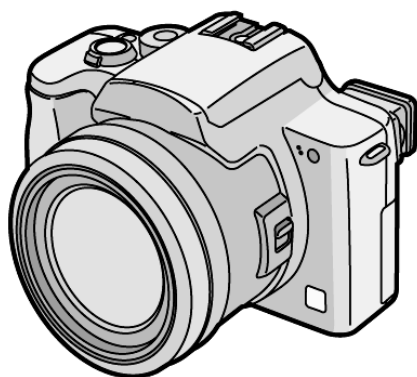


Service Manual

Digital Camera

LUMIX
SD™ LEICA
DC VARIO-ELMARIT



DMC-FZ20PP
DMC-FZ20EB
DMC-FZ20EG
DMC-FZ20EGM
DMC-FZ20GC
DMC-FZ20GD
DMC-FZ20GN
DMC-FZ20SG

Vol. 1

Colour

(S).....Silver Type (Except DMC-FZ20EB)

(K).....Black Type

Panasonic

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SPECIFICATIONS

ITEM	SPECIFICATION	ITEM	SPECIFICATION
Camera Effective pixels	5,000,000 Pixels	Flash	Built-in pop up flash, Flash range: (ISO AUTO) approx. 0.98 feet (30 cm) - 23.0 feet (7 m)
Image sensor	1/2.5" CCD, total pixel number 5,360,000 pixels Primary color filter		AUTO, AUTO/Red-eye reduction, Forced ON (Forced ON/Red-eye reduction), Slow sync./Red-eye reduction, Forced OFF
Lens	Optical 12× zoom, f=6-72 mm (35mm film camera equivalent: 36-432 mm)/F2.8		
Digital zoom	Max. 4×	Microphone	Monaural
Focus	TTL Normal/Macro/Manual/9-area-focusing/ 3-area-focusing/1-area-focusing/Spot-focusing	Speaker	Monaural
Focus range	0.98 feet (30 cm) (Wide)/ 6.56 feet (200 cm) (Tele)-∞	Recording media	SD Memory Card/MultiMediaCard
	Macro/Aperture-priority AE/Shutter-priority AE/ Manual exposure: 0.16 feet (5 cm) (Wide)/ 6.56 feet (200 cm) (Tele)-∞	Recording size	2560×1920, 2048×1536, 1600×1200, 1280×960, 640×480, 1920×1080 pixels (Still picture) 320×240 pixels (Motion image)
		Quality	Fine/Standard/TIFF
Shutter system	Electronic shutter + Mechanical shutter	Recording file format	Still Picture: JPEG (Design rule for Camera File system, based on Exif 2.2 standard)/TIFF (RGB), DPOF corresponding Still picture with audio: JPEG (Design rule for Camera File system, based on Exif 2.2 standard) + 640×480 pixels QuickTime (picture with audio) Motion image: QuickTime Motion JPEG (motion images with audio)
Burst recording	Burst speed: 3 frames/second (high speed), 2 frames/second (low speed), Approx. 2 frames/second (no limit) Number of recordable picture: Max 7 frames (standard)/max. 4 frames (fine), Depends on the capacity of the card. (no limit) (Performance in burst recording is only with SD Memory card. MultiMediaCard performance will be less.)		
Motion image recording	320×240 pixels (30 or 10 frames/second with audio. The maximum recording time depends on the capacity of the card.)	Interface	Digital: USB 2.0 (Full Speed) Analog video/audio: NTSC/PAL Composite (Switched by menu), Audio line output (monaural)
ISO sensitivity	AUTO (without flash: from ISO80 to ISO200/ with flash: from ISO100 to ISO400)/80/100/200/400	Terminal	REMOTE: ϕ 2.5 mm jack AV OUT/DIGITAL: Dedicated jack (8 pin) DC IN: type 3 jack
Shutter speed	8 - 1/2,000th Motion image mode: 1/30th - 1/2,000th	Power source	DC 8.4V
White balance	AUTO/Daylight/Cloudy/Halogen/Flash/White set	Power Consumption	2.4W (When recording with LCD Monitor) 2.2W (When recording with Viewfinder) 1.4W (When playing back with LCD Monitor) 1.2W (When playing back with Viewfinder)
Exposure (AE)	Program AE (P)/Aperture-priority AE (A)/ Shutter-priority AE (S)/Manual exposure (M) Exposure compensation (1/3 EV step, -2 - +2 EV)		
Metering mode	Multiple/Center weighted/Spot		
LCD monitor	2.0" low-temperature polycrystalline TFT LCD (130,000 Pixels) (field of view ratio about 100%)	Dimensions (W×H×D)	5"×3 7/16"×4 3/16"/127.6×87.2×106.2 mm (excluding the projection part)
Viewfinder	Color electrical Viewfinder (114,000 Pixels) (field of view ratio about 100%) (with diopter adjustment -4 +4 diopter)	Weight	Approx. 18.3 oz./520 g (excluding Memory Card and battery) Approx. 19.6 oz./556 g (with Memory Card and battery)
		Operating Temperature	32F – 104F (0°C – 40°C)
		Operating Humidity	10% – 80%
		Solder	This model use lead free solder (PbF).

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

⚠ 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 INTRODUCTION

1.1. INTRODUCTION

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

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

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

1.2. ABOUT LEAD FREE SOLDER (PbF)

Distinction of PbF PCB:

PCBs (manufactured) using lead free solder will have a PbF stamp on the PCB.

Caution:

- Pb free solder has a higher melting point than standard solder, Typically the melting point is 50-70°F (30-40°C) higher.
Please use a high temperature soldering iron. In case of soldering iron with temperature control, please set it to 700±20°F (370±10°C)
- Pb free solder will tend to splash when heated too high (about 1100°F/600°C).

When soldering or unsoldering, please completely remove all of the solder on the pins or solder area, and be sure to heat the soldering points with the Pb free solder until it melts enough.

1.3. IMPORTANT NOTICE 1: (Other than U.S.A. and Canadian Market)

1. The service manual does not contain the following information, because of the impossibility of servicing at component level.
 - a. Schematic diagram, Block Diagram and C.B.A. layout of Main C.B.A.
 - b. Parts list for individual parts of Main C.B.A.

When a part replacement is required for repairing Main C.B.A., replace as an assembled parts. (Main C.B.A.)

2. The following category is/are recycle module part. please send it/them to Central Repair Center.
 - MAIN C.B.A. (VEP56015A) : Excluding replacement of Lithium Battery

1.4. HOW TO DEFINE THE MODEL SUFFIX (NTSC or PAL model)

There are four kinds of DMC-FZ20, regardless the colours.

- a) DMC-FZ20S
- b) DMC-FZ20PP
- c) DMC-FZ20EB/EG/EGM/GC/GN/SG
- d) DMC-FZ20GD

(DMC-FZ20 is exclusively Japan domestic model.)

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

1.4.1. Defining methods:

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

a) DMC-FZ20S

DMC-FZ20S is exclusively Japan domestic model.

b) DMC-FZ20PP

The nameplate for this model show the following
Safty registration mark.



c) DMC-FZ20EB/EG/EGM/GC/GN/SG

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



d) DMC-FZ20GD

The nameplate for this model show the following
Safty registration mark.



NOTE:

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

The adjustment instruction is available at "software download" on the "CS-Web from AVC" web-site in "TSN system", together with Maintenance software.

1.4.2. INITIAL SETTINGS:

When you replace the Main C.B.A. be sure to perform the initial settings after achieving the Adjustment, by ordering the following procedure in accordance with model suffix.

• Step 1. The temporary cancellation of factory setting:

Set the mode dial to “P”.

While keep pressing **Burst** and “UP” of Cross key” simultaneously, turn the Power on.

• Step 2. The cancellation of factory setting:

Set the mode dial to “Playback”.

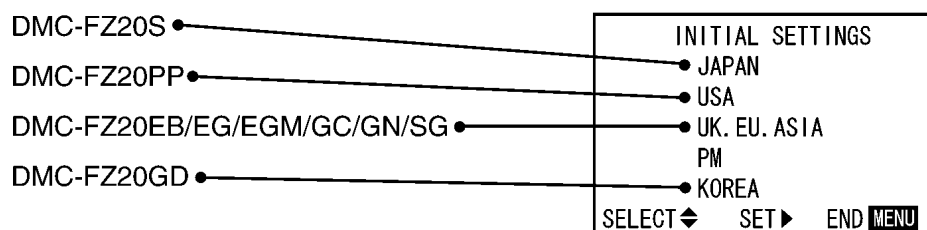
While keep pressing **Burst** and “UP” of Cross key” simultaneously, turn the Power off.

• Step 3. Turn the Power on:

Set the mode dial to “P”, and then turn the Power on.

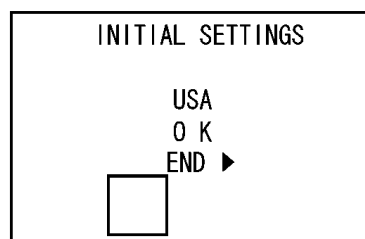
• Step 4. Display the INITIAL SETTING:

While keep pressing **MENU** and “RIGHT” of Cross key” simultaneously, turn the Power off.



• Step 5. Set the INITIAL SETTING:

Select the area with pressing “UP” / “DOWN” of Cross key”, and then press the “RIGHT” of Cross key”.



The only set area is displayed, and then press the “RIGHT” of Cross key” after confirmation. (The unit is powered off automatically.)

Confirm the display of “PLEASE SET THE CLOCK” in English when the unit is turned on again.

• Step 6. CONFIRMATION:

The display shows “PLEASE SET THE CLOCK” when turn the Power on again.

Connect the unit to PC with USB cable and is detected as removable media.

1) As for your reference Default setting condition is given in the following table.

• Default setting (After “INITIAL SETTINGS”)

	MODEL	VIDEO OUTPUT	LANGUAGE	DATE	REMARKS
a)	DMC-FZ20S	NTSC	Japanese	Year/Month/Date	
b)	DMC-FZ20PP	NTSC	English	Month/Date/Year	
c)	DMC-FZ20EB/EG/EGM/GC/GN/SG	PAL	English	Date/Month/Year	
d)	DMC-FZ20GD	NTSC	English	Year/Month/Date	

2 SAFETY PRECAUTIONS

2.1. GENERAL GUIDELINES

1. IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by \triangle 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.

2.2. LEAKAGE CURRENT COLD CHECK

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

2.3. LEAKAGE CURRENT HOT CHECK (See Figure 1.)

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

Hot-Check Circuit

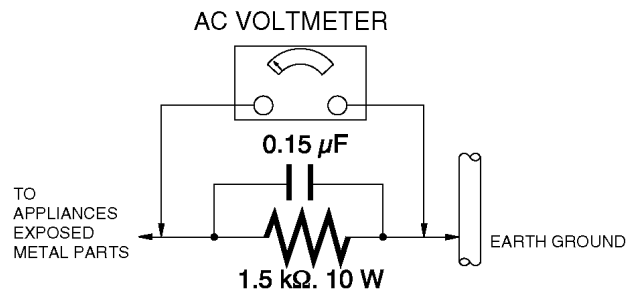


Figure. 1

3 PREVENTION OF ELECTRO STATIC DISCHARGE (ESD) TO ELECTROSTATICALLY SENSITIVE (ES) DEVICES

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

4 HOW TO RECYCLE THE LITHIUM ION BATTERY (U.S. ONLY)

ENGLISH



A lithium ion/polymer 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/polymère recyclable. Pour des renseignements sur le recyclage de la batterie, veuillez composer le 1-800-8-BATTERY.

5 CAUTION FOR AC CORD (EB only)

5.1. INFORMATION FOR YOUR SAFETY

IMPORTANT

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

WARNING

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

CAUTION

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

FOR YOUR SAFETY

DO NOT REMOVE THE OUTER COVER

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

5.2. CAUTION FOR AC MAINS LEAD

For your safety, please read the following text carefully.

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

A 5-ampere fuse is fitted in this plug.

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

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



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

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

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

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

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

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

If in any doubt, please consult a qualified electrician.

5.2.1. Important

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

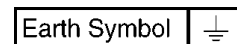
Blue	Neutral
Brown	Live

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

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

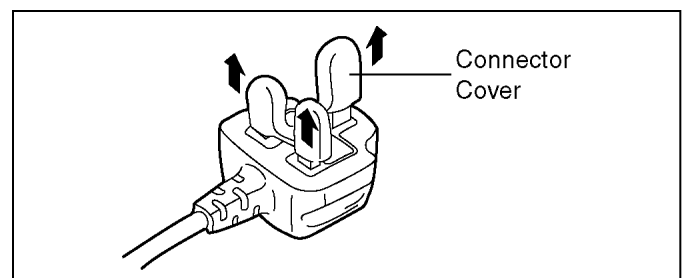
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

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



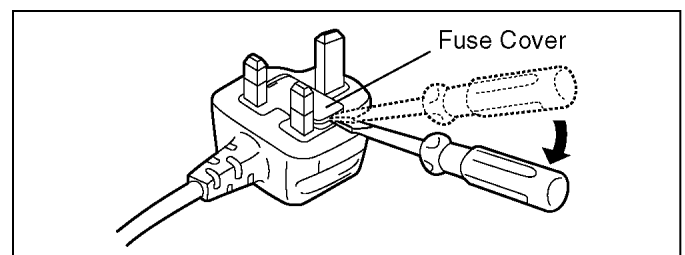
5.2.2. Before use

remove the Connector Cover as follows.

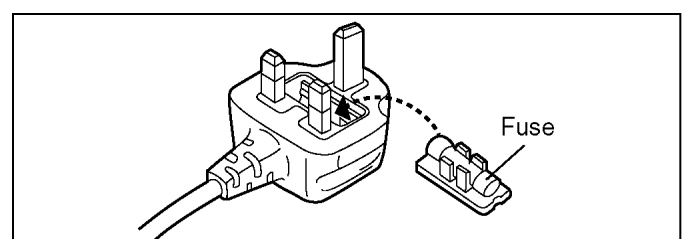


5.2.3. How to replace the Fuse

1. Remove the Fuse Cover with a screwdriver.



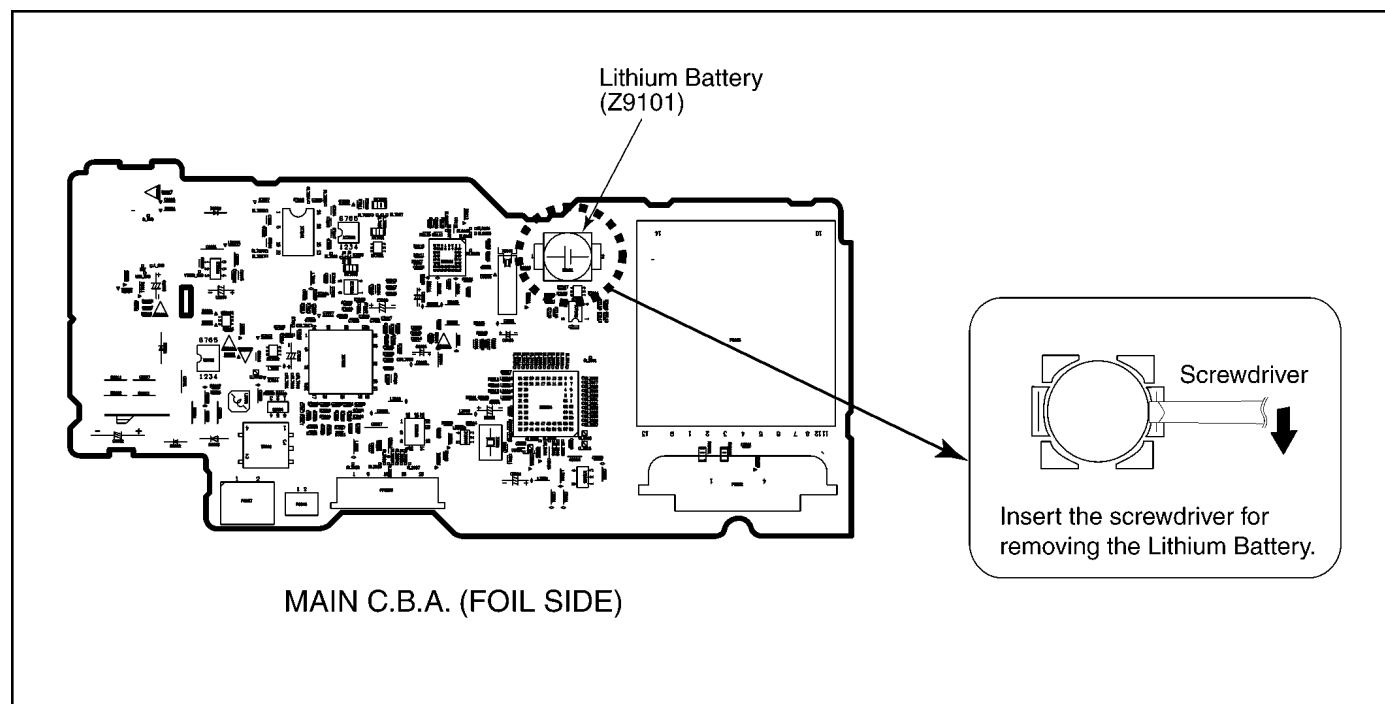
2. Replace the fuse and attach the Fuse cover.



6 HOW TO REPLACE THE LITHIUM BATTERY

6.1. REPLACEMENT PROCEDURE

1. Remove the MAIN C.B.A. (Refer to Disassembly Procedures.)
2. Remove the Lithium battery (Ref. No. "Z9101" at foil side of MAIN C.B.A.) and then replace it into new one.



NOTE:

This Lithium battery is a critical component. (Type No.: ML614S **Manufactured by Matsushita Battery Industrial Co.,Ltd.**)

It must never be subjected to excessive heat or discharge.

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

Replacement batteries must be of same type and manufacture.

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

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

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

(For English)**CAUTION**

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

(For French)**PRECAUTION**

Le fait de remplacer incorrectement la pile peut présenter des risques d'explosion.
 Remplacer la pile uniquement par une pile identique ou de type équivalent recommandée par le fabricant. Se débarrasser des piles usagées conformément aux instructions du fabricant.

(For German)**VORSICHT**

Bei einer falsch eingesetzten Batterie besteht Explosionsgefahr. Nur mit einer vom Hersteller empfohlenen Batterie vom gleichen Typ ersetzen.
 Verbrauchte Batterien beim Fachhändler oder einer Sammelstelle für Sonderstoffe abliefern.

(For Swedish)**VARNING**

Explosionsfara vid felaktigt batteribyte.
 Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattilverkaren.
 Kassera använt batteri enligt fabrikantens instruktion.

(For Norwegian)**ADVARSEL!**

Lithiumbatteri-Eksplosionsfare ved feilagtig håndtering.
 Udsiftning må kun ske med batteri af samme fabrikat og type.
 Levér det brugte batteri tilbage til leverandøren.

(For Finnish)**VAROITUS**

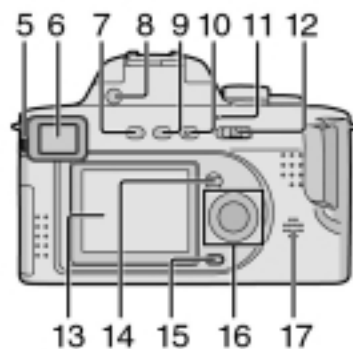
Paristo voi räjähtää, jos se on virheellisesti asennettu.
 Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.
 Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

7 OPERATING GUIDE

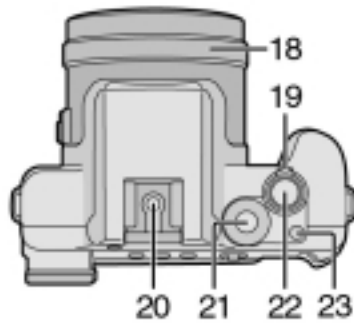
Names of the Components



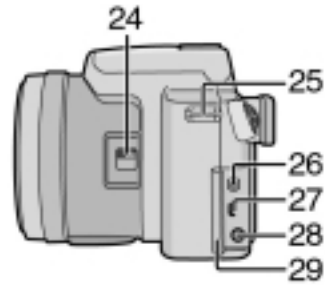
- 1 Lens
- 2 Flash
- 3 Microphone
- 4 Self-timer Indicator
AF Assist Lamp



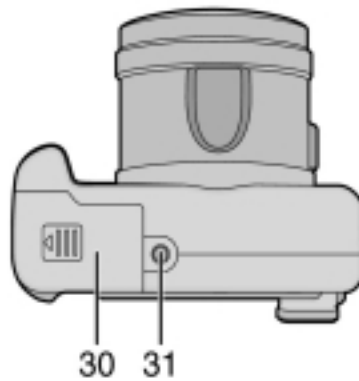
- 5 Diopter Adjustment Dial
- 6 Viewfinder
- 7 [EVF/LCD] Button
- 8 Flash Open Button
- 9 [DISPLAY] Button
- 10 [EXPOSURE] Button
- 11 Power Indicator
- 12 Camera Switch
- 13 LCD Monitor
- 14 [MENU] Button
- 15 Delete Button
- 16 Cursor buttons
 - ◀/Self-timer Button
 - ▼/[REVIEW] Button
 - ▶/Flash Mode Button
 - ▲/Flash Output Adjustment /
Exposure Compensation /Auto
Bracket /White Balance Fine
Adjustment Button
- 17 Speaker



- 18 MF Ring
- 19 Zoom Lever
- 20 Hot Shoe
- 21 Mode Dial
- 22 Shutter Button
- 23 Single/Burst Mode Button



- 24 Focus Switch
- 25 Strap Eyelet
- 26 [REMOTE] Socket
- 27 [AV OUT/DIGITAL] Socket
- 28 [DC IN] Socket
- Please be sure to use genuine Panasonic AC adaptor (DMW-CAC1; optional).
- 29 Terminal Door



- 30 Card/Battery Door
- 31 Tripod Receptacle

■ The Mode Dial

This camera has a mode dial to suit for recording of many kinds of scenes. Select the desired mode and enjoy the variety of recording. Rotate the mode dial slowly and securely.



P : Program AE mode

The exposure is automatically adjusted by the camera.

A : Aperture-priority AE

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

S : Shutter-priority AE

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

M : Manual exposure

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

Macro mode

This mode allows you to take a picture closely focusing on the subject.

Motion image mode

This mode allows you to record motion images with audio.

SCN1 : Scene mode 1

SCN2 : Scene mode 2

This mode allows you to take pictures depending on the recording scenes. This mode also allows you to set [SCENE MENU] on the [SETUP] menu to [OFF] and set the scene modes which are frequently used to [SCN1] and [SCN2] on the mode dial.

It is convenient because you can select the scene mode quickly and minimize the operation.

Playback mode

This mode allows you to play back recorded pictures.

8 SERVICE NOTES

8.1. WHEN REPLACING THE MAIN C.B.A.

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

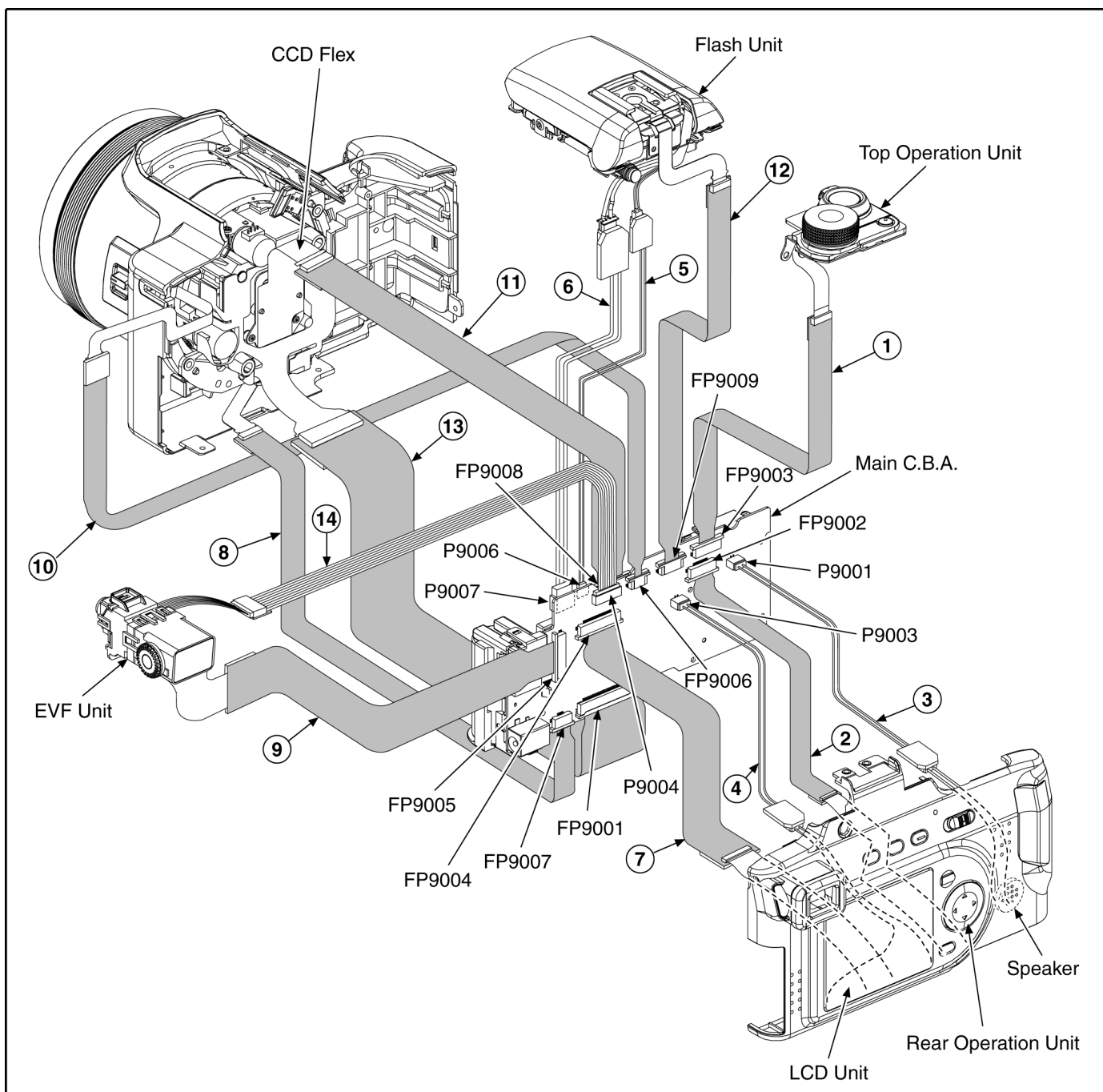
The adjustment instruction is available at “software download” on the “CS-Web from AVC” web-site in “TSN system”, together with Maintenance software.

8.2. SERVICE POSITION

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

Table S1 Extension Cable List

No.	Parts No.	Connection	Form
1	VFK1582A1225	FP9003 (MAIN) - TOP OPERATION	12PIN 0.5 FFC
2		FP9002 (MAIN) - REAR OPERATION	12PIN 0.5 FFC
3	VFK1576DC202	P9001 (MAIN) - SPEAKER	2PIN CABLE
4		P9003 (MAIN) - LCD BACK LIGHT	2PIN CABLE
5		P9006 (MAIN) - FLASH UNIT	2PIN CABLE
6	VFK1576DSC03	P9007 (MAIN) - FLASH UNIT	2PIN CABLE
7	VFK1284	FP9004 (MAIN) - LCD UNIT	24PIN 0.5 FFC
8	VFK1441	FP9007 (MAIN) - FOCUS ENCODER	8PIN 0.5 FFC
9	VFK1282	FP9005 (MAIN) - EVF FLEX	22PIN 0.5 FFC
10	VFK1480	FP9006 (MAIN) - SIDE OPERATION UNIT	6PIN 0.5 FFC
11	VFK1461	FP9008 (MAIN) - CCD FLEX	20PIN 0.5 FFC
12	VFK1582A1025	FP9009 (MAIN) - HOT SHOE UNIT	10PIN 0.5 FFC
13	VFK1582A4525	FP9001 (MAIN) - LENS UNIT	45PIN 0.5 FFC
14	VFK1920	P9004 (MAIN) - EVF BACKLIGHT C.B.A.	8PIN CABLE



CAUTION-1. (When servicing MAIN C.B.A.)

1. Be sure to discharge the capacitor on MAIN C.B.A.
Refer to “HOW TO DISCHARGE THE CAPACITOR ON MAIN C.B.A.”.
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 MAIN C.B.A.
3. DO NOT allow other parts to touch the high voltage circuit on MAIN C.B.A.

8.3. HOW TO DISCHARGE THE CAPACITOR ON MAIN C.B.A.

CAUTION:

1. Be sure to discharge the capacitor on MAIN C.B.A.
2. Be careful of the high voltage circuit on MAIN C.B.A. when servicing.

[Discharging Procedure]

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

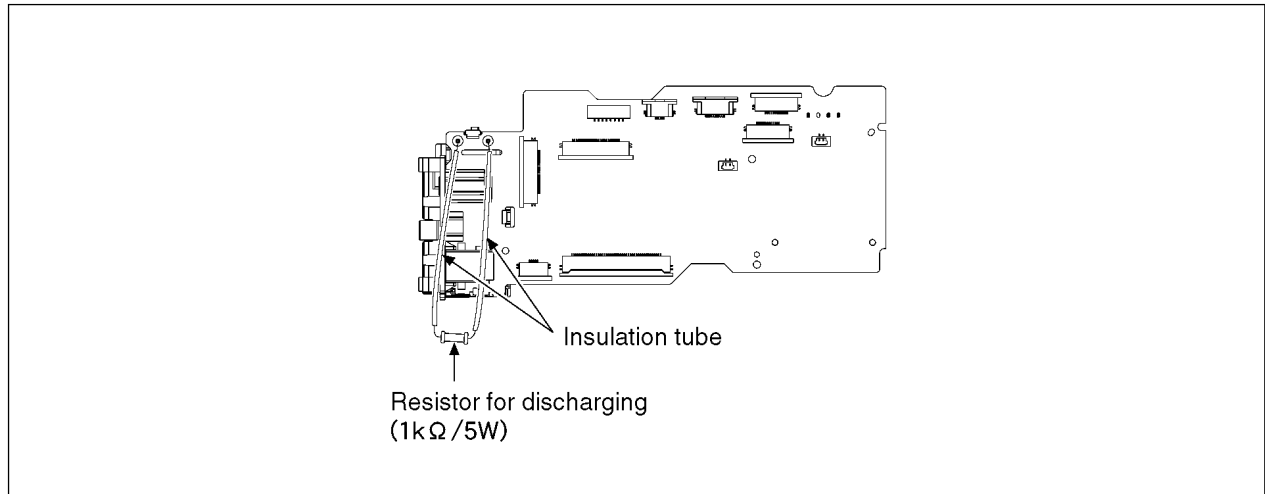


Fig. F1

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

Note:

A lens cleaning paper and lens cleaner are available at local camera shops and market place.

8.5. NOTE FOR SCHEMATIC DIAGRAM

[Circuit voltage and waveform]

Circuit voltage and waveform described herein shall be regarded as reference information when probing defect point, because it may differ from an actual measuring value due to difference of Measuring instrument and its measuring condition and product itself.

9 ADJUSTMENT PROCEDURES

Although the repair of Main C.B.A. is separated, it needs the electrical adjustment and factory setting when it is replaced the Main C.B.A., IC6002 (Flash-ROM) and related parts.

The electrical adjustment in this unit is separated two types as shown below.

(Concerning to the adjustment conditions and procedures, please use the "Adjustment Manual" contained in "View 3" on the web-site.

1. **Main unit adjustment:** All adjustments except for LCD and EVF adjustments.

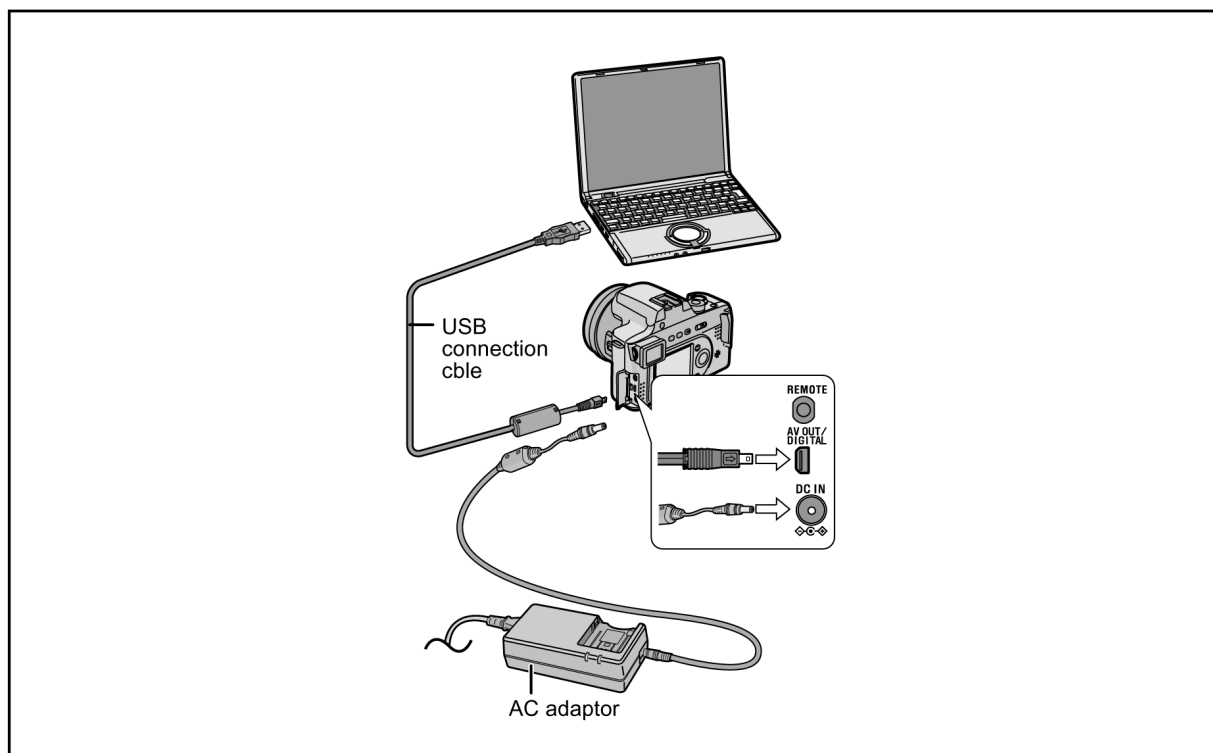
This unit mounts the adjustment software for main unit, it wouldn't need the connection between the PC and this unit with USB cable.

2. **LCD and EVF adjustment:** Adjustments for LCD and EVF.

It need the connection between the PC and this unit with USB cable.

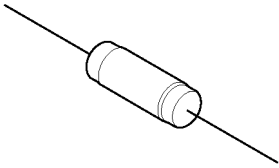
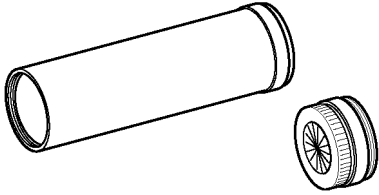
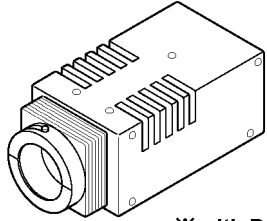
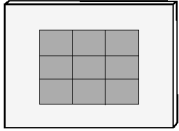
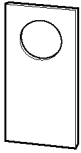
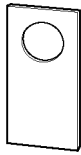
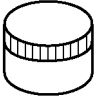


(This adjustments needs the adjustment software contained in "View 3".

The connection is shown to the figure below.



9.1. SERVICE FIXTURE AND TOOLS

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

Resistor for Discharging ERG5SJ102	Infinity Lens (with Focus Chart) VFK1164TCM02	LIGHT BOX VFK1164TDVLB
 <p>An equivalent type of Resistor may be used.</p>		 <p>※ with DC Cable</p>
Colour Bar Chart VFK1828	Filter (Slip-in Type) ND0.1 Type VFK1164ND01 (2 sheet are required for adjustment)	Color temperature conversion filter VFK1164LBB1
	 <p>An equivalent type of Filters may be used.</p>	 <p>An equivalent type of Filters may be used.</p>
Grease (for lens) VFK1829	Dome type magnifying glass VFK1835	Hanarl oil VFK1700
		

10 ERROR CODE MEMORY FUNCTION

1. General description

This unit is equipped with history of error code memory function, and can be memorized 32 error codes in sequence from the latest. When the error is occurred more than 32, oldest error is overwritten in sequence.

The error code is not memorized when the power supply is shut down forcibly (when the unit is powered on by the battery, the battery is pulled out) because the error code is memorized to FLASH ROM when the unit is powered off.

2. How to display

The error code can be displayed by the following procedure:

Before perform the error code memory function, connect the AC adaptor or insert the battery, and insert the SD card.

• 1. The temporary cancellation of factory setting:

Set the mode dial to "P".

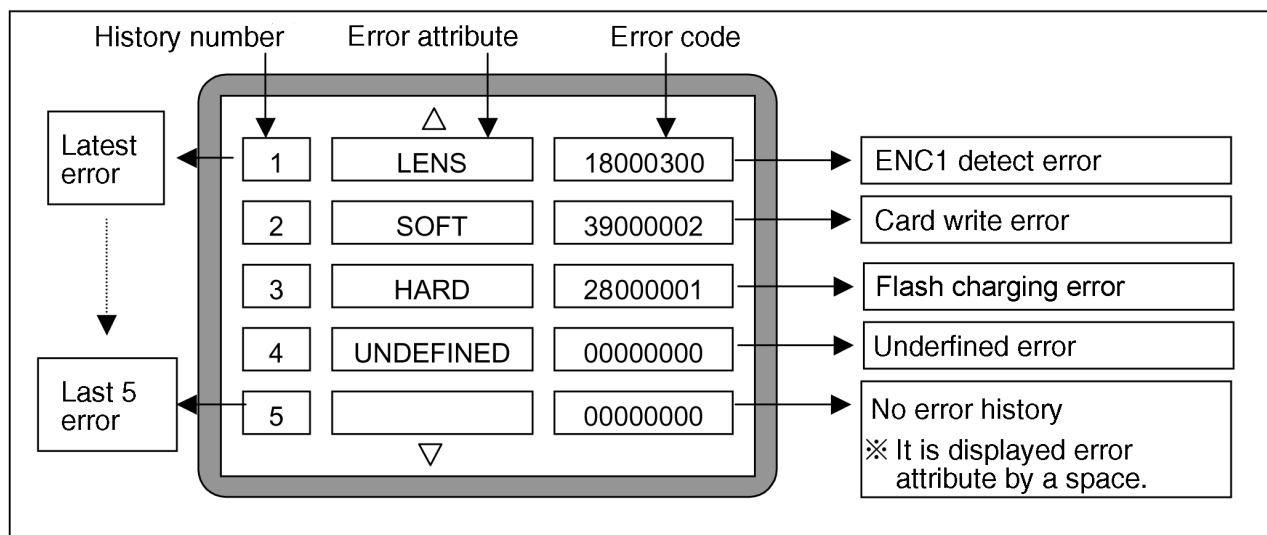
While pressing [Burst] and "UP" of Cross key" simultaneously and hold them, turn the Power on.

• 2. The display of error code:

Press [Burst], [MENU] and "LEFT" of Cross key" simultaneously with the step 1 condition.

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

Normal display → Error code display → Operation history display → Normal display →



Example of Error Code Display

• 3. The change of display:

The error code can be memorized 32 error codes in sequence, however it is displayed 5 errors on the LCD.

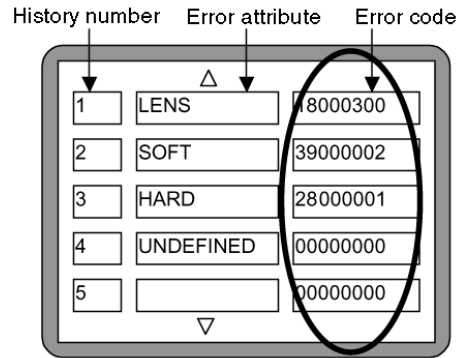
Display can be changed by the following procedure:

"UP" or [DOWN] of Cross key": It can be scroll up or down one.

"LEFT" or [RIGHT] of Cross key": It can be display last 5 error or another 5 error.

· 4. How to read the error code:

One error code is displayed for 8 bit, the contents of error codes is indicated the table as shown below.



Attribute	Main item	Sub item	Error code		Contents (Upper)		
			High 4 bits	Low 4 bits	Check point (Lower)		
Lens	Lens drive	OIS	1800	1000	PSD (X) error. Hole element (X axis) position detect error in OIS unit. OIS Unit.		
				2000	PSD (Y) error. Hole element (Y axis) position detect error in OIS unit. OIS Unit.		
				3000	GYRO (X) error. Gyro (IC7101: X axis) detect error on Main C.B.A.. IC7101 (Gyro element) or IC6001 (VENUS2).		
				4000	GYRO (Y) error. Gyro (IC7102: Y axis) detect error on Main C.B.A.. IC7102 (Gyro element) or IC6001 (VENUS2).		
				5000	MREF error (Reference voltage error). IC7002 (LENS drive) or IC6001 (VENUS2).		
		C.B./Zoom		0100	HP Low detect error (C.B. encoder <full retract> always Low detect). FP9001-(34) signal line or IC6001 (VENUS2).		
				0200	HP High detect error (C.B. encoder <full retract> always High detect). FP9001-(34) signal line or IC6001 (VENUS2).		
				0300	ENC1 detect error (C.B. motor encoder detect error). FP9001-(45) signal line or IC6001 (VENUS2).		
		Zoom		0010	HP Low detect error (Zoom encoder always Low detect error). FP9001-(31) signal line or IC6001 (VENUS2).		
				0020	HP High detect error (Zoom encoder always High detect error). FP9001-(31) signal line or IC6001 (VENUS2).		
		Focus		0001	HP Low detect error (Focus encoder always Low detect error). FP9001-(11) signal line or IC6001 (VENUS2).		
				0002	HP High detect error (Focus encoder always High detect error). FP9001-(11) signal line or IC6001 (VENUS2).		
		Lens		1801	0000	Power ON time out error. Lens drive system.	
				1802	0000	Power OFF time out error. Lens drive system.	
		HARD	VENUS A/D	Flash	2800	0001	Flash charging error. IC6001-(15) signal line or Flash charging circuit.
				MF Ring	2810	0000	MF Ring error Communication between IC6001(VENUS2) and focus encoder.
			AF frame, CCD power	VENUS resistor	2901	0000	VENUS resistor.
							IC6001 (VENUS2) or periphery circuit.

Attribute	Main item	Sub item	Error code		Contents (Upper)			
			High 4 bits	Low 4 bits	Check point (Lower)			
SOFT	CPU, ASIC hard	Monitor	3800	1000	AF frame movement check time out. IC6001 (VENUS2).			
		Stop		0001	Camera task finish process time out. Communication between Lens system and IC6001 (VENUS2).			
				0002	Camera task invalid code error. IC6001 (VENUS2).			
				Card	Card	3900	0001	Read error. SD card line or IC6001 (VENUS2).
							0002	Write/delete error. SD card line or IC6001 (VENUS2).
		0003					Format error. SD card line or IC6001 (VENUS2).	
	0004	Media error/No supported file system error. Media detect switch or media is detective.						
	Communica tion	Communica tion(USB)	3A00				0001	Read error. SD card line or IC6001 (VENUS2).
							0002	Write/delete error. SD card line or IC6001 (VENUS2).
							0003	Host side STALL. SD card line or IC6001 (VENUS2).
							0004	Printer error. Confirm the printer.
				0005	DISCOVERY process failure. Confirm the printer.			
				0006	No printer connection. Confirm the printer.			
				0007	No printer response. Confirm the printer.			

• **5. How to returned to Normal Display:**

Turn the power off and on, to exit from Error code display mode.

NOTE:

The error code can not be initialized by the unit only.

11 CONFIRMATION OF FIRMWARE VERSION

The Firmware version can be confirmed by ordering the following steps:

• **Step 1. The temporary cancellation of factory setting:**

Set the mode dial to "P".

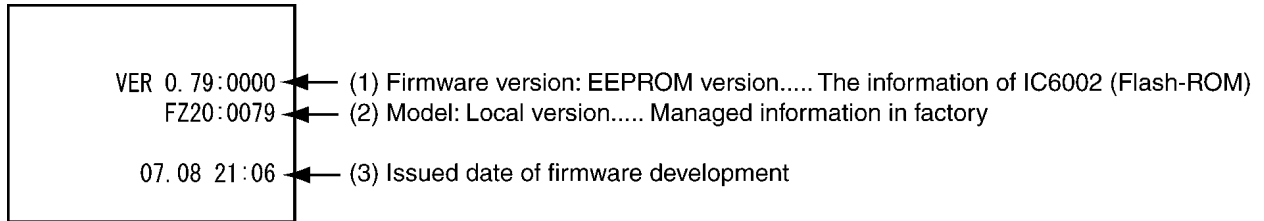
While keep pressing **BURST** and "UP" of Cross key" simultaneously. turn the power on with inserting the SD memory card which has a few photo data.

• **Step 2. Confirm the version:**

Set the mode dial to "Playback".

Press **BURST** and "DOWN" of Cross key" simultaneously. (No need to keep pressing.)

(The version information is displayed on the LCD with kight blue colour letters.)

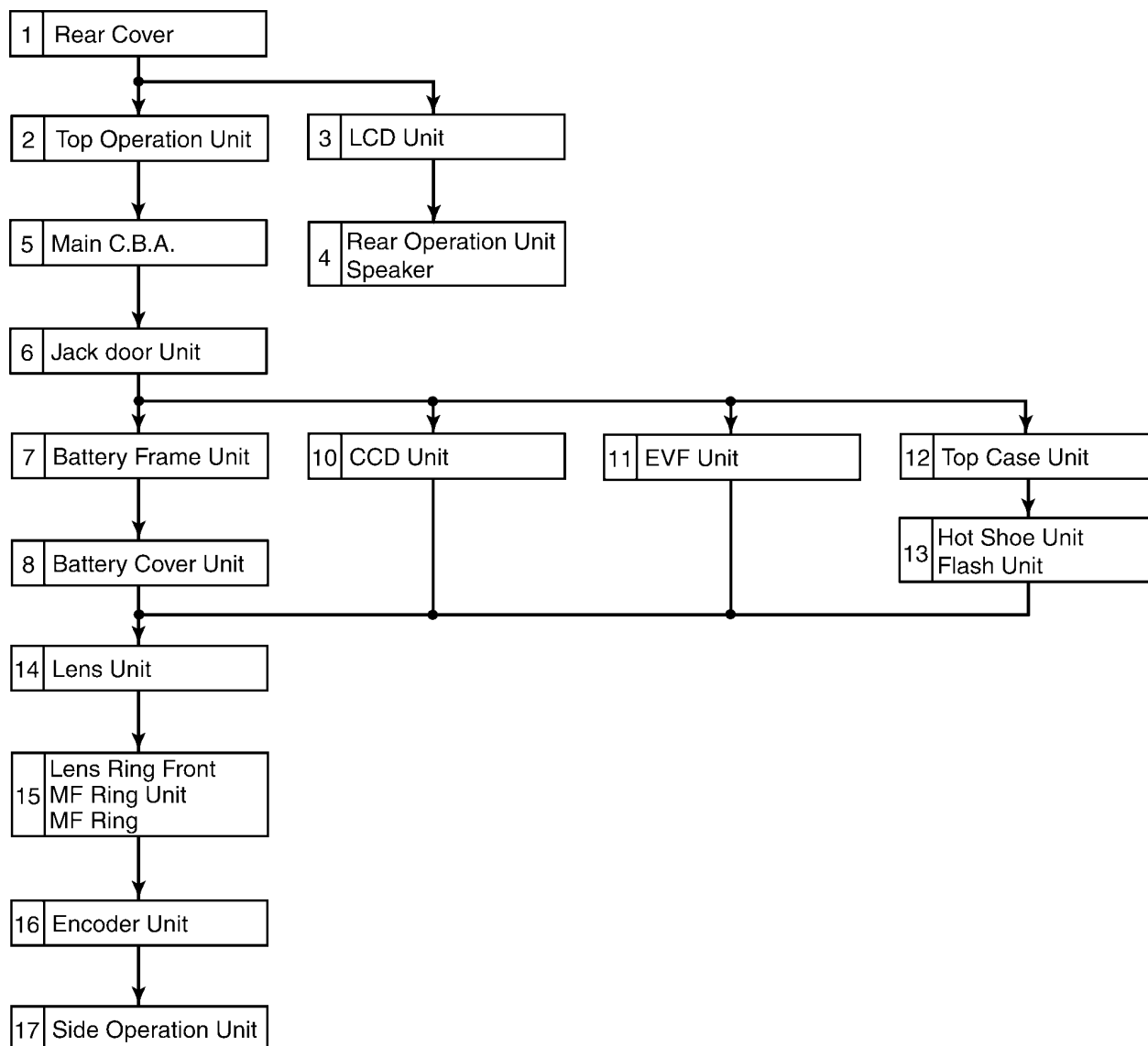


<Point>

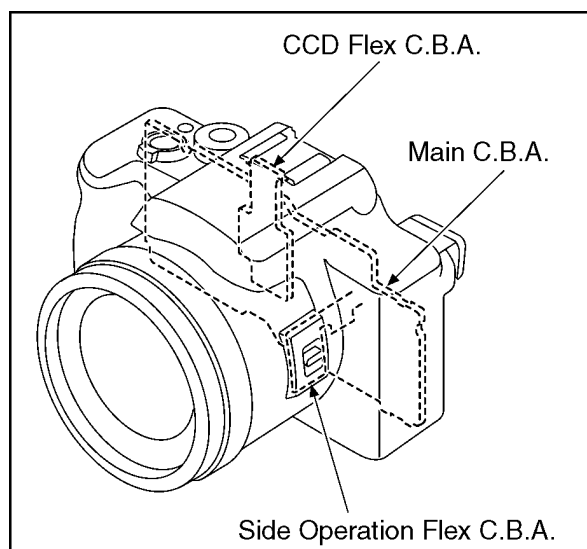
- The firmware version and EEPROM version can be confirmed with the information (1).
- The information (2), (3) are just reference.

12 DISASSEMBLY PROCEDURE

12.1. DISASSEMBLY FLOW CHART



12.2. C.B.A. LOCATION



12.3. DIASSEMBLY PROCEDURE

No.	Item	Fig.	Removal
1	Rear Cover	Fig. D1	Card
			Battery
			3 Screws <A>
			2 Screws
			2 Screws <C>
		Shoe Spring	
		Fig. D2	P9001(Connector)
			P9003(Connector)
			FP9002(Flex)
			FP9004(Flex)
Rear Cover			
2	Top Operation Unit	Fig. D3	FP9003(Flex)
			1 Screw <D>
			Top Operation Unit
3	LCD Unit	Fig. D4	1 Screw <E>
			LCD Holder
			2 Locking tabs
			2 Hooks
			LCD Unit
4	Rear Operation Unit Speaker	Fig. D5	4 Screws <F>
			Rear Operation Unit
			Speaker
5	Main C.B.A.	Fig. D6	P9004(Connector)
			FP9001(Flex)
			FP9006(Flex)
			FP9007(Flex)
			FP9009(Flex)
			3 Locking tabs
		3 Screws <G>	
		Fig. D7	P9006(Connector)
			P9007(Connector)
			FP9008(Flex)
Main C.B.A.			
6	Jack Door Unit	Fig. D8	1 Screw <H>
			2 Locking tabs
			Capacitor Cover
			Jack Door Unit
		Fig. D9	3 Locking tabs
			Capacitor Holder
7	Battery Frame Unit	Fig. D10	1 Screw <I>
			1 Screw <J>
			Battery Frame Unit
8	Battery Cover Unit	Fig. D11	Spring
			Shaft
			Battery Cover Unit
		Fig. D12	Installation of the Battery Cover Unit
10	CCD Unit	Fig. D13	3 Screws <K>
			CCD Unit
11	EVF Unit	Fig. D14	1 Screw <L>
			EVF Unit
12	Top Case Unit	Fig. D15	2 Screws <M>
			1 Screw <N>
			1 Screw <O>
			Flash Plate
			Top Case Unit
13	Hot Shue Unit Flash Unit	Fig. D16	2 Screws <P>
			Flash Top Cover
			Flash Lock Button
			2 Locking tabs
		Fig. D17	3 Screws <Q>
			Hot Shue Unit
		Fig. D18	2 Locking tabs
			Flash Unit

15	Lens Ring Front MF Ring Unit MF Ring	Fig. D20	2 Screws <S>
			Lens Unit
			3 Screws <T>
			3 Screws <U>
16	Encoder Unit	Fig. D21	Lens Ring Front
			MF Ring Unit
17	Side Operation Unit	Fig. D22	MF Ring
			2 Screws <V>
			Encoder Unit
18	Side Operation Unit	Fig. D23	2 Locking tabs
			Side Operation Holder
			Side Operation Unit

12.3.1. Removal of the Rear Cover

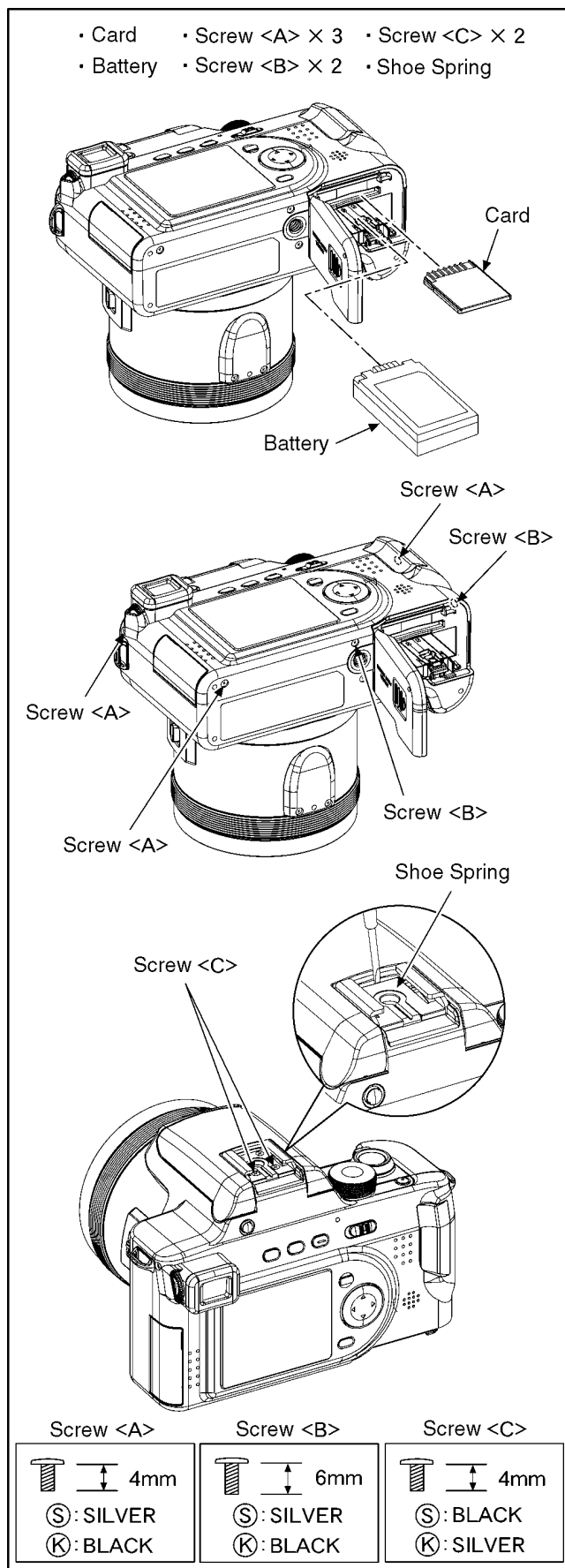


Fig. D1

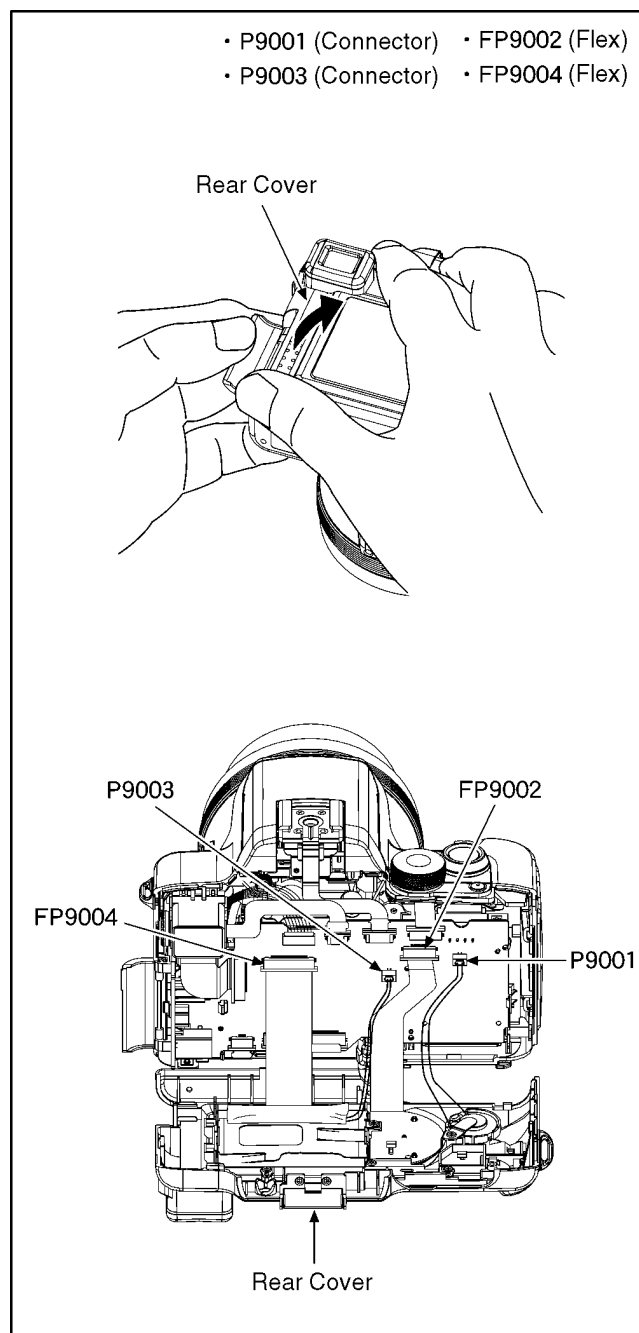


Fig. D2

12.3.2. Removal of the Top Operation Unit

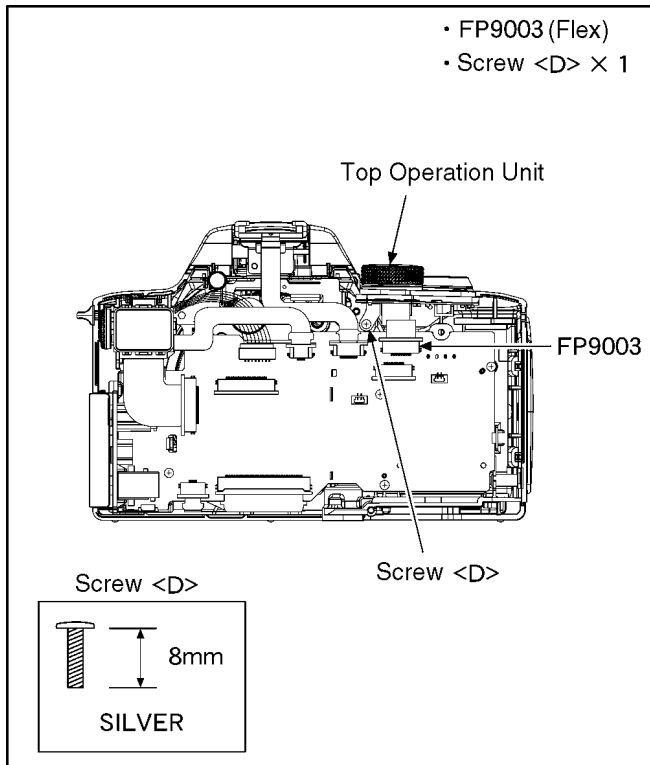


Fig. D3

12.3.3. Removal of the LCD Unit

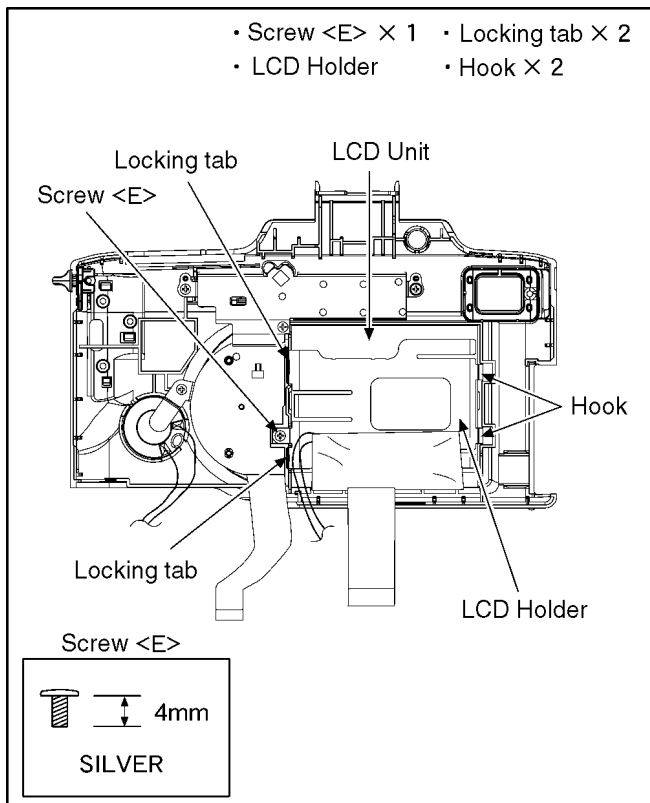
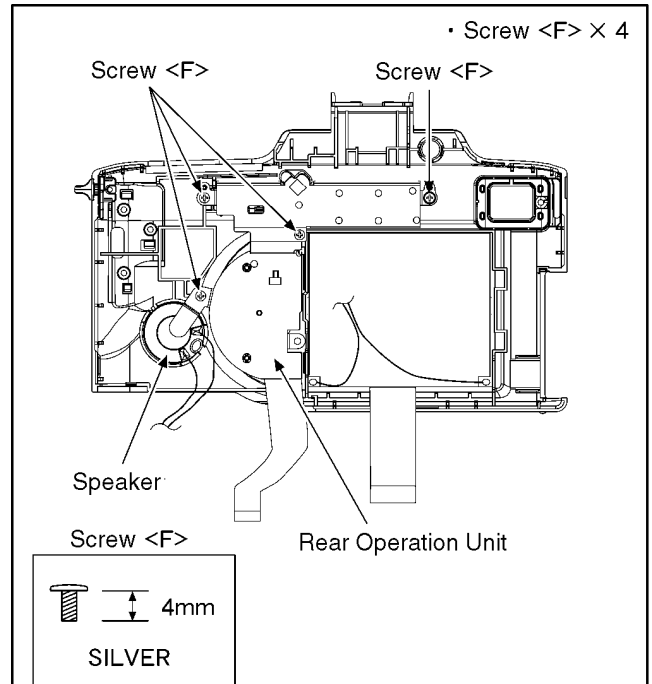


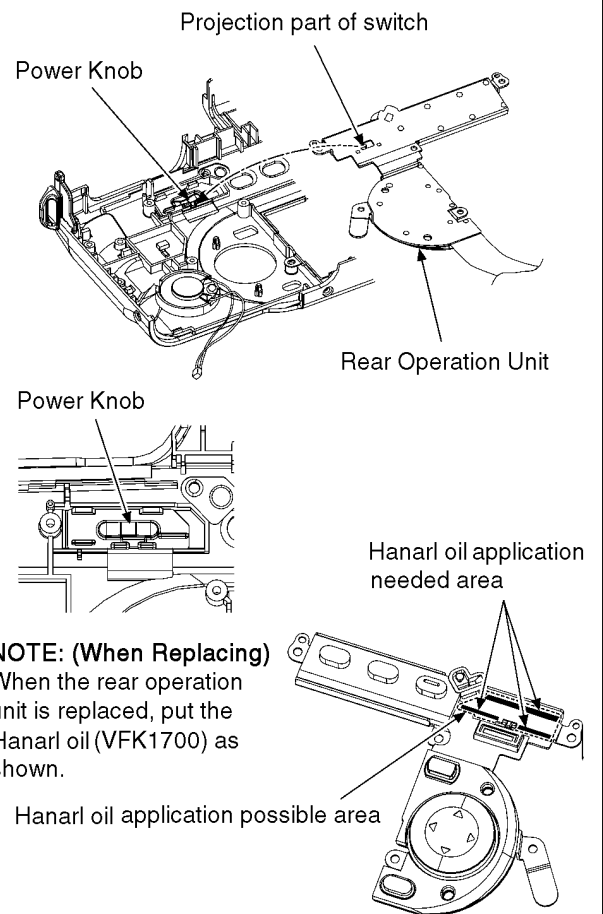
Fig. D4

12.3.4. Removal of the Rear Operation Unit and Speaker



NOTE: (When Assembling)

Align the projection part of switch with the power knob.
Align the power knob with the shape of rear case.

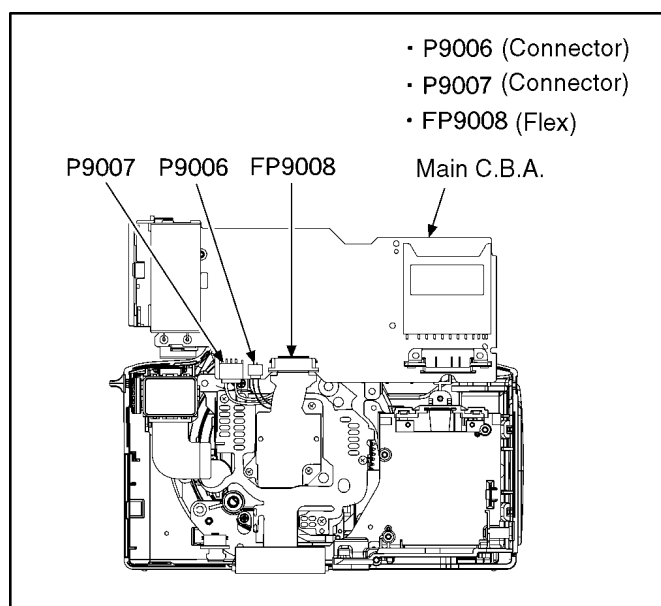
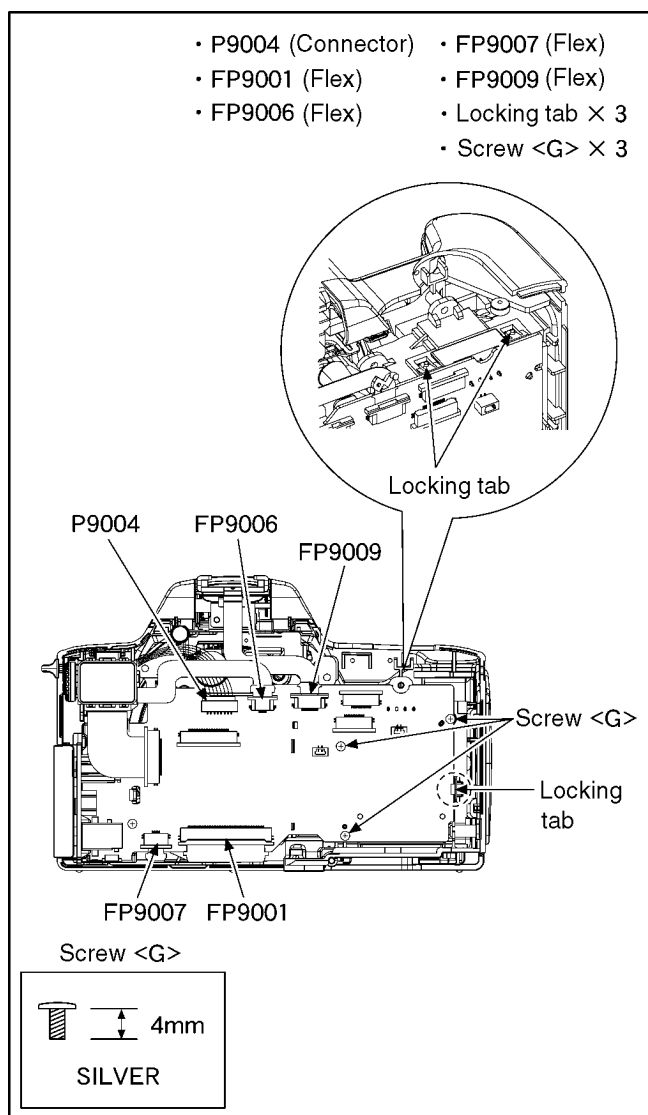


NOTE: (When Replacing)

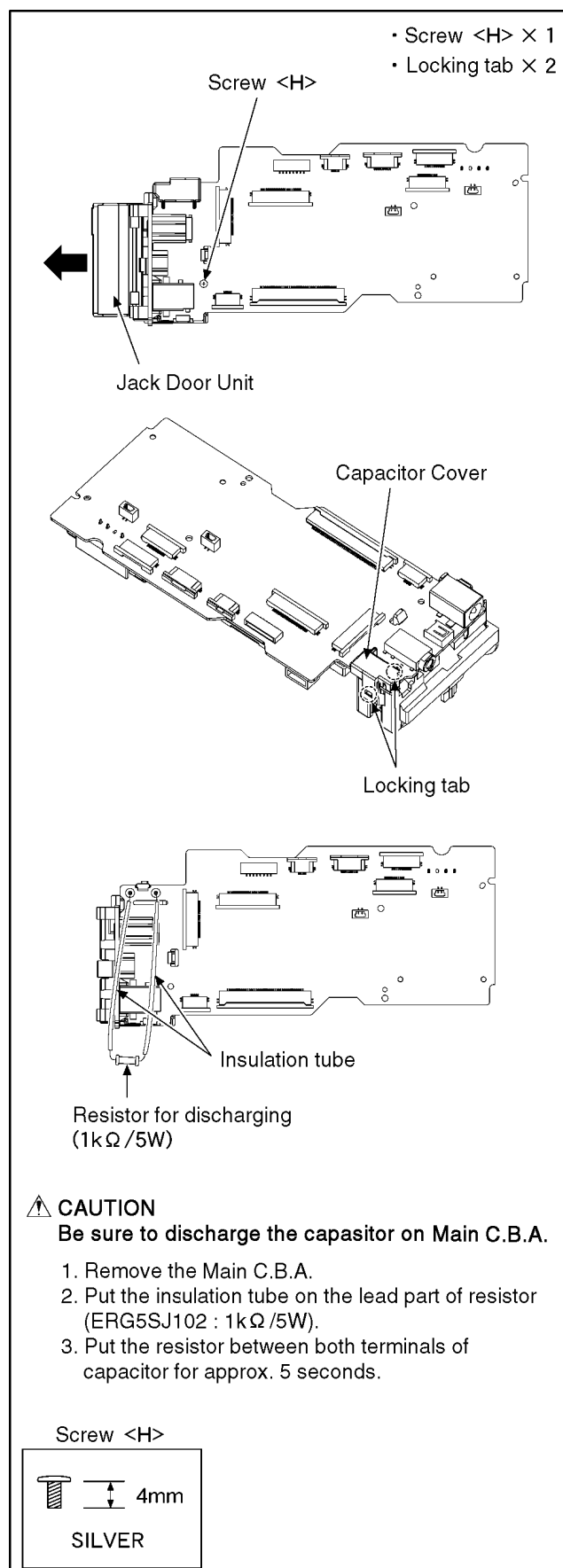
When the rear operation unit is replaced, put the Hanarl oil (VFK1700) as shown.

Fig. D5

12.3.5. Removal of the Main C.B.A.



12.3.6. Removal of the Jack Door Unit



- ⚠ CAUTION**
Be sure to discharge the capacitor on Main C.B.A.
1. Remove the Main C.B.A.
 2. Put the insulation tube on the lead part of resistor (ERG5SJ102 : 1kΩ/5W).
 3. Put the resistor between both terminals of capacitor for approx. 5 seconds.

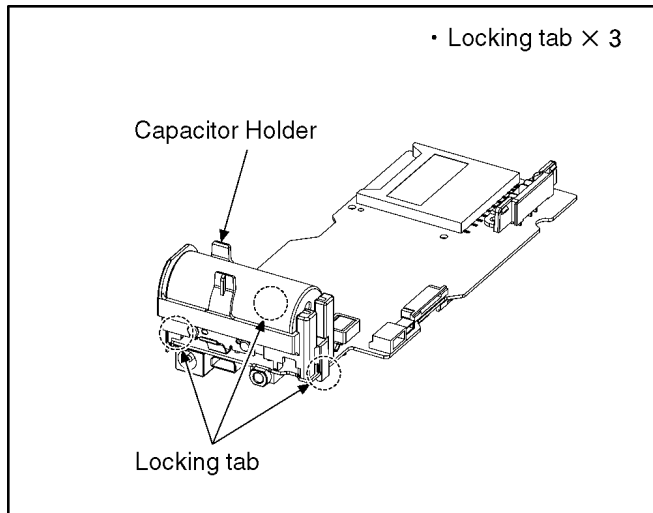


Fig. D9

12.3.7. Removal of the Battery Frame Unit

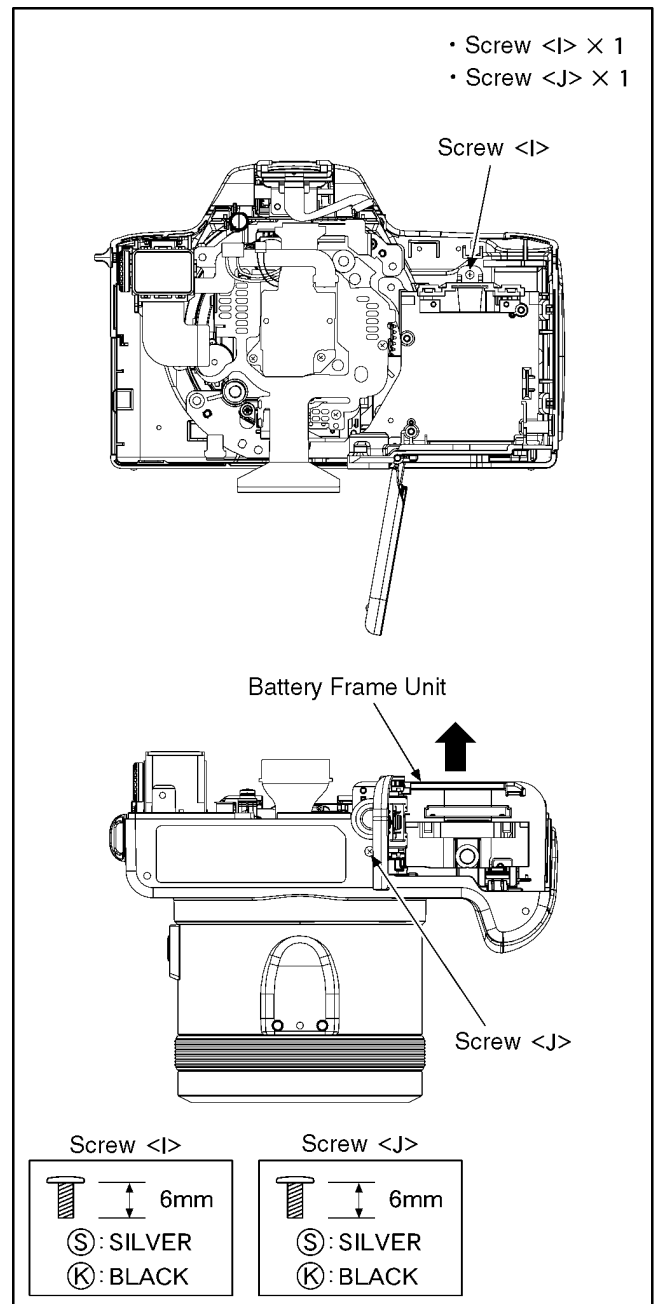


Fig. D10

12.3.8. Removal of the Battery Cover Unit

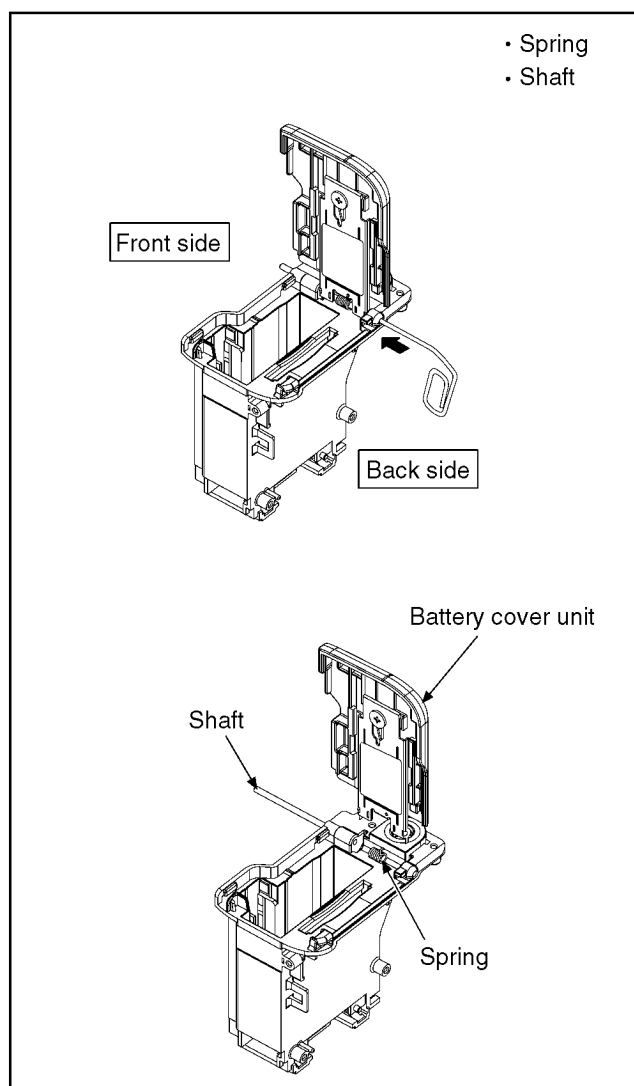


Fig. D11

12.3.9. Installation of the Battery Cover Unit

■ Assembly procedure

1. Insert the long lead side of the spring to hole (A) (□).
2. Put on the battery cover unit to specified position.
3. Insert the shaft from front side (lens side) to Line (A).
4. Insert the short lead side of the spring to hole (B) (○).
5. The shaft is pushed in completely.

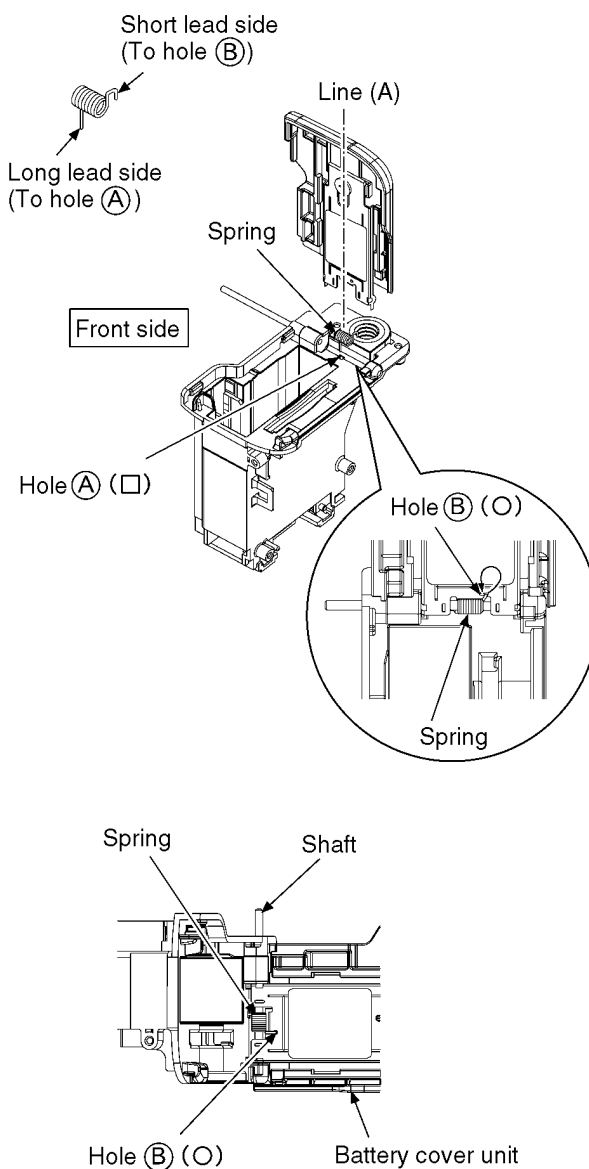


Fig. D12

12.3.10. Removal of the CCD Unit

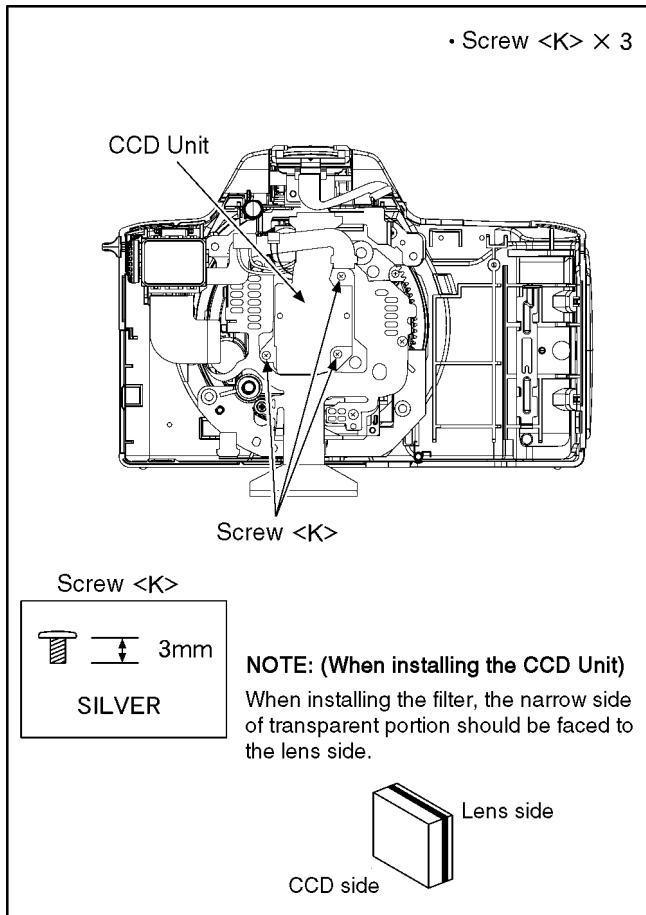


Fig. D13

12.3.11. Removal of the EVF Unit

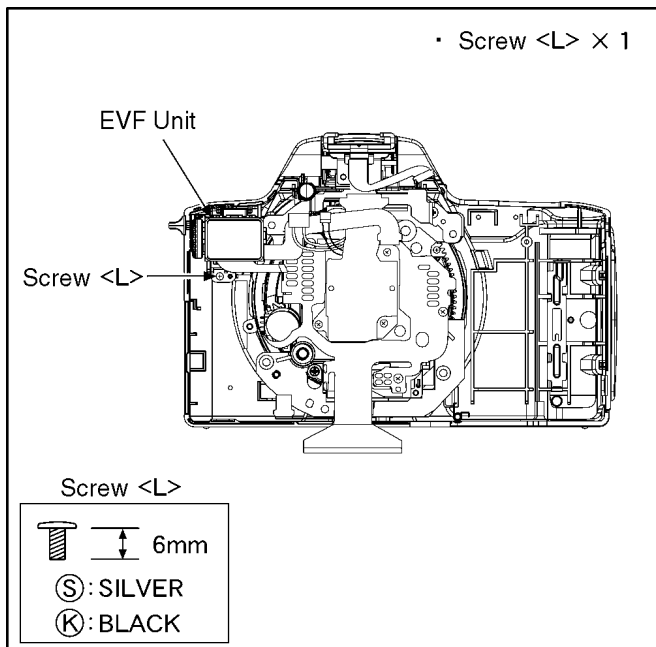


Fig. D14

12.3.12. Removal of the Top Case Unit

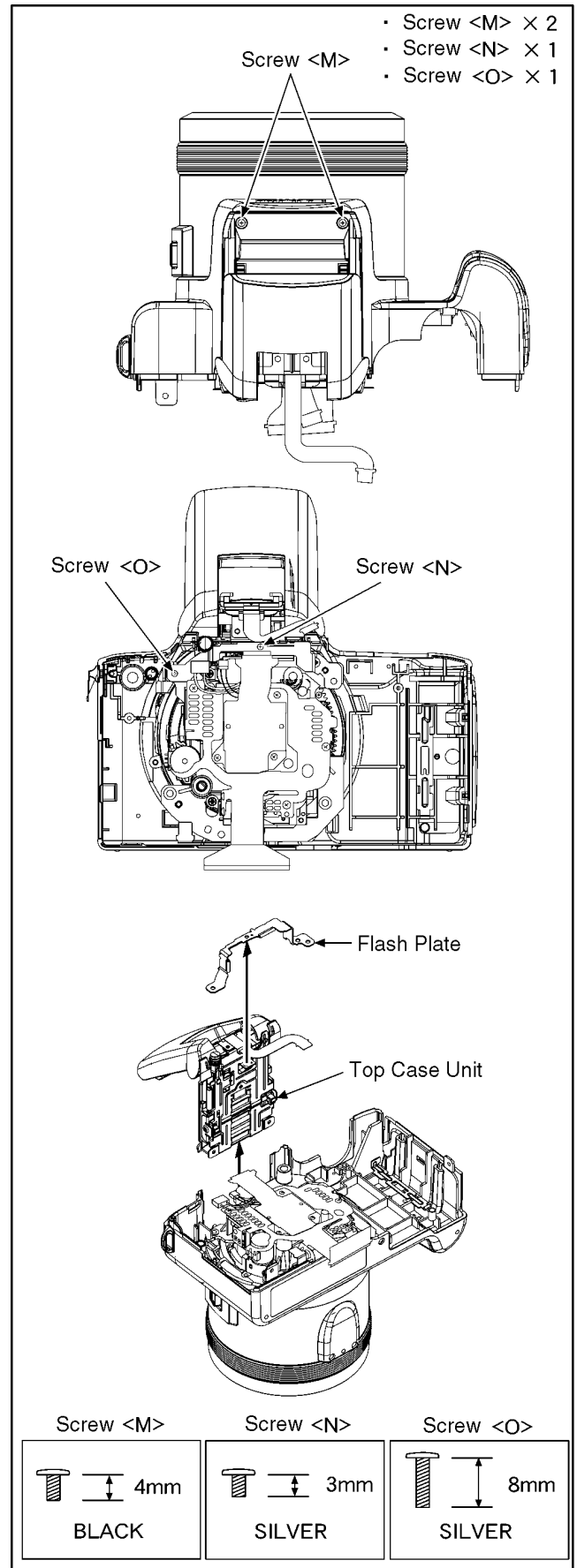
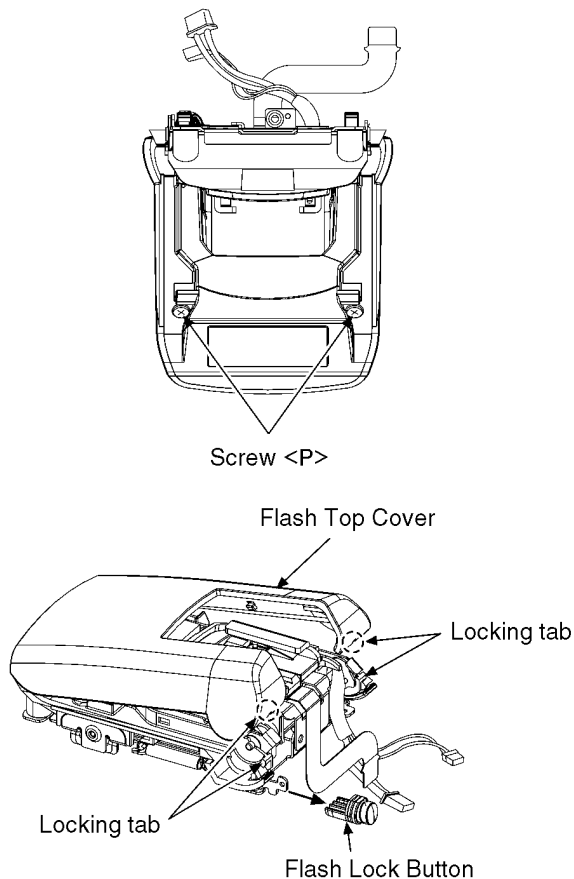


Fig. D15

12.3.13. Removal of the Hot Shoe Unit and Flash Unit

Removal of the Top Cover

- Screw <P> × 2
- Flash Top Cover
- Flash Lock Button
- Locking tab × 2



NOTE: (When Removing)

Remove the both sides of locking tabs in the rear of flash top cover, and then remove the flash top cover.

Screw <P>

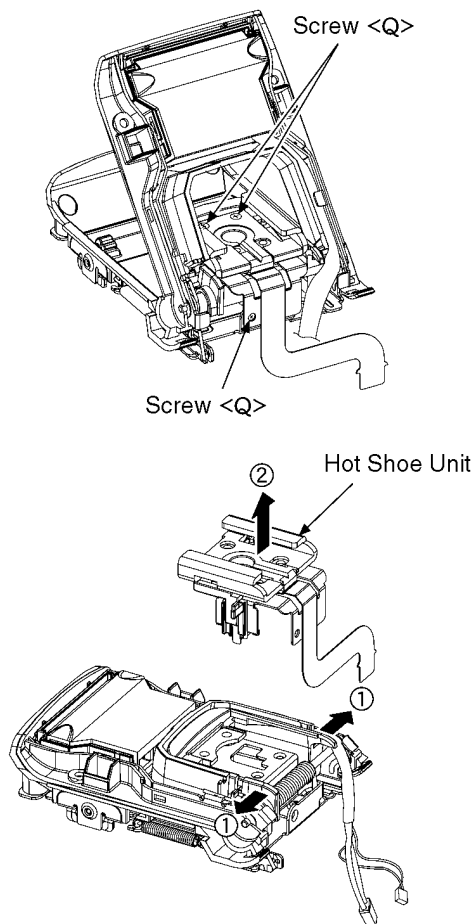


BLACK

Fig. D16

Removal of the Hot Shoe Unit

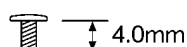
• Screw <Q> × 3



NOTE: (When Removing)

Spread the edge part of top case unit in the direction of arrow ①, remove the hot shoe unit in the direction of arrow ②.

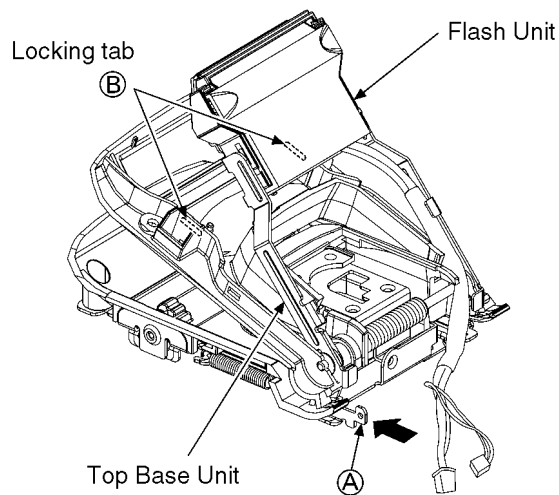
Screw <Q>



SILVER

Fig. D17

Removal of the Flash Unit



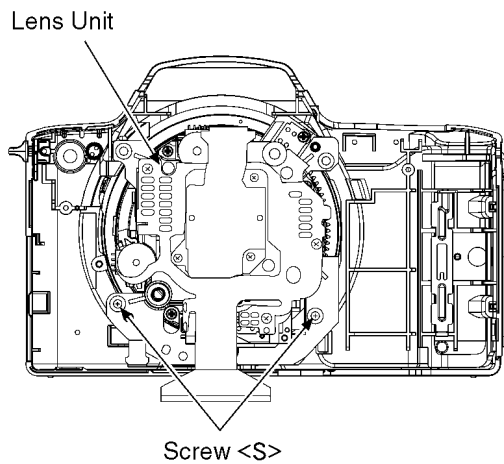
NOTE: (When Removing)

1. Push the part of (A) in the direction of arrow, and then the top base unit is pop up.
2. Remove the 2 locking tabs (B).

Fig. D18

12.3.14. Removal of the Lens Unit

• Screw <S> × 2



Screw <S>

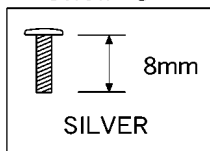


Fig. D19

12.3.15. Removal of the Lens Ring Front, MF Ring Unit and MF Ring

• Screw <T> × 3
• Screw <U> × 3

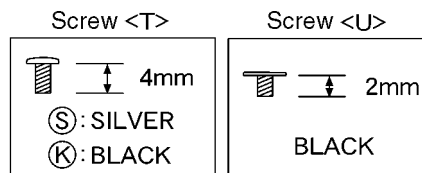
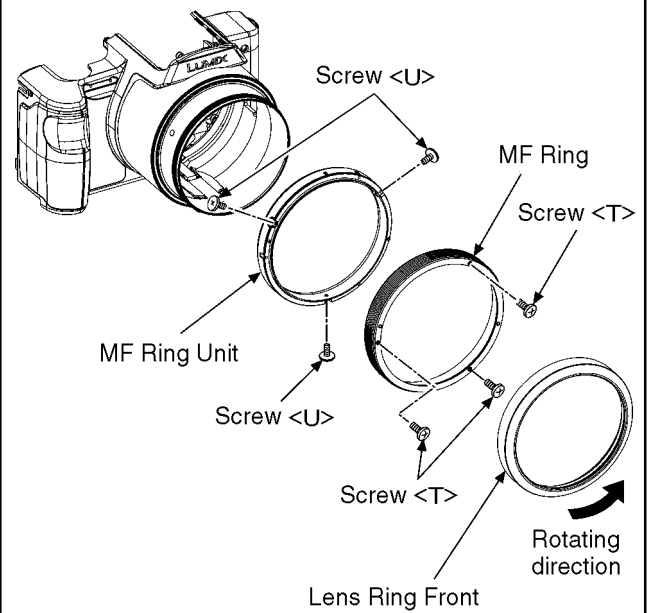


Fig. D20

12.3.16. Removal of the Encoder Unit

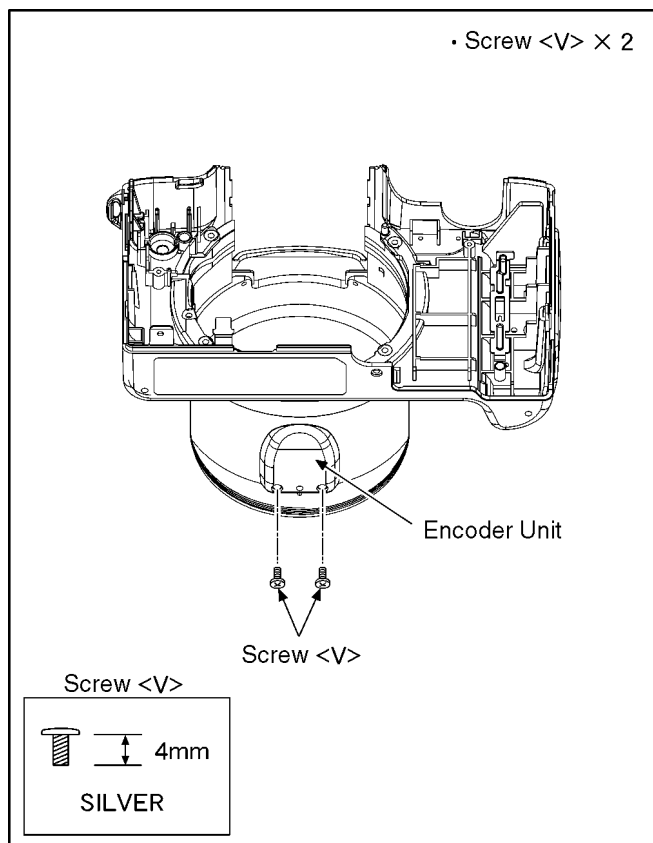


Fig. D21

12.3.17. Removal of the Side Operation Unit

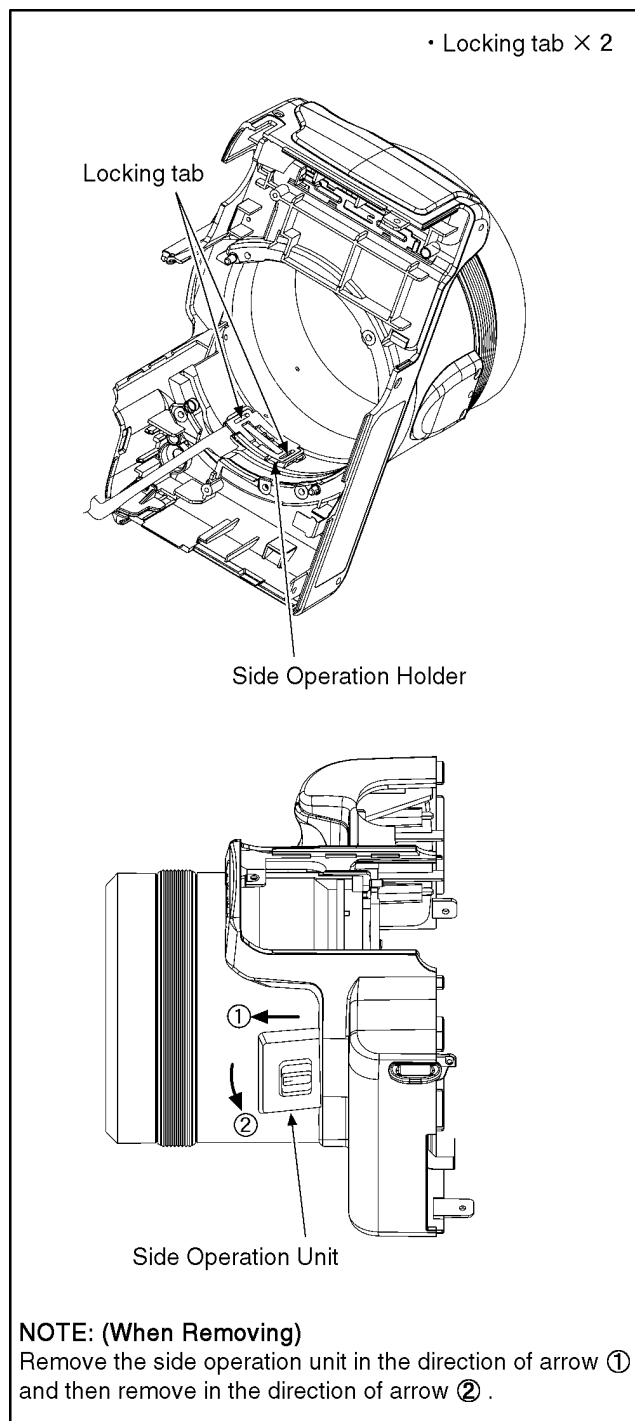


Fig. D22

Apply the Hanarl oil in the specified part when the side operation holder and lens ring base is replaced.
Hanarl oil: VFK1700

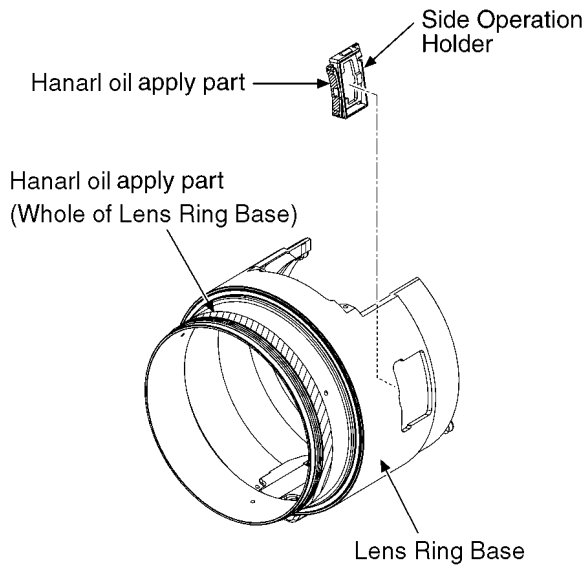


Fig. D23

NOTE: (When Assembling)

Confirm the contents as shown below.

- Condition of the screw is tightned.
- Assembling condition of mechanism parts (distortion, space etc.).
- Dust and dirt of the lens, display condition of the LCD (gradient etc.).
- Dust and dirt of the LCD

12.4. DISASSEMBLY / ASSEMBLY PROCEDURE FOR THE LENS

NOTE: When Disassembling and Assembling for the Lens

1. To prevent the lens from catching the dust and dirt, perform the following procedures with the CCD unit is installing.

Disassembling procedures for the CCD unit, refer to item 12.3.10.

2. Take care that the dust and dirt are not entered into the lens.

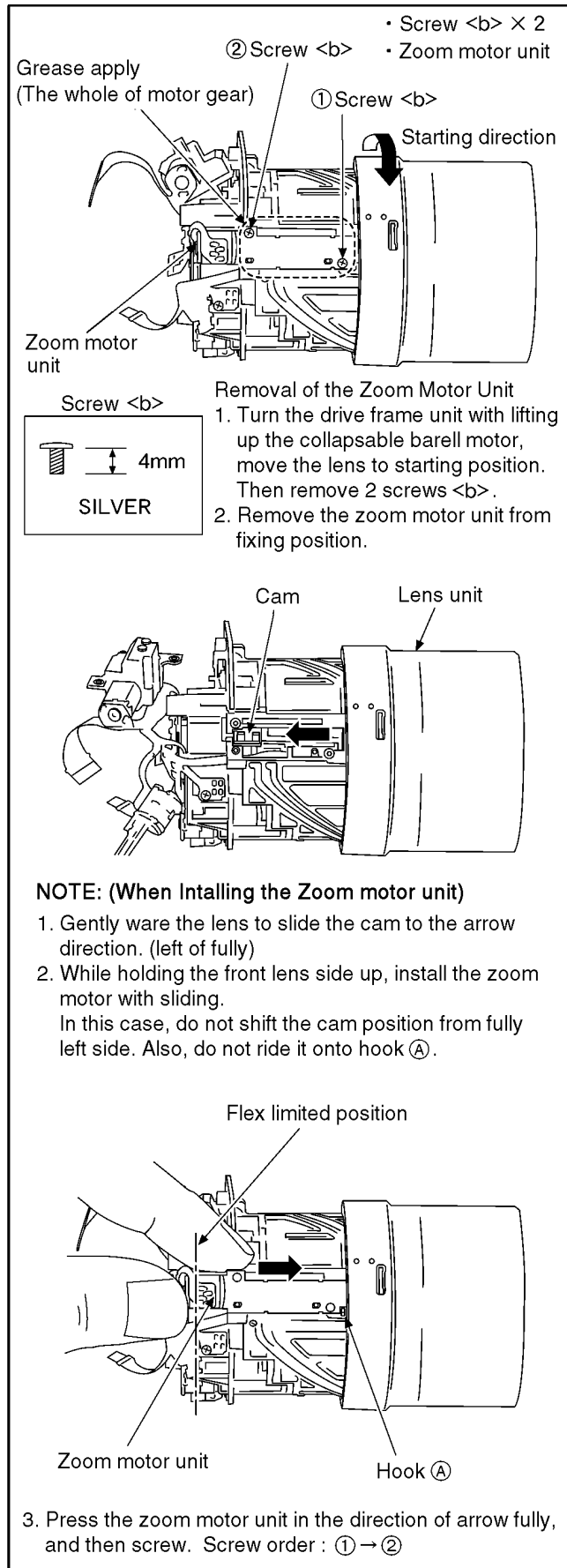
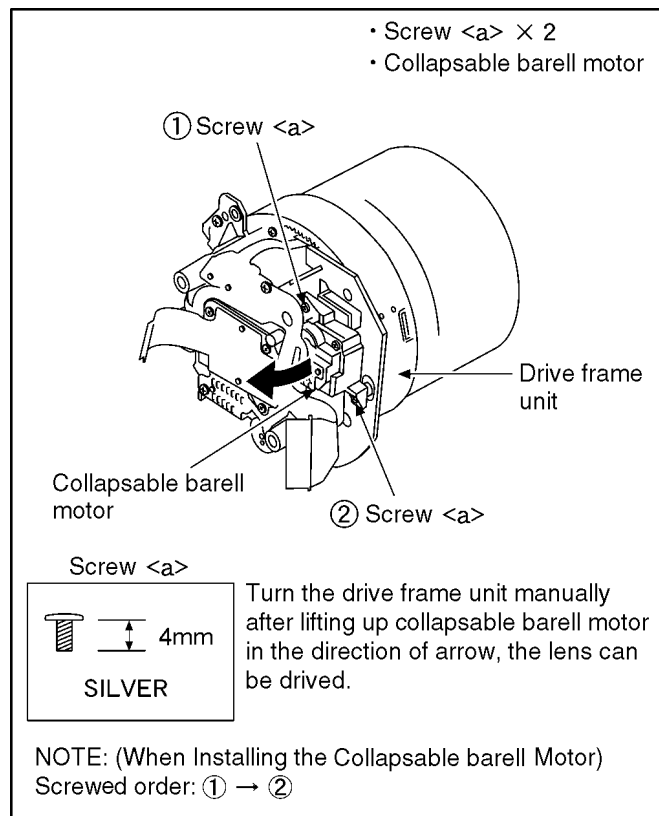
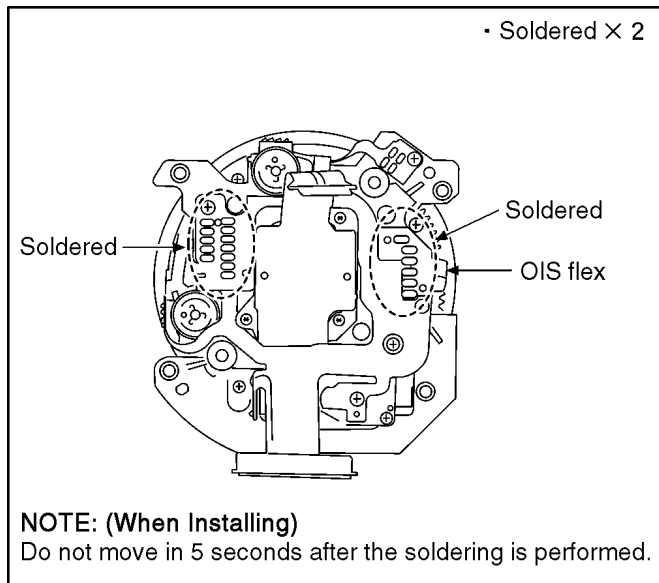
In case of the dust is putted on the lens, blow off them by airbrush.

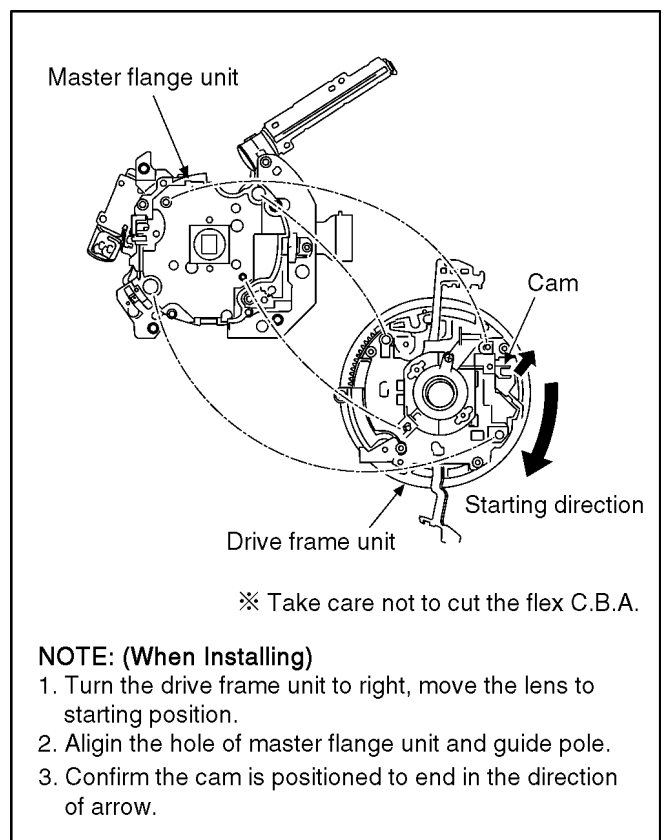
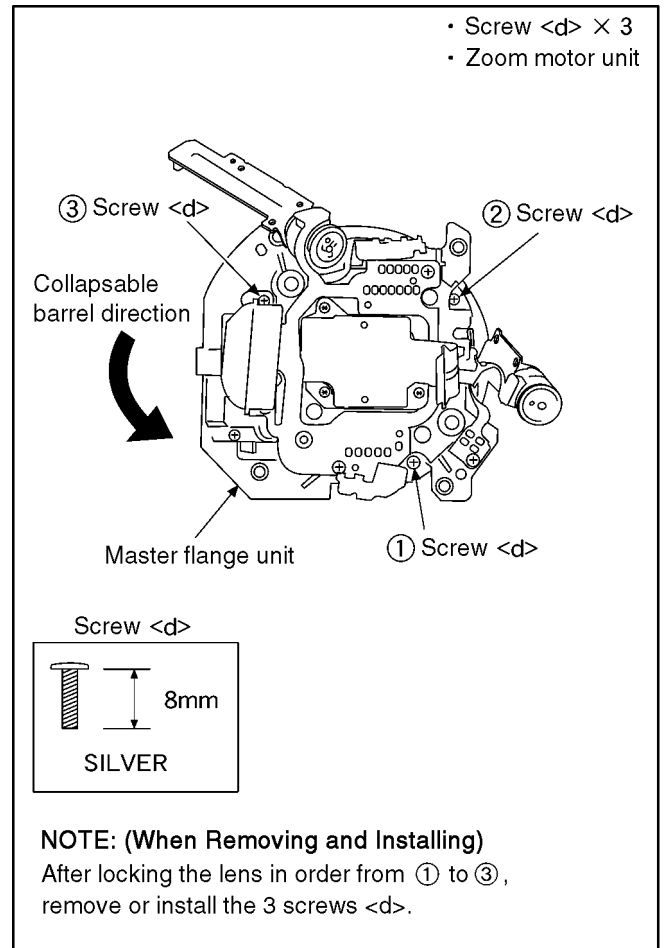
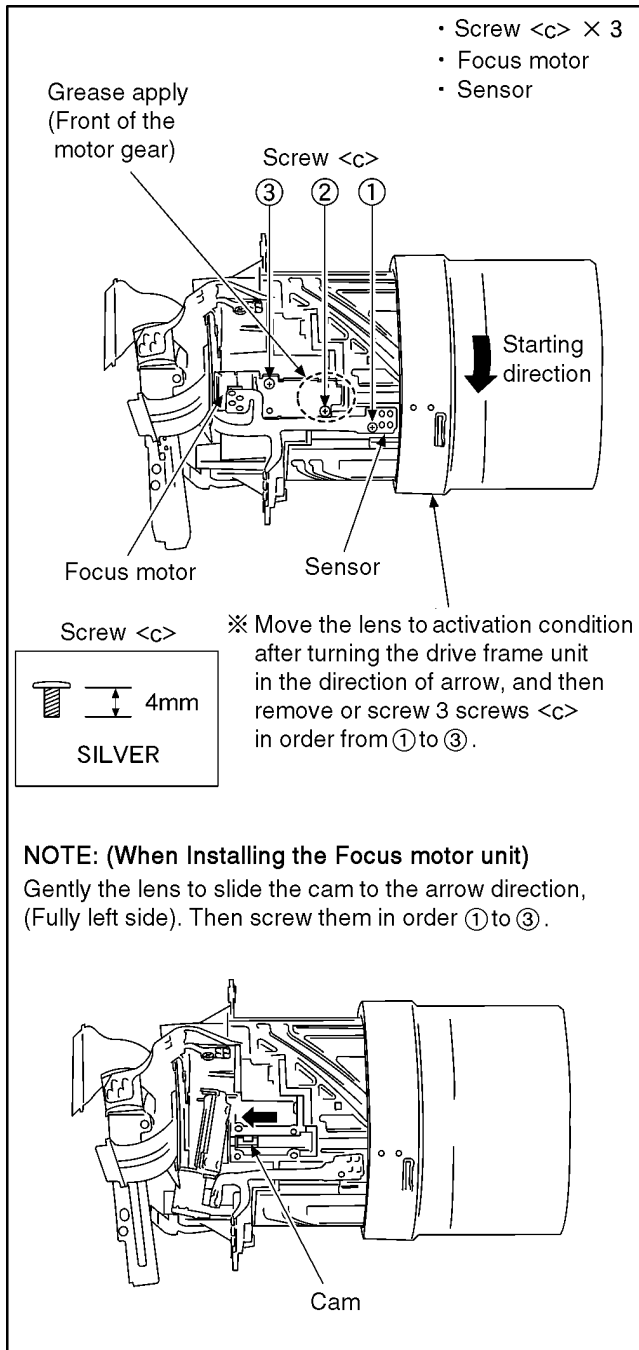
3. Do not touch the surface of lens.

4. Apply the grease (VKF1829) to the point where is shown to "Grease apply" in the figure.

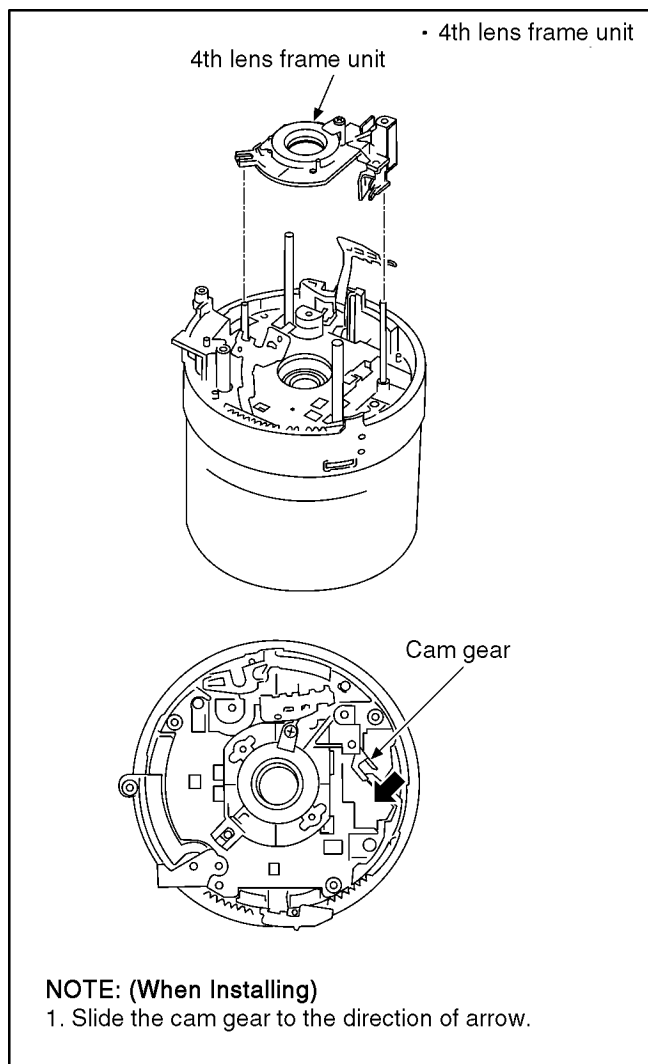
When the grease is applied, use a toothpick and apply thinly.

12.4.1. Removal of the Master Flange Unit





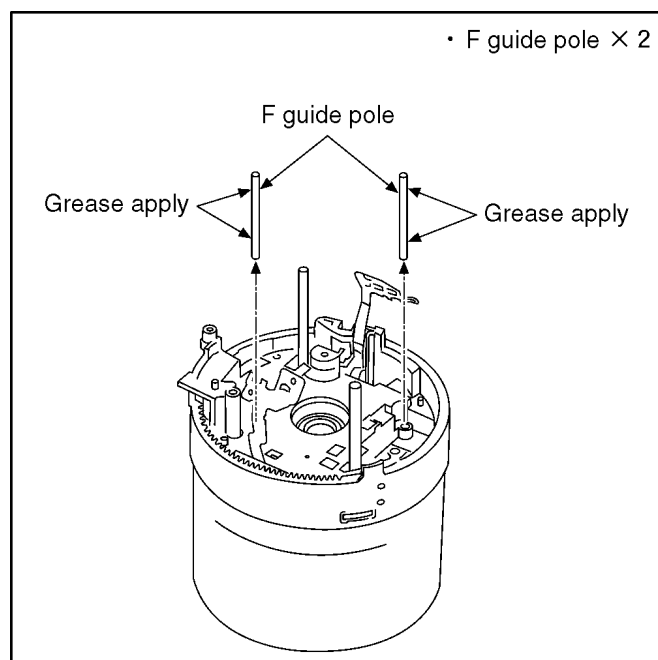
12.4.2. Removal of the 4th Lens Frame Unit



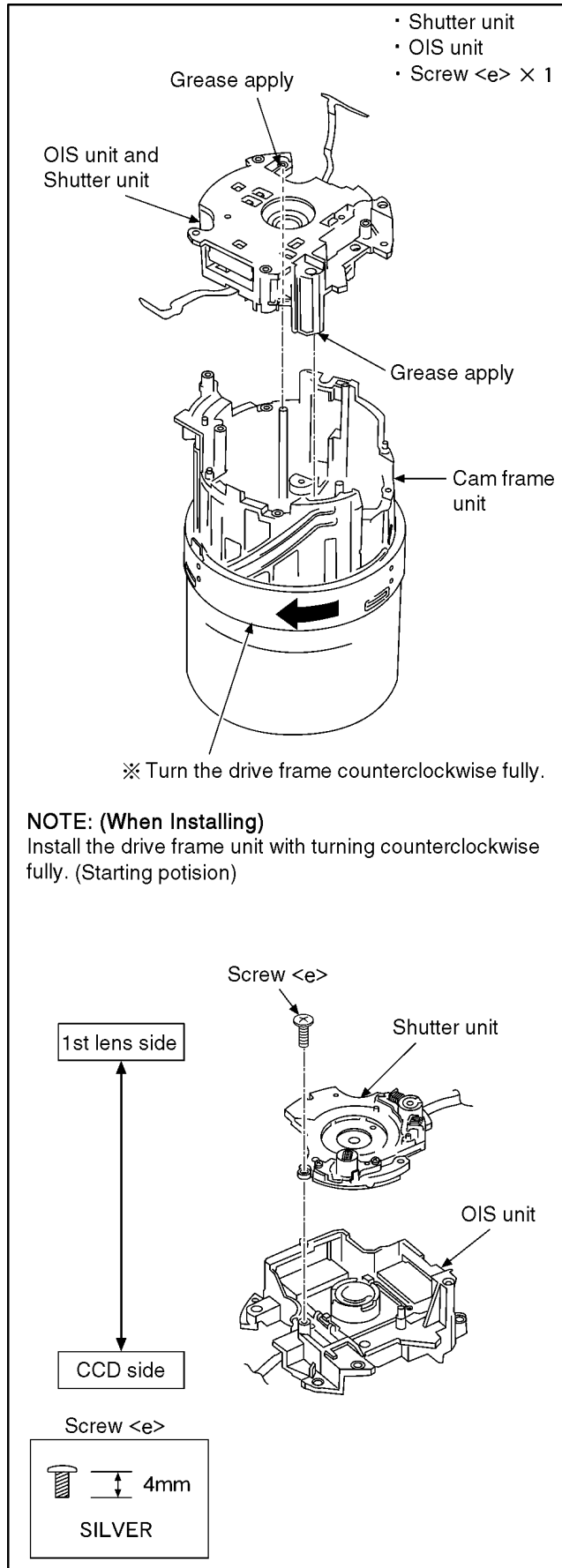
12.4.3. Removal of the F Guide Pole

NOTE:

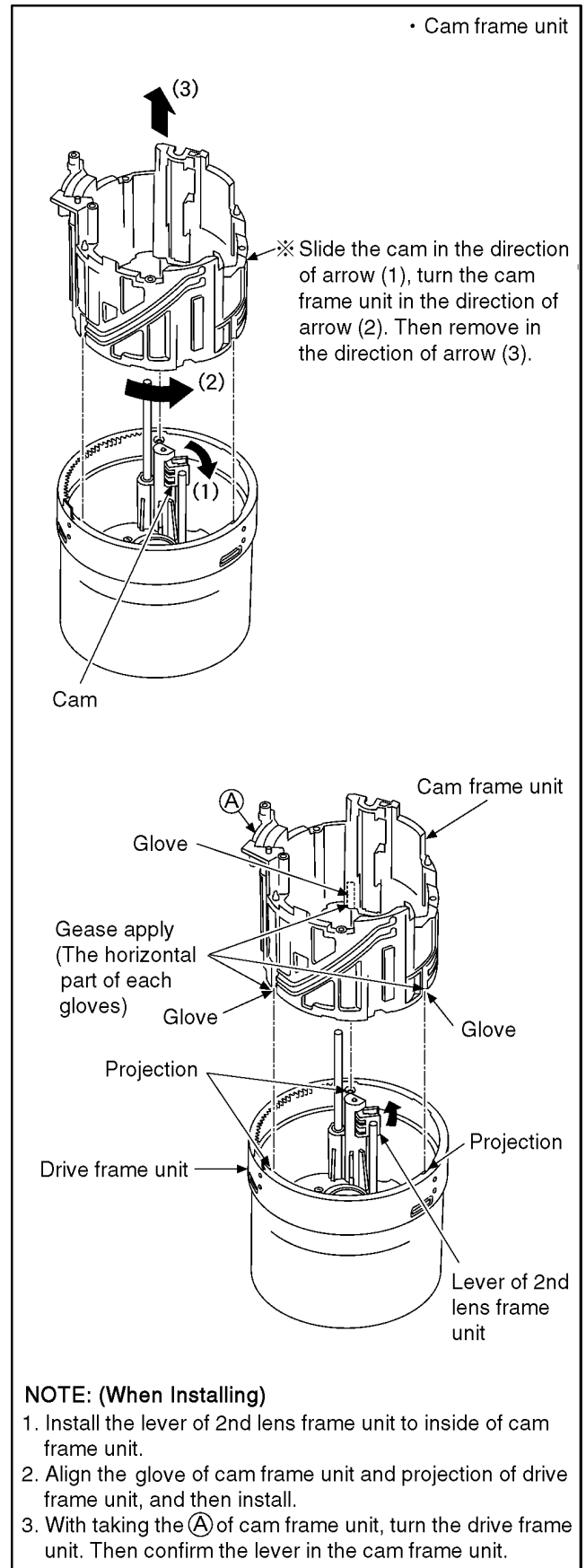
Do not remove F guide pole except for replacing.



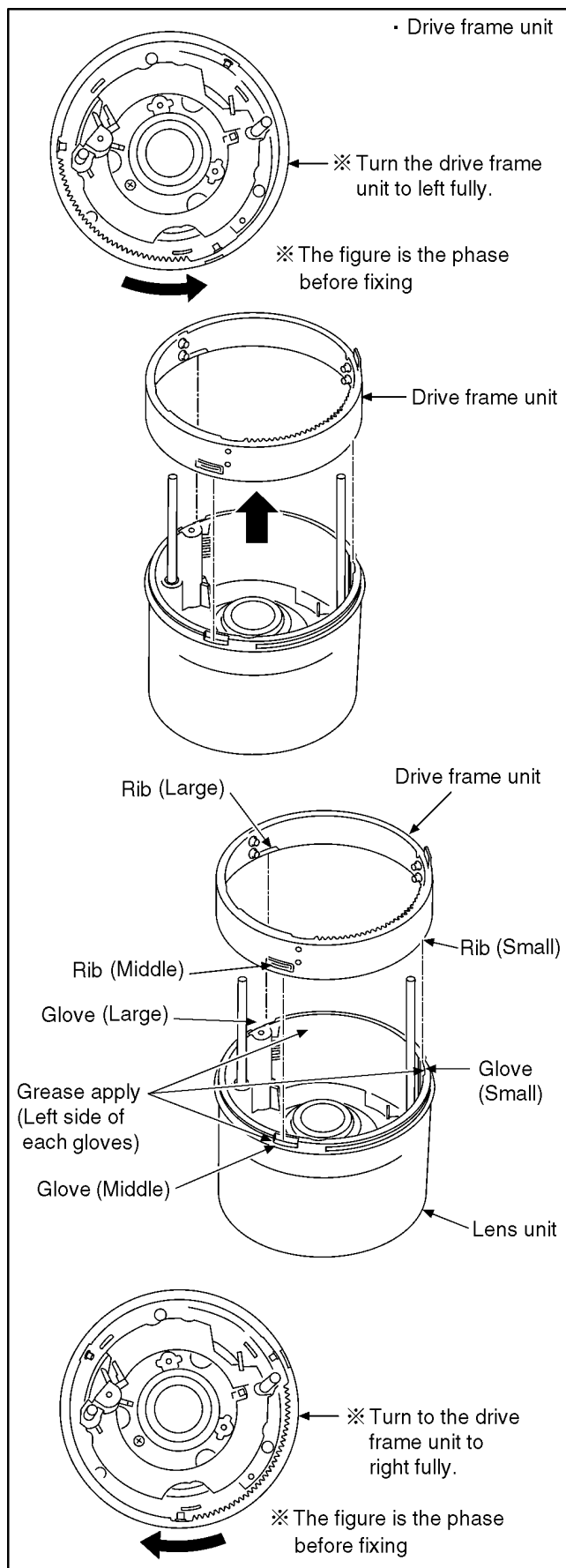
12.4.4. Removal of the OIS Unit and Shutter Unit



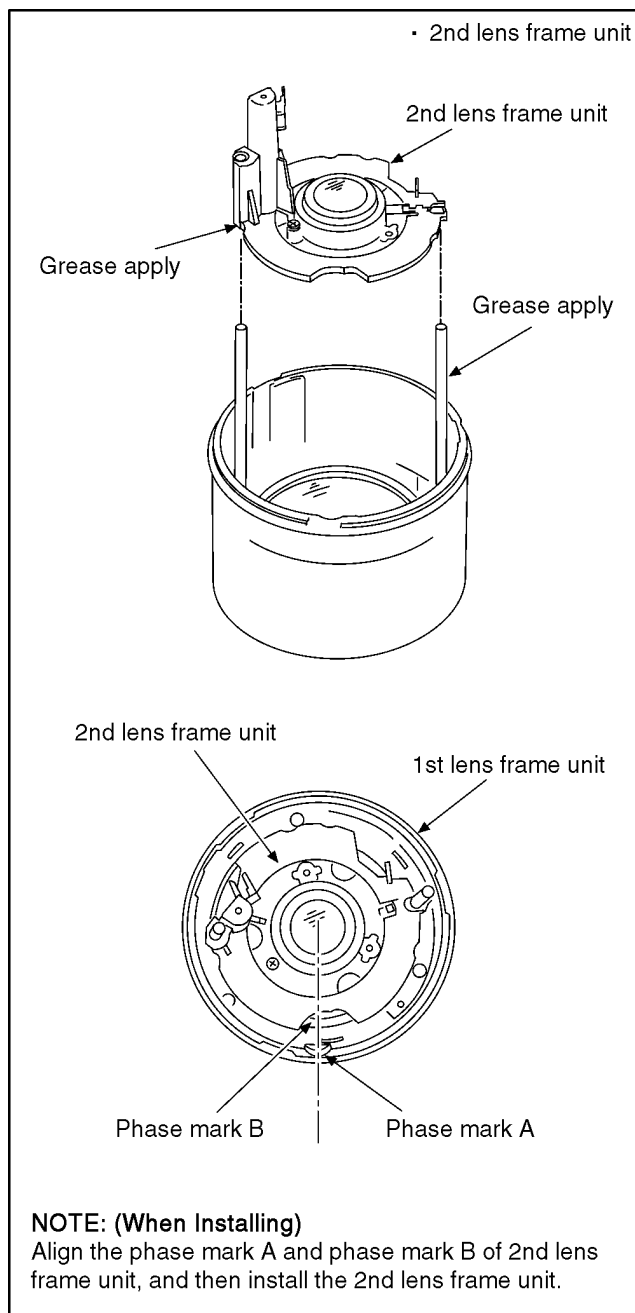
12.4.5. Removal of the Cam Frame Unit



12.4.6. Removal of the Drive Frame Unit



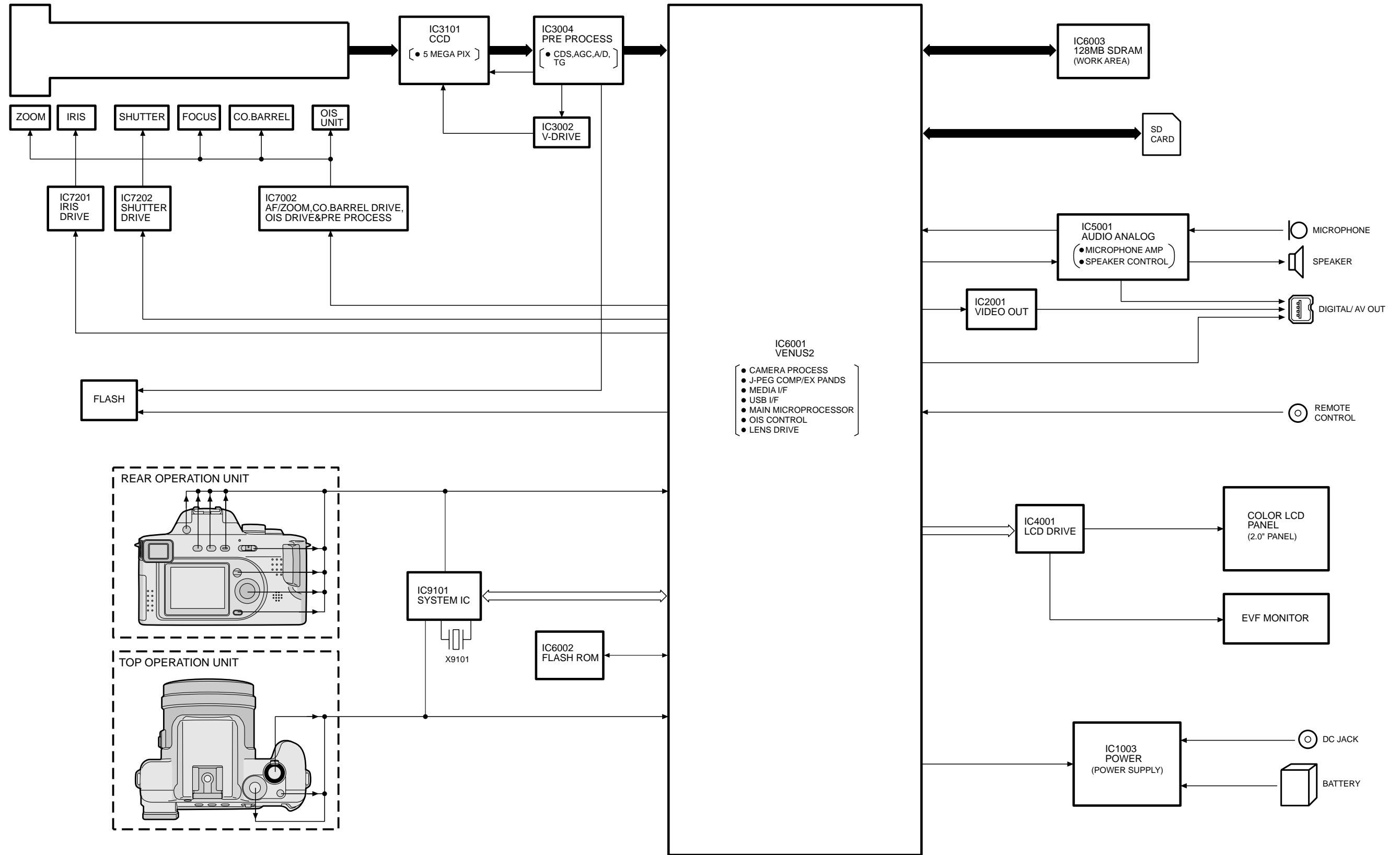
12.4.7. Removal of the 2nd Lens Frame Unit



13 SCHEMATIC DIAGRAMS

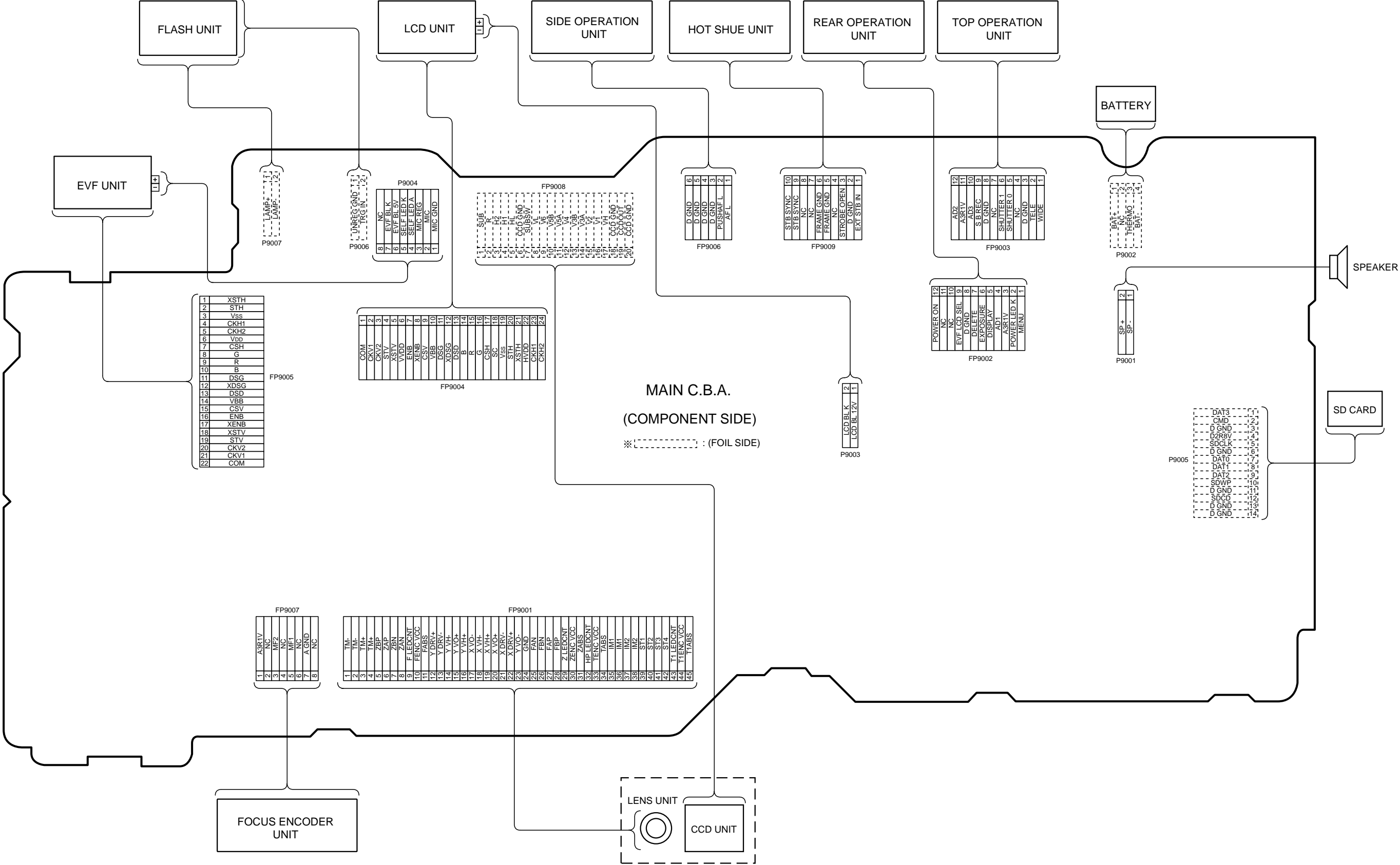
13.1. OVER ALL BLOCK DIAGRAM

OVERALL BLOCK DIAGRAM

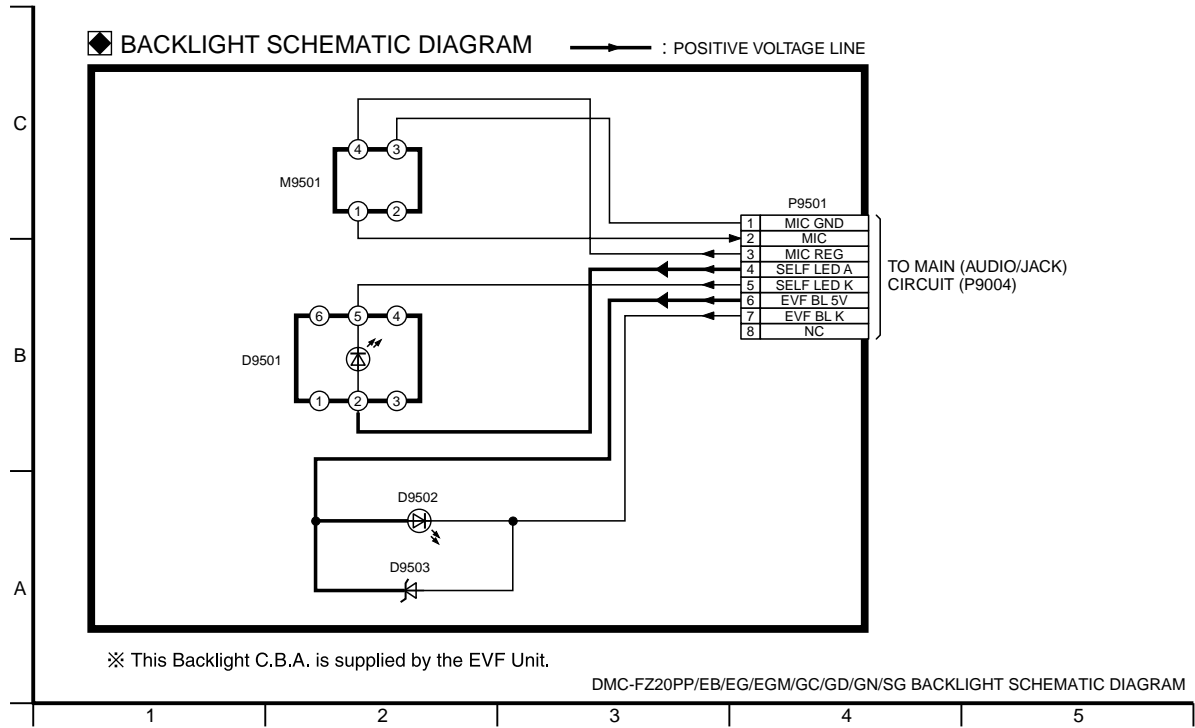


DMC-FZ20PP/EB/EG/EGM/GC/GD/GN/SG OVERALL BLOCK DIAGRAM

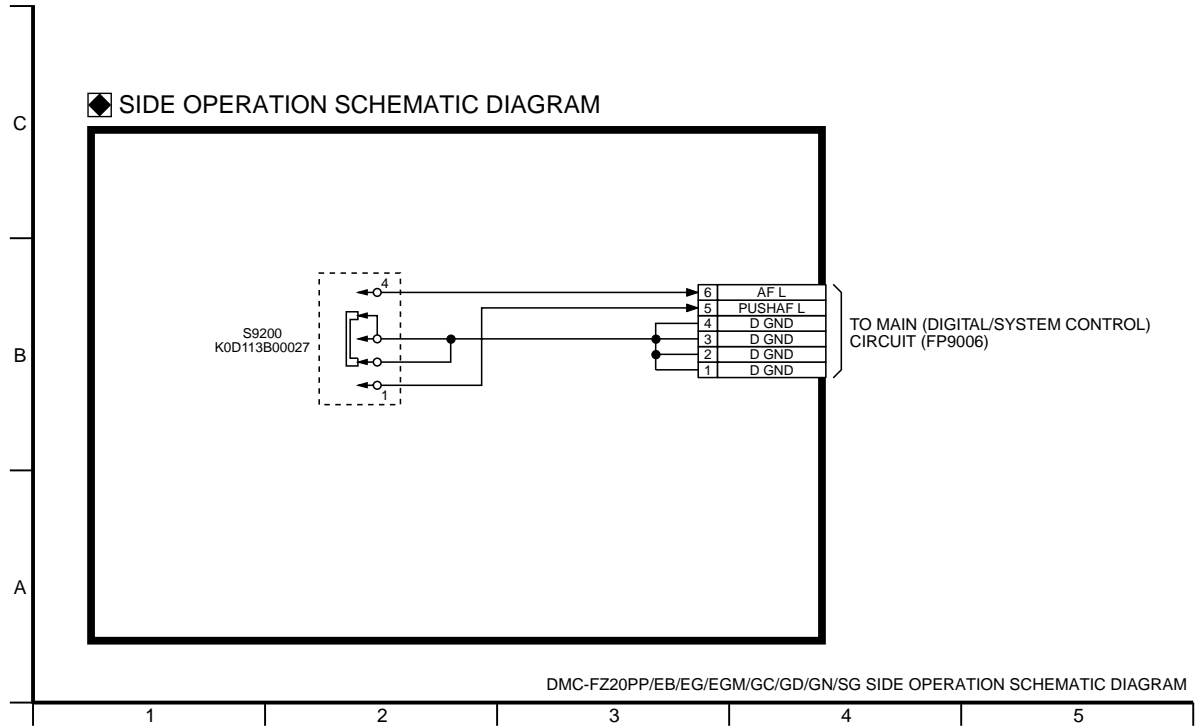
13.2. WIRING CONNECTION DIAGRAM



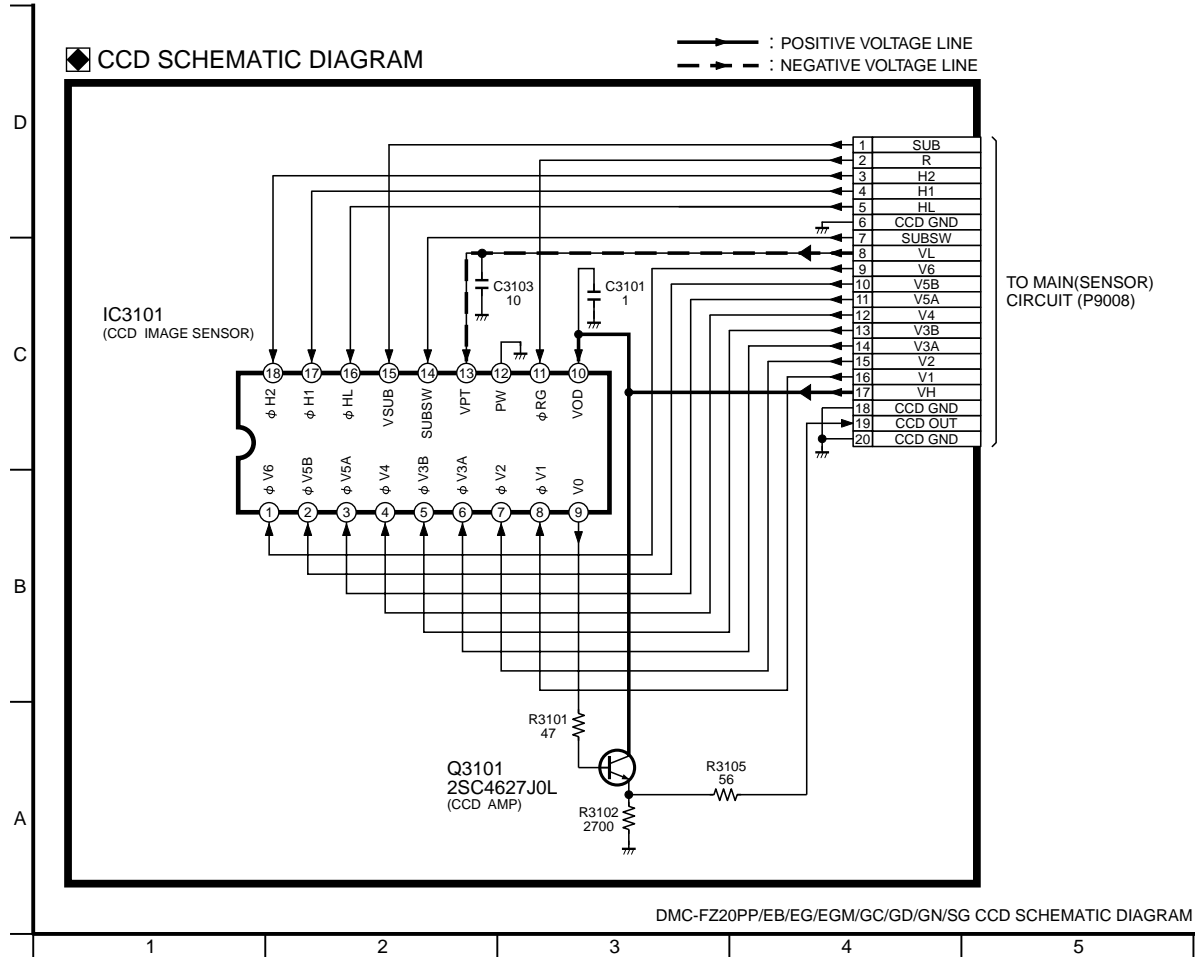
13.3. BACKLIGHT SCHEMATIC DIAGRAM



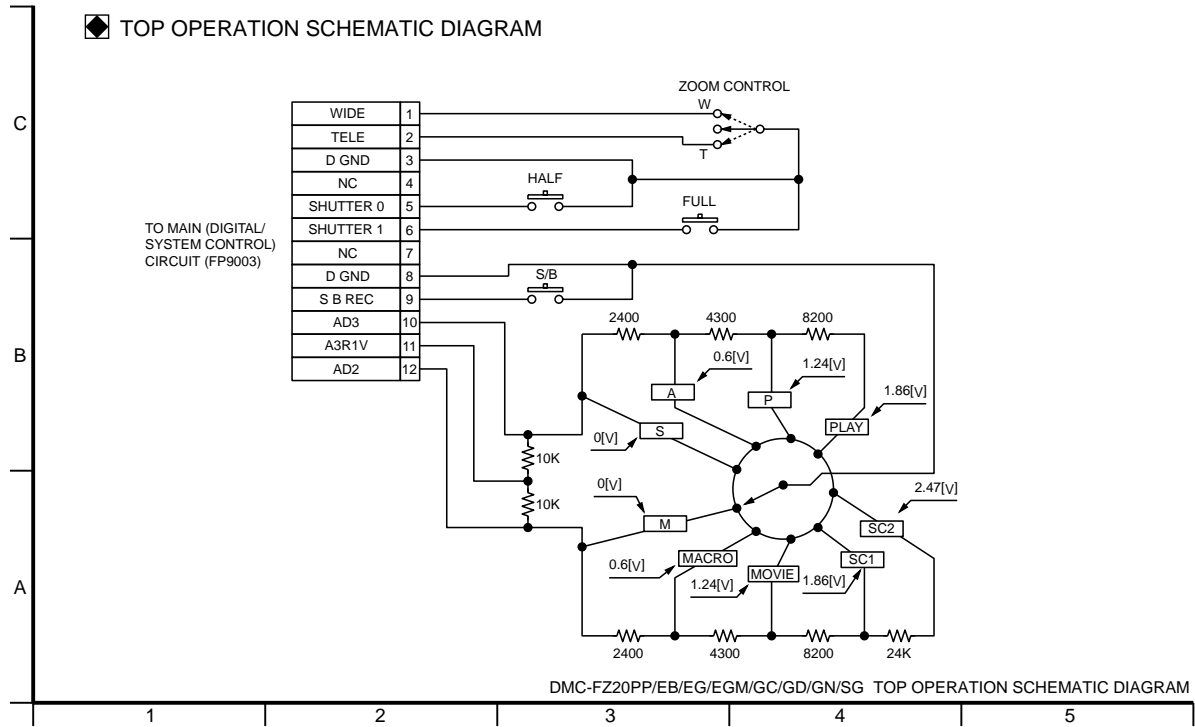
13.5. SIDE OPERATION SCHEMATIC DIAGRAM



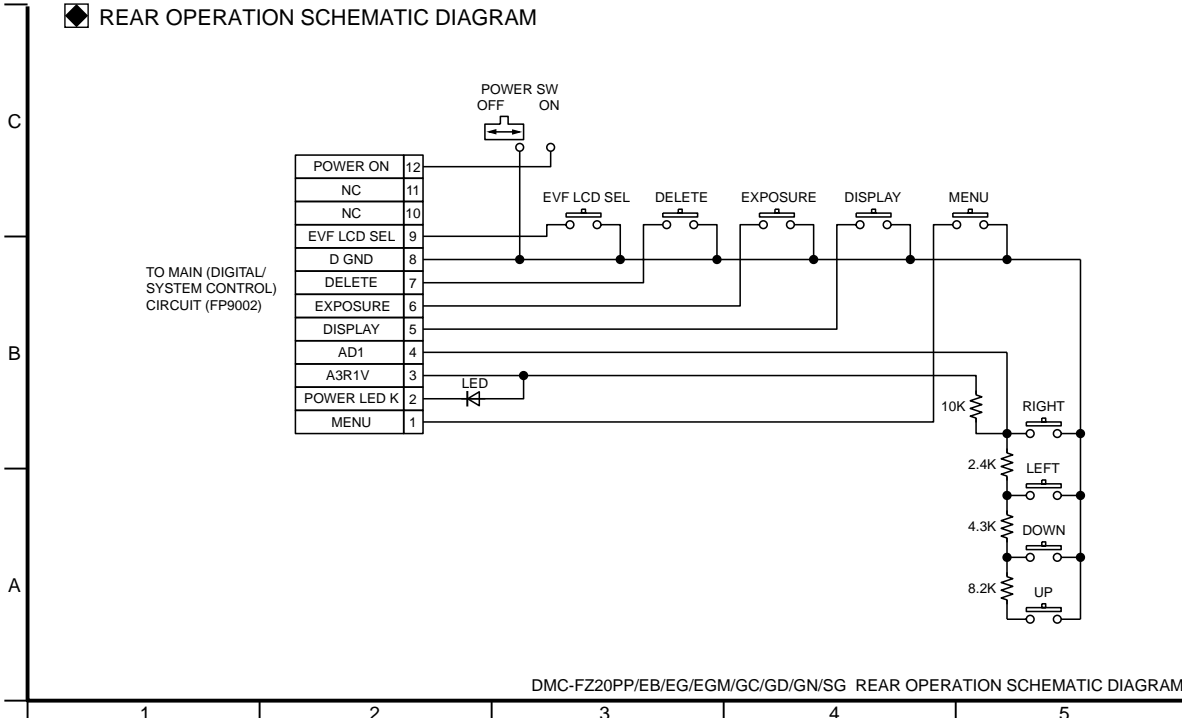
13.4. CCD SCHEMATIC DIAGRAM



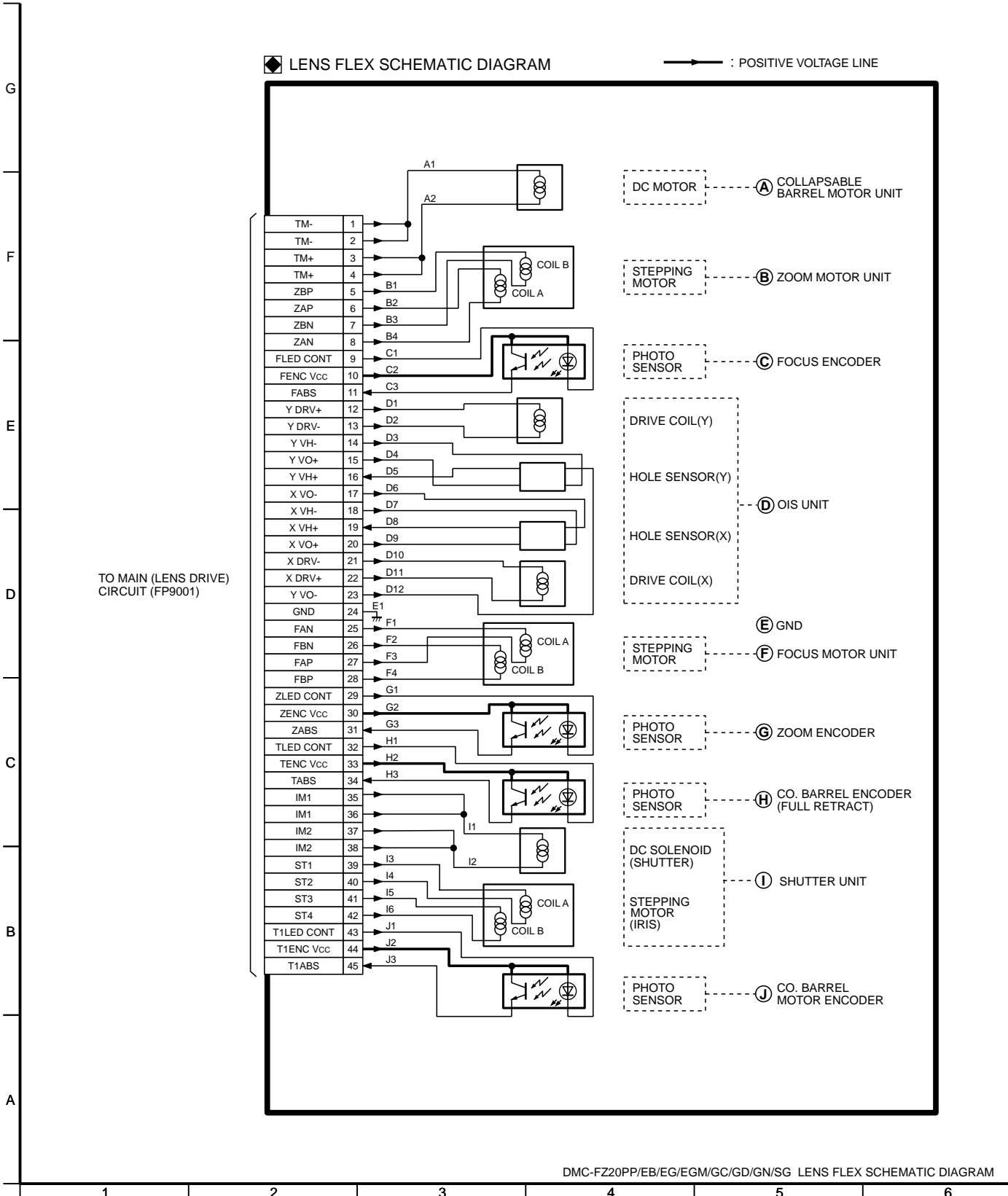
13.6. TOP OPERATION SCHEMATIC DIAGRAM



13.7. REAR OPERATION SCHEMATIC DIAGRAM

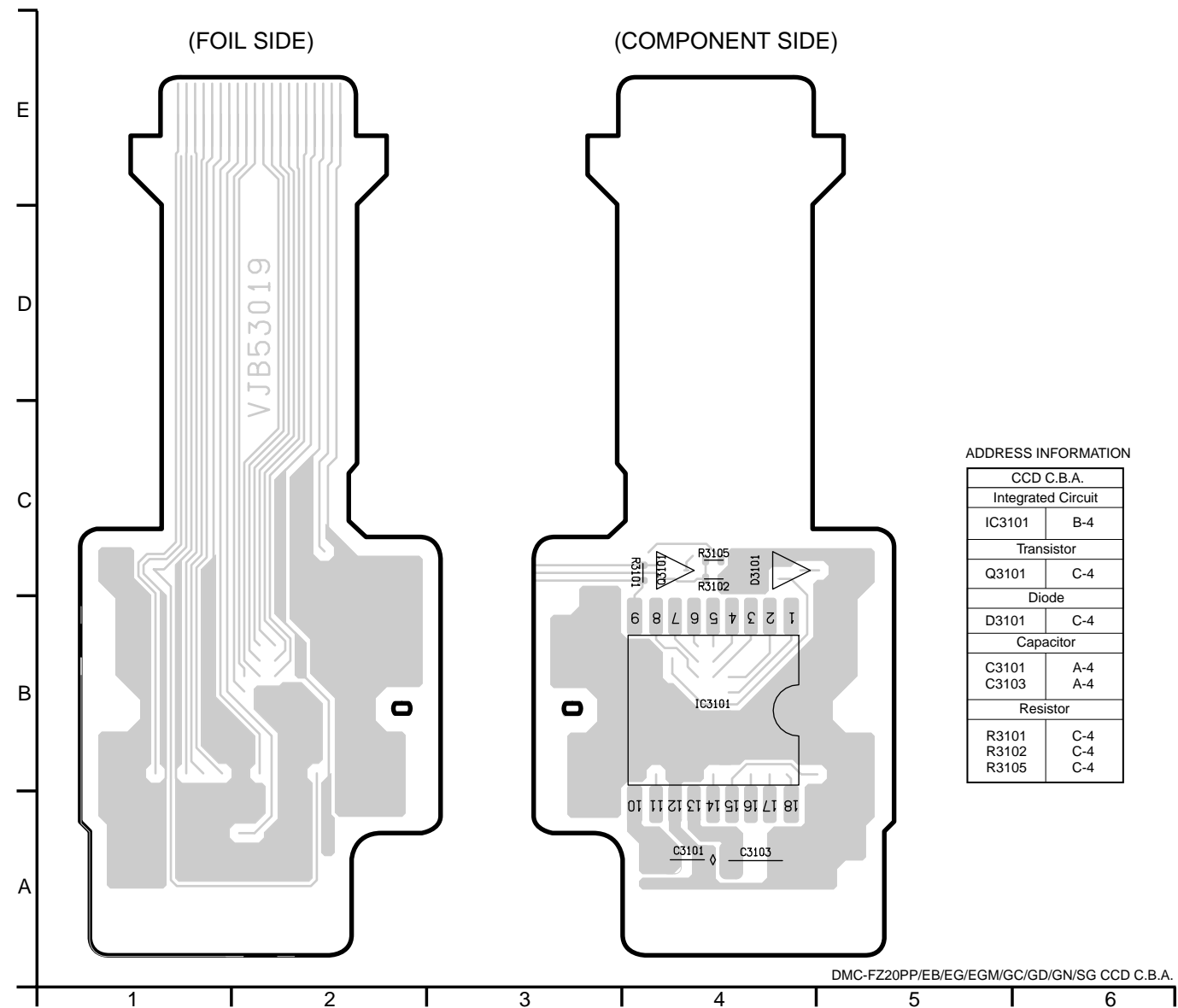


13.8. LENS FLEX SCHEMATIC DIAGRAM

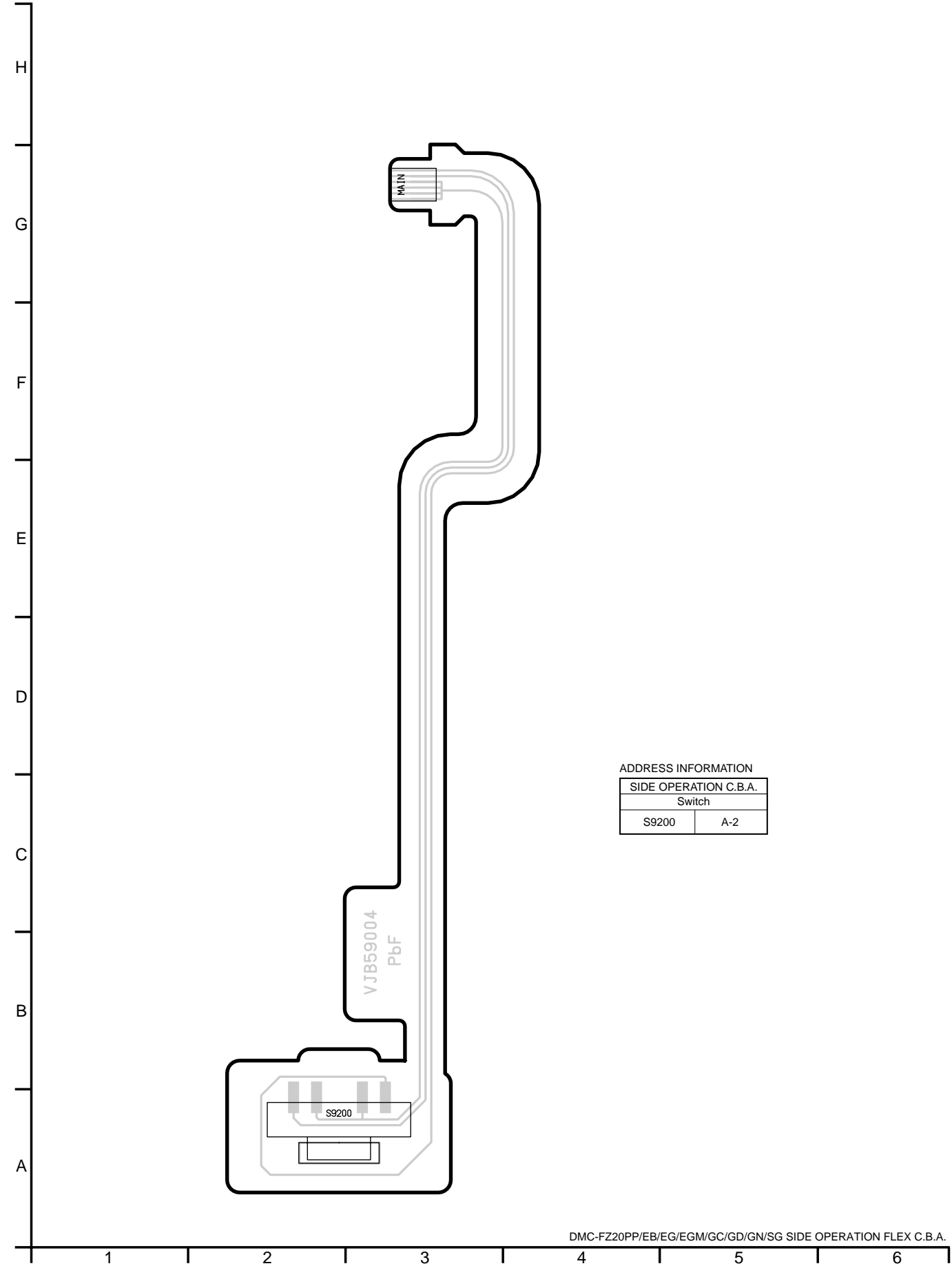


14 CIRCUIT BOARD ASSEMBLIES

14.1. CCD C.B.A.

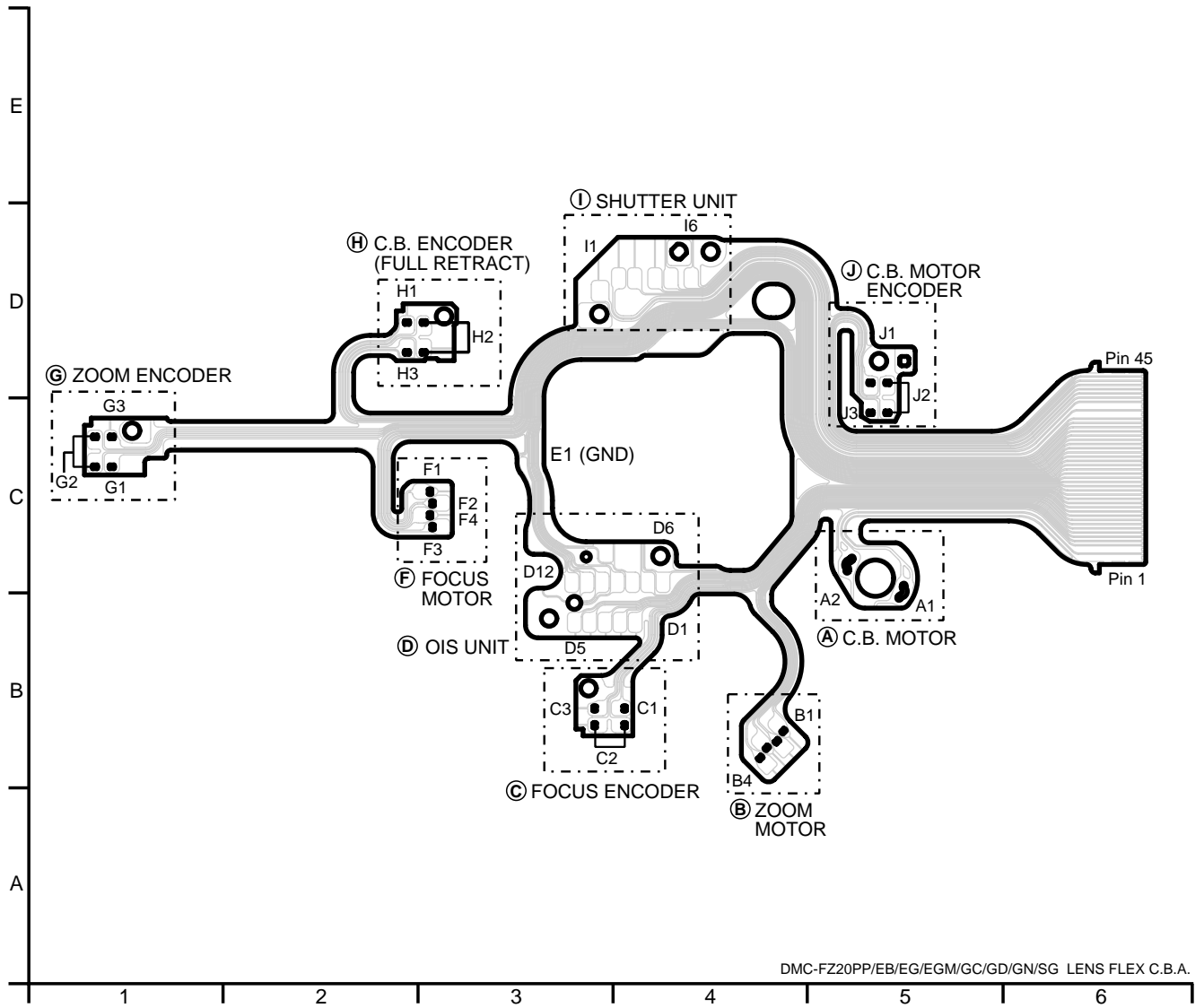


14.2. SIDE OPERATION FLEX C.B.A.



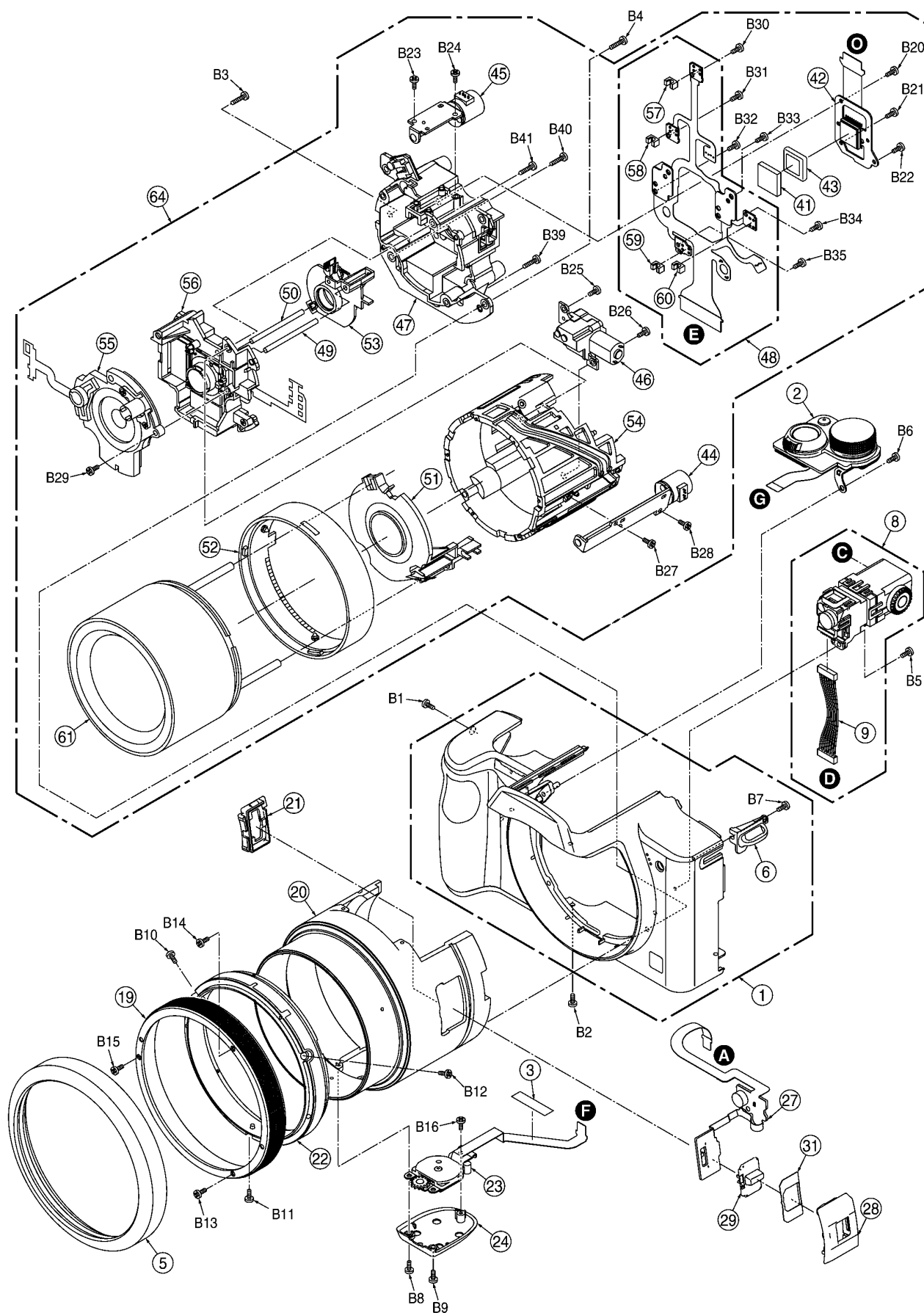
DMC-FZ20PP/EB/EG/EGM/GC/GD/GN/SG SIDE OPERATION FLEX C.B.A.

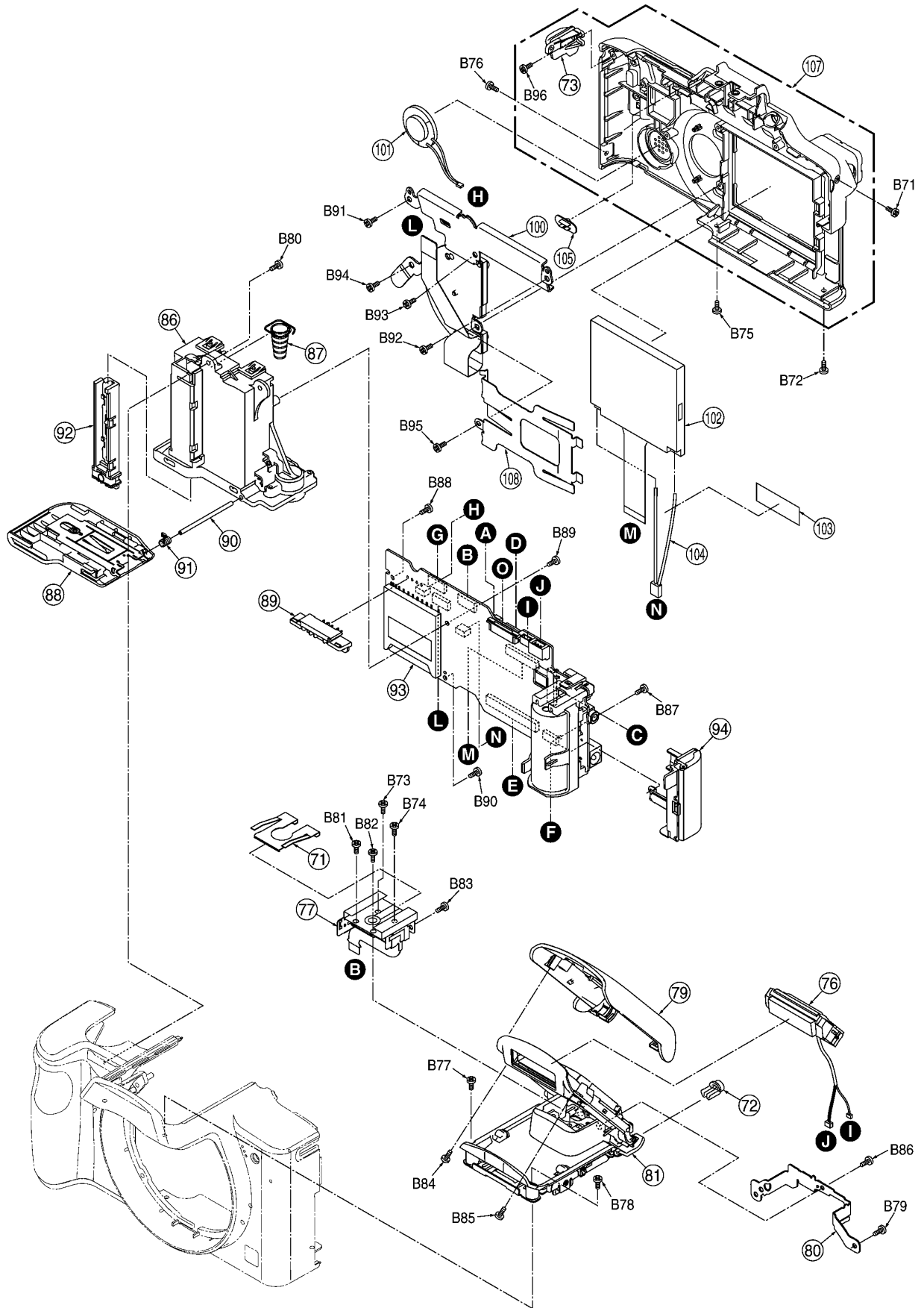
14.3. LENS FLEX C.B.A.



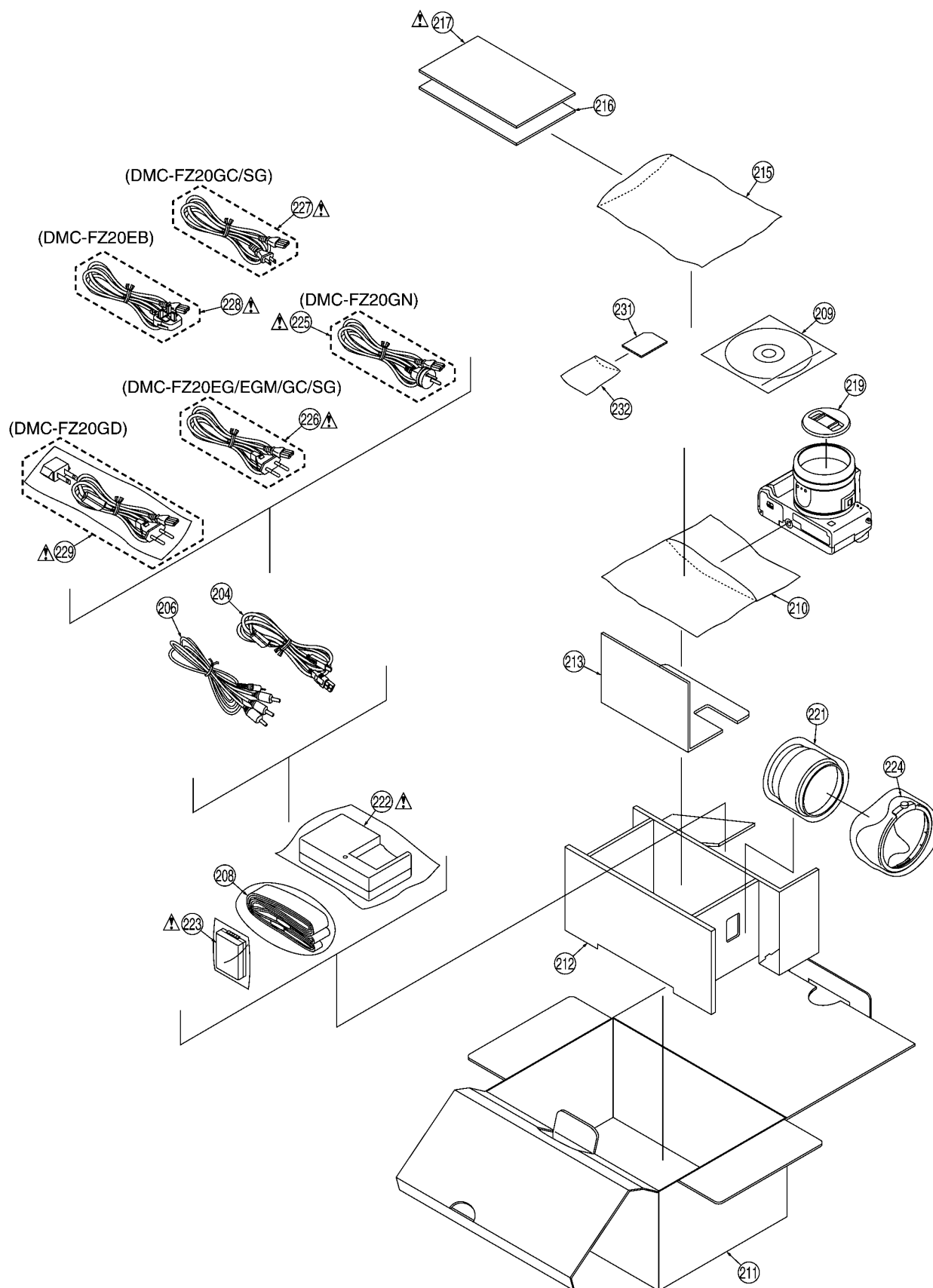
15 EXPLODED VIEWS

15.1. FRAME & CASING SECTION






15.2. PACKING PARTS & ACCESSORIES SECTION



16 REPLACEMENT PARTS LIST

16.1. MECHANICAL REPLACEMENT PARTS LIST

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

16.1.1. FRAME & CASING SECTION PARTS LIST

Definition of Parts supplier:

1. Parts marked with [AVC-SPC] in the remarks column are supplied from AVC COMPANY CS (AVC-SPC). Others are supplied from MKE SAIJYO (MKE).

Ref. No.	Part No.	Part Name & Description	Remarks
1	VYK1K70	FRONT CASE UNIT	SILVER
1	VYK1J74	FRONT CASE UNIT	BLACK
2	KORB01200007	TOP OPERATION UNIT	SILVER
2	KORB01200005	TOP OPERATION UNIT	BLACK
3	LSMF0048	SHEET	
5	VDW1099	LENS RING FRONT	SILVER
5	VDW1080	LENS RING FRONT	BLACK
6	VMS7523	STRAP HOLDER	
8	VYQ3196	EVF UNIT	SILVER
8	VYQ3214	EVF UNIT	BLACK
9	VEE1A43	EVF CONNECTOR UNIT	
19	VDW1100	MF RING	SILVER
19	VDW1081	MF RING	BLACK
20	VDW1098	LENS RING BASE	SILVER
20	VDW1079	LENS RING BASE	BLACK
21	VGQ7508	SIDE OPERATION HOLDER	
22	VXF0185	MF RING UNIT	
23	N9ZZ00000277	ENCODER UNIT	
24	VGP6091	ENCODER COVER	SILVER
24	VGP5992	ENCODER COVER	BLACK
27	VEP59004A	SIDE OPERATION C.B.A.	RTL
28	VGP6092	SIDE OPERATION COVER	SILVER
28	VGP5993	SIDE OPERATION COVER	BLACK
29	VGU9696	AF/MF KNOB	SILVER
29	VGU9502	AF/MF KNOB	BLACK
31	VMC1903	SIDE OPERATION SPRING	
41	VDL1589	OPTICAL FILTER	[AVC-SPC]
42	VEK0G95	CCD C.B.A.	[AVC-SPC]
43	VMX3391	CUSHION RUBBER	[AVC-SPC]
44	10S1F10F6NJ	ZOOM MOTOR UNIT	[AVC-SPC]
45	10S1F10F7NJ	FOCUS MOTOR UNIT	[AVC-SPC]
46	L6DA8BHB0002	COLLAPSABLE BARREL MOTOR	[AVC-SPC]
47	VDW1083	MASTER FLANGE	[AVC-SPC]
48	VEK0H04	LENS FLEX UNIT	[AVC-SPC]
49	VMS7434	F GUIDE POLE	[AVC-SPC]
50	VMS7434	F GAIDE POLE	[AVC-SPC]
51	VXP2404	2ND LENS FRAME UNIT	[AVC-SPC]
52	VXP2297	DRIVE FRAME UNIT	[AVC-SPC]
53	VXP2402	4TH LENS FRAME UNIT	[AVC-SPC]
54	VXQ1180	CAM FRAME UNIT	[AVC-SPC]
55	L9ZZ00000202	SHUTTER UNIT	[AVC-SPC]
56	VXQ1258	OIS UNIT	[AVC-SPC]
57	B3NAA0000074	PHOTO SENSOR	[AVC-SPC]
58	B3NAA0000074	PHOTO SENSOR	[AVC-SPC]
59	B3NAA0000074	PHOTO SENSOR	[AVC-SPC]
60	B3NAA0000074	PHOTO SENSOR	[AVC-SPC]
61	VXQ1294	1ST LENS FRAME UNIT	[AVC-SPC] SILVER

Ref. No.	Part No.	Part Name & Description	Remarks
61	VXQ1295	1ST LENS FRAME UNIT	[AVC-SPC] BLACK
64	VXW0690	LENS UNIT	[AVC-SPC] SILVER
64	VXW0680	LENS UNIT	[AVC-SPC] BLACK
71	VMC1752	SHOE SPRING	SILVER
71	VMC1768	SHOE SPRING	BLACK
72	VGU9697	FLASH LOCK BUTTON	SILVER
72	VGU9501	FLASH LOCK BUTTON	BLACK
73	VMS7523	STRAP HOLDER	
76	VEK0G92	FLASH UNIT	
77	VEK0H03	HOT SHOE UNIT	SILVER
77	VEK0H02	HOT SHOE UNIT	BLACK
79	VKM6617	FLASH TOP COVER	SILVER
79	VKM6602	FLASH TOP COVER	BLACK
80	VMA0R53	FLASH PLATE, STEEL	
81	VXF0196	TOP BASE UNIT	
86	VGQ8205	BATTERY CATCHER HOLDER	[AVC-SPC] SILVER
86	VGQ8162	BATTERY CATCHER HOLDER	[AVC-SPC] BLACK
87	VMB3935	CATCHER SPRING	[AVC-SPC]
88	VYF3020	BATTERY COVER UNIT	[AVC-SPC] SILVER
88	VYF3019	BATTERY COVER UNIT	[AVC-SPC] BLACK
89	K1ZZ00001294	BATTERY CATCHER	
90	VMS7525	BATTERY COVER HINGE SHAFT	[AVC-SPC]
91	VMB3931	BATTERY COVER HINGE SPRING	[AVC-SPC]
92	VYQ2569	BATTERY LOCK UNIT	[AVC-SPC]
93	VEP56015A	MAIN C.B.A.	RTL
94	VYQ3222	JACK DOOR UNIT	SILVER
94	VYQ3198	JACK DOOR UNIT	BLACK
100	KORB01100006	REAR OPERATION UNIT	SILVER
100	KORB01100005	REAR OPERATION UNIT	BLACK
101	L0AA01A00010	SPEAKER	
102	L5EDDYH00002	LCD MODULE	
103	LSMF0242	SHEET	
104	VEE1A35	LCD BL CONNECTOR UNIT	
105	VGU9698	POWER KNOB	SILVER
105	VGU9504	POWER KNOB	BLACK
107	VYK1L43	REAR CASE UNIT	SILVER
107	VYK1L42	REAR CASE UNIT	BLACK
108	VMA0R54	LCD HOLDER	
B1	VHD1680	SCREW, STEEL	SILVER
B1	VHD1684	SCREW, STEEL	BLACK
B2	XQN16+BJ6FN	SCREW, STEEL	SILVER
B2	XQN16+BJ6FJK	SCREW, STEEL	BLACK
B3	XQN16+B8FN	SCREW, STEEL	
B4	XQN16+B8FN	SCREW, STEEL	
B5	XQN16+BJ6FN	SCREW, STEEL	SILVER
B5	XQN16+BJ6FJK	SCREW, STEEL	BLACK
B6	XQN16+B8FN	SCREW, STEEL	
B7	XQN16+BJ5FN	SCREW, STEEL	
B8	VHD1680	SCREW, STEEL	SILVER
B8	VHD1684	SCREW, STEEL	BLACK
B9	VHD1680	SCREW, STEEL	SILVER
B9	VHD1684	SCREW, STEEL	BLACK
B10	VHD1652	SCREW, STEEL	
B11	VHD1652	SCREW, STEEL	
B12	VHD1652	SCREW, STEEL	
B13	XQN16+AJ4FN	SCREW, STEEL	SILVER
B13	XQN16+AJ4FJK	SCREW, STEEL	BLACK
B14	XQN16+AJ4FN	SCREW, STEEL	SILVER
B14	XQN16+AJ4FJK	SCREW, STEEL	BLACK
B15	XQN16+AJ4FN	SCREW, STEEL	SILVER
B15	XQN16+AJ4FJK	SCREW, STEEL	BLACK
B16	XQN16+BJ4FN	SCREW, STEEL	
B20	XQN14+CJ3FN	SCREW, STEEL	[AVC-SPC]

Ref. No.	Part No.	Part Name & Description	Remarks
B21	XQN14+CJ3FN	SCREW,STEEL	[AVC-SPC]
B22	XQN14+CJ3FN	SCREW,STEEL	[AVC-SPC]
B23	XQN16+CJ4FN	SCREW,STEEL	[AVC-SPC]
B24	XQN16+CJ4FN	SCREW,STEEL	[AVC-SPC]
B25	XQN16+CJ4FN	SCREW,STEEL	[AVC-SPC]
B26	XQN16+CJ4FN	SCREW,STEEL	[AVC-SPC]
B27	XQN16+CJ4FN	SCREW,STEEL	[AVC-SPC]
B28	XQN16+CJ4FN	SCREW,STEEL	[AVC-SPC]
B29	XQN16+CJ4FN	SCREW,STEEL	[AVC-SPC]
B30	XQN16+CJ4FN	SCREW,STEEL	[AVC-SPC]
B31	XQN16+CJ4FN	SCREW,STEEL	[AVC-SPC]
B32	XQN16+CJ4FN	SCREW,STEEL	[AVC-SPC]
B33	XQN16+CJ4FN	SCREW,STEEL	[AVC-SPC]
B34	XQN16+CJ4FN	SCREW,STEEL	[AVC-SPC]
B35	XQN16+CJ4FN	SCREW,STEEL	[AVC-SPC]
B39	XQN16+CJ8FN	SCREW,STEEL	[AVC-SPC]
B40	XQN16+CJ8FN	SCREW,STEEL	[AVC-SPC]
B41	XQN16+CJ8FN	SCREW,STEEL	[AVC-SPC]
B71	VHD1680	SCREW,STEEL	SILVER
B71	VHD1684	SCREW,STEEL	BLACK
B72	VHD1680	SCREW,STEEL	SILVER
B72	VHD1684	SCREW,STEEL	BLACK
B73	XQN16+B4FJK	SCREW,STEEL	SILVER
B73	XQN16+B4FN	SCREW,STEEL	BLACK
B74	XQN16+B4FJK	SCREW,STEEL	SILVER
B74	XQN16+B4FN	SCREW,STEEL	BLACK
B75	XQN16+BJ6FN	SCREW,STEEL	SILVER
B75	XQN16+BJ6FJK	SCREW,STEEL	BLACK
B76	XQN16+BJ6FN	SCREW,STEEL	SILVER
B76	XQN16+BJ6FJK	SCREW,STEEL	BLACK
B77	VHD1684	SCREW,STEEL	
B78	VHD1684	SCREW,STEEL	
B79	XQN16+B8FN	SCREW,STEEL	
B80	XQN16+BJ6FN	SCREW,STEEL	SILVER
B80	XQN16+BJ6FJK	SCREW,STEEL	BLACK
B81	XQN16+B4FN	SCREW,STEEL	
B82	XQN16+B4FN	SCREW,STEEL	
B83	XQN16+B4FN	SCREW,STEEL	
B84	XQN16+BJ4FJK	SCREW,STEEL	
B85	XQN16+BJ4FJK	SCREW,STEEL	
B86	XQN16+B4FN	SCREW,STEEL	
B87	VHD1680	SCREW,STEEL	
B88	XQN16+BJ4FN	SCREW,STEEL	
B89	XQN16+BJ4FN	SCREW,STEEL	
B90	XQN16+BJ4FN	SCREW,STEEL	
B91	XQN16+BJ4FN	SCREW,STEEL	
B92	XQN16+BJ4FN	SCREW,STEEL	
B93	XQN16+BJ4FN	SCREW,STEEL	
B94	XQN16+BJ4FN	SCREW,STEEL	
B95	XQN16+BJ4FN	SCREW,STEEL	
B96	XQN16+BJ5FN	SCREW,STEEL	

16.1.2. PACKING PARTS & ACCESSORIES SECTION PARTS LIST

Definition of Parts supplier:

1. Parts marked with [AVC-SPC] in the remarks column are supplied from AVC COMPANY CS (AVC-SPC). Others are supplied from MKE SAIJO (MKE).

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
DMC-FZ20PP-S	A
DMC-FZ20PP-K	B
DMC-FZ20EG-S	C
DMC-FZ20EG-K	D
DMC-FZ20EGMS	E
DMC-FZ20EGMK	F
DMC-FZ20EB-K	G
DMC-FZ20GC-S	H
DMC-FZ20GC-K	I
DMC-FZ20SG-S	J
DMC-FZ20SG-K	K
DMC-FZ20GN-S	L
DMC-FZ20GN-K	M
DMC-FZ20GD-S	N
DMC-FZ20GD-K	O


Ref. No.	Part No.	Part Name & Description	Remarks
204	K1HA08CD0001	USB CABLE W/PLUG	[AVC-SPC]
206	K1HA08CD0002	AV CABLE W/PLUG	[AVC-SPC]
208	VFC4078	STRAP	
209	VFF0254-S	CD-ROM	[AVC-SPC] (A,B)
209	VFF0255-S	CD-ROM	[AVC-SPC] (C,D,E,F,G, H,I,J,K,L,M, N,O)
210	VPF1193	CAMERA BAG,POLYETHYLENE	
211	VPK2914	PACKING CASE,PAPER	(A)
211	VPK2900	PACKING CASE,PAPER	(B)
211	VPK2915	PACKING CASE,PAPER	(C,E,H,J,L, N)
211	VPK2901	PACKING CASE,PAPER	(D,F,G,I,K, M,O)
212	VPN6232	CUSHION	
213	VPN6266	BOTTOM PAD	
215	VPF1100	BAG,POLYETHYLENE	[AVC-SPC] (A,B,G,L,M, N,O)
215	VPF1132	BAG,POLYETHYLENE	[AVC-SPC] (C,D,E,F,H, I,J,K)
216	VQT0L70	INSTRUCTION BOOK/ APPLICATION (ENGLISH/CANADIAN FRENCH)	[AVC-SPC] (A,B)
216	VQT0L77	INSTRUCTION BOOK/ APPLICATION (GERMAN/FRENCH)	[AVC-SPC] (C,D)
216	VQT0L78	INSTRUCTION BOOK/ APPLICATION (ITALIAN/DUTCH)	[AVC-SPC] (C,D)

Ref. No.	Part No.	Part Name & Description	Remarks
216	VQT0L79	INSTRUCTION BOOK/ APPLICATION (ITALIAN/DUTCH)	[AVC-SPC] (E,F)
216	VQT0L80	INSTRUCTION BOOK/ APPLICATION (SWEDISH)	[AVC-SPC] (E,F)
216	VQT0L76	INSTRUCTION BOOK/ APPLICATION (ENGLISH)	[AVC-SPC] (G)
216	VQT0L73	INSTRUCTION BOOK/ APPLICATION (ENGLISH/TRADITIONAL CHINESE)	[AVC-SPC] (H,I,J,K)
216	VQT0L74	INSTRUCTION BOOK/ APPLICATION (SIMPLIFIED CHINESE)	[AVC-SPC] (H,I,J,K)
216	VQT0L75	INSTRUCTION BOOK/ APPLICATION (ARABIC/RUSSIAN)	[AVC-SPC] (H,I,J,K)
216	VQT0L81	INSTRUCTION BOOK/ APPLICATION (ENGLISH)	[AVC-SPC] (L,M)
216	VQT0L72	INSTRUCTION BOOK/ APPLICATION (KOREAN)	[AVC-SPC] (N,O)
217	VQTM38	INSTRUCTION BOOK (ENGLISH)	△ [AVC-SPC] (A,B)
217	VQTM39	INSTRUCTION BOOK (CANADIAN FRENCH)	△ [AVC-SPC] (A,B)
217	VQTM40	INSTRUCTION BOOK (GERMAN)	△ [AVC-SPC] (C,D)
217	VQTM41	INSTRUCTION BOOK (FRENCH)	△ [AVC-SPC] (C,D)
217	VQTM42	INSTRUCTION BOOK (ITALIAN)	△ [AVC-SPC] (C,D)
217	VQTM43	INSTRUCTION BOOK (DUTCH)	△ [AVC-SPC] (C,D)
217	VQTM44	INSTRUCTION BOOK (SPANISH)	△ [AVC-SPC] (E,F)
217	VQTM45	INSTRUCTION BOOK (PORTUGUESE)	△ [AVC-SPC] (E,F)
217	VQTM46	INSTRUCTION BOOK (SWEDISH)	△ [AVC-SPC] (E,F)
217	VQTM47	INSTRUCTION BOOK (DANISH)	△ [AVC-SPC] (E,F)
217	VQTM48	INSTRUCTION BOOK (ENGLISH)	△ [AVC-SPC] (G)
217	VQTM49	INSTRUCTION BOOK (ENGLISH)	△ [AVC-SPC] (H,I,J,K)
217	VQTM50	INSTRUCTION BOOK (TRADITIONAL CHINESE)	△ [AVC-SPC] (H,I,J,K)
217	VQTM51	INSTRUCTION BOOK (SIMPLIFIED CHINESE)	△ [AVC-SPC] (H,I,J,K)
217	VQTM52	INSTRUCTION BOOK (RUSSIAN)	△ [AVC-SPC] (H,I,J,K)
217	VQTM53	INSTRUCTION BOOK (ARABIC)	△ [AVC-SPC] (H,I,J,K)
217	VQTM54	INSTRUCTION BOOK (ENGLISH)	△ [AVC-SPC] (L,M)
217	VQTM55	INSTRUCTION BOOK (KOREAN)	△ [AVC-SPC] (N,O)
219	VYK0W96	LENS CAP UNIT	
221	VYQ3226	LENS HOOD	(A,C,E,H,J, L,N)
221	VYQ3213	LENS HOOD	(B,D,F,G,I, K,M,O)
222	DE-993BA	AC ADAPTOR	△ (A,B)
222	DE-994AA	AC ADAPTOR	△ (C,D,E,F, G,L,M)
222	DE-994BA	AC ADAPTOR	△ (H,I,J,K, N,O)
223	-----	BATTERY	△
224	VYQ3234	STAR HOOD(U)	
225	K2CJ2DA00011	AC CABLE W/PLUG	△ (L,M)
226	K2CR2DA00004	AC CABLE W/PLUG	△ K2CQ2DA00002 (C,D,E,F,H, I,J,K)
227	K2CA2CA00020	AC CABLE W/PLUG	△ (H,I,J,K)
228	RJA0053-3X	AC CABLE W/PLUG	△ (G)
229	K2CP2DA00001	AC CABLE W/PLUG	△ (N,O)
231	RP-SD016BE0	SD CARD	
232	VPF1214	SD CARD BAG, POLYETHYLENE	[AVC-SPC]

16.1.3. SERVICE FIXTURE & TOOLS

Ref. No.	Part No.	Part Name & Description	Remarks
	VFK1582A1225	EXTENSION CABLE / (12PIN-FFC)	[FP9003 - TOP OPERATION] [FP9002 - REAR OPERATION]
	VFK1576DC202	EXTENSION CABLE / (2PIN-CABLE)	[P9001 - SPEAKER] [P9003 - LCD BACKLIGHT] [P9006 - FLASH U]
	VFK1576DSC03	EXTENSION CABLE / (2PIN-CABLE)	[P9007 - FLASH U]
	VFK1284	EXTENSION CABLE / (24PIN-FFC)	[FP9004 - LCD UNIT]
	VFK1441	EXTENSION CABLE / (8PIN-FFC)	[FP9007 - FOCUS ENCODER]
	VFK1282	EXTENSION CABLE / (22PIN-FFC)	[FP9005 - EVF FLEX]
	VFK1480	EXTENSION CABLE / (6PIN-FFC)	[FP9006 - SIDE OPERATION]
	VFK1461	EXTENSION CABLE / (20PIN-FFC)	[FP9008 - CCD FLEX]
	VFK1582A1025	EXTENSION CABLE / (10PIN-FFC)	[FP9009 - HOT SHOE]
	VFK1582A4525	EXTENSION CABLE / (45PIN-FFC)	[FP9001 - LENS UNIT]
	VFK1920	EXTENSION CABLE / (8PIN-CABLE)	[P9004 - EVF BACKLIGHT]
	ERG5SJ102	RESISTOR FOR DISCHARGING	
	VFK1164TDVLB	LIGHT BOX	
	VFK1164TCM02	INFINITY LENS	
	VFK1164ND01	ND FILTER (ND 0.1)	
	VFK1828	COLOR CHART	
	VFK1164LBB1	COLOR TEMP.CONV.FILTER	
	VFK1829	GLEASE	
	VFK1835	DOMO TYPE MAGNIFYING GLASS	
	VFK1700	HANARL OIL	

16.2. ELECTRICAL REPLACEMENT PARTS LIST

Note: 1. Be sure to make your orders of replacement parts according to this list.
 2. IMPORTANT SAFETY NOTICE : Components identified with the mark  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 P.C.Board units marked with "■" show below the main assembled parts.
 5. The marking(RTL) indicates the retention time is limited for this item. After the discontinuation of this assembly in production, it will no longer be available.

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

Definition of Parts supplier:

1. Parts marked with [MBI] in the remarks column are supplied from "Matsushita Battery Industrial co., Ltd." .
2. Parts marked with [AVC-SPC] in the remarks column are supplied from AVC COMPANY CS (AVC-SPC). Others are supplied from MKE SAIJO (MKE).

Ref. No.	Part No.	Part Name & Description	Remarks
		PRINTED CIRCUIT BOARD ASSEMBLY	
	VEP56015A	MAIN C.B.A.	E.S.D. [RTL]
	VEP59004A	SIDE OPERATION C.B.A.	[RTL]
	VEK0G95	CCD C.B.A.	[AVC-SPC]
		MAIN C.B.A.	E.S.D. [RTL]
		MISCELLANEOUS	
Z9101	ML-614S/ZT	BATTERY	[MBI]
	VGQ8163	CONDENSOR HOLDER	
	VGQ8164	CONDENSOR COVER	
		SIDE OPERATION C.B.A.	
		SWITCHES	
S9200	K0D113B00027	SWITCH SLIDE	
		CCD C.B.A.	[AVC-SPC]
		CAPACITORS	
C3101	ECJ2YB1C105K	C.CAPACITOR CH 16V 1UF	[AVC-SPC]
C3103	F1K1A1060016	C.CAPACITOR CH 10V 10UF	[AVC-SPC]
		TRANSISTORS	
Q3101	2SC4627J0L	TRANSISTOR NPN	[AVC-SPC]
		RESISTORS	
R3101	ERJ2GEJ470	M.RESISTOR CH 1/16W 47	[AVC-SPC]
R3102	ERJ2GEJ272	M.RESISTOR CH 1/16W 2.7K	[AVC-SPC]
R3105	ERJ2GEJ560	M.RESISTOR CH 1/16W 56	[AVC-SPC]

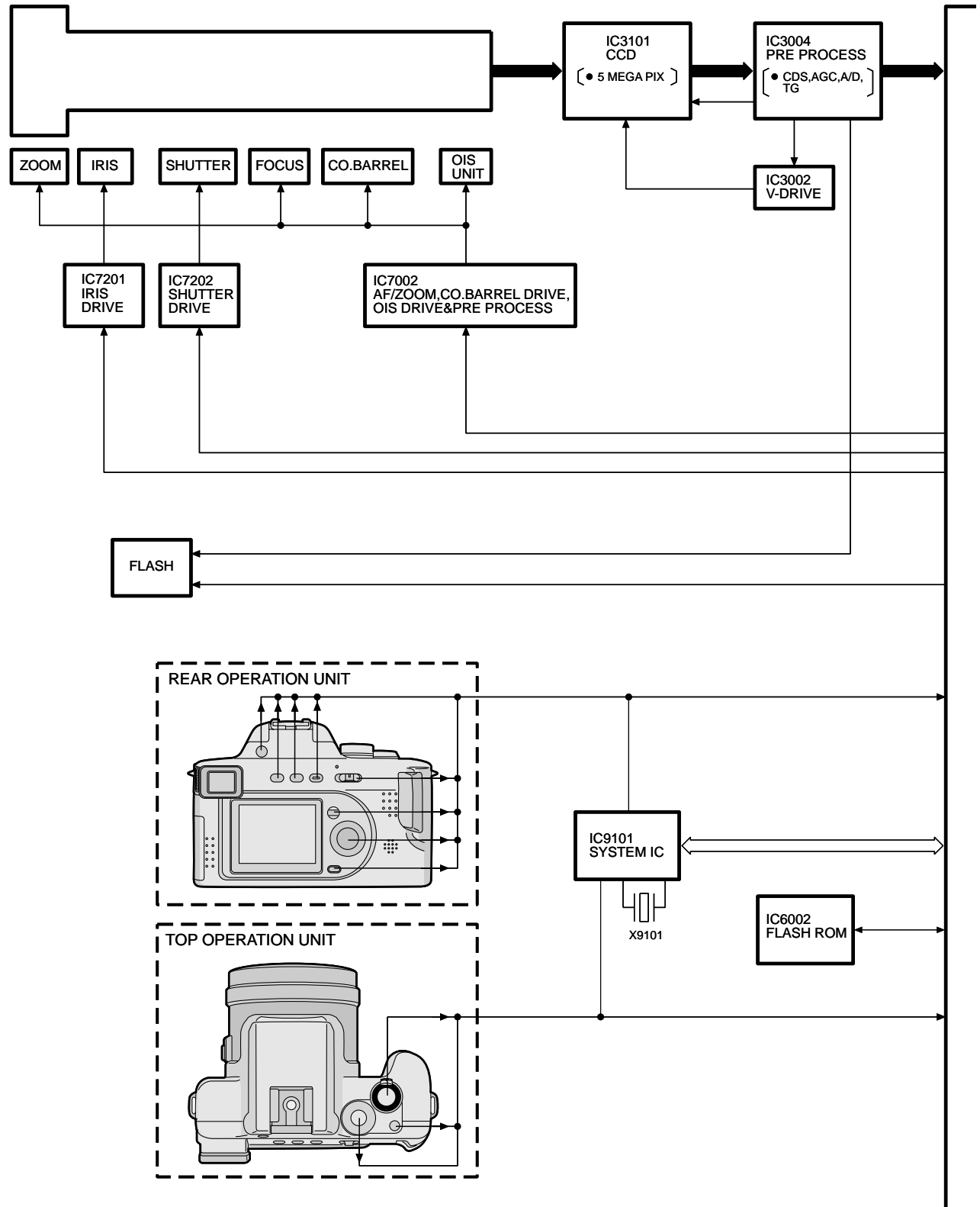
17 SCHEMATIC DIAGRAM FOR PRINTING WITH A4 SIZE

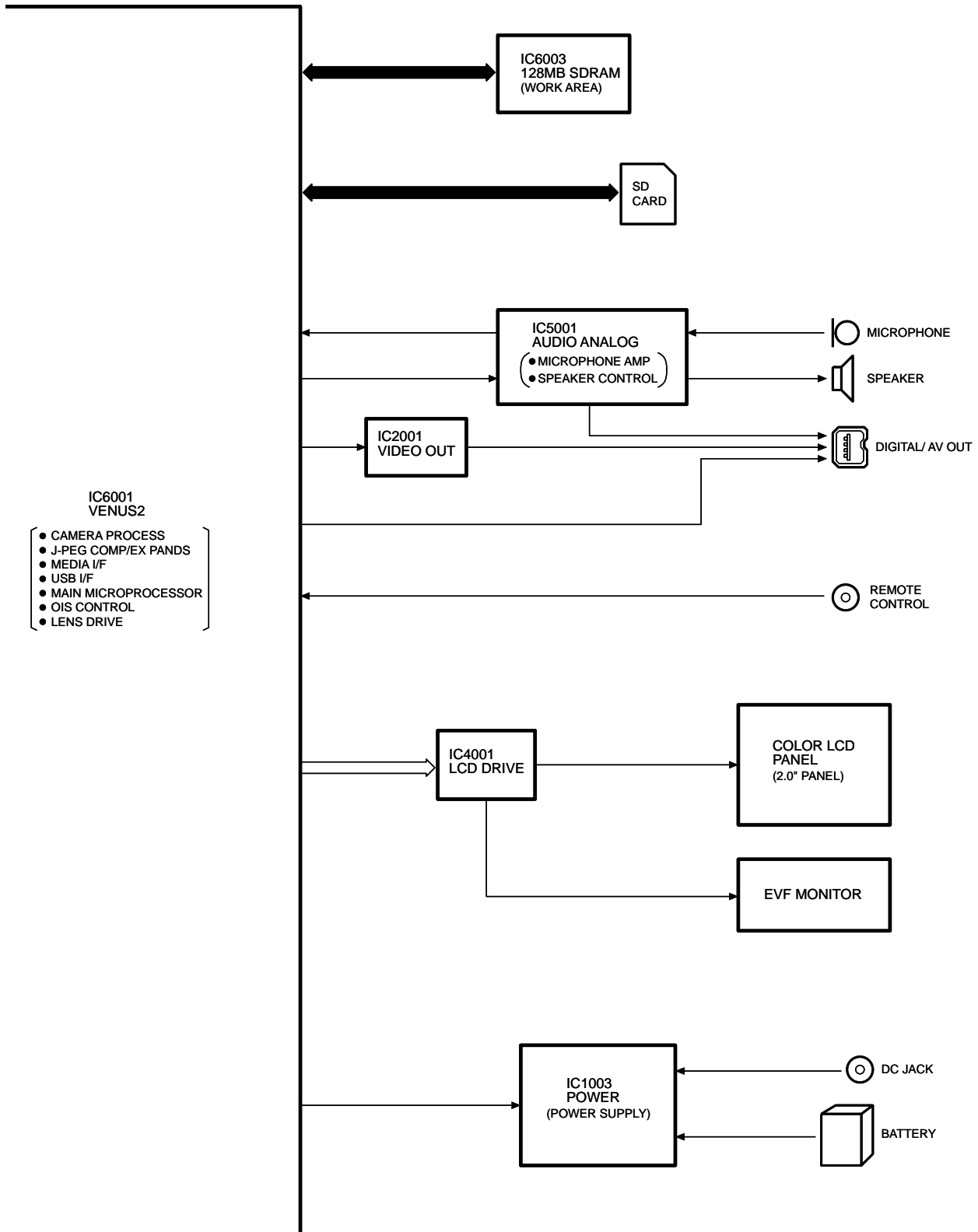


13 SCHEMATIC DIAGRAMS

13.1. OVER ALL BLOCK DIAGRAM

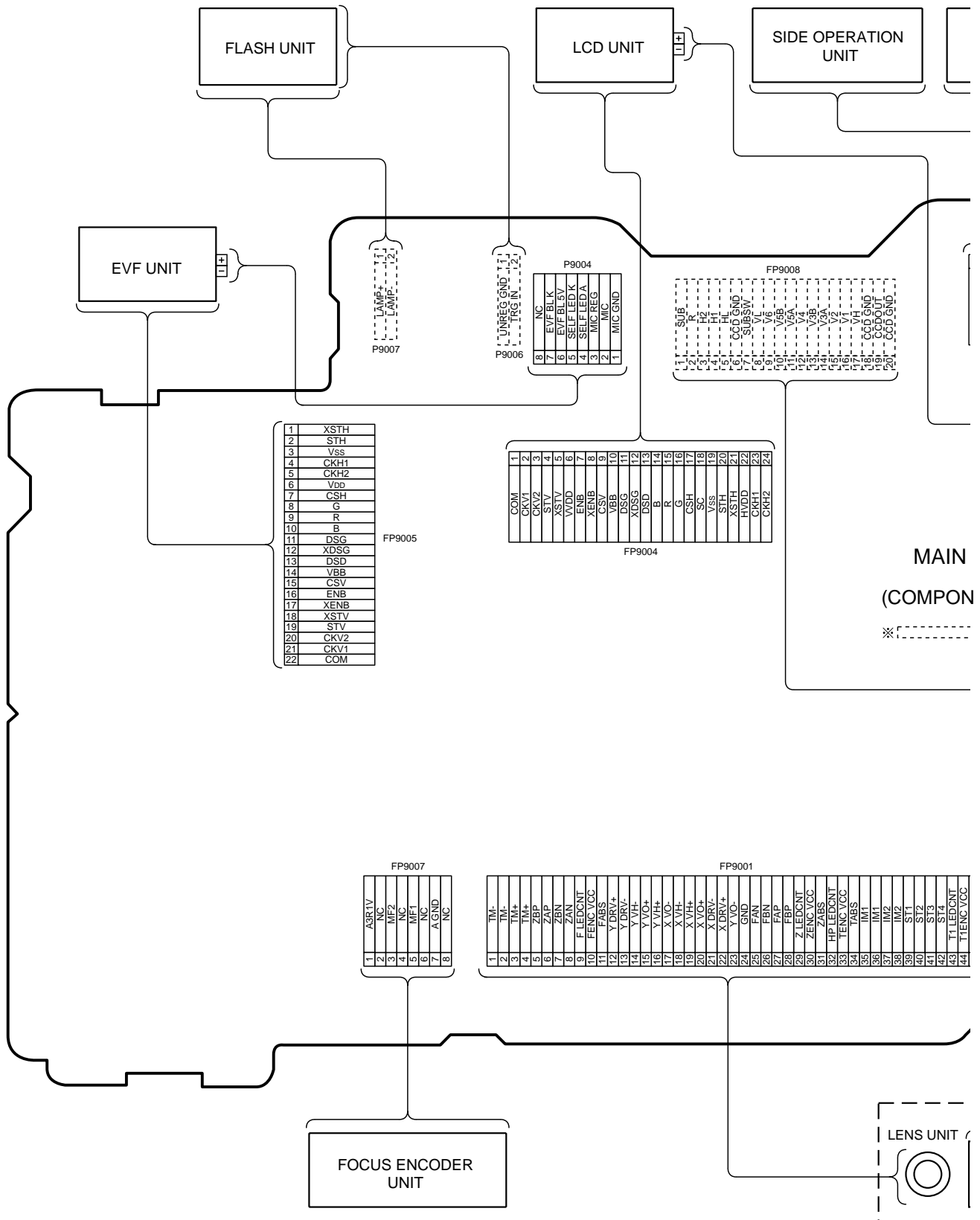
OVERALL BLOCK DIAGRAM

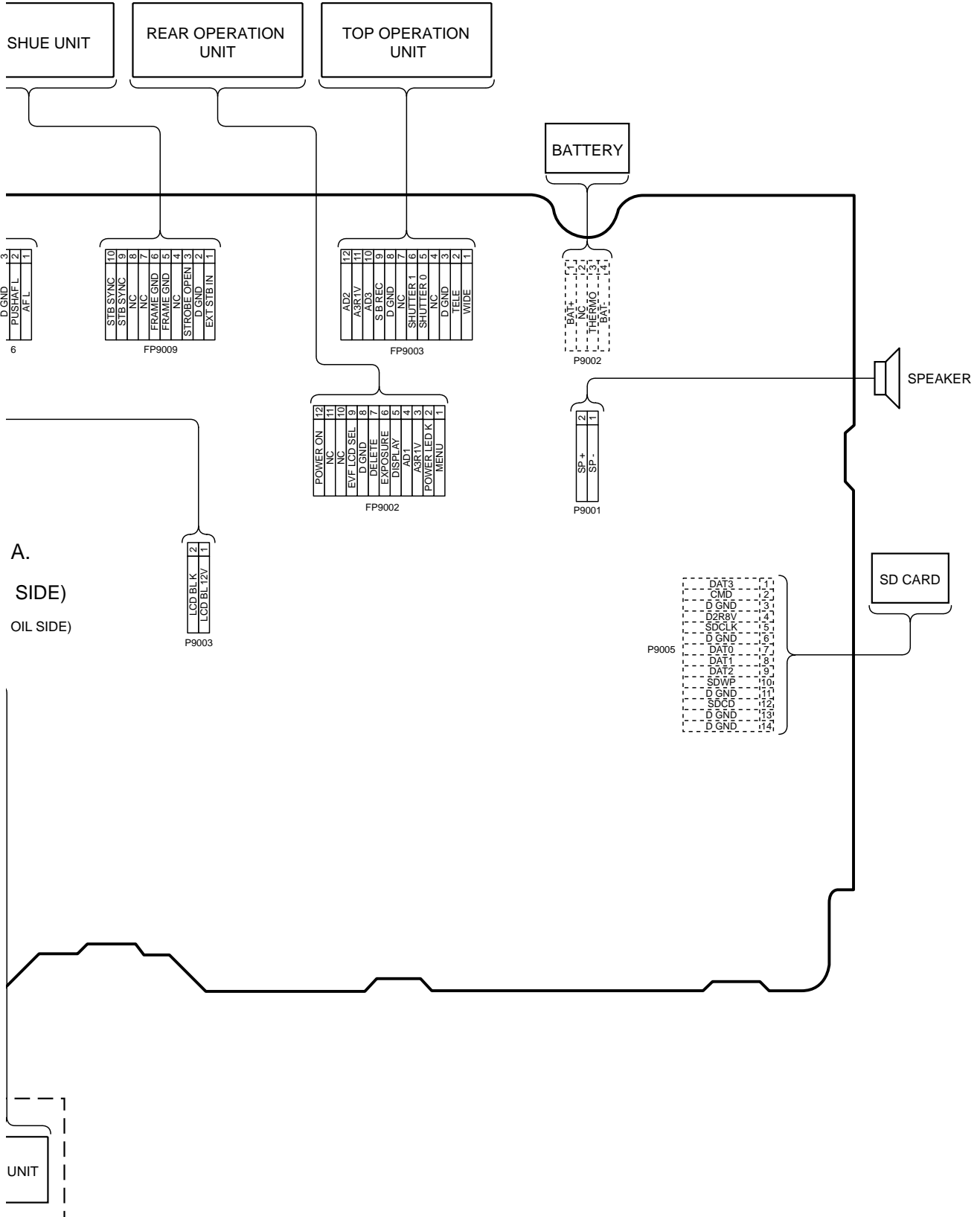




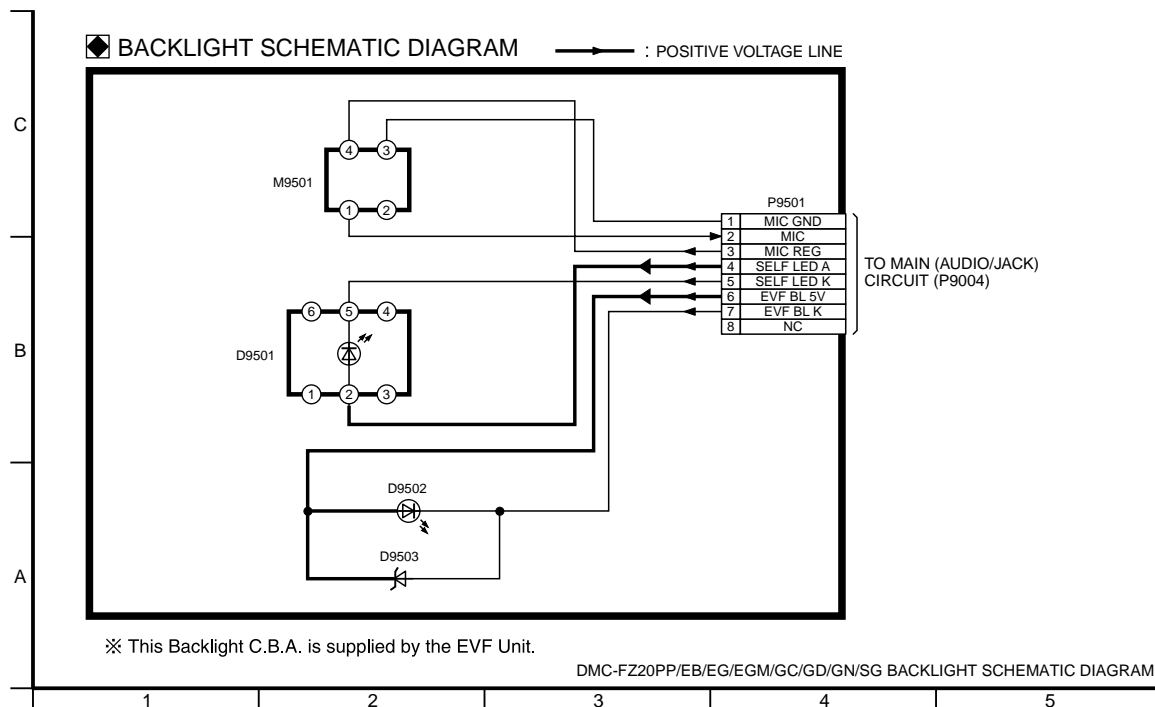
DMC-FZ20PP/EB/EG/EGM/GC/GD/GN/SG OVERALL BLOCK DIAGRAM

13.2. WIRING CONNECTION DIAGRAM

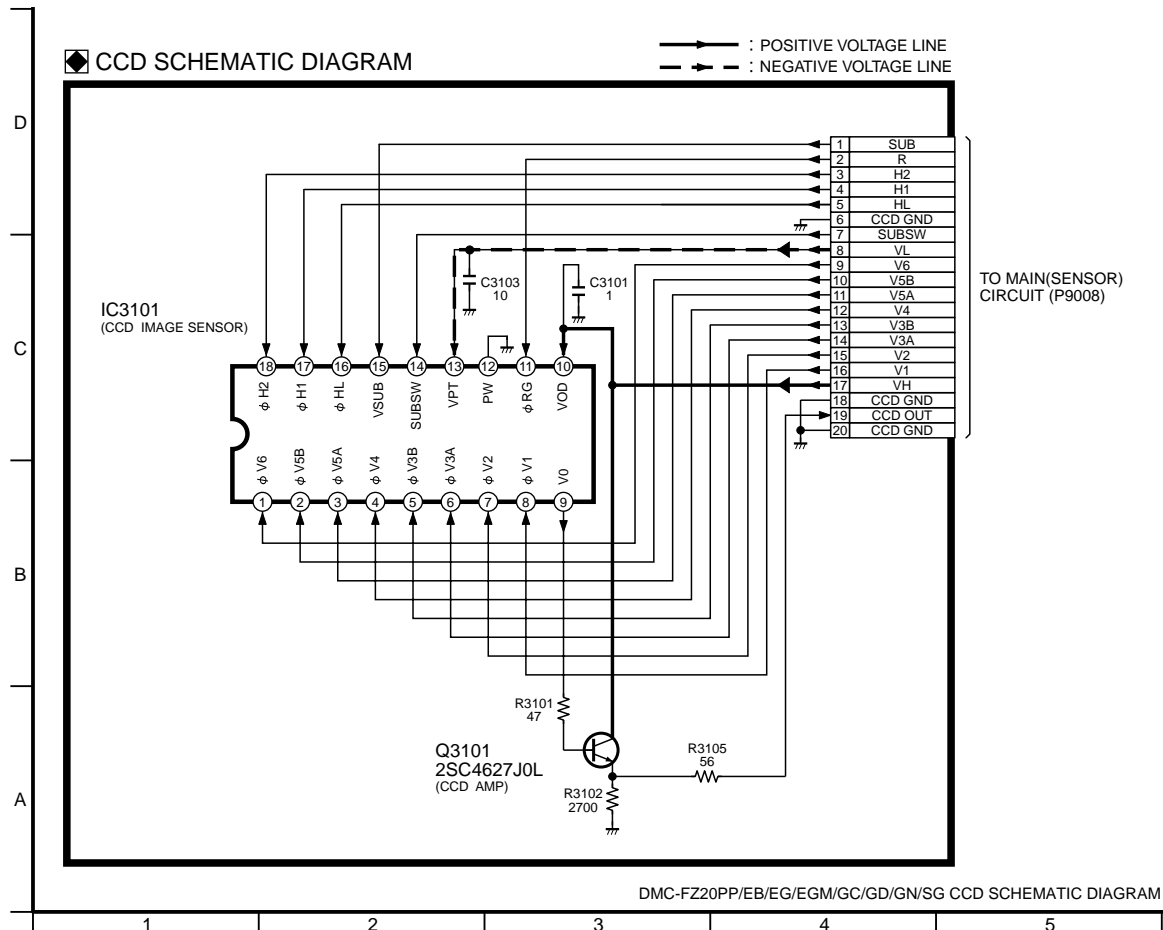




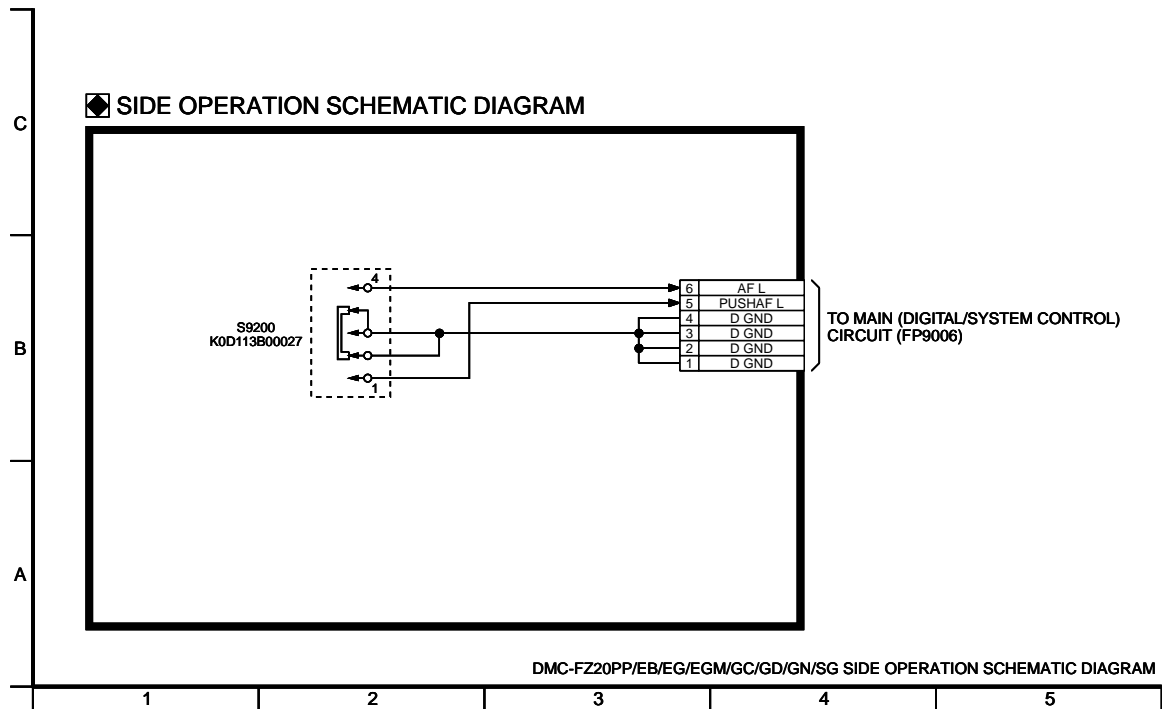
13.3. BACKLIGHT SCHEMATIC DIAGRAM



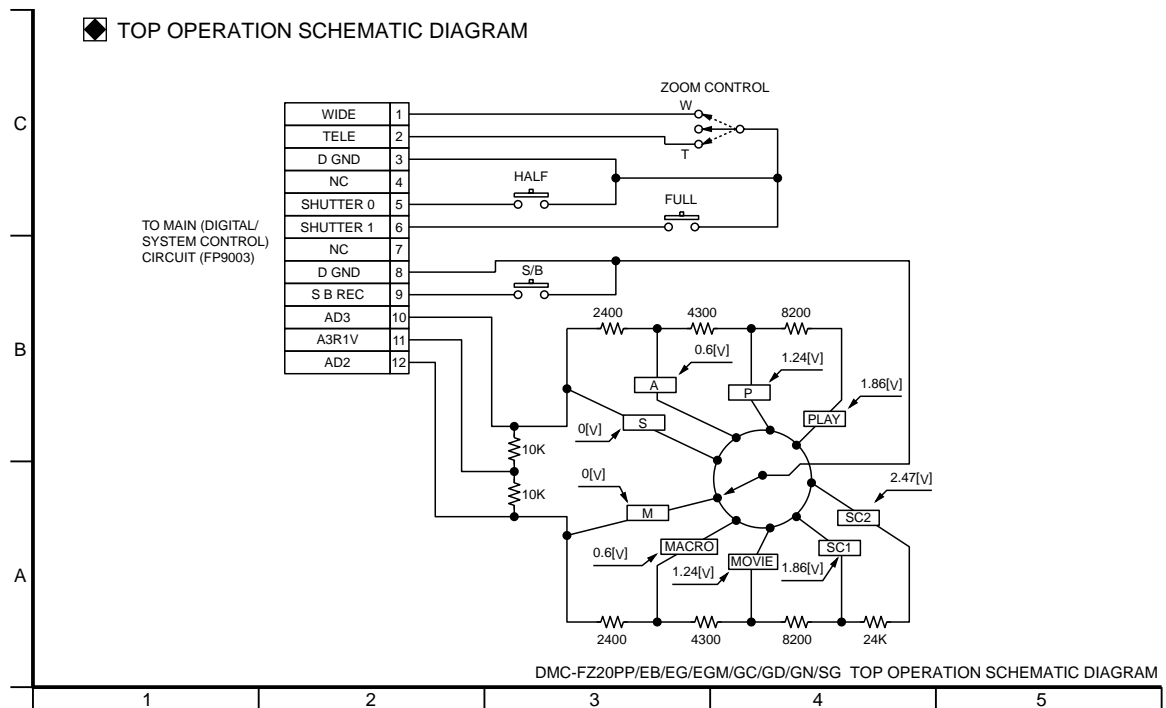
13.4. CCD SCHEMATIC DIAGRAM



.5. SIDE OPERATION SCHEMATIC DIAGRAM

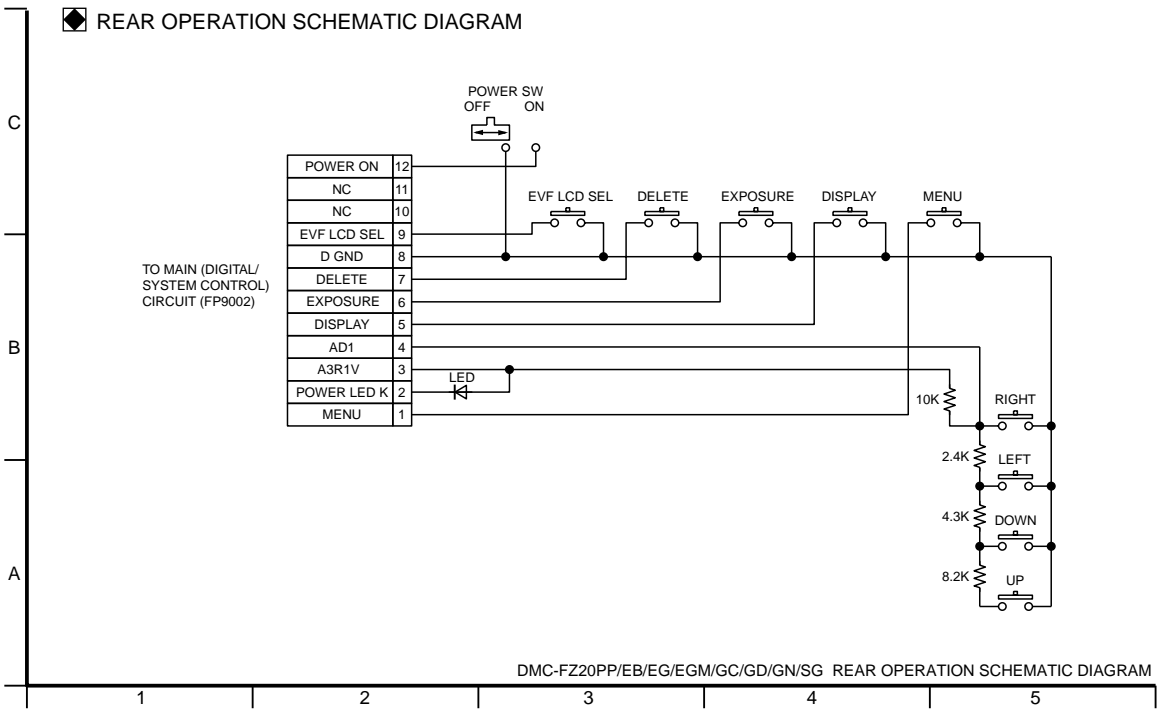


.6. TOP OPERATION SCHEMATIC DIAGRAM

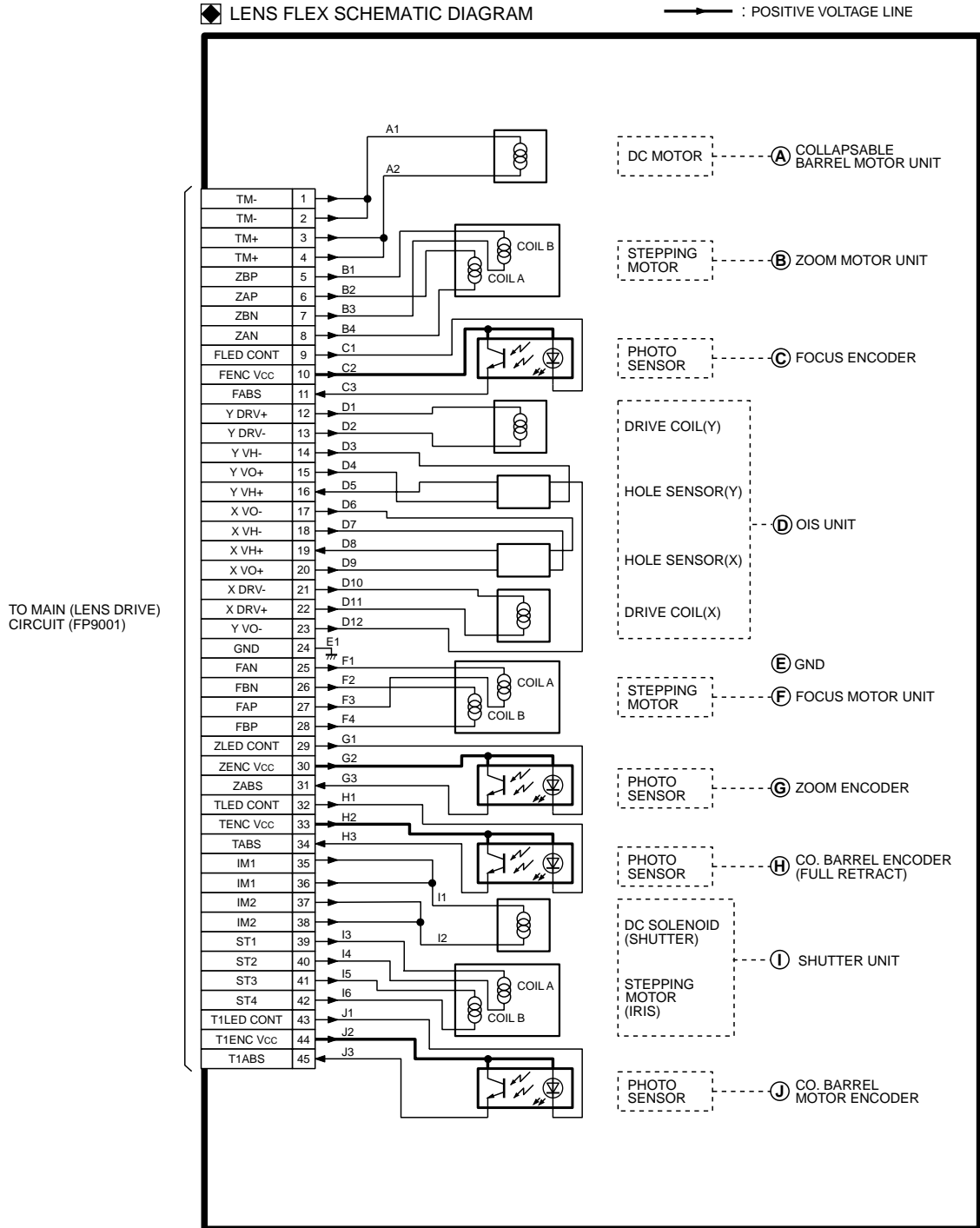




13.7. REAR OPERATION SCHEMATIC DIAGRAM



.8. LENS FLEX SCHEMATIC DIAGRAM



DMC-FZ20PP/EB/EG/EGM/GC/GD/GN/SG LENS FLEX SCHEMATIC DIAGRAM