PENTAX

Service Manual

ENGLISH

<ADJUSTMENT>

PENTAX K200D

Product No.77050 K200D

HOYA Corporation
PENTAX Imaging Systems Division
Development Department
Service Engineering Group
04.08

<ADJUSTMENT WITH USING PC>

[TABLE OF CONTENTS]

Table of jigs and testers

Exclusive use:		**Order Number**
Program soft for 77050		No.95901-P413
77050 Battery adaptor		No.95901-D30
77050 O100 cable		No.95901-J143
Common:		
Personal computer (Refer to 4page for details)		
USB cable (I-USB17)		
AC adaptor (K-AC76)		
SD card (1-4 pcs)		
SD card reader		
Image Viewing software (Example: ACDsee™)		
Clean wipe-P (For CCD cleaning paper)	60 boxes:	No.95901-A14
	1 box:	No.95901-A15
For adjustment:		
Light source for AE adjustment		
* Light value should equipped [LV6 / 8 / 10 / 12 / 16] or [LV6 / 9 / 12 / 15]		
AE master lens for LX (LML-240, 95901-D20 can be used)		No.95901-N27
AF positioning jig (Square) for 27830		No.95901-M521
AF positioning jig (Cross) for 27250		No.95901-M514
2m AF 2 charts for 27830 (Attached in the service manual for 27830)		
Focus master lens for 2m (ML-259)		No.95901-N24
1st mirror angle adjusting jig for 45°		No-95901-J104
2nd mirror angle adjusting jig for 27830		No.95901-J137
Mirror positioning scope		No.95901-N49
Hexagonal driver 1.5mm (HD-M1.5)		No.95901-K72
FA(F) 35-80mm F4-5.6 (For AF adj)		
D-FA Macro 50mm F2.8 (For AF adj)		
FA 50mm F1.4 (For checking)		
Remote control F (For checking)		
Cable release switch CS-205 (For checking)		
Jig for flash pop-up (Hand made, same as 76450 *istDS)		
Hexagonal driver 0.9mm (HD-M0.9) For flash positioning adj		No.95901-K283
Collimator chart with 3 lines (OCRC-259, For checking AF focus)		
Focus master lens for 35mm (KMK-01)		
Dial gauge comparator (PH-2)		No.95901-N1
Block gauge for 35mm (229N-A01-A2)		No.95901-N4
Mount block (1620-A) / mount block spacer		No.95901-N47
Mount block spacer (23600N-A01, A104-A-A)		
Mount spacer holder (23600N-A01, A104-A-B)		
1000mm Collimator		
Pen light (For checking photo sensor)		
Light source (LB3300)		No.95901-M86

Diaphragm set ring F8 (KA-0-1A)	No.95901-N26
Battery adopter for 76450	No.95901-D23
Color temperature tester (For correction of light source)	
LV checker (For correction of light source LV 11.00)	
Regulated DC power supply (capable current at least 3A and 18V)	
Dark curtain (For digital adjustment)	
For confirmation:	
Resolution check Chart	No.95901-D019
Color checker (Macbeth™ Chart)	
Gray chart	No.95901-B003
A light (2856K)	
Fluorescent lamp (White: 4244K)	
Fluorescent lamp (neutral: 5111K)	
For calibration:	
Color temperature tester (Example: KonikaMinolta CL-200)	----------
LV meter	----------

[Preparation and a check]

[Spec] The personal computer for adjustment

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

HD availability: 500MB or more

[Important] Installation of 3 kinds of software

*.net framework Ver2.0

*VC++2005 SP1

*VB Runtime (It is not required if the BV Runtime is already installed before)

[Note] New software (Installation of .net framework Ver2.0&VC++2005 SP1)

Select [dotnetfx.exe] from the software holder in CD-ROM then double click icon. Installer will be started up and follow the instruction on the screen and continue with the installation.

Next select [vcredist_x86.exe] from the software holder in CD-ROM then execute installation in the same way as above.

[Important] Storage location for 77050 soft

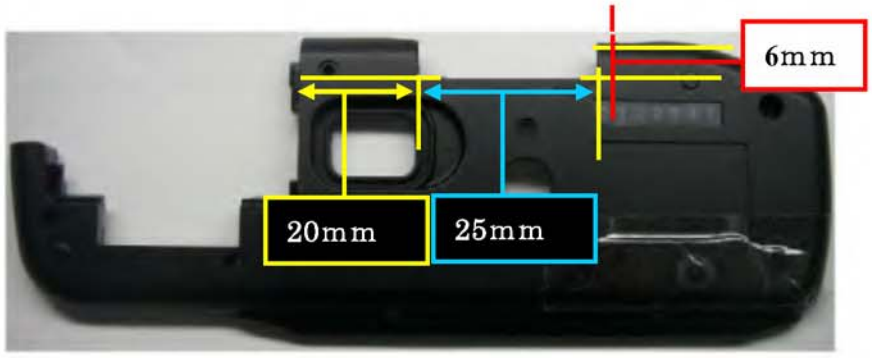
Copy the 77050 holder from CD-ROM (95901-P413) to C drive.

Attention!! Do not storage other than C drive and do not move the file holder from77050 holder, otherwise there is no guaranty for function of Software.

[Method for making temporally bottom cover for adjustment]

Use temporally bottom cover for CCD POSITION adjustment [K200D_PDCAdj01_v100.exe]

Prepare the bottom cover and cut off part of bottom cover to be able to adjust M100 as shown in figure.



[Method for installing firmware]

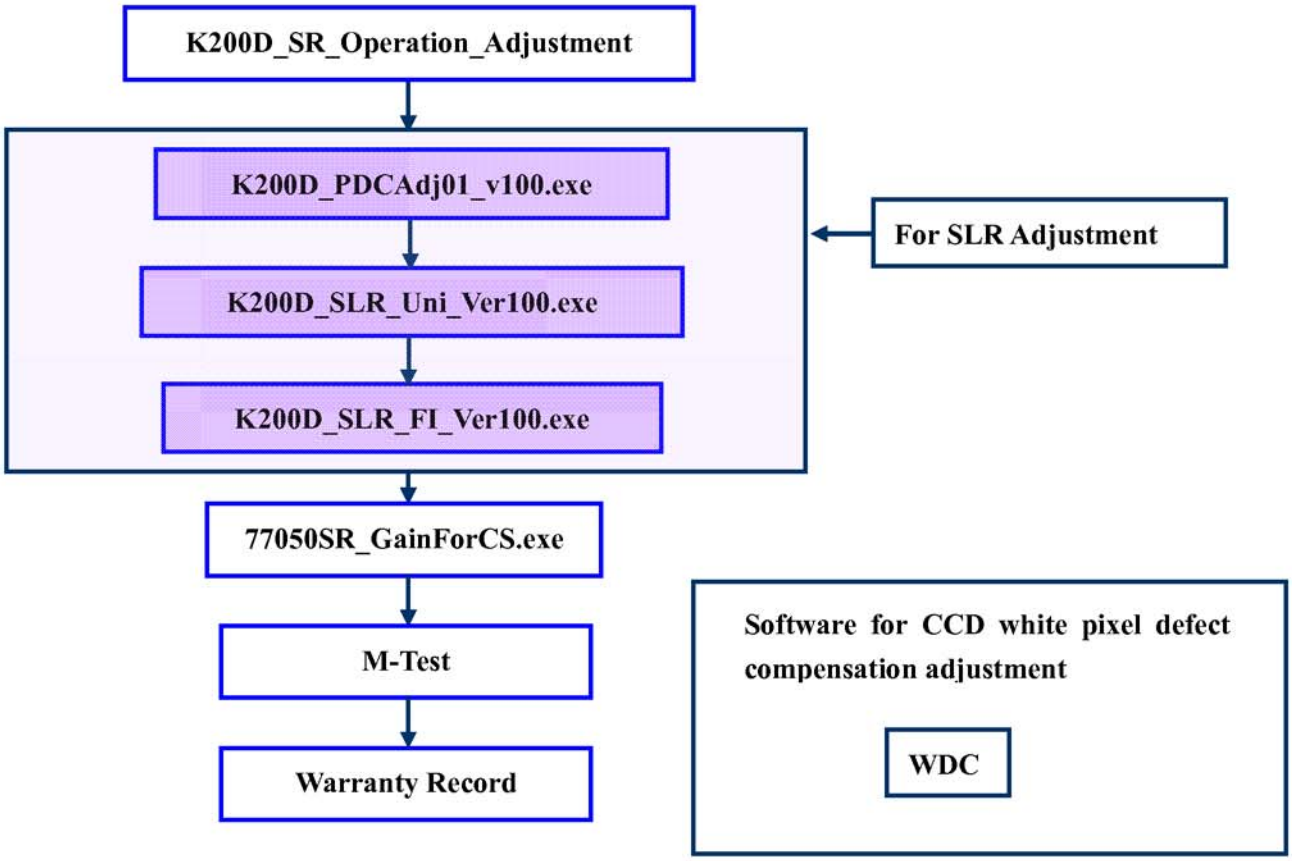
Copy the [fwdc184b.bin] to SD card from FW holder in CD-ROM.
Insert the SD card into the camera and close SD card cover.
Turn the main power ON while pressing menu button.
[UPDATING] will be displayed on LCD monitor.
When [COMPLETE] is displayed on lower left, installation is completed.
After completion, turn the main switch OFF and remove SD card.

[Method for checking FW version for Service] Full version

Copy the [TestMode_ON] to SD card from FW holder in CD-ROM.
Insert the SD card into the camera and leave the SD card cover open.
Turn the main power ON and then turn the main power OFF.
Turn the main power ON while pressing MENU button.
FW version for Service (Full version) will be displayed. (Test mode is ON condition)
After confirming FW version, insert the SD card (copied [TestMode_OFF] file) and leave the SD card cover open then turn the main power ON. Test mode will be canceled.

[Caution] Do not shut down the power during installation!
To prevent shut down the power during installation, use the AC adopter!

[Adjustment procedure]



[Adjustment]

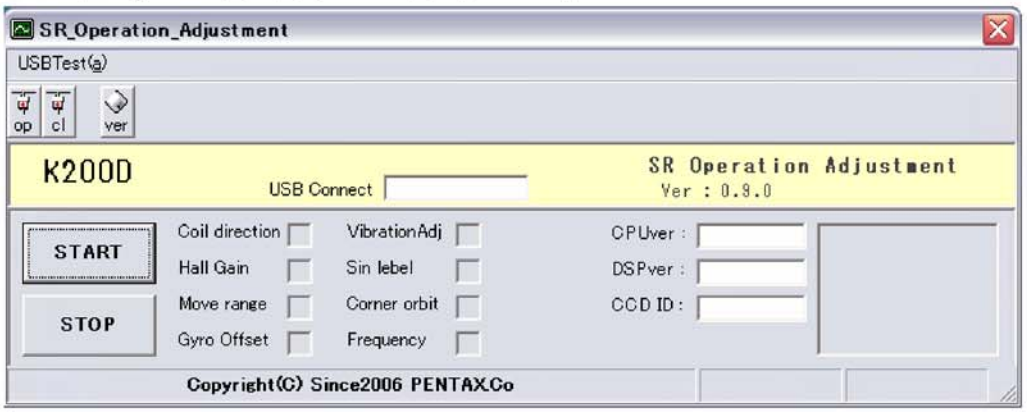
***K200D_SR_Operation_Adjustment**

[Caution 1] When replacing T100 or C000 block, you must execute this adjustment.

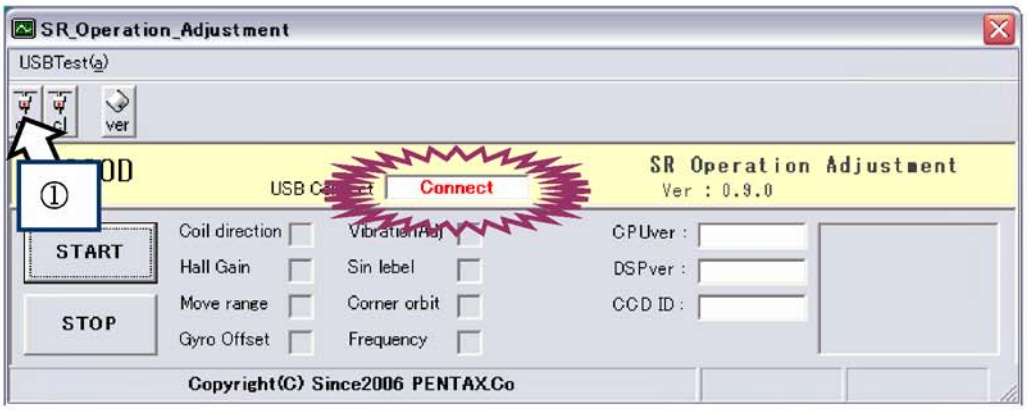
[Caution 2] Execute the adjustment on the stable table and do not give vibration to the camera while adjusting.

[Required equipment]

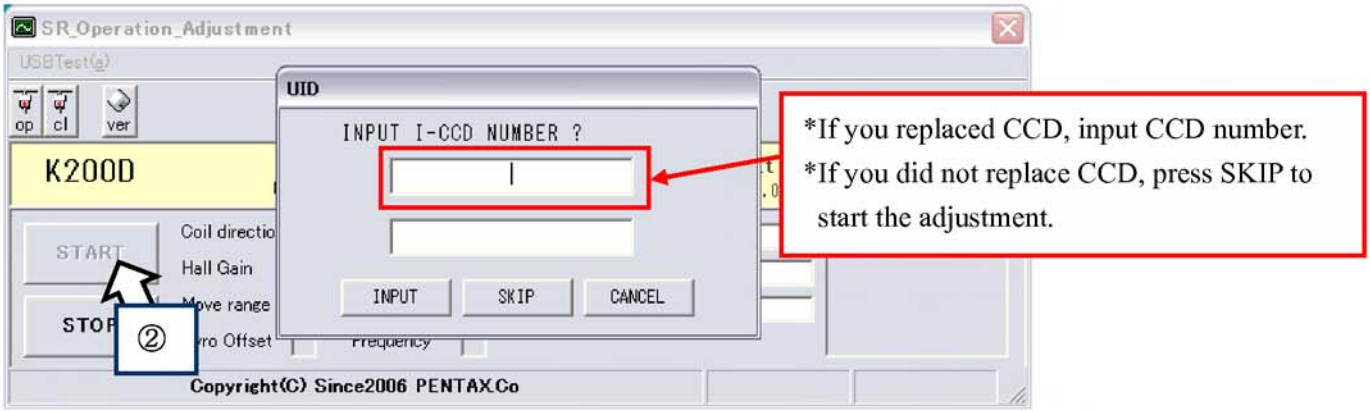
Programmed software for 77050 (for SR unit adjustment), SR adjustment stand,
Computer (refer to page 3), USB cable, AC adaptor
Connect the camera to the computer via USB cable and connect the AC adapter.
Start up to [K200D_SR_Operation_Adjustment]



1) Confirm that the camera is connected with computer then press Op button to connect.

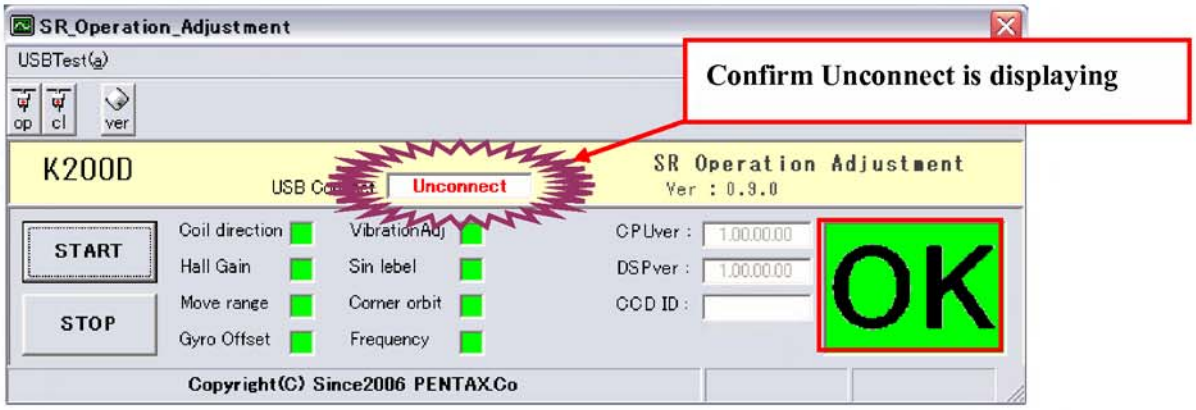


2) Turn the main power ON and confirm the camera is connected with the computer.
Press start. I-CCD number input screen will be displayed. If you replaced CCD, input CCD number then press INPUT. If you did not replace CCD, press SKIP to start the adjustment.



3) Do not touch the camera and base while adjusting the camera.

4) When adjustment is completed, OK will be displayed and automatically disconnect with software.



[SLR adjustment]

*K200D_PDCAdj01_v100.exe

Note: Adjustment procedure is similar to 76700 (K100D)

[Caution1] Execute this adjustment when replaced T100.

[Caution1] If you do not have the Reflection type of shutter tester, the shutter speed will check after the digital adjustment is completed. Refer to "Shutter speed adjustment by histogram"

[Required equipment]

Programmed software for 77050 (for SLR operation part), PC (Windows Xp SP2, with USB port equipped) USB cable (I-USB17), AC adaptor (K-AC76),
Light source (LV6/LV8 or LV9, LV12/LV15 or LV16, Can be used shutter tester), D20 or D20-01 and Diaphragm set ring F8 (KA-0-1A), AF positioning jig (Square) for 27830, AF positioning jig (Cross) for 27250, HD driver (HD-M1.5), AF chart for 2m x2 kinds, AF master lens for 2m, D-FA(FA) Macro 50mmF2.8, FA (F) 35-80mm F4-5.6, Regulated DC power supply (8V/3A or above), Battery adaptor, Reflection type of shutter tester for digital SLR (1/4000sec. refer to caution2), Battery adaptor for 76450

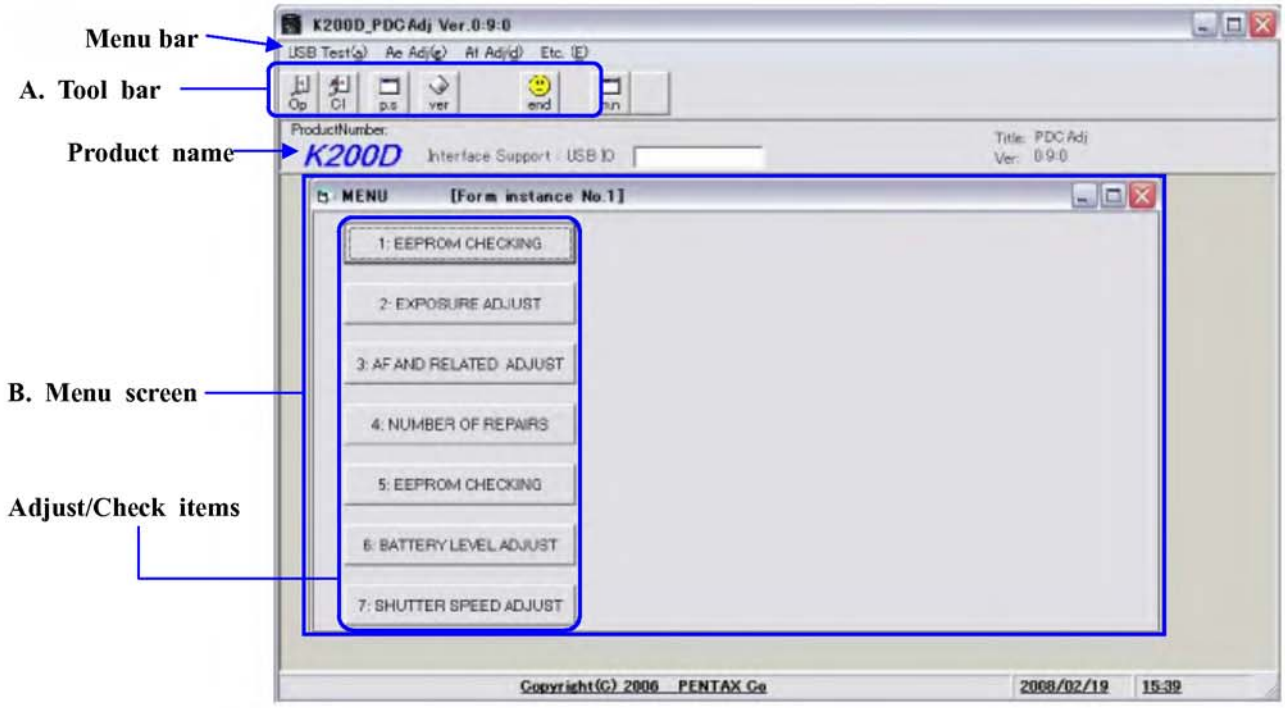
[Preparation]

*** When T100 or CCD is replaced, confirm the CCD ID No. and write down.**

① Attach battery cover for battery adaptor and temporally bottom cover.
② Set focus mode to [MF]
③ Set the Mode dial to [M]

[Adjustment screen]

When start up the adjustment software, the following screen will be displayed.

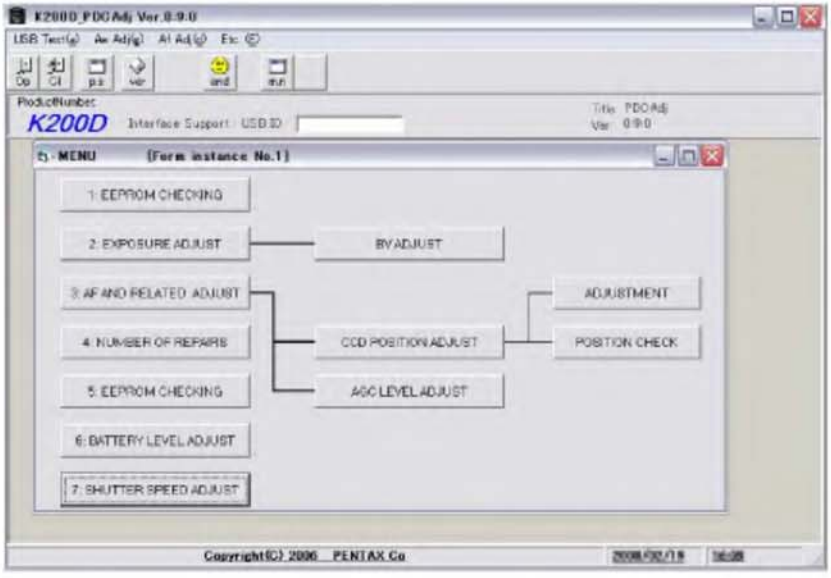


A. Tool bar

Op	**USB open: start the communication with camera (Same as [USB Test] in the menu bar)**
Cl	**USB close: Close the communication with camera (same as [USB Test] in the menu bar)**
p.s	**Print screen (Same function as key board)**
ver	**Display F/W Version**
end	**End of adjustment software**
m.n	**Display menu screen**

B. Menu screen

When click the each items, the detail will be displayed as follow.



Items for Adjustment/Check

1: [EPROM checking] Check the data

2: [Exposure adjust] Adjustment the exposure (menu bar: AeAdj)

[BV adjust] (Brightness value) Adjustment of brightness value

(Not use [TtlAdj] on menu bar)

3: [AF and related adjust] Adjustment of AF (Menu bar: AfAdj)

[CCD position adjust] AF sensor position

[AGC level adjust] AGC level adjustment

4:[Number of repairs] Recording the number of repair

5: Same as above 1

6: [Battery level adjust] Adjustment of battery level

7: [Shutter speed adjust] Adjustment of high shutter speed

[Adjustment procedure]

1) Turn the power of the camera off and then connect AC adaptor.

To prevent shut down the power during adjustment, install enough capacity of battery.

2) Connect the camera to the computer via USB cable.

3) Turn the power of the camera ON and confirm that the camera is recognized by computer.

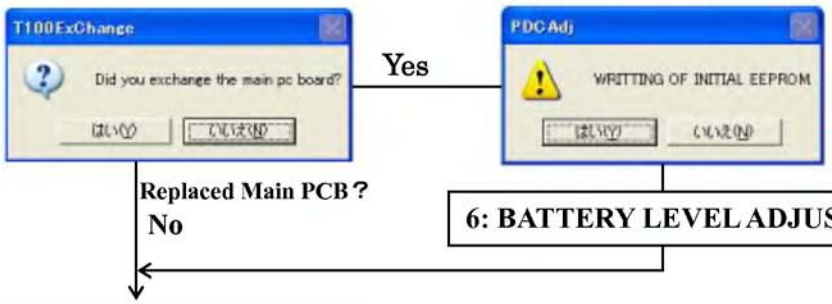
4) Click [PDCAdj01.exe] in the EXE folder.

5) Adjustment screen will be displayed.

6) Click [Op] to start communication with camera.

[Check!] [Connect] should display on USB IO.

7) Execute the check/adjustment following the display screen as follows



Initialize the data

[Caution] When execute SR adjustment, you must select [No].

1:EEPROM CHECKING

↓

2:EXPOSURE ADJUST

[BV ADJUST]

↓ **Required equipment** :Focus master lens for 35mm (KML-01), Diaphragm set ring F8 (KA-0-1A)

↓ Light source (LV6,LV8,LV12,LV15) or (LV6,LV9,LV12,LV16)

3: AF AND RELATED ADJUST

[CCD POSITION ADJUST]

↓ **Required equipment** : AF positioning jig (Square) for 27830, AF positioning jig (Cross) for 27250, Light source LV12

↓ Driver1.5mm (HD-M1.5), FA (F) 35-80mm F4-5.6, D-FA, D-FA(FA) Macro 50mmF2.8

ADJUSTMENT

1) Alpha-CROSS/Beta-SQUARE: Dump Start --- incline adjustment --- Stop

2) Focus: Start (chart position) --- Next (height adjustment) --- Stop --- Close

* When replaced M100, Click M100 button and then start adjustment

POSITION CHECK

↓

[AGC LEVEL ADJUST]

↓

5:EEPROM CHECKING (When finished all adjustment, execute EEPROM CHECKING).

* When replaced T100, the following adjustment should be done additionally

6:BATTERY LEVEL ADJUST *Note:When replacing T100, you must execute this adjustment.

Required equipment: Battery adaptor, Power supply (8V, 3A)

1) Follow the screen

*When open and close the battery cover, [Pc] will be displayed in the LCD panel of the camera.

2) Click Op and then start the communication with camera. Display will change to [- - -]

3) Press BC Adjust and execute the adjustment.

4) After finished the adjustment, press Close button.

*If the power turned ON again, execute above 2).

7:SHUTTER SPEED ADJUST *Note:When replacing T100, you must execute this adjustment.

Required equipment: Reflection type of Shutter tester

1) Select the shutter tester (1/4000).

2) Press RELESE button and release the shutter several times, also measure the data (shutter speeds).

3) Input Measurements data and press Input Data.

4) After finished the adjustment, press Close button.

Finish the [5:EEPROM CHECKING] --- Adjustment and chinking are finished

[Procedure for ending the program software]

Finish the program soft with following procedure

USB Close

Click "Cl"icon and disconnect the communication with camera.

[Confirm] [Unconnect] should be display on USB IO.

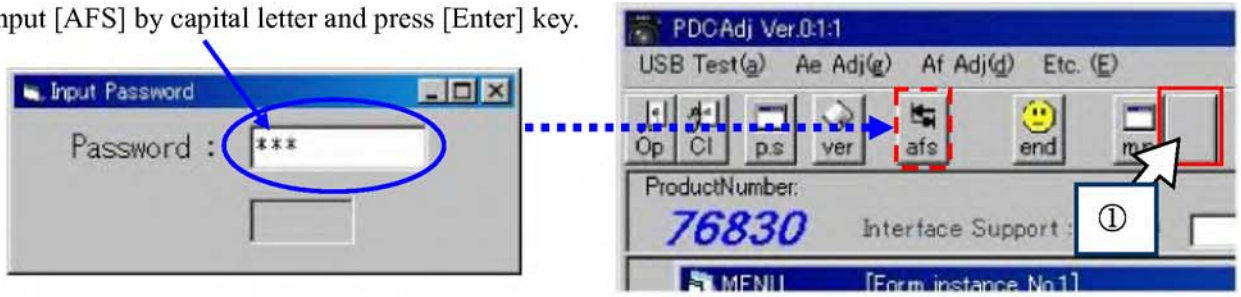
[Auto Focus shift adjustment] (If required)

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

*Procedure is similar to 76830 (explanation is using 76830)

1) Click □ button as shown in fig.

2) Input [AFS] by capital letter and press [Enter] key.

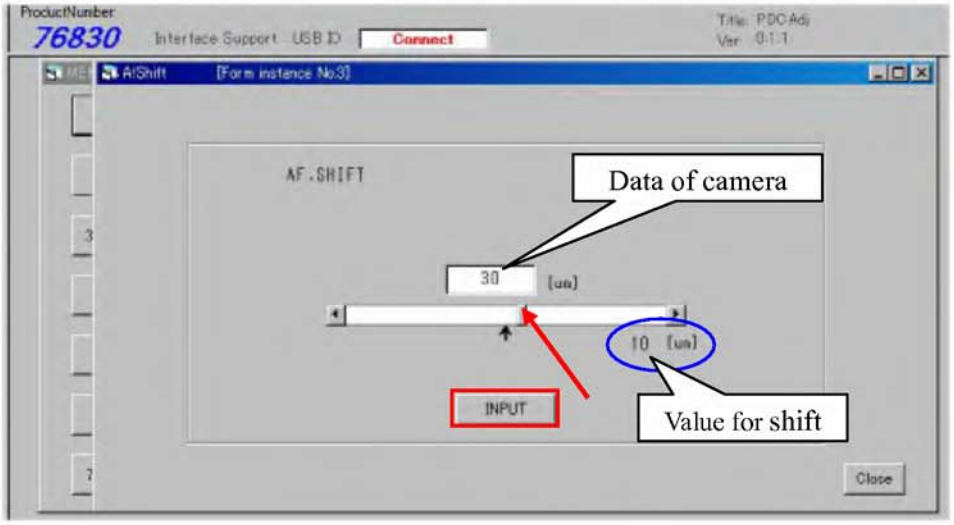


3) [afs] will be displayed on tool bar.

4) When click [afs] button, below AF shift screen will be displayed.

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

6) Click [Input] to adjust. (Can not input more than ±100um)

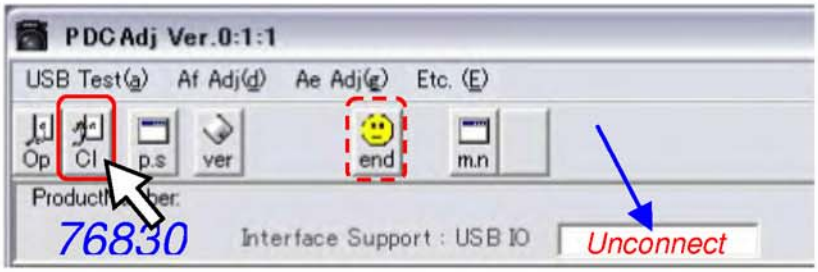


[Procedure for ending the program software]

1) Click "Cl"icon and disconnect the communication with camera. (USB close)

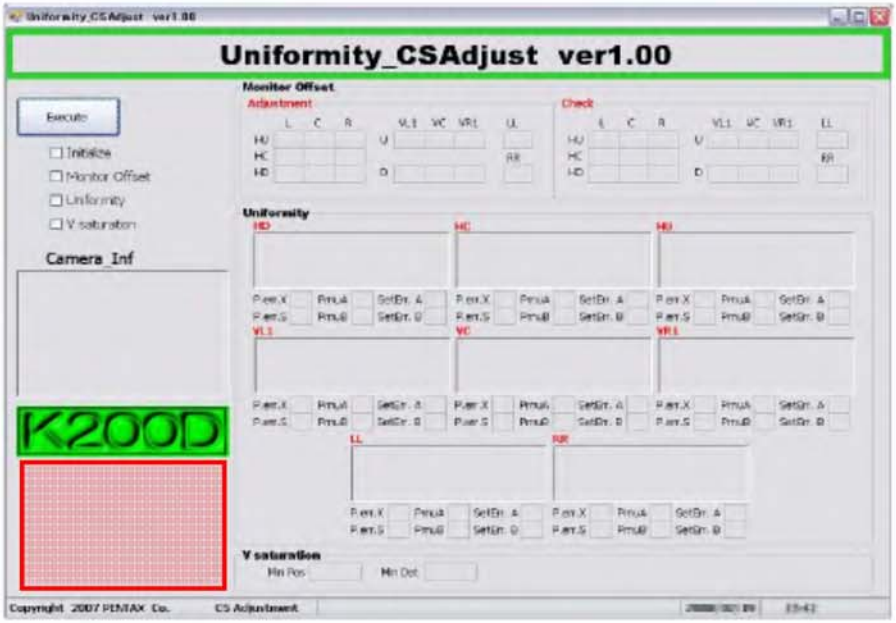
[Confirm] [Unconnect] is displayed on USB IO

*Finish the Program software with the same procedure of K100D.



[Uniformity_CSAAdjust]

*[K200D_SLR_Uni_Ver100.exe]



Tools: FA(F) 35-80mm F4-5.6, Light source (LV12)

[Note] Clean the auto focus sensor before adjustment.

Attach the FA(F) 35-80mm F4-5.6 lens to the camera and set to the light source (LV12) then press execute key (Enter key).

If adjustment is OK, "OK" will be displayed in red frame of screen.

[AF adjustment]

*[K200D_SLR_FI_Ver100.exe]

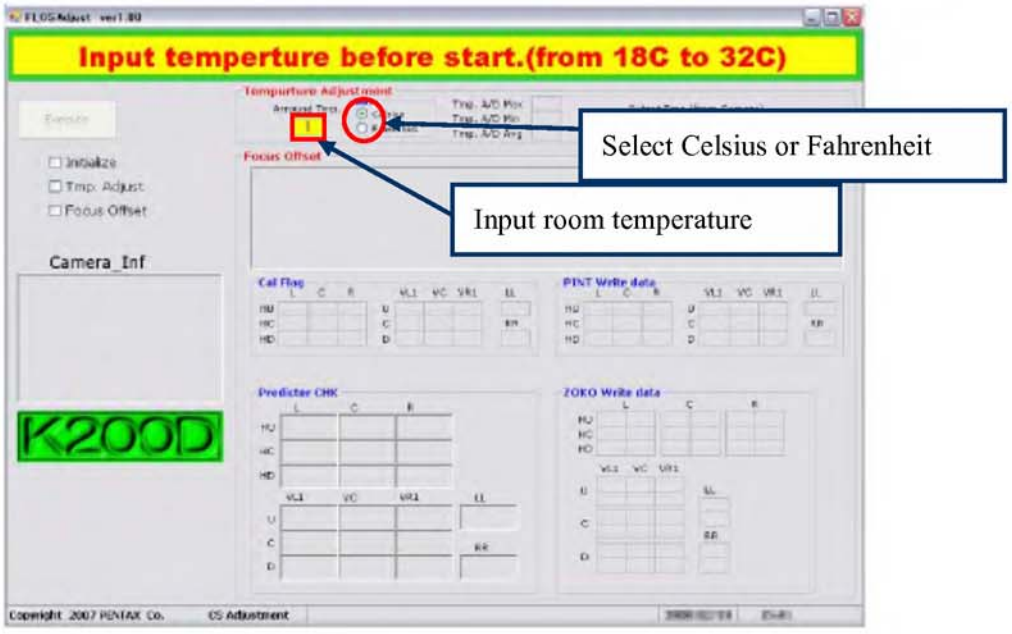
Required equipment: AF chart for 2m x2 kinds (No.1 and No.2), Focus master lens for 2m

[Note] Set the AF chart with following condition.

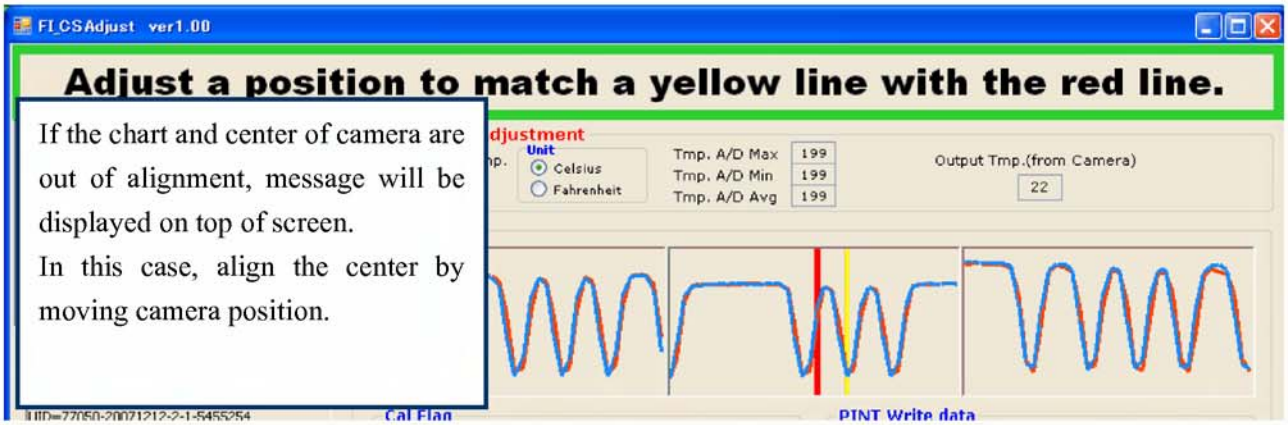
1) Distance between AF chart and camera mount --- 1,9545mm (1.9545m)

2) Chart should be set on vertical against axis of lens.

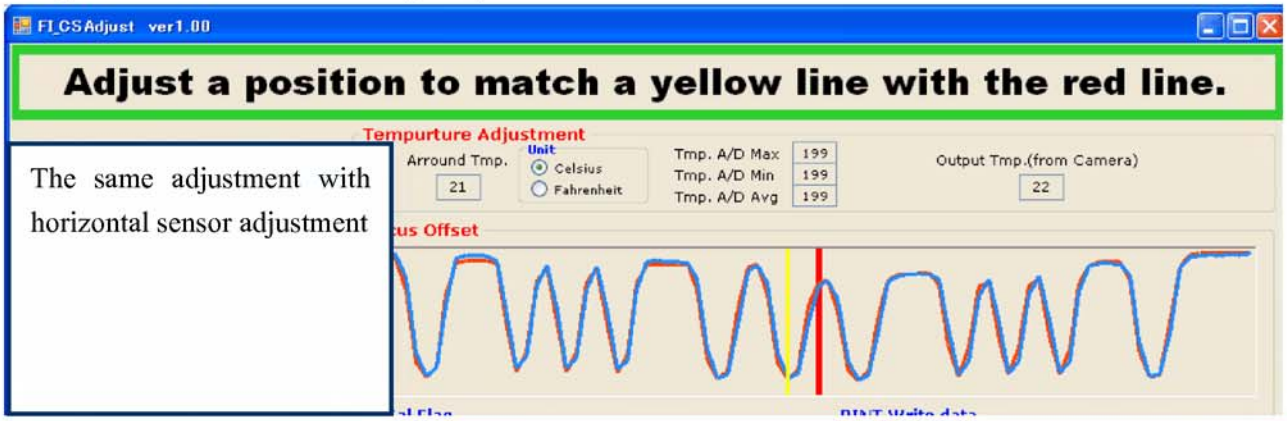
3) Lighten the chart EV11 to 12. If brightness is not enough, adjustment will not be passed.



4) Horizontal sensor adjustment. Use vertical line chart (No.1)



5) When horizontal sensor adjustment is completed, next will be vertical sensor adjustment
Replace to horizontal line chart (No.2)



***When OK is displayed after all adjustment, the adjustment is completed.**

[SR II adjustment]

***77050SR_GainForCS.exe**

[Caution 1] When replacing T100 or C000 block, you must execute this adjustment.

[Caution 2] [K200D_SR_Operation_Adjustment] must be done before this adjustment.

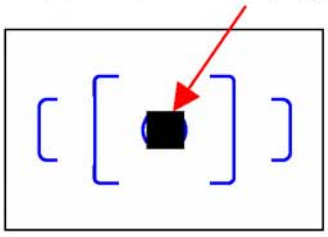
[Caution 3] Do not give the camera the vibration when you adjust it. Put on the sturdy and stabile table.

[Caution 4] The weight of the stage is more than 10kg, so pay attention the handling.
Do not hold black vibration table.

[Required equipments]

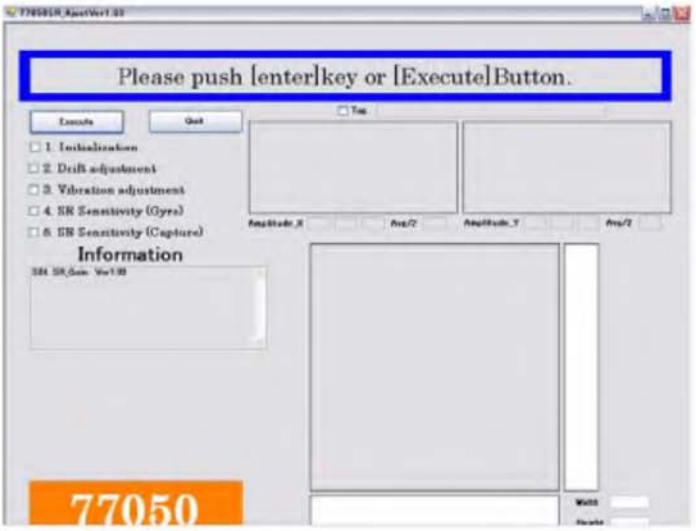
SR gain adjustment set, Chart for SR adjustment (Attached in service manual), DA50-200mm lens

1) Set the camera to SR adjustment tool (refer to figure)
2) Set the chart 2.00m from tripod screw part on the camera stand.
3) Match the chart with frame of spot measurement in the view finder

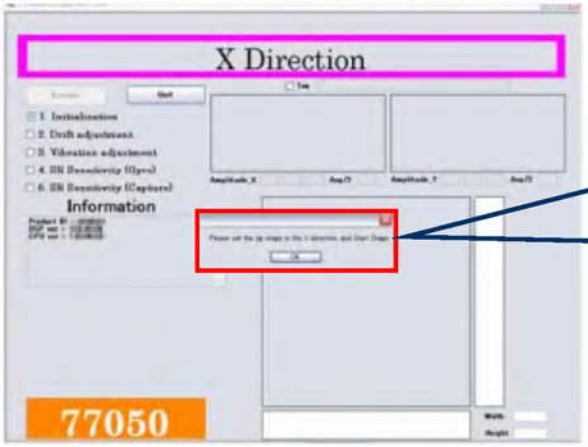


4) Lighting the chart evenly. Surface of chart should be approx. LV10-LV12.
5) Set the zooming position at 200mm and distance ring set at 2m and then fix each setting with tape.
6) Set the camera to the following condition.
   Mode dial: M
   AF switch: MF
   SR switch: ON

7) Attach camera to the driving stage and fix with two knobs properly.
8) Turn the power of the controller ON and adjust the meter to 1,000 rpm (1,000 turn/min) by turning controller dial. Turn the power of the controller OFF.
9) Connect the camera and computer via USB cable and start up [77050SR_GainForCS.exe]

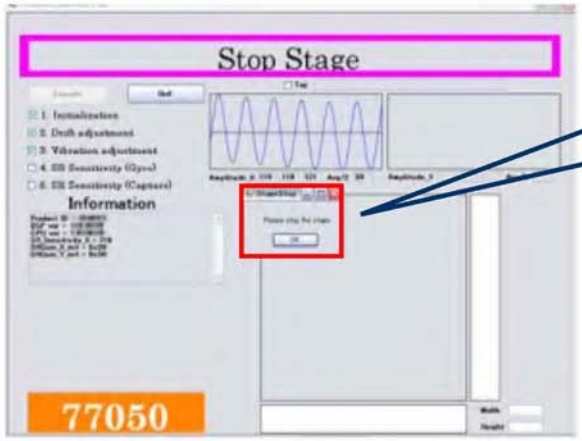


10) Press Execute and start adjustment for X direction.



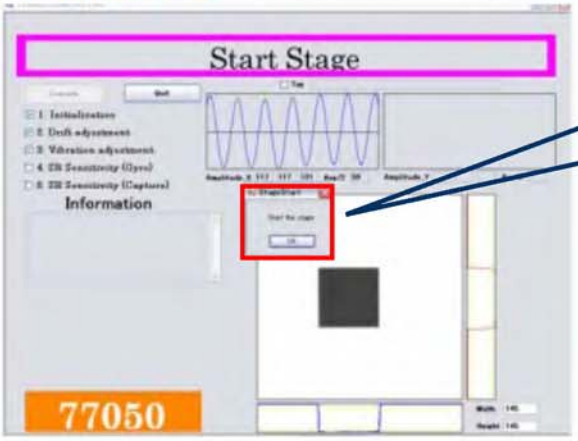
When "Please set the jig stage in the X direction and start stage" is displayed, turn ON the power of the controller and set the controller 1000rmp then press OK.

[In adjustment] Driving stage is operating



When "Please stop the stage" is displayed, turn off the power of the controller then click OK.

[In adjustment] Driving stage is stopping



When "Start the stage" is displayed, turn ON the power of the controller and set the controller 1000rpm then click OK.

[In adjustment] Driving stage is operating

11) Adjustment for Y direction.

When "Please set the jig stage in the Y direction and start stage" is displayed, change the position of camera and stage for Y adjustment. Set the chart 2.00m from tripod screw part on the camera stand and match the chart with frame of spot measurement in the view finder. Turn ON the power of the controller and set the controller 1000rpm then click OK.

[In adjustment] Driving stage is operating

Execute the adjustment with the same procedure of X direction. When OK is displayed after adjustment, the adjustment is completed.

[Shutter speed adjustment by histogram (1/4000 sec)]

The same procedure with 76700 (K100D)

* Adjustment (SLR function and Digital function) should be completed before.
* Shutter speed adjustment required when replaced T100 or 0-E000.
* When check the shutter speed by the reflection type of the shutter tester, follow the SLR function adjustment in the service manual.

[Required equipment]

Programmed software (for SLR operation), Computer (WindowsXP, with equipped USB port)
Diaphragm set ring F8 (KA-0-1A) and AE master lens (ML-240) or FA50mm F1.4,
Light box which has LV8 or LV9, USB cable (I-USB17), AC adaptor (K-AC76),
Memory card (For test), measure

[Preparation]

Preparation of Program soft adjustment (SLR Operation) and setting should be completed.

[Setting the camera]

Mode dial: Manual exposure mode
Focus lever: MF
ISO: 200
[Menu]: Capture: Setting the Image Tone --- Natural
Quality level / Recorded Pixels -- *** Best, 6M (default)
Saturation, Sharpness, Contrast --- Standard (default)
Playback: Quick view --- 5 Seconds
Playback display --- Setting the Histogram display
Custom: Using aperture ring --- Set to disable shutter release when lens aperture ring is set at other than A

Relation of setting on TV and ISO

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

[Checking procedure]

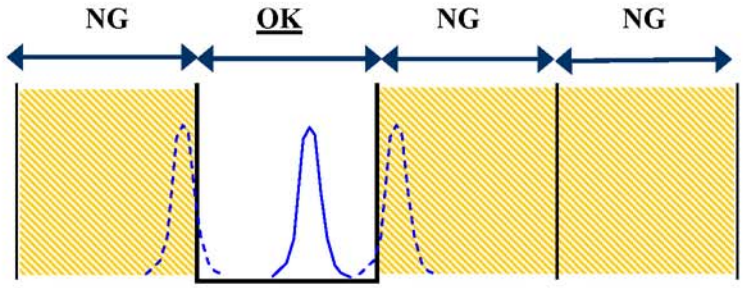
1) Set the light value at LV8 (or LV9).
2) Set TV at 250 and ISO 200. (When set LV9: Set TV at 500 and ISO 200)
3) Attach F8 setting ring and AE master lens.
4) Set aperture at F1.4 (Open position).
5) Set the camera to the light box.
   * To avoid the light from outside, shield the light source.
6) Capture 3 images --- **Standard data**

[Caution]

The peak position of histogram must be in the range of OK.

If the peak position of histogram is in NG, check the setting the camera again.

Also, re-adjust BV and digital adjustment.



* Set same light value (LV8 or LV9) and Set aperture at F1.4 (Open position).

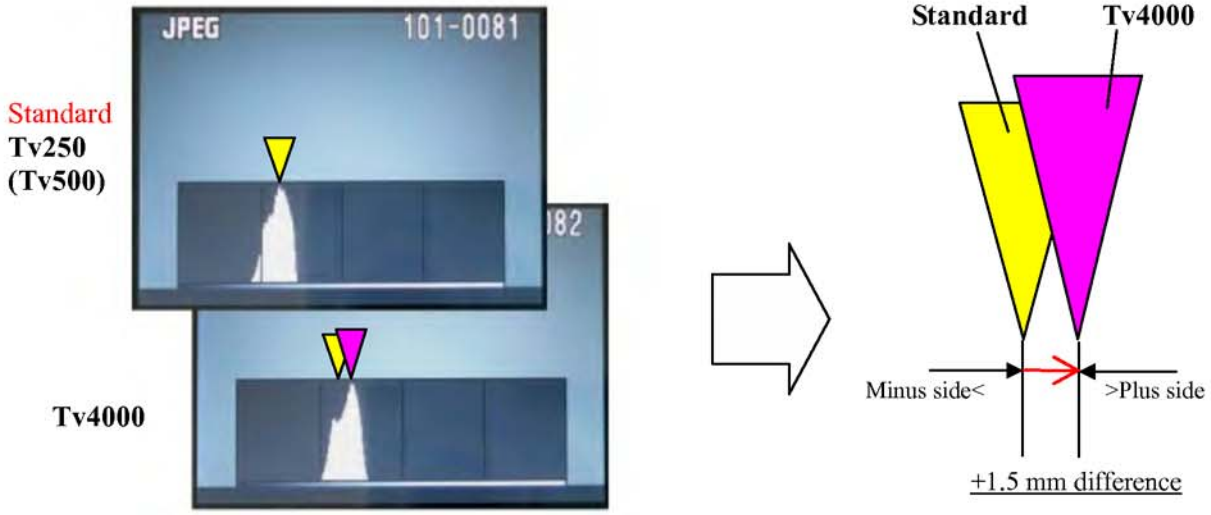
7) Set TV at 4000 and ISO 3200 (When set LV9: TV 4000 and ISO 1600).

8) Set the camera to the light box and capture 5 images.

9) Playback the image by histogram display and compare the peak position with standard data.
And then measure the difference (mm) on the monitor.

[Note] Measure it by viewing from in front of LCD monitor. Do not scratch on LCD window.

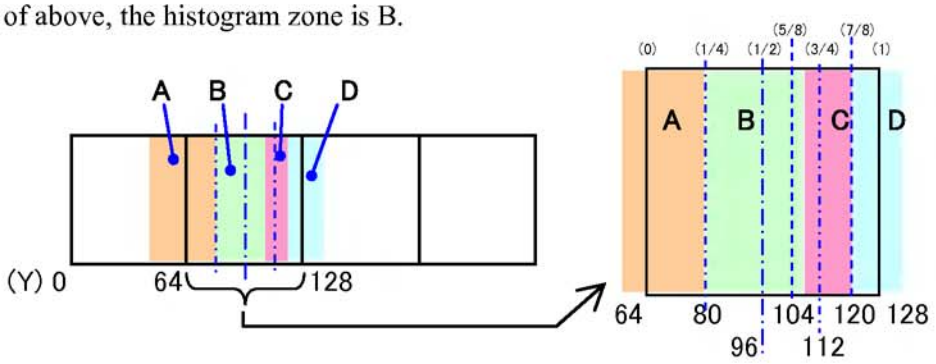
[Example]



Playback the image (Histogram display)

10) 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.



11) Obtain the shutter speed (mS) referring the conversion table below.

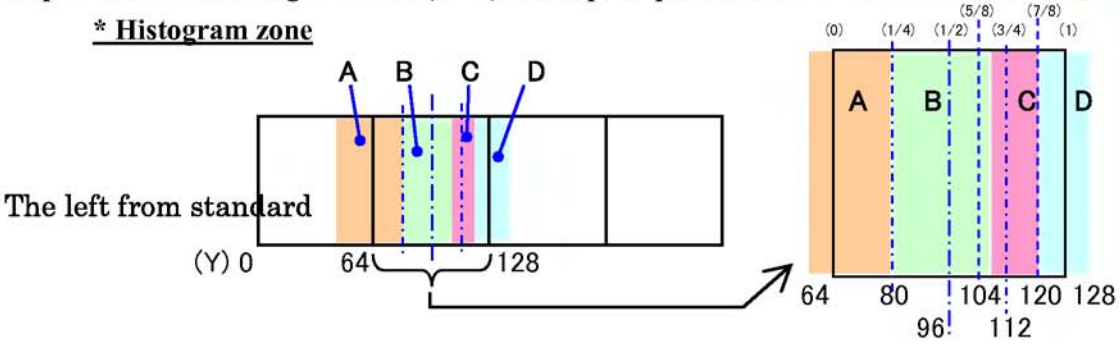
* In the case of above, difference of peak position is + 1.5mm (Right side of the standard) and histogram zone is B. Therefore, the shutter speed is [0.273ms].

[Conversion table of shutter speed]

Step 1: Compare the peak position with standard data
and then measure the difference (mm) on the monitor.

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

*** Histogram zone**



Step 3: Obtain the shutter speed (mS) from below conversion table.

Differ mm		The left from standard										
		-10.0	-9.5	-9.0	-8.5	-8.0	-7.5	-7.0	-6.5	-6.0	-5.5	-5.0
Zone	A	0.116	0.122	0.129	0.135	0.142	0.148	0.154	0.161	0.167	0.174	0.180
	B	0.054	0.064	0.073	0.083	0.092	0.102	0.111	0.121	0.130	0.140	0.149
	C	(0.001)	0.001	0.014	0.026	0.039	0.052	0.065	0.078	0.090	0.103	0.116
	D	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	0.004	0.020	0.036	0.052	0.068	0.084

(m S)

Differ mm		The left from standard										右 側
		-4.5	-4.0	-3.5	-3.0	-2.5	-2.0	-1.5	-1.0	-0.5	**0.0**	0.5
Zone	A	0.186	0.193	0.199	0.206	0.212	0.218	0.225	0.231	0.238	**0.244**	0.250
	B	0.159	0.168	0.178	0.187	0.197	0.206	0.216	0.225	0.235	**0.244**	0.254
	C	0.129	0.142	0.154	0.167	0.180	0.193	0.206	0.218	0.231	**0.244**	0.257
	D	0.100	0.116	0.132	0.148	0.164	0.180	0.196	0.212	0.228	**0.244**	0.260

(m S)

Differ mm		The right from										
		1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
Zone	A	0.257	0.263	0.270	0.276	0.282	0.289	0.295	0.302	0.308	0.314	0.321
	B	0.263	0.273	0.282	0.292	0.301	0.311	0.320	0.330	0.339	0.349	0.358
	C	0.270	0.282	0.295	0.308	0.321	0.334	0.346	0.359	0.372	0.385	0.398
	D	0.276	0.292	0.308	0.324	0.340	0.356	0.372	0.388	0.404	0.420	0.436

(m S)

Differ mm		The right from										
		6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0			
Zone	A	0.327	0.334	0.340	0.346	0.353	0.359	0.366	0.372			
	B	0.368	0.377	0.387	0.396	0.406	0.415	0.425	0.434			
	C	0.410	0.423	0.436	0.449	0.462	0.474	0.487	0.500			
	D	0.452	0.468	0.484	0.500	0.516	0.532	0.548	0.564			

(m S)

[Adjustment procedure]

1) Start the adjustment software and connect the camera to the computer.
2) Select SHUTTER SPEED ADJUSTMENT
3) Select the 1/4000 shutter tester and go to data input screen.
4) Input conversion data (mS). If the data is NG, back to the data input screen and input [0.25] and finish the adjustment.
5) After finish the adjustment, execute the software adjustment and then disconnect the connection.

[Confirmation] follow the above procedure 3 and 4, the shutter speed should be within 0.227mS ~ 0.30 mS (1/4000).

[Final function check 3]

*Execute [Function check 2] if necessary.

[Confirmation of the metering function]

*The checking method is the same as *istD series.

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

1) Attach the lens (FA50mm) to the camera and set the aperture to the A position.
2) Set 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)
3) Set the focusing ring to the infinity (∞).
4) Set the camera to the light source (shutter tester).
5) Change the light value of light source and confirm that the TV value is displayed as follows while depressing the release button halfway.
   (FNo.8・ISO200)

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

[M-Test]

[Prepare] Calibration with 76830 master body.

[Required equipment]

76830 master body, PC (Windows/XP with USB port equipped)

Light source (Example:LB-3300, Calibrated with A light color temperature:2856K±10 Brightness: LV11.00)

D20 or D20-01 and Diaphragm set ring F8 (KA-0-1A),

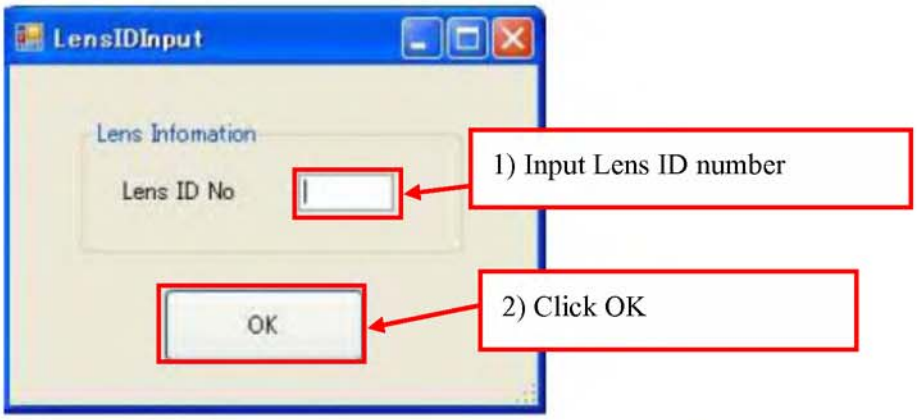
[Note] Use the same Lens ID number which is printed on adjustment CD-ROM

USB cable (I-USB17), AC adaptor (K-AC76), Dark curtain

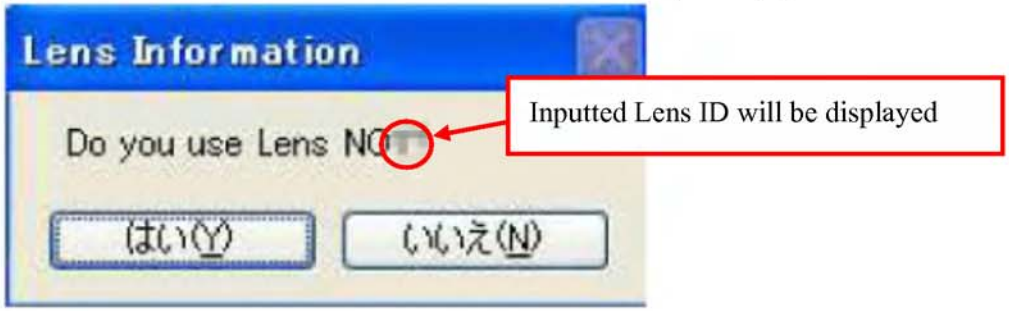
[Procedure]

1) Start up M-Test

2) Input using Lens ID number and click OK.

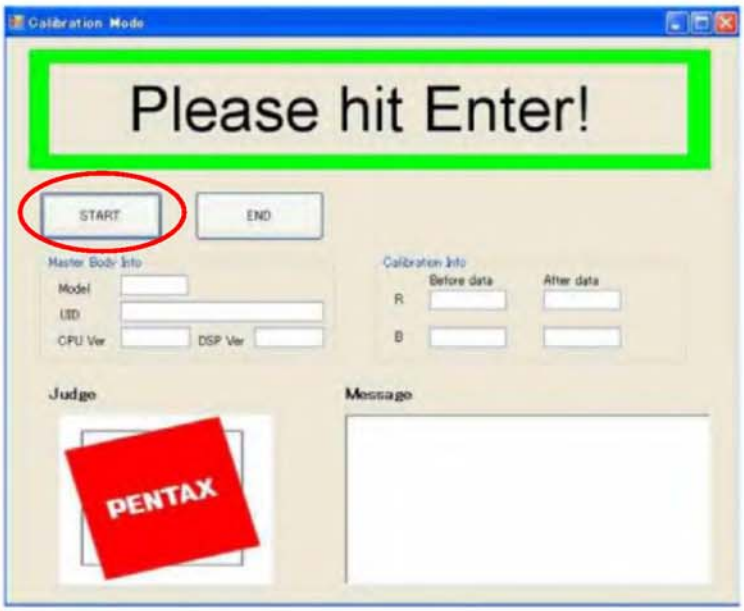


3) Inputted Lens ID number will be confirmed. If it is correct, click (Y).



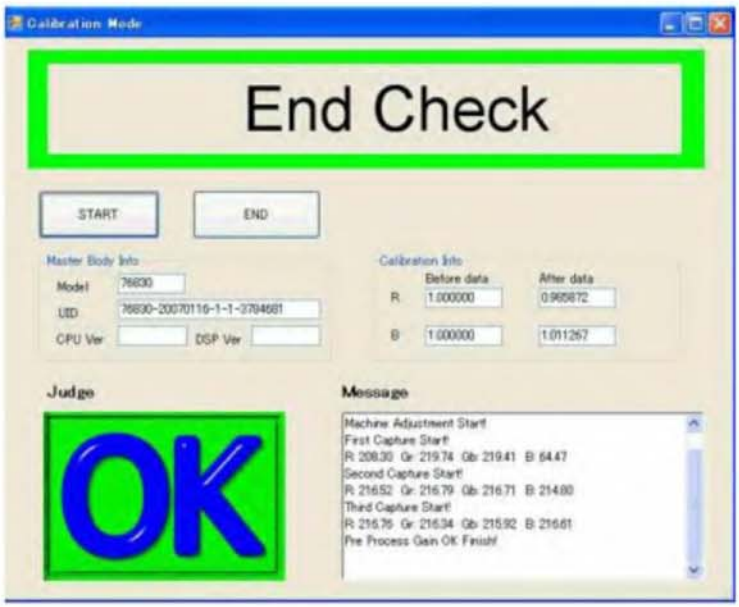
4) Adjusting software will start up then click "CAL" on upper left of screen.
Calibration mode will be displayed.

5) When start up calibration screen, set the diaphragm set ring F8 (KA-0-1A) and D20 or D20-01to the master body and set to light source. Set light sourceLV12 and click START.



6) Adjustment will be started automatically. Shutter will be released 15times (Approx: 35second)

7) When calibration is completed, below screen will be displayed and finished calibration.
(If NG is displayed, refer to error code list)



[Adjustment for M-Test]

Procedure is the same as *istD series

[Required equipment]

Adjusting software for 77050 (for digital), PC (Windows/XP with USB port equipped)

Light source (Example:LB-3300, Calibrated with A light color temperature:2856K±10 Brightness: LV11.00)

D20 or D20-01 and Diaphragm set ring F8 (KA-0-1A),

[Note] Use the same Lens ID number which is printed on adjustment CD-ROM

USB cable (I-USB17), AC adaptor (K-AC76), Dark curtain, Color temperature tester, LV checker

[Caution] When T100 or CCD is replaced, confirm the CCD ID No. and write down.

*Confirm that 77050 holder already copied to C drive from CD-ROM.

[Prepare]

* Attach Diaphragm set ring F8 (KA-0-1A) and D20 or D20-01
* Set the mode dial to [M]
* Set SR switch to OFF

[Contents for Adjustment]

[Initial Test] Initial test

Confirm FW version.

[Pre-Process] Pre process

From characteristic of CCD, each color of output is not even. This adjustment amplifies to become output of color evenly.

[ISO Base Gain] ISO base gain adjustment

This adjustment adjusts for proper CCD output when take a picture with proper shutter speed and diaphragm for brightness of subject.

[Bad pixel Adjust (Still)] CCD white pixel defect compensation adjustment

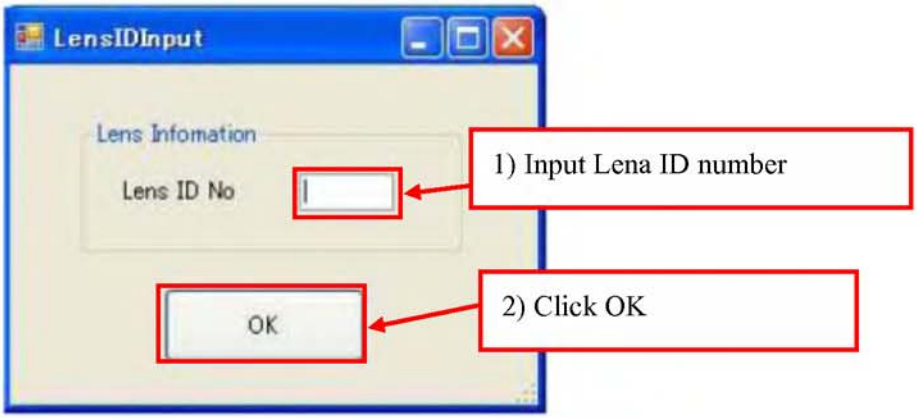
When darkness condition, if there is output CCD pixels, it calls white pixel defect.

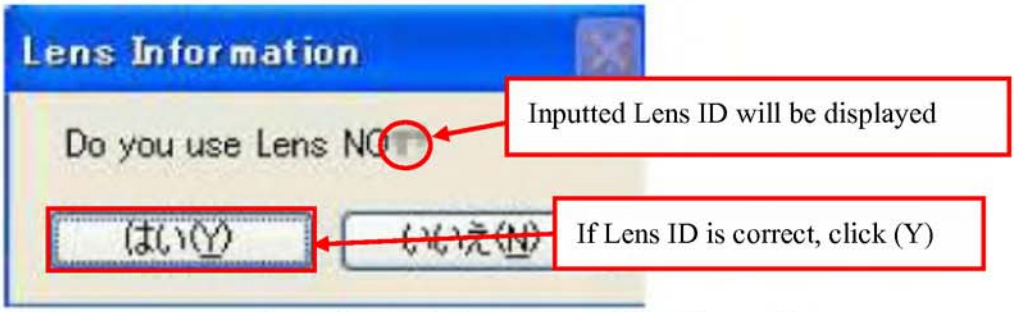
This adjustment detect CCD white pixel defect and compensate white pixel defect.

This adjustment can be adjusted separately with software in the WDC holder.

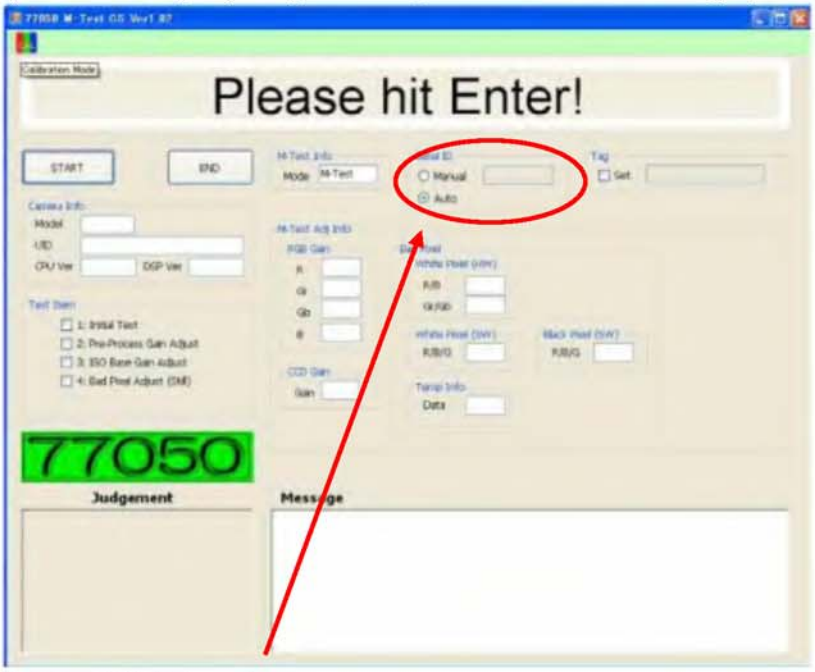
[Procedure for adjustment]

1) Connect the camera to the computer via USB cable.
2) Set D20 or D20-01 to F8 position.
3) Turn the power of the camera ON and confirm that the camera is recognized by computer.
4) Surely set the camera toward center of light window of light source (A light color temperature 2,850k±10, Brightness LV11) and then cover the whole camera by using a dark curtain
5) Start up adjustment software [77050_M-Test_Ver103.exe] in the 77050 holder.
6) Input Lens ID number and click OK button or press Enter key on key board





7) When start up adjusting software, below screen will be displayed.



8) Select [CCD Input]

When replacing T100 or CCD, you must select "Manual-ID"

Other case, select "Auto"

9) Execute the adjustment

[If selected "Manual-ID"]

Input CCD ID No (2 times)

Input ID No.

↓

Click "START button or

Press "Enter"key

↓

Input Lens ID No. again

↓

Click "OK"button or

Press "Enter" key to execute

adjustment →

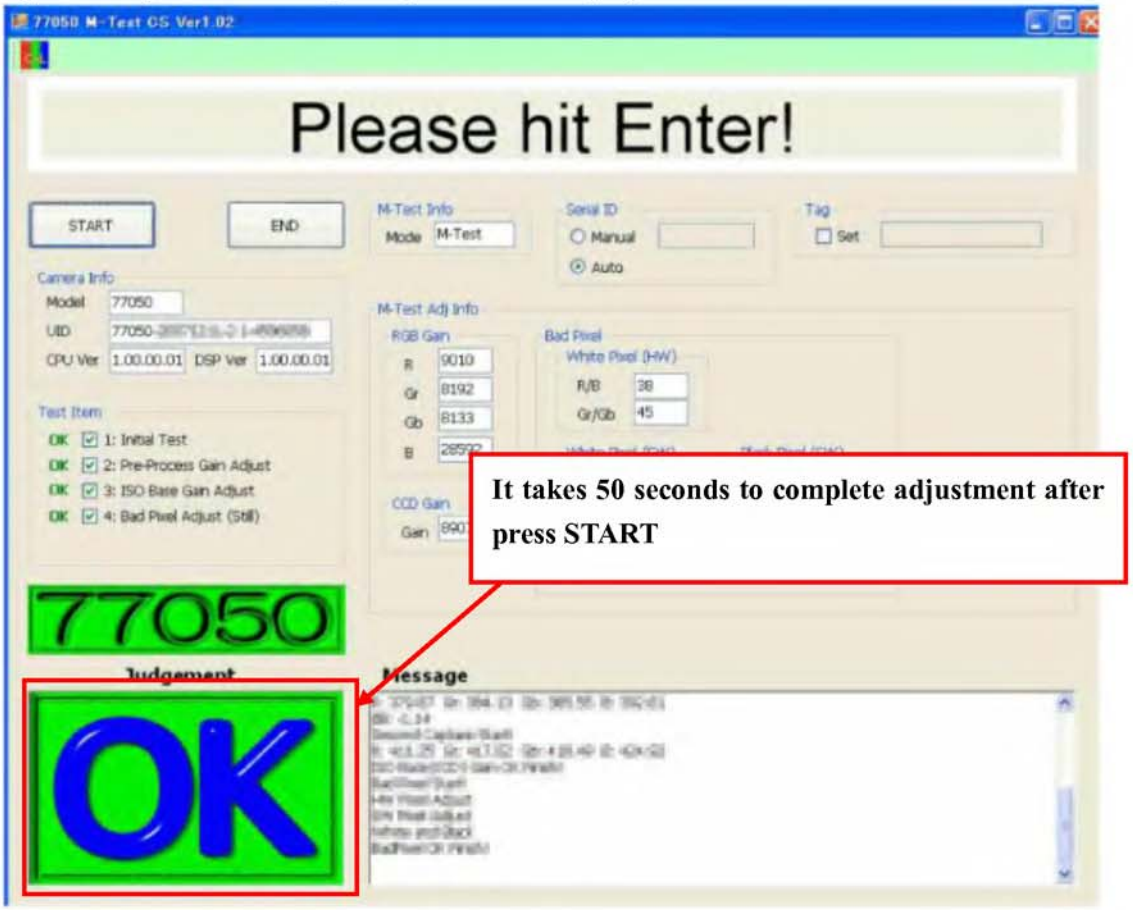
[If selected "auto"]

Click "START" button or press "Enter" key to execute adjustment.

If error is displayed at CCD ID section, select " Manual-ID" then input correct CCD ID No.

If still error is displayed even input correct ID number, please contact us to update the software.

10) When adjustment is completed, OK will be displayed.



[WDC adjustment]

[NOTE] CCD white pixel defect compensation item only can be adjustable by this procedure.

1) Connect the AC adaptor to the camera.
2) Connect the camera to the computer by the USB cable.
3) Turn the main switch ON, and then confirm that the camera is recognized as a [Removable Disk] under [My Computer].
4) Start the adjustment software (WDC.exe). **[NOTE]** Lens ID number is not necessary.
5) The following window will be displayed when the adjustment software is started.
6) Execute the adjustment by clicking "START" button in the dialog box or press Enter key on the keyboard.

7) When below screen is displayed, the adjustment is completed.

[Warranty Record]

[Required equipment] PC, AC adaptor, USB cable

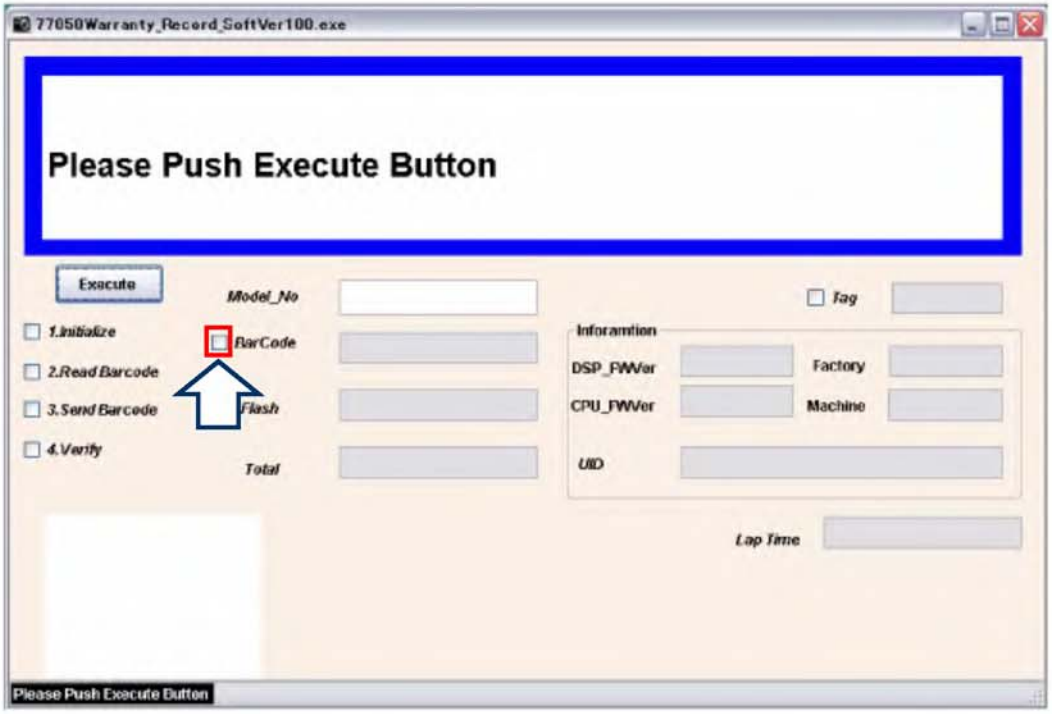
[Note] When replacing T100, you must execute this adjustment

1) Connect the AC adaptor to the camera.

2) Connect the camera to the computer via the USB cable.

3) Double click [Warranty Record] to start up software.

4) When below screen is displayed, check [BarCode] box.



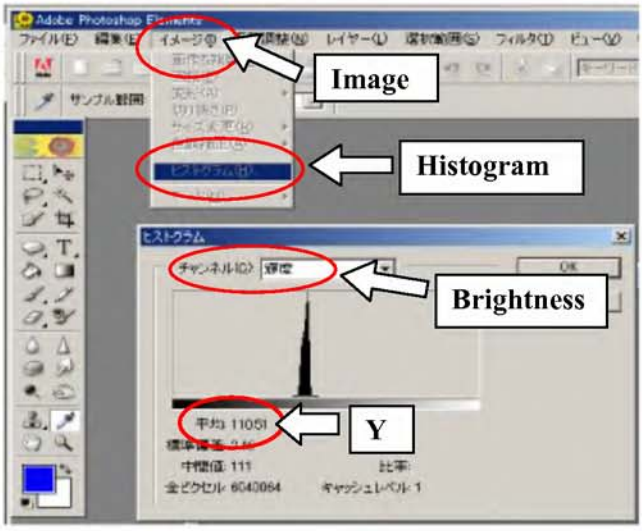
5) Input serial number then click [Execute].

6) When below screen is displayed, the adjustment is completed.

[Confirm exposure value]

[Required equipment] Computer , AC adaptor, USB cable (I-USB17), SD Card (for taking picture), FA50mm F1.4, Light source (LB-3300: color temperature must be calibrated 2850K°±10), Image viewing software (Adobe Photo shop, atc.)

1) Attach the lens (FA50mm) to the camera and set the aperture to the A position.
2) 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 : 10M (Default setting), Quality level : Best (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.
6) Open the recorded image by using the Image viewing software (Adobe Photo shop)
7) Select the histogram as shown in the figure below. (In the case of Adobe Photoshop EL⇒)
8) Confirm that the level of brightness must not vary remarkably from the standard (Y=110).
   [Caution] A standard applies only the bottom of above-mentioned setting condition.



■**K200D Standard of Exposure value**

P, Tv, Av–AE mode Light value / Lens	Tolerance (EV)	
	AE Master Lens (P)	F・FA 50mm F1.4 (∞)
LV6～14	+0.25～−1.00	+0.70～−0.50
LV15 (Multi-segment)	+0.75～−0.50	+1.20～±0.00

■**K200D, Correlation table of EV with Y:**

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

[Note] The standard is applied only when the camera is set to the condition as mentioned above.

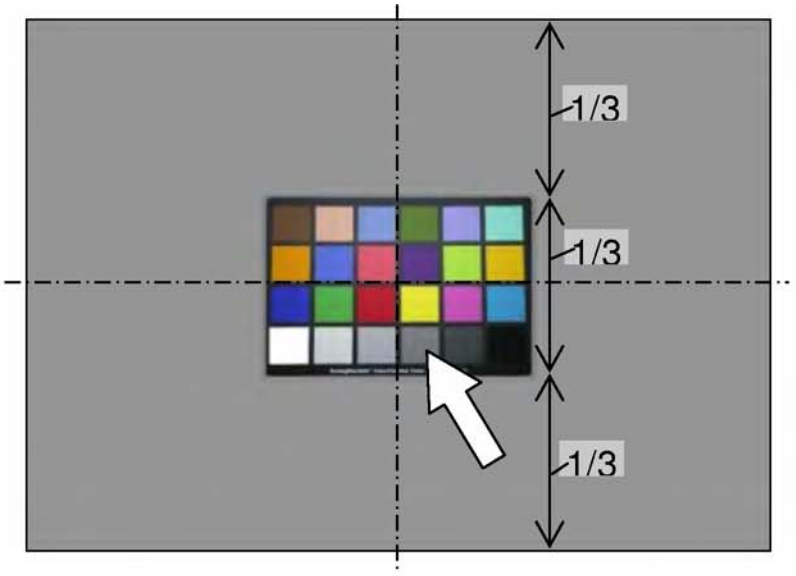
[Confirmation of White Balance]

*The checking method is the same as *istD series.

[Required equipment] Computer (for Digital adjustment), AC adaptor, USB cable (I-USB17), SD card (for taking picture), FA50mm F1.4, A light (2856 K°), Color checker (Macbeth™ Chart or equivalent), Fluorescent lamp (White 4244K°), Fluorescent lamp (Neutral white 5111K°), 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.

1) Attach the lens to the camera and insert the SD card to the camera.
2) Set the camera as follows.
   Image: Natural, Capture mode: AV (Aperture-priority) mode, Metering Method: Multi-Segment Metering, Sensitivity: ISO200, Focus mode SW: AF.S, Recorded pixels: 10M (Default setting), Quality Level: Best (Default setting), Color Saturation: Normal, Image Sharpness: Normal, Contrast: Normal, Color Space: sRGB (Default setting)
3) Put the Color checker on the Gray chart as shown in the figure below.
4) Light up the Color checker by the A light.
5) Set the WB (White Balance) mode to “Tungsten Light”.
6) 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.
7) Take 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.
8) Take a picture of them similarly by setting the WB to “Fluorescent Light W white” while using the Fluorescent lamp (white 4244K°) for lighting.
9) Take a picture of them similarly by setting the WB to “AWB” while using the Fluorescent lamp (Neutral white 5111K°) for lighting.
10) View 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.



[Confirmation of AF focus by taking a picture]

Confirmation is the same as *istD series.

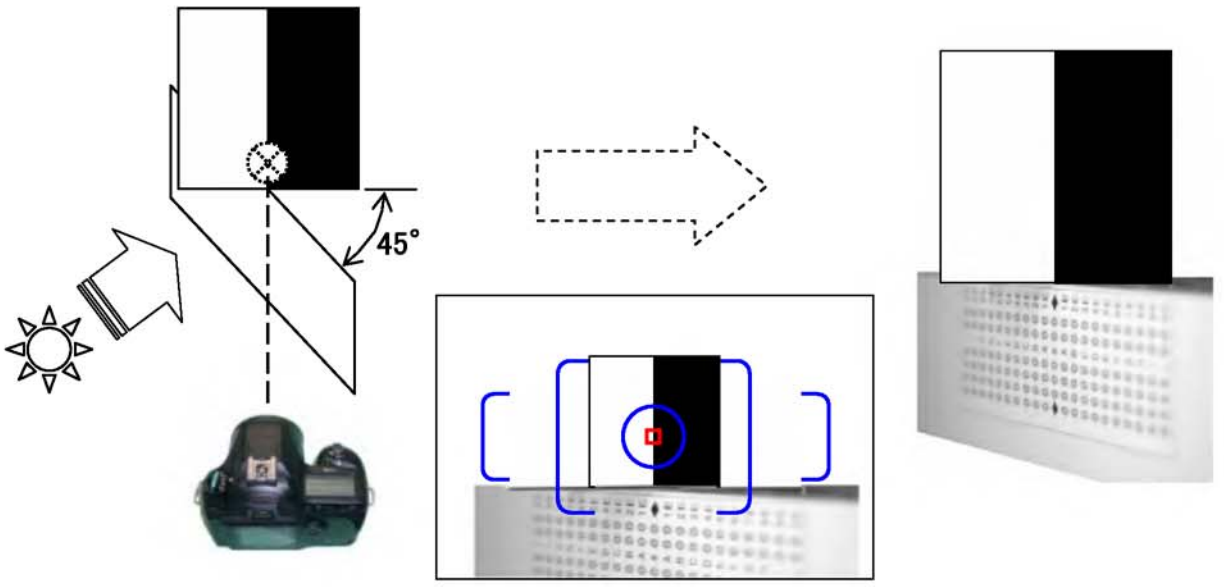
This section describes the method of checking the AF focus for your reference. It will enable you to do the overall confirmation of the position of the AF focus, and also will be useful in the service.

[Required equipment] Computer, AC adaptor, USB cable, SD card (for taking picture), FA50mm F1.4, AF chart for confirmation, Scale for confirmation (attached the end of manual),

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)

1) Attach the lens (FA 50mm) to the camera, and set the lens aperture to A position.
2) Set the camera as follows.
   Capture mode: AV (Aperture-priority) mode, Focus mode SW: AF.S, Focus point: Spot, White Balance: AWB, Recorded pixels: 10M (Default setting), Quality Level: Best, Color Saturation: Normal, Image Sharpness: Normal, Contrast: Normal
3) Set the aperture to open position by Av dial of camera.
4) Set the chart and scale as follows. Lighten the chart so that the white portion of chart becomes EV12 or more. If necessary, settle the camera on a tripod.
5) Set the camera so that the distance from the chart to camera becomes 1m.
6) Turn the distance ring of the lens to infinity (∞) by depressing the shutter button halfway while covering the front of lens with the palm.

7) Take two pictures of chart while aiming the focus point of center (for Spot) to the border line between white and black chart.
8) The 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.
9) Display the images on the computer with image viewing software.
10) Confirm 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 CCD 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 (0-A3, A4, A5,A6)

If camera is OK, There is possibility for trouble with the lens.

[Confirmation of SR mechanism]

It is the same as 76700 (K100D)

[Required equipment] Personal computer, AC adaptor, USB cable, FA50mm lens, SD card (For test), Image viewing software (PENTAX PHTO Browser™, ACDSee™, Adobe Photoshop)

1) Attach FA50mm lens to the camera and set aperture ring at A position.
2) Set the camera as follow
   Exposure Tv mode, AF focus mode, AF measurement --- Center, AF.S mode
   Drive mode --- Single, AWB (Fn menu), Recording size --- 10M ***
3) Set Tv15 (1/15sec) --- It is equal to approx 2.5 step
4) The distance of the camera is set from subject to 2m.
5) Set the SR switch to OFF and capture 10 images. (Camera is set on Horizontal position)
6) Set the SR switch to ON and capture 10 images. (Camera is set on Horizontal position)

[Caution] Release the shutter about 1 second later after hand shake indication is ON in the view finder

1) Open the image with application soft.
2) Compare the images (SR ON/ SR OFF) and confirm that whether SR function is effective.

[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
2) Converts above shutter speed to two step down
   1/300 → 1/150 → 1/75 **It is equal to approx 1/80**
3) Set Tv 80 (or TV 90 and 1/2 EV step)
4) Follow the procedure of 27－6, 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.

[CCD Cleaning]

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

[Required equipment]

Computer, AC adaptor, USB cable, AF 50mm F1.4 (or F1.7), Light box, Cleaning paper for CCD (Clean wipe-P), solvent for cleaning (EE6310 or C600), Tweezers (recommend to use flat tip), SD card for test, Image viewing software (e.g. Photo shop, ACDsee, etc.)

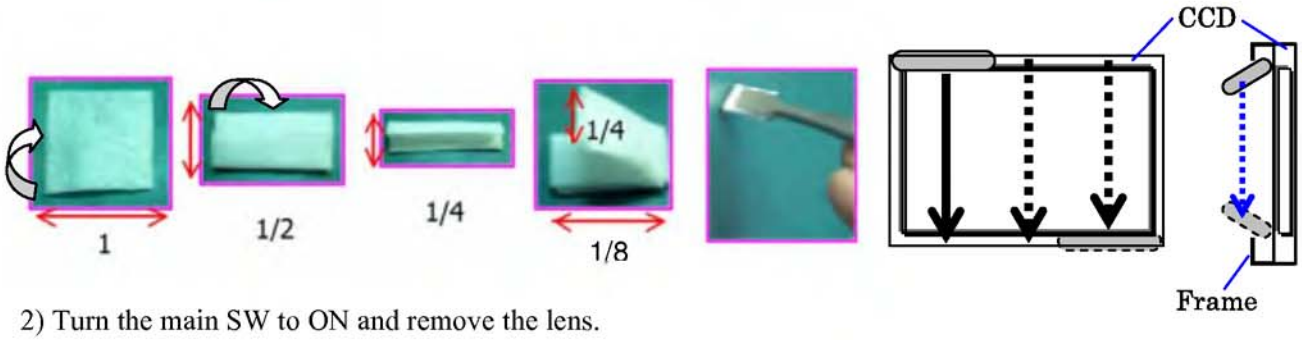
[Confirm]

1) Attach the FA50mm lens to the camera and set the lens aperture to A position.
2) Set the camera as follows.
   Capture mode: AV (Aperture-priority) mode and Set AV 22 (FNo.22), ISO speed: 200, Focus mode SW : MF, Exposure compensation:+1/2EV, Recorded pixels: 10M (Default setting), Quality Level: Best.
3) Turn the distance ring of the lens to infinity (∞).
4) Take the pictures of the light box from on 3cm.
5) Display 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 CCD. (Disassembly and cleaning or replace T600)

[Cleaning method of dust]

[Caution] 1) Do not wipe with strong force otherwise it will be affect performance.
2) For safety, use two type of power source for cleaning. (AC adapter and full capacity of battery)
3) Do not use a brush-less blower and a spray type blower to clean the CCD because there is a possibility that dust enters into the inside of CCD.

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



2) Turn the main SW to ON and remove the lens.
3) Set [Sensor Cleaning] on the Main menu to ON.
4) Select [Mirror up] on the [Sensor Cleaning] screen by the four-way controller.
5) Press the OK button. The mirror is locked in the up position.
6) Dip Clean wipe-P: 95901 A15 in the Solvent.
7) Wipe 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.
8) Turn 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.

PENTAX

Service Manual

ENGLISH

<Assembly and Disassembly>

PENTAX K200D

Product No.77050 K200D

HOYA Corporation
PENTAX Imaging Systems Division
Development Department
Service Engineering Group
04.08

[TECHNICAL INFORMATION]

[Battery consumption current]

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

Lens --- ○ : With　　× : Without　　SDM : Lens with a supersonic motor

SD card---- ○ : With　　× : Without

*5, 6 and 7 are peak value averages

No.	Condition of camera	Lens	SD card	battery		AC power supply
				5.5V	6.5V	6.5V
1	Main SW/OFF	○	×	50uA	50uA	10mA
			○	50uA	50uA	10mA
		×	×	50uA	50uA	10mA
2	After auto power OFF	○	×	250uA	250uA	10mA
		×	×	250uA	250uA	10mA
3	Main SW/ON（Meter OFF）	○	×	180mA	180mA	240mA
		○	○	180mA	180mA	240mA
		×	×	180mA	180mA	240mA
4	Main SW/ON（Meter ON）	○	×	370mA	350mA	420mA
			○	370mA	350mA	420mA
5	Charging Flash（Meter ON） *	○	×	2100mA	2200mA	2200mA
6	Driving AF motor *	○	×	2800mA	2800mA	2800mA
		SDM		1200mA	1200mA	1200mA
7	Releasing shutter *	○	×	3000mA	3200mA	3200mA
			○	3000mA	3200mA	3200mA
8	Recording image after release the shutter	○	○	350mA	380mA	350mA
9	Bulb	○	×	1200mA	1200mA	1200mA
			○	1200mA	1200mA	1200mA
10	Displaying menu (LCD)	○	×	500mA	450mA	450mA
11	Displaying menu (Video output)	○	×	400mA	350mA	350mA
12	Displaying playback image	○	○	500mA	450mA	450mA
13	Recording playback image in the card	○	○	500mA	450mA	450mA
14	Stand by for USB communication	○	○	300mA	300mA	300mA
15	Reading playback image in the card with USB communication	○	○	350mA	300mA	300mA

[Table of Error Code]

K200D_SR_Operation_Adjustment (SR adjustment)

Items	Error code	Contents
Coil direction check	11 – 0	USB communication error
	11 – 1	Coil reverse
Hall gain adjustment	12 – 0	USB communication error
	12 – 1	Gain over limit [T100]
	12 – 2	Gain_X over limit [C0 block]
	12 – 3	Gain_YL over limit [C0 block]
	12 – 4	Gain_YR over limit [C0 block] :
Movement range adjustment	13 – 0	USB communication error
	13 – 1	Range is too narrow
	13 – 2	Center is over limit
Gyro offset adjustment	14 – 0	Communication Error
	14 – 1	Offset value is over limit
	14 – 2	Gyro is unstable

[Error code for SR adjustment]

77050SR_GainForCS.exe

(aa)		(bb)		(xx)	
00	initialization	01	Read configuration file	01	Can't found setting file.
		02	Initialize USB	01	Can't Power on
				02, 03	Command error (Communication error)
				04	Can't use this program (This program for another model)
		03	Initial setting	xx	Command error (Communication error)
01	Initial capture check (X axis)	01	Initial setting	01-06	Command error (Communication error)
				07	SW error (Manual mode)
				08-10	Command error (Communication error)
				11	SW error (MF mode)
				12	Command error (Communication error)
				13	SW error (SR SW)
				14	Command error (Communication error)
		02	Config setting	xx	Command error (Communication error)
		03	Set initial data	xx	Command error (Communication error)
		04	Read initial data	01	Command error (Communication error)
		05	Set ram data for SR	xx	Command error (Communication error)
		06	Camera release	xx	Command error (Communication error)
		07	Get capture data	01, 02	Command error (Communication error)
				03	Can't display capture image
		08	Display capture data	01	Initial image is out of spec (X axis)
				02	Check image is out of spec (X axis)
				03	Initial image is out of spec (Y axis)
				04	Check image is out of spec (Y axis)
02	Sensitivity Adjustment (Gyro X)	01	Set initial data	xx	Command error (Communication error)
		02	Get gyro position data (X data)	xx	Command error (Communication error)
		03	Calculate	01	Gyro wave data is something wrong (X data)
				02	Gyro wave data is something wrong (Y data)
		04	Write gyro sensitivity data (X axis)	xx	Command error (Communication error)
03	Capture check (X axis)	"bb - xx" is same as a table of "01(aa) Initial capture check (X axis)".			
04	Prepare to remove USB	01	USB clear up	xx	Command error (Communication error)
05	initialization	02	Initialize USB	01	Can't Power on
				02, 03	Command error (Communication error)
				04	Can't use this program (This program for another model)
		03	Initial setting	xx	Command error (Communication error)
06	Initial capture check (Y axis)	"bb - xx" is same as a table of "01(aa) Initial capture check (X axis)".			
07	Sensitivity Adjustment (Gyro Y)	01	Set initial data	xx	Command error (Communication error)
		02	Get gyro position data (X data)	xx	Command error (Communication error)
		03	Calculate	01	Gyro wave data is something wrong (X data)
				02	Gyro wave data is something wrong (Y data)
		04	Write gyro sensitivity data (X axis)	xx	Command error (Communication error)
08	Capture check (Y axis)	"bb - xx" is same as a table of "01(aa) Initial capture check (X axis)".			
09	Prepare to remove USB	01	USB clear up	xx	Command error (Communication error)

[Warranty record]

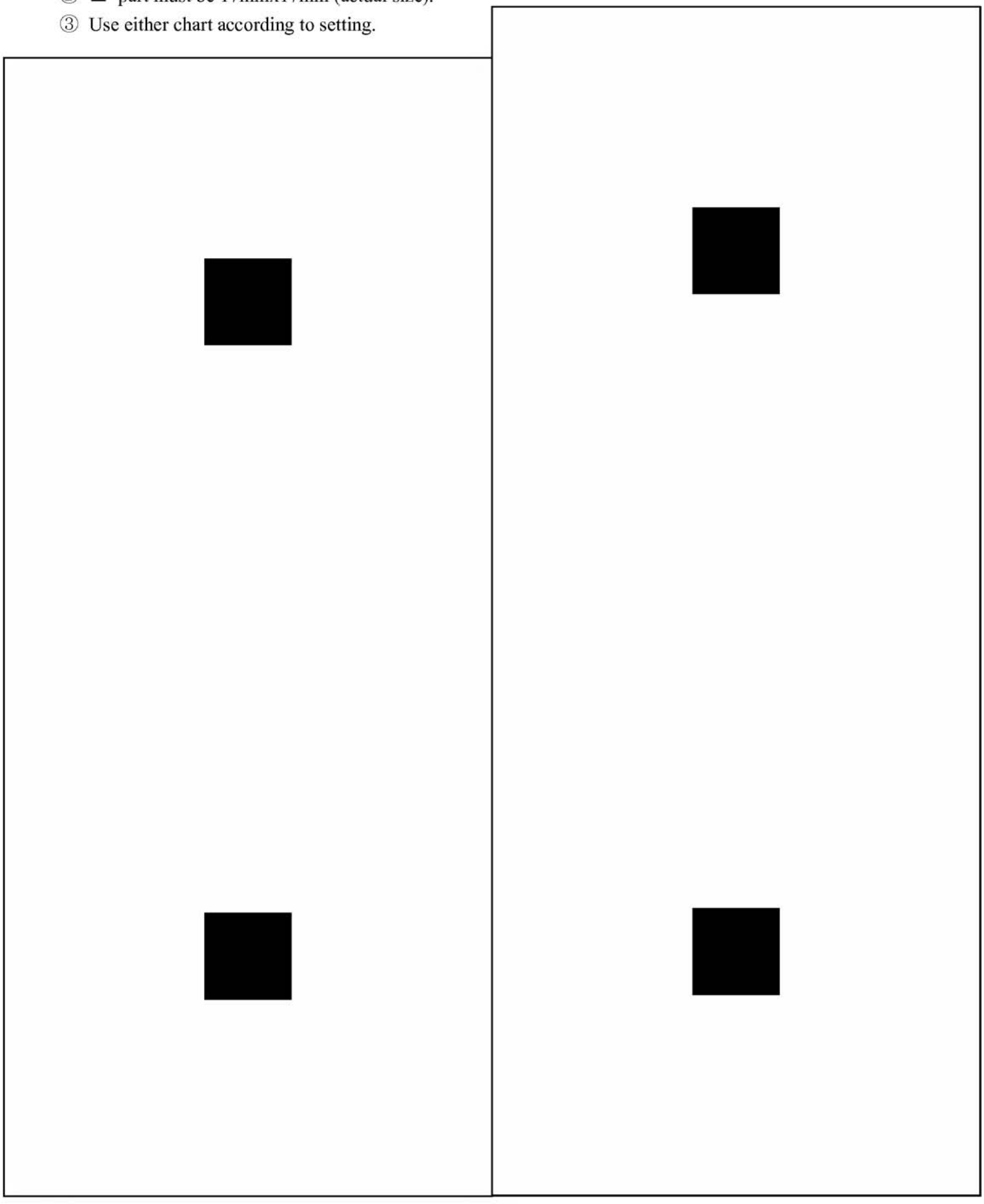
Status	Error Message	Cause
0	SUCCESS	
1	Comport Error	
2	Camera Communication Error	
3	Barcode read Communication Error	
4	Barcode Read Error	
5	Barcode Date Error	
6	UID Error	
7	Verify Error	
8	Time Out Error	
9	Remove Drive Error	
10	Write Date Error	
11	Read Date Error	
12	Model Error	Model number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

[Chart for SR Gain adjustment] The same chart with 76700/76830

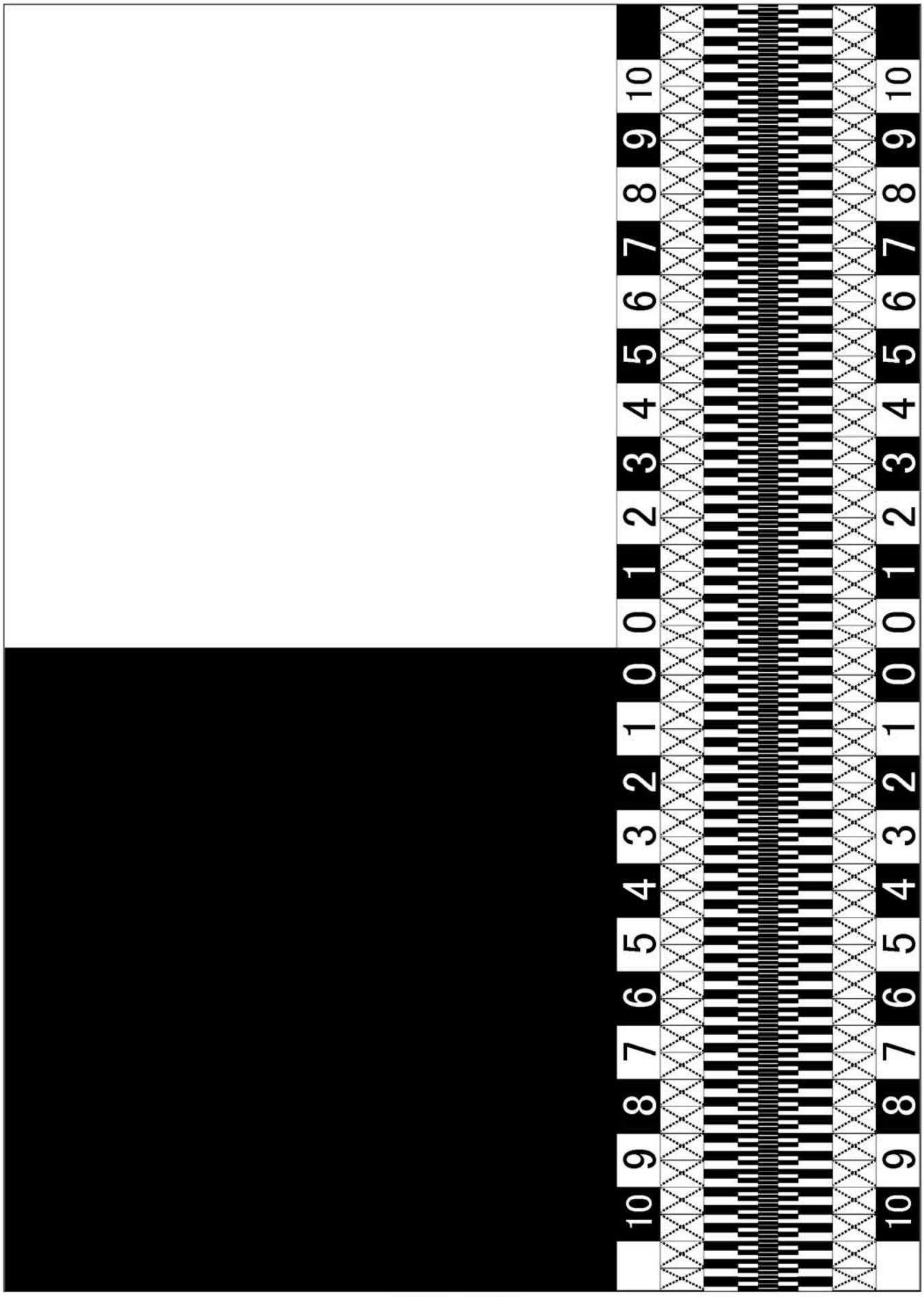
① When print the chart, set the printer to high-quality and use high- quality paper or glossy paper.

② ■ part must be 17mmx17mm (actual size).

③ Use either chart according to setting.



[AF confirmation chart and scale]



<DISASSEMBLY AND ASSEMBLY PROCEDURES>

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*Tools and Testers are listed on "Chapter of adjustment". Refer to page2-3.

Disassembly procedure (Assembly)

[Notice for Disassembly and assembly]

*In reverse order for assembly procedure

*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 to 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.

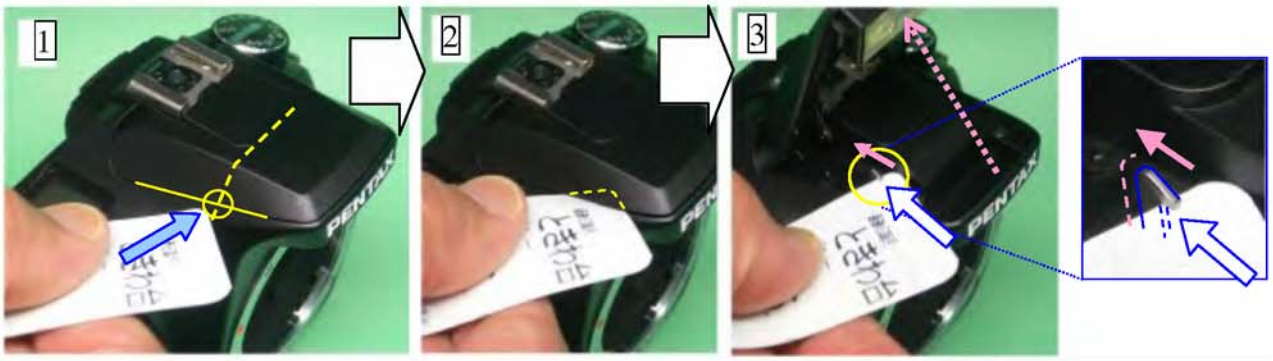
The temperature for tip of soldering iron must set between 340° ~ 360° for lead free solder.

A301 (Top cover)

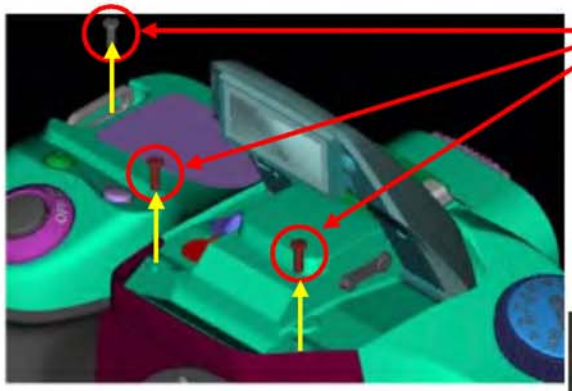
Pop-up the built-in flash

If camera does not pop-up the flash: use flash pop-up tool as shown figure below.

Procedure for pop-up



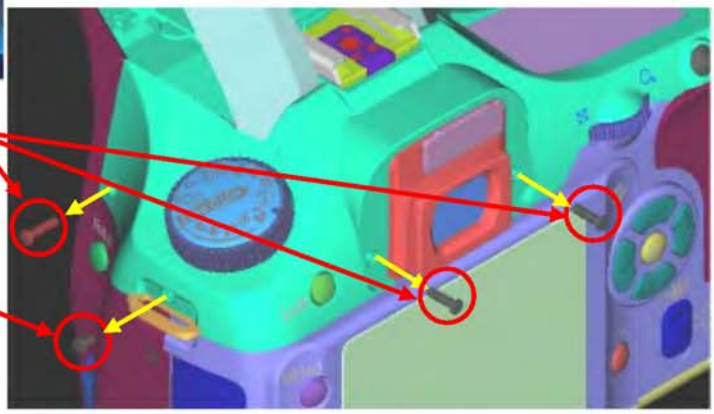
(1) Insert a thin card to gap between flash and top cover.
(2)-(3) Slide the card as shown figure and release the lock lever of flash.

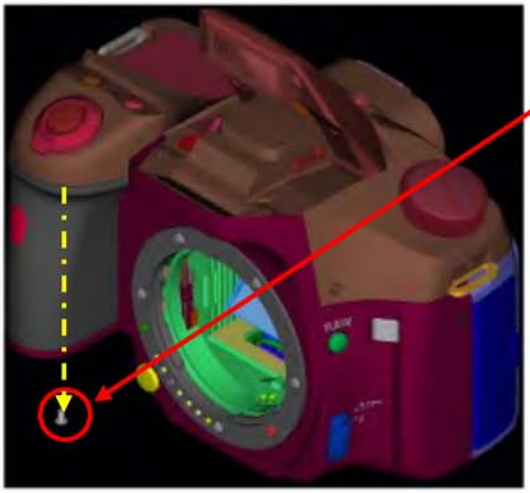


A189 x3

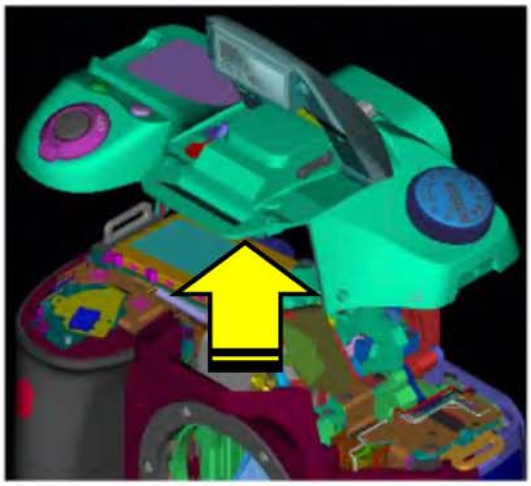
A191 x3

U1





Open the battery cover and unscrew CNL-D1.7 x 3.0

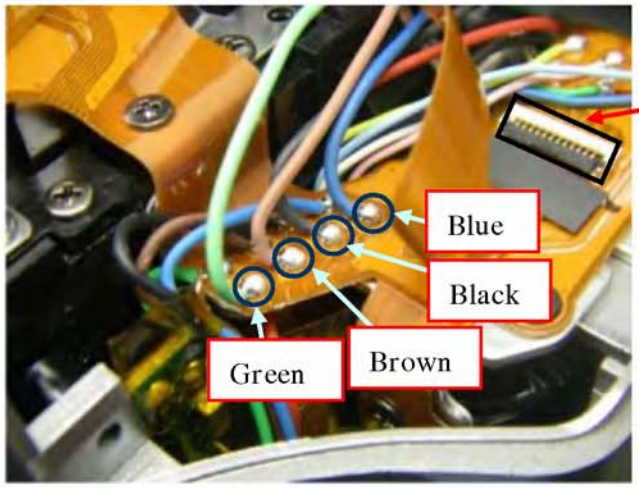


Discharge the main capacitor

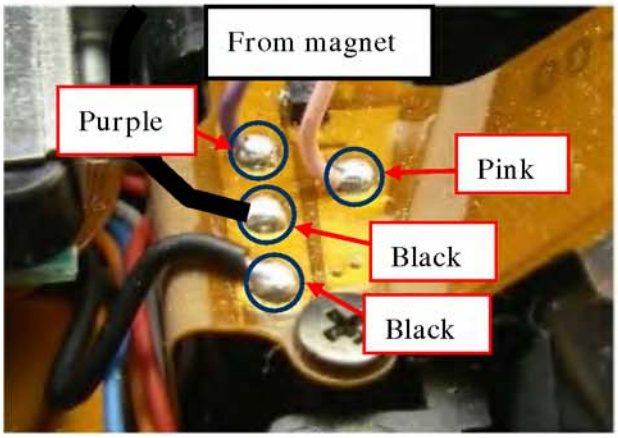
Lift up the A301 then discharge the main capacitor

Land of white lead wire and land of brown lead wire

Un-solder read wires

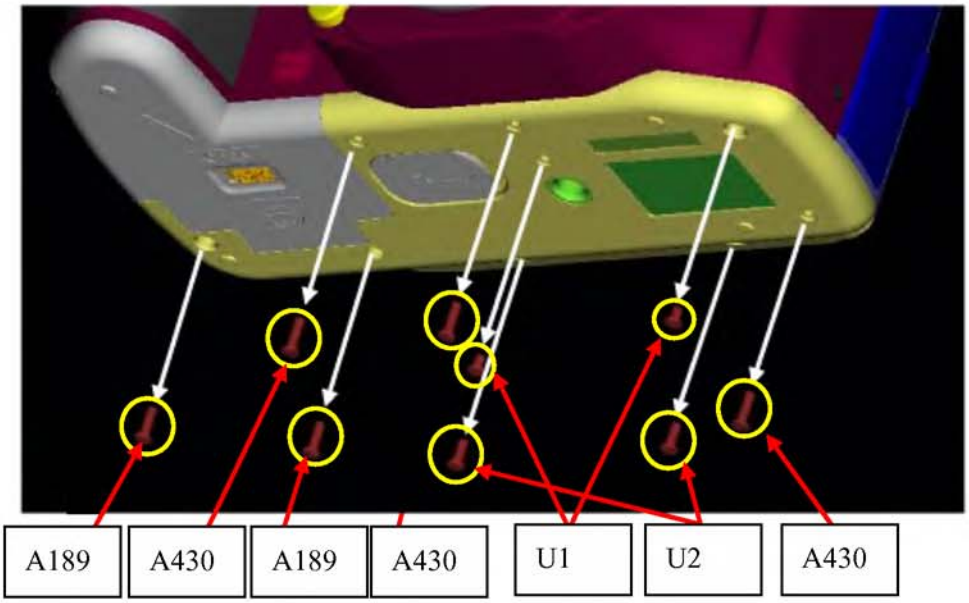


Disconnect the flex of A301 from connector



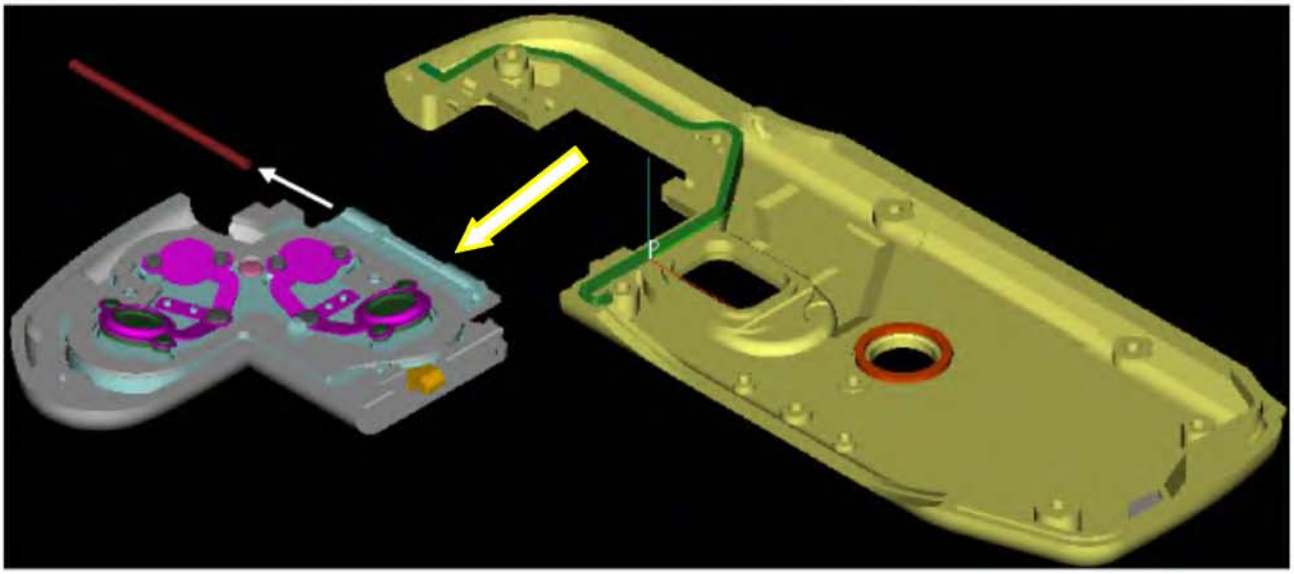
A401 (Bottom cover)

Unscrew 9 screws for A401

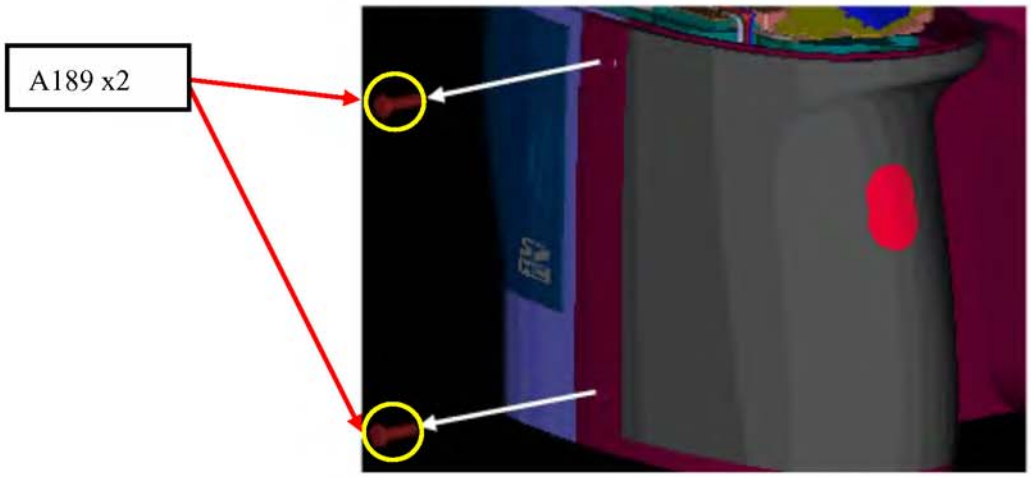


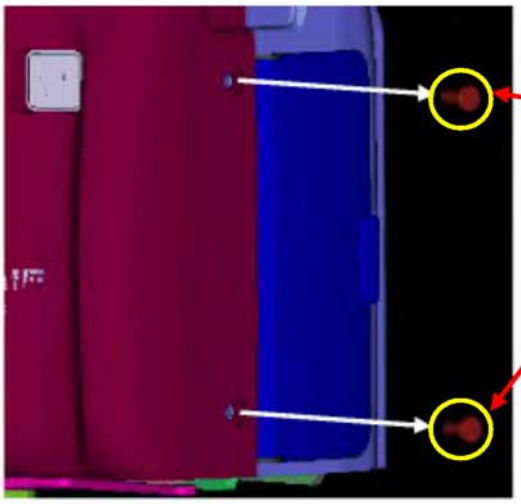
A412 (Battery cover)

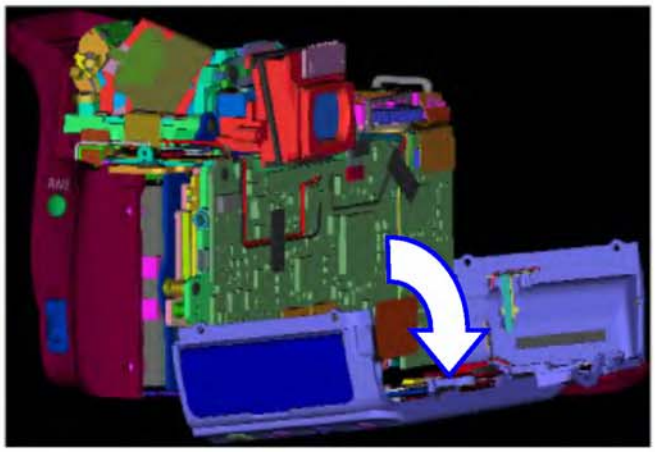
Remove A412 then remove A419



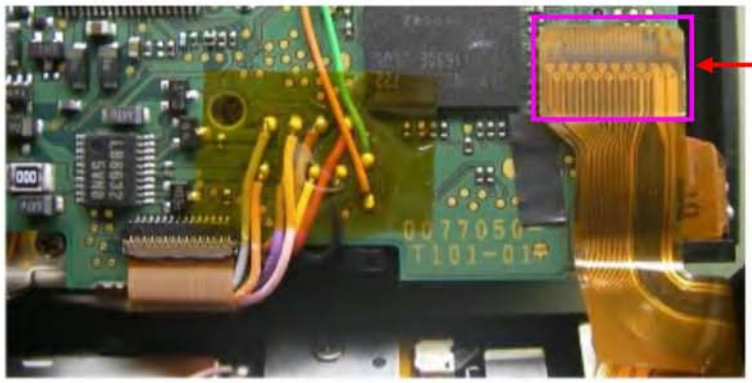
A201 (Back cover)

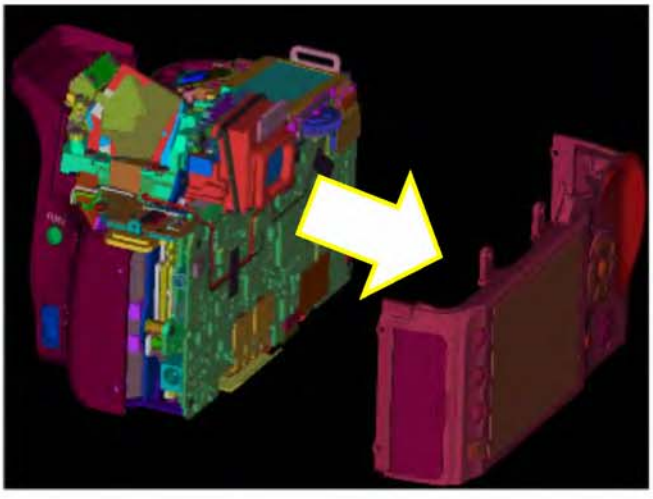


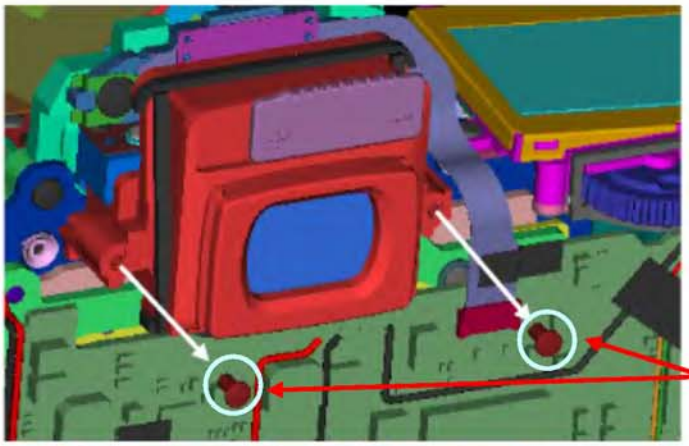




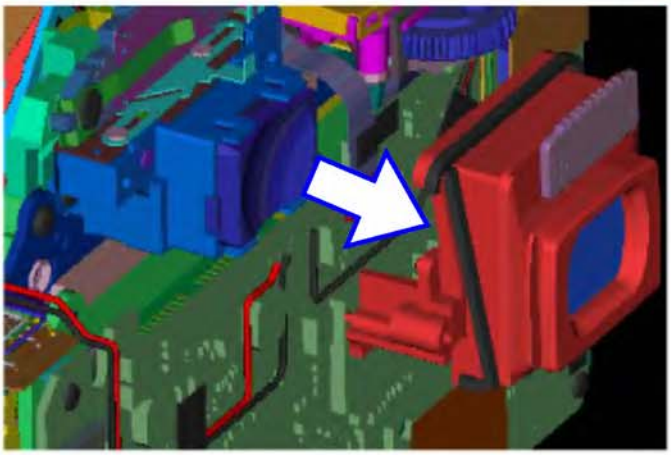
Open A201 downward as shown figure







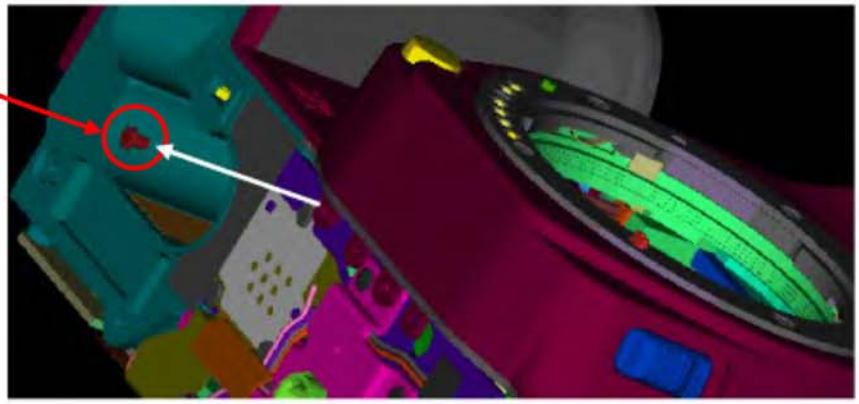
CNL-D 1.7 x 3.0 x2

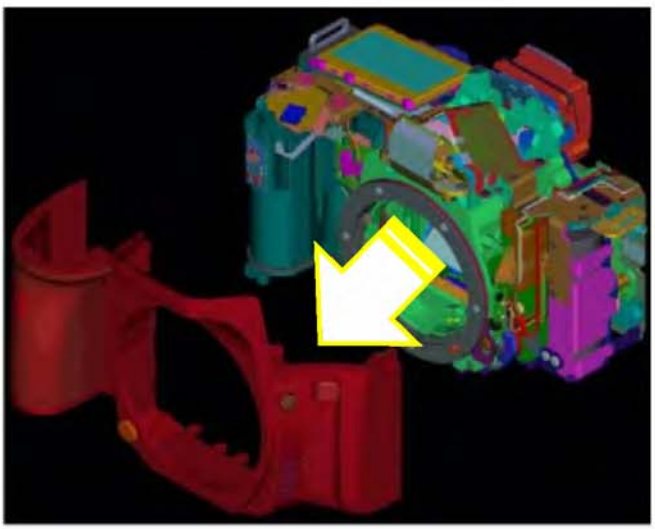


M31

A150 (Front cover)

CNL-D 1.7x2.5



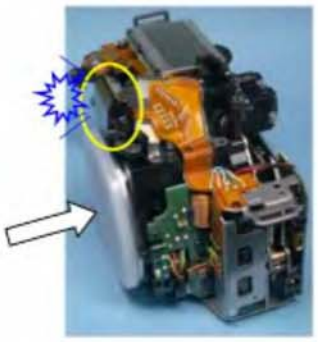


A150

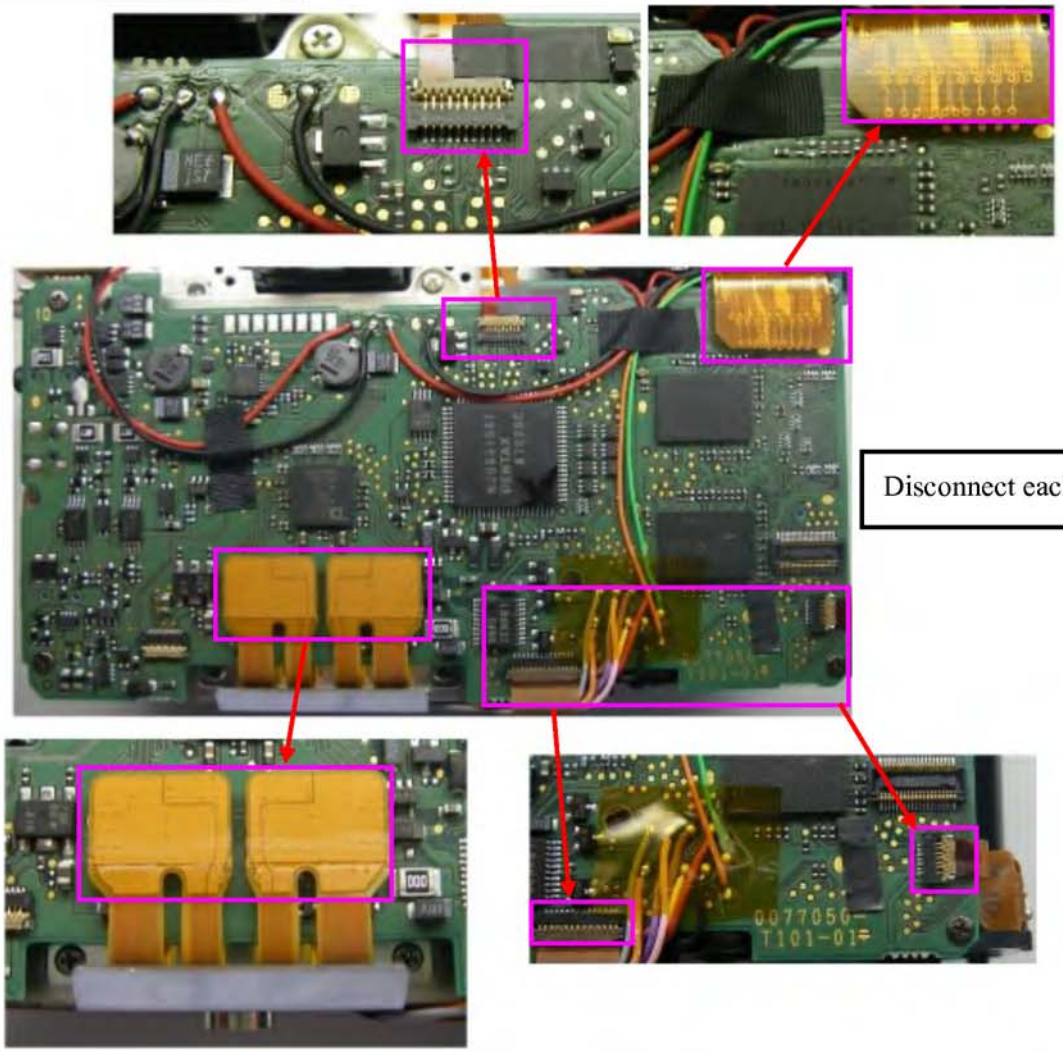
[Caution]

After removing A150, put the mount cover to protect M51

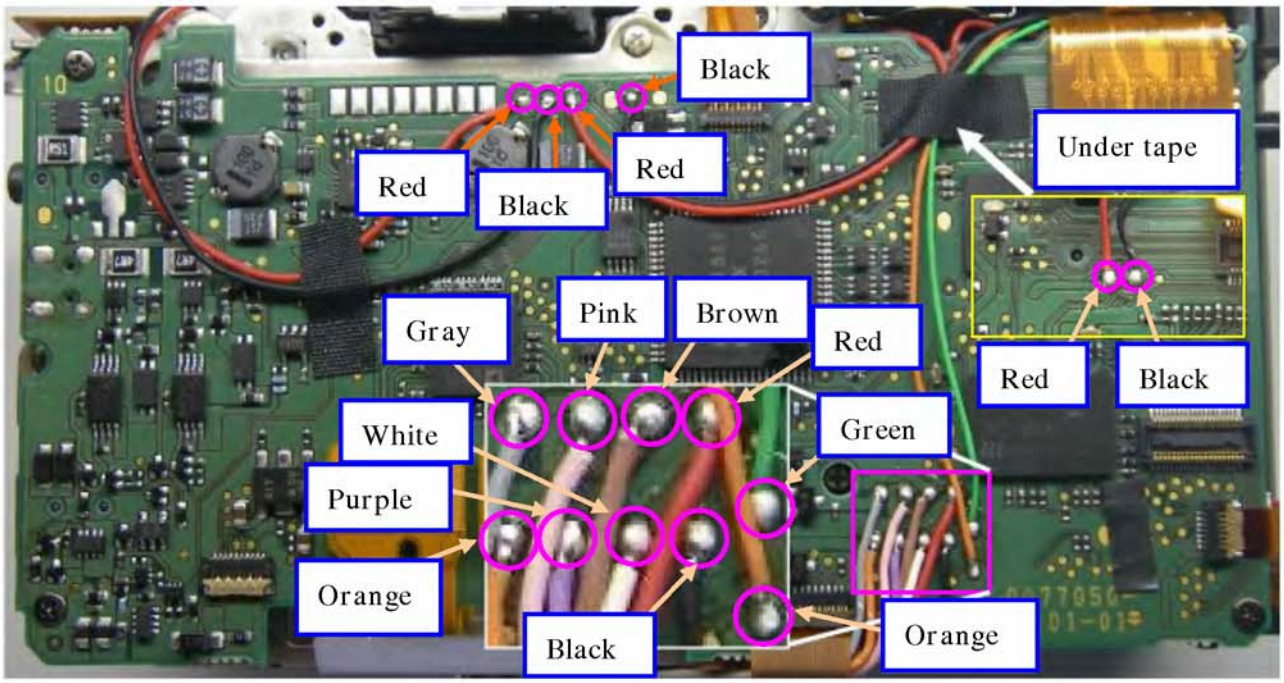
(To prevent damage on M51)

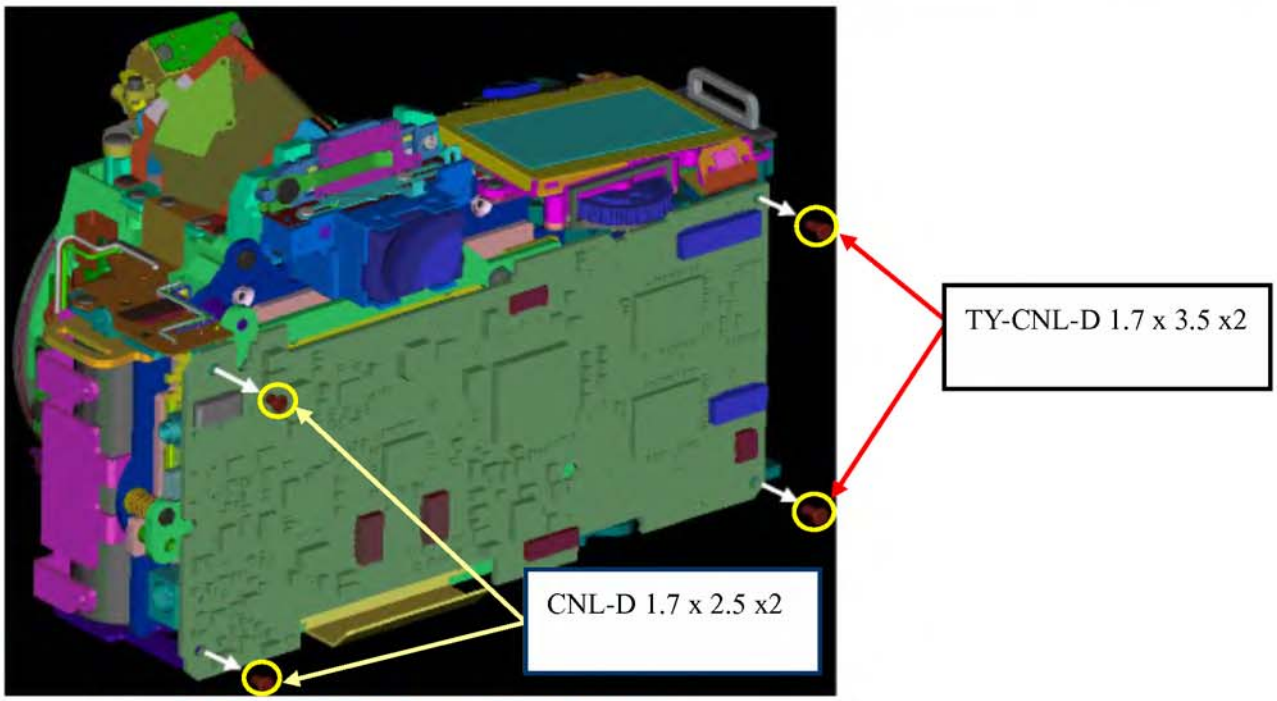


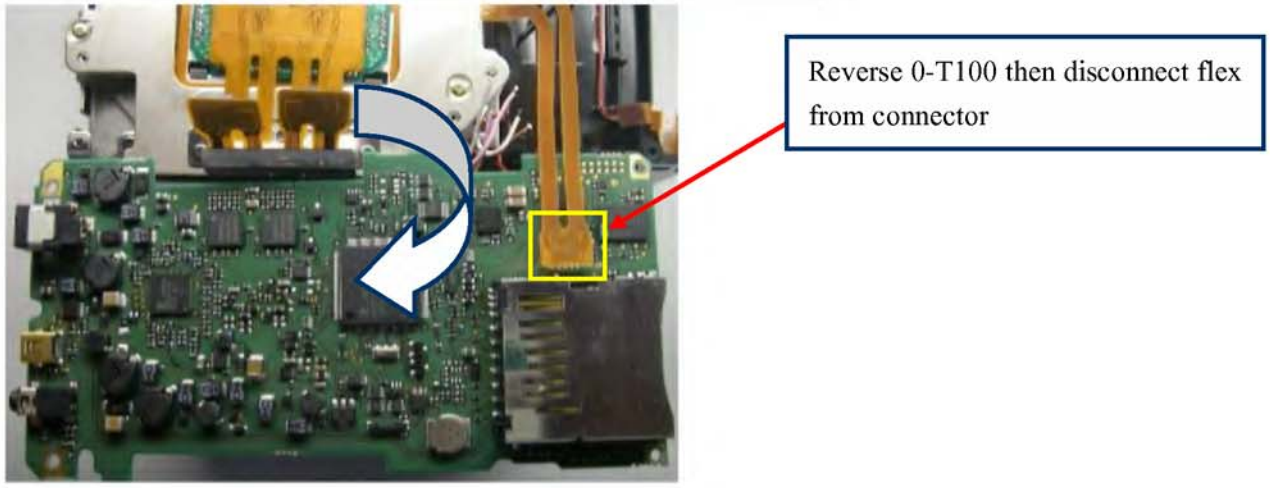
0-T100 (Main P.C.board)



Un-solder lead wires



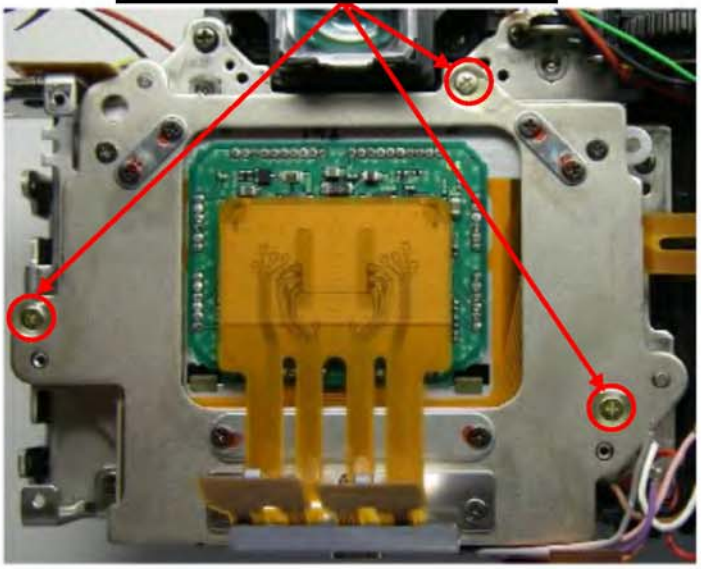




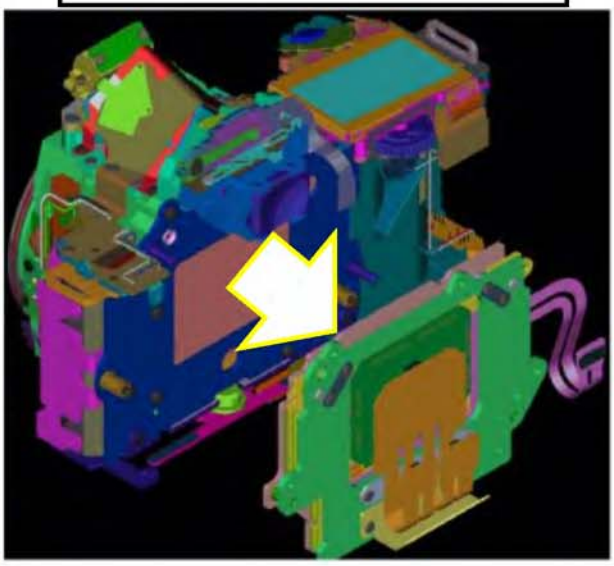
0-T100

0-C000 (CCD block assy)

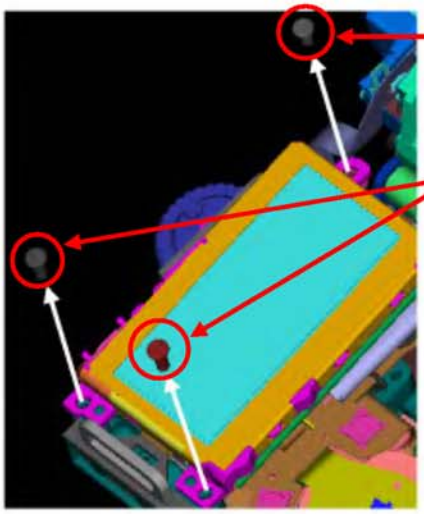
Clean super X then unscrew three screws



Remove 0-C000 direction of arrow as shown figure below

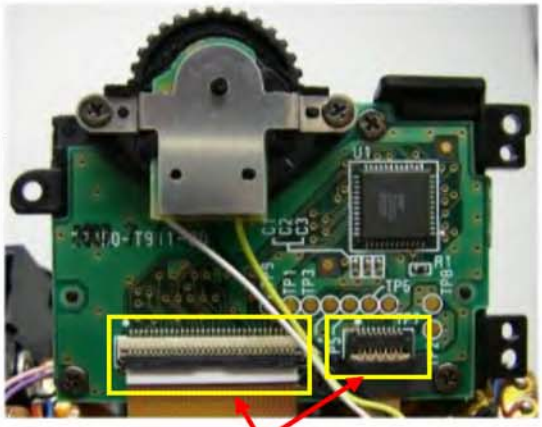


O202 (LCD flame)

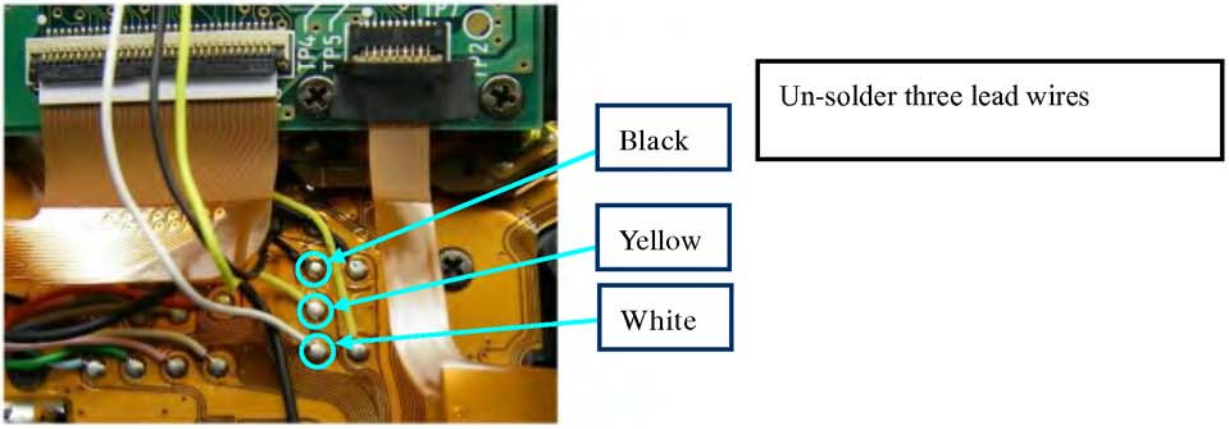


CNL-D1.7 x 3.5

TY-CNL-D1.7x4.0 x2

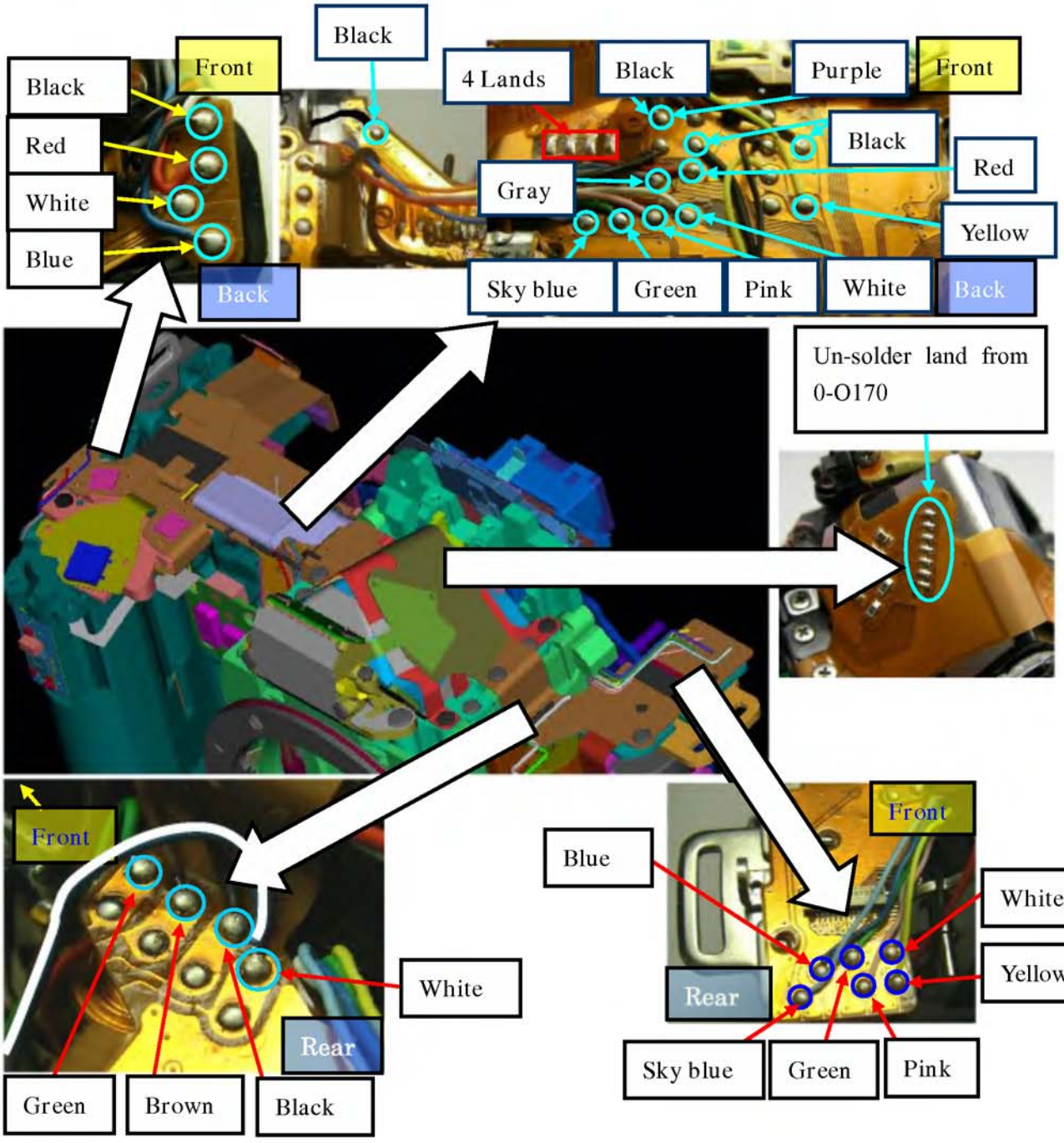


Reveres 0-O202 then disconnect two connectors

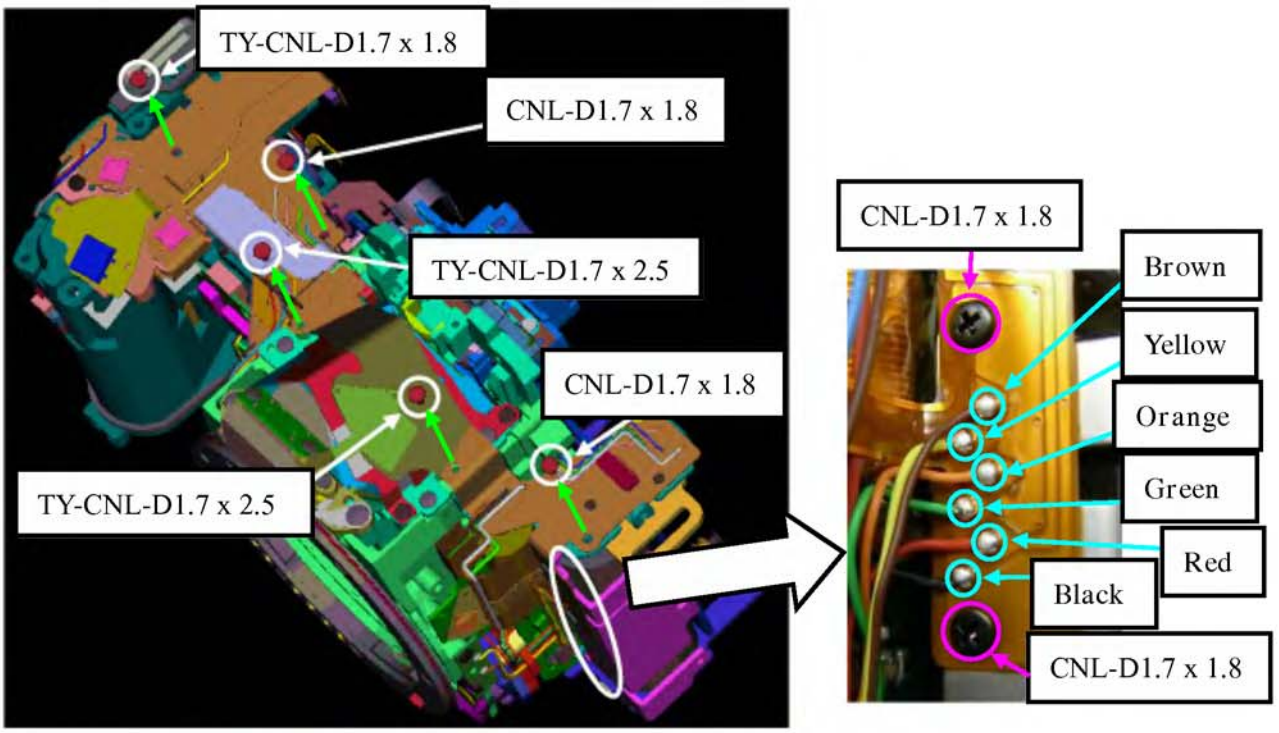


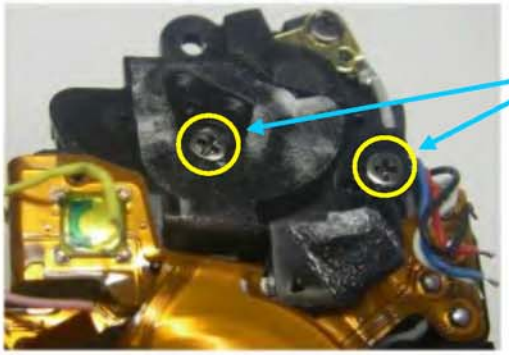
0-T700 (Upper P.C. board A)

Un-solder land and lead wires on 0-T700

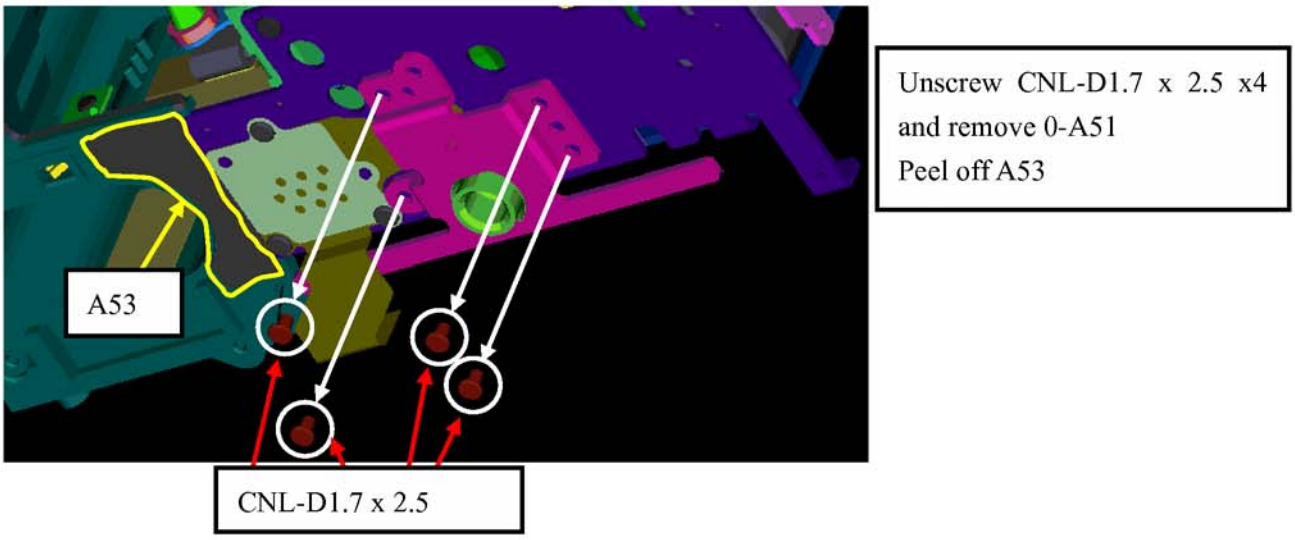


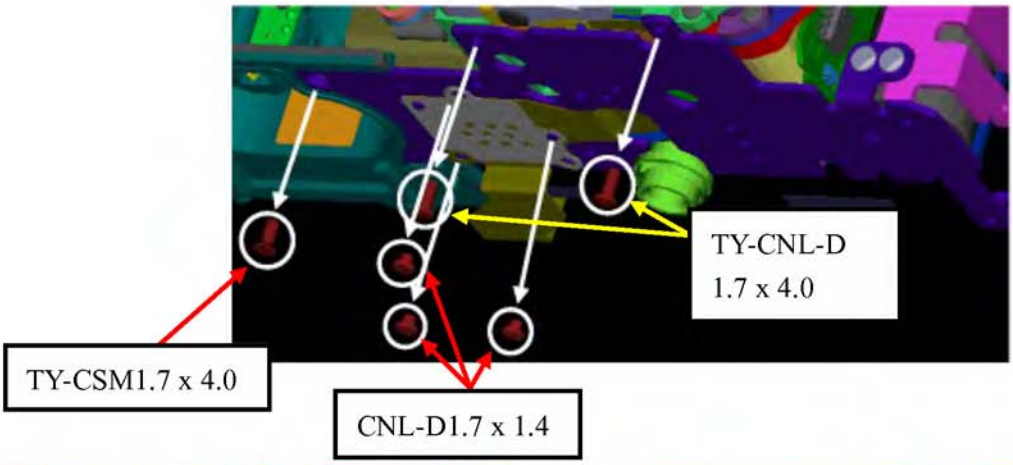
Unscrew screws and un-solder lead wires

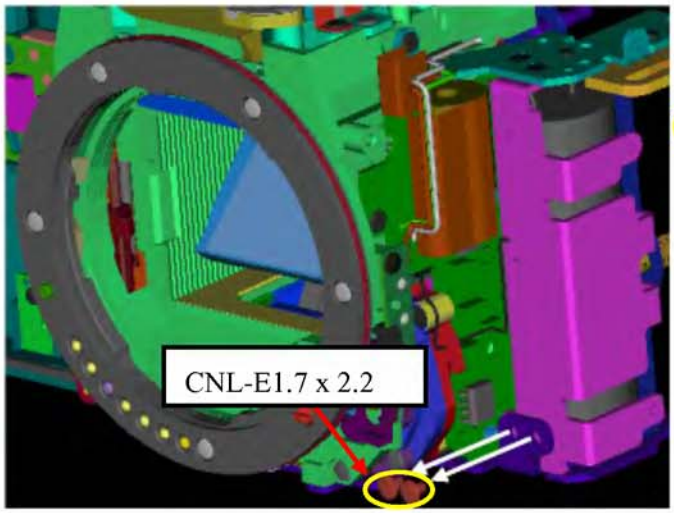


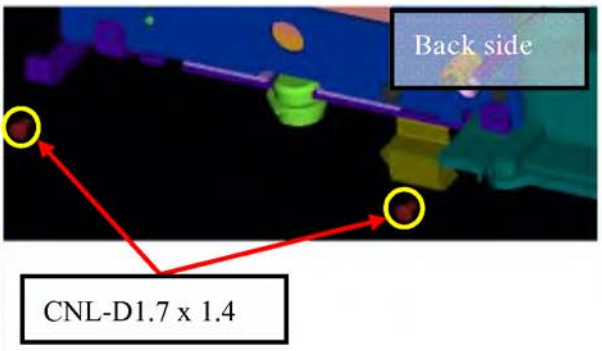


0-A51 (Tripod stand assy)

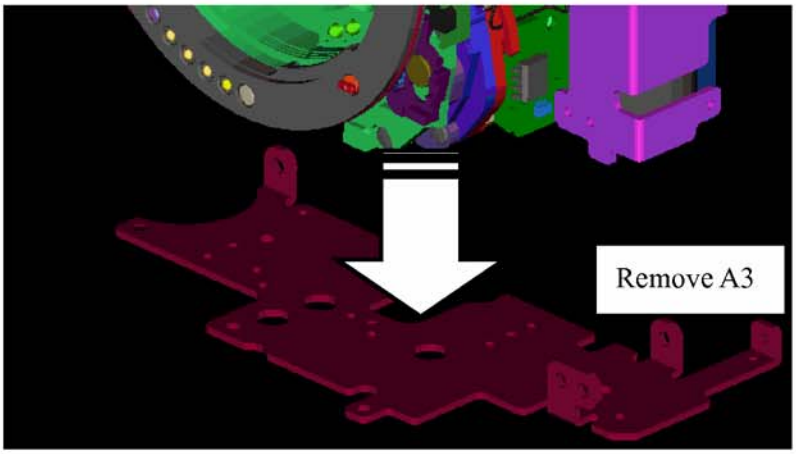




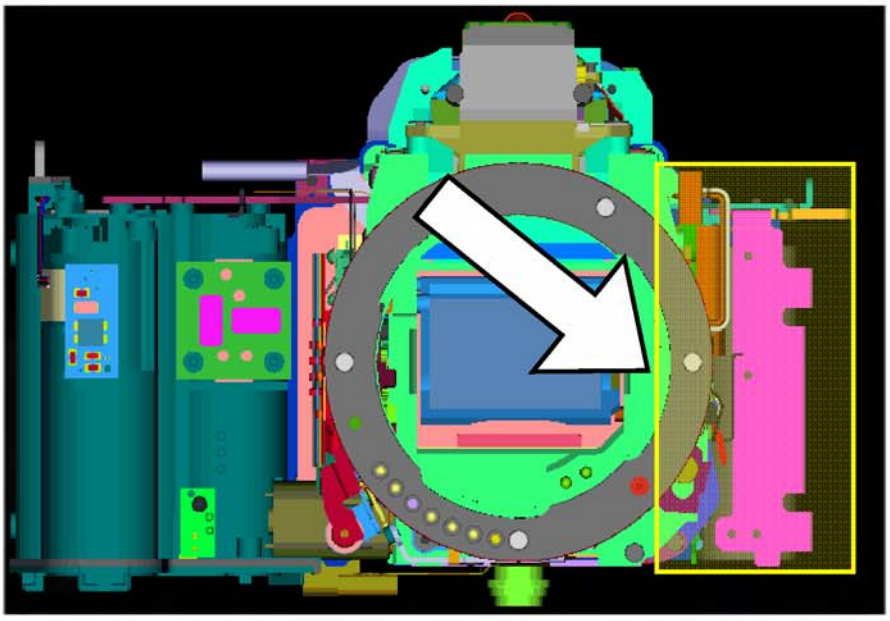


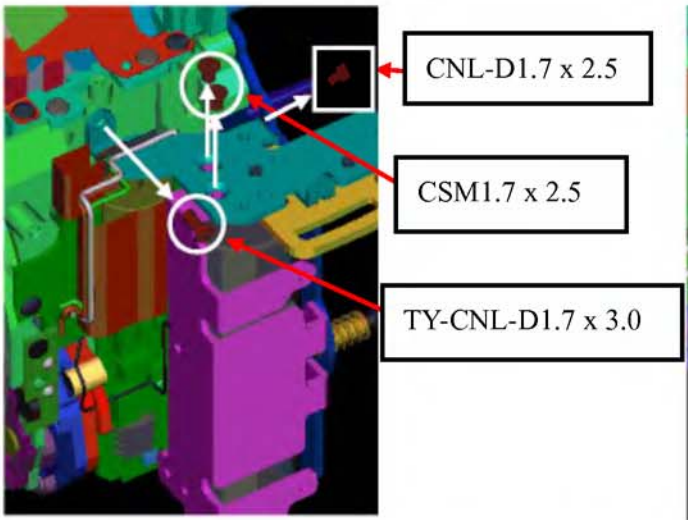


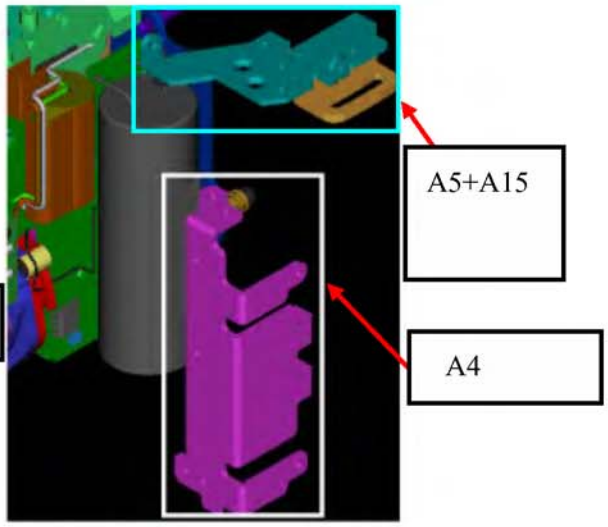
A3 (Bottom plate)

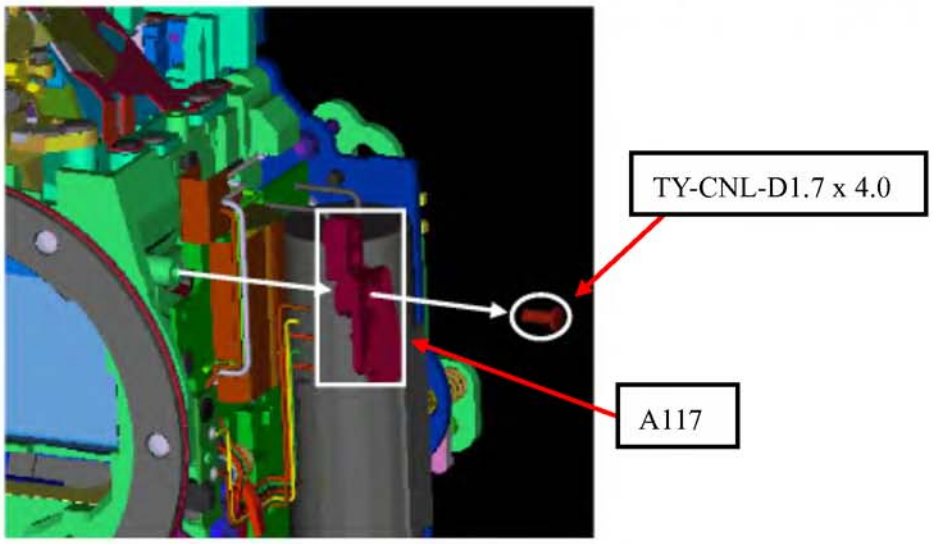


Remove parts on right side of camera (strap side)

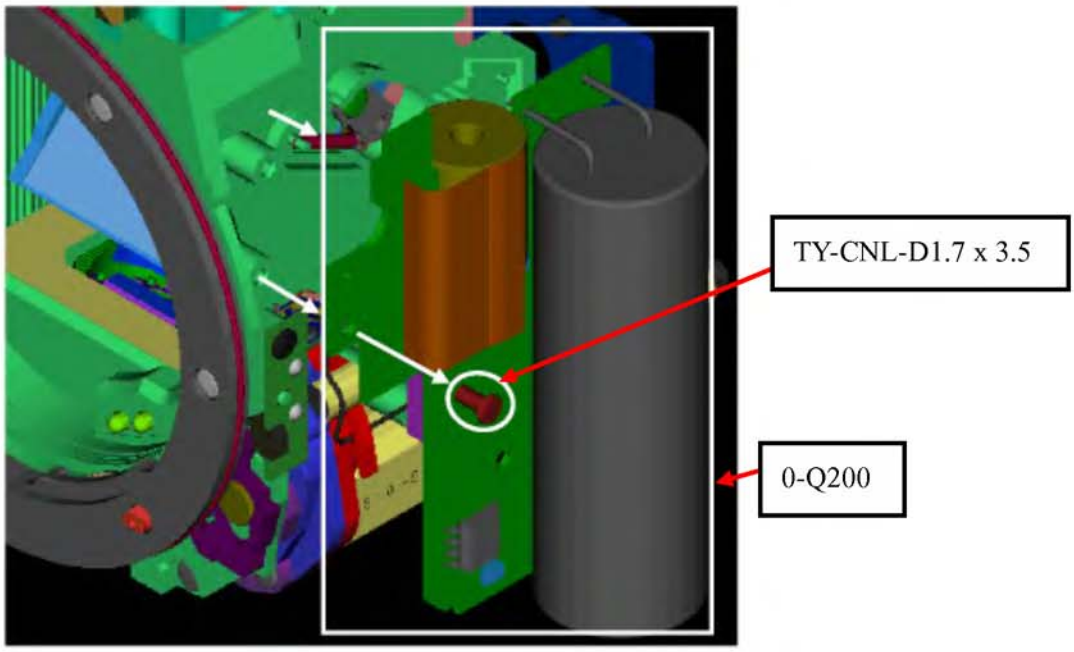




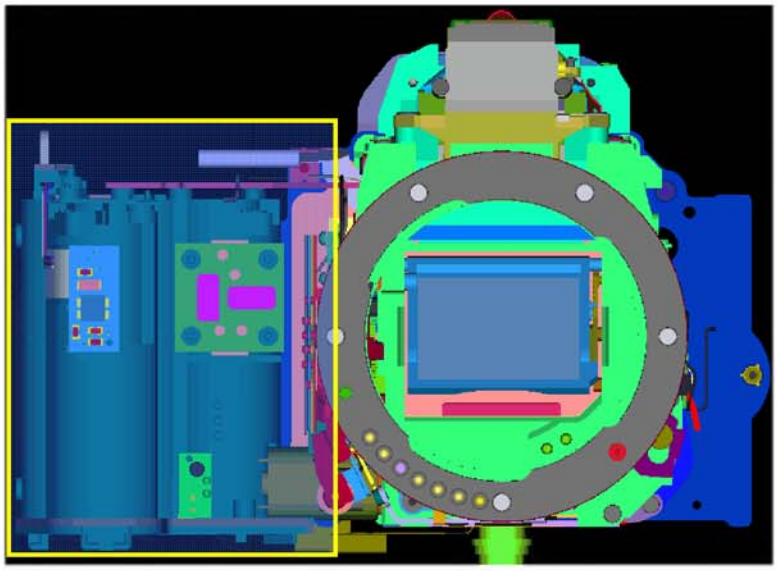




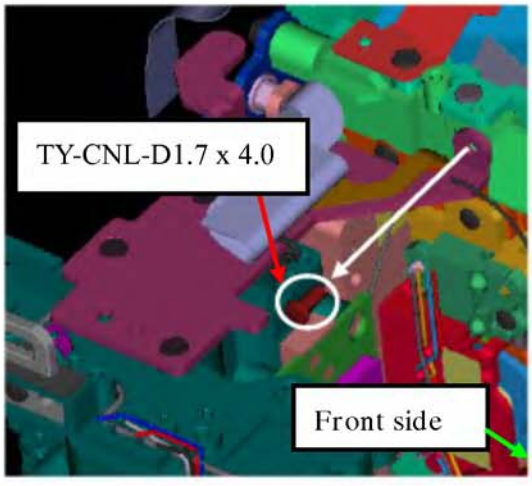
0-Q200 (Strobe P.C.board)

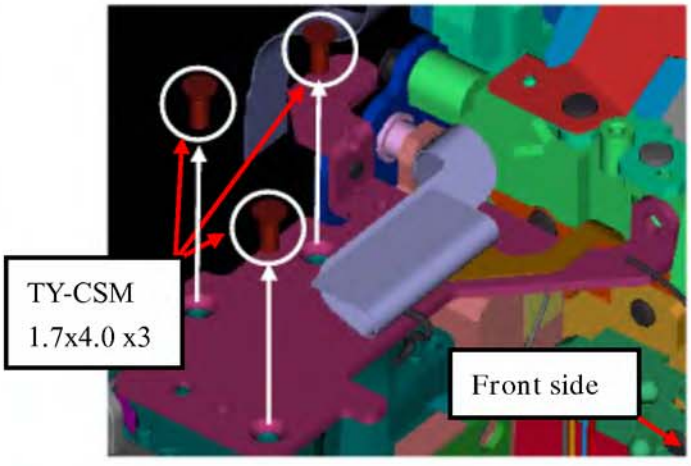


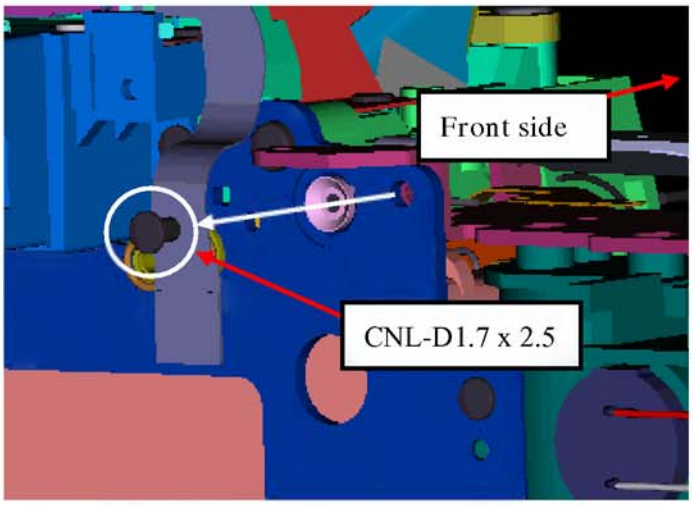
Remove parts on left side of camera (battery chamber side)

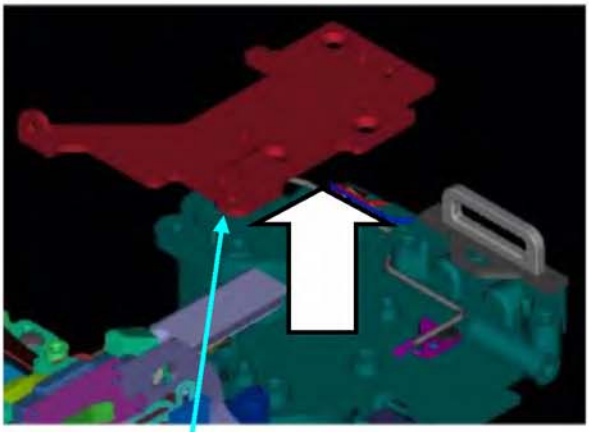


A6 (Left shoulder plate)

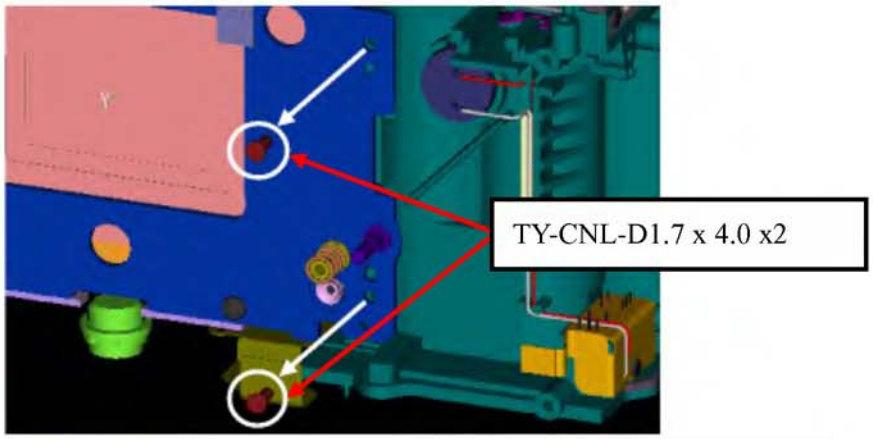


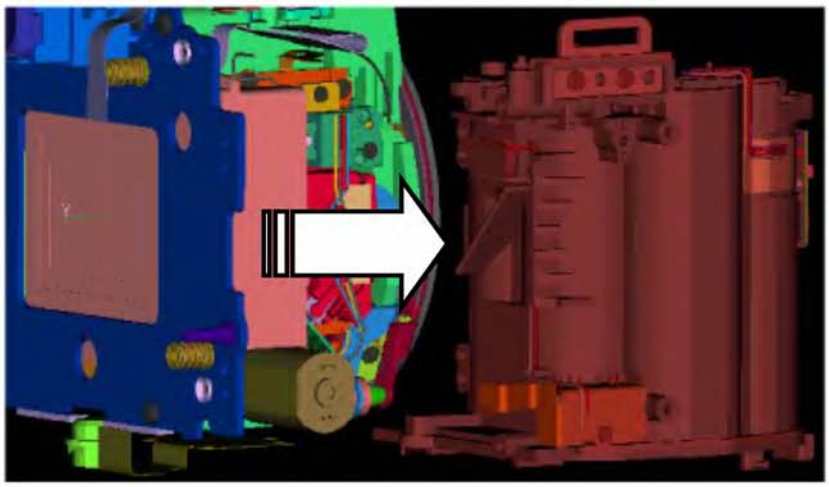






A13 (Battery case)





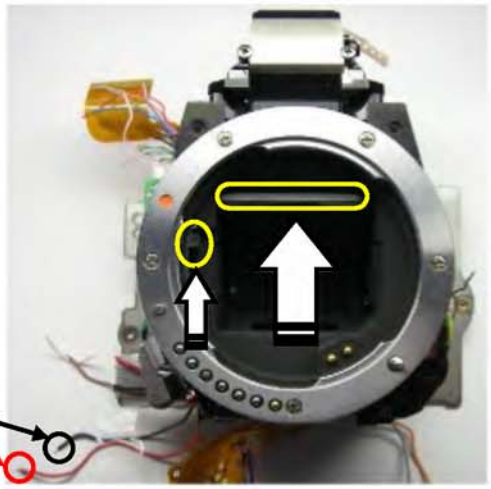
Remove A13 from 0-A101

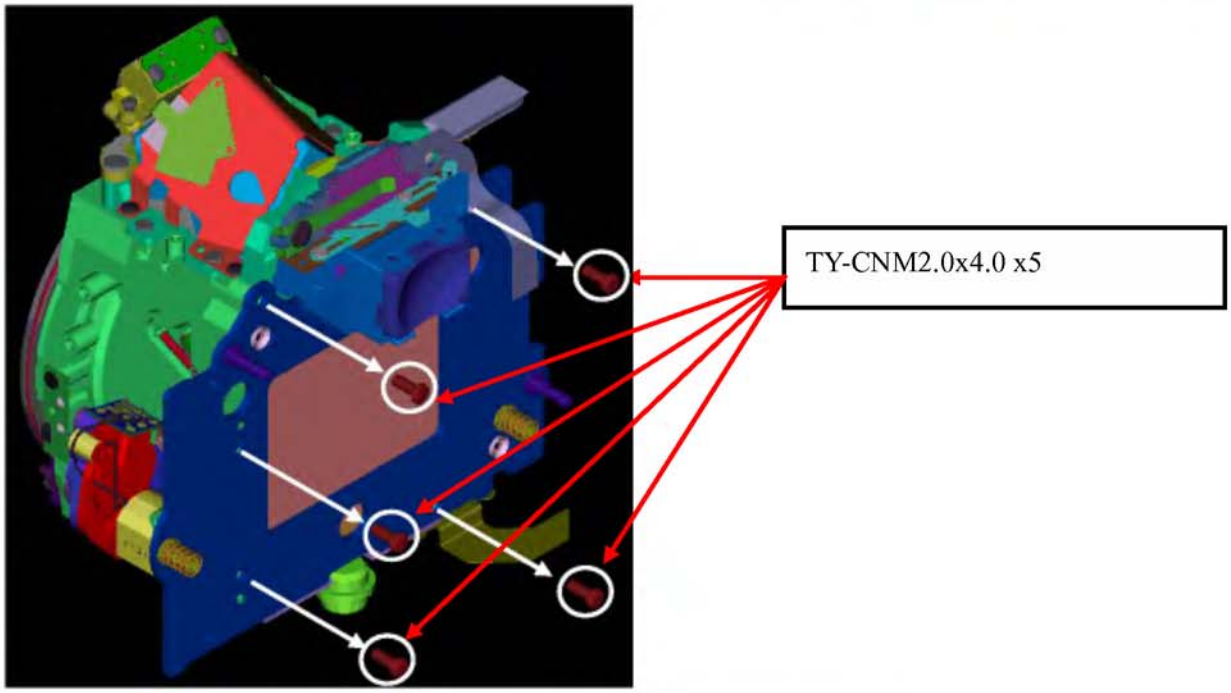
0-A101 (Front housing assy)

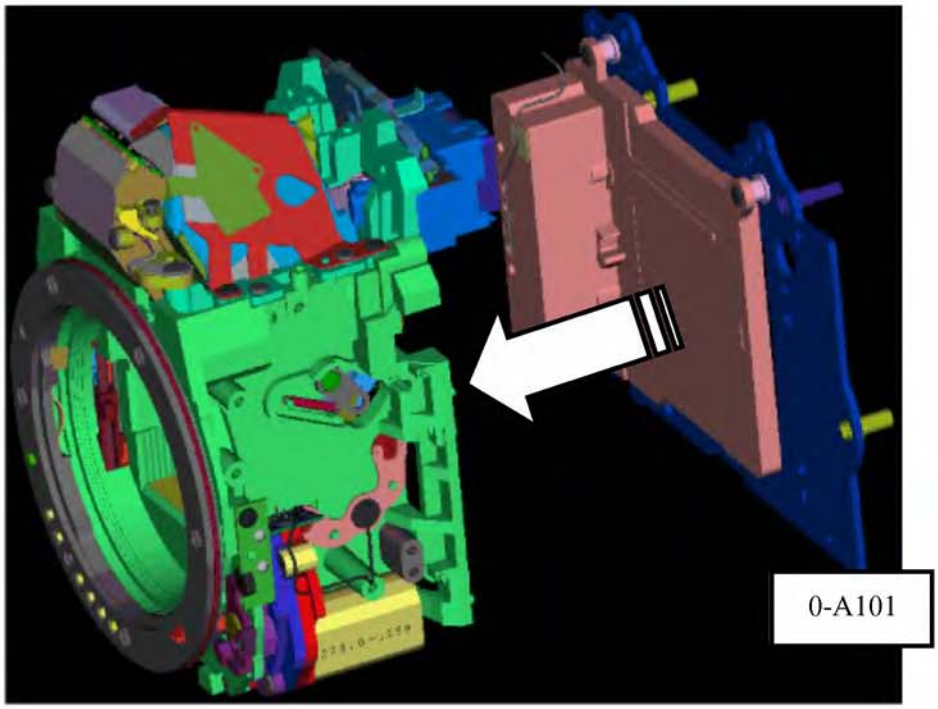
[Preparation before disassembling]

Supply DC2V to 0-S250 (Mirror motor).

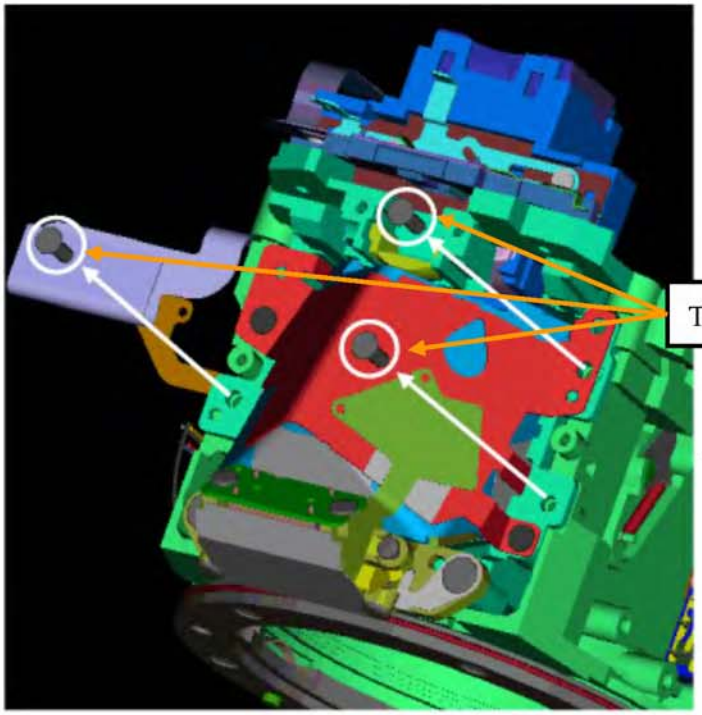
(Positive (+) on Red wire) Set the front housing block to mirror up position.





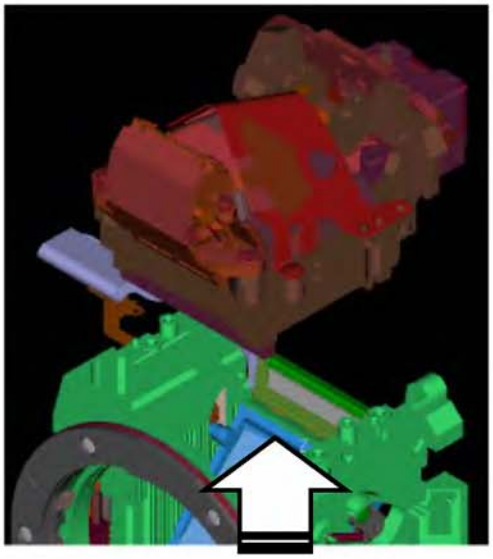


M1 (Pentaprism sheet)



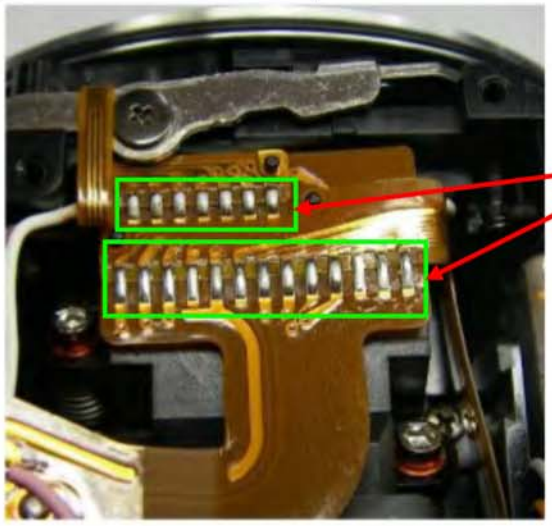
TY-CNL-D1.7 x 4.5 x3

Unscrew three screws then remove M1



Remove M1 from A101

T901 (Lower P.C. board)



Unsolder land of T901.
Carefully peel off A141.
(stick by double stick tape)
Do not damage on T901.

Disassembly and assembly for 0-A101 (Included 0-E000)

Disassembly and assembly procedure for 0-A101 is the same as other D-SLR.

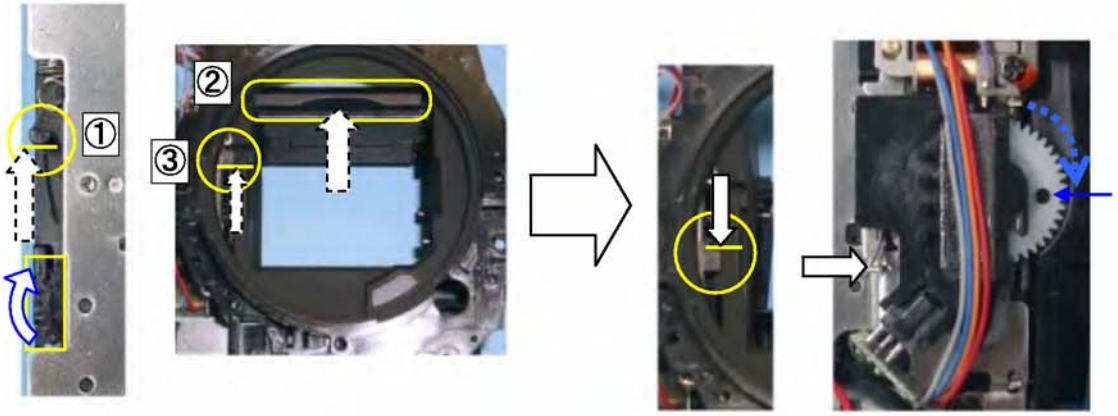
[Notice for Disassembly] Set the mirror seat at top position before removing 0-G100.

1. Set to mirror up position by turning gear as shown in figure.

[Caution] Since there is no stopper (B65) of a mirror, don't carry out by turning on electricity to a mirror motor.

Mirror up: (Shutter charge lever (1) and mirror seat (2) and sliding plate (3) must be top end position.)

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



Front housing block

A101, B41, M120, DT(4x15),

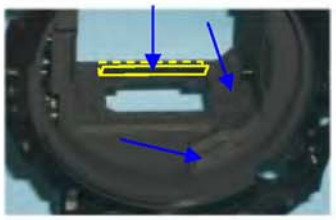
B58 x2, B59, TY-CNL-G1.7x2.0,

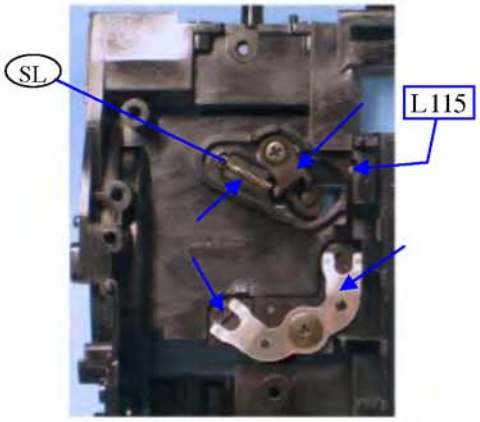
0-B52 (Mirror sheet),

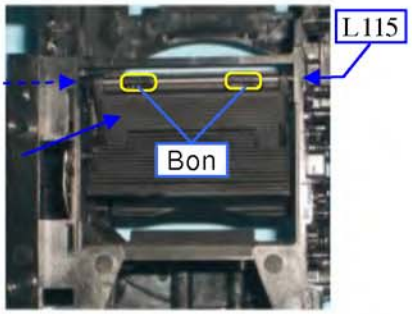
B66 (shaft) --- Apply super X and L115

B63, B57,

B62 (spring) --- Apply screw lock

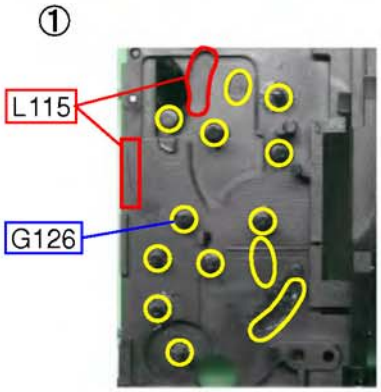






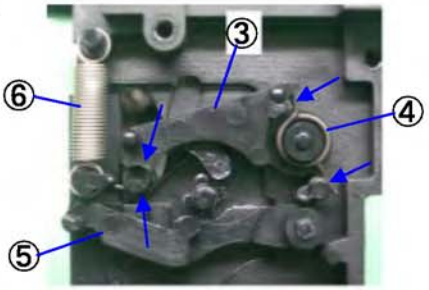
0-G100 (Diaphragm control block)

① Apply G126 at 13 positions and apply L115 at 2 positions.

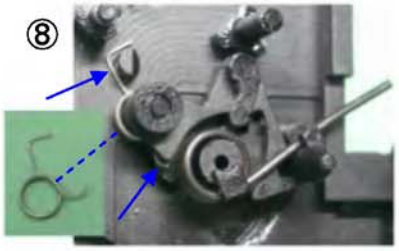


② Install B20 to B11.

③ B11 ----Hook the spring to shaft of mirror sheet.
[Note] Caution for come off spring.
④ B19
⑤ B10
⑥ B21



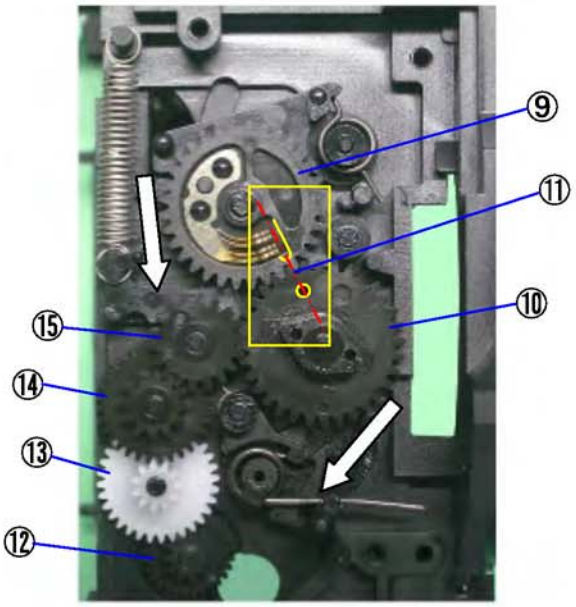
⑦ Install B17 to B9.
⑧ Install B18 to B9.



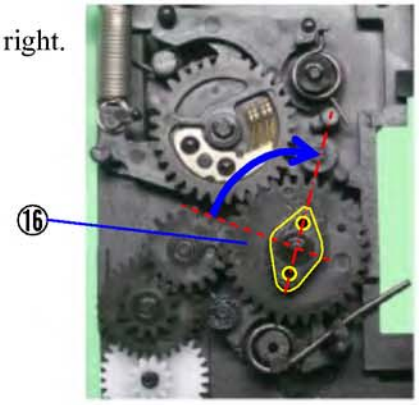
⑨ 0-B8
----Apply G126 to surface of cam.
⑩ B7
----Apply G126 to surface of cam on both sides.

⑪ Align the both hole of 0-B8 and B7.

⑫ B3
⑬ B4
⑭ B5
⑮ B6

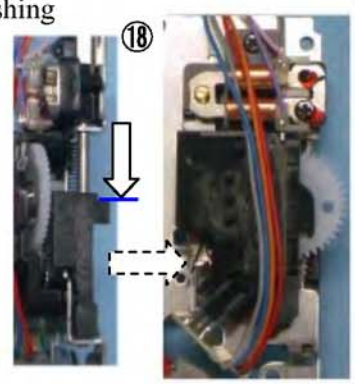


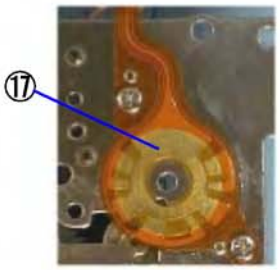
⑯Turn B7 clockwise until the arrow indicated in figure right.



⑰ Clean code plate by solvent and apply G151.

⑱ Latch the lever of G100 while pushing down the sliding plate.





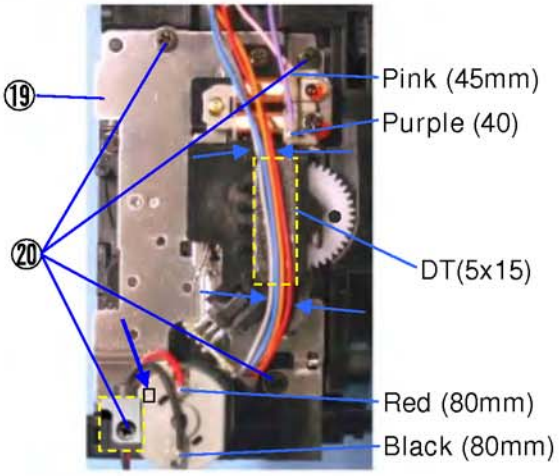
⑲ 0-G100

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

⑳ TY-CNL-D1.7x3.0 (x4)

[Arrangement when replace G100]

1. Arrange the lead wires with DT (5x15) as shown in figure.
2. Solder 4 lead wires.



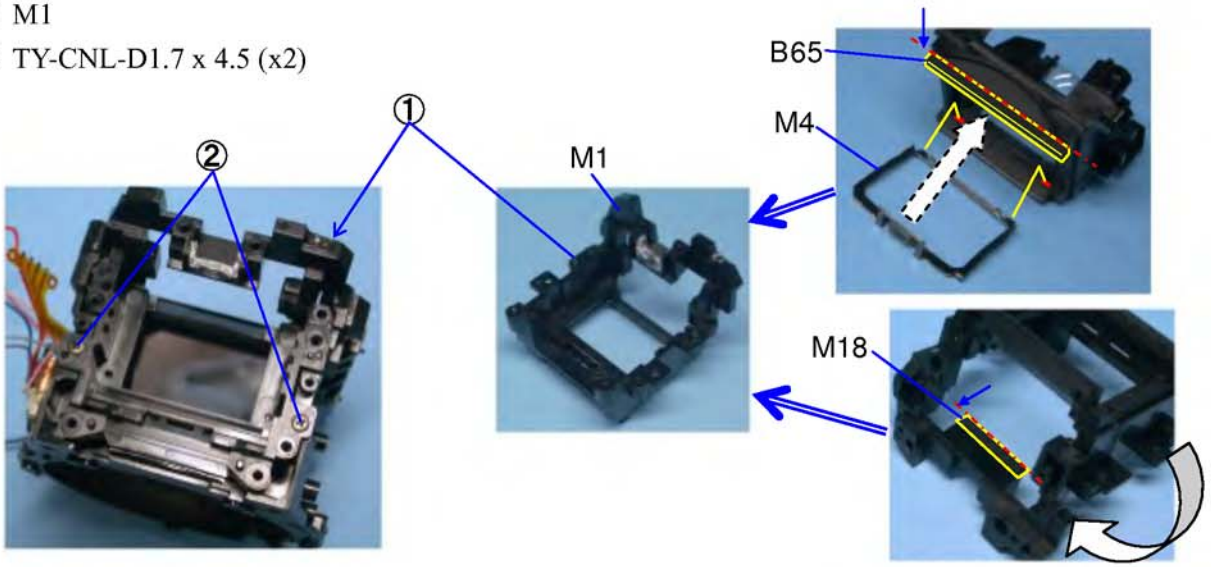
Disassembly and assembly for M1

The same as 76700 (K100D)

*B65, M4, and M18 should be attached with M1.

① M1

② TY-CNL-D1.7 x 4.5 (x2)



Checking the mirror function

[Confirm] Required equipment: Power supply

① Confirm the following points while applying DC2V to the mirror motor. (Red wire: Positive)

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

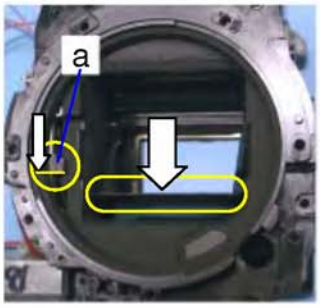
-2) The shutter charge lever(b) and sliding plate(a) must be moved smoothly and surely go up and down.

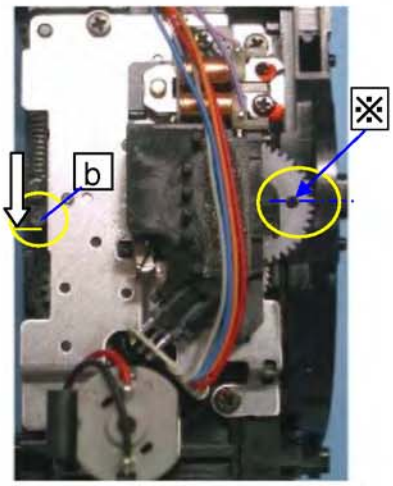
② Set the mirror seat to the down position while applying DC1.5V.

(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 seats are passed inward about 3mm by finger pressure.

④ Set the mirror seat to the down position.

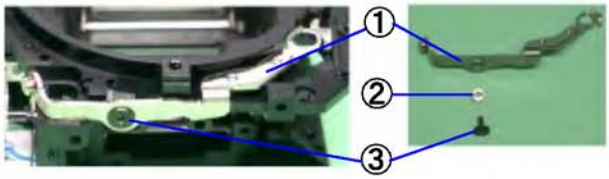
Assemble A104 (Mount ring)

The same as 76700 (K100D)

① 0-A121

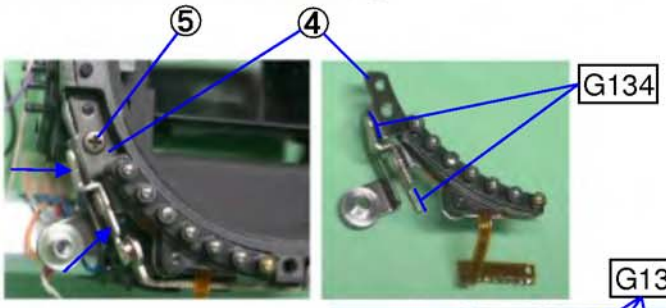
② A133

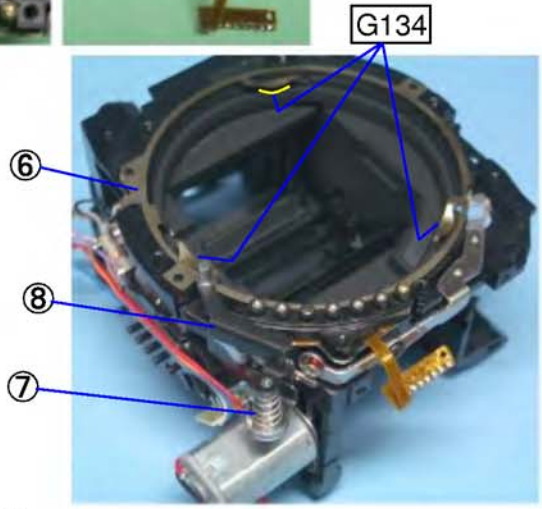
③ TY-CNL-F1.4x4.0



④ 0-A126 ----and related parts
Apply G134 as shown figure

⑤ TY-CNL-D1.7 x 3.0





⑥ A105 ---- Apply G134 as shown figure

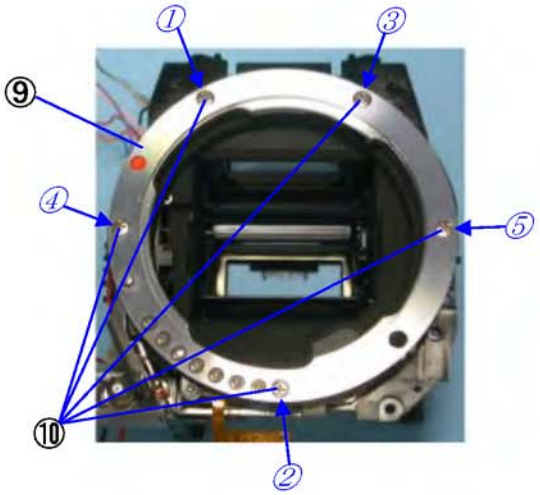
⑦ A110

⑧ 0-A108

⑨ A104

⑩ TY-CNS2.0x4.5Ni (x5)

Tighten screw diagonally as shown in figure.



[Confirm] Confirm and adjust mirror angle.

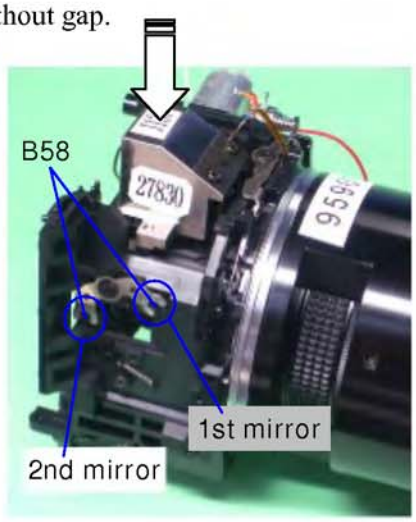
Required equipment: 1st mirror angle (45°) adjusting jig, Mirror angle adjusting jig for 27830, Mirror positioning scope

*Adjustment is performed by turning B58 (2 pcs). The Y-axis (the vertical direction) is adjusted to a 0 target.

*Front housing must set mirror down position.

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

Tolerance ----	X-axis : ±15'
	Y-axis : ±10'



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

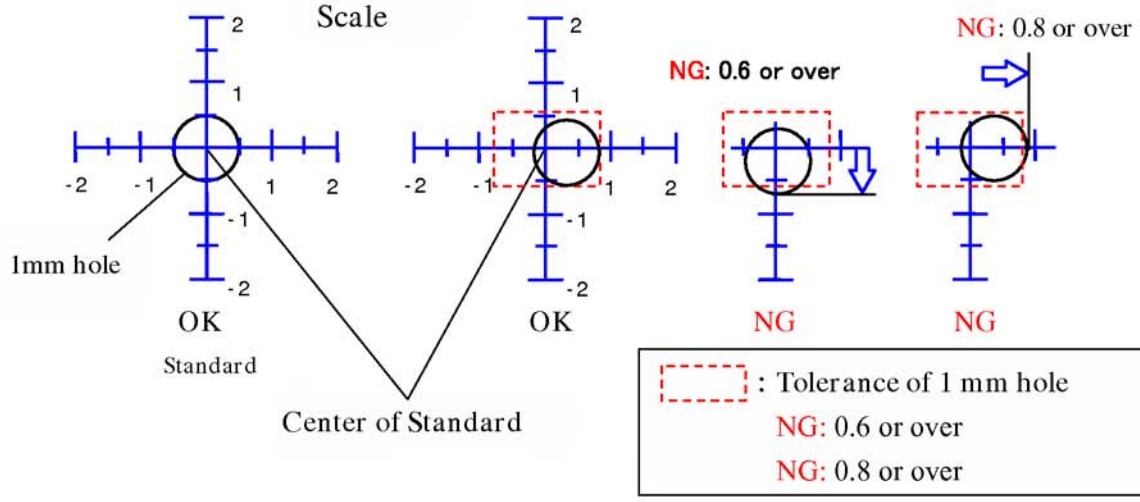
Tolerance ----	X-axis : ±0.3mm
	Y-axis : ±0.1mm

(Refer to below tolerance for positioning scope)

③ After adjustment is done, apply the supper-glue to both B58

■Tolerance for 2nd mirror position

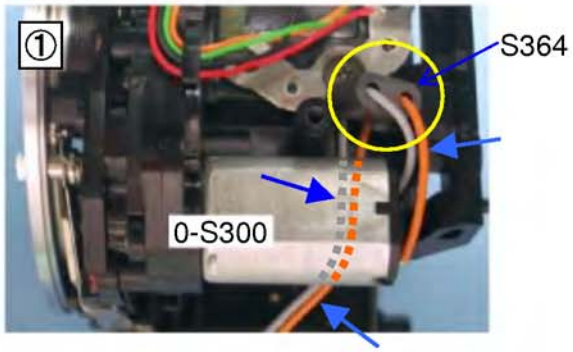
(Using with the mirror positioning scope)



0-S300 (AF drive block)

The same as 76700 (K100D)

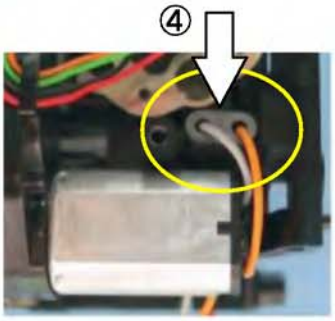
① Install 0-S300 while arranging lead wire from motor and S364 as shown in figure.

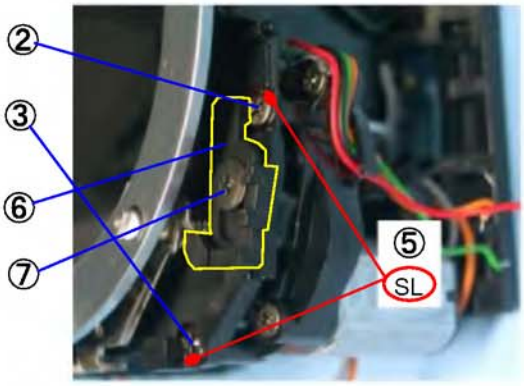


② TY-CNL-D1.7x3.5

③ TY-CNL-D1.7x5.5

④ Install S364 as shown in figure.





⑤Apply the screw lock. Do not apply too much screw lock.

⑥ A115

⑦ TY-CNL-G1.7x2.5

[Confirm and adjust] AF Joint stroke

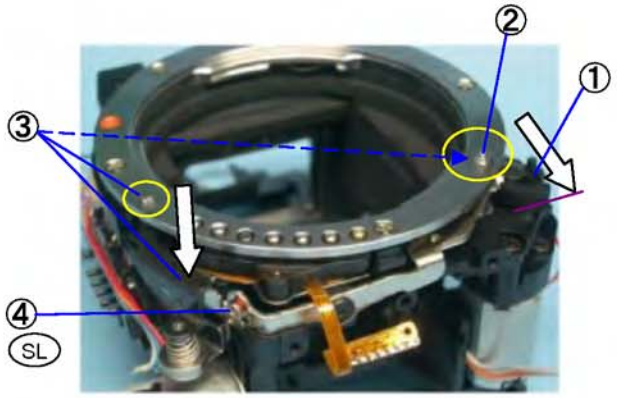
Required equipment: vernier caliper

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.

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

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



L2 and 0-L101 (Fresnel lens and Pentaprism)

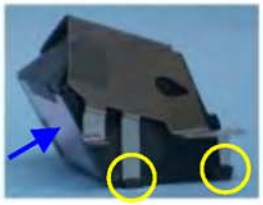
The same as 76700 (K100D)

[Caution] Confirm there is neither dust nor scratch on L2 and 0-L3

[Notice for disassemble]

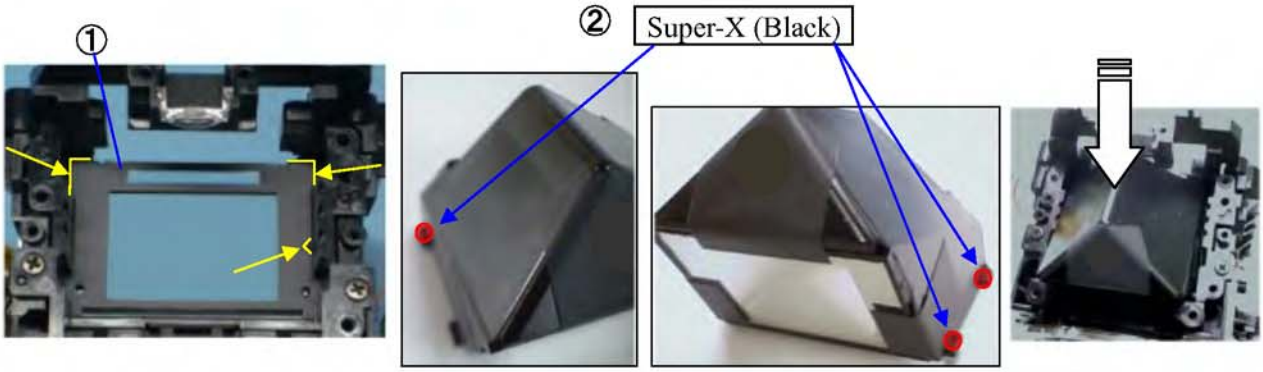
1. Remove retainer screw for M9 (Penta prism cover)
2. The bond between M9, and three leg tips and penta sheets is removed, and remove together with penta mirror.

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



① M3

② 0-L101---- Apply Super X (black) to three places and surely install it.

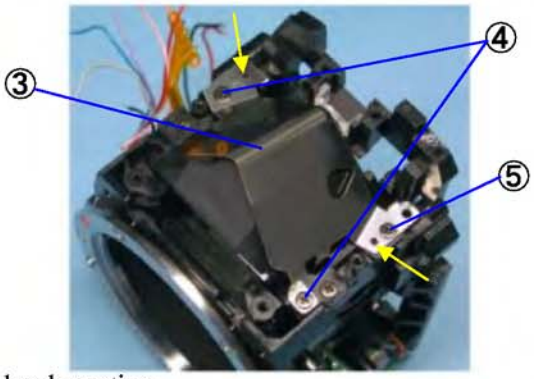


③ M9(M8 and M12 x2)

[Note] There is no bend on three leg part

④ TY-CNL-D1.7x3.0 (x2)

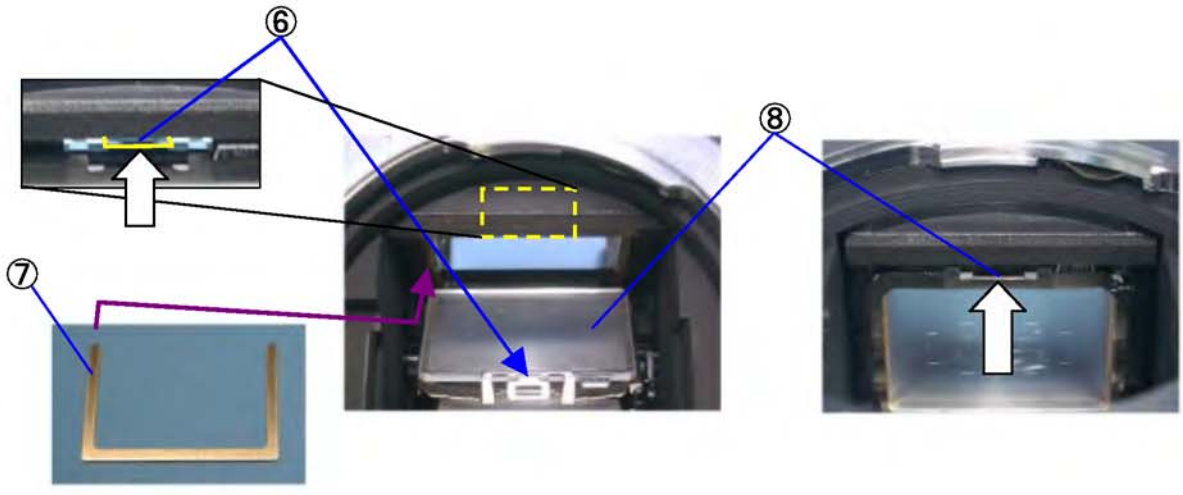
⑤ TY-CNL-D1.7x4.5



⑥ Drop the focusing screen frame(M4) by releasing the hook portion.

⑦ M22 --- In the case of temporary adjustment, Using with the M22-00G(0.45).

⑧ Put the focusing screen(L2) on the frame(M4) and then push it back until it locks in place.

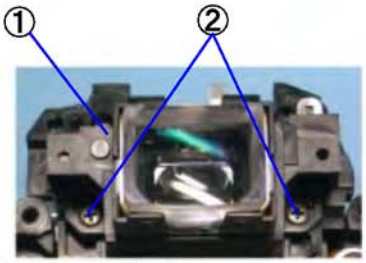


M301 (Eyepiece frame)

The same as 76700 (K100D)

① Eyepiece (M301,L7 and other)

② TY-CNL-D1.7x4.0 (x2)



SI block

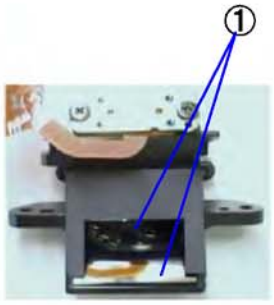
① Confirm that there is neither dust nor scratch on inside prism and mirror.

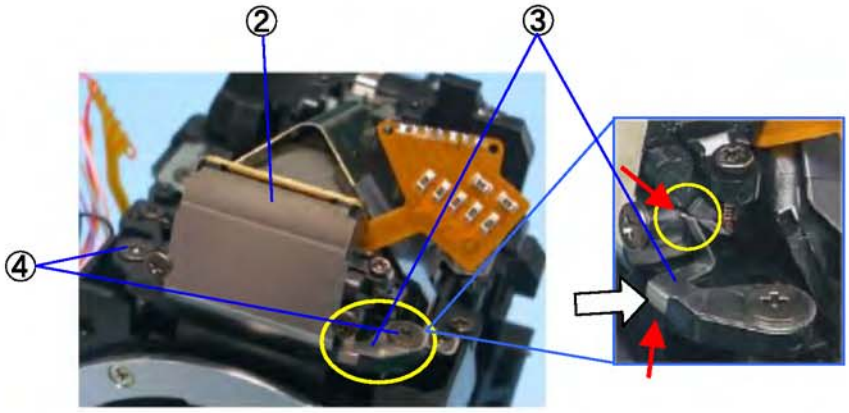
② SI block (0-M51, 0-M52, M53, L11, L12, 0-O170 and other)

③ Attach M55 (SI spring) as shown figure.

④ TY-CNL-F1.7x4.5 (x2)

--- Install SI block and M55(spring) to the pentamirror side as shown figure.





[Adjust and confirm] Viewfinder focus and parallax

Required 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)

Parallax

[Caution] Confirm that the Pentaprism must be installed securely.

①[Check]Confirm there is neither gap nor an inclination at an upper and lower, Right and left position.

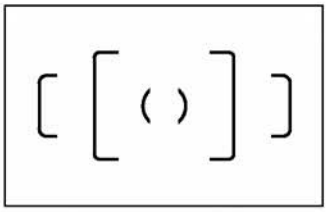
Standard: Right/Left Less than 1° Upside down Less than 1°50′

Viewfinder focus

① [Check] Check a viewfinder focus.

*One scale for focus master lens is 0.03mm.

Standard : 0±0.07 mm



②[Adjust] Exchanges for M22 of other thickness.

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

M22-00A	-00B	-00C	-00D	-00E	-00F	-00G	-00H	-00I	-00J
t=0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60

[Adjust] Positinoning 0-O170(SI-LED)

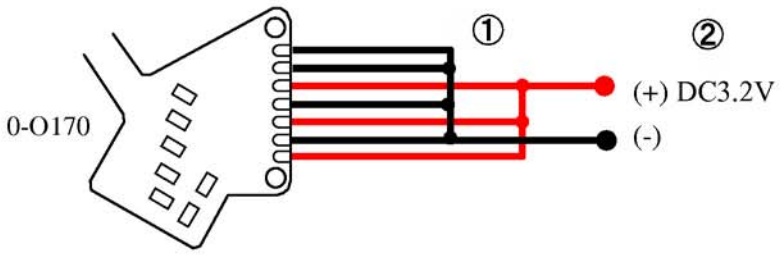
The same as 76700 (K100D)

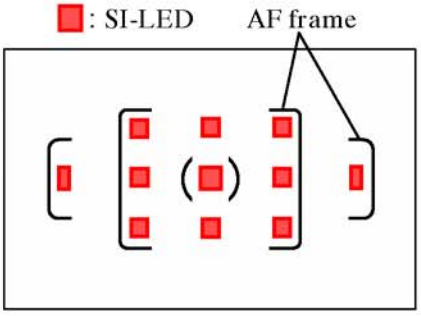
Required equipment: Power supply, lead wires

① Solder and arrange the lead wires on 0-O170 as shown in the figure below.

[Caution] Do not stress to the lands of 0-O170.

② Apply DC3.2V to 0-O170, and confirm the positioning and lighting of SI-LED 11points.





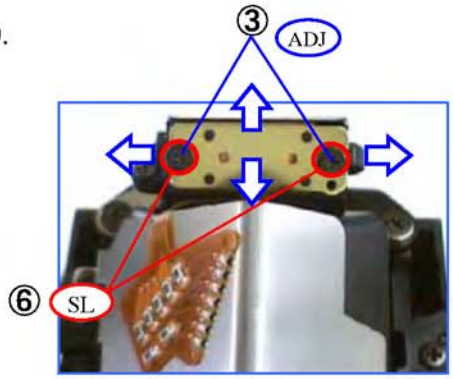
③ [Adjust 1] Loosen 2 screws, and then adjust the position of 0-O170.

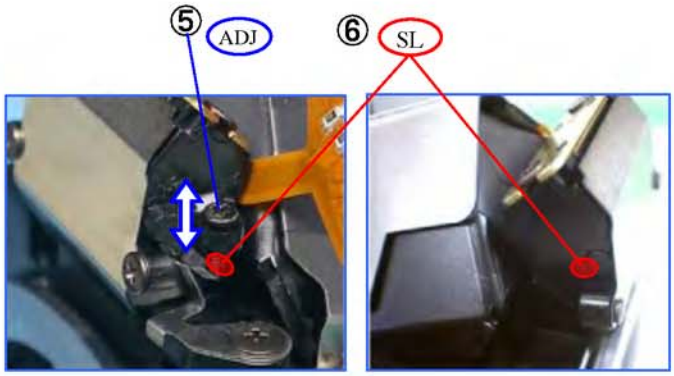
-- Clean screw lock (4 position)

④ Tighten screws, and then confirm the position again.

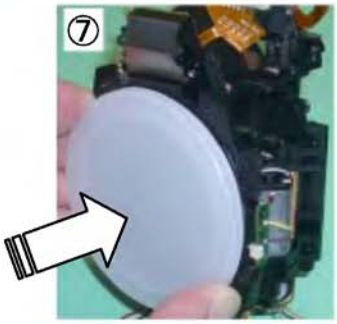
⑤ [Adjust 2] Turn adjusting screw to adjust fine adjustment for up and down position then confirm the position again.

⑥ After adjustment is done, apply the screw-lock to 4 points and remove the lead wires from 0-O170.





⑦ A mount cover is attached in order to protect a SI-LED part hitting during work.



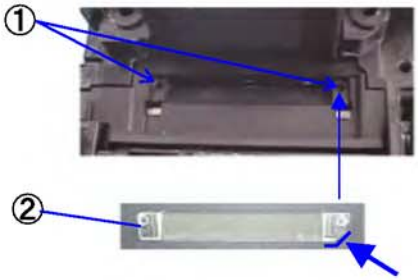
0-O100 (Finder LCD block)

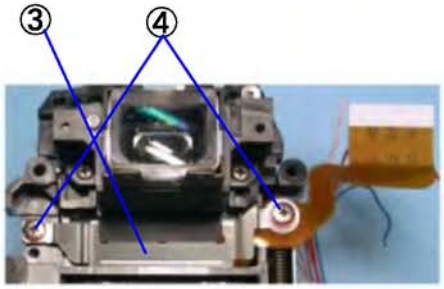
The same as 76700 (K100D)

[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 (②) is not replaced, not necessary to remove it --- Do not scratch on it

① Apply small quantity of dia bond (black) to the shown in figure.
② M2 prism --- There should be no dust.
③ 0-O100
④ TY-CNL-F1.7x3.0 (x2) -- * Install screws while pressing the plate of 0-O100.



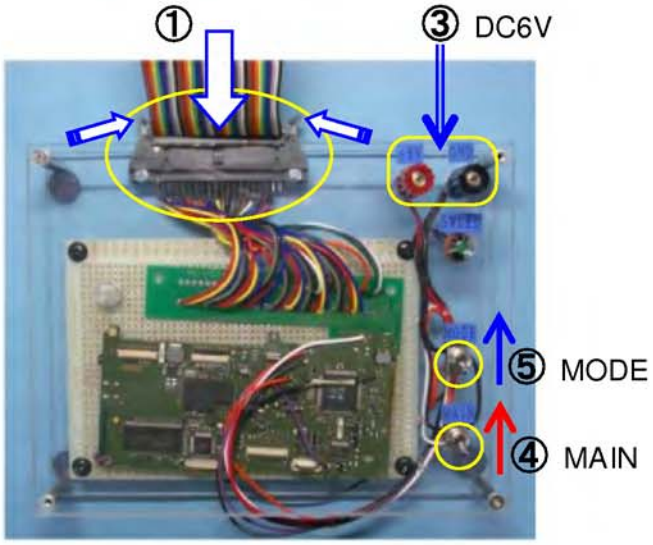


[Adjust] Adjustment of the position of viewfinder indication (0-O100)

The same as 76700 (K100D)

Preparation: Power supply (8V, 3A), O100 positioning jig for 77050

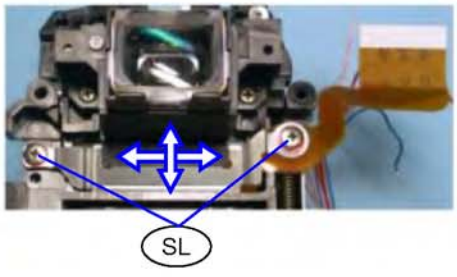
① Connect the flex board of 0-O100 to the jigs shown figure
② Connect the flex board of 0-O100 to the cable.
③ Apply 6.0 V to the jig. ④ Turn the main SW ON.
⑤ Turn the mode SW ON. *Indication of O100 is display



⑥ [Confirm] Check whether the position of the display is straight.
⑦ [Adjust] Loosen the screw and change the position.
After adjustment is done, apply screw lock.

⑥

⑦



0-M100 (AF block)

The same as 76700 (K100D)

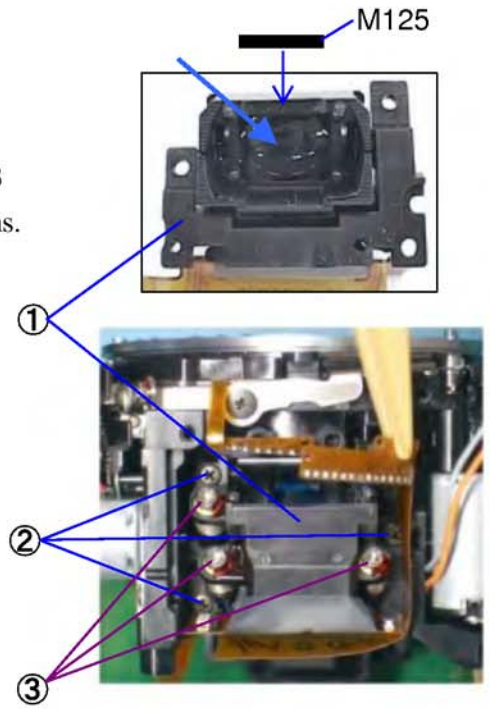
Preparation: Hexagonal screwdriver 1.5mm

① 0-M100(When replace 0-M100, put M125 at sensor side)
[Note] There should be no dust on lens.

② TY-CNL-D1.7 x 4.0 (x3)

③ [Adjust] Temporary adjustment of AF block --- Screw in 3 adjusting screws until they stops, then screw back two turns.

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



Disassembly and Assembly 0-J100 (Photo sensor block)

The same as 76700 (K100D)

[Notice for disassembly]
1. Set the Diopter lever to the left side.
2. Unscrew TY-CNL-G1.7 x 5 and remove 0 -M5.
3. Remove the bonds which are around the 0-J100. Do not damage on 0-J100
4. 0-J100
5. M10
6. M7 --- If M7 is not replaced, not necessary to remove it

[Assembly]

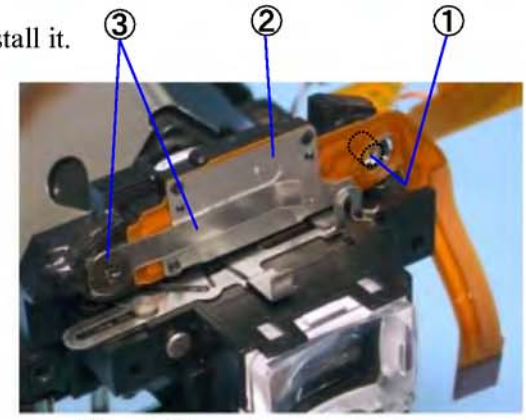
① M10 --- Set the diopter lever at end of left side and then install it.

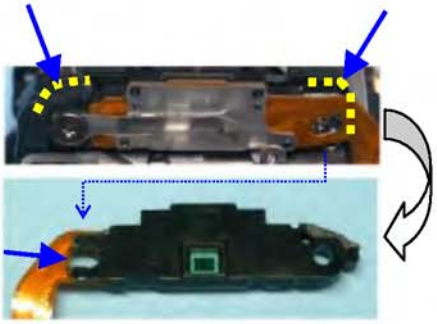
② 0-J100

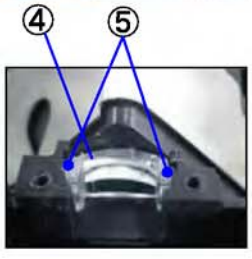
③ M5 and TY-CNL-G1.7 x 5.0(Temporary)

④ M7 --- There should be no dust.

⑤ Apply small amount of bond







Disassembly and Assembly 0-T940 (AF/MF P.C.board)

The same as 76700 (K100D)

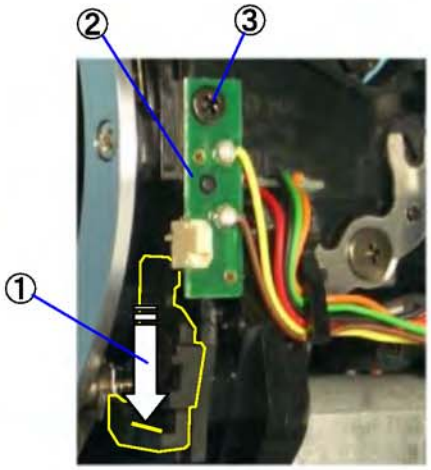
> [Notice for disassembly]
> Set AF SW to AF (Bottom side) when remove 0-T940.

[Assembly]

① Set AF mode lever to AF (Bottom side).

② 0-T940

③ TY-CNL-D1.7x3.0

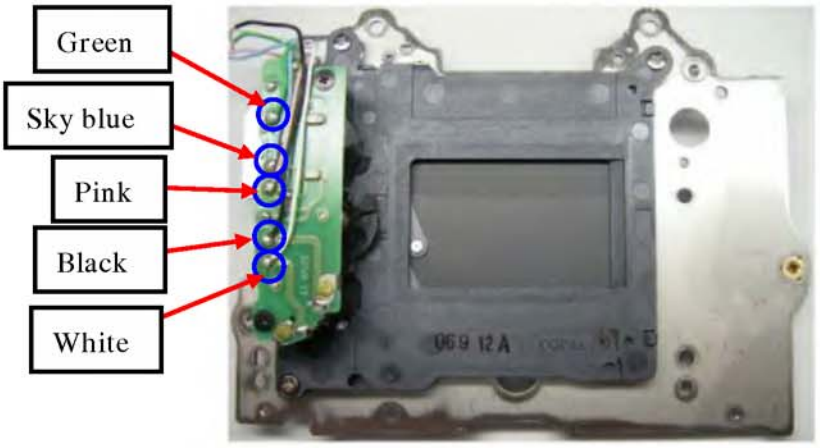


Disassembly and Assembly 0-E000 (Shutter block)

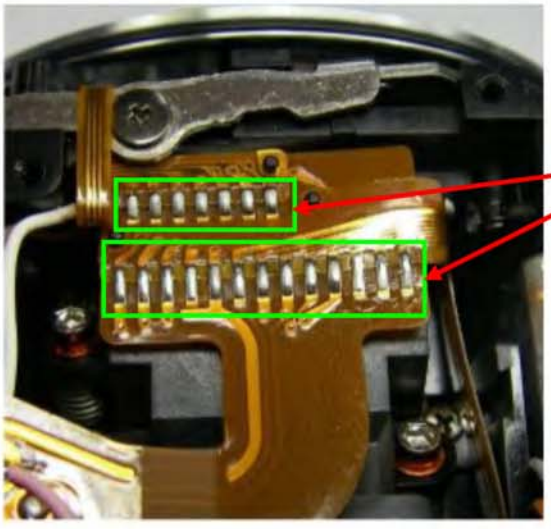
① 0-E000 - Check there is no dust and scratch.

② A70- x3 (shoulder screw)

*After install, 0-E000 has a little movement.



T901 (Lower P.C. board)

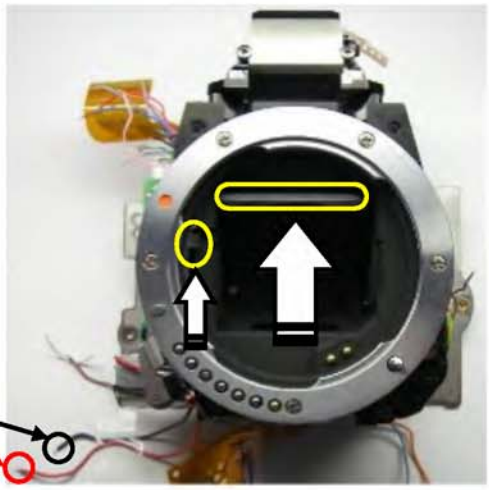


Solder land for T901
Do not make short circuit

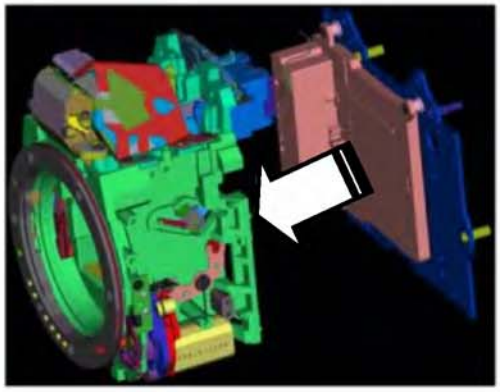
Assembly 0-A101and 0-E000 (Front housing assy and Shutter block)

① Apply DC 2V to the mirror motor, and set mirror up position. (Red - Positive/ Black ---Negative)

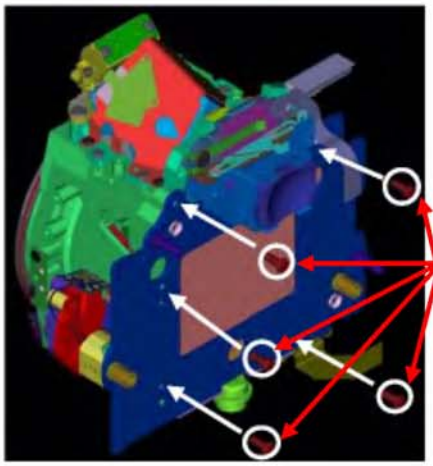
② To prevent the damage of SI-LED, attach mount cover. Then put downward.



Black – (-)
Red – (+)

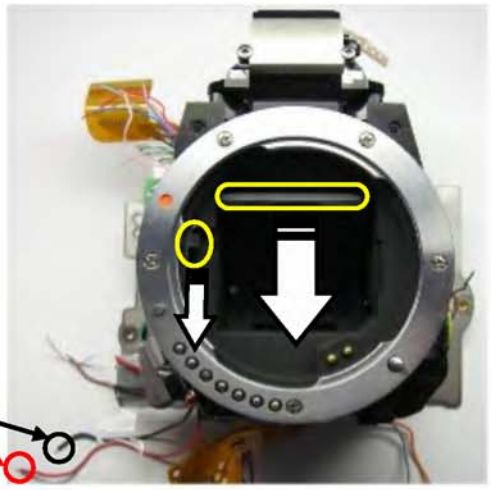


Combine 0-A101 and 0-E000



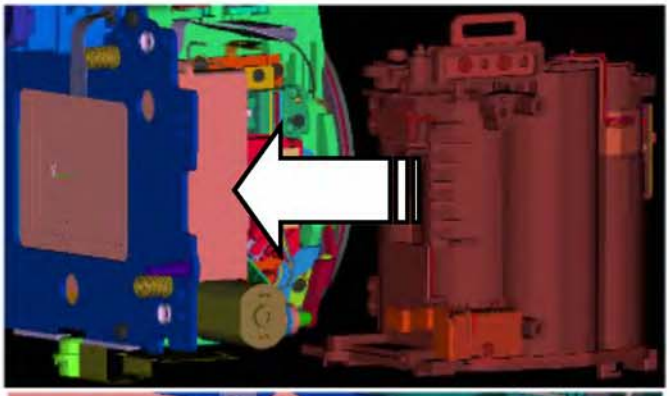
TY-CNM2.0 x 4.0 x5

Apply voltage to the mirror motor
and set mirror down position.

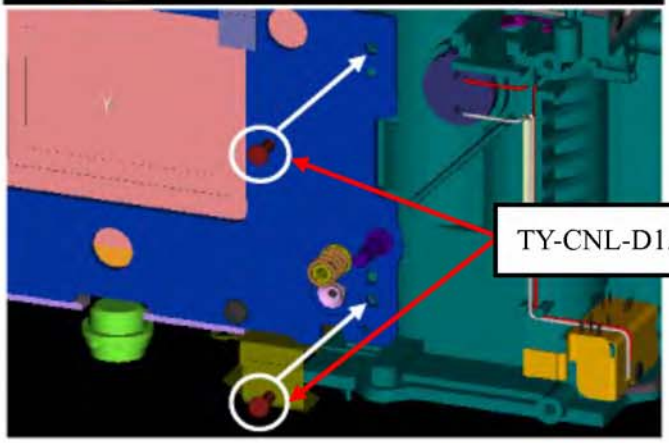


Black – (-)
Red – (+)

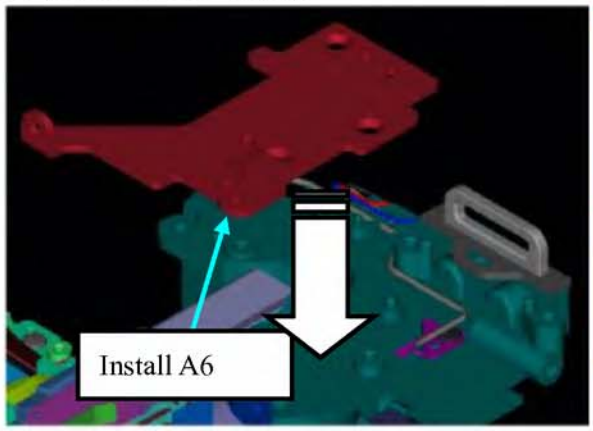
A13 (Battery case)

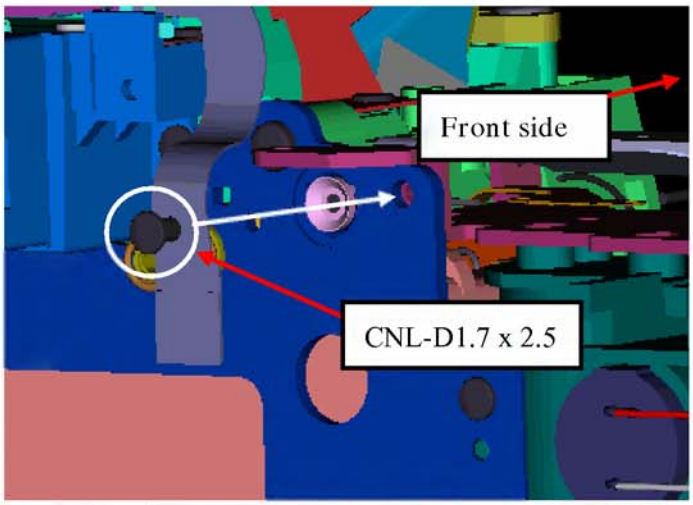


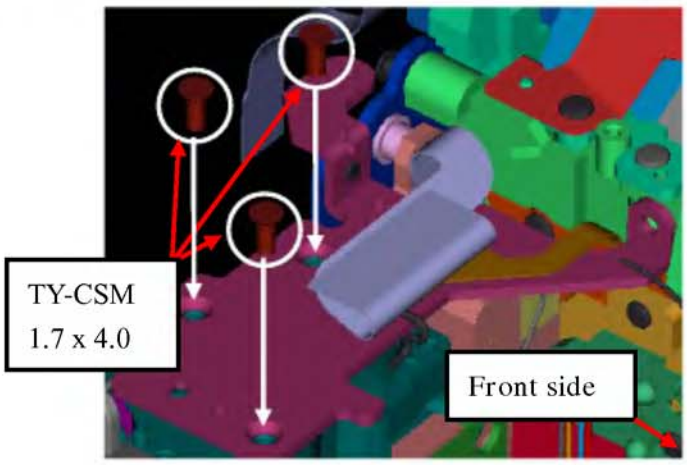
Install A13 to 0-A101

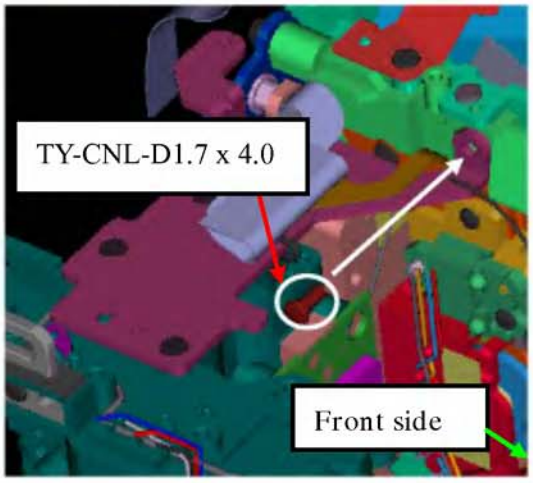


A6 (Left shoulder plate)

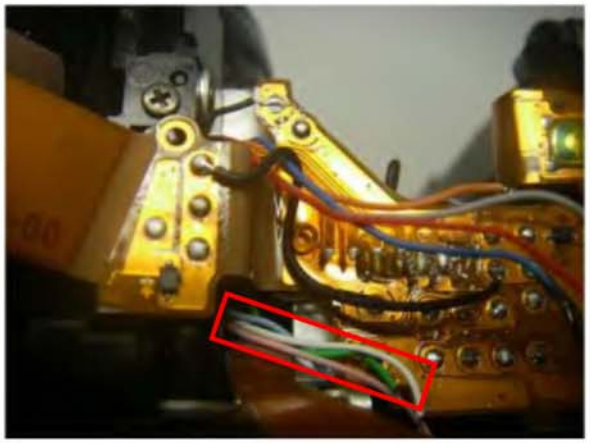




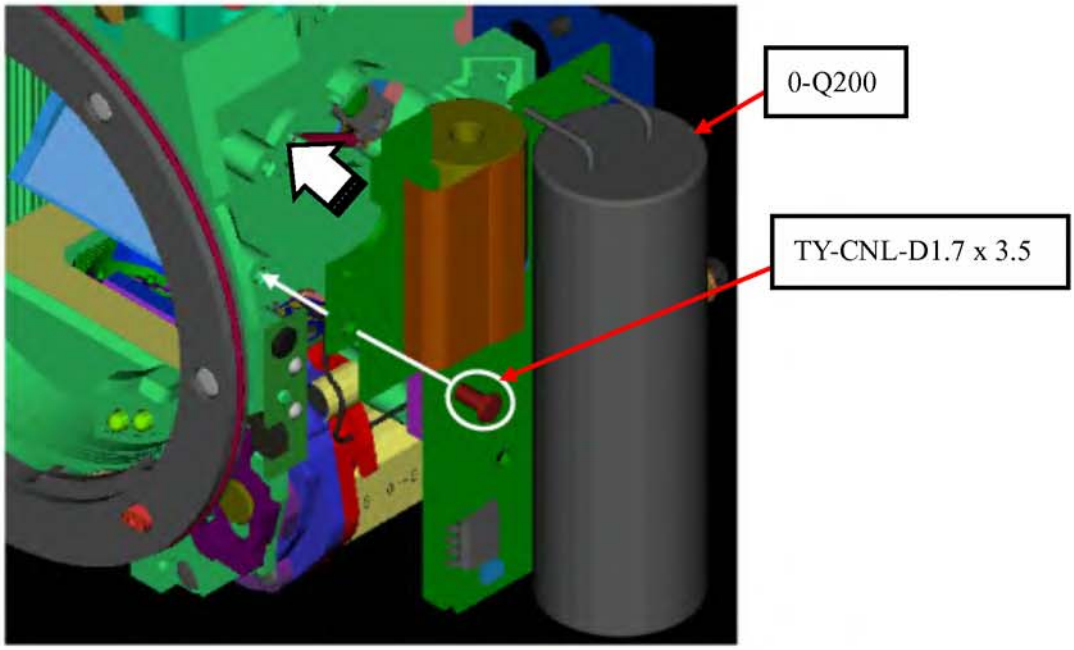




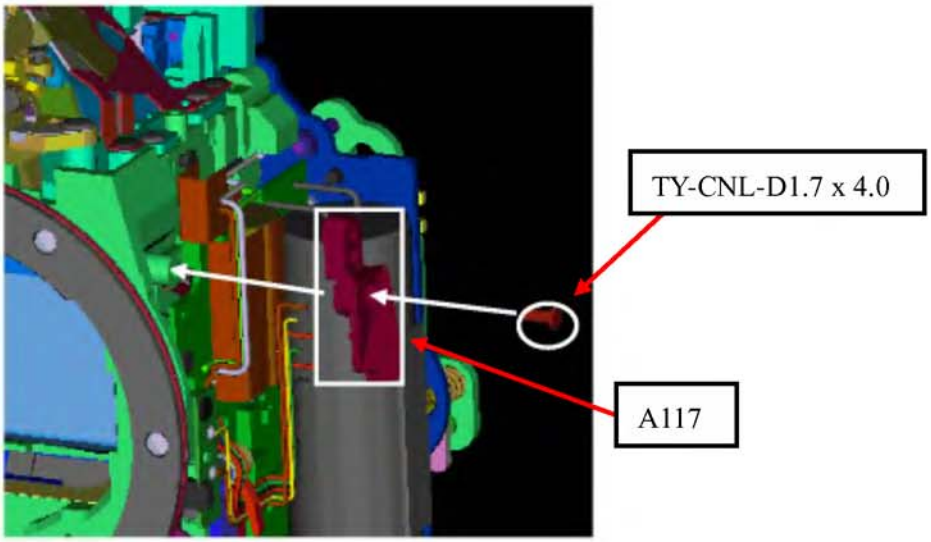
Arrange lead wires

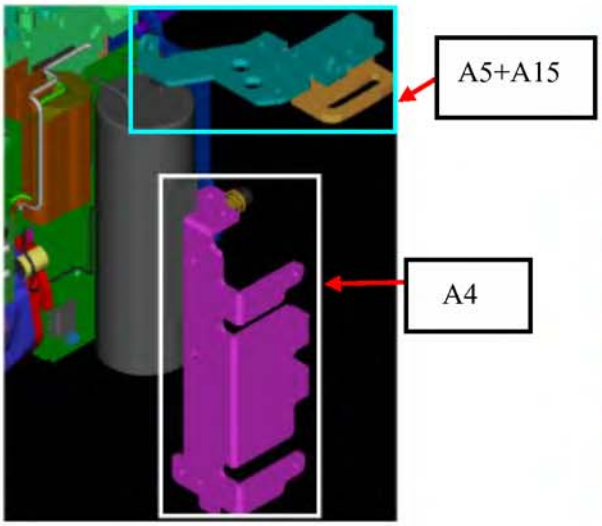


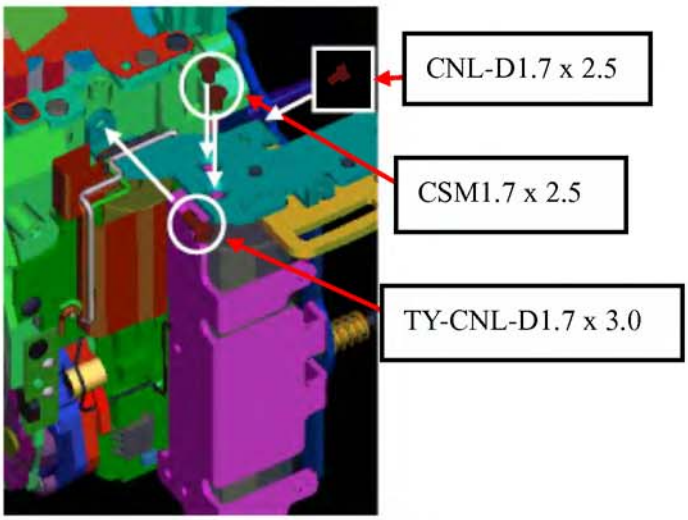
0-Q200 (Strobe P.C.board)



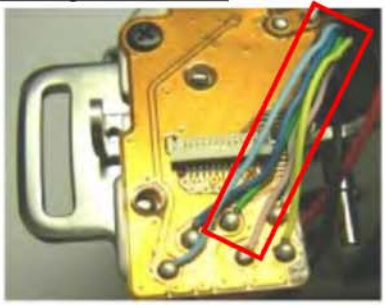
Install right side of camera



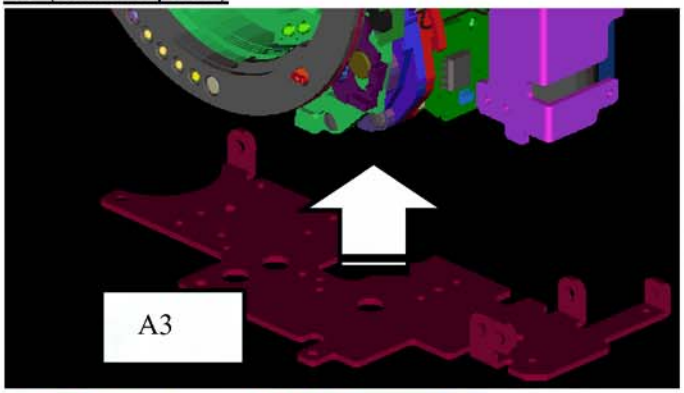


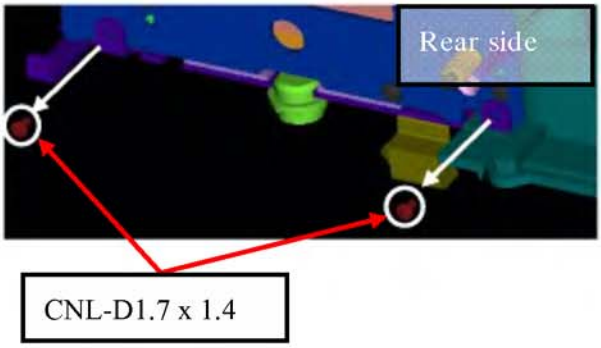


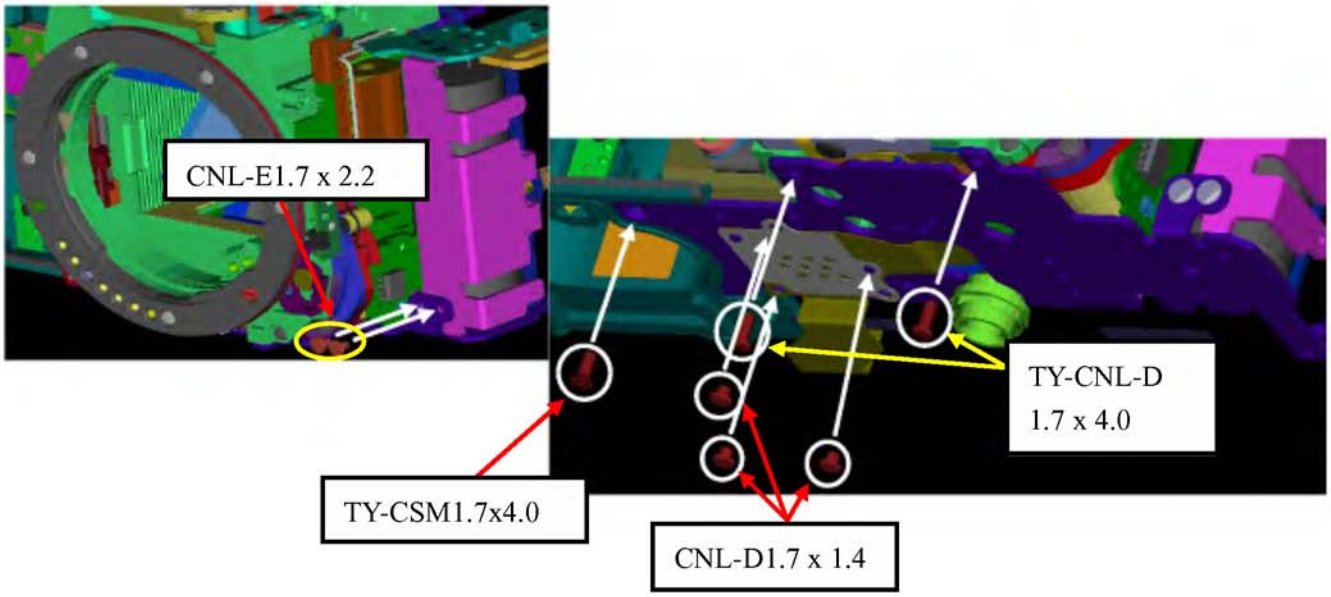
Arrange lead wires

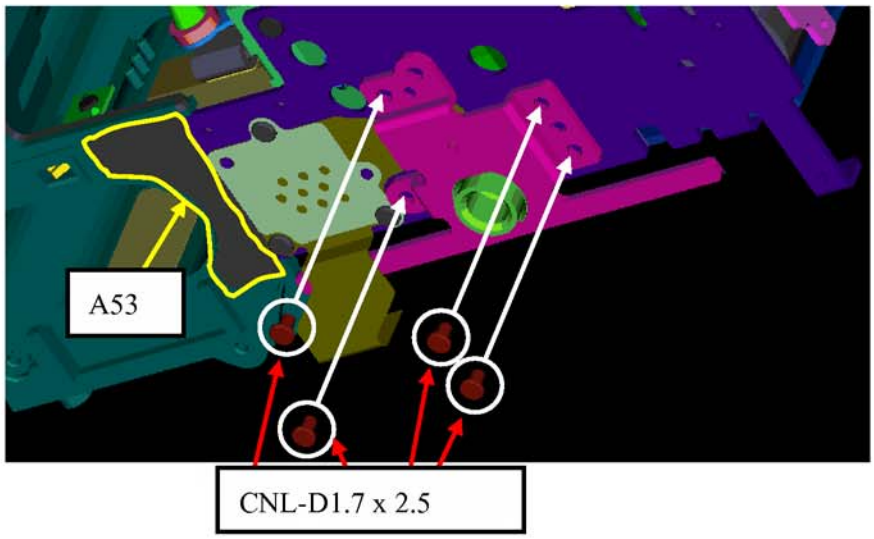


A3 (Bottom plate)



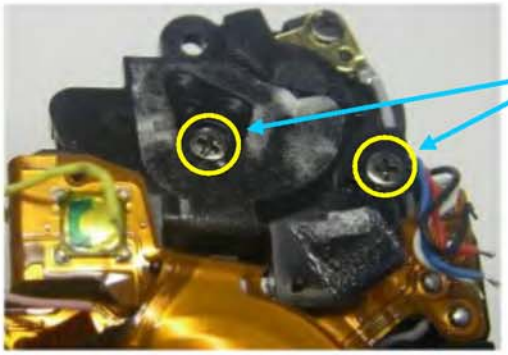






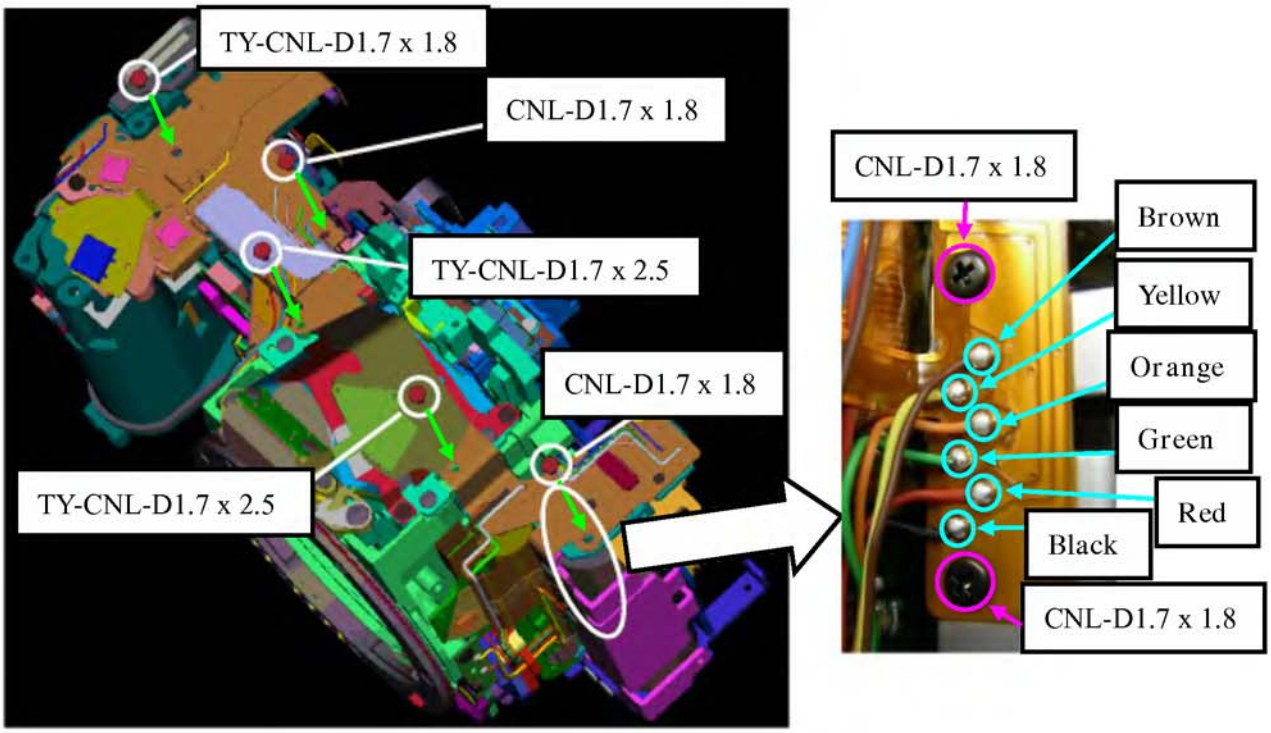
Install 0-A51and
CNL-D1.7 x 2.5 x4
then install A53

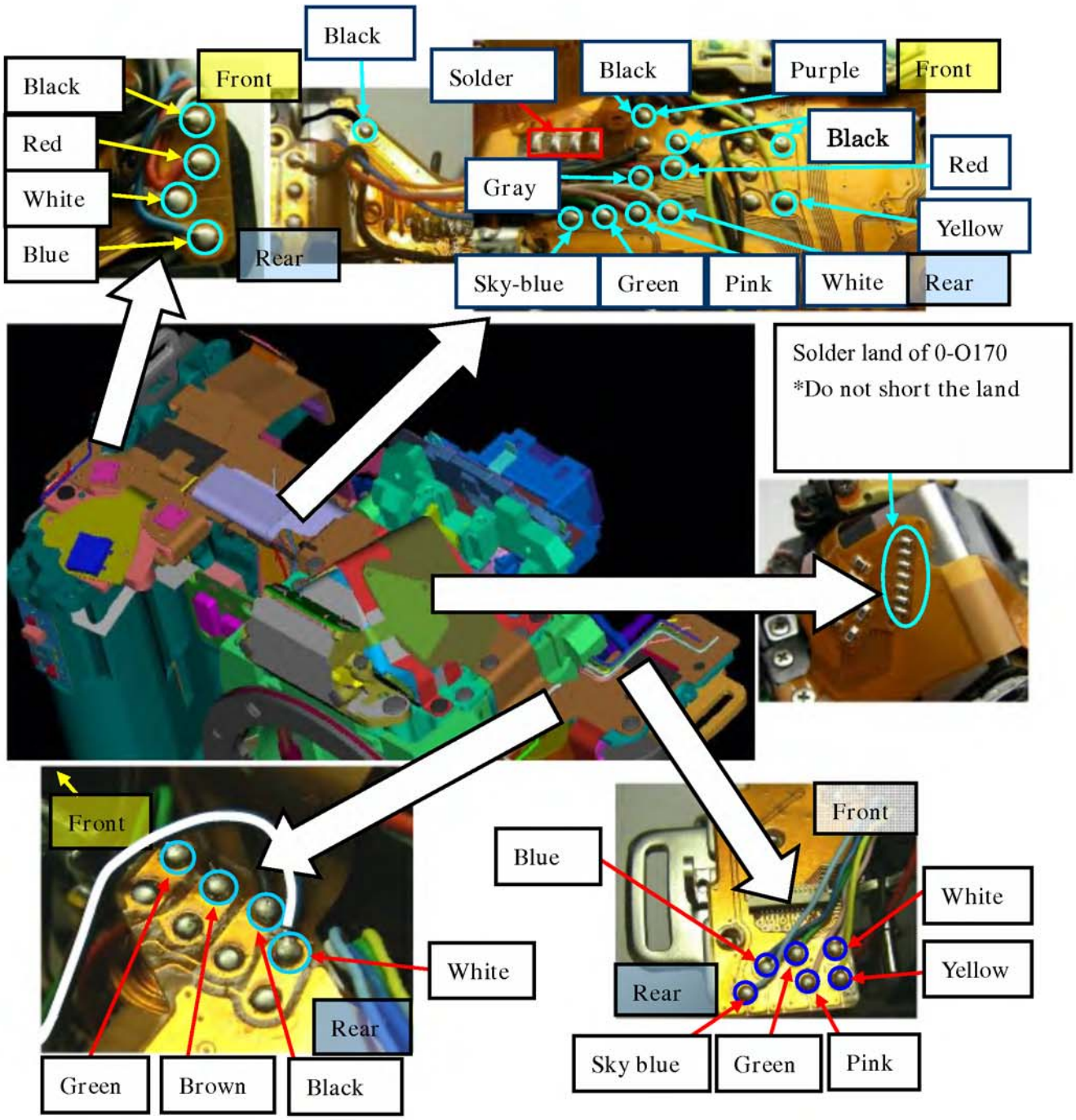
0-T700 (Upper P.C. board A)



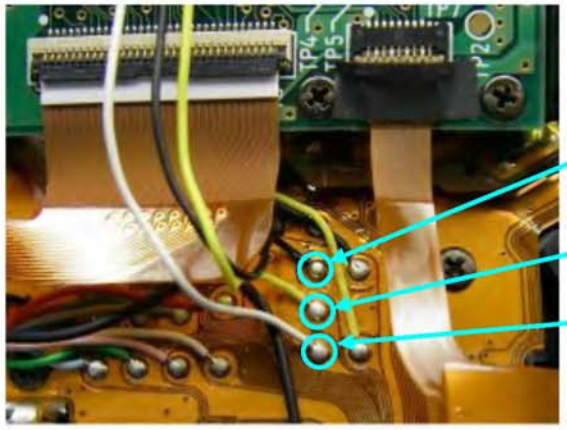
TY-CNL-D1.7 x 4.0

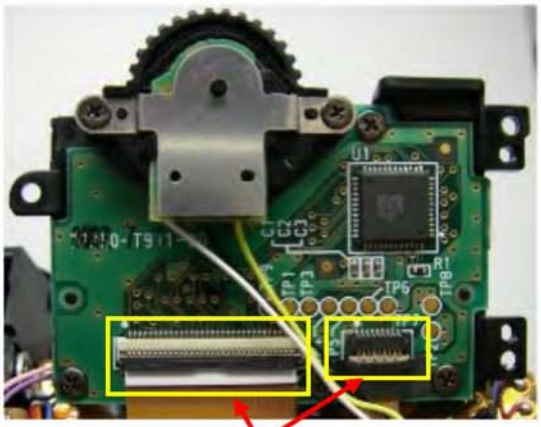
Peel off 0-T700 around shutter button then install screws



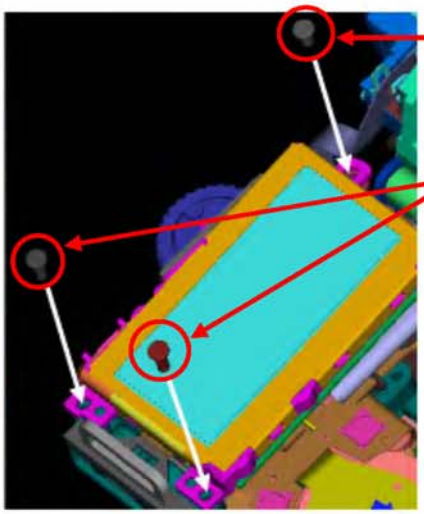


O202 (LCD flame)





Turn 0-O202 upside down then connect two flex



CNL-D1.7 x 3.5

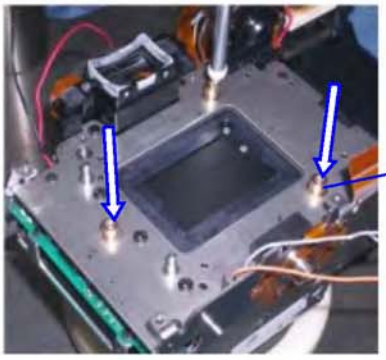
TY-CNL-D1.7x4.0 x4

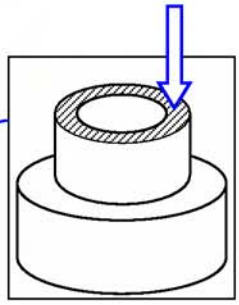
[Adjust and confirm] Height of CCD Base Plate Support Pillar

Required equipment: Block gauge for 35mm, Dial gauge comparator, etc. (same as MZ series)

Measure height of the CCD base support pillar (3 places) from the mount surface as shown in the figure.

	Using gauge
Tolerance (Only 77050)	Using Block gauge for 35mm (45.46mm)
49.45±0.1mm	3.99±0.1mm





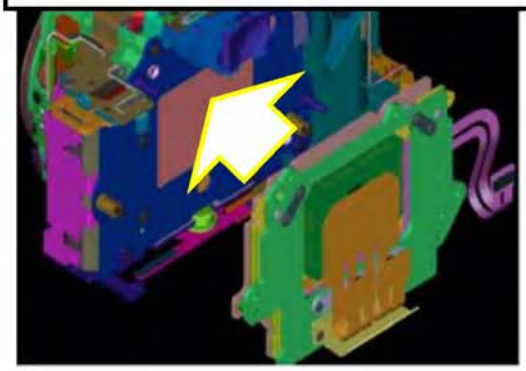
0-C000 (CCD Block assy)

*To prevent the damage of SI-LED, attach mount cover. Then put downward.

[Confirm] Center plate must move up and down and right and left by own weight.

Install 0-C000 to body

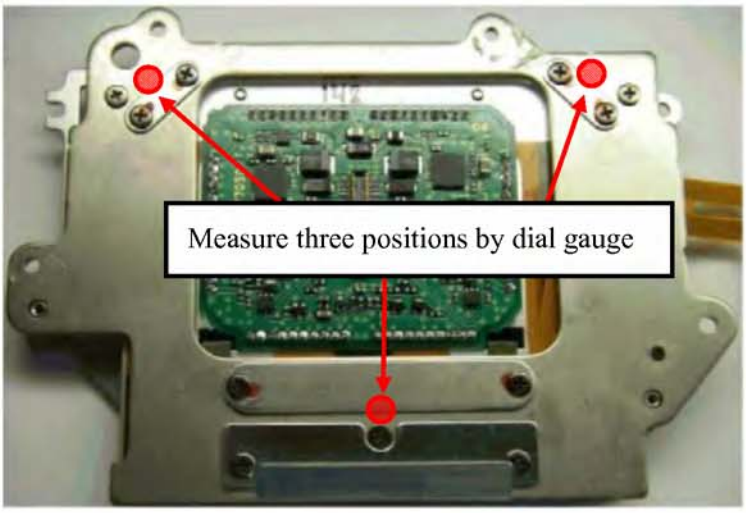
Caution: No gap between pillar and 0-C000



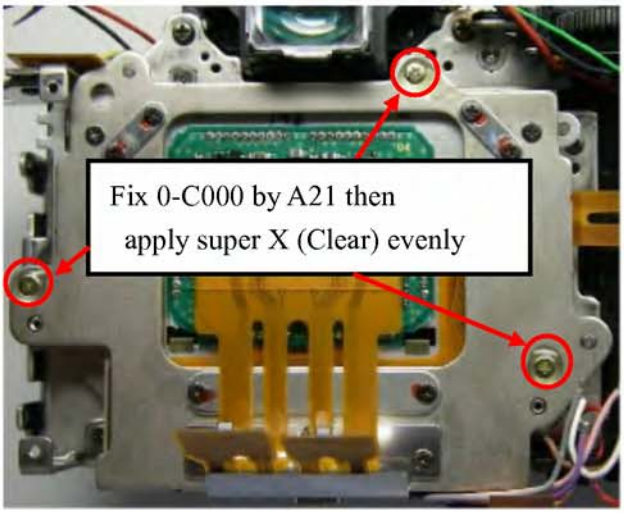
Tighten three screws certainly

[Adjust and confirm] Confirm height of installed CCD block

After install CCD, put dial gauge to the center of red circle as shown in figure then measure height.
Confirm the height should be within tolerance.
If the height is out of the tolerance, try CCD block installation again.

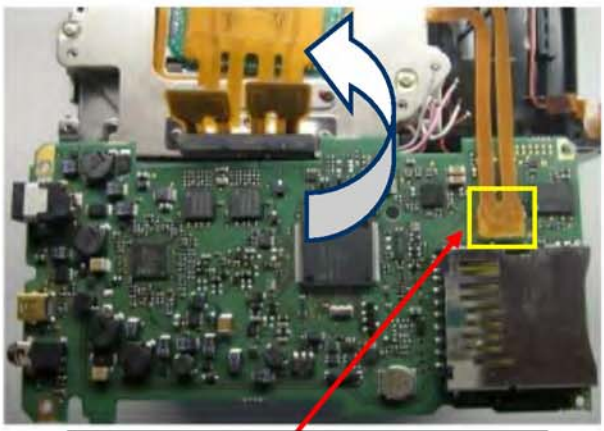


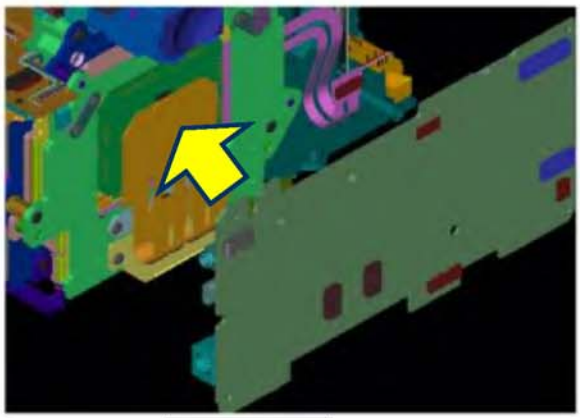
	Using gauge
Tolerance (Only 77050)	Using Block gauge for 35mm (45.46mm)
51.34±0.01mm	5.88±0.01mm

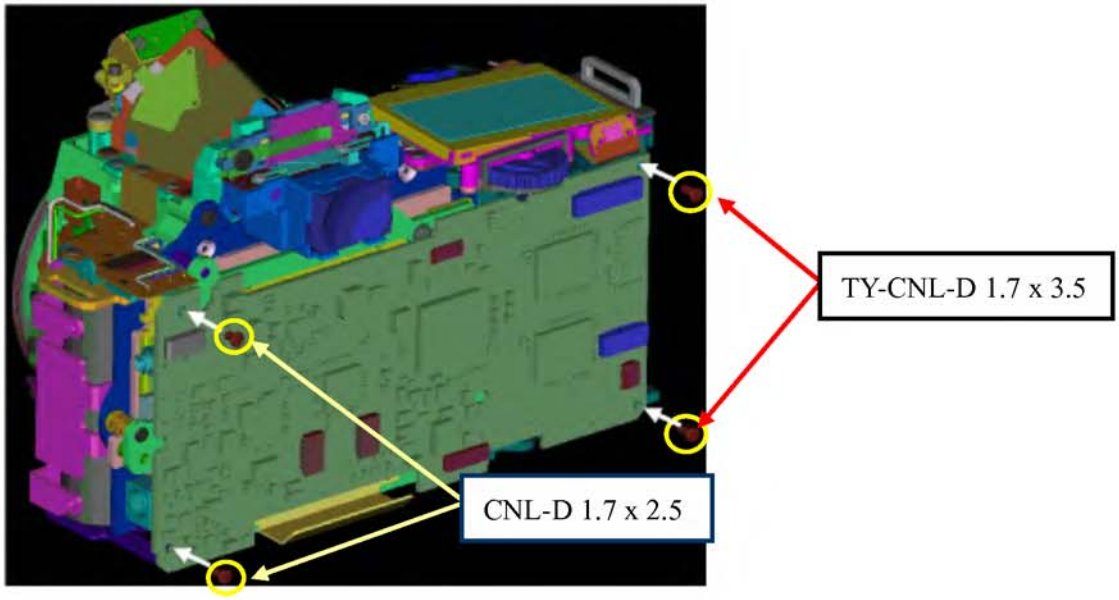


If the height should be within tolerance, apply superX (Clear) as shown in figure.
Caution: Apply super X evenly to certainly fix screw and CCD block

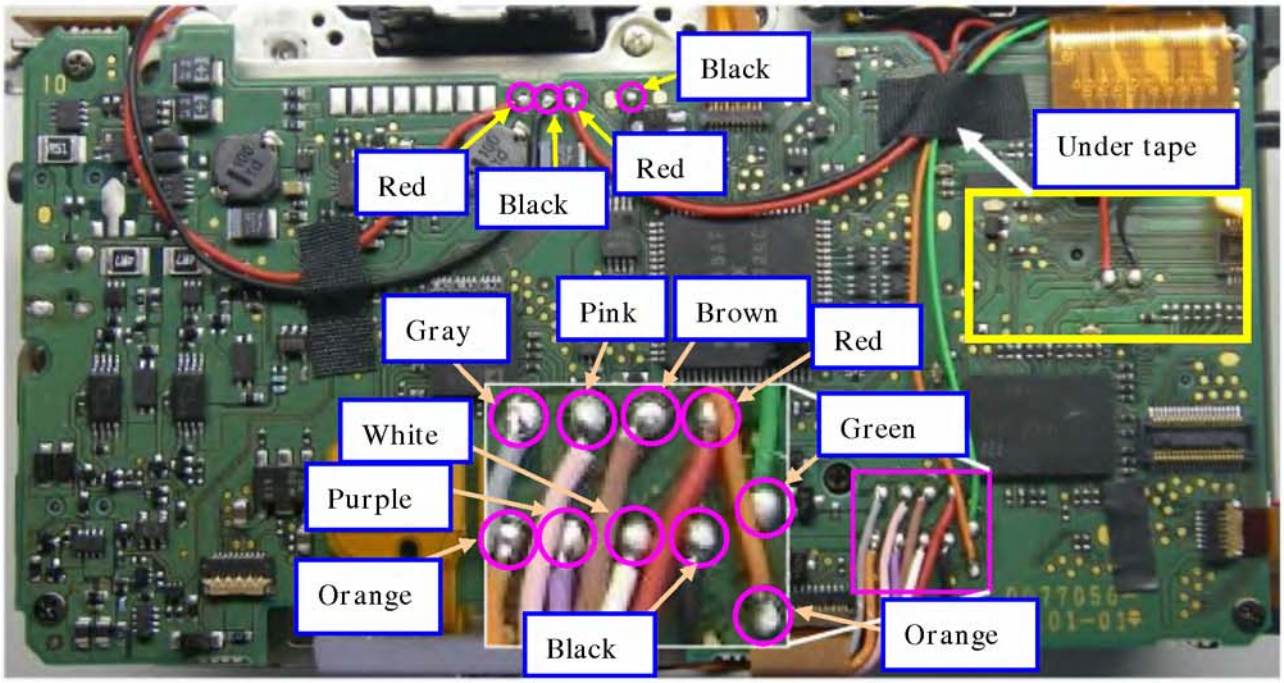
0-T100 (Main P.C.board)



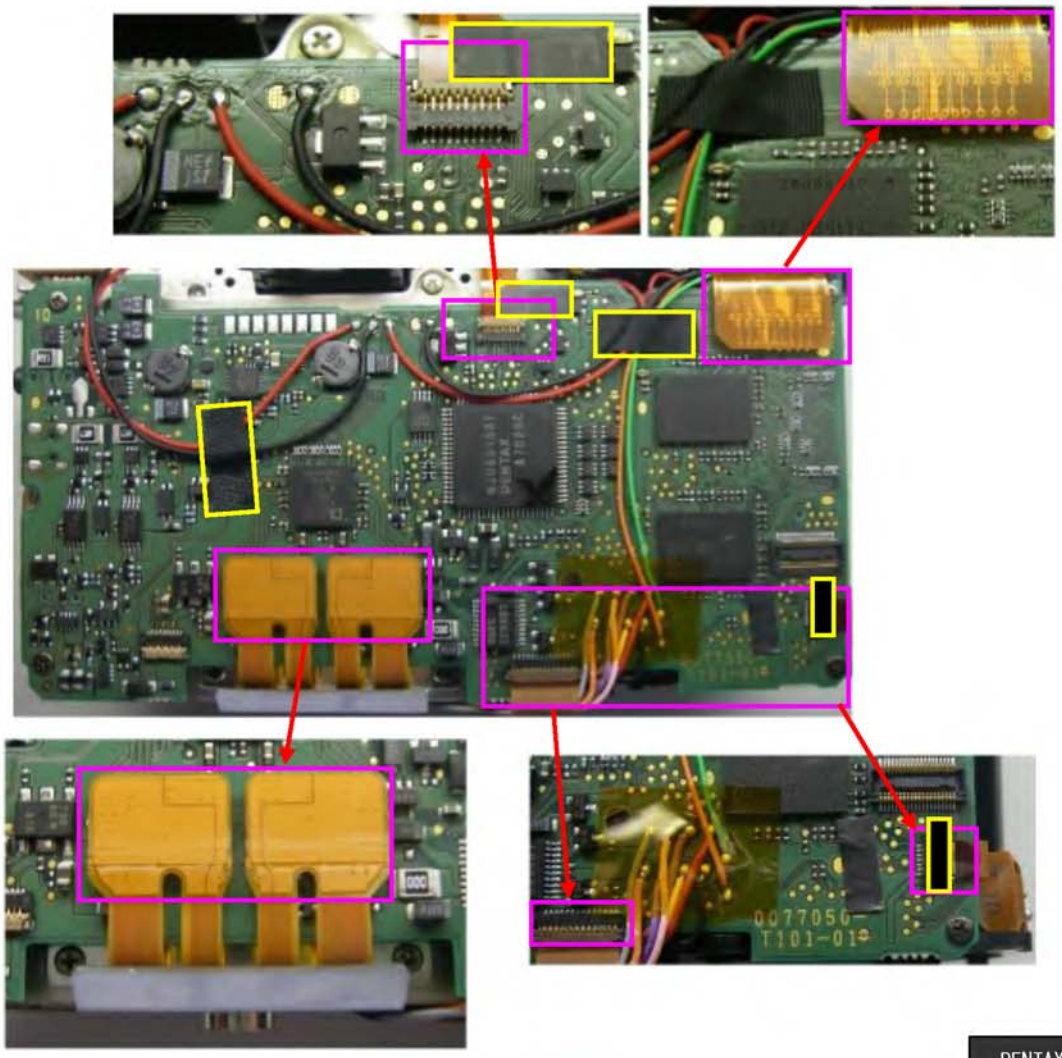




Solder lead wires



Arrange lead wires and put tapes as shown figure below.



Installing FW for replacing T100

[Caution] All setting will be cleared

① Connect the Video cable and AC adaptor to the camera.

② Surely install SD card (FW for replacing T100) to the card slot.

③ TV monitor will be displayed as right Fig.
If you cancel installation, disconnect AC adaptor first then remove SD card.

④ When [>>> EJECT SD CARD <<<] is displayed, remove the SD card.
Installation will be started. It takes approx.90sec. (UPDATING…)
[Caution]Do not turn OFF the power.

⑤ When [POWER OFF] is displayed, disconnect AC adaptor.
*leave the video cable.

Data initialization

[Caution] If execute this initialization, all EEPROM data will be initialized (Cleared)

① Install SD card (For data initialization) to the camera.

② Connect the AC adaptor. (Initialization will be started. It takes approx 20 sec.)

[Caution] Do not turn OFF the power

③ When monitor display is turn off, ("WAIT…" → "COMPLETE…" →)
disconnect the AC adapter.

Install covers

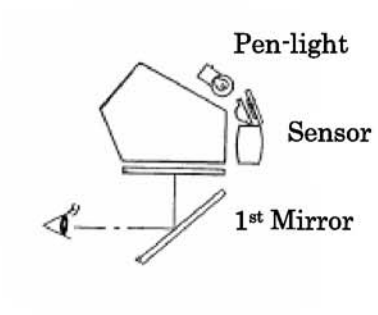
Refer to 2- 6page

[Adjust] Position of 0-J100 (Photo sensor block)

The same as 76700(K100D)

Required equipment: Penlight or equivalent

*Confirm that the mirror seat is downed condition.

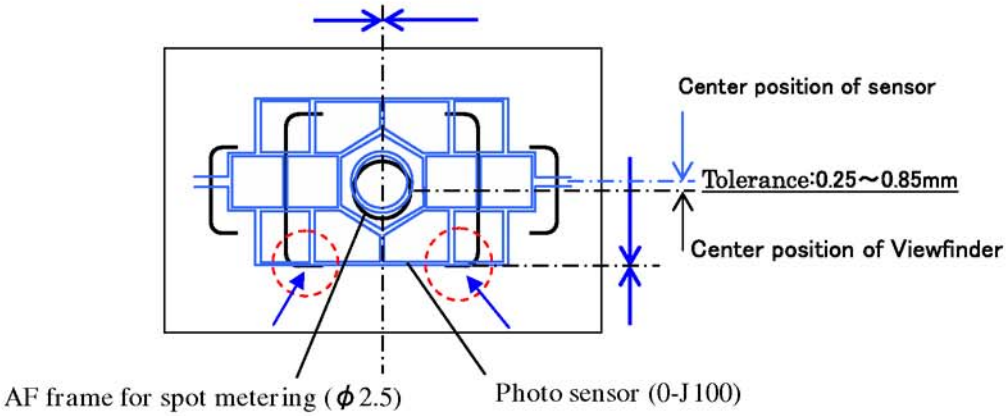


① Cover the eyepiece with a hand or black tape.

② Positioning the penlight 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.

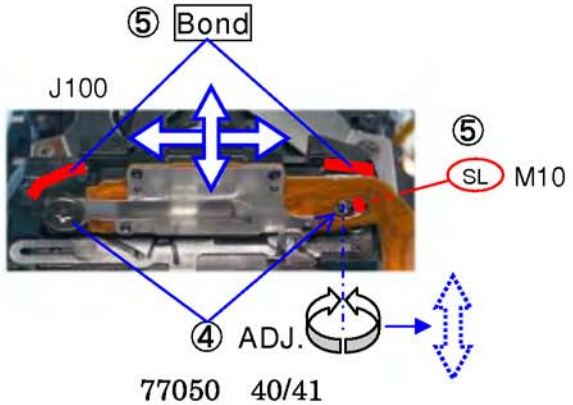
[Ref.] Attaching brighter lens is advisable to assist better visibility. (Ex.: FA 50mm f/1.4 Lens)

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



④ [Adjust] Loosen the screw a little, move M10 (eccentric screw) to left side.
Turn M10 to adjust height of left side, move 0-J100 to adjust whole position (height and inclination).
Tighten screw and ensure position is not changed.

⑤ After adjustment is completed, apply the dia bond to 0-J100 (2 places) and M10 as shown in the figure.



Chapter of disassembly and assembly are over.

For adjustment with using PC, refer to chapter of adjustment