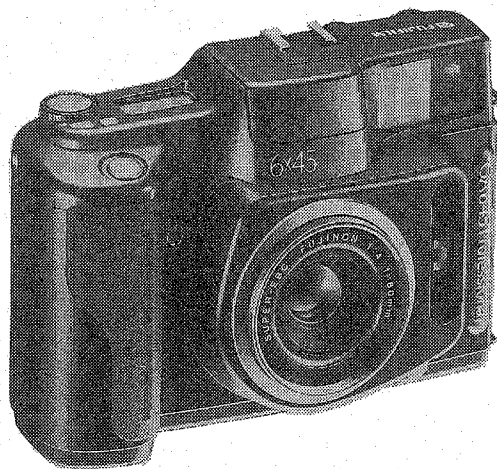




# **SERVICE MANUAL**

## **FUJI GA645 Professional**



**FUJI PHOTO FILM CO., LTD.**

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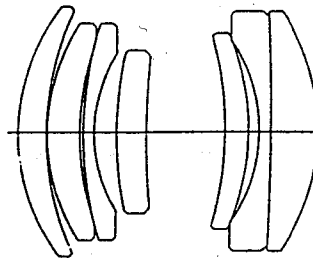
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## I. GENERAL

### 1. Specifications

Type	6x4.5cm Full Automatic
Picture size	6x4.5cm (Actual picture size: 56x41.5mm)
Applicable film	120 roll film (15EXP) or 220 roll film (30EXP)
Lens	Super EBC Fujinon 1:4 f=60mm (6 components, 7 elements) Covering power: 60° ; Equivalent to 37mm on 35mm camera Nearest focusing distance: 0.7m Filter diameter: 52mm



Focusing	Hybrid (Active/Passive) type auto-focus Range 0.7m ~ ∞ Can be switched over to manual focus mode With focus lock
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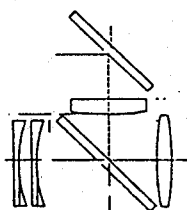
## Viewfinder

Light collecting type bright frame viewfinder

Automatic parallax compensation

Field of view: 93% at infinity, 93% at 3m, and 91% at 1m

Magnification: 0.5x



## Displays in the viewfinder

Field of view frame (Bright frame)

AF mark

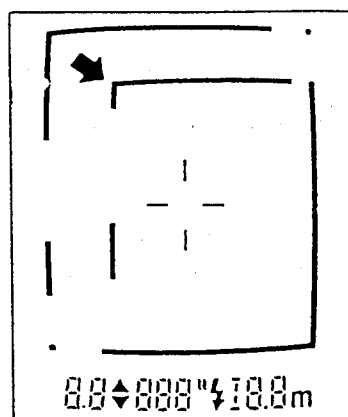
Data indications: Aperture

Exposure feasibility

Shutter speed

Flash ON

Range (m,ft)



<b>Shutter</b>	Programmed AE electronic lens shutter (Aperture priority, Manual exposure setting can be made) With a shutter operation end buzzer
<b>Shutter speed</b>	Bulb, 2 sec. ~ 1/700 sec. (F4 ~ 9.5 : 1/400 sec.)
<b>Self-timer</b>	Electronically controlled About 10 sec. delay With self-timer lamp
<b>Exposure control</b>	TTF center emphasized light measuring (Element: SPD) Programmed AE, Aperture priority AE, Manual exposure Working range: EV3 ~ EV19 / ISO 100
<b>Exposure compensation</b>	±2EV 1/2 step interval
<b>Film speed</b>	ISO 25 ~ 1600, 1/3 step interval
<b>Flash</b>	Built-in pop-up type Autoflash GN012 (ISO 100)
<b>Film transporting system</b>	Automatic first frame set Automatic film winding; With a final frame informing buzzer Automatic rewinding after exposing the final frame
<b>Exposure counter</b>	LCD Additive Automatically interlocked with the pressure plate “E” is displayed after exposing the final frame of a film.

### Liquid crystal display (LCD)

Exposure counter, Shutter speed, Aperture, Film speed

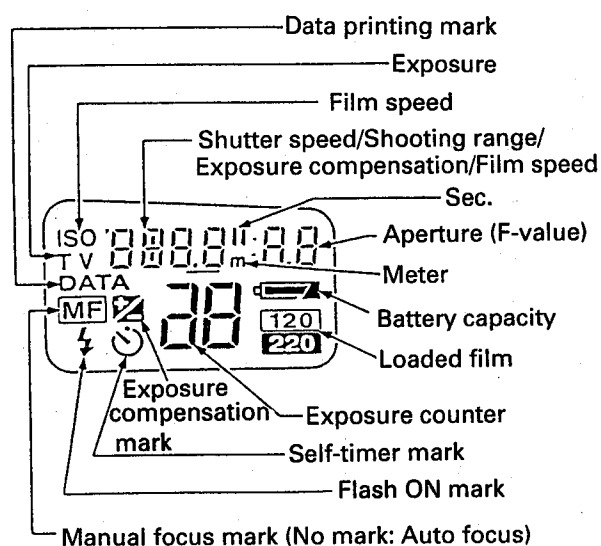
Loaded film (120 or 220), Battery capacity, Exposure compensation

Flash ON mark, Self-timer, MF mode

Year/Month/Day, Day/Hour/Minute

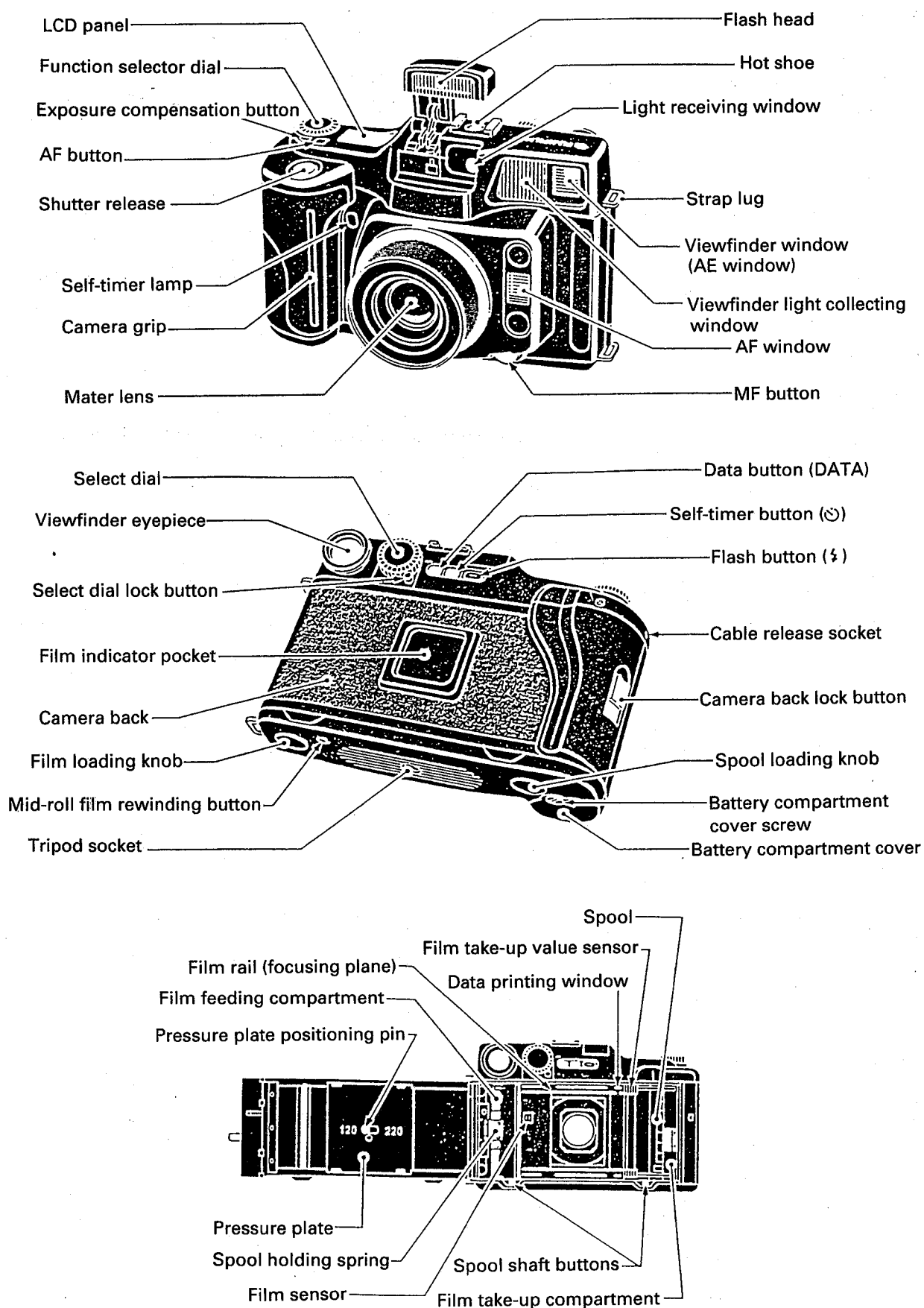
Range indication, Shutter actuation counter

LCD panel (When fully displayed)



<b>Data printing</b>	Outside picture frame printing: Date, Photographing data (Exposure mode, Aperture, Shutter speed Exposure compensation value)
<b>Others</b>	Hotshoe, Film indicator pocket, Cable release socket, Tripod socket, Buzzer ON-OFF switch
<b>Power supply</b>	Lithium battery (CR123A) x2 Capacity: About 3000 shots without using flash About 600 shots with flash used (Under Fuji's test conditions)
<b>Dimensions</b>	166 (W) x 110 (H) x 66(84) (D) mm
<b>Weight</b>	815 grams (without battery)
<b>Attachments in a package</b>	Soft case, Neck strap, Lens hood, Soft case of the lens hood, Lens cap, Lithium batteries (x2).

## 2. Names of parts

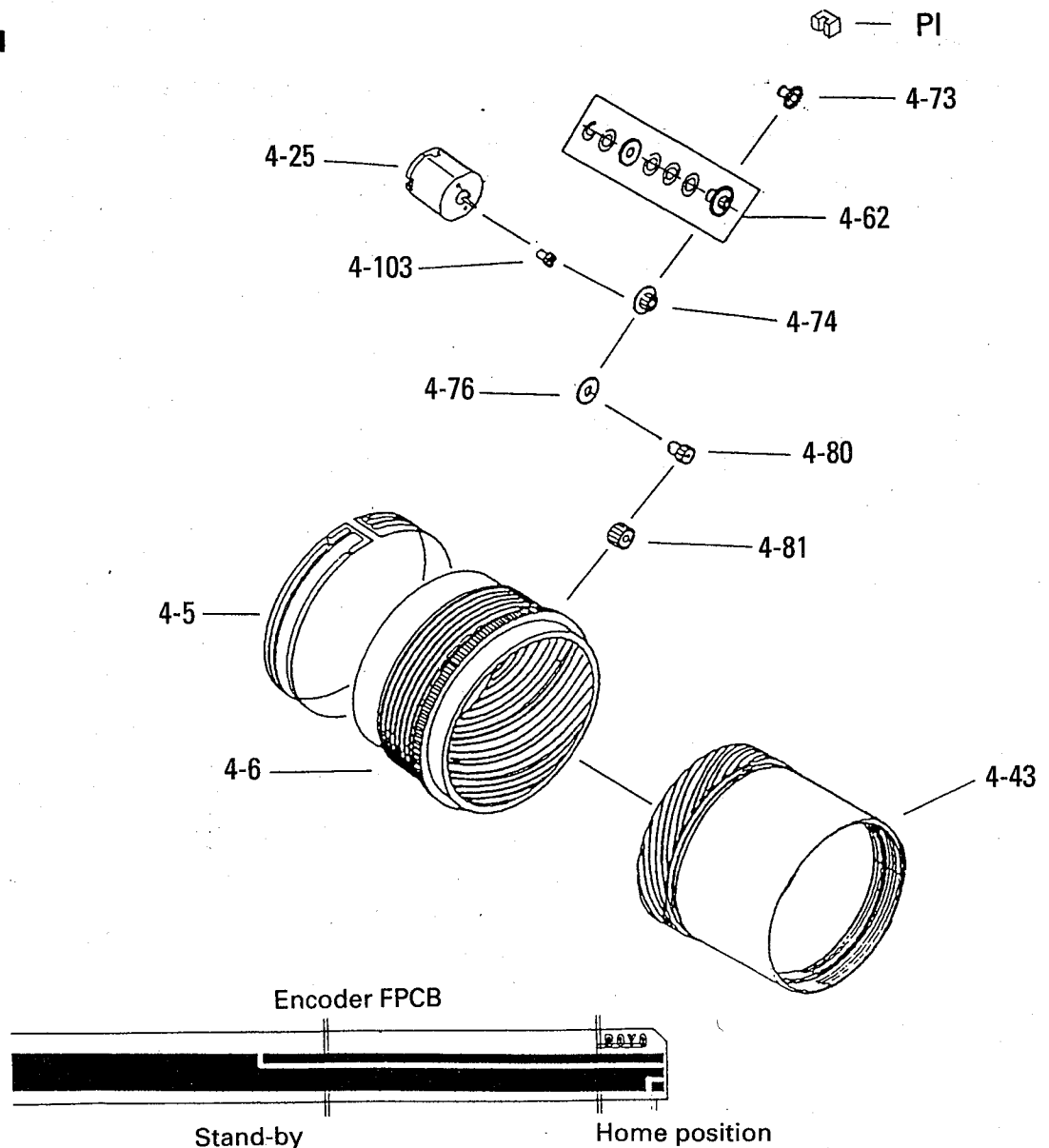


## II. DESCRIPTION FOR MECHANICAL SYSTEMS

### 1. Lens assembly

- 1) When power is supplied to the lens driving motor (4-25), the energy is transferred to the motor gear (4-103), friction gear assembly (4-62), gear L3-L4 (4-74), gear L5 (4-76), gear L6 (4-80), gear L7 (4-81) and helicoid barrel (4-6).
- 2) As the helicoid barrel (4-6) turns, the moving lens barrel assembly (4-43) operates.
- 3) The energy is further transferred from the friction gear assembly (4-62) to the encoder gear (4-73), and the photo-interrupter (PI) senses the encoder gear.
- 4) The encoder FPCB (4-5) is stuck on the helicoid barrel (4-6), and on the FPCB, home and stand-by positions are marked. Thus, the lens stops at the individual positions as the power is turned on and off.

Fig. II-1



## 2. Viewfinder

- 1) When power is supplied to the lens driving motor (4-25), the energy is transferred to the motor gear (4-103), friction gear assembly (4-62), gear L3-L4 (4-74), gear L5 (4-76), gear L6 (4-80), gear L7 (4-81) and helicoid barrel (4-6).
- 2) The energy is transferred to the interlock gear (4-45) which is engaged with the helicoid barrel (4-6) causing the interlock cam (4-4) to operate, and thus, the cam lever assembly (4-78) operates.
- 3) As the cam lever assembly (4-78) operates, the reticle frame 2 (3-54) is pulled down, causing the field of view frame in the viewfinder to operate.

### Displays in the viewfinder

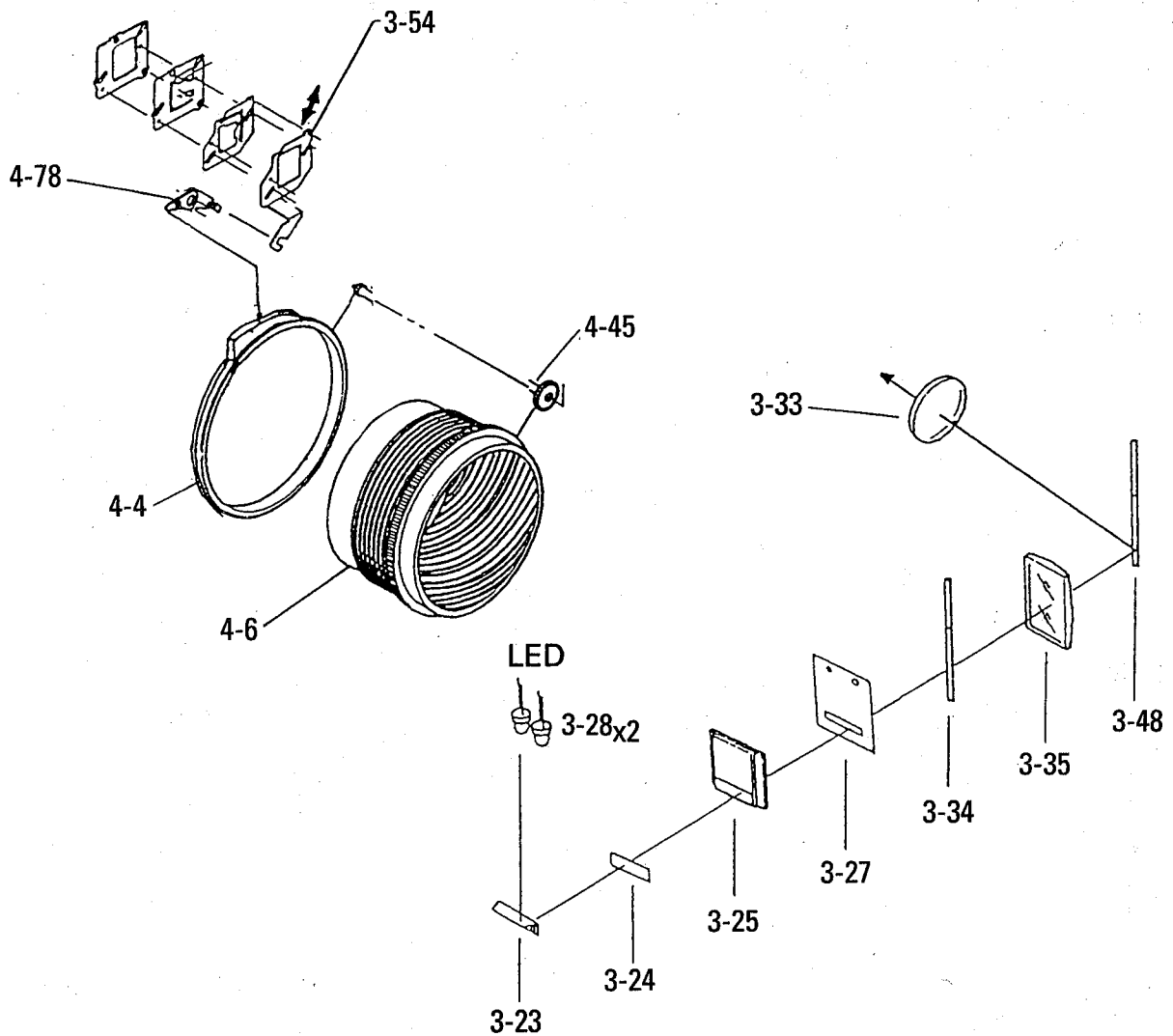
This camera displays various information with red letters in the bottom of the viewfinder.

The displayed information are, from the left to right, aperture, shutter speed and shooting range.

As for the construction, light of the red LED goes through the prism (3-23) and after being diffused by the diffuser (3-24), the light passes through the LCD as shown in Fig. II-2.

Thereafter, the light goes through the mirror G6 (3-34) and lens G5 (3-35) and information are displayed as the light is reflected by the mirror G5 (3-48).

Fig. II-2

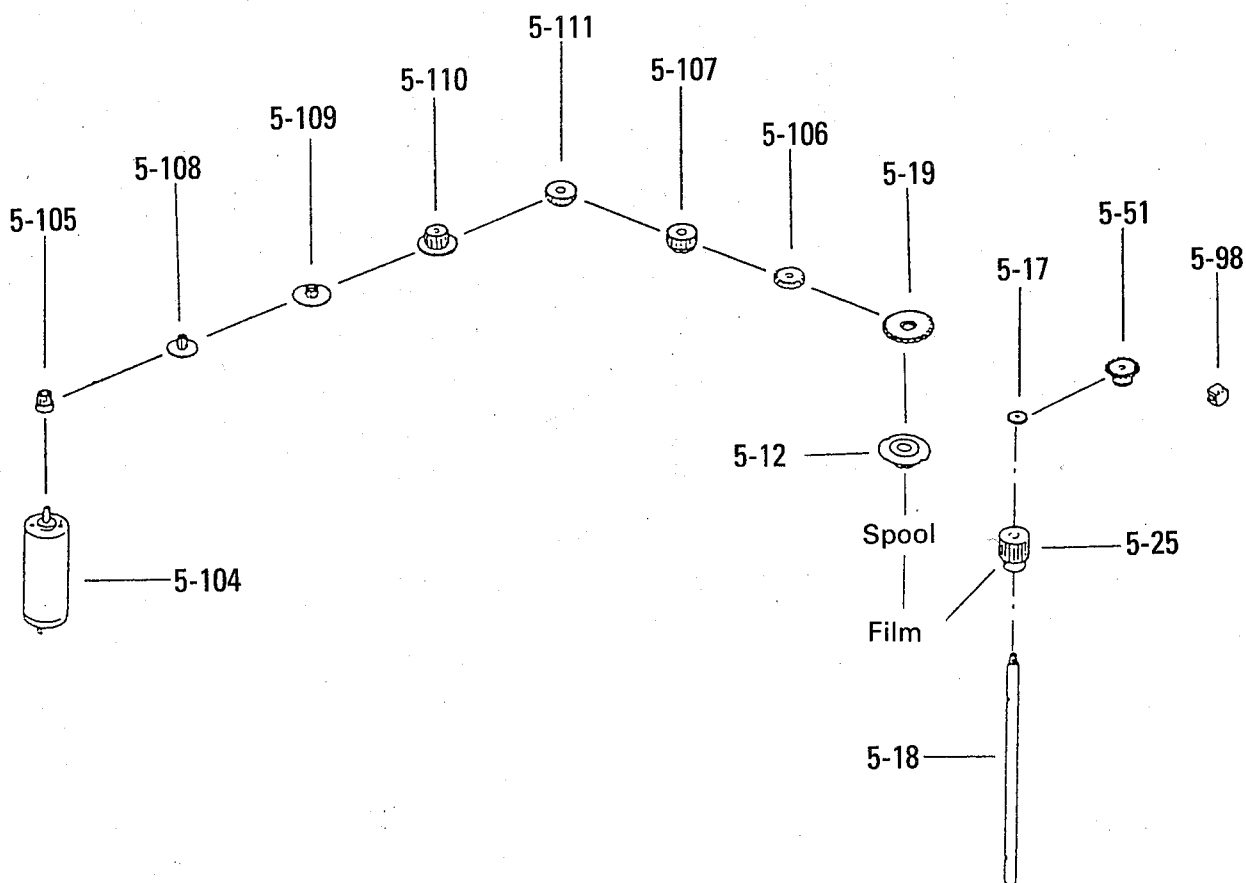




### 3. Film transporting system

- 1) When power is supplied to the film transporting motor (5-104), the energy is transferred to the motor gear (5-105), gear G1 (5-108), gear 2 (5-109), gear (5-110), gear G2 (5-111), double step gear (5-107), gear G6 (5-106) and film take-up gear (5-19).
- 2) The shaft holder (5-12) turns together with the film take-up gear (5-19).  
Then, the energy is transferred to the counter roller (5-25), shaft (5-18), gear (5-17) and encoder gear (5-51), the photo-interrupter (PI) senses the encoder gear operation, and thus, film transporting length is decided.
- 3) The first frame setting and film end checking are made by means of a photo-coupler.

Fig. II-3



### III. ELECTRICAL CIRCUIT DESCRIPTION

#### 1. Circuit description

The control FPCB assembly of this camera has two CPUs (U101 and U102). The U101 functions as the master CPU and U102 operates as the slave CPU. Based on SM switch and each mode switch inputs, the U101 decides shooting conditions, the decided conditions are informed to the U102 by means of a serial communication, and thus, the shutter and motors are controlled.

The control FPCB is equipped with an EEPROM (U103), and focusing, AE, AF, flash, etc. can be adjusted automatically.

##### 1) Loading batteries

When two 3V lithium batteries (CR123A) are loaded in the camera bottom, 6V input (VB) is converted to two types of voltage by the battery FPCB assembly. First, it is converted to 3.5V by U202, and this 3.5V power is supplied to the master CPU (U101). Next, it is converted to 5V by U201, and this 5V power is supplied to the slave CPU (U102), allowing the CPUs to control the camera operations. As the initial processing, the CPUs check the lens position first when SM (SMP, SMA and SMM are totally called SM) switch is turned on, and then, causes the LCD to make its full display. When the SM switch is not turned on, the lens does not operate.

##### 2) Turning on the main switch

When the select dial switch on the camera back is turned to the right (clockwise), the SM switch turns on, causing the lens to move out to the stand-by position.

○ SM:ON → Select dial switch → Solder:Control FPCB:SMP(A, M) → U101

↳ (Serial communication) → U102:INO ~ 2 → Pressed-to-tight: Battery FPCB:U204

↳ MT(+), MT(-) → Lens driving motor turns forward → Lens is fed out.

#### NOTE:

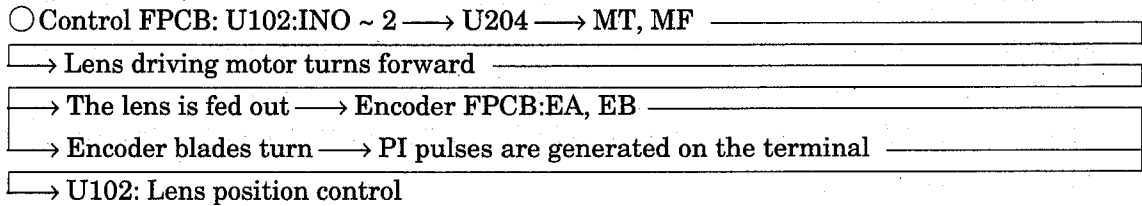
Switches which can be input

Top	Release switch (SP1, SP2)
	AF switch (SAF)
	Exposure compensation switch (SFC)
	Up-down switch (UP1 ~ 4)
Front	Manual focus switch (SMF)
Back	Select dial switch (SMP, SMA, SMM, SISO)
	Data switch (SDATA)
	Self-timer switch (SSELF)
	Flash switch
Bottom	Mid-roll rewind switch (SMR)
Right side	Release switch (SEXT)

Each switch can be input only when the main switch is turned on, except for the mid-roll rewind switch. The mid-roll rewind switch can be accepted normally.

### 3) Controlling the lens

Lens positions are controlled by digital codes sent from the encoder FPCB and PI installed on the control FPCB. The lens driving motor gear system has encoder blades. As the encoder blades turn in the PI, pulses are generated, and finding a number of lens driving motor turns, lens-moving stroke is calculated.



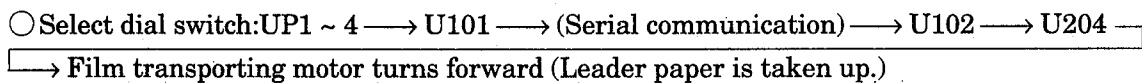
### 4) Transporting film

Open the camera back and set the pressure plate to the type of used film.

When the camera back is closed, the set pressure plate position detecting switch identifies the film type.

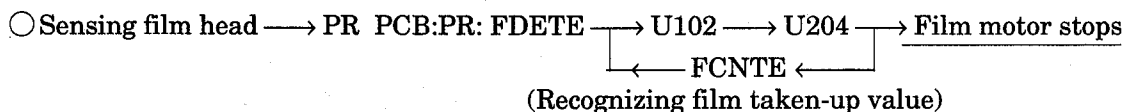
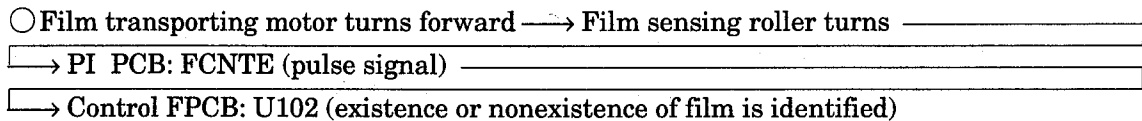
Now, load a film, wind up the leader paper on the film take-up spool, and turn the up-down switch to the left (counterclockwise) one step by one step. UP1 ~ 4 will be input sequentially to U101, causing the film transporting motor to turn forward.

○ Film pressure plate position sensing switch: SSIZE, KSE1\_1 → U102: Identifies film type (120 or 220)

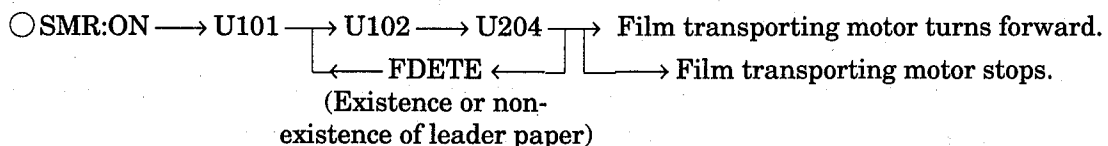


When the camera back is closed and SM switch is turned on by turning the select dial, the film transporting motor turns forward for one second. At this time, encoder blades turn in the PI of the PI PCB assembly as the film sensing roller turns. Then, FCNTE pulse signals are generated, and with the pulse signals, existence or non-existence of film is identified.

When a film exists, with FDETE signal sent from the PR (film sensor) of the PR PCB assembly, the film head is detected. Thereafter, with the pulse signals of the FCNTE, film taken up value is calculated, and thus, the first frame set is made. Moreover, one frame film advancing is done also by FCNTE.



As for the manual film advancing, when the mid-roll rewind switch (SMR) of the control FPCB assembly is turned on, the film transporting motor turns forward. When it is recognized with the PR of the PR PCB assembly that the leader paper of the film is gone, the motor stops 5 seconds later.



## 5) Battery FPCB motor terminal output table

	Mode	Terminal			
		MF	MR	MT	MW
Film transporting motor	Forward (Prewinding)	Hi	Lo	—	—
	Reverse (1 frame advancing, MR)	Lo	Hi	—	—
	Stand-by	Lo	Lo	—	—
Lens driving motor	Forward (Feeding lens out)	—	—	Hi	Lo
	Reverse (Feeding lens in)	—	—	Lo	Hi
	Stand-by	—	—	Lo	Lo

## 6) Flash

## (1) Built-in flash

This flash is not of a self-oscillating type. The built-in flash is charged as the oscillation transistor is turned on by a pulse signal sent from the U102.

Further, this flash is of a flashmatic, and discharge current is controlled by IGBT: Q610, and to its gate, 15V is supplied by the Zener diode (CR607).

○ Control FPCB:U102:FCT → Flash PCB:FCT → Q601 → T601 → CR602

→ Charging the main capacitor

○ Flash PCB: VCM → Control FPCB: U102 → U102:FINH2: L

→ Charging stops

○ Control FPCB:U102:VIGBT: H

→ Q609: ON → Q608: ON → Q610:IGBT: ON

→ CR611: ON → T602: ON → Xenon tube (V601) lights  
(high voltage pulse is generated)

→ Q604: ON → Q605: ON → Q606: Starting to receive light

→ C607, C608 and C609 are charged (Differs depending on each AV)

→ Q602:ON → Q611, Q612:ON → Q610:IGBT: OFF (Stopping flash firing)

## (2) Externally mounted flash

This camera has been so designed that an external flash can be mounted on the hotshoe on the top of the camera. For an external flash, flashmatic does function.

○ Control FPCB:U102:FT → Flash PCB:Q603: ON → Q608:ON

→ External flash fires

7) Printing data

Being interlocked with one frame film advancing, seven pieces of red LED built-in this camera light sequentially, and thus, data are printed.

○ Control FPCB:U102 → (Battery FPCB: Serial communication) → Data FPCB →  
→ U401 → DS401 (Red LEDs light) → Data are printed.

When the shutter is released with the camera back opened, seven LEDs light simultaneously and test mode is executed.

8) Self-timer

When the self-timer switch on the camera back is turned on, an SSELF signal is input to the U101 of the control FPCB assembly, and this is displayed on the LCD on the camera top.

○ Self-timer switch: SSELF:ON → Control FPCB:U101 → Indication on LCD

## 2. Camera operations

### 1) Releasing the shutter

#### (1) Normal shutter release (built-in shutter release)

When the shutter release is pressed down, the tact switch installed on the control FPCB assembly turns on, its signal is input to the U101 (CPU), and thus, the shutter is released in the following sequence:

○ Control FPCB:SP1: ON → SP1 → Control FPCB:U101 → BC →

→ Light measuring → Focusing (active, passive) → (Shutter speed and aperture are displayed on the camera to LCD, and shutter speed, aperture and ranging result are displayed on the LCD in the viewfinder.)

→ Lens feed out (Lens driving motor operates) → (Waiting for SP2:ON) SP2:ON →

→ Exposure (Flash fires under flash mode.) → Buzzer sounds one time

→ SELFLED lights (Shooting end display)




→ Lens feed in (Lens driving motor operates)

→ One frame film advancing (Data printed simultaneously) → Flash charge

#### (2) Cable release

When the shutter is released by the use of a cable release, a signal of other tact switch than that used for the normal shutter release is input to the U101 (CPU). In this case, SP1 and SP2 are input simultaneously. The point that differs from the above shown sequence is that there is no SP2 waiting.

### 2) Battery check voltage

	LCD mark	BC voltage
BC OK	 Lights	About 4.1V
BC warning	 Lights	About 3.9V
BC NG	 Blinks	

### 3) Light measurement

Output signal sent from the light measuring IC (U501) installed on the light measuring FPCB assembly is AD-converted by the U102 in the control FPCB assembly, and thus, light is measured.

○Automatic flash firing level at a low brightness under P-mode

	Flash firing level
When film speed is ISO 100	LV9

#### 4) Film speed (ISO) setting

Because of the type of film used for this camera, it is necessary to input film speed (ISO) before loading the film. When the select dial switch is set to ISO and up-down switch is turned, the set ISO (film speed) is displayed on the camera top LCD.

○Select dial switch: SISO  $\longrightarrow$  Control FPCB: U101  $\longrightarrow$  ISO display (LCD)

Up-down switch: UP1 ~ 4 →

## 5) Displays on LCDs

**This camera has two LCDs; One is on the camera top and the other is in the viewfinder.**

The one on the camera top is called LCD and one in the viewfinder is called FLCD.

These two LCDs are connected to the control FPCB assembly, and displays are controlled by the U101.

○Control FPCB:U101 —→ Zebra connector 1—→ LCD indications  
 —→ Zebra connector 2—→ FLCD indications

## 6) Autofocus (AF)

The AF system of this camera is capable of ranging with two types of systems; Active (The IRED emits light against an object, and PSD receives the light reflected back from the object.) and Passive (Phase difference between two images of an object focused on IC chip by two lenses is obtained.). However, depending on conditions of an object (brightness and distance), the data measured by either the active or passive system are employed.

When the SP1 turns on, with PAF sent from the U102, power is supplied to the AFIC (U302) and AF module (U301), allowing the AF system to operate. The operating sequences are shown below:

○ SP1: ON → Control FPCB: U102:PAF → AF FPCB: AF IC (U302)  
→ AF FPCB: AF module (U301)

## (1) Active system

○ Control FPCB:U102: CTRL → AF FPCB: AF IC (U302) → Q303: ON →  
→ IRED PCB: DS301 (IRED) Emits pulse light → (Object) →  
→ CR302 (PSD) receives reflected light → U302 operates → AFDA →  
→ Control FPCB: U102

## (2) Passive system

○ Control FPCB:U102: AFRST → AF FPCB:AF module: U301 (Reads data collected by two lenses and operates the data.) → AFDEP →  
→ Control FPCB: U102

## 7) Shooting mode

This camera has three types of shooting mode so that this camera can be used freely and easily by both professional and amateur photographers. These modes can be set by turning the select dial switch.

○ Select dial switch: SMP, SMA, SMM → Control FPCB: U101 sets a mode

○ Table of modes

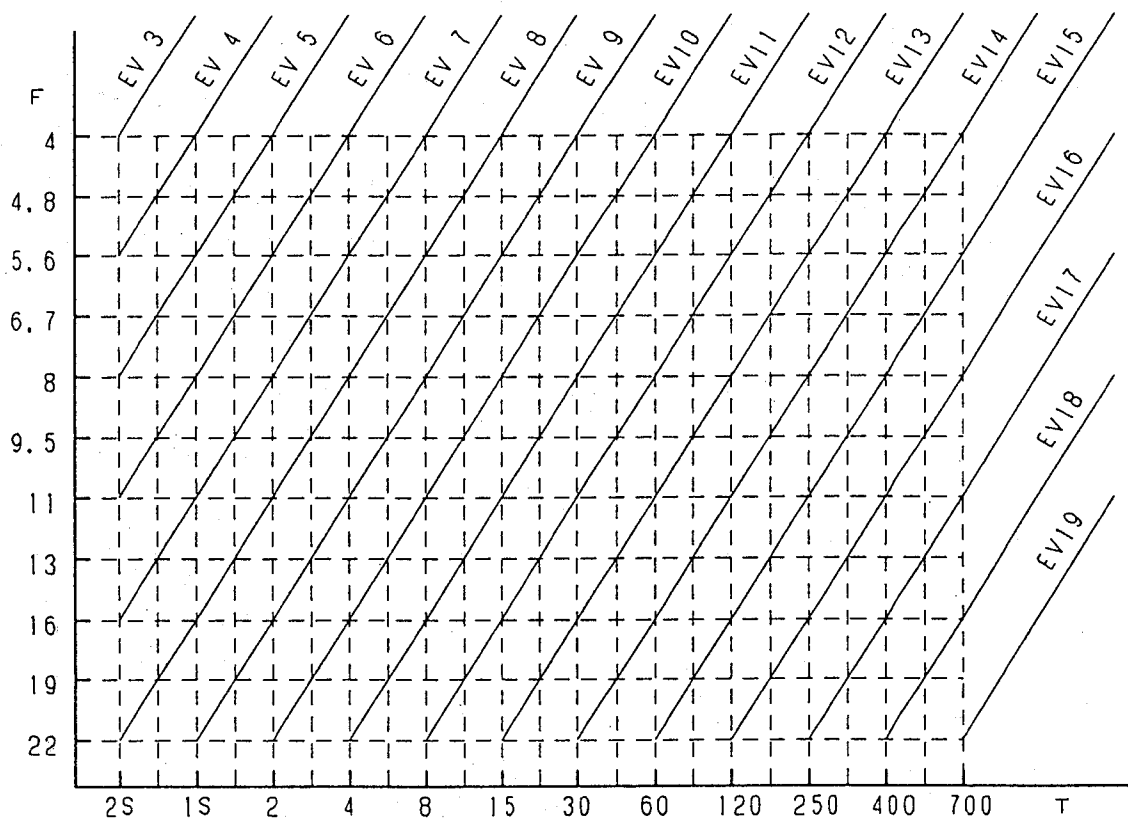
Mode	Name of mode	Focusing	Shutter speed	Aperture
<b>P</b>	Programmed AE	Automatic and manual	Automatic	Automatic
<b>A</b>	Aperture priority AE	Automatic and manual	Automatic	Manual
<b>M</b>	Manual exposure	Automatic and manual	Manual	Manual

In any case, light measuring and ranging are performed, and thereafter, judgement is made on the manually set values. The judgement standard is the algorithm programmed based on ISO (film speed), brightness of an object, distance to the object, etc.

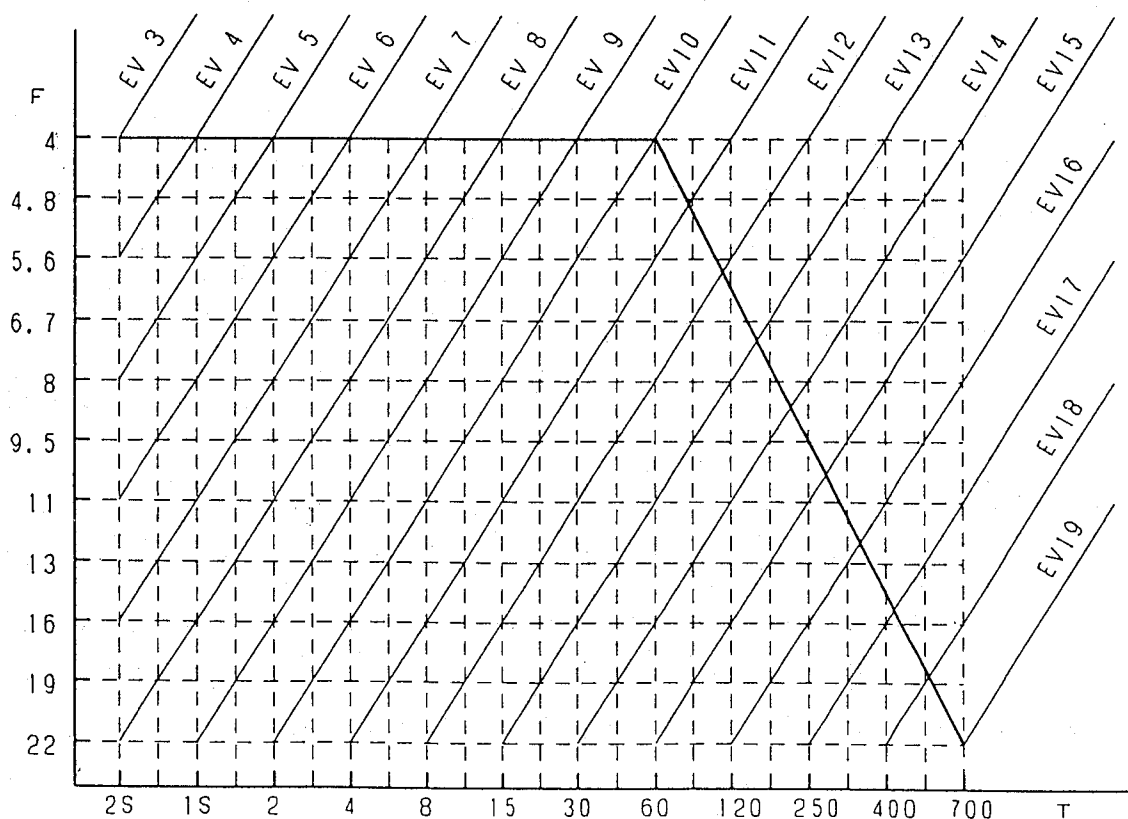


### 3. Shutter program diagram (ISO 100)

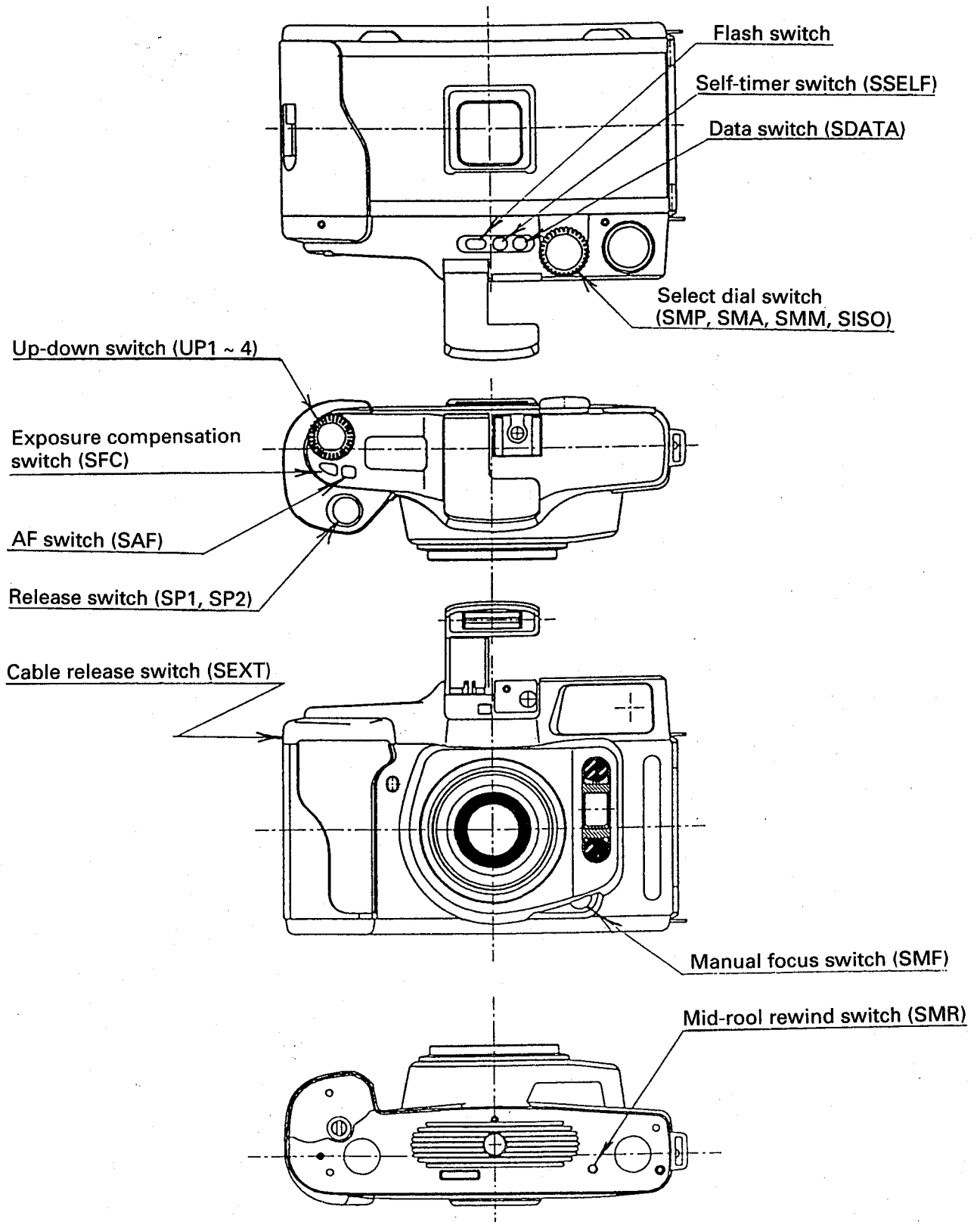
#### 1) A mode, M mode



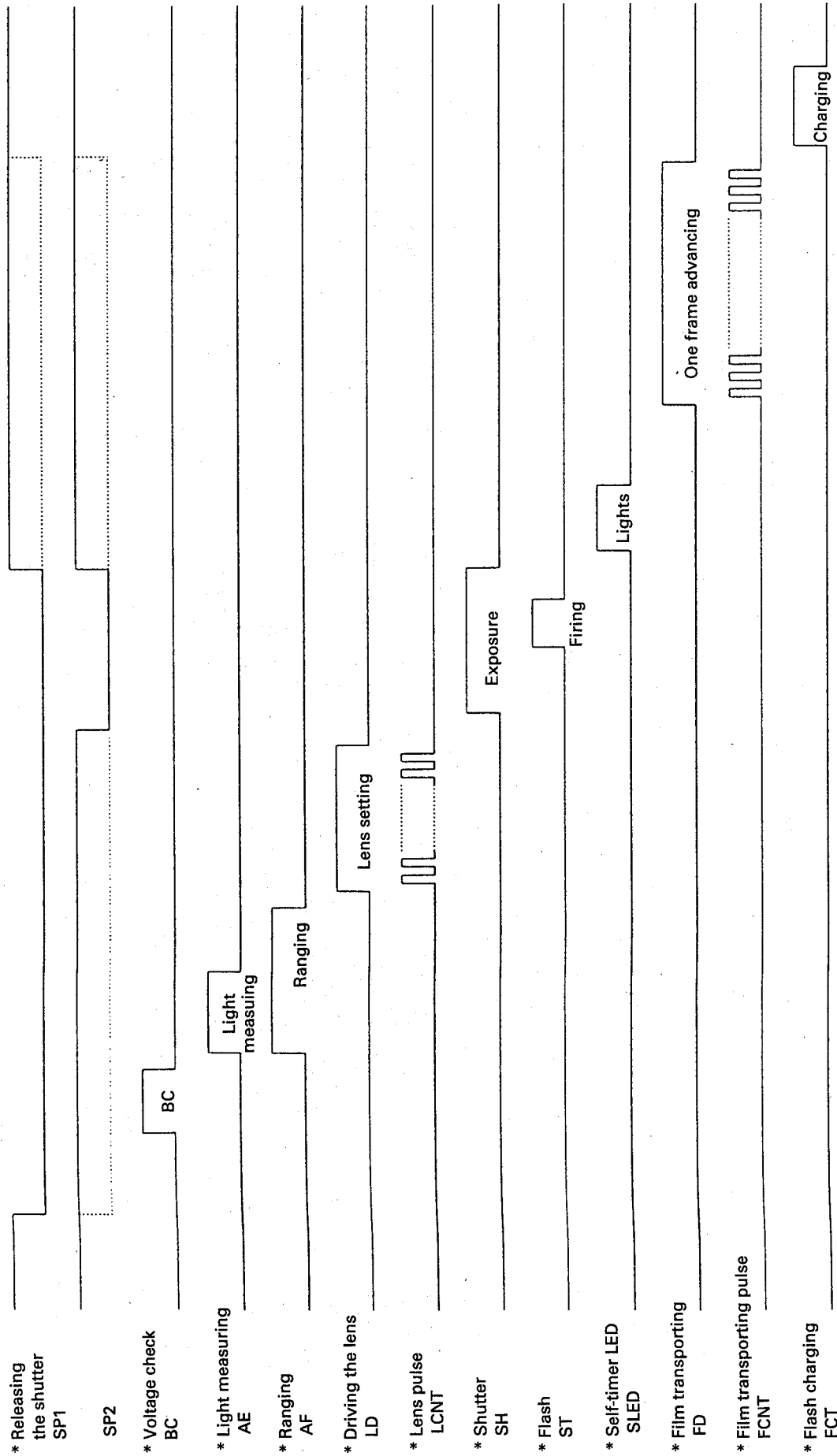
#### 2) P mode (When flash ON – FTL:1/30)



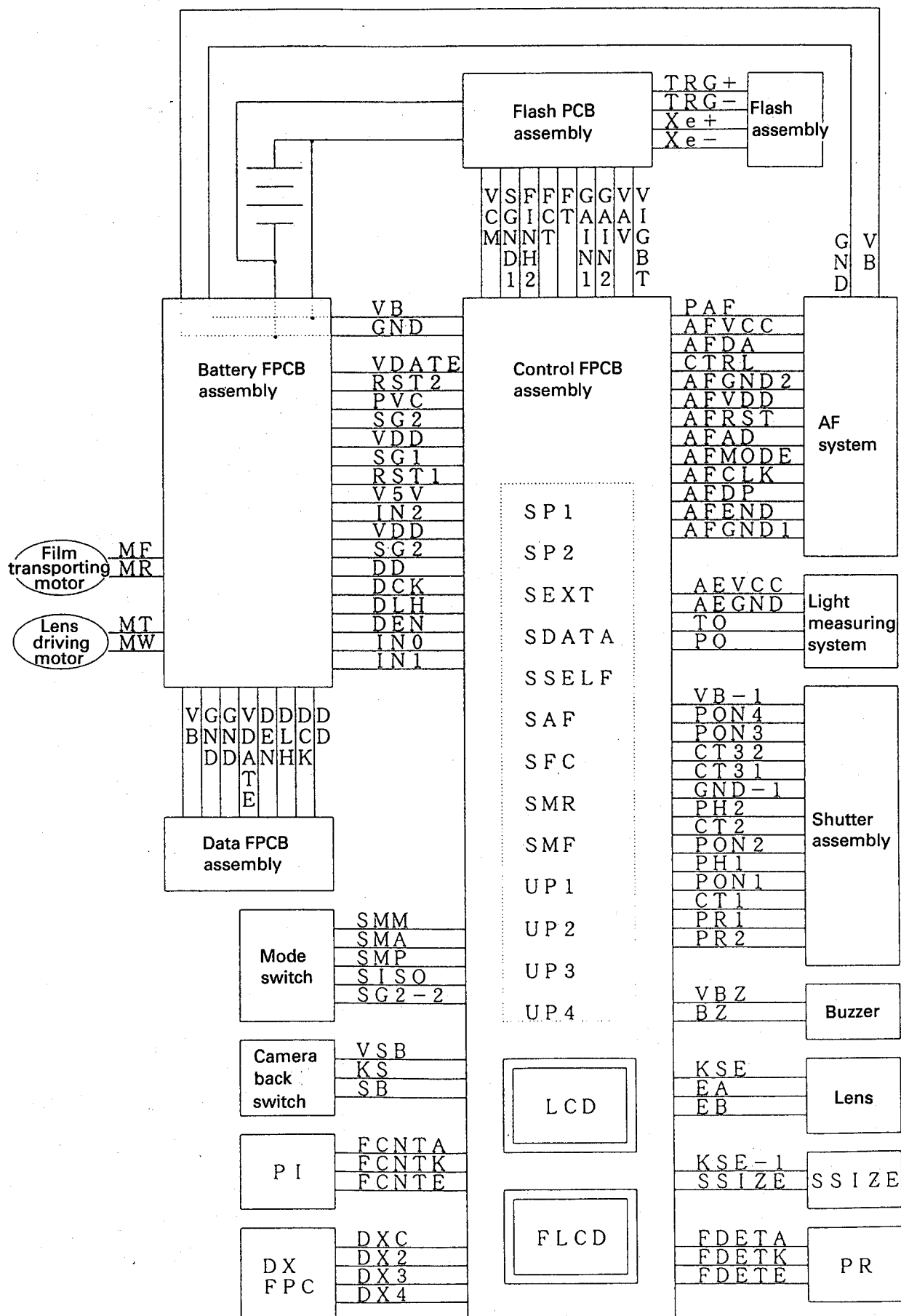
#### 4 Switch layout



5. Sequence time chart

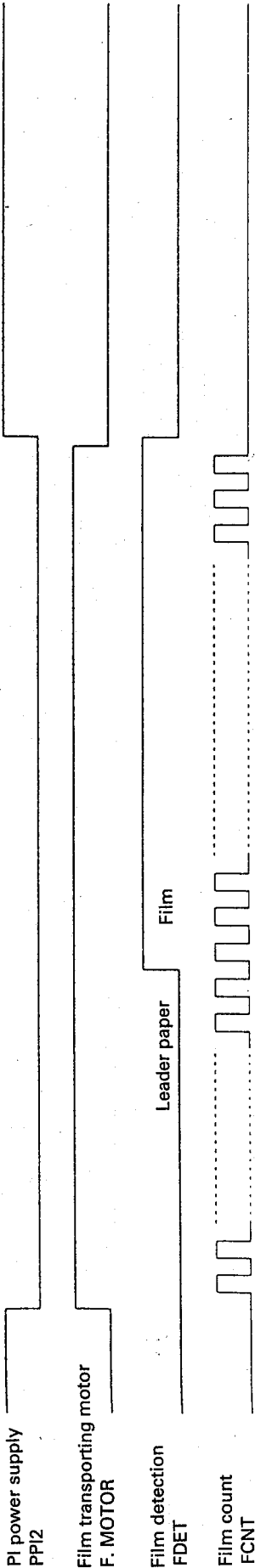


## 7. Overall circuit block diagram

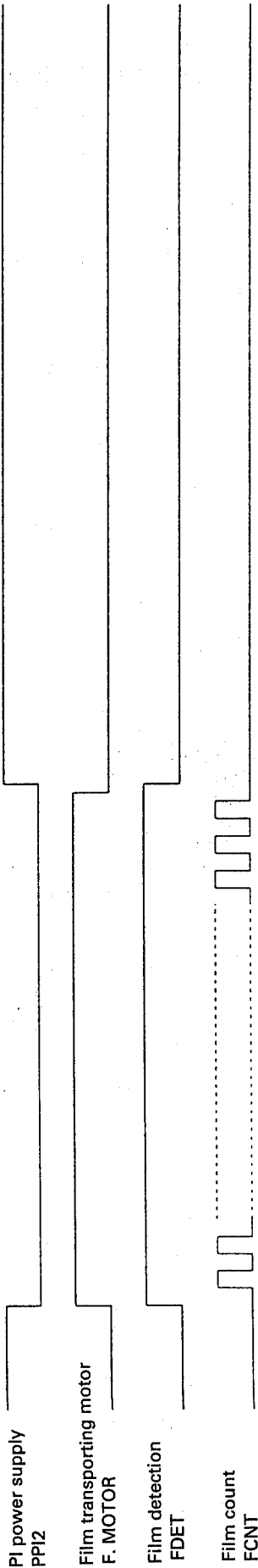


6. Film transporting time chart

1) First frame setting



2) One frame film advancing



**8. Table of signals**

Connections	Signal name	Description
Control FPCB ~ Battery FPCB	VDATE	Data power supply (+)
	RST2	U102 reset signal
	PVC	DC/DC power starting signal
	SG2	U101 power supply (-)
	VDD	U101 power supply (+)
	SG1	U102 power supply (-)
	RST1	U102 reset signal
	V5V	U101 power supply (+)
	IN0 ~ 2	Motor driver driving signal
	SG2-1	Data power supply (-)
	DD	Data data signal
	DCK	Data clock signal
	DLH	Data latch signal
	DEN	Data enable signal
Control FPCB ~ Select dial switch	SMM	Main switch (Manual)
	SMA	Main switch (Aperture priority)
	SMP	Main switch (Program)
	SISO	Main switch (ISO)
	SG2-2	Ground
Control FPCB ~ Camera back switch	VSB	Camera back switch
	KS	Camera back switch
	SB	Camera back switch
Control FPCB ~ PI PCB	FCNTA	Film transporting pulse signal
	FCNTK	Film transporting pulse signal
	FCNTE	Film transporting pulse signal
Control FPCB ~ DX FPCB	DXC	External communication signal (Common)
	DX2	External communication signal
	DX3	External communication signal
	DX4	External communication signal
Control FPCB ~ Flash PCB	VCM	Main capacitor voltage
	SGND1	Flash ground
	FINH2	Flash charge inhibit signal

Connections	Signal name	Description
Control FPCB ~ Flash PCB	FCT	Flash charge signal
	FT	Flash fire signal
	GAIN1	Flash gain signal
	GAIN2	Flash gain signal
	VAV	Flash reference signal
	VIGBT	Flash IGBT signal
Control FPCB ~ AF FPCB	PAF	AF power starting signal
	AFVCC	AF power supply (Active +)
	AFDA	AF active data signal
	CTRL	AF control signal
	AFGND2	AF power supply (Active -)
	AFVDD	AF power supply (Passive +)
	AFRST	AF reset signal
	AFAD	AF address signal
	AFMODE	AF mode signal
	AFCLK	AF clock signal
	AFDP	AF passive data signal
	AFEND	AF end signal
	AFGND1	AF power supply (Passive -)
Control FPCB ~ Light measuring FPCB	AEVCC	AE power supply (+)
	AEGND	AE power supply (-)
	TO	Temperature measuring signal
	PO	Light measuring signal
Control FPCB ~ Shutter assembly	VB-1	Shutter circuit power supply (+)
	PON4	Aperture compensation signal
	PON3	Aperture power supply
	CT32	Aperture driving signal
	CT31	Aperture driving signal
	GND-1	Shutter circuit power supply (-)
	PH2	Shutter open blade driving signal
	CT2	Shutter open blade driving signal
	PON2	Shutter open blade power supply
	PH1	Shutter close blade driving signal

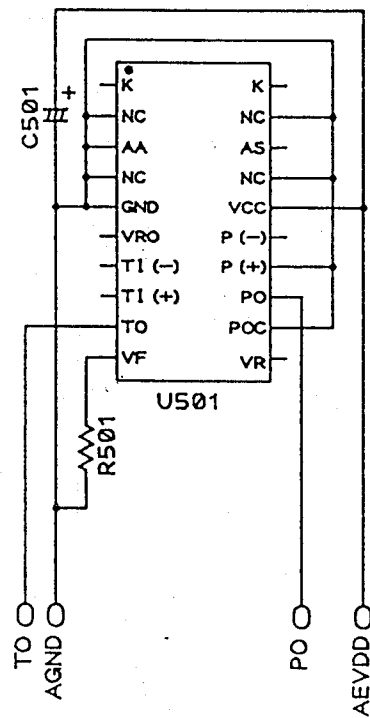
Connections	Signal name	Description
Control FPCB ~ Shutter assembly	PON1	Shutter close blade power supply
	CT1	Shutter close blade driving signal
	PR1	Aperture detection signal
	PR2	Shutter blade detection signal
Control FPCB ~ Buzzer	VBZ	Buzzer power supply
	BZ	Buzzer driving signal
Control FPCB ~ Lens assembly	KSE	Lens encoder common signal
	EA	Lens encoder signal
	EB	Lens encoder signal
Control FPCB ~ Film size switch	KSE-1	Film size signal
	SSIZE	Film size signal
Control FPCB ~ PR PCB	FDETA	Film detection signal
	FDETK	Film detection signal
	FDETE	Film detection signal
Battery FPCB ~ Film transporting motor	MF	Film transporting motor driving signal
	MR	Film transporting motor driving signal
Battery FPCB ~ Lens driving motor	MT	Lens driving motor driving signal
	MW	Lens driving motor driving signal
Flash PCB ~ Flash assembly	TRG+	Flash firing signal (+)
	TRG-	Flash firing signal (-)
	Xe+	Xenon tube lighting signal (+)
	Xe-	Xenon tube lighting signal (-)
Battery ~ Each assembly	VB	Battery (+)
	GND	Battery (-)
On the control FPCB	SP1	Release (1st step) signal
	SP2	Release (2nd step) signal
	SEXT	Cable release signal
	SDATA	Data switch signal
	SSELF	Self-timer switch signal
	SAF	AF switch signal
	SFC	Exposure compensation switch signal
	SMR	Mid roll rewinding signal
	SMF	Manual focus switch signal
	UP1 ~ 4	Up-down switch signal



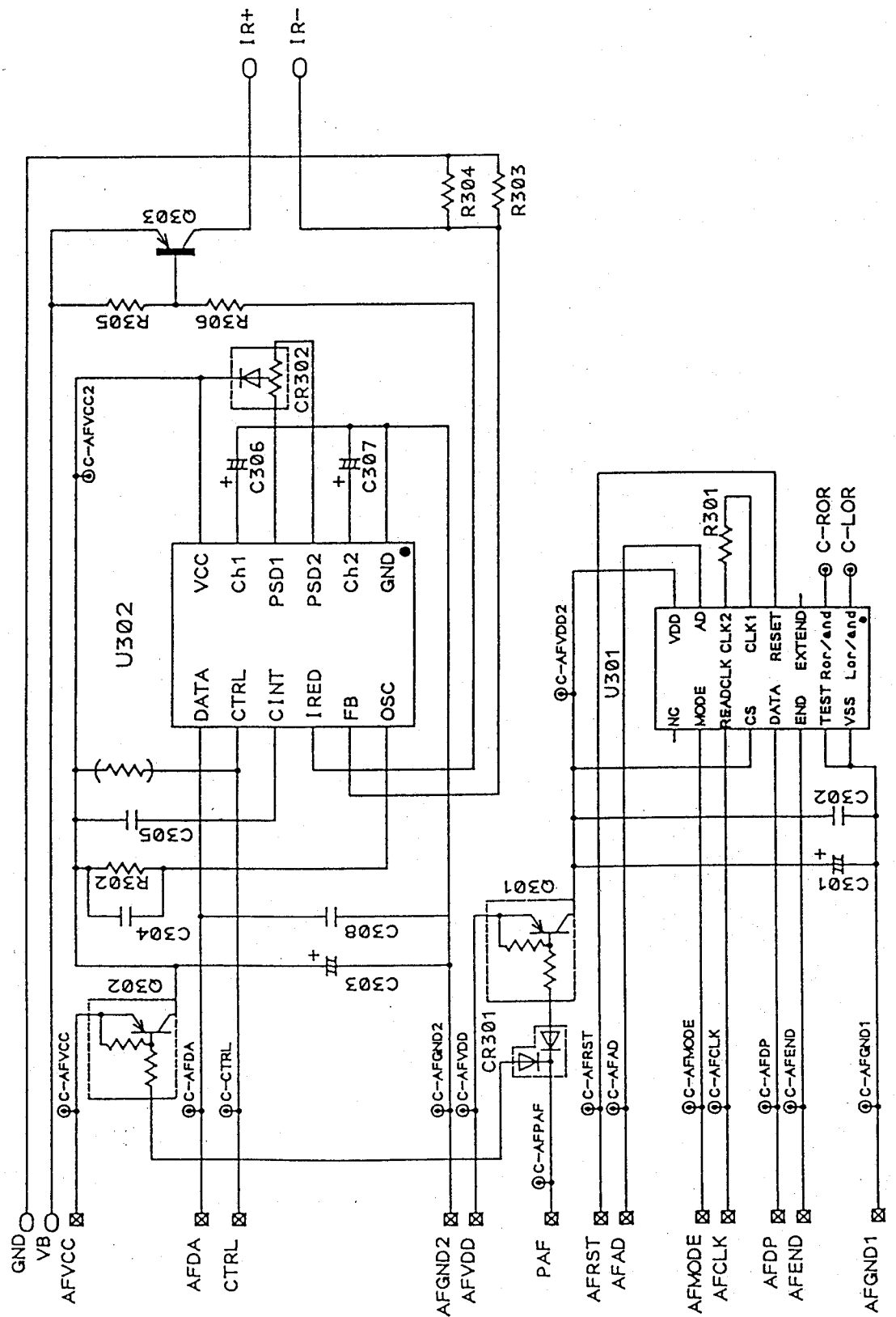
# MEMO

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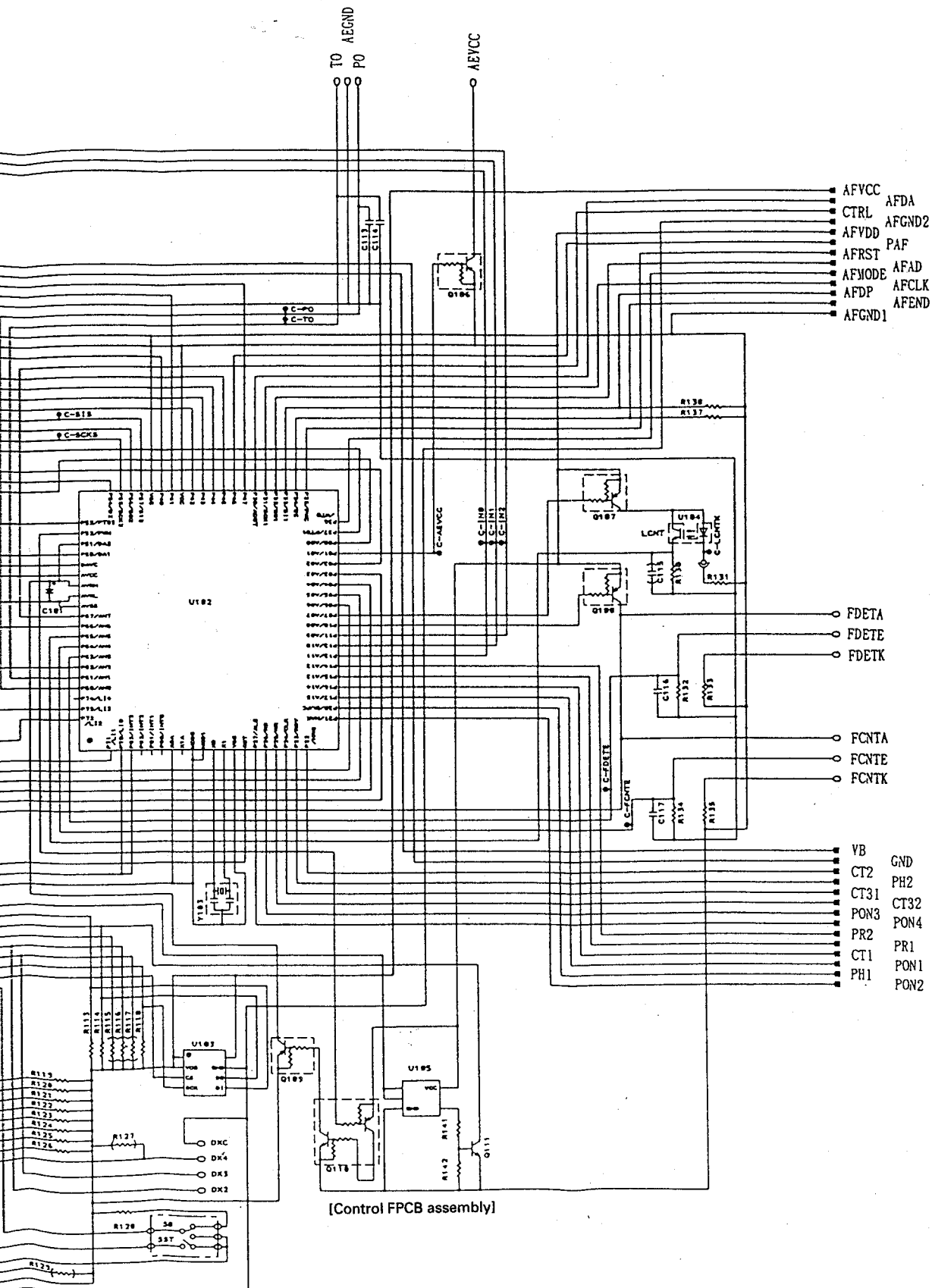
### 3) Light measuring FPCB assembly



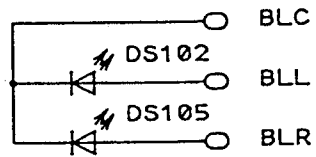
**9.**                    2)    AF FPCB assembly



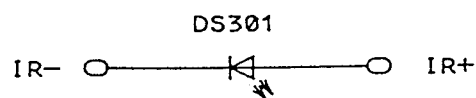




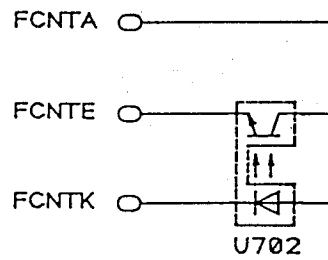
4) BL PCB assembly



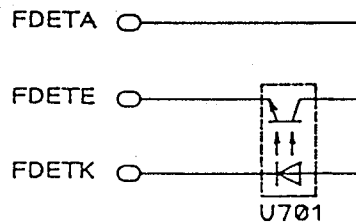
5) IRED PCB assembly



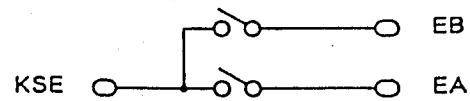
6) PI PCB assembly



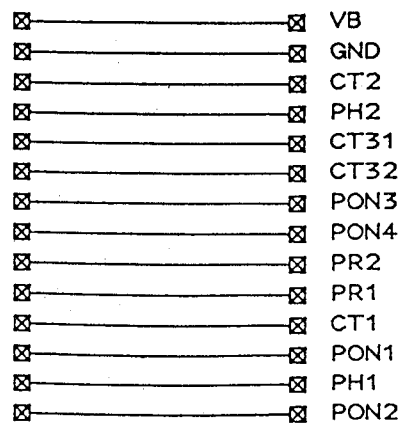
7) PR PCB assembly



8) Encoder FPCB

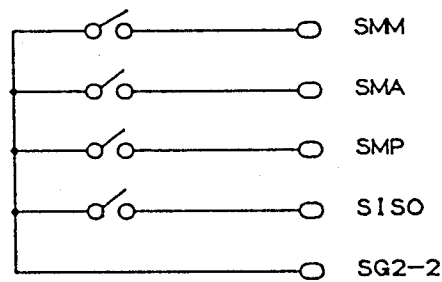


9) Relay FPCB

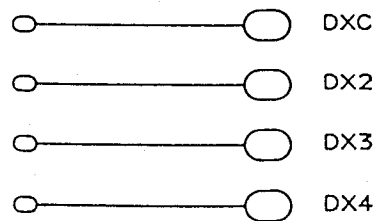




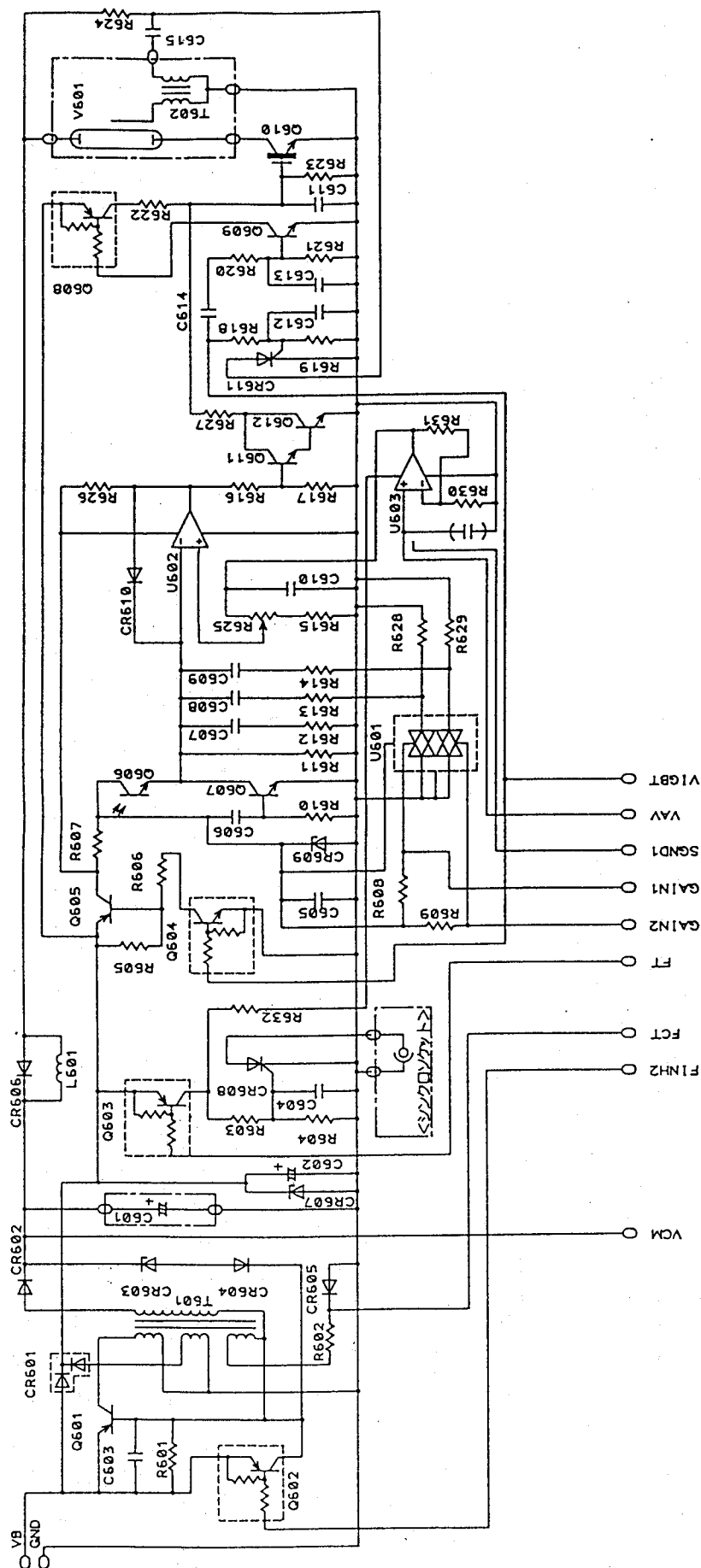
10) Mode switch FPCB



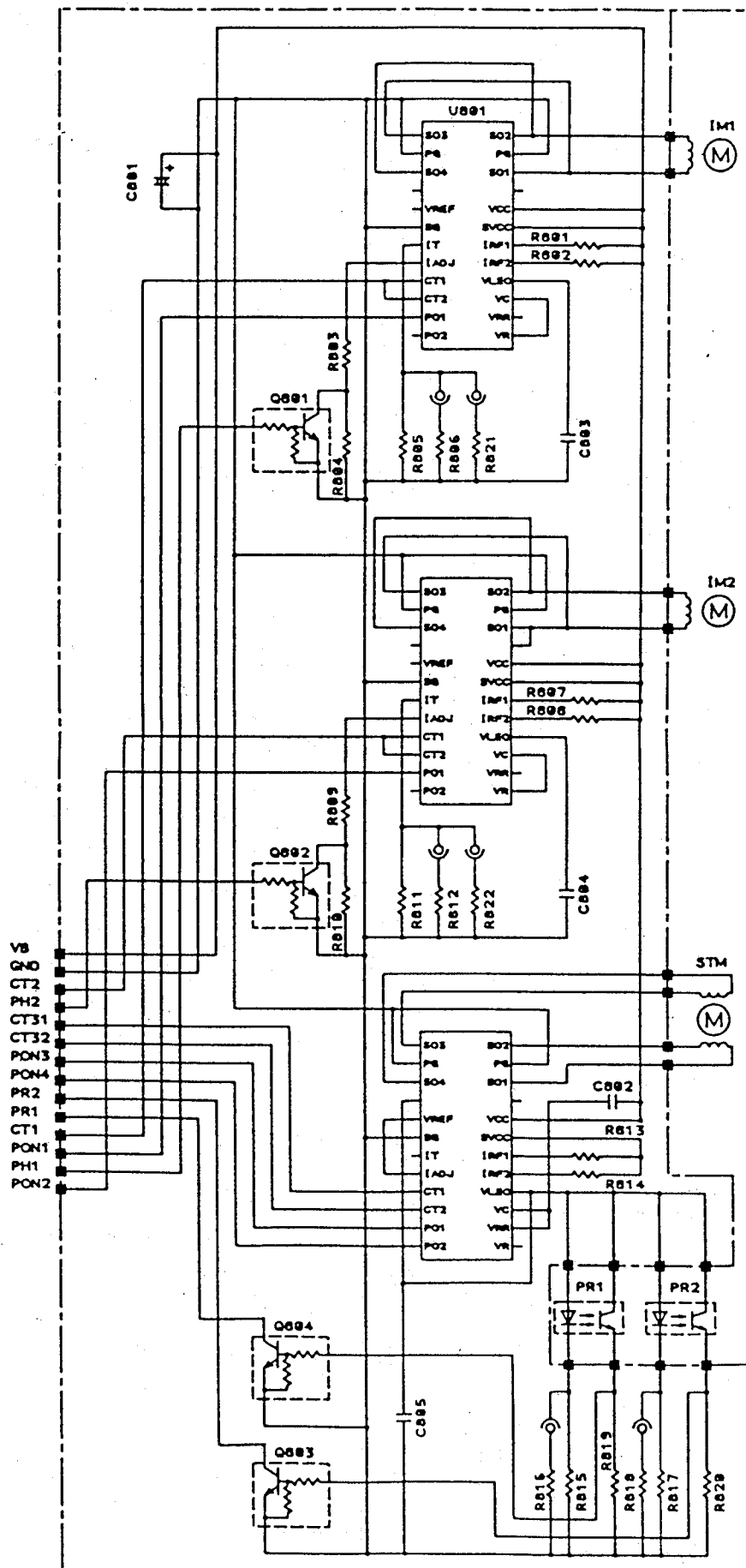
11) DX FPCB



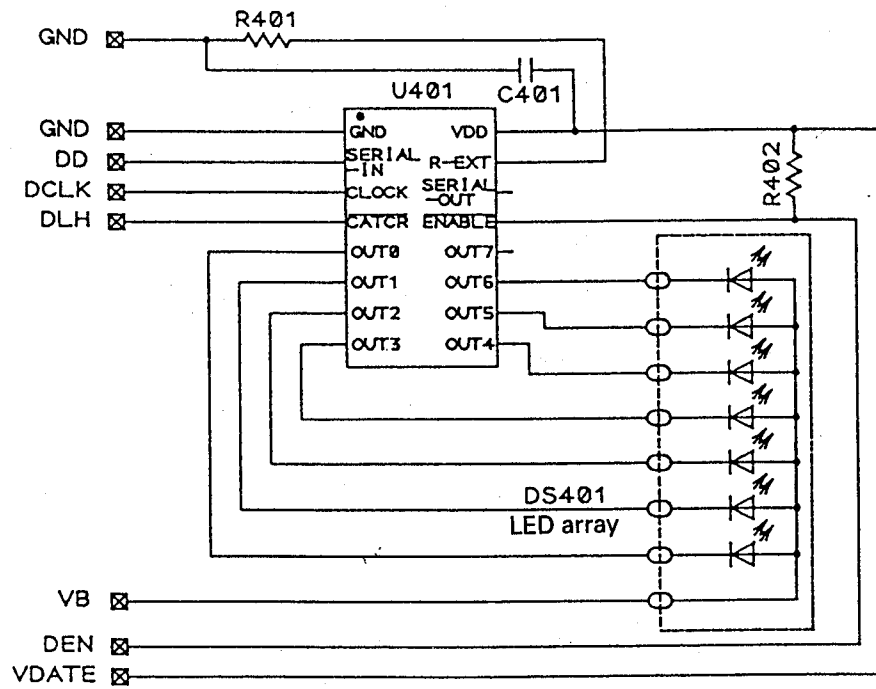
12) Flash assembly (Flash PCB assembly, Flash head assembly, Main capacitor assembly)



13) Shutter assembly



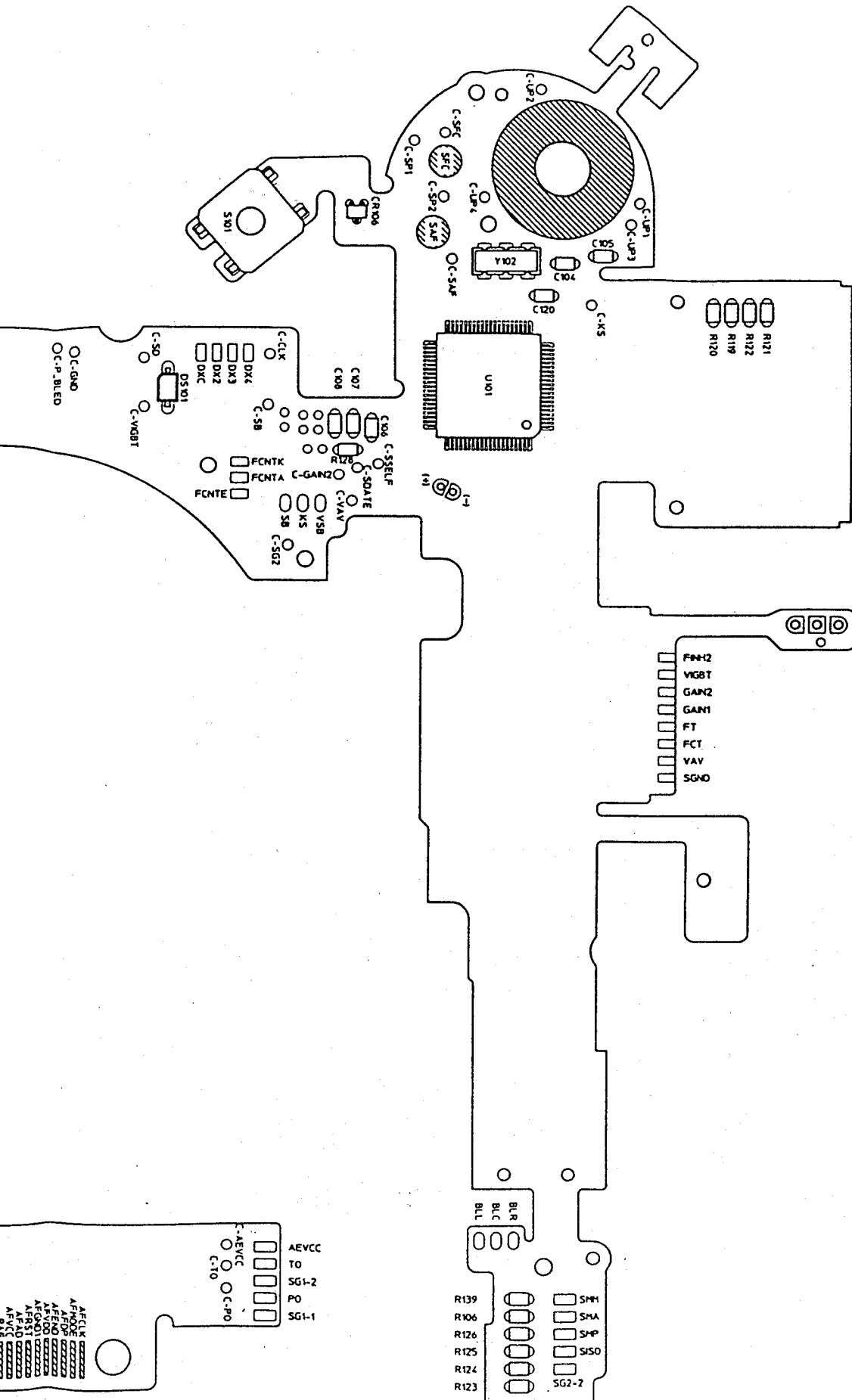
14) Data FPCB assembly

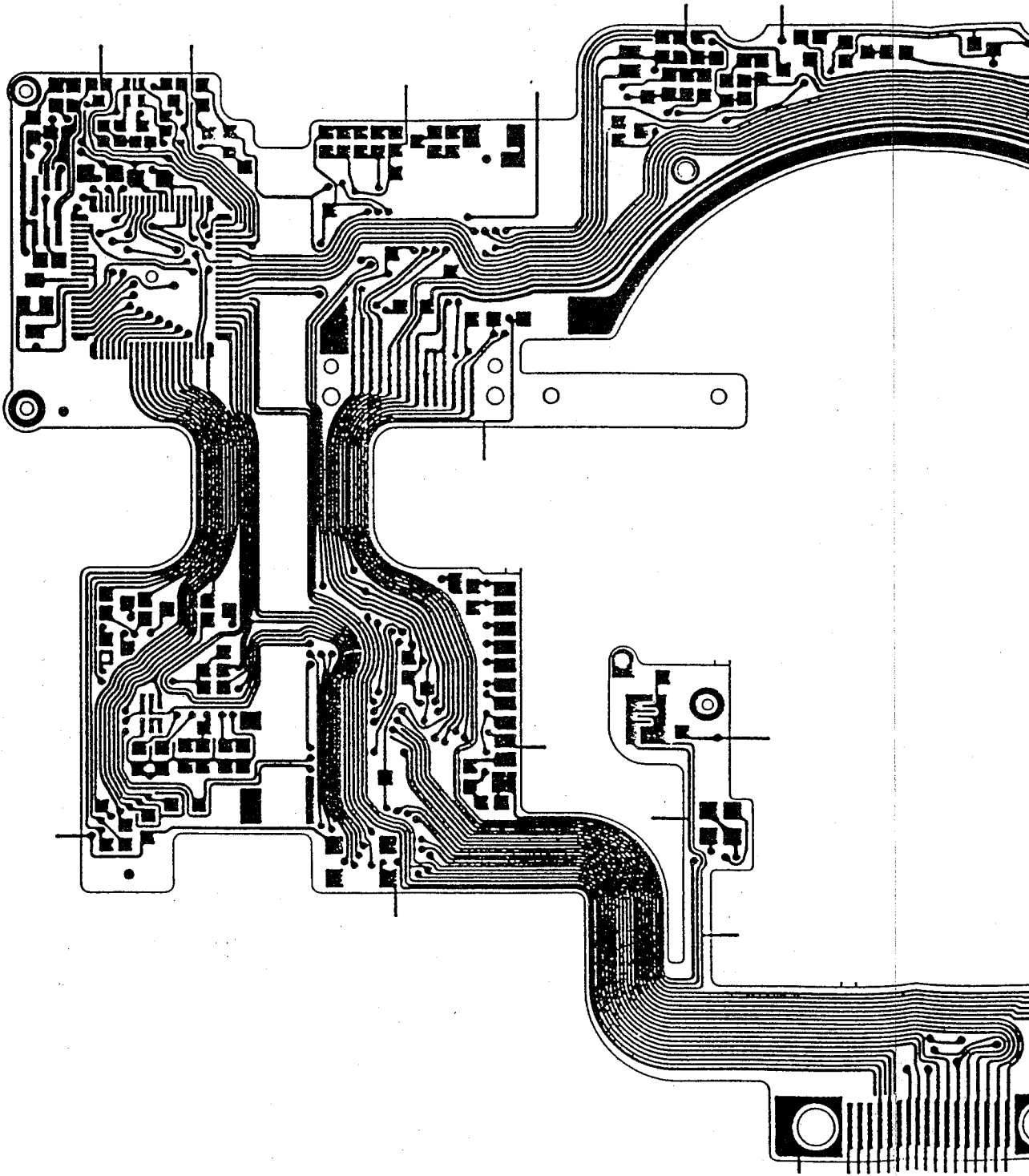


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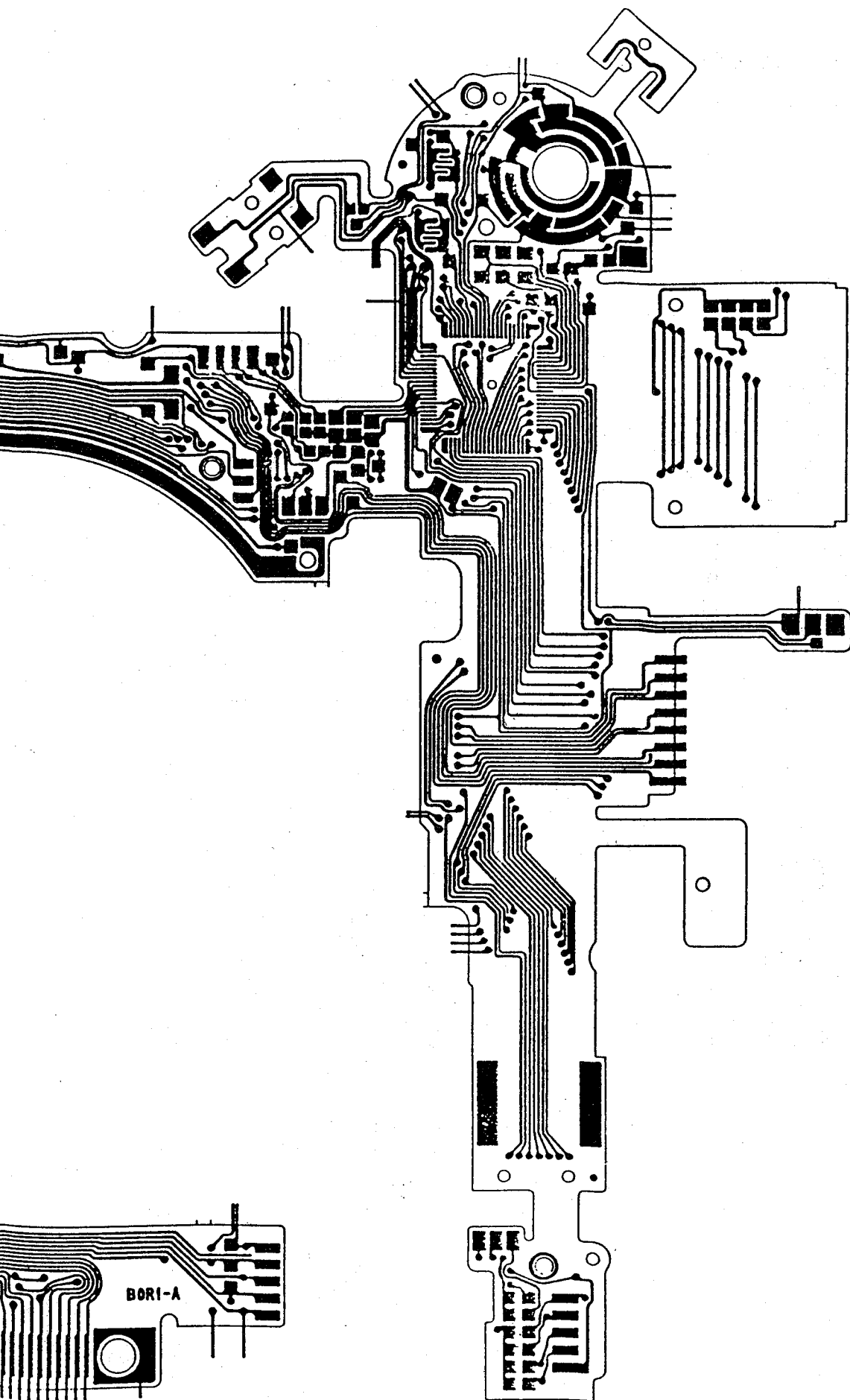
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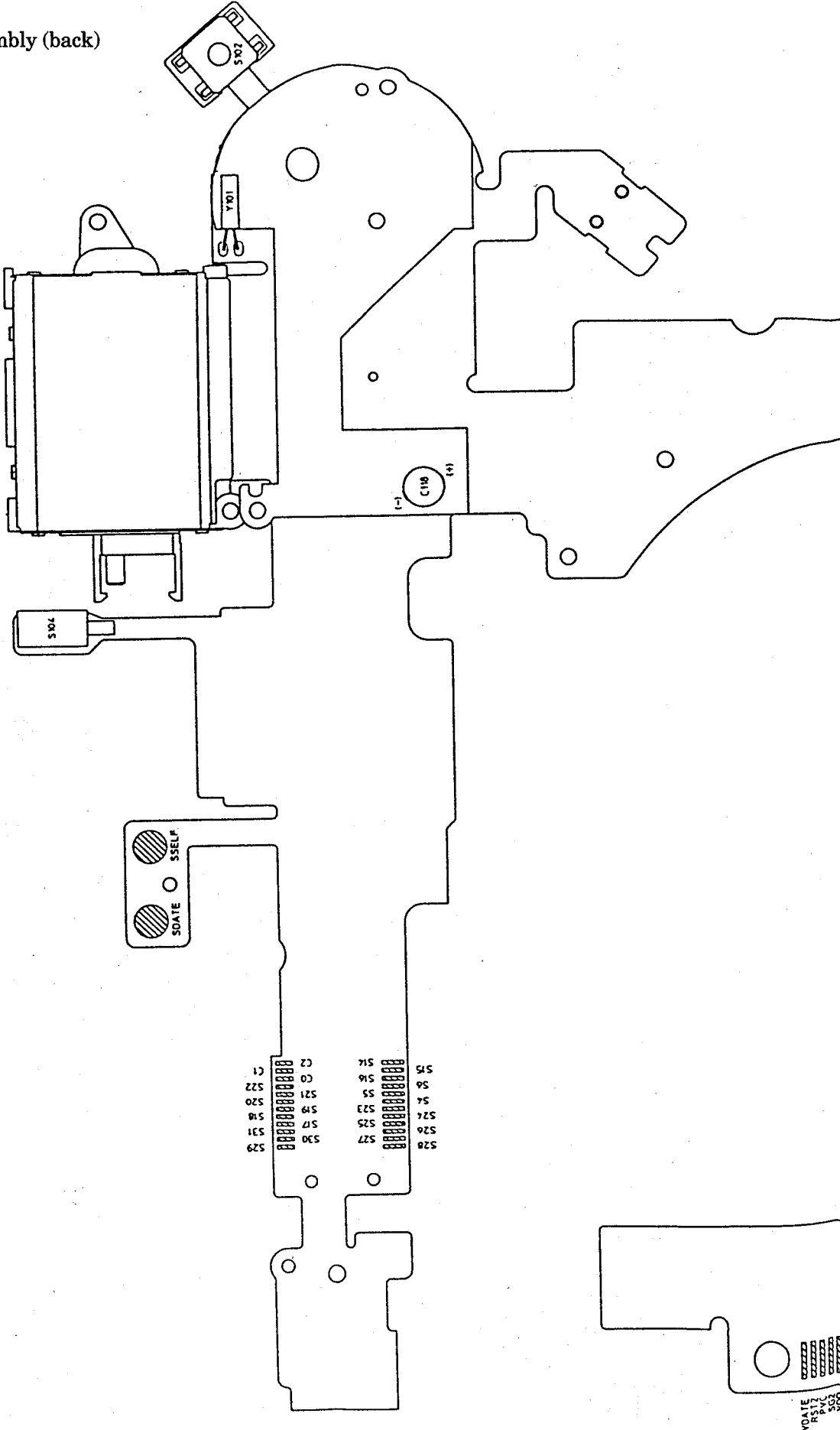


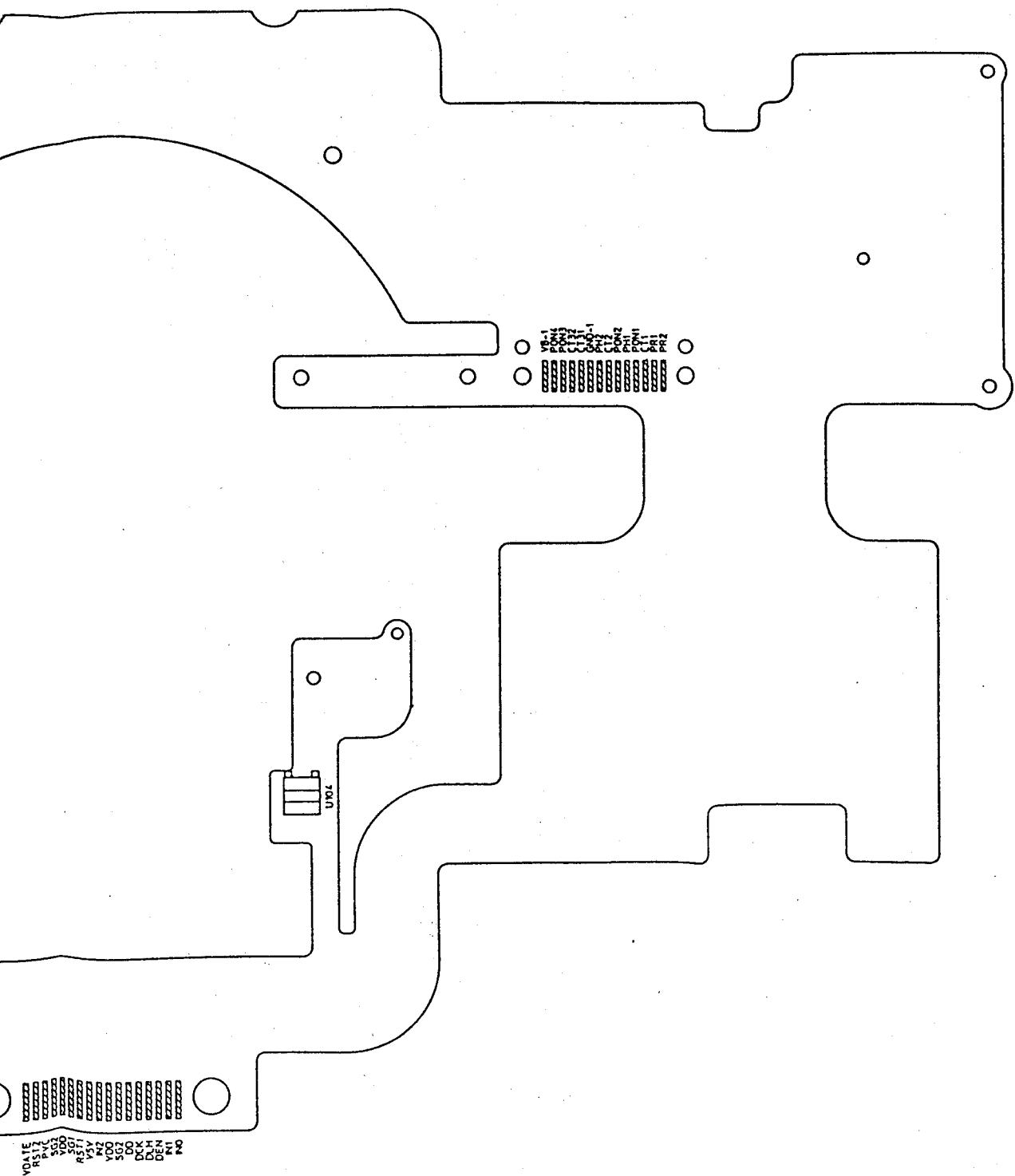


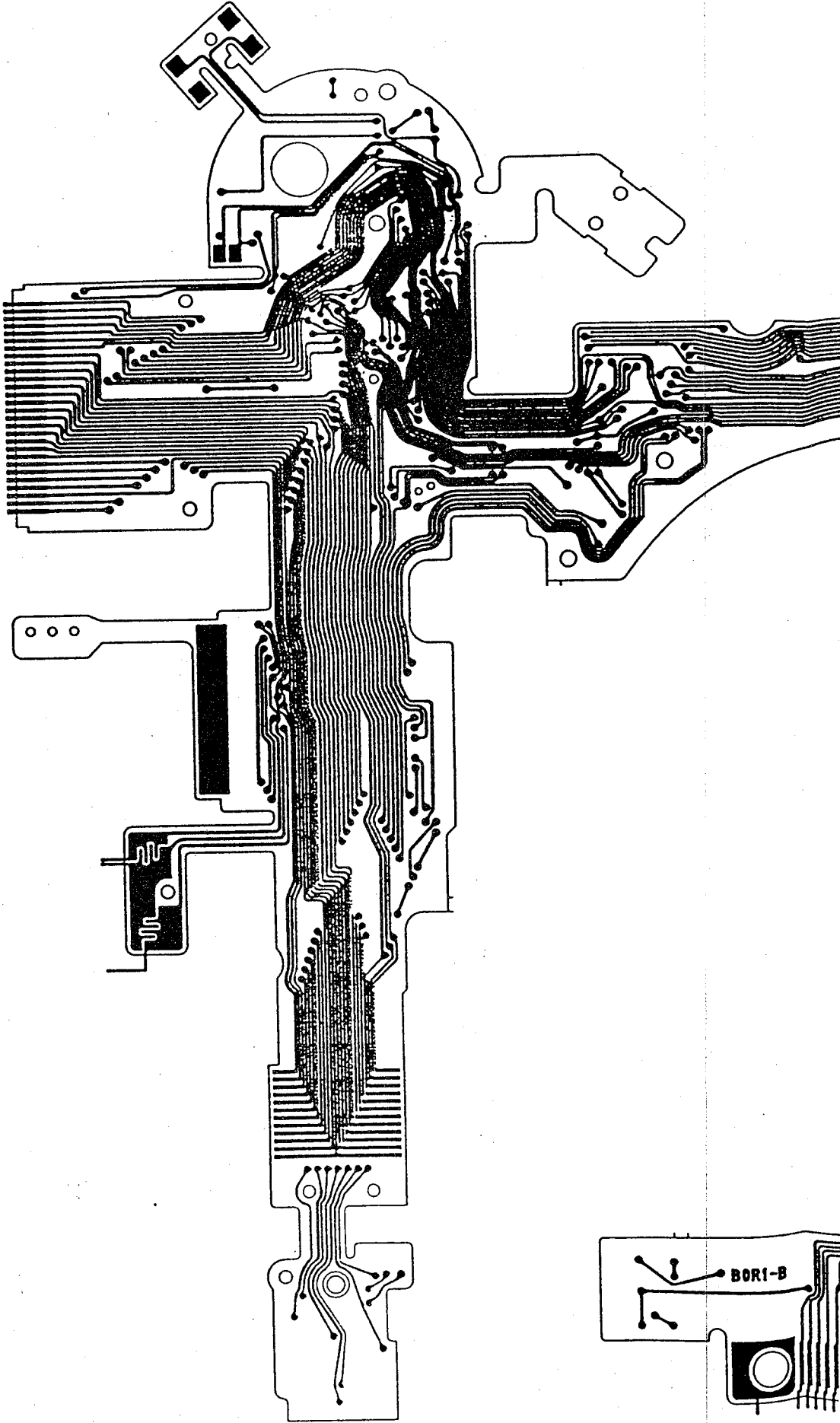


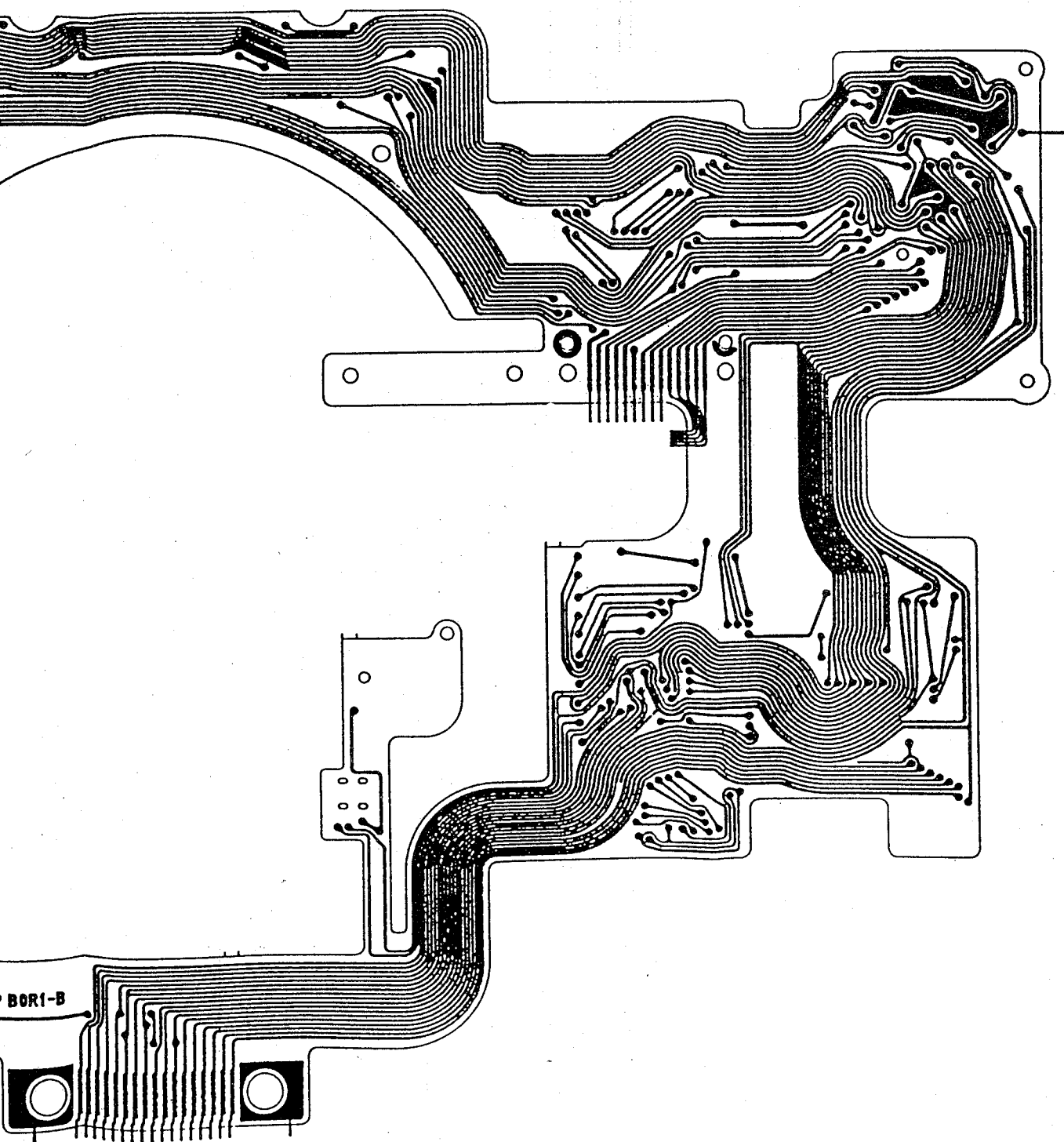


Control FPCB assembly (back)

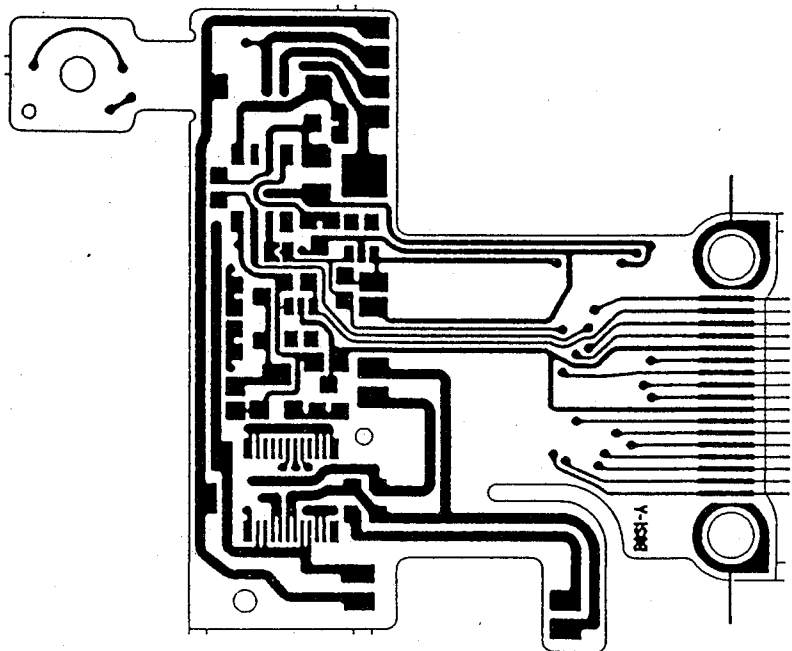
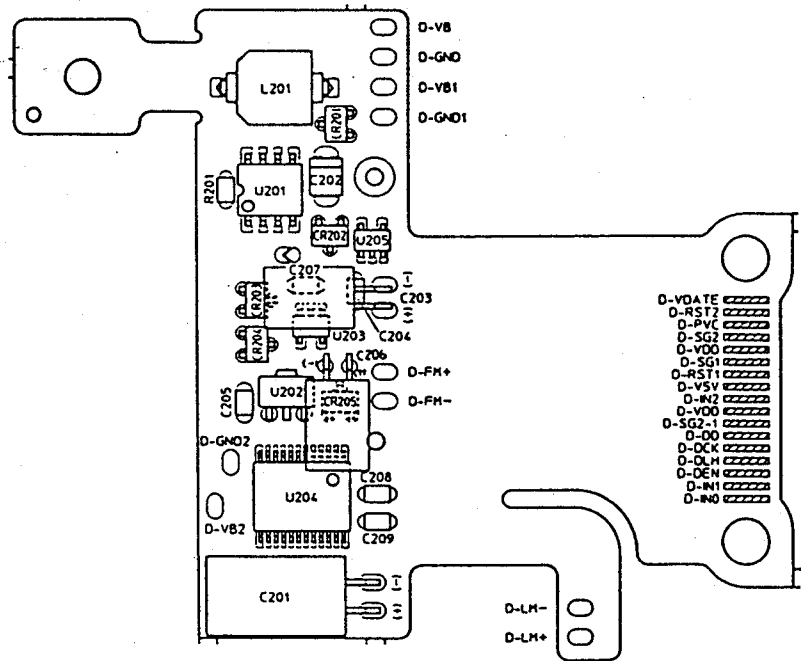




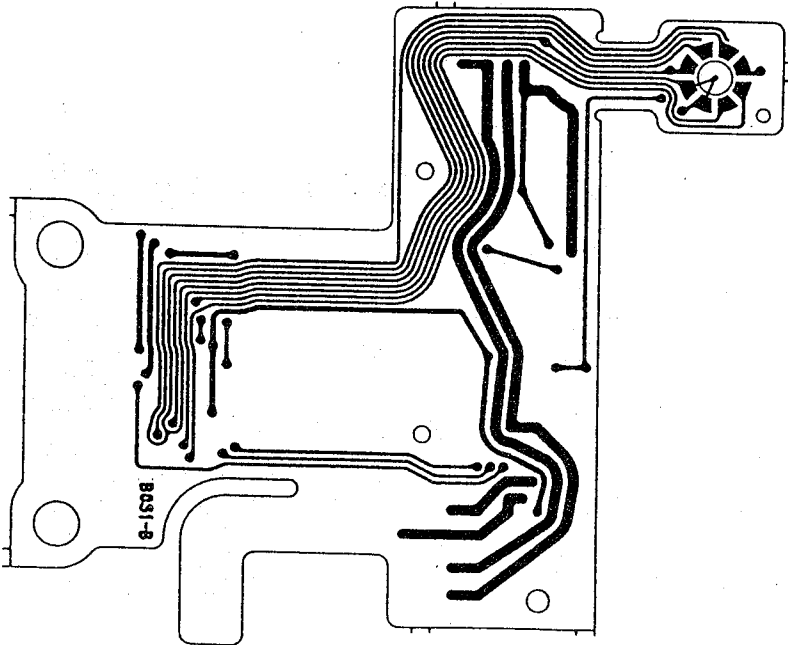
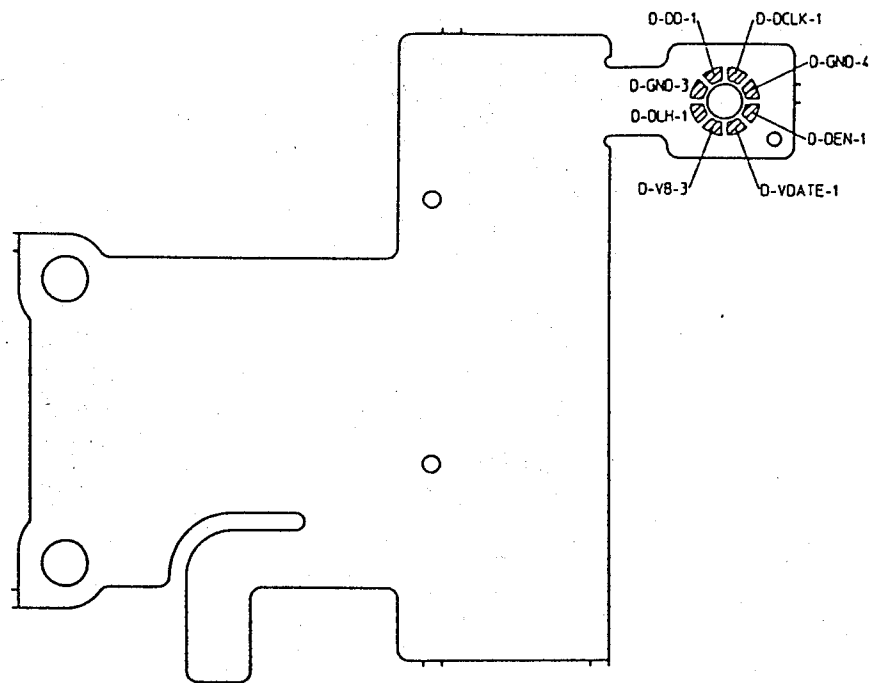




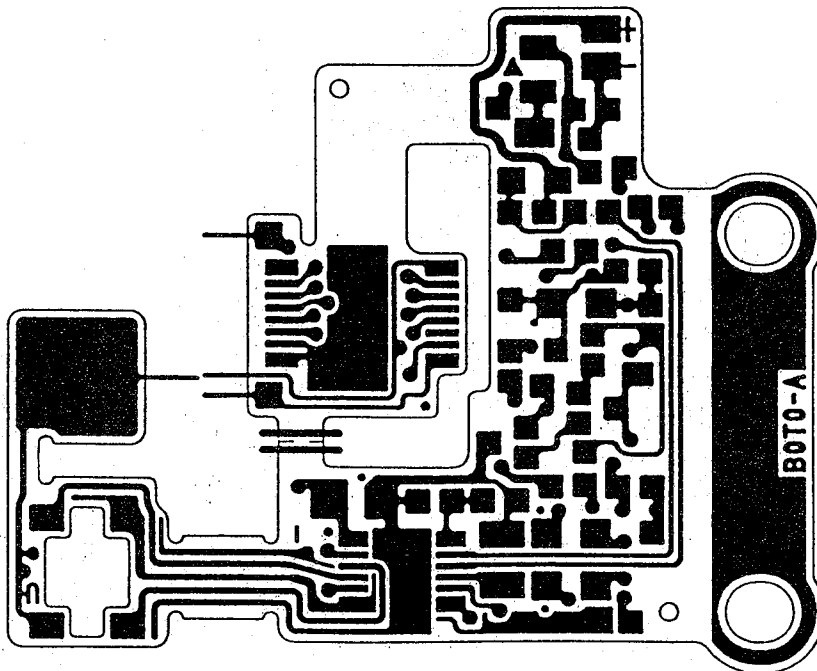
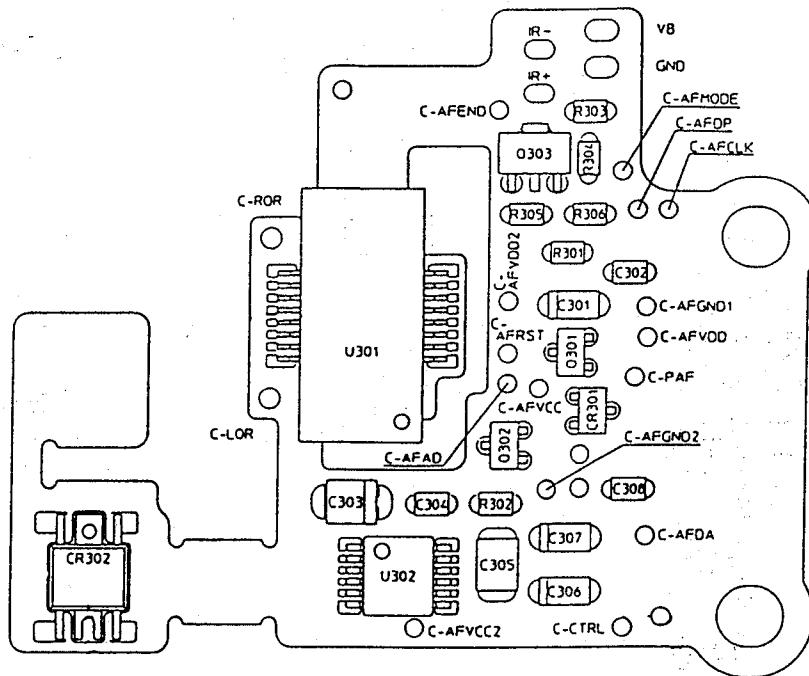
2) Battery FPCB assembly (front)



Battery FPCB assembly (back)

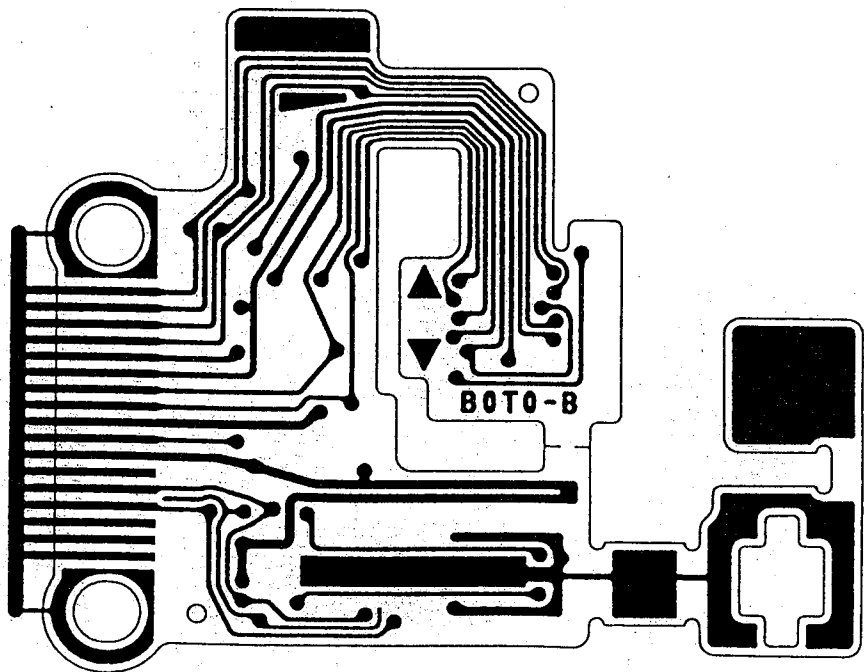
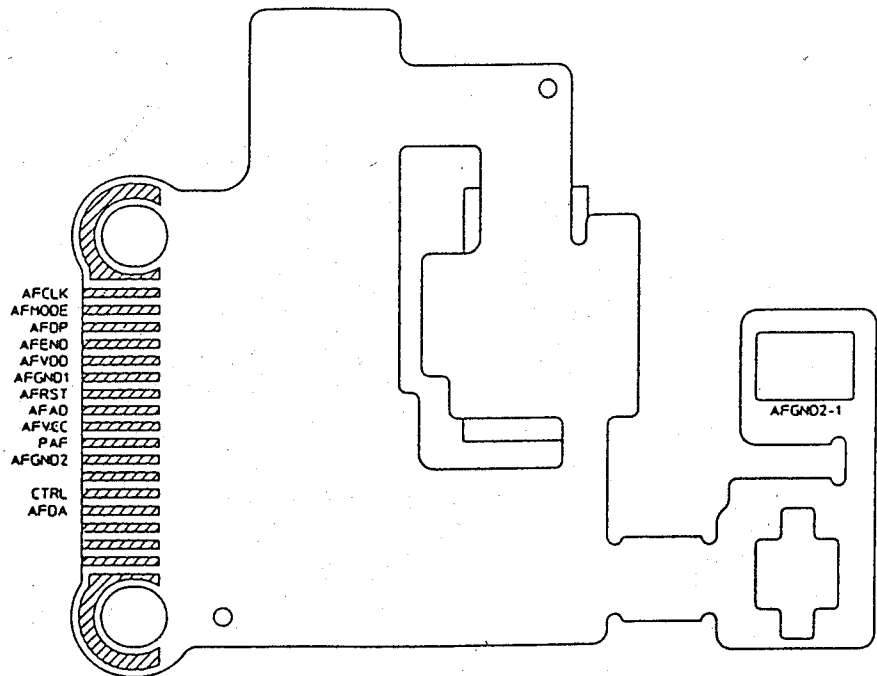


3) AF FPCB assembly (front)

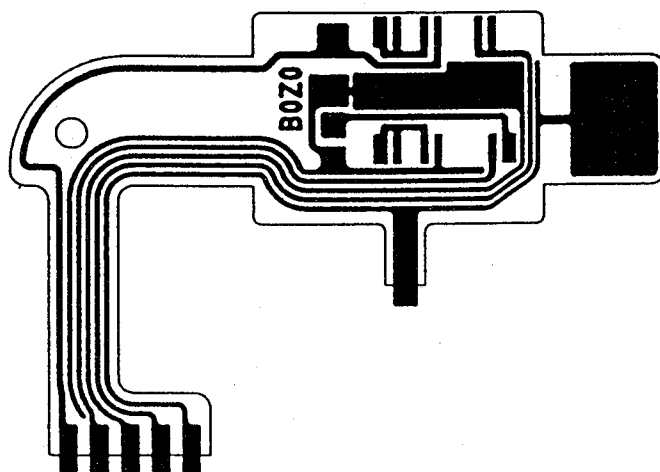
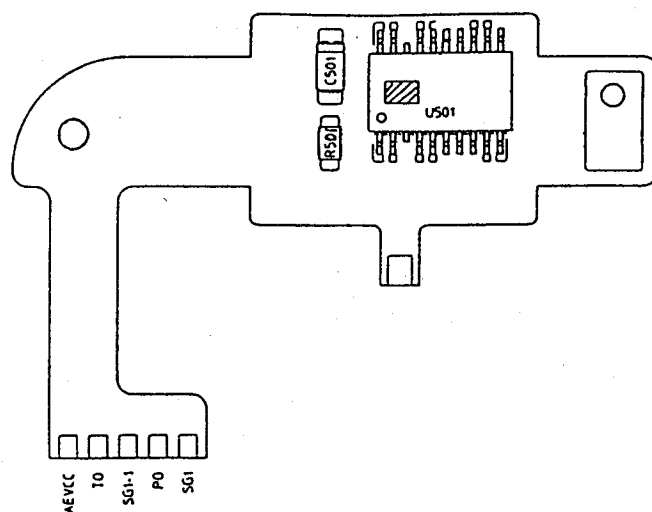




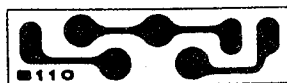
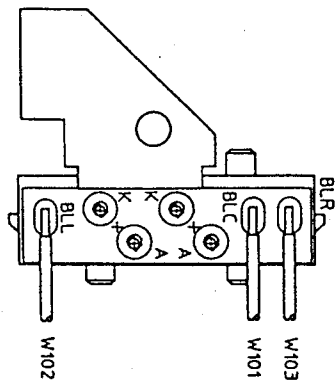
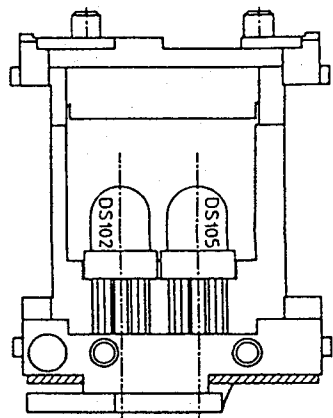
AF FPCB assembly (back)



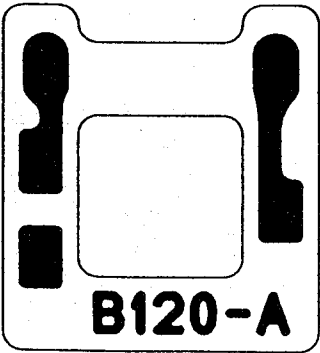
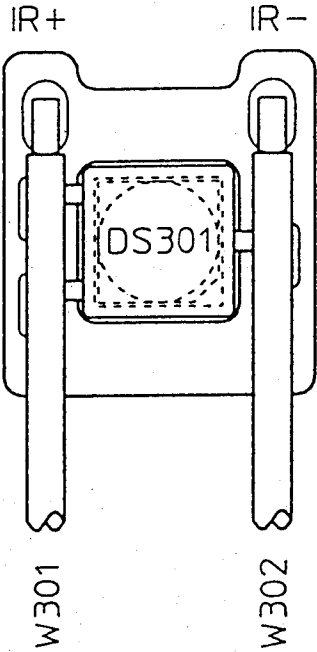
4) Light measuring FPCB assembly



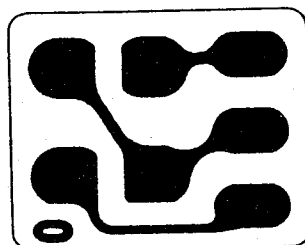
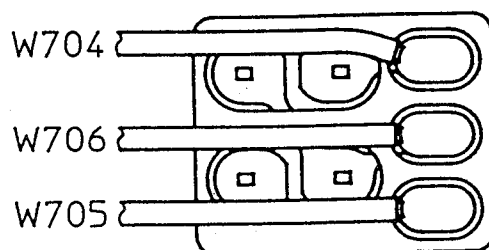
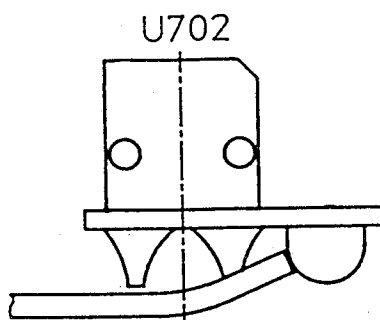
5) BL PCB assembly



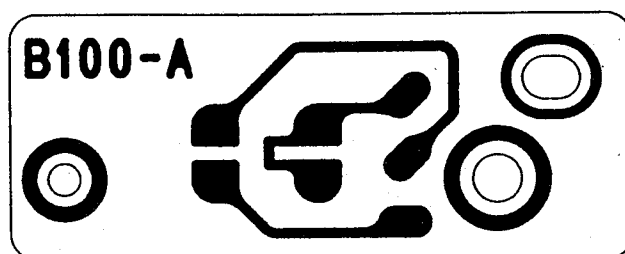
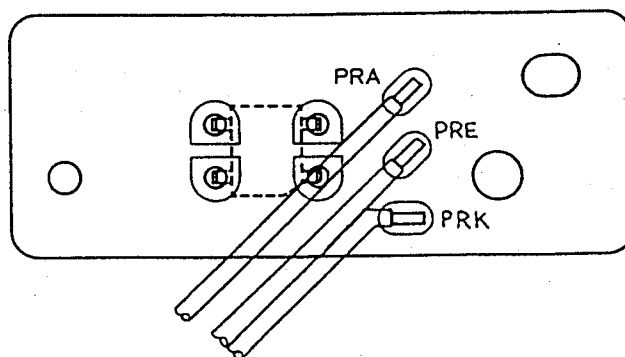
6) RED PCB assembly



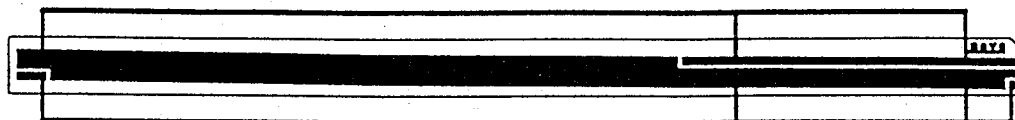
7) PI PCB assembly



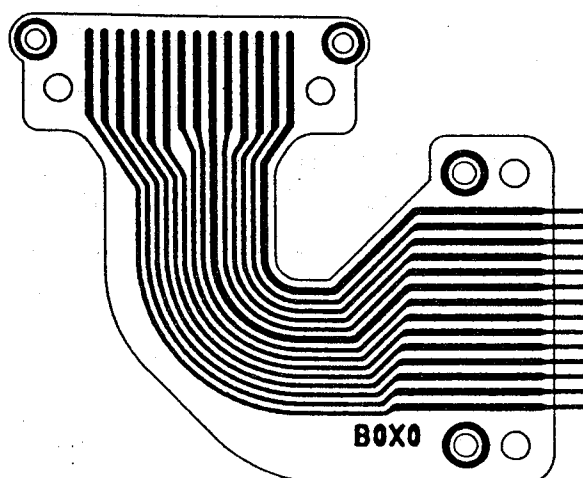
8) PR PCB assembly



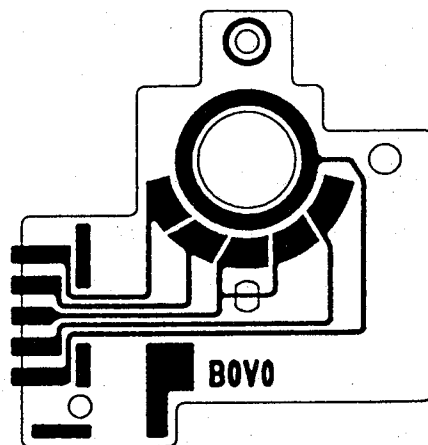
9) Encoder FPCB



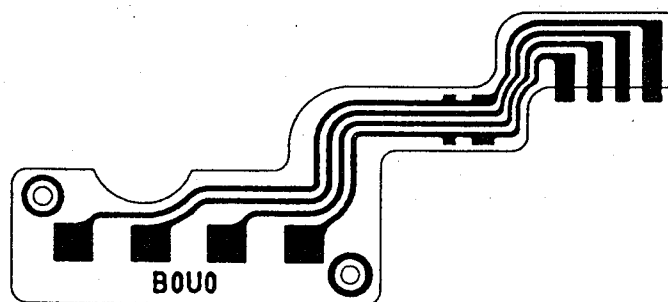
10) Relay FPCB



11) Mode switch FPCB



12) DX FPCB





## 11. Troubleshooting

### Before starting troubleshooting

#### 1. Precautions

- 1) In the camera under a trouble, a large current may flow damaging elements in the circuit.
- 2) Proceed the troubleshooting by checking current, etc.
- 3) When a large current (except for flash charging current) is flowing, turn off the power immediately, find out the cause of over-current, and take corrective actions.
- 4) The main capacitor is highly charged. Discharge it very carefully.

#### 2. Visual check

- 1) Soldering: Observe each soldered part from various angles to make sure that correct lead wire has been connected, no lead wire has been missed, no lead wire has been floated (lightly pull the lead wire) and no lead wire has been shorted with the adjacent one.
- 2) Fixtures: Make sure that all the fixtures are clean, properly and correctly tightened (rubber fixture is normal and screws are tightened correctly), positioned correctly and no foreign matter exists on the fixtures. (After checking the fixtures carefully as above, thoroughly clean them, and check operations once again.)

#### 3. For defective control FPCB, the following causes are anticipated:

- 1) Incorrectly soldered (floated or shorted) element pins
- 2) Broken or shorted line of flexible FPCB
- 3) Wrong parts used or incorrect polarity
- 4) Defective or damaged element
- 5) Abnormal EEPROM data

#### 4. Source voltage

For the stabilized power supply used to conduct troubleshooting, use 5.60V; 1 ohm.

#### 5. Use of a tester

- 1) Hints for tester check

Continuity: About 5 to 50 ohms or less

Non-continuity: About 5 kilo-ohms or more → A certain resistance will be indicated  
since the circuit is connected.

"H": 3V or higher → Actual voltage is unstable since there are three power supply  
systems.

"L": 0.5V or lower

- 2) Input impedance of the used tester

Should be 10MΩ

## Troubleshooting

### 1. Power is not turned on normally.

→ 1) Does not turn on at all . . . Not indicated on the LCD.

CHECK 1: Make sure that the battery FPCB, control FPCB and AFFPCB are tightly and correctly joined in three layers.

CHECK 2: Make sure that about 3.3V and 4.8V are output respectively for C\_VDD and C\_V5V.

When not output, defective battery FPCB assembly or incorrectly soldered lead wire extended from the battery is anticipated.

CHECK 3: Make sure that level of C\_RST1 is "H".

When it remains at "L", shorted solder bridge pattern of the battery FPCB assembly is anticipated.

As the result of the above checks, when still NG, the control FPCB assembly is anticipated to be defective.

→ 2) Exposure counter remains displaying . . . No other displays than exposure counter are displayed.

CHECK 1: Make sure that source voltage is 5.6V.

CHECK 2: Check two lead wires (SH) for incorrect soldering, reverse connections and/or break-down.

As the result of the above checks, when still NG, the control FPCB assembly is anticipated to be defective.

→ 3) LCD remains fully displaying

CHECK: Make sure that S103 is not pressed down continuously.

When the S103 is not pressed down continuously and still the LCD continues to make the full display, the control FPCB is anticipated to be defective.

2. Over leak-current

→ 1) LCD is working.

CHECK 1: Check all the items under paragraph 1 above (Power is not turned on normally.)

CHECK 2: Make sure that the SB switch lead wires are soldered correctly.

→ 2) LCD has gone out.

CHECK 1: Recheck all the lead wires and soldered parts.

CHECK 2: Disconnect FLASH + lead wire, and see if the LCD lights or not.

→ When recovers, the circuit across the flash and control FPCB is anticipated to be soldered incorrectly or flash PCB assembly is anticipated to be defective.

CHECK 3: Disconnect SH+ lead wire, and see if the LCD lights or not.

→ When recovers, the shutter assembly is anticipated to be defective or poor contact across the relay FPCB and control FPCB is anticipated.

CHECK 4: Disconnect AF+ lead wire, and see if the LCD lights or not.

→ When recovers, the AF system is anticipated to be defective.

As the result of the above checks, when still NG, the control FPCB assembly or battery FPCB assembly is anticipated to be defective.

3. Operations with the camera back opened are abnormal.

→ 1) [120], [220] film display is abnormal.

CHECK 1: Make sure that the display at the time of camera back "OPEN" is normal.

→ When abnormal, SB lead wire is anticipated to be connected reversely, or not to be soldered correctly.

CHECK 2: Make sure that the SZ lead wire is soldered correctly.

CHECK 3: Make sure that the pressure plate detecting pin operates smoothly

CHECK 4: Check continuity across SZ+ and SZ- lead wires with the power turned off.

Continuity exists when the pressure plate detecting pin is pressed down and continuity does not exist when the pin is released from the compression.

→ Normal

Continuity does not exist when the pressure plate detecting pin is pressed down and continuity exists when the pin is released from the compression.

→ SSIZE switch wiring is anticipated to be reversed.

Continuity does not exist regardless of pressed down or released pressure plate detecting pin

→ Broken lead wire or defective SSIZE switch.

As the result of the above checks, when still NG, the control FPCB assembly is anticipated to be defective.

→ 2) The film transporting motor does not turn, or turns reversely.

CHECK 1: Check the motor.

→ Tends to turn

→ Mechanically locked

→ Turns reversely

→ Motor lead wires are connected reversely, or connection (soldering) with the battery FPCB is reversed.

CHECK 2: Make sure that the display at the time of camera back "OPEN" is normal.

→ When abnormal, SB lead wire is anticipated to be connected reversely, or not to be soldered correctly.

CHECK 3: Check contact across the UP/DOWN contact and control FPCB.

CHECK 4: Make sure that the battery FPCB, control FPCB and AFFPCB are tightly and correctly joined in three layers.

CHECK 5: Make sure that the motor lead wires are connected correctly.

As the result of the above checks, when still NG, the control FPCB or battery FPCB is anticipated to be defective.

4. Operations under P mode are abnormal.

- 1) The lens is fed out for one second or so, and then, it returns to its home position. (The lens is not fed out to the normal position.)

CHECK 1: Make sure that the PI (U702) (which detects the lens driving) is installed correctly on the holder.

CHECK 2: Make sure that the solder bridge by the PRK lead wire is shorted correctly.

- 2) The lens stops immediately.

CHECK 1: Make sure that EA, EB and EC lead wires are soldered correctly and that they are not connected reversely.

CHECK 2: Make sure that the contact across the encoder FPCB and contact piece is good.

As the result of the above checks, when still NG, the control FPCB is anticipated to be defective.

- 3) The lens is fed to the stand-by position once, but it returns to the home position, or the LCD goes out.

CHECK 1: Turn the power switch and make sure that the aperture generates clicking sounds three times.

→ Yes, sounds

→ Proceed to CHECK 2 below.

→ No, does not sound

→ EA, EB and EC lead wires are not connected or soldered correctly, or encoder is anticipated to be in a poor contact.

CHECK 2: Turn off the power switch, and check the shutter for the pressed-to-tight installation and CPU2 for the soldering.

→ The pressed-to-tight installation of the shutter can be assured by checking terminals of the CPU2 with a tester.

Measure resistances across the terminals and GND and compare them with the following standards.

15 ~ 19, 21 ~ 23 → 80 ~ 120 kilo-ohms

20, 24 → 40 ~ 60 kilo-ohms

25, 26 → ∞

→ When measured resistances deviate the standards, check the relay FPCB and control FPCB for tight connection and CPU for soldering.

As the result of the above checks, when still NG, the shutter assembly is anticipated to be defective.

To next page

4. Operations under P mode are abnormal.

→ 4) LCD flickers, or unnecessary patterns light dimly.

CHECK 1: Push down the LCD frame lightly, and see if the LCD recovers or not.

If the LCD recovers, it is anticipated that the LCD is not tightly connected.

→ Remove the LCD frame carefully, thoroughly clean the pattern and zebra connector, and reassemble them. When the LCD is cracked, replace it with a new one.

CHECK 2: Check the turned over portion of the FPCB near the LCD frame to insure that it is not broken.

As the result of above checks, when still NG, the control FPCB is anticipated to be defective.

→ 5) The flash mark does not blink.

NOTE: Under the P mode, the flash mark goes out when the object is bright and the release switch is pressed in a half way down.

CHECK: Check continuity. SST (S104) switch is anticipated to be in a poor contact.

As the result of the above check, when still NG, the control FPCB is anticipated to be defective.

→ 6) Self-timer and date operations are abnormal.

CHECK 1: Make sure that the cable release switch has not been pressed down continuously.

CHECK 2: Make sure that the rubber switch has been installed correctly.

As the result of the above checks, when still NG, the control FPCB is anticipated to be defective.

5. AF operations are abnormal.

- 1) Range is not displayed, or obviously wrong.

CHECK: The FLCD is anticipated to be in a loose connection. Check the claw of the FLCD frame, etc., and when the claw is normal, reinstall the FLCD assembly correctly.

As the result of the above check, when still NG, the control FPCB is anticipated to be defective.

- 2) 0.7m is not displayed, and INF is displayed.

CHECK 1: Check AV and TV values. When values are FNo13 or higher and TV1/350 or higher, the circumference is too bright, or light measuring FPCB and/or light measuring IC is defective.

CHECK 2: When displayed range is 1.5 ~ 2m, it is anticipated that the PSD is installed reversely, or PSD is not completely shielded.

As the result of the above checks, when still NG, the AF assembly or control FPCB is anticipated to be defective.

6. Shutter operations are abnormal.

The lens returns to the home position when the shutter is released, or the shutter does not open.

- CHECK: Turn off the power, and check the shutter for tight connection and CPU2 or soldering.

→ The pressed-to-tight installation of the shutter can be assured by checking terminals of the CPU2 with a tester.

Measure resistances across the terminals and GND and compare them with the following standards.

15 ~ 19, 21 ~ 23 → 80 ~ 120 kilo-ohms

20, 24 → 40 ~ 60 kilo-ohms

25, 26 → ∞

→ When measured resistances deviate the standards, check the relay FPCB and control FPCB for tight connection and CPU for soldering.

As the result of the above check, when still NG, the shutter assembly is anticipated to be defective.

7. The flash is abnormal.

→ 1) The flash does not fire.

CHECK 1: See if the flash mark lights. The flash does not fire when the flash mark is blinking or not lighting.

→ When the flash mark remains blinking, the main capacitor lead wire is anticipated to be broken or not soldered correctly.

CHECK 2: Check four lead wires extended from the flash head for soldering.

CHECK 3: Check the control FPCB and flash PCB for soldering.

As the result of the above checks, when still NG, the flash PCB assembly is anticipated to be defective.

→ 2) The flash fires fully.

CHECK 1: Flash light changes depending on an FNo. Set film speed to ISO 100, FNo. to 4.0, and check at a close-up distance.

CHECK 2: The IGBT (Q610) is anticipated to be broken. Check continuity across G and E, and across C and E.

→ When continuity exists, the IGBT is damaged.

CHECK 3: Measure resistance across the GND and shield of the shielded wire extended from the light receiver for the flash.

→ When continuity exists, the shielded wire is anticipated to be shorted by itself, or shorted with other parts (camera chassis, for example).

CHECK 4: Check the control FPCB and flash PCB for soldering.

As the result of the above checks, when still NG, the flash PCB or control FPCB is anticipated to be defective.

8. Data are not printed correctly.

→ NG with a data printing tester

CHECK 1: Press down the shutter release, and make sure that the shutter is operating correctly.

→ When the shutter operations are abnormal, refer to paragraph 6 (Shutter operations are abnormal.) above.

CHECK 2: Turn the up/down switch and make sure that the film transporting motor turns.

→ When the motor does not turn, the SB switch is anticipated to be defective or not soldered correctly.

As the result of the above checks, when still NG, it is anticipated that the battery FPCB and data FPCB are in loose connection, or control FPCB or data FPCB is defective.



9. The buzzer is abnormal.

→ 1) The buzzer does not sound.

CHECK 1: Make sure that the camera is under buzzer ON mode.

→ The buzzer ON-OFF can be changed by turning the mode switch to ISO mode with the SELF switch pushed.

CHECK 2: Check the buzzer lead wires for soldering and breaking.

→ 2) The buzzer sounds but volume is too low.

CHECK 1: Make sure that the buzzer is installed firmly on the camera bottom cover.

CHECK 2: Check CR103 and R136 for polarity and soldering.

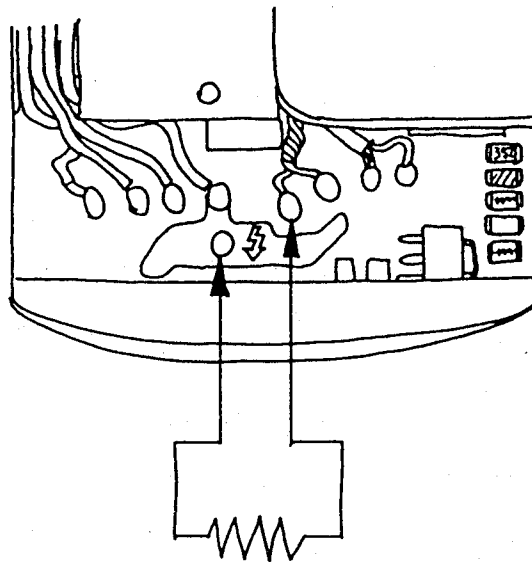
As the result of the above checks, when still NG, the control FPCB is anticipated to be defective.

## IV. DISASSEMBLY AND REASSEMBLY

### Before starting the work

- 1) Thanking to the high technology advancement during the recent years in the electric and electronic fields, this camera uses MOS IC and other electronic parts. These electronic parts are likely to be affected by static electricity causing them to be deteriorated or damaged. When removing even a single parts or repairing the camera, be sure to take the following preventive actions.
  - (1) Lay down a conductive rubber mat on the work table.
  - (2) Ground the soldering iron.
  - (3) Ground your body.
  - (4) Hopefully, ground both the soldering iron and your body to the earth.
- 2) This camera uses a normally charged type flash circuit. Keep this in your mind when repairing a camera. For the sake of safety, be sure to discharge the flash system as soon as the top cover is removed.

When discharging the flash system, use a 3 kilo-ohm/10W discharging resistor



- 3) When disassembling a camera up to the lens assembly, be sure to start the disassembly after fully opening the shutter. To fully open the shutter, place the camera under manual exposure mode, set the shutter speed to "Bulb", set the aperture to F4, release the shutter after setting manual focus to  $\infty$ , and pull out the battery.

## A. Removal and reinstallation

### 1. Top cover

#### (1) Removal

- 1) Remove the battery compartment cover assembly (1-64), and pull out the battery.
- 2) Raise the flash head assembly (1-25), remove the screw (1-35) and remove the flash cover (1-34).

NOTE:

When the flash cover (1-34) is removed, discharge the main capacitor. *Grij's en Blauw*

- 3) Disconnect six lead wires of the flash head assembly and synchro-contact.

NOTE:

If a soldering iron comes into contact with the top cover, the top cover may be deformed. Carefully handle the soldering iron.

- 4) Remove the shoe cover (1-26), remove three screws (1-27) and screw (1-28), and remove the accessory shoe (1-29) and shoe seat assembly (1-30).
- 5) Remove four screws (1-72).
- 6) After floating up the top cover assembly (1-1), remove the top cover assembly from the camera chassis. The FR button (1-69), MF button (1-70) and rubber switch (1-71) will come off. Be careful not to lose them.

#### (2) Reinstallation

- 1) Match the boss of the contact assembly (3-77) with the hole position of the shaft (1-11). (See Fig. IV-A-1-2.)
- 2) Match the up-down dial inside the top cover as shown in Fig. IV-A-1-1, install the top cover assembly on the camera chassis, and tighten four screws (1-72).

NOTE:

When placing the top cover assembly on the camera chassis, move the flash PCB assembly (3-63) away from the top cover since the frame will run against the top cover.

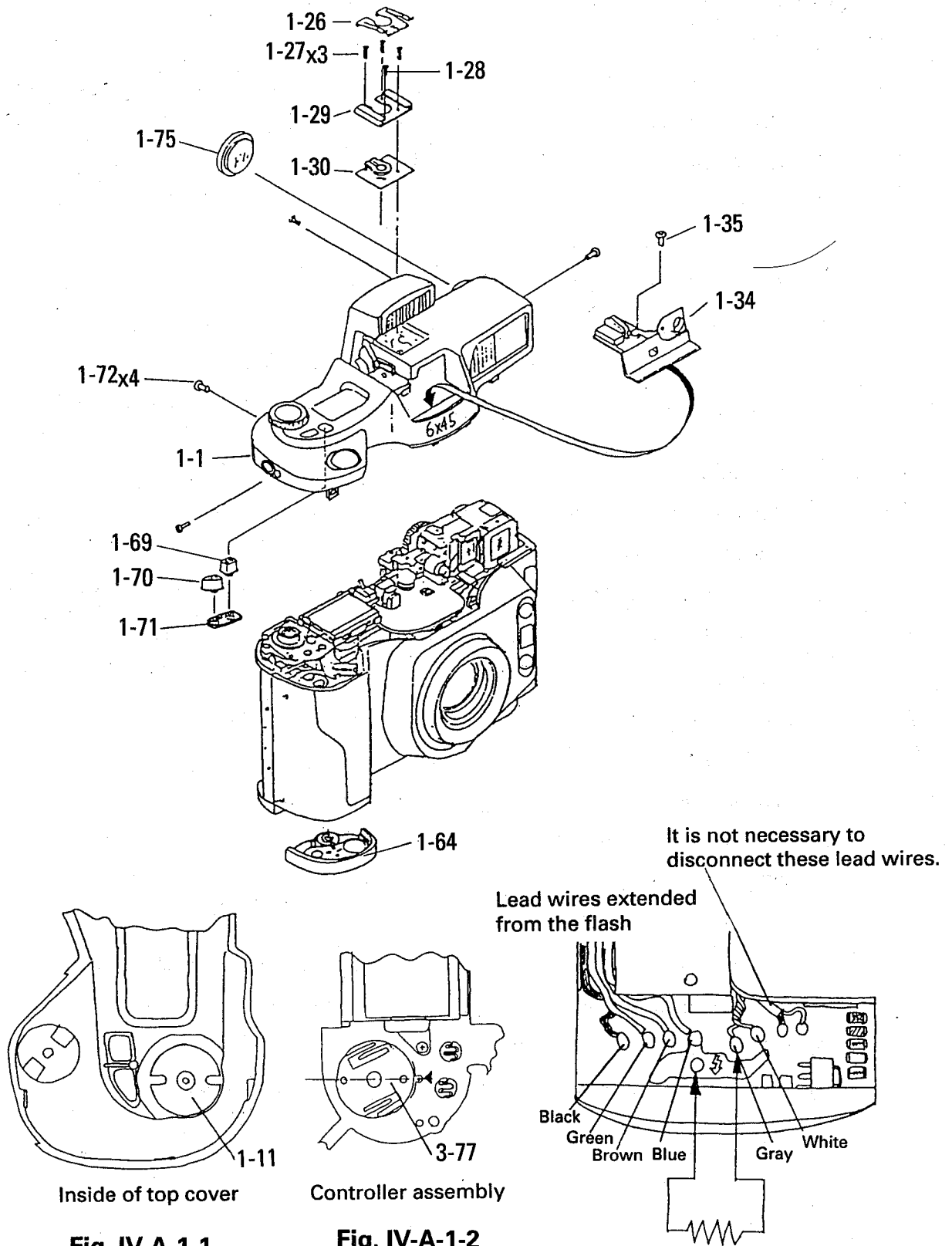
- 3) Install the shoe seat assembly (1-30) and accessory shoe (1-29).

NOTE:

Pass the synchro lead wires through the space in between the capacitor and transformer of the flash PCB assembly.

- 4) After soldering six lead wires, form them as shown in Fig. IV-A-1-3.
- 5) Tighten three screws (1-27) and screw (1-28), and install the shoe cover (1-26).
- 6) Make sure that the link (2-7) is installed on the hinge shaft (1-20), install the flash cover (1-34), and secure it with the screw (1-35).

Fig. IV-A-1



## **2. Bottom cover assembly (1-60), front cover assembly (1-46) and camera back assembly (2-22).**

### **(1) Removal**

- 1) Remove three screws (1-63).
- 2) Remove the bottom cover assembly (1-60) from the camera chassis. The FW button (1-62) will come out. Be careful not to lose it.
- 3) Disconnect two lead wires extended from the buzzer at the FPCB in the camera chassis side.
- 4) Remove four screws (1-78) and two screws (1-59).
- 5) Remove the front cover assembly (1-46) from the camera chassis. The focus lock button (1-57) and rubber switch (1-56) will come out. Be careful not to lose them.
- 6) Remove four screws (5-134), and remove the camera back assembly (2-22).

### **(2) Reinstallation**

- 1) Perform inspection before installing the front cover assembly.  
(Refer to V-1 Inspection without covers, below.)
- 2) Thoroughly clean the receiving lens (3-102) and emitting lens (3-103) of the AF system assembly (3-100) with alcohol, and make sure that the lenses are not scarred or scratched.
- 3) Install the front cover assembly (1-46) on the camera chassis with four screws (1-78) and two screws (1-59).
- 4) Solder and connect two lead wires to the camera chassis.
- 5) Install the FW button (1-62) on the bottom cover assembly (1-60) as shown in Fig. IV-A-2-1.

#### **NOTE:**

When installing the bottom cover assembly (1-60), be careful not to hold lead wires in between the camera chassis and bottom cover assembly.

- 6) Tighten three screws (1-63).
- 7) Install the camera back assembly (2-22) with four screws (5-134).

Fig. IV-A-2

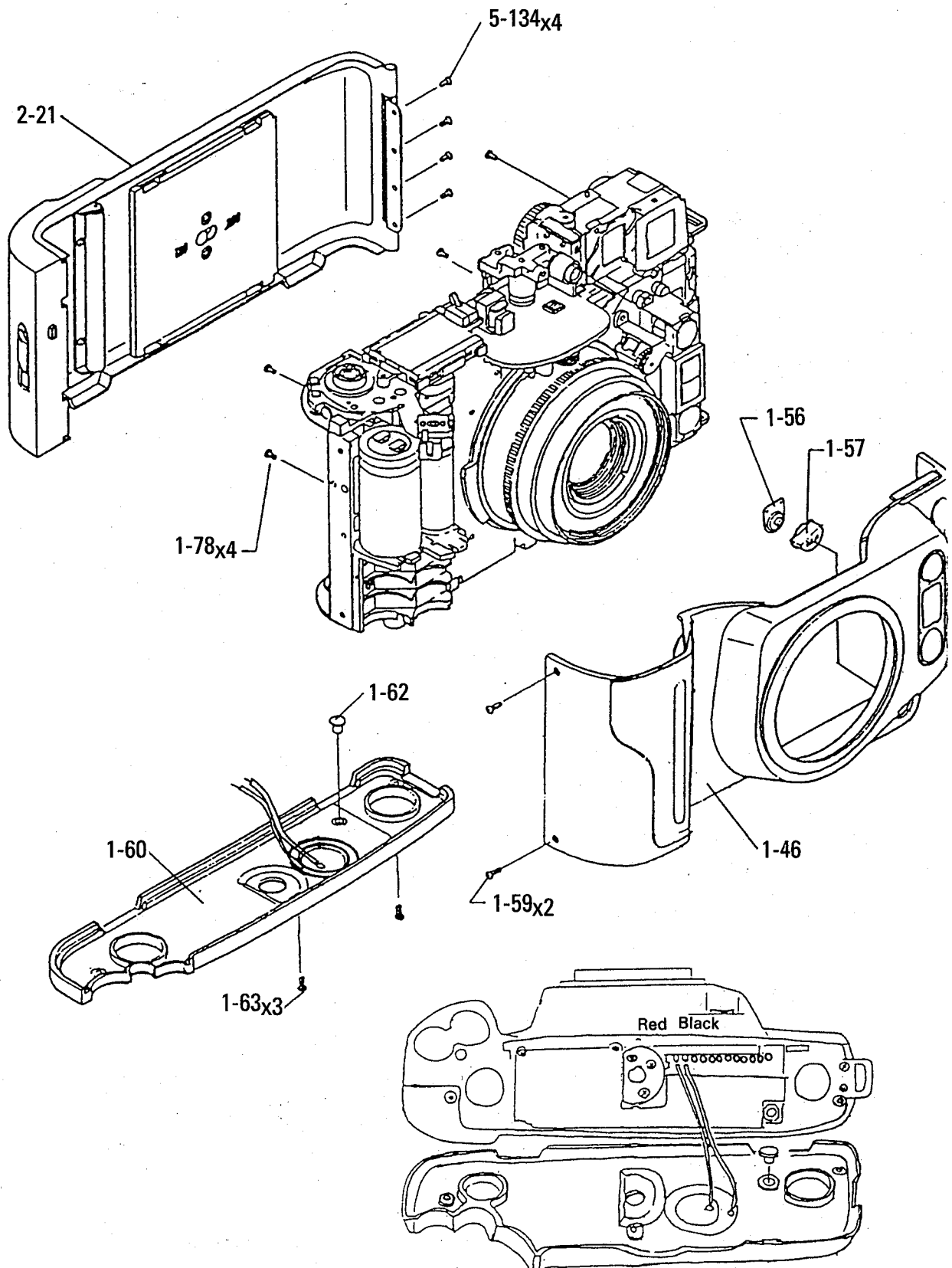


Fig. IV-A-2-1

### 3. AF system assembly (3-100) and flash PCB assembly (3-63)

#### (1) Removal

- 1) Disconnect two lead wires.
- 2) Remove two screws (3-94), and remove the metal fixture (3-95).  
NOTE: The rubber seal (5-125) is likely to come off. Take and keep it so as not to lose.
- 3) Remove two screws (3-122), and remove the AF system assembly (3-100) from the camera chassis.
- 4) Unsolder eight solder joints across the flash PCB assembly (3-63) and control FPCB assembly (3-70). (See Fig. IV-A-3-1.)
- 5) Disconnect five lead wires of the flash PCB assembly (3-63).
- 6) Remove two screws (3-67) and screw (3-68), and remove the flash PCB assembly (3-63) from the camera chassis.
- 7) Remove the rubber switch (3-64) and switch holder (3-66) from control FPCB assembly (3-70).

#### (2) Reinstallation

- 1) Install the flash PCB assembly (3-63) and switch holder (3-66) with two screws (3-67) and screw (3-68).
- 2) Solder and connect three lead wires.

NOTE:

Connect the remaining two lead wires extended from the main capacitor after completing the inspection.

- 3) Solder eight solder joints across the flash PCB assembly (3-63) and control FPCB assembly (3-70) as shown in the Fig. IV-A-3-1.
- 4) Install the switch holder (3-66) on the control FPCB assembly, and install the rubber switch (3-64).

NOTE:

Thoroughly clean the flexible PCB with alcohol.

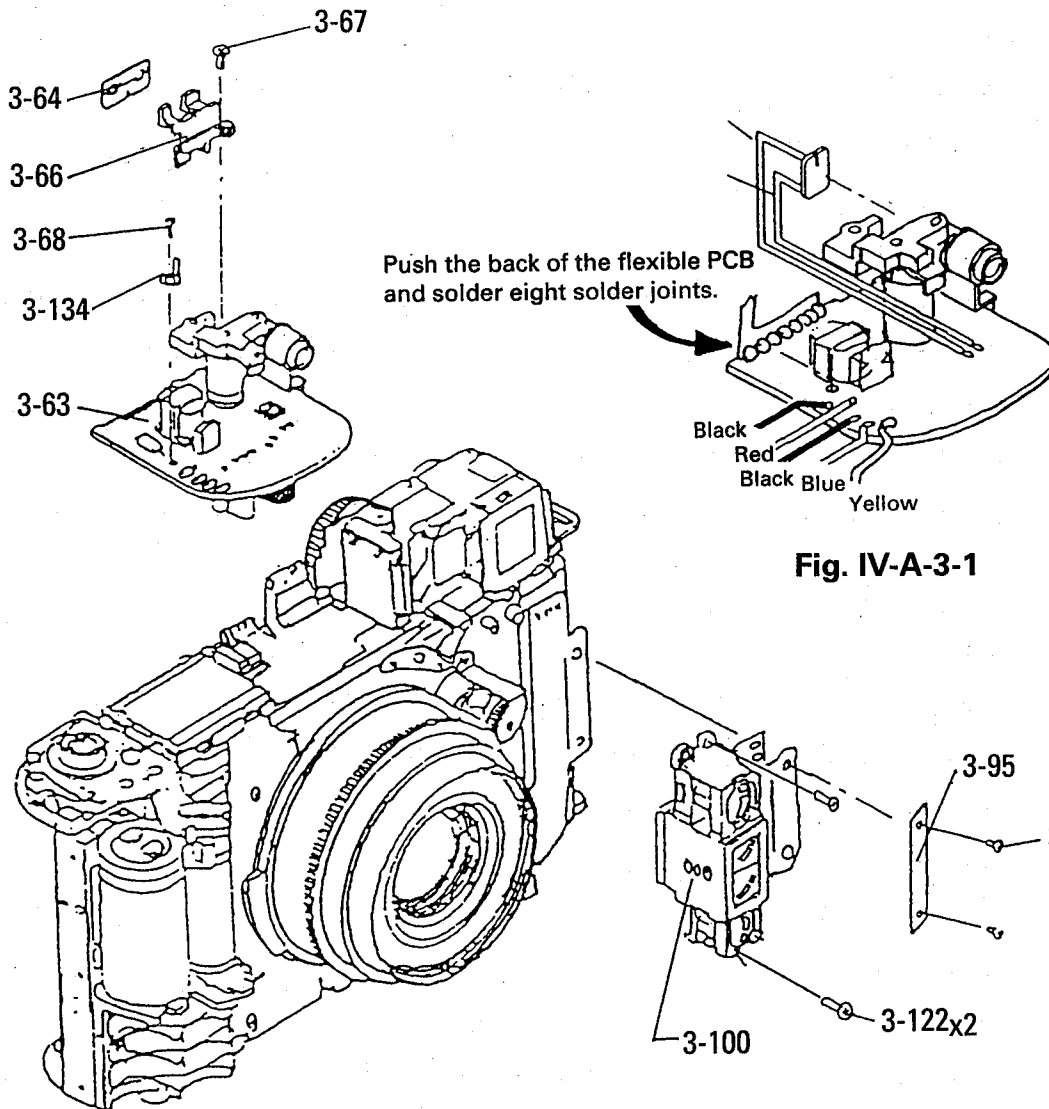
- 5) Install the AF system assembly (3-100) on the camera chassis with two screws (3-122).
- 6) Install the rubber seal (5-125) as shown in Fig. IV-A-3-2, and install the metal fixture (3-95) with two screws (3-94).

NOTE:

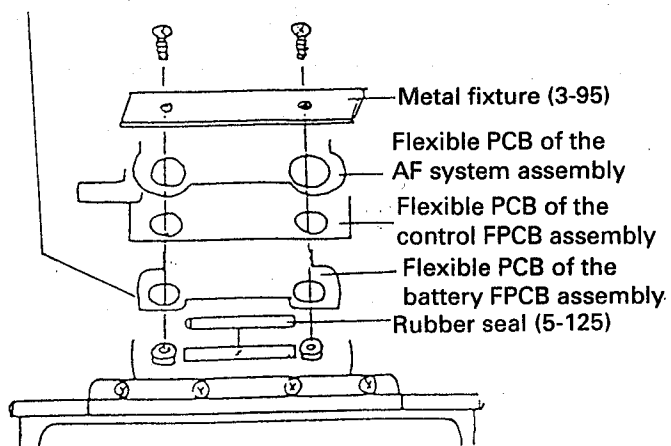
Clean the tightly connected portions of each flexible PCB with alcohol.

- 7) Solder and connect two lead wires (red and black) extended from the battery FPCB assembly.

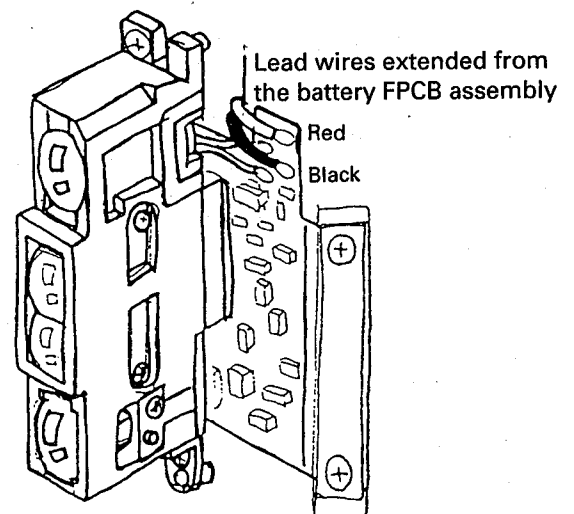
**Fig. IV-A-3**



Project out the flexible PCB of the battery FPCB assembly.



**Fig. IV-A-3-2**



**Fig. IV-A-3-3**



#### **4. Mode switch assembly (3-1) and viewfinder assembly (3-31)**

##### **(1) Removal**

- 1) Unsolder four solder joints on the top and five solder joints on the front face of the viewfinder assembly (3-31).
- 2) Pushing down the mode switch assembly (3-1) forward, pull it out.
- 3) Remove the screw (3-87).
- 4) Pull out the flexible PCB from the boss on the viewfinder chassis (3-32), and raising the FLCD portion of the control FPCB assembly (3-70), pull it out upward.  
(See Fig. IV-A-4-2.)
- 5) Remove two screws (3-61) and screw (3-49), and remove the viewfinder assembly (3-31) from the camera chassis (5-7). Be careful not to bend the lever on the front face of the viewfinder.

##### **(2) Reinstallation**

- 1) Hooking the lever of the reticle frame 2 (3-54) on the pin of the cam lever assembly (4-78), install the viewfinder assembly (3-31), and tighten three screws (3-61x2, 3-49x1).
- 2) Turn the eccentric pin of the cam lever assembly (4-78) to adjust infinity.  
(See Fig. IV-A-4-1.)
- 3) Install the control FPCB assembly on the viewfinder assembly by matching the FLCD portion with the viewfinder assembly. (See the Fig. IV-A-4-2.)

##### **NOTE:**

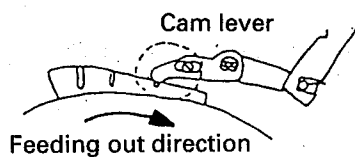
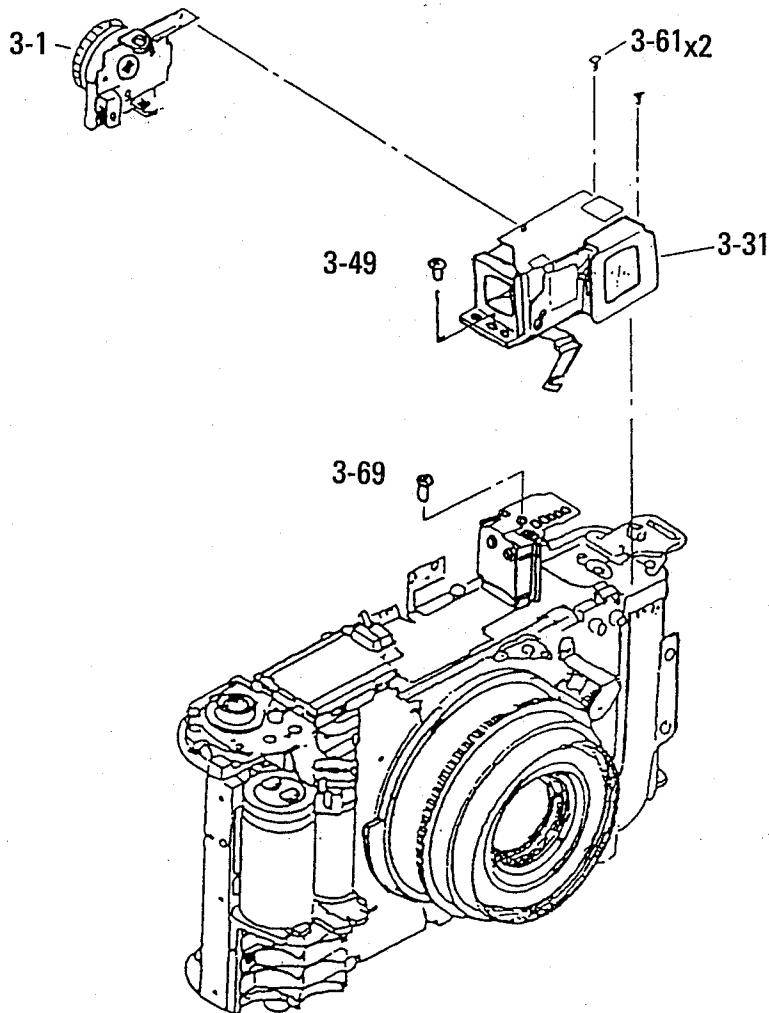
The LCD (3-72) is likely to be broken easily. Be careful.

- 4) Insert the flexible PCB into the viewfinder chassis (3-32), and tighten the screw (3-87).
- 5) Solder four solder joints and five solder joints on the viewfinder assembly (3-31).

##### **NOTE:**

When the reticle assembly (3-50) of the viewfinder assembly is removed from the viewfinder chassis (3-32), be sure to adjust parallax after installing the AF system assembly (3-100).

Fig. IV-A-4



When the lens is fed out and the head is not in contact, turn the (-) eccentric pin so that the head contacts.

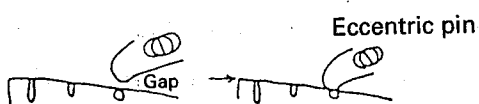
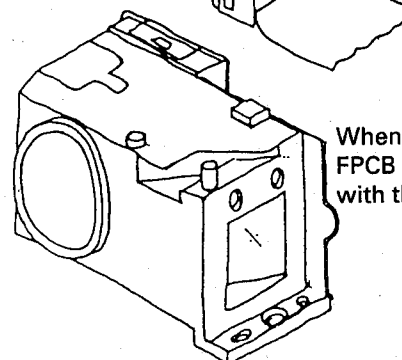
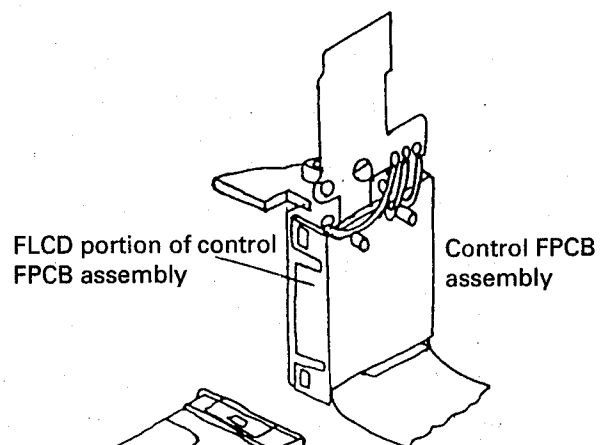


Fig. IV-A-4-1



When installing the control FPCB assembly, match it with the positioning boss.

Fig. IV-A-4-2

## 5. Control FPCB assembly (3-70)

### (1) Removal

- 1) Unsolder and disconnect 18 lead wires and solder joint across the control FPCB assembly (3-70) and DX FPCB (5-64).
- 2) Remove the adhesive tape (3-92) and three screws (3-86).
- 3) Push down the boss of the PI of the gear train assembly (4-55) and remove it from the top base plate (4-79).
- 4) Remove the tact switch (3-81) from the top base plate (5-103).

#### NOTE:

Handle the top base plate (5-103) carefully. The claw of the top base plate is likely to be broken easily.

- 5) Remove two screws (3-90) and remove the metal fixture (3-88).
- 6) Remove the switch (3-74) from the LCD frame (3-75).
- 7) Remove two screws (3-76), screw (3-69) and three screws (3-62).
- 8) Remove the control FPCB assembly (3-70) from the camera chassis.

#### NOTE:

The control FPCB assembly is secured on the camera chassis with adhesive tape. When removing the control FPCB assembly, be careful not to damage the flexible PCB.

### (2) Reinstallation

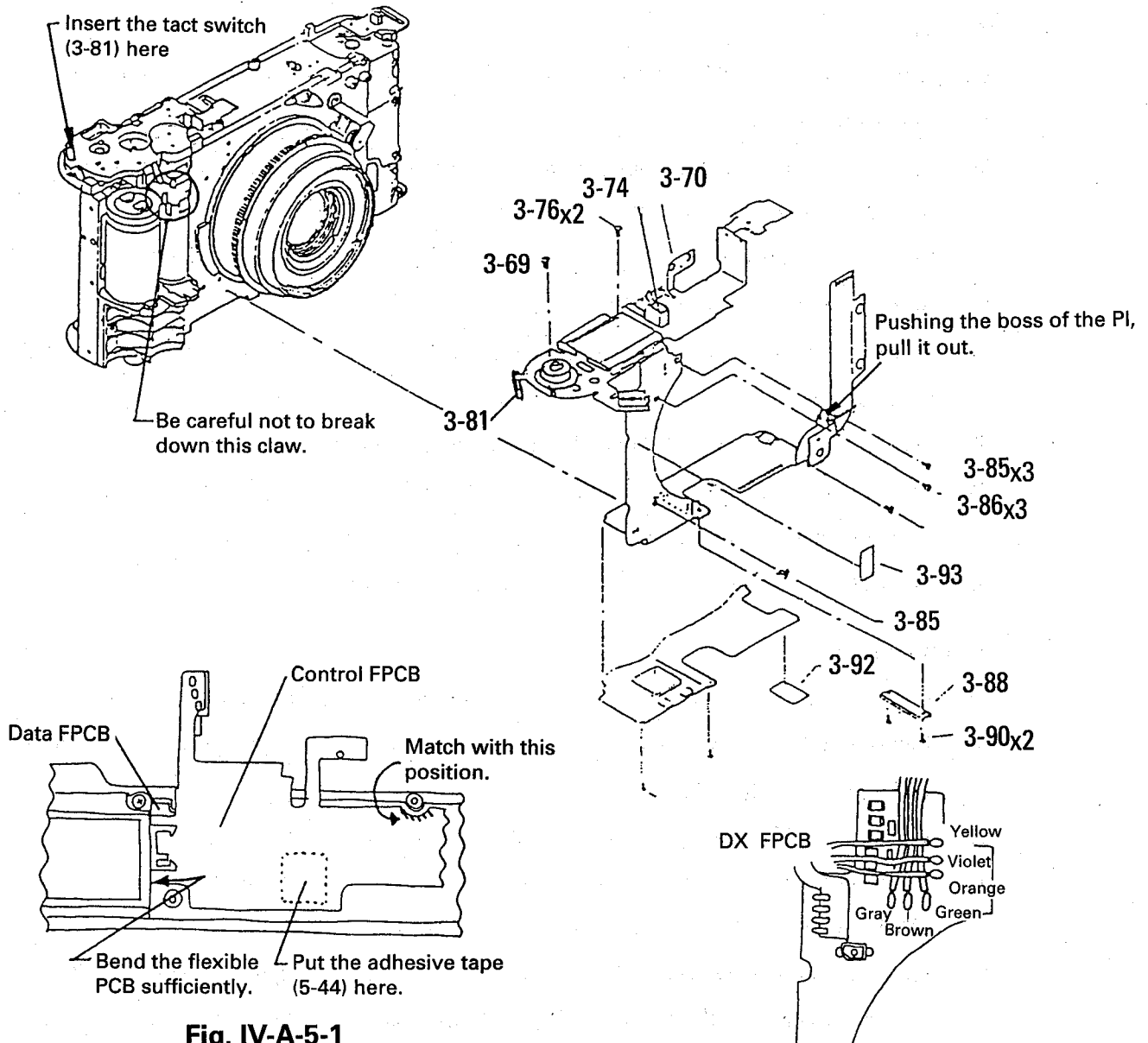
- 1) Install the control FPCB assembly on the camera chassis with screws.
- 2) Insert the tact switch (3-81) into the top base plate (5-103), and secure the control FPCB assembly with screws.
- 3) Fold the flexible PCB, and install the LCD frame (3-75) with two screws (3-76).
- 4) Stick the flexible PCB to the position shown in Fig. IV-A-5-1 with adhesive tape (5-44), and fit the switch (3-74) to the LCD frame (3-75).
- 5) Referring to Fig. IV-A-5-3, install the control FPCB assembly and relay FPCB (4-16), install the metal fixture (3-88) and tighten two screws (3-90).

#### NOTE:

Thoroughly clean the tightly connected portion of the flexible PCB with alcohol.

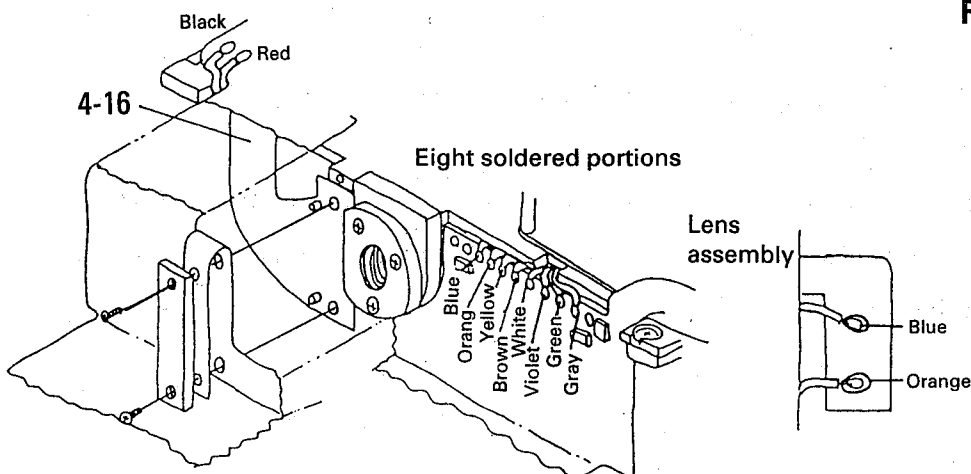
- 6) Fit the PI to the gear train assembly (4-55), and secure the flexible PCB with three screws (3-86).
- 7) Solder the solder joints across the control FPCB assembly (3-70) and DX FPCB (5-64), and solder and connect 18 lead wires as shown in the Figs. IV-A-5-2, 3 and 4.
- 8) Secure the flexible PCB with adhesive tape.

**Fig. IV-A-5**



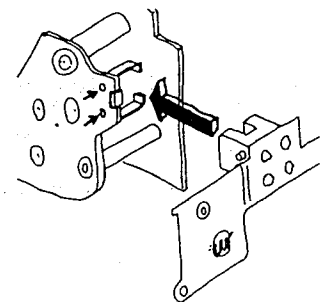
**Fig. IV-A-5-1**

**Fig. IV-A-5-2**



**Fig. IV-A-5-3**

**Fig. IV-A-5-4**



**Fig. IV-A-5-5**

## **6. Lens assembly (4-1) and film transporting mechanism assembly (5-101)**

### **(1) Removal**

- 1) Remove the relay FPCB (4-16) (which is beneath the lens assembly (4-1)) from the camera chassis (5-7).
- 2) Remove four screws (4-84), and remove the lens assembly (4-1) carefully and slowly from the camera chassis (5-7).
- 3) Remove the PI (5-98) from the film transporting mechanism assembly (5-101).
- 4) Remove the main capacitor (5-99).
- 5) Disconnect two lead wires of the film transporting motor (5-104) from the battery FPCB assembly (5-79).
- 6) Peel off the tape (5-48), and detach the lead wires from the cord clamp (5-31).
- 7) Remove two screws (5-121) and screw (5-131), and remove the film transporting mechanism assembly (5-101) from the camera chassis (5-7).
- 8) Pull out the encoder gear (5-51) from the camera chassis (5-7).

### **(2) Reinstallation**

- 1) Install the encoder gear (5-51) on the shaft on the camera chassis (5-7).
- 2) Install the film transporting mechanism assembly (5-101) on the camera chassis (5-7) with two screws (5-121) and screw (5-131).
- 3) Fit the PI (5-98) to the film transporting mechanism assembly (5-101).
- 4) Solder and connect lead wires of the film transporting motor (5-104) to the battery FPCB, and shape them up as shown in Fig. IV-A-6-1.
- 5) Pass the lead wires of the main capacitor (5-99) through the space beneath the film transporting motor (5-104), and stick the main capacitor (5-99) to the camera chassis (5-7).

#### **NOTE:**

When the adhesive tape on the main capacitor is deteriorated, replace it with a new one.

- 6) Install the lens assembly (4-1) on the camera chassis (5-7) with four screws (4-84) carefully so as not to hole any lead wire and flexible PCB in between the lens assembly and camera chassis.

Fig. IV-A-6

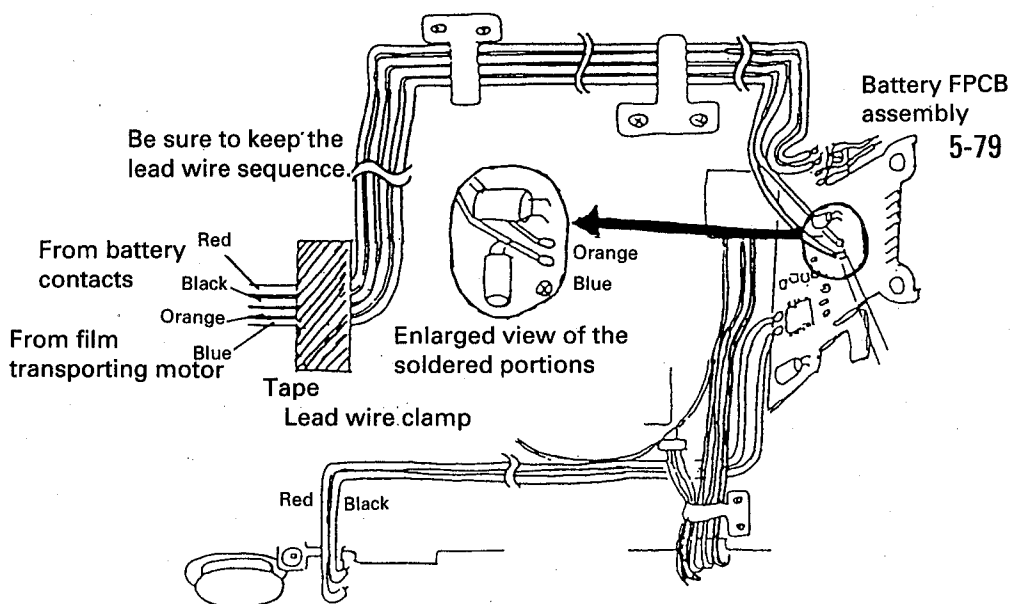
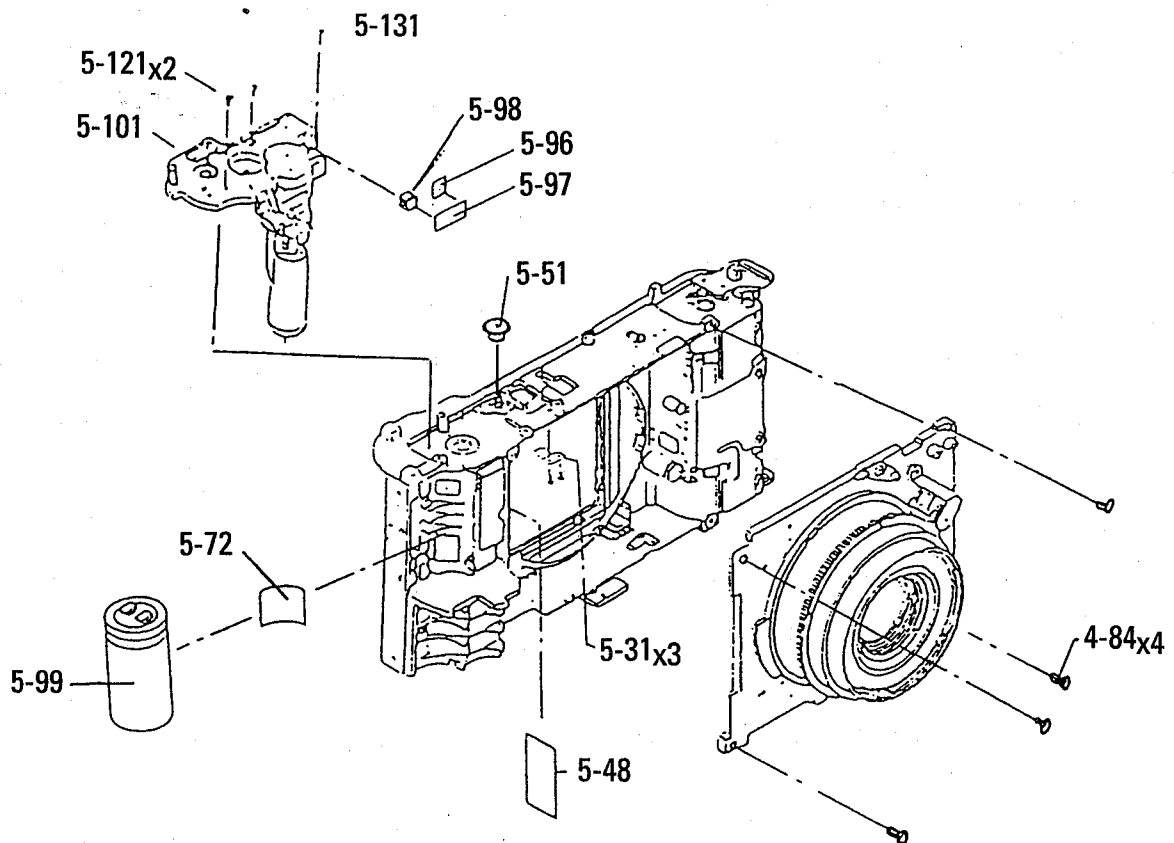


Fig. IV-A-6-1

## **B. Disassembly and reassembly**

### **1. Top cover assembly (1-1)**

#### **(1) Disassembly**

- 1) Slide the shaft (1-24) toward the eyepiece side, pull the shaft out, and remove the flash head assembly (1-25).
- 2) Peel off the adhesive, and remove the spring (1-16).
- 3) Remove the screw (1-17) and remove the pop-up lever (1-15).
- 4) Remove the screw (1-22), and remove the hinge assembly (1-18).
- 5) Peel off the guide (1-10). The guide is secured with two pieces of adhesive tape (1-9). Remove the shutter release (1-5) and blind cover (1-74) after pulling out the clip ring (1-8) and washer (1-7) from the column of the shutter release (1-5).
- 6) Peel off the name plate (1-40) secured with the adhesive tape (1-41).
- 7) Remove the screw (1-42), and remove the button (1-43) and shaft (1-11). Be careful not to lose the click plate (1-44) and two springs (1-45) located under the button (1-43).
- 8) Peel off the adhered diffuser (1-3) and window glass (1-4).
- 9) Peel off the adhesive tape (1-21).

#### **NOTE:**

1. The eyepiece (1-23) and LCD window (1-6) cannot be removed from the top cover (1-2). The hinge assembly (1-18) cannot be disassembled further because the component parts are caulked.
2. The nut (1-14) and screw (1-13) cannot be removed because they are adhered.

Fig. IV-B-1

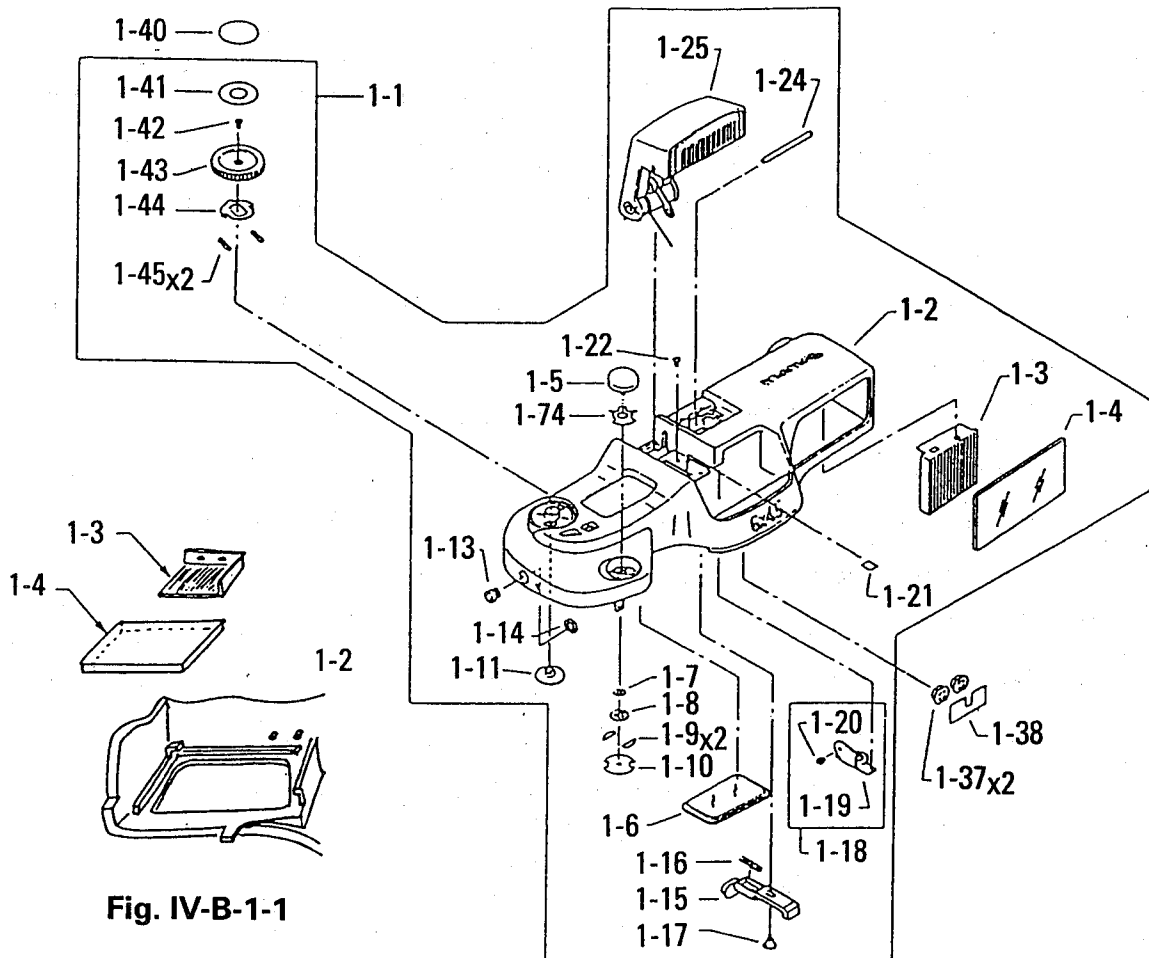
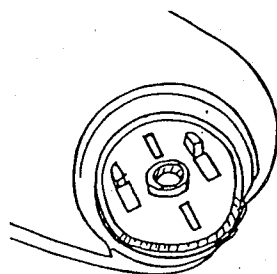
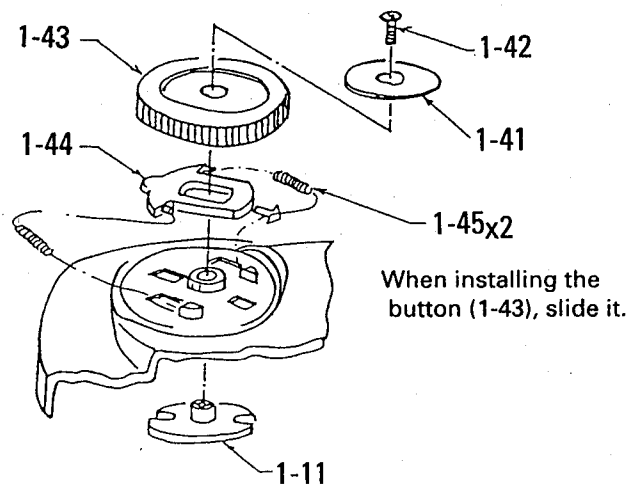


Fig. IV-B-1-1



Apply lubricant (tungsten disulfide) to the oblique-lined portion.

Fig. IV-B-1-2



When installing the button (1-43), slide it.

Fig. IV-B-1-3



## **2. Battery compartment cover assembly (1-64) and camera back assembly (2-22)**

### **(1) Disassembly**

- 1) Remove the E-clip (1-66), and remove the set screw (1-68).

**NOTE:**

The battery contact (1-65) is heat-caulked on the battery compartment cover (1-67), and cannot be removed.

- 2) Pull out the hinge shaft (2-25) from the camera back (2-23), and remove the hinge (2-24).
- 3) Remove three screws (2-53), and remove the light shielding plate (2-51) on which the moquette (2-52) is stuck.
- 4) Remove two screws (2-47), and with the camera back lock knob (2-43) raised, remove the grip (2-54).
- 5) Pull out the shaft (2-44), and remove the camera back lock knob (2-43).
- 6) Remove the spring (2-45).
- 7) Peel off the leather (2-26), and pull out the cover plate (2-28) from the pocket (2-27).
- 8) Push the head of the pin (2-50) into the roller (2-48), and remove it from the roller supporter (2-36). Be careful not to lose the spring (2-49).
- 9) Peel off the moquette (2-52) from the light shielding plate (2-51).

**NOTE:**

Further disassembly cannot be made as the parts are caulked.

Fig. IV-B-2

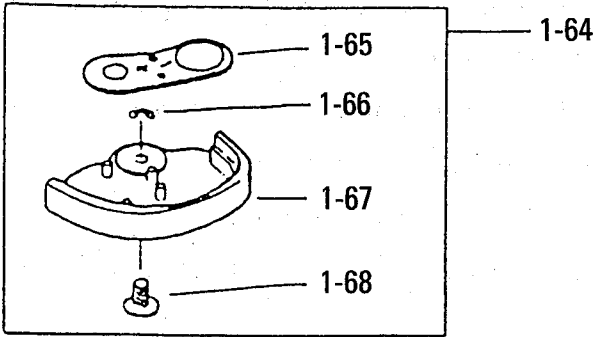


Fig. IV-B-2-1

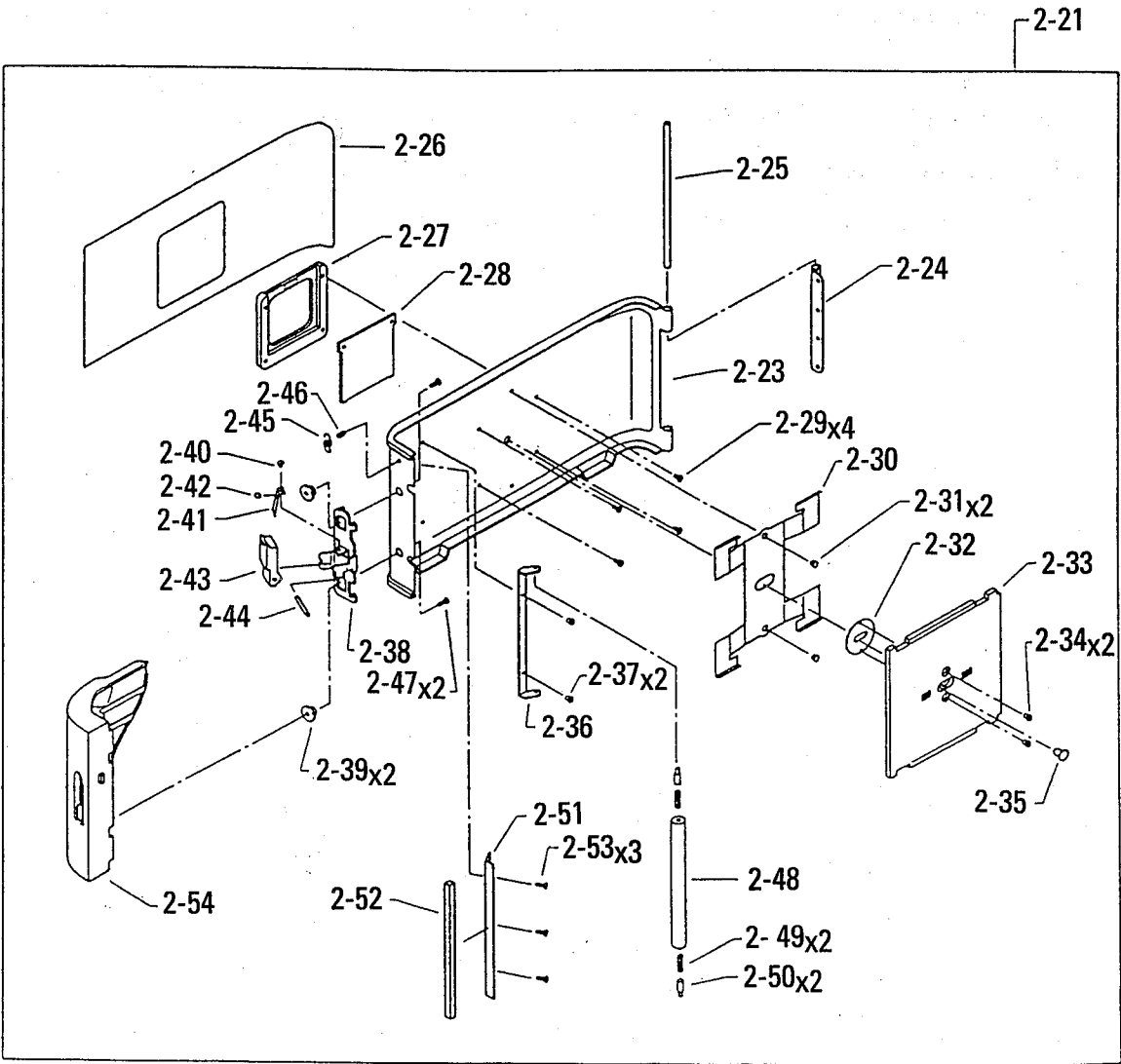


Fig. IV-B-2-2

## (2) Reassembly

- 1) Apply the set screw (1-68) from the bottom of the battery compartment cover(1-67), and secure it with the E-clip (1-66).
- 2) With two pins (2-50) and two springs (2-49) applied on both ends of the roller (2-48), installed them on the roller supporter (2-36).
- 3) Put the cover plate (2-28) into the pocket (2-27).
- 4) Install the leather (2-26) with adhesive (Pliobond FHD011) using the pocket as the center.
- 5) Apply the spring (2-45) to the pin on the camera back and to the hook (2-38).
- 6) Match the opening of the camera back lock knob (2-43) with the opening on the hook (2-38), and insert the shaft (2-44).
- 7) With the camera back lock knob (2-43) raised, insert the camera back lock knob (2-43) into the square opening of the grip (2-54), install them on the camera back (2-23), and tighten two screws (2-47).
- 8) Install the light shielding plate (2-51) with three screws (2-53).
- 9) Apply adhesive (Pliobond FHD011) to the light shielding plate (2-51), and install the moquette (2-52) on the light shielding plate (2-51)

Fig. IV-B-2

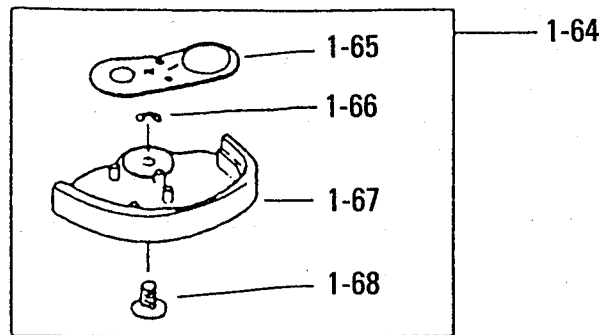


Fig. IV-B-2-1

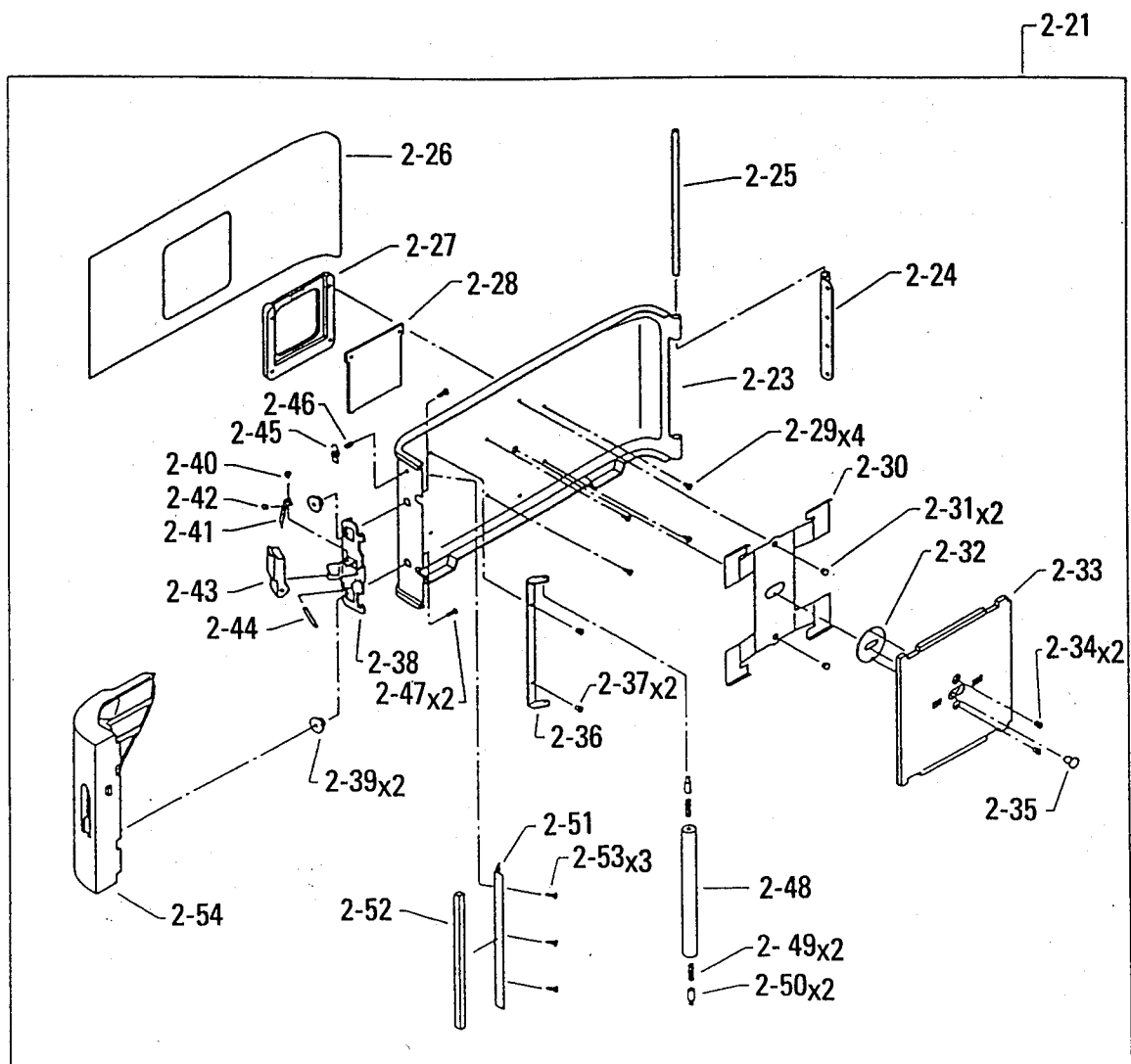


Fig. IV-B-2-2

### 3. Flash assembly (2-20)

#### (1) Disassembly

- 1) Remove two screws (2-2), and remove the flash outer cover (2-1).
- 2) Pull out the slider (2-9), slide shaft (2-10) and link (2-7) from the flash assembly (2-20), and remove the sleeve (2-4), washer (2-5) and spring (2-6).
- 3) Peel off the blind (2-3) from the flash outer cover (2-1).
- 4) Remove two screws (2-18), and pull out the reflector case (2-13) from the flash inner cover (2-8).
- 5) Remove the reflector (2-12), and remove the protector lens (2-11) from the flash inner cover (2-8).

#### (2) Reassembly

- 1) Place the protector lens (2-11) in the flash inner cover (2-8).
- 2) Install the reflector (2-12) and reflector case (2-13), and tighten two screws (2-18).

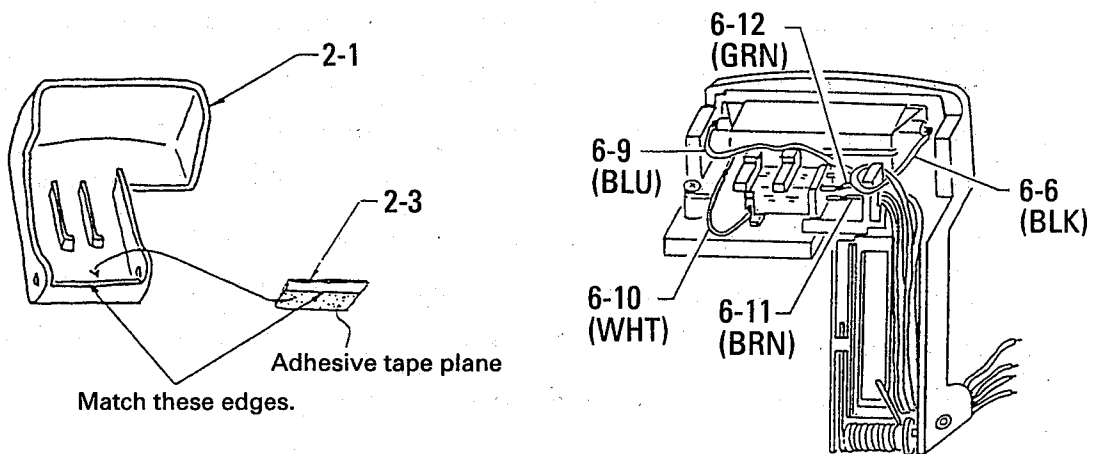
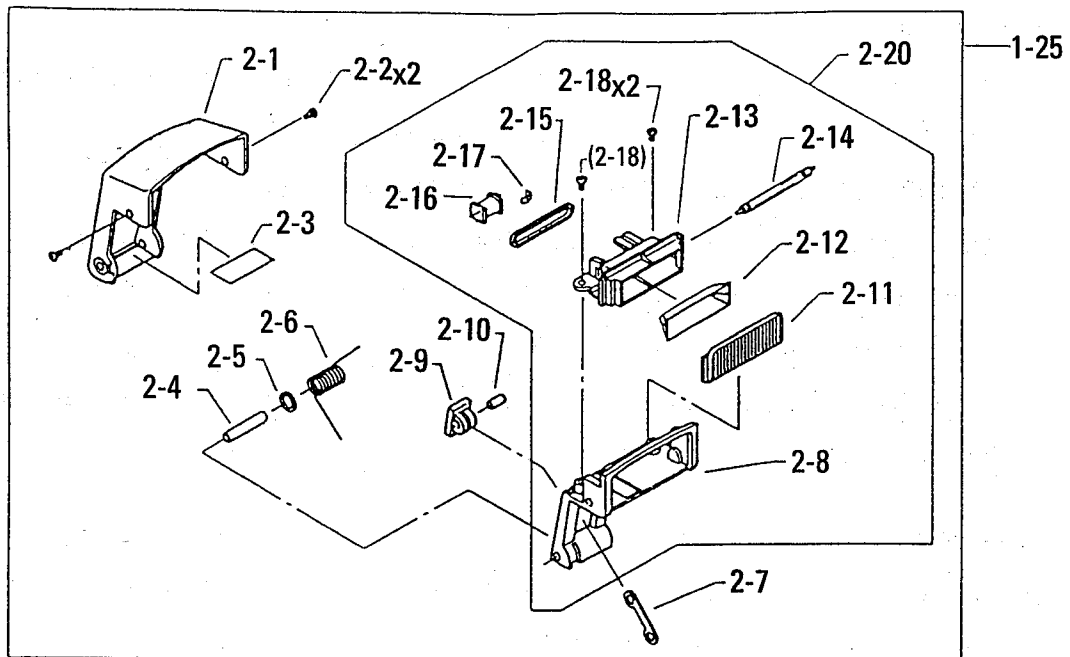
**NOTE:**

Be careful not to hold any lead wire in between the parts.

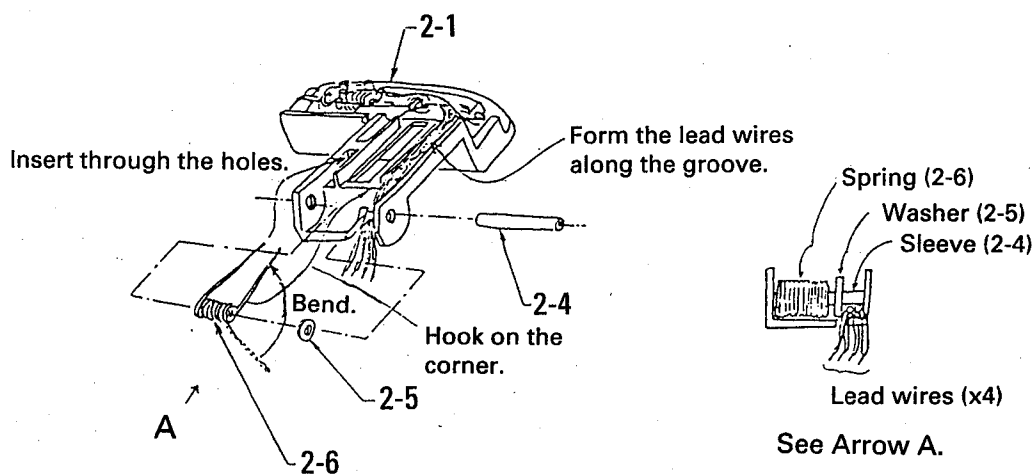
- 3) Stick the blind (2-3) to the flash inner cover (2-8). (See Fig. IV-B-3-1.)
- 4) Apply the washer (2-5) and spring (2-6) to the sleeve (2-4), and install them on the flash outer cover (2-1). (See Fig. IV-B-3-2.)
- 5) Apply the link (2-7) to the slider (2-9), insert the shaft (2-10) through the link (2-7) and slider (2-9), and install them on the flash assembly (2-20).

Now, install the flash outer cover (2-1) with two screws (2-2).

**Fig. IV-B-3**



**Fig. IV-B-3-1**



**Fig. IV-B-3-2**

#### **4. Front cover assembly (1-46)**

##### **(1) Disassembly**

- 1) Turn the cover ring (1-48) clockwise from the back of the front cover (1-47) to remove the cover ring (1-48), and remove the light shielding ring (1-50).
- 2) Peel off the light shielding cloth (1-49) from the cover ring (1-48).
- 3) Remove the adhesive from the top and bottom hooks of the self-timer window (1-51), and remove the self-timer window (1-51) carefully so as not to break the hooks.
- 4) Peel off the name plate assembly (1-55)
- 5) Push the AF window (1-52) from the back of the front cover (1-47) forward to remove it. The AF window (1-52) is adhered.

##### **(2) Reassembly**

- 1) Install the AF window (1-52) and name plate assembly (1-55) on the front cover (1-47) with adhesive (Three Bond 1521B or equivalent).
- 2) Install the self-timer window (1-51) so that the gate portion is in the lens side, and apply adhesive (Three Bond 1521B or equivalent) to the top and bottom hooks of the self-timer window (1-51) from the back of the front cover (1-47).
- 3) Stick the light shielding cloth (1-49) on the cover ring (1-48) interior.
- 4) Match two cut portions of the light shielding ring (1-50) with two bosses on the back of the front cover (1-47), turn the cover ring (1-48) clockwise from the front of the front cover (1-47) to install it temporarily. Now, apply adhesive (Three Bond 1401B) to the threads, and from the back of the front cover (1-47), turn the cover ring (1-48) counterclockwise to secure it. (Refer to Fig. IV-B-4-1.)

Fig. IV-B-4

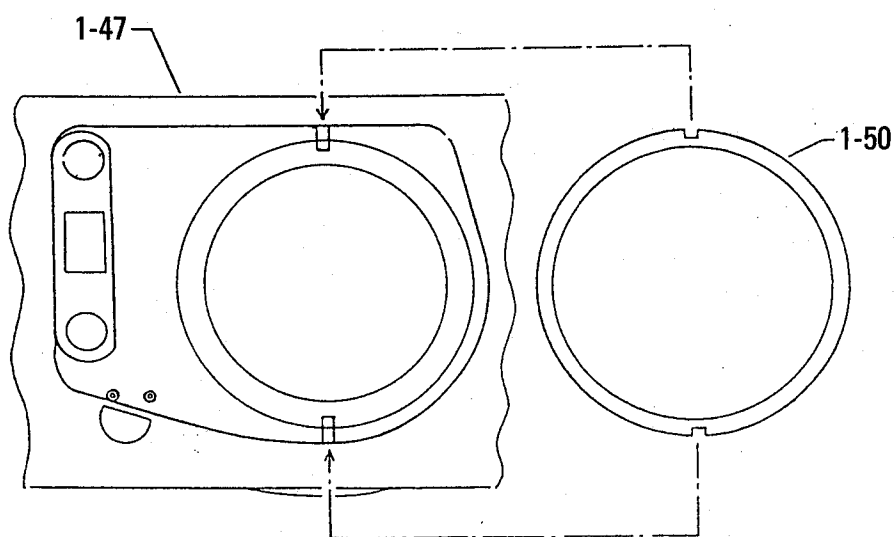
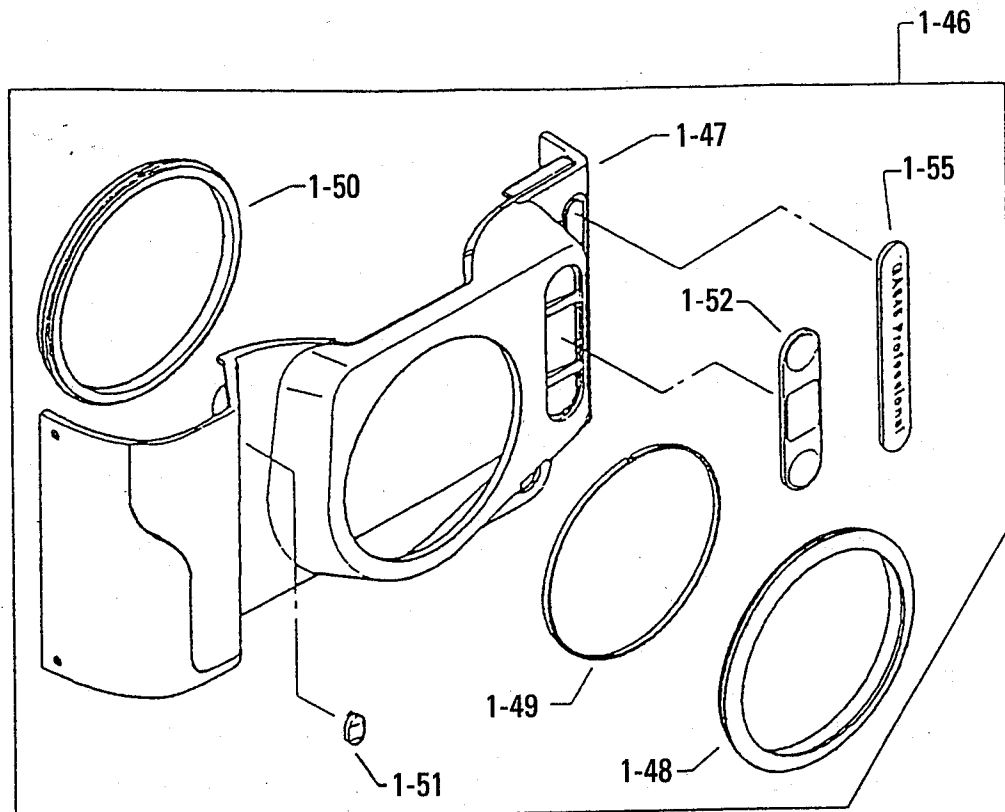


Fig. IV-B-4-1



## 5. AF system assembly (3-100)

### (1) Disassembly

- 1) Unsolder and disconnect lead wires (6-39) and (6-40), and peel off the adhered light shielding plate (3-110).
- 2) Remove the screw (3-121), remove the PSD holder (3-120) and pull out the PSD (3-112) from the positioning boss.
- 3) Remove two screws (3-119), and pull out the holder (3-118).
- 4) Pull out the AF PCB assembly (3-129) from the AF system chassis (3-101).
- 5) Peel off the light shielding tapes (3-109 and 3-108), and remove the moquette (3-106).
- 6) Remove the emitting lens (3-103) and receiving lens (3-102).

#### NOTE:

No further disassembly can be made because AF light emitting adjustment is extremely difficult.

### (2) Reassembly

- 1) Apply adhesive (Three Bond 1521B or equivalent), and install the emitting lens (3-103) and receiving lens (3-102). When installing these lenses, refer to Fig. IV-B-5-1.  
Thickness of the emitting lens differs from that of the receiving lens.  
(Leave these lenses for at least 30 minutes after adhering them.)
- 2) Stick the light shielding tapes (3-109 and 3-108), install the AF PCB assembly (3-119) (on which the moquette (3-106) is installed) on the AF system chassis (3-101), and after inserting the holder (3-118), tighten two screws (3-119). (Refer to Fig. IV-B-5-2.)
- 3) Fit the PSD (3-112) to two positioning bosses firmly so that the flat surface of the PSD (3-112) is faced toward the receiving lens (3-102).
- 4) Place the flexible PCB on the PSD (3-112) so that the gold-plated portion of the flexible PCB is faced to the front, and secure the PSD holder (3-120) with the screw (3-121).
- 5) Apply adhesive (Three Bond 1521B or equivalent) and stick the light shielding plate (3-110). (Refer to Fig. IV-B-5-3.)
- 6) Now, solder two lead wires (6-39 and 6-40).



## 6. Viewfinder assembly (3-31)

### (1) Disassembly

- 1) Peel off the photographic tape (3-47), and remove the lens holder (3-38).
- 2) Remove the spring (3-57), remove two screws (3-60), and take out the reticle assembly (3-50).

**NOTE:**

The reticle assembly (3-50) cannot be disassembled further because the components are caulked.

- 3) Unsolder and disconnect the FPCB assembly (3-45) from the FPCB holder (3-46), and remove the FPCB holder (3-46). Next, remove the FPCB assembly (3-45).
- 4) When replacing the light receiving lens (3-41) of the AE, remove the frame (3-42), and remove the adhered lens.

**NOTE:**

The mirror and lens can no longer be removed from the viewfinder chassis (3-32) because the optical adjustment is extremely difficult.

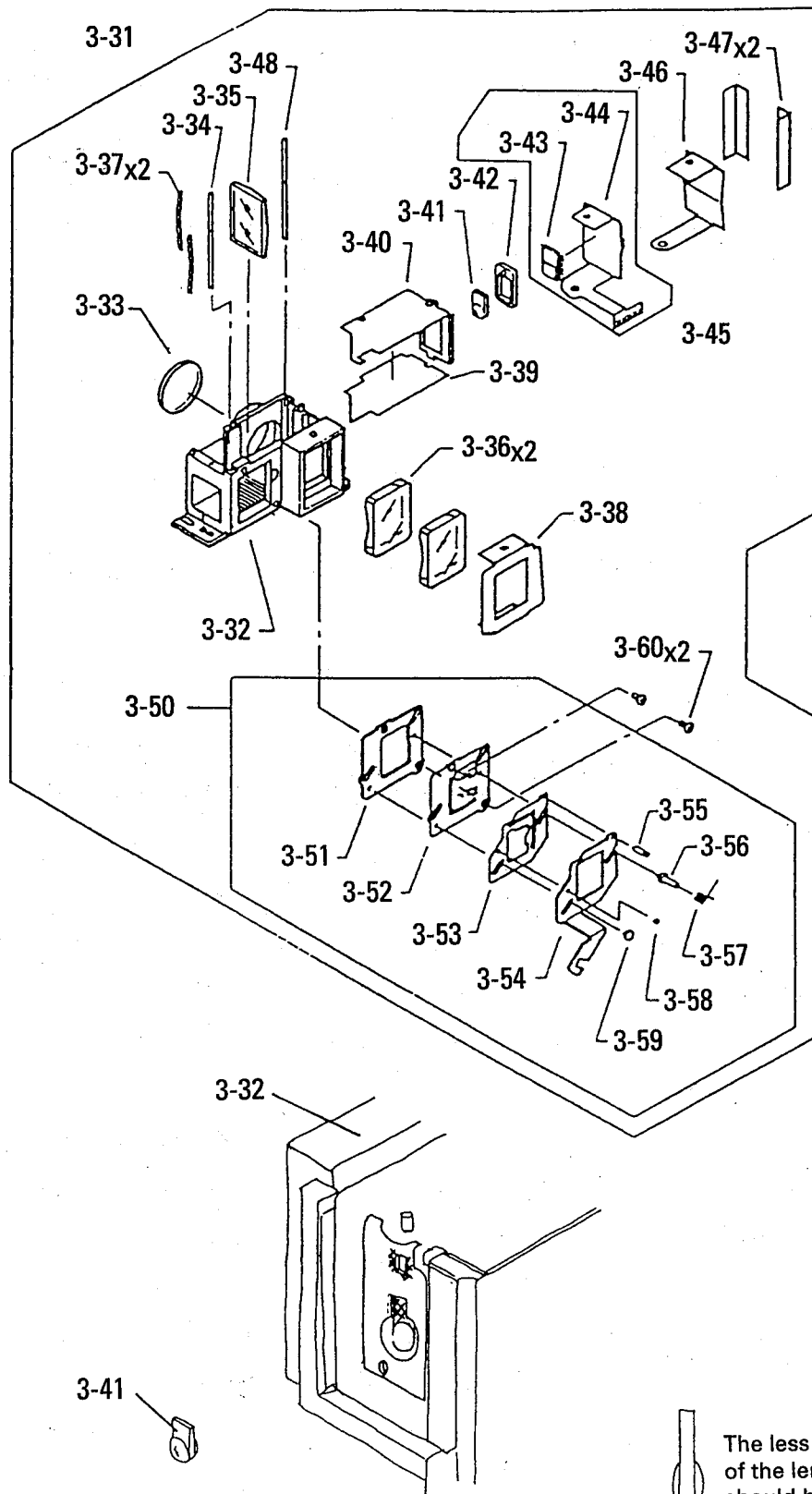
### (2) Reassembly

- 1) When replacing the lens (3-41) with a new one, apply adhesive (Three Bond 1521B or equivalent) to the viewfinder chassis (3-32), install the lens (3-41), and install the frame (3-42).
- 2) Install the FPCB assembly (3-45) on the top and bottom bosses on the viewfinder chassis (3-32), and after securing it with the FPCB holder (3-46), solder the FPCB assembly (3-45) and FPCB holder (3-46).
- 3) Stick two sheets of photographic tape (3-47), and after temporarily fixing the reticle assembly (3-50) with two screws (3-60), install the spring (3-57). Apply lubricant (Helicolube FHA054) to the pin on which the spring is hooked.
- 4) After adjusting parallax, install the reticle assembly (3-50) completely, and fit the lens holder (3-38).

**NOTE:**

For adjustment of parallax, refer to Chapter V below.

Fig. IV-B-6



## 7. Mode switch assembly (3-1)

### (1) Disassembly

- 1) Peel off the name plate (3-19) secured with adhesive tape, remove the screw (3-16), and remove the select dial (3-15). Remove and keep the click plate (3-13) and two springs (3-14) also at this time so as not to lose them.
- 2) Remove the screws (3-6 and 3-18), and remove the mode switch FPCB assembly (3-128) from the mode switch frame (3-2).
- 3) Pull out the spring (3-7) and lock lever assembly (3-125), and remove the contact assembly (3-124).

#### NOTE:

The lock lever assembly (3-125) and contact assembly (3-124) cannot be disassembled further because they are caulked.

- 4) The mode switch FPCB (3-3) is installed on the base plate (3-5) with the adhesive tape (3-4).

### (2) Reassembly

- 1) Matching with the hole position of the base plate (3-5), stick the mode switch FPCB (3-3) to the base plate, and apply lubricant (tungsten bisulfide) by referring to Fig. IV-B-7-1.
- 2) Apply lubricant (tungsten bisulfide) to the mode switch frame (3-2) (Refer to Fig. IV-B-7-2.), install the contact assembly (3-124), lock lever assembly (3-125) and spring (3-7), and install the mode switch FPCB assembly (3-128) on them with two screws (3-6 and 3-18). Make sure that the pin of the lock lever assembly (3-125) is in the hole on the base plate (3-5) correctly.
- 3) Place the click plate (3-13) on the mode switch frame (3-2), and install two springs (3-14) by referring to Fig. IV-B-7-3. Next, apply lubricant (tungsten bisulfide) to the select dial (3-15) (Refer to Fig. IV-B-7-4.), and secure the select dial with the screw (3-16).
- 4) Install the adhesive tape (3-4) on the select dial (3-15). Install the name plate (3-19) by matching it with the index on the top cover after installing top cover.

Fig. IV-B-7

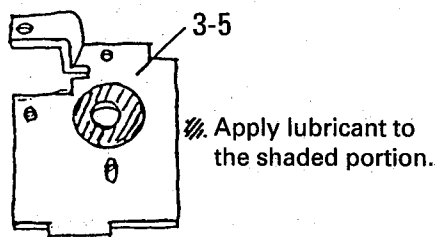
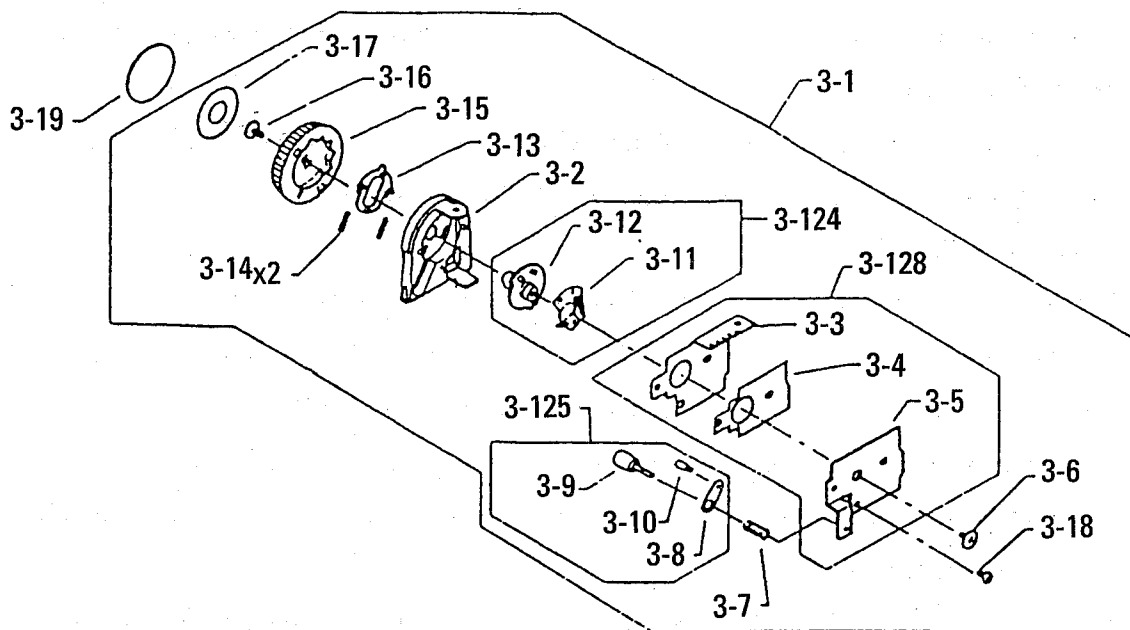


Fig. IV-B-7-1

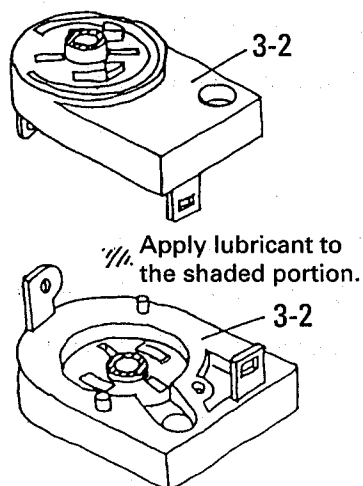


Fig. IV-B-7-2

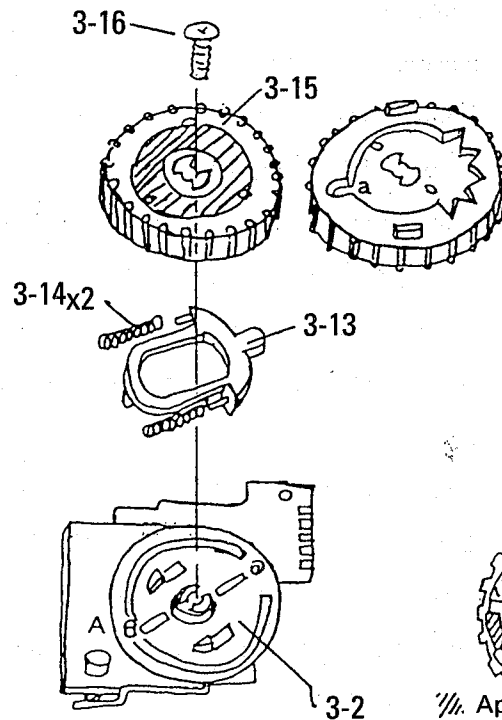


Fig. IV-B-7-3

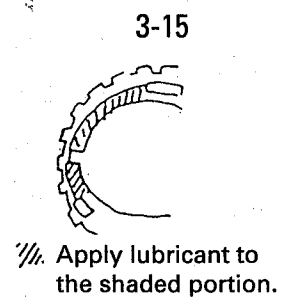


Fig. IV-B-7-4

## 8. Lens assembly (4-1)

### (1) Disassembly

- 1) Remove two screws (4-19), and remove the metal fixture (4-18), rubber piece (4-17) and relay FPCB (4-16).
- 2) Pull up the connector portion of the shutter circuit assembly (4-31), pull out the shutter assembly (4-30), and after removing the screw (4-20), remove the shutter circuit assembly (4-31).
- 3) Remove the E-clip (4-53), and pull out the cam lever assembly (4-78). When removing the shaft (4-47), use a special tool (JA60035).
- 4) Remove three screws (4-83), and remove the gear train assembly (4-55).
- 5) Remove two screws (4-28), and remove the lens driving motor assembly (4-64).
- 6) Peel off the tape (4-26), unsolder and disconnect the lead wires (6-41 and 6-42), and pull out the motor gear (4-103).
- 7) Remove the screw (4-46), and remove the gear holder (4-44) and interlock gear (4-45).
- 8) Peel off the light shielding tape (4-23), and remove the encoder holder (4-22) after removing two screws (4-24).
- 9) Unbend the cord clamp (4-14) which combines lead wires (6-24 through 6-26), and after disconnecting the lead wires, remove the encoder contact (4-21).
- 10) Remove two screws (4-13), pull out the guide (4-11), and peel off the light shielding sheet (4-12) as required.
- 11) Remove four screws (4-10), pull out two helicoid keys (4-8), and peel off two sheets of the light shielding sheet (4-9) as required.
- 12) Turn the moving lens barrel assembly (4-43) counterclockwise (when observed the see-through (4-2) from the front) to remove it, and turn the helicoid barrel (4-6) clockwise and remove it.
- 13) Peel off the encoder FPCB (4-5) as required.
- 14) Matching the interlock cam (4-4) with the shape of the fixed barrel (4-3), pull the interlock cam (4-4), peel off the rubber seat (4-27) as required, and remove the guide ring (4-104). Remove four screws (4-15), and remove the fixed barrel (4-3) from the see-through (4-2).

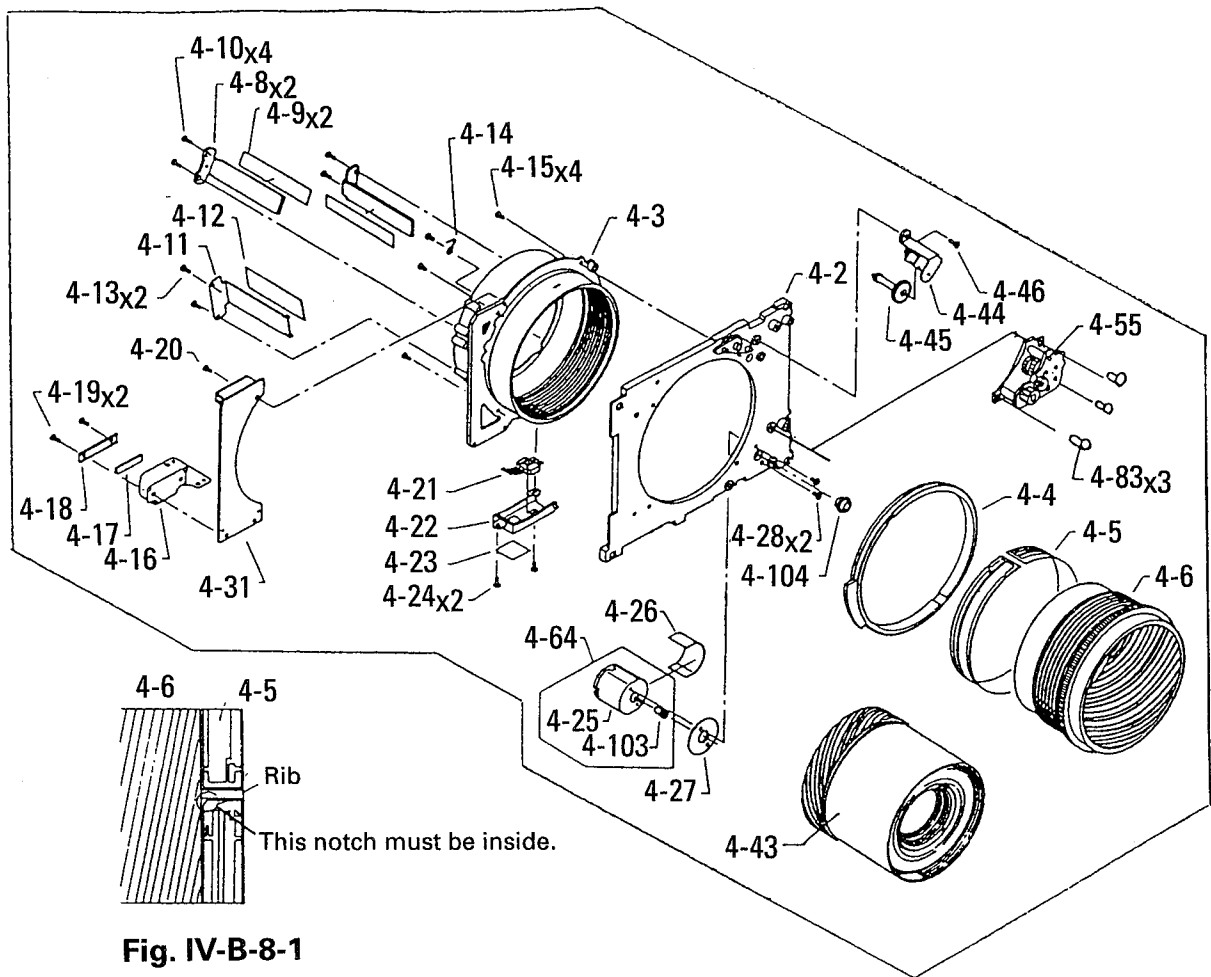
## 8. Lens assembly (4-1)

### (1) Disassembly

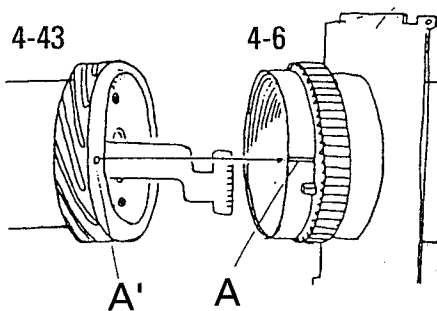
- 1) Remove two screws (4-19), and remove the metal fixture (4-18), rubber piece (4-17) and relay FPCB (4-16).
- 2) Pull up the connector portion of the shutter circuit assembly (4-31), pull out the shutter assembly (4-30), and after removing the screw (4-20), remove the shutter circuit assembly (4-31).
- 3) Remove the E-clip (4-53), and pull out the cam lever assembly (4-78). When removing the shaft (4-47), use a special tool (JA60035).
- 4) Remove three screws (4-83), and remove the gear train assembly (4-55).
- 5) Remove two screws (4-28), and remove the lens driving motor assembly (4-64).
- 6) Peel off the tape (4-26), unsolder and disconnect the lead wires (6-41 and 6-42), and pull out the motor gear (4-103).
- 7) Remove the screw (4-46), and remove the gear holder (4-44) and interlock gear (4-45).
- 8) Peel off the light shielding tape (4-23), and remove the encoder holder (4-22) after removing two screws (4-24).
- 9) Unbend the cord clamp (4-14) which combines lead wires (6-24 through 6-26), and after disconnecting the lead wires, remove the encoder contact (4-21).
- 10) Remove two screws (4-13), pull out the guide (4-11), and peel off the light shielding sheet (4-12) as required.
- 11) Remove four screws (4-10), pull out two helicoid keys (4-8), and peel off two sheets of the light shielding sheet (4-9) as required.
- 12) Turn the moving lens barrel assembly (4-43) counterclockwise (when observed the see-through (4-2) from the front) to remove it, and turn the helicoid barrel (4-6) clockwise and remove it.
- 13) Peel off the encoder FPCB (4-5) as required.
- 14) Matching the interlock cam (4-4) with the shape of the fixed barrel (4-3), pull the interlock cam (4-4), peel off the rubber seat (4-27) as required, and remove the guide ring (4-104). Remove four screws (4-15), and remove the fixed barrel (4-3) from the see-through (4-2).



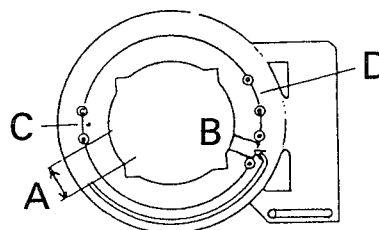
**Fig. IV-B-8**



**Fig. IV-B-8-1**

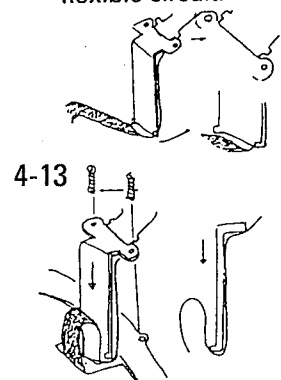


**Fig. IV-B-8-2**



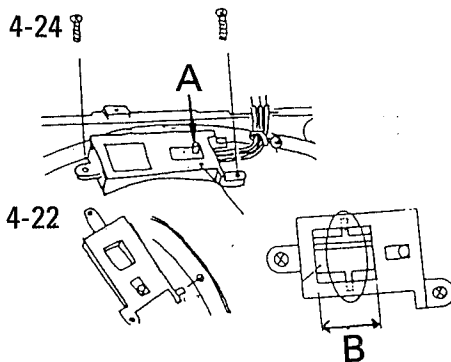
**Fig. IV-B-8-3**

Matching position of the flexible circuit.

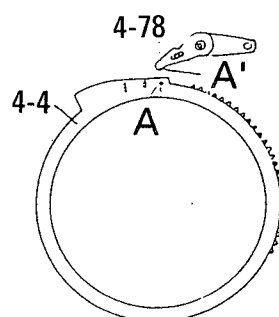


Bend the flexible circuit in U-shape.

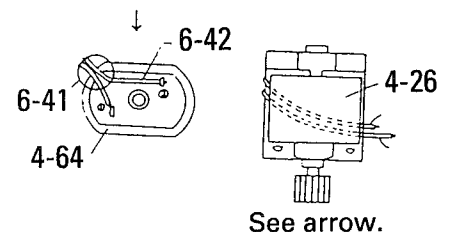
**Fig. IV-B-8-4**



**Fig. IV-B-8-5**



**Fig. IV-B-8-6**



See arrow.

**Fig. IV-B-8-7**

## (2) Reassembly

- 1) Install the fixed barrel (4-3) on the see-through (4-2) with four screws (4-15). When the rubber seat (4-27) has been removed, apply adhesive (Three Bond1521B or equivalent), and install the rubber seat (4-27).
- 2) Matching the interlock cam (4-4) with the shape of the fixed barrel (4-3), instal the interlock cam (4-4) so that the front side can be seen.
- 3) When the encoder FPCB (4-5) has been removed, stick (install) it by matching with the rib of the helicoid barrel (4-6). (Refer to Fig. IV-B-8-1.)
- 4) Turning the helicoid barrel (4-6) counterclockwise, screw the helicoid barrel (4-6) assembled as described in 3) above into the fixed barrel (4-3).
- 5) Insert the shutter flexible circuit of the moving lens barrel assembly (4-43) into the helicoid barrel (4-6), match the portion A of the helicoid barrel (4-6) with the portion A' of the moving lens barrel assembly (4-43), turn it clockwise so that they are combined completely. (See Fig. IV-B-8-2.) In this case, the shutter flexible circuit must be within range A. (See Fig. IV-B-8-3.)
- 6) Watching the shutter (4-30), turn the helicoid barrel (4-6) counterclockwise to position B, apply two helicoid keys (4-8) on which two light shielding sheets (4-9) are installed to C and D, and tighten four screws (4-10). (Refer to Fig. IV-B-8-3.)
- 7) Install the guide (4-11) on which the light shielding sheet (4-12) is installed, and tighten two screws (4-13). (Refer to Fig. IV-B-8-4.)
- 8) Solder and connect three lead wires to the encoder contact (4-21), place iton the fixed barrel (4-3), apply the projected portion of the encoder holder (4-22) to the fixed barrel (4-3), and tighten two screws (4-24). At this time, the encoder contact (4-21) must in position A. Next, bind three lead wires (6-24 through 6-26) with the cord clamp (4-14). (Refer to Fig. IV-B-8-5.)
- 9) Install the shutter circuit assembly (4-31) on the fixed barrel (4-3) with the screw (4-20), and fit the shutter assembly (4-30) to the connector.
- 10) When the shaft (4-47) has been removed, install it by the use of a special tool (JA60035), install the cam lever assembly (4-78), and secure it with the E-clip (4-53).

Fig. IV-B-8

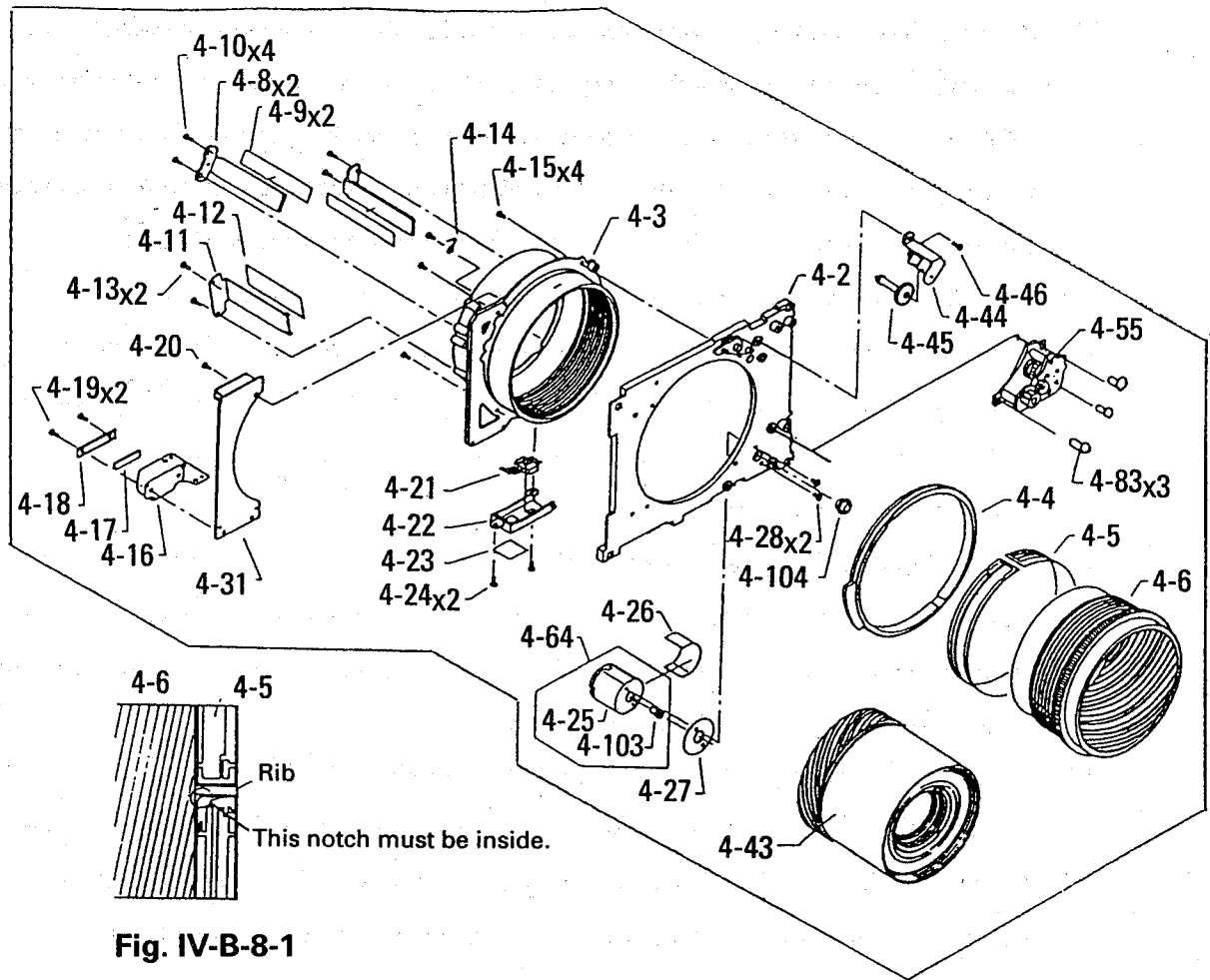


Fig. IV-B-8-1

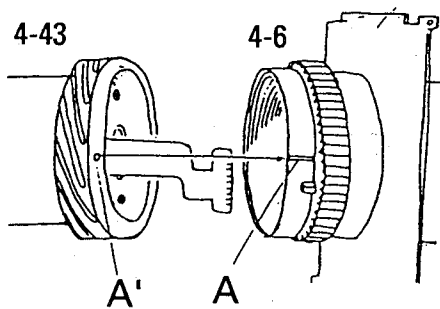


Fig. IV-B-8-2

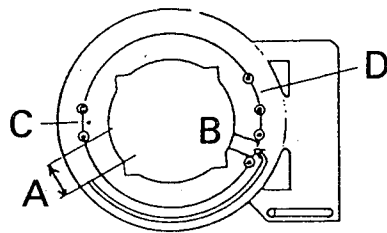
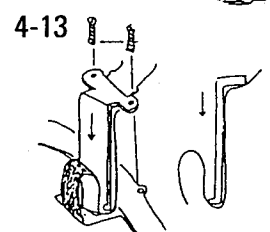
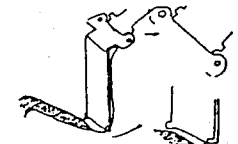


Fig. IV-B-8-3

Matching position of the flexible circuit.



Bend the flexible circuit in U-shape.

Fig. IV-B-8-4

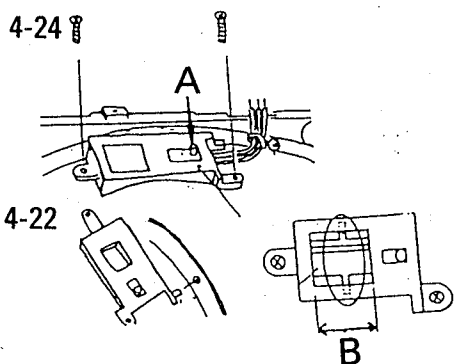


Fig. IV-B-8-5

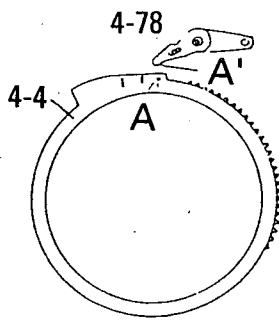
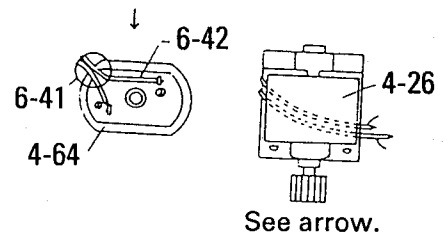


Fig. IV-B-8-6



See arrow.

Fig. IV-B-8-7

- 11) Place the lens assembly reassembled up to step 10) above on a camera body, tighten four screws, place them on a focus adjust stand, look into a collimator, and obtain the infinity position by turning the helicoid barrel (4-6). At this position, look through the square hole of the encoder holder (4-22) and make sure that the portion A of the encoder FPCB (4-5) is within range B. Now, dismount the lens from the camera body carefully so as not to move the helicoid barrel (4-6). (Refer to Fig. IV-B-8-5.)
- 12) Turn the interlock cam (4-4), and at the position where portion A of the interlock cam (4-4) is matched with portion A' of the cam lever assembly (4-78), install the gear holder (4-44) on which the interlock gear (4-45) is installed on the see-through (4-2) with the screw (4-46). (Refer to Fig. IV-B-8-6.)
- 13) Put the light shielding tape (4-23) on the square hole of the encoder holder (4-22).
- 14) Apply the motor gear (4-103) to the lens driving motor (4-25) until it stops, solder and connect two lead wires, extend the lead wires through portion A, and secure the lead wires with a piece of tape. (Refer to Fig. IV-B-8-7.)
- 15) Pass the lens driving motor assembly (4-64) through the back of the see-through (4-2), and install it with two screws so that the lead wires are in the fixed barrel (4-3) side.
- 16) Install the relay FPCB (4-16) on the shutter circuit assembly (4-31), and install the rubber piece (4-17) and metal fixture (4-18) on them with two screws (4-19).



## **9. Moving lens barrel assembly (4-43)**

### **(1) Disassembly**

- 1) Remove two screws (4-36) and remove the light shielding plate (4-34).
- 2) Remove three screws (4-35), raise the hood (4-33) to swell the center portion of the shutter assembly (4-30), remove the shutter assembly (4-30) from the hook on the hood (4-33), and remove the hood (4-33).
- 3) Turn the front lens assembly (4-41) counterclockwise and remove it by the use of a tool (compass).
- 4) Peel off the moquette (4-42), remove three screws (4-38), and remove the shutter (4-30) from the shutter frame (4-32).
- 5) Remove two screws (4-37), and remove the moving lens barrel (4-7).
- 6) Remove the rear lens assembly (4-40) by the use of a special tool (JA1499).

#### **NOTE:**

The front lens assembly (4-41) and rear lens assembly (4-40) cannot be disassembled further as the optical adjustments are extremely difficult.

### **(2) Reassembly**

- 1) Matching it with the shutter frame (4-32), turn the rear lens assembly (4-40) clockwise to tighten by the use of a special tool (JA1499), and matching it with the shape of the shutter frame (4-32), place the moving lens barrel (4-7). Now, tighten two screws (4-37).
- 2) With the shutter assembly (4-30) positioned down side, pass the head of the flexible circuit through the opening of the shutter frame (4-32), pull the head of the flexible circuit, place the shutter in the shutter frame, and tighten three screws (4-35) from the back. (Refer to Fig. IV-B-9-1.)
- 3) Pass the shutter assembly (4-30) through the hook on the hood (4-33), place the hood (4-33) in the moving lens barrel (4-7), and secure the hood (4-33) with three screws (4-35).
- 4) Matching it with the shape of the hood (4-33), install the light shielding plate (4-34) with two screws (4-36), and install the front lens assembly (4-41) to which the moquette (4-42) is stucked on the shutter frame (4-32) by the use of a tool (compass). (Refer to Fig. IV-B-9-2.)

Fig. IV-B-9

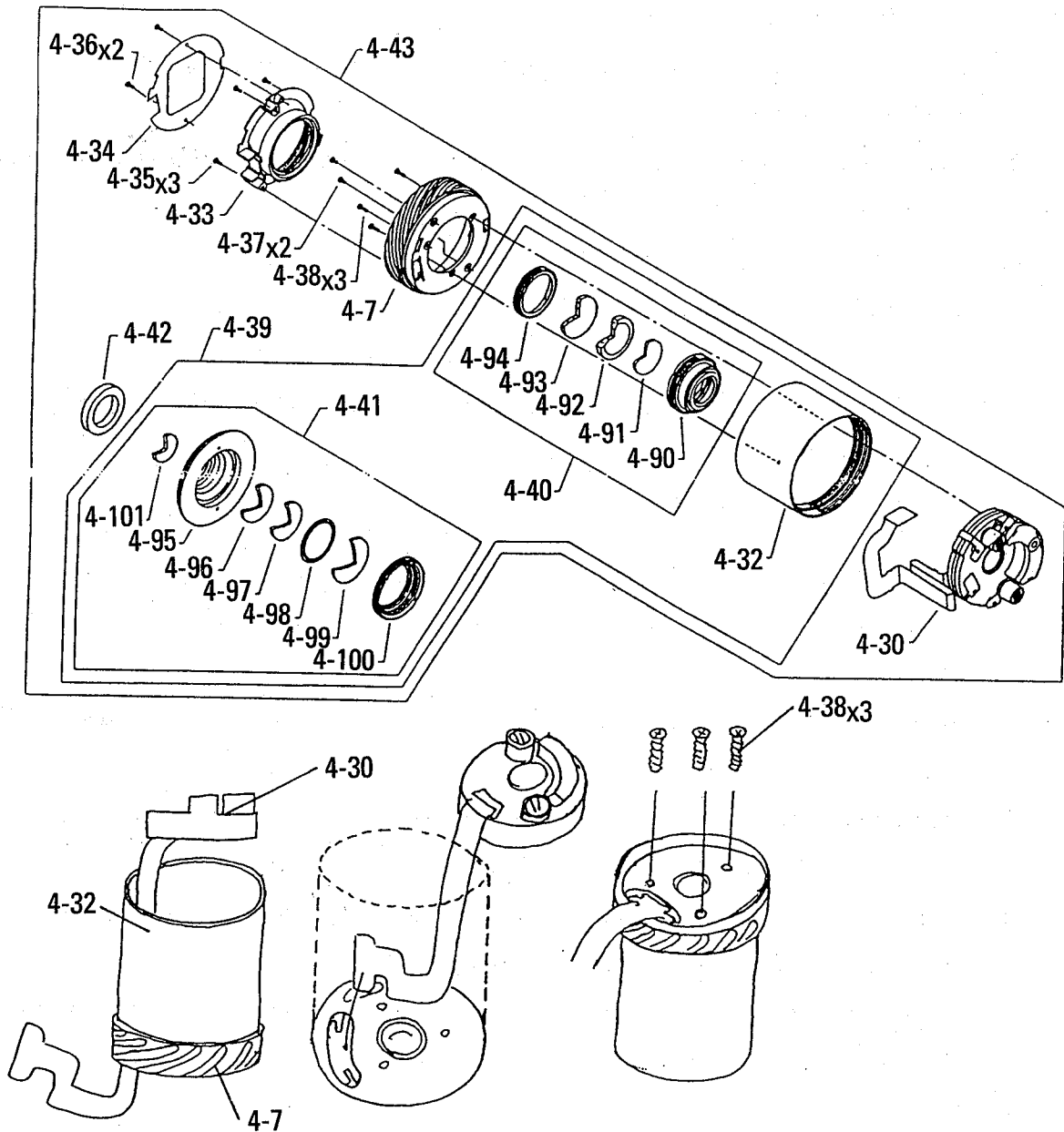


Fig. IV-B-9-1

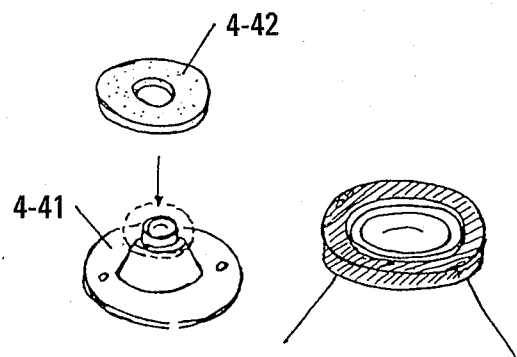


Fig. IV-B-9-2

## 10. Gear train assembly (4-55)

### (1) Disassembly

- 1) Remove three screws (4-57), remove the bottom base plate (4-56), and pull out the friction gear assembly (4-62).
- 2) Remove the E-clip (4-72), pull out the encoder gear (4-73), remove the E-clip (4-71), and remove the gear L3-L4 (4-74).
- 3) Remove the E-clip (4-82), remove the gear L7 (4-81), remove the screw (4-69), and remove gears L5 (4-76) and L6 (4-80).

#### NOTE:

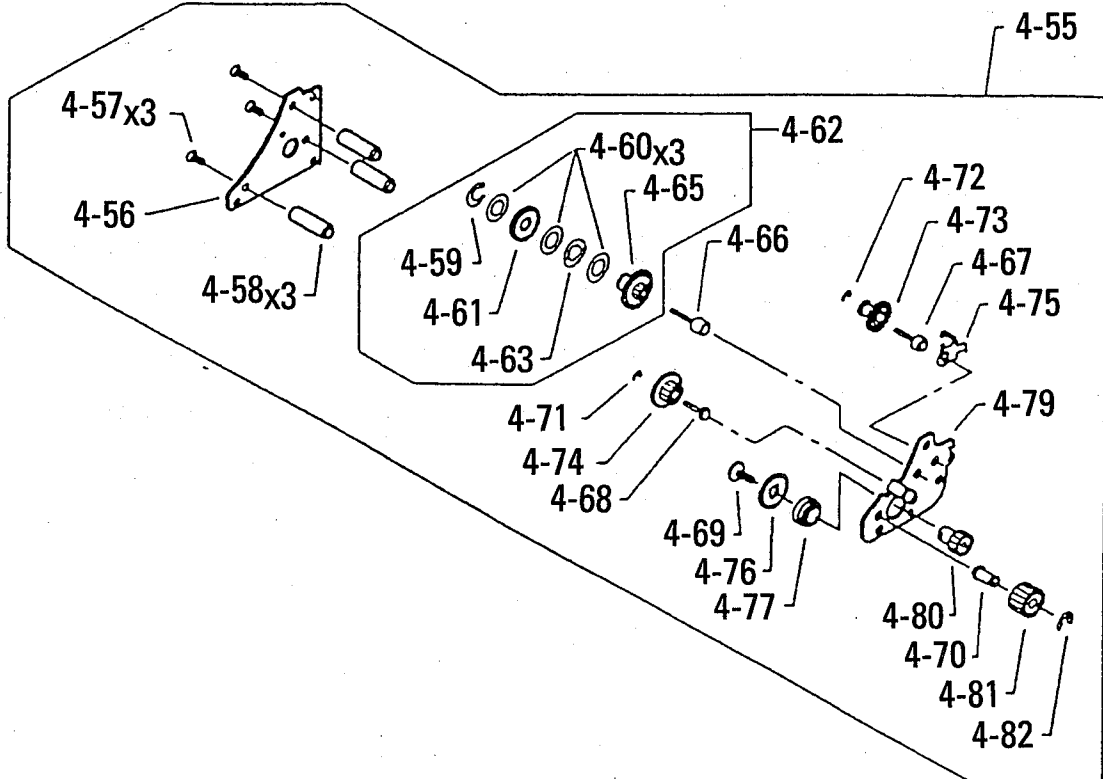
The gear train assembly (4-55) cannot be disassembled further because the parts are caulked.

### (2) Reassembly

- 1) Apply grease (G30M) to the shaft holder interior, install the gear L6 (4-80), and matching the gear L5 (4-76) with the shape of the gear L6 (4-80), secure the gear L6 (4-80) with the screw (4-69).
- 2) Apply grease (G30M) to the shaft, install the gear L7 (4-81) on the shaft, and secure the gear L7 (4-81) with the E-clip (4-82).
- 3) Apply grease (G30M) to the shaft, install the gear L3-L4 (4-74) on the shaft, and secure the gear L3-L4 (4-74) with the E-clip (4-71).
- 4) Apply grease (G30M) to the shaft, install the encoder gear (4-73) on the shaft, and secure the encoder gear (4-73) with the E-clip (4-72).
- 5) Apply grease (G30M) to the shaft, install the friction gear assembly (4-62) and install the bottom base plate (4-56) with three screws (4-57).



Fig. IV-B-10



## **11. Friction gear assembly (4-62)**

### **(1) Disassembly**

- 1) Pull out the C-clip (4-59), and remove the gear L1 (4-61) after removing the washer (4-60).
- 2) Remove the washer (4-60) and friction ring (4-63), and remove the washer (4-60) from the gear L2-E1 (4-65).

### **(2) Reassembly**

- 1) Apply the washer (4-60) to the gear L2-E1 (4-65), apply the friction gear (4-63), and apply the washer (4-60).
- 2) Apply the gear L1 (4-61), apply the washer (4-60), and matching it with the shape of the gear L2-E1 (4-65), install the C-clip (4-59) by the use of a special tool (JA1497).

Fig. IV-B-11

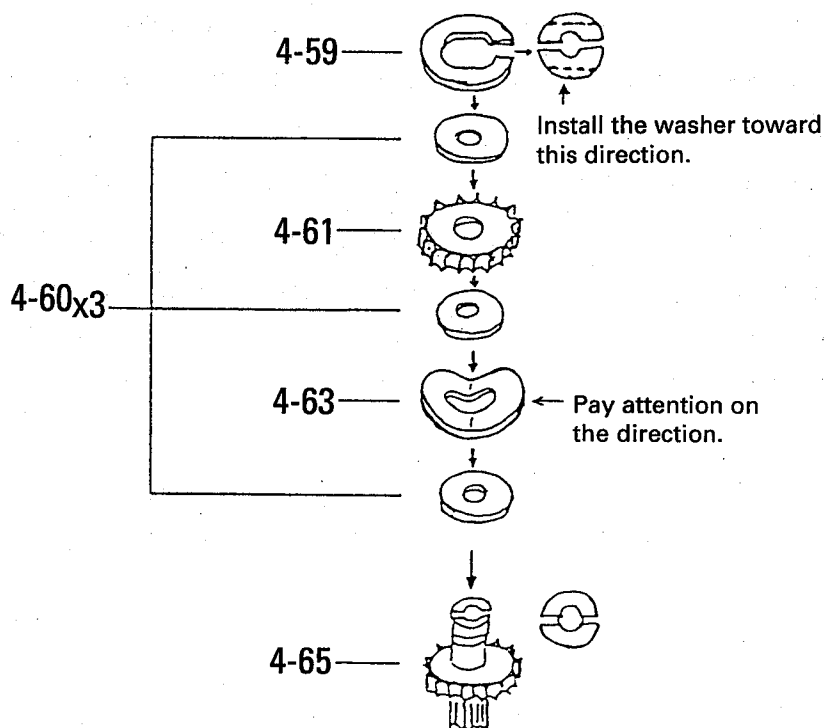
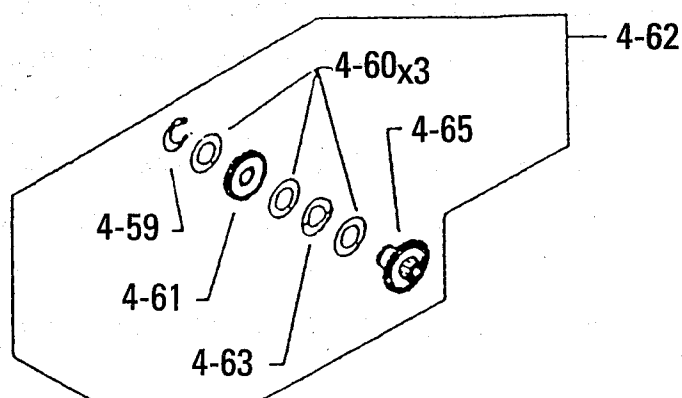


Fig. IV-B-11-1

## 12. Film transporting mechanism assembly (5-101)

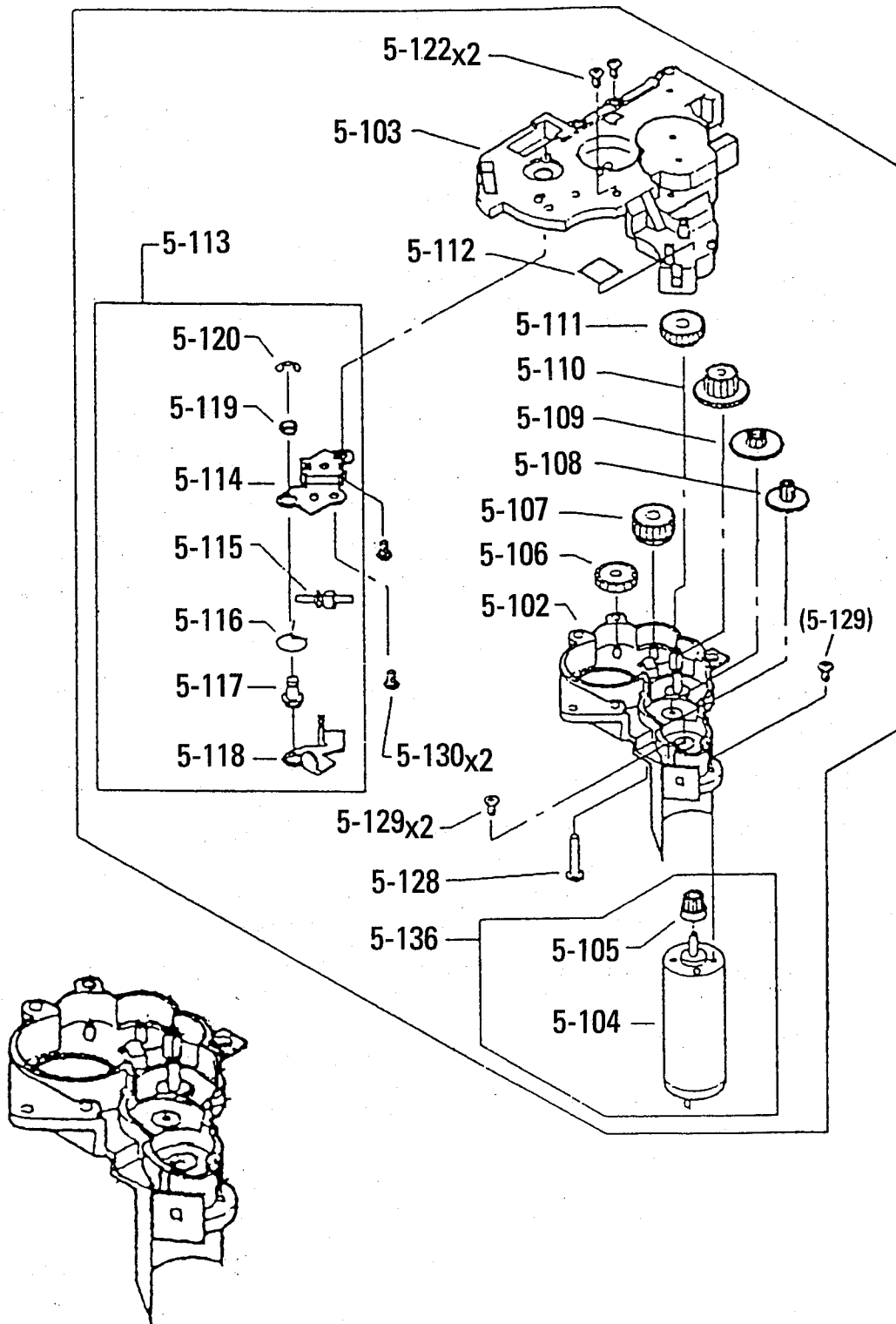
### (1) Disassembly

- 1) Remove two screws (5-122), unhook the claw and remove the top base plate (5-103).
- 2) Remove the gear G2 (5-111), gear (5-110), gear 2 (5-109), gear G1 (5-108), double step gear (5-107), and gear G6 (5-106).
- 3) Remove two screws (5-129), remove the film transporting motor assembly (5-136) from the bottom base plate (5-102), and pull out the motor gear (5-105) from the film transporting motor (5-104).
- 4) Remove two screws (5-130) from the top base plate (5-103), and remove the release lever assembly (5-113).

### (2) Reassembly

- 1) Place the release lever assembly (5-113) on the top base plate (5-103), and tighten two screws (5-130).
- 2) Fit the motor gear (5-105) tightly to the film transporting motor (5-104), and install them on the bottom base plate (5-102) with two screws (5-129).
- 3) Apply lubricant (Losoid 6308-1G, Tungsten bisulfide) to the bottom base plate (5-102). (Refer to Fig. IV-B-12-1.)
- 4) Install the gear G6 (5-106), double step gear (5-107), gear G1 (5-108), gear 2 (5-109), gear (5-110) and gear G2 (5-111) on the bottom base plate (5-102) in that order.
- 5) Put the top base plate (5-103) on the above assembled parts, and tighten two screws (5-122).

**Fig. IV-B-12**



**Apply lubricant to the shaded portions.**

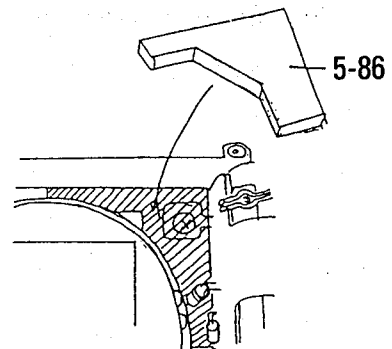
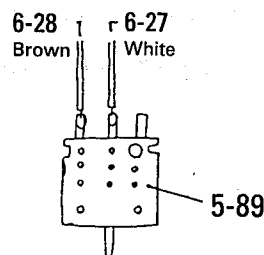
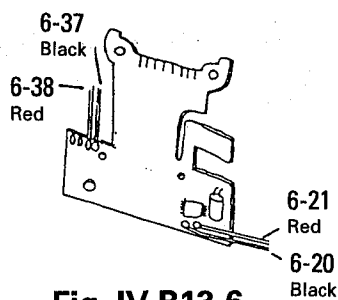
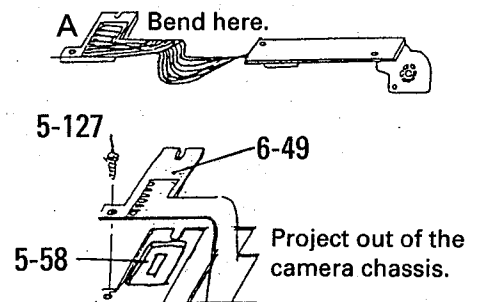
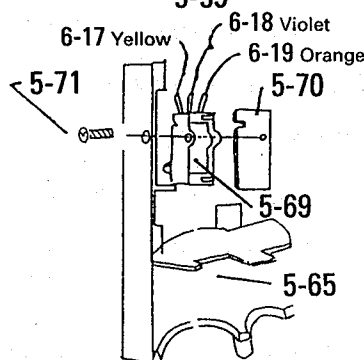
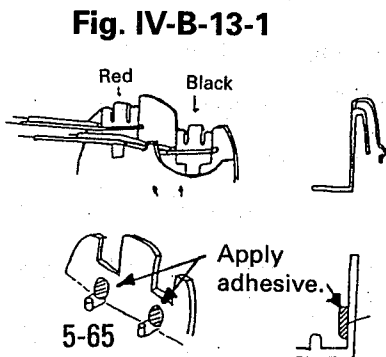
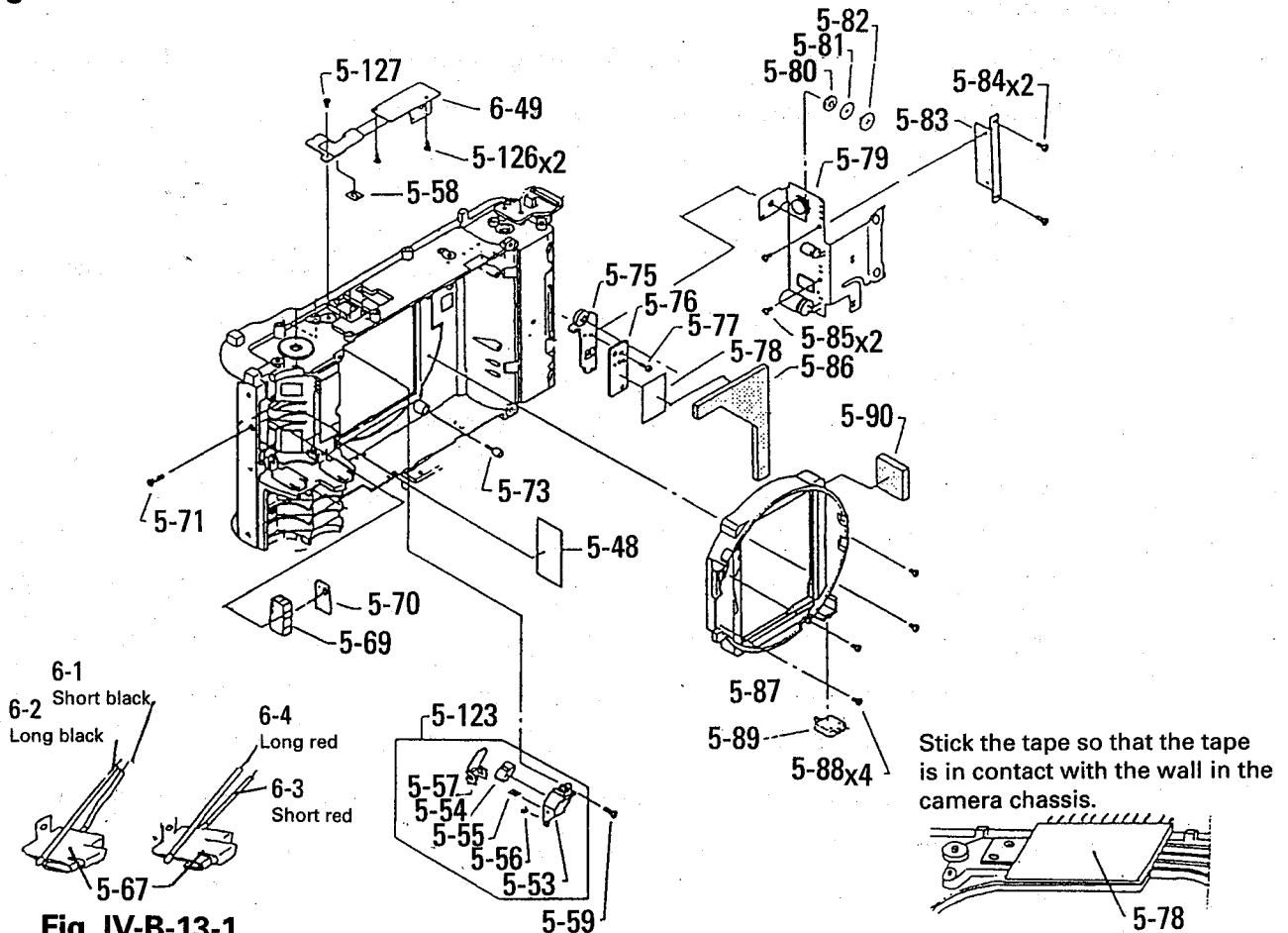
**Fig. IV-B-12-1**

### **13. Camera body assembly (2) (5-1)**

#### **(1) Disassembly**

- 1) Pull out the moquette (5-86), remove four screws (5-88), remove the hood (5-87), and pull out the pin (5-73).
- 2) Remove the SZ switch (5-89) from the hood (5-87), peel off the moquette (5-90), and unsolder the disconnect the lead wires (6-27 and 6-28) from the SZ switch (5-89).  
(Refer to Fig. IV-B-13-7.)
- 3) Unsolder and disconnect two lead wires (6-2 and 6-4) extended from the battery contact (5-67), and pull out the lead wires from the cord clamp (5-31). Peel off the tape (5-48).  
(Refer to Fig. IV-B-13-6.)
- 4) Remove the set screw (5-82), and remove the washer (5-81) and rubber ring (5-80).
- 5) Remove two screws (5-84), and remove the battery FPCB assembly (5-79) from the bracket (5-83). Next, remove two screws (5-85) and remove the bracket (5-83).
- 6) Remove the screw (5-127), raise the data FPCB assembly (6-49), remove the mask (5-58), remove two screws (5-126) and remove the data FPCB assembly (6-49).
- 7) Remove the screw (5-59), and remove the data lens assembly (5-132).
- 8) Peel off the light shielding tape (5-78), remove the screw (5-77), and remove the PR PCB assembly (5-76) and holder (5-75).
- 9) Remove the screw (5-71), remove the SB switch (5-69) and holder (5-70), and unsolder and disconnect lead wires (6-17 through 6-19) from the SB switch (5-69).  
(Refer to Fig. IV-B-13-3.)
- 10) Remove two adhered battery contacts (5-67), and unsolder and disconnect lead wires (6-1 through 6-4). Peel off the adhesive tape (5-72). (Refer to Fig. IV-B-13-1.)

**Fig. IV-B-13**

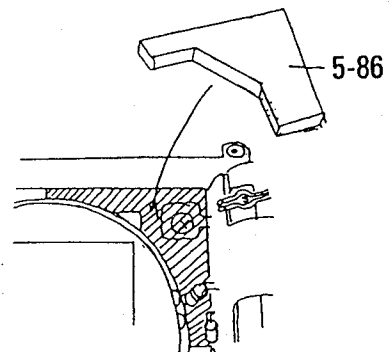
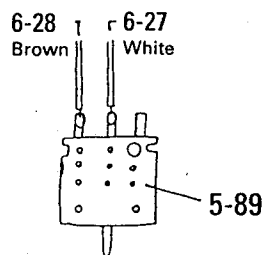
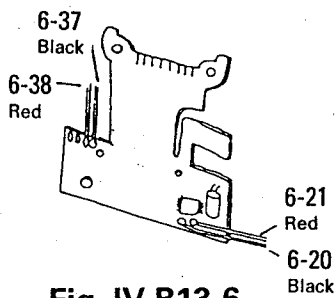
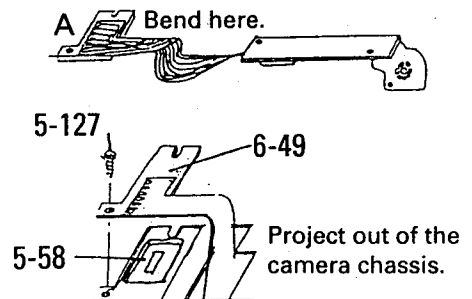
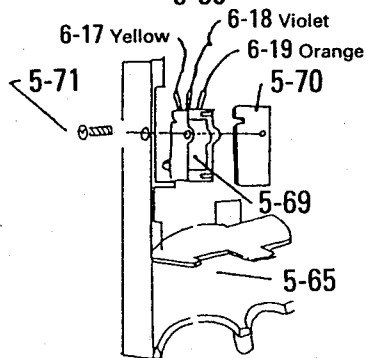
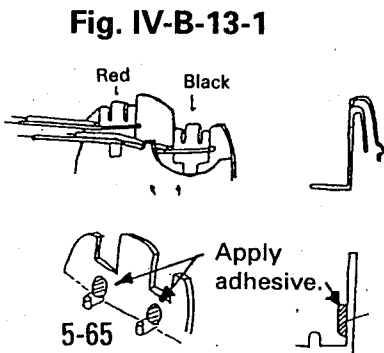
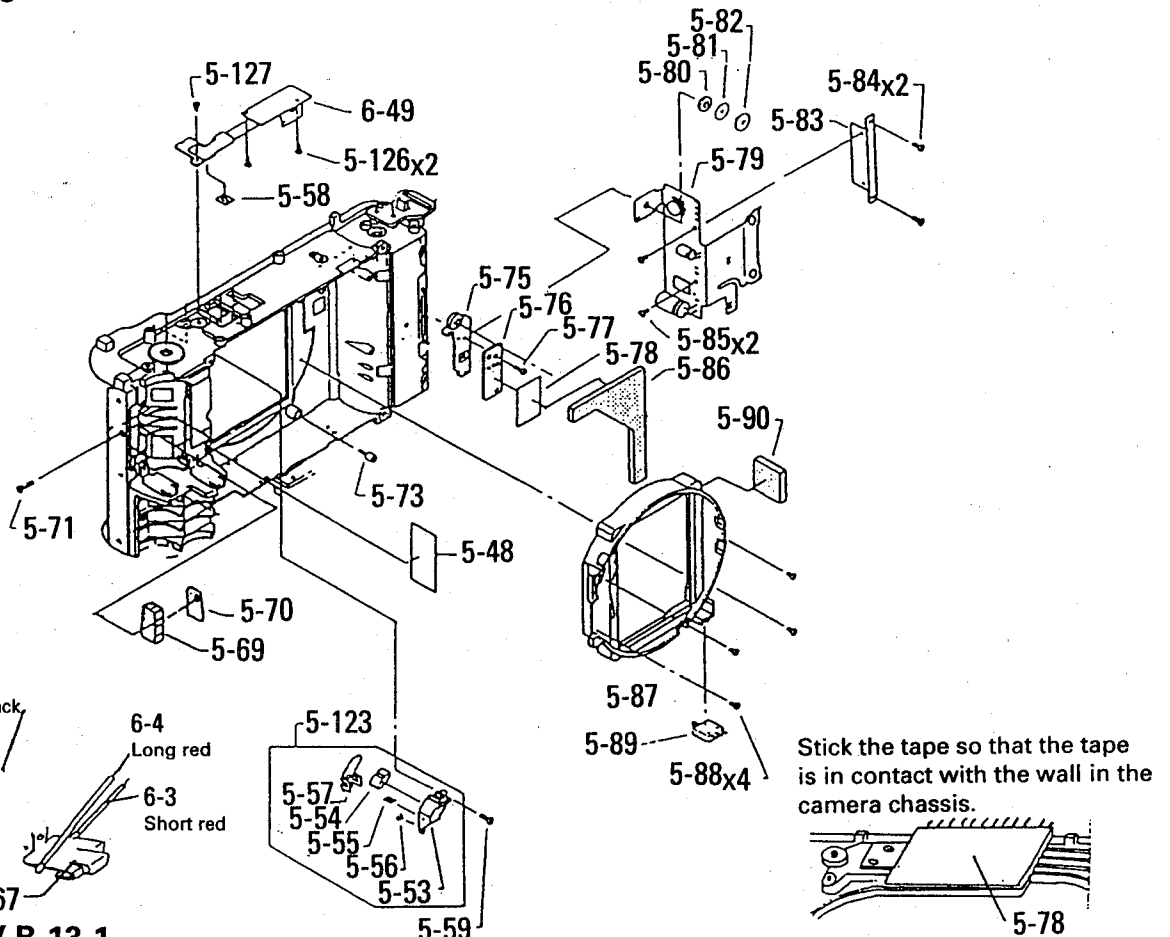


## (2) Reassembly

- 1) Solder and connect four lead wires (6-1 through 6-4) to two battery contacts (5-67), install the battery contacts (5-67) on the battery compartment base (5-65) on which adhesive (Three Bond 1521B or equivalent) is applied, and put the adhesive tape (5-72). (Refer to Figs. IV-B-13-1 and IV-B-13-2.)
- 2) Install the SB switch (5-69) (to which three lead wires (6-17 through 6-19) are soldered) on the battery compartment base (5-65) together with the holder (5-70) with the screw (5-71), and form the lead wires. (Refer to Fig. IV-B-13-3.)
- 3) Install the holder (5-75) and PR PCB assembly (5-76) on the camera chassis (5-7) in that order with the screw (5-77), and put the light shielding tape (5-78). (Refer to Fig. IV-B-13-4.)
- 4) Install the data lens assembly (5-132) on the camera chassis (5-7) with the screw (5-59), project out the LED of the data FPCB assembly (6-49) from the opening on the interior of the camera chassis (5-7), and with the gold-plated circuit pattern placed on the holder (5-75), secure the PR PCB assembly on the camera chassis (5-7) with the screw (5-77).
- 5) Place the mask (5-58) on the data lens assembly (5-132), place them so that the LED of the data FPCB is faced downward, and tighten the screw (5-127). (Refer to Fig. IV-B-13-5.)
- 6) Solder and connect four lead wires to the battery FPCB assembly (5-79), and after securing it on the bracket (5-83) with two screws (5-84), install the bracket on the camera chassis (5-7) with two screws (5-85). (Refer to Fig. IV-B-13-6.)
- 7) Apply the tightly connected portion of the battery FPCB assembly (5-79) to the guide boss of the holder (5-75), put the rubber ring (5-80) and washer (5-81) in that order, and tighten the screw (5-82).
- 8) Install the pin (5-73) on the camera chassis (5-7), fit the SZ switch (5-89) (to which the lead wires are soldered) to the hood (5-87) (Refer to Fig. IV-B-13-7.) install the moquette (5-90), and tighten four screws (5-88).
- 9) Solder and connect two lead wires to the battery FPCB assembly (5-79), and form the lead wires. Install the moquette (5-86) on the camera chassis (5-7).



**Fig. IV-B-13**



## **14. Camera body assembly (1) (5-2)**

### **(1) Disassembly**

- 1) Remove three screws (5-68) and remove the battery compartment base (5-65).
- 2) Remove the DX FPCB (5-64) from the battery compartment base (5-65), and peel off the battery label (5-66).
- 3) Remove six screws (5-32) and remove three cord clamps (5-31).
- 4) Remove the encoder shaft (5-52), remove the screw (5-20), and remove the film take-up gear (5-19) and take-up shaft assembly (5-60).
- 5) Remove two screws (5-24), and pull out the shaft (5-18) in which the gear (5-17) installed from the camera chassis (5-7). Now, remove two counter rollers (5-25) from the counter drum (5-23). Further, remove the gear (5-17) from the shaft (5-18).
- 6) Peel off two pieces of the moquette (5-47 and 5-26), peel off three insulators (5-45, 5-46 and 5-50), remove the metal fixture (5-49), and remove the light shielder (5-133).
- 7) Push the pin (5-15) through the hole on the top of the camera chassis (5-7) and remove the roller (5-14). Be careful not to lose two springs (5-16) and two pins (5-15).
- 8) Remove two screws (5-22), and remove the leaf spring assembly (5-4) and leaf spring (5-21).
- 9) Remove two screws (5-30), remove the strap lug (bottom) (5-29), remove two screws (5-28), and remove the strap lug (top) (5-27).
- 10) Remove four screws (5-43), remove two guide ring assemblies (5-3), remove two springs (5-34), and pull out two release bars (5-37 and 5-33).
- 11) Remove three screws (5-36), and remove the tripod socket (5-35).
- 12) Remove the shaft holder (5-13) and shaft holder (5-12).

#### **NOTE:**

Other parts are caulked and cannot be disassembled further.

Fig. IV-B-14

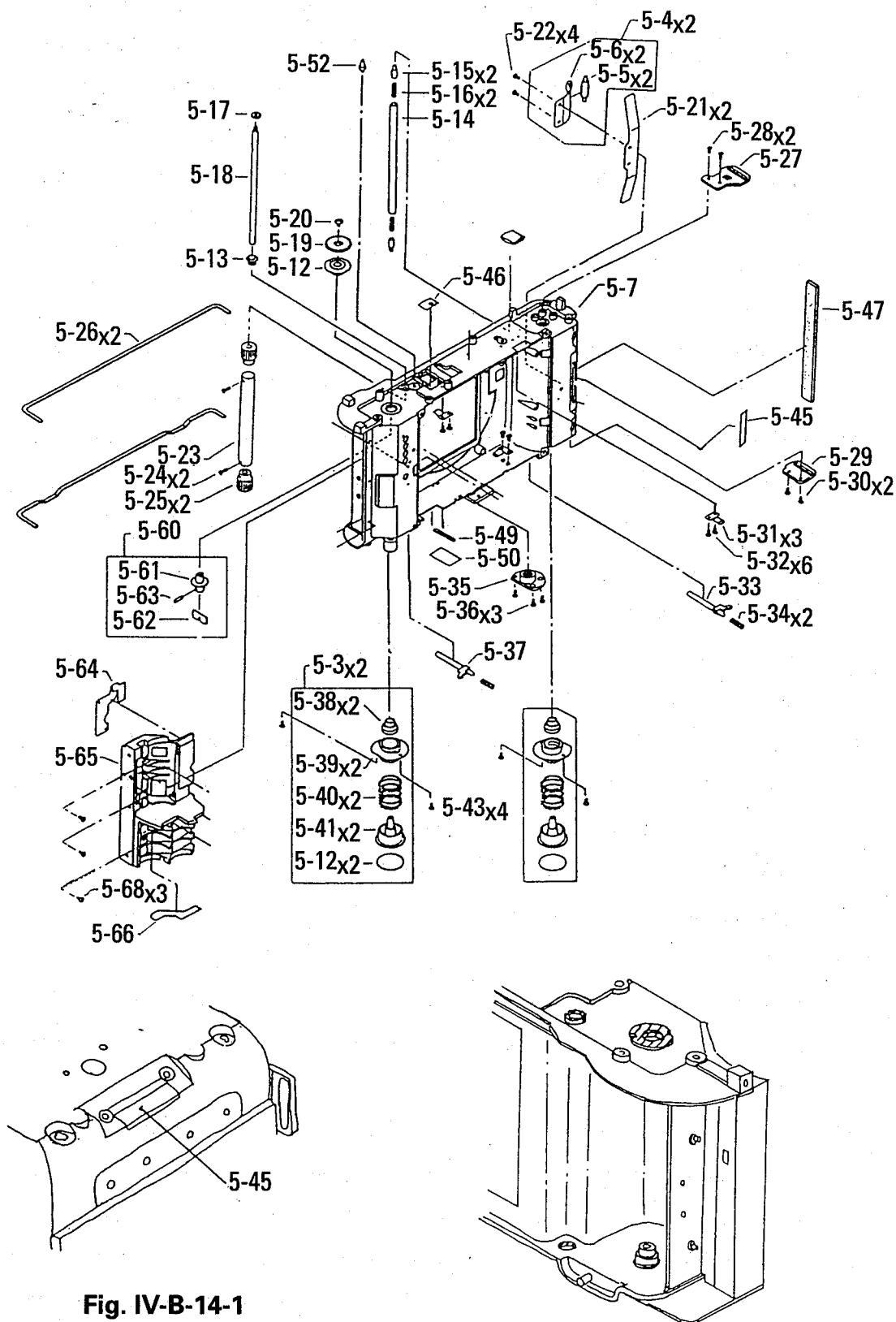


Fig. IV-B-14-1

/// Apply lubricant to the shaded portion.

Fig. IV-B-14-2

## (2) Reassembly

- 1) Lightly screw the shaft holder (5-12) and shaft holder (5-13) into the camera chassis (5-7), and after applying adhesive (Pliobond FHD011), tighten two shafts completely.
- 2) Install the tripod socket (5-35) on the camera chassis (5-7), and after applying screw locking agent (Technotite H-100), tighten three screws (5-36).
- 3) Install the release bars (5-37 and 5-33) on the camera chassis (5-7), pass two springs (5-34) through heads of two release bars (5-37 and 5-33), install two guide ring assemblies (5-3), and after applying screw locking agent (Technotite H-100), tighten four screws (5-43).
- 4) Install the top and bottom strap lugs (5-27 and 5-29) respectively with screws (5-28x2 and 5-30x2) after applying screw locking agent (Technotite H-100) to the screws.
- 5) Install the leaf spring (5-21) and leaf spring assembly (5-4) in the film chamber of the camera chassis (5-7) in that order, and tighten two screws (5-22).
- 6) With the springs (5-16) and pins (5-15) installed on both ends of the roller (5-14), install the roller (5-14) on the camera chassis (5-7).
- 7) Place the metal fixture (5-49) in the groove on the camera chassis, and stick the insulator (5-45) on the metal fixture. Now, stick two insulators (5-46 and 5-50) to the camera chassis. (Refer to Fig. IV-B-14-1.)
- 8) Apply adhesive (Pliobond FHD011) to the grooves on the top and bottom of the camera chassis and side surface of the camera chassis, and install the moquettes (5-47 and 5-26x2). Next, apply lubricant (Helicolube FHA054) to the shaded portion of the camera chassis (5-7). (Refer to Fig. IV-B-14-2.)
- 9) Apply screw locking agent (Technotite H-100) to the head of the shaft (5-18) install the gear (5-17) on the shaft (5-18).
- 10) With the counter rollers (5-25) applied to both ends of the counter drum (5-23), install the counter drum (5-23) on the camera chassis (5-7), install the shaft (5-18) and tighten two screws (5-24).
- 11) Apply lubricant (Helicolube FHA054) to the take-up shaft assembly (5-60), install it from the film chamber, install the film take-up gear (5-19) on the shaft, and after applying screw locking agent (Technotite H-100), tighten the screw (5-20).
- 12) Stick the battery label (5-66) by matching it to the shape of the battery compartment base (5-65), fit the DX FPCB (5-64) to the guide boss, and tighten three screws (5-68).
- 13) Install the light shielder (5-133) on the camera chassis (5-7), and install the encoder shaft (5-52).

Fig. IV-B-14

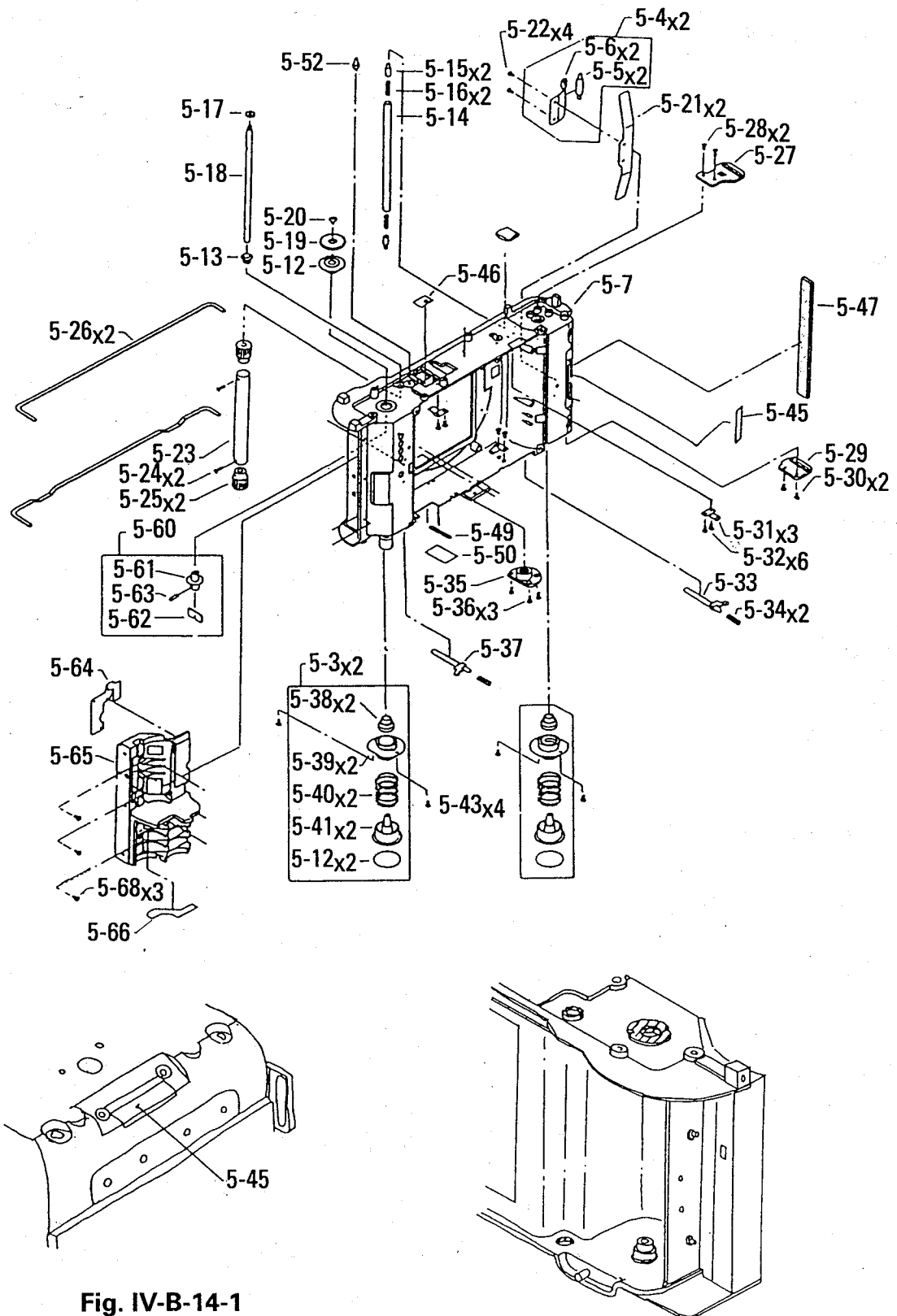


Fig. IV-B-14-1

/// Apply lubricant to the shaded portion.

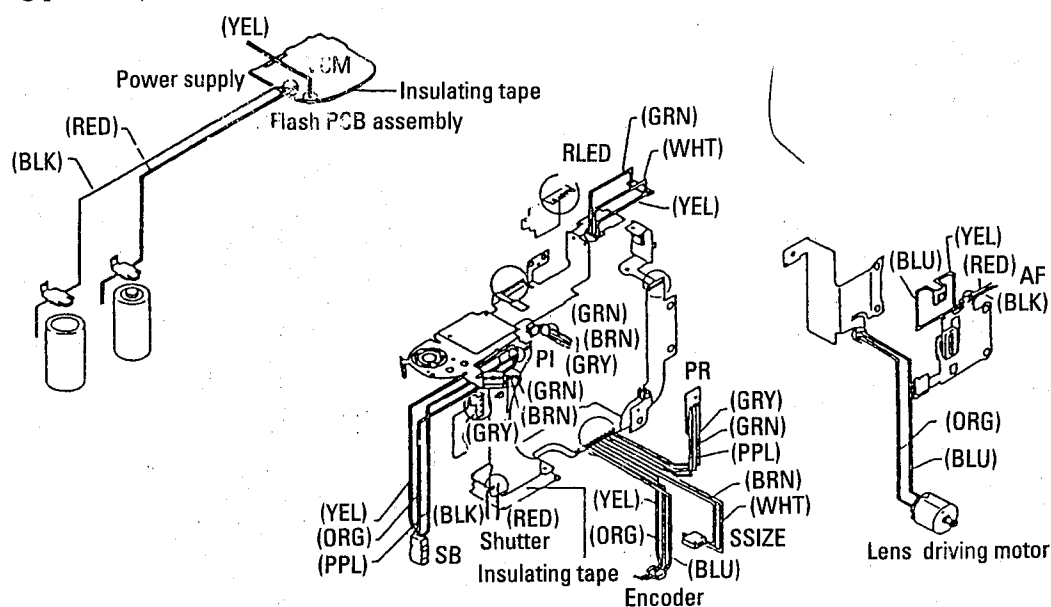
Fig. IV-B-14-2

## V. INSPECTION AND ADJUSTMENT

### 1. Inspecting the camera without covers



	Procedure	Checked Item	Remarks
1. Checking stabilized power supply		Output : $5.6V \pm 0.05V$	Dummy battery (JA60081)
2. Inspected item 2.1 Appearance (1) Soldering of wire		(1) Control FPCB assembly → BLED (3), AF (2), Lens driving motor (2), Shutter (2), Encoder (3), SSIZE (2), PR (3), PI (3) (2) Flash PCB assembly → Battery (2), VCM (3) Grounding wire	Erroneous wiring, connected position and soldered condition
(2) Soldering across flexible FPCBs		(1) Control FPCB assembly → Flash (8) Main switch (5) AE (5), DX (4)	Crack and short-circuit
(3) Tightness of connection		(1) Control FPCB assembly → Triple layer	FPCB deviation
(4) Insulating tape		(1) Soldered surface of flash PCB (2) Main FPCB (CPU)	Peel off

\*Wiring position, etc.



- Wrist band •Jig (Dummy battery) •Ammeter (110 $\mu$ A)
- Stabilized power supply (Load capacity : 5A or higher) connected with a one ohm  $\pm 5\%$ .

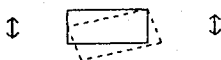

	Procedure	Checked Item	Remarks
2. Inspected item 2-2 Performance inspection (1) Checking power start and leak current	Turn off SM switch, and load a dummy battery with the camera back . closed	<ul style="list-style-type: none"> <li>Both FLCD and LCD must fully light, each display must be in correct position and all characters must be displayed fully and clearly.</li> <li>Leak current: 35μA or less</li> </ul>	Check with an ammeter
(2) Power supply – 1 operation check (LCD)	(1) Open the camera back (2) Turn the UP/DOWN to the left. (3) Set the pressure plate to [120], and close the camera back. (4) Open the camera back, set the pressure plate to [220] and close the camera back.	<ul style="list-style-type: none"> <li>ISO count must indicate “ 0 ”</li> <li>Film transporting motor must turn.</li> <li>[120] must be displayed on the LCD.</li> <li>[220] must be displayed on the LCD.</li> </ul>	Check with the shaft.
	(5) Set SM switch to [P].	<ul style="list-style-type: none"> <li>The film transporting motor must turn about one second and the lens must move from the home position to stand-by position.</li> </ul>	P → A → M when the SM switch is turned to the right ISO when turned to the left.
(3) Self-timer operation check (LCD)	(1) Press down SSELF on the camera back. (2) Press down SSELF again.	<ul style="list-style-type: none"> <li>Self-timer mark [⌚] must be displayed.</li> <li>Self-timer mark [⌚] must go out.</li> </ul>	Rubber switch on the back Right: SSELF Left: SDATA
(4) Data operation check (LCD)	(1) Press down SDATA on the camera back. (2) Press down SDATA again. (3) Press down SDATA again. (4) Press down SDATA again. (5) Press down SDATA again. (6) Press down SDATA again. (7) Press down SDATA again.	DATA [-----] lights  DATA [YYMMDD] lights DATA [DDtmm] lights DATA [TV AV] lights DATA [YMD ] [TVAV] must blink alternately. DATA [YMD ] [tm] must blink alternately. DATA [-----] lights	For example: 95_1_1

	Procedure	Checked Item	Remarks
(5) FC operation check (LCD)	(1) Keep pressing SFC on the camera top. (2) Release SFC from pressing.	<ul style="list-style-type: none"> <li>• FC mark [+/-] must light.</li> <li>• FC mark [+/-] must go out.</li> </ul>	The switch in the right side of the camera top FPCB (In front of UP/DOWN switch) Right side: SFC Left side: SAF
(6) Power supply – 2 operation check (LCD)	(1) Set SM switch to [A]. (2) Set SST to ON (turned down toward you)	<ul style="list-style-type: none"> <li>• Flash mark [  ] must light.</li> <li>• Flash mark [  ] must go out.</li> </ul>	
	(3) Set SM switch to [OFF]	<ul style="list-style-type: none"> <li>• The lens must move from the stand-by position to home position.</li> </ul>	
	(4) Set SM switch to [ISO]. (5) Turn UP/DOWN switch and check ISO indication. (6) Turn UP/DOWN switch and set ISO to [100].	<ul style="list-style-type: none"> <li>• [ISO] must blink.</li> <li>• ISO display must change from 25 to 1600.</li> <li>• Set ISO to [100].</li> </ul>	Set it to "25", turn about 1.1/4 and check 1600.
(7) Lens operation check	(1) Set SM switch to [P]. (2) Press down SAF switch (3) Keep pressing SMF switch, and turn UP/DOWN to set it to [Inf].	<ul style="list-style-type: none"> <li>• The lens must move from the home position to stand-by position</li> <li>• [MF] mark must be displayed.</li> <li>• [MF] mark blinks when SMF switch is pressed down.</li> <li>• [Inf] mark must be displayed.</li> </ul>	The switch in the right side of the camera top FPCB (In front of the UP/DOWN switch) Right side: SFC Left side : SAF
	(4) Set SP switch to ON (press down lightly) and release it.	<ul style="list-style-type: none"> <li>• The lens must be fed out from the stand-by position and viewfinder frame must move accordingly.</li> <li>• The lens must stay in the fed out position when SP switch is turned off.</li> </ul>	
	(5) Press down SAF switch.	<ul style="list-style-type: none"> <li>• MF mark goes out.</li> <li>• The lens must move from fed out position to stand-by position.</li> </ul>	



	Procedure	Checked Item	Remarks
(8) Shutter operation check	(1) Make the place around the camera bright, face the camera to an object in a distance (0.7m or longer), and set SP switch to ON (press down lightly).	<ul style="list-style-type: none"> <li>• [<math>\ast</math>. <math>\ast</math>m] must be displayed on FLCD.</li> <li>• The lens must move from the stand-by position to fed out position.</li> <li>• The lens must move from the fed out position to stand-by position when SP switch is turned off.</li> </ul>	Distance fluctuates as AF has not been adjusted. AV $\neq$ 4, TV $\neq$ 60  After the SP switch is turned off, measured light value must be displayed in the viewfinder for about 5 seconds.
	(2) Press down SP switch deeply.	<ul style="list-style-type: none"> <li>• SELF LED must light for a second when the shutter is released.</li> <li>• The lens must move from the fed out position to stand-by position.</li> </ul>	
	(3) Set SP switch to OFF.	<ul style="list-style-type: none"> <li>• The display in the FLCD goes out.</li> </ul>	
	(4) Cover up the lower side of the AF, face the camera to an object, and set SP switch to ON (press down lightly).	<ul style="list-style-type: none"> <li>• [<math>\ast</math>. <math>\ast</math>m] must be displayed on FLCD, and the lens must move to the fed out position.</li> </ul>	Passive inspection
	(5) Set SP switch to OFF.		
	(6) Face the camera to a 9% reflector located in a position about 50cm from the camera, and set SP switch to ON (press down lightly).	<ul style="list-style-type: none"> <li>• [0.7m] must blink on FLCD.</li> </ul>	Active inspection
	(7) Set SP switch to ON (press down lightly) once again.	<ul style="list-style-type: none"> <li>• IRED must blink.</li> <li>• The lens must move to the fed out position.</li> </ul>	
	(8) Set SP switch to OFF.		
(9) End	(1) Set SM switch to OFF  (2) Set power switch to OFF.	<ul style="list-style-type: none"> <li>• The lens must returns to the home position.</li> <li>• LCD goes out.</li> </ul>	Condition of camera at the end: Pressrue plate → 220

## 2. Inspecting the camera with covers installed.

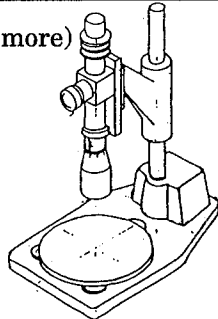
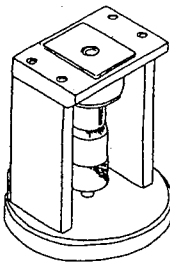
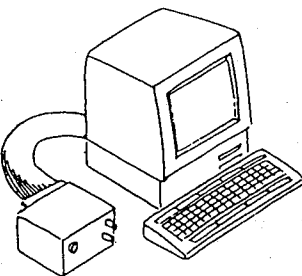
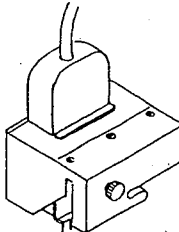
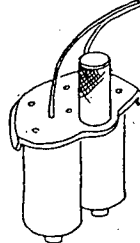
Inspected item	Method of inspection	Judgement standard
1. Shock the camera lightly.		(Battery label)
2. Checking M-mode (manual mode)	<ul style="list-style-type: none"> <li>• Set the mode dial to "M", and turn the UP/DOWN dial.</li> <li>• Pushing  button, turn the UP/DOWN dial and watch LCD.</li> <li>• Set the shutter to BULB, and by pressing down the shutter release, watch the lens.</li> <li>• Pop up the flash head, face the camera to a bright object, and see if the flash fires or not.</li> </ul>	<ul style="list-style-type: none"> <li>• Aperture display must change (4.0 ~ 22)</li> <li>• Shutter speed display must change.</li> <li>• The lens must be clean.</li> <li>• The flash head must pop up smoothly.</li> <li>• The flash must fire (normal firing).</li> </ul>
3. Checking A-mode (Aperture priority mode)	<ul style="list-style-type: none"> <li>• Set the mode dial to "A", press down the shutter release by changing brightness, and watch the displays in the viewfinder and on the LCD.</li> <li>• Pop up the flash head, change distance to an object, and see if the flash fires or not.</li> </ul>	<ul style="list-style-type: none"> <li>• The aperture must not change even if the brightness changes, but shutter speed must change.</li> <li>• The display in the viewfinder must be same as that on the LCD.</li> <li>• The flash must fire. (normal firing, check synchronizing)</li> </ul>
4. Checking P-mode (Program mode) and automatic flash firing at a low brightness	<ul style="list-style-type: none"> <li>• Set the mode dial to "P", press down the shutter release by changing brightness, and watch the displays in the viewfinder and on LCD.</li> <li>• Pop up the flash head, face the camera to a bright and dark objects, and release the shutter.</li> </ul>	<ul style="list-style-type: none"> <li>• Aperture value and shutter speed combination must change when brightness changes.</li> <li>• The display in the viewfinder must be same as that on the LCD.</li> <li>• The display in the viewfinder must be complete and has no remarkable reflection.</li> <li>• The flash must not fire when the camera is faced to a bright object, must fire when the camera is faced to a dark object, and it must be synchronized.</li> </ul>

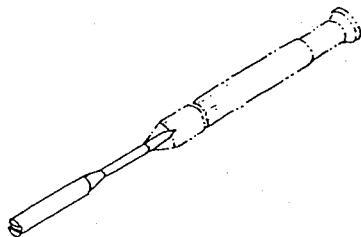
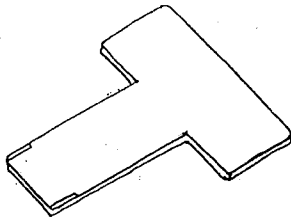
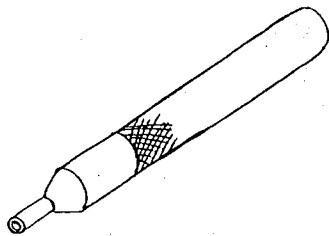
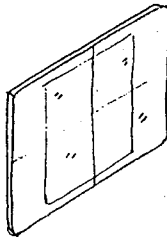
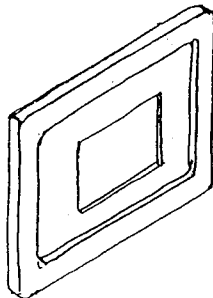
Inspected item	Method of inspection	Judgement standard
5. AF/MF switch over.	<ul style="list-style-type: none"> <li>Press down <b>AF</b> button and watch LCD.</li> </ul>	<ul style="list-style-type: none"> <li>At AF: No display must be made.</li> <li>At MF: <b>MF</b> must be displayed. The field of view frame must move when 5m is selected.</li> </ul>
6. Checking MF setting	<ul style="list-style-type: none"> <li>Set the camera to <b>MF</b> mode, turn the UP/DOWN dial by pressing down the MF button, and watch the LCD.</li> </ul>	<ul style="list-style-type: none"> <li><b>MF</b> mark must blink and the display must be made from 0.7m through Inf.</li> </ul>
7. Film transporting	<ul style="list-style-type: none"> <li>Transport each one 120 and 220 size film. Change over the setting of the pressure plate, also. After one film is transported completely, open the camera back and unload the film.</li> <li>With the camera back closed, press down the film loading knob.</li> </ul>	<ul style="list-style-type: none"> <li>The spool installation, FFS, one frame film advancement, exposure counter display, etc. must be normal.</li> <li>Electronic sound must be generated whenever the shutter is released. (When no electronic sound is generated, check if the camera is under ON mode or not.)</li> <li>Mid-run rewind (MR) (3 to 4 frames) must be made.</li> <li>Type of film changeover on the pressure plate must coincide with the display on the LCD.</li> <li>15 frames must be exposed with a 120 film, 30 frames must be exposed with a 220 film, the exposure counter must displays "E" at the end of film, and the "E" must go out when the camera back is opened.</li> <li>The knob must not jump out.</li> </ul>
8. Checking self-timer	<ul style="list-style-type: none"> <li>Press down the self-timer button and watch the LCD.</li> <li>Press down the shutter release and watch the self-timer LED.</li> </ul>	<ul style="list-style-type: none"> <li>Self-timer mark must be displayed.</li> <li>The LED must light first, blink thereafter, and the shutter must be released.</li> </ul>
9. Cable release installation	<ul style="list-style-type: none"> <li>Install a cable release, and try to release the shutter.</li> </ul>	<ul style="list-style-type: none"> <li>It must be possible to install a cable release.</li> <li>The shutter must be released.</li> </ul>

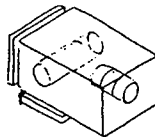
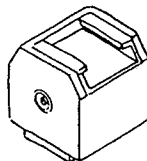

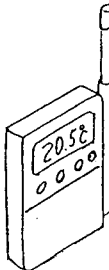
Inspected item	Method of inspection	Judgement standard
10. Interior appearance	<ul style="list-style-type: none"> <li>Open the camera back, and visually check inside the camera body and camera back interior.</li> </ul>	<ul style="list-style-type: none"> <li>The roller and film size changeover pin (push it) must operate normally.</li> <li>There should be no remarkable scar, contamination and lack of parts.</li> <li>All the moquettes are installed correctly.</li> </ul>
11. Checking data changeover and printing	<ul style="list-style-type: none"> <li>Press down the DATA button and watch the LCD.</li> <li>Open the camera back, and watch the LED lighting on the mask.</li> </ul>	<ul style="list-style-type: none"> <li>DATA must blink, and it is changed over in the order of month/day/hour, aperture, shutter speed and print inhibit.</li> <li>The LEDs must light correctly.</li> </ul>
12. Exterior appearance	<ul style="list-style-type: none"> <li>Check the top cover, camera back, front cover, bottom cover and lens for appearance.</li> </ul>	<ul style="list-style-type: none"> <li>There should be no remarkable scar, scratch, contamination and incorrect printing.</li> <li>All the parts must be installed correctly and firmly.</li> </ul>
13. Checking fractional control	<ul style="list-style-type: none"> <li>Pushing <span style="border: 1px solid black; padding: 0 2px;">+/-</span> button, turn the UP/DOWN dial and watch the LCD.</li> </ul>	<ul style="list-style-type: none"> <li>The display must change 0.5 step by 0.5 step.  <div style="display: flex; align-items: center; justify-content: center;"> <div style="font-size: 2em; margin: 0 10px;">[</div> <div style="text-align: center;"> <math>-2.0 \sim +2.0</math>  No LCD display at zero only. </div> <div style="font-size: 2em; margin: 0 10px;">]</div> </div> </li> </ul>
14. Viewfinder	<ul style="list-style-type: none"> <li>Press down the shutter release at a close-up distance (about 70 cm), and look into the viewfinder.</li> <li>Make sure that no dust exist in the viewfinder and object can be seen clearly.</li> </ul>	<ul style="list-style-type: none"> <li>The frame must be reduced (It must operate smoothly without dragging. It must return when the shutter release is released from the depression.)</li> <li>No dust should exist and any object must be seen clearly.</li> </ul>
15. Checking feet and meter changeover	<ul style="list-style-type: none"> <li>With the <span style="border: 1px solid black; padding: 0 2px;">AF</span> button pressed down, set the mode dial from OFF to ISO and watch the LCD.</li> </ul>	<ul style="list-style-type: none"> <li>m and Ft must be displayed.</li> </ul>

Inspected item	Method of inspection	Judgement standard
16.Film speed (ISO) changeover	<ul style="list-style-type: none"> <li>Set the mode dial to ISO, turn the UP/DOWN dial and watch the LCD.</li> </ul>	<ul style="list-style-type: none"> <li>It must be locked when the mode dial is set to OFF, and it should not operate unless the release button is pressed down. Further, it must click.</li> <li>ISO display must change accordingly. (25 through 1600)</li> </ul>
17.Checking AF	<ul style="list-style-type: none"> <li>Face the camera to a chart, and watch the viewfinder display. Inspect for 1.0m, 2.0m and <math>\infty</math>. (Inspections for both active and passive. When inspecting for passive, cover up the light emitter of active.)</li> </ul>	<ul style="list-style-type: none"> <li>The viewfinder display must change accordingly at 1.0m, 2.0m and <math>\infty</math>.  <div style="border-left: 1px solid black; border-right: 1px solid black; padding: 5px; margin: 10px 0;"> Test chart  Active → Gray chart  Passive → Pattern chart </div> </li> </ul>
18.Checking AE	<ul style="list-style-type: none"> <li>Set the mode dial to "P", and set the camera on an AE tester. (ISO 100)</li> </ul>	<ul style="list-style-type: none"> <li>LV8 → Within <math>\pm 0.3\text{EV}</math></li> <li>LV12 → Within <math>\pm 0.3\text{EV}</math></li> </ul>
19.Intrusion of foreign matter	<ul style="list-style-type: none"> <li>Shake the camera and see if any noise is generated or not.</li> </ul>	<ul style="list-style-type: none"> <li>No noise should be generated.</li> </ul>
20.Contact efficiency	<ul style="list-style-type: none"> <li>Measure by means of a measuring instrument.</li> </ul>	<ul style="list-style-type: none"> <li>Must be 60% or higher.</li> </ul>

## VI. SPECIAL TOOL LIST

Name	Application	Remarks
Collimater	For adjustment of focus	(f = 200mm or more) 
Focus adjust stand (JA869)	For adjustment of focus	(Common used 6 X 9) 
EEPROM adjust jig	For adjustment of AE, BC, AF and focus	
Connecter (JA1496)	For adjustment of AE, BC, AF and focus	
Dummy battery (JA60081)		

Name	Application	Remarks
Shaft tightening jig (JA60035)	To tighten shaft (4-47)	
Rear lens assembly tightening jig (JA1499)	To tighten rear lens assembly (4-40)	
Clip ring tightening jig (JA1497)	To tighten clip ring (1-8)	
Parallax adjust jig (JA1495)	For adjustment of viewfinder Parallax	
AE light receiver adapter (JA1494)	For adjustment of AE	

Name	Application	Remarks
Level (Available in a commercial market)	To hold the camera horizontally when measuring passive AF.	
Flash code connecting adapter (Available in a commercial market)	To check flash synchronization	
Flash meter (Available in a commercial market)	To measure synchronization (For EEPROM writing)	 <p>(With 10° viewfinder)</p>
Thermometer (Available in a commercial market)	To measure temperature (For EEPROM writing)	



## VII. LUBRICANTS, ADHESIVES AND SOLVENT

The following table shows the lubricants, adhesives and solvent required when repairing the camera.

No volume is specified particularly. Apply them properly.

Segment	Name	Maker	Main application
Lubricant	Losoid 6308/1G	Logimole	Film transporting mechanism
	G30M	Taken care by FPO-TS	Lens driving system
	Helicolube (FHA054)	Taken care by FPO-TS	Camera body (take-up shaft)
	Tungsten bisulfide (WS2)	Taken care by FPO-TS	Camera body Film transporting system Top cover assembly
	Hilube A7104	Harves	Controller assembly (UP/DOWN contact)
	Dry Surf MF-2400N	Harves	Top cover assembly (Pop-up lever)
Adhesive	Three Bond 1521B	Three Bond	
	Three Bond 1401B	Three Bond	Front cover assembly (Front lens)
	Technotite		Camera body
	Pliobond	Taken care by FPO-TS	Number plate, Leather on the camera back
	Cemedine Hi-Super 30	Cemedine	AF system (PSD)
Solvent	(Cleaning alcohol)	Not designated particularly	Cleaning contacts in the electrical system

