VBA14001-R.3694.A

作成承認印	配布許可印
ニコン 映像カンパニー 品質保証部 GM	サービス 計画課 M

D80 VBA14001

REPAIR MANUAL

Nikon | NIKON CORPORATION
Tokyo, Japan

Recycled paper
再生紙を使用しています

Printed in Japan Aug 2006

Specifications

Type	Single-lens reflex digital camera
Effective pixels	10.2 million
CCD	23.6×15.8 mm; total pixels: 10.75 million
Image size (pixels)	• 3,872×2,592 (Large) • 2,896×1,944 (Medium) • 1,936×1,296 (Small)
Lens mount	Nikon F mount with AF coupling and AF contacts
Compatible lenses*	
Type G or D 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 (135) format is approx. 1.5 times lens focal length.
Viewfinder	Optical fixed eye-level pentaprism
Diopter	–2.0 to +1.0 m^{-1}
Eyepoint	19.5 mm (–1.0 m^{-1})
Focusing screen	Type-B BriteView Clear Matte Screen Mark II with superimposed focus brackets and On-Demand grid lines
Frame coverage	Approx. 95% of lens (vertical and horizontal)
Magnification	Approx. 0.94× (50 mm lens at infinity; –1.0 m^{-1}
Reflex mirror	Quick return
Lens aperture	Instant return with depth-of-field preview
Depth-of-field preview	When CPU lens is attached, depth-of-field preview button stops aperture down to value selected by user (**A** and **M** modes) or by camera (other modes)
Self-timer	Electronically controlled timer with 2, 5, 10 or 20 s duration
Focus-area selection	Focus area can be selected from 11 focus areas
Lens servo	• Autofocus (AF): Instant single-servo AF (AF-S); continuous-servo AF (AF-C); auto AF-S/AF-C selection (AF-A); predictive focus tracking activated automatically according to subject status • Manual focus (M)
Storage	
Media	SD (**S**ecure **D**igital) memory cards
File system	Compliant with **D**esign Rule for **C**amera **F**ile System (DCF) 2.0 and **D**igital **P**rint **O**rder **F**ormat (DPOF)
Compression	• **NEF (RAW)**: compressed 12-bit • **JPEG**: JPEG baseline-complaint
Autofocus	TTL phase detection by Nikon Multi-CAM 1000 autofocus sensor module
Detection range	–1.0 to +19 EV (ISO 100 at 20°C/68°F)
AF-area mode	Single-area AF, dynamic-area AF, auto-area AF
Focus lock	Focus can be locked by pressing the shutter-release button halfway (single-servo AF) or by pressing the **AE-L/AF-L** button
ISO sensitivity (Recommended Exposure Index)	100 to 1600 with additional settings of up to 1 EV over 1600 in steps of 1/3 EV

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, or 10 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 to 20 EV (3D color matrix or center-weighted metering) 2 to 20 EV (spot metering)
Exposure meter coupling	CPU coupling
Mode	Digital Vari-Program (auto, portrait, landscape, macro close-up, sports, night landscape, nigh portrait); programmed auto (**P**) with flexible program; shutter-priority auto (**S**); aperture-priority auto (**A**); manual (**M**)
Exposure compensation	–5 to +5 EV in increments of ⅓ or ½ EV
Bracketing	Exposure and / or flash bracketing (2–3 exposures in increments of ⅓ or ½ EV)
Exposure lock	Exposure locked at detected value with **AE-L/AF-L** button
Shutter	Electronically-controlled vertical-travel focal plane shutter
Speed	30 to ¼,₀₀₀ s in steps of ⅓ or ½ EV, bulb
White balance	Auto (TTL white balance with 420-segment RGB sensor); six manual modes with fine tuning; color temperature setting; preset white balance
Bracketing	2 to 3 exposures in increments of 1, 2, or 3
Built-in flash	• , , , : Auto flash with auto pop-up • **P**, **S**, **A**, **M**: Manual pop-up with button release
Guide number (m/ft)	Approx. 13/42 at ISO 100 and 20 °C (68 °F)
Flash	
Sync contact	X-contact only; flash synchronization at shutter speeds of up to ½₀₀ s
Flash control	
TTL	TTL flash control by 420-segment RGB sensor • **SB-800, SB-600**: i-TTL balanced fill-flash for digital SLR and standard i-TTL fill-flash for digital SLR
Auto aperture	Available with SB-800 and 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
Flash mode	• , , : Auto, auto with red-eye reduction; fill-flash and red-eye reduction available with optional Speedlight • : Auto, auto slow sync, auto slow sync with red-eye reduction; slow sync and slow sync with red-eye reduction available with optional Speedlight • , , : Fill-flash and red-eye reduction available with optional Speedlight • **P**, **S**, **A**, **M**: Fill flash, slow sync, rear-curtain sync, red-eye reduction, slow sync with red-eye reduction
Flash-ready indicator	Lights when built-in flash or SB-series Speedlight such as 800, 600, 80DX, 28DX, 50DX, 28, 27, or 22s is fully charged; blinks for about 3 s after flash is fired at full output
Accessory shoe	Standard ISO hot-shoe contact with safety lock
Nikon Creative Lighting System	With SB-800, 600, and R200, supports Advanced Wireless Lighting (SB-600 and R200 only support AWL when used as remote flash), Auto FP High-Speed Sync, Flash Color Information Communication, modeling Flash, and FV Lock.
Monitor	2.5 in., 230,000-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	¼ in. (ISO)

Firmware upgrades	Firmware can be upgraded by user
Supported languages	Chinese (Simplified and Traditional), Dutch, English, Finnish, French, German, Italian, Japanese, Korean, Polish, Portuguese, Russian, Spanish, Swedish
Power source	• One rechargeable Nikon EN-EL3e Li-ion battery; charging voltage (MH-18a quick charger): 7.4 V DC • MB-D80 Multi-Power battery pack (available separately) with one or two rechargeable Nikon EN-EL3e Li-ion batteries or six LR6 alkaline, HR6 Ni-MH, FR6 lithium, or ZR6 nickel manganese AA batteries • EH-5 AC adapter (available separately)
Dimensions (W × D × H)	Approx. 132 × 103 × 77 mm (5.2 × 4.1 × 3.0 in.)
Weight	Approx. 585 g (1 lb. 5 oz.) without battery, memory card, body cap, or LCD monitor cover
Operating environment	
Temperature	0 to +40 °C (+32 to 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).

☑ Specifications

Nikon reserves the right to change the specifications of the hardware and software described in 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	
	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
・ 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. ・ Use the special soldering iron respectively for lead-free solder and lead solder. They cannot be used in common.

Caution:

Whenever "Separation of Front and rear bodies", "Disassembly of CCD/FPC unit", or "Disassembly of Bayonet" are performed, be sure to perform "RESET AF-DEFOCUS COMPENSATION" of camera adjustment software after reassembling.

Disassembly

1. Separation of Front and Rear Bodies

Bottom Cover

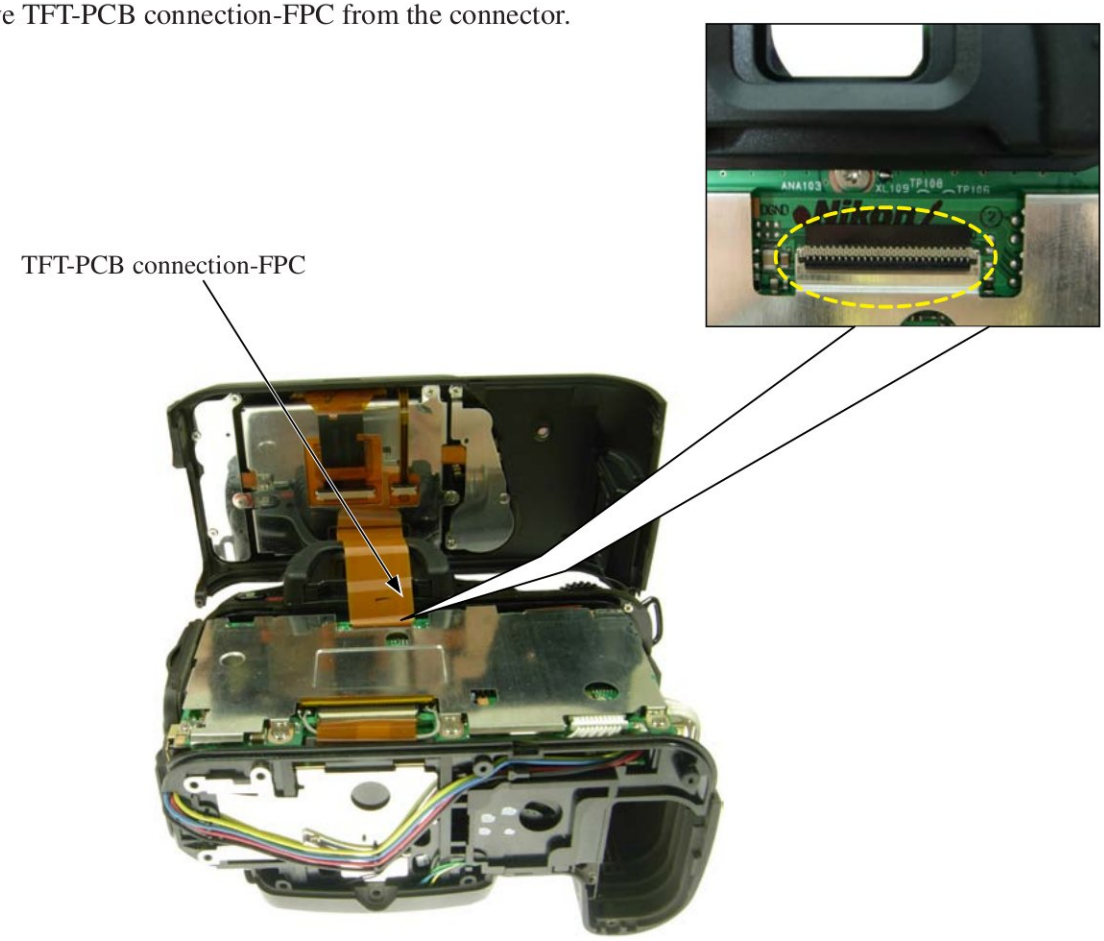
- Take out two screws (#692), one screw (#658) and four screws (#657).
- Remove the bottom cover.

Rear cover

- Take out two screws (#657) and two screws (#656).
- Remove the rear cover.

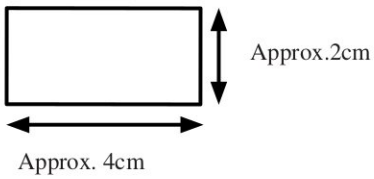
Note: Remove the rear cover slowly so as not to cut TFT-PCB connection-FPC of the upper portion of the cover.

・ Remove TFT-PCB connection-FPC from the connector.

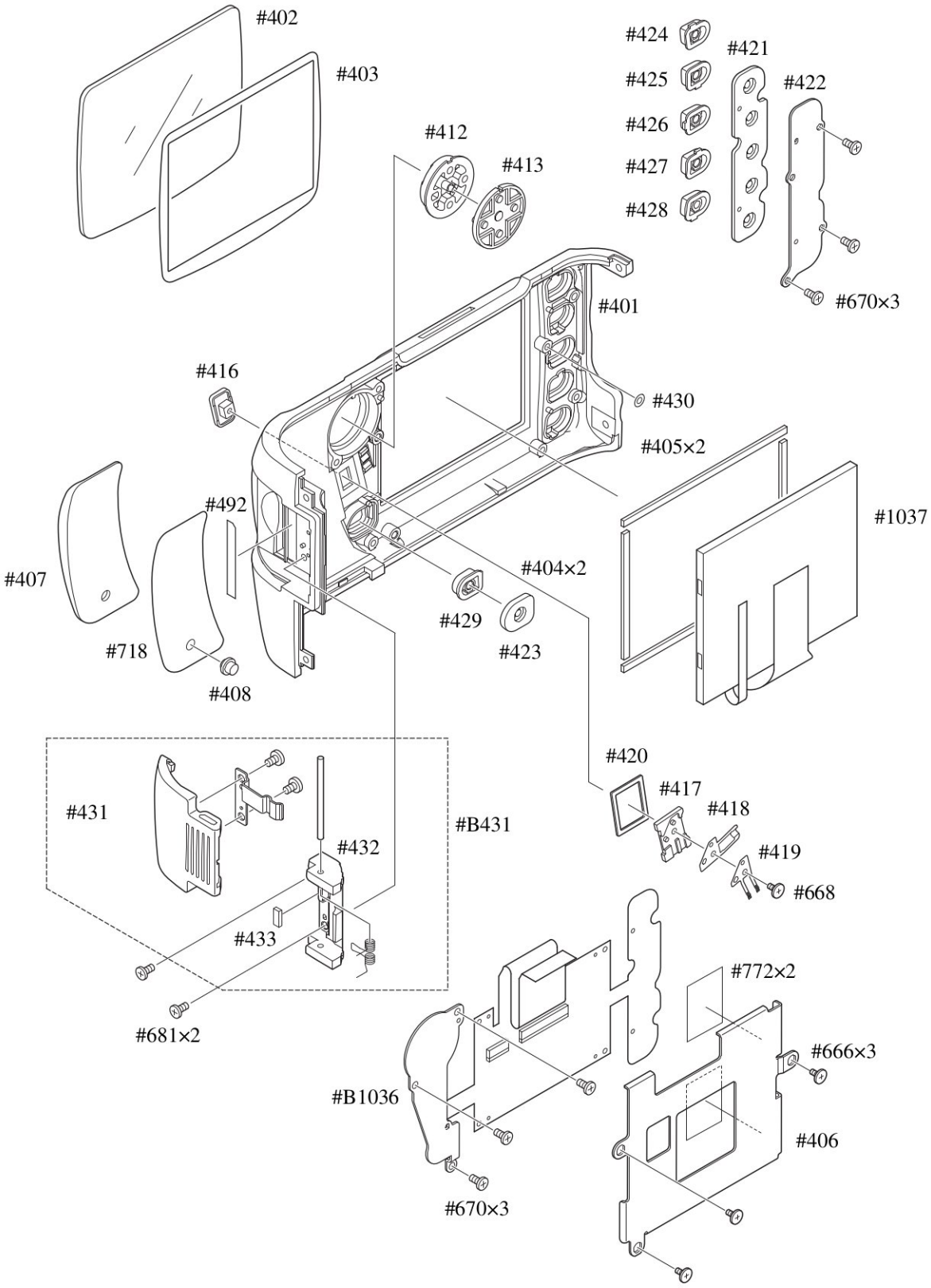


SB pop-up

・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.



背面カバー分解

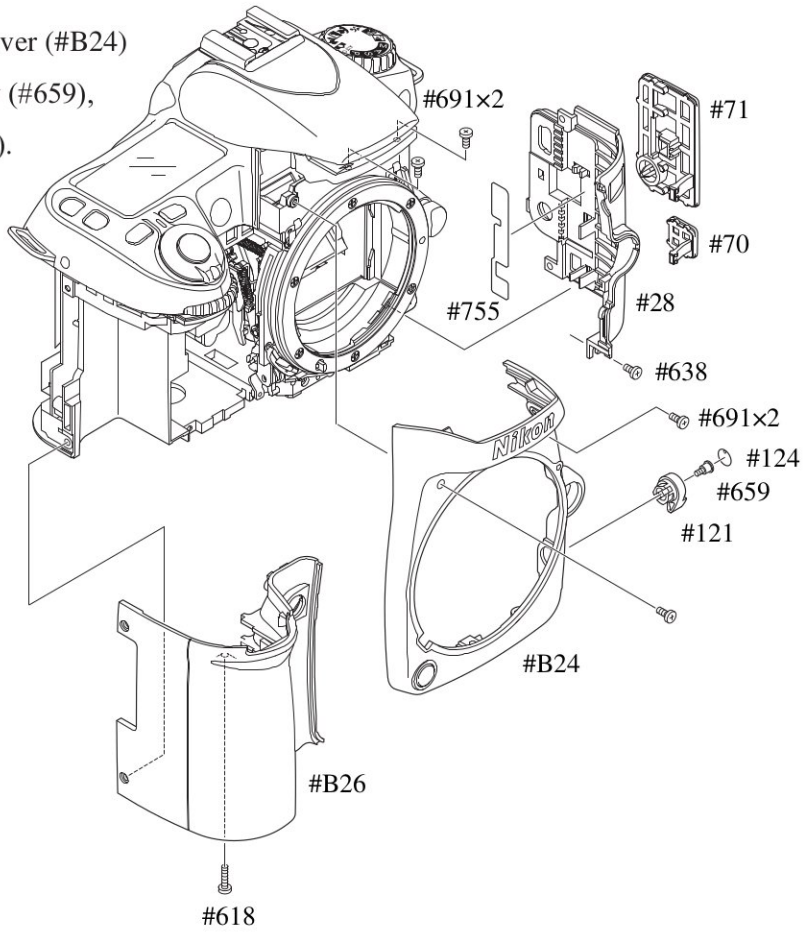

#402
#403
#412
#413
#424
#425
#426
#427
#428
#421
#422
#670×3
#401
#416
#430
#405×2
#1037
#492
#407
#404×2
#429
#423
#718
#408
#420
#417
#418
#419
#668
#431
#B431
#432
#433
#681×2
#772×2
#666×3
#B1036
#406
#670×3

⚠WARNING

- 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 repar manuals.

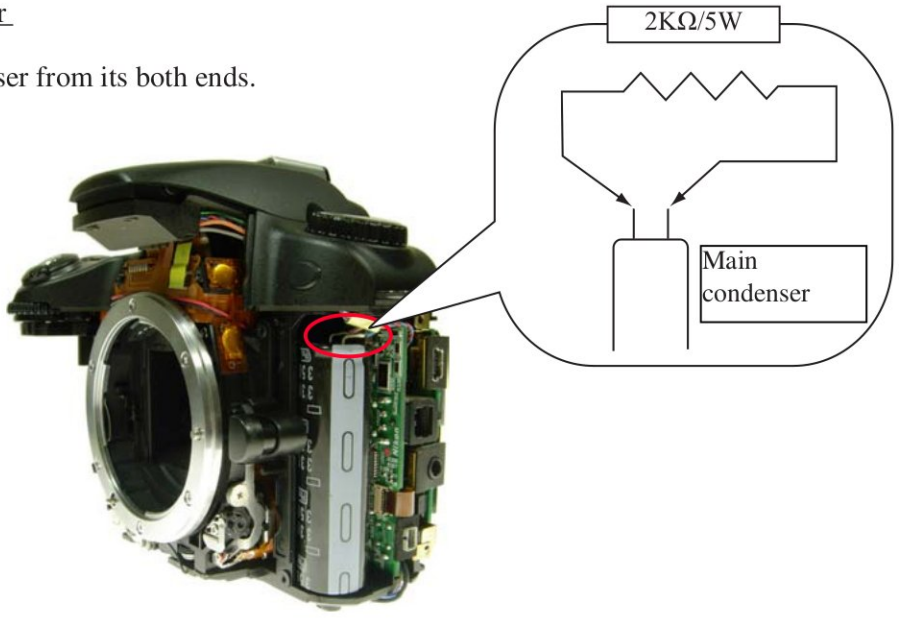
Covers

・ In order to remove the front cover (#B24) first, remove [#124], the screw (#659), [#121], and four screws (#691).



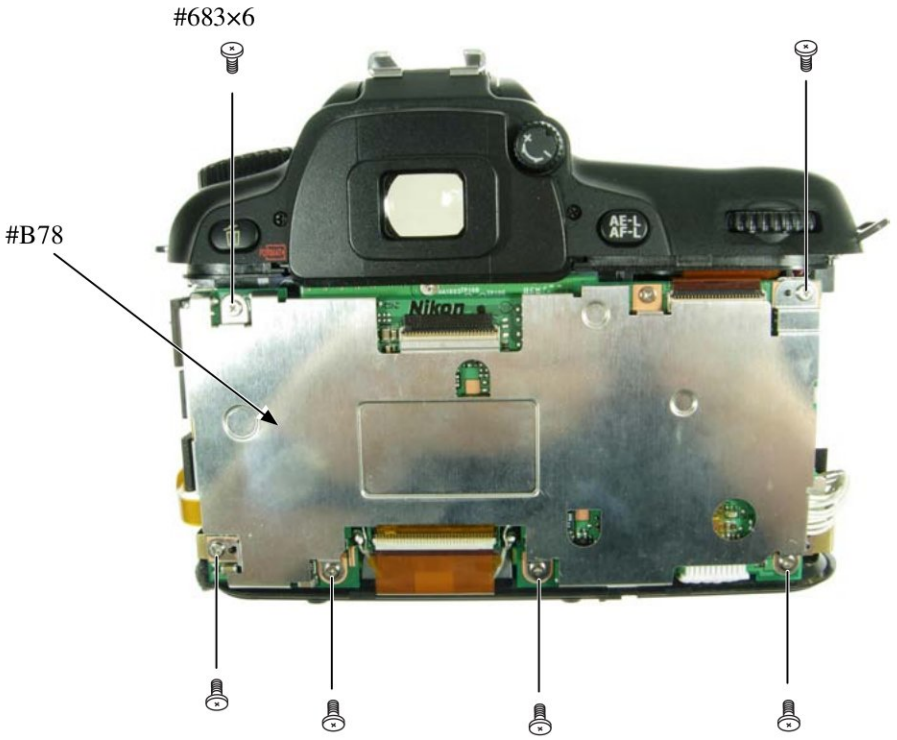
Discharge of Main condenser

・ Discharge the main condenser from its both ends.



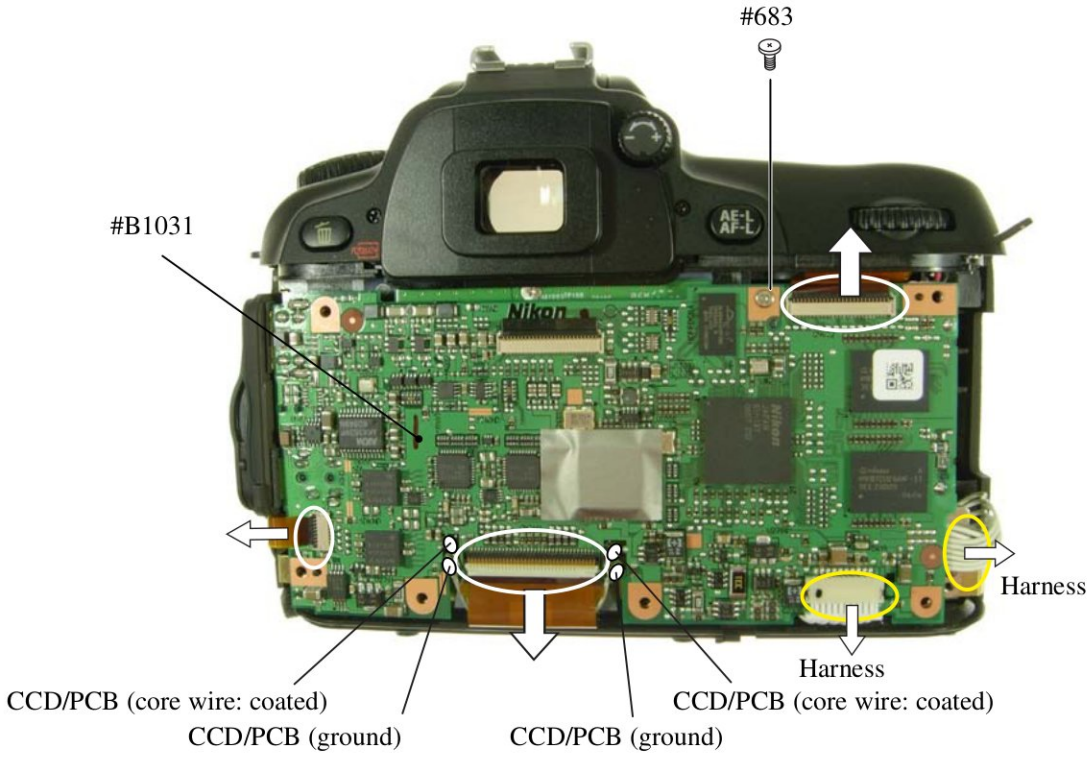
DG shield plate

- Take out six screws (#683).
- Remove DG shield plate (#B78).



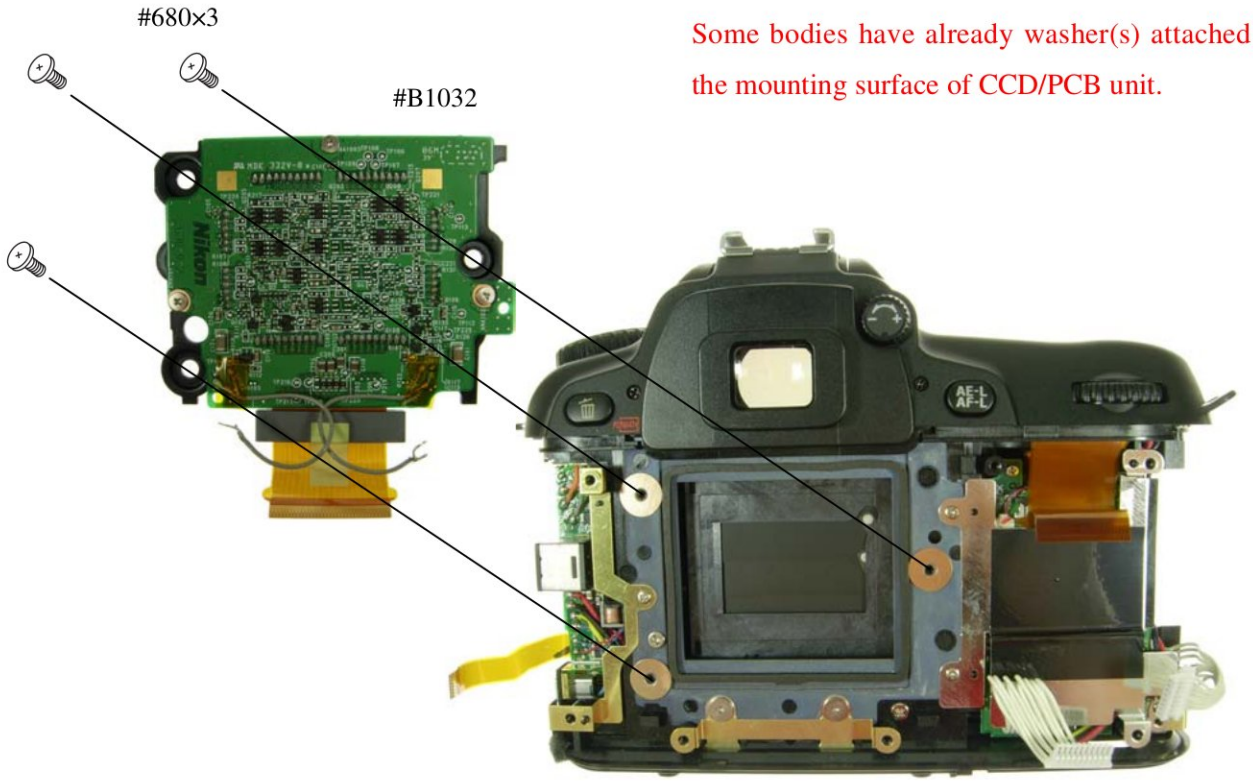
DG-PCB unit

- Remove the three FPCs, two harnesses, and four solderings.
- Take out the screw (#683) and remove the DG-PCB unit (#B1031).



CCD/PCB unit

- Take out three screws (#680) and remove the CCD/PCB unit (#B1032).

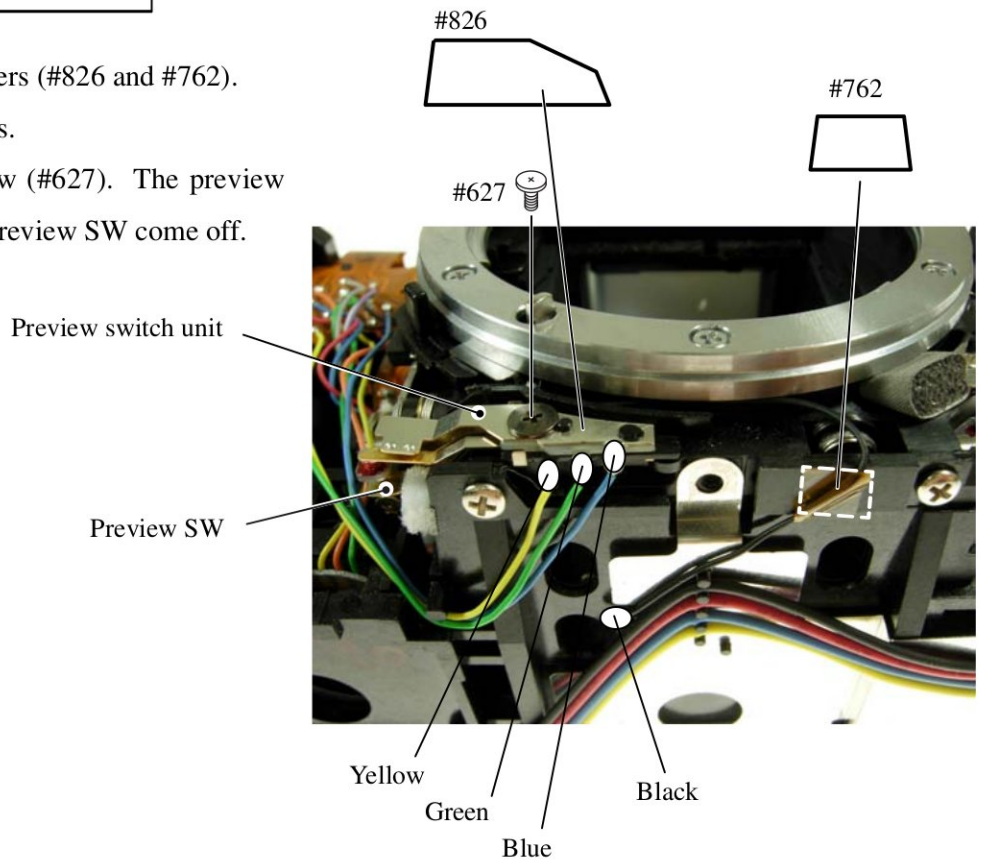


Caution:

Some bodies have already washer(s) attached on the mounting surface of CCD/PCB unit.

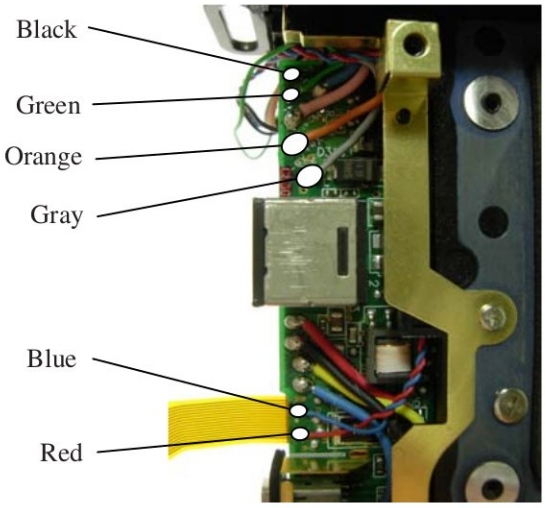
Preview SW/FminGND wire

- Remove two stickers (#826 and #762).
- Remove four wires.
- Take out the screw (#627). The preview SW unit and the preview SW come off.

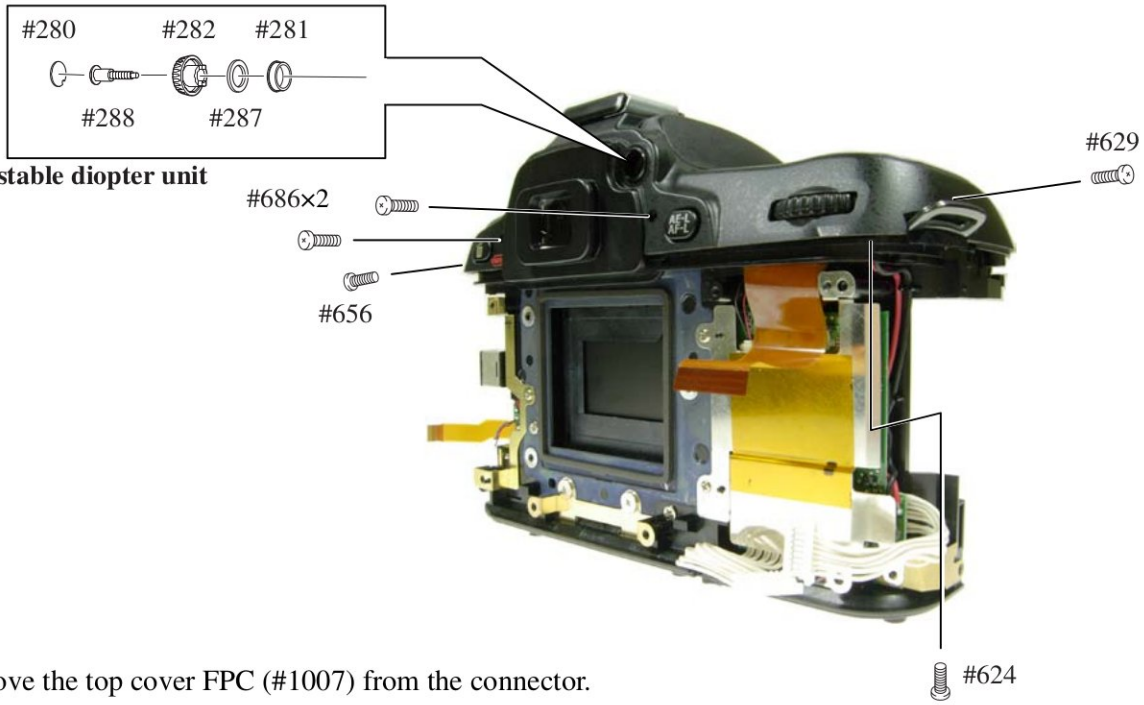


Top cover

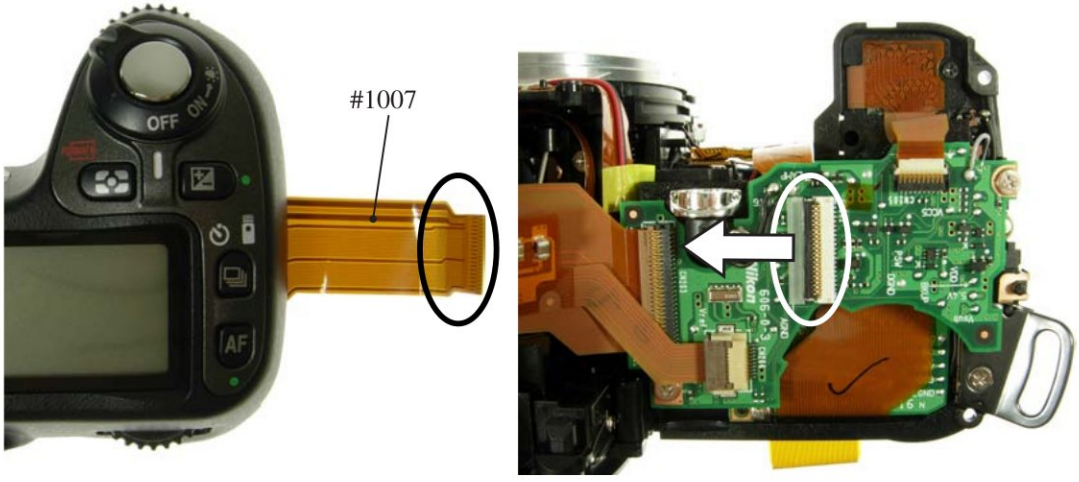
- Unsolder six wires that are connected from the top cover.



- Take out screws (#656,#629,and #624) and two screws (#686).
- Remove the adjustable diopter unit (#280, 288, 282, 287, 281).



- Remove the top cover FPC (#1007) from the connector.

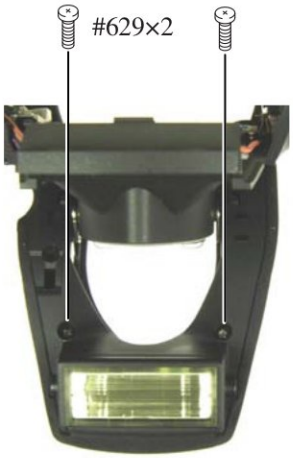


Disassembly of Top cover

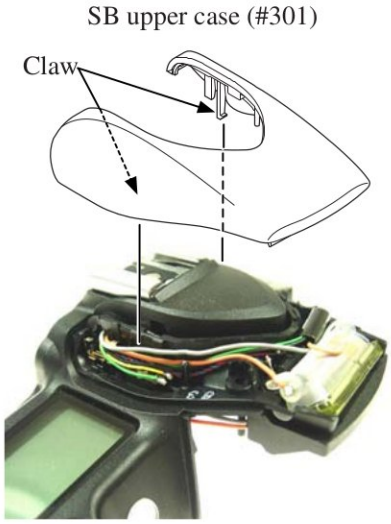
SB upper case

- Press the pop-up lever A part of the top cover unit so that the built-in SB pops up.
- Take out two screws (#629).

- Take out two screws (#629).

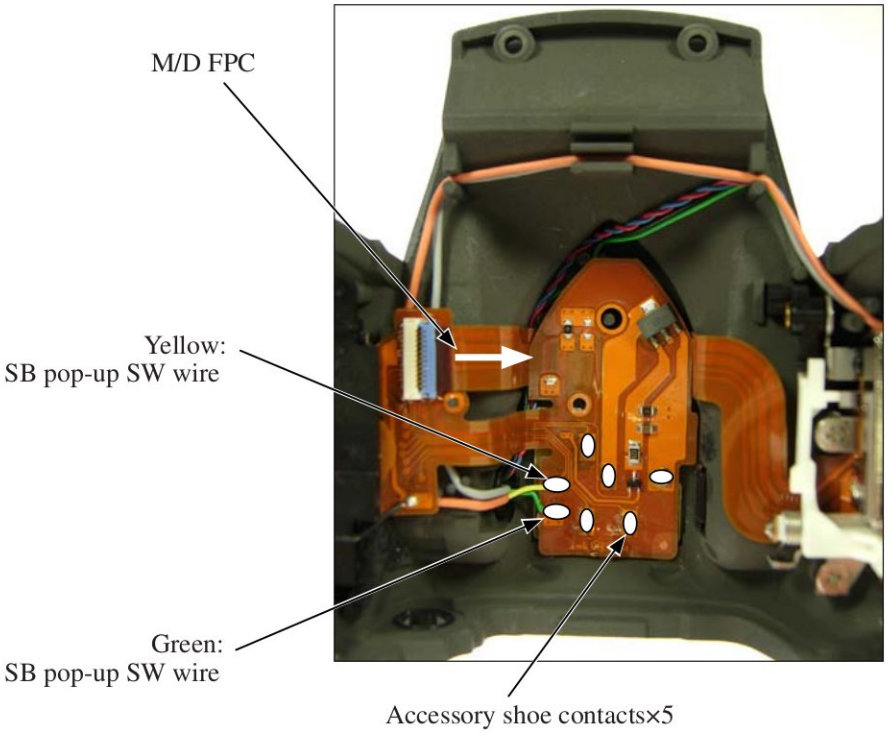


- Release the two claws. House the built-in SB and remove the SB upper case (#301).

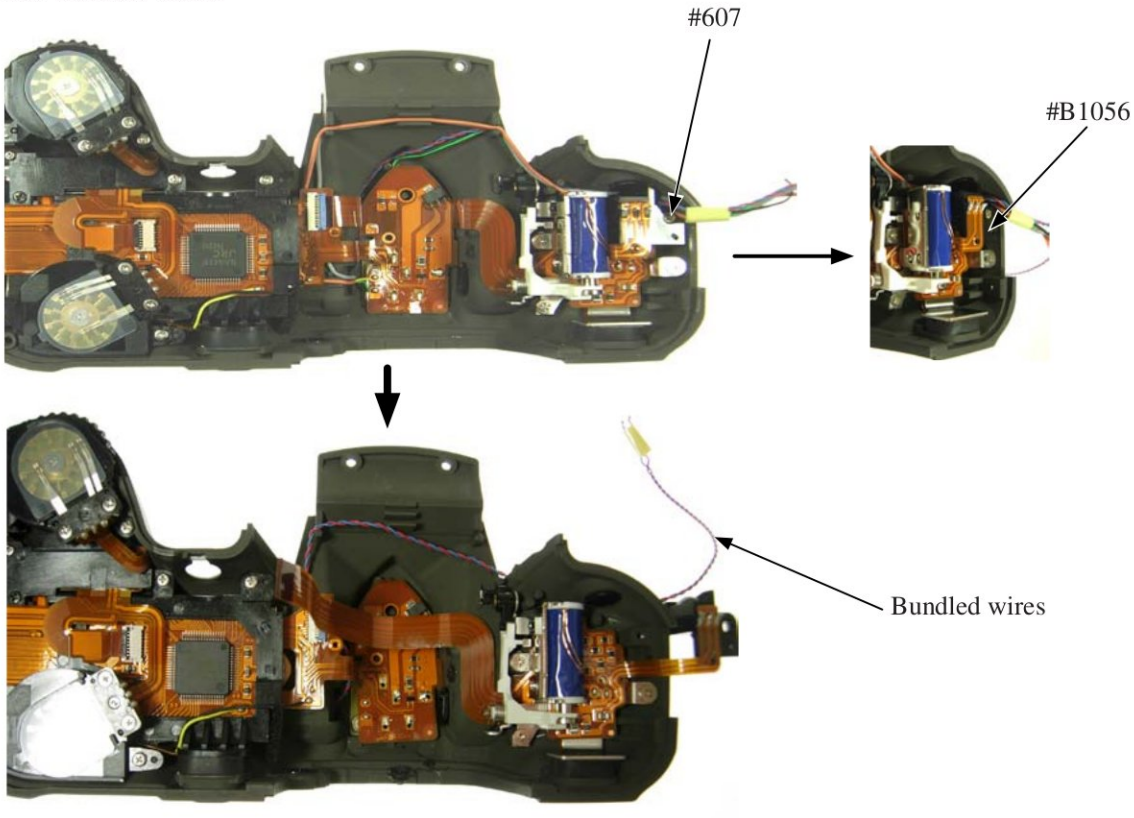


Top cover FPC / Wiring

- Remove the M/D FPC.
- Unsolder two SB pop-up SW wires.
- Remove five solders of the accessory shoe contacts.



- Remove the screw (#607).
- Remove the remote control unit (#B1056).
- Remove the bundled wires.



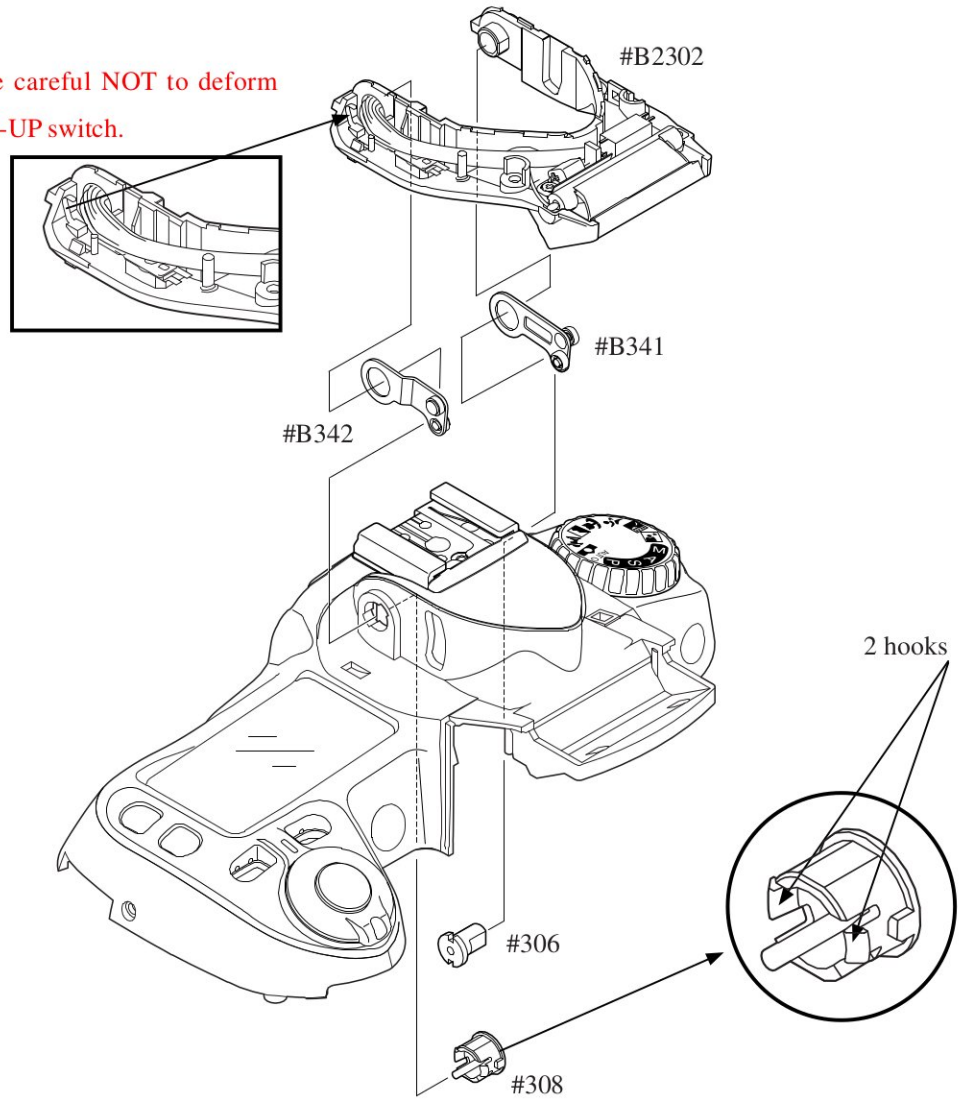
Flash-up spring

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

SB lower case unit

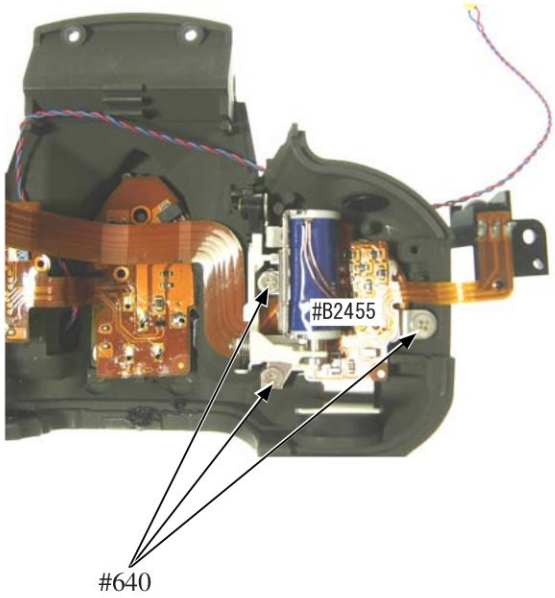
- Pull each wire out of holes.
- Loosen two hooks of the collar (#308), and remove [#308].
- Remove the SB-case rotate shaft (#306).
- Detach the SB lower case unit (#B2302) from the top cover.
- Remove [#B341] and [#B342].

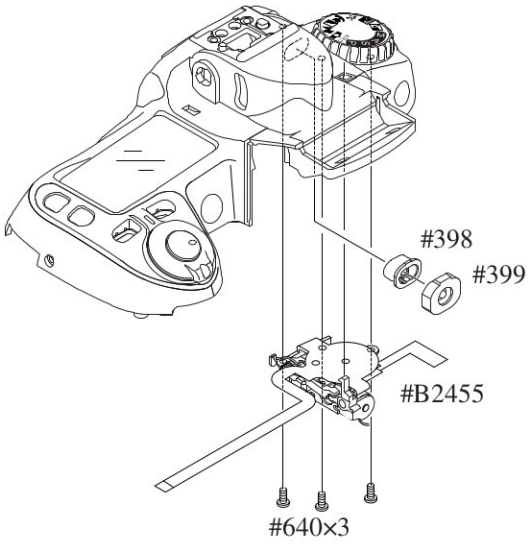
Caution : Be careful NOT to deform the SB POP-UP switch.



M/DFPC unit

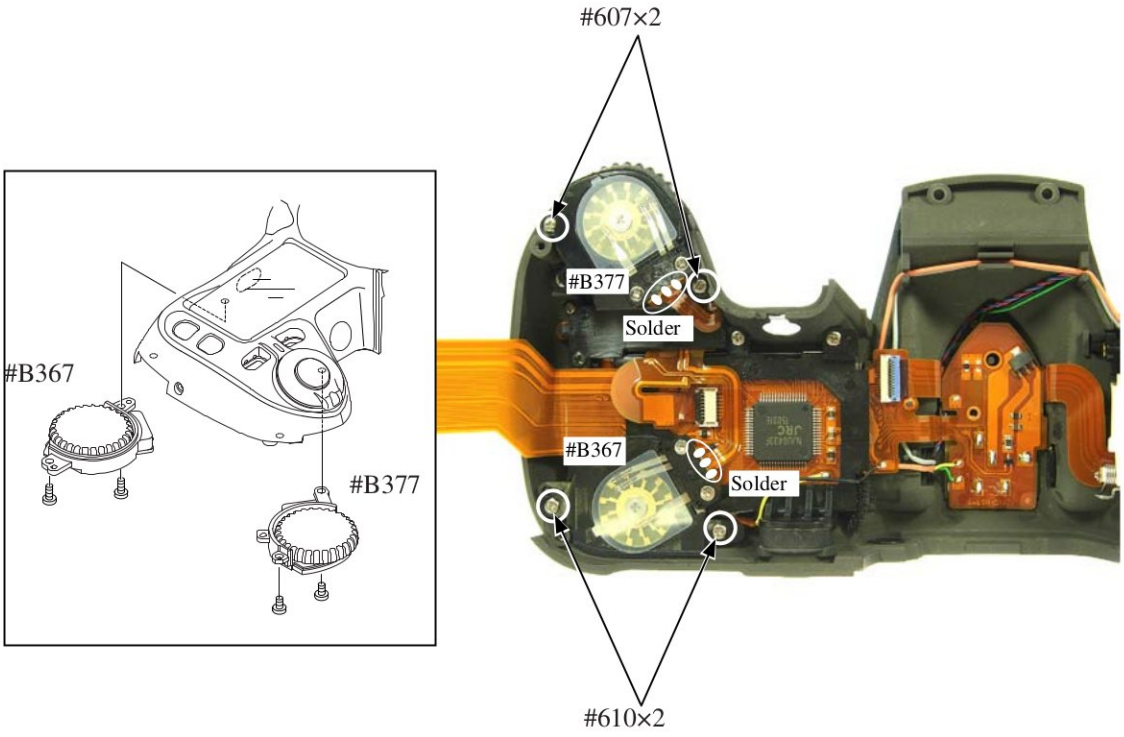
- Take out three screws (#640), and remove the M/DFPC unit (#B2455).
- Remove the delete-button rubber SW (#399) and the delete button (#398).





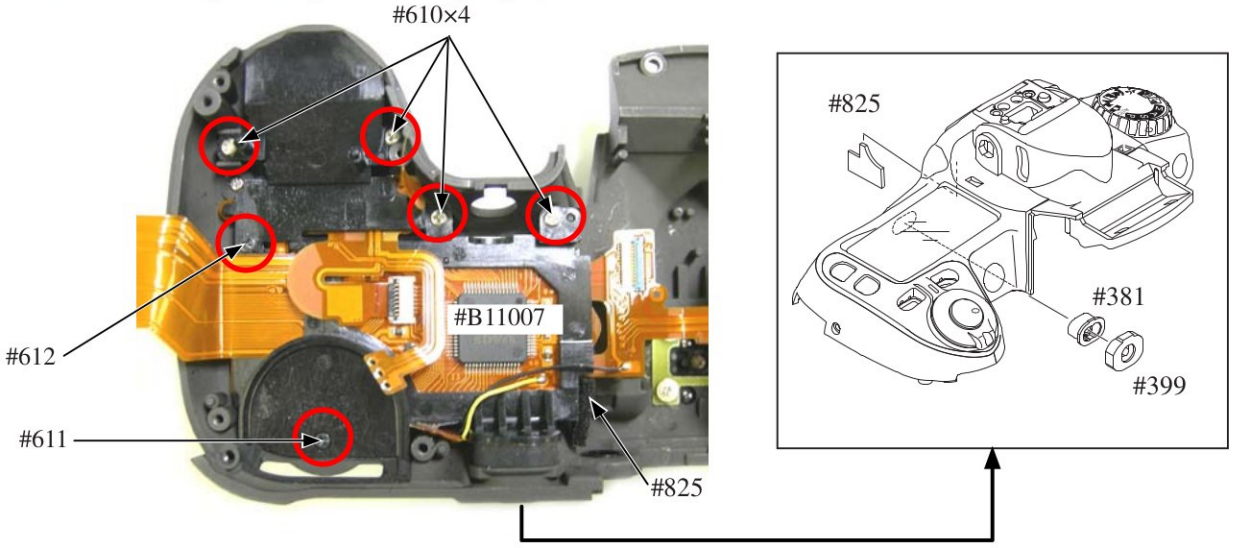
AF-assist illuminator window / Command dial

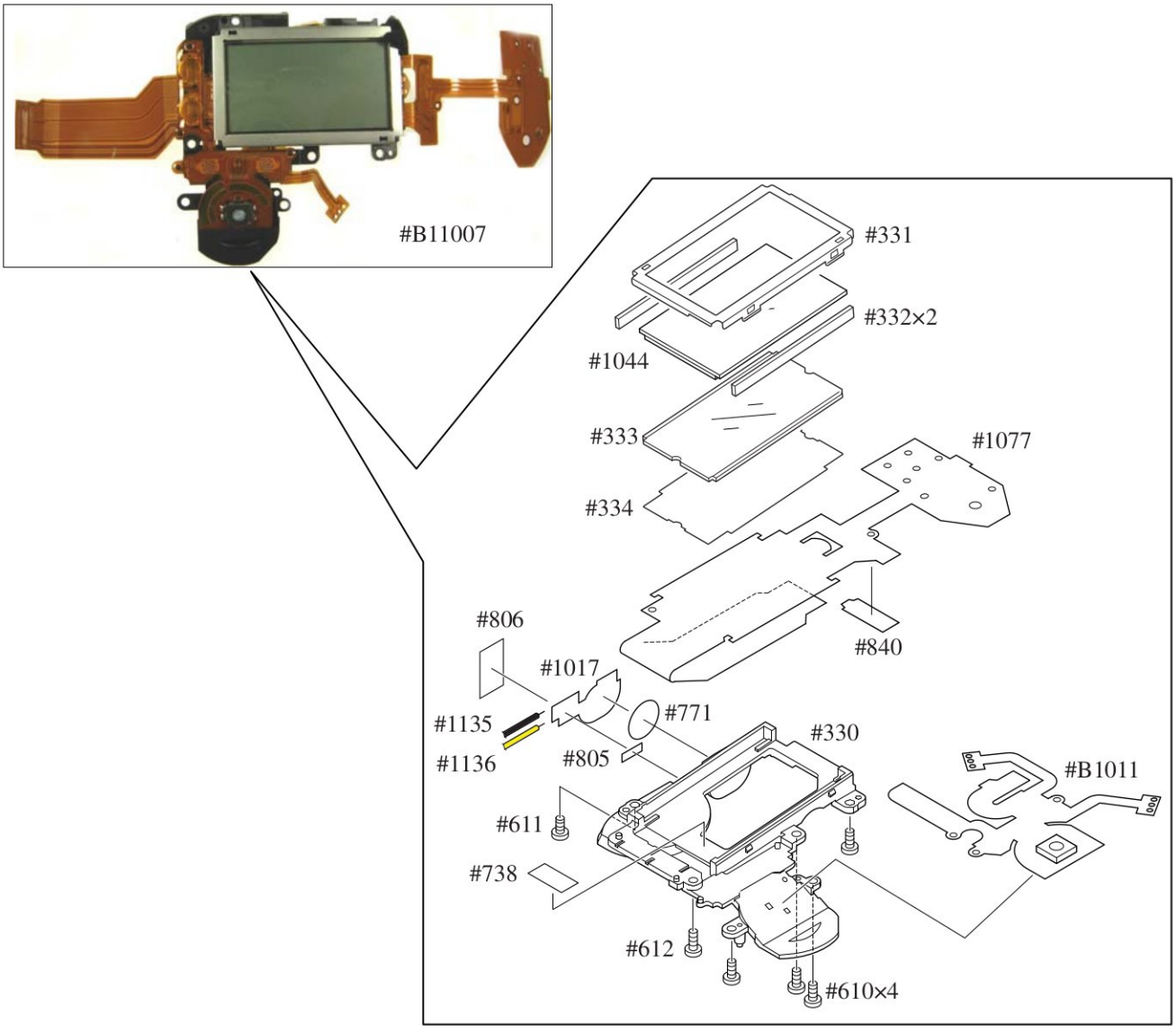
- Unsolder the command dial (#B367 and #B377).
- Take out the two screws (#610) of [#B367].
- Take out the two screws (#607) of [#B377].
- Remove the command dials (#B367 and #B377).



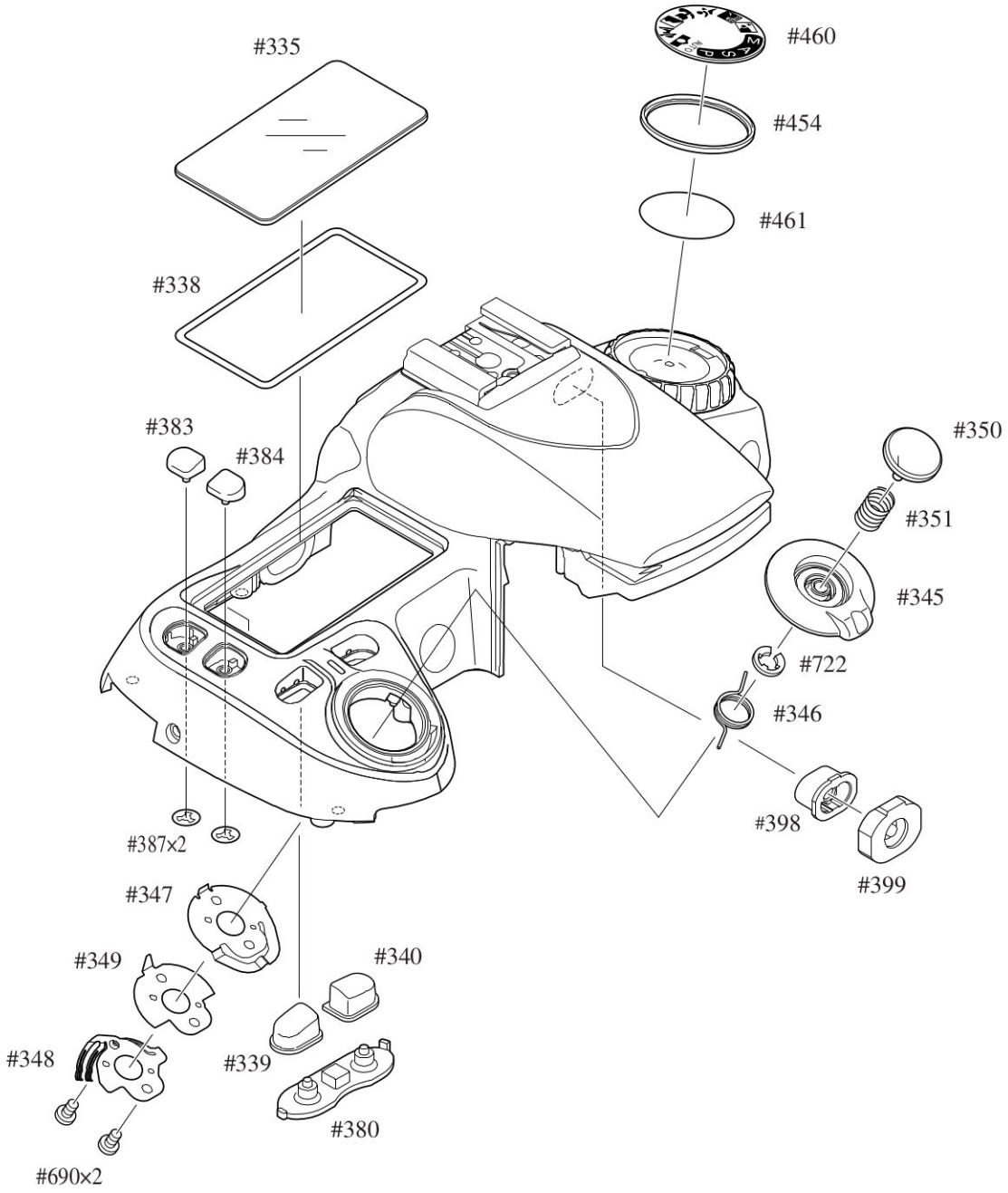
Top cover FPC unit

- Take out four screws (#610).
- Take out the screw (#612).
- Take out the screw (#611).
- Remove the top cover FPC unit (#B11007).
- Remove the AE-L rubber SW (#399) and AE-L button (#381).
- Remove the light-leak prevention sponge (#825).

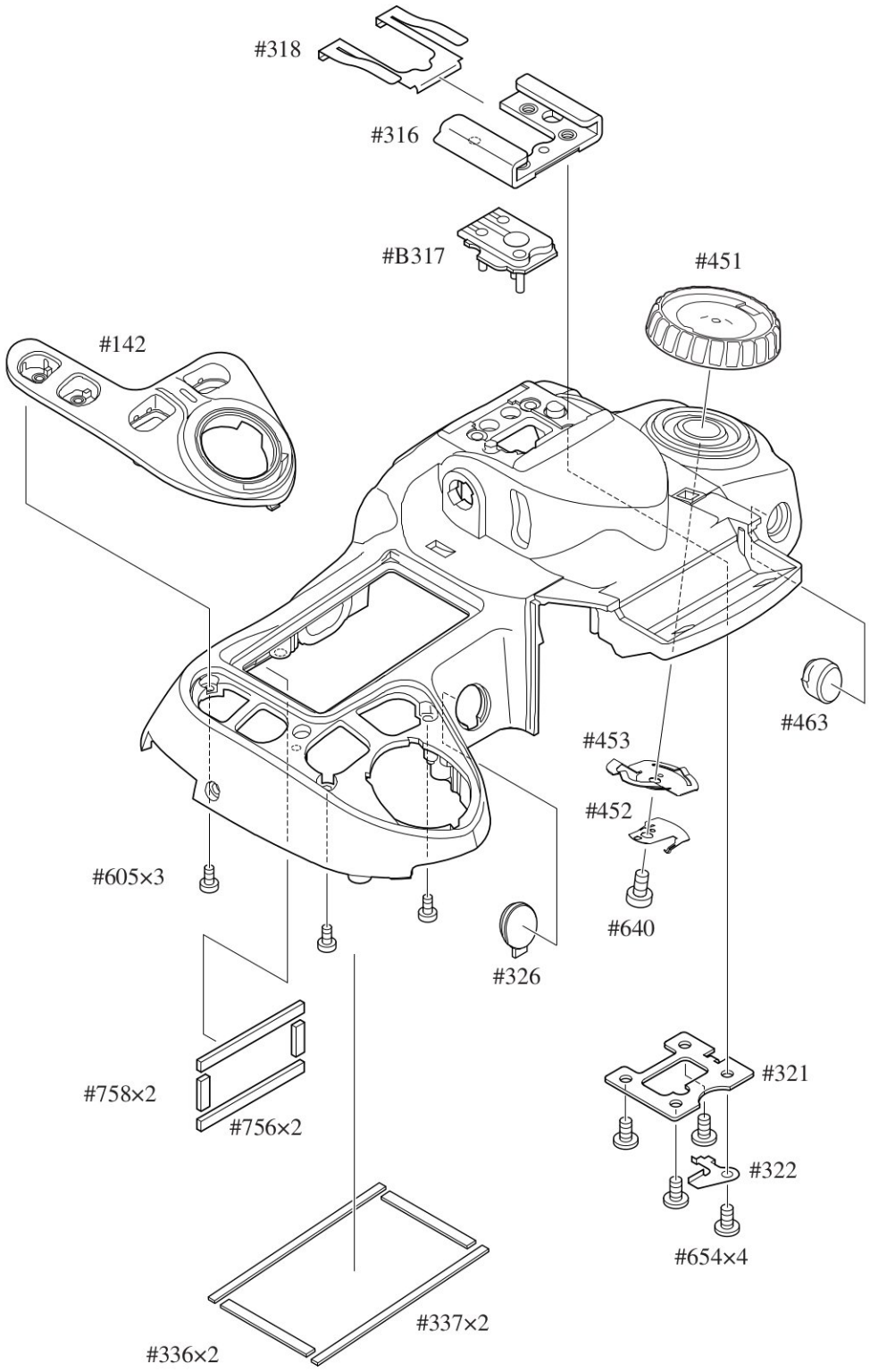




Release button / other small parts

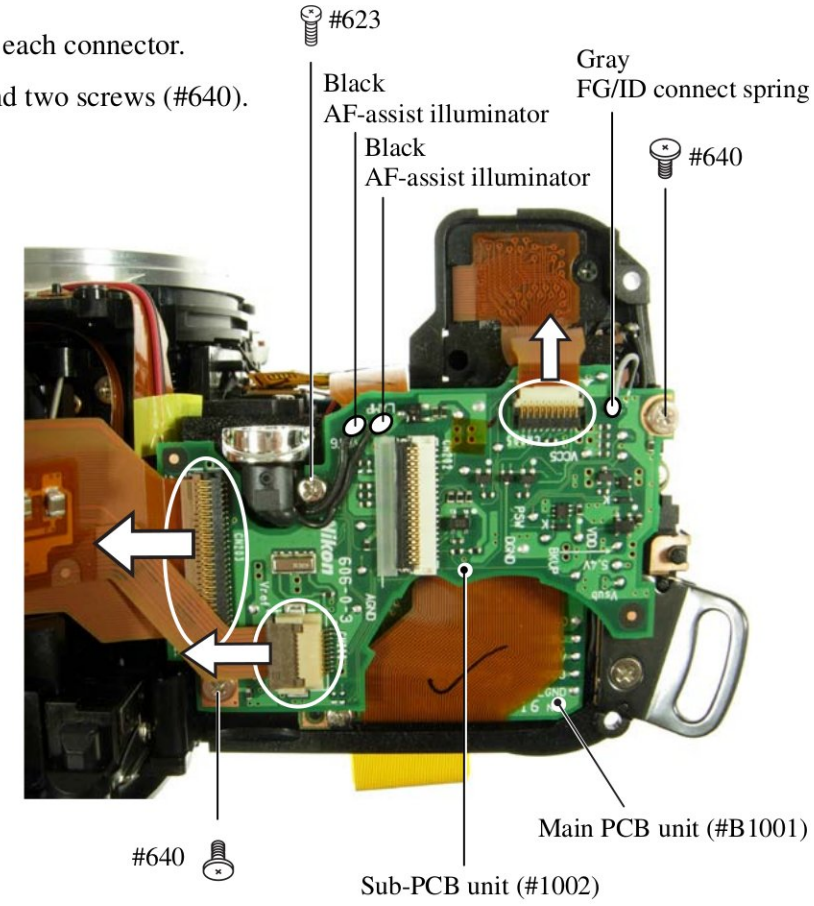


Outer LCD window / shoe mold unit / accessory shoe / other small parts

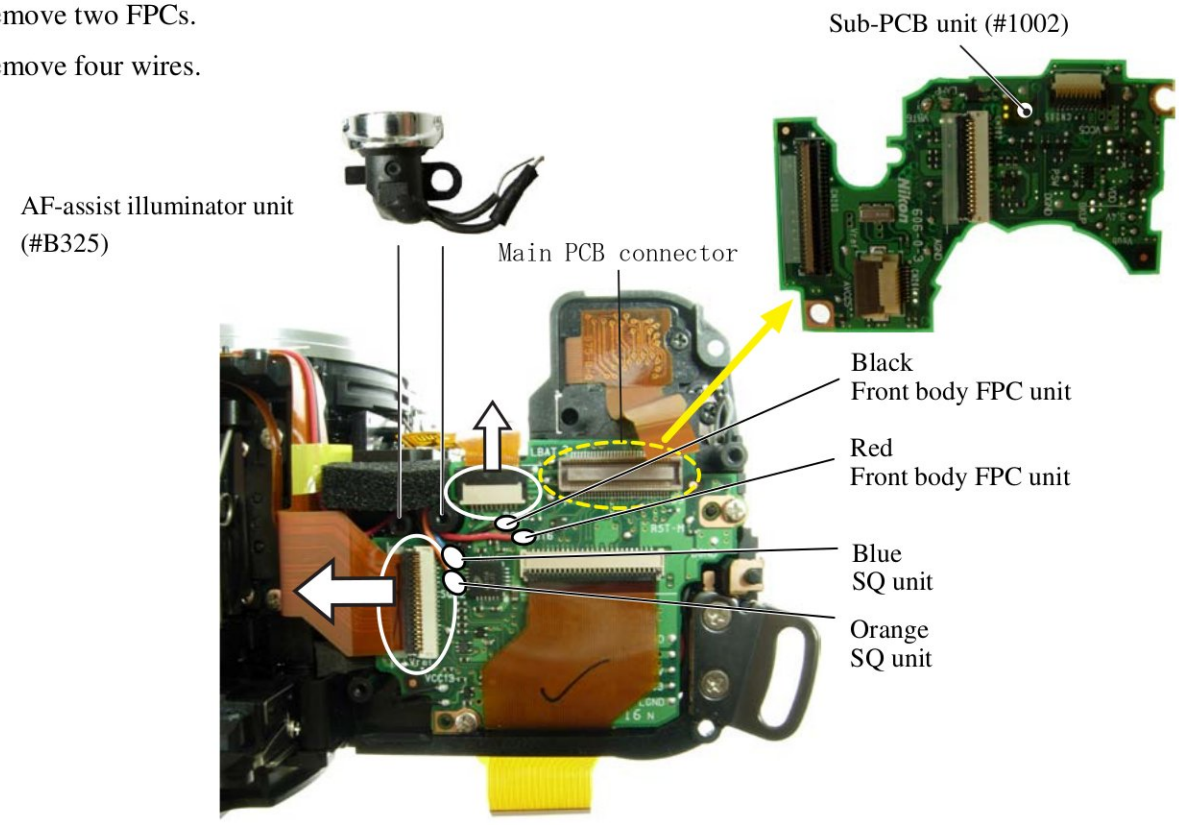


Sub-PCB unit

- Unsolder three wires.
- Disconnect three FPCs from each connector.
- Take out the screw (#623) and two screws (#640).

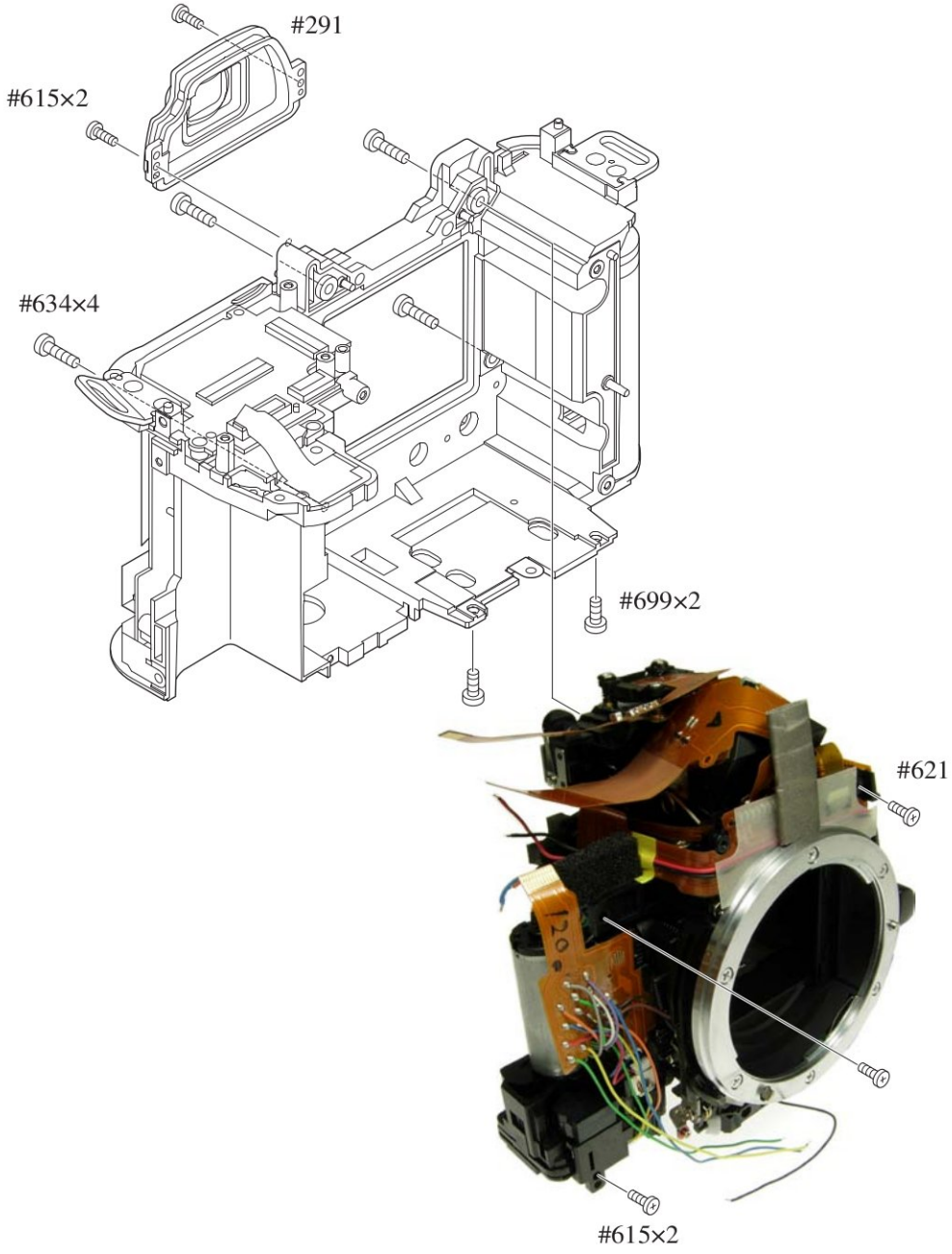


- Disconnect the sub-PCB unit (#1002) from the underneath connector of the main PCB.
- AF-assist illuminator unit (#B325) comes off.
- Remove two FPCs.
- Remove four wires.



Separation of Front and Rear bodies

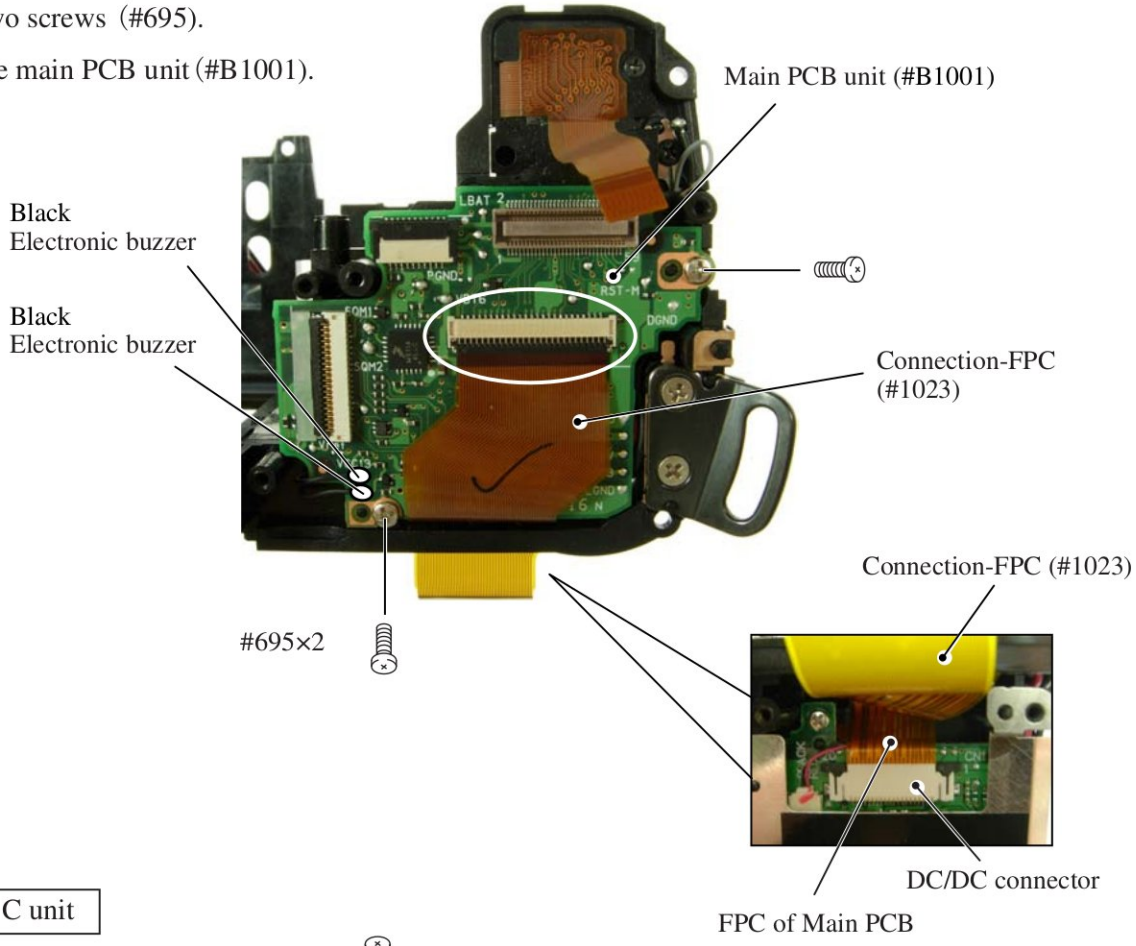
- Take out two screws (#615), and remove the eyepiece mold (#291).
- Take out two screws (#699), four screws (#634), two screws (#615) and one screw (#621). Then remove the front body.



3. Rear body

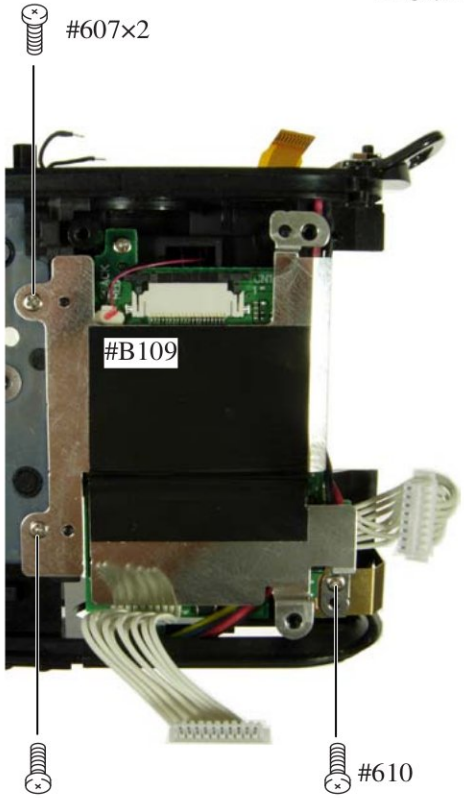
Main PCB unit

- Remove connection-FPC (#1023).
- Unsolder two wires of electronic buzzer unit.
- Disconnect the FPC of the main PCB from the DC/DC connector.
- Take out two screws (#695).
- Remove the main PCB unit (#B1001).



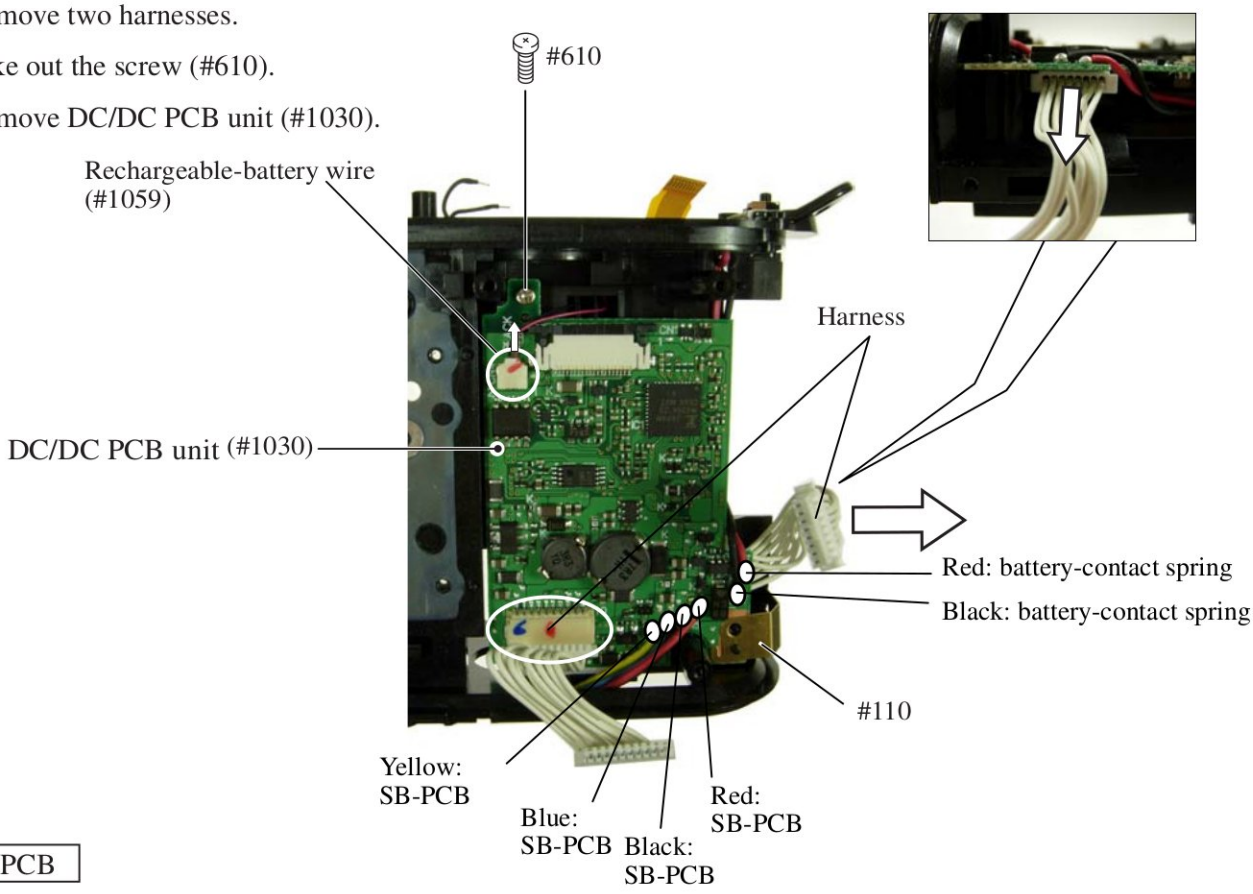
GND-plate C unit

- Take out two screws (#607) and one screw (#610). Then remove [#B109].



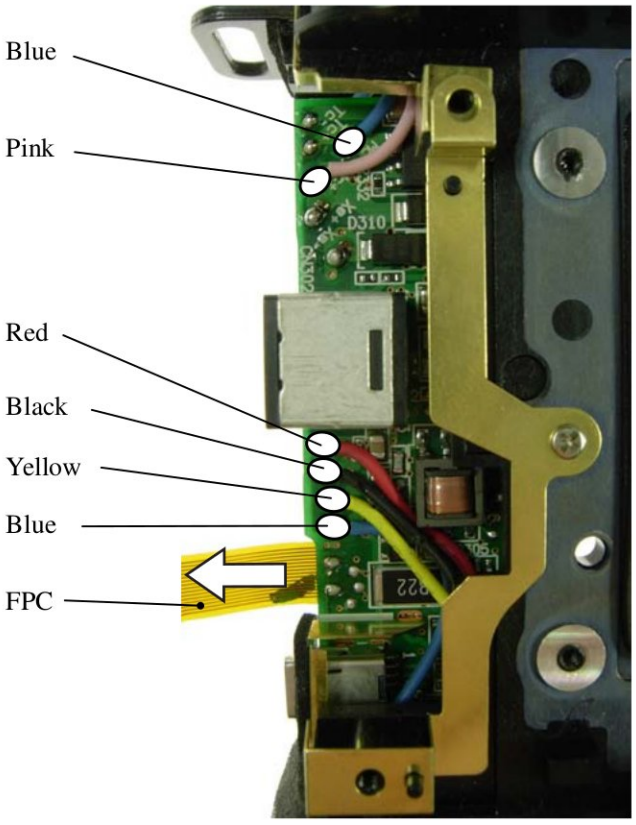
DC/DC PCB unit

- Remove [#110].
- Unsolder six wires.
- Disconnect the rechargeable-battery wire (#1059) from the connector.
- Remove two harnesses.
- Take out the screw (#610).
- Remove DC/DC PCB unit (#1030).



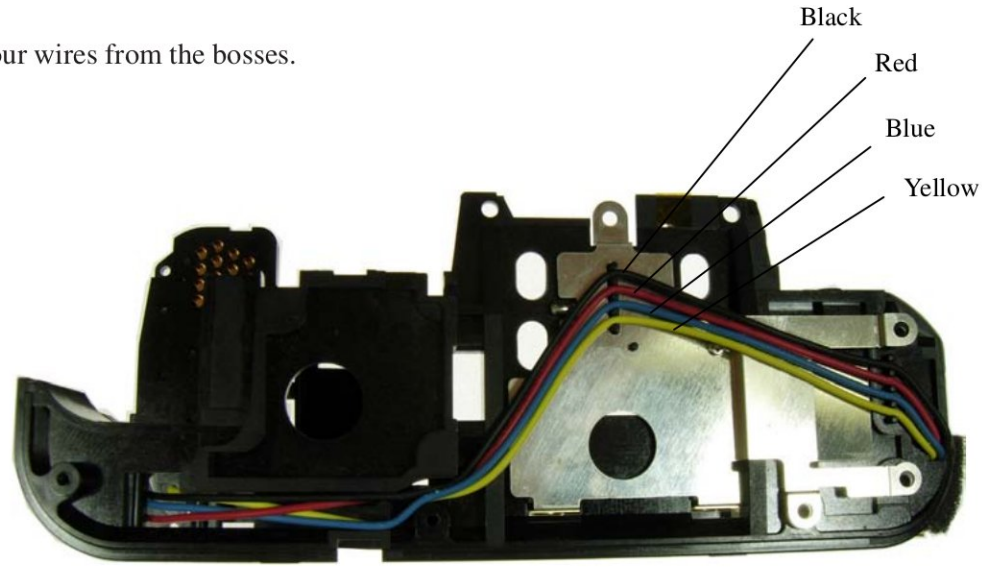
SB PCB

- Remove the FPC.
- Remove six wires.



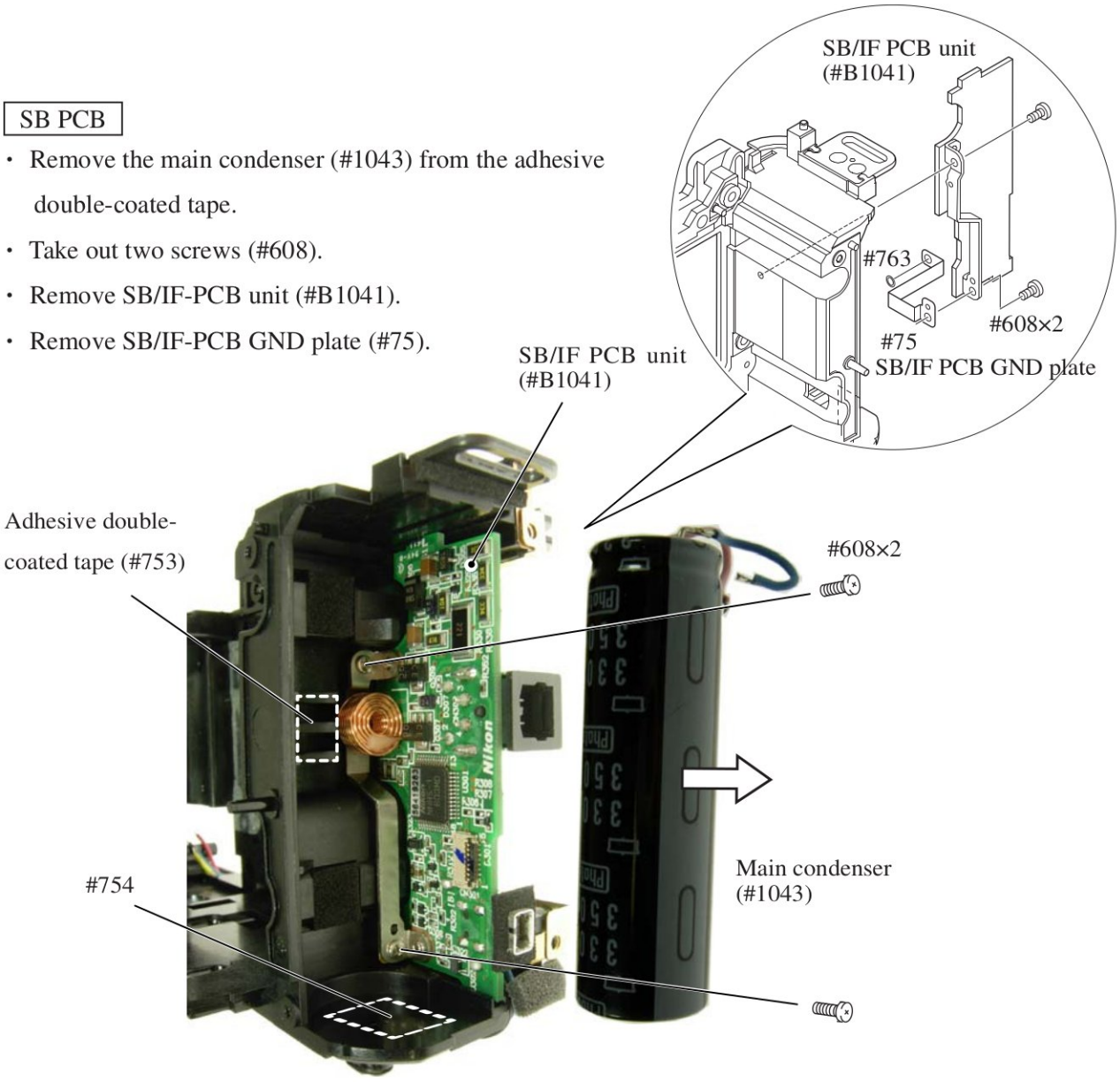
Bottom wires

- Detach the four wires from the bosses.



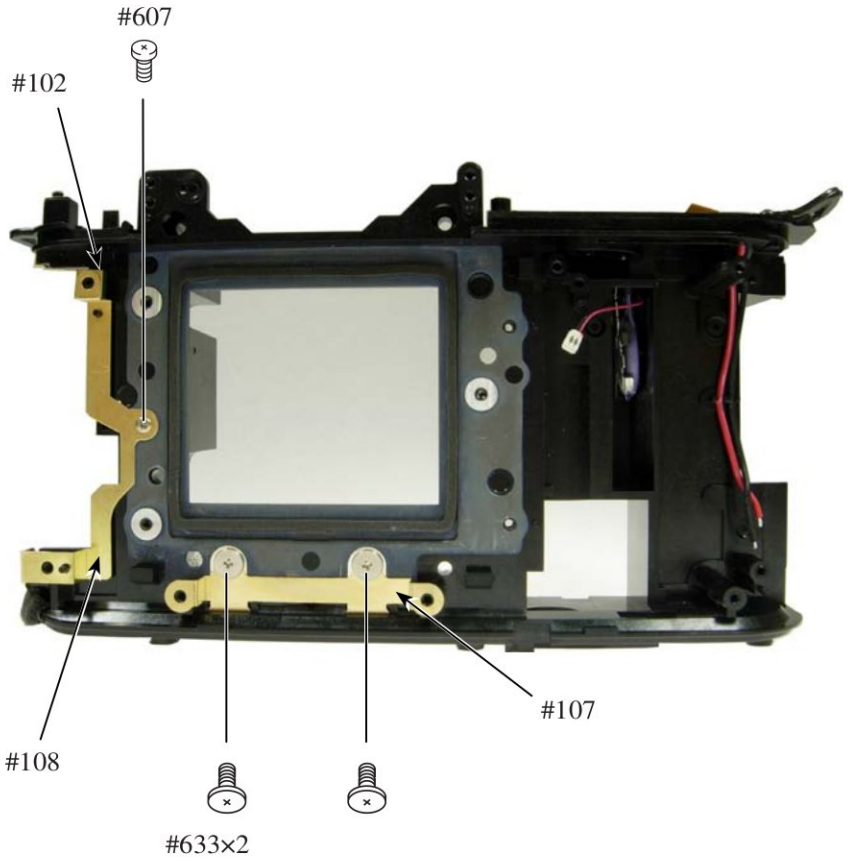
SB PCB

- Remove the main condenser (#1043) from the adhesive double-coated tape.
- Take out two screws (#608).
- Remove SB/IF-PCB unit (#B1041).
- Remove SB/IF-PCB GND plate (#75).

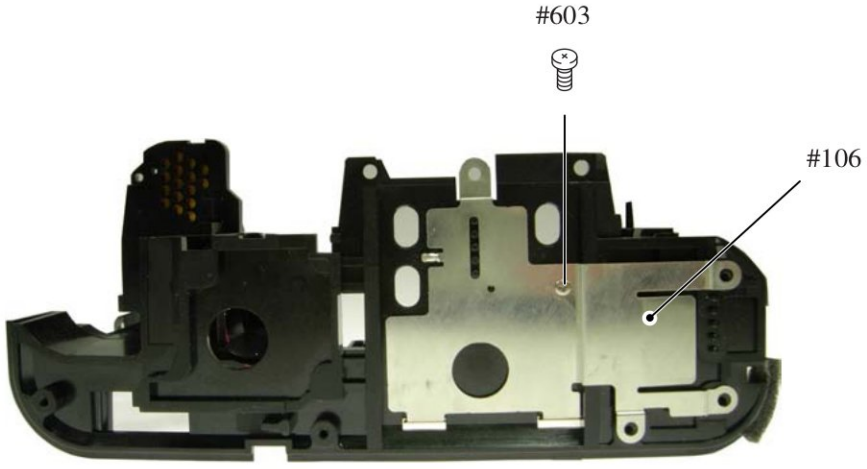


GND plate

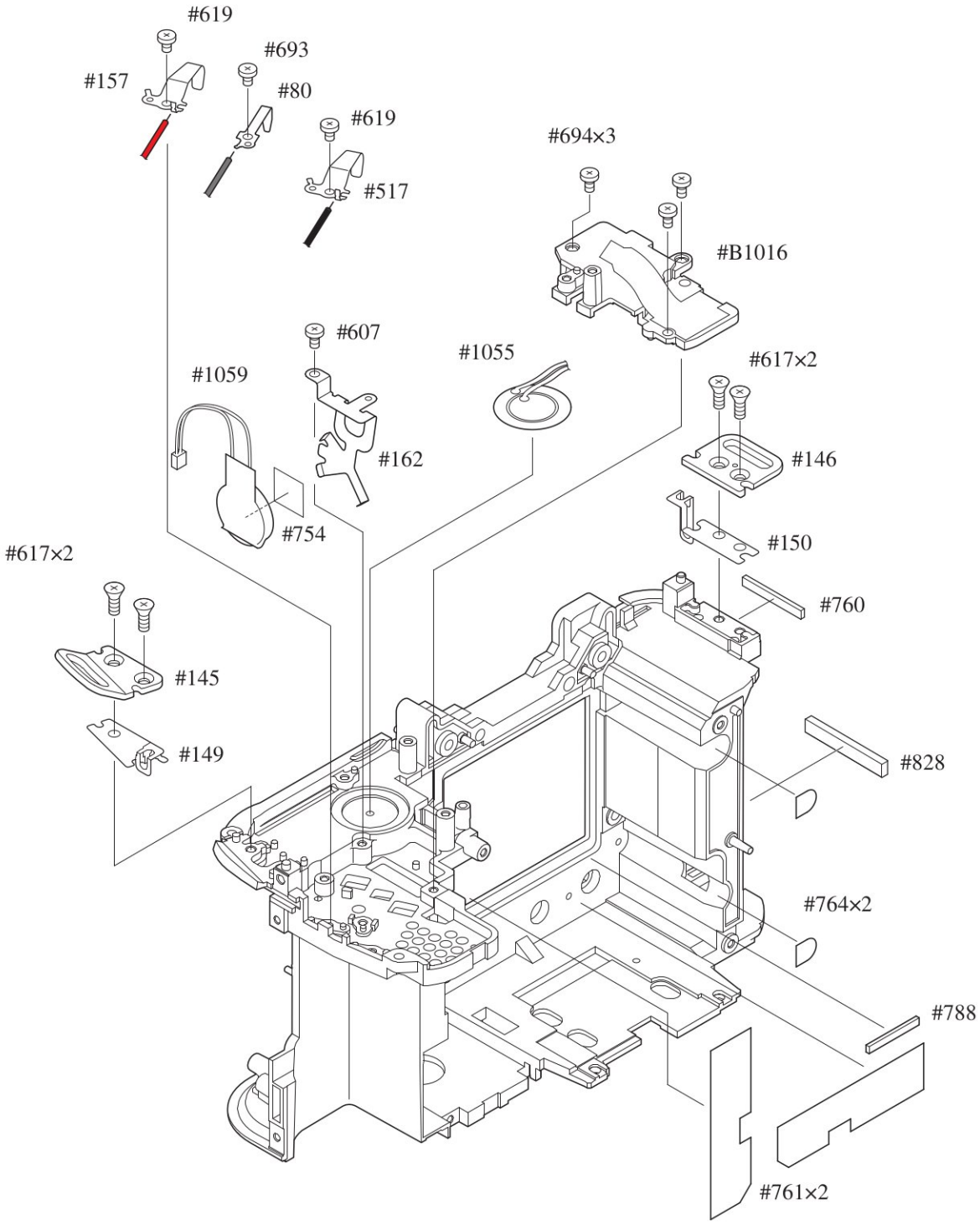
- Take out the screw (#607), and remove [#108].
- Remove [#102].
- Take out two screws (#633), and remove [#107].



- Take out the screw (#603) and remove [#106].



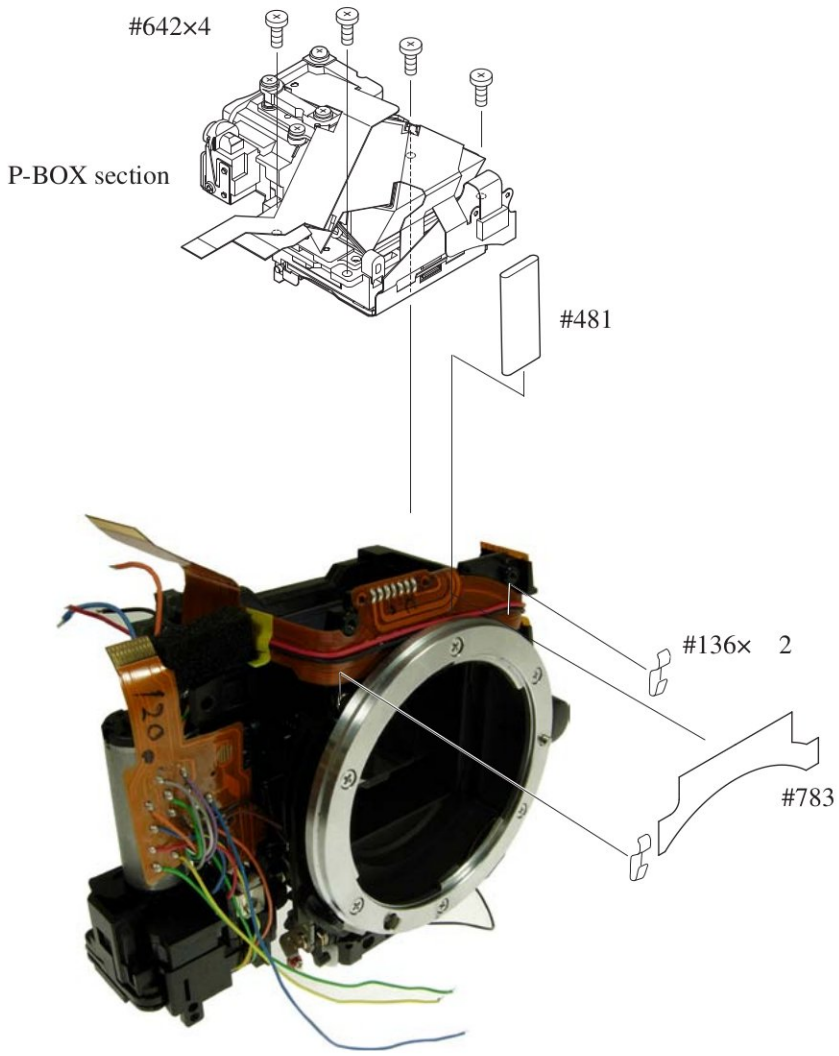
OP FPC unit, Electronic buzzer unit, Clock battery unit, other small parts



3. Front Body

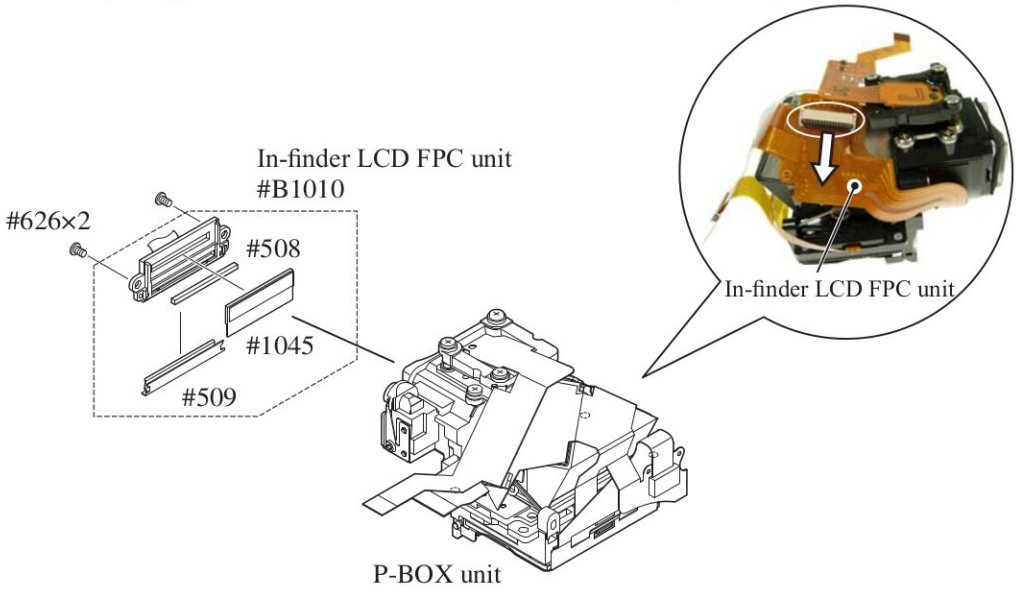
P-BOX section

- Remove two fingers (#136).
- Remove the gasket (#481).
- Remove the tracing film sheet (#783).
- Take out four screws (#642) and remove the P-BOX section.



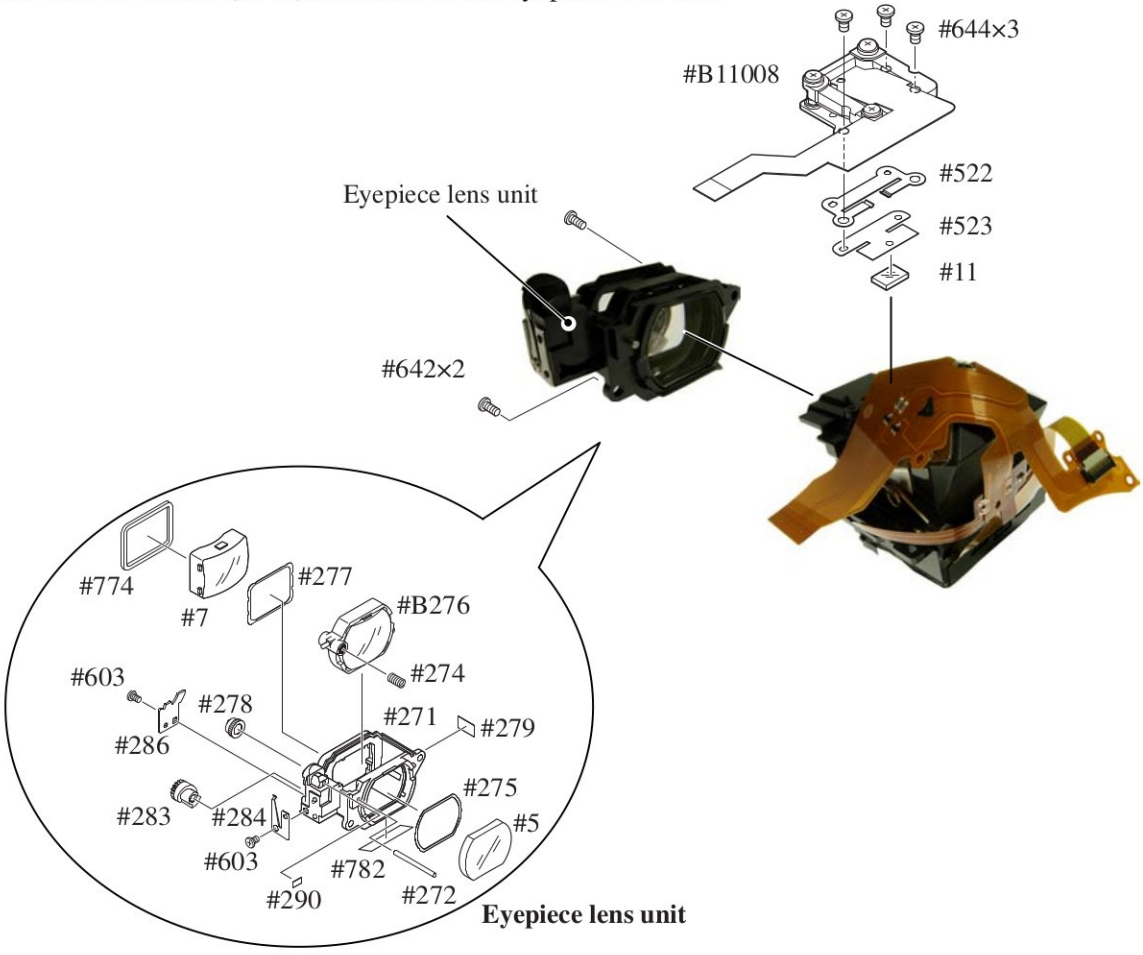
In-finder LCD FPC unit

- Disconnect the in-finder LCD FPC from the connector.
- Take out two screws (#626), and remove the in-finder LCD FPC unit (#B1010).



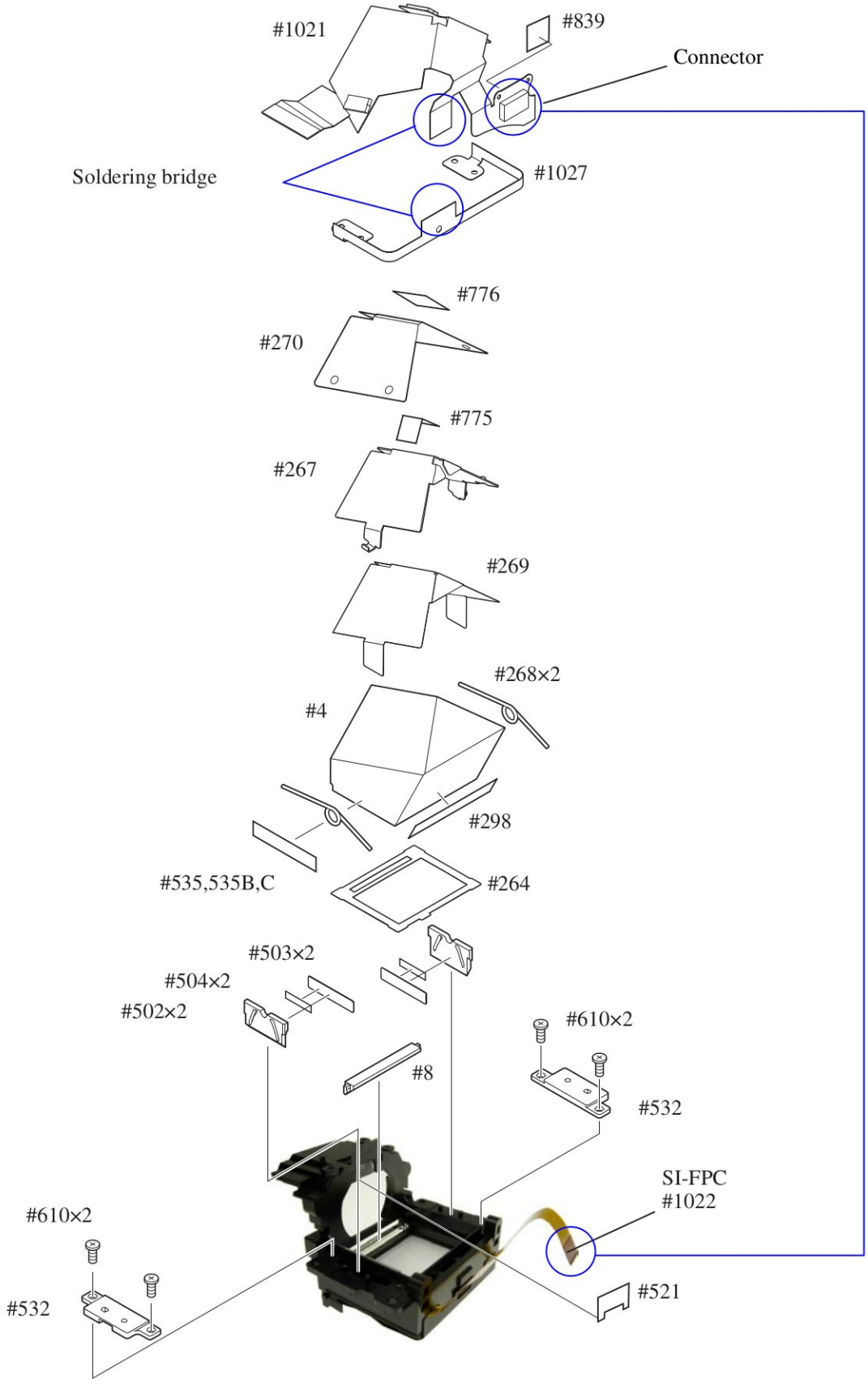
Metering FPC unit
Eyepiece lens unit

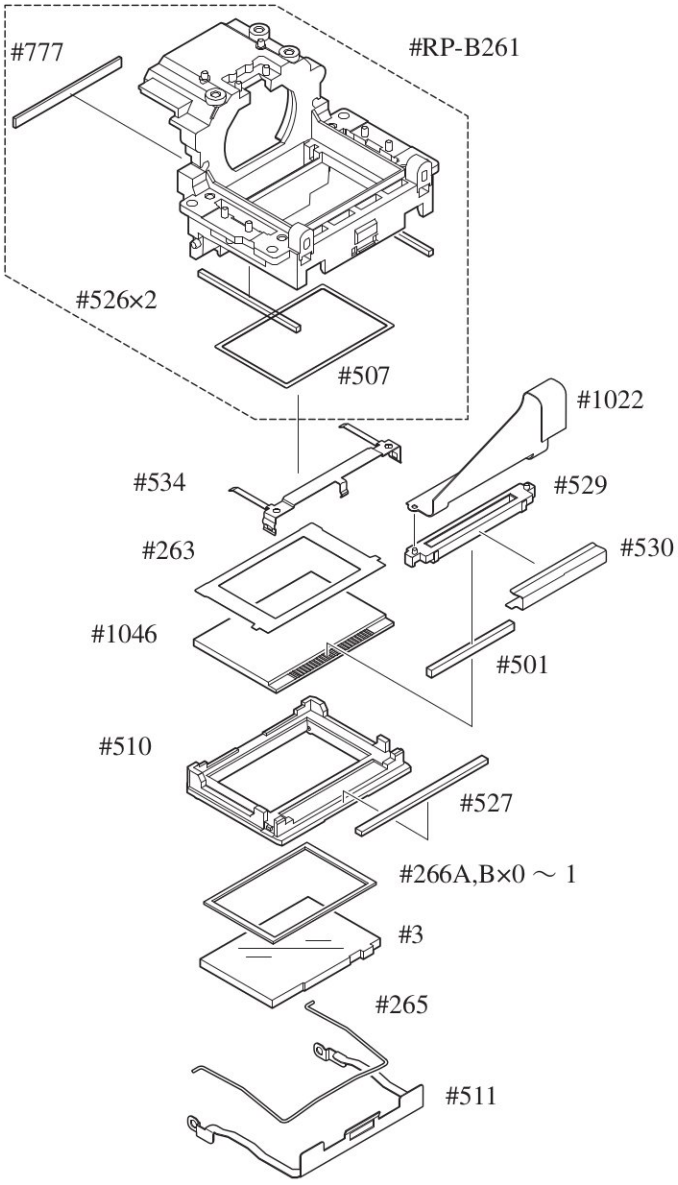
- Take out three screws (#644), and remove the metering FPC unit (#B11008).
- Take out two screws (#642), and remove the eyepiece lens unit.



Penta unit

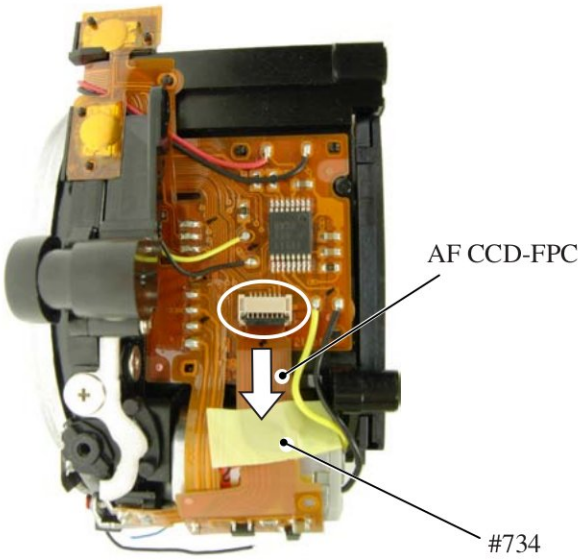
- Disconnect SI-FPC (#1022) from the connector of [#1021].
- Remove the soldering bridge that joints [#1021] and [#1027].

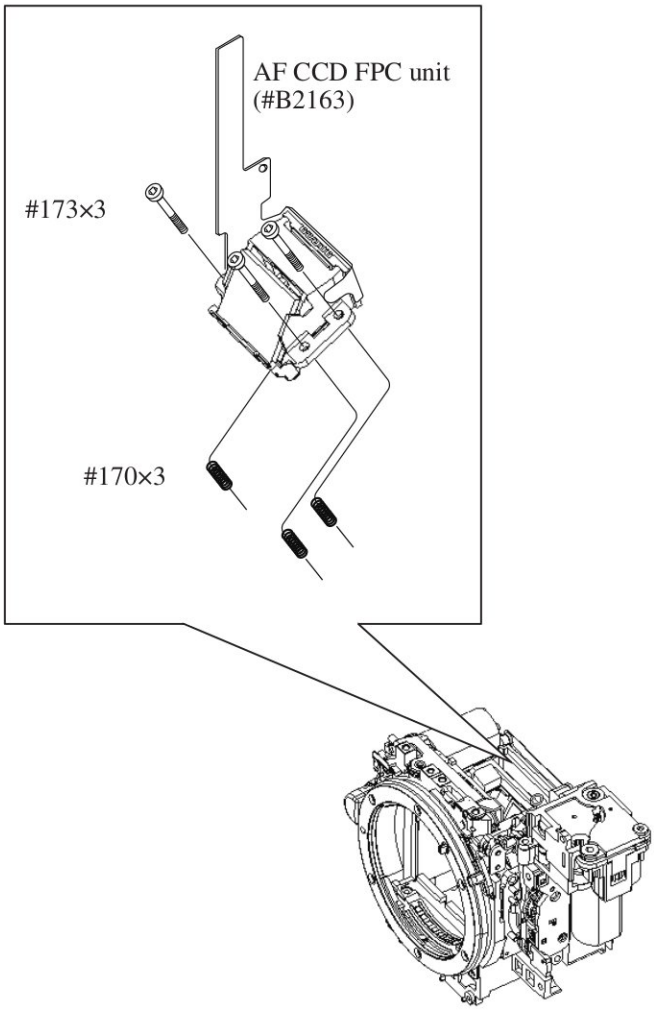



#777
#RP-B261
#526×2
#507
#1022
#534
#529
#263
#530
#1046
#501
#510
#527
#266A,B×0 ～ 1
#3
#265
#511

AFCCD FPC unit

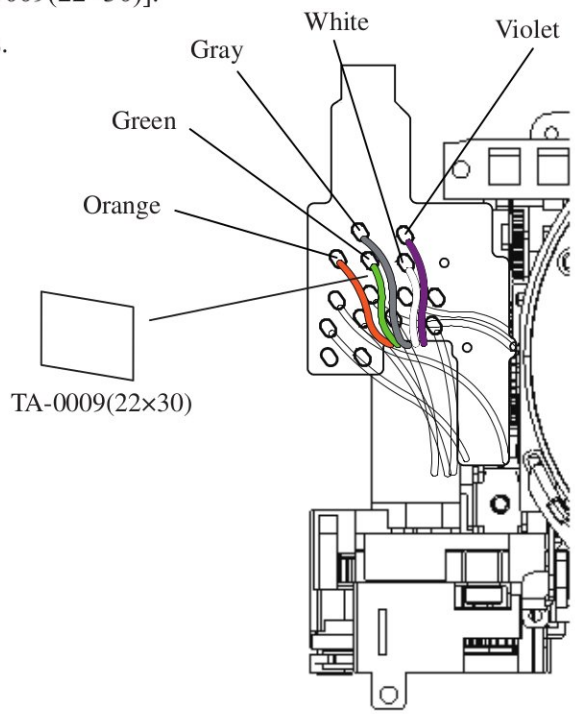
- Remove the tape (#734).
- Remove AFCCD-FPC.
- Take out three screws (#173) with Hexagonal wrench (φ1.5mm) to remove AFCCD FPC unit (#B2163).
- Three springs (#170) come off, too.



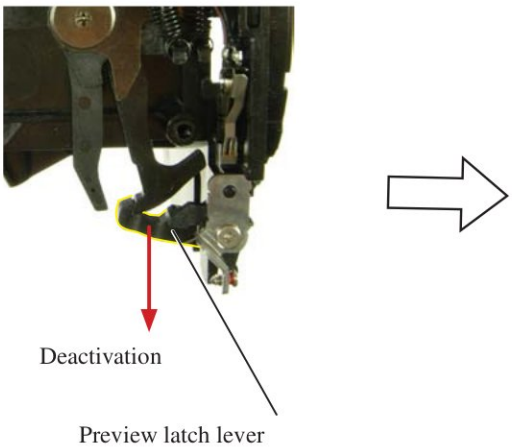


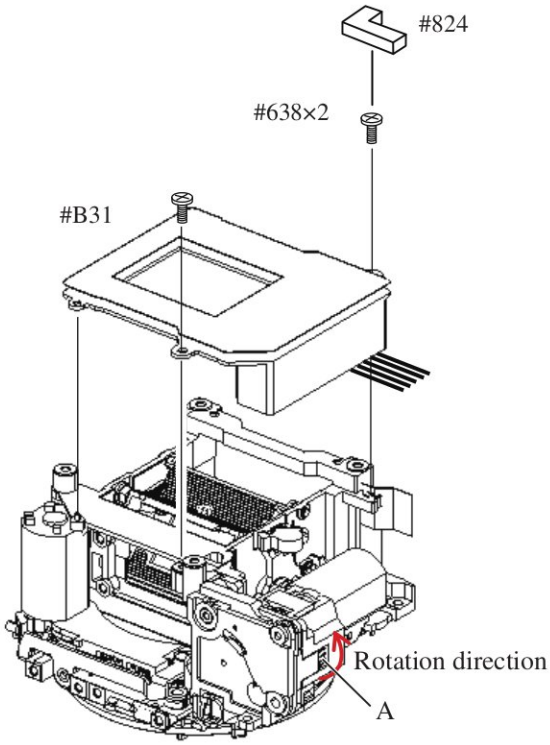
Shutter unit

- Remove the tape [TA-0009(22×30)].
- Unsolder the five wires.



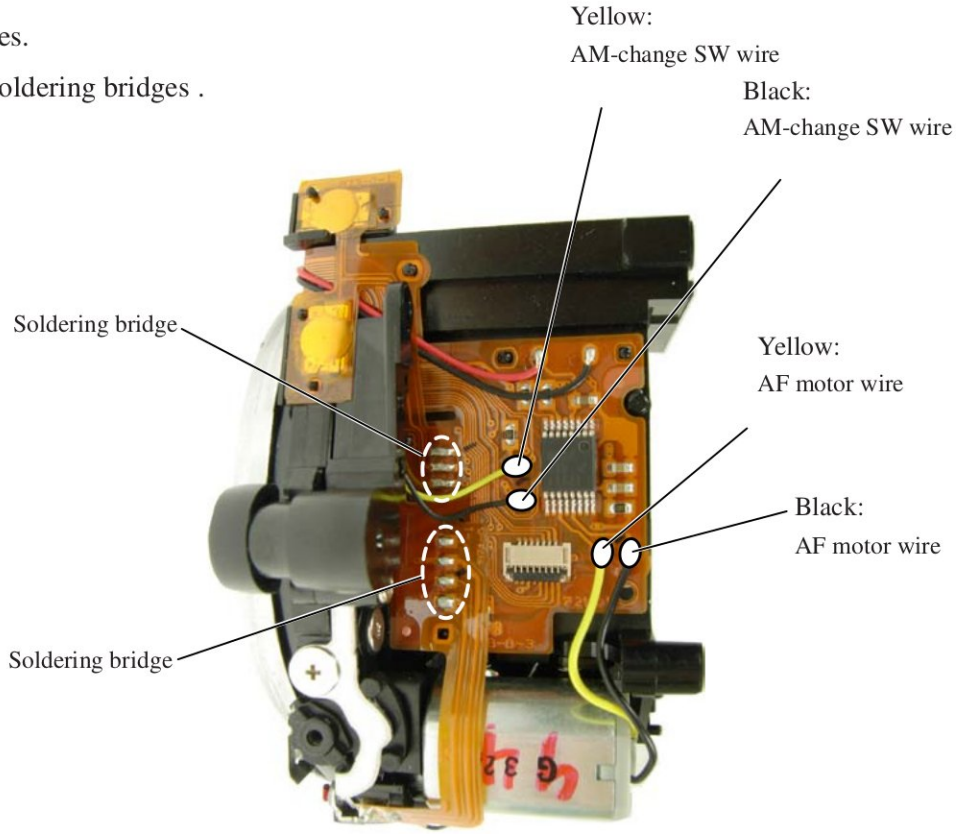
- Remove the sponge (#824).
- Deactivate the preview latch lever. Then, rotate "A" in the direction of the arrow and raise the mirror.
- Take out two screws (#638), and remove the shutter unit (#B31).



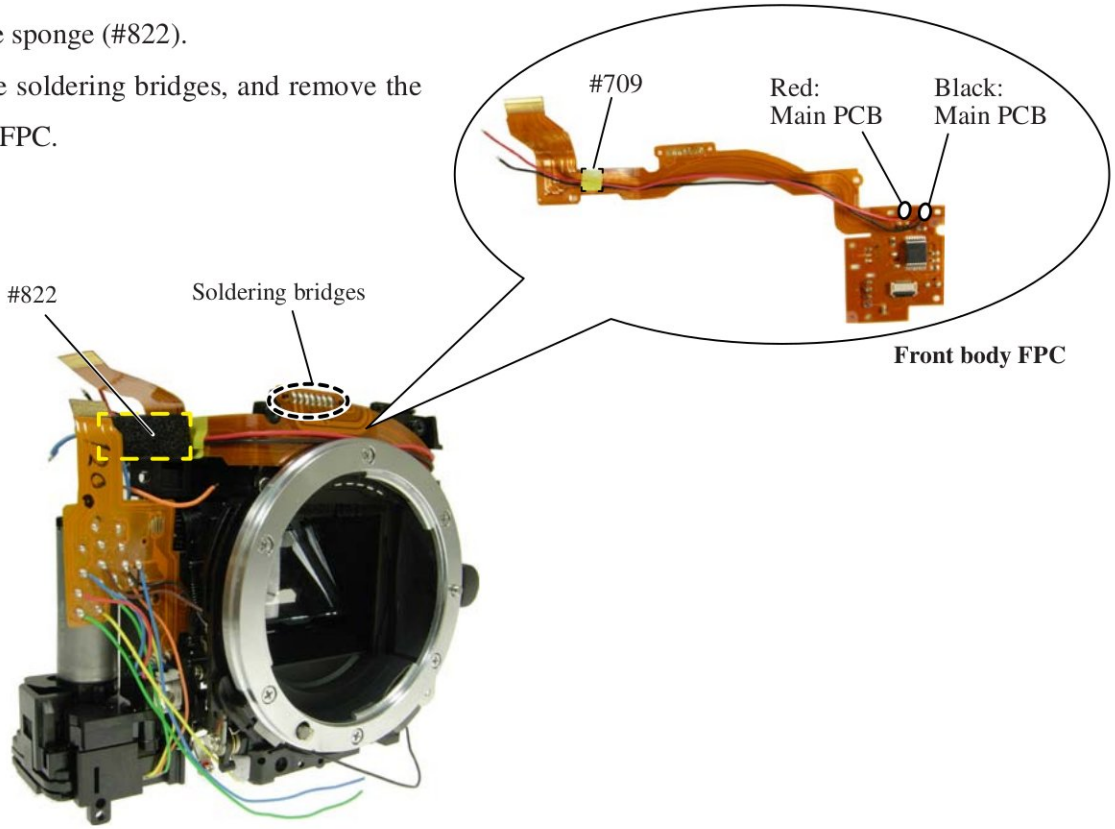


Front body FPC unit

- Unsolder four wires.
- Remove the two soldering bridges .



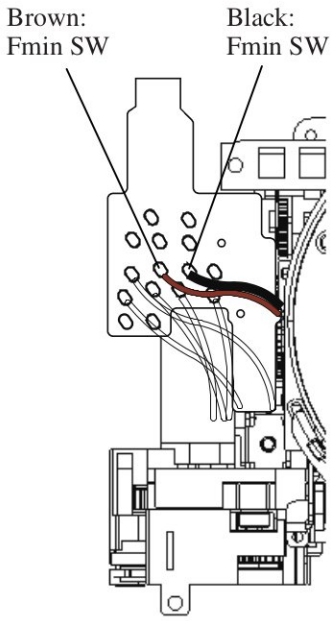
- Remove the sponge (#822).
- Remove the soldering bridges, and remove the front body FPC.

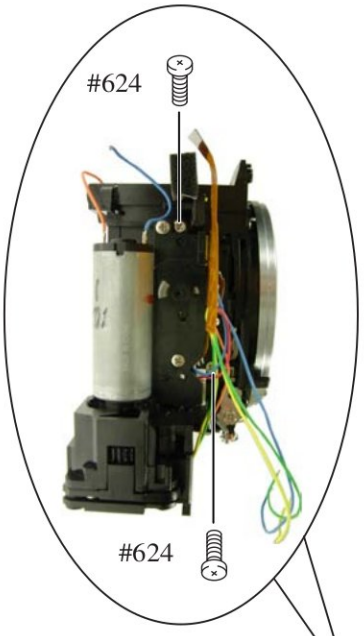


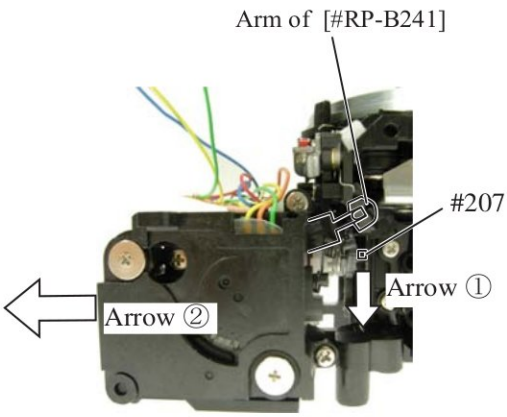
Aperture control unit

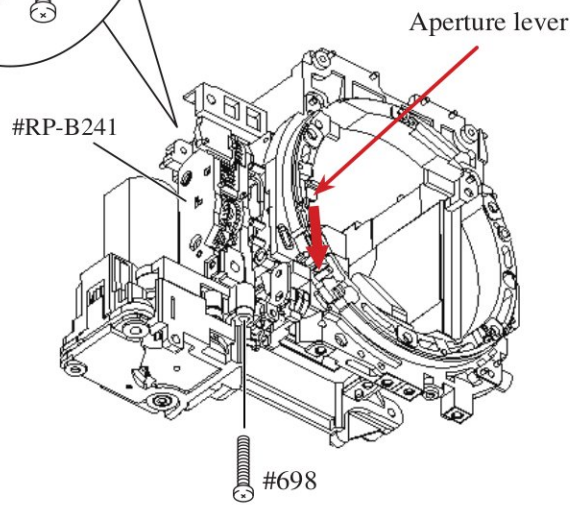
Procedure

1. Remove two wires.
2. Take out two screws (#624) and one screw (#698).
3. Press down the aperture lever with finger, and move the aperture coupling lever (#207) the direction of arrow (①).
4. In state of 3., while letting the arm of [#RP-B241] escape, remove the aperture control unit (#RP-B241) by pulling it in the direction indicated by arrow (②).

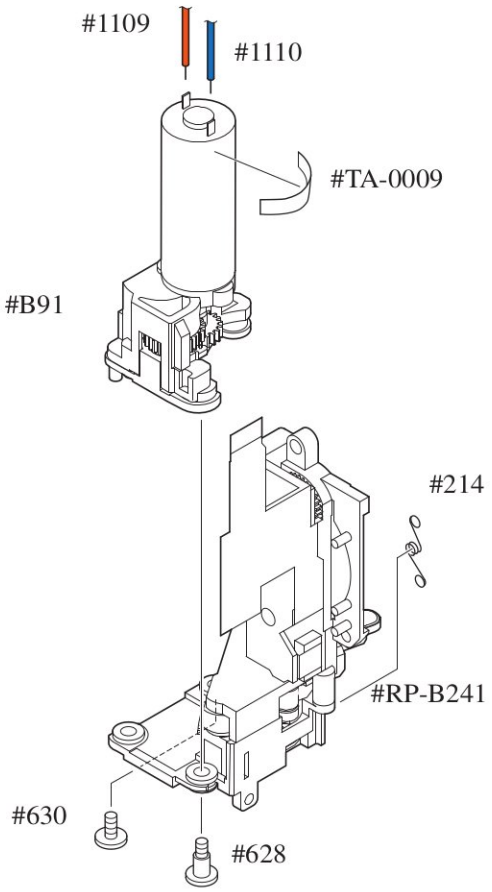






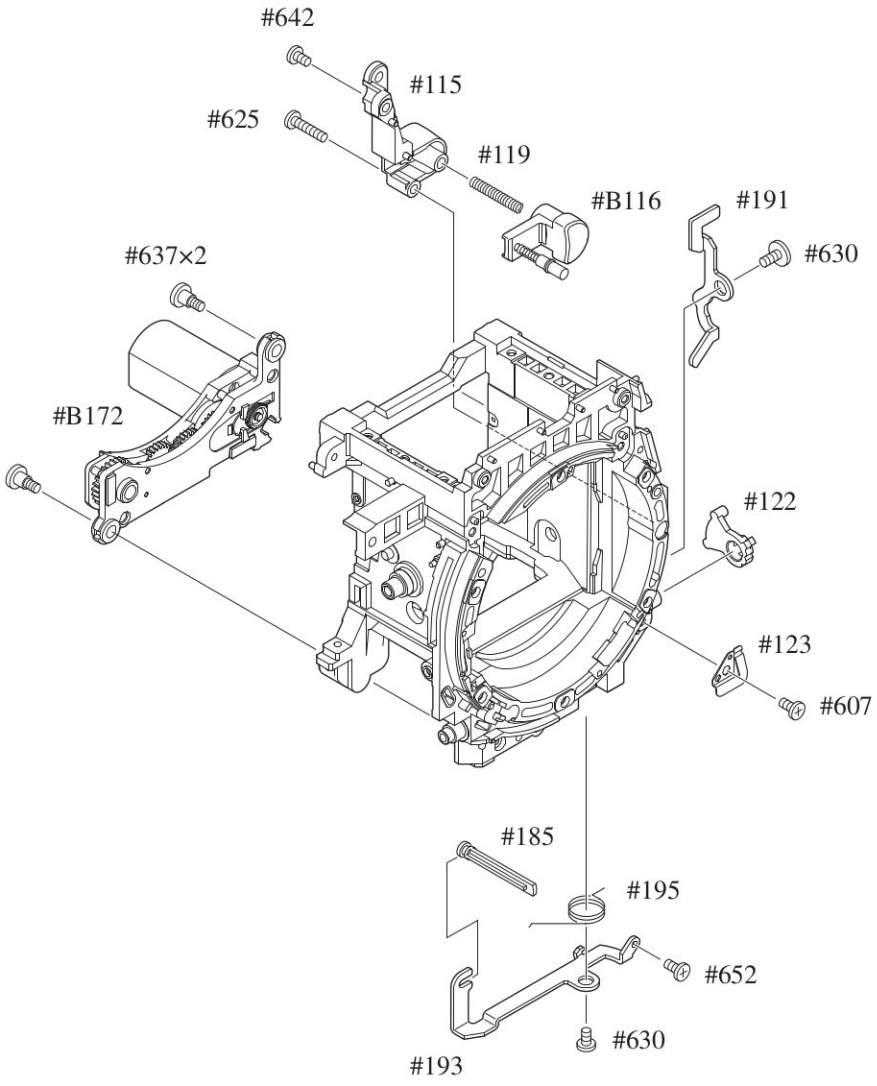


Aperture control PCB
SQ unit

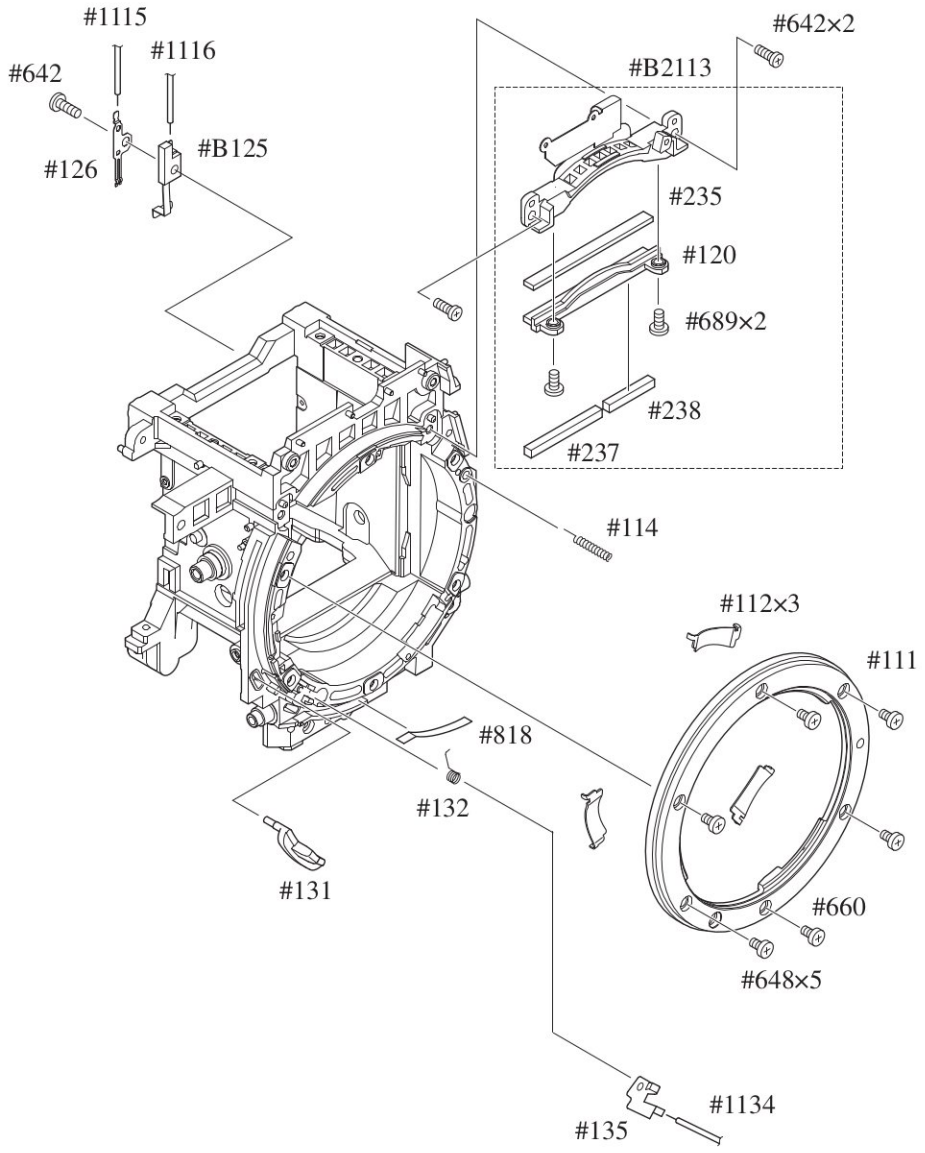


AF driving unit
Lens release button /
Vertical lever /
Horizontal lever areas

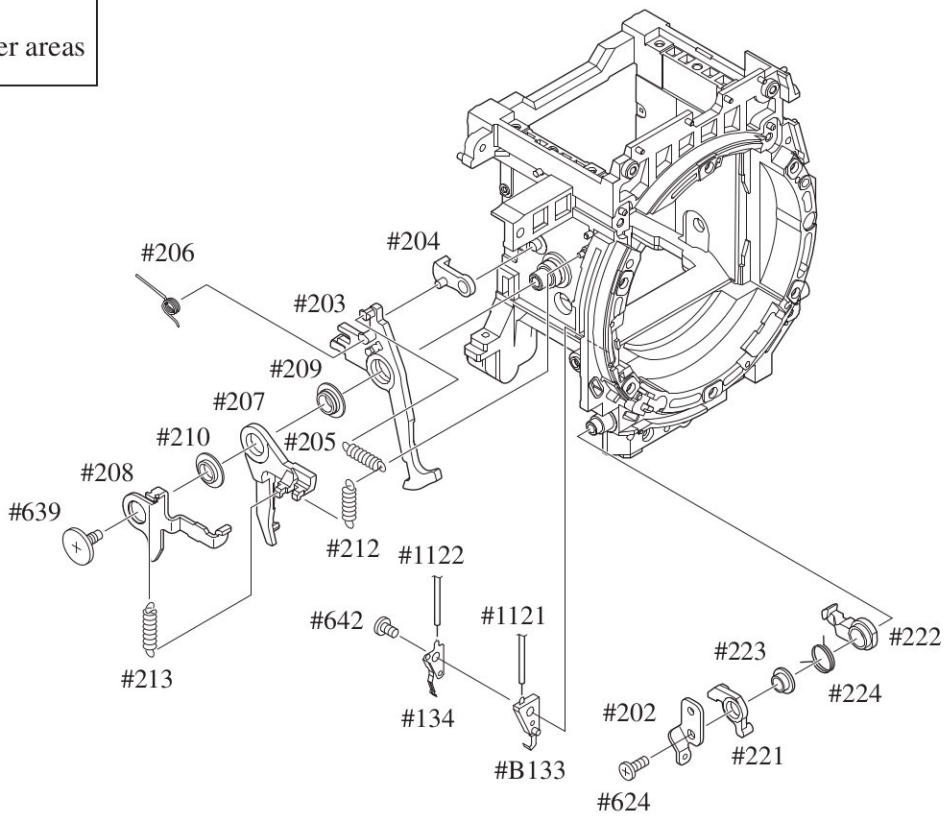
- Remove the horizontal lever (#193), and remove the AF motor PCB (#B172).
- Remove the vertical lever (#191), and remove the release-button holder (#B116).



Bayonet /
A/M-change SW /
Lens-contact areas

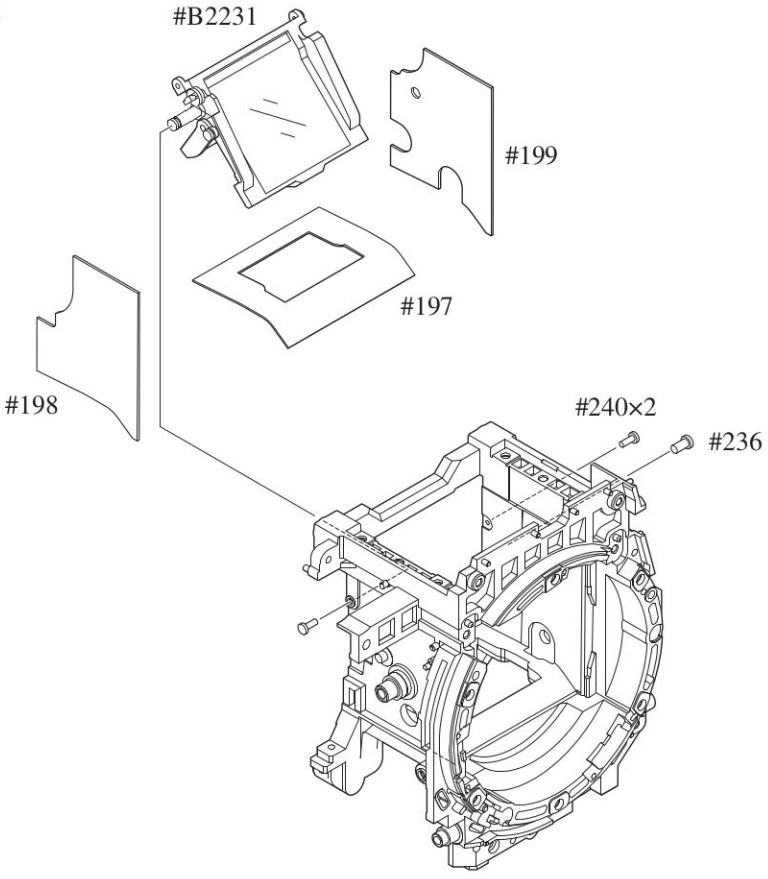


Aperture lever /
F-min SW /
Preview locking-lever areas



Mirror unit

・Note that two pins (#240) and the pin (#236) are attached with the Super X.

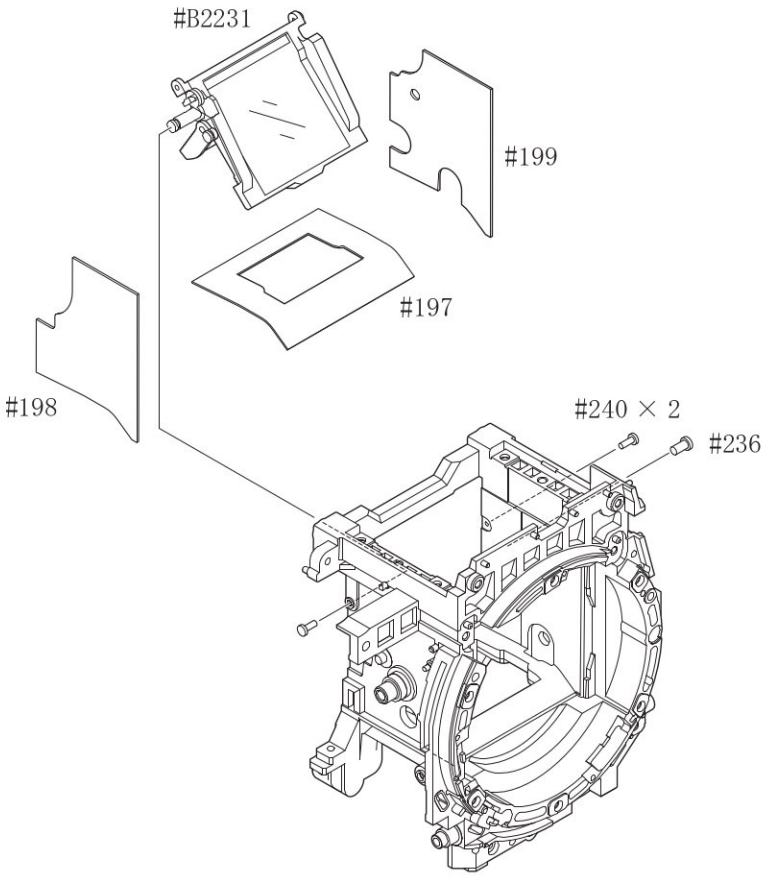


Assembly/ Adjustment

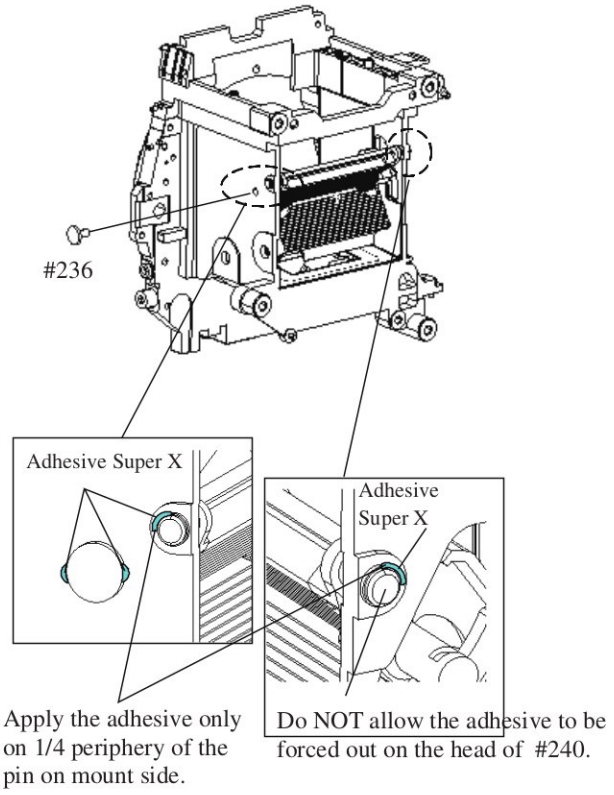
・ NOTE: For undescribed tapes and sponges here in"Assembly", refer to PARTS LIST.

1. Front body

Mirror unit

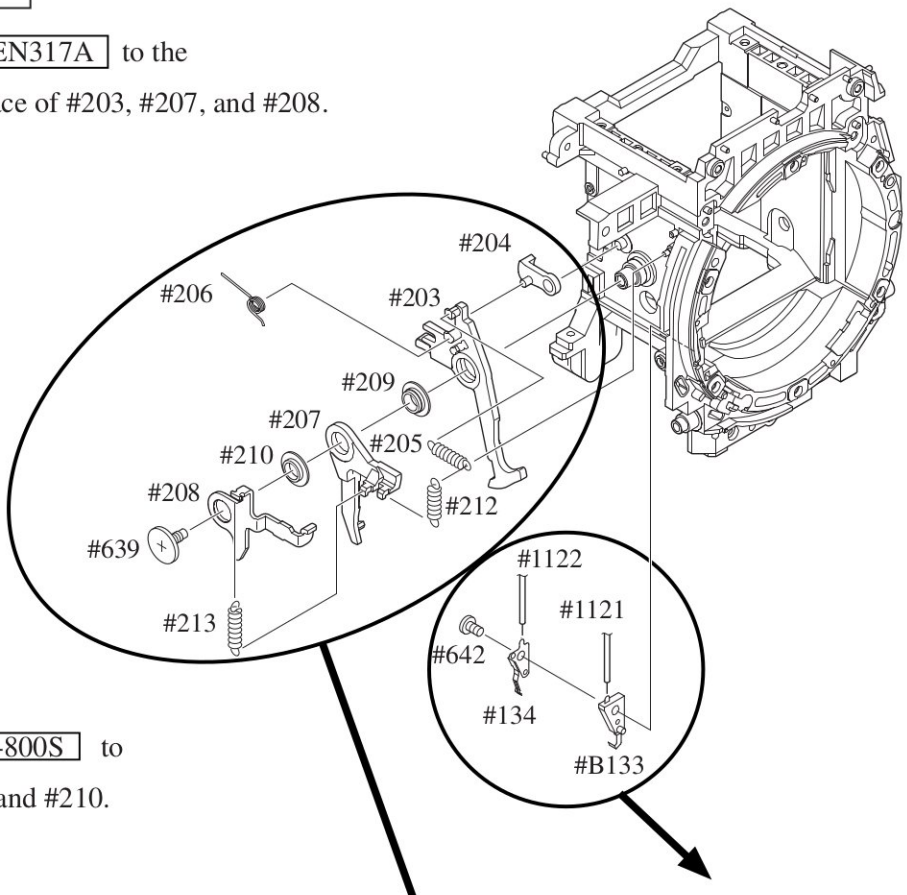


・ With being mirror-up as shown right, assemble the pins and apply the adhesive (Super X) on each pin.

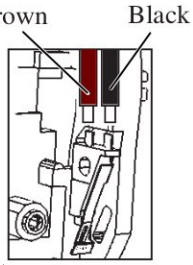


Aperture lever
F-min SW areas

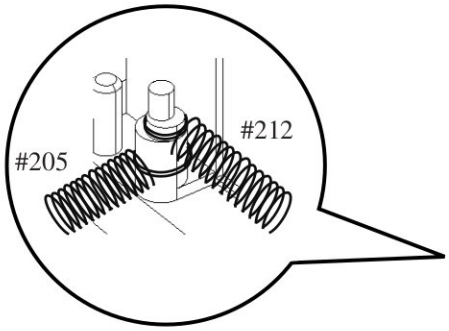
Apply Grease: LEN317A to the inner diameter surface of #203, #207, and #208.

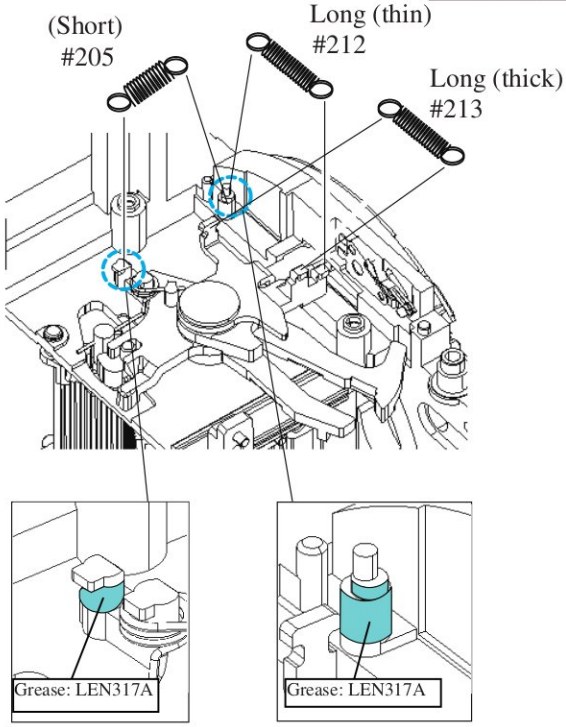


Apply Grease: MZ-800S to the overall of #209 and #210.

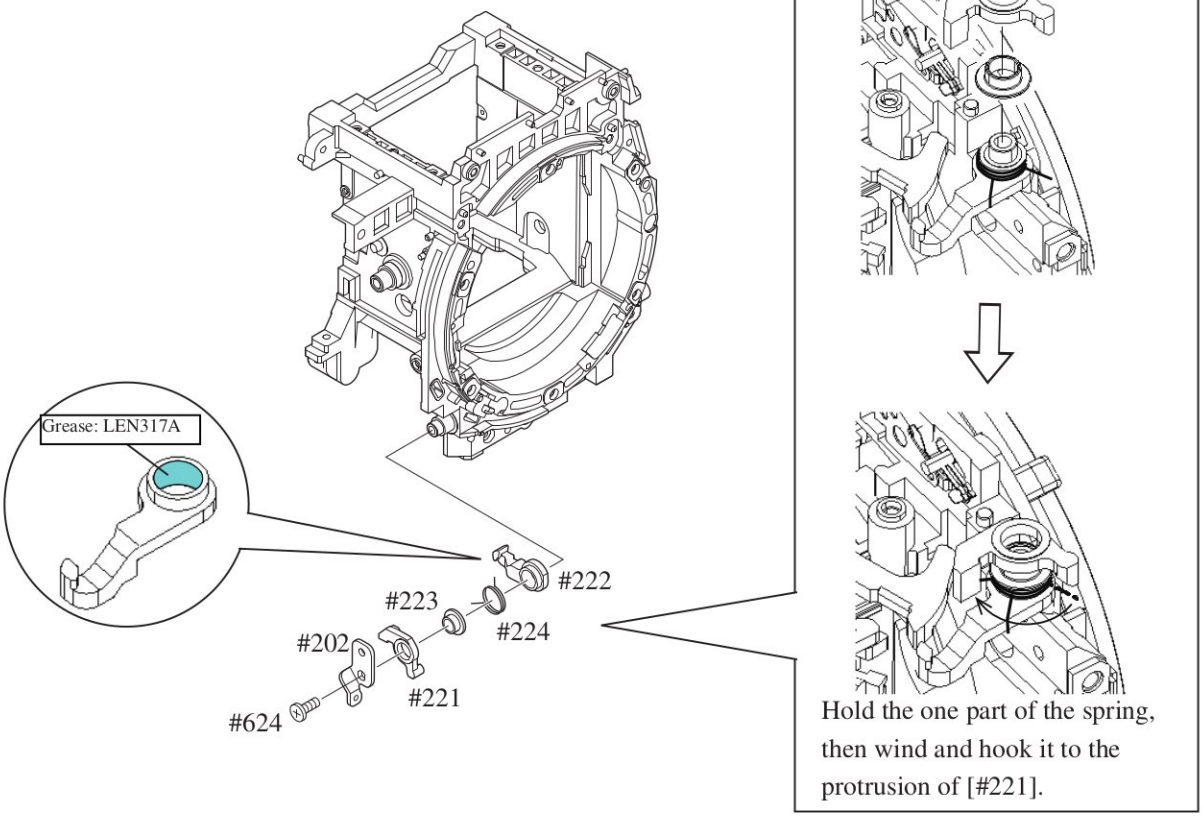


Position for hooking spring

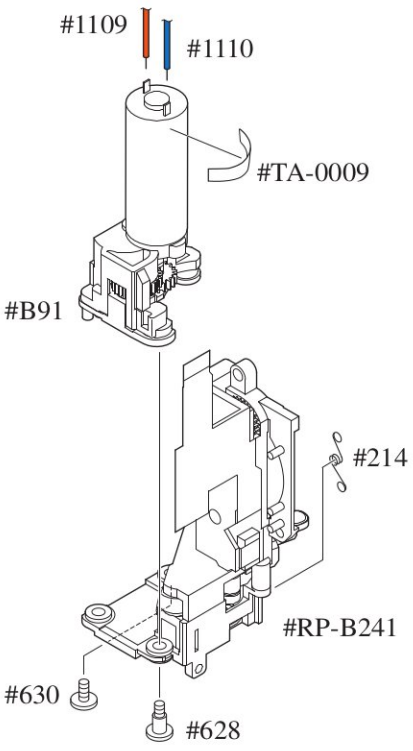




Preview latch lever



Aperture control unit
SQ unit



Aperture control unit

1. Turn the below [1] all the way to the end. Then press [2] in the direction to lock. (ref. Fig. ①)
2. Insert the arm between [#207] and [#203]. (ref. Fig. ②)
3. Tighten two screws (#624) and one screw (#698). (ref. Fig. ③ and ④)

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

Fig. ①

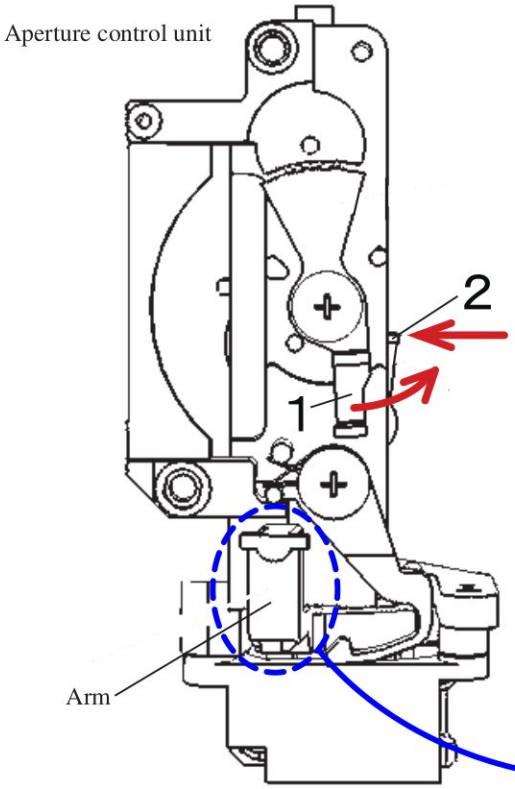


Fig. ②

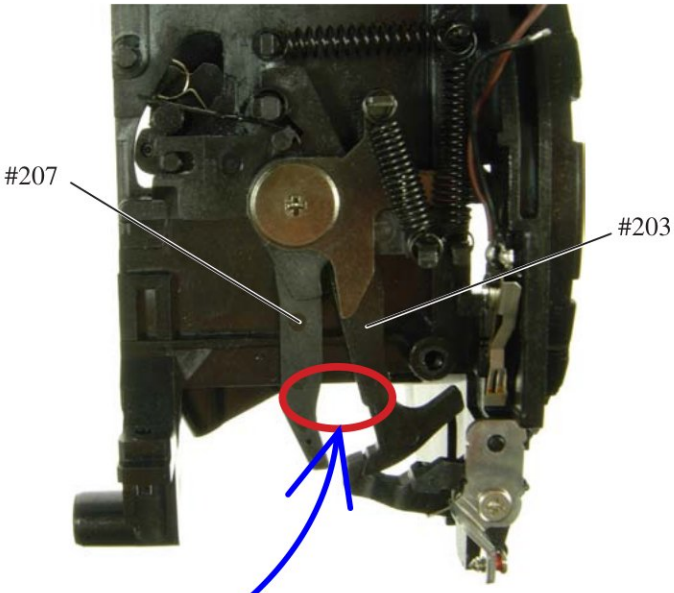


Fig. ③

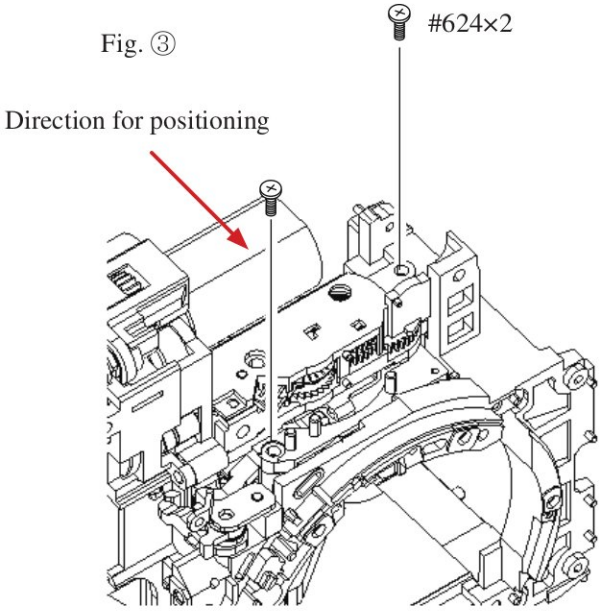
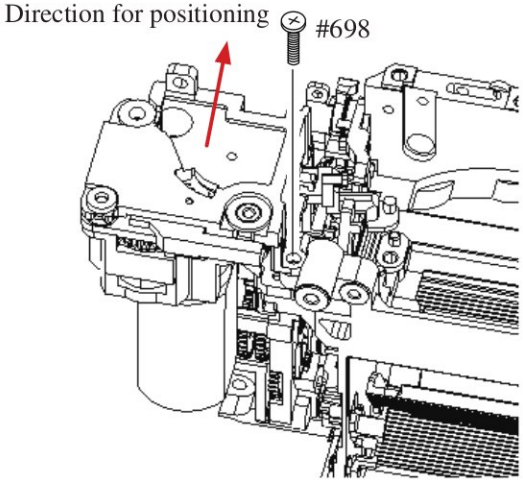
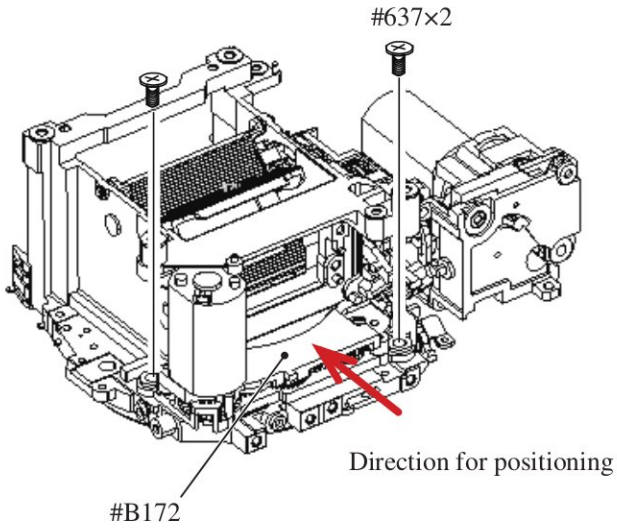


Fig. ④

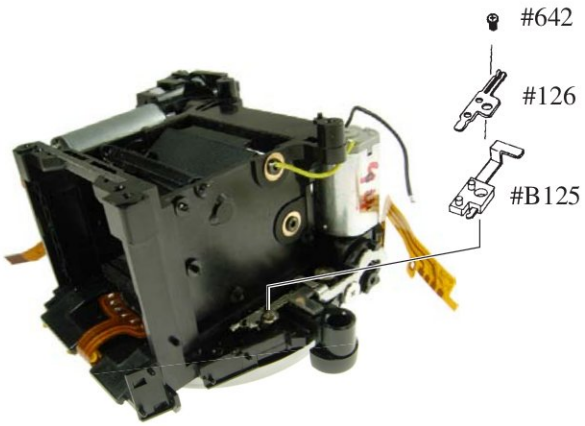


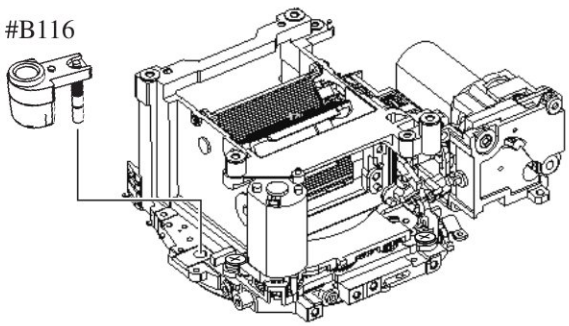
AF driving unit

・Mount the AF motor PCB (#B172) by following the direction for positioning, and fix it with two screws (#637).



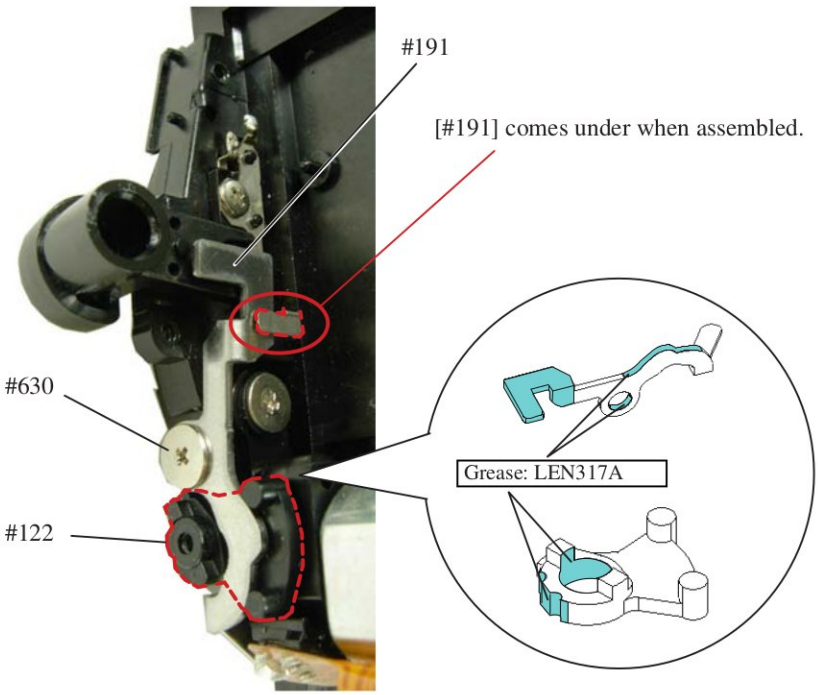
A/M change SW
Lens release button





Vertical lever

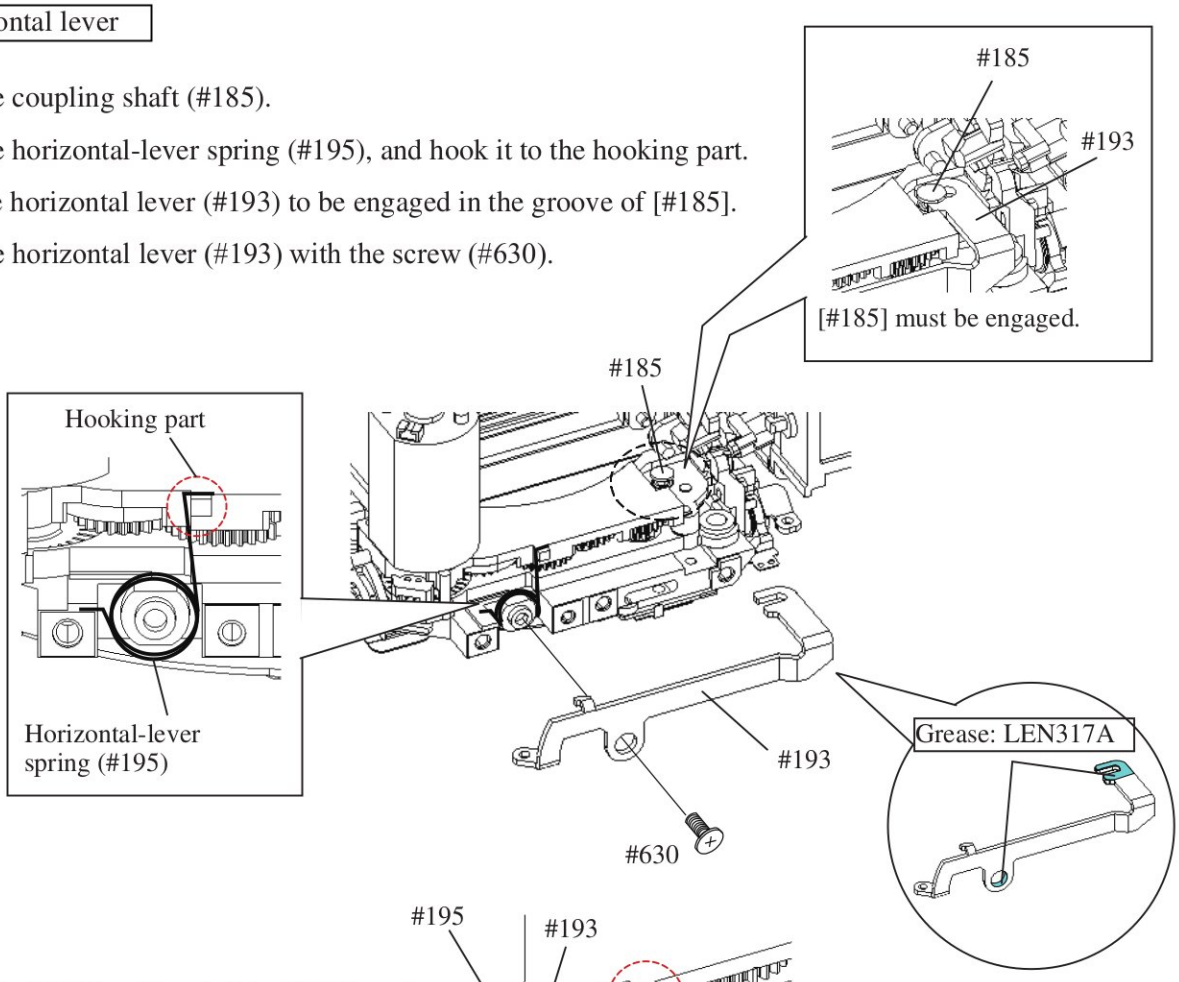
- Assemble by the following order.
  #122→#191→#630



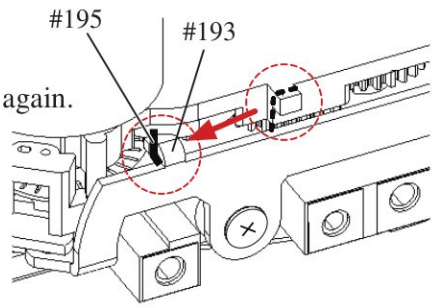
Note: Be careful NOT to bend contact blade of the lens release SW.

Horizontal lever

- Put the coupling shaft (#185).
- Put the horizontal-lever spring (#195), and hook it to the hooking part.
- Set the horizontal lever (#193) to be engaged in the groove of [#185].
- Fix the horizontal lever (#193) with the screw (#630).

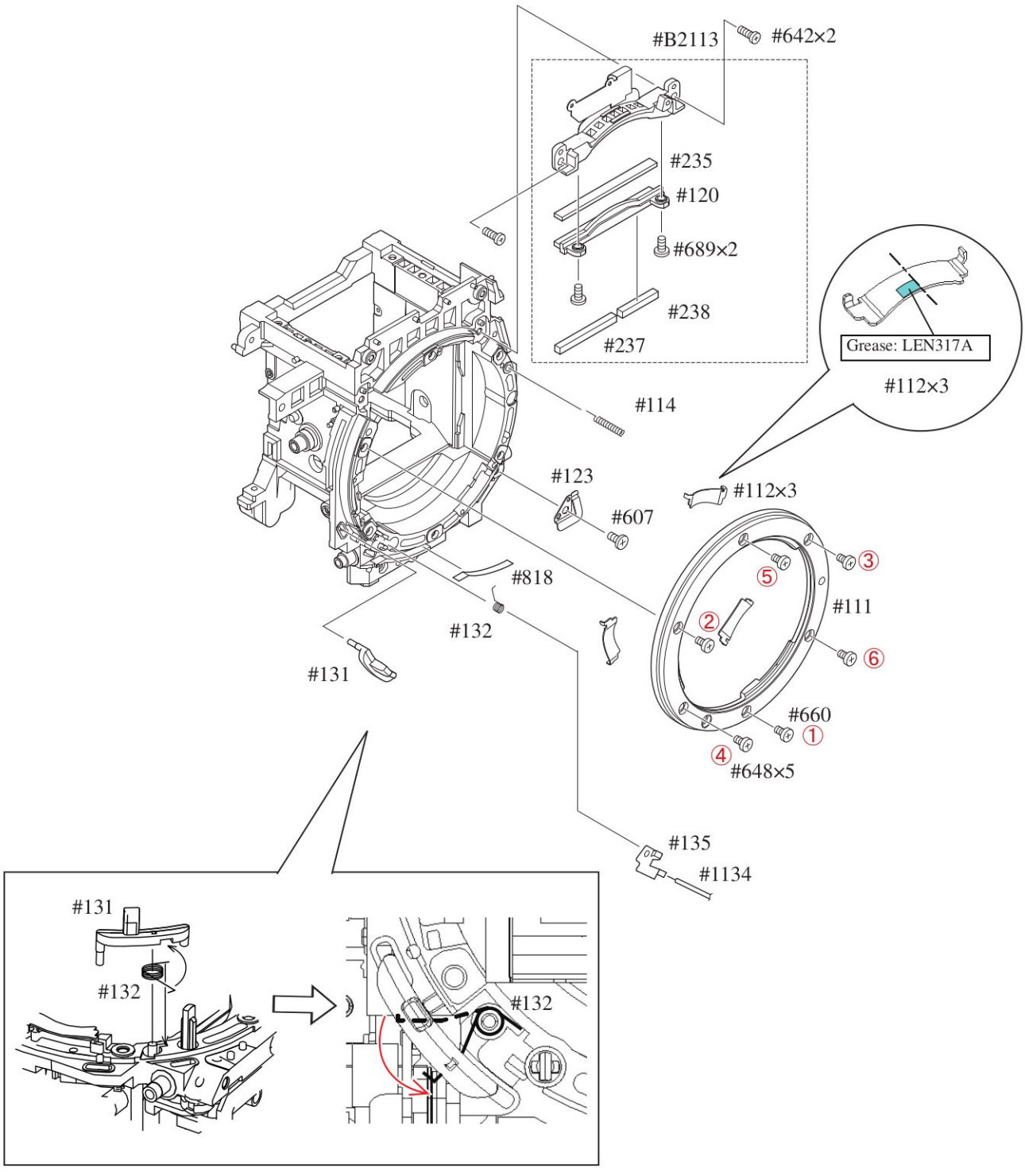


- Unhook [#195] and hook it to [#193] again.



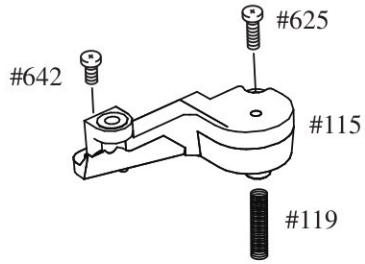
Bayonet
AF lens contacts areas

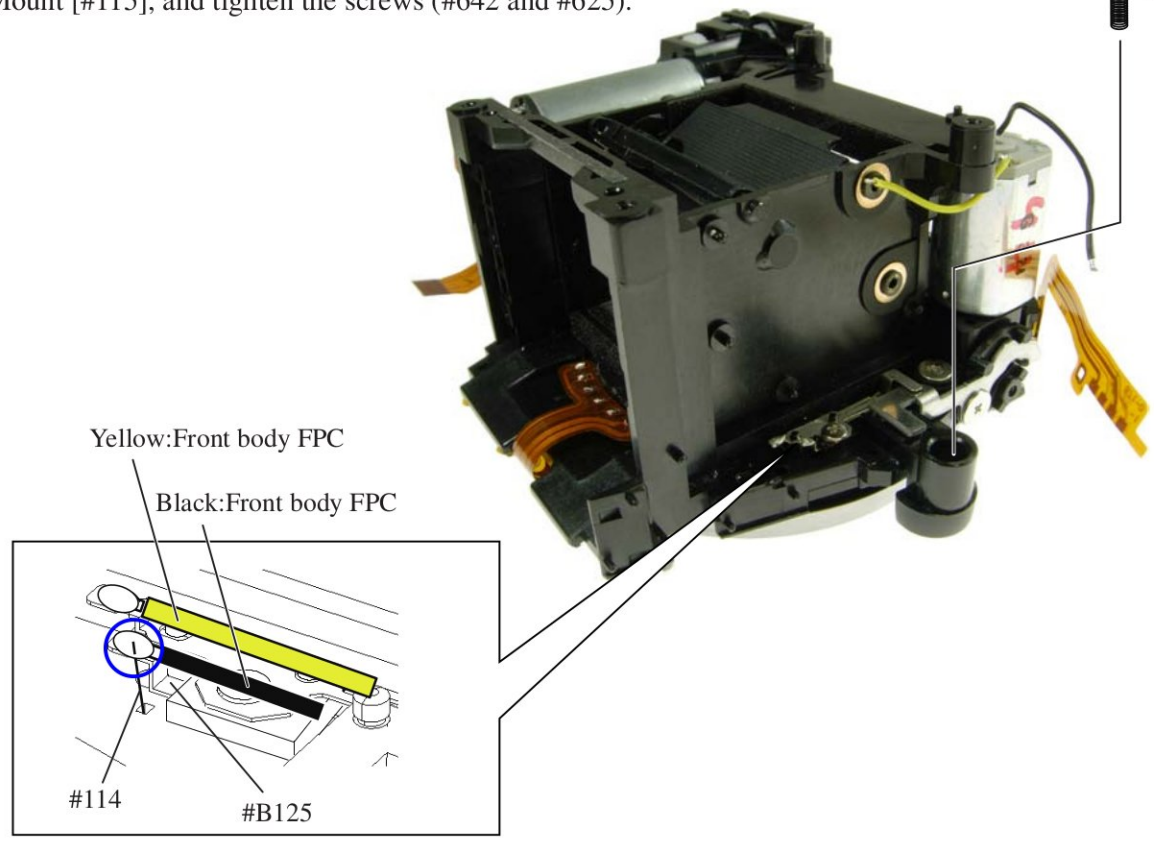
- Fix [#123] with the screw (#607).
- Fix the lens contacts unit (#B2113) with two screws (#642).
- Put the Fmin spring (#132) and Fmin coupling block (#131) so that they can be fit in the groove.
- Attach [#135], and arrange the wire (#1134) inside the groove.
- Attach [#114].
- Attach three plate springs [#112].
- Fix the bayonet (#111) with the screw (#660) and five screws (#648), in the order from ① to ⑥ .
- Hook the spring (#132).



A/M change SW cover area

- Solder two wires.
  [Make soldering bridge to joint the black wire, AM change SW unit (#B125) and the mount GND spring (#114).]
- Insert [#119].
- Mount [#115], and tighten the screws (#642 and #625).



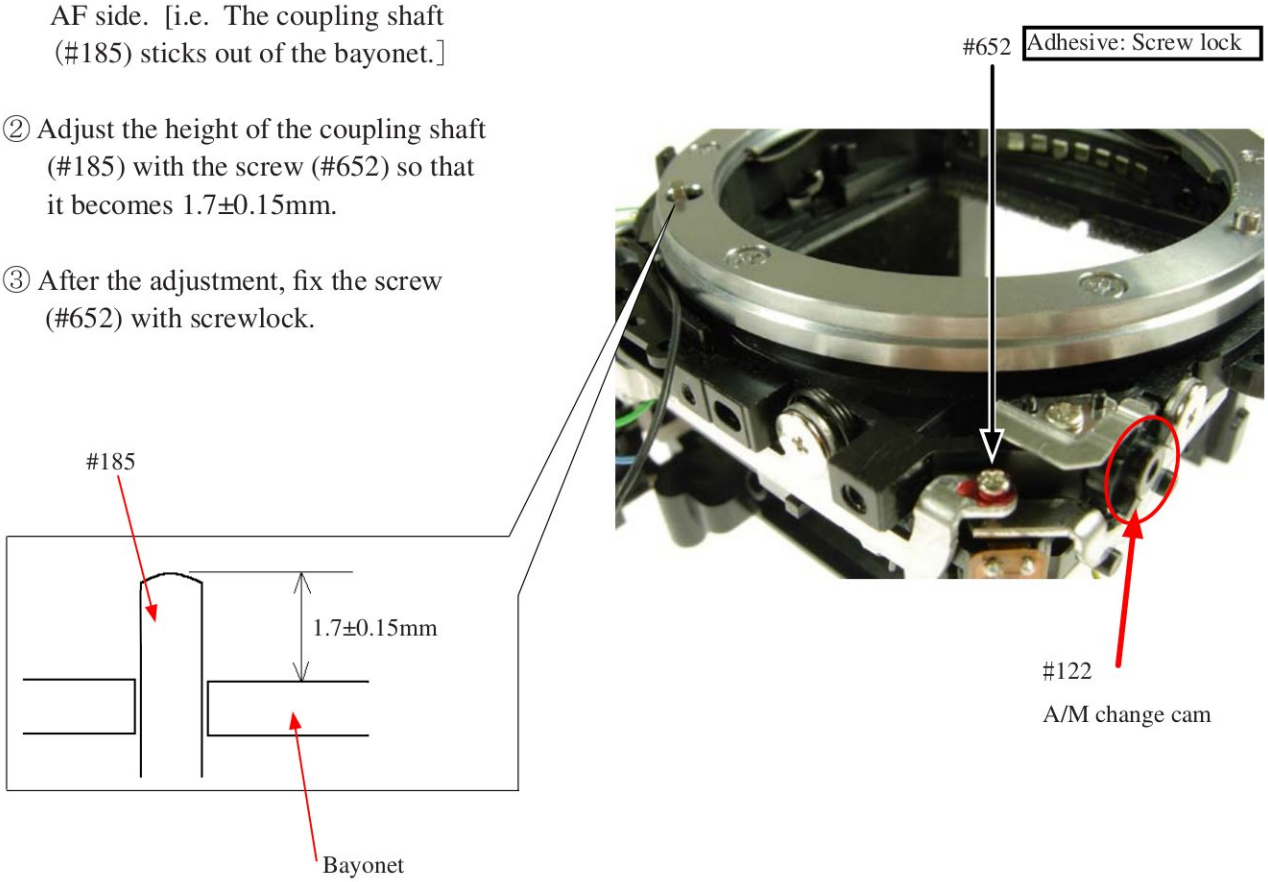


Height adjustment of AF coupling shaft

① Set the A/M change cam (#122) to AF side. [i.e. The coupling shaft (#185) sticks out of the bayonet.]

② Adjust the height of the coupling shaft (#185) with the screw (#652) so that it becomes 1.7±0.15mm.

③ After the adjustment, fix the screw (#652) with screwlock.



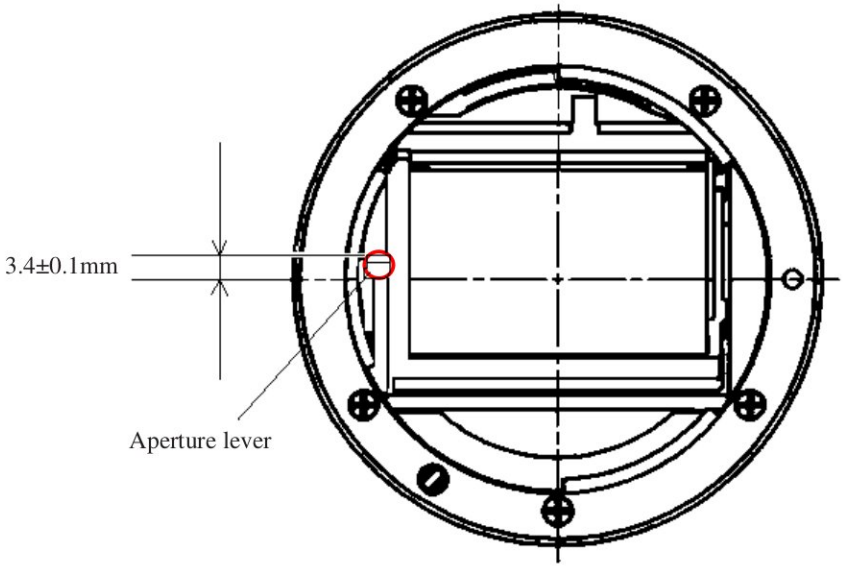
Height adjustment of Aperture lever

・Measure the height of the aperture lever by using the tool (J18004).

Standard: 3.4±0.1mm

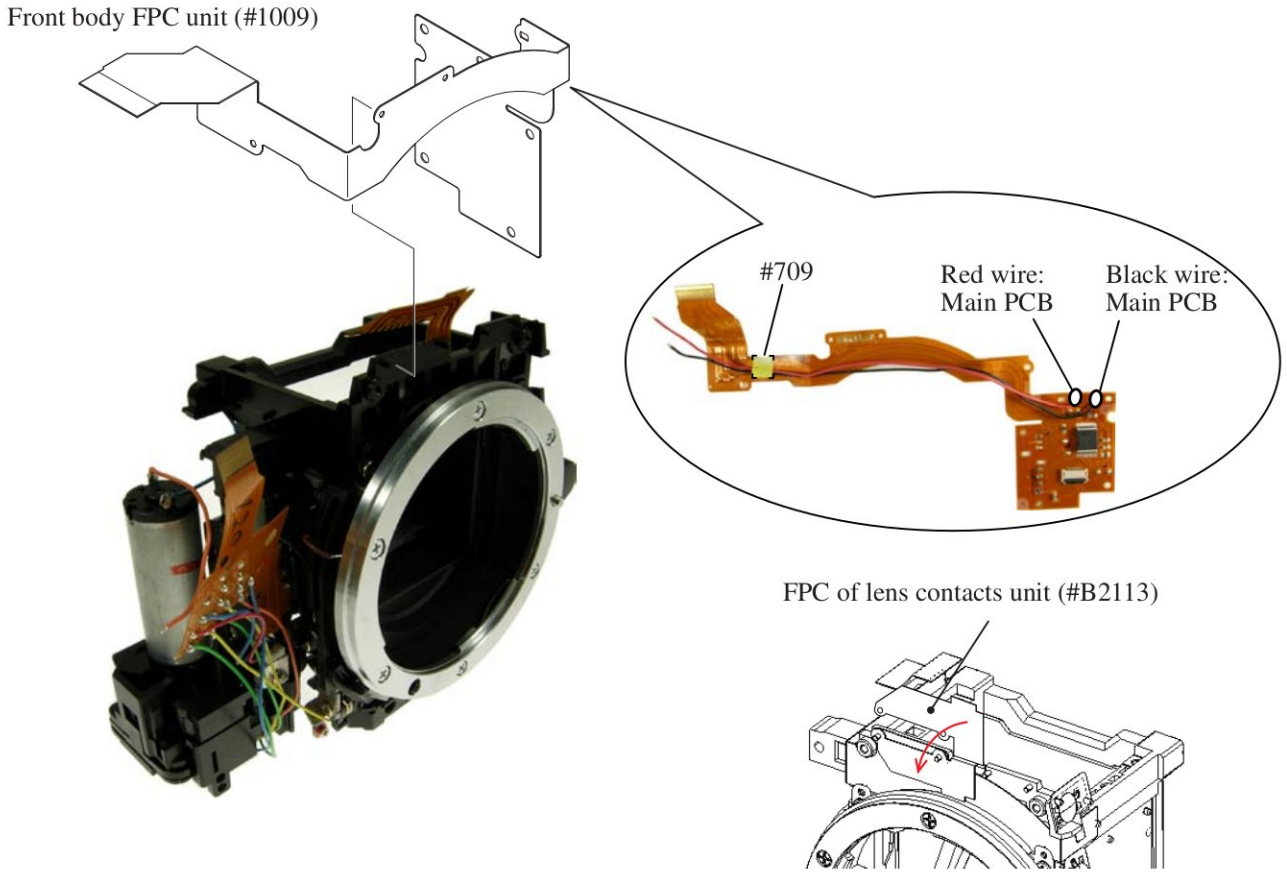
In case the value is out of standard, make an adjustment by bending the circled part.

Caution: Be careful NOT to bend the inner part of the lever when adjusting.

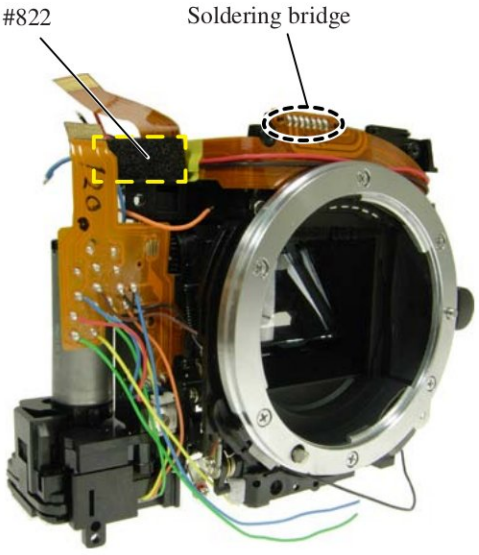


Front body FPC

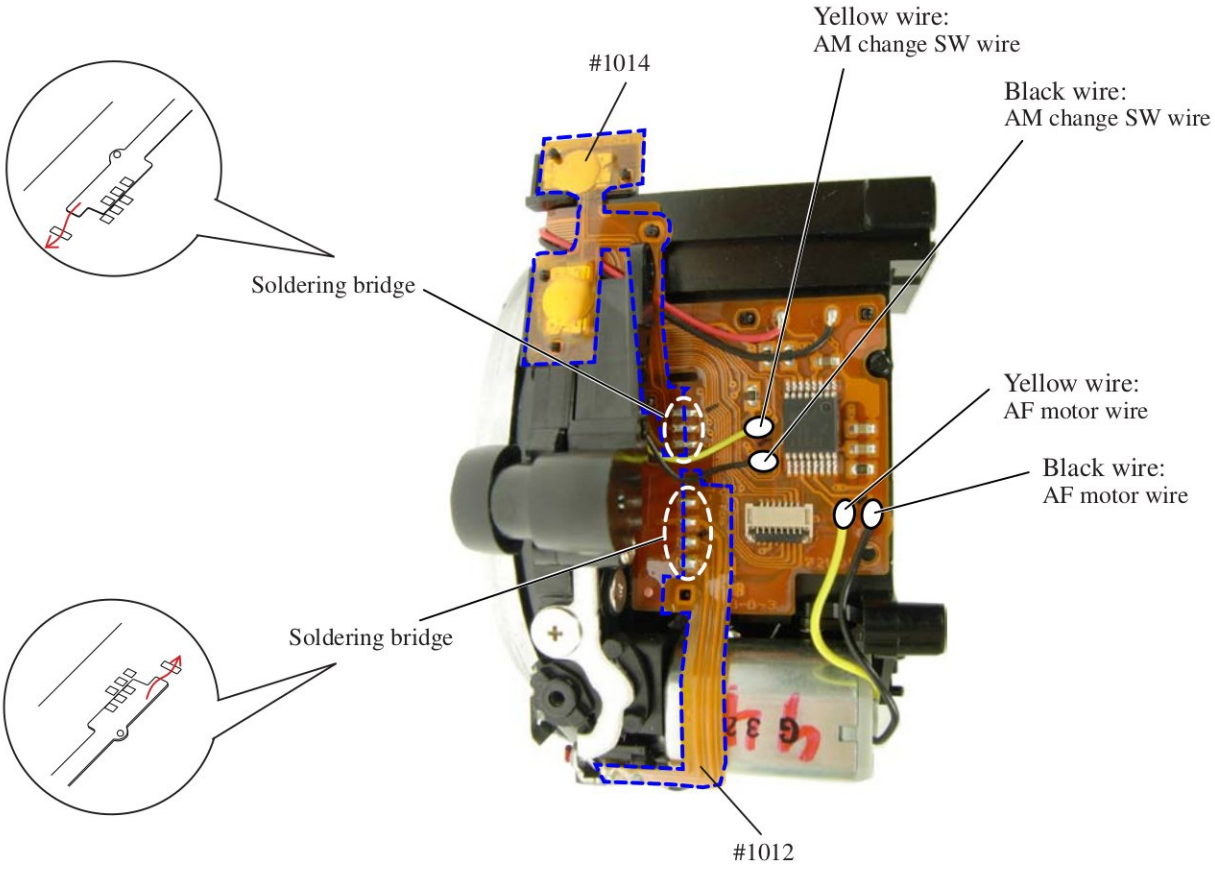
- Mount the front-body FPC unit (#1009) by fitting in eight bosses.
- Bend the FPC of the lens contacts unit (#B2113) toward bayonet side, and attach it by fitting in two bosses.



- Make soldering bridge to joint [#1009] and the FPC of the lens contacts unit (#B2113).
- Attach the sponge (#822).

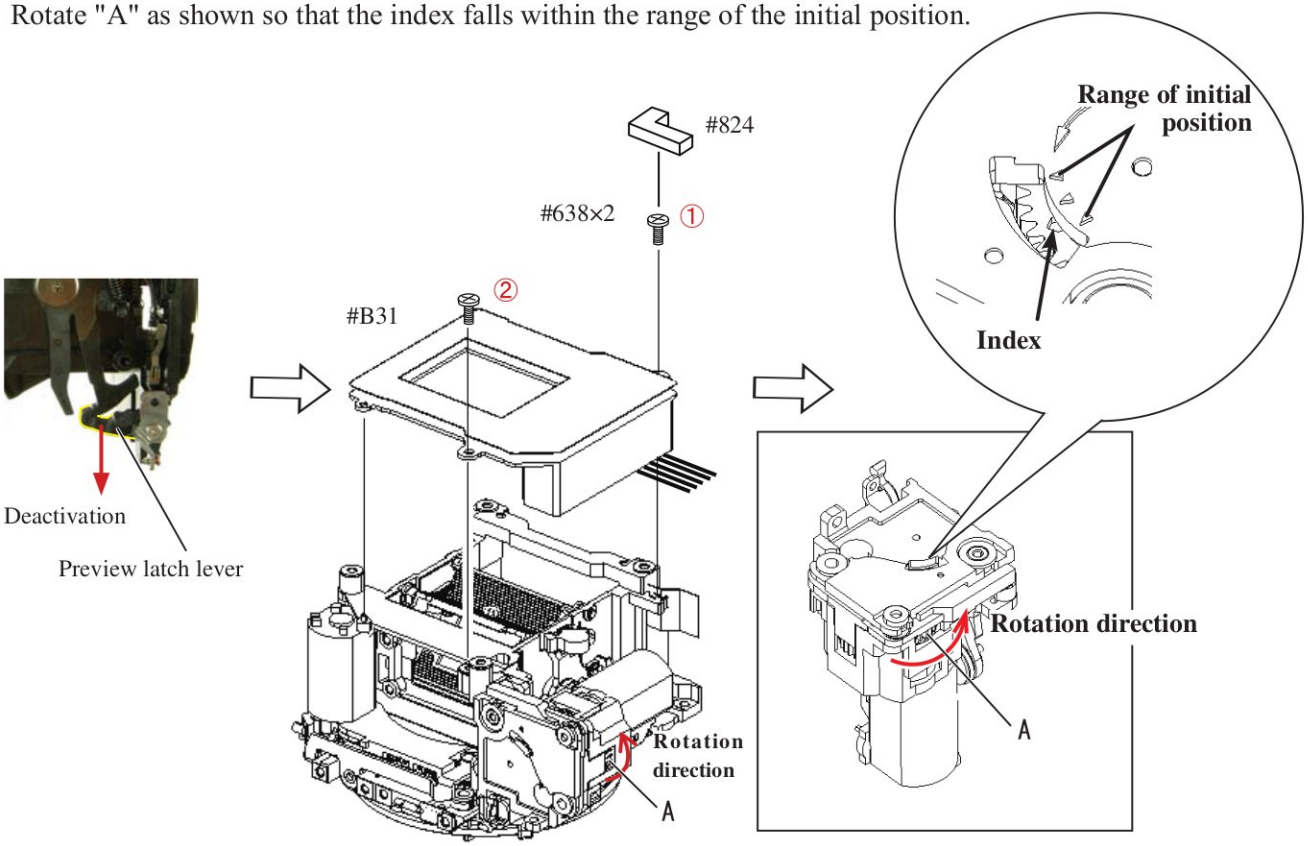


- Set [#1014].
- Pass [#1014] and [#1012] through the holes, and make soldering bridges.
- Solder four wires.

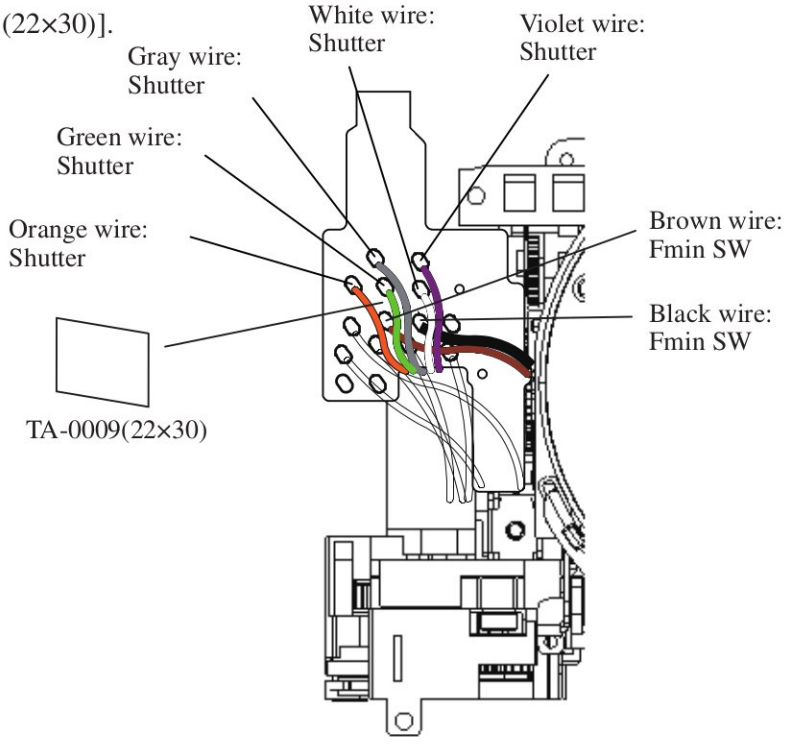


Shutter unit

- Deactivate the preview latch lever. Rotate "A" in the direction of the arrow, and raise the mirror.
- Mount the shutter unit (#B31). Tighten two screws (#638) in the order from ① to ② .
- Attach the sponge (#824).
- Rotate "A" in the direction of the arrow, and let the mirror down.
- Rotate "A" as shown so that the index falls within the range of the initial position.

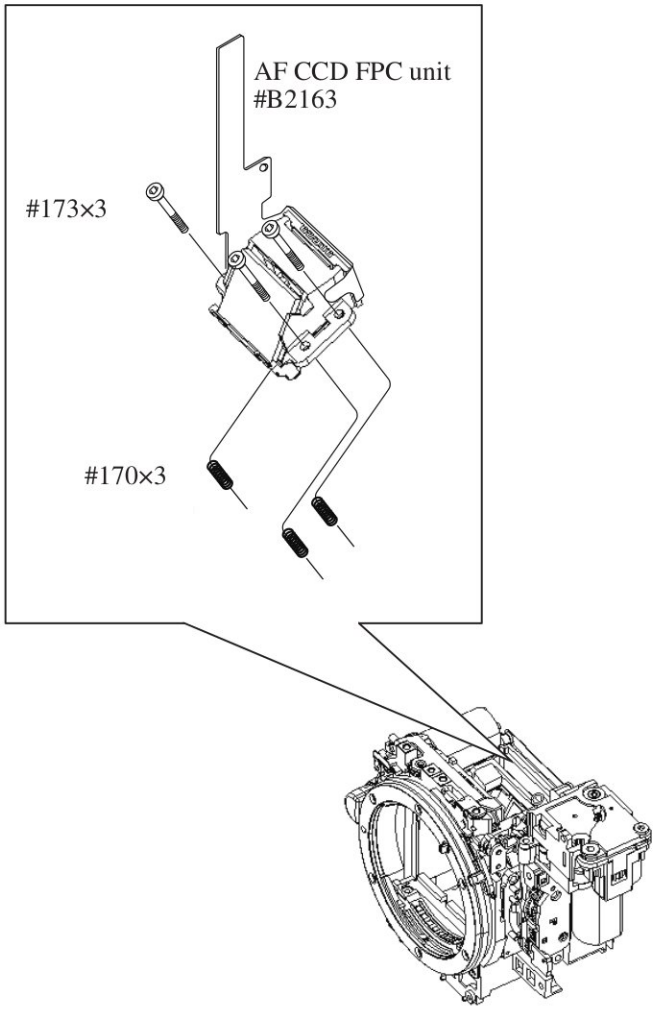


- Solder seven wires.
- Attach the tape [TA-0009 (22×30)].

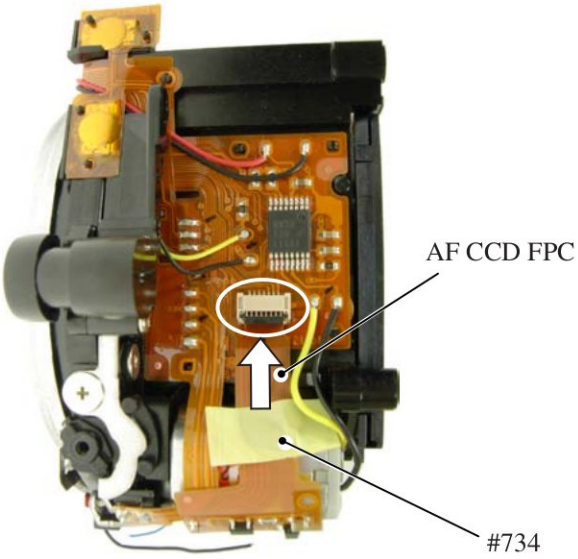


AF CCD FPC unit

- Put three springs (#170).
- Mount the AF CCD FPC unit (#B2163), and turn the three screws (#173) softly all the way to the end with the hexagonal wrench (φ1.5mm), then give it approx. four turns counterclockwise.

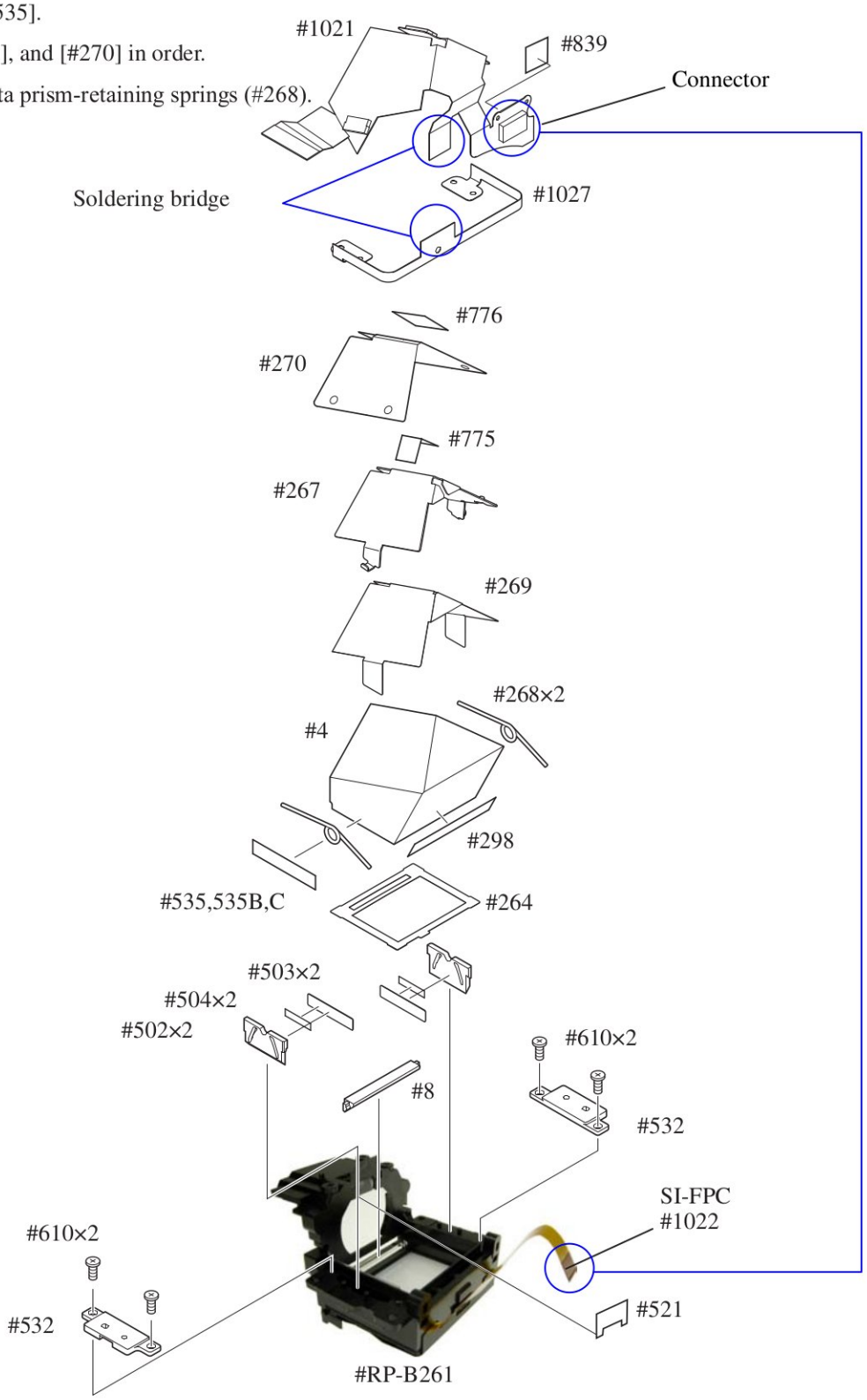


- Connect the AF CCD FPC to the connector.
- Attach the tape (#734).

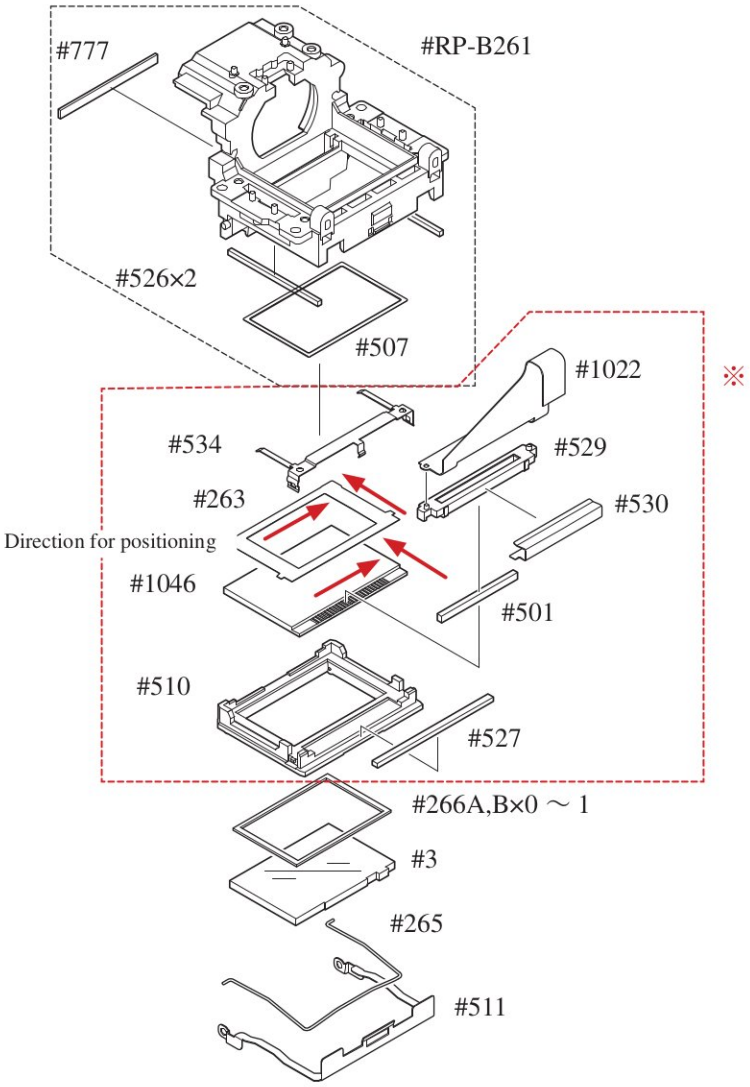


Penta unit

- Attach [#8].
- Attach the two [#503] with the two [#502], and assemble the two [#502].
- Mount [#1021] and [#1027], which were jointed by soldering bridges, on [#RP-B261]. Then fix them with the two [#532] and tighten two screws (#610).
- Mount the finder field frame (#264).
- Mount the prism (#4).
- Attach [#298] and [#535].
- Mount [#269], [#267], and [#270] in order.
- Fix with the two penta prism-retaining springs (#268).
- Attach [#1021].

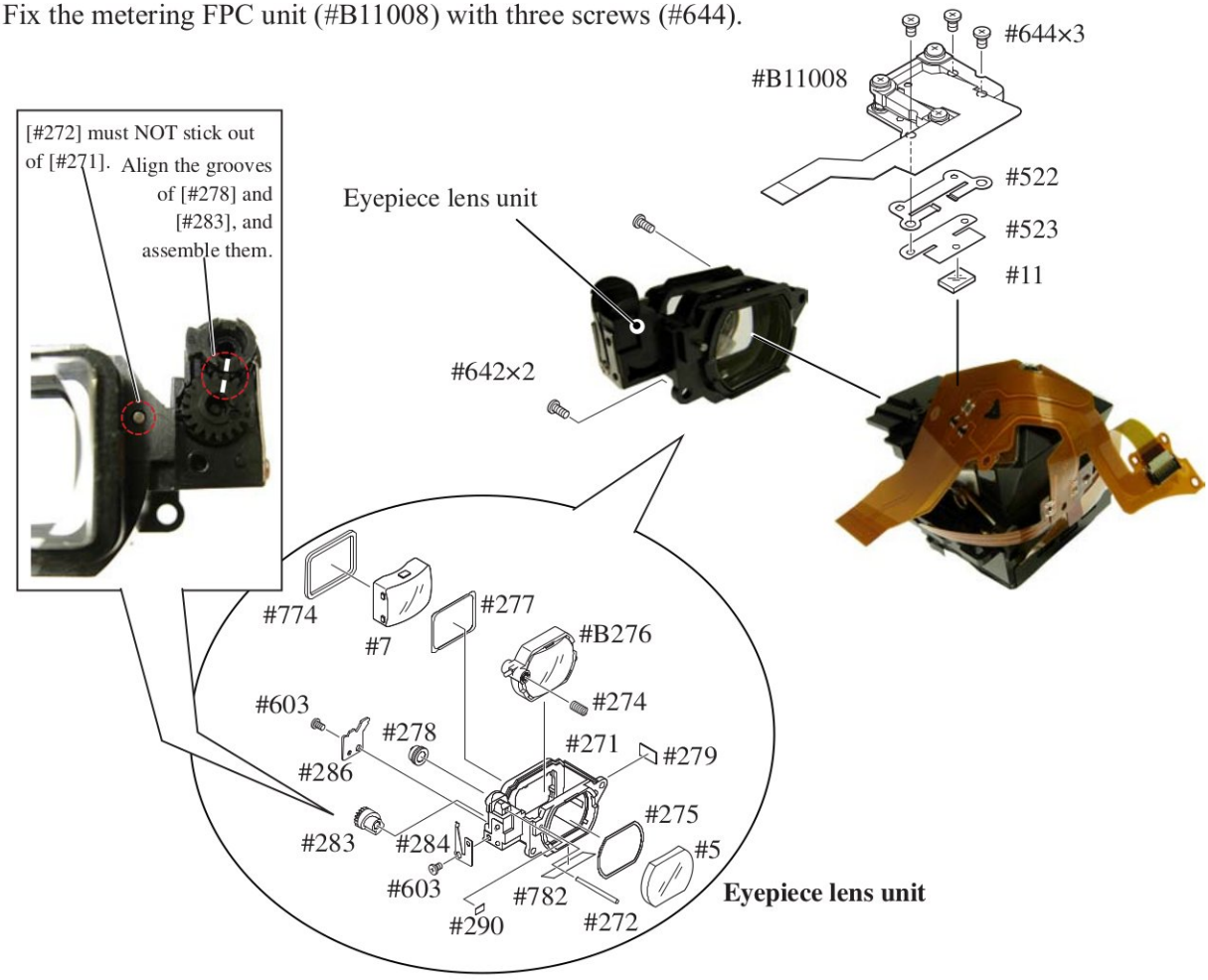


- Attach [#511].
- Assemble ※ and [#265].
- Assemble [#266] and [#3], and hold them with [#265].
- Connect the SI-FPC (#1022) to the connector of the penta FPC unit（#1021).



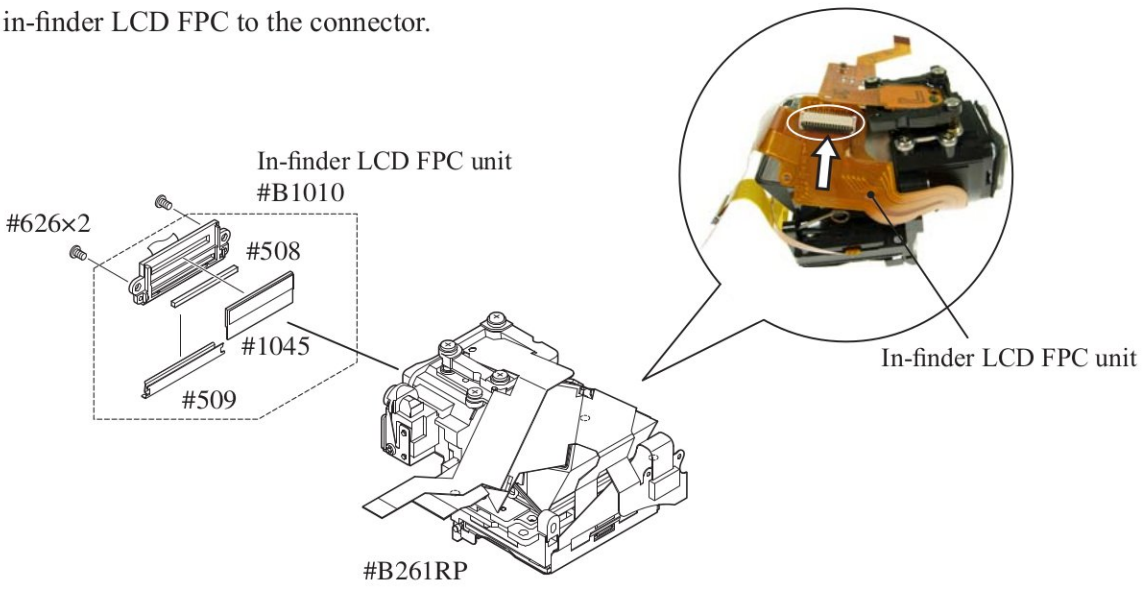
Metering FPC unit
Eyepiece lens unit

- Fix the eyepiece lens unit with two screws (#642).
- Fix the metering FPC unit (#B11008) with three screws (#644).



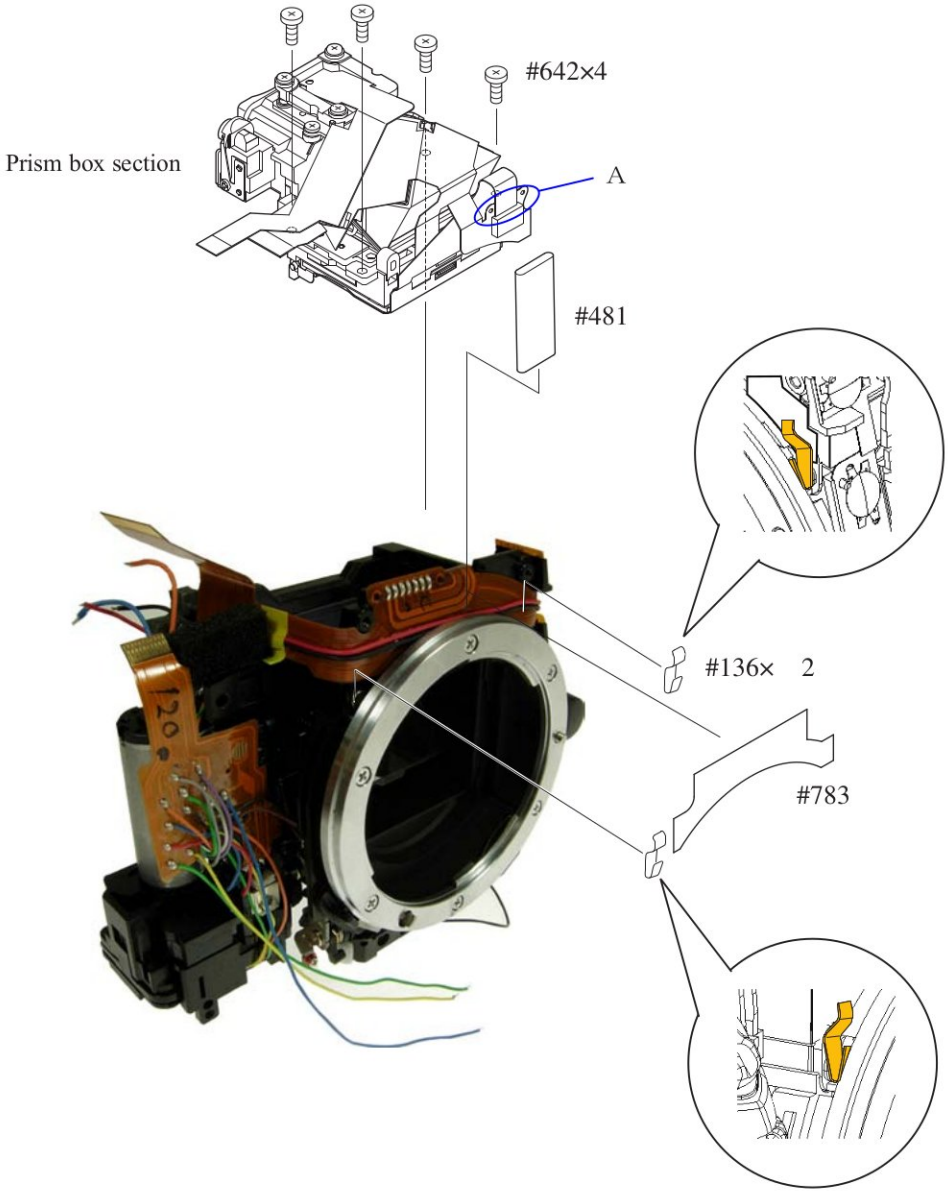
In-finder LCD FPC unit

- Fix the in-finder LCD FPC unit (#B1010) with two screws (#626).
- Connect the in-finder LCD FPC to the connector.



P-BOX section

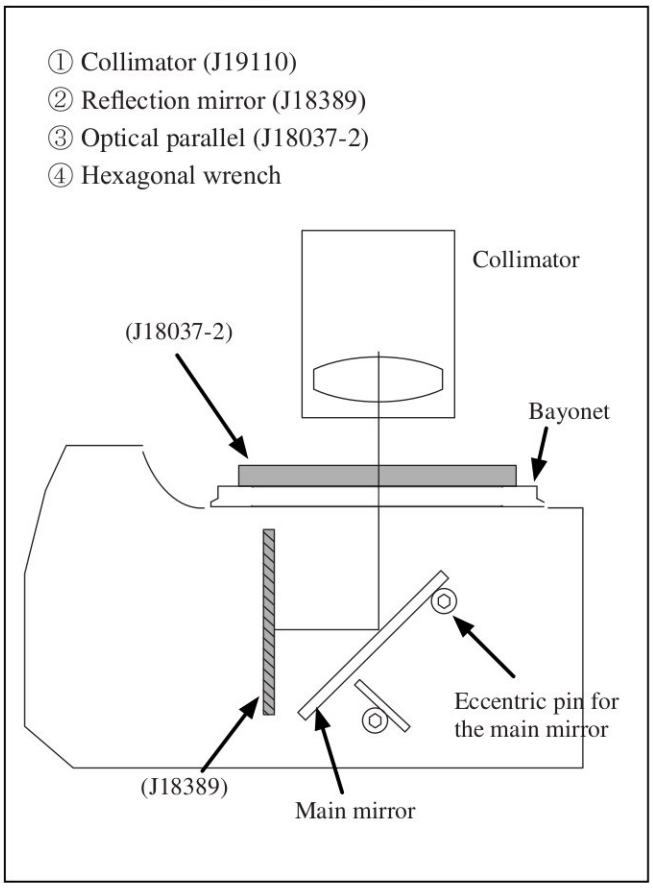
- Fix the P-BOX section with four screws (#642).
- Press-contact "A" part into the two bosses.
- Attach the tracing film sheet (#783).
- Put the gasket (#481).
- Attach two fingers (#136).



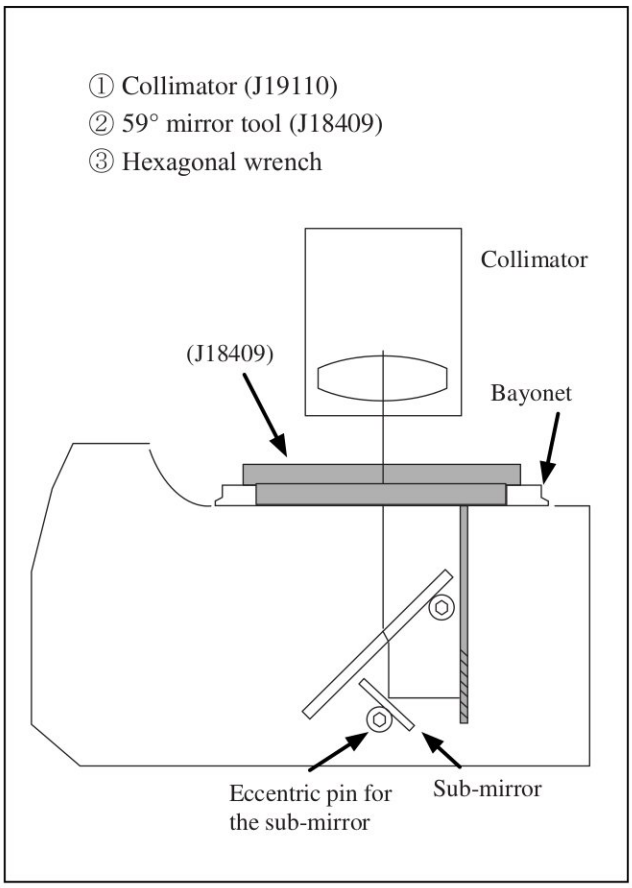
Angle inspection and adjustment of Main mirror and sub-mirror

Device:

1.Main mirror 45° inspection and adjustment

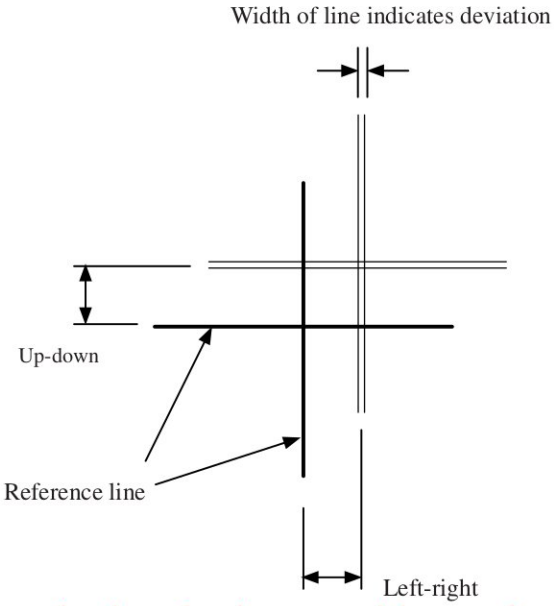


2.Sub-mirror 59° inspection and adjustment



Standard:

	Main mirror	Sub-mirror
Left-right deviation	± 25'	———
Up-down deviation	± 10'	+5 ± 5'
Distortion	8'or less	8'or less



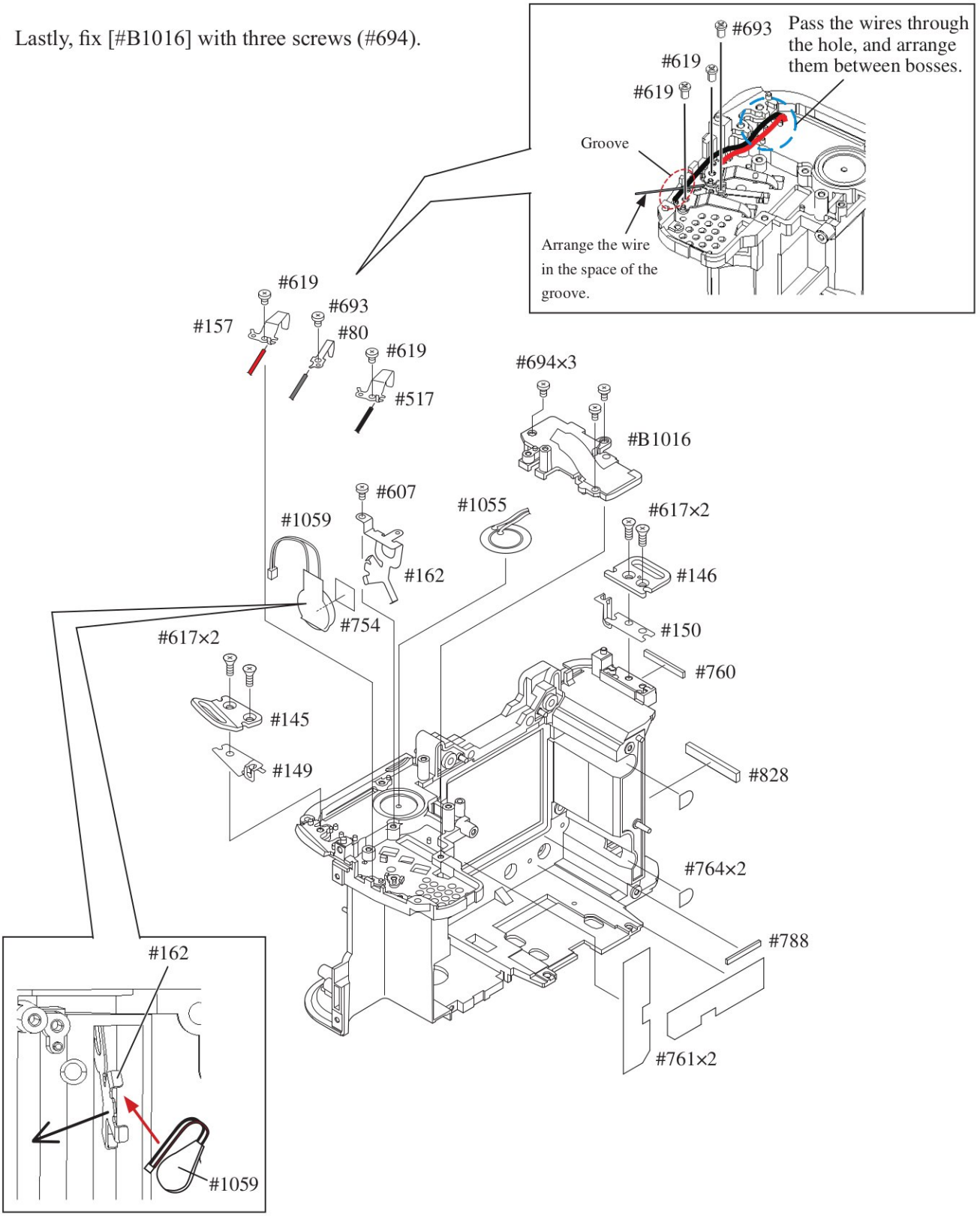
Caution:

- 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 result is out of standard, make an adjustment by turning the eccentric pin with Hexagonal wrench.
- In case the the result of checking up-downward and right-leftward deviation is out of standard, the front plate area or mirror unit should be defective.
- In case inspection and adjustment are made only with the front body, check again after assembling the front body into the rear body.

2. Rear body

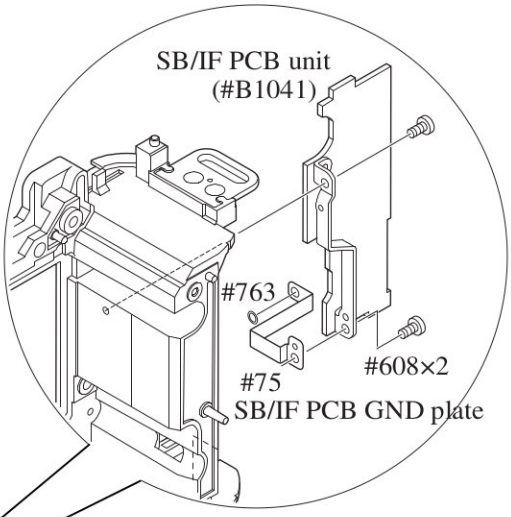
OP FPC unit, Electronic buzzer unit, Clock battery unit, other small parts

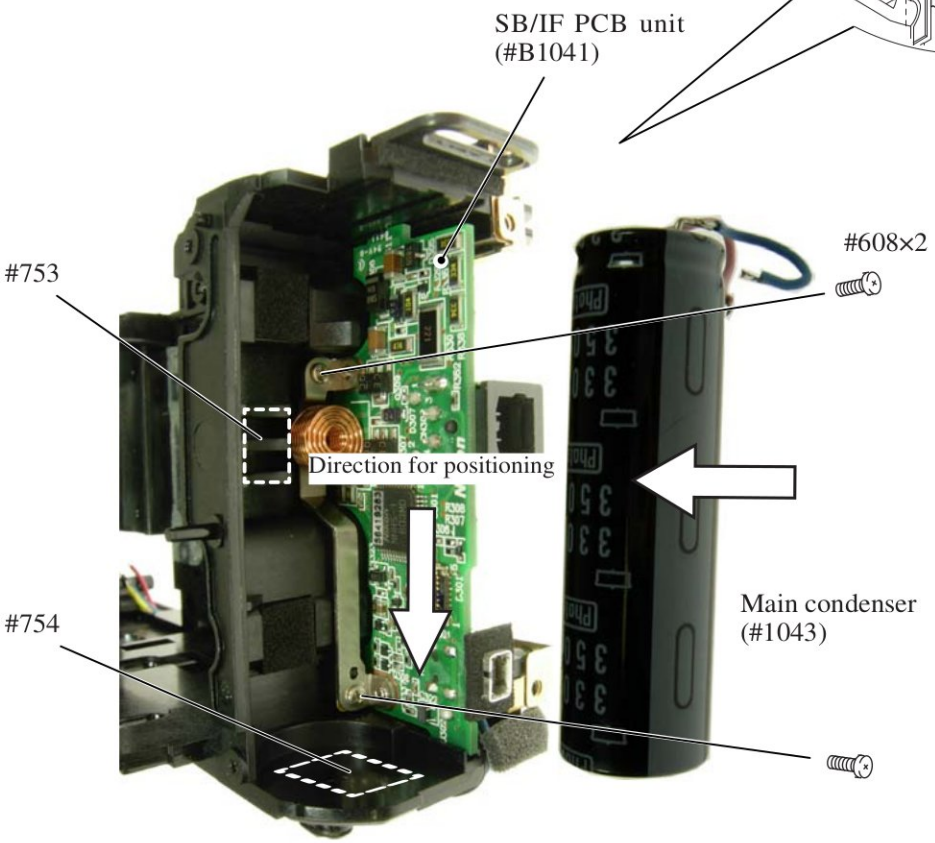
・ Lastly, fix [#B1016] with three screws (#694).



SB PCB

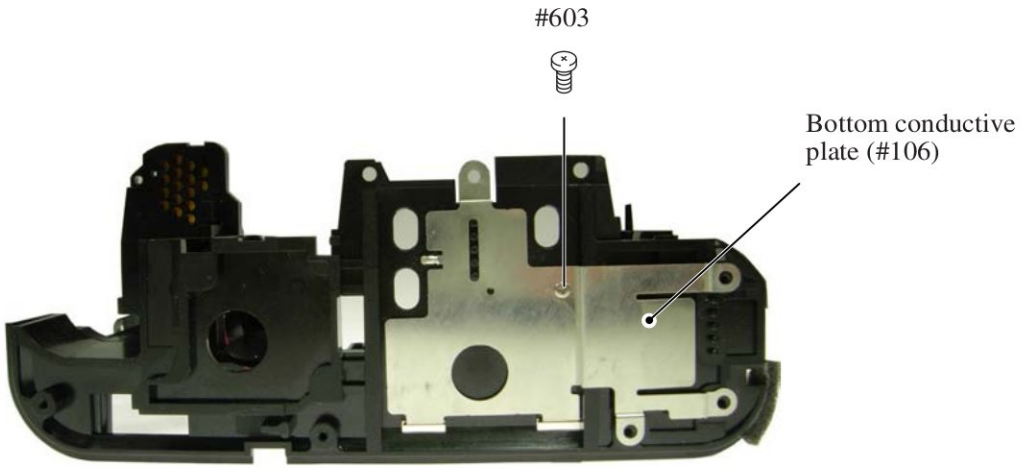
- Attach the tape (#763), and put the SB/IF PCB GND plate (#75).
- Mount the SB/IF PCB unit (#B1041).
- Tighten two screws (#608).
- Position the main condenser (#1043) in the direction of the arrow, and fix it with the adhesive double-coated tape (#753 and #754).





Bottom conductive plate

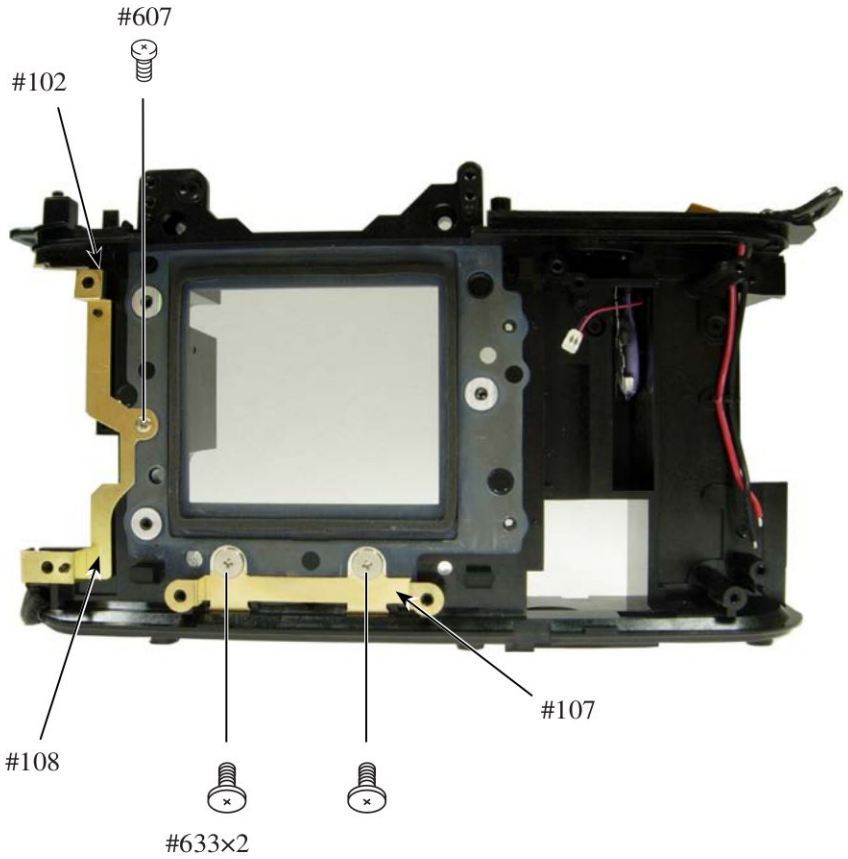
・Put the bottom conductive plate (#106), and tighten the screw (#603).



GND plate

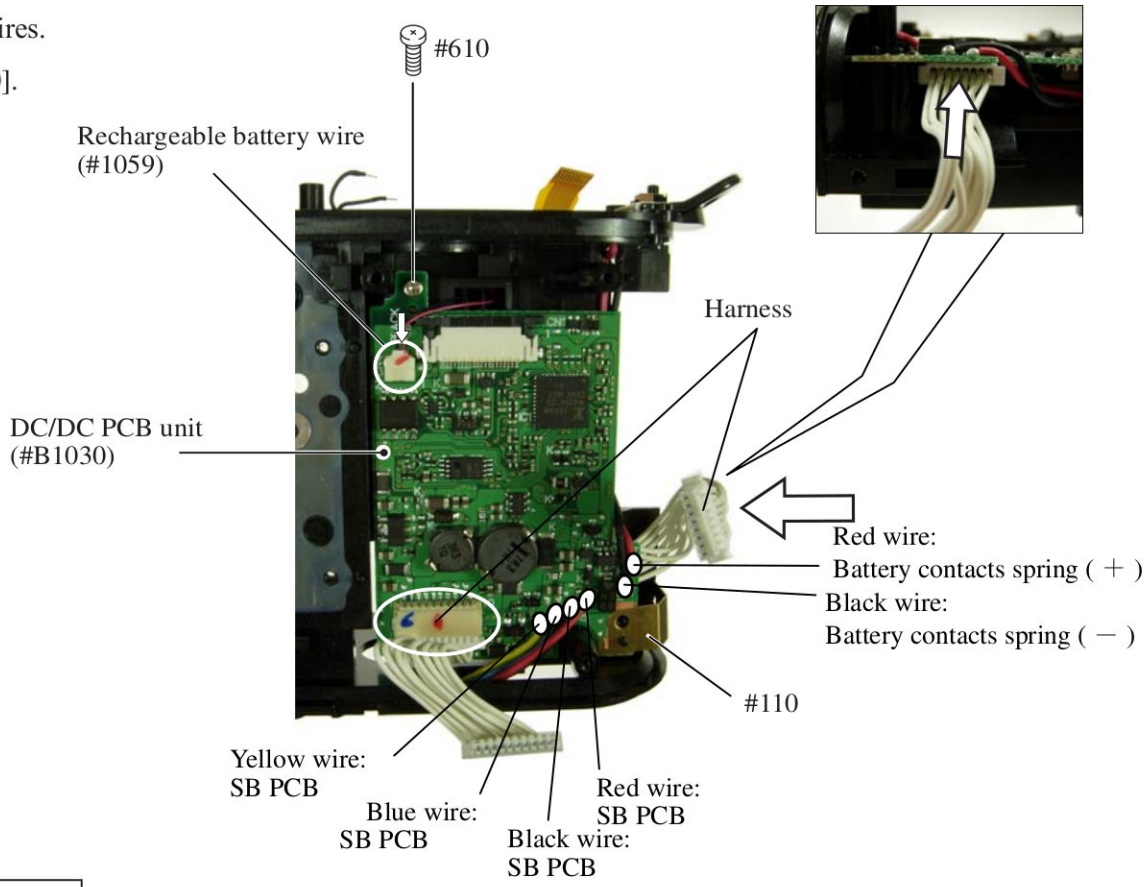
・ Put [#102] and [#108], and tighten the screw (#607).

・ Put [#107], and tighten two screws (#633).



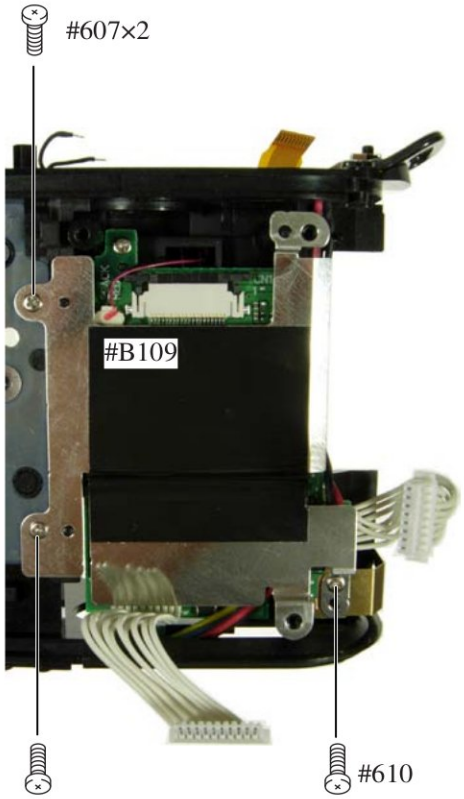
DC/DC PCB unit

- Mount the DC/DC PCB unit (#B1030).
- Connect the two harnesses to each connector.
- Tighten the screw (#610).
- Connect the rechargeable battery wire (#1059).
- Solder six wires.
- Attach [#110].



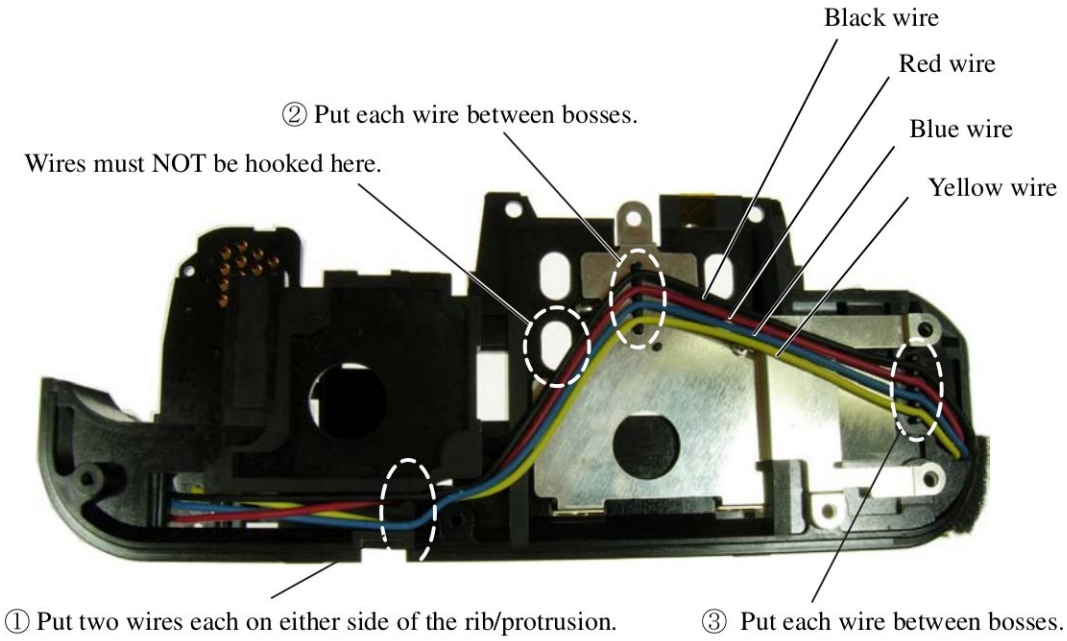
GND-plate C unit

- Fix [#B109] with two screws (#607) and one screw (#610).



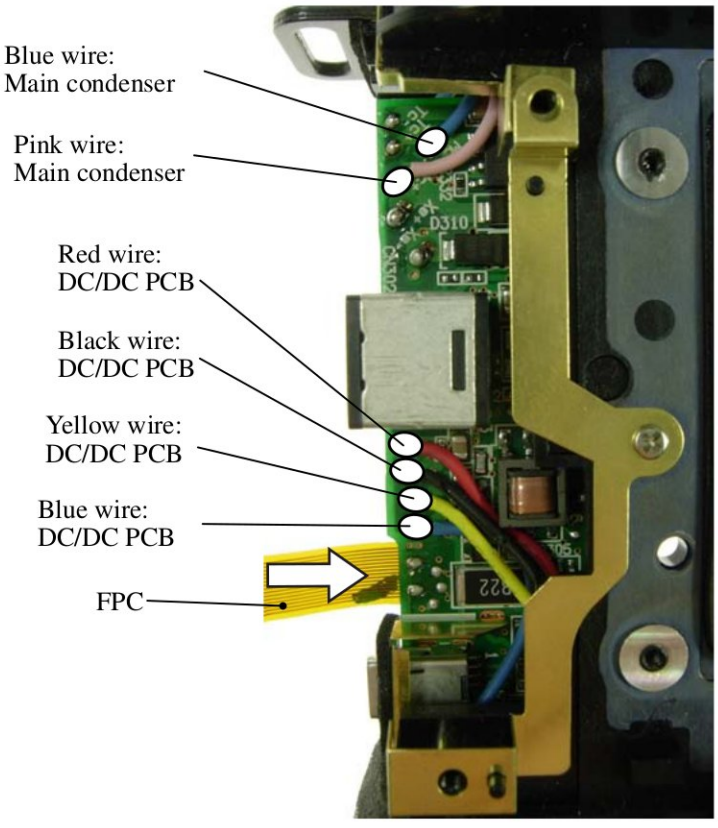
Bottom wires

- Arrange four wires among bosses.



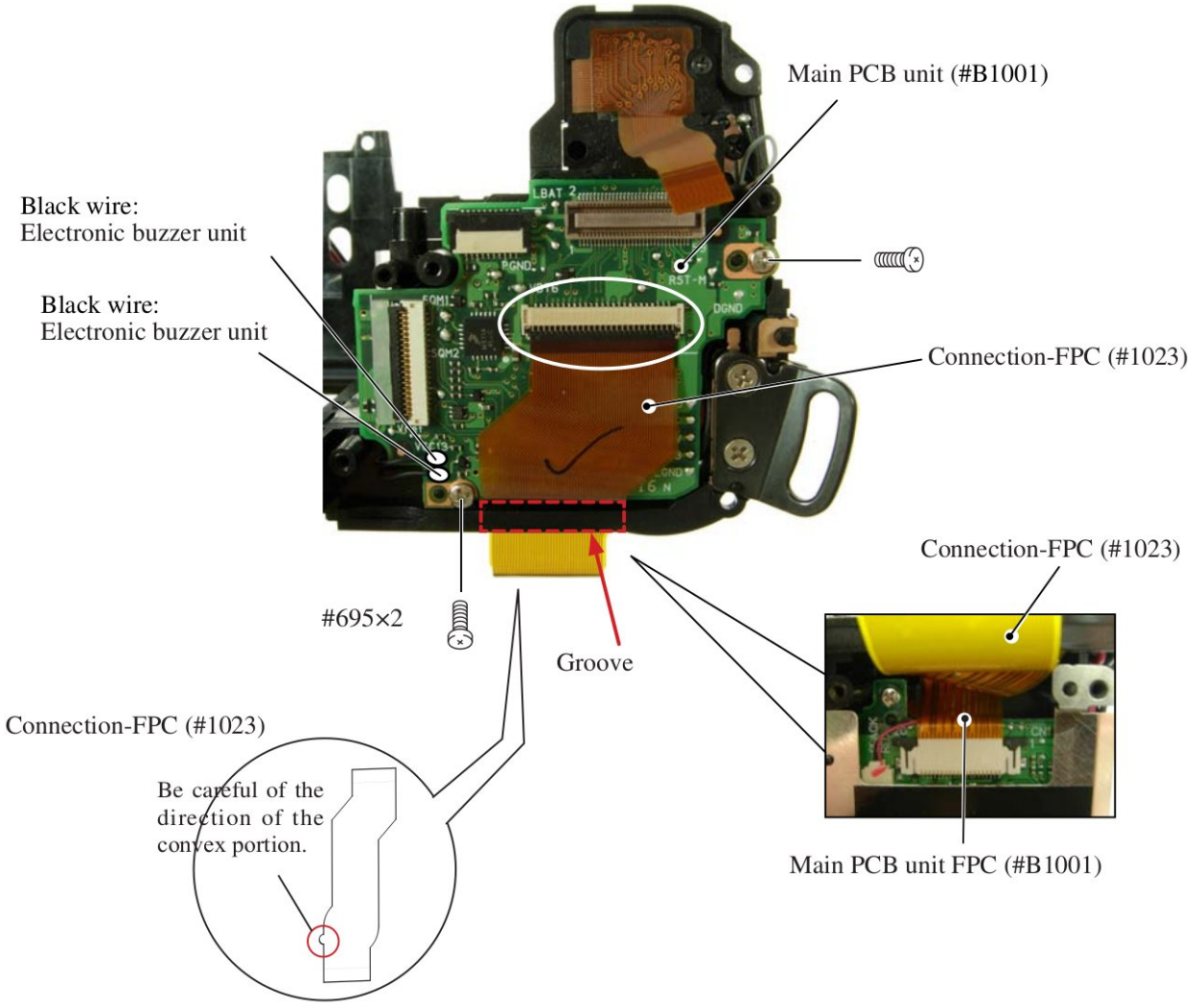
SB PCB

- Solder six wires.
- Connect the FPC to the connector.



Main PCB unit

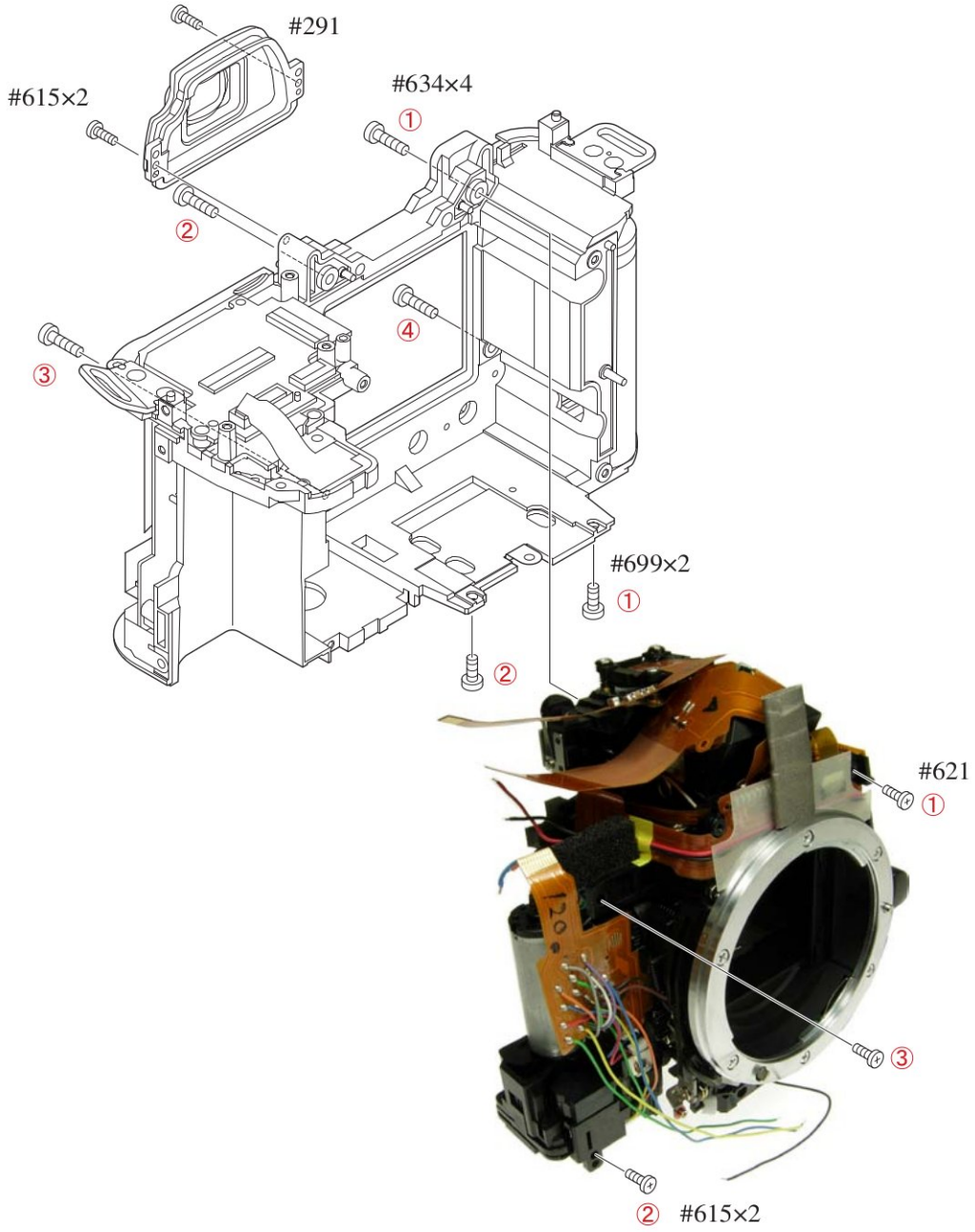
- Mount the main PCB unit (#B1001).
- Tighten two screws (#695).
- Solder the two wires of the electronic buzzer unit.
- Connect the main PCB-FPC (#B1001) to the connector of the DC/DC PCB.
- Connect the connection-FPC (#1023) to the connector, and pass it through the groove.



3. Mounting of Front body on Rear body

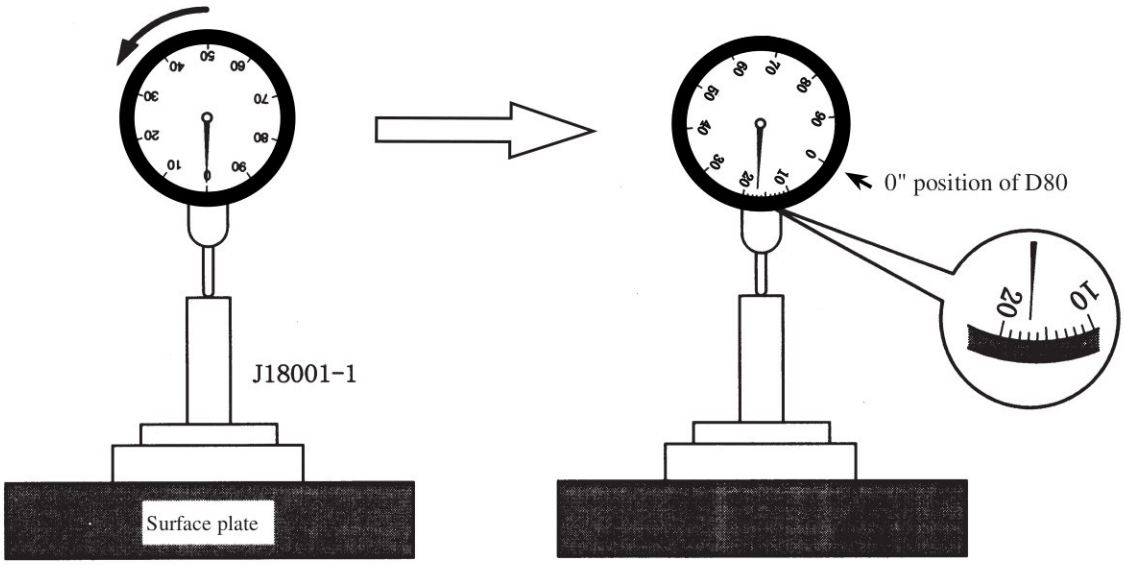
Mount the front body on the rear body

- Mount the front body on the rear body.
- Tighten the screw (#621) and two screws (#615) in the order from ① to ③ .
- Tighten four screws (#634) in the order from ① to ④ .
- Tighten two screws (#699) in the order from ① to ② .
- Attach the eyepiece mold (#291) and fix it with two screws (#615).



Inspection and Adjustment of Body back

＊ "0" positioning of the dial gauge

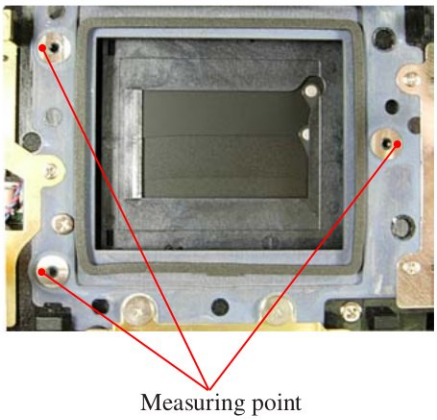


① Put the tool (J18001-1) on the surface plate, and set the dial gauge to "0".
② Turn the index ring in the direction of the arrow, and set to the scale "17" from "0" that was set in ① . (This is "0"-position of D80.)
③ Measure the body back based on "0" reference position of the index ring.

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

Standard:48.50±0.015mm/ Parallelism: within 0.015mm

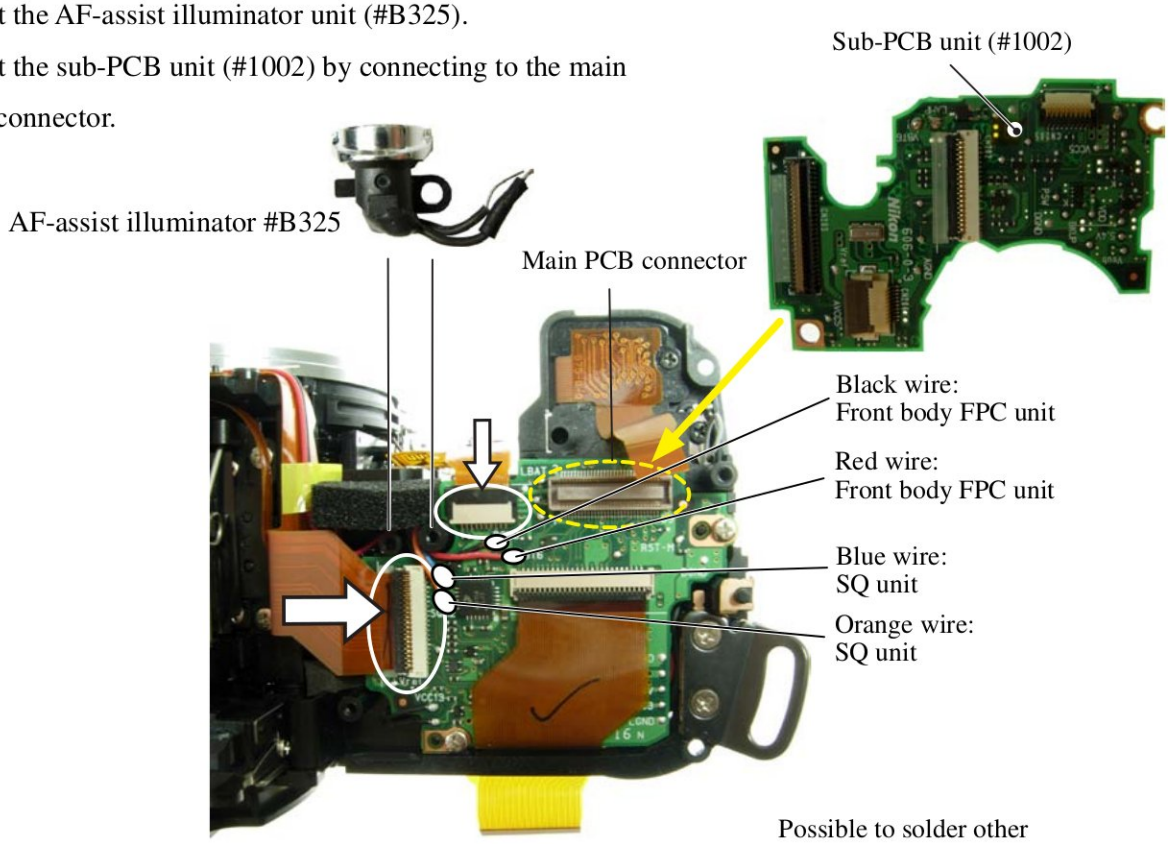
・In case it is out of standard, make an adjustment by loosening screws that attach the front and rear bodies, or by putting the washer(s) on the contact surface between the front body and rear body.


Measuring point

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

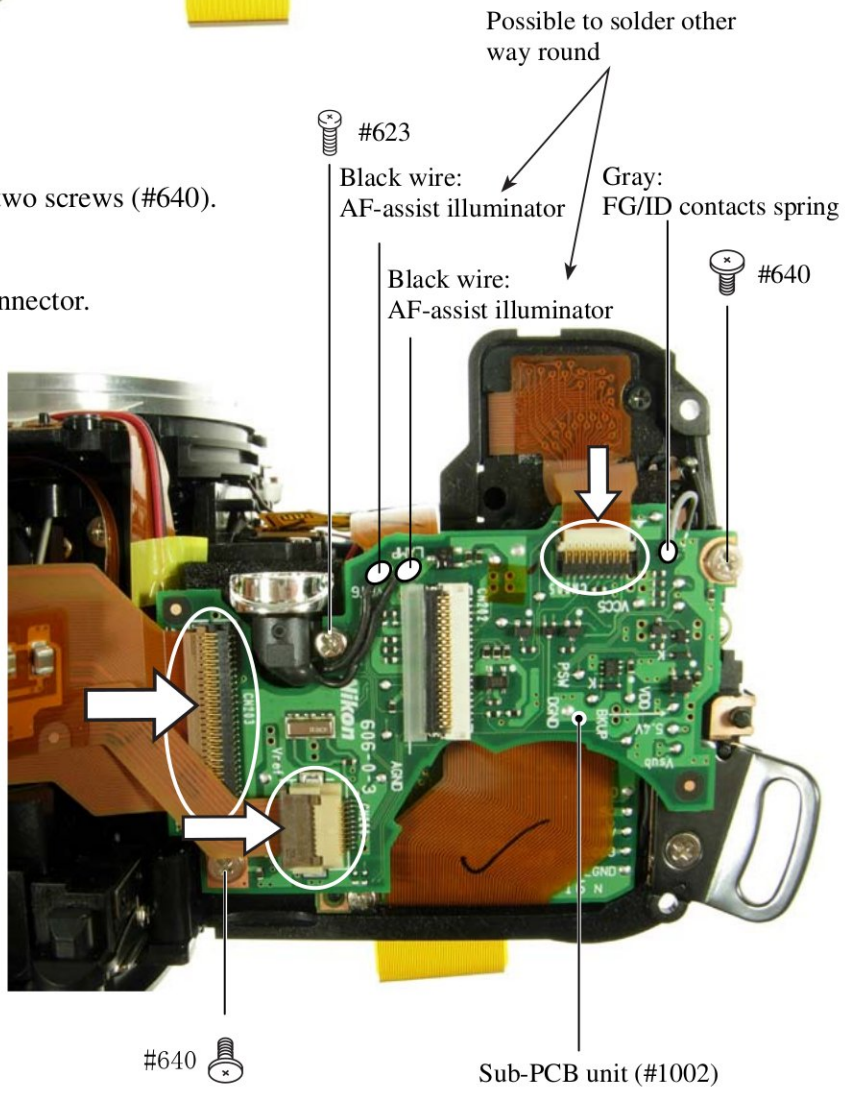
1. Purpose : To adjust the height of the camera body
There are indications by color marker (washer thickness) on the camera body side of the CCD-PCB attaching face.
{Blue =0.02mm (#63A), Red = 0.01mm (#63B), Green = 0.06mm (#63C)}
＊ By adding the measured value to the thickness of washers, check if it is within the standard (48.50±0.015mm).
2. Purpose : To adjust the height of the CCD bracket
There are indications by red marker of the CCD-bracket attaching face
{Red circle = 0.1 mm (#63B)} (Washers are equally put on the three locations.)
＊ When the CCD PCB is replaced, remove the washers.

- Solder four wires.
- Connect the two FPCs to the connector.
- Mount the AF-assist illuminator unit (#B325).
- Mount the sub-PCB unit (#1002) by connecting to the main PCB-connector.



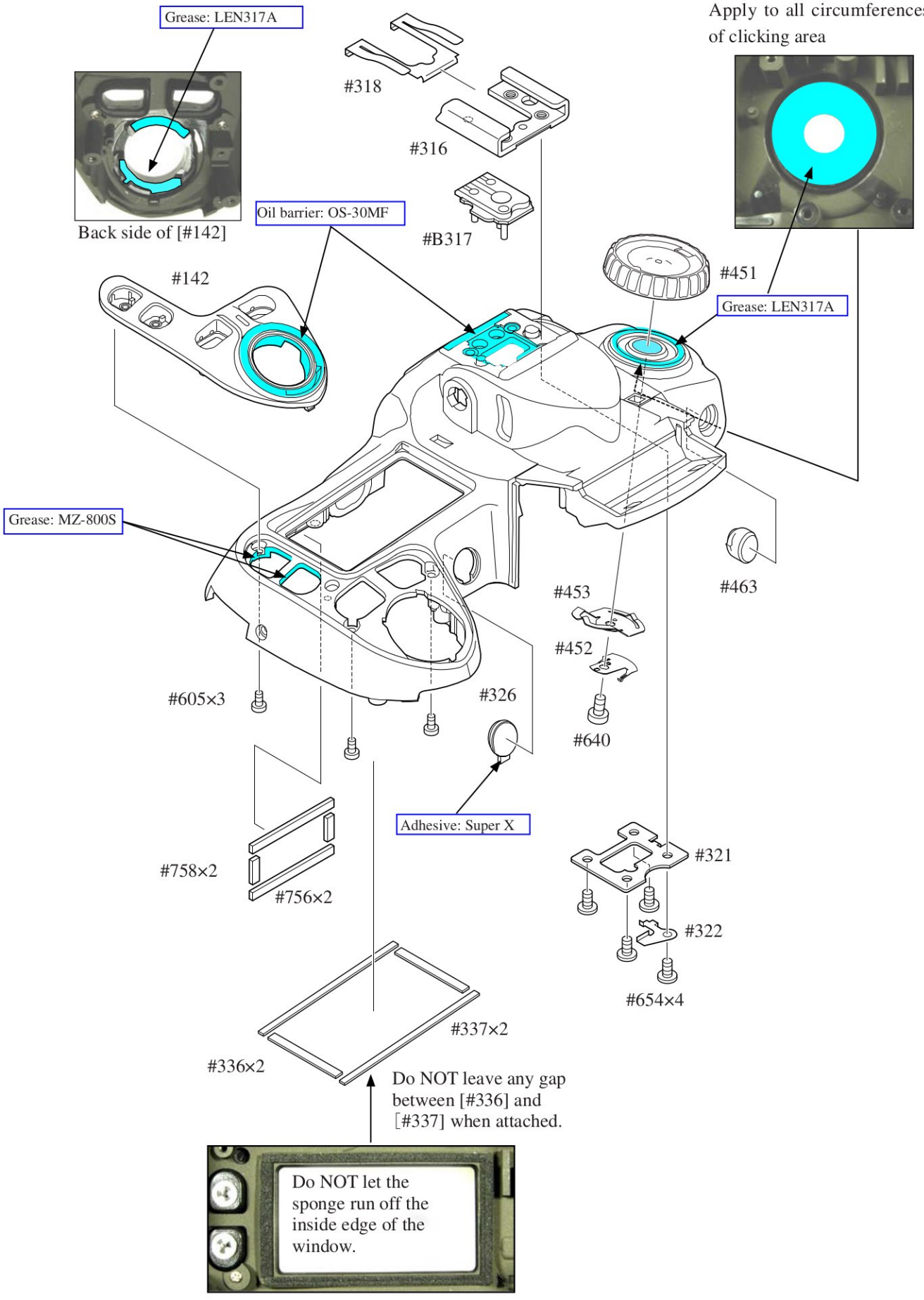
Sub-PCB unit

- Tighten one screw (#623) and two screws (#640).
- Solder three wires.
- Connect three FPCs to each connector.

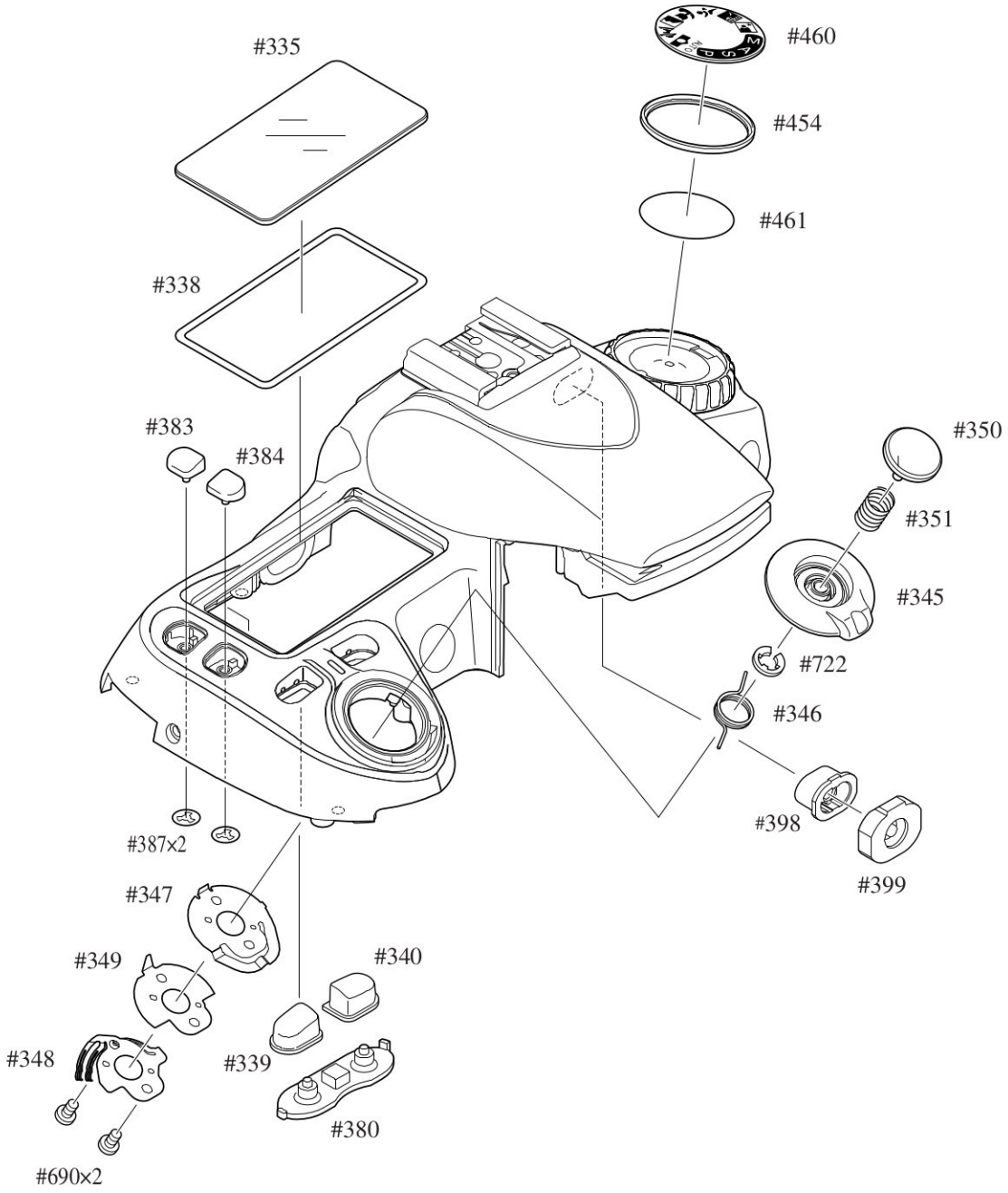


Assembly of Top cover

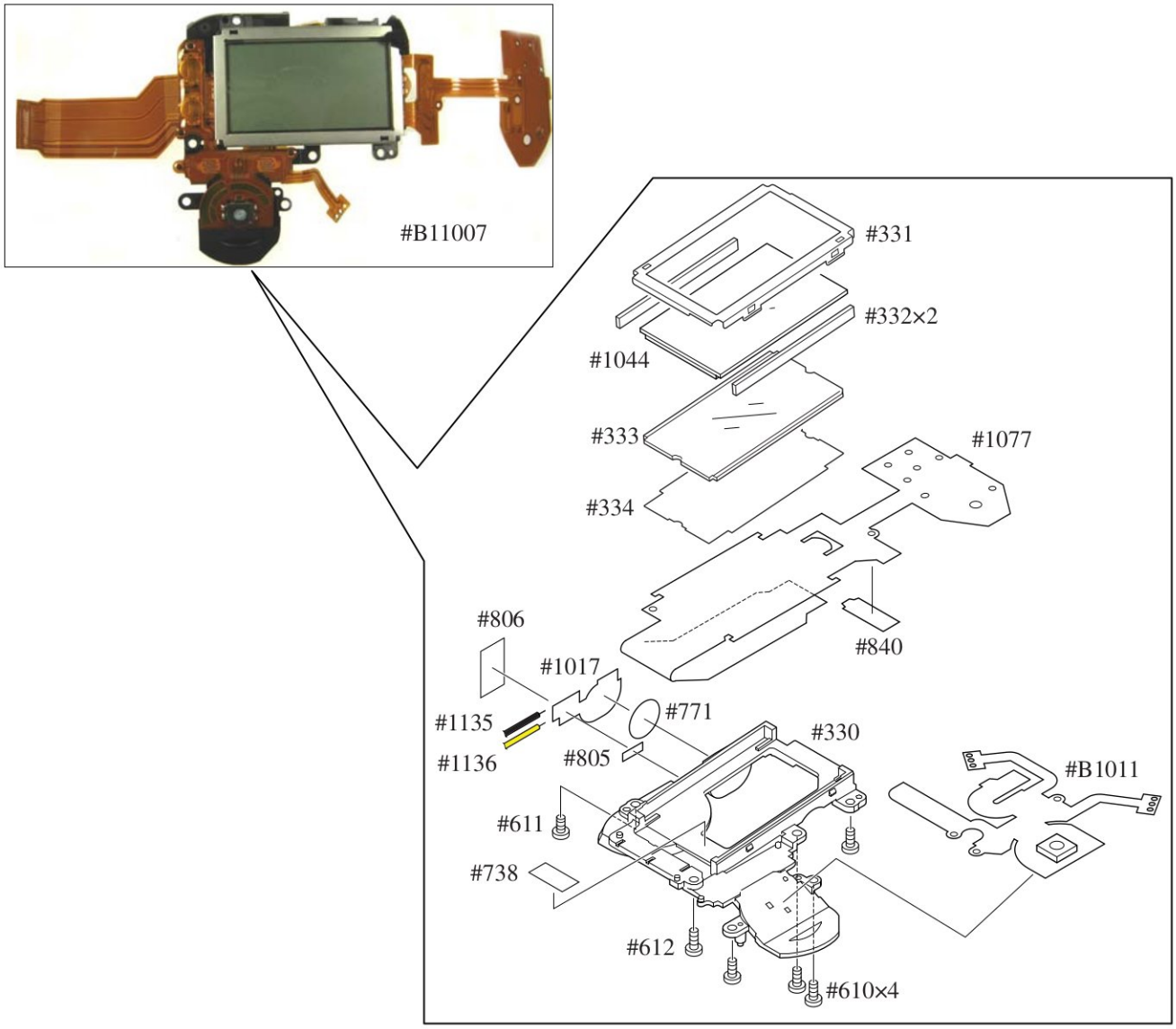
Outer LCD window / shoe mold unit / accessory shoe / other small parts



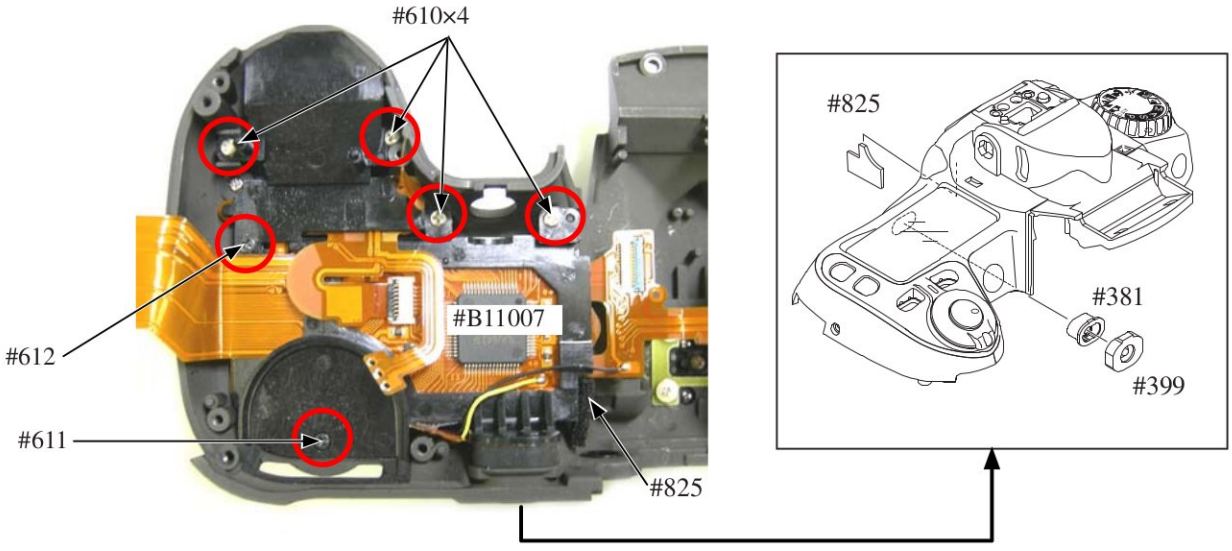
Release button / other small parts



Top cover FPC unit

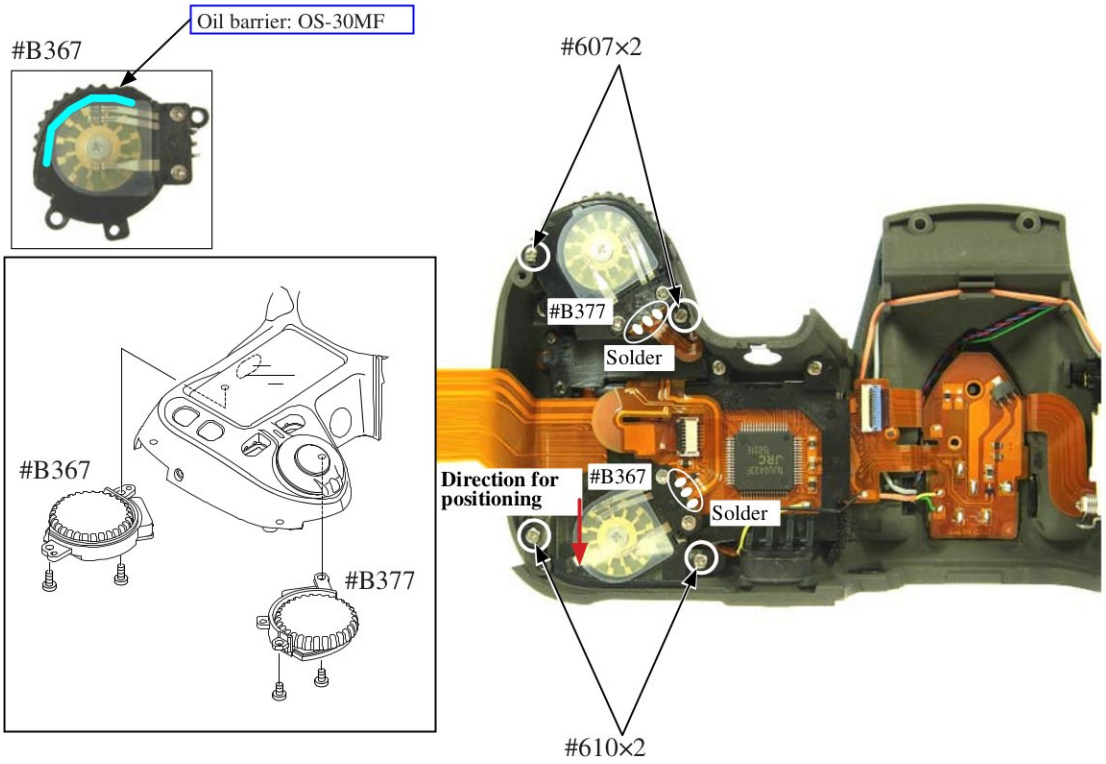


- Attach the AE-L rubber SW (#399) and AE-L button (#381).
- Mount the top cover FPC unit (#B11007).
- Tighten the screw (#611).
- Tighten the screw (#612).
- Tighten four screws (#610).
- Attach the light-leak prevention sponge (#825).



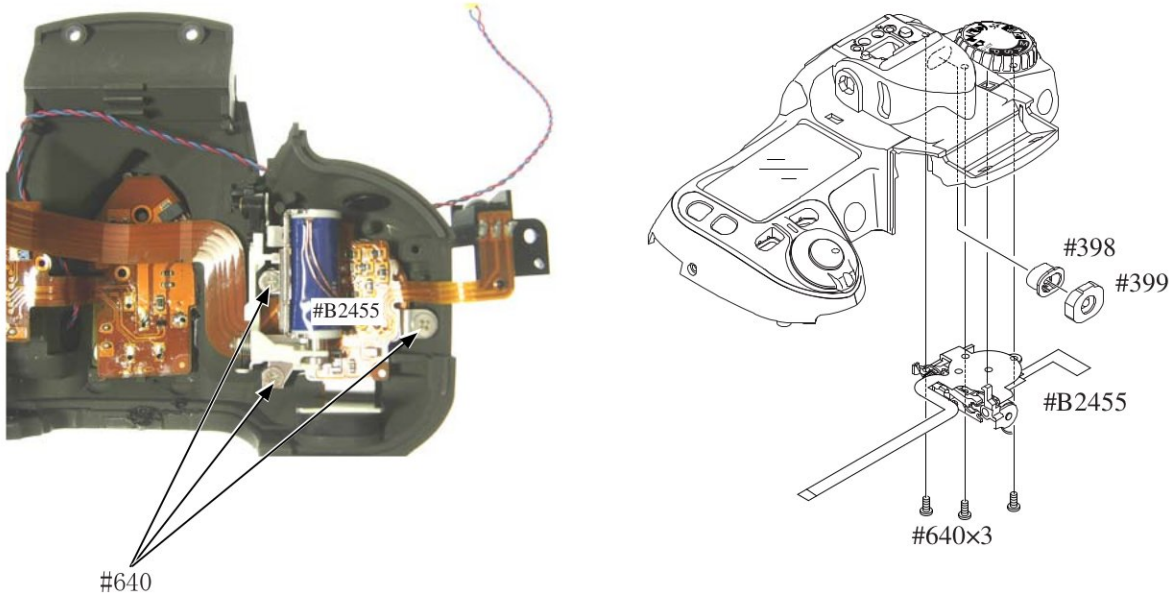
AF-assist illuminator window / Command dial

- Attach the command dials (#B367 and #B377).
- Tighten the two screws (#607) of [#B377].
- Position [#B367] in the direction of the arrow, and tighten two screws (#610).
- Solder the command dials (#B367 and #B377).



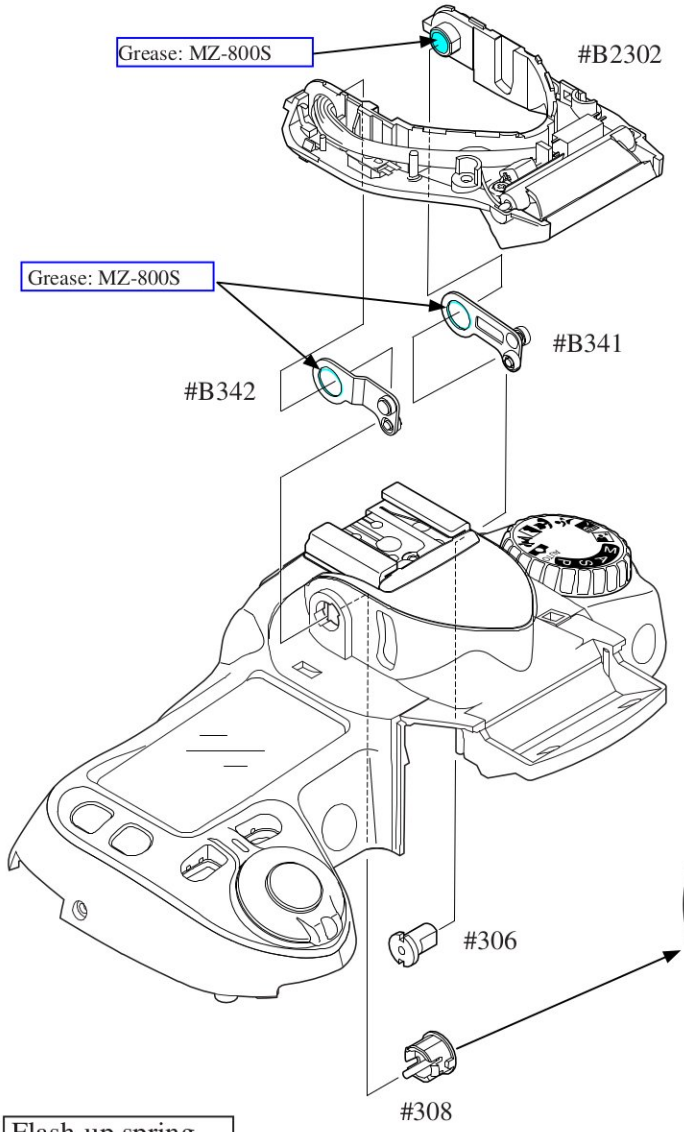
M/DFPC unit

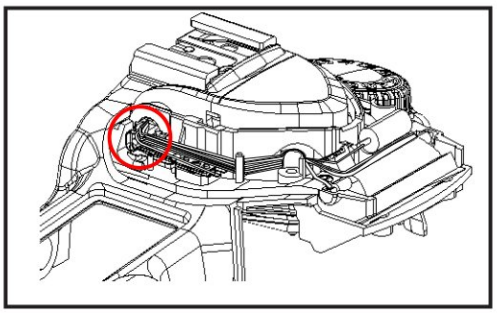
- Attach the delete-button rubber SW (#399) and the delete button (#398).
- Mount the M/DFPC unit (#B2455).
- Tighten three screws (#640).



SB lower case unit

- Attach [#B341] and [#B342].
- Mount the SB lower case unit (#B2302) on the top cover.
- Insert the SB-case rotate shaft (#306) in the top cover.
- Insert the collar (#308) in the top cover, and fix it by hooking at two places.
- Pass each wire through the hole (#308).





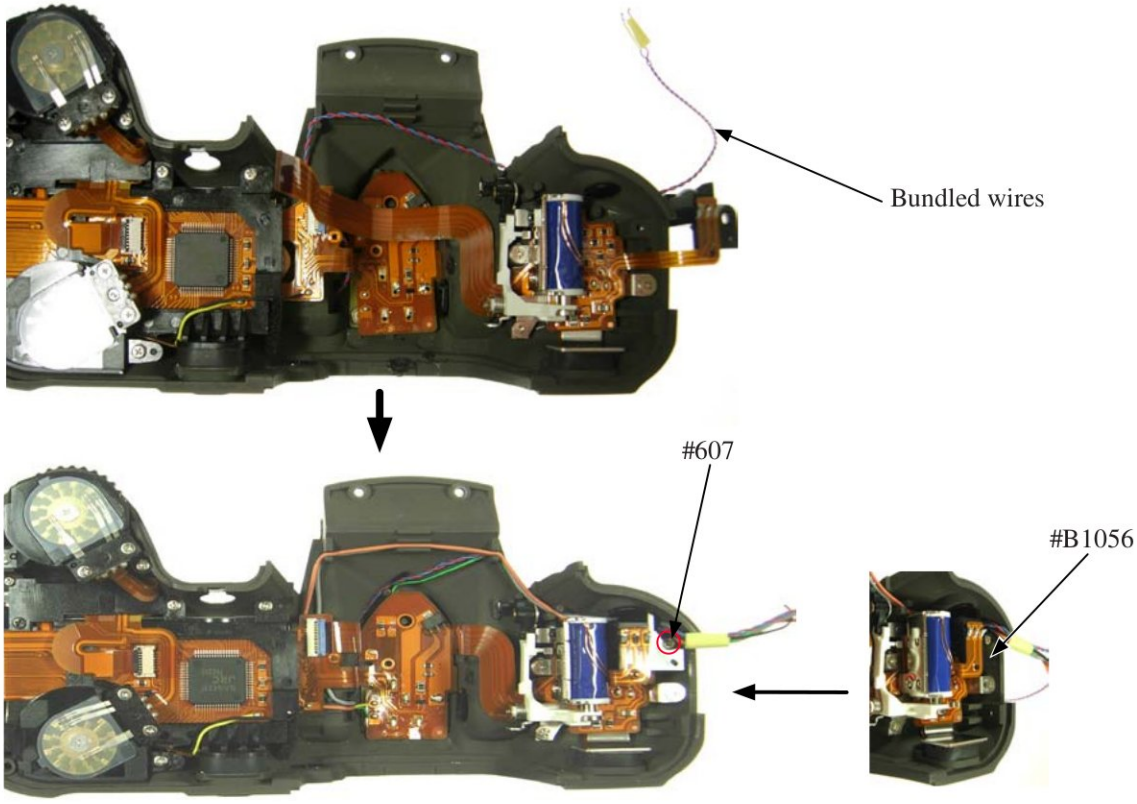
Arrangement of built-in SB wires
Be careful so that the wires do NOT touch the SB POP UP SW.

Flash-up spring

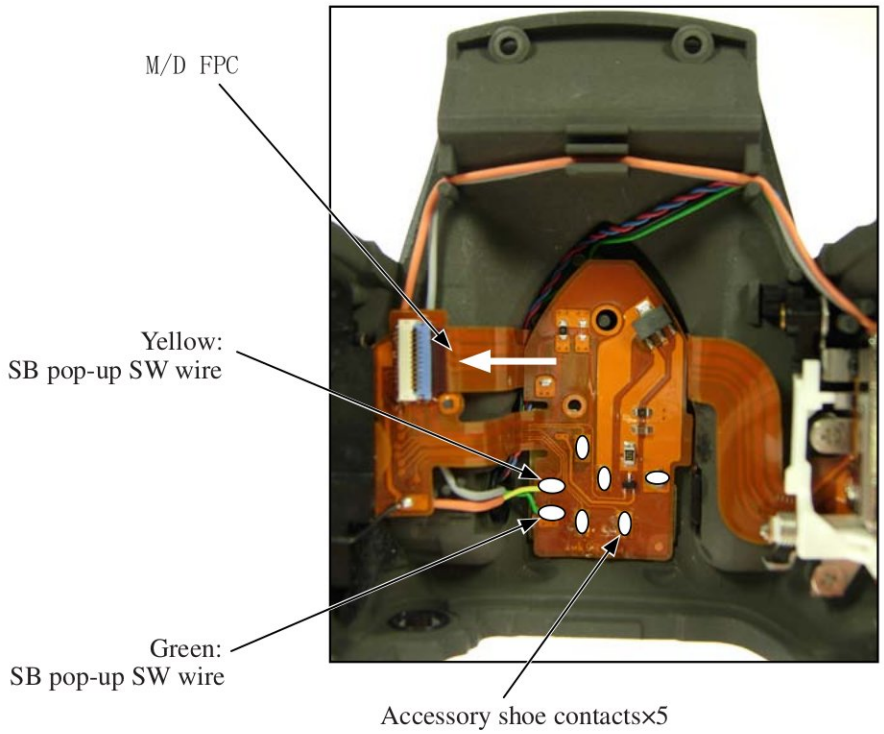
- Put the flash-up spring (#305).
- Fix it with the screw (#650).
- Hook the flash-up spring (#305) by following the direction of the arrow.

Wiring / Top cover FPC

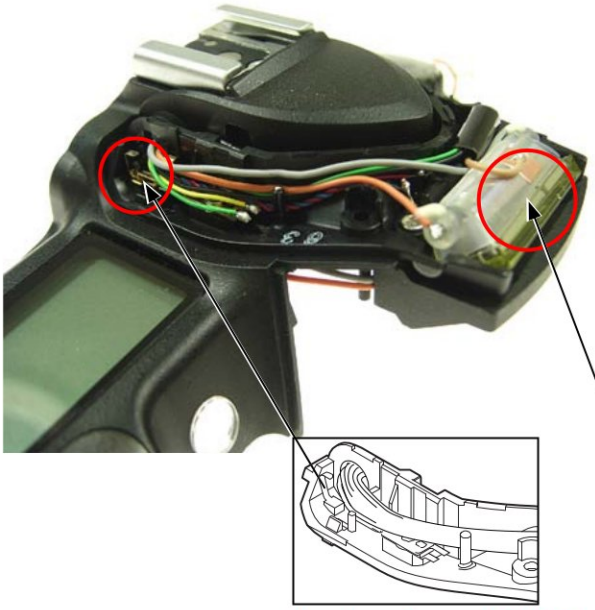
- Arrange the bundled wires.
- Mount the remote control unit (#B1056).
- Tighten the screw (#607).



- Solder the accessory shoe contacts at five places.
- Solder the two SB pop-up SW wires.
- M/D FPC to the connector.



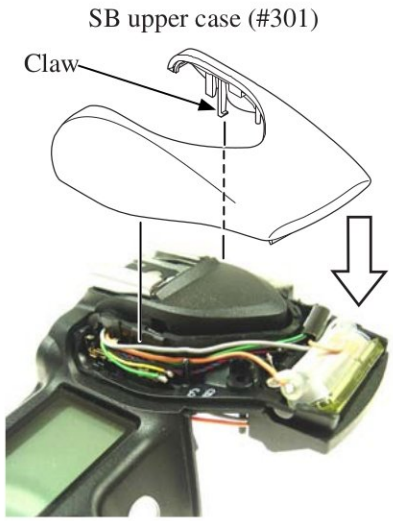
SB upper case

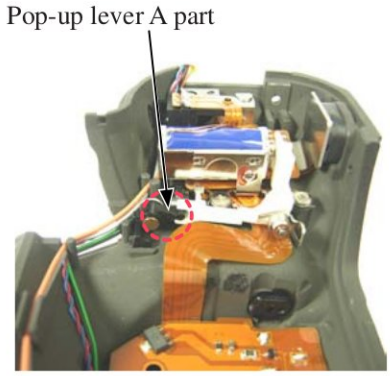


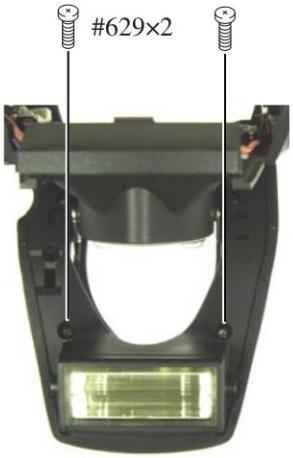
Caution: Both ends of the SB flash unit are just inserted in each part without any adhesive.

Caution： Be careful NOT to deform the SB POP-UP switch.

- Mount the SB upper case (#301) on the SB lower case unit.
- Press the pop-up lever A part of the top cover unit, in order to pop the built-in SB up.
- Tighten two screws (#629).



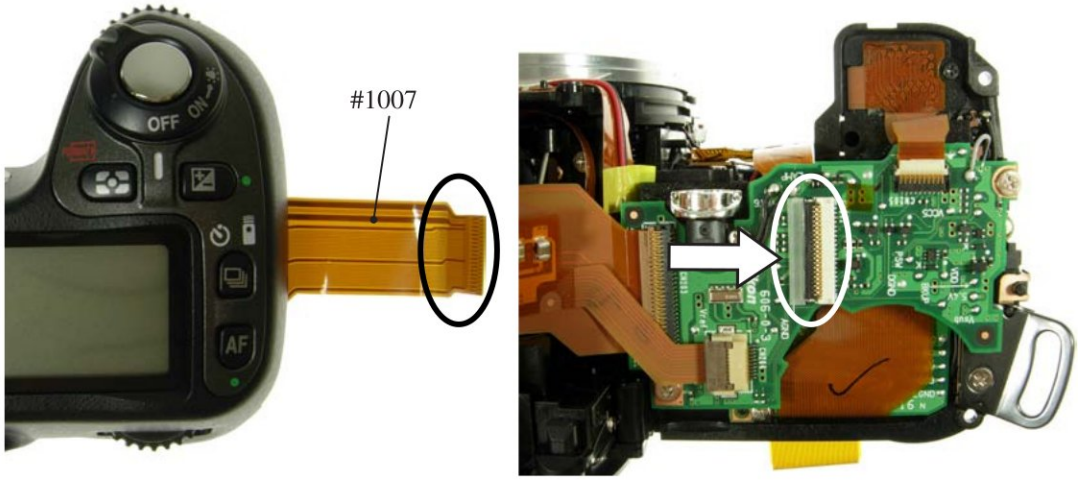




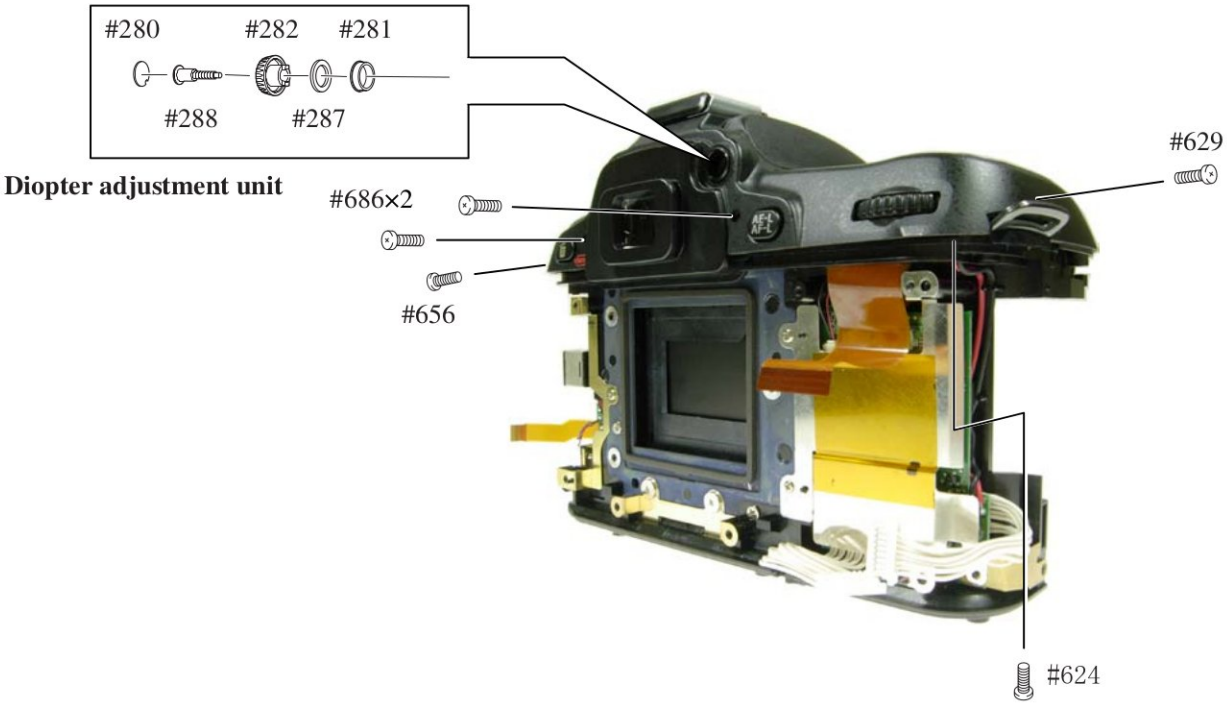
Top cover

- Connect the top cover-FPC (#1007) to the connector, and set the top cover.

> ∗ When AE-CCD positioning adjustment is made, assemble temporarily up to Page A38 without attaching the screws to the top cover, putting the diopter adjustment unit, and soldering six wires.

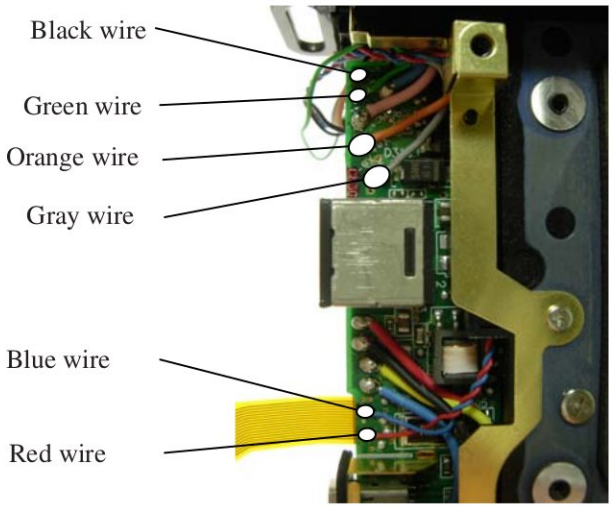


- Tighten the screws (#656, #629, and #624) and two screws (#686).
- Put the diopter adjustment unit (#281, #287, #282, #288, and #280).



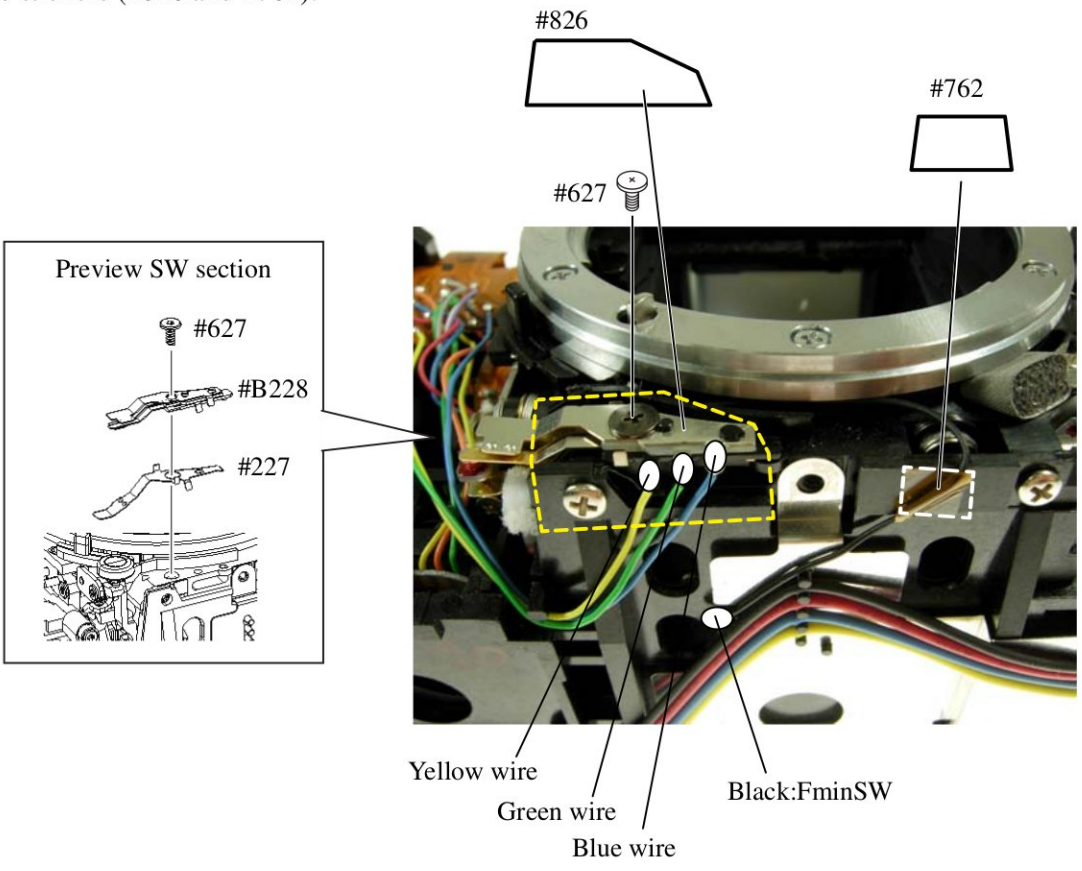
∗ After setting the top cover, slide the diopter adjustment lever, and check the movement of the diopter-correcting lens.

・ Solder six wires that are connected from the top cover.



Preview SW/Fmin GND wire

・ Put the preview SW (#227) and preview SW unit (#B228), and fix them with the screw (#627).
・ Solder four wires.
・ Attach two stickers (#826 and #762).

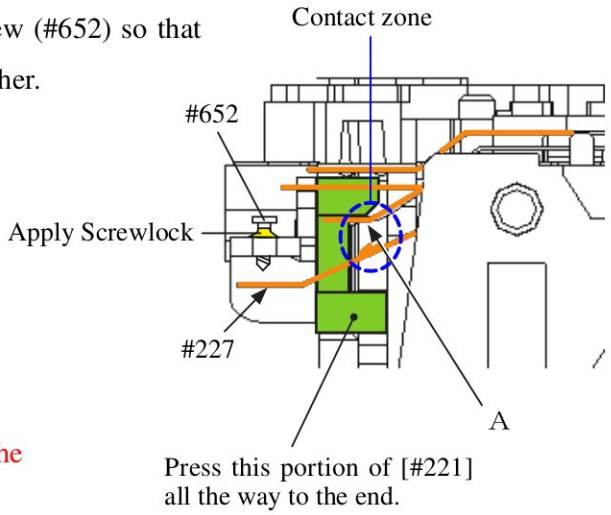


Preview SW adjustment

① Press the lever (#221) with a screwdriver, etc, from the bottom of the body all the way to the end.

② In the state of ① , adjust by turning the screw (#652) so that [#227] and "A" part slightly touch with each other.

③ Adhere the screw (#652) with the screwlock.

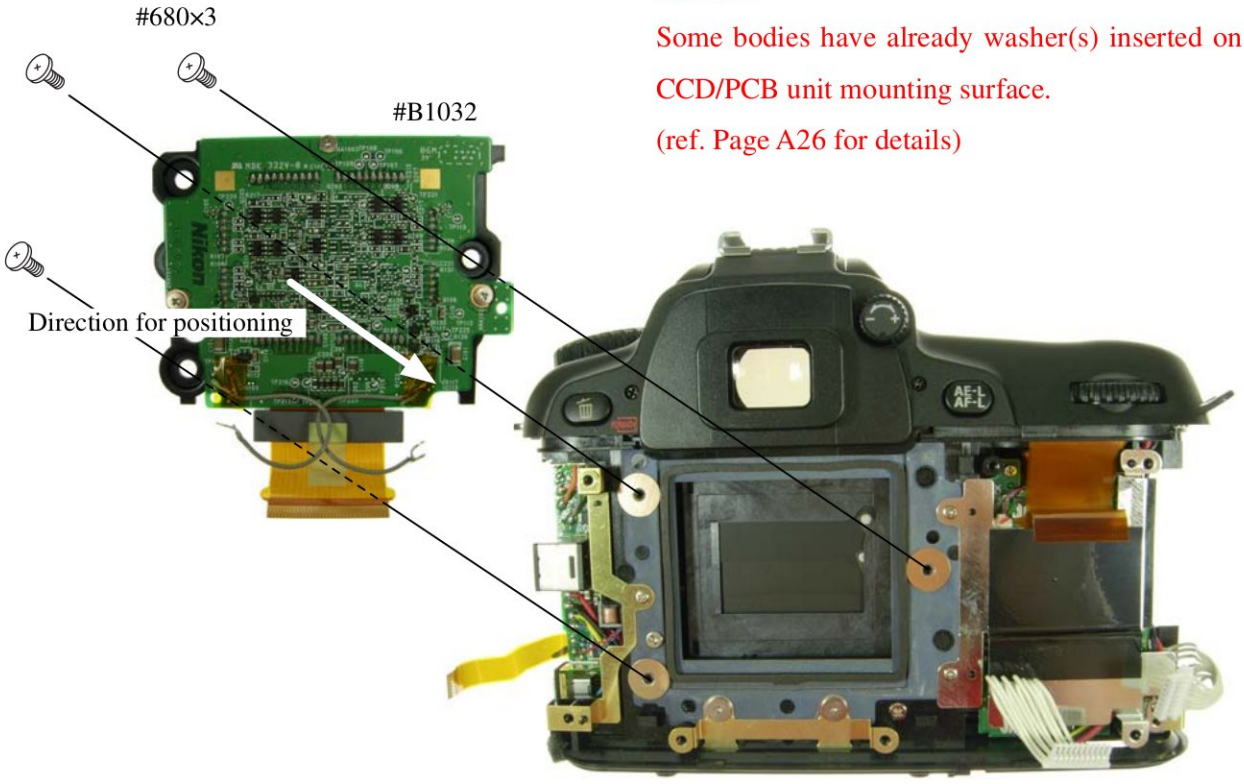


Caution:

Perform the work that follows with care, because the preview SW segment can be easily bent.

CCD/PCB unit

・ Mount the CCD/PCB unit (#B1032) and tighten three screws (#680).



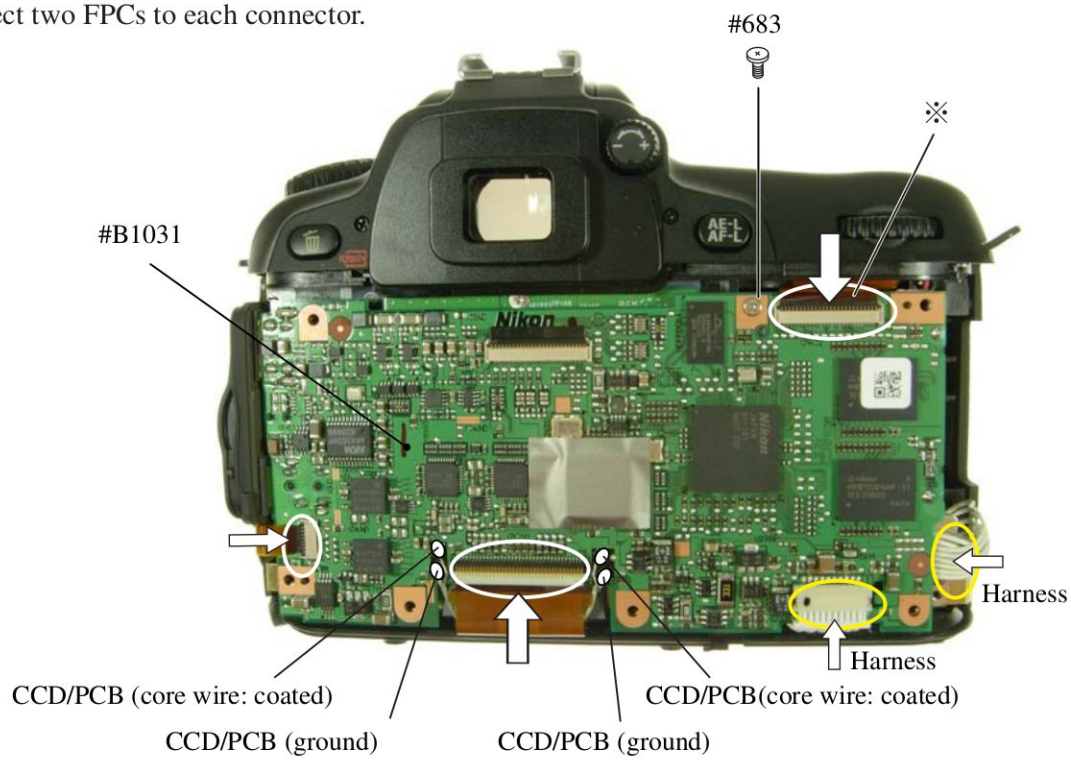
Caution:

Some bodies have already washer(s) inserted on the CCD/PCB unit mounting surface.

(ref. Page A26 for details)

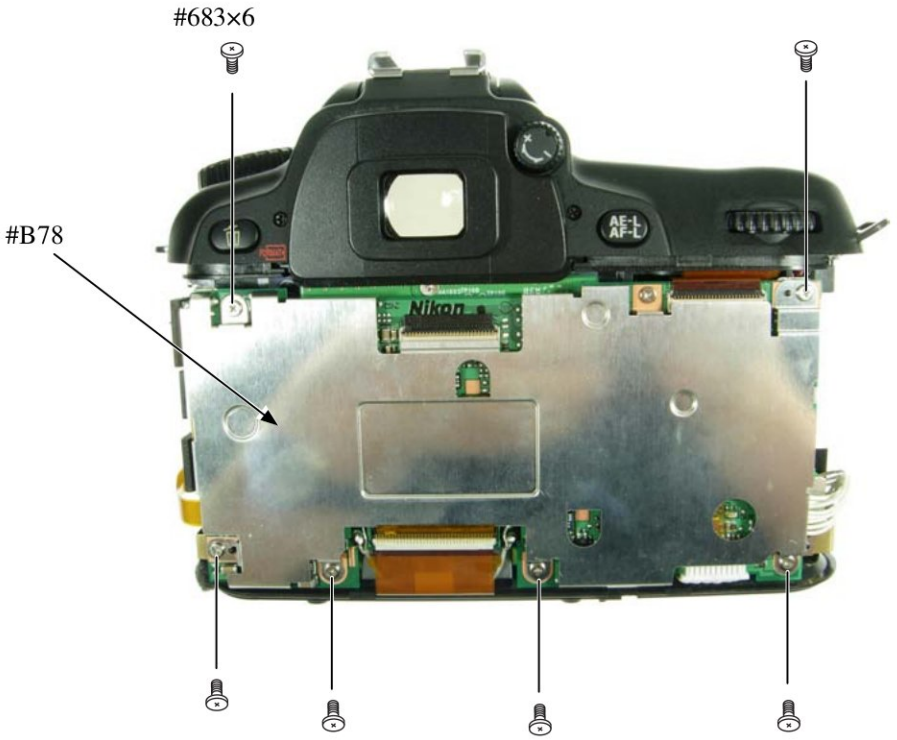
DG-PCB unit

- Connect the FPC of ※ and two harnesses to each connector.
- Mount the DG-PCB unit (#B1031), and tighten the screw (#683).
- Solder the shield wires at four places.
- Connect two FPCs to each connector.



DG shield plate

- Mount the DG shield plate (#B78).
- Tighten six screws (#683).



Inspection and adjustment of AE CCD Alignment

⚠ WARNING

- 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.

＊ Under the environment where the AE-CCD positioning is adjusted, use the reference body (and change the environment depending on measured results).
- In case the measured value is out of standard, check if there is no misalignment of the grid lines.
- In case the measured value is out of standard, change the environment of measurements. (e.g. setting place/ direction, room brightness, etc)

Procedure

① Make temporary assembly of the following four parts: Top cover (connected only with the FPC without tightening the screws), grip cover, I/F cover, and bottom cover (with the tripod base plate being attached.)

② Mount "AF50/1.4D" on the camera, and fix them on the tripod horizontally.

③ Connect the camera and PC via USB cable (UC-E4).

④ Connect the AC adapter EH-5.
Caution: Be careful NOT to cause a short-circuit at uncovered portions.

⑤ Attach the AE-CCD positioning tool (J15428) in the color viewer (J63070), and turn power ON.

⑥ Keep the 0.7-m distance between the front face of the AE-CCD positioning tool and the reference surface of the camera. Set the camera AF to manual, and the focus ring to "0.7 m" by rotating it.

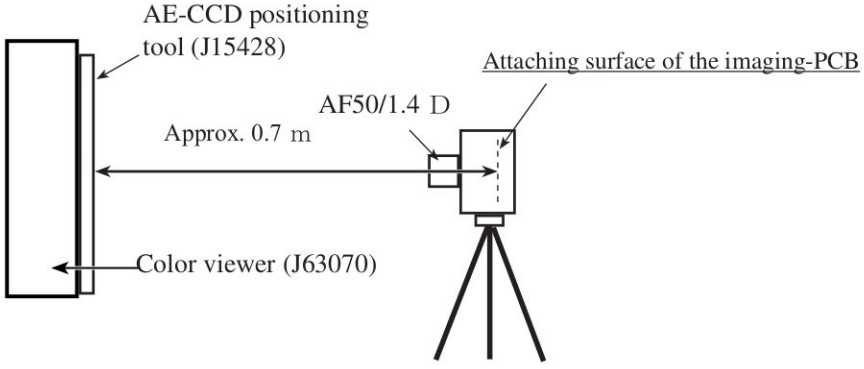
⑦ Start up the inspection and adjustment software for D80 (J18412), and select "Inspection and Adjustment for AE CCD POSITION" then "Set Camera for AE CCD POSITION".
Looking through the viewfinder, move the camera so that the grid lines of the camera coincide with the extension lines of the AE-CCD positioning tool.
＊ Set the camera and AE-CCD positioning tool horizontally.

⑧ Select "Inspection and Adjustment for AE CCD POSITION".
＊ Cover the camera with a black cloth, etc, when measured.

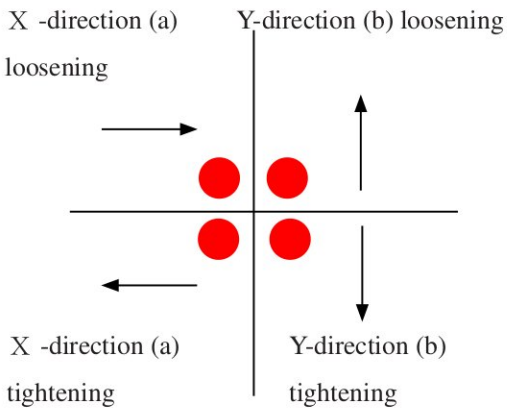
⑨ Attach the metering FPC unit with three screws (#514) lightly, then give each screw two turns. By following instructions on PC, make the position adjustment of AE-CCD by the screws (a:#514, b:#514).

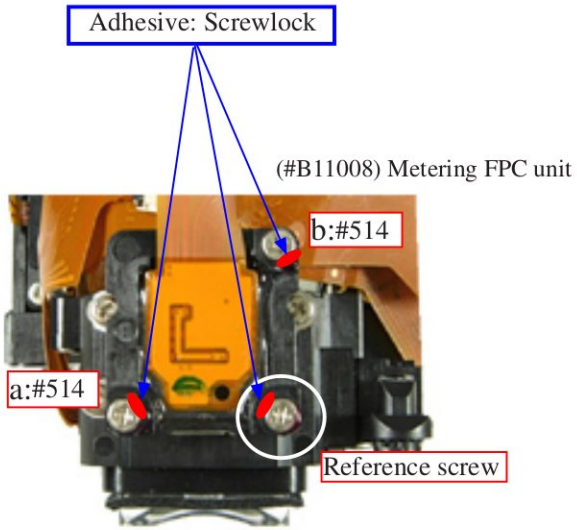
⑩ Fix the three screws with screw lock.

⑪ After completing the adjustment,fix the top cover with the screw and inspect the accuracy. If the result is out of standard, make readjustment.



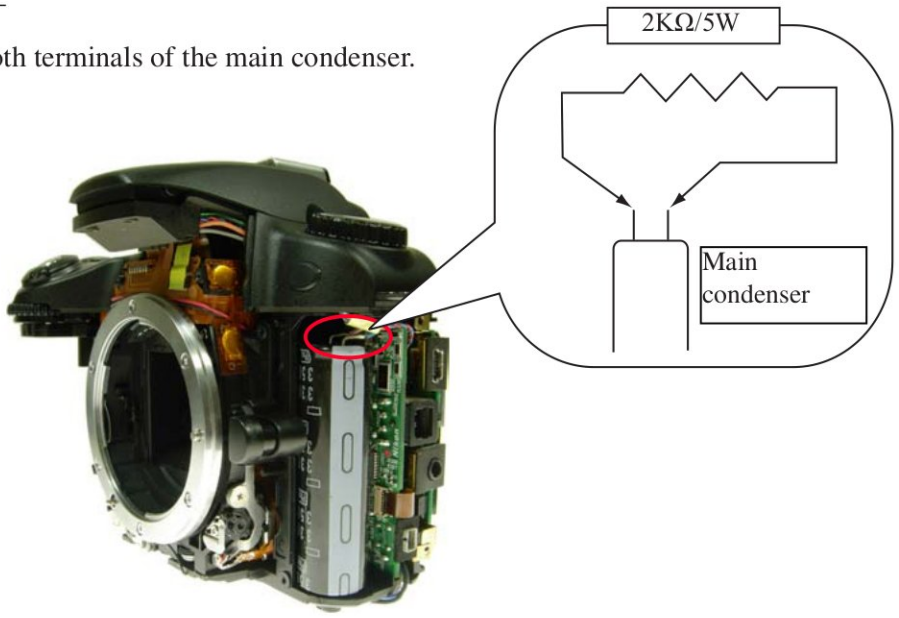
Standard → Reference screw
X-direction → a: Screw
Y-direction → b: Screw





Discharge of Main condenser

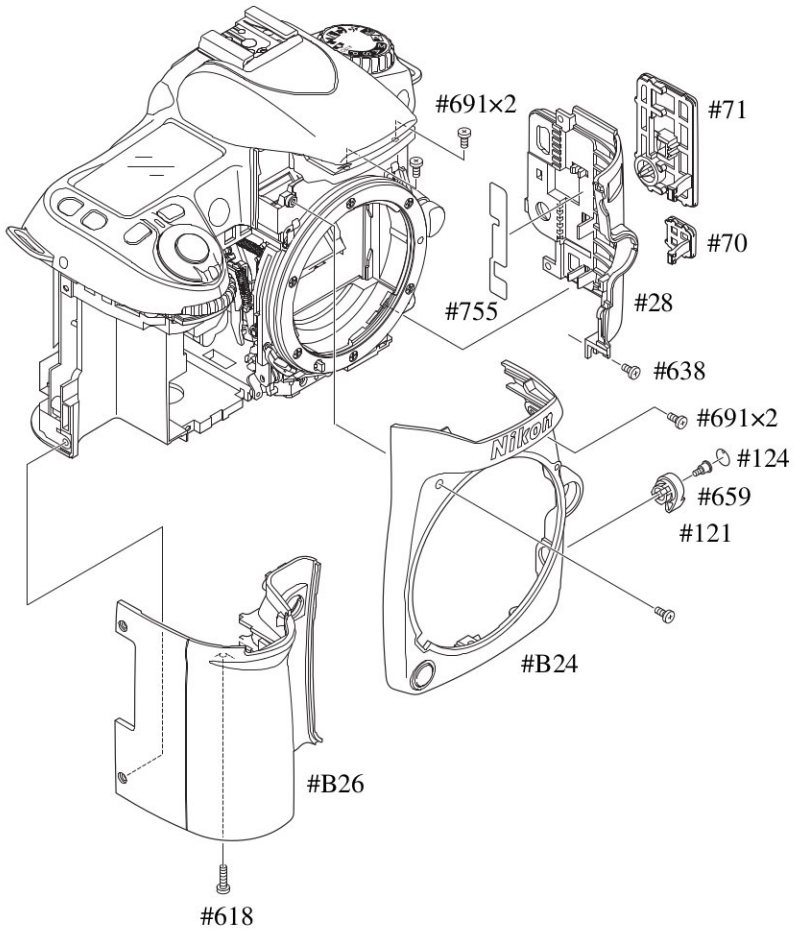
・ Discharge currents from both terminals of the main condenser.



⑫ When the adjustment is completed, remove the temporality attached each cover. Then fix the top cover unit with the screw and solder six wires.

Covers

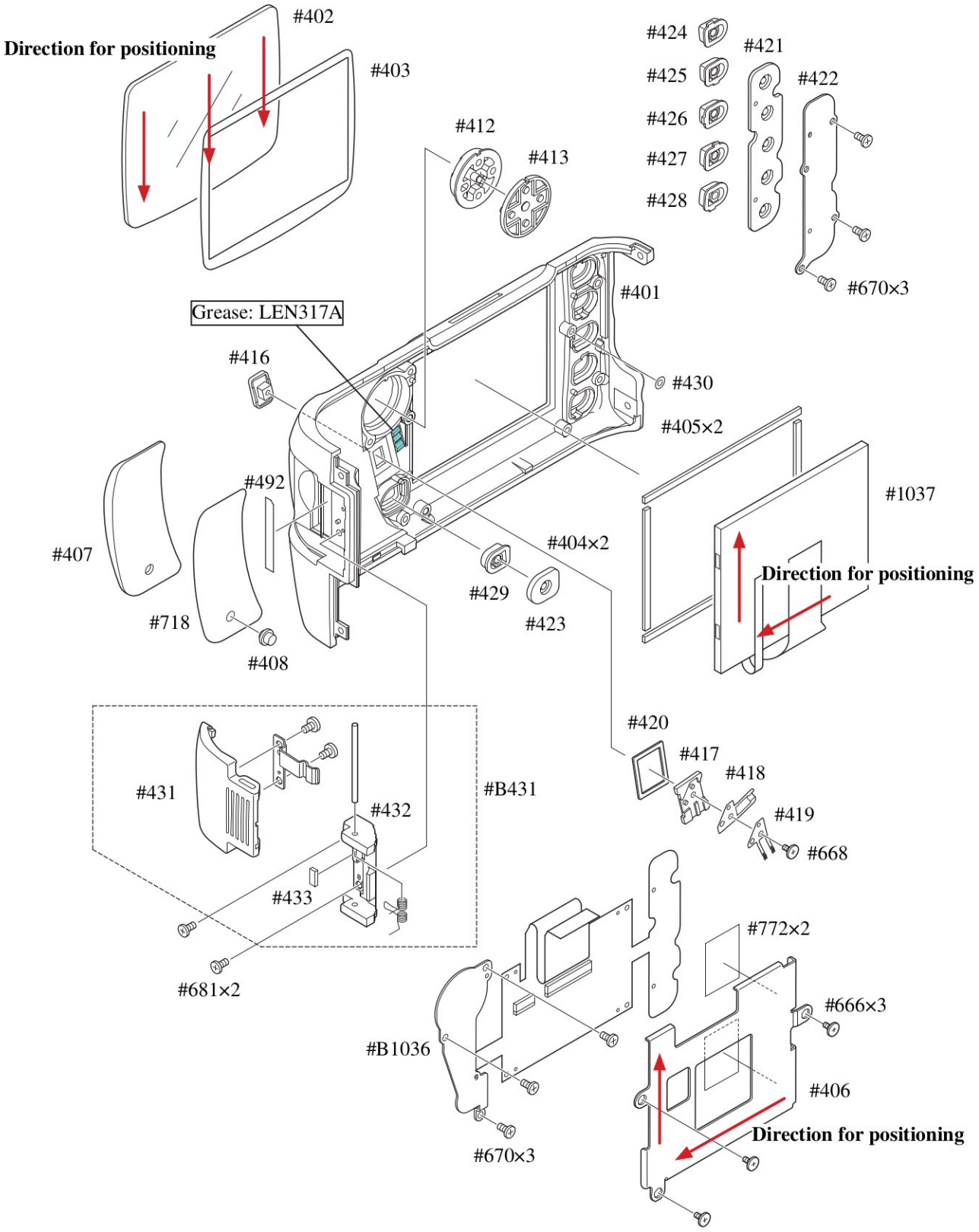
- Mount [#28] and tighten the screw (#638).
- Mount [#B26] and tighten the screw (#618).
- Mount [#B24], and tighten four screws (#691).
- Put the AM change lever (#121), and tighten the screw (#659) and attach [#124].



Gap adjustment of SB lighting unit

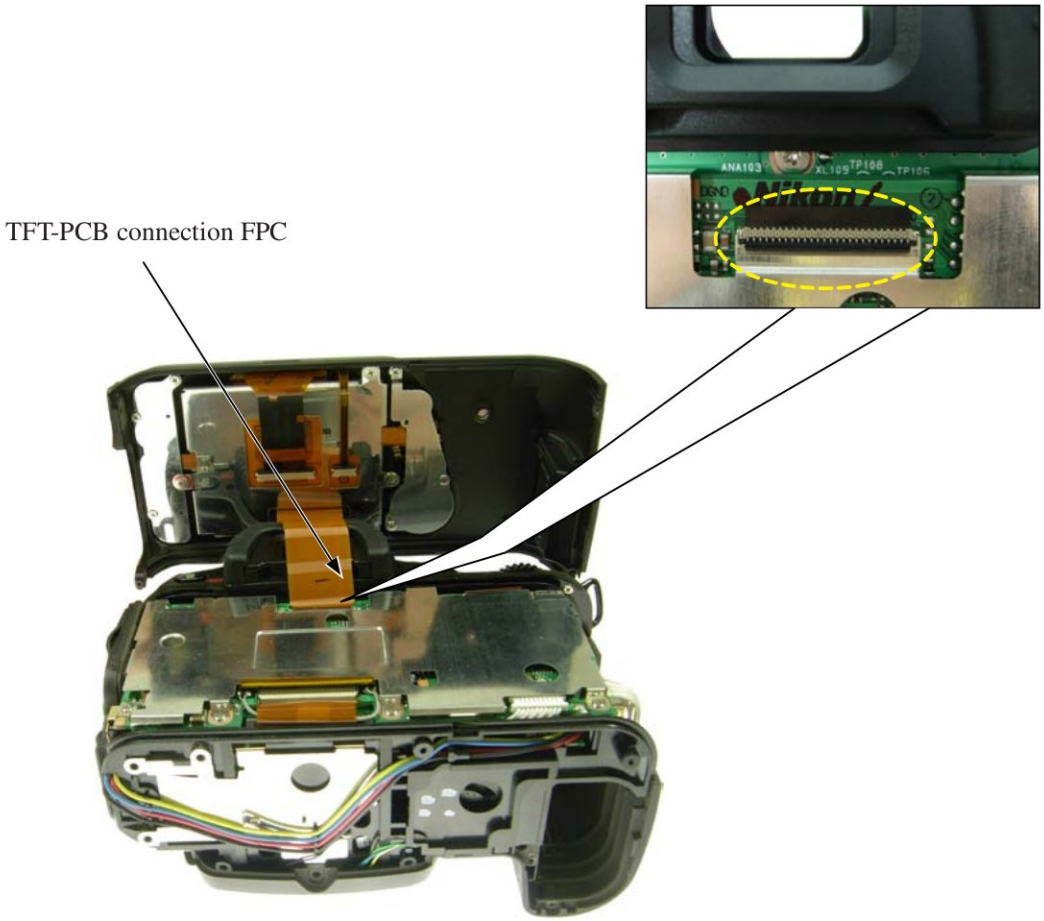
- In case it is out of standard, pop the SB unit up and make an adjustment by turning the adjusting dial with Hexagonal wrench.

Assembly of Rear cover



Rear cover

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

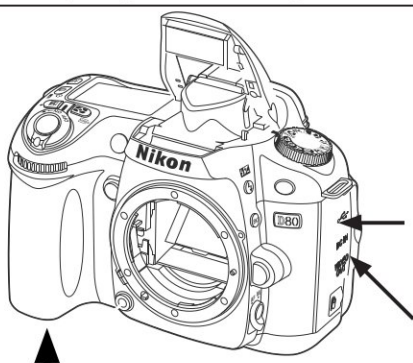


・ Mount the rear cover, and fix it with two screws (#657) and two screws (#656).

Accuracy inspection and adjustment (Camera body)

★ : New tool

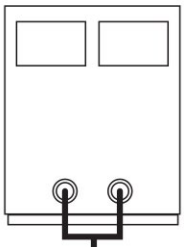
Commercially available straight cable



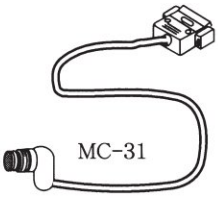
USB cable: UC-E4

AC adapter: EH-5

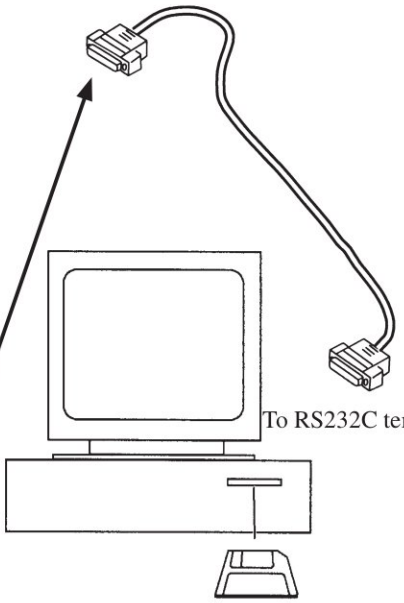
Stabilized power supply
Set value = 7.4V 0.3Ω 5.0A
or AC adapter EH-5



★
Battery tool
J61213



MC-31



To RS232C terminal

J18412

★
D80 inspection and adjustment software

Use [9pin-25pin] conversion connector for a computer with 9-pin RS-232C terminal.
RJ is not available, so use a commercial item.

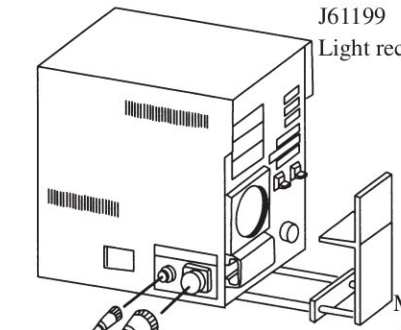
＊ Note:
When inspecting/adjusting the shutter speed and when adjusting “battery check” voltage, be sure to use the battery tool (J61213).
When communications are made by RS232C, supply power from the battery tool.
SW-ON sets to communication mode.

Flash meter

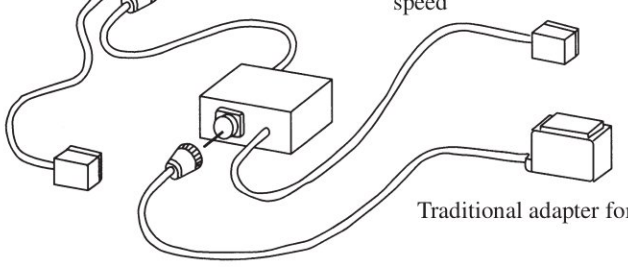
Not prepared as RJ

Shutter tester (The illustration shows "EF-8000".)

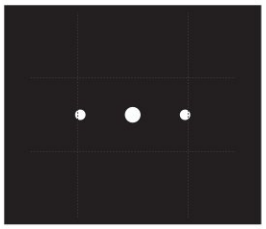
J61199
Light receiving adapter (in common with D100)



Measuring adapter (APS) for shutter speed



Traditional adapter for camera



★ AE-CCD positioning tool (J15428)
Set up in front of color viewer (J63070)

AF50/1.4D

AF28/2.8D

When M 1/4000 is adjusted, use the measuring adapter (APS) for shutter speed and the light receiving adapter (J61199).
Caution: When the inspection and adjustment are made with the shutter tester, turn the tester ON to light a lamp, and carry out the aging for 3-5 minutes.

D80 Inspection and Adjustment Software (J18412)

This inspection and adjustment software runs on Windows.

Install the software by following the below procedure.

<Operating environment>

Check the following operating environment which is required for installing this program on PC.

PC	IBM PC/AT compatible
OS	Windows XP Professional Edition, Windows XP Home Edition, Windows2000,
CPU	Pentium Ⅱ 300MHz ～ Pentium 4 2.2GHz
RAM (memory)	256 MB or more
HD	6MB-or-more free disk space is required when installing
Monitor resolution	1024 × 768 pixels or more
Interface	※ USB interface (V1.1, 2.0) Serial interface (switchable from COM1 to COM9)

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

＜ Cautions in starting program ＞

When starting this program, close all the other applications.

If some other applications are running, this program may not be activated.

＜ File ＞

D80.exe	Application execution file
NkdPTP.dll	Library file: USB communication application extension file for Windows XP
NkdPTPDi.dll	Library file: USB communication application extension file for Windows 2000
PTP	Driver file storing folder for PTP: for Windows 2000

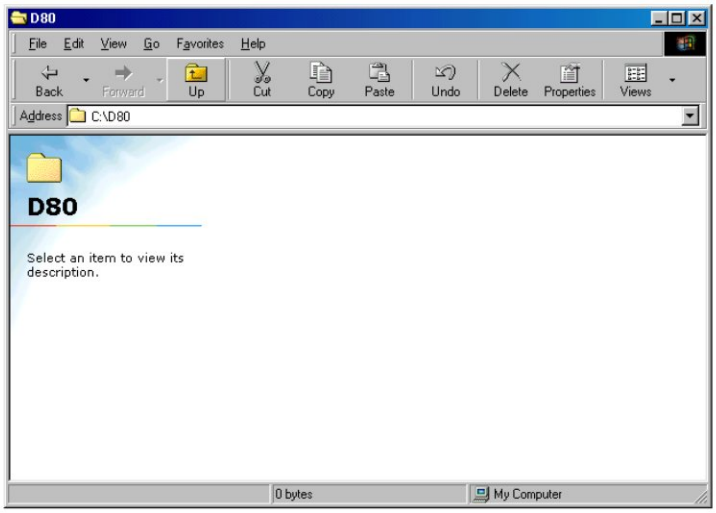
<Procedure for installation>

The file (PD80.exe) of this program is provided via FD or e-mail.

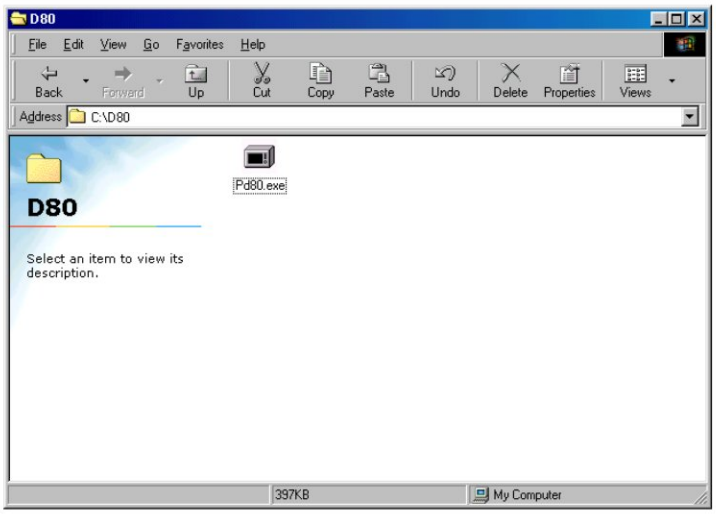
Because this is the self-extracting file, decompress the file before installing, and follow the next procedure.

1. Create a folder for installation under any drive and name.

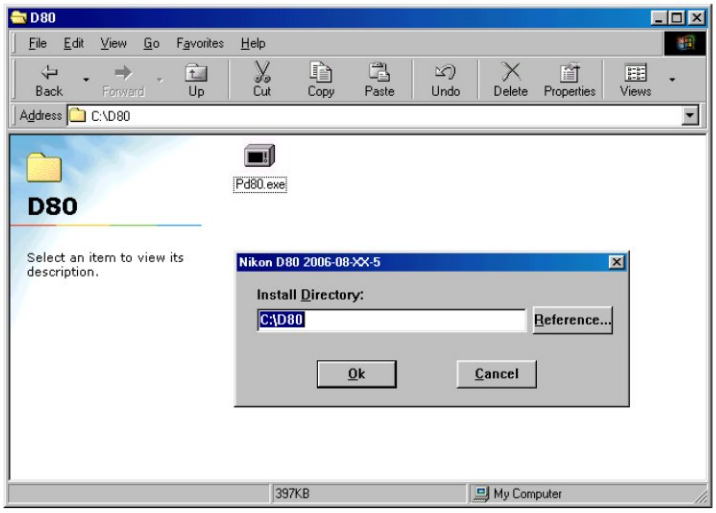
（e.g.）C:\D80



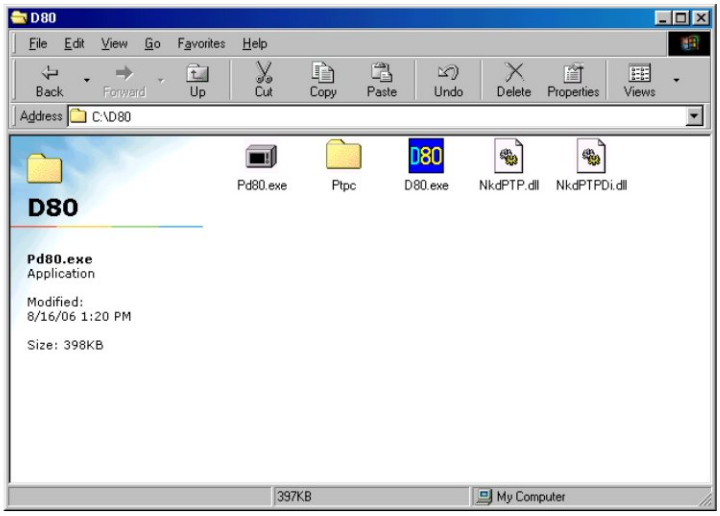
2. Paste the file (PD80.exe) in the created folder.



3. Double-click on the pasted file to display the following screen.
   Press the OK button, then decompression starts.



4. When the decompression of file is finished, the file (D80.exe) is created.



5. The install is completed.

Procedure for installing USB driver

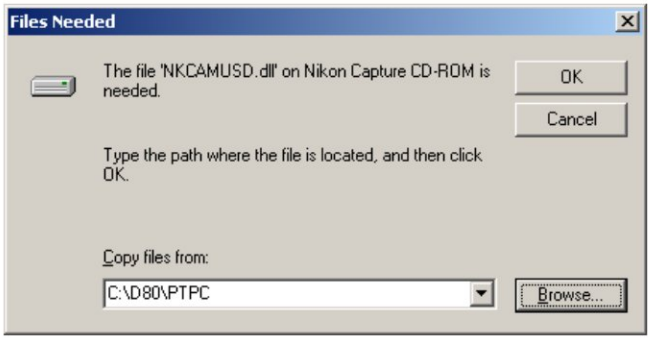
If this program is used by the USB interface, installing the USB driver is necessary.

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. "Add New Hardware Wizard" is indicated, and the next "4." screen is automatically displayed.

4. Click "Yes".

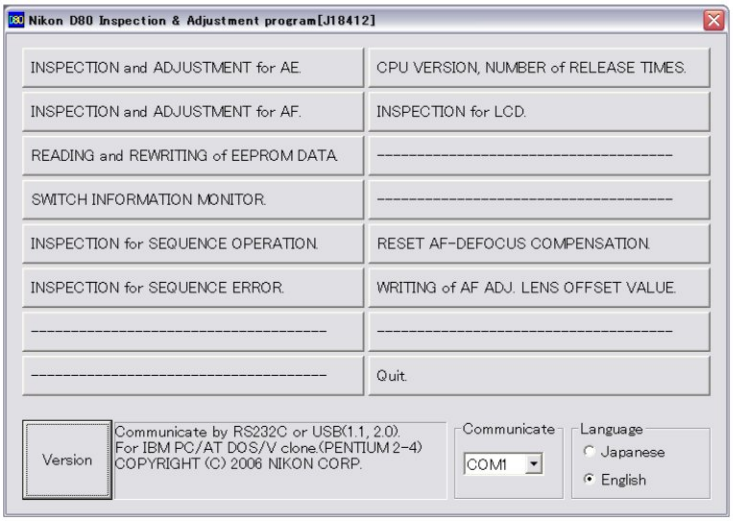
5. Click "Reference". Select "C:\D80\PTPC" of C drive, and click "OK".



6. Reboot the PC to complete the installation.

<Start-up of Program>

1. Double-click the file (D80.exe), then Inspection and adjustment program for D80 starts.



2. To display in Japanese, select the radio button "Japanese" in "Language" in the lower right-hand corner of the screen.
   However, this is not properly viewed in the English OS.

3. In the pulldown menu of "Communicate", from "COM1" to "COM9" or "USB" is available for "COMPORT".

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

5. Select each item button according to operation.
   Follow the instructions on the next screen that will be shown after pressing the item button.

6. 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 A39,A40 for details)
《USB connection communication》
② AE accuracy inspection and adjustment 《USB connection communication》
③ Aperture accuracy inspection 《USB connection communication》
④ M1/4000 Accuracy inspection and adjustment 《RS232C connection communication》
⑤ Adjustment for battery check level (Use the battery tool (J61213) and stabilized power supply.)
《RS232C connection communication》
⑥ Built-in SB flash inspection and adjustment 《USB connection communication》
〔Tools required〕 ref. Page A44.

・AE accuracy inspection and adjustment

When AE accuracy inspection and adjustment is made,
Two types of lenses (AF50/1.4D and AF28/2.8D) are used.
Caution:
AE accuracy is not inspected by using the exposure value of the traditional shutter tester. The metering value is displayed on PC screen.

・Battery check voltage level adjustment

Connect the battery tool (J61213) to the camera, and turn the communication change-SW to ON. Then make adjustment.

・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 three cameras of D80 and measure by "WRITING of AF ADJ. LENS OFFSET VALUE" on the main menu.

《USB connection communication》

① AF accuracy adjustment (Make the overall following adjustment.)
② YAW, PITCH inspection and adjustment
③ LARK adjustment (inc. CCD output adjustment)
④ AF shift adjustment

〔Tools required〕

1. When adjusting for all adjustment items
   ref. Page A44.
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

In "AF shift adjustment", the distance from the bayonet reference plane to the imaging area (CCD) is calculated by the actual shot photo, and its error is recorded in EEPROM as compensation amount, and adjusted.

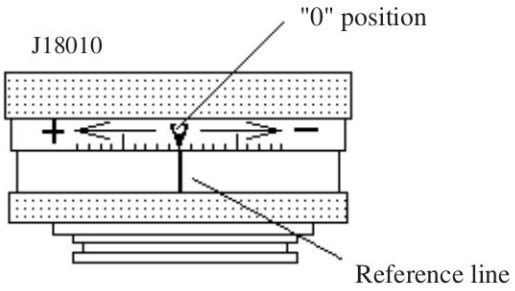
Bottom cover

・Mount the bottom cover and fix it with two screws (#692), the screw (#658), and four screws (#657).

∞ Infinity focus inspection & adjustment

・Replace the finder screen with the infinity focus check screen (J18394), and use the reference lens (J18010) and read the value. In case it is out of standard, increase or decrease washers (#836A, #836B, or #836C) for adjustments. * Supply the power (Battery or EH-5) for checking.

Caution: When (J18394) is put in to replace the finder screen, put it with the silver spacers upward, which are attached on both sides.



Standard: ±0.04mm (1 scale=0.01mm)

#836A	1K602-832	Screen washer A	0.10mm
#836B	1K602-833	Screen washer B	0.20mm
#836C	1K602-976	Screen washer C	0.05mm

Necessary adjustments when parts are replaced

1. D80 adjustment software and updates

Adjustments / Replacement parts	EEPROM fixed values	AE CCD positioning adjustment	AE accuracy inspection & adjustment	M1/4000 inspection & adjustment	Aperture accuracy inspection	Battery check voltage level adjustment	Built-in SB light volume inspection & adjustment	AF accuracy inspection & adjustment
Shutter unit				○				
Main FPC ＊1	○	＊2 △	○	○	○	○	○	○
Sub-PCB								
AF sensor unit								○
Top cover or SB lower case unit							○	
DC/DC PCB unit						○	○	
Metering FPC unit		○	○					
Aperture control PCB unit					○			

＊ 1. When the main PCB unit is replaced, be sure to update the version before writing the fixed values.

＊ 2. Make an inspection.

2. Shooting image adjustment software and Software updates

Adjustments / Replacement parts	Writing of fixed values writing	Gr/Gb difference compensation ADJ (G filter)	Sensitivity	Shading	Gr/Gb compensation adj. (R/B filter)	Sensitivity ratio	Image shutter adjustment	Pixel defect compensation - Black point	Pixel defect compensation - White point	TFT adjustment	Factory default setting
Shutter unit							○				
Main PCB unit							○				
AF sensor unit											
DC/DC PCB unit											
Metering FPC unit											
DG PCB unit ＊1	○	○	○	○	○	○	○	○	○	○	○
CCD/FPC PCB unit		○	○	○	○	○	○	○	○		
TFT monitor										○	

＊1. When the DG-PCB unit is replaced, be sure to update the firmware before writing the fixed value.

Shooting Image Adjustment

1. Summary

When D80 shooting image-related and listed parts on Page A53 are replaced, be sure to make an adjustment by the shooting image adjustment software for D80 (J65091). The details of its function and how to use this software are as follows:

2. Adjustment software function

(1) Gr/Gb difference compensation adjustment (G filter)
(2) "Sensitivity" adjustment
(3) Shading adjustment
(4) Gr/Gb compensation adjustment (R/B filter) / Line crawl adjustment
(5) "Sensitivity ratio" adjustment
(6) Image shutter inspection and adjustment
(7) Pixel defect compensation - black point
(8) Pixel defect compensation - white point
(9) Getting reference values
(10) Factory default setting
(11) Checking of the adjustment value
(12) Reading of RISC version
(13) TFT adjustment

※ When the adjustments from (1) to (5) are made, get in advance the reference values of (9) by using the reference body, then perform the adjustments.

3. Hardware requirements

OS : Windows2000, WindowsXP
Japanese or English OS
PC : CPU Pentium Ⅱ or more
Memory 256MB or more
USB1.1 or 2.0
Screen size: 1024×768 pixels or more

4. How to set up

Create any directory in the harddisc (except desk top) of PC, and copy the following files.

・D80IMG.exe・・・・・・・・・Application file
・D80STD.DAT ・・・・・・・・ Standard file
・NkdPTP.dll・・・・・・・・・USB-communication application extension file for WinXP
・NkdPTPDi.dll・・・・・・・・USB-communication application extension file for Win98SE and Win2000
・CCDFLG.DAT・・・・・・・・・Fixed value data (writing of fixed values)
・CCDINIT.DAT ・・・・・・・・Initial value data (factory default setting)
・TFTFLG.DAT ・・・・・・・・Fixed value data
・TFTINIT.DAT ・・・・・・・・Initial value data (factory default setting)
・ShadingFittingQ340DLL.dll ・For line crawl, shading
・ShadingFittingQ340_GLC.ini・System initialization file for line crawl
・ShadingFittingQ340_SD.ini・ System initialization file for shading

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

6. Basic usage

(1) Execute "D80IMG.exe" to start up the main screen. (ref. Fig.1)
(2) Select English/ Japanese in Language to display any menu. (ref. Fig.2)
(3) Click the button to start adjustments.
※ When the adjustments from 1. to 5. are made, calculate to get the "Sensitivity" and "Sensitivity ratio" reference values by using the reference body beforehand, then perform the adjustments.
(4) Follow the instructions on screen.
(5) To complete the procedure, click "QUIT" button or "×" button at the upper-right corner of the menu.

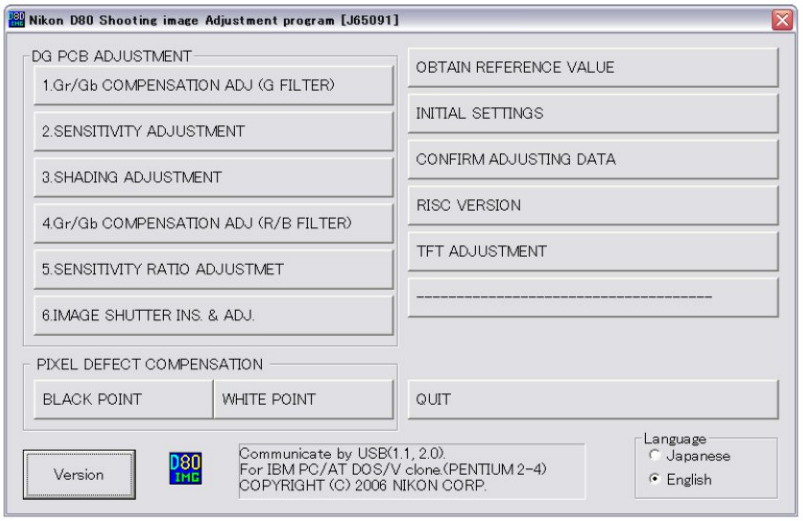


Fig.1

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 tool

	Item	Required device	Setting/Remarks
1	Gr/Gb difference compensation adjustment (G filter)	・5100K color viewer J63070 (ex-model viewer J63049 is also available.) ・Luminance meter BM-3000 J63068 ・Tool lens (to fix aperture) J61185 ・SP2 (G filter) J63086	Luminance LV13 equivalent Aperture F5.6
2	Sensitivity adjustment	・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+ND4×1)	Luminance LV13 equivalent Aperture F8 52 mm, Use the packaged product; 5-step light reduction
3	Shading adjustment	・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)	Luminance LV13 equivalent Aperture F5.6 Use the packaged product; 3-step light reduction
4	Gr/Gb compensation adjustment (R/B filter) / Line crawl adjustment	・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	Luminance LV13 equivalent Aperture F5.6
5	Sensitivity ratio adjustment	・Shutter tester ・Luminance meter BM-3000 J63068 ・Tool lens (to fix aperture) J61185 ・5100K color viewer J63070 (ex-model viewer J63049 is also available.)	Luminance LV9 Aperture F5.6; No filter Inspection luminance LV13 equivalent
6	Image shutter inspection and adjustment	・Shutter tester ・Luminance meter BM-3000 J63068 ・Tool lens (to fix aperture) J61185	Luminance LV9, 15 Aperture F5.6
7	Pixel defect compensation - black point	・5100K color viewer J63070 (ex-model viewer J63049 is also available.) ・Luminance meter BM-3000 J63068 ・Tool lens (to fix aperture) J61185	Luminance LV13 equivalent Aperture F5.6
8	Pixel defect compensation - white point	Body cap or lens cap	Environmental temperature approx. 20 - 25℃
9	Getting of reference values	Same as "Sensitivity adjustment" and "sensitivity ratio adjustment".	No filter when sensitivity ratio reference value is calculated.
10	Factory default setting	None	
11	Checking of adjustment value	None	
12	Reading of RISC version	None	
13	TFT adjustment	None	

8. Summary

The summary on each adjustment is as follows:

(1) Gr/Gb difference compensation adjustment (G filter)

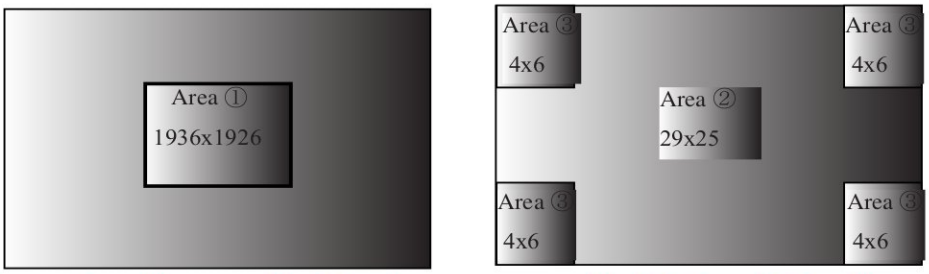
Camera is faced to the light-emitting box (color viewer) of LV13 equiv. with SP2 (G filter) being put between them. G-line crawl (3895×2610 pixels) is divided into (29×25) blocks, and the adjustment is made so that the difference between Gr and Gb output can fall in the standard range.

(2) Sensitivity adjustment

Camera is faced to the color viewer of LV13 equiv. with ND filter (-5 steps) being put between them, and the adjustment is made by changing the ampgain so that G output can fall in the standard range. The gain value is adjusted so that the G output average value (Average of Gr/Gb) in the center (425×425 pixels) can reach the target output level (approx. 1040LSB). The actual adjustment of the gain value is made only under the condition of ISO100 and ISO1600, and the medium sensitivity is calculated by the adjustment values of these 2 conditions.
For target output level, G output average of sensitivity reference value (ISO100) is used, which was calculated by the reference body.

(3) Shading adjustment (5100K color viewer is shot by this camera, and adjustment is made.)

Camera is faced to the color viewer of LV13 equiv. with ND filter (-3 steps) being put between them, and the adjustment of white balance distribution is made for 3 areas [Area ① : Central 1936×1926-pixel area; Area ② : All the divided areas except ③ -areas after dividing (3890×2606-pixels) into (29×25-pixels); Area ③ ; 4 corners of (4×6-pixels) after dividing (3890×2606-pixel) into (29×25-pixels)]



Caution:If "Data read error" is occurred by PC environment, remove the AC adapter EH-5 and insert it, reboot adjustment software, change the delay time, then execute from "Shading" again.

(4) Gr/Gb compensation adjustment (R/B filter) / Line crawl adjustment

Camera is faced to the light-emitting box (color viewer) of LV13 equiv. with SP3 (R filter) or SP1 (B filter) being put between them, and the adjustment is made so that the difference in G output average between B-G line and G-R line, when the whole screen is divided in areas, can fall in the standard range.

(5) Sensitivity ratio adjustment

With the shutter tester of LV9, the adjustment is made 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. The adjustment is made only under the condition of ISO100, and the average value of the center (425 pixels × 425 pixels) is used. After the adjustment, check with the 5100K color viewer.

(6) Image shutter adjustment

Based on the 1/60 sec. data of LV9, fine-tune the 1/4000 sec. data of LV15. After the adjustment, release the shutter and inspect data deviation nine points of the shot image.

(7) Pixel defect compensation - black point

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

(8) Pixel defect compensation - white point

Shots are taken on the dark surface. In case the pixel output is found to be beyond the standard value, the detected pixel coordinate is additionally written as the pixel defect compensation data.

(9) Getting of reference values

・Sensitivity reference value calculation
The reference body is faced to the color viewer of LV13 equiv. with the ND filter (-5 step) being put between them. Then, store the G output average value of the center (425 pixels × 425 pixels) is stored in the D80BSD.DAT file as the sensitivity reference value.

・Sensitivity ratio reference value calculation
The reference body is faced to the shutter tester of LV 9 equiv. (without filter) and LV13 equiv. (without filter). Then, the sensitivity ratio reference value GR and GB is calculated, based on the G/R/B output average of the center (425 pixels × 425 pixels), and they are stored in the D80BSD.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.

(10) Factory default setting

By reset the settings of camera, factory default settings are restored.

Select the language and video mode to perform.

Because this setting of RP DG-PCB is blank, be sure to set the initial default setting when the DG-PCB is replaced.

When this setting is used, the USB mode is set to "Mass Storage" mode.

(11) Checking of adjustment value

The adjustment value is confirmed, functioning as substitute for the traditional "READING AND REWRITING OF EEPROM DATA.".

(12) Reading of RISC version

The RISC firmware version is displayed.

(13) TFT adjustment

Flickering, color and luminance of TFT are adjusted.

※ Whenever the DG-PCB and TFT monitor are replaced, be sure to perform "REWRITING THE TFT FIXED VALUE.".

9. Procedure

9-1. Shooting image adjustment

- Calculate the "Sensitivity" and "Sensitivity ratio" reference values by using D80 reference body beforehand, then perform the adjustments. (ref. 9-4.)
- For shooting image adjustment, make all items from (1) to (6). The adjustments from (1) through (6) are all programmed to be executed in serial order. When 1 item is completed, the software automatically goes on to the next adjustment.
- In case adjustments are interrupted by NG, the adjustments can be continued again after NG. As for adjustments that were ended with OK, the flash memory updates of the adjustment value 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 luminance of the color viewer to LV13 equivalent.
- Set the shutter tester to LV9.

(1) Gr/Gb difference compensation adjustment (G filter)

- Click "1. Gr/Gb COMPENSATION ADJ (G FILTER)" of the main menu on screen.
- Attach the tool lens (Aperture F5.6) and SP2 (G 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 item.

(2) Sensitivity adjustment

- Click "2. 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.

(3) Shading adjustment

- Click "3. SHADING ADJUSTMENT" on the menu.
- Attach the tool lens (Aperture F5.6) and ND filter (ND 8× 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.
- The software automatically goes on to the next adjustment item.

Caution: If "Data read error" is occurred by PC environment, remove the AC adapter EH-5 and insert it, reboot adjustment software, change the delay time, then execute from "Shading" again.

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

- Click "4. Gr/Gb COMPENSATION ADJ (R/B 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.

(5) Sensitivity ratio adjustment

- Click "5. SENSITIVITY RATIO 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 shutter tester.
- The adjustment starts. When it is completed, "OK" is displayed.
- 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.

(6) Image shutter adjustment

- Click "6. IMAGE SHUTTER INS. & ADJ." 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 shutter tester.
- Make inspection and adjustment with the luminance LV9 and LV15.
- Confirm that the inspection is within standard.

9-2. Pixel defect compensation - black point

- 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 "BLACK POINT" of "PIXEL DEFECT COMPENSATION" of the menu.
- 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.
- The software automatically goes on to the next "WHITE POINT" of "PIXEL DEFECT COMPENSATION". (After the black point compensation, be sure to perform the white point compensation, too.)

Note: In some cases, NG occurs due to dusts on the CCD.
Be sure to clean the CCD surface before adjustments.

9-3. Pixel defect compensation - white point

- 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 "WHITE POINT" of "PIXEL DEFECT COMPENSATION" of the menu.
- 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 "×" button.
- When it is completed, "OK" is displayed.

9-4. Getting of reference values

- 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 "OBTAIN REFERENCE VALUE." of the menu on screen.
- Click "Start".
- 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 obtaining starts. When it is completed, the software goes on to the sensitivity ratio reference value.
- Attach the tool lens (Aperture F5.6). (Remove ND filter).
- Get the camera closest to the center of the illuminated surface of the shutter tester of LV9.
- Get the camera closest to the center of the illuminated surface of the color viewer of LV13 equiv.
- The confirmation of acquired value starts. When it is completed, the sensitivity and sensitivity reference values are stored in the standard setting file (D80BSD.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.

9-5. 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 "RISC VERSION" of the menu on screen.
- RISC version is displayed.

9-6. 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 updating are not displayed even after selecting "FIRMWARE VERSION" from the SETUP menu.

9-7. TFT adjustment

- Provide the power for the camera via AC adapter.
- Connect the camera and PC via USB cable.
- Turn the camera ON.

Flicker adjustment

- Usually the default value can be used, and this adjustment is not necessary.
- If flicker can be checked with eyes, drag the slider and adjust the camera's monitor not to flicker.
- Remove the USB cable from the camera, and also remove the AC adapter without turning the power OFF.

Hue adjustment

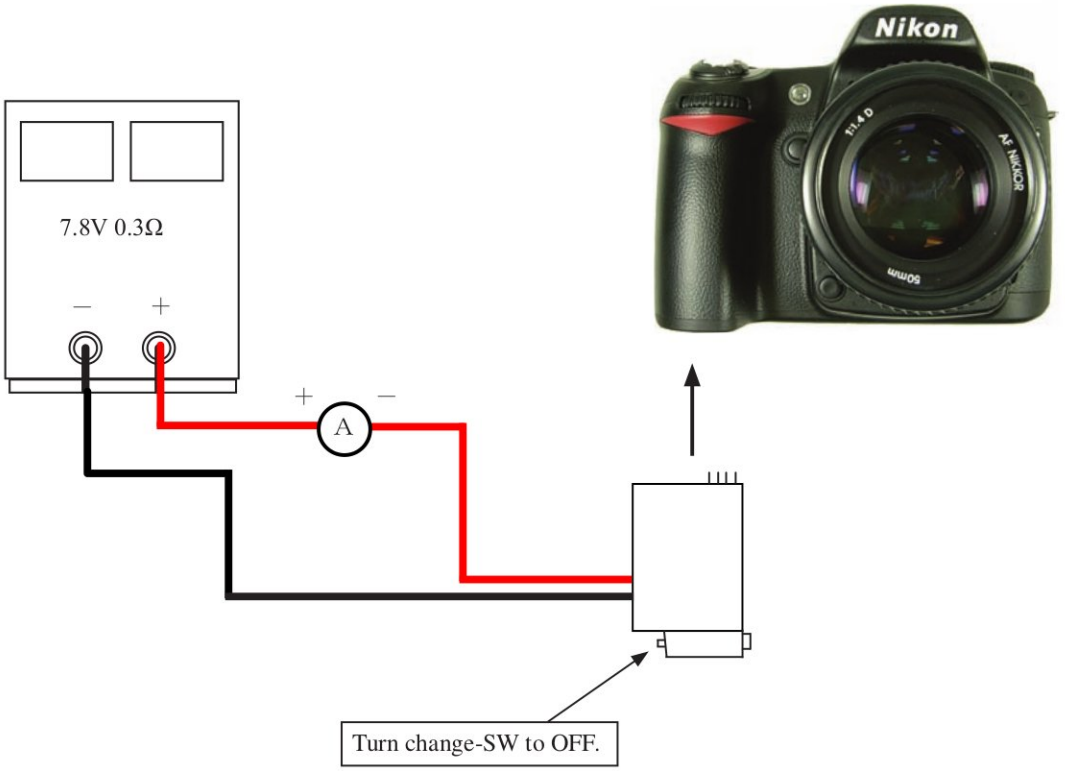
- Usually the default value can be used, and this adjustment is not necessary.
- If improper hue can be checked with eyes, drag the slider and adjust the camera's monitor not to flicker.
- Remove the USB cable from the camera, and also remove the AC adapter without turning the power OFF.

Luminance adjustment

- Usually the default value can be used, and this adjustment is not necessary.
- If improper hue can be checked with eyes, drag the slider and adjust the camera's monitor not to flicker.
- Remove the USB cable from the camera, and also remove the AC adapter without turning the power OFF.

＜ Measurement of Consumption current value ＞

When this camera is used for measuring the consumption current value, connect the battery tool (J61213), and turn the change-SW to OFF. Then make measurements based on the following.



《Inspection standards》

Test item	Standard	Test condition
Main SW・OFF All operational buttons are NOT pushed.	200 μA or less	ref. above. AF50/1.4D、EV12
Main SW・ON (Half-release timer OFF)	200 μA or less	
Main SW・ON (Half-release timer ON)	200 μA or less	
Main SW・ON (Illumination ON)	300 μA or less	
Main SW・ON (TFT ON)	1 A or less	

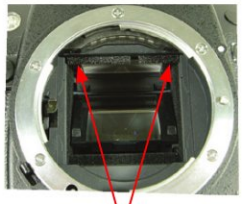
Caution:

When the consumption current value is measured, backup battery must be fully charged.

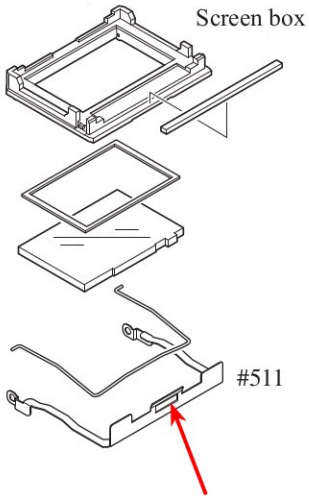
Cleaning between Penta prism and SI-LCD

《In case of cleaning by NOT removing the screen box》

・Take out the two screws (#689), and remove the mirror receiving part.



・Release the claw (indicated by the arrow) of the screen box retaining plate (#511), and lower [#511].



・Pull the screen box section down straightforward until the position shown in the picture.

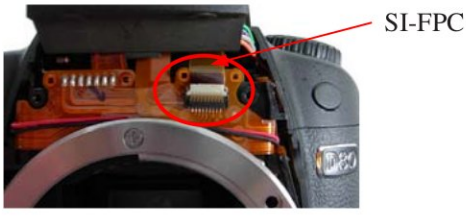
＊ Do NOT pull down with force because the FPC is connected.

・Cleaning by blower is possible from the arrow-indicated area.

・After the cleaning, reassemble the screen box by pushing right upward, and fix with the screen box retaining plate (#511).

《In case of cleaning by removing the screen box》

・Remove the front cover. Disconnect the SI-FPC from the connector, then it is possible to remove the screen box section, and carry out cleaning.

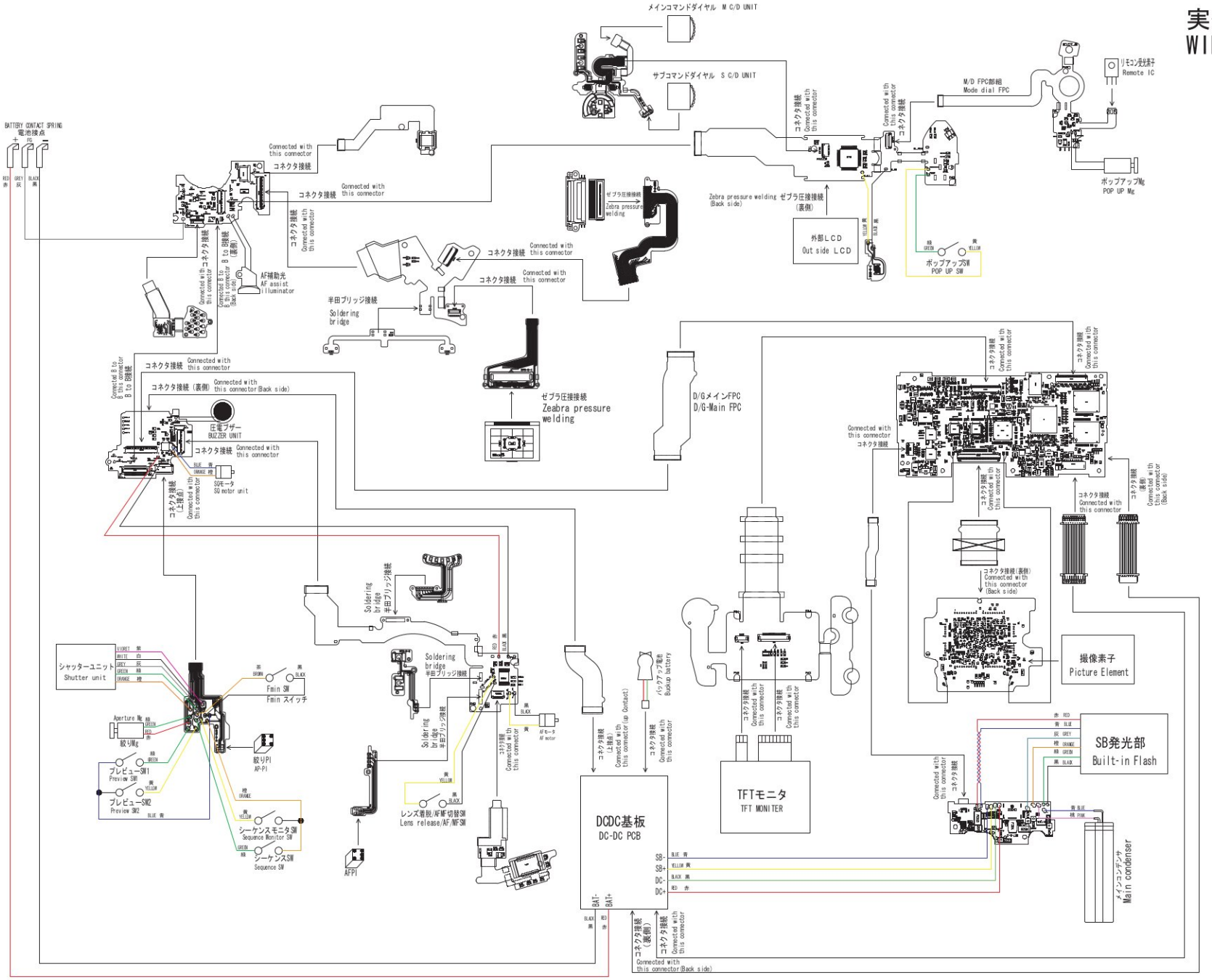


Screen box section

Caution:

When the above cleaning is carried out, check the positioning of the finder field frame 1 (#263), then make assembly. After the assembly, inspect the focusing of the viewfinder. （Refer to Page A15 for positioning.）

実体配線図
WIRING



Inspection standards

Items	Judgment standard	Remarks
External view		
Step (height difference)	Between top cover and apron: 0.2 mm or less Other parts: 0.3 mm or less Moving parts: 0.5 mm or less	Visual check Digital micrometer
Clearance	from Top cover to Apron; to I/F cover: 0.2 mm or less from Bottom cover to Apron; to I/F cover: 0.2 mm or less from Top cover to around grip strap eyelet: 0.3 mm or less from Top cover to around rear cover strap eyelet: 0.4 mm or less When SB is housed, from SB upper case to Top cover; to Apron: 0.3 mm or less Other parts: 0.3 mm or less Moving parts: 0.5 mm or less	
Size / Force		
Shutter release button	Protrusion: 0.8 ± 0.2 mm Halfway pressing force: 100 ± 50 g Halfway pressing stroke: 0.6 ± 0.2 mm Releasing force: 260 ± 70 g Releasing stroke: 0.8 ± 0.25 mm (Half-release pressing ON) Extra stroke after releasing button: 0.6 mm or more Difference btwn Half-releasing and Full pressing force: 51 g or more	Digital micrometer Tension gauge
Aperture lever	3.4 height: 3.4 + 0.1 mm	3.4 height gauge
Main mirror	45° angle: Up-down ± 10' Right-left ± 30' Distortion: 8' or less Clearance for up-mirror in mirror box: None	Collimator Main mirror tool Visual check Feeling in hand Sub-mirror tool
Sub-mirror	59° angle: Up-down 0 ± 20' Distortion: 8' or less	
∞ Infinity focus	±100μm	Collimator ∞ focus lens

Items	Judgment standard	Remarks
AF accuracy Yaw	Center : ± 4 mrad Others: ± 10 mrad	PC Special tool Brightness box
Pitch	Center : ± 5 mrad Others: ± 11 mrad	
Def amount	Others than Side: 0 ± 50μm (Average of 3 times or more)	
AF-assist illuminator Lighting level	Switchable from OFF to ON with EV4.5 - 5.5	Brightness box SB-800
AE accuracy Exposure on image	1/4000: ±0.65EV (excl. AMP) Speed at less than 1/4000 ～ 1/2000 or more: ±0.65EV Lower speed at less than 1/2000: ± 0.5EV	Shutter speed tester AF50/1.4D
Dispersion	Speed at 1/2000 or more: 0.6EV or less Lower speed at less than 1/2000: 0.3EV or less Difference in Metering mode: 0.3EV or less ＊ AE-A mode, each metering mode, ∞, ISO100 Note: AMP: EV3 - 10 SPOT : EV2 - 20 Data spread in min. aperture/ continuous shooting: 0.5EV	
Shutter accuracy Speed accuracy	Speed at more than 1/2000: ± 0.55EV 1/2000: ± 0.35EV (1/2000) ～ 30 : ±0.25EV	Shutter speed tester
Dispersion	1/4000 - (1/2000): 0.4EV or less 1/2000 - (1/1000): 0.3EV or less 1/1000 - 30: 0.25EV or less	
Shutter curtain speed	Both front and rear curtains (16.6mm or less): approx. 3.8 ms or less	
Shutter curtain bound	Black/white bound (within screen frame): None	
Synchronization	Time lag: -0.05-0.5 ms	

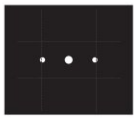
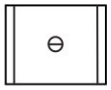
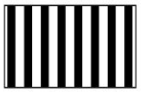
Items	Judgment standard	Remarks
Viewfinder Inner LCD lower panel window position	Up-down position: 0.5 – 1.25a (a= LCD width) from the finder field frame Tilt: 1°or less	Visual check
Finder field frame	Tilt: (Right-left tilt from the lower part of finder field frame): 30' or less Relative angle to image sensor: 30'or less	Shoot the finder field frame with the 0.2-mm-or-less tilt of optical axis from the viewfinder eyepiece optical axis, and measure the angle.
Field of viewfinder (frame covage)	In height and width: 95^{+3}_{-2} %	AF50/1.4D, F5.6
Parallax (Difference of center from the shot image/ sensor)	Up-down: 0.5 mm or less Right-left: 0.5 mm or less	Measure a difference in the center btwn the marked finder field and actual shot object.
Eye point	Distance to eyepiece protective glass: 19.5 ± 10%	Eye point tool Vernier caliper
Battery life EN-EL3e	Professional mode Room temperature: 2500 frames or more 0℃ : : 1900 frames or more ・Setting ISO100, Exposure mode: M, 1/250 sec., F16, AF-C, operation mode: C, Panasonic RP-SDK512J1A, Illuminated surface: LV12, Image quality: BASIC, Image size: M, White balance: A, Halfway press→ Card format → Repeat the below "Operation" → Remove the card when the no. of exposures remaining becomes "0" → Card format →… ・Lens: [AF-S DX18-135/3.5-5.6G] ・Operation: Halfway press for 3 sec. → AF-scan reciprocating motion 3 times → Continuous releases 6 times → TFT playback for 5 sec.→ Half-release timer OFF waiting for 6 sec. General mode Room temperature: 500 frames or more 0℃ : 400 frames or more ・Setting ISO100, Exposure mode: M, 1/250 sec., F16, AF-C, operation mode: S, Panasonic RP-SDK512J1A, Illuminated surface: LV12, Image quality: NORM, Image size: L, White balance: A, Halfway press→ Card format → Repeat the below "Operation" → Remove the card when the no. of exposures remaining becomes "0" → Card format →… ・Lens: AF-S DX ED18-70/3.5-4.5G(IF) ・Operation: Repeat the following the odd-numbered shots and even-numbered shots until the number of exposures remaining becomes "0". Switch power OFF for 1 min. each time 10 frames are shot.	

Shots	Odd-numbered shots	Even-numbered shots
Repeat operation MENU ① - ⑤ .	① Halfway press 5 sec. ② AF scan reciprocating motion once ③ Release… Built-in SB full flash ④ TFT playback 5 sec. ⑤ Half-release timer OFF waiting 6 sec. ※ Activate the flash of AF-assist illuminator.	① Halfway press 5 sec. ② AF scan reciprocating motion once ③ Release… Built-in SB full flash ④ TFT playback 5 sec. ⑤ Half-release timer OFF waiting 6 sec. ※ Do NOT activate the flash of AF-assist illuminator.

Items	Judgment standard	Remarks
Standby / consumed current	Main SW / OFF: 250μA or less (Do NOT press any operational buttons.) Main SW / ON (Half-release timer: OFF): 250μA or less Main SW / ON (Half-release timer: ON): 250μA or less Main SW / ON (Illumination: ON): 300μA or less Main SW / ON (TFT ON): 1A or less	Constant-voltage power source (5A or more) Battery tool (J61213) Ammeter AF50/1.4 EV12
Operation time / consumption current accumulated	Lens scan AF50/1.8 Operation time: 1000 ms or less Consumption current accumulated: 500mAsec or less AF70-210/4-5.6 Operation time: 2000ms or less Consumption current accumulated: 800mAsec or less Preview Operation time: 200ms or less Consumption current accumulated: 120mAsec or less Release without memory card Operation time: 300ms or less Consumption current accumulated: 250mAsec or less	Constant voltage power source (5A or more) Battery tool (J61210) Special tool Oscilloscope LV12
Clock accuracy	Difference par month: ±30 seconds (20℃)	Wave clock
BC level	Level 5: 5 lights up Charge remaining: 70 ～ 100% Level 4: 4 lights up Charge remaining: 50 ～ 69% Level 3: 3 lights up Charge remaining: 35 ～ 49% Level 2: 2 lights up Charge remaining: 20 ～ 34% Level 1: 1 light up Charge remaining: 1 ～ 19% Level 0: 1 light blinking Charge remaining: 0%	Check the level in the LCD control panel on top of camera or TFT battery information Communication-capable battery tool
Bulb battery life	When special Li-ion is used: 2 and a half hours or more	Clock Remote wire

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
★	J15428		AE CCD 位置出し工具 AE CCD positioning tool	
	J18394		無限合致調整用スクリーン Infinity focus adjustment screen	FOR D200
	J18389		反射ミラー Reflection mirror	FOR D200
★	J18412		カメラ部点検、調整ソフト Inspection and adjustment software for CAMERA	
★	J65091		撮像部点検、調整ソフト Inspection and adjustment software for IMAGING	
	J18230		ＹＡＷ、ＰＩＴＣＨ工具 Yaw,Pitch adjustment tool	FOR F5,F100,F90,F90X,D70,D70s.D50.D200
	J15259		ＡＦ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		ＡＦ調整用Ｚレンズ（１ｍ用） Z adjustment lens (For 1m)	FOR F5,F100,D70,D70s.D50.D200
	J15274		J15264 用チャートボード Chart board for J15264	
	J18344		ＡＦチャート AF adjusting chart	FOR D100,D70,D70s.D50.D200

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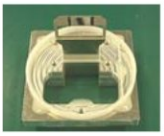
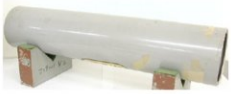
J19110 	小型バック出しコリメータ Back focus collimator	
★ J18409 	サブミラー５９°出し工具 Sub mirror angle adjustment tool	
J18037-2 	オプチカルパラレル Optical parallel	
J18004 	絞りレバー高さ点検工具 Aperture lever positioning gauge	
J19004-1 	インジケータ及びスタンド （ボディバック台、ゲージ） Dial indicator and Stand	
J18001-1 	ボディバック出し工具 Body back focus gauge	
J19001 	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 Standeard Lens 50/1.8	払底品
J61199 	D100 AE 受光部アダプター D100 LIGHT RECEIVE ADAPTER	FOR D100,D2H,D2X
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

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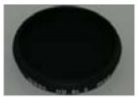
J18267 	ＡＦ５０／１．４Ｄ Lens AF50/1.4D	
J61185 	撮像関係調整用レンズ D1 Standard lens	FOR D1,D2H,D70,D70s,D50 D200
J18191 	ＮＤフィルター８Ｘ ND filter 8X	FOR D2H,D70,D70s,D50.D200
J18358 	ＮＤフィルター４Ｘ ND filter 4X	1枚使用 It uses by one pieces
J63070 	カラービュワー Color Viewer	
J63068 	輝度計（BM-3000） Luminance Meter BM-3000	
J63085 	ﾌｨﾙﾀｰ SP1（75X75MM） Filter SP1（75X75MM）	FOR D2H,D70,D70s,D50.D200
J63086 	ﾌｨﾙﾀｰ SP2（75X75MM） Filter SP2（75X75MM）	FOR D2H.D200
J63087 	ﾌｨﾙﾀｰ SP3（75X75MM） Filter SP3（75X75MM）	FOR D2H,D70,D70s,D50.D200
★ J61213 	電池工具 Battery tool	
J19109 	ＭＣ－３１（接続コード） ＭＣ－３１（CONNECTING CORD）	

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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（φ1.5mm） HEX.KEY WRENCH（φ1.5mm）	汎用品 RJ is Not available
	ＡＦ２８／２．８Ｄ Lens AF28/2.8D	製品転用 RJ is Not available