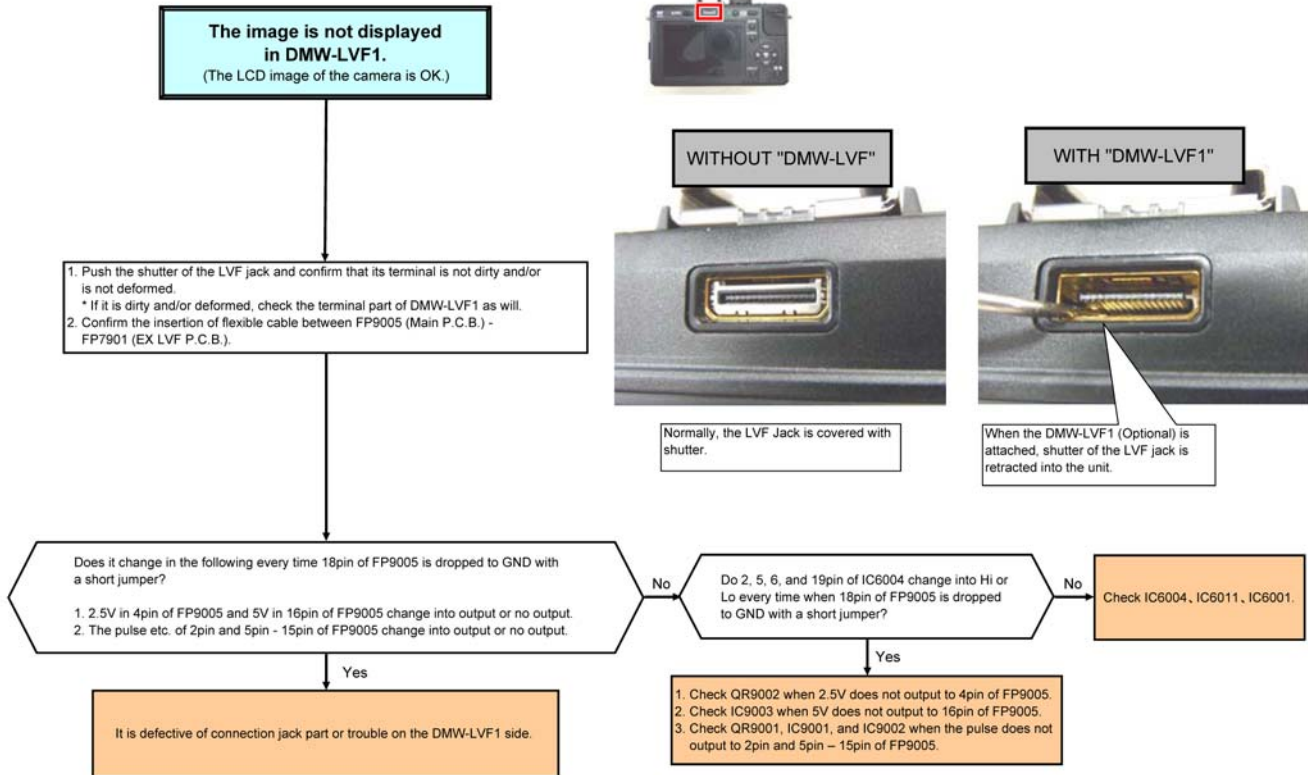


[Check Flow]

• Preparation:

*If there is no DMW-LVF1, connect a short jumper between 17pin of FP9005 and GND in order to make a DMW-LVF1 being attached condition.

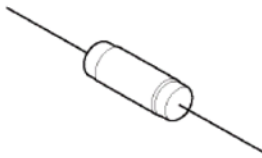
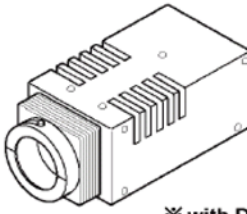

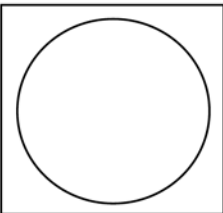
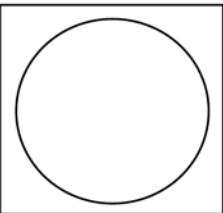
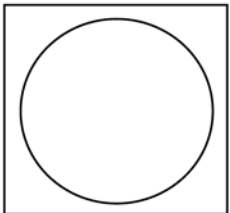
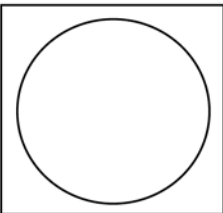
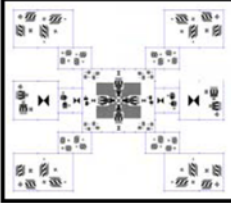
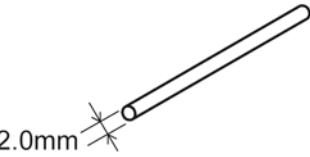

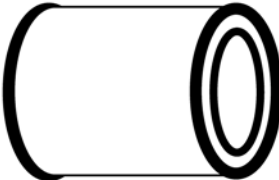


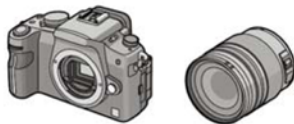
*If there is DMW-LVF1, attach it to the DMC-GF1.



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 ERG5SJ102  An equivalent type of Resistor may be used.	LIGHT BOX VFK1164TDVLB  ※ with DC Cable RFKZ0523 can be used.	ND FILTER VFK1164ND09 
CC FILTER 1 RFKZ0511 	CC FILTER 2 RFKZ0512 	LB FILTER 1 RFKZ0520 
LB FILTER 2 RFKZ0521 	RESOLUTION CHART RFKZ0510  ※ Supplied as divided chart parts. (Assemble it before use.)	Adjustment Shaft × 3 VMS7941  2.0mm An equivalent type can be used (Less than 2.0mm)
Lens Cleaning Kit (BK) VFK1900BK  * Only supplied as 10 set/box.	NAME RING FIXTURE (for H-FS014045) RFKZ0507 	TORQUE DRIVER RFKZ0456  Spec.: 2-30N · cm (Equiv. 0.2-3kgf/cm)
Driver VFK1390 	DMC-G1K Standard model *Correspond by the marketed commodity. (It does not supply as service fixture and tools.) 	

8.2. Clean Box

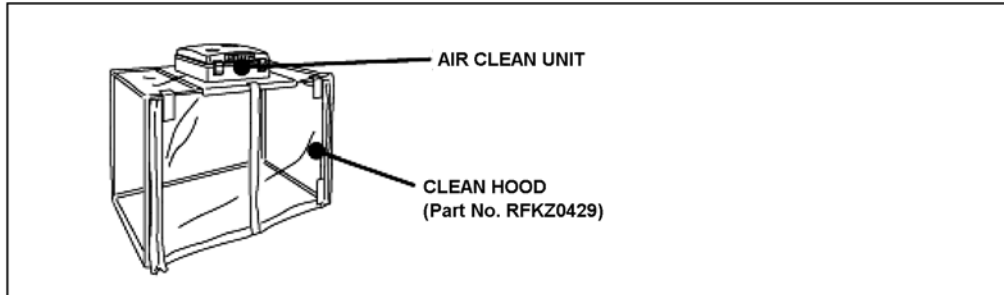
- The repair quality is considered, and it is recommended working in the environment of satisfied clean level less than class 10,000 (Federal Standard 209D).

(When remove the 1st lens frame, it is indispensable.)

[NOTE]

- Work in the environment of satisfied clean level less than class 10,000 (Federal Standard 209D) when remove the 1st lens frame for cleaning.

*Refer to "11.2. General description (Lens cleaning: Interchangeable Lens/H-H020)", "11.3. General description (Lens cleaning: Interchangeable Lens/H-FS014045)" section of this service manual for details.

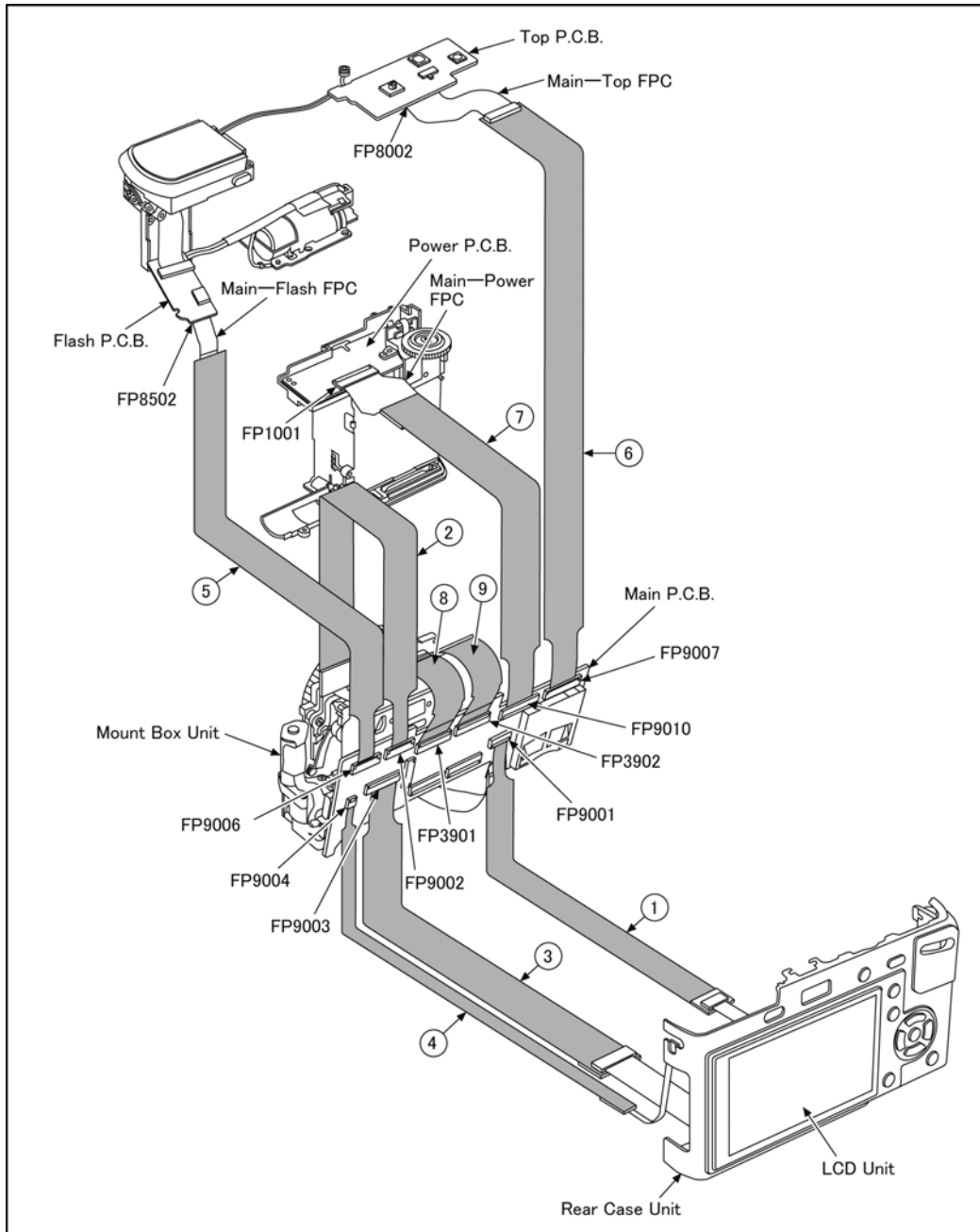


8.3. Service Position

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	VFK1582A1225	FP9001 (MAIN) - REAR OPERATION SW	12PIN 0.5 FFC
2	VFK1364	FP9002 (MAIN) - MOUNT BOX UNIT	14PIN 0.5 FFC
3	RFKZ0477	FP9003 (MAIN) - LCD UNIT	45PIN 0.3 FFC
4	VFK1974	FP9004 (MAIN) - LCD UNIT	4PIN 0.5 FFC
5	VFK1364	FP9006 (MAIN) - MAIN-FLASH FPC - FP8502 (FLASH)	14PIN 0.5 FFC
6	VFK1492	FP9007 (MAIN) - MAIN-TOP FPC - FP8002 (TOP)	26PIN 0.5 FFC
7	VFK2024	FP9010 (MAIN) - MAIN-POWER FPC - FP1001 (POWER)	51PIN 0.3 FFC
8	RFKZ0494	FP3901 (MAIN) - MOUNT BOX UNIT	45PIN 0.3 FFC
9	RFKZ0494	FP3902 (MAIN) - MOUNT BOX UNIT	45PIN 0.3 FFC

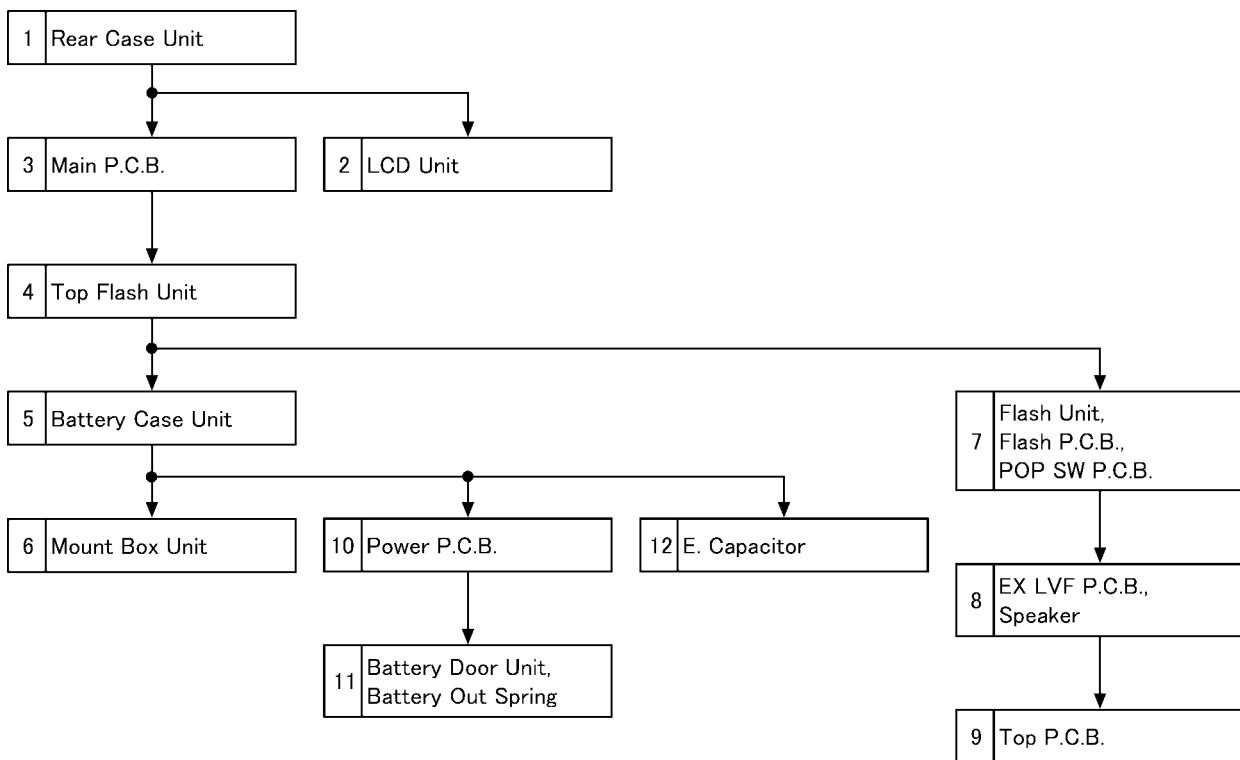


CAUTION-1. (When servicing FLASH SUB P.C.B.)

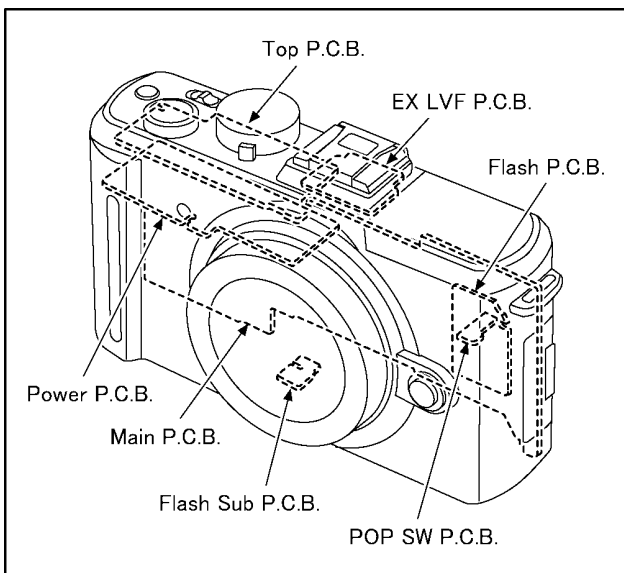
1. Be sure to discharge the capacitor on FLASH SUB P.C.B.
Refer to "HOW TO DISCHARGE THE CAPACITOR ON FLASH SUB P.C.B."
The capacitor voltage is not lowered soon even if the AC Cord is unplugged or the battery is removed.
2. Be careful of the high voltage circuit on FLASH SUB P.C.B..
3. DO NOT allow other parts to touch the high voltage circuit on FLASH SUB P.C.B..

9 Disassembly and Assembly Instructions

9.1. Disassembly Flow Chart



9.2. PCB Location



9.3. Disassembly Procedure

No.	Item	Fig	Removal
1	Rear Case Unit	(Fig. D1)	Card
			Battery
			Hot Shoe Cover
			Shoe Spring
		(Fig. D2)	2 Screws (A)
			2 Screws (B)
			2 Screws (C)
			2 Screws (D)
			1 Screw (E)
		(Fig. D3)	FP9001(Flex)
			FP9003(Flex)
FP9004(Flex)			
Rear Case Unit			
2	LCD Unit	(Fig. D4)	1 Screw (F)
			1 Screw (G)
			Strap Holder
			3 Locking tabs
			LCD Tape
			3 Locking tabs
			LCD Unit
		(Fig. D5)	NOTE:(When Installing)
		(Fig. D6)	FP3901(Flex)
			FP3902(Flex)
			FP3903(Flex)
FP3904(Flex)			
3	Main P.C.B.	(Fig. D6)	FP9001(Flex)
			FP9002(Flex)
			FP9005(Flex)
			FP9006(Flex)
			FP9007(Flex)
			FP9010(Flex)
			1 Screw (H)
			1 Screw (I)
			1 Screw (J)
			P.C.B. Terminal
		(Fig. D7)	P9001(Connector)
Main P.C.B.			
4	Top Flash Unit	(Fig. D8)	Jack Door
			2 Screws (K)
			1 Screw (L)
			1 Screw (M)
			Flash P.C.B. Cover
			P8501(Connector)
			Top Flash Unit
5	Battery Case Unit	(Fig. D9)	2 Screws (N)
			Battery Case Unit
6	Mount Box Unit	(Fig. D10)	4 Screws (O)
			Mount Box Unit
7	Flash Unit Flash P.C.B. POP SW P.C.B.	(Fig. D11)	2 Screws (P)
			P8002(Connector)
			FP8501(Flex)
			1 Screw (Q)
			Flash Tape
			Flash Unit
			Flash P.C.B.
			POP SW P.C.B.

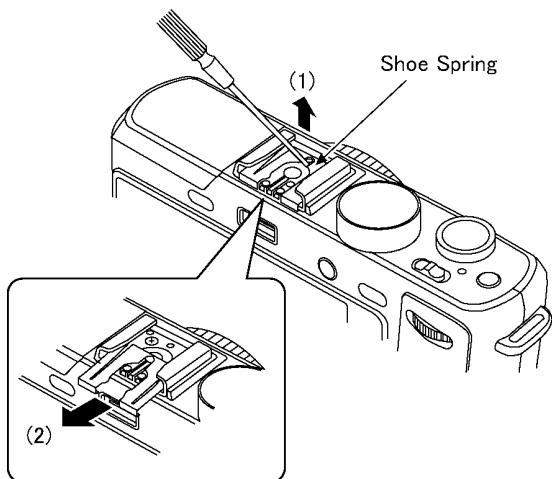
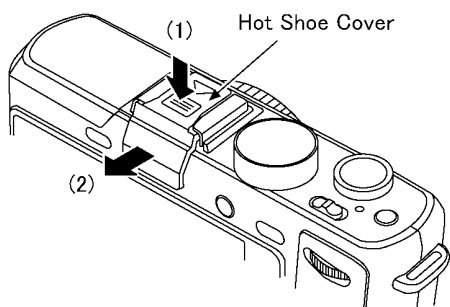
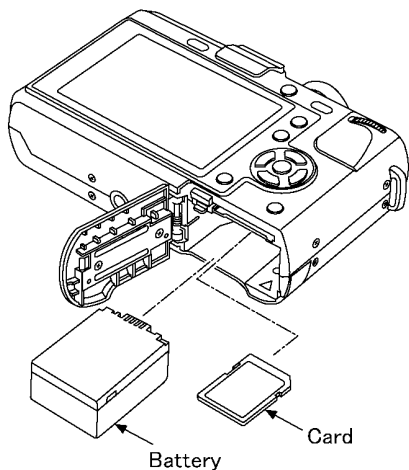
No.	Item	Fig	Removal		
8	EX LVF P.C.B. Speaker	(Fig. D12)	1 Screw (R)		
			P8001(Connector)		
			2 Screws (S)		
		(Fig. D13)	Shield Plate		
			1 Screw (T)		
			EX LVF P.C.B.		
9	Top P.C.B.	(Fig. D14)	FP8001(Flex)		
			FP8003(Flex)		
			3 Screws (U)		
		(Fig. D15)	Top P.C.B.		
			Top Plate (L)		
			Power LED Panel		
			Power Knob		
			Mic		
		10	Power P.C.B.	(Fig. D16)	3 Screws (V)
					Battery Catcher Cover
					FP1002(Flex)
(Fig. D17)	Rear Dial				
	2 Locking tabs				
	Battery Case Plate				
11	Battery Door Unit Battery Out Spring	(Fig. D18)	Solder (4 points)		
			Power P.C.B.		
			Battery Lock Knob		
			Battery Lock Spring		
			Battery Door Shaft		
			Battery Door Spring		
12	E. Capacitor	(Fig. D19)	Battery Door Unit		
			Battery Out Spring		
			1 Screw (W)		
		(Fig. D20)	1 Screw (X)		
			Tripod Fixing Plate		
			Capacitor Tape		
11	Battery Door Unit Battery Out Spring	(Fig. D18)	1 Locking tab		
			Capacitor Holder		
12	E. Capacitor	(Fig. D19)	E. Capacitor		

9.3.1. Removal of the Rear Case Unit

NOTE:

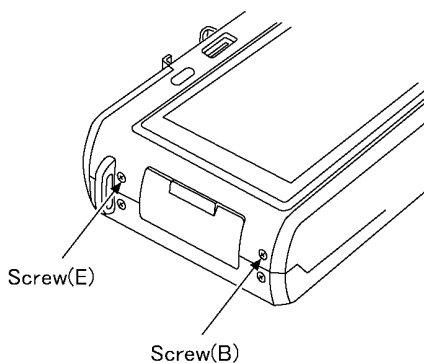
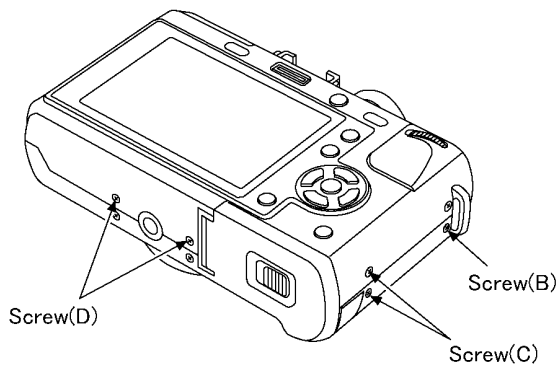
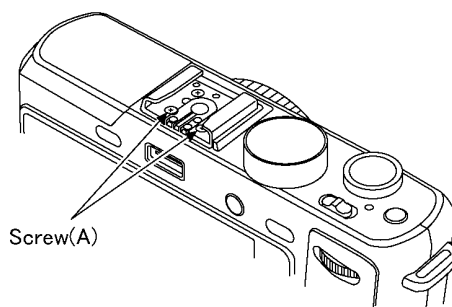
- When servicing and reassembling, remove the card and battery from the unit.
- Install the body cap, except when it is necessary to prevent garbage and dust.






- Card
- Hot Shoe Cover
- Battery
- Shoe Spring



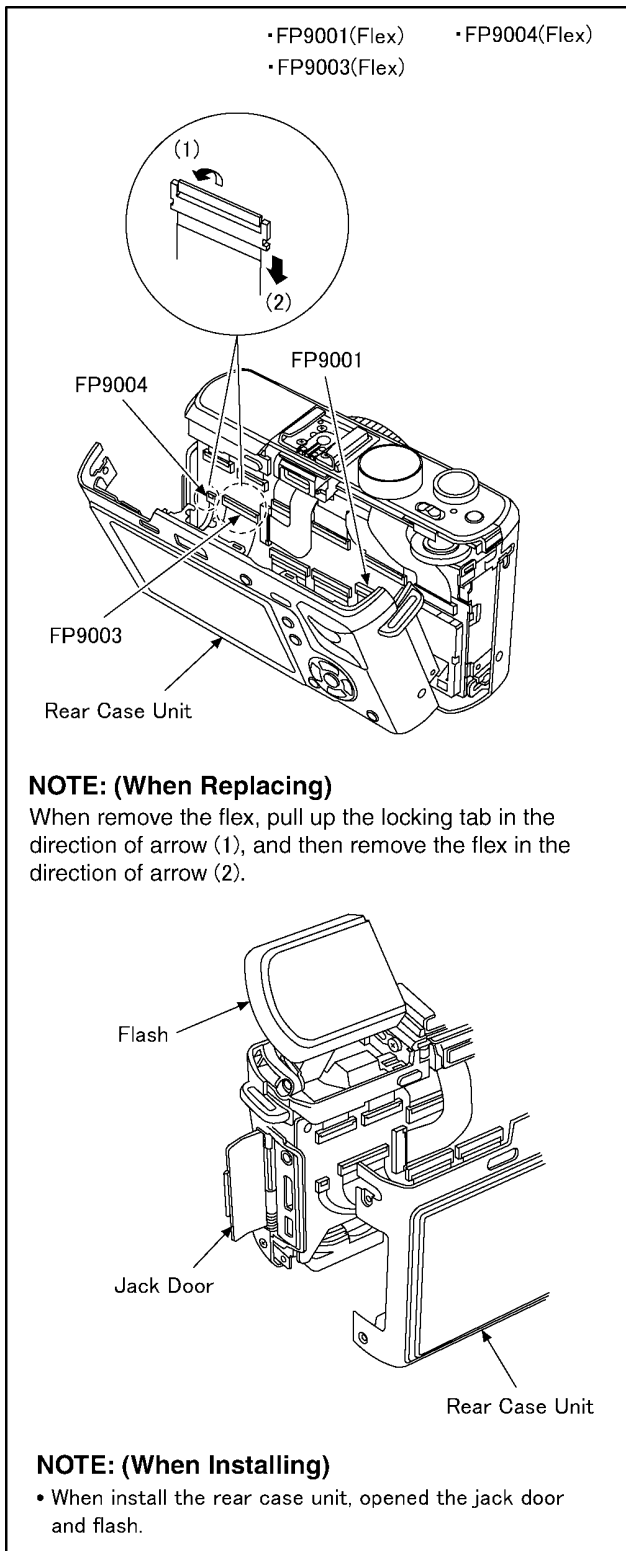
(Fig. D1)

- Screw(A) × 2
- Screw(B) × 2
- Screw(C) × 2
- Screw(D) × 2
- Screw(E) × 1



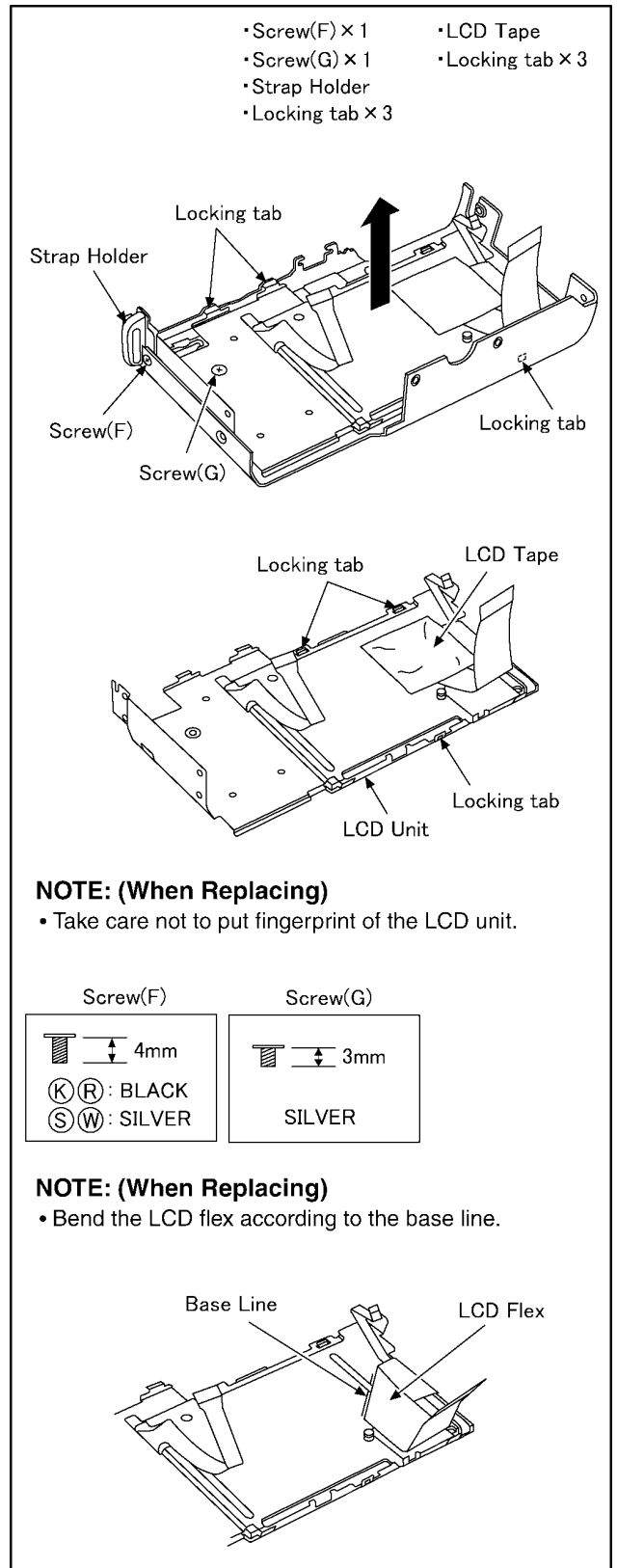
Screw(A)	Screw(B)	Screw(C)
 4mm	 4mm	 4mm
SILVER	(K) (R) : BLACK (S) (W) : SILVER	(K) (R) : BLACK (S) (W) : SILVER
Screw(D)	Screw(E)	
 2.5mm	 6.5mm	
(K) (R) : BLACK (S) (W) : SILVER	(K) (R) : BLACK (S) (W) : SILVER	

(Fig. D2)

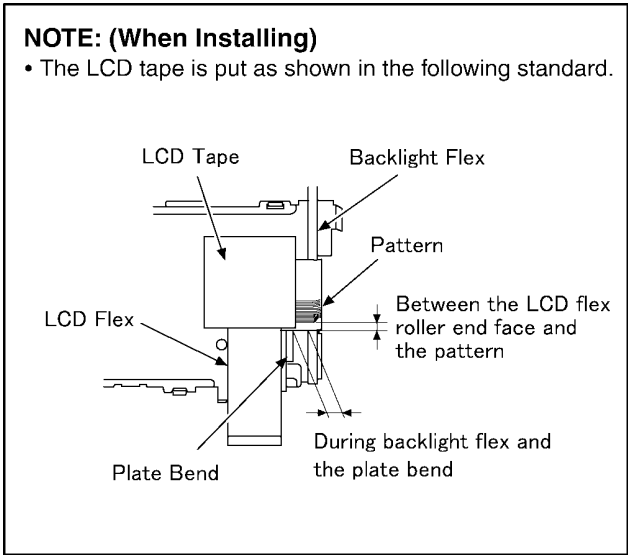


(Fig. D3)

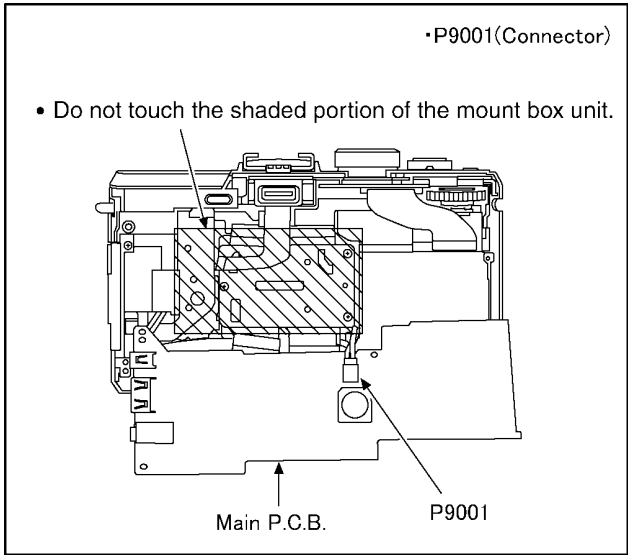
9.3.2. Removal of the LCD Unit



(Fig. D4)

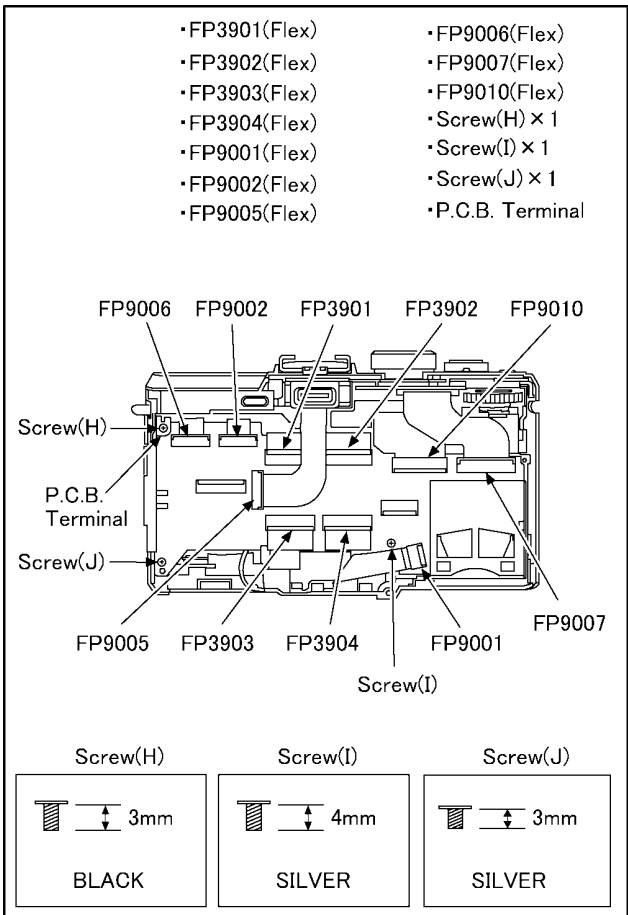


(Fig. D5)



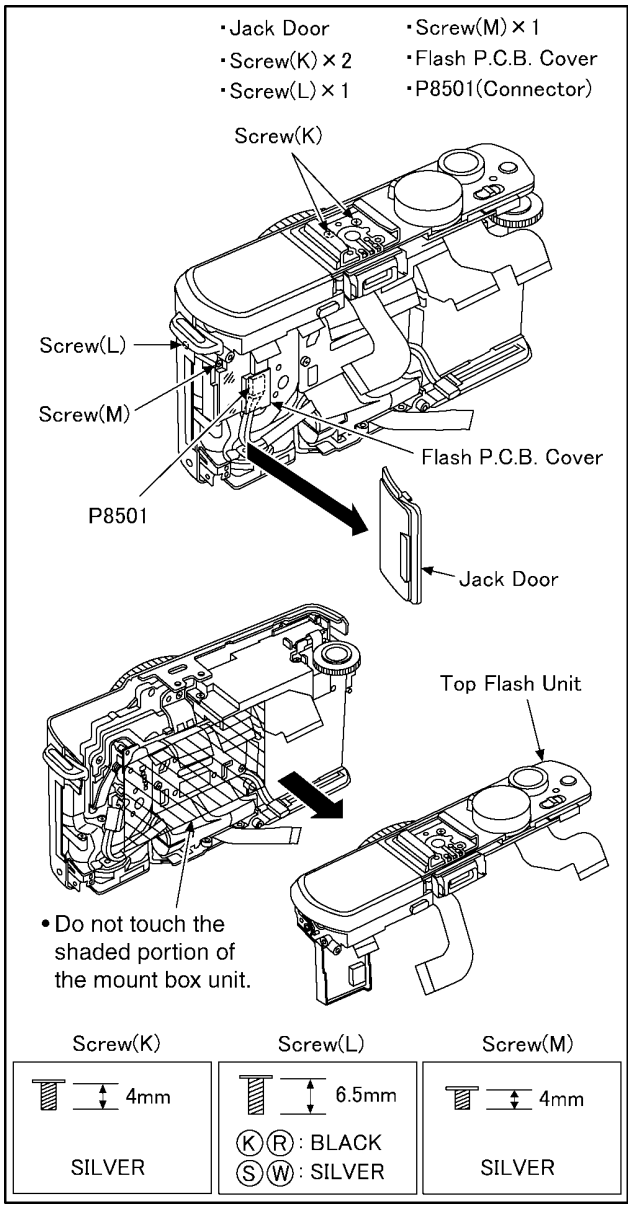
(Fig. D7)

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



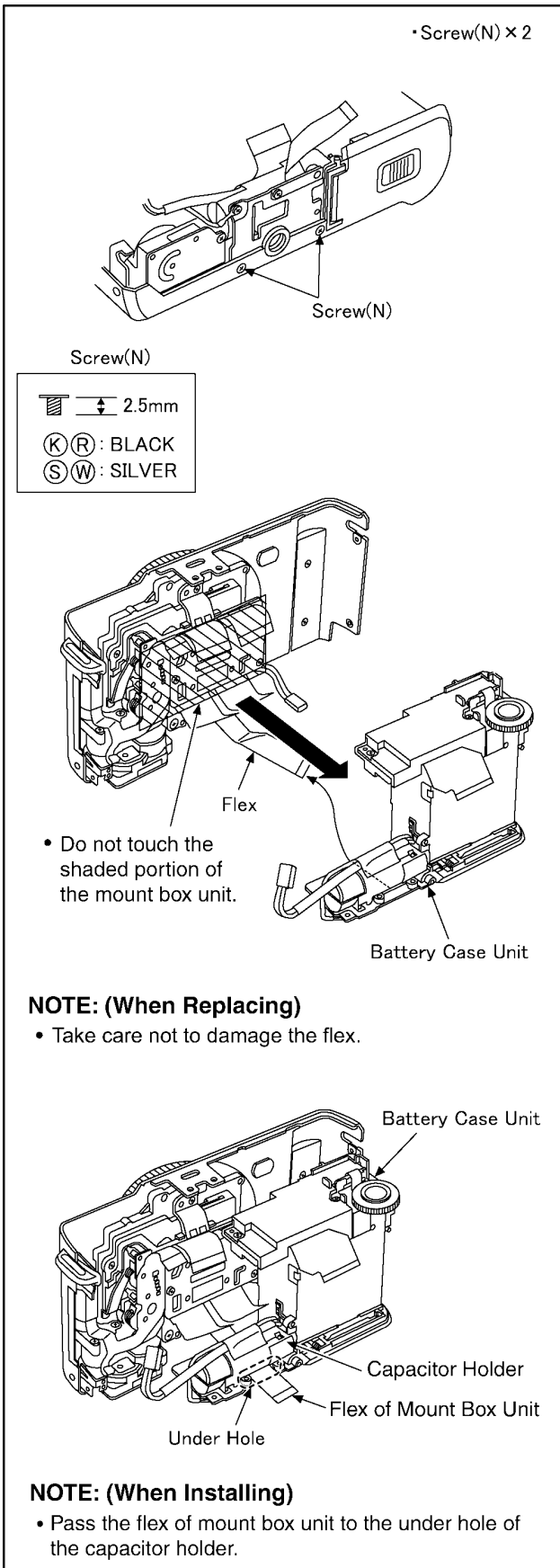
(Fig. D6)

9.3.4. Removal of the Top Flash Unit



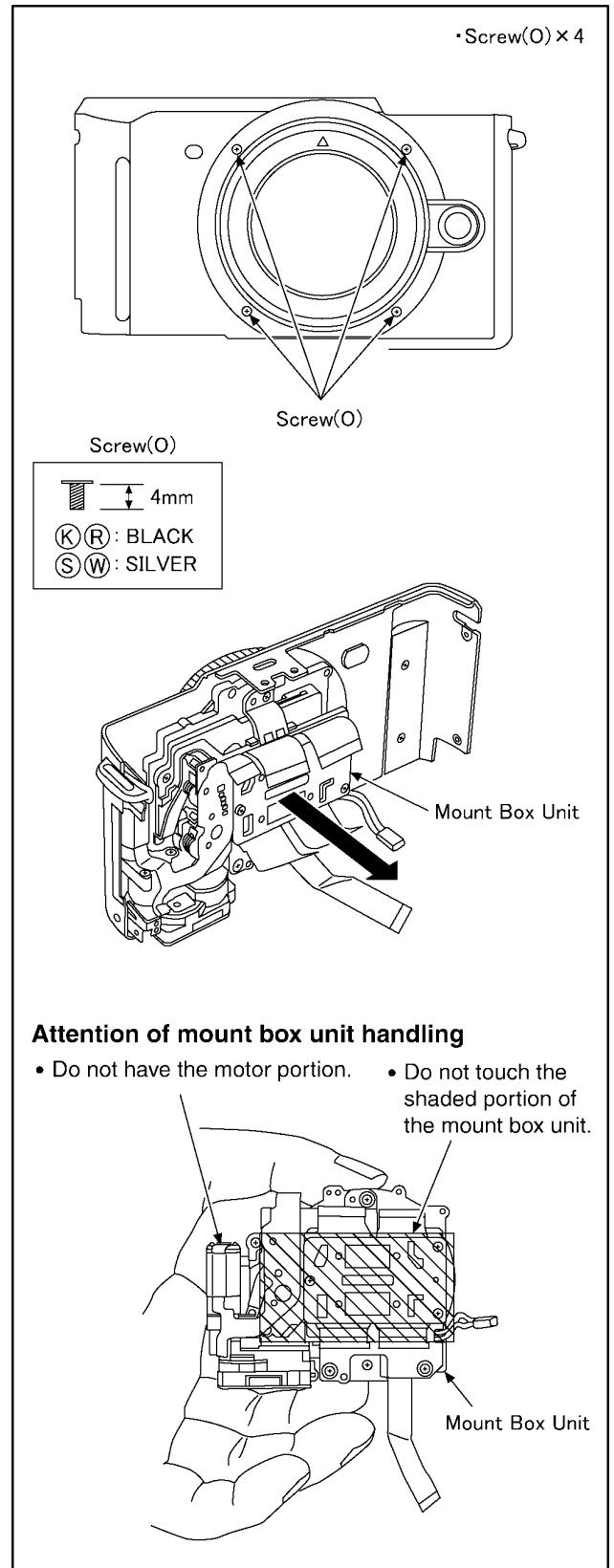
(Fig. D8)

9.3.5. Removal of the Battery Case Unit



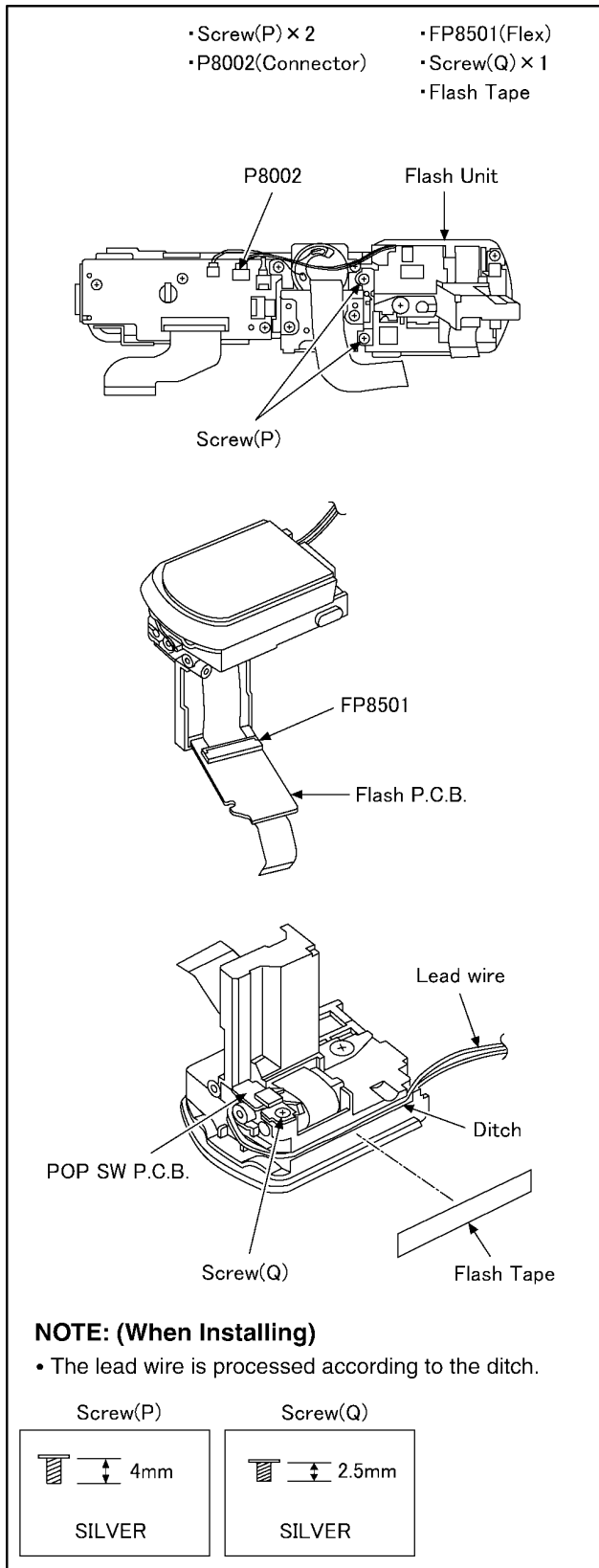
(Fig. D9)

9.3.6. Removal of the Mount Box Unit



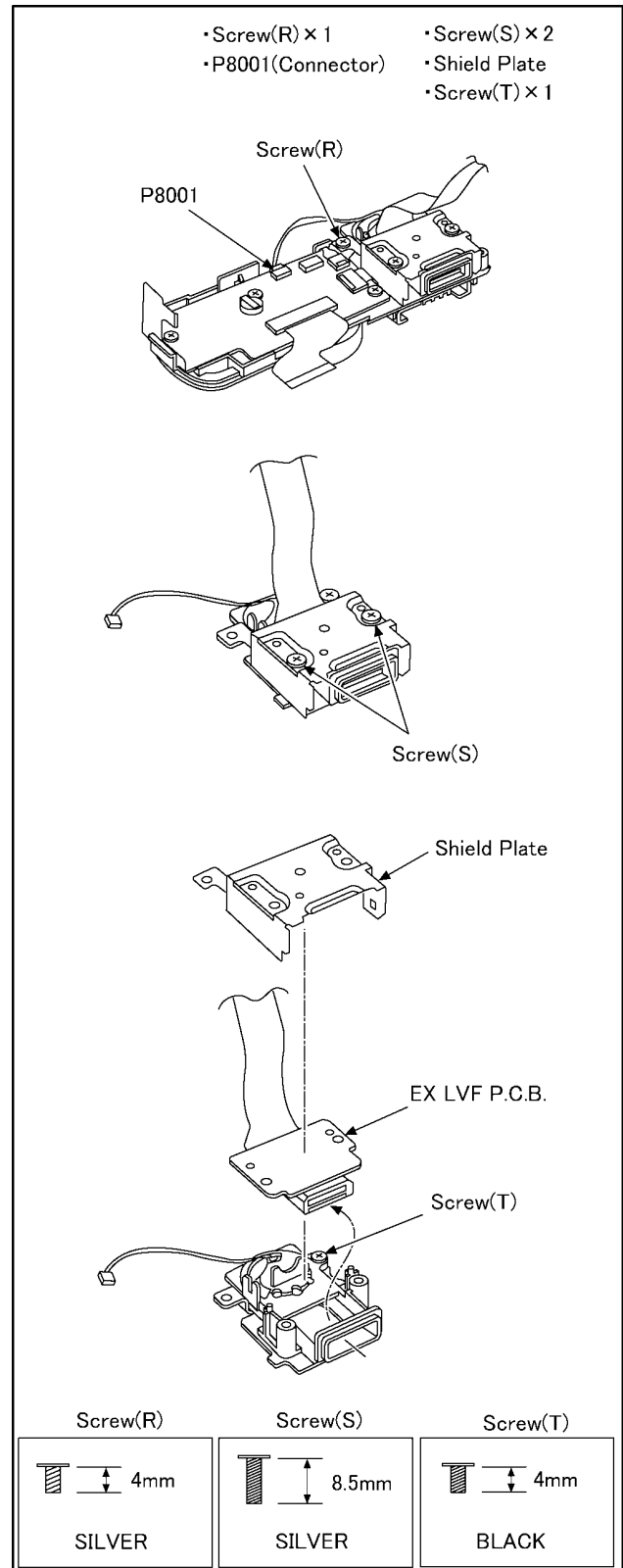
(Fig. D10)

9.3.7. Removal of the Flash Unit, Flash P.C.B. and POP SW P.C.B.

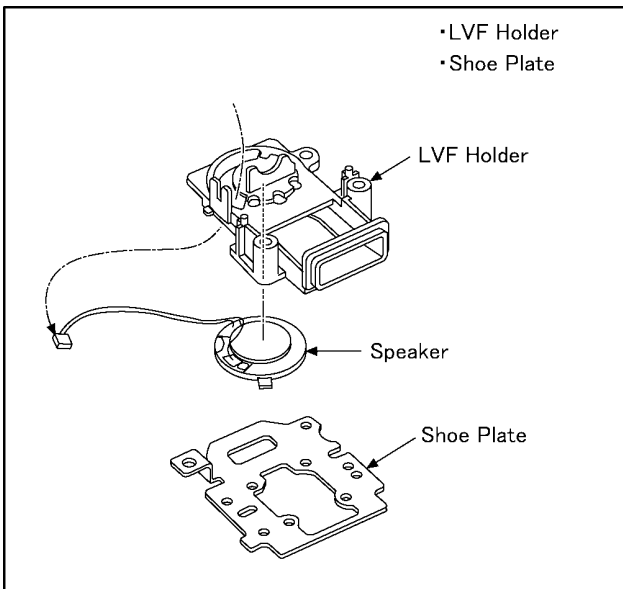


(Fig. D11)

9.3.8. Removal of the EX LVF P.C.B. and Speaker

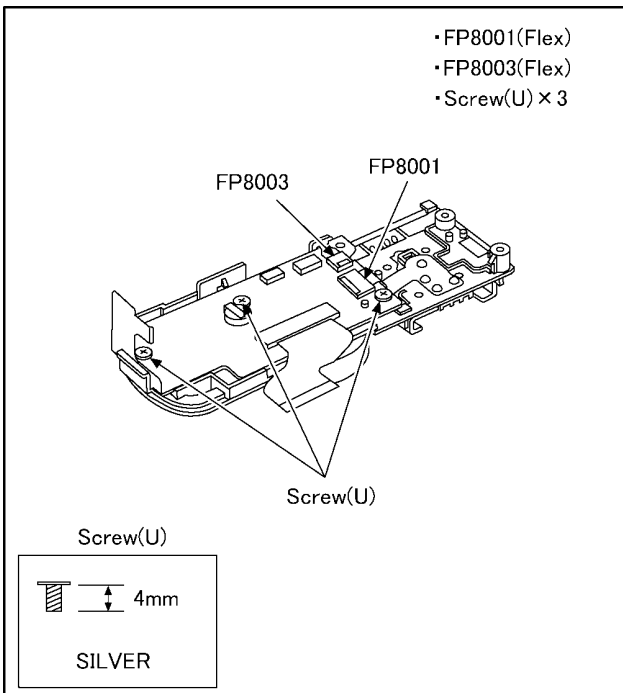


(Fig. D12)

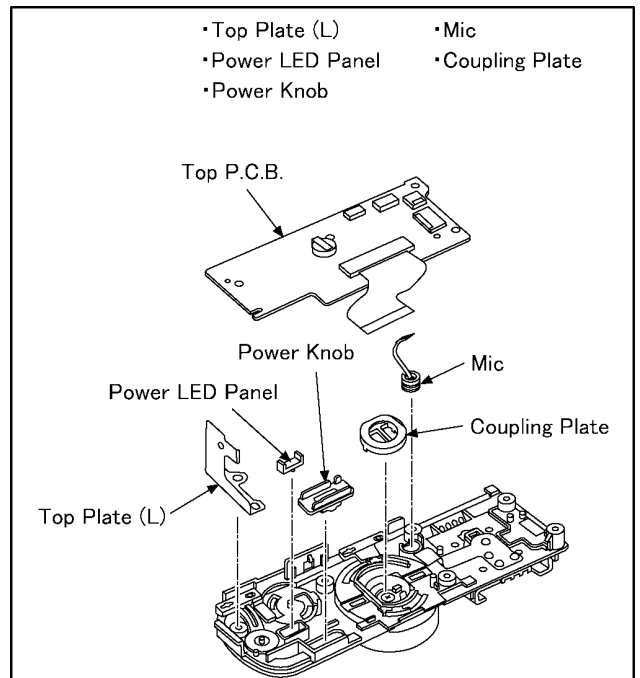


(Fig. D13)

9.3.9. Removal of the Top P.C.B.



(Fig. D14)

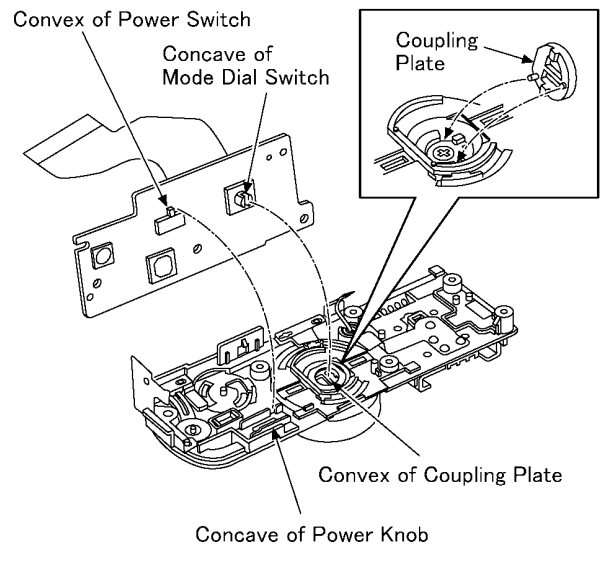


NOTE: (When Replacing)

- Be careful not to lose parts, it becomes easy to separate from the top plate (L), power LED panel, power knob, mic and coupling plate when removing the top P.C.B..

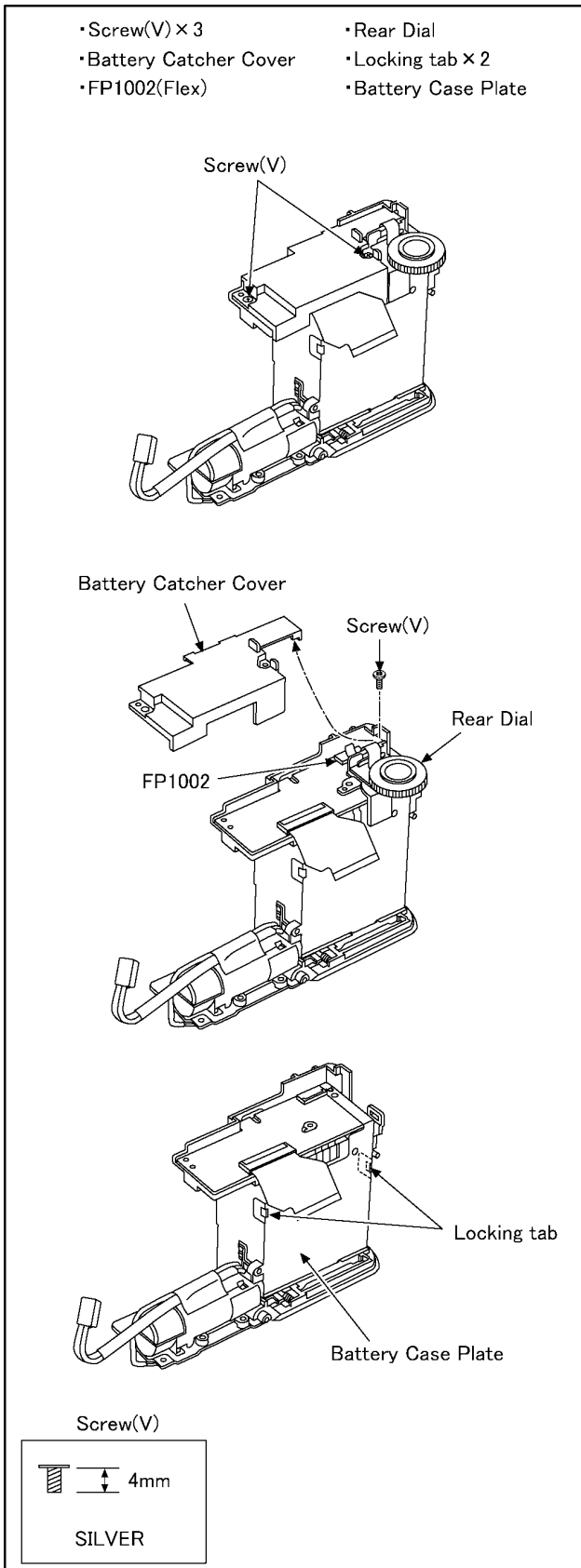
NOTE: (When Installing)

1. Align the convex of power switch and concave of power knob.
2. Align the concave of mode dial switch and convex of coupling plate.

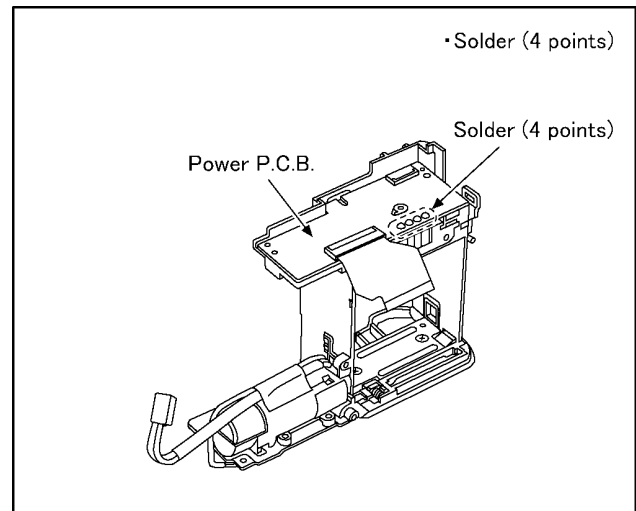


(Fig. D15)

9.3.10. Removal of the Power P.C.B.

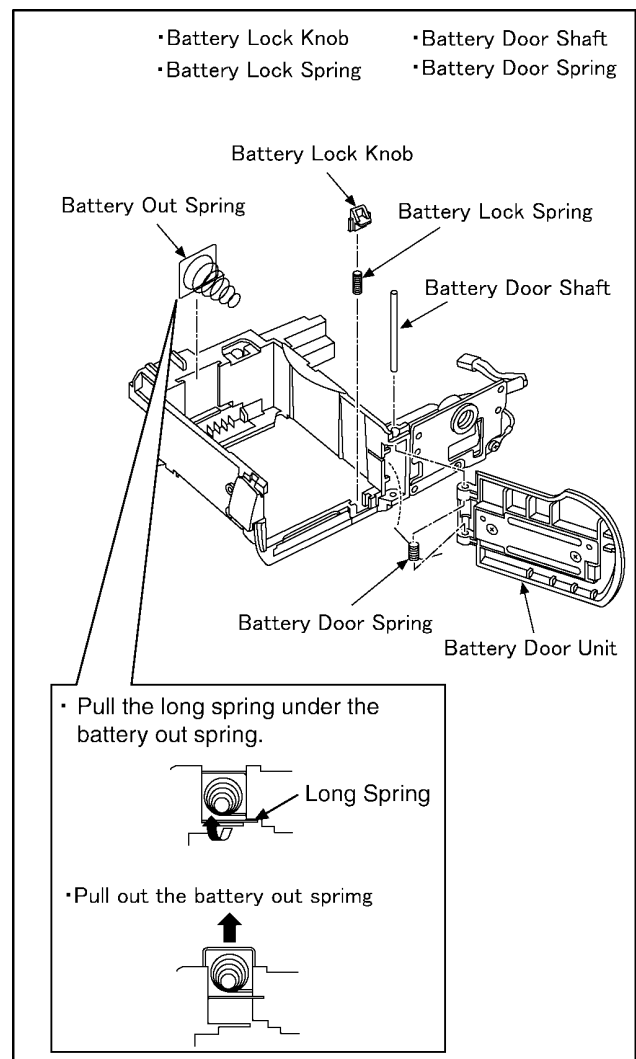


(Fig. D16)



(Fig. D17)

9.3.11. Removal of the Battery Door Unit and Battery Out Spring



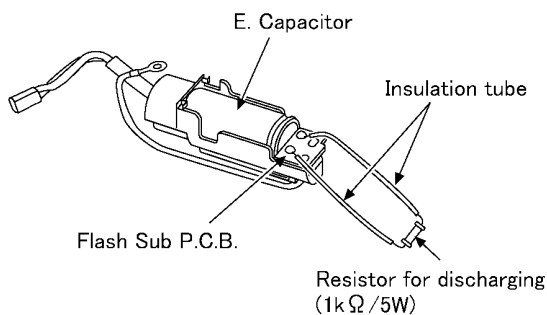
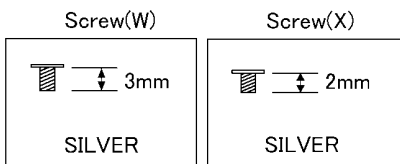
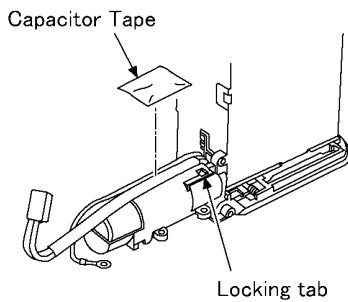
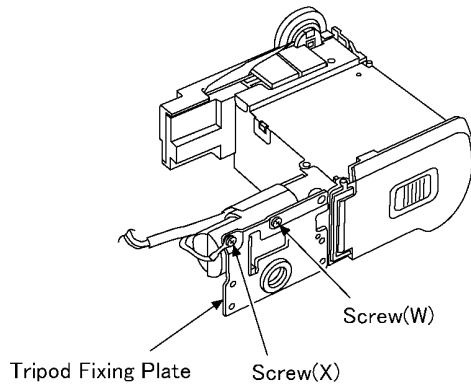
(Fig. D18)

9.3.12. Removal of the E.Capacitor

IMPORTANT NOTICE:

Take care not apply any bending load to the charging capacitor. It brings about the possibility of P.C.B. and/or component damage on the Flash Sub P.C.B..

- Screw(W) × 1
- Screw(X) × 1
- Tripod Fixing Plate
- Capacitor Tape
- Locking tab × 1



CAUTION

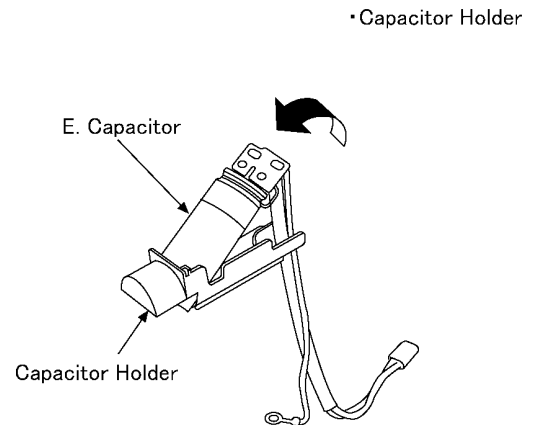
Be sure to discharge the E.Capacitor on Flash Sub P.C.B. before disassembling.

1. Put the insulation tube on the lead part of resistor (ERG5SJ102: 1kΩ/5W).
2. Put the resistor between both terminals of capacitor unit for approx. 5 seconds.

(Fig. D19)

IMPORTANT NOTICE:

Take care not apply any bending load to the charging capacitor. It brings about the possibility of P.C.B. and/or component damage on the Flash Sub P.C.B..



(Fig. D20)

NOTE: (When Installing)

Be sure to confirm the following points when installing.

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

9.4. Disassembly and Assemble Procedure for the Lens (H-H020)

It is recommended dealing with clean box, to keep maintaining the dustproof environment.
(Refer to "8.2. Clean Box" section of this service manual for details.)

Important:

1. When servicing the enclosure part (refer to Fig. C1), it must be performed inside of satisfied clean level.
(Satisfied clean level: Less than class 10,000 (Federal Standard 209D))
As for procedure, refer to the "11 Maintenance" for details.
2. To minimize the possibilities/risk of getting the dust/dirt on the lens surface, keep covering the lens unit with lens caps (front & rear), other than necessary cases.
3. Do not touch the surface of the lens glasses with your fingers.
4. Blow off the dust on the surface of the lens with a blower brush.
5. Use lens cleaning KIT (BK)(VFK1900BK).

Proceed disassemble/assemble, by referring the following table and Fig. C1.

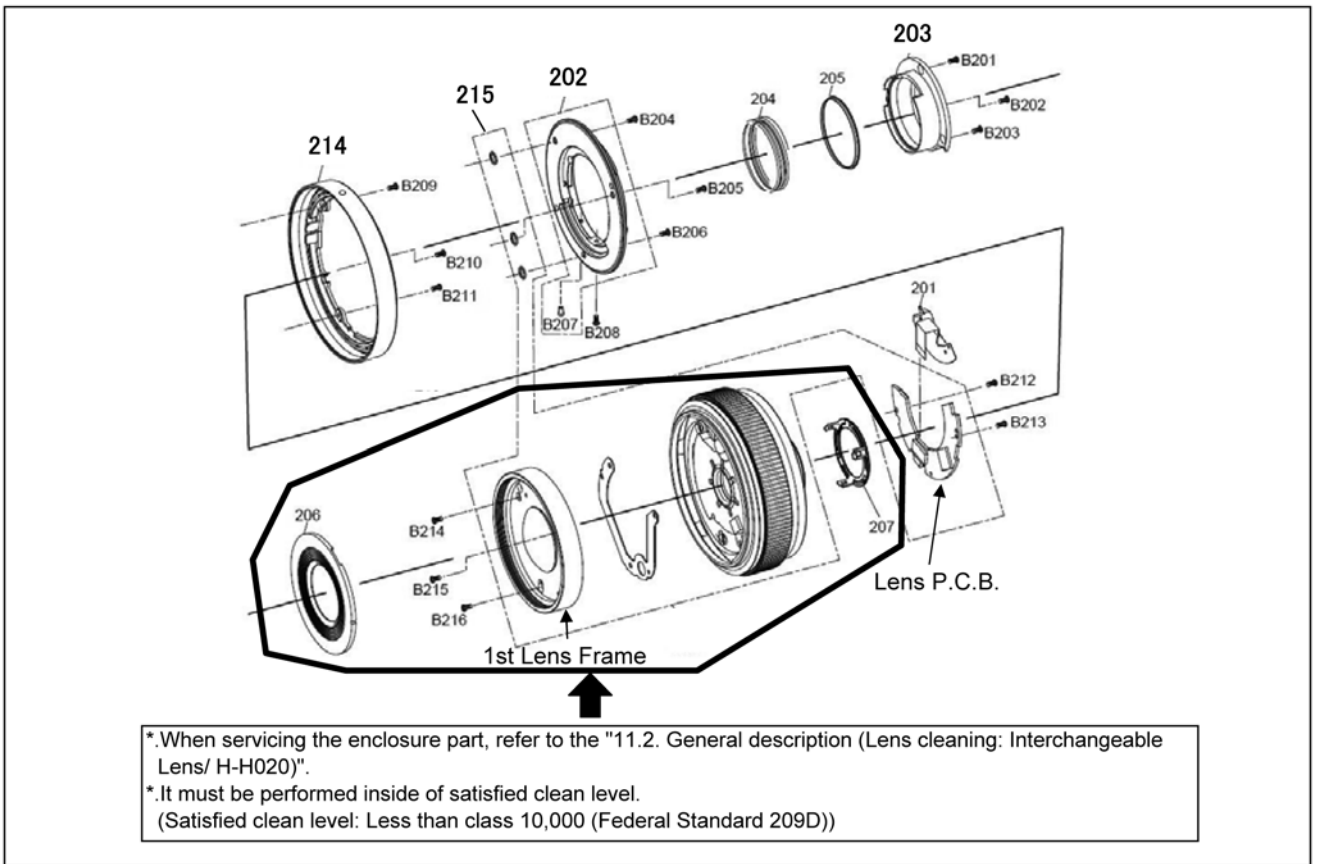
NOTE:

1. When installing the screws, be sure to use the torque driver (RFKZ0456) and tighten the screws with specified torque, mentioned on the above table.
2. The Ref.B207 is no need to remove/install for disassembly and assembly.
3. Use small driver (VFK1390) when removing/tighten the B208.

Interchangeable Lens (H-H020)

Caution:
Keep covering the lens unit with Lens caps (front & rear), other than necessary cases.

Concerned parts		Screws					Remarks
Part name	Ref. No.	Ref. No.	Color	Length(mm)	Torque value	Order	
Shading frame	203	B201	Black	3mm	10±1.2 N·cm	[1]	Refer to the "9.4.1. Important Notice (Shading Frame)"
		B202	Black	3mm	10±1.2 N·cm	[2]	
		B203	Black	3mm	10±1.2 N·cm	[3]	
L mount unit	202	B205	Silver	5mm	20±1.2 N·cm	[1]	Refer to the "9.4.2. Important Notice (L Mount Unit)"
		B204	Silver	5mm	20±1.2 N·cm	[2]	
		B206	Silver	5mm	20±1.2 N·cm	[3]	
		B208	Silver	3mm	-----	[4]	Use Small Driver (VFK1390)
Rear frame unit	214	B211	Black	4mm	10±1.2 N·cm	[1]	
		B210	Black	4mm	10±1.2 N·cm	[2]	
		B209	Black	4mm	10±1.2 N·cm	[3]	
Lens body unit	215						
Lens P.C.B.	---	B213	Silver	3mm	6±1.0 N·cm	[1]	
		B212	Silver	3mm	6±1.0 N·cm	[2]	
1st lens frame unit	---	B214	Silver	4mm	8±1.0 N·cm	[1]	
		B215	Silver	4mm	8±1.0 N·cm	[2]	
		B216	Silver	4mm	8±1.0 N·cm	[3]	

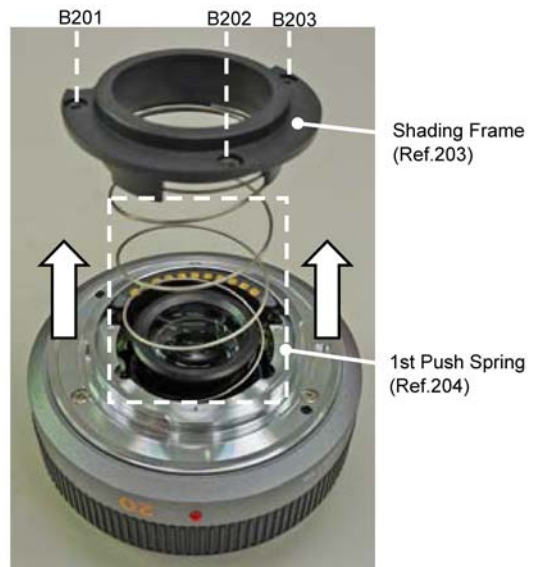


(Fig. C1)

9.4.1. Important Notice (Shading Frame)

Important:

When removing the 3 screws (B201, B202, and B203), take care not to dash out the shading frame by the 1st push spring.



9.4.2. Important Notice (L Mount Unit)

Important:

There are some kinds of spacers are fixed with 3 screws (B204, B205 and B206), different in thickness.

(In accordance with the lens unit, few pieces may be used.)

Use originally fitted spacers with same number/position, as it was.

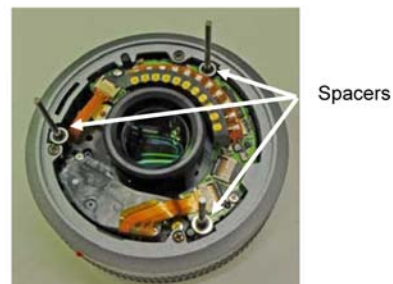
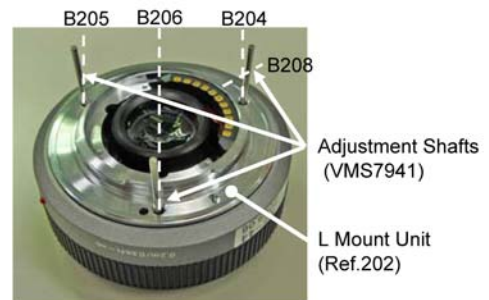
(Do not miss and/or mix up the spacers.)

[Disassembly Procedures]

1. After removing the 3 screws (B204, B205 and B206), insert the adjustment shafts (VMS7941 or equivalent) before removing the L mount unit.
2. Remove the 1 screw (B208).
3. Remove the L mount unit.
4. Remove the adjustment shafts together with spacers.
(Be sure to keep them to be fitted back to original position.)

[Assembly Procedures]

1. Insert the adjustment shafts together with spacers at original position.
2. Insert the L mount unit.
3. Tighten the screws (B204, B205 and B206) with specified torque in numerical order.
(Torque spec: $20 \pm 1.2 \text{ N} \cdot \text{cm}$)
4. Tighten the screw (B208).



9.5. Disassembly and Assemble Procedure for the Lens (H-FS014045)

It is recommended dealing with clean box, to keep maintaining the dustproof environment.
(Refer to "8.2. Clean Box" section of this service manual for details.)

Important:

1. When servicing the enclosure part (refer to Fig. K1), it must be performed inside of satisfied clean level.
(Satisfied clean level: Less than class 10,000 (Federal Standard 209D))
As for procedure, refer to the "11 Maintenance" for details.
2. To minimize the possibilities/risk of getting the dust/dirt on the lens surface, keep covering the lens unit with lens caps (front & rear), other than necessary cases.
3. Do not touch the surface of the lens glasses with your fingers.
4. Blow off the dust on the surface of the lens with a blower brush.
5. Use lens cleaning KIT (BK)(VFK1900BK).

Proceed disassemble/assemble, by referring the following table and Fig. K1.

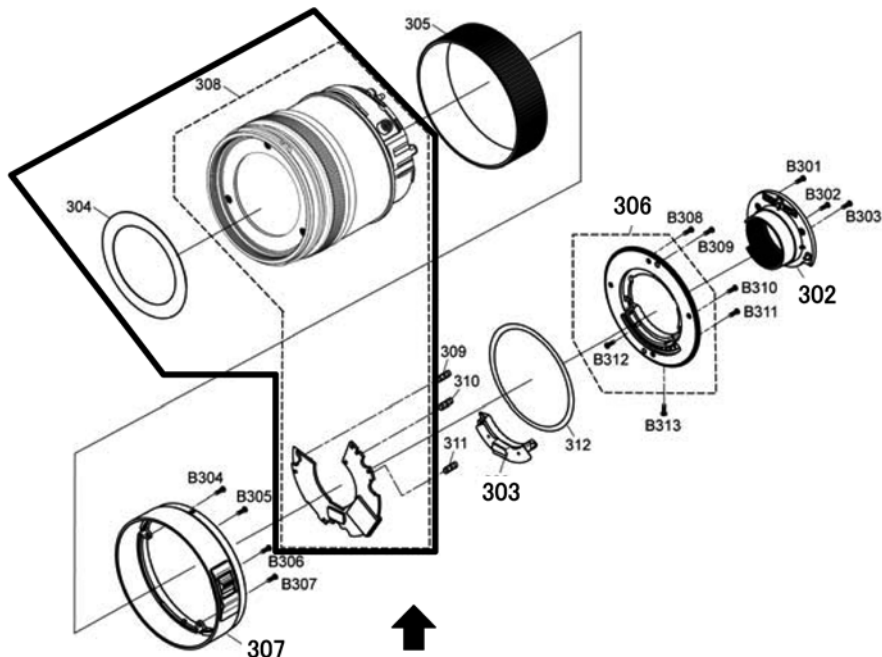
NOTE:

1. When installing the screws, be sure to use the torque driver (RFKZ0456) and tighten the screws with specified torque, mentioned on the above table.
2. The Ref.B312 is no need to remove/install for disassembly and assembly.
3. Use small driver (VFK1390) when removing/tighten the B313.

Interchangeable Lens (H-FS014045)

Caution:
Keep covering the lens unit with Lens caps (front & rear), other than necessary cases.

Concerned parts		Screws			
Part name	Ref. No.	Ref. No.	Color	Length(mm)	Torque value
Shading frame	302	B301	Black	3mm	10±1.2 N·cm
		B302	Black	3mm	10±1.2 N·cm
		B303	Black	3mm	10±1.2 N·cm
L mount unit	306	B308	Silver	5mm	20±1.2 N·cm
		B309	Silver	5mm	20±1.2 N·cm
		B310	Silver	5mm	20±1.2 N·cm
		B311	Silver	5mm	20±1.2 N·cm
Mount contact unit	303	B313	Silver	3mm	8±1.2 N·cm
Rear frame 2 unit	307	B304	Black	4mm	10±1.2 N·cm
		B305	Black	4mm	10±1.2 N·cm
		B306	Black	4mm	10±1.2 N·cm
		B307	Black	4mm	10±1.2 N·cm



*.When servicing the enclosure part, refer to the "11.3. General description (Lens cleaning: Interchangeable Lens/ H-FS014045)".
 *.It must be performed inside of satisfied clean level.
 (Satisfied clean level: Less than class 10,000 (Federal Standard 209D))

(Fig. K1)

10 Measurements and Adjustments

10.1. Matrix Chart for Replaced Part and Necessary Adjustment

The relation between Replaced part and Necessary Adjustment is shown in the following table.

When concerned part is replaced, be sure to achieve the necessary adjustment(s).

As for Adjustment condition/procedure, consult the "Adjustment Manual" which is available in Adjustment software.

NOTE:

After adjustments have been terminated, make sure to achieve "INITIAL SETTINGS".

Adjustment Item		Replaced Part					
		Mount Box Unit (*3)	Main P.C.B. (*2)	Flash P.C.B.	Power P.C.B.	LCD U	Lens U/ L-Mount/ Rear Frame
Camera Body Section	ISO sensitivity adjustment (ISO)	O	O	-	-	-	-
	High brightness coloration inspection (SEN)	O	O	-	-	-	-
	AWB adjustment (WBL/WBM)	O	O	-	-	-	-
	IMAGE SENSOR white scratch compensation (WKI)	O	O	-	-	-	-
	IMAGE SENSOR black scratch compensation (BKI)	O	O	-	-	-	-
	Mount Box Adjustment data writing	O	-	-	-	-	-
	AVCHD function inspection	-	O(*4)	-	-	-	-
Defect Part Division/ Inspection	Resolution inspection (*1)	O	-	-	-	-	-

- *1**
- Inspect it, not only corresponding part is replaced, but also camera body is shocked and/or dropped.
 - The DMC-G1/DMC-GH1/DMC-GF1 unit (marketed commodity: operates normal) etc. in accordance with the Micro Four Thirds System and normal zoom lens H-FS014045 (marketed commodity) are necessary.
 - Refer to the adjustment instruction in the adjustment software for details.

***2 NOTE: (When exchange the MAIN P.C.B.)**

- Correspond by either the following when exchange the MAIN P.C.B. unavoidably by destruction and damage etc. of MAIN P.C.B..
 - When it can turn on power, and the adjustment software can communicate with the camera body:
 - Before replacing, proceed the FLASH-ROM data backup from the unit. After replacing, overwrite the FLASH-ROM data with backup data from the unit, before proceeding the main body adjustment.
 - When it cannot turn on power, or the adjustment software cannot communicate with the camera body:
 - The readjustment of mount box unit etc. are necessary.
 - Refer to the adjustment instruction in the adjustment software for details.

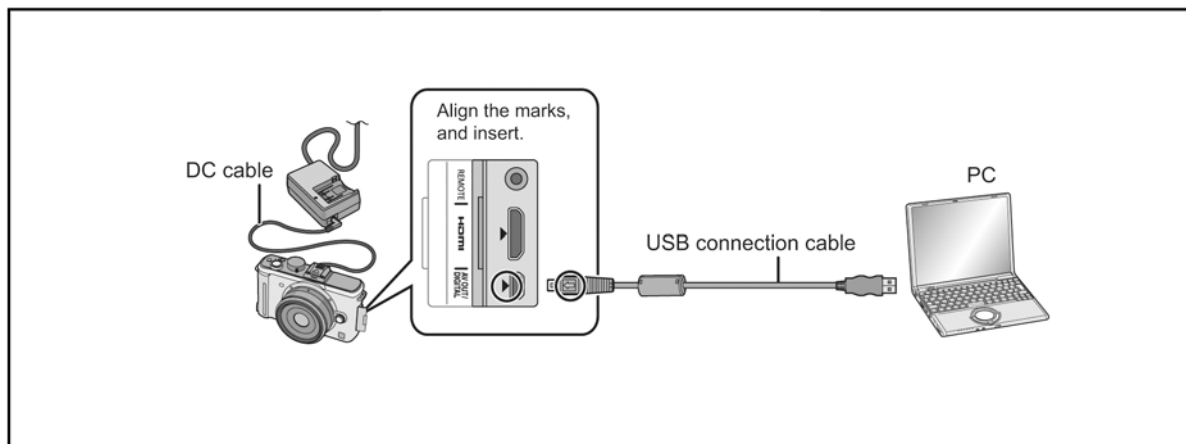
***3 NOTE: (After exchange the mount box unit)**

- Execute the resolution inspection by the comparison with the standard model (DMC-G1K etc.: operates normal).
- Refer to the adjustment instruction in the adjustment software for details.

***4**

- Confirm self recording/playback motion picture of AVCHD mode by the LCD.
- Confirm it on the TV with HDMI socket when repair HDMI relation.

* There are no LCD adjustment model.



11 Maintenance

11.1. Notice in external cleaning

11.1.1. ABOUT THE BODY

NOTE:

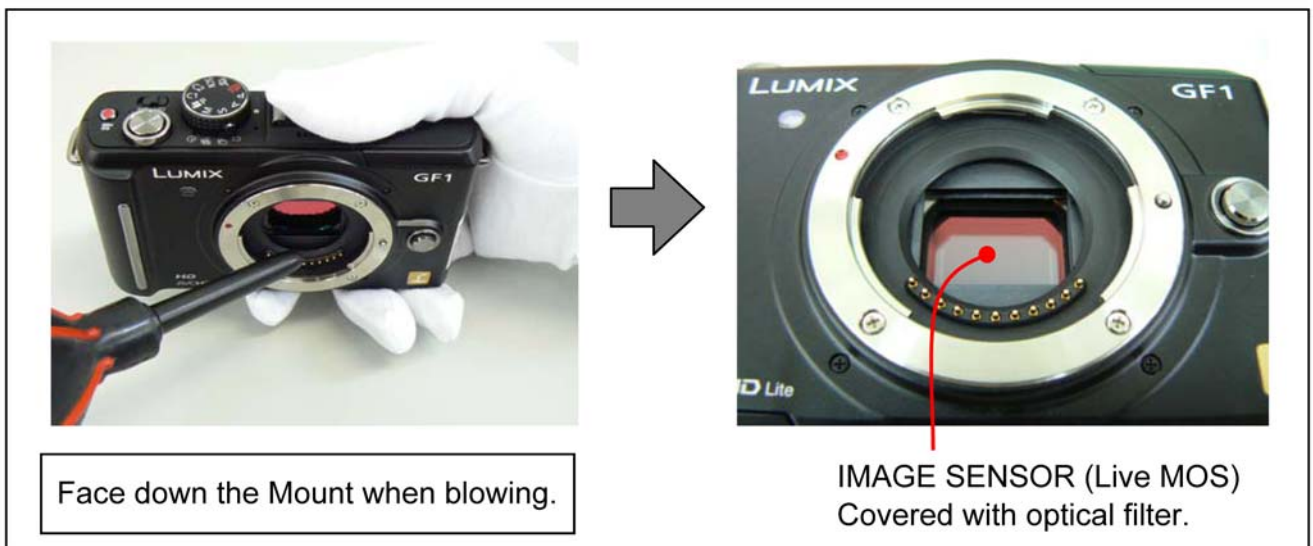
Before cleaning the camera, remove the battery and/or disconnect power plug from the outlet.
Also, remove the SD Memory card and lens unit.

11.1.1.1. DUST/DIRT ON THE OUTER CASING PART (S)

1. Blow off the dust first, then sweep out the dust from narrower spaces with soft cleaning brush.
2. Wipe up fingerprint and/or dirt on the Outer casing part with the dry fuzz-free cloth.

11.1.1.2. DUST/DIRT ON THE IMAGE SENSOR

1. Blow off the dust on the surface of the Image sensor with the Blower. (Refer to the following Figure.)
 - Keep the Mount Facing down condition towards to floor when cleaning.
 - Do not put the Blower further inside than the lens mount.
 - Be careful not to blow too strongly.
2. Wipe off the dirt on the image sensor surface with Lens cleaning KIT(BK)(VFK1900BK).



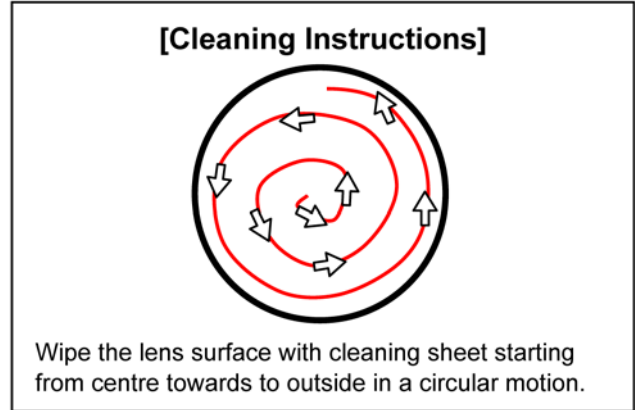
11.1.2. ABOUT THE LENS

11.1.2.1. DUST/DIRT ON THE OUTER CASING PART(S)

1. Blow off the dust first, then sweep out the dust from narrower spaces with soft cleaning brush.
2. Wipe up the Outer casing part with the dry fuzz-free cloth.

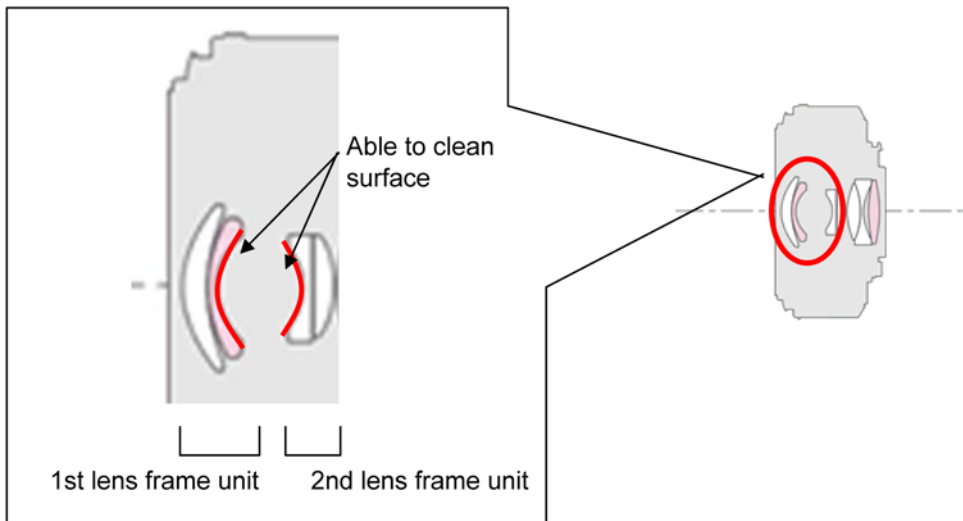
11.1.2.2. DUST/DIRT ON THE LENS GLASSES

- Define the location of the dust/dirt first, whether it is outside lens surface or not.
 1. When it is outside surface of the lens:
 - When the dust and/or dirt gets on the outer side surface of the Lens glasses, order the following procedures.
 - a. Blow off the dust on the Lens glass surface with the Blower, gently. (Do not Blow too strongly.)
 - b. Wipe out the dirt on the lens glass surface with Lens cleaning KIT(BK) (VFK1900BK) if necessary. (Consult the Instruction sheet which is included in the Lens cleaning KIT(BK) in details.)
 2. When it is inside of the lens:
 - Refer to the "11.2. General description (Lens cleaning: Interchangeable Lens/H-H020)", "11.3. General description (Lens cleaning: Interchangeable Lens/H-FS014045)" section of this service manual.



11.2. General description (Lens cleaning: Interchangeable Lens/H-H020)

When there is a dust/dirt inside surface of the 1st lens frame unit and/or subject side surface of the 2nd lens frame unit, remove it by referring the following procedures.



CAUTION

*DO NOT REMOVE 1st LENS FRAME UNIT OTHER THAN INSIDE OF SPECIFIED CLEAN LEVEL.
(Specified clean level: Less than class 10,000 (Federal Standard 209D))

Important:

1. When removing the 1st lens frame unit, it has to be proceed inside of satisfied clean level. (Less than class 10,000 (Federal Standard 209D))
As for clean box, refer to the "8.2. Clean Box", in details.
2. When tighten the screws (A), use torque driver (RFKZ0456) with specified torque.
3. To keep the Lens performance, use only the 1st lens frame unit which was fitted as it was. Therefore, the 1st lens frame unit is not supplied as spare parts.
Also do not exchange the 1st lens unit taking from others.

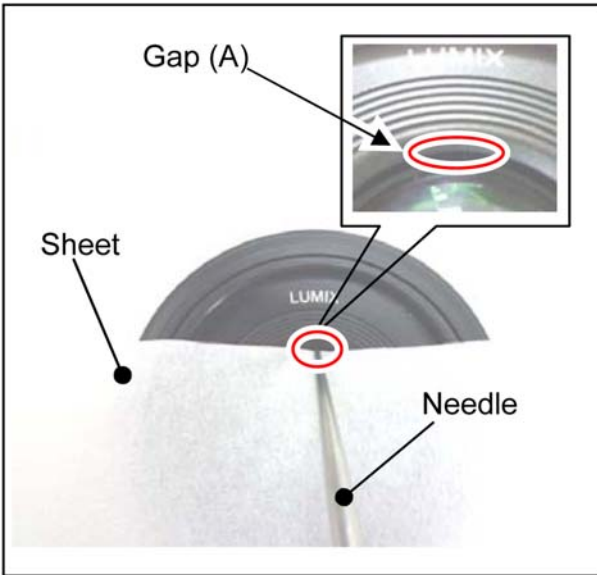
11.2.1. Disassembly procedure

Important:

It must be performed inside of satisfied clean level.
(Satisfied clean level: Less than class 10,000 (Federal Standard 209D))

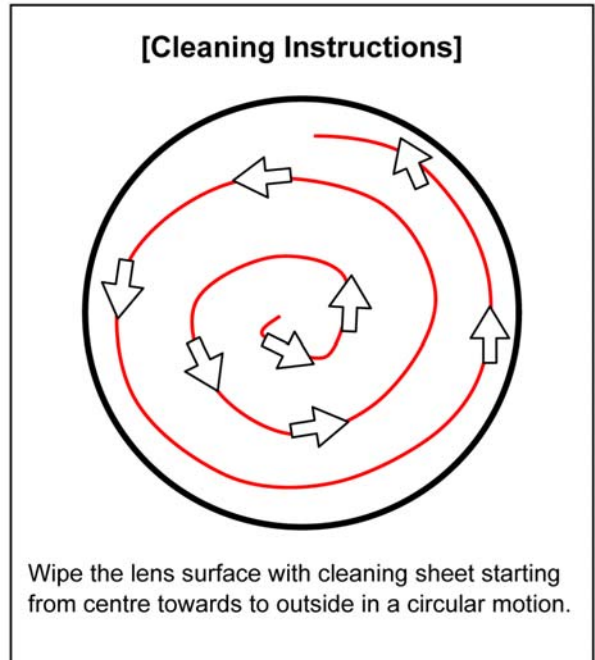
11.2.1.1. Removal of the Decoration Ring

1. Decoration ring is stuck on the 1st lens frame unit.
2. Put the sheet so that the lens glass is fully covered.
3. Insert the needle to Gap (A) (between the decoration ring and lens glass), and peel off the decoration ring gently.



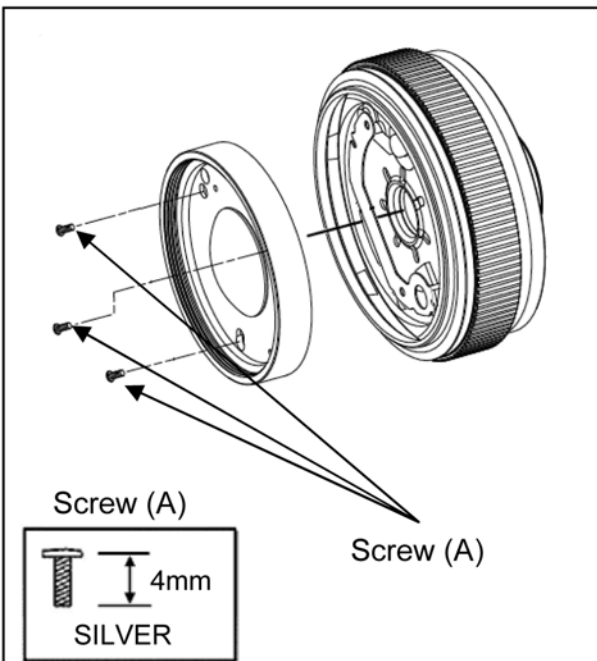
11.2.1.3. Removal of a dust /dirt

1. Blow off the dust on the surface of the lens with a blower brush.
2. Use lens cleaning KIT(BK) (VFK1900BK), if necessary.



11.2.1.2. Removal of the 1st Lens Frame Unit

1. Remove the 3 screws (A).



2. Blow off the dust on the surface of the lens with a blower brush.
3. Use lens cleaning KIT(BK) (VFK1900BK), if necessary.

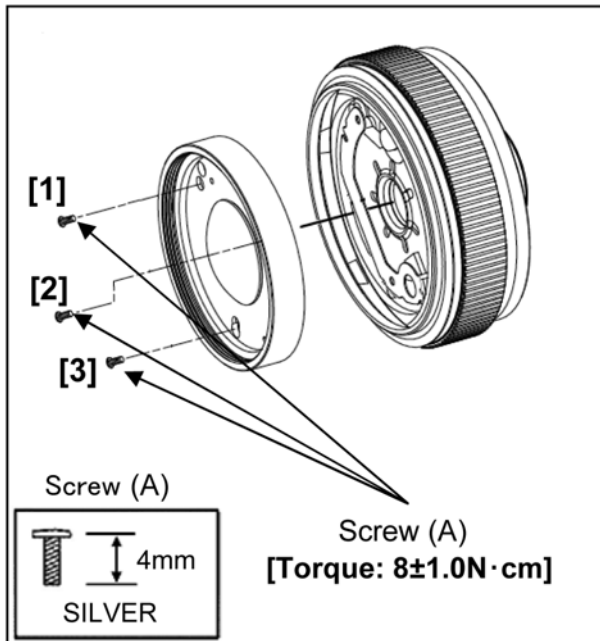
11.2.2. Assembly procedure

Important:

When tightening the screw, use a torque driver (RFKZ0456) by ordering the screwing order with specified torque described in each step.

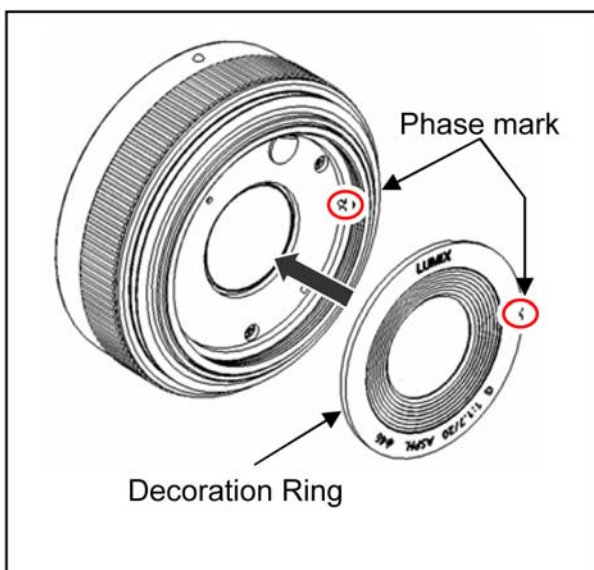
11.2.2.1. Installation of the 1st lens frame unit

1. Tighten the 3 screws (A) with specified torque in numerical order.
(Torque Driver: RFKZ0456)
(Torque: 8 ± 1.0 N-cm)



11.2.2.2. Installation of the Decoration Ring

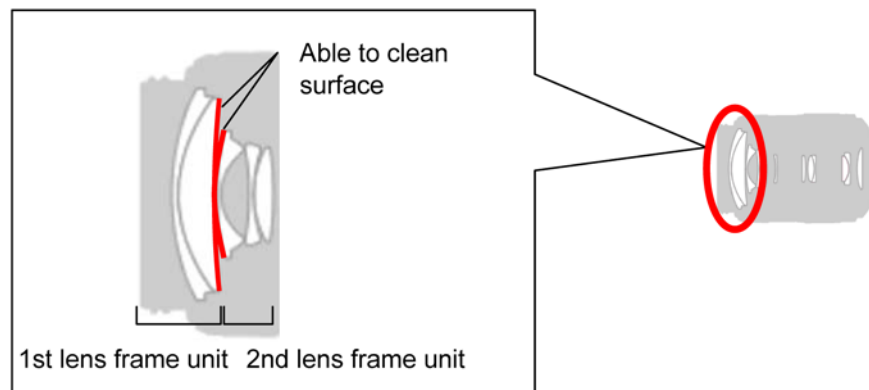
1. Install the decoration ring by referring the phase mark.
(Use new one, do not use the one which is removed.)



2. After installing the decoration ring, press the decoration ring with finger.

11.3. General description (Lens cleaning: Interchangeable Lens/H-FS014045)

When there is a dust/dirt inside surface of the 1st lens frame unit and/or subject side surface of the 2nd lens frame unit, remove it by referring the following procedures.



CAUTION

***DO NOT REMOVE 1st LENS FRAME UNIT OTHER THAN INSIDE OF SPECIFIED CLEAN LEVEL.
(Specified clean level: Less than class 10,000 (Federal Standard 209D))**

Important:

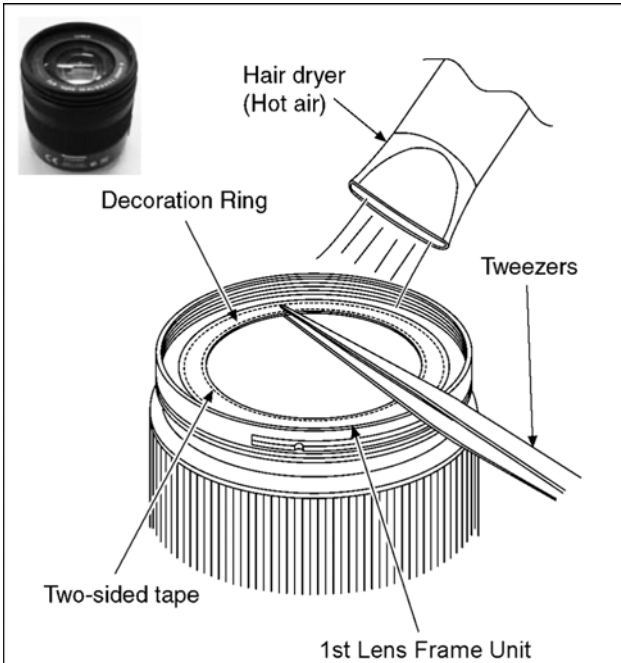
1. When removing the 1st lens frame unit, it has to be proceed inside of satisfied clean level.
(Less than class 10,000 (Federal Standard 209D))
As for clean box, refer to the "8.2. Clean Box", in details.
2. When tighten the screws (A), use torque driver (RFKZ0456) with specified torque.
3. To keep the Lens performance, use only the 1st lens frame unit which was fitted as it was.
Therefore, the 1st lens frame unit is not supplied as spare parts.
Also do not exchange the 1st lens unit taking from others.

11.3.1. Disassembly procedure

11.3.1.1. Removal of the Decoration Ring

NOTE:

Be careful not touch the lens surface with Tweezers when removing the Decoration Ring.

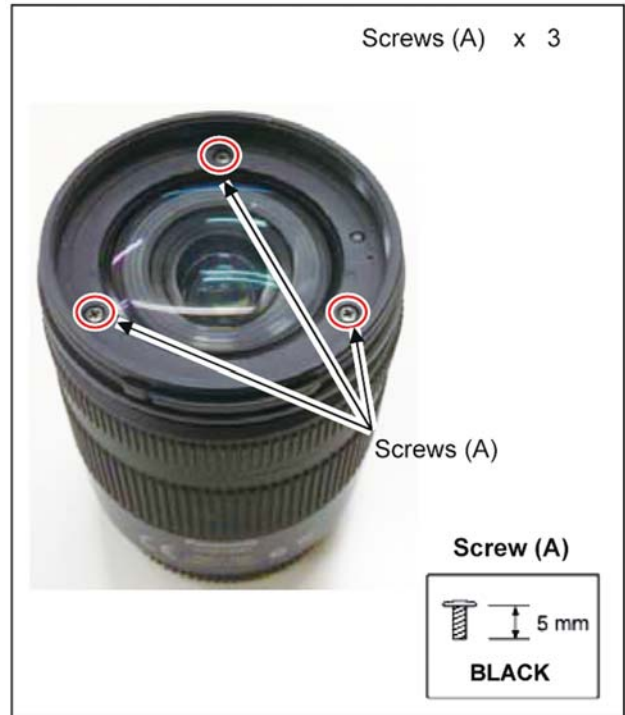


NOTE: (When Disassembling)

- Decoration Ring is taped to 1st Lens Frame Unit by two-sided tape.
- It can be easy to remove the two-sided tape with sending hot air by hair dryer.
- Insert the tweezers between Decoration Ring and 1st Lens Frame Unit, and then remove the Decoration Ring. (Be careful to lens is not damaged.)

11.3.1.2. Removal of the 1st Lens Frame Unit

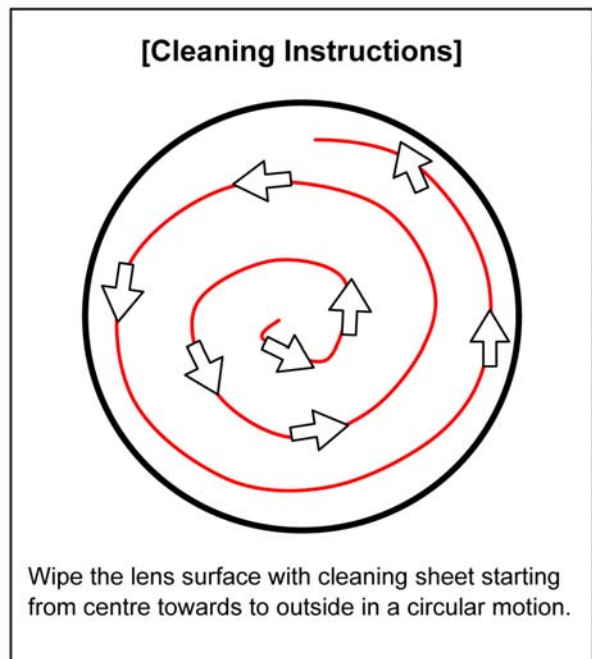
1. Remove the 3 screws (A).



2. Blow off the dust on the surface of the lens with a blower brush.
3. Use lens cleaning KIT(BK) (VFK1900BK), if necessary.

11.3.1.3. Removal of a dust /dirt

1. Blow off the dust on the surface of the lens with a blower brush.
2. Use lens cleaning KIT(BK) (VFK1900BK), if necessary.



11.3.2. Assembly procedure

Important:

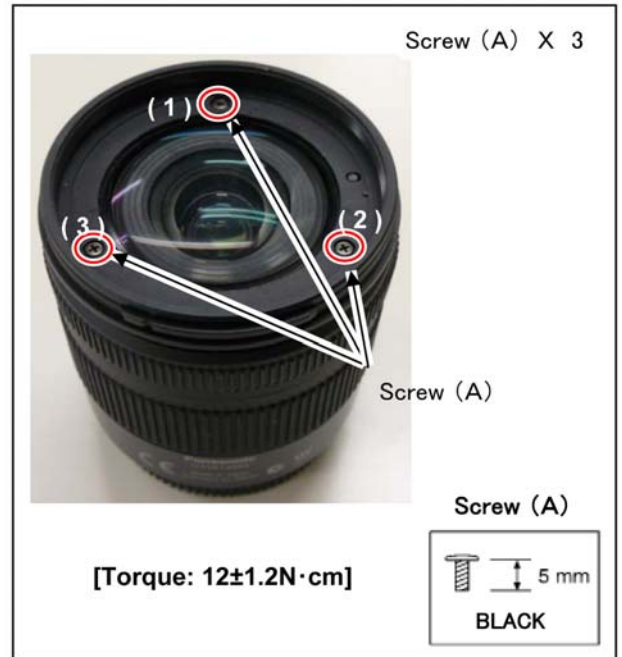
When tightening the screw, use a torque driver (RFKZ0456) by ordering the screwing order with specified torque described in each step.

11.3.2.1. Installation of the 1st lens frame unit

1. Install the 1st lens frame unit onto the lens unit to meet the through hole (A) with projection (A).

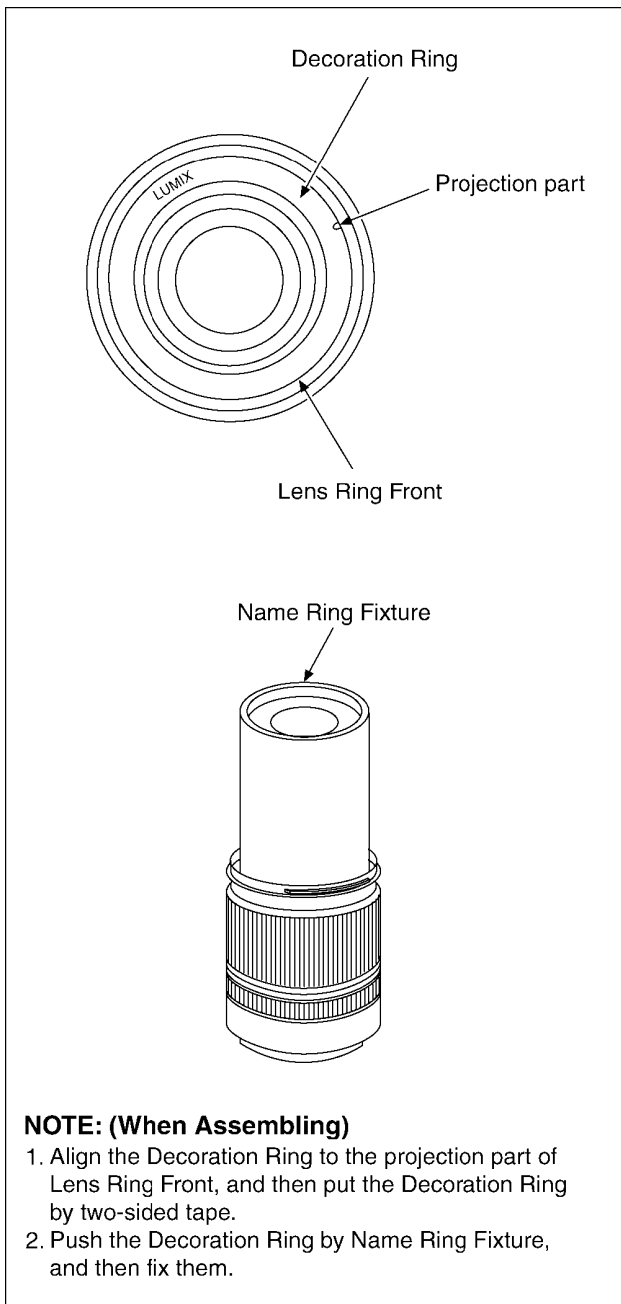


2. Tighten the 3 screws (A) with specified torque in numerical order.
(Torque Driver: RFKZ0456)
(Torque: 12 ± 1.2 N-cm)



11.3.2.2. Installation of the Decoration Ring

1. Use the Name Ring fixture (RFKZ0507)
2. Use new Decoration ring. (Do not use the one which is removed.)



Service Manual

Diagrams and Replacement Parts List

Digital Camera/Lens Kit/Body

Model No.

DMC-GF1CPP	DMC-GF1KPP	DMC-GF1PP
DMC-GF1CEB	DMC-GF1KEB	DMC-GF1EB
DMC-GF1CEC	DMC-GF1KEC	DMC-GF1EC
DMC-GF1CEG	DMC-GF1KEG	DMC-GF1EG
DMC-GF1CGC	DMC-GF1KGC	DMC-GF1GC
DMC-GF1CGH	DMC-GF1KGH	DMC-GF1GH
DMC-GF1CGK	DMC-GF1KGK	
DMC-GF1CGN	DMC-GF1KGN	

Vol. 1

Colour

- (K).....Black Type
- (S).....Silver Type (only EB/EG/GC/GH/GK)
- (R).....Red Type (except GN)
- (W).....White Type (only EG/GH)

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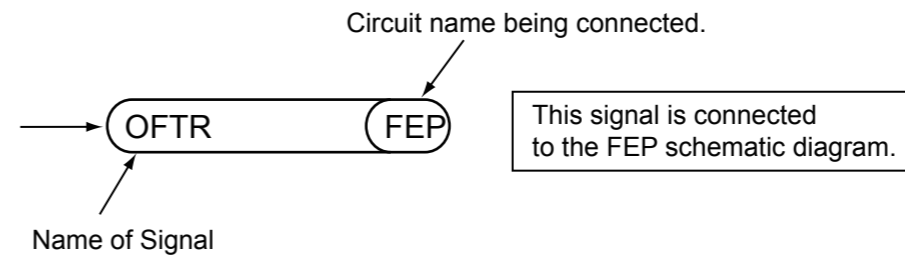
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S1. About Indication of The Schematic Diagram

S1.1. Important Safety Notice

COMPONENTS IDENTIFIED WITH THE MARK \triangle HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS USE ONLY THE SAME TYPE.

1. Although reference number of the parts is indicated on the P.C.B. drawing and/or schematic diagrams, it is NOT mounted on the P.C.B. when it is displayed with "\$" mark.
2. It is only the "Test Round" and no terminal (Pin) is available on the P.C.B. when the TP (Test Point) indicated as "●" mark.
3. The voltage being indicated on the schematic diagram is measured in "Standard-Playback" mode when there is no specify mode is mentioned.
4. Although the voltage and waveform available on here is measured with standard frame, it may be differ from actual measurement due to modification of circuit and so on.
5. The voltage being indicated here may be include observational-error (deviation) due to internal-resistance and/or reactance of equipment. Therefore, handle the value indicated on here as reference.
6. Use the parts number indicated on the Replacement Parts List .
7. Indication on Schematic diagrams:



S2. Voltage Chart

Note) Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard.
Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

S2.1. Flash P.C.B.

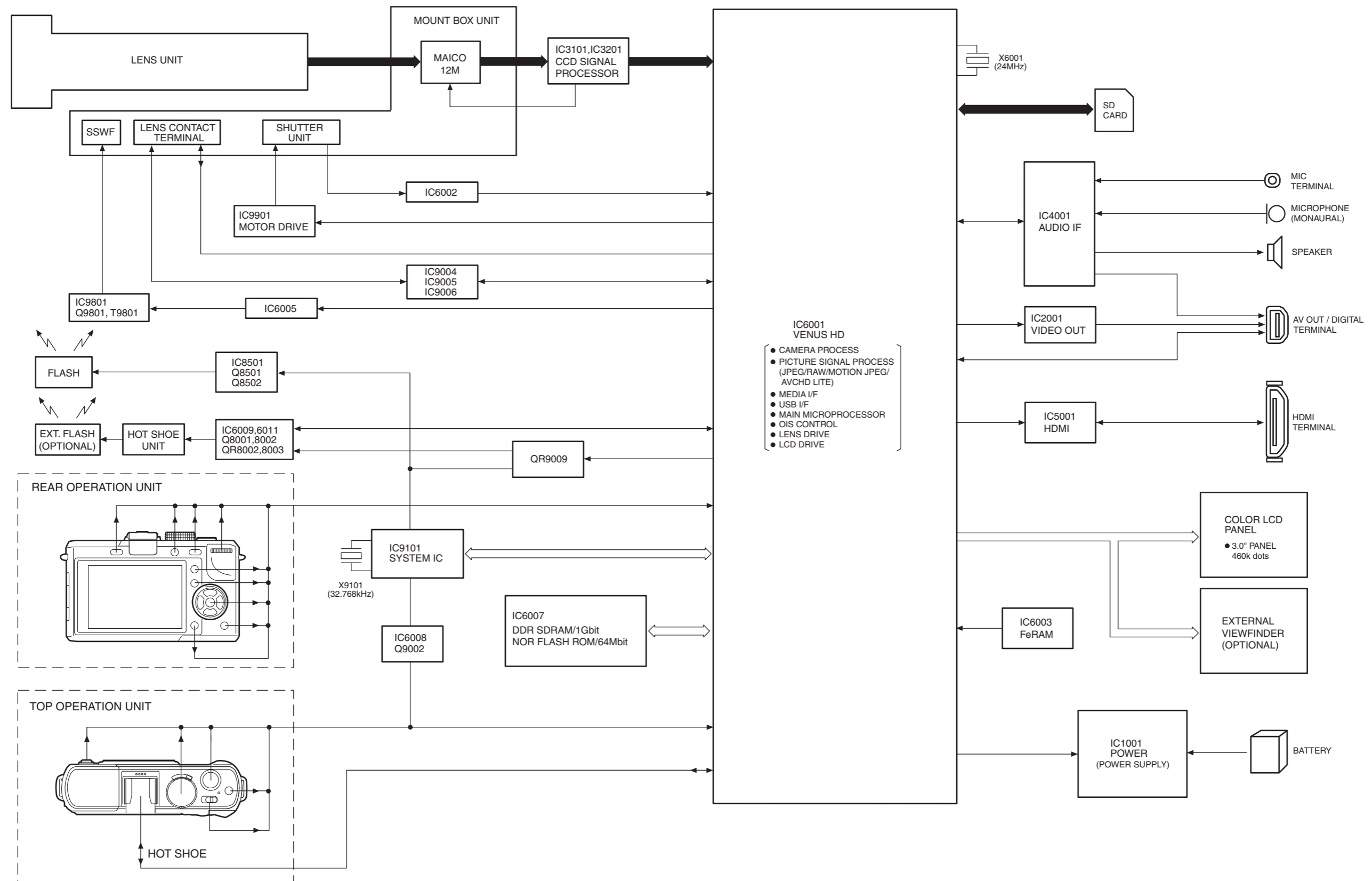
S2.2. Top P.C.B.

REF No.	PIN No.	POWER ON
IC8501	1	0
IC8501	2	0
IC8501	3	4.8
IC8501	4	0
IC8501	5	0
Q8502	1	8.2
Q8502	2	8.2
Q8502	3	0
Q8502	4	0
Q8502	5	8.2
Q8502	6	8.2

REF No.	PIN No.	POWER ON
Q8001	E	0
Q8001	C	0
Q8001	B	0
Q8002	S	0
Q8002	D	2.0
Q8002	G	0
Q8003	1	1.8
Q8003	2	0.9
Q8003	3	0
Q8003	4	2.4
Q8004	1	0.9
Q8004	2	0
Q8004	3	0
Q8004	4	2.4
QR8001	E	0
QR8001	C	0
QR8001	B	0
QR8002	1	0
QR8002	2	0
QR8002	3	0
QR8002	4	2.8
QR8002	5	2.4
QR8002	6	2.4
QR8003	1	0
QR8003	2	2.6
QR8003	3	0
QR8003	4	2.8
QR8003	5	2.6
QR8003	6	0

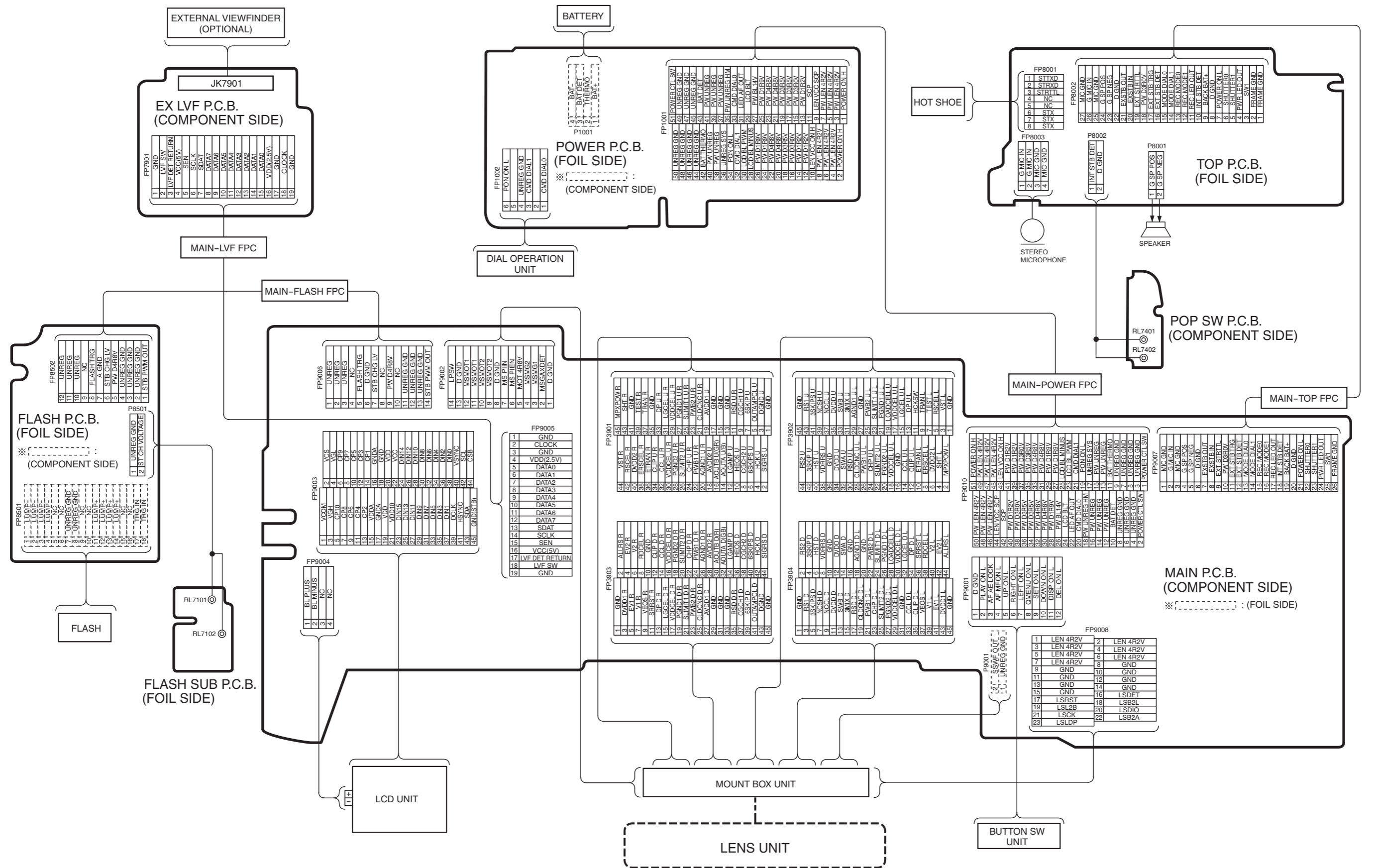
S3. Block Diagram

S3.1. Overall Block Diagram

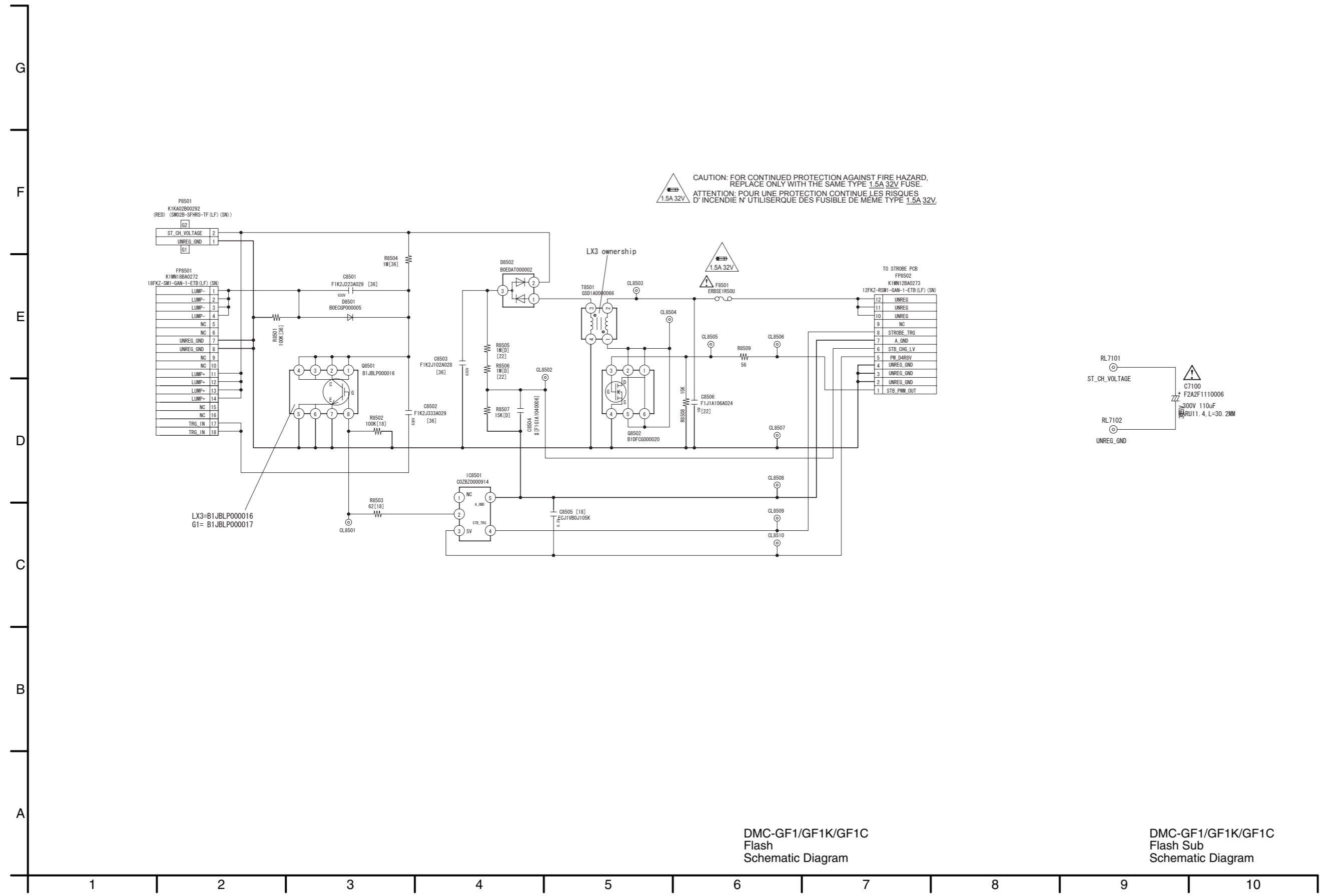


S4. Schematic Diagram

S4.1. Interconnection Diagram



S4.2. Flash Schematic Diagram / S4.3. Flash Sub Schematic Diagram



DMC-GF1/GF1K/GF1C
Flash
Schematic Diagram

DMC-GF1/GF1K/GF1C
Flash Sub
Schematic Diagram

S4.4. Top Schematic Diagram

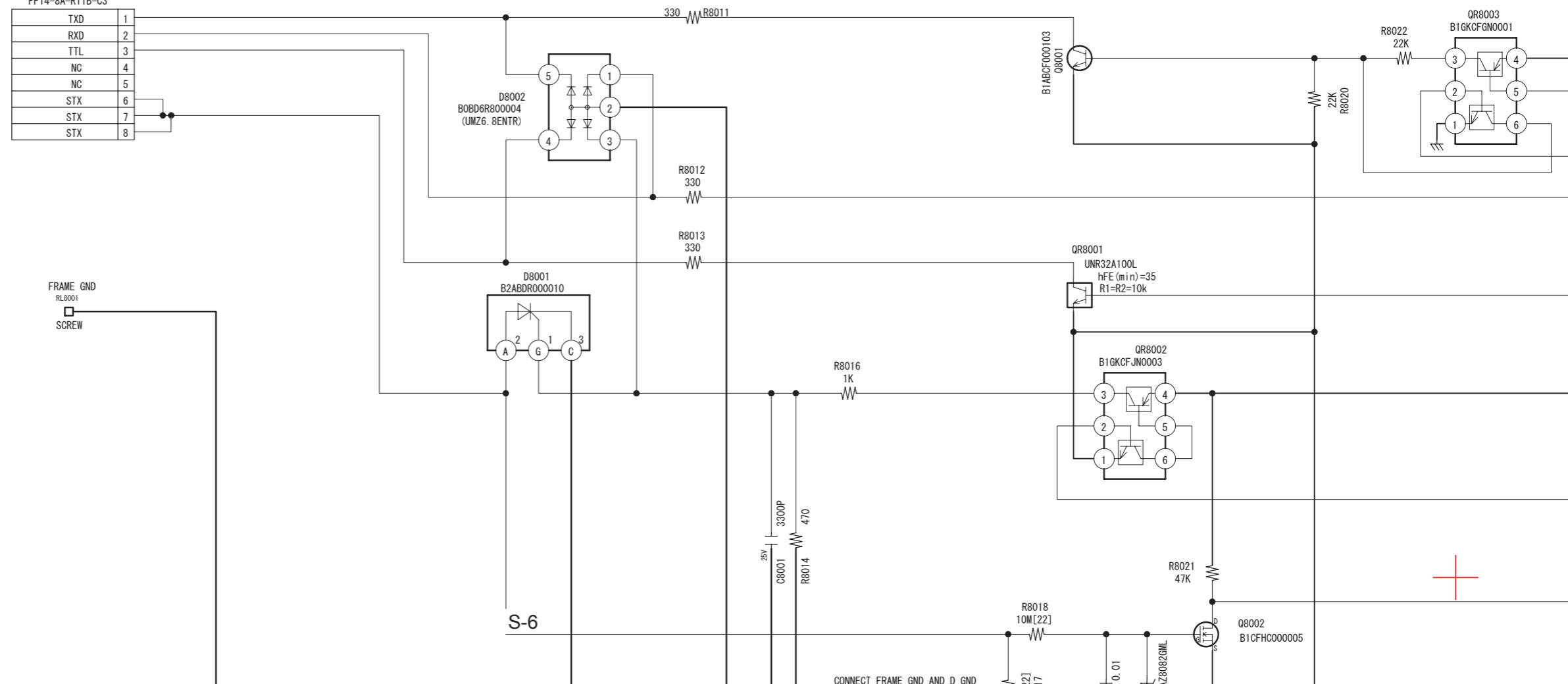
1/4 DMC-GF1/GF1K/GF1C
Top
Schematic Diagram

TO HOT SHOE

FP8001
K1MN08BA0208
FF14-8A-R11B-C3

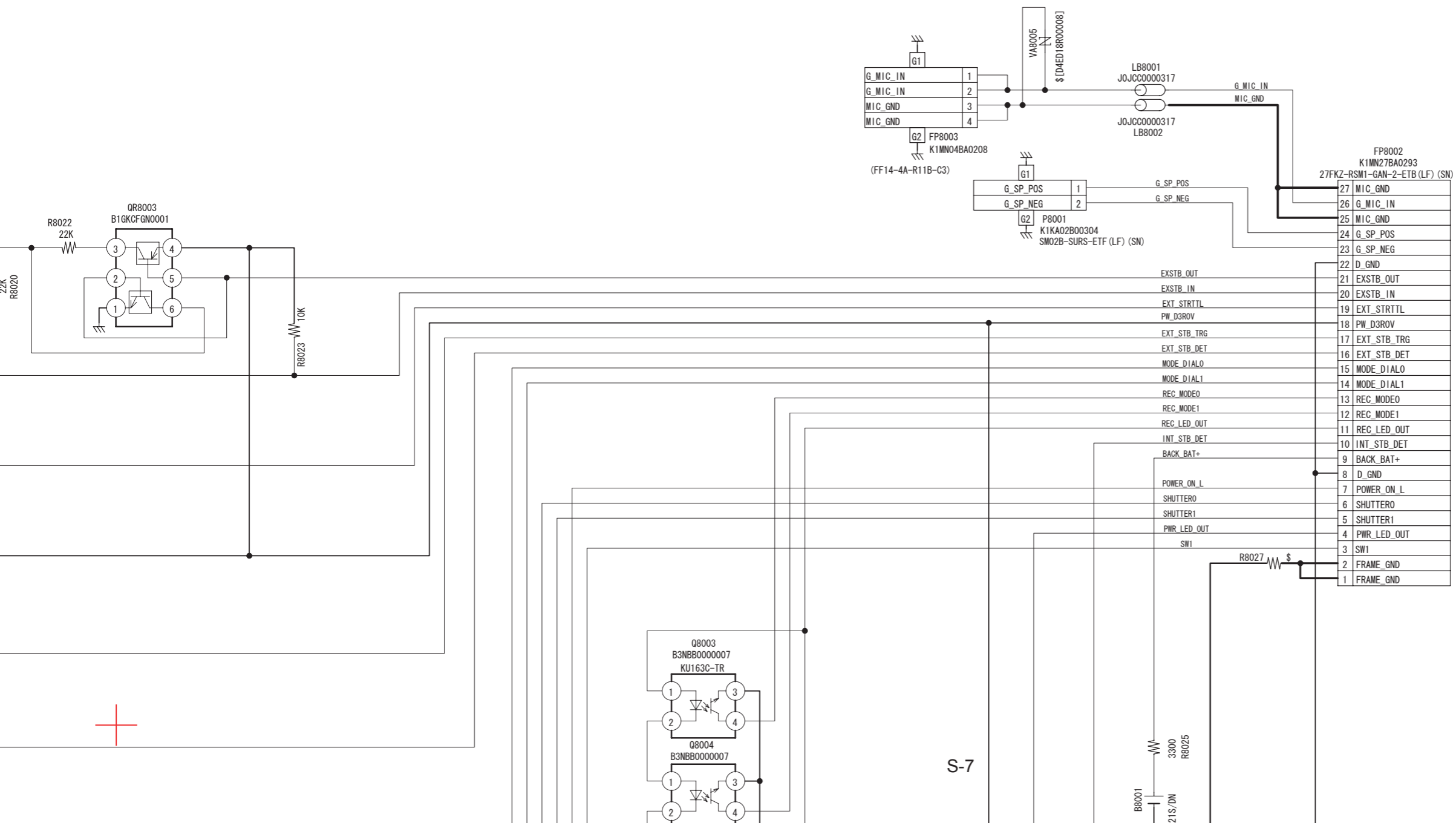
TXD	1
RXD	2
TTL	3
NC	4
NC	5
STX	6
STX	7
STX	8

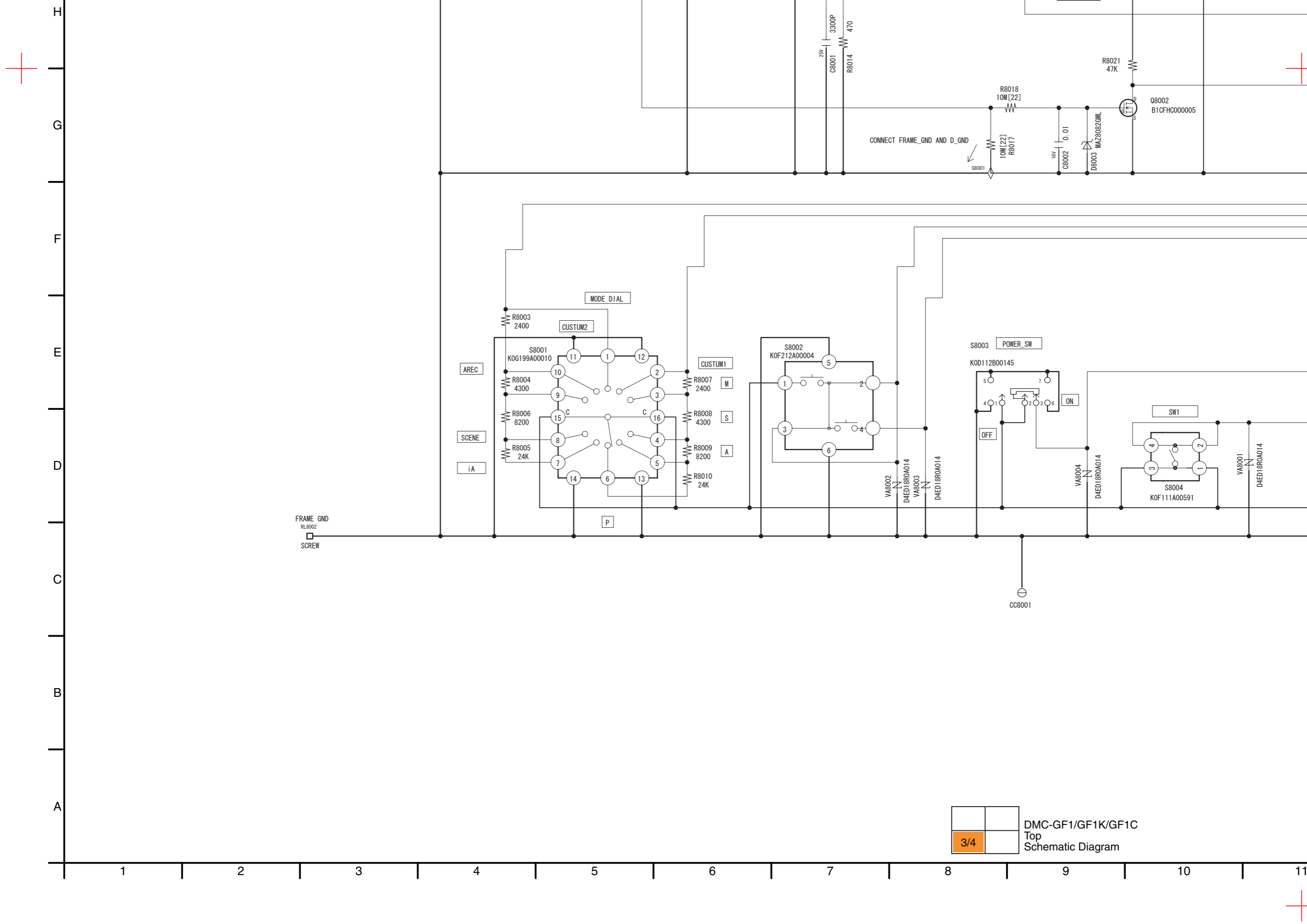
FRAME GND
RL8001
SCREW



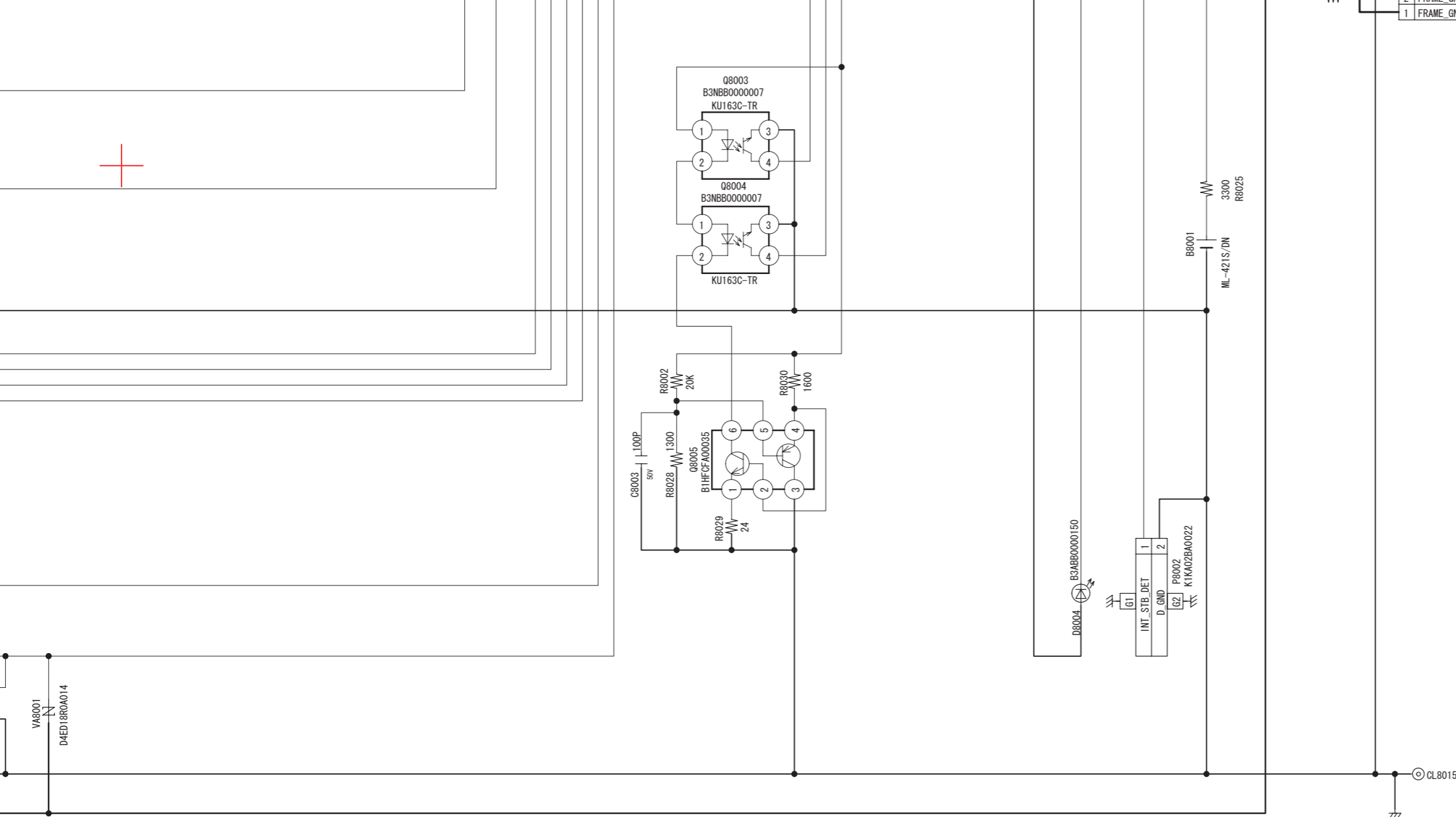
S-6

CONNECT FRAME GND AND D. GND



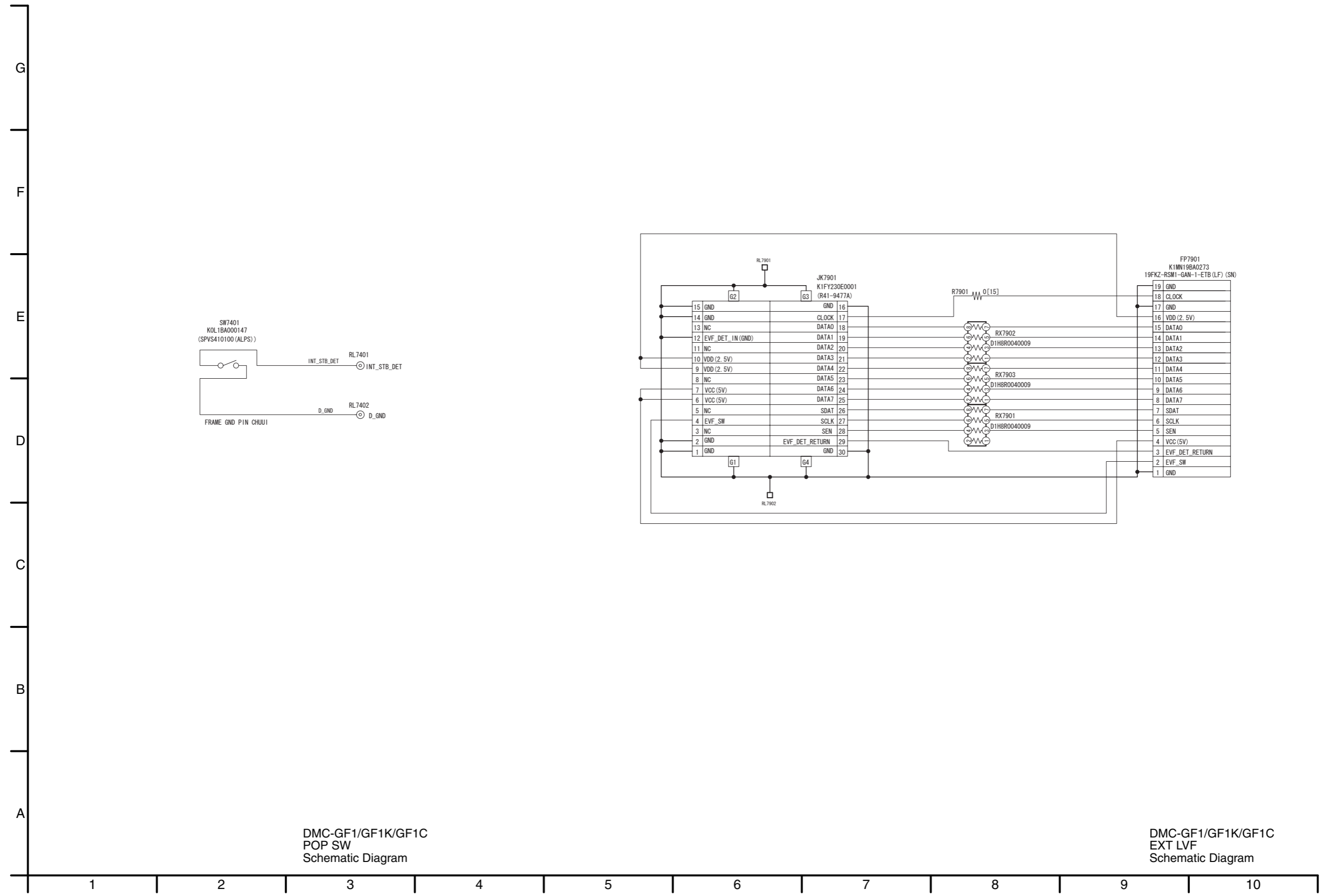


3/4	DMC-GF1/GF1K/GF1C Top Schematic Diagram



VAR001
DAEDT6R0A014

S4.5. POP SW Schematic Diagram / S4.6. EXT LVF Schematic Diagram

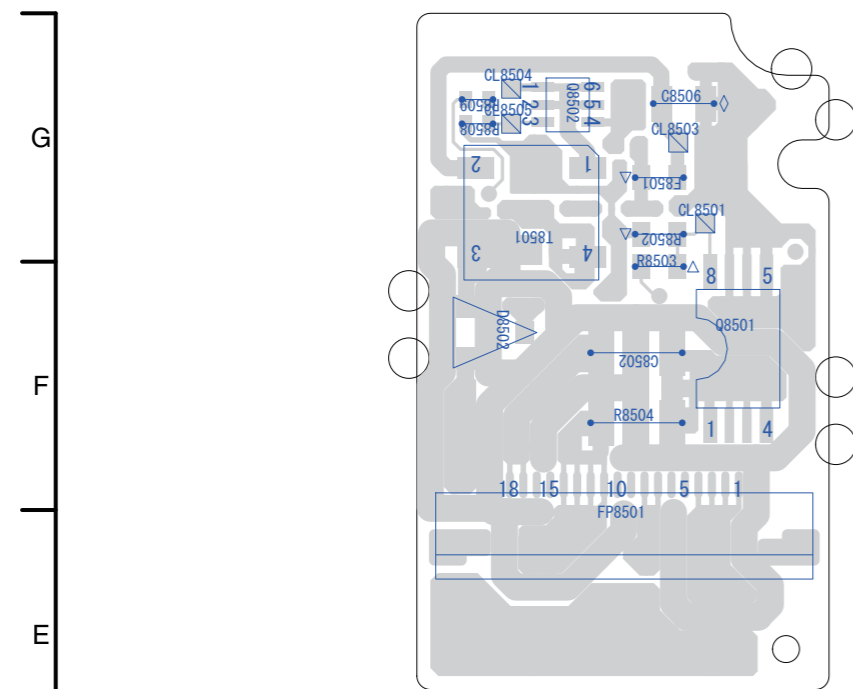


DMC-GF1/GF1K/GF1C
POP SW
Schematic Diagram

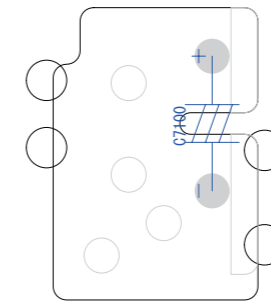
DMC-GF1/GF1K/GF1C
EXT LVF
Schematic Diagram

S5. Print Circuit Board

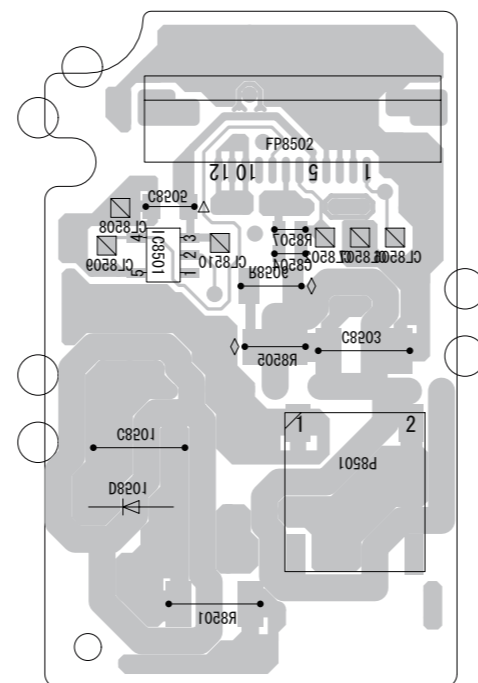
S5.1. Flash P.C.B. / S5.2. Flash Sub P.C.B.



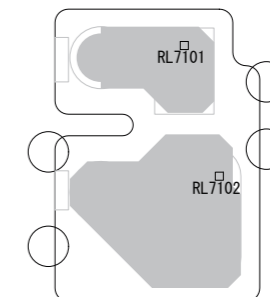
(Component Side)



(Component Side)



(Foil Side)

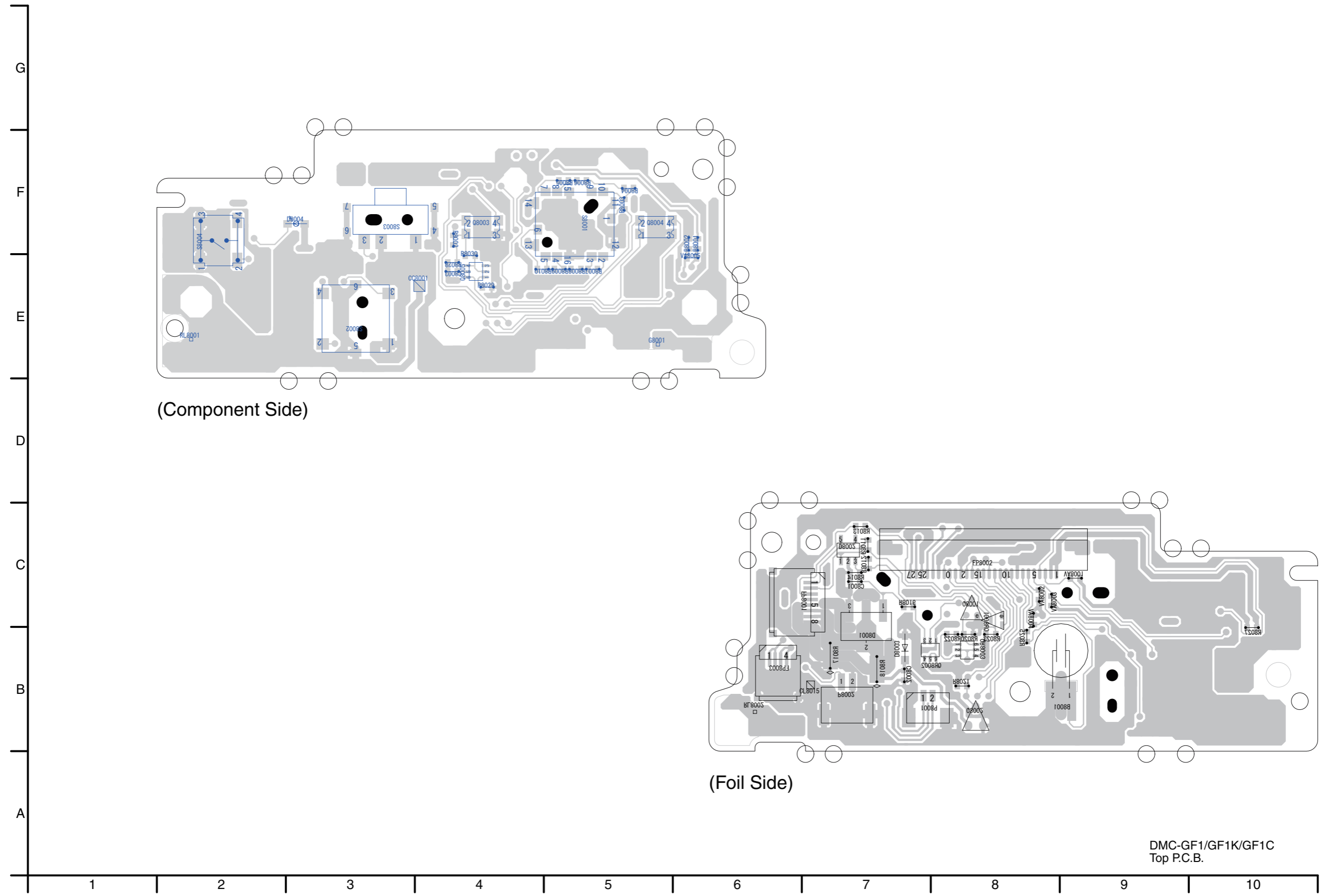


(Foil Side)

DMC-GF1/GF1K/GF1C
Flash P.C.B.

DMC-GF1/GF1K/GF1C
Flash Sub P.C.B.

S5.3. Top P.C.B.

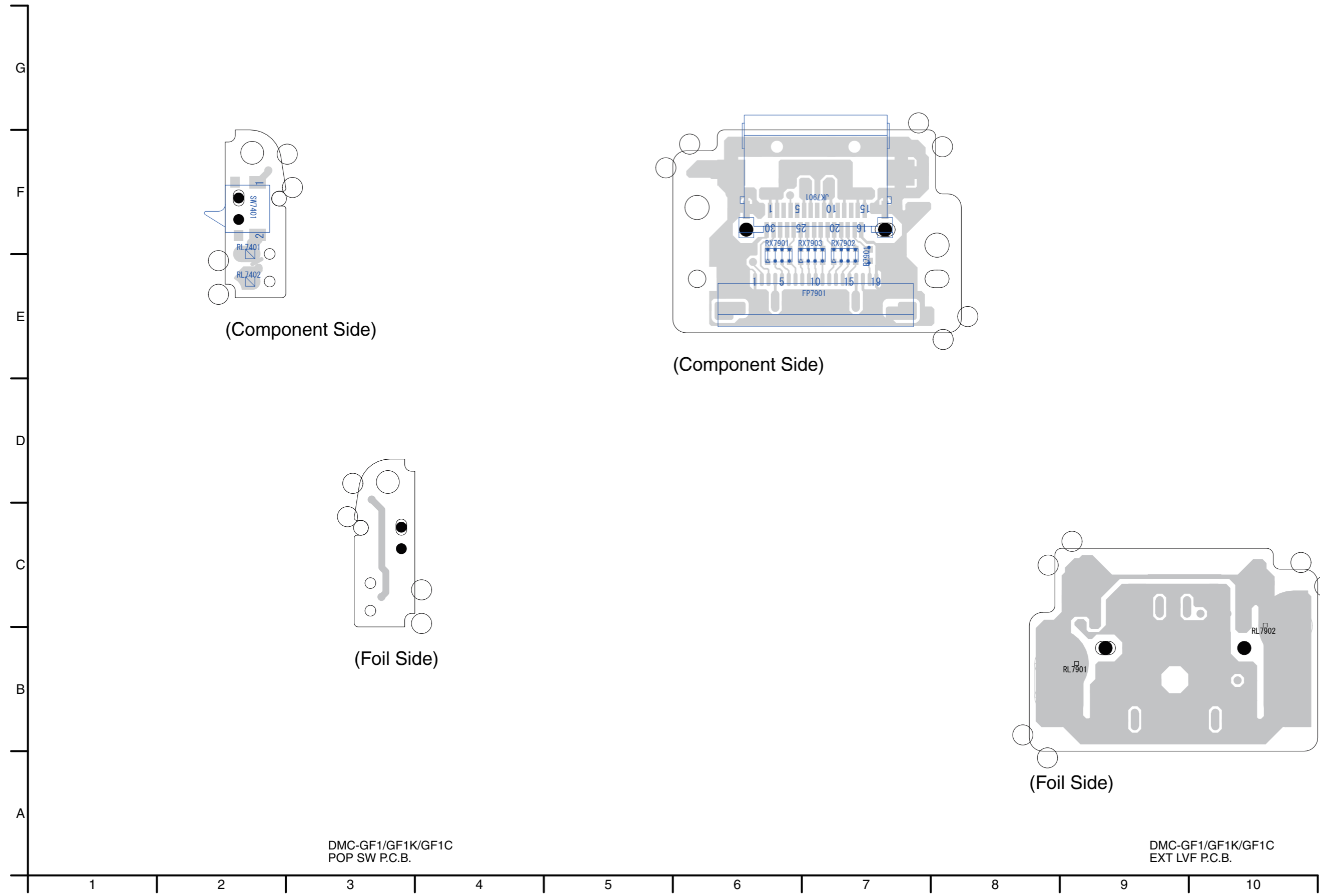


(Component Side)

(Foil Side)

DMC-GF1/GF1K/GF1C
Top P.C.B.

S5.4. POP SW P.C.B. / S5.5. EXT LVF P.C.B.



DMC-GF1/GF1K/GF1C
POP SW P.C.B.

DMC-GF1/GF1K/GF1C
EXT LVF P.C.B.

S6. Replacement Parts List

- Note:
1. * Be sure to make your orders of replacement parts according to this list.
 2. **IMPORTANT SAFETY NOTICE**
Components identified with the mark \triangle have the special characteristics for safety.
When replacing any of these components, use only the same type.
 3. Unless otherwise specified,
All resistors are in OHMS, K=1,000 OHMS. All capacitors are in MICRO-FARADS (uf), P=uuF.
 4. The marking (RTL) indicates the retention time is limited for this item. After the discontinuation of this assembly in production, it will no longer be available.
 5. Supply of CD-ROM, in accordance with license protection, is allowable as replacement parts only for customers who accidentally damaged or lost their own.
 6. This IC is mounted on either of drawing No. IC6003 or IC6004.

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

Definition of Parts supplier:

1. Parts marked with [ENERGY] in the remarks column are supplied from Panasonic Corporation Energy Company.
2. Parts marked with [PAVCSG] in the remarks column are supplied from PAVCSG. Others are supplied from AVC-CSC-SPC.

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
		----- P.C.B. LIST -----		
##	VEP56094A	MAIN P.C.B.		(RTL)E.S.D. (PP,GC,GH,GK,GN)
##	VEP56094B	MAIN P.C.B.		(RTL)E.S.D. (EB,EC,EG)
##	VEP51025A	POWER P.C.B.		[PAVCSG](RTL)E.S.D.
##	VEP58099A	FLASH P.C.B.		[PAVCSG](RTL)E.S.D.
##	VEP58100A	FLASH SUB P.C.B.		[PAVCSG](RTL)
##	VEP50053A	TOP P.C.B.		[PAVCSG](RTL)E.S.D.
##	VEP58101A	POP SW P.C.B.		[PAVCSG](RTL)
##	VEP59071A	EX LVF P.C.B.		[PAVCSG](RTL)
		---ELEC. COMPONENTS---		
##	VEP58099A	FLASH P.C.B.		[PAVCSG](RTL)E.S.D.
C8501	F1K2J223A029	CAPACITOR	1	[PAVCSG]
C8502	F1K2J333A029	CAPACITOR	1	[PAVCSG]
C8503	F1K2J102A028	CAPACITOR	1	[PAVCSG]
C8505	ECJ1V0J105K	C.CAPACITOR CH 6.3V 1U	1	[PAVCSG]
C8506	F1J1A106A024	CAPACITOR	1	[PAVCSG]
D8501	B0ECGP000005	DIODE	1	[PAVCSG]E.S.D.
D8502	B0EDAT000002	DIODE	1	[PAVCSG]E.S.D.
△ F8501	ERBSE1R50U	FUSE	1	[PAVCSG]
FP8501	K1MN18BA0272	CONNECTOR 18P	1	[PAVCSG]
FP8502	K1MN12BA0273	CONNECTOR 12P	1	[PAVCSG]
IC8501	C0ZBZ0000914	IC	1	[PAVCSG]E.S.D.
P8501	K1KA02B00292	CONNECTOR 2P	1	[PAVCSG]
Q8501	B1JBLP000016	TRANSISTOR	1	[PAVCSG]E.S.D.
Q8502	B1DFCG000020	TRANSISTOR	1	[PAVCSG]E.S.D.
R8501	ERJ8GEJ104V	M.RESISTOR CH 1/4W 100K	1	[PAVCSG]
R8502	ERJ3GEJ104V	M.RESISTOR CH 1/10W 100K	1	[PAVCSG]
R8503	ERJ3GEJ620V	M.RESISTOR CH 1/10W 62	1	[PAVCSG]
R8504	ERJ8GEJ105V	M.RESISTOR CH 1/4W 75	1	[PAVCSG]
R8505	ERJ6RED105V	M.RESISTOR CH 1/10W 1M	1	[PAVCSG]
R8506	ERJ6RED105V	M.RESISTOR CH 1/10W 1M	1	[PAVCSG]
R8507	ERJ2RHD153X	M.RESISTOR CH 1/10W 15K	1	[PAVCSG]
R8508	ERJ2GEJ153X	M.RESISTOR CH 1/10W 15K	1	[PAVCSG]
R8509	ERJ2GEJ560X	M.RESISTOR CH 1/10W 56	1	[PAVCSG]
T8501	G5D1A0000066	TRANSFORMER	1	[PAVCSG]
##	VEP58100A	FLASH SUB P.C.B.		[PAVCSG](RTL)
△ C7100	F2A2F110006	CAPACITOR	1	[PAVCSG]
##	VEP50053A	TOP P.C.B.		[PAVCSG](RTL)E.S.D.
△ B8001	ML-421S/DN	BUTTON BATTERY	1	[ENERGY]
C8001	ECJ0EB1E332K	C.CAPACITOR CH 25V 3300P	1	[PAVCSG]
C8002	ECJ0EB1C103K	C.CAPACITOR CH 16V 0.01U	1	[PAVCSG]
C8003	ECJ0EC1H101J	C.CAPACITOR CH 50V 100P	1	[PAVCSG]
D8001	B2ABDR000010	DIODE	1	[PAVCSG]E.S.D.
D8002	B0BD6R800004	DIODE	1	[PAVCSG]E.S.D.
D8003	MAZ8082GML	DIODE	1	[PAVCSG]E.S.D.
D8004	B3ABB0000150	DIODE	1	[PAVCSG]E.S.D.
FP8001	K1MN08BA0208	CONNECTOR 8P	1	[PAVCSG]
FP8002	K1MN27BA0293	CONNECTOR 27P	1	[PAVCSG]
FP8003	K1MN04BA0208	CONNECTOR 4P	1	[PAVCSG]
LB8001	J0JCC0000317	COIL	1	[PAVCSG]
LB8002	J0JCC0000317	COIL	1	[PAVCSG]

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
P8001	K1KA02B00304	CONNECTOR 2P	1	[PAVCSG]
P8002	K1KA02BA0022	CONNECTOR 2P	1	[PAVCSG]
Q8001	B1ABCF000103	TRANSISTOR	1	[PAVCSG]E.S.D.
Q8002	B1CFHC000005	TRANSISTOR	1	[PAVCSG]E.S.D.
Q8003	B3NBB0000007	TRANSISTOR	1	[PAVCSG]E.S.D.
Q8004	B3NBB0000007	TRANSISTOR	1	[PAVCSG]E.S.D.
Q8005	B1HFCFA00035	TRANSISTOR	1	[PAVCSG]E.S.D.
QR8001	UNR32A100L	TRANSISTOR-RESISTOR	1	[PAVCSG]E.S.D.
QR8002	B1GKCFJN0003	TRANSISTOR-RESISTOR	1	[PAVCSG]E.S.D.
QR8003	B1GKCFGN0001	TRANSISTOR-RESISTOR	1	[PAVCSG]E.S.D.
R8002	ERJ2GEJ203X	M.RESISTOR CH 1/10W 20K	1	[PAVCSG]
R8003	ERJ2GEJ242X	M.RESISTOR CH 1/16W 2.4K	1	[PAVCSG]
R8004	ERJ2GEJ432X	M.RESISTOR CH 1/16W 4.3K	1	[PAVCSG]
R8005	ERJ2GEJ243X	M.RESISTOR CH 1/16W 24K	1	[PAVCSG]
R8006	ERJ2GEJ822X	M.RESISTOR CH 1/16W 8.2K	1	[PAVCSG]
R8007	ERJ2GEJ242X	M.RESISTOR CH 1/16W 2.4K	1	[PAVCSG]
R8008	ERJ2GEJ432X	M.RESISTOR CH 1/16W 4.3K	1	[PAVCSG]
R8009	ERJ2GEJ822X	M.RESISTOR CH 1/16W 8.2K	1	[PAVCSG]
R8010	ERJ2GEJ243X	M.RESISTOR CH 1/16W 24K	1	[PAVCSG]
R8011	ERJ2GEJ331X	M.RESISTOR CH 1/16W 330	1	[PAVCSG]
R8012	ERJ2GEJ331X	M.RESISTOR CH 1/16W 330	1	[PAVCSG]
R8013	ERJ2GEJ331X	M.RESISTOR CH 1/16W 330	1	[PAVCSG]
R8014	ERJ2GEJ471X	M.RESISTOR CH 1/16W 470	1	[PAVCSG]
R8016	ERJ2GEJ102X	M.RESISTOR CH 1/16W 1K	1	[PAVCSG]
R8017	ERJ6GEYJ106V	M.RESISTOR CH 1/8W 10M	1	[PAVCSG]
R8018	ERJ6GEYJ106V	M.RESISTOR CH 1/8W 10M	1	[PAVCSG]
R8020	ERJ2GEJ223X	M.RESISTOR CH 1/10W 22K	1	[PAVCSG]
R8021	ERJ2GEJ473X	M.RESISTOR CH 1/10W 47K	1	[PAVCSG]
R8022	ERJ2GEJ223X	M.RESISTOR CH 1/10W 22K	1	[PAVCSG]
R8023	ERJ2GEJ103X	M.RESISTOR CH 1/10W 10K	1	[PAVCSG]
R8025	ERJ2GEJ332X	M.RESISTOR CH 1/10W 3.3K	1	[PAVCSG]
R8028	ERJ2GEJ132X	M.RESISTOR CH 1/10W 1.3K	1	[PAVCSG]
R8029	ERJ2GEJ240X	M.RESISTOR CH 1/10W 24	1	[PAVCSG]
R8030	ERJ2GEJ162X	M.RESISTOR CH 1/10W 1.6K	1	[PAVCSG]
S8001	K0G199A00010	SWITCH	1	[PAVCSG]
S8002	K0F212A00004	SWITCH	1	[PAVCSG]
S8003	K0D112B00145	SWITCH	1	[PAVCSG]
S8004	K0F111A00591	SWITCH	1	[PAVCSG]
VA8001	D4ED18R0A014	VARISTOR	1	[PAVCSG]
VA8002	D4ED18R0A014	VARISTOR	1	[PAVCSG]
VA8003	D4ED18R0A014	VARISTOR	1	[PAVCSG]
VA8004	D4ED18R0A014	VARISTOR	1	[PAVCSG]
##	VEP58101A	POP SW P.C.B.		[PAVCSG](RTL)
SW7401	K0L1BA000147	SWITCH	1	[PAVCSG]
##	VEP59071A	EX LVF P.C.B.		[PAVCSG](RTL)
FP7901	K1MN19BA0273	CONNECTOR 19P	1	[PAVCSG]
JK7901	K1FY230E0001	JACK	1	[PAVCSG]
R7901	ERJ2GE0R00X	M.RESISTOR CH 1/16W 0	1	[PAVCSG]
RX7901	D1H8R0040009	RESISTOR NETWORKS	1	[PAVCSG]
RX7902	D1H8R0040009	RESISTOR NETWORKS	1	[PAVCSG]
RX7903	D1H8R0040009	RESISTOR NETWORKS	1	[PAVCSG]

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1	VEP56094A	MAIN P.C.B.	1	(RTL)E.S.D.(PP,GC,GH,GK,GN)
1	VEP56094B	MAIN P.C.B.	1	(RTL)E.S.D.(EB,EC,EG)
2	VMC2111	SHOE SPRING	1	
3	VXQ1840	MOUNT BOX UNIT	1	
5	K0RC01100002	DIAL OPERATION UNIT	1	[PAVCSG]
6	K4ZZ04000050	SHIELD FINGER	1	[PAVCSG]
7	VEE1G98	LEAD WIRE WITH CONNECTOR	1	[PAVCSG]
8	VEE1G99	LEAD WIRE WITH CONNECTOR	1	[PAVCSG]
9	VEP51025A	POWER P.C.B.	1	[PAVCSG](RTL)E.S.D.
10	VEP58100A	FLASH SUB P.C.B.	1	[PAVCSG](RTL)
11	VMB4303	CAPACITOR EARTH SPRING	1	[PAVCSG]
12	VMB4304	BATTERY LOCK SPRING	1	[PAVCSG]
13	VMB4334	BATT DOOR SPRING	1	[PAVCSG]
14	VMP9481	TRIPOD	1	[PAVCSG]
15	VMP9482	BATTERY CASE PLATE	1	[PAVCSG]
16	VMS8026	BATTERY DOOR SHAFT	1	[PAVCSG]
17	VWJ2114	MAIN-POWER FPC	1	[PAVCSG]
18	VYF3274	BATTERY DOOR UNIT	1	(-K) [PAVCSG]
18	VYF3281	BATTERY DOOR UNIT	1	(-R) [PAVCSG]
18	VYF3282	BATTERY DOOR UNIT	1	(-W) [PAVCSG]
18	VYF3283	BATTERY DOOR UNIT	1	(-S) [PAVCSG]
19	VGK3573	GRIP PIECE (FRONT)	1	[PAVCSG]
20	VGQ0H42	STRAP HOLDER	1	[PAVCSG]
21	VGQ0H44	FRONT GRIP HOLDER	1	[PAVCSG]
22	VMP9484	SIDE PLATE (R)	1	[PAVCSG]
23	VMP9485	LENS RELEASE FIX PLATE	1	[PAVCSG]
24	VYF3272	JACK DOOR UNIT	1	(-K) [PAVCSG]
24	VYF3278	JACK DOOR UNIT	1	(-R) [PAVCSG]
24	VYF3279	JACK DOOR UNIT	1	(-W) [PAVCSG]
24	VYF3280	JACK DOOR UNIT	1	(-S) [PAVCSG]
25	VYQ5052	LENS RELEASE BUTTON UNIT	1	[PAVCSG]
26	VGK3577	REAR GRIP	1	[PAVCSG]
27	VGQ0J14	LCD TAPE	1	[PAVCSG]
28	VGU0F27	REAR BUTTON	1	[PAVCSG]
30	VGQ0H42	STRAP HOLDER	1	[PAVCSG]
31	VGQ0J69	SHADING SHEET	1	[PAVCSG]
32	L0CBAA000013	MIC	1	[PAVCSG]
34	VEP50053A	TOP P.C.B.	1	(RTL)E.S.D.[PAVCSG]
35	VGL1318	POWER LED PANEL	1	[PAVCSG]
36	VGQ0H34	COUPLING PLATE	1	[PAVCSG]
38	VGU0F20	POWER KNOB	1	[PAVCSG]
39	VGU0F37	REC BUTTON	1	[PAVCSG]
41	VMP9478	TOP PLATE (L)	1	[PAVCSG]
42	VWJ2115	MAIN-TOP FPC	1	[PAVCSG]
43	VWJ2117	MAIN-LVF FPC	1	[PAVCSG]
44	VYQ5054	SHUTTER RING UNIT	1	[PAVCSG]
45	L0AA01A00043	SPEAKER	1	[PAVCSG]
46	VEP59071A	EX LVF P.C.B.	1	[PAVCSG](RTL)
47	VGK3571	LVF HOLDER	1	[PAVCSG]
48	VMP9477	LVF SHIELD PLATE	1	[PAVCSG]
49	VMP9479	SHOE PLATE	1	[PAVCSG]
50	VEE1H00	LEAD WIRE WITH CONNECTOR	1	[PAVCSG]
51	VEP58099A	FLASH P.C.B.	1	(RTL)E.S.D.[PAVCSG]
52	VEP58101A	POP SW P.C.B.	1	[PAVCSG](RTL)
53	VGQ0H52	FLASH P.C.B. COVER	1	[PAVCSG]
56	VGQ0J13	FLASH TAPE	1	[PAVCSG]
61	VMP9539	P.C.B. TERMINAL	1	[PAVCSG]
62	VWJ2116	MAIN-FLASH FPC	1	[PAVCSG]
63	VGQ0H35	CAPACITOR HOLDER	1	[PAVCSG]
64	VGQ0H36	BATTERY CATCHER COVER	1	[PAVCSG]
65	VGQ0H38	CAPACITOR TAPE	1	[PAVCSG]
66	VGQ0H48	DC COVER	1	(-K) [PAVCSG]
66	VGQ0H70	DC COVER	1	(-R) [PAVCSG]
66	VGQ0H72	DC COVER	1	(-S) [PAVCSG]
66	VGQ0H71	DC COVER	1	(-W) [PAVCSG]
67	VGU0F25	BATTERY LOCK KNOB	1	[PAVCSG]
68	VKM8117	BATTERY CASE	1	[PAVCSG]
69	VMB4302	BATTERY OUT SPRING	1	[PAVCSG]
70	VYK3R09	FRONT CASE UNIT	1	(-K) [PAVCSG]
70	VYK3R10	FRONT CASE UNIT	1	(-R) [PAVCSG]
70	VYK3R12	FRONT CASE UNIT	1	(-S) [PAVCSG]
70	VYK3R11	FRONT CASE UNIT	1	(-W) [PAVCSG]
71	VYK3R13	REAR CASE UNIT	1	(-K) [PAVCSG]
71	VYK3R14	REAR CASE UNIT	1	(-R) [PAVCSG]
71	VYK3R16	REAR CASE UNIT	1	(-S) [PAVCSG]
71	VYK3R15	REAR CASE UNIT	1	(-W) [PAVCSG]

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
72	VYK3R18	LCD UNIT	1	[PAVCSG]
73	VYQ5101	REAR OPERATION SW PLATE UNIT	1	[PAVCSG]
74	VYK3R17	TOP CASE UNIT	1	[PAVCSG]
75	VYQ5102	HOT SHOE UNIT	1	[PAVCSG]
76	VYK3R19	FLASH UNIT	1	(-K) [PAVCSG]
76	VYK3R20	FLASH UNIT	1	(-R) [PAVCSG]
76	VYK3R22	FLASH UNIT	1	(-S) [PAVCSG]
76	VYK3R21	FLASH UNIT	1	(-W) [PAVCSG]
76-1	VGQ0H54	FLASH TOP COVER	1	[PAVCSG]
76-2	VKM8120	FLASH CASE TOP	1	(-K) [PAVCSG]
76-2	VKM8131	FLASH CASE TOP	1	(-R) [PAVCSG]
76-2	VKM8132	FLASH CASE TOP	1	(-W) [PAVCSG]
76-2	VKM8133	FLASH CASE TOP	1	(-S) [PAVCSG]
76-3	VGQ0H58	FLASH LOCK	1	[PAVCSG]
76-4	VMB4311	FLASH RELEASE SPRING	1	[PAVCSG]
76-5	VMP9489	FLASH RELEASE LEVER	1	[PAVCSG]
△ 77	ML-421S/DN	BUTTON BATTERY	1	[PAVCSG](B8001)[ENERGY]
△ 78	F2A2F1110006	E.CAPACITOR	1	[PAVCSG](C7100)
79	VGQ0K96	GASKET	1	[PAVCSG]
80	VMZ3842	FERRITE SHEET	1	[PAVCSG]
81	VGQ0L04	LCD FPC SHEET	1	[PAVCSG]
82	VGQ0K25	FPC SHEET	1	[PAVCSG]
83	VGQ0H89	TAPE	1	[PAVCSG]
84	VGQ0H89	TAPE	1	[PAVCSG]
85	VGQ0H92	SHEET	1	
B1	VHD2103	SCREW	1	(-K,-R)
B1	VHD2102	SCREW	1	(-S,-W)
B2	VHD2103	SCREW	1	(-K,-R)
B2	VHD2102	SCREW	1	(-S,-W)
B3	VHD2103	SCREW	1	(-K,-R)
B3	VHD2102	SCREW	1	(-S,-W)
B4	VHD2103	SCREW	1	(-K,-R)
B4	VHD2102	SCREW	1	(-S,-W)
B5	VHD2166	SCREW	1	(-K,-R)
B5	VHD2183	SCREW	1	(-S,-W)
B6	VHD2166	SCREW	1	(-K,-R)
B6	VHD2183	SCREW	1	(-S,-W)
B7	VHD2166	SCREW	1	(-K,-R)
B7	VHD2183	SCREW	1	(-S,-W)
B8	VHD2166	SCREW	1	(-K,-R)
B8	VHD2183	SCREW	1	(-S,-W)
B9	VHD2179	SCREW	1	(-K,-R)
B9	VHD2138	SCREW	1	(-S,-W)
B10	VHD2179	SCREW	1	(-K,-R)
B10	VHD2138	SCREW	1	(-S,-W)
B11	VHD2178	SCREW	1	(-K,-R)
B11	XQN16+BJ65FC	SCREW	1	(-S,-W)
B12	VHD2178	SCREW	1	(-K,-R)
B12	XQN16+BJ65FC	SCREW	1	(-S,-W)
B13	VHD2179	SCREW	1	(-K,-R)
B13	VHD2138	SCREW	1	(-S,-W)
B14	VHD2179	SCREW	1	(-K,-R)
B14	VHD2138	SCREW	1	(-S,-W)
B15	XQN16+B3FN	SCREW	1	
B16	XQN16+B4FN	SCREW	1	
B17	XQN16+B4FN	SCREW	1	
B18	XQN16+B4FN	SCREW	1	
B19	XQN16+B4FN	SCREW	1	
B20	XQN16+B4FN	SCREW	1	
B21	XQN16+B4FN	SCREW	1	
B22	XQN16+B2FN	SCREW	1	[PAVCSG]
B23	XQN16+B4FN	SCREW	1	[PAVCSG]
B24	XQN16+B4FN	SCREW	1	[PAVCSG]
B25	XQN16+B4FN	SCREW	1	[PAVCSG]
B26	VHD1909	SCREW	1	[PAVCSG]
B27	VHD1909	SCREW	1	[PAVCSG]
B29	VHD2062-A	SCREW	1	[PAVCSG]
B30	VHD2062-A	SCREW	1	[PAVCSG]
B32	VHD2167	SCREW	1	[PAVCSG]
B33	VHD2167	SCREW	1	[PAVCSG]
B35	XQN16+BJ4FN	SCREW	1	[PAVCSG]
B36	XQN16+BJ4FN	SCREW	1	[PAVCSG]
B37	XQN16+BJ4FN	SCREW	1	[PAVCSG]
B38	XQN16+BJ4FN	SCREW	1	[PAVCSG]
B39	VHD1996	SCREW	1	[PAVCSG]
B40	VHD2163-A	SCREW	1	[PAVCSG]

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
201	VEJ2309	LENS MOUNT CONTACT UNIT	1	(GF1C)	302	VDW1717	SHADING FRAME	1	(GF1K)
202	VXQ1806	L MOUNT UNIT	1	(GF1C)	303	VEJ2295	MOUNT CONTACT UNIT	1	(GF1K)
203	VDW1934	SHADING FRAME	1	(GF1C)	304	VGH5049	DECORATION RING	1	(GF1K)
204	VMB4295	1ST PUSH SPRING	1	(GF1C)	305	VMG1837	ZOOM RUBBER RING	1	(GF1K)
205	VMX3794	SPRING HOLDER	1	(GF1C)	306	VXQ1615	L MOUNT UNIT	1	(GF1K)
206	VYC1004	DECORATION RING UNIT	1	(GF1C)	307	----	REAR FRAME 2 UNIT	1	(GF1K) (Not supplied)
207	VDS0246	L7 LENS COVER	1	(GF1C)	308	----	LENS BODY UNIT	1	(GF1K) (Not supplied)
214	----	REAR FRAME 2 UNIT	1	(GF1C) (Not supplied)	309	VMG1855	FLOATING RUBBER	1	(GF1K)
215	----	LENS BODY UNIT	1	(GF1C) (Not supplied)	310	VMG1855	FLOATING RUBBER	1	(GF1K)
					311	VMG1855	FLOATING RUBBER	1	(GF1K)
					312	VMG1847	DUST PROOF RING	1	(GF1K)
B201	VHD2142	SCREW	1	(GF1C)	B301	XQN14+B3FNK	SCREW	1	(GF1K)
B202	VHD2142	SCREW	1	(GF1C)	B302	XQN14+B3FNK	SCREW	1	(GF1K)
B203	VHD2142	SCREW	1	(GF1C)	B303	XQN14+B3FNK	SCREW	1	(GF1K)
B204	XQN2+AJ5FN	SCREW	1	(GF1C)	B304	XQN14+BJ4FNK	SCREW	1	(GF1K)
B205	XQN2+AJ5FN	SCREW	1	(GF1C)	B305	XQN14+BJ4FNK	SCREW	1	(GF1K)
B206	XQN2+AJ5FN	SCREW	1	(GF1C)	B306	XQN14+BJ4FNK	SCREW	1	(GF1K)
B207	VHD1868	SCREW	1	(GF1C)	B307	XQN14+BJ4FNK	SCREW	1	(GF1K)
B208	XQN14+AJ3FN	SCREW	1	(GF1C)	B308	XQN2+AJ5FN	SCREW	1	(GF1K)
B209	XQN14+BJ4FNK	SCREW	1	(GF1C)	B309	XQN2+AJ5FN	SCREW	1	(GF1K)
B210	XQN14+BJ4FNK	SCREW	1	(GF1C)	B310	XQN2+AJ5FN	SCREW	1	(GF1K)
B211	XQN14+BJ4FNK	SCREW	1	(GF1C)	B311	XQN2+AJ5FN	SCREW	1	(GF1K)
B212	XQN14+BJ3FN	SCREW	1	(GF1C)	B312	XQN14+AJ3FN	SCREW	1	(GF1K)
B213	XQN14+BJ3FN	SCREW	1	(GF1C)	B313	VHD1868	SCREW	1	(GF1K)
B214	XQN16+BJ4FN	SCREW	1	(GF1C)					
B215	XQN16+BJ4FN	SCREW	1	(GF1C)					
B216	XQN16+BJ4FN	SCREW	1	(GF1C)					

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
△ 501	DE-A49BA	BATTERY CHARGER	1	(GF1CPP)
△ 501	DE-A49CB	BATTERY CHARGER	1	(GF1CEB,EC,EG,GC,GH,GN)
△ 501	DE-A49EA	BATTERY CHARGER	1	(GF1CGK)
△ 503	-----	BATTERY	1	(GF1C)
504	K1HA08AD0003	USB CABLE W/PLUG	1	(GF1C)
505	K1HA08CD0020	AV CABLE W/PLUG	1	(GF1C)
506	VFC4459	SHOULDER STRAP	1	(GF1C)
507	VFF0530-S	CD-ROM	1	(GF1CPP,EB,EC,EG,GC,GH,GN)
				See"Notes"
507	VFF0531-S	CD-ROM	1	(GF1CGK)
				See"Notes"
509	VPF1294	BAG, POLYETHYLENE	1	(GF1CEB, GH, GK, GN)
509	VPF1132	BAG, POLYETHYLENE	1	(GF1CPP, EC, EG, GC)
△ 510	VQT2G56	INSTRUCTION BOOK	1	(GF1CEB)
		(ENGLISH)		
△ 510	VQT2G52	INSTRUCTION BOOK	1	(GF1CEC)
		(SPANISH)		
△ 510	VQT2G53	INSTRUCTION BOOK	1	(GF1CEC)
		(PORTUGUESE)		
△ 510	VQT2G54	INSTRUCTION BOOK	1	(GF1CEC)
		(SWEDISH)		
△ 510	VQT2G55	INSTRUCTION BOOK	1	(GF1CEC)
		(DANISH)		
△ 510	VQT2G48	INSTRUCTION BOOK	1	(GF1CEG)
		(GERMAN)		
△ 510	VQT2G49	INSTRUCTION BOOK	1	(GF1CEG)
		(FRENCH)		
△ 510	VQT2G50	INSTRUCTION BOOK	1	(GF1CEG)
		(ITALIAN)		
△ 510	VQT2G51	INSTRUCTION BOOK	1	(GF1CEG)
		(DUTCH)		
△ 510	VQT2G57	INSTRUCTION BOOK	1	(GF1CGC, GH)
		(ENGLISH)		
△ 510	VQT2G58	INSTRUCTION BOOK	1	(GF1CGC, GH)
		(CHINESE(TRADITIONAL))		
△ 510	VQT2G59	INSTRUCTION BOOK	1	(GF1CGC)
		(RUSSIAN)		
△ 510	VQT2G60	INSTRUCTION BOOK	1	(GF1CGC)
		(ARABIC)		
△ 510	VQT2G61	INSTRUCTION BOOK	1	(GF1CGK)
		(CHINESE(SIMPLIFIED))		
△ 510	VQT2G62	INSTRUCTION BOOK	1	(GF1CGN)
		(ENGLISH)		
△ 510	VQT2G44	INSTRUCTION BOOK	1	(GF1CPP)
		(ENGLISH)		
△ 510	VQT2G45	INSTRUCTION BOOK	1	(GF1CPP)
		(CANADIAN FRENCH)		
△ 510	VQT2G46	INSTRUCTION BOOK	1	(GF1CPP)
		(SPANISH)		
△ 510	VQT2G47	INSTRUCTION BOOK	1	(GF1CPP)
		(PORTUGUESE)		
511	VQT2G68	O/I SOFTWARE	1	(GF1CEB,GN)
		(ENGLISH)		
511	VQT2G67	O/I SOFTWARE	1	(GF1CEC)
		(SPANISH/PORTUGUESE/ SWEDISH/DANISH)		
511	VQT2G66	O/I SOFTWARE	1	(GF1CEG)
		(GERMAN/FRENCH/ITALIAN/ DUTCH)		
511	VQT2G69	O/I SOFTWARE	1	(GF1CGC, GH)
		(ENGLISH/ CHINESE(TRADITIONAL)/ RUSSIAN/ARABIC)		
511	VQT2G70	O/I SOFTWARE	1	(GF1CGK)
		(CHINESE(SIMPLIFIED))		
511	VQT2G65	O/I SOFTWARE	1	(GF1CPP)
		(ENGLISH/CANADIAN FRENCH/ SPANISH/PORTUGUESE)		
513	VPK4040	PACKING CASE	1	(GF1CPP)
513	VPK4041	PACKING CASE	1	(GF1CEB,EC,EG,GC,GH,GN)
513	VPK4042	PACKING CASE	1	(GF1CGK)
514	VPN6940	CUSHION A	1	(GF1C)
515	VPN6941	CUSHION B	1	(GF1C)
517	VPF1316	CAMERA BAG	1	(GF1C)
520	VFC4460	LENS STORAGE BAG	1	(GF1C)
522	VPF1328	AIR CAP BAG	1	(GF1C)

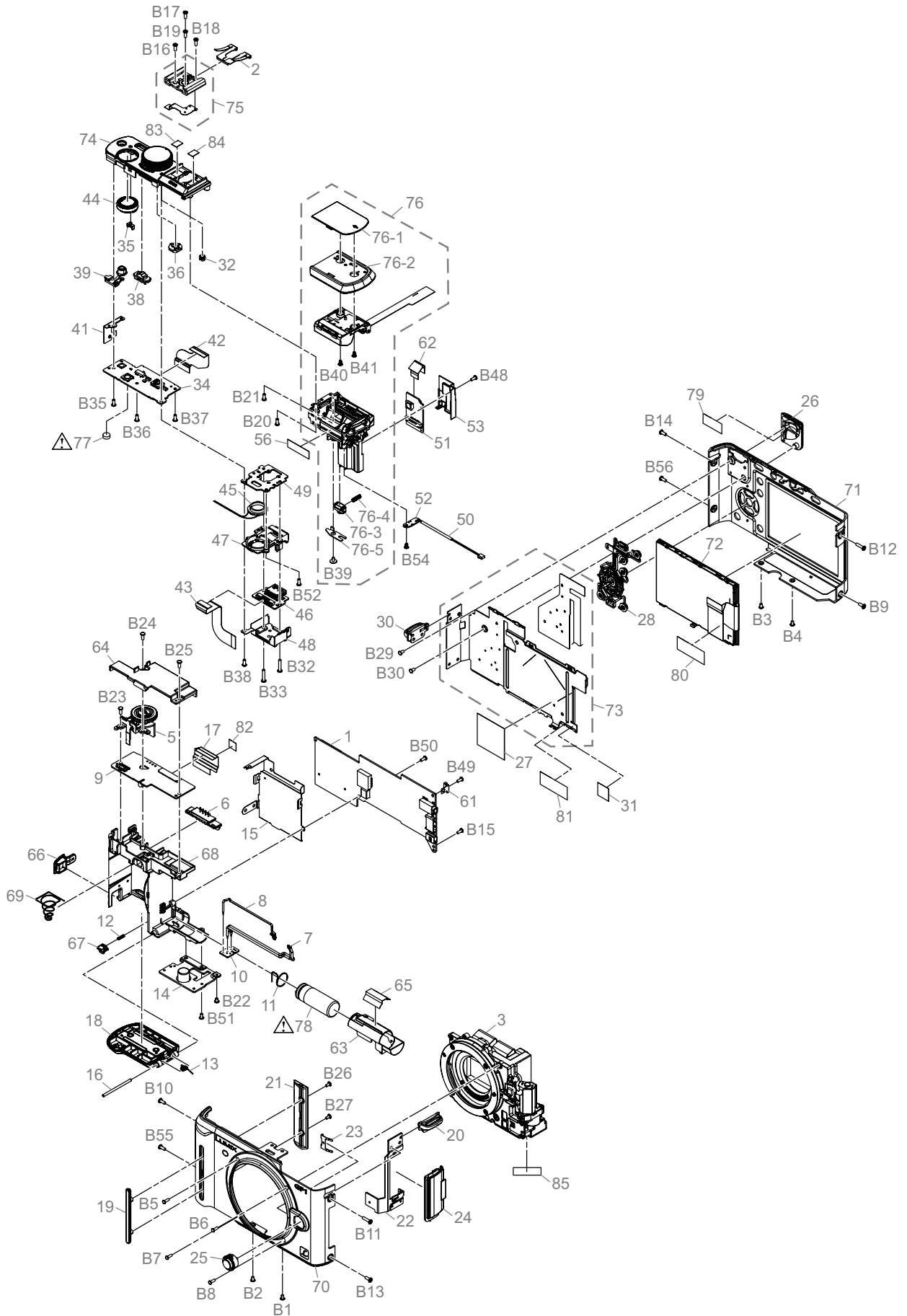
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
523	VPN6942	CUSHION C	1	(GF1C)
524	VQL1V21	COLOR LABEL	1	(GF1CEB-R,EC-R,EG-R, GC-R,GH-R)
524	VQL2B12	COLOR LABEL	1	(GF1CEB-S,EG-S,GC-S,GH-S)
524	VQL2B13	COLOR LABEL	1	(GF1CEG-W,GH-W)
524	VQL2B47	COLOR LABEL	1	(GF1CGK-R)
524	VQL2B48	COLOR LABEL	1	(GF1CGK-S)
524	VQL1V19	COLOR LABEL	1	(GF1CPP-R)
525	VQL1V21	COLOR LABEL	1	(GF1CEB-R,EC-R,EG-R, GC-R,GH-R)
525	VQL2B12	COLOR LABEL	1	(GF1CEB-S,EG-S,GC-S,GH-S)
525	VQL2B13	COLOR LABEL	1	(GF1CEG-W,GH-W)
525	VQL2B47	COLOR LABEL	1	(GF1CGK-R)
525	VQL2B48	COLOR LABEL	1	(GF1CGK-S)
525	VQL1V19	COLOR LABEL	1	(GF1CPP-R)
526	VQL1V21	COLOR LABEL	1	(GF1CEB-R,EC-R,EG-R, GC-R,GH-R)
526	VQL2B12	COLOR LABEL	1	(GF1CEB-S,EG-S,GC-S,GH-S)
526	VQL2B13	COLOR LABEL	1	(GF1CEG-W,GH-W)
526	VQL2B47	COLOR LABEL	1	(GF1CGK-R)
526	VQL2B48	COLOR LABEL	1	(GF1CGK-S)
526	VQL1V19	COLOR LABEL	1	(GF1CPP-R)
△ 528	K2CQ29A00002	AC CORD W/PLUG	1	(GF1CEC,EG,GC)
△ 529	K2CA2EA00002	AC CORD W/PLUG	1	(GF1CPP)
△ 529	K2CA2YY00070	AC CORD W/PLUG	1	(GF1CGK)
△ 530	K2CJ29A00002	AC CORD W/PLUG	1	(GF1CGN)
△ 531	K2CT39A00002	AC CORD W/PLUG	1	(GF1CEB,GC,GH)
532	VFC4315	REAR LENS CAP	1	(GF1C)
533	VYF3260	LENS CAP	1	(GF1C)
534	VKF4385	BODY CAP	1	(GF1C)
535	VYF3287	HOT SHOE COVER	1	(GF1C)
536	VPF1371	LENS BAG	1	(GF1C)
537	VQL1S66	LABEL	1	(GF1CGK)

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
△ 601	DE-A49BA	BATTERY CHARGER	1	((GF1KPP))
△ 601	DE-A49CB	BATTERY CHARGER	1	((GF1KEB,EC,EG,GC,GH,GN))
△ 601	DE-A49EA	BATTERY CHARGER	1	((GF1KGK))
△ 603	-----	BATTERY	1	((GF1K))
604	K1HA08AD0003	USB CABLE W/PLUG	1	((GF1K))
605	K1HA08CD0020	AV CABLE W/PLUG	1	((GF1K))
606	VFC4459	SHOULDER STRAP	1	((GF1K))
607	VFF0530-S	CD-ROM	1	((GF1KPP,EB,EC,EG,GC,GH,GN))
				See"Notes"
607	VFF0531-S	CD-ROM	1	((GF1KGK))
				See"Notes"
609	VPF1294	BAG, POLYETHYLENE	1	((GF1KEB,GH,GK,GN))
609	VPF1132	BAG, POLYETHYLENE	1	((GF1KPP,EC,EG,GC))
△ 610	VQT2G56	INSTRUCTION BOOK	1	((GF1KEB))
		(ENGLISH)		
△ 610	VQT2G52	INSTRUCTION BOOK	1	((GF1KEC))
		(SPANISH)		
△ 610	VQT2G53	INSTRUCTION BOOK	1	((GF1KEC))
		(PORTUGUESE)		
△ 610	VQT2G54	INSTRUCTION BOOK	1	((GF1KEC))
		(SWEDISH)		
△ 610	VQT2G55	INSTRUCTION BOOK	1	((GF1KEC))
		(DANISH)		
△ 610	VQT2G48	INSTRUCTION BOOK	1	((GF1KEG))
		(GERMAN)		
△ 610	VQT2G49	INSTRUCTION BOOK	1	((GF1KEG))
		(FRENCH)		
△ 610	VQT2G50	INSTRUCTION BOOK	1	((GF1KEG))
		(ITALIAN)		
△ 610	VQT2G51	INSTRUCTION BOOK	1	((GF1KEG))
		(DUTCH)		
△ 610	VQT2G57	INSTRUCTION BOOK	1	((GF1KGC,GH))
		(ENGLISH)		
△ 610	VQT2G58	INSTRUCTION BOOK	1	((GF1KGC,GH))
		(CHINESE(TRADITIONAL))		
△ 610	VQT2G59	INSTRUCTION BOOK	1	((GF1KGC))
		(RUSSIAN)		
△ 610	VQT2G60	INSTRUCTION BOOK	1	((GF1KGC))
		(ARABIC)		
△ 610	VQT2G61	INSTRUCTION BOOK	1	((GF1KGK))
		(CHINESE(SIMPLIFIED))		
△ 610	VQT2G62	INSTRUCTION BOOK	1	((GF1KGN))
		(ENGLISH)		
△ 610	VQT2G44	INSTRUCTION BOOK	1	((GF1KPP))
		(ENGLISH)		
△ 610	VQT2G45	INSTRUCTION BOOK	1	((GF1KPP))
		(CANADIAN FRENCH)		
△ 610	VQT2G46	INSTRUCTION BOOK	1	((GF1KPP))
		(SPANISH)		
△ 610	VQT2G47	INSTRUCTION BOOK	1	((GF1KPP))
		(PORTUGUESE)		
611	VQT2G68	O/I SOFTWARE	1	((GF1KEB,GN))
		(ENGLISH)		
611	VQT2G67	O/I SOFTWARE	1	((GF1KEC))
		(SPANISH/PORTUGUESE/ SWEDISH/DANISH)		
611	VQT2G66	O/I SOFTWARE	1	((GF1KEG))
		(GERMAN/FRENCH/ITALIAN/ DUTCH)		
611	VQT2G69	O/I SOFTWARE	1	((GF1KGC,GH))
		(ENGLISH/ CHINESE(TRADITIONAL)/ RUSSIAN/ARABIC)		
611	VQT2G70	O/I SOFTWARE	1	((GF1KGK))
		(CHINESE(SIMPLIFIED))		
611	VQT2G65	O/I SOFTWARE	1	((GF1KPP))
		(ENGLISH/CANADIAN FRENCH/ SPANISH/PORTUGUESE)		
613	VPK4044	PACKING CASE	1	((GF1KPP))
613	VPK4045	PACKING CASE	1	((GF1KGK))
613	VPK4049	PACKING CASE	1	((GF1KEB,EC,EG,GC,GH,GN))
614	VPN6940	CUSHION A	1	((GF1K))
615	VPN6941	CUSHION B	1	((GF1K))
617	VPF1316	CAMERA BAG	1	((GF1K))
619	VPQ0276	AIR CAP SHEET	1	((GF1K))
620	VFC4456	LENS STORAGE BAG	1	((GF1K))

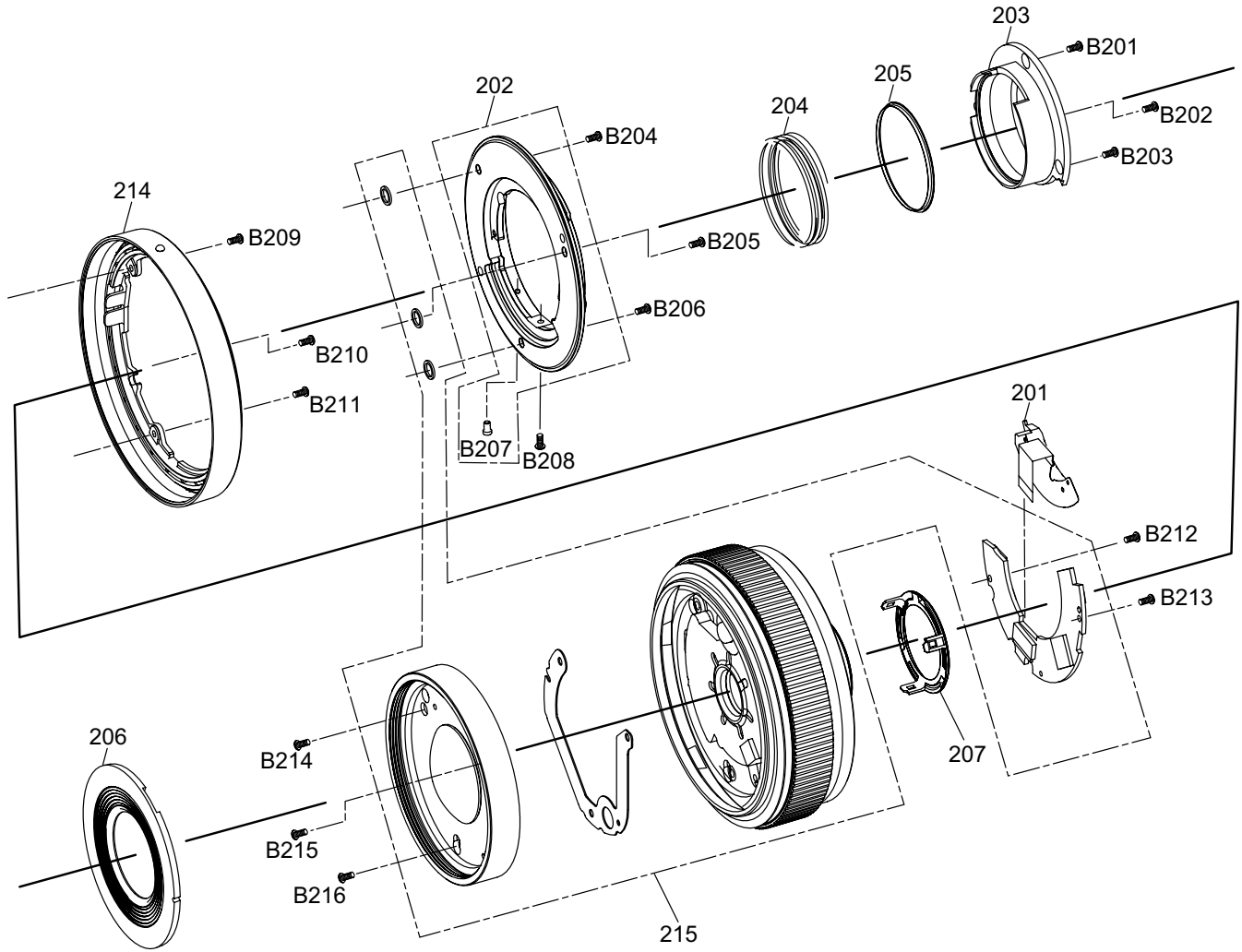
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
621	VYC0981	LENS HOOD	1	((GF1K))
623	VPN6945	CUSHION C	1	((GF1K))
624	VQL1V21	COLOR LABEL	1	((GH1KEB-R,EC-R,EG-R))
624	VQL2B12	COLOR LABEL	1	((GF1KEB-S,EG-S))
624	VQL2B13	COLOR LABEL	1	((GF1KEG-W))
624	VQL1V19	COLOR LABEL	1	((GF1KPP-R))
625	VQL1V21	COLOR LABEL	1	((GH1KEB-R,EC-R,EG-R))
625	VQL2B12	COLOR LABEL	1	((GF1KEB-S,EG-S))
625	VQL2B13	COLOR LABEL	1	((GF1KEG-W))
625	VQL1V19	COLOR LABEL	1	((GF1KPP-R))
626	VQL1V21	COLOR LABEL	1	((GH1KEB-R,EC-R,EG-R))
626	VQL2B12	COLOR LABEL	1	((GF1KEB-S,EG-S))
626	VQL2B13	COLOR LABEL	1	((GF1KEG-W))
626	VQL1V19	COLOR LABEL	1	((GF1KPP-R))
△ 628	K2CQ29A00002	AC CORD W/PLUG	1	((GF1KEC,EG,GC))
△ 629	K2CA2EA00002	AC CORD W/PLUG	1	((GF1KPP))
△ 629	K2CA2YY00070	AC CORD W/PLUG	1	((GF1KGK))
△ 630	K2CJ29A00002	AC CORD W/PLUG	1	((GF1KGN))
△ 631	K2CT39A00002	AC CORD W/PLUG	1	((GF1KEB,GC,GH))
632	VFC4315	LENS REAR CAP	1	((GF1K))
633	VYF3201	LENS CAP	1	((GF1K))
634	VKF4385	BODY CAP	1	((GF1K))
635	VYF3287	HOT SHOE COVER	1	((GF1K))
636	VPF1321	LENS BAG	1	((GF1K))
637	VQL1S66	LABEL	1	((GF1KGK))

S7. Exploded View

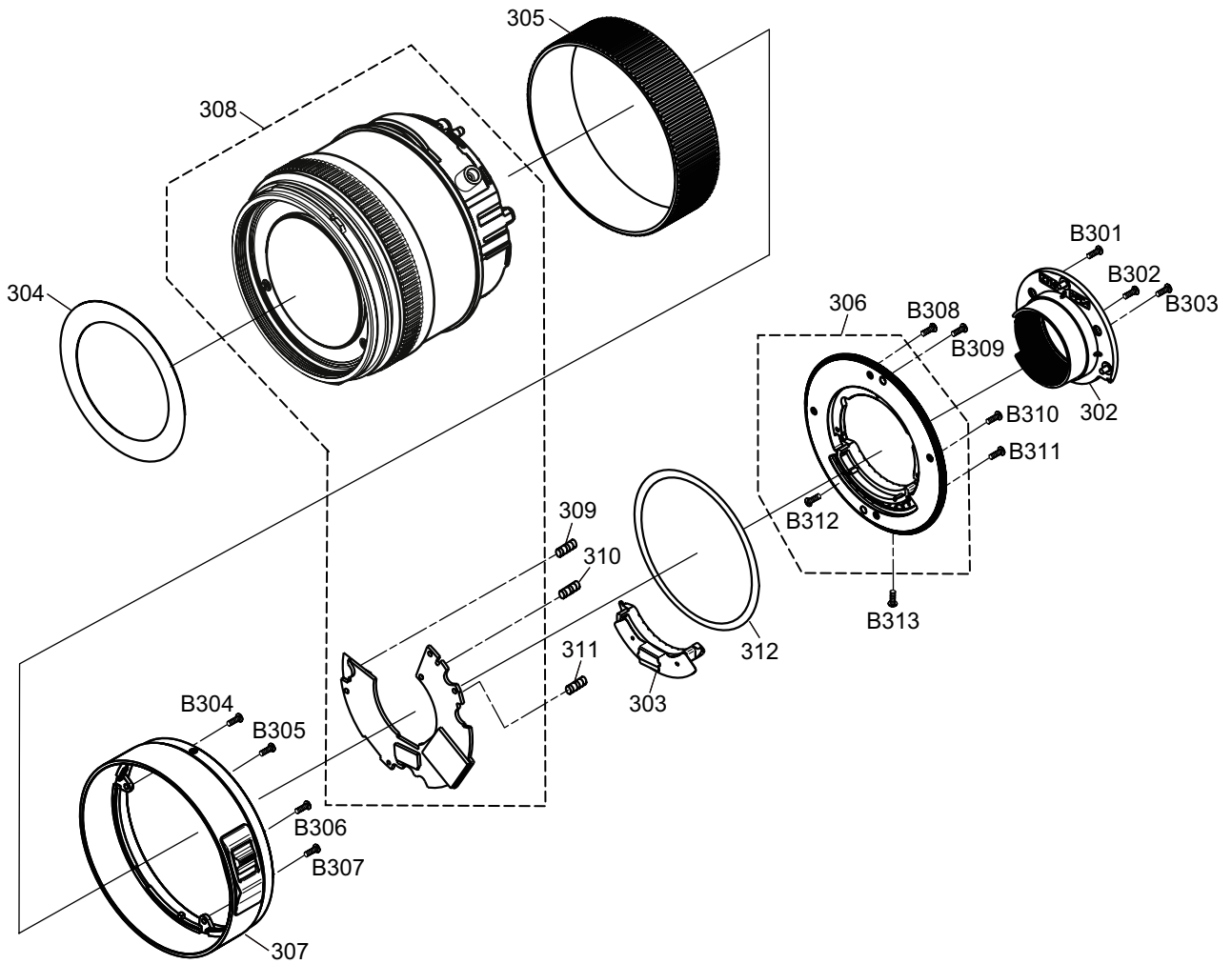
S7.1. Frame and Casing Section



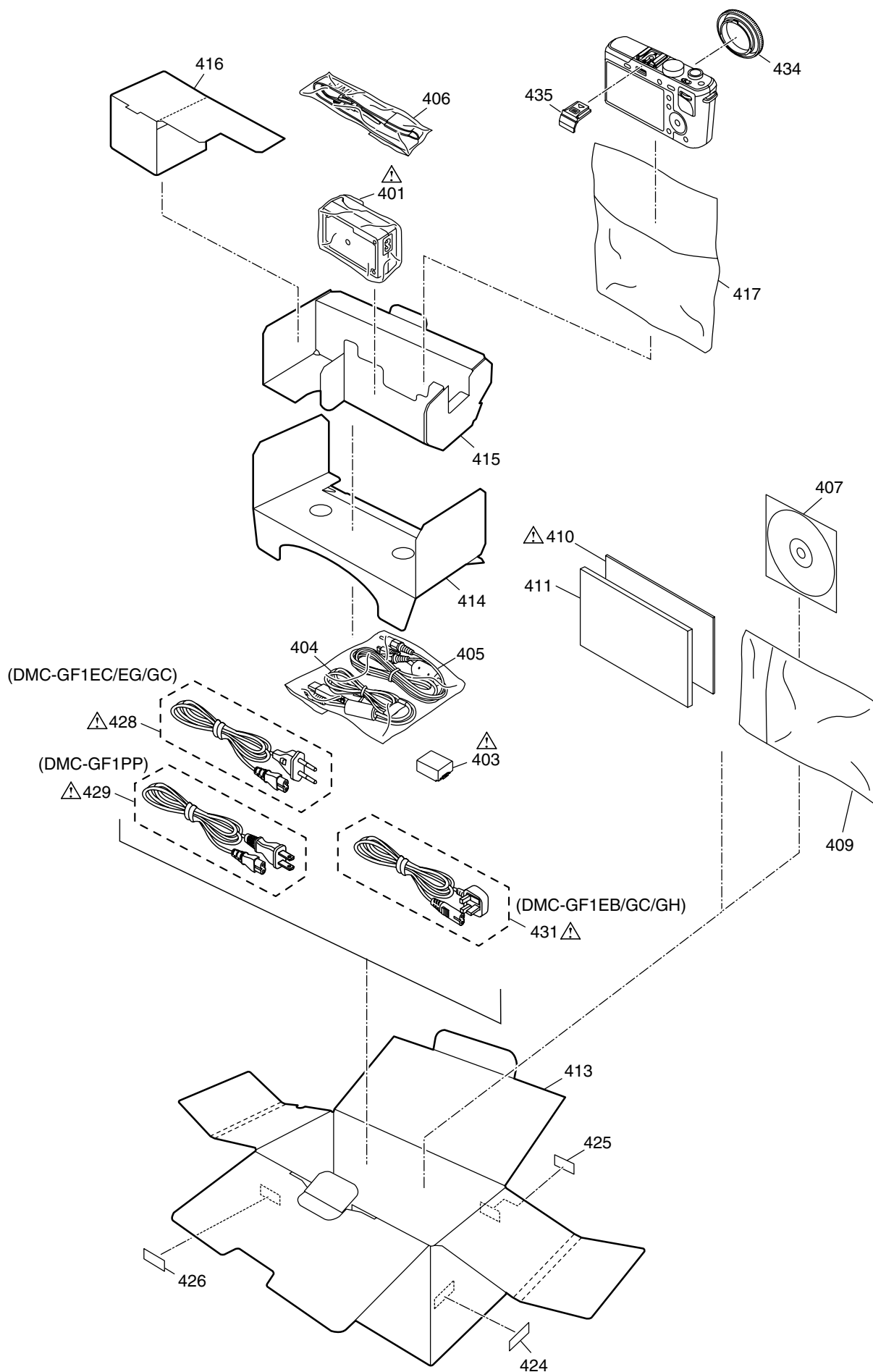
S7.2. Camera Lens Section (1)



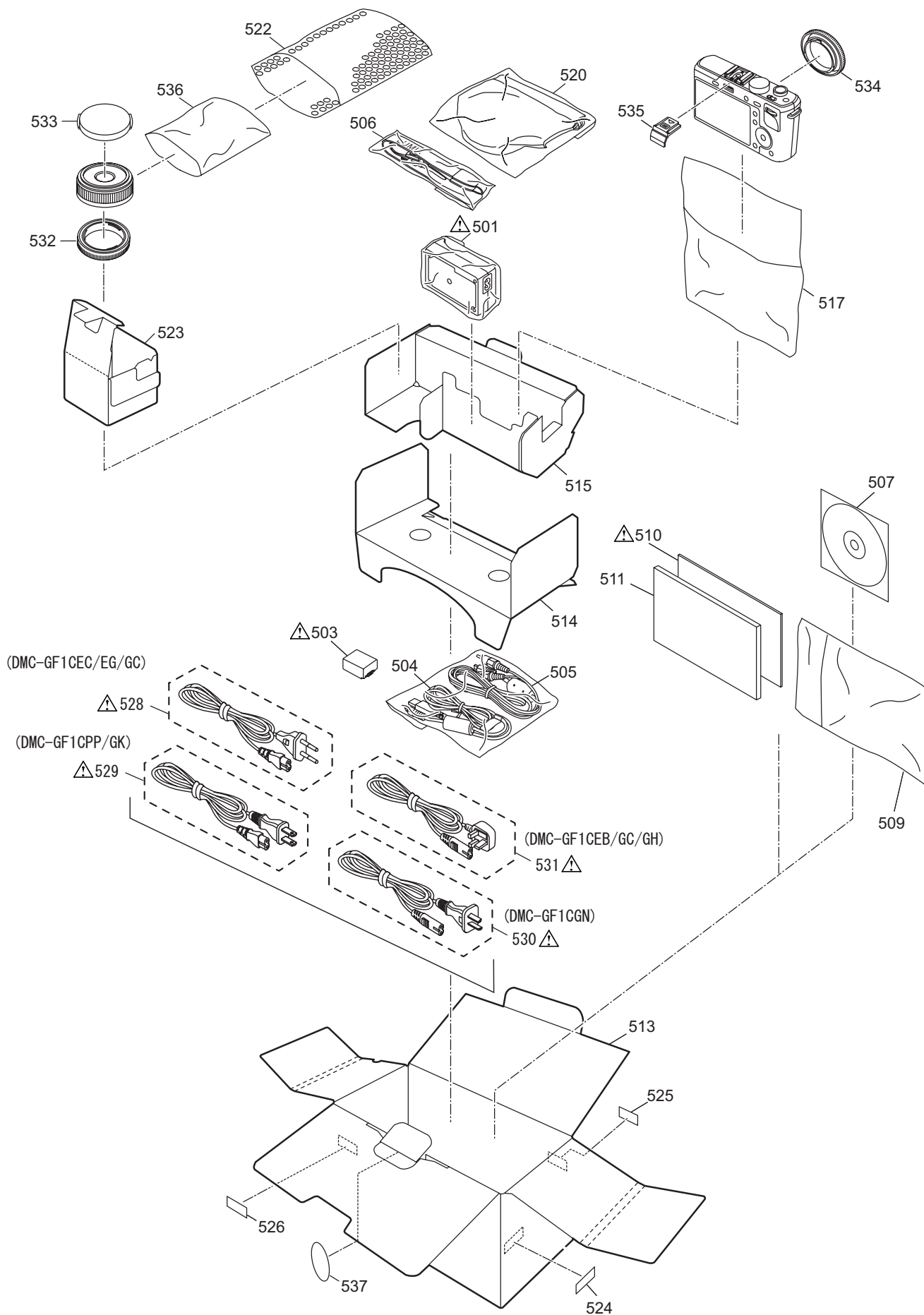
S7.3. Camera Lens Section (2)



S7.4. Packing Parts and Accessories Section (1)



S7.5. Packing Parts and Accessories Section (2)



S7.6. Packing Parts and Accessories Section (3)

