PENTAX™

Service Manual

ENGLISH

PENTAX K-r

Product No.77420

HOYA CORPORATION
PENTAX Imaging Systems Division
Technical Service Group
11.10 N.T

[TABLE OF CONTENTS]

PREPARATION

The following preparations are required before disassembling and assembling the camera.

1. Prepare the Jigs; tools and testers (Refer to the table of Jigs, tools and testers.)
2. Make the preparation for adjustment with referring [Preparation of Adjustments].

Preparation of Adjustments

[Required equipment]

Programmed software for 77420(CD-ROM)

Computer (PC)

OS: Windows XP SP2 CPU: 1GHz or more RAM: 512MB or more

Free disk space (HD): 500MB or more

SD card 5 pieces (16Mb or above) --- for FW

SD card reader or USB cable (I-USB17) --- For connecting with PC

1. Prepare SD card (5 pcs) for confirming adjustment

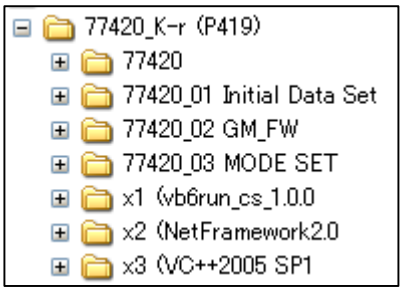
***prepare SD card (5pcs)**

1. For Product FW (Firmware)
2. For writing Initial Data
3. For Initial set (Initialize / Product shipment)
4. For test mode ON / OFF (For confirming full version, 1 pcs each)

2. Installing procedure of the Adjustment Software (Setting of the Computer)

***Set programmed software for 77420 (CD-R) to CD-ROM drive.**

① Copy the [77420] folder from the programmed software contained in the CD-ROM to [C: drive]
② Copy the file from [GM_FW] folder to SD card --- For Product FW (Firmware)
③ Copy the 2 files from [Initial Data Set] folder to SD card. --- For writing Initial Data.
④ Copy the file from [Initial Set] folder in the [MODE SET] to SD card.--- For Initial set (Initialize)
⑤ Copy the file from [Test mode ON] and [Test mode OFF] folder in the [MODE SET] to each SD card.
(Since the name of all files is the same, you should distinguish them by name label etc.)



3. Installing software

[Important] Install below 3 kind of software (The same as 77010:K20D and 77050:K200D)

1. Net Framework Ver2.0 (Common with 77010 and 77050. It is not required if the software is already installed)

2. VC++2005 SP1 (Common with 77010 and 77050. It is not required if the software is already installed)

3. VB Runtime (Common with other product. It is not required if the VB Runtime is already installed)

* Set Programmed software for 77420 (CD-R) to CD-ROM drive.

① Select [dotnet.exe] from the [NetFramework2.0] folder in CD-ROM then double click icon. Installer will be started up and follow the instruction on the screen and continue with the installation.

② Select [vcredist_x86.exe] from the [VC++2005 SP1] folder in the CD-ROM then double click icon. Installer will be started up and follow the instruction on the screen and continue with the installation.

③ If [VB Runtime] is not set up to your PC yet, select [setup.exe] from the [vb6run_cs_xxx] folder in CD-ROM then double click icon. Installer will be started up and follow the instruction on the screen and continue with the installation. (Refer to the service manual for 76700 for details)

4. Calibration of light source for Digital adjustment

[Important] Execute Calibration of light source before 77420 Digital adjustments.

When replaced the program software, replaced light source or replaced AE master lens, it is required calibration. (Refer to the service manual for 76830 K10D for calibration procedure)

[Required equipment]

K10D Master body for calibration (HOYA Corporation will rend the master body. Please contact with us)

Digital adjustment software for 77420 (M-test)

Computer (Windows Xp, support USB), Light source (Example: LB3300, A light source)

Master lens for 76180 (D20 or D20-01), and F8 set ring

***Use the same master lens as the ID number printed on CD-ROM to adjust it accurately.**

USB cable, AC adaptor for 76830, Dark curtain, Color temperature tester (for calibrate light source),

LV meter (for check LV value)

4-1. setting for computer

Complete the [2. Setting for computer] of [PREPARTAION]. (Use software for Digital adjustments)

4-2. Calibration of light source

① Before calibration, turn ON the light source and leave 30 minutes for stabilizing light source.

② Calibrate Color temperature and Brightness by using color meter and LV checker as shown below table.

Light source	Brightness	Color temperature
LV12	LV12.00Ev ±0.50	2,856K ±30

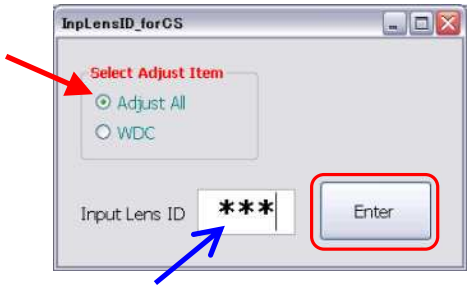
*Calibrate with using the master body according to the following procedure.

4-3. Setting for Master body and Master lens

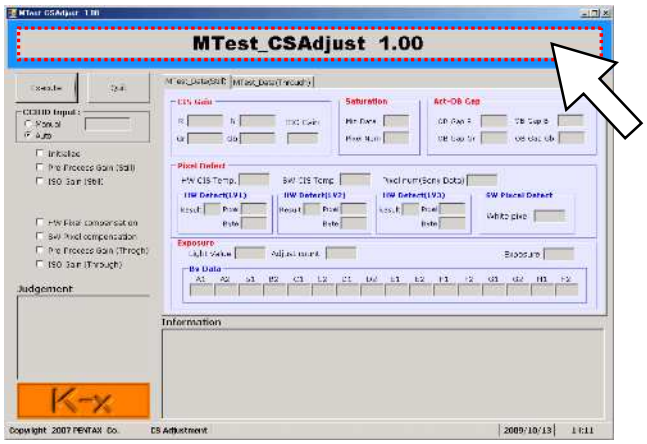
① Set the mode dial to [M].
② Set the focus mode lever to [MF].
③ Set SR function [OFF].
④ Attach the master lens and F8 set ring to the body.
⑤ Set the master lens aperture to [F8 position]

4-4. Procedure for calibration

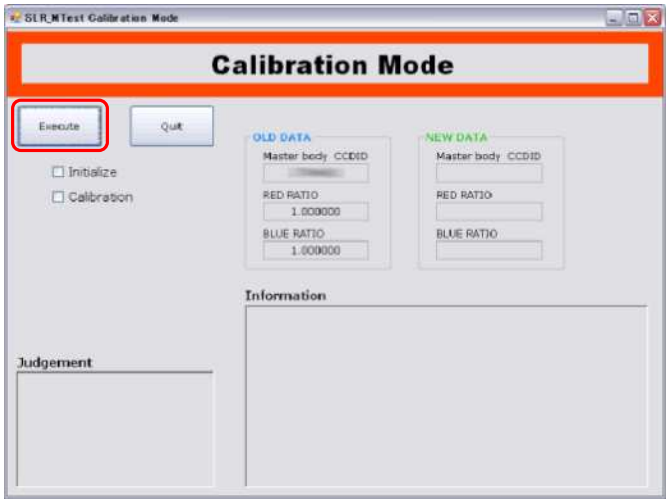
① Connect the AC adaptor to the master body.
② Connect to PC with USB cable.
③ Turn ON the power and confirm that the camera is recognized by PC.
④ Set the light source to [LV12].
Surely set the camera and lens toward center of light window and cover the whole camera and light window by using a dark curtain
⑤ Double crick the adjusting software[K-r_ SLR_MTest.exe] in [K-r_ MTest] folder to start-up.
⑥ On first screen, select [Adjust All] and input the lens ID number correctly then click [Enter].



⑦ When below screen is displayed, click around the title in blue frame to change calibration mode.

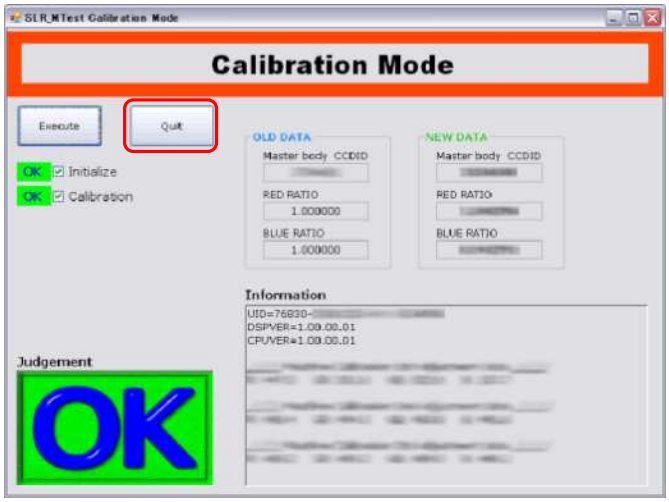


⑧ Click Execute on calibration mode to start calibration.



⑨ Confirm the light source is set at LV12 then click OK to execute.
(Shutter will be released 15 times)

⑩ When calibration is completed, OK screen will be displayed.
⑪ Click [X] button or Quit to finish adjustment software.



* If adjustment is NG, refer to [table of error code].

Outline of Assembly and disassembly

1. Caution

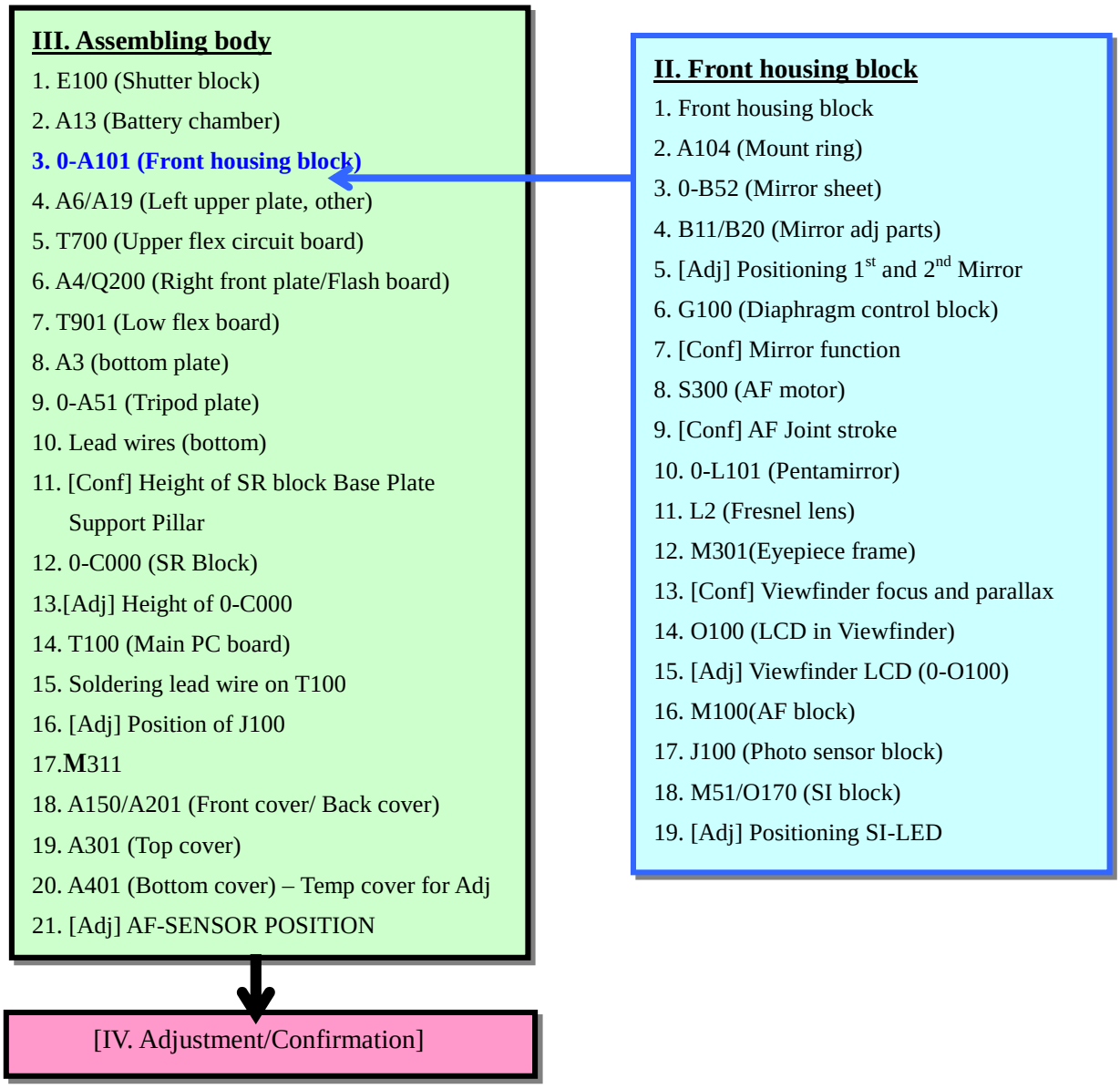
1. Be sure to use the anti-static mat and wrist strap to prevent static failure of circuits.

2. This product is used lead free solder.

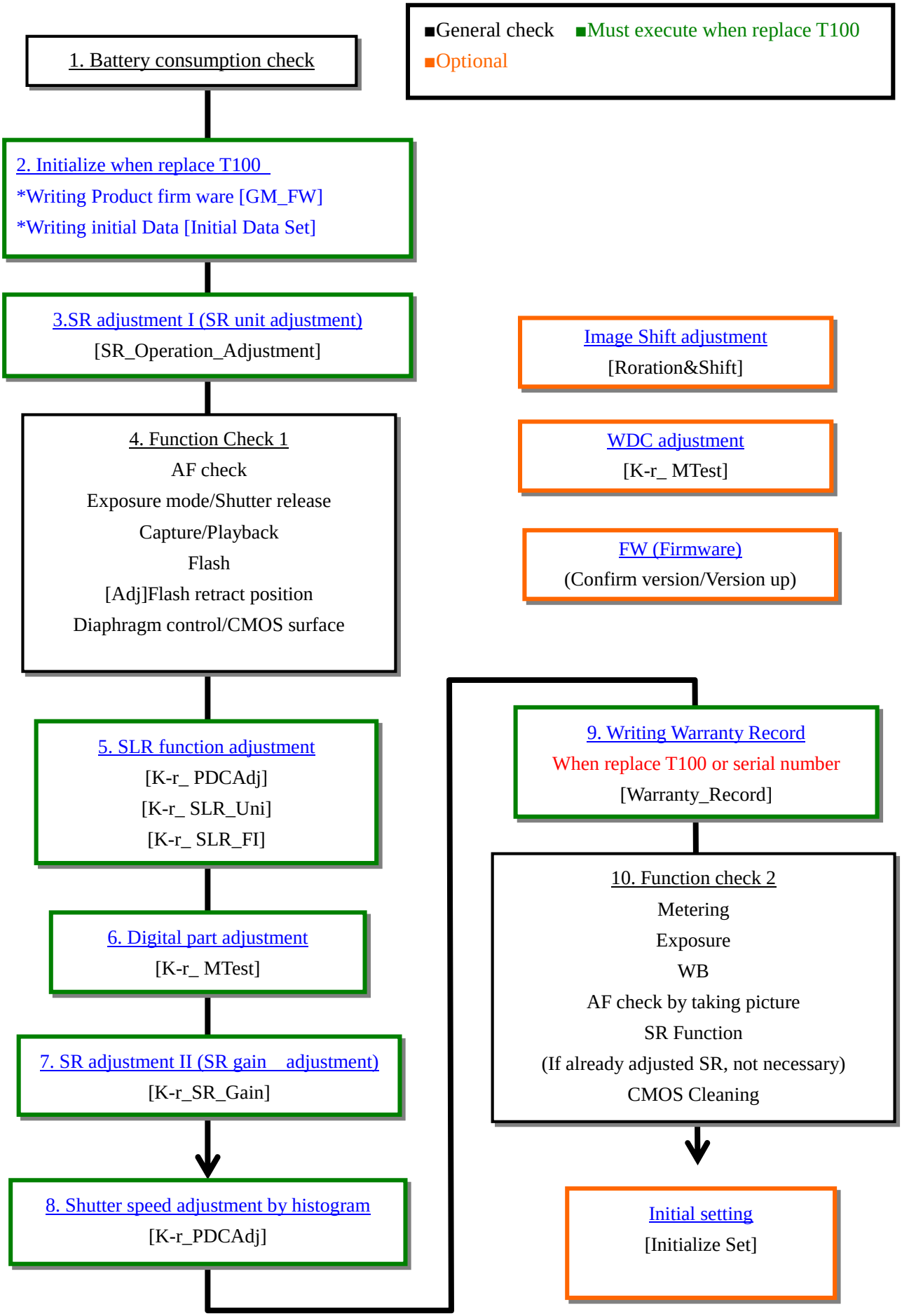
Surface of solder will be white-tinged color. Solder quickly, because melting temperature is high and so if heat too much, it is possible to damage to PC board. Soldering iron requirement: The temperature can be adjusted up to 400℃ and exclusive use for lead free solder. Also it is desirable to use antistatic soldering iron. The temperature for tip of soldering iron must set between **340℃～360℃** for lead free solder.

3. Do not stress to the connector terminals and flexible boards because they are very delicate parts. Pay careful attention to the connector terminals and flexible boards and, we recommend marking to the flexible board before disconnecting them. This will be helpful to reconnect the flexible board to the connector terminal properly.

2. Flow chart for assembling body and Front housing



3. [IV. Confirmation/ Adjustment] Flow



Assembly and Disassembly

I. Disassembly procedure of main body

[Preparation] Remove the Hot shoe cover and Eye cap from the main body.

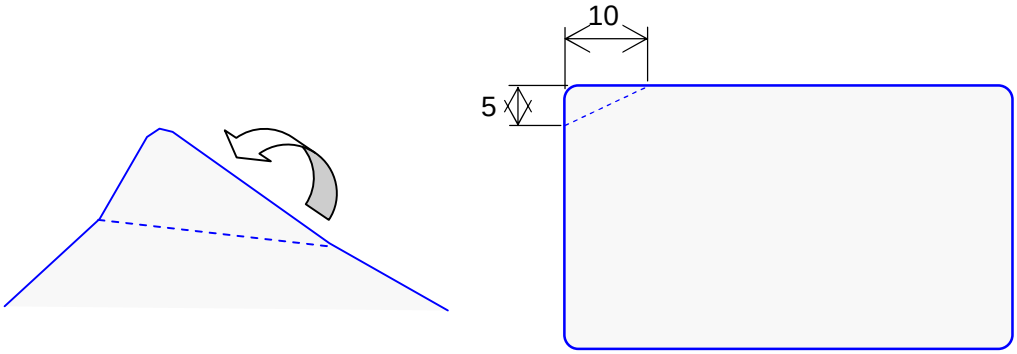
1. POP-up the built-in flash

① For removing top cover, install the batteries to the camera and turn on the camera then pop-up the flash by pressing pop-up button.

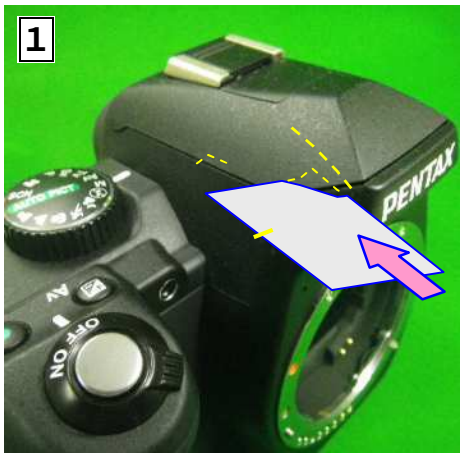
***If the camera does not pop-up the flash.**

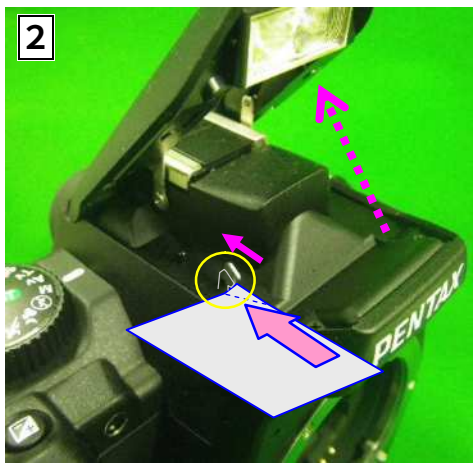
②[Preparation] Use flash pop-up tool as shown in follow.

(The same tool as MZ-7) --- Use such as thin magnetic card and processes it as follow.

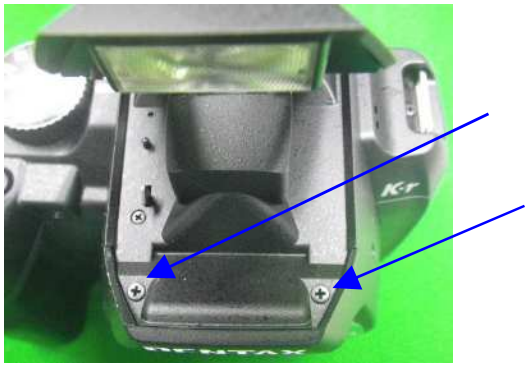


③ Procedure for pop-up.





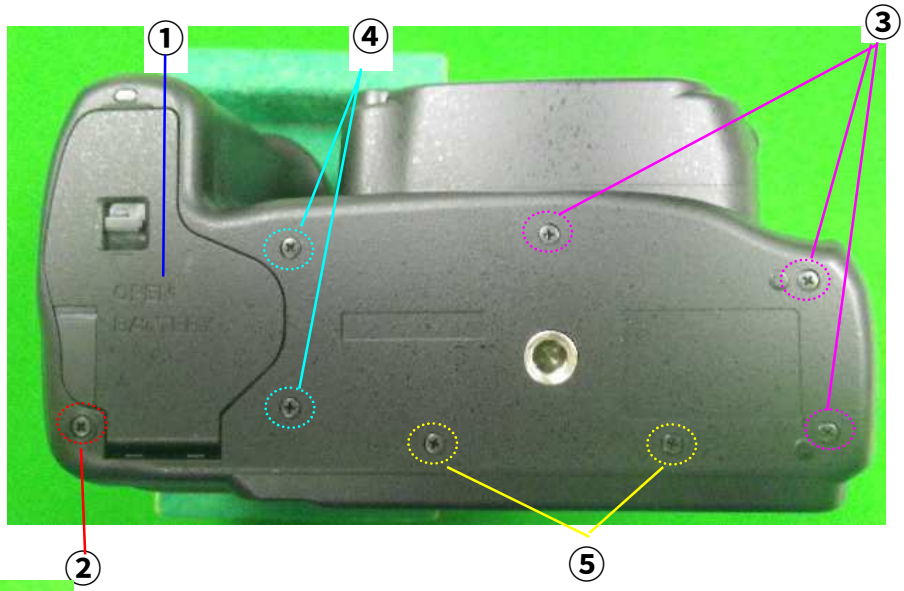
④ Unscrew U2 x2 (CNL-D 1.7x4.0)

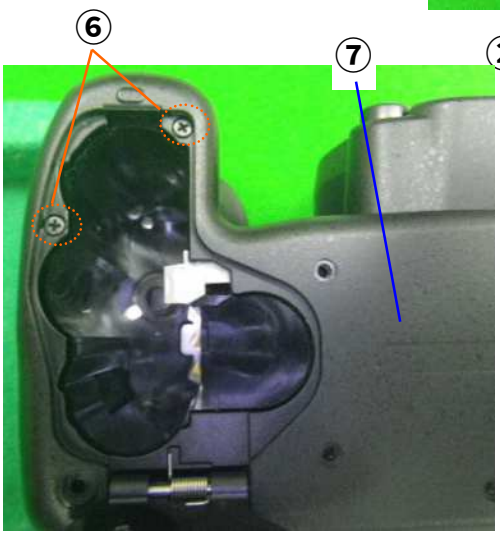


2. Removing A401

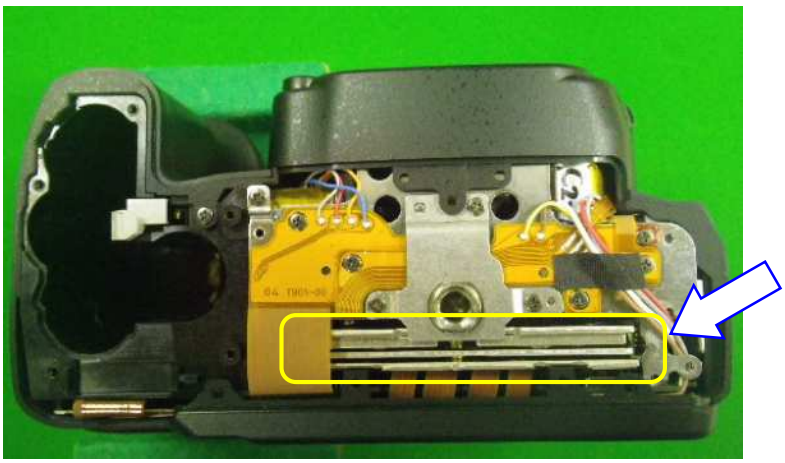
[CAUTION] There is strong magnet in the CCD/SR blocks therefore please do not place a screw or magnetic card near the camera after outside cover is removed.

① Open the battery cover.
② Unscrew U4 (1.7x7.0)
③ Unscrew A34 x3 (1.7x5.0)
④ Unscrew A255 x2 (1.7x4.5)
⑤ Unscrew A185 x2 (1.7x3.5)
⑥ Unscrew A191 x2 (1.7x6.0)
⑦ A401





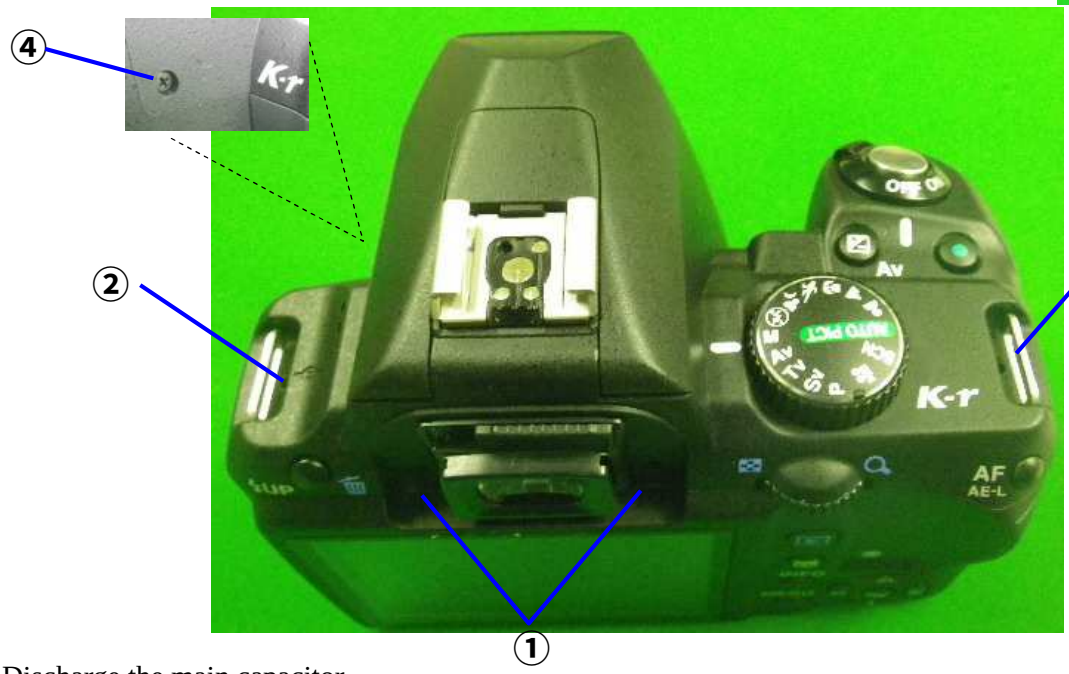
[CAUTION] Do not make impact to SR/CCD block on bottom side as shown in figure below.



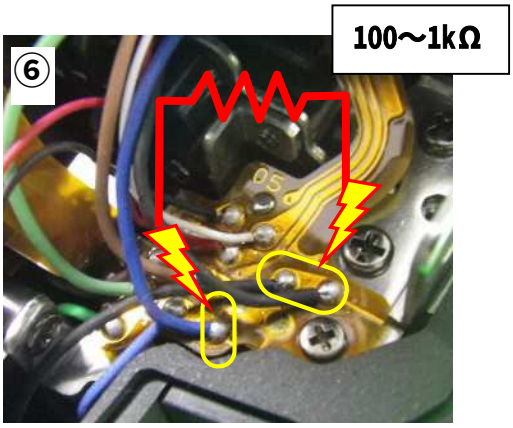
3. Removing top cover (0-A301)

① Unscrew A68 x2 (1.7x6.0)
② Unscrew A196 (1.7x8.0)
③ Unscrew A255 (1.7x4.5)
④ Unscrew A187 (1.7x5.0)
⑤ Unscrew TY-CNL-D1.7x4.5 Ni（In the battery box）

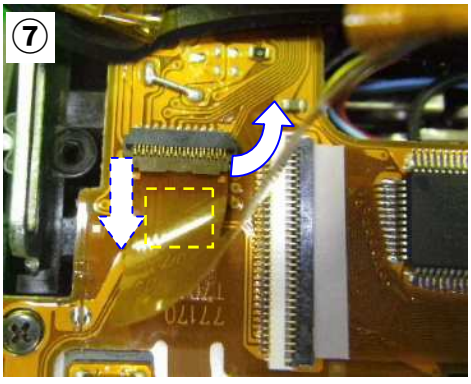
[CAUTION] Be careful the electric shock where flash circuit board is inside the cover.

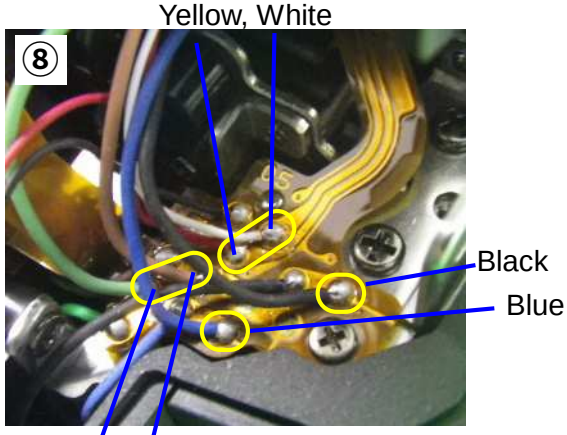


⑥ Discharge the main capacitor.
*Rift up the A301 and discharge the main capacitor by using 100Ω-1kΩ resistor.
(Discharge between Blue and Black soldering land on T750.)



⑦ Disconnect T50 (Flip lock) and peel off the double-stick tape.
⑧ Unsolder lead wire x6
⑨ A301





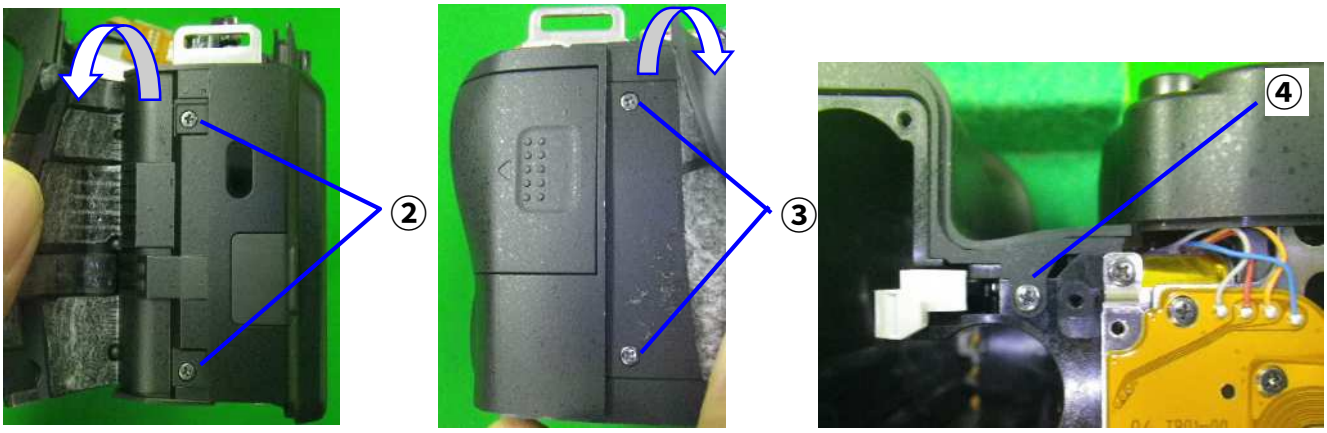
4. Removing A150 and A201

① Set the AF mode lever to [AF]

② Peel off the G rubber (A161) and unscrew (CNL-D 1.7x4.0 x2)

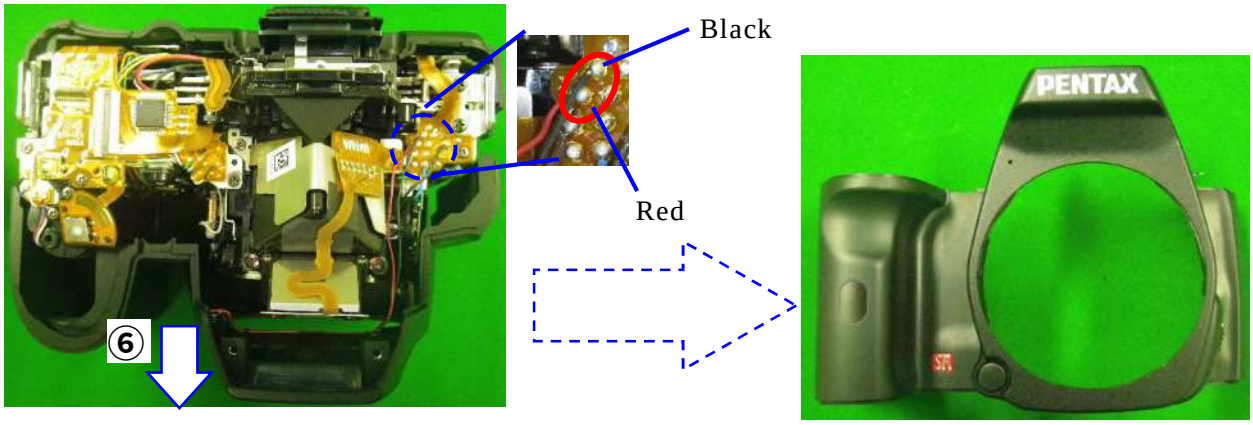
③ Peel off the G rubber (A151) and unscrew (TY-CNL-D 1.7x4.5 x2)

④ The bottom side of camera, unscrew (TY-CNL-D 1.7x4.0)



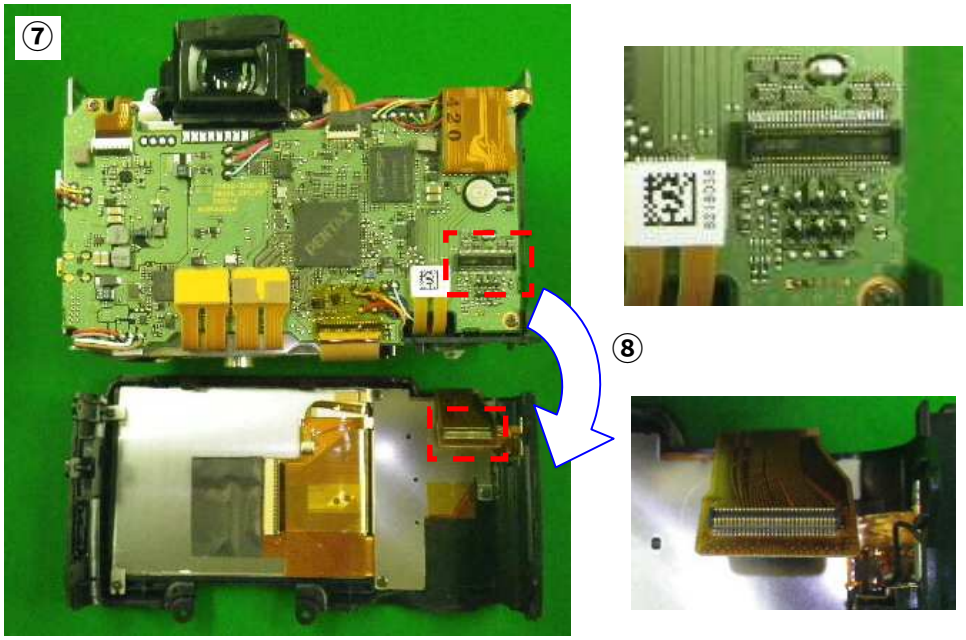
⑤ Unsolder lead wire x2 (Red, Black)

⑥ A150 --- Remove A150 while lifting side of grip part as shown in figure below.



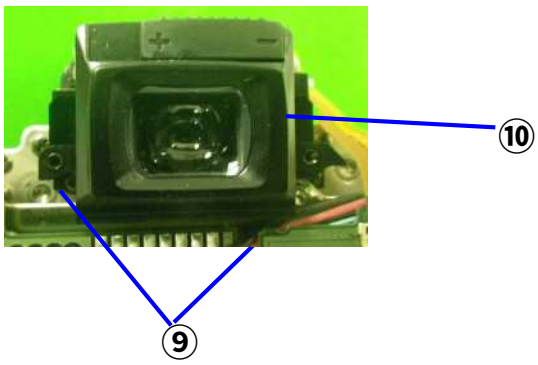
⑦ A201 --- Remove A201 while lifting side of both as shown in figure below.

⑧ Disconnect T920 (Plug-in)



⑨ Unscrew CNL-D1.7x3.0 x2

⑩ M311



5. Removing 0-T100

① Peel off PI tape (U3 (13x17))

② Peel off PVF tape (A38 (3.8x10))

③ Disconnect flexible board (2 positions Flip lock)

④ Disconnect flexible board (4 positions Plug-in)

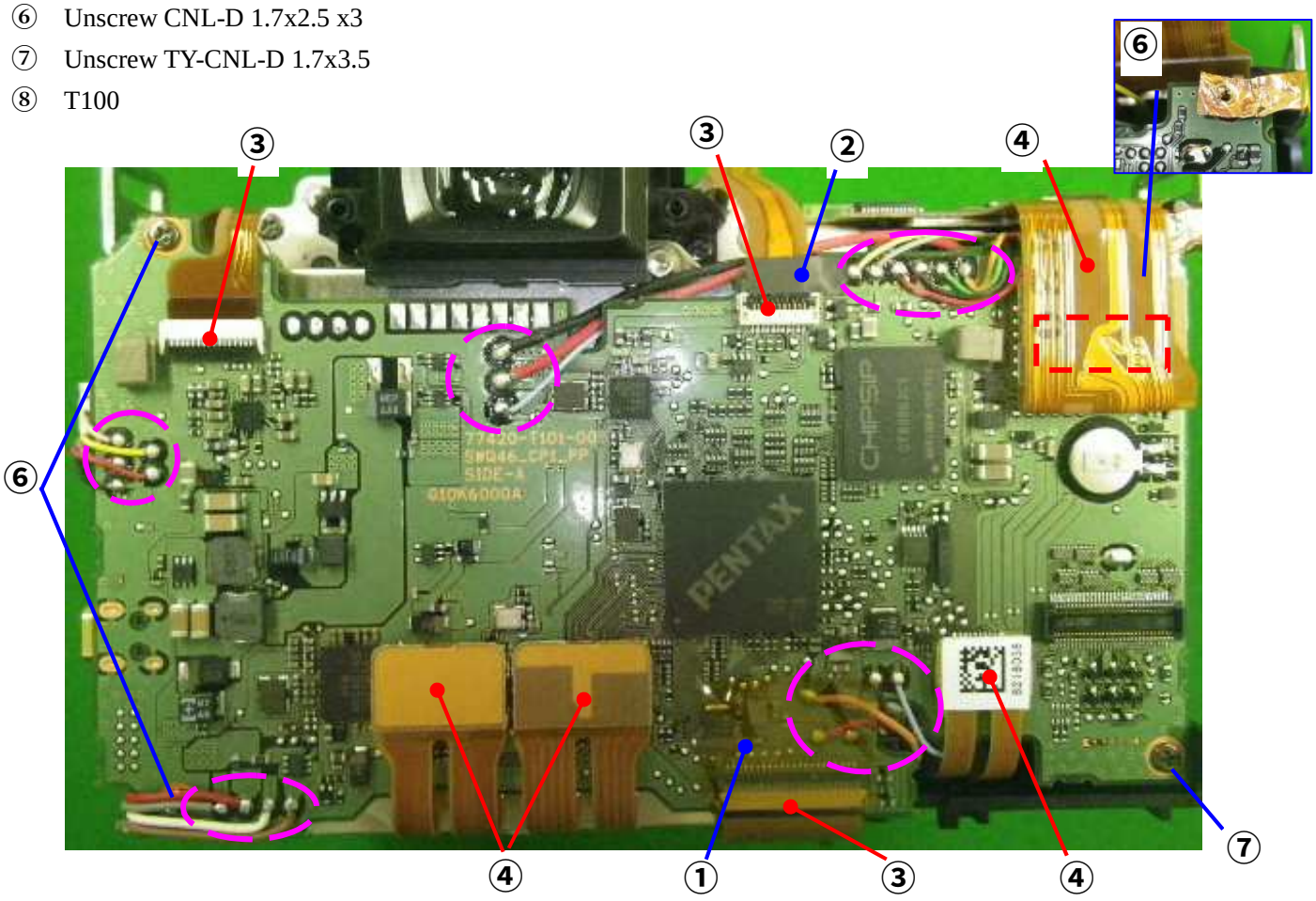
[CAUTION] The flex from CCD block should be taken care (no stress, no bend), otherwise it will affect the performance of CCD.

⑤ Unsolder lead wire x24

⑥ Unscrew CNL-D 1.7x2.5 x3

⑦ Unscrew TY-CNL-D 1.7x3.5

⑧ T100



6. Removing 0-C000 (SR block)

[Requires equipment] Hexagon wrench 1.5mm

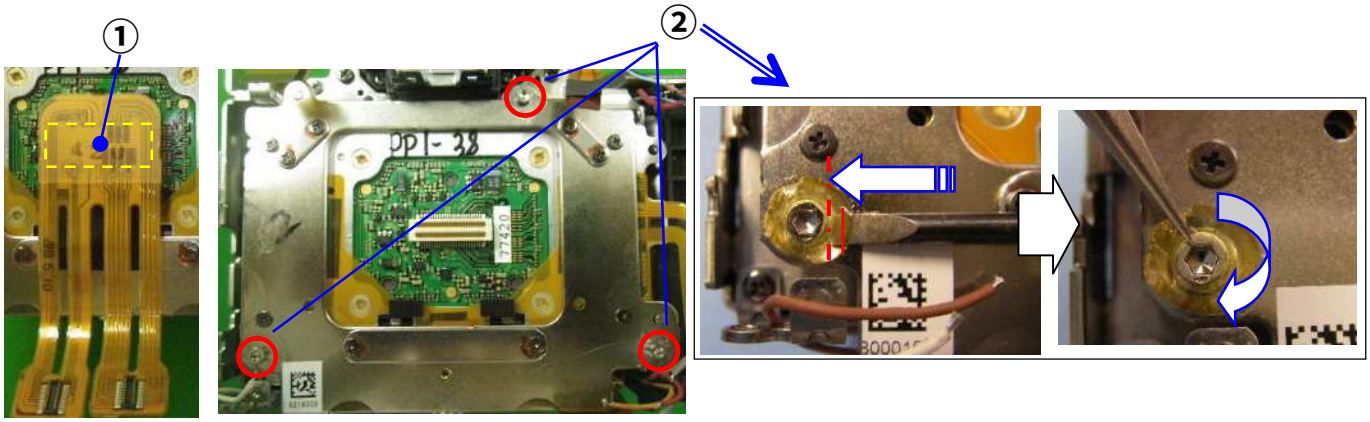
[CAUTION 1] Pay attention, there is powerful magnet is carried in the SR block.

[CAUTION 2] Since performance can be damaged, the SR block cannot be disassembled and also don't apply the external pressure to a movable part.

[CAUTION 3] The flex from SR block should be taken care, otherwise it will affect the performance of SR function.

① Disconnect T640 with care. (Plug-in) *Do not damage on T640.

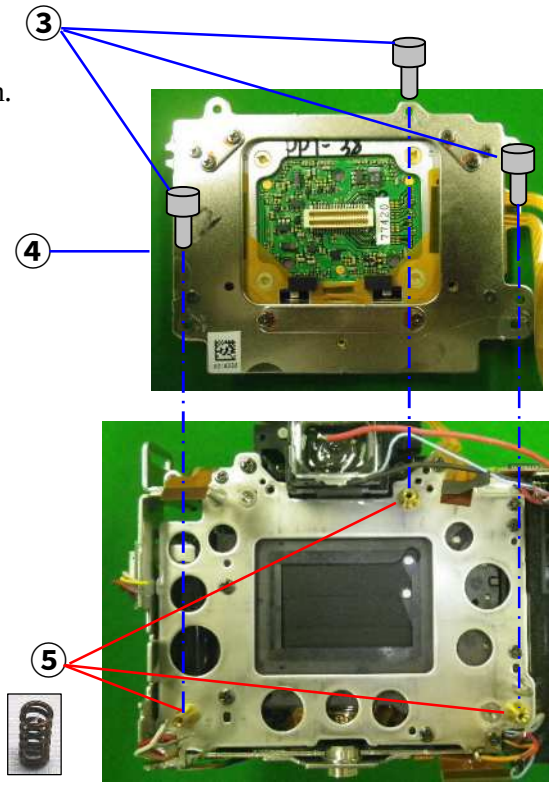
② Remove the glue with using tools. (3 Points) --- Peel off part of glue by tool then turn screw.



③ A31 Adjusting screws x3 by using Hexagon wrench 1.5mm.

④ 0-C000 --- Do not scratch on surface of sensor.

⑤ A22 Coil springs x3.



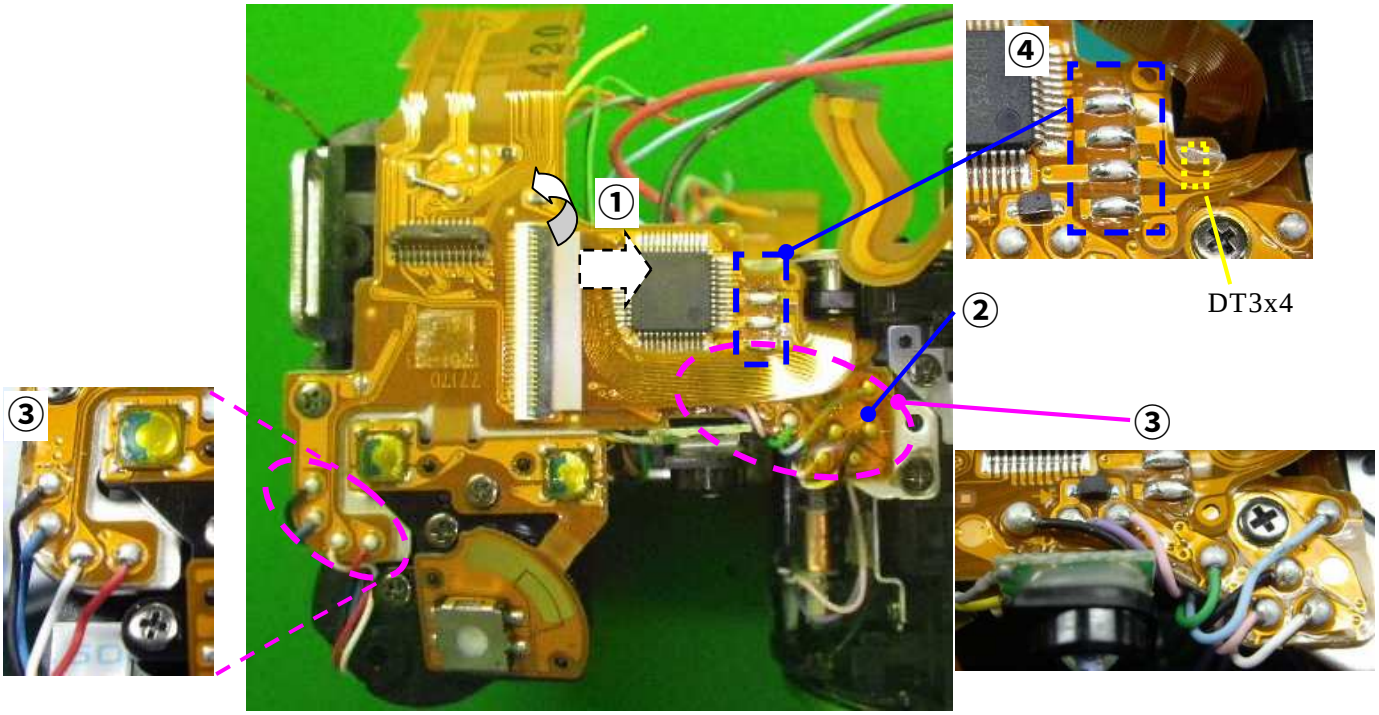
7. Removing T700

① Disconnect O100 flex from connector. (Flip lock)

② Peel off PI tape (T89)

③ Unsolder lead wires x12

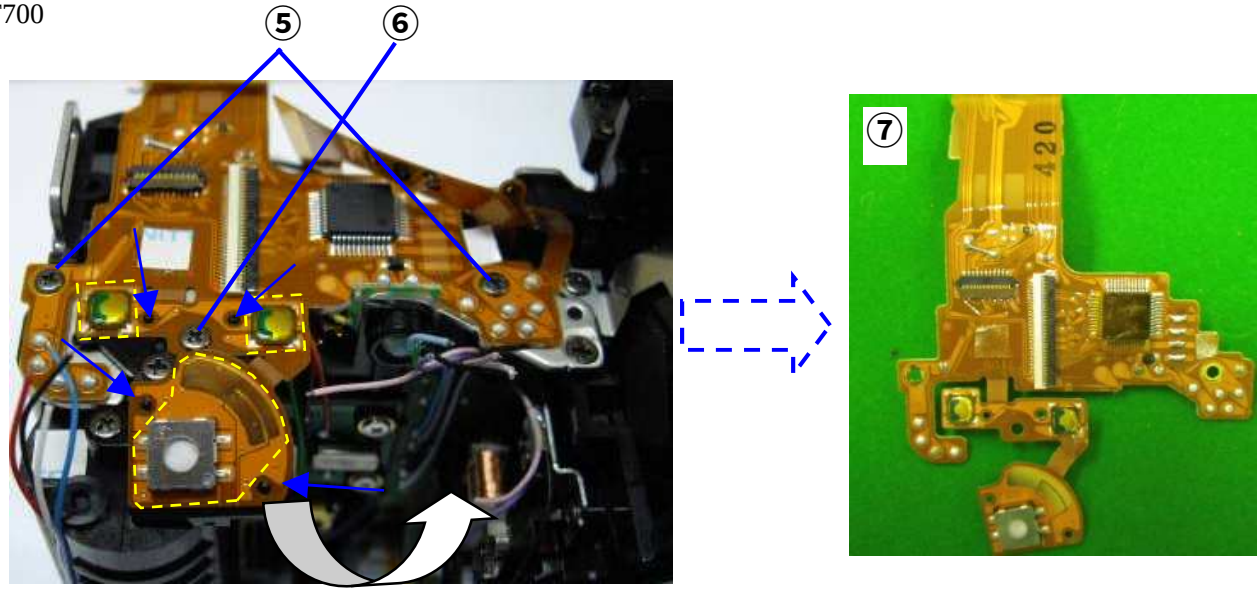
④ Unsolder flex 4 lands on T71 (G100)



⑤ Unscrew CNL-D1.7x1.6 x2

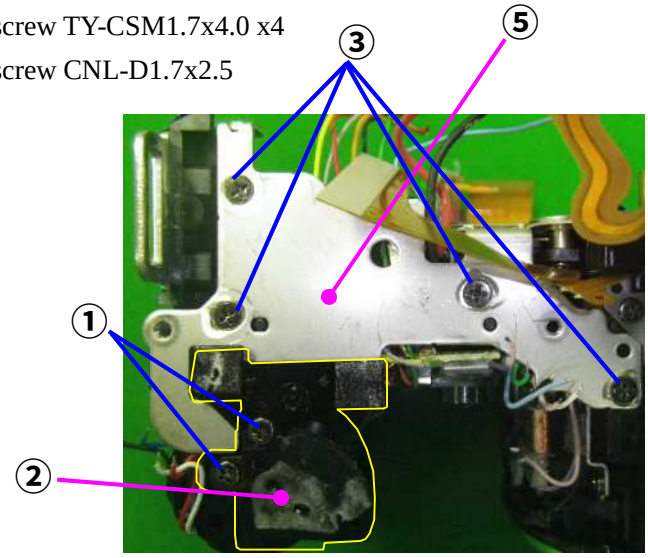
⑥ Unscrew TY-CNL-D1.7x2.5

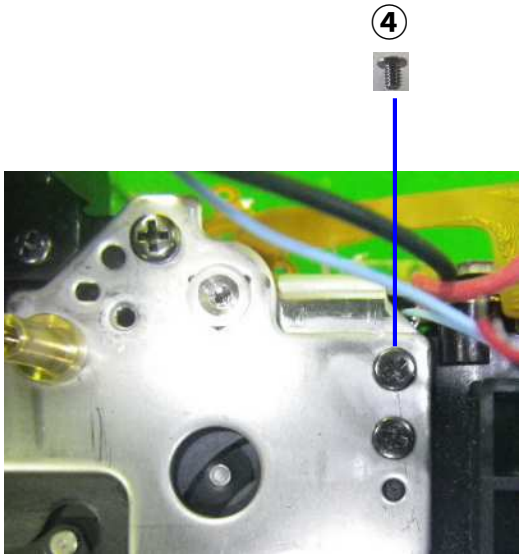
⑦ T700



8. Removing A6, A19

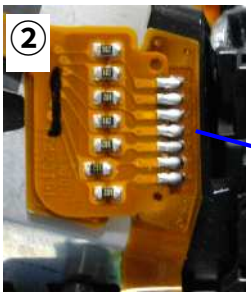
① Unscrew TY-CNL-D1.7x4.0 x2
② A19
③ Unscrew TY-CSM1.7x4.0 x4
④ Unscrew CNL-D1.7x2.5
⑤ A6

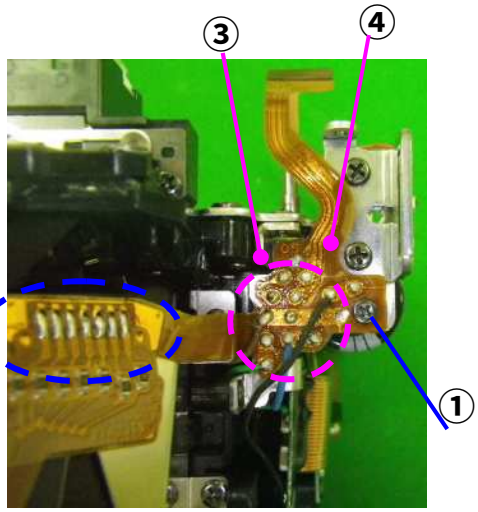




9. Removing T750 (Strobe flex board)

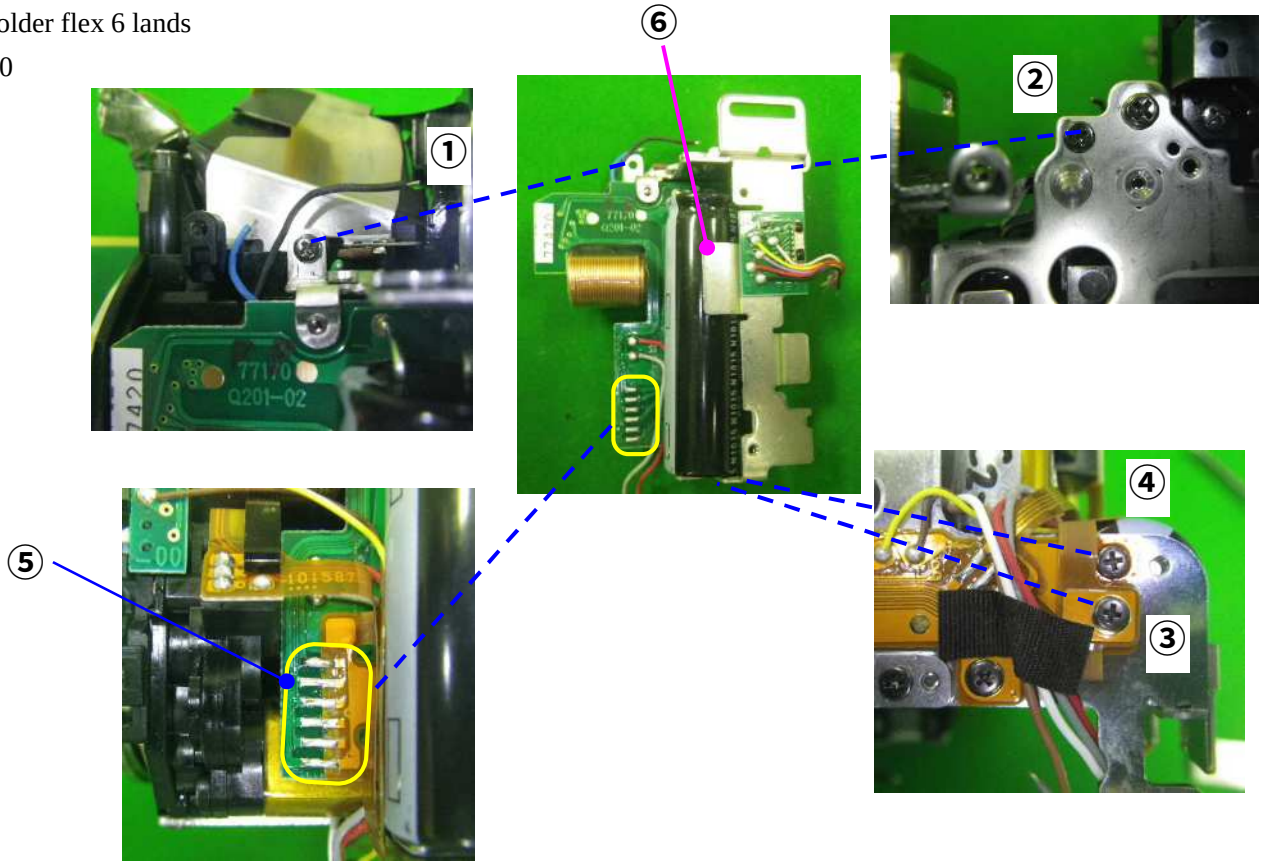
① Unscrew CNL-D 1.7x3.0
② Unsolder flex 7 lands on O170
③ Unsolder lead wires x4
④ T750





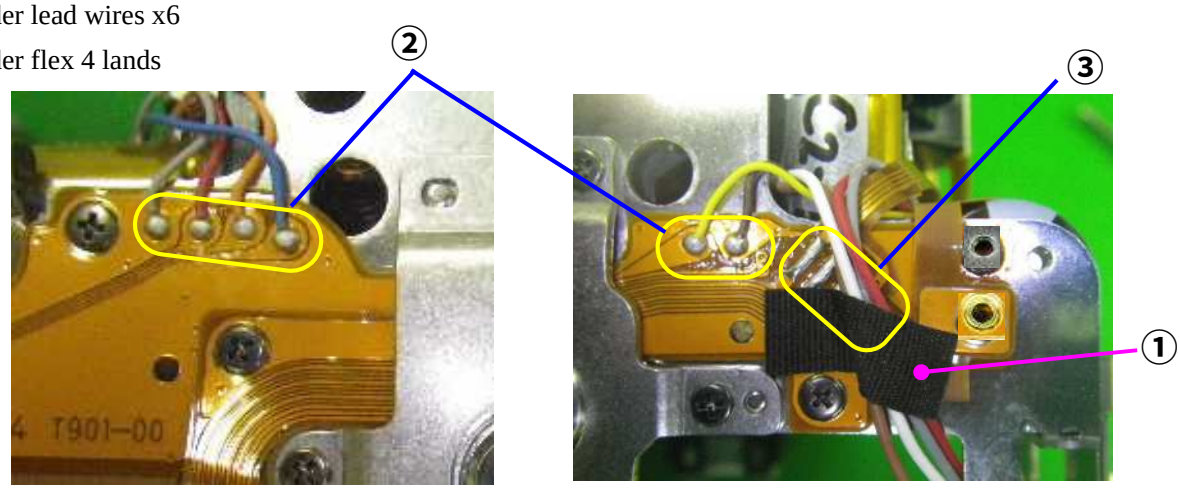
10. Removing A4,Q200 (Right front plate, Strobe circuit block)

① Unscrew TY-CNL-D1.7x4.0
② Unscrew CNL-D1.7x2.5
③ Unscrew CNL-D 1.7x1.6
④ Unscrew CNL-D 1.7x2.2
⑤ Unsolder flex 6 lands
⑥ Q200



11. Unsolder lead wires (Bottom side)

① Peel off BT
② Unsolder lead wires x6
③ Unsolder flex 4 lands

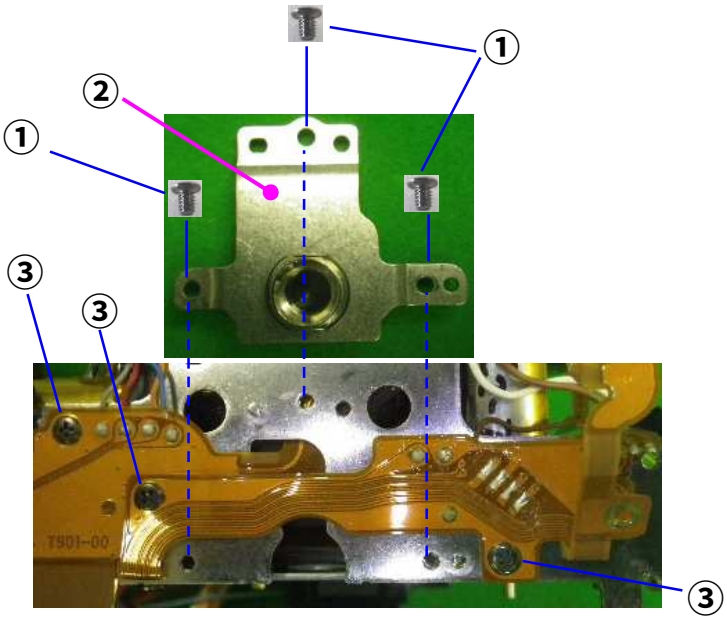


12. Removing 0-A51 (Tripod plate assy.)

① Unscrew CNL-D1.7x2.2 x3

② 0-A51

③ Unscrew CNL-D1.7x1.6 x3

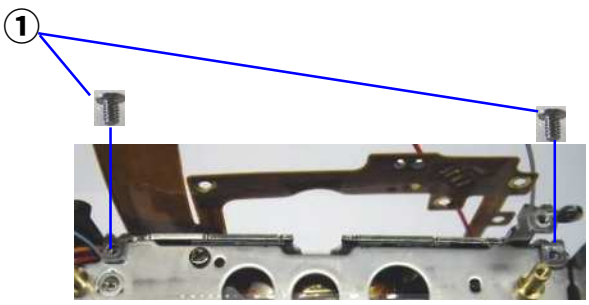


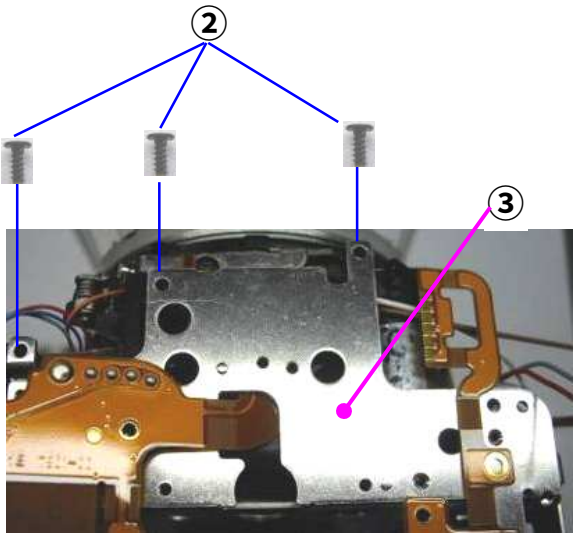
13. Removing A3 (Bottom plate)

① Unscrew CNL-D1.7x2.5 x2

② Unscrew TY-CNL-D1.7x4.0 x3

③ A3





14. Removing T901 (Lower flex board)

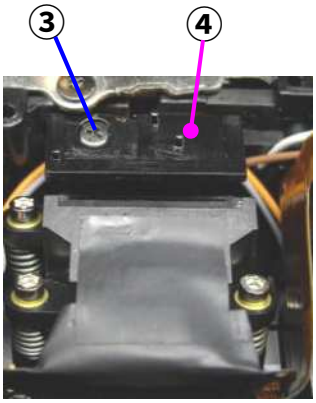
① Unsolder flex 22 lands (T301, M100)

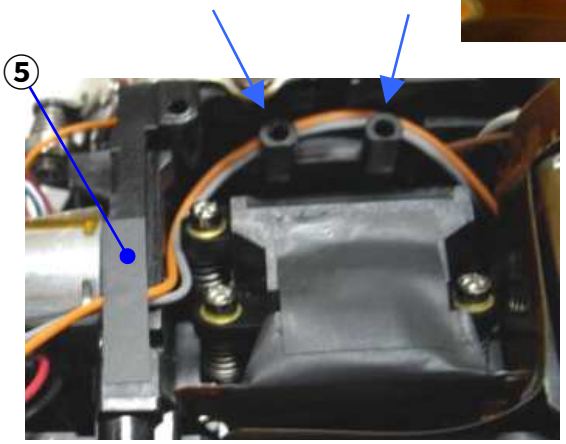
② T901

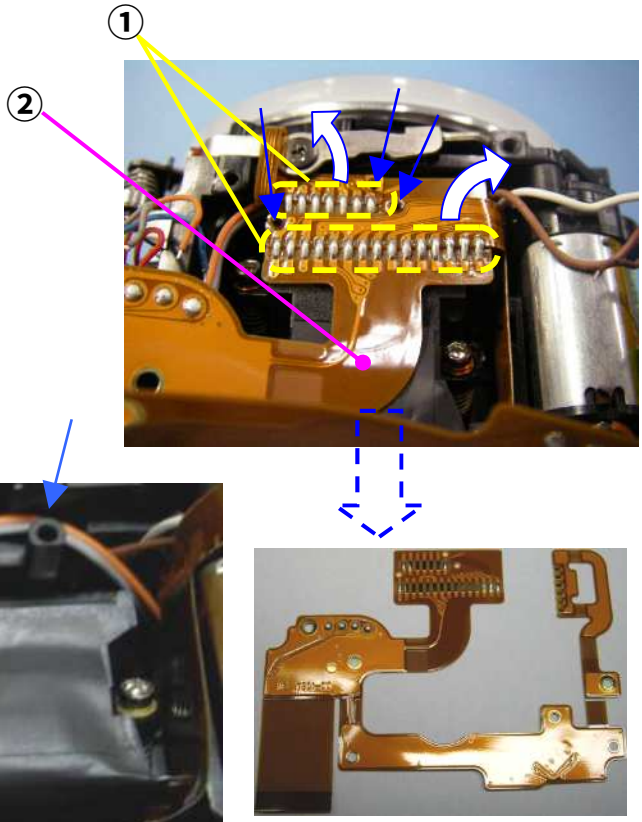
③ Unscrew TY-CNL-D1.7x3.5

④ A141

⑤ X58





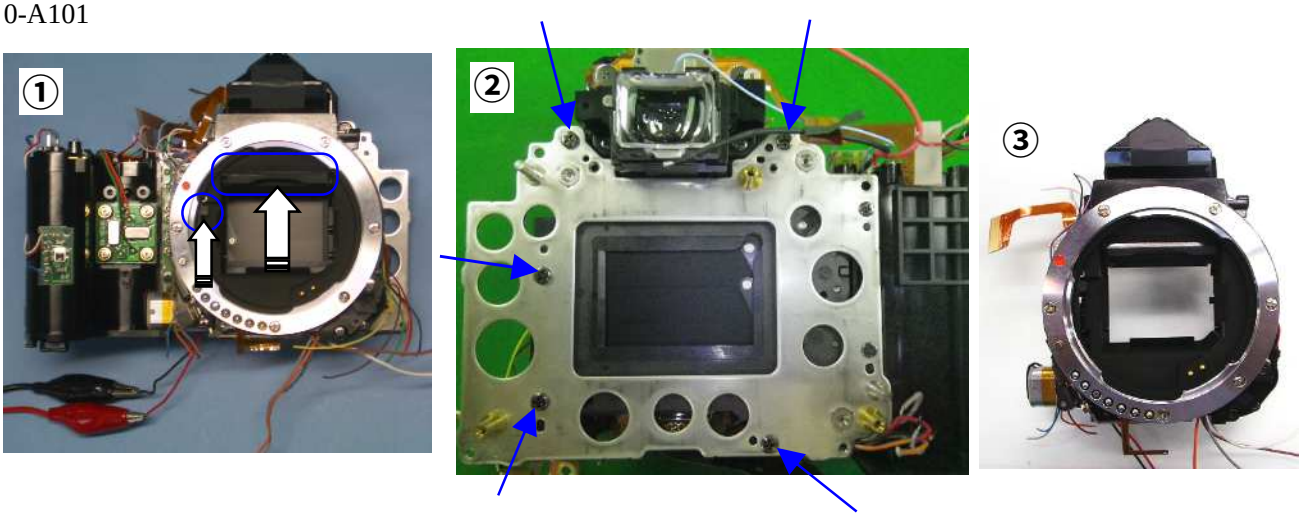


15． Removing 0-A101 (Front housing assy.)

① Set the mirror seat top position before removing G100.
Apply DC 2V to 0-S250 and set the mirror seat at top position. (Red lead wire with +)

② Unscrew TY-CNM2.0x5.0 x5

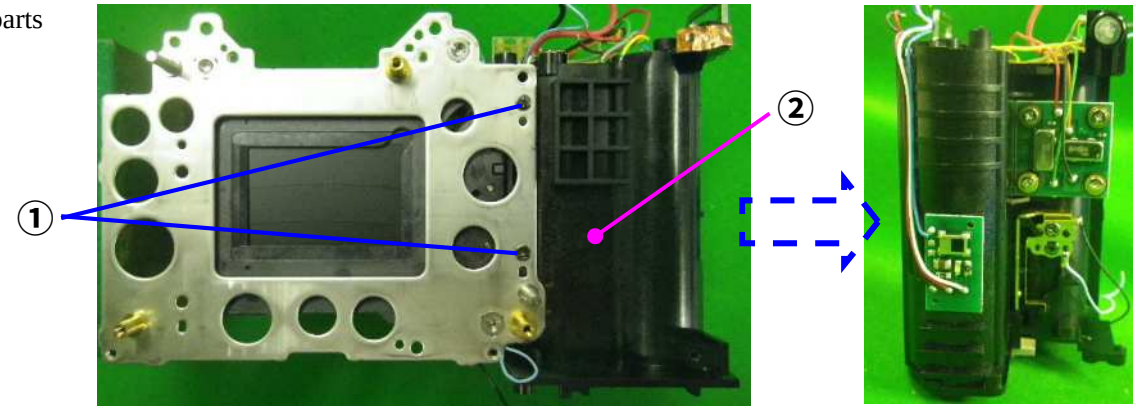
③ 0-A101



16. Removing A13 and related parts

① Unscrew TY-CNL-D1.7x4.0 x2

② A13 and related parts

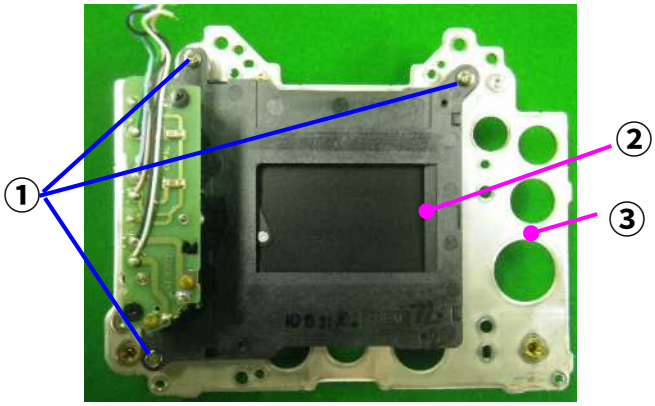


17. Removing E100 (Shutter block)

① Unscrew A70 x3

② E100

③ Master plate (Not supply)



II. Assembly and disassembly procedure of front housing block

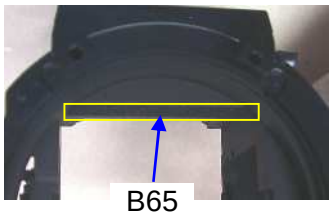
***Disassemble the front housing block in reverse of assembly procedures.**

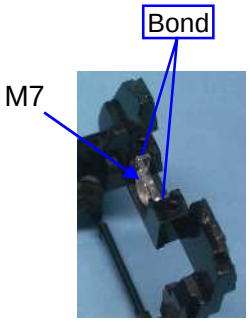
***Some pictures are using previous model but basic structural is the same as K-r.**

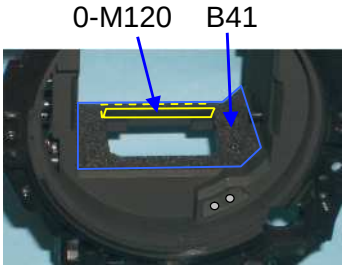
[Assembly]

1. Front housing block

- B65
- B41, 0-M120 (DT(4x15))
- M7 --- Confirm that the surface of lens is clean.

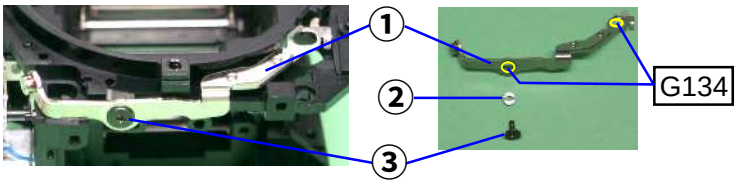




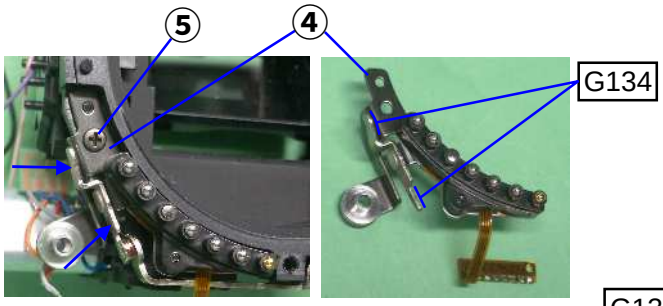


2. A104

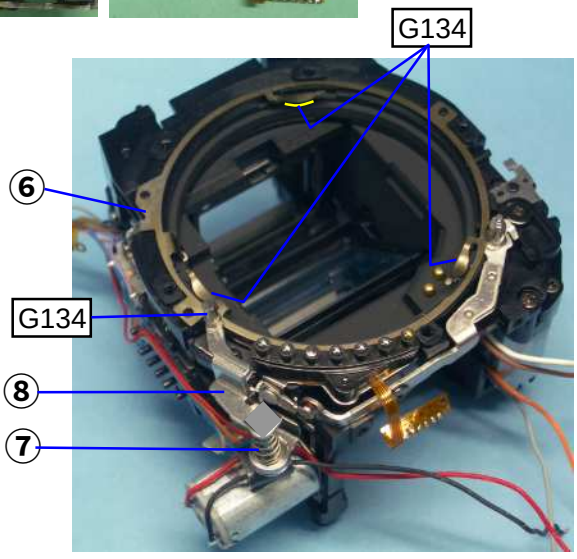
① 0-A121
② A133
③ TY-CNL-F1.4x4.0



④ 0-A126 and related parts.
Apply G134 as shown in figure.
⑤ TY-CNL-D1.7x3.0



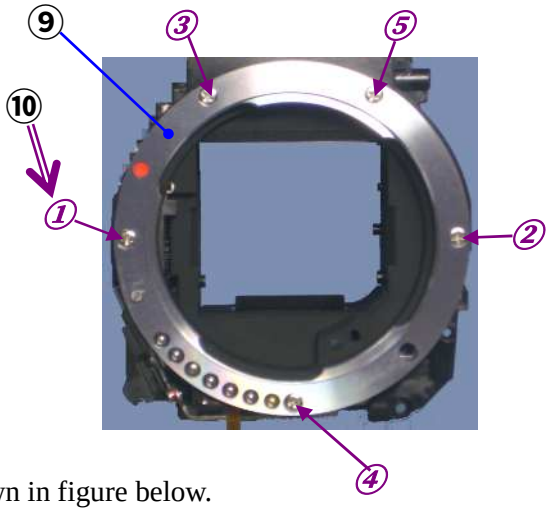
⑥ A105 --- Apply G134 as shown in figure.
⑦ A110
⑧ 0-A108 --- Apply G134 to two shaft part.



⑨ A104

⑩ TY-CNS2.0x4.5Ni x5

*Tighten screw diagonally as shown in figure.



3. 0-B52

① B58 x2 --- [Temporary position] Installing position as shown in figure below.

② B59

③ TY-CNL-G1.7x2.0

④ 0-B52 (mirror sheet)

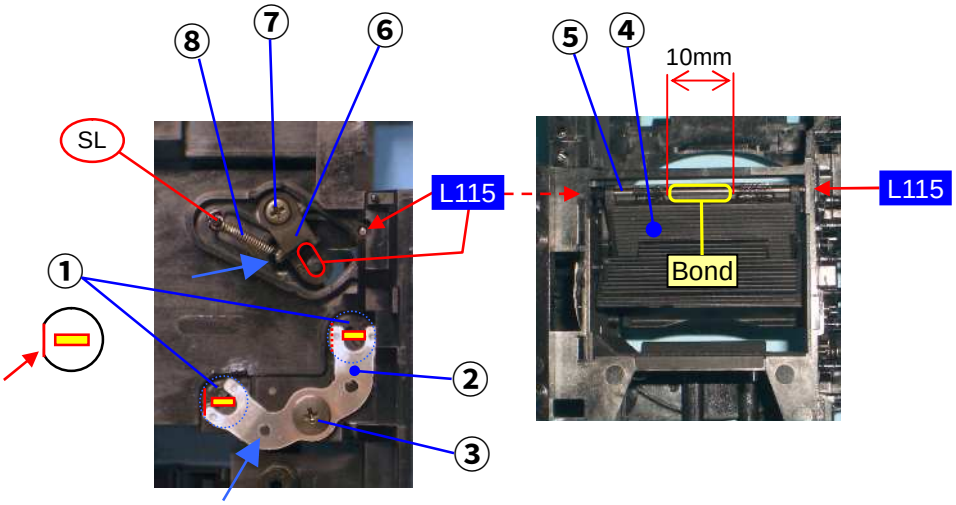
⑤ B66 (shaft) --- Apply L115 at both side of B66 as shown in figure below.

Apply Daia bond (black) to fix 0-B52 as shown in figure below.

⑥ B63

⑦ B57

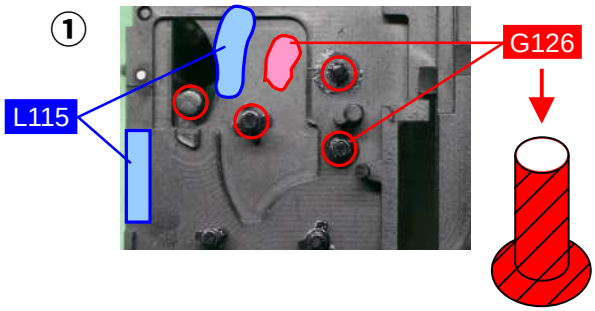
⑧ B62 (spring) --- Apply screw lock.



4. B11 • B20

① Apply G126 (5 positions) and L115 (2 positions) as shown in figure.

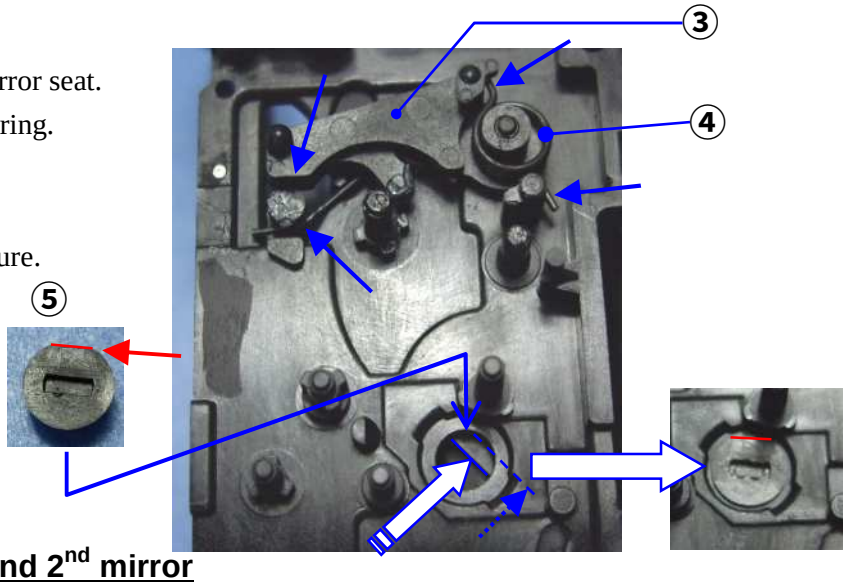
② Install B20 to B11.



③ B11 --- Hook the spring to shaft of mirror seat.
[CAUTION] Caution for come off spring.

④ B19

⑤ B70 --- Push up 1st mirror then
Surely install B70 as shown in figure.



5. [Adjustment] Positioning 1st and 2nd mirror

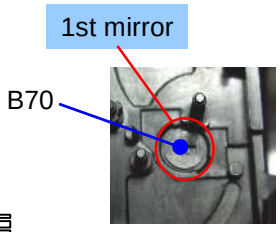
[Required equipment] 1st mirror angle (45 °) adjustment tool,
Mirror angle adjusting for 27830 (need modify), Mirror positioning scope.

*** Adjustment is performed by turning B70 and B58 (1 pcs). The Y-axis (the vertical direction) is adjusted to a 0 target.**

*** Front housing must set mirror down position.**

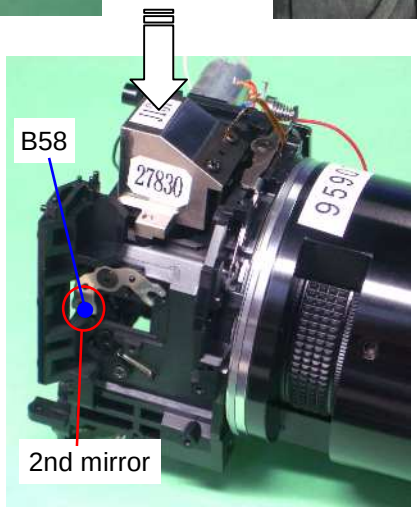
① Position 1st mirror : Put the 1st mirror angle (45°) adjusting tool on the camera, and then adjust the mirror seat so that the adjusting tool touches the mirror without gap.

Tolerance --- X-axis: ±10'
Y-axis: ±10'

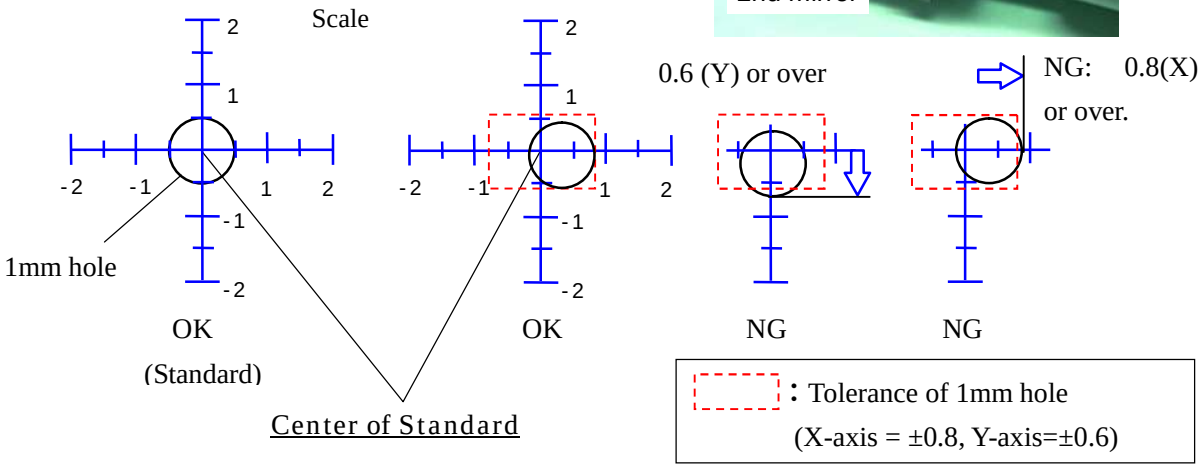


②Positioning 2nd mirror : Attach the mirror positioning scope and the 2nd mirror angle adjusting tool to the camera, and then adjust the mirror angle while looking through the eyepiece lens.

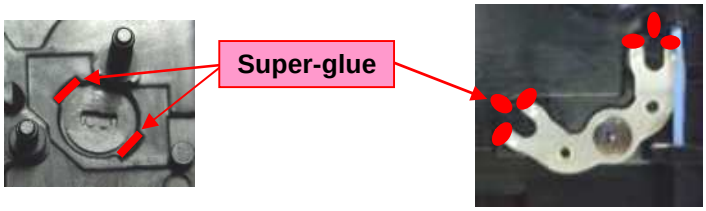
Tolerance --- X-axis: ±0.3mm
Y-axis: ±0.1mm
(Refer to below tolerance for positioning scope)



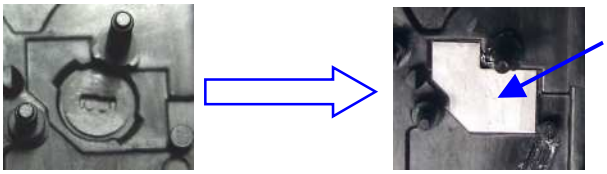
■ Tolerance for 2nd mirror position
(Using with the mirror positioning scope)



③After adjusting and confirming, apply Super-glue as shown in figure.

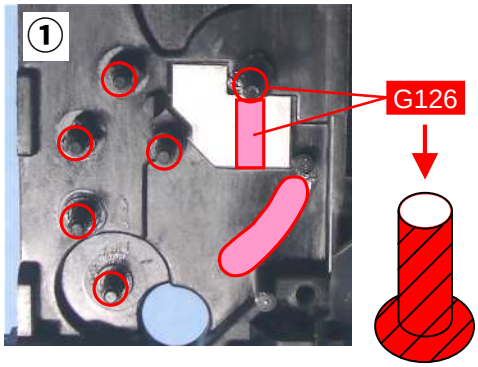


④ B71, B72 --- Surely affix without any gap.



6. 0-G100

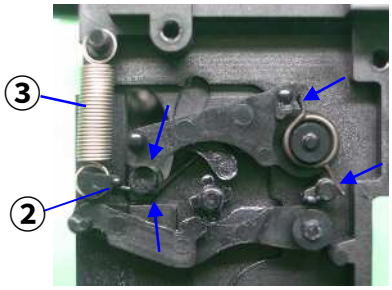
① Apply G126 (8 points) as shown figure.



[CAUTION] Caution for come off spring.

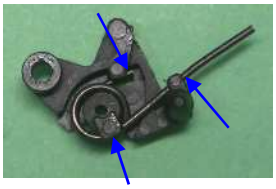
② B10

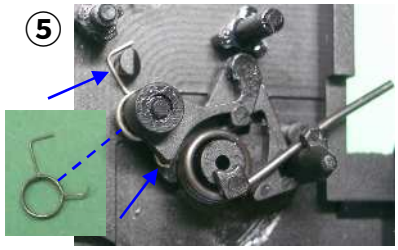
③ B21



④ Install B17 to B9.

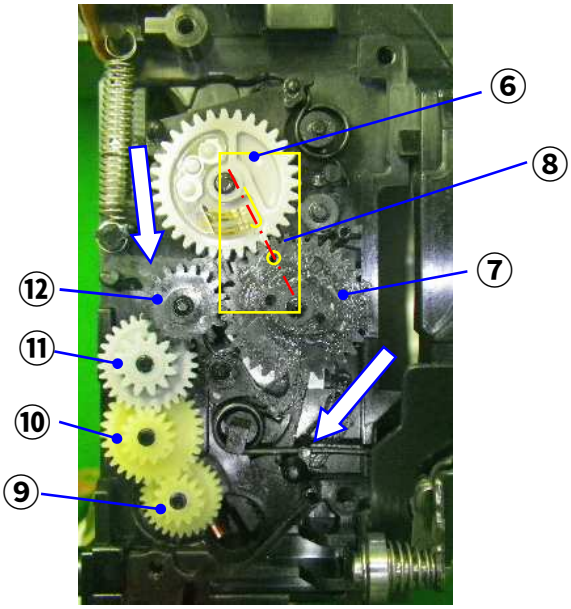
⑤ Install B18 and B9.





⑥ 0-B8 (gray)

--- Apply G126 to surface of cam.



⑦ B7

--- Apply G126 to surface of cam on both sides.

⑧ Align the both hole of 0-B8 and B7.

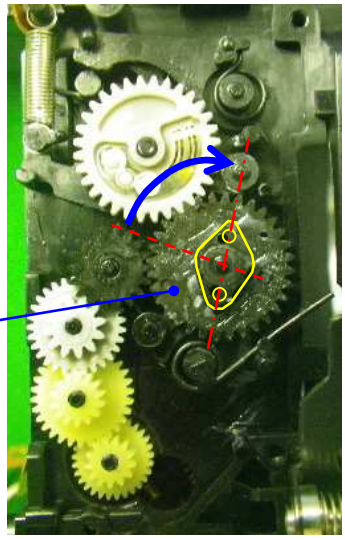
⑨ B3

⑩ B4

⑪ B5

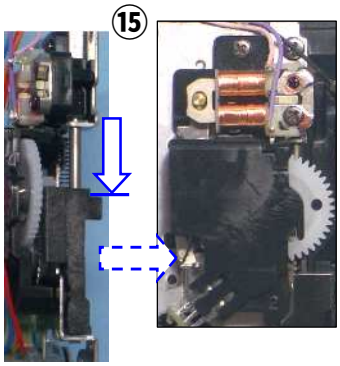
⑫ B6

⑬ Turn B7 clockwise until the arrow indicated in figure right.



⑭ Clean code plate by solvent and apply G151.

⑮ Latch the lever of G100 while pushing down the sliding plate.

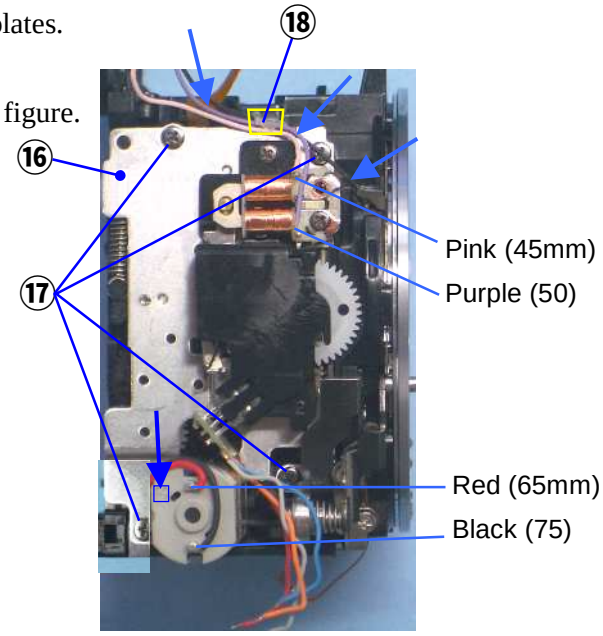


⑯ 0-G100

--- Surely install G100 without any gap between plates.

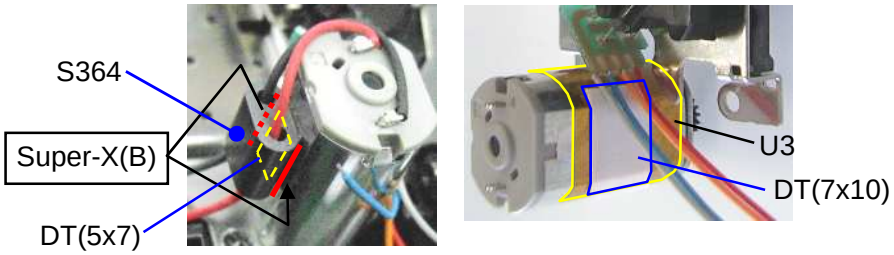
⑰ TY-CNL-D1.7x3.0 (x4)

⑱ Arrange the lead wires with DT(5x5) as shown in figure.



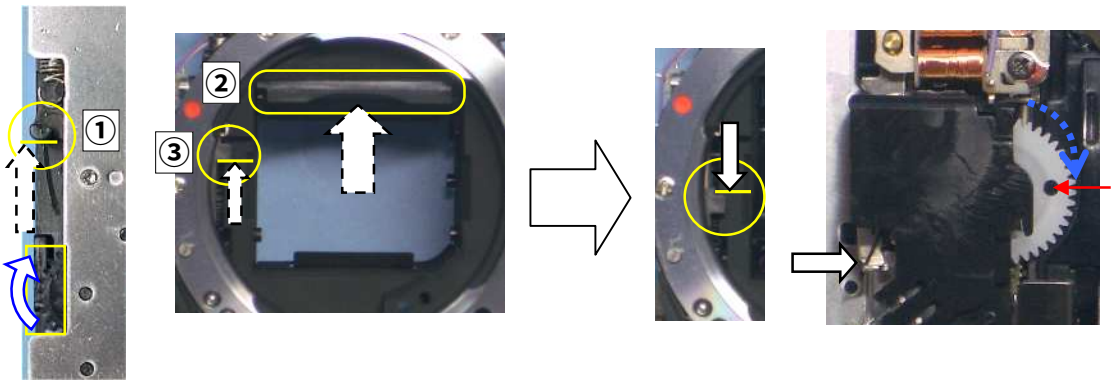
[Arrangement when replace 0-S250]

1. Affix 76140-A61 and DT (7x10) on the mirror motor as shown in figure.
2. Affix S364 on the mirror motor by DT (5x7) and apply super-X (B).



[Notice for disassembly] Set the mirror sheet at top position before removing 0-G100

1. As shown in a figure, a gear is turned, and it sets to a mirror up position.
   Mirror up: (Shutter charge lever (1) and mirror sheet (2) and sliding plate (3) must be top end position.)
2. Latch the lever of G100 while pushing down the sliding plate.
3. Remove G100



7. [Confirmation] Checking the mirror function

[Required equipment] Power supply

① Confirm the following points while applying DC 2V to the mirror motor. (Red wire: Positive)

-1) The mirror seat must be moved smoothly without noise.

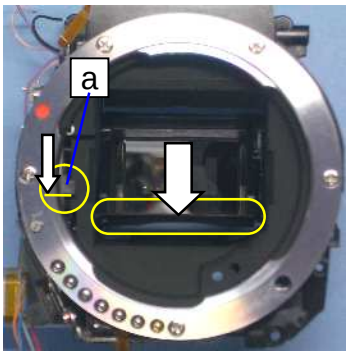
-2) The shutter charge lever (b) and sliding plate (a) must be moved smoothly and surely go up and down.

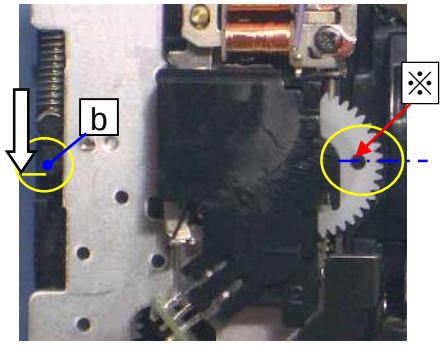
② Set the mirror seat to the down position while applying DC1.5V.

(Fine adjustment is possible when turn white gear at behind of G100.)

Mirror down: mirror, sliding lever, shutter charge lever at down position.

White gear must be positioned as shown in figure. (※)





③ Both mirror seats 1st and 2nd must be returned smoothly to the original position when both mirror seat are passed inward about 3mm by finger pressure.

④ Set the mirror seat to the down position.

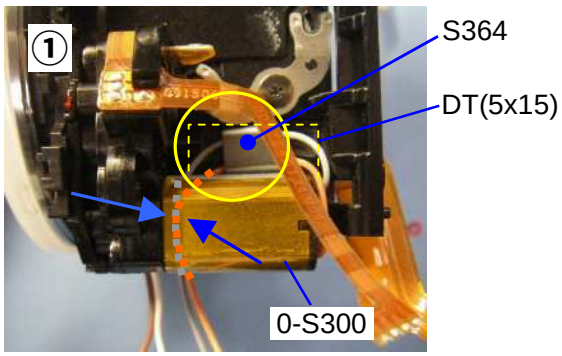
8. 0-S300

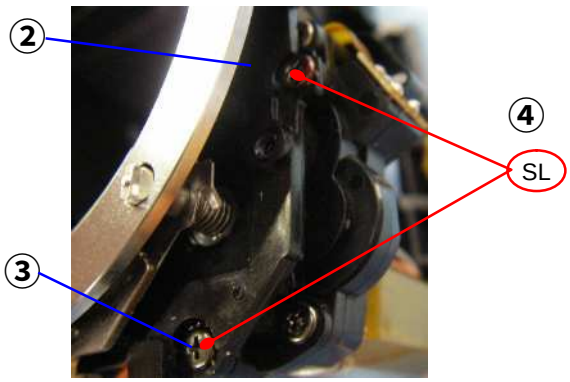
① Arranged lead wire from motor and S364 as shown in figure and then attach 0-S300.

② TY-CNL-D1.7x3.5

③ TY-CNL-D1.7x5.5

④ Apply screw lock.



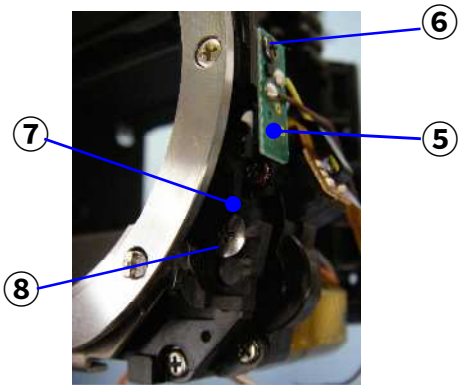


⑤ T940

⑥ TY-CNL-D1.7x3.0

⑦ A115

⑧ TY-CNL-G1.7x2.5



9. [Adjustment] AF Joint stroke.

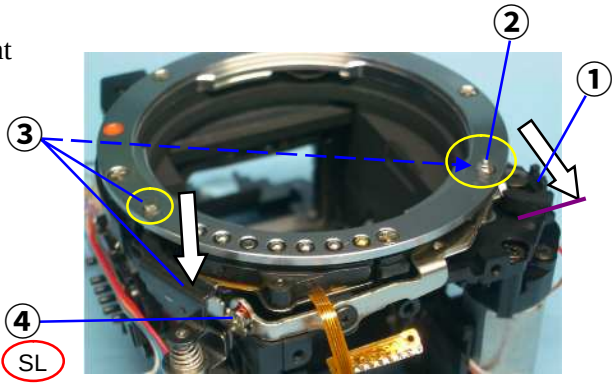
[Required equipment] Vernier calipers

① Set the AF lever (0-A115) to the AF.C position.

② AF coupler (0-S300) must be projected from the mount surface by 1.2mm or more.

③ When the mount lock pin comes to the mount surface with pressing the mount lock lever, the AF coupler must not be projected out of the mount surface.

④ Adjust 0-A121 by turning an eccentric screw, and apply the screw lock.

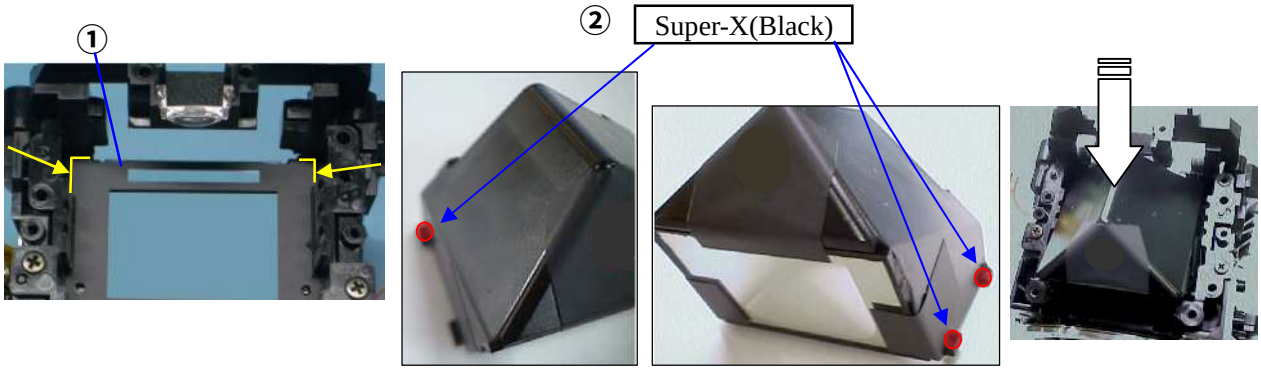


10. 0-L101

[CAUTION] Confirm there is neither dust nor scratch on 0-L101

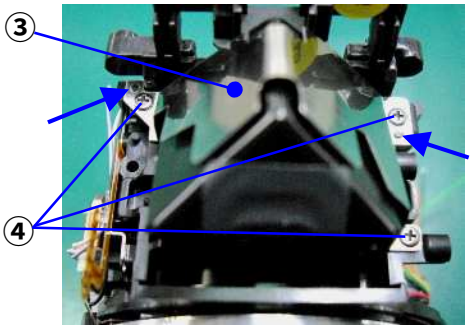
① M3

② 0-L101 --- Apply Super X (black) to three places.



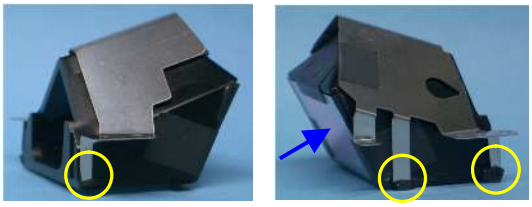
③ M9 (M12 x2)
[CAUTION] Confirm that three legs are not bent

④ TY-CNL-D1.7x3.0 (x3)



[Note of Disassembly]

1. Three screws which hold M9 (Penta cover) are removed.
2. The glue between M9, and three leg tips and Penta sheets is removed, and is removed together with penta mirror.



[CAUTION] Confirm there is neither scratch on front of pentamirror.

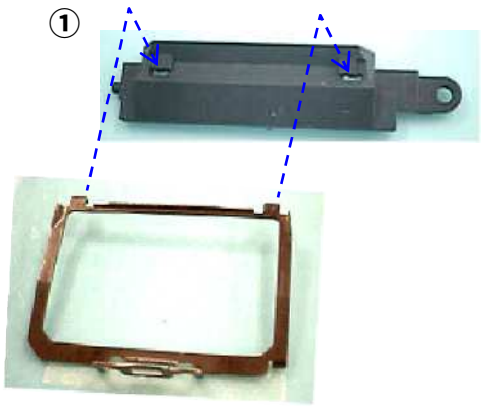
11. L2

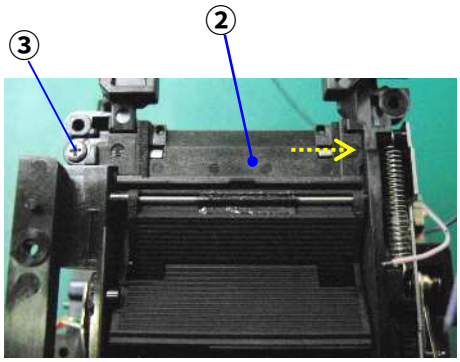
[CAUTION] Confirm there is neither dust nor scratch on L2.

① Install M21 to M4.

② Install ① to front housing block with avoiding scratch on mirror.
(M21 --- In first, put positioning post in the Front housing block.)

③ TY-CNL-D1.7x3.5

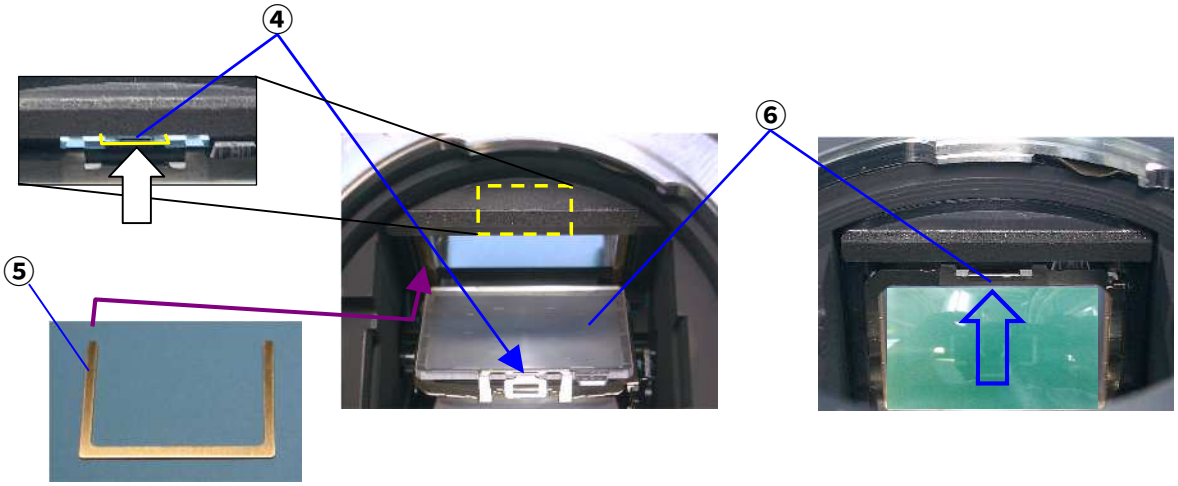




④ Unlock of M4.

⑤ M22 --- In the case of temporary adjustment, using with the M22-010E (0.35)

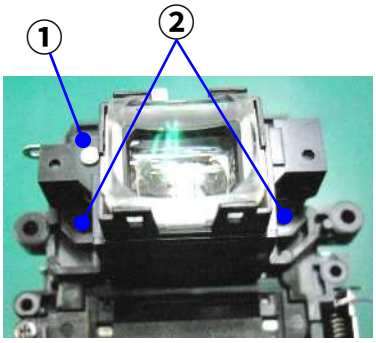
⑥ Put the focusing screen (L2) on the frame and then push it back until it locks in place.



12. M301

① Eyepiece (M301, L7 and other)

② TY-CNL-D1.7x4.0 (x2)



13. [Adjustment] Viewfinder focus and parallax.

[Requires equipment] 50mm lens, collimator, focus master lens.

[Preparation]

1. Adjust the diopter by the diopter adjustment lever.
2. Set the AF mode switch to MF position. (Upper position)

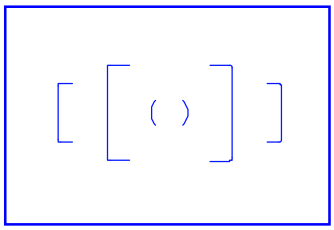
13-1. Parallax

[CAUTION] Confirm that the pentaprism must be installed securely.

① **[Confirmation]**Confirm there is neither gap nor an inclination at upper and lower, right and left position.

Standard: Right/Left Less than 0.5°
Upside down Less than 0.5 °

13-2. Viewfinder focus



① **[Confirmation]** Confirm a viewfinder focus.

*One scale for focus master lens is 0.03mm.

Standard: 0±0.07 mm

② **[Adjustment]** Exchanges for M22 of other thickness.

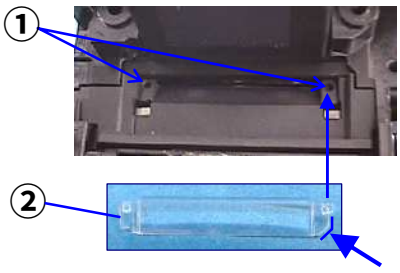
The tolerance lever at the time of adjustment is 0±0.04 mm.

M22-00A	-00B	-00C	-00D	-00E	-00F	-00G	-00H	-00I	-01J
t=0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.10

14. O100

① Apply small amount of Daia bond (black) as shown in figure.

② M2 prism --- Make sure that there is no dust on M2.

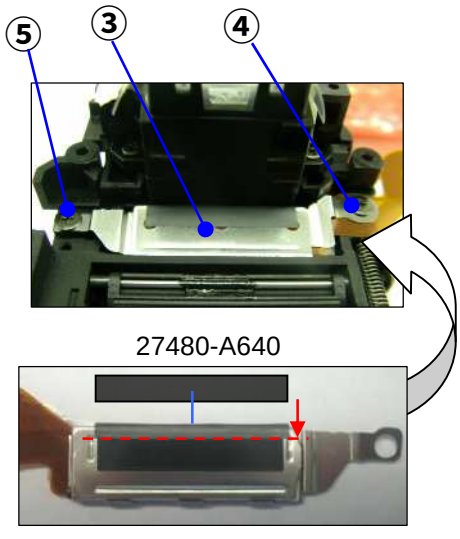


③ O100, 27480-A640

④ TY-CNL-F1.7x3.0

⑤ TY-CNL-F1.7x4.5

--- Temporary tightens screws while holding O100 plate.



[Note of Disassembly]

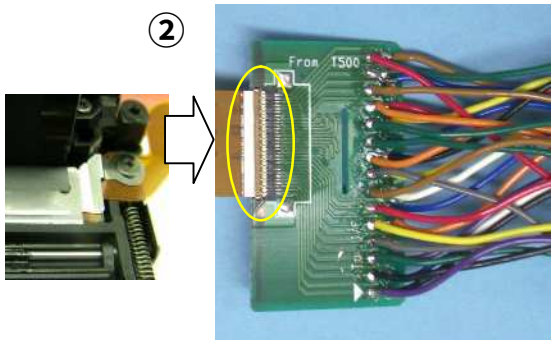
1. Remove the screw lock which is stick to the screw.
2. Unscrew (x2) while pressing the plate of 0-O100.
3. If M2 does not replace, you do not necessary to disassembly.

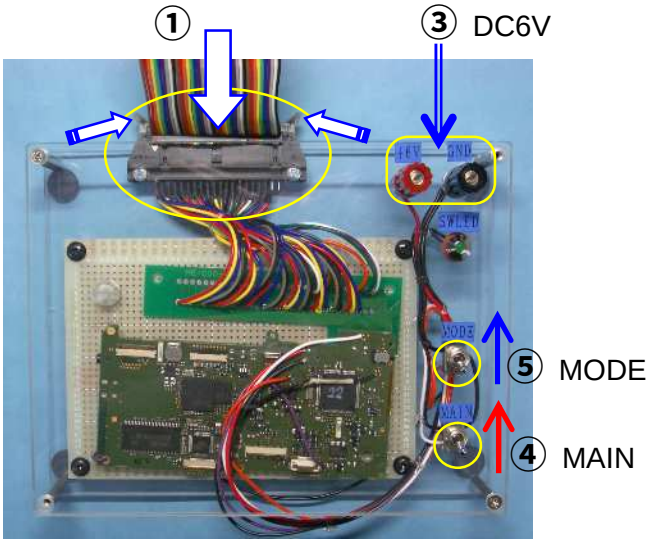
15. [Adjustment] Positioning 0-O100 (Viewfinder indications)

[Preparation] O100 cable for 77170, O100 positioning jig for 76700, Power supply (8V,3A)

15-1. Preparation

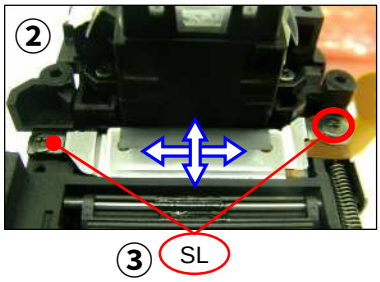
① Connect the O100 cable for 77170 to the jig as shown figure.
② Connect the flex board of O100 to the cable.↓ (Flip lock)
③ Apply 6.0 V to the jig
④ Turn the main switch ON.
⑤ Turn the mode switch ON.
*Indication of O100 is display.





15-2. Adjustment

① **[Confirmation]** Check whether the position of the display is straight.
② **[Adjustment]** Loosen the screw and change the position.
③ After adjustment is done, apply screw lock.

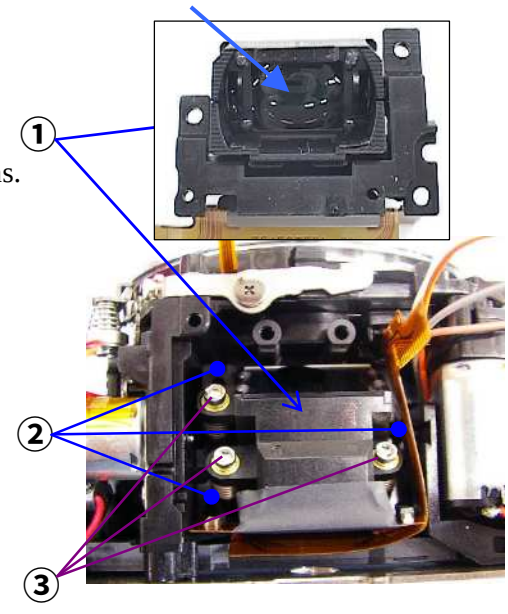


16. 0-M100

[Preparation] Hexagonal screwdriver 1.5mm.

① M100
[CAUTION] There is no dust and stain on the surface of lens.
② TY-CNL-D1.7x4.0 (x3)
③ **[Adjustment]** Temporary adjustment of AF block.
--- Screw in 3 adjusting screws until they stops,
then screw back two turns.

[Note] After sensor position adjustment with programmed Software is done, apply screw-lock agent to between the head of adjustment screws and washers.

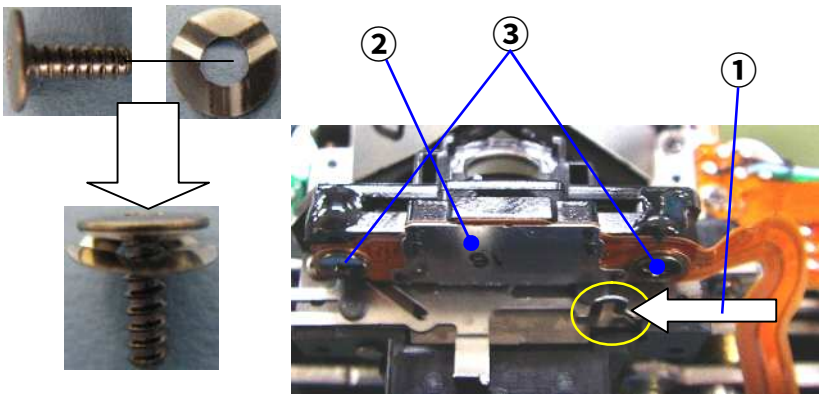


17. J100

① Set diopter lever at end left side and then install it.

② J100

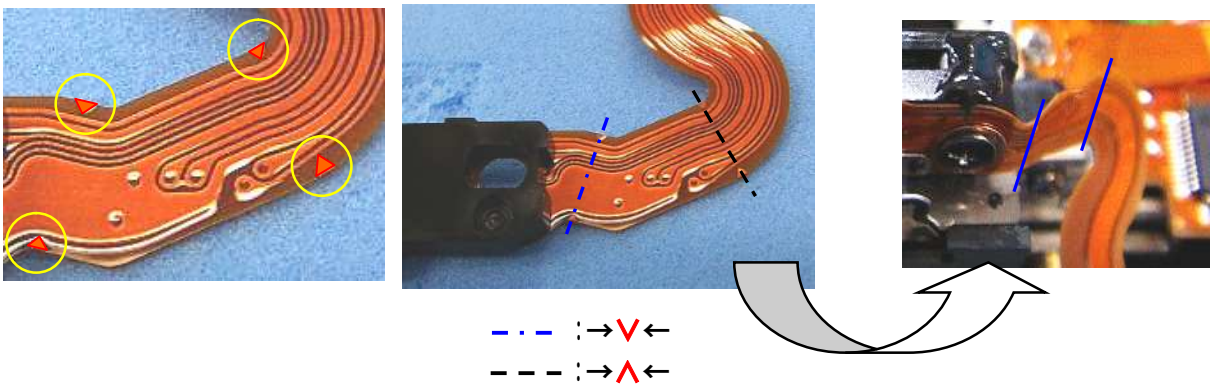
③ J110, TY-CNL-G1.7x5.0 (Temporary) --- 2 positions



[Caution for replacing J100]

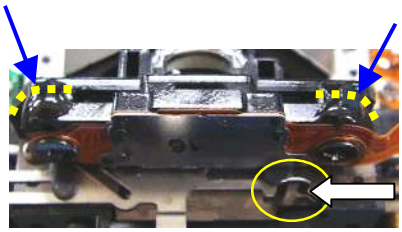
*When replacing J100, fold J100 flexible board as that shown in figure. (Approx. 90°)

*Do not damage on flexible board.



[Caution] --- Disassembly

1. Set the diopter lever to the left side.
2. TY-CNL-G1.7x5.0 and washer x2.
3. Remove the glue which is around the J100.→
   ***Not to damage on J100.**
4. 0-J100



18． M51, O170 (SI Block)

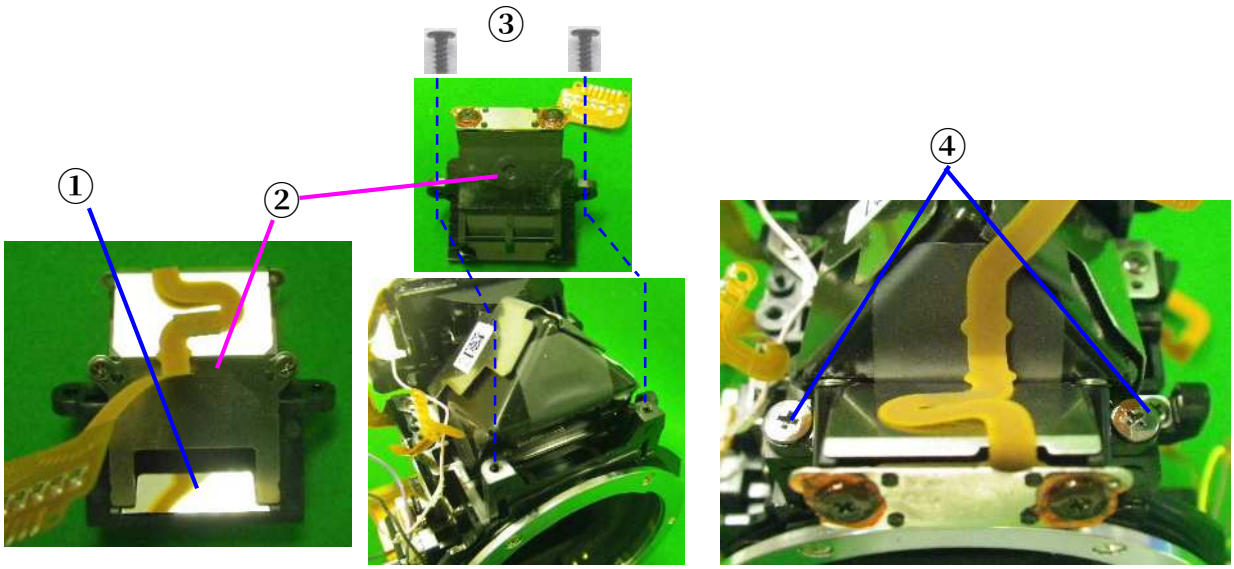
① Confirm that there is neither dust nor scratch on inside prism and mirror.

② SI block(M51,M52,M53,L11,L12,O170 and other)

③ TY-CNL-F1.7x4.5 x2

　　① ・・Install SI block to the pentaprism side as shown figure.

④ Apply screw lock.



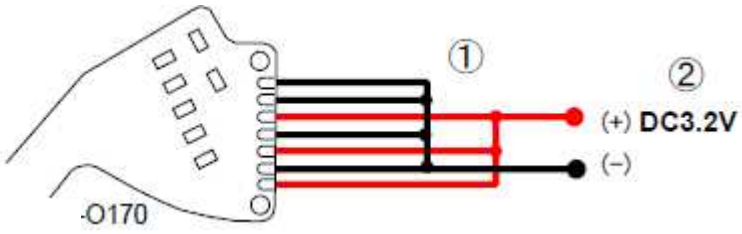
19．[Adjustment] Positioning SI-LED

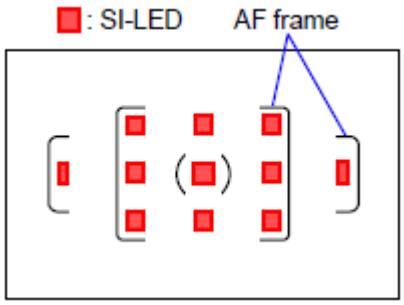
[Required equipment] Power supply, lead wires

① Solder and arrange the read wires on O170 as shown in the figure below.

[Caution] Do not stress to the lands of O170.

② Apply DC3.2V to O170, and confirm the positioning and lighting of SI-LED 11 points



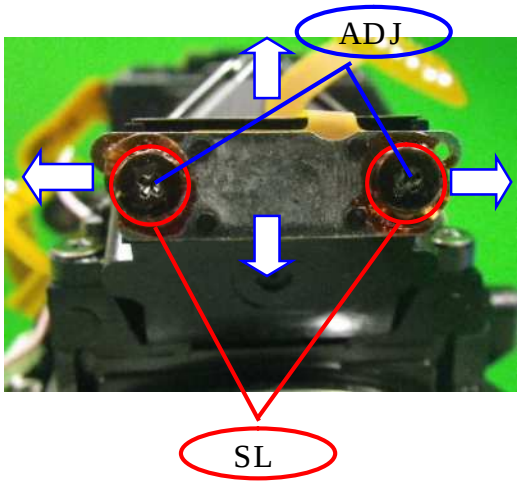


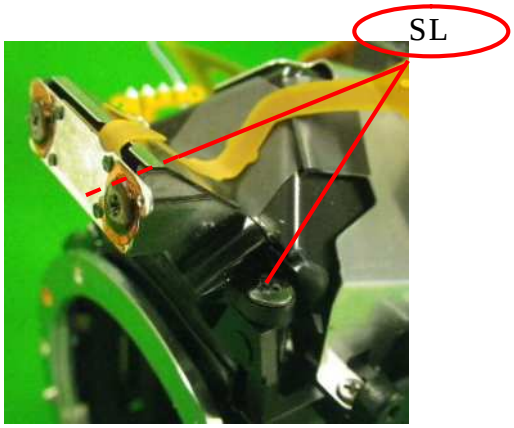
③ **[ADJ]** Loosen 2 screws, and then adjust the position of O170.

・・・Remove the adhering screw lock (two positions)

④ Tighten the screw and confirm the position.

⑤After adjustment is done, apply the screw-lock to 3 positions and remove the read wires from O170.





Ⅲ. Assemble procedure of main body

1. E100（Shutter block）

① Main body

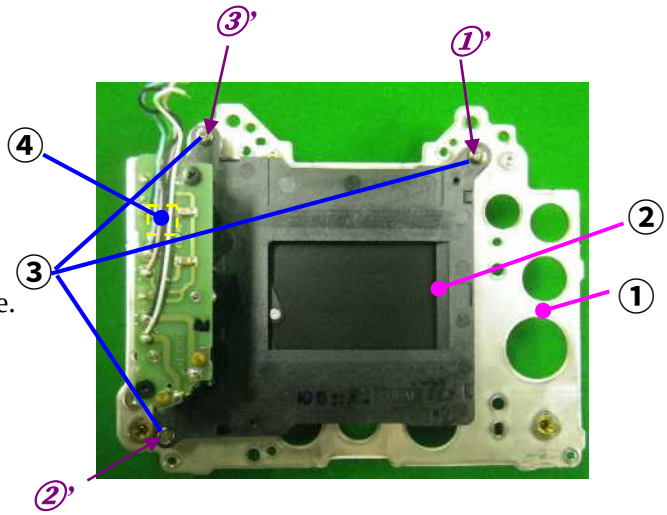
② E100

③ A70 screw x3

--- Tighten screw in order of number as shown in figure.

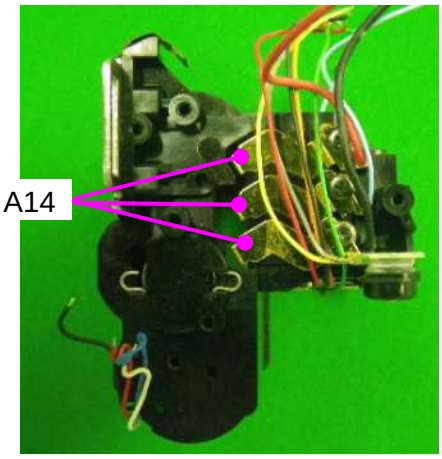
④ Arrange 5 lead wires by DT (5x5).

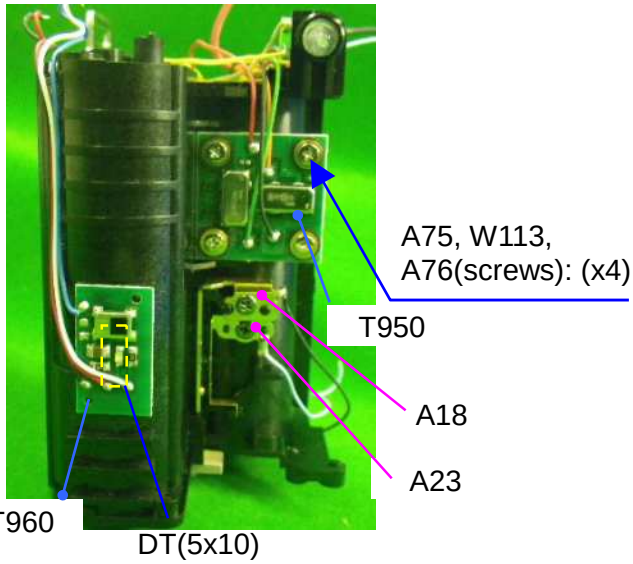
*After install, 0-E000 has little movement.

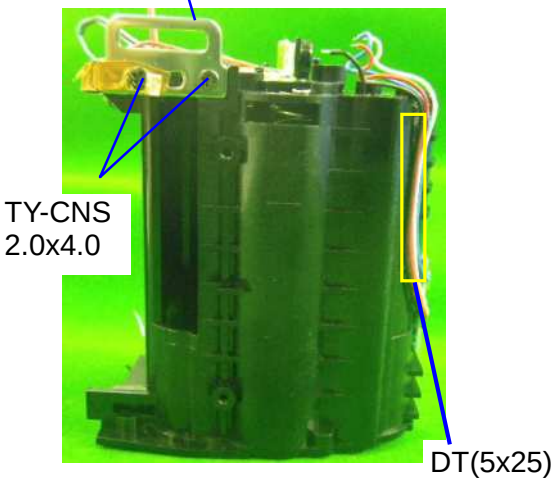


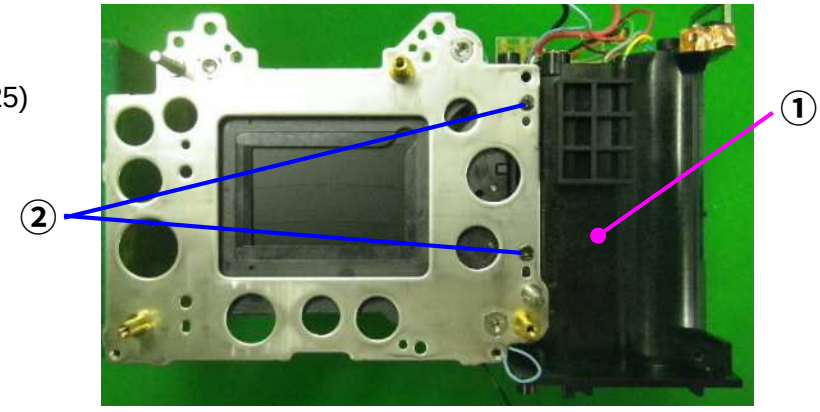
2. A13 (Battery case) and related parts

[Confirm] Each parts are installed correct position.







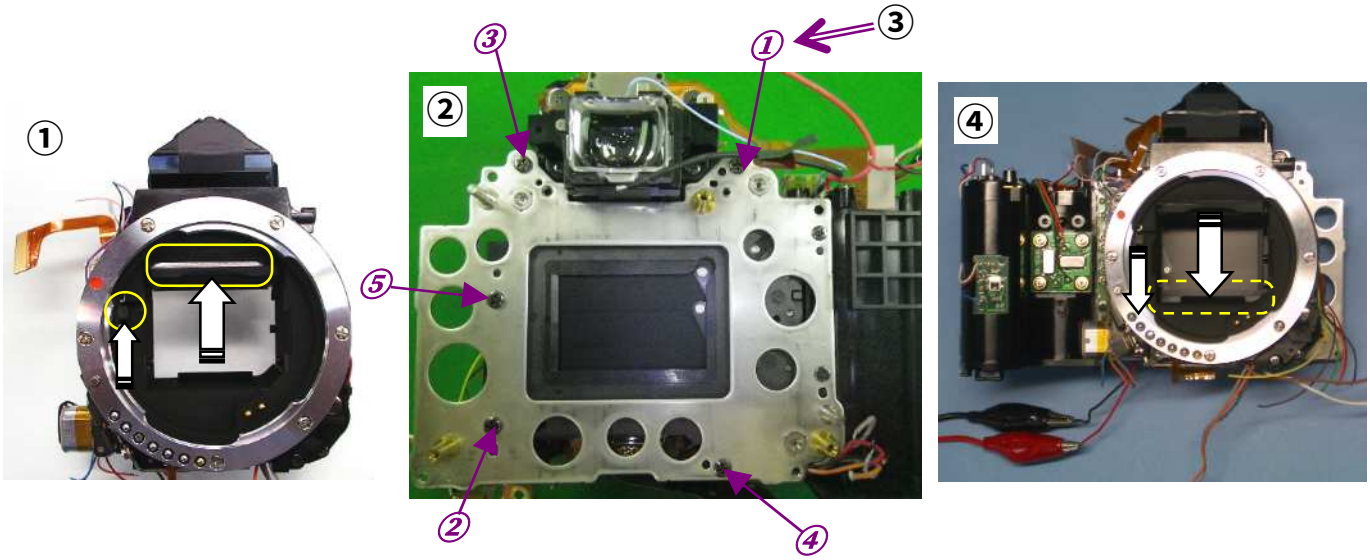


③ A13 and related parts.

④ TY-CNL-D1.7x4.0 x2

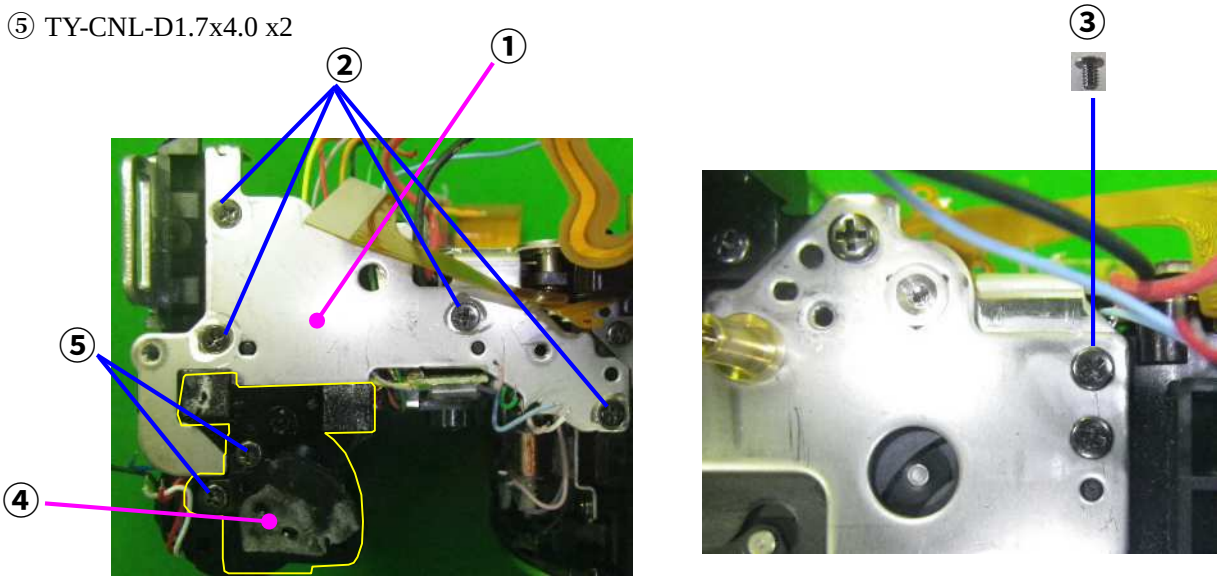
3. 0-A101 (Front housing assy.)

① Apply DC 2V to the mirror, and set mirror up position. (Red---Positive/Black---Negative)
② Install body to the Front housing assy. Do not pinch lead wires and flexible board.
③ TY-CNM2.0x5.0 (x5)
--- Tighten screw in order of number as shown in figure.
④ Apply Voltage to the mirror motor and set mirror down position.
[CAUTION] Do not scratch on eyepiece lens during working.



4. A6 and A19 (L upper plate and others)

① Install A6 while arranging the lead wires and flexible board.
② TY-CSM1.7x4.0 x4
③ CNL-D1.7x2.5
④ A19
⑤ TY-CNL-D1.7x4.0 x2

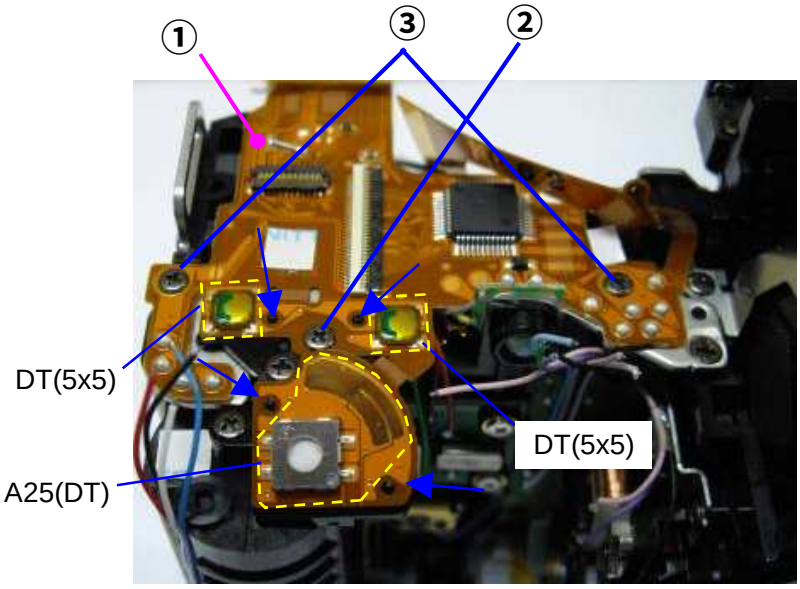


5. T700 (Upper flex circuit block)

① T700

② TY-CNL-D1.7x2.5

③ CNL-D1.7x1.6 x2

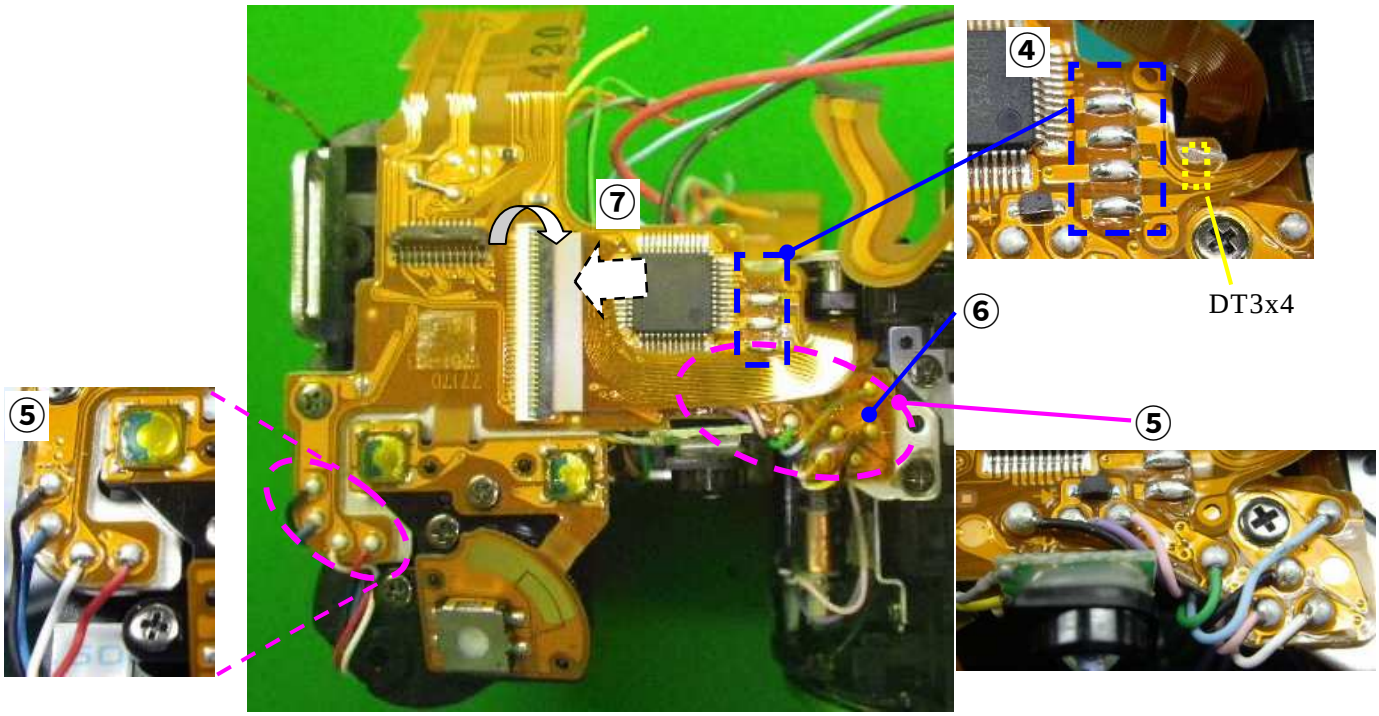


④ Hold T71 (G100) flex by DT (3x4) then solder 4 lands.

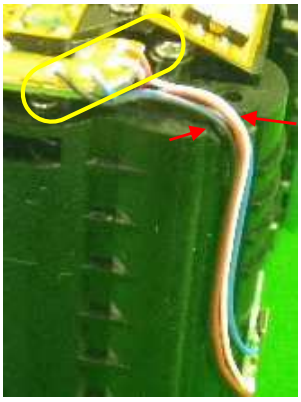
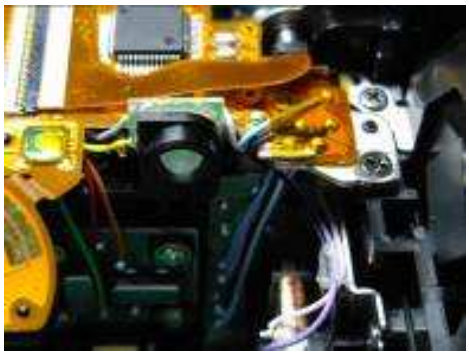
⑤ Solder 12 lead wires then arrange lead wires. (④-T960/②-G100/⑤-E100/①-A105)

⑥ Affix T89 (PI tape).

⑦ Connect O100 flex (Flip lock)

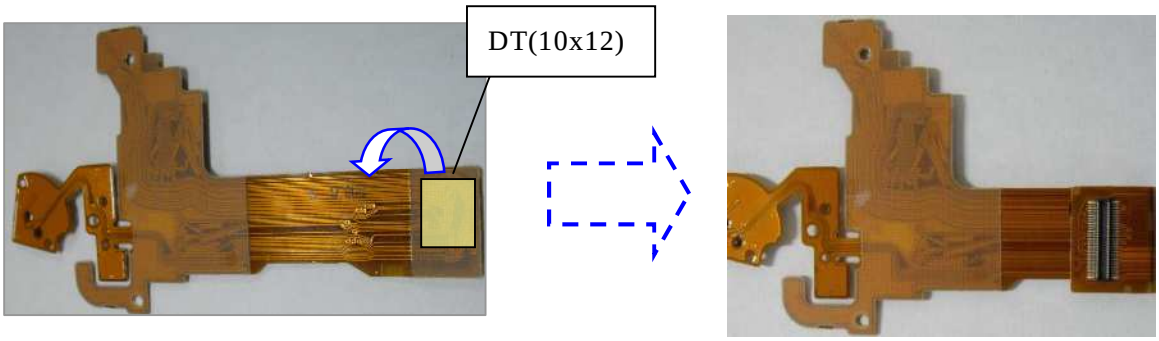


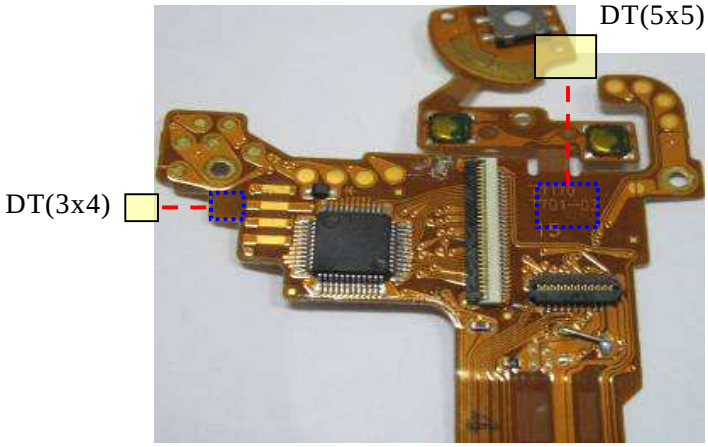
【Arrangement of lead wire】


【Arrangement when replacing T700】

＊Arrange the T700 by DT as shown in figure.



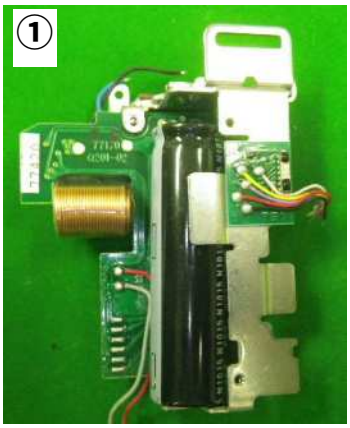


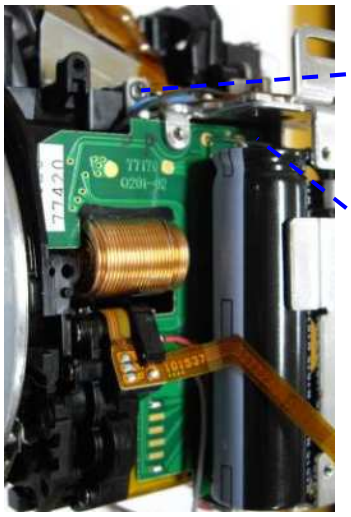
6. A4 and 0-Q200 (Right front plate, Flash P.C.board and related parts)

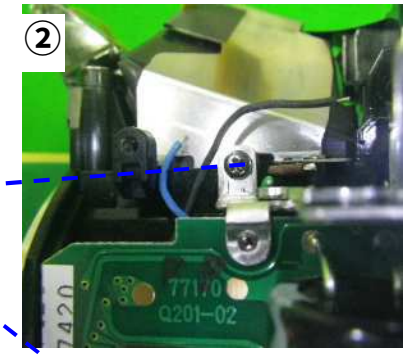
① Install A4 and 0-Q200 to 0-A101. Do not pinch lead wires.

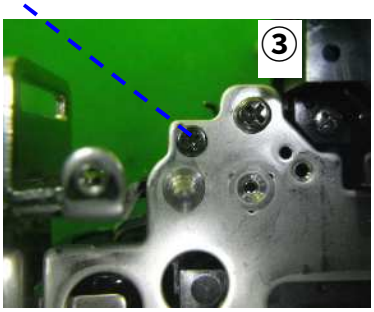
② TY-CNL-D1.7x4.0

③ CNL-D1.7x2.5



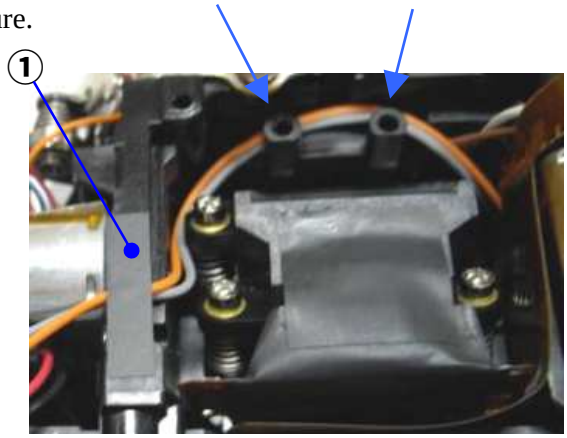






7. T901 (Lower flex board)

① X58 --- Arrange lead wires as shown in figure.

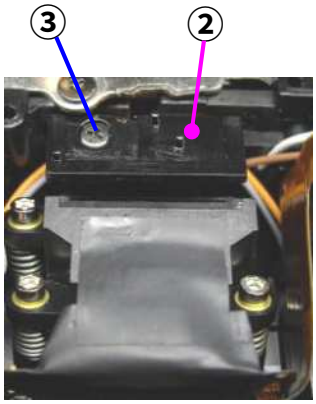


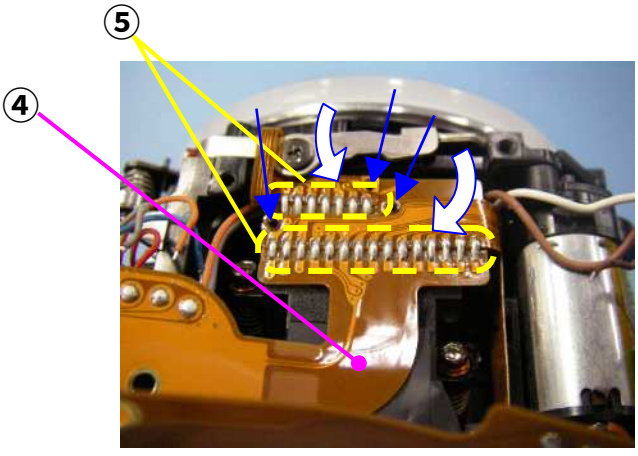
② A141

③ TY-CNL-D1.7x3.5

④ T901

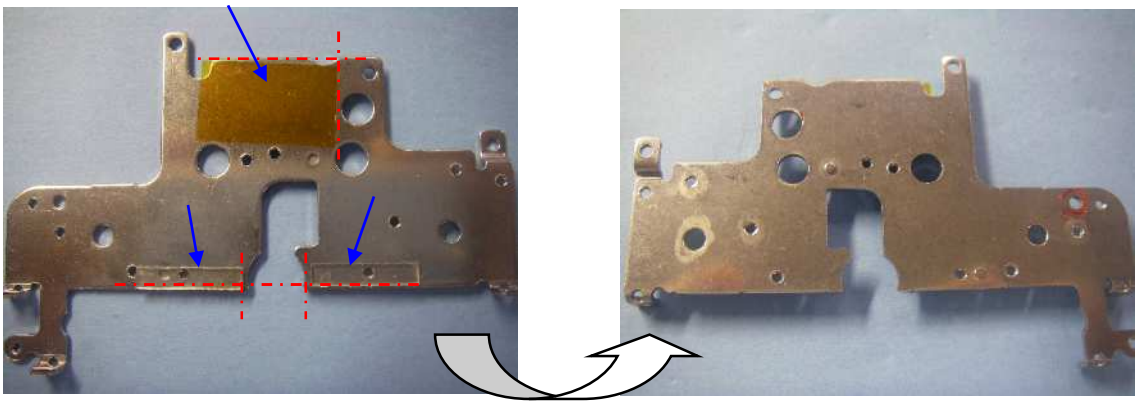
⑤ Solder 22 lands for T301 and M100.





8. A3 (Bottom plate)

① Make sure there are 3 parts are installed.

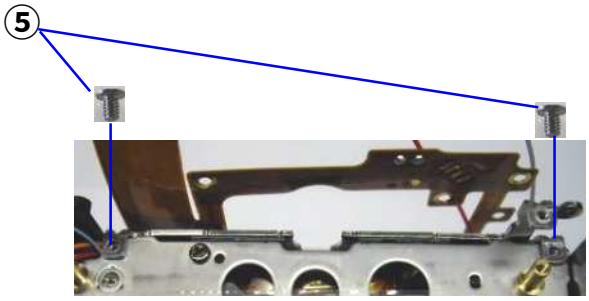


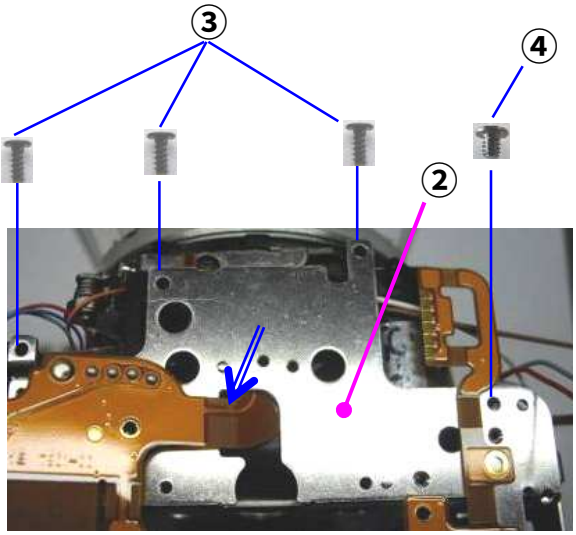
② Install A3 while arranging flex.

③ TY-CNL-D1.7x4.0 x3

④ CNL-D1.7x2.2

⑤ CNL-D1.7x2.5 x2





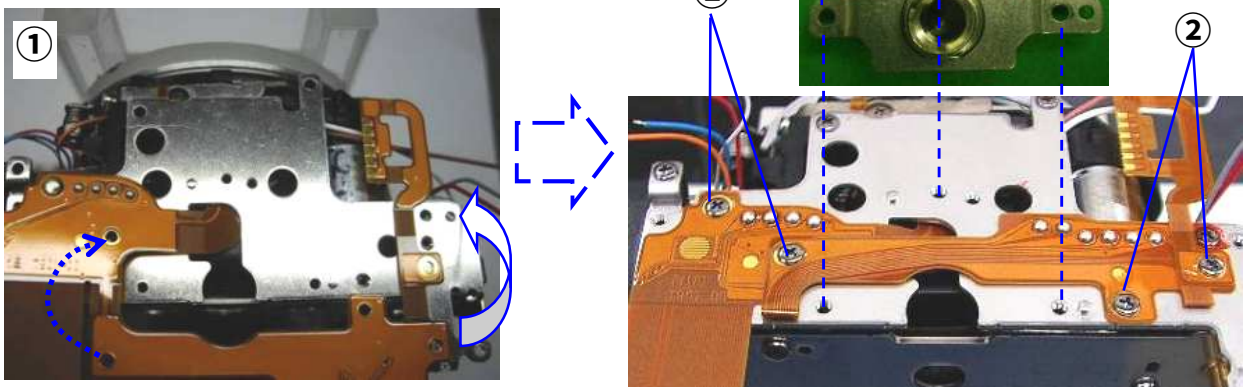
9. 0-A51 (Tripod plate assy.)

① Install T901 flex as shown in figure. (The screw hole is matched.)

② CNL-D1.7x1.6 x4

③ 0-A51

④ CNL-D1.7x2.5 x3

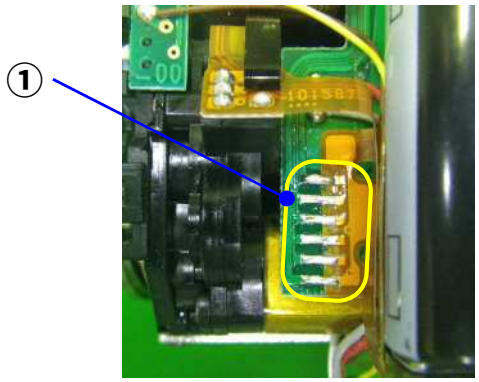


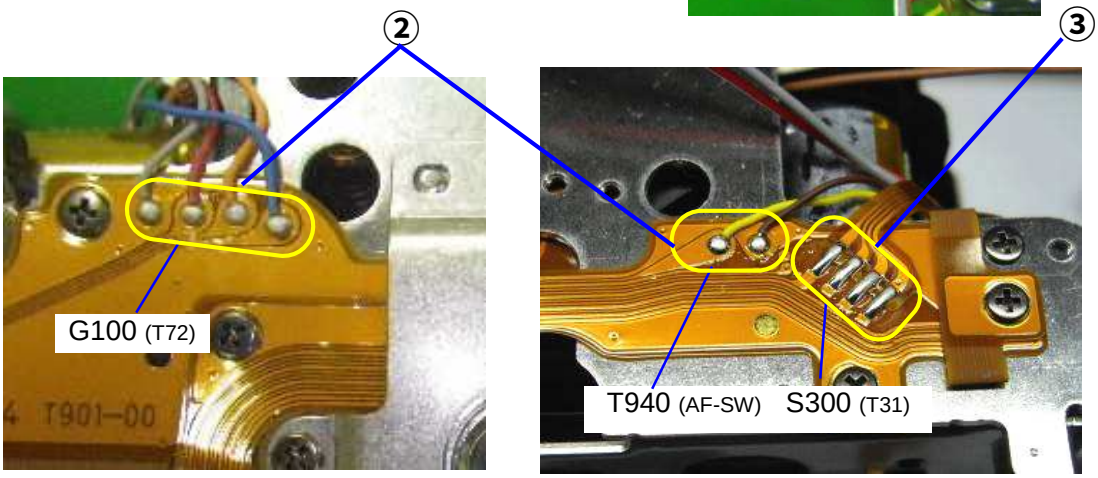
10. Lead wires on bottom side

① Solder 6 lands

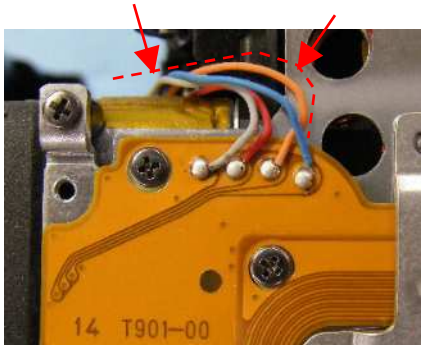
② Solder 6 lead wires

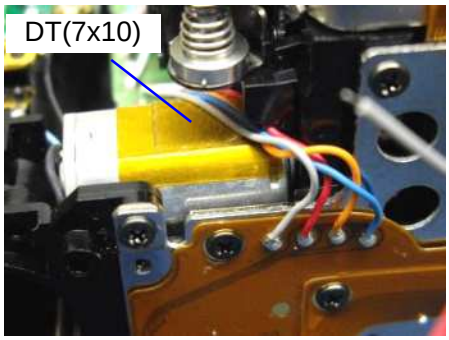
③ Solder 4 land





④ Arrange lead wires as shown in figure.



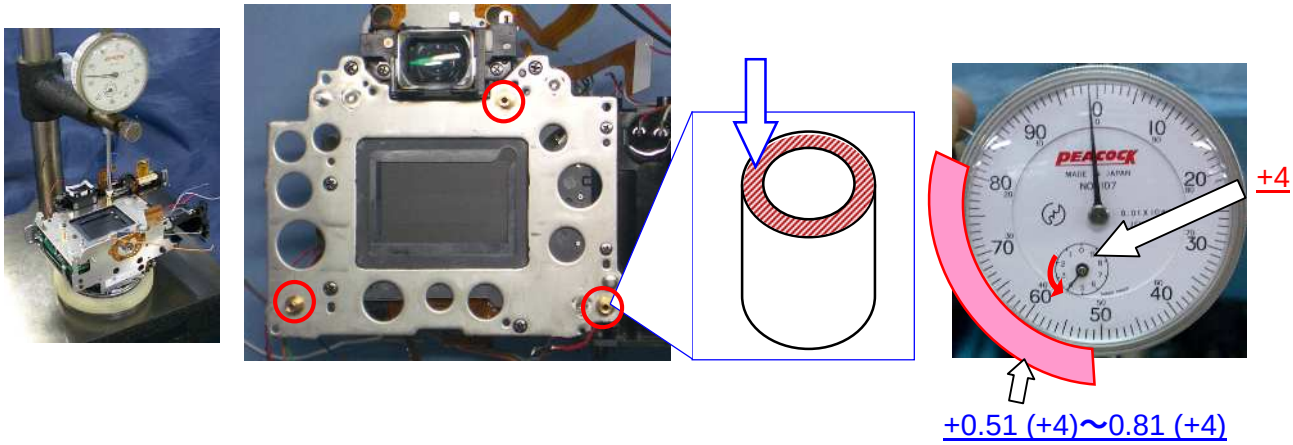


11. [Confirmation] Height of SR block base support pillar.

[Required equipment]: Block gauge for 35mm, Dial gauge comparator, etc. (same as K100D)

① Measure height of 0-C000 base support pillar (3 places) from the mount surface as shown in the figure.

Tolerance (In common with 77310):	50.1+0.17/-0.13 mm
Using block gauge for 35mm (45.46mm):	**+4.51～4.81 mm**



12. 0-C000 (SR block assy.)

[Required equipment] Hexagon wrench 1.5mm

[CAUTION 1] Pay attention, there is powerful magnet is carried in the SR block.

[CAUTION 2] Since performance can be damaged, the SR block cannot be disassembled and also do not apply the external pressure to a movable part.

[CAUTION 3] The flex from SR should betaken care, otherwise it will affect the performance of SR function.

[CAUTION 4] There is neither scratch nor dust on CCD.

*** Attach mount cover then put downward.**

① Install A22 x3 to pillar.

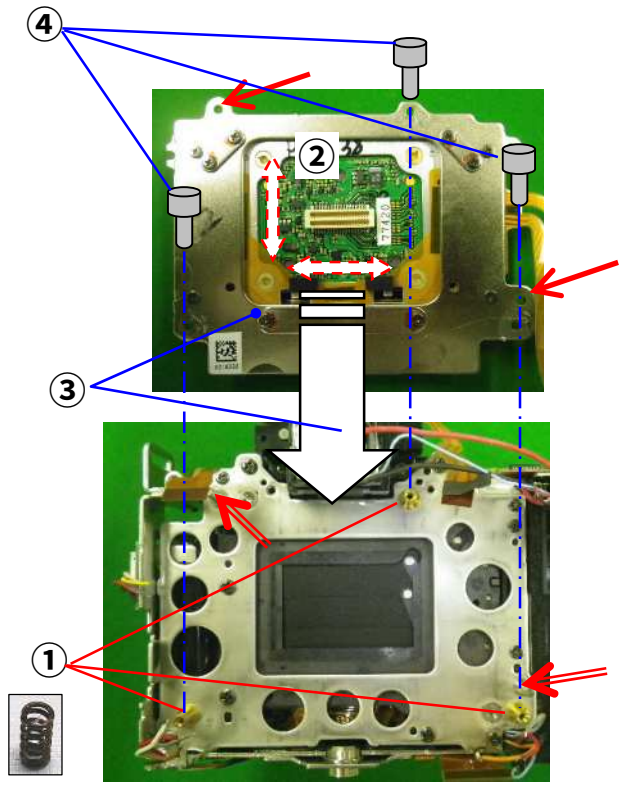
② **[Confirmation]** Center plate must move up and down and right and left by own weight.

③ 0-C000 --- Align with two guides post while arranging lead wire and flex then press 0-C000 against the body.

[CAUTION] Confirm that A22 is not stick on the magnet

④ A31 x3 --- Tighten three screws until stop while press 0-C000 against the body.

⑤ **[Adjustment]** A31 x3 --- Screw back two turns --- Temporary adjustment of height of CCD.



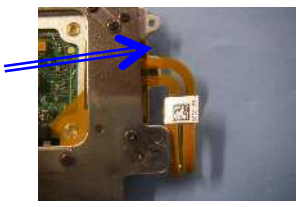
[When replacing 0-C000]

① Replace to new bar-code seal on T630 and M9 (Penta cover)

[Caution: The number should be readable.]

T630 M9

② Write down new number for adjustment.
(Sensor ID No.)



***Transfer previous seal to replaced 0-C000.**

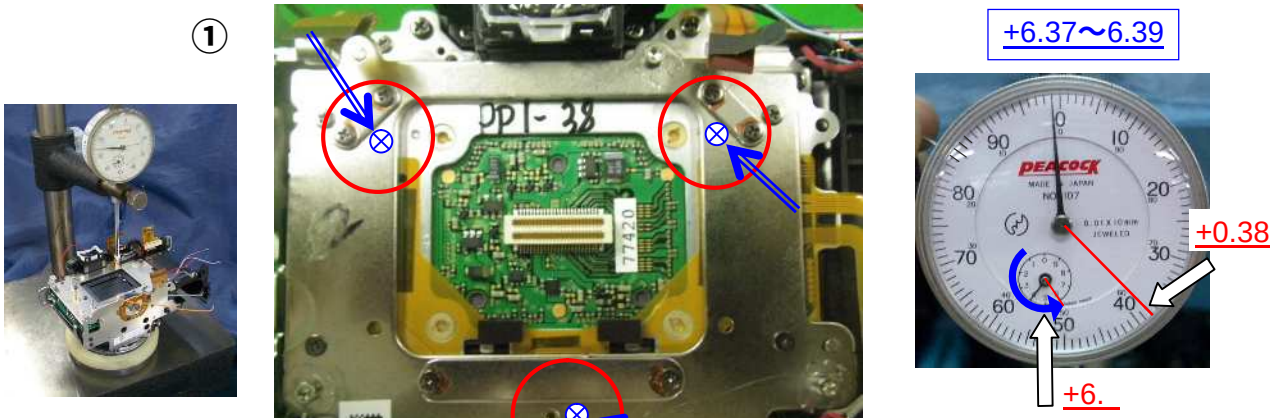
13. [Adjustment] Height of 0-C000

Required equipment: Hexagon wrench 1.5mm, Block gauge for 35mm, Dial gauge comparator, etc.

Specified Adhesive: **super X (Clear) --- Order number: 95901-S133**

① **[Confirmation]** Measure height of the 0-C000 rear plate (3 places) from the mount surface as shown in the figure.

	Not disassembled parts	When adjusting
Tolerance (Only for 77420):	51.75～51.91 mm	51.84±0.01 mm
Using Block gauge for 35mm (45.46mm)	*+6.29～6.45 mm*	*+6.38±0.01 mm* *(+6.37～6.39 mm)*

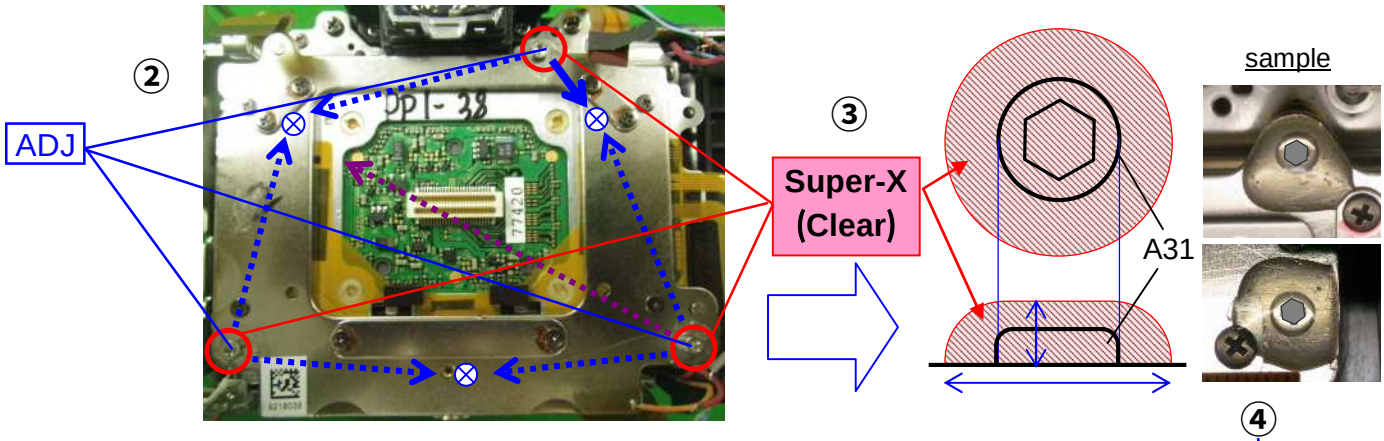


② **[Adjustment]** Turn three adjustment screw A31. Target for adjustment is **+6.38**. (Maximum and minimum difference is within 0.01)

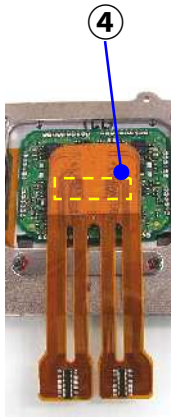
You must finish the adjustment with turning A31 tighten direction. (Clockwise direction)

③ After adjusting, clean A31and around A31 then apply Super X on screw as shown in figure.

[Caution] Do not touch it until Super X becomes hardened.

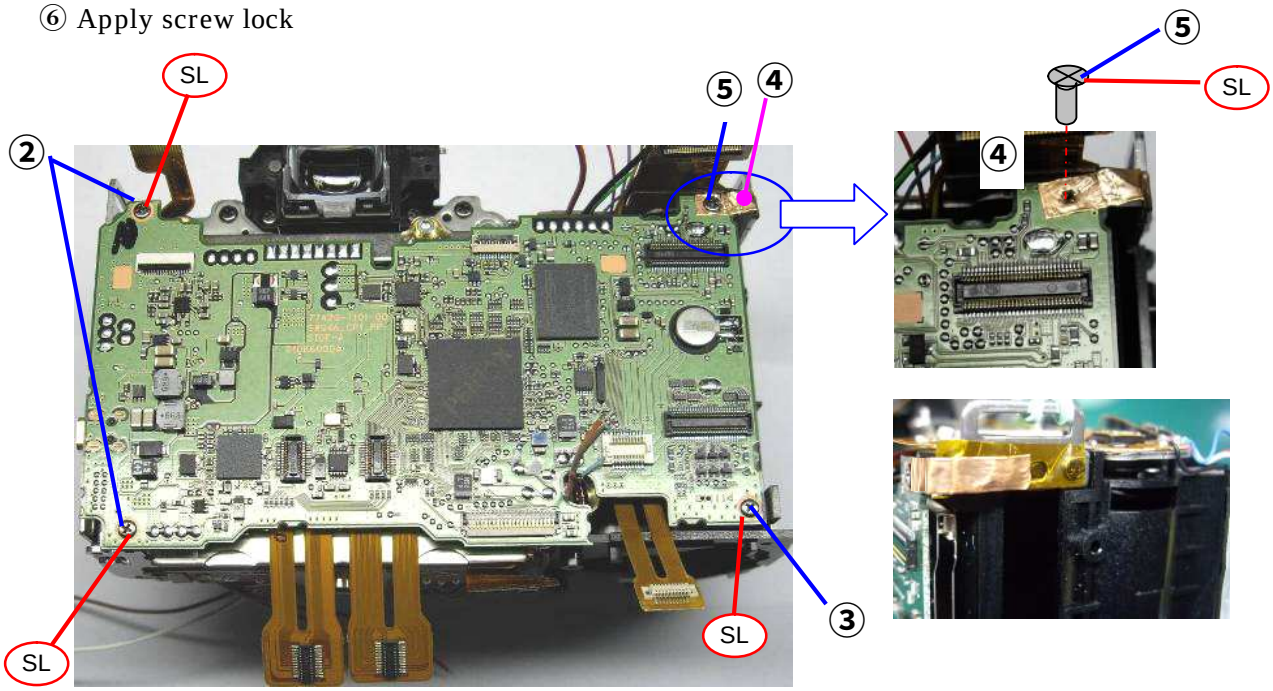


④ Connect T640 (Plug-in) --- Do not give too much force.



14. 0-T100 (Main P.C.B)

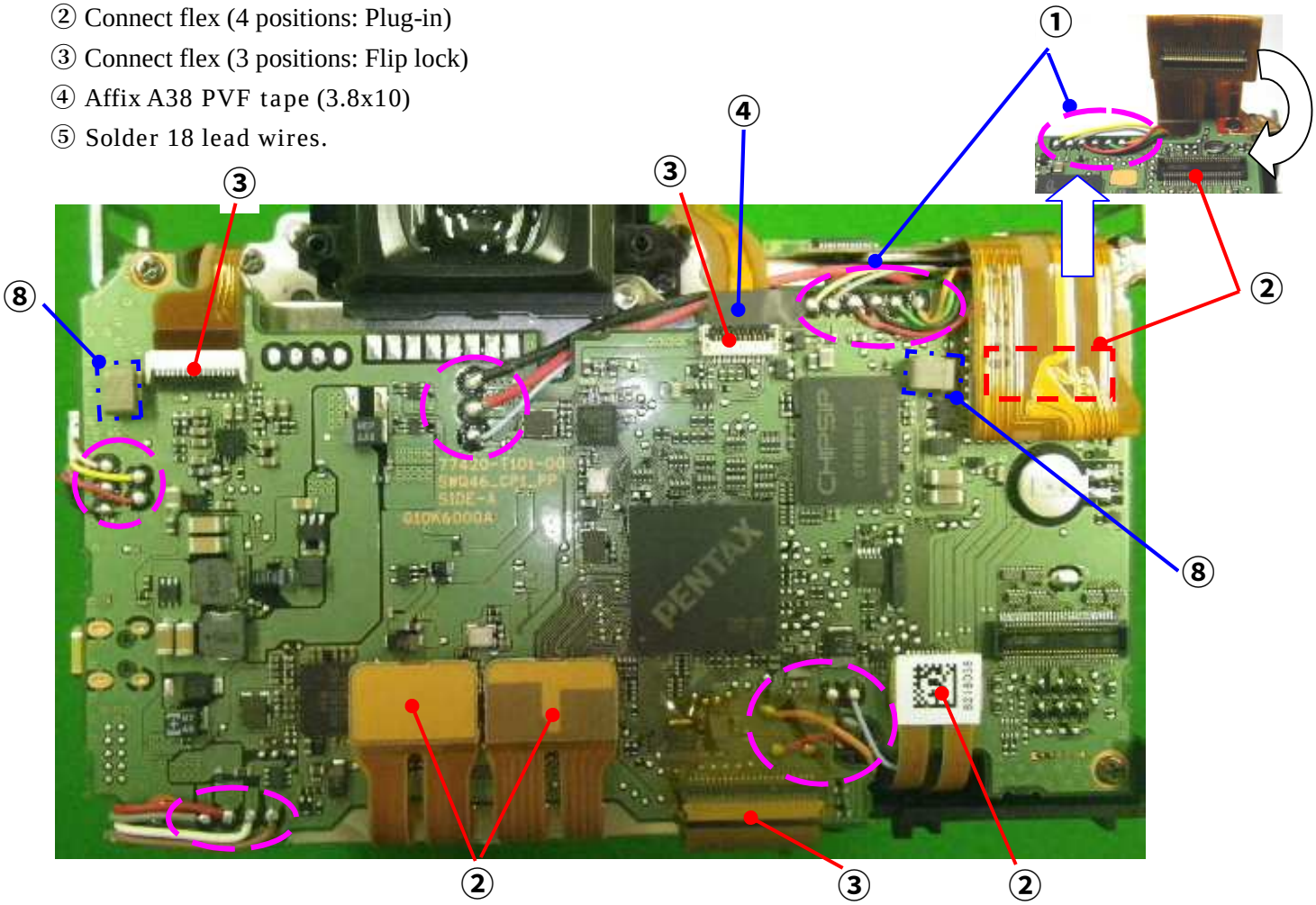
① Install T100 with avoiding pinch lead wires and flex.
② CNL-D1.7x2.5 x2
③ TY-CNL-D1.7x3.5
④ Affix T67 --- If T67 is new part., make a hole for screw hole.
⑤ CNL-D1.7x2.5
⑥ Apply screw lock



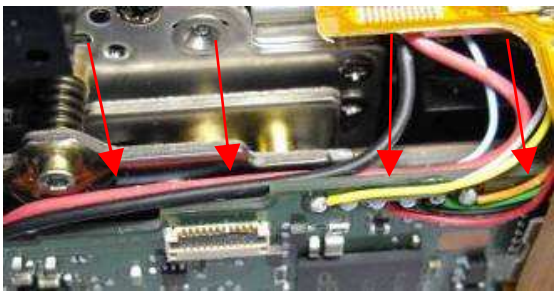
15. Soldering lead wires for T100

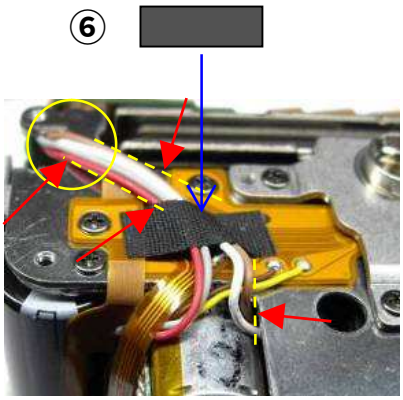
[Caution] The flex from SR block should be taken care (no stress, no bend), otherwise it will affect the performance of SR function.

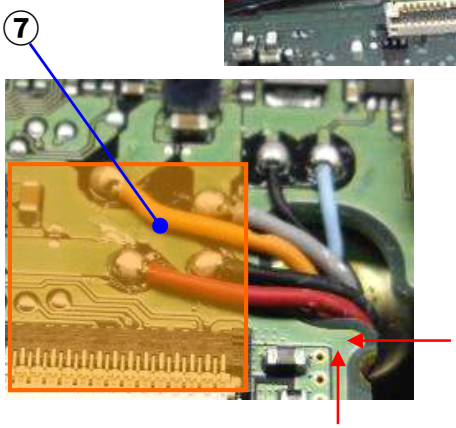
① Solder 6 lead wires.
② Connect flex (4 positions: Plug-in)
③ Connect flex (3 positions: Flip lock)
④ Affix A38 PVF tape (3.8x10)
⑤ Solder 18 lead wires.



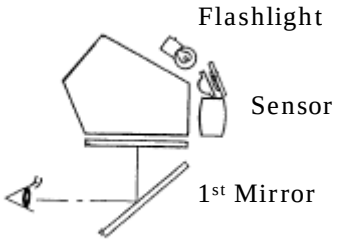
⑥ Arrange lead wire by BT (6x15)
⑦ Affix A61 PI tape (13x17)
⑧ Confirm to A26 (x2)







16. [Adjustment] Position of J100



Required equipment: flashlight or equivalent

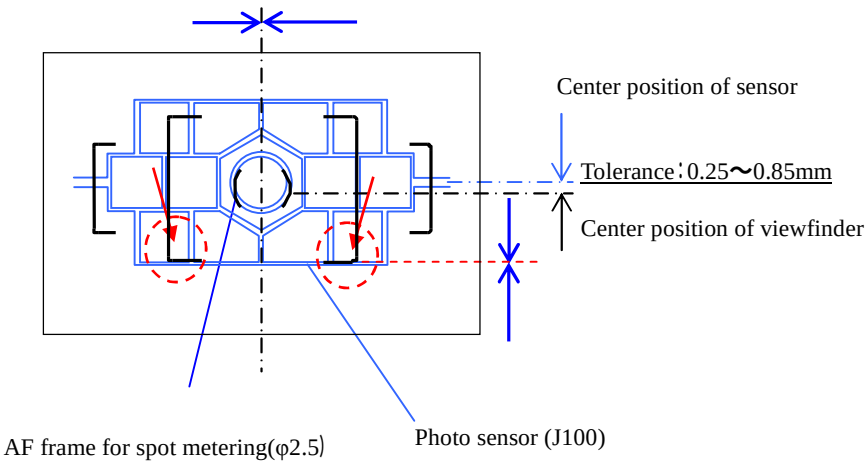
***Mirror must be at down position.**

①Cover the eyepiece with a hand or black tape.

②Positioning the flashlight to the photo sensor as shown in the figure right, and search the position where the pattern of the photo sensor can be seen on the 1st mirror from the mount ring side.

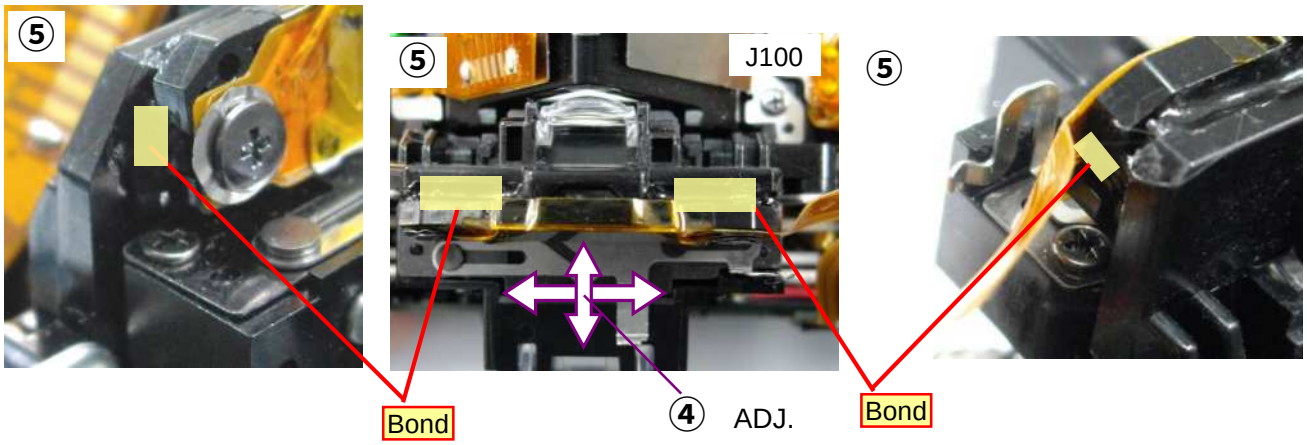
[Ref.] Attaching brighter lens is advisable to assist better visibility. (Ex.: FA 50mm f/1.4 Lens)

③The photo sensor must be positioned at the AF frame and there is no inclination as shown in the figure.



④**[Adjust]** Loosen the screw a little, move J100 to adjust whole position.
Tighten screw and ensure position is not changed.

⑤ After adjustment is completed, apply the Daia bond to J100 (4 places) as shown in the figure.

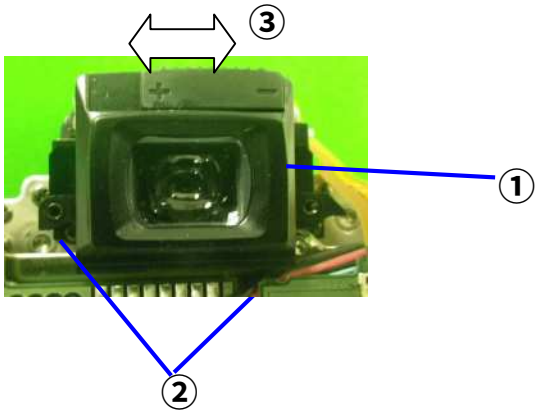


17. M311

① M311 --- Engage dioptor lever.

② CNL-D1.7x3.0 x2

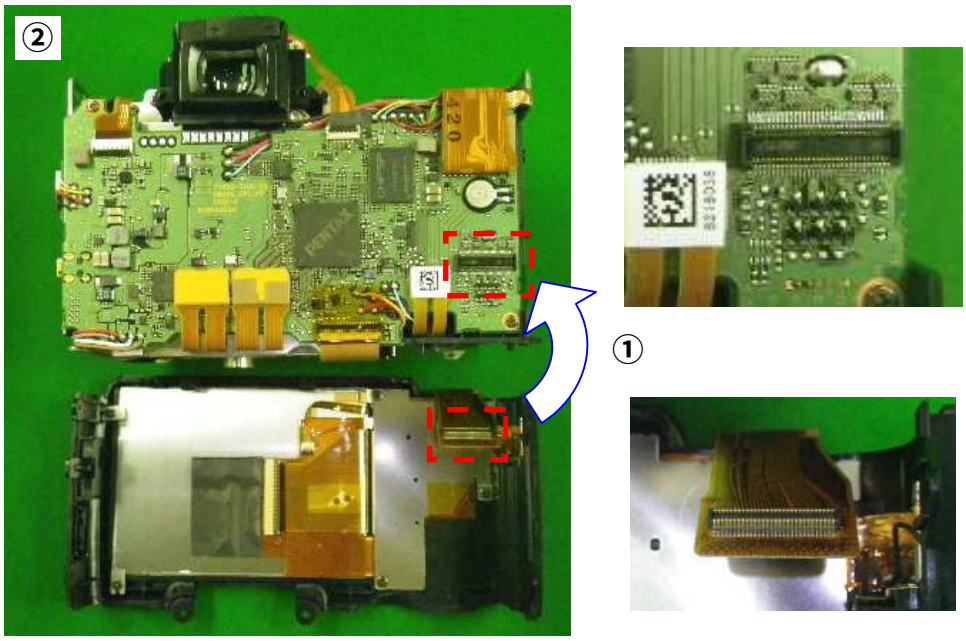
③ **[Confirm]** When move diopter adjustment lever, viewfinder must be engaged.



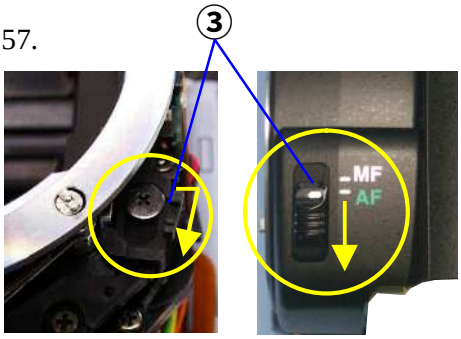
18. A150 and A201 (Front cover and Back cover)

① Connect T920 flex (Plug-in)

② Install A201 from connect side while opening the connecter cover as shown in figure.

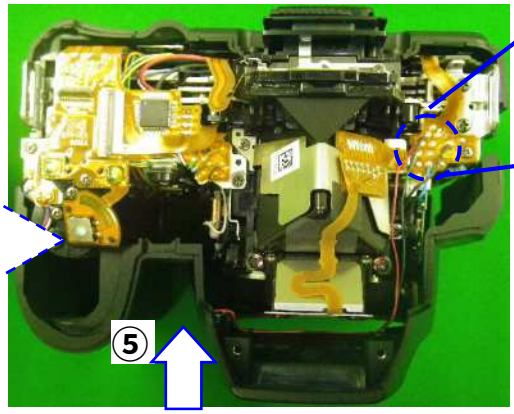


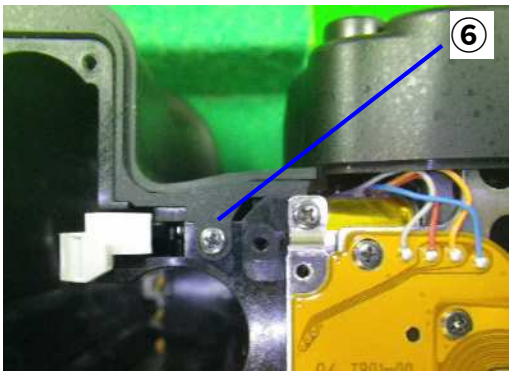
③ Set the AF mode lever to [AF] both of body and A157.

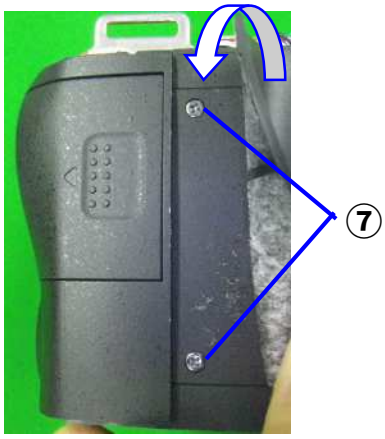


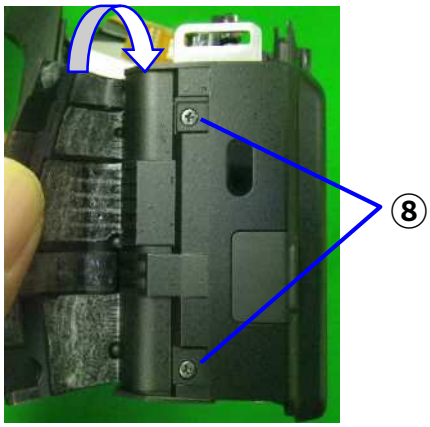
④ Solder 2 lead wire (To T750 flex)

⑤ A150





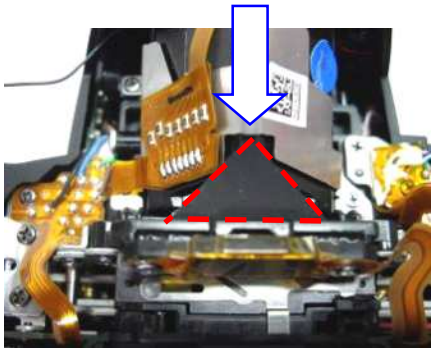




⑥ Bottom of the camera, Install screw (TY-CNL-D 1.7x4.0)
⑦ Peel off A151 grip rubber, Install screw (TY-CNL-D 1.7x4.5 x2)
⑧ Peel off A161 grip rubber, install screw (CNL-D 1.7x4.0 x2)
⑨ Confirm the installation condition of each cover. (Grip rubber, other)
⑩ Confirm M16 and A26 position.

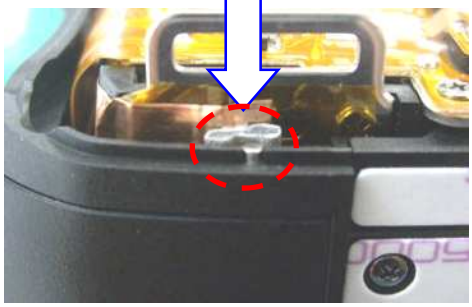
Upper, J100 part

M16



A26

Left side,
Between A201 and A16



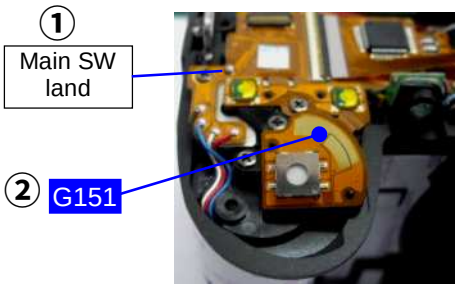
19. A301 (Top cover)

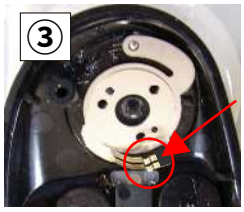
* Confirm that the top cover parts are completely installed and ready for installation.

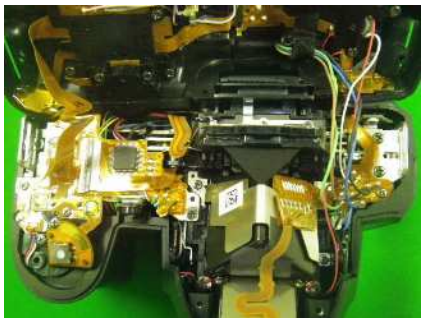
① If main switch land is soldered, unsoldered, unsolder main switch land.

② Apply G151 on main switch contact.

③ Confirm that there is no dust or no damage on contact. The contact must be the same height.



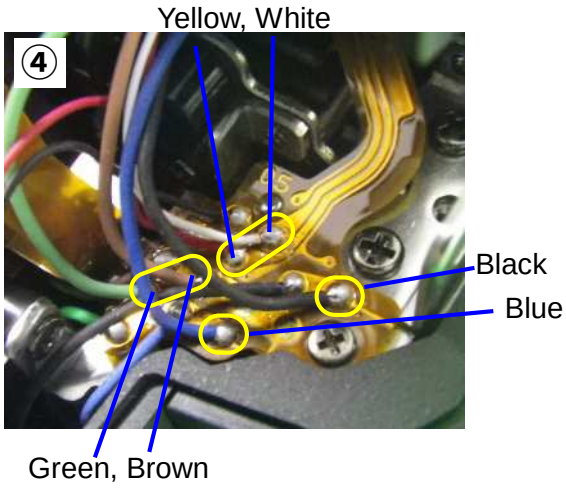


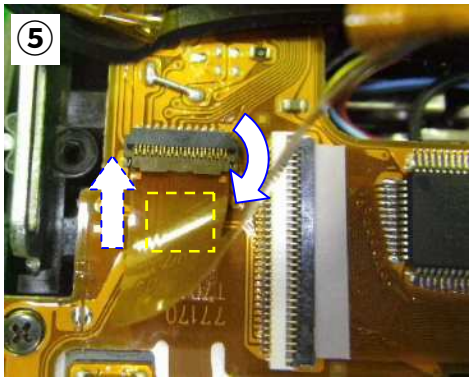


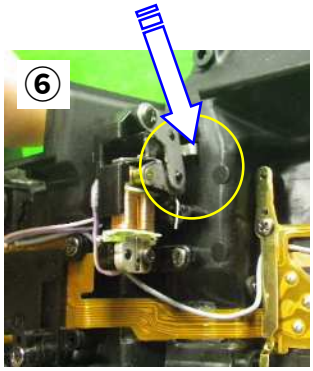
④ Solder 6 lead wires from A301.

⑤ Connect flex (Flip lock) the fix DT (5x5)

⑥ Pop-up the flash by releasing the lever as shown in figure.

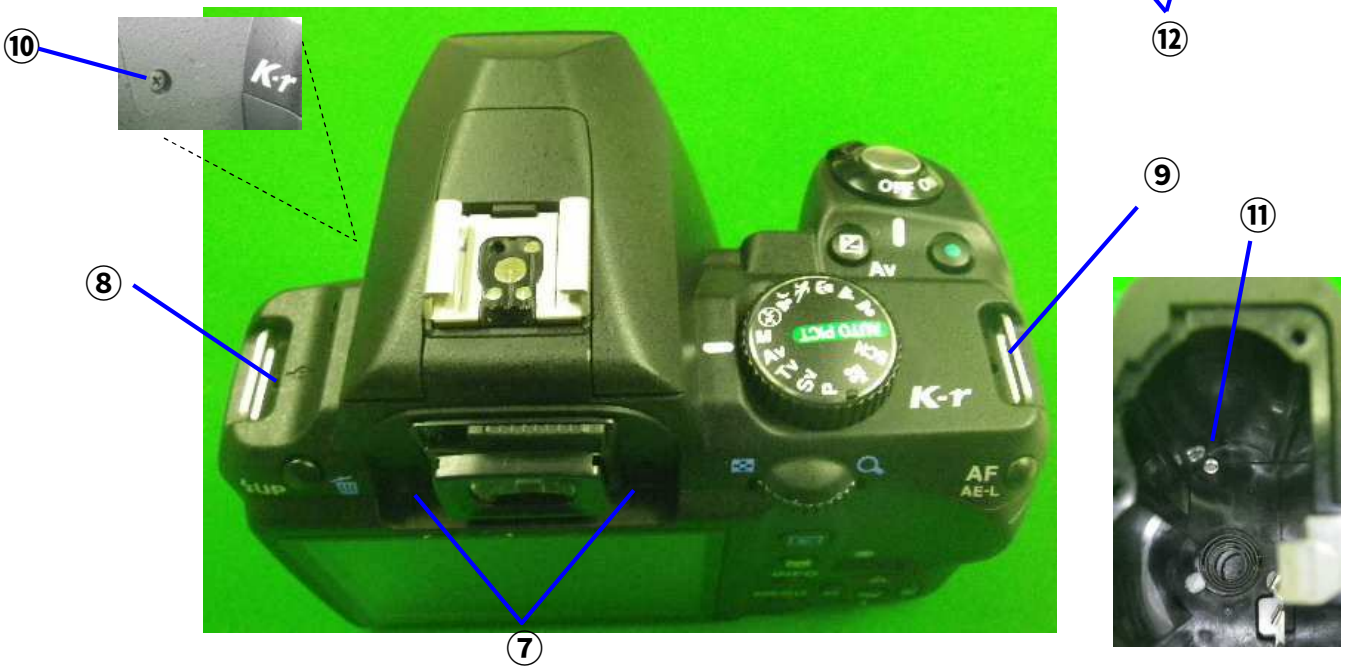






(following page)

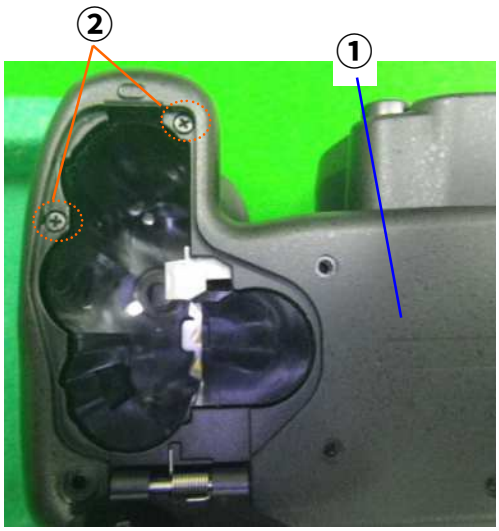
⑦ A68 x2 (TY-CNL-D 1.7x6.0)
⑧ A196 (CNL-D 1.7x8.0)
⑨ A255 (TY-CNL-D 1.7x4.5)
⑩ A187 (TY-CNL-D 1.7x5.0)
⑪ TY-CNL-D1.7x4.5 Ni（In battery case）

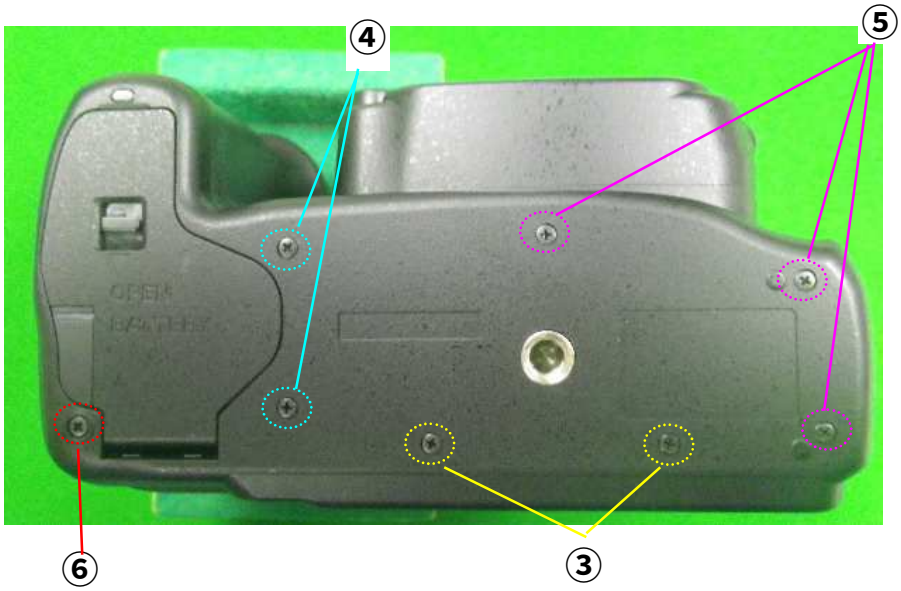


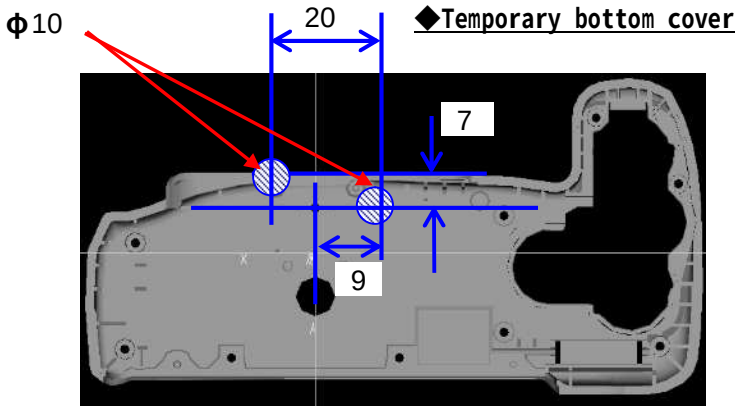
20. A401 (Bottom cover)

***If you adjust M100 position (SLR function, CCD position), Install temporary bottom cover at this point. After adjustment, apply screw lock to M100 adjustment screw (3 screws) then install original bottom cover.**

① Install battery cover and shaft to bottom cover then install to body with opening battery cover.
② A191 x2 (TY-CNS 1.7x6.0)
③ A185 x2 (TY-CNL-D 1.7x3.5)
④ A255 x2 (TY-CNL-D 1.7x4.5)
⑤ A34 x3 (CNL-D 1.7x5.0)
⑥ U4 (TY-CNL-D 1.7x7.0)
⑦ Confirm that the battery cover is closed certainly.







21. [Adjustment] AF-CCD POSITION

[Caution 1] [CCD POSITION] on AF and related adjustment carry out at this point.

[Caution 2] When replace 0-M100 or adjust mirror position, this adjustment is required.

[Caution 3] After adjustment, each setting will be initialized.

[Caution 4] Even if the temporary bottom cover is installed, the screw of No.1 might not be turned easily. In that case, remove the front cover(A150) and adjust the screw No.1.

Required equipment：

☐Programmed software for 77420 （Kr_CCD(M100)Adj）

☐PC (Windows Xp (SP2) with USB port equipped)

☐AF position jig (Square, Cross), ☐HD driver (HD-M1.5), ☐Light source (LV12),

☐AF chart for 2m (AF Chart No.1), ☐2m AF master lens, ☐USB cable (I-USB17),

☐Regulated DC power supply (8.3V / 3A), ☐DC cable, ☐Am meter,

☐DC coupler, ☐AC adaptor

21-1. Check Power

① Connect DC cable to Regulated DC power supply and set DC8.3V (3A).

② Turn OFF the camera then connect DC cord to the camera.

With this condition, make sure there is a no short circuit or no battery leak.

[Caution] If there is over current, disconnect the power immediately.

Pay attention to the flash board.

③ Turn on the power and confirm battery current. (refer to below table)

Consumption current (Average)	Power (Use DC coupler, DC cable, Power supply – DC8.3V)
Main SW/OFF	200μA or less*
Main SW/ON--- Light metering OFF	350mA
Light metering ON	500mA

*：When replace T100 (Before back-up battery is charged)

*Carry out general function check if necessary.

(If T100 is replaced, function may not work normally because each adjustment is not finished yet)

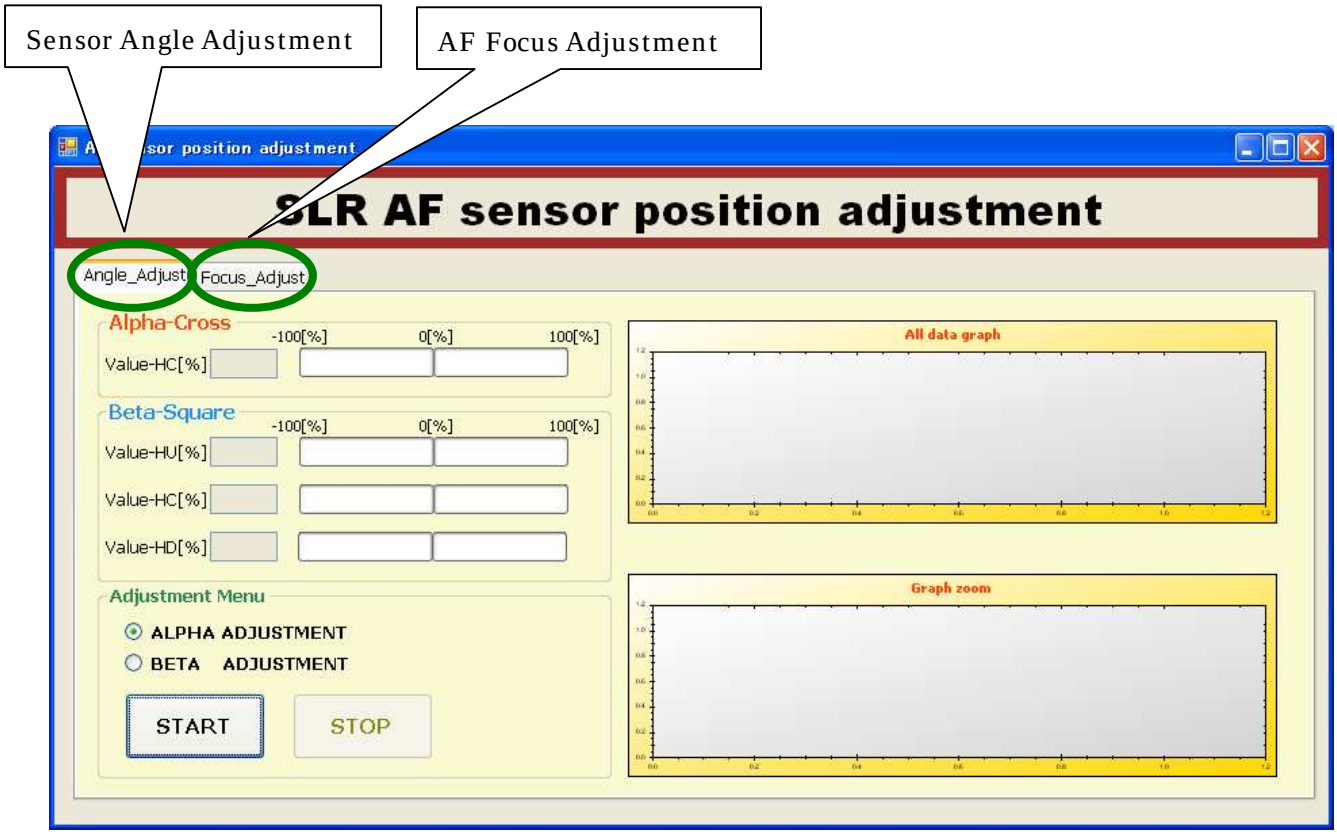
④ Disconnect DC cord from camera.

21-2. Preparation for adjustment

① Set focus mode to [MF].
② Connect AC adaptor to the camera.
③ Connect the camera to PC by USB cable then turn ON the power.

21-3. Adjustment (Kr PDCAdj)

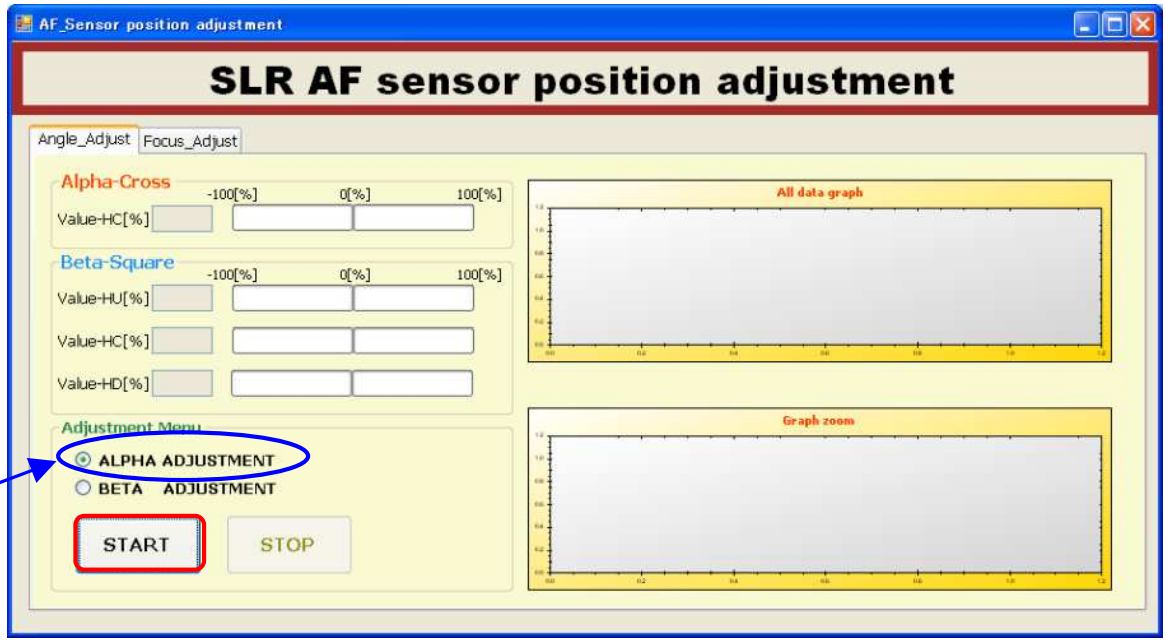
① Double click [D_SLR_M100_3point.exe] in the [Kr_CCD_Adj_] Folder to start up software.
② Below screen will be displayed. ↓



21-3-1. Alpha Adjustment (Cross)

① Below screen will be displayed. Click [ALPHA ADJUSTMENT].

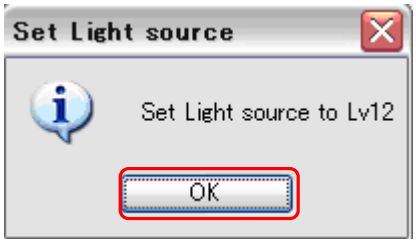
② Click [START]



③ Follow the screen and set the camera.

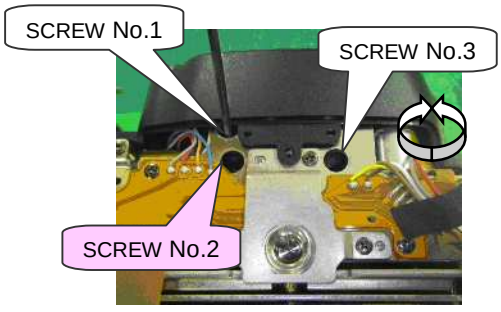
Attach the AF position jig (Cross) to the camera and set the Light source toLV12.

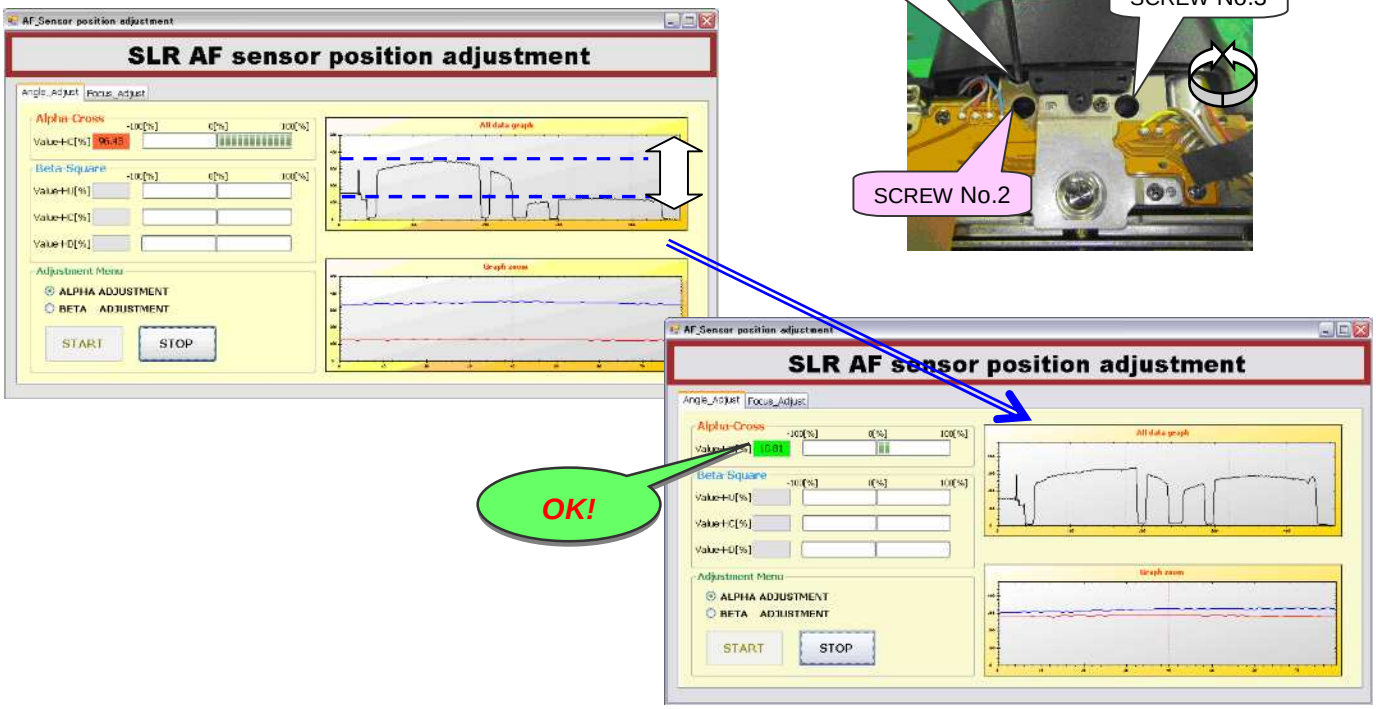
④ Set the camera (with AF position jig) to center of Light source window and click [OK].



⑤ Turn the adjustment screw No.1 (or No.3) by HD driver until green is indicated on Value window(OK).

⑥ When green (OK) is displayed press [Stop].



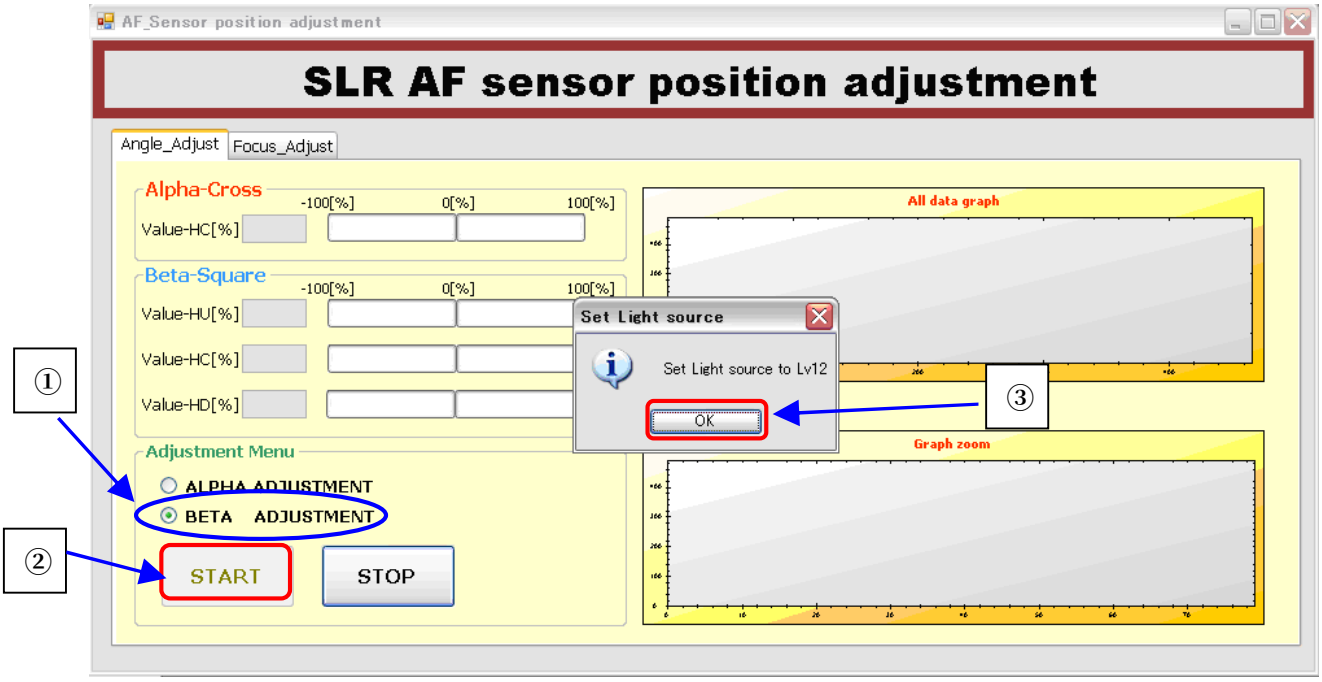


21-3-2. Beta Adjustment (Square)

① Click [BETA ADJUSTMENT]

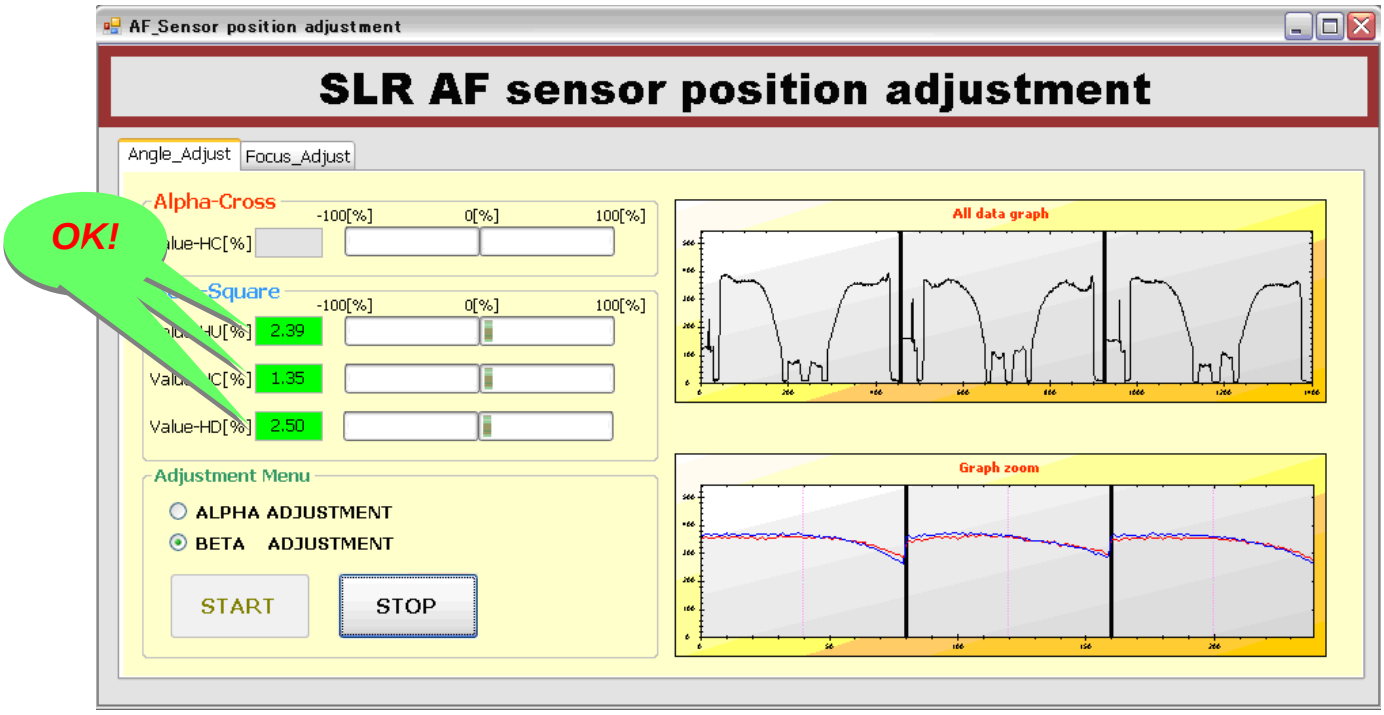
② Click [START]

③ Attach the AF position jig (Square) to the camera and set the Light source toLV12.
Set the camera (with AF position jig) to center of Light source window and click [OK].



④ Turn the adjustment screw No.3 (or No.1) by HD driver (HD-M1.5) until green is indicated on Value window(OK).

⑤ When green (OK) is displayed, click [Stop].

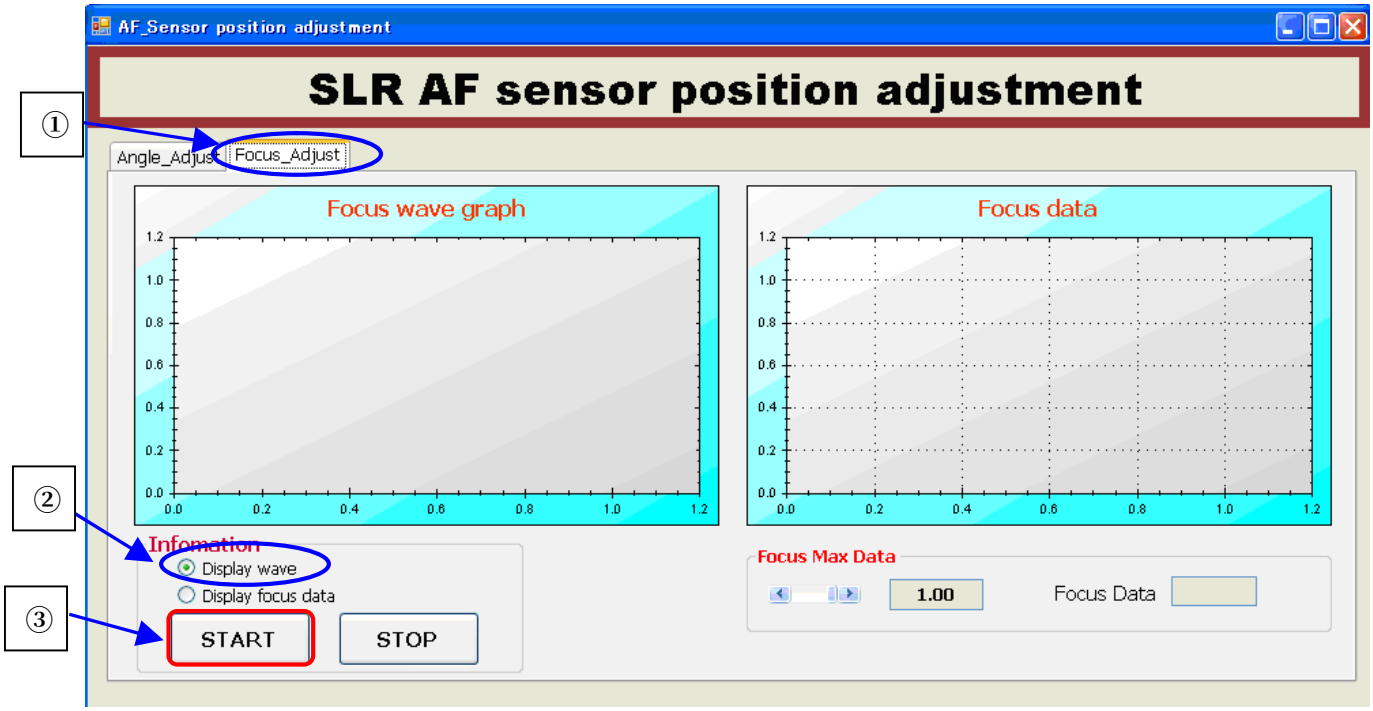


21-3-3．Focus Adjust

① Click [Focus Adjust] tab.

② Below screen will be displayed. Click [Display wave].

③ Click [Start].



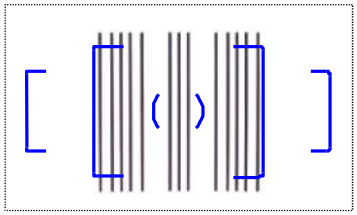
④ Set the camera.

Set the 2m AF chart (No.1) and attach the 2m AF master lens to the camera.

*Set the chart with blow condition.

1) Distance between camera mount and chart: 1,954.5mm (=1.9545m)

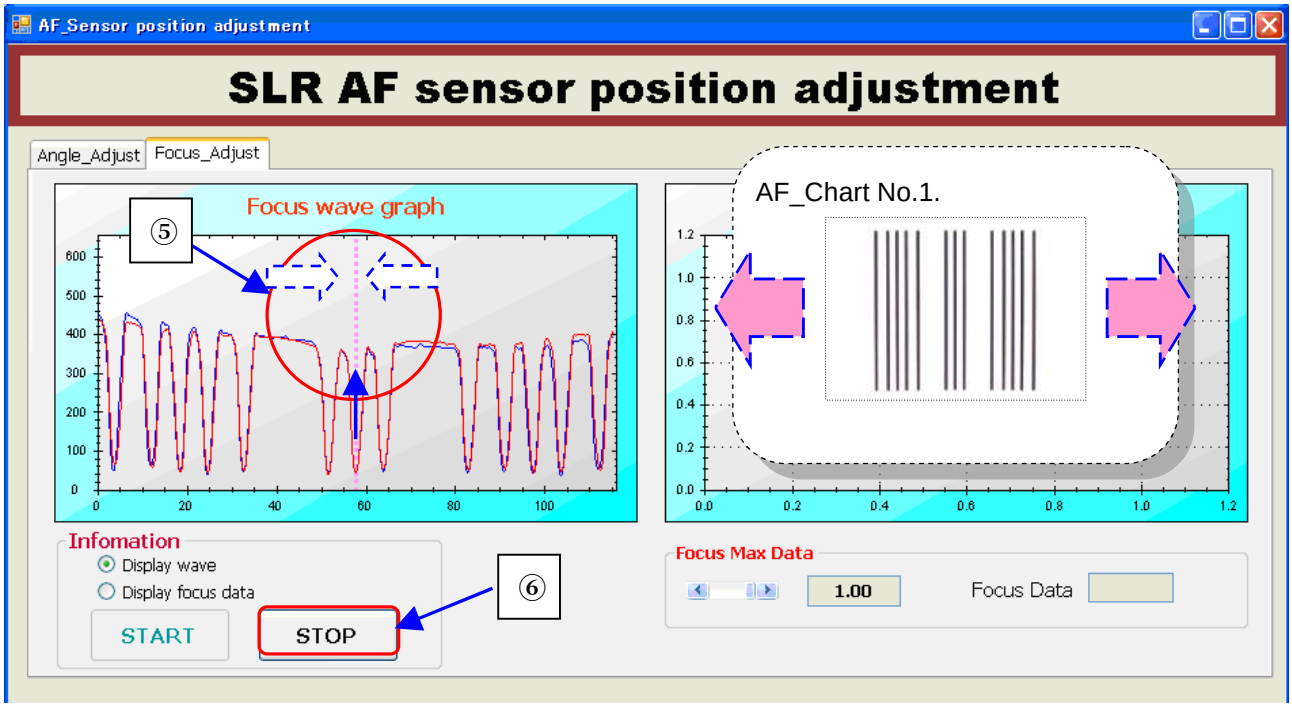
2) Chart should be set center of lens axis and horizontal and vertical.



(following page)

⑤ Align the center by moving camera position and match the center of red line with center of waveform.

⑥ When match the center of red line with center of waveform click [STOP].

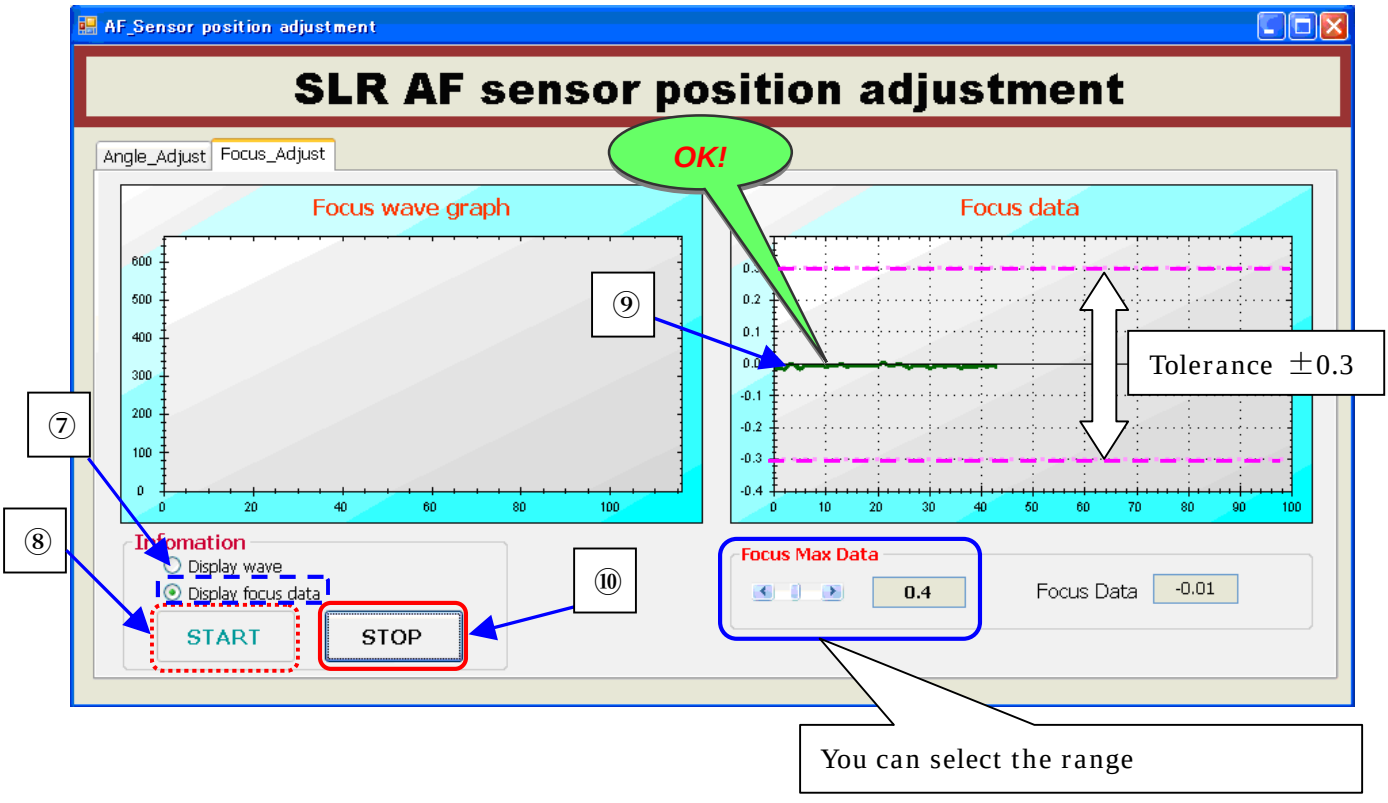


⑦ Click [Display focus data]

⑧ Click [START]

⑨ Turn the adjustment three screw (No.1-3) evenly by HD driver (HD-M1.5) until green is indicated on Value window(OK).

⑩ When green (OK) is displayed, click [STOP].

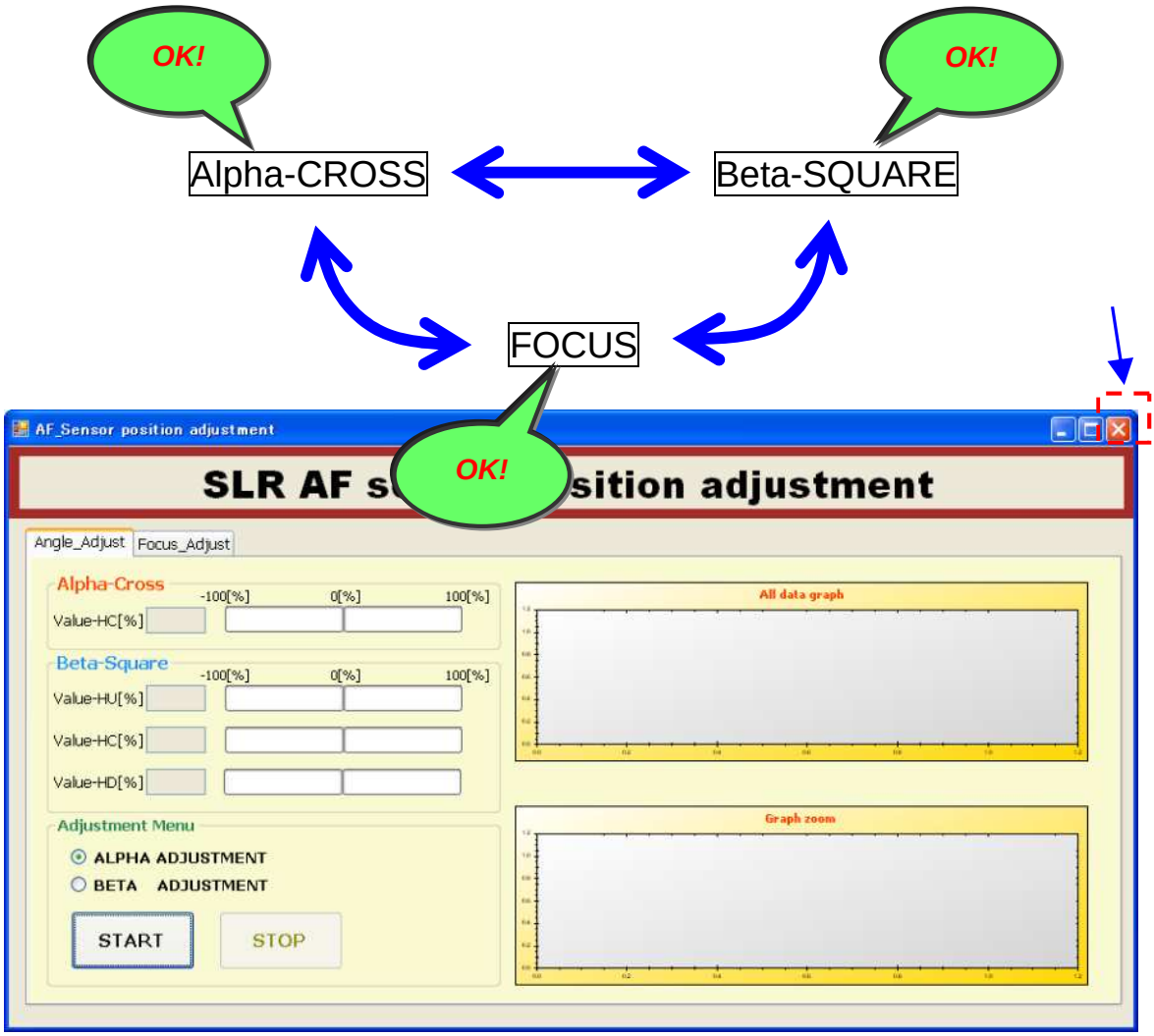


21-3-4.Finish the adjustment

① **[Caution]** Alpha-CROSS, Beta-SQUARE and FOCUS ADJ (2m) should be all OK.

② **[Caution]** After finish the adjustment, confirm other two adjustment. If you readjust one adjustment, confirm other two adjustment again. Carry out adjustment and confirmation repeatedly until all adjustment become OK.

③ After finish the all adjustment, click [Close] to finish adjustment.



④ Apply screw lock to three adjustment screw for M100.

IV. Adjustment and Confirmation

*Following contents are adjustment and confirmation after complete [III. Assemble procedure of main body]

*[Preparation for adjustment] should be completed.

***[Caution]** When execute adjustment with program software, each setting will be initialized.

1. [Confirmation] Confirmation for Battery consumption current

[Required equipment] □DC coupler □DC cable □Power supply (DC8.3V/3A or above)
□Circuit tester

[Caution] There are two kind of method for confirming Battery consumption current.
Depending on type of battery, select either method as followings.

***Select DC coupler with affix insulation tape or DC coupler without affix insulation tape.**

① Use DC coupler without affix insulation tape: condition → Using external power supply (AC adaptor) or Lithium-ion battery (Set the power supply 8.3V)
(For confirming, External power supply (AC adaptor)＝Lithium-ion battery)

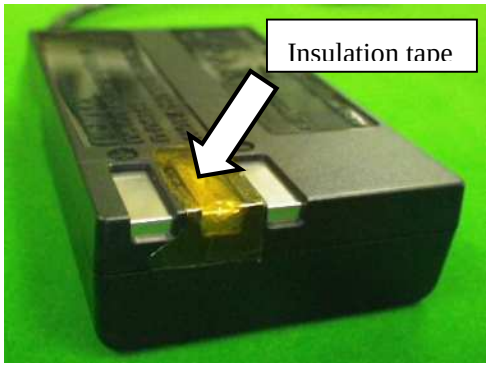
② Use DC coupler with affix insulation tape: condition→Using AA batteries (Set the power supply 6.0V)

Method for checking

[Caution] Be sure to set the correct voltage. Do not mistake to set type of power source.

① Connect DC cable to the power supply and set DC6.0 or 8.3V (3A).

② Install DC coupler into battery chamber.



DC coupler and DC cable

③ Connect DC cable to DC coupler. Confirm that there must be neither short nor leakage.
[Caution]If there is short circuit, disconnect the power immediately.

④ Turn on the power and release 3 times.

⑤ **[Confirmation]** Turn off the power and confirm the battery consumption current. (Refer to below table)

⑥ Confirm other current if necessary. (Refer to technical information)

Consumption current (Ave)	Power (DC coupler/DC cable/Power supply/DC6.0 / 8.3V)
Main SW/OFF	200μA or less*
Main SW/ON・・・ Meter OFF	400mA / 350mA
Meter ON	540mA / 500mA

*： When replacing T100 (Before back-up battery is charged)

2. [Adjustment] Initialization when replace T100

[Caution] When replacing T100, you must execute this initialization.

[Caution] Use AC adaptor or fully charged battery for adjustment.

[Required equipment]

AC adaptor kit

2 SD cards for K-r adjustment (Product FW, Initialization)

2-1. Writing FW

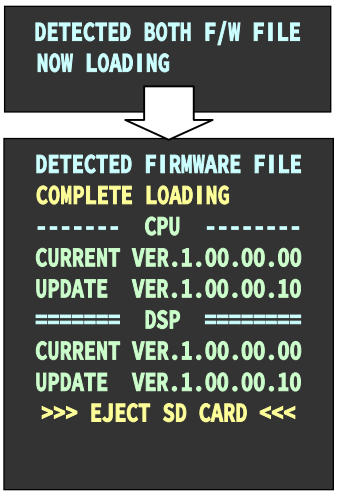
[Caution] All settings are initialized.

[Caution] Use AC adaptor or Power supply.

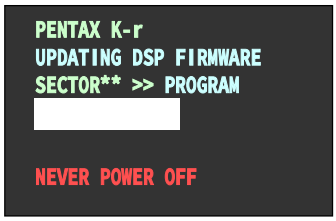
① Turn OFF the power.

② Insert SD card for Product FW to the camera then leave the SD card covers open and keep this condition.

③ Camera read SD card automatically and right screen will display.
*If you cancel the writing, disconnect power first then remove SD card.



④ Remove the SD card when the message [>>> EJECT SD CARD <<<] is appeared then starting updating.
(It takes approx 90sec for loading firmware)
[Caution] Do not turn OFF the power.



⑤ Display and main power will turn off automatically when FW installation is finished.
Confirm that the FW is installed. (finish)

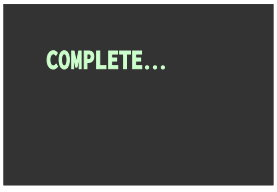
2-2. Data initialization

[Caution] All EEPROM data will be initialized. Execute only replacing T100.

① Turn OFF the power

② Insert SD card for initialization to the camera.

③ Turn ON the power while opening SD card cover.
(Initialization will be started. It takes few sec.)
[Caution] Do not turn OFF the power.



④ When display is changed to “COMPLETE…”, it is completed.
Turn OFF the power.

3. [Adjustment]　SR adjustment I (Unit adjustment)

[Caution1] Execute this adjustment when replaced T100, T640 or SR block.

[Caution2] Execute the adjustment on the stable table and do not give the vibration to the camera during the adjustment.

[Caution3] When replacing T100 or C000, write down C000 ID number

***Some pictures and adjustment screen are using previous model but basic contents (usage / operation message) are the same as K-r**

[Required equipment] Adjusting software for 77420, SR adjustment stand, Computer (Windows Xp (SP2),USB port as standard equipment), USB cable, AC adaptor kit

3-1. Preparation

① Set focus mode to [MF].

② Attach the SR adjustment stand to the camera.

③ Put the camera on the stable table with lens downward.

3-2. Procedure for adjustment

① Start up the computer.

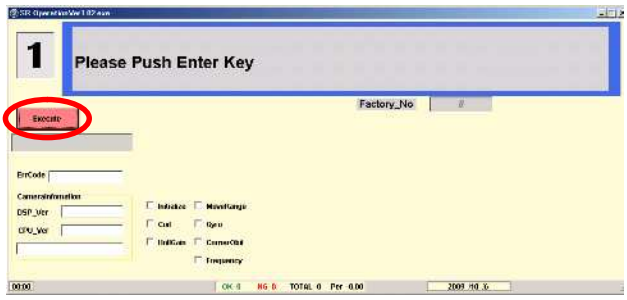
② Connect the camera to the computer via USB cable and connect the AC adapter (Power ON).

③ Confirm that the camera is recognized by computer. (Hot plug icon).

④ Double click [SR Operation.exe] in the [SR_Operation ver1.03] folder.

⑤ Adjustment screen will be displayed.

⑥ Click [Execute] button.

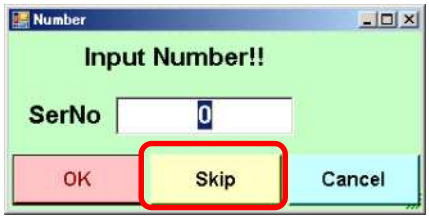


⑦ Input screen will be displayed as shown figure right.

⑧ Input number or select Skip.

[If T100 or C000 are not replaced]

Click [Skip] button.

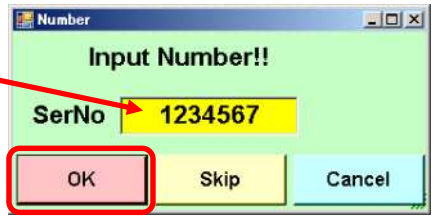


[If T100 or C000 are replaced]

Input ID No. (7 digit)

↓

Click [OK]



*If cancel the adjustment, click [Cancel]

⑨ Adjusting screen is indicated during adjustment.

(Adjusting time: Approx, 1 minute and 30seconds)

[Caution] Do not give vibration to the camera during adjustment,
also do not even walk around the camera.

* If vibration is given, readjust again even adjustment is passed.
* If you stop the adjustment, click [Stop] button.

⑩ When below screen is displayed, the adjustment is completed.
⑪ Confirm [OK!! SUCCESS!!] is displayed then click [X] button to complete the adjustment.

*If adjustment is NG, green color display will be changed red color display and indicate error code.
Refer to the technical information for [The table of error code].

4. [Adjustment] Metering, Battery check, AGC adjustment

[Caution1] When the T100 is replaced, all adjustments are required.

[Caution2] When replace J100 or adjusted position, [BV adjustment] is required.

[Caution3] When replace M100 or adjusted M100 or mirror position, [AGC adjustment] is required.

[Required equipments]

□Programmed software for 77420 ---BV adjustment (K-r_BVAdjust)

□PC (Windows Xp (SP2), with USB port equipped)

□USB cable (I-USB17) □AC adaptor □DC coupler □DC cable

***For BV adjustment (Metering)**

□Light source (LV6/LV8 or LV9, LV12/LV15 or LV16, Can be used shutter tester)

□D20 + F5.6 set plate or D20-01 (with lens ID number)

□Diaphragm set ring F8 (KA-0-1A)

***For battery level adjustment (Battery check level)**

□DC coupler for K-r with custom (with affix insulation tape) □DC cable □Regulated DC power supply (8.3V/3A and above)

***AGC adjustment (M100 auto gain control)**

□AF master lens for 2m □Light source (LV12)

4-1.Preparation

① Set focus mode to [MF].

② Set the Mode dial to [M].

③ Connect AC adaptor and DC coupler to the camera.

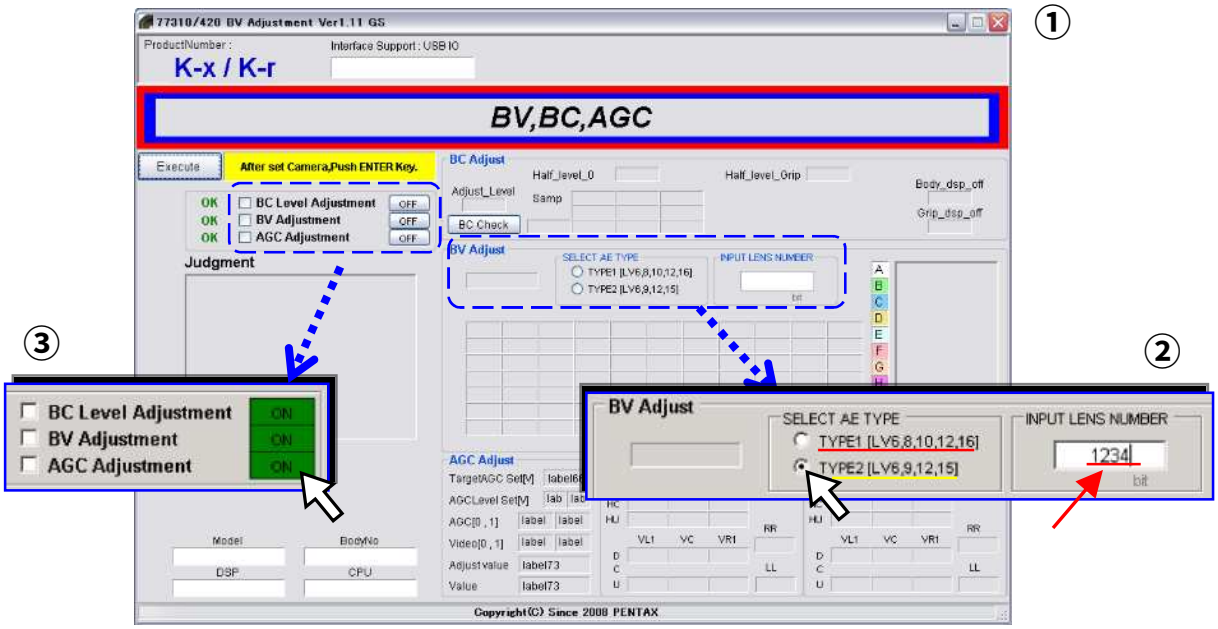
④ Connect USB cable to the camera then turn ON the camera.

4-2. Adjustment (BVAdjust)

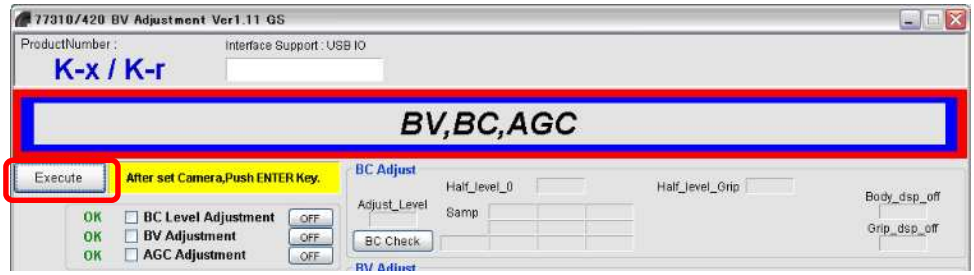
① Click [774200_BVAdjust.exe] in [77420_BVAdjust] folder to start up software.
(Adjustment screen display ↓)

② Select the type of Light source for BV adjustment and input lens ID number.
If you do not execute BV adjustment, it is not necessary.

③ Click [OFF] button to select adjust item --- Display will be changed to [OK] and enable to adjustment.

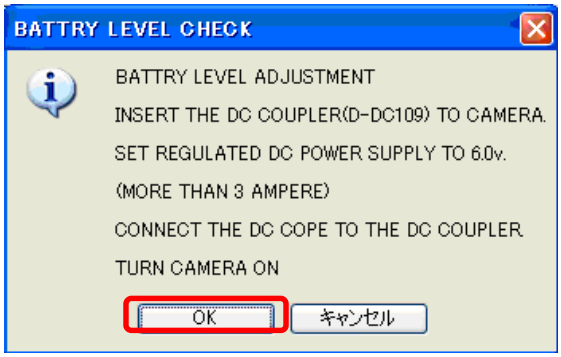


④ Click [Execute] button --- Mirror will be activated one time.
Adjustment will be executed in order from [BC → BV → AGC] that are selected section③.

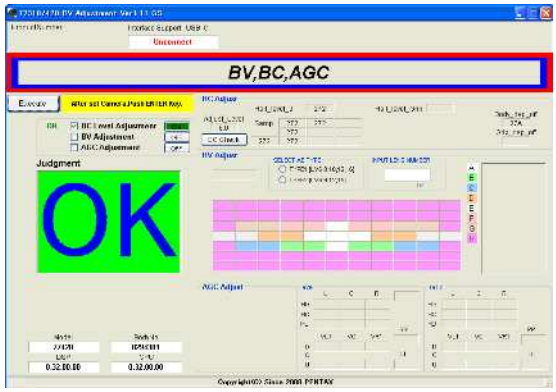


4-2-1. BC level adjustment

③ Below message screen will be displayed. Follow the message on screen.
④ Attach the DC coupler and DC cable to the camera.
⑤ Set the connected DC power supply to DC6.0V(3A).
⑥ Click [OK] to execute adjustment.



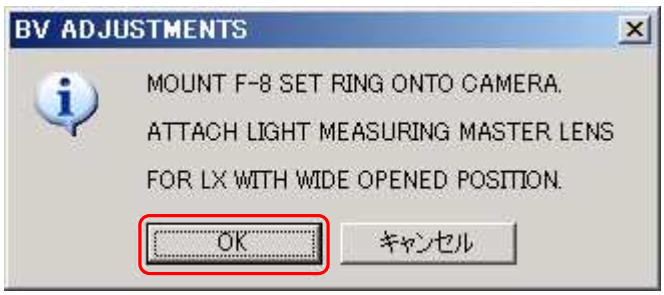
⑦ When adjustment is completed, [OK] will be displayed.



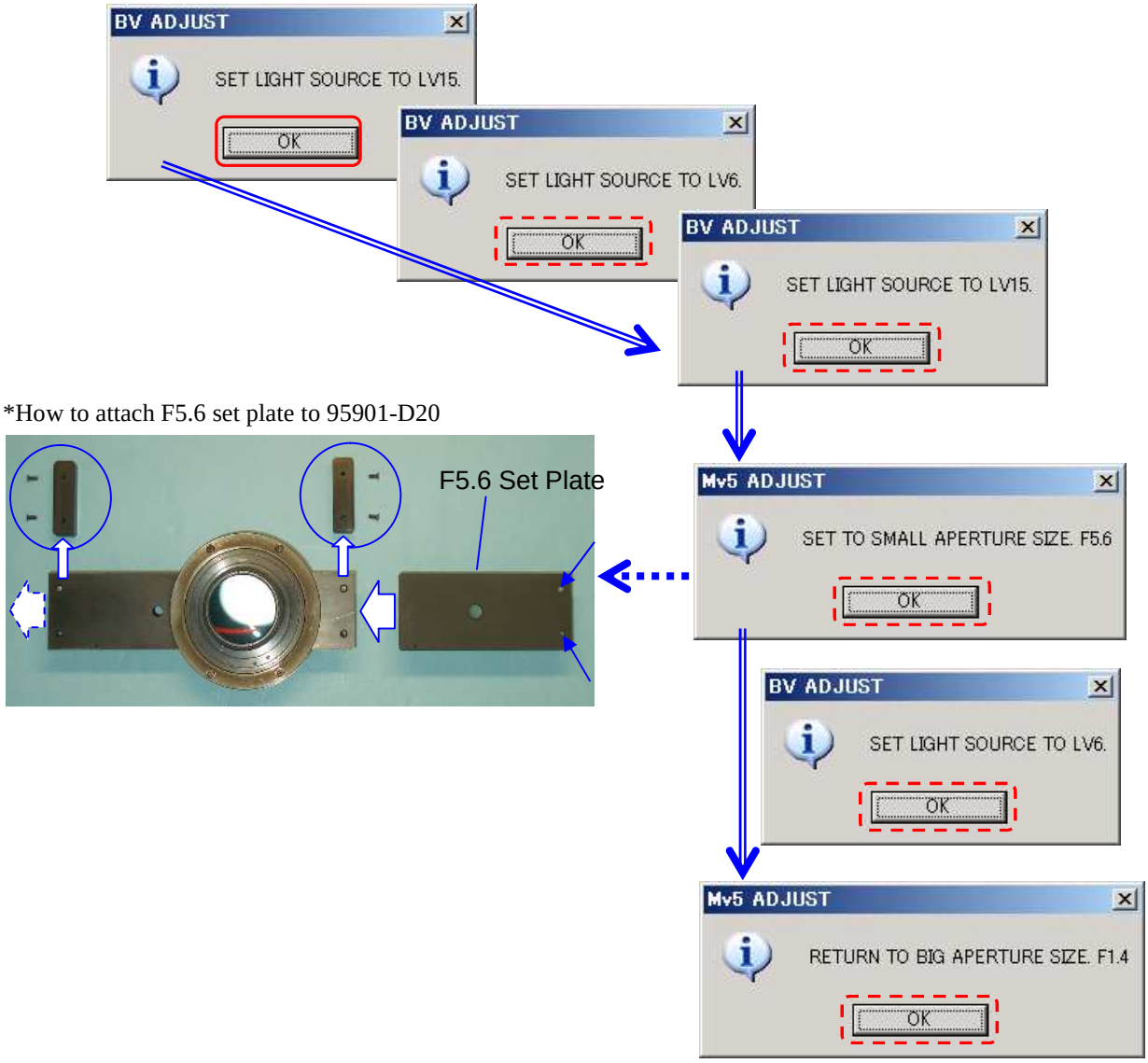
⑧ Disconnect DC cable and connect the AC adaptor to the camera.

4-2-2. BV adjustment

① Attach F8 set ring to the camera and set D20(D20-01) at full open.
[Caution] Set the camera at center of Light source window.
[Caution] Cover the camera and Light source window by dark curtain to avoid unnecessary light.
② Click [OK] to execute adjustment.



③ Follow the message on screen and change the Light source and set plate.



④ When adjustment is completed, [OK] will be displayed (EX display: Selected BV and AGC)

Go to the next page.

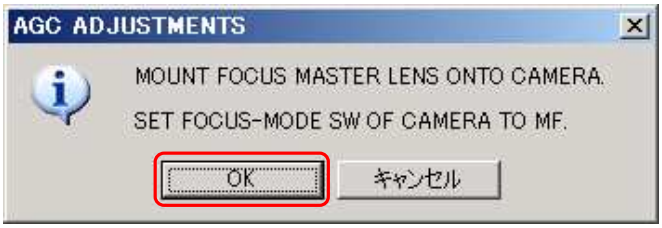
4-2-3. AGC adjustment

① Below message screen will be displayed. Follow the message on screen.

② Attach the AF master lens for 2m to the camera.

③ Set the focus mode SW at [MF].

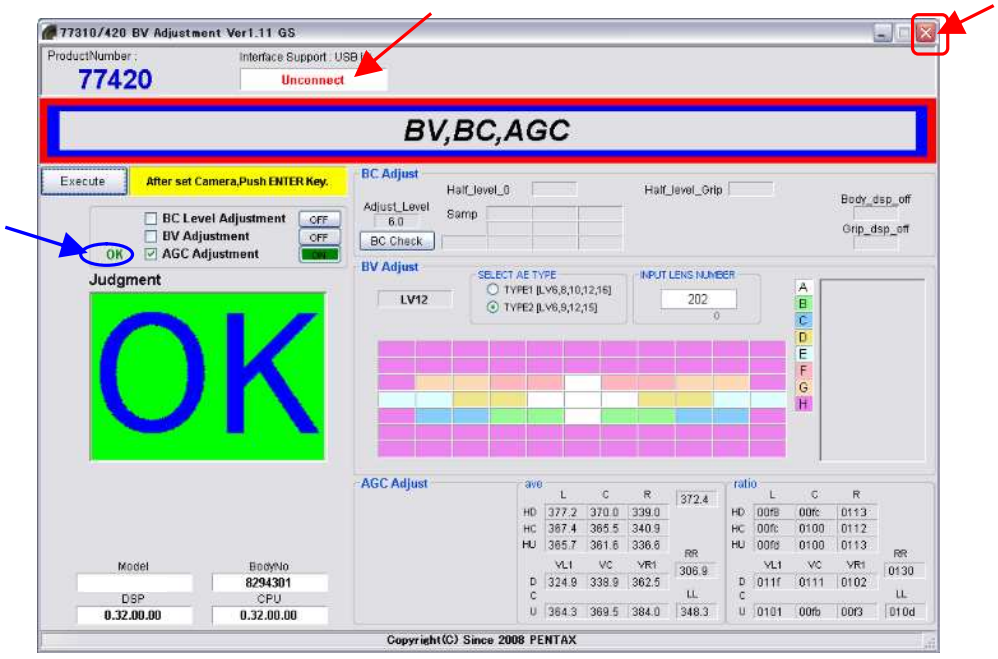
④ Click [OK].



⑤ Set the Light source at LV12.
Click [OK] to execute adjustment.

⑥ When adjustment is completed, [OK] will be displayed.

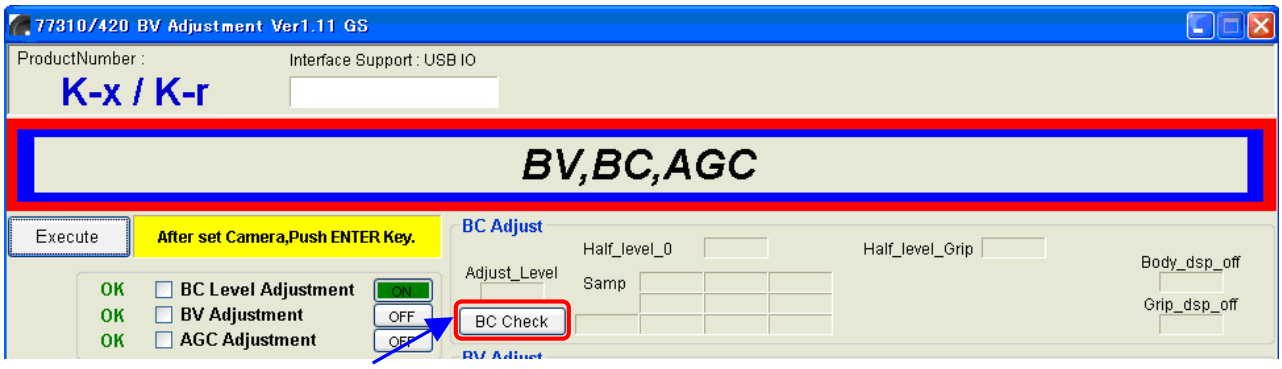
⑦ Confirm [Unconnected] is displayed then click [X] button to finish adjustment.



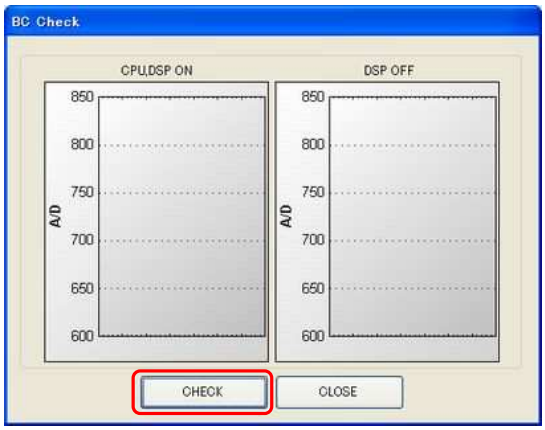
4-2-4. Confirm BC level (If necessary)

① Click [77420_BVAdjust.exe] in [77420_BVAdjust] folder to start up software.

② Click [BC Check] button.



③ Click [CHECK] button.

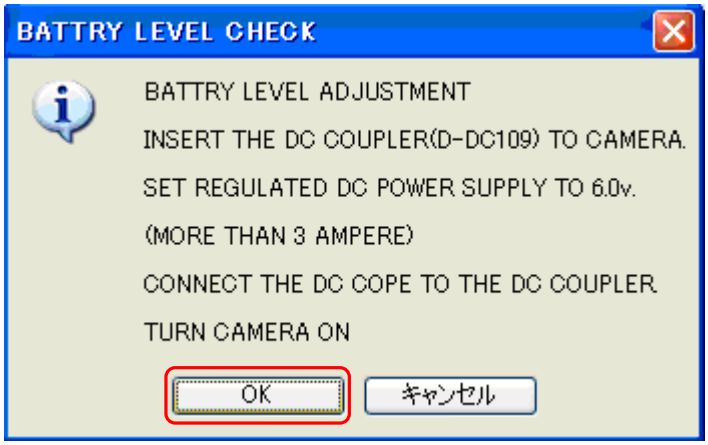


④ Attach the customize DC coupler and DC cable to the camera.

⑤ Set the connected DC power supply to DC6.0V (3A).

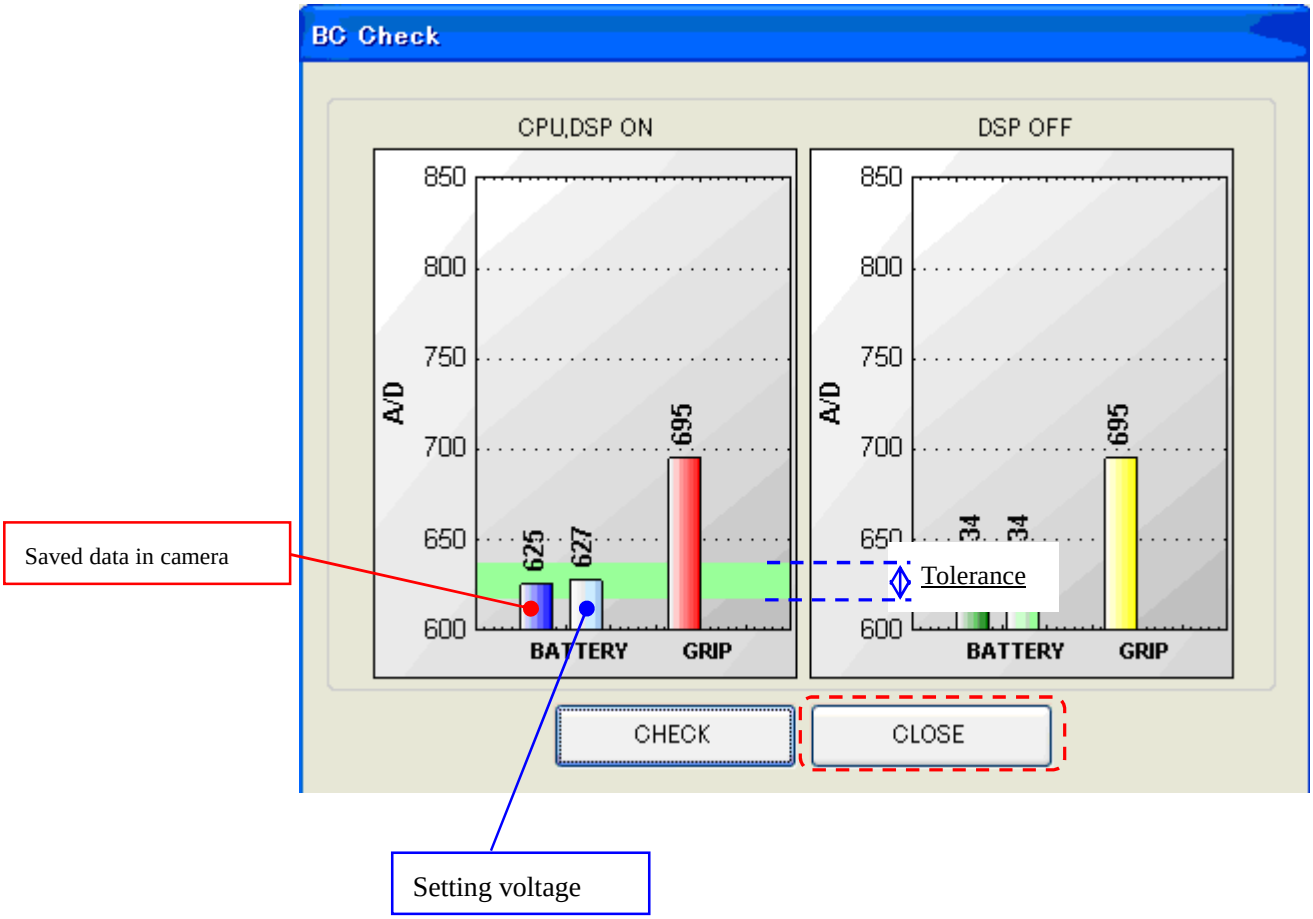
⑥ Turn ON the camera.

⑦ Click [OK] to execute chinking.



(Go to the next page)

⑧ Saved data and setting voltage will be displayed.
Confirm the difference between Saved data and setting voltage.
If there is a big difference, execute BC level adjustment.



⑨ Click [CLOSE] to finish checking.

5. [Adjustment] M100 adjustment (AF)

[Caution1] When T100 is replaced, this adjustment is required.

[Caution2] When replace M100 or adjusted M100 position, this adjustment is required.

[Caustion3] When replace 0-A101 or 0-B52 and adjusted mirror position, this adjustment is required.

***Some pictures and adjustment screen are using previous model but basic contents (usage / operation message) are the same as K-r.**

[Required equipment]

□Programmed software for 77420 ---M100 adjustment (K-r SLR_Uni and K-r SLR_FI)

□PC (Windows Xp (SP2), with USB port equipped) □USB cable (I-USB17) □AC adaptor kit

□D-FA(FA) Macro 50mm F2.8 □Light source (LV12) □AF chart for 2m x2 kinds □AF master lens for 2m

5-1. AF Uniformity and related adjustment.

[Required equipments]

□D-FA(FA) Macro 50mm F2.8 □Light source (LV12) □Lens cap and ME finder cap

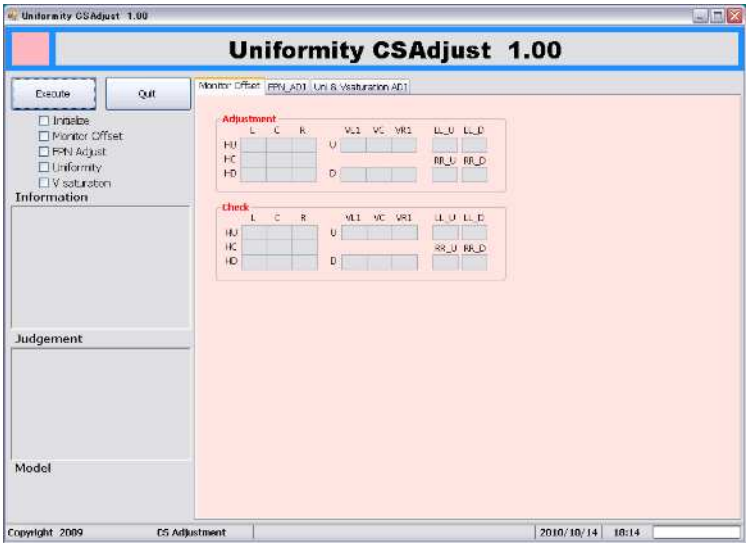
① Set the mode dial at [M] and Focus mode switch at [MF]

② Attach the lens to the camera and set focus ring at infinity.

③ Set the camera at center of Light source window.

④ Click [Kr SLR_Uni.exe] in [K-r SLR_Uni] folder to start up software.
(Adjustment screen will be displayed)

⑤ Click [Execute] button to start adjustment.



⑥ When [Lens cap] is displayed, put lens cap and finder cap to the camera. Turn OFF the Light source.

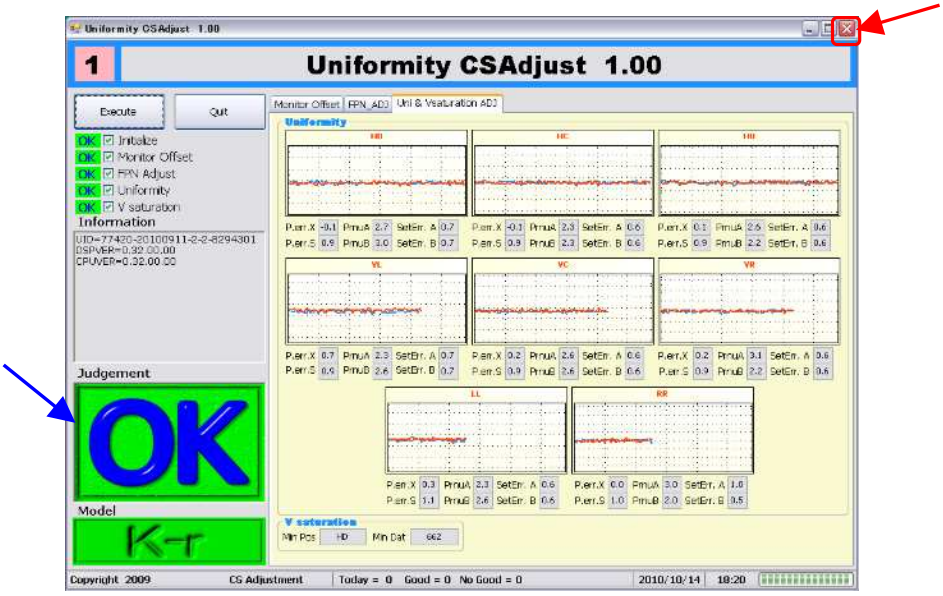
⑦ Click [OK] to continue the adjustment.

⑧ When [Remove the les cap] is displayed, remove lens cap and finder cap.
Torun ON the Light source and set the camera and lens to the Light source.

⑨ Click [OK] to continue the adjustment.

⑩ When adjustment is completed, [OK] is displayed.

⑪ Click [X] button to finish the adjustment.



⑫ If adjustment is NG, NG and error code will be displayed.
Refer to the technical information for [The table of error code].

5-2. AF FI adjustment

[Required equipments]

□AF chart for 2m (No.1 and 2)　□AF master lens for 2m

*Set the AF chart for 2m as following condition.

1) Distance between AF chart and camera mount surface: 1,954.5mm(=1.9545m).

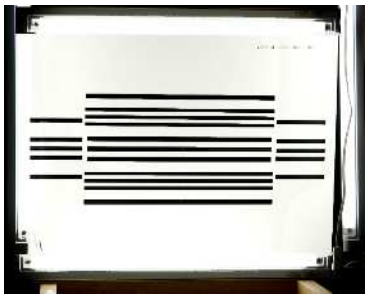
2) Chart should be set at perpendicularly against light axis of the lens.

3) Lighting the chart approx LV11~12 on surface of chart.

If brightness is not enough, adjustment will not be passed (NG)

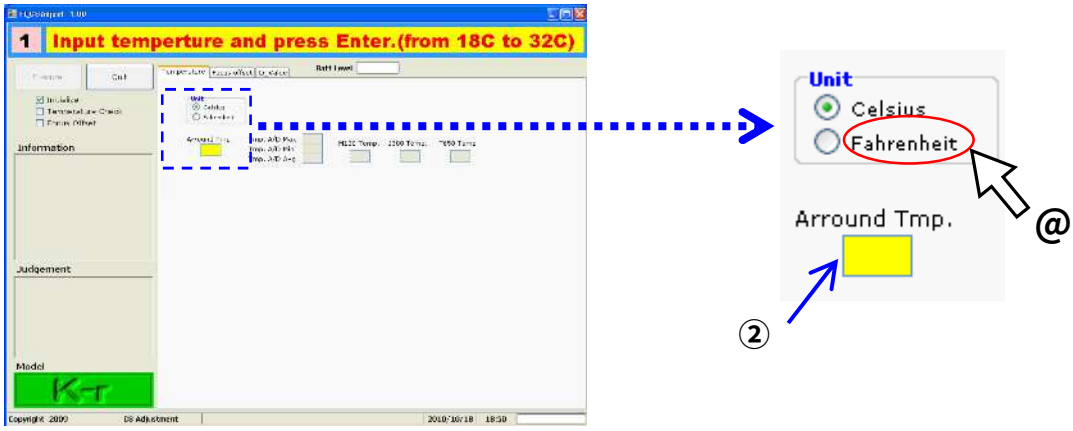
◆Example for lighting→

AF Chart No.2



① Double click [K-5_FI Ver100.exe] in [K-5_FI Ver100] folder to start up software.
(Following adjusting screen is displayed)

② Input temperature(℃) and press [Enter] key. ((a):Select Celsius or Fahrenheit by cursor)



*In case of NG, there is possibility that the temperature is difference more than 2℃between room temperature and temperature for inside of camera.

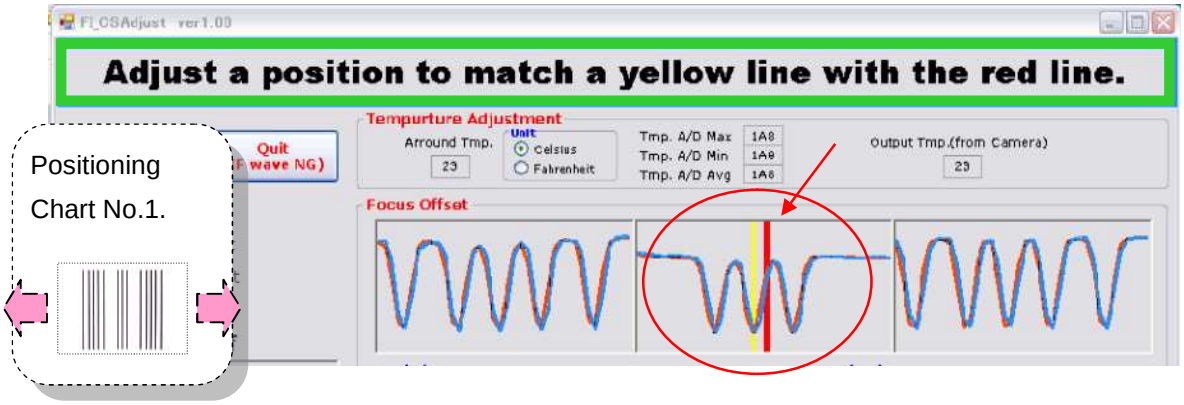
*Adjust the camera after the camera fit in the room temperature.

③ When temperature adjustment is completed, right screen is displayed.→

④ Set the camera to AF chartNo.1 (vertical line).

⑤ Press [OK] button then start to align the cart position.

⑥ If the chart and center of camera are out of alignment, below screen will be displayed. Align the center by moving camera position. (Match a yellow line with red line.)



⑦ If the position is in alignment, below screen will be displayed. When you keep the position, adjustment will be started automatically.

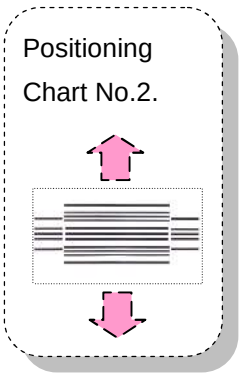
[Caution] Don't touch camera or chart during adjustment. If you touch it, readjust is necessary.

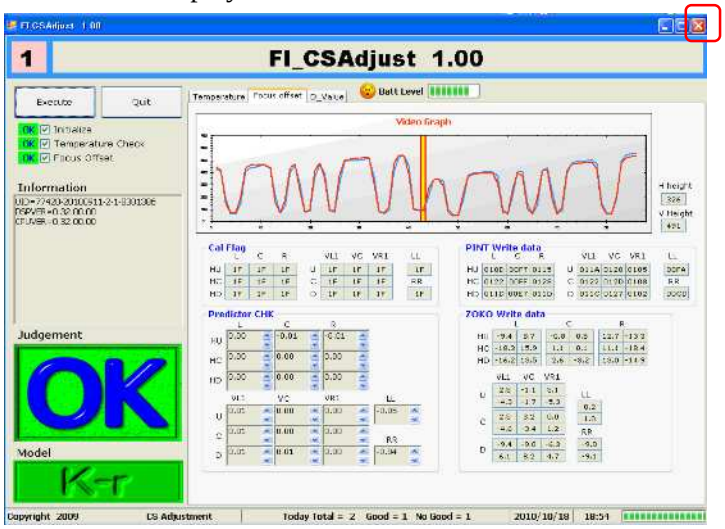
⑧ When horizontal sensor adjustment is completed, right screen is displayed.

⑨ Replace AF chart (No.2) (horizontal line) then press [OK]

⑩ Align the camera and chart (Up-and –down) then adjust.

⑪ When adjustment is completed, OK screen will be displayed as shown in below.





⑫ Click [X] button to finish adjusting software.

⑬ If adjustment error is displayed, [NG] and error code will be displayed.
Refer to [Table of error code]

6. [Adjustment] Digital part (M-Test)

[Caution1] When T100 or C000 is replaced, this adjustment is required.

[Caution2] When replacing T100 or C000, [SR adjustment I (Unit adjustment)] (Input ID number) should be completed before this adjustment.

[Caution3] Calibration of Light source with master body (76830) should be completed before this adjustment.

[Caution4] Calibrate (Confirm) brightness and color temperature with using the color meter and LV checker.

Light value	Brightness	Color temperature
LV12	LV12.00Ev ±0.10	2,856K ±30
LV11	LV11.00Ev ±0.01	—
LV 8	LV8.00Ev ±0.10	—

***Some pictures and adjustment screen are using previous model but basic contents (usage / operation message) are the same as K-r.**

[Required equipments]

□Programmed software for 77420 ---Digital adjustment (K-rCS_MTest)

□Light source(EX:LB3300,A light) □PC (Windows Xp (SP2), with USB port equipped)

□Master lens D20 or D20-01 and Diaphragm set ring F8 (KA-0-1A)

*Use the same master lens as the ID number printed on CD-ROM

□USB cable (I-USB17) □AC adaptor kit □Dark curtain

□Color temperature tester (for calibration) □LV meter (for calibration)

6-1. Setting the computer and Light source

① Set mode dial to [M] and Set focus mode lever to [MF].

② Attach Diaphragm set ring F8 and Master lens(D20 or D20-01) to the camera.

③ Set master lens to [F8 position].

④ Set the lens toward center of light source window.

⑤ Connect the camera and PC with USB cable and turn ON the camera.

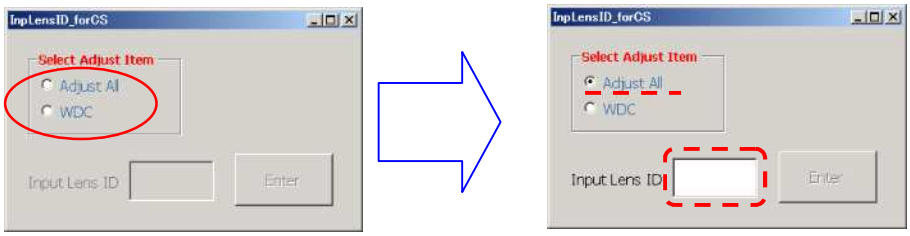
⑥ Cover the whole camera and light window by using dark curtain to avoid surrounding light.

6-2. Procedure of adjustment

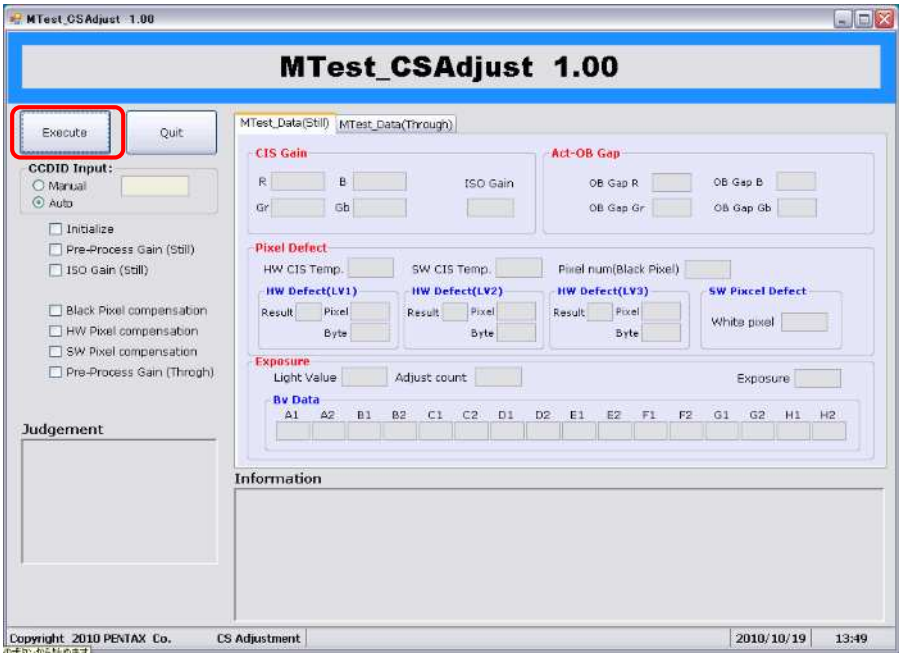
① Double click [K-r_SLR_MTestt.exe] in [K-rCS_ MTest] folder to start up.

② Select content on below screen.(Basically All or WDC only)
Following method for selecting “Basically All”.

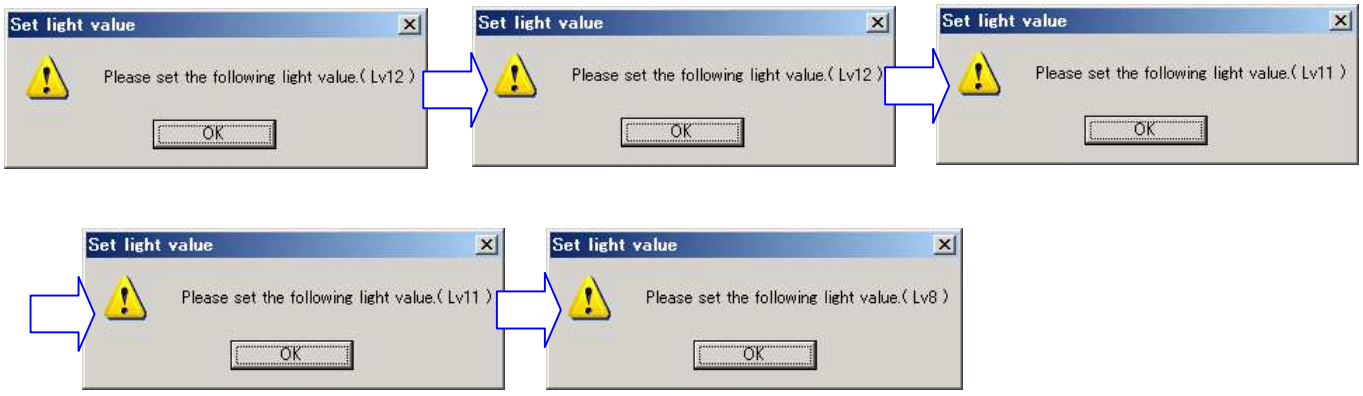
③ Input lens ID number then click [Enter]. (EX:”321”, ”058”→ **58**)



④When adjusting screen is displayed, click [Execute] to start adjustment. Follow the screen for adjustment.



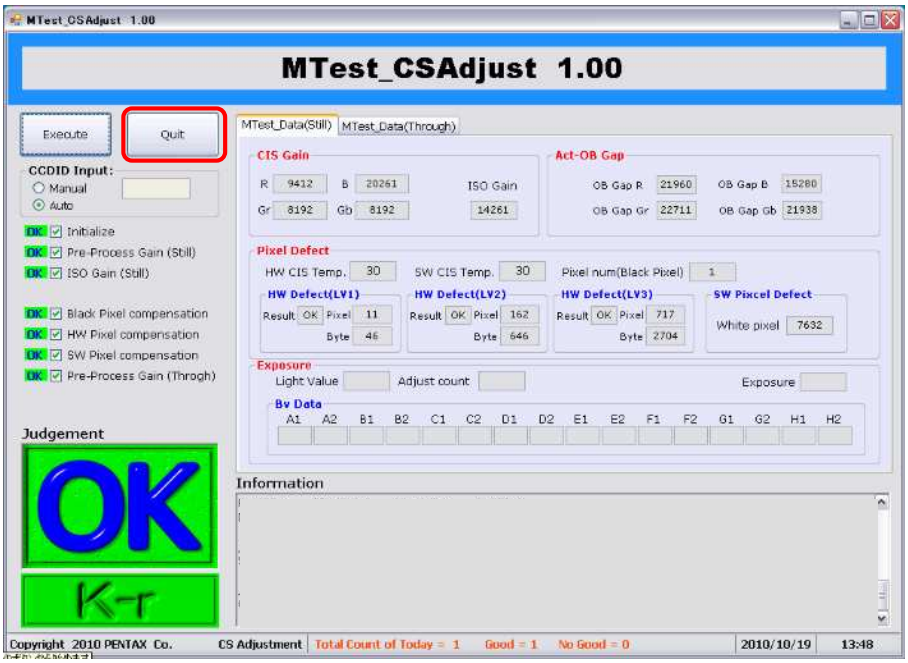
⑤ Middle of adjustment, “Please set LV--” message will be displayed, set the light value to LV8, LV11 or LV12then click [OK].



(Go to the next page)

⑥ When adjustment is completed, [OK] will be displayed.

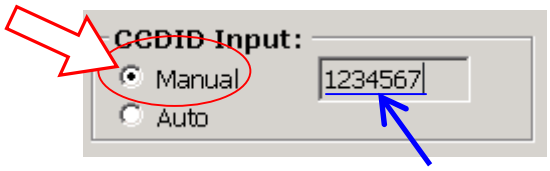
⑦ Click [Quit] button or [x] to finish adjusting software. (Adjustment time approx.3 minutes)



*If adjustment error is displayed, [NG] and error code will be displayed. Refer to [Table of error code].

*When starting adjustment, if ID error is displayed…

1) Select [Manual] on Serial-ID screen and Input correct CMOS ID number.
2) Click [START] to execute adjustment.
3) If still displaying error message even input correct ID number, contact PENTAX Global Service Department and inform the ID number.



6-3.WDC Adjustment (If necessary)

It can be adjusted only for white pixel defect compensation separately.

(Light source and Master lens are not necessary for this adjustment)

*There is possibility that pixel defect compensation can be adjusted by adjust repeatly.

[Required equipments]

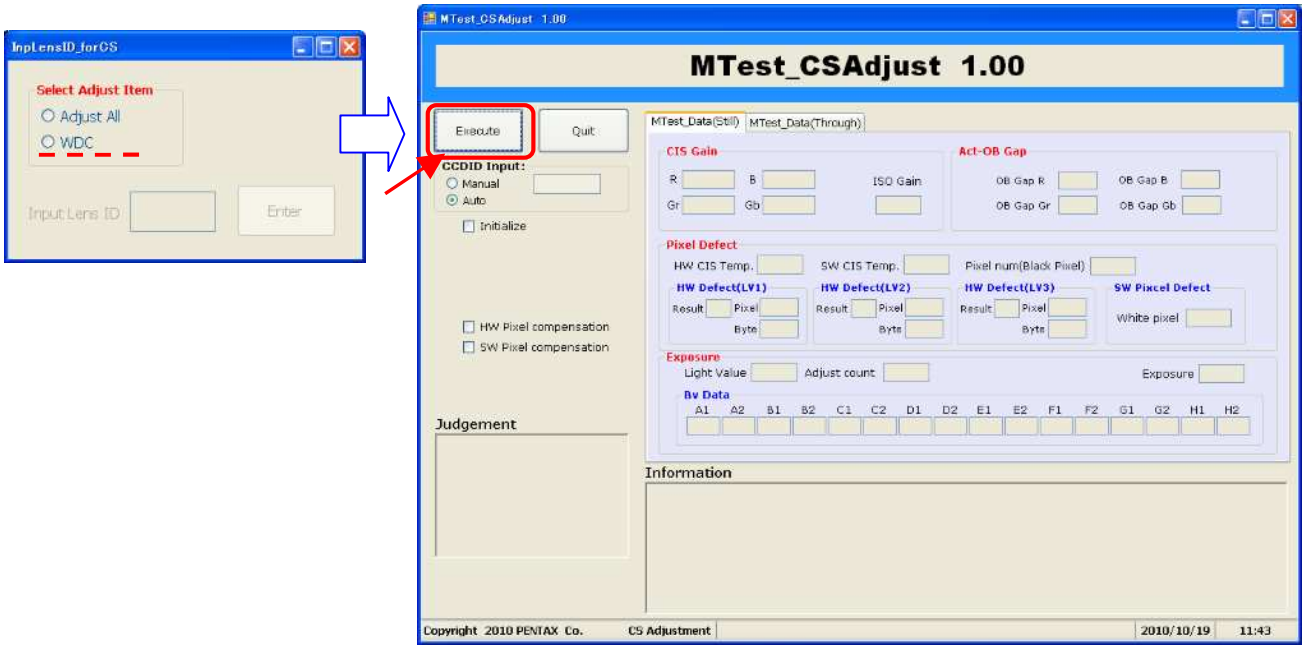
□Programmed software for 77420 [K-r CS_MTest]

① Set mode dial to [M] and Set focus mode lever to [MF].

② Connect the camera and PC with USB cable and turn ON the camera.

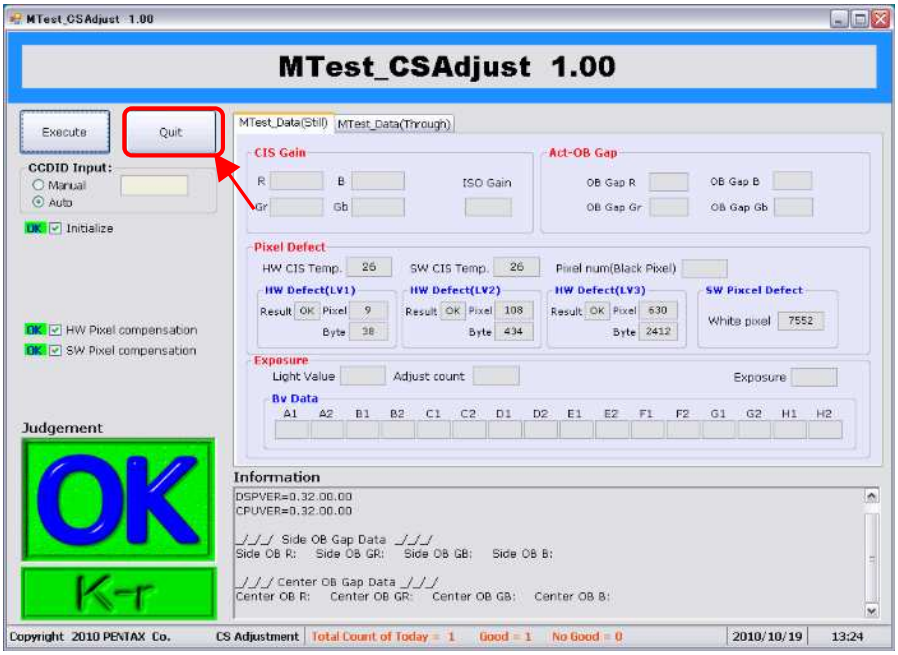
③ Double click [K-r SLR_ MTest.exe] in adjustment folder to start up software.

④ Select WDC and click [Execute] to start adjustment.



⑤ When adjustment is completed, [OK] will be displayed.

⑥ Click [END] to finish adjustment software.



7. [Adjustment] SR adjustment II (Gain adjustment)

*Adjustment is basically the same as 76830 (K10D) and 76700(K100D).

[Caution1] When replaced T100, T640, T950or SR block, this adjustment is required.

[Caution2]SR adjustment I (Unit adjustment)should be completed before this adjustment.

[Caution3]Execute the adjustment on the stable table and do not give the vibration to the camera during the adjustment.

[Caution4] The weight of the stage is more than 10kg, so pay attention the handling. Do not hold black stand parts.

***Some pictures and adjustment screen are using previous model but basic contents (usage / operation message) are the same as K-r.**

[Required equipment]

□Programmed software for 77420--- K-r_SR_Gain

□SR gain adjustment set *(Controller, stage, speed meter)

□Chart for SR gain adjustment (Attached in service manual for 76700)

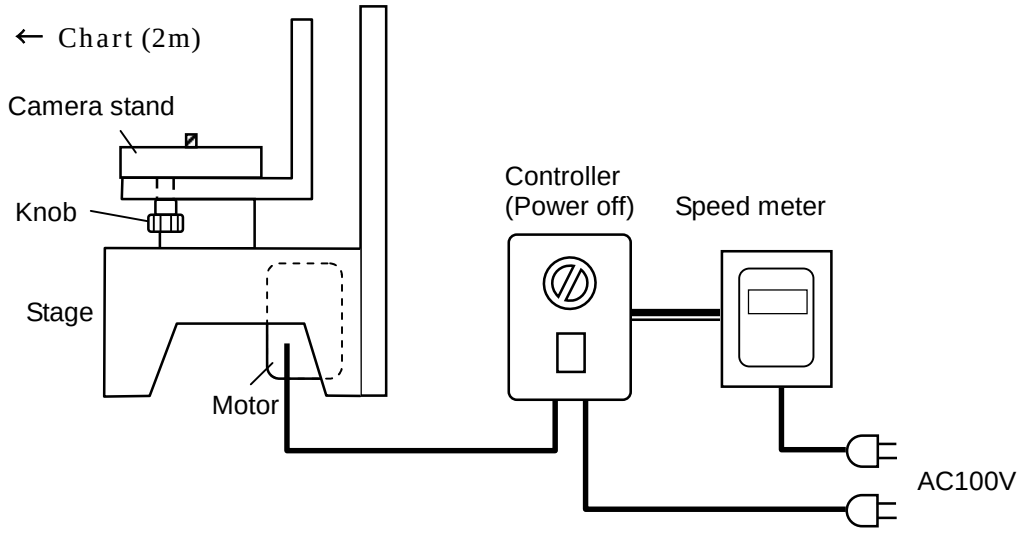
□Personal computer (Windows Xp (PS2) which equipped USB port)

□DA 50-200mm lens □USB cable □ Enough capacity of Battery

7-1. Setting the SR adjustment tools

① Set the SR adjustment equipment on the desk (Desk must be stability and sturdy).
Set the chart 2m away from the camera stand.

② Setting the stage, controller and speed meter as follow. (Turn the power of the controller OFF)



7-2.Preparation

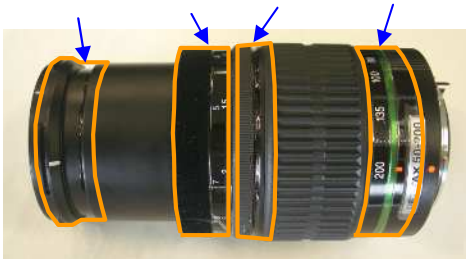
① Set the chart (■) **2.00m** from tripod screw part on the camera stand.

② Lighting the chart evenly. Surface of chart should be approx. LV10-LV12.

③ Set the zooming position at 200mm and distance ring set at 2m and then fix each setting with tape.
(To avoid backlash, fix four positions by tap)

④ Attach lens to the camera

⑤ Set the camera to the following condition.
Mode dial: M
AF switch: MF



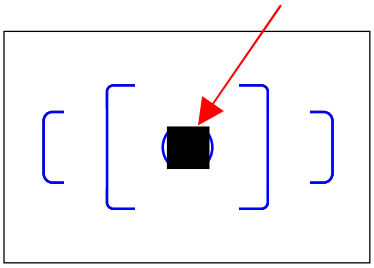
⑥ Attach camera to the driving stage.

⑦ Fix with two knobs properly.

⑧ Set the camera **2.00m** away from the chart and match the chart (■)with frame of spot measurement in the view finder. [Confirm] Reconfirm distance at 2.00

⑨ Turn the power of the controller ON and adjust the meter to **1.000 rpm (1,000 turn/min)** by turning controller dial. Then turn OFF the controller.

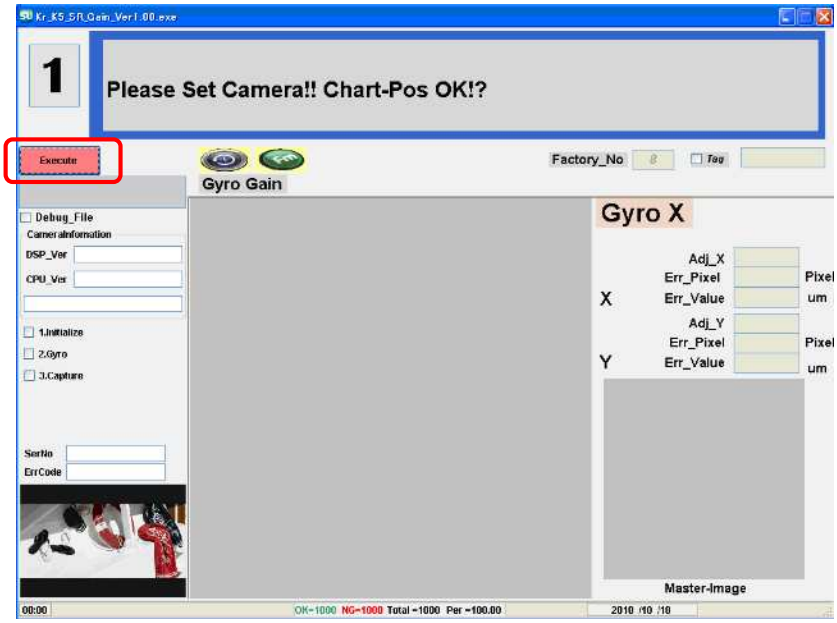
⑩ Connect the camera and computer via USB cable and then turn ON the camera.



7-3. Adjustment procedure

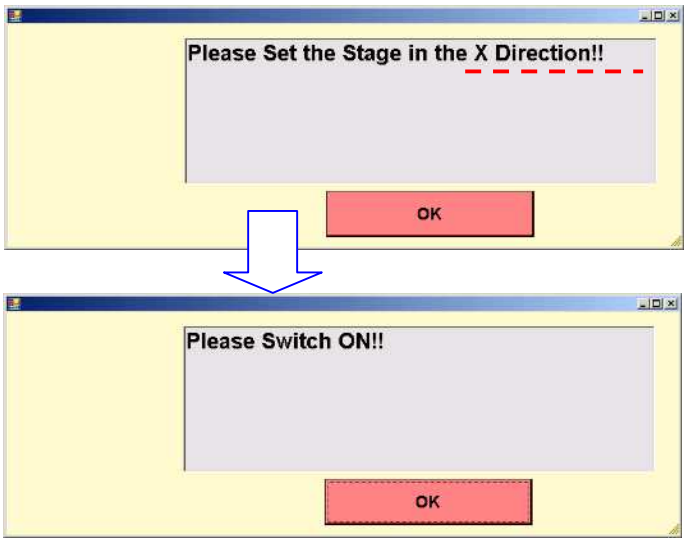
① Double click [K-r_SR_Gain_ver.exe] in [K-r_SR_Gain] folder to start up software.
Adjustment screen will be displayed

② Press [Execute] button to start adjustment.

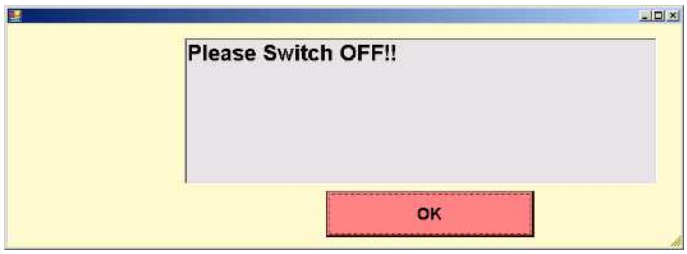


(Go to the next page)

③ When below message is displayed, set the stage in the X direction.
Turn ON the controller. (Confirm the meter is 1,000rpm)
Press [OK] button to start X adjustment.



④ Turn OFF the controller and Press [OK] button. (next adjustment will be started)

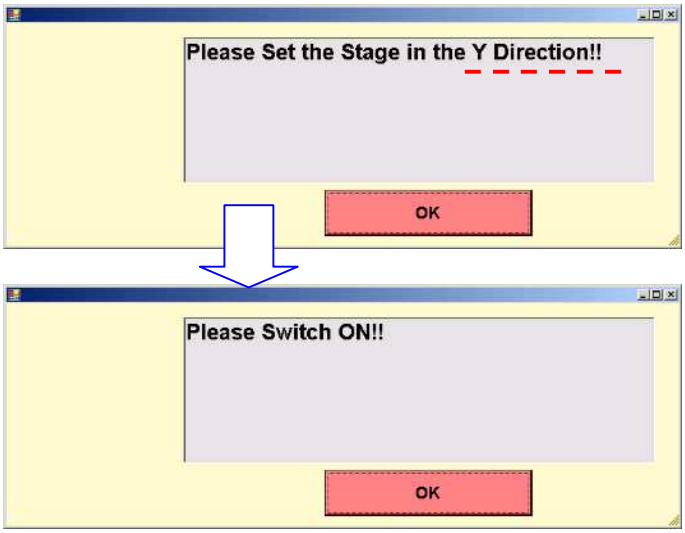


⑤ Turn OFF the controller. Change the position of camera and stage for Y adjustment.
[Caution] The weight of the stage is very heavy, so pay attention the handling.
Do not hold black stand parts.
⑥ Set the chart **2.00m** from tripod screw on camera stand and match the chart (■) with frame of spot measurement in the view finder.

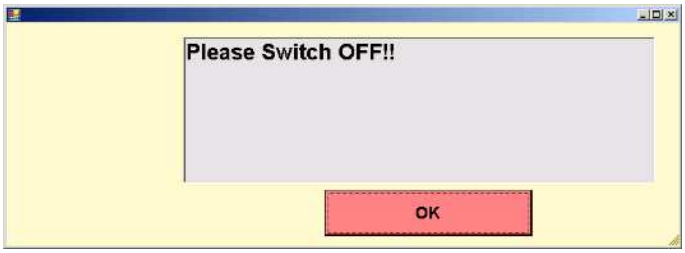

ex. K10D

(Go to the next page)

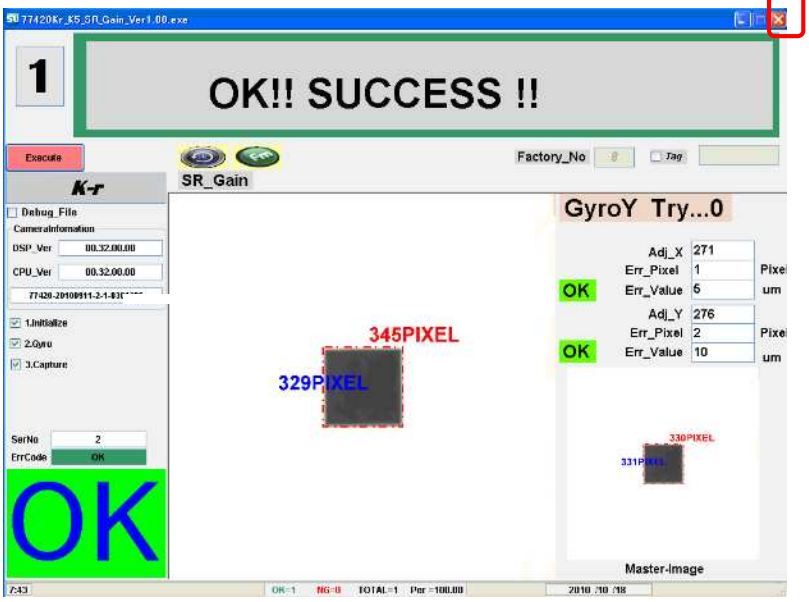
⑦ When below message is displayed, set the stage in the Y direction.
Click [OK] to execute Y adjustment. (The same procedure as X adjustment)



⑧ Turn OFF the controller and click [OK] button. Next adjustment will be started.



⑨ When all adjustment is completed, [OK] screen will be displayed.
⑩ Click [×] to finish adjustment software.



*If adjustment error is displayed, [NG] and error code will be displayed.
Refer to [Table of error code]

8.[Adjustment] Shutter speed adjustment by histogram

*Method for adjustment is the same as 76830 (K10D) and 76700(K100D)

[Caution1] When replaced 0-E000 or T100, this adjustment is required.

[Caution2] [Adjustment (BV adjust) and M-Test] should be completed before execute this adjustment.

[Required equipment]

□Programmed software for 77420 (Kr_PDCAdj)

□PC (Windows Xp with equipped USB port)

□Diaphragm set ring F8 (KA-0-1A) and Master lens D20 or D20-01(or FA50mm F1.4)

□Light source which has LV8 or LV9 □USB cable □AC adaptor kit

□Scale (To prevent scratch, plastic scale is recommended)

8-1.Setting the camera

① Setting the camera as follows.

Mode dial: [M], Focus lever: [MF]

WB: Tungsten light

Taking picture: Instant review [Display time: 5 second, Setting Histogram display]

Custom setting: 1. EV Steps --- [2: 1/2 EV]

2. Sensitivity steps --- [2: As AV steps]

22. Using Aperture Ring --- [2: Permitted] (When attached master lens)

② Setting for Light source, Tv and ISO

	LV8		LV9	
Shutter speed (ms)	1/250	1/4000	1/500	1/4000
ISO sensitivity	ISO200	ISO3200	ISO200	ISO1600

*Set lens aperture full open (F1.4)

8-2.Procedure for taking picture

① Set the light value at LV8 (or LV9) and Set lens aperture full open (F1.4).

② Set ISO sensitivity to 200 and Tv250.(If using LV9, set ISO200 and Tv500)

③ Attach F8 setting ring and master lens D20 or D20-01 to the camera. (Or FA50mm F1.4)

④ Set the camera to the light source--- [Note] To avoid the light from outside, shield the light source.

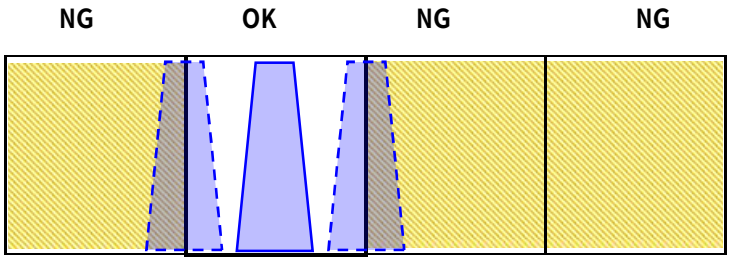
⑤ Capture 3 images. Put mark by such as paper tape at peak of average (Right end) as shown in figure below. --- **Standard data**

⑥ The same light value and aperture. Set ISO sensitivity to 3200 and Tv4000 (If using LV9, set ISO1600 and Tv4000)

⑦ Set the camera to the light source and capture 5 images then put mark at peak of average

---**Tv4000(Adjust Tv)**

[Caution]In histogram display, the peak position must be within following OK range.
If peak position is out of range (NG), confirm the setting or re-adjust BV and digital adjustment.

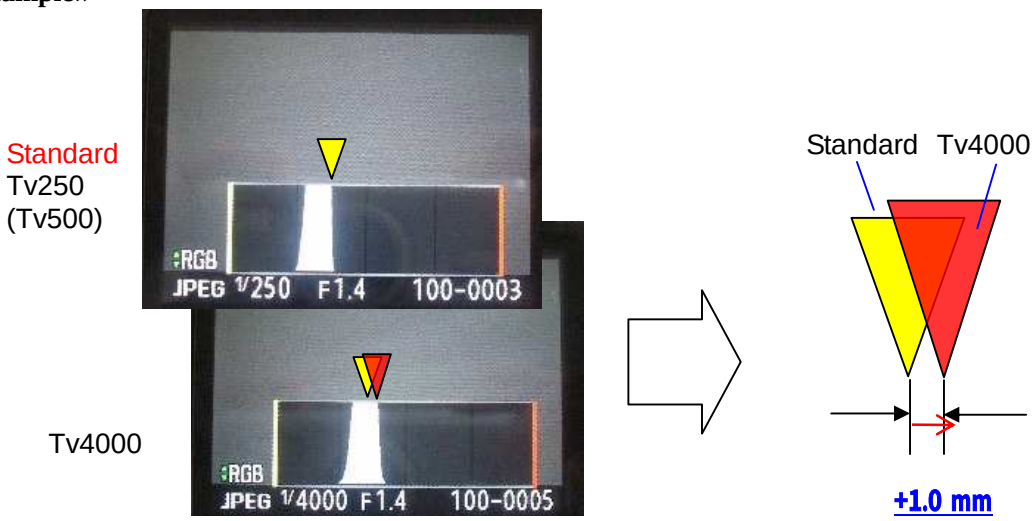


8-3.Shutter speed calculation

① Playback the image by histogram display and compare the peak position between standard data and Tv4000. Then measure the difference (mm) on the monitor.

[Caution] Confirms it from the position of the front to the LCD monitor and do not make scratch on LCD monitor.

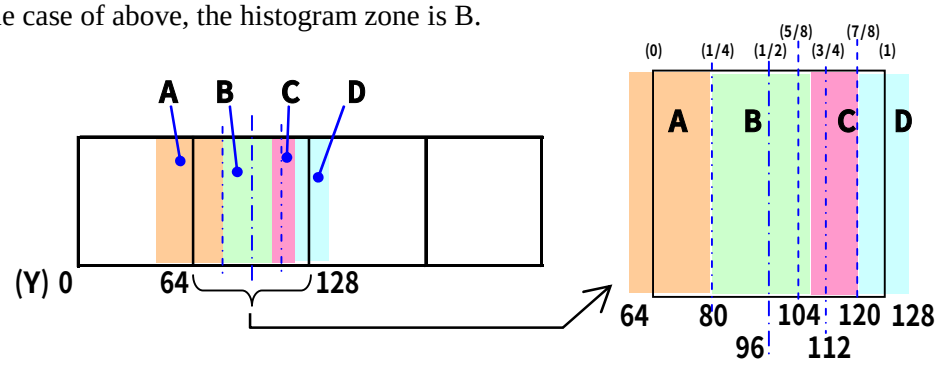
≪**Example**≫



Playback (Histogram display)

② Select the histogram zone (A~D) of the peak position of Tv 4000 from the below.

* In the case of above, the histogram zone is B.

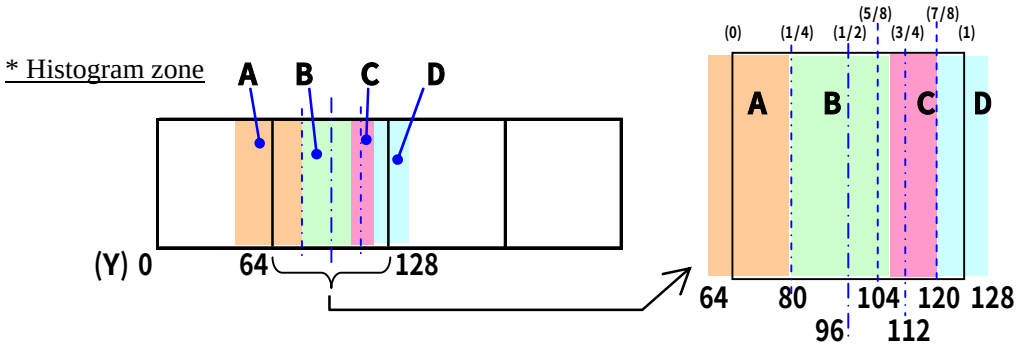


③ Obtain the shutter speed (ms) referring the conversion table.

* In the case of above, difference of peak position is **+1.0mm** and histogram zone is **B**. Therefore, the shutter speed is **[0.263ms].**

K-r Shutter speed conversion table

Step1: Select the histogram zone (A~D) of the peak position of Tv 4000 from the below.



Step2：Obtain the shutter speed (mS) from below conversion table.

◇Conversion table

Left from standard						Right from standard				
Deviation mm	Histogram zoon					Deviation mm	Histogram zoon			
	A	B	C	D			A	B	C	D
-10.0	0.116	0.054	(0.001)	(0.001)		**0.0**	**0.244**	**0.244**	**0.244**	**0.244**
-9.5	0.122	0.064	0.001	(0.001)		0.5	0.250	0.254	0.275	0.260
-9.0	0.129	0.073	0.014	(0.001)		1.0	0.257	0.263	0.270	0.276
-8.5	0.135	0.083	0.026	(0.001)		1.5	0.263	0.273	0.282	0.292
-8.0	0.142	0.092	0.039	(0.001)		2.0	0.270	0.282	0.295	0.308
-7.5	0.148	0.102	0.052	0.004		2.5	0.276	0.292	0.308	0.324
-7.0	0.154	0.111	0.065	0.020		3.0	0.282	0.301	0.321	0.340
-6.5	0.161	0.121	0.078	0.036		3.5	0.289	0.311	0.334	0.356
-6.0	0.167	0.130	0.090	0.052		4.0	0.295	0.320	0.346	0.372
-5.5	0.174	0.140	0.103	0.068		4.5	0.302	0.330	0.359	0.388
-5.0	0.180	0.149	0.116	0.084		5.0	0.308	0.339	0.372	0.404
-4.5	0.186	0.159	0.129	0.100		5.5	0.314	0.349	0.385	0.420
-4.0	0.193	0.168	0.142	0.116		6.0	0.321	0.358	0.398	0.436
-3.5	0.199	0.178	0.154	0.132		6.5	0.327	0.368	0.410	0.452
-3.0	0.206	0.187	0.167	0.148		7.0	0.334	0.377	0.423	0.468
-2.5	0.212	0.197	0.180	0.164		7.5	0.340	0.387	0.436	0.484
-2.0	0.218	0.206	0.193	0.180		8.0	0.346	0.396	0.449	0.500
-1.5	0.225	0.216	0.206	0.196		8.5	0.353	0.406	0.462	0.516
-1.0	0.231	0.225	0.218	0.212		9.0	0.359	0.415	0.474	0.532
-0.5	0.238	0.235	0.231	0.228		9.5	0.366	0.425	0.487	0.548
0.0	**0.244**	**0.244**	**0.244**	**0.244**		10.0	0.372	0.434	0.500	0.564

8-4.Procedure for adjustment (Kr_PDCAdj)

① Connect the camera and PC with USB cable and turn ON the camera.

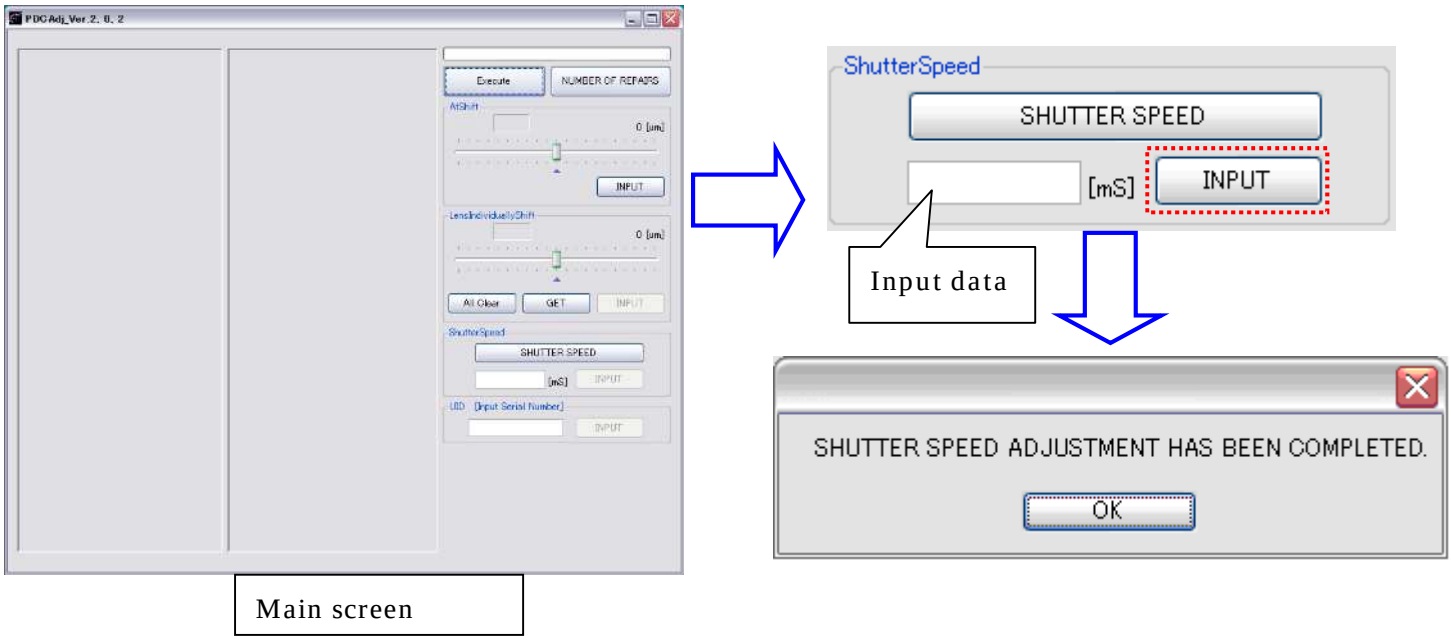
② Double click [Kr_PDCAdjv204.exe] in [Kr_ PDCAdj] folder to start up software. ↓

③ Click [SHUTTER SPEED]. Then it can push the [INPUT] button.

④ Input shutter speed data (EX: 0.26ms) and click [Input Data] button.

⑤ If data is NG, input [0.26]and click [Input Data]. (⑤ become effective)

⑥ When completed the adjustment, click in order to [Close] → [Cl]"Unconnect" → [end] to finish the program software.



⑦ **[Confirm]** confirm the deviation by histogram again and confirm the shutter speed should be within below tolerance.

Tolerance for adjustment: 0.224~0.290mS(Standard:0.265mS, Tv4000)

⑧ **[Confirm]** confirm Tv6000by histogram. There is no big difference from Tv4000.

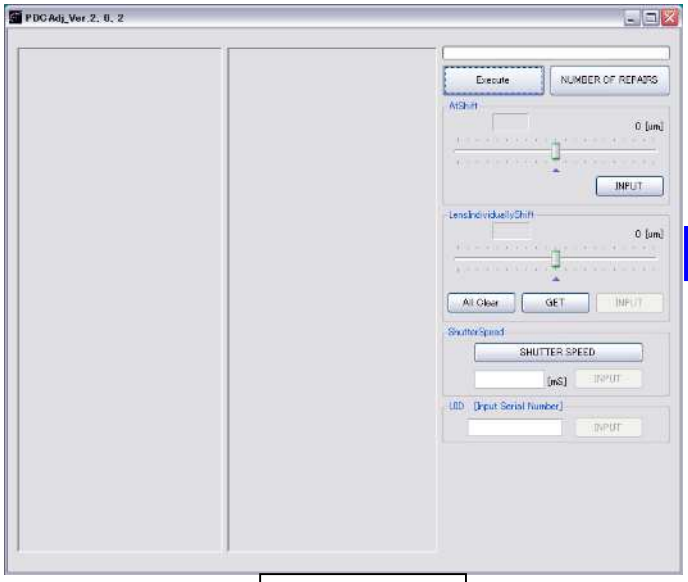
	LV8		LV9	
Shutter speed（mS）	1/4000	1/6000	1/4000	1/6000
ISO sensitivity	ISO3200	ISO6400	ISO1600	ISO3200

8-5. AF shift adjustment (If necessary　Kr_PDCAdj)

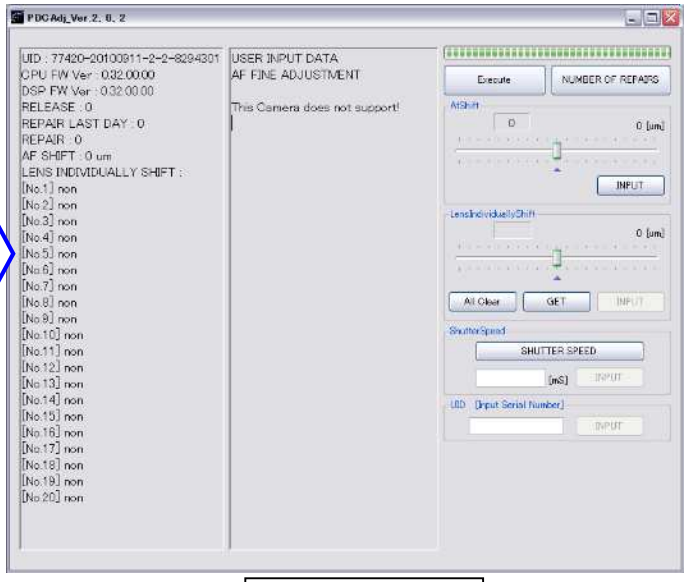
*If AF does not improve by AF focus adjustment and there is no other factor, execute AF shift adjustment if necessary.

① Start up PDCAdj_v204.exe.（Below main screen will be displayed.）

② The set up information of a present camera appears to the left of the screen when the Execute button is clicked.



Main screen

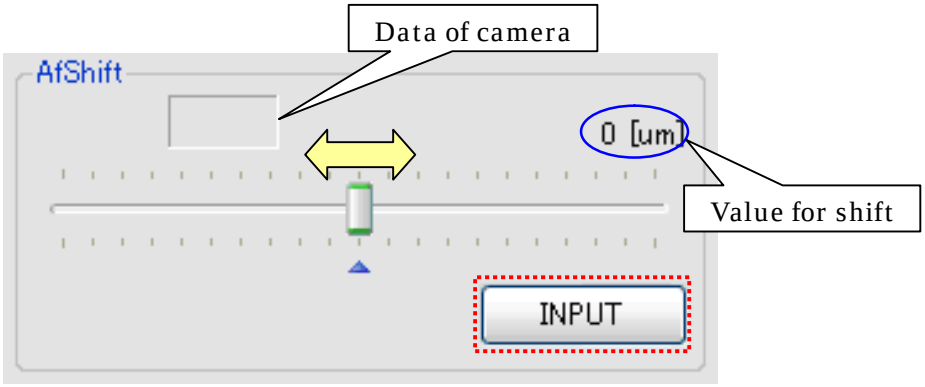


Current status

③ Move the cursor right or left to change the value of AF shift. (+: shift to front side, -: shift to back side)

④ Click [Input] to adjust. (Can not input more than ±100um. There is other factor)

⑤ Press [Execute] button, Confirm the adjustment status.



[AF focus shift function for individual lens]

*If fine adjustment is necessary for AF focus on lens side, it came be compensated by camera with this adjustment.

*It cam be adjusted 20 kind of AF lens.(Basically the same as K10D)　(Refer to T07-005)

① Start up PDCAdj_v204.exe.（Below main screen will be displayed）

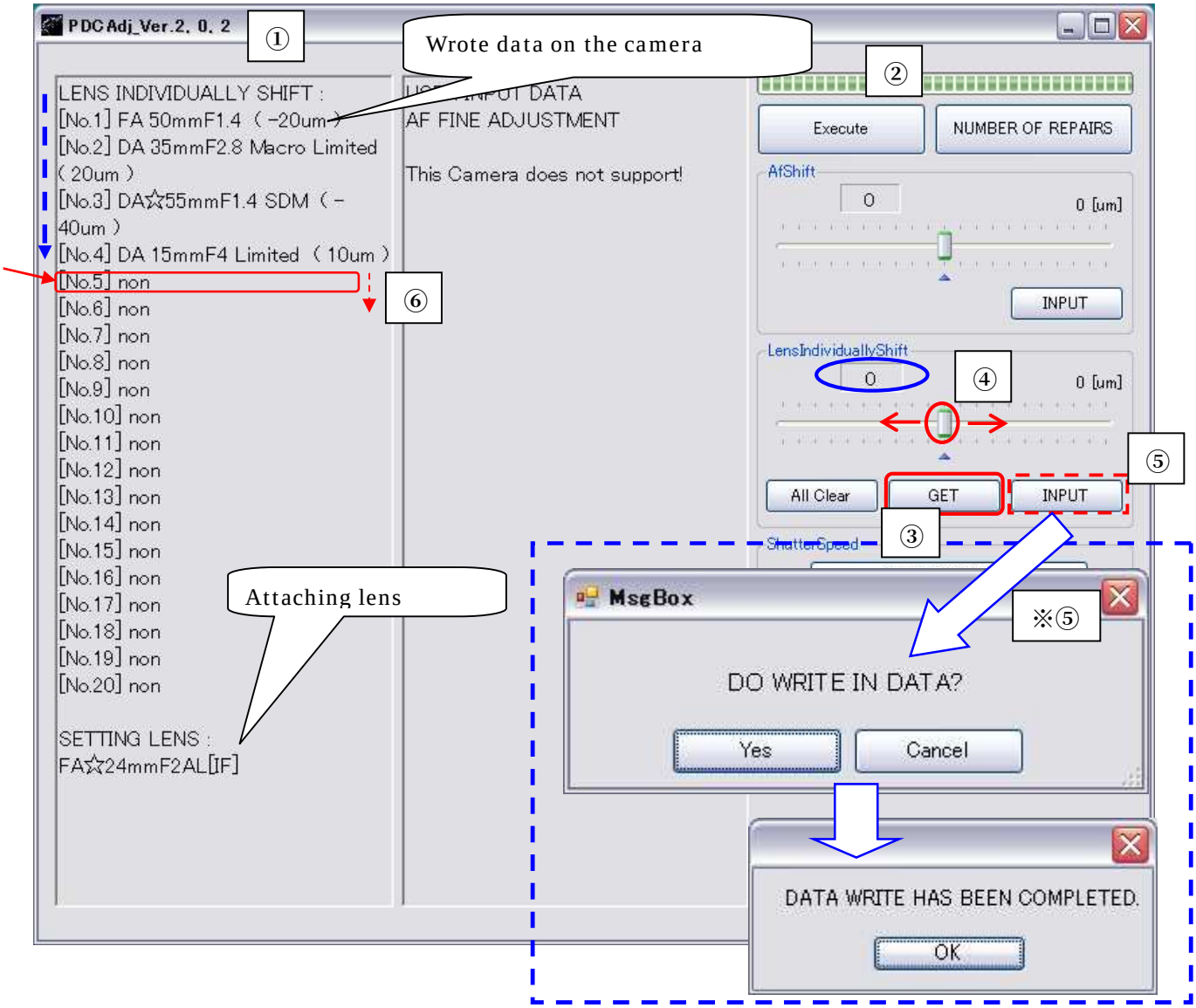
② The set up information of a present camera appears to the left of the screen when the Execute button is clicked.

③ Attach the object lens to the camera and click [GET]. Lens information and data will be displayed.

④ Move the cursor right or left to change the value of AF shift.

⑤ Click [Input] to adjust. Data will be written.

⑥ Note: when input multiple lens data, the data should be moved over top side at end of adjustment.



9．[Adjustment] Image shift adjustment

[Required equipments]

□Programmed software for 77420 ---[Rotation&Shift_Ver]

□Exclusive cart for adjustment (Attached service manual etc)　□Tripod (Set horizontal and vertical)

□String (Diameter: Approx.1mm) and weight (To set chart horizontal and vertical)

□50mm lens □PC (Windows Xp (SP2), with USB port equipped) □USB cable (I-USB17) □AC adaptor kit

□Remote control F

9-1.Confirm image

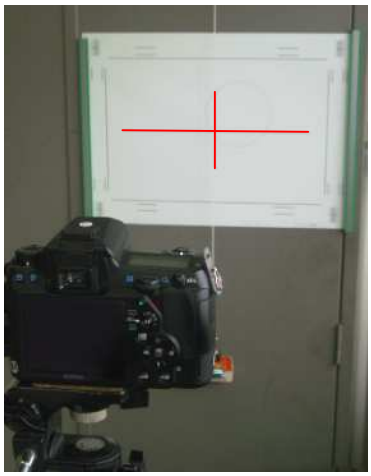
① Execute confirmation without connecting with PC.

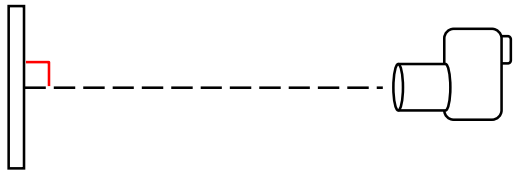
② To avoid camera shaking and misalignment with chart, set the drive mode to [Remote Control] and set Instant Review to [5sec].

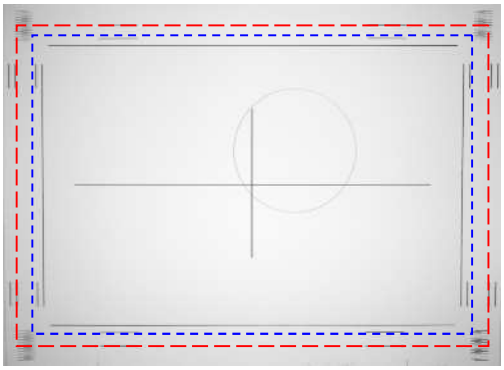
③ Align the viewfinder frame between red square and blue square as shown in figure below.
And set the camera at center of chart.

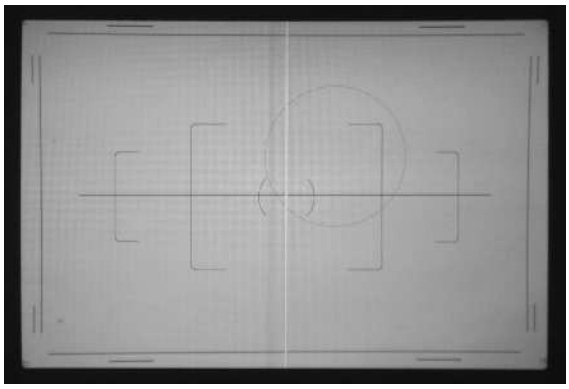
[Caution1] Direction of eye should be center of viewfinder. Camera should be set vertical against chart.

[Caution2] Viewfinder frame should be evenly for right, left, top and bottom against the chart.
And there is no tilting.



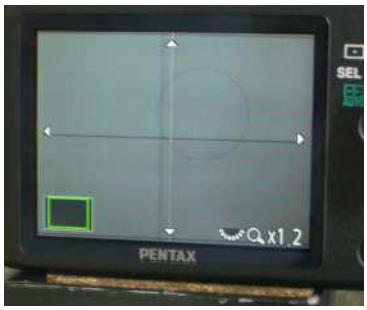






④ Release by remote control.

⑤ **[Confirm]**Enlarge the image by electric dial on Instant Review.
Confirm at center and four corner of image. The image should be evenly for right, left, top and bottom and there is no tilting at center of image.



[Tolerance]	Pal lax: top and bottom / right and left	--- 0.1mm or less (on image screen)
	Tilt: Within ±30′(minutes)	
When adjusting image shift, adjust as close as zero.		

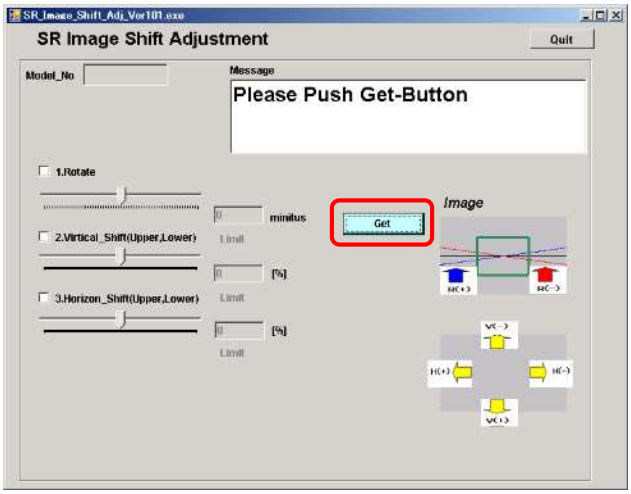
⑥ If it is not within tolerance, calculate shift amount (Ratio) and tilted amount then execute following adjustment.

9-2. Adjustment (If necessary)

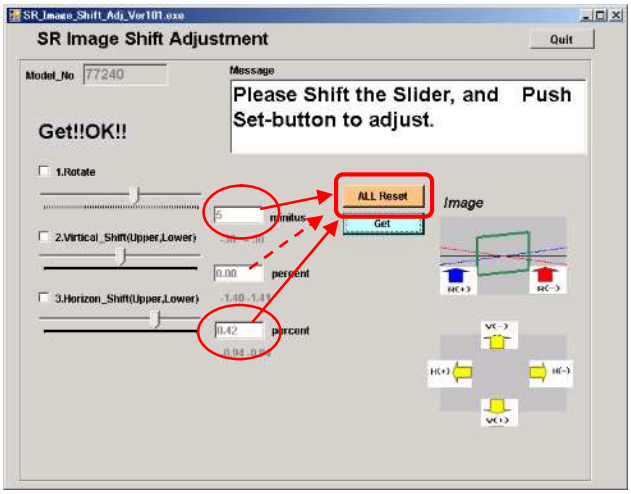
① Connect the camera to PC.

② Double click [SR_Image_ Shift_ Adj.exe] in [Rotation_Ver]holder] to start up software.

③ When adjustment screen is displayed, click [Get] button.



④ **[Caution]** If value is indicated other than zero, click [ALL Reset] to clear adjusted value.

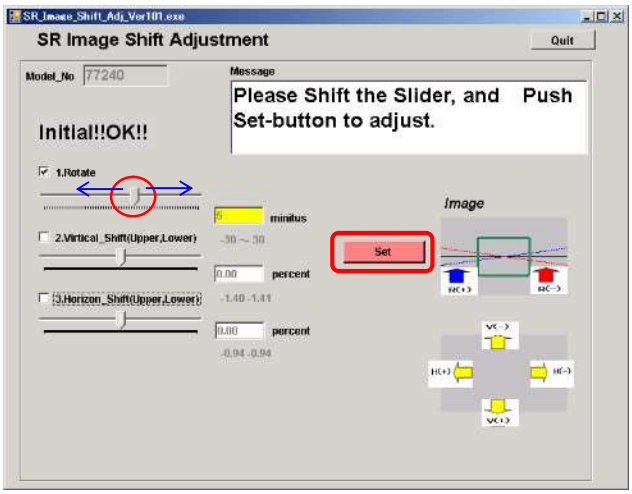


⑤ At first, adjust tilt by moving slide. If adjustment value is zero, go to next step.

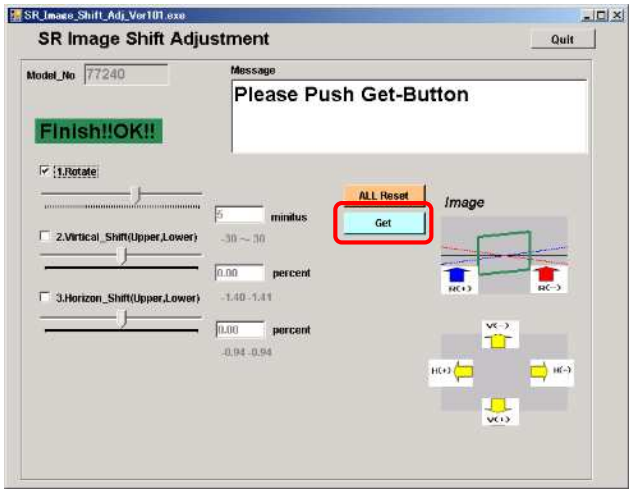
(EX:+5′(minutes)　＋:Tilt image to counterclockwise)

⑥ Click [Set]

When adjustment is completed, [OK] will be displayed.

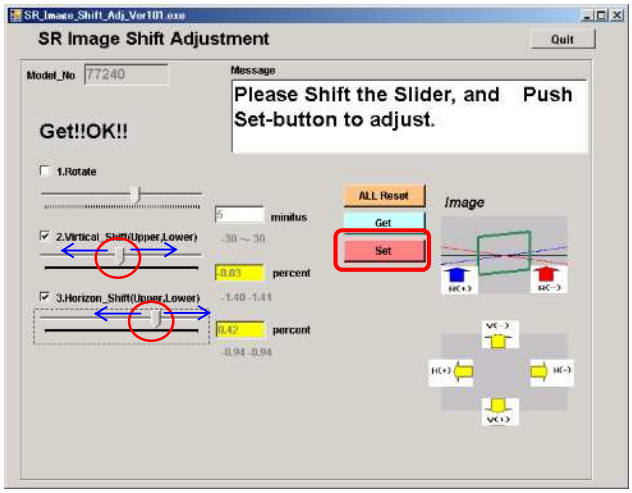


⑦ Click [Get].



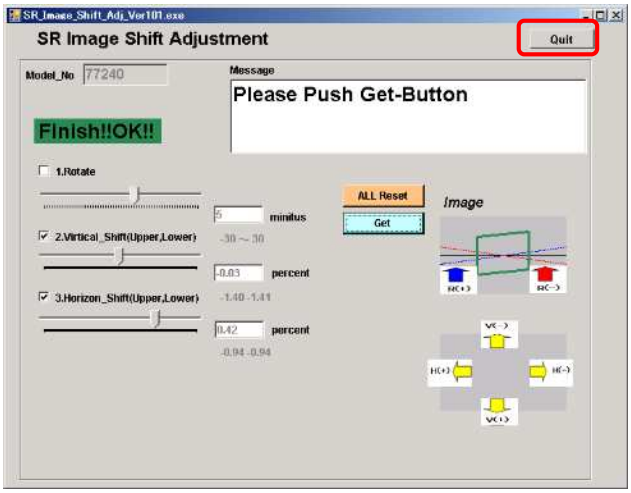
⑧ Next, Adjust 2. Top and bottom and 2. Right and left by slider.
If adjustment value is zero, go to next step.(EX: Top and bottom -0.03 (- : Image shift to topside), Right and left+0.42%（+:Image shift to left side）

⑨ Click [Set].



⑩ When adjustment is completed, [OK] will be displayed.

⑪ Click [Quit] to finish adjustment.



9-3. Reconfirm

① Execute [9-1.Confirm image].

② If adjustment is necessary, execute [9-2. Adjustment]

③ Repeat ① and ② until adjustment become within tolerance.

10. [Adjustment] Writing Warranty Record

* Method for adjustment is the same as 77310(K-r), 77240 (K-7), 77010 (K20D), 77050(K200D) and 77170(K-m/K2000).

[Caution] Execute this adjustment when replaced T100 or change the serial number.

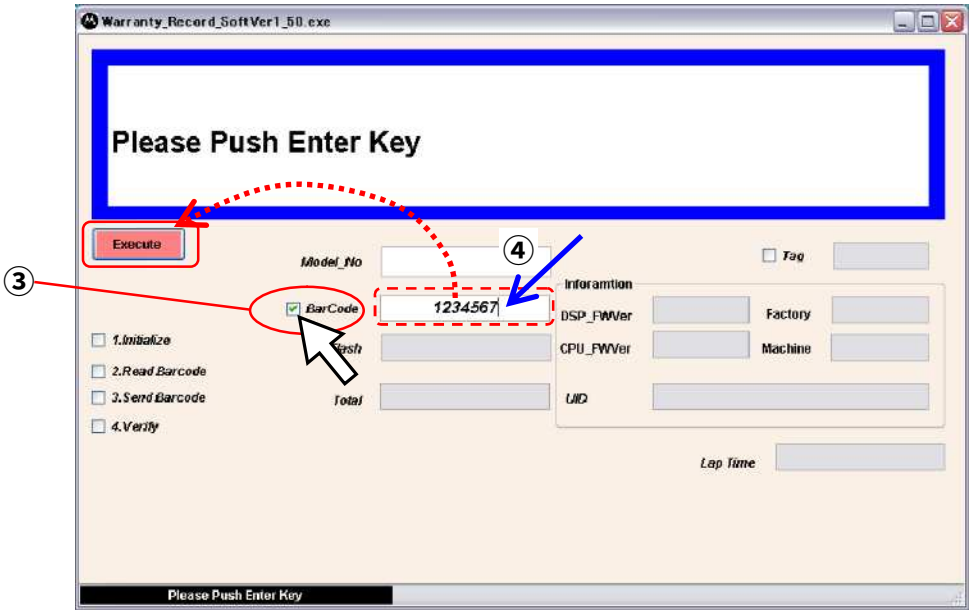
[Required equipments] □Warranty Record software □PC □USB cable □AC adaptor kit

① Connect the camera and PC by USB cable then turn ON the power.

② Double click [Warranty_Record_SoftVer_.exe] in adjustment software folder.

③ Put check mark in [□BarCode] by mouse pointer.

④ Input serial No. then push the [Execute] button.(EX:1234567)



⑤ When [OK] is displayed, writing is completed. Click [X] and turn OFF the camera then disconnect the camera.

11. [Confirmation]Function Check

*Skip the same content with K10D and K20D on this manual refer to the each service manual and Operating manual for K-r

11-1. Mainly contents.

- ☐ Confirm AF function(Focus mode, beep, AF button, SI display, AF point switching, AF assist light)
- ☐ Exposure mode switching/Check shutter release (e-dial, aperture, shutter, exposure Compensation, AE-L button, each indications, Remote control, Cable release, RAW button)
- ☐ Check shooting and playback (setting menu, SD card, Format, Shooting (vertical and horizontal), Playback, INFO button, Delete image)
- ☐ Confirm Live view and movie
- ☐ Check flash(pop-up, Flash status, Discharge, flash control, retract flash and retract position (Adjust), External flash)
- ☐ Confirm SD card cover.
- ☐ Confirm metering (Tv and Av indication)
- ☐ Confirm Exposure value (Standard :Y=110 (A light, WB -Tungsten)
- ☐ Confirm WB (White balance)
- ☐ Confirm AF focus by taking picture--- [AF master lens for D-SLR] [AF checking stand]If fine adjustment is necessary, execute [8-5.AF sift adjustment].
- ☐ Confirm SR function (If already adjusted, confirmation is not necessary)
- ☐ Confirm image sensor and cleaning --- [Caution] Do not wipe with strong force otherwise it will affect SR performance. Use cleaning stick.

11-2. AF check

① Attach the lens (A position) and set AF lever to AF.
②Confirm AF function while pressing shutter button half way.
③Confirm AF function by pressing AF button.

11-3. Check exposure mode and shutter release

① Set the AF lever to MF and attach the lens.(A position)
② Set mode dial to Av.
③ When release shutter button half way, Tv and Av value should be indicated on LCD monitor and viewfinder.
④ When turning e-dial, Tv and Av value should be changed.
⑤ Set the mode dial to each exposure mode and confirm the LCD monitor and viewfinder indication.
⑥ Set the drive mode to 3sec Remote Control then confirm that the camera can be released by remote Control. Also the beep can be heard. (Depending on setting)
⑦ EV compensation can be set by turning e-dial while pressing [+/-] button.

11-4. Check capture and playback

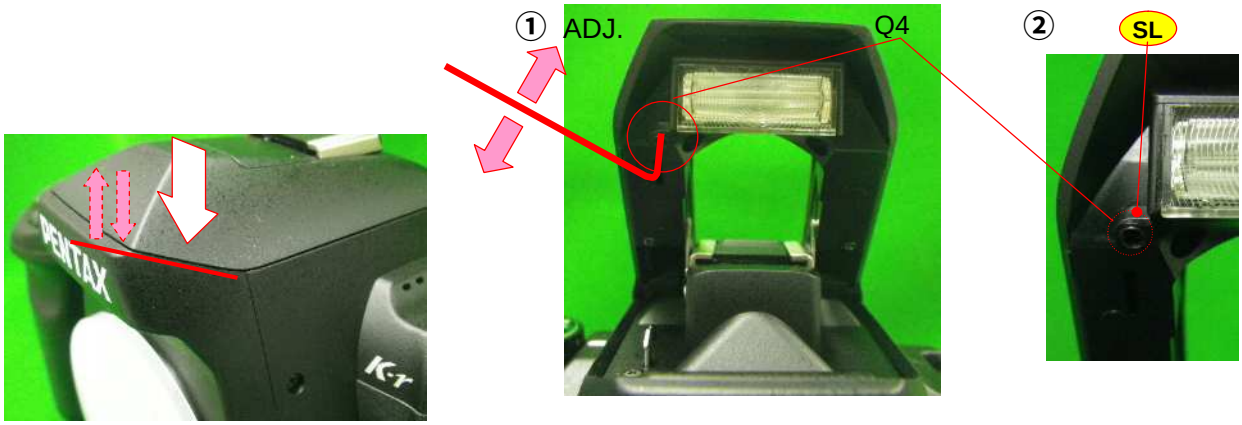
① Turn OFF the power and insert SD card for test shooting.
② Turn ON the power.
③ Press Menu button and format can be execute on [Set- up Menu 4].
④ Take 3 pictures. (Recorded pixels/Quality:12M/★★★)
⑤ Press playback button and confirm the images.
⑥ Also, press INFO button and Histogram indication is displayed.
⑦ When press INFO again, Detailed information display is displayed.
⑧ Playback image and delete the image by pressing delete button.
⑨ Turn OFF power and remove SD cards.

11-5. Check Built-in flash

①The built-in flash pops up when the flash button is pressed. And, ϟ mark must be indicated
②The flash must be discharged when taking a picture in low light condition.
③The built-in flash must be retracted firmly when flush is pushed down by finger.
*If flash does not retract properly or too much gap, follow the [Adjustment of flash retract position].
④Confirm that ϟ must be indicated and discharged when an external flash is attached.

11-6. Adjustment of Flash retract position

[Preparation]: Hexagonal driver 0.9mm (HD-M0.9)
*If flash does not retract properly or too much gap (more than 0.3mm), execute below adjustment.
① Adjustment: Turn Q4 by Hexagonal driver.
② Confirm the retract position and gap then apply Screw lock (clear or black) to Q4.



11-7. Check Aperture control and surface of CMOS

① Attaching the lens to the camera. Set the focus mode and Capture mode to MF and B.
② The aperture of lens must change similarly when the aperture value (Av) is set in opening, the middle, and the minimum with the Av dial.
③ Detach the lens from camera, and depress the release button, and make the camera long exposure condition. Confirm there is neither dust nor scratch on the CMOS.

11-8. Confirmation of the metering function

[Required equipment] Light source (Shutter tester), FA50mm F1.4

①Attach the lens (FA50mm) to the camera and set the aperture to the A position.

②Set the camera as follows.

Capture mode : AV (Aperture-priority) mode, aperture value : Av8 (FNo.8), Sensitivity : ISO200,
Focus mode SW : Manual focus, Exposure setting step : 1/2 (Default setting of custom function)

③Set the focusing ring to the infinity (∞).

④Set the camera to the light source (shutter tester).

⑤Change the light value of light source and confirm that the TV value is displayed as follows while depressing the release button halfway.

■Display（FNo.8 / ISO200）

＼	LV6	LV8	LV9	LV10	LV12	LV15	LV15 (Multi-segment)
TvDisplay	Tv0.5”	Tv8	Tv15	Tv30	Tv125	Tv1000	Tv750

11-9. Confirmation of the Exposure value

[Required equipment] PC, DC/AC adaptor, USB cable, FA50mm F1.4 (Aperture must be within standard)
Light source (EX:LB-3300, A light), SD Card (for taking picture),
Image viewing software (Required: indicate brightness level by Histogram. EX:Adobe Photo shop, etc.)

①Attach the lens (FA50mm) to the camera and set the aperture to the A position.

Set the camera as follows.

Image : Natural, Capture mode : Program mode, Metering Method : Multi-Segment metering,
Focus mode SW : Manual focus, White Balance : Tungsten Light, Color Saturation : Normal, Image,
Sharpness : Normal, Contrast : Normal, Recorded pixels : Image size :Default setting, Quality level : Default setting

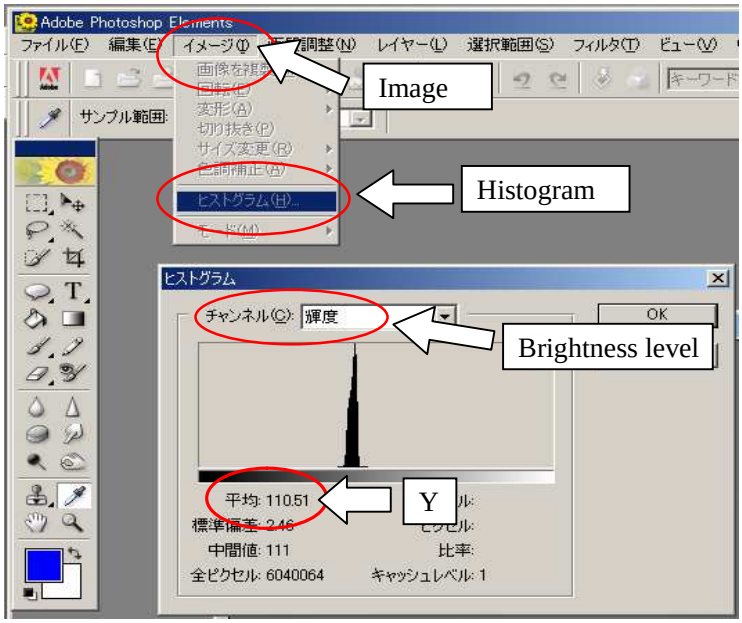
③ Set the focusing ring to the infinity (∞).

④ Set the camera to the light source.

⑤ Take a picture while changing the light value of light source.
(Change ISO if necessary)

⑥Open the recorded image by using the Image viewing software.

⑦Select the histogram as shown in the figure right.
(In the case of Adobe Photoshop EL)



⑧Confirm that the level of brightness must not vary remarkably from the standard (Y=110).

Correlation table of EV with Y:

EV	−1.0	−0.5	**±0**	+0.5	+1.0
Y=	67	87	**110**	132	155

11-10. .WB (Confirmation of White Balance)

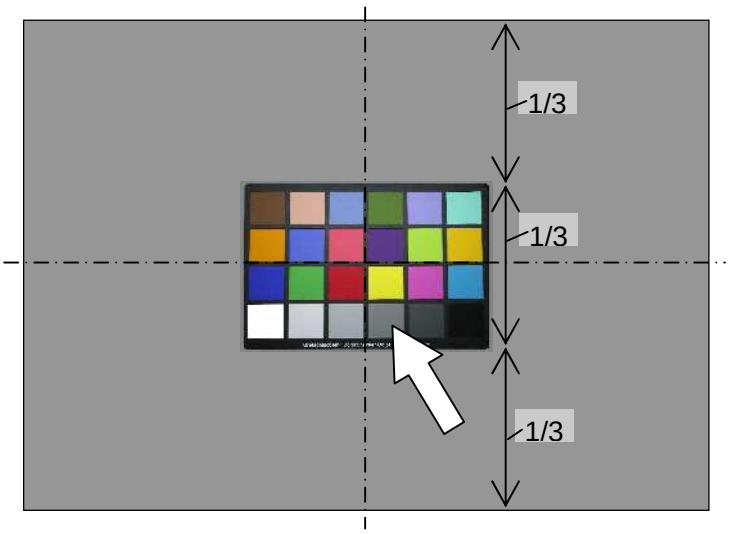
*The checking method is the same as 6830(K10D) ,76700(K100D), 77170 (K-m) and 77310 (K-x).

[Required equipment]PC, DC/AC adaptor, USB cable, FA50mm F1.4 (or F1.7), A light (2856 K°), Color checker (Macbeth™ Chart or equivalent), Fluorescent lamp (White 4244K°), Fluorescent lamp (Neutral white 5111K°), SD card (for taking picture), Image viewing software (e.g. Adobe Photo shop or ACDSee™), Gray chart (90x60cm or above)

[CAUTION] Both fluorescent lamps for checking should be used the Inverter (high-frequency converter) lighting.

[Preparations] Attach the lens to the camera and insert the SD card to the camera then set as followings.
Image: Natural, Capture mode: AV (Aperture-priority) mode, Metering Method:
Multi-Segment Metering, Sensitivity: ISO200, Focus mode SW: AF, Recorded pixels: Default setting, Quality Level: Default setting, Color Saturation: Normal, Image
Sharpness: Normal, Contrast: Normal, Color Space: sRGB (Default setting)

① Put the Color checker on the Gray chart as shown in the figure below.
② Light up the Color checker by the A light.
③ Set the WB (White Balance) mode to “Tungsten Light”.
④ Position the camera so that the Color-Checker and Gray-Chart are framed in the viewfinder as shown in the figure below while looking through the viewfinder.
⑤Take a picture of them while changing the aperture value (F2.8~F8) so that the TV value becomes between from 1/30 to 1/250.
⑥Take a picture of them similarly by setting the WB to “Fluorescent Light W white” while using the Fluorescent lamp (white 4244K°) for lighting.
⑦Take a picture of them similarly by setting the WB to “AWB” while using the Fluorescent lamp (Neutral white 5111K°) for lighting.
⑧View the three pictures which have been taken above by the Image viewing software, and confirm whether the true color of Neutral 5 indicated by arrow in the figure below is reproduced or not while comparing with Color chart. And, confirm that other colors also have not been changed.



11-11. Confirmation of AF focus by taking a picture

This section describes the method of checking the AF focus for your reference. It will enable you to do the overall confirmation of the position of the AF focus, and also will be useful in the service.

[Required equipment] PC, AC adaptor, USB cable, AF master lens (95901 N57 or confirmed accurate lens AF), AF chart for confirmation/ Scale for confirmation (attached the end of manual), SD card (for taking picture), Lighting (If the fluorescent lamp is used for lighting, the Inverter lighting (Flicker-less) must be used.), Image viewing software (For Example :ACDSee™, Adobe Photo shop or other)

***If more accurate confirmation is necessary, use AF CHACKING STAND (95901 M150).**

*When lighting AF CHACKING STAND, use fluorescent lamps (Daylight color) with the Inverter lighting (Flicker-less).

*When confirming the focus under the fluorescent lamps (Indoor), set the WB to fluorescent lamps.

①Attach the lens to the camera, and set the lens aperture to A position.

②Set the camera as follows.

Capture mode: AV (Aperture-priority) mode, Focus mode SW: AF, Focus point: Spot, White Balance: Daylight color, Recorded pixels: Default setting, Quality Level: Default setting, Color Saturation: Normal, Image Sharpness: Normal, Contrast: Normal

③Set the aperture to open position by Av dial of camera.

④Set the chart and scale as follows. Lighten the chart so that the white portion of chart becomes EV12 or more.

⑤Set the camera so that the distance from the chart to camera becomes 1m.

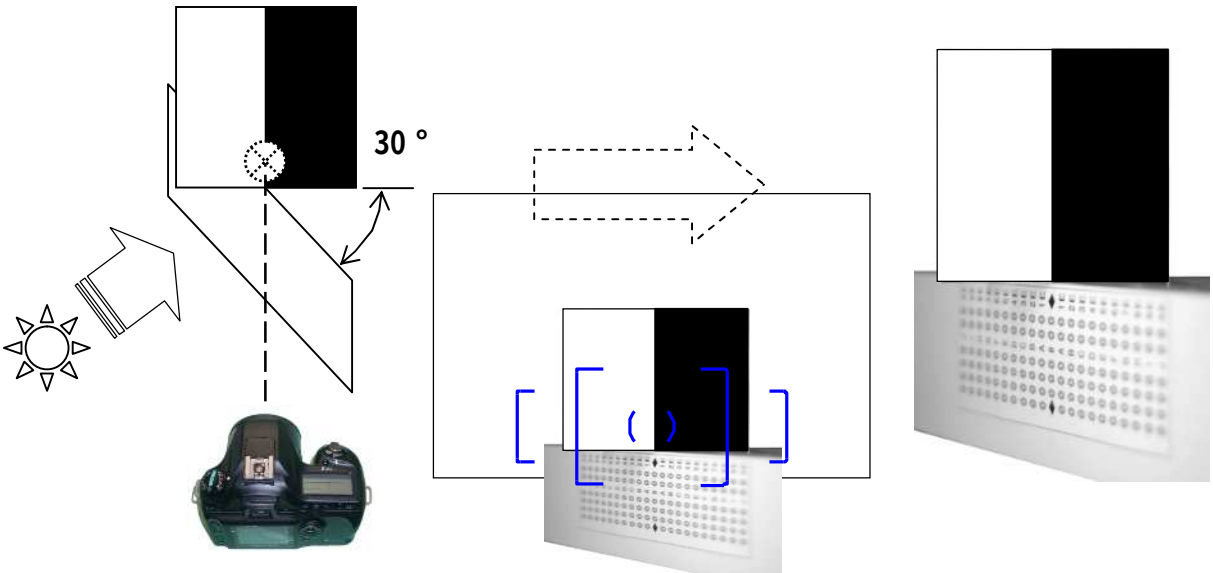
⑥Turn the distance ring of the lens to infinity (∞) by depressing the shutter button halfway while covering the front of lens with the white paper.

⑦Take three pictures of chart while aiming the focus point of center (for Spot) to the border line between white and black chart.

⑧The same manner with above. Turn the distance ring of the lens to minimum focus distance and repeat above (7), for confirming vertical sensor, set the camera at vertical position.

⑨Display the images on the computer with image viewing software.

⑩Confirm the camera in focus on chart.



[Supplement] If focus is NG, There is possibility with following factors.

AF focus position error or adjusting error. (Confirm AF focus position (FI) : NG)
→Adjust positioning of 1st and 2nd Mirror, AF adjustment by programmed software (Part of SLR mechanism)

Height of the CMOS Base Plate Support Pillar is NG
→Confirm with disassembly, Adjust with washer and re-assemble.
Related parts: Mount ring, Front, Front Housing Block, body main plate (pillar installing parts), and other frame (A3, A4, A6)
If camera is OK, There is possibility for trouble with the lens.

11-12. Confirmation of SR mechanism

Method for confirmation is the same as 76830(K10D)
[Required equipment] PC, Battery (AC adaptor), USB cable, F/FA50mm lens, SD card (for taking picture), Image viewing software (For Example :ACDSee™, Adobe Photo shop or other)

①Attach FA50mm lens to the camera and set aperture ring at A position.
②Set the camera as follow.
Exposure Tv mode, Focus mode SW: AF, Focus point: Spot, Drive mode: single frame
White balance :AWB, Recorded pixels: Default setting, Quality Level: Default setting
③Set Tv8 (1/8sec) --- It is equal to approx 3.5 step.
④The distance of the camera is set from subject to 2m.
⑤Set the SR switch to OFF and capture 10 images. (Camera is set on Horizontal/Vertical position)
⑥Set the SR switch to ON and capture 10 images. (Camera is set on Horizontal/Vertical position)
[CAUTION] Release the shutter about 1 second later after hand shake indication is ON in the view finder.
⑦Open the image with Image viewing software.
⑧Compare the images (SR ON/ SR OFF) and confirm that whether SR function is effective.
[CAUTION] It may differ depending on the condition of holding camera.

Confirmation of SR mechanism (When use different type of focal length)

The shutter speed of prevention for shaking is calculate with [1 / focal length of the lens]
For instance, if the focal length is 200mm: 1/ (200 x 1.5) = 1/300
* Size of picture for digital camera is 23.5 x 15.7mm and it is about 1.5 times when converting it into the focal length of 35milli-size camera.
① Calculate the shutter speed of prevention for shaking as above.
For instance, if the focal length is 200mm: 1/ (200 x 1.5) = 1/300

②Converts above shutter speed to three step down. (If necessary, four step down)
Ex: 200mm → equal to approx 1/30 (Three steps)
③Set Tv 30.
④Follow the procedure of 10-5 ④～⑧.
[CAUTION] The effect of the shake reduction is influenced by the focal length of the lens and the object distance and effect might not become visible in the short distance (D-FA50mm Macro 0.4m), also an enough effect might not become visible at the low temperature.

11-13. CMOS Cleaning

*This method of confirmation is assumption for CMOS cleaning in service.

[Required equipment] PC, DC/AC adaptor, USB cable, 50mm lens, Light box, Cleaning paper for CCD (Clean wipe-P), solvent for cleaning, Tweezers (recommend to use flat tip), SD card for test, Image viewing software (e.g. Photo shop, ACDsee, etc.)

[Confirmation]

①Attach the FA50mm lens to the camera and set the lens aperture to A position.

②Set the camera as follows.

Capture mode: AV (Aperture-priority) mode and Set AV 22 (FNo.22), ISO speed: 100, Focus mode SW: MF, Exposure compensation: +1/2EV, Recorded pixels: Default setting, Quality Level: Default setting

③Turn the distance ring of the lens to infinity (∞).

④Take the pictures of the light box from on 30mm.

⑤Display the images on the computer with image viewing software.

⑥ Set the image to life size (1:1) and confirm dust. (Better to make clear the position of dust with such as coordinate)

If you see dust clearly on image, there is possibility that the dust enters into the inside of CMOS. (Disassembly and cleaning or replace CMOS)

[Cleaning method of dust]

[CAUTION] 1, Do not wipe with strong force otherwise it will be affect performance.

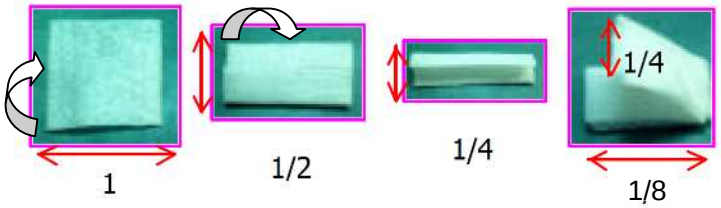
2, For safety, use AC adapter or full capacity of battery.

3, Do not use a brush-less blower and a spray type blower to clean the CMOS because there is a possibility that dust enters into the inside of CMOS.

***You can try Dust Removal function before cleaning.**

***Only cleaning dust – Use cleaning stick (0-ICK1) for cleaning.**

① Cut the Clean wipe-P about 1/4 (50x105mm) and hold the Clean wipe-P 7-8mm width.

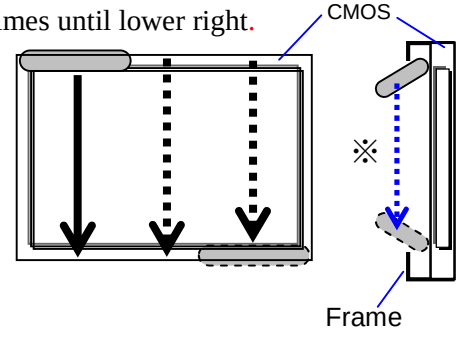


② Set [Sensor Cleaning] on the Set-up menu.

③ Dip Clean wipe-P: 95901 A15 in the Solvent.

④Wipe the surface of CCD from upper left to bottom and repeat 3-4 times until lower right.

You can confirm dust or trace of wipe by cleaning at under the bright light source.



⑤Turn off the power and return to step (1) of the confirmation then confirm dust.

[Supplement] Dust on the CCD

Cause of dust into the camera. → Dust enters from outside of the camera when changing the lens. Dust stick by moving mirror or shutter. According to CCD characteristic the static electricity occurs when taking a picture and so the condition is dust stick easily. Besides customer can find dust easily by viewing image by the computer. It is very difficult to remove dust completely therefore, before cleaning the camera, explain to customer for cleaning as much as possible.

12. [Adjustment] each setting

12-1.Default setting (If necessary)

*This setting is initialize camera as condition of product shipment.

[Required equipment] SD card (For default setting for 77420), AC adaptor

① Turn OFF the camera and connect AC adaptor to the camera.

② Insert the SD card(For default setting) into the camera.

③ Turn ON the camera while opening SD card cover.

④ When full version of DSP and CPU are displayed on LCD, turn OFF the camera.

⑤ Remove the SD card.

⑥ **[Confirm]** When turn ON the camera [Language/言語設定] setting screen will be displayed on LCD monitor.

[Reference] Only file No. (-0001) can be reset by setting [Memory] and operating shooting.

12-2.FW version up

Version up latest FW if necessary, Refer to [FW Firmware]

FW　FIRMWARE

Version up latest FW if necessary.

1. Method for Checking FW version

1-1. Checking FW version for customer

Turn the main switch to ON while pressing [Menu] button. The firmware version for customer [VER:x.xx] will be displayed on the LCD monitor for 5 seconds.

1-2. Checking FW version for Service

[Required equipment] SD card x2 (FW version check for [ON] and [OFF]), AC adaptor or full capacity of battery**.**

① Turn the main switch to OFF.
② Insert the SD card for Test mode [ON] into the camera.
③ Turn ON the camera while opening SD card cover. Access lamp will blink for about 3 seconds.
④ After the access lamp is disappeared, turn the main switch to OFF and remove the SD card from the camera.
⑤ Turn the main switch to ON while pressing [Menu] button.
Full version of DSP and CPU are displayed on LCD monitor for 5 seconds. (VER:x.xx.xx.xx)
[CAUTION] After confirmed, the test mode must be canceled with below method
⑥ Turn the main switch to OFF.
⑦ Insert the SD card for Test mode [OFF] into the camera.
*Or you can select [DEBUG MODE DISABLE] from test menu and cancel the test mode.
⑧ Execute above ③and ④.
⑨ Turn the main switch to ON while pressing [Menu] button and confirm [VER:x.xx] is displayed
If Full version of DSP and CPU are displayed, execute from above ⑥.

2.Method for Updating Firmware Version

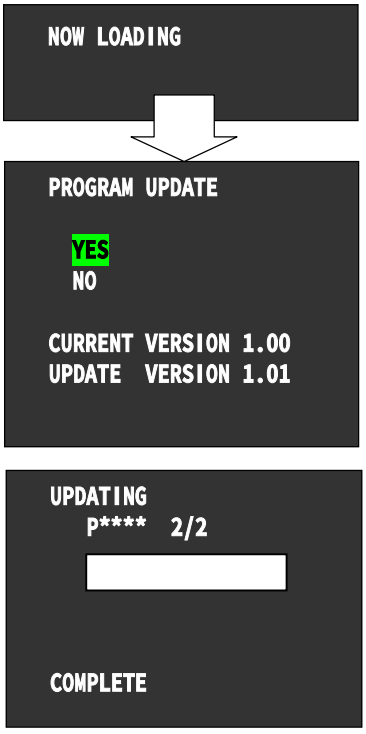
2-1.Method for Updating Firmware version for customer

[Required equipment] Latest product Firmware for customer (SD Card), AC adaptor or full capacity of battery.

[CAUTION]When executing this updating, customer setting will not set default setting.

[CAUTION] If power is shut down during updating firmware, electric part in the camera will be damaged. Use AC adaptor or fully charged battery.

①Connect the AC adaptor to the camera.
②Insert the SD card (FW) into the camera.
③Turn the main switch to ON while pressing [Menu] button.
④When right screen is displayed, select [YES] by pressing four-way key and press [OK]. Update will be started.
(It takes approx 60sec for loading firmware)
[CAUTION]Do not turn OFF the camera.



*Right figure indicate FW for customer

⑤ When [COMPLETE] is displayed, turn OFF the camera.
Update is completed.

2-2. Method for Updating Firmware version for Service

The same as “2. [Adjustment] Initialization when replace T100” --- “2-1. Writing FW”

[Required equipment] SD card for product Firmware, AC adaptor, or full capacity of battery.

[Caution]When executing this updating, the camera will be initialized.

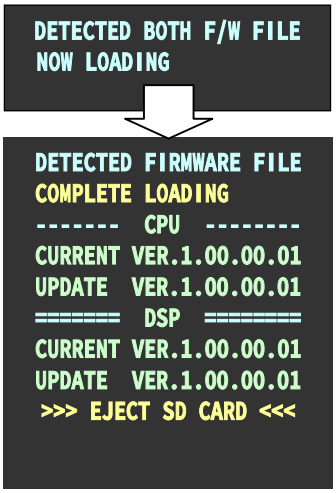
[Caution] Use AC adaptor, or full capacity of battery.

① Turn OFF the camera.

② Insert the SD card for product FW into the camera.
The SD card cover must open during updating.

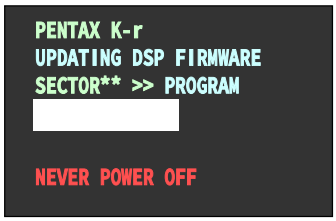
③ Turn the main switch to ON while opening SD card cover.

④ Right screen is displayed on LCD monitor
*If you cancel the update, disconnect the power first then remove SD card.



⑤Remove the SD card when the message [>>> EJECT SD CARD <<<] is displayed then starting updating. (It takes approx 90sec for loading firmware)

[CAUTION]Do not turn OFF the camera.



⑥When [POWER OFF] is displayed, Turn OFF the camera.
Updating is completed automatically.

TECHNICAL INFORMATION

Battery consumption current

Condition : Lens [FA lens, A position], each mode and setting is default setting.

Lens---- ○ : With × : Without SD card---- ○ : With × : Without

*Value on Battery equivalent --- DC adaptor + Power supply (3A or above)

*Value on AC power supply --- DC adaptor + AC adaptor

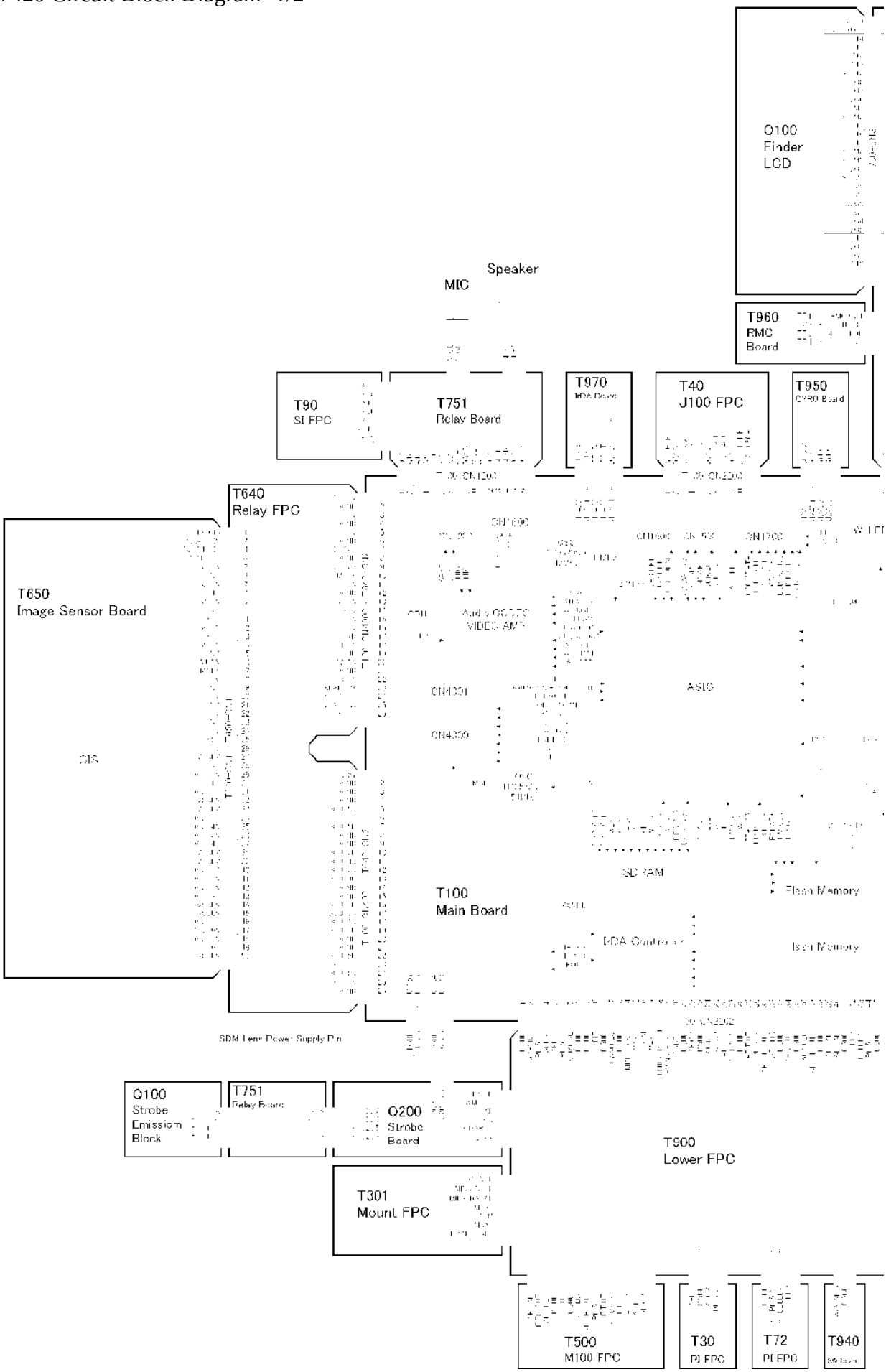
*5,6 and 7 are peak value averages. Other value is average.

	Condition of camera	Lens	Card	Battery equivalent		ACPower supply DC8.3V
				DC6.0V	DC8.3V	
1	Main SW/OFF*	○	×	200μA	200μA	200μA
		○	○	200μA	200μA	200μA
		×	×	200μA	200μA	200μA
2	After auto power OFF	○	×	300μA	300μA	300μA
		×	×	300μA	300μA	300μA
3	Main SW/ON (Meter OFF)	○	×	400mA	350mA	350mA
		○	○	400mA	350mA	350mA
		×	×	400mA	350mA	350mA
4	Main SW/ON (Meter ON)	○	×	540mA	500mA	500mA
		○	○	540mA	500mA	500mA
5	Charging Flash (Meter ON) *	○	×	2,200mA	2,500mA	2,500mA
6	Driving AF motor *	○	×	2,800mA	2,800mA	2,800mA
	(phase difference AF)	SDM	×	1,500mA	1,200mA	1,200mA
7	Driving AF motor *(Contrast AF)	○	×	2,800mA	2,800mA	2,800mA
		SDM	×	1,800mA	1,600mA	1,600mA
8	Releasing shutter *	○	×	3,600mA	3,600mA	3,600mA
		○	○	3,600mA	3,600mA	3,600mA
9	Recording image after release the shutter	○	○	600mA	600mA	600mA
10	Bulb	○	○	1,000mA	1,000mA	1,000mA
11	Displaying menu (LCD)	○	×	600mA	600mA	600mA
12	Displaying menu (Video output)	○	×	600mA	600mA	600mA
13	Displaying playback image	○	○	600mA	600mA	600mA
14	Recording playback image in the card	○	○	600mA	600mA	600mA
15	Stand by for USB communication	○	○	500mA	500mA	500mA
16	Reading playback image in the card with USB communication	○	○	500mA	500mA	500mA
17	During Live view	○	○	1,100mA	1,000mA	1,000mA
18	Stand by for Movie	○	×	1,100mA	1,000mA	1,000mA
19	Recoding Movie	○	○	1,200mA	1,100mA	1,100mA
20	Playback Movie	○	○	600mA	600mA	600mA

*:Replacing T100 (back up capacitor is not charged)

Block Diagram

77420 Circuit Block Diagram -1/2



＊77420 Circuit Block Diagram -2/2

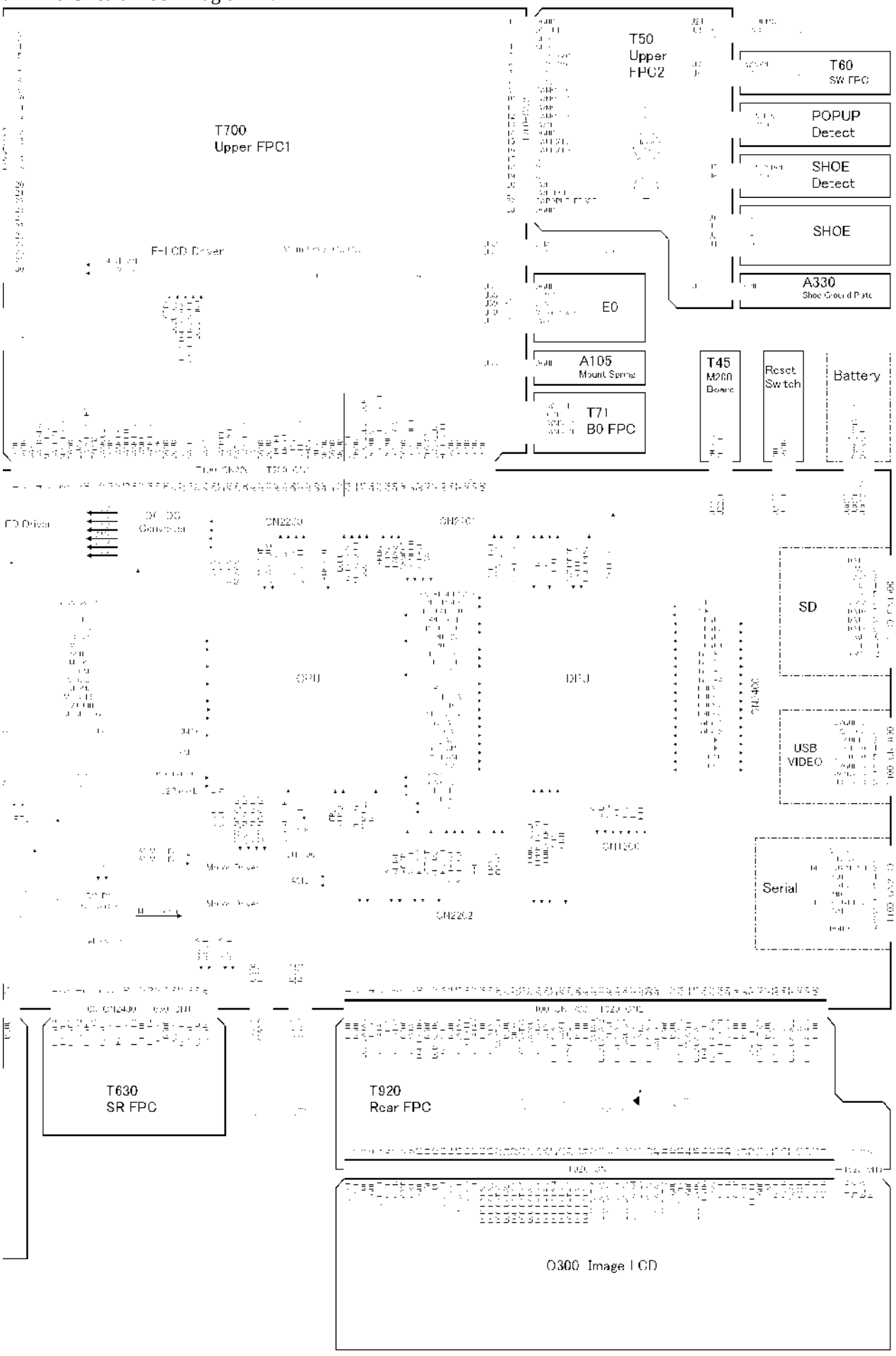


Table of Error Code 1 (SR unit adjustment)

SR unit adjustment, Table of Error Code (7– bb)

Error Code (bb)			Contents	
7	Coil	1	X MOVE ERROR	Lead wire is touching, connector contact NG, SR block NG
		2	Y MOVE ERROR	〃
		3	X DIR ERROR	〃
		4	YL DIR ERROR	〃
		5	YR DIR ERROR	〃
	Holl_Gain	6	VREF ERROR	connector contact NG
		7	IREF ERROR	Lead wire is touching, Screw is stick on
	Move_Range	8	RANGE OVER ERROR	〃
		9	Ereki Limit ERROR	〃
		10	Center Over ERROR	〃
	Corner_Obit	11	Obit Core ERROR	Weak connector contact, Bending flexible board
		12	Obit Center ERROR	〃
		13	Obit Corner ERROR	〃
	Frequency	15	"4HZ ERROR"	〃
		16	"6HZ ERROR"	〃
		17	"10HZ ERROR"	〃
	Gyro	14	GYRO VALUE ERROR	Miss arranging gyro board lead wire
		22	Reverse ERROR	Coil is reversed
		23	"0HZ ERROR"	No use

Table of Error Code2 (SR unit adjustment)

SR gain adjustment, Table of Error Code (7 – bb)

Error Code (bb)			Contents	
7	Gyro	18	GYRO WAVE ERROR	Gyro NG or condition of stage
		19	CHART NOT CENTER ERROR	Chart is not center of viewfinder
	Caputure	20	SR_X_ERR	Captured image is not right exposure
		21	SR_Y_ERR	〃

Table of Error Code 3 for Uniformity (AF) adjustment

Table of uniformity adjustment Error Code (aa – bb) aa:comtents of adjustment bb: contents of error

**-20	No power on
**-21	Can't communicate with the control box
**-22	Model Error
**-23	Battery level error
**-24	Camera version NG
**-25	Process lucking
**-26	Can't set the Mode Dial Manual
**-27	Can't set Focus Mode MF
**-28	Can't set the Mirror up sw off(77320)
**-29	Can't set SR SW OFF
**-30	Can't set AF adjust flag
**-31	After calculate data is over flow
**-32	Monitor offset adjust data is illegal
**-33	Monitor offset data is out of standard
**-34	Lens cap error during FPN adjustment(need lens cap)
**-35	Lens cap error during FPN adjustment(need to take out the lens cap)
**-36	Not yet adjust monitor offset
**-37	FPN video dump data is too hi
**-38	FPN video dump data is too low
**-39	FPN Flag error
**-40	Camera temperature is out of standard
**-41	Uniformity data error in adjustment
**-42	Uniformity data error in check
**-43	V saturation data is out of standard

Table of Error Code 4 for FI (AF) adjustment

FI (AF) adjustment error code (aa-bb) aa:comtents of adjustment bb: contents of error

**-20	No power on
**-21	Master body check error(Don't adjust master body)
**-22	Battery level error
**-23	Model Error
**-24	Camera version NG
**-25	Process lucking
**-26	Can't set the Mode Dial Manual
**-27	Can't set Focus Mode MF
**-28	Can't set SR SW OFF
**-29	Can't set the Mirror up sw off(77320)
**-30	Can't set TV Set NG
**-31	Can't set AV Set NG

**-32	Can't set SV Set NG
**-33	Can't set XV Set NG
**-34	Manual input temp NG
**-35	Around temp too low
**-36	Around temp too HI
**-37	Camera temp NG
**-38	Camera temp A/D NG
**-39	Sensor temp NG
**-40	Camera temp check NG
**-41	Sensor temp check NG
**-42	Wave pattern NG->Check jig condition
**-43	Wave pattern NG
**-44	Wave height NG(moist)
**-45	CAL FLAG NG
**-46	ZOKO data NG
**-47	Focus offset NG
**-48	Predictor data NG
**-49	H_D1 predictor data is too low
**-50	H_D1 predictor data is too hi
**-51	H_D2 predictor data is too low
**-52	H_D2 predictor data is too hi
**-53	V_D1 predictor data is too low
**-54	V_D1 predictor data is too hi
**-55	V_D2 predictor data is too low
**-56	V_D2 predictor data is too hi
**-57	H D value data is too low
**-58	H D value data is too hi
**-59	V D value data is too low
**-60	V D value data is too hi

Table of Error Code 5 for Digital adjustment

Digital adjustment (M_Test), Table of Error Code (aa-bb)

aa:comtents of adjustment bb: contents of error

**-20	No power on
**-21	Can't found Gain table file
**-22	Master body check error(Don't adjust master body)
**-23	Can't found CCDID
**-24	Model Error
**-25	Battery level error

**-26	Camera version NG
**-27	Process lucking
**-28	Can't set the Mode Dial Manual
**-29	Can't set Focus Mode MF
**-30	Can't set SR SW OFF
**-31	Can't set TV Set NG
**-32	Can't set AV Set NG
**-33	Can't set SV Set NG
**-34	Can't set XV Set NG
**-35	Still PPG data error(Over)
**-36	Still PPG data error(Under)
**-37	Still ISOG minus(Light source setting NG or others)
**-38	Still ISOG over
**-39	Still ISOG under
**-40	Temperature too hi
**-41	Temperature too low
**-42	Too much SW Pixel Defect
**-43	Too much SW Black Pixel Defect
**-44	Act-OB level is too low
**-45	Bv data over
**-46	Bv data under
**-47	Exposure data over
**-48	Exposure data under
**-49	Through PPG data error
**-50	Through PPG data error
**-51	Through ISOG minus(Light source setting NG or others)
**-52	Through ISOG over
**-53	Through ISOG under

Table of Error Code 6 for Digital adjustment (Writing Warranty record)

Writing Warranty record (Serial No), Table of Error Code

Status	Error Message	Cause
0	SUCCESS	
1	Comport Error	
2	Camera Communication Error	
3	Barcode read Communication Error	
4	Barcode Read Error	
5	Barcode Date Error	
6	UID Error	
7	Verify Error	
8	Time Out Error	
9	Remove Drive Error	
10	Write Date Error	
11	Read Date Error	
12	Model Error	Not mach Model number and software
13	FW Version Error	FW version is not correct
14	Barcode Size Error	

Information of Jigs, Tools and Testers for 77420

Order No.

*** Exclusive use for 77420**

Program soft for 77420 (For SLR/digital/SR) No.95901-P419

DC coupler D-DC109 (Battery level adjustment/ Battery consumption check) Provide locally

*When adjusting battery level, affix insulation tape on Battery adaptor.

AC adaptor kit (D-AC50, DC coupler D-DC109, AC code) Provide locally

2 SD card (32MB or above)
(For FW, test shooting --- Recommend 512MB or above)

Temporary bottom cover (For M100 adjustment, Hand made)
--- Refer to the Method for making temporally bottom cover below.

DC coupler and DC code

***For 77170**

77170 O100 cable (connect with 76700 O100 positioning jig) No.95901-J146

***For 76830**

K10D Master body for calibration

PENTAX will rend the master body. Please contact with us.

F5.6 Set plate for D20 (95901 D20)

--- ***If you have D20-01, you do not need set plate.**

F5.6 Set plate A (For Lens ID No.101~130) No. 95901-D27-00A

F5.6 Set plate B (For Lens ID No.1~99) No. 95901-D27-00B

DC code (connect with power supply or DC adaptor, Battery consumption check) No.95901-D25

***For 76700**

76700 SR adjusting Jig (required AC100V) No.95901-J140

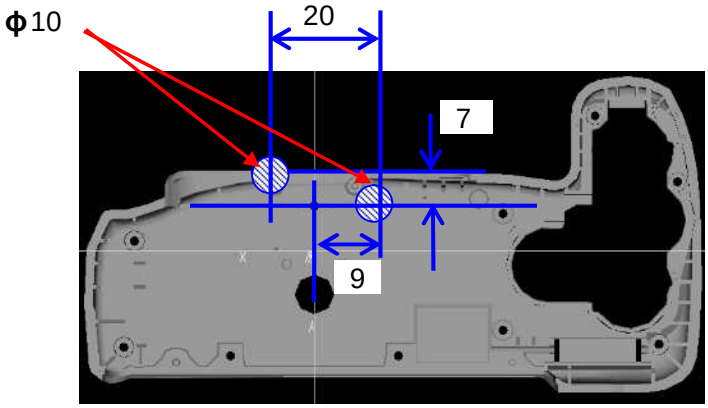
[Caution] If your area is not 100V, you must provide transformer at locally.

76700 SR unit adjusting base No.95901-J141

SR gain chart (Attached this service manual. The same as K100D)

***Others --- Common with 76700(K100D)**

(Refer to service manual for 76700)



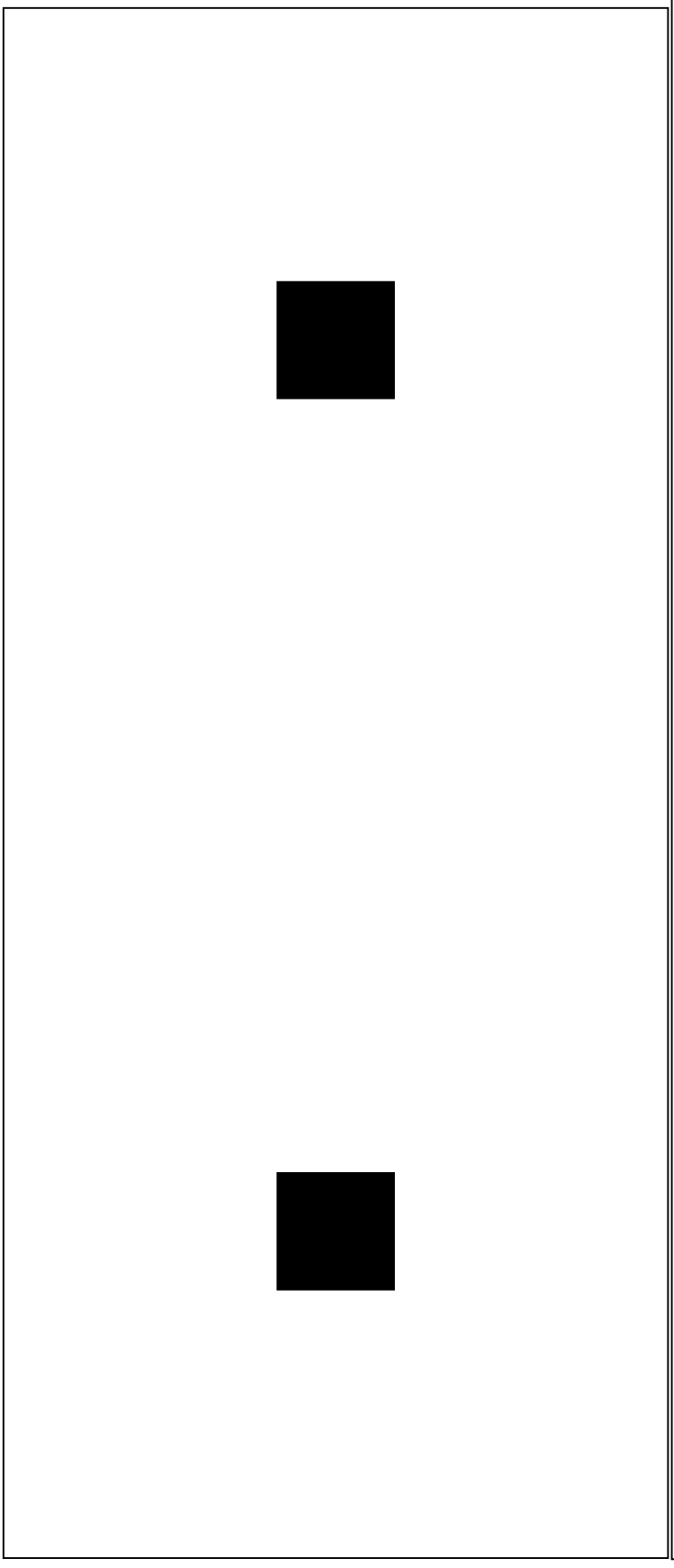
Method for making temporally bottom cover

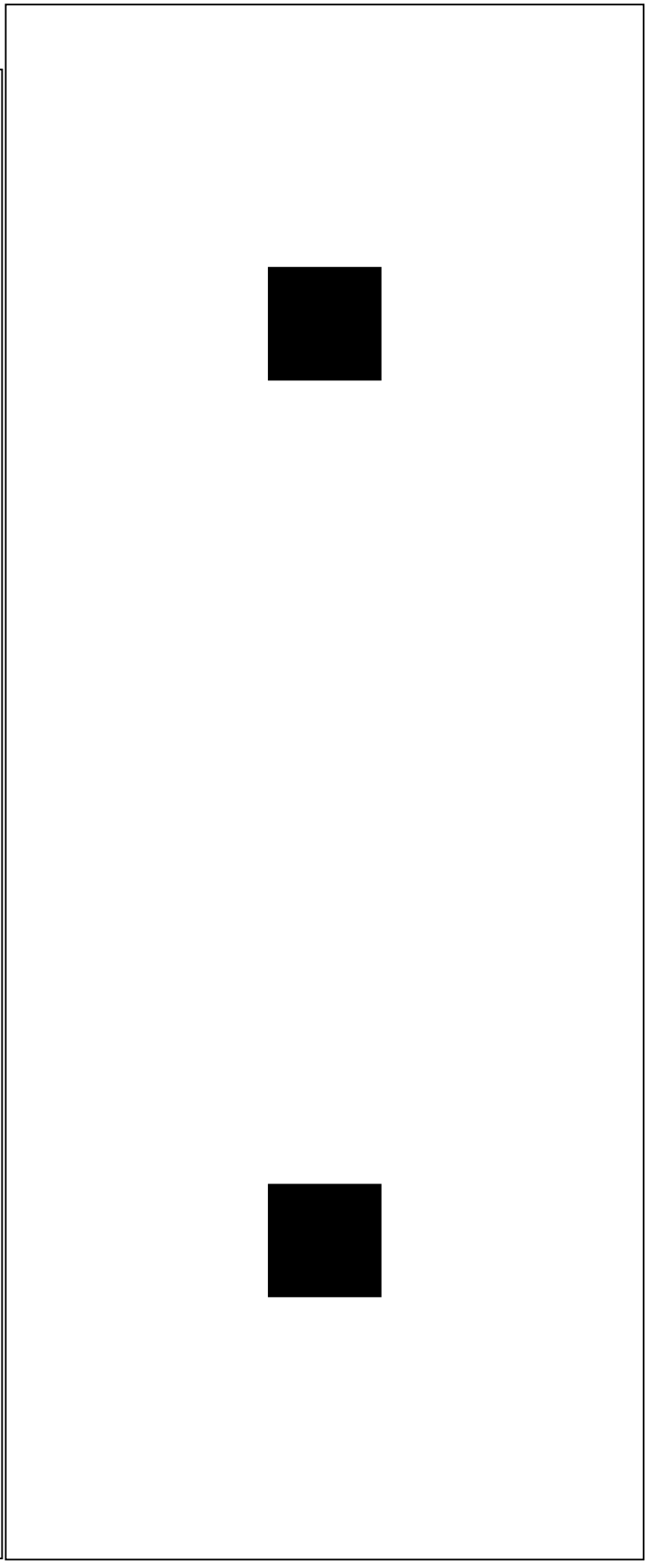
[Required equipment] A401 bottom cover

① Cut off [▨] part of bottom cover
as shown in figure.

Chart for SR Gain adjustment

1. When print the chart, set the printer to high-quality and use high- quality paper or glossy paper.
2.■ part must be 17mmx17mm (actual size).
3.Use either chart according to setting.





AF confirmation chart and scale Ver.2