

作成承認印

配布許可印



Lite•Touch  
Zoom70W  
AF

FCA46001

Lite•Touch  
Zoom70W  
AF *QUARTZ DATE*

FCA46201

REPAIR MANUAL

**Nikon** | NIKON CORPORATION  
Tokyo, Japan

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## Specification

Model	Built-in zoom lens 135 Auto-focus AE lens shutter camera
Applicable film	135 format film (Picture Format : 24×36mm)
Focal distance	2.8 ~ 7.0 mm F5.6~70
Lens mechanism	5 elements 4 groups (G3&G4 = glass, G1&G2&G5 = plastic)
Shutter	Programmed auto exposure electronic shutter
Finder	Real image zoom finder (28 - 70 mm) Field of view : 80-100% (2.0m) Diopter : -1.0±1.0 Magnification : 0.28 (28mm) ~ 0.62 (70mm) x
Focussing	Infrared active system
Number of steps	8 Autofocus steps + Infinity mode + Macro mode
Focus lock	Focus lock function by lightly pressing the shutter button.
Shooting distance	2.8 mm : 0.9m ~ ∞ 7.0 mm : 1.2m ~ ∞ Macro : 0.6m ~ 1.0m
Exposure control	Auto exposure made by electronically controlled programmed. Photo-electric element : CDS cell
Applicable film speed	ISO 100 / 200 and 400 (2 steps) using DX contact feature on film cartridge.
Flash System	Auto flash ; Flash cancel ; slow sync ; Daylight Fill Flash ; 4 kinds of Flash command Shutter button to be locked while fully charged With Red-eye reduction mode G.No : 11±0.5EV (m-ISO 100) Recycling Time : approx. 6 sec
Effective Flash Range	ISO 100 : 28mm . . . 0.9 - 3.3m 70mm . . . 1.2 - 1.9m ISO 400 : 28mm . . . 0.9 - 6.6m 70mm . . . 1.2 - 3.8m
Power Source	1 pc. CR-2 Lithium Battery.
Battery Life	12 rolls of 24 exposure film (50% with flash).
Date mode	With 5 mode [year/month/day], [month/day/year], [day/month/year], [day/time/min.], [no data]. Power Source for date : User replaceable CR2025 Lithium battery. Auto Calendar: 1998 to 2049 are stored in memory.

# Disassembling

1. Lens name plate/Slide cover .....	D 1
2. Rear cover/Front cover .....	D 2
3. Discharge of main condenser .....	D 2
4. Camera back .....	D 3
5. Main FPC .....	D 3
6. Macro-switch PCB/SB-FPC/Speed light emitting unit .....	D 4
7. Removal of tape and sponge .....	D 5
8. Main condenser/AF condenser .....	D 6
9. Speed light frame unit/AF unit .....	D 6
10. Lens barrel unit .....	D 7
11. Film advance gear .....	D 7
12. Camera back lock key unit/Film motor unit/Spool .....	D 8
13. Other parts .....	D 1 0
14. Lens barrel unit .....	D 1 0 ~ D 1 2

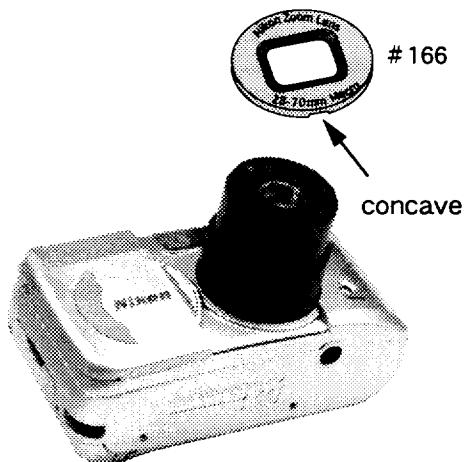
# Disassembly

 <b>WARNING</b>	
	<ul style="list-style-type: none"> <li>● There are high voltage parts inside. Be careful of this electric shock, when you remove the cover.</li> <li>● You must discharge the main condenser according to the instruction of this repair manual after you remove the frontcover.</li> </ul>

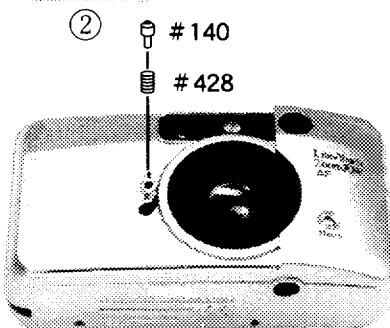
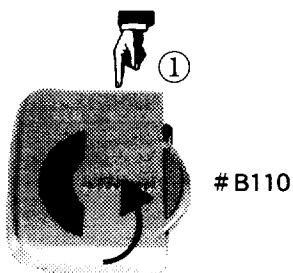
## Note

- ① Remove the batteries before beginning disassembly.
- ② When disassembling the camera, be certain to remember how wires are attached, which types of screws go where, etc.
- ③ Electronic components are vulnerable to damage from static electricity. Always be certain to ground yourself when handling such components.

### 1. Lens name plate/Slide cover

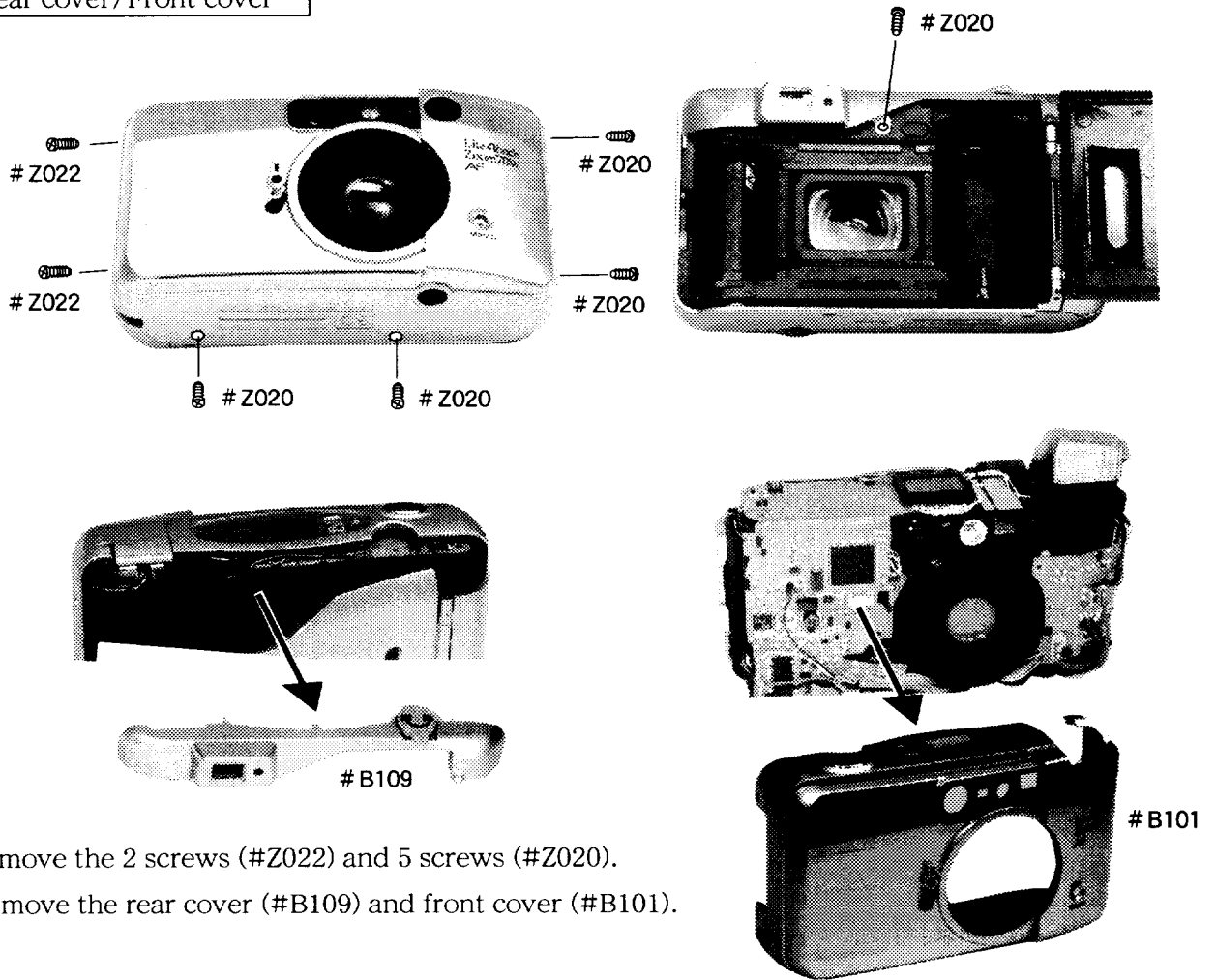


- Open the slide cover and set the camera to "ON" .
- Set the lens barrel to the Tele position with the zoom lever.
- Put the claw into the lower concave section of the lens name plate (#166) and remove the lens name plate.
- Close the slide cover and set the camera to "OFF" .
- Remove the battery from the camera.





- Slide the slide cover (#B110) to the position where the lens can be seen.
- As pushing down ①, raise ② to remove the slide cover.
- #140 and #428 can be removed.

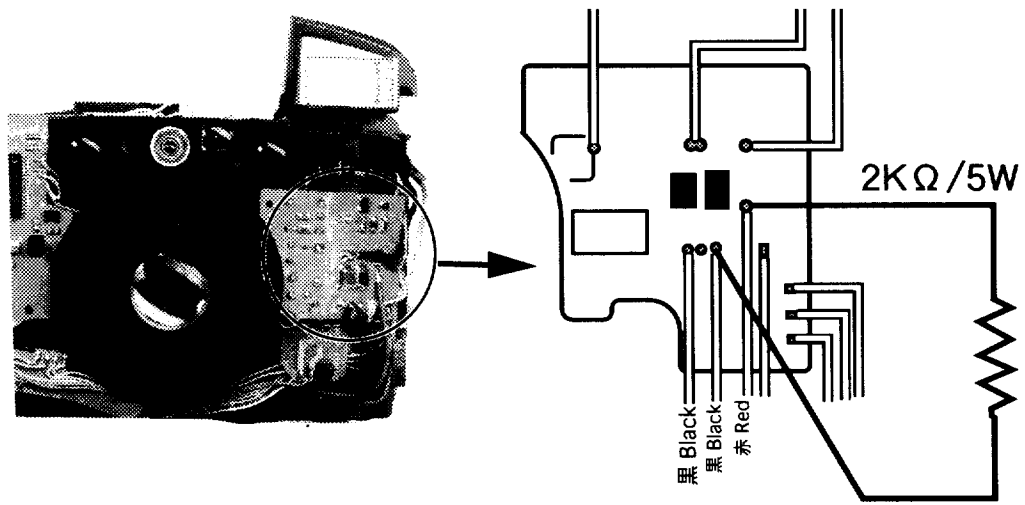
2. Rear cover/Front cover



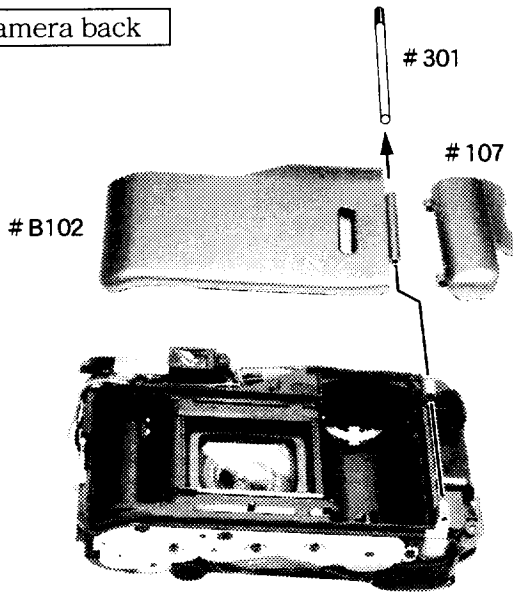
- Remove the 2 screws (#Z022) and 5 screws (#Z020).
- Remove the rear cover (#B109) and front cover (#B101).

3. Discharge of main condenser

 <b>WARNING</b>	
	<ul style="list-style-type: none"> <li>● There are high voltage parts inside. Be careful of this electric shock, when you remove the cover.</li> <li>● You must discharge the main condenser according to the instruction of this repair manual after you remove the frontcover.</li> </ul>

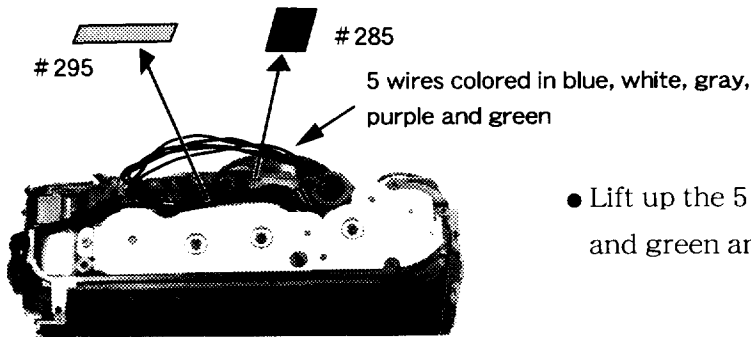


4. Camera back

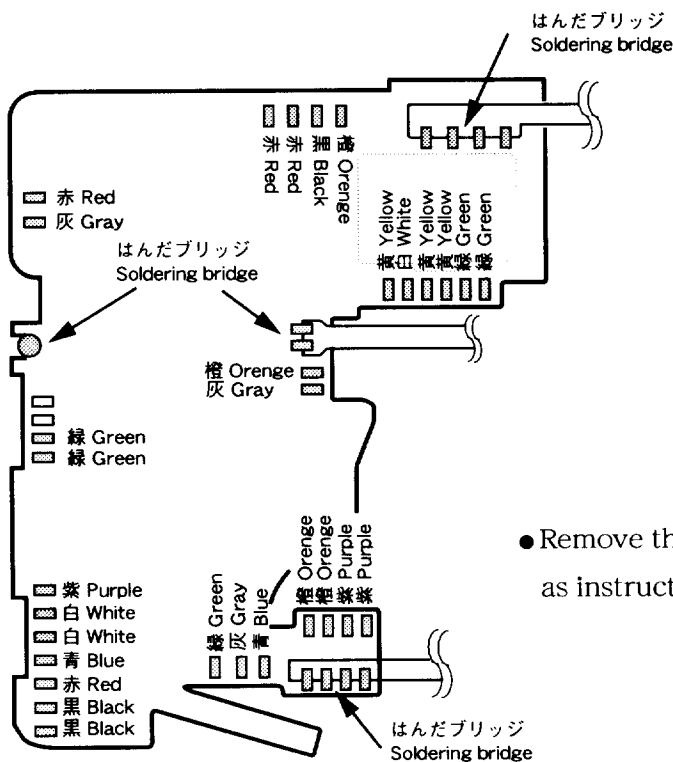


- Push the shaft (#301) from the bottom and remove it from the camera.
- The battery cover (#107) and camera back (#B102) can be removed.

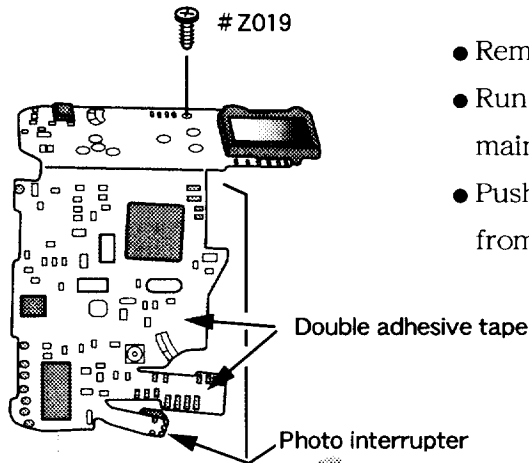
5. Main FPC



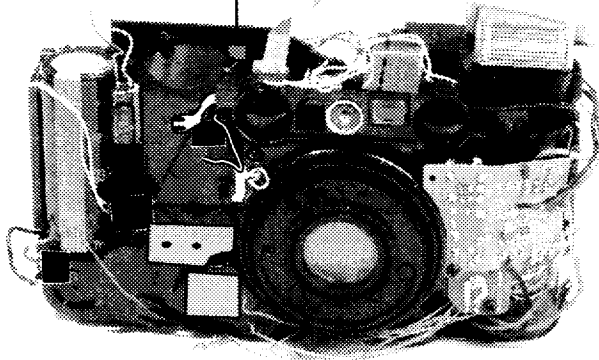
- Lift up the 5 wires colored in blue, white, gray, purple and green and take off the tapes (#295 and #285).



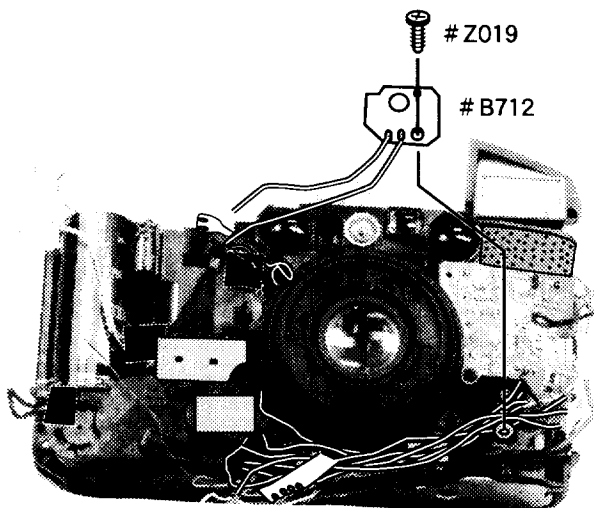
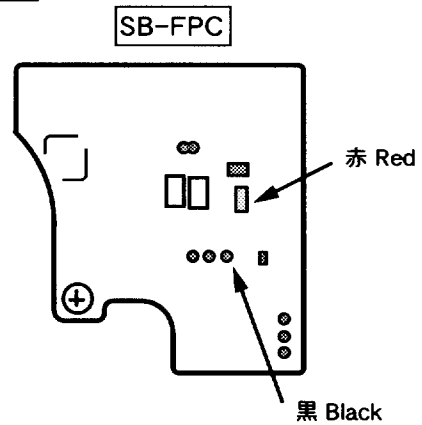
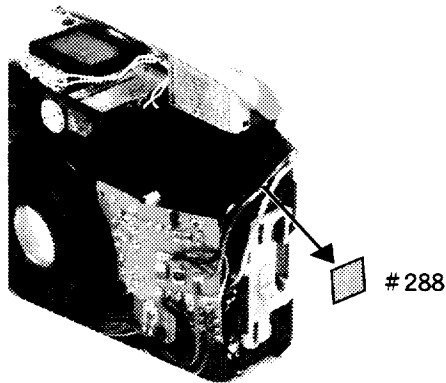
- Remove the solder from the wires and soldering bridges as instructed.



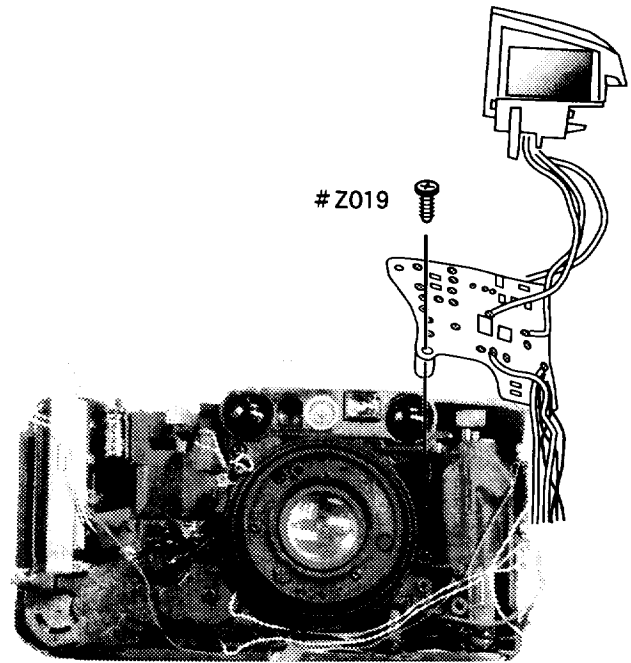
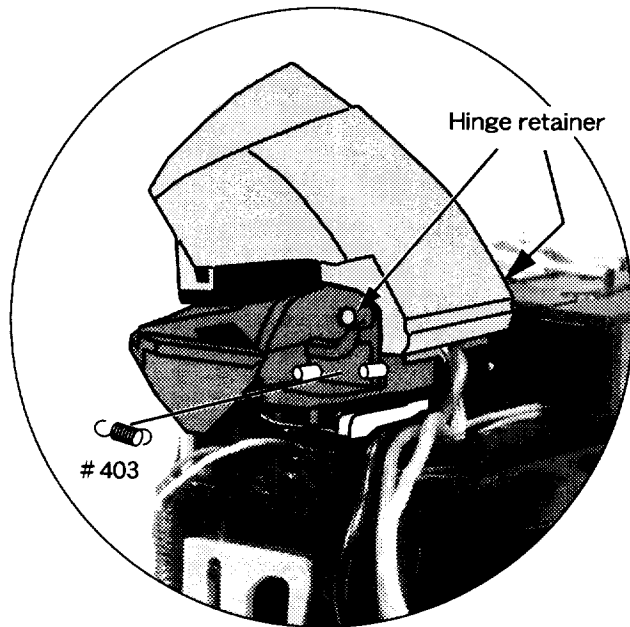
- Remove the screw (#Z019).
- Run alcohol into the double adhesive tape section to remove the main FPC from the camera.
- Push the photo interrupter toward the lens bottom and remove it from the camera.



6. Macro-switch PCB/SB-FPC/Speed light emitting unit

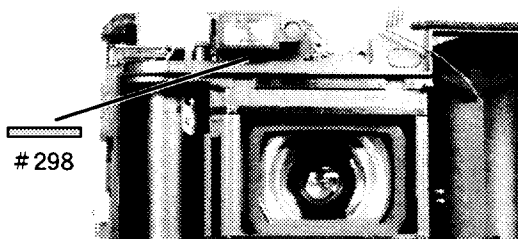
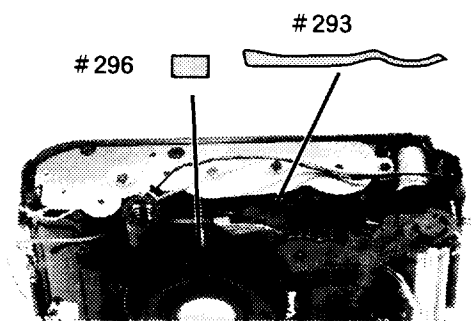
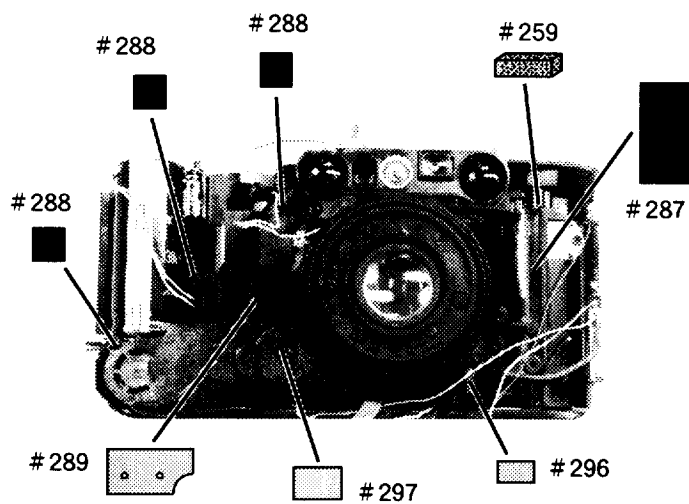


- Take off the tape (#288).
- Remove the solder of the red and black wires from SB-FPC.
- Remove the screw (#Z019).
- Remove the macro-switch PCB (#B712).



- Remove the spring (#403).
- Try to open the hinge retainers at 2 places and remove the light emitting unit.
- Remove the screw (#Z019) and remove SB-FPC and the light emitting unit.

7. Removal of tape and sponge



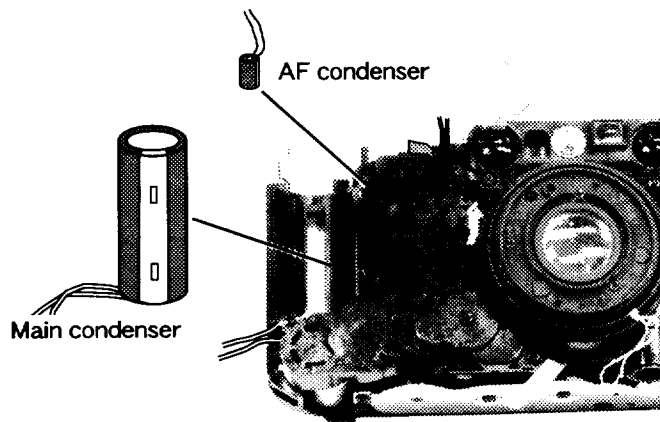
- Take off the sponge (#259).
- Take off the light-shield tapes (#287) and (#288, 3 pcs.).
- Take off the double adhesive tapes (#297), (#289), (#296, 2 pcs.) and (#293).

Note:

Remember the adhesion positions of each tape and sponge.

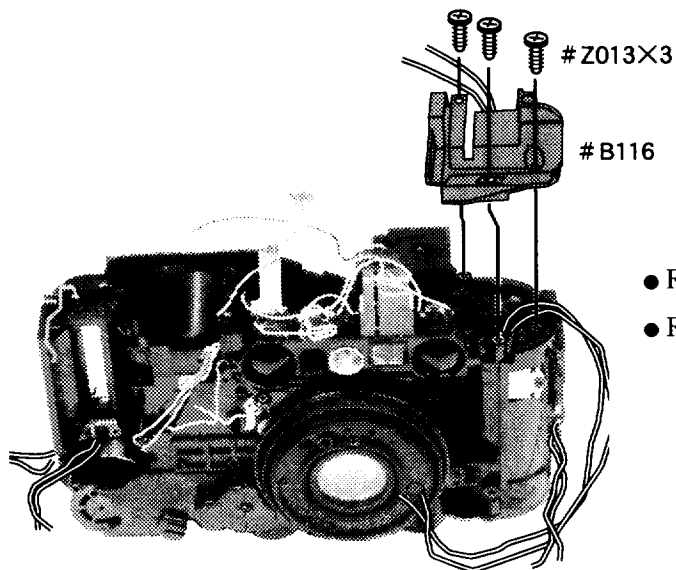


8. Main condenser/AF condenser

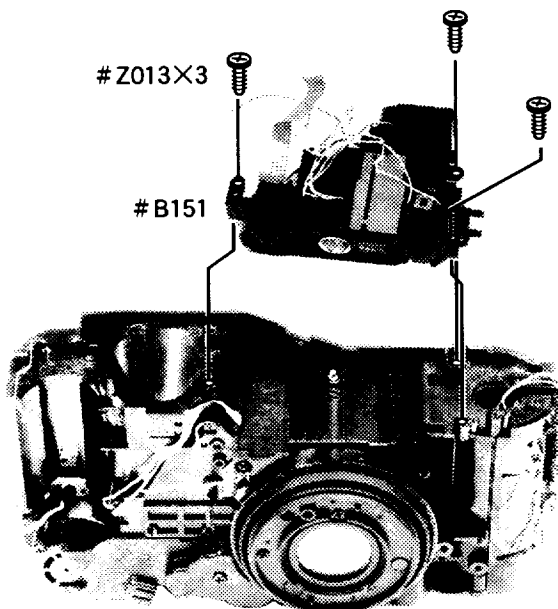


- Remove the AF condenser.
- Remove the main condenser.

9. Speed light frame unit/AF unit

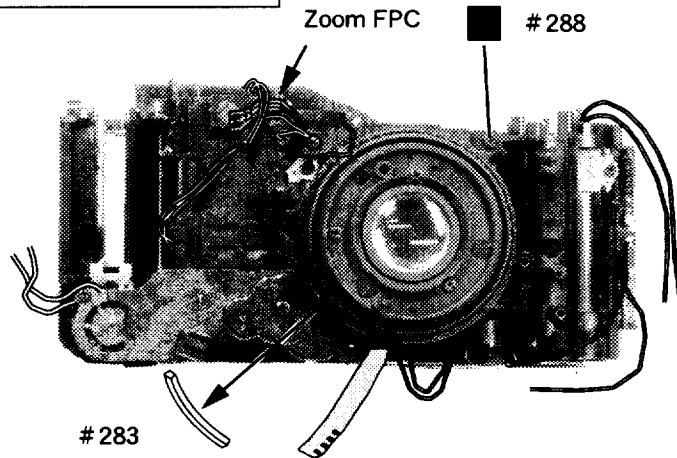


- Remove the 3 screws (#Z013).
- Remove the speed light frame unit (#B116).

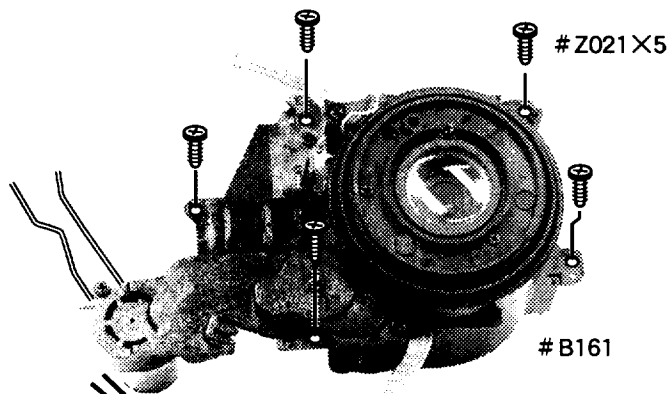


- Remove the 3 screws (#Z013).
- Remove the AF unit (#B151).

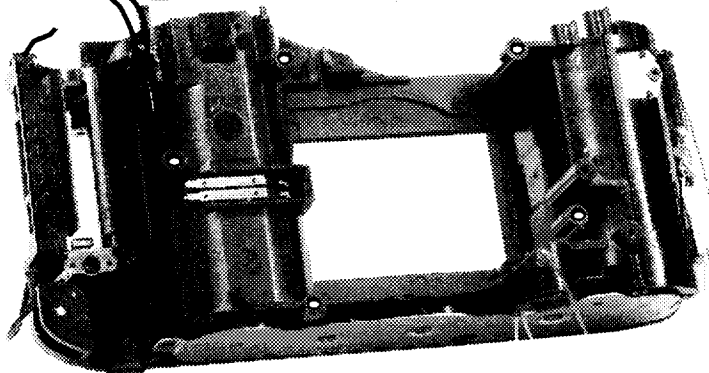
10. Lens barrel unit



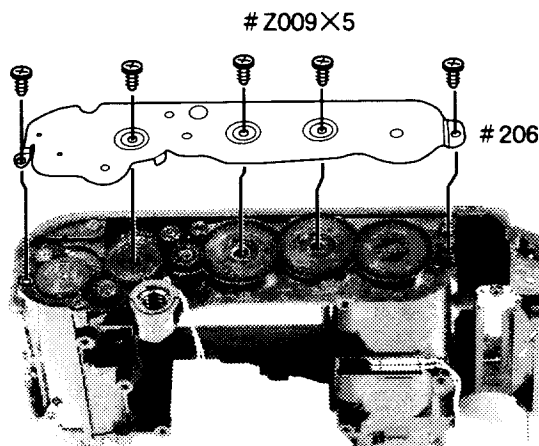
- Take off the sponge (#283).
- Peel off the tape (#288).
- Peel off the Zoom FPC from the body.



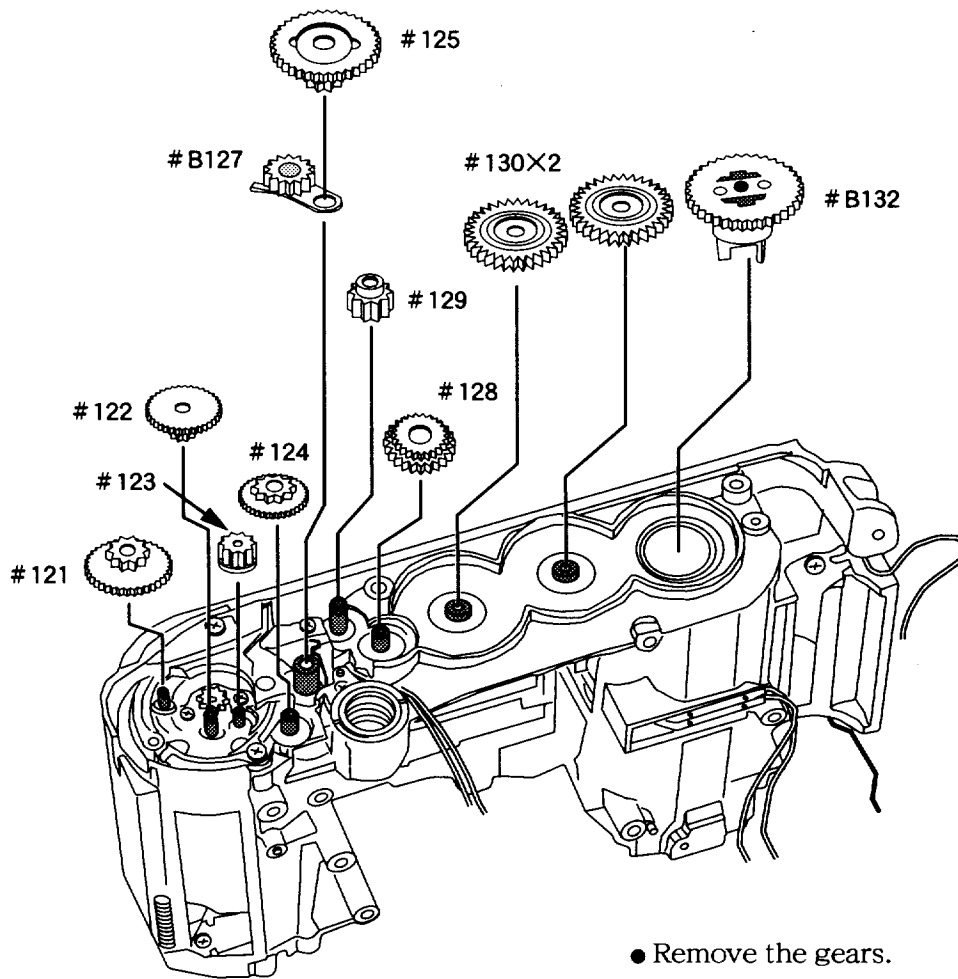
- Remove the 5 screws (#Z021).
- Remove the lens barrel unit (#B161).



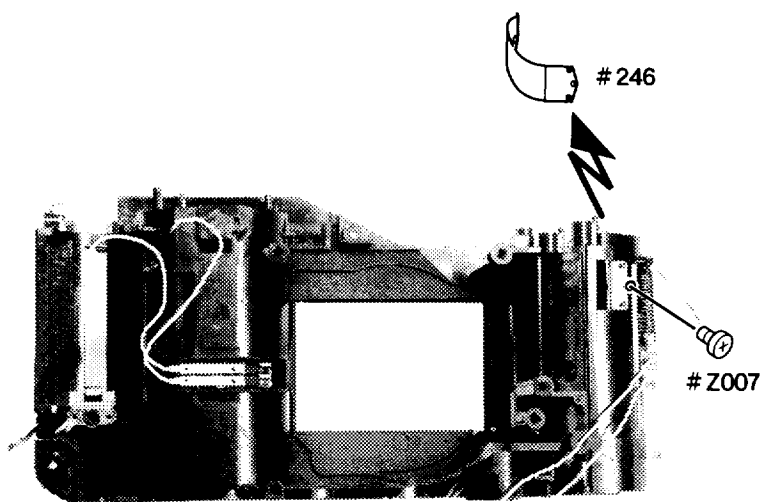
11. Film advance gear



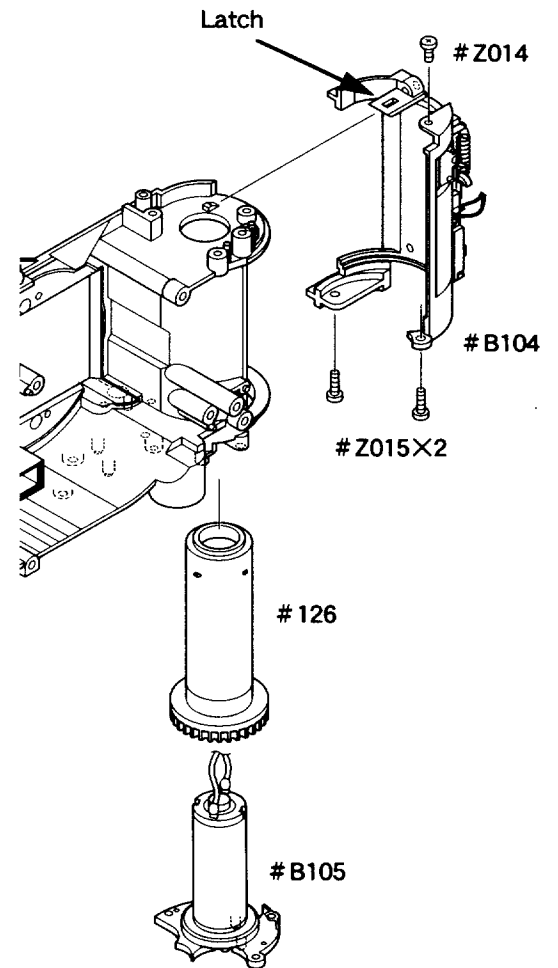
- Remove the 5 screws (#Z009).
- Remove the gear mount (#206).



12. Camera back lock key unit/Film motor unit/Spool

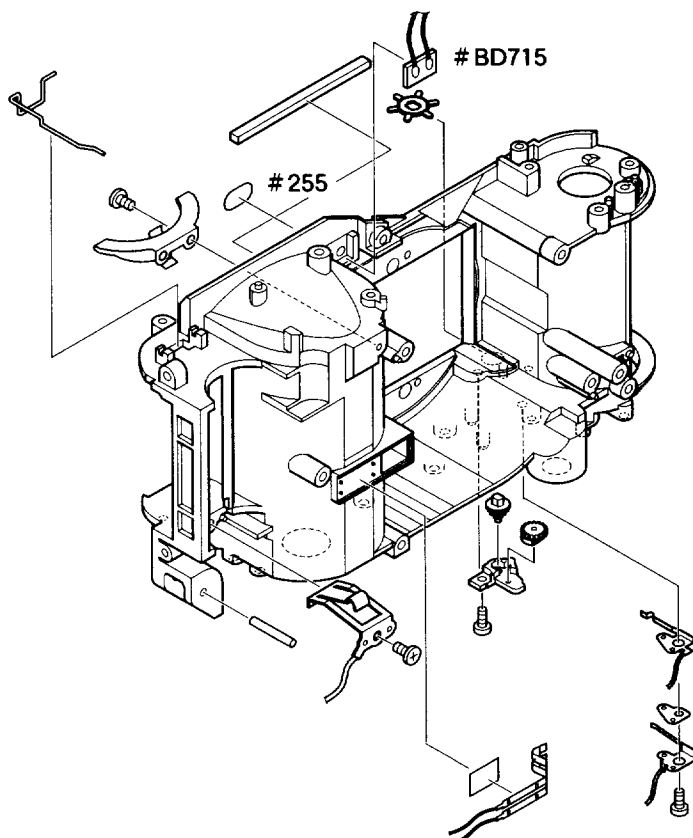


- Remove the screw (#Z007).
- Remove the film retainer (#246).  
(Remove it toward the spool side.)



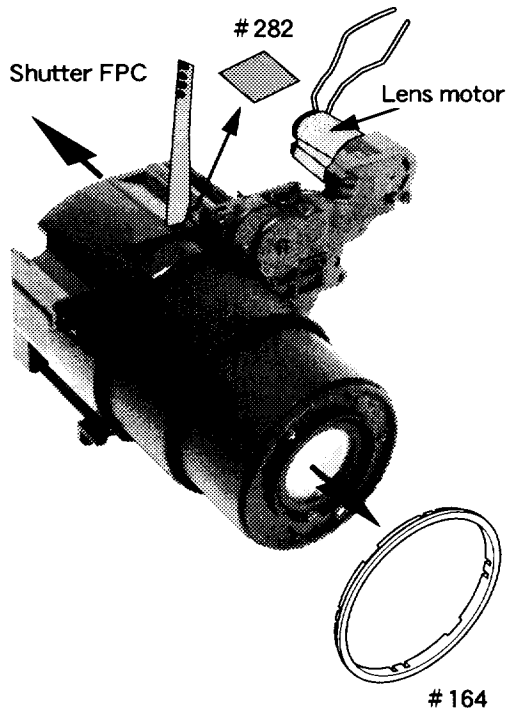
- Remove the 2 screws (#Z015).
- Remove the screw (#Z014).
- Lift up the latch and remove the camera back lock key unit (#B104).
- Remove the film motor unit (#B105).
- Remove the spool (#126).

13. Other parts

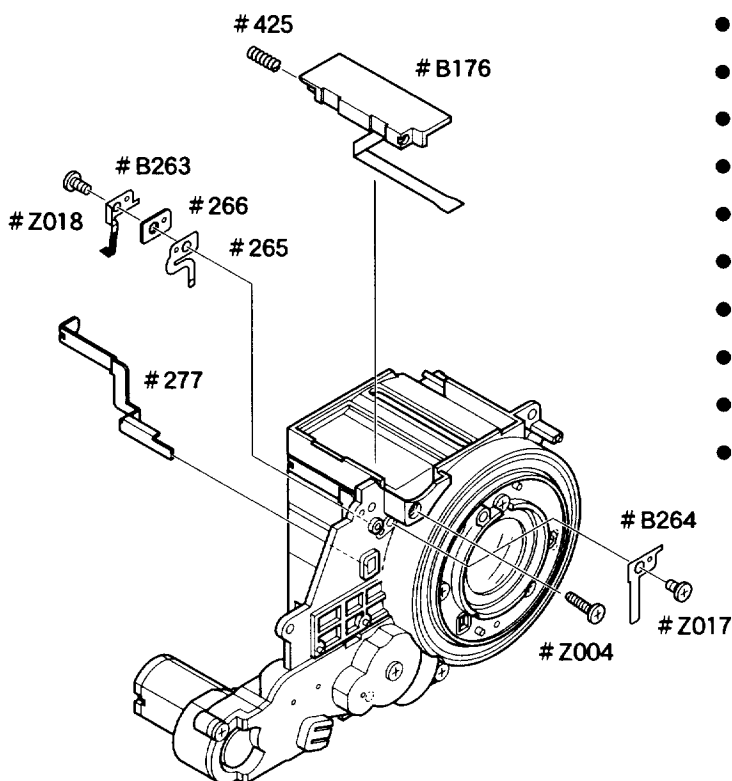


- The QD PCB (#BD715) is used only for the QD type body.
- The cover (#255) is used only for the normal body.

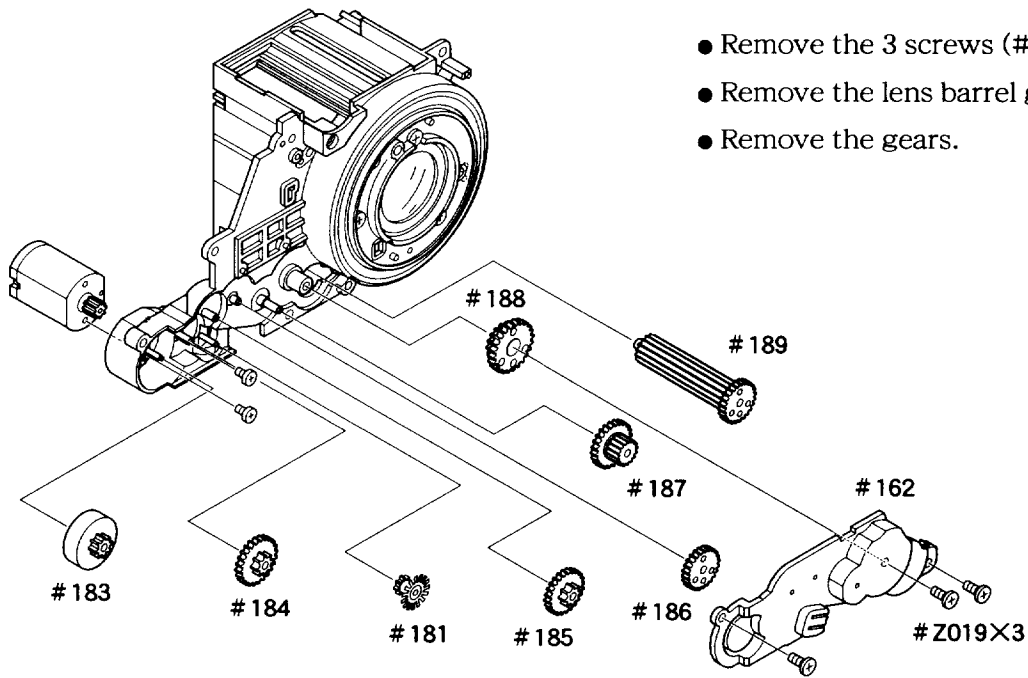
## 14. Lens barrel unit



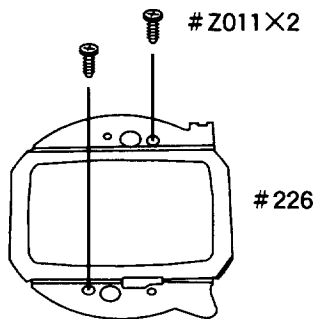
- Operate the lens motor with the battery and set the lens barrel to the Tele side. (White wire for positive side and blue wire for negative side)
- Peel off the tape (#282).
- Remove the shutter FPC toward the inside of the fixing ring.
- Remove the lens barrel ring (#164).
- Operate the lens motor with the battery and set the lens barrel to the Wide side. (White wire for negative side and blue wire for positive side)



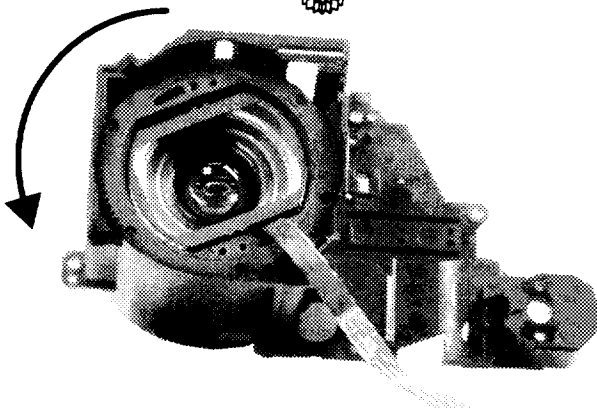
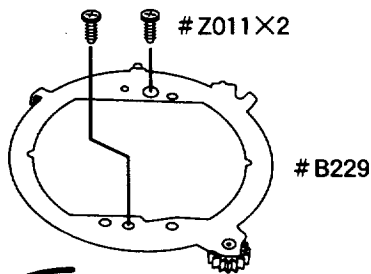
- Remove the screw (#Z017).
- Remove the contact blade (#B264).
- Remove the screw (#Z018).
- Remove the contact blade (#B263).
- Remove the insulating sheet (#266).
- Remove the spring (#265).
- Remove the slide lock lever (#277).
- Remove the screw (#Z004).
- Remove the zoom FPC plate (#B176).
- The spring (#425) can be removed.

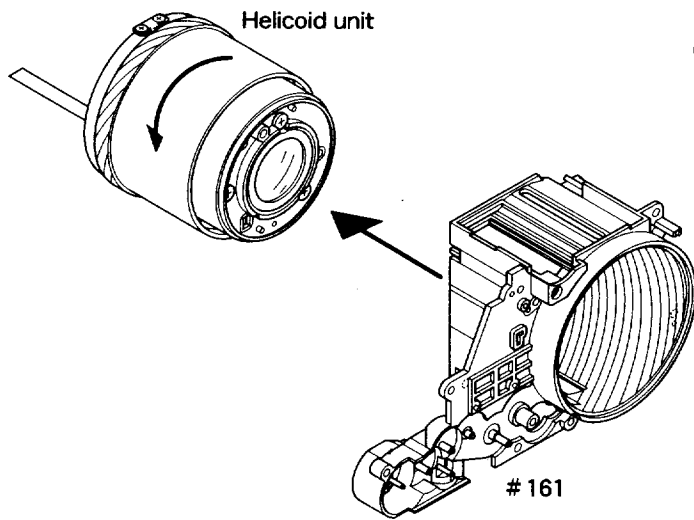


- Remove the 3 screws (#Z019).
- Remove the lens barrel gear mount (#162).
- Remove the gears.

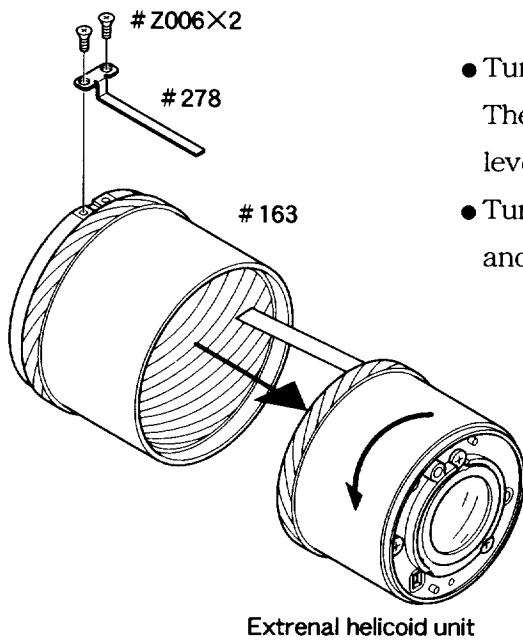


- Remove the 2 screws (#Z011).
- Remove the light baffle plate (#226).
- Remove the zoom brush (#239).
- Remove the 2 screws (#Z011).
- As turning the internal helicoid counterclockwise a little, remove the light baffle plate assembly (#B229).

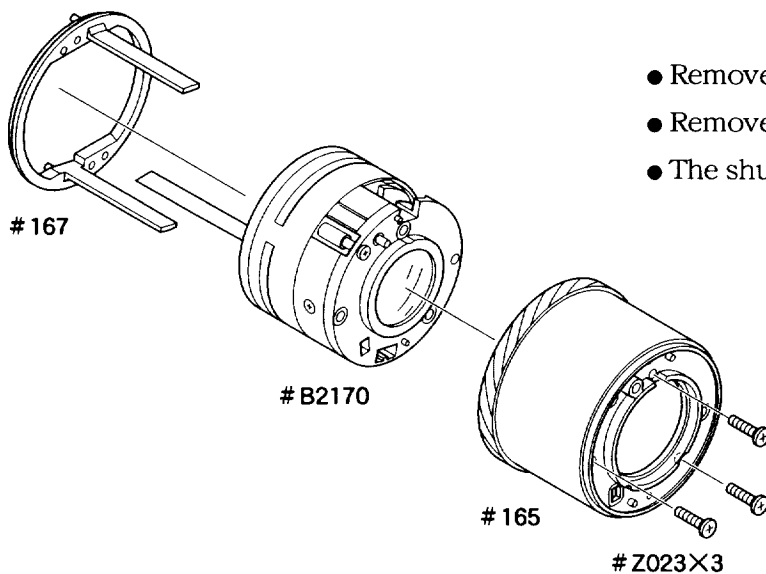




- Turn the helicoid unit counterclockwise and remove it from the fixing ring (#161).



- Turn the external helicoid unit counterclockwise till it stops. Then, remove the 2 screws (#Z006) and remove the zoom cam lever (#278).
- Turn the external helicoid unit counterclockwise furthermore, and the intrnal helicoid unit can be removed.



- Remove the straight key (#167).
- Remove the 3 screws (#Z023).
- The shutter unit (#B2170) can be removed.

## Assembling and Adjustment

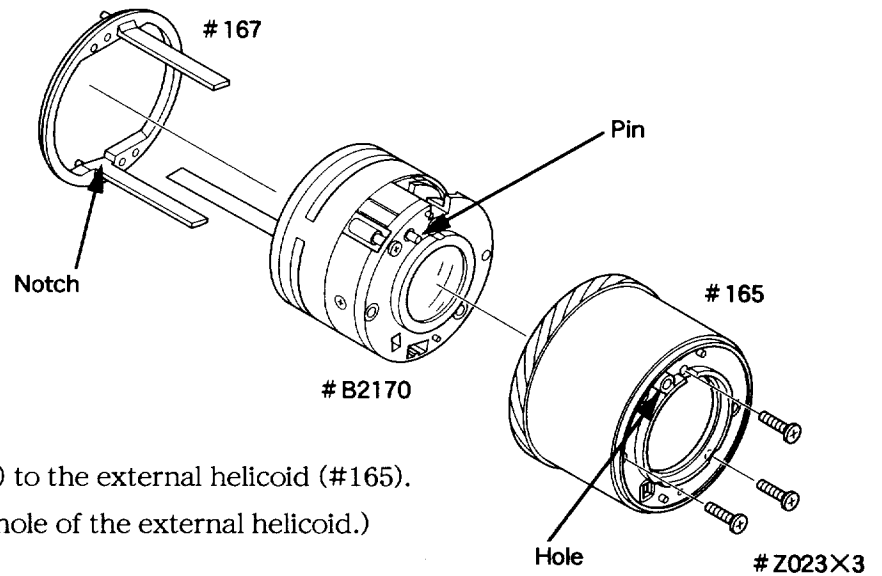
1.	Lens barrel unit .....	A 1 ~ A 5
2.	Body and other parts .....	A 5
3.	Camera back lock key unit/Film motor unit/Spool .....	A 6
4.	Film advance gear .....	A 7
5.	Lens barrel unit .....	A 8
6.	Speed light frame unit/AF unit .....	A 9
7.	Main condenser/AF condenser .....	A 9
8.	Adhesion of tapes and sponge .....	A 1 0
9.	Macro-switch PCB/SB-FPC/Speed light emitting unit .....	A 1 1 ~ A 1 2
10.	Main FPC .....	A 1 3
	1) Wire arrangement on the top of the camera (Part 1) .....	A 1 3
	2) Mounting and soldering of main FPC .....	A 1 3
	3) Wire arrangement on the bottom of the camera .....	A 1 4
	4) Wire arrangement on the top of the camera (Part 2) .....	A 1 5
	5) Wire arrangement on the front of the camera .....	A 1 5
11.	AE adjustment .....	A 1 6
12.	Lens back adjustment .....	A 1 7 ~ A 1 9
13.	Camera back .....	A 2 0
14.	Rear cover/Front cover .....	A 2 0
15.	Slide cover/Lens name plate .....	A 2 1
16.	AF adjustment / inspection .....	A 2 2 ~ A 2 3



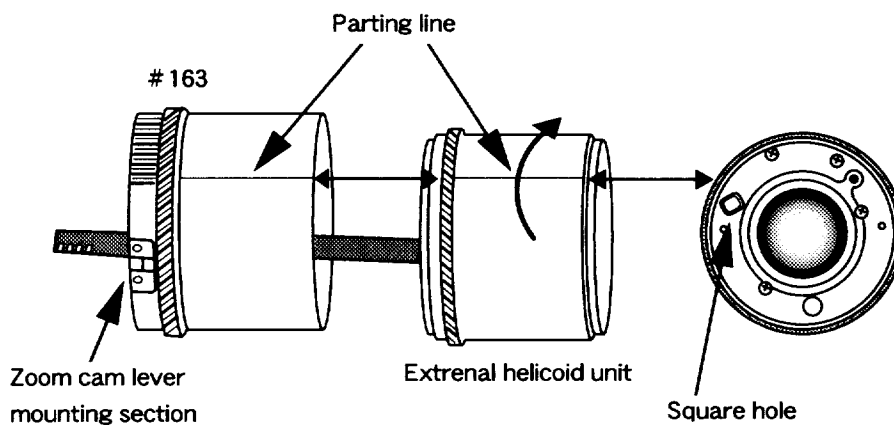
## Assembly/Adjustment

### 1. Assembly

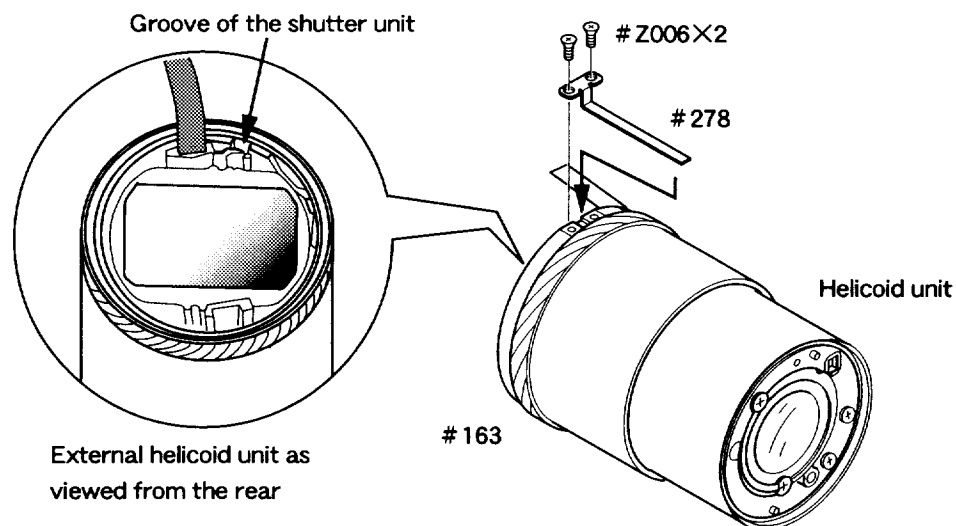
#### 1. Lens barrel unit



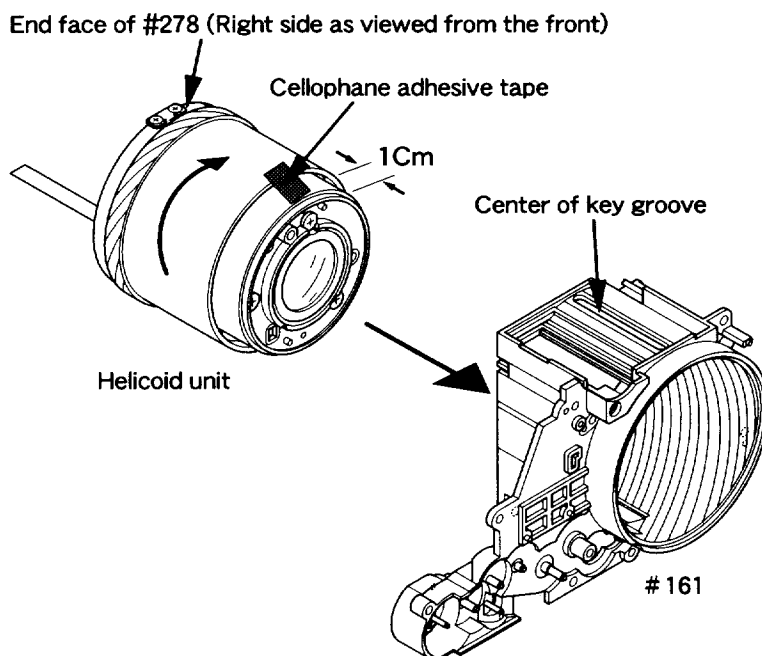
- Mount the shutter unit (#B2170) to the external helicoid (#165).  
(Fit the pin of the shutter to the hole of the external helicoid.)
- Attach the 3 screws (#Z023).
- Mount the straight key (#167). (Set the notch on the FPC side.)



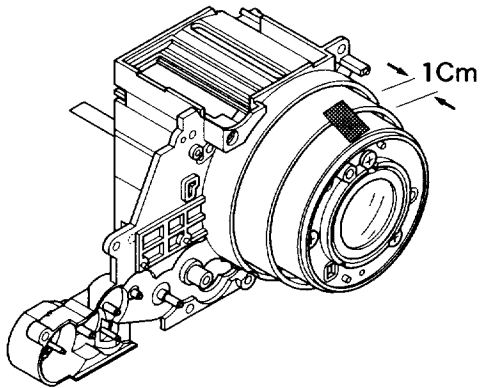
- Mount the external helicoid (#165) to the internal helicoid (#163) in the above illustrated position and turn the external helicoid unit clockwise.
- After mounting, make sure that the external helicoid rotates lightly.
- Turn the external helicoid (#165) counterclockwise till it is about to come off from the internal helicoid (#163).
- Under the above condition, slide the straight key (#167) to behind the lens barrel.



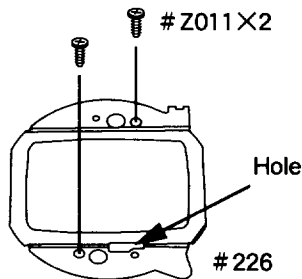
- Hold the straight key (#167) is being held behind the lens barrel, insert the top end of the zoom cam lever (#278) into the mounting section of the internal helicoid (#163).
- At this time, put the top end of the zoom cam lever (#278) into “groove of the shutter unit” .
- Attach the 2 screws (#Z006).
- After attaching, make sure that the helicoid rotates lightly.



- Take out the external helicoid unit from the top end of the internal helicoid by approx. 1cm and adhere a cellophane adhesive tape.
- Under the above condition, mount the helicoid unit to the fixing ring (#161) in the above illustrated position and turn the helicoid unit clockwise.



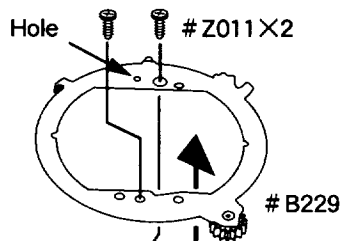
- Turn the internal helicoid till it comes out from the top end of the fixing ring by approx. 1cm.



- Mount the light baffle plate assembly (#B229) to the lens barrel unit as illustrated in the left. The pin of the straight key (#167) is put into the hole of the light baffle plate assembly (#B229).



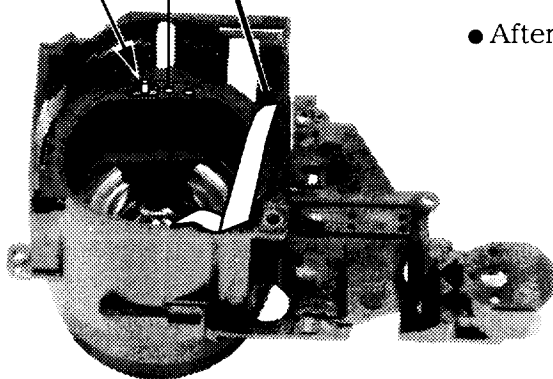
- Attach the screw (#Z011).
- Mount the zoom brush (#239).
- Mount the light baffle plate (#226).
- Attach the screw (#Z011).



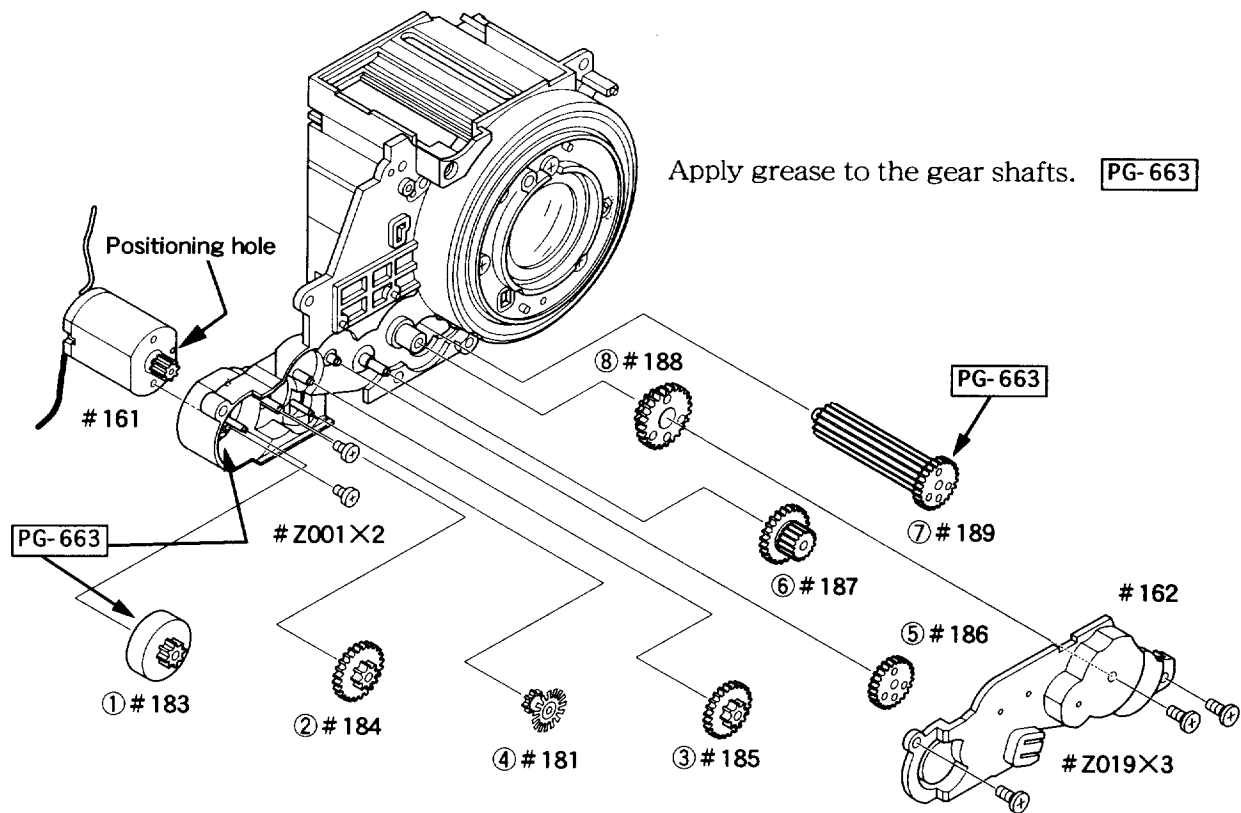
**Note:**

ZOOM FPC should pass through the inside of the light baffle plate assembly (# B229) and the hole of the light baffle plate (# 226).

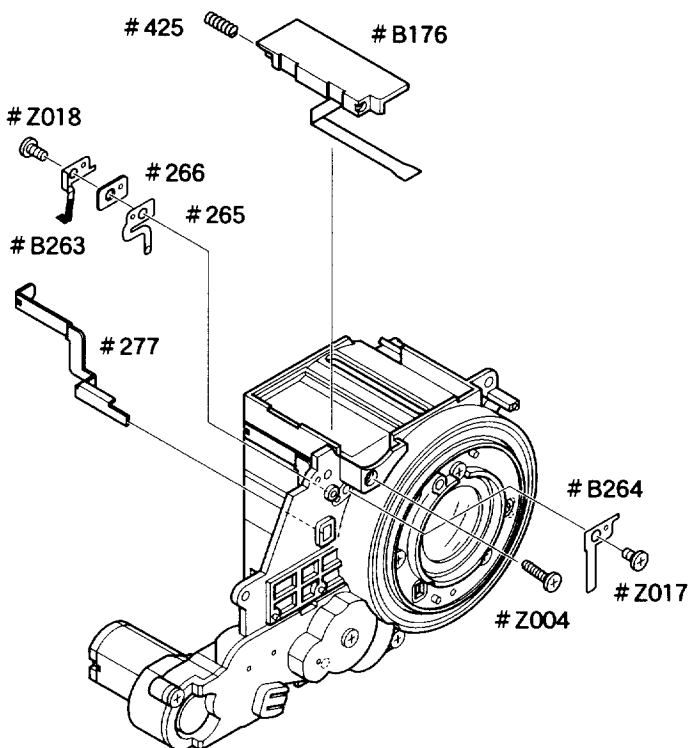
Pin of #167



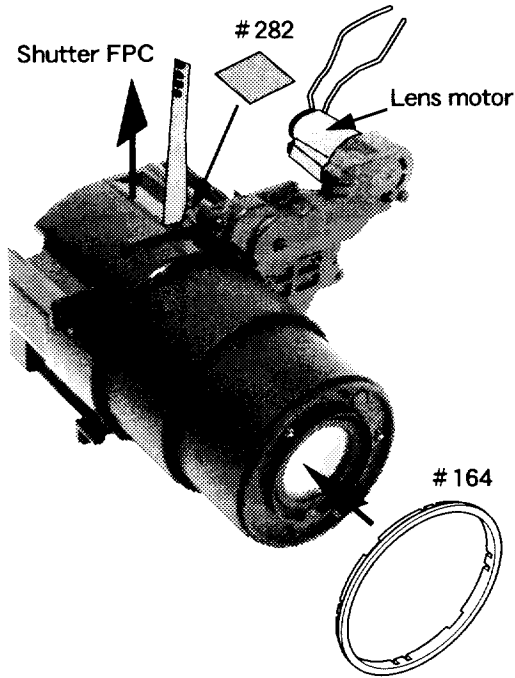
- Take off the cellophane adhesive tape which was adhered in Page A2.
- After mounting, make sure that the helicoid rotates lightly.



- Mount the zoom motor (#161).
- Attach the 2 screws (#Z001).
- Mount the gears. (① ~ ⑧ show the order for mounting.)
- Set the lens barrel gear mount (#162).
- Attach the 3 screws (#Z019).

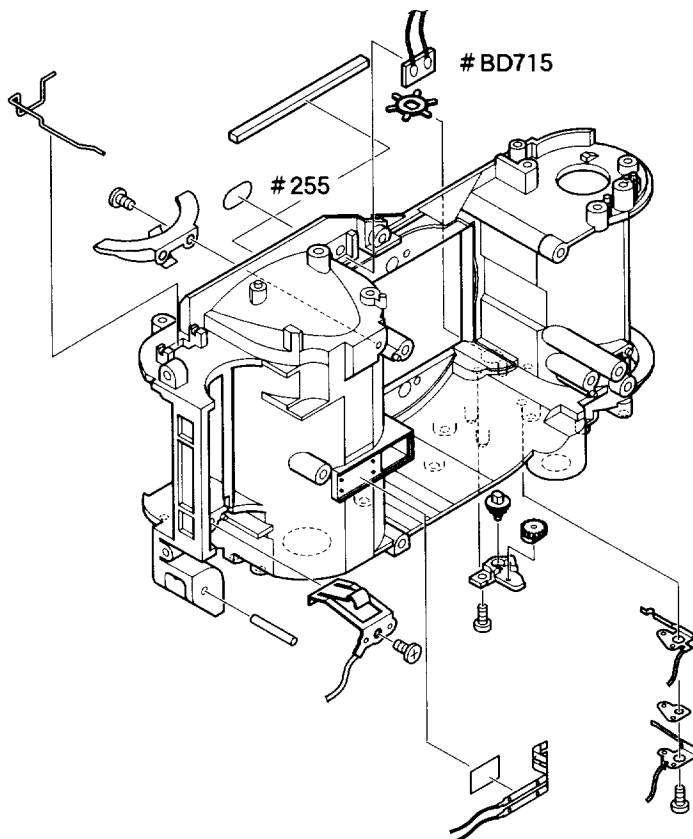


- Mount the spring (#425) to the pin of the zoom FPC plate (#B176) and then mount the zoom FPC plate to the helicoid unit.
- Attach the screw (#Z004). After tightening the screw, return it by 1 turn.
- Mount the slide lock lever (#277).
- Mount the spring (#265).
- Mount the insulating sheet (#266).
- Mount the contact blade (#B263).
- Attach the screw (#Z018).
- Mount the contact blade (#B264).
- Attach the screw (#Z017).



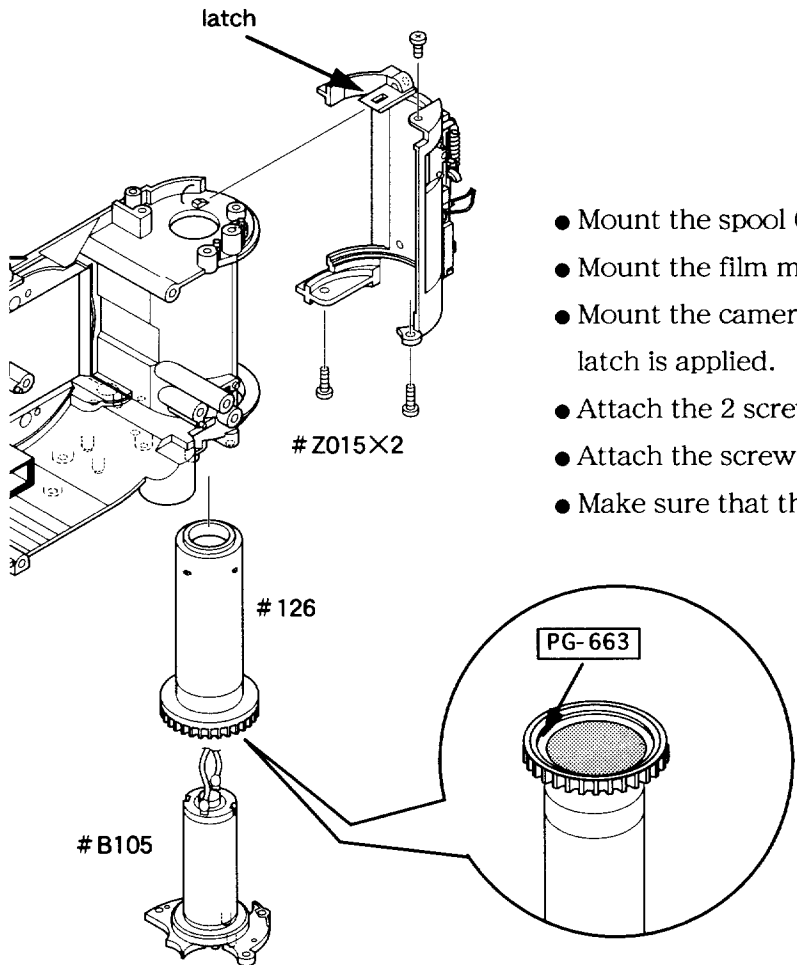
- Operate the lens motor with the battery and set the lens barrel to the Tele side. (Blue wire for negative side and white wire for positive side)
- Remove the shutter FPC toward the outside of the fixing ring.
- Fix the shutter FPC with the tape (#282).
- Mount the lens barrel ring (#164).
- Operate the lens motor with the battery and make sure that the lens barrel operates normally.
- Operate the lens motor with the battery and set the lens barrel to the reset position. (White wire for negative side and blue wire for positive side)

2. Body and other parts

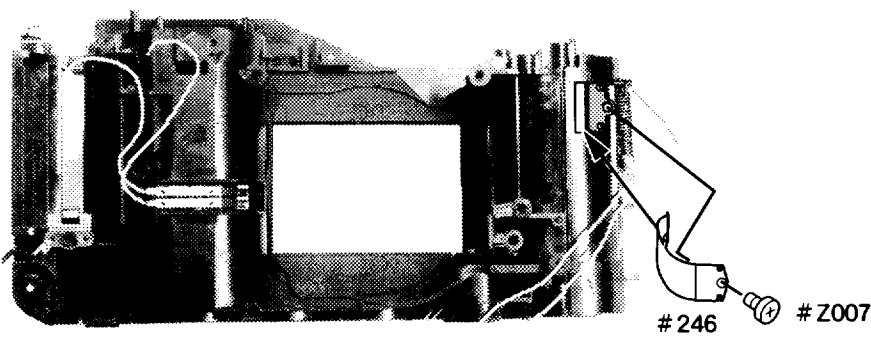


- The QD PCB (#BD715) is used only for the QD type body.
- The cover (#255) is used only for the normal body.

3. Camera back lock key unit/Film motor unit/Spool

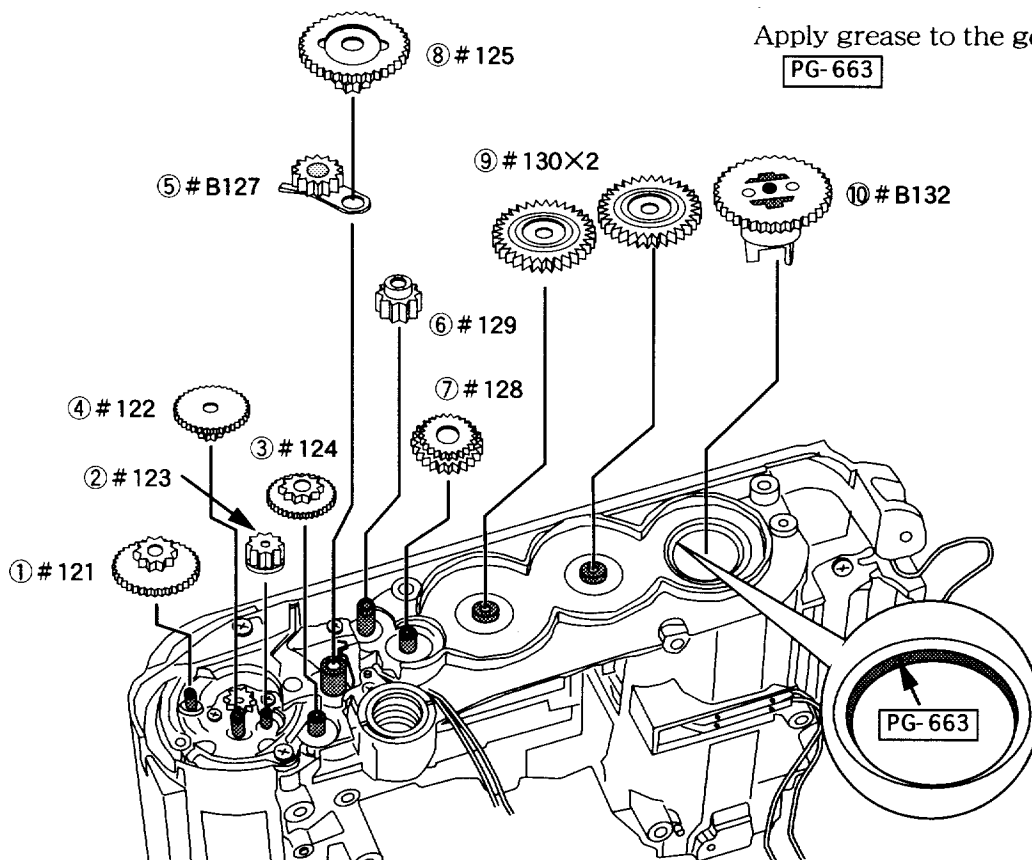


- Mount the spool (#126).
- Mount the film motor unit (#B105).
- Mount the camera back lock key unit (#B104) till the latch is applied.
- Attach the 2 screws (#Z015).
- Attach the screw (#Z014).
- Make sure that the spool rotates lightly.

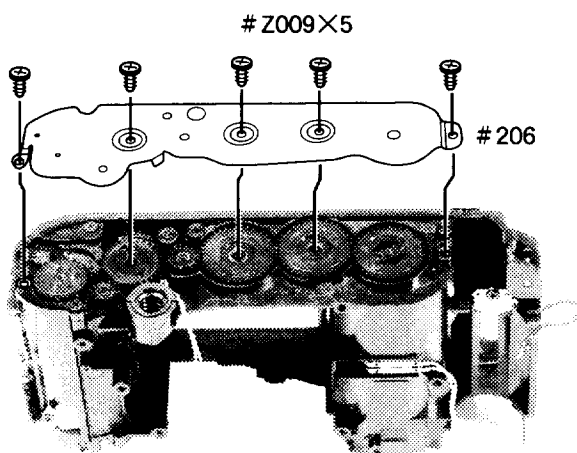


- Mount the film retainer (#246).
- Attach the screw (#Z007).

4. Film advance gear

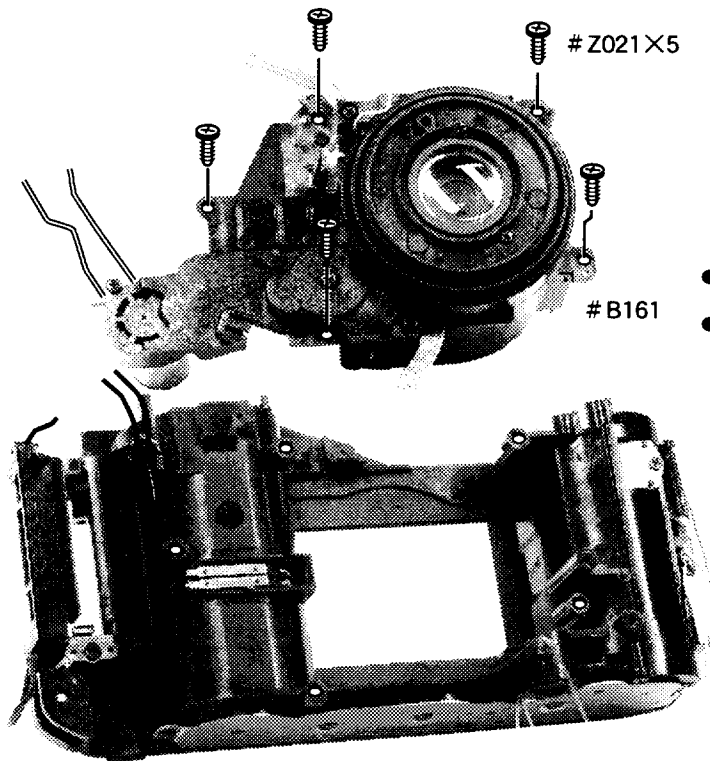


- Mount the gears. (① ~ ⑩ show the order for mounting.)

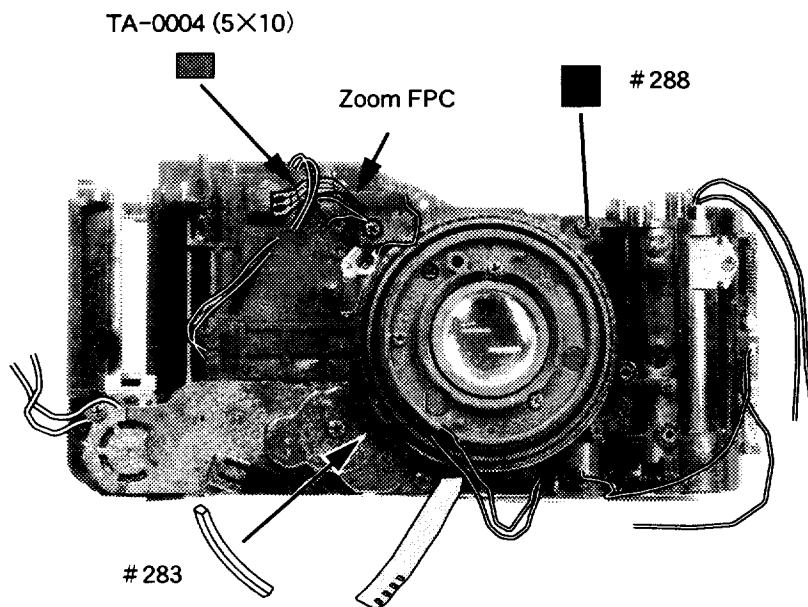


- Set the gear mount (#206).
- Attach the 5 screws (#Z009).

5. Lens barrel unit



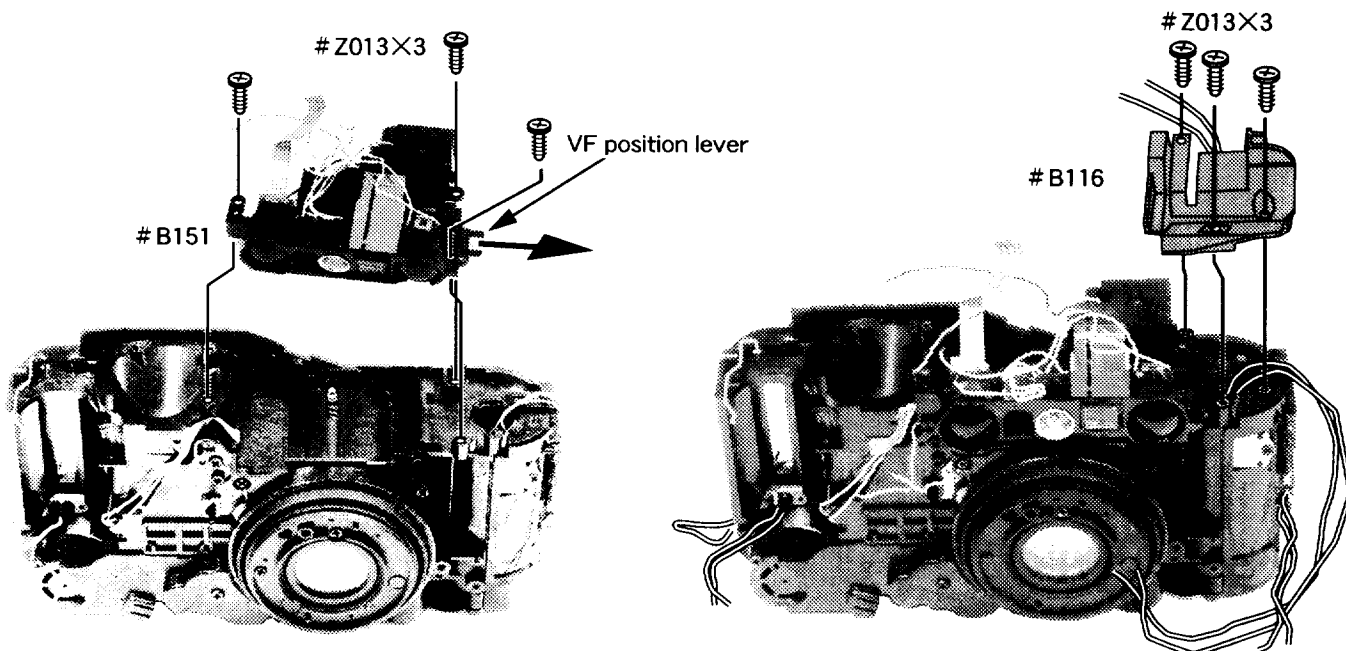
- Mount the lens barrel unit (#B161).
- Attach the 5 screws (#Z021).



- Mount the sponge (#283).
- Adhere the tape (#288).
- Mount the Zoom FPC to the body with the double adhesive tape.

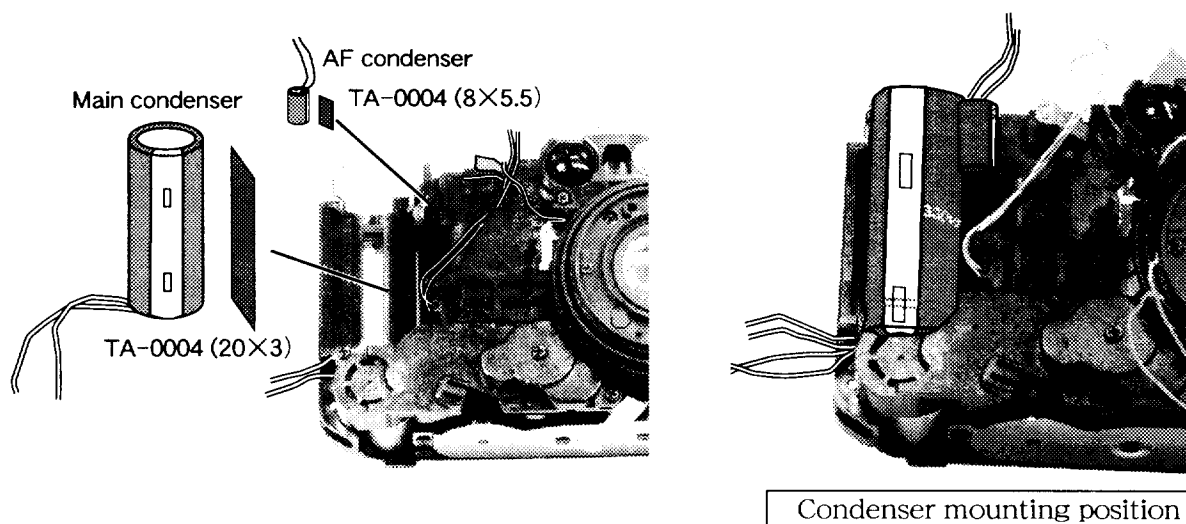


6. Speed light frame unit/AF unit



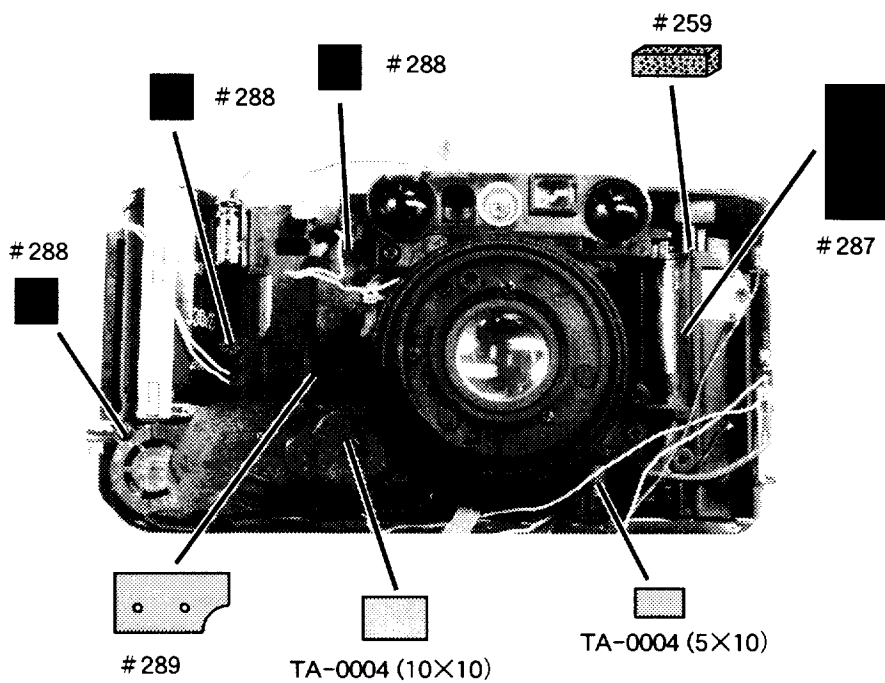
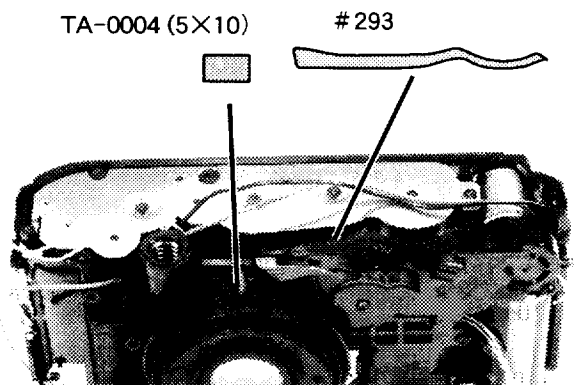
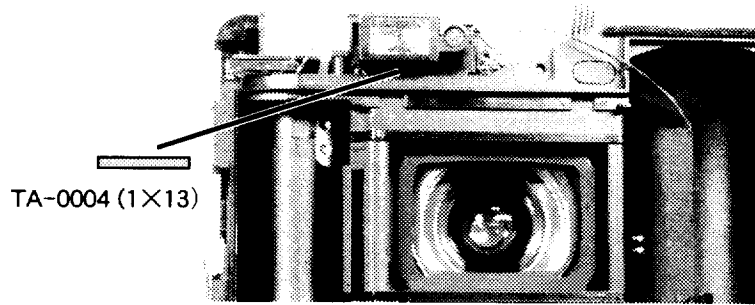
- Move the VF position lever in the arrow mark direction. (The finder is set to Wide.)
- Mount the AF unit (#B151).
- Attach the 3 screws (#Z013).
- Mount the speed light frame unit (#B116).
- Attach the 3 screws (#Z013).

7. Main condenser/AF condenser



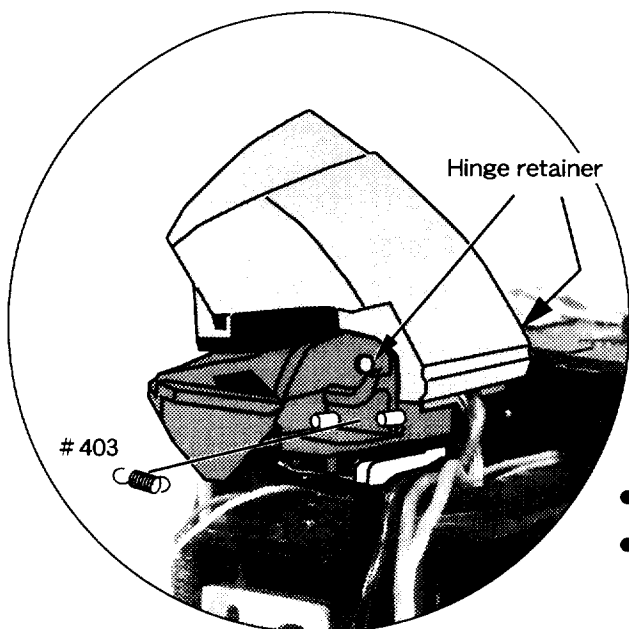
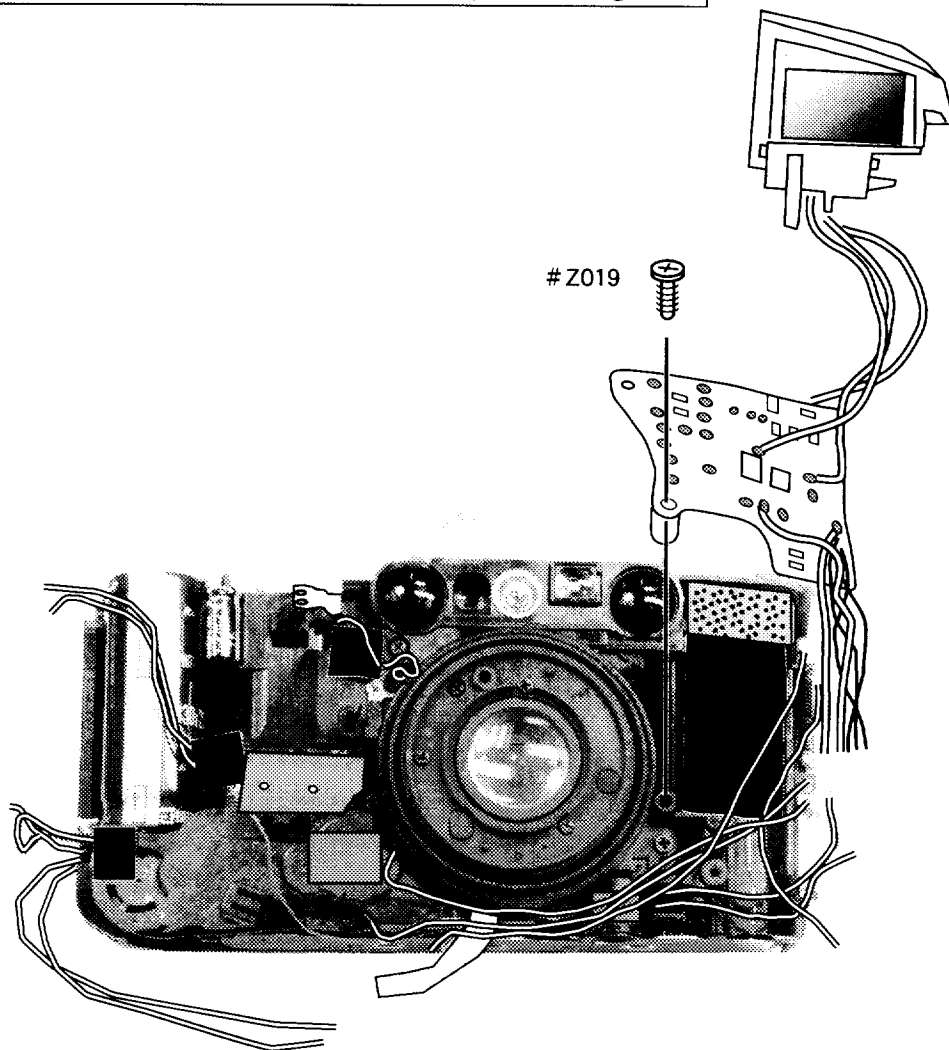
- Mount the main condenser to the camera with the double adhesive tape.
- Mount the AF condenser to the camera with the double adhesive tape.

8. Adhesion of tapes and sponge

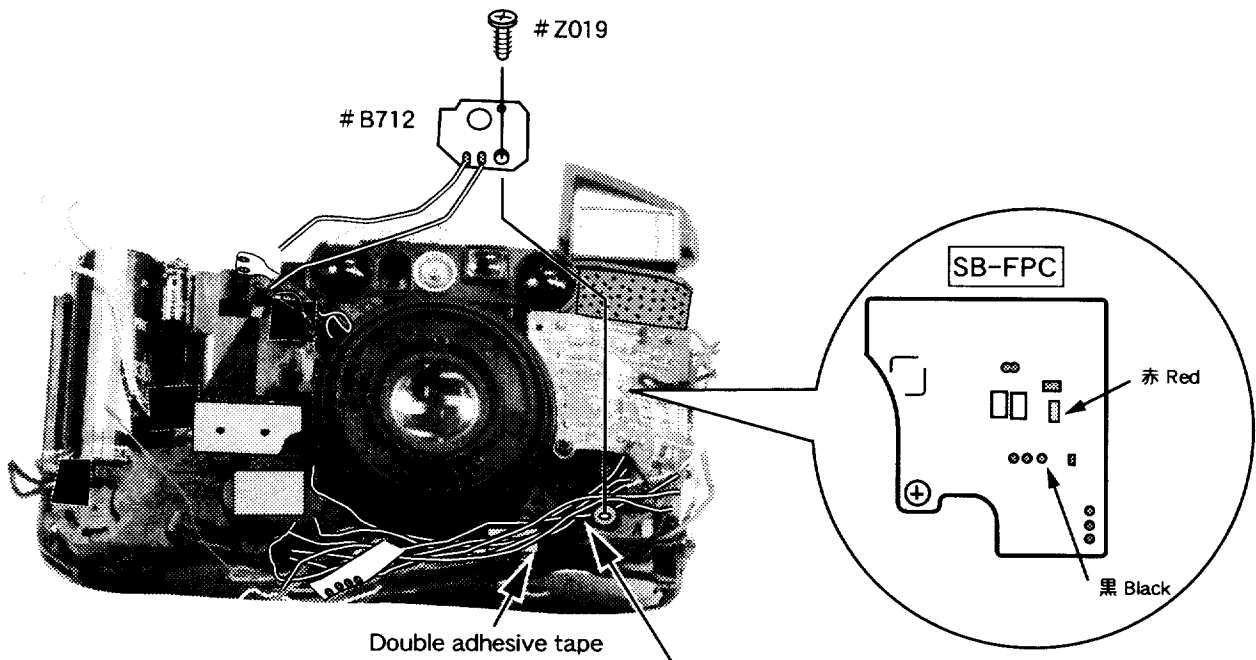
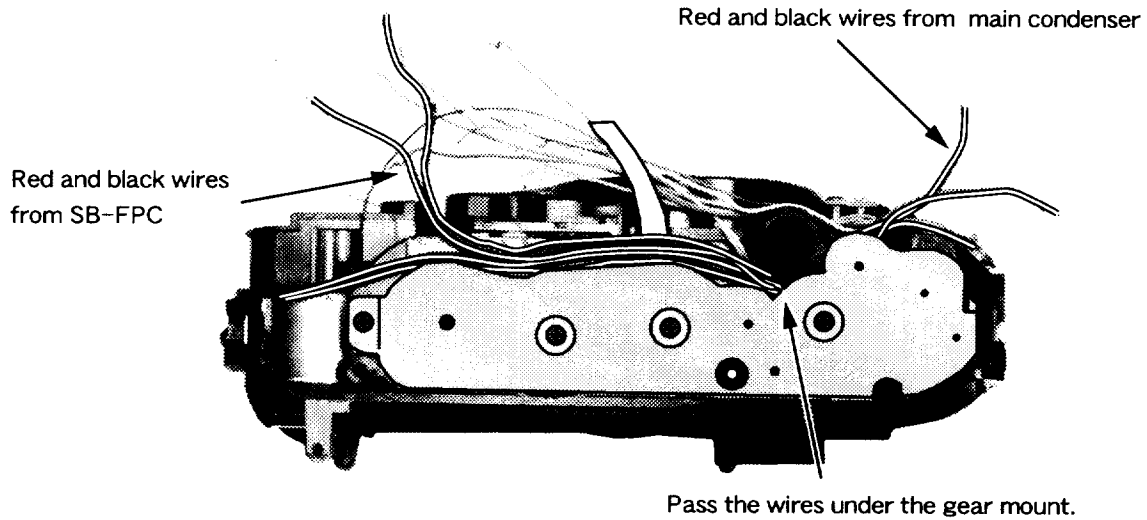


- Clean the surfaces to which the sponge (#259), light-shield tapes and double adhesive tapes will be adhered with alcohol.
- Adhere the sponge (#259), light-shield tapes and double adhesive tapes to the camera.

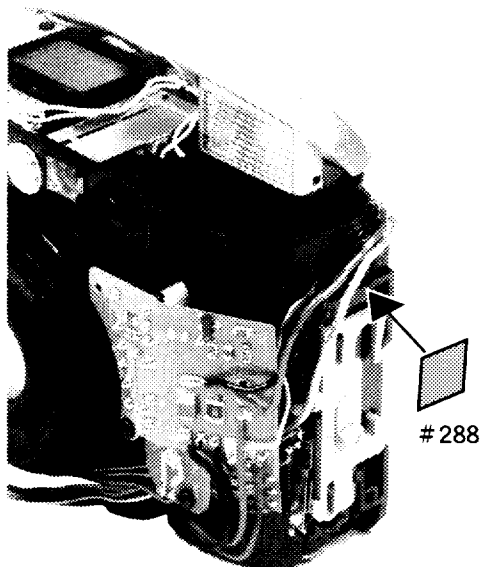
9. Macro-switch PCB/SB-FPC/Speed light emitting unit



- Mount SB-FPC to the camera with the screw (#Z019).
- Try to open the hinge retainers at 2 places and mount the light emitting unit.
- Mount the spring (#403).



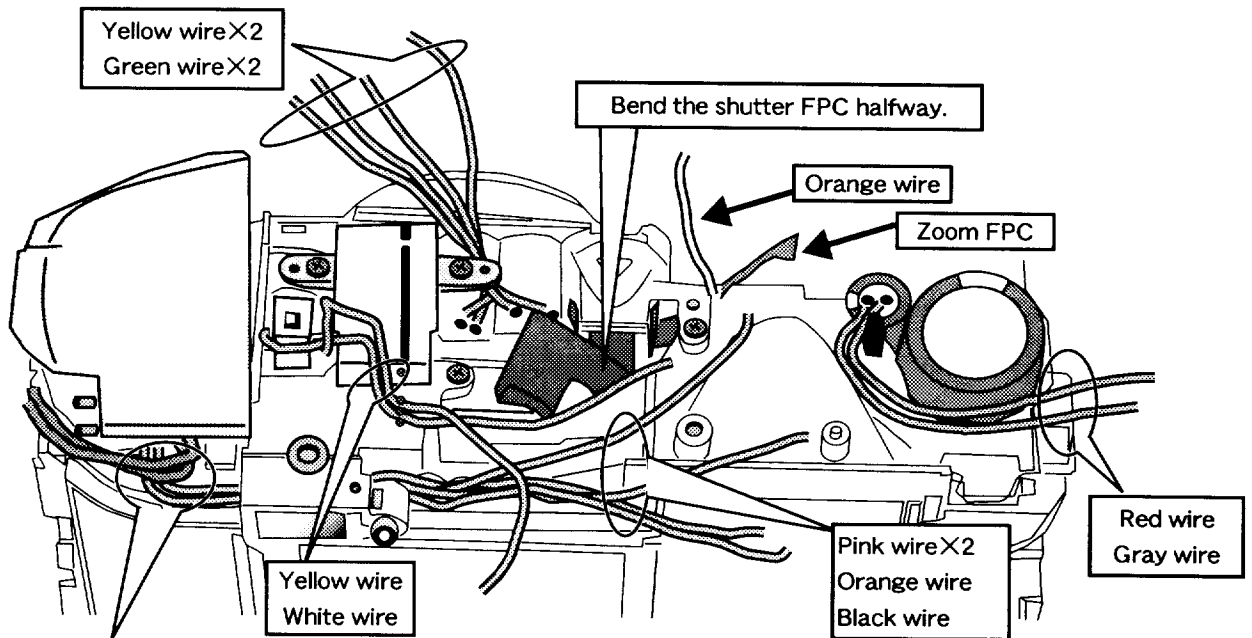
Put the wires (3 purple wires and white, green, blue and gray wires) into the lens side of the macro-switch PCB mounting pole and hold them with the double adhesive tape.



- Arrange the 4 red and black wires connected to the main condenser and SB-FPC.
- Mount the macro-switch PCB (#B712) with the screw (#Z019).
- Solder the red and black wires to SB-FPC.
- Adhere the tape (#288).

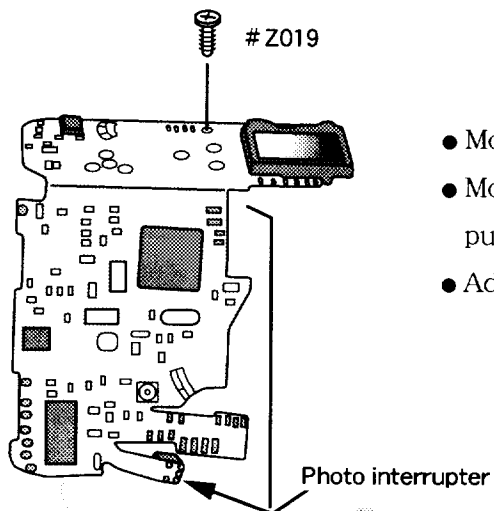
10. Main FPC

① Wire arrangement on the top of the camera (Part 1)

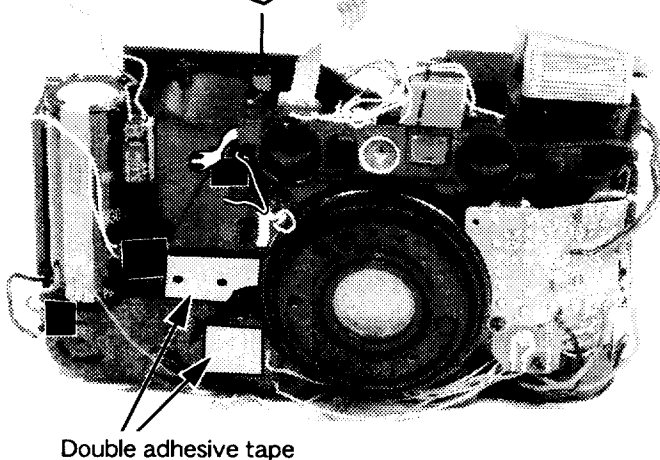


Arrange the 2 pink wires, orange wire and black wire as illustrated above.  
The pop-up operation of the speed light emitting unit must be done smoothly.

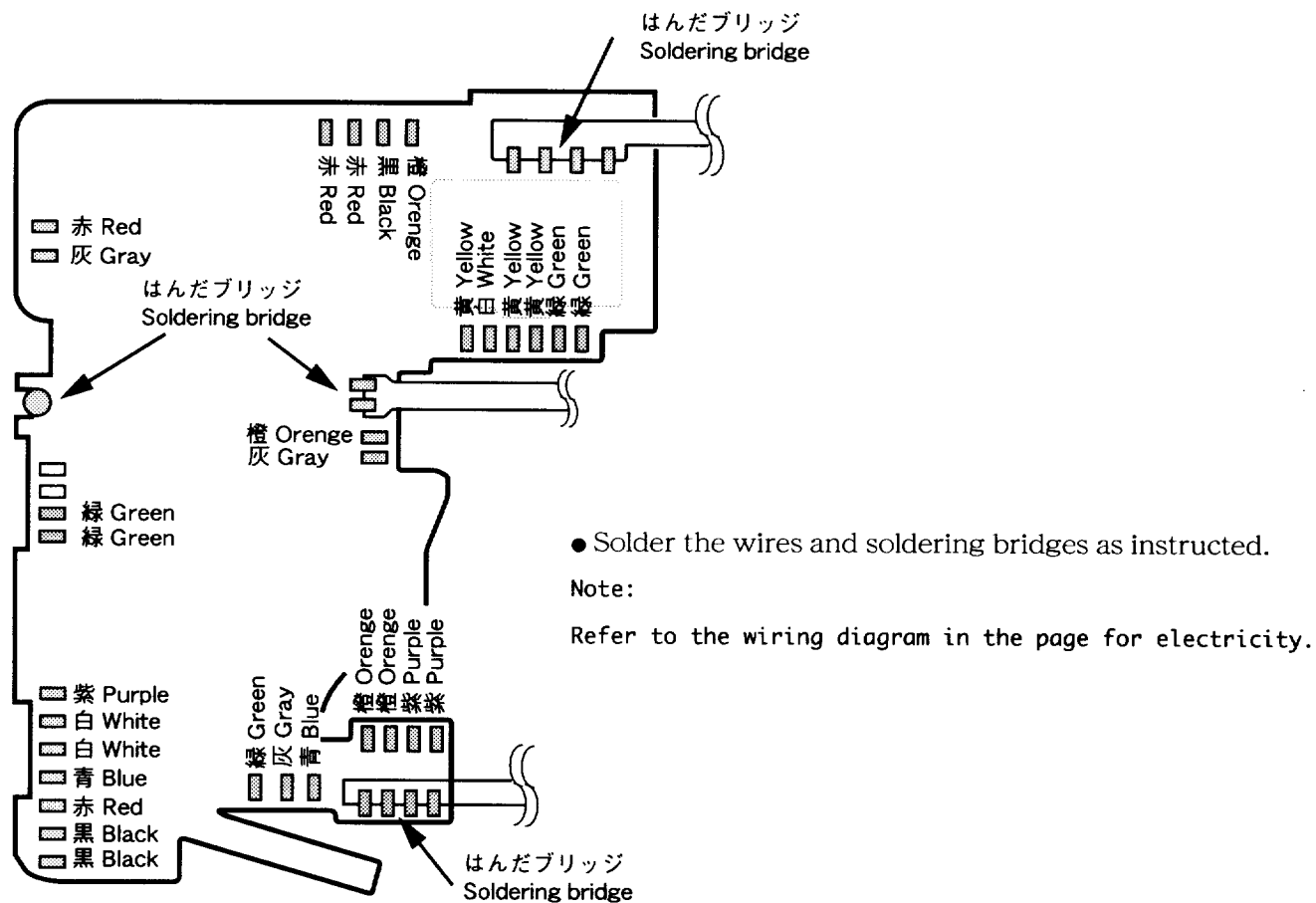
② Mounting and soldering of main FPC



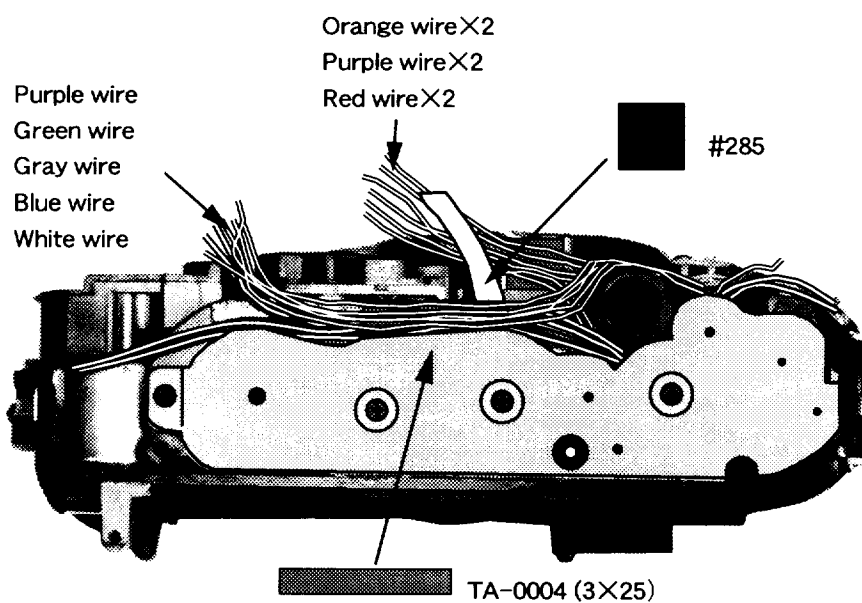
- Mount the main FPC with the screw (#Z019).
- Mount the photo interrupter to the camera mounting position by pushing.
- Adhere the main FPC to the double adhesive tape.



Double adhesive tape

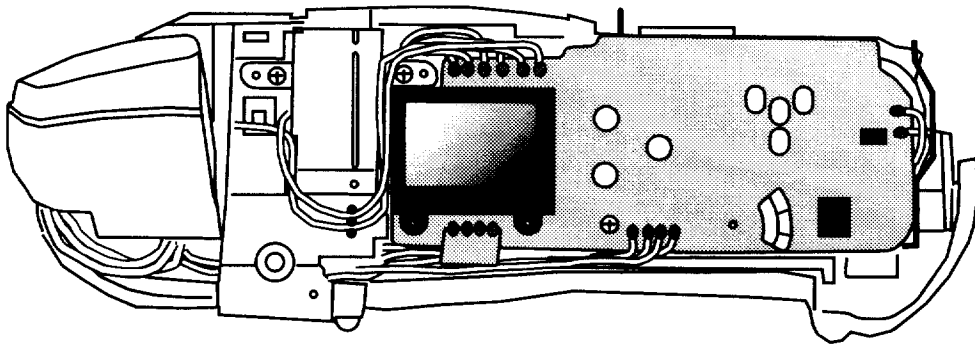


③ Wire arrangement on the bottom of the camera

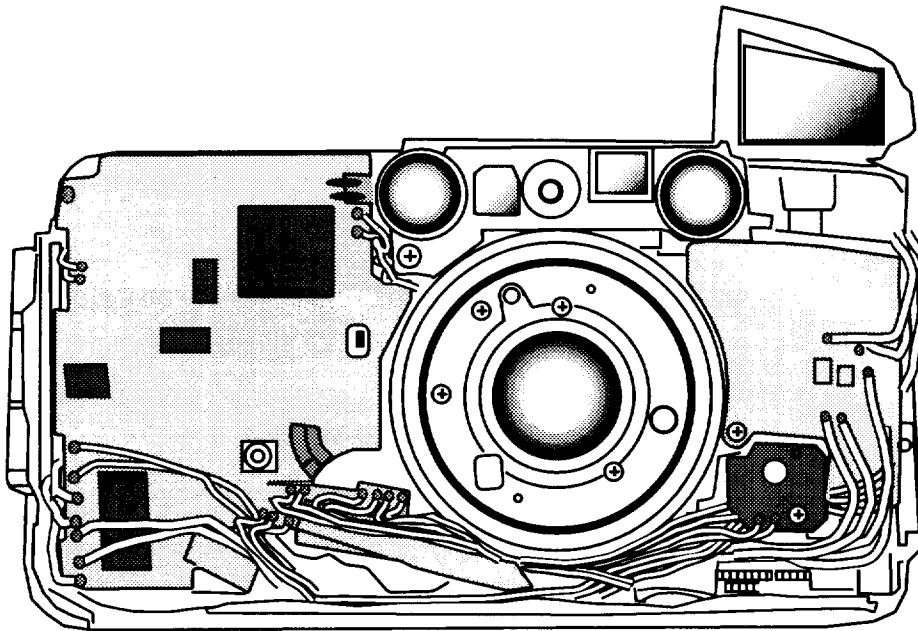


- Adhere the double adhesive tape to hold the purple, green, gray, blue and white wires.
- Arrange another 6 wires on the bottom of the lens barrel.
- Hold the shutter FPC with the tape (#285).

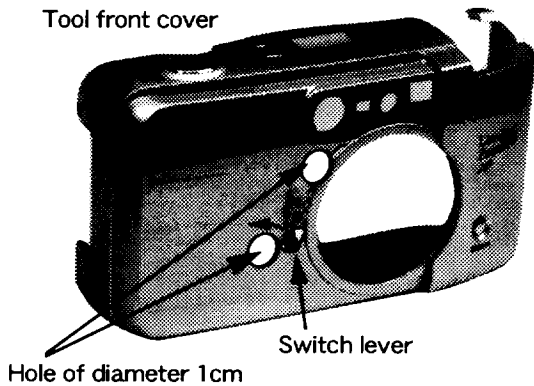
④ Wire arrangement on the top of the camera (Part 2)



⑤ Wire arrangement on the front of the camera



## 11. AE adjustment



- Prepare a front cover of camera and, by using it, make a tool front cover with 2 holes of diameter 1cm. Then, mount the tool front cover to the camera.
- Mount the rear cover temporarily.
- Load the battery into the camera.
- Move the switch lever in the arrow mark direction and set the camera to "ON" .
- Set the speed light cancel mode.
- Adhere a tape to the switch lever unit to lock the switch lever.

By using a shutter tester, perform shutter release at each luminance of LV9, LV12 and LV15. Measure the image field illuminance at each luminance.

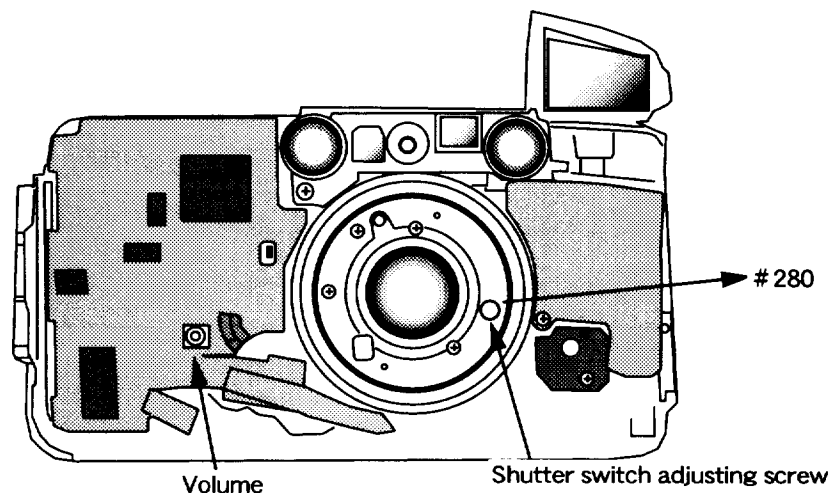
Standard :	LV9	- 1.5~+1.5EV
	LV12	- 1.5~+1.5EV
	LV15	- 1.5~+1.5EV

If the illuminance is out of standard, make adjustment in the following procedure.

- 1) . When the measured value is extremely different
  - Remove the cover plate (#280) on the front of the lens. In the inside, there is a shutter switch adjusting screw. Adjust the AE accuracy with the shutter switch adjusting screw.
- 2) . When the measured value is slightly different or when fine adjustment is necessary after adjusting with the shutter switch adjusting screw
  - Make adjustment with the volume resistor on the main FPC. (Make adjustment through the hole of the tool front cover.)

Each of the above adjustment procedures is level adjustment for the whole AE accuracy.

If one luminance value is out of standard though the above adjustment has been done, it is necessary to replace the AF assembly or main FPC.





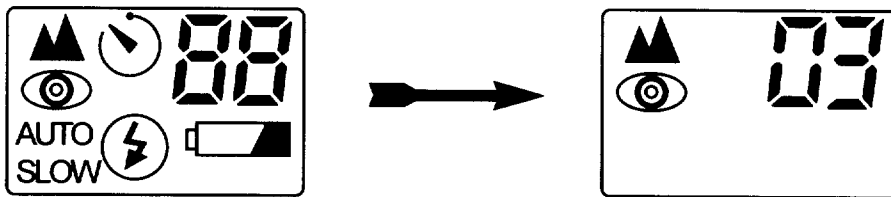
## 12. Lens back adjustment

Tools to be prepared for adjustment

- ① Collimator (J1 9 0 1 9)
- ② FFD adjustment microstand (J1 5 2 9 1)

● Set the manual adjusting mode for the camera.

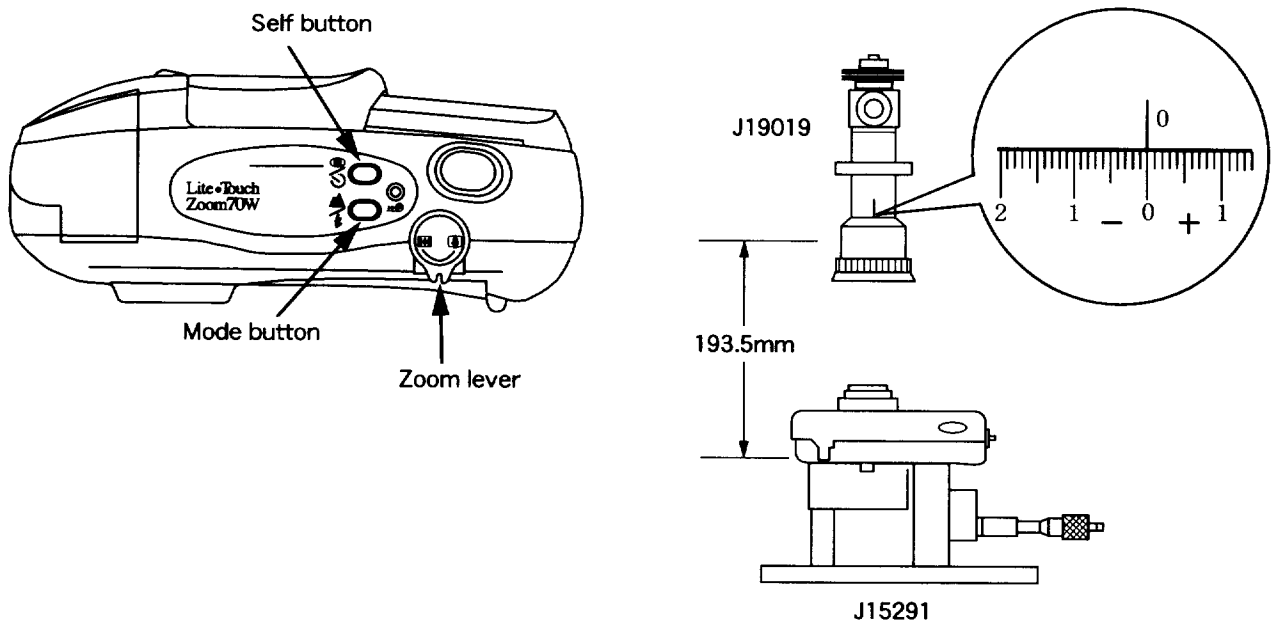
- ① Set the camera back lock key to the lower side.
- ② Take off the tape from the switch lever unit of the tool front cover and set the camera to "OFF" .
- ③ As pressing the mode button, set the camera to "ON" with the switch lever of the tool front cover.
- ④ As keeping the "②" condition, press the self button and release it.
- ⑤ Release the mode button. (The adjusting mode is set.)



- ⑥ Adhere a tape to the switch lever unit to lock the switch lever.
- ⑦ Operate the zoom lever several times to display "03" on the LCD screen.
- ⑧ Press the release button and make sure that "A0" is displayed on the LCD screen.
- ⑨ After the above check, press the release button again. Release is done while the camera is in "∞" and "Bulb" mode.
- ⑩ Press the self button, and the "Bulb" mode is canceled.

Note:

If the "Bulb" mode continues for 10 seconds or more, the shutter mechanism unit is damaged.



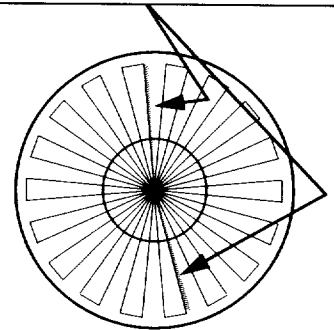
## Inspection and adjustment of lens back

### Inspection and adjustment of WIDE end

- ① Turn the objective lens of the collimator (J19019) and set the scale to "0 mm".
- ② Set "0" for the display of the FFD adjusting micro-stand (J15291).  
Hereafter, do not turn the spindle of the micro-stand.
- ③ Press the release button to set the shutter in the "Bulb" mode.
- ④ Turn the objective lens of the collimator (J19019), perform focusing in the collimator and read the value.

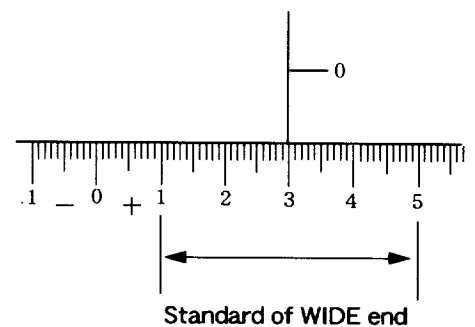
\*The focusing position is where the screen color of the collimator is changed from blue to red.

The position where the vertical line color is bluish purple (changed from blue to red)



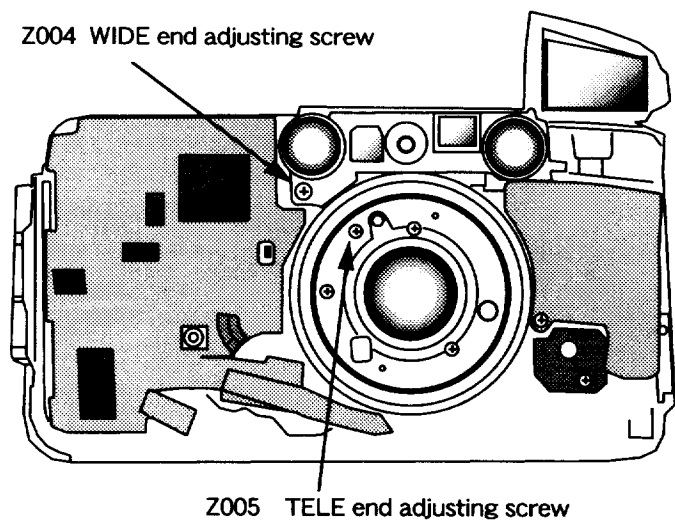
**Standard of WIDE end :  $+3.0\text{mm} \pm 2.0\text{mm}$**

- ⑤ If the WIDE end is out of the standard, turn the WIDE end adjusting screw (Z004) to be within the standard.
- ⑥ Press the self button to cancel the "Bulb" mode.



### Note:

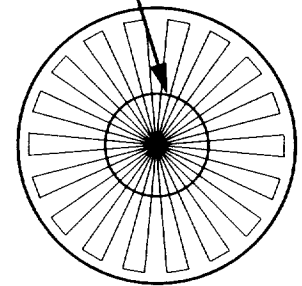
If you measure the WIDE end again, press the release button to display "A 0" on the LCD screen. Then, repeat ③ ~ ⑥.



**Inspection and adjustment of TELE end**

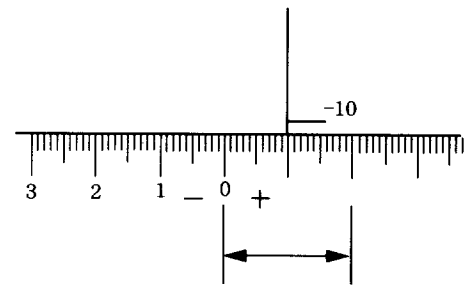
- ① Press the release button to display “A 0” on the LCD screen.
  - ② Operate the zoom lever to set the lens barrel to TELE end. Press the release button to set the shutter in the “Bulb” mode.
  - ③ Turn the objective lens of the collimator (J19019), perform focusing in the collimator and read the value.
- \*The focusing position is where focus is fit in the scale circle of the collimator.

Focus is made at the infocus position in the scale circle on the collimator.



**Standard of TELE end : -9.0mm±1.0mm**

- ④ If the TELE end is out of standard, turn the TELE end adjusting screw (Z005) to be within the standard.



**Note:**

When measuring the TELE end, repeat “⑥ ⇒ ① ⇒ ② ⇒ ③ ⇒ ④” .

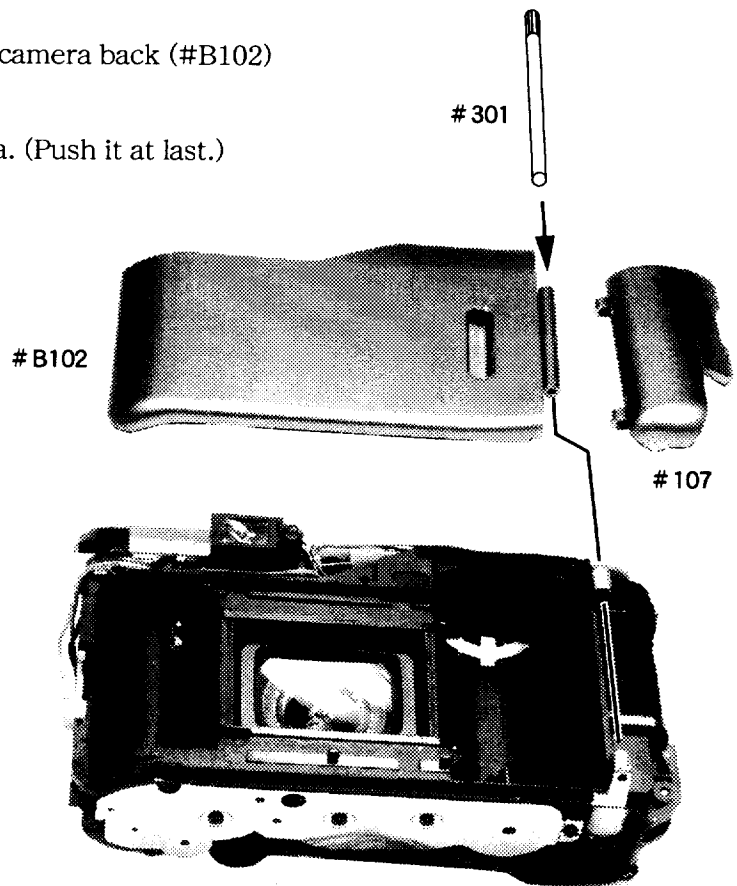
- ⑤ After adjustment, check the lens back at WIDE end and TELE end. (Operate the zoom lever.)
- ⑥ Press the self button to cancel the “Bulb” mode.
- ⑦ Set the camera to “OFF” with the switch lever of the tool front cover and remove the battery.
- ⑧ Remove the rear cover.
- ⑨ Remove the tool front cover.

<b>WARNING</b>	
	<ul style="list-style-type: none"> <li>● There are high voltege parts inside. Be careful of this electric shock, when you remove the cover.</li> <li>● You must discharge the main condenser according to the instruction of this repair manual after you remove the frontcover.</li> </ul>

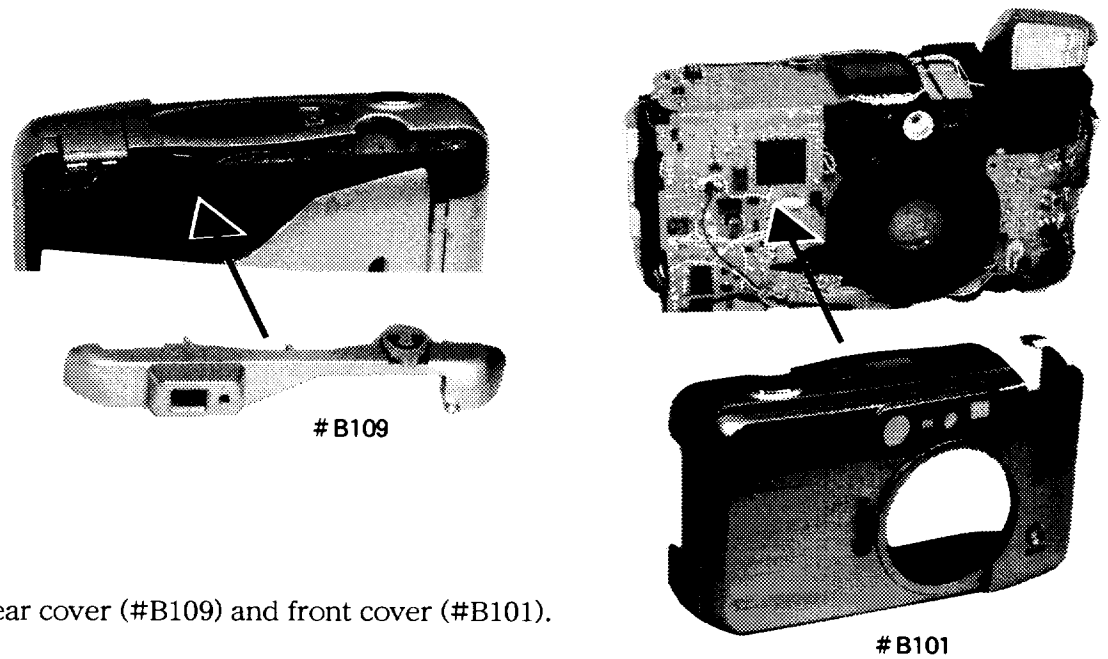
Discharge the main condenser. (Refer to Page D2.)

13. Camera back

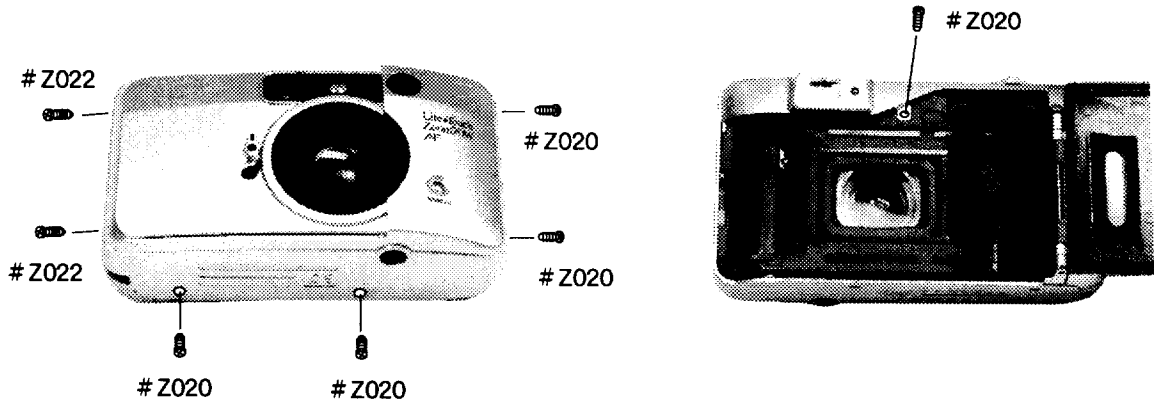
- Mount the battery cover (#107) and camera back (#B102) to the camera.
- Mount the shaft (#301) to the camera. (Push it at last.)



14. Rear cover/Front cover

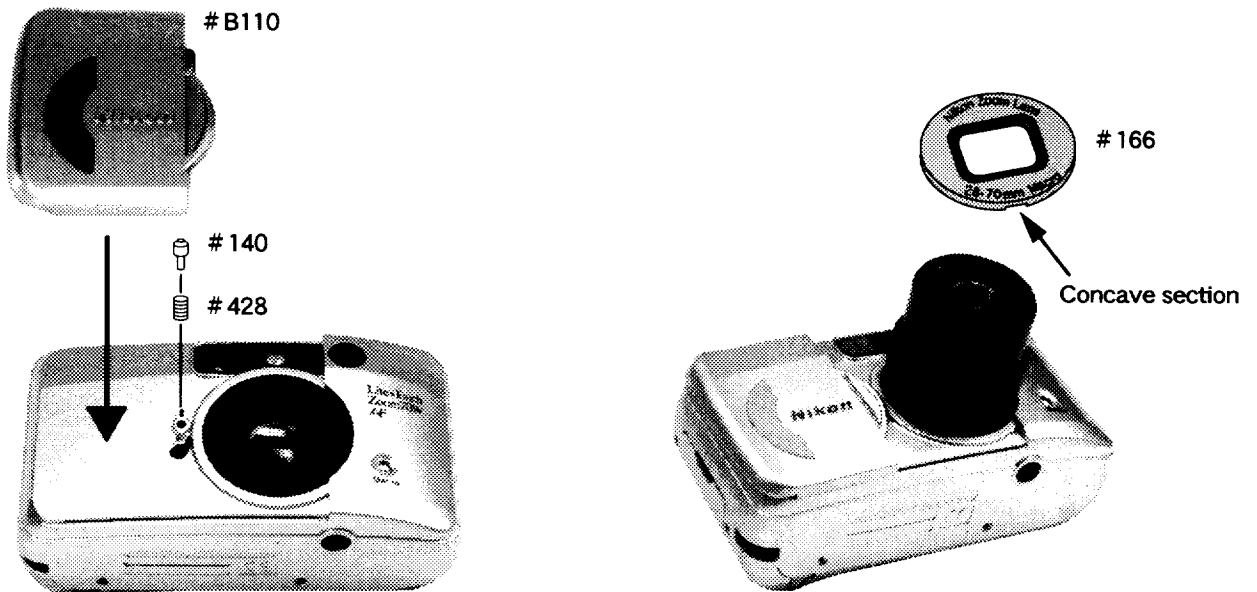


- Mount the rear cover (#B109) and front cover (#B101).



- Attach 2 screws (#Z022) and 5 screws (#Z020).

15. Slide cover/Lens name plate



- Attach #140 and #428.
  - Fit the slide cover into the front cover unit. First, fit its upper section and then the lower section.
- Note:**  
**The slide cover must slide lightly.**
- Mount the lens name plate (#166) with its concave section at the lower side to the lens barrel unit.

## 16. AF adjustment

Tools to be prepared for adjustment

- ① Large standard reflection plate
- ② Tripod for camera
- ③ Tapeline

● Set the manual adjusting mode for the camera.

- ① Open the camera back.
- ② Slightly close the slide cover, which has been opened, and set the camera to “OFF” .
- ③ As pressing the mode button, open the slide cover and set the camera to “ON” .
- ④ As keeping the “②” condition, press the self button and release it.
- ⑤ Release the mode button. (The adjusting mode is set.)
- ⑥ Operate the zoom lever several times to display “0 5” on the LCD screen.

### AF adjustment

Distance (m)	Display of LCD
0.900	A 1
1.100	A 2
1.200	A 3
1.466	d 1
1.658	d 2
1.911	d 3
2.259	d 4
2.767	d 5
3.585	d 6
5.110	d 7

- ① Set “0.900m” for the distance from the camera film surface to the standard reflection plate.  
Press the release button and make sure that “A1” is displayed on the LCD screen.
- ② Set next distance and repeat “①” .
- ③ When the set distance is 5.110m, press the release button and make sure that “D 7” is displayed on the LCD screen. Then, press the release button again. “E E” is displayed on the LCD screen.
- ④ Press the self button. Then, close the slide cover and set the camera to “OFF” to exit from the manual adjusting mode.

## AF inspection

- ① Set the manual adjusting mode for the camera. Operate the zoom lever several times to display “0 4” on the LCD screen.
- ② While the AF window is covered by hand, make sure that “0 8” is displayed 5 times or more continuously on the LCD screen.
- ③ When the distance in the following table is set, make sure that each numeral is displayed 5 times or more continuously on the LCD screen.
- ④ Press the self button. Close the slide cover and set the camera to OFF to exit from the manual adjusting mode.

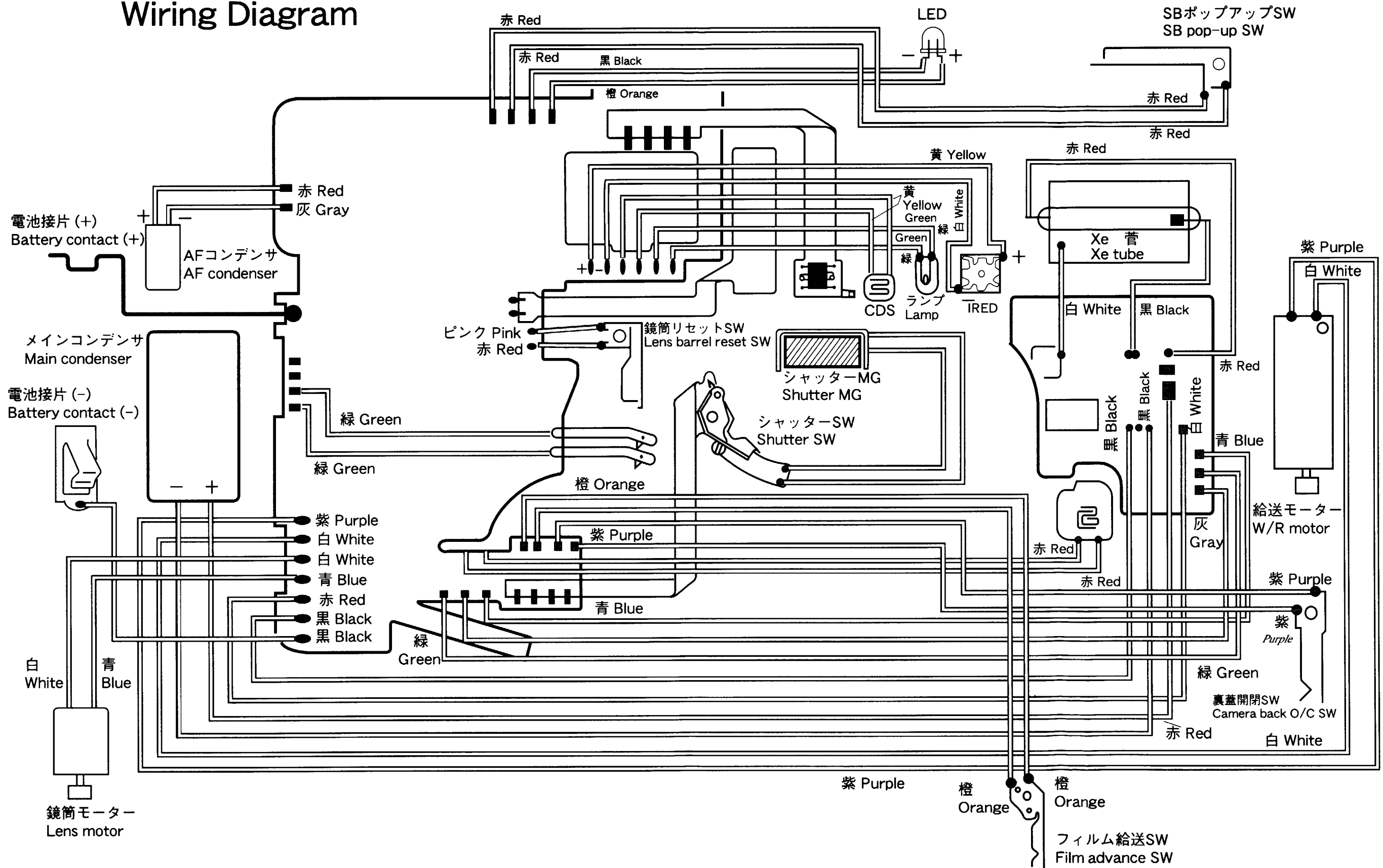
Distance (m)	Display of LCD
4.211	0 7
3.122	0 6
2.486	0 5
2.069	0 4
1.775	0 3
1.556	0 2
1.386	0 1

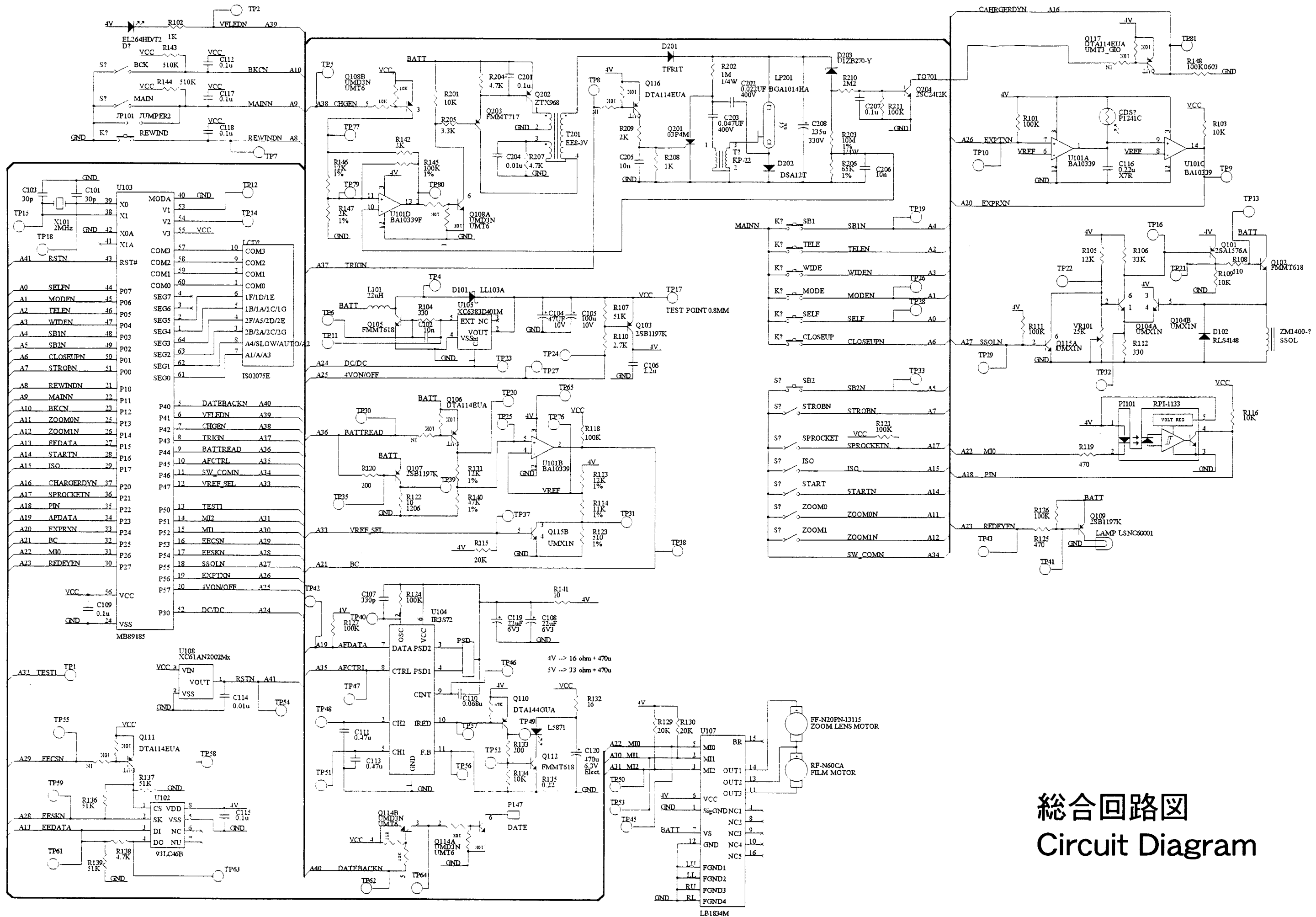
## Electric circuit

Wiring Diagram .....	E 1
Circuit Diagram .....	E 2
MAIN FPC Surface parts mount figure .....	E 3
MAIN FPC Surface pattern figure .....	E 4
SB FPC Surface parts mount and pattern figure .....	E 5
SB FPC Reverse parts mount figure .....	E 6



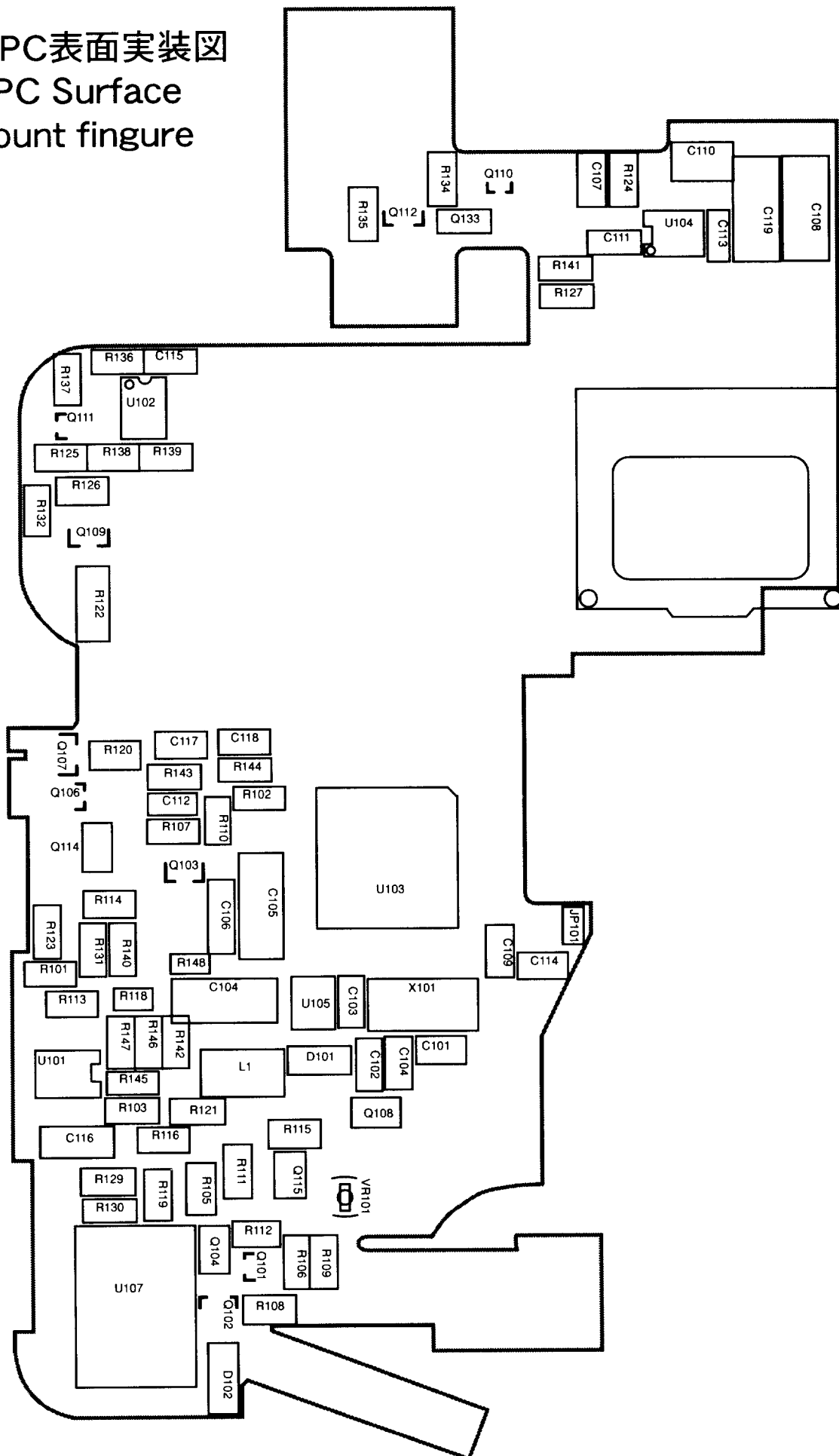
# 実体配線図 Wiring Diagram



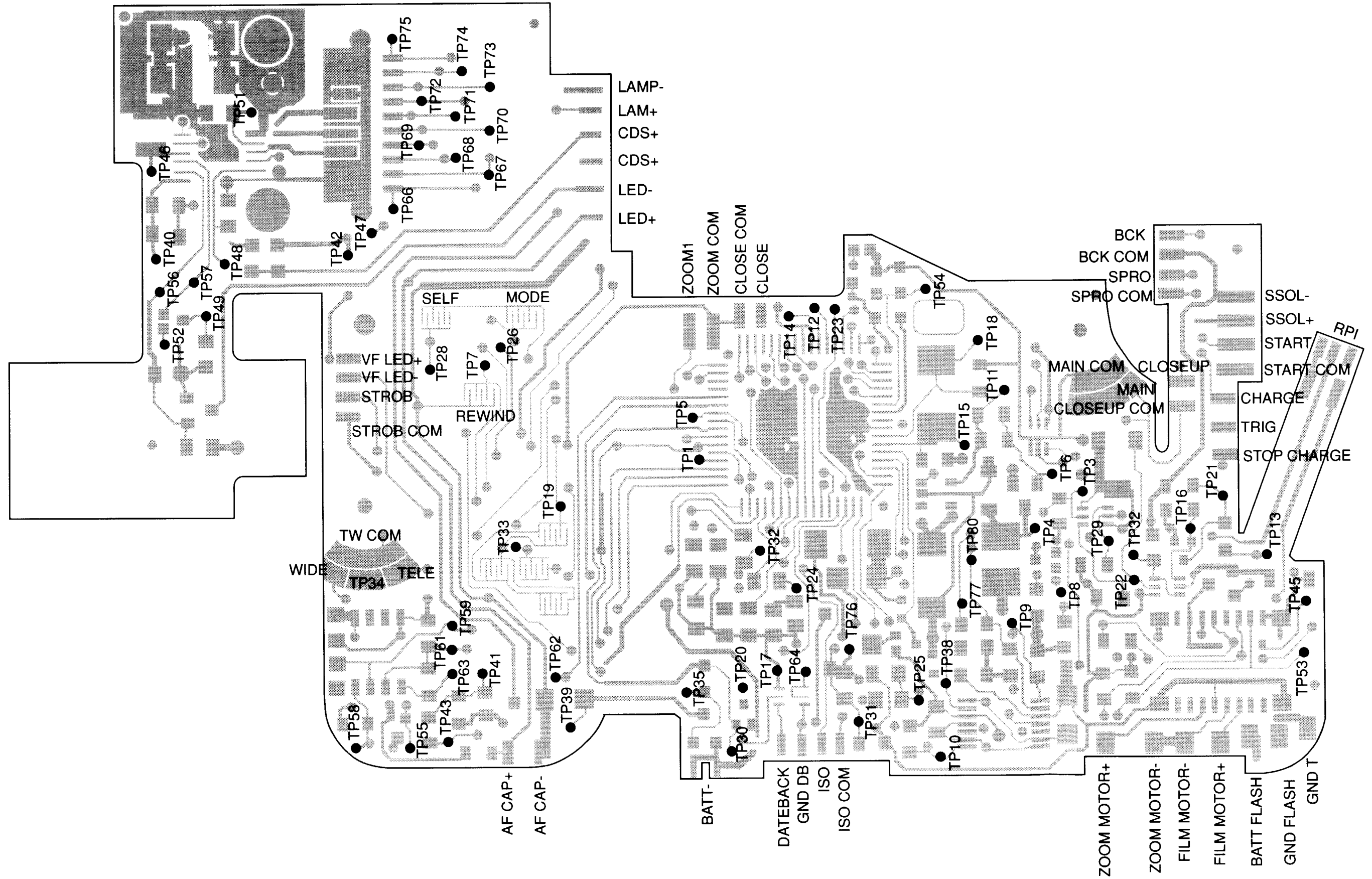


総合回路図  
Circuit Diagram

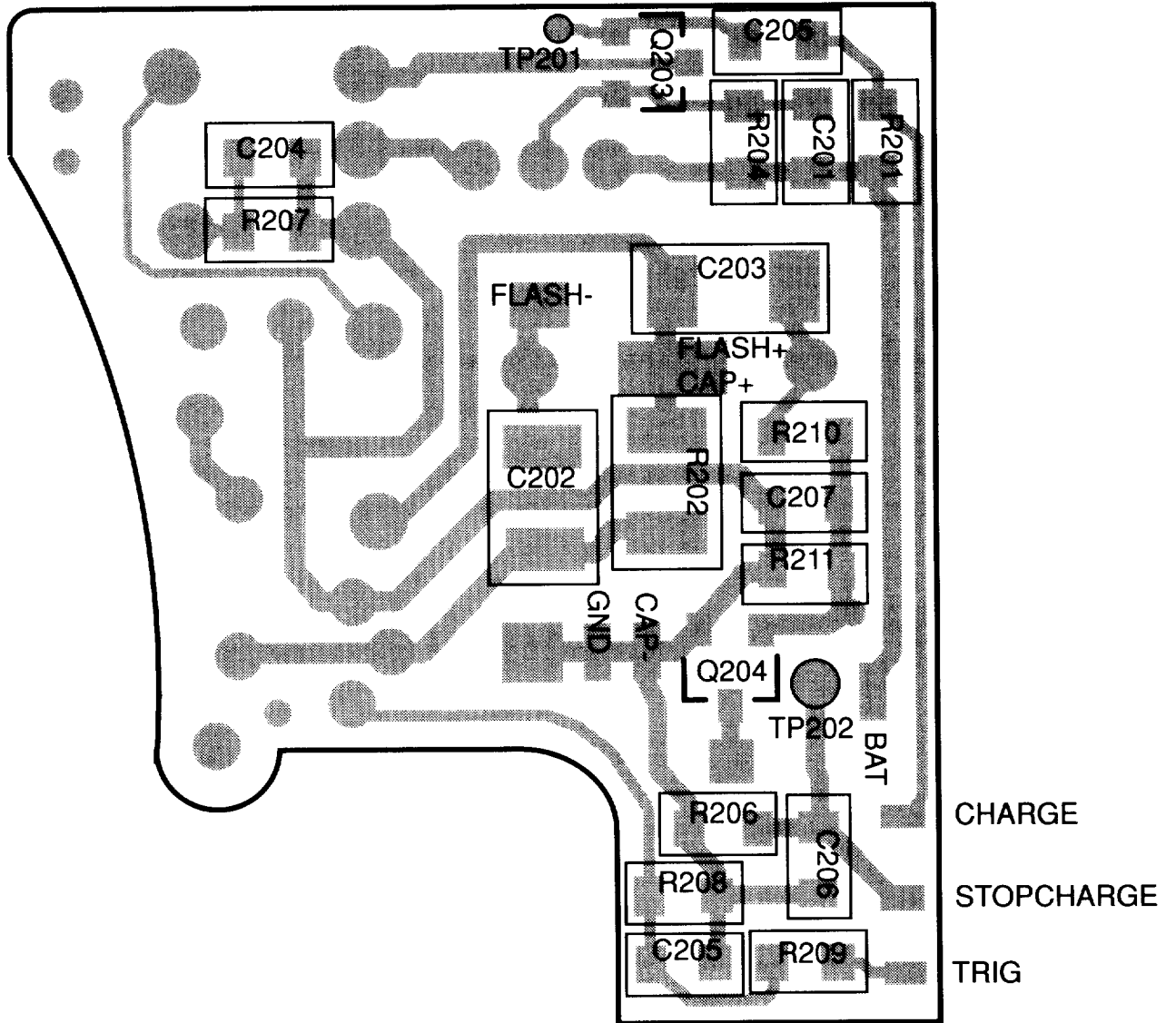
メインFPC表面実装図  
 MAIN FPC Surface  
 parts mount figure



# メインFPC 表面パターン図 MAIN FPC Surface pattern figure

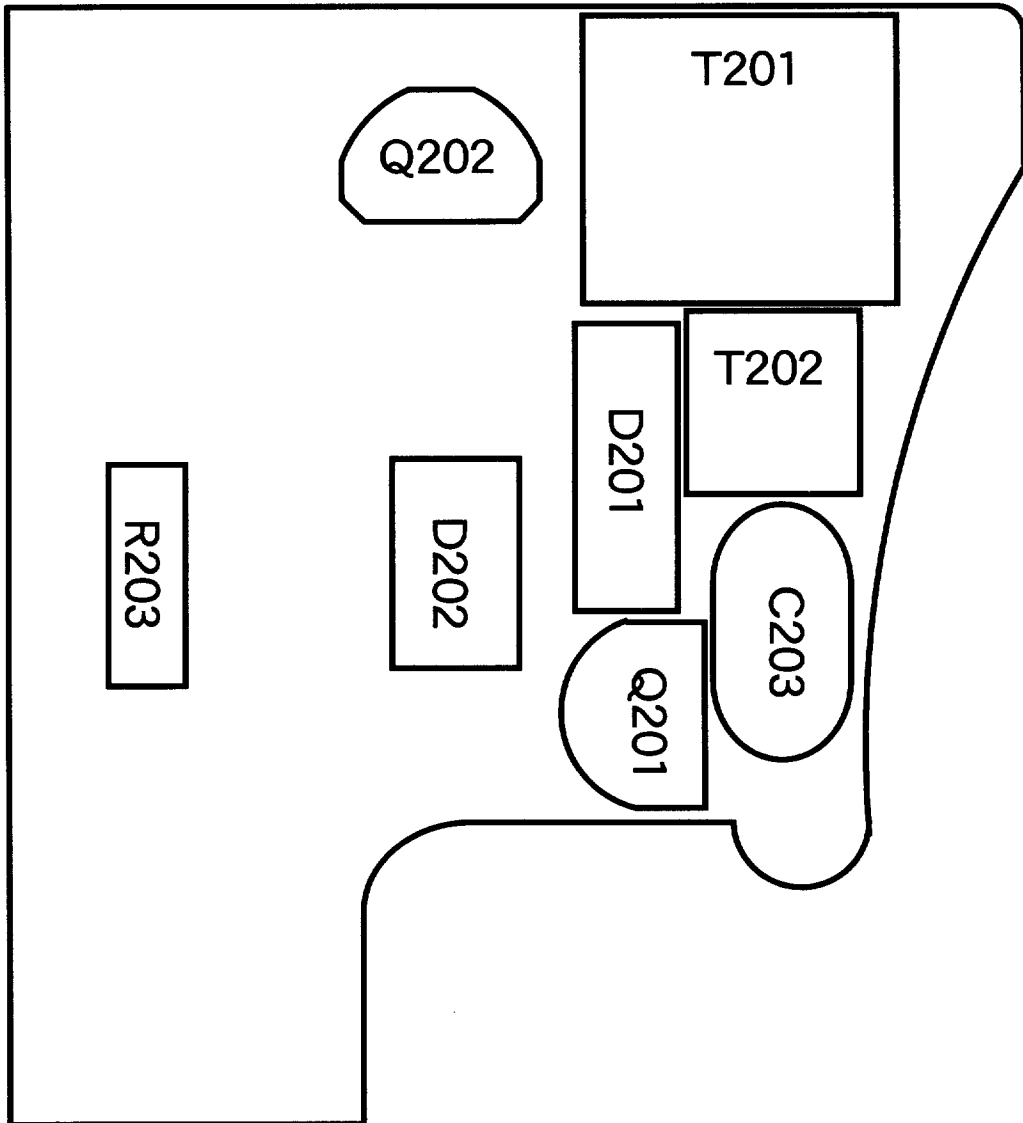


SB FPC表面実装図/パターン図  
 SB FPC Surface  
 parts mount and pattern figure



SB FPC裏面実装図

SB FPC Reverse parts mount figure



# INSPECTION STANDARD

[1] INSPECTION STANDARD ..... R 1 ~ R 4

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## CONDITION FOR INSPECTION

Normal temperature :  $25 \pm 5^{\circ}\text{C}$  (Relative humidity :  $65 \pm 20\%$ )


Power source : 3.0 V      2.0 A or more at  $0.5 \pm 0.1 \Omega$

Light source :  $2856^{\circ}\text{K}$

K coefficient : 1.3

## ● Standard of inspection

### 1. Picture

Item	Standard of judgment	Method and tools
Picture size	2. Length 24.4 ±0.4 mm 3. Width 36.4 ±0.4 mm	Factory microscope
Picture position	 <p>Measure the dimension from the inside end face of the perforation.</p>	Scale with loupe Film
Film space	<ul style="list-style-type: none"> <li>•5mm ~ 3.5mm</li> <li>•There should be no overlap.</li> <li>•Take photograph at forced infinity of Wide and Tele.</li> <li>•Measure the space of each picture place from the first frame to the thirty-sixth frame after taking photograph at Wide and Tele.</li> </ul>	

### 2. Photography and lens function

c	Standard of judgment	Method and tools
AE sensor position	<ul style="list-style-type: none"> <li>•The main object should be at the exposure level of practical use.</li> <li>•Set a person to cover approx. 1/4 of the area at the center of a picture and take a picture with normal light.</li> <li>•Check AE sensor position at Wide and Tele.</li> </ul>	Film
Speed light division unevenness	<ul style="list-style-type: none"> <li>•There should be no extreme unevenness.</li> <li>•There should be no striped-pattern unevenness.</li> <li>•Take a picture of the background paper in the nearest and 2m distance with Wide.</li> </ul>	Standard Reflection paper
Focal distance W *Official 28mm *Design (29mm) T *Official 70mm * Design (67.5mm)	<ul style="list-style-type: none"> <li>•Wide end (∞) 28mm±5% (26.6~29.4mm)</li> <li>•Tele end (∞) 70mm±5% (66.5~73.5mm)</li> <li>•Make the camera bulb at the manual test mode and measure.</li> </ul>	Optical bench
Aperture *Official F(5.6) * Design F(10)	<ul style="list-style-type: none"> <li>•Wide end (∞) F±5% (F5.32~F5.88)</li> <li>•Tele end (∞) F±5% (F9.5~F10.5)</li> <li>•Based on measured focal length</li> </ul>	Factory microscope
Back focus	<ul style="list-style-type: none"> <li>•W : +3.0mm ±2.0mm</li> <li>•T : -9.0mm ±1.0mm</li> <li>•Check it with the scale of the objective lens of the collimator.</li> </ul>	F=193.5mm Collimator

### 3. Zoom lens

Item	Standard of judgment	Method and tools
Zoom Speed time	<ul style="list-style-type: none"> <li>•Re↔Wide &lt;0.5 sec</li> <li>•Wide↔Tele &lt;2.0</li> <li>•Tele→Re &lt;2.5</li> </ul>	3.0 V power supply Oscilloscope
Current	<400mA	

### 4. AF

Item	Standard of judgment	Method and tools
High luminance limit	<ul style="list-style-type: none"> <li>•AF should be the infinity Step at BV (8).</li> <li>•Shade IRED projective part, and make A light source and the camera face to face and read it from AF data at the test mode.</li> </ul>	Standard Reflection paper
AF function guaranteed accuracy	<ul style="list-style-type: none"> <li>•Less than BV(9)</li> <li>•Check the AF performance under the above luminance. (On the standard reflecting sheet)</li> </ul>	
Near Distance Warning	<ul style="list-style-type: none"> <li>•Near distance warning signal must be displayed under the following conditions.</li> <li>•Wide : 0.9m±0.08m</li> <li>•W2/3 : 1.1m±0.08m</li> <li>•W4/Tele : 1.2m±0.08m</li> </ul>	Reflection paper Tape measure



## 5. AE

Item	Standard of judgment	Method and tools
AE accuracy Error Difference	·A light source: $-1.5 \sim +1.5$ EV Error; Error of the exposure average value obtained by continuous 5 measuring operations Difference between the maximum and minimum values obtained by continuous 5 measuring operations	Luminance meter AE multimeter AE Tester Dx film of each film speed type
ISO change	Satisfy AE accuracy at ISO 100 and 400. ( Non Dx should be controlled at ISO100) Load each of Dx film to the camera and measure.	3.0 V power supply AE Tester Dx film
Macro Mode Apertures	$\cdot 16 \pm 1f$ stop	AE Tester
AE lock On self mode	Should be controlled at the same luminance with when it starts. Start the self with turning it to the luminance face and measure it with changing the luminance in the middle of operation.	3.0 V power supply AE Tester
Capability in high luminance	The sector should be open in use of ISO 200 film in the brightness of BV 11.	Brightness box
Difference in voltage	· The level of voltage between 'the voltage for BC warning' and '3.2 V should be maintained to normally operate the camera. Measure at BC1 ( the battery mark blinks) and 3.2V.	3.0 V power supply AE Tester
T-W difference	Difference between tele and wide shall be less than 1.0 EV.	
Brightness for auto flash	·Wide ISO100/200 EV8.75 $\pm$ 0.5EV ISO400 EV10.75 $\pm$ 0.5EV ·Tele ISO100/200 EV10.75 $\pm$ 0.5EV ISO400 EV12.75 $\pm$ 0.5EV	Brightness box

## 6. ELECTRONIC FLASH

Item	Standard of judgment	Method and tools
Guide Number (ISO100·m)	·Full $11 \pm 0.5$ EV (9.25~13.1) More than -0.9EV against NL1 full G No. Measure after 30 seconds at measured distance 2M with a brand new battery. Release at 2 times/sec. continuously from the non-charged condition and measure the lowest value for these times.	Flash meter Fresh battery
Flash Distribution	Maximum light loss at radial distance of 2 m, compared to flash output on the camera optical axis, shall be as follows <0.8EV 22.5° Vertical <0.8EV 31.8° Horizontal <1.3EV 36.7° Diagonal	Light distribution characteristics tester Flash meter
Recycle Time	· < 6 sec measured from 4th flash Check it after 8 seconds that the recycling time of the SB third firing at Red-eye reduction AUTO mode.	Fresh battery Stop watch
Color Temperature	·Full 6000°K $\pm$ 300°K Check it at NL1 and the full battery.	Color temperature meter New battery

## 7. Stroke of each operation

Item	Standard of judgment	Method and tools
Slide barrier	Turn the main SW on by opening the slide cover fully. Measure after turning the main SW on by opening the slide cover fully.	Oscilloscope
Each button	·S1 ON 0.7 $\pm$ 0.2 mm ·S2 ON (1.4 $\pm$ 0.6mm) ·Difference of S2,S1 <0.3mm ·MOS ON 0.4~1.0mm ·Self ON 0.4~1.0mm ·QDMOSWON 0.7~1.5mm ·SEL/AJSON 0.7~1.5mm ·MUS ON 0.7~1.5mm ·ZSW ON 2.5 ~3.5mm ·Macro ON 0.7~1.5mm Turn the MSW on and check it with the change of LCD display or each function.	Dial gauge Vernier caliper Factory microscope

## 8. Capacity of Each operative position

Item	Standard of judgment	Method and tools
Slide barrier	<ul style="list-style-type: none"> <li>·Closing click</li> <li style="padding-left: 20px;">Close → Full open 500~1200g</li> <li style="padding-left: 20px;">Half open → Close &lt;900g</li> <li>·Opening click</li> <li style="padding-left: 20px;">Half open → Full open &lt;500g</li> <li style="padding-left: 20px;">Full open → Half open 700~1400g</li> </ul>	Tension gauge
Each button  Back door knob  Battery cover	<ul style="list-style-type: none"> <li>·S1 ON 40~100g</li> <li>·S2-S1 &gt;200g</li> <li>·S2 ON &lt;500g</li> <li>·MOSW ON 50~200g</li> <li>·Self SW ON 50~200g</li> <li>·QDMOSW ON 50~200g</li> <li>·SEL/AJS ON 50~200g</li> <li>·MUSW ON 50~200g</li> <li>·ZUSW ON 75~200g</li> <li>·ZDSW ON 75~200g</li> <li>·777 ON 50~200g</li> <li>·Open position 500~200g</li> <li>·Close 500~1500g</li> <li>·Open 200~400g</li> <li>·Close (with battery) 300~700g</li> </ul> <p>Measure each one at an angle of 45 against the battery cover.</p>	Tension gauge Push and pull gauge

## 9. Film advance

Item	Standard of judgment	Method and tools
Winding period	<ul style="list-style-type: none"> <li>·0.35~2.0 sec/flame</li> <li>Take photograph to the last frame of the film and check.</li> </ul>	Oscilloscope
Rewinding period	<ul style="list-style-type: none"> <li>· Within 45 sec. in the case of 36EX film</li> <li>Measure the time from starting to rewind to the motor stopping.</li> </ul>	Each type film Stop watch
Film advance driving noise	<ul style="list-style-type: none"> <li>Less than 60dB. (Average sound pressure)</li> <li>·There should be no remarkable irregular sound or allophone when rewinding.</li> </ul>	Sound level meter Each type film

## 10. Finder

Item	Standard of judgment	Method and tools
Shading	<ul style="list-style-type: none"> <li>·The whole finder field can be checked.</li> <li>Look into the center of the finder with wearing general glasses.</li> </ul>	Observe the image visually
Diopter	<ul style="list-style-type: none"> <li>·Perspective image <math>-1.0 \pm 1.0</math>dpt</li> <li>·AF flame line &lt;0.7dpt</li> <li>·There should not be remarkable unclearness in the finder field frame and compensation rule.</li> <li>·Difference the imege and flame &lt;0.7dpt</li> <li>·Zoom difference &lt;1.0dpt</li> </ul>	Diopter telescope  Observe the image visually
Magnification	<ul style="list-style-type: none"> <li>·Wide <math>0.28 \pm 15\%</math> times</li> <li>·Tele <math>0.7 \pm 15\%</math> times</li> </ul>	Diopter telescope
Field of view	<ul style="list-style-type: none"> <li>·Full 80~100%</li> <li>Want by tracing the range which can be confirmed by the finder to the picture place took at 3m distance.</li> <li>Check at Wide and Tele.</li> </ul>	Tape measure  Factory microscope
Parallax  Macro compensation line	<ul style="list-style-type: none"> <li>·A picture of the whole finder field should be taken.</li> <li>·When macro shooting, all of the top, the left and the right of the finder image should be printed. (The bottom should not protrude remarkably.)</li> <li>Shooting with fitting the macro compensation line at the most close distance.</li> <li>Check at macro.</li> </ul>	Loupe with scale

## 11. Self timer

Item	Standard of judgment	Method and tools
Self-timer Ramp Cancel	<ul style="list-style-type: none"> <li>·10±1 sec</li> <li>·Blinking 7 times (8 sec)</li> <li>·Lighting 2 sec</li> <li>Measure the time from S2 ON to release.</li> <li>It must be able to be canceled by the MSW.</li> <li>·Try to turn the MSW OFF after starting the self start.</li> </ul>	Stop watch  Observe the image visually

## 12. Red-eye Reduction

Item	Standard of judgment	Method and tools
Brightness	·> 7 lux at 30 cm distance from the RER front window.	Lux meter Fresh battery Tape measure
Duration	·1.0±0.2 sec	3.0 V power supply Oscilloscope
Current	·< 400mA Include the camera body consumption.	Ammeter 3.0 V power supply

## 13. Date Imprinting

Item	Standard of judgment	Method and tools
Imprinting time	<ul style="list-style-type: none"> <li>·ISO100 80ms</li> <li>·ISO400 50ms</li> </ul>	Each type film
Imprinting size	<ul style="list-style-type: none"> <li>· Width :4.5 mm±0.5mm</li> <li>·Height:0.75mm±0.5mm</li> </ul>	Factory microscope
Imprinting Position	<ul style="list-style-type: none"> <li>·From the Center of imprinting</li> <li>Right 12mm +0.5mm -1mm</li> <li>Bottom 9mm +0.5mm -1mm</li> </ul>	

## 14. Electrical characteristics

Item	Standard of judgment	Method and tools
Current Standby Current 1 Standby Current 2 Half-way pushing Film Winding Film Rewinding Peak charging current	<ul style="list-style-type: none"> <li>· &lt; 30μA      Measure when MSW OFF.</li> <li>· &lt; 30μA      Measure after a second after MSW ON.</li> <li>· &lt; 30mA</li> <li>· &lt; 400mA    for 36exp film</li> <li>· &lt; 400mA    for 36exp film</li> <li>· &gt; 1000mA</li> <li>· &lt; 2500mA</li> </ul>	3.0 V power supply Ammeter
B.C Voltage	<ul style="list-style-type: none"> <li>·Warning level 1 : 2.3V±0.1V (Blinking the battery symbol)</li> <li>·NG level 2 : 2.18V±0.1V (Turn off the LCD and release lock)</li> <li>·Warning range      Warning - NG≥0.12VE</li> <li>Measure the voltage when pre-releasing the shutter release button while making the power supply voltage low and the battery mark blinks on the LCD.</li> <li>Measure the voltage when pre-releasing the shutter release button while making the power supply voltage low and the LCD puts off the light.</li> <li>Calculate the display range of the battery mark.</li> </ul>	3.0 V power supply (with out resistor)