

REPAIR GUIDE

This repair guide section contains the disassembly and adjustment procedures.
For the assembly procedure, follow the reverse procedure.

SYMBOLS

:Cautions and keypoints

G	: Grease
B	: Adhesive
T	: Tool

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Precautions

Chemicals

Handle chemicals of high volatility with care, use of which will affect to your health and environment.

1. Store them sealed in a specific place to prevent exposure to high temperature or direct sunlight.
2. Avoid dividing them into small containers and prevent vaporization.
3. Keep containers sealed when not in use.
4. Avoid using them as much as possible. When required, remove only required amount from the container to make full use.

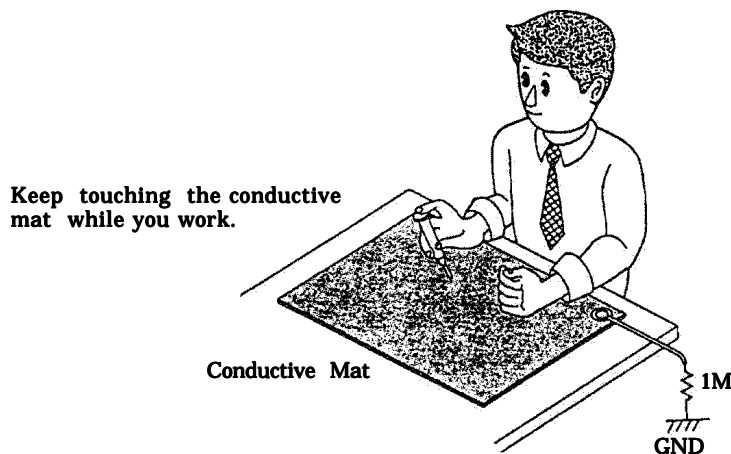
Plastic parts

1. When cleaning plastic parts, use cleaning paper or cloth. Never use thinner, ketone, ether.
2. When installing plastic parts, insert the specific screws vertically to the parts. (Be careful not to tighten too much.

PCBs

Since PCBs use MOS IC, you must reduce static electricity. When repairing a PCB itself, or when wiring, please perform your work as illustrated below.

If grounding is impossible, connect a cable to a steel desk or shelf.



Discharge

Before disassembly, be sure to discharge the main condenser in the following manner. (Fig. 1)

Fig. 1

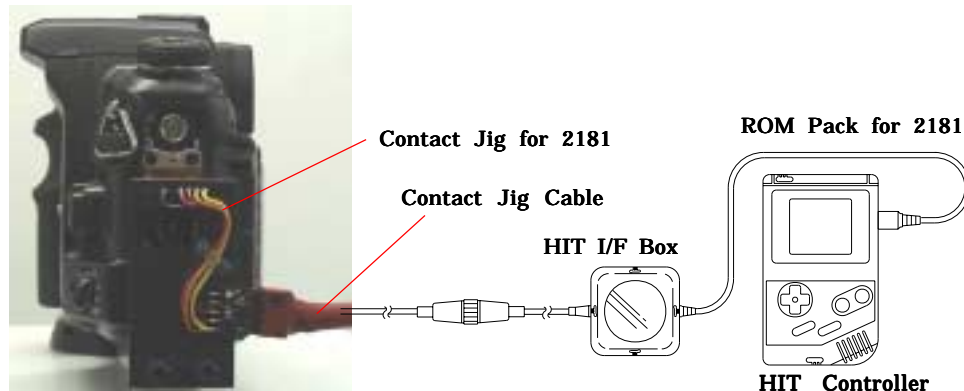
Short-circuit with discharger or resistor of 200-300 ohm/3w.
Check voltage to make sure it is discharged.



To inhibit flash charge

Be sure to make flash charge available after repair.

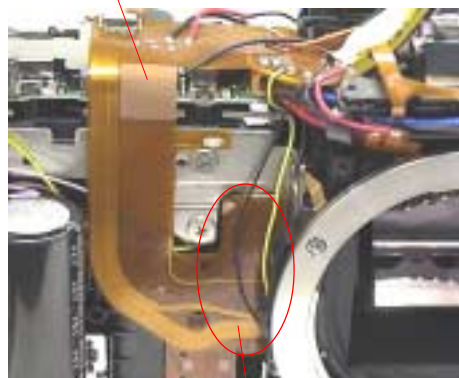
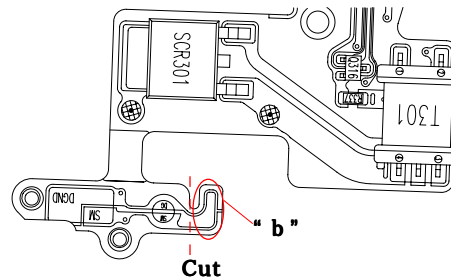
1. Set up the camera as Fig. 2.
2. Select " ASSIST MODE "from main menu and press SELECT Button.
3. Select " FLASH CHARGE ON/OFF "from assist mode menu and press SELECT Button.
4. Press Shutter-Release Button partway down.
5. Press Button-A or -B to select flash charge on/off. And press SELECT Button.
 Button-A: ON (flash charge available)
 Button-B: OFF (flash charge inhibited)
6. Press Shutter-Release Button partway down. HIT Controller beeps.
7. Re-install Battery.
 Select " MENU "and press SELECT Button to return to the assist mode menu.

Fig. 2**To activate without exterior parts**

Short-circuit the pattern -a of I/O FLEXIBLE ASSY with solder.

When using replacement I/O FLEXIBLE ASSY, no need to short these patterns because it has pattern-b.

*Before installing BACK COVER ASSY, be sure to unsolder the pattern-a or to cut the pattern-b.

**" a "****I/O FLEXIBLE ASSY****Connection****Cut**

1. Disassembly of the exterior parts

Disassemble it in order of step 1to 10.

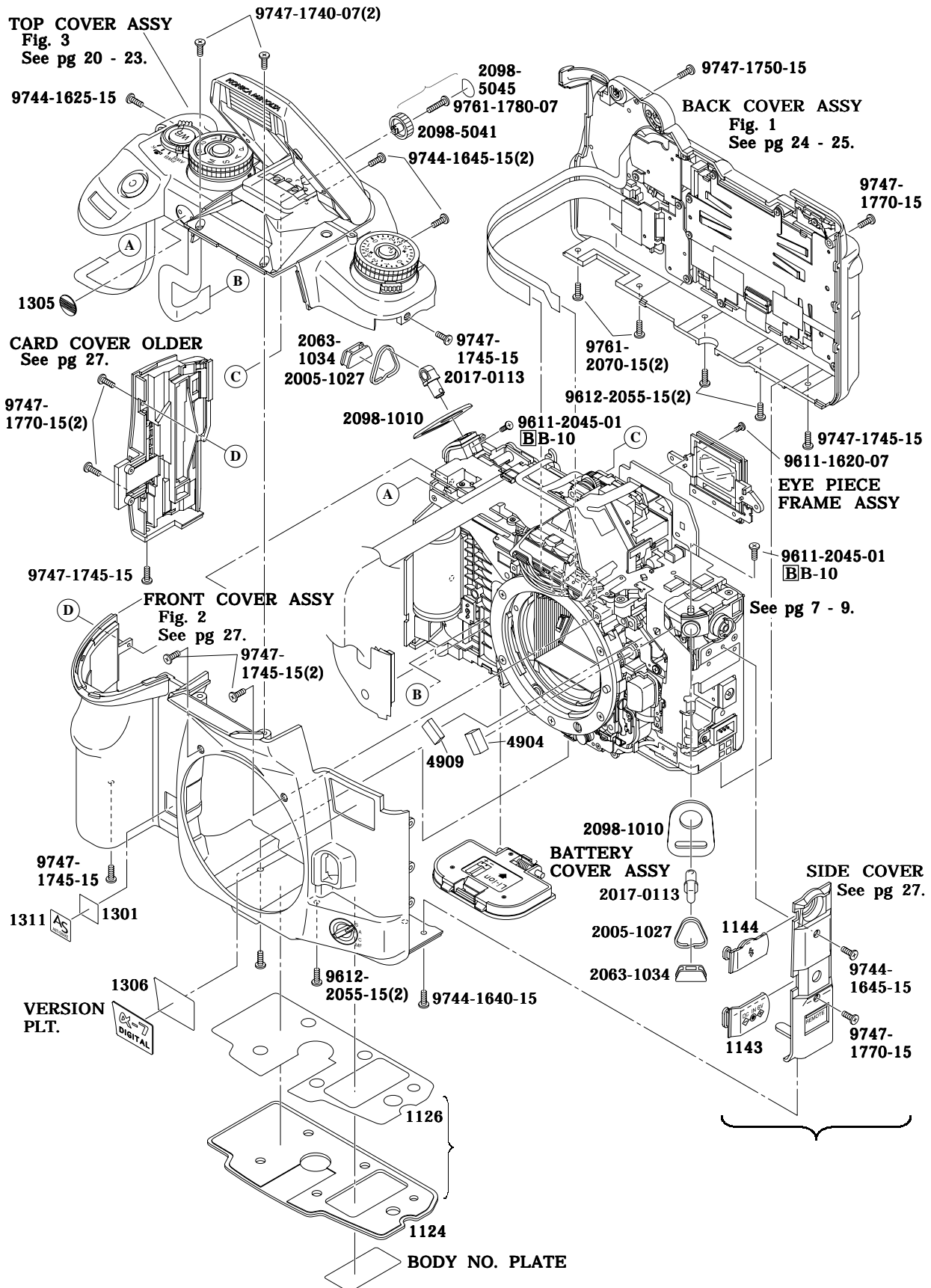
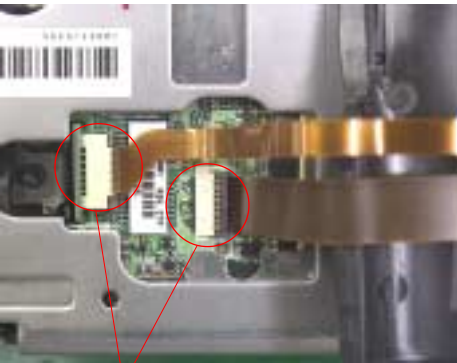
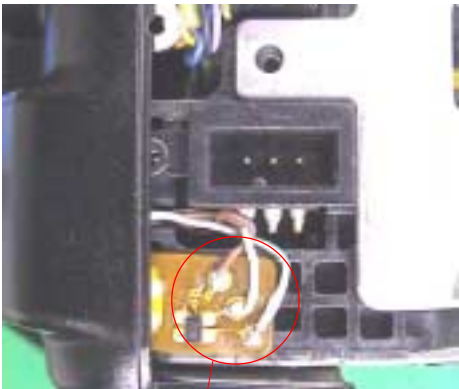


Fig. 1 Removal the BACK COVER ASSY



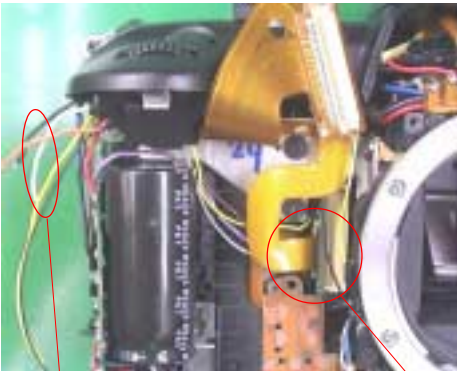
Connector

Fig. 2 Removal the FRONT COVER ASSY

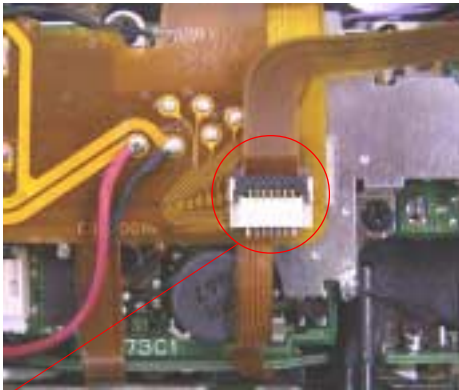


Lead wires

Fig. 3 Removal the TOP COVER ASSY

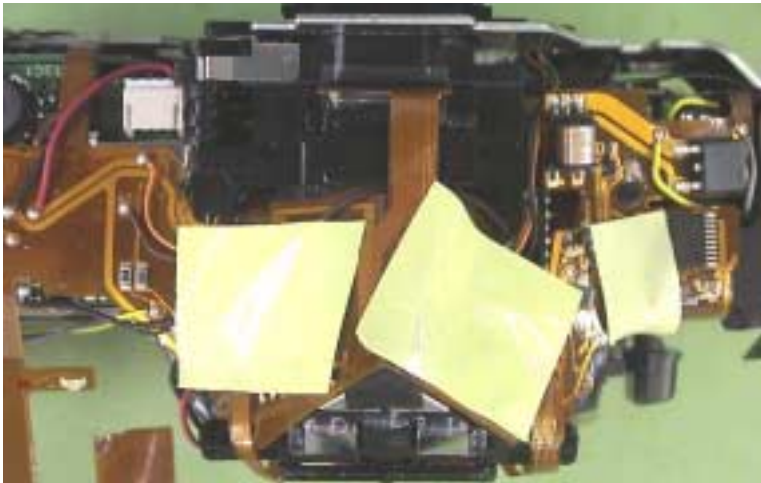


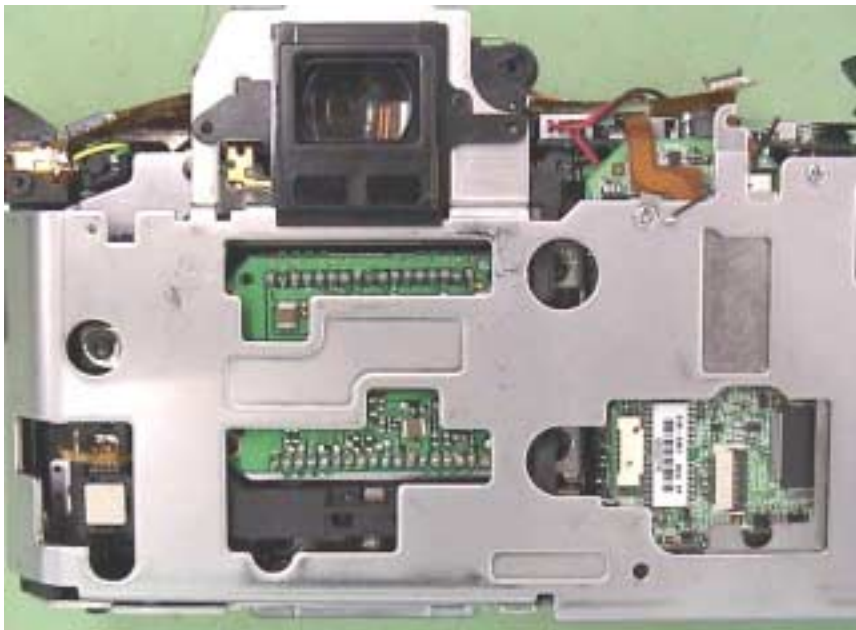
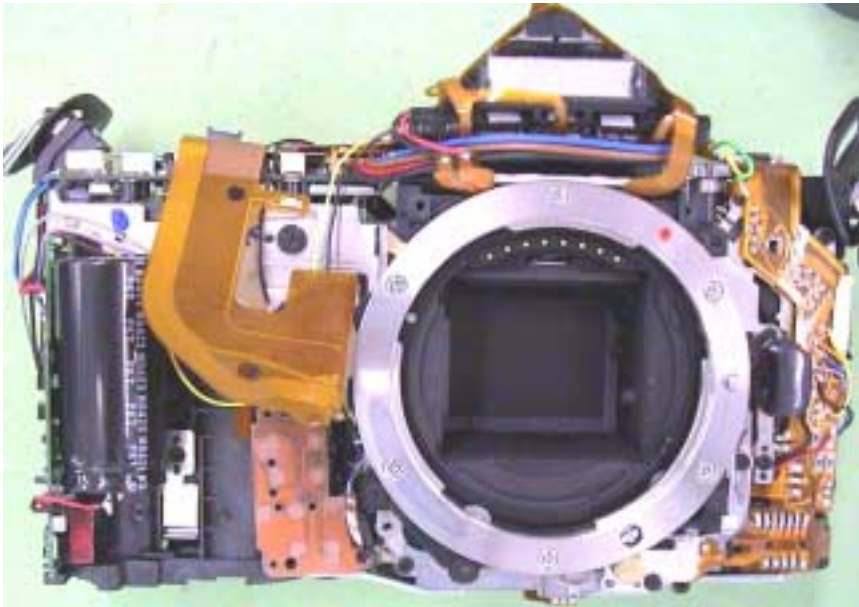
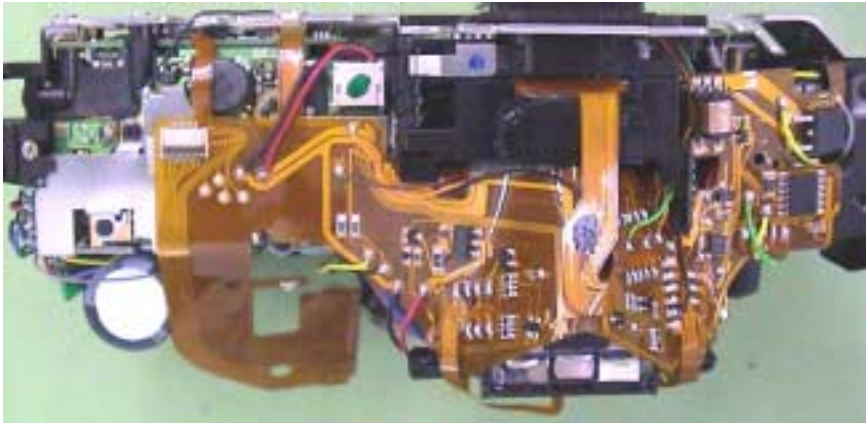
**Lead wires of TOP COVER ASSY
(Black x 2/ White/ Orange/ Yellow)**



Connector

Wires arrangement





When CCD is out of position after replacing CCD ASSY, tighten three AORI ADJ SCREW #2706 until they stop, then evenly loosen them by 3 turns.

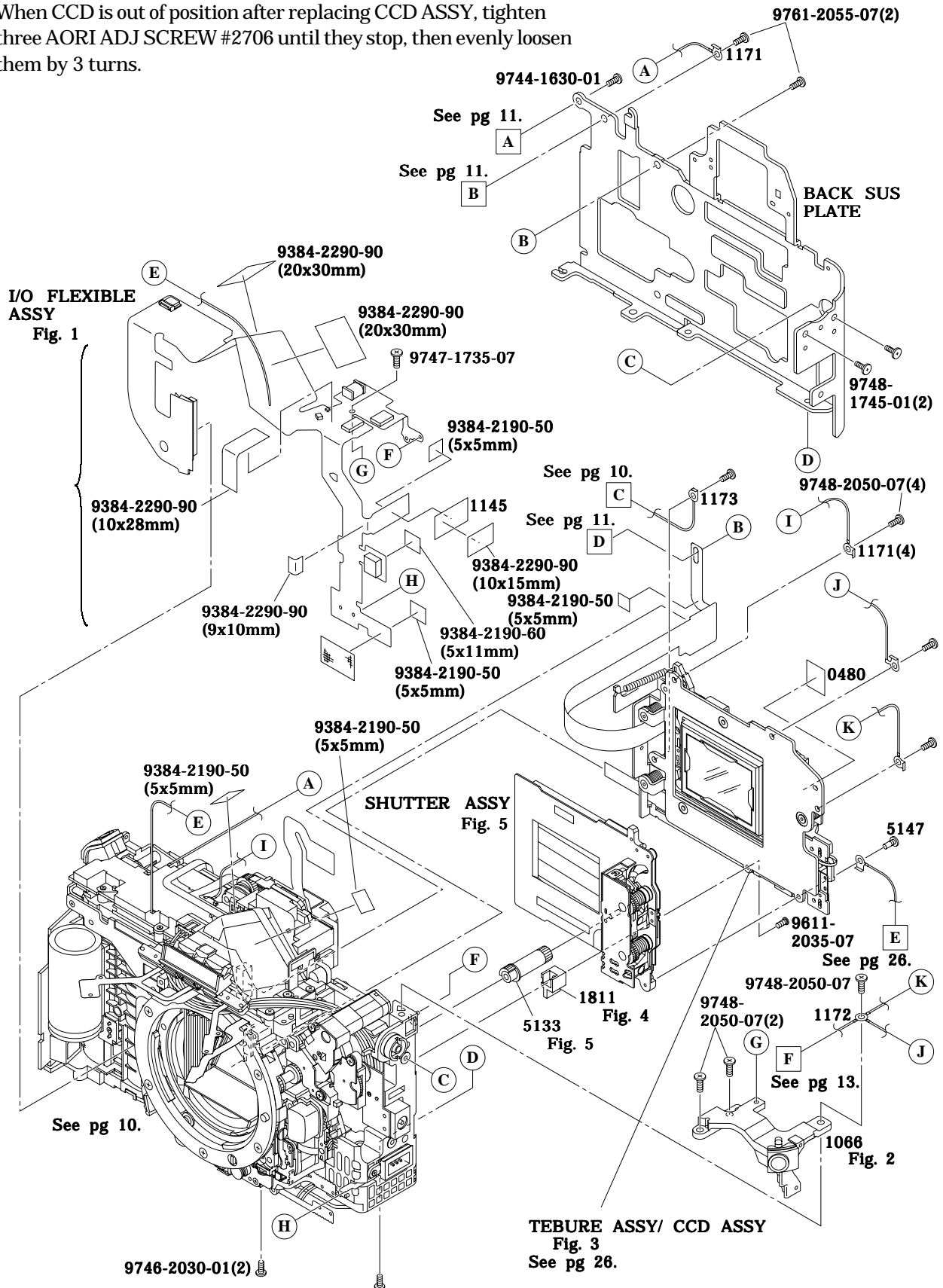
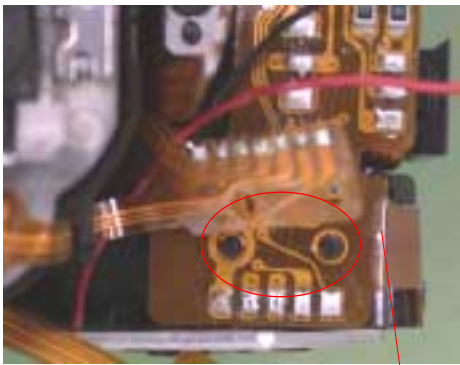


Fig. 1 Removal the I/OFLEXIBLE ASSY



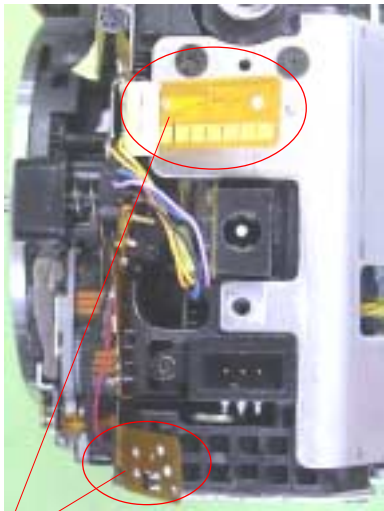
I/O FLEXIBLE ASSY



I/O FLEXIBLE ASSY



I/O FLEXIBLE ASSY



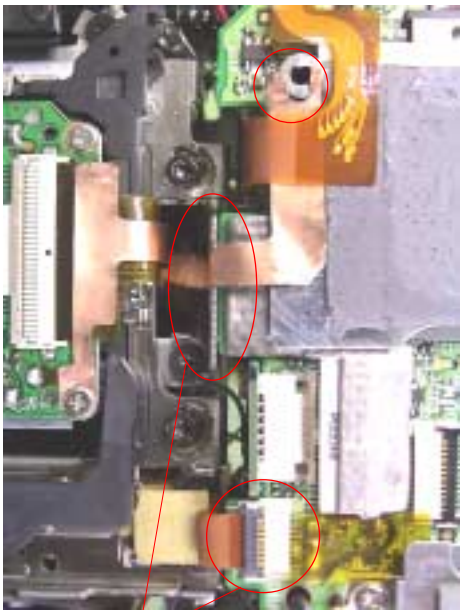
I/O FLEXIBLE ASSY

Fig. 2 Arrange the HARNESS 2



HARNESS 2

Fig. 3 Removal the TEBURE ASSY and CCD ASSY



Connector

Fig. 4

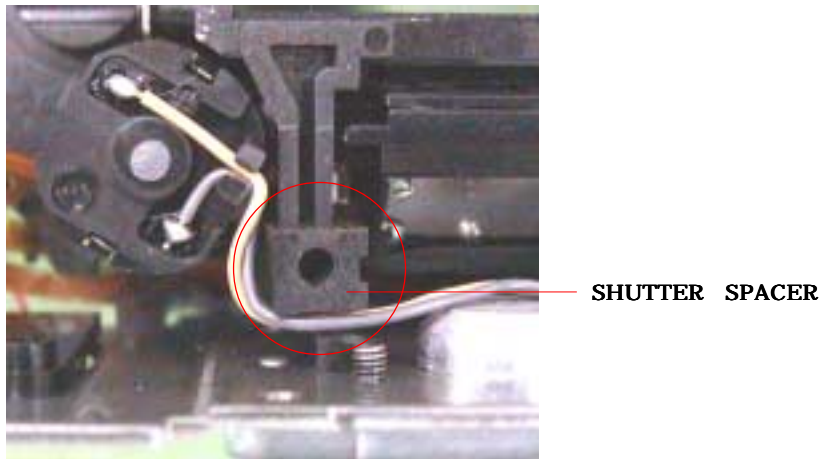
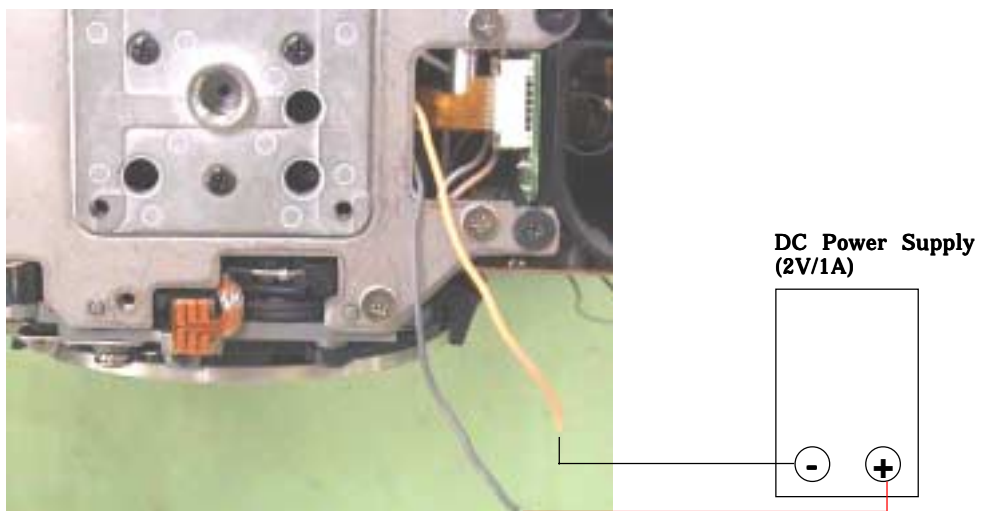


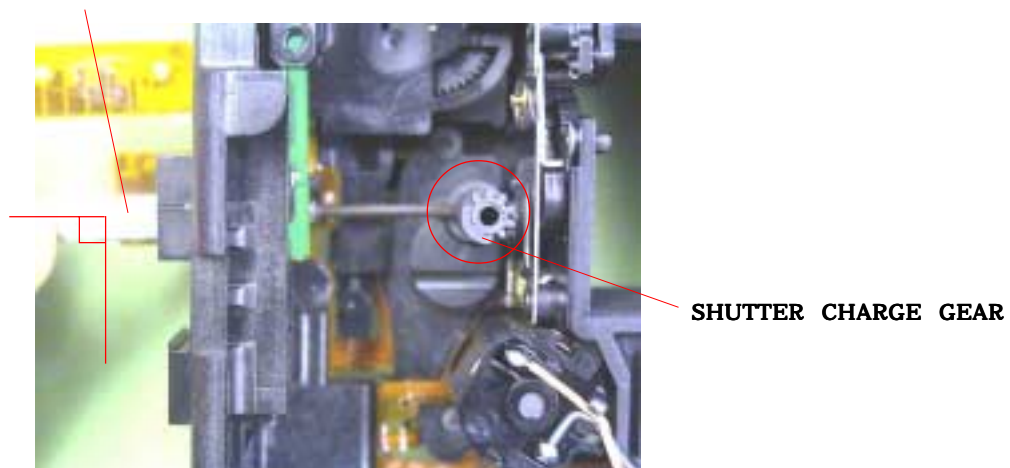
Fig. 5 SHUTTER ASSY Installation

1. Supply power to the charge motor at 2V/1A to drive it normally until the mirror raises completely.



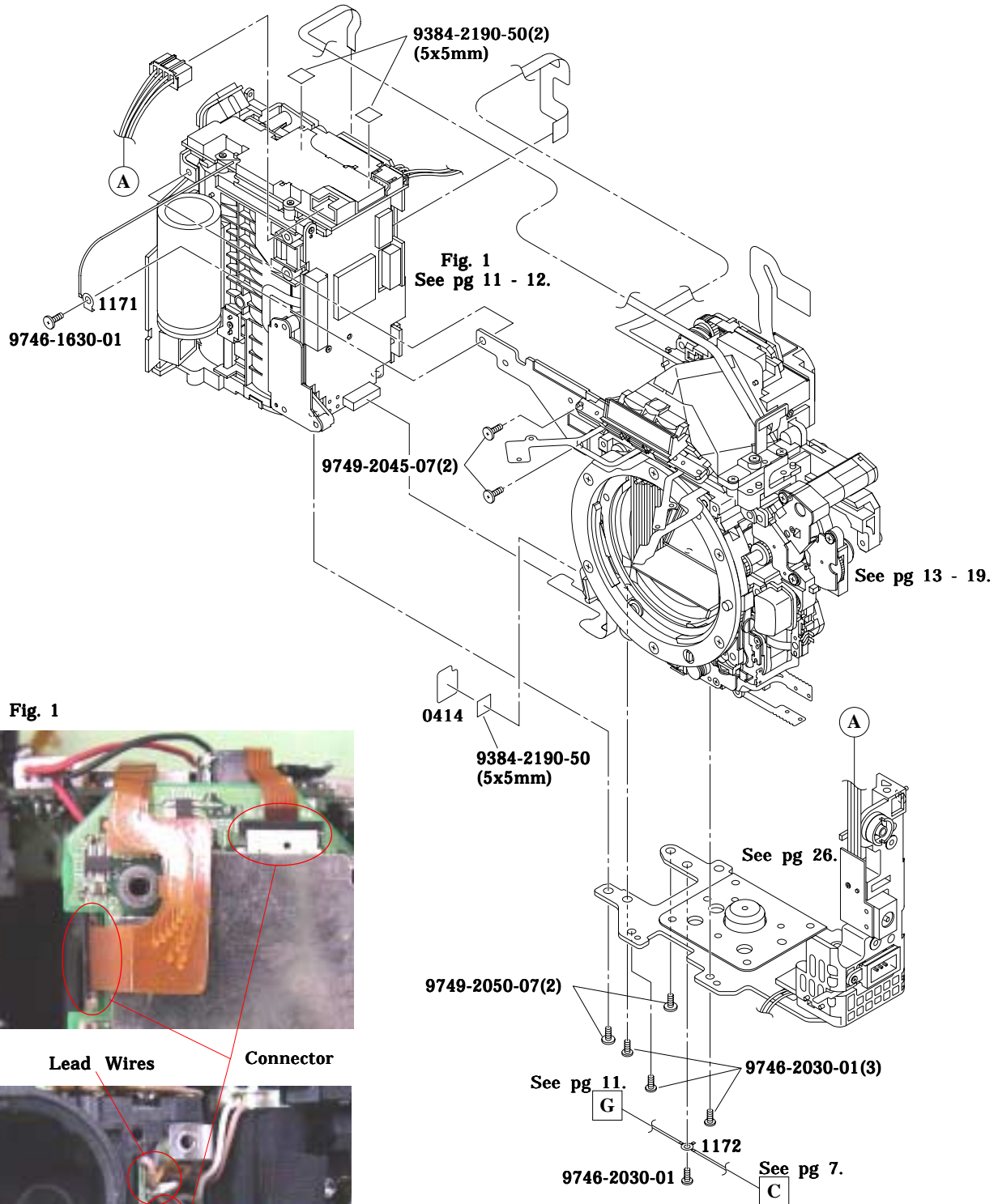
2. Insert screw driver into the hole of "SHUTTER CHARGE GEAR", and put "SHUTTER ASSY" by holding the screw driver at the 90 degrees position shown on the picture.

Driver



3. Disassembly of the MIRROR BOX ASSY, BATTERY HOLDER

Disassemble it in order of step 1 to 3.



4. Disassembly of the IMAGE BOARD ASSY, MAIN BOARD ASSY

Disassemble it in order of step 1 to 11.

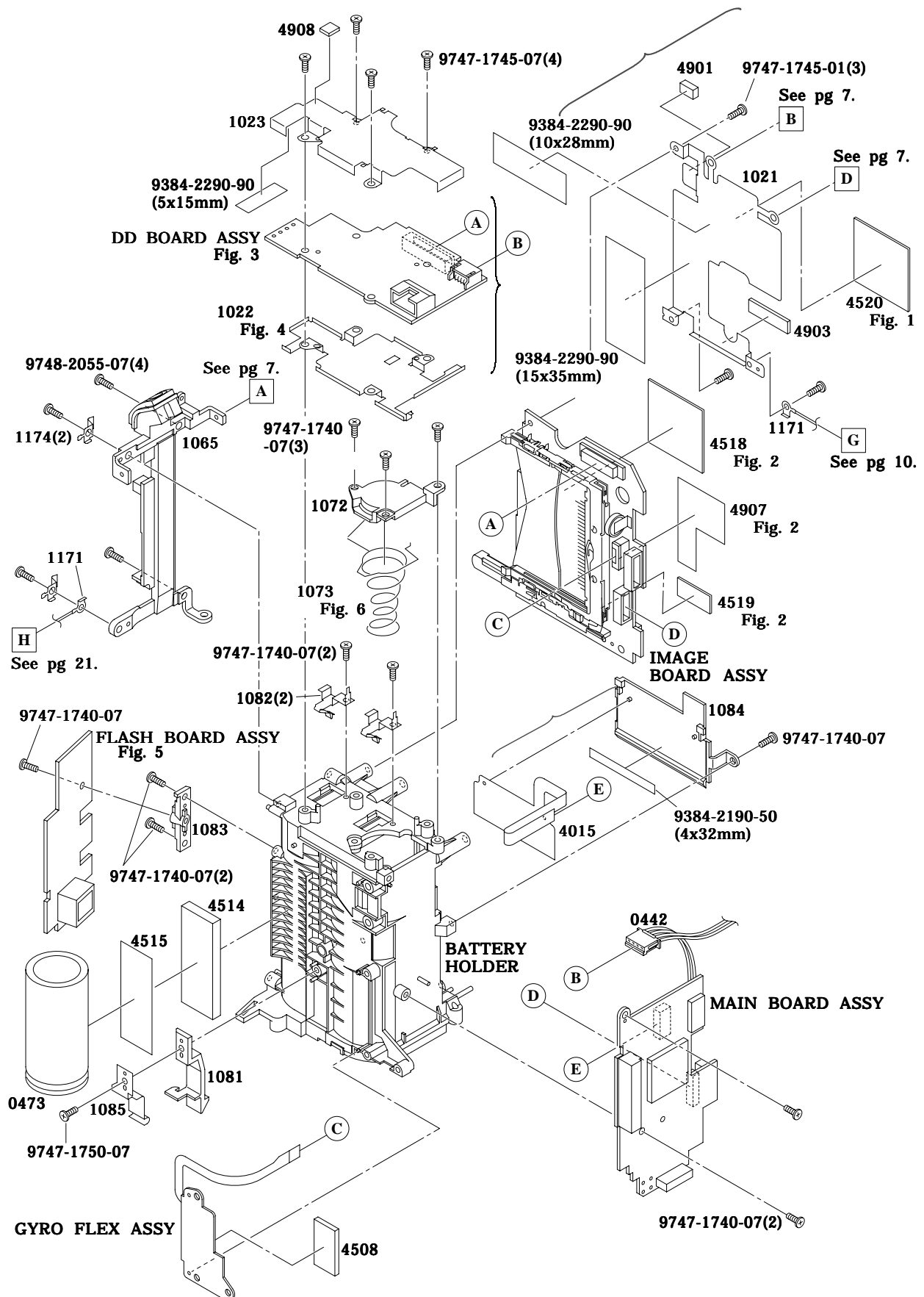


Fig. 1

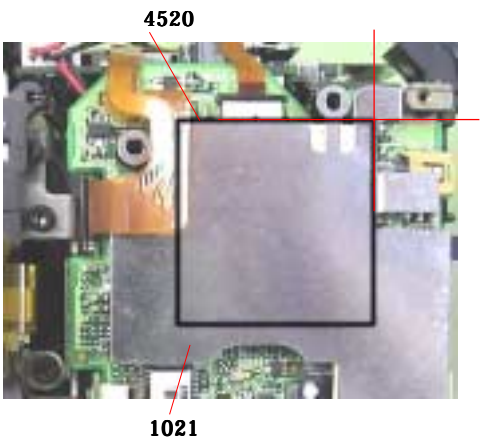


Fig. 2

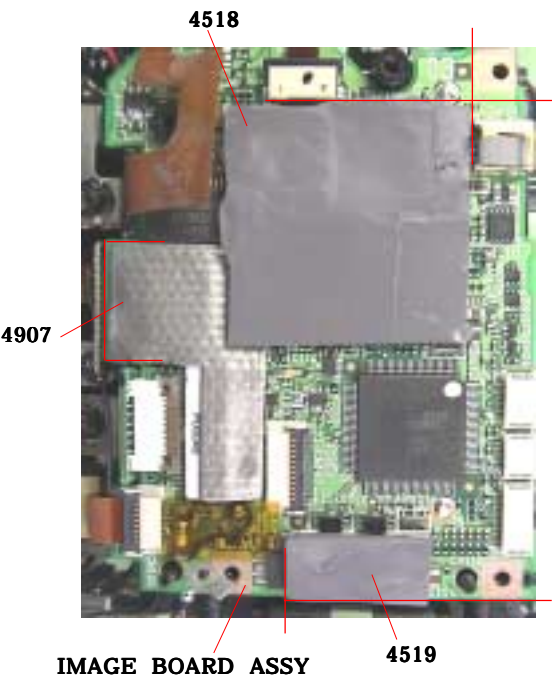


Fig. 3

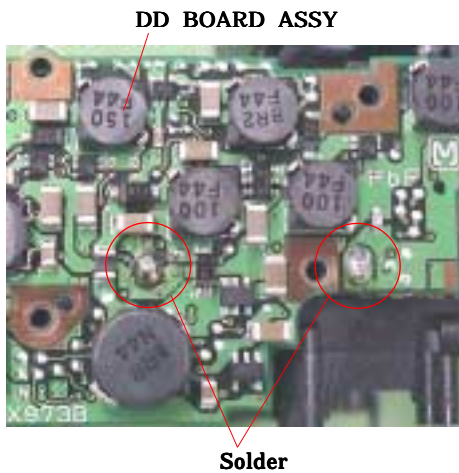


Fig. 4

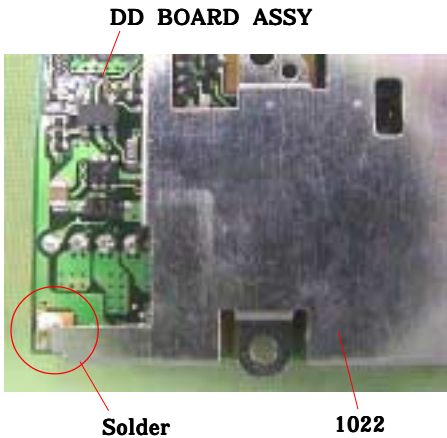


Fig. 5

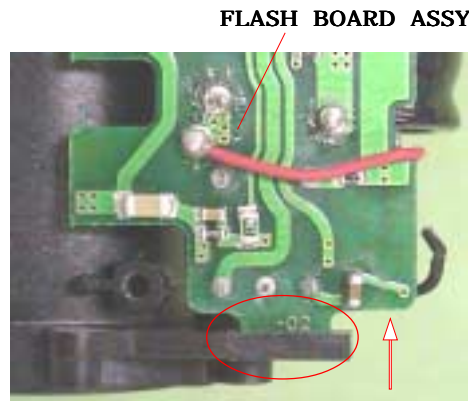
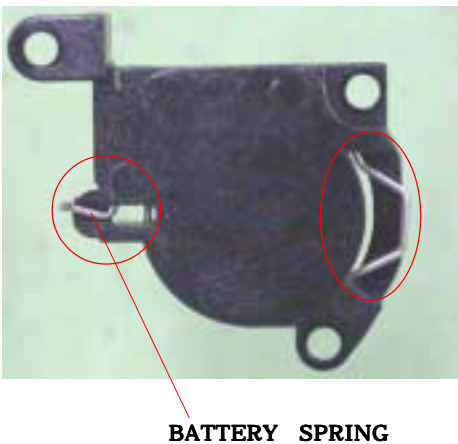


Fig. 6



5. Disassembly-1 of the MIRROR BOX ASSY

Disassemble it in order of step 1 to 9.

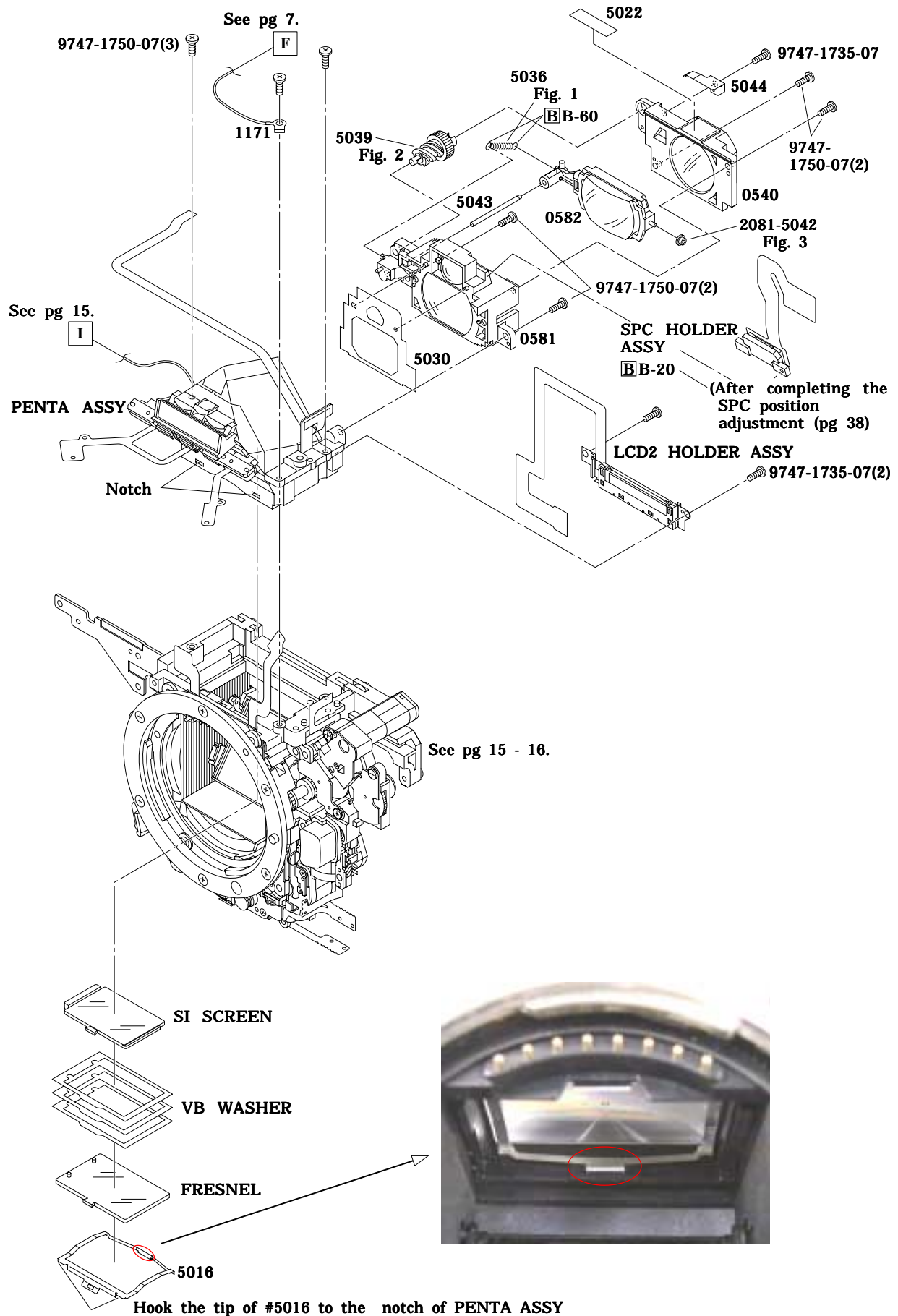
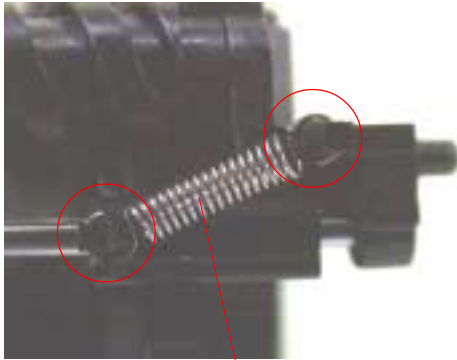


Fig. 1



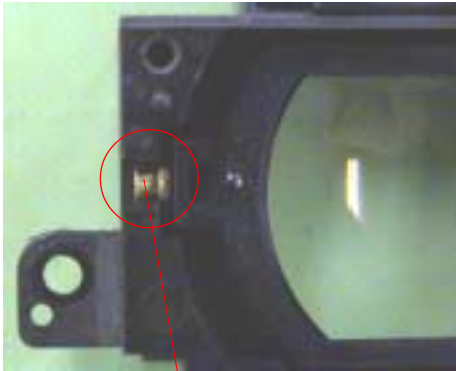
DIOPTER SPRING

Fig. 2



DIOPTER CAM

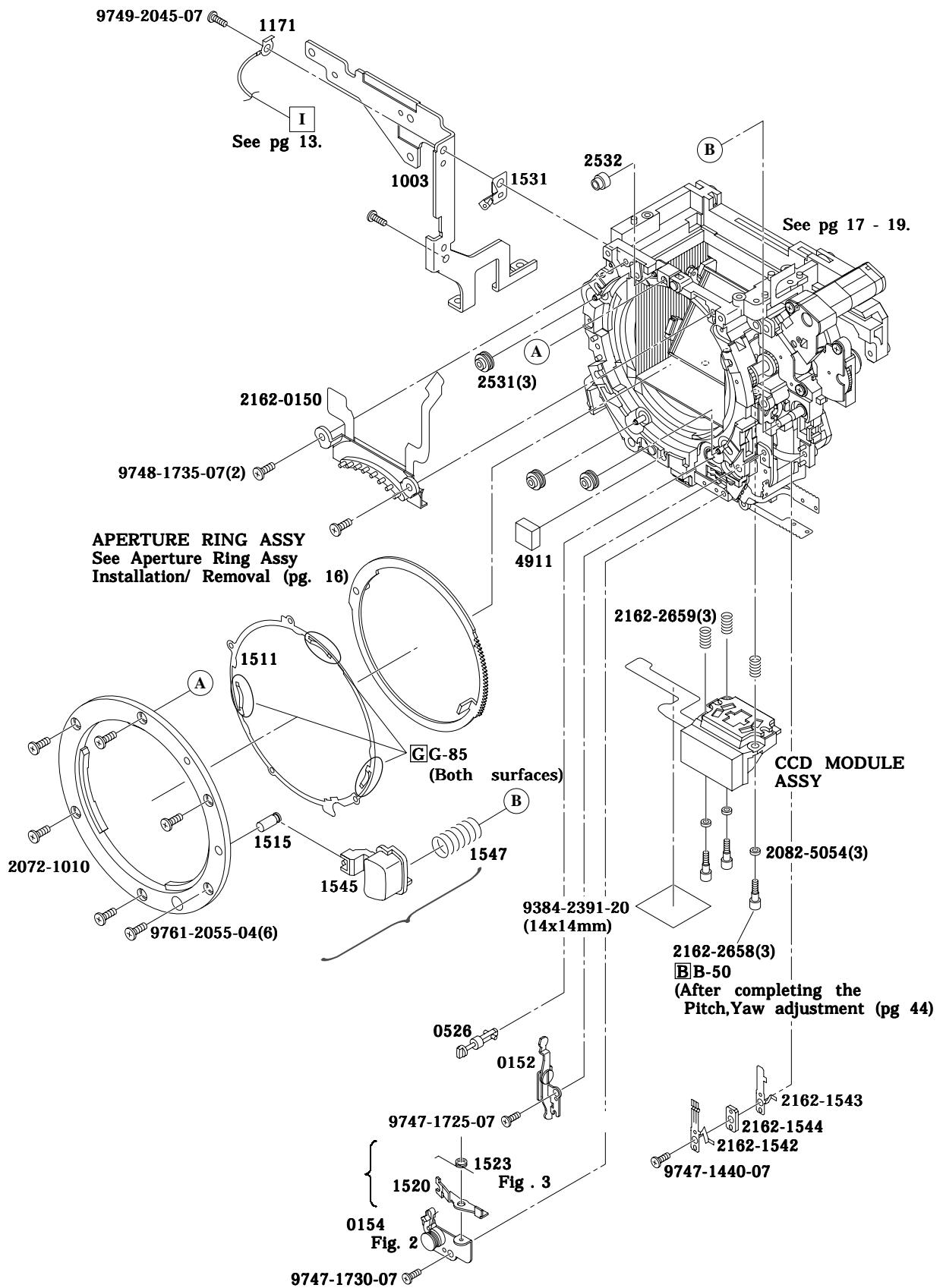
Fig. 3



DIOPTER ADJUSTMENT SHAFT-A

6. Disassembly-2 of the MIRROR BOX ASSY

Disassemble it in order of step 1 to 7.



APERTURE RING ASSY Removal/Installation

Removal

Turn APERTURE RING ASSY clockwise until it stops (Fig. 1). Now the ring can be removed. Be careful not to turn the aperture coupling gear in APERTURE BASEPLATE ASSY.

Installation

1. Set APERTURE BASEPLATE ASSY to the default charge position referring to Charge Position Setting procedure (pg 18.), then install to FRONT FRAME ASSY.
APERTURE BASEPLATE ASSY is at the charge completion position if it has never been removed, or the aperture coupling gear has not been turned after removing APERTURE RING ASSY.
2. Install APERTURE RING ASSY so that the punch mark is positioned as illustrated. (Fig. 1)

Fig. 1

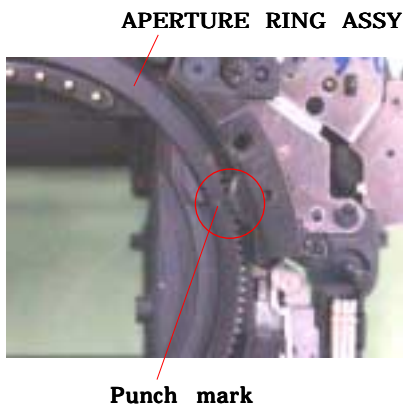


Fig. 2

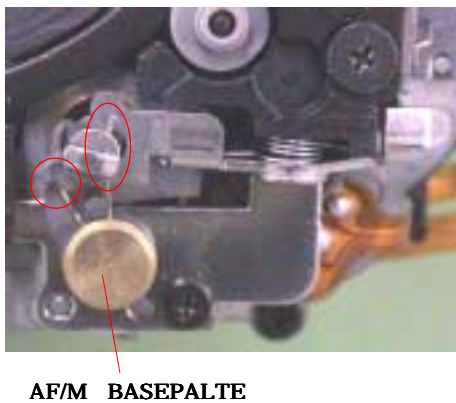
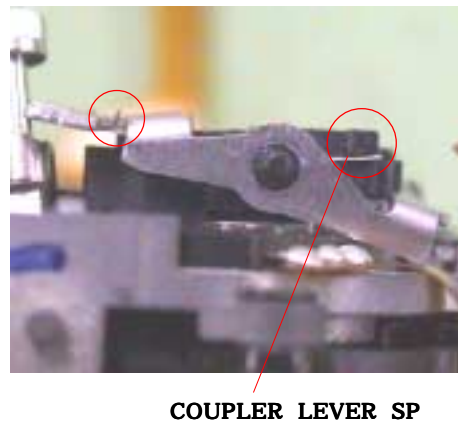


Fig. 3



7. Disassembly-3 of the MIRROR BOX ASSY

Disassemble it in order of step 1 to 8.

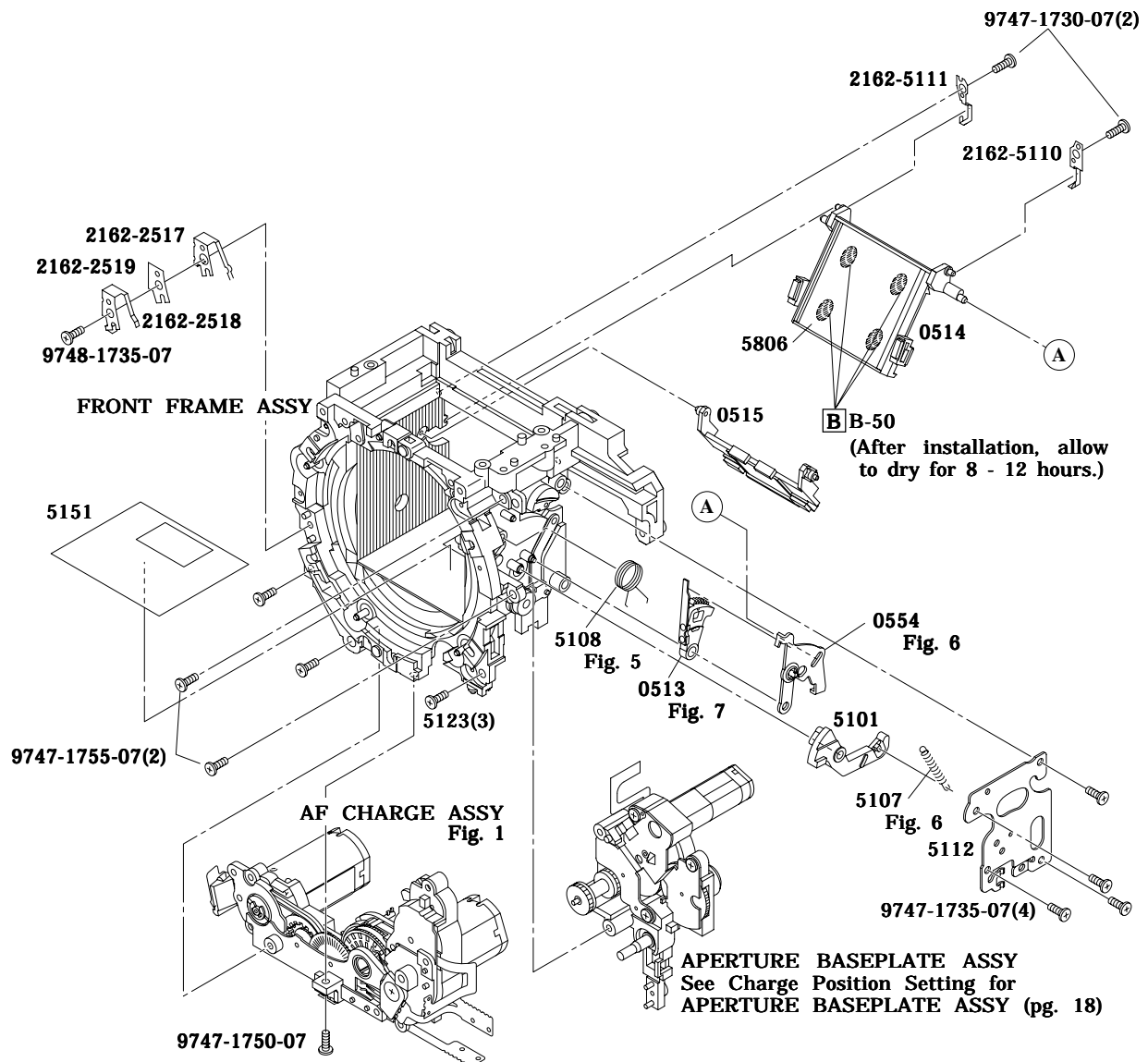
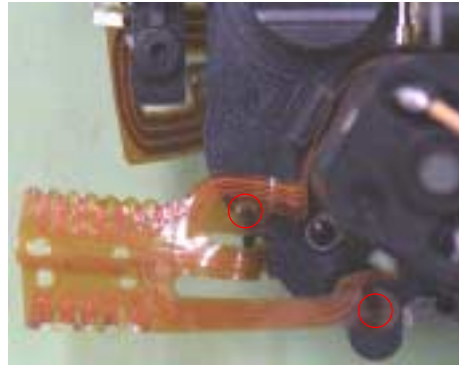


Fig. 1 AF CHARGE ASSY Installation

1. Rotate the designated cam-gear in arrow direction while keep pushing the lever against it until the lever descends down to the lowest.
2. Arrange the flexes.



APERTURE BASEPLATE ASSY Setting

Firstly confirm APERTURE BASEPLATE ASSY is at the default position (Spare parts are supplied at the default position) then set the charge position before installation.

Default Position Check/ Setting

1. Confirm on which side ("a" or "b" in Fig. 2) in the square opening (of APERTURE BASEPLATE ASSY) the spring leg lies.
2. Turn the aperture reduction gear in the direction opposite to the spring location ("a" or "b" in Fig. 2) until the spring leg moves over to the other side.
e.g. IF the spring lies at "a" in Fig. 2, turn the gear toward "a" in Fig. 2.
3. With the above condition, turn the aperture reduction gear slightly until its through hole aligns with the through hole of the aperture baseplate-B (Fig. 3). This is the default position.

Charge Position Setting

1. Make sure that APERTURE BASEPLATE ASSY is set to the default position.
2. Charged position of APERTURE REDUCTION GEAR
 - a) View from the front of APERTURE BASEPLATE ASSY.
 - b) Turn APERTURE REDUCTION GEAR to counterclockwise direction 3 times and turn additional 120 degrees to the same direction and then "-" sign is appeared on the APERTURE REDUCTION GEAR. APERTURE REDUCTION GEAR is set to charged position. (Fig. 4)

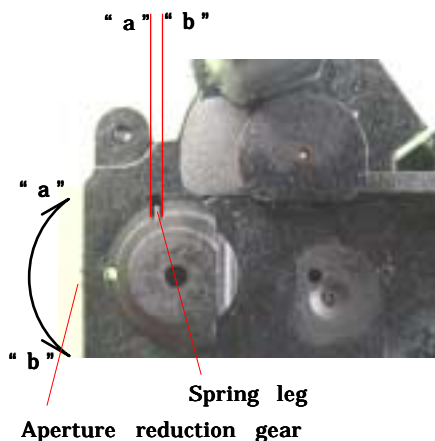
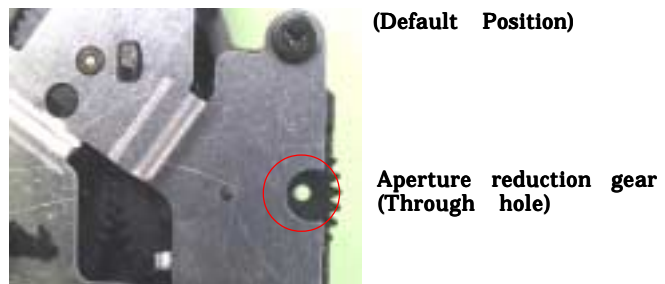
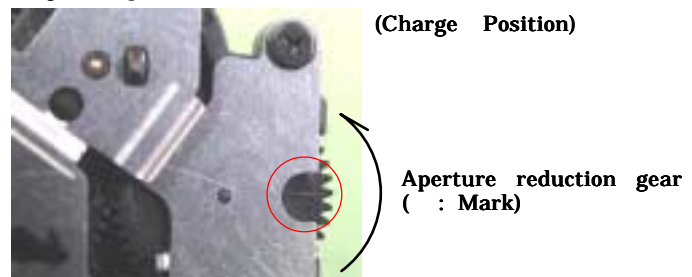
Fig. 2 Bottom**Fig. 3 Top****Fig. 4 Top**

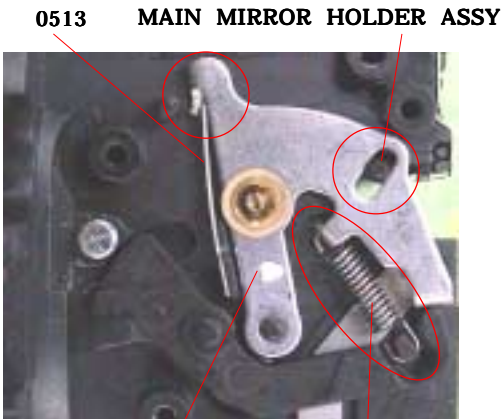
Fig. 5



5108

MIRROR DRIVE LEVER

Fig. 6



0513

MAIN MIRROR HOLDER ASSY

5107

MAIN MIRROR DRIVE LEVER ASSY

Fig. 7



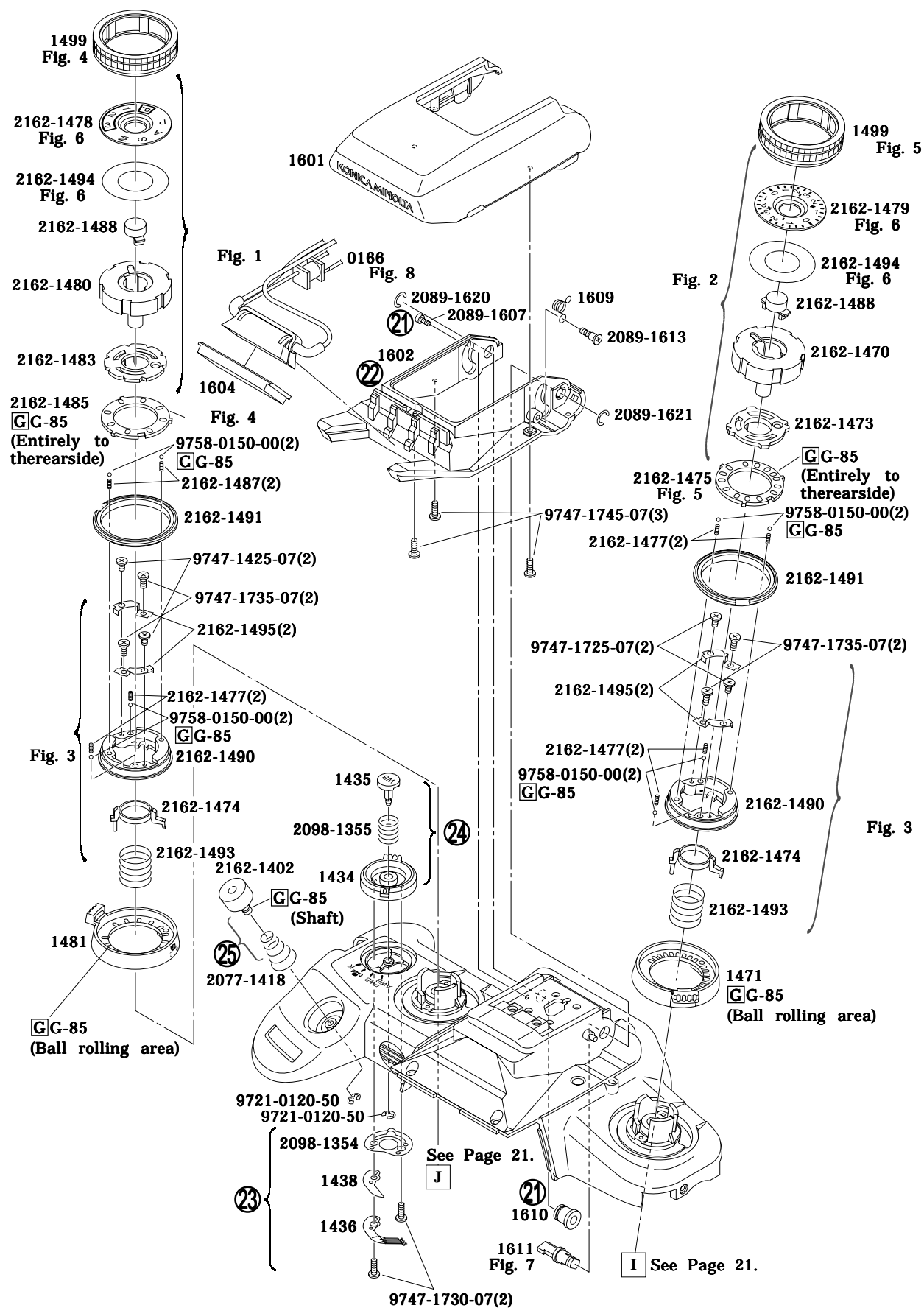
Mark

MAIN MIRROR HOLDER ASSY

0513

Disassemble it in order of step 1 to 26. (Continued to the next page)

Disassemble it in order of step 1 to 26. (Continued to the next page)



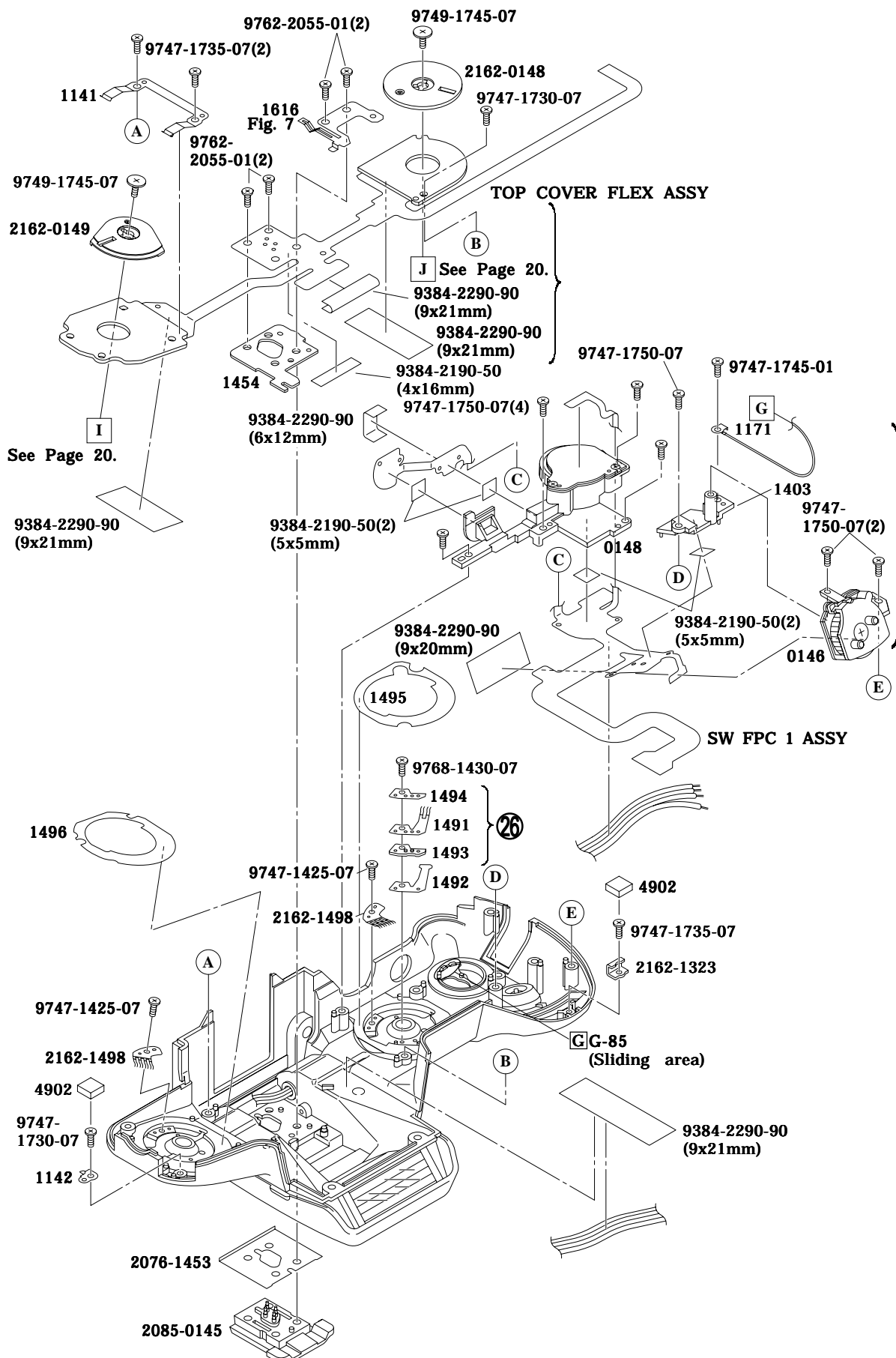


Fig. 1

Fit part-a of #2162-1474 between the longest legs of #2162-1483.

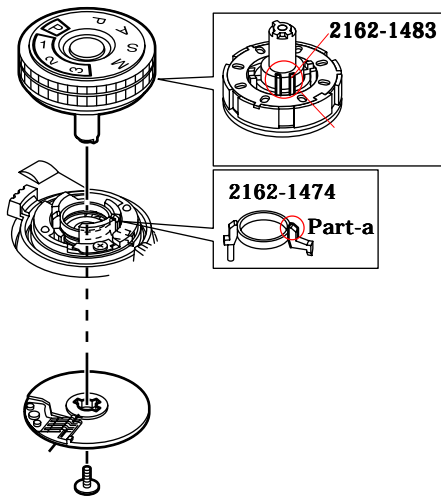


Fig. 2

Fit part-a of #2162-1474 between the longest legs of #2162-1473.

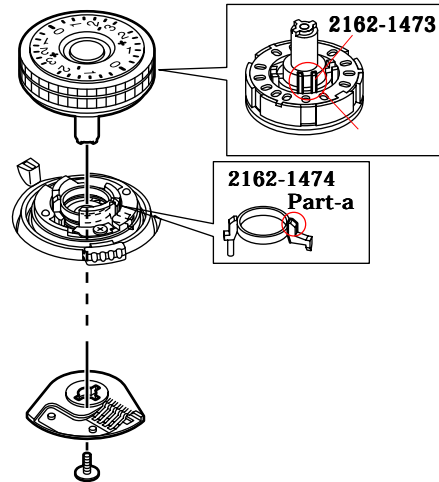


Fig. 3

1. Fit the post of #2162-1474 to the hole on TOP COVER ASSY.
2. Align notches of 2162-1490 to each screw hole to install.

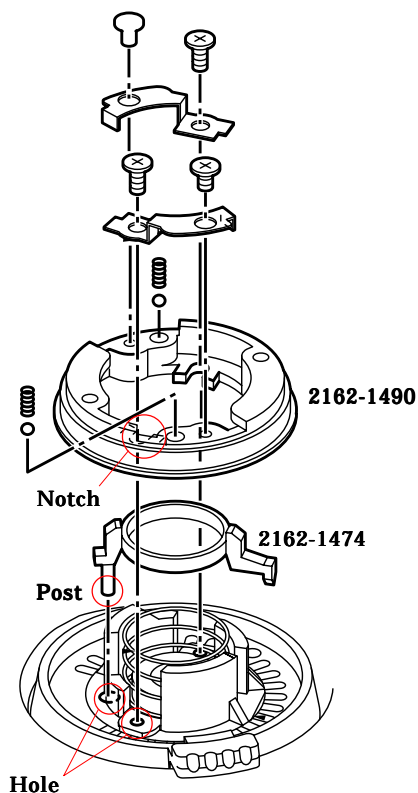


Fig. 4

1. Install #2162-1485 to #2162-1480 fitting its notch to part-a.
2. Fit #2162-1499 to #2162-1480 aligning its projections to each dent.

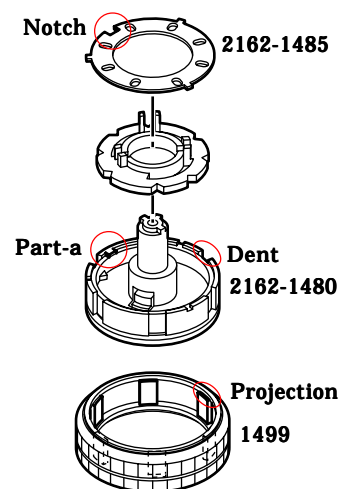


Fig. 5

- 1. Install #2162-1475 to #2162-1470 fitting its notch to part-a.
- 2. Fit #1499 to #2162-1470 aligning its projections to each dent.

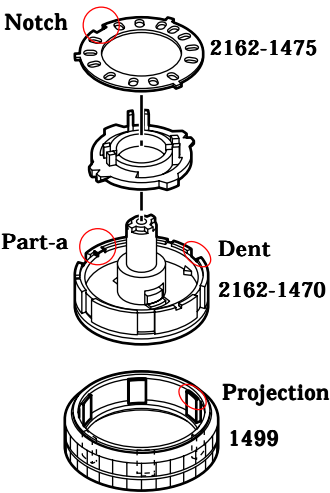


Fig. 6

- 1. Stick #2162-1494 aligning its oval hole to the groove of #2162-1470/ 1480.
- 2. Fit the projection of #2162-1478/ 1479 to the groove of #2162-1470/ 1480 to install.

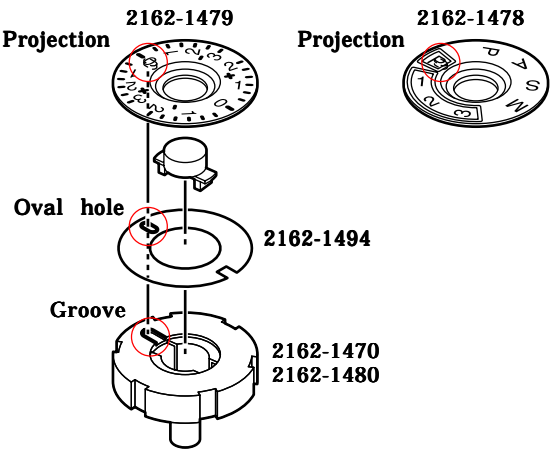


Fig. 7

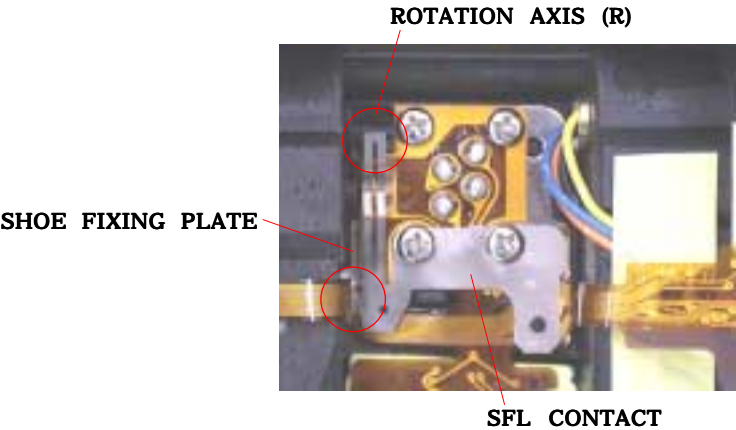


Fig. 8
Arrange lead wires



9. Disassembly of the BACK COVER ASSY

Disassemble it in order of step 1 to 11.

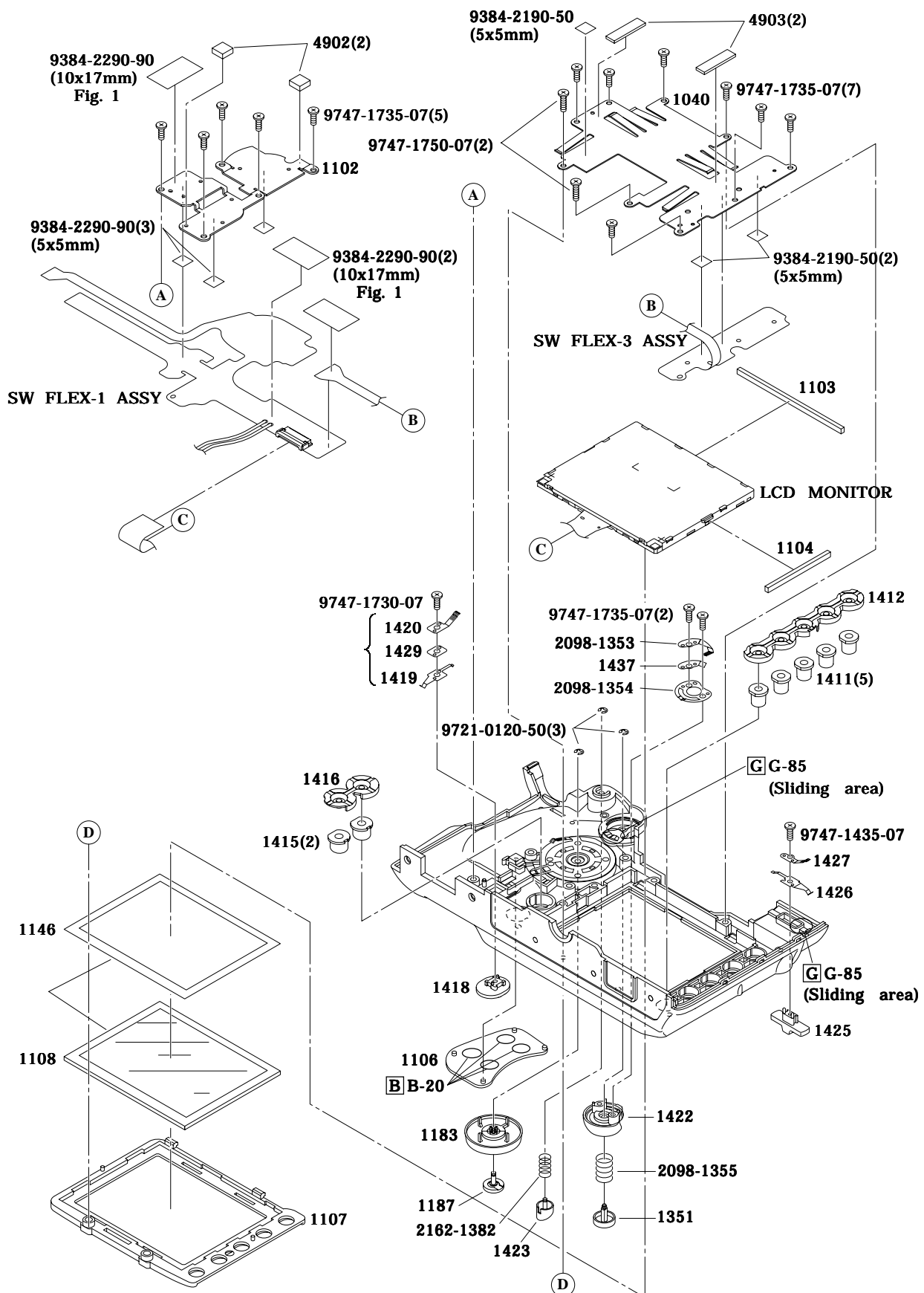
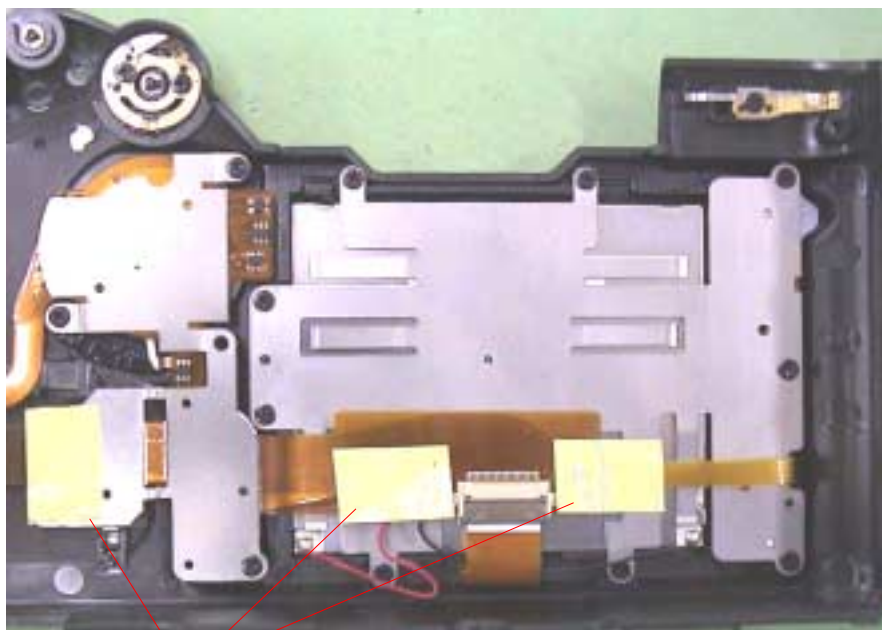


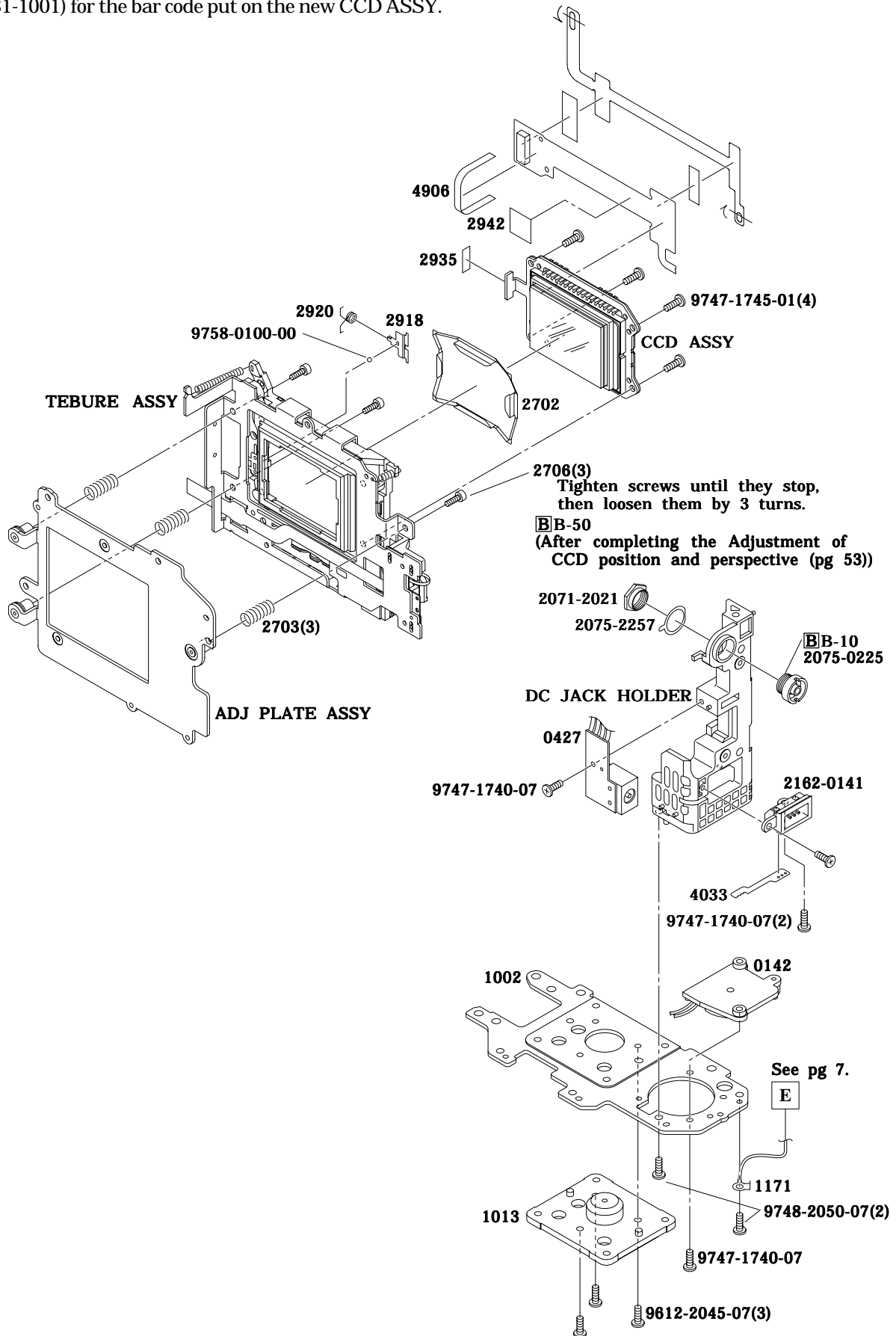
Fig. 1
Stick #9384-2290-90 to the designated position.



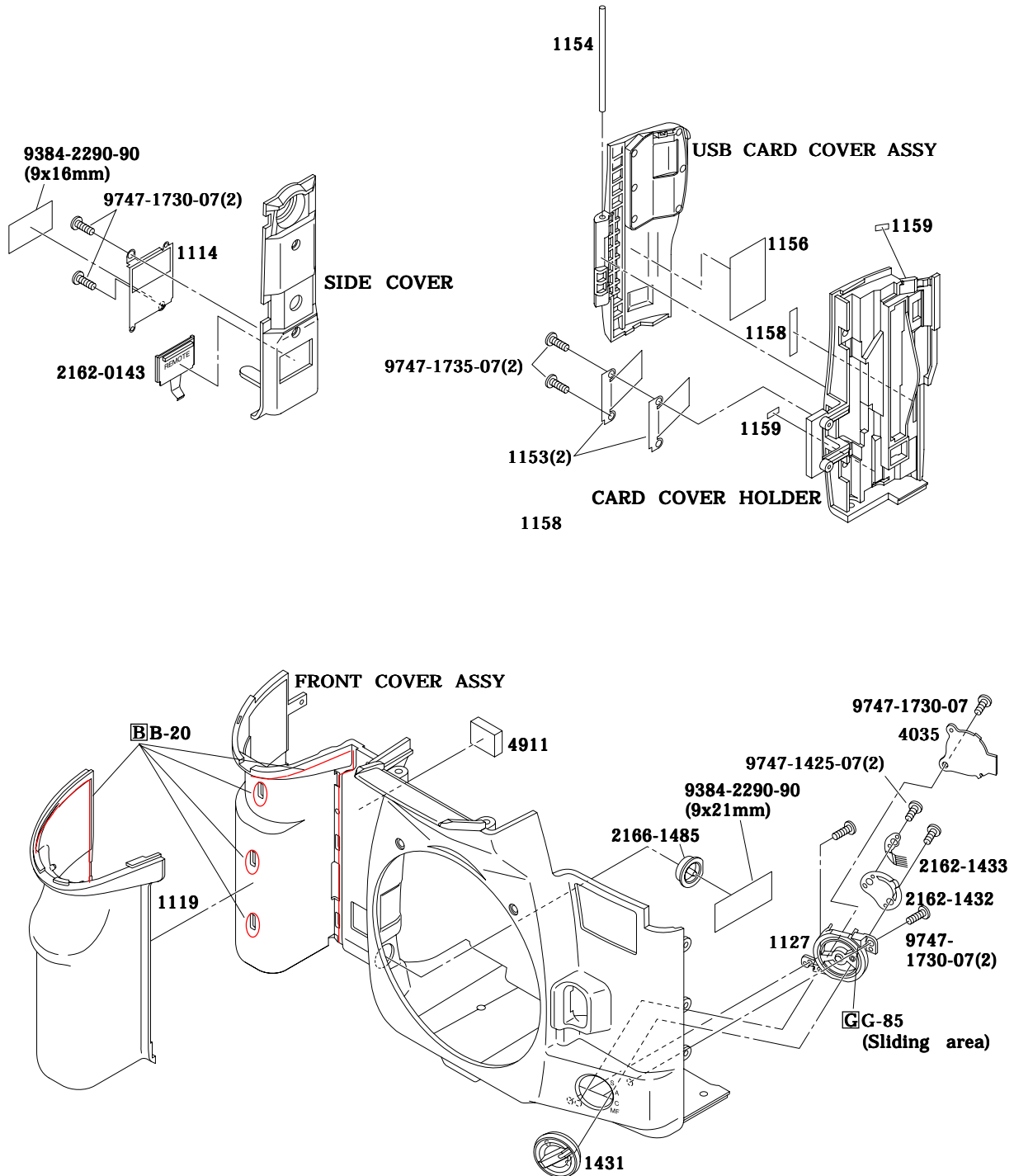
9384-2290-90(3)
(10x17mm)

10. Disassembly of the CCD ASSY, DC JACK HOLDER

If CCD ASSY (2181-1001) is exchanged for new one, exchange the bar code on the BACK SUS PLATE (2181-1001) for the bar code put on the new CCD ASSY.



11. Disassembly of the CARD COVER HOLDER, SIDE COVER, FRONT COVER ASSY



How to replace "SHUTTER ASSY"

By using this method for exchanging "SHUTTER ASSY",
you do not have to perform adjustment of CCD perspective
and adjustment of center part of CCD.

Disassemble it in order of step 1 to 11.

Do these action when mirror is up. (See Page 9 Fig 5-1)

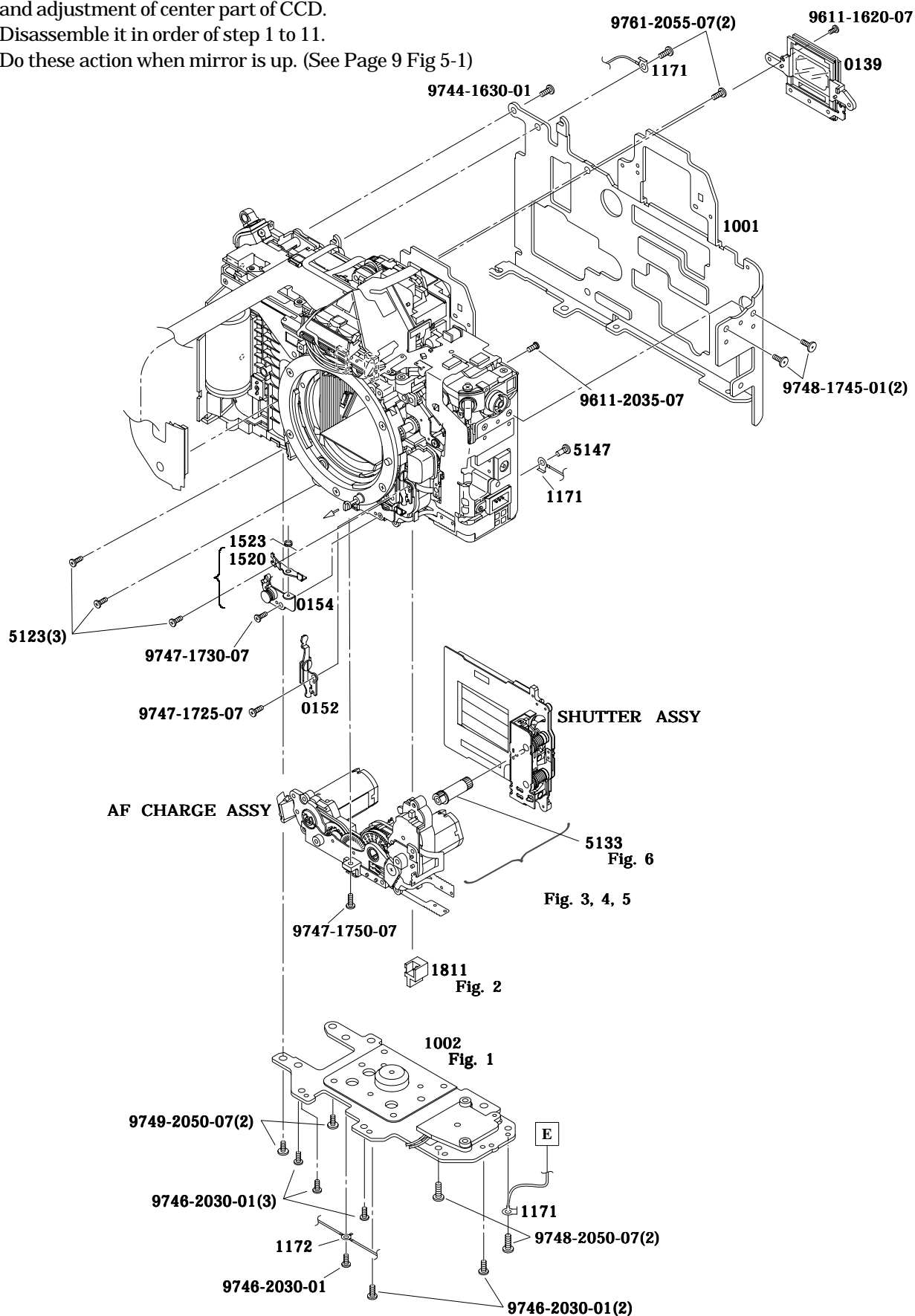


Fig. 1

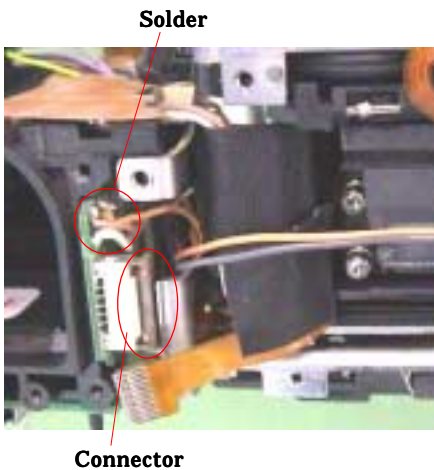


Fig. 2

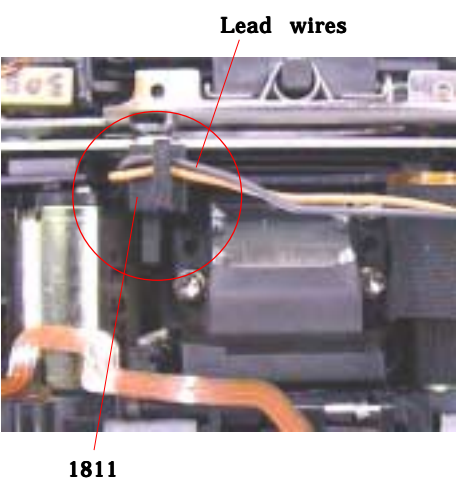


Fig. 3

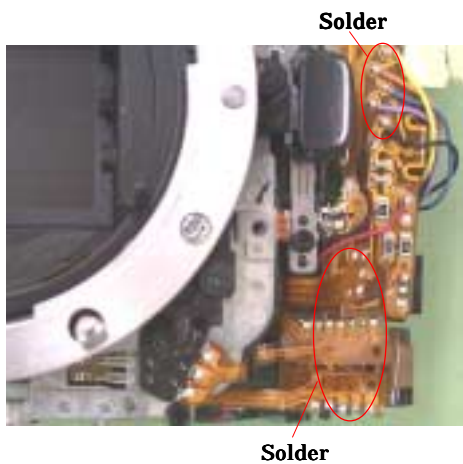


Fig. 4

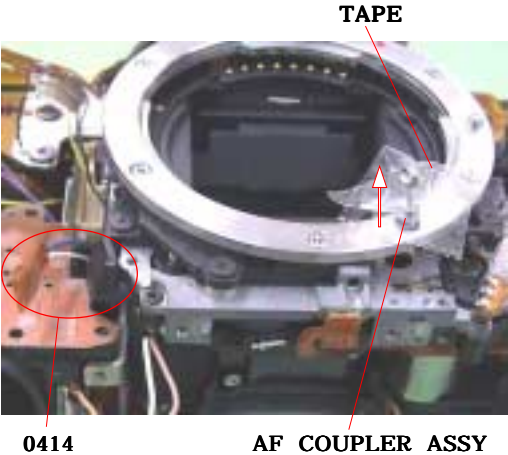


Fig. 5

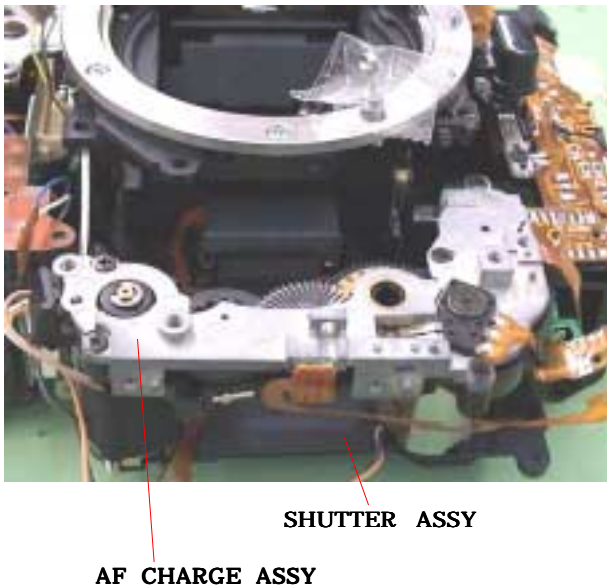
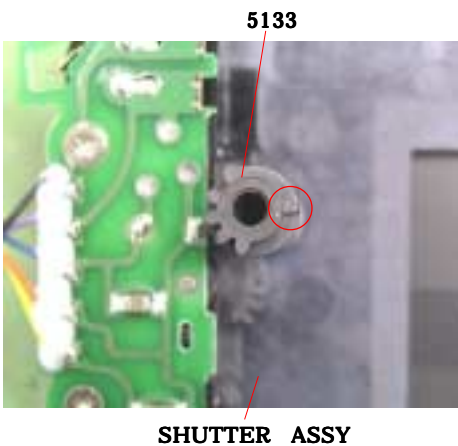


Fig. 6



Required adjustment, setting and confirmation items after repairing (exchanging parts)

Adjust, set and confirm as the following table when the following parts are removed (exchanged).

Follow the steps from the upper line to adjust.

Parts Adjustment/	REFLECTOR ASSY (0166)		SHUTTER ASSY (0220)		APERTURE ASSY (0250)		CCD MODULE ASSY (0265)		CCD ASSY (0271)		IMAGE BOARD ASSY (0401)	
	Removed	Replaced	Removed	Replaced	Removed	Replaced	Removed	Replaced	Removed	Replaced	Removed	Replaced
Viewfinder Back												
SPC Position												
Manual Set SS												
PI-PR												
Aperture Preset												
AF Area												
PITCH, YAW												
EZ												
CCD Vsub												
CCD Aori and Center												
ACT DRV FREQ												
SERVO GAIN												
GYRO												
AE												
GAIN												
DEFECT PIXEL												
WB												
SHAKE GAIN												
Resolving Power												
Exposure Accuracy												
Exposure Accuracy with Built-in Flash												
Grayscale												
Color Reproduction												
Current Consumption												
B.C. Voltage												

Parts Adjustment/	FLASH BOARD ASSY (0404)		I/O FLEXIBLE ASSY (0406)		GYRO FLEX ASSY (0414)		DD BOARD ASSY (0452)		MAIN BOARD ASSY (0455)		MIRROR BOX ASSY (0500)	
	Removed	Replaced	Removed	Replaced	Removed	Replaced	Removed	Replaced	Removed	Replaced	Removed	Replaced
Viewfinder Back												
SPC Position												
Manual Set SS												
PI-PR												
Aperture Preset												
AF Area												
PITCH, YAW												
EZ												
CCD Vsub												
CCD Aori and Center												
ACT DRV FREQ												
SERVO GAIN												
GYRO												
AE												
GAIN												
DEFECT PIXEL												
WB												
SHAKE GAIN												
Resolving Power												
Exposure Accuracy												
Exposure Accuracy with Built-in Flash												
Grayscale												
Color Reproduction												
Current Consumption												
B.C. Voltage												

Parts Adjustment/	AF CHARGE ASSY (0521)		PENTA ASSY (0580)		SPC HOLDER ASSY (0587)		TEBURE ASSY (0901)	
	Removed	Replaced	Removed	Replaced	Removed	Replaced	Removed	Replaced
Viewfinder Back								
SPC Position								
Manual Set SS								
PI-PR								
Aperture Preset								
AF Area								
PITCH, YAW								
EZ								
CCD Vsub								
CCD Aori and Center								
ACT DRV FREQ								
SERVO GAIN								
GYRO								
AE								
GAIN								
DEFECT PIXEL								
WB								
SHAKE GAIN								
Resolving Power								
Exposure Accuracy								
Exposure Accuracy with Built-in Flash								
Grayscales								
Color Reproduction								
Current Consumption								
B.C. Voltage								

When MAIN BOARD ASSY is exchanged for new one, setting of camera is sometimes changed.

Flash charge is prohibited.

*After SS adjustment (P.37), Flash charge is automatically allowed.

Related adjustment and required setting items

When each adjustment or setting is operated, be sure to follow the related adjustment and setting items listed below.

Number : Related adjustment items. Adjust and set in order of the number.

× : Related adjustment items. However, these items mean not to adjust the adjustment order is different (the adjustment should be completed).

None : Unrelated adjustment and setting items (possible to adjust and set solely).

Related adjustment Adjustment	Viewfinder Back	SPC Position	Manual Set SS	PI-PR	Aperture Preset	AF Area	PITCH, YAW	EZ	CCD Vsub	CCD Aori and Center	ACT DRV FREG	SERVO GAIN	GYRO	AE	GAIN	DEFECT PIXEL	WB	SHAKE GAIN
Viewfinder Back										×								
SPC Position														1				
Manual Set SS															1		2	
PI-PR																		
Aperture Preset																		
AF Area							(1)	2										
PITCH, YAW							(1)	2										
EZ						×	×											
CCD Vsub															1		2	
CCD Aori and Center															1		2	3
ACT DRV FREG												1	2					3
SERVO GAIN											×		1					2
GYRO											×	×						1
AE		×																
GAIN			×						×	×						1	2	3
DEFECT PIXEL															×			1
WB			×						×	×					×			
SHAKE GAIN										×	×	×	×		×	×		

Using HIT System

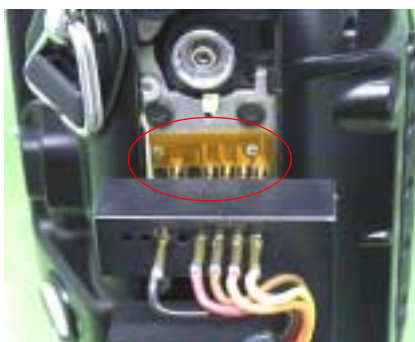
Basic operation

Before attaching the contact jig-* to or detaching from the camera, be sure to remove the power supply from the camera and turn off the HIT controller.

In case of making a Data Copy of adjustment data, keep the controller activated.

1. Attach the contact jig to the camera so that the probes of the jig properly make contact with the check lands. (Fig. 1)
2. Set up the equipment as in Fig. 1.
3. Power the camera, then turn on the camera and HIT Controller. Main menu will appear in HIT Controller display. (Fig. 2)
4. Select an item with Control Pad. The selected item appears in a black box. Then press SELECT Button to enter.

Fig. 1



Set "Shutter lock" to "Off" in the CUSTOM menu of camera.

Attach contact jig to the camera as the rightmost pin of the contact jig make contact with the rightmost land of the camera.



CONTACT JIG FOR 2181

ROM Pack for 2181

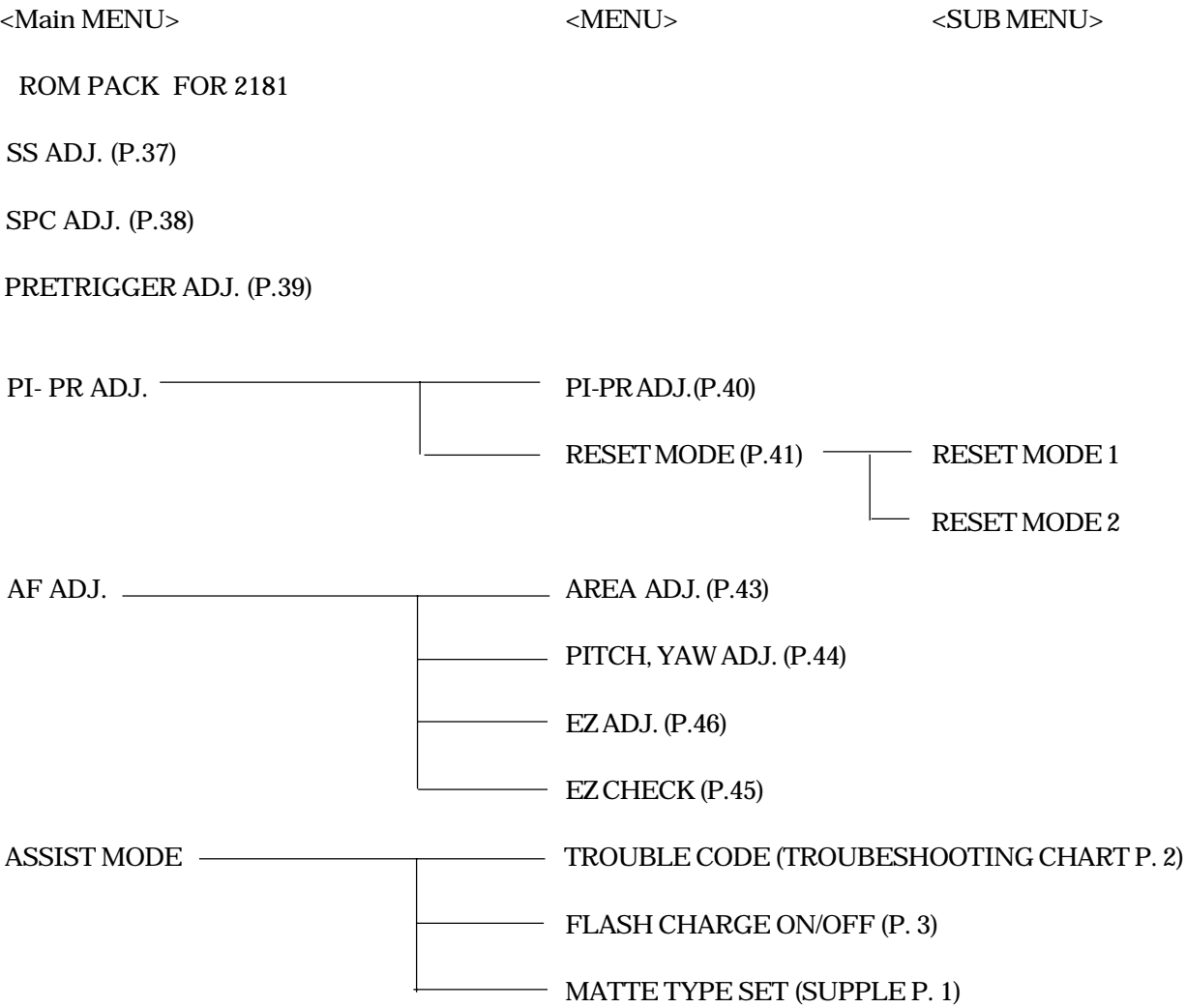
HIT I/F Box

HIT Controller

Fig.2

2181 ADJ. PROGRAM
SS ADJ.
SPC ADJ.
PRETRIGGER ADJ.
GN ADJ.
PI-PR ADJ.
AF ADJ.
ASSIST MODE

Adjustment/Check items available with 2181 ROM Pack



*In case performing SPC position adjustment (P.38)
Peform this adjustment without TOP COVER ASSY, after disassembling from step 1 to step 9 in P.4.

*In case performing AF adjustment (P.42)
Peform this adjustment without FRONT COVER ASSY, after disassembling from step 1 to step 6 in P.4.

Viewfinder Back Adjustment

Equipment Required

1000mm Collimator

AE Master Lens

Magnifier

Adjustment

1. Set up the camera as in Fig. 1, so that the chart is at the center of viewfinder.
2. Set Master Lens to infinity.
3. Check that the chart is in focus.

If not, Select one or two VB Washers, and install Washer(s) as in Fig. 2.

In case of front focus: Make VB Washers thinner.

In case of rear focus: Make VB Washers thicker.

Fig. 1

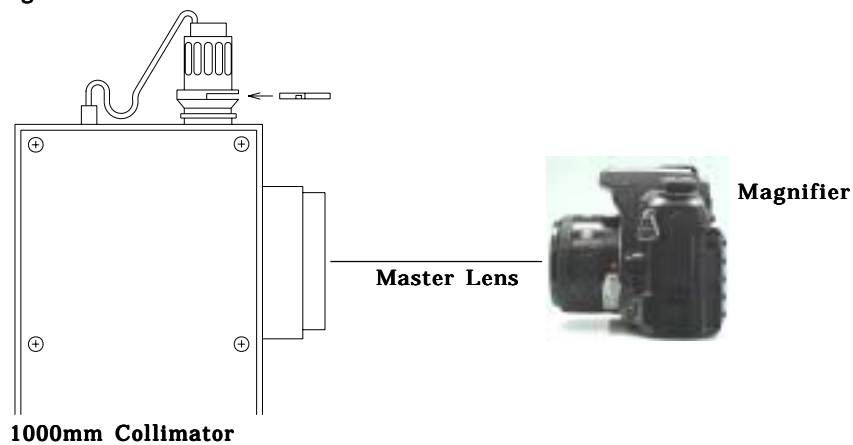
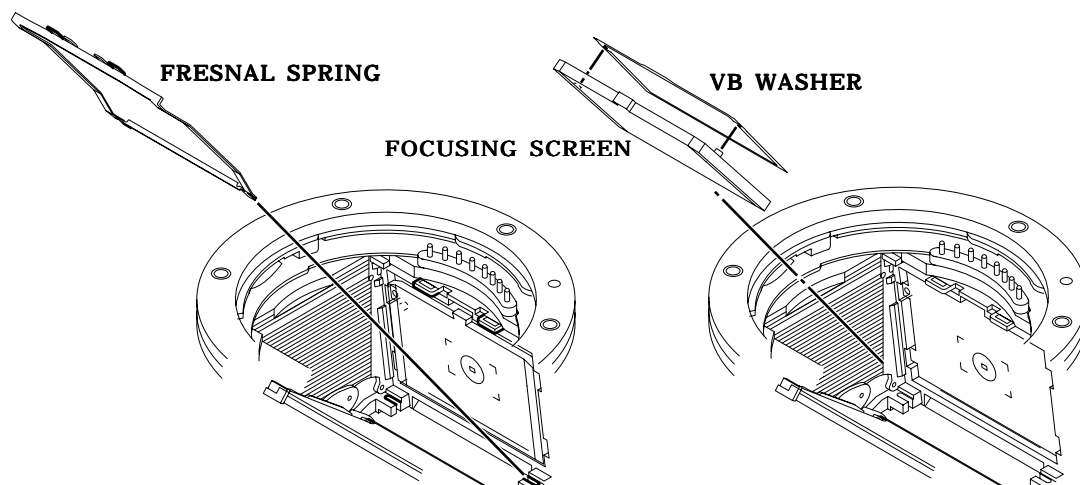


Fig. 2

VB WASHER

	Parts No.	T= (mm)
A	2181-5045-01	0.05
B	2181-5046-01	0.1
C	2181-5047-01	0.15
D	2181-5048-01	0.2



Manual Set SS & X-Sync. Time-lag Check

Equipment Required

Shutter Tester
Sync. Cable

Manual SS Check

1. Set up the equipment as in Fig. 1.
2. Release the shutter at each shutter speed, and check that reading meets the table-1 below.

X Sync. Time-Lag Check

1. Set up the equipment as in Fig. 1 by connecting camera to Shutter Tester with Sync. Cable, and set the shutter speed to 1/180sec..
2. Release the shutter and check that reading meets the table-2 below.

Fig.1



Manual SS Check
Shutter Tester
FUNC: EXP
CAMERA
Exposure mode: M

X Sync. Time-Lag Check
Shutter Tester
FUNC: X
CAMERA
Exposure mode: M
SS:1/180

Table-1

SS	Period (ms)	Tolerance (ms)	Allowable range	Exposure variation
1/4000	0.244	0.156 - 0.383	With in 0.30EV	Difference between Max. and Min. value among range A, B, and C: within $\pm 0.6\text{EV}$ Difference between range A & B, B & C: within $\pm 0.3\text{E V}$
1/2000	0.488	0.333 - 0.714		
1/1000	0.977	0.793 - 1.202		
1/500	1.950	1.590 - 2.40		
1/250	3.910	3.17 - 4.81		
1/125	7.810	6.35 - 9.62		
1/60	15.60	12.7 - 19.2		
1/30	31.30	29.2 - 33.5		
1/15	62.50	58.3 - 67.0		
1/8	125	117 - 134		
1/4	250	233 - 268		
1/2	500	467 - 539		

Table-2

Shutter speed	Item	Allowance
1/180	X-sync delay time	0.3 ms or longer
	From X ON to the 2nd curtain appearance	1.45 ms or longer

Manual Set SS Adjustment

Equipment Required

Shutter Tester
HIT Controller
ROM Pack for 2181
Contact Jig for 2181
I/F Box for HIT
Contact Jig Cable

Adjustment

1. Set up the equipment as in Fig. 1.
2. Set the shutter speed to 1/4000 sec and release the shutter several times, then calculate an average of readings at B-Range.
If the average is out of standard, perform adjustment below.
3. Set up the camera as in Fig. 2.
4. Select "SS ADJ." from the main menu and press SELECT Button.
5. Select "269" using Control Pad.
6. Set the average (micro sec.) obtained at step-2 using Control Pad and Button-A/-B, then press SELECT Button.
In ± 5 stop: Press Control Pad while pressing and holding Button-A.
In ± 50 stop: Press Control Pad while pressing and holding Button-B.
7. Press Shutter-release Button partway down. "COMPLETE" appears when adjustment is complete. (S1 ON).
8. Press SELECT Button to return to the main menu.

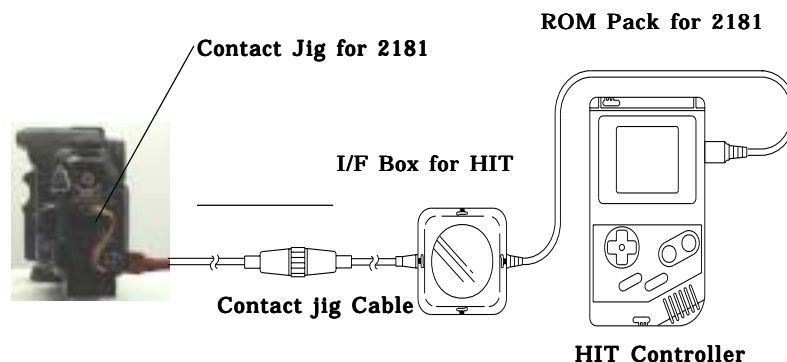
Fig.1

Standard Value: 0.249ms - 0.289ms



Shutter Tester
FUNC: EXP
CAMERA
Exposure mode: M
SS:1/4000

Fig.2



SPC Position Adjustment

Perform this adjustment without TOP COVER ASSY, after disassembling from step 1 to step 9 in P.4, by using Remote cord.

Equipment Required

Master Lens
HIT Controller
ROM Pack for 2181
Contact Jig for 2181
Contact Jig Cable
I/F Box for HIT
SPC Chart for 2181
Remote-cord

Adjustment

1. Set up the equipment as in Fig. 1.
2. Select "AE ADJ." from the main menu and press SELECT Button.
3. Select "SPC ADJ." from the menu and press SELECT Button.
4. Press Shutter-release Button partway down. (S1 ON)
5. Adjust the position of SPC1 HOLDER ASSY so that mark " " comes inside the white area in the display. (Fig. 2)
Apply B-20 to the designated position as in Fig. 3 when adjustment is complete.
6. Press SELECT Button while pressing and holding Shutter-release Button partway down (S1 ON) to return to the previous menu.

Fig.1

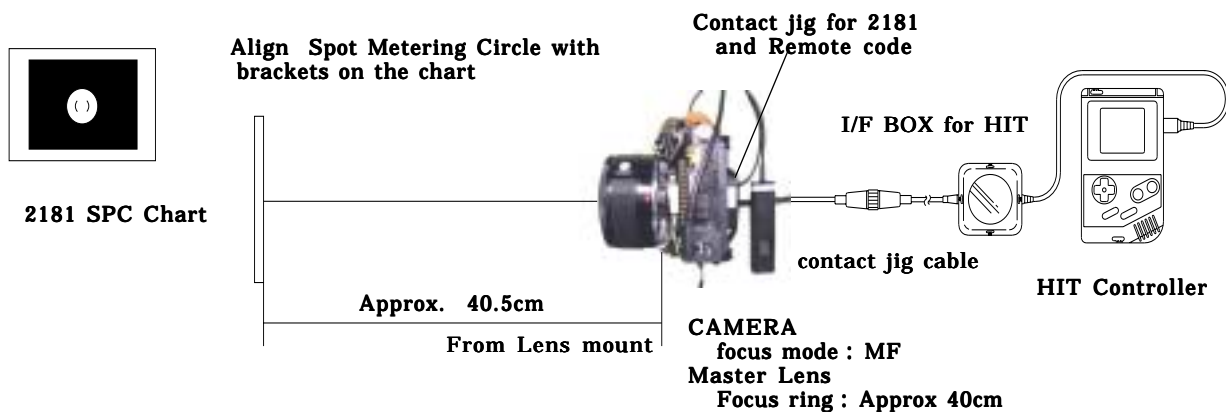
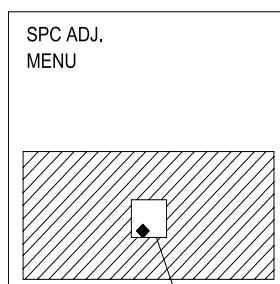


Fig.2



Set the mark inside the white box.

Fig.3

SPC HOLDER ASSY



Aperture Preset Check

Equipment Required

HIT Controller
ROM Pack for 2181
Contact Jig for 2181
Contact Jig Cable
I/F Box for HIT
HIT I/O Tester
Preset Signal Adapter

Check

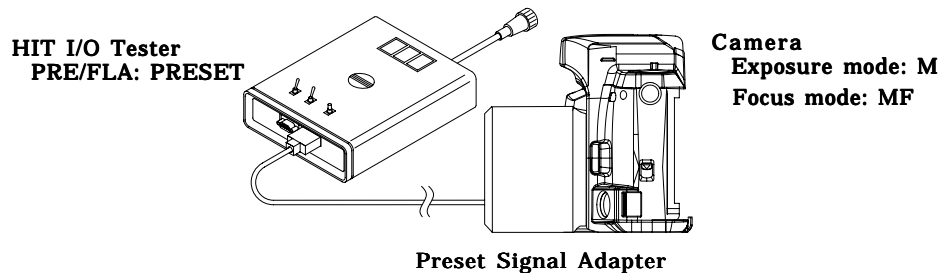
1. Set up the equipment as in Fig. 1, and set camera to "M" mode and "Bulb".
2. Press Reset Button on HIT I/O Tester so that "00" appears in the display.
3. Set aperture to f/11, and release the shutter.
Check the reading in HIT I/O Tester is within the standard. (Reading appears while Shutter-release Button is pressed all-the-way down.)
If the reading is out of standard, make Aperture Preset adjustment.

Standard f/11: Ab - bb

NOTE: These indications look similar
in HIT I/O Tester display
Figures in HIT I/O Tester is in hexadecimal notation.

5 ----- 6
b ----- b

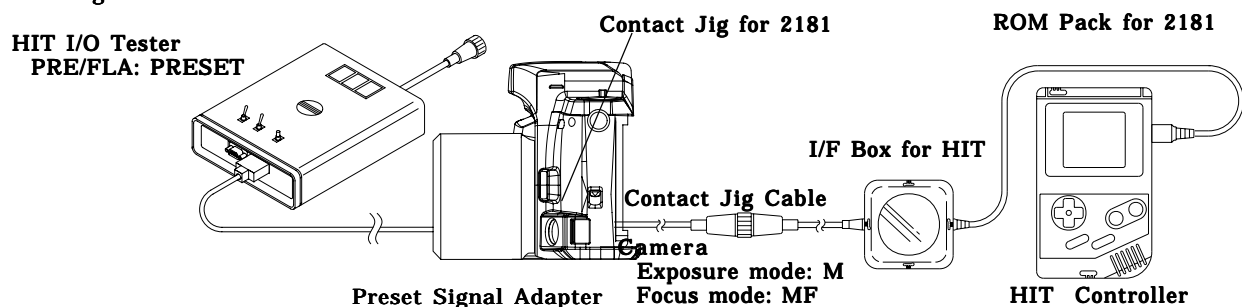
Fig. 1



Adjustment

1. Set up the equipment as in Fig. 2.
2. Select "PRITRIGGER ADJ." from the main menu and press SELECT Button.
3. Press SELECT Button again.
4. Press Reset Button on HIT I/O Tester so that "00" appears in the display.
5. Press Shutter-release Button partway down. (S1 ON)
The shutter is automatically released twice. Confirm the average of readings at HIT I/O Tester.
6. Input the average to HIT Controller, then press SELECT Button.
First digit: Press Control Pad while pressing and holding Button-A.
Second digit: Press Control Pad while pressing and holding Button-B.
7. Repeat step-4 to -6. The adjustment is automatically done for each aperture settings; f/4.5, f/9.5, f/19.
8. Press Shutter-release Button partway down. "COMPLETE" appears when adjustment is complete.
9. Press SELECT Button to return to the main menu.

Fig. 2



PI-PR Adjustment

To read output level of sensor devices for aperture (F PI), AF/MF (AFM PR) and focus (AF PI).

Equipment Required

HIT Controller
ROM Pack for 2181
Contact Jig for 2181
I/F Box for HIT
Contact Jig Cable
AC adpter AC-11

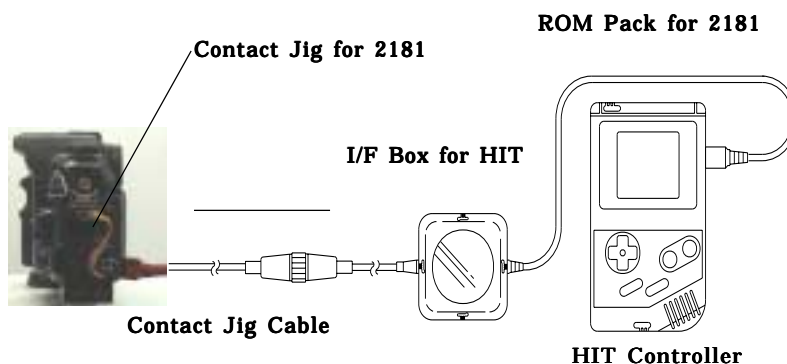
Adjustment

1. Set up the equipment as in Fig. 1.

Note: This adjustment must be performed without lens.
If this adjustment is performed with lens, camera is not functional, often. When this happens you must perform RESET MODE written in the next page.

2. Select "PI-PR ADJ." from the main menu and press SELECT Button.
3. Select "PI-PR ADJ." from the menu and press SELECT Button.
4. Press SELECT Button again.
- 5-1. Press Shutter-release Button partway down. (S1 ON)
The HIT Controller confirms F PI output, and beeps.
- 5-2. Press Shutter-release Button partway down. (S1 ON)
The HIT Controller confirms AFM PR output, and beeps.
- 5-3. Press Shutter-release Button partway down. (S1 ON)
The AF coupler will move forward and rotate.
The HIT Controller confirms AF PI output, and " COMPLETE " appears when the adjustment is complete.
6. Press SELECT Button to return to the main menu.

Fig.1

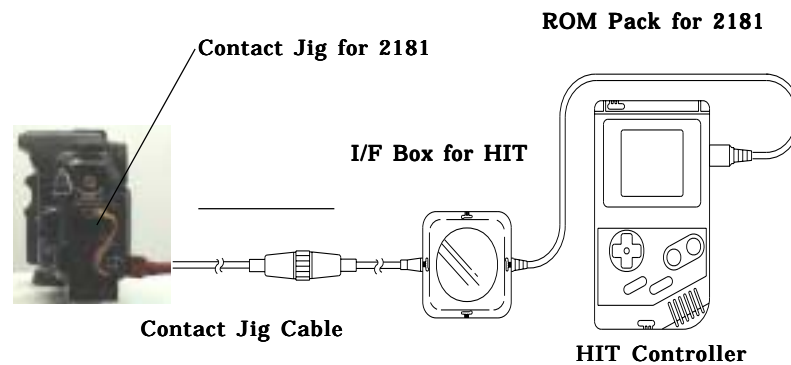


How to Handle RESET MODE

Caution: This MODE must be used only when PI-PR adjustment fails and camera is not functional at all. If camera is not functional at all, you can not do switch on or off camera power or you can not release at all by the communication failure.

1. Set up the equipment as in Fig. 1.
2. Select "PI-PR ADJ." from the main menu and press SELECT Button.
3. Select "RESET MODE" from the menu and press SELECT Button.
4. Select "RESET MODE 1" from the sub menu and press SELECT Button.
5. Connect AC Adapter and press SELECT Button, when "SET BATTERY" is displayed.
6. Press Shutter-release Button partway down. (S1 ON)
After do this, PI-PR communication is terminated in the camera.
7. Press SELECT Button to return to sub menu.
8. Disconnect AC Adapter.
9. Connect AC Adapter again.
After connecting to the AC Adapter, PI-PR Adjustment is automatically executed in the camera.
10. Select "RESET MODE 2" from the sub menu and press SELECT Button.
11. Press Shutter-release Button partway down. (S1 ON)
After do this, RESET MODE is cancelled and return to normal mode.
12. Press SELECT Button to return to sub menu.

Fig.1



Preparation before AF adjustment

Note: After replacing CCD MODULE ASSY and/or MIRROR BOX ASSY or its relative parts, always perform adjustment 1 to 4 (pg. 43-46). If customer says focus function is not normal, perform this adjustment too.

Preparations

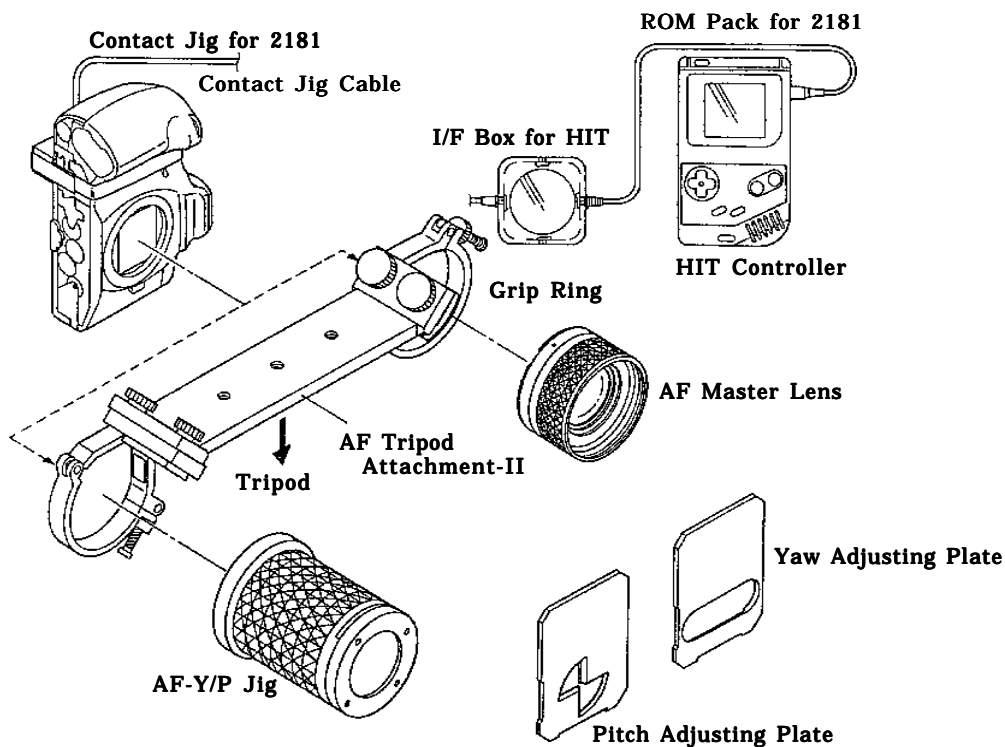
The following items should have been completed before starting AF adjustment.

1. Perform this adjustment without TOP COVER ASSY, after disassembling from step 1 to step 9 in P.4.
2. When CCD sensor module is out of position after replacing CCD MODULE ASSY, tighten three AF adjusting screws until they stop, then evenly loosen them by 0.4mm (1.14 turns).

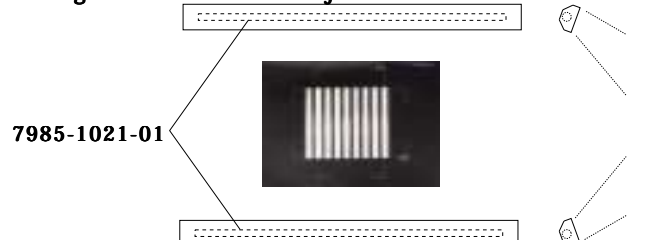
Equipment Required

See the list on pg.64-65 for the measuring instruments, tools and jigs.

AF Master Lens	AF-Y/P Adjuster
AF Chart I for 2163	AF Tripod Attachment-II
AF Chart II for 2163	Grip Ring
AF Chart III for 2163	TORX L-Wrench
HIT Controller	Hexagon Bar Wrench (1.5) or Hexagon Screwdriver
ROM Pack for 2181	Fluorescent (FL40S W-SDL) (EZ check and adjustment)
Contact Jig for 2181	Flood Lamp (AF Area and Pitch Yaw adjustment)
Contact Jig Cable	(color temperature of 2800 degrees K and brightness higher than or equal to EV 10)
I/F Box for HIT	



Setting for EZ check and adj.



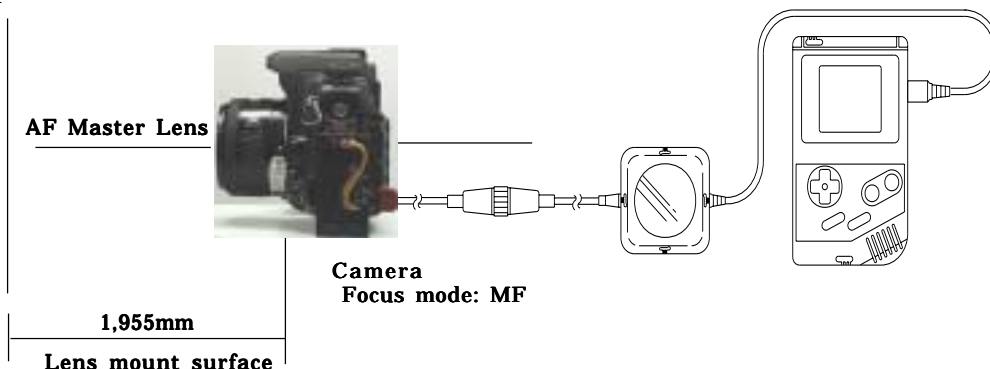
AF Area Adjustment

Adjustment

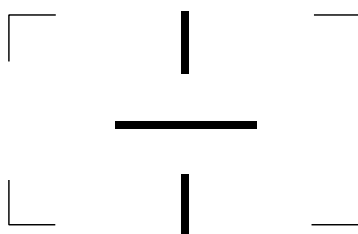
1. Set up the equipment as in Fig. 1.
2. Select "AREA ADJ." from the main menu and press SELECT Button.
3. Press and hold Shutter-release Button partway down after Navigation Display goes out, so that lines with two dents and a value appear in the display and remain for 3 sec.
Check that each line has two dents like the ones in Fig. 2, and reading is within the standard.
If not, adjust as follows.
4. Adjust the sub-mirror position using TORX L-Wrench as in Fig.3.
5. Repeat step-3 and -4 until the reading is within the standard.
6. Press SELECT Button while pressing and holding Shutter-release Button partway down (S1 ON) to return to the previous menu.

Standard:96-104

Fig.1



AF Chart-III for 2163



Align center of each island with the chart.

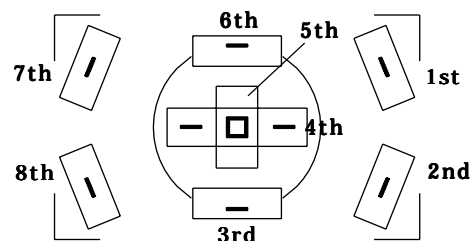


Fig.2

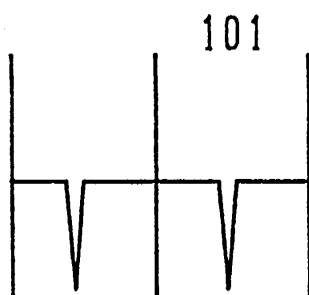
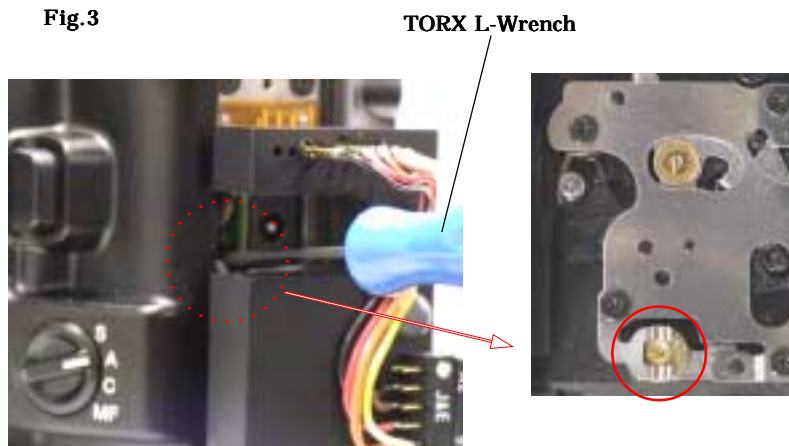


Fig.3



Pitch Yaw Adjustment

Turn a flood lamp toward camera during Pitch Yaw Adjustment.

How to Peform Adjustment

Pitch Adjustment

1. Attach AF-Y/P Adjuster to the camera, and set Pitch Adjusting Plate as in Fig. 1.
2. Select "PITCH, YAW ADJ." from the main menu and press SELECT Button.
3. Press and hold Shutter-release Button partway down after Naviagation Display goes out, so that lines with two dents and a value appear in the display and remain for 5 sec.
4. Adjust the Pitch Adjusting Screw as in Fig.4 so that reading is within the standard. Then go on to Yaw adjustment below.

Yaw Adjustment

5. Attach AF-Y/P Adjuster to the camera, and set Yaw Adjusting Plate as in Fig. 3.
6. Adjust the Yaw Adjusting Screw as in Fig.4 so that reading is within the standard.
7. Press SELECT Button while pressing and holding Shutter-release Button partway down (S1 ON) to return to the previous menu.

Check

Perform " AF Area Adjustment" and " Pitch Yaw Adjustment" repeatedly until all readings meet the respective standard.

Item	Standard
Pitch	077 - 130
Yaw	073 - 137

Fig.1

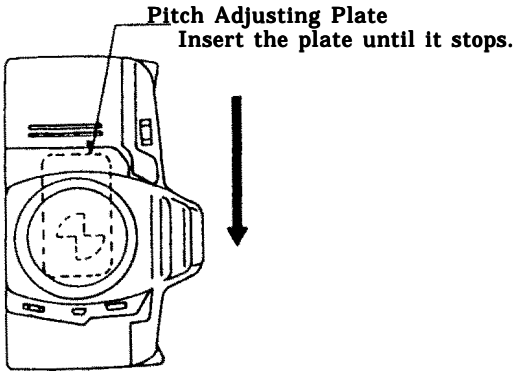


Fig.2

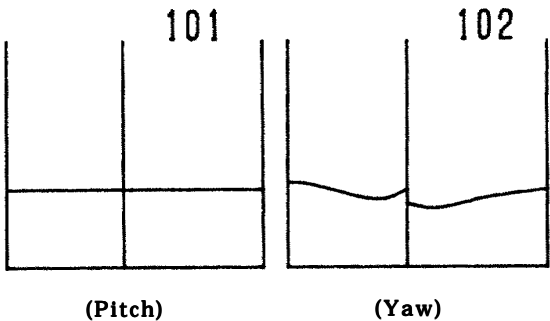


Fig.3

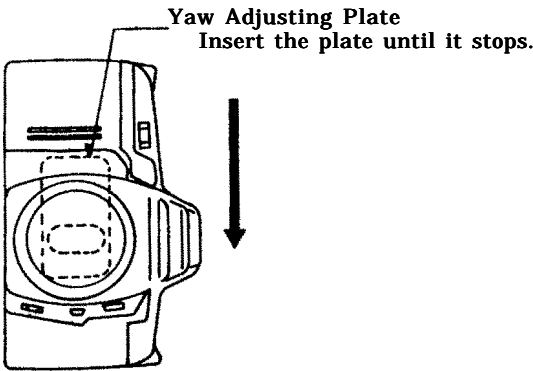


Fig.4



EZ Check

Check

1. Set up the equipment as in Fig. 1.
2. Select "EZ CHECK" from the main menu and press SELECT Button.
3. Select the desired island group from the menu, then press SELECT Button.
Use the appropriate chart according to the desired island group. (See table as follows.)
4. Look through the viewfinder and align the focus frame with the measuring point as in Fig. 2.
Then press SELECT Button.
5. Press and hold Shutter-release Button partway down so that HIT Controller beeps and the reading appears in the display for 3 sec.
Confirm that reading is within the standard.
6. Select "MENU" and press SELECT Button to return to the previous menu.

Island group	Chart	Measurement point
3rd, 4th, 6th ISLAND	AF Chart-I for 2163 (Horizontal)	A
5th ISLAND	AF Chart-I for 2163 (Vertical)	E
1st, 7th ISLAND	AF Chart-II for 2163 (Horizontal)	I
2nd, 8th ISLAND	AF Chart-II for 2163 (Horizontal) *	M

When checking the reading at 2nd island group and 8th island group, use AF Chart-II for 2163 upside down.

Standard: -50 to +50

Fig.1

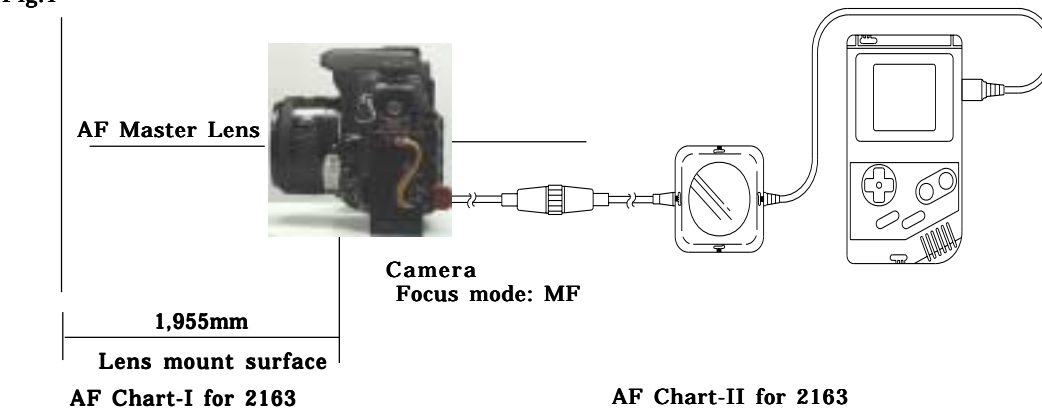


Fig . 2

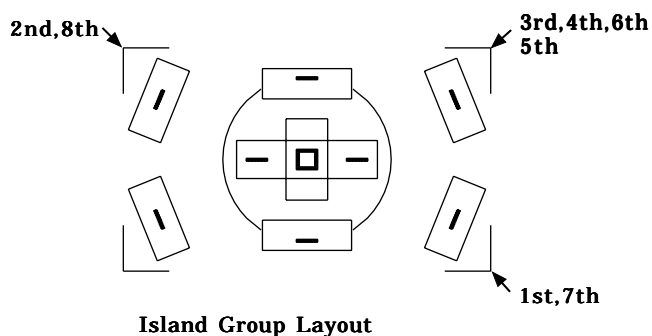
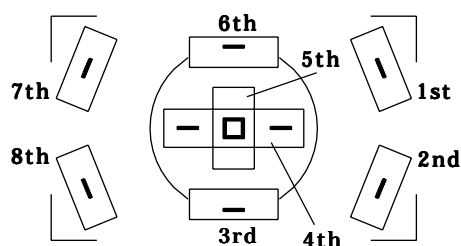


Fig . 3



EZ Adjustment

Be sure to perform the adjustment for all island groups in series according to the display after replacing CCD MODULE ASSY.

If ERROR (communication failure with HIT) occurs during adjustment, start over from the item that has been interrupted. It is unnecessary to start back to the beginning.

When a reading is out of standard at "EZ Check", the single item is selectable at option.

Adjustment

1. Set up the equipment as in Fig. 1.
2. Select "EZ ADJ." from the main menu and press SELECT Button.
3. Press SELECT Button again, then "3rd,4th,6th ISLAND" appears in the display.
Use the appropriate chart according to the desired island group. (See table as follows.)
4. Align the focus frame with the measuring point as in Fig. 2, then press SELECT Button.
5. Press and hold Shutter-release Button partway down after Naviagation Display goes out, so that HIT Controller beeps and adjustment is finished.
6. Repeat step 4 and step 5 until "OK" appears in the display.
7. Press SELECT Button.

The display is replaced with the EZ menu, and the next island group appears in the display.

8. Repeat step-3 to -7 until "COMPLETE" appears after "2nd,8th ISLAND" adjustment is completed.
9. Press SELECT Button to return to the previous menu.

Island group	Chart	Measurement point
3rd, 4th, 6th ISLAND	AF Chart-I for 2163 (Horizontal)	A - D
5th ISLAND	AF Chart-I for 2163 (Vertical)	E - H
1st, 7th ISLAND	AF Chart-II for 2163 (Horizontal)	I - L
2nd, 8th ISLAND	AF Chart-II for 2163 (Horizontal) *	M - P

When checking the reading at 2nd island group and 8th island group, use AF Chart-II for 2163 upside down.

Fig . 1

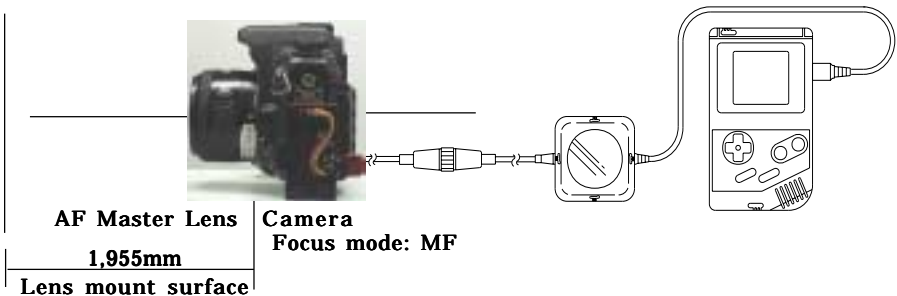
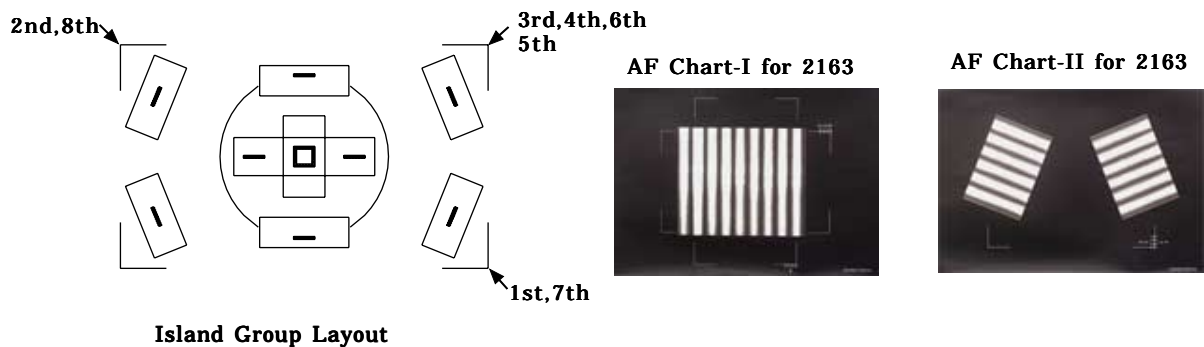


Fig . 2



Assist MODE

Equipment Required

HIT Controller
ROM Pack for 2181
Contact Jig for 2181
I/F Box for HIT
Contact jig Cable

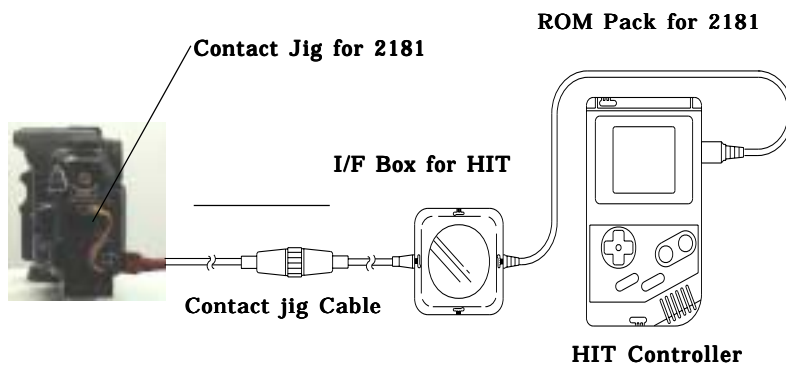
The following 2 assistant items are available.

TROUBLE CODE
FLASH CHARGE ON/OFF

Preparation

1. Set up the equipment as in Fig. 1.
2. Select "ASSIST MODE" from the main menu and press SELECT Button.
Assist mode menu appears in the display and an item is selectable at option.

Fig.1



LCD Displays Check

How to do LCD displays check

First, turn on main Switch without battery.

Second, attach battery with pushing these four buttons, "Menu" button, "ISO" button, "MSET" button and "WB" button.

*Turn on backlight of LCD, all marks on infinder LCD and AF area indicator in finder.

To turn off, detach battery from camera.

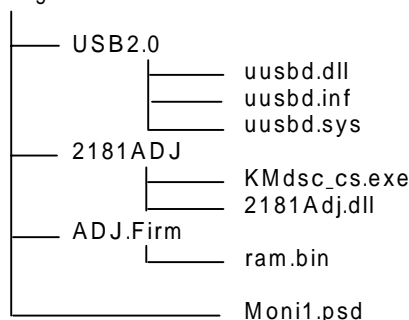
■ Preparing the 2181 adjustment program

PC for use

The PC loaded on either Windows 98/98SE, 2000 Professional or XP and USB terminal originally 40MB or more of available memory and 15MB or more of available hard-disk space
VGA or more monitor capable of displaying at least 32,000 colors

Details of the 2181 adjustment program CD

2181 adjustment program CD



Installation of the 2181 adjustment program

1. Insert the 2181 adjustment program CD into the CD-ROM drive of PC.
2. Copy the "2181 ADJ" folder from CD-ROM to the desktop.

Installation of the USB driver

*This is an example on Windows 2000. On other version of Windows, procedure is a little different.

Caution: This USB driver is completely new one. Installation of the USB driver is necessary to use this adjustment program. Adjustment program for 2181 is not functional with old USB driver like the USB driver for 2720 and this USB driver can be used with 2720 or other cameras which were used with old USB driver.

1. Copy "USB2.0" folder in the 2181 adjustment program CD to anywhere on PC.
2. Copy the following files from "USB2.0" folder to c:\Windows\system folder.
uusbd.dll
*Select "Display all" from the file option of Windows.
3. Set the camera to adjustment mode and then start up the 2181 adjustment program, "KMdsc.exe."
Starting up the 2181 adjustment program (in the adjustment mode) (see P.49).
4. The new registration for USB is started on PC, and the dialog is opened for specifying USB driver software.
5. Click "next" on "Add New Hardware Wizard" window.
6. Check "Search for the best driver for your device." and click "next".
7. Check "Specify a location." and click "next".
8. Click "Browse".
9. Select "uusbd.inf" in "USB2.0" folder.
10. Click "OK" to start searching driver and then "Windows detect the driver of the device" is displayed on the screen. Click "next" to start installation.
11. "Windows has finished installing the software that your new hardware device requires." is displayed and installation is complete.

Confirmation after installation (In case of using Windows 2000)

12. Right click on "My Computer" icon and select "Property".
13. Select "Hardware" tab and click "Device Manager" button.
14. Check whether "Universal USB Driver (Adjust)" is displayed under the tree of "USB device for UUSB".

Make CF card for Adjustment (Used for starting adjustment mode of camera)

1. Insert the 2181 adjustment program CD into the CD-ROM drive of PC.
2. Copy "ram.bin" in "Adj Firm" folder of CD-ROM to the root of CF card.

Starting up the 2181 adjustment program (in the adjustment mode).

Outline

Connect the camera and PC with USB-2 and start up the camera in the "adjustment mode."

"Adjustment mode" means the condition of that the camera can contact with the 2181 adjustment program in the PC.

Required equipment

PC with preinstalled the 2181 adjustment program

CF card for Adjustment

AC Adapter AC-11

USB-2 (USB cable)

* Use the AC adapter (AC-11) not batteries when adjusting.

Starting up the 2181 adjustment program (in the adjustment mode).

1. Set camera to "M" mode.
2. Insert "CF card for Adjustment". Main power switch on with pressing shutter release button on (S2).
After starting the adjustment mode, "BBBB" is displayed at the counter of LCD monitor. (Fig.1)
3. Connect camera and the PC with USB cable, after starting camera by adjustment mode.
4. Starting up the 2181 adjustment program, "Kmdsc_cs.exe."
There is the message "Please select camera code." in the window of the 2181 adjustment program.
5. Select "2181" from "CAMERA CODE" in the window, according to the display.
The message changes to "Please connect #2181 and click START." in the window.
6. Click the "START" button in the window, according to the display.
The message changes to "Camera Boot mode READ-OUT has completed." in the window. (Fig.2)

Fig.1



Fig.2



Quitting the 2181 adjusting program and cancel adjustment mode of camera

1. Click "ADJUSTMENT END" in the window of the 2181 adjustment program.
2. Remove the AC adapter.

Adjustment items in the 2181 Adjustment Program

- Adjustment of CCD Vsub voltage
- Adjustment of CCD center position
- Adjustment of CCD perspective
- Adjustment of camera shaking actuator
- Adjustment of the servo for camera shaking
- Adjustment of the gyro for camera shaking
- Adjustment of the AE
- Sensitivity adjustment
- Adjustment of the defective pixel
- Adjustment of white balance
- Adjustment of camera shaking compensation

*Perform adjustment of CCD center position and adjustment of CCD perspective (P. 52) without BACK COVER ASSY, after disassembling from step 1 to step 4 in P.4.

■ Back up Flash ROM data of Master Body

Save flash ROM data of master body (Mass production camera body of #2181), which is used for adjustment of CCD center position and adjustment of white balance, to PC.

If flash ROM data of master body is over written by mistake, load flash ROM data from PC and re-write flash ROM data of master body.

Caution: Exchange Master body for new 2181 body at every 5000 times shutter release to keep accuracy of adjustment.

Required equipment

PC with preinstalled the 2181 adjustment program

CF card for Adjustment

AC Adapter AC-11

USB-2 (USB cable)

* Use the AC adapter (AC-11) not batteries when adjusting.

Save Flash ROM data of Master Body to PC.

Caution: Perform this operation at every time you register Master Body.

1. Click "SAVE", left side of "PAST" in adjustment menu.

2. Save data to anywhere with any name you like.

For Example

Save location: "2181ADJ" folder on Desktop of PC

File name: "MASTER_DATA"

If you use the file name above, the real file name of saved data is "MASTER_DATA2181".

3. Click "SAVE", message below is displayed and saving data is complete.

"The adjustment data save has completed!"

Load Flash ROM data to Master Body from PC

Perform this operation, if flash ROM data of master body is over written by mistake.

1. Click "PAST", right side of "SAVE" in adjustment menu.

2. Select saved flash ROM data.

For Example

Saved location: "2181ADJ" folder on Desktop of PC

File name: "MASTER_DATA2181"

3. Click "Open", message below is displayed and pasting data is complete.

"The adjustment data copy has completed!"

Adjustment of CCD Vsub voltage

Memorize the number printed on the bar code put on the CCD ASSY, when CCD ASSY (2181-0271) or MAIN BOARD ASSY (2181-0455) is replaced.

If CCD ASSY (2181-1001) is exchanged for new one, exchange the bar code on the BACK SUS PLATE (2181-1001) for the bar code put on the new CCD ASSY.

Required equipment

PC with preinstalled the 2181 adjustment program

CF card for Adjustment

AC Adapter AC-11

USB-2 (USB cable)

* Use the AC adapter (AC-11) not batteries when adjusting.

Preparation of adjustment

Set camera to adjustment mode. Refer to " Starting up the 2720 adjustment program ". (P49)

Adjustment process

1. Click " VSUB " in adjustment menu.
" CCD V-sub Adjustment " windows is appeared.
2. Input memorized number on the CCD ASSY and click " OK ".
3. " OK " is displayed and adjustment is complete.

Setting of Master body and chart for the adjustment of CCD position

Required equipment

AF Master Lens
 Master body (Production body of #2181)
 2181 AORI-Chart
 Grip Ring
 Tripod
 USB-2 (USB cable)
 AC Adapter AC-11

Setting the Master body and the chart

1. Setting all equipment according to the order listed below (Fig.1).

Caution: Use stable tripod. Please be careful to detach camera from AF Master Lens without changing any condition, like the position of tripod.
 If some changes happen, you can not perform correct adjustment.
 Luminance on the chart must be between Ev10.7 and Ev 11.3.

- 1) Set Grip Ring to the tripod and set AF Master Lens to Grip Ring.
- 2) Attach Master body to AF Master Lens.
- 3) Set Master body and chart. Distance between Master body and chart is listed below.
 470mm
- 4) Look into the finder of Master body.
- 5) Focusing to the chart by rotating the focus ring of AF Master Lens.
- 6) Align the center of focus frame to the center of the chart.
- 7) Confirm whether cross line of the chart is located at the center of the screen or not by setting the camera to after view mode. If cross line is not located at the center of the screen, please perform setting, step 1 to step 6 again.

Fig. 1 470mm Position of CCD
 Marking the center

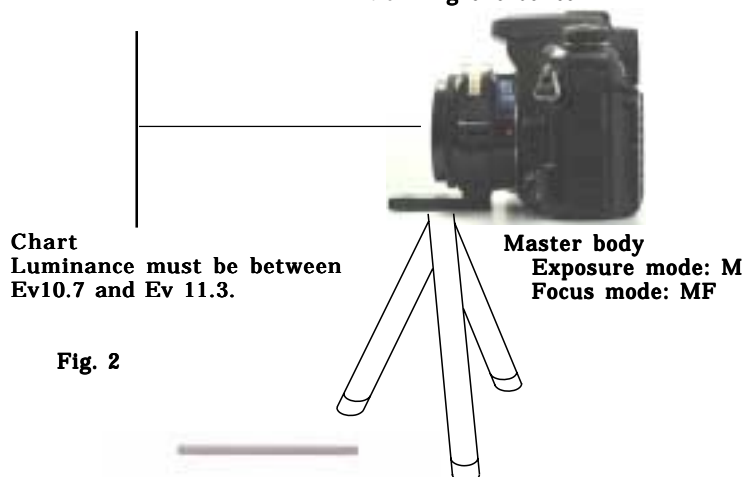
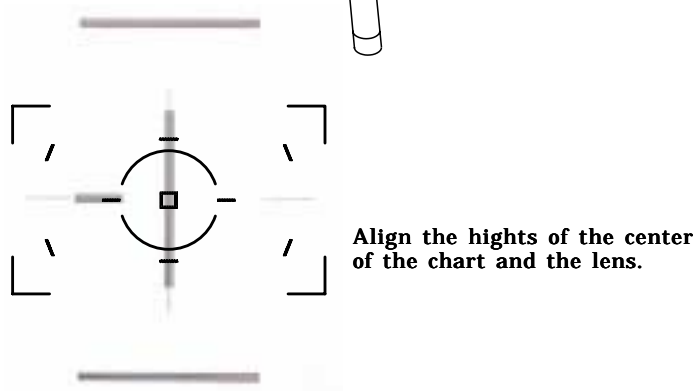


Fig. 2



Position of CCD

Adjustment of CCD position and perspective

Outline

Perform adjustment of CCD position and perspective.

*See Setting the camera and the chart when adjusting the CCD perspective (P. 52).

Required equipment

Fluorescent light stand SQ967W
 PC with preinstalled the 2181 adjustment program
 CF card for Adjustment
 Master body
 USB-2 (USB cable)
 AC Adapter AC-11
 Grip Ring
 Tripod
 Hexangular wrench (1.5) or hexangular screwdriver

Preparation of the adjustment

*When CCD sensor module is out of position after replacing CCD MODULE ASSY, tighten three AORI adjusting screws until they stop, then evenly loosen them by 3 turns.

1. Perform this adjustment without BACKCOVER ASSY, after disassembling from step 1 to step 4 in P.4.
2. Set Master body and chart.
 Refer to "Setting of Master body and chart for the adjustment of CCD position" in P. 52.
3. Set camera to adjustment mode.
 Refer to "Starting up the 2181 adjustment program (in the adjustment mode)" in P. 49.

Adjustment of CCD center position and AORI

1. Click "AORI & CENTER" in adjustment menu.
2. Click MASTER BODY "AORI & CENTER" in AORI & CENTER Adjustment menu. (Fig. 1)
3. "Setting Data of master body has complete!" is displayed, then reading Master body data is complete.
4. Click "END" in AORI & CENTER Adjustment menu.
5. Click "ADJUSTMENT END" in adjustment menu.
6. Set target camera to adjustment mode.
 Refer to "Starting up the 2181 adjustment program (in the adjustment mode)" in P. 49.
7. Exchange Master camera for target camera.
 Be careful to exchange camera to avoid any change to the setting.
8. Click "AORI & CENTER" in adjustment menu.
9. Click ADJUSTMENT "CENTER" in AORI & CENTER Adjustment menu. (Fig. 1)
10. "Does it adjust?" is displayed in the window, then click "YES".
11. "OK" is displayed in adjustment menu, then "CENTER" adjustment is complete.
12. Click ADJUSTMENT "AORI" in AORI & CENTER Adjustment menu. (Fig. 1)
13. Check the numbers displayed in Aori Adjustment window, whether value of "C" and "dPI" is in the range of standard value. (Fig. 2)

Standard value of C: Between -30 and 30 Standard value of dPI: Between -30 and 30
--

- 1) If displayed value is out of range, perform this adjustment.

Turn AORI adjusting screws, according to the displayed content of Aori Adjustment window (Fig. 2)

14. Repeat step 12 and 13 until displayed value is in range.
15. Click "END" in AORI & CENTER menu, then adjustment is complete.

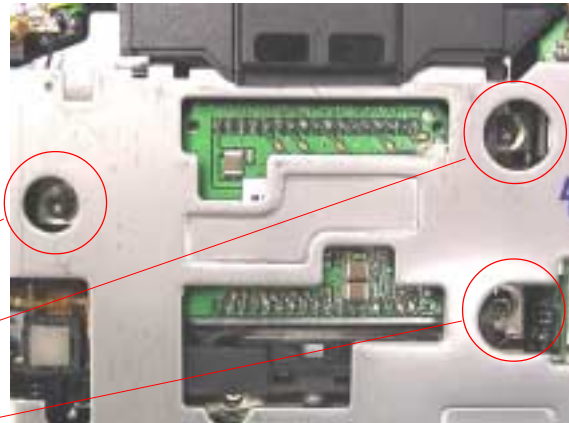
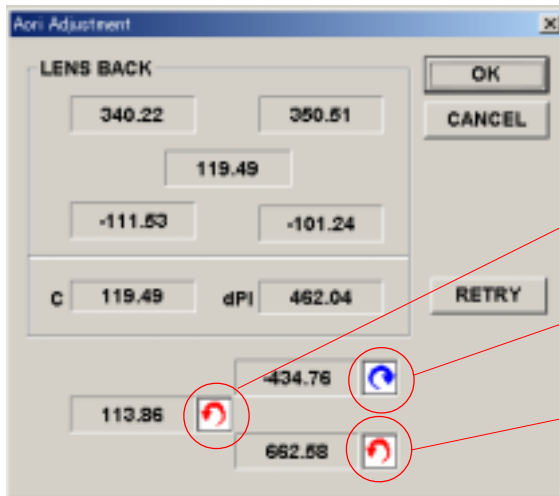
Perform "Resolving Power" check according to the check list, P.4, after finishing adjustment. Repeat adjustment of CCD center position and AORI until the result of this check satisfies the standard.

Fig. 1



Fig. 2

AORI adjusting screws



Numbers mean the degrees of rotating adjusting screw
Arrows mean the direction of rotating adjusting screw

Procedure of CCD AORI checking

1. Click "AORI & CENTER" in adjustment menu.
2. Click MASTER BODY" AORI & CENTER "in AORI & CENTER Adjustment menu. (Fig. 1)
3. " Setting Data of master body has complete! "is displayed, then reading Master body data is complete.
4. Click " END "in AORI & CENTER Adjustment menu.
5. Click " ADJUSTMENT END "in adjustment menu.
6. Exchange Master camera for target camera.
Be careful to exchange camera to avoid any change to the setting.
7. Set camera to adjustment mode.
Refer to " Starting up the 2181 adjustment program (in the adjustment mode) "in P. **.
8. Click " AORI & CENTER "in adjustment menu.
9. Click CHECK" AORI "in AORI & CENTER Adjustment menu. (Fig. 1)
10. Check the numbers displayed in Aori Adjusment window, whther value of C "and" dPI "is in the range of standard value. (Fig. 2)

Standard value of C: From -10 to 10
Standard value of dPI: From -10 to 10

■ Adjustment of the frequency for camera shaking (ACT DRV FREQ)

Required equipment

PC with preinstalled the 2181 adjustment program
CF card for Adjustment
USB-2 (USB cable)
ACAdapterAC-11

Preparation of the adjustment

Set camera to adjustment mode.

Refer to "Starting up the 2181 adjustment program (in the adjustment mode)" in P. 49.

Procedure of the adjustment

1. Click "ACT DRV FREQ" of the adjustment menu.
The adjustment is automatically started.
2. The adjustment is completed when "OK" is displayed on the adjustment menu.

■ Adjustment of the servo for camera shaking (SERVO)

Required equipment

PC with preinstalled the 2181 adjustment program
CF card for Adjustment
USB-2 (USB cable)
AC-11

Preparation of the adjustment

Set camera to adjustment mode.

Refer to "Starting up the 2181 adjustment program (in the adjustment mode)" in P. 49.

Procedure of the adjustment

1. Click "SERVO" of the adjustment menu.
The adjustment is automatically started.
2. The adjustment is completed when "OK" is displayed on the adjustment menu.

■ Adjustment of the gyro for camera shaking (GYRO)

Required equipment

PC with preinstalled the 2181 adjustment program
CF card for Adjustment
USB-2 (USB cable)
ACAdapterAC-11

Preparation of the adjustment

Set camera to adjustment mode.

Refer to "Starting up the 2181 adjustment program (in the adjustment mode)" in P. 49.

Procedure of the adjustment

1. Click "GYRO" of the adjustment menu.
The adjustment is automatically started.
2. The adjustment is completed when "OK" is displayed on the adjustment menu.

Adjustment of the AE (AE)

Required equipment

Luminance box
 L-2101/L-2111 or multi camera tester: EF-8301
 Master Lens
 PC with preinstalled the 2181 adjustment program
 CF card for Adjustment
 USB-2 (USB cable)
 AC Adapter AC-11

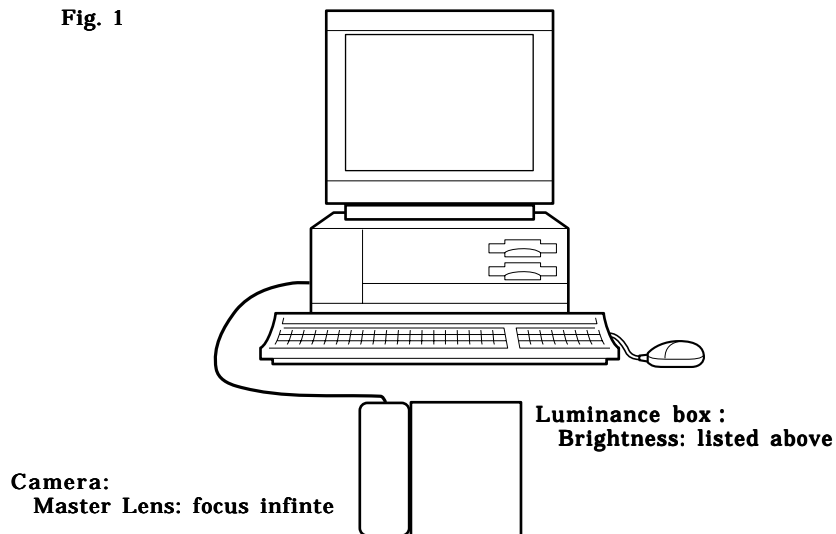
Preparation of the adjustment

1. Set camera to adjustment mode.
 Refer to "Starting up the 2181 adjustment program (in the adjustment mode)" in P. 49.
2. Set the camera and the measuring instrument as shown on the Fig.1.

Procedure of the adjustment

1. Click "AE" of the adjustment menu.
2. According the displayed information in the window, set the brightness of the luminance box and then click "OK".
3. Repeat step 2 5 times, with brightness EV 6, EV 15, EV 10, EV 6 again and EV 15 again.
4. The adjustment is completed when "OK" is displayed on the adjustment menu.

Fig. 1



Sensitivity adjustment (GAIN)

Required equipment

Luminance box
L-2101/L-2111 or multi camera tester: EF-8301
Master Lens
PC with preinstalled the 2181 adjustment program
CF card for Adjustment
USB-2 (USB cable)
AC Adapter AC-11

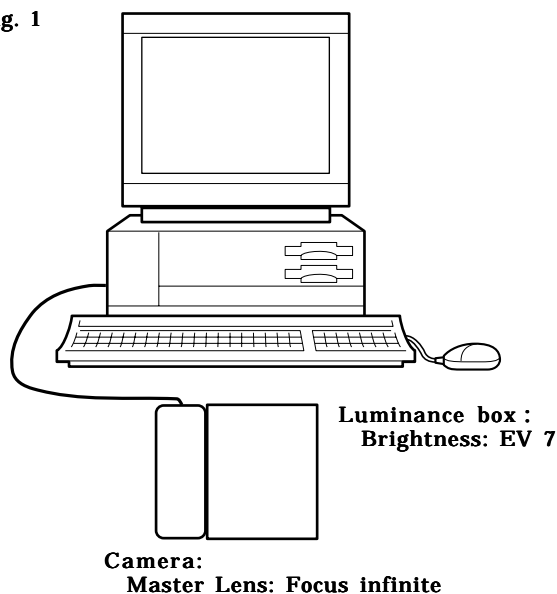
Preparation of the adjustment

1. Set camera to adjustment mode.
Refer to "Starting up the 2181 adjustment program (in the adjustment mode)" in P. 49.
2. Set the camera and the measuring instrument as shown on the Fig.1.

Procedure of the adjustment

1. Set the brightness of the luminance box to EV 7.
2. Click "GAIN" of the adjustment menu.
The adjustment is automatically started.
3. The adjustment is completed when "OK" is displayed on the adjustment menu.

Fig. 1



■ Adjustment of the defective pixel (DEFECT PIXEL)

Required equipment

- Luminance box
 - L-2101/L-2111 or multi camera tester: EF-8301
- Master Lens
- PC with preinstalled the 2181 adjustment program
- CF card for Adjustment
- USB-2 (USB cable)
- AC Adapter AC-11

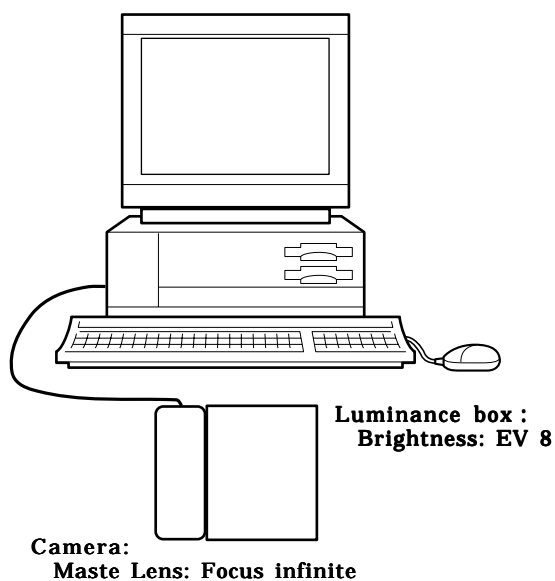
Preparation of the adjustment

1. Set camera to adjustment mode.
Refer to "Starting up the 2181 adjustment program (in the adjustment mode)" in P. 49.
2. Set the camera and the measuring instrument as shown on the Fig.1.

Procedure of the adjustment

1. Set the brightness of the luminance box to EV 8.
2. Click "DEFECT PIXEL" of the adjustment menu.
The adjustment is automatically started.
3. The adjustment is completed when "OK" is displayed on the adjustment menu.

Fig. 1



Adjustment of white balance (WB)

Required equipment

Light Source-A. Refer to Light source-A maintenance, P. 62.
 Light balancing filter LB200
 Master body (Mass Production camera)
 Master Lens
 PC with preinstalled the 2181 adjustment program
 CF card for Adjustment
 USB-2 (USB cable)
 AC Adapter AC-11
 White chart
 Grip Ring

Preparation of the adjustment

1. Set camera to adjustment mode.
 Refer to "Starting up the 2181 adjustment program (in the adjustment mode)" in P. 49.
2. Set the camera and the measuring instrument as shown on the Fig.1.

Procedure of the adjustment

1. Click "WB" of the adjustment menu.
2. Click "MASTER" of WB adjustment menu.
3. Click "OK" after setting light source-A, according to the displayed information.
 The adjustment is automatically started.
4. Click "OK" after setting light source-C, according to the displayed information. (Fig. 2)
 The adjustment is automatically started.
5. "OK" is displayed on the adjustment menu, then reading data is complete.
6. Click "ADJUSTMENT END"
7. Exchange Master camera for target camera.
 Be careful to exchange camera to avoid any change to the setting.
8. Set camera to adjustment mode.
 Refer to "Starting up the 2181 adjustment program (in the adjustment mode)" in P. 49.
9. Click "WB" of the adjustment menu.
10. Click "ADJUSTMENT" of WB Adjustment menu.
11. "Does it adjust?" is displayed in the window, then click "YES".
12. Click "OK" after setting light source-A, according to the displayed information.
 The adjustment is automatically started.
13. Click "OK" after setting light source C, according to the displayed information. (Fig. 2)
 The adjustment is automatically started.
14. The adjustment is completed when "OK" is displayed on the adjustment menu.

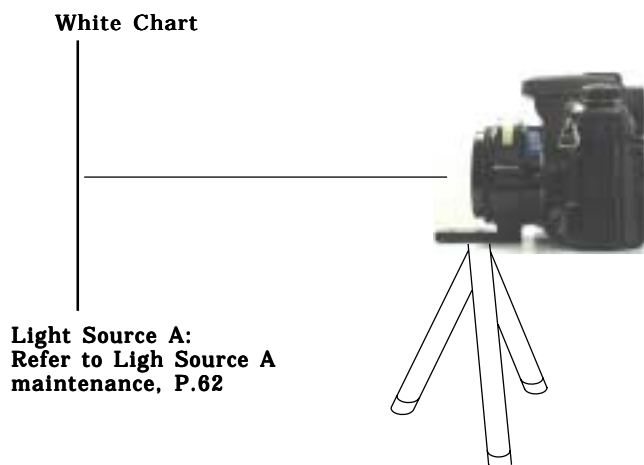


Fig. 2



Adjustment of the camera shaking compensation (SHAKE GAIN)

Required equipment

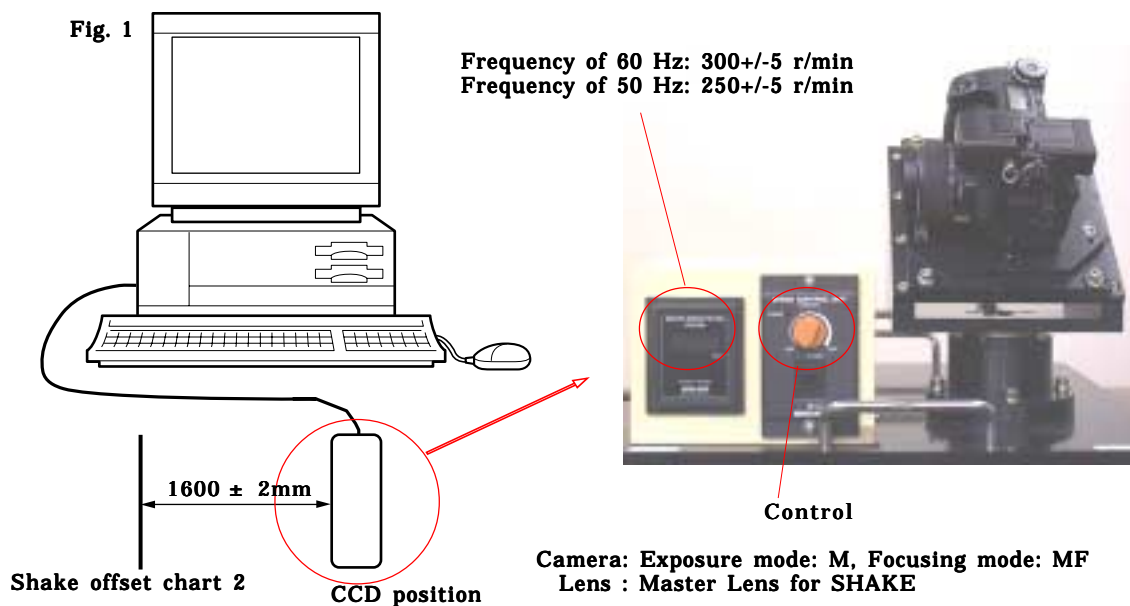
Vibration tester
 Shake Offset Chart 2
 PC with preinstalled the 2181 adjustment program
 CF card for Adjustment
 USB-200 (USB cable)
 AC Adapter AC-11
 Master Lens for SHAKE

Preparation of the adjustment

1. Set the camera without USB cable and the measuring instrument as shown on the Fig.1.
 Set distance between camera and Shake Offset Chart 2 to 1600mm.
 Note 1: Distance between camera and chart means distance between CCD position of the camera and chart. About CCD position, refer to P.52 Fig 1.
 Note 2: Use indirect lighting like room light for the lighting of the chart, not to use other direct lighting.
 If direct lighting is used, adjustment error often happens because of the mis-detecting of the cross line of the chart.
2. Set the center of the camera finder to the center of the chart.
3. Confirm whether the center of the chart is located at the center of the screen or not by setting the camera to after view mode. If the center of the chart is not located at the center of the screen, please perform setting again.
4. Set camera to adjustment mode.
 Refer to "Starting up the 2181 adjustment program (in the adjustment mode)" in P. 49.

Procedure of the adjustment

1. Click "SHAKE GAIN" of the adjustment menu.
 Take a picture in the automatic mode.
2. Follow the message, "Please turn on shake!" Turn the power of the vibration tester on, and click "OK" after setting the rotation as follows (Fig.1).
 8 or 4 pictures are automatically taken.
 Frequency of 60 Hz: 300 \pm 5 r/min
 Frequency of 50 Hz: 250 \pm 5 r/min
3. Follow the message, "Please turn off shake!" Turn the power of the vibration tester off, and click "OK" (Fig.3).
4. The adjustment is completed when "OK" is displayed on the adjustment menu.



Setting of Destination (DESTINATION)

*Always perform the setting and confirming the destination.

Required equipment

PC with preinstalled the 2181 adjustment program
 CF card for Adjustment
 USB-200 (USB cable)
 ACAdapter AC-11

Preparation of the adjustment

Set camera to adjustment mode.

Refer to "Starting up the 2181 adjustment program (in the adjustment mode)" in P. 49.

Procedure of the adjustment

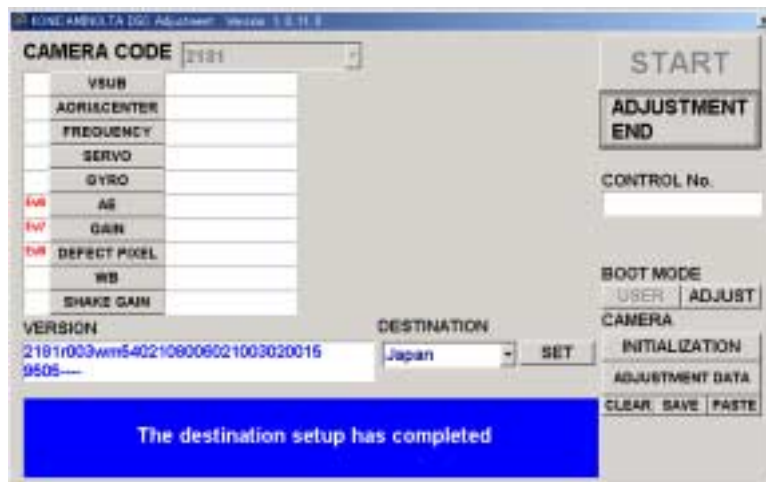
1. Click down arrow under the "DESTINATION" in adjustment menu and select required destination from the item list.

Destination: Europe/Japan/USA/China

2. Click "SET" button under "DESTINATION" after selecting required destination.

Then "The destination setup has completed" is displayed on the screen and setting is completed.
 (Fig. 1)

Fig. 1



Light Source-A Maintenance

Outline

Because high accuracy of required light source-A is required when adjusting and confirming.

Measuring instrument

Chroma meter (CL-200)

Luminance meter (LS-100)

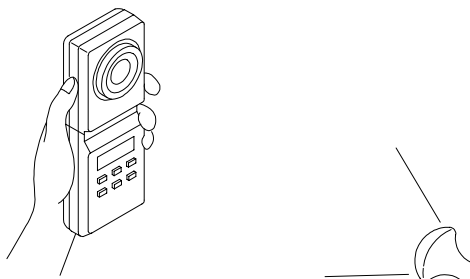
Light source-A (tungsten light)

Procedure

*Managements of the chromaticity and the luminance

1. Light the light source-A on.
2. Measure the chromaticity coordinate (x,y) with the chroma meter. (Fig.1)

Fig.1



3. The result should be within the range of the following table.

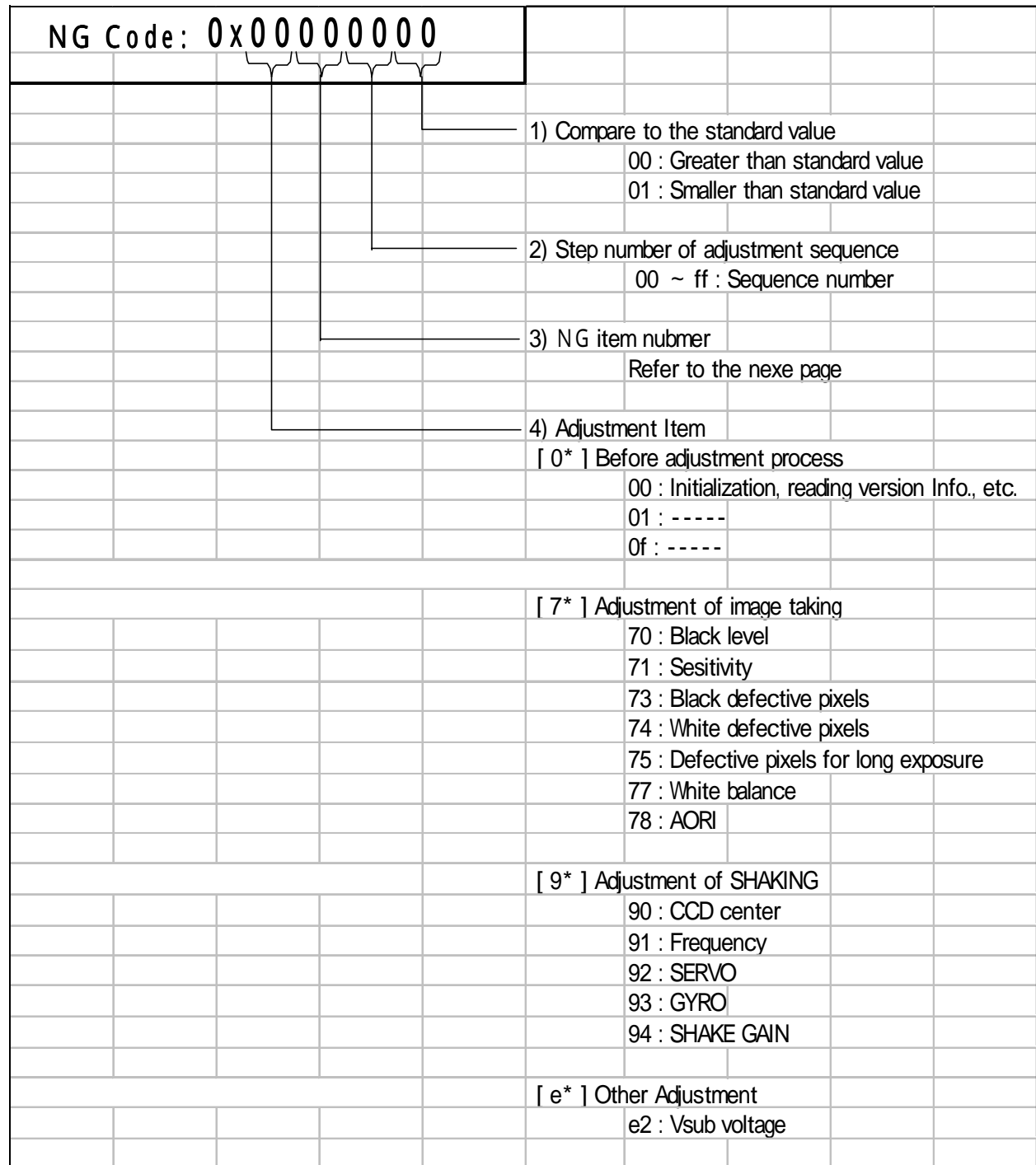
* If the result is out of the range, adjust the light voltage of the light source-A through the slidax.

Chromaticity	$x = 0.445 \sim 0.455$
	$y = 0.405 \sim 0.415$

4. Measure the luminance with the luminance meter.
5. The result should be within the range of the following table.

*If the result is out of the range, adjust the distance of the light source-A.

$Ev10 \pm 0.3Ev$



Adjustment (Common)	
0x**00****	At the time of a successful adjustment
0x**f0****	Arguments are not good. (Not camera errors)
0x**f1****	USB port initialization is not good
0x**f2****	Diaphragm control is not good
0x**f3****	Reset of ANT-SHAKE is not good
0x**f4****	Reset of FOCUS is not good
0x**f5****	Reset of SHUTTER control is not good
0x**f6****	Camera-charging time has been exceeded
0x**f7****	Readout of ZOOM data is not good
0x**f8****	Readout of Temperature data is not good
0x**f9****	Zoom drive is not good
0x**fa****	Adjustment sequence is not good
0x**fb****	Setting of Camera mode is not good
0x**fc****	Initialization
0x**fd****	Adjustment data is not good. (Out of the standard)
0x**fe****	Access of Flash ROM is not good
0x**ff****	Setting of various kinds is not good
Adjustment (Image taking system)	
0x70*****	NG for Black level Adjustment
0x**01****	Value is Greater than standard
0x71*****	NG for Sensitivity Adjustment
0x**01****	Retry over
0x**02****	Value is too small
0x**03****	Value is too large
0x73*****	NG for Missing Pixel Comp. Adjustment (Blk)
0x**00****	There are many black dead pixels
0x**01****	Both adjoining pixels are dead pixels
0x74*****	NG for Missing Pixel Comp. Adjustment (Wht)
0x**00****	There are many white defective pixels
0x**01****	Both adjoining pixels are defective pixels
0x75*****	NG for Missing Pixel Comp Adj. (Long Exp.)
0x**00****	There are many white defective pixels
0x**01****	Both adjoining pixels are defective pixels
0x77*****	NG for WB Adjustment
0x**00****	Setting of Camera or USB communication err.
0x**01****	Too low exposure
0x**02****	Too high exposure
0x**03****	Too low R-Gain on Light source-A
0x**04****	Too high R-Gain on Light source-A
0x**05****	Too low B-Gain on Light source-A
0x**06****	Too high B-Gain on Light source-A
0x**07****	Too low R-Gain on Light source-C
0x**08****	Too high R-Gain on Light source-C
0x**09****	Too low B-Gain on Light source-C
0x**0a****	Too high B-Gain on Light source-C
0x78*****	NG for ACRI Adjustment
0x**00****	Setting of Camera or USB communication err.

Adjustment (ANTI-SHAKE system)	
0x90*****	NG for CCD CENTER Adjustment
0x**01****	Setting of Camera
0x**02****	Communication for SHAKE compensation
0x**03****	Communication for SHAKE compensation
0x**04****	Communication for Image taking system
0x**05****	Setting of Driving-direction
0x**06****	Shading-data has not been detected.
0x**07****	Shading-data has not been detected.
0x**08****	Adjustment value (Pitch)
0x**09****	Adjustment value (Yaw)
0x**0a****	Writing of Adjustment value
0x91*****	NG for ACT DRV FREQ Adjustment
0x**00****	USB communication
0x**01****	Setting of Camera
0x**02****	Communication for SHAKE compensation
0x**03****	Adjustment value
0x**04****	Writing of Adjustment value
0x**05****	Speed error of Pitch or Yaw
0x**08****	
0x92*****	NG for SERVO Adjustment
0x**01****	Setting of Camera
0x**02****	Communication for SHAKE compensation
0x**03****	Received data of CPU
0x**04****	Electric current mode
0x**10****	
0x**20****	Check Sum error
0x**21****	Frequency error
0x**22****	Final distributed data error
0x**23****	Final distributed data error
0x93*****	NG for GYRO Adjustment
0x**01****	Setting of Camera
0x**02****	Communication for SHAKE compensation
0x**03****	Voltage of IC Vref
0x**04****	Value of GYRO offset
0x**05****	Value of GYRO offset
0x**06****	Initial value of DAC
0x**07****	Initial value of DAC
0x**08****	Vibration was detected during adj. (Pitch)
0x**09****	Vibration was detected during adj. (Yaw)
0x**0a****	Temperature of Lens
0x**0b****	Writing of Adjustment value
0x94*****	NG for SHAKE GAIN Adjustment
0x**01****	Detect white line
0x**02****	P to P error
0x**0a****	
0x**0b****	White line is too wide. (Pitch)
0x**0c****	White line is too wide. (Yaw)
0x**0d****	No detection of minimum gain.
0x**10****	
0x**11****	Rest of SHAKE Comp. Greater than standard. (pitch)
0x**12****	Rest of SHAKE Comp. Greater than standard. (Yaw)
Other Adjustment	
0xe2*****	NG for Vsub Adjustment
0x**01****	Adjustment initialization error
0x**02****	Vsub data 1 is out of range.
0x**03****	Vsub data 2 is out of range.

Measuring instrument

PC (AT convertible) with preinstalled Windows 98, 98SE, 2000 or XP. (USB port should be guaranteed its performance by the maker. Also, Adobe Photoshop 6.0 or later should be installed if Windows 2000 or XP is installed on PC.)

* It is possible to confirm the performance on PC with Windows 95 (AT convertible).

(Card reader and PC card adapter are required.)

640 x 480 or more color display capable of displaying at least 32,000 colors

Adobe Photoshop

USB Cable For USB-2

Luminance box L-2101 / 2111

Multi camera tester EF-8301

Luminance meter (LS-100)

Chroma meter (CL-200)

DC power supplies PR18-5A

Digital storage scope DS-8706

Digital multi meter <FLUKE 83>

Camera leak tester <CL-1101 ,CL-1201>

Macbeth color checker <2755-0008-75>

2766 resolving power chart (W) <2766-0005-75>

Color calculator II <2766-0008-75>

2181 adjustment program CD (Ver. 1.0) <2181-0001-75>

Fluorescent light stand SQ 967W <7981-9012-61>

Fuluorescent light FPL 27EX-N <7985-1020-01>

Vibration tester <7981-9013-01>

Master Lens for SHAKING <2181-0004-75>

Shake Offset Chart 2 <2181-0006-75>

Hexangular screwdriver <7983-1040-01>

White chart

Light balancing filter LB200 <2720-0002-75>

Light source A: Tungsten light 150W type.

Light source C: (Light source A + light balancing filter LB200 <2720-0002-75>)

CF card: Prepare for 4MB or more CF card for Adjustment mode of camera

Blackout curtain

AC adapter AC-11

Tripod

Hexangular wrench (1.5)

HIT controller <7981-5001-01>

I/F BOX for HIT <7981-5001-33>

Contact Jig Cable <7981-5001-05>

HIT I/O Tester <7981-5001-03>

Preset Signal Adapter <7981-2014-62>

AF Chart-I for 2163 <2163-0001-75>

AF Chart-II for 2163 <2163-0002-75>

AF Chart-III for 2163 <2163-0003-75>

ROM Pack for 2181 <7981-5002-86>

Contact Jig for 2181 <7981-5001-43>

SPC Chart for 2181 <2181-0002-75>

Master Lens <2072-0001-75>

AF Master Lens <2072-0006-75>

AF Y/P Adjuster <2076-0006-75>

Remote Cord

Grip Ring <7983-9004-11>

Magnifier V

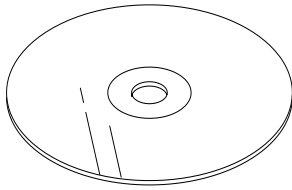
X Cable <7981-2014-16>

AORI Chart for 2181 <2181-0003-75>

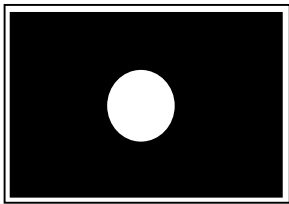
Fluorescent (FL40S W-SDL) <7985-1021-01>

66 (2181)

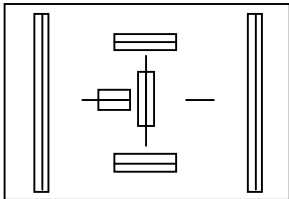
2181 adjustment program CD (Ver. 1.0)
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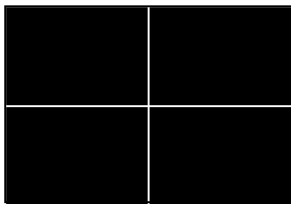
SPC Chart for 2181
<2181-0002-75>



AORI-Chart for 2181
<2181-0003-75>



Shake Offset Chart 2
<2181-0006-75>



Fluorescent (FL40S W-SDL)
<7985-1021-01>



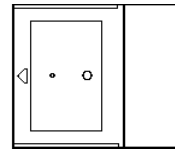
Master Lens for Shaking
<2181-0004-75>



contact Jig. for 2181
<7981-5001-43>



ROM Pack for 2181
<7981-5002-86>



DSC Shutter Tester Model 7FR-80D
<7981-1029-01>



Subsidiary Materials

Grease

G-85 <7984-1085-02>

Adhesive

B-10 <7984-2010-01>

B-20 <7984-2020-01>

B-50 <7984-2050-01>

B-60 <7984-2060-01>