

Panasonic®

ORDER NO.DSC1706014CE

B26

Service Manual

Digital Camera

- Model No. **DC-TZ90EB**
DC-TZ90EF
DC-TZ90EG
DC-TZ90EP
DC-TZ90GA
DC-TZ90GC
DC-TZ90GN
DC-TZ91EG
DC-TZ92EF
DC-TZ93EB
DC-ZS70P
DC-ZS70PP
DC-ZS70GH
DC-ZS70GK
DC-ZS70GT

Product Color

Colours

(S).....Silver Type

(K).....Black Type

LUMIX



AVCHD™
Progressive





⚠ 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 Δ 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 $1M\Omega$ and $5.2M\Omega$. When the exposed metal does not have a return path to the chassis, the reading must be infinity.

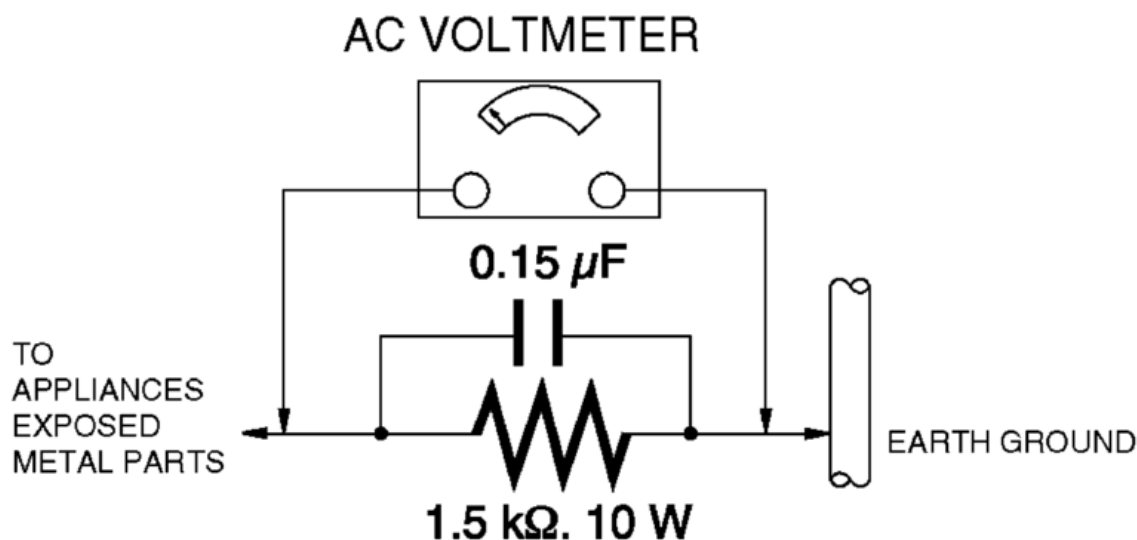
1.3 Leakage Current Hot Check (See Figure 1)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a $1.5k\Omega$, 10 W resistor, in parallel with a $0.15\mu F$ 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 $1k\Omega/V$ or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 V RMS.

A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 mA. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

Figure 1

Hot-Check Circuit



1.4 How to Discharge the Capacitor on Top P.C.B. Unit

CAUTION:

- Be sure to discharge the capacitor on Top P.C.B. Unit.
- Be careful of the high voltage circuit on Top P.C.B. Unit when servicing.

[Discharging Procedure]

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

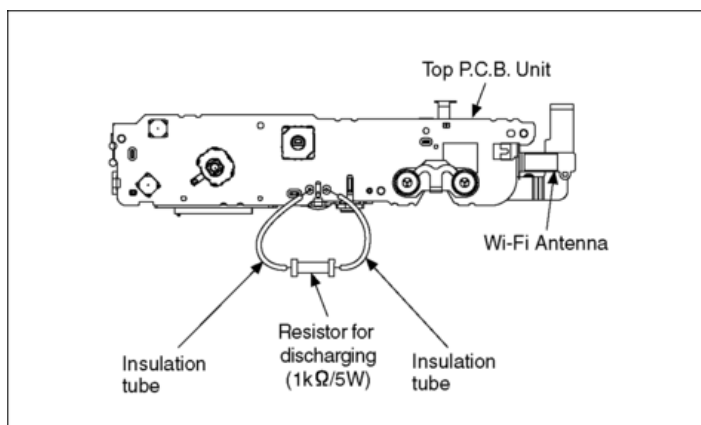


Fig. F1

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 MOS image sensor, IC (integrated circuits) and some field-effect transistors and semiconductor "chip" components.

The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).



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

CAUTION:

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

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

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

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

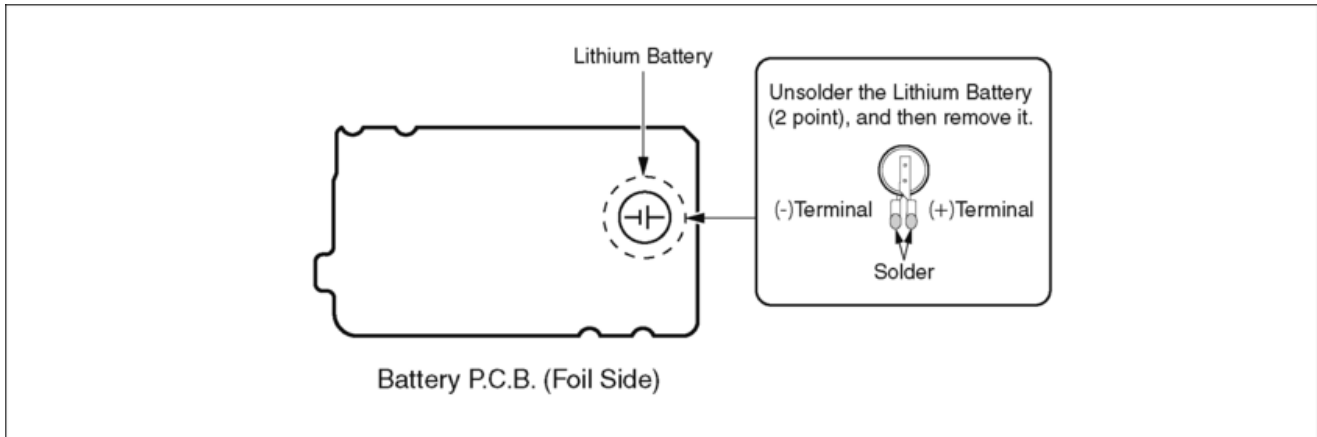
2.3 How to Replace the Lithium Battery

2.3.1 Replacement Procedure

1. Remove the Battery P.C.B. (Refer to Disassembly Procedures.)
2. Unsolder the each soldering point of electric lead terminal for Lithium battery (Ref. No. B9401 at foil side of Battery P.C.B.) and remove the Lithium battery together with electric lead terminal. Then replace it into new one.

Note:

The Lithium battery includes electric lead terminals.

**CAUTION**

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type.

CAUTION

The battery used in this device may present a risk of fire or chemical burn if mistreated.
Do not recharge, disassemble, heat above 100°C (212°F), or incinerate.
Replace battery with Panasonic part number ML-421S/DB only.
Use of another battery may present a risk of fire or explosion.
Dispose of used battery promptly.
Keep away from children.
Do not disassemble and do not dispose of in fire.

Note:

The lithium battery is a critical component.
It must never be subjected to excessive heat or discharge.
It must therefore only be fitted in equipment designed specifically for its use.
Replacement batteries must be of the 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 DC-TZ90/TZ91/TZ92/TZ93/ZS70 series, as well.

3 Service Navigation

3.1 Introduction

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

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

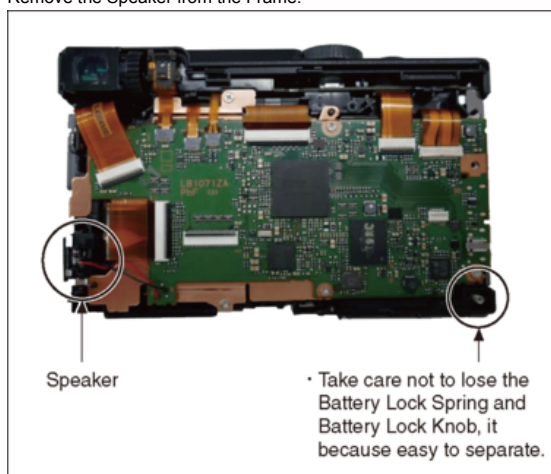
If the circuit is changed or modified, the information will be followed by service manual to be controlled with original service manual.

3.2 Important Notice

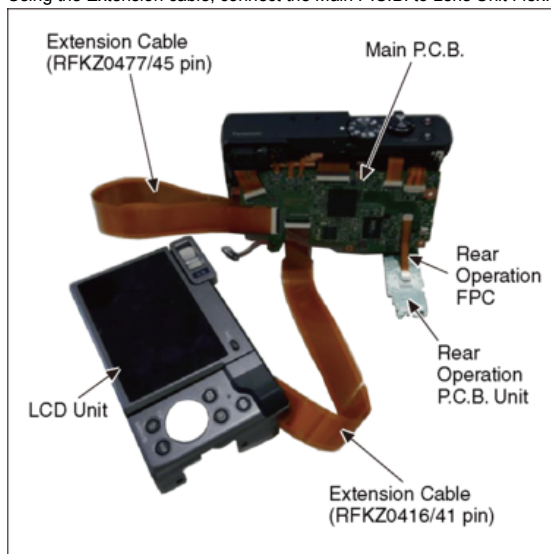
3.2.1 About lens block

The image sensor (MOS) unit which are connected to the lens unit with 3 screws. These screws are locked, after performing the Optical tilt adjustment. During servicing, if one of MOS fixing screws are loosened, the Optical tilt adjustment must be performed. (About the Optical tilt adjustment, refer to the "10.3.2 [Adjustment Specifications](#)" for details.)

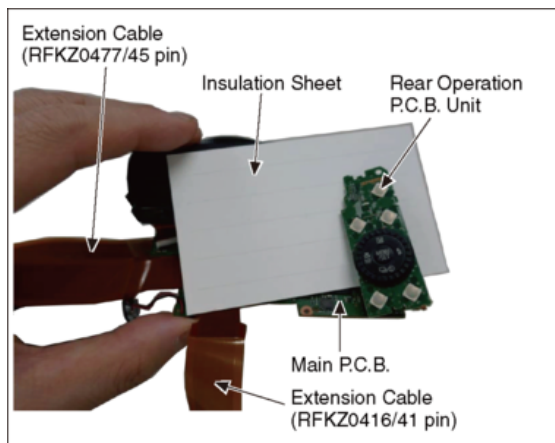
- Using the Extension cable, perform the Optical tilt adjustment according to the following procedure.
 1. Remove the Frame Plate. (Refer to Disassembly Procedures.)
 2. Remove the Speaker from the Frame.



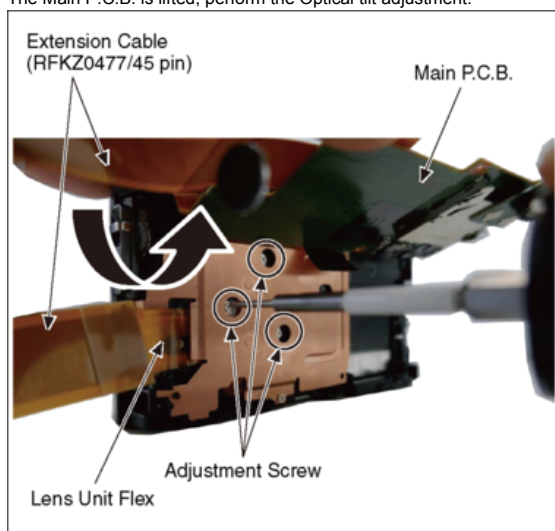
3. Using the Rear Operation FPC, connect the Main P.C.B. to Rear Operation P.C.B. Unit.
4. Using the Extension cable, connect the Main P.C.B. to LCD Unit.
5. Using the Extension cable, connect the Main P.C.B. to Lens Unit Flex.



6. Insulation Sheet is inserted between the Rear Operation P.C.B. Unit and the Main P.C.B.



7. The Main P.C.B. is lifted, perform the Optical tilt adjustment.

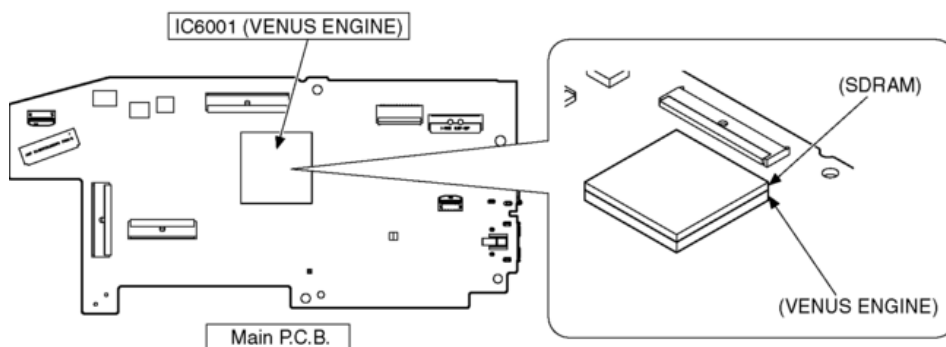


3.2.2 About VENUS ENGINE (IC6001) < Located on the Main P.C.B. >

- The VENUS ENGINE (IC6001) consists of two IC chips, which are fixed together with solder. (It is so called, "P_package Q_n Package" type of IC.)

Caution:

- During servicing, do not press down hard on the surface of IC6001.



3.2.3 About Flash ROM (IC6004) and Charging Control Microcomputer (IC1502)

When the Flash Rom or Charging Control Microcomputer is replaced, it is need to adjust the firmware of the Charging Control Microcomputer to the one of the Flash ROM. For details, refer to "10.3.2. [Adjustment Specifications](#)".

It may takes about 10 seconds. While doing the adjustment, don't turn the power off forcibly. (It cause the Charging Control Microcomputer crush, then the camera can not turn on.)

3.2.4 About Flexible Cable and Connector

Do not touch carelessly so that the foreign body should not adhere to the terminal part of flexible cable and connector.

Wipe off with a clean cloth and the cotton bud, etc. when the terminal part is dirty.

3.3 Service Notes

3.3.1 About Wi-Fi Function

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

- **Operating the camera by connecting it to a smartphone**
 - Taking pictures via a smartphone (→49)
 - Playing back pictures in the camera on a smartphone (→49)
 - Saving pictures in the camera to a smartphone
 - Sending pictures in the camera to social networking services
 - Adding location information to pictures in the camera from a smartphone
 - Combining motion pictures recorded with Snap Movie according to your preference on a smartphone
- **Displaying still pictures on a TV**
- **Wireless printing**
- **Sending pictures to AV device**
- **Sending pictures to a PC**
- **Using WEB services**

3.3.2 Important Notice of Servicing

This Camera unit has the personal information of wireless LAN connection the customer has registered.

For the protection of private information, please erase the personal information after the completion of repair by "INITIAL SETTING".

In addition, please print out the following documents, and pass to the customer with the Camera unit.

Printing Material [Leaflet for Customer]



3.4 General Description About Lead Free Solder (PbF)

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

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

Definition of PCB Lead Free Solder being used

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

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

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

Recommended Lead Free Solder (Service Parts Route.)

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

Note:

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

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

There are seven kinds of DC-TZ90/TZ91/TZ92/TZ93/ZS70, regardless of the colours.

- a) DC-TZ90 (Japan domestic model.)
- b) DC-ZS70P/PP
- c) DC-TZ90EB/EF/EG/EP, TZ91EG, TZ92EF, TZ93EB
- d) DC-TZ90GN
- e) DC-ZS70GK
- f) DC-ZS70GT
- g) DC-TZ90GA/GC, ZS70GH

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

3.5.1 Defining methods

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

a) DC-TZ90 (Japan domestic model)

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

**b) DC-ZS70P/PP**

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

**c) DC-TZ90EB/EF/EG/EP, TZ91EG, TZ92EF, TZ93EB**

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



(rear side)

d) DC-TZ90GN

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

**e) DC-ZS70GK**

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

**f) DC-ZS70GT**

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

**g) DC-TZ90GA/GC, DC-ZS70GH**

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

Note:

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

3.5.2 INITIAL SETTINGS:

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

1. IMPORTANT NOTICE:

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

CAUTION :(INITIAL SETTINGS)

--- AFTER REPLACING THE MAIN P.C.B. and/or FLASH-ROM ---

[Except "DC-TZ90EB/EF/EG/EP, TZ91, TZ92 and TZ93" models]

- *. The model suffix can be chosen **JUST ONE TIME**.
(Effective model suffix : DC-TZ90 "GA/GC and GN", DC-ZS70 "P/PP/GH/GK and GT" and "JCP")
- *. Once one of the model suffix has been chosen, the model suffix lists will not be displayed, thus, it can not be changed.

2. PROCEDURES:

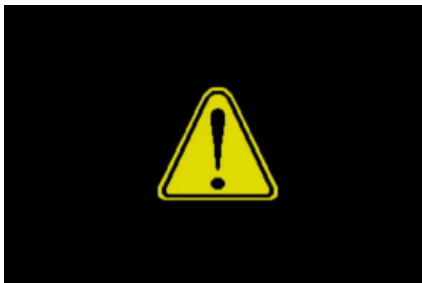
Precautions: Read the above "CAUTION" carefully.

Preparation:

- a. Attach the fully charged Battery and insert the memory card (32MB or more).
- b. Set the [Mode dial] to "[P](Program AE mode)".

* If the mode dial position is other than "[P](Program AE mode)", it does not display the initial settings menu.

- **Step 1. The temporary cancellation of "INITIAL SETTINGS":**
While keep pressing "[RIGHT] of Cursor button", [MENU/SET] button and [DISPLAY] button simultaneously, turn the Power on.
- **Step 2. The cancellation of "INITIAL SETTINGS":**
Press [PLAYBACK] button to switch to the playback screen. (Keep pressing the button.)
Press "[UP] of Cursor button" additionally, then turn the Power off.
The LCD displays the " ! " mark before the unit powers down.



• **Step 3. Turn the Power on:**

Turn the Power on.

• **Step 4. Display the "INITIAL SETTINGS" menu:**

* If the unit is other than "[P](Program AE mode)", it does not display the initial settings menu.

While keep pressing [MENU/SET] button and "[RIGHT] of Cursor button" simultaneously, turn the Power off.

The "INITIAL SETTINGS" menu is displayed.

There are two kinds of "INITIAL SETTINGS" menu form as follows:

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

[Except for "DC-TZ90EB/EF/EG/EP, TZ91, TZ92 and TZ93" models : (1PB1DV1071Z 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. (Three pages in total)

<p>DC-ZS70P ● ZS70</p> <p>DC-ZS70PP ● ZS70</p> <p>DC-TZ90GC ● TZ90</p> <p>DC-ZS70GT ● ZS70</p>	<p style="text-align: center;">INITIAL SETTINGS [Strict]</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">P</td><td style="text-align: center;">01</td></tr> <tr><td style="text-align: center;">PP</td><td style="text-align: center;">22</td></tr> <tr><td style="text-align: center;">GC(A)</td><td style="text-align: center;">05</td></tr> <tr><td style="text-align: center;">GT</td><td style="text-align: center;">06</td></tr> </table> <p style="text-align: center;">Select Set Exit</p>	P	01	PP	22	GC(A)	05	GT	06	<p>ZS70 ● DC-ZS70GK</p> <p>TZ90 ● DC-TZ90GN</p> <p>ZS70 ● DC-ZS70GH</p> <p>TZ90 ● DC-TZ90GA</p>
P	01									
PP	22									
GC(A)	05									
GT	06									
<p>DC-TZ90 (Japan domestic model) ● TZ90</p>	<p style="text-align: center;">INITIAL SETTINGS [Strict]</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">JPC</td><td style="text-align: center;">1D</td></tr> </table> <p style="text-align: center;">Select Set Exit</p>	JPC	1D							
JPC	1D									

[Only for "DC-TZ90EB/EF/EG/EP, TZ91, TZ92 and TZ93" models : (1PB1DV1017Y is used as a Main P.C.B.)]

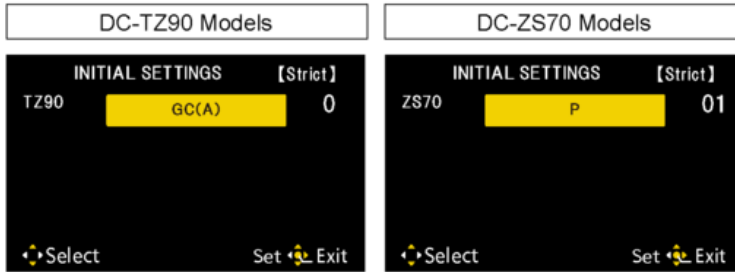
When Main P.C.B. has just been replaced, only 5 model suffix are displayed as follows. (Two pages in total)

DC-TZ90 Models	DC-TZ91/92/93 Models									
<p>DC-TZ90EG ● TZ90</p> <p>DC-TZ90EF ● TZ90</p> <p>DC-TZ90EB ● TZ90</p> <p>DC-TZ90EP ● TZ90</p>	<p style="text-align: center;">INITIAL SETTINGS [Strict]</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">EG(B)</td><td style="text-align: center;">02</td></tr> <tr><td style="text-align: center;">EF(B)</td><td style="text-align: center;">08</td></tr> <tr><td style="text-align: center;">EB(B)</td><td style="text-align: center;">09</td></tr> <tr><td style="text-align: center;">EP(B)</td><td style="text-align: center;">13</td></tr> </table> <p style="text-align: center;">Select Set Exit</p>	EG(B)	02	EF(B)	08	EB(B)	09	EP(B)	13	<p>TZ91 ● DC-TZ91EG</p> <p>TZ92 ● DC-TZ92EF</p> <p>TZ93 ● DC-TZ93EB</p> <p>TZ90 ● (No "EP" model)</p>
EG(B)	02									
EF(B)	08									
EB(B)	09									
EP(B)	13									

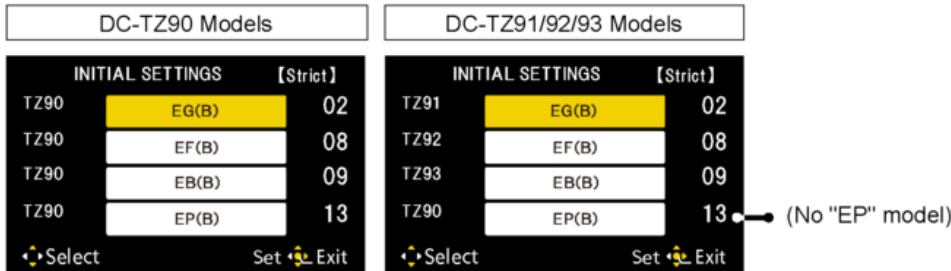
To display the "TZ91/TZ92/TZ93" model suffix, choose the "EG/EF/EB" area and press the [DELETE] button.

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

< Other than "EG/EF/EB and EP" models >

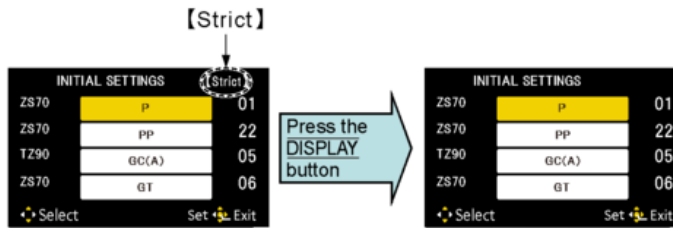


< Only "EG/EF/EB and EP" models >



• **Step 5. The cancellation of "STRICT MODE":**

Press [DISPLAY] button, then [Strict] in the upper right corner of the LCD display will disappear.



• **Step 6. Chose the model suffix in "INITIAL SETTINGS": (Refer to "CAUTION")**

[Caution: After replacing Main P.C.B. and/or Flash-ROM]

(Especially, other than "DC-TZ90EB/EF/EG/EP, TZ91, TZ92 and TZ93" models)

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 not be changed.

Therefore, select the area carefully.

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

• **Step 7. Set the model suffix at "INITIAL SETTINGS":**

Press the "[RIGHT] of Cursor button".

The only set area is displayed. Press the "[RIGHT] of Cursor button" after confirmation.

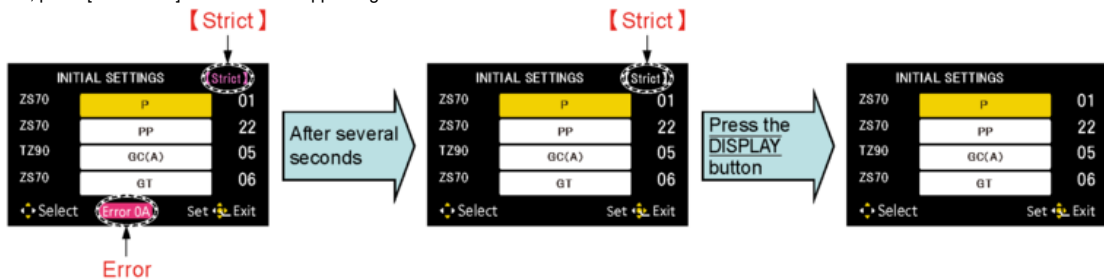
(The unit is powered off automatically.)



Note:

It may cause the following error indication without cancellation of "STRICT MODE".

In this case, press [DISPLAY] button after disappearing error indication.



- **Step 8. CONFIRMATION:**

Confirm the display of "PLEASE SET THE CLOCK" in concerned language when the unit is turned on again.

When the unit is connected to PC with USB cable, it is detected as removable media.

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

- **Default setting (After "INITIAL SETTINGS")**

	MODEL	VIDEO OUTPUT	LANGUAGE	DATE	REMARKS
a)	DC-TZ90 (Japan domestic model)	NTSC	Japanese	Year/Month/Date	
b)	DC-TZ90EB	PAL	English	Date/Month/Year	
c)	DC-TZ80EF	PAL	English	Date/Month/Year	
d)	DC-TZ90EG	PAL	English	Date/Month/Year	
e)	DC-TZ90EP	PAL	English	Date/Month/Year	
f)	DC-TZ90GA	PAL	English	Date/Month/Year	
g)	DC-TZ90GC	PAL	English	Date/Month/Year	
h)	DC-TZ90GN	PAL	English	Date/Month/Year	
i)	DC-TZ91EG	PAL	English	Date/Month/Year	
j)	DC-TZ92EF	PAL	English	Date/Month/Year	
k)	DC-TZ93EB	PAL	English	Date/Month/Year	
l)	DC-ZS70P	NTSC	English	Month/Date/Year	
m)	DC-ZS70PP	NTSC	English	Month/Date/Year	
n)	DC-ZS70GH	PAL	English	Date/Month/Year	
o)	DC-ZS70GK	PAL	Chinese (simplified)	Year/Month/Date	
p)	DC-ZS70GT	NTSC	Chinese (traditional)	Year/Month/Date	

4 Specifications

The following specification is for DC-TZ90EB/DC-TZ93EB.
Some specifications may differ depending on model suffix.

Digital Camera: Information for your safety

Power Source	DC 8.4 V (≈ 8.4 V)
Power	1.9 W (When recording with monitor)
Consumption	2.9 W (When recording with viewfinder) 1.6 W (When playing back with monitor) 1.6 W (When playing back with viewfinder)

Camera effective pixels	20,300,000 pixels
Image sensor	1/2.3" MOS sensor, total pixel number 21,100,000 pixels Primary colour filter
Lens	Optical 30x zoom f=4.3 mm to 129 mm (35 mm film camera equivalent: 24 mm to 720 mm) Max. Wide: F3.3 to F8.0 Max. Tele: F6.4 to F8.0
Image Stabiliser	Optical method
Focus range	AF: 50 cm (1.6 feet) (Max. Wide)/ 2 m (6.6 feet) (Max. Tele) to ∞ AF Macro/MF/Intelligent Auto/Motion picture: 3 cm (0.098 feet) (Max. Wide)/ 2 m (6.6 feet) (Max. Tele) to ∞
Shutter system	Electronic shutter + Mechanical shutter
Minimum Illumination	Approx. 10 lx (when i-Low light is used, the shutter speed is 1/25th of a second)

Shutter speed	Still picture: 30 seconds to 1/2000th of a second (When the mechanical shutter is used and [Artistic Nightscape] is selected as the Scene Guide Mode), 4 seconds to 1/2000th of a second (When the mechanical shutter is used, in cases other than the above), 1 second to 1/16000th of a second (When the electronic shutter is used) Motion picture: 1/2 second to 1/16000th of a second (When [Exposure Mode] is set to [M] in Creative Video Mode and [MF] is selected), 1/25th of a second to 1/16000th of a second (Other than the above)
Exposure (AE)	Programme AE (P)/Aperture-priority AE (A)/ Shutter-priority AE (S)/Manual exposure (M) Exposure Compensation (1/3 EV steps, -5 EV to +5 EV)
[Metering Mode]	Multiple/Centre weighted/Spot
Monitor	3.0" TFT LCD (3:2) (Approx. 1,040,000 dots) (field of view ratio about 100%) Touch screen
Viewfinder	0.2" Colour LCD Live Viewfinder (4:3) (Approx. 1,170,000 dots equivalent) (field of view ratio about 100%) [Magnification approx. 2.59x, 0.46x (35 mm film camera equivalent), with 50 mm lens at infinity; -1.0 m ⁻¹] (with diopter adjustment -4.0 to +4.0 diopter)
Flash	AUTO, AUTO/Red-Eye Reduction, Forced ON, Forced ON/Red-Eye Reduction, Slow Sync., Slow Sync./Red-Eye Reduction, Forced OFF

Microphones	Stereo
Speaker	Monaural
Recording media	SD Memory Card/SDHC Memory Card*/ SDXC Memory Card* * UHS-I UHS Speed Class 3
Recording file format	
Still picture	RAW/JPEG (based on Design rule for Camera File system, based on Exif 2.3 standard/DPOF corresponding)
Motion picture	AVCHD Progressive/AVCHD/MP4
Audio compression format	AVCHD: Dolby Audio™ (2 ch) MP4: AAC (2 ch)
Interface	
[HDMI]	Micro HDMI Type D
[USB/CHARGE]	USB 2.0 (High Speed) Micro-B Data from the PC cannot be written to the camera using the USB connection cable.
Dimensions	Approx. 112.0 mm (W) x 67.3 mm (H) x 41.2 mm (D) [4.41" (W) x 2.65" (H) x 1.62" (D)] (excluding the projection part)
Mass	With card and battery: Approx. 322 g (0.71 lb) Excluding card and battery: Approx. 280 g (0.62 lb)
Operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Operating humidity	10%RH to 80%RH

■ Wi-Fi

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

■ AC adaptor

(Panasonic SAE0012F): Information for your safety


Input:	110 V – 240 V ~ 50/60 Hz 0.2 A
Output:	5 V \equiv 1.0 A

■ Battery pack (lithium-ion)

(Panasonic DMW-BLG10E): Information for your safety

Voltage/capacity:	7.2 V/1025 mAh
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The symbols on this product (including the accessories) represent the following:

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

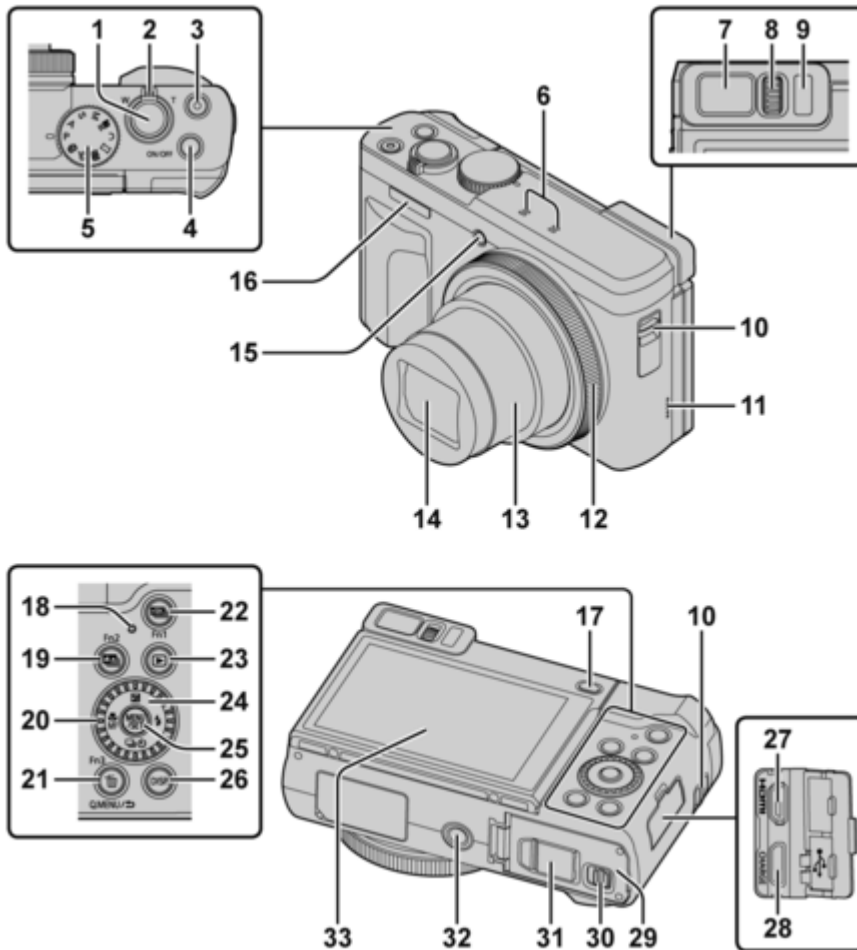
Specifications are subject to change without notice.

5 Location of Controls and Components





The following description is for DC-TZ90EB/DC-TZ93EB.

Some description may differ depending on model suffix.

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



- 1 Shutter button (→18)
- 2 Zoom lever (→19)
- 3 Motion picture button (→35)
- 4 Camera [ON/OFF] button (→16)
- 5 Mode dial (→20)
- 6 Stereo microphone (→17)
- 7 Viewfinder (→17, 51)
- 8 Diopter adjustment dial
 - Rotate the diopter adjustment dial to adjust until you are able to clearly see the characters displayed in the viewfinder.
- 9 Eye sensor (→17)
- 10 Strap eyelet

- To prevent dropping, be sure to attach the supplied strap and fit it to your wrist.
- 11 Speaker (→17)
- 12 Control ring (→22)
- 13 Lens barrel
- 14 Lens
- 15 Self-timer indicator / AF Assist Lamp (→17)
- 16 Flash (→17)
- 17 [LVF] button (→17) / [Fn4] button (→23)
- 18 Charging lamp (→15) / Wi-Fi[®] connection lamp
- 19  ([Post Focus]) button (→32) / [Fn2] button (→23)
- 20 Control dial (→22)
- 21 [Q.MENU/⏏] (Cancel) button /  (Delete) button (→39) / [Fn3] button (→23)
 - You can easily call some of the menu items and set them during recording.
- 22  (4K photo mode) button (→29) / [Fn1] button (→23)
- 23  (Playback) button (→39)
- 24 Cursor button (→21)
- 25 [MENU/SET] button
 - Confirmation of setting contents, etc., is performed.
- 26 [DISP.] button
 - Use this to change display.
- 27 [HDMI] socket
 - You can view pictures on a TV screen by connecting your camera to your TV with the HDMI micro cable.
- 28 [USB/CHARGE] socket (→14)
- 29 Card/Battery door (→13)
- 30 Release lever (→13)
- 31 DC coupler cover (→60)
- 32 Tripod mount
 - Do not attach this unit to tripods that have screws with a length of 5.5 mm (0.22 inch) or more. Doing so may damage this unit or the unit may not be secured properly on the tripod.
- 33 Touch screen (→23) / monitor (→17, 51)

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:

o **Preparation:**

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

b. Set the [Mode dial] to "[P](Program AE mode)".

* If the mode dial position is other than "[P](Program AE mode)", it does not display the initial settings menu.

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

While keep pressing "[RIGHT] of Cursor button", [MENU/SET] button and [DISPLAY] button simultaneously, turn the Power on.

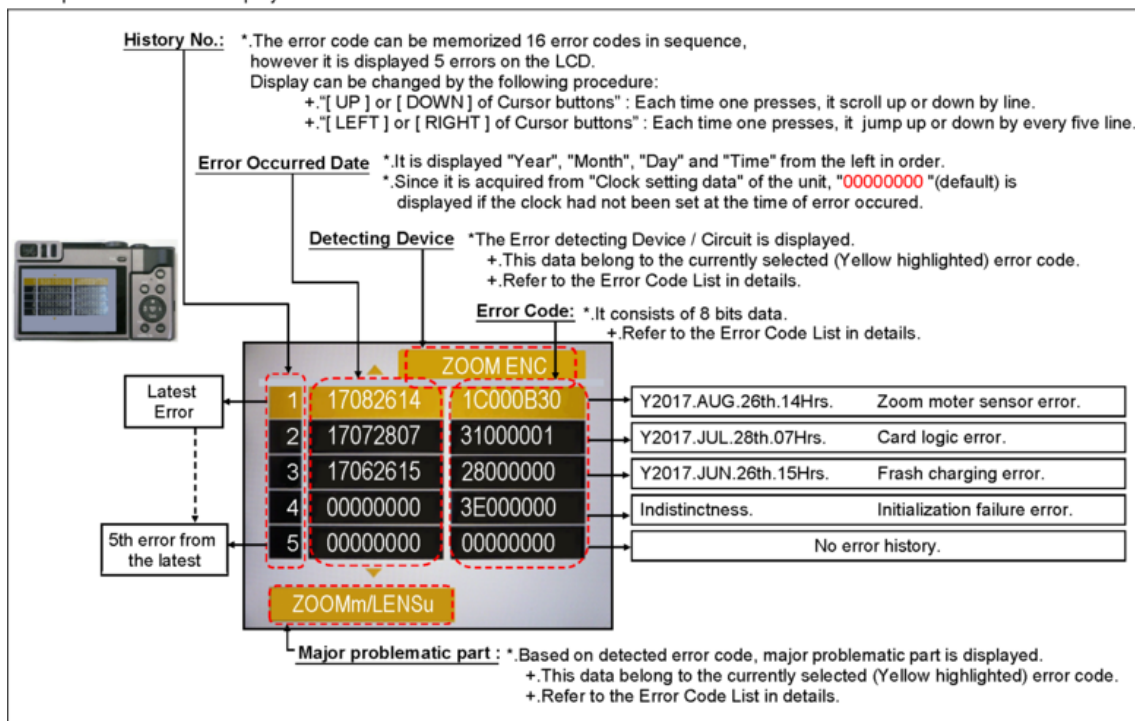
o **Step 2. Execute the error code display mode:**

Press the "[PLAYBACK] button, "[LEFT] of Cursor button" and [MENU/SET] button simultaneously.

The display is changed as shown below when the above buttons are pressed simultaneously.

Normal display → Error code display → CAMERA INFO → Normal display →

Example of Error Code Display



Error Code List

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

Attribute	Main item	Sub item	Error code		Contents (Upper) Check point (Lower)	Error Indication	
			High 4 bits	Low 4 bits		Detecting device	Part/Circuit
LENS	Lens drive	Focus	1C*0	0?01	HP High detect error (Focus encoder always detects High, and not becomes Low) Mechanical lock, FP9004-(43) signal line or IC6001 (VENUS ENGINE)	FOCUS L	LENS FPC/DSP
				0?02	HP Low detect error (Focus encoder always detects Low, and not becomes High) Mechanical lock, FP9004-(43) signal line or IC6001 (VENUS ENGINE)		
		Zoom	0?10	Collapsible barrel Low detect error (Collapsible barrel encoder always detects High.) Mechanical lock, FP9004-(43) signal line or IC6001	ZOOM L	ZOOMm/LENSu	

				(VENUS ENGINE)		
			0?20	Collapsible barrel High detect error (Collapsible barrel encoder always detects Low.) Mechanical lock, FP9004-(43) signal line or IC6001 (VENUS ENGINE)	ZOOM H	
			0?30	Zoom motor sensor error. (Initialized or Terminated) Mechanical lock, FP9004-(4) signal line or IC6001 (VENUS ENGINE)	ZOOM ENC	
			0?40	Zoom motor sensor error. (During monitor mode.) Mechanical lock, FP9004-(4) signal line or IC6001 (VENUS ENGINE)		
			0?50	Zoom motor sensor error. (During monitor mode with slow speed.) Mechanical lock, FP9004-(4) signal line or IC6001 (VENUS ENGINE)		
			0?60	Detection of zoom misregistration by impact such as fails. Lens Unit	(No indication)	(No indication)
		OIS	1000	PSD (X) error. Hall element (X axis) position detect error in OIS unit. OIS Unit	OIS X	LENSu NG
			2000	PSD (Y) error. Hall element (Y axis) position detect error in OIS unit. OIS Unit	OIS Y	
			3000	GYRO (X) error. Gyro (IC7101 : X axis) detect error on Main P.C.B. IC7101 (Gyro element) or IC6001 (VENUS ENGINE)	GYRO X	GYRO NG
			4000	GYRO (Y) error. Gyro (IC7101 : Y axis) detect error on Main P.C.B. IC7101 (Gyro element) or IC6001 (VENUS ENGINE)	GYRO Y	
			5000	GYRO (R) error, Gyro (IC7101 : R axis) detect error on Main P.C.B. IC7101 (Gyro element) or IC6001 (VENUS ENGINE)	GYRO R	
			6000	Drive voltage (X) error. LENS Unit, LENS flex breaks, IC6001(VENUS ENGINE) AD value error, etc.	OISX REF	LENSu/LENS FPC
			7000	Drive voltage (Y) error. LENS Unit, LENS flex breaks, IC6001(VENUS ENGINE) AD value error, etc.	OISY REF	
			8000	OIS GYRO - Digital communication error. IC7101 (Gyro element) or IC6001 (VENUS ENGINE)	(No indication)	(No indication)
		Lens	18*1	0000 Power ON time out error. Lens drive system	LENS DRV	LENSu
			18*2	0000 Power OFF time out error. Lens drive system		
	Adj.History	OIS	1D*0	2000 OIS adj. Yaw direction amplitude error (small) 3000 OIS adj. Pitch direction amplitude error (small) 4000 OIS adj. Yaw direction amplitude error (large) 5000 OIS adj. Pitch direction amplitude error (large) 8000 OIS adj. Yaw direction off set error 9000 OIS adj. Pitch direction off set error A000 OIS adj. Yaw direction gain error B000 OIS adj. Pitch direction gain error C000 OIS adj. Yaw direction position sensor error D000 OIS adj. Pitch direction position sensor error E000 OIS adj. other error	OIS ADJ	OIS ADJ
HARD	FLASH	Flash	28*0	0000 Flash charge timeout error (system error indicated)	STRB CHG	TOP P.C.B./FPC
				0001 EEPROM of External Flash is damaged	EST EEP	E STRB
				0002 ZOOM function of External Flash is damaged	EST	
		0003 Other function of External Flash is damaged	EST			
	FLASH ROM	Data Area	2B*0	0001 IC6004 (Flash-ROM) data reading error is detected when the unit turns ON	FROM RE	FROM
				0002 IC6004 (Flash-ROM) data writing error is detected when the unit turns OFF	FROM WR	FROM
	Program Area		0005 Firmware update error	FIRMUP FAIL	FROM	
			0006 Firmware update error (USB Micon)	USBFWUP FAIL	USB	
SOFT	CPU	Reset	30*0	0001 System error (NMI reset) 0007	NMI RST	MAIN P.C.B.
	Recording Media	Memory card	31*0	0002 Memory card physical error During formatting the memory card, there is no response from the memory card If the mini-SD memory card is used, check the SD memory card adaptor	SD CARD	SD CARD/DSP
				0004 Memory card writing error Check the memory card. It might be damage one.	SD WRITE	
	Lens	Communication	3C11	**** Lens communication error	LENS COMM	SOFT

Camera	System	37*0	0001	Activation: Electronic signature hash value mismatch	VLOG	VLOG
			0002	Activation: Serial number mismatch		
			0003	Activation: Model name mismatch		
			0004	Activation: Origin country mismatch		
			0005	Activation: Firmware version down		
			0006	Activation: Activation code mismatch		
			0007	Activation: Old firmware		
			3B*0	0000		
		3D*0	0000	Assert occurrence	ASSERT	SOFT
		3E*0	0001	Exposure charging operation failure	MSHUT	MSHUT
			0002	Failure of the returning operation to the home position		
			0003	Failure of the mecha shutter sensor		
			0004	Failure of the mecha shutter sensor		
			0005	Failure of the mecha shutter sensor		
			0006	Exposure charging recovery operation failure		
			0011	Failure of the mecha shutter sensor		
			0012	Failure of the mecha shutter sensor		
			0013	Failure of the mecha shutter sensor		
			0014	Abnormal current of shutter drive motor		
			0101	Failure of the electromagnetic front curtain open		
0102	Failure of the electromagnetic front curtain open					
0111	Failure of the electromagnetic front curtain open					
0112	Failure of the electromagnetic front curtain open					
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		
Wi-Fi		3211	**02 **0C	Wi-Fi related errors: *Generally, above are unable to specified the, which cannot be used for malfunction diagnosis.		

Important notice about "Error Code List"

1) About "*" indication:

The third digit from the left is different as follows.

- In case of 0 (example: 18 001000)
 - When the third digit from the left shows "0", this error occurred under the condition of INITIAL SETTINGS has been completed.
 - It means that this error is occurred basically at user side.
- In case of 8 (example: 18 801000)
 - When the third digit from the left shows "8", this error occurred under the condition of INITIAL SETTINGS has been released.
 - (Example; Factory assembling-line before unit shipment, Service mode etc.)
 - It means that this error is occurred at service side.

2) About "?" indication: ("18*0 0?01" to "18*0 0?50"):

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

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

Simply, turn the power off. (Since Error code display mode is executed under the condition of temporary cancellation of "INITIAL SETTINGS", it wake up with normal condition when turn off the power.)

Note:

The error code can not be initialized.

7 Troubleshooting Guide

7.1 Wi-Fi Module (Top P.C.B. Unit)

7.1.1 How to Remove Wi-Fi Password Protection

To prevent incorrect operation or use of the Wi-Fi function by a third party and to protect saved personal information, this unit protects the Wi-Fi function with a password.

It is unable to service with password locked condition. When accepting for repair, the unit has been set the Wi-Fi password by customer, run the [Reset Wi-Fi Settings] for removing Wi-Fi password, then check the operation.

[Reset Procedure of Wi-Fi Settings]

1. Press the [MENU/SET] button, and select the [SETUP] mode by Cursor buttons, then press the [MENU/SET] button.
2. Select [Reset Wi-Fi Settings] by Cursor buttons, then press the [MENU/SET] button.
3. Select [YES] and press the [MENU/SET] button in several times.
(The [Reset Wi-Fi Settings] performs not only resetting Wi-Fi Password but also resetting other all Wi-Fi Settings.)

7.1.2 Checking of trouble caused by Wi-Fi Module on Top P.C.B. Unit or not

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

(Primary Confirmation)

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

(Procedure)

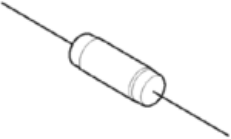
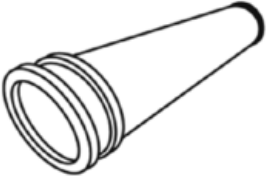
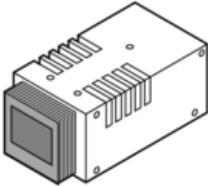



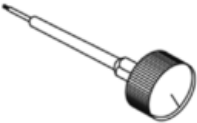
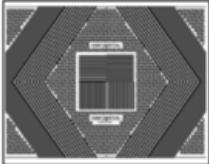


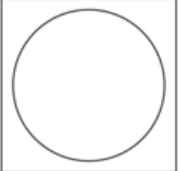


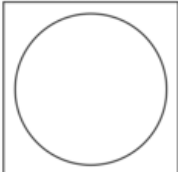
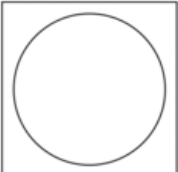
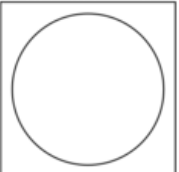
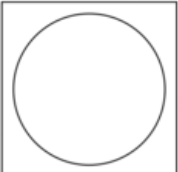
- 1) Select [Wi-Fi] in [Setup] menu.
- 2) Select [Wi-Fi Function] in [Wi-Fi] menu.
- 3) Select [New Connection] in [Wi-Fi Function] menu.
- 4) Select optional function in [Select a function] menu, then select [Via Network] in [Select connection method] menu.
- 5) Select [From List] in [Select connection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

* Replace the Top P.C.B. Unit, when the above checking detected the abnormal of Wi-Fi module.

8 Service Fixture & Tools

8.1 Service Fixture and Tools

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

Resistor for Discharging (1k Ω /5W) ERG5SJ102	COLLIMATOR (built-in Focus Chart) RFKZ0422	LIGHT BOX (with DC Cable) RFKZ0523	
 * An equivalent type of resistor may be used.			
Lens Cleaning Kit (BK) VFK1900BK	Torque Driver RFKZ0542	Diffuser RFKZ0591	
 * Only supplied as 10 set/box.			
Driver (for Optical Axis Adjustment) RFKZ0609	Optical Axis Adjustment Chart RFKZ0570	Camera stand RFKZ0333J	
 * T3 Torx type			
Gray Card RFKZ0506	ND Filter (ND0.3) RFKZ0513	ND Filter (ND0.6) VFK1164ND06	ND Filter (ND0.9) VFK1164ND09
			
CC Filter (CC-C7.5) RFKZ0511	CC Filter (CC-Y10) RFKZ0512	LB Filter (LBB2) RFKZ0520	LB Filter (LBB8) RFKZ0521
			

8.2 When Replacing the Main P.C.B.

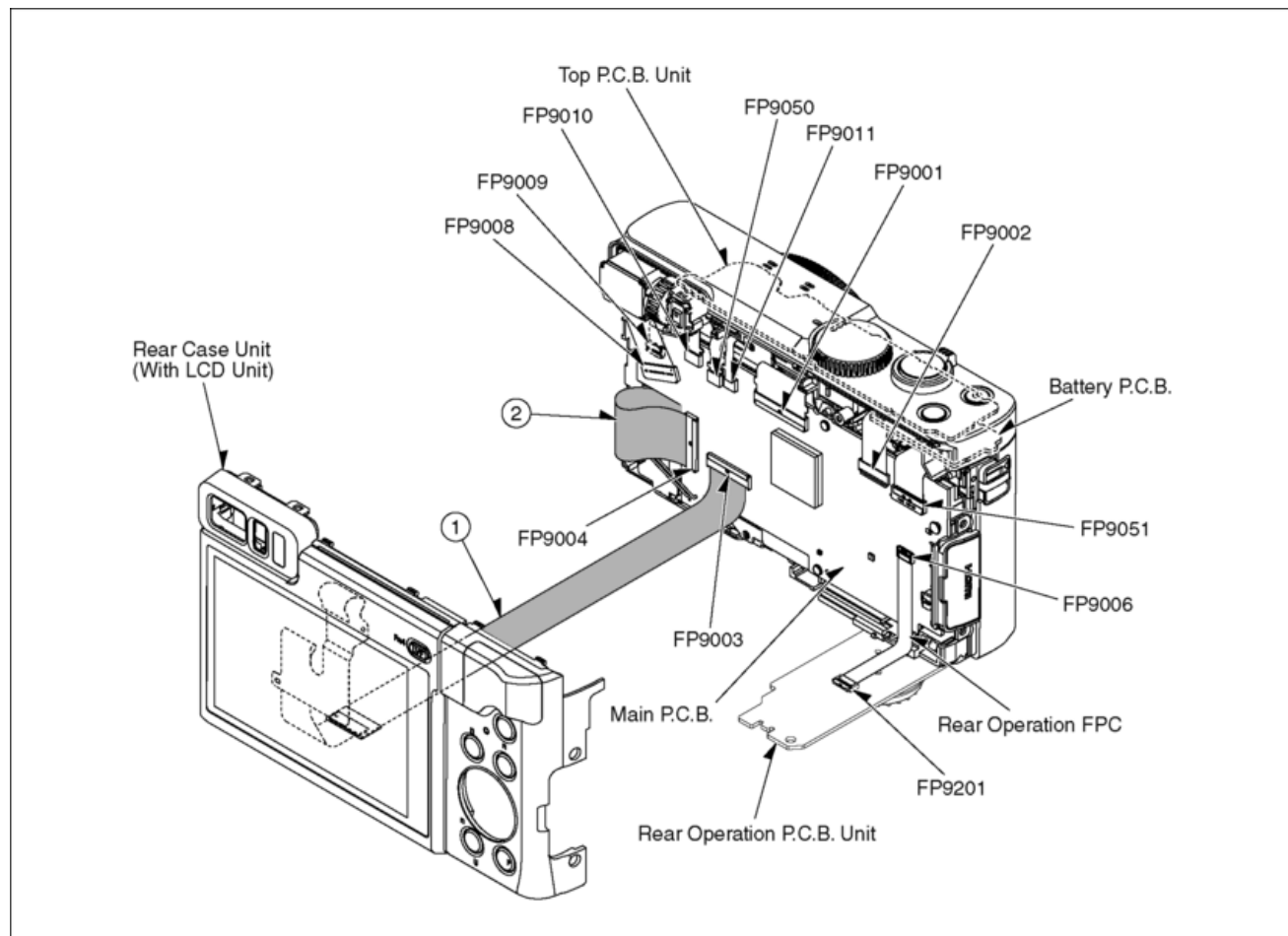
After replacing the Main P.C.B., be sure to achieve adjustment.

8.3 Service Position

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

No.	Parts No.	Connection	Form
1	RFKZ0416	FP9003 (Main P.C.B.) ↔ LCD Unit	41PIN / 0.3 FFC
2	RFKZ0477	FP9004 (Main P.C.B.) ↔ Lens Unit	45PIN / 0.3 FFC

8.3.1 Extension Cable Connections



CAUTION (When servicing Top P.C.B. Unit)

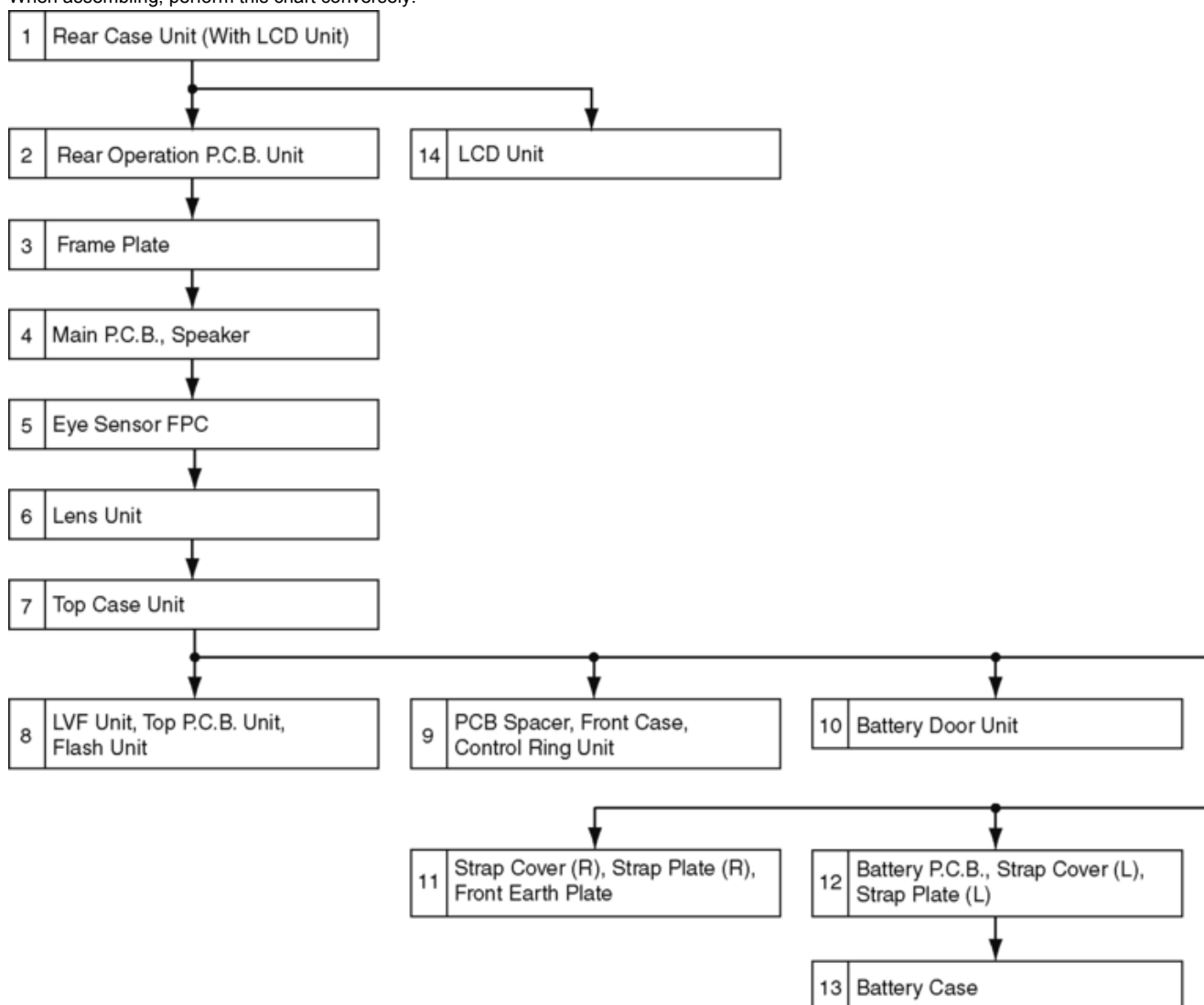
1. Be sure to discharge the capacitor on Top P.C.B. Unit.
Refer to "HOW TO DISCHARGE THE CAPACITOR ON Top P.C.B. Unit".
The capacitor voltage is not lowered soon even if the AC Cord is unplugged or the battery is removed.
2. Be careful of the high voltage circuit on Top P.C.B. Unit.
3. DO NOT allow other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

9 Disassembly and Assembly Instructions

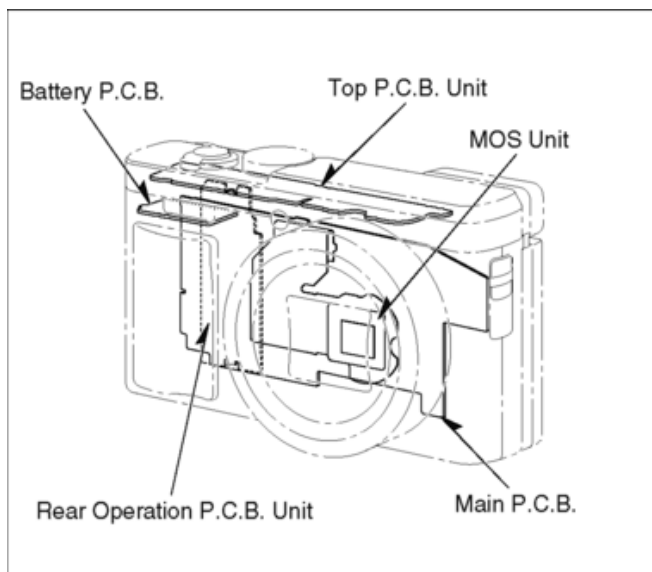
9.1 Disassembly Flow Chart

This is a disassembling chart.

When assembling, perform this chart conversely.



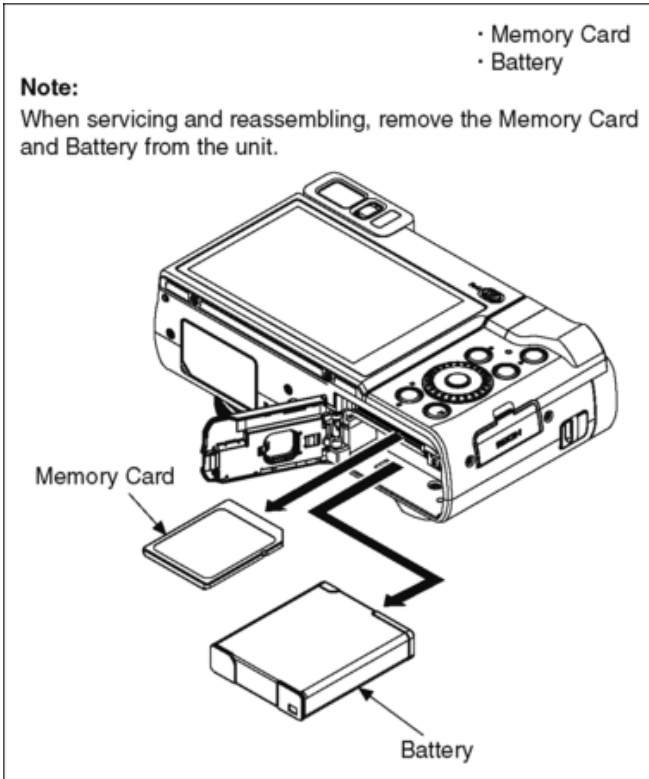
9.2 P.C.B. Location



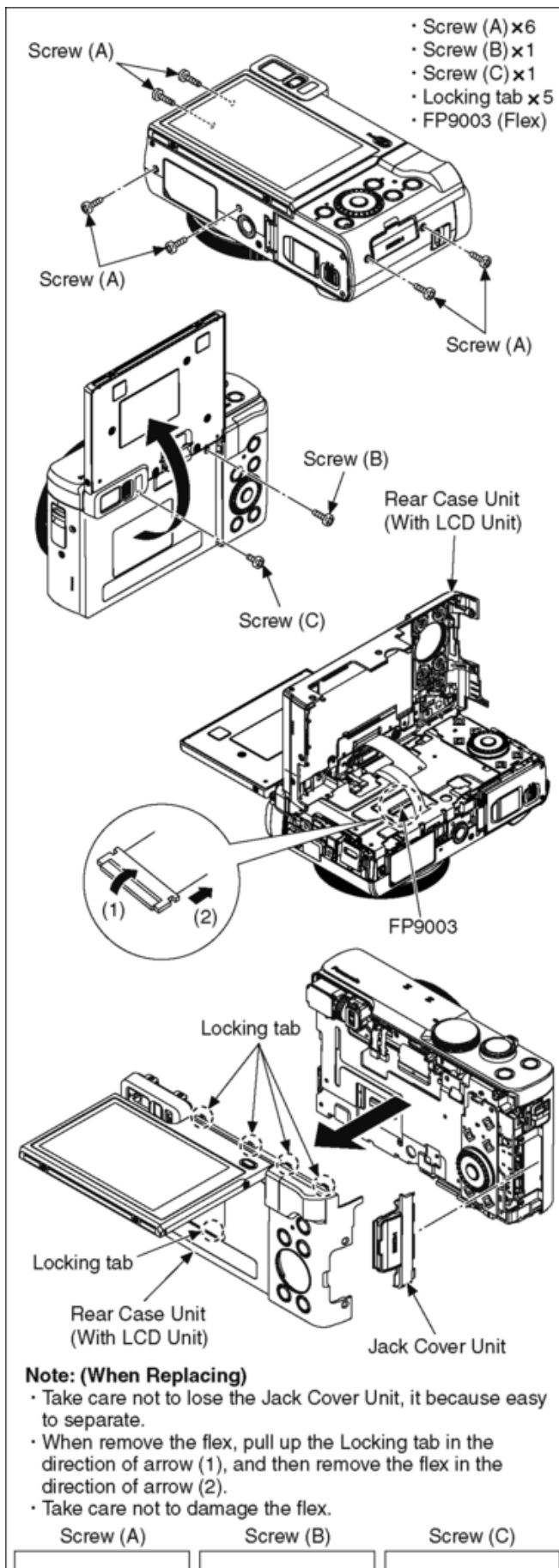
9.3 Disassembly Procedure

No.	Item	Fig.	Removal
1	Rear Case Unit (With LCD Unit)	(Fig. D1)	Screw (A) × 6 Screw (B) × 1 Screw (C) × 1 Locking tab × 5 FP9003 (Flex) Jack Cover Unit Rear Case Unit (With LCD Unit)
2	Rear Operation P.C.B. Unit	(Fig. D2)	Locking tab × 1 FP9006 (Flex) Rear Operation FPC Rear Operation P.C.B. Unit
3	Frame Plate	(Fig. D3)	Screw (D) × 1 Locking tab (A) × 1 Battery Lock Spring Battery Lock Knob Frame Plate
4	Main P.C.B., Speaker	(Fig. D4)	Locking tab × 2 Speaker Plate Unit FP9001 (Flex) FP9002 (Flex) FP9004 (Flex) FP9008 (Flex) FP9009 (Flex) FP9010 (Flex) FP9011 (Flex) FP9050 (Flex) FP9051 (Flex) Screw (E) × 3 Main P.C.B.
		(Fig. D5)	Note: (When replacing Main P.C.B.) Heat Radiation Sheet, CU Protection Sheet
		(Fig. D6)	Solder (2 points) Speaker
5	Eye Sensor FPC	(Fig. D7)	Positioning boss × 2 Hooking part × 3 Eye Sensor FPC
6	Lens Unit	(Fig. D8)	Screw (F) × 3 Lens Fix Plate Lens Unit

7	Top Case Unit	(Fig. D9)	Screw (G) × 1 Locking tab × 2 Top Case Unit
8	LVF Unit, Top P.C.B. Unit, Flash Unit	(Fig. D10)	Screw (H) × 4 Locking tab (A) × 1 LVF Unit Top P.C.B. Unit MIC Holder MIC Spacer MIC Unit MIC Damper Mode Plate Locking tab (B) × 2 AF Panel Light Flash Spacer Earth Spring Solder A (3 points) E. Capacitor Solder B (3 points) Flash Unit Top Earth Plate Top Earth Plate B Wi-Fi FPC Top FPC
		(Fig. D11)	Note: (When replacing Top P.C.B. Unit, LVF Unit)
		(Fig. D12)	Note: (Precautions concerning handling of Top P.C.B. Unit)
9	PCB Spacer, Front Case Unit, Control Ring Unit	(Fig. D13)	Hooking part × 2 PCB Spacer Screw (I) × 1 Locking tab × 1 Front Case Unit Screw (J) × 3 Control Ring Unit
10	Battery Door Unit	(Fig. D14)	Battery Door Shaft Battery Door Spring Battery Door Unit
11	Strap Cover (R), Strap Plate (R), Front Earth Plate	(Fig. D15)	Screw (K) × 1 Locking tab (A) × 1 Locking tab (B) × 1 Strap Cover (R) Locking tab (C) × 1 Hooking part × 2 Positioning boss × 2 Strap Plate (R) Front Earth Plate
12	Battery P.C.B., Strap Cover (L), Strap Plate (L)	(Fig. D16)	Screw (L) × 1 Battery FPC Hooking part × 1 Battery P.C.B. Locking tab (A) × 1 Locking tab (B) × 2 Strap Cover (L) Strap Plate (L)
13	Battery Case	(Fig. D17)	Locking tab × 4 Battery Case Gasket
14	LCD Unit	(Fig. D18)	Screw (M) × 1 Screw (N) × 2 Locking tab × 1 Hooking part × 1 Positioning boss × 2 Hinge Cover LCD Unit



9.3.1 Removal of the Rear Case Unit (With LCD Unit)



9.3.2 Removal of the Rear Operation P.C.B. Unit

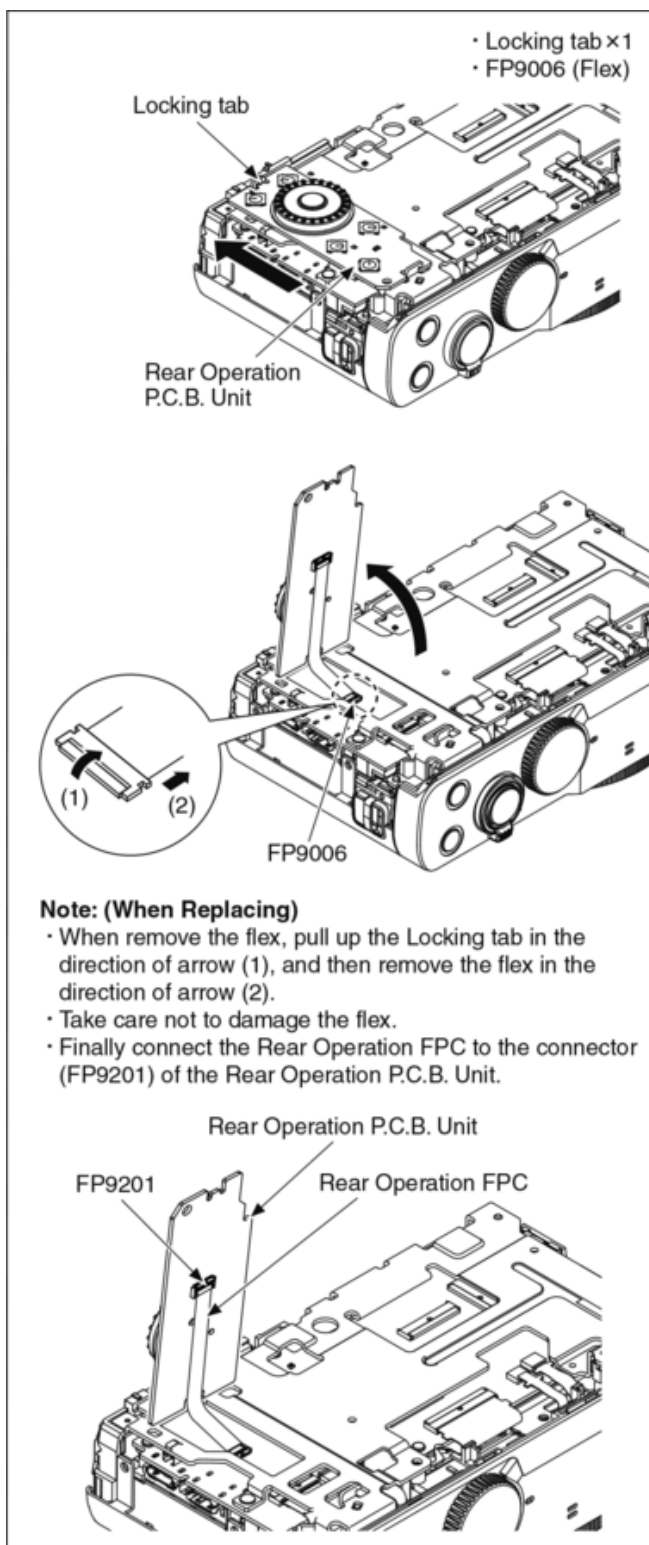


Fig. D2

9.3.3 Removal of the Frame Plate

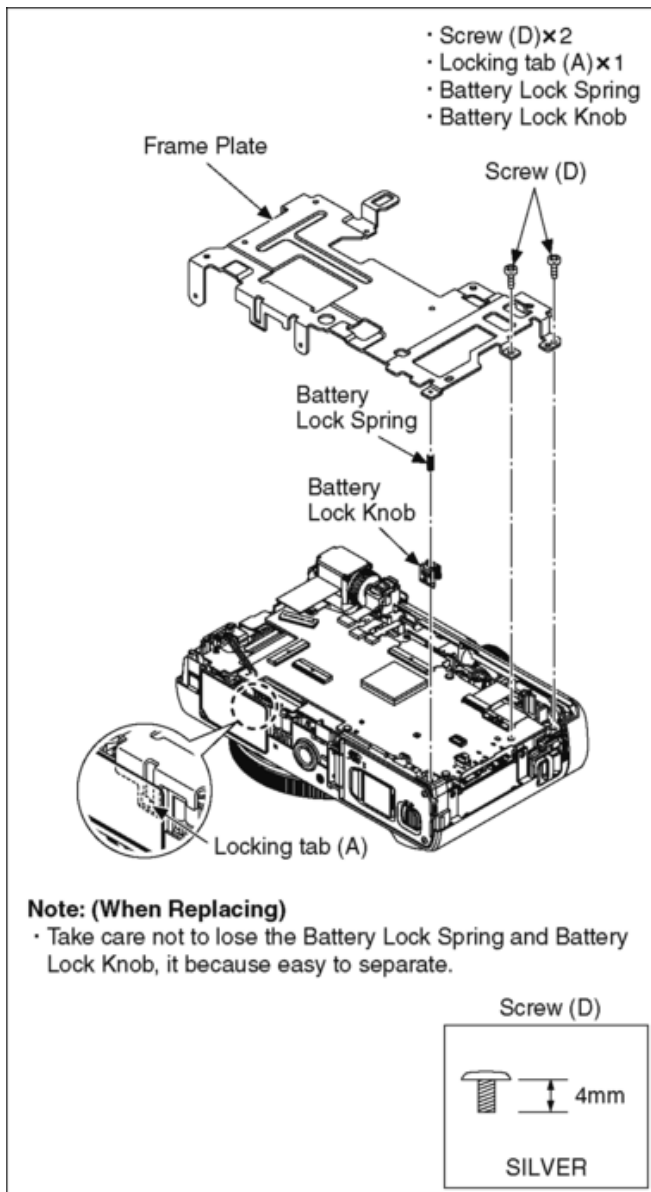


Fig. D3

9.3.4 Removal of the Main P.C.B., Speaker

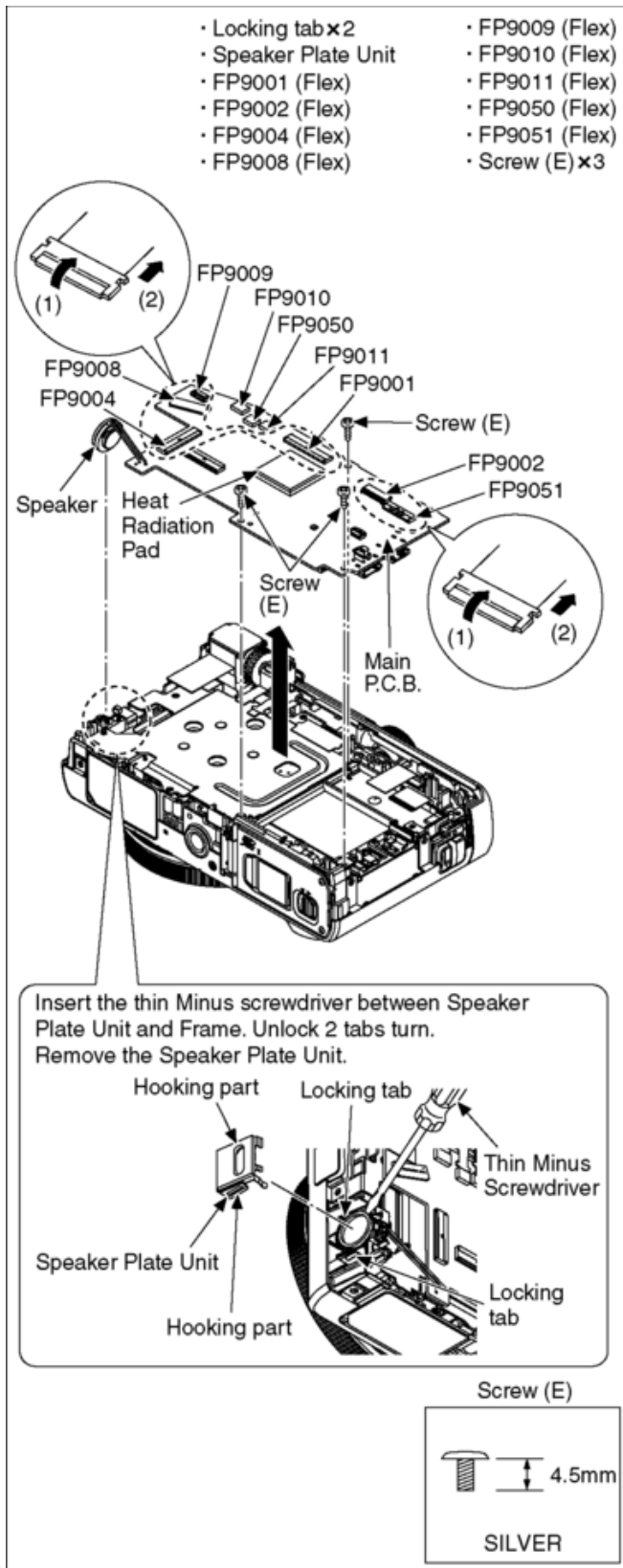


Fig. D4

Note: (When Replacing)

- When remove the flex, pull up the Locking Tab in the direction of arrow (1), and then remove the flex in the direction of arrow (2).
- Take care not to damage the flex.
- When attaching the Heat Radiation Pad, confirm the attaching position to attach.
- When attaching the CU Protection Sheet, confirm the attaching position to attach.

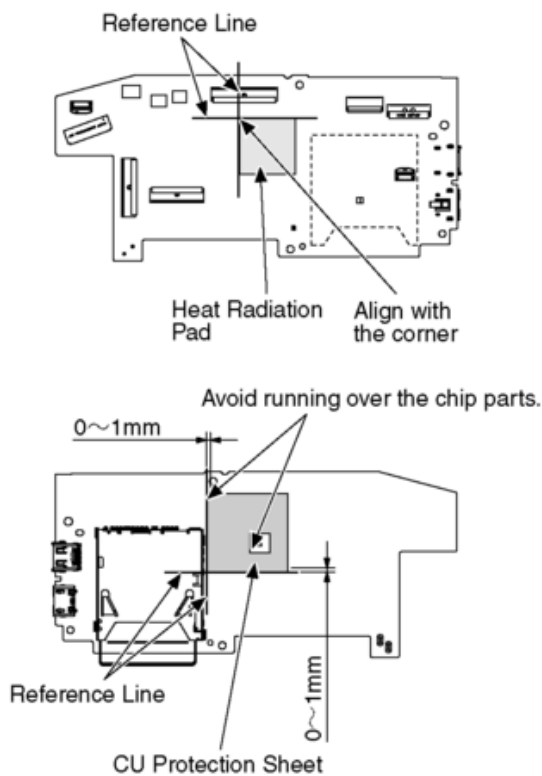


Fig. D5

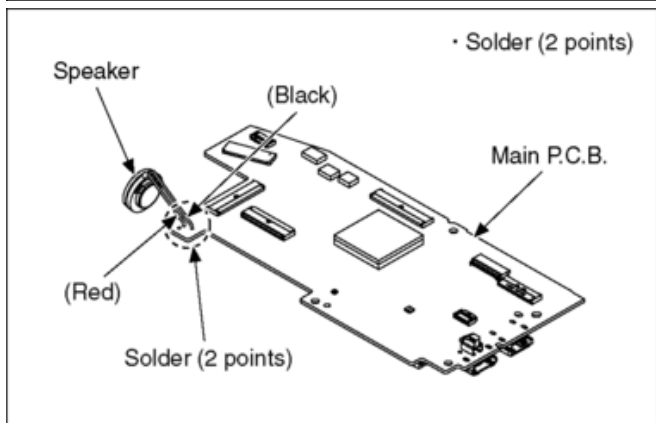


Fig. D6

9.3.5 Removal of the Eye Sensor FPC

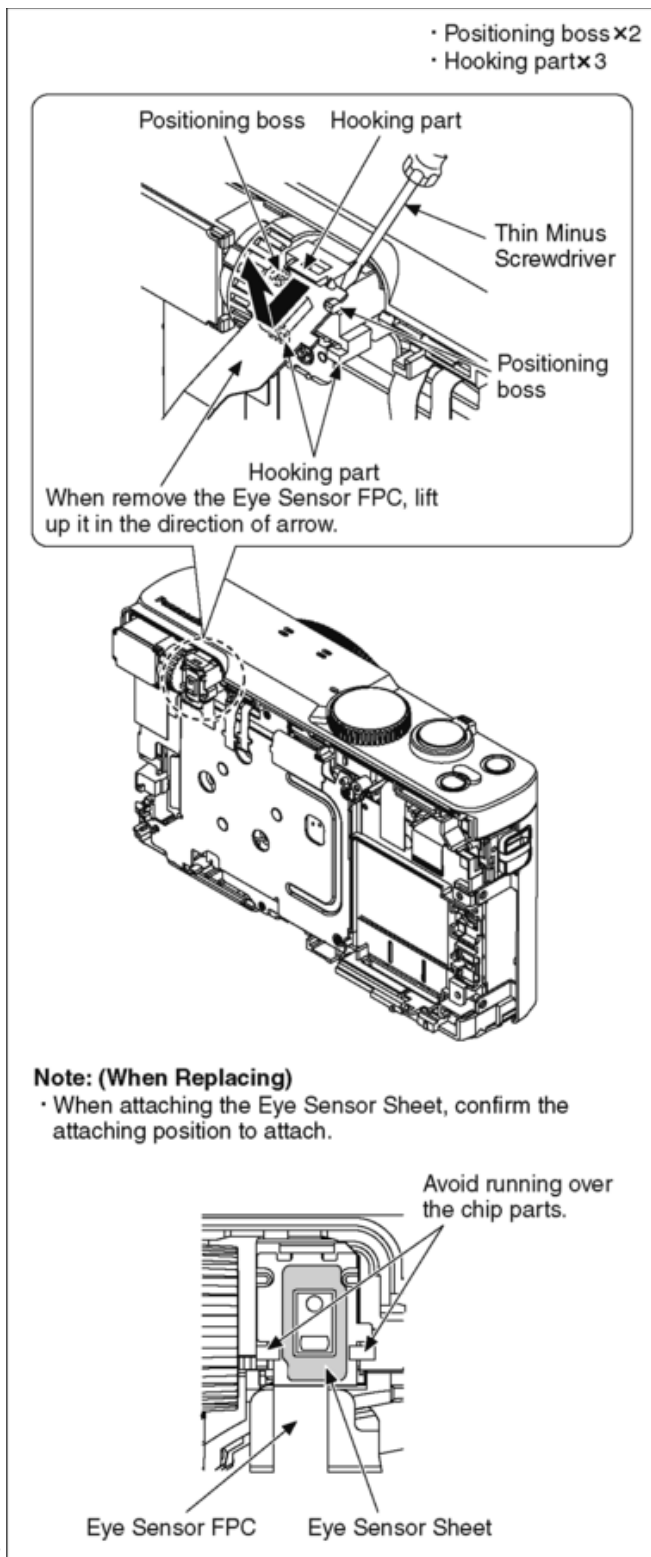


Fig. D7

9.3.6 Removal of the Lens Unit

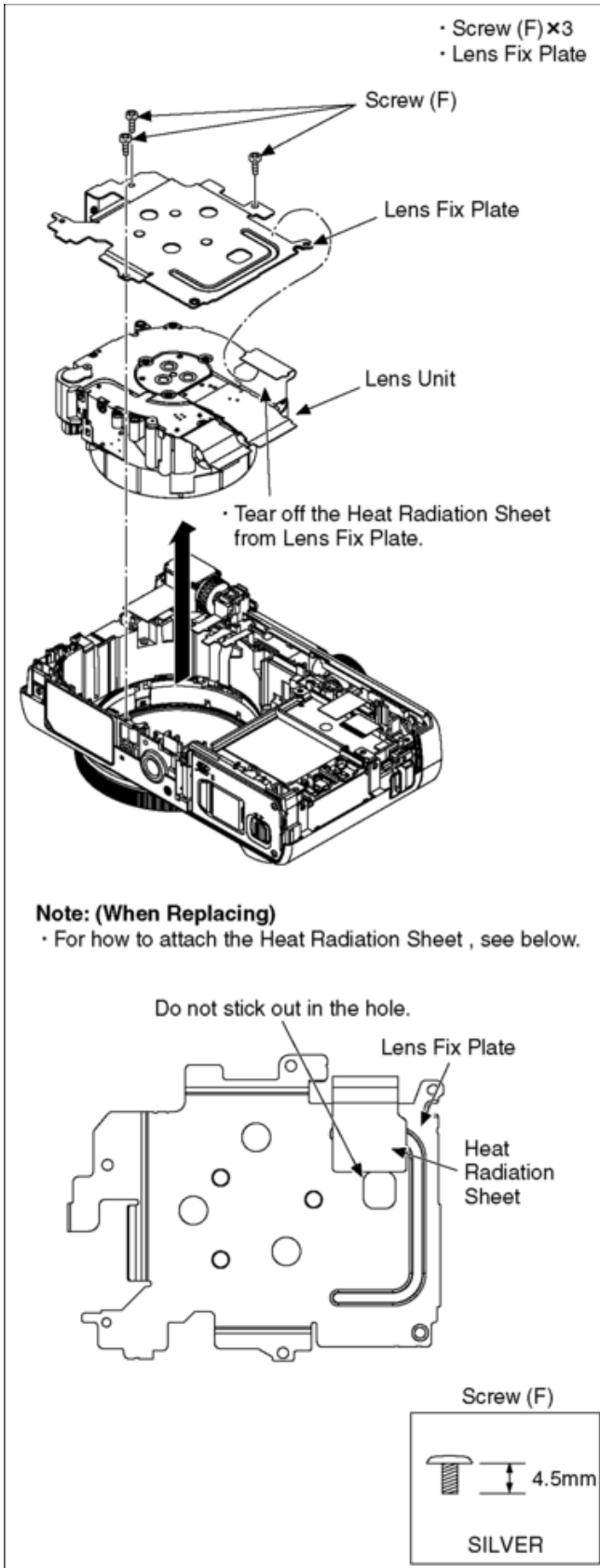


Fig. D8

9.3.7 Removal of the Top Case Unit

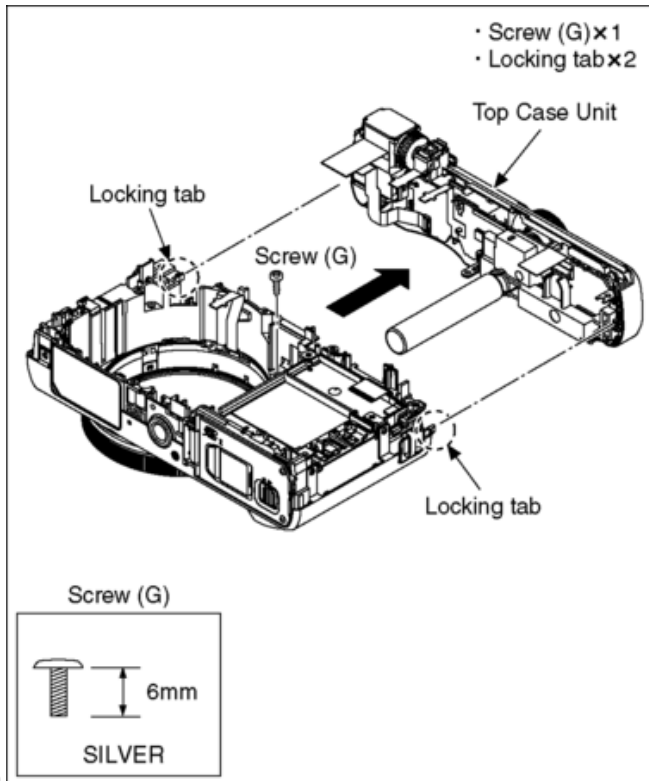
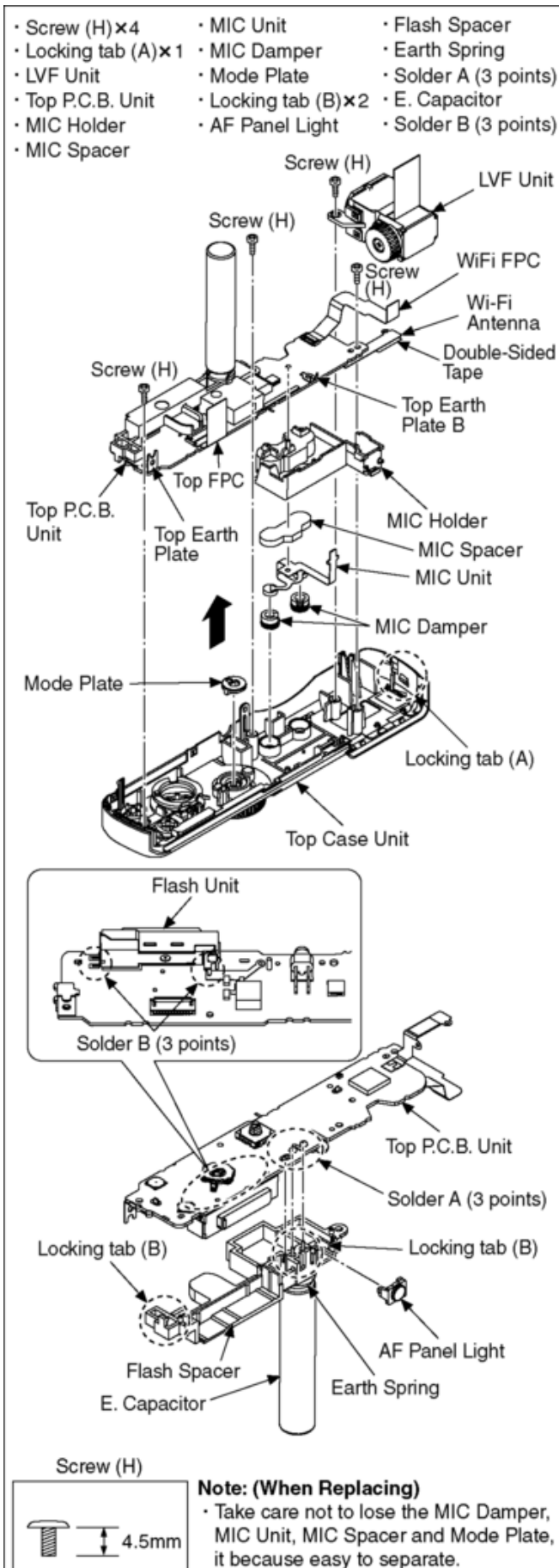


Fig. D9


9.3.8 Removal of the LVF Unit, Top P.C.B. Unit, Flash Unit

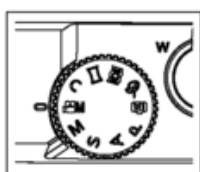


Note: (When Replacing)

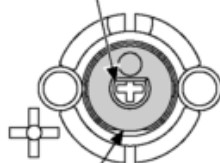
- Remove the Wi-Fi Antenna slowly and carefully.
- When attaching the Wi-Fi Antenna, confirm the attaching position to attach.
- Top P.C.B. and Wi-Fi Antenna are unit supply.
- ※ Set the Zoom Switch to the center position and fix with the Zoom Lever.

Match the D-cut with the D-shaft

- Attach the Mode Plate
Dial Mode: 

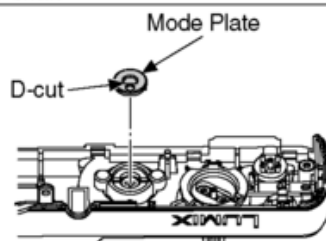


D-cut of Mode Plate



D-cut of Top Case Unit

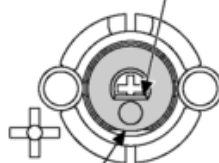
【 OK 】



Mode Plate

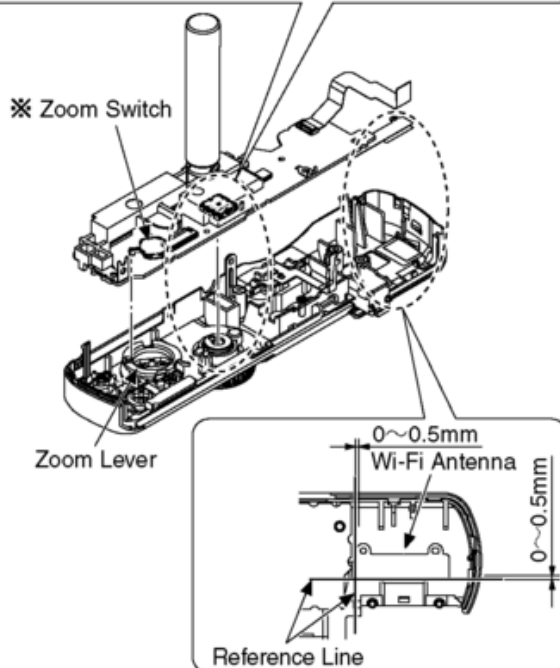
D-cut

D-cut of Mode Plate

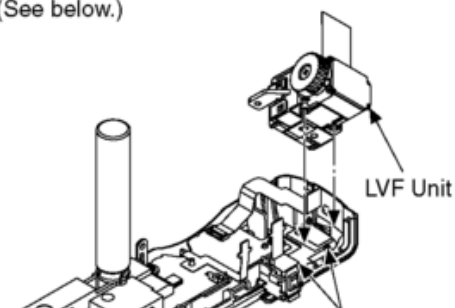


D-cut of Top Case Unit

【 NG 】



- Take care not to put fingerprint of the finder part of LVF unit.
- Insert the LVF Unit to the boss of the top case and then attach. (See below.)



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 Top P.C.B. Unit.

CAUTION

Be sure to discharge the capacitor on Top P.C.B. Unit before disassembling.

1. Remove the Top P.C.B. Unit.
2. Put the insulation tube on the lead part of resistor (ERG5SJ102: 1k Ω /5W).
3. Put the resistor between both terminals of capacitor unit for approx. 5 seconds.

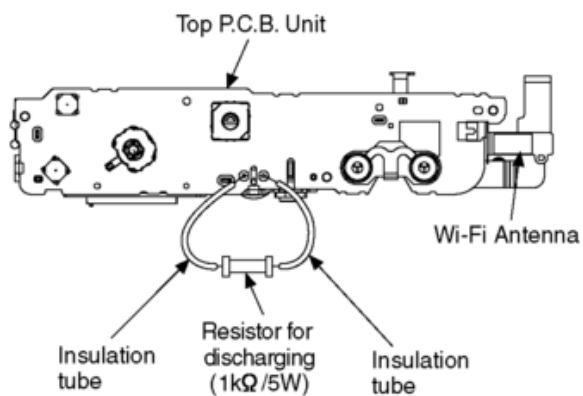


Fig. D12

9.3.9 Removal of the PCB Spacer, Front Case Unit, Control Ring Unit

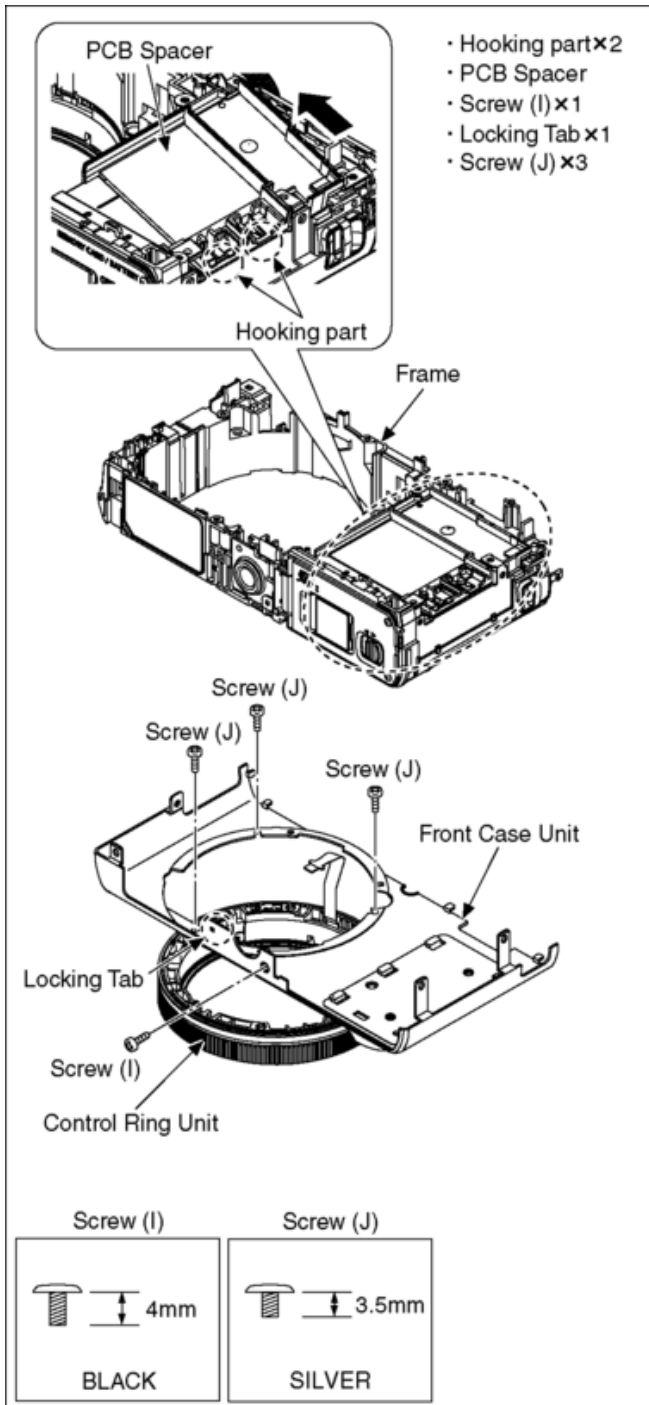


Fig. D13

9.3.10 Removal of the Battery Door Unit

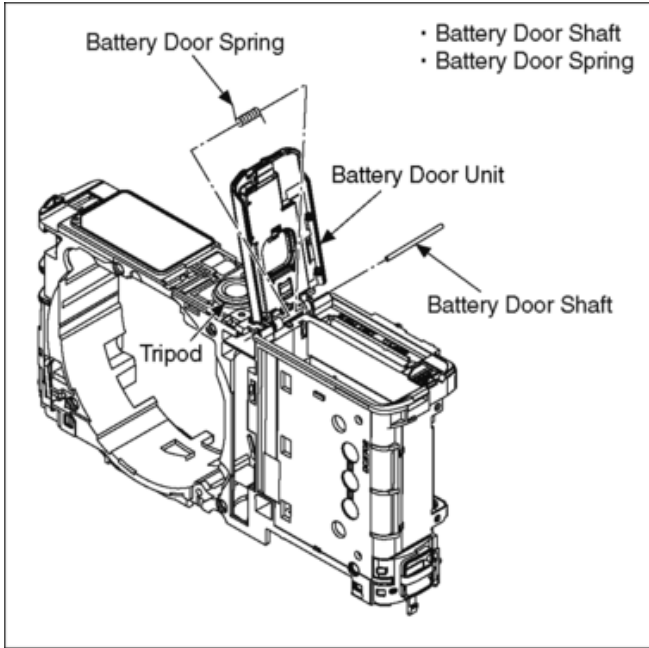


Fig. D14

9.3.11 Removal of the Strap Cover (R), Strap Plate (R), Front Earth Plate

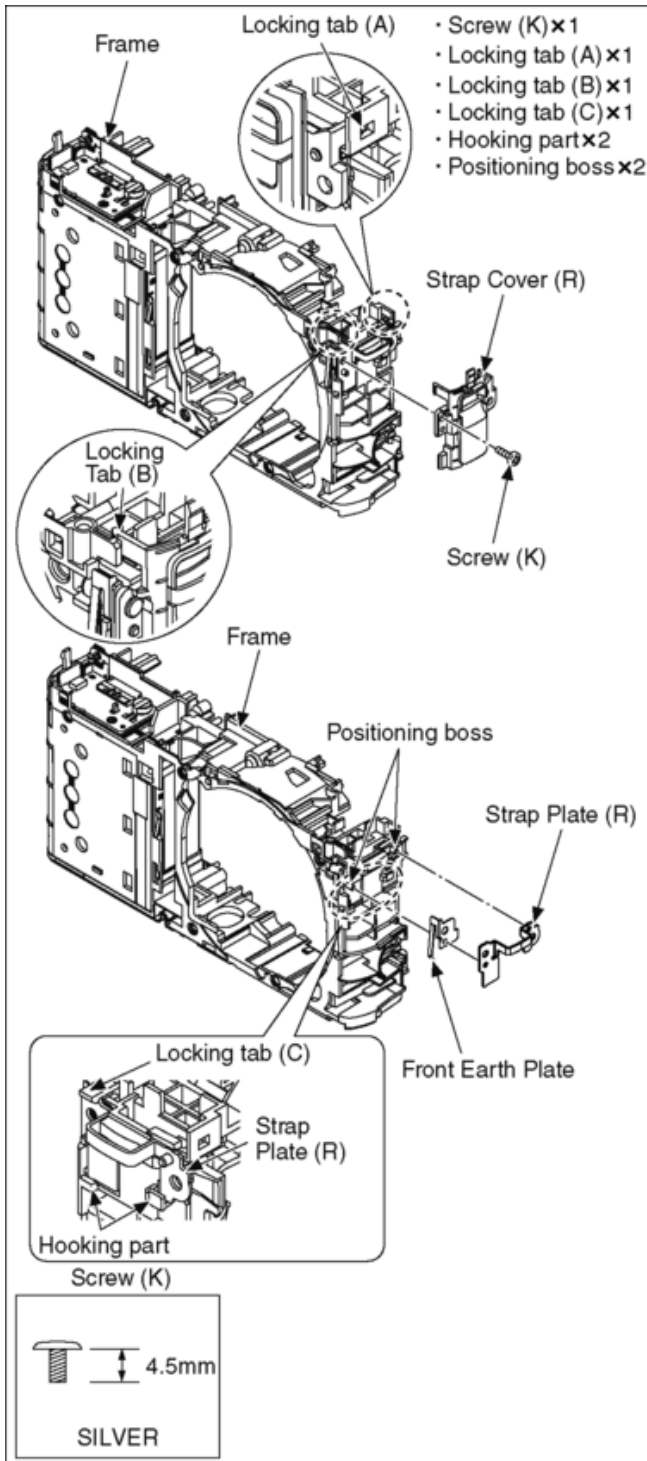


Fig. D15

9.3.12 Removal of the Battery P.C.B., Strap Cover (L), Strap Plate (L)

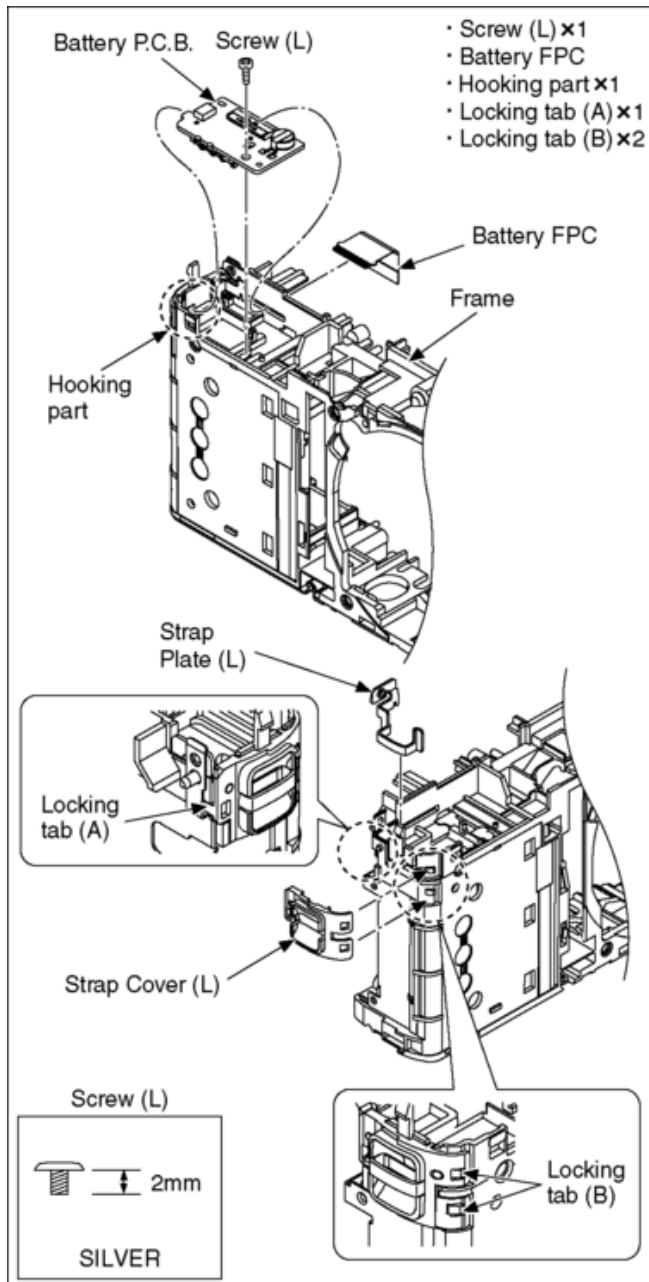


Fig. D16

9.3.13 Removal of the Battery Case

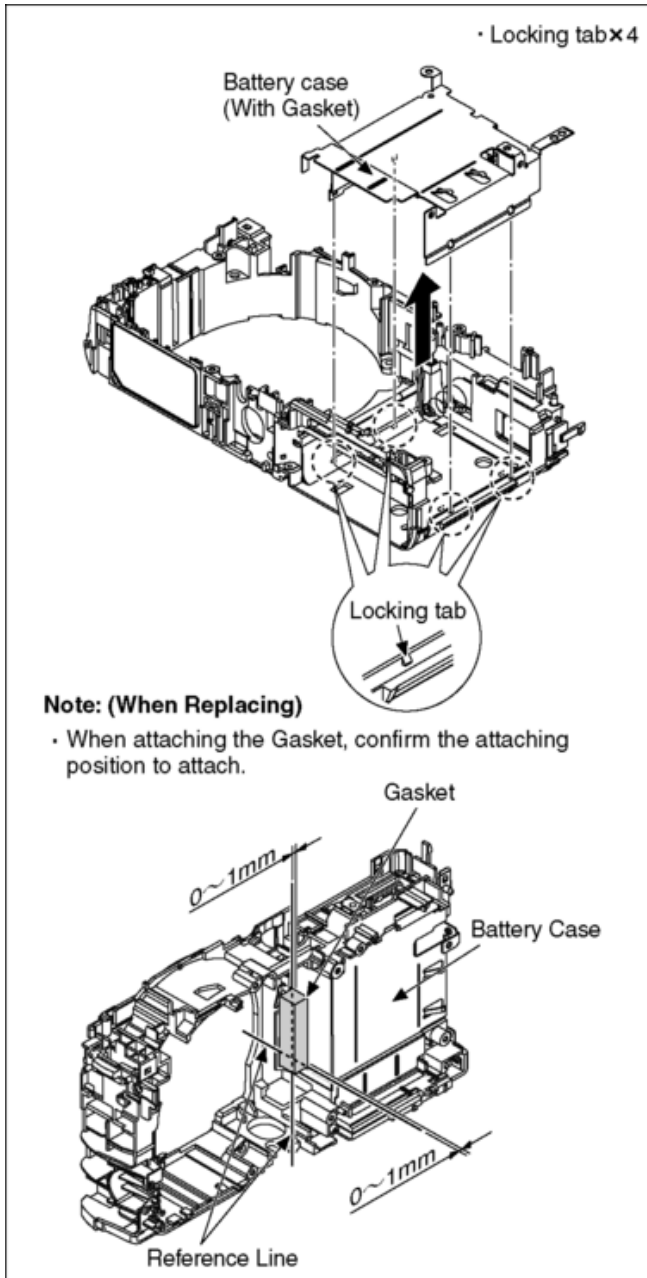


Fig. D17

9.3.14 Removal of the LCD Unit

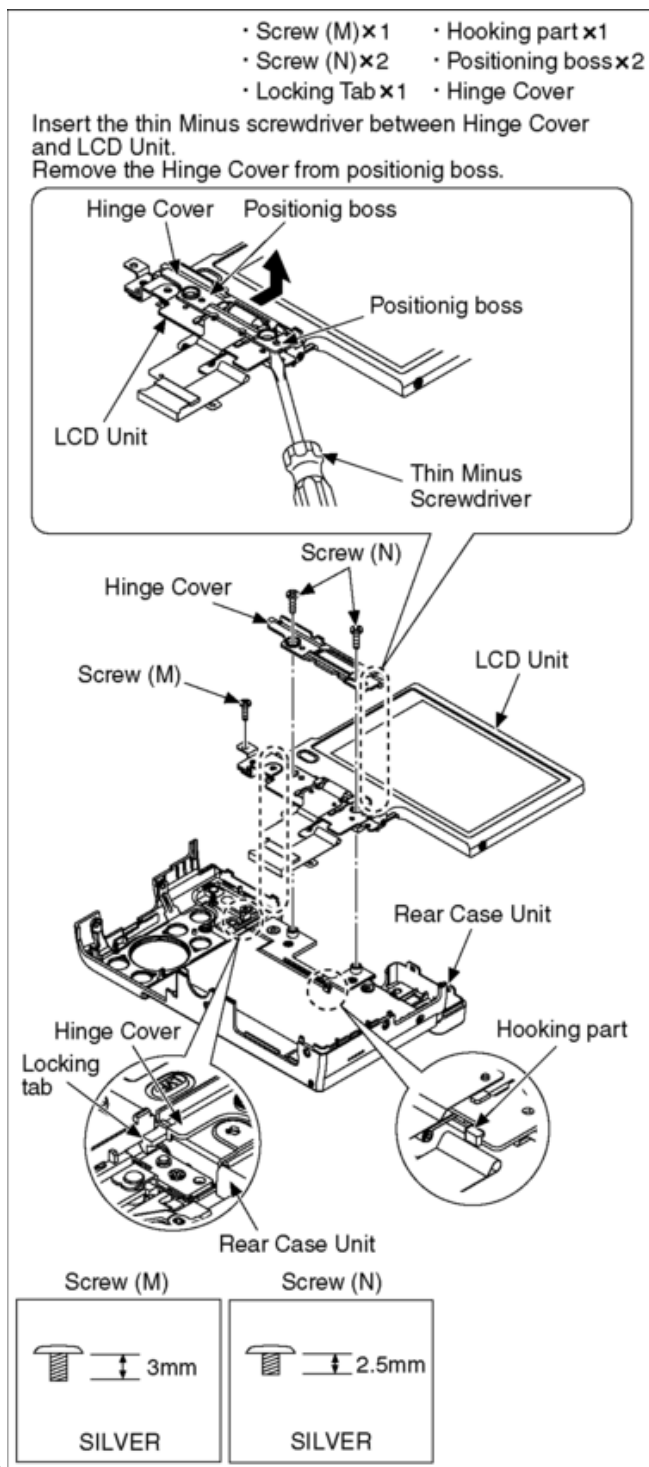


Fig. D18

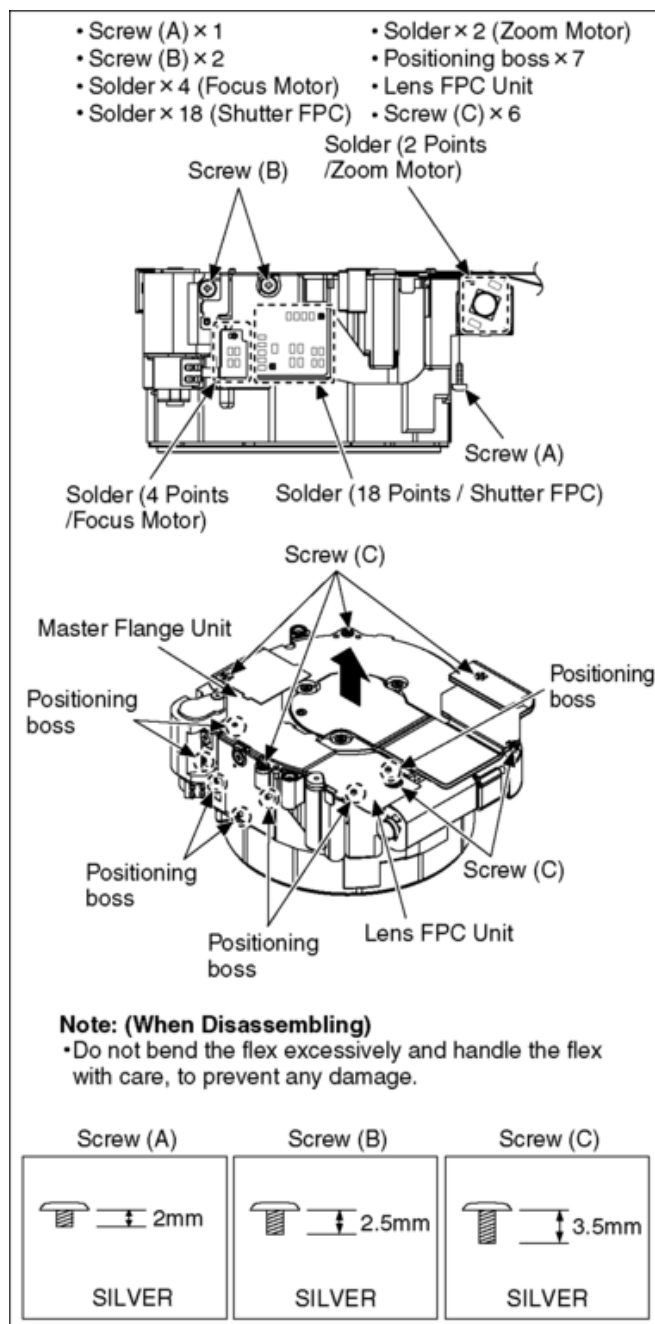
9.4 Lens Disassembly Procedure

Precaution:

1. Do not remove the MOS when disassembling or re-assembling the lens in order to maintain it clean.
When remove it, refer to item "9.6".
2. Keep dust or dirt away from the lens.
3. To remove dirt or dust from the lens, blow with dry air.
4. Do not touch the lens surface.
5. Use lens cleaning KIT (BK)(VFK1900BK).

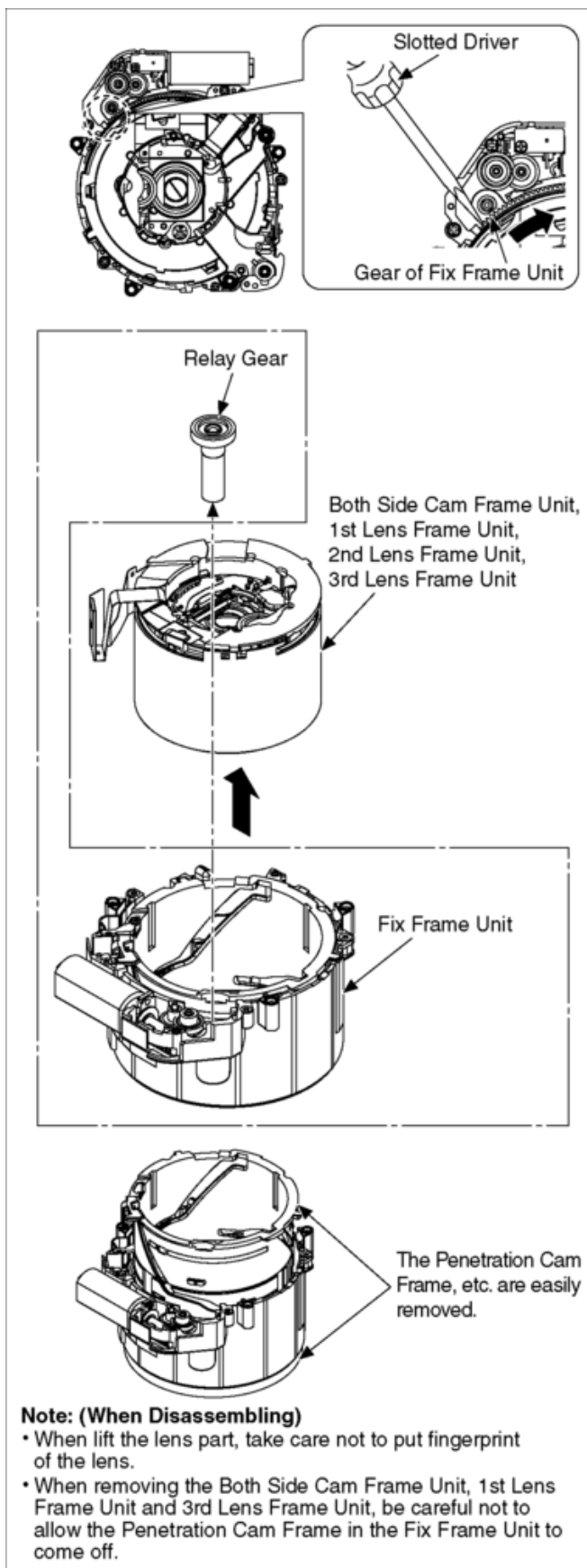
9.4.1 Removal of the Master Flange Unit

1. Unscrew the 1 screw (A) to remove the sensor of Zoom Motor.
2. Unscrew the 2 screws (B) to remove the sensor of Focus Motor.
3. Unsolder 4 points to remove the Focus Motor FPC.
4. Unsolder 18 points to remove the Shutter FPC from Lens FPC Unit.
5. Unsolder 2 points to remove the Lens FPC Unit.
6. Unscrew the 6 screws (C) to remove the Master Flange Unit.



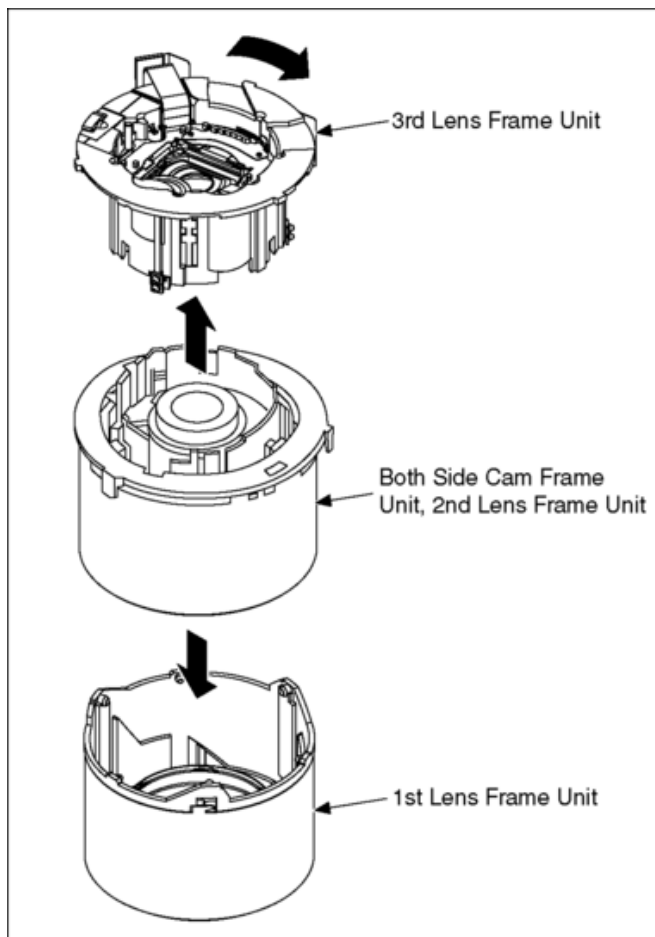
9.4.2 Both Side Cam Frame, 1st Lens Unit, 2nd Lens Unit and 3rd Lens Unit

1. Pull out the Relay Gear using tweezers, etc.
2. Turn the Gear of Fix Frame Unit using Slotted Driver, etc. in the direction of arrow.
3. Push the 1st Lens Frame Unit to the indicated by arrow from lens side, then remove the unit of Both Side Cam Frame Unit, 1st Lens Frame Unit, 2nd Lens Frame Unit and 3rd Lens Unit from Fix Frame Unit.



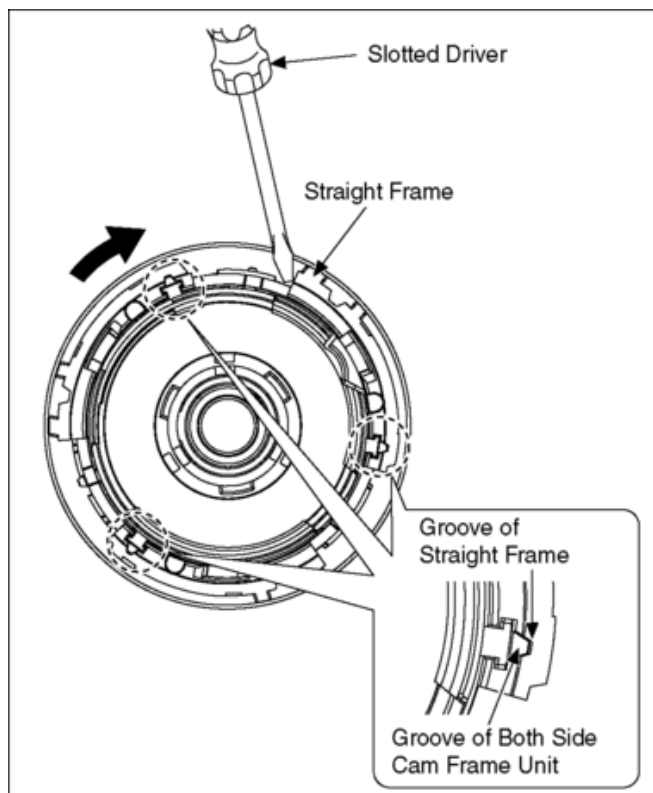
9.4.3 Removal of the 1st Lens Frame Unit and 3rd Lens Frame Unit

1. Turn the 3rd Lens Frame Unit in the direction of arrow fully.
2. Remove the 1st Lens Frame Unit and 3rd Lens Frame Unit from the Both Side Cam Frame Unit.

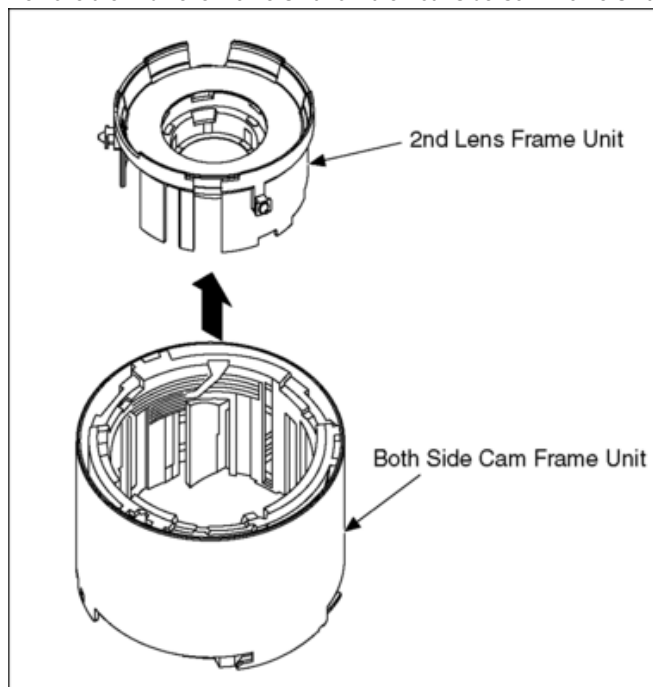


9.4.4 Removal of the 2nd Lens Frame Unit

1. Turn the Straight Frame using Slotted Driver, etc. and then align the Groove of Straight Frame and Groove of Both Side Cam Frame Unit.



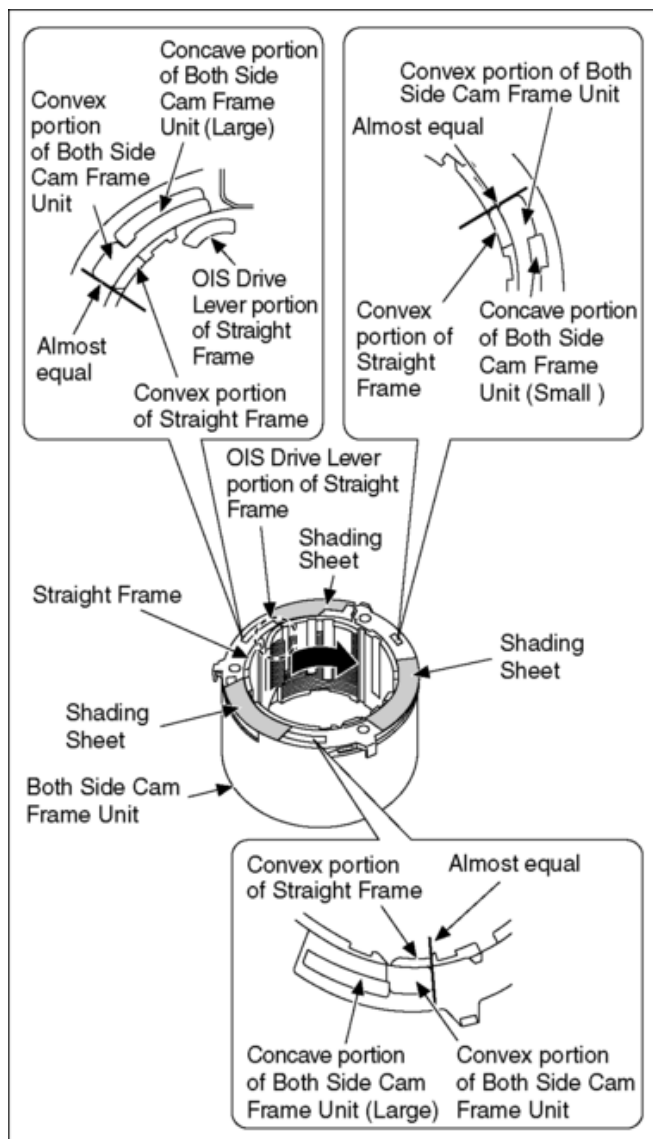
2. Remove the 2nd Lens Frame Unit from the Both Side Cam Frame Unit.



9.5 Assembly Procedure for Lens (Revised Version)

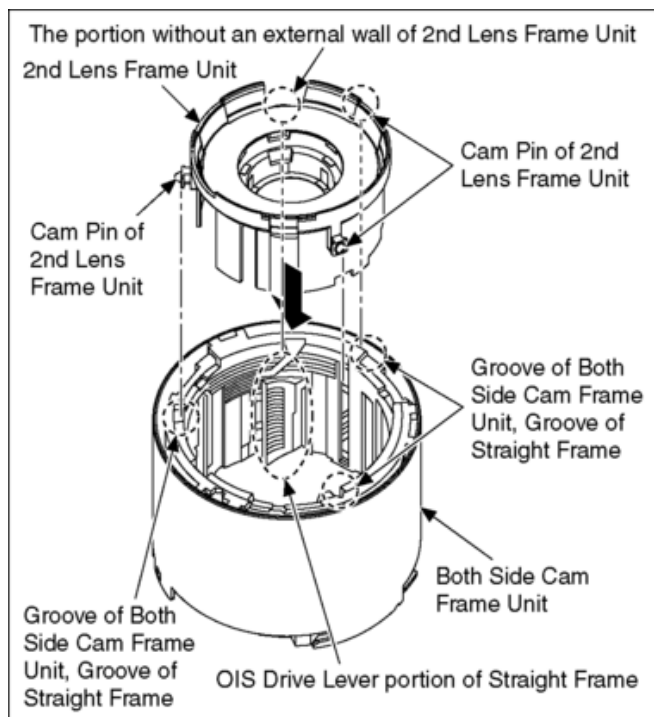
9.5.1 Insert the 2nd Lens Frame Unit

1. Turn the Straight Frame in the direction of arrow, then align the convex portion of Straight Frame and the concave portion of Both Side Cam Frame Unit.
* Refer to the OIS Drive Lever portion of Straight Frame as shown below.



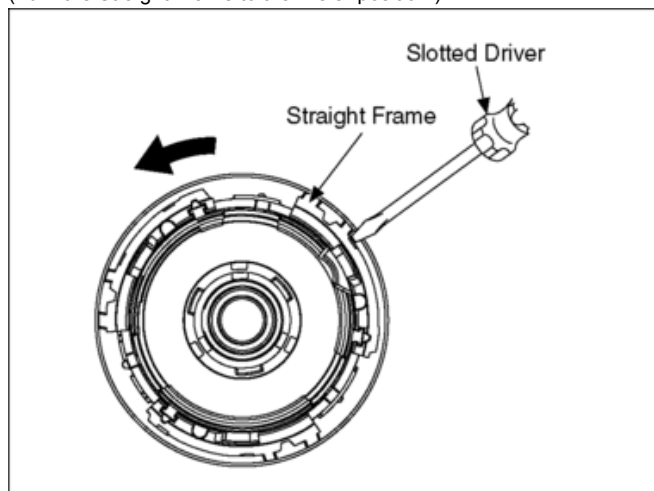
2. Insert the 2nd Lens Frame Unit as the drawing below indicated.

* Align the portion without an external wall of the 2nd Lens Frame Unit with the OIS Drive Lever portion of the Straight Frame, then put the each Cam Pin of the 2nd Lens Frame in the each Groove of the Both Side Cam Frame Unit and the Straight Frame.



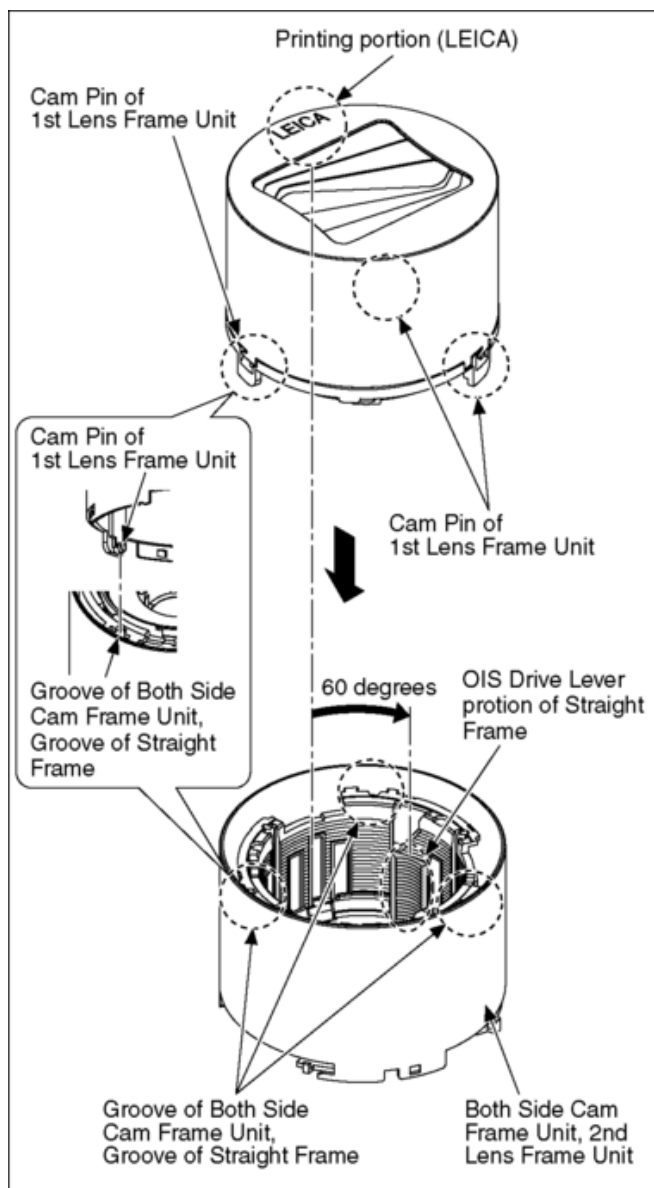
9.5.2 Insert the 1st Lens Frame Unit

1. Turn the Straight Frame using Slotted Driver, etc., then turn it in the direction of arrow fully. (Turn the Straight Frame to the "Tele" position.)



2. Insert the 1st Lens Frame Unit as the drawing below indicated.
 - (1) Position the printing portion (LEICA) of the 1st Lens Frame Unit and the OIS Drive Lever portion of the Both Side Cam Frame Unit as shown below. (deviated approx. 60 degrees)
 - (2) Insert the each Cam Pin of the 1st Lens Frame Unit in the each Groove of the Both Side Cam Frame Unit and the Straight Frame.

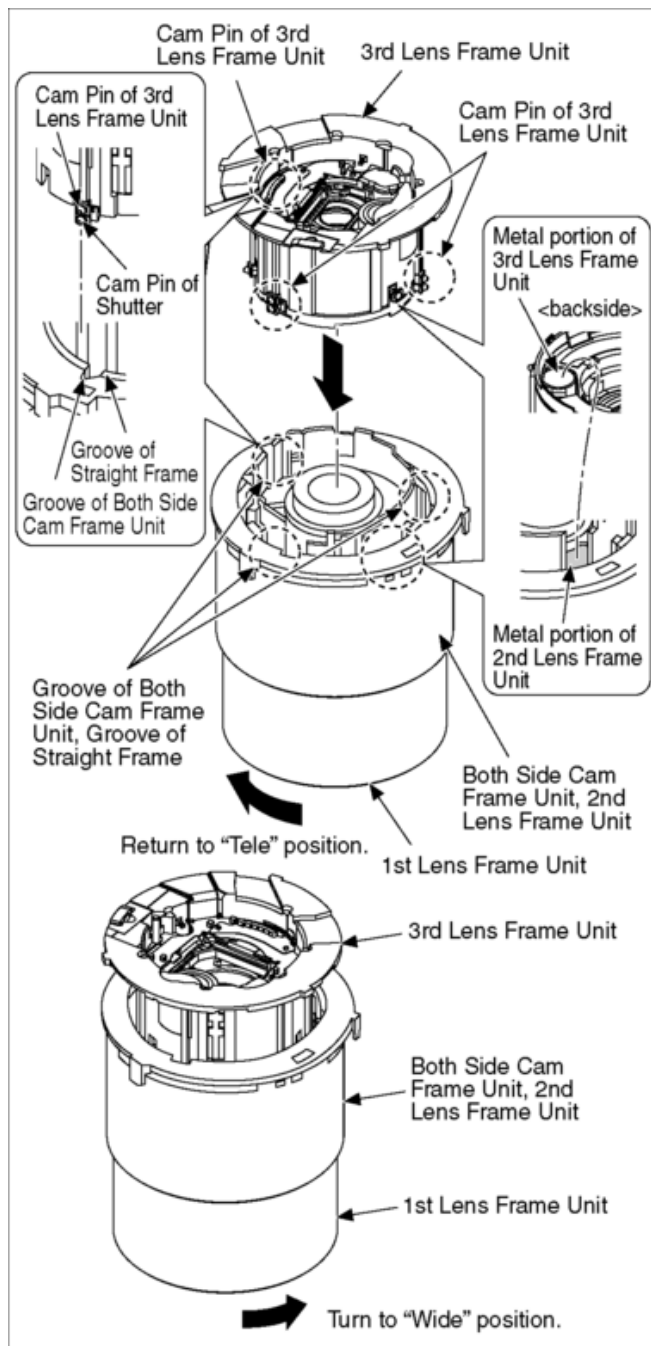
* Check if the 2nd Lens Frame Unit moves smoothly when the 1st Lens Frame Unit is rotated.



9.5.3 Insert the 3rd Lens Frame Unit

1. Insert the 3rd Lens Frame Unit as the drawing below indicated.
 - (1) Restore the position to the state ("Tele" position) when the 1st Lens Frame Unit is inserted. (Align the each Groove of the Straight Frame and the each Groove of the both Side Cam Frame Unit.)
 - (2) Align the metal part of the 3rd Lens Frame Unit with the metal part of the 2nd Lens Frame Unit.
 - (3) Insert the each Cam Pin of the 3rd Lens Frame Unit and Shutter Cam Pin in the each Groove of the Both Side Cam Frame Unit and the Straight Frame.
2. Make the lens into a retracted position state. ("Wide" position)

(Turn the 1st Lens Frame Unit and 3rd Lens Frame Unit in the direction of arrow fully.)

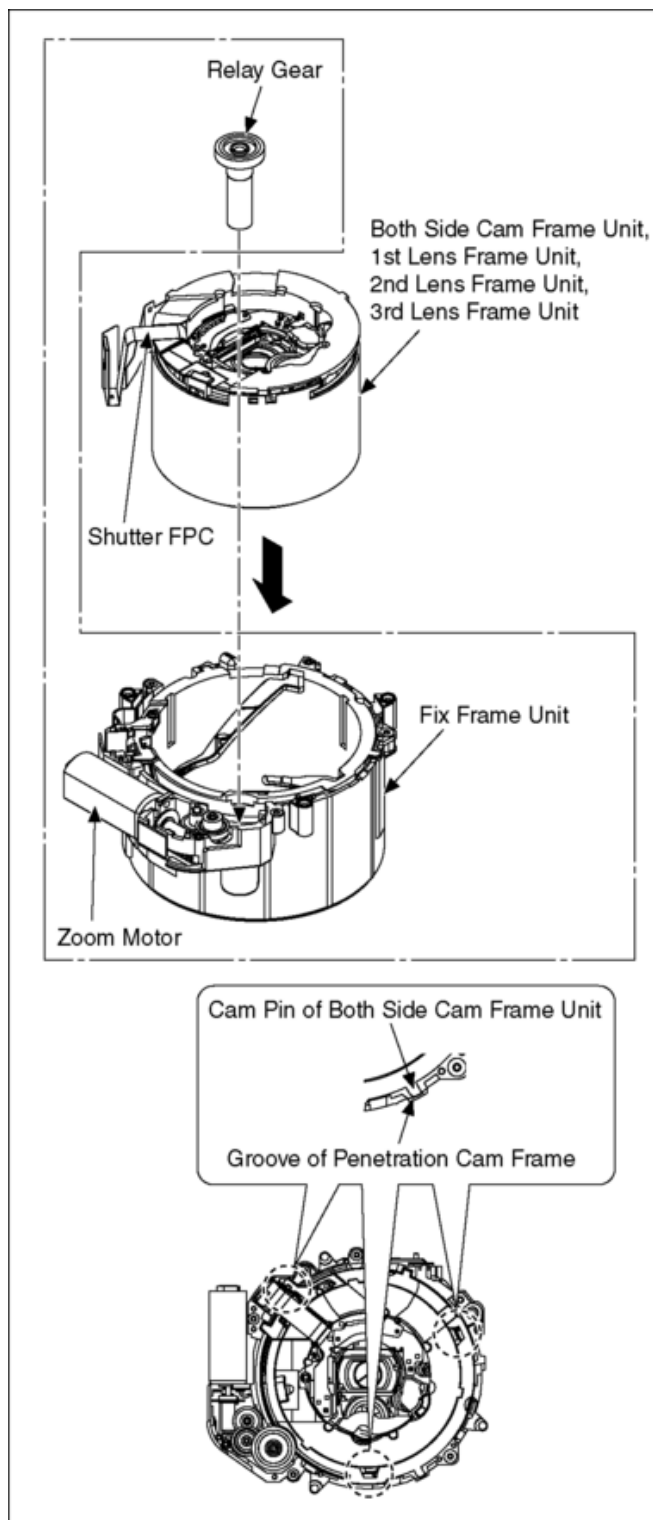


9.5.4 Insert the Fix Frame Unit

Note: (When Installing)

When using the Fix Frame Unit of service part, remove the Master Flange Unit (used to prevent fall of the gear) and the Relay Gear before assembling the Fix Frame Unit.

1. Align the Zoom Motor of the Fix Frame Unit with the Shutter FPC, then put the each Cam Pin of the Both Side Cam Frame Unit in the each Groove of Penetration Cam Frame.
2. Insert the Relay Gear to the Fix Frame Unit.



9.5.5 Insert the Master Flange Unit

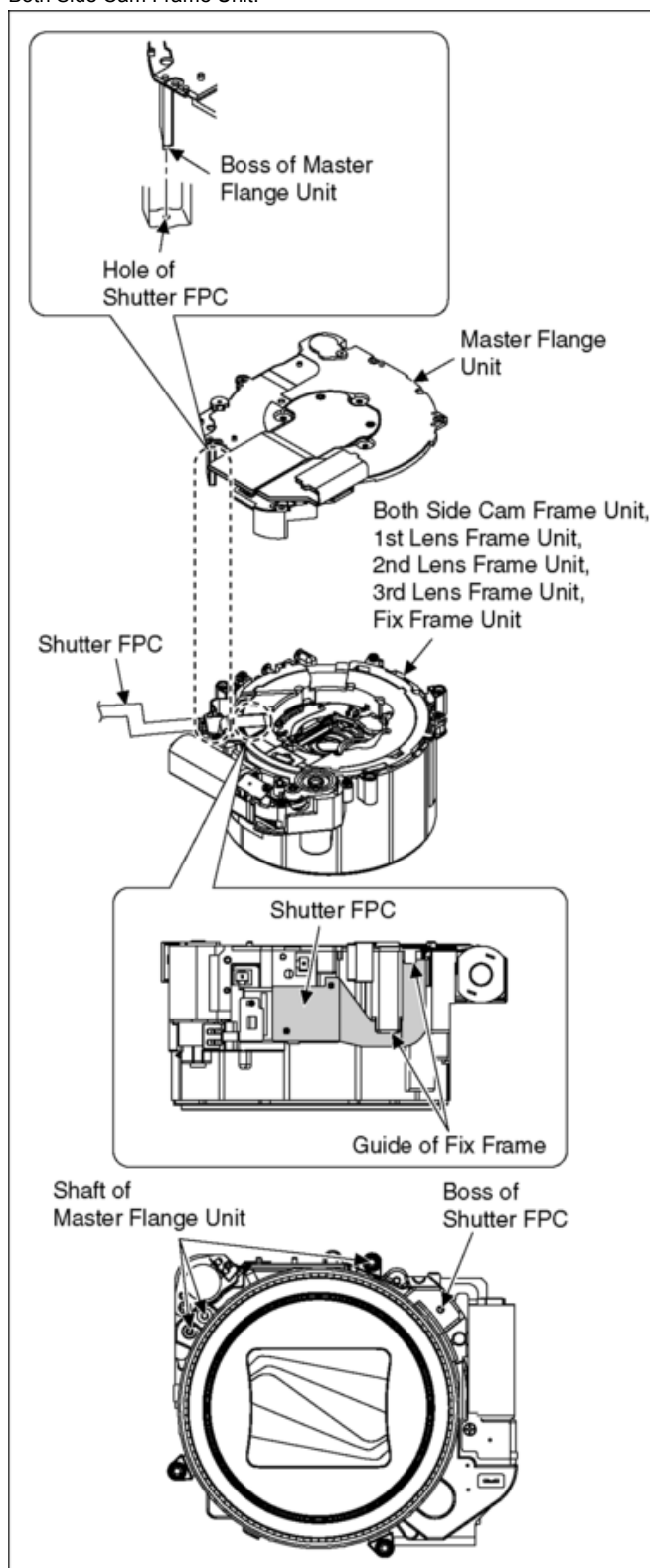
Note: (When Installing)

Take Care not to damage the flex.

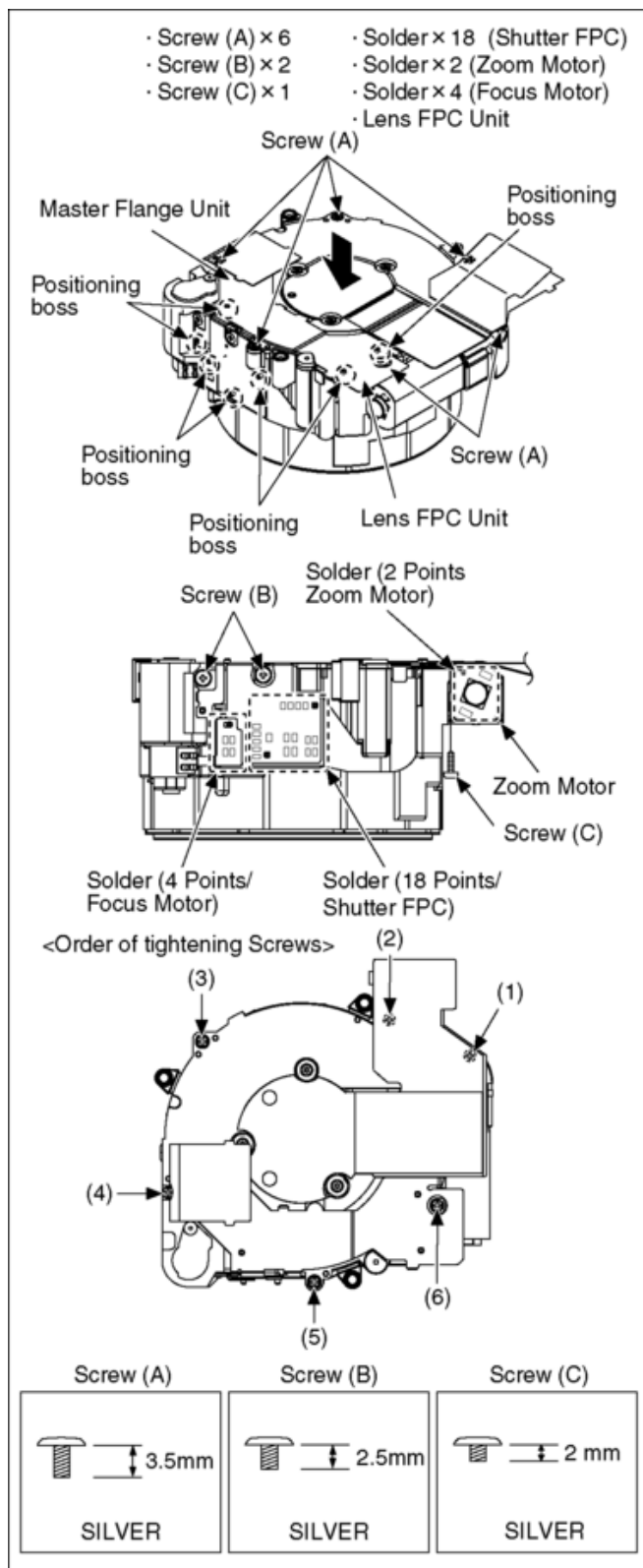
Take Care not to tuck in to the Master Flange Unit, When inserting the Shutter FPC.

1. Push the Hole of the Shutter FPC to the Boss of the Master Flange Unit tightly.
2. Place the Shutter FPC following the Guide of the Fix Cam Frame, and install the Master Flange Unit to the Unit of Both Side Cam Frame Unit, 1st Lens Frame Unit, 2nd Lens Frame Unit, 3rd Lens Frame Unit and Fix Frame Unit.
3. Check if the positioning boss of the Shutter PFC and shaft of the Master Flange Unit are inserted into the designated hole of the

Both Side Cam Frame Unit.



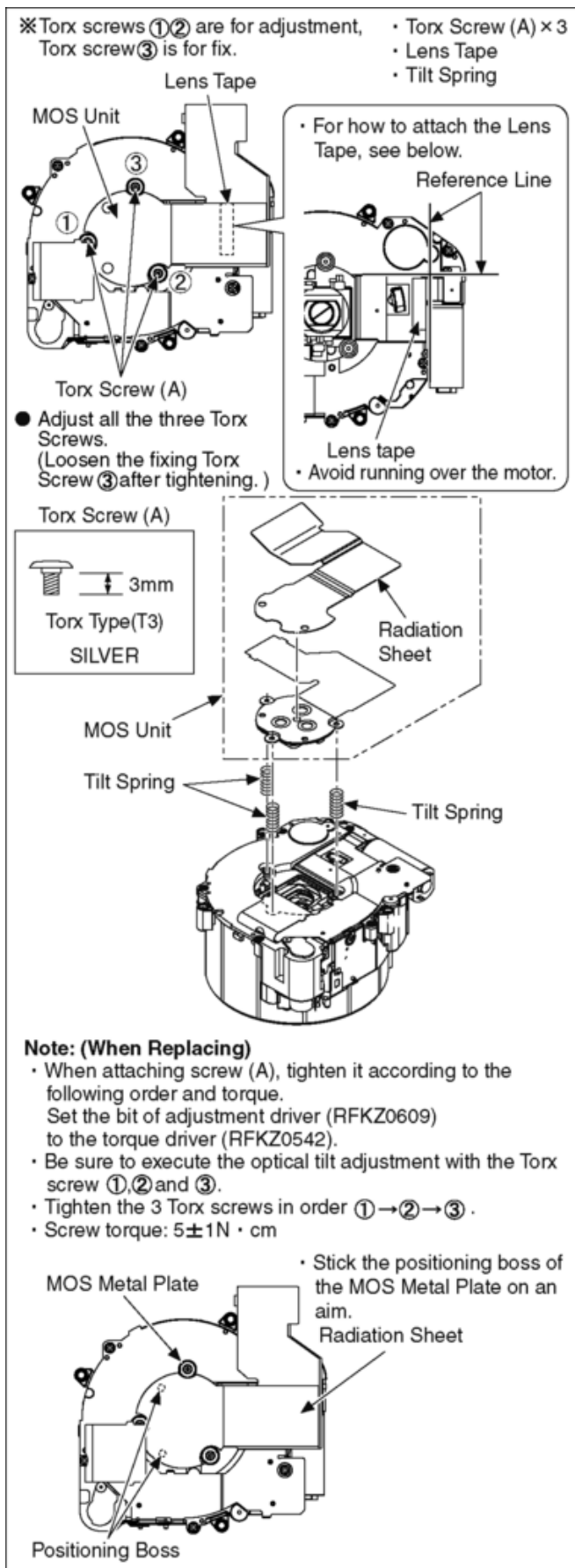
4. Attach the Master Flange Unit, then tighten 6 screws (A).
5. Attach the sensor for Focus Motor of Lens FPC Unit, then tighten 2 screws (B).
6. Attach the sensor for Focus Motor of Lens FPC Unit, then tighten 1 screw (C).
7. Soldering the Lens FPC Unit and the Shutter FPC. (18 points)
8. Soldering the Lens FPC Unit and the Zoom Motor. (2 points)
9. Soldering the Lens FPC Unit and the Focus Motor FPC. (4 points)



9.6 Removal of the MOS Unit

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

1. Remove the 3 Torx screws (A) to remove the MOS Unit and 3 Tilt Springs.



10 Measurements and Adjustments

10.1 Introduction

When servicing this unit, make sure to perform the adjustments necessary based on the part(s) replaced.

When trouble occurs, it is recommended to backup the Flash-rom data before disassembling the unit.

NOTICE: (When replacing the Lens unit, Master flange unit and MOS unit)

- When the MOS unit is unavoidably removed for Lens unit, Master flange unit and MOS unit replaced, an optical adjustment is necessary after parts are exchanged.
- It is necessary to use the "DSC_Tilt" software to allow the "Optical tilt adjustment".
- The Adjustment software "DSC_Tilt" is available at "TSN Website".

NOTICE (When replacing the Flash ROM(IC6004) or Charging Control Microcomputer(IC1502))

When the Flash Rom or Charging Control Microcomputer is replaced, it is need to adjust the firmware of the Charging Control Microcomputer to the one of the Flash ROM.

For details, refer to "10.3.2. Adjustment Specifications".

It may takes about 10 seconds. While doing the adjustment, don't turn the power off forcibly.

(It cause the Charging Control Microcomputer crush, then the camera can not turn on.)

NOTICE (When replacing the Main P.C.B.)

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

IMPORTANT NOTICE (After replacing the Main P.C.B.)

After replacing the Main P.C.B., it is necessary to achieve adjustment.

10.2 Before Disassembling the unit

10.2.1 Initial Setting Release

The cameras specification are initially set in accordance with model suffix (such as EB, EG, GK, GC, and so on.).

Unless the initial setting is not released, an automatic alignment software in the camera is not able to be executed when the alignment is carried out.

Note:

The initial setting should be again done after completing the alignment. Otherwise, the camera may not work properly.

Therefore as a warning, the camera display a warning symbol " ! " on the LCD monitor every time the camera is turned off.

Refer to the procedure described in "3.5.2. INITIAL SETTINGS" for details.

[How to Release the camera initial setting]

Preparation:

- Attach the fully charged Battery and insert the memory card (32MB or more).
- Set the [Mode dial] to "[P](Program AE mode)".

* If the mode dial position is other than "[P](Program AE mode)", it does not display the initial settings menu.

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

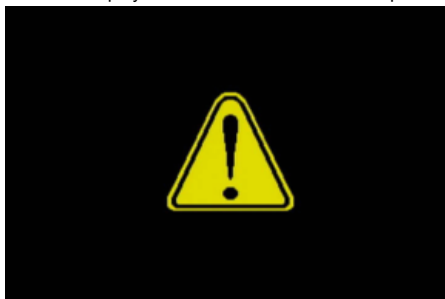
While keep pressing "[RIGHT] of Cursor button", [MENU/SET] button and [DISPLAY] button simultaneously, turn the Power on.

Step 2. The cancellation of "INITIAL SETTINGS":

Press [PLAYBACK] button to switch to the playback screen. (Keep pressing the button.)

Press "[UP] of Cursor button" additionally, then turn the Power off.

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



10.2.2 Flash-Rom Data Backup

Number of necessary adjustment items decreases by copying the backup data to new Main P.C.B. when adjustment data in old Main P.C.B. can be read by ROM_BACKUP "DSC→SD".

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

[ROM_BACKUP (Method of Non-PC backup)]

1. Insert the Memory Card into the camera.
2. Set the camera to "Temporary cancellation of the initial settings".
3. Select the "SETUP" menu.

From the "SETUP" menu, select "ROM BACKUP".

Note:

This item is not listed on the customer's "SET UP" menu.

4. When this "ROM_BACKUP" item is selected, the following submenus are displayed.



Item	Function	Details
DSC → SD	Save all the DSC's Flash-rom data to Memory Card	<ul style="list-style-type: none"> DSC's Flash-rom data is saved to the Memory Card as a data file. (DATA BACKUP) File location: ROOT DIRECTORY in Memory Card. File Name: <ol style="list-style-type: none"> 1) User Setup Information data: <Model No.>U.txt [Depending on the model, more than one file may be generated (e.g. <Model No.>U.TXT and <Model No.>U3.TXT).] 2) Electrical Adjustment data: <Model No.>F.txt [Depending on the model, more than one file may be generated (e.g. <Model No.>F.TXT and <Model No.>F3.TXT).] If the concerned file already exists, "OVERWRITE?" message is displayed.
SDALL → DSC (ID CHECK)	Write the all data to DSC's Flash-rom from Memory Card	<ul style="list-style-type: none"> The backup data stored in the Memory Card is transferred to DSC unit. ID CHECK: When the model ID is different, data is not transferred. FORCE: Even if the model ID is different, data is transferred. * If the main PCB is replaced, select "SDALL → DSC(FORCE)".
SDALL → DSC (FORCE)	Write the all data to DSC's Flash-rom from Memory Card	
SDUSER → DSC (FORCE)	Only "User setup information" is written from the saved file in the Memory Card to DSC's Flash-rom.	<ul style="list-style-type: none"> Only the user's "setup" setting condition is transferred to DSC unit. FORCE: Even if the model ID is different, the data is transferred.
I → LUMIX	Shipping set without initializing "User setup information"	<ul style="list-style-type: none"> Initial setting is executed without initializing the user's set up setting condition. * The initial setting must be performed while the Self-timer LED is blinking, * The picture data stored in the built-in memory of the DSC is not erased, with this operation.
ADJFLAG → ALL F	Set all adjustment flags completion	<ul style="list-style-type: none"> Status of the all adjustment flags are changed to "F"(completion).
WBADJ → STEPMODE	ISO: Adjustment WBL, WBM: Setting	<ul style="list-style-type: none"> ISO: Sensitivity adjustment. WBL: Setting up the white in low color temperature. WBM: Setting up the white in high color temperature.
STEPMODE → WBADJ	Cancel "STEPMODE"	<ul style="list-style-type: none"> Cancel the "STEPMODE" mode.

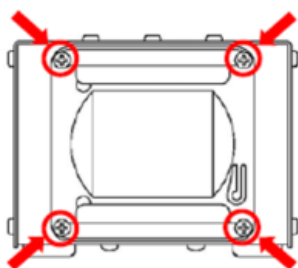
10.2.3 About Light Box

How to remove the Front Hood

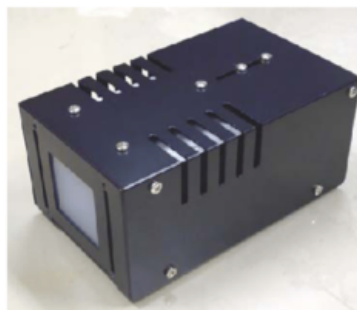
In order to utilize maximum of the diffusing surface of light box, some adjustment items need the distance between diffusing surface of light box and camera body becomes several cent-meters.

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

[For RFKZ0523 Light Box]



Unscrew the 4 screws, then remove the front hood.



10.3 Details of Electrical Adjustment

10.3.1 How to execute the Electrical Adjustment

It is not necessary to connect the camera to a PC to perform adjustments.

"Flag reset operation" and "Initial setting operation" are required when carrying out the alignment, follow the procedure below.

10.3.1.1 Startup Electrical Adjustment mode

1. Release the initial settings.
2. Insert a recordable Memory Card (32MB or more).

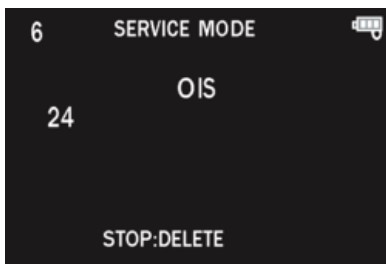


Fig. 3-3

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

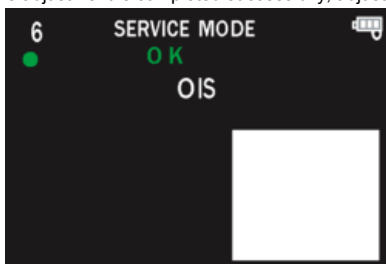


Fig. 3-4

10.3.1.4 Attention point during Adjustment

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

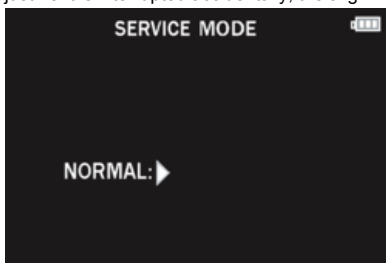


Fig. 3-5

10.3.1.5 Finalizing the Adjustment

- Several adjustment flags can be reset ("F" into "0") at the same time. In this case, when the adjustment has been completed, the screen will change showing the adjustment for the next item until all reset items are completed.
Also, when the shutter button is pressed, the screen jump to the next adjustment item.
- To cancel the adjustment mode while in the process of performing the adjustment, follow this procedures.
 - Press [DISPLAY] button.
 - Press "[RIGHT] of Cursor button".

Note:

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

10.3.2 Adjustment Specifications

The following matrix table shows the relation between the replaced part and the Necessary Adjustment.

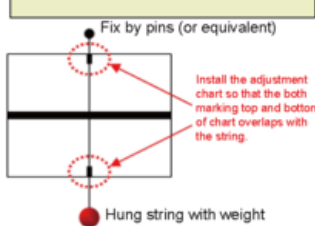
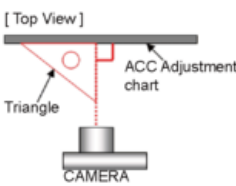




When a part is replaced, make sure to perform the necessary adjustment(s) in the order indicated.

The table below shows all the information necessary to perform each adjustment.

Adjustment order	Adjustment Item	FLAG	Purpose	Replacing Parts							JIG/TOOLS	SET UP	How to Operate		
				MAIN P.C.B./VENUS ENGINE	MAIN P.C.B. (When written Backup data)	Flash-ROM (IC6004)	Charging Control Microcomputer (IC1502)	Lens Part (Excluding Image Sensor)	Image Sensor	Microphone				Flash Part	Electronic Level (IC6201)
1	Synchronization of Flash-ROM with the charge control micro computer	—	Executing synchronization (optimization) of Flash-ROM with the charge control micro computer (Upgrading the software version)	—	—	○	○	—	—	—	—	—	—	<ul style="list-style-type: none"> Do adjust the firmware of the Charging Control Microcomputer to the firmware of the one of the Flash ROM by the following procedure. <ol style="list-style-type: none"> Release the camera initial setting. Insert a memory card (32MB or more). Turn the power off. The camera check the firmware of both the Flash ROM and the Charging Control Microcomputer. If they are not match, the firmware of the Charging Control Microcomputer is updated and the camera is turned the power off automatically. *While doing adjustment, don't turn the power off forcibly. It takes about 10 seconds to update the firmware of the Charging Control Microcomputer. While updating, the camera is displaying a warning symbol "1" on the LCD and lighting the AF Assist Lamp. (If the firmware of the camera(Flash ROM) is old, the AF Assist Lamp does not light.) 	
2	Optical Tilt	—	Adjustment of MOS Unit installation angle to the Lens	—	—	—	○	○	—	—	—	—	—	<p>Note: It is necessary to use the "DSC_Tilt" software to allow the "Optical tilt adjustment". The Adjustment software "DSC_Tilt" is available at "TSN Website".</p> <ul style="list-style-type: none"> Optical Tilt Adjustment Chart RFKZ0570 Optical Tilt Adjustment Driver RFKZ0609: T3 Camera Stand RFKZ0333J Torque Driver RFKZ0542 	
3	Zoom Home Position	ZHP	Zoom Home Position inspection	—	—	○	—	○	○	—	—	—	NONE	NONE	<ol style="list-style-type: none"> Change the flag into the "0", and then proceed to the adjustment mode. Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
4	Venus Zoom *4	PZM	Venus Zoom inspection	○	○	○	—	—	—	—	—	—	NONE	NONE	<ol style="list-style-type: none"> Change the flag into the "0", and then proceed to the adjustment mode. Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
5	OIS sensor	OIS	OIS sensor output level adjustment	○	—	○	—	○	○	—	—	—	NONE	NONE	<ol style="list-style-type: none"> Change the flag into the "0", and then proceed to the adjustment mode. Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
6	Backfocus / GYRO *4	BF	To have the focus tracking curve be appropriate shape and GYRO sensor adjustment	○	○	○	—	○	○	*1	—	—	○	—	<ul style="list-style-type: none"> Collimator RFKZ0422 <ol style="list-style-type: none"> Set the camera in front of collimator so that the distance between collimator and camera body becomes 7.5 cm as shown in Fig. A. (It is not distance between lens barrel top and diffusing surface of light box.) * Set the camera on a tripod to prevent it from falling down. <ol style="list-style-type: none"> Change the flag into the "0", and then proceed to the adjustment mode. Set the camera angle so that the star chart is displayed to the center, and press the shutter button fully. (Green mark is displayed on LCD.) Press the shutter button fully, again. (When a result is OK, it is the completion of an inspection.)
7	Iris	IRS	Iris adjustment	○	—	○	—	○	○	—	—	—	○	—	<ul style="list-style-type: none"> Light Box RFKZ0523 <ol style="list-style-type: none"> Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes 5.0 cm as shown in Fig. B. (It is not distance between lens barrel top and diffusing surface of light box.) <ol style="list-style-type: none"> Change the flag into the "0", and then proceed to the adjustment mode. Set the camera angle so that the diffusing surface of light box is displayed on the full of LCD monitor, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
8	Shutter	SHTs	Shutter speed adjustment	○	—	○	—	○	○	—	—	—	○	—	<ul style="list-style-type: none"> Light Box RFKZ0523 <ol style="list-style-type: none"> Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes 5.0 cm as shown in Fig. B. (It is not distance between lens barrel top and diffusing surface of light box.) <ol style="list-style-type: none"> Change the flag into the "0", and then proceed to the adjustment mode. Set the camera angle so that the diffusing surface of light box is displayed on the center of LCD monitor, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
		SHD	Do not use "SHD" adjustment flag for this unit. Use "BK2" adjustment flag, instead.												

Adjustment order	Adjustment Item	FLAG	Purpose	Replacing Parts										JIG/TOOLS	SET UP	How to Operate																															
				MAIN P.C.B./VENUS ENGINE	MAIN P.C.B. (When written Backup data)	Flash-ROM (IC6004)	Charging Control Microcomputer (IC1502)	Lens Part (Excluding Image Sensor)	Image Sensor	Microphone	Flash Part	Electronic Level (IC6201)	Eye Sensor																																		
<p>• Set "STEPMODE" to adjust 9: ISO, 10: WBL and 11: WBM. <How to switch to "STEPMODE"> 1. Perform "10.2.2. Flash-ROM Data Backup", and select "WBADJ → STEPMODE" for ROM_BACKUP. 2. Press "SET", and move to the flag setting screen at "STEPMODE". ⇒ The screen appears on the LCD. (See Fig. on the right.)</p>																																															
<table border="0" style="width:100%; text-align:center;"> <tr> <td colspan="10">Normal flag setting screen</td> <td colspan="6">[STEPMODE] flag setting screen</td> </tr> <tr> <td colspan="10"> </td> <td colspan="6"> </td> </tr> </table>																Normal flag setting screen										[STEPMODE] flag setting screen																					
Normal flag setting screen										[STEPMODE] flag setting screen																																					
9	ISO	ISO	ISO sensitivity adjustment	○	○	○	○	○	○	○	○	○	○	○	○	<ul style="list-style-type: none"> Light Box RFKZ0523 ND0.3 Filter RFKZ0513 	1) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes 5.0 cm as shown in Fig. B. (It is not distance between lens barrel top and diffusing surface of light box.)	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Set the camera angle so that the diffusing surface of light box is displayed on the center of LCD monitor, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)																													
10	White balance (Low color temp.)	WBL	Setting up the white in low color temperature	○	○	○	○	○	○	○	○	○	○	○	○	<ul style="list-style-type: none"> Light Box RFKZ0523 ND0.9 Filter VFK1164ND09 ND0.3 Filter RFKZ0513 CC-C7.5 Filter RFKZ0511 	1) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes 5.0 cm as shown in Fig. B. (It is not distance between lens barrel top and diffusing surface of light box.)	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Set the camera angle so that the diffusing surface of light box is displayed on the center of LCD monitor, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)																													
11	White balance (High color temp.)	WBM	Setting up the white in high color temperature	○	○	○	○	○	○	○	○	○	○	○	○	<ul style="list-style-type: none"> Light Box RFKZ0523 ND0.9 Filter VFK1164ND09 ND0.3 Filter RFKZ0513 CC-C7.5 Filter RFKZ0511 CC-Y10 Filter RFKZ0512 LBB2 Filter RFKZ0520 LBB8 Filter RFKZ0521 	1) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes 5.0 cm as shown in Fig. B. (It is not distance between lens barrel top and diffusing surface of light box.)	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Set the camera angle so that the diffusing surface of light box is displayed on the center of LCD monitor, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)																													
<p>• After adjusting 9: ISO, 10: WBL and 11: WBM, perform Initial Settings once. Then, cancel "STEPMODE". <How to release of "STEPMODE"> • Perform "10.2.2. Flash-ROM Data Backup", and select "STEPMODE → WBADJ" for ROM_BACKUP. Press "SET". Then again, cancel the Initial Settings. Move to the servicing mode, and continue the subsequent adjustment.</p>																																															
<table border="0" style="width:100%; text-align:center;"> <tr> <td></td> <td>→</td> <td></td> <td>→</td> <td></td> </tr> </table>																	→		→																												
	→		→																																												
12	Offset gain	SAT	Setting up the offset gain	○	○	○	○	○	○	○	○	○	○	○	○	<ul style="list-style-type: none"> Light Box RFKZ0523 ND0.6 Filter VFK1164ND06 	1) Set the ND0.6 filter to diffusing surface of light box. 2) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes 5.0 cm as shown in Fig. B.	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Set the camera angle so that white is displayed on the LCD monitor fully. 3) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)																													
13	Eye sensor	EYE	Inspecting sensitivity of eye sensor	○	○	○	○	○	○	○	○	○	○	○	○	<ul style="list-style-type: none"> Gray Card RFKZ0506 	1) Set the camera in front of gray card so that the distance between gray card and eye sensor of camera body becomes 5.5 cm as shown in Fig. C.	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Set the camera angle so that the attachment side of eye sensor and center of the gray card is perpendicular, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)																													
14	Flash adjustment *4	STB	Flash adjustment	○	○	○	○	○	○	○	○	○	○	○	○	NONE	NONE	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Press the shutter button fully. 3) Check that a flash shines. (It is different for every model how many times it shines.) * When a flash does not shine, there is a possibility that the flash unit is out of order. 4) Check a test result. * Results of the tests are usually NG. (When a result is OK, it is the completion of an inspection.) 5) When a result is NG, rewrite STB flag to an adjustment using ADJFLG → ALL F of ROM BACKUP. * The flag "STB" is an item which checks shines operation of a flash automatically at a Manufacturing facility. For this reason, except environment for exclusive use, a result will be NG. but it is no problem if shines operation can be checked visually.																													

Adjustment order	Adjustment Item	FLAG	Purpose	Replacing Parts								JIG/TOOLS	SET UP	How to Operate		
				MAIN P.C.B./VENUS ENGINE	MAIN P.C.B. (When written Backup data)	Flash-ROM (IC6004)	Charging Control Microcomputer (IC1502)	Lens Part (Excluding Image Sensor)	Image Sensor	Microphone	Flash Part				Electronic Level (IC8201)	Eye Sensor
15	MOS sensor Temp. white missing pixels *2	SKI	Registration of the Temp. white missing pixels	○	—	○	—	○	—	—	—	—	NONE	NONE	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)	
16	MOS sensor FD white missing pixels *2	WKI	Registration of the FD (floating diffusion) white missing pixels	○	—	○	—	○	○	*1	—	—	—	NONE	NONE	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
BKI Do not use "BK1" adjustment flag for this unit. Use "BK2" adjustment flag, instead. (In case of most DSC models, the adjustment flag for MOS SENSOR Missing Pixels is "BK1". But, in this model, "BK2" the adjustment flag for MOS SENSOR Missing Pixels.)																
17	Color reproduction inspection Microphone check	COL	Color reproduction inspection and Microphone check	○	—	○	—	○	○	○	—	—	—	NONE	NONE	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Press the shutter button fully. 3) Utter the voice for about 5 seconds into the microphone, just before pushing a shutter release. * Utter the voice at the above the MIC. * Comparatively high voice is ideal. (Standard: about 1KHz) (When a result is OK, it is the completion of an inspection.)
18	Linear adjustment	OLN	Linear adjustment	○	—	○	—	○	○	○	—	—	—	* Linear Adjustment Chart Download the "Linear Adjustment chart .pdf" and print it by the actual size. ("Linear Adjustment chart .pdf" is available at "TSN Website". (Fig. 1) To download, click on "Support information from NWBG/VDBG -AVC") * Black Bar length: 55 mm	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Press the shutter button fully. Error occurs, but zoom position becomes "Tele". ("720" is displayed on left center of the LCD screen.) (Fig.2) 3) Clear the error flag, and then proceed to the adjustment mode. (Press the delete button. → Press the display button, then the flag status screen is displayed. → Select "OLN" by pressing the cursor button. → Press the delete button. → Press the display button, then adjustment screen is displayed.) 4) Set the camera so that the distance between the lens and the linear adjustment chart becomes 200 cm as shown in Fig. 3. *Adjust the height and position of the camera to keep the middle black bar in the guide for adjustable of view angle. 5) While keeping "Tele" zoom position (confirm "720" display), press the shutter button fully. (When a result is OK, it is the completion of an inspection.) *If "720" is not displayed, do procedure from 2) to 4) again.	
<p>Black bar length: 55mm (54.9mm)</p> <p>Linear adjustment chart Fig.1</p>				<p>Guide for adjustable of view angle</p> <p>720</p> <p>Center mark of chart</p> <p>Fig.2</p>				<p>The "TELE" (The "720" is displayed in the left central part of the LCD screen.) position of lens.</p> <p>200cm</p> <p>CAMERA</p> <p>Linear adjustment chart</p> <p>Fig.3</p>								

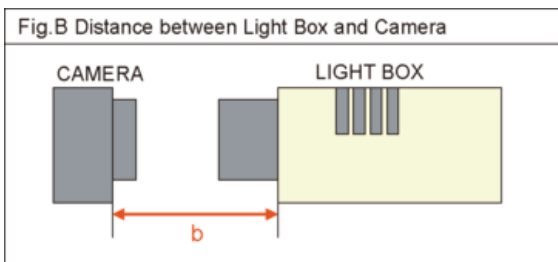
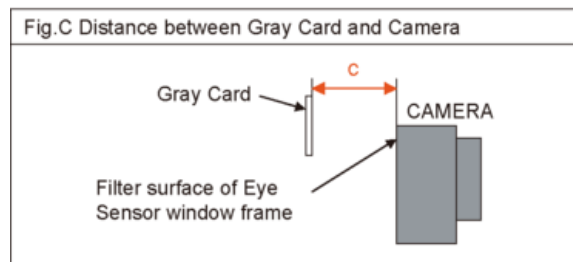
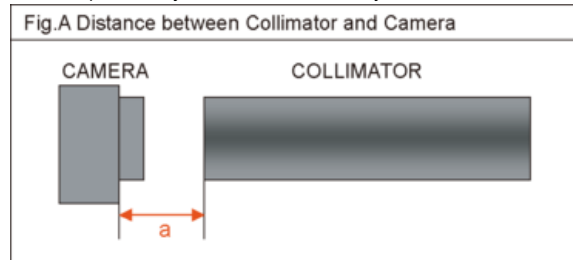
Adjustment order	Adjustment Item	FLAG	Purpose	Replacing Parts							JIG/TOOLS	SET UP	How to Operate		
				MAIN P.C.B./VENUS ENGINE	MAIN P.C.B. (When written Backup data)	Flash-ROM (IC6004)	Charging Control Microcomputer (IC1502)	Lens Part (Excluding Image Sensor)	Image Sensor	Microphone				Flash Part	Electronic Level (IC6201)
19	Electronic Level	AA2 + AA3	Electronic Level adjustment	○	○	○	-	-	-	-	-	○	-	<p>1) Download the "ACC Adjustment chart .pdf" and print it to A3 size (or equivalent size) paper. ("ACC Adjustment chart .pdf" is available at "TSN Website". To download, click on "Support information from NWBG/VDBG-AVC")</p> <p>2) Hang in the string with weight, then put the printed ACC adjustment chart on the wall or panel horizontally. (Fig. 4)</p> <p>* After putting the adjustment chart horizontally, remove the string with weight.</p> <p>* Attach the camera to tripod.</p> <p><Setup procedures></p> <p>3-1) Adjust the height of tripod to match the lens of camera and center of the adjustment chart.</p> <p>3-2) Apply the triangle (or equivalent) in center of the chart, then adjust center of the lens of camera on the vertical extension.</p> <p>3-3) Confirm that the chart is displayed on the LCD monitor fully.</p> <p>3-4) Fine adjust the camera angle so that the horizontal bar of chart is displayed horizontally on the LCD monitor and matches the cross guide line of the LCD monitor. (Fig. 5)</p> <p>• ACC Adjustment Chart</p>	<p>1) Change the flag "AA2" and "AA3" into the "0", and then press DISPLAY button and proceed to the adjustment mode.</p> <p><Offset adjustment></p> <p>2) Set the camera to the horizontal position. Then set the distance between adjustment chart and camera body becomes 29 cm. And optical axis of the lens and center of the chart crosses right-angled. (Fig. 6)</p> <p>3) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)</p> <p><Tilt adjustment></p> <p>4) Rotate the camera to the 90 degrees, so that the grip side down, and press the shutter button. (Fig. 7)</p> <p>5) Set the camera to the horizontal position, and press the shutter button. (Fig. 8)</p> <p>6) Rotate the camera to the 90 degrees, so that the grip side up, and press the shutter button. (Fig. 9) (When a result is OK, it is the completion of an inspection.)</p>
<p>Fig.4: Setting of the adjustment chart horizontally</p> 				<p>Fig.5: Setting of the camera to the front of adjustment chart</p> 				<p>Fig.6: [Offset] (Horizontal Position)</p> 		<p>Fig.7: [Vertical Position] (Grip side Down)</p> 		<p>Fig.8: [Horizontal Position]</p> 		<p>Fig.9: [Vertical Position] (Grip side Up)</p> 	
	WiFi		Do not use "WiFi" adjustment flag for servicing. This adjustment is for factory procedure. (For confirmation of Wi-Fi function, use the reception of Wi-Fi access point as usual.)												
20	Shading Compensation and MOS SENSOR Missing Pixels (Black) *3	BK2	Compensation of Shading and Compensation of MOS SENSOR Missing Pixels (Black)	○	○	○	○	○	○	○	○	○	○	<p>• Light Box RFKZ0523</p> <p>• Diffuser RFKZ0591</p> <p>1) Set the Diffuser to diffusing surface of light box.</p>	<p>1) Change the flag into the "0", and then proceed to the adjustment mode. (BK2 flag is 2nd pages.)</p> <p>2) Press the shutter button fully. → Green ● mark is displayed on LCD.</p> <p>3) Attach the Camera Lens on the Diffuser. And set the camera angle so that the diffusing surface of light box is displayed on the full of LCD monitor, and press the shutter button fully. → The 1st adjustment is executed, and then Green ● mark is displayed on LCD.</p> <p>4) Separate the camera body from light box, and press the shutter button fully. → The lens starts zooming and stops automatically, then green ● mark is displayed on LCD.</p> <p>5) Attach the Camera Lens on the Diffuser. And set the camera angle so that the diffusing surface of light box is displayed on the full of LCD monitor, and press the shutter button fully. → The 2nd adjustment is executed, and then Green ● mark is displayed on LCD.</p> <p>6) Separate the camera body from light box, and press the shutter button fully. → The lens starts zooming and stops automatically, then green ● mark is displayed on LCD.</p> <p>7) Attach the Camera Lens on the Diffuser. And set the camera angle so that the diffusing surface of light box is displayed on the full of LCD monitor, and press the shutter button fully. → The 3rd adjustment is executed. When a result is OK, it is the completion of an inspection.</p>

*1: This adjustment must be performed not only replacing the MOS unit, but also simply removing the MOS unit.

*2: The pixel that always lights while shaded is called a white wound.

*3: The pixel that does not light while complete exposed is called a black wound. This unit does not have the LCD adjustment of the camera (LCD flicker adjustment etc.).

*4: If the adjusted data is backed up from the main board before replacement or repair, write the data to the new main board. If parts other than the main board are not replaced, adjustment is not necessary for items other than "Venus Zoom(PZM)/Backfocus/GYRO(BF)/Flash(STB)".



■ IMPORTANT NOTICE (After replacing the Main P.C.B.)

After replacing the Main P.C.B., make sure to perform the "INITIAL SETTINGS" first, then release the "INITIAL SETTINGS" in order to proceed the electrical adjustment.

Note:

1. If electrical adjustment or data re-writing is executed before "INITIAL SETTINGS", suffix code list is never displayed, and it cannot be chosen suitable suffix code.
2. Never remove the battery during initial setting in process.

10.4 After Adjustment

10.4.1 Initial Setting

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

[IMPORTANT]

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

11 Maintenance

11.1 Cleaning Lens, Viewfinder and LCD Panel

Do not touch the surface of lens, Viewfinder and LCD Panel with your hand.

When cleaning the lens, use air-Blower to blow off the dust.


When cleaning the LCD Panel, dampen the lens cleaning paper with lens cleaner, and the gently wipe the their surface.

Note:

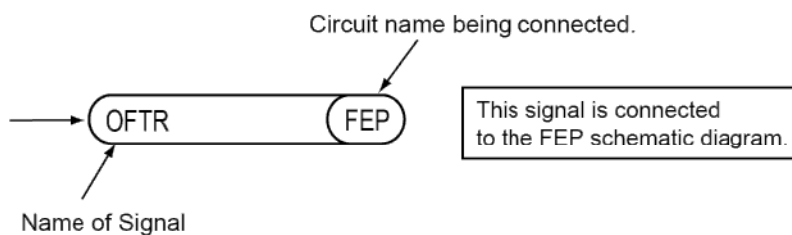
The Lens Cleaning KIT; VFK1900BK(Only supplied as 10 set/Box) is available as Service Aid.

Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Schematic Diagram Note

IMPORTANT SAFETY NOTICE:

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

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. Use the parts number indicated on the Replacement Parts List .
4. Indication on Schematic diagrams:



5. It might be taking time for display and/or access of the Schematic Diagrams & P. C. B. having the heavy data volume.

Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Parts List Note

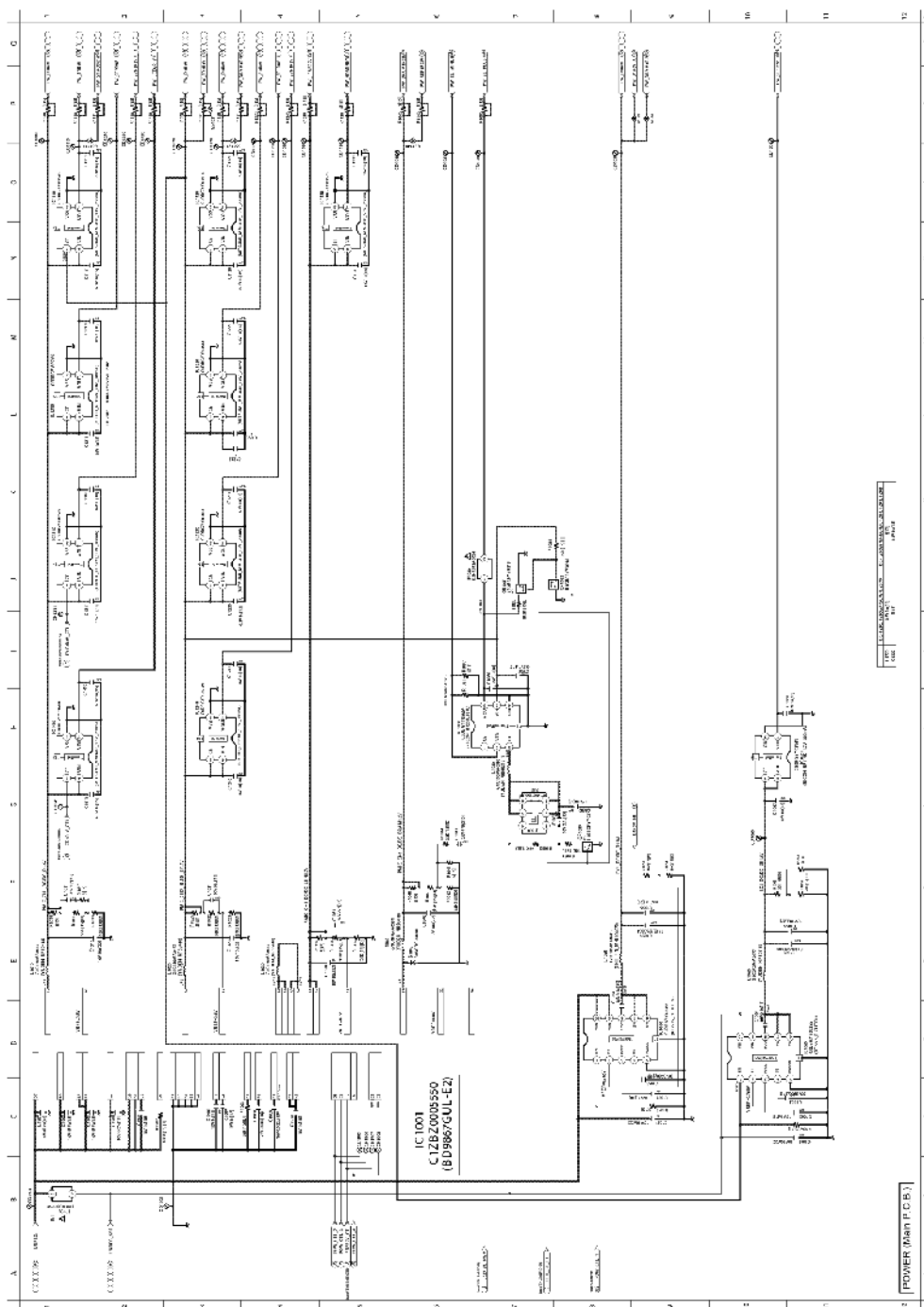
- Note:
1. * Be sure to make your orders of replacement parts according to this list.
 2. **IMPORTANT SAFETY NOTICE**
Components identified with the mark \triangle have the special characteristics for safety.
When replacing any of these components, use only the same type.
 3. Unless otherwise specified,
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 or DVD, in accordance with license protection, is allowable as replacement parts only for customers who accidentally damaged or lost their own.

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

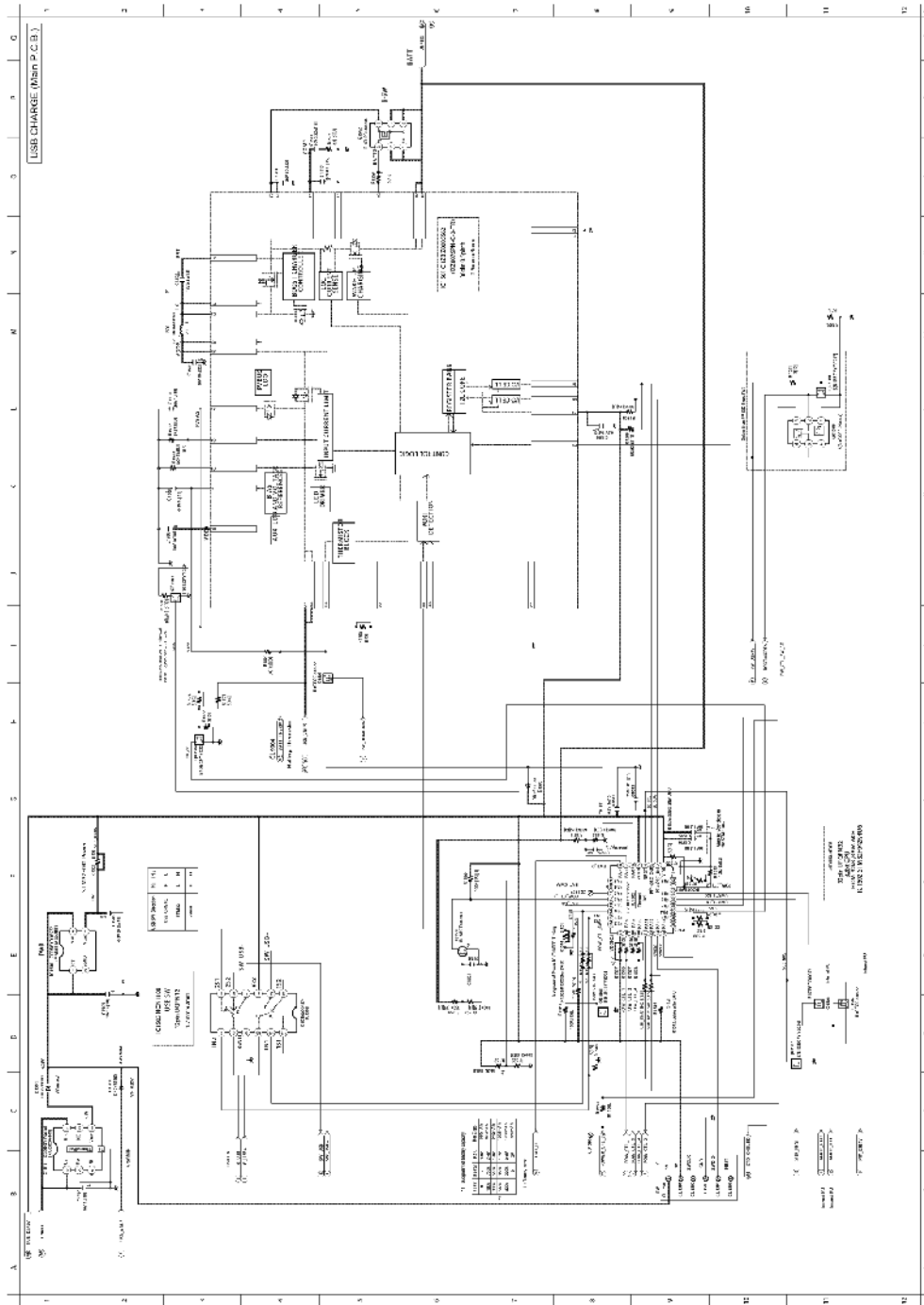
Definition of Parts supplier:

1. **Parts marked with [INBD] in the remarks column are supplied from AP-INBD.**
Others are supplied from PAVCX.

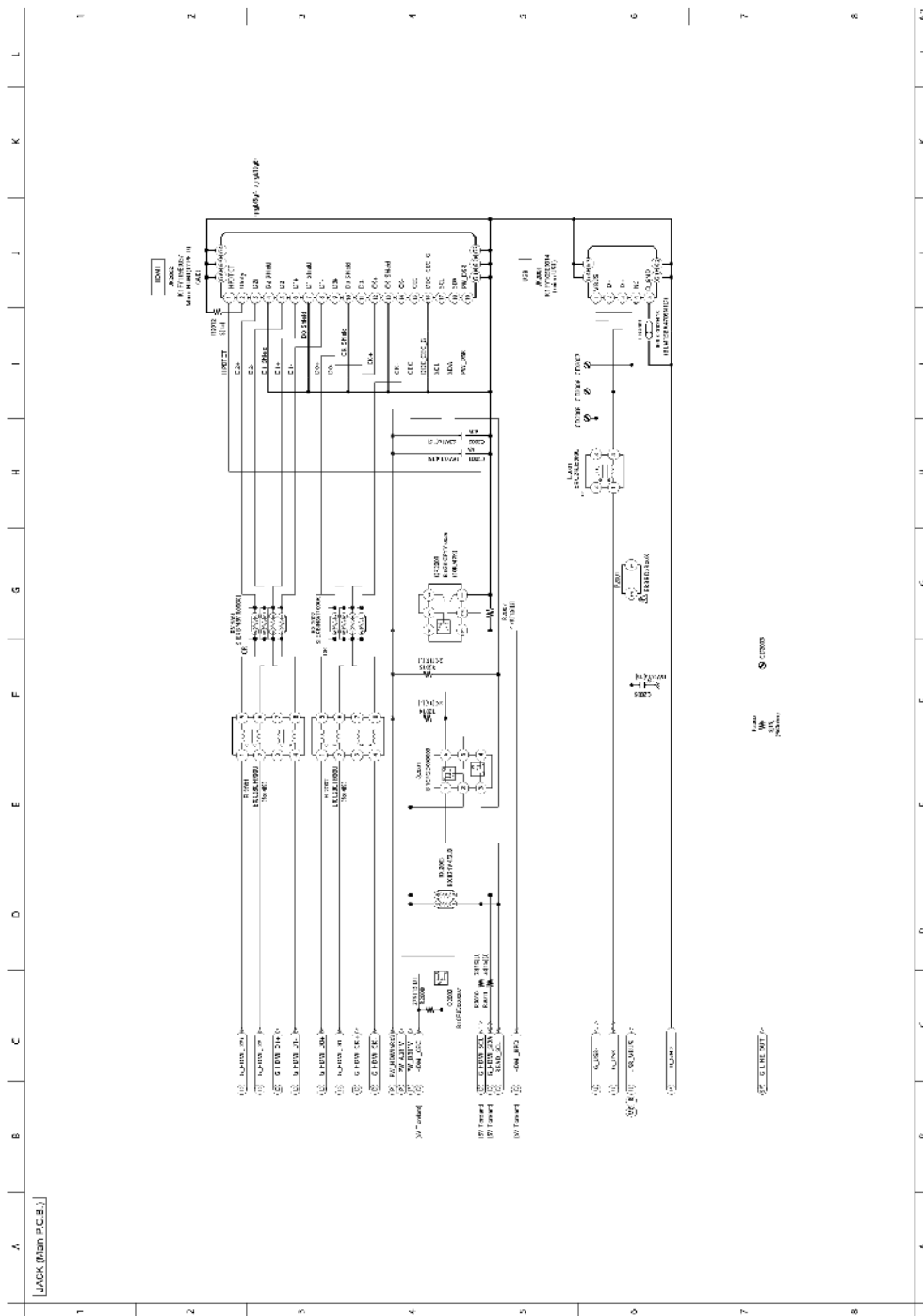
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Power (P) (Main P.C.B.)



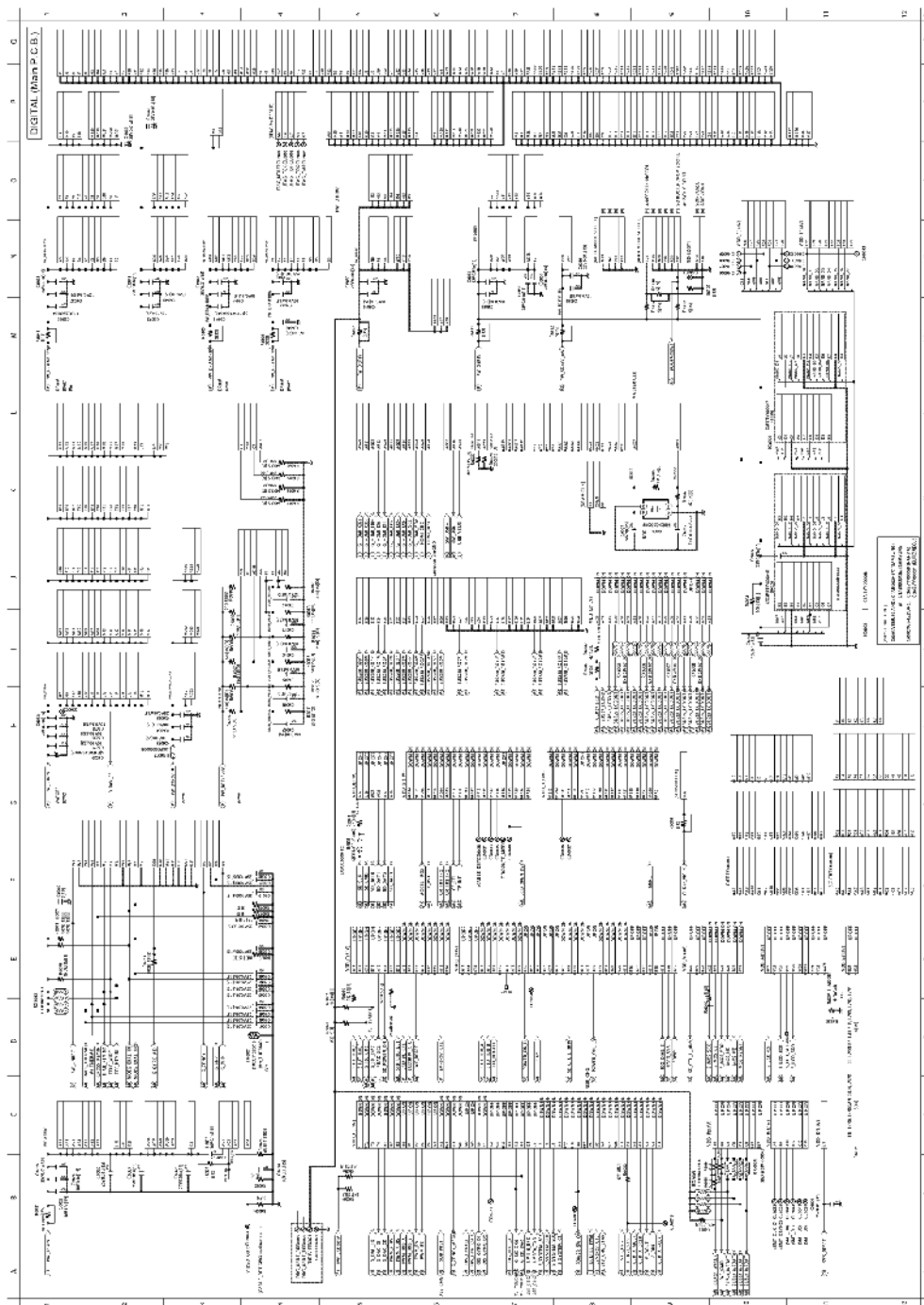
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 USB Charge (U/UC) (Main P.C.B.)



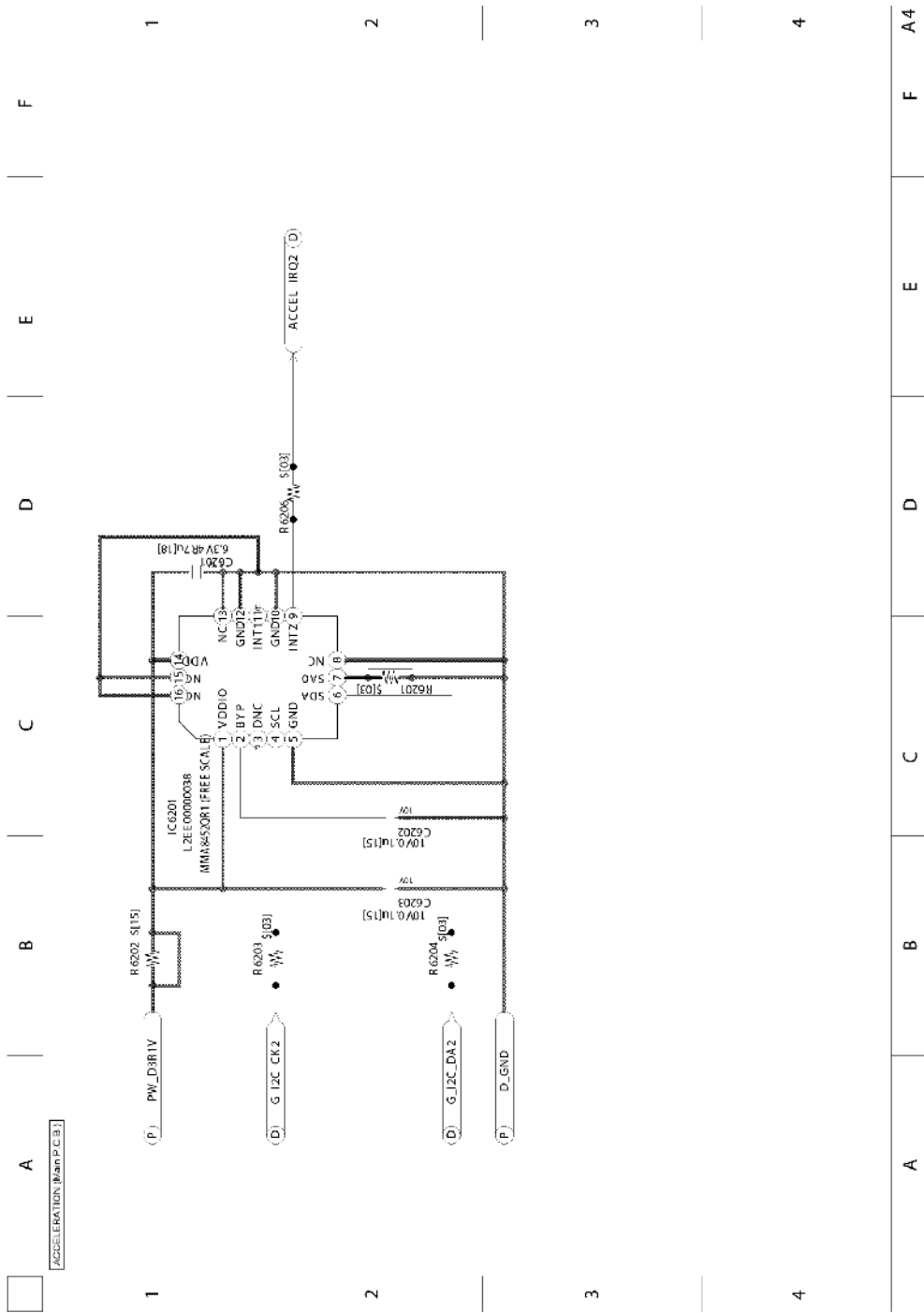
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Jack (J) (Main P.C.B.)



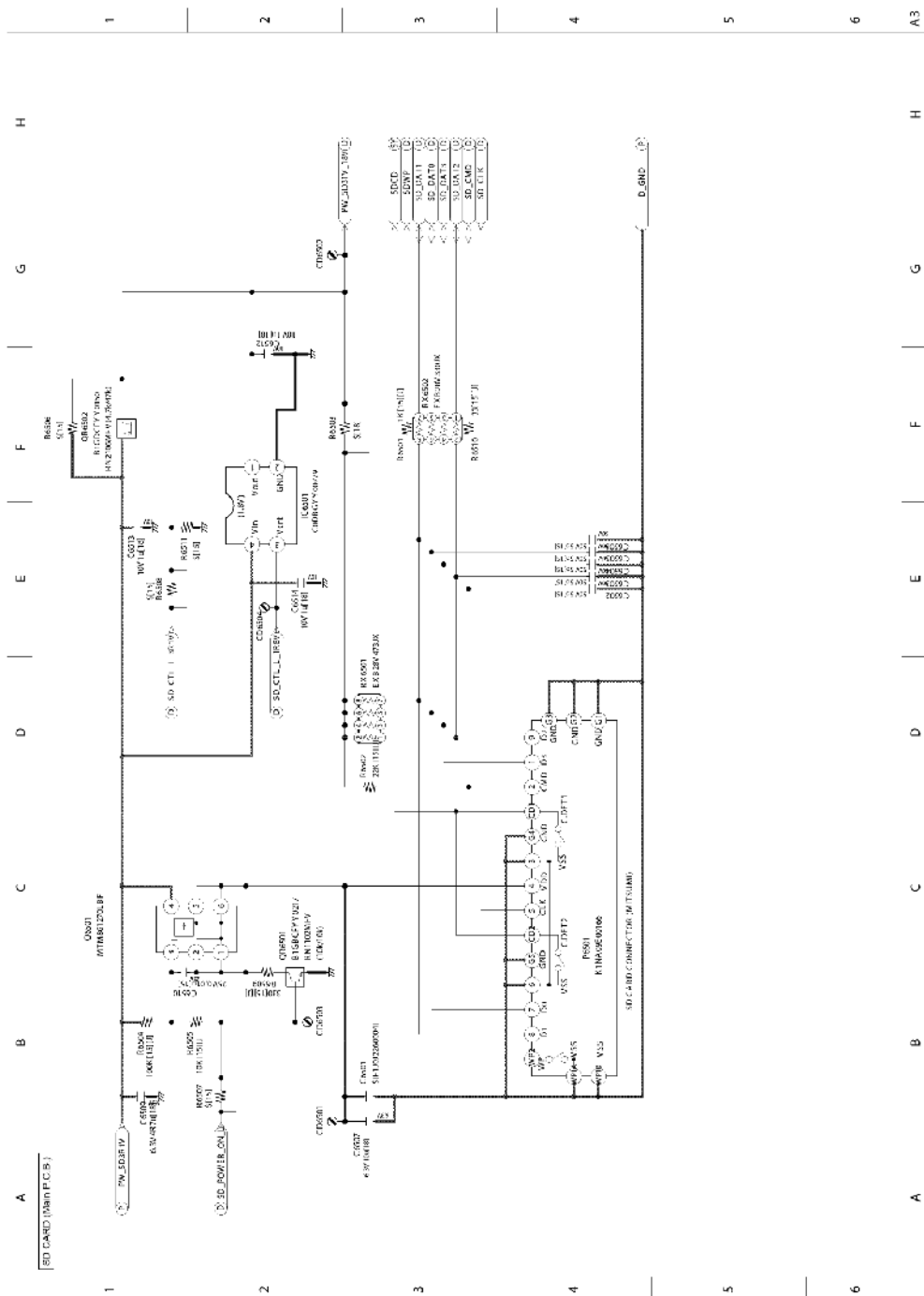
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Digital (D) (Main P.C.B.)



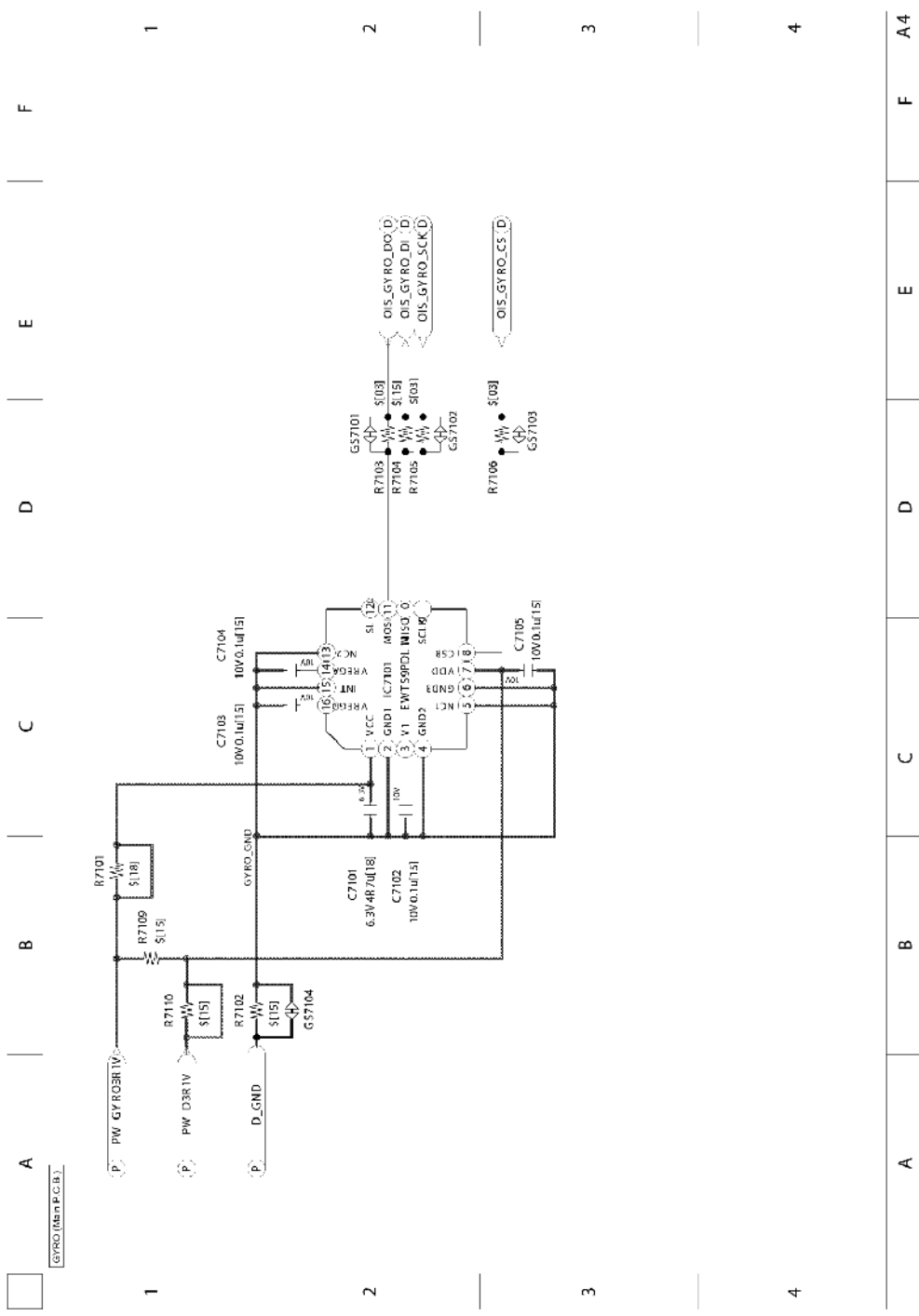
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Acceleration (AC) (Main P.C.B.)



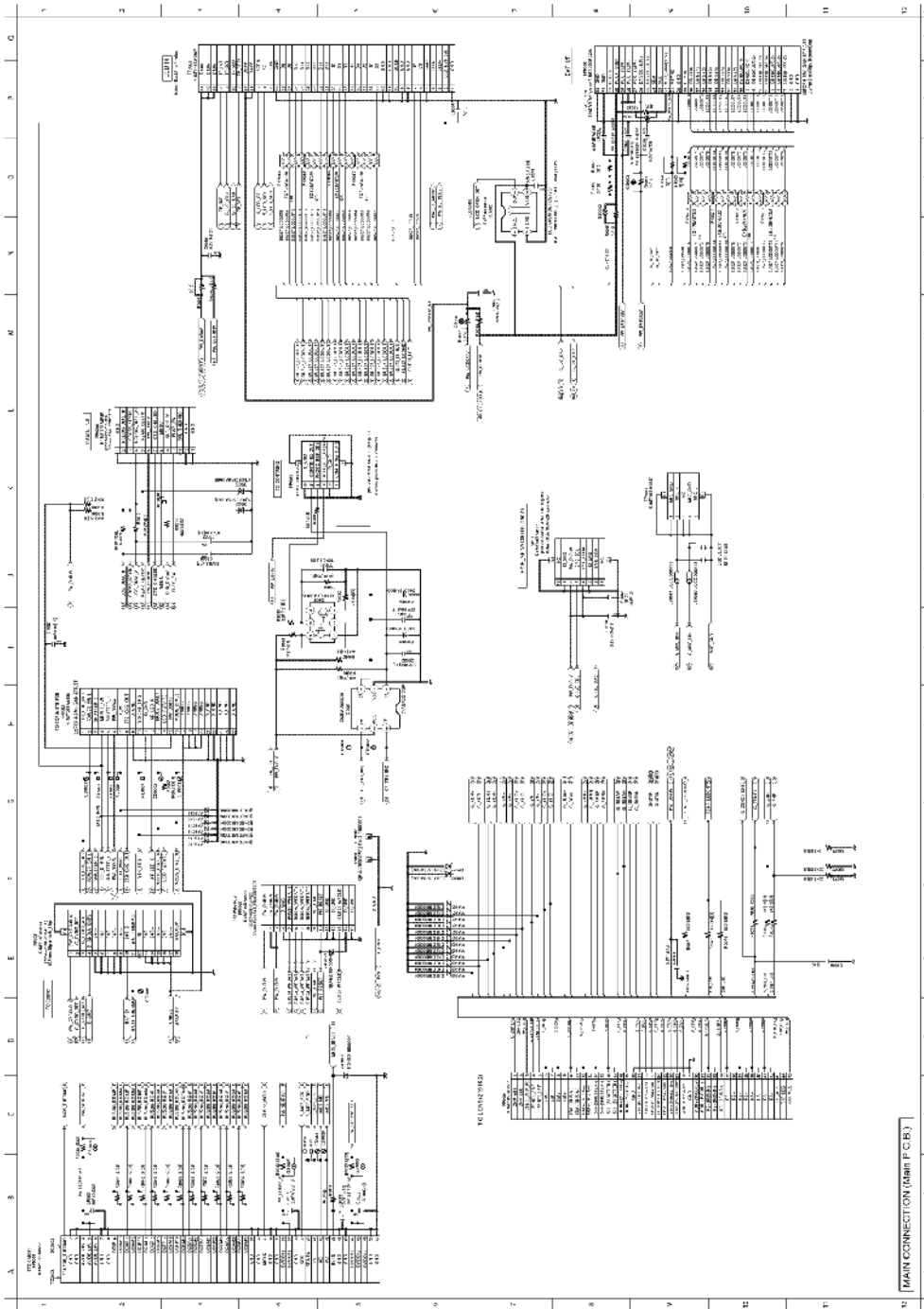
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 SD CARD (SD) (Main P.C.B.)



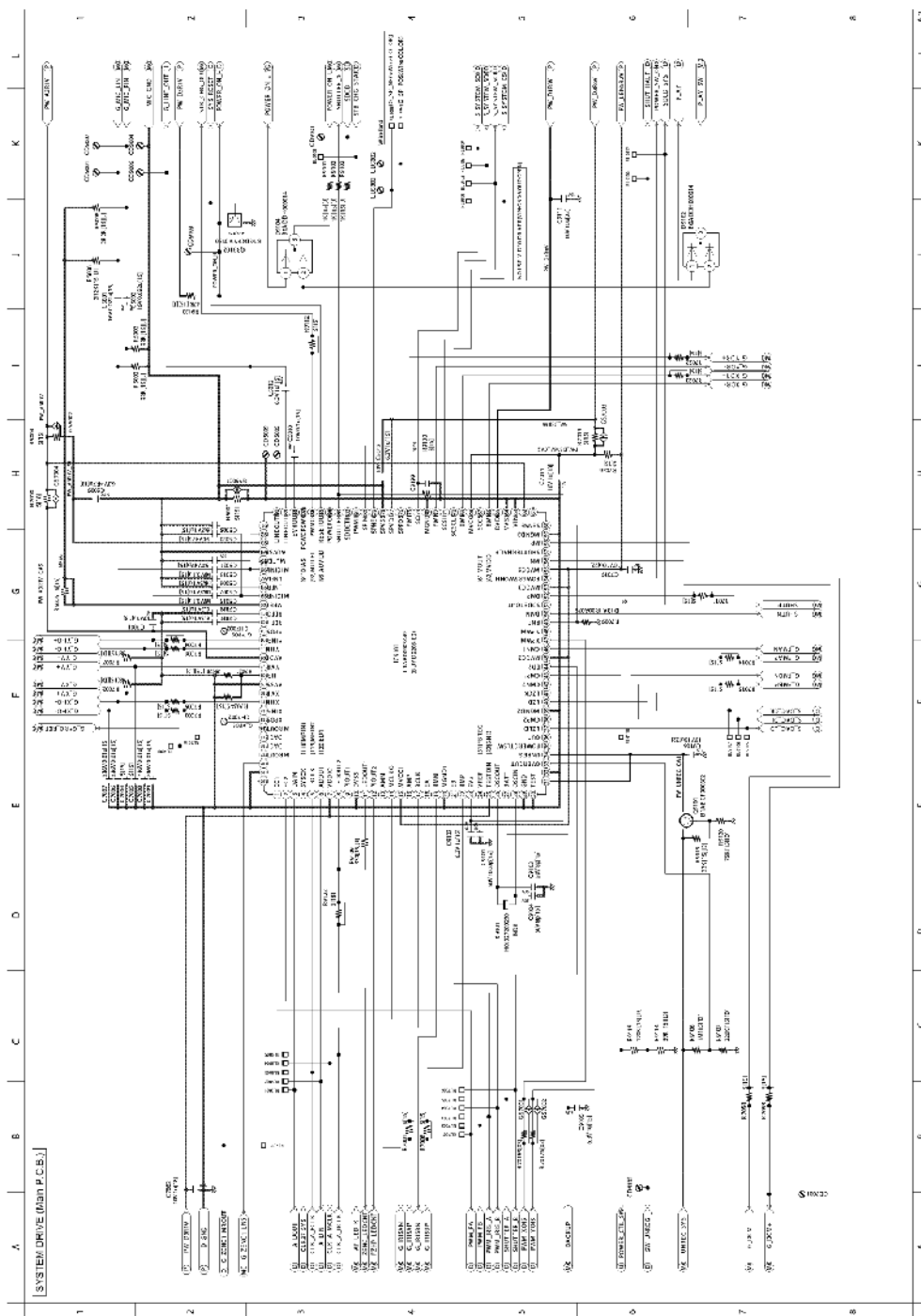
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 GYRO (GY) (Main P.C.B.)



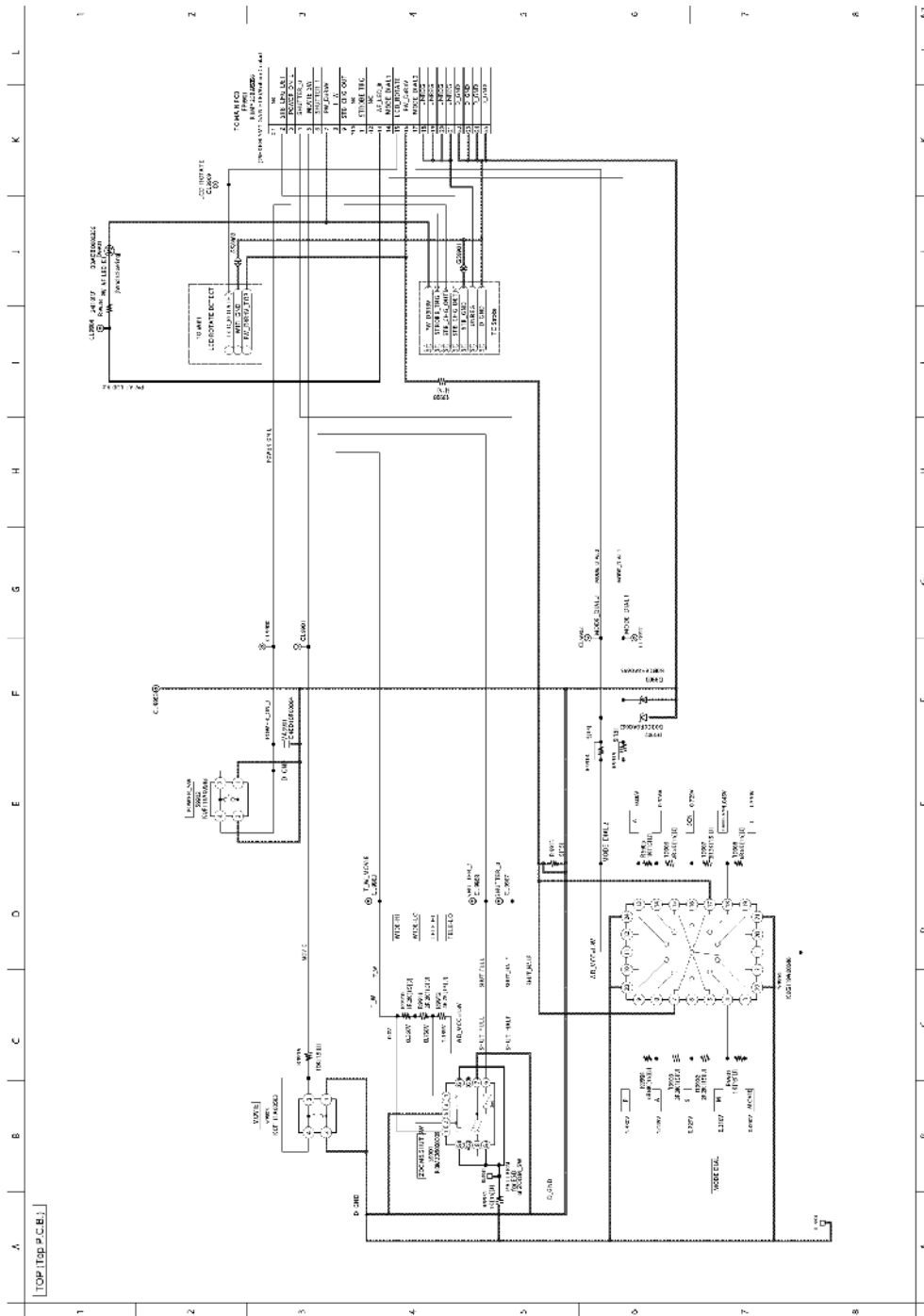
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Main Connection (MC) (Main P.C.B.)



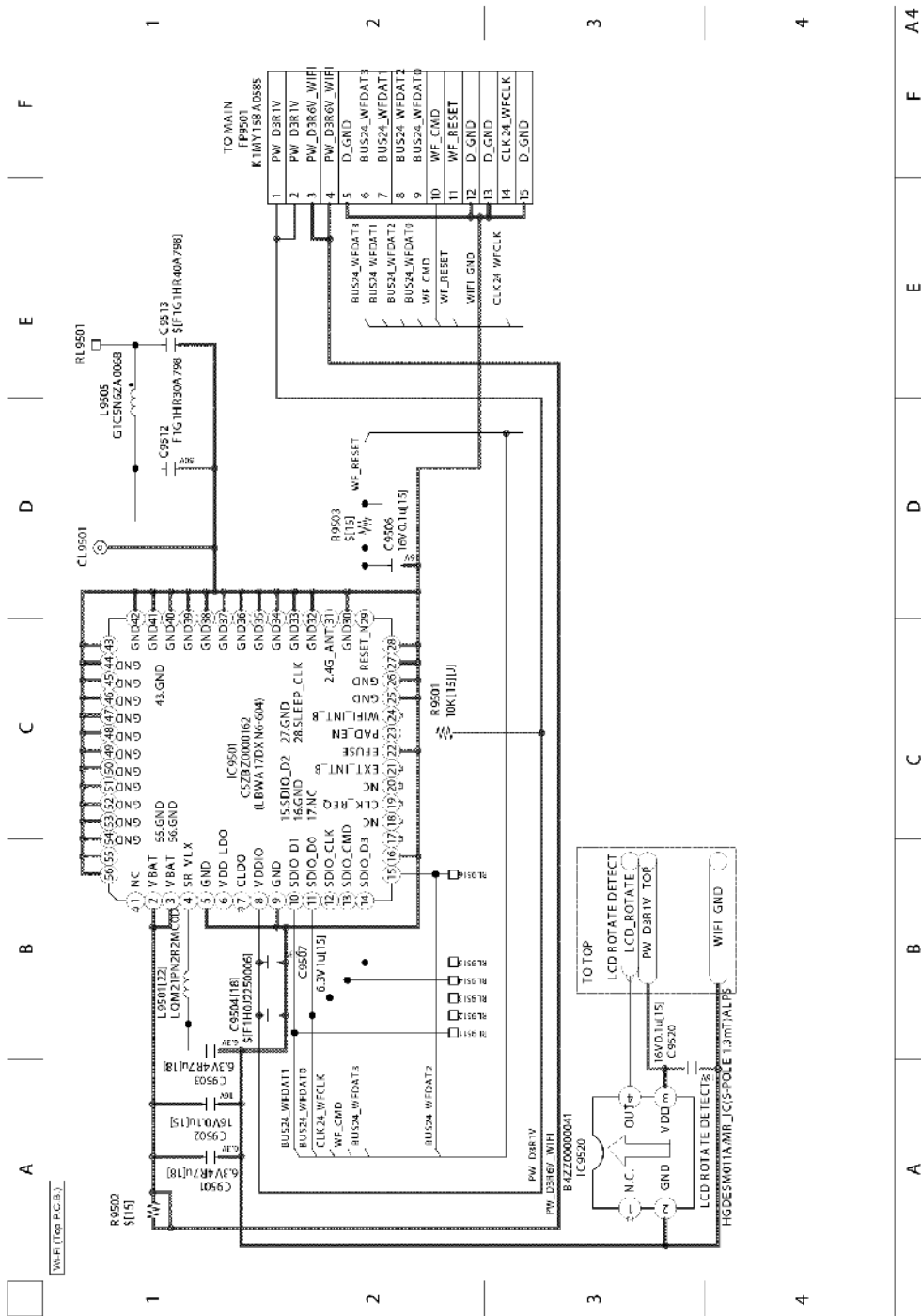
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 System Driver (SY) (Main P.C.B.)



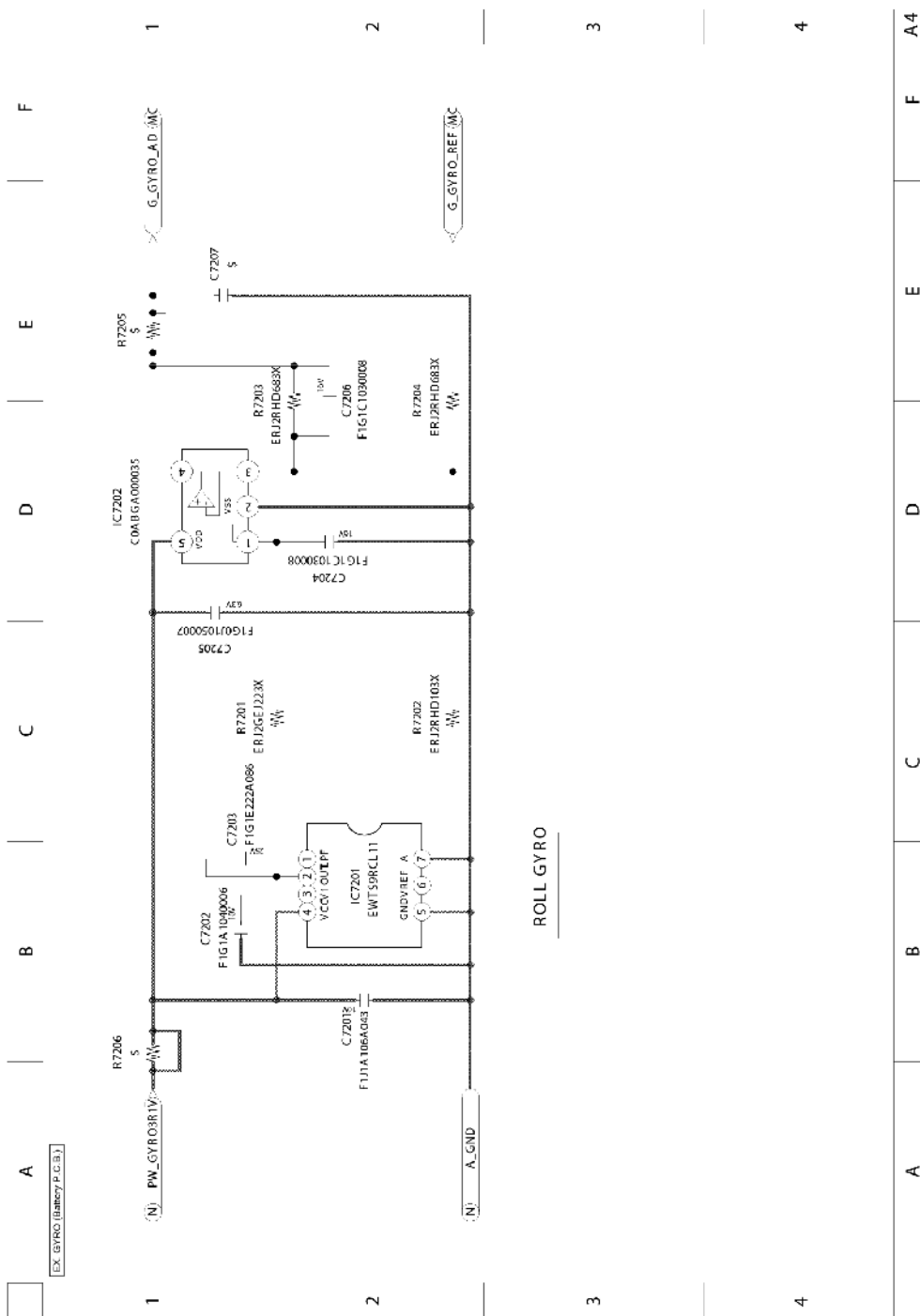
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Top (TP) (Top P.C.B.)



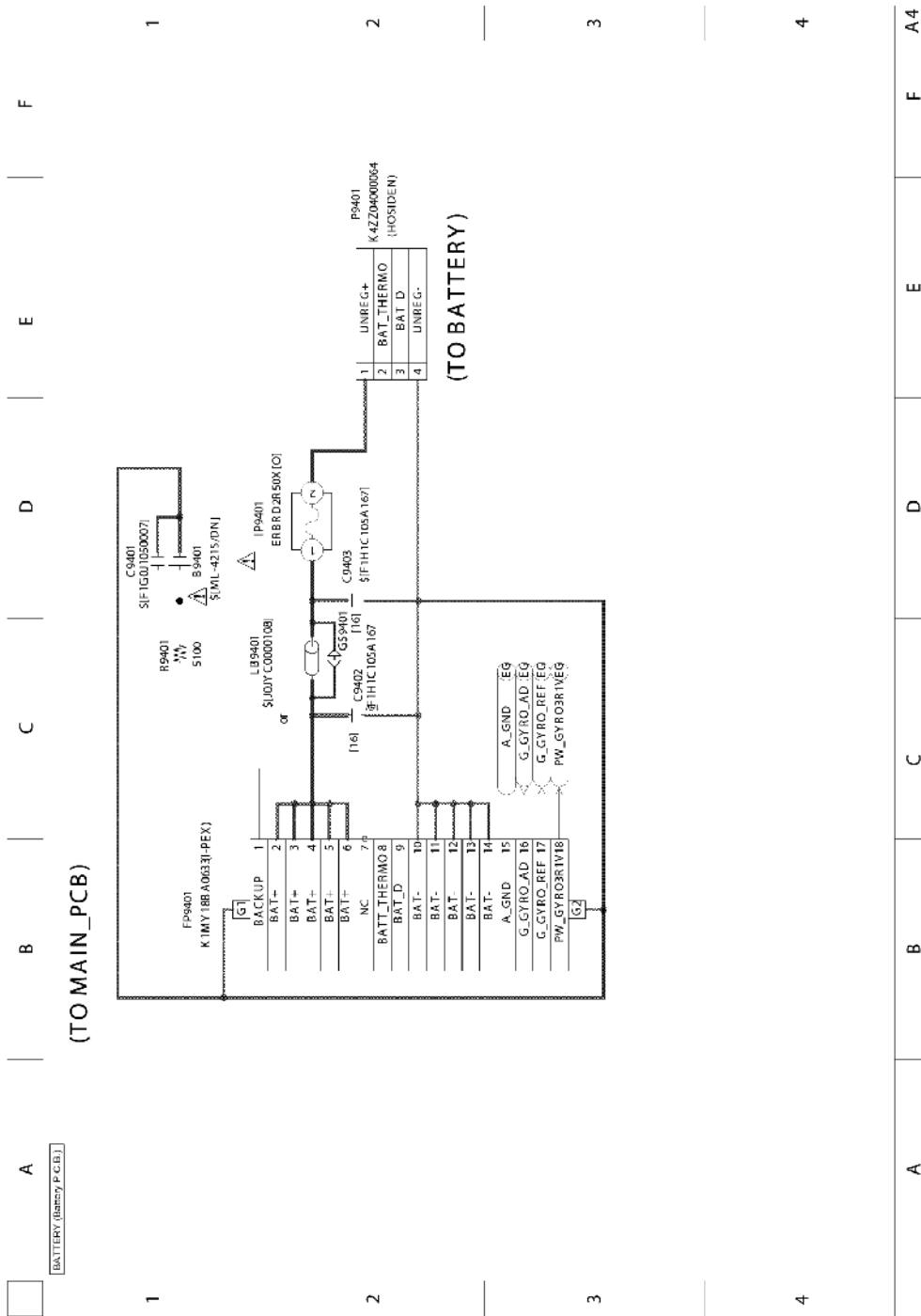
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 WIFI (W) (Top P.C.B.)



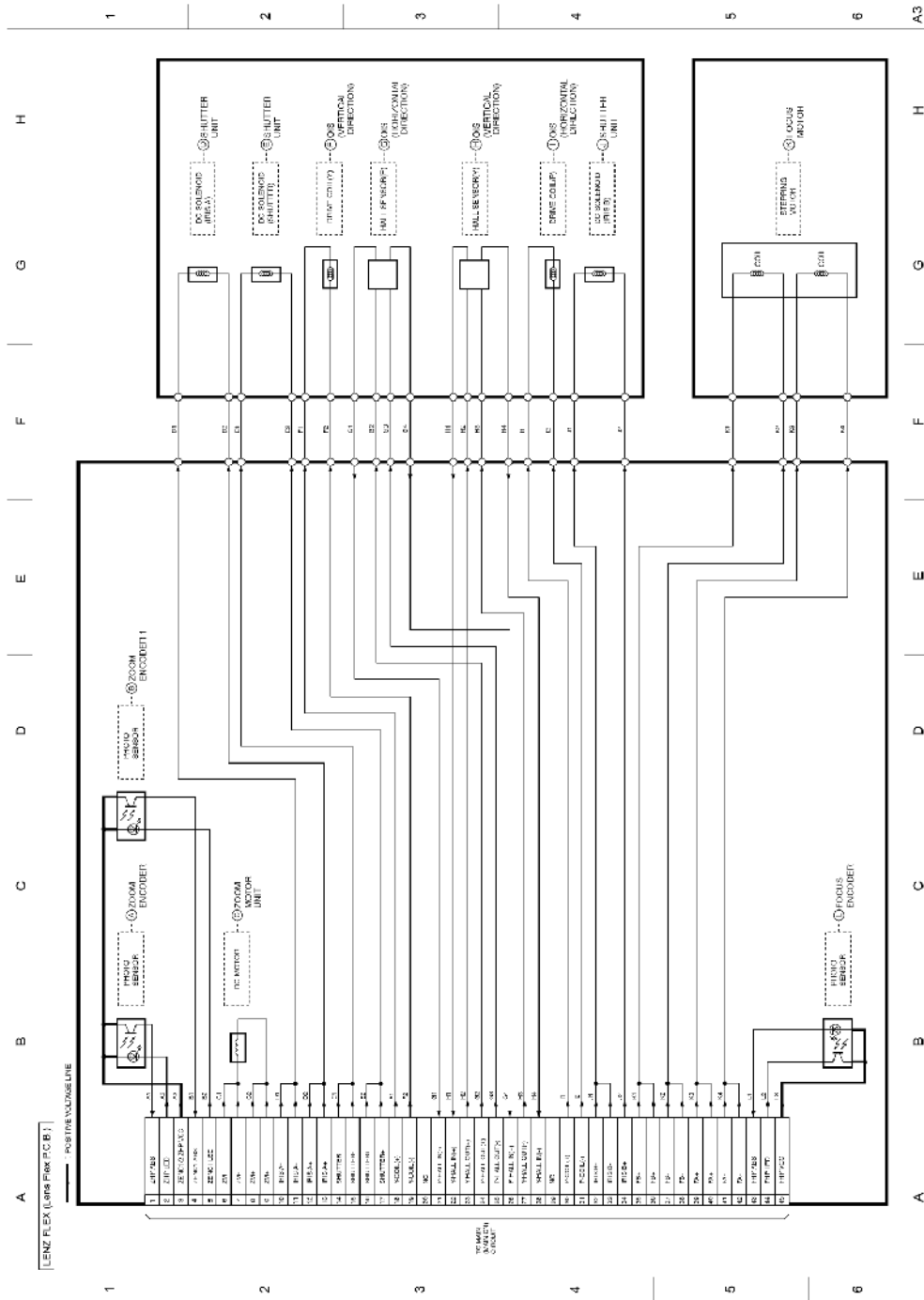
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 EX GYRO (EG) (Battery P.C.B.)



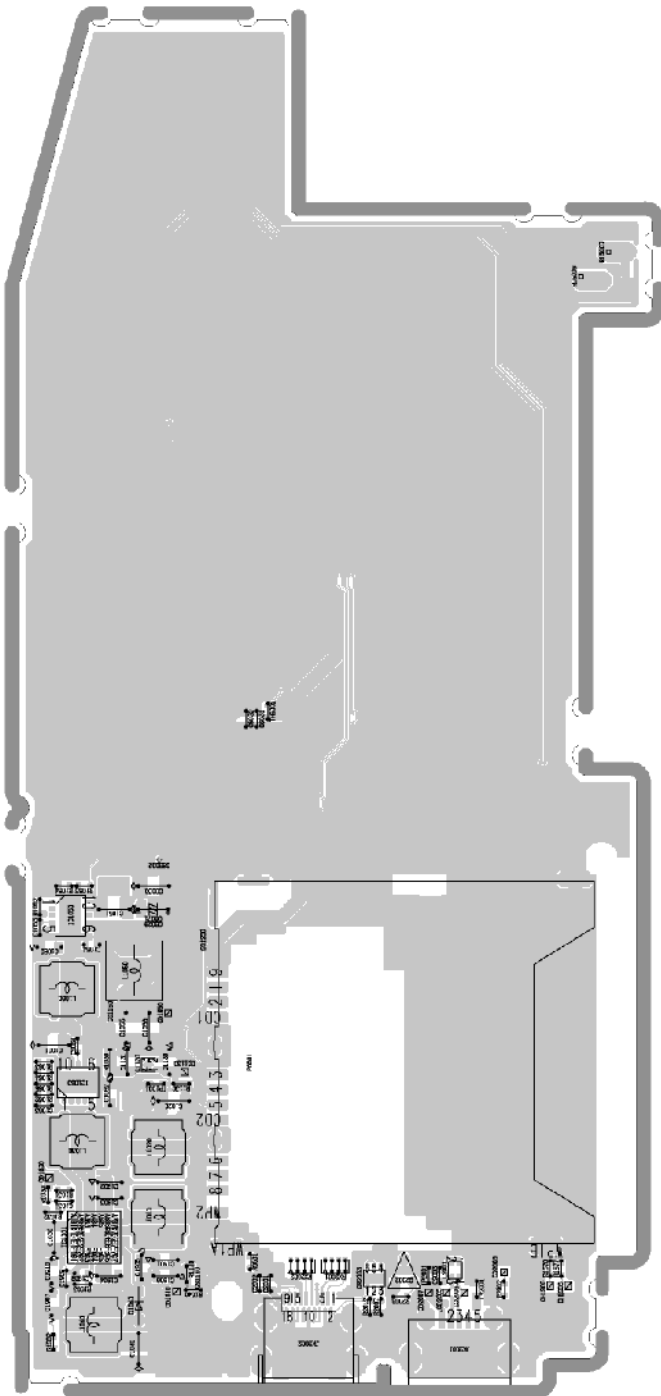
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Battery (Battery P.C.B.)



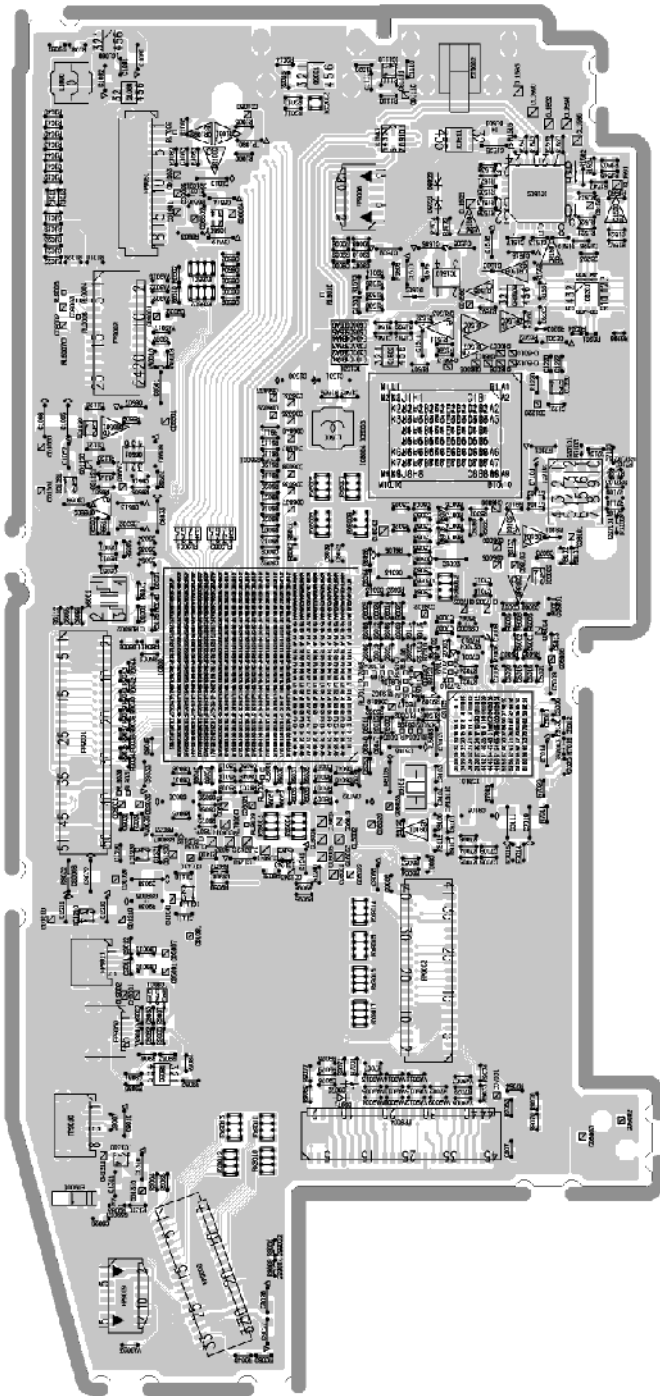
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Lens Flex (Lens Flex P.C.B.)



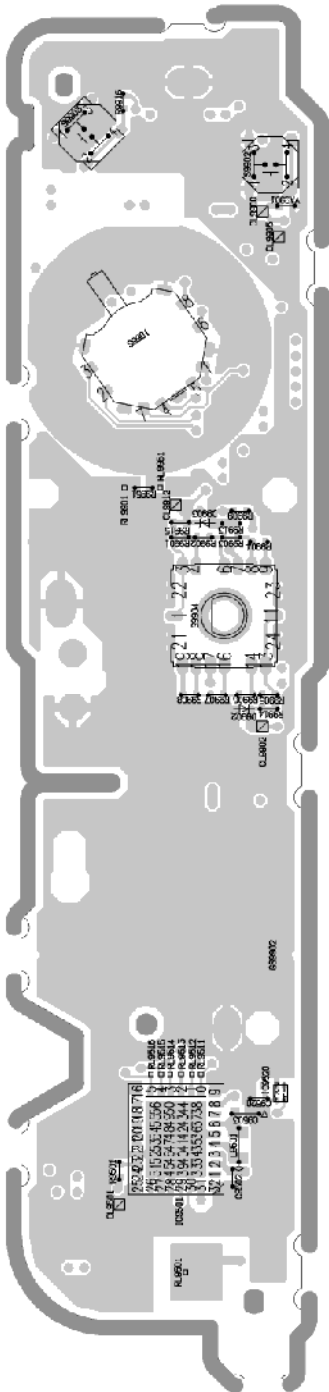
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Main P.C.B. (Component Side)



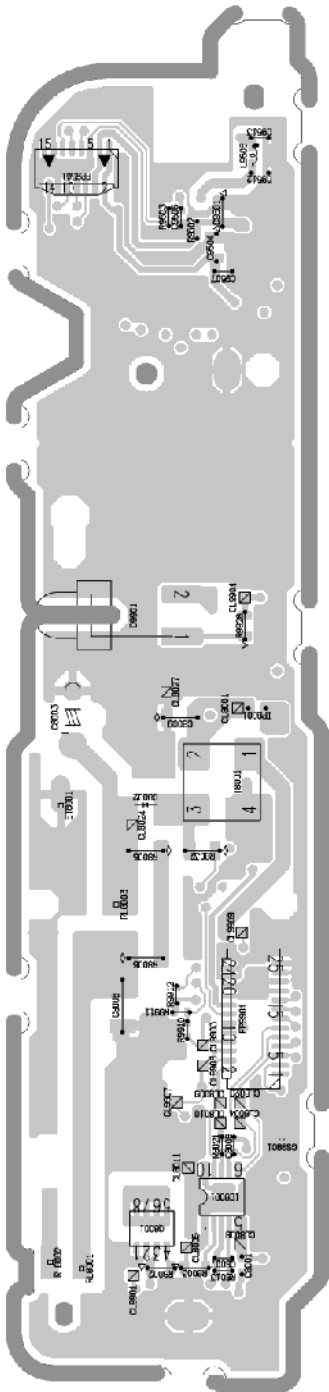
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Main P.C.B. (Foil Side)



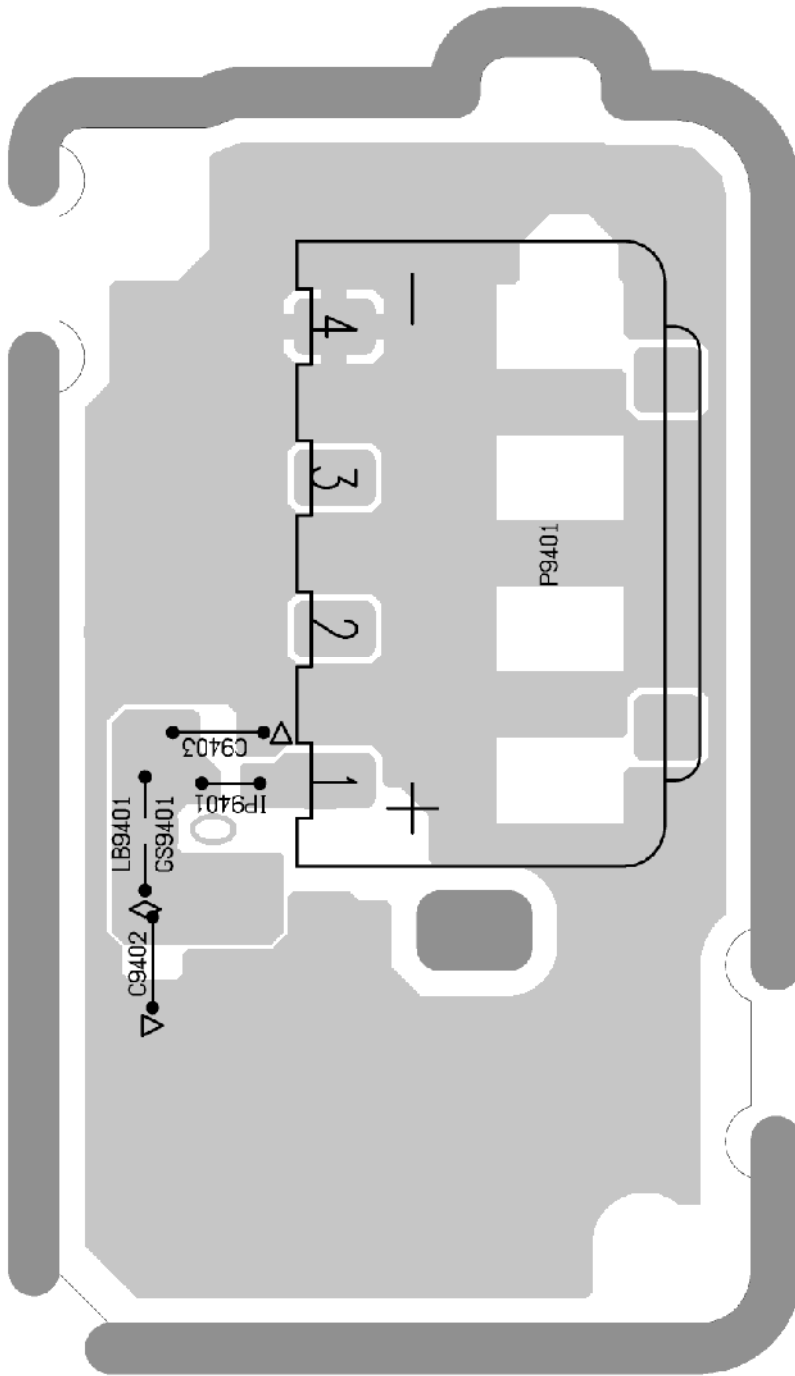
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Top P.C.B. (Component Side)



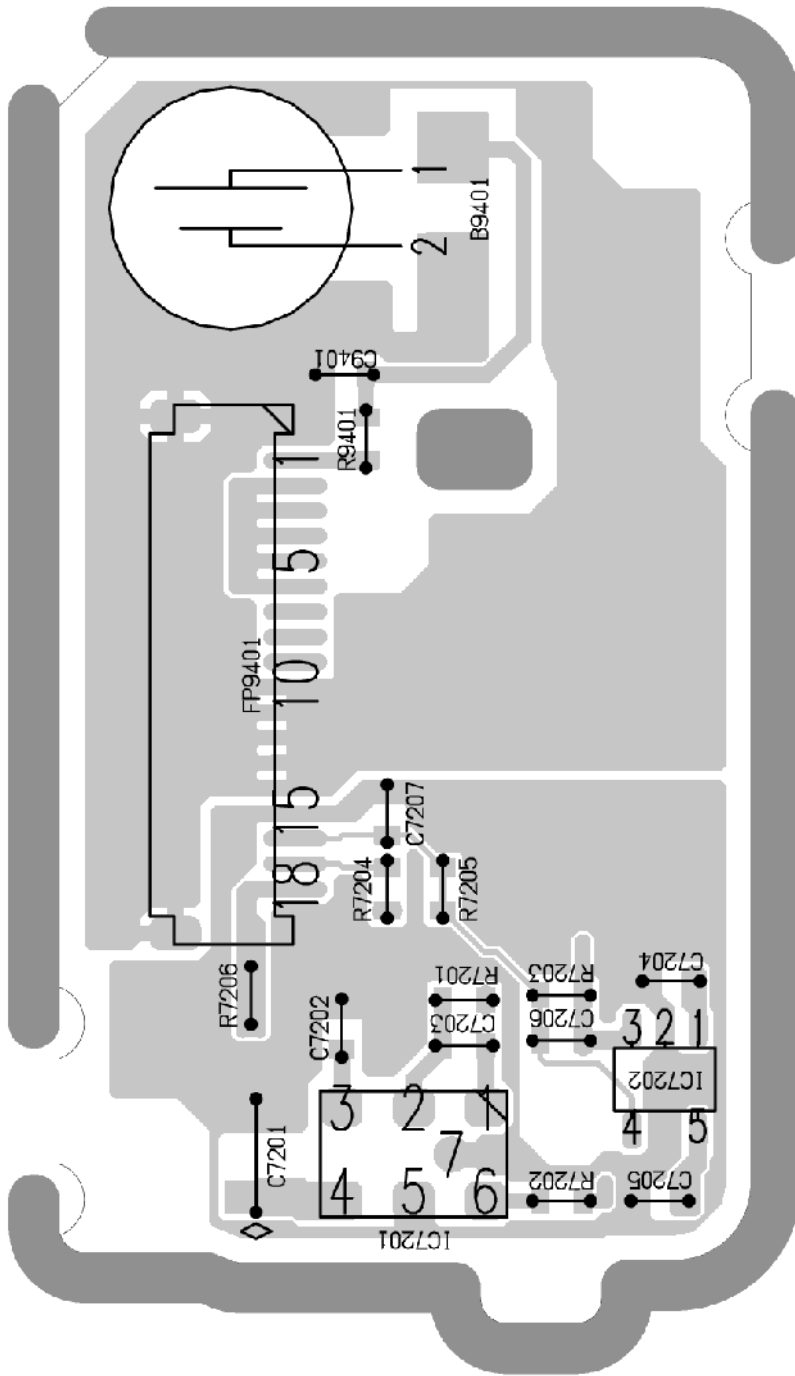
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Top P.C.B. (Foil Side)



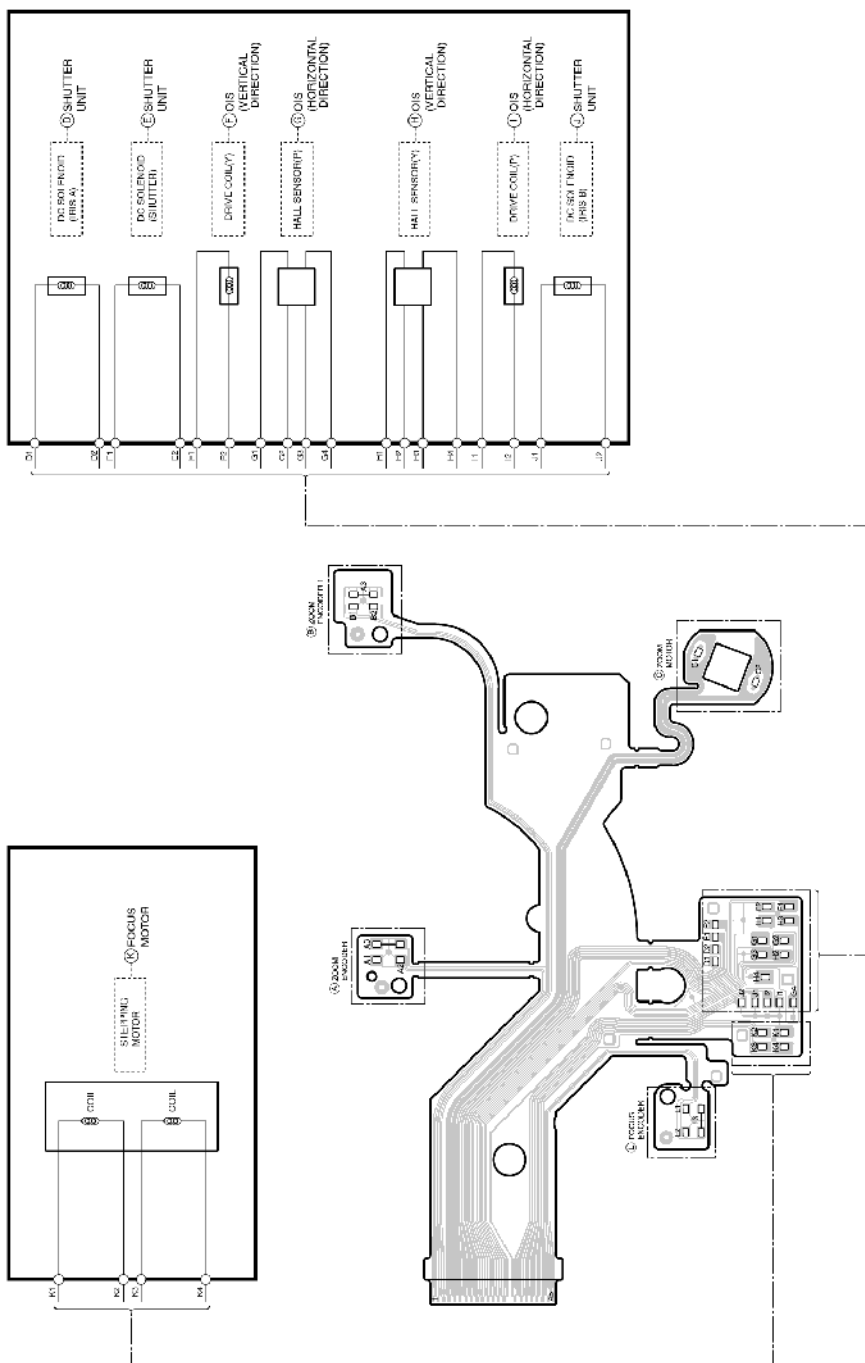
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Battery P.C.B. (Component Side)



Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Battery P.C.B. (Foil Side)



Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Lens Flex P.C.B.



Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		C1010	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C1011	F1G1H330A834	C.CAPACITOR CH 50V 33P	1	
		C1020	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C1021	F1G1H680A834	C.CAPACITOR CH 50V 68P	1	
		C1030	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C1031	F1G1H270A834	C.CAPACITOR CH 50V 27P	1	
		C1040	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C1041	F1G1H471A830	C.CAPACITOR CH 50V 470P	1	
		C1051	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C1052	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1053	F1G1H392A830	C.CAPACITOR CH 50V 3900P	1	
		C1054	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C1055	F1J0J2260004	C.CAPACITOR CH 6.3V 22U	1	
		C1056	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C1061	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C1062	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1063	F1G1H392A830	C.CAPACITOR CH 50V 3900P	1	
		C1064	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C1065	F1J0J2260004	C.CAPACITOR CH 6.3V 22U	1	
		C1066	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C1067	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1068	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1080	F1H1E105A116	C.CAPACITOR CH 25V 1U	1	
		C1081	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C1082	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1083	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C1110	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C1111	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C1120	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C1121	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C1130	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1131	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1210	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1211	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1220	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	GC, GA, GN, P, PP, GH, GT, GK
		C1221	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C1222	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	EG, EP, EF, EB
		C1230	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C1231	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C1240	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1241	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1310	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1311	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1410	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C1411	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C1501	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C1502	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C1503	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C1504	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C1505	F1H1A105A025	C.CAPACITOR CH 10V 1U	1	
		C1506	F1H0J2250008	C.CAPACITOR CH 6.3V 2.2U	1	
		C1508	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C1509	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1510	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1511	F1H1A224A012	C.CAPACITOR CH 10V 0.22U	1	
		C1512	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C1513	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C1515	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1516	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1517	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C1525	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	

		C1526	F1G1H471A830	C.CAPACITOR CH 50V 470P	1	
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Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		C1901	F1H1A475A083	C.CAPACITOR CH 10V 4.7U	1	
		C1902	F1H1A475A083	C.CAPACITOR CH 10V 4.7U	1	
		C1903	F1H1A475A083	C.CAPACITOR CH 10V 4.7U	1	
		C1904	F1H1A475A083	C.CAPACITOR CH 10V 4.7U	1	
		C1905	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1906	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1907	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C1908	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C1909	F1G1C223A146	C.CAPACITOR CH 16V 0.022U	1	
		C1910	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		C2001	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C2002	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C2003	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C5001	F1G1C223A146	C.CAPACITOR CH 16V 0.022U	1	
		C5002	F1G1C223A146	C.CAPACITOR CH 16V 0.022U	1	
		C5005	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C5006	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C5007	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C5009	F1H0J4750004	C.CAPACITOR CH 6.3V 4.7U	1	
		C5010	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C5012	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C5013	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C5015	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C5016	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C5020	F1G1H470A834	C.CAPACITOR CH 50V 47P	1	
		C5021	F1G1H470A834	C.CAPACITOR CH 50V 47P	1	
		C6001	F1G1H90A833	C.CAPACITOR CH 50V 9P	1	
		C6004	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6005	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6006	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6007	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6008	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6009	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6010	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6011	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6012	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6013	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6014	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6019	F1G1H102A830	C.CAPACITOR CH 50V 1000P	1	
		C6021	F1G1H102A830	C.CAPACITOR CH 50V 1000P	1	
		C6022	F1G1H102A830	C.CAPACITOR CH 50V 1000P	1	
		C6023	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C6024	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6025	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6026	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6027	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6028	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6030	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C6031	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6032	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6033	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C6034	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6035	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6036	F1J0J2260004	C.CAPACITOR CH 6.3V 22U	1	
		C6037	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6038	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6039	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6040	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6041	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6042	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6044	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	

		C6045	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
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Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		C6046	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C6047	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6048	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6049	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6050	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6051	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6052	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6053	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6054	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6055	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6056	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6057	F1G1H100A834	C.CAPACITOR CH 50V 10P	1	
		C6058	F1G1H102A830	C.CAPACITOR CH 50V 1000P	1	
		C6061	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6062	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6063	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6064	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6065	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6066	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6067	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6068	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6069	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6071	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C6072	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C6201	F1H0J4750004	C.CAPACITOR CH 6.3V 4.7U	1	
		C6202	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6203	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C6502	F1G1H5R0A831	C.CAPACITOR CH 50V 5P	1	
		C6503	F1G1H5R0A831	C.CAPACITOR CH 50V 5P	1	
		C6504	F1G1H5R0A831	C.CAPACITOR CH 50V 5P	1	
		C6505	F1G1H5R0A831	C.CAPACITOR CH 50V 5P	1	
		C6506	F1G1H5R0A831	C.CAPACITOR CH 50V 5P	1	
		C6507	F1H0J1060006	C.CAPACITOR CH 6.3V 10U	1	
		C6509	F1H0J4750004	C.CAPACITOR CH 6.3V 4.7U	1	
		C6510	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C6512	F1H1A105A025	C.CAPACITOR CH 10V 1U	1	
		C6513	F1H1A105A025	C.CAPACITOR CH 10V 1U	1	
		C6514	F1H1A105A025	C.CAPACITOR CH 10V 1U	1	
		C7001	F1H1A105A025	C.CAPACITOR CH 10V 1U	1	
		C7003	F1H1A105A025	C.CAPACITOR CH 10V 1U	1	
		C7006	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C7007	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C7008	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C7009	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C7010	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C7011	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C7014	F1H1A105A025	C.CAPACITOR CH 10V 1U	1	
		C7019	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C7101	F1H0J4750004	C.CAPACITOR CH 6.3V 4.7U	1	
		C7102	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C7103	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C7104	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C7105	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C7201	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C7202	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C7203	F1G1E222A086	C.CAPACITOR CH 25V 2200P	1	
		C7204	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C7205	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C7206	F1G1E103A144	C.CAPACITOR CH 25V 0.01U	1	
		C9002	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C9006	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	

		C9007	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
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Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		C9010	F1H0J4750004	C.CAPACITOR CH 6.3V 4.7U	1	
		C9027	F1H0J4750004	C.CAPACITOR CH 6.3V 4.7U	1	
		C9028	F1H0J1060006	C.CAPACITOR CH 6.3V 10U	1	
		C9029	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C9030	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C9031	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C9032	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C9033	F1H0J4750004	C.CAPACITOR CH 6.3V 4.7U	1	
		C9071	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C9078	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C9081	F1G1C104A077	C.CAPACITOR CH 16V 0.1U	1	
		C9082	F1G1H101A834	C.CAPACITOR CH 50V 100P	1	
		C9083	F1G1H101A834	C.CAPACITOR CH 50V 100P	1	
		C9085	F1H1A475A083	C.CAPACITOR CH 10V 4.7U	1	
		C9086	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C9101	F1G1H102A830	C.CAPACITOR CH 50V 1000P	1	
		C9102	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C9103	F1G1H8R0A833	C.CAPACITOR CH 50V 8P	1	
		C9104	F1G1H8R0A833	C.CAPACITOR CH 50V 8P	1	
		C9105	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	
		C9106	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C9111	F1J1A106A043	C.CAPACITOR CH 10V 10U	1	
		C9402	F1H1C105A167	C.CAPACITOR CH 16V 1U	1	
		D1040	B0ACRC000001	DIODE	1	E.S.D.
		D1501	DB2S31100L	DIODE	1	E.S.D.
		D1502	DB2S31100L	DIODE	1	E.S.D.
		D1503	DB2S31100L	DIODE	1	E.S.D.
		D9102	B0ADEJ000054	DIODE	1	E.S.D.
		D9104	B0ADEJ000054	DIODE	1	E.S.D.
		ET9002	K4CC01000001	EARTH SPRING	1	
		FL2001	EXC28CH900U	FILTER	1	
		FL2002	EXC28CH900U	FILTER	1	
		FP9001	K1MY51BA0667	CONNECTOR 51P	1	
		FP9002	K1MY25BA0556	CONNECTOR 25P	1	
		FP9003	K1MY41BA0667	CONNECTOR 41P	1	
		FP9004	K1MY45BA0667	CONNECTOR 45P	1	
		FP9006	K1MY13BA0585	CONNECTOR 13P	1	
		FP9008	K1MY33BA0556	CONNECTOR 33P	1	
		FP9009	K1MY15BA0585	CONNECTOR 15P	1	
		FP9010	K1MY08BA0557	CONNECTOR 8P	1	
		FP9011	K1MY05BA0557	CONNECTOR 5P	1	
		FP9050	K1MY06BA0557	CONNECTOR 6P	1	
		FP9051	K1MY18BA0633	CONNECTOR 18P	1	
		FP9401	K1MY18BA0633	CONNECTOR 18P	1	
		IC1001	C1ZBZ0005550	IC	1	E.S.D.
		IC1050	C0DBAYY02385	IC	1	E.S.D.
		IC1060	C0DBAYY02385	IC	1	E.S.D.
		IC1061	C0DBGYY05343	IC	1	E.S.D.
		IC1080	C0DBAYY02664	IC	1	E.S.D.
		IC1110	C0DBGYY03640	IC	1	E.S.D.
		IC1120	C0DBGYY03614	IC	1	E.S.D.
		IC1130	C0DBGYY03678	IC	1	E.S.D.
		IC1210	C0DBGYY05359	IC	1	E.S.D.
		IC1220	C0DBGYY03614	IC	1	E.S.D.
		IC1230	C0DBGYY03614	IC	1	E.S.D.
		IC1240	C0DBGYY05349	IC	1	E.S.D.
		IC1310	C0DBGYY02527	IC	1	E.S.D.
		IC1410	C0DBGYY03640	IC	1	E.S.D.
		IC1501	C1ZBZ0005562	IC	1	E.S.D.
		IC1502	SUBF000022	IC	1	E.S.D. [INBD]
		IC1503	C1CB00004574	IC	1	E.S.D.

		IC1510	C0DBGYY03972	IC	1	E.S.D.
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Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		IC1511	C0DBGYY06165	IC	1	E.S.D.
		IC6001	1SM1V09N68Z	IC	1	E.S.D.
		IC6004	1VK1DCTZ90Z	IC	1	E.S.D.
		IC6201	L2EE00000038	IC	1	E.S.D.
		IC6501	C0DBGYY00779	IC	1	E.S.D.
		IC7101	EWTS9PDL1A	IC	1	E.S.D. [INBD]
		IC7201	EWTS9RCL1A	IC	1	E.S.D. [INBD]
		IC7202	COABGA000035	IC	1	E.S.D.
		IC9001	C0JBAU000226	IC	1	E.S.D.
		IC9002	B4ZZ00000031	IC	1	E.S.D.
		IC9101	C1AB00003449	IC	1	E.S.D.
	⚠	IP1001	ERBRDR75X	FUSE 32V 750MA	1	
	⚠	IP1080	K5H1512A0024	FUSE 50V 0.15A	1	
	⚠	IP2001	ERBRD2R00X	FUSE 32V 2.0A	1	
	⚠	IP9401	ERBRD2R50X	FUSE 32V 2.5A	1	
		JK2001	K1FY105E0014	JACK, USB	1	
		JK2002	K1FY119E0057	JACK, HDMI	1	
		L1010	G1C150MA0477	CHIP INDUCTOR 15UH	1	
		L1020	G1C150MA0477	CHIP INDUCTOR 15UH	1	
		L1030	G1C150MA0477	CHIP INDUCTOR 15UH	1	
		L1040	G1C4R7MA0584	CHIP INDUCTOR 4.7UH	1	
		L1050	G1C1R5MA0943	CHIP INDUCTOR 1.5UH	1	
		L1060	G1C2R2MA0477	CHIP INDUCTOR 2.2UH	1	
		L1080	G1C100MA0392	CHIP INDUCTOR 10UH	1	
		L1500	G1C2R2MA0392	CHIP INDUCTOR 2.2UH	1	
		L2001	EXC24CE900U	FILTER	1	
		LB2001	J0JCC0000415	FILTER	1	
		LB6002	J0JFC0000006	FILTER	1	
		LB9010	J0JCC0000415	FILTER	1	
		LB9011	J0JCC0000415	FILTER	1	
		P6501	K1NA09E00166	SD CARD CONNECTOR	1	
		P9401	K4ZZ04000064	CONNECTOR 4P	1	
		Q1080	MTM861280LBF	TRANSISTOR	1	E.S.D.
		Q1502	B1CHPB000008	TRANSISTOR	1	E.S.D.
		Q1505	B1CFGC000022	TRANSISTOR	1	E.S.D.
		Q1506	B1CFGC000022	TRANSISTOR	1	E.S.D.
		Q1507	B1CFGC000022	TRANSISTOR	1	E.S.D.
		Q1508	B1ABCF000302	TRANSISTOR	1	E.S.D.
		Q2001	B1CFGD000003	TRANSISTOR	1	E.S.D.
		Q2002	B1CFJD000007	TRANSISTOR	1	E.S.D.
		Q6501	MTM861270LBF	TRANSISTOR	1	E.S.D.
		Q9081	B1HFCFA00035	TRANSISTOR	1	E.S.D.
		Q9101	B1ABCF000302	TRANSISTOR	1	E.S.D.
		QR1080	B1GBCFYY0217	TRANSISTOR-RESISTOR	1	E.S.D.
		QR1081	B1GBCFYY0218	TRANSISTOR-RESISTOR	1	E.S.D.
		QR1082	B1GBCFYY0218	TRANSISTOR-RESISTOR	1	E.S.D.
		QR1503	B1GBCFYY0224	TRANSISTOR-RESISTOR	1	E.S.D.
		QR1504	B1GBCFYY0224	TRANSISTOR-RESISTOR	1	E.S.D.
		QR1505	B1GBCFYY0224	TRANSISTOR-RESISTOR	1	E.S.D.
		QR2003	B1GKCFJN0008	TRANSISTOR-RESISTOR	1	E.S.D.
		QR6501	B1GBCFYY0217	TRANSISTOR-RESISTOR	1	E.S.D.
		QR6502	B1GDCFYY0150	TRANSISTOR-RESISTOR	1	E.S.D.
		QR9102	B1GDCFYY0150	TRANSISTOR-RESISTOR	1	E.S.D.
		R1011	D1BA5602A022	M.RESISTOR CH 1/16W 56K	1	
		R1012	D1BA1602A022	M.RESISTOR CH 1/16W 16K	1	
		R1022	D1BA6802A022	M.RESISTOR CH 1/16W 68K	1	
		R1023	D1BA2402A022	M.RESISTOR CH 1/16W 24K	1	
		R1031	D1BA1103A022	M.RESISTOR CH 1/16W 110K	1	
		R1032	D1BA2002A022	M.RESISTOR CH 1/16W 20K	1	
		R1041	D1BA1502A022	M.RESISTOR CH 1/16W 15K	1	
		R1042	D1BA6802A022	M.RESISTOR CH 1/16W 68K	1	

	R1044	D1BA3302A022	M.RESISTOR CH 1/16W 33K	1	
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Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		R1053	D1BA1002A022	M.RESISTOR CH 1/16W 10K	1	
		R1054	D1BA3002A022	M.RESISTOR CH 1/16W 30K	1	
		R1063	D1BA2202A022	M.RESISTOR CH 1/16W 22K	1	
		R1064	D1BA2002A022	M.RESISTOR CH 1/16W 20K	1	
		R1081	D1BA14R0A023	M.RESISTOR CH 1/16W 14	1	
		R1082	D0GA473JA023	M.RESISTOR CH 1/10W 47K	1	
		R1083	D0GA103JA023	M.RESISTOR CH 1/10W 10K	1	
		R1085	D0GA152JA023	M.RESISTOR CH 1/10W 1.5K	1	
		R1086	D0GA223JA023	M.RESISTOR CH 1/10W 22K	1	
		R1501	D1BA1002A022	M.RESISTOR CH 1/16W 10K	1	
		R1507	D0GA470JA023	M.RESISTOR CH 1/10W 47	1	
		R1508	D0GA332JA023	M.RESISTOR CH 1/10W 3.3K	1	
		R1509	D0GA332JA023	M.RESISTOR CH 1/10W 3.3K	1	
		R1511	D1BA6803A022	M.RESISTOR CH 1/10W 680K	1	
		R1512	D1BA3003A022	M.RESISTOR CH 1/10W 300K	1	
		R1513	D0GA103JA023	M.RESISTOR CH 1/10W 10K	1	
		R1520	D0GA364JA023	M.RESISTOR CH 1/10W 360K	1	
		R1521	D0GA564JA023	M.RESISTOR CH 1/10W 560K	1	
		R1522	D1BA3001A022	M.RESISTOR CH 1/16W 3K	1	
		R1531	D1BA8201A022	M.RESISTOR CH 1/16W 8.2K	1	
		R1560	D0GA104JA023	M.RESISTOR CH 1/10W 100K	1	
		R1561	D0GA104JA023	M.RESISTOR CH 1/10W 100K	1	
		R1573	D0GA104JA023	M.RESISTOR CH 1/10W 100K	1	
		R1591	D0GA334JA023	M.RESISTOR CH 1/10W 330K	1	
		R1592	D0GA104JA023	M.RESISTOR CH 1/10W 100K	1	
		R1593	D0GA102JA023	M.RESISTOR CH 1/10W 1K	1	
		R1902	D0GA104JA023	M.RESISTOR CH 1/10W 100K	1	
		R1903	D1BA8202A022	M.RESISTOR CH 1/16W 82K	1	
		R2007	D0GA473JA023	M.RESISTOR CH 1/10W 47K	1	
		R2008	D0GA273JA023	M.RESISTOR CH 1/10W 27K	1	
		R2010	D0GA330JA023	M.RESISTOR CH 1/10W 33	1	
		R2011	D0GA330JA023	M.RESISTOR CH 1/10W 33	1	
		R2014	D0GA202JA023	M.RESISTOR CH 1/10W 2K	1	
		R2015	D0GA202JA023	M.RESISTOR CH 1/10W 2K	1	
		R5002	D0GA333JA023	M.RESISTOR CH 1/10W 33K	1	
		R5003	D0GA333JA023	M.RESISTOR CH 1/10W 33K	1	
		R5006	D0GA222JA023	M.RESISTOR CH 1/10W 2.2K	1	
		R5008	D0GA222JA023	M.RESISTOR CH 1/10W 2.2K	1	
		R6004	D0GA103JA023	M.RESISTOR CH 1/10W 10K	1	
		R6005	D1BA5100A022	M.RESISTOR CH 1/16W 510	1	
		R6006	D1BA5100A022	M.RESISTOR CH 1/16W 510	1	
		R6007	D1BA5100A022	M.RESISTOR CH 1/16W 510	1	
		R6008	D1BA5100A022	M.RESISTOR CH 1/16W 510	1	
		R6009	D1BA5100A022	M.RESISTOR CH 1/16W 510	1	
		R6010	D1BA5100A022	M.RESISTOR CH 1/16W 510	1	
		R6011	D1BA5100A022	M.RESISTOR CH 1/16W 510	1	
		R6012	D1BA5100A022	M.RESISTOR CH 1/16W 510	1	
		R6013	D1BA5100A022	M.RESISTOR CH 1/16W 510	1	
		R6014	D1BA5100A022	M.RESISTOR CH 1/16W 510	1	
		R6015	D1BA5100A022	M.RESISTOR CH 1/16W 510	1	
		R6016	D1BA5100A022	M.RESISTOR CH 1/16W 510	1	
		R6017	D1BA2400A022	M.RESISTOR CH 1/16W 240	1	
		R6018	D1BA2400A022	M.RESISTOR CH 1/16W 240	1	
		R6019	D1BA2400A022	M.RESISTOR CH 1/16W 240	1	
		R6020	D1BA2400A022	M.RESISTOR CH 1/16W 240	1	
		R6026	D1BA6801A022	M.RESISTOR CH 1/16W 6.8K	1	
		R6027	D1BA4701A022	M.RESISTOR CH 1/16W 4.7K	1	
		R6028	D1BA2000A022	M.RESISTOR CH 1/16W 200	1	
		R6032	D0GA470JA023	M.RESISTOR CH 1/10W 47	1	
		R6035	D0GA473JA023	M.RESISTOR CH 1/10W 47K	1	
		R6039	D0GA102JA023	M.RESISTOR CH 1/10W 1K	1	

		R6041	DOGA270JA023	M.RESISTOR CH 1/10W 27	1	
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Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Parts List

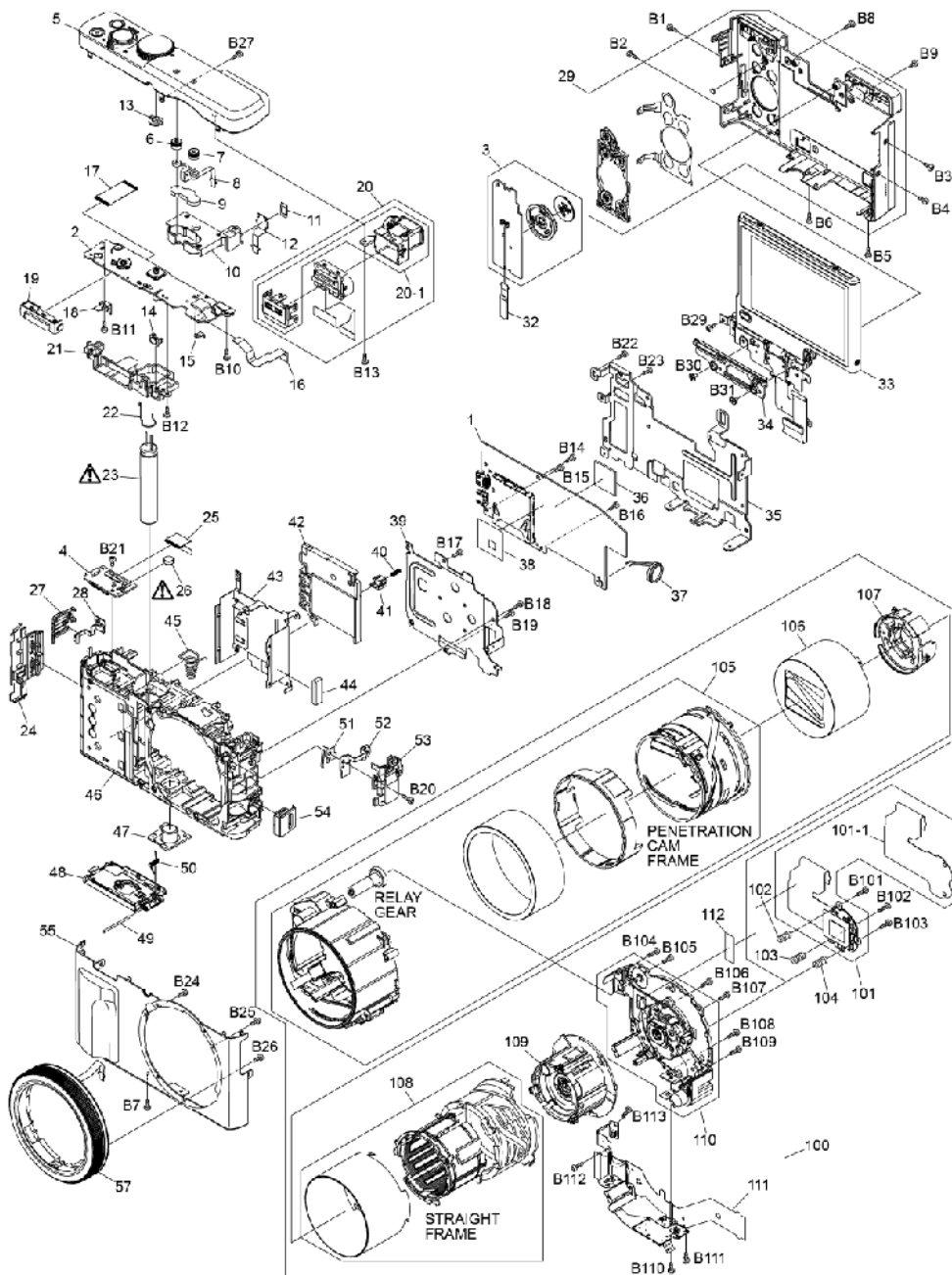
Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		R6042	DOGA470JA023	M.RESISTOR CH 1/10W 47	1	
		R6046	DOGA105JA023	M.RESISTOR CH 1/10W 1M	1	
		R6047	DOGA102JA023	M.RESISTOR CH 1/10W 1K	1	
		R6061	DOGA302JA023	M.RESISTOR CH 1/10W 3K	1	
		R6062	DOGA302JA023	M.RESISTOR CH 1/10W 3K	1	
		R6063	DOGA302JA023	M.RESISTOR CH 1/10W 3K	1	
		R6064	DOGA302JA023	M.RESISTOR CH 1/10W 3K	1	
		R6070	DOGA472JA023	M.RESISTOR CH 1/10W 4.7K	1	
		R6071	D1BA8201A022	M.RESISTOR CH 1/16W 8.2K	1	
		R6072	D1BA1002A022	M.RESISTOR CH 1/16W 10K	1	
		R6073	DOGA472JA023	M.RESISTOR CH 1/10W 4.7K	1	
		R6074	DOGA472JA023	M.RESISTOR CH 1/10W 4.7K	1	
		R6076	DOGA102JA023	M.RESISTOR CH 1/10W 1K	1	
		R6125	DOGAR00J0005	M.RESISTOR CH 1/10W 0	1	EG, EP, EF, EB
		R6501	DOGA102JA023	M.RESISTOR CH 1/10W 1K	1	
		R6502	DOGA223JA023	M.RESISTOR CH 1/10W 22K	1	
		R6504	DOGA104JA023	M.RESISTOR CH 1/10W 100K	1	
		R6505	DOGA103JA023	M.RESISTOR CH 1/10W 10K	1	
		R6509	DOGA331JA023	M.RESISTOR CH 1/10W 330	1	
		R6510	DOGA330JA023	M.RESISTOR CH 1/10W 33	1	
		R7002	D1BA68R0A022	M.RESISTOR CH 1/16W 68	1	
		R7007	D1BA68R0A022	M.RESISTOR CH 1/16W 68	1	
		R7009	D1BA1R00A079	M.RESISTOR CH 1/16W 1	1	
		R7021	D1BA8201A022	M.RESISTOR CH 1/16W 8.2K	1	
		R7201	DOGA223JA023	M.RESISTOR CH 1/10W 22K	1	
		R7202	D1BA1002A022	M.RESISTOR CH 1/16W 10K	1	
		R7203	D1BA6802A022	M.RESISTOR CH 1/16W 68K	1	
		R7204	D1BA6802A022	M.RESISTOR CH 1/16W 68K	1	
		R9006	DOGA103JA023	M.RESISTOR CH 1/10W 10K	1	
		R9008	DOGA103JA023	M.RESISTOR CH 1/10W 10K	1	
		R9009	DOGA392JA023	M.RESISTOR CH 1/10W 3.9K	1	
		R9010	DOGA392JA023	M.RESISTOR CH 1/10W 3.9K	1	
		R9014	DOGA681JA023	M.RESISTOR CH 1/10W 680	1	
		R9031	DOGA102JA023	M.RESISTOR CH 1/10W 1K	1	
		R9069	DOGA183JA023	M.RESISTOR CH 1/10W 18K	1	
		R9070	DOGA183JA023	M.RESISTOR CH 1/10W 18K	1	
		R9071	DOGA151JA023	M.RESISTOR CH 1/10W 150	1	
		R9073	DOGA331JA023	M.RESISTOR CH 1/10W 330	1	
		R9074	DOGA331JA023	M.RESISTOR CH 1/10W 330	1	
		R9075	DOGA103JA023	M.RESISTOR CH 1/10W 10K	1	
		R9077	DOGA223JA023	M.RESISTOR CH 1/10W 22K	1	
		R9078	DOGA223JA023	M.RESISTOR CH 1/10W 22K	1	
		R9079	DOGA752JA023	M.RESISTOR CH 1/10W 7.5K	1	
		R9081	D1BA2201A022	M.RESISTOR CH 1/16W 2.2K	1	
		R9082	D1BA75R0A022	M.RESISTOR CH 1/16W 75	1	
		R9083	D1BA2202A022	M.RESISTOR CH 1/16W 22K	1	
		R9084	DOGA302JA023	M.RESISTOR CH 1/10W 3K	1	
		R9085	DOGA680JA023	M.RESISTOR CH 1/10W 68	1	
		R9086	DOGA473JA023	M.RESISTOR CH 1/10W 47K	1	
		R9087	DOGA473JA023	M.RESISTOR CH 1/10W 47K	1	
		R9097	DOGA182JA023	M.RESISTOR CH 1/10W 1.8K	1	
		R9101	DOGA102JA023	M.RESISTOR CH 1/10W 1K	1	
		R9102	DOGA102JA023	M.RESISTOR CH 1/10W 1K	1	
		R9103	DOGA102JA023	M.RESISTOR CH 1/10W 1K	1	
		R9106	ERJ2RKD105	M.RESISTOR CH 1/16W 1M	1	
		R9107	D1BA2203A022	M.RESISTOR CH 1/16W 220K	1	
		R9109	DOGA331JA023	M.RESISTOR CH 1/10W 330	1	
		R9114	D1BA3902A022	M.RESISTOR CH 1/16W 39K	1	
		R9115	D1BA1203A022	M.RESISTOR CH 1/16W 120K	1	
		R9119	D1BA3302A022	M.RESISTOR CH 1/16W 33K	1	
		R9120	D1BA7502A022	M.RESISTOR CH 1/16W 75K	1	

		R9133	DOGA473JA023	M.RESISTOR CH 1/10W 47K	1	
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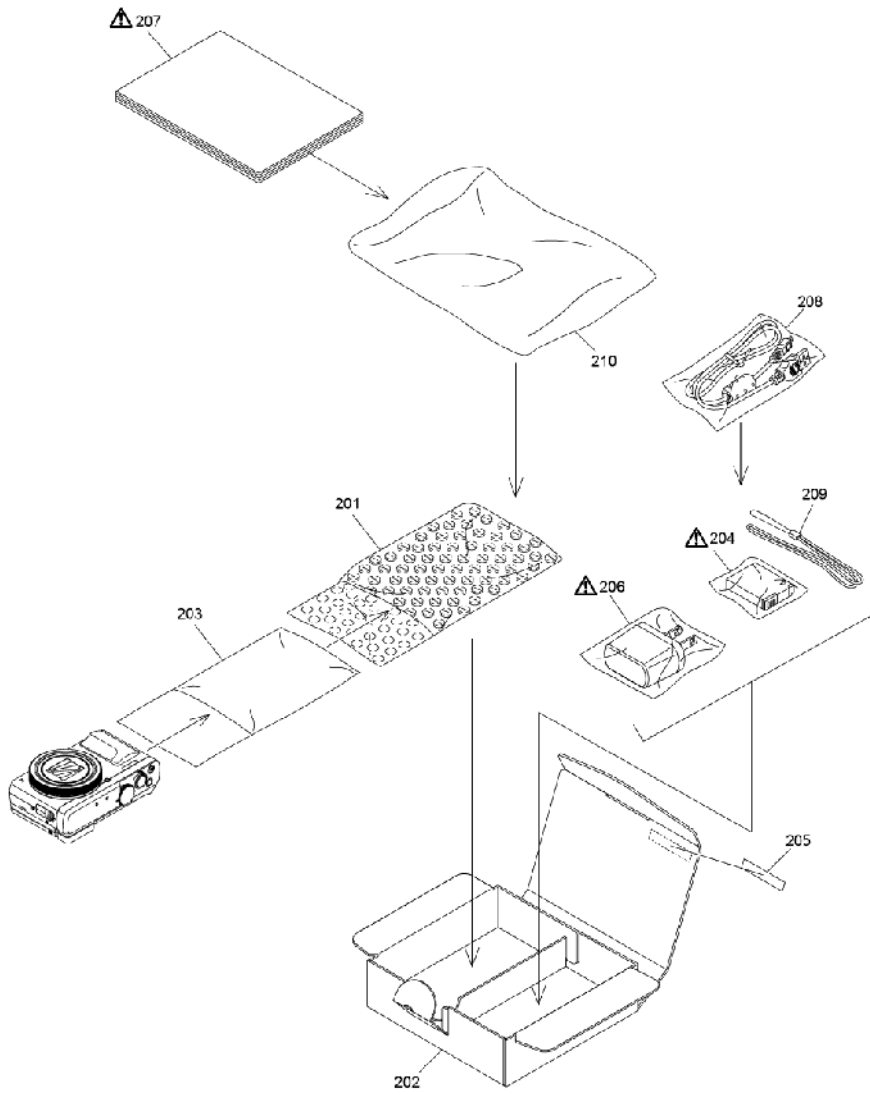
Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		R9401	DOGA512JA023	M.RESISTOR CH 1/10W 5.1K	1	
		RX2003	EXB24V472JX	RESISTOR NETWORKS	1	
		RX6003	D1H84734A042	RESISTOR NETWORKS	1	
		RX6005	D1H81014A042	RESISTOR NETWORKS	1	
		RX6006	D1H81014A042	RESISTOR NETWORKS	1	
		RX6007	D1H81014A042	RESISTOR NETWORKS	1	
		RX6008	D1H81014A042	RESISTOR NETWORKS	1	
		RX6012	D1H81034A042	RESISTOR NETWORKS	1	
		RX6501	D1H84734A042	RESISTOR NETWORKS	1	
		RX6502	D1H83304A042	RESISTOR NETWORKS	1	
		RX9010	D1H84704A042	RESISTOR NETWORKS	1	
		RX9011	D1H84704A042	RESISTOR NETWORKS	1	
		RX9012	D1H84704A042	RESISTOR NETWORKS	1	
		RX9013	D1H84704A042	RESISTOR NETWORKS	1	
		RX9014	D1H84704A042	RESISTOR NETWORKS	1	
		RX9015	D1H84704A042	RESISTOR NETWORKS	1	
		RX9016	D1H84704A042	RESISTOR NETWORKS	1	
		RX9017	D1H84704A042	RESISTOR NETWORKS	1	
		TH6001	D4CC11030013	THERMISTOR	1	
		VA9001	D4ED18R00004	VARISTOR	1	
		VA9002	D4ED18R00004	VARISTOR	1	
		VA9004	D4ED18R00004	VARISTOR	1	
		VA9005	D4ED18R00004	VARISTOR	1	
		VA9006	D4ED18R00004	VARISTOR	1	
		VA9007	D4ED18R00004	VARISTOR	1	
		VA9008	D4ED18R00004	VARISTOR	1	
		VA9009	D4ED18R00004	VARISTOR	1	
		VA9010	D4ED18R00004	VARISTOR	1	
		VA9011	D4ED18R00004	VARISTOR	1	
		VA9012	D4ED18R00004	VARISTOR	1	
		VA9013	D4ED18R00004	VARISTOR	1	
		VA9014	D4ED18R00004	VARISTOR	1	
		VA9015	D4ED18R00004	VARISTOR	1	
		X6001	H0J240500048	CRYSTAL OSCILLATOR	1	
		X9101	H0J327200230	CRYSTAL OSCILLATOR	1	

Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Frame and Casing Section



Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Packing Parts and Accessories Section



Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		1	1PB1DV1071Y	MAIN P.C.B.	1	(RTL) E.S.D. TZ90EG, TZ90EP, TZ90EF, TZ90EB, TZ91EG, TZ92EF, TZ93EB
		1	1PB1DV1071Z	MAIN P.C.B.	1	(RTL) E.S.D. TZ90GC, TZ90GA, TZ90GN, ZS70P, ZS70PP, ZS70GH, ZS70GT, ZS70GK
		2	DVVE1013Z	TOP P.C.B. UNIT	1	E.S.D.
		3	SYQ0678	REAR OPERATION P.C.B. UNIT	1	
		4	1PB1DV1074Z	BATTERY P.C.B.	1	(RTL) E.S.D.
		5	DVYE1023Z	TOP CASE UNIT	1	
		6	VMT2027	MIC DAMPER	1	
		7	VMT2027	MIC DAMPER	1	
		8	SEP0752AB	MIC UNIT	1	
		9	DVHX1065Z	MIC SPACER	1	
		10	DVUF1007Z	MIC HOLDER	1	
		11	DVHX1098Z	EYE SENSOR SHEET	1	
		12	SEP0718AB	EYE SENSOR FPC	1	E.S.D.
		13	SGQ0691	MODE PLATE	1	
		14	VGL1365	AF PANEL LIGHT	1	
		15	SMP0289	TOP EARTH PLATE B	1	
		16	STJ0176	WIFI FPC	1	
		17	STJ0173	TOP FPC	1	
		18	VMP0H67	TOP EARTH PLATE	1	
		19	EFN-AMFH9ZD	FLASH UNIT	1	
		20	2KE1CTZ90K	LVF UNIT	1	
		20-1	2KE2CTZ90K	LVF COVER UNIT	1	
		21	SGQ0683	FLASH SPACER	1	
		22	SMB0189	EARTH SPRING	1	
	⚠	23	F2A2F8200003	E.CAPACITOR	1	(C8003)
		24	DVYE1022Z	JACK COVER UNIT	1	(-K)
		24	DVYE1027Z	JACK COVER UNIT	1	(-S)
		25	STJ0174	BATTERY FPC	1	
	⚠	26	ML-421S/DB	BUTTON BATTERY	1	(B9401)
		27	DVKV1008Z	STRAP COVER (L)	1	(-K)
		27	DVKV1012Z	STRAP COVER (L)	1	(-S)
		28	DVME1058Z	STRAP PLATE (L)	1	
		29	1KM1DC2702Z	REAR CASE UNIT	1	GC-K, GA-K, GN-K, P-K, PP-K, GH-K, GT-K, GK-K
		29	2KM1DC2702Z	REAR CASE UNIT	1	EG-K, EP-K, EF-K, EB-K
		29	5KM1DC2702Z	REAR CASE UNIT	1	GC-S, GA-S, GN-S, P-S, PP-S, GH-S, GT-S, GK-S
		29	6KM1DC2702Z	REAR CASE UNIT	1	EG-S, EP-S, EF-S, EB-S
		32	STJ0175	REAR OPERATION FPC	1	
		33	5KM1CTZ90K	LCD UNIT	1	(-K)
		33	5KM1CTZ90S	LCD UNIT	1	(-S)
		34	DVKV1010Z	HINGE COVER	1	(-K)
		34	DVKV1014Z	HINGE COVER	1	(-S)
		35	DVME1060Z	FRAME PLATE	1	
		36	SJD0034	HEAT RADIATION PAD	1	
		37	L0AA01A00182	SPEAKER	1	
		38	SGS0084	CU PROTECT SHEET	1	
		39	SMP0240	LENS FIX PLATE	1	
		40	VMB4304	BATTERY LOCK SPRING	1	
		41	SGQ0697	BATTERY LOCK KNOB	1	
		42	SGQ0682	PCB SPACER	1	
		43	SMP0236	BATTERY CASE	1	
		44	SJQ0026	GASKET	1	
		45	VMB4851	BATTER OUT SPRING	1	
		46	DVUW1014Z	FRAME	1	
		47	VGQ1S23	TRIPOD	1	
		48	1KK1CTZ90K	BATTERY DOOR UNIT	1	(-K)
		48	1KK1CTZ90S	BATTERY DOOR UNIT	1	(-S)

		49	VMS8342	BATT DOOR SHAFT	1	
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Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		50	VMB4767	BATTERY DOOR SPRING	1	
		51	SMP0290	FRONT EARTH PLATE	1	
		52	DVME1059Z	STRAP PLATE (R)	1	
		53	DVKV1009Z	STRAP COVER (R)	1	(-K)
		53	DVKV1013Z	STRAP COVER (R)	1	(-S)
		54	SYK1383	SPEAKER FIX PLATE UNIT	1	
		55	DVYE1021Z	FRONT CASE UNIT	1	(-K)
		55	DVYE1026Z	FRONT CASE UNIT	1	(-S)
		57	1KE1CTZ90K	CONTROL RING UNIT	1	
		100	SXW0317	LENS UNIT (W/O MOS)	1	
		101	1SE1Z191K3Z	MOS UNIT	1	
		101-1	SZT0250	HEAT RADIATION SHEET	1	
		102	VMB4601	TILT SPRING	1	
		103	VMB4601	TILT SPRING	1	
		104	VMB4601	TILT SPRING	1	
		105	SXW0065	FIX FRAME UNIT	1	
		106	VXP3972	1ST LENS FRAME UNIT	1	
		107	VXP3977	2ND LENS FRAME UNIT	1	
		108	SXW0063	BOTH SIDE CUM FRAME UNIT	1	
		109	VXP3978	3RD LENS FRAME UNIT	1	
		110	SXQ0667	MASTER FLANGE UNIT	1	
		111	SEQ0132	LENS FPC UNIT	1	
		112	SZT0247	LENS TAPE	1	
		B1	VHD2240	SCREW	1	
		B2	VHD2240	SCREW	1	
		B3	VHD2240	SCREW	1	
		B4	VHD2240	SCREW	1	
		B5	VHD2240	SCREW	1	
		B6	VHD2240	SCREW	1	
		B7	VHD2240	SCREW	1	
		B8	DVHD1040Z	SPECIAL SCREW	1	
		B9	VHD2408	SCREW	1	
		B10	VHD2369	SCREW	1	
		B11	VHD2369	SCREW	1	
		B12	VHD2369	SCREW	1	
		B13	VHD2369	SCREW	1	
		B14	VHD2369	SCREW	1	
		B15	VHD2369	SCREW	1	
		B16	VHD2369	SCREW	1	
		B17	VHD2369	SCREW	1	
		B18	VHD2369	SCREW	1	
		B19	VHD2369	SCREW	1	
		B20	VHD2369	SCREW	1	
		B21	VHD2409	SCREW	1	
		B22	VHD2239	SCREW	1	
		B23	VHD2239	SCREW	1	
		B24	VHD2457	SCREW	1	
		B25	VHD2457	SCREW	1	
		B26	VHD2457	SCREW	1	
		B27	VHD2371	SCREW	1	
		B29	VHD2515	SCREW	1	
		B30	VHD1900	SCREW	1	
		B31	VHD1900	SCREW	1	
		B101	VHD2388	SCREW	1	
		B102	VHD2388	SCREW	1	
		B103	VHD2388	SCREW	1	
		B104	VHD2390	SCREW	1	
		B105	VHD2390	SCREW	1	
		B106	VHD2390	SCREW	1	
		B107	VHD2390	SCREW	1	
		B108	VHD2390	SCREW	1	

		B109	VHD2390	SCREW	1	
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Model No. : DMC-TZ90/TZ91/TZ92/TZ93/ZS70 Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		B110	VHD2451	SCREW	1	
		B111	VHD2451	SCREW	1	
		B112	VHD2492	SCREW	1	
		B113	VHD2492	SCREW	1	
		201	SPF0014	PROTECTION BAG	1	
		202	DVFK1084Z	PACKING CASE	1	TZ90EG, TZ90EP, TZ90EF, TZ90EB, TZ90GC, TZ90GA, TZ90GN
		202	DVFK1085Z	PACKING CASE	1	TZ91EG
		202	DVFK1086Z	PACKING CASE	1	TZ92EF
		202	DVFK1087Z	PACKING CASE	1	TZ93EB
		202	DVFK1082Z	PACKING CASE	1	ZS70P, ZS70PP
		202	DVFK1083Z	PACKING CASE	1	ZS70GH, ZS70GT
		202	DVFK1088Z	PACKING CASE	1	ZS70GK
		203	SPF0065	CAMERA BAG	1	
	⚠	204	-----	BATTERY PACK	1	
		205	VQL2T97	COLOR LABEL	1	-S (except GK)
		205	VQL2V11	COLOR LABEL	1	GK-S
	⚠	206	SAE0012DB	AC ADAPTOR	1	TZ90EG, TZ90EP, TZ90EF, TZ90GA, TZ91EG, TZ92EF
	⚠	206	SAE0012FB	AC ADAPTOR	1	TZ90EB, TZ93EB, ZS70GH
	⚠	206	SAE0012HB	AC ADAPTOR	1	TZ90GC
	⚠	206	SAE0012GB	AC ADAPTOR	1	TZ90GN
	⚠	206	SAE0012AB	AC ADAPTOR	1	ZS70P, ZS70PP, ZS70GT
	⚠	206	SAE0012CB	AC ADAPTOR	1	ZS70GK
	⚠	207	DVQX1225Z	BASIC O/I (GERMAN)	1	TZ90EG, TZ91EG
	⚠	207	DVQX1226Z	BASIC O/I (FRENCH)	1	TZ90EG, TZ90EF, TZ91EG, TZ92EF
	⚠	207	DVQX1227Z	BASIC O/I (ITALIAN)	1	TZ90EG
	⚠	207	DVQX1228Z	BASIC O/I (DUTCH)	1	TZ90EG, TZ90EF, TZ92EF
	⚠	207	DVQX1229Z	BASIC O/I (SPANISH)	1	TZ90EG
	⚠	207	DVQX1230Z	BASIC O/I (PORTUGUESE)	1	TZ90EG
	⚠	207	DVQX1231Z	BASIC O/I (FINNISH)	1	TZ90EP
	⚠	207	DVQX1232Z	BASIC O/I (DANISH)	1	TZ90EP
	⚠	207	DVQX1233Z	BASIC O/I (SWEDISH)	1	TZ90EP
	⚠	207	DVQX1234Z	BASIC O/I (POLISH)	1	TZ90EP
	⚠	207	DVQX1235Z	BASIC O/I (CZECH)	1	TZ90EP
	⚠	207	DVQX1236Z	BASIC O/I (HUNGARIAN)	1	TZ90EP
	⚠	207	DVQX1237Z	BASIC O/I (ENGLISH)	1	TZ90EB, TZ93EB
	⚠	207	DVQX1240Z	BASIC O/I (ENGLISH)	1	TZ90GC
	⚠	207	DVQX1241Z	BASIC O/I (ARABIC)	1	TZ90GC
	⚠	207	DVQX1242Z	BASIC O/I (ENGLISH)	1	TZ90GA, ZS70GH
	⚠	207	DVQX1243Z	BASIC O/I (CHINESE (TRADITIONAL))	1	TZ90GA, ZS70GH
	⚠	207	DVQX1246Z	BASIC O/I (ENGLISH)	1	TZ90GN
	⚠	207	DVQX1222Z	BASIC O/I (ENGLISH)	1	ZS70P, ZS70PP
	⚠	207	DVQX1223Z	BASIC O/I (SPANISH)	1	ZS70P, ZS70PP
	⚠	207	DVQX1224Z	BASIC O/I (FRENCH)	1	ZS70PP
	⚠	207	DVQX1244Z	BASIC O/I (CHINESE (TRADITIONAL))	1	ZS70GT
	⚠	207	DVQX1245Z	BASIC O/I (CHINESE (SIMPLIFIED))	1	ZS70GK
		208	K1HY04YY0106	USB CABLE	1	
		209	VFC4297	HAND STRAP	1	
		210	VPF1553	BAG, POLYETHYLENE	1	