

作成承認印

配布許可印



D50 VBA12001

REPAIR MANUAL

Nikon | NIKON CORPORATION
Tokyo, Japan

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Specifications

Type	Single-lens reflex digital camera with interchangeable lenses
Effective pixels	6.1 million
CCD	23.7 × 15.6 mm; total pixels: 6.24 million
Image size (pixels)	<ul style="list-style-type: none"> • 3008 × 2000 (Large) • 2256 × 1496 (Medium) • 1504 × 1000 (Small)
Lens mount	Nikon F mount (with AF coupling and AF contacts)
Compatible lenses*	
Type G or D AF Nikkor	All functions supported
Micro Nikkor 85 mm f/2.8D	All functions supported except autofocus and some exposure modes
Other AF Nikkor†	All functions supported except 3D color matrix metering II
AI-P Nikkor	All functions supported except 3D color matrix metering II and autofocus
Non-CPU	Can be used in mode M , but exposure meter does not function; electronic range finder can be used if maximum aperture is f/5.6 or faster
* IX Nikkor lenses can not be used † Excluding lenses for F3AF	
Picture angle	Equivalent in 35-mm format is approximately 1.5 times lens focal length
Viewfinder	Fixed-eyelevel penta-Dach-mirror type
Diopter adjustment	-1.6 – +0.5 m ⁻¹
Eyepoint	18 mm (-1.0 m ⁻¹)
Focusing screen	Type B BriteView clear matte screen Mark V with superimposed focus brackets
Frame coverage	Approximately 95% of lens (vertical and horizontal)
Magnification	Approximately 0.75× (50-mm lens at infinity; -1.0 m ⁻¹)
Reflex mirror	Quick return
Lens aperture	Instant return with depth-of-field preview
Focus-area selection	Can be selected from 5 focus areas
Lens servo	<ul style="list-style-type: none"> • Autofocus (AF): Instant single-servo AF(AF-S);continuous-servo AF (AF-C); auto AF-S/AF-C selection(AF-A); predictive focus tracking automatically activated according to subject status • Manual focus (M)

Autofocus	TTL phase detection by Nikon Multi-CAM900 autofocus module with AF-assist illuminator (range approximately 0.5–3.0 m / 1'8"–9'10")
Detection range	–1 – +19 EV (ISO 100 at 20 °C/68 °F)
AF-area mode	Single-area AF, dynamic-area AF, dynamic-area AF with closest subject priority
Focus lock	Focus can be locked by pressing shutter-release button halfway (single-servo AF) or by pressing AE-L/AF-L button
Exposure	
Metering	Three-mode through-the-lens (TTL) exposure metering
Matrix	3D color matrix metering II (type G and D lenses); color matrix metering II (other CPU lenses); metering performed by 420-segment RGB sensor
Center-weighted	Weight of 75% given to 6, 8, 10, or 12-mm circle in center of frame
Spot	Meters 3.5-mm circle (about 2.5% of frame) centered on active focus area
Range (ISO 100 equivalent, f/1.4 lens, 20 °C/68 °F)	0 – 20 EV (3D color matrix or center-weighted metering) 2 – 20 EV (spot metering)
Exposure meter coupling	CPU coupling
Exposure control	
Operating mode	Digital Vari-Program ( auto,  portrait,  landscape,  Child,  close up,  sports,  night portrait), programmed auto (P) with flexible program; shutter-priority auto (S); aperture priority auto (A); manual (M)
Exposure compensation	–5 – +5 EV in increments of 1/3 or 1/2 EV
Bracketing	Exposure and / or flash bracketing (up to ± 2EV over 3 exposures)
Exposure lock	Luminosity locked at detected value with AE-L/AF-L button
Shutter	Combined mechanical and CCD electronic shutter
Speed	30 – 1/4000 s in steps of 1/3 or 1/2 EV, bulb, remote
Sensitivity	200 – 1600 (ISO equivalent) in steps of 1/3 EV
White balance	Auto (TTL white-balance with 420 pixels RGB sensor), six manual modes with preset white balance
Bracketing	3 exposures in increments of 1, 2, or 3

Built-in Speedlight	    auto flash with auto pop-up • P, S, A, M : manual pop-up with button release
Guide number (m / ft at 20 °C/68 °F)	• ISO 200: approximately 15/49 (manual 17/56) • ISO 100: approximately 11/36 (manual 12/39)
Flash	
Sync contact	X-contact only; flash synchronization at up to 1/500 s
Flash control	
TTL	TTL flash control by 420-segment RGB sensor (CPU lenses only) • Built-in Speedlight: i-TTL balanced fill-flash for digital SLR, or standard i-TTL flash for digital SLR (spot metering or mode dial set to M) • SB-800 or 600: i-TTL balanced fill-flash for digital SLR, or standard i-TTL flash for digital SLR (spot metering)
Auto aperture	Available with SB-800 with CPU lens
Non-TTL auto	Available with such Speedlights as SB-800, 80DX, 28DX, 28, 27, and 22s
Range-priority manual	Available with SB-800
Sync modes	•     : front curtain sync, red-eye reduction •  : slow sync, slow sync with red-eye reduction •   : front curtain sync and red-eye reduction available with optional Speedlights • P, S, A, M: front curtain sync, slow sync, rear-curtain sync, red-eye reduction, slow sync with red-eye reduction
Flash compensation	-3 – +1 EV in increments of 1/3 or 1/2 EV
Accessory shoe	Standard ISO hot-shoe contact with safety lock
Creative Lighting System	Supports Flash Color Information Communication and FV lock with built-in Speedlight, SB-800, and SB-600. SB-800 and 600 also support Advanced Wireless Lighting.
Storage	
Media	SD (Secure Digital) memory cards
File system	Compliant with Design Rule for Camera File System (DCF) 2.0 and Digital Print Order Format (DPOF)
Compression	• NEF (RAW): compressed 12-bit • JPEG: JPEG baseline-compliant

Self-timer	Electronically controlled timer with 2 – 20 s duration
Monitor	2.0" , 130,000-dot, low-temperature polysilicon TFT LCD with brightness adjustment
Video output	Can be selected from NTSC and PAL
External interface	USB 2.0 Hi-speed
Tripod socket	1/4" (ISO)
Firmware upgrades	Firmware can be upgraded by user
Supported languages	Chinese (Simplified and Traditional), Dutch, English, French, German, Italian, Japanese, Korean, Portuguese, Russian, Spanish, Swedish
Power source	<ul style="list-style-type: none"> • One rechargeable Nikon EN-EL3 Li-ion battery; charging voltage (MH-18a quick charger or optional MH-19 multi charger): 7.4 V DC • EH-5 AC adapter (available separately)
Dimensions (W × H × D)	Approximately 133 × 102 × 76 mm (5.2" × 4.0" × 3.0")
Weight	Approximately 540 g (1 lb 3 oz) without battery, memory card, body cap, or monitor cover
Operating environment	
Temperature	0 – 40 °C (+32 – 104 °F)
Humidity	Less than 85% (no condensation)

- Unless otherwise stated, all figures are for a camera with a fully-charged battery operating at an ambient temperature of 20 °C (68 °F).
- Nikon reserves the right to change the specifications of the hardware and software described this manual at any time and without prior notice. Nikon will not be held liable for damages that may result from any mistakes that this manual may contain.

Points to notice for Disassembly / Assembly

 WARNING	
	<ul style="list-style-type: none"> ● Due to an internal high voltage area, take extra care not to get an electric shock when detaching covers.. ● After removing covers, be sure to discharge the main condenser according to the instructions of repair manuals.

Note:

- ① When disassembling/(re)assembling, be sure to use the conductive mat (J5033) and wrist strap (J5033-5) for static protection of electrical parts.
- ② Before disassembling, be sure to remove batteries or AC power wires.
- ③ When disassembling, make sure to memorize the processing state of wires and FPC, screws to be fixed and their types, etc.
- ④ Because the low pass filter of the imaging CCD PCB is easily damaged, handle it with enough care.

Points to notice for Lead-free solder products
<ul style="list-style-type: none"> ▪ Lead-free solder is used for this product. ▪ For soldering work, the special solder and soldering iron are required. ▪ Do NOT mix up lead-free solder with traditional solder.

Note:

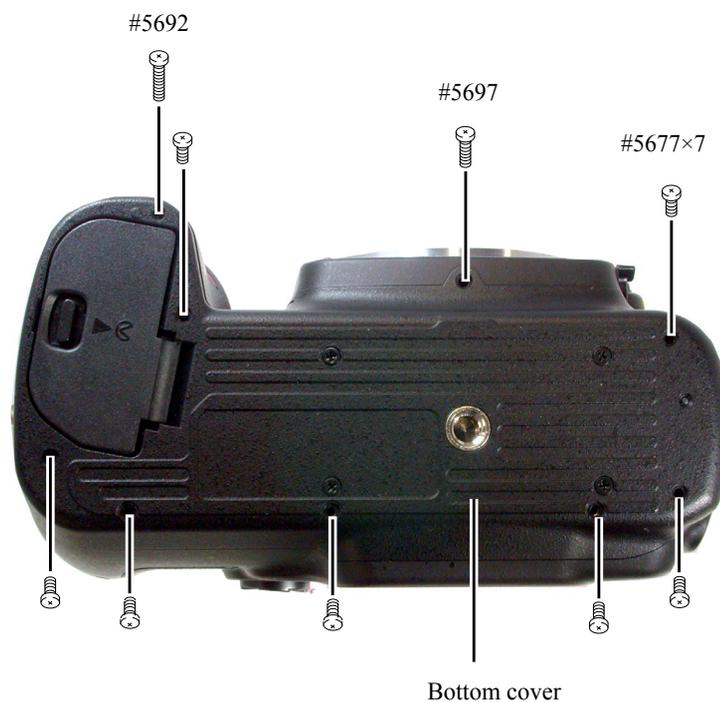
When "Separating Front and Rear bodies", "Disassembling Image PCB", and "Disassembling Bayonet", be sure to perform "Reset of AF defocus compensation amount" by D2X adjustment software after reassembly.

Disassembly

1. Separation of Front and Rear Bodies

Bottom Cover

- Take out the screws (#5692 and #5697) and 7 screws (#5677).
- Remove the bottom cover.



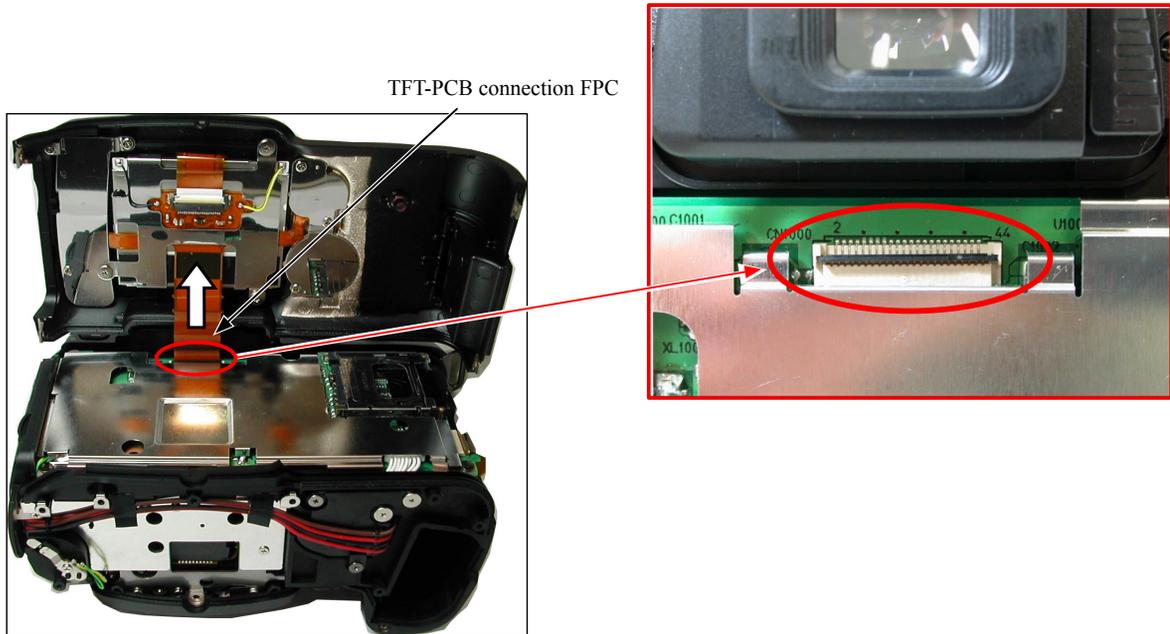
Rear cover

- Take out 4 screws (#623).
- Cover to remove the rear cover.

Note: Remove the rear cover slowly so as not to cut TFT-PCB connection FPC of the upper portion of the cover.

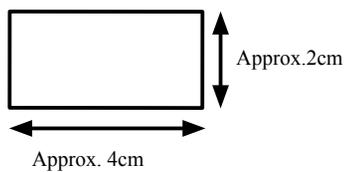


- Remove TFT-PCB connection FPC from the connector.



SB pop-up

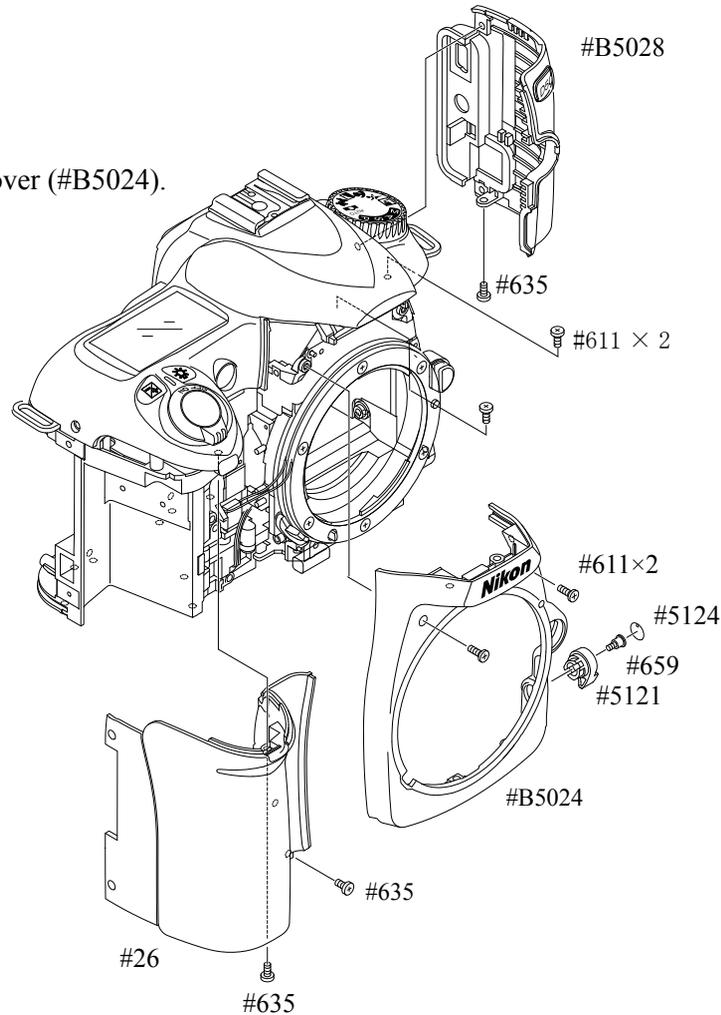
- Cut the tracing film sheet, etc into the below size of piece. Then insert it into the clearance of the top cover pop-up part as shown right, and pop it up by sliding the sheet in the direction of the arrow.



! WARNING	
	<ul style="list-style-type: none"> • Due to an internal high voltage area, take extra care not to get an electric shock when detaching covers. • After removing the covers, be sure to discharge the main condenser according to the instructions of repair manuals.

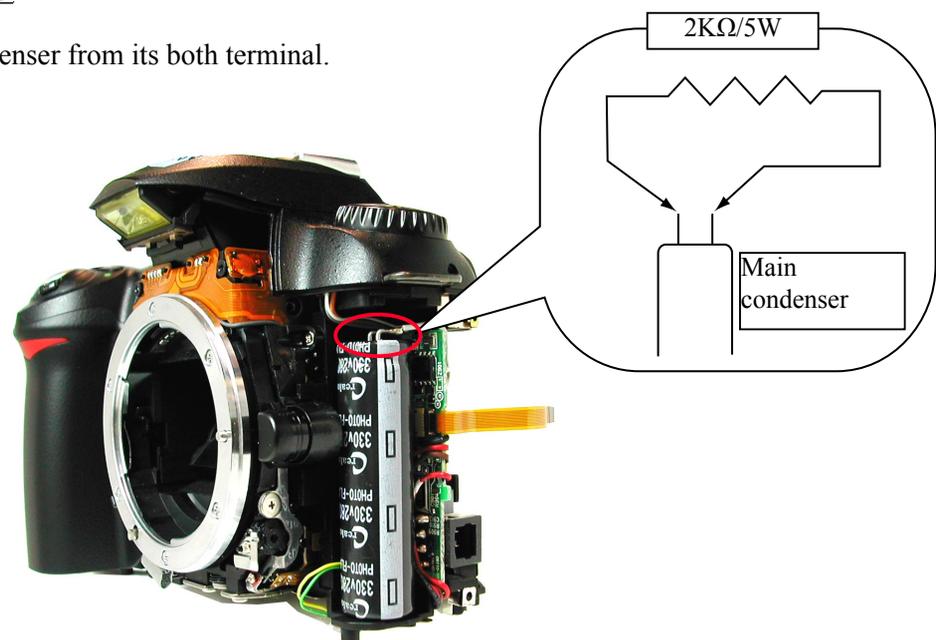
Covers

- First, remove the front cover (#B5024).



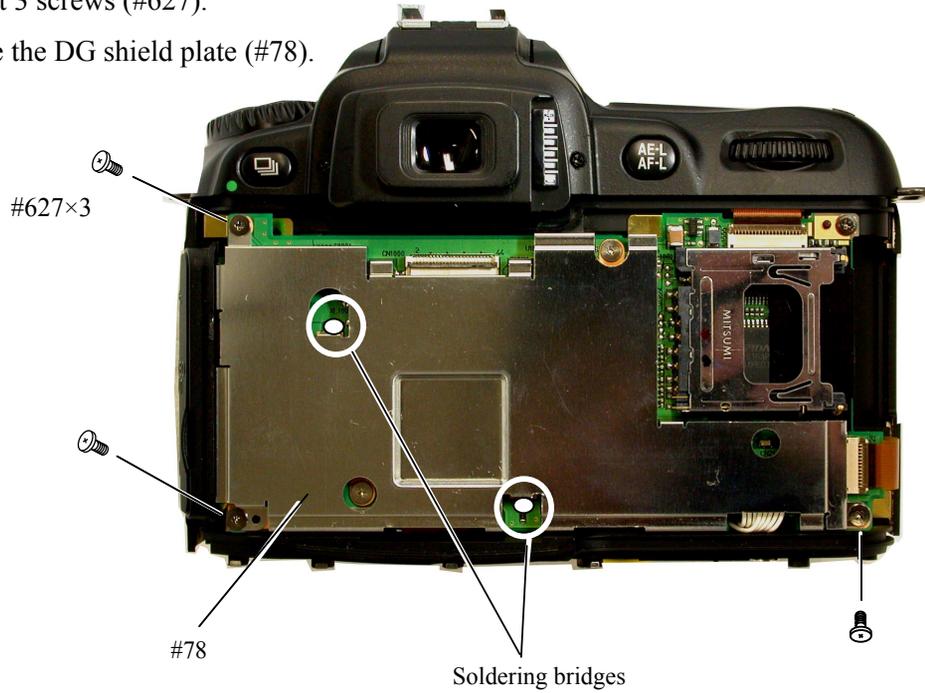
Discharge Main condenser

- Discharge the main condenser from its both terminal.



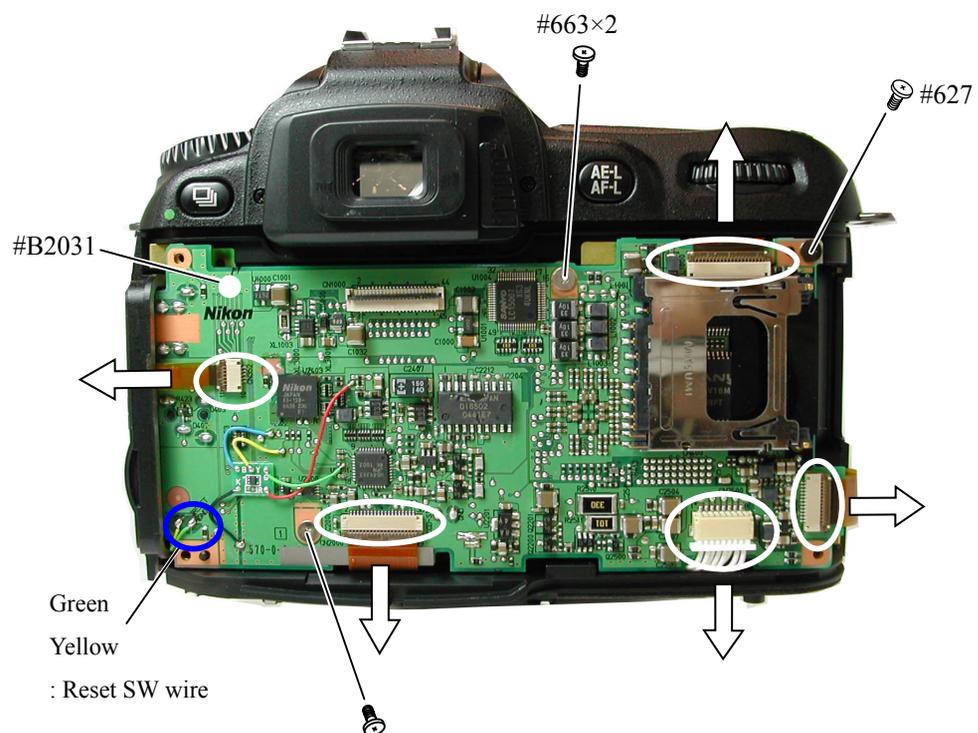
DG shield plate

- Remove 2 soldering bridges.
- Take out 3 screws (#627).
- Remove the DG shield plate (#78).



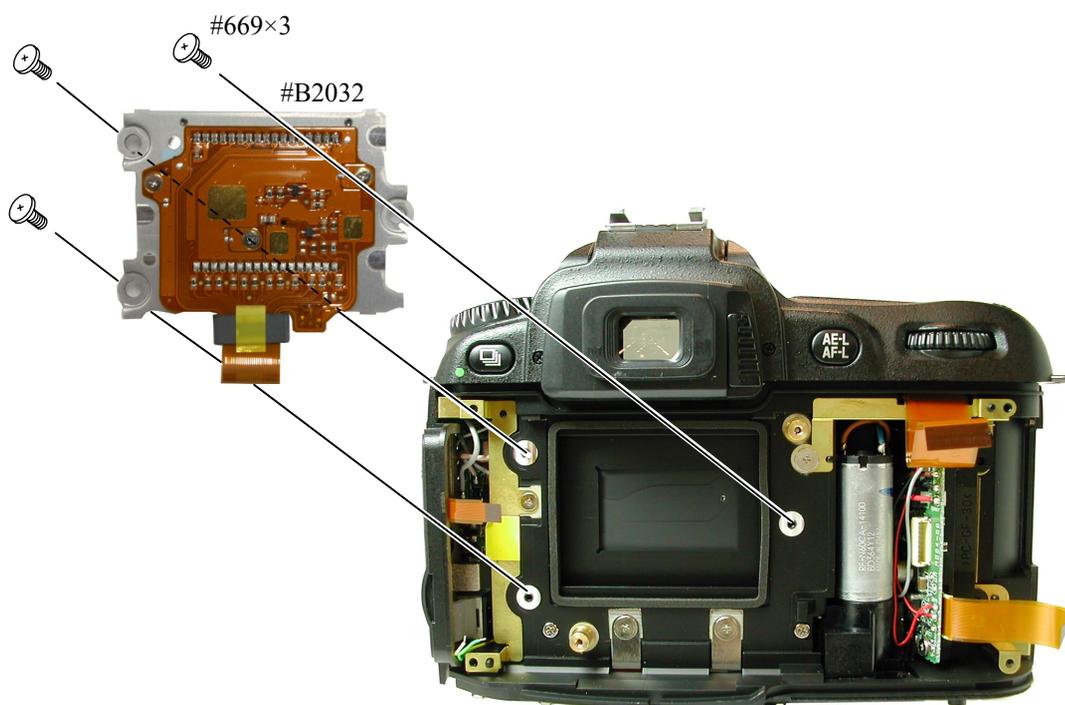
DG-PCB unit

- Remove 5 connectors.
- Unsolder 2 reset SW wires.
- Take out 2 screws (#663) and the screw (#627) to remove the DG-PCB unit (#B2031).



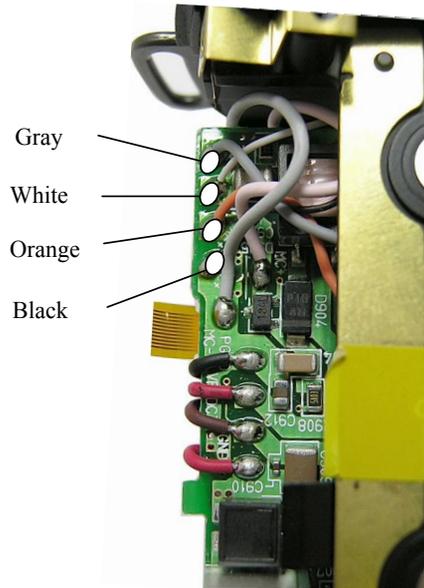
CCD/FPC unit

- Take out 3 screws (#669) to remove the CCD/FPC unit (#B2032).

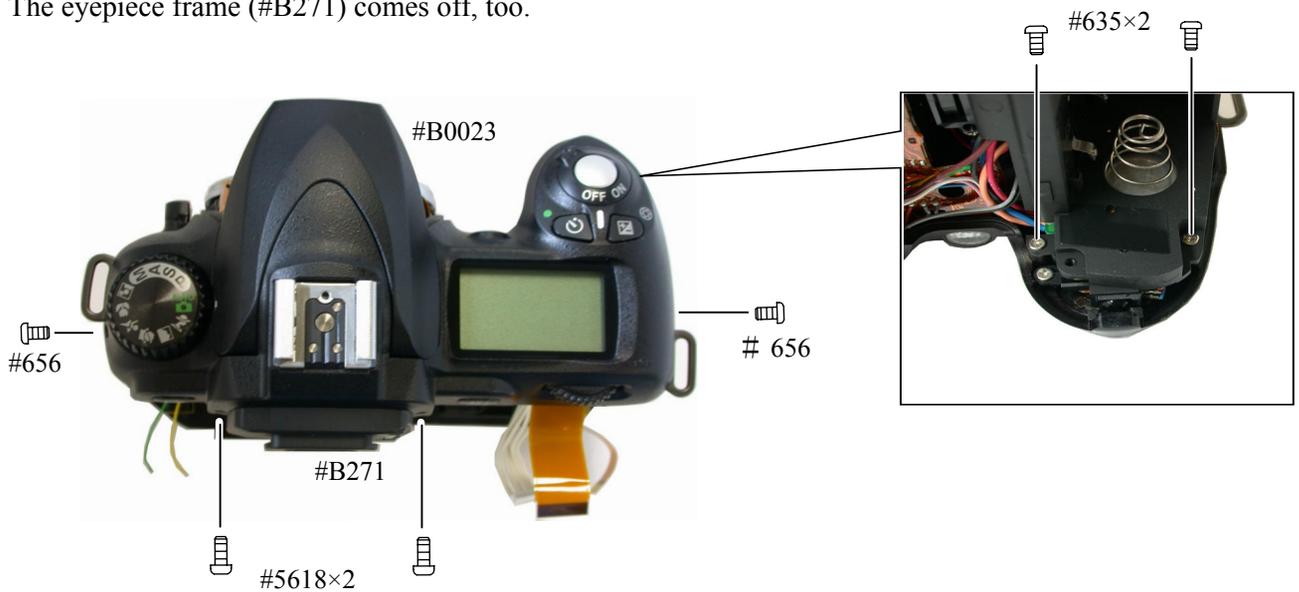


Top Cover

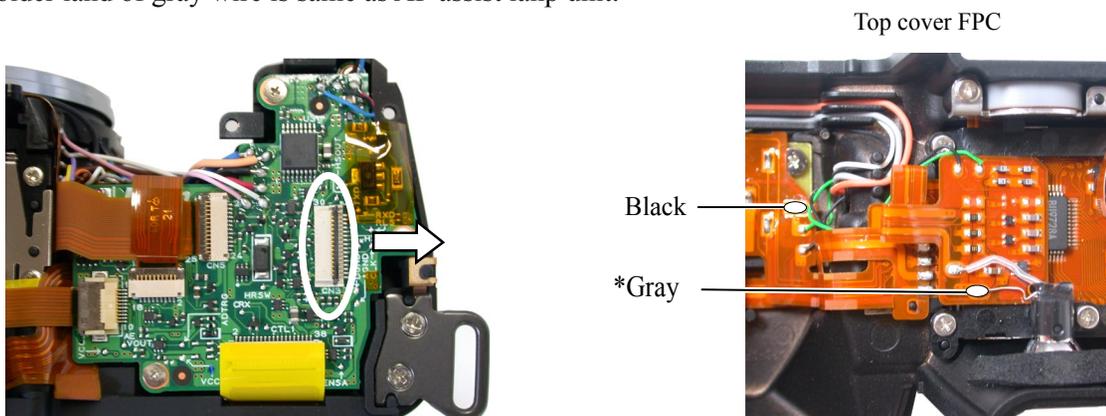
- Unsolder 4 wires.



- Take out 2 screws each of (#635, #656, and #5618).
- The eyepiece frame (#B271) comes off, too.

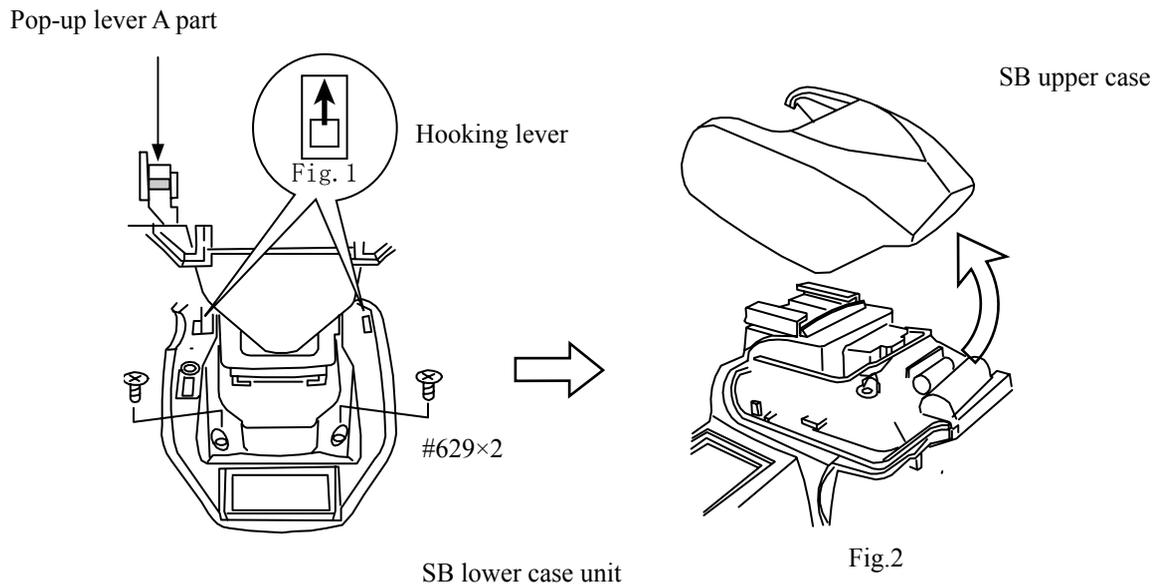


- Remove the top cover FPC (#1007) from the connector.
- Unsolder 2 wires of the top cover FPC.
- * The solder land of gray wire is same as AF assist lamp unit.

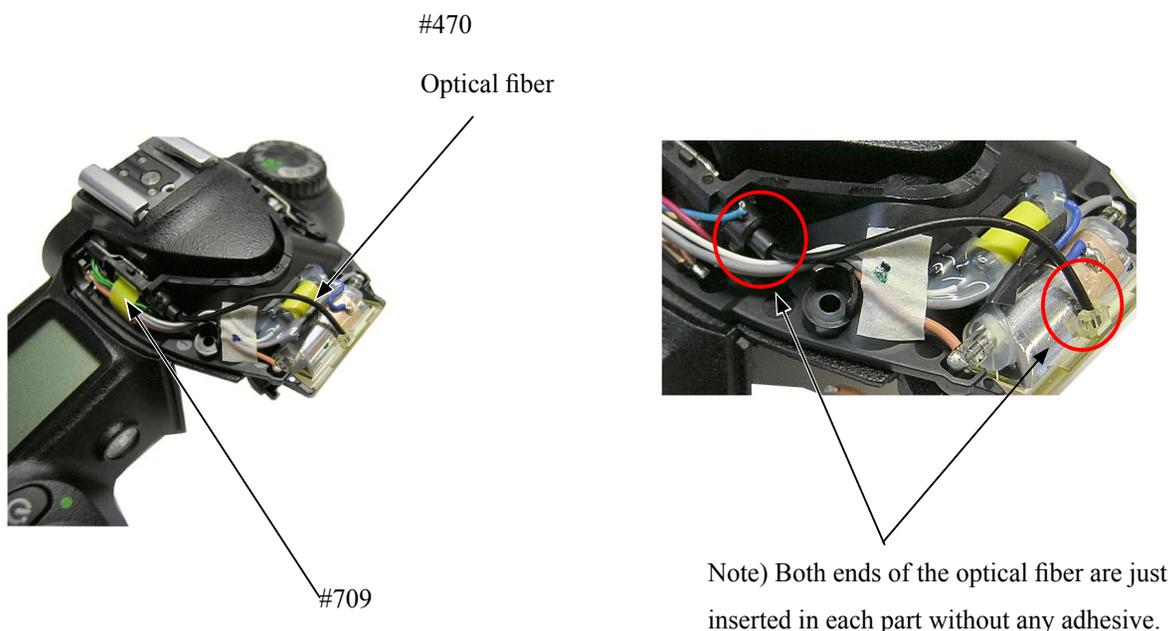


SB upper case

- Press the pop-up lever A part of the top cover unit so that the built-in SB pops up.
- Take out 2 screws (#629).
- Push from beneath the hooking lever of the SB upper case as shown in Fig.1 . Then slide 2 hooks in the direction of the arrow to remove the lever.
- Deactivate pop-up of the SB lower case unit, and remove the SB upper case. (Fig.2)

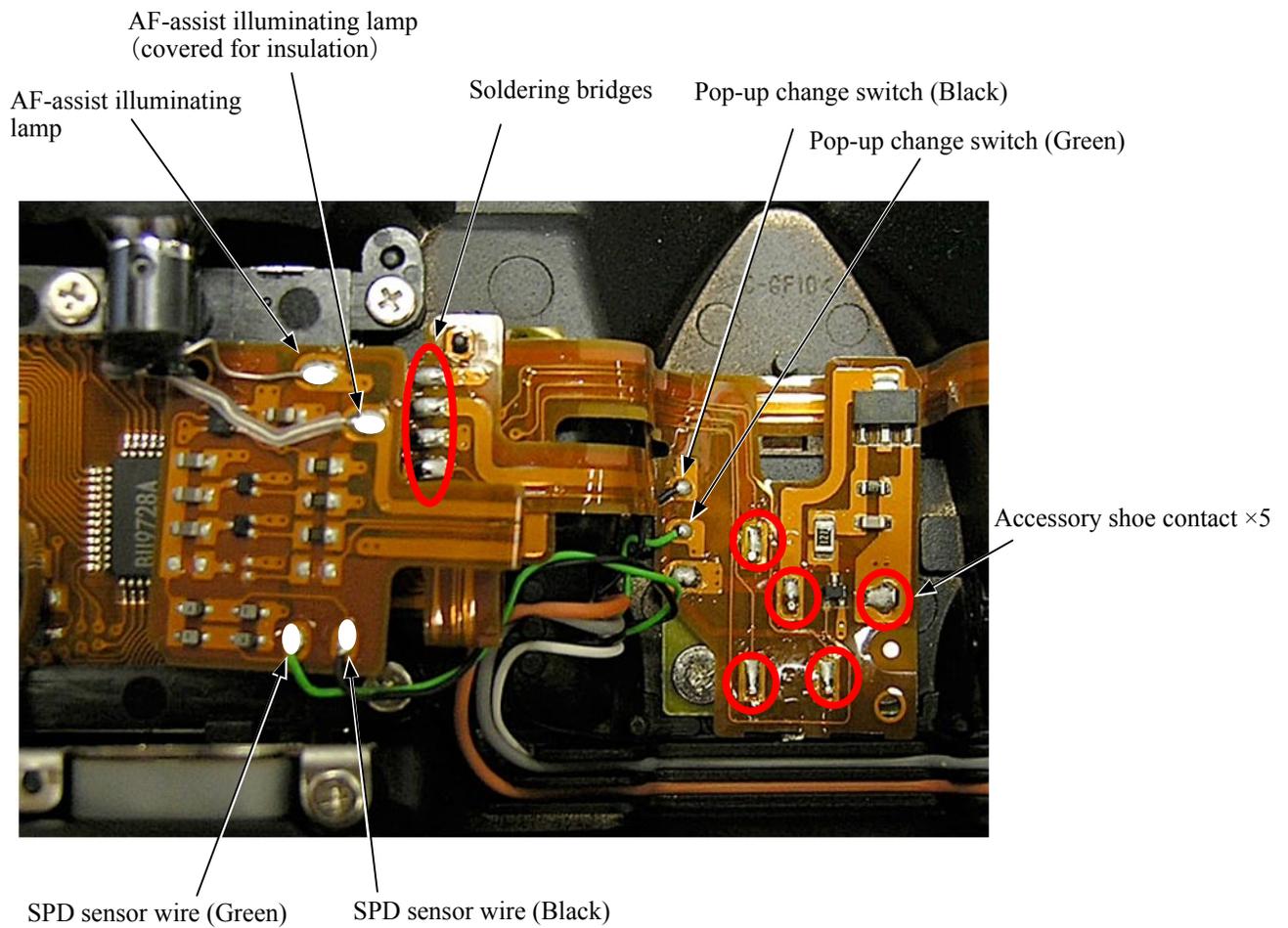


- Remove the tape (#709).
- Remove the optical fiber (#470) from the sensor.

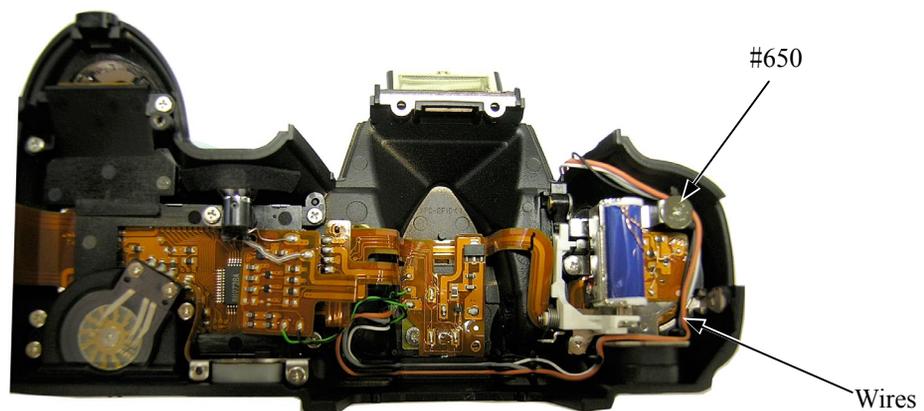


Top cover FPC / Wiring

- Remove the soldering bridges.
- Remove the 2 solders of AF-assist illuminating lamps.
- Remove the solders of 2 SPD sensor wires.
- Remove the solders of 2 pop-up change SW wires.
- Remove the solders of 5 accessory shoe contacts.

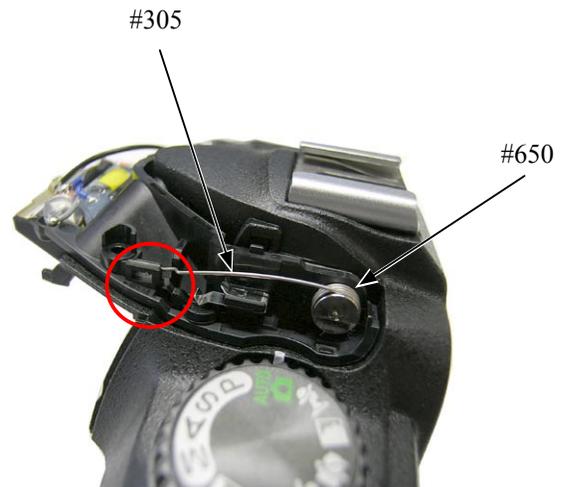


- Remove the wire-retaining screw (#650).
- Remove wires.



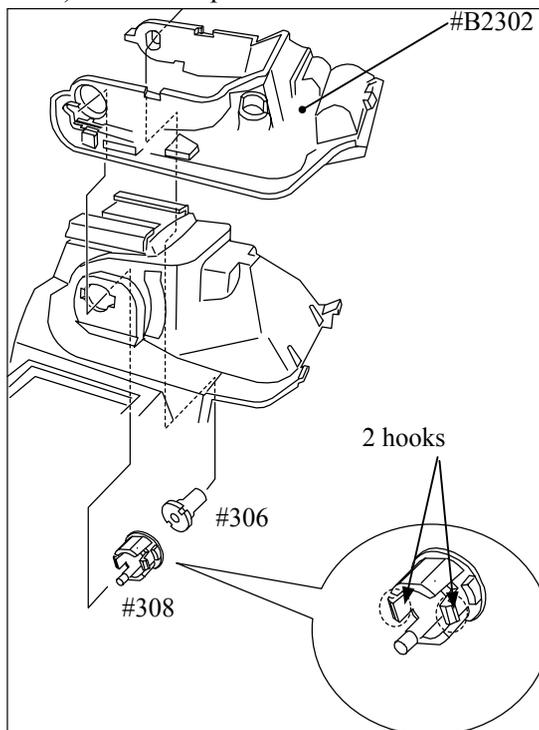
Flash-up spring

- Unhook the Flash-up spring (#305).
- Take out the screw (#650) and remove the Flash-up spring (#305).

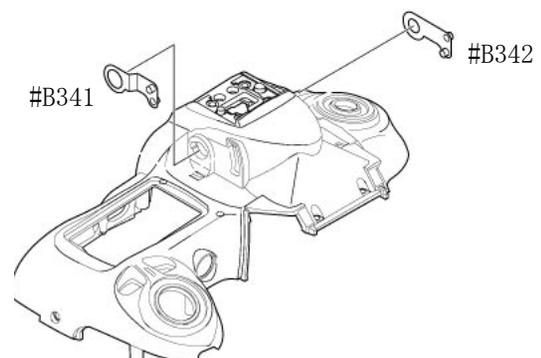


SB lower case unit

- Pull each wire out of hole.
- Loosen 2 hooks of the collar (#308) to remove it.
- Remove the SB case axle (#306).
- Detach the SB lower case unit (#B2302) from the top cover.

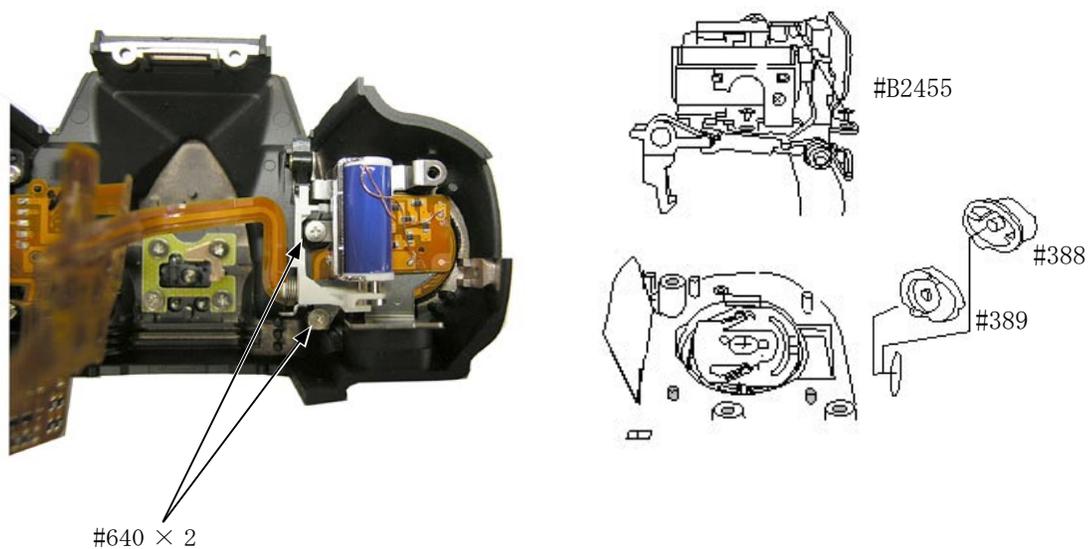


- Remove #B341 and #B342.



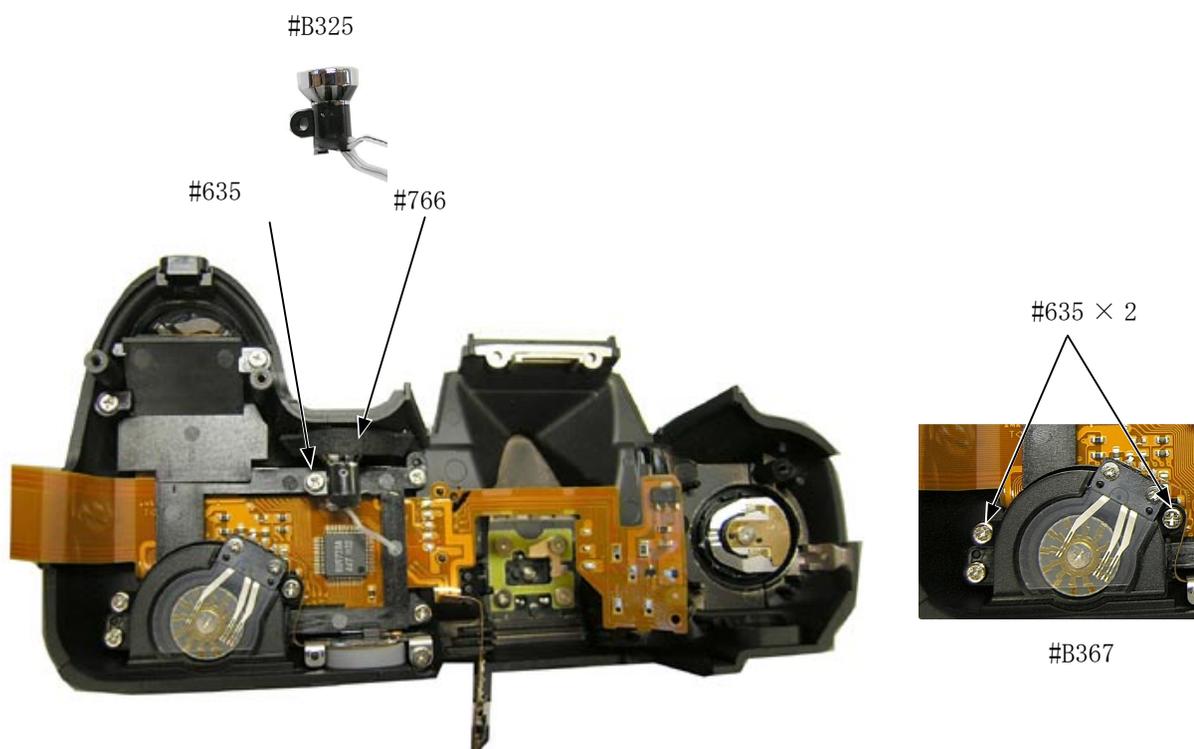
M/DFPC unit

- Take out 2 screws (#640) to remove the M/DFPC unit (#B2455).
- Remove the rubber SW (#389) and shooting operation-mode button (#388).



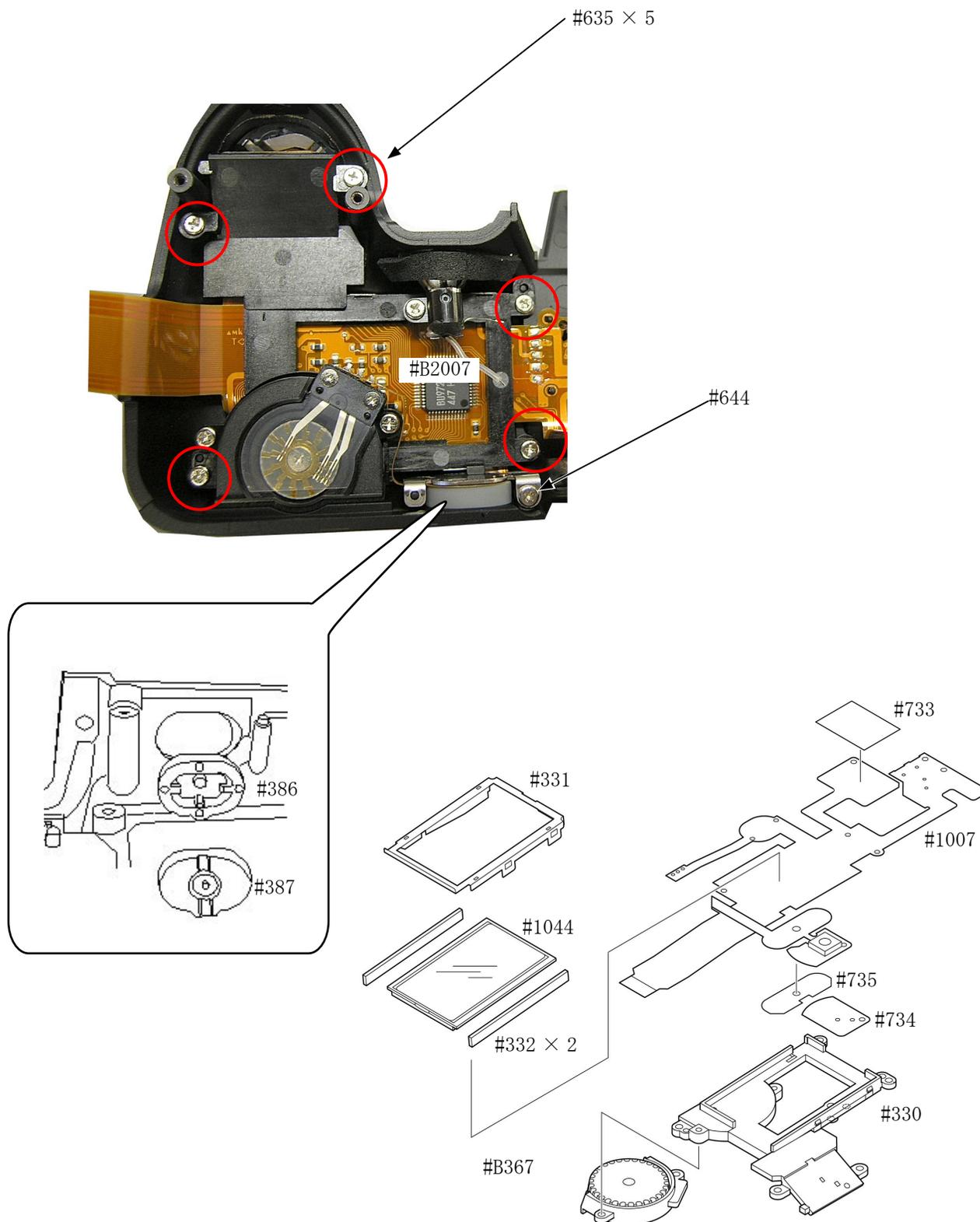
AF-assist illuminating lamp / Command dial

- Remove the light-leak proof sponge (#766).
- Take out the screw (#635).
- Remove the AF-assist illuminating lamp (#B325).
- Remove 2 screws (#635).
- Lift to slack the command dial (#B367).

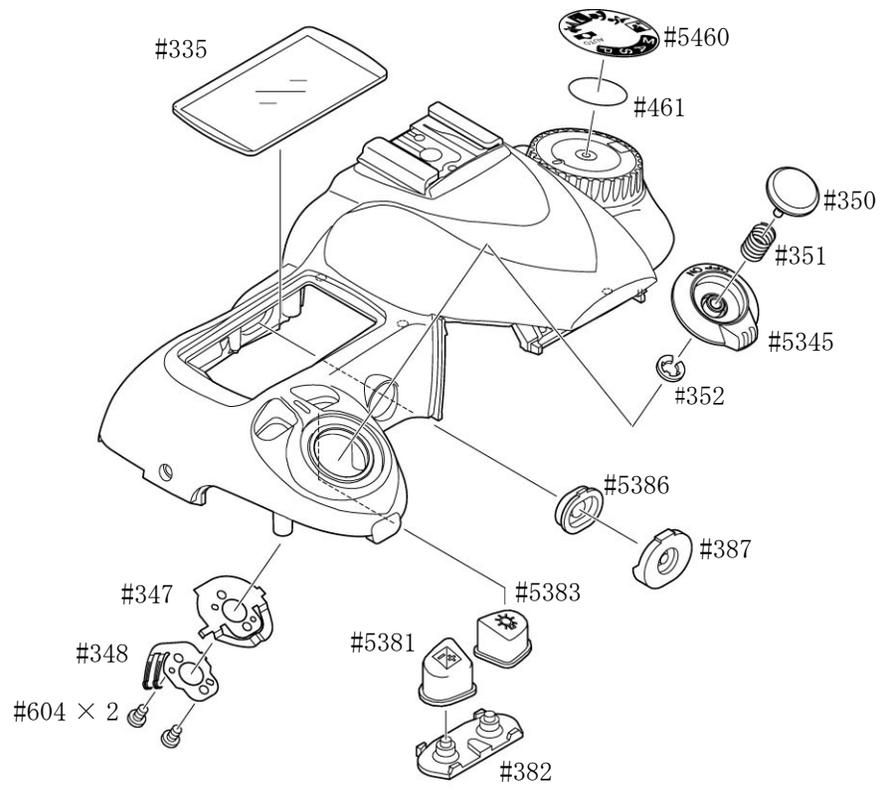


Top cover FPC

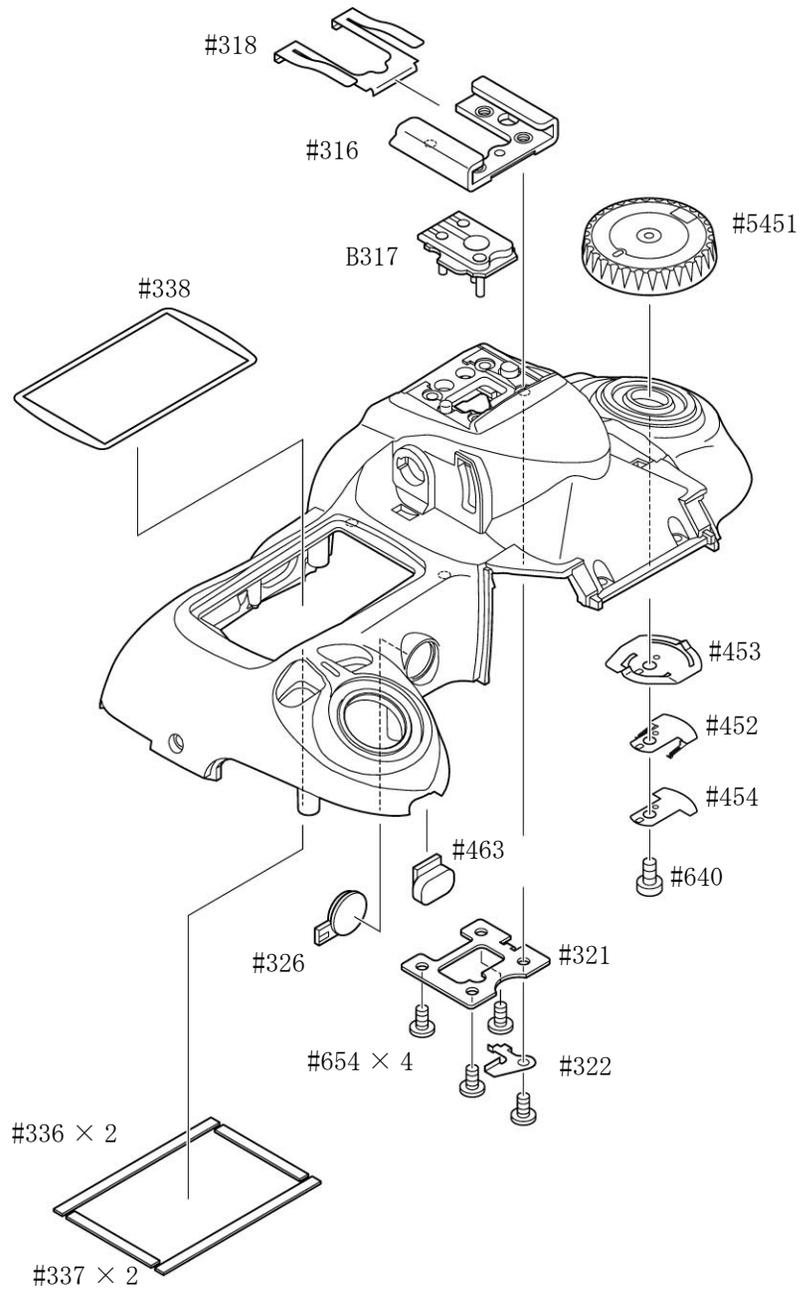
- Take out the screw (#644).
- Take out 5 screws (#635).
- Remove the top cover FPC (#B2007).
- Remove the AE-L rubber SW (#387) and AE-L button (#386).



Release button / other small parts

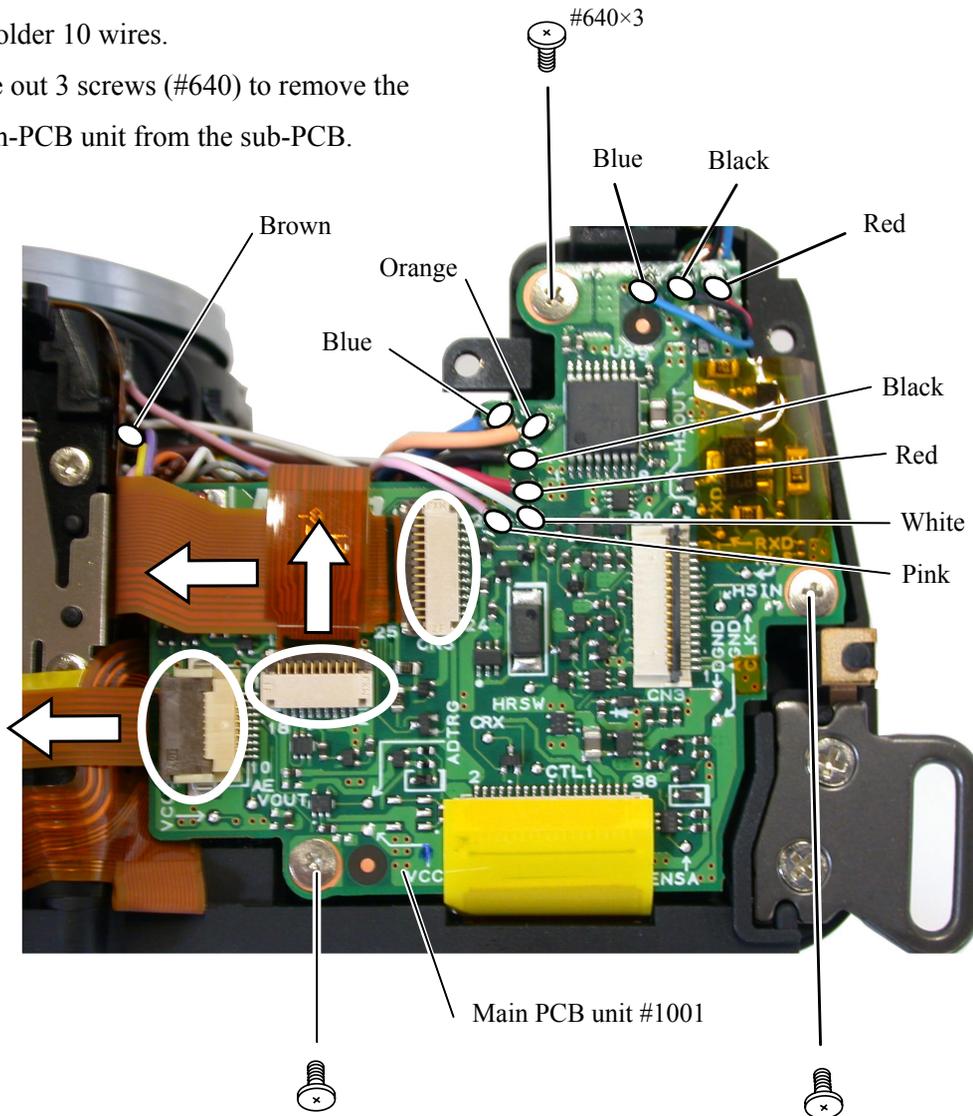


Outer LCD window / shoe mold unit / accessory shoe / other small parts



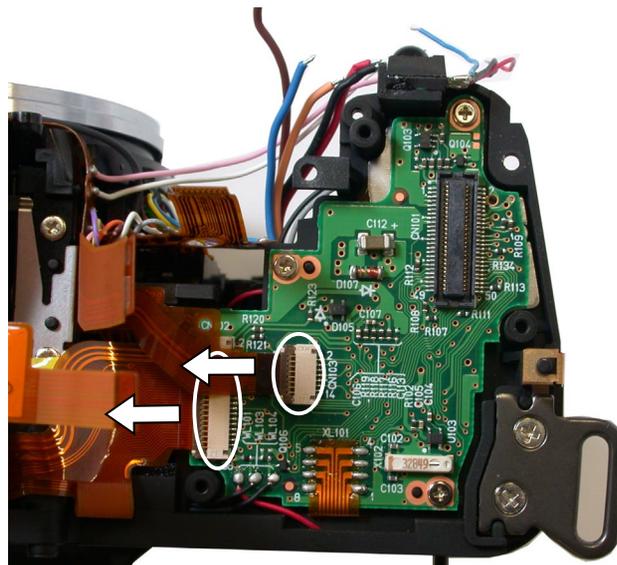
Main PCB unit

- Remove 3 FPCs from the connector.
- Unsolder 10 wires.
- Take out 3 screws (#640) to remove the main-PCB unit from the sub-PCB.



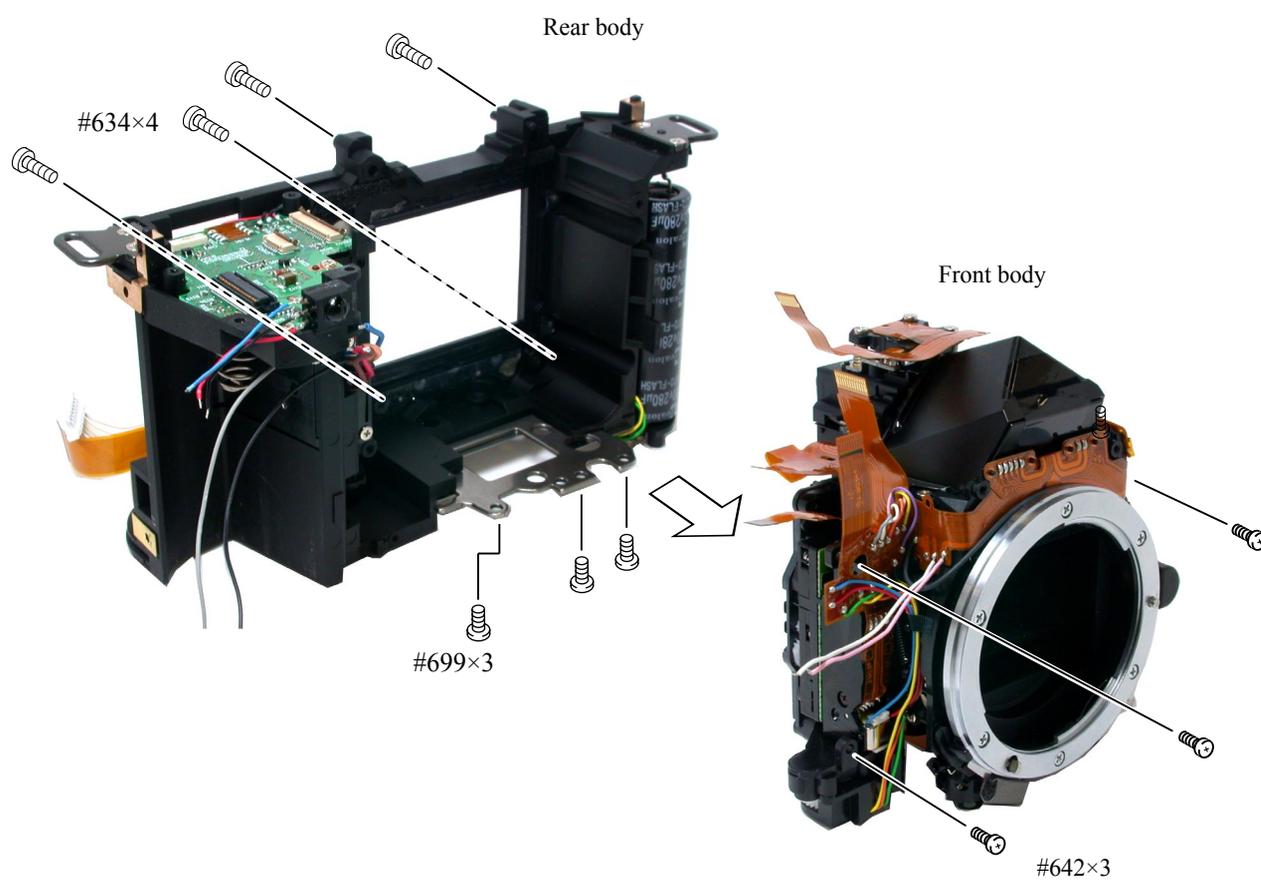
Removal of Connector

- Remove 2 FPCs from the connector



Separation of Front and Rear bodies

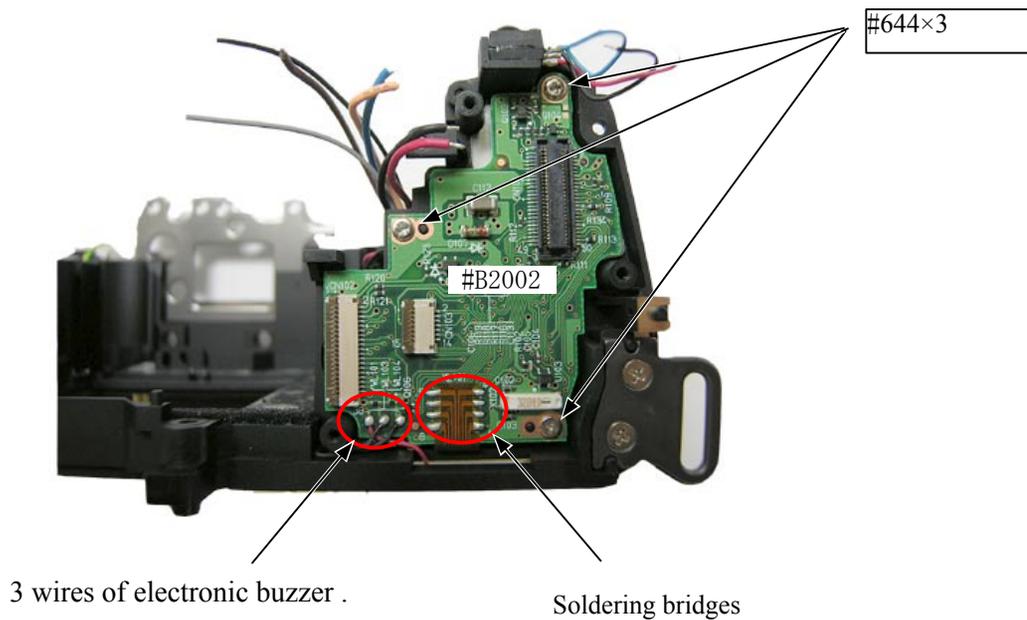
- Take out 3 screws (#699), 4 screws (#634), and 3 screws (#642) to remove the front body.



2. Rear body

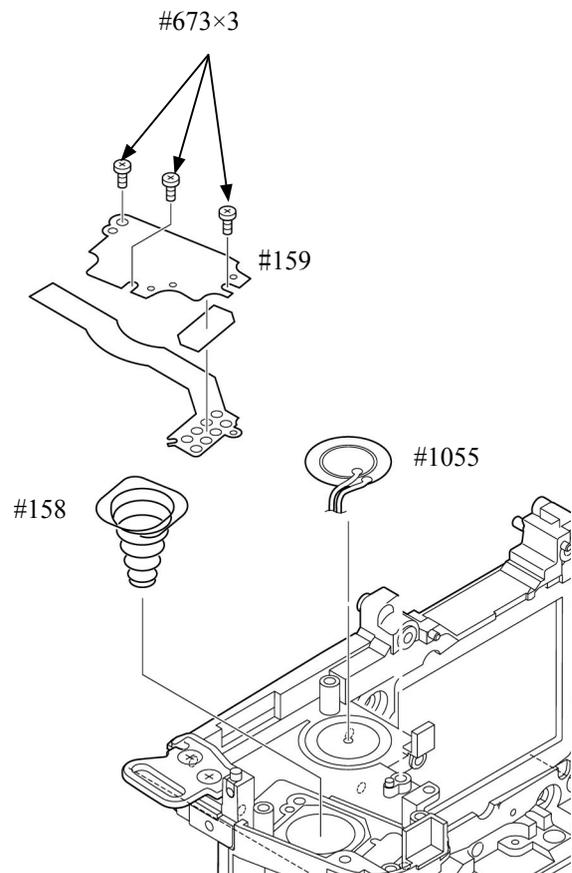
Sub-PCB unit

- Unsolder 3 wires of electronic buzzer .
- Remove the soldering bridges.
- Take out 3 screws (#644).
- Remove Sub-PCB.(#B2002)



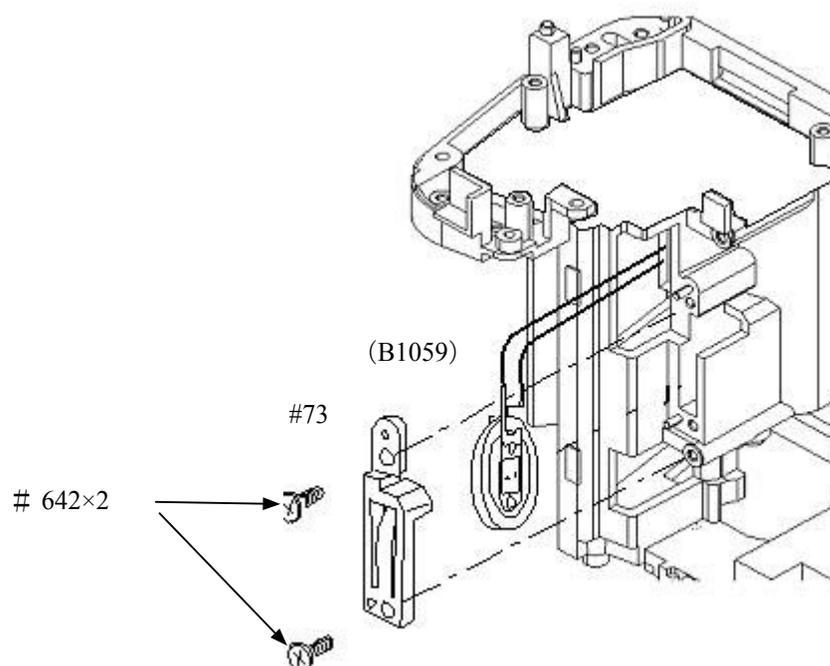
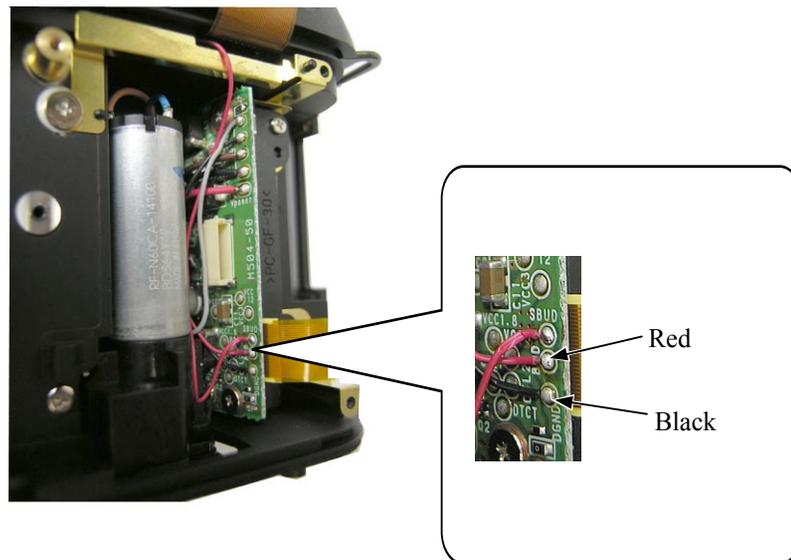
Electronic buzzer unit / Battery-extrusion spring

- Take out 3 screws (#673).
- Remove the retaining plate (#159).
- Remove the battery-extrusion spring (#158).
- Remove the electronic buzzer unit (#1055).



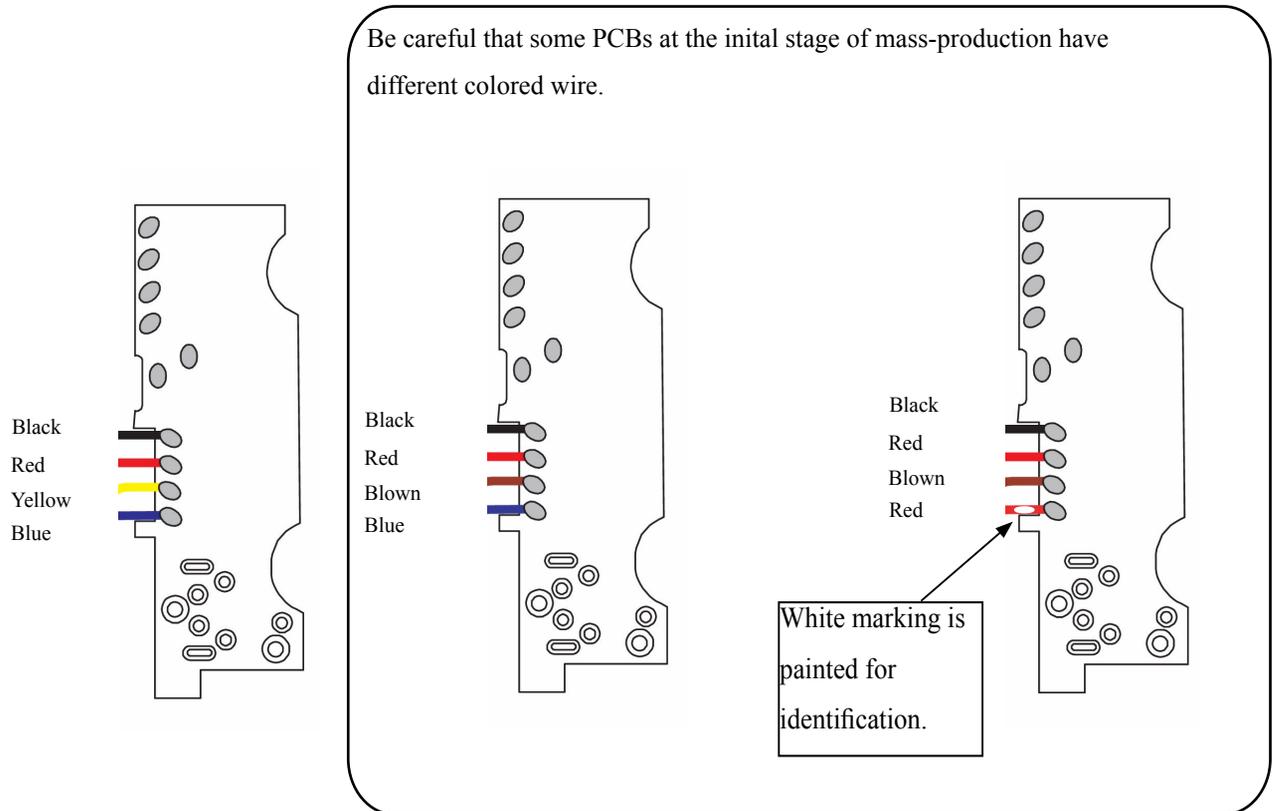
Clock battery unit

- Unsolder 2 wires of the clock battery unit.
- Remove 2 screws (#642).
- Remove the clock battery holder (#73).
- Remove the clock battery unit (B1059).



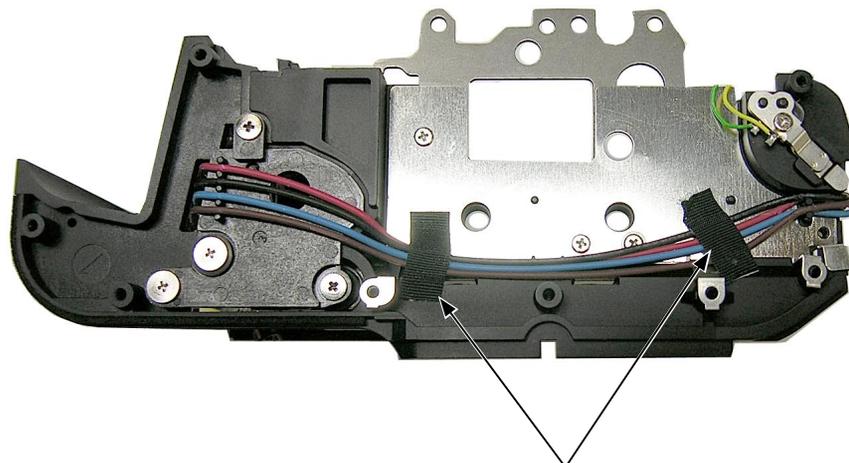
SB-PCBwires

- Unsolder 4 wires of DC/DC PCB unit.



Bottom wires

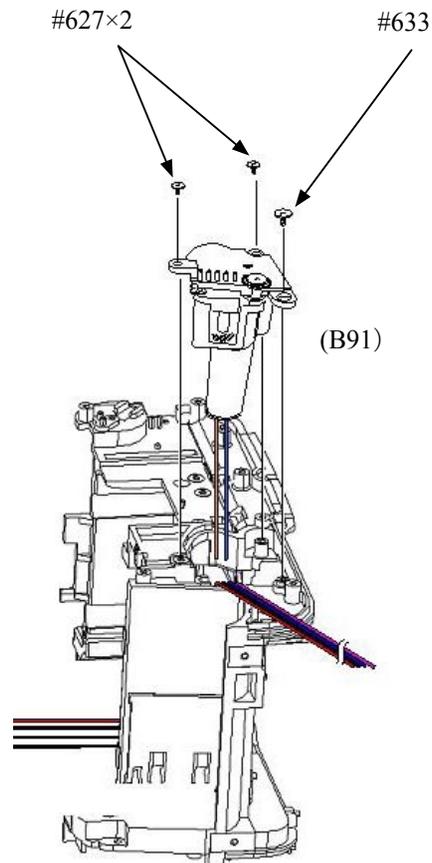
- Remove 2 pieces of tape that arrange wires (#715).
- Remove wires.



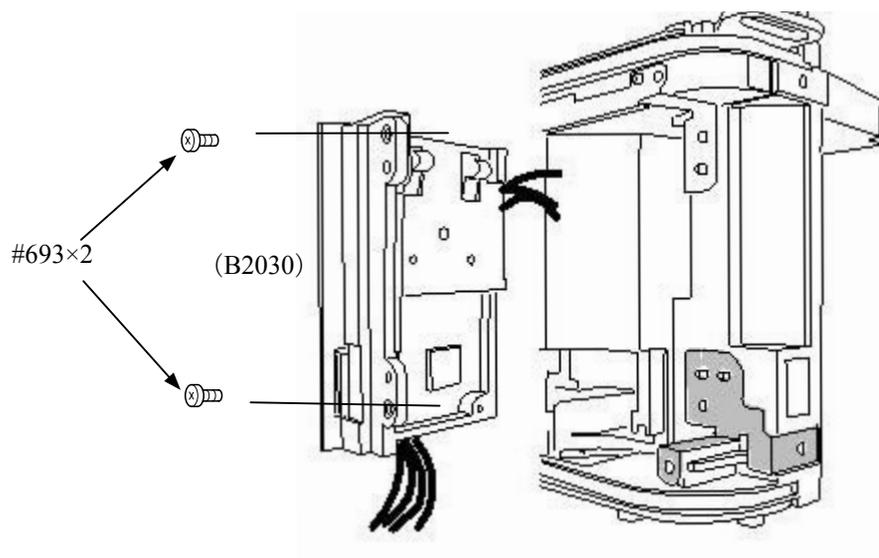
Wire arrangement tape
#715x2

SQ PCB

- Take out 2 screws (#627).
- Take out the screw (#633).
- Remove the SQ-PCB (B91).

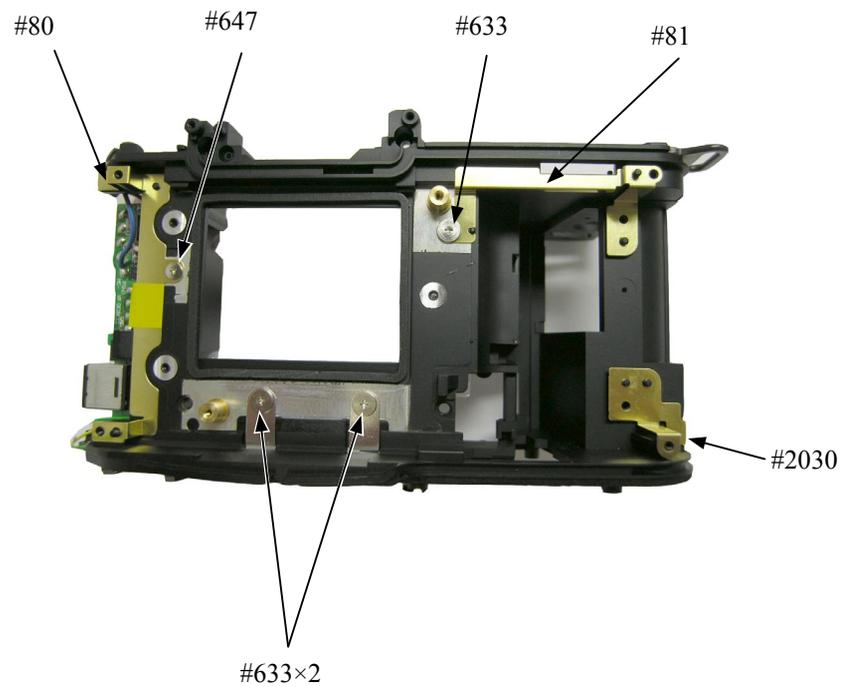
**DC/DC PCB unit**

- Take out 2 screws (#693).
- Remove the DC/DC PCB unit (B2030).

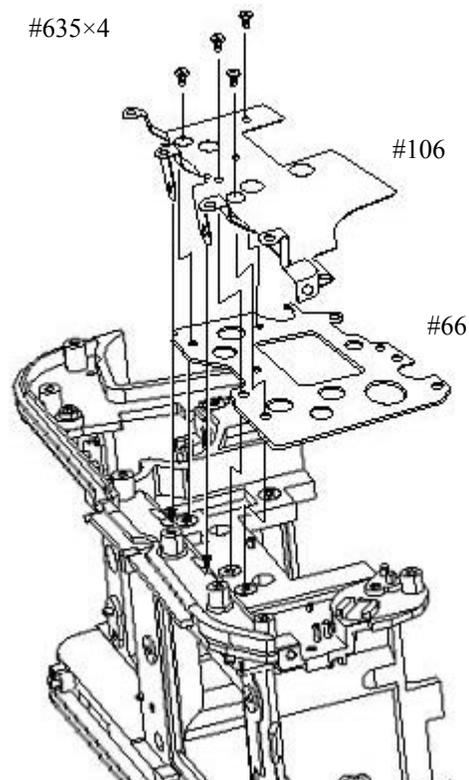


Lug plate / Bottom base unit

- Take out the screw (#647).
- Remove #80.
- Take out the screw (#633).
- Remove #81.
- Remove #2030.
- Take out 2 screws (#633).



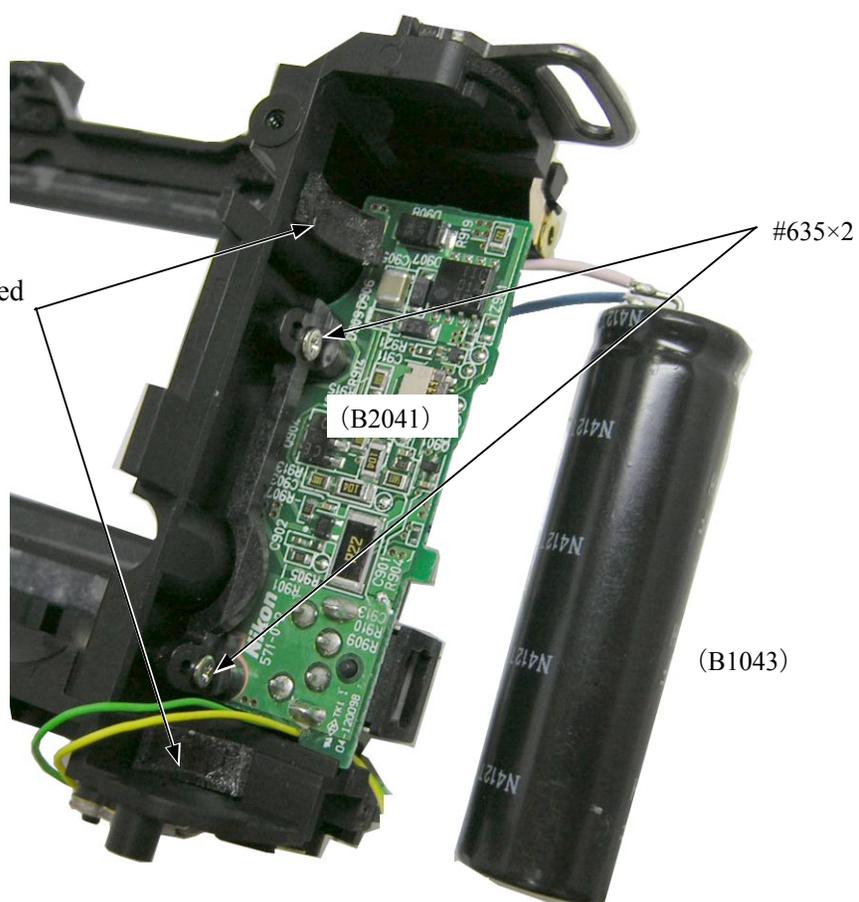
- Take out 4 screws (#635).
- Remove the bottom base unit (#66) and bottom conduction plate (#106).



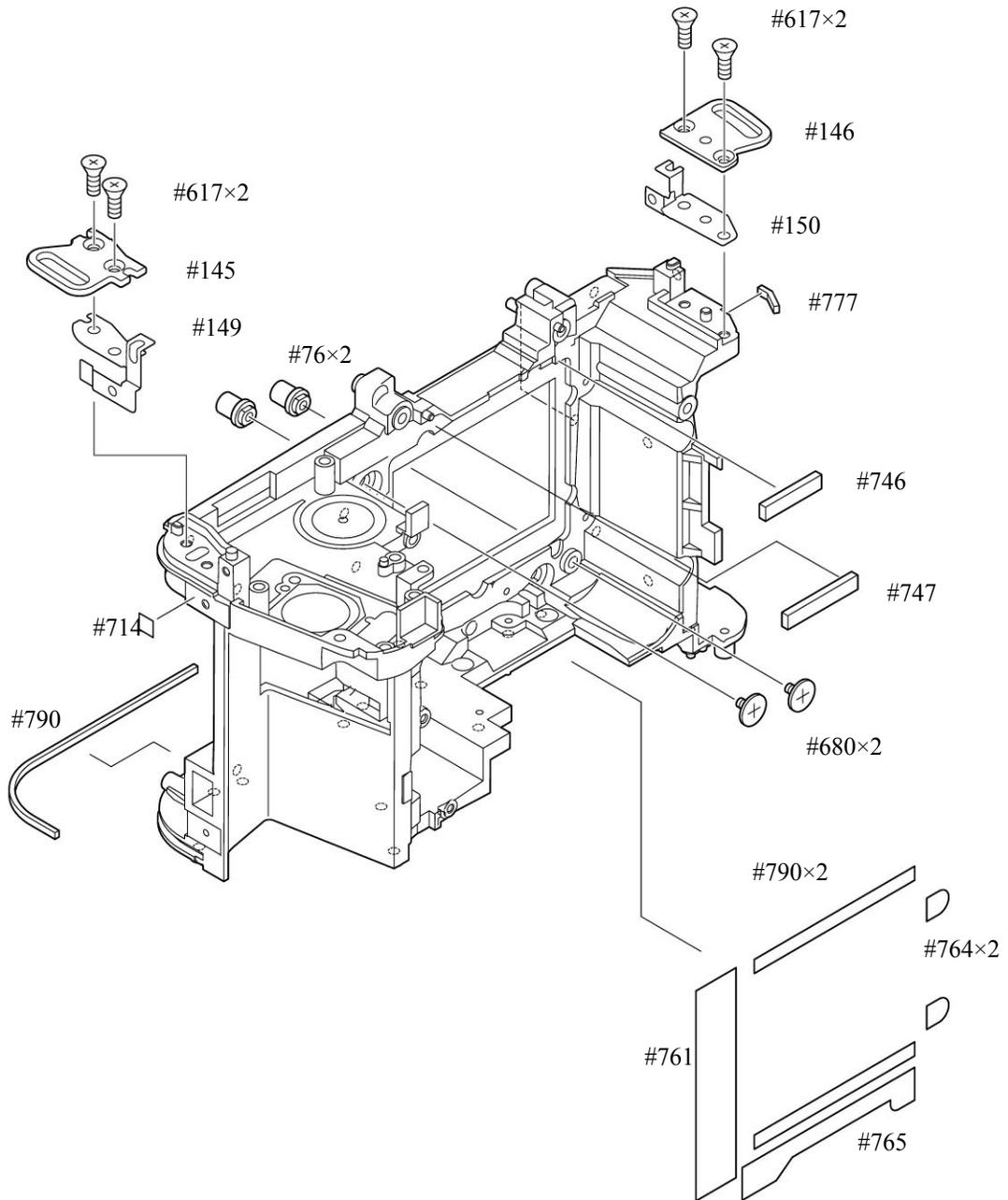
SB unit

- Remove the condenser (B1043).
- Take out 2 screws (#635).
- Remove the SB unit (B2041).

The condenser (#B1043) is fixed with 2 pieces of the both-sided adhesive tape (#754).



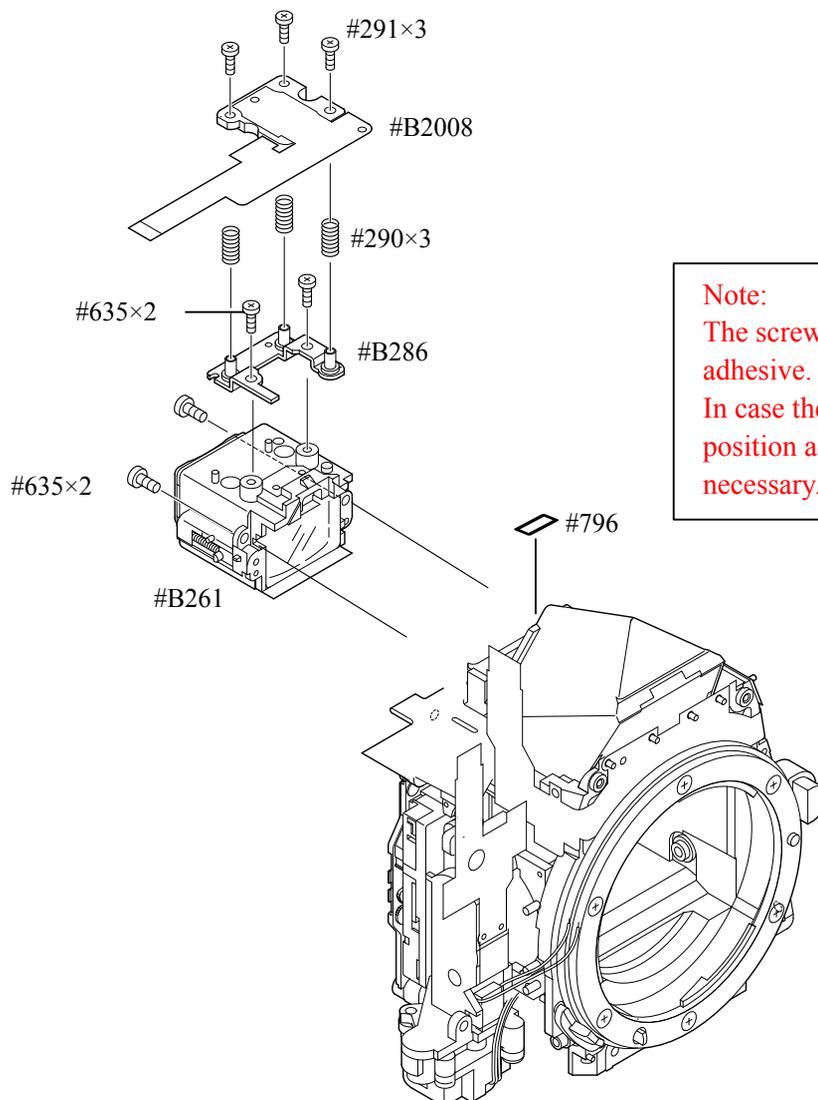
Rear body small parts



3. Front Body

Eyepiece unit Metering FPC unit

- Take out 3 screws (#291) to remove the metering FPC unit (#B2008).
- 3 springs (#290) come off.
- Take out 2 screws (#635) to remove the metering FPC-base unit (#B286).
- Remove the tape (#796).
- Take out the screw (#635) to remove the eyepiece-lens unit (#B261).

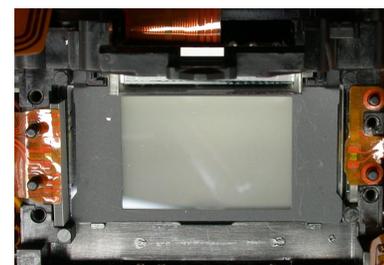
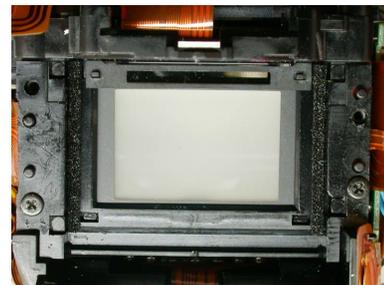
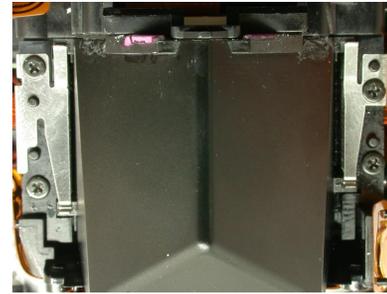
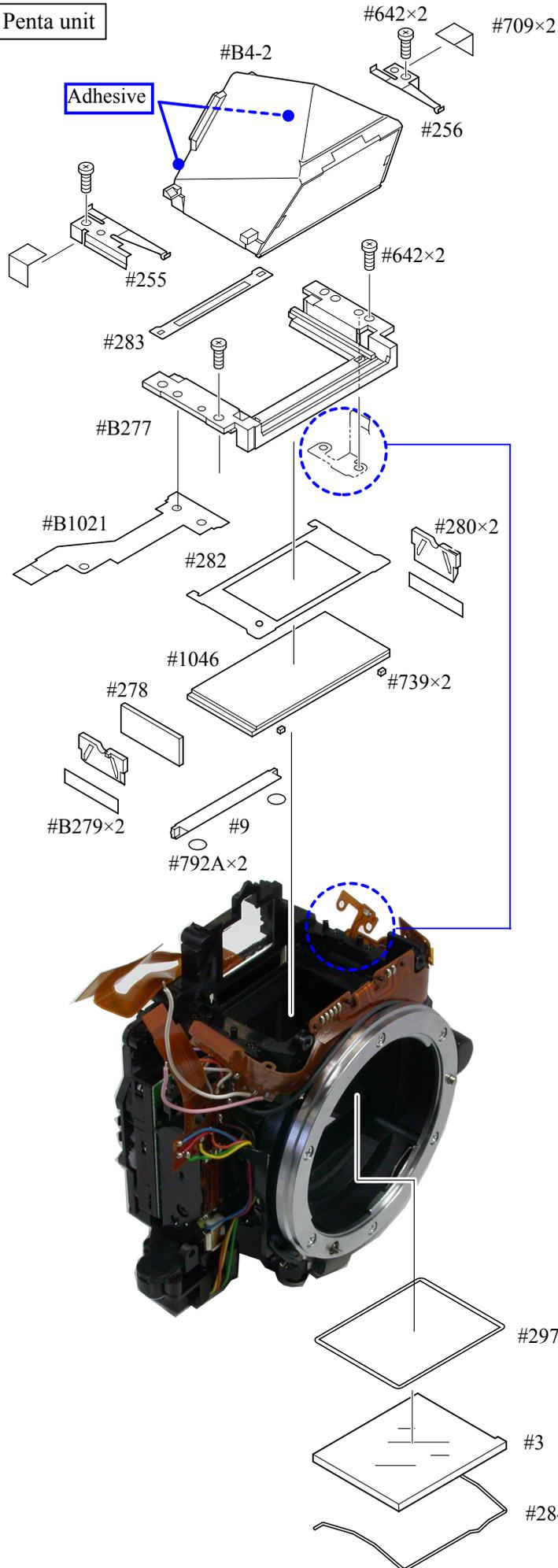


Note:

The screws (#291) are attached with the adhesive.

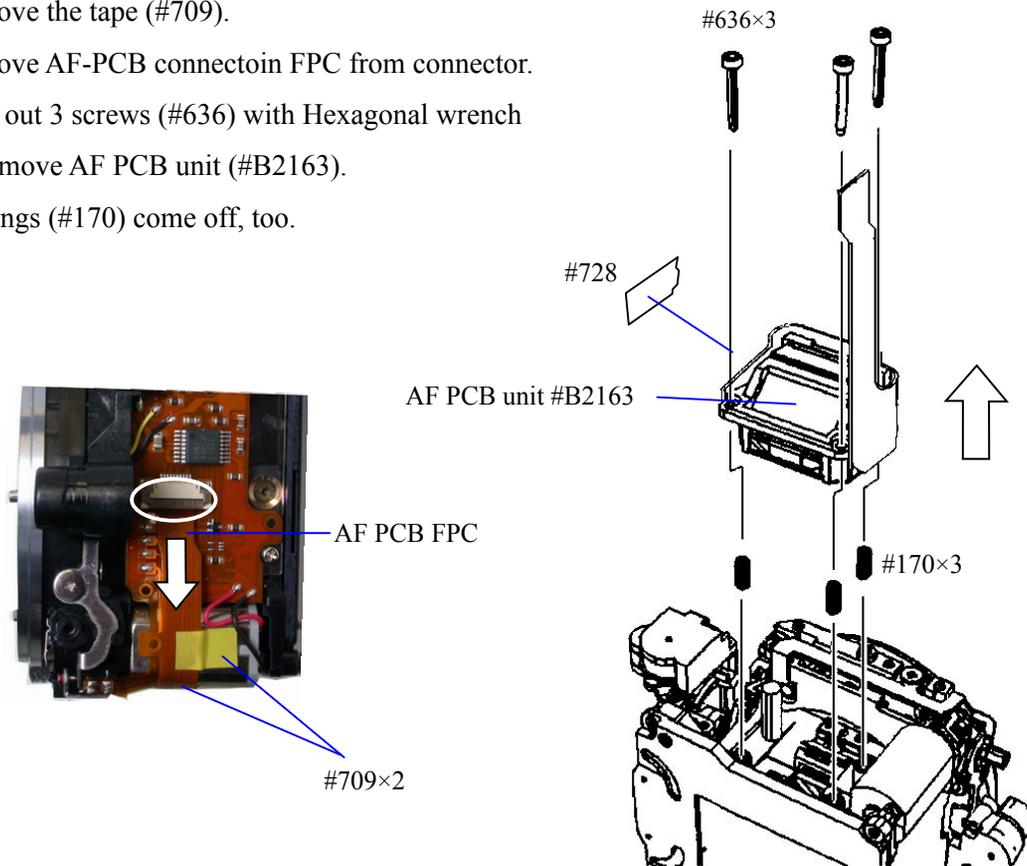
In case they (#291) are moved, AE CCD position adjustment (ref. Assembly) becomes necessary.

Penta unit



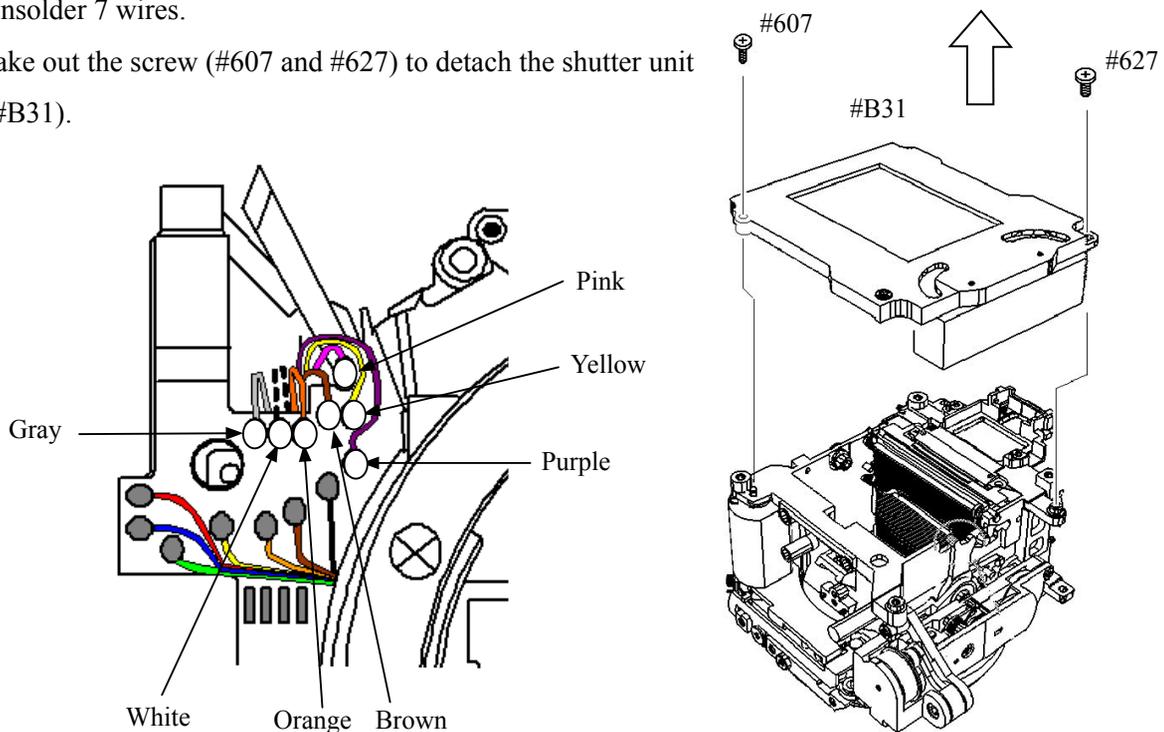
AF PCB unit

- Remove the tape (#709).
- Remove AF-PCB connectoin FPC from connector.
- Take out 3 screws (#636) with Hexagonal wrench to remove AF PCB unit (#B2163).
- 3 springs (#170) come off, too.



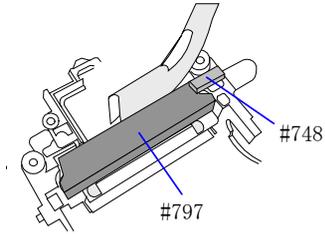
Shutter unit

- Unsolder 7 wires.
- Take out the screw (#607 and #627) to detach the shutter unit (#B31).

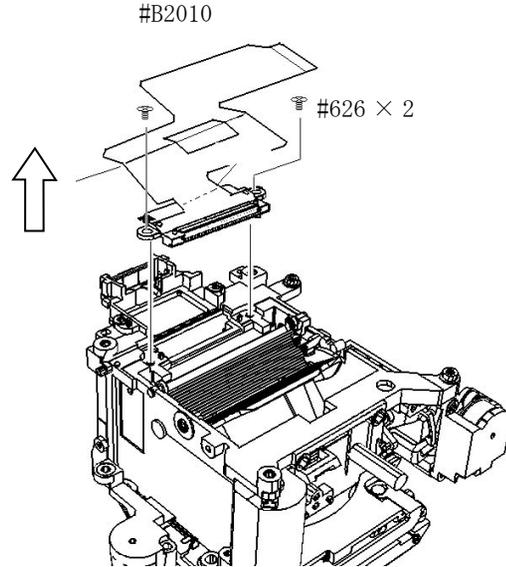


Inner LCD unit

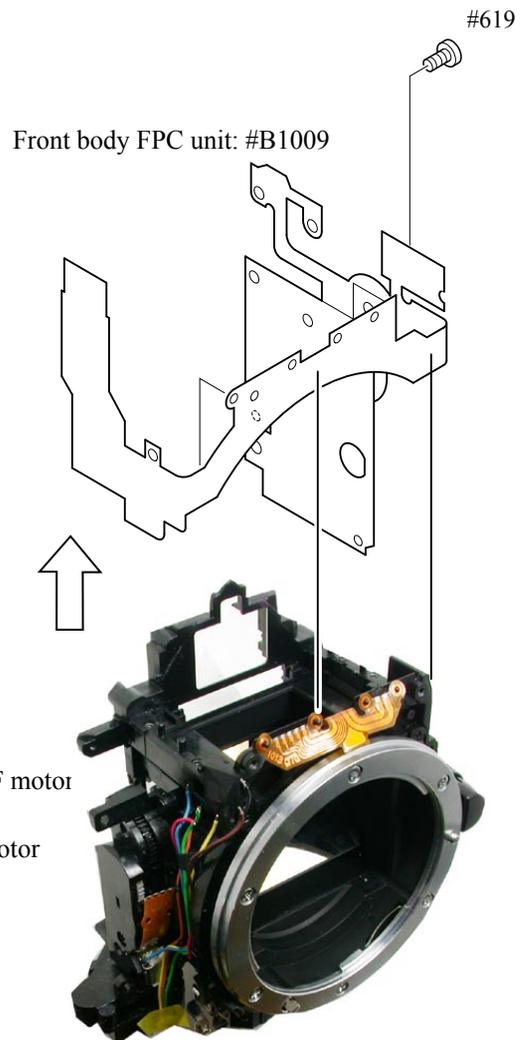
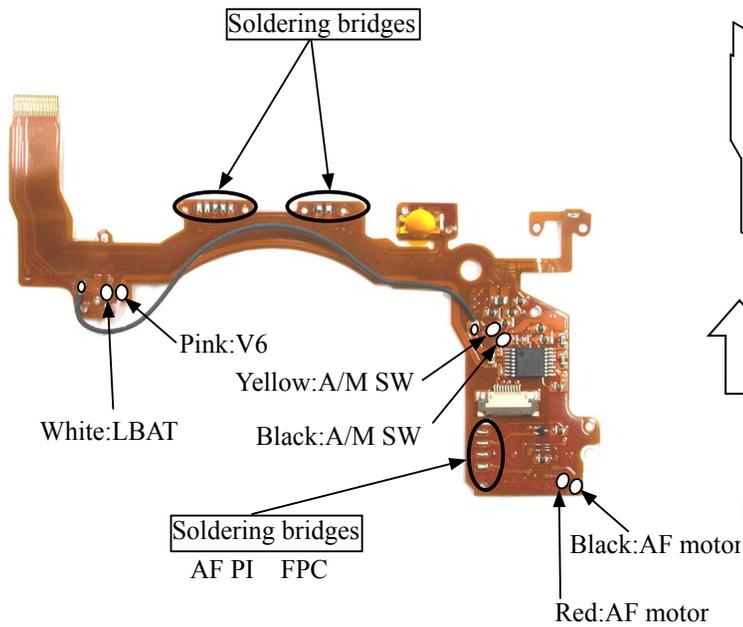
- Remove the sponge (#797 and #748).



- Take out 2 screws (#626) to remove the inner LCD unit (#B2010).



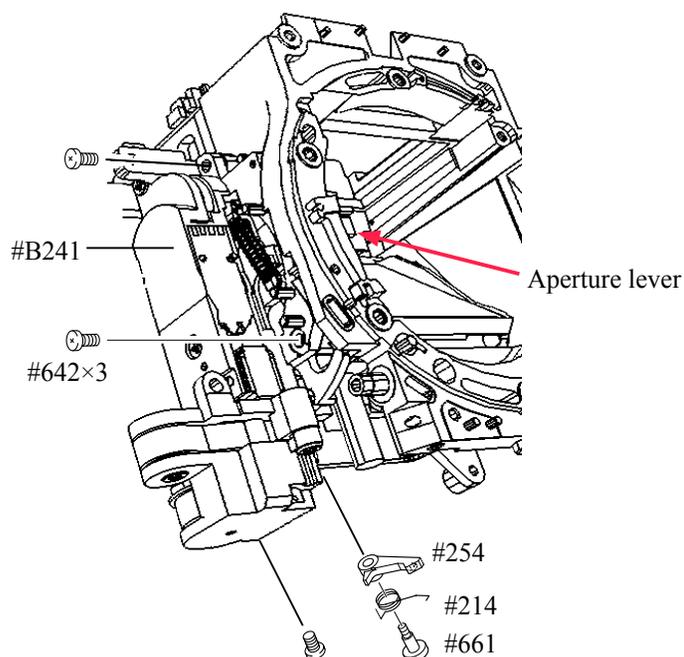
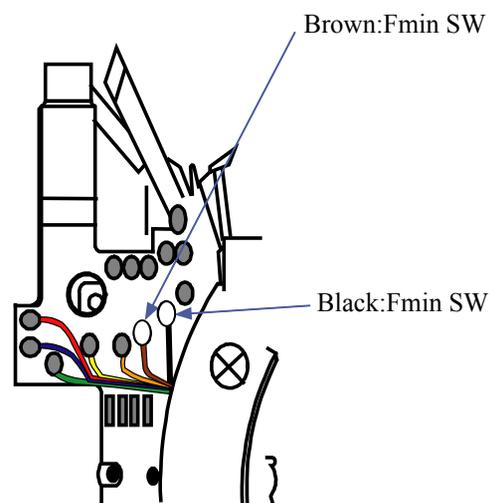
Front body FPC unit



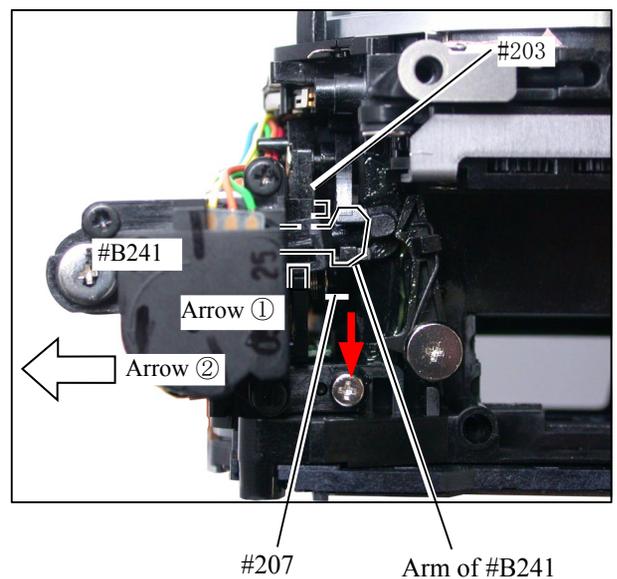
Aperture control unit

Procedure

- ① Unsolder 2 wires .
- ② Remove the screw (#661), spring (#214) and the lever (#254).
- ③ Take out 3 screws (#642).
- ④ Press down the aperture lever with Finger to move the aperture coupling lever (#207) in the direction of arrow(①).
- ⑤ In state of ④ , remove the aperture control unit (#B241) by pulling it in the direction indicated by arrow (②) while letting the arm (#B241) escape.



Front body viewed from the bottom



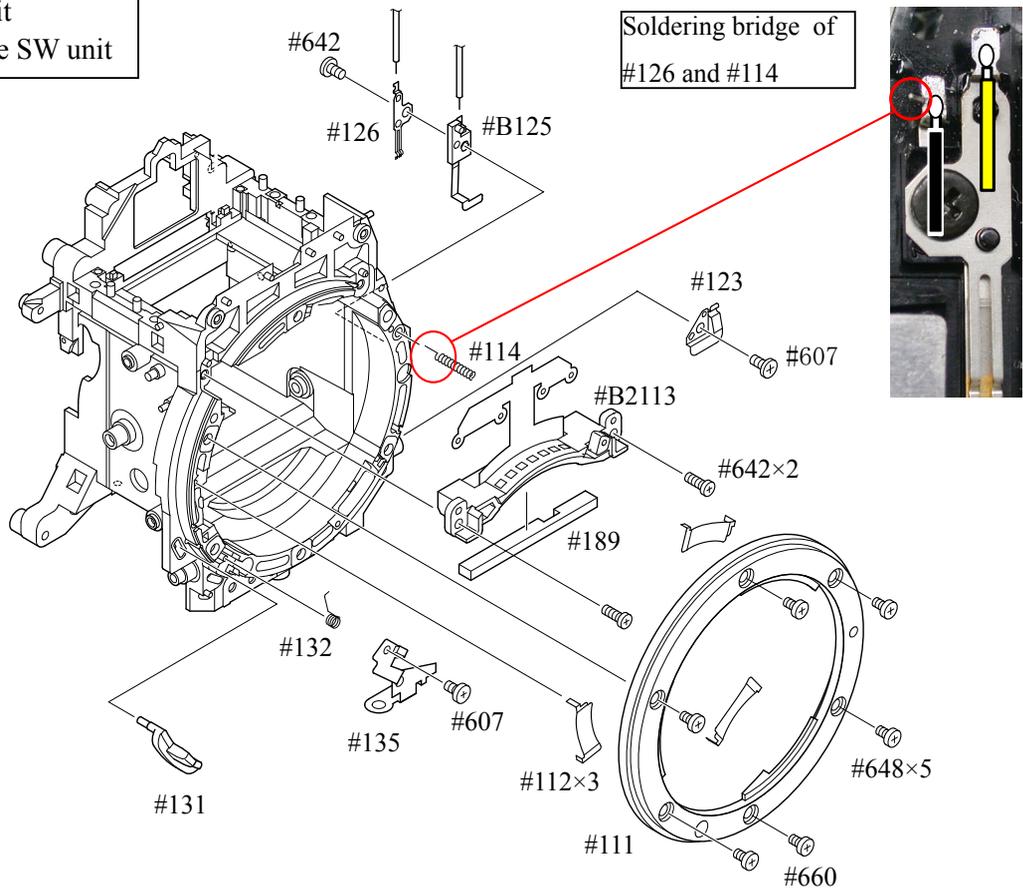
AF driving unit
 Lens release button
 Vertical lever
 Horizontal lever

- First, remove the horizontal lever (#193).

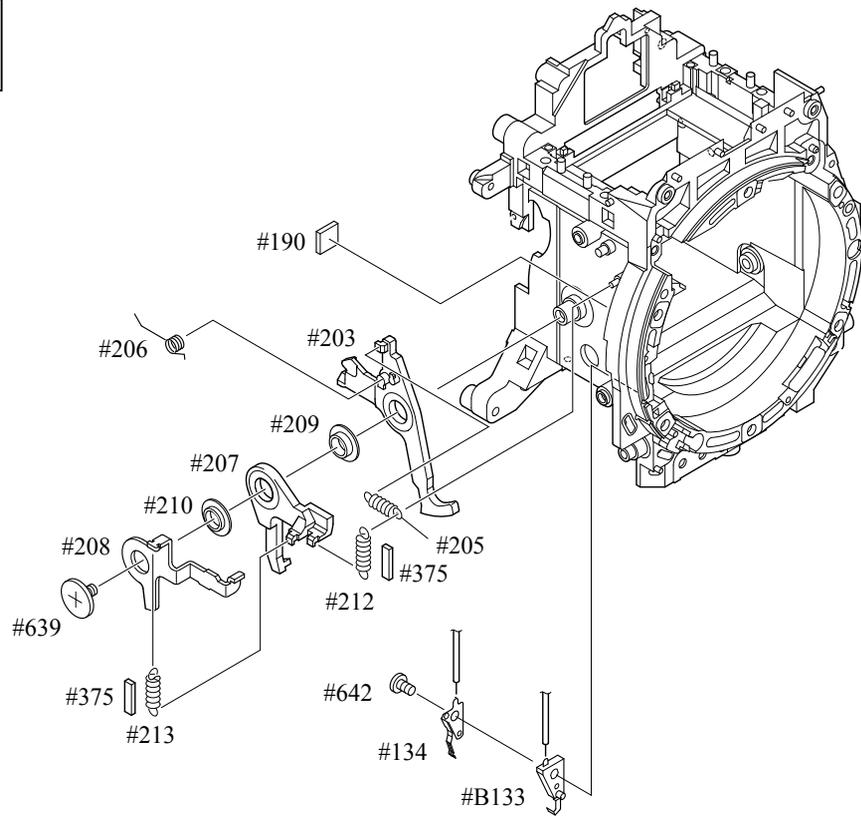


Bayonet unit
 A/M-change SW unit

Soldering bridge of #126 and #114

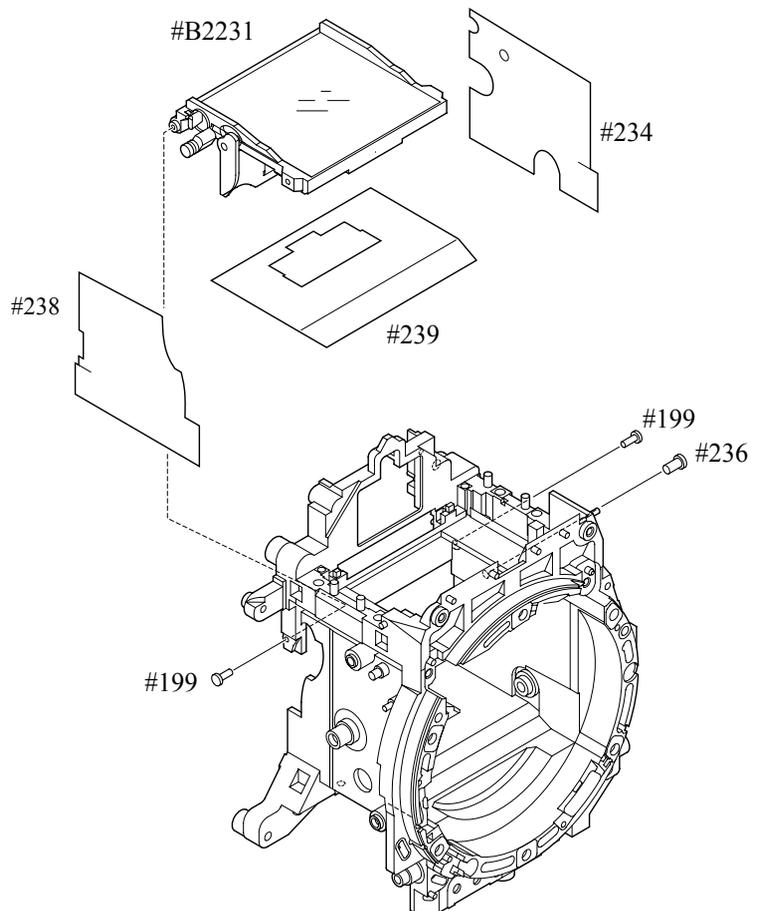


Aperture lever unit
F-min Switch unit



Mirror unit

- Note that 2 pins (#199) and the pin (#236) are attached with the Super X.

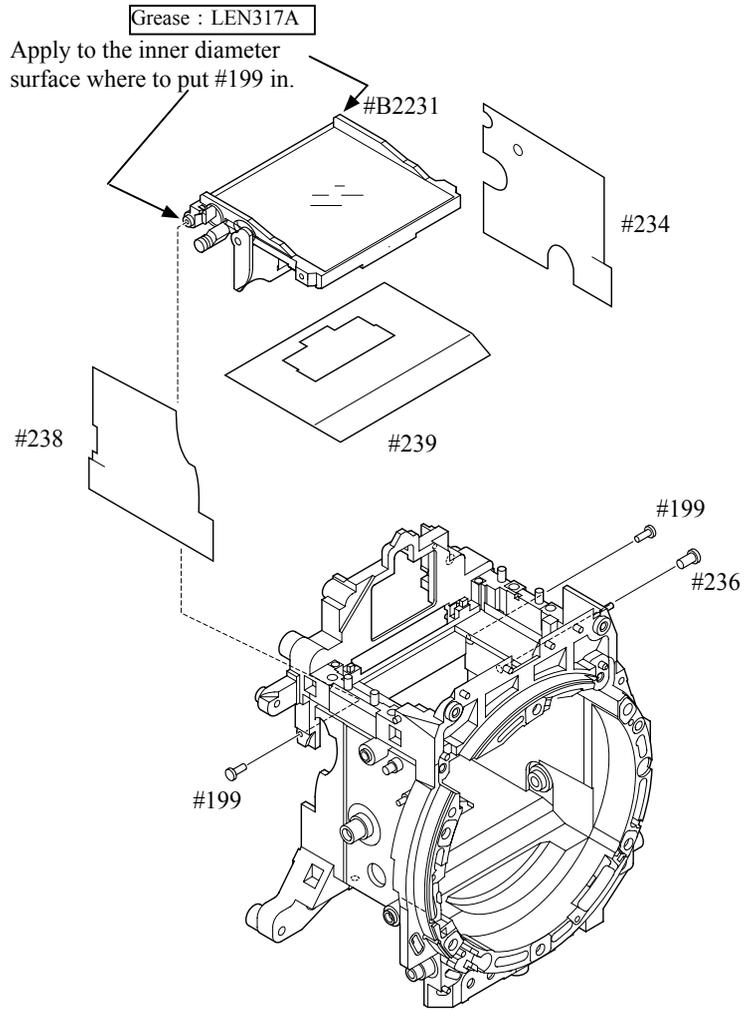


Assembly/ Adjustment

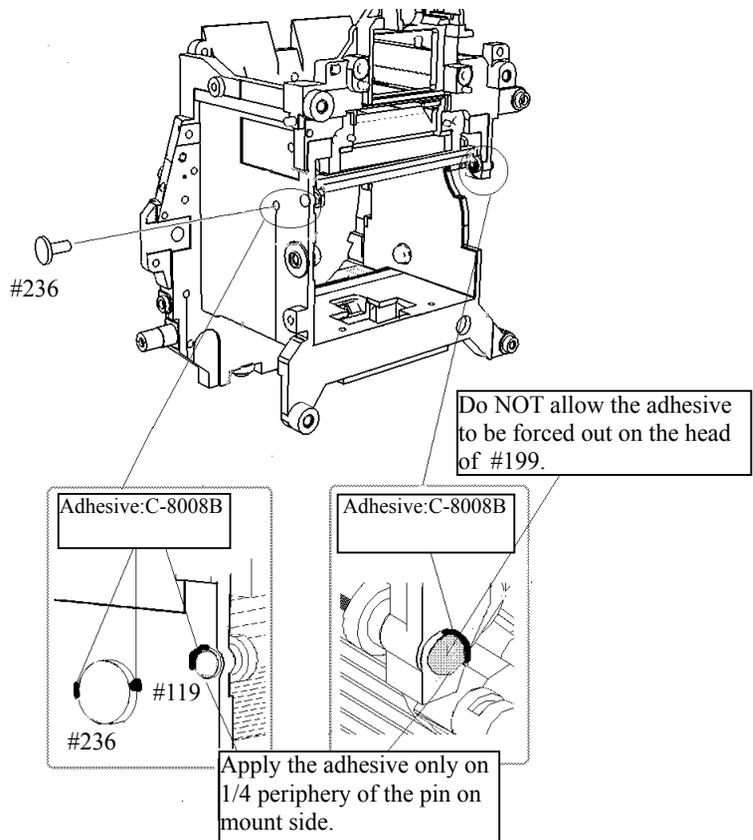
• NOTE: For undescribed tapes and sponges here in "Assembly", refer to "other tapes/sponges" on PARTS LIST.

1. Front body

Mirror unit



- With being mirror-up as shown right, assemble the pins and apply C-8008B (Adhesive: Super X) on each pin.



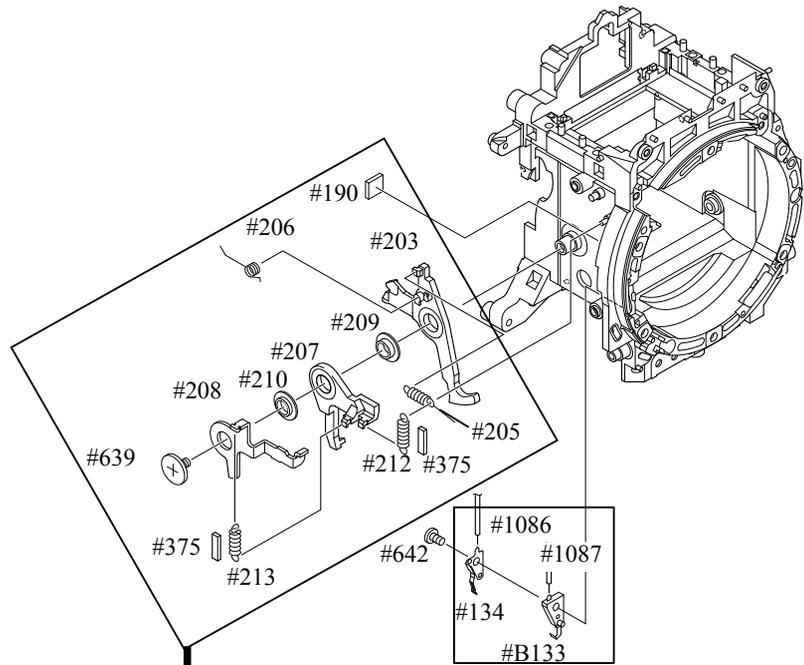
Aperture lever unit
F-min SW

Grease: LEN317A

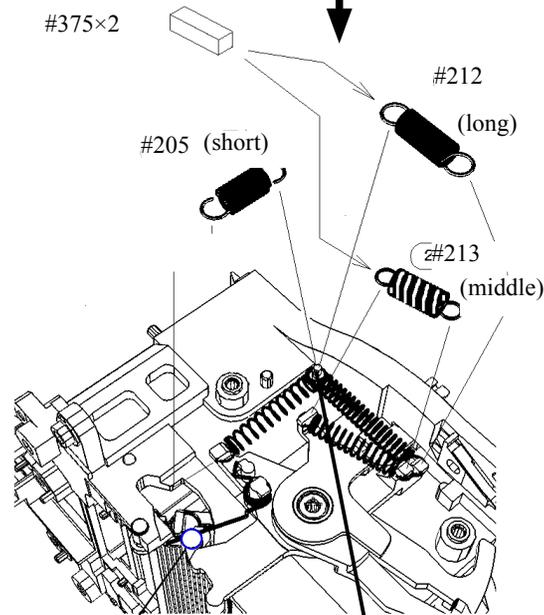
Apply inner diameter surface of
#203, #207, and #208.

Grease: MZ-800S

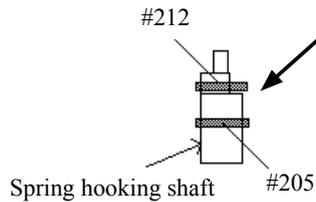
Apply to overall of #209 and #210.



Position for hooking spring



Grease: LEN317A
Apply to periphery of shaft



Aperture control unit

1. Turn the sequence white gear of the aperture control unit in the direction of the arrow, and position the arm as shown in Fig. ① .
2. Place #248 in center of movement of range, and lock it with #249. (ref. Fig. ①)
3. Insert the arm between #207 and #203. (ref. Fig. ②)
4. Attach 3 screws (#642). (ref. Fig. ③ and ④)

* Note: Be careful not to bend contact blade of F-min SW.

Fig. ①

Fig. ②

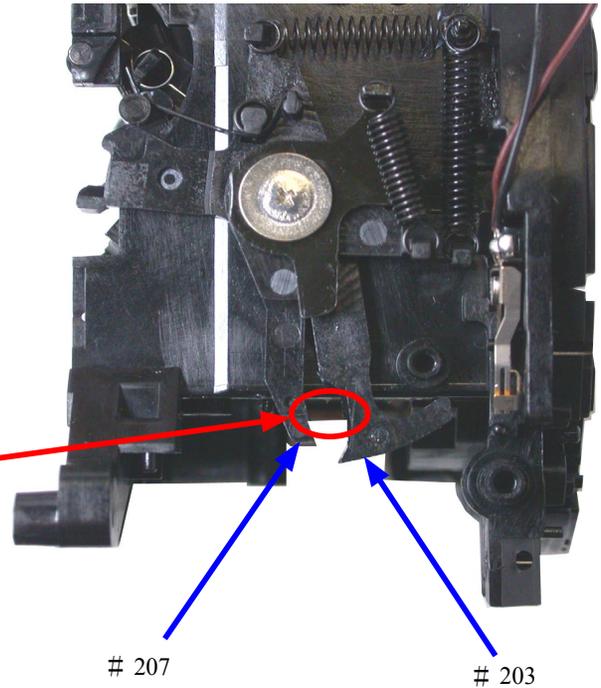
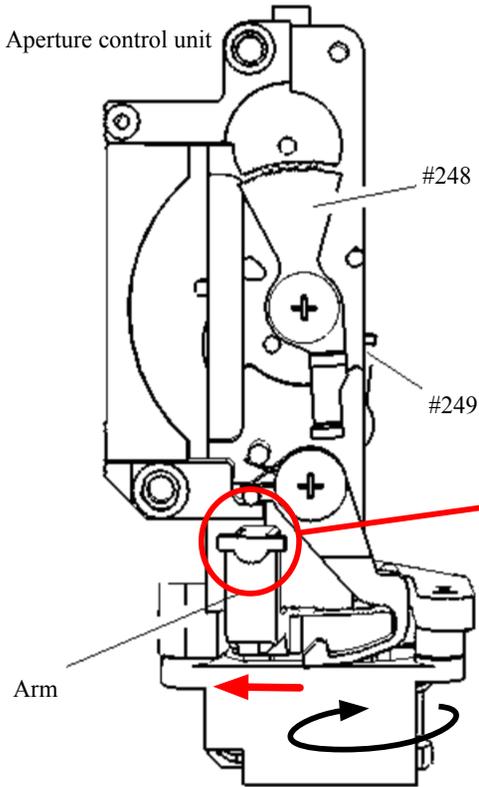
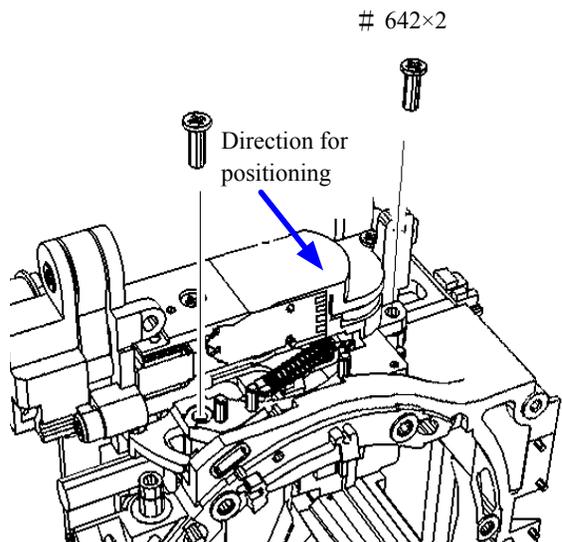
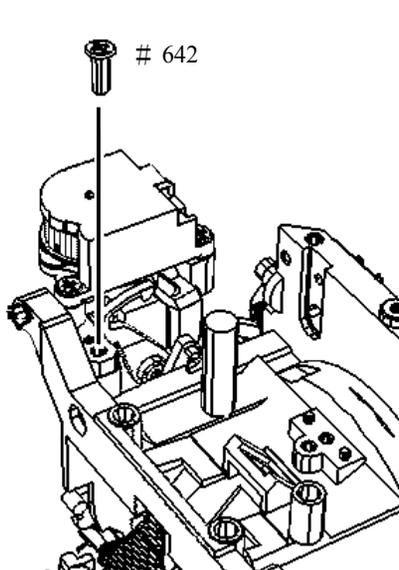


Fig. ③

Fig. ④

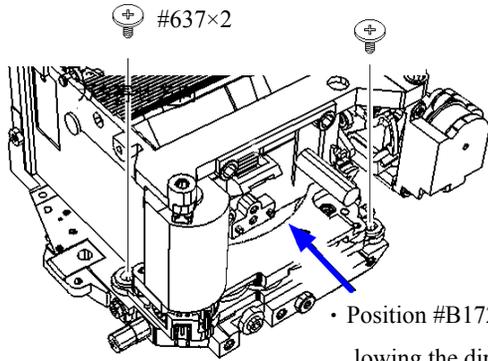
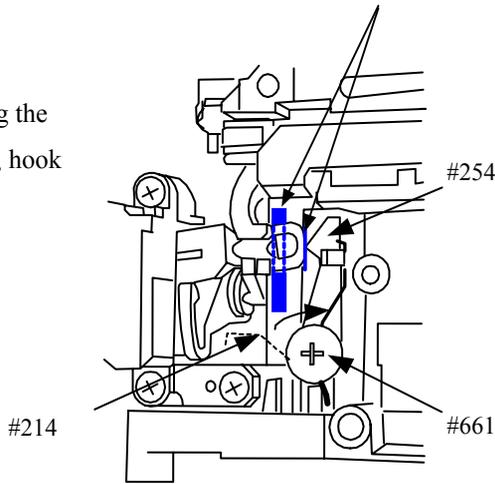


AF driving unit

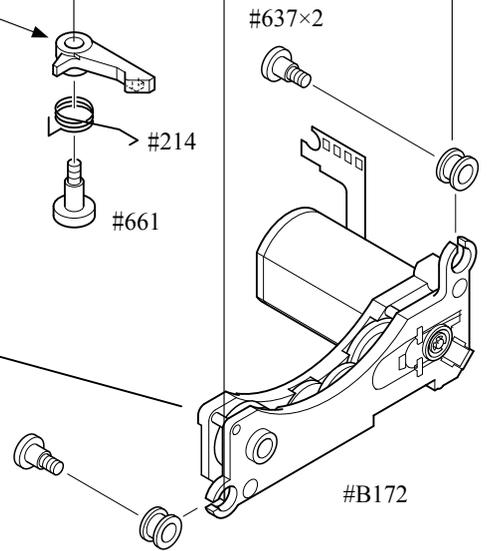
Grease: LEN317A

Apply a little on sliding surface

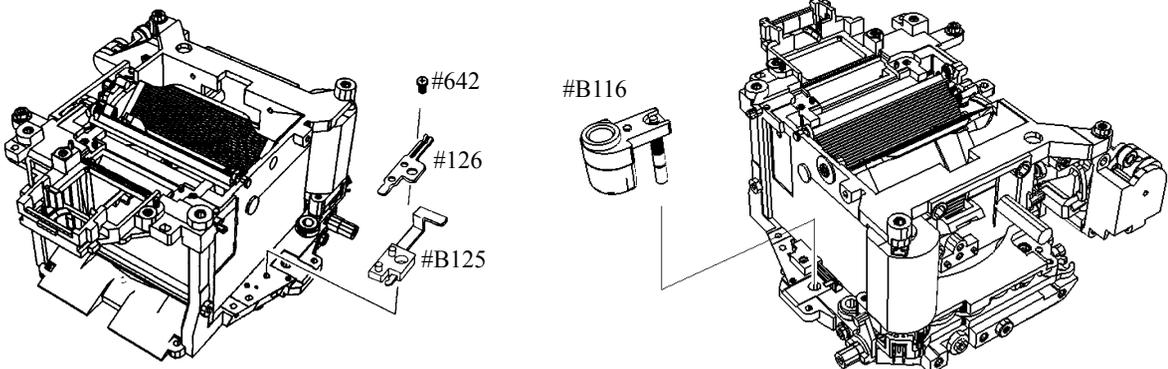
- After screwing the spring (#214), hook it to #254.



- Position #B172 by following the direction and screw it.



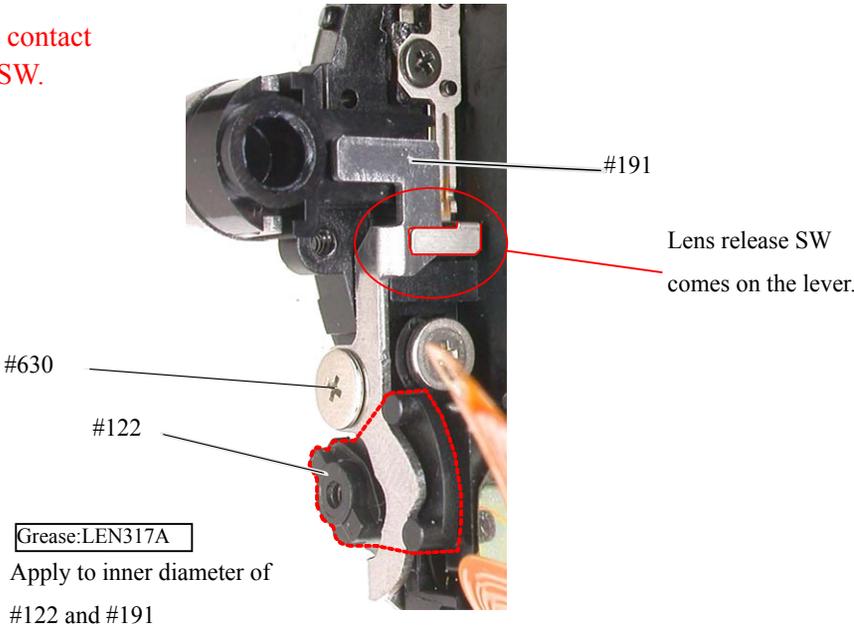
A/M change SW
Lens release button



Vertical lever

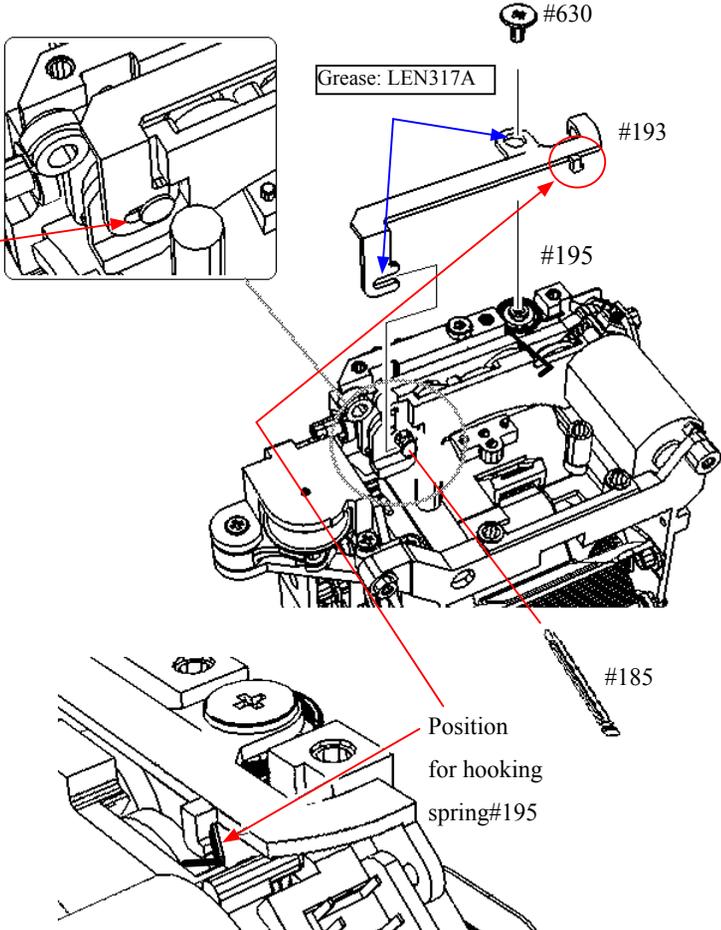
- Assemble by the following order.
#122→#191→#630

* Note: Be careful NOT to bend contact blade of the lens release SW.

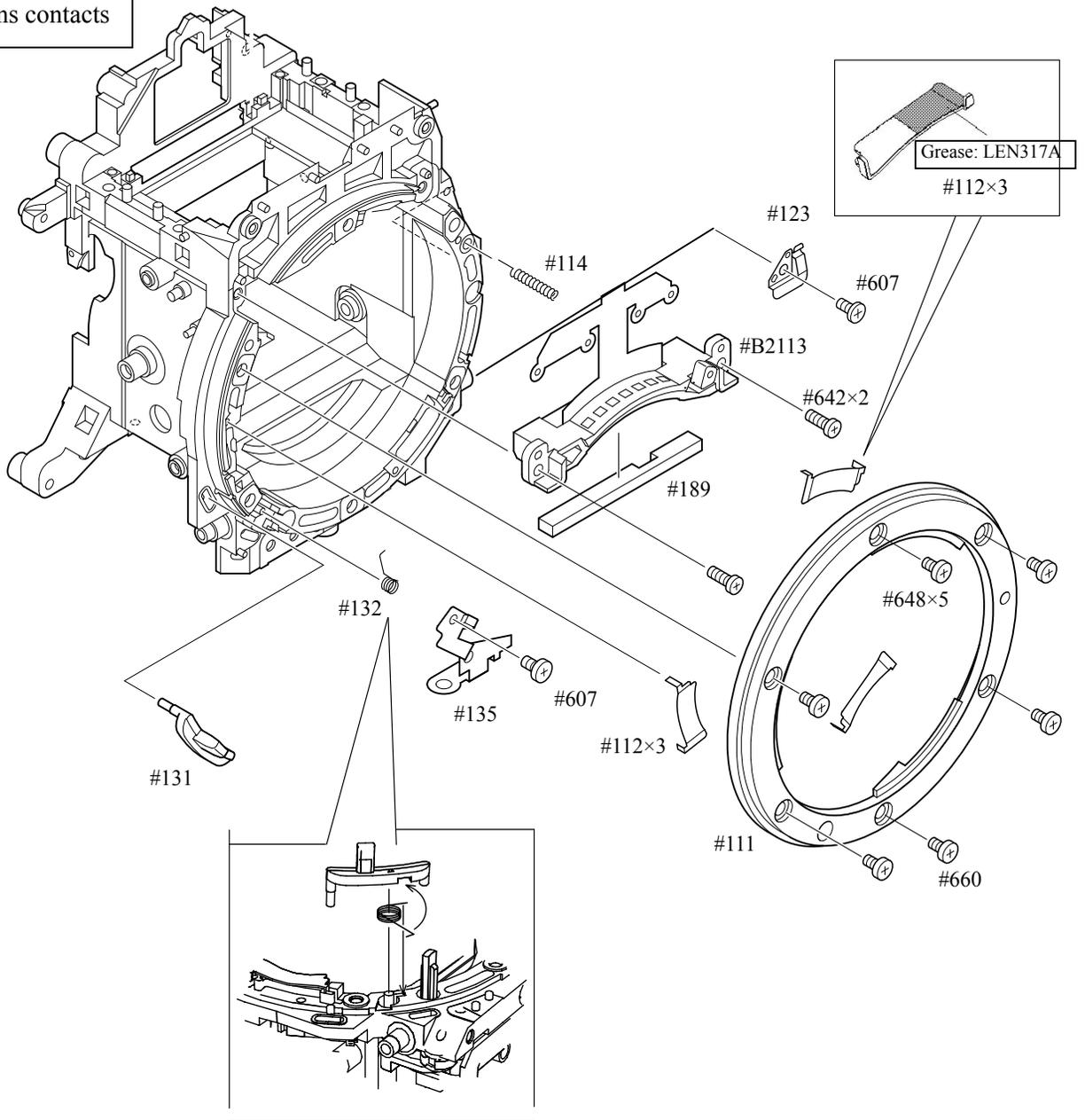


Horizontal lever

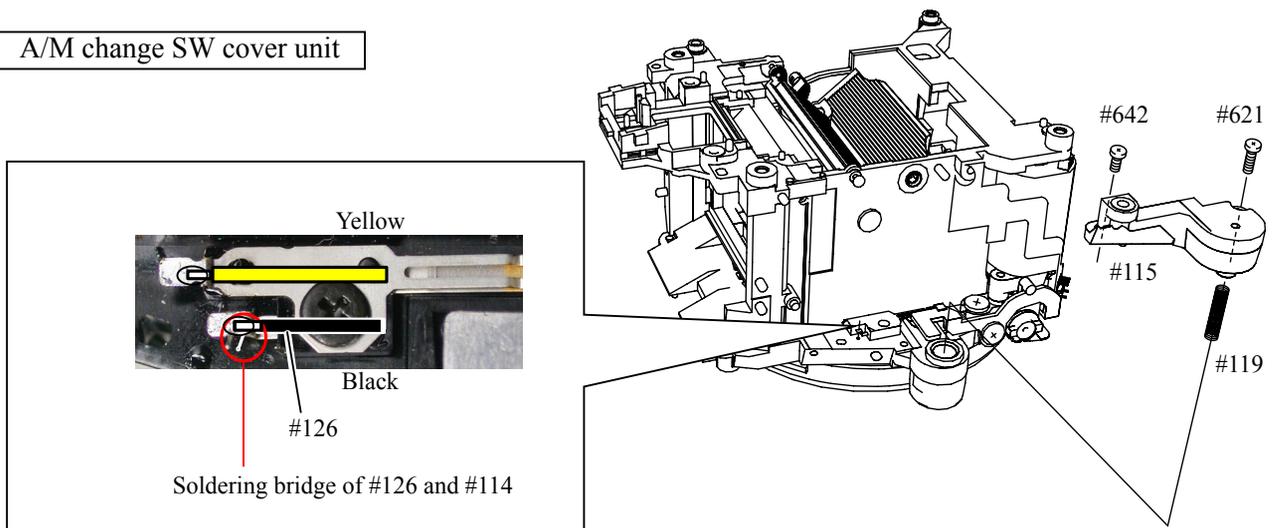
- Insert the U-shaped part of #193 into the groove of the AF driving shaft (#185).



Bayonet unit
AF lens contacts

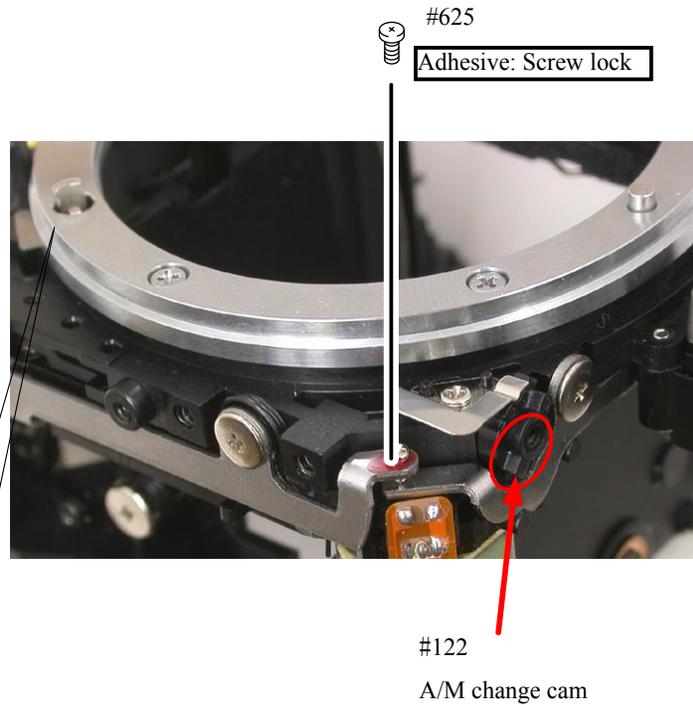
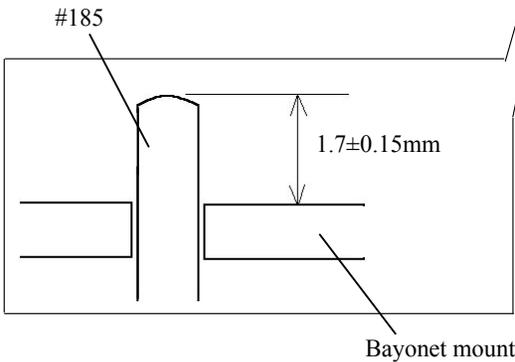


A/M change SW cover unit



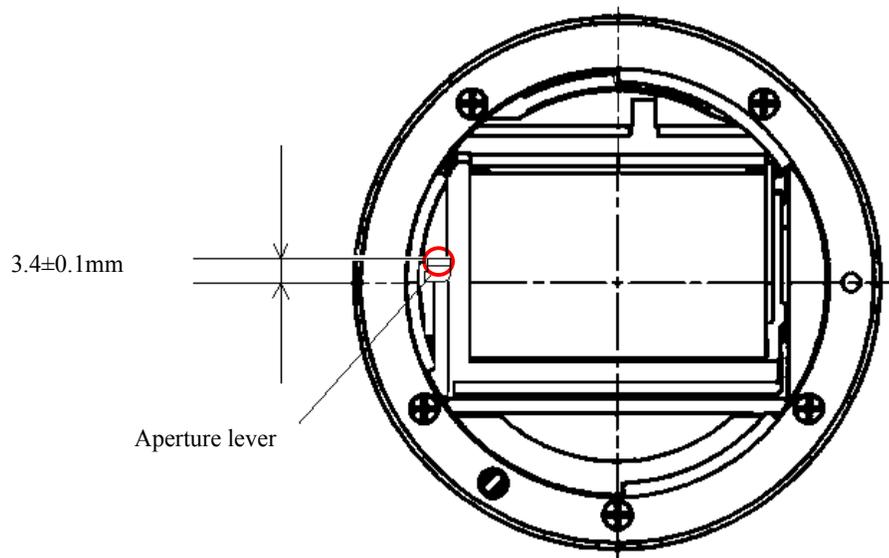
Height adjustment of AF coupling shaft

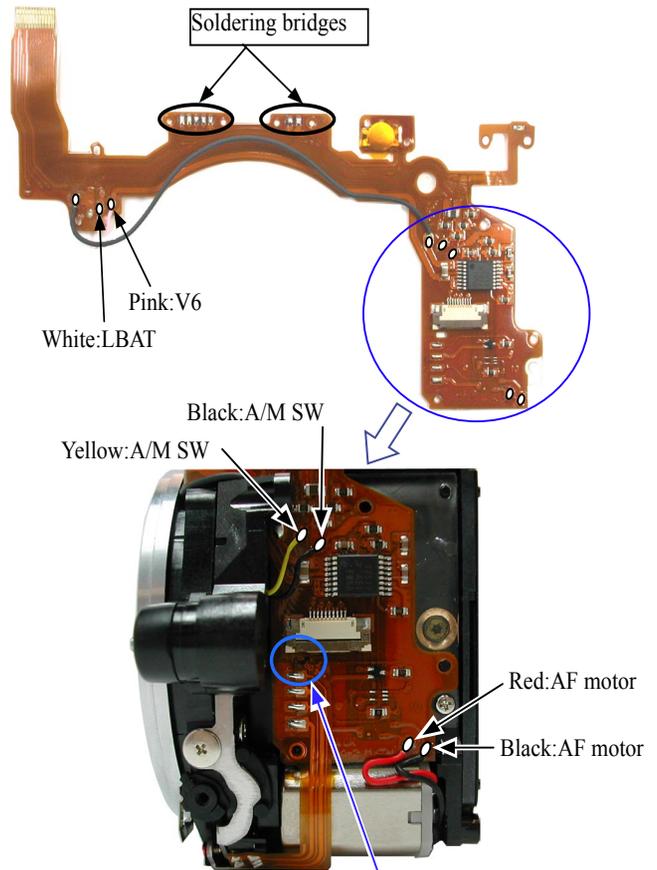
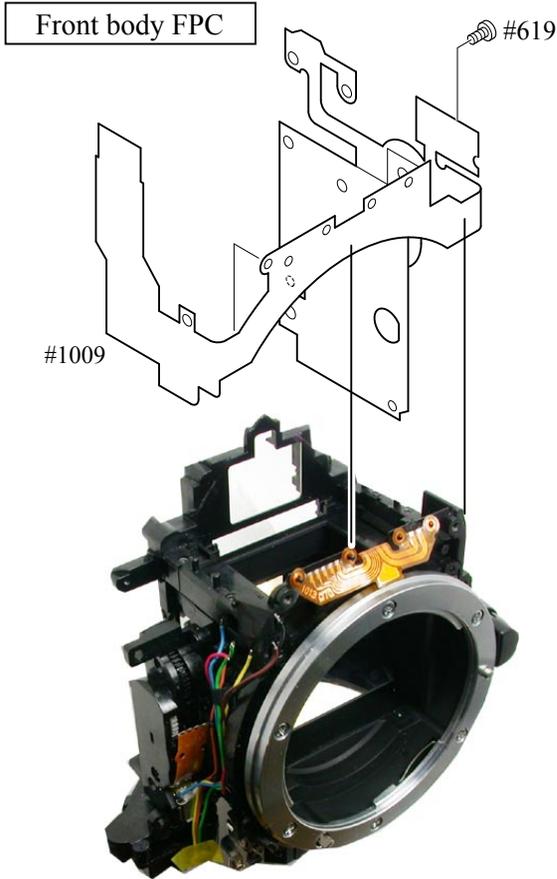
- ① Set the A/M change cam (#122) to AF side. (i.e. The AF coupling shaft (#185) sticks out of the bayonet.)
- ② Adjust the height of the AF coupling shaft (#185) with the screw (#625) so that it becomes $1.7\pm 0.15\text{mm}$.
- ③ After the adjustment, fix the screw (#625) with screwlock.



Height adjustment of Aperture lever

- Measure the height of the aperture lever by using the tool (J18004).
Standard: $3.4\pm 0.1\text{mm}$
 In case the value is out of standard, make an adjustment by bending the circled part.
 Be careful NOT to bend the inner part of the lever when adjusting!

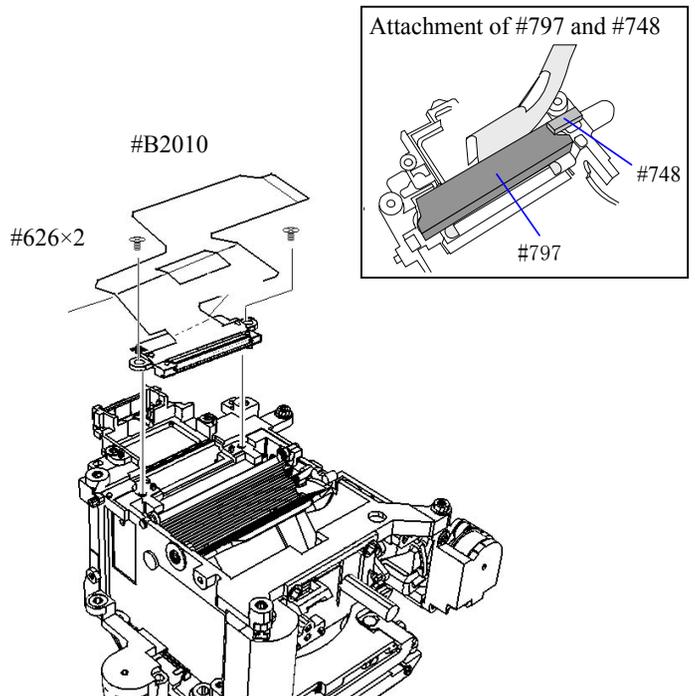
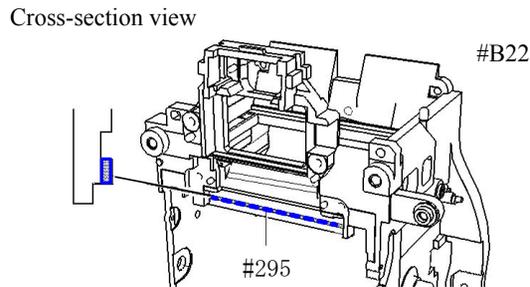




Inner LCD unit

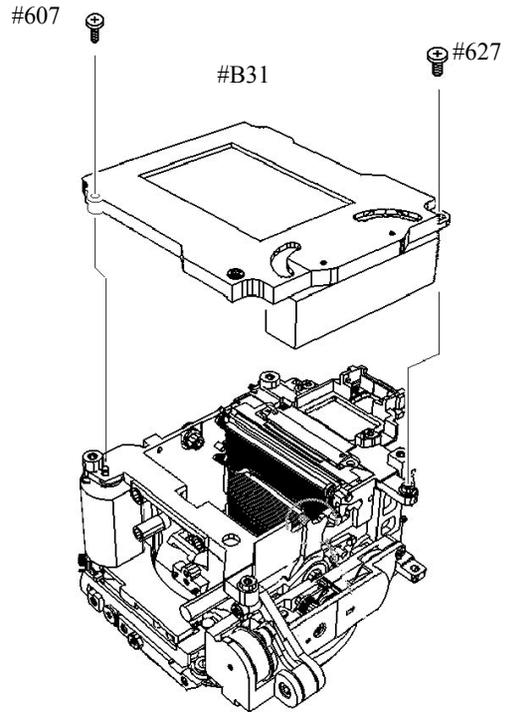
- Attach the sponge (#295) on the front plate (#22).

- Attach the inner LCD unit (#B2010) with 2 screws (#626).
- Attach the sponge (#797) and (#748)



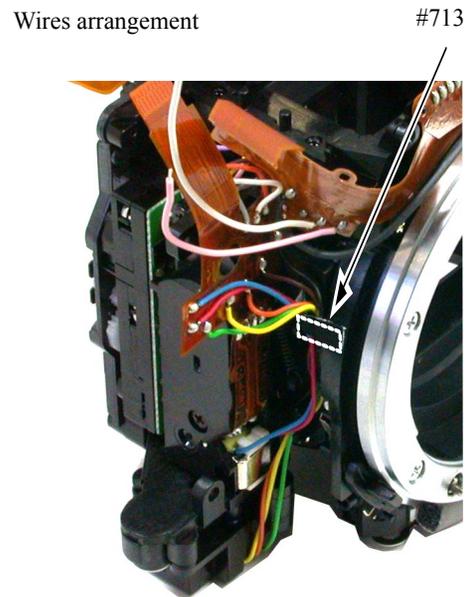
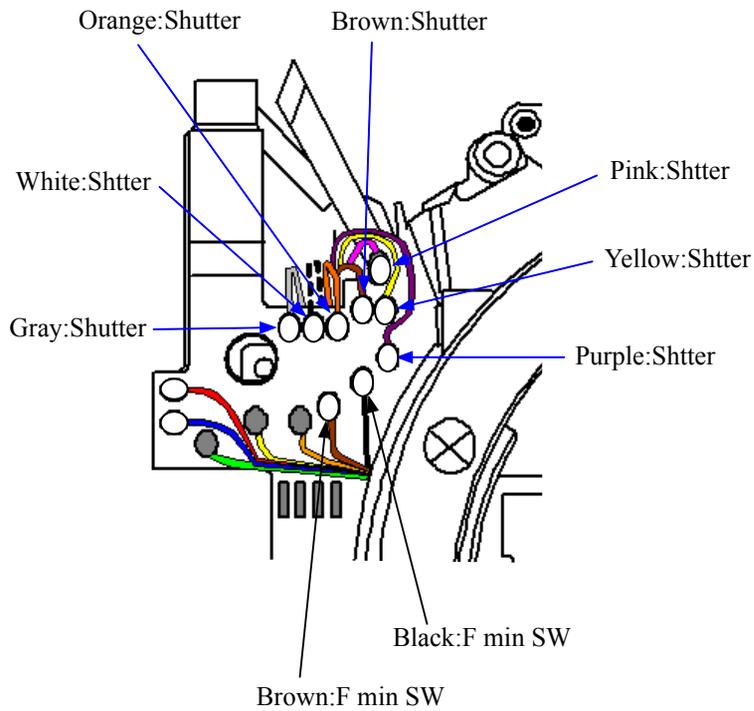
Shutter unit

- Attach the shutter unit (#B31) with the screws (#607 and #627).



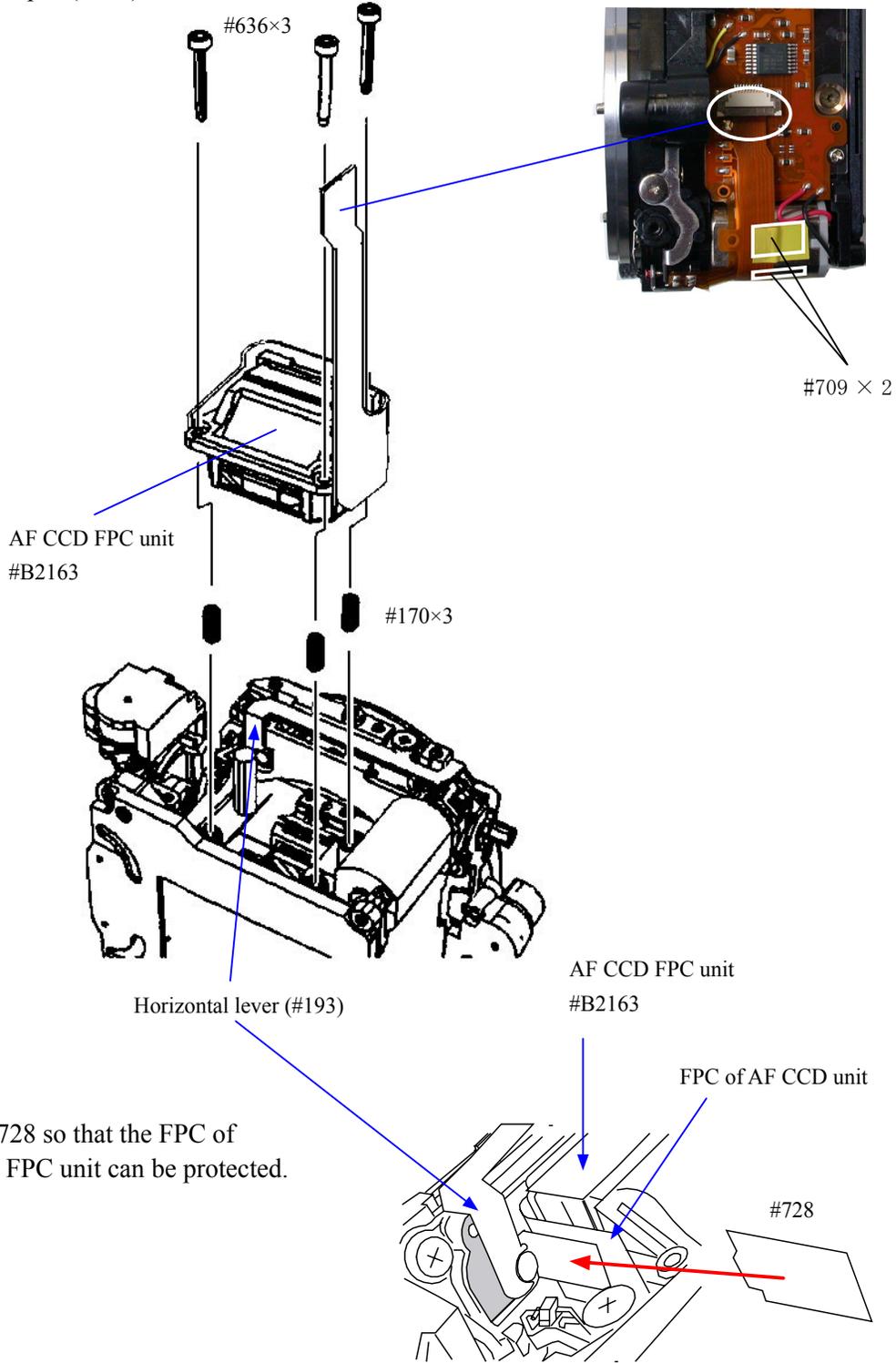
- Solder 9 wires.

- Make an arrangement of wires and attach the tape (#713).



AF sensor FPC unit

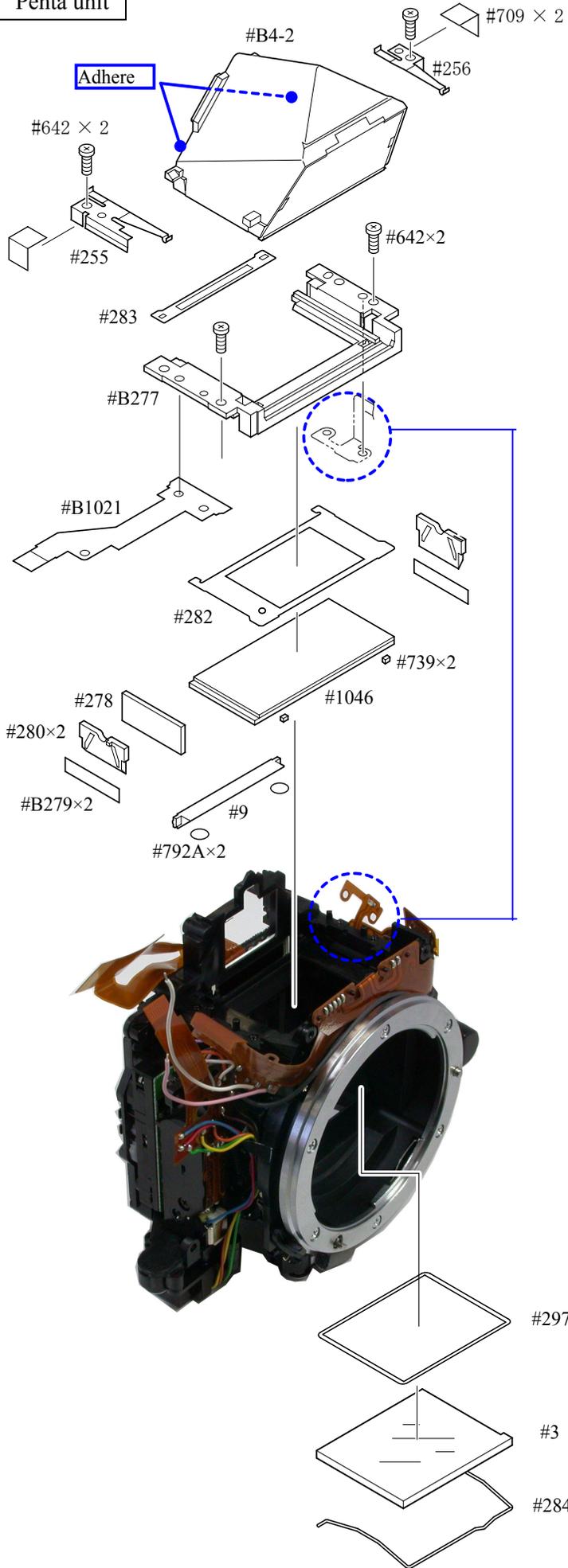
- Attach 3 screws (#636) with Hexagonal wrench to screw up but not too tight, then give it about 1 turn counterclockwise.
- Attach 2 tapes (#709).



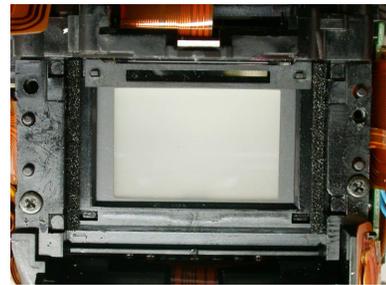
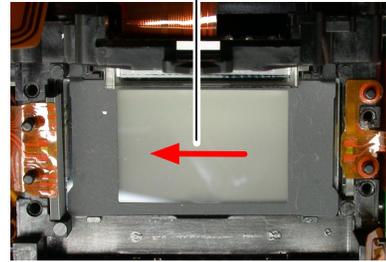
- Attach #728 so that the FPC of AF CCD FPC unit can be protected.

Position for attaching #728

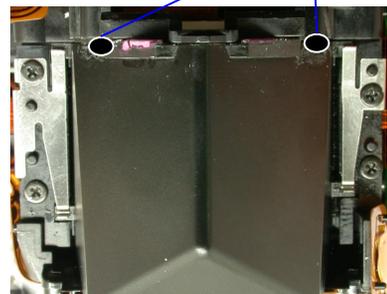
Penta unit



Direction for positioning of SI glass (#1046)



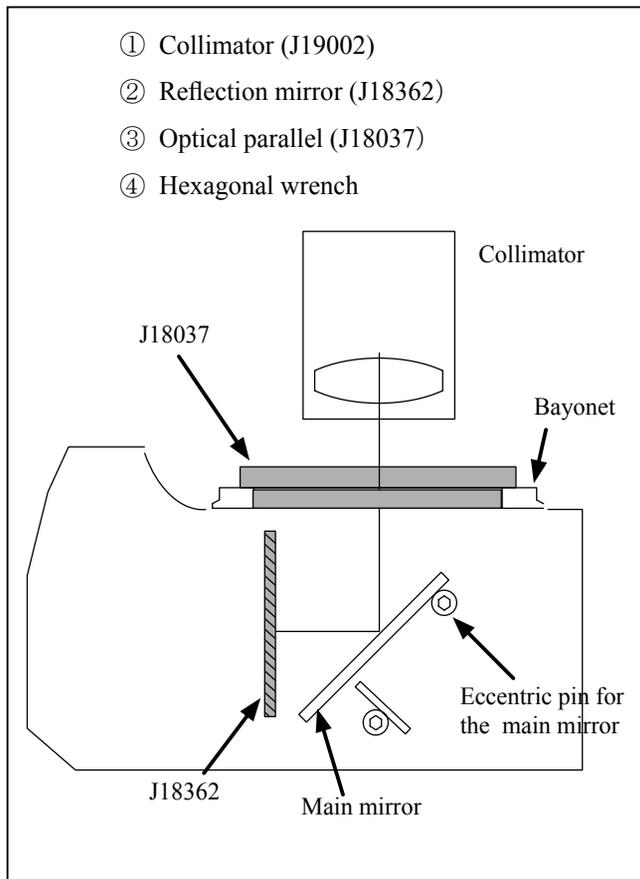
Adhesive: C-8008B



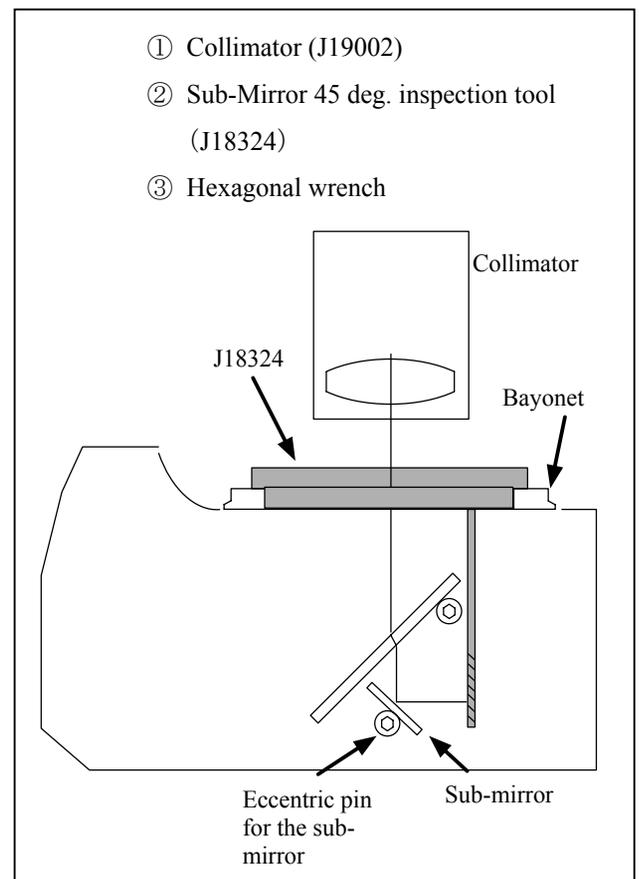
Angle adjustment of Main mirror and sub-mirror

*Tools required:

1. Main mirror 45° Inspection and Adjustment

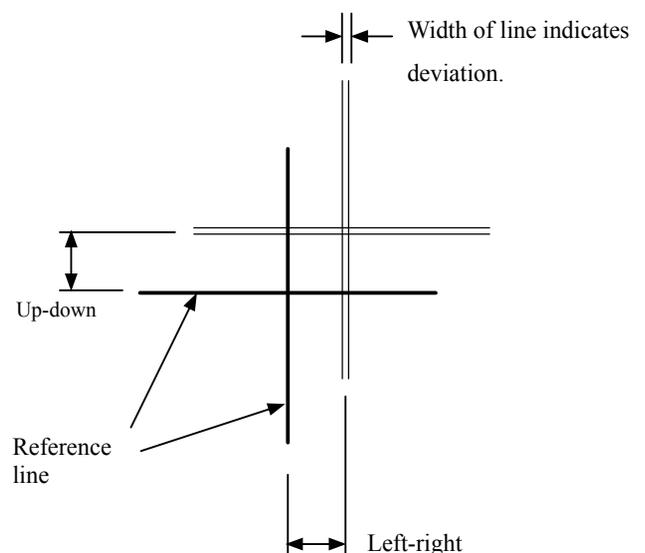


2. Sub-mirror 47.75° Inspection and Adjustment



* Standard:

	Main mirror	Sub-mirror
Left-right deviation	$\pm 30'$ or less	—
Up-down deviation	$\pm 10'$	$+15' \sim -50'$
Distortion	8' or less	8' or less

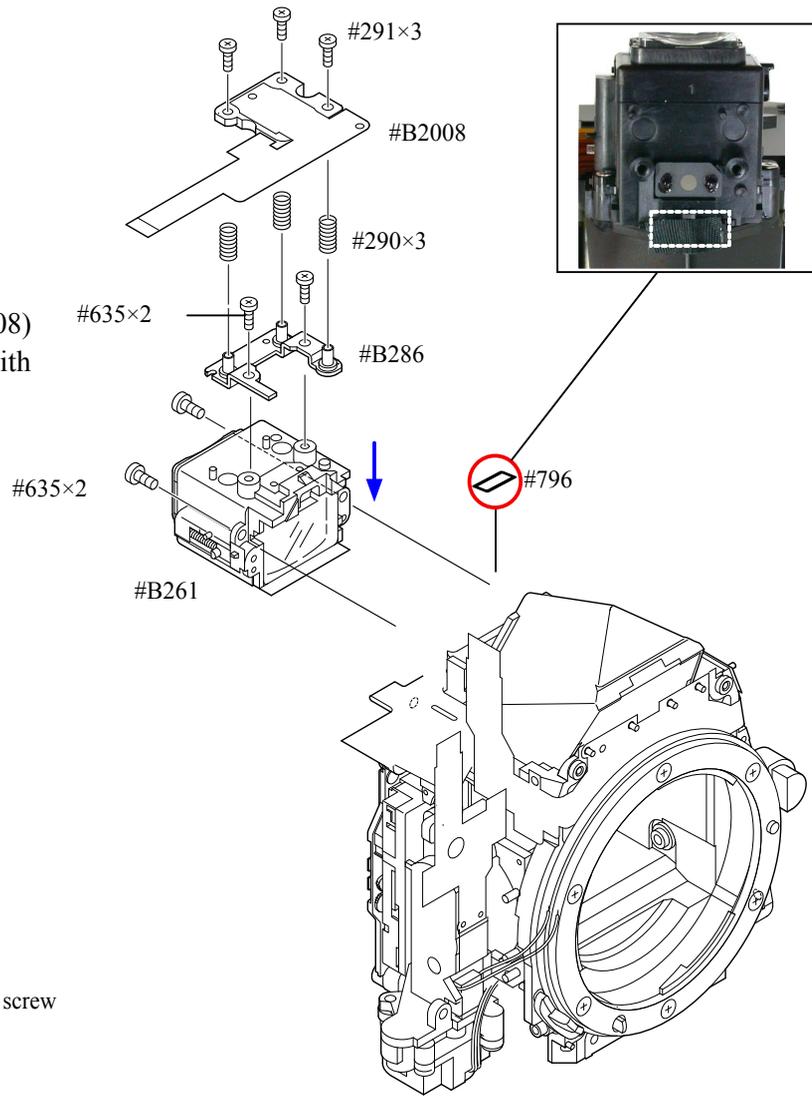


* Note:

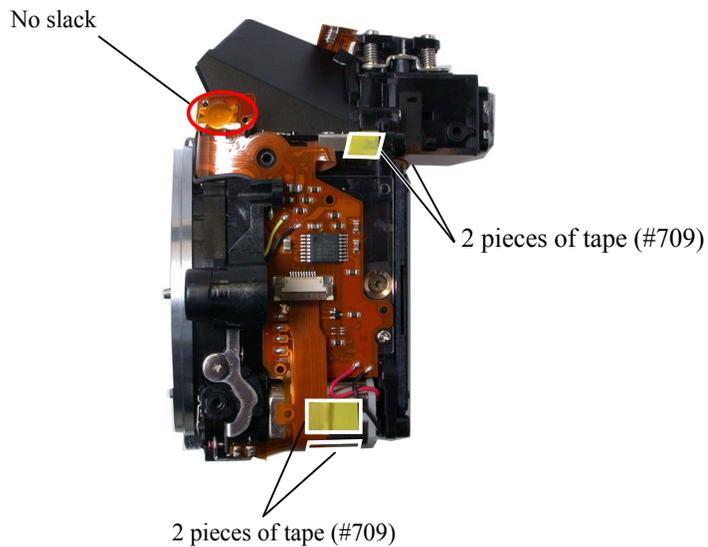
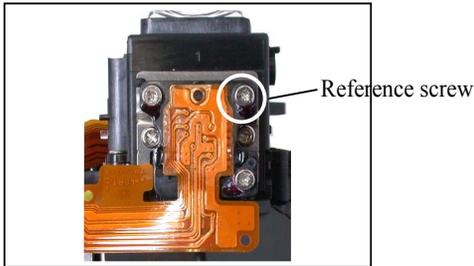
- Before and after the adjustment, check the accuracy by moving the main mirror up- and downwards a few times.
- Check for the up-down deviation. In case the deviation is out of standard, make an adjustment by turning the eccentric pin with Hexagonal wrench.
- In case the deviations of up-down and left-right are out of standard, the front plate unit or mirror unit is regarded as malfunctioning.
- In case of checking or adjusting only the front body, check again after assembling the front body into the rear body.

**Eyepiece unit
Metering FPC unit**

- Position the eyepiece unit (#B261) downward and fix it with 2 screws (#635).
- Attach the tape (#796).
- Fix the metering FPC-base unit (#B286) with 2 screws (#635).
- Attach the metering FPC unit (#B2008) and 3 springs (#290) temporarily with 3 screws (#291).



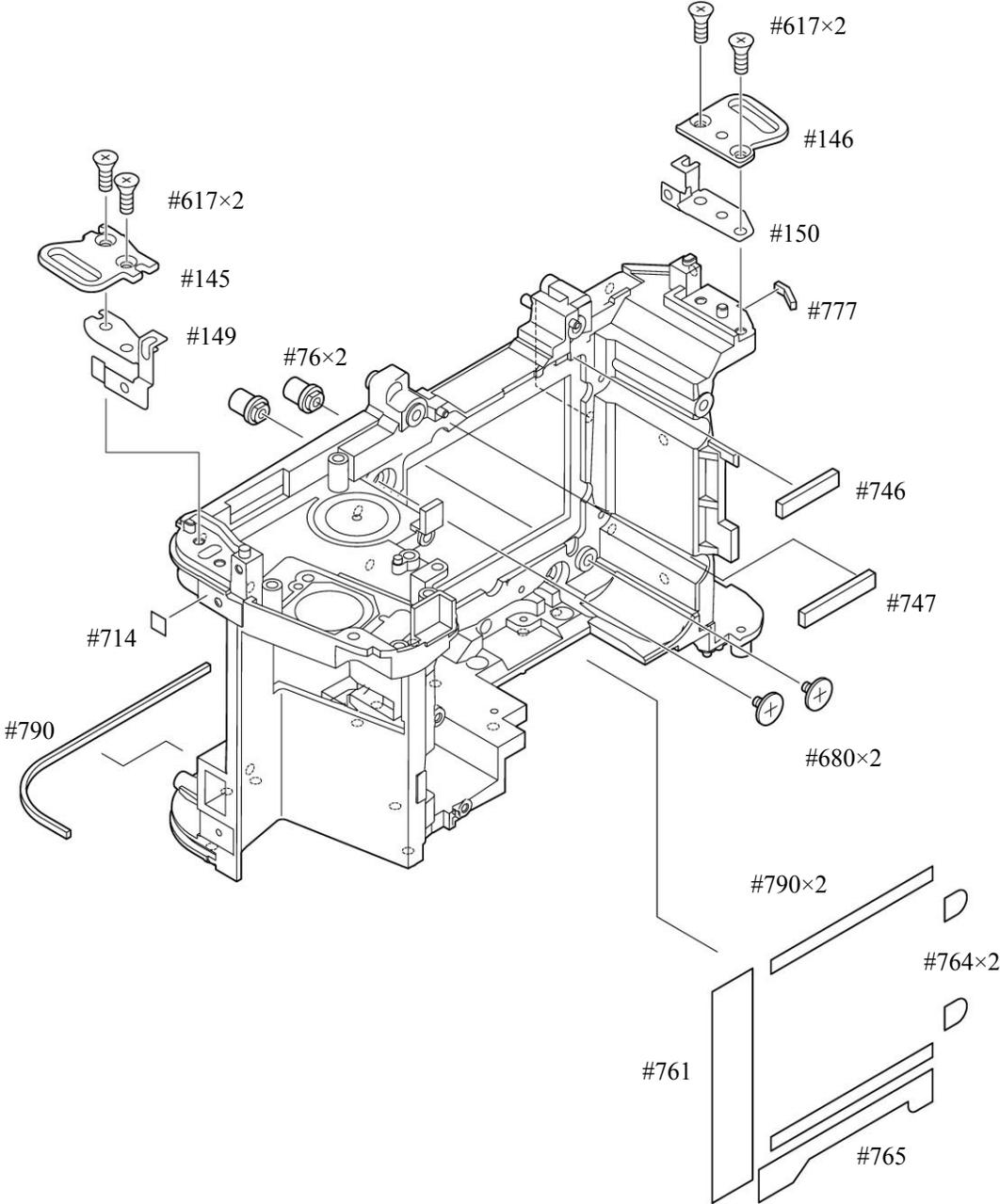
- Attach 3 screws (#291) until the metering FPC unit is lightly fixed.
Give the reference screw 1 turn counterclockwise.



Note: Be careful that slack here catches the rear body when it is assembled.

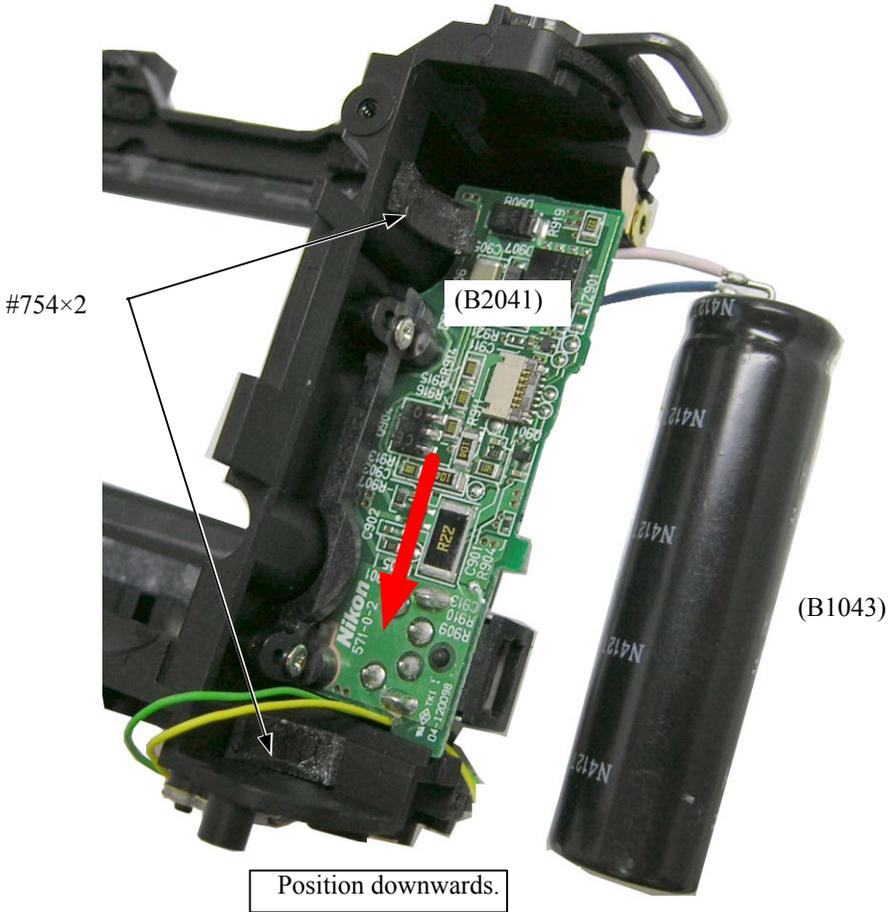
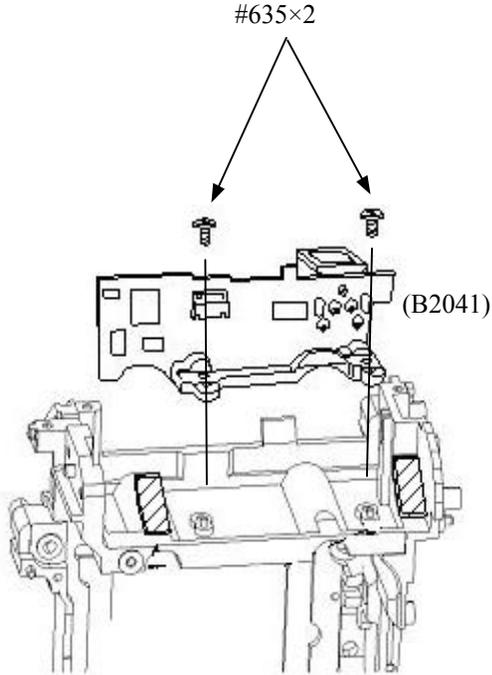
2. Rear body

Rear body small parts



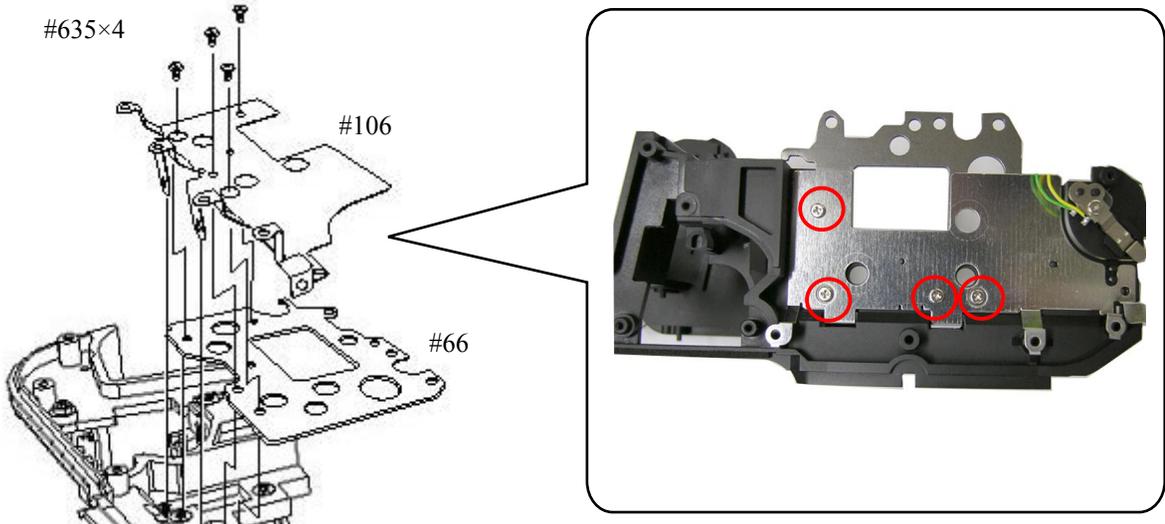
SB unit

- Install the SB unit (B2041).
- Fix 2 screws (#635).
- Attach 2 pieces of tape (#754).
- Mount the condenser (#B1043) by positioning it in the direction of the arrow.



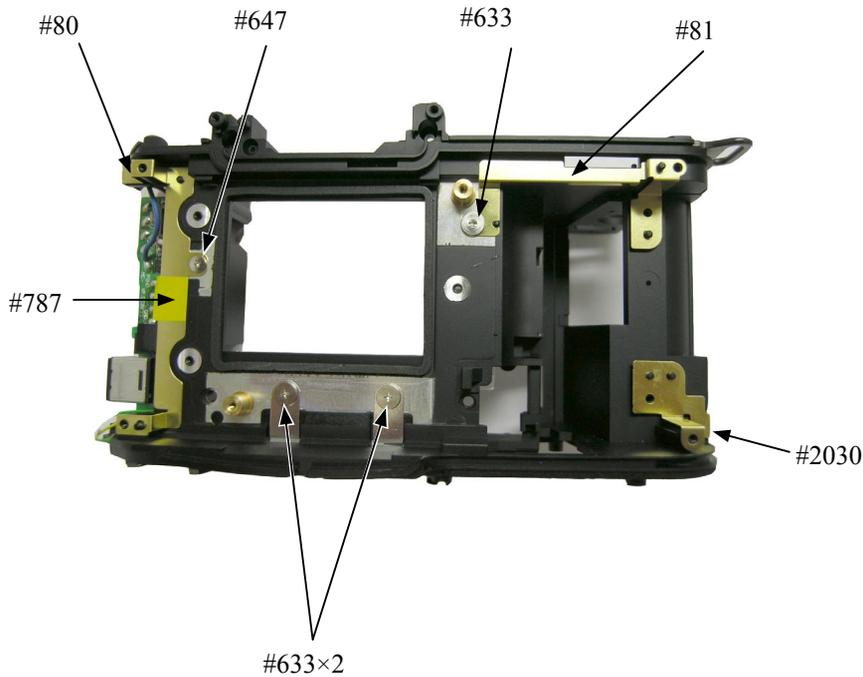
Bottom base unit / Lug plate

- Mount the bottom base unit (#66) and bottom conducting plate (#106).
- Fix 4 screws (#635).

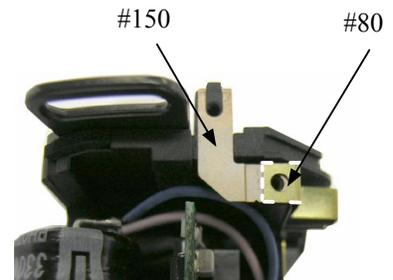


- Fix 2 screws (#633).
- Attach #80.
- Fix the screw (#647).
- Attach the short-circuit proof tape (#787) on #80.

- Attach #81.
- Fix the screw (#633).
- Attach #2030.

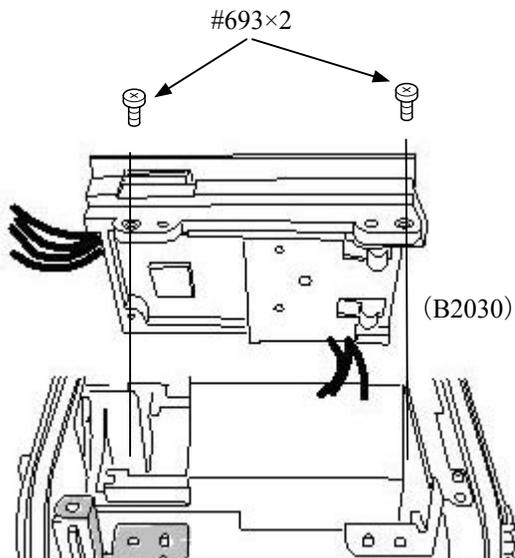


#80 must NOT seat below #150.



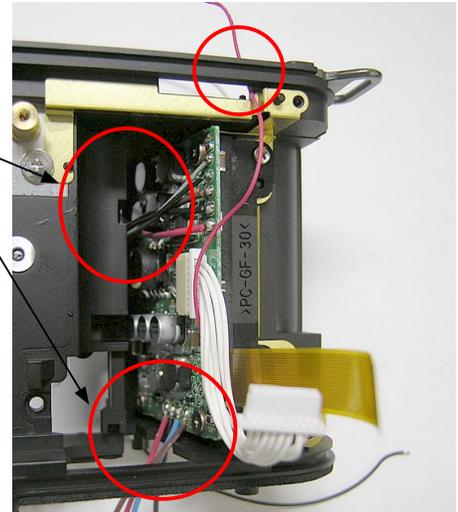
DC/DC PCB unit

- Mount the DC/DC PCB unit (B2030).
- Pass the wires through the holes.
- Fix 2 screws (#693).



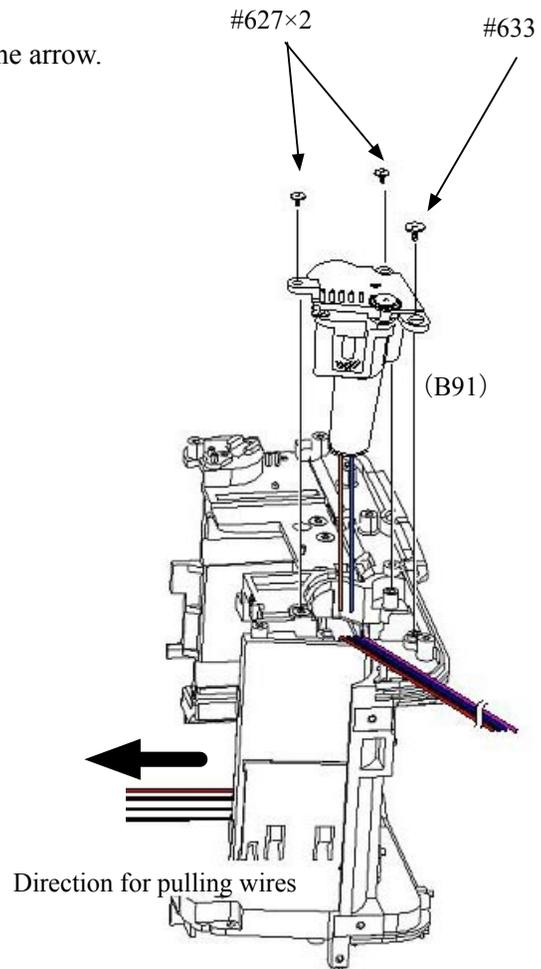
Pass the wire of the electronic buzzer (red) through the hole.

Pass the wires through the holes.



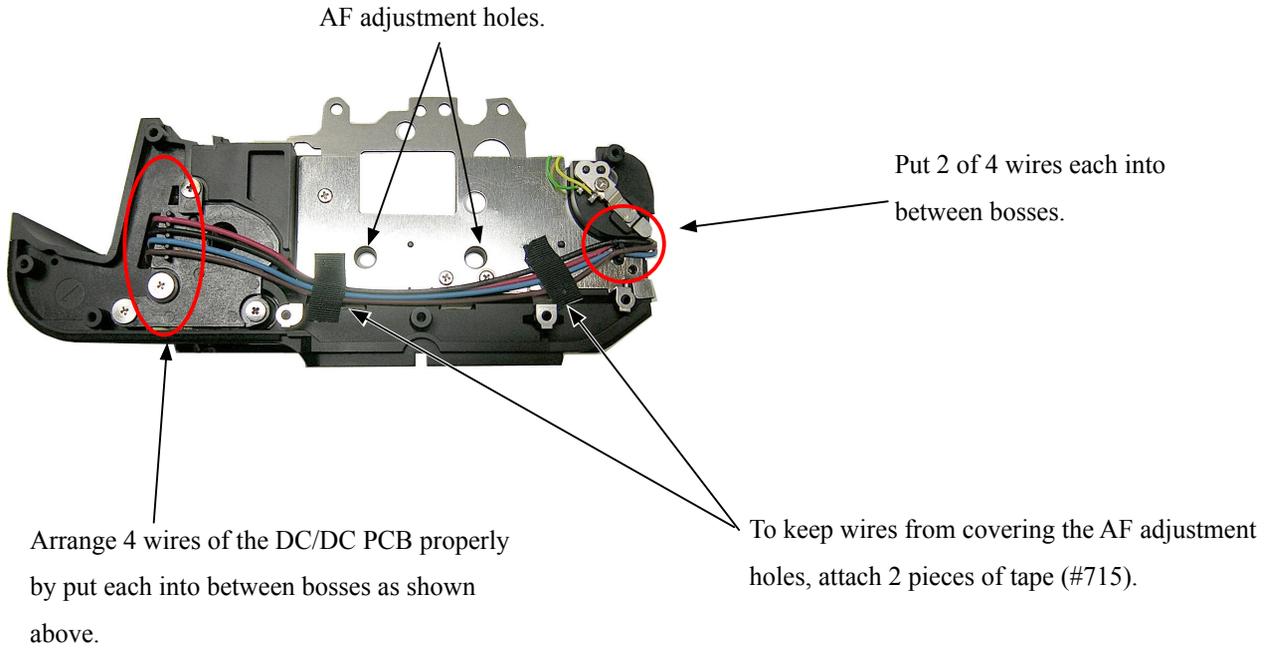
SQ unit

- Mount the SQ PCB (B91).
- Arrange wires by pulling them in the direction of the arrow.
- Fix the screw (#633).
- Fix 2 screws (#627).



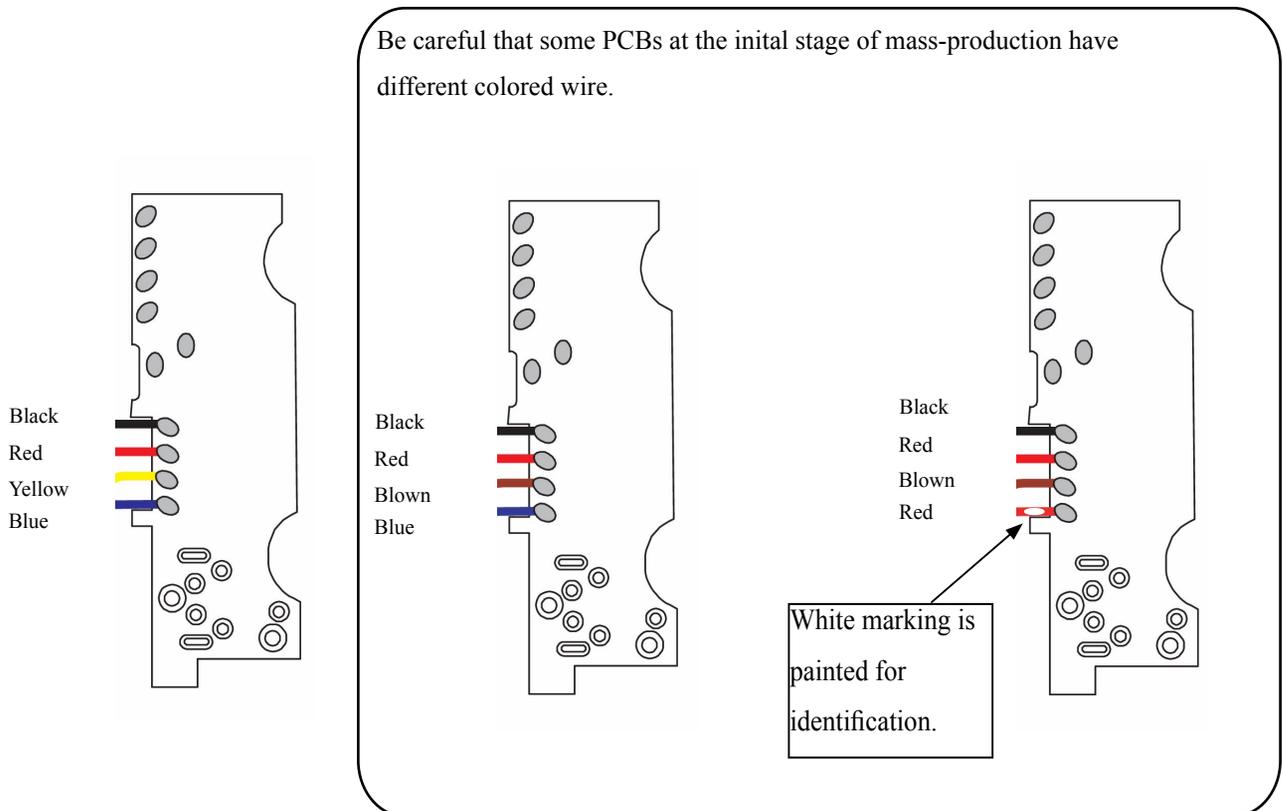
Bottom wires

- Arrange wires.
- Attach 2 pieces of tape (#715).



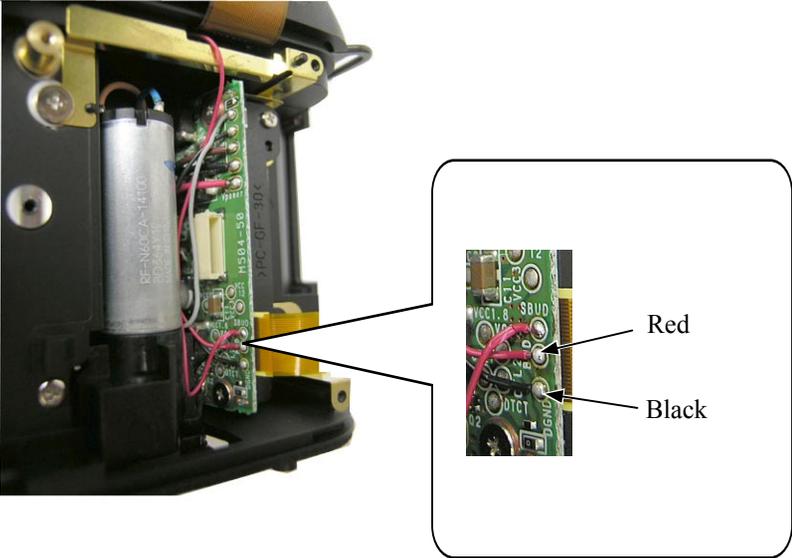
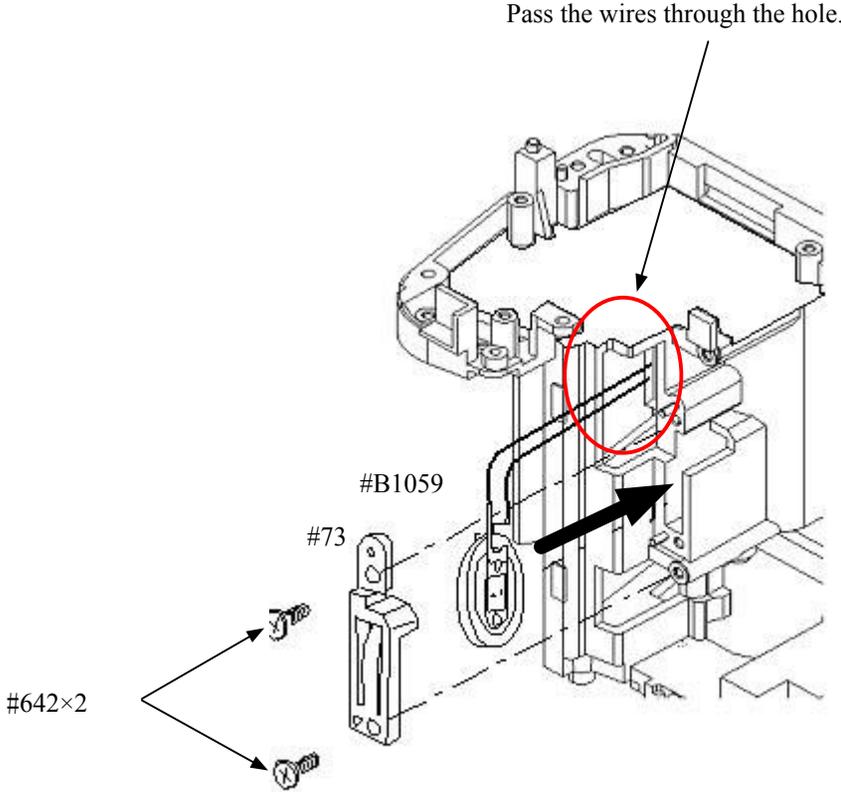
SB-PCBwires

- Solder 4 wires of DC/DC PCB unit.



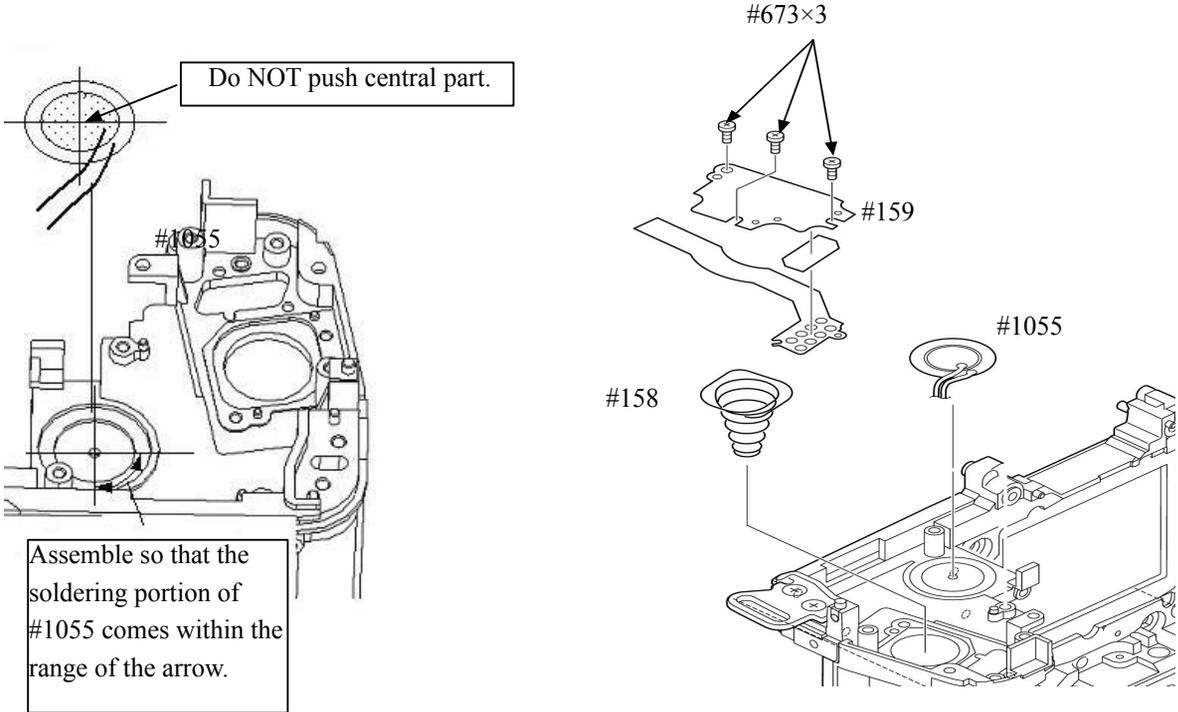
Clock battery unit

- Set the clock battery unit (B1059).
- Pass the wires through the hole.
- Attach the clock battery holder (#73).
- Fix 2 screws (#642).
- Solder 2 wires of the clock battery unit.



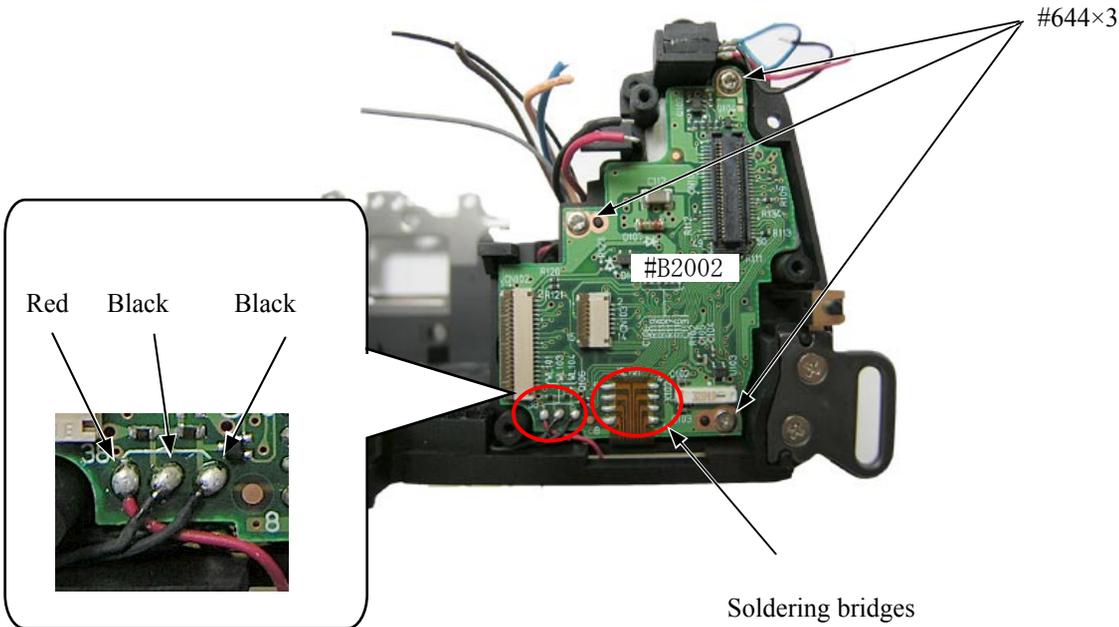
Electronic buzzer unit / Battery-extrusion spring

- Mount the electronic buzzer unit (#1055).
- Set the battery-extrusion spring (#158).
- Attach the retaining plate (#159).
- Fix 3 screws (#673).



Sub-PCB unit

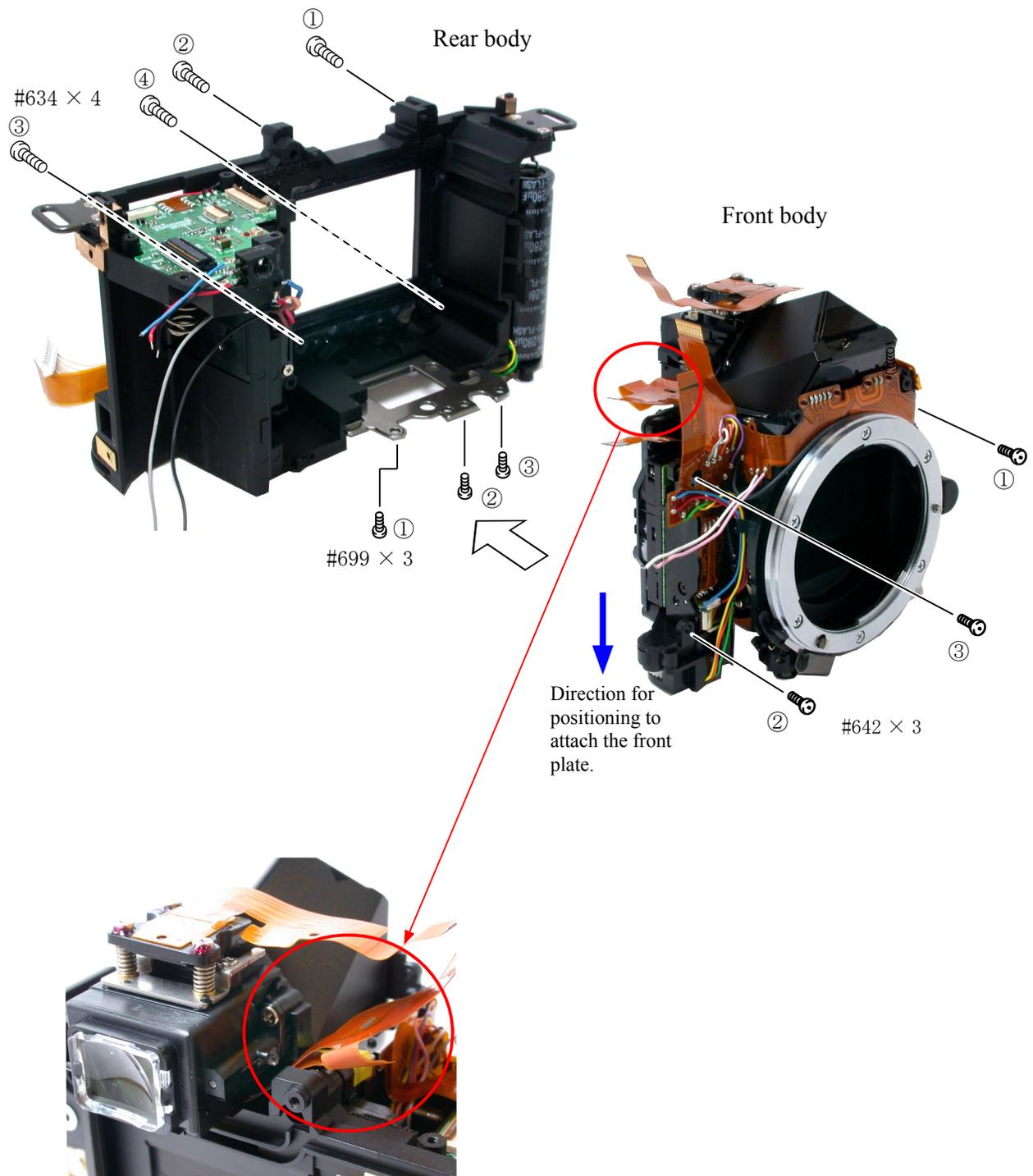
- Mount the sub-PCB.(B2002)
- Fix 3 screws (#644).
- Solder 3 wires of the electronic buzzer .
- Make the soldering bridges.



3. Mount Front body on Rear body

Mount the front body on the rear body

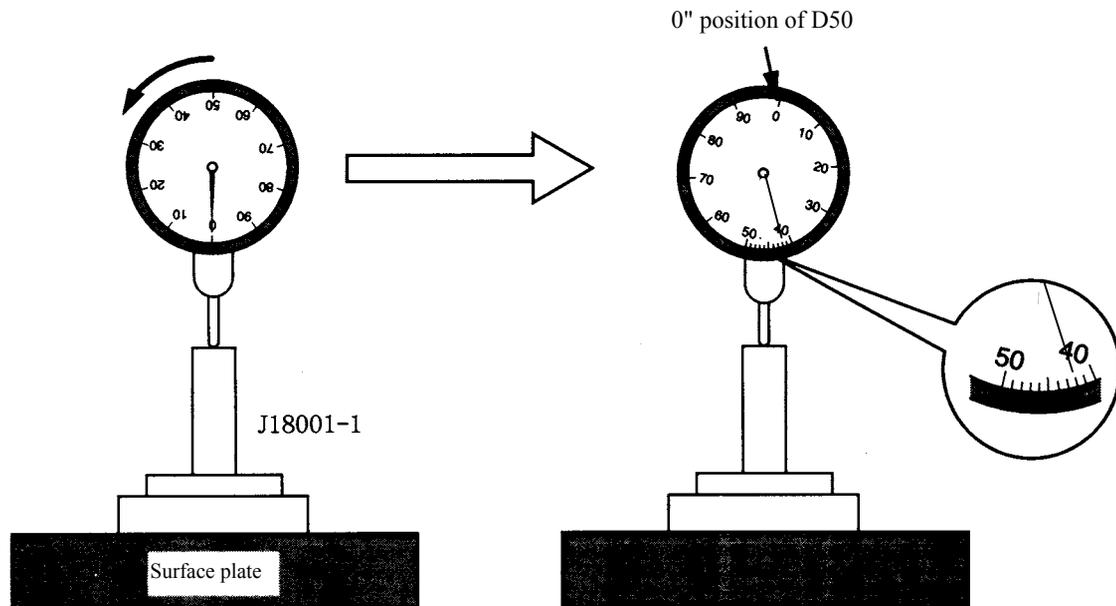
- ① Do NOT pinch wires and FPCs. Assemble by positioning them.
- ② Fix 3 screws (#642) by the following order: ①, ②, and ③.
- ③ Fix 4 screws (#634) by the following order: ①, ②, ③, and ④.
- ④ Fix 3 screws (#699) by the following order: ①, ②, and ③.



Arrange FPCs of the inner LCD by putting them into the clearance between rear body and eyepiece.

Inspection and Adjustment of Body back
--

* "0" positioning of the dial gauge

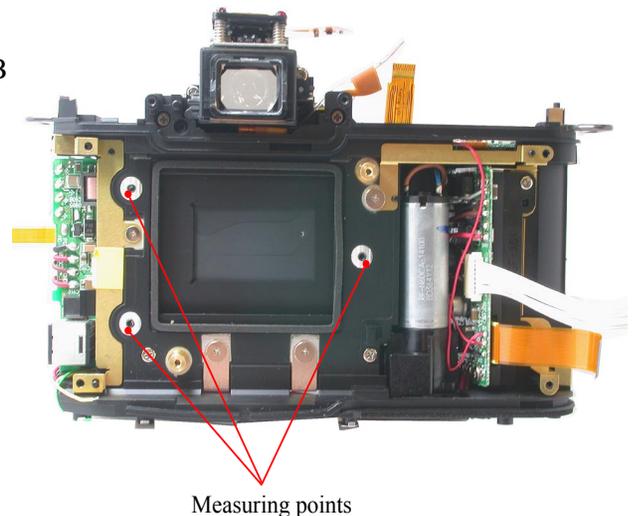


- ① Put the tool (J18001-1) on the surface plate, and set the dial gauge to "0".
- ② Turn the index ring to shift the position by "0.42 mm" from "0" that was set in ① .
(This position is "0" of D50.)
- ③ Measure the body back based on "0" reference position of the index ring.

- Measure 4 parts from the bayonet face to the CCD-PCB attaching face.

Standard: 48.25±0.015mm/ Parallelism: within 0.015mm

- In case it is out of standard, make an adjustment by loosening screws that attach the front and rear bodies, or by putting the washer(s) on the contact surface between the front body and rear body.



Note: For some bodies, washer(s) are already put on the attaching face of the CCD-bracket.

There are 2 cases as follows.

1. Purpose : To adjust the height of the camera body

There are indications(color mark) on the camera body side of the CCD-PCB attaching face.

{Blue = 0.02mm (#87), Red = 0.1mm (#88), Green = 0.06mm (#89)}

* By adding the measured value to the thickness of washers, check if it is within the standard (48.25±0.015mm).

2. Purpose : To adjust the height of the CCD bracket

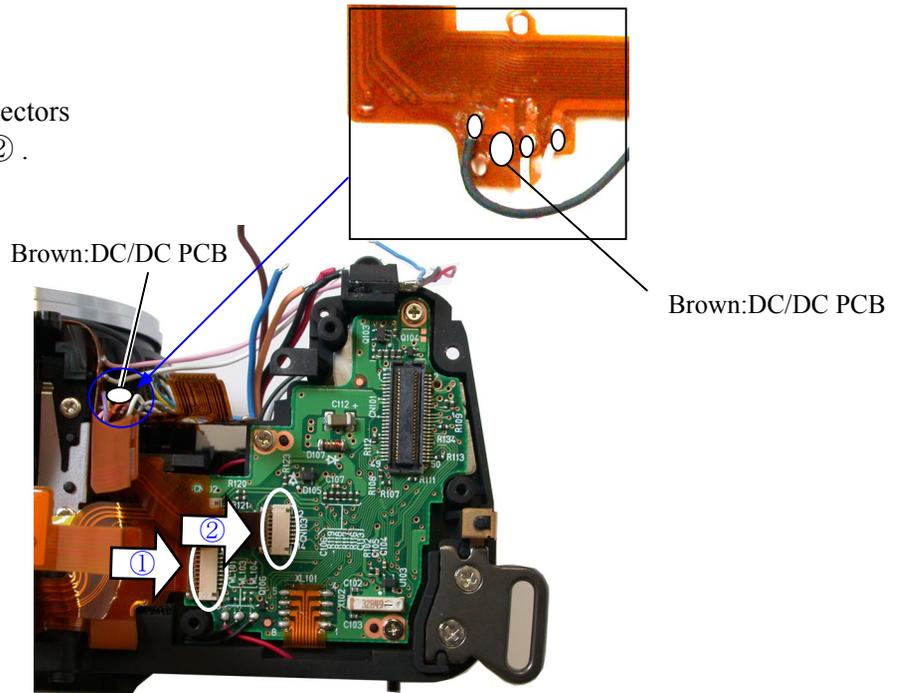
There are indications(color mark) of the CCD-bracket attaching face

{Red 2 lines = 0.02mm (#87), Red 1 line = 0.1mm (#88)}

* When the CCD PCB is replaced, remove the washers.

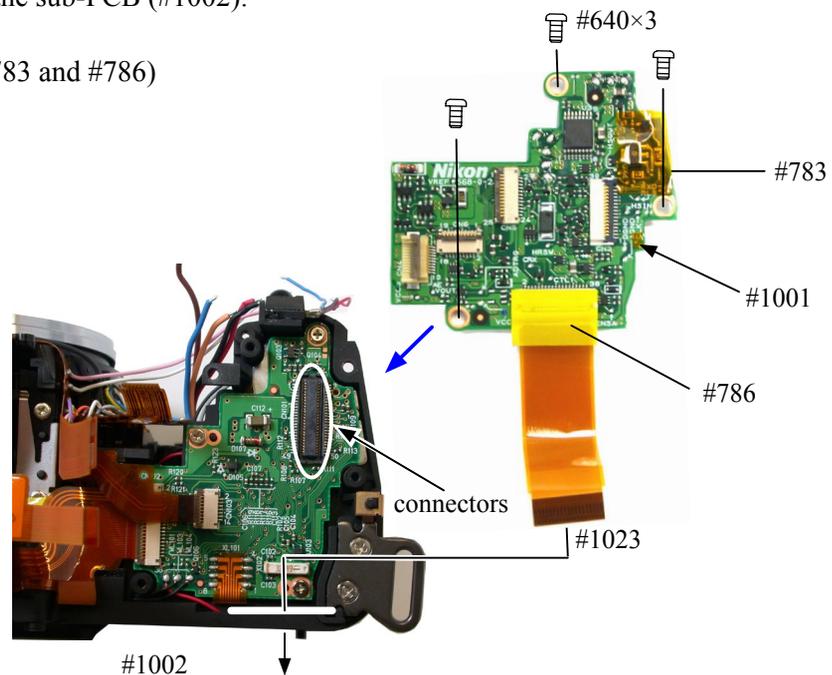
SUB PCB unit

- Solder 1 wire
- Connect each FPC to the connectors in the order of ① and then ②.

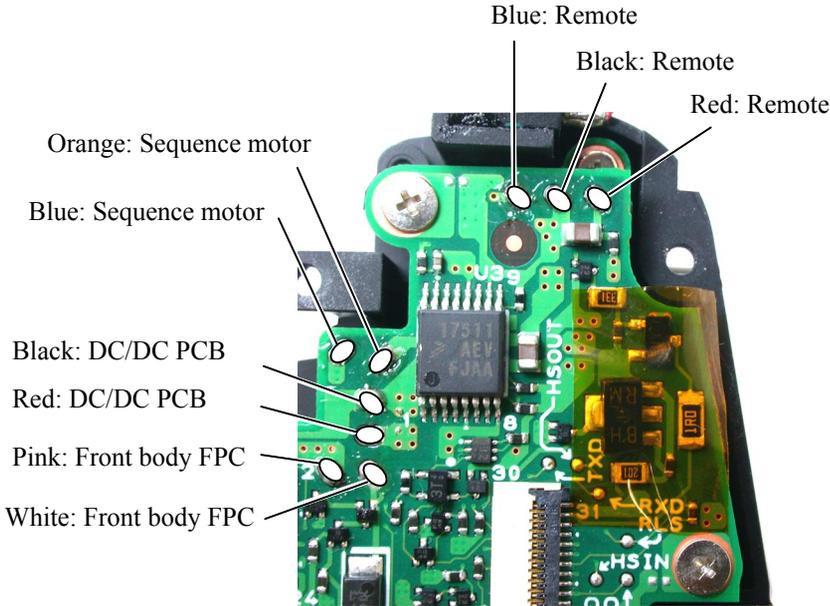


Main PCB unit

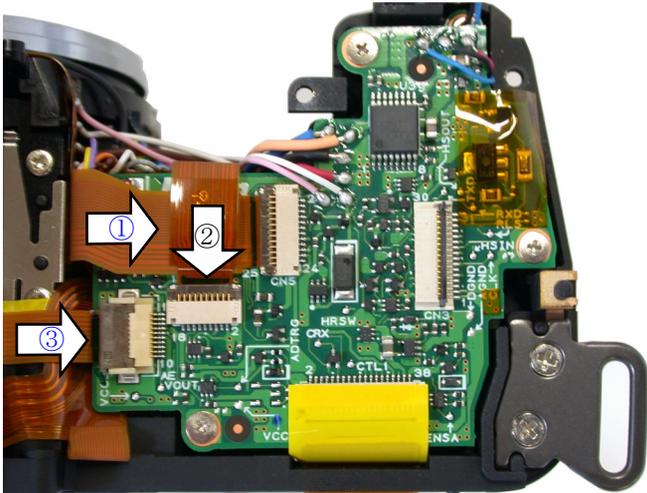
- Pass the D/G main FPC (#1023) through the hole of the rear body.
- Connect the connectors of the backside of the main FPC (#1001) and the sub-PCB (#1002).
- Fix 3 screws (#640).
- Attach the two tapes (#783 and #786)



- Solder 9 wires.



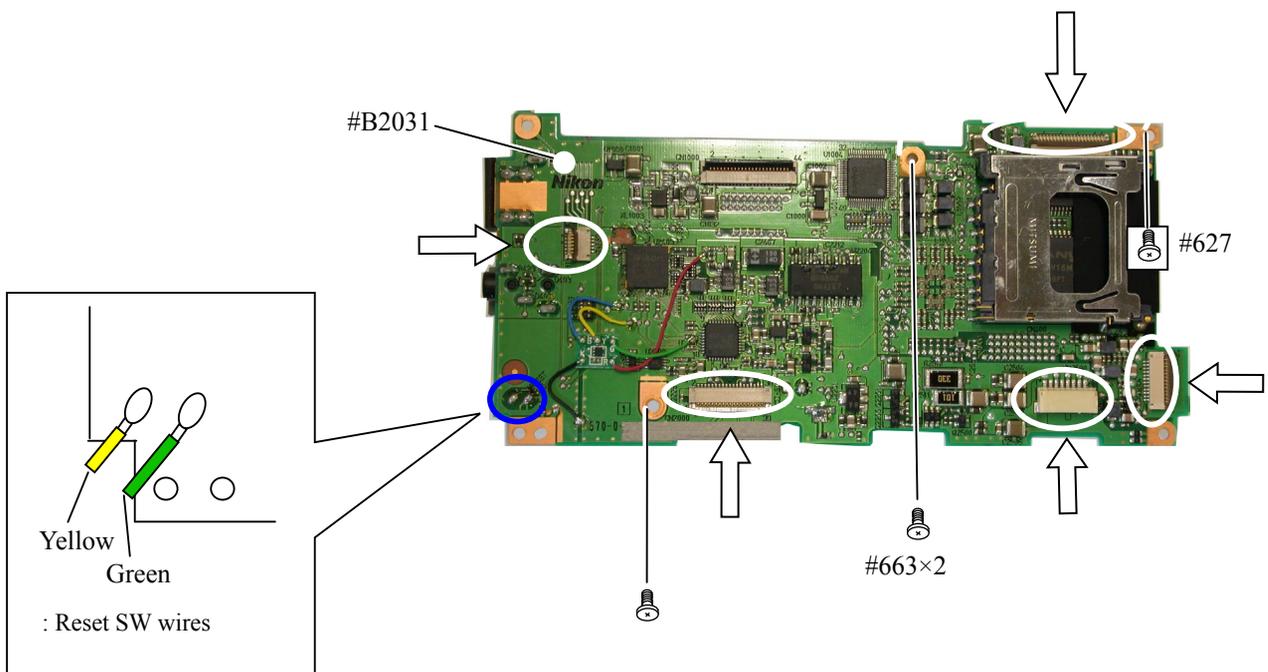
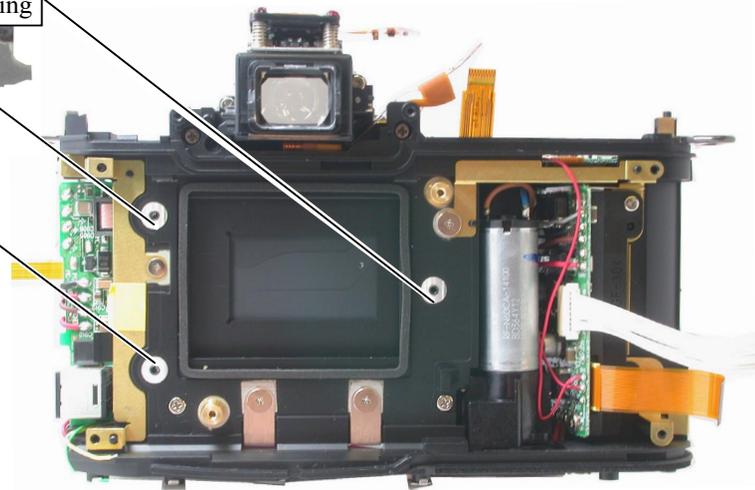
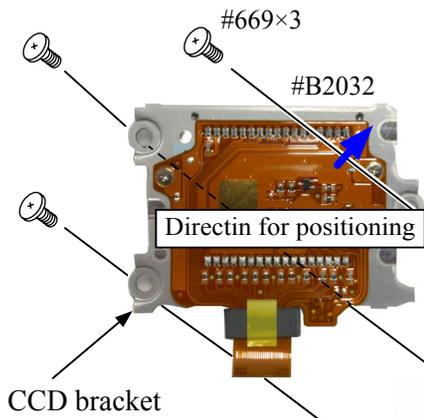
- Connect each FPC to the connectors in the order of ① and ② the ③ .



CCD/FPC unit
DG PCB unit

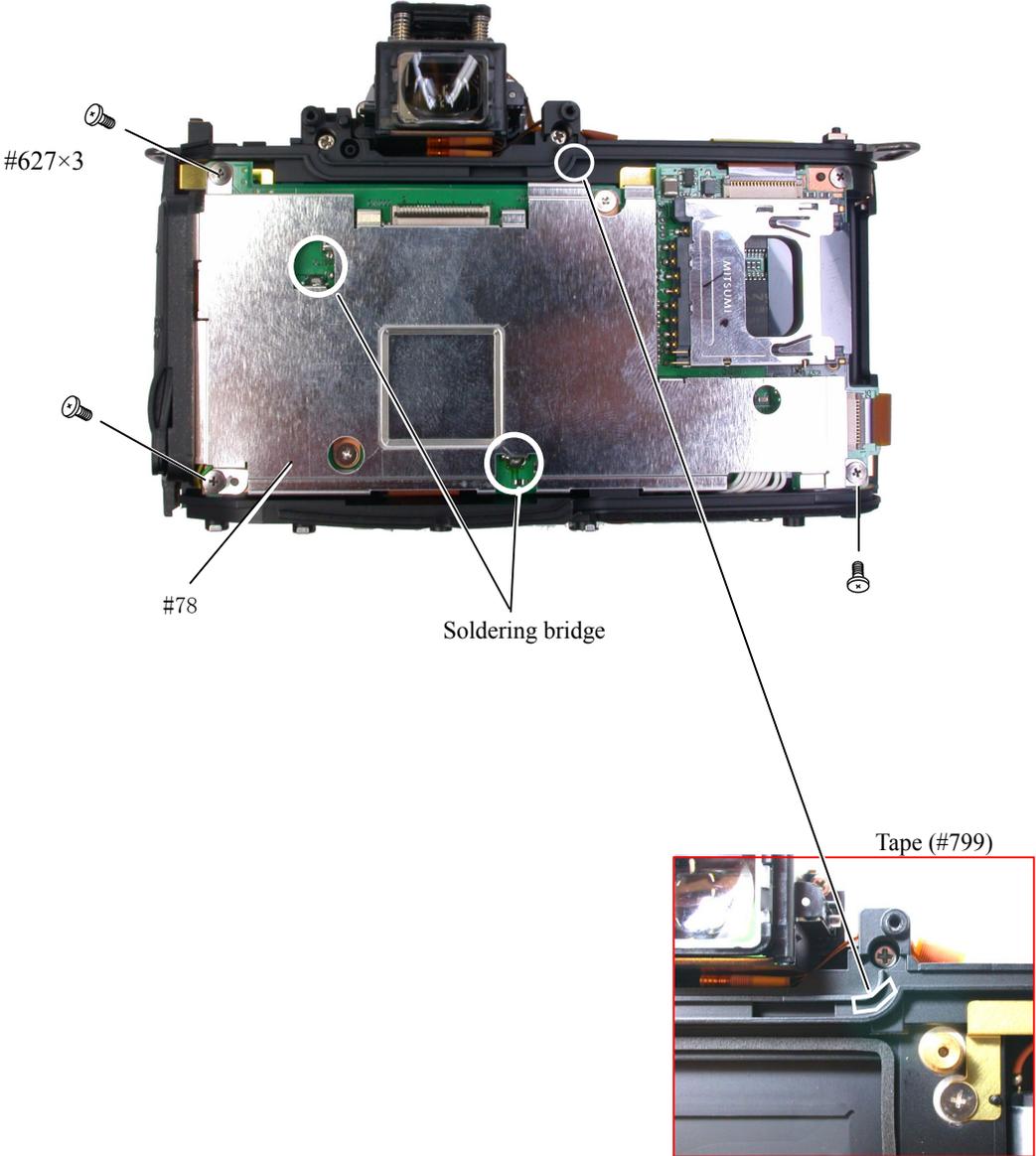
- Attach the CCD/FPC unit (#B2032) with 3 screws (#669).
- Attach the DG-PCB (#B2031) with 2 screws (#663) and the screw (#627).
- Solder 2 wires of the reset SW.
- Connect 5 connectors.

*** Note**
 1. In case a washer is put between the rear body and the CCD bracket, follow the instructions of Page A22.
 2. In case a spacer is attached on "a" part of the body, do NOT remove and leave it as is. (There is No indication of marking.)



DG shield plate

- Attach the DG shield plate (#78) with 3 screws (#627).
- Make 2 soldering bridges.
- Attach the tape (#799)

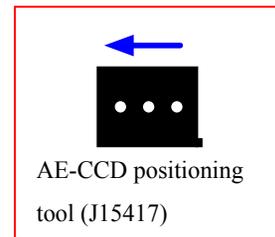


Remove backlash of the rear cover.

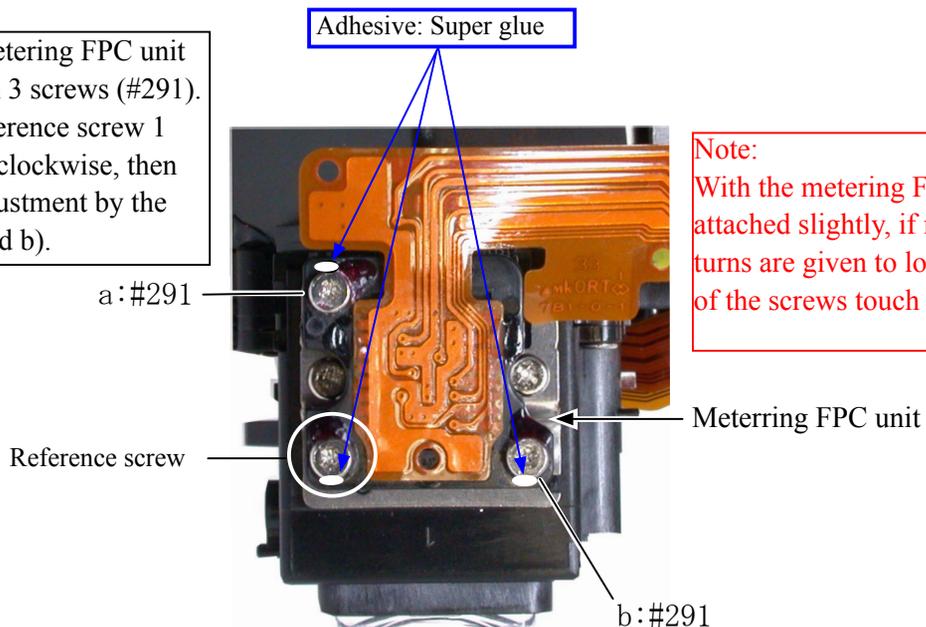
Inspection and adjustment of AE CCD Alignment

• Procedure

- ① To prevent short circuit, attach the grip (#26) with the screw (#635), and also I/F cover (#B5028) with the screws (#635). Insert AECCD alignment tool (J15417) between the FD screen and the SI plate.
 - * Position AE-CCD positioning tool in the direction of the arrow to insert.
- ② Connect camera and PC via USB cable UC-E4.
- ③ Provide power to camera via AC adapter EH-5.
 - * Note: Be careful of short circuit where there is no cover.
- ④ Start up the inspection and adjustment software for D50 (J18385), and select "INSPECTION AND ADJUSTMENT FOR AECCD POSITION" then "CCD ALIGNMENT INSPECTION AND ADJUSTMENT".
 - * Cover the camera with black cloth, when measured.
- ⑤ By following instructions on PC, make the position adjustment of AECCD by the screws (#291 a,b).
- ⑥ Select "CCD SLANT INSPECTION" of the adjustment software and make an inspection.
- ⑦ After the adjustment, fix the AECCD by applying Crazy glue slightly..
- ⑧ Remove EH-5, UC-E4, and AECCD positioning tool(J15417).
- ⑨ Take out the grip (#26), and I/F cover unit (#B5028).

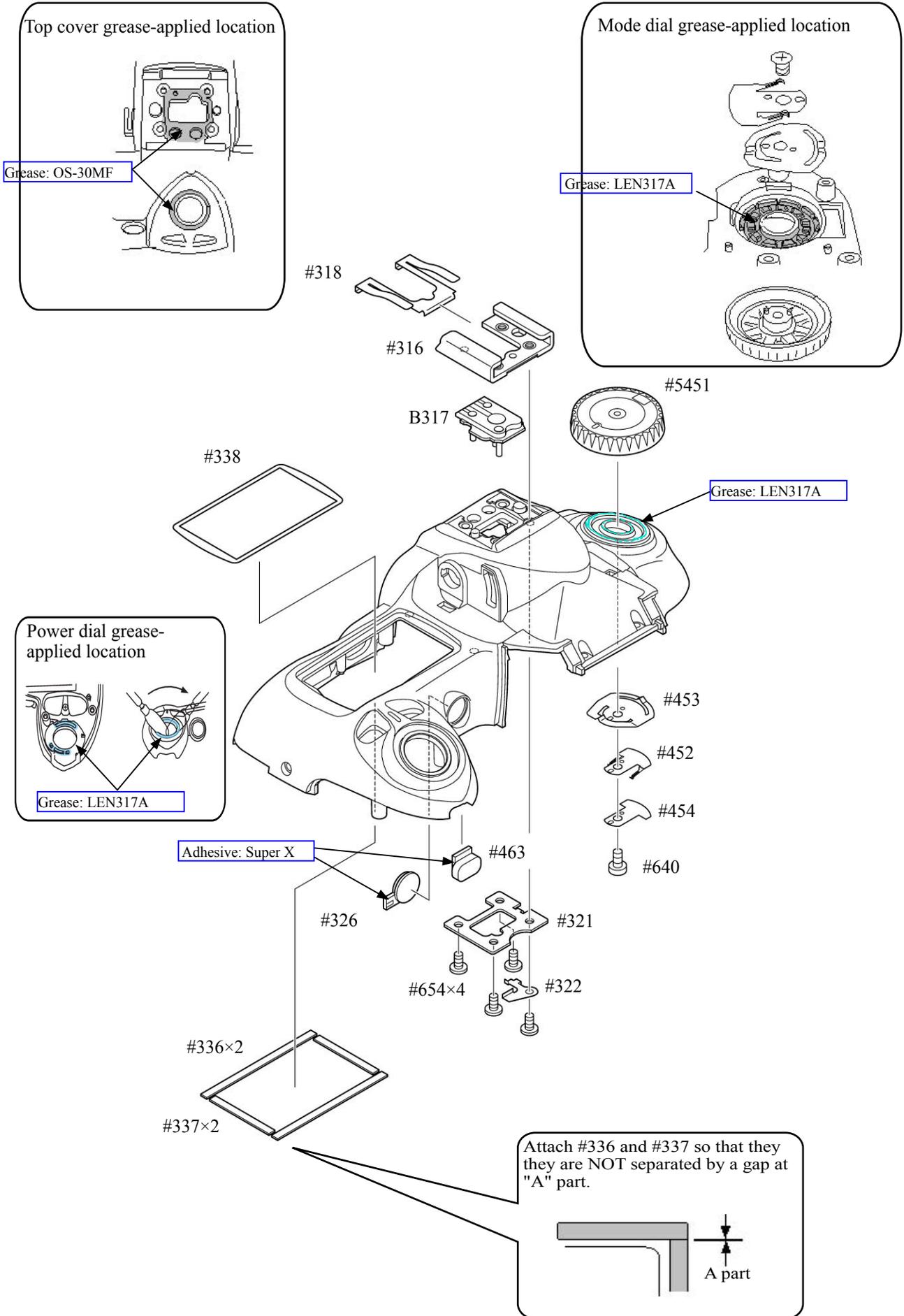


• Attach the metering FPC unit slightly with 3 screws (#291). Give the reference screw 1 turn counterclockwise, then make an adjustment by the screws (a and b).

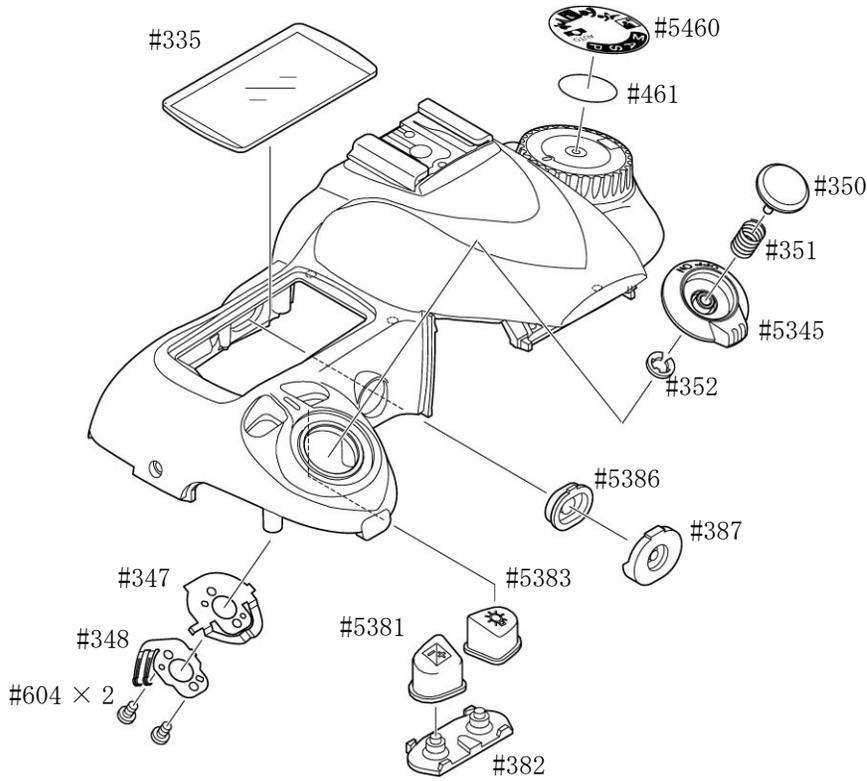


Note:
With the metering FPC unit being attached slightly, if more than 3 turns are given to loose, the head of the screws touch the top cover.

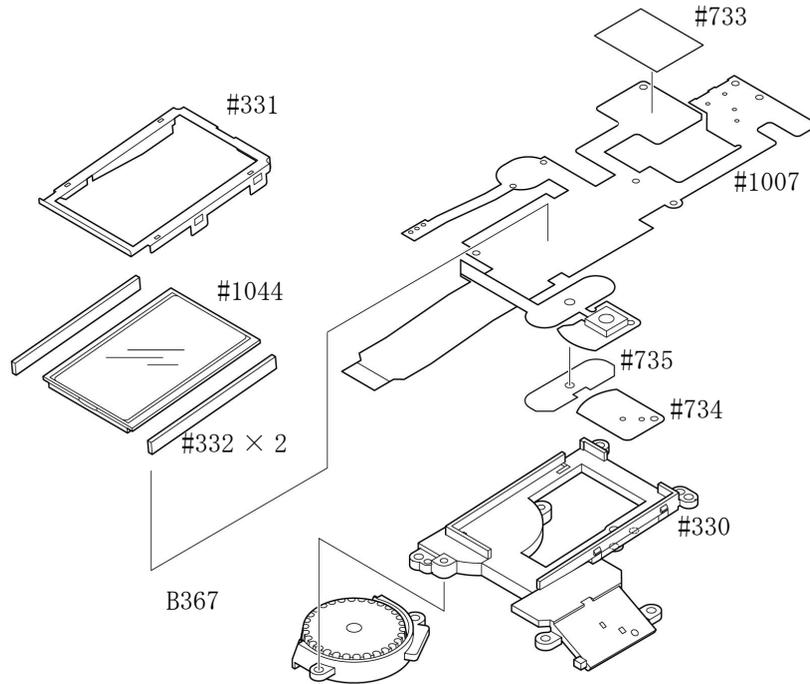
Outer LCD window / shoe mold unit / accessory shoe / other small parts



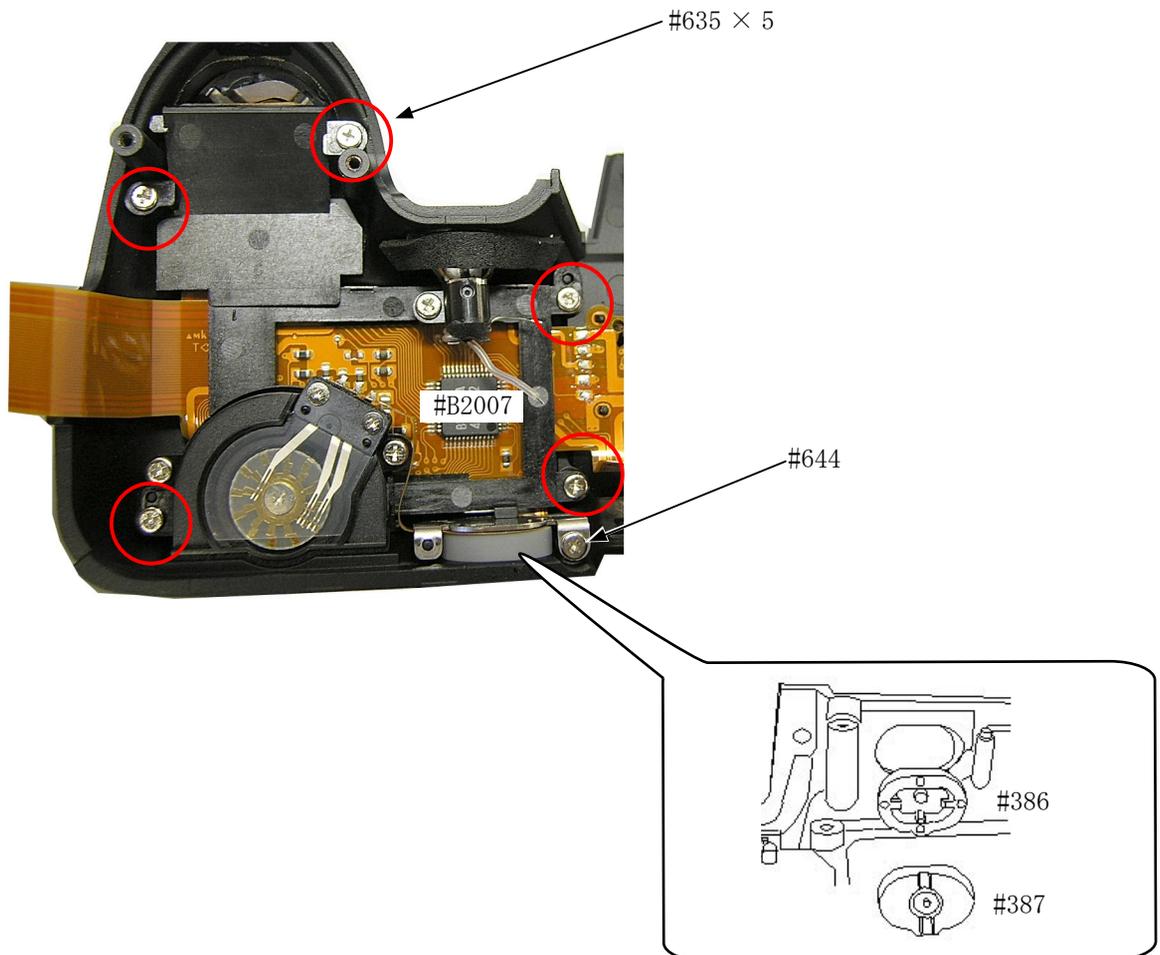
Release button / other small parts



Top cover FPC

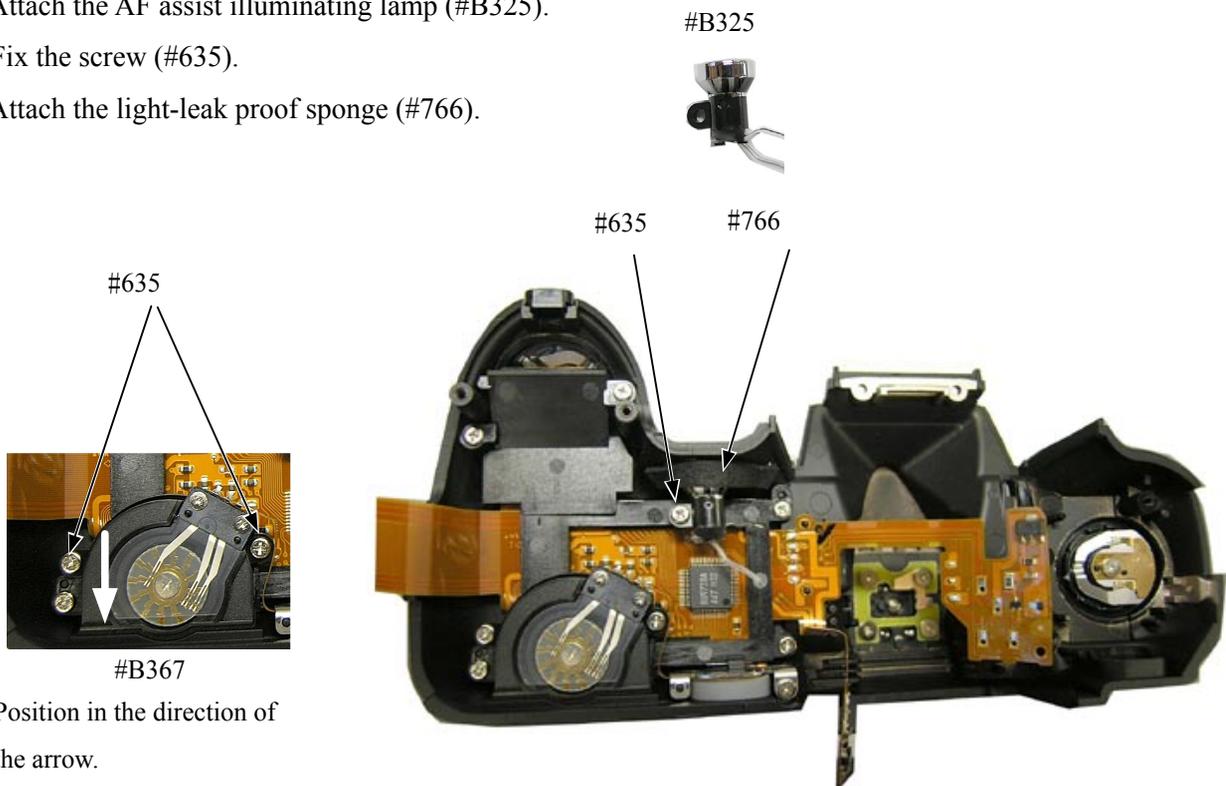


- Attach the top cover FPC (#B2007).
- Assemble AE-L button (#386) and AE-L rubber SW (#387).
- Fix the screw (#644).
- Fix 5 screws (#635).



AF-assist illuminating lamp / command dial

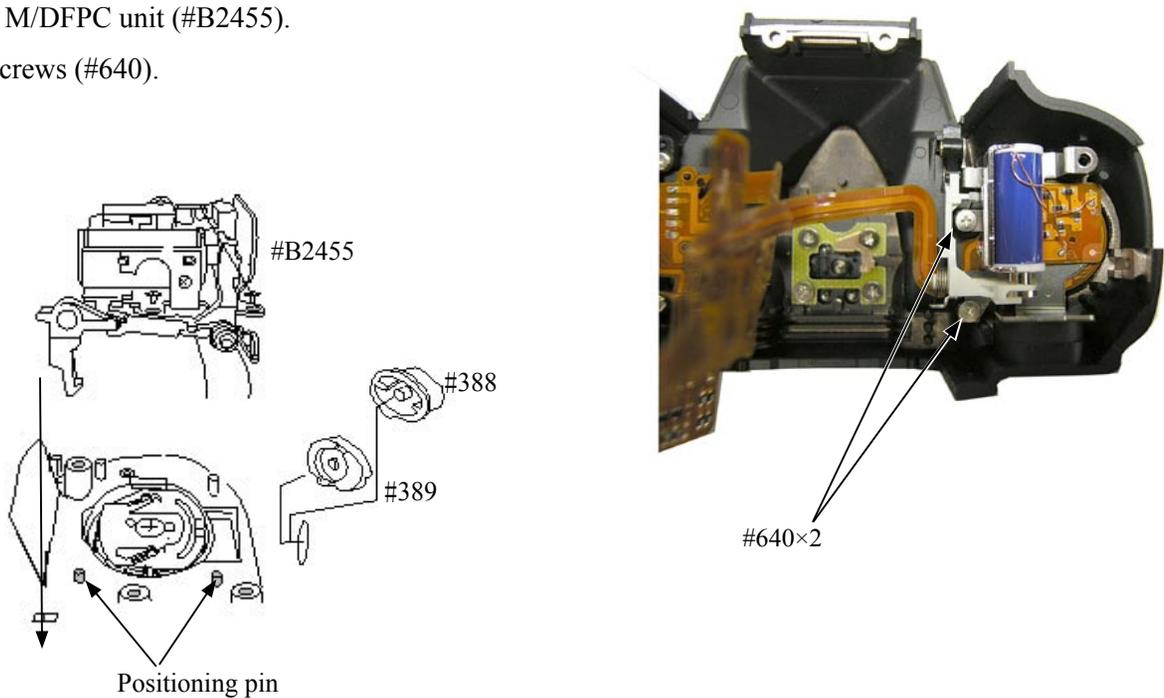
- Position the command dial (#B367).
- Fix 2 screws (#635).
- Attach the AF assist illuminating lamp (#B325).
- Fix the screw (#635).
- Attach the light-leak proof sponge (#766).



Position in the direction of the arrow.

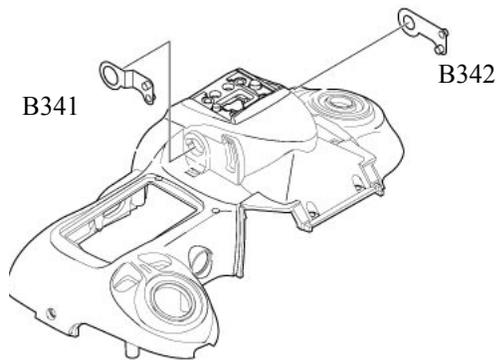
M/DFPC unit

- Attach the shooting operation-mode button (#388) and the rubber SW (#389).
- Mount M/DFPC unit (#B2455).
- Fix 2 screws (#640).

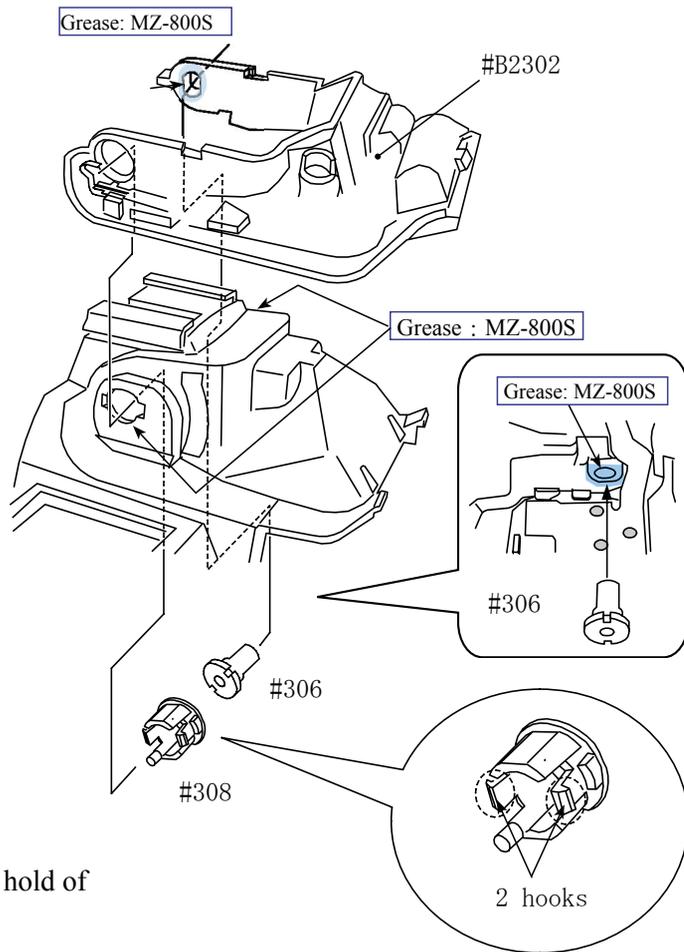
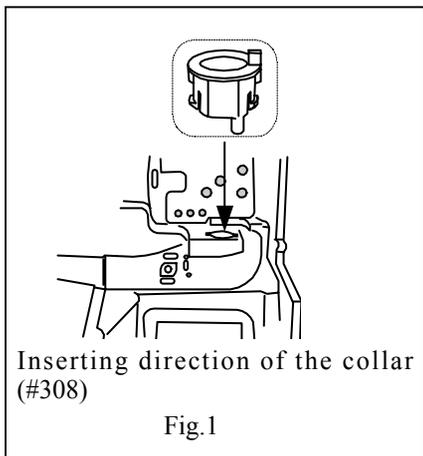


SB lower case unit

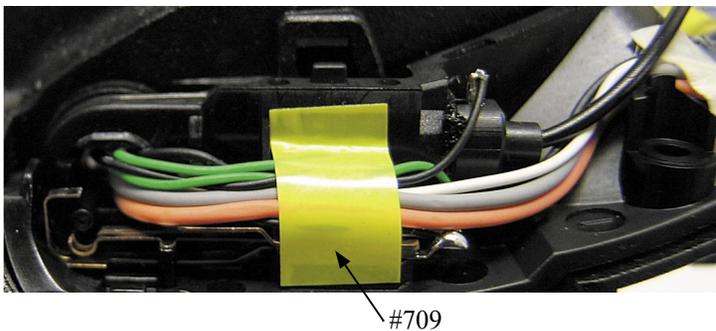
- Attach #B341 and #B342.



- Mount the SB lower case unit (#B2302) on the top cover.
- Insert the collar (#308) in the direction shown in Fig.1 into the top cover, and set it in place by hooking 2 parts.
- Put the turning-shaft (#306) in the top cover.
- Pass each wire through the hole of the collar (#308).

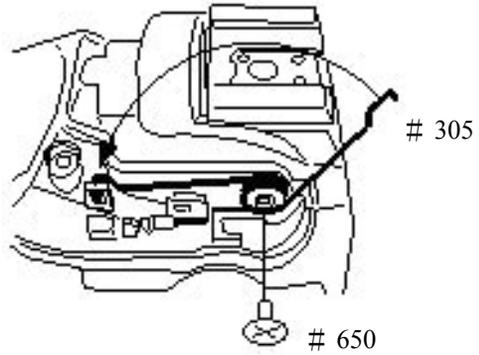


- Arrange the wires that were passed through the hold of the collar as shown below.
- Fix them with the tape (#709).



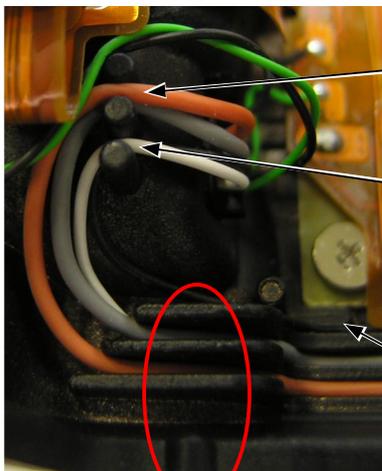
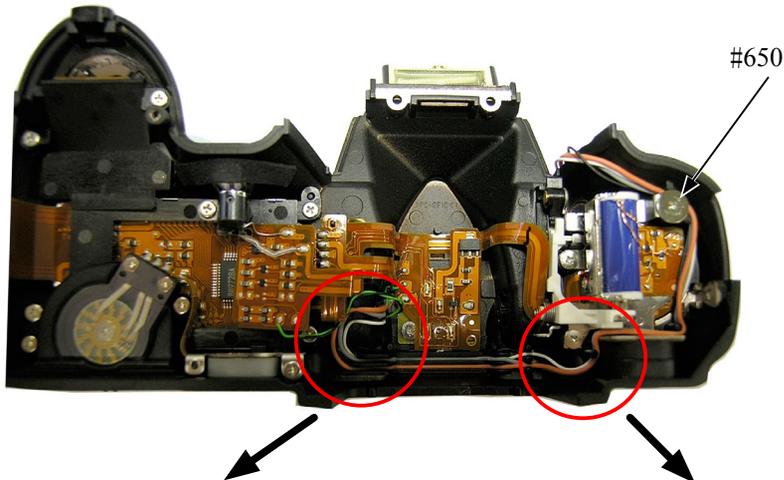
Flash-up spring

- Attach the flash-up spring (#305) and fix it with the screw (#650).
- Hook the flash-up spring (#305) in the direction of the arrow.



Wiring / Top cover FPC

- Arrange the wires as shown below.
- Fix the wire-retaining screw (#650).



From the top
Orange
Gray
White
Black

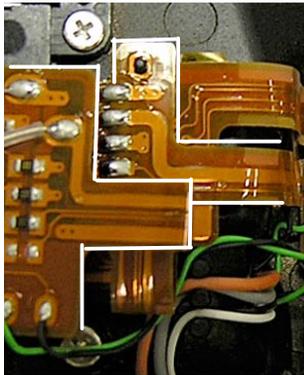
Arrange the wires by putting them into the groove.



From the top
Orange
Gray
White
Black

Gray
White
Orange

- Assemble the FPC as shown below.
- Solder 5 accessory shoe contacts.
- Solder 2 pop-up change switches.
- Solder 2 SPD sensor wires.
- Solder AF-assist illuminating lamp.
- Make soldering bridges.



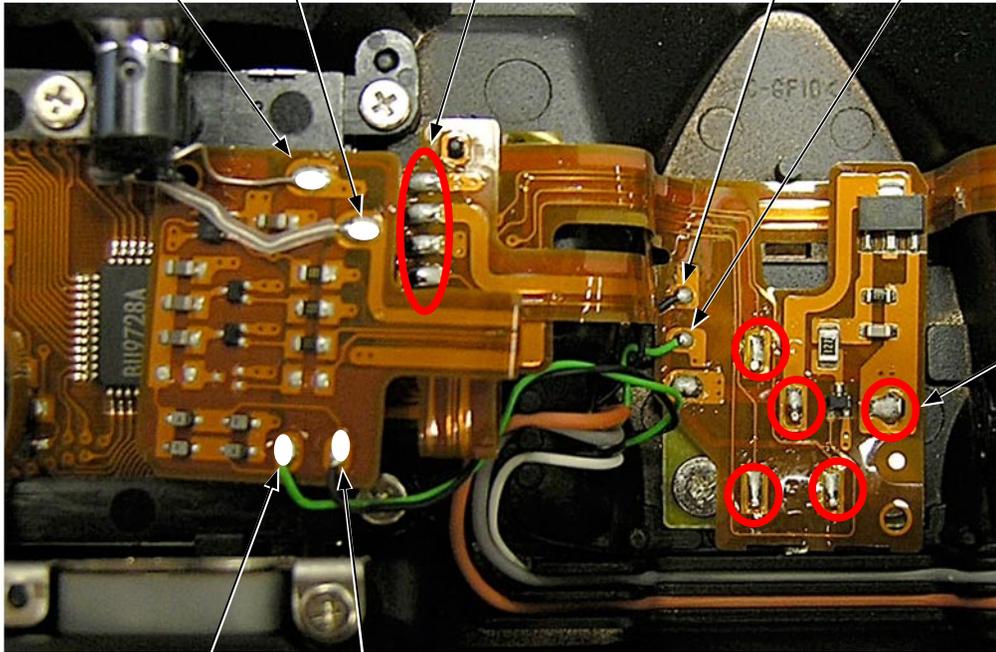
AF-assist illuminating lamp
(covered for insulation)

AF-assist illuminating lamp

Soldering bridges

Pop-up change switch (Black)

Pop-up change switch (Green)



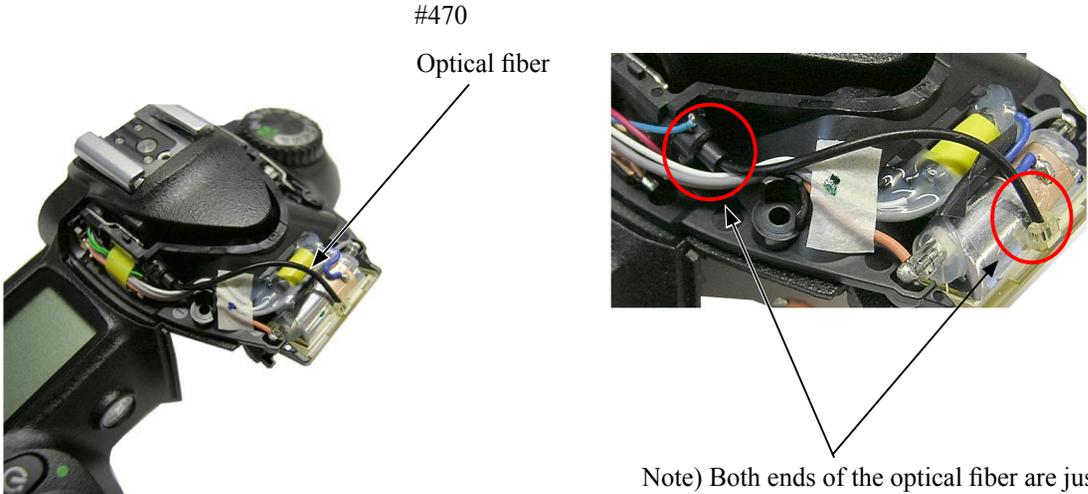
Accessory shoe
contact ×5

SPD sensor wire (Green)

SPD sensor wire (Black)

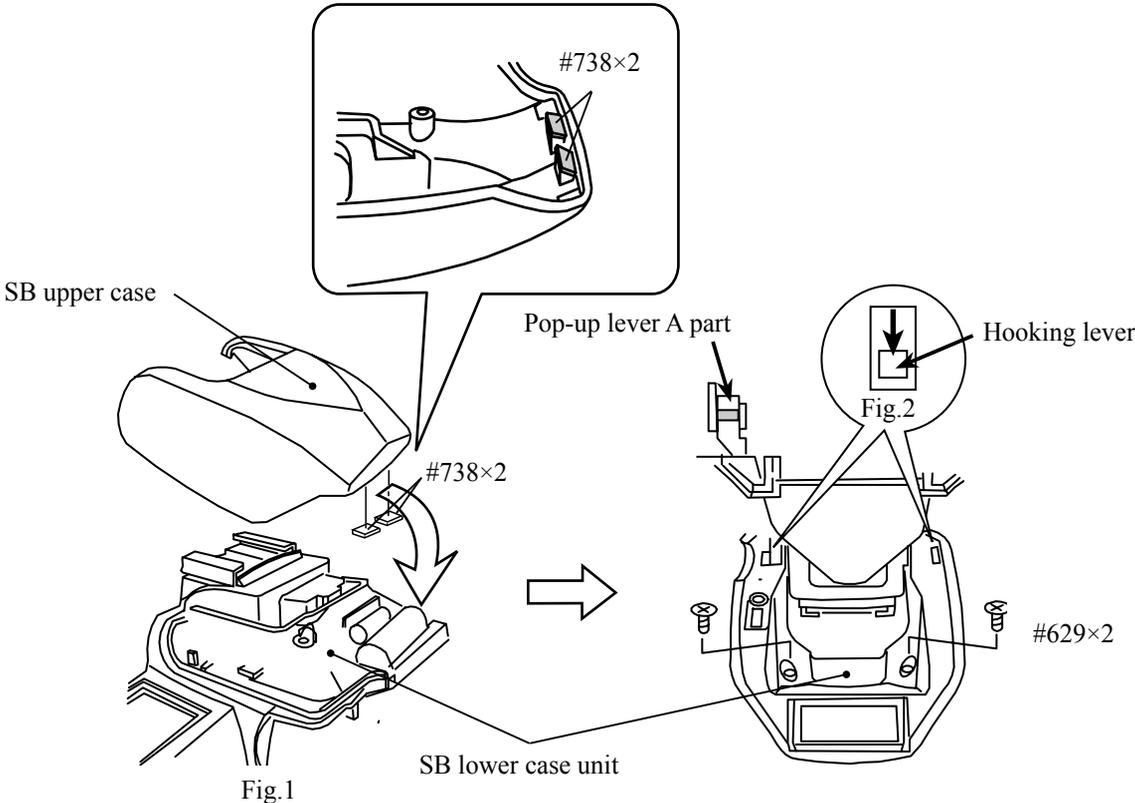
SB upper case

- Attach the optical fiber (#470).



Note) Both ends of the optical fiber are just inserted in each part without any adhesive.

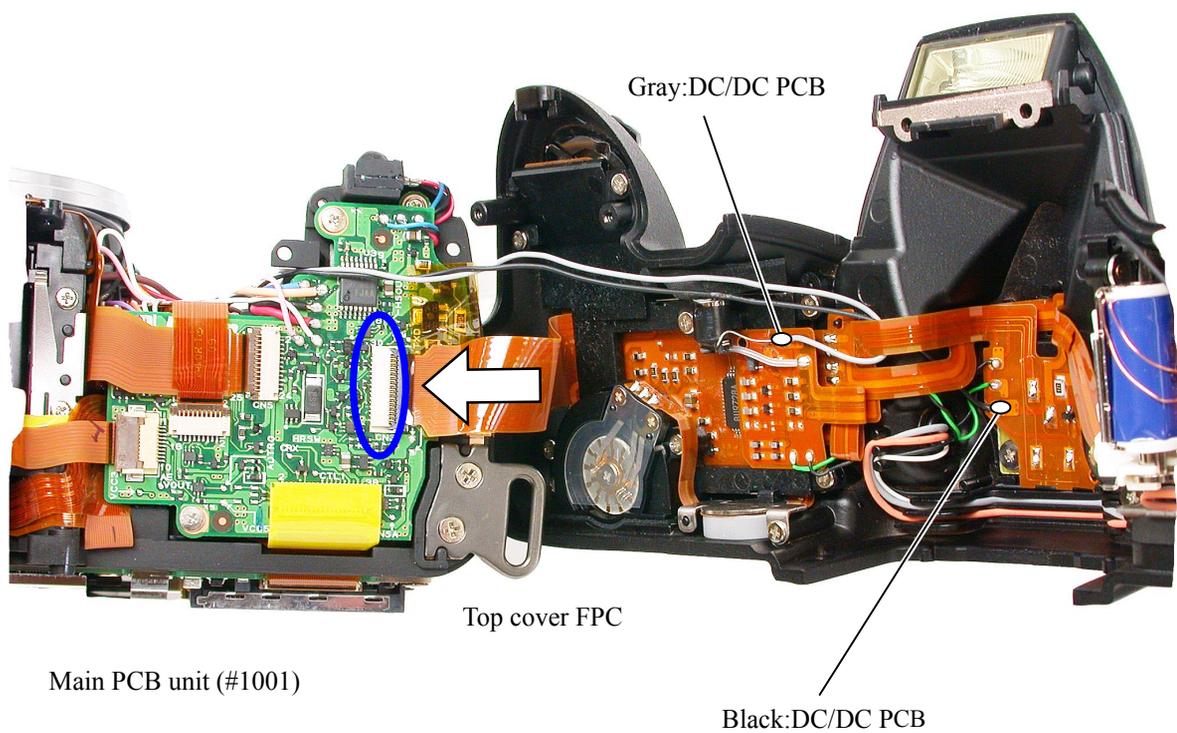
- Mount the SB upper case on the SB lower case. (Fig.1)
- Press the pop-up lever A part of the top cover unit, and pop up the built-in SB.
- Confirm that the hooking levers of the SB upper case are surely hooked in the 2 holes. (Fig.2)
- Fix 2 screws (#629).



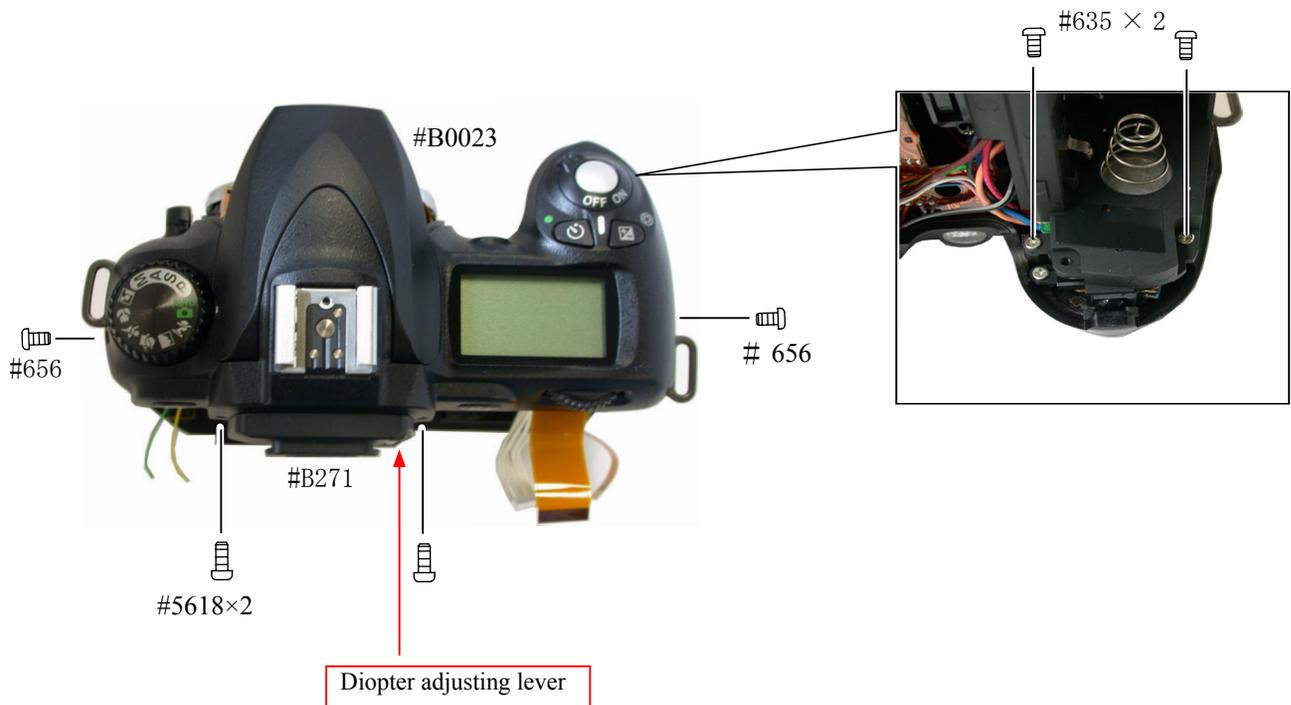
Top cover

Mount Top cover

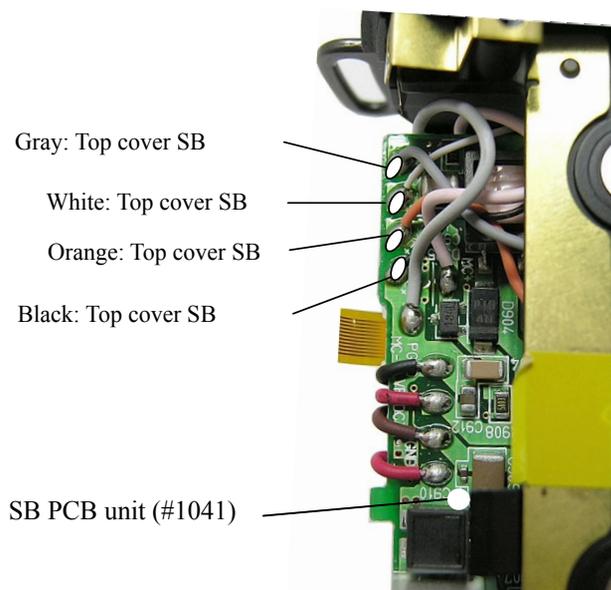
- Solder 2 wires on the top cover FPC unit (#1007).
- * The solder land of gray wire is same as AF assist lamp unit.
- Connect the top cover FPC to the connector of the main PCB unit (#1001).
- * Insert FPC all the way seated without any slant.



- Assemble the eyepiece frame (#B271) by putting the diopter adjusting lever at the lowermost position.
- Fix 2 screws (#635), 2 screws (#656), and 2 screws (#5618).
- * After pushing outside the AE/AF lock button from the inside of the top cover, assemble the top cover.

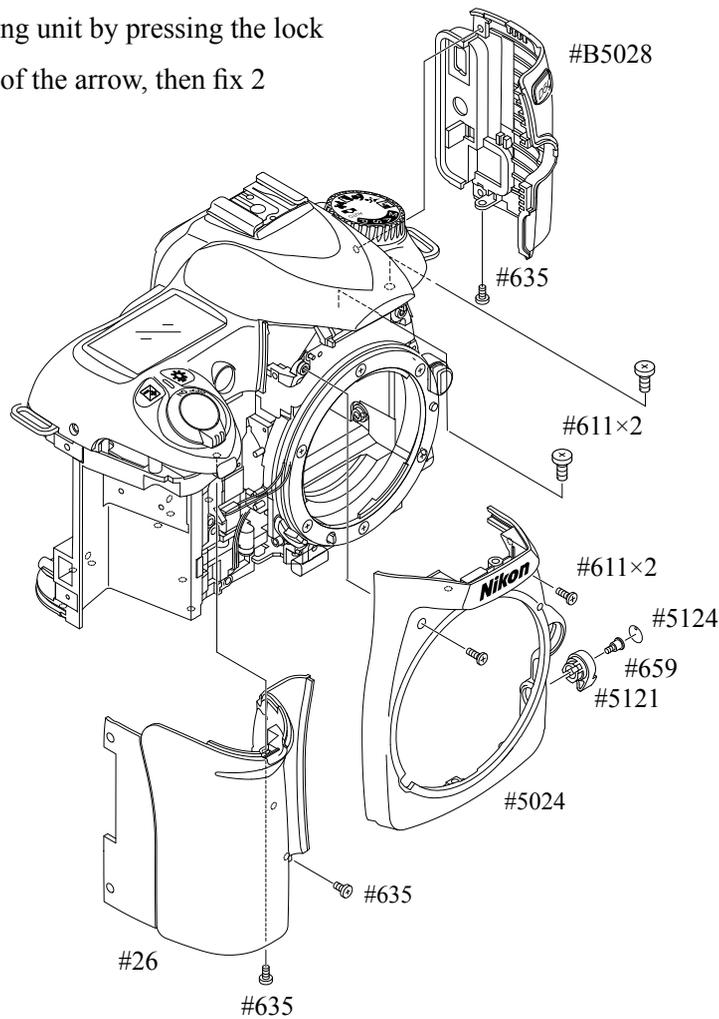


- Solder 4 wires on the SB PCB unit (#1041).



Covers

- Assemble the front cover (#5024) at the last stage.
- Pop up the SB lighting unit by pressing the lock lever in the direction of the arrow, then fix 2 screws (#611).



Gap adjustment of SB lighting unit

- In case it is out of standard, pop the SB unit up and make an adjustment by turning the adjusting dial with Hexagonal wrench.

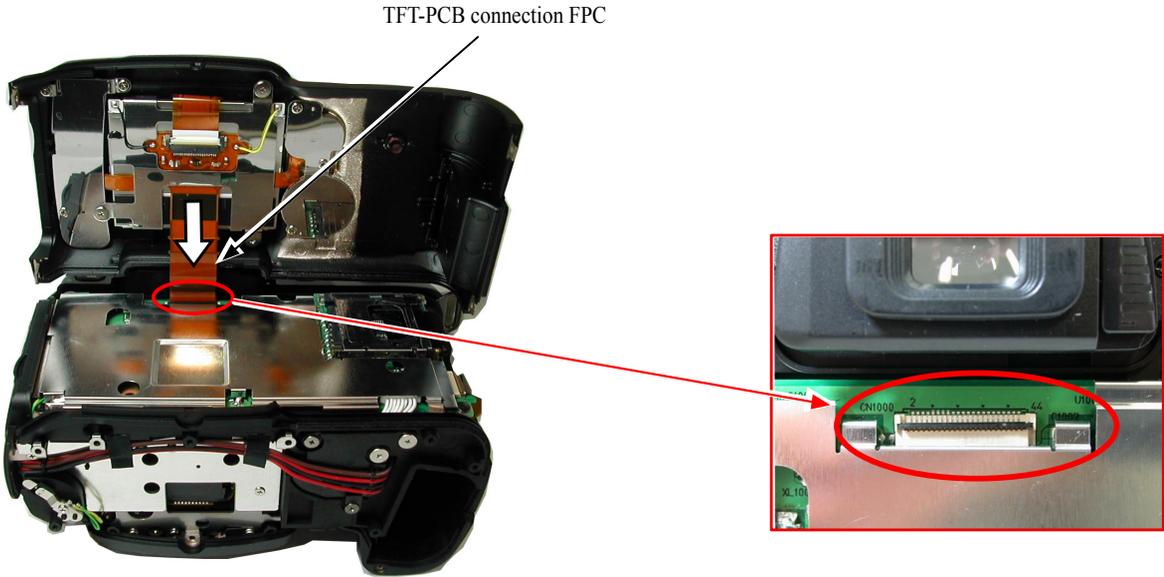
Standard : 0 ~ 0.5mm



Adjusting dial

Rear cover

- Connect TFT-PCB connection FPC to the connector of the DG-PCB.

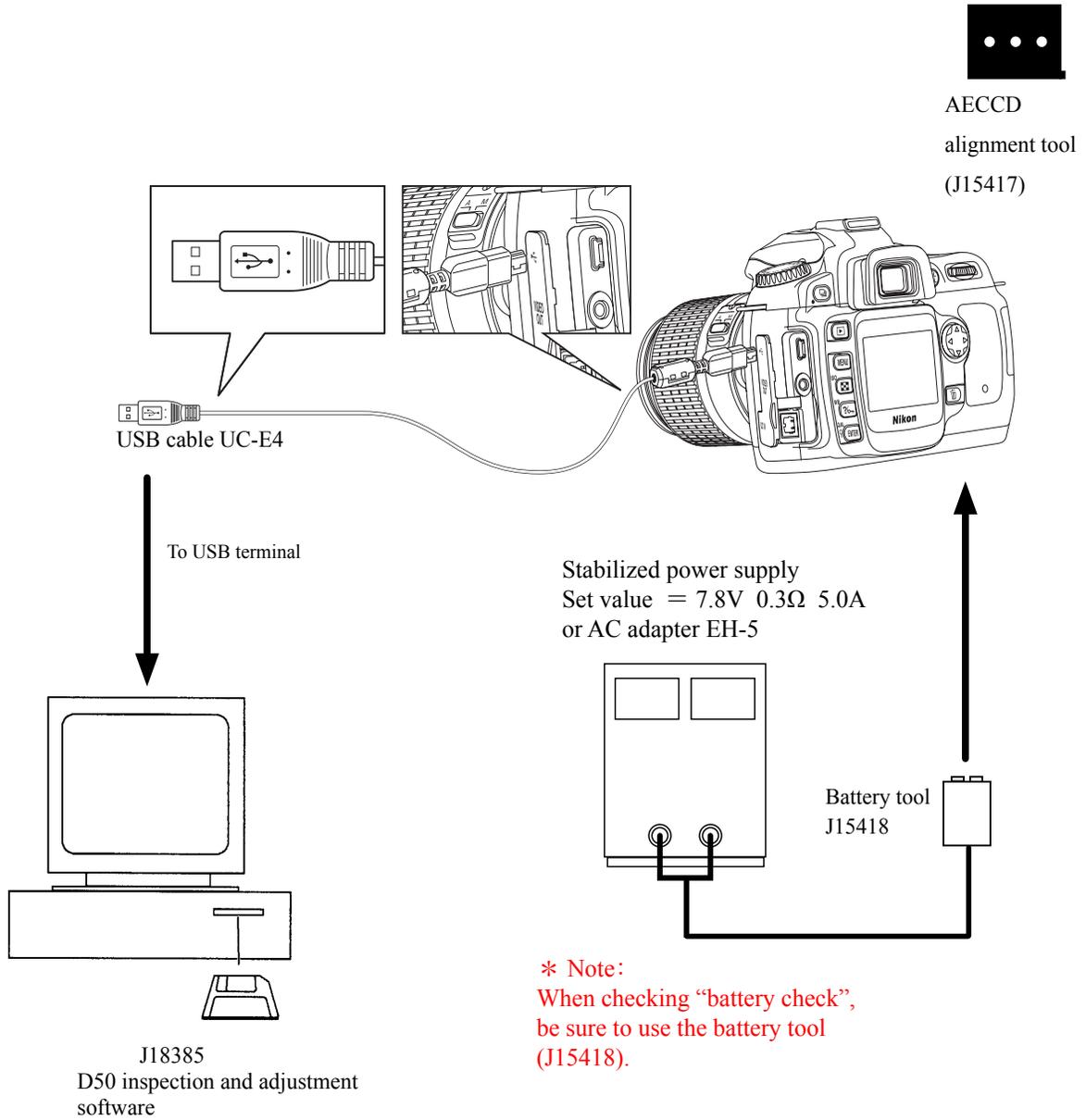


- Fix the rear cover with 4 screws (#623).



Accuracy inspection and adjustment (Camera body)

- To connect to PC, as shown below, connect USB cable UC-E4 to the USB terminals of PC and camera.

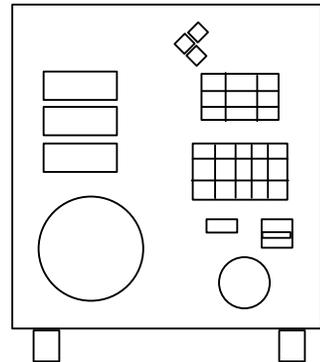


Flash meter
Not prepared as RJ

AF50/1.4D



Shutter tester (EF-8000, etc)



D50 Inspection and Adjustment Software (J18385)

This inspection and adjustment software runs on Windows.

Install the software by following the below procedure.

<Operating environment>

The following operating environment is required for installing this program on PC.

【In case of using USB interface】

PC	IBM PC/AT compatible
OS	Windows XP Professional Edition, Windows XP Home Edition, Windows 2000, Windows 98 Second Edition (SE)
CPU	Pentium II 266MHz ~ Pentium 4 2.2GHz
RAM (memory)	64MB or more
HD	6MB-or-more free disk space is required when installing
Monitor resolution	800×600 pixels or more
Interface	USB Interface : USB1.1

As long as the above hardware requirements are met, any PC such as desktop or laptop, etc is available.

<Procedure for installation>

The file (D50SOFT.EXE) of this program is provided via FD or e-mail.

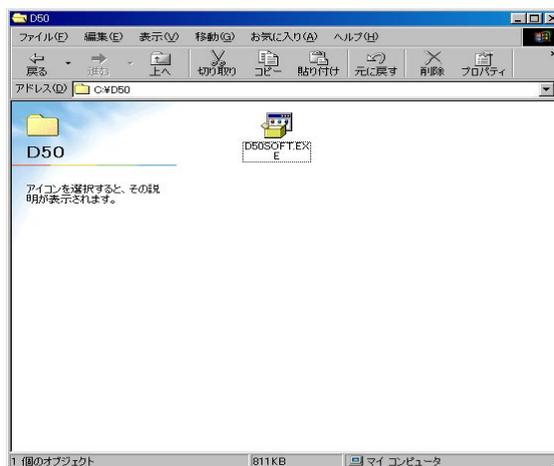
Because this is the self-extracting file, decompress the file before installing, following the next procedure.

The operating system used here is "Windows 98 SE".

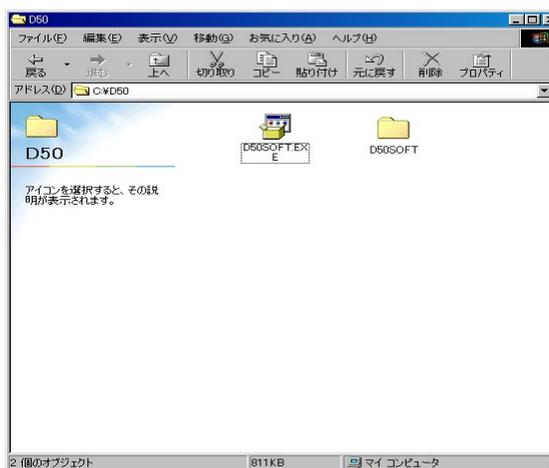
1. Create a folder for installation under a name you like and PC drive.

(e.g.) C:\D50

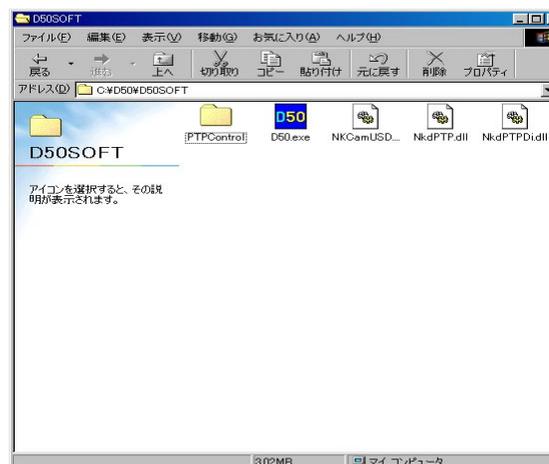
Paste the file (D50SOFT.EXE) in the created folder.



2. Double-click on the pasted file to display the following screen.



3. Open the folder D50SOFT, the following 5 files and PTPControl folder are appeared.



< How to install USB driver >

If this program is used by the USB interface, installing the USB driver is necessary.

But if the OS is "Windows XP", the driver is already preloaded so it is not necessary to install it.

1. Set the USB of camera to "PTP".

(SETUP menu → USB setting → PTP)

2. Connect the camera and PC by USB cable.

Turn camera ON.

3. When "Add New Hardware Wizard" is displayed, click "Next".



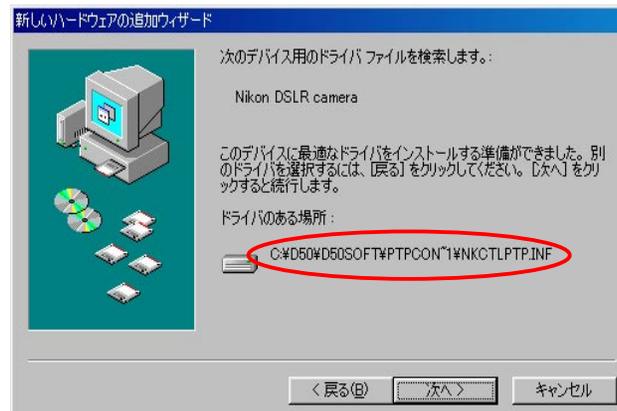
4. Select "Search for a better drive than the one your device is using now. (Recommended)", and click "Next".



5. Check the box of "Specify a location" and select "¥D50¥D50SOFT¥PTPControl " of C drive. Then click "Next".



6. Confirm that the driver is located at the right place, and click "Next".



7. Click "Finish" to complete the installation.



< File >

D50.exe		Application executable file
Nk_PTP.INF	INF file:	PTP control driver installation file
NKCamUSD.dll	Library file:	PTP control driver registration file
NkdPTP.dll	Library file:	USB communication application extension file for Windows XP
NkdPTPDi.dll	Library file:	USB communication application extension file for Windows 98 SE, Windows 2000
PTPControl	PTP driver file storing folder:	for Windows 98 SE, Windows 2000

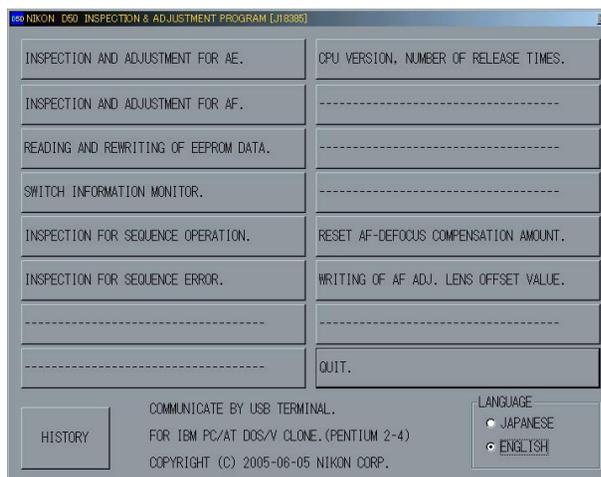
< Point to notice for starting up program >

Before starting up this program, close all the other applications softwares.

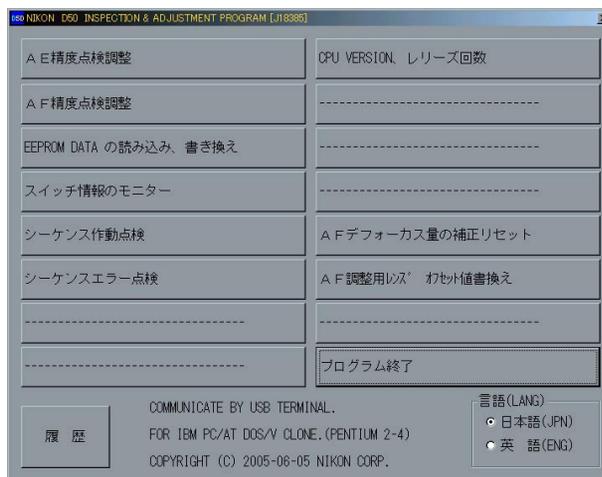
If other application softwares are running, this program may not work.

<Start-up of Program>

1. Double-click the file (D50.EXE), then Inspection and adjustment program for D50 starts.



2. To display in Japanese, select the radio button "JAPANESE" in "LANGUAGE" in the lower right-hand corner of the screen.



3. When the "HISTORY" button at the lower-left is pressed, the program version will be displayed.



4. Select each item button according to operation.

Follow the instructions on the next screen that will be shown after pressing the item button.

5. To finish the program, press the "Close (×)" button in the right-hand corner of the screen or "QUIT".

AE inspection and adjustment

- ① AE CCD alignment inspection and adjustment (ref. Page A27 for details)
- ② AE accuracy inspection and adjustment
- ③ Aperture accuracy inspection
- ④ Adjustment for battery check level (Use the battery tool (J15418) and stabilized power supply.)
- ⑤ Built-in SB flash inspection and adjustment

[Tools required] ref. Page A41.

• Inspection on Battery check indications

After the battery check adjustment, input each voltage of the below into camera, and check the indications of the outer LCD.

Note: Make an inspection by switching the voltage in the order of ① - ⑦ .

Outer LCD indication	Set voltage of Stabilized power supply	
	① 7.80V	⑦ 7.715±0.1V
	② 7.415±0.1V	⑥ 7.620±0.1V
	③ 7.320±0.1V	⑤ 7.470±0.1V
 Blink	④ 7.170±0.1V	

• Built-in SB flash inspection and adjustment

Set the distance between camera and flash meter to 1 m, and inspect and adjust the light volume of the built-in SB. (ref. adjustment software for details)

AF inspection and adjustment

Note: When using the adjustment software for the first time, prepare 5 cameras of D70s (or D70) and input the average value of the 5 cameras, which was measured when checking the AF accuracy, in "WRITING OF AF ADJ. LENS OFFSET VALUE" on the main menu.

- ① AF accuracy inspection and adjustment (Make all the following adjustments.)
- ② YAW, PITCH inspection and adjustment
- ③ LARK adjustment (inc. CCD output adjustment)

[Tools required]

1. When adjusting for all adjustment items

ref. Page A41.

2. When inspecting AF accuracy

- ① AF adjustment lens (J18266)
- ② AF adjusting tool (J15259)
- ③ Lens holder for F4 (J15280)
- ④ AF chart (J18344)
- ⑤ Chart illuminator for AF (J15264)

3. When adjusting YAW, PITCH

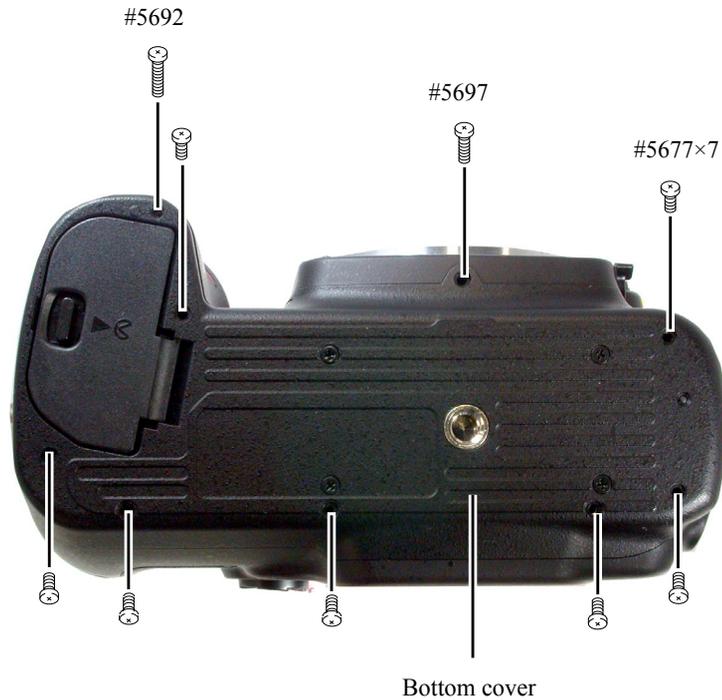
YAW, PITCH tool (J18230)

4. When adjusting LARK

The above tool when inspecting AF accuracy

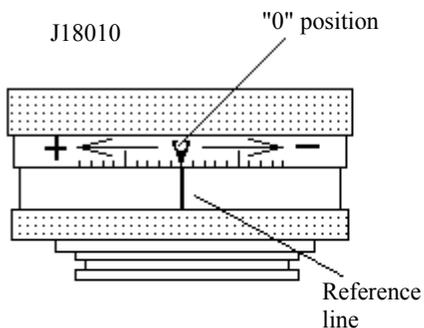
Bottom cover

- Attach the bottom cover with the screw (#5692), the screw (#5697), and 7 screws (#5677).



∞ Infinity alignment & adjustment

- Replace the finder screen with the infinity focus check screen (J15410), and use the reference lens (J18010) and read the value. In case it is out of standard, increase or decrease washers (#297A or #297B) for adjustments. * Supply the power (Battery or EH-5) for checking.



Standard: $\pm 0.07\text{mm}$ (1 scale = 0.01mm)

Value of J18010	Adjustment
+0.07 ~ -0.07	Adjustment unnecessary if within standard
+0.08 ~ +0.15	Decrease washers (#297) (for thinning)
-0.08 ~ -0.15	Increase washers (#297) (for thickening)
+0.15 or more; -0.15 or less	Check if Front body or Penta box is not deformed.

Necessary adjustments when parts are replaced

1. D50 adjustment software and updates

Adjustments Parts to be replaced	EEPROM fixed values	AE CCD positioning adjustment	AE accuracy inspection & adjust- ment	Aperture accuracy inspection	battery check level adjustment	built-in SB light volume inspection & adjust- ment	AF accuracy inspection & adjust- ment	VrUP
Shutter unit								
Main FPC	○	* 2 △	○	○	○	○	○	* 1 ○
Sub PCB unit								
AF sensor unit							○	
Top cover or SB lower case unit						○		
DC/DC PCB unit					○	○		
Metering FPC unit		○	○					
Aperture control PCB unit				○				

* 1 Before the adjustment, update the firmware.

* 2 Make an inspection.

2. Shooting image adjustment software and updates

Adjustments Parts to be replaced	Sensitivity	Gr/Gb compensation ADJ (R/B filter)	Sensitivity ratio	Gr/Gb compensation inspection (No filter)	CCD black point defect compensation	CCD white point defect compensation	TFT angle of view	VrUP
Shutter unit								
Main PCB unit								* 1 ○
AF sensor unit								
DC/DC PCB unit								
Metering FPC unit								
DG PCB unit	○	○	○	* 2 △	○	○	○	
CCD/FPC PCB unit	○	○	○	* 2 △	○	○		
TFT monitor							○	

* 1 Before the adjustment, update the firmware.

* 2 Make an inspection.

Shooting Image Adjustment

1. Summary

When D50 shooting image-related and listed parts on Page A51 are replaced, be sure to make an adjustment by the shooting image adjustment software for D70s (J65076). The details of its function and how to use this software are as follows:

2. Adjustment software function

- (1) "Sensitivity" adjustment
- (2) Gr/Gb compensation adjustment (R/B filter)
- (3) "Sensitivity ratio" adjustment
- (4) Gr/Gb compensation inspection (No filter)
- (5) CCD black point defect compensation
- (6) CCD white point defect compensation
- (7) "Sensitivity" and "Sensitivity ratio" reference values calculation
- (8) "TFT angle of view" adjustment
- (9) Reading of RISC version

※ When the adjustments from (1) to (3) are made, calculate the sensitivity and sensitivity ratio reference values of (7) by using the reference body in advance, then perform the adjustments.

3. Hardware requirements

OS : Widows98SE, Windows2000, WindowsXP
 Japanese or English OS
 PC : CPU Pentium II or more
 Memory 128MB or more
 USB1.1
 Screen size: 1024×768 pixels or more

4. How to set up

Create any directory in the harddisc of PC, and copy the following files.

- D50IMG.exe Application file
- STD.DAT Standard file
- NkdPTP.dll USB-communication application extension file for WinXP
- NkdPTPDi.dll USB-communication application extension file for Win98SE, Win2000

※ Be sure to copy the above files in the same directory.

5. Install USB driver

When this software is used, USB driver becomes necessary. However, USB-driver installation is not needed if USB driver has already been installed at the time of installing "D50 inspection and adjustment program". As for WindowsXP, the installation is neither needed, because it is already included in OS.

6. How to use

- (1) Perform the D50IMG.exe to start up the main screen. (ref. Fig.1)
- (2) Select ENGLISH / JAPANESE in Language to display the expected menu. (ref. Fig.2)
- (3) Click the desired button to start adjustments.
- ※ When the adjustments from 1. to 3. are made, calculate to get the “Sensitivity” and “Sensitivity ratio” reference values of (7) by using the reference body beforehand, then perform the adjustments.
- (4) Follow the instructions to be displayed on screen.
- (5) To complete the procedure, click "QUIT" button or "Close" button at the upper-right corner of the menu.

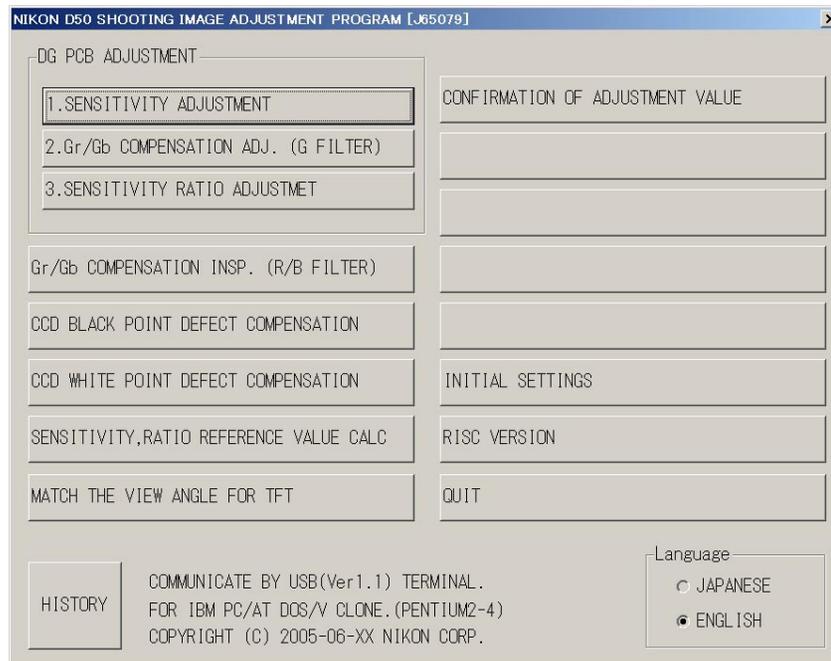


Fig.1

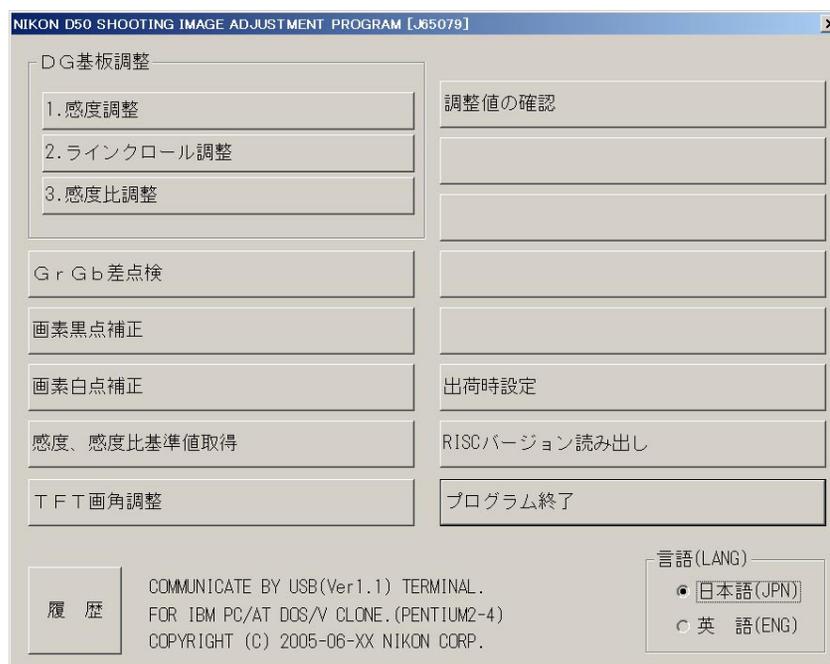


Fig.2

7. Required equipment and conditions

※ AC adapter EH-5 and USB cable (mini B type) UC-E4 are used for all adjustments so they are not specified in the list.

★ New established tool

	Item	Required device	Setting/Remarks
1	Sensitivity adjustment	<ul style="list-style-type: none"> • 5100K color viewer J63070 (ex-model viewer J63049 is also available.) • Luminance meter BM-3000 J63068 • Tool lens (to fix aperture) J61185 • ND filter (ND8×1+ND4×2) 	Equivalent to luminance LV13 Aperture F8 52 mm,5-step light reduction; Use the packaged product
2	Gr/Gb compensation adjustment (R/B filter)	<ul style="list-style-type: none"> • 5100K color viewer J63070 (ex-model viewer J63049 is also available.) • Luminance meter BM-3000 J63068 • Tool lens (Fixed aperture) J61185 • SP3 (R filter) J63087 • SP1 (B filter) J63085 	Equivalent to luminance LV13 Aperture F5.6
3	Sensitivity ratio adjustment	<ul style="list-style-type: none"> • 5100K color viewer J63070 (ex-model viewer J63049 is also available.) • Luminance meter BM-3000 J63068 • Tool lens (to fix aperture) J61185 	Equivalent to luminance LV13 Aperture F8; No filter
4	Gr/Gb compensation inspection (No filter)	<ul style="list-style-type: none"> • 5100K color viewer J63070 (ex-model viewer J63049 is also available.) • Luminance meter BM-3000 J63068 • Tool lens (to fix aperture) J61185 	Equivalent to luminance LV13 Aperture F5.6; No filter
5	CCD black point defect compensation	<ul style="list-style-type: none"> • 5100K color viewer J63070 (ex-model viewer J63049 is also available.) • Luminance meter BM-3000 J63068 • Tool lens (to fix aperture) J61185 	Equivalent to luminance LV13 Aperture F5.6
6	CCD white point defect compensation	Body cap or lens cap	Environmental temperature approx. 20 - 25°C
7	Sensitivity, sensitivity ratio reference value calculation	Same as "Sensitivity adjustment"	No filter when sensitivity ratio reference value is calculated.
8	TFT angle of view adjustment	None	Only for NTSC (unnecessary for PAL)
9	Reading of RISC version	None	

8. Summary

The summary on each adjustment is as follows:

(1) Sensitivity adjustment

Face the camera to the color viewer of LV13 equiv. putting the ND filter (-5 step) between them, and make an adjustment by changing the amp gain so that G output can fall in the standard range. Adjust the gain value so that the G output average value (Average of Gr/Gb) in the center (300×300 pixels) can reach the target output level (approx. 600LSB). The actual adjustment of the gain value is made only under the condition of ISO200 and ISO1600, and the medium sensitivity is calculated by the adjustment values of these 2 conditions.

For target output level, use the G output average of sensitivity reference value (ISO200) that was calculated by the reference body.

(2) Gr/Gb compensation adjustment (R/B filter)

Face the camera to the light-emitting box (color viewer) of LV13 equiv. putting the SP3 (R filter)/SP1 (B filter) between them, and make an adjustment so that the output difference in G output average between G-B line and G-R line when the whole screen is divided into areas can fall in the standard range.

(3) Sensitivity ratio adjustment

Face the camera to the color viewer of LV13 equiv., and make an adjustment so that the R/G, B/G output becomes the same as the output ratio of the sensitivity ratio reference value that was calculated by the reference body. Adjust only under the condition of ISO200, and use the average value of the center (300 pixels × 300 pixels).

(4) Gr/Gb compensation inspection (No filter)

None

(5) CCD black point defect compensation

When pixels of which the output level is under specified value with LV13 equiv., are detected, rewrite the coordinates of the detected pixels as pixel defect compensation data.

(6) CCD white point defect compensation

Take a shot on the dark surface. In case the pixel output is found to be beyond the standard value, store the detected pixel coordinate as the pixel defect compensation data.

(7) "Sensitivity" and "Sensitivity ratio" reference values calculation

- Sensitivity reference value calculation

By using the reference body, face the camera to the color viewer of LV13 equiv. putting the ND filter (-5 step) between them. Then, store the G output average value of the center (300 pixels × 300 pixels) in the STD.DAT file as the sensitivity reference value.

- Sensitivity ratio reference value calculation

By using the reference body, face the camera to the color viewer of LV 13 equiv. (without filter). Then, calculate the sensitivity ratio reference value GR and GB based on the G/R/B output average of the center (300 pixels × 300 pixels), and store them in the STD.DAT file.

It is necessary to calculate the reference values of "Sensitivity" and "Sensitivity ratio" in order to prevent the color temperature fluctuation caused by color viewer's changes over time from affecting the results of the shooting image adjustment. By using the reference body, calculate the reference values once in about every 3 months, when the fluorescent of the color viewer is replaced.

(8) TFT view angle adjustment

This is for adjusting the display position of TFT. Make an adjustment only for NTSC. (Unnecessary for PAL)

(9) Reading of RISC version

Display the RISC firmware version.

9. Procedure

9-1. Shooting image adjustment

- Calculate the "Sensitivity" and "Sensitivity ratio" reference values by using D50 reference body beforehand, then perform the adjustments. (ref. 9-5.)
- For the shooting image adjustment from (1) to (3), perform all of them in this order. The adjustments from (1) through (3) are all programmed to be executed in serial order. When (1) is completed, the software automatically goes on to the next adjustment.
- In case adjustments are interrupted by NG, it is possible to continue the adjustments again after NG. As for adjustments that were ended with OK, the storage of adjustment values into EEPROM and the flashram-up are completed.

* Note: Adjustments are not possible without resetting "Custom setting" of this camera.

Before the adjustments, record the details of "Custom setting" set by customers if necessary.

Start adjustments

- Provide the power for the camera via AC adapter.
- Reset "Custom setting".
- Set "PTP" mode by Setup menu.
- Set the focus mode to M, exposure mode to M, and the exposure compensation to "0" of the camera.
- Connect the camera and PC via USB cable.
- Set the color viewer luminance to LV13 equiv.

(1) Sensitivity adjustment

- Click "SENSITIVITY ADJUSTMENT" of the main menu on screen.
- Attach the tool lens (Aperture F8) and ND filter (ND 8× 1+ ND 4×1) to the camera.
- Get the camera closest to the center of the illuminated surface of the color viewer.
- The adjustment starts. When it is completed, "OK" is displayed.
- The software automatically goes on to the next adjustment item.

(2) CCD Gr/Gb compensation adjustment (R/B filter)

- Click "Gr/Gb COMPENSATION ADJ (G FILTER)" on the menu.
- Attach the tool lens (Aperture F5.6) and SP3 (R filter) to the camera.
- Get the camera closest to the center of the illuminated surface of the color viewer.
- The adjustment starts. When it is completed, the next instructions are displayed.
- Attach the tool lens (Aperture F5.6) and SP1 (B filter) to the camera.
- Get the camera closest to the center of the illuminated surface of the color viewer.
- The adjustment starts. When it is completed, "OK" is displayed.
- The software automatically goes on to the next adjustment.

(3) Sensitivity ratio adjustment

- Click "SENSITIVITY ADJUSTMENT" of the main menu on screen.
- Attach the tool lens (Aperture F8) to the camera (without filter).
- Get the camera closest to the center of the illuminated surface of the color viewer.
- The adjustment starts. When it is completed, "OK" is displayed.

9-2. Gr/Gb compensation inspection (No filter)

- Click "SENSITIVITY ADJUSTMENT" of the main menu on screen.
- Attach the tool lens (Aperture F5.6) to the camera (without filter).
- Get the camera closest to the center of the illuminated surface of the color viewer.
- When the inspection is completed, the data is indicated twice and "Gr/Gb COMPENSATION INSP IS GOOD." is displayed.

9-3. Pixel defect (black spots) compensation

- Set the color viewer luminance to LV13 equiv.
- Provide the power for the camera via AC adapter.
- Reset "Custom setting".
- Set "PTP" mode by Setup menu.
- Set the focus mode to M, exposure mode to M, and the exposure compensation to "0" of the camera.
- Connect the camera and PC via USB cable.
- Click "CCD BLACK POINT DEFECT COMPENSATION" of the menu on screen.
- Attach the tool lens (Aperture F5.6) to the camera (without filter).
- Get the camera closest to the center of the illuminated surface of the color viewer.
- When the adjustment starts, pixel defects are detected, displaying the number of pixels and addresses.
- After confirming the above, click "X" button.
- When it is completed, "OK" is displayed.

* Note: In some cases, NG occurs due to dusts on the CCD.

Be sure to clean the CCD surface before adjustments.

9-4. Pixel defect (white spots) compensation

- Check the environmental temperature (approx. 20-25°C.).
- Provide the power for the camera via AC adapter.
- Reset "Custom setting".
- Set "PTP" mode by Setup menu.
- Set the focus mode to M, exposure mode to M, and the exposure compensation to "0" of the camera.
- Connect the camera and PC via USB cable.
- Click "CCD WHITE POINT DEFECT COMPENSATION" of the menu on screen.
- Cap the camera with the body cap or lens cap to shield light from the mount.
- When the adjustment starts, pixel defects are detected, displaying the number of pixels and addresses.
- After confirming the above, click "X" button.
- When it is completed, "OK" is displayed.

9-5. Sensitivity ratio reference value calculation

- Set the color viewer luminance to LV13 equiv.
 - Provide the power for the camera via AC adapter.
 - Reset "Custom setting".
 - Set "PTP" mode by Setup menu.
 - Set the focus mode to M, exposure mode to M, and the exposure compensation to "0" of the camera.
 - Connect the camera and PC via USB cable.
 - Select "SENSITIVITY, RATIO REFERENCE VALUE CALC" of the menu on screen.
 - The current reference value is displayed on screen.
 - Click "SENSITIVITY, RATIO REFERENCE VALUE CALC".
 - The calculation of the sensitivity reference value starts. The message to set conditions is displayed.
 - Attach the tool lens (Aperture F8) and ND filter (ND 8×1 + ND 4×1) to the camera.
 - Get the camera closest to the center of the illuminated surface of the color viewer.
 - The adjustment starts. When it is completed, the software goes on to the sensitivity ratio reference value.
 - Attach the tool lens (Aperture F8)(Remove ND filter).
 - The adjustment starts. When it is completed, the sensitivity and sensitivity reference values are stored in the standard setting file (STD, DAT).
 - After this procedure, when the shooting image adjustment is made, the sensitivity and sensitivity ratio that were calculated this time are used.
- ※ Calculate the sensitivity and sensitivity ratio reference values once in about every 3 months, and when the fluorescent of the color viewer is replaced.

9-6. "TFT angle of view" adjustment (only for NTSC; unnecessary for PAL)

- Provide the power for the camera via AC adapter.
- Set "PTP" mode by Setup menu.
- Connect the camera and PC via USB cable.
- Click "TFT VIEW ANGLE ADJUSTMENT" of the menu on screen.
- When the adjustment starts, a frame appears in the LCD area of camera.
- By clicking the "Left", or "Right", or "Up" or "Down" buttons on the window, move the frame from right to left or up and down to prevent the frame from running off the edge of the TFT monitor of the camera.

9-7. Reading of RISC version

- Provide the power for the camera via AC adapter.
- Set "PTP" mode by Setup menu.
- Connect the camera and PC via USB cable.
- Click "READING OF RISC VERSION" of the menu on screen.
- RISC version is displayed.

9-8. Procedure for upgrading RISC firmware:

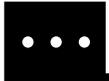
- After preparing the CF card, copy the latest version (XXXX.BIN) into the root directory.
- Insert the CF card, and select "FIRMWARE VERSION" from the SETUP menu.
- Follow the instructions on screen for version upgrading. It takes approx. 3-4 minutes.
- Check the version of firmware by "RISC VERSION" of the image adjustment software.

Note:

In case incorrect files are included in the CF card, the details for upgrading are not displayed even after selecting "FIRMWARE VERSION" from the SETUP menu.

工 具 ・ TOOLS

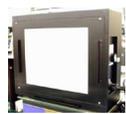
★ : 新規設定工具 ・ NEW TOOL

工具番号 Tool No.	名 称 Name of tool	備 考 Others
★ J15417	 AE CCD 位置出し工具 AE CCD positioning tool	
J15410	 無限合致調整用スクリーン Infinity focus adjustment screen	FOR D70, D70S
J18362	 反射ミラー Reflection mirror	FOR D70, D70s
★ J18385	 カメラ部点検、調整ソフト Inspection and adjustment software for CAMERA	
★ J65079	 撮像部点検、調整ソフト Inspection and adjustment software for IMAGING	
J18344	 A F チャート AF adjusting chart	FOR D100, D70, D70s
J18230	 YAW、PITCH 工具 Yaw, Pitch adjustment tool	FOR F5, F100, F90, F90X, D70, D70s
J15259	 A F 調整工具台 AF adjusting tool	
J15280	 Z レンズ用支持ホルダー Lens holder	
J15264	 高周波タイプ蛍光灯器具 Illumination box for AF adjustment	
J18266	 A F 調整用 Z レンズ (1m 用) Z adjustment lens (For 1m)	For F5, F100, D70, D70s
J19123	 シャッター試験機 EF-1 (CE) Shutter Tester EF-1 (CE)	共立電機製 KYORITSU ELECTRIC EF -8000 usable

★ : 新規設定工具・NEW TOOL

工具番号 Tool No.	名称 Name of tool	備考 Others
J19002	 縦型焦点面検査機 LT-500S Back focus collimator LT-500S	J 19110 usable J 19110 でも代用可
J18324	 サブミラー45°出し工具 Sub mirror angle adjustment tool	FOR F5, F100, F80, F65, D70, D70s
J18037	 オプチカルパラレル Optical parallel	
J18004	 絞りレバー高さ点検工具 Aperture lever positioning gauge	
J19004-1	 インジケータ及びスタンド (ボディバック台、ゲージ) Dial indicator and Stand	
J18001-1	 ボディバック出し工具 Body back focus gauge	
J19001	 無限合致コリメーター F=600mm Collimator F=600mm	
J18010	 無限大合致基準レンズ 50/1.8 Infinity Standard Lens 50/1.8	
J18267	 A F 5 0 / 1 . 4 D Lens AF50/1.4D	
J15274	 J15264用チャートボード Chart board for J15264	
★ J15418	 電池工具 Battery tool	
J61185	 撮像関係調整用レンズ D1 Standard lens	FOR D1, D2H, D70, D70s

★ : 新規設定工具・NEW TOOL

工具番号 Tool No.	名 称 Name of tool	備 考 Others
J18191 	NDフィルター 8 X ND filter 8X	FOR D2H, D70, D70s
J18358 	NDフィルター 4 X ND filter 4X	1 枚使用 It uses by one pieces
J63070 	カラービューワ Color Viewer	J63049 でも代用可 J63049 usable
J63068 	輝度計 (BM-3000) Luminance Meter BM-3000	
J63085 	フィルター SP1 (75X75MM) Filter SP1 (75X75MM)	FOR D2H, D70, D70s
J63087 	フィルター SP3 (75X75MM) Filter SP3 (75X75MM)	FOR D2H, D70, D70s

★ : 新規設定工具・NEW TOOL

工具番号 Tool No.	名称 Name of tool	備考 Others
OS-30MF 	ドライサーフ OS-30MF DRY SURF OS-30MF (OIL BARRIER)	
LEN317A 	グリース LEN317A Grease LEN317A	
EDB0011 	ネジロック (赤) 1401C Screw lock 1401C	
C-8008B 	セメダイン 8008 (黒) Cemedain 8008 (BLACK)	
MZ-800S 	ドライサーフ MZ-800S DRY SURF MZ-800S	
	アロンアルファ Crazy glue	汎用品 RJ is Not available
	フラッシュメーター Flash Meter	汎用品 RJ is Not available
	デジタルマルチメータ Digital meter	汎用品 RJ is Not available
	ACアダプター EH-5 AC adapter EH-5	製品転用 RJ is Not available
	USBケーブル UC-E4 USB cable UC-E4	製品転用 RJ is Not available
	パーソナルコンピュータ Personal computer	汎用品 RJ is Not available
	安定化電源 (10V 5A) Power supply(10V 5A)	汎用品 RJ is Not available
	ヘクスキー (φ 1.5mm) HEX. KEY WRENCH (φ 1.5mm)	汎用品 RJ is Not available