KYOCERA

No	419-01-50 RA1AM01

CONTAX RX

Repair Manual

Approved by	Made by
風 '94.9.30 良	氏 '94.9.30 家

京セラ株式会社 海外営業部 '94.10.05 発行

KYOCERA CORPORATION
Optical Equipment Group
Service Dept. 1AM 940930

CONTENTS

A. GENERAL & TECHNICAL INFORMATION

B. DISASSEMBLY & REASSEMBLY PROCEDURES

C. ADJUSTMENT PROCEDURES, ETC.

A. GENERAL & TECHNICAL INFORMATION

FEATURES

1. "DIGITAL FOCUS INDICATOR" INCORPORATED

The CONTAX RX incorporates the "Digital Focus Indicator (DFI)" function as an auxiliary function for focusing.
The Digital Focus Indicator shows at the bottom of the viewfinder the variance between the focus point for the subject and the current focal position of the lens. (Quantity of defocusing)
Thanks to the accurate indication of the variance from the true point of focus by the DFI function, the camera assures both a high focus accuracy and excellent operational efficiency.
For DFI function, there are two indication modes, namely, Depth of Focus Scale Indication mode and Focus Scale Indication mode.

- The Depth of Focus Scale Indication mode indicates the depth of focus which changes with the aperture setting value as well as the variance from the true focus point and the direction of variance.
- The Focus Scale Indication mode indicates only the variance from the true focus point, with emphasis placed on easy continuous shooting.

2. HIGHLY DURABLE AND RELIABLE CAMERA BODY

The excellent durability and reliability of the camera body are realized so that it withstands a long use under severe shooting conditions. The highly reliable, rigid chassis is diecast from aluminum alloy and the top and bottom covers are made of metal so that they protect the precision mechanism inside the camera securely. In addition, the main controls are large dial type designed for easy operation and excellent readability.

3. DESIRED DRIVE MODE AND DFI FUNCTION SELECTABLE BY SINGLE ACTION

The Drive Mode Selector Dial is provided with a green position so that the photographer can select his or her desired shooting mode quickly. The green position is provided for presetting a desired scale indication (Focus Scale or Continuous) of the DFI system. While taking pictures, the setting of the Drive Mode Selector Dial to the green position will change the drive mode and scale indication to the preset ones, thus the photographer can cope with the change in the photographic conditions flexibly.

4. CUSTOM FUNCTIONS PROVIDED

The CONTAX RX provides a method called Custom Function, which allows the photographer to set functions as the user wishes. This method allows: ● Selection of viewfinder display ● Mode setting at green position ● Selection of AE Lock method ● Selection of multiple exposure ● Selection of the order of Automatic Bracketing Control (A.B.C.) system.

5. ENHANCED OPERATIONAL EFFICIENCY AT SHOOTING WITH FLASH

The combination of the CONTAX RX and TLA360 Flash Unit results in improved communication between camera and flash, the ISO and aperture information are held in common. And the displayed on the back panel of the flash shows the coupled shooting range. Also together with exposure compensation on the camera, exposure compensation on the flash is allowed so that the balance between flash light and natural light can be adjusted. The auto - power - on charging mechanism on the TLA360 is activated by de - pressing the shutter release button on the camera halfway even while the auto - power - off feature on the TLA360 for power saving is in action.

6. OTHER FEATURES

○ **Highly Reliable and High - precision Shutter**

The shutter speed can be set in a range of 16 seconds to 1/4000 second in Aperture Priority AE mode and Program AE mode, 4 seconds to 1/4000 second in Shutter Speed Priority AE mode, it can be set to B (Bulb), X or in a range of 4 seconds to 1/4000 second in Manual mode.

○ **Light Metering Modes**

The camera is provided with two light metering systems —— the center - weighted average metering system, which displays excellent performance at continuous shooting, and the spot metering system, which determines the exposure precisely. Switching between these two systems can be performed by a simple operation of the Metering Mode Selector Lever. The spot metering zone corresponds to the about 5mm central area in the viewfinder.

○ **Exposure Control Modes**

The camera can be operated in Aperture Priority AE mode (Av) , Shutter Priority AE mode (Tv) , Program AE mode (P) and Manual Exposure mode (M) to cope with a wide range of photographic conditions.

○ **Dioptric Adjuster**

The CONTAX RX incorporates a dioptric adjuster which can be adjusted according to the ocular refraction of the photographer. The bright viewfinder and this dioptric adjuster facilitate high - precision focusing.

○ **Data Back for Imprinting Data between Frames Provided as Standard Feature**

As a standard feature, the camera is provided with the data back which imprints data in the vertical margin between the film frames. The photographer can select one of the five imprinting patterns —— year/ month/day, day/hour/minute, no print, month/day/year and day/month/year.

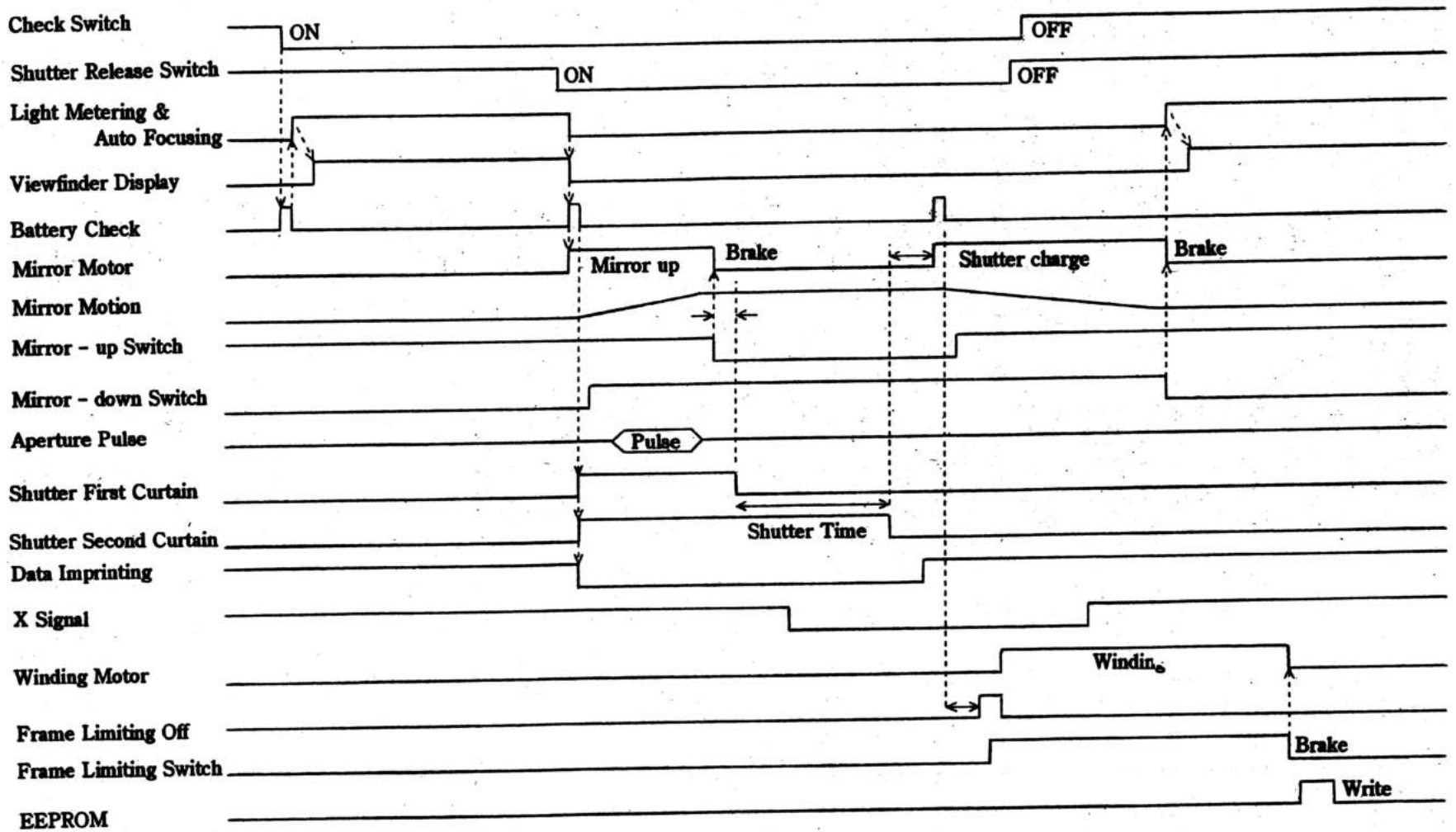
CONTAX RX SPECIFICATIONS

Type	:	35mm Focal Plane Shutter AE SLR Camera.
Film Size	:	24 × 36mm.
Lens Mount	:	CONTAX/YASHICA MM Mount
Shutter	:	Electronically controlled, Vertical - travel Focal Plane Shutter.
Shutter Speed	:	AV (Aperture Preferred) & P (Program) 16 secs. – 1/4000 sec., TV setting (Shutter Speed Preferred) 4 secs. – 1/4000 sec., Manual: B, X (1/125 sec.), 4 secs. – 1/4000 sec.
Flash Synchronization	:	X - setting at 1/125 sec. or slower. Direct X - setting & synchro - terminal provided.
Self - Timer	:	Electronic - type with 10 sec. delay.
Shutter Release	:	Electromagnetic release with exclusive release socket.
Exposure Control Mode	:	1. Aperture preferred AE (Av) 2. Shutter Speed Preferred AE (Tv) 3. Program AE (P) 4. Manual Exposure (M) 5. TTL Auto Flash 6. Manual Flash
Metering System	:	TTL Center - weighted Average Metering & Spot Metring
Metering Range (ISO 100, f/1.4)	:	Center - weighted Average Metering: EV1 - EV20, Spot Metering: EV5 - EV20
Film Speed Setting	:	Automatic with DX - coded film of ISO 25 - 5000. Manual Setting ISO 6 - 6400
AE Lock	:	By Exposure Value on the image plane in memory
Exposure Compensation	:	+2EV to –2EV (in 1/3 EV steps)
A.B.C. System	:	A.B.C. lever . 3 frames continuous exposures or single frame advance. Exposure range: ± 0.5EV to ± 1.0EV
Coupled Flash System	:	TTL Direct Flash Control w/TLA flash.
Flash Coupling	:	Automatic shifting of shutter speed at full charge of the exclusive TLA flash.
Auto - Set Flash System	:	Automatic switch - on system works with TLA - 360.
Second Curtain synchro	:	Possible with an exclusive TLA flash which is capable of second curtain synchronization.
Focus Indicator	:	TTL Phase Difference Detection method, Display with Digital Focus Indicator in the finder. Focus sensing range (ISO 100): EV 2 - 20.
View Finder	:	Fixed Eye - Level Pentaprism (long eye - point) with 95% of field of view & 0.8X magnification with 50mm standard lens at infinity & –1D diopter
Dioptric Adjustment	:	Internally adjustable from +1D to –3D.
Focusing Screen	:	Horizontally split - image/Microprism (FW - 1) as standard. Focusing screens are interchangeable.
Finder Display	:	Digital Focus Indicator, Shutter Speed, Aperture, Exposure Mark, A.B.C. display, Exposure compensation, Metering display, Flash mark, Film counter
External LCD Panel	:	Display of: Film counter, Film speed, Self - timer count, LT exposure (Bulb) count, Customs function display, Battery warning mark, A.B.C. display, Multi - exposure display
Film Loading	:	Auto loading, Automatic film advance to frame No.1 when the shutter release button is pressed.
Film Advance	:	Automatic film advance with built - in motor

Film Rewind	:	Automatic film rewind with built - in motor (Film - rewind stops when the film is rewound.) Mid - roll rewinding possible.
Drive Mode	:	Single - frame, continuous exposure, self - timer and multi - exposure modes.
Film Advance Speed	:	Max. 3 frames per second on continuous mode (with fresh battery in normal temperatures.)
Film Counter	:	Automatic resetting, Additive type ; display shows LT exposure (Bulb) count, self - timer count, A.B.C. display
ACC. Shoe	:	Direct X - contact (Coupled With TLA flash)
Custom Function	:	● Display of selected mode in the finder (Focus priority mode/Exposure priority mode/No display) ● Mode selection at green "o" position. ● Method selection of AE - lock (by half - way pressing of shutter release button /by exposure check button, or no AE - lock setting.) ● Multi exposure selection ● A.B.C. exposure order selection ● Depth - of - field preview operation ● Film rewinding mode selection
Camera Back Cover	:	Opened by the camera back opening lever. Detachable, Data - back and film check window are provided.
Data Back	:	Built - in Quartz clock (auto calendar), Imprint: Year/Month/Day, Day/ Hour/Minute, Month/Day/Year, Day/Month/Year, and No print.
Power Source	:	1 pc. 6V Lithum Battery (2CR5), 1 pc. 3V Lithum Battery (CR2025) for Data - back.
Battery Check	:	Automatic checking system. Display on the LCD panel.
Others	:	Depth - of - field preview button.
Dimensions	:	151 (W) × 104.5 (H) × 59mm (D) (6 × 4-1/8 × 2-3/8in.)
Weight	:	810grams (28.57ozs) (without battery)

* Design and specifications are subject to change without notice in advance.

TIMING CHART



[INTERNAL STRUCTURE]

(1) Body Structure

The main driving units and their layout are as shown in Fig.1. ① is the Film Winding Mechanism, ② the Quick Return Mechanism and ③ and ④ the Film Rewind Mechanism. These units are provided with their own motors which are designed to give appropriate torques, respectively.

The Film Winding Gear Train, located above the Grip, is driven by the motor in the Spool.

The Quick Return Mechanism, placed at the side of the Mirror Box on the Grip side, is driven by the motor in the lower part on the Grip side. This mechanism performs mirror up and down, aperture control and Shutter Lever charge by rotating the cam.

The Rewind Mechanism rewinds the film by the energy which is given from a motor to the 1st Gear Train ③ and transmitte to the 2nd Gear Train via the Transmission Shaft ⑤

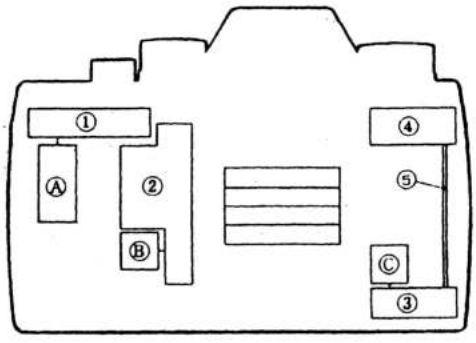


Fig.1 Layout of Units

(2) Film Winding and Rewind Mechanisms

Fig.2 shows the structure of the Winding and Rewind Mechanisms. For winding, the dedicated high - performance miniature motor ① incorporated in the spool drives the Winding Spool via the Gear Train ② having a proper reduction ratio.

For rewinding, the dedicated high - performance miniature motor ③ at the bottom of the body drives the Rewind Fork via the Primary Reduction Gear Train ④ at the bottom of the body, the Drive Shaft ⑤ and the Secondary Reduction Gear Train ⑥ at the top of the body.

In the winding and rewind mechanisms, a clutch mechanism using an epicyclic gear is provided in the drive gear trains. Before the driving of one of the two mechanisms, the motor of the other mechanism is reversed to make the latter mechanism free.

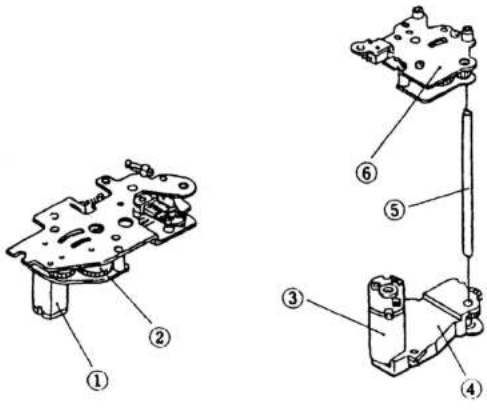


Fig.2 Winding and Rewind Units

Fig.3 shows operational positions of the Frame Limiting Mechanism which enhances the accuracy of the film stop position. When the Magnet Plunger has been energized after completion of the shutter travel sequence, the claw at the end of the Frame Limiting Lever ③ is released from the part of grooved in the Frame Limiting Cam ④ by tensile force of the Frame Limiting Cam ④ (Ⅱ). Consequently, the Sprocket connected directly to the Frame Limiting Cam becomes free and the motor can drive the Spool to advance the film. During the film advancement by one frame, the trip in force for the claw is charged by the cam (Ⅲ).

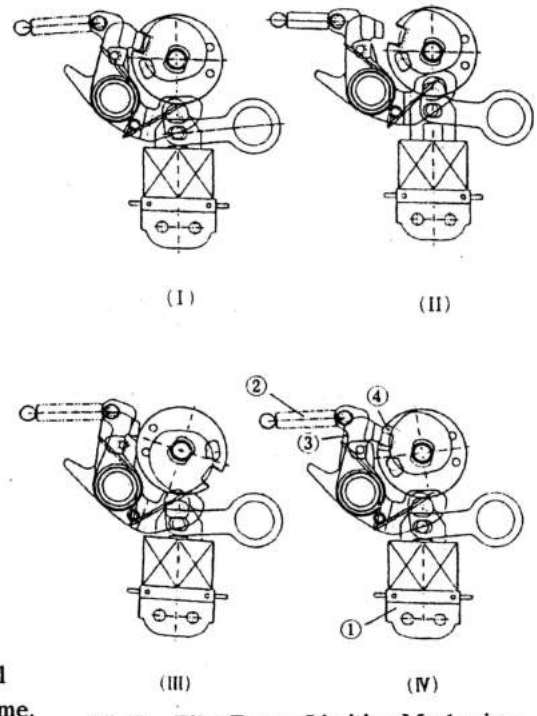


Fig.3 Film Frame Limiting Mechanism

And when the film has advanced by one frame, the claw trips in the part of grooved of the cam at the end of its one revolution so that the Sprocket stops with accuracy. The cam consisting of two layers reverses during rewinding. At reversing, the two layers rotate differentially to narrow the width of the grooved, thus preventing the claw from tripping in (Ⅳ). Therefore, in spite of the incorporation of the mechanical frame limiting means, automatic rewinding is allowed.

(3) Mirror Drive and Aperture Control Mechanism (Fig.4)

The release sequence is such that the plunger operates to release the hook first and then the motor runs so that the lever moves on the cam to perform mirror - up, release the latch of shutter and aperture stop - down. Coupled with aperture stop - down, an encoder detects the amount of travel and the plunger and ratchet control aperture. After the opening and closing of the shutter, the motor runs again to perform mirror - down, shutter charge and aperture return at different timings so that the motor is loaded evenly.

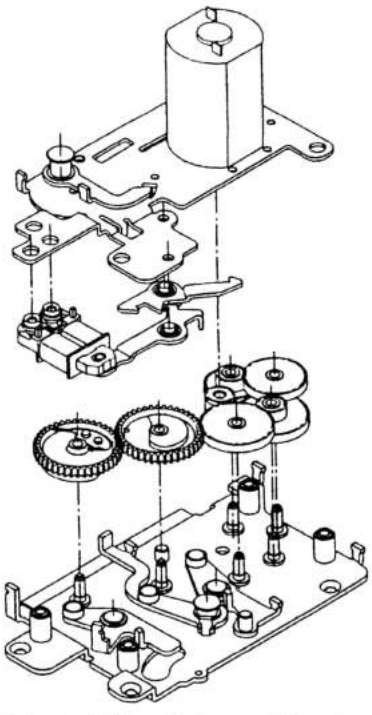


Fig.4 Mirror Drive and Aperture Control Unit

(4) Optical System

Fig.5 shows the sectional view of the optical system. For the viewfinder optical system, the Focusing Screen ① is used with the matte surface down, a Condenser Lens ② is located and the reflection surface of the Pentaprism ③ is coated by silver - evaporation to realize a bright viewfinder. The Eyepiece ④ is provided with a dioptric adjuster.

For the viewfinder screen, the horizontal split - image/ microprism collar screen is supplied as standard equipment. And additional four interchangeable types of focusing screens (microprism spot/collar screen, matte screen, sectioned grid matte screen and cross - scale screen) are available for enhanced focusing of various subjects and shooting conditions. In the light metering optical system, the element for steady light metering ⑤ is located above the eyepiece and the element for TTL direct flash metering ⑥ is under the Mirror Box. In the auto focusing system, the auto focusing element ⑦ is placed under the Mirror Box and light is led under the Mirror Box by the Sub Mirror to determine the distance.

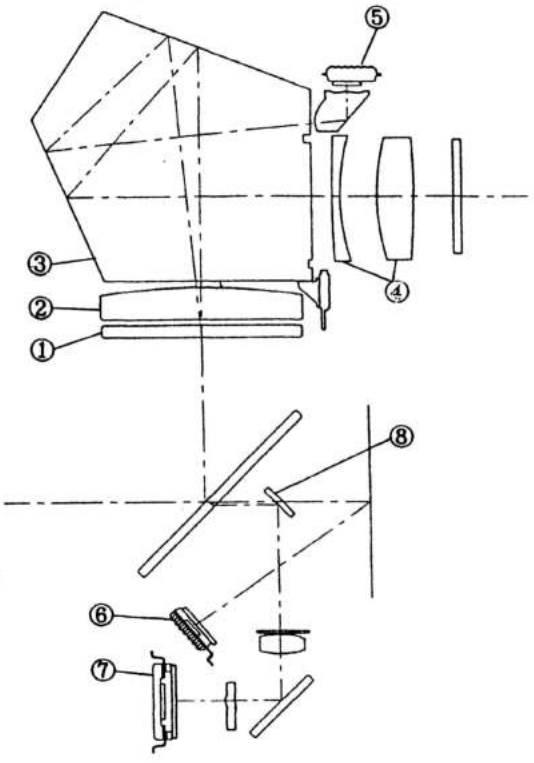


Fig.5 Optical System Layout

[INFORMATION DISPLAY]

(1) Viewfinder Display

The viewfinder display, using LCD information, is always kept easy to see by adjusting the brightness of the back light LED. The indication color is yellow - green, which is least stimulative to the eyes.

The indicators, concentrated at the bottom of the viewfinder, are ① Film counter, ② Metering display, ③ Exposure compensation, ④ Flash mark, ⑤ Digital focus indicator, shutter speed, ⑥ Aperture value, ⑦ Exposure mark and ⑧ Shutter speed indicator. (Fig.6)

The film counter indicates 00, 01, 02, ····, 99.

The 2 - digit positions show the A.B.C. photographic conditions: Both digits blink to show normal exposure, only the left digit blinks to show overexposure and the right digit blinks to show underexposure. At use of the self - timer, the counter counts down like 10, 09, 08,···, 00.

In the metering display position, only a frame appears at center - weighted average metering while a circle blinks at the center of the frame when spot metering is turned ON. At AE lock, each display blinks.

The exposure compensation indicator shows "+" at setting on the plus side or "−" at setting on the minus side.

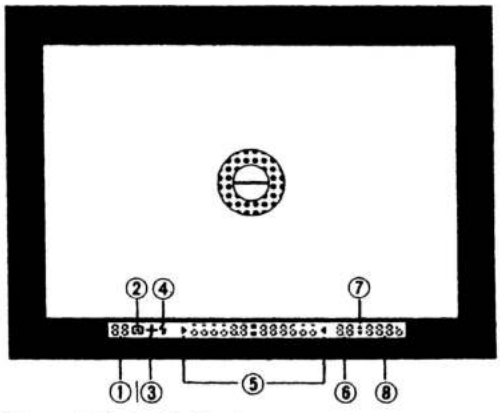
The flash mark lights up upon completion of the charging of the dedicated flash.

When the result of TTL automatic flash metering is within the allowable range, the mark blinks for two seconds to show the completion of flash metering. The aperture value display shows the aperture setting value in Aperture Priority AE mode or Manual Exposure mode while it shows an aperture value according to the brightness in Shutter Priority AE mode or Program AE mode.

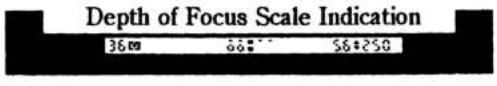
In the exposure mark position, a triangle mark lights up when exposure is above the manual exposure setting while a upside - down triangle mark lights up when exposure is below the setting.

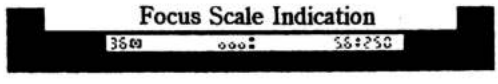
In Aperture Priority AE mode, Shutter Priority AE mode and Program AE mode, the triangle mark blinks for warning when the external light is too bright.

The shutter speed indicator shows 16" to 4000 for 16 seconds to 1/4000 second.

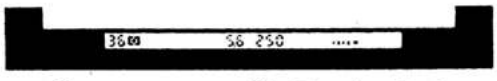


Focus Priority Indication





Exposure Priority Indication

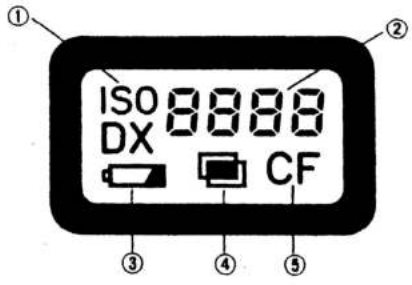


① Film counter, ② Metering display,
③ Exposure compensation,
④ Flash mark, ⑤ Digital focus indicator, shutter speed, ⑥ Aperture value,
⑦ Exposure mark,
⑧ Shutter speed indicator

Fig.6 Viewfinder Display

(2) External Display

An LCD panel is used for the external display. It indicates ① ISO, DX mark, ② film counter/film speed setting, ③ battery warning mark, ④ multi - exposure mark and ⑤ Custom Function mark.
The ISO mark lights up when ISO Setting mode is set or when film speed is displayed by pressing the "UP" or "DOWN" Button.
The DX mark lights up at automatic setting by DX code.
The film counter is always lighting even with the Main Switch turned OFF. Also this counter counts down at use of the Self - timer and in - dicates the shooting time at Bulb (up to 9'59 and repeating after that). The multi - exposure mark lights up when the multi - exposure position is selected and blinks for warning during multi - exposure shooting.

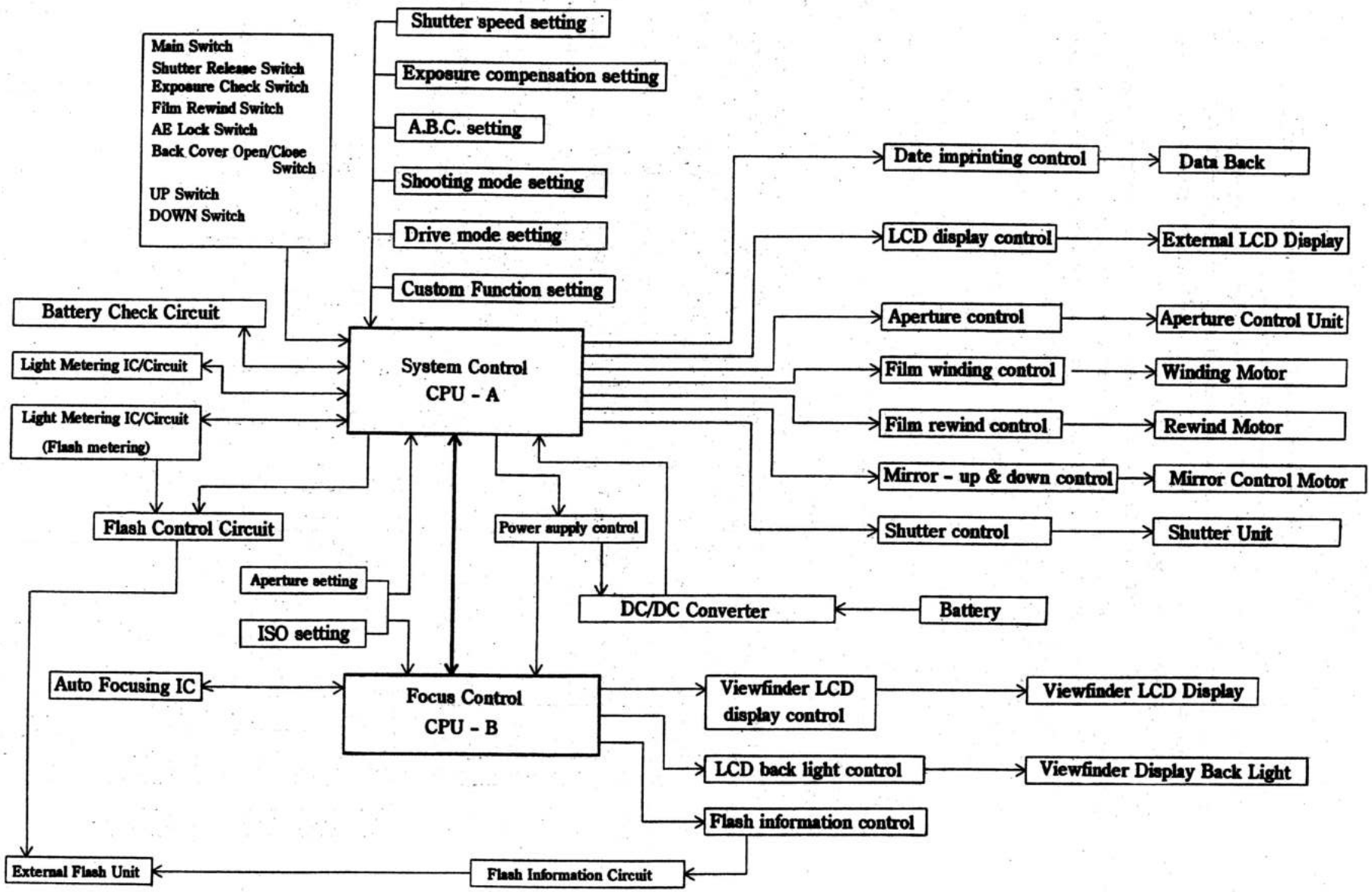


① ISO, DX mark, ② Film counter/film speed setting, ③ Battery warning mark, ④ Multi - exposure mark, ⑤ Custom Function mark

Fig. 7 External Display

No.	419-01-50-RA1AM01

Fig.8 Circuit Block Diagram



[ELECTRONIC CIRCUITRY]

The electronic circuitry consists of two high - performance CPUs as its central elements, a light metering circuit, auto focusing circuit, flash control circuit and other drive circuits.
The CPU - A controls the basic operations of the camera, such as light metering and release sequence, and related arithmetic operations. The CPU - B controls the arithmetic operations for Digital Focus Indicator functions and related viewfinder displays. The two CPUs perform their respective controls at the same time, thus enabling high - speed operations of the camera.
The CPU - B is positioned under control of the CPU - A to eliminate unnecessary power consumption.
The light metering circuit consists of a light metering sensor IC and the CPU - A. The light metering sensor IC , which is a package containing a photodiode and processing circuit, selects internally a light metering range according to the command of the CPU, converts the photocurrent to a voltage and transmit it to the CPU. The CPU has only to read this voltage by A/D conversion, since temperature compensation are already processed in the IC. Therefore, high - precision light metering is realized.
The auto focusing circuit consists of an auto focusing sensor IC and the CPU - B. The auto focusing IC integrates a CCD line sensor and signal processing circuit into one chip. The signal processing circuit extracts only the change in signal necessary for auto focusing and then amplifies and outputs it. The CPU receives this output directly for arithmetic operation. Because of no need of any external interface IC, the wiring is so simple that the circuit is not only resistant to external noise, showing a steady performance but also requires a small mounting area.
The flash control circuit consists of an flash metering sensor IC and the CPU - A. The flash metering sensor IC, which is a hybrid IC containing a photodiode and control IC in a package, starts flash metering upon receiving a signal from the CPU. It measures the quantity of the light reflected from the film plane and outputs a flash stop signal when the light exposure has reached a certain level. A high - precision flash metering is realized, since the flash stop signal is sent to the flash directly, not through the CPU. Also the CONTAX RX outputs through its hot shoe the necessary photographic data, such as aperture, ISO and exposure compensation by serial communication. Therefore, the indications and operations coupled with these data are allowed if an accessory capable of receiving this signal is mounted.
The battery check circuit checks the battery voltage according to the loads at the Main Switch ON, the Mirror up or down and film rewinding. It sends current into each drive motor for a moment and checks the battery voltage A/D converted by the CPU - A at that time. Judgment is made in two stages. In the 1st stage, the user is warned that the battery voltage is insufficient and in the 2nd stage, not only warning is given but also the camera operation is inhibited to prevent operation errors caused by voltage drop.
In addition, the CONTAX RX realizes a high - precision system by storing in EEPROM the values of light metering, auto focusing, flash metering and shutter speed to prevent their varying with cameras.

[DFI FUNCTION]

It is the DFI (Digital Focus Indicator) function that has been developed to assure a quicker, easier, accurate focusing.
For the DFI function, there are two indication modes, namely, Depth of Focus Scale Indication mode and Focus Scale Indication mode (Fig.9).
The Depth of Focus Scale Indication mode indicates the depth of focus which changes with the aperture setting value as well as the variance from the true focus point and the direction of variance. The Focus Scale Indication mode indicates only the variance from the true focus point, with emphasis placed on easy continuous shooting.

[Principle of DFI Function]

The DFI function is based on the TTL phase difference detection method which is widely used on SLR cameras. This focal point detection method is such that as shown in Fig.10, the image on the plane equivalent to the film plane in reformed as two images on the CCD Sensor through the refocusing lens and the distance between the two images on the sensor is measured to determine the variance from the true focus point and its direction.

Depth of focus is used to show the allowable range of the variance. This range is determined by the diameter of the minimum dispersion circle which shows the aperture value and the width of focal point. The larger the aperture value, the wider the depth of focus.

The Depth of Focus Scale Indication in the viewfinder shows the depth of focus corresponding to the aperture setting value (Fig.10).

The focus scale indication under the depth of focus scale indication can be compared with the depth of focus scale indication to decide whether or not the subject before or behind the focus is within the depth of focus. The focus scale showing the focus variance is controlled as a function of depth of focus so that it can indicate the in - focus position precisely. This indication is very useful when attention is paid to depth of field or a precise focusing is required. The indication, however, may fluctuate with a slight movement of the subject or camera all the more because the in - focus position is indicated precisely.

The Focus Scale Indication mode shows only the focus variance, indicating in - focus, rear focus or front focus. In this indication, the in - focus width is changed by taking the aperture setting value into account, so that the indication does not fluctuate around the in - focus position significantly. Also the focus scale showing the focus variance is controlled as a function independent of depth of focus. Therefore, the indication responds smoothly to the focusing of the lens and thus to the focusing in a out - of - focus area, so that this mode is useful for taking a picture of a moving subject or general photographs.

Thus the DFI function detects focus variance so precisely that it can be checked against the depth of focus. Consequently, the sensitivity of the CCD sensor is improved. Also the focus variance detected precisely is indicated steadily by providing a hysteresis with a width corresponding to the variance.

The " ▷ " or " ◁ " mark blinks when the focus variance is relatively large. Both the " ▷ " and " ◁ " marks blink for warning when auto focusing is impossible because of too low contrast of the subject.

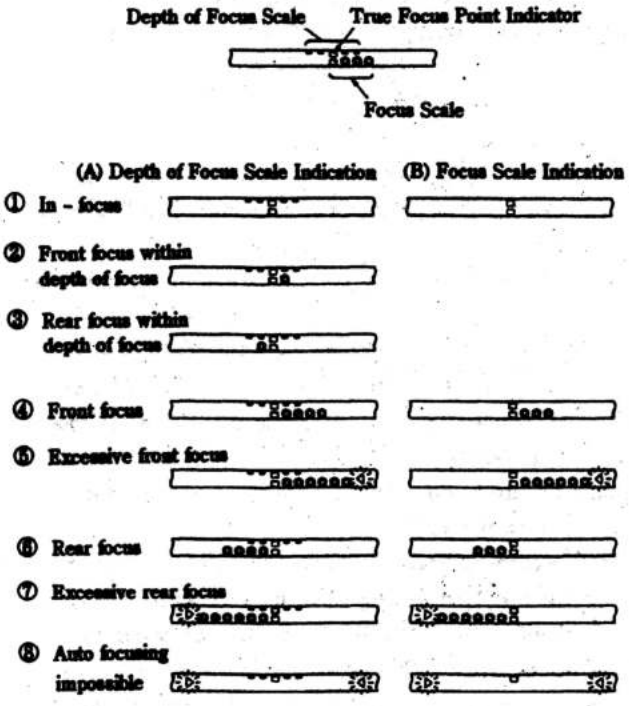


Fig.9 DFI Indication

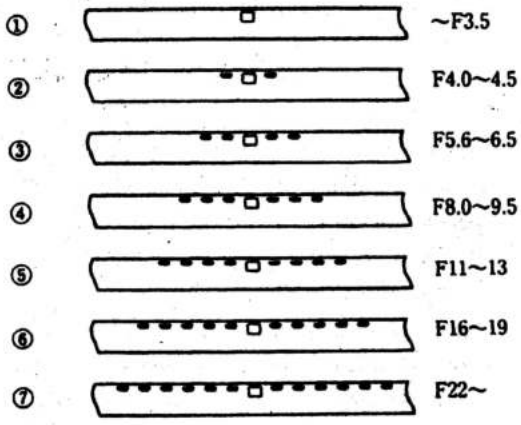


Fig.11 Relationship between Aperture and Depth of Focus

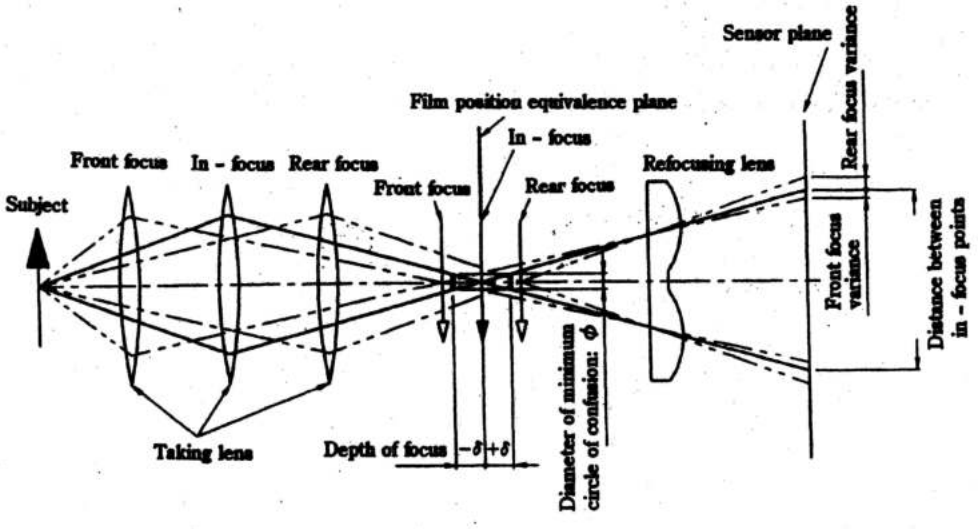


Fig.10 Principle of DFI Function

[EXPOSURE CONTROL]

(1) Light Metering

The light metering optical system and SPD are located above the eyepiece and an aspheric lens is used for the condensing lens to minimize the light metering error.

There are two light metering modes —— center - weighted average metering mode and spot metering mode. Either one can be selected by means of the Metering Mode Selector Lever. In the spot metering mode, light metering is made for the zone within a circle of 5mm diameter (converted value on film plane) in the center of the screen.

When the Main Switch is set to AE Lock (AEL), the measuring light exposure is locked at each measured in any light metering mode. It is also possible to select a custom function so that AE Lock can be set by depressing the Shutter Release Button halfway.

In TTL direct flash metering, light reflected from the film plane is measured by the SPD located under the Mirror Box and a flash stop signal is output to control the flash intensity of the TLA Flash Unit.

(2) Shutter and Exposure Mode

There are six exposure modes —— Aperture Priority mode (Av), Shutter Priority mode (Tv) and Program AE mode (P), Manual Exposure mode (M), X - sync (X) and Bulb (B). Among these six modes, any desired one can be selected and set by means of the Exposure Mode Selector Lever.

In Tv or M mode, shutter speed can be set and controlled in the range of 1/4000 to 1 second in increments of 1 Tv by setting the Shutter Speed Dial. In Av or P mode, shutter speed is controlled in the range of 1/4000 second to 16 seconds. When the aperture value calculated from the shutter speed setting through the Dial exceeds the control range, the shutter speed is so shifted that a proper exposure is obtained.

For shooting with flash, the TTL direct flash metering can be used in combination with the TLA Flash Unit. Also upon completion of charging the TLA Flash, the flash charge completion indicator appears and the shutter speed (1/125 sec.) allowing synchronization is automatically set.

When the TLA - 360 Flash Unit is used, the exposure compensation setting value on the TLA - 360 is effective in TTL direct flash metering. Therefore, with this value combined with the exposure compensation value on the camera, the photographer can create the photographic image by adjusting the balance between external light and flash light.

For A.B.C. (automatic exposure compensation in a three frame sequence) function, ± 0.5EV or ± 1.0EV can be selected as the compensation values. A.B.C. exposure order is either ① standard exposure, ② over exposure and ③ underexposure or ① overexposure, ② standard exposure and ③ underexposure, which can be selected by setting an appropriate custom function. This A.B.C. function can be used in all the exposure modes except shooting with flash or Bulb.

Exposure compensation can be set in the range of −2.0 to +2.0EV in 1/3EV steps. On the viewfinder display, "+" or "−" blinks to show that exposure is being compensated.

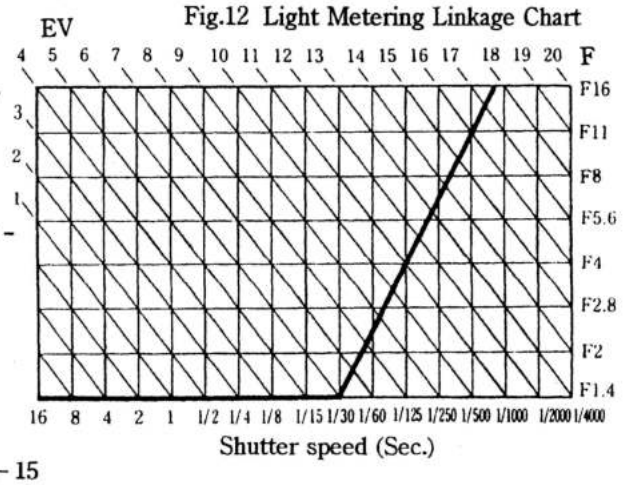
(3) Multiple Exposure

Multi - exposure function can be used even in combi - nation with any of the above - mentioned exposure functions so that the photographer can expand his or her photographic creativity.

By custom functions, the photographer can select flexi - bly a multiple exposure sequence based on a preset number of exposures or multi - exposure which can be continued as long as the photographer desires.

Since AE Lock can be kept effective by the switch, continuous picture - taking by any desired number of frames is possible with an exposure value fixed.

Fig.12 Light Metering Linkage Chart



[CUSTOM FUNCTIONS]

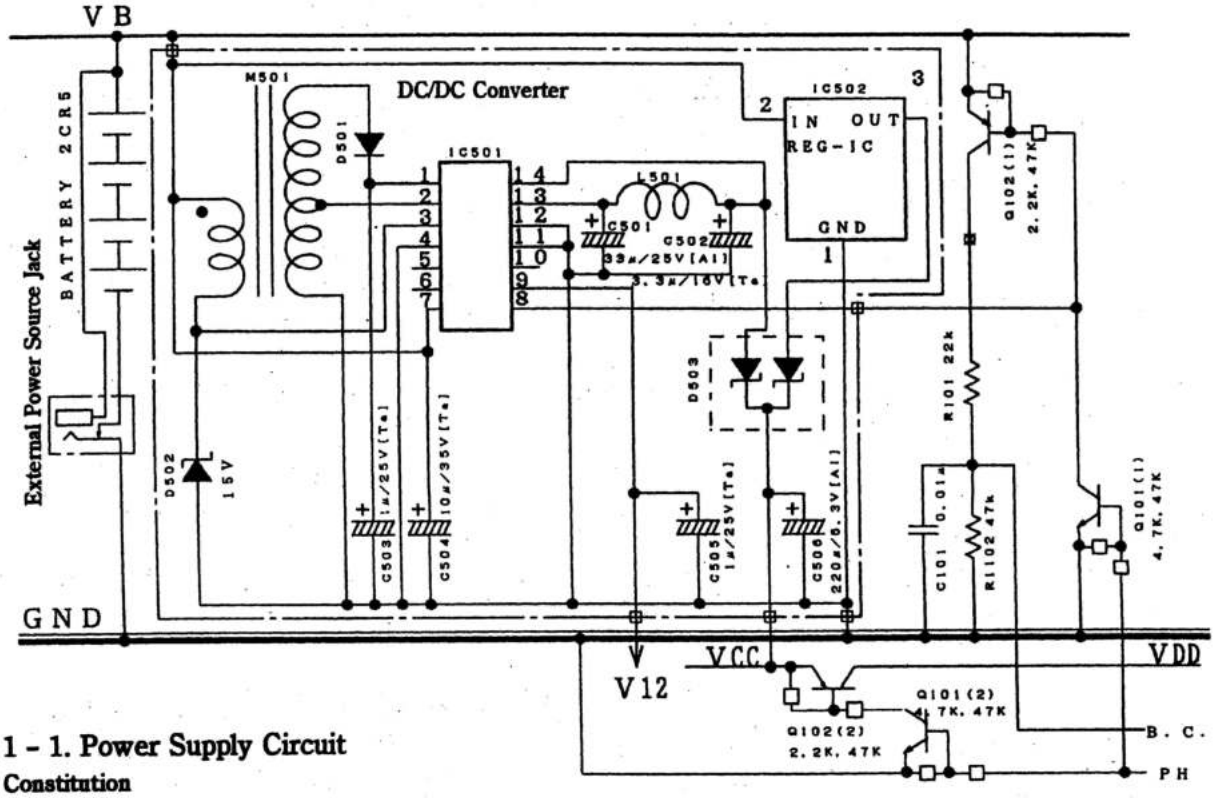
The CONTAX RX provides the Custom Function, which allows the photographer to set functions in desired combinations. Table 1 shows the functions which can be set by the Custom Function and their settings. The camera is shipped with the functions in the respective standard settings. The settings, however, can be changed according to the shooting conditions and the subject.
For example, when AE Lock is to be effected by depressing the Shutter Release Button halfway, set CF4 to 1. In this setting, AE Lock is set by depressing the Shutter Release Button halfway or pressing the Exposure Check Button. All the custom functions can be easily restored to the standard settings by setting CLE.

Table 1 Settings of Custom Functions

CF	Description	Setting " 0 "	Setting " 1 "	Setting " 2 "	Setting" 3 "
1	Viewfinder display for " S ", " C " or "⏲"	Depth of Focus Scale indication	Focus Scale indication	Exposure priority indication	No indication
2	Drive mode at green position	S	C	–	–
3	Viewfinder display at green position	Focus Scale indication	Depth of Focus Scale indication	–	–
4	Exposure Check Button	Exposure check function	Exposure check function + AE Lock function	–	–
5	Multi - exposure setting	Automatic release after a preset number of exposures	Manual release after a desired number of exposures	–	–
6	A.B.C. exposure order	Normal → Overexposure → Underexposure	Overexposure → Normal → Underexposure	–	–
7	Preview operation	The Depth of Field Preview button stops down the lens as long as the button is depressed	The Depth of Field Preview button is pressed once to stop down the lens and again to release	–	–
8	Film rewind type	Film rewound entirely in cartridge	Film leader remaining outside cartridge	–	–
9	Film rewind method	No auto rewind	Auto rewind	–	–
CLE	All Custom Functions are reset	–	–	–	–

[DESCRIPTION OF ELECTRIC CIRCUITRY]

1. Power Supply and Battery Check Circuit



1 - 1. Power Supply Circuit

Constitution

The Power Supply Circuit consists of a DC/DC Converter IC whose control terminal (Pin 8 of IC501) controls battery check by hardware. (PH signal)

Functions

Upon PH ON "Hi", the DC/DC Converter IC supplies a voltage of 5V to VCC and 12V to V12. At the same time, Q102 (2) is turned ON and the voltage of 5V is also supplied to VDD.

The voltage at VCC is assured unless the voltage at VB drops below about 2.5V.

At PH OFF "Lo", the DC/DC Converter stops and power to VCC is supplied from the Regulator IC (IC502).

In this state, operation is possible until the voltage at VCC drops to the reset voltage (VCC=3.7V).

Q102 (2) is turned OFF and thus the voltage supply to VDD is stopped.

The fluctuation range of the power supply voltage is as follows:

Vcc	4.8 ± 0.3V
VDD	4.8 ± 0.3V

Condition: current consumption 0 ~ 50mA

1 - 2. Battery Check Circuit

Constitution

The Battery Check Circuit consists of Q102(1), R101, R102 and C101.

Functions

The VB voltage divided by R101 and R102 is input to the A/D port of the CPU-A for checking.

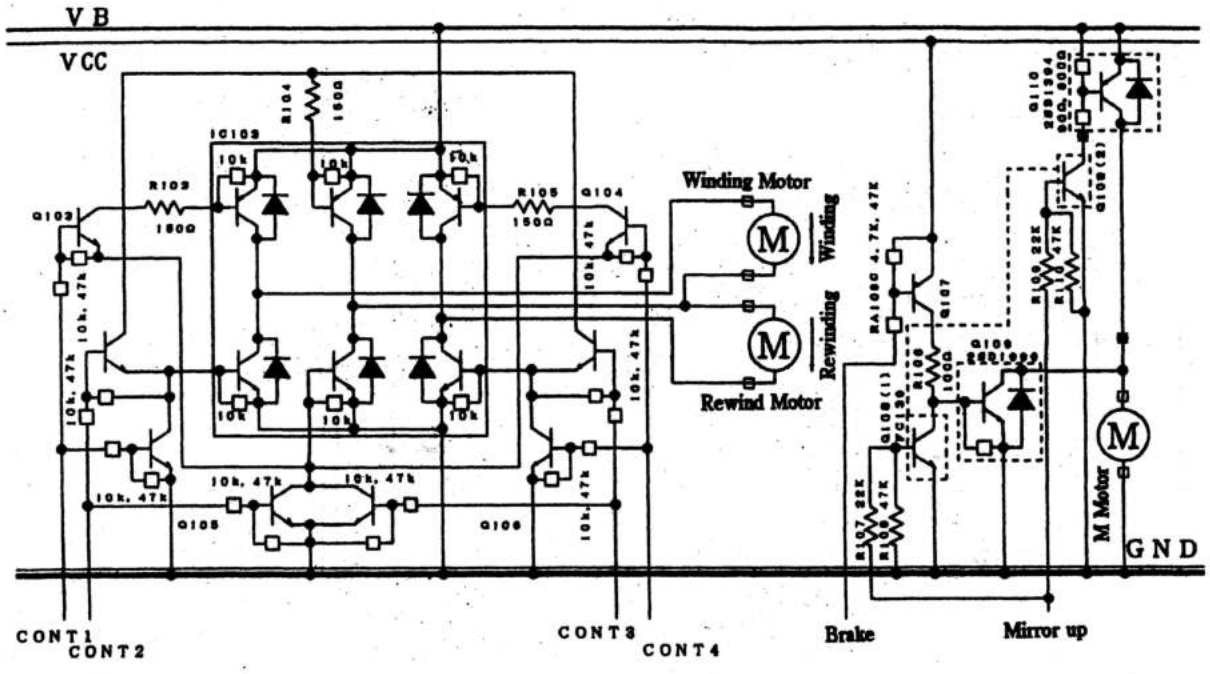
This voltage is stabilized by C101 and the current to be consumed by this resistor is cut by Q102 (1) at PH OFF.

The voltage input to the A/D port is as follows:

$VBC = VB \times 47k/(22k+47k) = VB \times 0.681$

(VB must be a maximum of 7.2V and B.C must not exceed 5V.)

2. Motor Drive Circuit



2 - 1. Winding/Rewind Circuit

Constitution

This circuit consists of the drive IC (IC103), transistors Q103 and Q104 for predriving, transistors Q105 and Q106 for protection, and base resistors R104, 105 and 106.

Functions

The control terminals are controlled by the CPU - A as shown below.

The Winding Motor and Rewind Motor must not run at the same time.

Thanks to a safety circuit incorporated, no through - current flows even if all the control terminal signals turn "Hi" because of, say, the runaway of the CPU.

CONT1	CONT2	CONT3	CONT4	Winding	Rewind
Hi	Lo	Lo	Lo	Forward run	Stop
Lo	Hi	Lo	Lo	Reverse run	Stop
Hi	Hi	Lo	Lo	Brake	Stop
Lo	Lo	Hi	Lo	Stop	Forward run
Lo	Lo	Lo	Hi	Stop	Reverse run
Lo	Lo	Hi	Hi	Stop	Brake

2 - 2. Mirror - up Circuit

Constitution

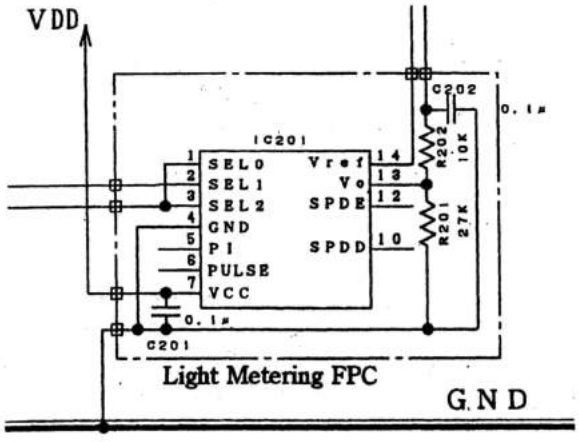
This circuit consists of Q110 for driving, Q109 for brake, Q107, Q108 (1) and (2) for predriving and for protection against through - current and the resistors R106, R107, R108, R109 and R110 for current - limiting of the transistors.

Functions

The mirror - up control terminal signal is turned "Hi" to start the Mirror - up Motor and the brake control terminal is turned "Lo" to brake the Mirror - up Motor.

To prevent a through - current flowing in Q109 and Q110, Q109 is not turned ON with the Mirror - up Motor running even if the brake control terminal signal turns "Lo".

3. Light Metering Circuit



3 - 1. Light Metering Circuit

Constitution

This circuit consists of a light metering IC (IC201) incorporating an SPD, and R201, R202, C201 and C202

Functions

The SEL0, 1 and 2 terminal signals are directly controlled by the CPU - A to determine the light metering area. The SEL0 and SEL2 terminal signals are under a common control for use of spot metering and center - weighted average metering.

The following table shows the relationship between the control terminal settings and the light metering areas.

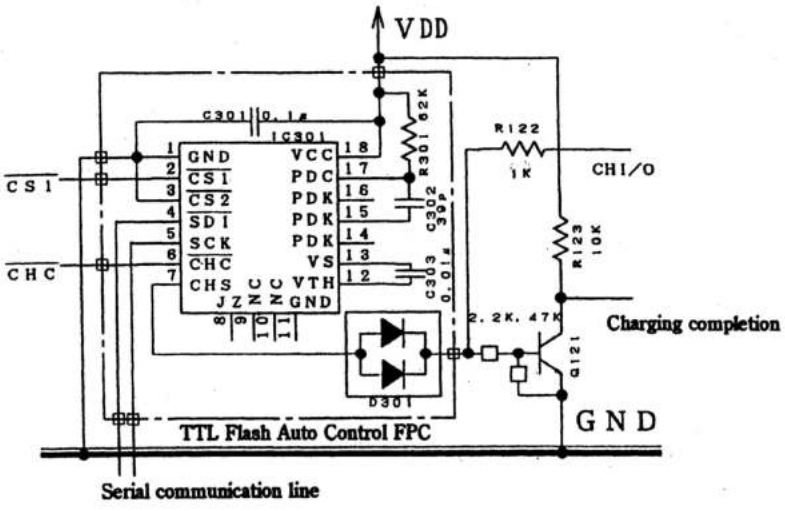
Control Terminal Settings and Light Metering Areas

Control terminal	Average	Spot	Decision
SEL 0, 2	H	L	L
SEL 1	H	H	L

When the decision state of the light metering IC is not used, the SEL1 terminal voltage may be pulled up to the VDD voltage. As the Vo terminal outputs a voltage proportional to the quantity of light received by the built - in SPD, the CPU - A receives this voltage for a certain time through the A/D conversion port and calculates the light exposure. Also light metering IC automatically performs temperature compen - sation and compensation for differences due to light metering areas, so that the CPU - A has not to perform extra operations.

Light exposure adjustment is not performed by hardware, but by arithmetic operation using the adjusted values (reference value and inclination) which have been measured with the specified adjusting tool and written in EEPROM (IC106) as backup data.

4. TTL Flash Auto Control Circuit



4 - 1. TTL Flash Auto Control Circuit

Constitution

This circuit consists of a light metering IC (IC301) incorporating an SPD, and R122, R123, R301, C302, C303, Q121 and D301.

Functions

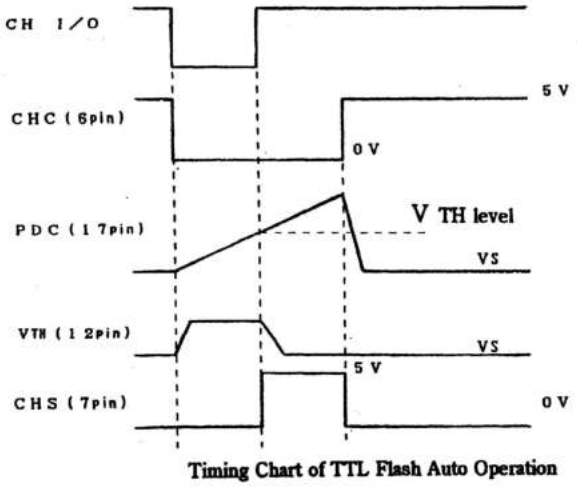
This circuit starts integration (accumulation of charges in C302) upon receiving the TTL Flash Auto control start signal "Lo" from the CPU - A and outputs the flash stop signal ("Hi" at CHS terminal) when the integral voltage has reached the reference voltage (V_{TH}). The CHS signal is output through D301 to CHI/O terminal.

The CPU - A controls TTL Flash Auto indication by receiving the $\overline{CHS}$ signal, which is the inverted flash stop signal.

For this TTL Flash Auto control operation, the CPU - A, while receiving the charging completion signal of the $\overline{CHS}$ signal, outputs the TTL Flash Auto control start signal (CHC) when the $\overline{CHS}$ signal has turned "Hi" after the turning - ON of the Shutter Release Switch. The reference voltage V_{TH} varies with ISO values. Each ISO value is transferred in the form of 5 - bit data by serial communication and converted to a voltage in the TTL Flash Auto IC.

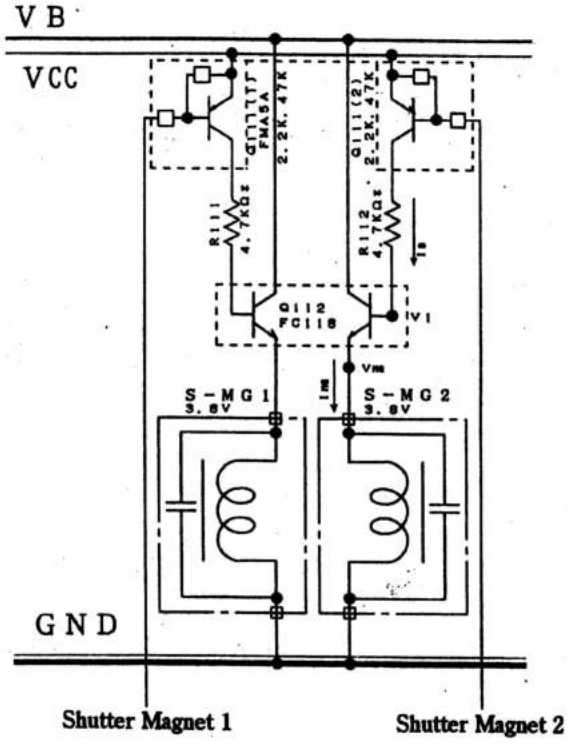
The adjustment of TTL Flash Auto control time of each camera is performed by shifting the ISO data. (Example: At setting of ISO100, ISO125 is transferred instead of ISO100 data.)

This adjustment is performed with the adjusting tool and the shift of the ISO data is stored in EEPROM (IC106) as backup data.



Timing Chart of TTL Flash Auto Operation

5. Shutter Magnet drive Circuit



5 - 1. Shutter Drive

Constitution

This circuit consists of the transistor Q111 for predriving, resistors R111 and R112 for base current limiting and the transistor Q112 for driving.

Functions

This circuit is basically a regulated DC power circuit. The voltage applied across each magnet is about 4.1V when V B is 4.2V or above or about (V B − 0.1)V when V B is about 4.1V or below.

The specifications for the shutter are as follows:

DC resistance R MG: 150 Ω ± 15 Ω

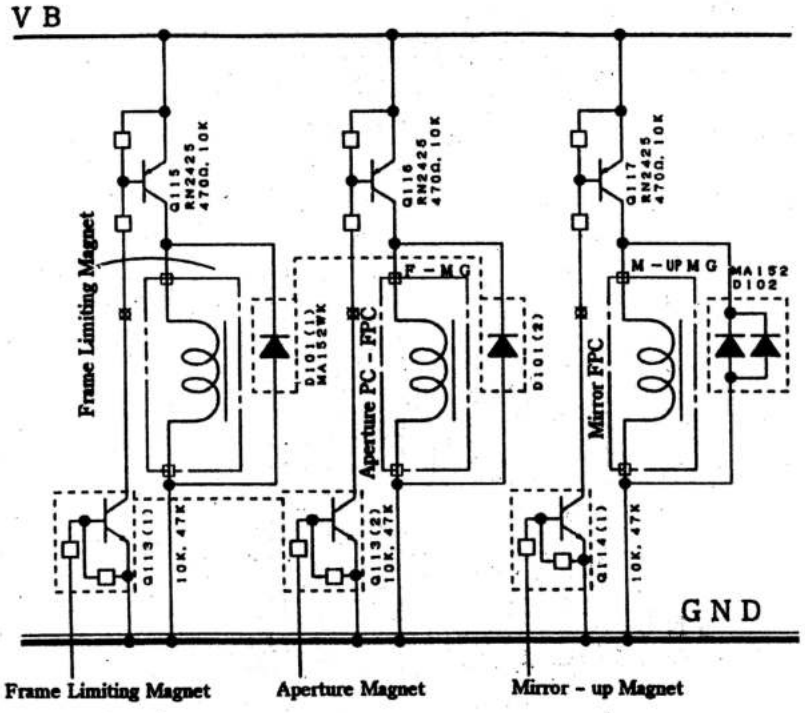
Operating voltage range: 3.8V ± 0.35V

The magnets are controlled as follows:

First Curtain Magnet S - MG1: ON when P12 signal of CPU - A is "Lo"

Second Curtain Magnet S - MG2: ON when P13 signal of CPU - A is "Lo"

6. Magnet Drive Circuit



6 - 1. Mirror, Aperture and Frame Limiting Magnets

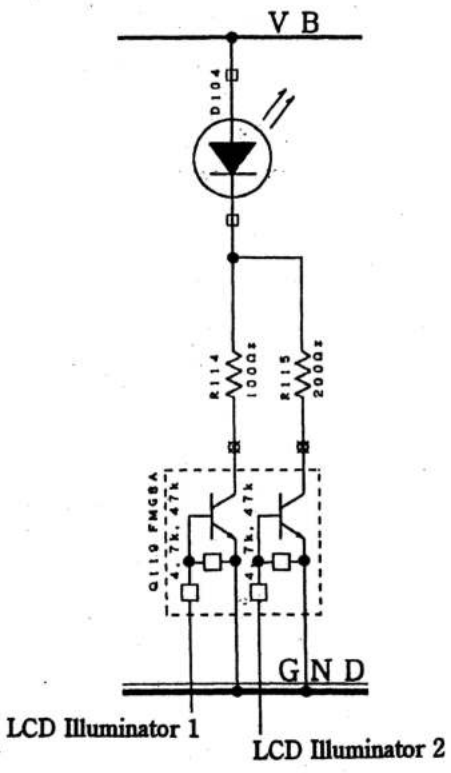
Constitution

This circuit consists of the transistors Q113 and Q114 for predriving the respective magnets, the transistors Q115, Q116 and Q117 for driving and the diodes D101 and D102 for absorbing counter electromotive force.

Functions

By turning the signal at the required control terminal "Hi" by the CPU - A, the transistor for driving is turned ON to energize the magnet.

7. Drive Circuit for Viewfinder LCD Back Light



7 - 1. Back Light LED Drive

Constitution

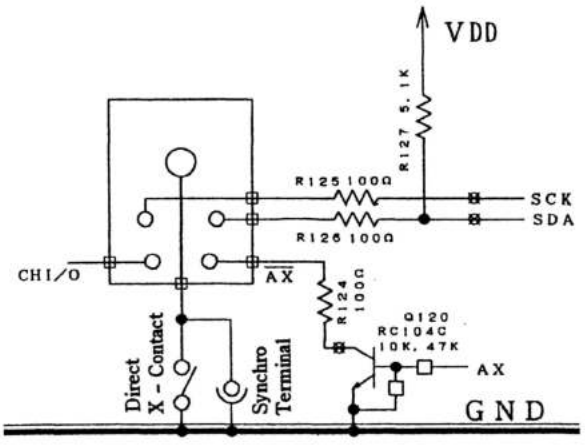
This circuit consists of the transistor Q119 for driving and the resistors R114 and R115 for current limiting.

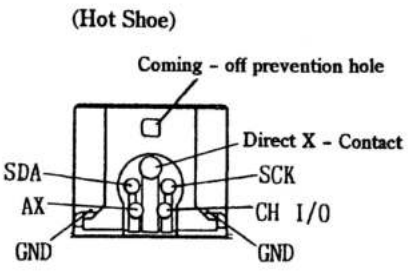
Functions

By controlling the two control lines for the LCD Illuminator 1 and LCD Illuminator 2 directly by the CPU - B, the brightness of the LCD back light is controlled in three steps according to the brightness of external light.

Brightness	Illuminator 1	Illuminator 2
Bright	H	H
Medium	H	L
Dim	L	H

8. Flash Circuit





8 - 1. Flash Related Circuit

Constitution

This circuit consists of the resistors R124, R125 and R126 for protecting the IC terminals, the pull - up resistor R127 for the SDA terminal, and the transistor Q120 for AX output.

Functions

For addition of communication function to the hot - shoe terminal, the SCK and SDA terminals are provided in addition to the conventional contact. Since the signals from these terminals are input directly to the ports of the CPU, the resistors R125 and R126 (100 Ω each) are connected to protect the terminals of the CPU.

The AX contact need output signals in the open collector or open drain state, and it outputs signals through Q120.

8 - 2. Description of Hot - shoe Terminal

X (Synchro Contact)

- When the Flash Unit is in the first curtain synchro mode, flash firing is started by the ON signal from the camera.
- When the Flash Unit is in the second curtain synchro mode, flash is not fired by this signal.

AX (Auxiliary Synchro Contact)

- Signal to start flash firing in second curtain synchro mode
  In the second curtain synchro mode, flash firing is started by ON → OFF of AX with the X signal turned ON.

CH I/O Contact

- This contact informs the camera of charging:
  Charging not completed: "Lo", Charging completed: "Hi"
  After flash firing: "Lo", Power Switch OFF: "Lo"
- This contact receives the flash stop signal.
  After flash firing start, the contact enters the mode "Lo" in which it waits for the flash stop signal from the camera. And it stops flash firing at "Lo" → "Hi" of the signal from the camera.

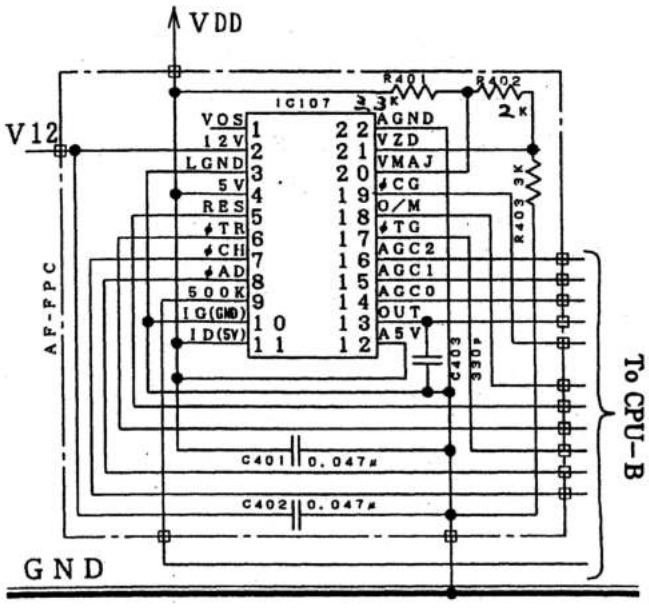
SDA Contact (serial data)

- Data signal between Camera ←→ Flash Unit (bidirectional for input and output) in data communication with Flash Unit

SCK Contact (serial clock)

- Cycle clock in serial data communication with Flash Unit
  Camera → Flash Unit (output from camera/input to Flash Unit)

9. Auto Focusing Circuit



9 - 1. Auto Focusing Circuit

Constitution

This circuit consists of the AF - IC (IC107).

Functions

This circuit, controlled by the CPU - B entirely, carries out the arithmetic operation of the distance metering result and indicates it on the Viewfinder Display.

The functions of the AF - IC terminals are as follows:

- OUT

  Outputs the accumulated charge by converting it to a voltage.

- AGC0, AGC1 and AGC2

  Change the amplification.

AGC2	AGC1	AGC0	Amplification
0	0	0	≒1
0	0	1	2
0	1	0	4
0	1	1	8
1	0	0	16
1	0	1	≒1
1	1	0	32
1	1	1	64

※ For test

- O/M

  Selects an analog signal to be output through the OUT terminal and selects a shift pulse generation signal.

O/M	OUT terminal output	Shift pulse generation factor
H	Sensor output	External signal $\overline{\phi TG}$
L	Moniter output	Internal comparater

· $\overline{\phi}$ CG

Input terminal for accumulation start signal ("H" → "L": accumulation start)

· $\overline{\phi}$ TG

Trigger pulse input terminal for shift pulse generation

Only with "H" at O/M terminal, shift pulse is generated at fall of ϕ TG.

· ϕ CH

Accumulation signal output terminal: outputs "Hi" level during accumulation.

"L" → "H" at fall of ϕ CG and "H" → "L" at fall of shift pulse.

· $\overline{\phi}$ TR

Input terminal for transfer timing clock

$\overline{\phi}$ TR="H" → "L" only when "H" is input to $\overline{\text{RESET}}$ terminal.

· ϕ AD

Output terminal for AD timing clock

Indicates that sensor output is steady.

ϕ AD="L" → "H" when ϕ TR="H" → "L", ϕ AD="H" → "L" when the sensor output has been stabilized after drive pulse generation, and ϕ AD="L" when RESET="L".

· $\overline{\text{RESET}}$

Reset signal output terminal

When RESET="L", logic timing is initialized by discharging the CCD at a high speed of 250kHz drive clock.

· VMAJ

Reference voltage adjusting terminal for internal comparator

Inputs V DD divided by R401, R402 and R403.

· VZD

Reference voltage source for amplification for arithmetic operation

Inputs V DD divided by R401, R402 and R403.

[DESCRIPTION OF FUNCTION OF ELECTRIC PARTS]

Symbol	Part Name	Model	Functions
IC101	CPU - A	ROM 24K	CPU - A: Entire control of camera (except auto focusing) Various arithmetic operations (light metering, TTL flash Auto control, etc.) Mechanical controls, such as winding, rewinding, aperture and shutter controls Control of external LCD display, input of various information Test mode program, etc.
IC102	CPU - B	ROM 16K	CPU - B: Control of auto focusing and control of viewfinder display Input of film and lens information Control of communication with flash
IC103	Motor Drive IC		Motor drive IC (Winding and rewinding)
IC104	REG - IC	1.7V output	1.7V regulated DC voltage IC (LCD drive of CPU - A)
IC105	RES - IC	3.8V reset	Reset IC (reset of CPU - A)
IC106	EEPROM		EEPROM (Memory for backup data, counter and memory of status information)
IC107	AF - IC		Auto focusing IC (same as that for 300 AF camera)
IC201	Light Metering IC		Light metering IC (same as that for C × ST camera)
IC301	TTL Flash Auto IC		TTL Flash Auto IC (same as that for C × ST camera)
Q101	Chip Digital Tr.	2.2k/47k PNP	B.C. circuit, power ON
Q102	Chip Digital Tr.	2.2k/47k P*2	B.C. circuit, power ON
Q103	Chip Digital Tr.	10k/47k N*2	Predriving of winding motor drive circuit
Q104	Chip Digital Tr.	10k/47k N*2	Predriving of rewind motor drive circuit
Q105	Chip Digital Tr.	10k/47k N*2	Prevention of through - current in winding motor drive circuit
Q106	Chip Digital Tr.	10k/47k N*2	Prevention of through - current in rewind motor drive circuit
Q107	Chip Digital Tr.	4.7k/47k PNP	Predriving of mirror motor brake circuit
Q109	Chip Digital Tr.	RBE=1.5k/NPN	Driving of mirror motor brake circuit
Q110	Chip Digital Tr.	90/800/PNP	Driving of mirror motor drive circuit
Q111	Chip Digital Tr.	2.2k/47k P*2	Predriving of shutter drive circuit
Q112	Chip Digital Tr.	Ic=500mA N*2	Driving of shutter drive circuit
Q113	Chip Digital Tr.	10k/47k N*2	Predriving of drive circuit of Frame Limiting Mg. and Aperture Mg.
Q114	Chip Digital Tr.	10k/47k N*2	Predriving of Drive Circuit of Mirror Mg. and Self - timer LED
Q115	Chip Digital Tr.	470/10k Ic=800mA/P	Driving of drive circuit of Frame Limiting Mg.

Symbol	Part Name	Model	Functions
Q116	Chip Digital Tr.	470/10k Ic=800mA/P	Driving of drive circuit of Aperture Mg.
Q117	Chip Digital Tr.	470/10k Ic=800mA/P	Driving of drive circuit of Mirror Mg.
Q118	Chip Digital Tr.	2.2k/47k PNP	Driving of drive circuit of Self - timer LED
Q119	Chip Digital Tr.	2.2k/47k N*2	Driving of drive circuit of Back Light LED
Q120	Chip Digital Tr.	10k/47k N*2	Inversion of Accessory Shoe CHI/0 and AX signal
Q122	Chip Digital Tr.	47k/47k NPN	Inversion of Data Back imprinting signal
Q123	Chip Digital Tr.	10k/47k N*P	Switching of analog reference voltage of CPU - A
Q124	Chip Digital Tr.	RB=10k/PNP	Switching of analog reference voltage of CPU - A
Q125	Chip Digital Tr.	4.7k/47k NPN	Control of Photo - interrupter LED
Q126	Chip Tr.	High hFE	Prevention of through - current in mirror motor drive circuit
Q127	Chip Tr.	High hFE	Predriving of mirror motor drive circuit
C101	Chip Ceramic Capacitor	0.01 μ	Stabilization of battery check line
C102	Chip Ceramic Capacitor	0.47 μ	Stabilization of LCD drive power
C103	Chip Ceramic Capacitor	0.47 μ	LCD drive 1/3 bias boosting
C104	Chip Ceramic Capacitor	0.47 μ	LCD drive 1/3 bias boosting
C105	Chip Ceramic Capacitor	0.47 μ	LCD drive 1/3 bias boosting
C106	Chip Ceramic Capacitor	0.1 μ	Stabilization of reset output
C107	Chip Tantalum Capacitor	6.8 μ /7v (Ta)	Bypass capacitor of CPU - A
C108	Chip Tantalum Capacitor	6.8 μ /7v (Ta)	Bypass capacitor of CPU - B
C109	Chip Ceramic Capacitor	22p	Stabilization of sub clock oscillation of CPU - A
C110	Chip Ceramic Capacitor	22p	Stabilization of sub clock oscillation of CPU - A
C111	Chip Tantalum Capacitor	6.8 μ /7v (Ta)	Stabilization of data write in EEPROM
C201	Chip Ceramic Capacitor	0.1 μ	Bypass capacitor of light metering IC
C202	Chip Ceramic Capacitor	0.1 μ	Stabilization of light metering output
C301	Chip Ceramic Capacitor	0.1 μ	Bypass capacitor of TTL Flash Auto IC
C302	Chip Ceramic Capacitor	39p	TTL Flash Auto control integration
C303	Chip Ceramic Capacitor	0.01 μ	Stabilization of TTL Flash Auto VTH

Symbol	Part Name	Model	Functions
C401	Chip Ceramic Capacitor	0.047 μ	Bypass capacitor of AF - IC logic circuit
C402	Chip Ceramic Capacitor	0.047 μ	Bypass capacitor of AF - IC analog circuit
C403	Chip Ceramic Capacitor	330p	Stabilization of AF - IC analog output
D101	Chip Diode	A - COMMON	Absorption of counter electromotive force of Frame Limiting Mg. and Aperture Mg.
D102	Chip Diode	A - COMMON	Absorption of counter electromotive force of Mirror Mg.
D103	Self - Timer LED		Self - Timer mode lamp
D104	Back Light LED		Illumination of viewfinder LCD
D105	Chip Zener Diode	3.6V regulated DC voltage	Supply of analog reference voltage for CPU - A
D106	Chip Schottky Diode		Prevention of counter current of charge in power supply bypass capacitor for EEPROM
D301	Chip Diode	A - COMMON	Directing of TTL Flash Auto control signal in one direction
R101	Chip Resistor	22k	Division of VB voltage of battery check circuit
R102	Chip Resistor	47k	Division of VB voltage of battery check circuit
R103	Chip Resistor	150	Base current limiting of winding motor drive Tr.
R104	Chip Resistor	150	Base current limiting of winding/rewind motor drive Tr.
R105	Chip Resistor	150	Base current limiting of rewind motor drive Tr.
R106	Chip Resistor	100	Base current limiting of mirror motor brake Tr.
R107	Chip Resistor	22k	Current limiting of through - current prevention Tr. for mirror motor drive circuit
R108	Chip Resistor	47k	Control stabilization of through - current prevention Tr. for mirror motor drive circuit
R109	Chip Resistor	22k	Base current limiting of mirror motor drive Tr.
R110	Chip Resistor	47k	Control stabilization of mirror motor drive Tr.
R111	Chip Resistor	180	Current limiting of shutter first curtain drive
R112	Chip Resistor	180	Current limiting of shutter second curtain drive
R113	Chip Resistor	220	Current limiting of Self - timer LED
R114	Chip Resistor	100	Current restriction at high brightness of Back Light LED
R115	Chip Resistor	200	Current restriction at low brightness of Back Light LED
R116	Chip Resistor	1M	Pull - up resistance of Main Switch
R117	Chip Resistor	1M	Pull - up resistance of Back Cover Switch
R118	Chip Resistor	330	Current limiting of analog reference voltage terminal of CPU - B
R119	Chip Resistor	330k	Ladder resister for CPU - B LCD drive
R120	Chip Resistor	330k	Ladder resister for CPU - B LCD drive
R121	Chip Resistor	330k	Ladder resister for CPU - B LCD drive

Symbol	Part Name	Model	Functions
R122	Chip Resistor	1k	Prevention of static electricity at CHI/0 terminal of Accessory Shoe
R123	Chip Resistor	10k	Pull - up resistance of flash charge completion signal
R124	Chip Resistor	100	Prevention of static electricity at AX terminal of Accessory Shoe
R125	Chip Resistor	100	Prevention of static electricity at SCX terminal of Accessory Shoe
R126	Chip Resistor	100	Prevention of static electricity at SDA terminal of Accessory Shoe
R127	Chip Resistor	5.1k	Pull - up resistance of SDA terminal of Accessory Shoe
R128	Chip Resistor	680	Current limiting of photodiode of Photo - interrupter
R129	Chip Resistor	10k	Pull - up resistance of pulse signal of Photo - interrupter
R130	Chip Resistor	680k	Pull - down resistance of Shutter Dial signal
R131	Chip Resistor	220k	Load resistance of sub clock of CPU - A
R132	Chip Resistor	10M	Load resistance of sub clock of CPU - A
R201	Chip Resistor	27k	Output stabilization of Light Metering IC
R202	Chip Resistor	10k	Output stabilization of Light Metering IC
R301	Chip Resistor	62k	Stabilization of TTL Flash Auto control integration circuit
R401	Chip Resistor	3.3k	Division of AF - IC reference voltage
R402	Chip Resistor	2k	Division of AF - IC reference voltage
R403	Chip Resistor	3k	Division of AF - IC reference voltage
X01	Oscillator (8MHz)		Main clock of CPU - A
X02	Oscillator (32KHz)		Sub clock of CPU - A
X03	Oscillator (5MHz)		Main clock of CPU - B

[DESCRIPTION OF FUNCTIONS OF IC TERMINALS]

<IC101> CPU - A

Pin No.	Signal Name	I/O	Signal Functions
1	A. B. C. Setting	I	Reading of A. B. C. Setting (0, ± 0.5, ± 1.0) (Analog signal input)
2	Shooting Mode	I	Reading of shooting mode (Av, Tv, P, M, X, B, ISO, CF) setting (Analog signal input)
3	Drive Mode	I	Reading of drive mode (, S, C, green position,) setting (Analog signal input)
4	Aperture Setting	I	Reading of aperture setting value (4" ~ 1/4000) (Analog signal input)
5	Exposure Compensation Setting	I	Reading of setting value of exposure compensation (−2.0 +2.0, 1/3EV steps) (Analog signal input)
6	Shutter Drive Setting	I	Reading of Shutter Dial setting value (Aperture Ring) (Analog signal input)
7	B. C. Level	I	Detection of battery level (Analog signal input)
8	Light Metering Vout	I	Detection of Light Metering IC output (Analog signal input)
9	Perforation SW	I	Film perforation detection signal
10	DBL/Adjusting Tool ACK	I	Data Back imprinting signal (ON: "L") and Input signal of Adjusting Tool ACK (in common)
11	Preview SW	I	Detection of Preview Button position (ON: "L", OFF: "H")
12	Aperture Pulse	I	Detection of aperture stop - down pulse
13	Adjustment M/A	I	Input terminal for switching between manual adjustment and auto adjustment (Manual: "H", Auto: "L")
14	Frame Limiting SW	I	Frame Limiting Switch for film winding control (During winding: "H")
15	Adjusting Tool C/D	I	Adjusting Tool C/D input
16	CHS	I	Detection of flash charge completion or TTL Flash Auto signal (flash charge completed: "L", not completed: "H"; TTL Flash Auto control: "L" detection)
17	Light Metering Mode SW	I	Light metering mode switching input (Ave: "H", Spot: "L")
18	SCK	O	Serial clock — Communication with EEPROM, TTL Flash Auto IC, Adjusting Tool
19	SDO	O	Serial data output
20	SDI	I	Serial data input
21	Back Cover SW	I	Detection of Back Cover Open/Close Switch (Open: "L",Close: "H")
22	Main Switch	I	Detection of Main Switch (ON: "L", OFF: "H")
23	AE - L SW	I	Detection of AE Lock Switch (AE Lock ON: "L", AE Lock OFF: "H")
24	Vref Switching	O	Switching of reference voltage for A/D conversion (Vref=Vdd: "L", Light Metering IC output: "H")

<IC101> CPU - A

Pin No.	Signal Name	I/O	Signal Functions
25	D3	I/O	Communication data line D3 between CPUs, bidirectional (input/output switching)
26	D2	I/O	Communication data line D2 between CPUs, bidirectional (input/output switching)
27	D1	I/O	Communication data line D1 between CPUs, bidirectional (input/output switching)
28	D0	I/O	Communication data line D0 between CPUs, bidirectional (input/output switching)
29	M2	O	Control of second curtain magnet (Hold: "L", Release: "H")
30	M1	O	Control of first curtain magnet (Hold: "L", Release: "H")
31	REQ	O	Request for communication between CPUs (CPU - A → CPU - B)
32	ACK	I	Response to communication between CPUs (CPU - B → CPU - A)
33	RESET	I	CPU - A reset terminal (Reset: "L")
34	Xcin	I	Sub clock, 32.768kHz oscillator connected
35	Xcout	O	Same as above
36	Xin	I	Main clock, 8.0 MHz oscillator connected
37	Xout	O	Same as above
38	GND	–	Grounding terminal
39	Adjusting Tool REQ	I	Adjusting Tool REQ
40	Mode Switching Detection SW	I	Changing like "H" → "L" → "H" for power - on between B⟷ISO⟷CF, ⟷S
41	Test	I	Test terminal for adjustment (Test adjusting mode: "L")
42	Rewind SW	I	Rewind Switch detection (ON: "L", OFF: "H")
43	DOWN SW	I	DOWN Switch detection (ON: "L", OFF: "H")
44	UP SW	I	UP Switch detection (ON: "L", OFF: "H")
45	Release SW	I	Release Switch detection (ON: "L", OFF: "H")
46	Check SW	I	Check Switch detection (ON: "L", OFF: "H")
47	Mirror - up SW	I	Mirror - up Switch detection (Mirror - up state ON: "L", OFF: "H")
48	Mirror - down SW	I	Mirror - down Switch detection (Permission of Mirror - down state ON: "L", OFF: "H")
49	Mirror Mg	O	Mirror - up start Mg. (Permission of Mirror - up operation ON: "H", OFF: "L")
50	Aperture Mg	O	Aperture stop - down operation stop Mg. (Aperture stop - down operation stop ON: "H", OFF: "L")
51	CPU - B Reset	O	Stop of CPU - B at unstable state of voltage and oscillation
52	Winding Control 2	O	Control of Winding Motor
			Forward run / Reverse run / Short brake Control 1: H / L / H Control 2: L / H / H
53	Not used	–	
54	Winding Control 1	O	

<IC101> CPU - A

Pin No.	Signal Name	I/O	Signal Functions
55	Rewind Control 2	O	Control of Rewind Motor Forward run / Reverse run / Short brake Control 1: H / L / H Control 2: L / H / H
56	Rewind Control 1	O	
57	Frame Limiting Mg	O	Mg. control to release Frame Limiting Switch (Release ON: "H", OFF: "L")
58	Aperture PC LCD	O	Control of Photo - interrupter LED for detecting aperture stop - down value (Lighting ON: "H", OFF: "L")
59	EEPROM CS	O	CS for serial communication with EEPROM (Select: "H")
60	TTL Flash Auto IC CS	O	CS for serial communication with TTL Flash Auto IC (Select: "L")
61	Not used	–	
62	DATE	O	Data Back imprinting signal (Imprinting: "H")
63	PH - CONT	O	Power hold (DC/DC) control (ON: "H")
64	SEL0, 2	O	Selection of light Metering IC output / Selection of Ave. / SEL0, 2: 1 / SEL1: 1
65	SEL1	O	Selection of light Metering IC output / Selection of Spot / SEL0, 2: 0 / SEL1: 1
66	CHC	O	Accumulation control for TTL Auto control (TTL Flash Auto control start: "H" → "L")
67	AX	O	Flash AX (auxiliary synchro) signal (Lighting: "H", Going out: "L")
68	Self - timer LED	O	Control of Self - timer count indicating LED (Lighting: "H", Going out: "L")
69	Mup Forward	O	Mirror - up (Shutter Charge) Motor forward run / Mup Forward / Mup Brake Forward run: 1 / 0 Brake: 0 / 1
70	Mup Brake	O	Mirror - up (Shutter Charge) Motor brake
71 ~ 76	Not used	–	
77	SEG11	O	ISO, 4 - E, F
78	SEG10	O	4 - D, G, A
79	SEG9	O	DX, 4 - C, B
80	SEG8	O	◀, 3 - E, F
81	SEG7	O	3 - D, G, A
82	SEG6	O	●, 3 - C, B
83	SEG5	O	-, 2 - E, F
84	SEG4	O	2 - D, G, A
85	SEG3	O	-, 2 - C, B
86	SEG2	O	-, 1 - E, F
87	SEG1	O	1 - D, G, A
88	SEG0	O	CF, 1 - C, B
89	Vcc	–	Power supply voltage (5V)

<IC101> CPU - A

Pin No.	Signal Name	I/O	Signal Functions
90	Vref	I	Reference voltage for A/D conversion (Light metering: 2.88V, Others: VDD used by switching)
91	GND	–	Grounding terminal
92	Not used	–	
93	COM2	O	Common signal 2 for external indication LCD
94	COM1	O	Common signal 1 for external indication LCD
95	COM0	O	Common signal 0 for external indication LCD
96	VL3	–	LCD drive power input terminal (0 ≦ VL1 ≦ VL2 ≦ VL3 ≦ Vcc)
97	VL2	–	LCD drive power input terminal (0 ≦ VL1 ≦ VL2 ≦ VL3 ≦ Vcc)
98	C2	–	Capacity external mounting terminal for LCD drive built - in boosting circuit
99	C1	–	Capacity external mounting terminal for LCD drive built - in boosting circuit
100	VL1	–	LCD drive power input terminal (0 ≦ VL1 ≦ VL2 ≦ VL3 ≦ Vcc)

<IC102> CPU - B

Pin No.	Signal Name	I/O	Signal Functions
1	Open F, F3	I	Reading of open aperture value
2	Open F, F2	I	Reading of open aperture value
3	Open F, F1	I	Reading of open aperture value
4	Open F, F0	I	Reading of open aperture value
5	AGC2	O	AF - IC control signal
6	AGC1	O	
7	AGC0	O	
8	AFout	I	AF - IC output detection (Analog signal input)
9	ϕ CG	O	AF - IC control signal
10	Not used	–	
11	O/M SELECT	O	AF - IC control signal
12	AF Reset	O	AF - IC control signal
13	ϕ TR	O	AF - IC control signal
14	ϕ TG	O	AF - IC control signal
15	ϕ AD	I	AF - IC control signal
16	ϕ CH	I	AF - IC control signal
17	Not used	–	
18	SCK	O	Flash communication SCK (Serial clock)
19	SDO	O	Flash communication SDA (Serial data): Serial data output
20	SDI	I	Flash communication SDA (Serial data): Serial data input
21	INTI	I	Flash communication SDA (Serial data): External offiering terminal
22	REQ	I	Request for communication between CPUs (CPU - A → CPU - B)
23	500kHz	O	AF - IC system clock (500kHz)
24	ACK	O	Response to communication between CPUs (CPU - B → CPU - A)
25	D3	I/O	Communication data line D3 between CPUs, bidirectional (input/output switching)
26	D2	I/O	Communication data line D2 between CPUs, bidirectional (input/output switching)
27	D1	I/O	Communication data line D1 between CPUs, bidirectional (input/output switching)
28	D0	I/O	Communication data line D1 between CPUs, bidirectional (input/output switching)
29	With θ Compensation	I	Lens : With Compensation / Without Compensation / No use Terminal [With θ Compensation : L / L(L) / H] [Without θ Compensation : H / H(L) / H]
30	Without θ Compensation	I	
31	Not used	–	
32	Not used	–	
33	CPU - B Reset	I	Stop of CPU - B operation in unstable state (Reset: "L")
34	Not used	–	
35	Not used	–	
36	Xin	I	Main clock, 8.0 MHz oscillator connected
37	Xout	O	Same as above
38	GND	–	Grounding terminal
39	Not used	–	

<IC102> CPU - B

Pin No.	Signal Name	I/O	Signal Functions
40	Not used	–	
41	Film Detect SW	I	Cartridge presence/absence detection (Film present: "L", absent: "H")
42	DX4	I	DX code read terminal
43	DX3	I	DX code read terminal
44	DX2	I	DX code read terminal
45	DX1	I	DX code read terminal
46	DX0	I	DX code read terminal
47	Brightness H	O	Brightness switching of LCD back light Brightness : OFF / Low brightness / Medium brightness / High brightness Brightness H : L / H / L / H Brightness L : L / L / H / H
48	Brightness L	O	
49	SEG39	O	RTIM1 - CDEG, RTIM2 - B, C
50	SEG38	O	RTIM2 - A, G, D
51	SEG37	O	RTIM1 - F, RTIM2 - F, E
52	SEG36	O	- , RTIM3 - B, C
53	SEG35	O	RTIM3 - A, G, D
54	SEG34	O	- , RTIM3 - F, E
55	SEG33	O	- , RTIM4 - B, C
56	SEG32	O	RTIM4 - A, G, D
57	SEG31	O	- , RTIM4 - F, E
58	SEG30	O	▼ , R. F. D - B, C
59	SEG29	O	R. F. D - A, G, D
60	SEG28	O	▲ , R. F. D - F, E
61	SEG27	O	R. F. U - B, C, H
62	SEG26	O	R. F. U - A, G, D
63	SEG25	O	- , R. F. U - F, E
64	SEG24	O	R 1 - A, CDEG, Right
65	SEG23	O	LTIM1 - CDEG, LTIM2 - B, C
66	SEG22	O	LTIM2 - A, G, D
67	SEG21	O	LTIM1 - F, LTIM2 - F, E
68	SEG20	O	LTIM1 - A, LTIM3 - B, C
69	SEG19	O	LTIM3 - A, G, D
70	SEG18	O	R 2 - CDEG, LTIM3 - F, E
71	SEG17	O	R 2 - A, LTIM4 - B, C
72	SEG16	O	LTIM3 - A, G, D
73	SEG15	O	- , LTIM4 - F, E
74	SEG14	O	Lower ■ , L. F. D - B, C
75	SEG13	O	L. F. D - A, G, D
76	SEG12	O	Upper ■ , L. F. D - F, E
77	SEG11	O	L. F. U - B, C, H
78	SEG10	O	L. F. U - A, G, D
79	SEG9	O	L 4 - CDEG, L. F. U - F, E
80	SEG8	O	L 4 - A, L 3 - A, CDEG
81	SEG7	O	L 1 - A, L 2 - A, CDEG
82	SEG6	O	· , Counter 1 - F, E
83	SEG5	O	↯ , Left♀, L 1 - CDEG

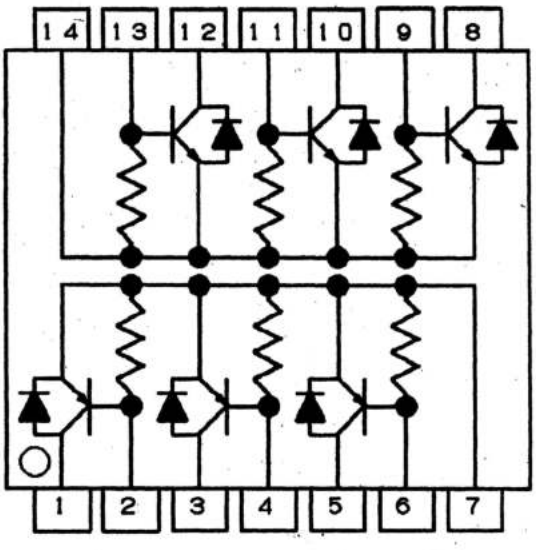
<IC102> CPU - B

Pin No.	Signal Name	I/O	Signal Functions
84	SEG4	O	[ ] , Counter 1 - B, C
85	SEG3	O	Counter 1 - A, G, D
86	SEG2	O	— , Counter10 - B, C
87	SEG1	O	Counter10 - A, G, D
88	SEG0	O	⊦ , Counter10 - F, E
89	Vdd2	–	Power supply voltage (5v)
90	3.6V	I	Reference voltage for A/D conversion (AF - IC:3.6V)
91	GND	–	Grouding terminal
92	Not used	–	
93	COM2	O	Common signal 2 for external indication LCD
94	COM1	O	Common signal 1 for external indication LCD
95	COM0	O	Common signal 0 for external indication LCD
96	VL3	–	LCD drive power input terminal (0 ≦ VL1 ≦ VL2 ≦ VL3 ≦ Vcc)
97	VL2	–	LCD drive power input terminal (0 ≦ VL1 ≦ VL2 ≦ VL3 ≦ Vcc)
98	C2	–	Capacity external mounting terminal for LCD drive built - in boosting circuit
99	C1	–	Capacity external mounting terminal for LCD drive built - in boosting circuit
100	VL1	–	LCD drive power input terminal (0 ≦ VL1 ≦ VL2 ≦ VL3 ≦ Vcc)

<IC103> Motor Drive IC

Pin No.	Port Name	I/O	Symbol Name	Pull Up	Contents of Function
1	PNP1 Collector	O	REWIND	-----	Winding forward:PNP3, NPN2 ON Winding reverse:PNP2, NPN1 ON Rewind forward:PNP2, NPN3 ON Rewind reverse:PNP1, NPN2 ON Winding brake:PNP2, PNP3 ON Rewind brake:PNP1, PNP2 ON All the transistors which are not specified above: OFF CPU is controlled by four ports: P06: "H" → Winding forward P07: "H" → Winding reverse P10: "H" → Rewind forward P12: "H" → Rewind reverse P06, P07: "H" → Winding brake P10, P12: "H" → Rewind brake
2	PNP1 Base	I	BASEP1	Built - in	
3	PNP2 Collector	O	COMMON	-----	
4	PNP2 Base	I	BASEP2	Built - in	
5	PNP3 Collector	O	WIND	-----	
6	PNP3 Base	I	BASEP3	Built - in	
7	PNP Emitter	–	VB	-----	
8	NPN1 Collector	O	WIND	-----	
9	NPN1 Base	I	BASEN1	PULL DOWN	
10	NPN2 Collector	O	COMMON	-----	
11	NPN2 Base	I	BASEN2	PULL DOWN	
12	NPN3 Collector	O	REWIND	-----	
13	NPN3 Base	I	BASEN3	PULL DOWN	
14	NPN Emitter	–	GND	-----	

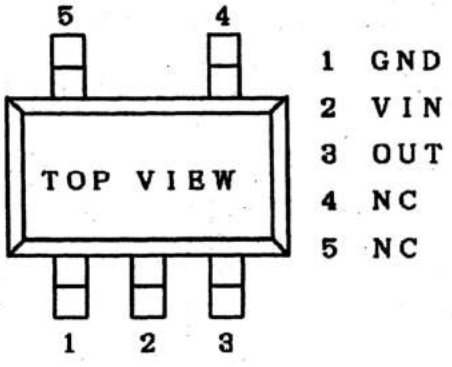
(IC103 Motor Drive IC Pin Arrangement)



<IC104> Regulator IC

Pin No.	Port Name	I/O	Symbol Name	Pull Up	Contents of Function
1	GND	–	GND	-----	Grounding terminal
2	Vin	I	IN	-----	Vcc input terminal
3	Vout	O	OUT	-----	1.7V output terminal
4	NC	–	NC	-----	Non - connection
5	NC	–	NC	-----	Non - connection

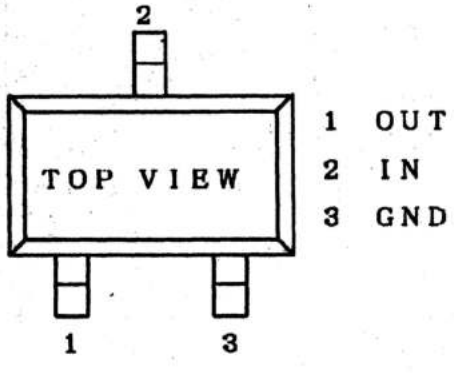
(IC104 Regulator IC Pin Arrangement)



<IC105> Reset IC

Pin No.	Port Name	I/O	Symbol Name	Pull Up	Contents of Function
1	OUT	O	OUT	-----	"L" output and reset of IC101 (CMOS output)
2	IN	I	IN	-----	Detection of Vcc=3.75 ± 0.15V
3	GND	–	GND	-----	Grounding terminal

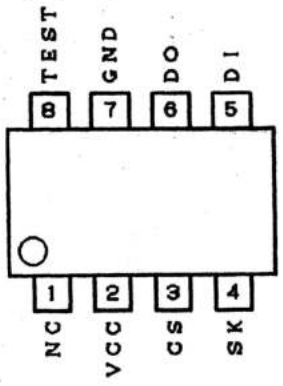
(IC105 Reset IC Pin Arangement)



<IC106> EEPROM

Pin No.	Port Name	I/O	Symbol Name	Pull Up	Contents of Function
1	NC	–	NC	-----	Non - connection
2	Vcc	–	VDD	-----	Power supply (VDD ≒4.8V)
3	CS	I	CS	-----	Chip select
4	SK	I	SCK	-----	Serial clock input
5	DI	I	SDO	-----	Serial data input
6	DO	O	SDI	-----	Serial data output
7	GND	I	GND	-----	Grounding terminal
8	TEST	–	TEST	-----	Test terminal for manufacturer (connected to GND)

(IC106 EEPROM Pin Arangement)

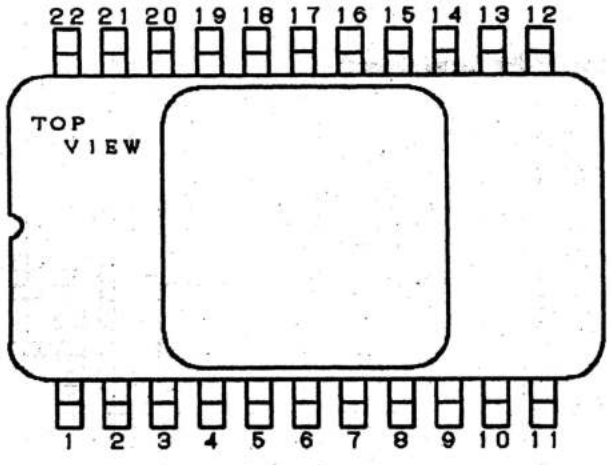


<IC107> AF - IC

Pin No.	Port Name	I/O	Symbol Name	Pull Up	Contents of Function
1	Vos	O	Vos	-----	Test terminal
2	12V	–	V12	-----	12V power input
3	LGND	–	LGND	-----	Grounding terminal (logic system)
4	5V	–	L5V	-----	5V power input (power to logic system)
5	RES	I	RESET	-----	Reset at "L": initialize, high - speed discharge at 250kHz
6	ϕ TR	I	TR	-----	Input terminal for transfer timing clock
7	ϕ CH	O	CH	-----	Accumulation signal output terminal (during accumulation: "H")
8	ϕ AD	O	AD	-----	AD timing clock output
9	500K	I	CK	-----	Reference clock (500kHz) input
10	IG	I	IG	-----	Test terminal
11	ID	–	ID	-----	Test terminal
12	A5V	–	A5V	-----	5V power input (power to analog system)

Pin No.	Port Name	I/O	Symbol Name	Pull Up	Contents of Function
13	OUT	O	OUT	-----	Analog signal output terminal
14 15 16	AGC0 AGC1 AGC2	I I I	AGC0 AGC1 AGC2	----- ----- -----	Input terminal for amplification switching signal For test AGC0 0 1 0 1 01 0 1 AGC1 0 0 1 1 00 1 1 AGC2 0 0 0 0 11 1 1 Amplification 1 2 4 8 16 1 32 64
17	ϕ TG	I	TG	-----	Trigger pulse input terminal for shift pulse generation
18	O/M	I	O/M	-----	Selection of output signal ("H": sensor, "L": monitor)
19	ϕ CG	I	CG	-----	Accumulation start signal input ("H" → "L": start)
20	VMAJ	I	VMAJ	-----	Reference voltage adjusting terminal for internal comparator 3V
21	VZD	–	VZD	-----	Reference voltage power for operational amplifier (1.8V)
22	AGND	–	AGND	-----	Grounding terminal (analog system)

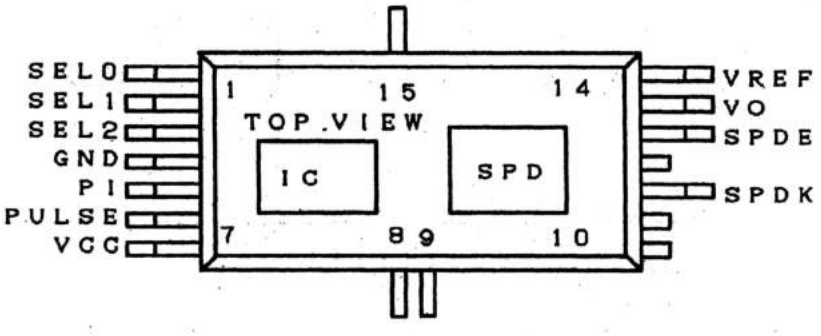
(IC107 AF - IC Pin Arrangement)



<IC201> Light Metering IC

Pin No.	Port Name	I/O	Symbol Name	Pull Up	Contents of Function
1	SEL0	I	SEL0	Built - in	Divided light metering select terminal SEL0=SEL1=SEL2=H: Average metering SEL0=SEL2, SEL1=H: Spot metering
2	SEL1	I	SEL1	Built - in	
3	SEL2	I	SEL2	Built - in	
4	GND	–	GND	-----	Grounding terminal
5	PI	I	PI	-----	Photo - coupler signal input terminal (Not used (open))
6	PULSE	O	PULSE	-----	Photo - coupler sharping output terminal
7	Vcc	–	Vcc	-----	Power supply input (VDD 4.8V connected)
8	SPDB	–	SPDB	-----	Internal SPD connecting terminal (Not used: open)
9	SPDA	–	SPDA	-----	
10	SPDD	–	SPDD	-----	
11	SPD K	–	SPD K	-----	
12	SPDE	–	SPDE	-----	
13	Vo	O	Vo	-----	Light metering output terminal
14	Vref	O	VREF	-----	Reference voltage output terminal (TYP 2.88V)
15	SPDC	–	SPDC	-----	Internal SPD connecting terminal (Not used)

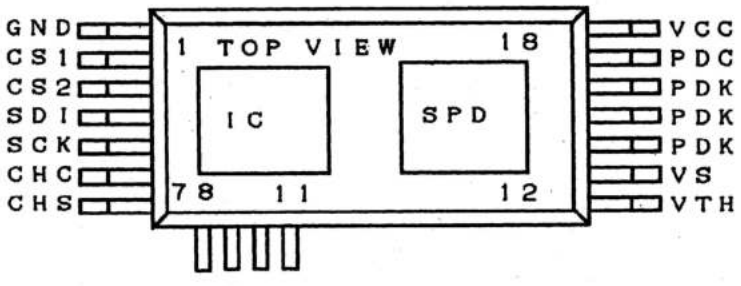
(IC201 Light Metering IC Pin Arrangement)



<IC301> TTL Flash Auto IC

Pin No.	Port Name	I/O	Symbol Name	Pull Up	Contents of Function
1	GND	–	GND	-----	Grounding terminal
2	CS1	I	TTL FLASH AUTO IC CS1	Built - in	Chip select signal (selection at "L": from CPU - A)
3	CS2	I	TTL FLASH AUTO IC CS2	-----	Connected to GND
4	SDI	I	SDI	Built - in	Serial data in: input of ISO data from CPU - A
5	SCK	I	SCK	Built - in	Serial clock: input of clock from CPU - A
6	CHC	I	CHC	Built - in	TTL Flash Auto control start signal (TTL Flash Auto control during "L")
7	CHS	O	CHS	-----	TTL Flash Auto control stop signal (stop at rise)
8	JZ	–	J2	-----	Not used (open)
9	NC	–	NC	-----	
10	NC	–	NC	-----	
11	GND	–	GND	-----	
12	VTH	–	VTH	-----	Reference voltage for TTL Flash Auto control integration (changing by ISO)
13	VS	O	VS	-----	Reference voltage output terminal (TYP 1.22V)
14	PDK	–	PDK	-----	Internal SPD connecting terminal : cathode (Not used: open)
15	PDK	–	PDK	-----	
16	PDK	–	PDK	-----	
17	PDC	–	PDC	-----	Internal SPD connecting terminal : anode (Not used: open)
18	VCC	–	VCC	-----	Power supply terminal (connected to VDD)

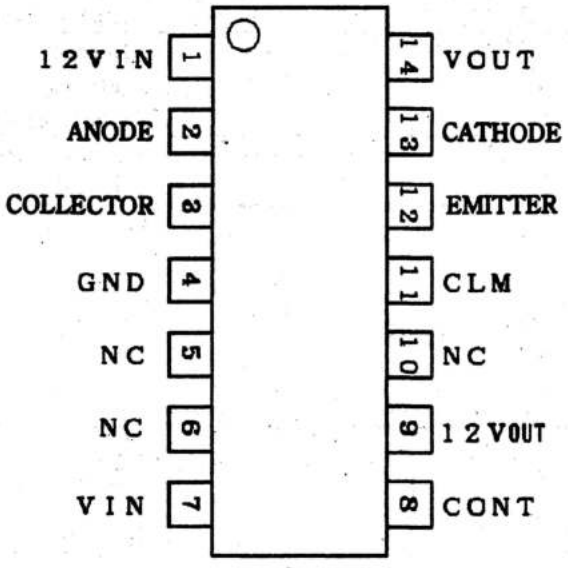
(IC301 Light Metering IC Pin Arrangement)



<IC501> DC/DC Converter IC

Pin No.	Port Name	I/O	Symbol Name	Pull Up	Contents of Function
1	12V IN	I	SERIES POWER OUT	-----	12V AC voltage input
2	ANODE	–	ANODE	-----	5V AC voltage input
3	Collector	O	COLLECTOR	-----	Coil primary - side control terminal
4	GND	–	GND	-----	Grounding terminal
5	NC	–	NC	-----	Non - connection
6	NC	–	NC	-----	Non - connection
7	V B	–	V IN	-----	Battery voltage input
8	CONT	I	CONTROL	-----	Operation control terminal ("L" active)
9	12V OUT	O	SERIES POWER OUT	-----	12V output terminal
10	NC	–	NC	-----	Non - connection
11	CLM	I	CLM	-----	Current feedback terminal (connected to GND)
12	Emitter	–	EMITTER	-----	GND of coil control terminal
13	Cathode	–	CATHODE	-----	5V feedback
14	V OUT	O	OUTPUT1	-----	5V output

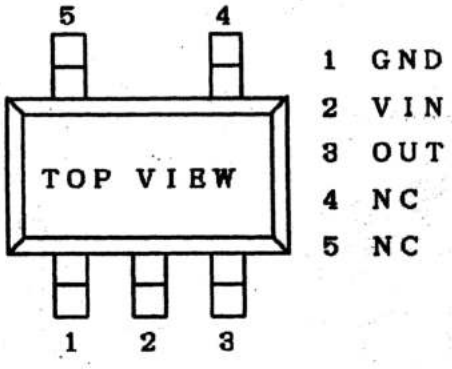
(IC501 DC/DC Converter IC Pin Arrangement)



<IC502> Regulator IC

Pin No.	Port Name	I/O	Symbol Name	Pull Up	Contents of Function
1	GND	–	GND	-----	Grounding terminal
2	Vin	I	IN	-----	Terminal for input of VB, DC/DC output
3	Vout	O	OUT	-----	5V output terminal
4	NC	–	NC	-----	Non - connection
5	NC	–	NC	-----	Non - connection

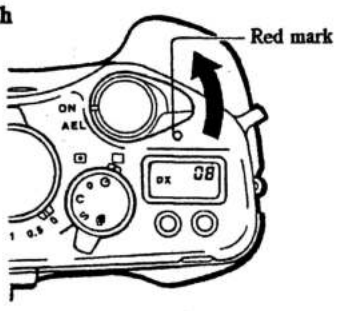
(IC502 Regulator IC Pin Arrangement)



[FUNCTIONS OF SWITCHES]

<Operation Switches, Dials and Levers>

○ **Main Switch**

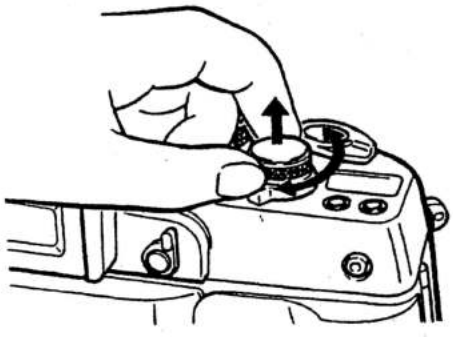


OFF ↑↓ ON ↑↓ AEL

OFF: Main Switch OFF
ON: Main Switch ON
AEL: AE Lock (with Main Switch turned ON)

○ **Drive Mode Dial**

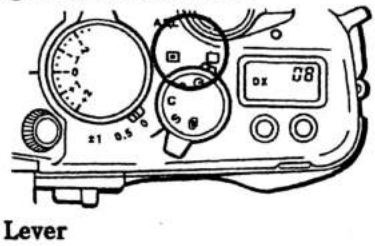
Set the Drive Mode Dial by pulling up and turning.



Self-timer ↑↓ Green position ↑↓ C ↑↓ S ↑↓ Multiple exposure

Self - timer
Green position
C: Continuous
S: Single
Multiple exposure (For setting, see "UP/DOWN Switch")

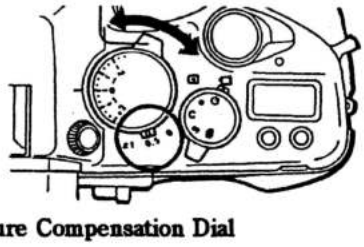
○ **Metering Mode Selector Lever**



Center-weighted average metering ↑↓ Spot metering

Center - weighted average metering
Spot metering

○ **A.B.C. Lever**

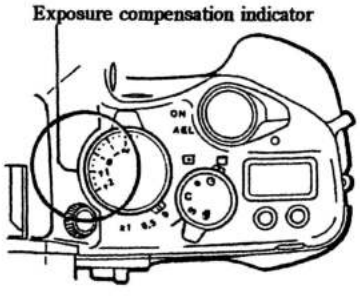


0 ↑↓ 0.5 ↑↓ 1

0: A.B.C. setting OFF
0.5: A.B.C. operation setting of ± 0.5EV
1: A.B.C. operation setting of ± 1.0EV

○ **Exposure Compensation Dial**

Exposure compensation indicator

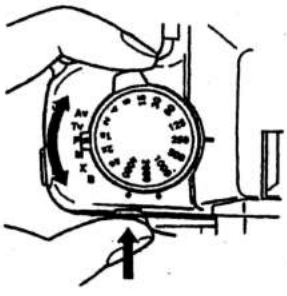


0 ↔ $-\frac{1}{3}$ ↔ $-\frac{2}{3}$ ↔ -1.0 ↔ $-1\frac{1}{3}$ ↔ $-1\frac{2}{3}$ ↔ -2.0

0 ↔ $+\frac{1}{3}$ ↔ $+\frac{2}{3}$ ↔ +1.0 ↔ $+1\frac{1}{3}$ ↔ $+1\frac{2}{3}$ ↔ +2.0

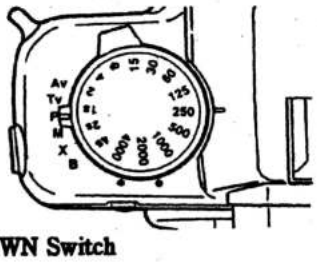
○ **Exposure Mode, ISO and CF Setting Selector Lever**

For setting, turn the Exposure Mode Selector Lever while pressing the Exposure Mode Lock Release Button.



AV ↑↓ **Aperture Priority AE mode**
TV ↑↓ **Shutter Priority AE mode**
P ↑↓ **Program AE mode**
M ↑↓ **Manual Exposure mode**
X ↑↓ **Flash photography**
B **Bulb**
↑↓ ISO **ISO setting (For setting, see "UP/DOWN Switch")**
↑↓ CF **CF setting (For setting, see "UP/DOWN Switch")**

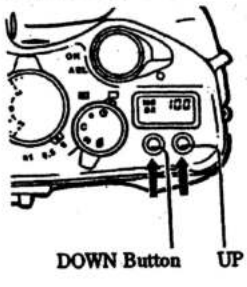
○ **Shutter Speed Dial**



4000↔2000↔1000↔500↔250↔125↔60↔30
↕
4S ↔ 2S ↔ 1S ↔ 2 ↔ 4 ↔ 8 ↔15

○ **UP/DOWN Switch**

① ISO Setting



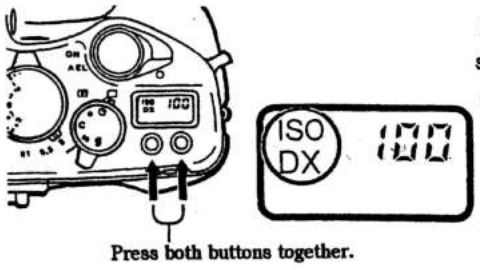
Perform ISO setting by means of the UP/DOWN Switch when the Exposure Mode, ISO and CF Selector Lever is in the "ISO" position.

UP Switch ON (clockwise) → ← DOWN Switch ON (counterclockwise)

DX↔6↔8↔10↔12↔16↔20↔25↔32↔40↔50↔64↔80↔100↔125↔160↔200↔320
↕ ↕
6400↔5000↔4000↔3200↔2000↔1600↔1250↔1000↔800↔640↔500↔500↔400

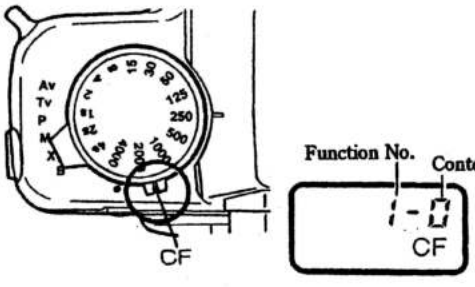
From any position, the setting is restored to the "DX" position by pressing both the UP and DOWN Buttons together.

② ISO Setting Check



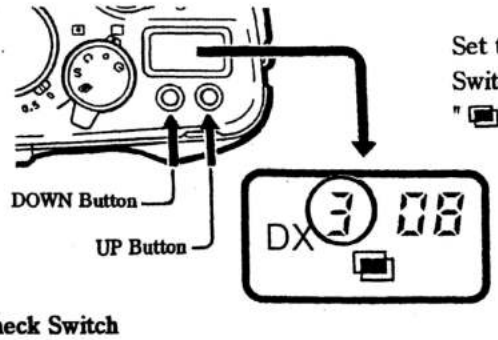
In any shooting mode (except ISO, CF and multi - exposure setting modes), ISO setting is displayed by pressing the UP and DOWN Buttons together.

③ CF (Custom Function) Setting



Perform CF setting by means of the UP/DOWN Switch when the Exposure Mode, ISO and CF Selector Lever is in the "CF" position.
Select a Function No. by the DOWN Button and a Content No. of the Function by the UP Button.

④ Multi - exposure Count Setting

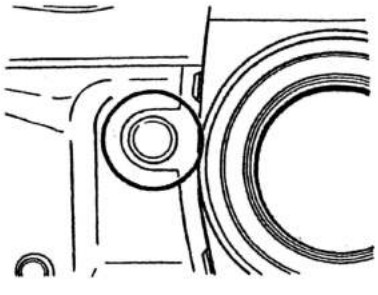


Set the number of exposures by means of the UP/DOWN Switch when the Drive Mode Dial is in the Multi - Exposure "▣" position.

○ **Check Switch**

Depress the Shutter Release Button halfway to turn on the Check Switch, and power will be supplied to circuits and light metering (distance metering) will be activated.

○ **Exposure Check Switch**



Depress the Shutter Release Button halfway to turn on the Check Switch, and power will be supplied to circuits and light metering (distance metering) will be activated.

○ **Shutter Release Switch**

Depress the Shutter Release Button fully, and the shutter will operate.

○ **External Release Switch**

This switch operates the shutter upon receiving the electric signal from the accessory.

○ **Rewind Switch**

Turn the Rewinding Lever in the direction of the arrow while pressing the Rewinding Lock Release Button, and film rewinding will be started.

○ **Depth of Field Preview Switch**

In any exposure mode excepting "Tv" and "P", the turning - on of the Depth of Field Preview Switch will stop down aperture to a preset value.

<Internal Mechanical Switches>

○ **Back Cover Switch**

This switch detects the opening and closing of the Back Cover.

"H" ····· Back Cover close
"L" ····· Back Cover open

○ **Frame Limiting Switch**

This switch, coupled with the winding sprocket, detects the winding by one frame.

"H" ····· During winding
"L" ····· Winding is stopped

○ **Mirror - up Switch**

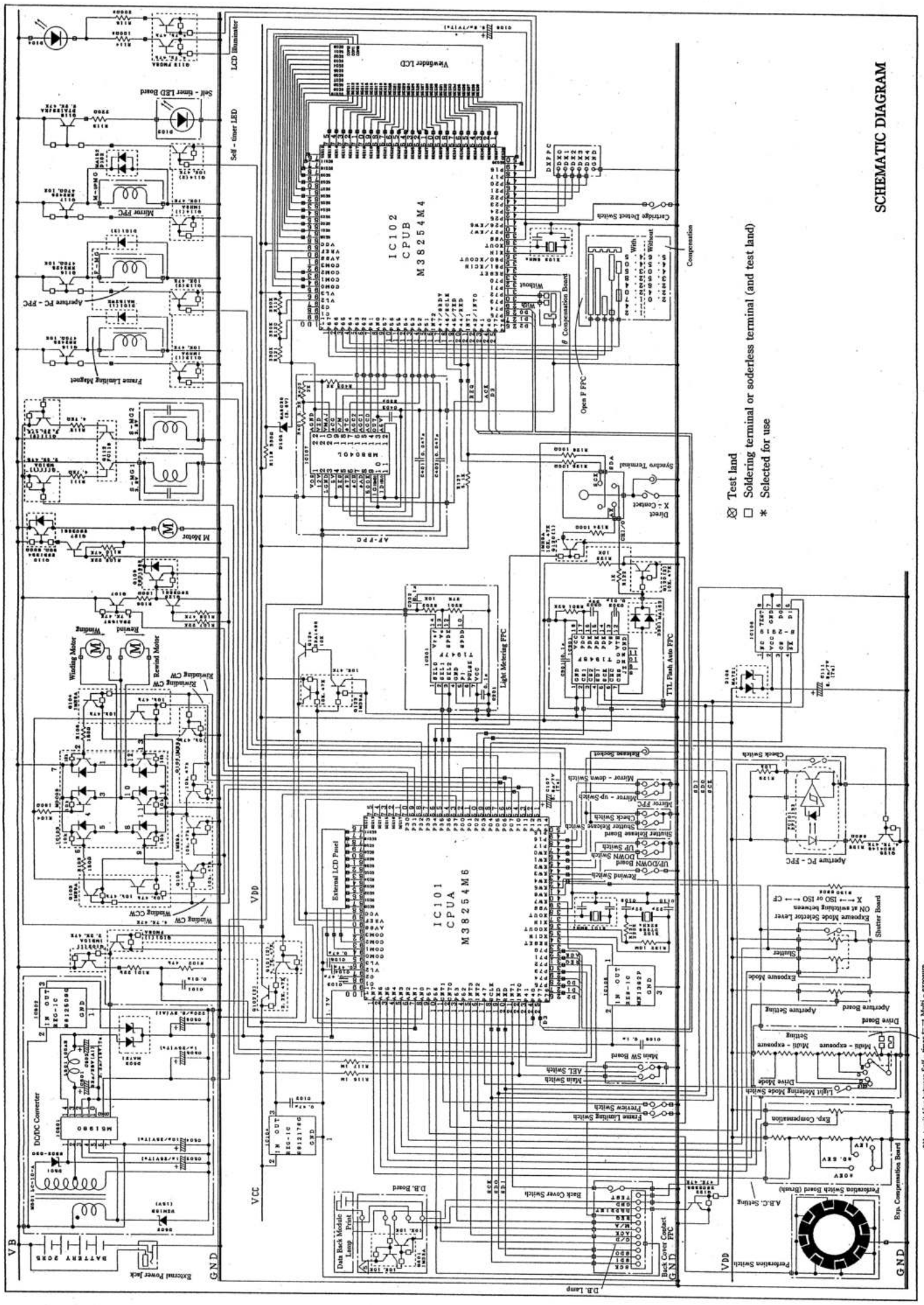
This switch, coupled with the Mirror Motor, detects the mirror up.

"H" ····· Mirror in the down position
"L" ····· Mirror in the up position

○ **Mirror - down Switch**

This switch, coupled with the Mirror Motor, detects the mirror down.

"H" ····· Mirror in the up position
"L" ····· Mirror in the down position



B. DISASSEMBLY & REASSEMBLY PROCEDURES

B - 1. REMOVAL OF EXTERIOR PARTS

[Chart for Removal of Exterior Parts]

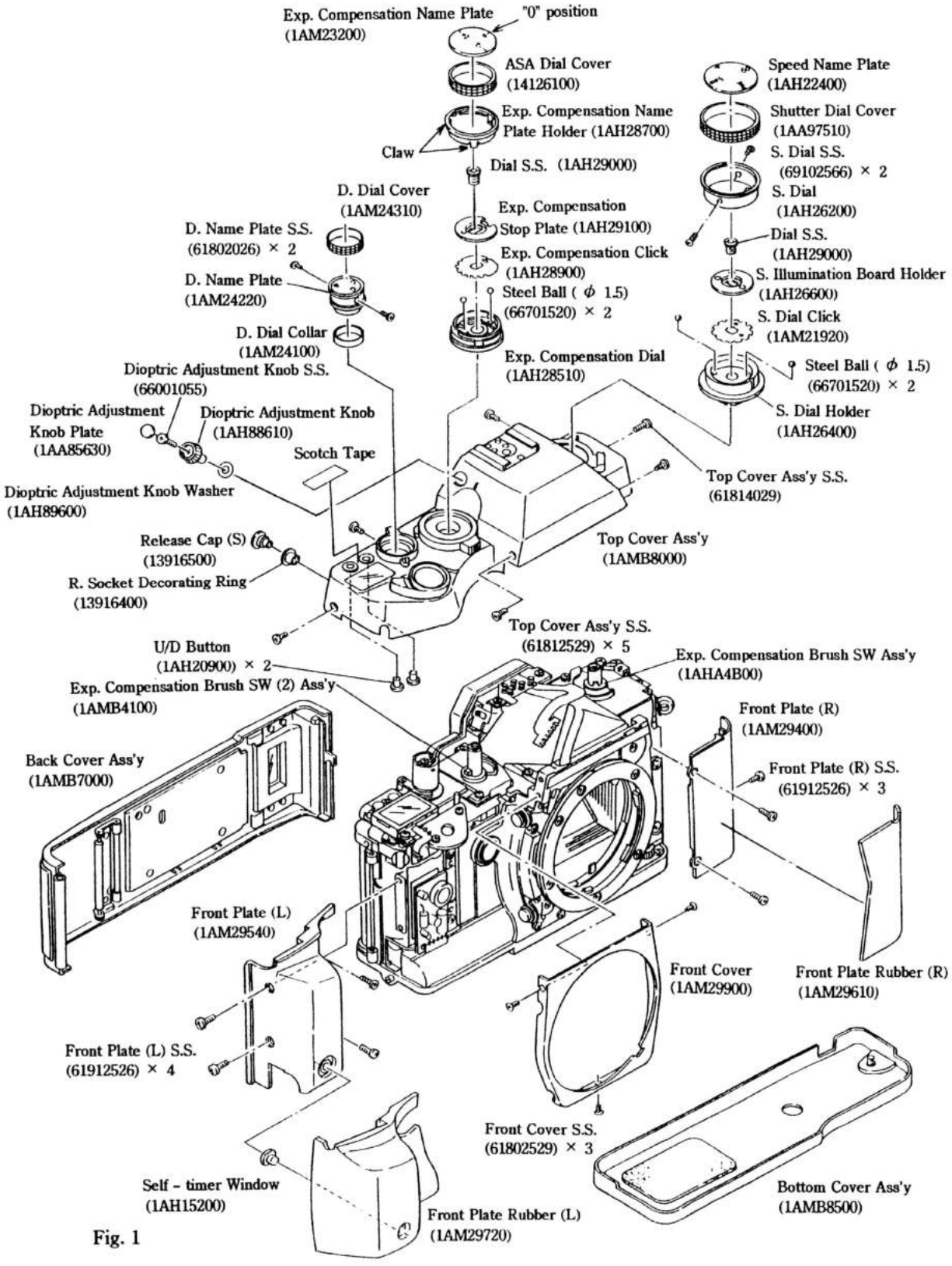


Fig. 1

B - 1 - 1. Removal of Back Cover Ass'y

1) Open the Back Cover Ass'y (1AMB7000) by pressing and sliding down the Lock Release Button of the Lock Plate Unit.
2) Remove the Back Cover Ass'y while pushing down the Back Cover Release Pin.

B - 1 - 2. Removal of Bottom Cover Ass'y

1) Loosen the Bottom Cover Screw using a coin or something like and take off the Bottom Cover Ass'y (1AMB8500).

B - 1 - 3. Removal of Front Cover

1) Remove the Front Cover Setscrews (61802529) × 3 and take off the Front Cover (1AM29900).

B - 1 - 4. Removal of Top Cover Ass'y

1) Peel off the Dioptric Adjustment Knob Plate (1AA85630) with tweezers or the like.
Note: The Dioptric Adjustment Knob Plate is fixed with double - stick tape.

2) Remove the Dioptric Adjustment Knob Setscrews (66001055) and take off the Dioptric Adjustment Knob (1AH88610) and Dioptric Adjustment Knob Washer (1AH89600).

3) Remove the Shutter Dial Cover (1AA97510).
Note: The Shutter Dial Cover is fixed to the S. Dial with the bond (Cemedine 551).

4) Remove the S. Dial Setscrews (69102566) × 2 and take off the S. Dial (1AH26200) W/Speed Name Plate (1AM22400).
Note: The Speed Name Plate is fixed to the S. Dial with the bond (Cemedine 551).
In repair, do not remove the Speed Name Plate.

5) Remove the Dial Setscrews (1AH29000) and take off the S. Illumination Board Holder (1AH26600), S. Dial Click (1AM21920) and S. Dial Holder (1AH26400).
Note: Take care not lose the Steel Balls (66701520) × 2 fitted in the S. Dial Holder.

6) Remove the ASA Dial Cover (14126100).
Note: The ASA Dial Cover is fixed to the Exp. Compensation Dial with the bond (Cemedine 551).

7) Raise gently the two claws of Exp. Compensation Name Plate Holder (1AH28700) positioned away from the "0" position of the Exp. Compensation Name Plate (1AM23200) and remove upward the EXP. Compensation Name Plate Holder W/Exp. Compensation Name Plate.
Notes: a) The Exp. Compensation Name Plate is fixed to the Exp. Compensation Name Plate Holder with the bond (Cemedine 551).
In repair, do not remove the Exp. Compensation Name Plate.
b) The claws of the Exp. Compensation Name Plate Holder break easily, so take ample care in removal and installation.

8) Remove the Dial Setscrew (1AH29000) and take off the Exp. Compensation Stop Plate (1AH29100), Exp. Compensation Click (1AH28900) and Exp. Compensation Dial (1AH28510).
Note: Take care not to lose the Steel Balls (66701520) × 2 fitted in the Exp. Compensation Dial.

9) Remove the D. Dial Cover (1AM24310).
Note: The D. Dial Cover is fixed to the D. Name Plate with the bond (Cemedine 551).

10) Remove the D. Name Plate Setscrews (61802026) × 2 and take off the D. Name Plate (1AM24220) W/D. Dial Collar (1AM24100).
Note: The D. Dial Collar is press - fitted in the D. Name Plate. In repair, do not remove the D. Dial Collar.

11) Remove the Release Cap (S) (13916500) and R. Socket Decorating Ring (13916400).
12) Stick the Scotch Tape to the U/D Button (1AH20900) × 2. (See Fig. 1)
13) Remove the Top Cover Ass'y Setscrews (61812529) × 5, (61814029) and take off the Top Cover Ass'y (1AMB8000).
Notes: a) After the removal of the Top Cover Ass'y, you can take off the Exp. Compensation Brush SW Ass'y (1AHA4B00) and Exp. Compensation Brush SW (2) Ass'y (1AMB4100). (See Fig. 1)
b) The contact of the Exp. Compensation Brush bends easily, so take ample care in handling.

[Notes on Handling of Top Cover Ass'y]

The Top Cover Ass'y incorporates the Mode Contact, A.B.C. Contact, Light Metering Contact and Main Switch. Take care not to bend or deform the contacts.

B - 1 - 5. Removal of Front Plates

1) Peel off the Front Plate Rubber (R) (1AM29600).
2) Peel off the Front Plate Rubber (L) (1AM29710) and remove the Self - timer Window (1AH15200).
Note: The Front Plate Rubber (R) and Front Plate Rubber (L) are fixed to the Front Plates with double - stick tape.

3) Remove the Front Plate (R) Setscrews (61912526) × 3 and take off the Front Plate (R) (1AM29400).
4) Remove the Front Plate (L) Setscrews (61912526) × 4 and take off the Front Plate (L) (1AM29540).
5) Unsolder the Black and Pink lead wires (from Cell Case) on the DC/DC Converter Ass'y.
6) Unsolder the 5 soldered joints between the DC/DC Converter Ass'y and the Main FPC.
7) Remove the DC/DC Converter Ass'y Set - screws (66001081) and take off the DC/DC Converter Ass'y (1AME1000).
8) Peel off the DC/DC Converter Sheet (1AM12000) and unsolder the Orange and Green lead wires (from Self - timer LED Board).

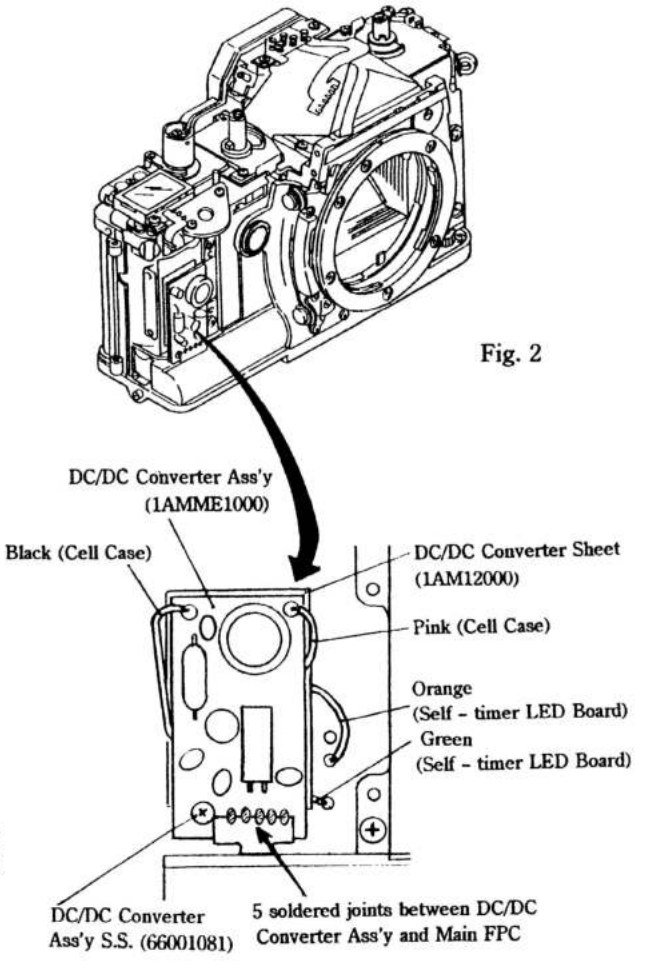


Fig. 2

[Assembly Procedure for Shutter Dial]

1) Make certain that the Exp. Compensation Brush SW Ass'y (1AHA4B00) (6 contacts) is positioned as shown in Fig. 3.

2) Install the S. Dial Holder (1AH26400) in the position as shown in Fig. 4.
3) Apply a small amount of the Grease (HK - 9) to the Steel Ball (66701520) × 2. Then put the Steel Balls in the holes in the S. Dial Holder.

4) Apply the Grease (HK - 9) to the grooves in the S. Dial Click (1AM21920) on its dull coner side and install it in the S. Dial Holder. In doing so, install the S. Dial Click in the position as shown in Fig. 5.
5) Install the S. Illumination Board Holder (1AH26600) in the position as shown in Fig. 5 and tighten the Dial Setscrew (1AH29000).
6) Install the S. Dial W/Speed Name Plate by fitting the projections of the S. Dial (1AH 26200) into the grooves in the S. Dial Holder. In doing so, make certain that the shutter speed is set in the "4000" position. Tighten the S. Dial Setscrews (69102566) × 2.
Turn the S. Dial and make certain that it turns smoothly without a catch or rough feel but with clicks to the feel.
7) Apply a small amount of the bond (Cemedine 551) to the periphery of the S. Dial. Put the Shutter Dial Cover (1AA97510) on the periphery of the S. Dial.

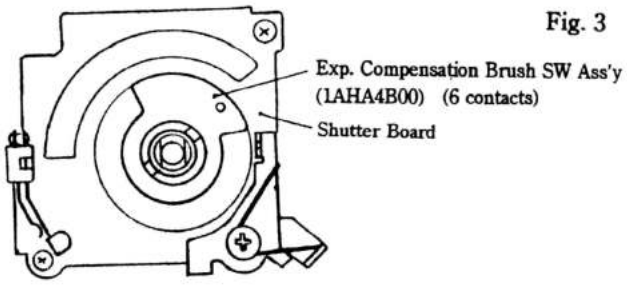


Fig. 3

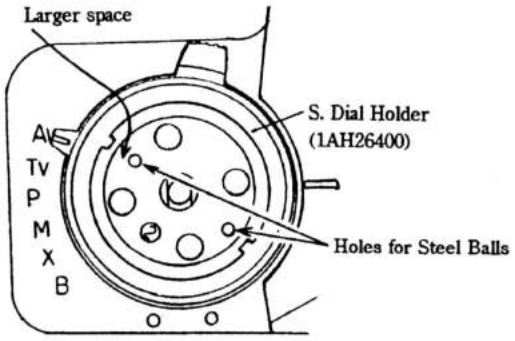


Fig. 4

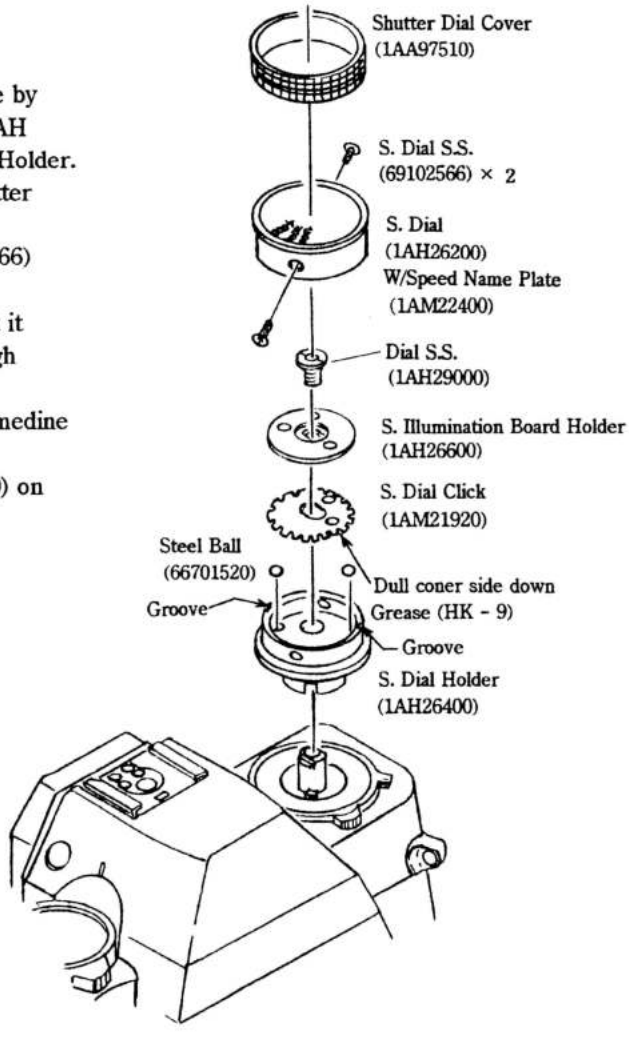


Fig. 5

[Assembly Procedure for Exp. Compensation Dial]

1) Make certain that the Exp. Compensation Brush SW (2) Ass'y (1AMB4100) (4 contacts) is positioned as shown in Fig. 6.

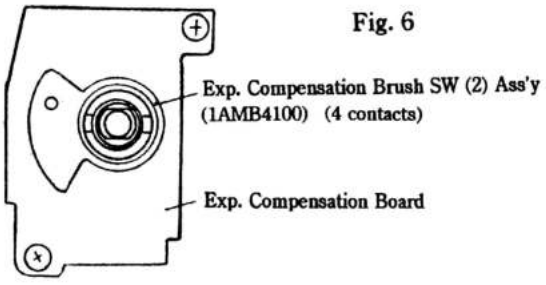


Fig. 6

2) Install the Exp. Compensation Dial (1AH 28510) in the position as shown in Fig. 7.
3) Apply a small amount of the Grease (HK - 9) to the the Steel Balls (66701520) × 2. Then put the Steel Balls in the two holes in the Exp. Compensation Dial.

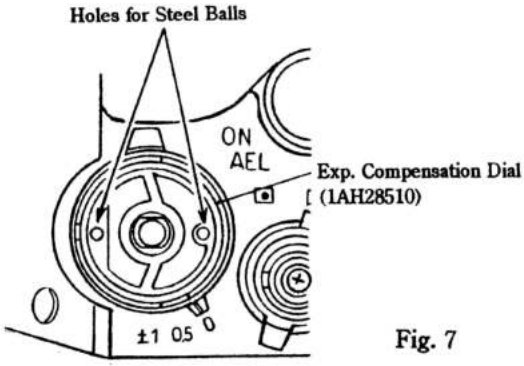
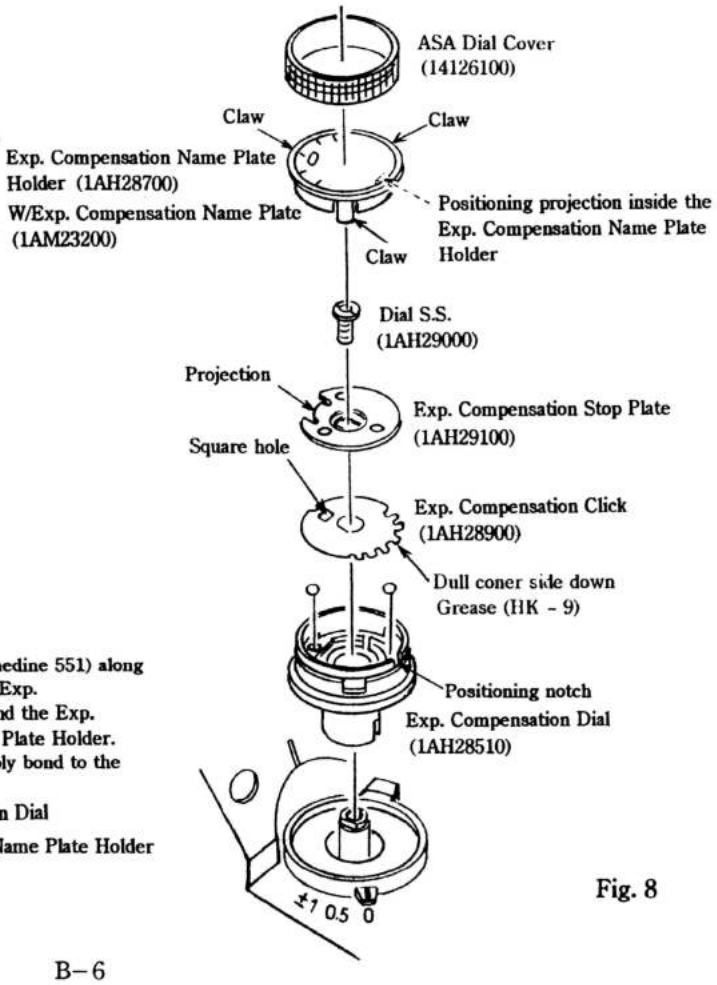


Fig. 7

4) Apply the Grease (HK - 9) to the grooves in the Exp. Compensation Click (1AH28900) on its dull coner side and install it in the Exp. Compensation Dial.
5) Install the Exp. Compensation Stop Plate (1AH29100) so that its projection comes in the square hole in the Exp. Compensation Click. Then tighten the Dial Setscrew (1AH29000).
6) Fit the positioning notch in the Exp. Compensation Dial onto the positioning projection of the Exp. Compensation Name Plate Holder (1AH28700) and install the Exp. Compensation Name Plate Holder W/ Exp. Compensation Name Plate.
In doing so, lock the three claws of the Exp. Compensation Name Plate Holder to the Exp. Compensation Dial.
Turn the Exp. Compensation Dial and make certain that it turns smoothly without a catch or rough feel but with clicks to the feel.
7) Apply the bond (Cemedine 551) to the pe - riphery along the gap between the Exp. Compensation Dial and the Exp. Compen - sation Name Plate Holder. (See Fig. 9) However, do not apply bond to the three claws of the Exp. Compensation Name Plate Holder.
8) Put the ASA Dial Cover (14126100) on the periphery of the Exp. Compensation Dial.



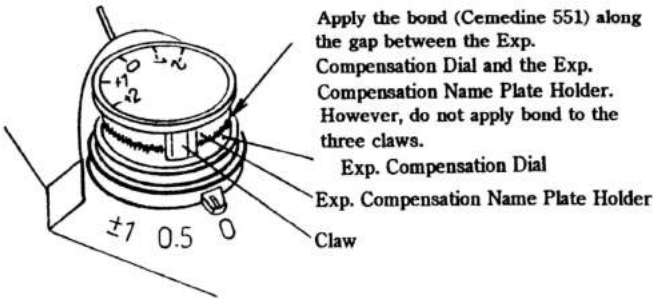


Fig. 8

[How to Attach Speed Name Plate]

1) Set the Speed Name Plate (1AM22400) in the S. Dial (1AH26200) by placing the "1000" position of the Name Plate at the hole in the S. Dial.
2) Apply the bond (Cemedine 551) to the back side of Speed Name Plate.

Note: Do not apply bond to the A or B.

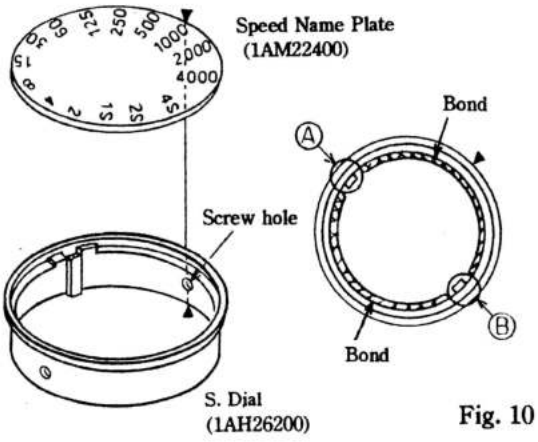


Fig. 10

[How to Attach Exp. Compensation Name Plate]

1) Set the Exp. Compensation Name Plate (1AM23200) in the Exp. Compensation Name Plate Holder (1AH28700) by positioning the "0" of the Name Plate at the claw (triangle mark) of the Holder.
2) Apply the bond (Cemedine 551) to the back side of Exp. Compensation Name Plate.

Note: Do not apply the bond to A, B or C.

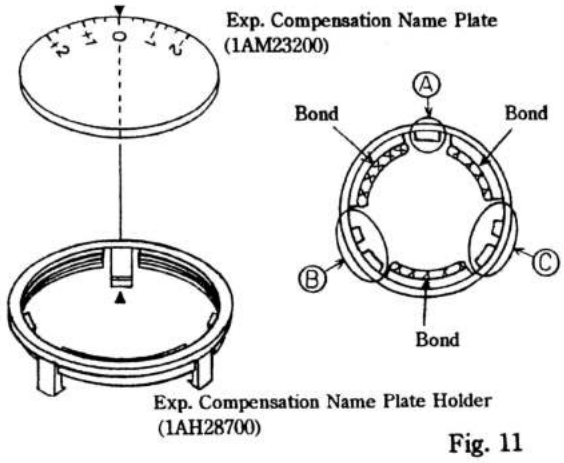


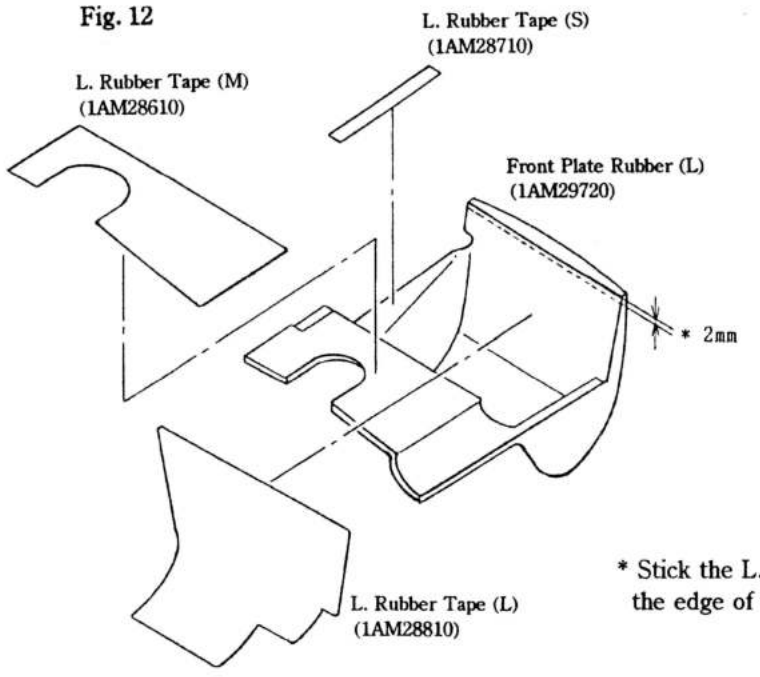
Fig. 11

[Sticking of Double - Stick Tape to Front Plate Rubbers]

Notes: a) The adhesive force of the double - stick tape on the Front Plate Rubber (L) and Front Plate Rubber (R) weakens, once the Front Plate Rubbers are peeled off. Therefore, stick new double - stick tape before attaching the Front Plate Rubbers again.

b) Stick the double - stick tapes so that they do not protrude from the Front Plate Rubbers.

Fig. 12



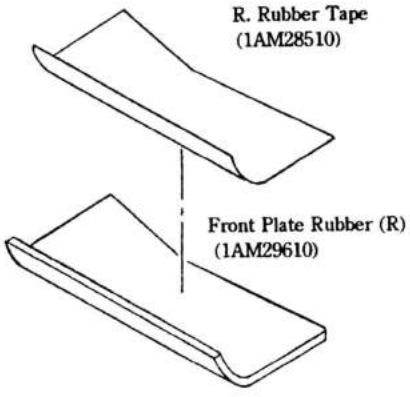


Fig. 13

* Stick the L. Rubber Tape (L) about 2mm below the edge of the Front Plate Rubber (L).

B - 2. REMOVAL OF CELL CASE ASS'Y

B - 2 - 1. Removal of Cell Case Ass'y

1) Remove the Cell Case Ass'y Setscrews (61925026) × 6 and take off the Cell Case Ass'y (1AMB7900).

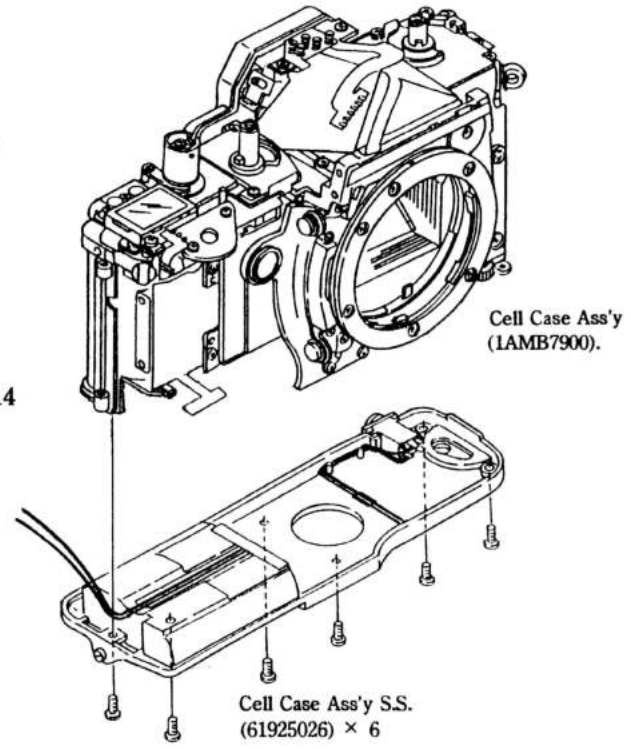


Fig. 14

[Notes on Dressing of Battery Contact Lead Wires]

a) Place the lead wires (Pink and Black) of the Cell Case between the projection on the left side of the Body and the Cell Case. Take care not to dress the lead wires over the projection on the left side of the Body or over the Cell Case. (See Fig. 15)
b) Lead the Pink lead wire of the Cell Case behind the DC/DC Converter and solder it to the DC/DC Converter. (See Fig. 16)

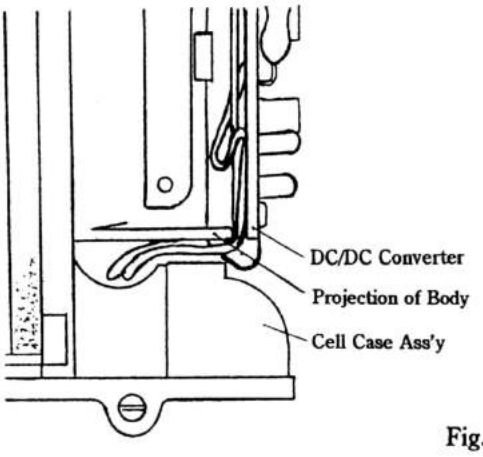


Fig. 15

(Left side view of Body)

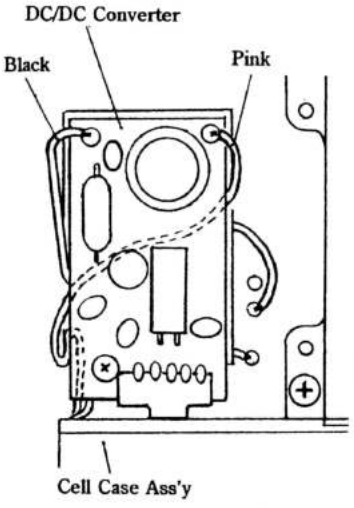


Fig. 16

(Front view of Body)

B-3. REMOVAL OF MAIN FPC ASS'Y

[Chart for Unsoldering on Main FPC Ass'y]

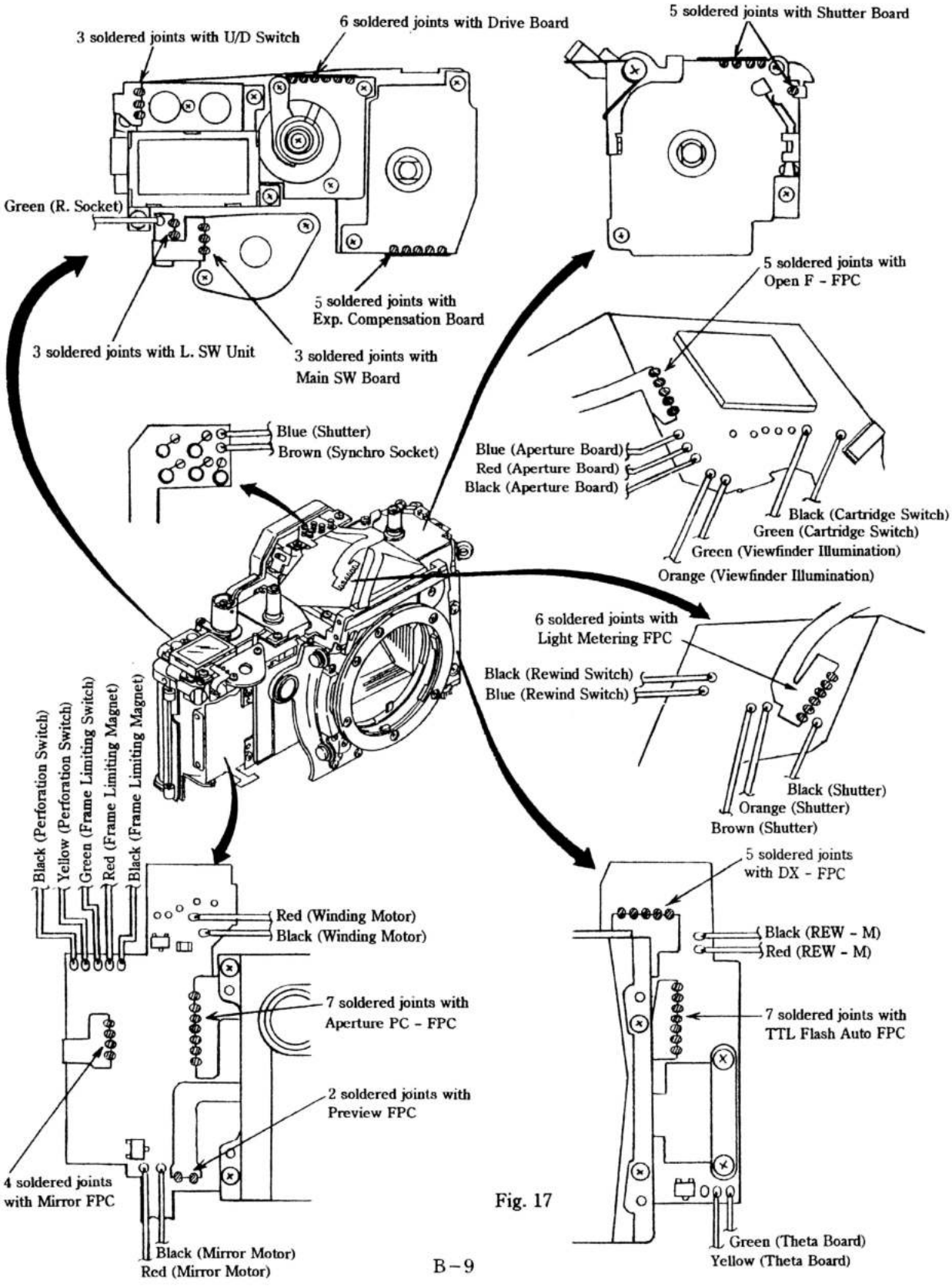


Fig. 17

B - 3 - 1. Removal of Main FPC Ass'y

(Top of Body)

1) Unsolder the Blue lead wire (from Shutter (X)) and Brown lead wire (from Synchro Socket).
2) Unsolder the Black and Blue lead wires (from Rewind Switch).
3) Unsolder the Brown, Orange and Black lead wires (from Shutter).
4) Unsolder the 6 soldered joints between the Light Metering FPC and the Main FPC.
5) Unsolder the Black and Green lead wires (from Cartridge Switch).
6) Unsolder the Black, Red and Blue lead wires (from Aperture Board).
7) Unsolder the Green and Orange lead wires (from Viewfinder Illumination).
8) Unsolder the 5 soldered joints between the Open F - FPC and the Main FPC.

(Top Left of Body)

9) Unsolder the Green lead wire (from R. Socket).
10) Unsolder the 3 soldered joints between the Main SW Board and Main FPC.
11) Unsolder the 3 soldered joints between the L. SW Unit and the Main FPC.
12) Unsolder the 3 soldered joints between the U/D Switch and the Main FPC.
13) Peel off the acetate cloth tape attached to the soldered joints between the Drive Board and Main FPC and unsolder the 6 soldered joints between the Drive Board and the Main FPC.
14) Unsolder the 5 soldered joints between the Exp. Compensation Board and the Main FPC.

(Top Right of Body)

15) Unsolder the 5 soldered joints between the Shutter Board and the Main FPC.

(Front Right of Body)

16) Unsolder the Red and Black lead wires (from Mirror Motor).
17) Unsolder the Black and Yellow lead wires (from Perforation Switch), Green lead wire (from Frame Limiting Switch), Red and Black lead wires (from Frame Limiting Magnet).
18) Unsolder the 2 soldered joints between the Preview FPC and the Main FPC.
19) Unsolder the 7 soldered joints between the Aperture PC - FPC and the Main FPC.
20) Unsolder the 4 soldered joints between the Mirror FPC and the Main FPC.

(Front Left of Body)

21) Unsolder the Black and Red lead wires (from REW - M).
22) Unsolder the Green and Yellow lead wires (from Theta Board).
23) Unsolder the 7 soldered joints between the TTL Flash Auto FPC and the Main FPC.
24) Unsolder the 5 soldered joints between the DX - FP and the Main FPC.
25) Remove the FPC Connect Plate Setscrews (66001025) × 2 and take off the FPC Connect Plate (1AM12220) and FPC Connect Rubber (1AM12510).
26) Remove the Connect Post (1AH10300) × 2.

(Top Right of Body)

27) Remove the LCD Base Plate Setscrews (63912526) × 2 and take off the LCD Base Plate W/External LCD Panel.
28) Remove the Release Base Plate Setscrews (63912526) × 2, (63914026) and take off the Release Base Plate Ass'y (1AMB4000).
29) Remove the Main FPC Ass'y (61901822).

(Top Left of Body)

30) Release the hook of the Mode Lock Spring (1AM27810) and remove the Mode Lock Lever Ass'y Setscrews (66001049). Then take off the Mode Lock Spring and the Mode Lock Lever Ass'y (1AMB4600).
31) Remove the Mode Lock Shaft (1AH23810) and Shutter Board Setscrews (63912526), (63914026) and take off the Shutter Board (1AM53310) and S. Dial Base Plate Ass'y (1AMB4500).
32) Remove the Indicator Connect Plate Setscrews (66001010) × 4 and take off the Indicator Connect Plate (1AM13000) and FPC Connect Rubber (1AM12510) × 2.
33) Remove the Main FPC Ass'y Setscrews (63912526) and take off the Main FPC Ass'y (1AME0800).

Note: The Main FPC is attached to the Accessory Shoe Base with the Shoe Base Tape (1AM81700), so take due care in removing the Main FPC Ass'y.

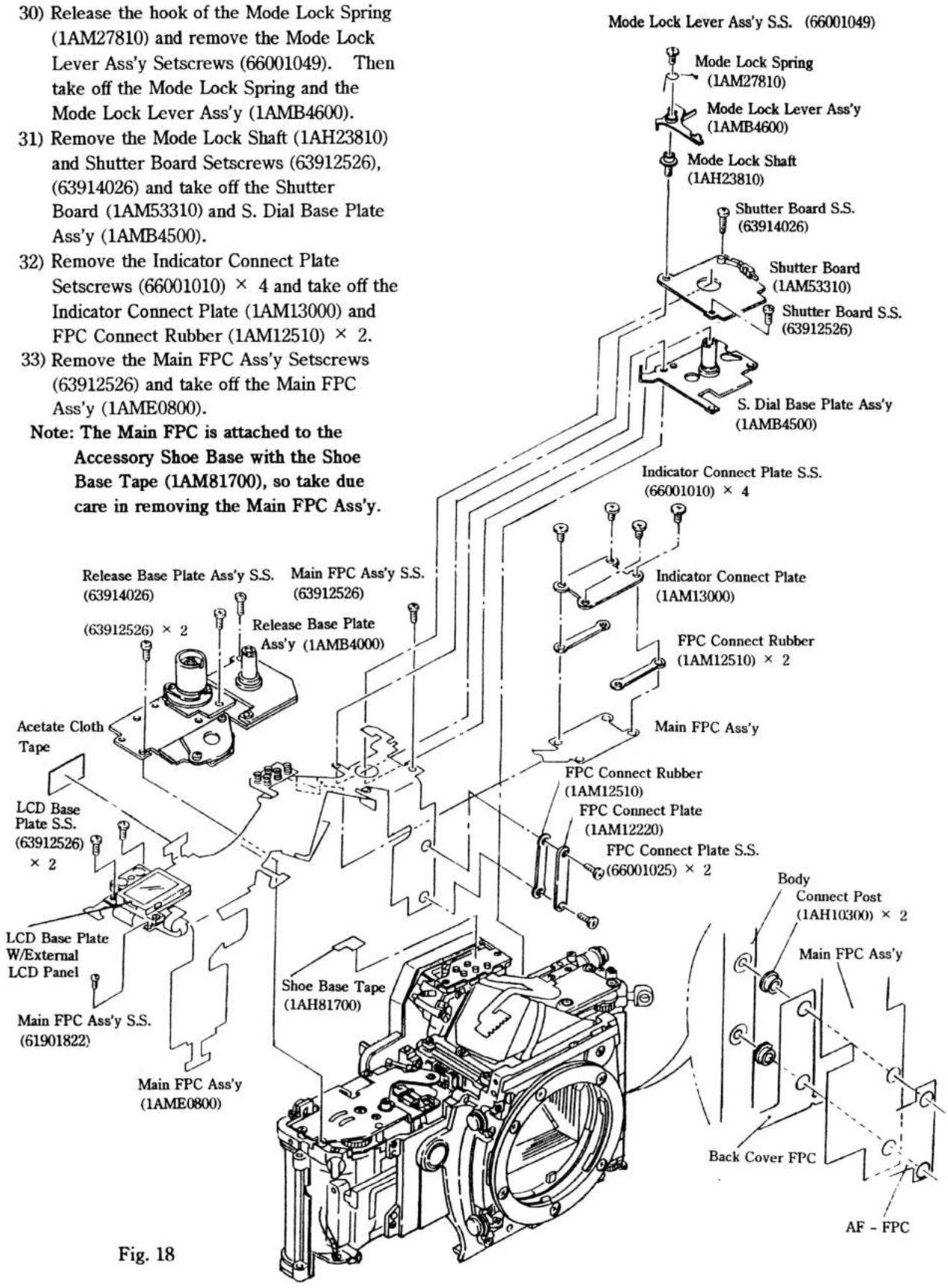


Fig. 18

B - 4. REMOVAL OF MIRROR BOX ASS'Y

B - 4 - 1. Removal of Mirror Box Ass'y

1) Remove the Eye - piece Ass'y Setscrews (61924026) × 2 and take off the Eye - piece Ass'y (1AMF0600).
2) Remove the Mirror Box Ass'y Setscrews (6600160) × 2, (63925026) × 4 and take off the Mirror Box Ass'y (1AHA2000).

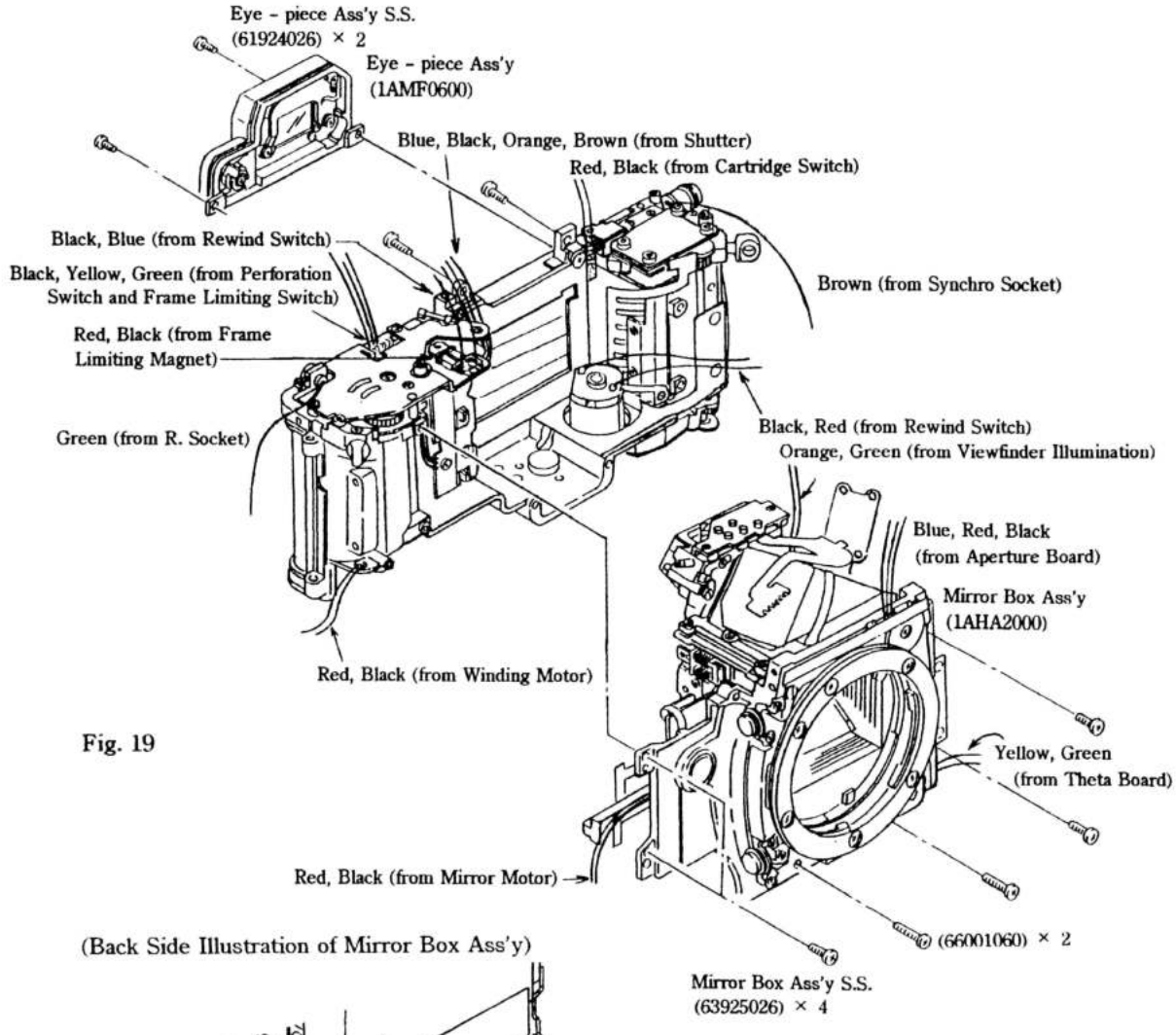


Fig. 19

(Back Side Illustration of Mirror Box Ass'y)

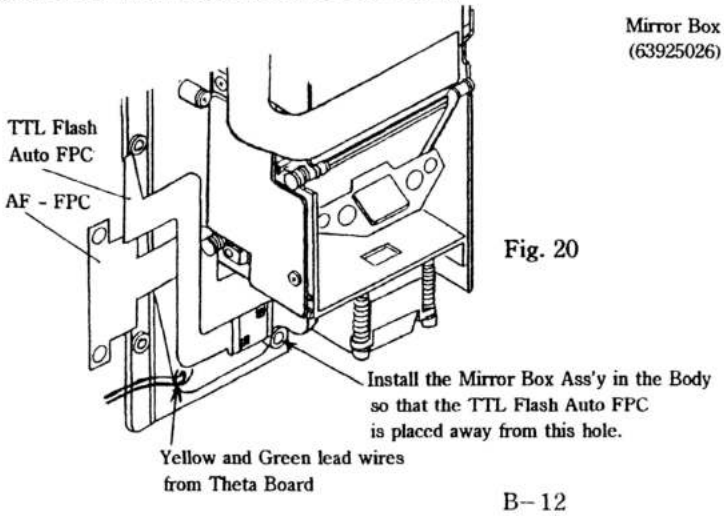


Fig. 20

[Notes on Installation of Mirror Box Ass'y]

*** When installing the Mirror Box Ass'y in the Body, observe the following instructions:**

a) The lead wires connected to the Body and those connected to the Mirror Box Ass'y must be placed out of the Body as shown in Fig. 19. And when installing the Mirror Box Ass'y, take care not to catch any lead wires or FPC between the Body and the Mirror Box Ass'y.
Make certain that the lead wires are placed out as shown in Fig. 22.

b) Make certain that the hook of the S. Charge Lever and the hook of the S. Charge Hold Lever are released, and then install the Mirror Box Ass'y in the Body.

(Procedure for Releasing Hook of S. Charge Lever and Hook of S. Charge Hold Lever)

① Turn the Mirror Gear (3) (1AM71300) in the direction of the arrow Ⓐ , and the FC Charge Lever will move upward in the hole in the Mirror Base Plate (Upper) by the effect of the cam of the Cam Gear.

② Turn the Mirror Gear (3) further, and the S. Charge Lever is pulled downward by the force of the Charge Lever Spring (1AM72710). After that, move the S. Charge Hold Lever in the direction of the arrow Ⓑ , and the hook of the S. Charge Lever and the hook of the S. Charge Hold Lever will be released and the Mirror will move up.

③ Turn the Mirror Gear (3) further in the direction of the arrow Ⓐ until the Aperture Lever comes to the up position (see Fig. 40). Then install the Mirror Box Ass'y in the Body.

(Side View of Mirror Box Ass'y)

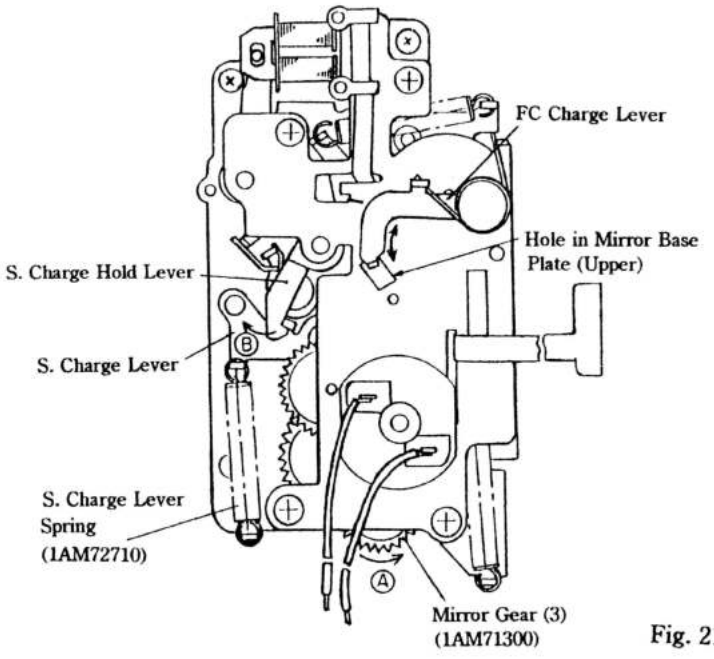


Fig. 21

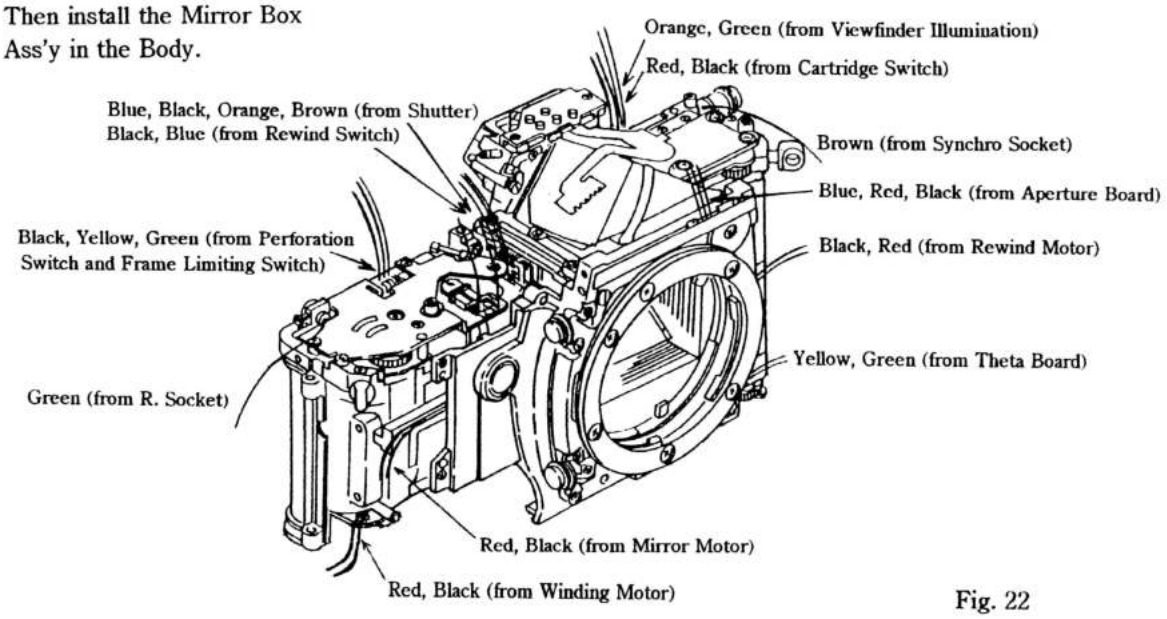


Fig. 22

B - 5. DISASSEMBLY OF WINDING MECHANISM

B - 5 - 1. Disassembly of Winding Mechanism

1) Peel off the Lock Claw Moquette (2) (1741600).
2) Remove the Hinge Cover Ass'y Setscrews (66001187), (69113576) and take off the Hinge Cover Ass'y (1AMB0600).

Notes: a) Remember that the Hinge Cover Ass'y Setscrew (66001187) is an inverse screw.
b) In repair, it is not necessary to remove the Lock Claw Moquette (2) or Hinge Cover Ass'y. To install the Spool, however, move the Film Roller in the direction of the arrow and install the Spool with the Film Roller held there.

3) Remove the Film Fixer Ass'y Setscrews (63913526) × 2 and take off the Film Fixer Ass'y (174B1100).
4) Remove the Winding Unit Ass'y Setscrews (61913522), (61813026) × 2 and take off the Winding Unit Ass'y (1AMB1700).
5) Remove the Spool (1AM31600).
6) Remove the Spool Holder Setscrews (63911826) × 3 and take off the Spool Holder (17438200).
7) Remove the Sprocket (17437100).

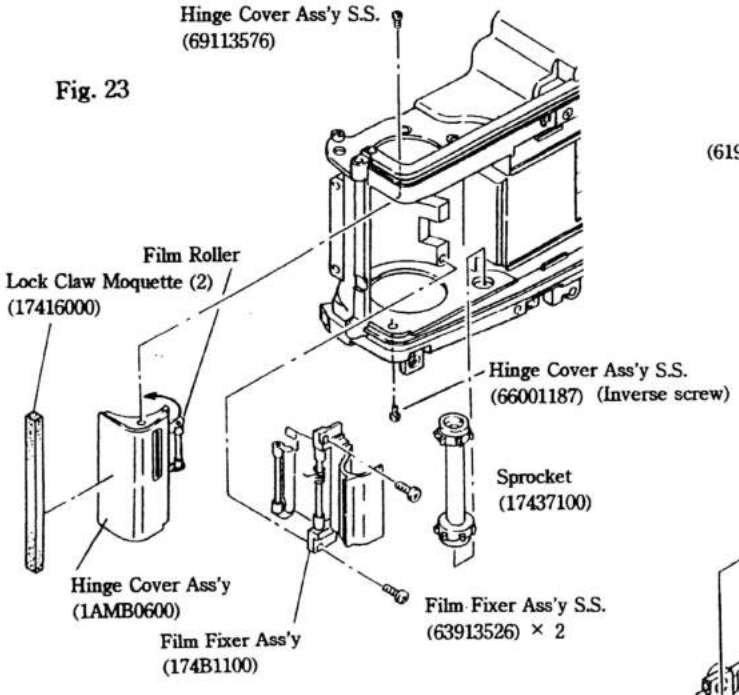


Fig. 23

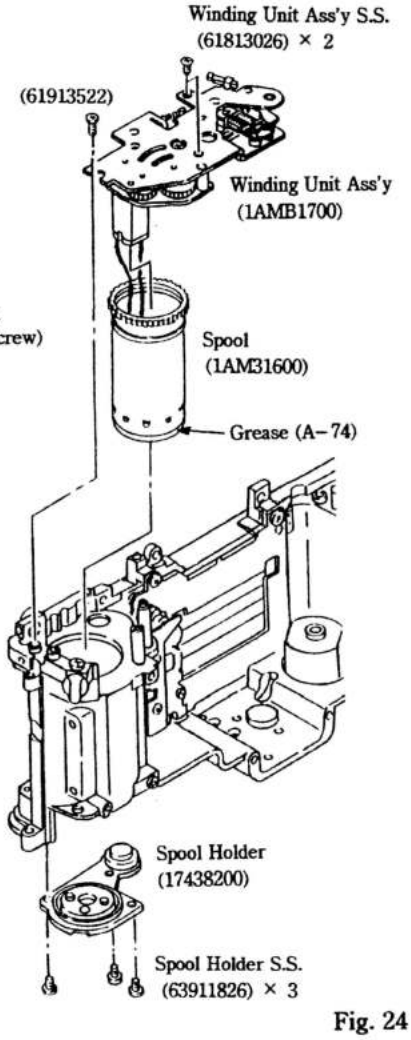


Fig. 24

B - 6. REMOVAL OF SHUTTER UNIT

B - 6 - 1. Removal of Shutter Unit

1) Peel off the Light - Proof Curtain (1) (1AH88200).
2) Remove the Shutter Unit Setscrews (61924029), (66001065), (66001001) and take off the Shutter Unit (1AM30100).

Notes: a) The blades of the Shutter Unit are made with precision. Never touch the blades with your finger, nor push them with any tool.

b) The Light - Proof Curtain (1) is attached to the Body with the Shutter Light - Proof Curtain Tape (1AM30200).

c) When installing the Shutter Unit, push the Shutter Unit in the direction of the arrow as shown in Fig. 25 and tighten the Shutter Unit Setscrews.

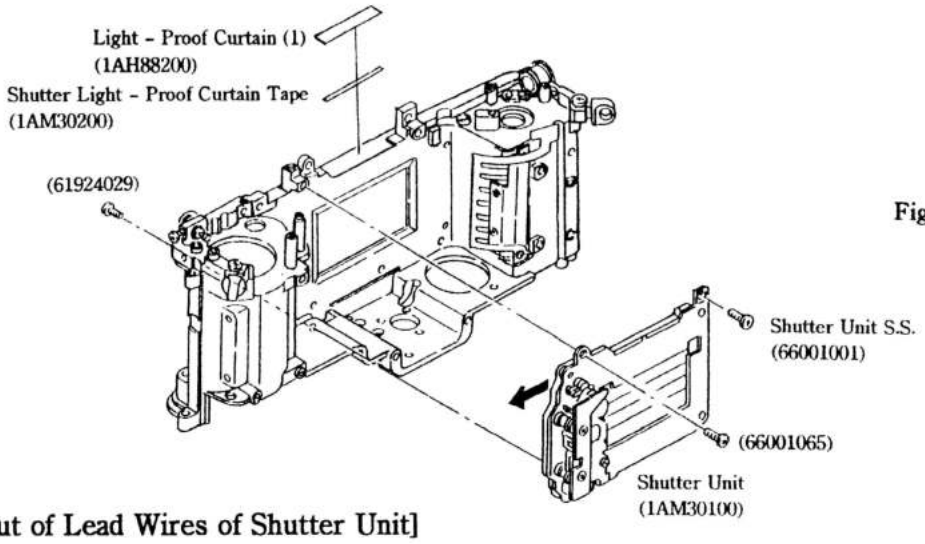


Fig.25

[Layout of Lead Wires of Shutter Unit]

① Blue lead wire (X)
② Brown lead wire (M1)
③ Black lead wire (GND)
④ Orange lead wire (M2)

(Front View of Shutter Unit)

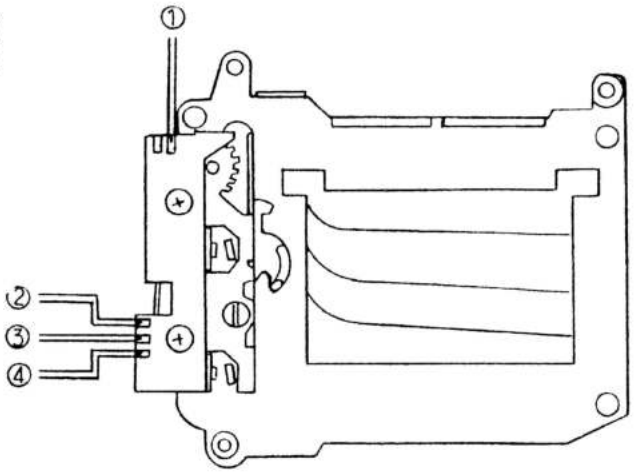


Fig. 26

B - 7. REMOVAL OF REWIND MECHANISM

B - 7 - 1. Removal of Rewind Base Plate (Upper) Ass'y

1) Remove the FPC Connect Base Plate Ass'y Setscrews (61913526) × 2 and take off the FPC Connect Base Plate Ass'y (1AMB1300).
2) Remove the Rewind Base Plate (Upper) Ass'y Setscrews (61913526) × 3 and take off the Rewind Base Plate (Upper) Ass'y (1AMB0800).
3) Remove the Drive Shaft (1AM41820).
4) Remove the Cartridge SW Pin (1AM11700).

B - 7 - 2. Removal of Rewind Base Plate (Lower) Ass'y

1) Remove the Bottom Cover Screw Holder Ass'y Setscrews (61923026) × 2 and take off the Bottom Cover Screw Holder Ass'y (1AMB0700).
2) Remove the Rewind Base Plate (Lower) Ass'y Setscrews (63914026) × 3 and take off the Rewind Base Plate (Lower) Ass'y (1AMB1400).

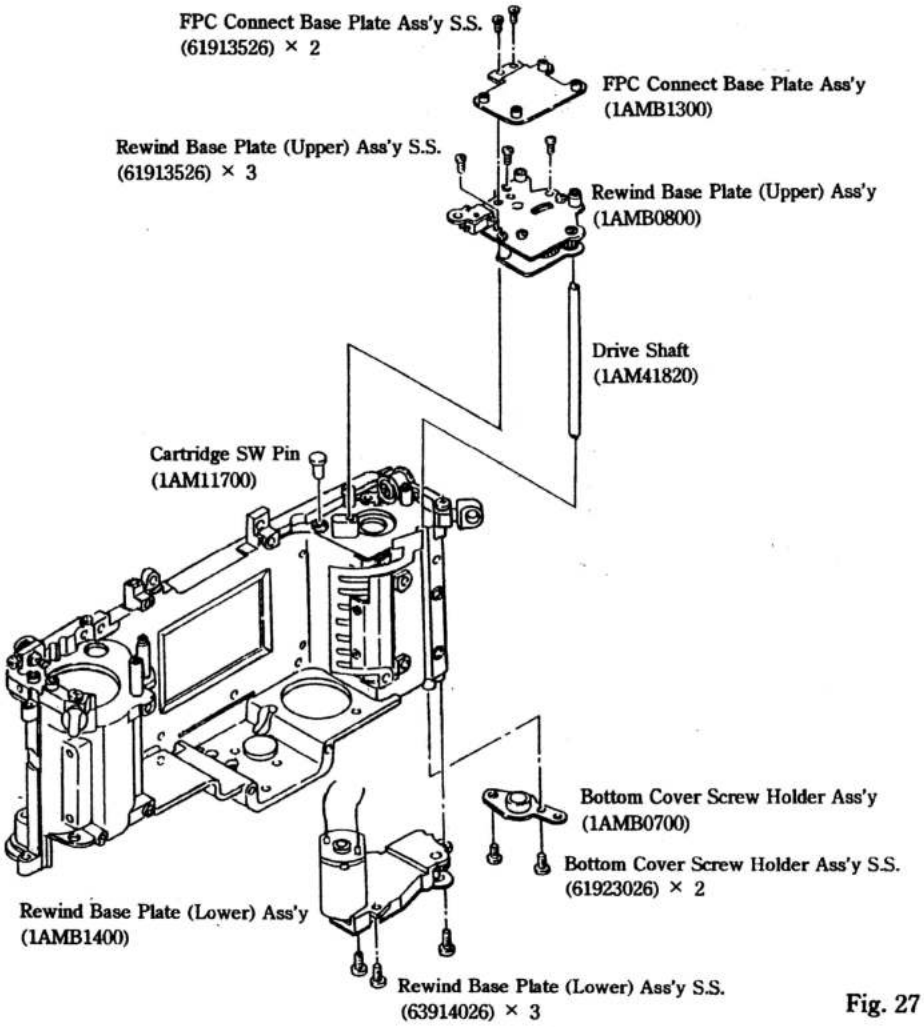


Fig. 27

B - 6. REMOVAL OF SHUTTER UNIT

B - 6 - 1. Removal of Shutter Unit

1) Peel off the Light - Proof Curtain (1) (1AH88200).
2) Remove the Shutter Unit Setscrews (61924029), (66001065), (66001001) and take off the Shutter Unit (1AM30100).

Notes: a) The blades of the Shutter Unit are made with precision. Never touch the blades with your finger, nor push them with any tool.

b) The Light - Proof Curtain (1) is attached to the Body with the Shutter Light - Proof Curtain Tape (1AM30200).

c) When installing the Shutter Unit, push the Shutter Unit in the direction of the arrow as shown in Fig. 25 and tighten the Shutter Unit Setscrews.

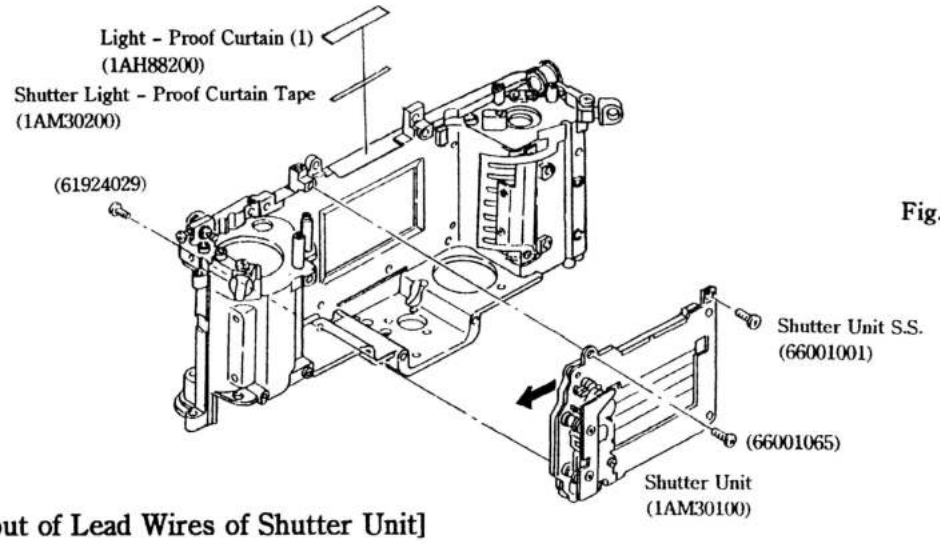


Fig.25

[Layout of Lead Wires of Shutter Unit]

① Blue lead wire (X)
② Brown lead wire (M1)
③ Black lead wire (GND)
④ Orange lead wire (M2)

(Front View of Shutter Unit)

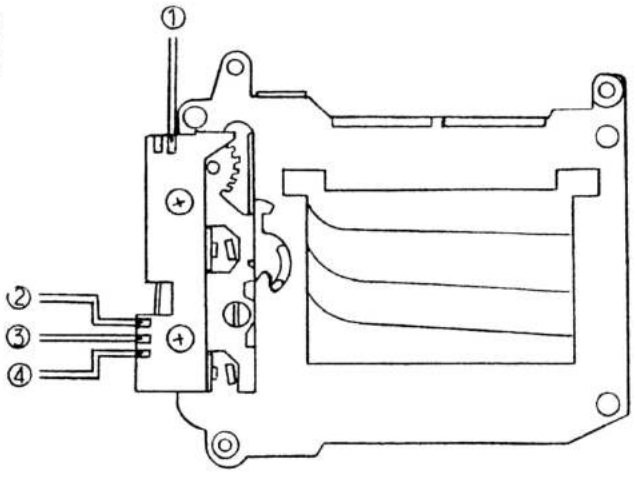


Fig. 26

B - 7. REMOVAL OF REWIND MECHANISM

B - 7 - 1. Removal of Rewind Base Plate (Upper) Ass'y

1) Remove the FPC Connect Base Plate Ass'y Setscrews (61913526) × 2 and take off the FPC Connect Base Plate Ass'y (1AMB1300).
2) Remove the Rewind Base Plate (Upper) Ass'y Setscrews (61913526) × 3 and take off the Rewind Base Plate (Upper) Ass'y (1AMB0800).
3) Remove the Drive Shaft (1AM41820).
4) Remove the Cartridge SW Pin (1AM11700).

B - 7 - 2. Removal of Rewind Base Plate (Lower) Ass'y

1) Remove the Bottom Cover Screw Holder Ass'y Setscrews (61923026) × 2 and take off the Bottom Cover Screw Holder Ass'y (1AMB0700).
2) Remove the Rewind Base Plate (Lower) Ass'y Setscrews (63914026) × 3 and take off the Rewind Base Plate (Lower) Ass'y (1AMB1400).

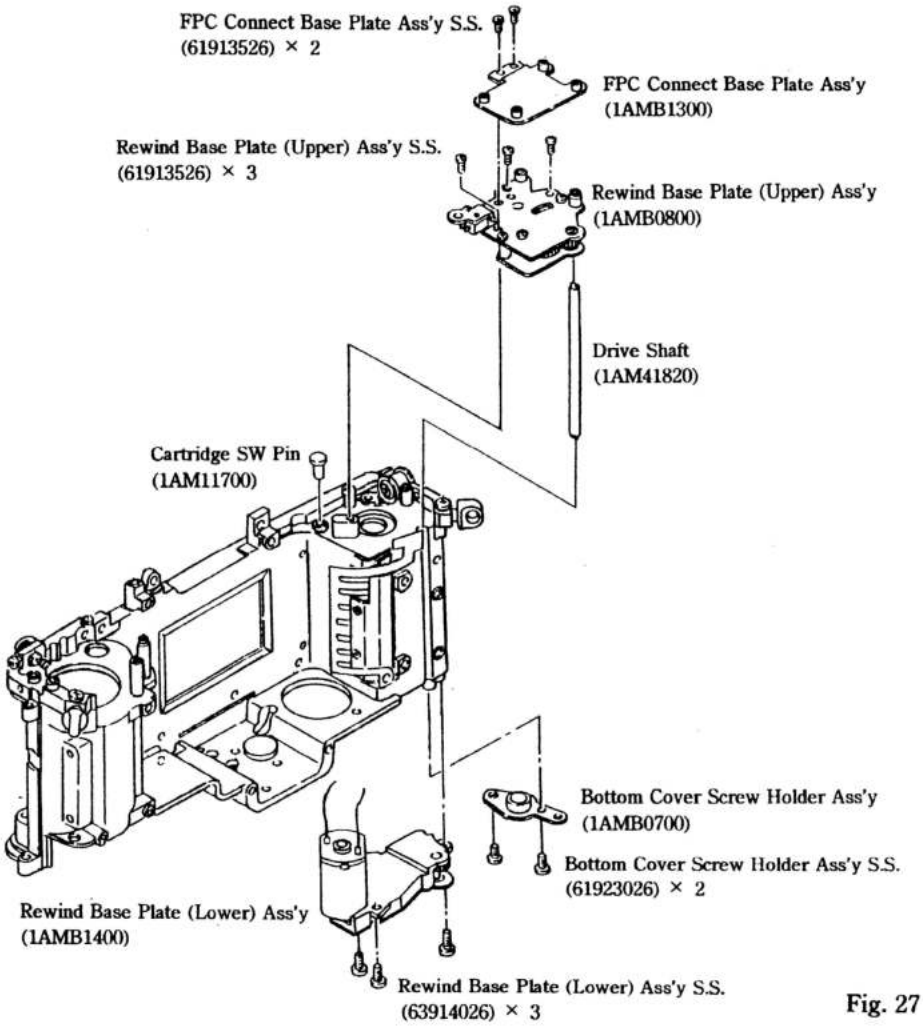


Fig. 27

B - 8. REMOVAL OF OTHER PARTS

B - 8 - 1. Removal of Back Cover FPC

1) Remove the Lock Plate Unit Ass'y Setscrews (66001122) and take off the Lock Plate Unit Ass'y (1AHA1Q00).
2) Remove the Contact Cover Setscrews (66001167) × 3 and take off the Contact Cover (1AM13510).
3) Remove the Back Cover FPC (1AM51500).

Note: Remove the Back Cover FPC carefully, since it is attached to the Body with the Bottom FPC Tape (1AM11900).

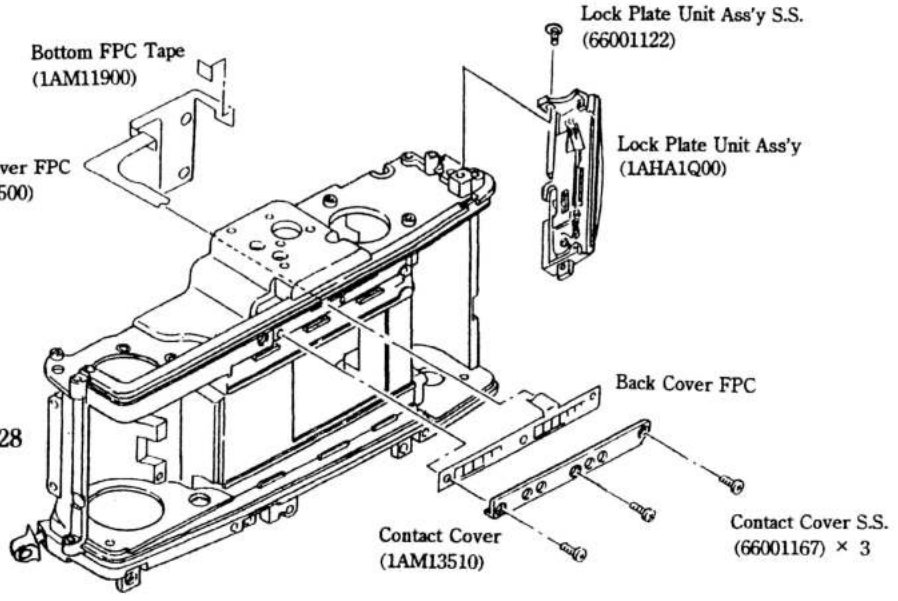


Fig. 28

B - 8 - 2. Removal of DX Ass'y

1) Remove the DX Ass'y Setscrews (61913022) × 2 and take off the DX Ass'y (174B1400).

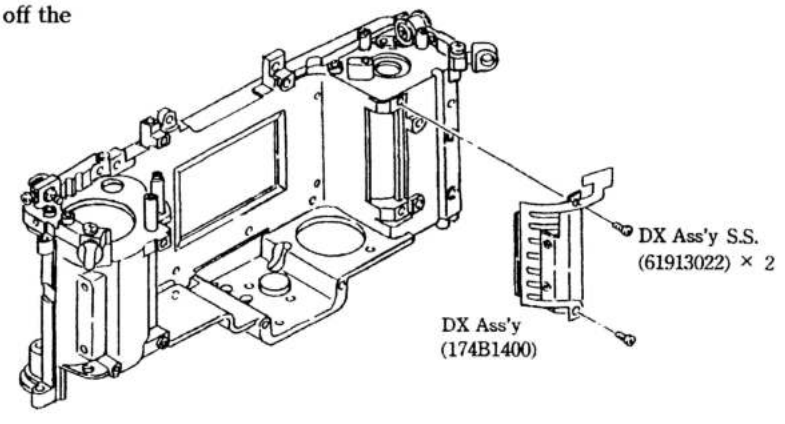


Fig. 29

B - 9. DISASSEMBLY & REASSEMBLY PROCEDURES FOR ASS'Y PARTS

B - 9 - 1. Disassembly of Mirror Box Ass'y

Note: When disassembling the Mirror Box Ass'y, observe the following instructions:

a) Do not remove the AF Module. Its removal can cause a defective Digital Focus Indicator, thus re - sulting in incorrect focusing. If the AF Module is found defec - tive, replace the Mirror Box Ass'y (1AMG1200).

b) Do not remove the Mirror Frame Ass'y, Mirror Hinge Plate, Sub Mirror Adjusting Plate, Main Adjusting Plate or Mirror Stopper. Their removal can cause a defec - tive Digital Focus Indicator, thus resulting in incorrect focusing.

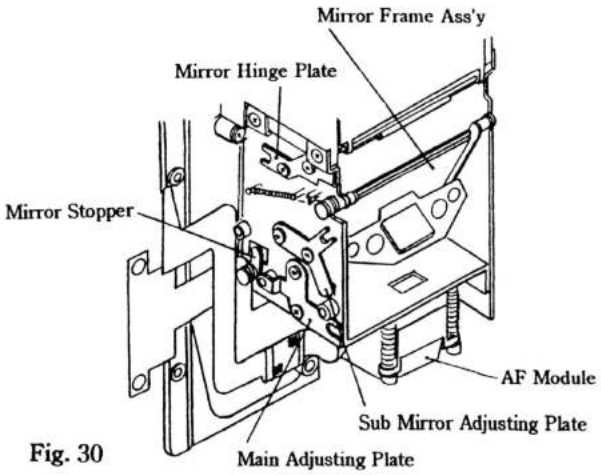


Fig. 30

1) Remove the Dioptric Adjuster Ass'y Setscrews (63914026) × 2 and take off the Dioptric Adjuster Ass'y (1AMF0500).

2) Remove the Finder LCD Ass'y Setscrews (63902226) × 2 and take off the Finder LCD Ass'y (1AMF0400).

Note: Remove the Finder LCD Ass'y carefully, since the FPC of the Finder LCD Ass'y is attached to the Mirror Box with the Finder Indicator FPC Tape (1AM81800).

3) Remove the Penta Prism Holder Setscrews (63915526) × 4 and take off the Penta Prism Holder W/Penta Prism.

4) Remove the four Focus Adjust Washers.

Note: In reassembly, put back the same Focus Adjust Washers. When the finder focusing is not right, make the finder focus adjustment by replacing these Focus Adjust Washers.

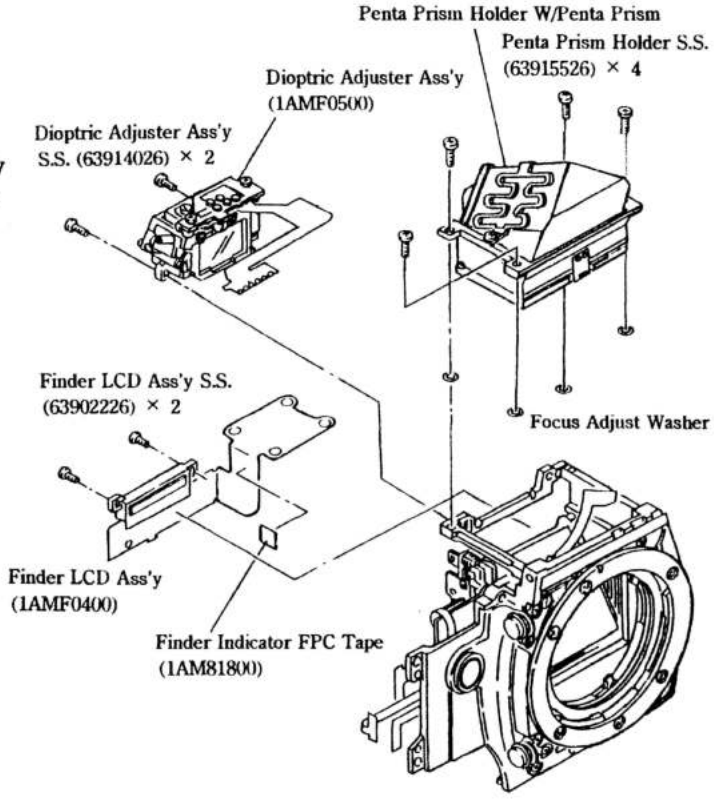


Fig. 31

5) Remove the FC Base Plate Ass'y Setscrews (63912526) × 3 and take off the FC Base Plate Ass'y (1AMG2500) and FC Gear (1) Ass'y (1AMG2400).
6) Remove the Mirror Base Plate Ass'y Setscrews (63913026), (61812226) × 3 and take off the Mirror Base Plate Ass'y (1AMG1900).

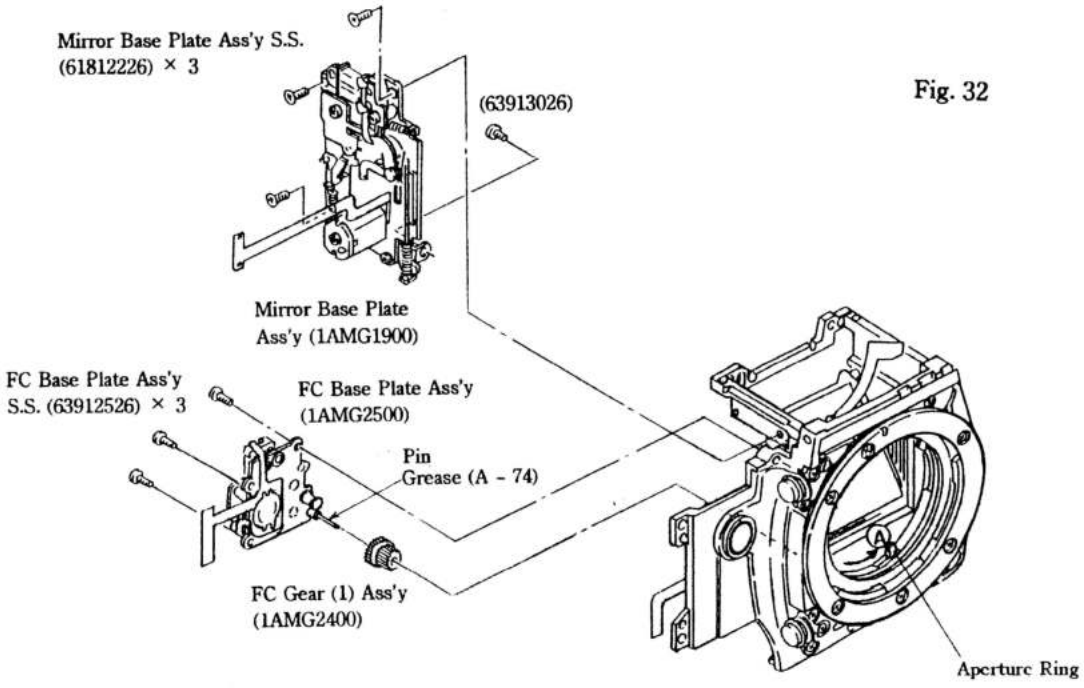


Fig. 32

(See Fig. 33 and 34)

7) Remove the Body Mount Setscrews (61925522) × 5, (66001138) and take off the Body Mount (1AA75000) and Mount Ring (1AM79000).
8) Remove the Theta Base Plate Ass'y Setscrews (61912522) and take off the Theta Base Plate Ass'y (1AMG1100).
9) Remove the Preview Switch Ass'y Setscrews (63913026) × 2 and take off the Preview Switch Ass'y (1AMG1000) and Lens Lock Button Ass'y (1AMG0900).
10) Remove the Mount Stopper Setscrews (61913026) × 2 and take off the Mount Stopper (13981300).
11) Remove the Mount Spring Setscrews (61913026) × 6 and take off the Mount Springs (13981230) × 3.
12) Remove the Front Cover Light - Proof Curtain (1AA74910).
13) Remove the Aperture Interlock Cover Setscrew (61902022) and take off the Aperture Interlock Cover (1AA78700).
14) Remove the Aperture Code Ass'y Setscrews (61913026) × 2 and take off the Aperture Code Ass'y (1AMG0600).
15) Remove the Lens Lock Lever Setscrew (1AA78600) and take off Lens Lock Lever Spring (1AA78510) and Lens Lock Lever (1AA78420).
16) Remove the Ring Plate Ass'y Setscrews (61913026) × 6 and take off the Ring Plate Ass'y (1AMG0200).

[Chart for Disassembly of Mirror Box Ass'y]

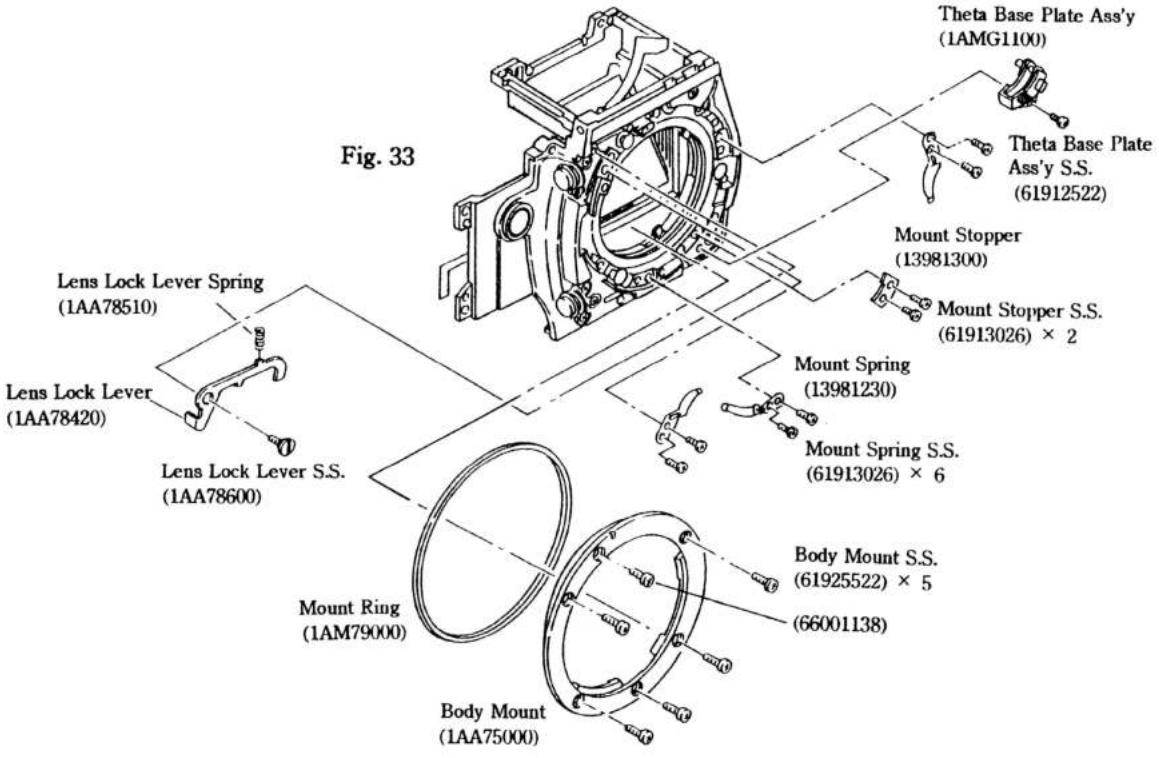


Fig. 33

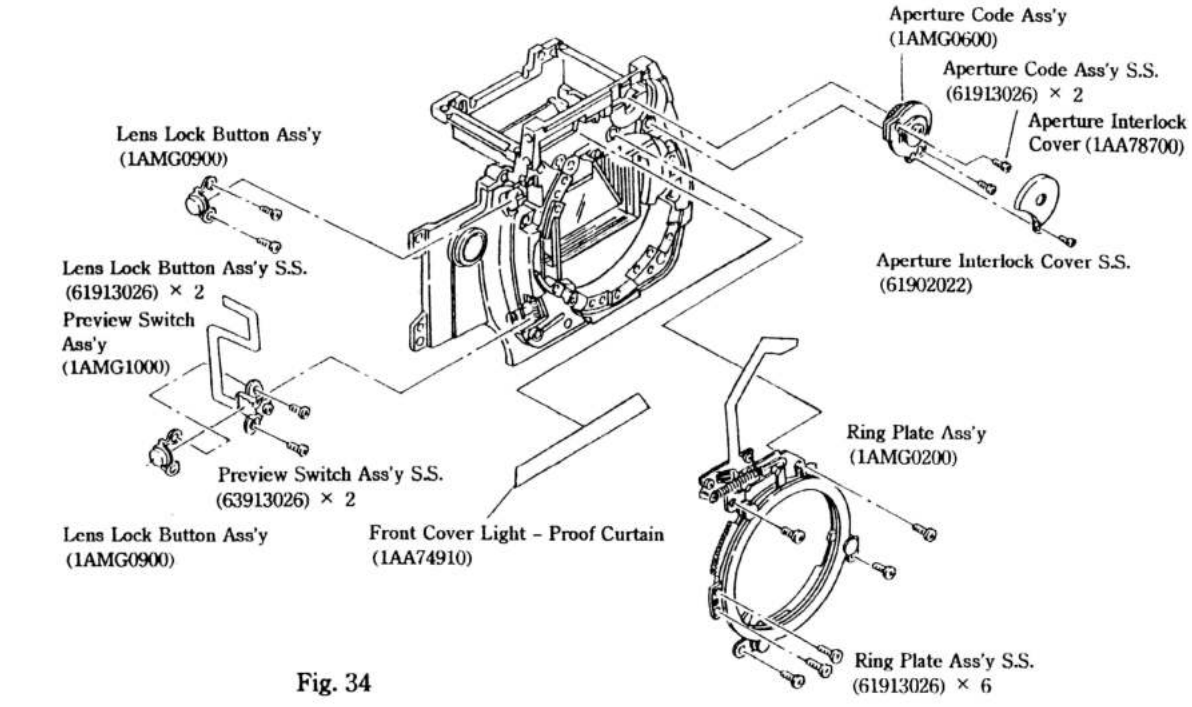


Fig. 34

[Installation Procedure for Parts of Mirror Box Ass'y]

1) Insert the Ⓐ portion of the Open F - FPC through the Ⓑ portion of the hole in the Mount Base and move the Aperture Interlock Ring of the Ring Plate Ass'y (1AMG0200) in the direction of the arrow Ⓒ (in the direction of opening the aperture). In this state, install the Ring Plate Ass'y in the Mirror Box.
2) Tighten the Ring Plate Ass'y Setscrews (61913026) × 6.

Notes: a) Make certain that each ring of the Ring Plate Ass'y turns smoothly.
b) Take care not to flaw the Ⓓ surface of the Mount Base.
c) Lock the Ring Plate Ass'y Setscrews (61913026) × 6 by applying the bond (Cemedine 551) to their heads.

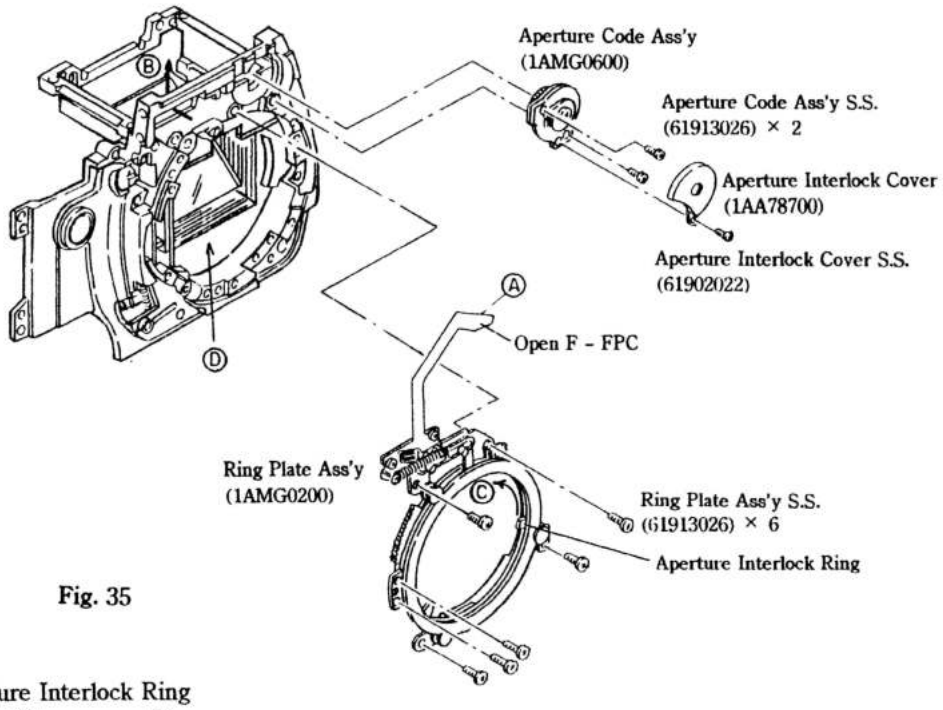


Fig. 35

3) Move the Aperture Interlock Ring in the direction of the arrow Ⓒ and hold it there. (See Fig. 35)
4) Turn the hook point Ⓕ (marked with a felt - tipped marker) of the spiral spring on the Aperture Interlock Gear (A) of the Aperture Code Ass'y (1AMG0600) by about 300 degrees in the direction of the arrow Ⓔ . With the hook point in this position, install the Aperture Code Ass'y in the Mirror Box and tighten the Aperture Code Ass'y Setscrews (61913026) × 2. (See Fig. 36)

(Back Side View of Aperture Code Ass'y)

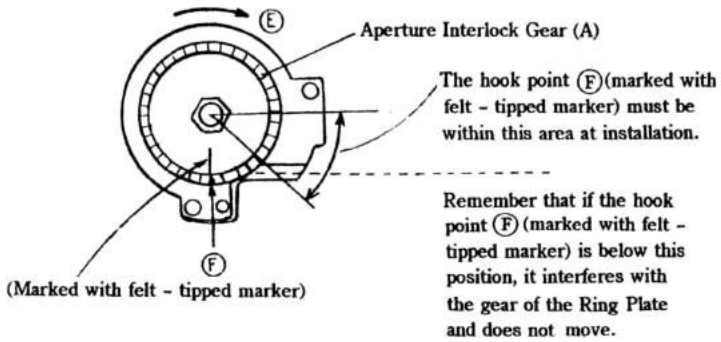


Fig. 36

5) Position the Aperture Interlock Base Contact of the Aperture Code Ass'y at the second piece of the Aperture Code pattern and tighten up the Aperture Interlock Base Assembly Setscrews (66001050). (See Fig. 37)
6) Install the Aperture Interlock Cover (1AA78700) and tighten the Aperture Interlock Cover Setscrews (61902022).

(Surface View of Aperture Code Ass'y)

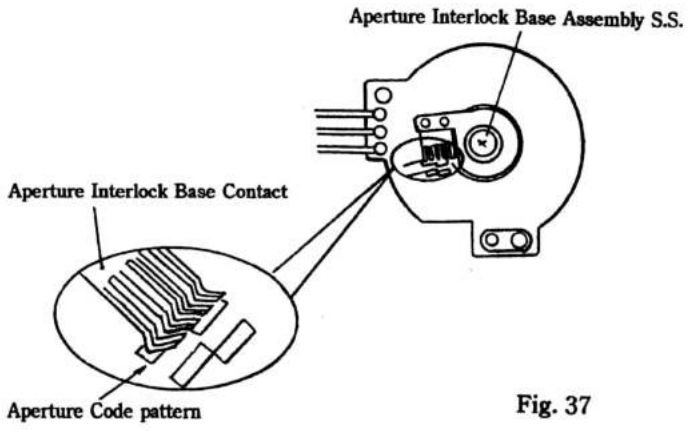


Fig. 37

(See Figs. 33 and 34)
7) Install the Lens Lock Lever (1AA78420) by tightening the Lens Lock Lever Setscrew (1AA78600) and install the Lens Lock Lever Spring (1AA78510).

Note: Apply Loctite to about 1.5 threads of the Lens Lock Lever Setscrew. Take care that the Loctite does not come out of the screw hole. Apply a proper amount of Loctite.

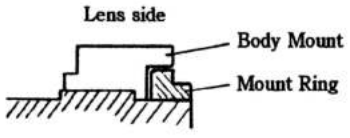
8) Install the Lens Lock Button Ass'y (1AMG0900) and tighten the Lens Lock Button Ass'y Setscrews (63913026) × 2.
Press the Lens Lock Button and make certain that the Lens Lock Lever moves properly.
9) Install the Lens lock Button Ass'y (1AMG0900) and Preview Switch Ass'y (1AMG1000) and tighten the Preview Switch Ass'y Setscrews (63913026) × 2.

Note: Take care not to deform the Preview Switch when installing the Preview Switch Ass'y.

10) Install the Theta Base Plate Ass'y (1AMG1100) and tighten the Theta Base Plate Ass'y Setscrews (61912522). Pass the lead wires (Blue and Orange) of the Theta Base Plate Ass'y through the hole in the Mount Base. (See Fig. 20)
11) Install the Mount Spring (13981230) × 3 and tighten the Mount Spring Setscrews (61913026) × 6.
12) Install the Mount Stopper (13981300) and tighten the Mount Stopper Setscrews (61913026) × 2.
13) Put the Mount Ring (1AM79000) on the Body Mount (1AA75000) and install them on the Mount Base. Then tighten the Body Mount Setscrews (66001138), (61925522) × 5.

Note: In installing the Mount Ring, orient it as shown in Fig. 38.

Fig. 38



(Sectional View of Body Mount/Mount Ring)

14) Turn the Mirror Gear (3) of the Mirror Base Plate Ass'y (1AMG1900) in the direction of the arrow Ⓑ until the Aperture Lever comes to the up position. At this point, the Aperture Lever Spring must be in the expanded position. (See Fig. 40)

15) Install the Mirror Base Plate Ass'y in the Mirror Box while inserting the pin of the Mirror Frame Ass'y in the hole in the Mirror Base Plate Ass'y. And tighten the Mirror Base Plate Ass'y Setscrews (61812226) × 3, (63913026).

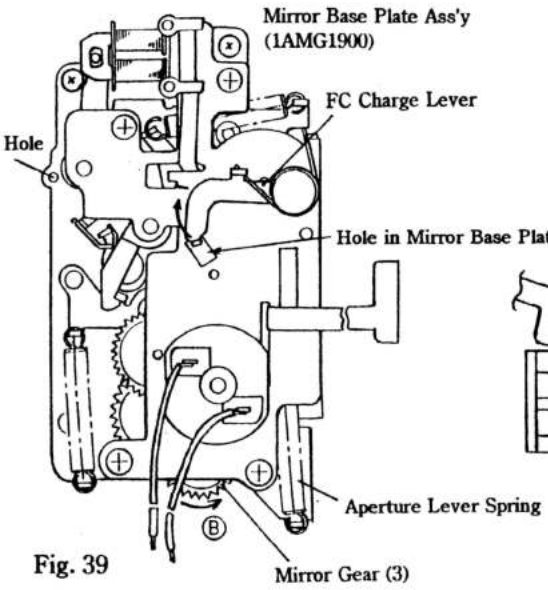


Fig. 39

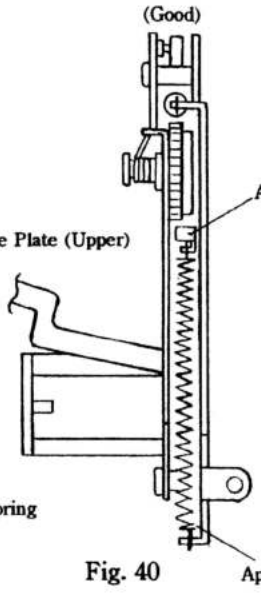


Fig. 40

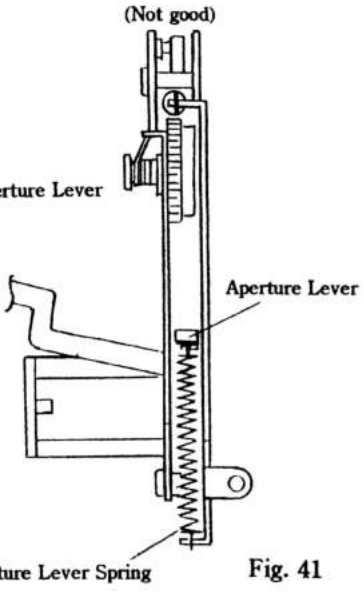


Fig. 41

(Side View of Mirror Base Plate Ass'y)

16) Install the FC Gear (1) Ass'y (1AMG2400) and engage it with the gear of the Aperture Ring.

17) Lock the FC Slit Plate by the following procedure and then install the FC Base Plate Ass'y (1AMG2500) in the Mirror Box.

(See Fig. 42)

① Move the FC Lever of the FC Base Plate Ass'y in the direction of the arrow Ⓒ.

② Turn the FC Gear (5) in the direction of the arrow Ⓓ (about one revolution). Then separate the FC Gear (5) and make certain that the FC Gear (5) turns smoothly.

③ From the stop position of the FC Gear (5), turn it by about 360 degrees in the direction of the arrow Ⓓ . With the FC Gear (5) in this state, move the FC Lever in the direc - tion of the arrow Ⓔ to lock the FC Slit Plate. At this point, make certain that the spring is hooked to the FC Gear (5).

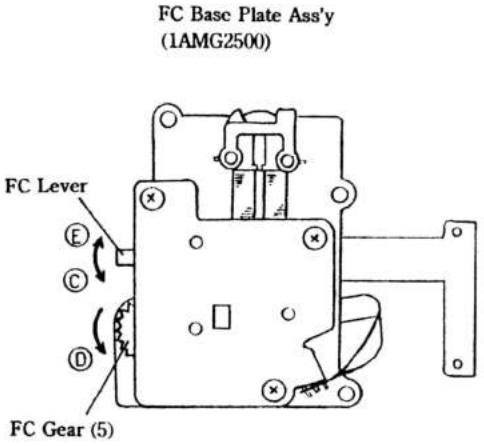


Fig. 42

18) Make certain that the Aperture Ring has been turned in the direction of the arrow Ⓐ (see Fig. 32). Then insert the pin of the FC Base Plate Ass'y in the hole in the FC Gear (1) Ass'y and install them in the Mirror Box.
Tighten the FC Base Plate Ass'y Setscrews (63912526) × 3.

[Assembly Procedure for Mirror Base Plate Ass'y]

1) Set the S. Hold Lever Spring (1AM73800) and FC Charge Lever Spring (1AM74800) on the Mirror Base Plate (Upper).

Note: Take care not to deform the S. Hold Lever Spring or FC Charge Lever Spring.

2) Install the Mirror Motor Ass'y (1AMG2300) and tighten the Mirror Motor Ass'y Setscrews (61812026) × 2.
   Lock the Mirror Motor Ass'y Setscrews by applying the bond (Cemedine 551) to their heads.
3) Install the Magnet (1AD87400) and tighten the Magnet Setscrews (61903526) × 2.
   In doing so, make sure that the pin of the S. MG Lever is positioned at the center of the hole in the Armature.
   Lock the Magnet Setscrews by applying the bond (Cemedine 551) to their heads.
4) Pass the Ⓐ portion of the Mirror FPC (1AM51900) through the slit in the Mirror Base Plate (Upper). Fit the hole Ⓑ in the Mirror FPC on the dowel of the Mirror Base Plate (Upper). And tighten the Mirror FPC Setscrew (61911826) so that the Mirror FPC does not float.
5) Pass the Ⓒ portion of the Mirror FPC through the slot in the Mirror Base Plate (Upper) and bend the Mirror FPC.
6) Bend the Ⓐ portion of the Mirror FPC as shown in Fig. 43 and solder it to the terminals of the Magnet.

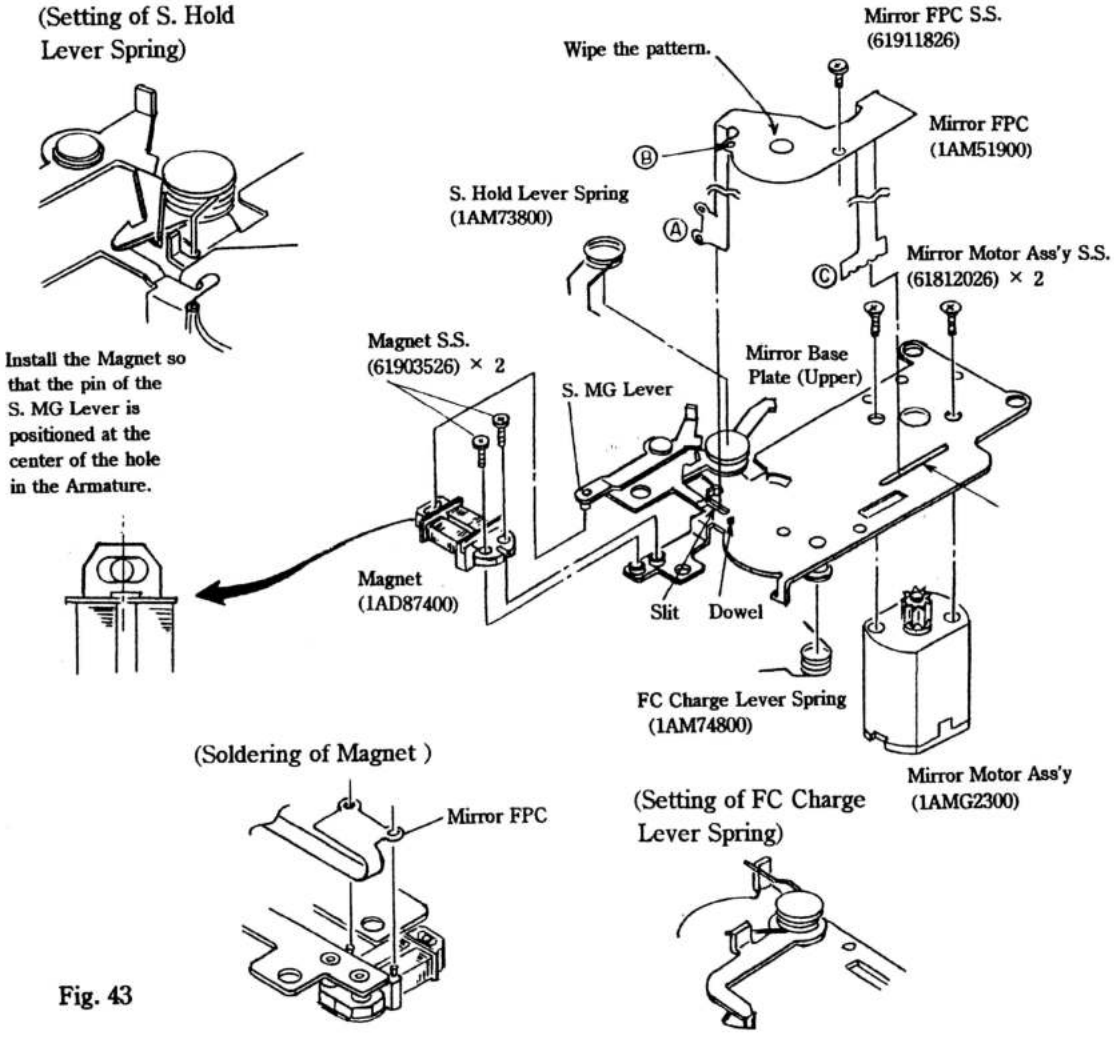


Fig. 43

7) Set the S. MG Lever Spring (1AM74200) on the Mirror Base Plate (Lower).
Note: Take care not to deform the S. MG Lever Spring.

8) Install the Mirror Cam (2) Ass'y (1AMG2100).
Notes: a) Take care not to deform the contact of the Mirror Cam (2) Ass'y.
b) Take care that the roller of the Mirror Up Lever does not come inside the cam of the Mirror Cam (2) Ass'y.

9) Install the Mirror Cam (1) (1AM71600) so that the hole in the Mirror Cam (1) is positioned at the hole in the Mirror Cam (2) Ass'y.
Note: Take care that the roller of the Aperture Lever or S. Charge Lever does not come inside the cam of the Mirror Cam (1).

10) Install the Mirror Gear (2) (1AM71200), Mirror Gear (4) (1AM71400), Mirror Gear (3) (1AM71300) and Mirror Gear (5) (1AM71500) in the named order.
11) Set the S. Charge Lever Spring (1AM72700), Mirror Up Spring (1AM72900) and Aperture Lever Spring (1AM73300) in the named order.
Notes: a) Hook the Mirror Up Lever Spring to the Mirror Up Lever so that the cut end of the Mirror Up Lever Spring is positioned up.
b) Lock the hook of the S. Charge Lever Spring to the Mirror Base Plate with the bond (Cemedine 551),

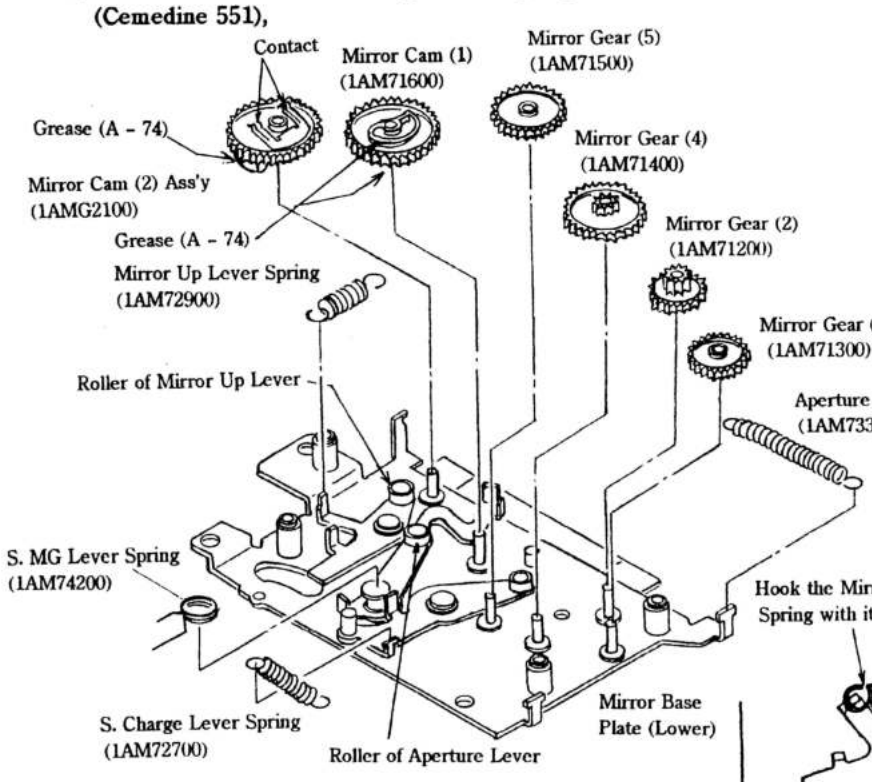


Fig. 44

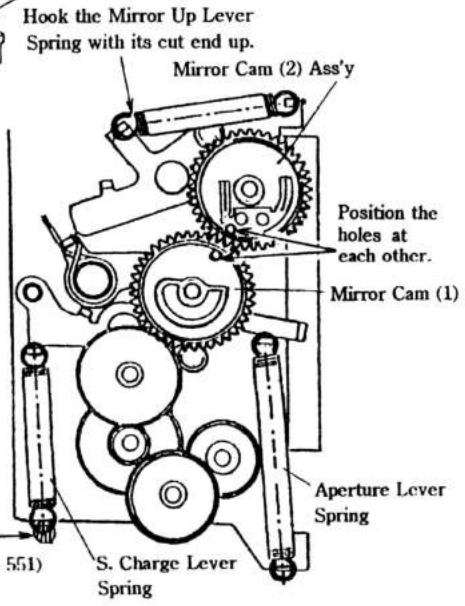


Fig. 45

12) Wipe the contact pattern on the Mirror FPC with lens cleaning paper with ether alcohol. (See Fig. 43)
13) Make certain that the contacts of the Mirror Cam (2) Ass'y are free from fatigue or deformation.
14) Make certain that the hole in the Mirror Cam (2) Ass'y is positioned at the hole in the Mirror Cam (1). (See Fig. 45)
15) Install the Mirror Base Plate (Upper) on the Mirror Base Plate (Lower) with care taken that the end of the FC Charge Lever does not come inside the cam of the Mirror Cam (1). In doing so, the S. MG Lever Spring must be positioned outside the S. MG Lever.
16) Make certain that all the four posts of the Mirror Base Plate (Lower) are inserted in the holes in the Mirror Base Plate (Upper), and then tighten the Mirror Base Plate (Upper) Setscrews (63913026) × 4.
17) Move the Armature against the magnetic force by pushing the S. MG Lever and make certain that the S. MG Lever returns to the original position by the attraction force of the Magnet.
18) Operate the S. Hold Lever and make certain that the S. Hold Lever returns to the original position fully by the force of the Spring.

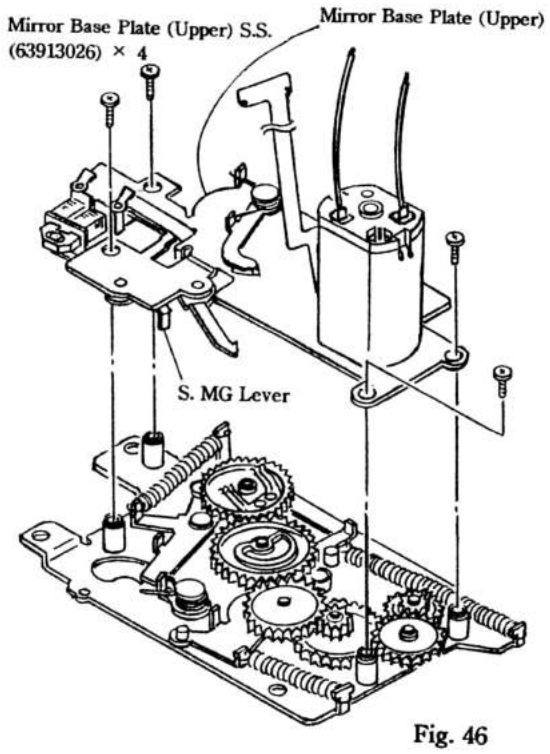


Fig. 46

(Greasing Points)

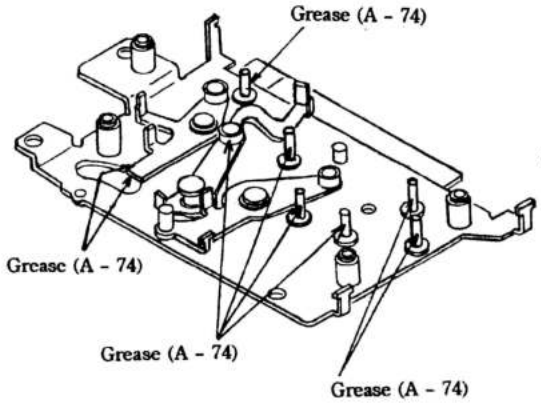


Fig. 47

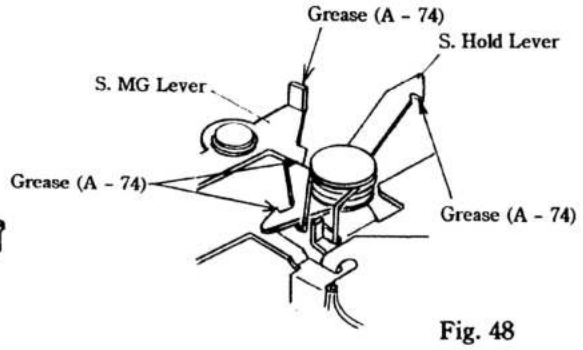


Fig. 48

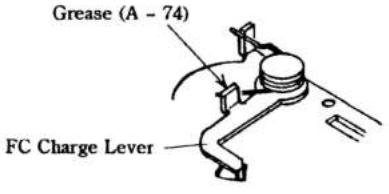


Fig. 49

B - 9 - 2. Disassembly of Penta Prism Ass'y

Note: Shielder (black) has been applied to the gap between the Penta Prism and the Penta Prism Holder to prevent dust from entering the Viewfinder. Therefore, remove the shielder before removing the Penta Prism.

1) Push the end of the FS Lock Spring (L) and remove the Focusing Screen.
2) Take out the FS Hinge Shaft (1AM83000) and remove the FS Holder Ass'y (1AMF0200).
3) Peel off the Penta Prism Dust - Proof Moquette (1AH85000).
4) Pick off the Shielder applied around the Penta Prism, using tweezers or the like.
5) Peel off the Penta Cover (17484210).

Note: The Penta Cover is fixed to the Penta Prism Retaining Spring with double - stick tape.

6) Remove the Penta Prism Retaining Spring Setscrews (61913026) × 2 and take off the Penta Prism Retaining Spring (1AM82110).
7) Remove the Penta Prism Cover (1AH84800), Penta Prism (1AM84100) and Viewfinder Frame (B) (1AM82510).
8) Remove the Finder Indicator Prism (1AM 82310).

Note: The Finder Indicator Prism is fixed to the Penta Prism Holder with the bond (Cemedine 551).

9) Remove the Penta Prism Spacer (1AM82000), Condenser Lens (1AH84600) and Viewfinder Frame (A) (1AH84400).

[Checks after Assembly of Penta Prism]

a) After the assembly of the Penta Prism, make certain that there is no dust in the Viewfinder.
b) After the assembly of the Penta Prism, apply the shielder to the gap between the Penta Prism and the Penta Prism Holder.

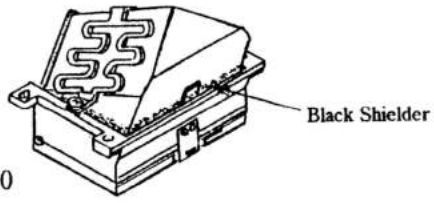


Fig.50

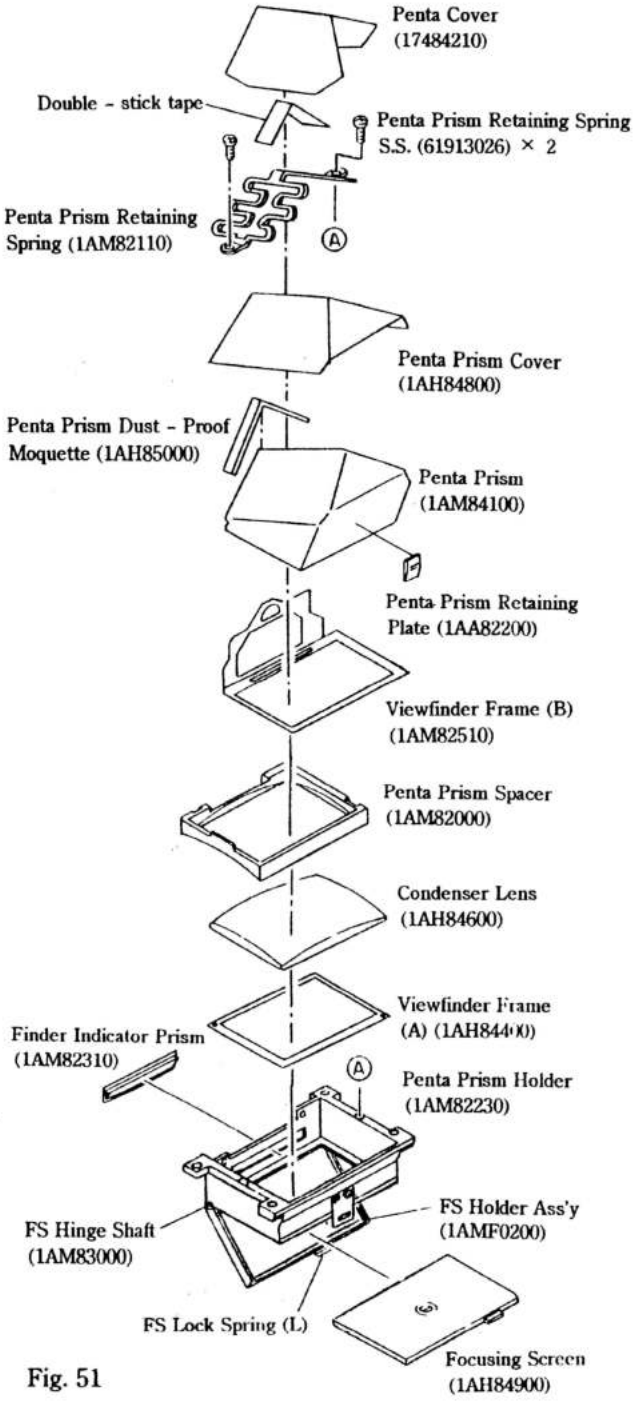


Fig. 51

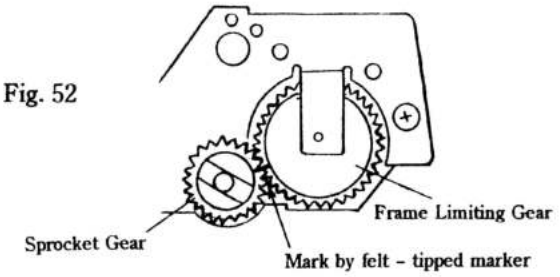
B - 9 - 3. Disassembly of Winding Unit Ass'y

Notes: a) During repair, take care not to bend or deform the Rewind Switch (1AA57400).
b) Once the Winding Unit Ass'y is disassembled, make the adjustment of perforation position. (See page C-3)
c) Remove the Sprocket Gear Holder (1AM35120) and mark the Sprocket Gear and the Frame Limiting Gear with a felt - tipped marker before moving the Sprocket Gear. In doing so, the Frame Limiting Gear must be engaged with the Frame Limiting Lever and must not move. In installing the Sprocket Gear, engage the marked teeth, and you do not have to make the adjustment of perforation position. However, check the perforation position for properness. (See page C-4)

1) Remove the Sprocket Gear Holder Setscrews (61901826) × 2 and take off the Sprocket Gear Holder (1AM35120) and Sprocket Gear (17437010) (or Sprocket Gear (A) (17436910) used by selection).
2) Remove the FW Lower Base Plate Setscrews (66001068) × 3 and take off the FW Upper Base Plate.
3) Disassemble the Winding Unit Ass'y as shown in Fig. 53.

Note: The Frame Limiting Gear Ass'y (1AMB2000) is attached to The FW Lower Base Plate with the Frame Tape (1AM34300).

Fig. 52



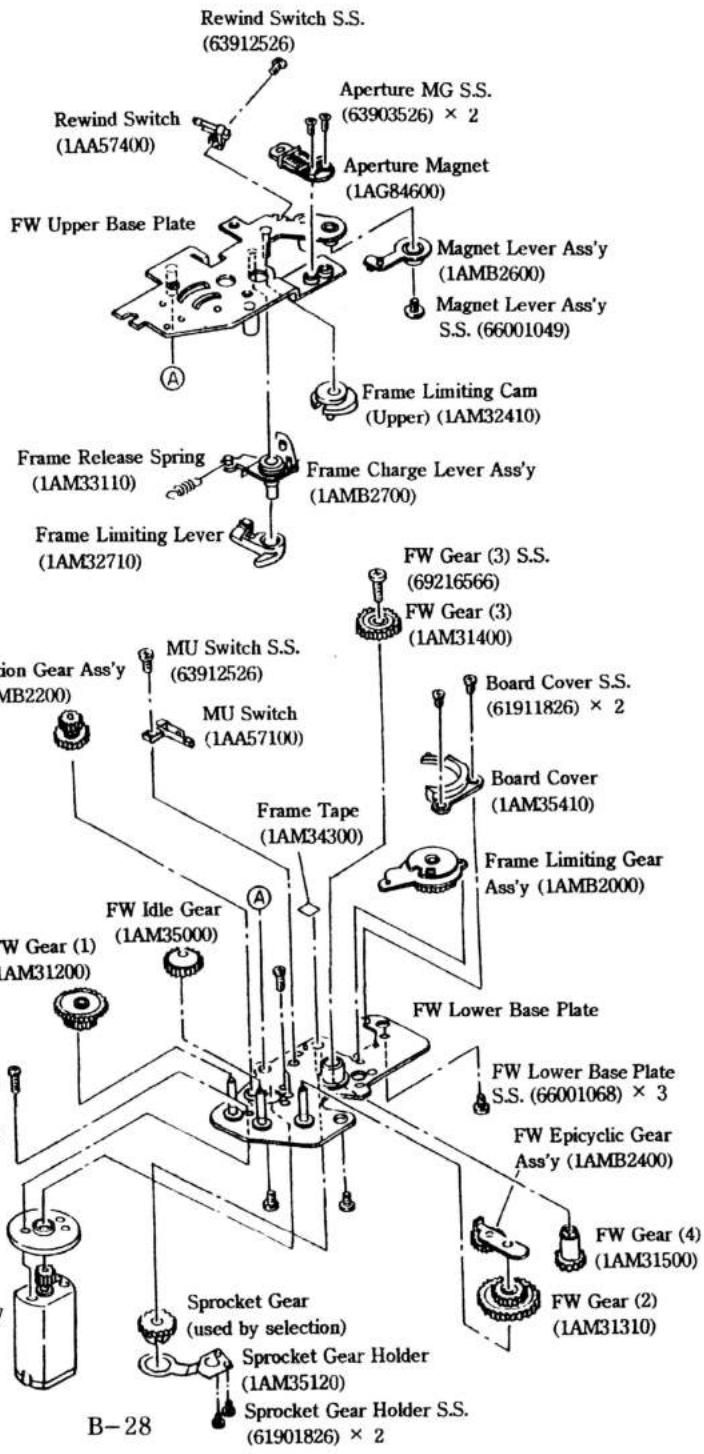


Fig. 53

[Assembly Procedure for Winding Unit]

1) As shown in Fig. 53, install the parts on the FW Upper Base Plate.

Notes:

a) The spring of the Frame Charge Lever Ass'y (1AMB2700) must be in contact with the pin of the Magnet Lever Ass'y (1AMB2600).

b) Engage the end of the Frame Limiting Lever (1AM32710) with the groove of the Frame Limiting Cam (Upper) (1AM32410).

c) Catch the Frame Release Spring (1AM33100) in the groove. And lock the Spring with the bond (Cemedine 551).

d) When installing a new Aperture Magnet (1AG84600), cut off the two upper terminals of the Aperture Magnet at their root beforehand.

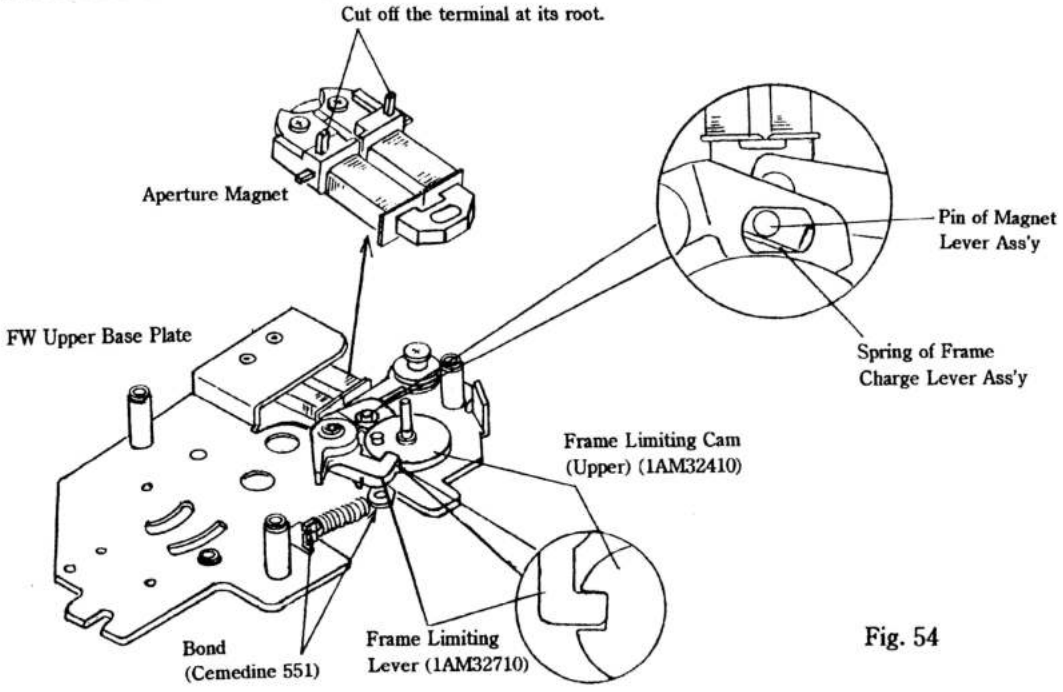
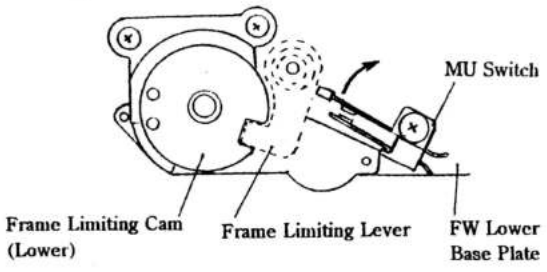


Fig. 54

2) As shown in Fig. 53, install the parts on the FW Base Plate.

Note: Push the MU Switch (1AA57100) in the direction of the arrow shown in Fig. 55 and tighten the MU Switch Setscrew (63912526).

Fig. 55



3) Install the FW Upper Base Plate on the FW Lower Base Plate. In doing so, engage the groove of the Frame Limiting Cam (Lower) with the end of the Frame Limiting Lever.

4) Tighten the FW Lower Base Plate Setscrews (66001068) × 3.

5) Install the Sprocket Gear (Sprocket Gear (A) (17436910) or Sprocket Gear (17437010) selected for use) and align the mark by felt - tipped marker on the Sprocket Gear with that on the Frame Limiting Gear.
6) Install the Sprocket Gear Holder (1AM35100) and tighten the Sprocket Gear Holder Setscrews (61901826) × 2.

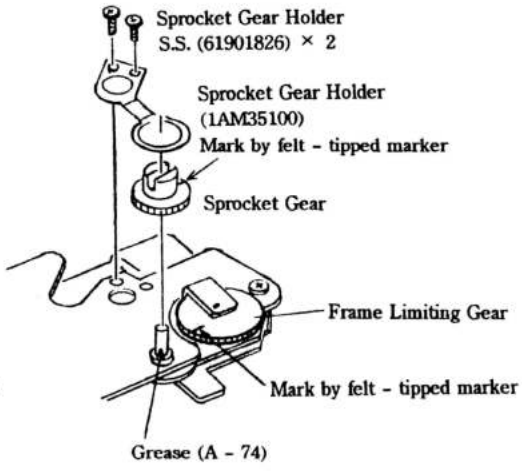


Fig. 56

7) Loosen the Aperture Magnet Setscrews (63903526) × 2. Tighten the Aperture Magn Setscrews while positioning of the Magnet Lever Ass'y center of the Armature. Lock the Aperture Magnet Setscrews by applying the bond (Cemedine 551) to their heads.

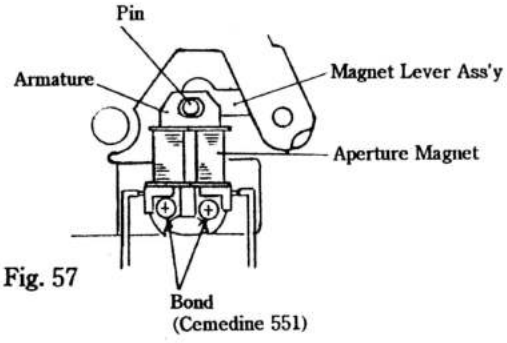


Fig. 57

(Greasing Points)

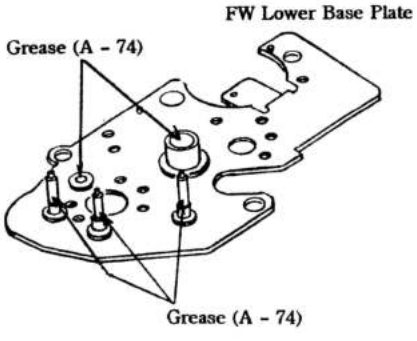


Fig. 58

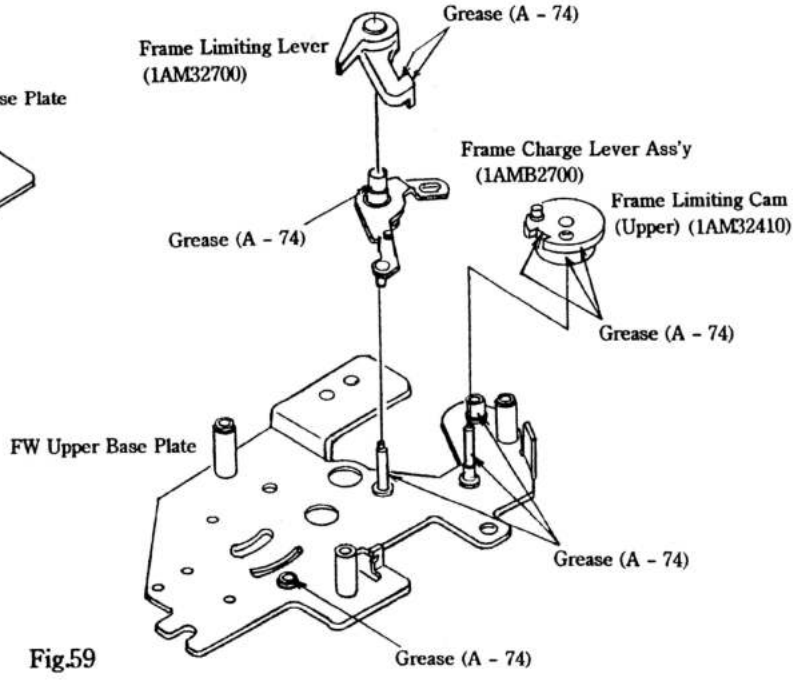


Fig.59

B - 9 - 4. Disassembly of Rewind Base Plate (Upper) Ass'y

1) Remove the RW Upper Base Plate Ass'y Setscrews (66001068) × 3 and take off the RW Upper Base Plate Ass'y (1AMB09000).
2) Disassemble the Ass'y as shown in Fig. 60.

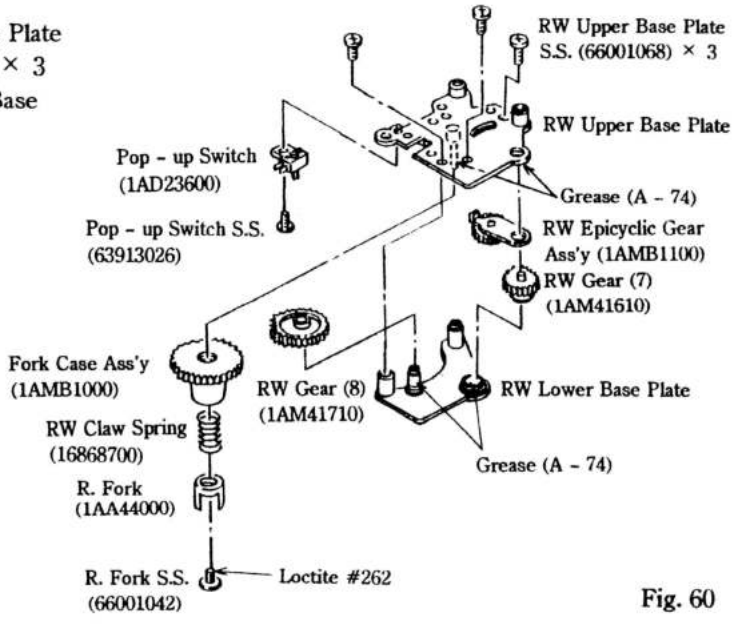


Fig. 60

B - 9 - 5. Disassembly of Rewind Base Plate (Lower)

1) Remove the RW Gear Box Plate Setscrews (69113576) × 3 and take off the RW Gear Box Plate.
2) Disassemble the Ass'y as shown in Fig. 61.

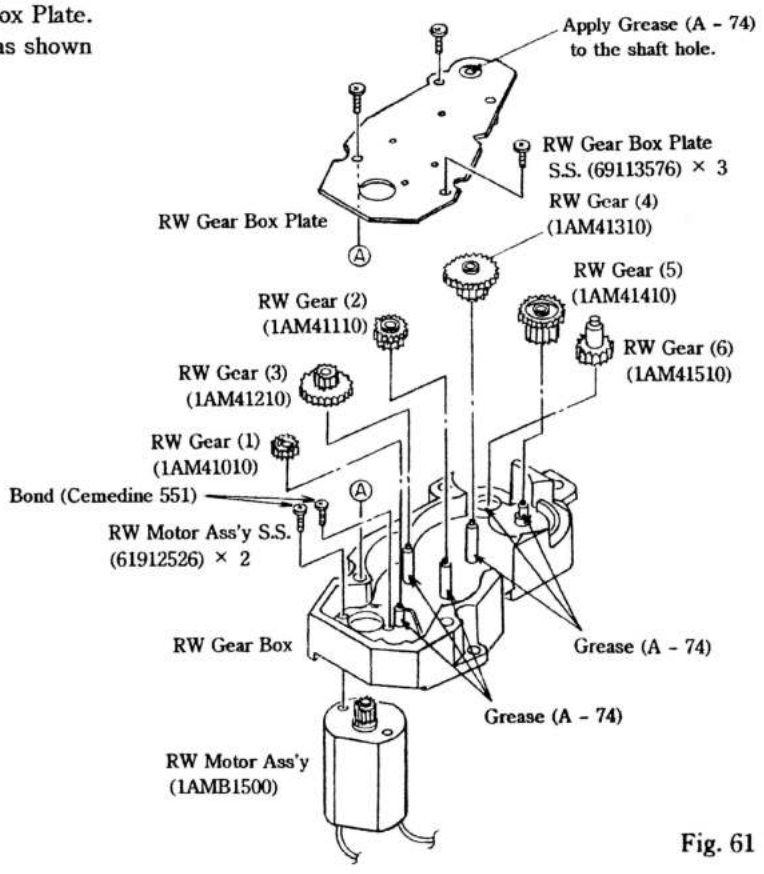


Fig. 61

B - 10. DISASSEMBLY OF BACK COVER ASS'Y

B - 10 - 1. Disassembly of Back Cover Ass'y

1) Disassemble the Back Cover Ass'y as shown below.

Notes:

a) The Date Module is fixed to the DM Holder with a super glue.
Once the Auto Date Module is removed, adjust the position of the Auto Date Module.

b) The D. Battery Contact (−) (38415930) and the D. Battery Contact (+) (38415840) are fixed to the DM Holder with the bond (Cemedine 551).

c) Once the Back Cover Rubber (S) (1AM15700) and the Back Cover Rubber (L) (1AM15610) are removed, the adhesive force of the double - stick tapes weakens. Therefore, replace the Back Cover Tape (S) (1AM15400), Back Cover Tape (L1) (1AM15210) and the Back Cover Tape (L2) (1AM15300) with new ones.

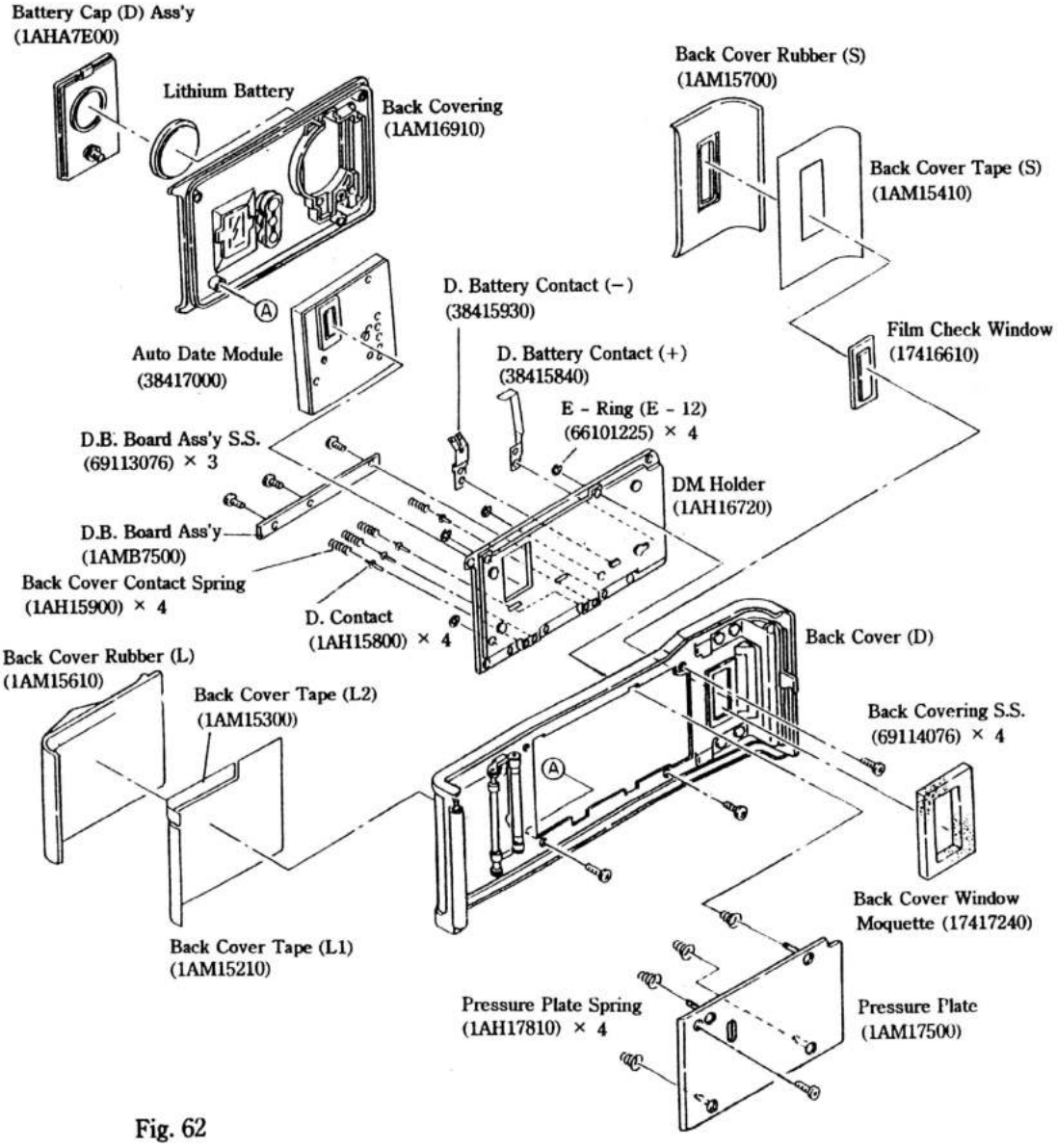


Fig. 62

[Wiring of Date Module and D.B. Board]

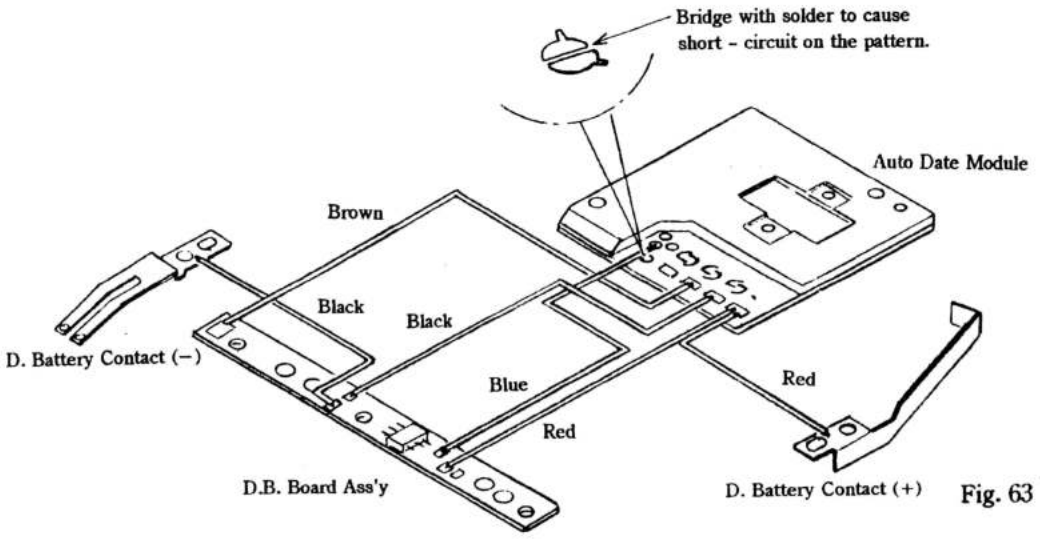


Fig. 63

[Installation of Parts on Back Covering]

1) Install the Date Window (1AH19400), Mode Button (38515410) and Battery Cap Screw Socket (1AH16800) on the Back Covering (1AH16910).
2) Lock the Date Window, Mode Button and Battery Cap Screw Socket by applying the bond (Cemedine 551) to their whole peripheries.

Note: The Back Covering, Date Window and Mode Button, which are exterior parts, must be free from flaws, stains, spilling bond, etc.

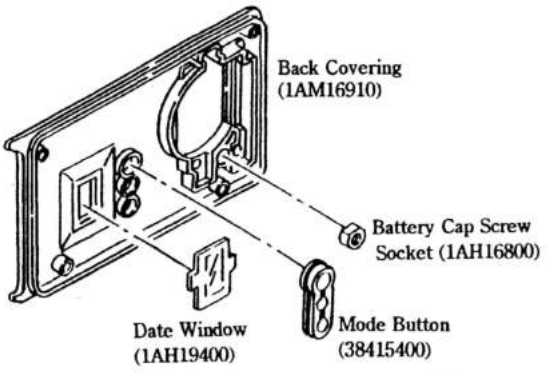


Fig. 64

■ PARTS MODIFICATION LIST

[1] Modification of Main FPC Ass'y

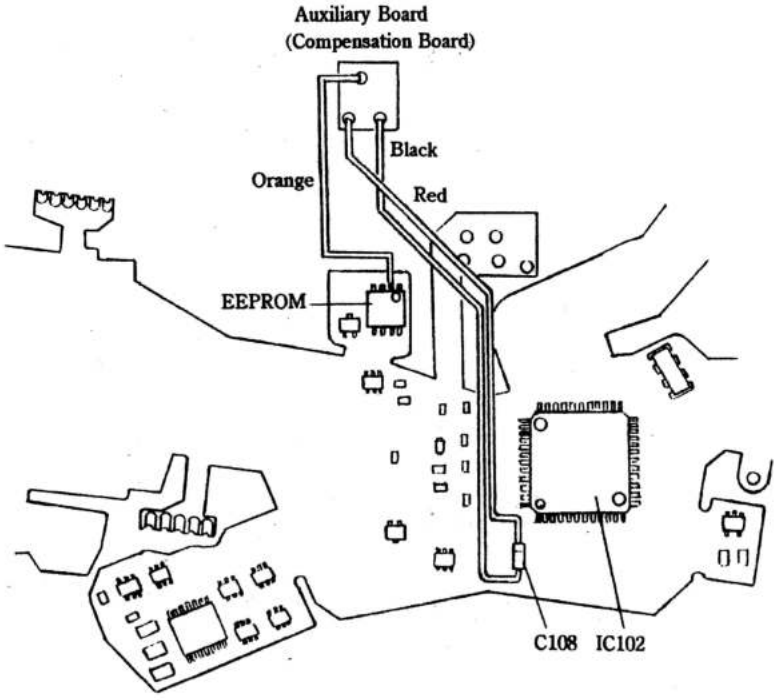
In this camera, the Main FPC Ass'y was modified in the course of production to improve the quality. The instructions given in this Repair Manual are generally intended for repair of the new type product. Perform the repair of the old type product as follows:

(Auxiliary Board)

At the early stage of production, some cameras were provided with an Auxiliary Board for the compensation of the EEPROM Power Circuit to improve the quality. The new type camera, whose Main FPC Ass'y has been improved, is not provided with the Auxiliary Board.

a) Lead wire connection diagram

* The Auxiliary Board is fixed to the IC102 with double - stick tape.



b) Repair Information

No old type Main FPC Ass'y will be supplied.
Only the new type Main FPC Ass'y is available.
The old type Main FPC Ass'y and the new type Main FPC Ass'y are interchangeable with each other. Therefore, install the new type Main FPC in the Body the same as the old type one. After the replacement of the Main FPC, make the adjustment of compensation values.

C. ADJUSTMENT PROCEDURES, ETC.

C - 1. ADJUSTMENT OF OPEN SIGNAL CONTACT POSITION

*** After the Ring Plate Ass'y is replaced, adjust the position of the Open Signal Contact.**

1) Loosen the Open F - FPC Setscrews (6601009) × 2.
2) Install the Planar F1.4/50 Lens on the Body Mount.
3) Set the aperture of the lens to "F 1.4".
4) Adjust the position of the Open F - FPC so that the Open Signal Contact is positioned between the two lowest patterns on the Open F - FPC.
5) Tighten the Open F - FPC Setscrews.

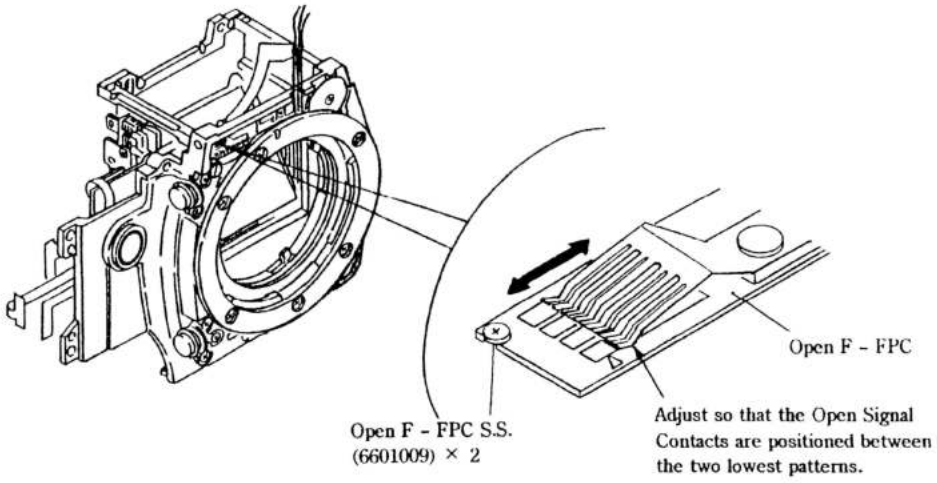


Fig. 65

C - 2. ADJUSTMENT OF PERFORATION POSITION

*** Once the Winding Unit Ass'y is disassembled, adjust the position of perforations.**

1) Turn the Frame Limiting Gear in the direction of the arrow to eliminate the play of the gear.
2) Install the Sprocket Gear (A) (17436910) so that the end of the groove is position - ed at the center of the screw hole in the FW Upper Base Plate.
3) When the Sprocket Gear (A) can not been installed in the position as shown in Fig. 66, install it in the 180 - degree turned position. If the Sprocket Gear (A) can not be installed even in the 180 - degree turned position, re - place and install the Sprocket Gear (17437010). If even the Sprocket Gear can not be installed in the position as shown in Fig. 66, install it in the 180 - degree Qturned position.

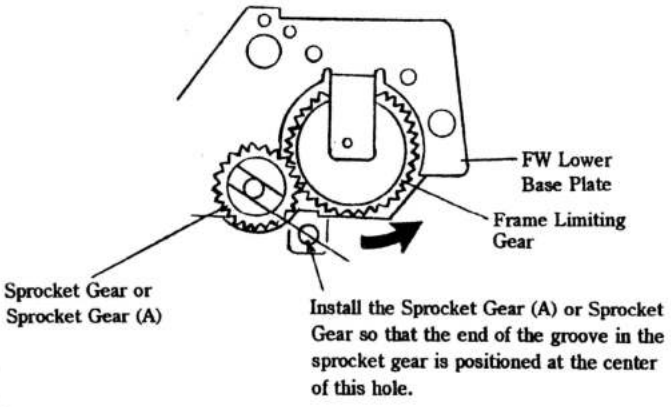


Fig. 66

4) After installing the Sprocket Gear (A) or Sprocket Gear in the correct position, install the Sprocket Gear Holder (1AM35120) and tighten the Sprocket Gear Holder Setscrews (61901826) × 2.
5) Install the Winding Unit Ass'y (1AMB1700) in the Body and tighten the Winding Unit Ass'y Setscrews (61813026) × 2, (61913522). (See Fig. 24)
6) Perform the checking of perforation position.

* Make the adjustment of perforation position by selecting one of the four ways, using the two sprocket gears, namely, the Sprocket Gear and the Sprocket Gear (A).
* Do not install the Winding Unit Ass'y in the Body with the Sprocket Gear or Sprocket Gear (A) dis - located; otherwise, the perforations will not be positioned properly.

(Distinction between Sprocket Gear and Sprocket Gear (A))

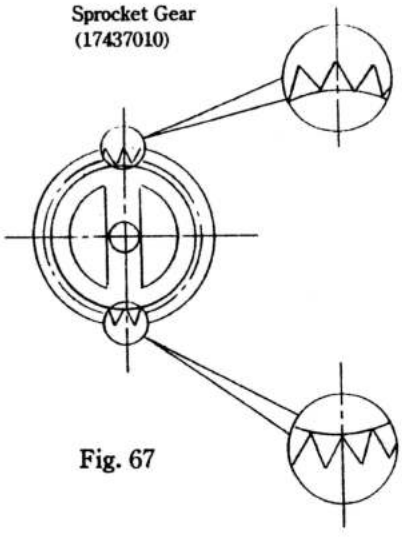


Fig. 67

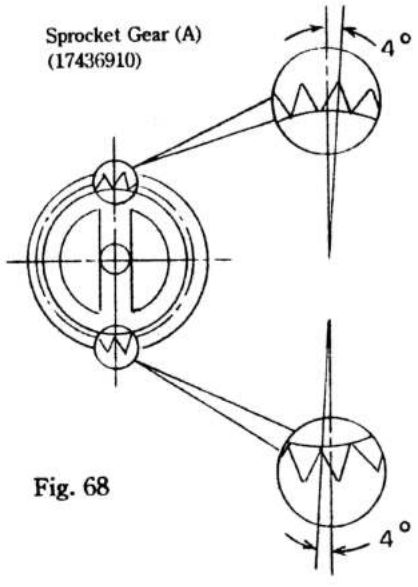


Fig. 68

[Checking of Perforation Position]

* Put a film (non - exposed and developed Black & White film) on the Sprocket and check the position of a perforation relative to the image plane frame.
  Make certain that the edge of the image plane frame is positioned 0.2 ~ 0.3mm away to the right from a perforation in the film.

Adjustment Procedure

① Engage film perforations with Sprocket teeth.
② Curl the film slightly by pressing its right side gently with your fingers.
③ Pull the left side of the film gently in the direction of the arrow.
④ Make certain that the edge of the image plane frame is positioned 0.2 ~ 0.3mm away to the right from a perforation in the film.
⑤ If the perforation position is not proper, make the adjustment of C - 2 again.

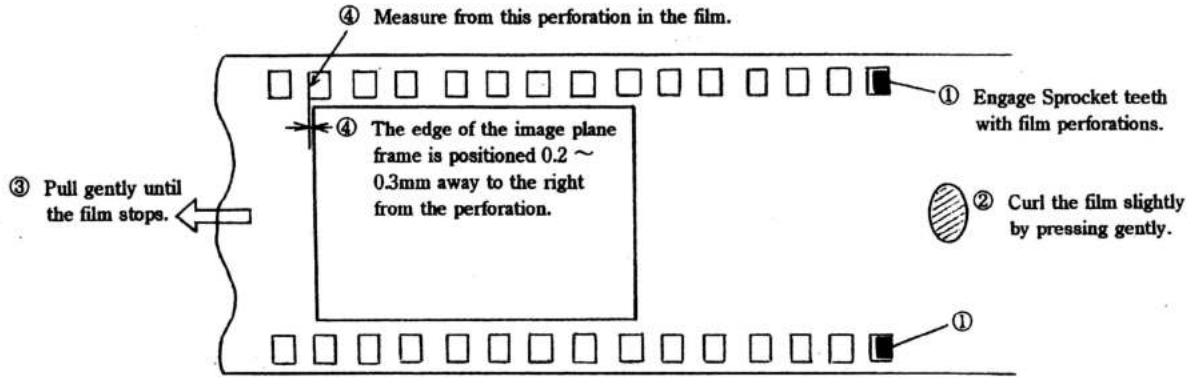


Fig. 69

C - 3. ADJUSTMENT OF VIEWFINDER INDICATION POSITIONS

* Place your eye at the center of the eyepiece lens and make adjustment so that all the indications (film counter, metering display, exposure compensation indication, flash mark, Digital Focus Indicator, aperture display, exposure mark and shutter speed indicator) can be seen without vignetting.

1) Remove the Dioptric Adjuster Ass'y Setscrews (63914026) × 2 and take off the Dioptric Adjuster Ass'y (1AMF0500). (See Fig. 31)
2) Loosen the Finder LCD Ass'y Setscrews (63902226) × 2.
3) Set the voltage of the regulated DC power supply to about 5.17V.
4) Connect the (+) terminal of the regulated DC power supply to the Orange lead wire of the Finder LCD and the (−) terminal to the Green lead wire.
5) Install the Dioptric Adjuster Ass'y temporarily.
6) Turn on the switch of the regulated DC power supply.
7) Look in the viewfinder through the eyepiece lens and adjust the position of the Finder LCD Ass'y by moving it.
8) Remove the Dioptric Adjuster Ass'y and tighten the Finder LCD Ass'y Setscrews.
   Lock the Finder LCD Ass'y Setscrews by applying the bond (Cemedine 551) to their heads.
9) Install the Dioptric Adjuster Ass'y and tighten the Dioptric Adjuster Setscrews.

(Viewfinder Display)

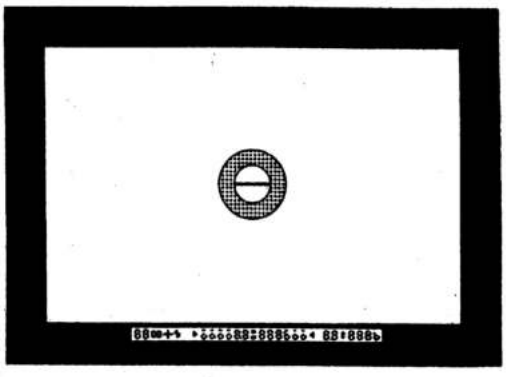


Fig. 70

(Rear View of Mirror Box Ass'y)

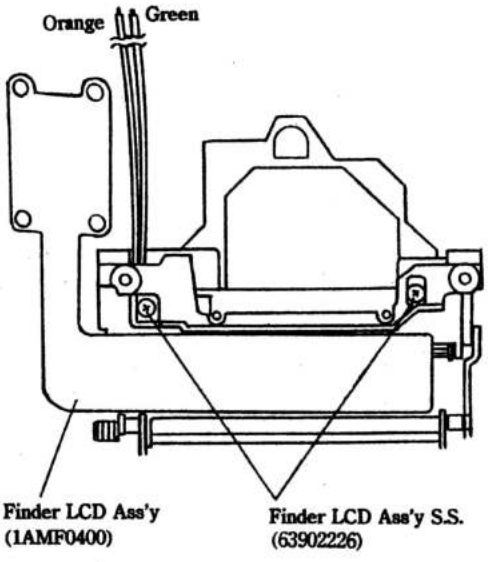


Fig. 71

C - 4. ADJUSTMENT OF SPOT LIGHT METERING POSITION

* Adjust the position of the light metering sensor (SPD) for correct spot light metering.
* After the Dioptric Adjuster Ass'y or the Light Metering FPC is replaced, be sure to make this adjustment of spot light metering position.

(Adjusting Tools)

- EF - 500 or EF - 8000 AE Tester
- Planar F1.4/50 Lens
- Black Chart (to be prepared)

(Preparation of Chart)

- Prepare a chart of about 40mm × 90mm of low - reflectivity black paper.

(Preparation of Chart)

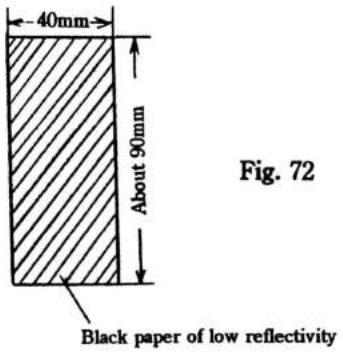


Fig. 72

Adjustment Procedure

1) Loosen the Accessory Shoe Base Setscrews (69214076) × 2 slightly.
2) Install the Top Cover Ass'y temporarily.
3) Set the Planar F1.4/50 Lens on the camera.
4) Set the exposure mode to "Av".
5) Set the Metering Mode Selector Lever to the spot metering mark " ⊙ ". Turn on the Main Switch.
6) Fix the black chart vertically to the light source surface of the AE Tester (EF - 500 or EF - 8000) with Scotch tape.
7) Set the brightness of the AE Tester to "LV15".

(Top View of Dioptric Adjuster Ass'y)

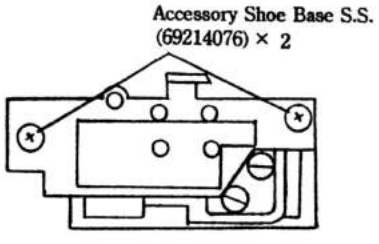


Fig. 73

(Light Source Area of AE Tester)

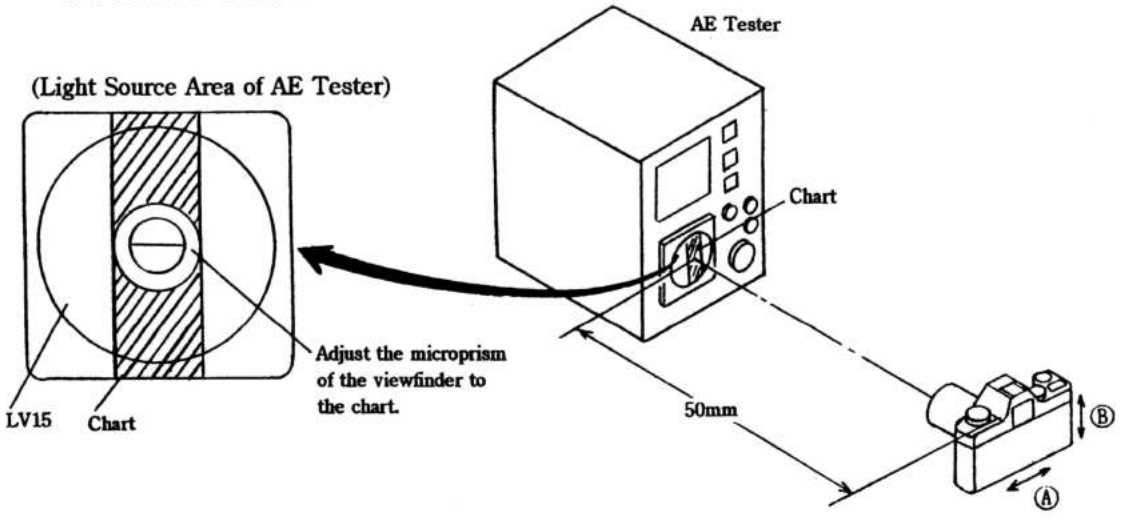


Fig. 74

8) Set the camera at 50cm from the black chart and focus the lens. At this time, adjust the microprism area (about ϕ 5mm) of the viewfinder to the side lines of the black chart rectangle.
9) Look into the viewfinder and swing the camera gently right and left (in the direction of the arrow Ⓐ). (See Fig. 74)
   And adjust by turning the Adjusting Screw ⓐ so that the shutter speed indicator shows the slowest speed.
   * Remove the Top Cover Ass'y for this adjustment.

10) Repeat 8) and 9).
11) Remove the black chart and fix it with the long side of the rectangle in the horizontal position.
12) Set the camera at 50cm from the black chart and focus the lens. At this time, adjust the microprism area (about ϕ 5mm) of the viewfinder to the side lines of the black chart rectangle.
13) Look into the viewfinder and swing the camera gently up and down (in the direction of the arrow Ⓑ). (See Fig. 74)
   And adjust by turning the Adjusting Screw ⓑ so that the shutter speed indicator shows the slowest speed. (See Fig. 74)
14) Repeat 12) and 13).
15) Tighten up the Accessory Shoe Base Setscrews (69214076) × 2.
16) Lock the Adjusting Screws with the bond (Cemedine 551) as shown in Fig. 75.

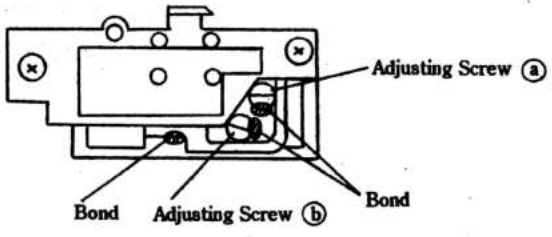


Fig. 75

C - 5. ADJUSTMENT OF FLANGE BACK

① Distance from the Body Mount surface to the film rail surface:

45.43 ± 0.02 mm

For the adjustment, insert appropriate washers between the Body Mount and the Mirror Box.

Adjusting washers: 0.05 mm (12866600), 0.02 mm (12866700)

② Level difference between the film rail surface and the pressure plate rail surface:

0.20 ± 0.02 mm

C - 6. ADJUSTMENT OF VIEWFINDER FOCUSING

① If focusing is not achieved even when the focus ring of the Lens is turned to the infinity position

The finder back is too long, so shorten (lower) the position of the focusing plate.

② If focusing occurs before the focus ring of the Lens is turned to the infinity position

The finder back is too short, so lengthen (raise) the position of the focusing plate.

For the adjustment, replace the washer under the Penta Holder. (See Fig.31)

C - 7. ADJUSTMENT OF COMPENSATION VALUES

This camera permits the adjustments of compensation values (adjusted values) only by its manual operation. Therefore, adjustments can be made without communication with any special adjusting tools.

C - 7 - 1. Setting of Adjusting Mode

1) Remove the Contact Cover Setscrews (66001167) × 3 and take off the Contact Cover (1AM13500).
2) Turn ON the Main Switch.
3) Connect the TEST terminal to the GND terminal on the Back Cover FPC with tweezers, and the adjusting mode will be set.

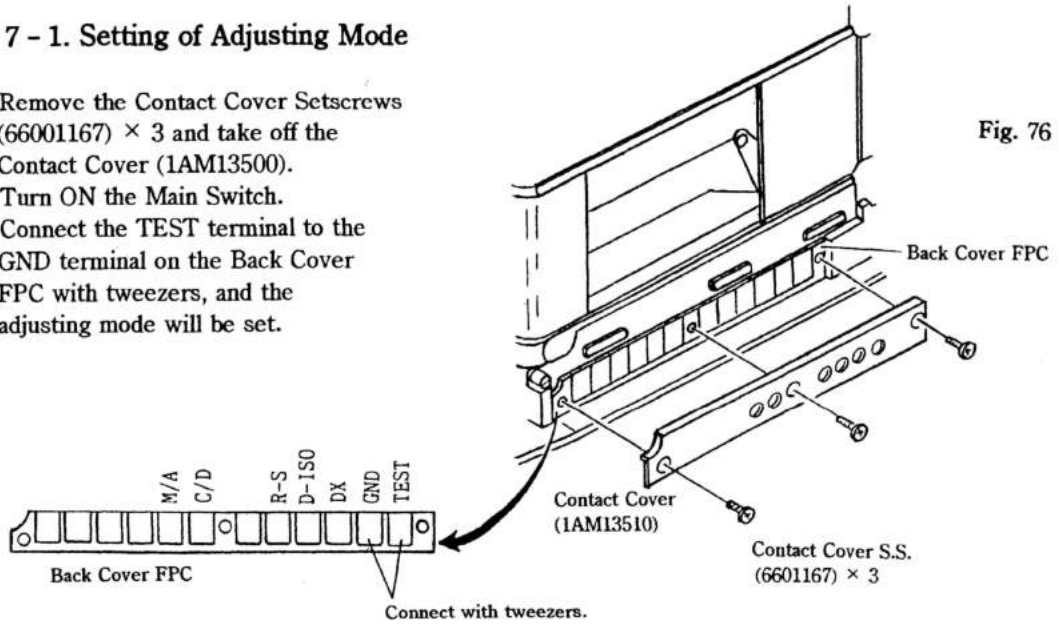
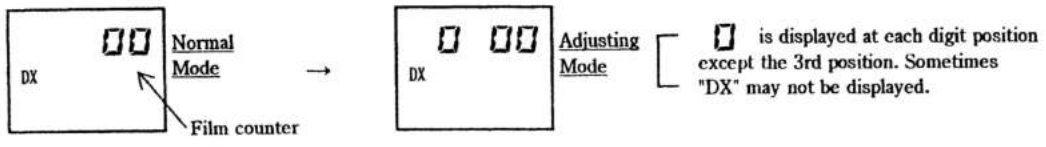


Fig. 76

4) At transition to adjusting mode, the display on the External LCD Panel changes as follows:

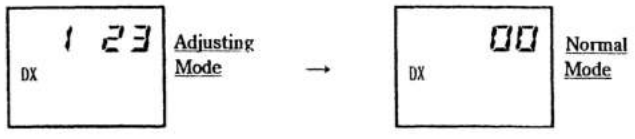


Notes:

a) Perform the setting of adjusting mode with the Main Switch turned ON.
b) Once adjusting mode is set, you may remove the tweezers.
c) The viewfinder display maintains the same status as that before the transition to adjusting mode. Therefore, the viewfinder display does not light up when the adjusting mode is set from the power OFF state.

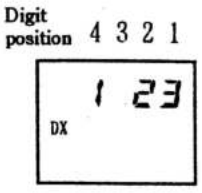
[Cancellation of Adjusting Mode]

The normal mode can be restored by turning OFF the Main Switch or removing the battery. At this point, the display on the External LCD Panel changes as follows:



C - 7 - 2. Display, Change and Storage of Adjusted Values

(1) Display of Adjusted Value



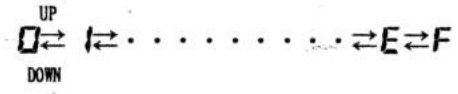
① 4th digit: Indicates the adjustment item number. The hexadecimal numbers of 0 ~ F represent 16 adjustment items.
☆ Initial display: " 0 "

② 3rd digit: Indicates the plus or minus sign of the number indicated at the 1st and 2nd digit positions. However, the plus is represented by a blank and the minus is represented by "−".
☆ Initial display: " " (blank)

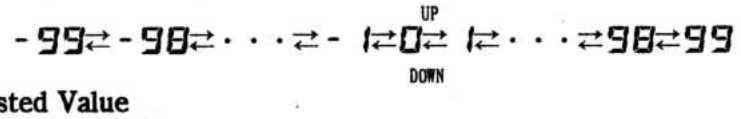
③ 1st and 2nd digits: Indicates the adjusted value of the selected adjustment item. Adjusted values are represented by decimal numbers ranging from - 99 to 99 .
☆ Initial display: " 00 "

(2) Change

① Change of adjustment item number:
While pressing the Exposure Check Switch, press the UP Button to increment the item number or press the DOWN Button to decrement it. One press will change the number by one. However, press of the DOWN Button with " 0 " displayed or press of the UP Button with " F " displayed will not change the number.

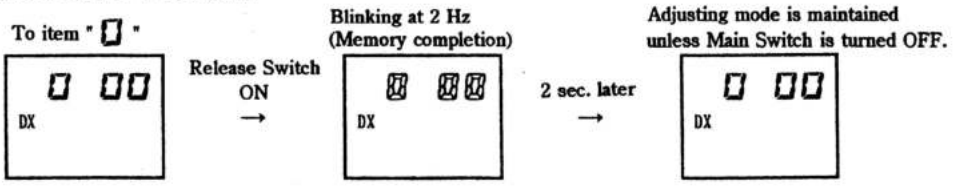


② Change of adjusted value:
Change the adjusted value of the adjustment item selected in ① . The value adjusted previously is displayed first. Then adjust the value (initial value is " 00 "). Press the UP Button to increment the value or press the DOWN Button to decrement it. One press of the button will change the value by one. The upper limit and lower limit of the value vary with the adjustment items. In the widest, you can not change the value by pressing the DOWN Button at " - 99 " or the UP Button at " 99 ". Keep pressing the UP or DOWN Button (for more than 1.2 sec.), and the value will be changed as rapidly as at four times a second.



(3) Storage of Adjusted Value

Return the item number to " 0 " and turn ON the Release Switch, and the adjusted value of each adjustment item will be written in EEPROM, whether the adjusted value has been changed or not. That is, the item " 0 " means memory mode, where the display at the adjusted value position always becomes " 00 " (The UP and DOWN Buttons do not work). At the turning - ON of the Release Switch, the display blinks at 2 Hz for 2 seconds.



(4) Change of Adjusting Mode

There are three adjusting modes, which can be switched by means of the A.B.C Lever.

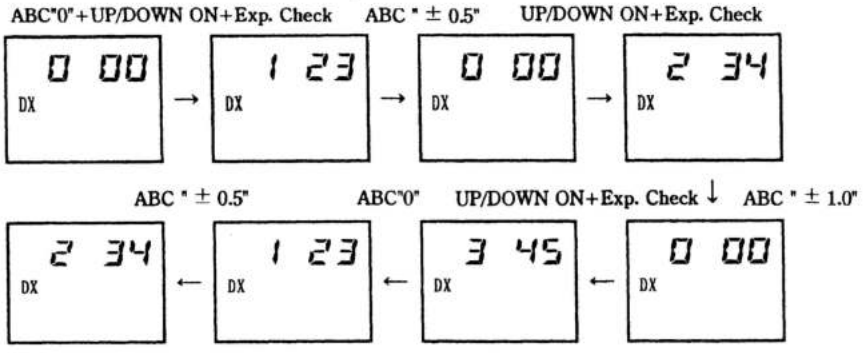
Table 1 Change of Adjusting Mode

Setting position of A.B.C. Lever	Mode
0	Output adjustment
± 0.5	Input adjustment
± 1.0	Semiautomatic adjustment/display

Notes

At the beginning of adjusting mode, the item number " 0 " is displayed in each adjusting mode even by changing the A.B.C. Lever setting only. And the item numbers in each mode are closed within each mode. Therefore, the adjusted values in each mode are written in EEPROM by turning ON the Release Switch with the item number of the mode returned to " 0 ".

※ The display changes as shown below by changing the A.B.C. Lever position. However, return the item number to " 0 " and turn ON the Release Switch to leave each mode; otherwise, the adjusted values in the mode will remain as before.



C - 7 - 3. Description of Adjustment Items

Table 2 describes the adjustment items in the each modes.

[Complementary Notes]

☆ In the spare area, " 00 " is displayed at the adjusted value position even by changing the item number. That is, the operation at the adjusted value position is not possible (UP/DOWN operation is possible as long as the Exposure Check Switch is turned ON.)

☆ Never change any data of the adjustment items other than specified for use in repair.

☆ Notes on output adjustment mode

For the adjustment items 1 ~ 7, the release sequence is executed by turning ON the Release Switch. At this time, however, the battery check is not performed. Therefore, pay attention to the voltage of the battery.

☆ Notes on semiautomatic adjustment/display mode

· The items of 1 ~ 3 are semiautomatic adjustment items and 4 ~ C are display items. The data of 4 and 7 ~ C are indicated hexadecimally.

· The data of the adjustment items 4 ~ 7 only can be written at the item 0 .

Table 2 Adjustment Items

Mode	Item No.	Adjustment item	Resolution	Range of indications (adjusted values)
ABC 0 Output adjust-ment	0	Writing	——	00 → (0 00 blinking)
	1	Shutter time	8 μ s	-30~ 16 (-30*8 ~ 16*8 μ s)
	2	Aperture delay pulse	1/16Av (1 pulse)	-20~ 20 (-20 ~ 20 pulses)
	3	TTL Flash Auto control value	1/3Ev	-03~ 03 (-3/3 ~ 3/3Ev)
	4	Reference value for average metering light exposure	1/8Lv	-16~ 16 (-16/8 ~ 16/8Lv)
	5	Average metering inclination	2^{-7} =0.0078	-99~ 99 (-0.773 ~ 0.773)
	6	Reference value for spot metering light exposure	1/8Lv	-16~ 16 (-0.773 ~ 0.773)
	7	Spot metering inclination	2^{-7} =0.0078	-99~ 99 (-16/8 ~ 16/8Lv)
	8	Battery check B1	28.67mv	-35~ 35 (B1-1.003 ~ B1+1.003v)
	9	Battery check B2	28.67mv	-35~ 35 (B2-1.003 ~ B2+1.003v)
	A	AF	1/128 pitch	-99~ 99 (-99/128 ~ 99/128 pitch)
	b c	] Not used by serviceside. Never change the data, however.		
	d	Boundary value of Focus Indicator	3.9 μ m	-99~ 99 (-386.1 ~ 386.1 μ m)
	E F	] Spare	——	00
ABC ± 0.5 Input adjust-ment	0	Writing	——	00 → (0 00 blinking)
	1	Reference value for exposure compensation resistance	1/48Ev	-50~ 50 (-50/48 ~ 50/48Ev)
	2	Inclination of exposure compensation resistance	2^{-5} =0.031	-65~ 65
	3	Reference value for aperture resistance	1/24Av	-50~ 50 (-50/24 ~ 50/24Av)
	4	Inclination of aperture resistance	2^{-5} =0.031	-97~ 97
	5	Reference value for shutter resistance	1/16Tv	-50~ 50 (-50/16 ~ 50/16Tv)
	6	Inclination of shutter resistance	2^{-5} =0.031	-65~ 65
	7 8 9 A b c d E F	] Spare	——	00

ABC ± 1.0	0	Writing	——	00 → (0 00 blinking)
	1	Semiautomatic adjustment of aperture resistance	——	(14→ 16→ 1 11 blinking/ E EE blinking)
	2	Semiautomatic adjustment of shutter resistance	——	(40→ 41→ 2 22 blinking/ E EE blinking)
	3	Semiautomatic adjustment of exposure compensation resistance	——	(-02→ 02→ 3 33 blinking/ E EE blinking)
	4	Error code display	——	See Table 4.
Semi - automatic adjust - ment /display	5	Cumulative counter value	1024 shots	00~ 99 (0 ~ 101, 376 shots)
	6	Cumulative counter value (H)	256 shots	00~ 03 (0 ~ 1, 023 shots)
	7	Cumulative counter value (L)	1 shot	00~ FF (0 ~ 255 shots)
	8 9 A	Not used by serviceside. Special indications are performed.		
	b	De - focus amount (integer part)	1mm	00~ FF (−128 ~ 127mm)
	c	De - focus amount (decimal part)	3.9 μ m	00~ FF (0 ~ 996 μ m)
	d	All viewfinder indications lighting	——	00 → (d dd blinking)
	E	Not used by serviceside. Never press Shutter Release; otherwise, data will be destroyed.		
	F	Spare	——	00

C - 7 - 4. Adjustment Procedure

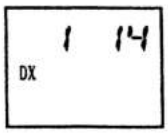
(1) Adjustment of Aperture Resistance

* Perform the following operations with the standard lens of 50mm/f1.4 (Planar) mounted on the camera:

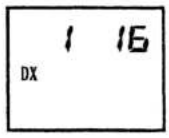
① After transition to adjusting mode, set the A.B.C. Lever in the " ± 1.0" position and select the item number by pressing UP or DOWN Button while turning ON the Exposure Check Switch. (Display is as shown at upper right.)

② At this point, set the Aperture Ring of Lens to F1.4 and turn ON the Release Switch. (Display is as shown at center right.)

③ Then set the Aperture Ring of Lens to F16 and turn ON the Release Switch. (Display is as shown at lower right.)



↓ Release Switch ON



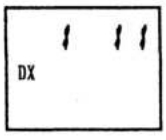
1 11 blinks (at 2 Hz for 2 sec.) when the adjusted value is within the allowable range.

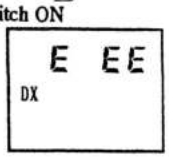
E EE blinks (at 2 Hz for 4 sec.) when the adjusted value is out of the allowable range.

After that, the display will return to that as shown at upper right.

OK NG

Release Switch ON





Through the operations of ①~③ , the reference value for aperture resistance and the inclination of aperture resistance are calculated in the camera and the adjusted values are written. (There is no need of returning the item number to 0 .)

④ The adjusted values can be checked by setting the adjustment items " 3 " and " 4 " with the A.B.C. Lever set in the " ± 0.5" position. Also the adjusted values can be written directly. In this case, any of the values up to ± 50 can be input as the reference value. However, the input value must be limited to within the range of ± 06 to meet the specification.

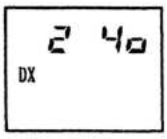
※ Inclination --- When the A/D value changes by 6 for every 1/4 Av, a change in the adjusted value by ± 1 causes a change in the A/D value by 6 ± 0.031.

(2) Adjustment of Shutter Resistance

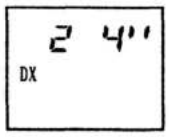
① After transition to adjusting mode, set the A.B.C. Lever in the " ± 1.0" position and select the item number 2 by pressing UP or DOWN Button while turning ON the Exposure Check Switch. (Display is as shown at upper right.)

② At this point, set the Shutter Dial to 1/4000 and turn ON the Release Switch. (Display is as shown at center right.)

③ Then set the Shutter Dial to 4" and turn ON the Release Switch. (Display is as shown at lower right.)



↓ Release Switch ON



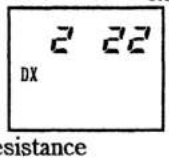
2 22 blinks (at 2 Hz for 2 sec.) when the adjusted value is within the allowable range.

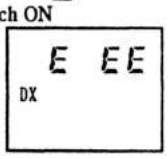
E EE blinks (at 2 Hz for 4 sec.) when the adjusted value is out of the allowable range.

After that, the display will return to that as shown at upper right.

OK NG

Release Switch ON





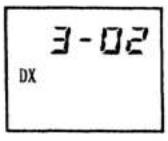
Through the operations of ①~③ , the reference value for shutter resistance and the inclination of shutter resistance are calculated in the camera and the adjusted values are written. (There is no need of returning the item number to 0 .)

④ The adjusted values can be checked by setting the adjustment items " 5 " and " 6 " with the A.B.C. Lever set in the " ± 0.5" position. Also the adjusted values can be written directly. In this case, any of the values up to ± 50 can be input as the reference value. However, the input value must be limited to within the range of ± 08 to meet the specification.

※ Inclination --- When the A/D value changes by 4 for every 1/4 Tv, a change in the adjusted value by ± 1 causes a change in the A/D value by 4 ± 0.031.

(3) Adjustment of Exposure Compensation Resistance

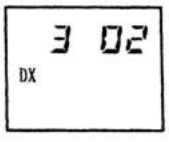
① After transition to adjusting mode, set the A.B.C. Lever in the " ± 1.0" position and select the item number 3 by pressing UP or DOWN Button while turning ON the Exposure Check Switch.
(Display is as shown at upper right.)



② At this point, set the Exp. Compensation Dial to −2.0 and turn ON the Release Switch. (Display is as shown at center right.)

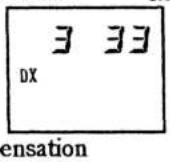
↓ Release Switch ON

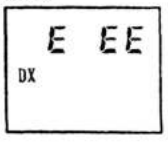
③ Then set the Exp. Compensation Dial to +2.0 and turn ON the Release Switch. (Display is as shown at lower right.)



3 33 blinks (at 2 Hz for 2 sec.) when the adjusted value is within the allowable range.
E EE blinks (at 2 Hz for 4 sec.) when the adjusted value is out of the allowable range.

OK ↙ ↘ NG
Release Switch ON





After that, the display will return to that as shown at upper right.

Through the operations of ①~③, the reference value for exp. compensation resistance and the inclination of exp. compensation resistance are calculated in the camera and the adjusted values are written.
(There is no need of returning the item number to 0 .)

④ The adjusted values can be checked by setting the adjustment items " 1 " and " 2 " with the A.B.C. Lever set in the " ± 0.5" position. Also the adjusted values can be written directly. In this case, any of the values up to ± 50 can be input as the reference value. However, the input value must be limited to within the range of ± 16 to meet the specification.

※ Inclination --- When the A/D value changes by 4 for every 1/12 Ev, a change in the adjusted value by ± 1 causes a change in the A/D value by 4 ± 0.031.

(4) Adjustment of Shutter Time

* Before this adjustment, make the adjustment of the Shutter Resistance.

① Set the camera on the shutter tester with the Back Cover open.
② Set the Exposure Mode Dial to "M" and the Shutter Dial to "1/4000".
③ After transition to adjusting mode, set the A.B.C. Lever in the "0" position and select the item number " 1 " by pressing UP or DOWN Button while turning ON the Exposure Check Switch.
④ Turn ON the Release Switch to execute the release sequence and change the adjusted value according to the time Tm displayed on the shutter tester, by pressing UP or DOWN Button.

Tm: slow → Press DOWN Button (to - 30 max.)
Tm: fast → Press UP Button (to 16 max.)

At this point, determine the adjusted value based on 1/4000 sec. (244 μ s) and employ the value calculated from the following formula for use with all the shutter speeds. However, do not add the adjusted value for any shutter speed of 1/8 second and larger.

Adjusted value = INT {(244 μ s − Shutter speed)/8 μ s}

※ The allowable range of shutter time is shown in below.

⑤ After the change of the adjusted value, return the item to " 0 " and turn ON the Release Switch to store the new adjusted value.

⑥ Restore the normal mode by turning OFF the Main Switch and make certain that the result of the adjustment is proper, using the shutter tester.

(Allowable Range of Manual Exposure Time)

Shutter speed	+	Refernce value	−	Tolerance
X	8.37	7.81	7.29	± 0.10EV
1″	1035	1000	966	± 0.05EV
1/2	517.6	500	483.0	
1/4	258.8	250	241.5	
1/8	134.0	125	116.6	± 0.10EV
1/15	66.99	62.50	58.32	
1/30	33.55	31.30	29.20	
1/60	16.75	15.63	14.58	
1/125	8.37	7.81	7.29	
1/250	4.81	3.91	3.17	± 0.30EV
1/500	2.40	1.95	1.58	
1/1000	1.21	0.98	0.80	
1/2000	0.647	0.49	0.371	± 0.40EV
1/4000	0.383	0.244	0.155	± 0.65EV

*A parallel light source shutter tester is used. (Unit: ms)

(5) Adjustment of Light Exposure

* Before the adjustment of light exposure, be sure to make the adjustment of shutter time. Adjust the light exposure at average metering and that at spot metering the same way, since there is no difference in the range of adjusted values and resolution between them.

(5) - 1 Adjustment of reference value for light exposure

① Mount the 50mm, F1.4 Standard Lens (MM) on the camera and set the camera on the light exposure tester with the Back Cover open.

② Set the Exposure Mode Dial to "Av", the aperture to F5.6 and the light exposure tester to Lv15.

③ After transition to adjusting mode, set the A.B.C. Lever in the "0" position and select the item number " 4 " for average metering or " 5 " for spot metering by pressing UP or DOWN Button while turning ON the Exposure Check Switch.

※ At this point, the ISO is fixed to "100" and the light metering type is automatically determined at the setting of the item number above, irrespective of the Lever position.

④ Turn ON the Release Switch to execute the release sequence and change the adjusted value according to the light exposure variance △ Ev displayed on the light exposure tester, by pressing UP or DOWN Button.

- △ Ev: plus → Press DOWN Button (to- 15 max.)
- △ Ev: minus → Press UP Button (to 15 max.)

⑤ After the change of the adjusted value, return the item to " 0 " and turn ON the Release Switch to store the new adjusted value.

⑥ Restore the normal mode by turning OFF the Main Switch and make certain that the result of the adjustment is proper, using the light exposure tester.

(5) - 2 Adjustment of inclination of light exposure

① Mount the 50mm, F1.4 Standard Lens (MM) on the camera and set the camera on the light expoure tester with the Back Cover open.
② Set the Exposure Mode Dial to "Av", the aperture to F5.6 and the light exposure tester to Lv9.
③ After transition to adjusting mode, set the A.B.C. Lever in the "0" position and select the item number " 5 " for average metering or " 7 " for spot metering by pressing UP or DOWN Button while turning ON the Exposure Check Switch.

※ At this point, the ISO is fixed to "100" and the light metering type is automatically determined at the setting of the item number above, irrespective of the Lever position.

④ Turn ON the Release Switch to execute the release sequence and change the adjusted value according to the light exposure variance △ Ev displayed on the light exposure tester, by pressing UP or DOWN Button.

- △ Ev: minus → Press DOWN Button (to - 99 max.)
- △ Ev: plus → Press UP Button (to 99 max.)

⑤ After the change of the adjusted value, return the item to " 0 " and turn ON the Release Switch to store the new adjusted value.
⑥ Restore the normal mode by turning OFF the Main Switch and make certain that the result of the adjustment is proper, using the light exposure tester.

※ To simplify the procedure above, you may change the Lv value of the light exposure tester according to the adjustment items 4 ~ 7 of ①~④, input each adjusted value while consulting the △ Ev and write all the adjusted values together by ⑤.

Allowable Range of Light Exposure Values

Brightness (LV)	Allowable range
9 (8)	−0.5 ~ +0.5EV
12	−0.5 ~ +0.5EV
15	−0.5 ~ +0.5EV

ISO : 100
K value: 1.04

(6) Adjustment of Aperture Delay Pulse

* Before this adjustment, be sure to make the adjustment of light exposure.

① Mount the 50mm, F1.4 Standard Lens (MM) on the camera and set the camera on the light exposure tester with the Back Cover open.
② Set the Exposure Mode Dial to "P", the aperture to F16 and the light exposure tester to Lv12.
③ After transition to adjusting mode, set the A.B.C. Lever in the "0" position and select the item number " 2 " by pressing UP or DOWN Button while turning ON the Exposure Check Switch.
※ At this point, the ISO is fixed to "100".

④ Turn ON the Release Switch to execute the release sequence and change the adjusted value according to the light exposure variance △ Ev displayed on the light exposure tester, by pressing UP or DOWN Button.

- △ Ev: plus → Press UP Button (to 20, though setting to 06 possible.)
- △ Ev: minus → Press DOWN Button (to - 20, though setting to - 06 possible.)

⑤ After the change of the adjusted value, return the item to " 0 " and turn ON the Release Switch to store the new adjusted value.
⑥ Restore the normal mode by turning OFF the Main Switch and make certain that the result of the adjustment is proper, using the light exposure tester.
※ Light exposure error: In each mode (Av, P or Tv), the light exposure error at average metering, spot metering and AE - L must be 0.3Ev or less.

(7) Adjustment of TTL Flash Auto Control Value

* Make this adjustment under conditions without external light.

① Install the 50mm, F1.4 Standard Lens (MM), the TLA Flash Unit and the Standard Pressure Plate (Ektachrome 64 film) on the camera.
② Set the Exposure Mode Dial to "X" and the aperture to F5.6 and set a standard reflector with a reflectivity of 18% at 2 m from the film plane.
③ After transition to adjusting mode, set the A.B.C. Lever in the "0" position and select the item number " 3 " by pressing UP or DOWN Button while turning ON the Exposure Check Switch.
※ At this point, the ISO is fixed to "100" and exposure compensation is zero.

④ Turn ON the Release Switch to execute the release sequence, measure the flash light with a flash meter and change the adjusted value so that △ Ev comes within ± 0.6Ev, by pressing UP or DOWN Button while turning ON the Exposure Check Switch.

△ Ev: plus → Press UP Button (to 03 max.)
△ Ev: minus → Press DOWN Button (to - 03 max.)

⑤ After the change of the adjusted value, return the item to " 0 " and turn ON the Release Switch to store the new adjusted value.
⑥ Restore the normal mode by turning OFF the Main Switch and make certain that the result of the adjustment is proper, using the flash meter.

(Reference)

Flash Auto control time: 450 μ s ~ 700 μ s

AE Camera Tester: LV12
Check with Standard Pressure Plate
ISO: 100
K: 1.04
F5.6 full aperture lens

(8) Adjustment of Battery Check Level

* Adjusted values are used for two battery check levels, namely, B1 level (warning) and B2 level (operation stop).

① After transition to adjusting mode, set the A.B.C. Lever in the "0" position and select the item number " 8 " for B1 level or " 9 " B2 level by pressing UP or DOWN Button while turning ON the Exposure Check Switch.
② At the shipment from the factory, the adjusted values for battery check levels are so set that B1 level is 3.8V and B2 level 3.5V. Each of B1 and B2 levels changes by 28.67mV as the adjusted value changes by ± 1. The battery check levels can be adjusted in the range of ± 1.003V.

To set a lower level → Press DOWN Button (to - 35 max.)
To set a higher level → Press UP Button (to 35 max.)

③ After the change of the adjusted value, return the item to " 0 " and turn ON the Release Switch to store the new adjusted value.

(9) Adjustment of AF

* Make the camera perform distance metering actually and calculate the difference between the actual PE value and the designed PE value. And use the difference as the AF compensation value in the subsequent AF operations by adding or subtracting it to determine the normal AF data.

① On the camera locked on a tripod, mount the 50/1.4 Standard Lens with its Focusing Ring fixed to "2m".
② Place a target chart at 2m from the camera and adjust the brightness to LV12.
③ After transition to adjusting mode, set the A.B.C. Lever in the "0" position. Then select the item " b " or " c " by pressing UP or DOWN Button while turning ON the Exposure Check Switch.
④ Turn ON the Release Switch to execute distance metering and read the value displayed on the LCD. On the display, the difference from the designed PE value is indicated as follows:

Item " b ": de - focus amount (integer part) 00 ~ FF (−128 ~ 127mm)
Item " c ": de - focus amount (decimal part) 00 ~ FF (0 ~ 996 μm)

If b = 80 or c = 00 , however, distance metering is impossible. In such a case, repeat ④. If impossible distance metering is repeated, replace the target chart with another one for easy focusing.

⑤ The designed distance between in - focus points is 79.117 pitches. That is, the value displayed at ④ represents the difference from the designed distance between in - focus points.
⑥ The data (unit: [mm]) on " b " or " c " displayed at ④ is divided by the de - focus sensitivity and the resultant value (unit: [pitches]) is subtracted from the current compensation value (the value displayed at item A with the A.B.C. Lever in the "0" position) to determine the new AF compensation value.

De - focus sensitivity = 0.402010 [mm/pitch]

*** How to write compensation value
① After transition to adjusting mode, set the A.B.C. Lever in the "0" position and select the item number " A " by pressing UP or DOWN Button while turning ON the Exposure Check Switch.
② Add the difference from the designed distance between in - focus points calculated above to the value at A . If the resultant value is not within the range of -99 ~ 99 (−99/128 ~ 99/128 pitch), the adjustment must be considered impossible.
③ When the value is within the adjustable range, write the new AF compensation value in item " A " by pressing the UP or DOWN Button.
④ Select the item number " 0 " by pressing UP or DOWN Button while turning ON the Exposure Check Switch.
⑤ Turn ON the Release Switch, and the new AF compensation value will be written in EEPROM.
⑥ Including confirmation, repeat the adjustment several times to determine the AF compensation value properly.

(10) Adjustment of Indicator

* It is possible to shift the focus indication in the viewfinder from the actual focus position detected by the AF Sensor. This function can be used to compensate for the differences in the sharpest focus position between lenses.

① After transition to adjusting mode, set the A.B.C. Lever in the "0" position and select the item number " d " by pressing the UP or DOWN Button while turning ON the Exposure Check Switch.
② By pressing the UP or DOWN Button, input a value to shift the focus indication in the desired direction as follows:

To infinity ---> ooo■ 00 ~ 99 (0 ~ 386.1 [μm]
To close point ---> ■ooo 00 ~ -99 (0 ~ 386.1 [μm]

* The adjusted value must be within the range of 99 ~ -99 and the resolution is 3.9 [μm]. If the adjusted value is not within this range, the adjustment must be considered impossible.

③ Select the item number " 0 " by pressing UP or DOWN Button while turning ON the Exposure Check Switch. And turn ON the Release Switch to write the new adjusted value in EEPROM.
④ Operate the camera normally and make certain that the indication is proper (check the difference between the split image positions and the focus indication in the Indicator).

(11) Display of Error Code

* The displayed error code represents the last error which occurred actually. Once the error is corrected by repair, write 00 by the following procedure.

① After transition to adjusting mode, set the A.B.C. Lever in the " ± 1" position and select the item number " 4 " by pressing UP or DOWN Button while turning ON the Exposure Check Switch. Then one of error codes shown in Table 4 will be displayed at the adjusted value display position.
※ The error code corresponding to a blank at Error will not be displayed.

Table 4 Error Code Table

Error Code	Error	Error Code	Error
00	No error (initial state)	10	B2 error (no - load battery check)
01		11	B2 error (initial)
02	Winding Timing Switch error	12	B2 error (winding)
03	Mirror - up control error	13	B2 error (mirror - up)
04	Mirror - down control error	14	B2 error (rewind)
05	Aperture control error	15	B2 error (blank shots advance)
06	Blank shots advance perforation error	16	B2 error (Bulb operation)
07	Blank shots advance Timing Switch error	17	
08	Frame Limiting Switch release error	18	
09		19	
0b		1b	
0c		1c	
0d	AF accumulation start error	1d	Inter - CPU communication error
0E	AF accumulation end error	1E	
0F	AF data transfer error	1F	Flash communication error

② Upon successful completion of repair, set 00 at the adjusted value display position by pressing the UP or DOWN Button.
③ Select the item number " 0 " by pressing UP or DOWN Button while turning ON the Exposure Check Switch. And turn ON the Release Switch to write the 00 in EEPROM.

(12) Display of Cumulative Counter

* The Cumulative Counter automatically writes the number of shutter releases.
When the Shutter has been replaced with a new one, be sure to set the Cumulative Counter to 00 by the following procedure.

① After transition to adjusting mode, set the A.B.C. Lever in the " ± 1" position and select the item numbers " 5 ", " 6 " and " 7 " by pressing UP or DOWN Button while turning ON the Exposure Check Switch. Then the number of shots will be displayed at the adjusted value display position as follows:
- Item 5 -----> Count taken every 1024 shots (to 99 max.)
- Item 6 -----> Count taken every 256 shots (to 03 max.)
- Item 7 -----> Count taken every shot (to FF max.)

② After the replacement of the Shutter, set 00 at the adjusted value display position of each item by pressing the UP or DOWN Button.
③ Select the item number " 0 " by pressing UP or DOWN Button while turning ON the Exposure Check Switch. And turn ON the Release Switch to write the 00 in EEPROM.

(13) Checking of Viewfinder LCD Indications

* After the repair of the camera, check the indications for broken segments. The checking procedure is as follows:

① After transition to adjusting mode, set the A.B.C. Lever in the " ± 1" position and select the item number " d " by pressing UP or DOWN Button while turning ON the Exposure Check Switch. Then the number displayed at the adjusted value position will not always the same, but it does not mean anything.

※ Immediately before entering adjusting mode, the camera must be in the power - ON state. That is, the Back Light LED must be lighting. In the power - OFF state, the checking of the indications is impossible, since the Back Light LED remains out.

② Look into the viewfinder while turning ON the Release Switch, and make certain that all the viewfinder in dications are lighting properly. At this point, the External LCD displays dd at the adjusted value position (once the Release Switch is turned ON, this display is maintained).

※ All the viewfinder LCD indications are lighting as long as the Release Switch is kept ON and go out when the Release Switch is turned OFF (Back Light LED remains lighting).

C - 8. OTHERS

C - 8 - 1. Curtain Travel Speed

* The curtain travel speed can not be adjusted. Therefore, replace the Shutter Unit if the travel speed of each curtain is significantly different from the specified value.
* The travel speeds of the first curtain and second curtain are both such that each curtain takes about 5.30 ms to travel the vertical length of 21 mm.

C - 8 - 2. Synchro Contact

① Delay time

Sensing point of Shutter Tester: 21 mm
Measure at shutter time X

A range: 0.2 ~ 1.0 ms
C range: 1.7 ms or above

② Contact efficiency

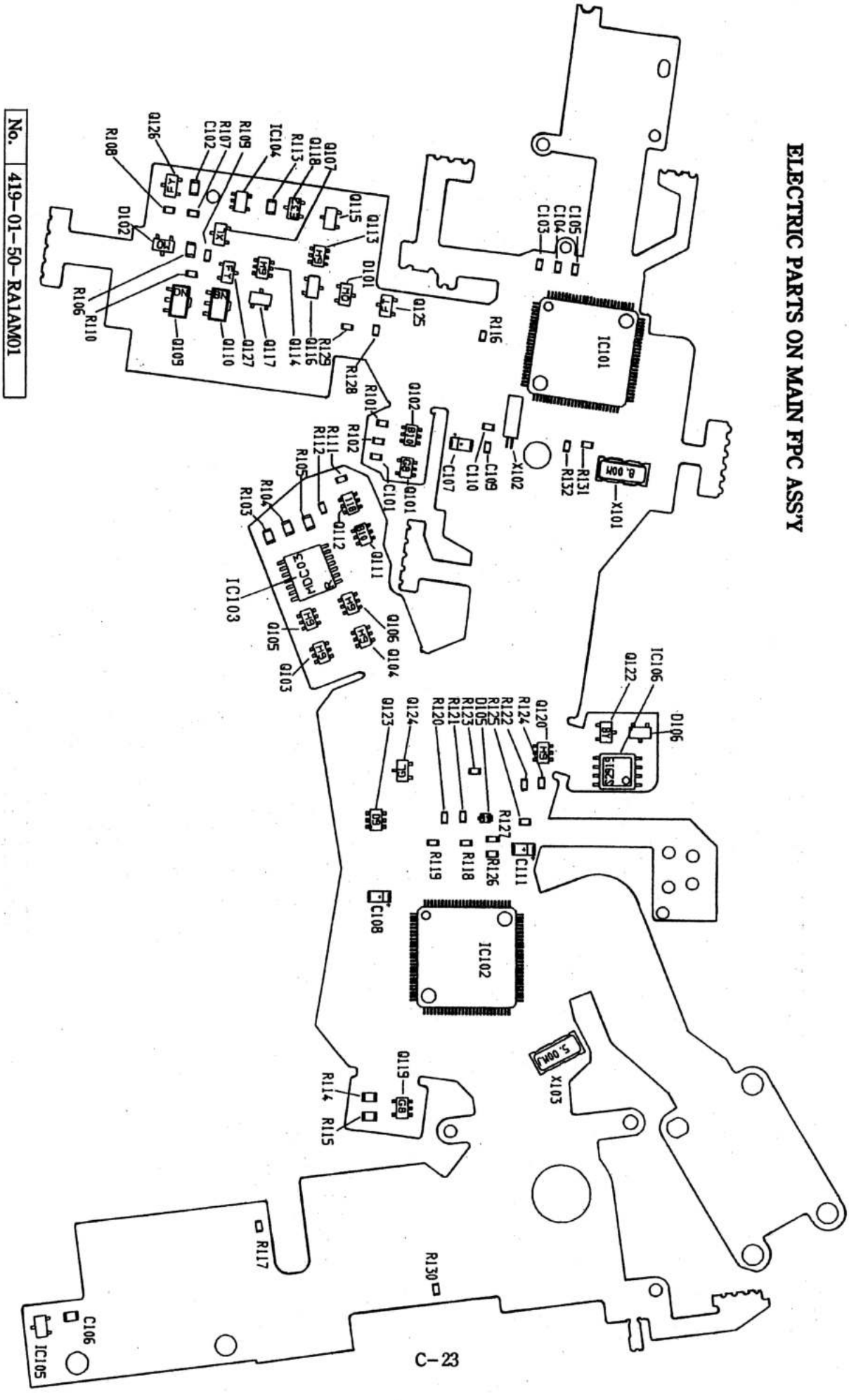
The contact efficiency must be 60% or above at shutter speed of 1/125 sec. (X) or less.
(Use a contact efficiency tester at 1 ms.)

C - 8 - 3. Current Consumption

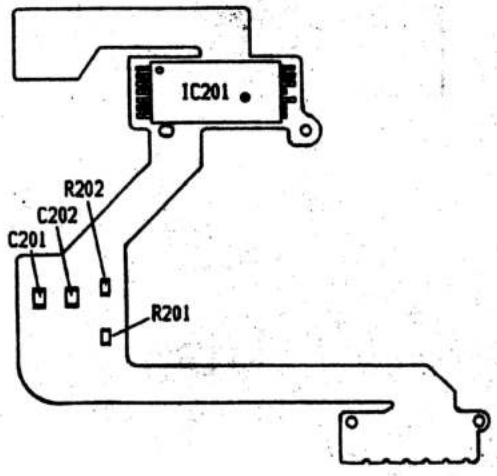
Main Switch OFF (standby current)	20 μA or below
Power ON	
LCD ON	100 mA or below
LCD OFF	25 μA or below
Winding operation	800 mA or below (Check with film in)
Winding stop current	2000 mA or below (Check with film in)
Rewinding operation	500 mA or below (Check with film in)
Release (shutter operation, single)	600 mA or below (Check with film in)

ELECTRIC PARTS ON MAIN FPC ASSY

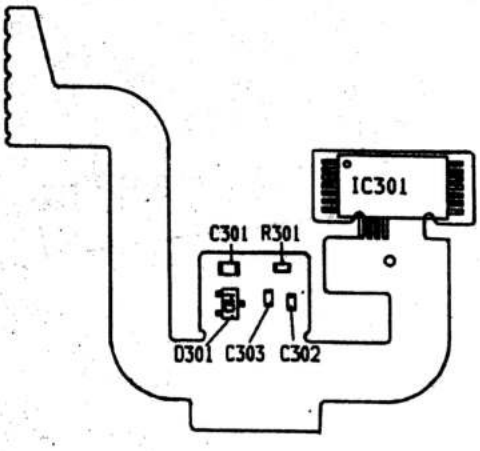
No.	419-01-50-RA1AM01



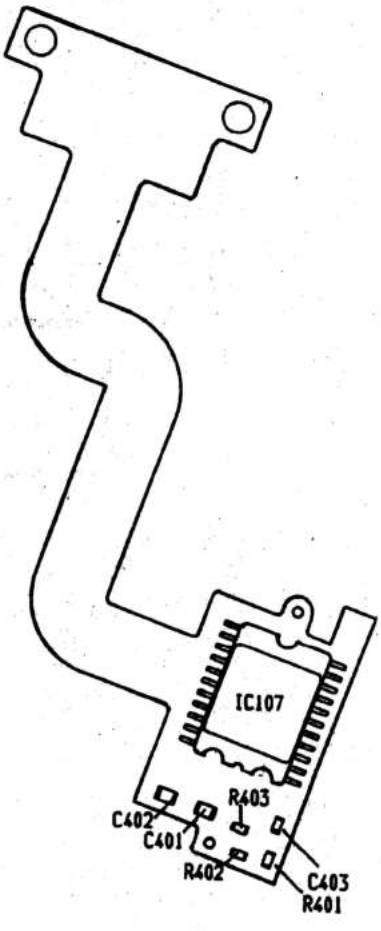
ELECTRIC PARTS ON LIGHT METERING FPC



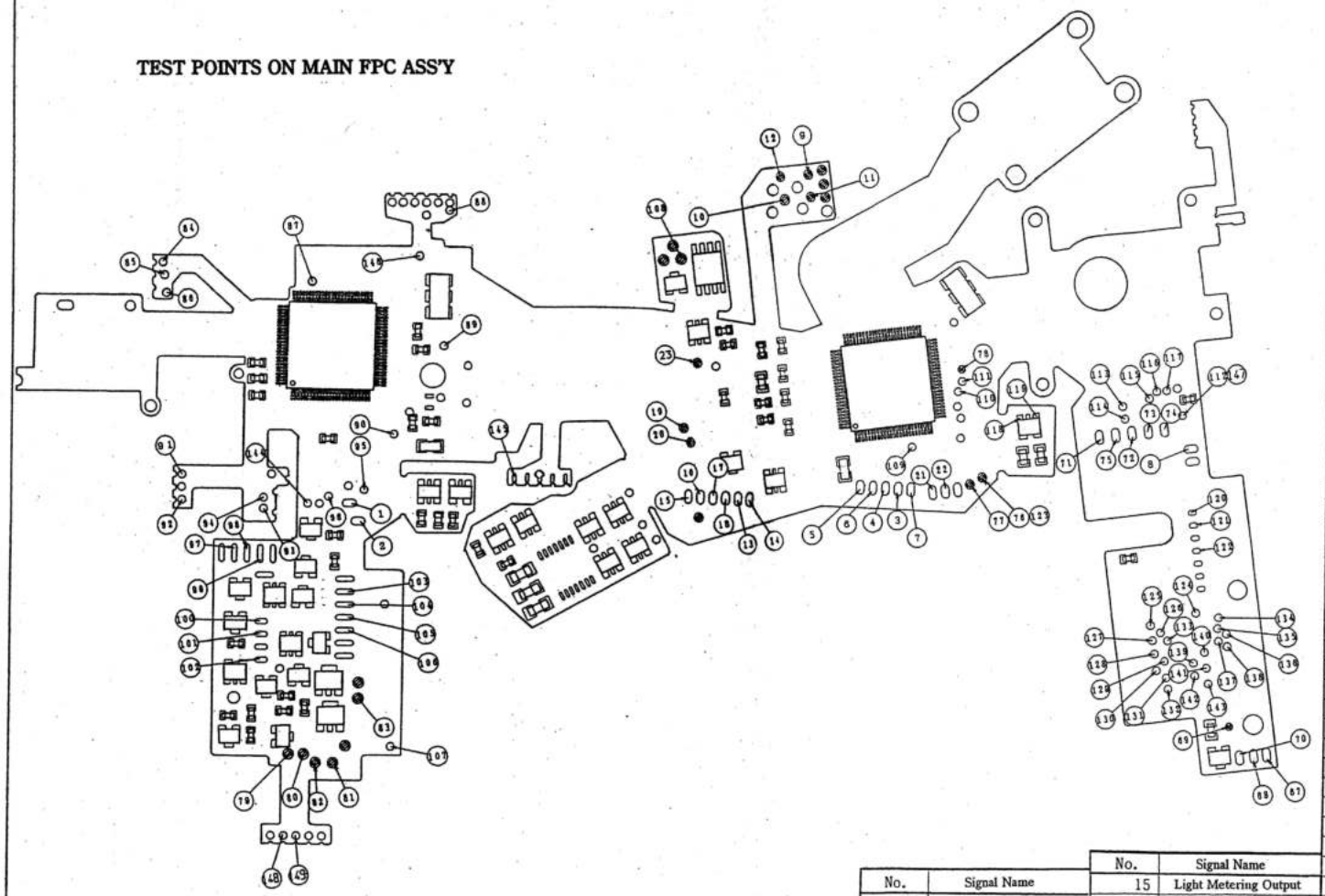
ELECTRIC PARTS ON TTL FLASH AUTO CONTROL FPC



ELECTRIC PARTS ON AF - FPC



TEST POINTS ON MAIN FPC ASS'Y



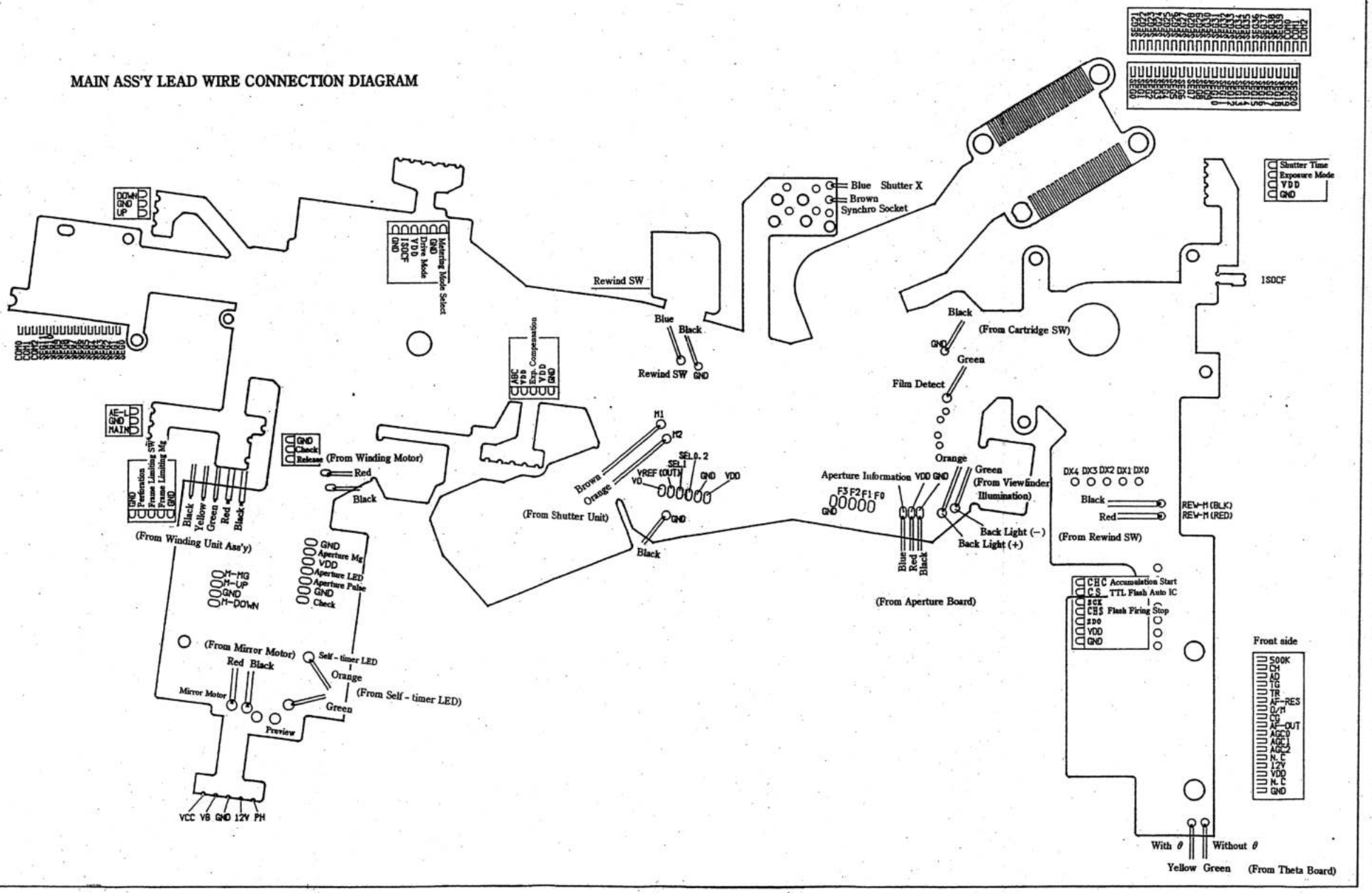
No.	Signal Name
1	Winding Motor (+)
2	Winding Motor (−)
3	Open F Code/F1
4	F2
5	GND
6	F3
7	F0
8	Rewind Motor (−)
9	AX(EXT)
10	SCK(B)
11	SDA(B)
12	CH(EXT)
13	GND
14	VDD

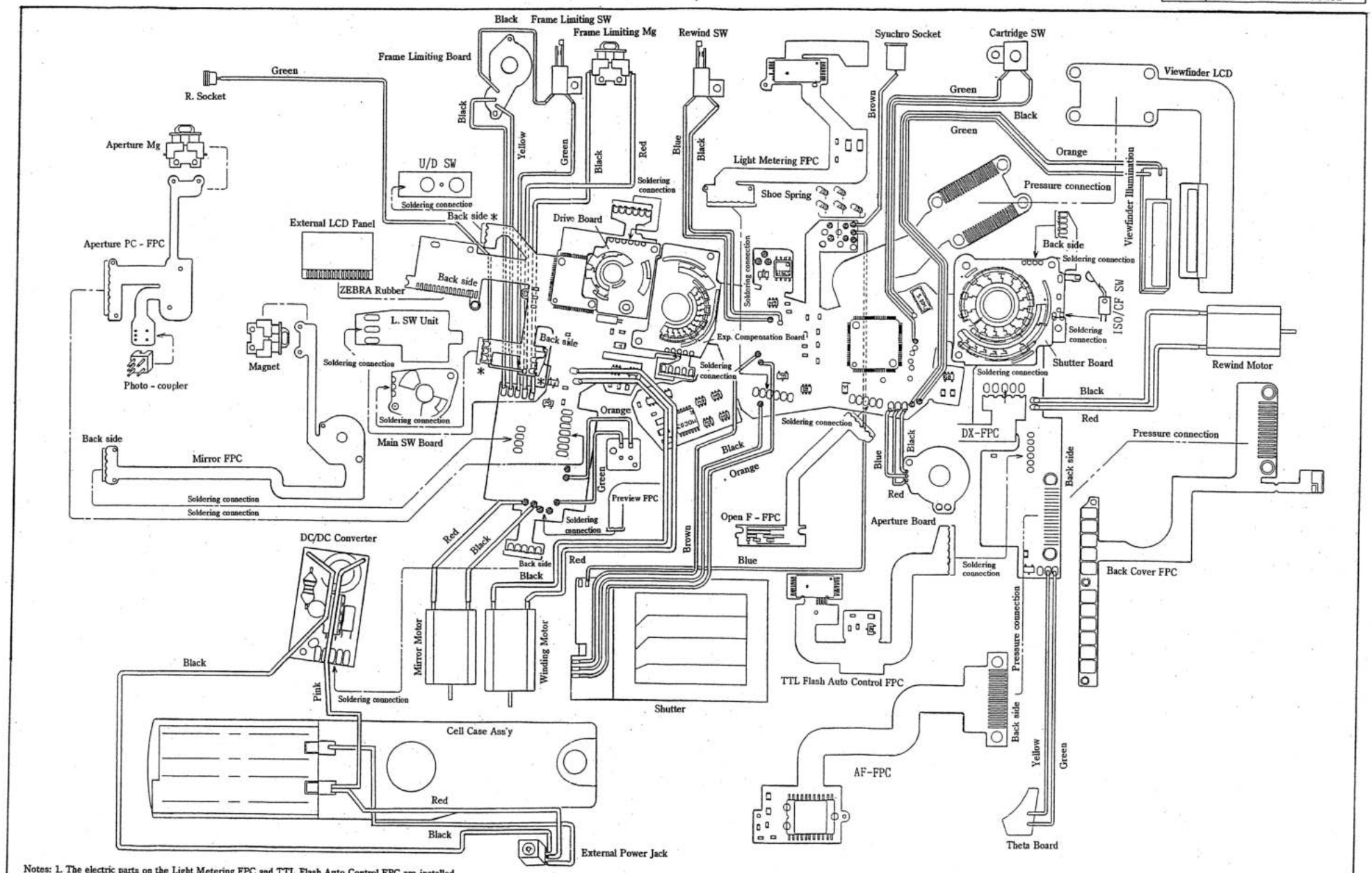
No.	Signal Name
15	Light Metering Output
16	VREF (IC Output)
17	SEL1
18	SEL0, 2
19	Shutter M1
20	Shutter M2
21	Aperture Setting
22	VDD
23	Rewind SW
24	CPUB SEG 4
25	5
26	12
27	1
28	20
29	17

No.	Signal Name
30	15
31	13
32	11
33	19
34	9
35	6
36	7
37	16
38	3
39	2
40	10
41	8
42	14
43	18
44	0
45	37
46	29
47	27
48	35
49	26
50	COM 1
51	COM 0
52	SEG 36
53	25
54	34
55	24
56	22
57	32
58	30
59	28
60	COM 2
61	SEG 31
62	38
63	23
64	33
65	39
66	21
67	Without θ
68	With θ
69	VB
70	GND
71	DX4
72	DX2
73	DX1
74	DX0
75	DX3
76	Back Light (−)
77	Back Light (+)
78	Film SW
79	Mirror Motor (+)
80	Mirror Motor (−)
81	Preview SW
82	GND
83	Self - timer LED (+)
84	DOWN SW
85	GND
86	UP SW
87	Drive Mode
88	Light Metering Mode SW
89	ACK

No.	Signal Name
90	Exp. Compensation
91	Main SW
92	AE Lock
93	Release
94	Check
95	VCC
96	B.C
97	Perforation SW
98	Frame Limiting SW
99	Frame Limiting Mg (+)
100	Mirror Mg (+)
101	Mirror - up SW
102	Mirror - down SW
103	F-Mg
104	VDD
105	Aperture LED
106	Aperture Pulse
107	PH(DC/DC)
108	CS(EPR)
109	REQ
110	Shutter Time Setting
111	Exposure Mode
112	Mode Selector SW
113	500K
114	CH
115	SDI(A)
116	SDO(A)
117	SCK(A)
118	Back Light (L)
119	Back Light (H)
120	CHC
121	CS (TTL Flash Auto IC)
122	CHS
123	Back Light LED (−)
124	DB-PRN(DB)
125	Back Cover SW
126	D.B. Lamp
127	ACK (Adjusting Tool)
128	M/A
129	TEST
130	C/D
131	SDI(A)
132	12V
133	REQ (Adjusting Tool)
134	AD
135	TG
136	TR
137	RES(AFIC)
138	O/M Select
139	AF-OUT
140	CG
141	AGC0
142	AGC1
143	AGC2
144	VL1
145	ABC
146	VREF(A)
147	ISOCF
148	VB
149	GND

MAIN ASS'Y LEAD WIRE CONNECTION DIAGRAM





Notes: 1. The electric parts on the Light Metering FPC and TTL Flash Auto Control FPC are installed on the back side in this drawing.
2. The soldering connection marked with "*" is performed with the arrangement opposite to that in the drawing (upside down or left and right inverted).
3. The soldering connection marked with "Back side" is performed on the back side in the drawing.

WIRING DIAGRAM