

SAL100M28

(MACRO 2.8/100) (100mm F2.8 Macro)

SERVICE MANUAL

[Ver 1.1 2007.02](#)

[Revision History](#)

[How to use
Acrobat Reader](#)



*US Model
Canadian Model
AEP Model
Chinese Model*

Link

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LENS FOR DSLR CAMERA

SONY[®]



SPECIFICATIONS

- This lens is equipped with a distance encoder. The distance encoder allows more accurate measurement (ADI) by using a flash for ADI.
- Depending on the lens mechanism, the focal length may change with any change of the shooting distance. The focal length assumes the lens is focused at infinity.

Equivalent 35mm-format focal length *1 (mm)

150

*1 The value for equivalent 35mm-format focal length is based on Digital Single Lens Reflex Cameras equipped with an APS-C sized image sensor.

Lens groups elements

8-8

Angle of view 1 *2

24°

Angle of view 2 *2

16°

*2 The value of angle of view 1 is based on 35mm-format cameras, and that of angle of view 2 is based on Digital Single Lens Reflex Cameras equipped with an APS-C sized image sensor.

Minimum focus (m (feet)) *3

0.35 (1.2)

*3 Minimum focus is the shortest distance from the image sensor to the subject.

Maximum magnification (×)

1

Minimum f-stop

f/32

Filter diameter (mm)

55

Dimensions (maximum diameter × height) (mm (in.))

Approx. 75 × 98.5 (3 × 4)

Mass (g (oz.))

Approx. 505 (18)

Included items

Lens (1), Front lens cap (1), Rear lens cap (1), Lens hood (1), Set of printed documentation

Designs and specifications are subject to change without notice.

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1. SERVICE NOTE

1-1. Chemicals

Some chemicals used for servicing are highly volatile.

Their evaporation caused by improper management affects your health and environment, and wastes resources.

Manage the chemicals carefully as follows.

- Store chemicals sealed in a specific place to prevent from exposure to high temperature or direct sunlight.
- Avoid dividing chemicals into excessive numbers of small containers to reduce natural evaporation.
- Keep containers sealed to avoid natural evaporation when chemicals are not in use.
- Avoid using chemicals as much as possible. When using chemicals, divide only required amount to a small plate from the container and use up it.

1-2. Exterior Parts

Be careful to the following points for exterior parts used in this unit.

- Use a piece of cleaning paper or cleaning cloth for cleaning exterior parts. Avoid using chemicals.
Even if you have to use chemicals to clean heavy dirt, don't use paint thinner, ketone, nor alcohol.
- Insert the specific screws vertically to the part when installing a exterior part.
Be careful not to tighten screws too much.

1-3. Unleaded Solder

This unit uses unleaded solder.

Boards requiring use of unleaded solder are printed with the lead free mark (LF) indicating the solder contains no lead.

(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size.)



: LEAD FREE MARK

Be careful to the following points to solder or unsolder.

- Set the soldering iron tip temperature to 350 °C approximately.
If cannot control temperature, solder/unsolder at high temperature for a short time.
Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
Unleaded solder is more viscous (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Be sure to control soldering iron tips used for unleaded solder and those for leaded solder so they are managed separately. Mixing unleaded solder and leaded solder will cause detachment phenomenon.

1-4. SAFETY CHECK-OUT



After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are “pinched” or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
 - Keep the temperature of the soldering iron around 270 °C during repairing.
 - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
 - Be careful not to apply force on the conductor when soldering or unsoldering.


CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type.

SAFETY-RELATED COMPONENT WARNING!!

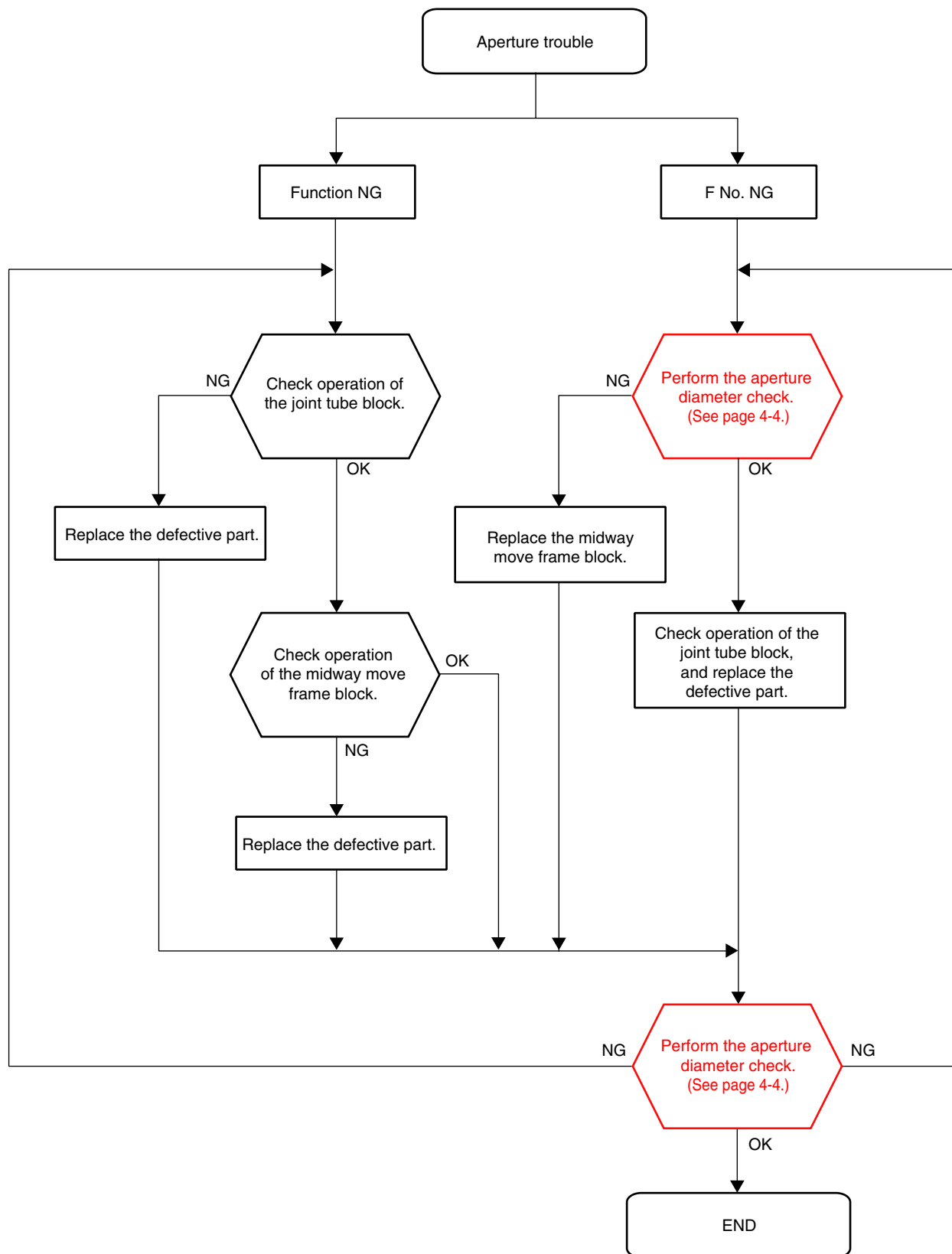
COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

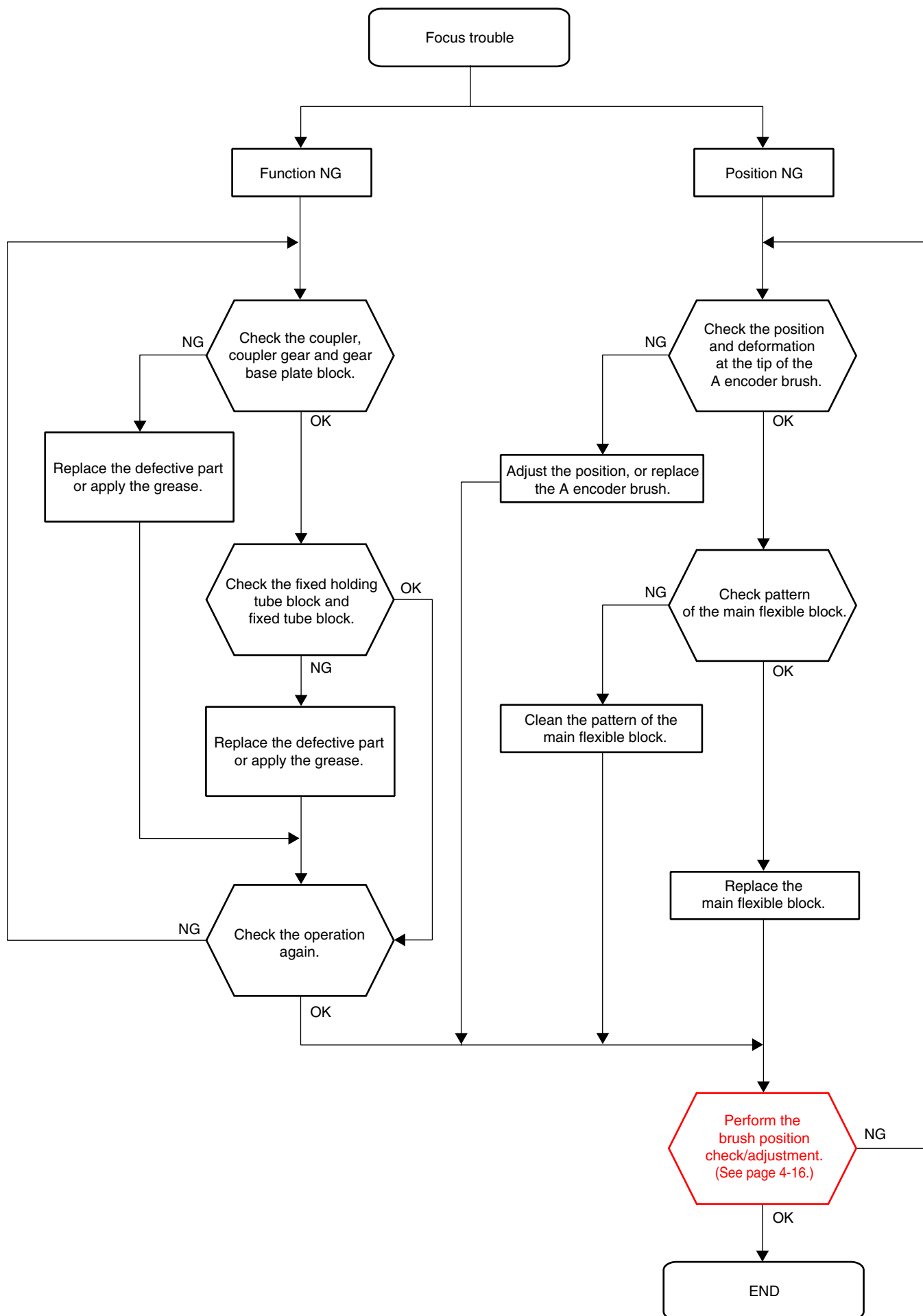
LES COMPOSANTS IDENTIFÉS PAR UNE MARQUE  SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

1-5. TROUBLESHOOTING

1-5-1. Aperture Trouble



1-5-2. Focus Trouble

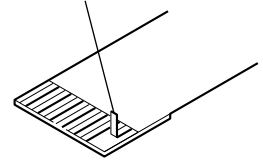


2. DISASSEMBLY

NOTE FOR REPAIR

- Make sure that the flat cable and flexible board are not cracked or bent at the terminal. Do not insert the cable insufficiently nor crookedly.
- When remove a connector, don't pull at wire of connector. It is possible that a wire is snapped.
- When installing a connector, don't press down at wire of connector. It is possible that a wire is snapped.
- Do not apply excessive load to the gilded flexible board.

Cut and remove the part of gilt which comes off at the point.
(Be careful or some pieces of gilt may be left inside)

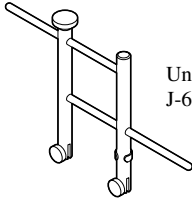
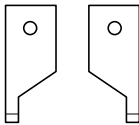
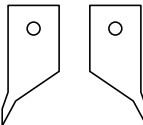


UNIVERSAL WRENCH

In case of the following notches or holes are located in the lens block, etc during disassembling/ assembling the lens, Use the universal wrench.



How to Use

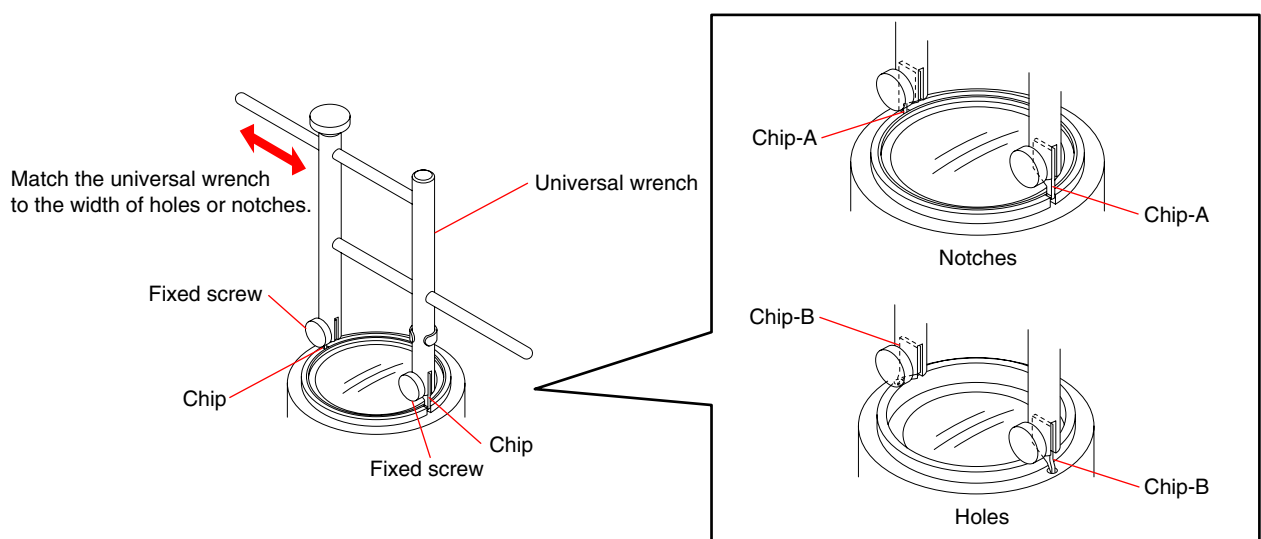
 <p>Universal wrench J-6082-609-A</p>	 <p>Chip-A for universal wrench: J-6082-609-1</p>	 <p>Chip-B for universal wrench: J-6082-609-2</p>
-----------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------

Attach the chip-A or chip-B to the universal wrench.

For the notches: chip-A

For the holes: chip-B

Match the universal wrench to the holes or notches of the lens block, etc.

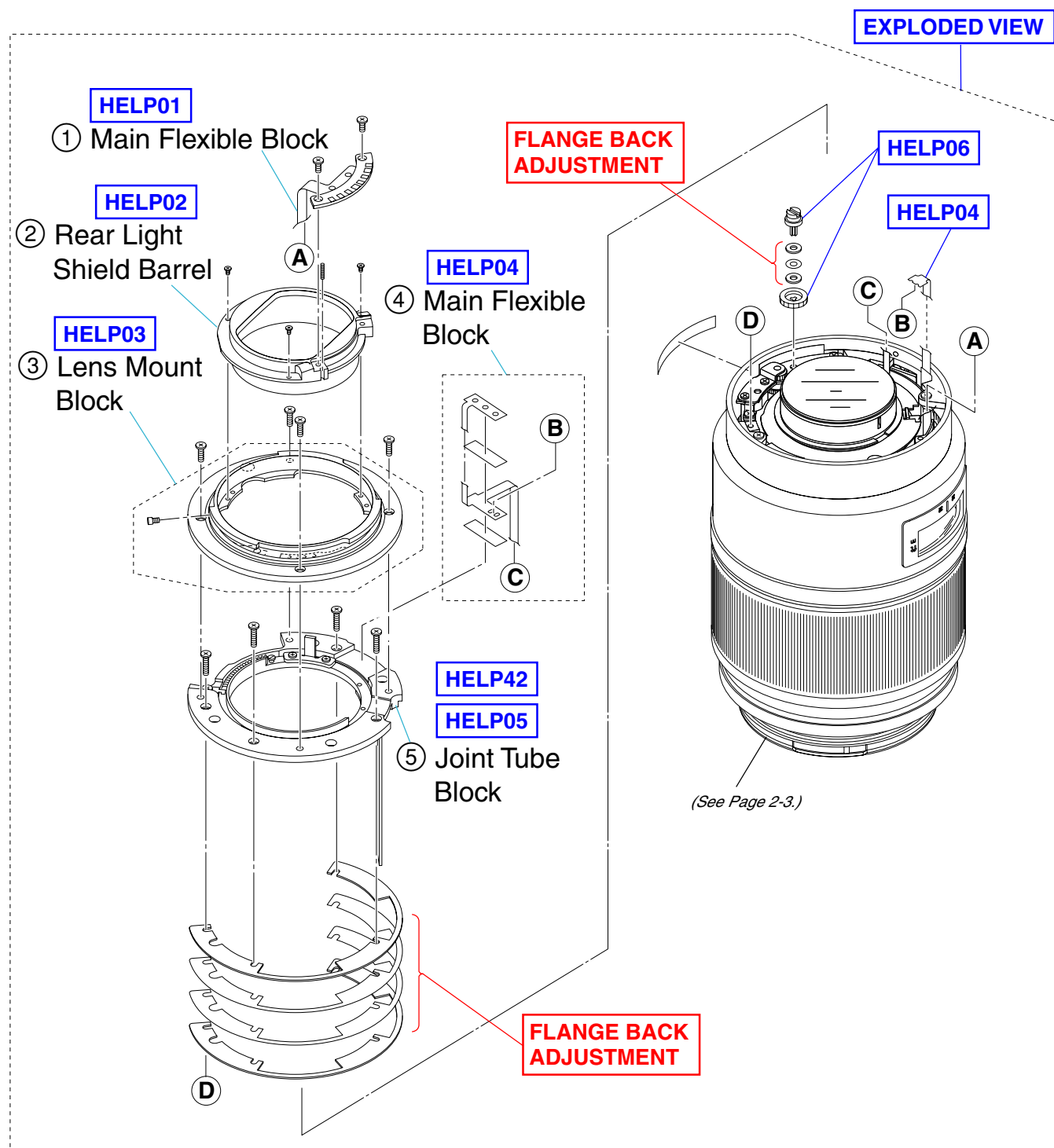


When top of tip does not reach holes or notches because the fixed screw becomes obstructive, replace the fixed screw to below.

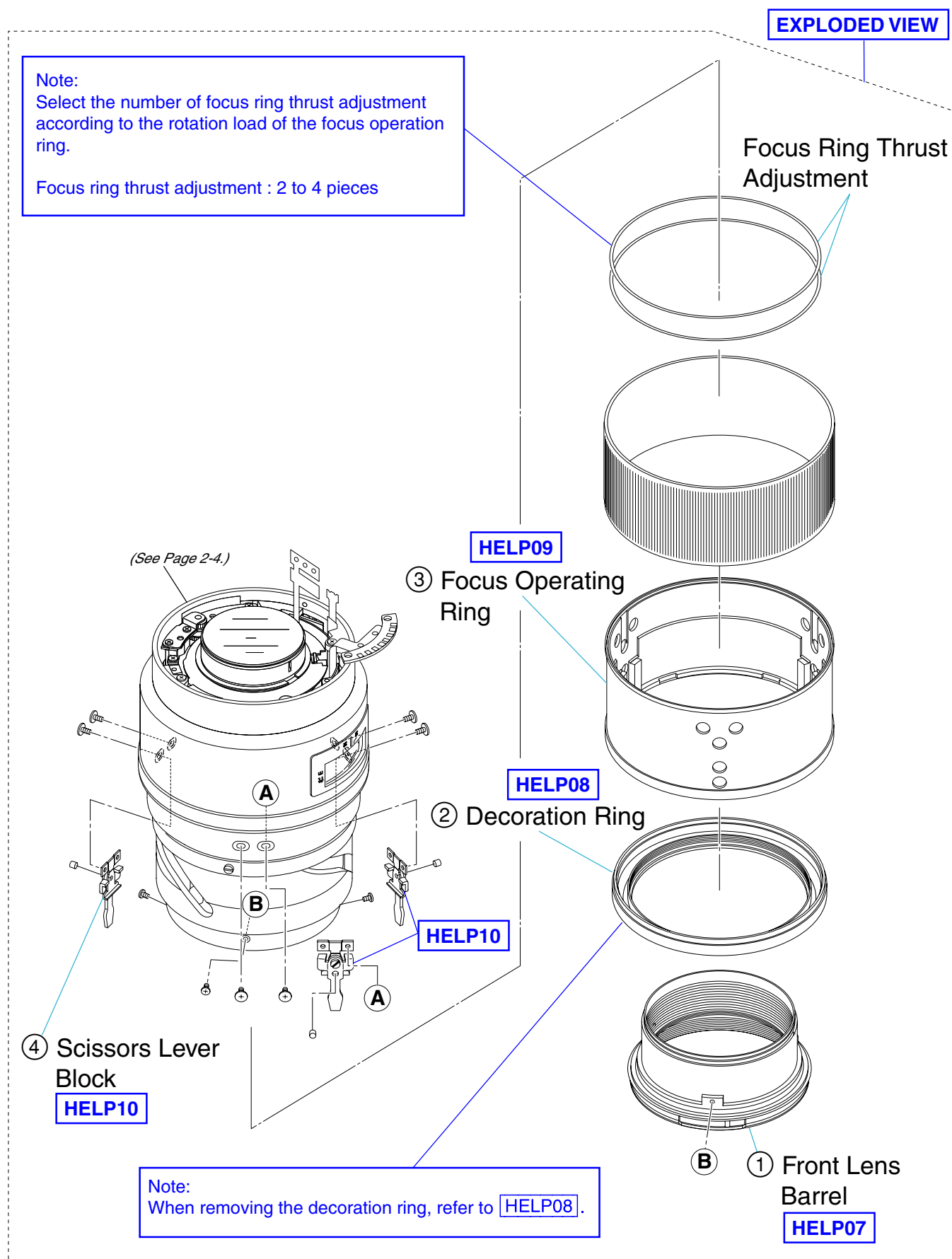
+B 3X5 7-682-546-09

2-1. DISASSEMBLY

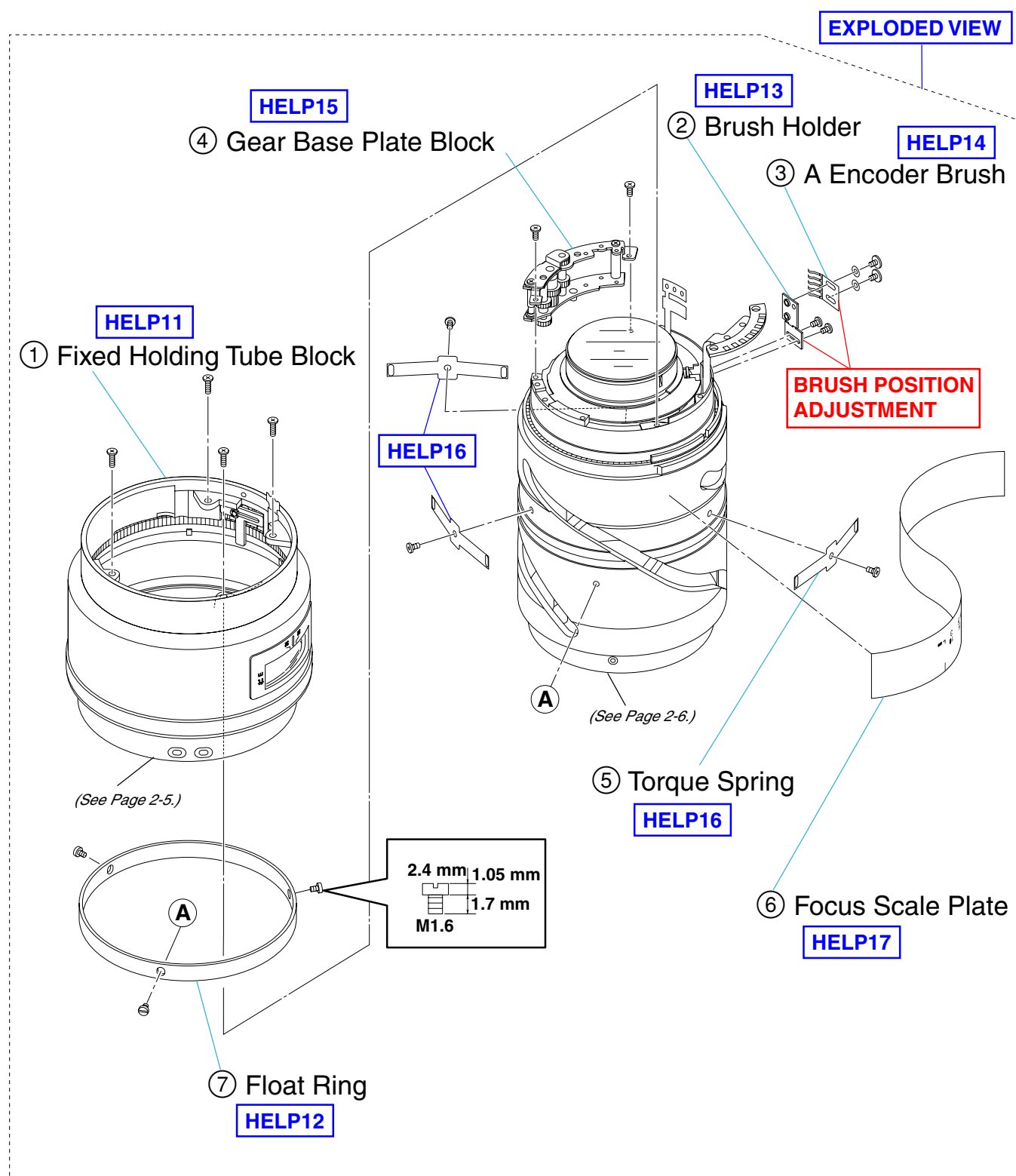
2-1-1. LENS MOUNT BLOCK AND JOINT TUBE BLOCK



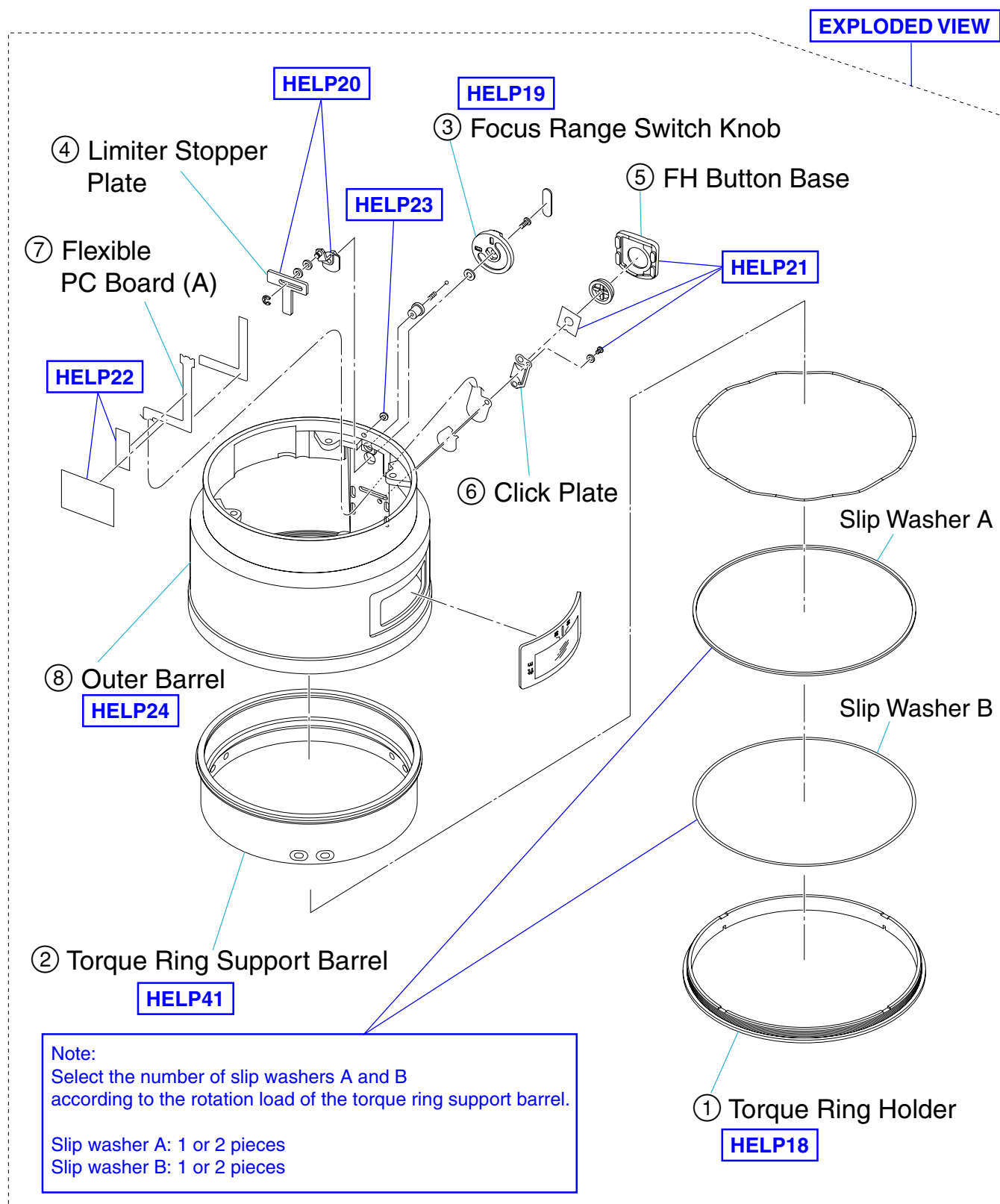
2-1-2. FRONT LENS BARREL AND FOCUS OPERATION RING



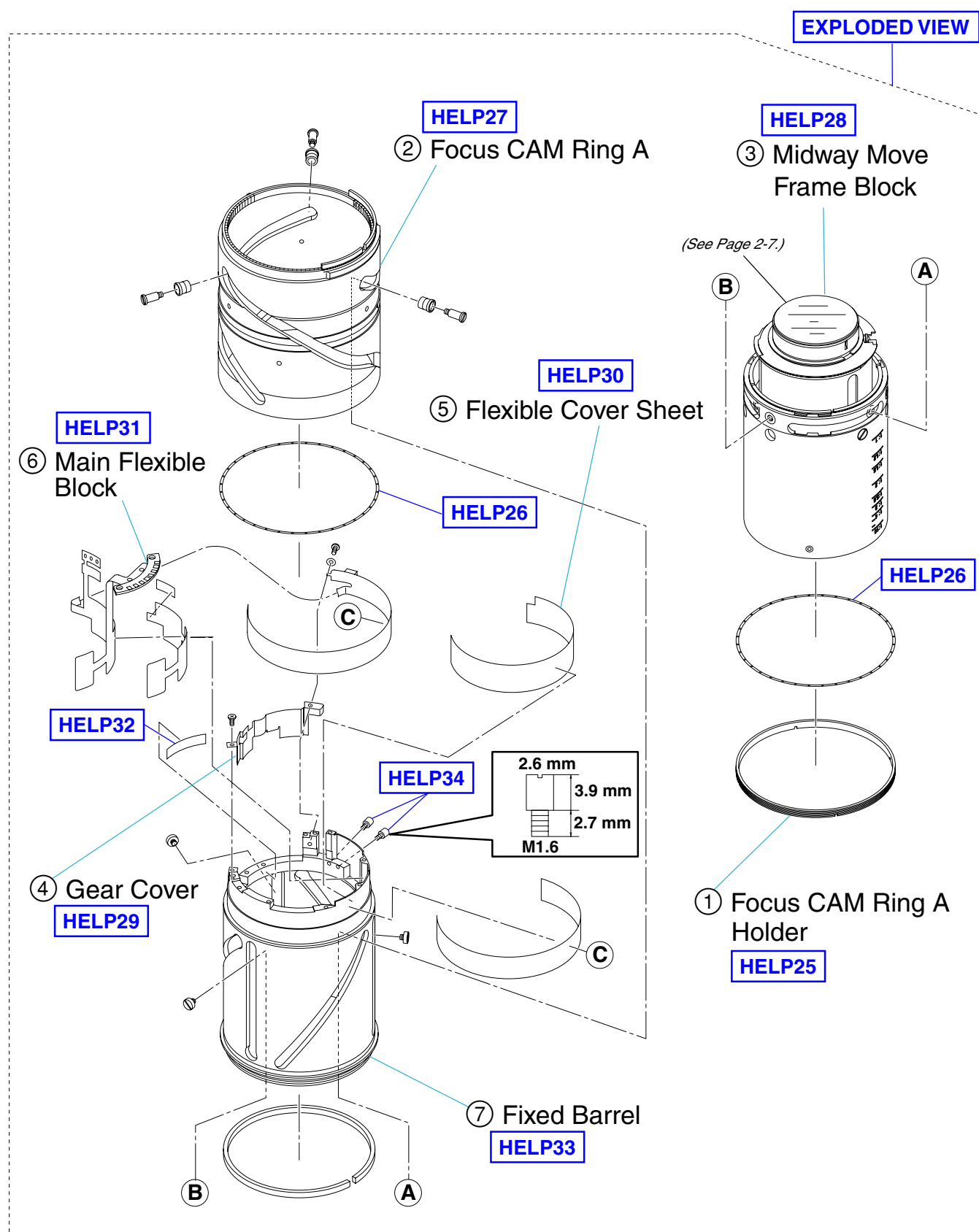
2-1-3. GEAR BASE PLATE BLOCK AND A ENCODER BRUSH



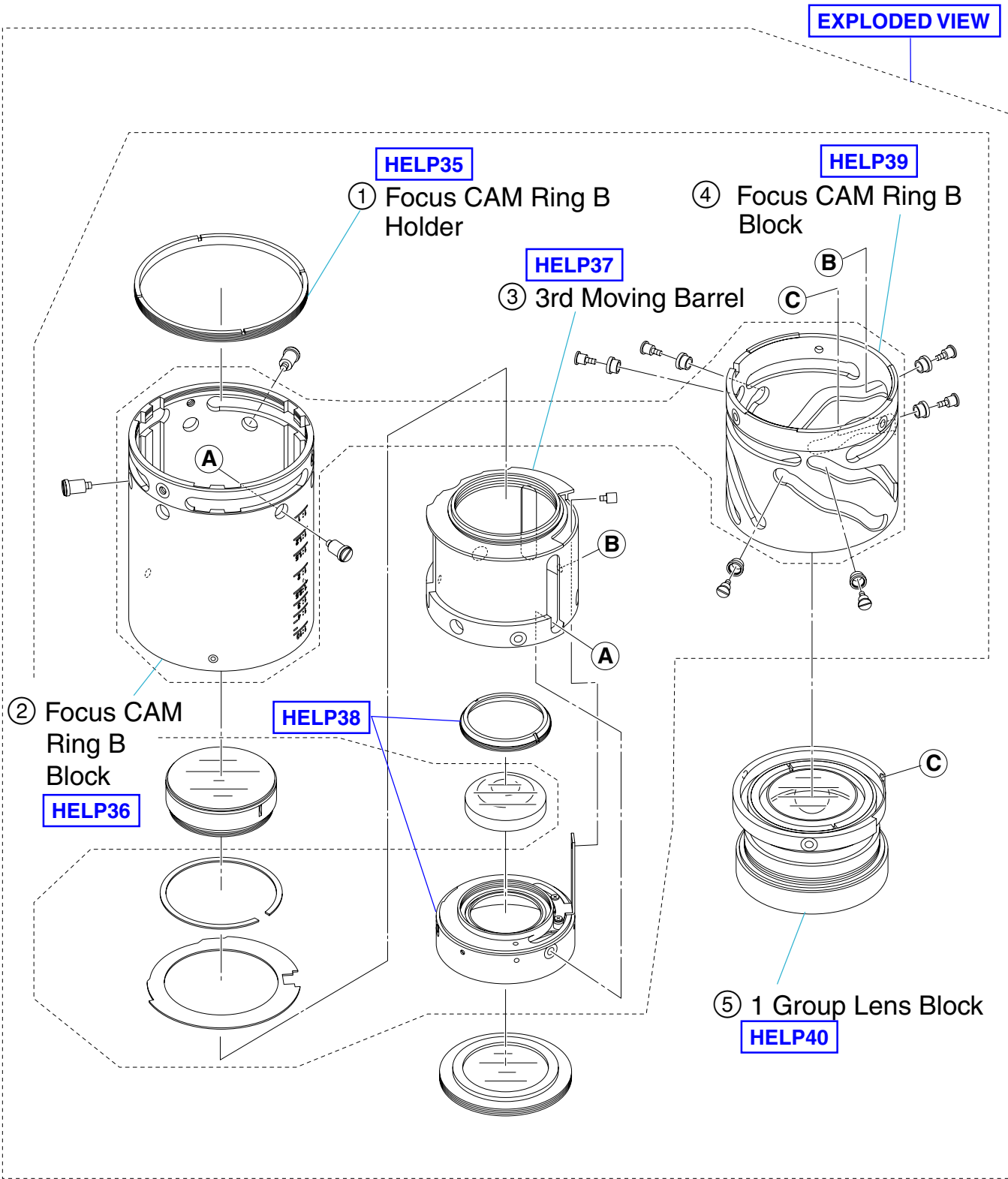
2-1-4. FIXED HOLDING TUBE BLOCK



2-1-5. FIXED TUBE BLOCK AND MAIN FLEXIBLE BLOCK



2-1-6. MIDWAY MOVE FRAME BLOCK



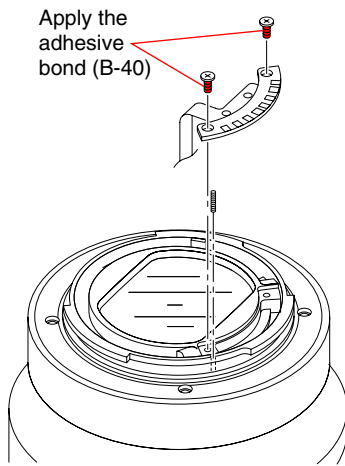
HELP

Note for assembling and grease applying positions are shown.

HELP01

Adhesive bond (B-40): J-6082-614-A

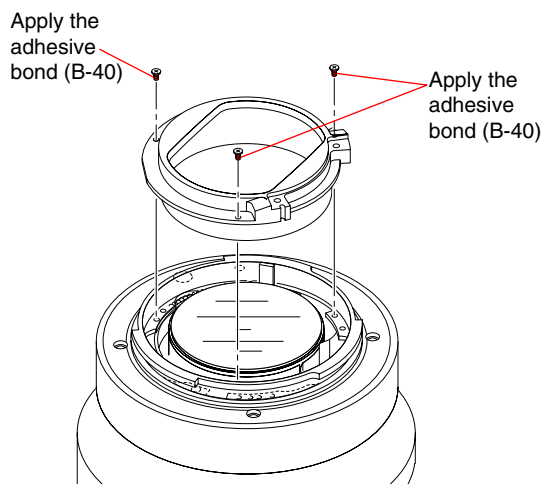
Apply the adhesive bond (B-40) to the two screws and tighten them as shown in the figure.



HELP02

Adhesive bond (B-40): J-6082-614-A

Apply the adhesive bond (B-40) to the three screws and tighten them as shown in the figure.



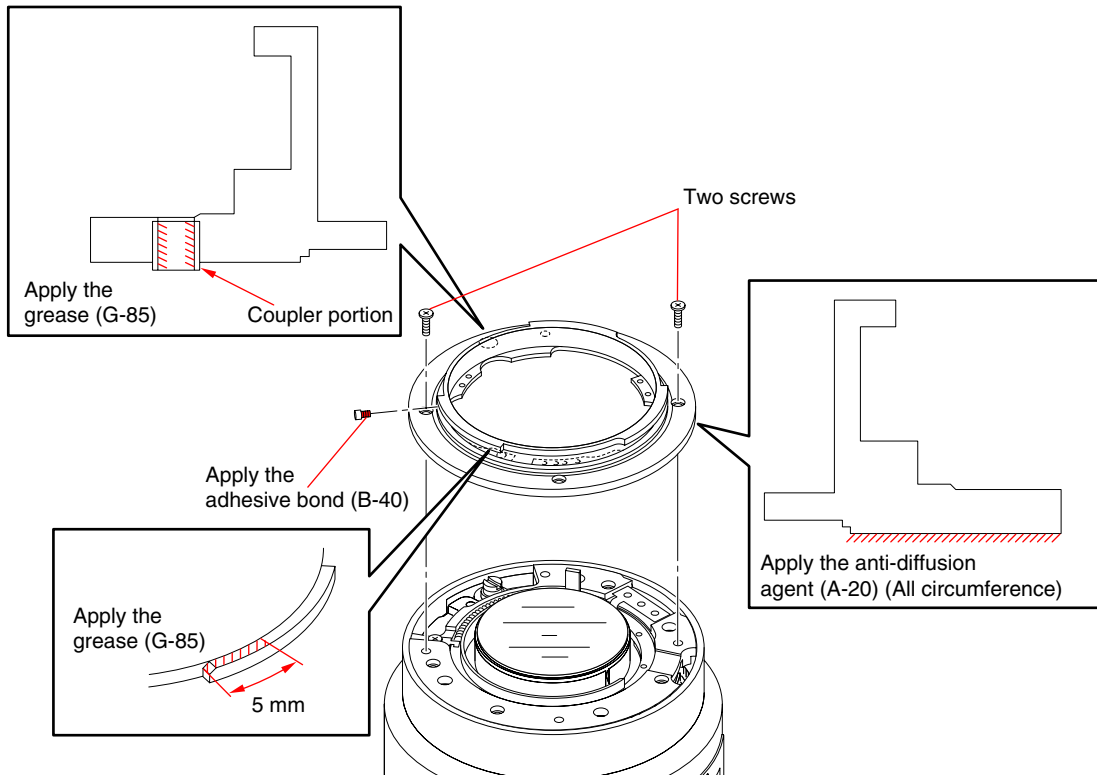
HELP03

Grease (G-85): J-6082-626-A

Anti-diffusion agent (A-20): J-6082-611-A

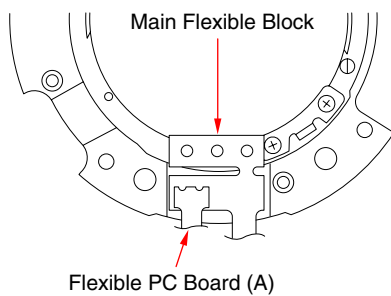
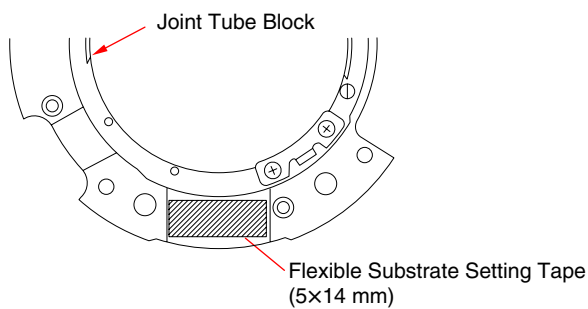
Adhesive bond (B-40): J-6082-614-A

1. Apply the grease (G-85) and anti-diffusion agent (A-20) to the instruction part of the lens mount block.
2. Apply the adhesive bond (B-40) to the screw and tighten it as shown in the figure.
3. When the flange back (f'F) adjustment, tighten the two screws tentatively as shown in the figure.

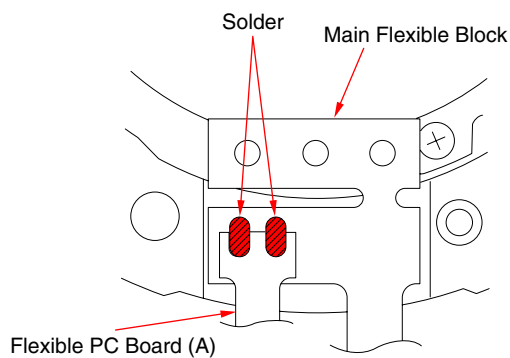


HELP04

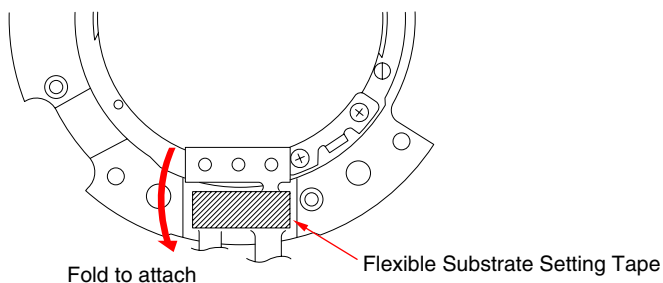
1. Attach the flexible substrate setting tape to the joint tube block.
2. Attach the main flexible block and flexible pc board (A) as shown in the figure.



3. Solder the flexible pc board (A) to the main flexible block as shown in the figure.



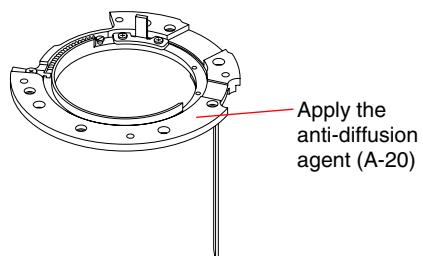
4. Attach the flexible substrate setting tape, and fold the main flexible block to fix as shown in the figure.



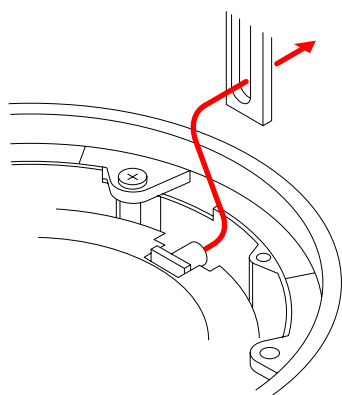
HELP05

Anti-diffusion agent (A-20): J-6082-611-A

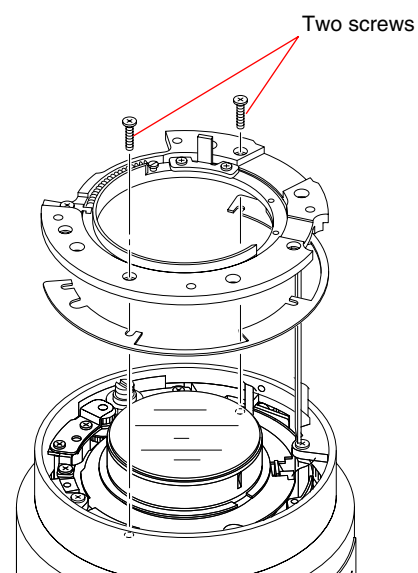
1. Apply the anti-diffusion agent (A-20) to the instruction part of the joint tube block.



2. Attach the joint tube block as shown in the figure.



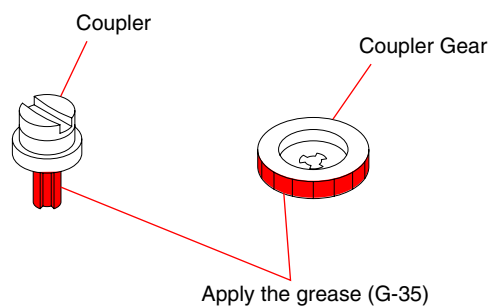
3. When the flange back (f'F) adjustment, tighten the two screws tentatively as shown in the figure.



HELP06

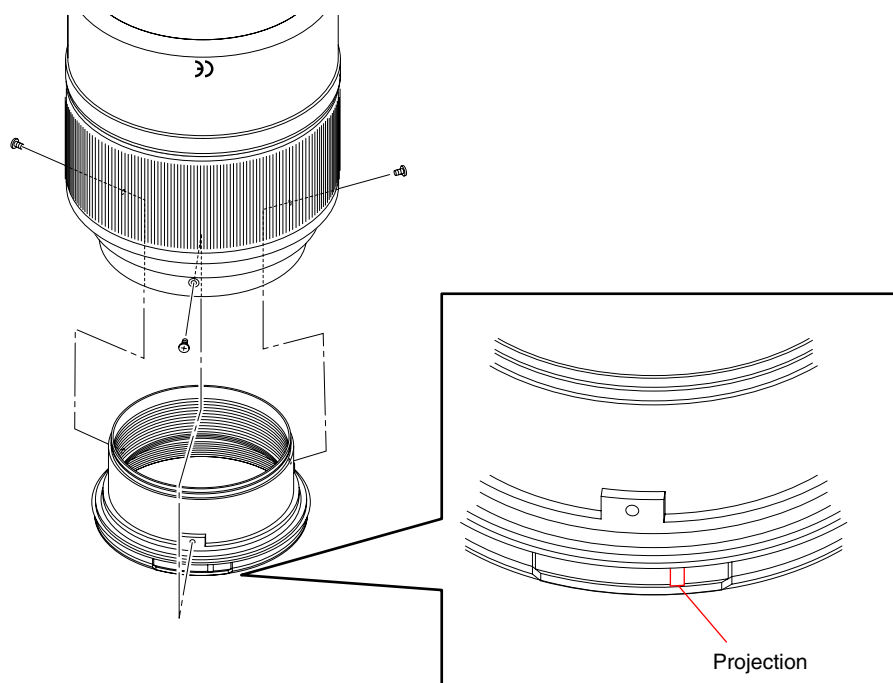
Grease (G-35): J-6082-621A

Apply the grease (G-35) to the instruction part of the coupler and coupler gear.



HELP07

Align the projection of the front lens barrel to CE mark as shown in the figure, and attach it.

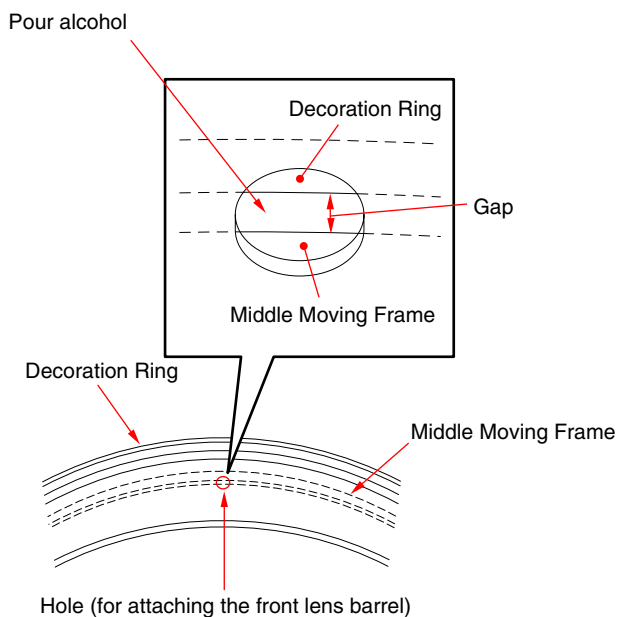


HELP08

Adhesive bond (B-10): J-6082-612-A

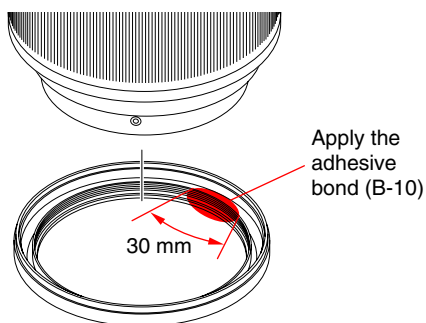
Removing the Decoration Ring

1. Turn the focus operation ring to the infinity slowly until the gap between the fixed barrel and decoration ring appears within the hole of the middle moving frame (hole for attaching the front lens barrel).
2. Pour alcohol into the gaps (3 areas) using the tweezers, etc, then leave it for a few minutes.
Note: Leave it with the lens mount upward to prevent the alcohol from spreading inside.
3. Grip and remove the decoration ring using the nonskid rubber, etc.



Attaching the Decoration Ring

Apply the adhesive bond (B-10) to the instruction part of the decoration ring.

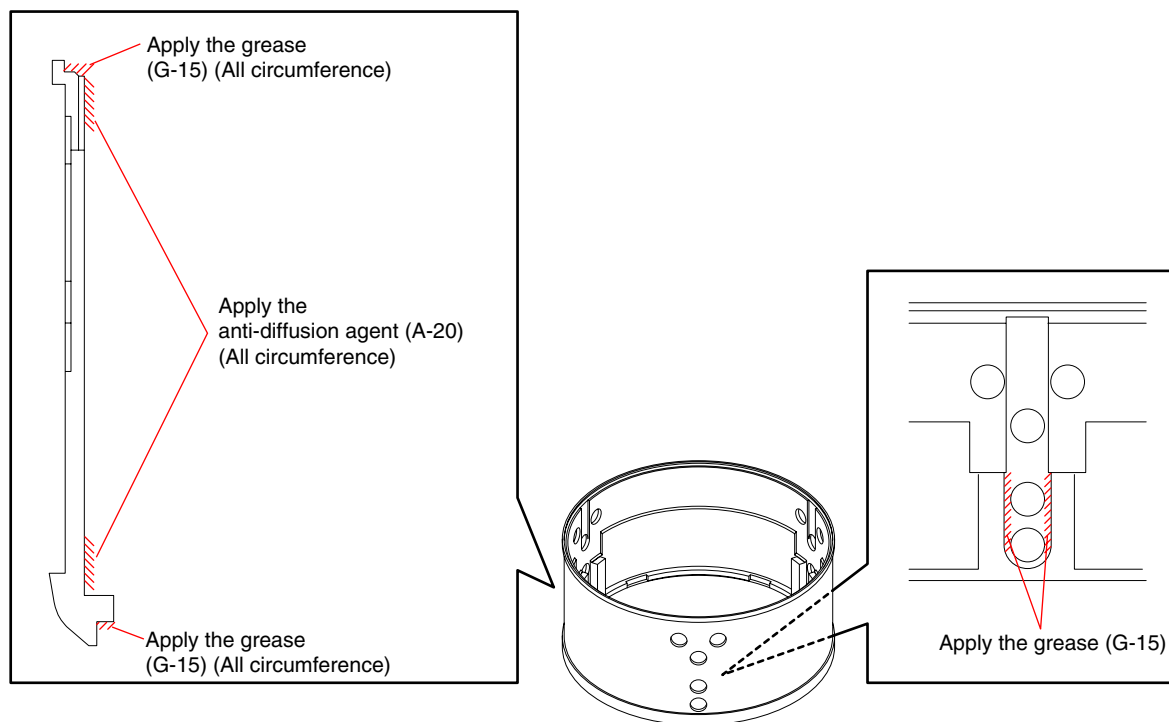


HELP09

Grease (G-15): J-6082-619-A

Anti-diffusion agent (A-20): J-6082-611-A

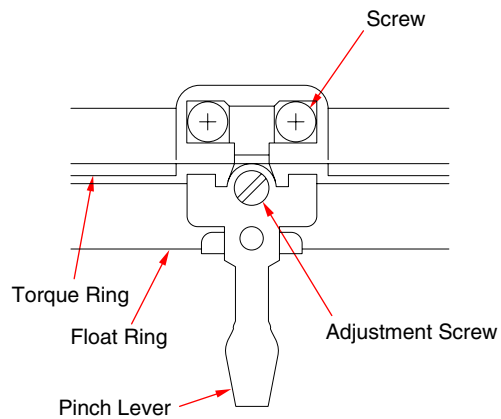
Apply the grease (G-15) and anti-diffusion agent (A-20) to the instruction part of the focus operation ring.



HELP10

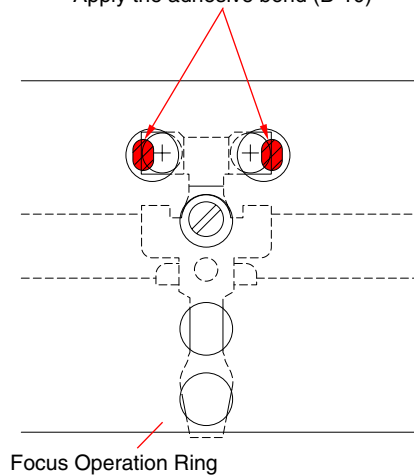
Adhesive bond (B-10): J-6082-612-A

1. Attach the scissors lever block.
2. Turn the adjustment screw until the float ring rotate smoothly without rattling.



3. Assemble the focus operation ring.
4. Check the operation of the focus operation ring, and apply the adhesive bond (B-10) as shown in the figure.

Apply the adhesive bond (B-10)

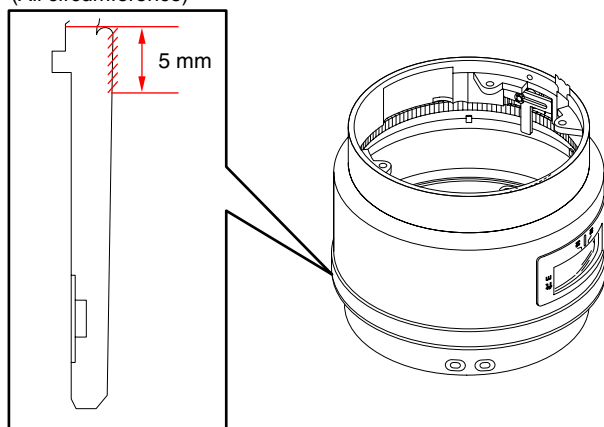


HELP11

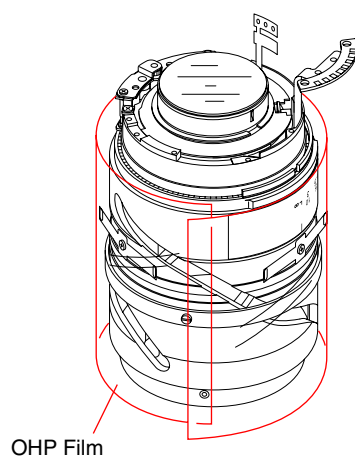
Grease (F-10): J-6082-631-A

1. Apply the grease (F-10) to the instruction part of the fixed holding tube block.

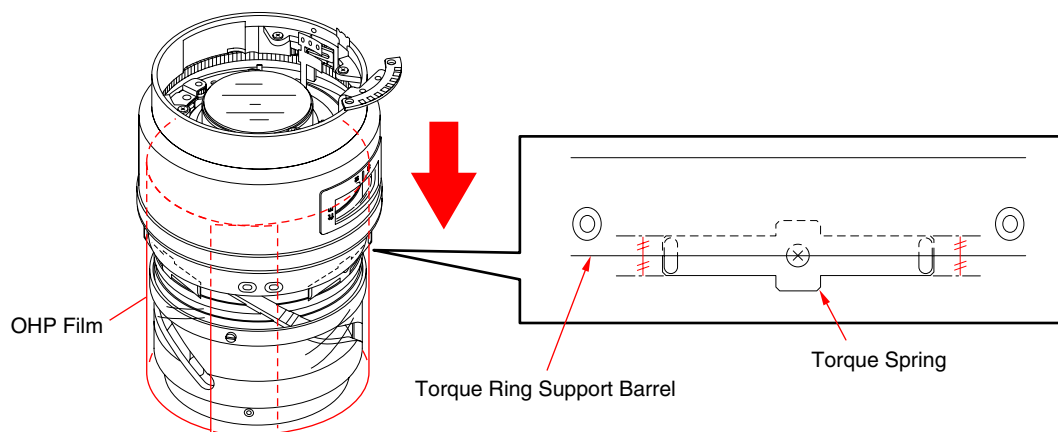
Apply the grease (F-10)
(All circumference)



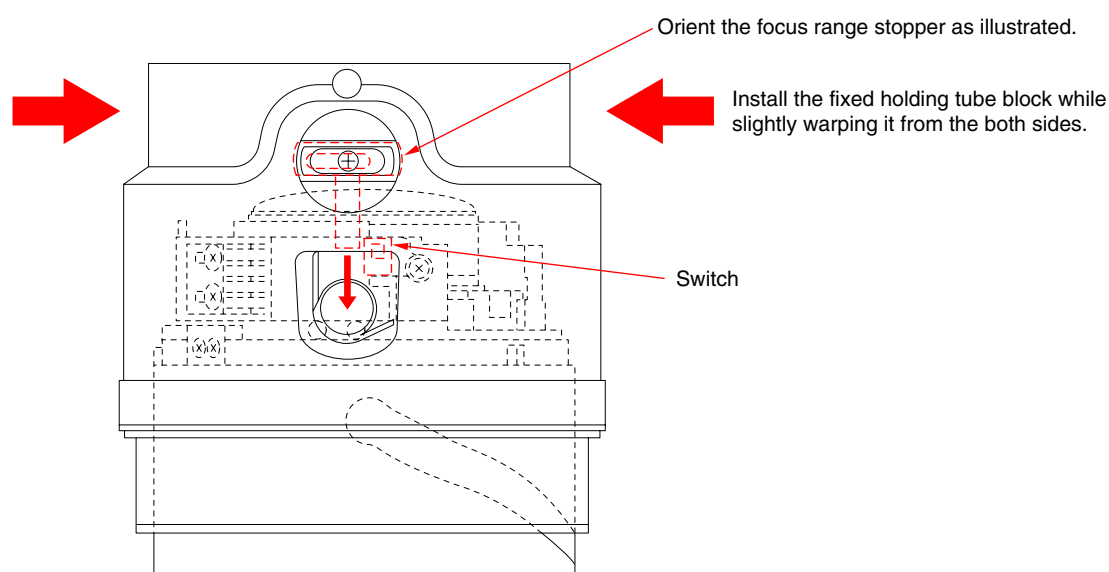
2. Cut the OHP film to the size large enough to cover the lens block, then wind it as shown in the figure.



3. Install the fixed holding tube block down to the position as shown in the figure, then pull the OHP film off to remove.



Note: When installing the fixed holding tube block, do not damage the switch shown in the figure.

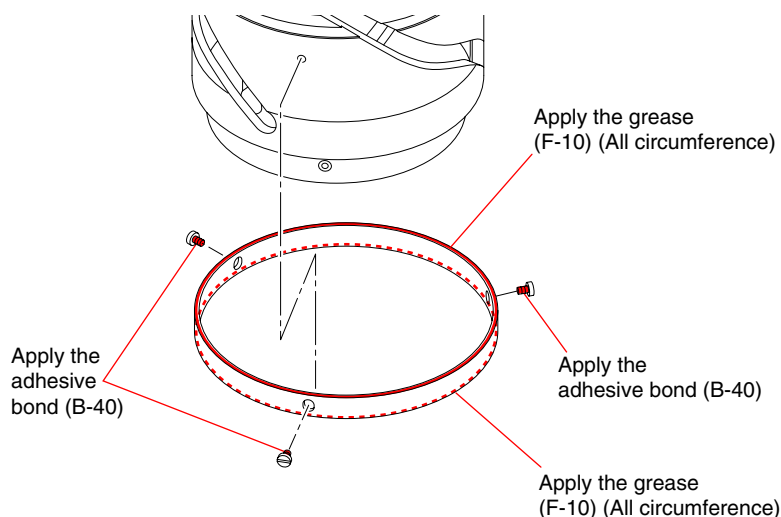


HELP12

Grease (F-10): J-6082-631-A

Adhesive bond (B-40): J-6082-614-A

1. Apply the grease (F-10) to the instruction part of the float ring.
2. Attach the float ring, and apply the adhesive bond (B-40) to the three screws and tighten them as shown in the figure.



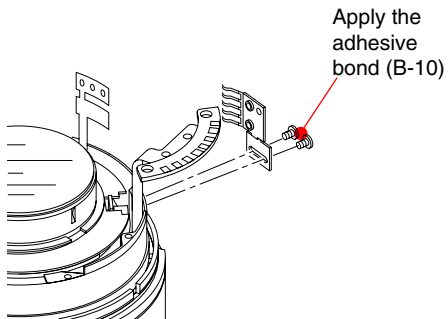
SAL100M28 (MACRO 2.8/100) (100mm F2.8 Macro)

HELP

HELP13

Adhesive bond (B-10): J-6082-612-A

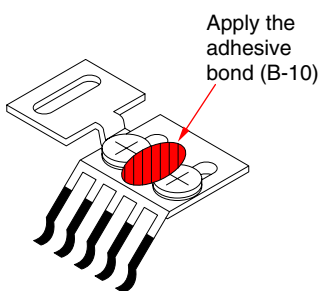
After the brush position adjustment is completed, tighten the two screws and apply the adhesive bond (B-10) to them as shown in the figure.



HELP14

Adhesive bond (B-10): J-6082-612-A

After the brush position adjustment is completed, apply the adhesive bond (B-10) to the two screws as shown in the figure.

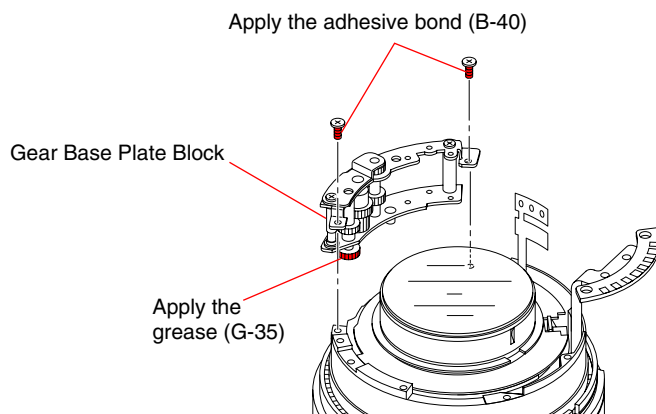


HELP15

Grease (G-35): J-6082-621-A

Adhesive bond (B-40): J-6082-614-A

1. Apply the grease (G-35) to the instruction part of the gear base plate block.
2. Attach the gear base plate block, and apply the adhesive bond (B-40) to the two screws and tighten them as shown in the figure.

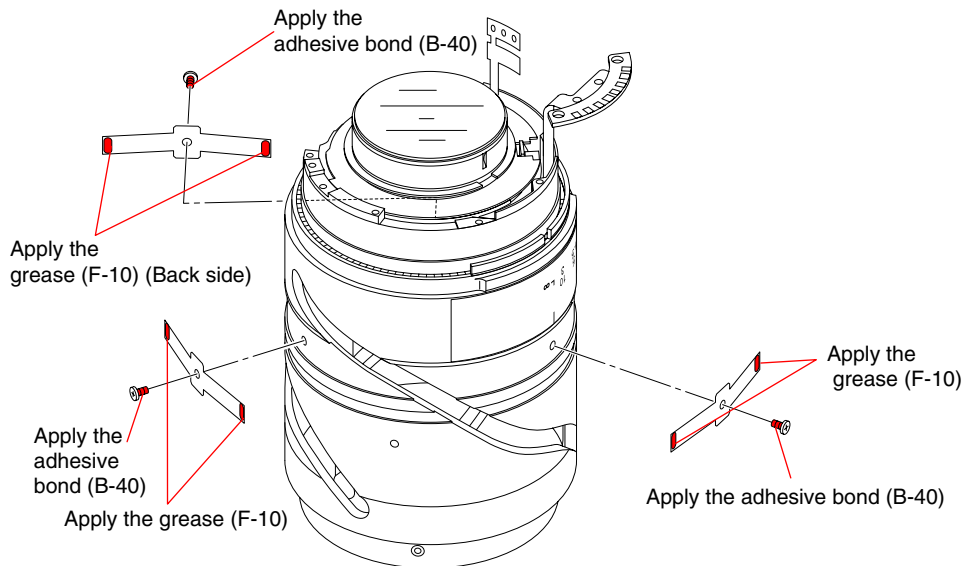


HELP16

Grease (F-10): J-6082-631-A

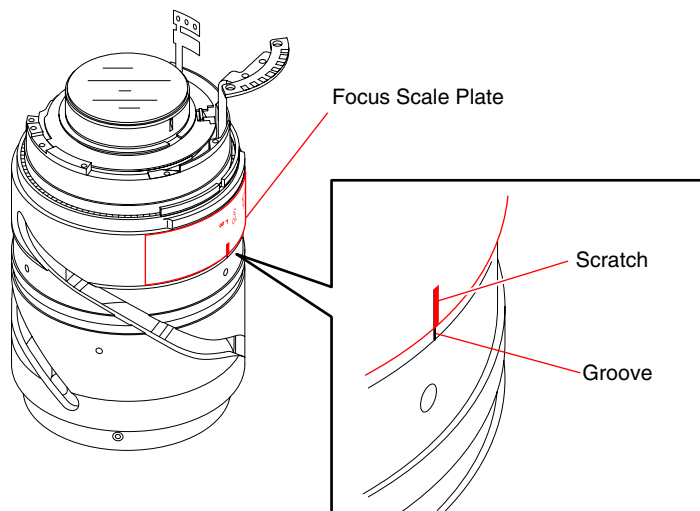
Adhesive bond (B-40): J-6082-614-A

1. Apply the grease (F-10) to the instruction part of the torque spring.
2. Attach the torque spring, and apply the adhesive bond (B-40) to the three screws and tighten them as shown in the figure.



HELP17

Match the scratch of the focus scale plate to the groove of the focus cam ring A, and attach the focus scale plate.



HELP18

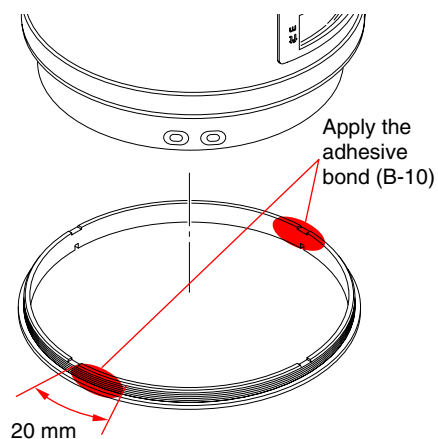
Adhesive bond (B-10): J-6082-612-A

Universal Wrench: J-6082-609-A

Chip-A For Universal Wrench: J-6082-609-1

Chip-B For Universal Wrench: J-6082-609-2

Apply the adhesive bond (B-10) to the instruction part of the torque ring holder, it tightens with a universal wrench.

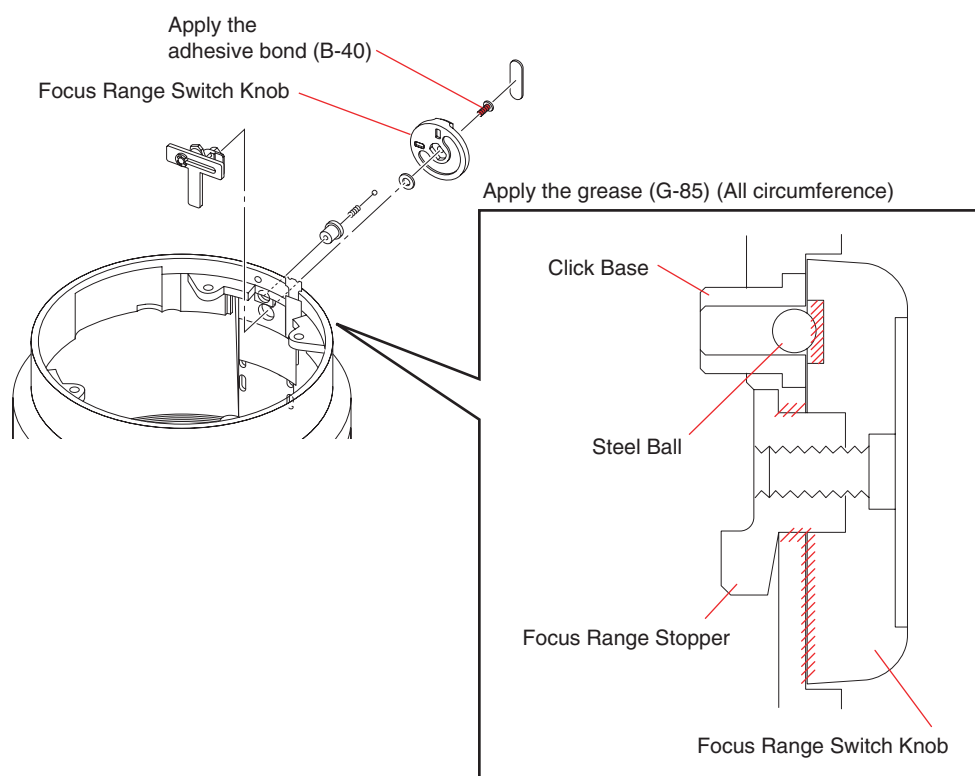


HELP19

Grease (G-85): J-6082-626-A

Adhesive bond (B-40): J-6082-614-A

1. Apply the grease (G-85) to the instruction part as shown in the figure.
2. Attach the focus range switch knob, and apply the adhesive bond (B-40) to the screw and tighten it as shown in the figure.



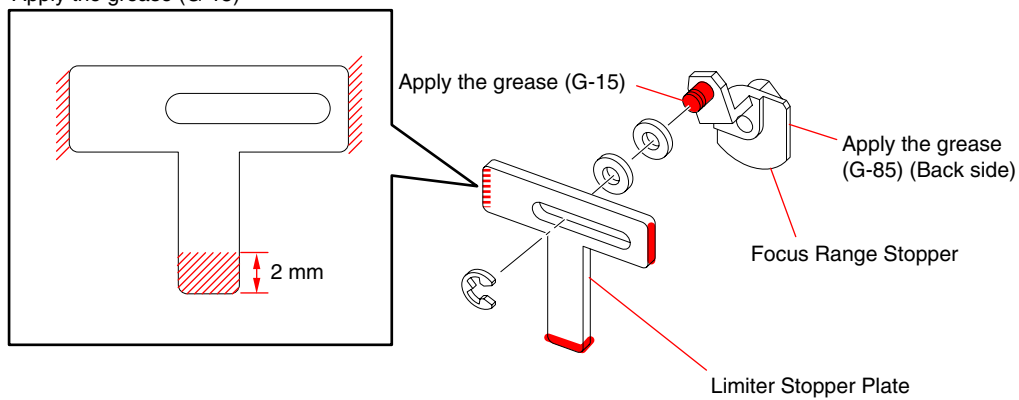
HELP20

Grease (G-15): J-6082-619-A

Grease (G-85): J-6082-626-A

Apply the grease (G-15, G-85) to the instruction part of the limiter stopper plate and focus range stopper.

Apply the grease (G-15)



HELP21

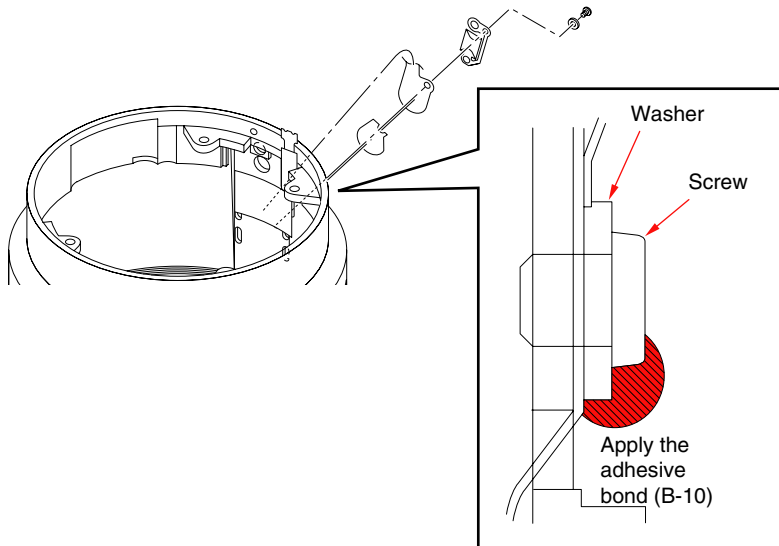
Adhesive bond (B-10): J-6082-612-A

Adhesive bond (LOCTITE 460) (Note)

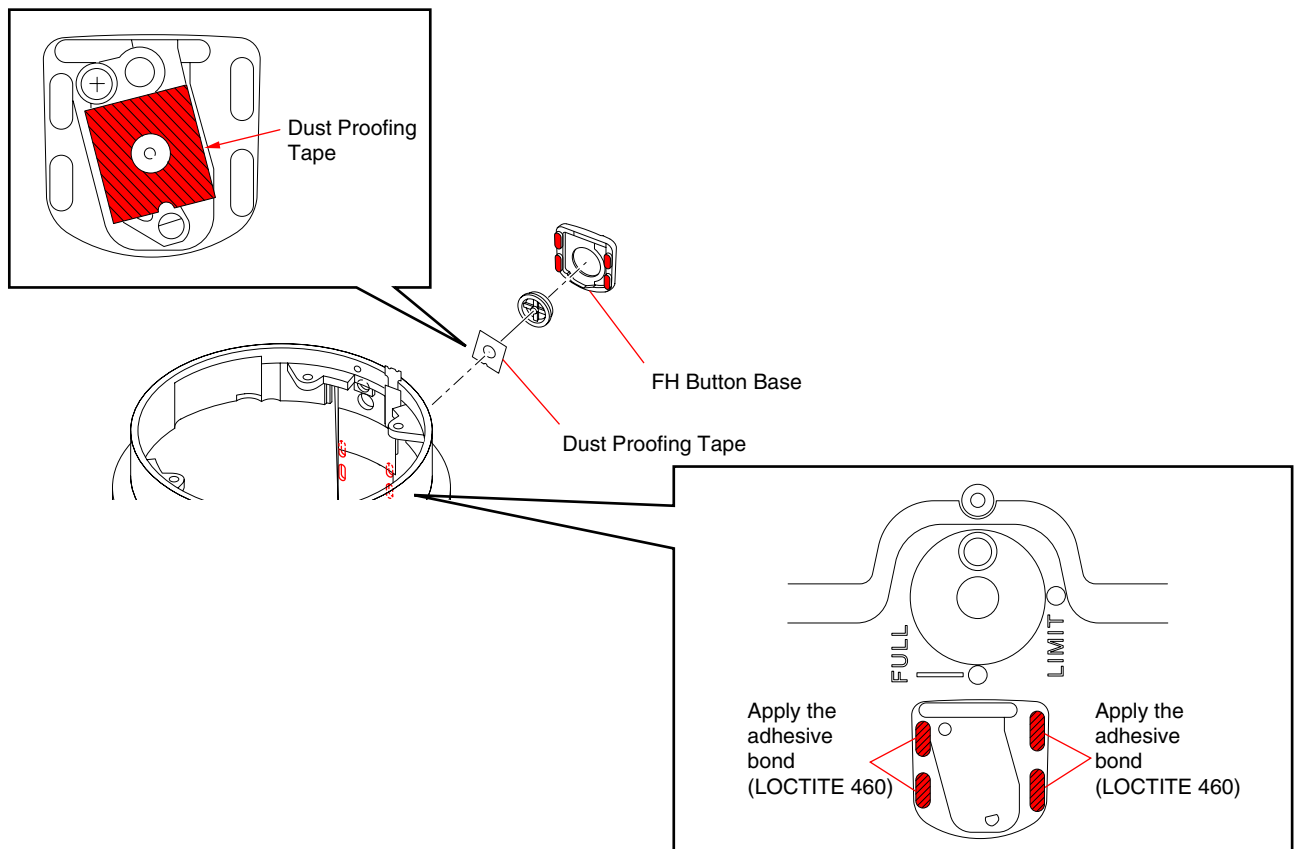
Note: Use adhesive bond (LOCTITE 460) or an equivalent article.

Don't use what becomes white after drying like a quick-drying glue.

1. Attach the click plate, and apply the adhesive bond (B-10) to the instruction part as shown in the figure.

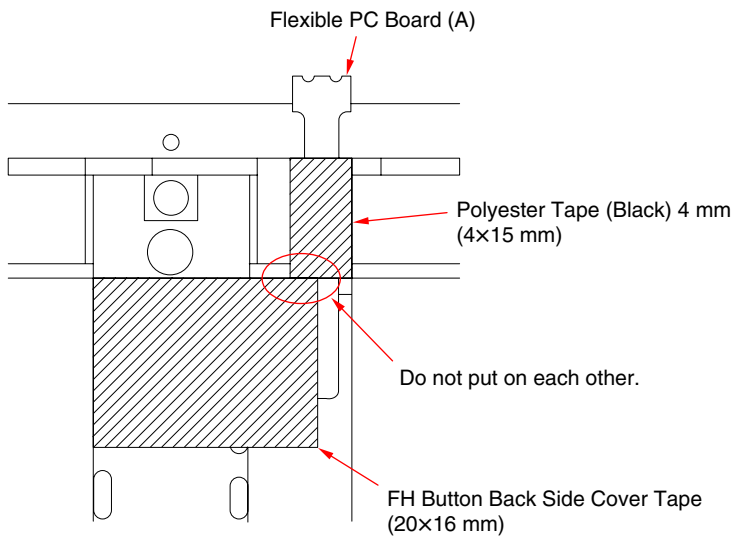


2. Attach the dust proofing tape as shown in the figure.
3. Apply the adhesive bond (LOCTITE 460) to the instruction part as shown in the figure, and attach the FH button base.



HELP22

Attach the flexible PC board (A), and attach the FH button back side cover tape and polyester tape (black) 4 mm as shown in the figure.



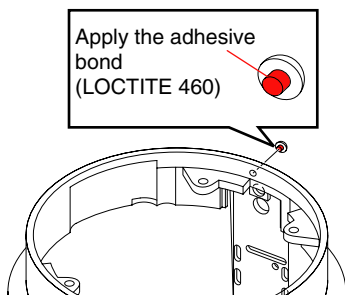
HELP23

Apply the adhesive bond (LOCTITE 460) to the instruction part of the mount index.

Adhesive bond (LOCTITE 460) (Note)

Note: Use adhesive bond (LOCTITE 460) or an equivalent article.

Don't use what becomes white after drying like a quick-drying glue.

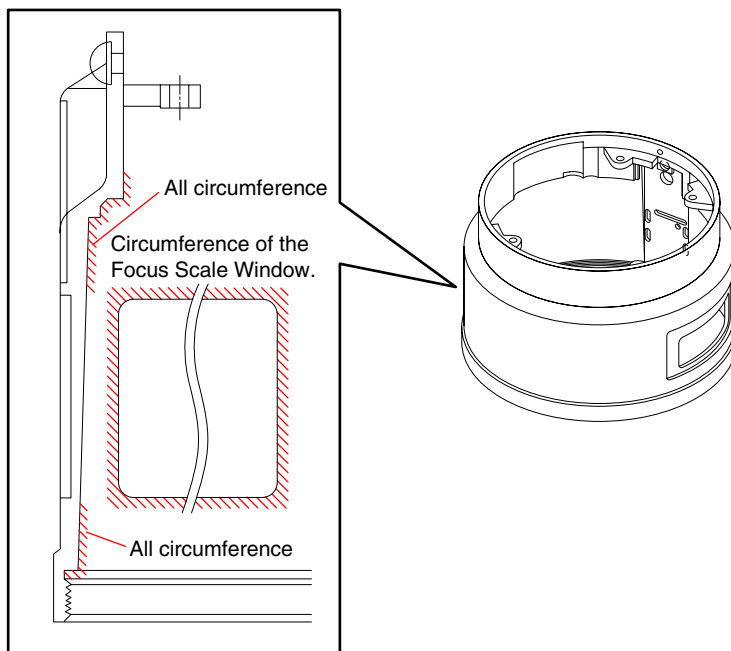


HELP24

Anti-diffusion agent (A-20): J-6082-611-A

Apply the anti-diffusion agent (A-20) to the instruction part of the outer barrel.

Apply the anti-diffusion agent
(A-20) (All circumference)



HELP25

Grease (G-35): J-6082-621-A

Adhesive bond (B-10): J-6082-612-A

Universal Wrench: J-6082-609-A

Chip-A For Universal Wrench: J-6082-609-1

Chip-B For Universal Wrench: J-6082-609-2

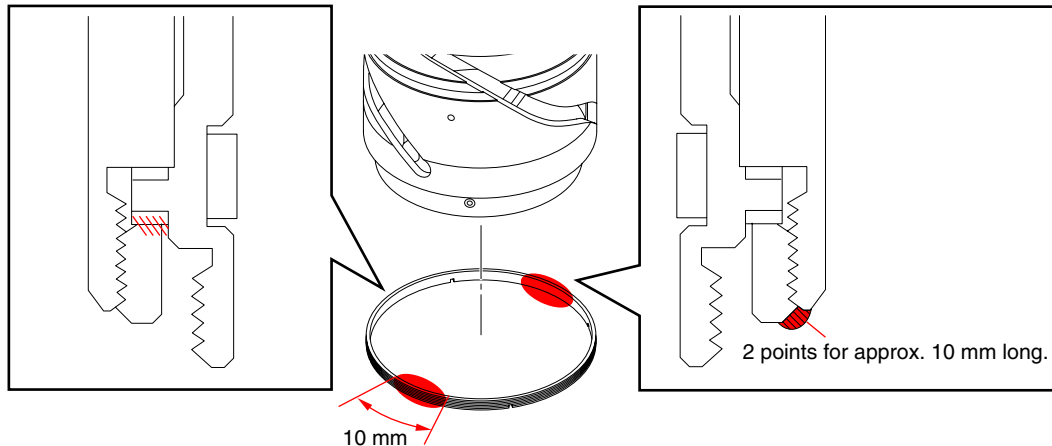
1. Apply the grease (G-35) to the instruction part of the focus cam ring holder.
2. Use the universal wrench, fasten the focus cam ring A holder until it stops, then loosen back by 10 to 15 mm.

Note: Ensure no rattling.

3. Apply the adhesive bond (B-10) to the instruction part as shown in the figure.

Apply the grease (G-35) (All circumference)

Apply the adhesive bond (B-10)

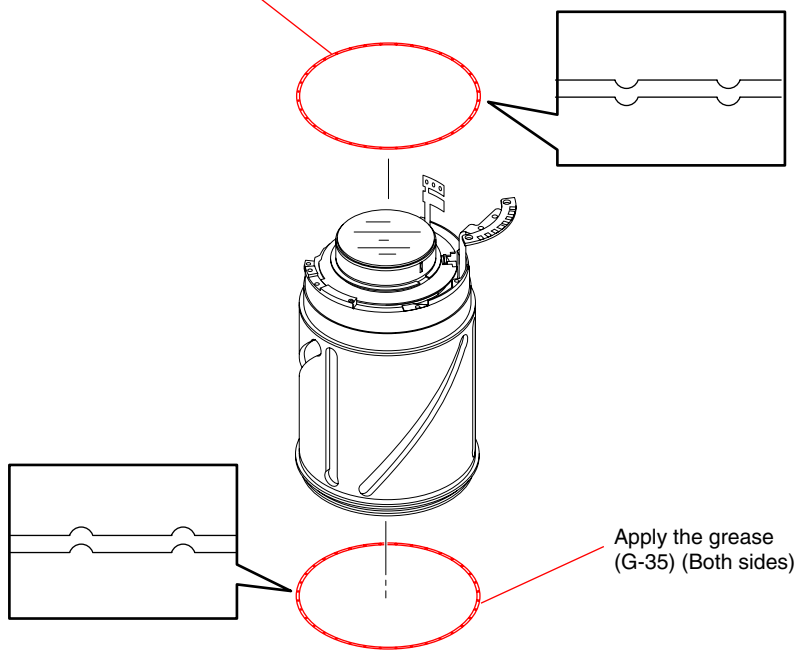


HELP26

Grease (G-35): J-6082-621-A

1. Apply the grease (G-35) to the spacer adjustment washer.
2. Attach the spacer adjustment washer as shown in the figure.

Apply the grease (G-35) (Both sides)



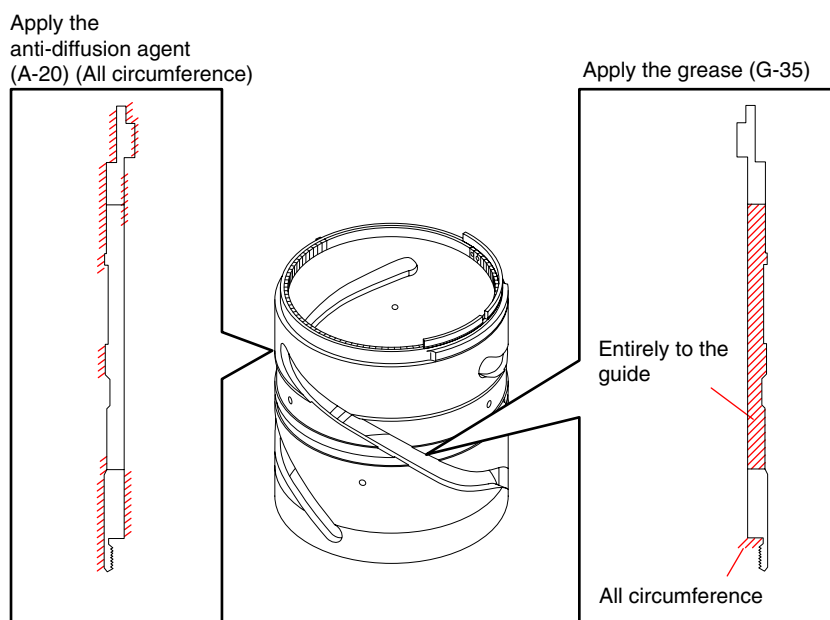
HELP27

Grease (G-35): J-6082-621-A

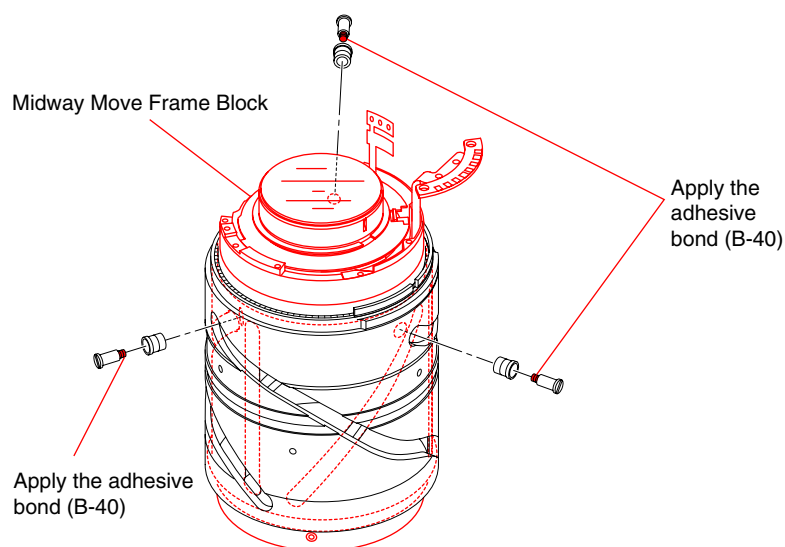
Anti-diffusion agent (A-20): J-6082-611-A

Adhesive bond (B-40): J-6082-614-A

1. Apply the grease (G-35) and anti-diffusion agent (A-20) to the instruction part of the focus cam ring A.



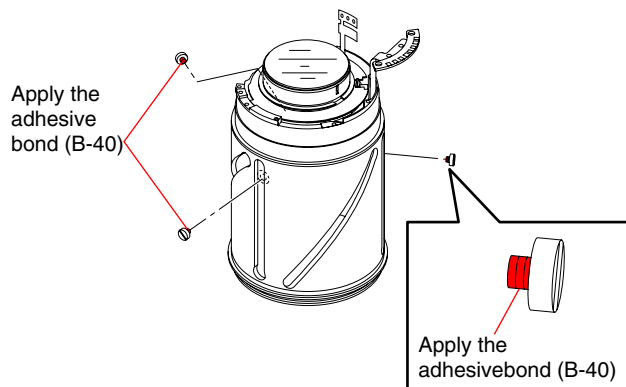
2. Attach the fixed tube block to the midway move frame block.
3. Apply the adhesive bond (B-40) to the three guide pins and tighten them.



HELP28

Adhesive bond (B-40): J-6082-614-A

1. Attach the fixed tube block to the midway move frame block.
2. Apply the adhesive bond (B-40) to the three linear guide pins and tighten them.

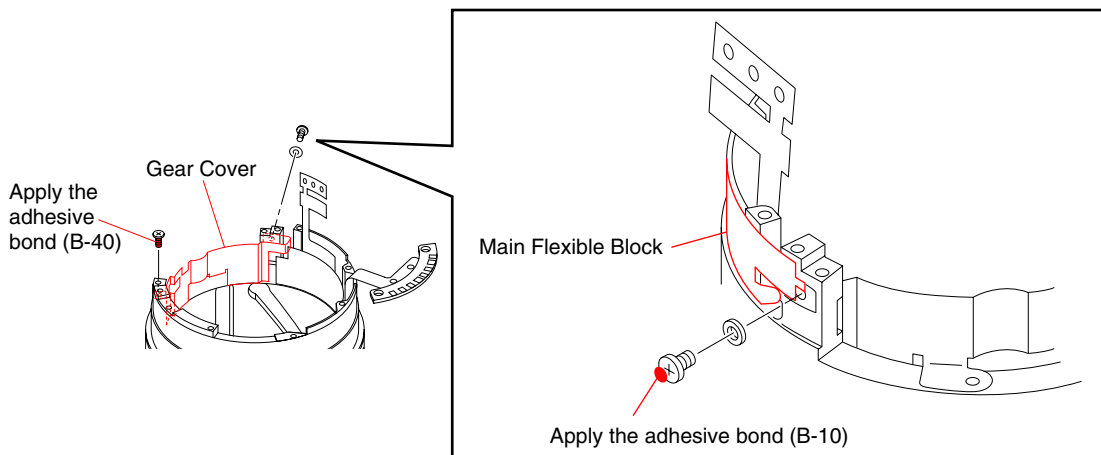


HELP29

Adhesive bond (B-10): J-6082-612-A

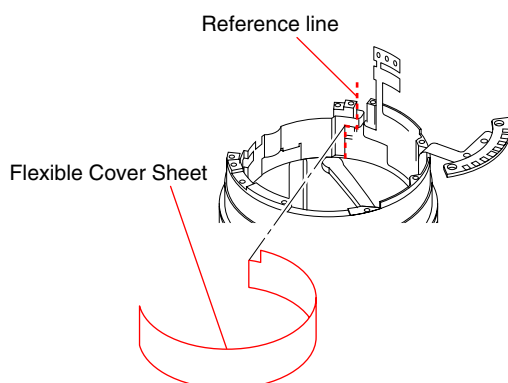
Adhesive bond (B-40): J-6082-614-A

Attach the gear cover, and apply the adhesive bond (B-10, B-40) to the two screws as shown in the figure.



HELP30

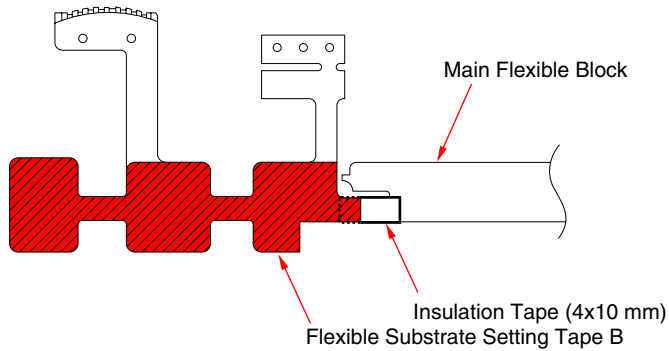
Attach the flexible cover sheet as shown in the figure.



HELP31

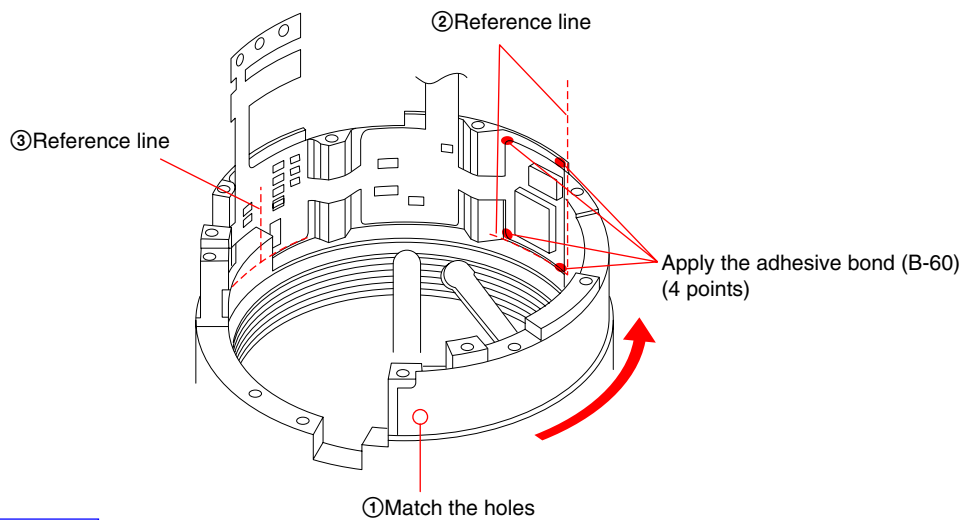
Adhesive bind (B-60): J-6082-616-A

1. Attach the insulation tape, then attach the flexible substrate setting tape B to the main flexible block.



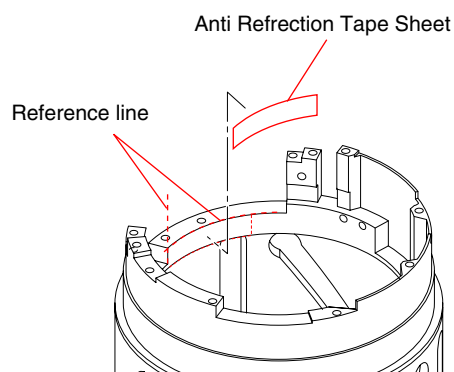
2. Match the hole of main flexible block to the hole of outer barrel.
3. Attach the main flexible block in the direction of the arrow.
4. Apply the adhesive bind (B-60) to the instruction part as shown in the figure

Note: Do not adhere the bond (B-60) on the terminals of IC and soldering portion on each device.
In case that the bond is adhere to them, wipe out the adherent bond.



HELP32

Attach the anti refraction tape sheet as shown in the figure.



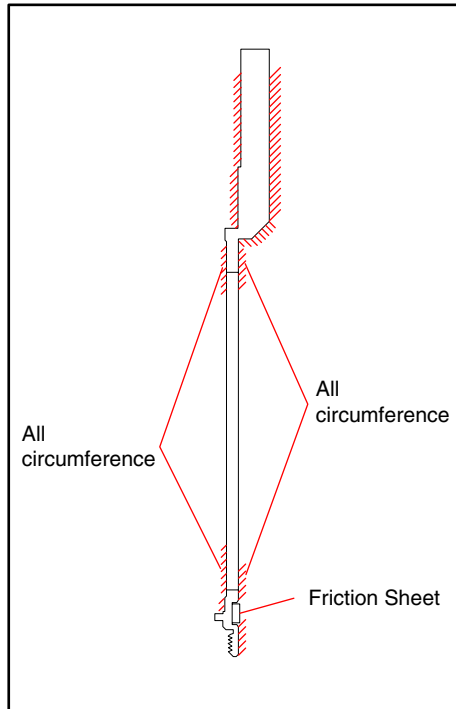
HELP33

Grease (G-35): J-6082-621-A

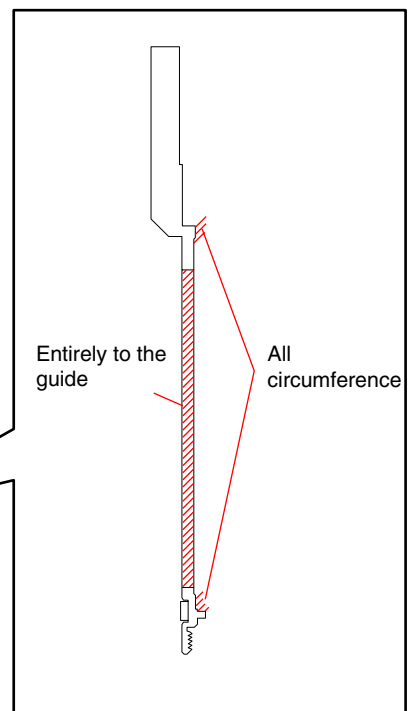
Anti-diffusion agent (A-20): J-6082-611-A

Apply the grease (G-35) and anti-diffusion agent (A-20) to the instruction part of the fixed barrel.

Apply the anti-diffusion agent (A-20)



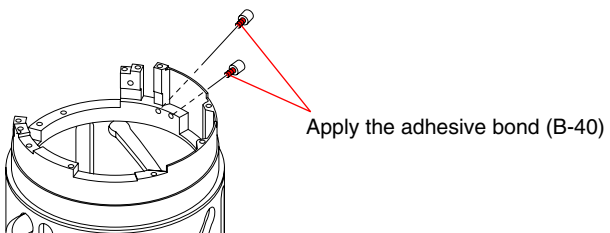
Apply the grease (G-35)



HELP34

Adhesive bond (B-40): J-6082-614-A

Apply the adhesive bond (B-40) to the focus stopper and tighten it.



HELP35

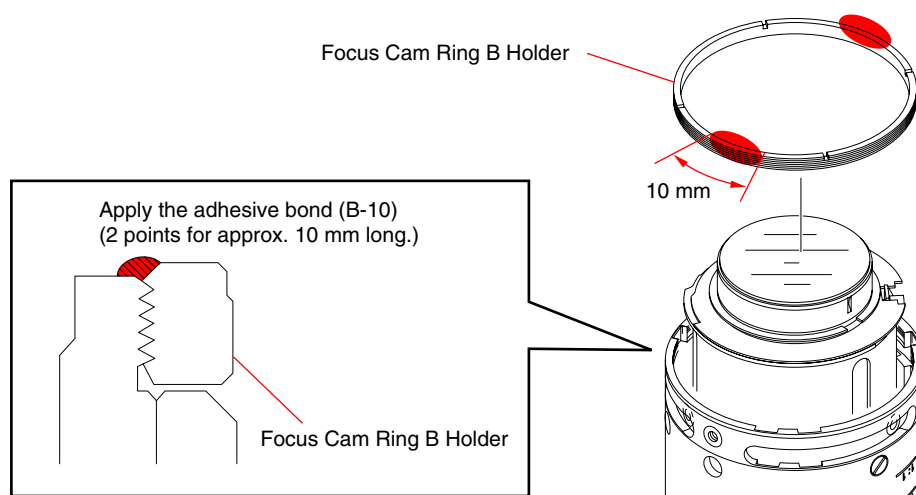
Adhesive bond (B-10): J-6082-612-A

Universal Wrench: J-6082-609-A

Chip-A For Universal Wrench: J-6082-609-1

Chip-B For Universal Wrench: J-6082-609-2

1. Fasten the focus cam ring B holder until it stops, then loosen back by 5 mm.
2. Apply the adhesive bond (B-10) to the instruction part as shown in the figure, it tightens with a universal wrench.



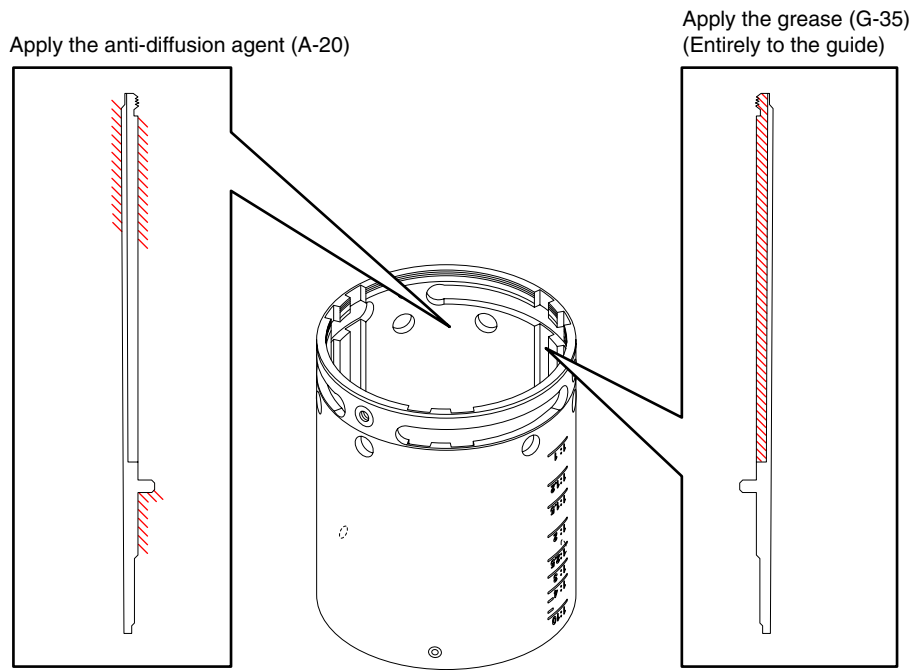
HELP36

Grease (G-35): J-6082-621-A

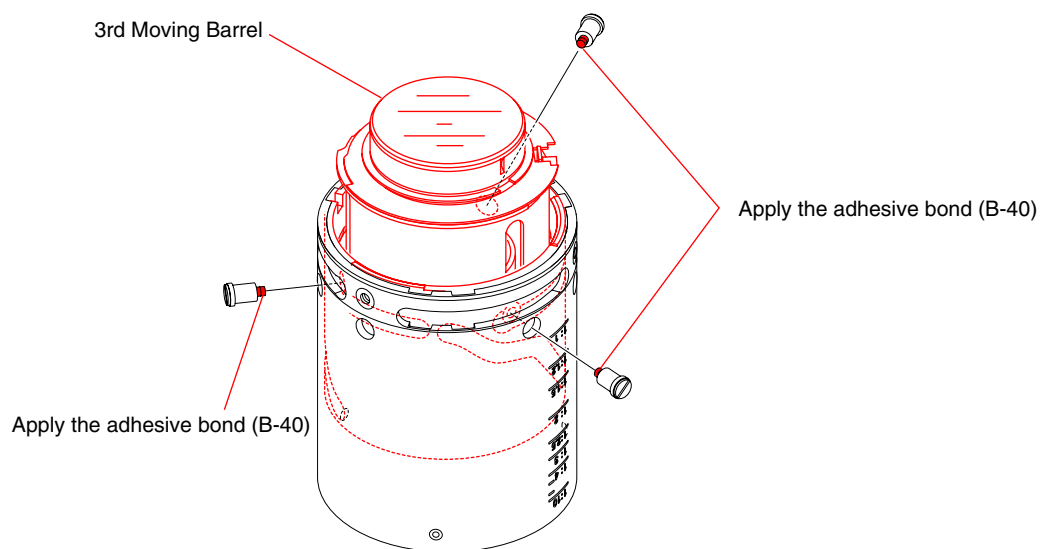
Anti-diffusion agent (A-20): J-6082-611-A

Adhesive bond (B-40): J-6082-614-A

1. Apply the grease (G-35) and anti-diffusion agent (A-20) to the instruction part of the focus cam ring B block.



2. Attach the focus cam ring B block to the 3rd moving barrel, and apply the adhesive bond (B-40) to the three guide pins and tighten them.



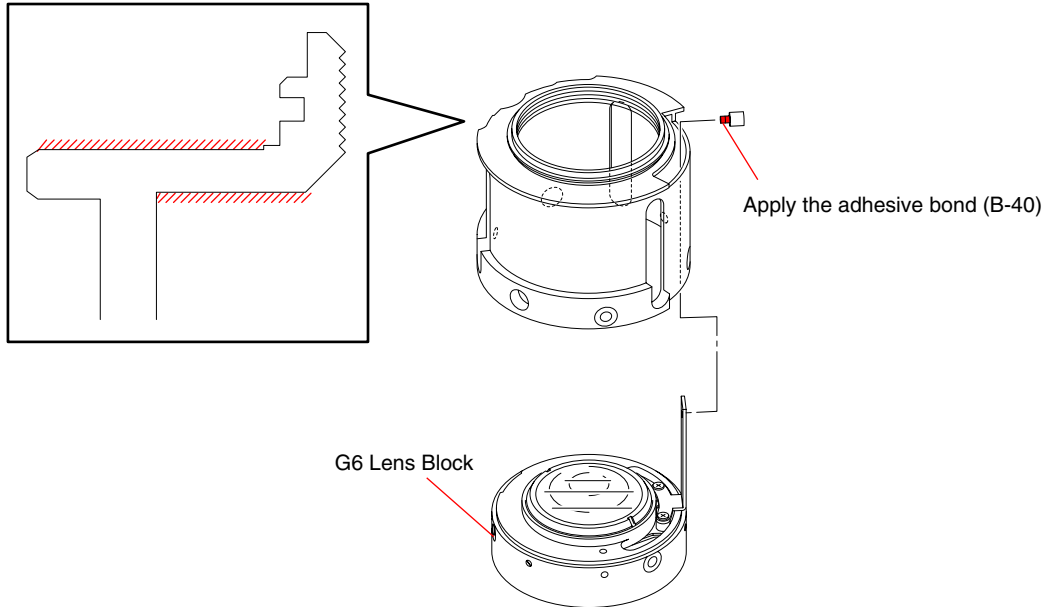
HELP37

Anti-diffusion agent (A-20): J-6082-611-A

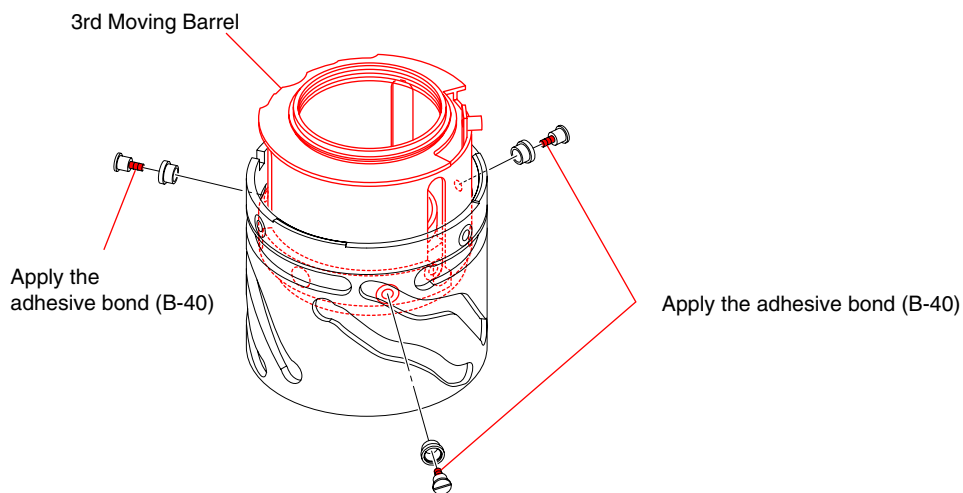
Adhesive bond (B-40): J-6082-614-A

1. Apply the anti-diffusion agent (A-20) to the instruction part of the 3rd moving barrel.
2. Attach the G6 lens block to the 3rd moving barrel, and apply the adhesive bond (B-40) to the aperture connecting pin and tighten it.

Apply the anti-diffusion agent (A-20)



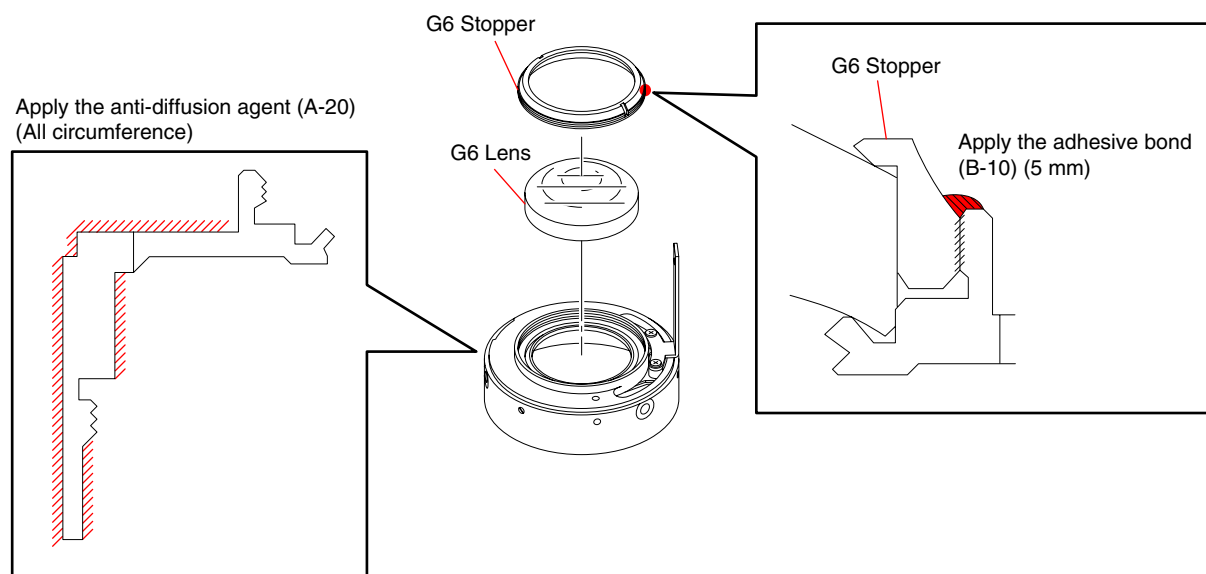
3. Attach the focus cam ring B block to the 3rd moving barrel, and apply the adhesive bond (B-40) to the three guide pins and tighten them.



HELP38

Anti-diffusion agent (A-20): J-6082-611-A
Adhesive bond (B-10): J-6082-612-A
Universal Wrench: J-6082-609-A
Chip-A For Universal Wrench: J-6082-609-1
Chip-B For Universal Wrench: J-6082-609-2

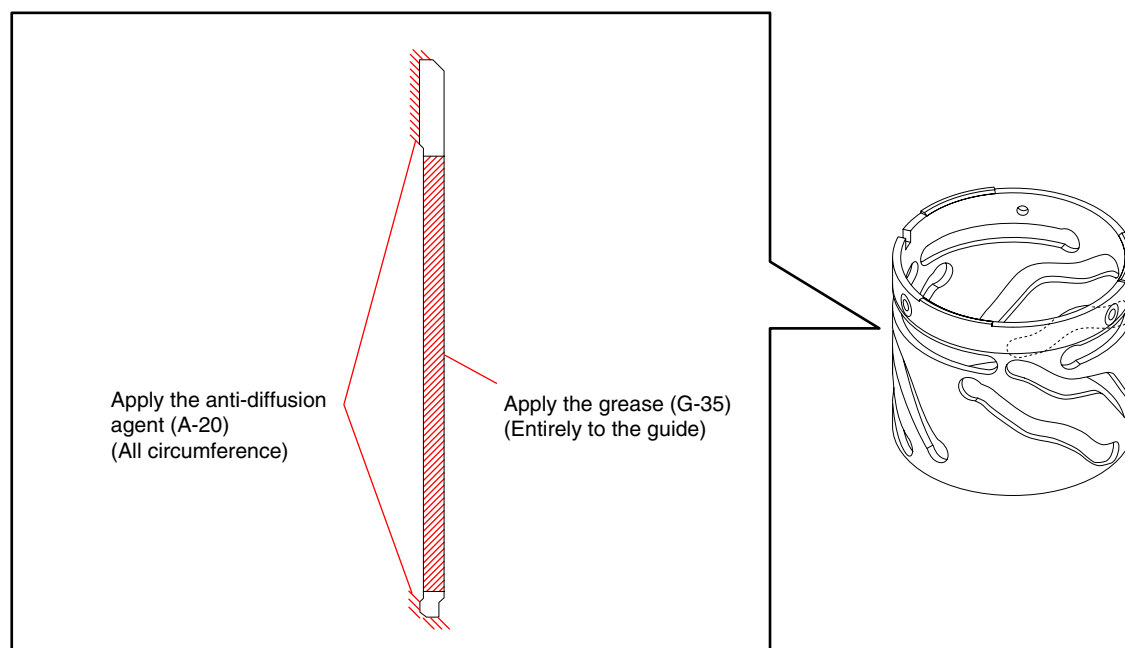
1. Apply the anti-diffusion agent (A-20) to the instruction part as shown in the figure.
2. Attach the G6 lens and G6 stopper, and apply the adhesive bond (B-10) as shown in the figure.



HELP39

Grease (G-35): J-6082-621-A
Anti-diffusion agent (A-20): J-6082-611-A

Apply the grease (G-35) and anti-diffusion agent (A-20) to the instruction part of the focus cam ring B block.



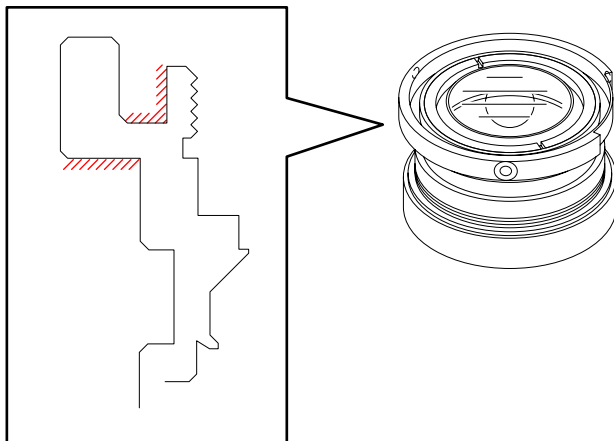
HELP40

Anti-diffusion agent (A-20): J-6082-611-A

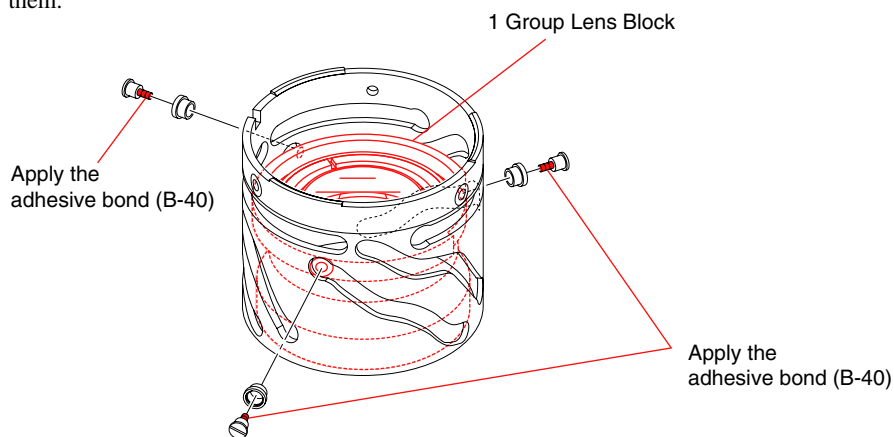
Adhesive bond (B-40): J-6082-614-A

1. Apply the anti-diffusion agent (A-20) to the instruction part of the 1 group lens block.

Apply the anti-diffusion agent (A-20)
(All circumference)



2. Attach the focus cam ring B block to the 1 group lens block, and apply the adhesive bond (B-40) to the three guide pins and tighten them.



HELP41

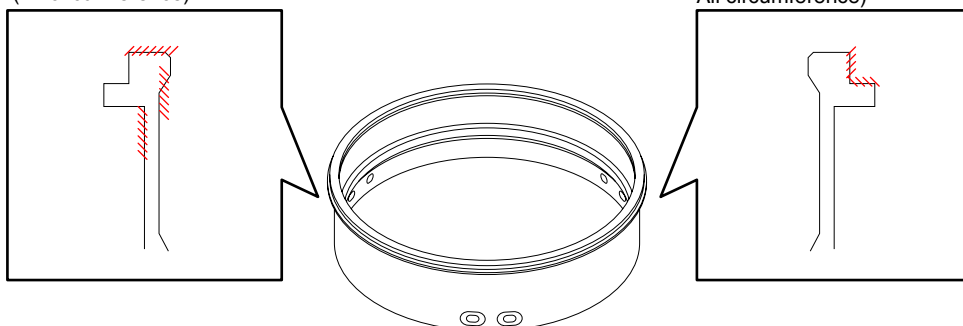
Anti-diffusion agent (A-20): J-6082-611-A

Grease (G-85): J-6082-626-A

Apply the anti-diffusion agent (A-20) and grease (G-85) to the instruction parts of the torque ring support barrel.

Apply the anti-diffusion agent (A-20)
(All circumference)

Apply the grease (G-85)
(Slide portion of the outer barrel:
All circumference)

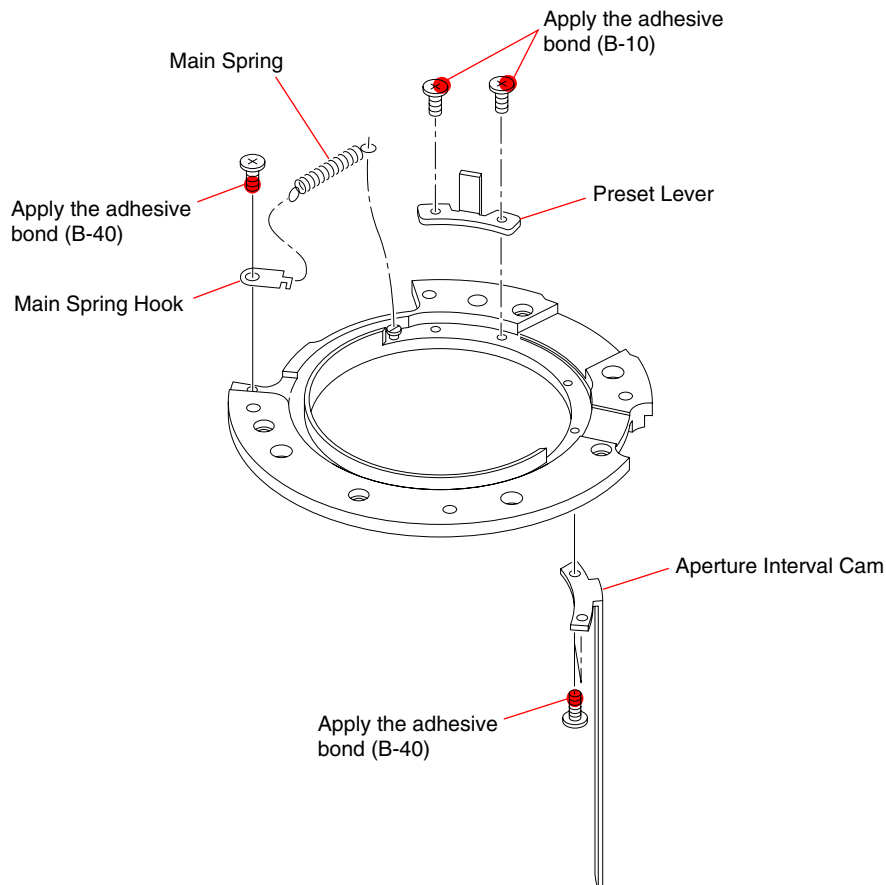


HELP42

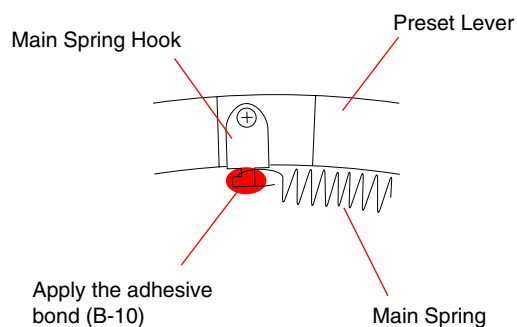
Adhesive bond (B-10): J-6082-612-A

Adhesive bond (B-40): J-6082-614-A

1. Attach the preset lever, and apply the adhesive bond (B-10) to the two screws as shown in the figure.
2. Attach the aperture interval cam, and apply the adhesive bond (B-40) to the two screws and tighten as shown in the figure.
3. Attach the main spring hook, and apply the adhesive bond (B-40) to the screws and tighten as shown in the figure.



4. Attach the preset lever, and apply the adhesive bond (B-10) to the instruction part as shown in the figure.



3. REPAIR PARTS LIST

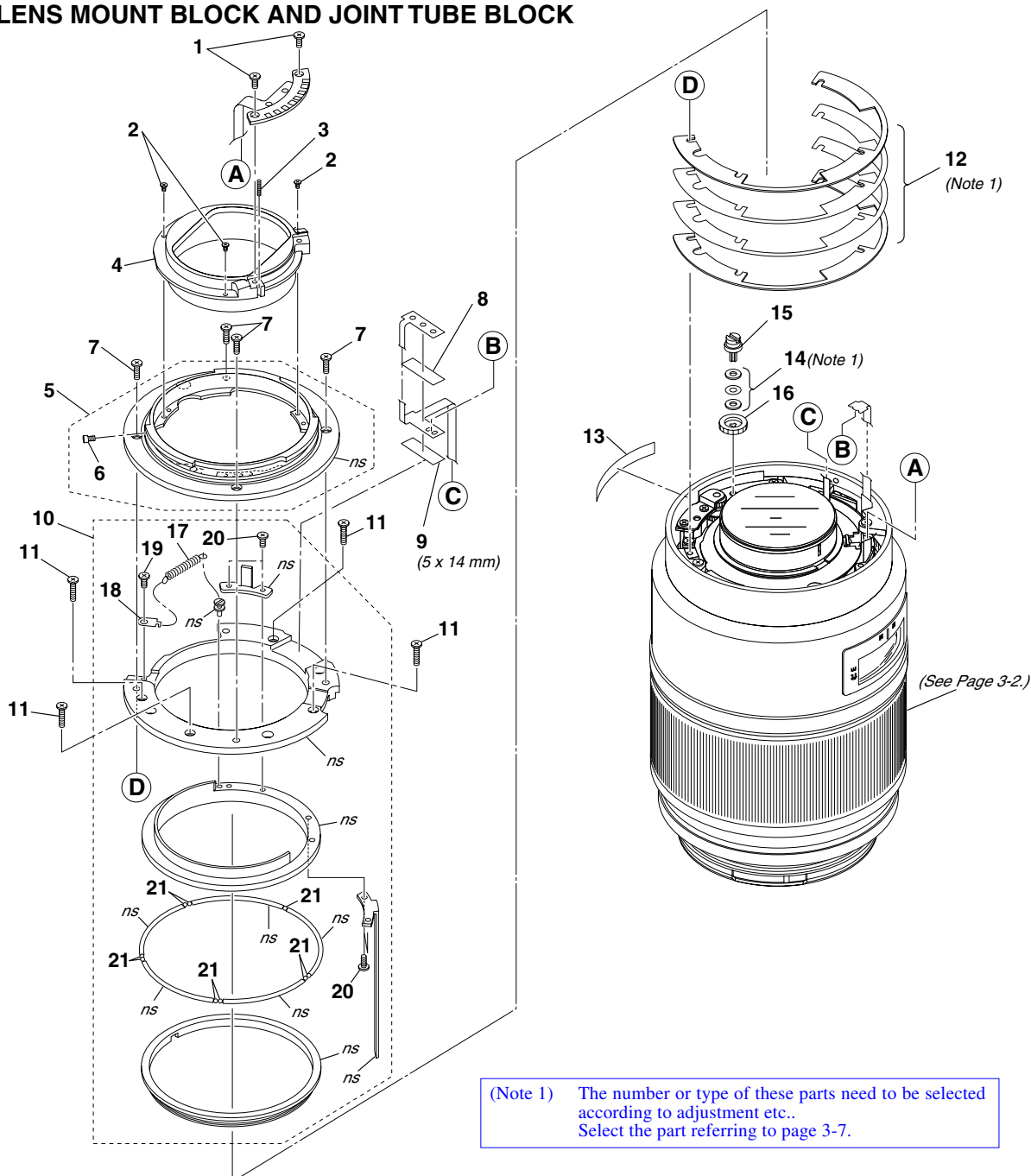
DISASSEMBLY

NOTE:

- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

3-1. EXPLODED VIEWS

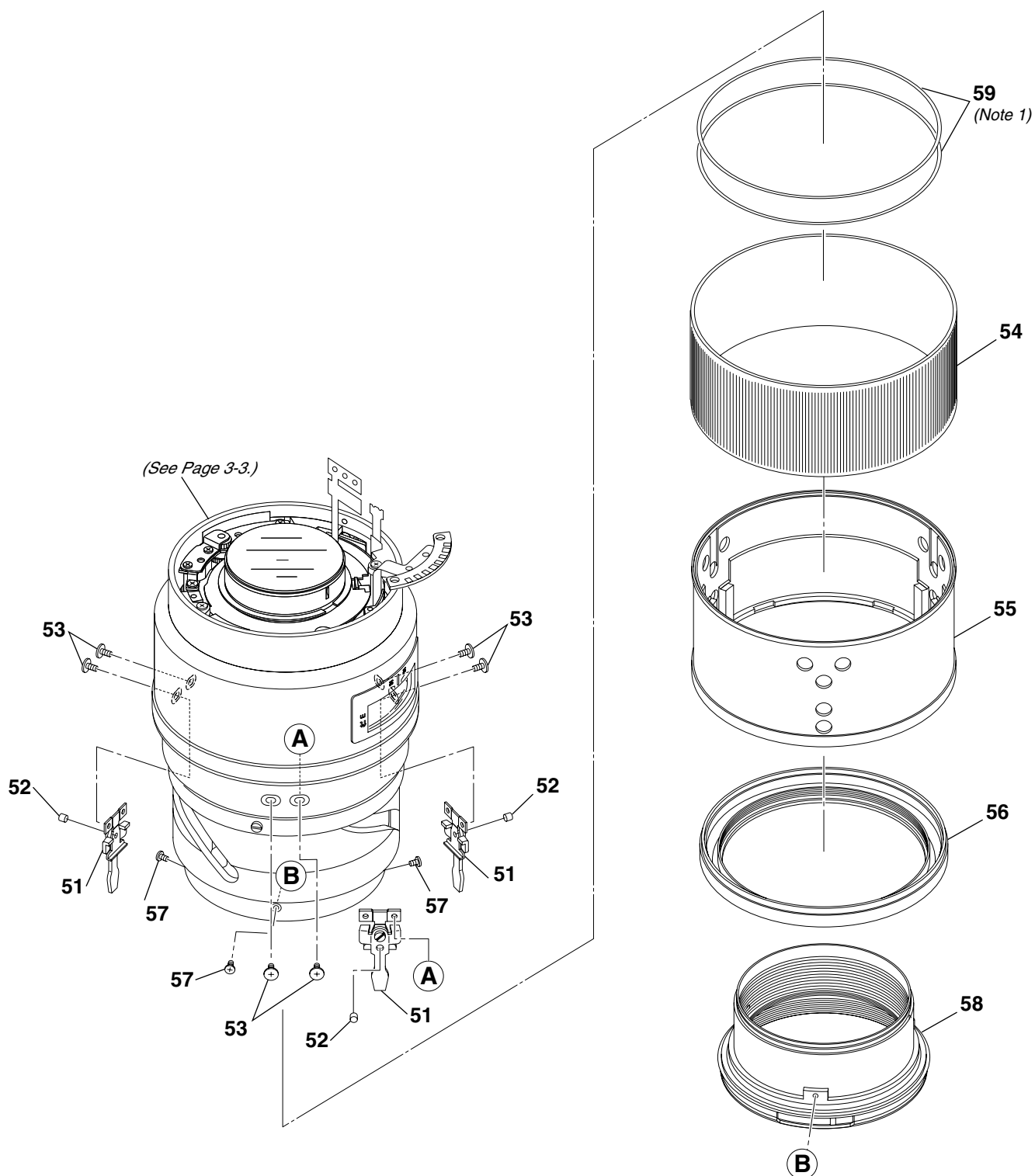
3-1-1. LENS MOUNT BLOCK AND JOINT TUBE BLOCK



Ref. No.	Part No.	Description
1	2-684-066-01	TAPPING SCREW 1.7 M1.7X4.0
2	2-684-064-01	SCREW M1.4X2.2
3	2-684-065-01	GROUND SPRING
4	2-685-530-01	REAR LIGHT SHIELD BARREL
5	A-1192-251-A	BLOCK, LENS MOUNT
6	2-684-244-01	STOPPER SCREW
7	2-687-685-01	SCREW M2.0X4.0
8	2-684-121-01	FLEXIBLE SUBSTRATE SETTING TAPE
9	2-684-071-01	FLEXIBLE SUBSTRATE SETTING TAPE
10	A-1192-250-A	BLOCK, JOINT TUBE

Ref. No.	Part No.	Description
11	2-687-743-01	SCREW M1.6X7.0
12	Selection part	BACK ADJUSTMENT WASHER A to E (Note 1)
13	2-684-073-01	LENS NO. PLATE
14	Selection part	WASHER(COUPLER ADJUSTMENT WASH (A to E) (Note 1)
15	2-685-524-01	COUPLER
16	2-685-523-01	GEAR(COUPLER GEAR)
17	2-684-994-01	MAIN SPRING
18	2-687-670-01	MAIN SPRING HOOK
19	2-684-119-01	PHI 3HEAD SCREW M1.6X2.0
20	2-687-691-01	SCREW M1.6X2.5
21	2-684-171-01	STEEL BALL

3-1-2. FRONT LENS BARREL AND FOCUS OPERATION RING

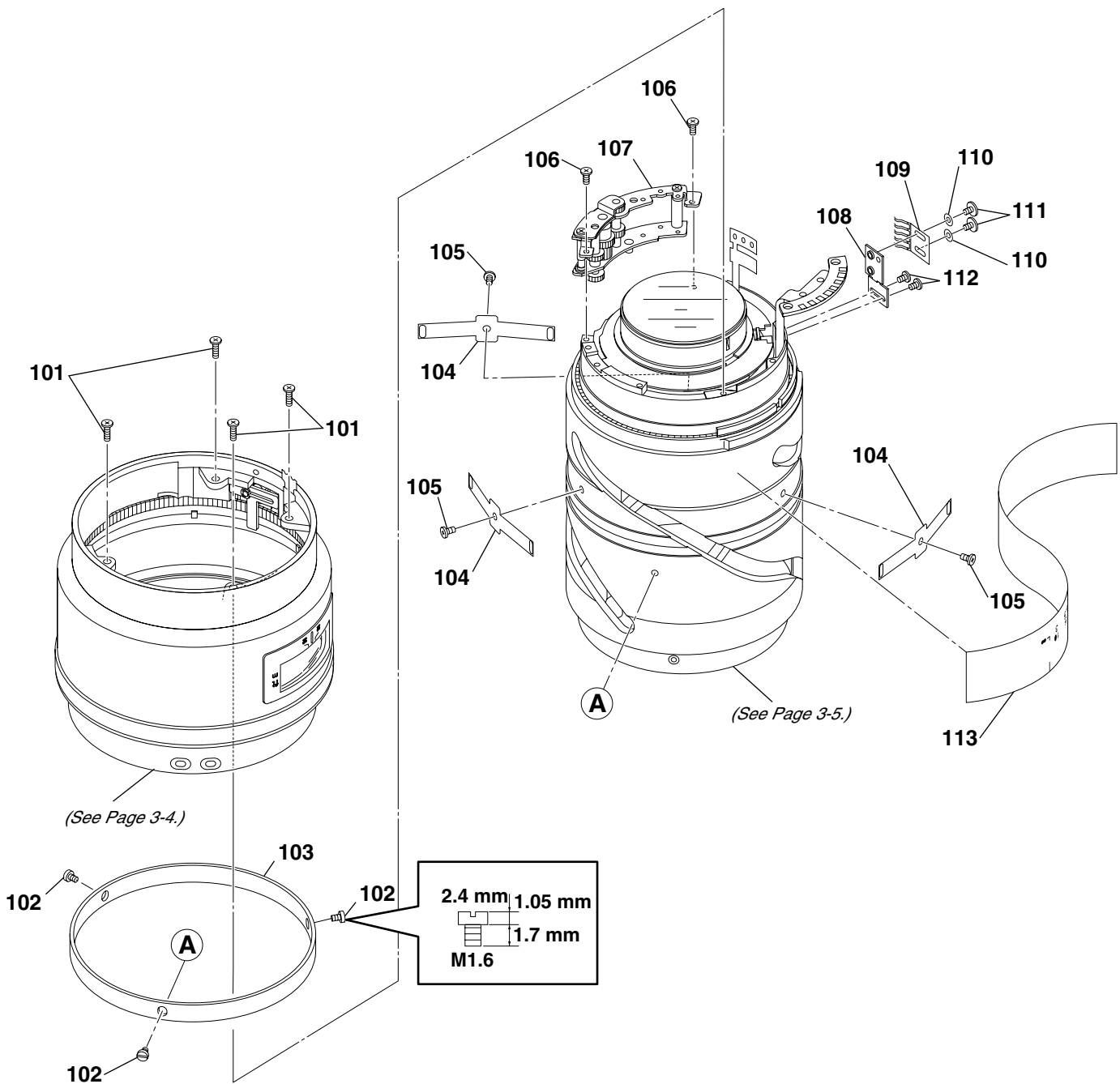


(Note 1) Refer to page 2-3
Select the number of focus ring thrust adjustment
(Ref. No. 59) according to the rotation load of the
focus operation ring.

Ref. No.	Part No.	Description
51	A-1192-249-A	BLOCK, SCISSORS LEVER
52	2-685-587-01	RUBBER(PRESS RUBBER)
53	2-685-585-01	PHI 4 HEAD SCREW M1.6X2.5
54	2-685-534-01	FOCUS RUBBER RING
55	2-685-588-01	FOCUS OPERATION RING

Ref. No.	Part No.	Description
56	2-685-589-01	RING(DECORATION RING)
57	2-685-533-01	TAPPING SCREW M1.7X2.5
58	2-685-532-01	RING(FRONT LENS BARREL)
59	2-685-586-01	FOCUS RING THRUST ADJUSTMENT (Note 1)

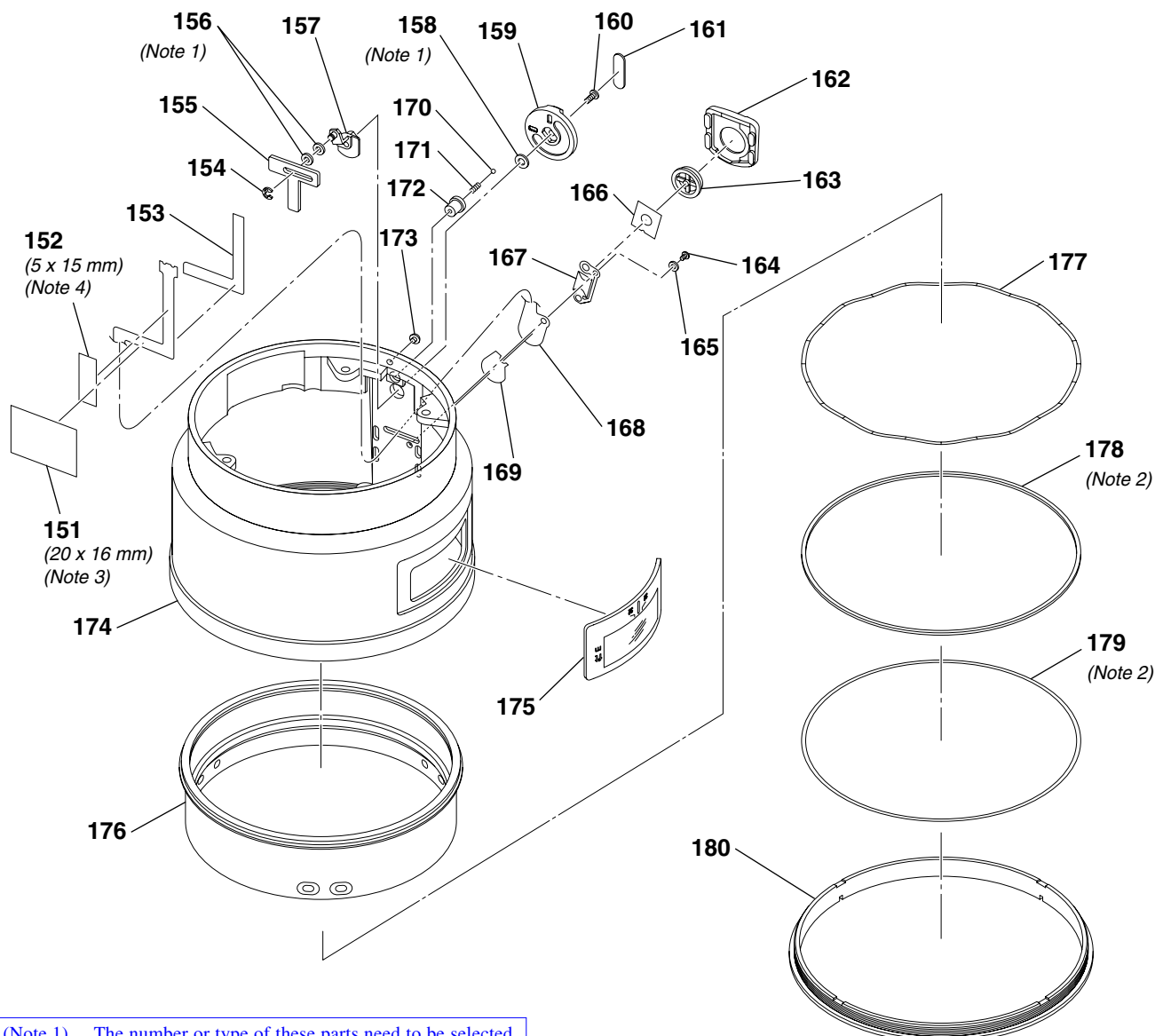
3-1-3. GEAR BASE PLATE BLCOK AND A ENCODER BRUSH



<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
101	2-684-117-01	SCREW M1.6X4.0
102	2-685-568-01	PIN(GUIDE PIN)
103	2-685-567-01	RING(FROAT RING)
104	2-685-580-01	TORQUE SPRING
105	2-684-203-01	PHI 3 HEAD SCREW M1.6X1.6
106	2-685-694-01	PHI 3 HEAD SCREW M1.6X4.0
107	A-1192-243-A	BLOCK, GEAR BASE PLATE

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
108	2-685-719-01	HOLDER(BRUSH HOLDER)
109	2-684-202-01	A ENCODER BRUSH
110	2-684-060-01	COUPLER ADJUSTMENT WASHER D
111	2-685-720-01	PHI 4 HEAD SCREW M1.6X2.0
112	2-684-119-01	PHI3 HEAD SCREW M1.6X2.0
113	2-685-579-01	PLATE(FOUCS SCALE PLATE)

3-1-4. FIXED HOLDING TUBE BLOCK



(Note 1) The number or type of these parts need to be selected according to adjustment etc..
Select the part referring to page 3-7.

(Note 2) Refer to page 2-5
Select the number of slip washers A and B (Ref. No. 178, 179) according to the rotation load of the torque ring support barrel.

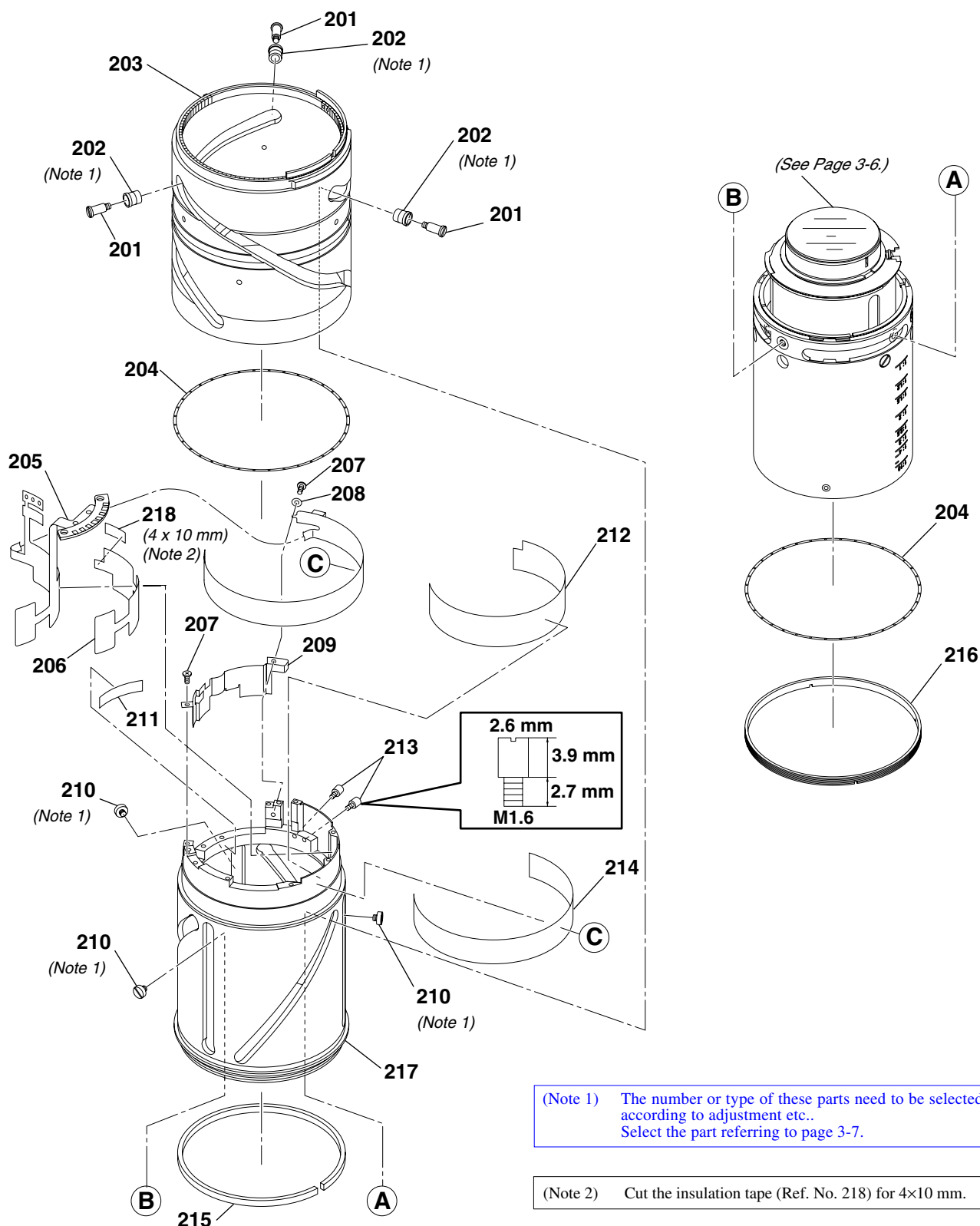
(Note 3) Cut the FH button back side cover tape (Ref. No. 151) for 20x16 mm.

(Note 4) Polyester tape (black) 4 mm (Ref. No. 152) for 5x15 mm.

Ref. No.	Part No.	Description
151	2-685-724-01	FH BUTTON BACK SIDE COVER TAPE (Note 3)
152	9-913-210-04	POLYESTER TAPE (BLACK) 4mm (Note 4)
153	2-685-723-01	FLEXIBLE SETTING TAPE C
154	2-684-223-01	E RING
155	2-685-727-01	LIMITER STOPPER PLATE
156	Selection part	COUPLER ADJUSTMENT WASHER A to C (Note 1)
157	2-684-214-01	FOCUS RANGE STOPPER
158	Selection part	GAP ADJUST WASHER A to D (Note 1)
159	2-684-221-01	FOCUS RANGE SWITCH KNOB
160	2-684-120-01	SCREW M1.6X4.0
161	2-684-077-01	PLATE (DECORATION PLATE)
162	2-684-213-01	FH BUTTON BASE
163	2-684-212-01	FH BUTTON
164	2-684-209-01	SCREW M1.4X1.5
165	2-684-850-01	WASHER

Ref. No.	Part No.	Description
166	2-684-211-01	DUST PROOFING TAPE
167	2-684-208-01	CLICK PLATE
168	2-685-722-01	PC BOARD (A), FLEXIBLE
169	2-684-207-01	FHB ADHESIVE TAPE
170	2-684-217-01	STEEL BALL
171	2-684-216-01	FOCUS CLICK SPRING
172	2-684-215-01	CLICK BASE
173	2-683-692-01	CHIP (MOUNT INDEX)
174	2-685-721-01	RING(OUTER BARREL)
175	A-1192-254-A	UNIT(FOCUS SCALE WINDOW UNIT)
176	2-685-728-01	TORQUE RING SUPPORT BARREL
177	2-685-581-01	SPRING(FRICTION SP-A)
178	2-685-582-01	WASHER(SLIP WASHER A) (t=0.2mm) (Note 2)
179	2-685-583-01	WASHER(SLIP WASHER B) (t=0.2mm) (Note 2)
180	2-685-584-01	RING (TORQUE RING HOLDER)

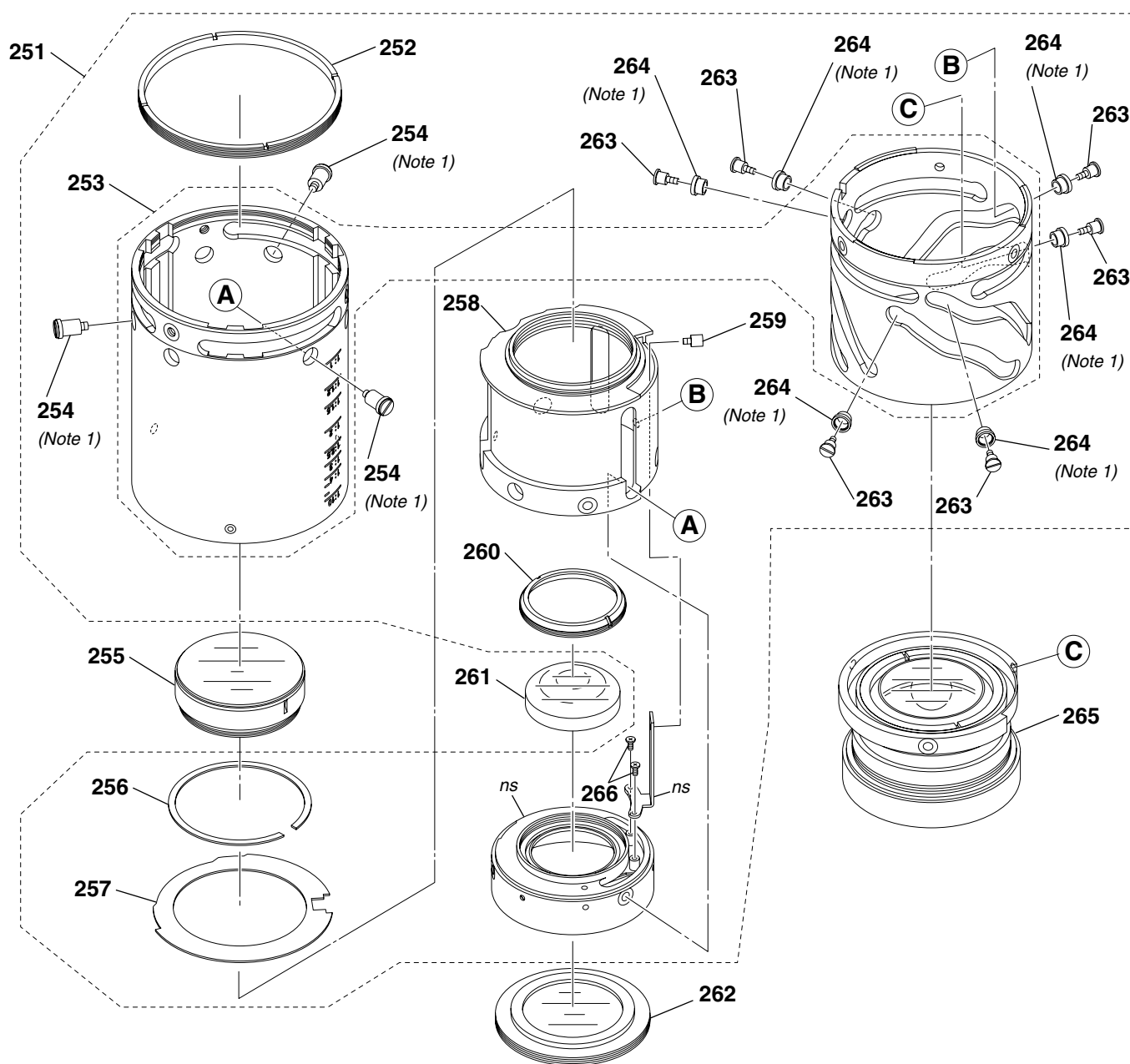
3-1-5. FIXED TUBE BLOCK AND MAIN FLEXIBLE BLOCK



Ref. No.	Part No.	Description
201	2-685-557-01	PIN(GUIDE PIN)
202	Selection part	ROLLER(GUIDE ROLLER A to K,M,N) (Note 1)
203	2-685-688-01	FOCUS CAM RING A
204	2-685-689-01	SPACER ADJUSTMENT WASHER
205	A-1192-242-A	BLOCK, MAIN FLEXIBLE
206	2-685-570-01	TAPEB(FLEXIBLESUBSTRATESSETTING
207	2-685-576-01	PHI 3 HEAD SCREW M1.6X3.0
208	2-685-577-01	CONDUCT TYPE WASHER
209	2-685-572-01	COVER(GEAR COVER)

Ref. No.	Part No.	Description
210	Selection part	PIN (LINEAR GUIDE PIN A to D) (Noye 1)
211	2-685-571-01	SHEET (ANTI REFLECTION TAPE)
212	2-685-578-01	SHEET (FLEXIBLE COVER)
213	2-685-691-01	PIN(FOCUS STOPPER)
214	2-685-686-01	TAPEA(FLEXIBLESUBSTRATESSETTING
215	2-685-687-01	FRICTION SHEET
216	2-685-690-01	RING(FOCUS CAM RING A HOLDER)
217	2-685-685-01	FIXED BARREL
218	9-913-210-01	INSULATION TAPE (Noye 2)

3-1-6. MIDWAY MOVE FRAME BLOCK



(Note 1) The number or type of these parts need to be selected according to adjustment etc..
Select the part referring to page 3-7.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
251	A-1192-233-A	BLOCK, MIDWAY MOVE FRAME	259	2-685-636-01	PIN(APERTURE CONNECTING PIN)
252	2-685-611-01	FOCUS CAM RING B HOLDER	260	2-685-635-01	G6 STOPPER
253	A-1192-234-A	FOCUS CAM RING B BLOCK	261	2-685-634-01	G6 LENS
254	Selection part	PIN(GUIDE PIN A to E) (Note 1)	262	A-1192-239-A	BLOCK (LEAD FREE), FRAME LENS
255	A-1192-253-A	BLOCK (LEAD FREE), 3 GROUP LENS	263	2-685-605-01	GUIDE PIN
256	2-685-633-01	APERTURE LINKAGE PLATE HOLDER	264	Selection part	GUIDE ROLLER A to I, ROLLER J,K,M,N(1*3 BLOCK GUIDE) (Note 1)
257	2-685-632-01	APERTURE LIGHT SHIELD PLATE	265	A-1192-240-A	BLOCK (LEAD FREE), 1 GROUP LENS
258	2-685-631-01	FRAME(3RD MOVING BARREL)	266	2-684-181-01	SCREW M1.6X2.0

3-1-7. SELECTION PARTS

Ref. No.12

These washers are provided for flange back adjustment.
Change the thickness (t) according to result of adjustment.

Part No.	Description
2-685-590-01	BACK ADJUSTMENT WASHER A (t=0.05mm)
2-685-591-01	BACK ADJUSTMENT WASHER B (t=0.07mm)
2-685-592-01	BACK ADJUSTMENT WASHER C (t=0.1mm)
2-685-593-01	BACK ADJUSTMENT WASHER D (t=0.2mm)
2-685-594-01	BACK ADJUSTMENT WASHER E (t=0.5mm)

Ref. No.14

These washers are provided for flange back adjustment.
Change the thickness (t) according to result of adjustment.

Part No.	Description
2-685-525-01	WASHER A(COUPLER ADJUSTMENT) (t=0.05mm)
2-685-526-01	WASHER B(COUPLER ADJUSTMENT) (t=0.07mm)
2-685-527-01	WASHER C(COUPLER ADJUSTMENT) (t=0.1mm)
2-685-528-01	WASHER D(COUPLER ADJUSTMENT) (t=0.2mm)
2-685-529-01	WASHER E(COUPLER ADJUSTMENT) (t=0.5mm)

Ref. No.156

Select the type of part according to the operation load of the associated parts.

Part No.	Description
2-684-057-01	COUPLER ADJUSTMENT WASHER A (t=0.05mm)
2-684-058-01	COUPLER ADJUSTMENT WASHER B (t=0.07mm)
2-684-059-01	COUPLER ADJUSTMENT WASHER C (t=0.1mm)

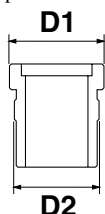
Ref. No.158

Select the type of part according to the operation load of the associated parts.

Part No.	Description
2-684-218-01	GAP ADJUST WASHER A (t=0.05mm)
2-684-219-01	GAP ADJUST WASHER B (t=0.1mm)
2-684-220-01	GAP ADJUST WASHER C (t=0.2mm)
2-685-726-01	GAP ADJUST WASHER D (t=0.07mm)

Ref. No.202

Select the type of part according to the operation load of the associated parts.



Part No.	Description
2-685-558-01	ROLLER(GUIDE ROLLER A) (D1=5.03mm,D2=4.53mm)
2-685-559-01	ROLLER(GUIDE ROLLER B) (D1=5.03mm,D2=4.52mm)
2-685-560-01	ROLLER(GUIDE ROLLER C) (D1=5.03mm,D2=4.51mm)
2-685-561-01	ROLLER(GUIDE ROLLER D) (D1=5.02mm,D2=4.53mm)
2-685-562-01	ROLLER(GUIDE ROLLER E) (D1=5.02mm,D2=4.52mm)
2-685-563-01	ROLLER(GUIDE ROLLER F) (D1=5.02mm,D2=4.51mm)
2-685-564-01	ROLLER(GUIDE ROLLER G) (D1=5.01mm,D2=4.53mm)
2-685-565-01	ROLLER(GUIDE ROLLER H) (D1=5.01mm,D2=4.52mm)
2-685-566-01	ROLLER(GUIDE ROLLER I) (D1=5.01mm,D2=4.51mm)
2-688-640-01	ROLLER (GUIDE ROLLER J) (D1=5.00mm,D2=4.50mm)
2-688-641-01	ROLLER (GUIDE ROLLER K) (D1=5.00mm,D2=4.49mm)
2-688-642-01	ROLLER (GUIDE ROLLER M) (D1=4.99mm,D2=4.50mm)
2-688-643-01	ROLLER (GUIDE ROLLER N) (D1=4.99mm,D2=4.49mm)

Ref. No.210

Select the type of part according to the operation load of the associated parts.

Part No.	Description
2-685-553-01	PIN (LINEAR GUIDE PIN A) (D=4.52mm)
2-685-554-01	PIN (LINEAR GUIDE PIN B) (D=4.51mm)
2-685-555-01	PIN (LINEAR GUIDE PIN C) (D=4.50mm)
2-685-573-01	PIN (LINEAR GUIDE PIN D) (D=4.49mm)

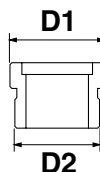
Ref. No.254

Select the type of part according to the operation load of the associated parts.

Part No.	Description
2-685-606-01	PIN(GUIDE PIN A) (D=5.23mm)
2-685-607-01	PIN(GUIDE PIN B) (D=5.22mm)
2-685-608-01	PIN(GUIDE PIN C) (D=5.21mm)
2-685-609-01	PIN(GUIDE PIN D) (D=5.20mm)
2-685-610-01	PIN(GUIDE PIN E) (D=5.19mm)

Ref. No.264

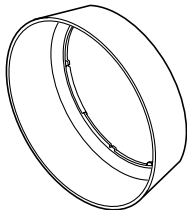
Select the type of part according to the operation load of the associated parts.



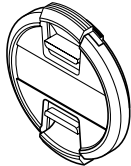
Part No.	Description
2-685-595-01	GUIDE ROLLER A (D1=5.03mm,D2=4.53mm)
2-685-596-01	GUIDE ROLLER B (D1=5.03mm,D2=4.52mm)
2-685-597-01	GUIDE ROLLER C (D1=5.03mm,D2=4.51mm)
2-685-598-01	GUIDE ROLLER D (D1=5.02mm,D2=4.53mm)
2-685-599-01	GUIDE ROLLER E (D1=5.02mm,D2=4.52mm)
2-685-600-01	GUIDE ROLLER F (D1=5.02mm,D2=4.51mm)
2-685-601-01	GUIDE ROLLER G (D1=5.01mm,D2=4.53mm)
2-685-602-01	GUIDE ROLLER H (D1=5.01mm,D2=4.52mm)
2-685-603-01	GUIDE ROLLER I (D1=5.01mm,D2=4.51mm)
2-688-648-01	ROLLER J (1*3 BLOCK GUIDE) (D1=5.00mm,D2=4.50mm)
2-688-649-01	ROLLER K (1*3 BLOCK GUIDE) (D1=5.00mm,D2=4.49mm)
2-688-650-01	ROLLER M (1*3 BLOCK GUIDE) (D1=4.99mm,D2=4.50mm)
2-688-651-01	ROLLER N (1*3 BLOCK GUIDE) (D1=4.99mm,D2=4.49mm)

3-2. SUPPLIED ACCESSORIES

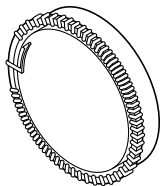
Checking supplied accessories.



Lens Hood (SH0007)
2-687-046-01



Front Lens Cap
2-683-616-01



Rear Lens Cap
2-683-615-01

Other accessories

- 2-685-162-01 MANUAL, INSTRUCTION
(JAPANESE, ENGLISH, FRENCH, SPANISH)
- 2-685-162-11 MANUAL, INSTRUCTION
(GERMAN, DUTCH, SWEDISH, ITALIAN) (AEP)
- 2-685-162-21 MANUAL, INSTRUCTION (PORTUGUESE, RUSSIAN,
TRADITIONAL CHINESE, KOREAN) (AEP)
- 2-685-162-31 MANUAL, INSTRUCTION
(SIMPLIFIED CHINESE, ARABIC) (AEP, CH)

• Abbreviation
CH :Chinese model

4. ADJUSTMENTS

Note: After the service repair, perform the adjustments referring to this section.

4-1. PREPARATIONS

4-1-1. List of Service Tools and Equipments

- Variable Transformer (Output voltage: AC 100 V) (Note 3)
- Camera DSLR-A100
- Compact Flash (CF) Card (For image saving)
- Screen (Art paper)
- Tape Measure
- Plane Mirror (For SLRs)
- Adhesive bond (B-10): J-6082-612-A
- Color Calculator 2

Note: Color Calculator 2 is downloadable from the ESI homepage.


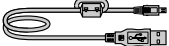
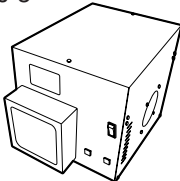

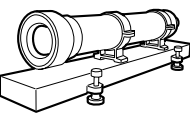
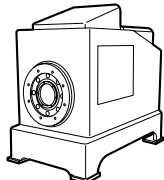
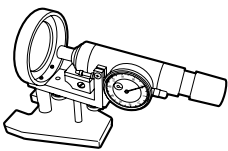
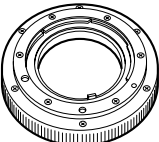
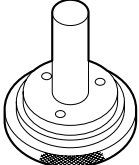
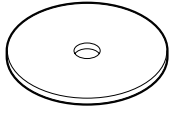
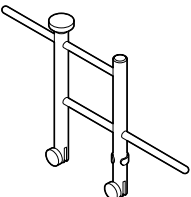
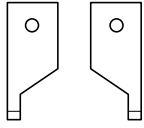
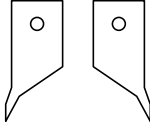
<p>J-1</p>  <p>Personal computer (Note 1)</p>	<p>J-2</p>  <p>USB cord with connector 1-833-062-11</p>	<p>J-3</p>  <p>Luminance box J-6082-581-A</p>
<p>J-4</p>  <p>AE master lens J-6082-597-A</p>	<p>J-5</p>  <p>1000 mm Collimator 110V: J-6082-604-A 240V: J-6082-604-B (Note 2)</p>	<p>J-6</p>  <p>Lens test projector J-6082-605-A (Note 3)</p>
<p>J-7</p>  <p>Flange back tester J-6082-606-A</p>	<p>J-8</p>  <p>A-mount attachment J-6082-607-A</p>	<p>J-9</p>  <p>Flange back gauge (43.50mm) J-6082-608-A</p>
<p>J-10</p>  <p>Aberration measuring cap 55mm (SAL100M28) J-6082-632-A</p>	<p>J-11</p>  <p>Universal wrench J-6082-609-A</p>	<p>J-12</p>  <p>Chip-A for universal wrench J-6082-609-1</p>
<p>J-13</p>  <p>Chip-B for universal wrench J-6082-609-2</p>		

Fig. 4-1-1

Note 1: Personal Computer (PC)
(Color Calculator 2 installed)
OS: Windows2000 Professional/XP
MEMORY: 40 M Byte or more recommended
Hard disk free area: 15 M Byte or more recommended
USB terminal: Standard equipment
Graphics: 32,000 colors or more recommended VGA monitor

Note 2: Attach the chart to the 1000 mm collimator as shown in Fig. 4-1-2.

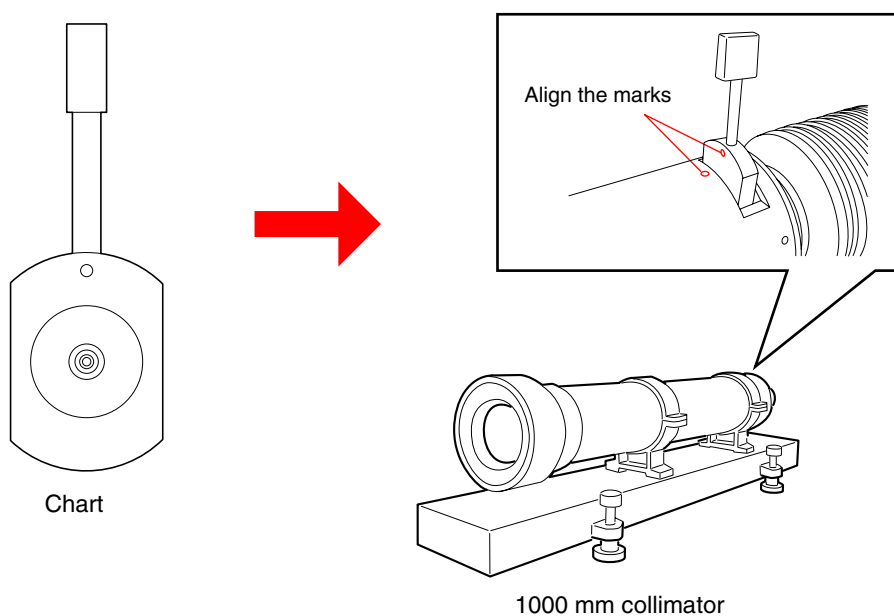


Fig. 4-1-2

Note 3: Connect the variable transformer (Output voltage: **AC 100 V**) to the lens test projector.

4-1-2. Lens Adjustment Program

The lens adjustment program is required for the following check/adjustment.

4-6. LENS ROM CHECK

4-7. BRUSH POSITION CHECK/ADJUSTMENT AND PATTERN CHECK

Prepare/start the Lens adjustment program with the following steps.

Equipment

- Personal Computer (PC)
- Camera DSLR-A100
- USB Cord With Connector
- Lens Adjustment Program

Note: Lens Adjustment Program is downloadable from the ESI homepage.

1. Installation of the Lens Adjustment Program

For installation of the lens adjustment program, refer to the link “• Preparing the DSLR-A100 adjustment program” described on the top cover of the camera DSLR-A100 service manual “9-852-130-5□”.

Note: Store the lens adjustment program “LensAdjustment.exe” and related file “AlphaLensAdjust.txt” in the folder that contains the DSLR-A100 adjustment program “DSLRadj_cs.exe”.

2. Start the Lens Adjustment Program

- 1) Connect the camera and PC with the USB cord with connector.
- 2) Set the mode dial of camera to “M”.
- 3) Turn the POWER switch of the camera to OFF, then turn the POWER switch to ON while pressing the shutter button halfway down with pressed the ▲ button of controller keys and MENU buttons.
- 4) Check that the remaining number of recordable images on the LCD monitor is “BBBB”.

Note: When “BBBB” is displayed, the camera activates in the adjustment mode.

- 5) Start the lens adjustment program “LensAdjustment.exe”.

4-2. APERTURE DIAMETER CHECK

4-2-1. Aperture Diameter Check

Equipment

- Luminance Box
- Camera DSLR-A100
- AE Master Lens
- Compact Flash (CF) Card (For image saving)
- Personal Computer (PC)
(Color Calculator 2 installed)

1. Preparations

- 1) Install the CF card to the camera.
- 2) Set the equipments, camera and master lens as shown in Fig.4-2-1.

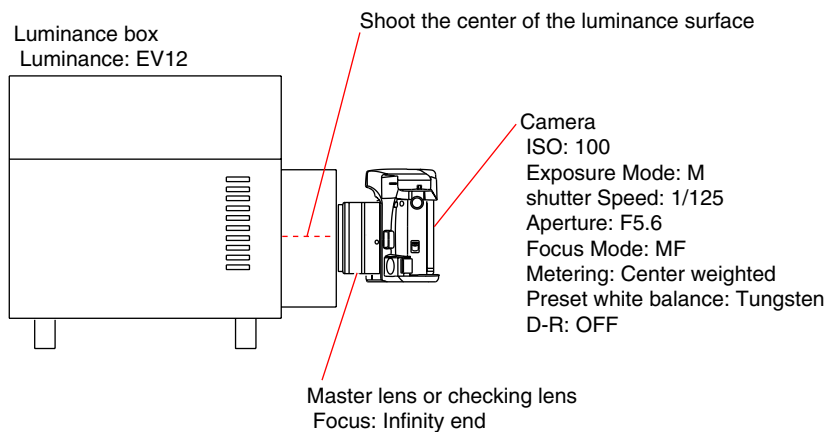


Fig.4-2-1

- 3) Shoot the images under the following conditions and save them.

Note: Shoot the center of the luminance surface three times with the master lens and checking lens.

Setting of Luminance box:

Luminance: EV12

Setting of Lens:

Focus: Infinity end

Setting of Camera:

ISO: 100

Exposure Mode: M

shutter Speed: 1/125

Aperture: F5.6

Focus Mode: MF

Metering: Center weighted

Preset white balance: Tungsten

D-R: OFF

2. Checking of Image

Note: Check the image of both master lens and checking lens.

- 1) Start the Color Calculator 2.

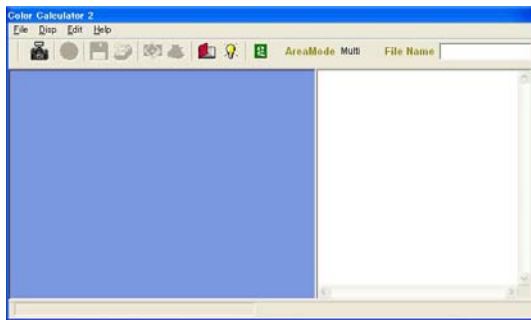


Fig.4-2-2

- 2) Read the image from the file menu.

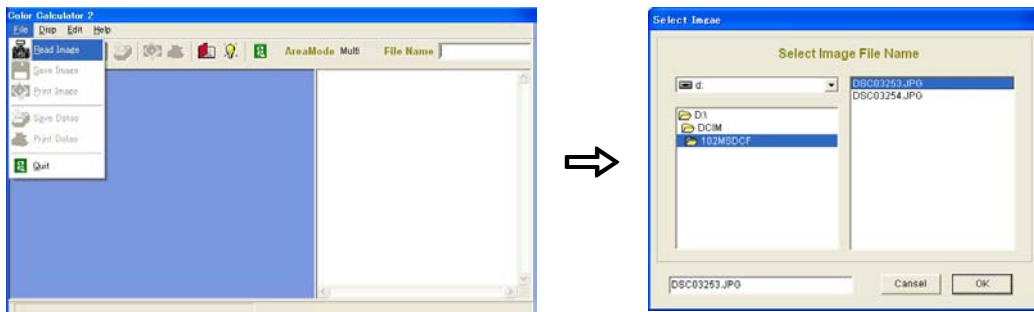


Fig.4-2-3

- 3) Set the Color Calculator 2 as follows.

Measured value display (Display menu): RGB+L*a*b*

Measuring method (Display menu): Center Single Area



Fig.4-2-4

Color space (Edit menu): sRGB



Fig.4-2-5

Area size for calculate (Edit menu → Option): 256×256 Pixels



Fig.4-2-6

- 4) Click the calculate button to measure the image.
- 5) After measuring, check the “G” values.
 Average “G” value of the three images shoot with master lens: (a)
 Average “G” value of the three images shoot with checking lens: (b)

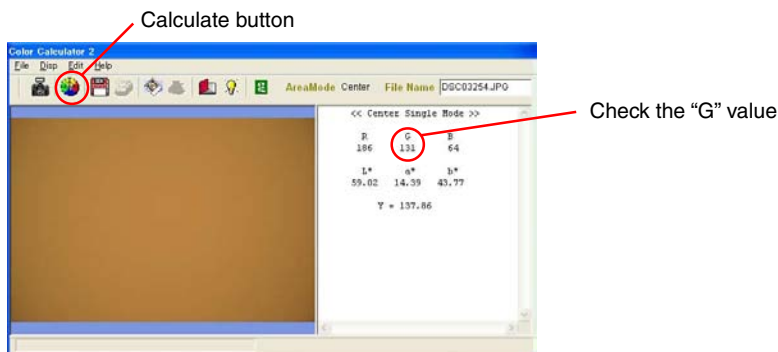


Fig.4-2-7

3. Checking Method

- 1) Calculate aperture error using the following formula, and check that the aperture error is within the specification.

$\text{Aperture error} = \text{Average "G" value of master lens (a)} - \text{Average "G" value of checking lens (b)}$

Specification

Aperture error = 0 ± 12

- 2) When the aperture error is out of specification, replace the midway move frame block and perform the check again.

4-3. PROJECTIVE RESOLVING POWER CHECK

Equipment

- Lens Test Projector and Variable Transformer (Output voltage: AC 100 V)
Note: Connect the variable transformer (Output voltage: AC 100 V) to the lens test projector.
- A-mount Attachment
- Screen (Art paper)
- Tape Measure
- Plane Mirror (For SLRs)

1. Preparations

Note: Check the projective resolving power of the checking lens at the following focal-length and distance.

Focal-length f (mm)	distance (m)
100	4.2

Table 4-3-1

- 1) Perform the following steps (1) to (3), and incorporate the internal lenses of the lens test projector according to the checking focal-length.
- (1) Open the lid of the lens test projector.
 - (2) Pull up and turn the fixed levers on the right and left sides of the lens test projector.
 - (3) Remove or insert the lens.

Note: Be sure to have the right position and direction of the lens.

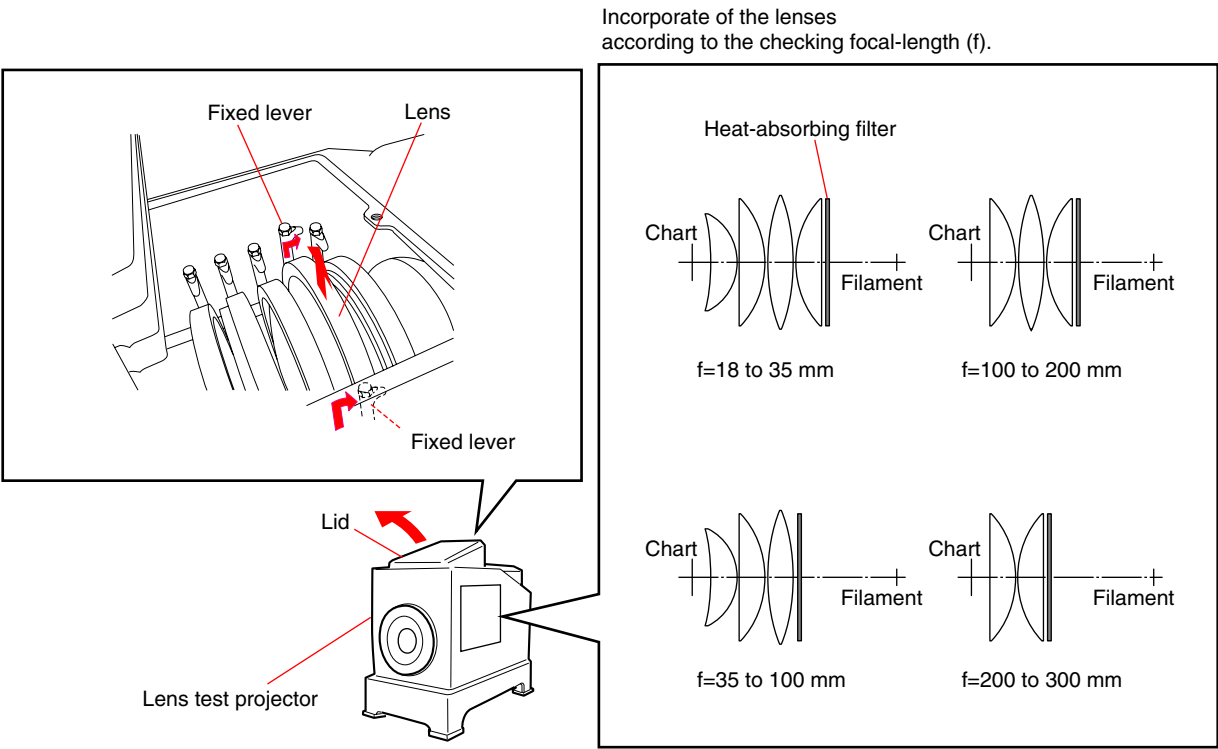


Fig.4-3-1

- 2) Attach the checking lens to the lens test projector, and set the equipments as shown in Fig.4-3-2.
- 3) Turn the fan switch of the lens test projector to ON, then turn the lamp switch to ON.

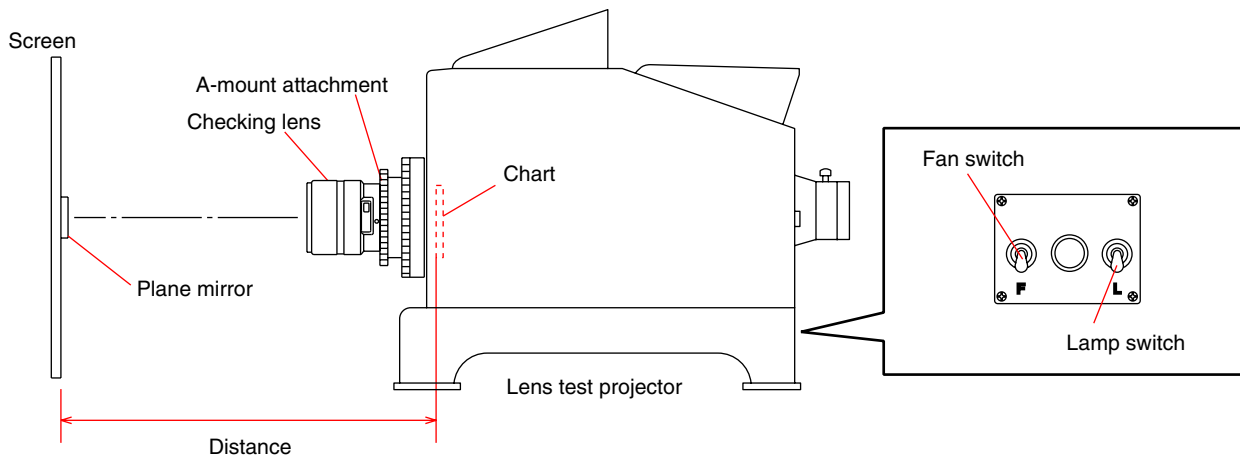


Fig.4-3-2

- 4) Turn the focus ring of the checking lens until the chart image projected on the screen is the sharpest at the center ($y'=0$).
- 5) Set the plane mirror to the center of the projected image ($y'=0$), and adjust the projector position so that the mirror reflects the light to the center of the lens.

2. Checking Method

- 1) Turn the focus ring of the checking lens until the chart image projected on the screen is the sharpest at the center ($y'=0$).
- 2) Read the number of the smallest pitched lines at the center ($y'=0$).

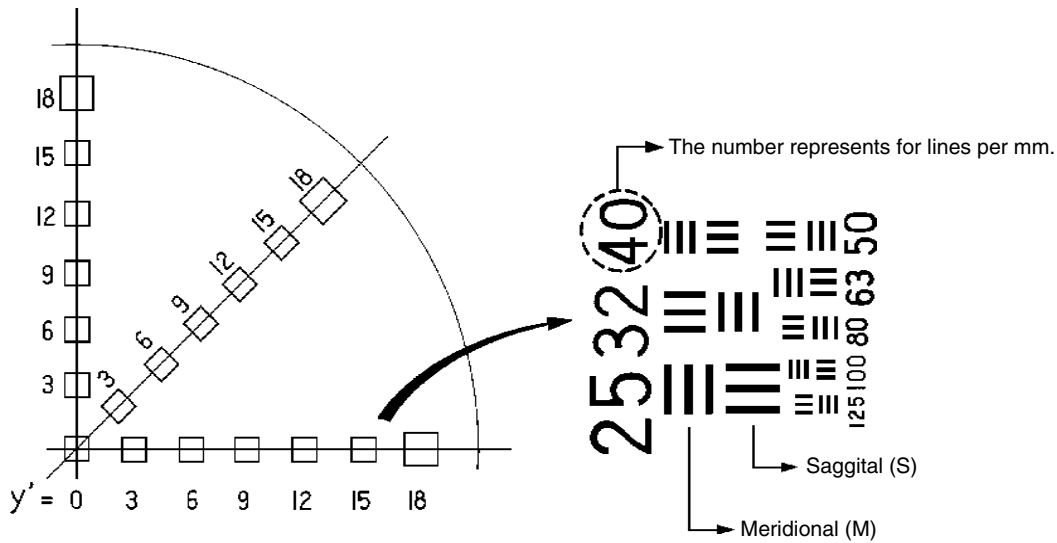


Fig.4-3-3

- 3) Turn the mount rotation ring of lens test projector until the projected image at a certain peripheral point ($y'=15$ or 18) on the screen appears the most unsharp.

Read the number of the smallest pitched lines (both saggital and meridional: 3 lines) at the peripheral point.

Note: When reading the number of the smallest pitched lines, be careful of the spurious resolution.

Spurious resolution is the reversed image of 2 or 4 lines which appears on screen when focus is beyond maximum revolving power.

Do not confuse spurious resolution for the smallest pitched lines.

Correct resolution



Spurious resolution

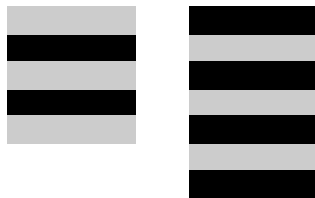


Fig.4-3-4

- 4) Check that the all readings ($y'=0$, saggital (S) and meridional (M) at $y'=15$ or 18) is within the specification of the Table 4-3-2.

Specification

Focal-length f (mm)	distance (m)	Number of the smallest pitched lines				
		Center (y'=0) (Lines per mm)	y' = 15		y' = 18	
			S	M	S	M
100	4.2	125	63	50	50	50

Table 4-3-2

- 5) After the checking is completed, turn the lamp switch of the lens test projector to OFF and cool the inside of the lens test projector, then turn the fan switch to OFF.

4-4. FLANGE BACK (f'F) CHECK/ADJUSTMENT

4-4-1. Flange Back (f'F) Check

Equipment

- 1000 mm Collimator
- Flange Back Tester
- A-mount Attachment
- Flange Back Gauge (43.50mm)

1. Preparations

- 1) Set the equipments as shown in the Fig.4-4-1.

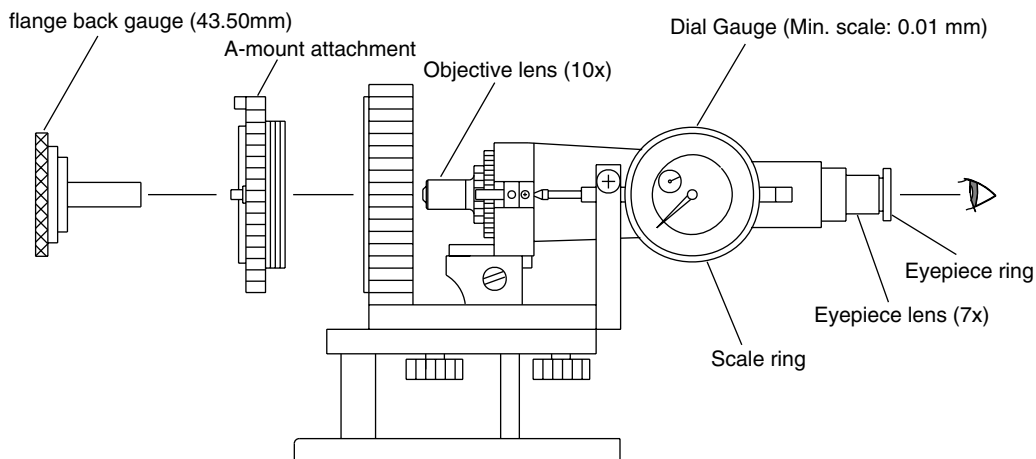


Fig.4-4-1

- 2) Looking through the eyepiece lens, turn the eyepiece ring of the flange back tester so that cross line or scale in the view is the sharpest.
- 3) Attach the flange back gauge (43.50mm) securely to the A-mount attachment and hold them together.
- 4) Turn the focusing knob of the flange back tester so that fine scratches on the flange back gauge (43.50mm) is the sharpest.

Note: Turn the knob in the direction of the arrow of Fig.4-4-2 for correct reading.

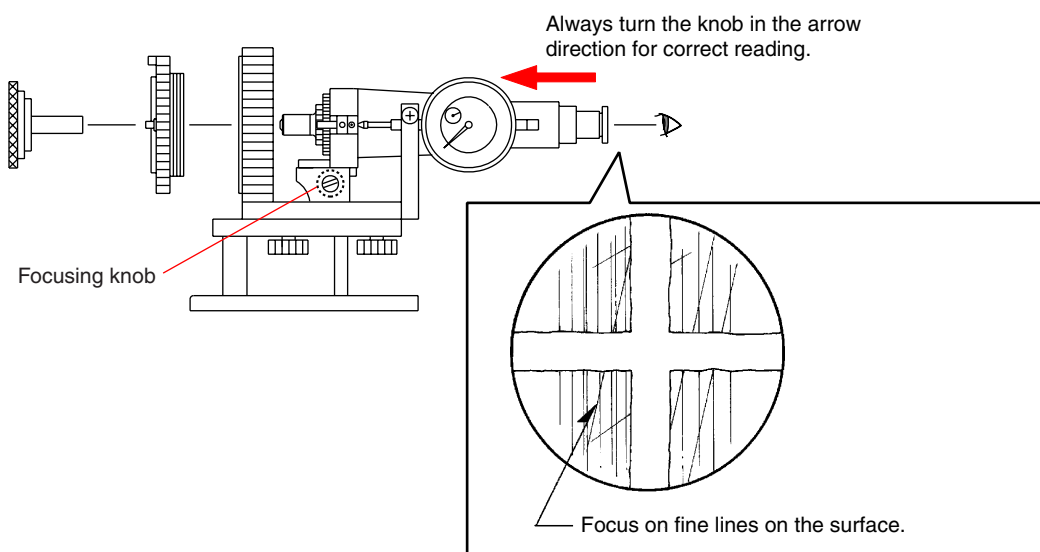


Fig.4-4-2

- 5) Turn the scale ring of the dial gauge until the long pointer indicates "0".

Note: This position is the flange back (f'F) = 43.50 mm.

Memorize the position of short-pointer.

2. Checking Method

- 1) Attach the checking lens to the flange back tester, and set the 1000 mm collimator.

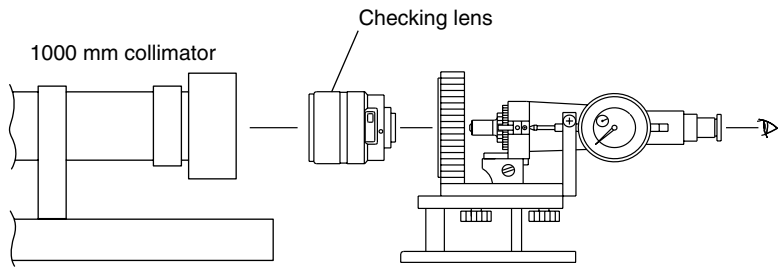


Fig.4-4-3

- 2) Set the focus ring of the checking lens to infinity end position while looking through the microscope, and align the optical axis to the center of the chart image accurately.
- 3) Turn the focusing knob of the flange back tester, and set the dial gauge value to “44.56 mm”.
- 4) Turn the focus ring of the checking lens from near to infinity side until the chart image is the sharpest (red and green color areas are equal on the chart *).

*: Position in which the color of collimator chart changes from green into red and come into focus.

Also check the optical axis aligns with the chart center. (Refer to Fig.4-4-4.)

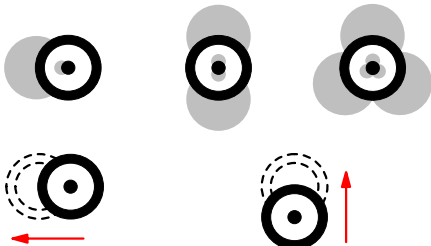
Note: Figure shows example. The cause depends on individual lens.

Optical Alignment
Best alignment



Incorrect aligned

e.g. As the focusing knob is turned, the chart may appear blurry as illustrated.
The cause depends on individual lens.



Appearance	Allowance
Off center	Within 0.05 mm
Astigmatism	Within 0.04 mm

Fig.4-4-4

- 5) Check that the infinity index of the distance scale is within the distance index width of the distance scale window as shown in the Fig. 4-4-5.

If not, perform “4-4-2. Flange Back (f’F) Adjustment”.

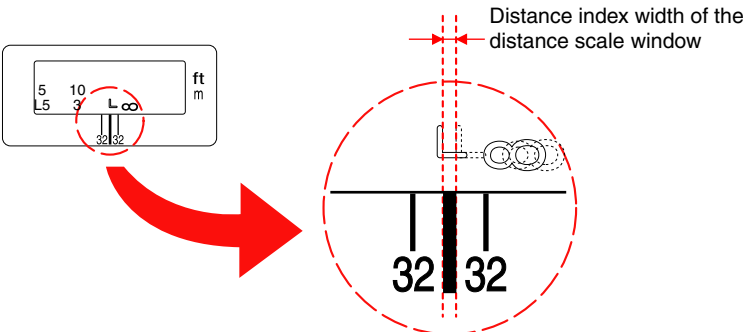


Fig. 4-4-5

- 6) After the check is completed, perform “4-5. FOCUS-SHIFT CHECK”.

4-4-2. Flange Back (f'F) Adjustment

Equipment

- 1000 mm Collimator
- Flange Back Tester
- A-mount Attachment

Adjusting Method

- 1) Perform “4-4-1. Flange Back (f'F) Check”, and check that the checking lens is out of specification.
- 2) Turn the focus scale plate of the checking lens and align the infinity index of the distance scale to the focus index of the focus scale window as shown in the Fig.4-4-6.

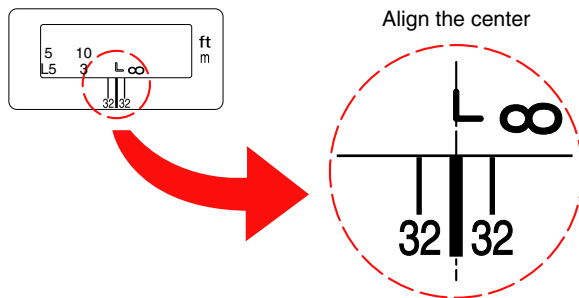


Fig. 4-4-6

- 3) Turn the focusing knob of the flange back tester until the chart image is the sharpest while looking through the microscope.
- 4) Calculate the flange back (f'F).

Flange back (f'F) of the checking lens = (Flange back gauge) + (Number of short-pointer revolution) + (Reading of long-pointer)

- 5) Calculate focus error amount using the following formula.

Focus error amount = Flange back (f'F) reading - 44.56 mm

Focus error amount: Amount that should be adjusted by the back adjustment washer thickness.

f'F: Flange back value (Reading value)

- 6) Adjust the back adjustment washer and coupler adjustment washer thickness according to the result of step 5).
(Refer to Table 4-4-1 and Fig.4-4-7.)

Note: Use the micrometer gauge (or slide gauge) to measure the back adjustment washer and coupler adjustment washer thickness.

If focus error is a negative value: Decrease back adjustment washer and coupler adjustment washer thickness by error amount to increase flange back.
If focus error is a positive value: Increase back adjustment washer and coupler adjustment washer thickness by error amount to decrease flange back.

Back adjustment washer	Parts No.	T (mm)	Coupler adjustment washer	Parts No.	T (mm)
A	2-685-590-01	0.05	A	2-685-525-01	0.05
B	2-685-591-01	0.07	B	2-685-526-01	0.07
C	2-685-592-01	0.1	C	2-685-527-01	0.1
D	2-685-593-01	0.2	D	2-685-528-01	0.2
E	2-685-594-01	0.5	E	2-685-529-01	0.5

Table 4-4-1

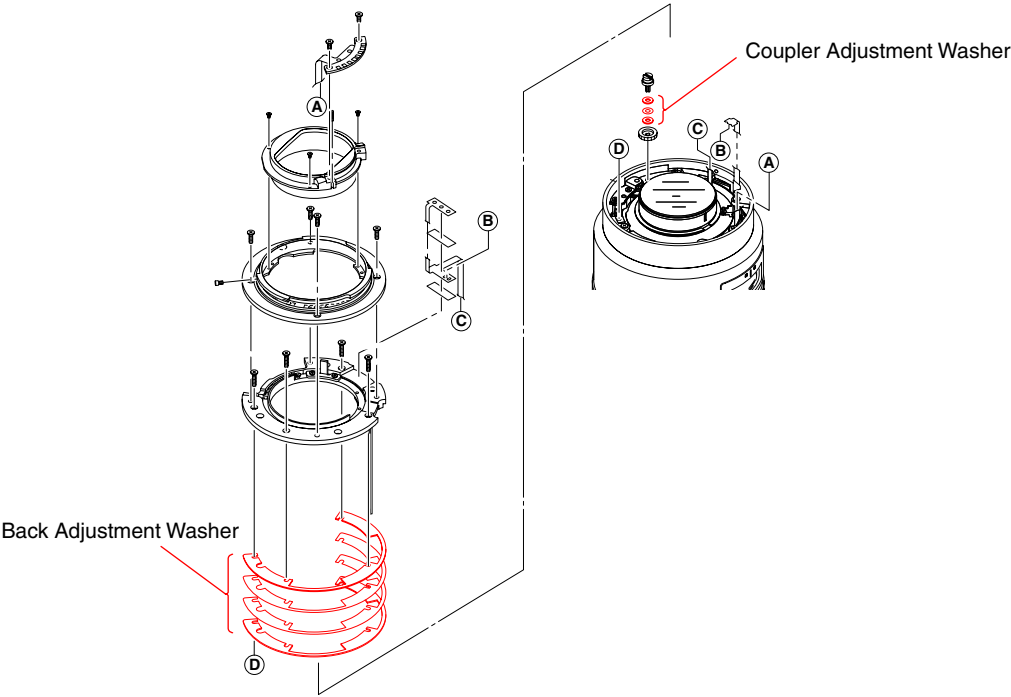


Fig.4-4-7

- 7) Install the back adjustment washer and coupler adjustment washer, and perform “4-4-1. Flange Back (f’F) Check” again.

4-5. FOCUS-SHIFT CHECK

This section describes the check of focus-shift amount resulting change of focal-length by aperture setting.

Equipment

- 1000 mm Collimator
- Flange Back Tester
- A-mount Attachment
- Flange Back Gauge (43.50mm)
- Aberration Measuring Cap 55mm

1. Preparations

- 1) Perform “1. Preparations” of “4-4-1. Flange Back (f’F) Check”.

2. Checking Method

- 1) Set the lens aperture to the open aperture position, and measure the flange back (f’F).
- 2) Set the aberration measuring cap 55mm (F8 equivalent) on the tip of lens as shown in the Fig.4-5-1, then measure the flange back (f’F).

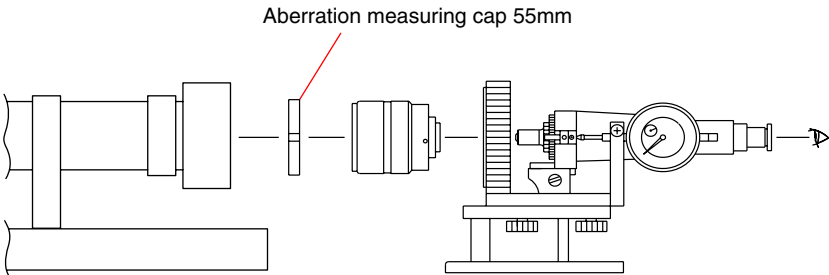


Fig.4-5-1

- 3) Calculate amount of focus-shift using the following formula, and check that the specification is satisfied.

Note: The focus-shift amount of the checking lens is difference between the flange back (f’F) of open aperture and flange back (f’F) reading (using aberration measuring cap 55mm).

Focus-shift = flange back (f’F) of open aperture reading - flange back (f’F) reading (using aberration measuring cap 55mm)

Specification

Focus-shift (mm) = -0.06 to +0.08

- 4) When the focus-shift is out of specification, perform the parts replacement and adjustment/check referring to the Fig.4-5-2.

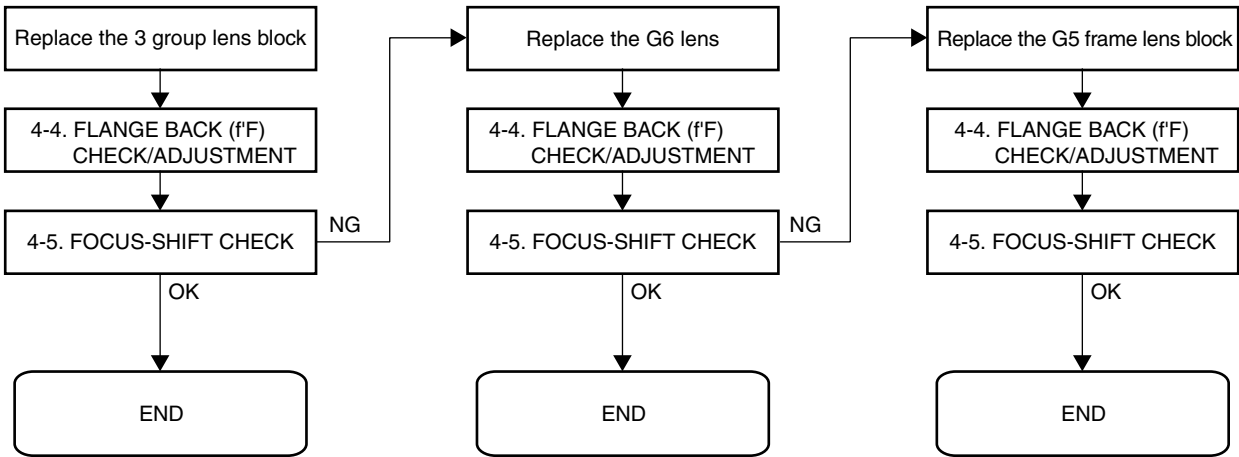


Fig.4-5-2

4-6. LENS ROM CHECK

Note: If dialog box of error code appears during the checking, check the reason of error referring to page 4-19.

Equipment

- Personal Computer (PC)
- Camera DSLR-A100
- USB Cord With Connector
- Lens Adjustment Program

Note: Lens Adjustment Program is downloadable from the ESI homepage.

1. Preparations

- 1) Connect the checking lens to the camera.
- 2) Start the lens adjustment program “LensAdjustment.exe” referring to “4-1-2. Lens Adjustment Program”.

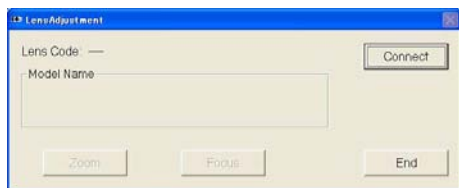


Fig. 4-6-1

2. Checking Method

- 1) Click the **Connect** button on the lens adjustment program.

Note: Click the **End** button to disconnect the USB connection, then lens adjustment program will terminate.

- 2) Check that the display of “Lens Code” and “Model Name” is correct.

Note: Focus position setting is not required.

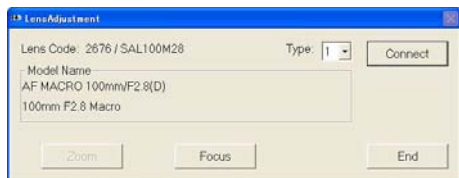


Fig. 4-6-2

- 3) Click the **End** button to terminate the lens adjustment program.
- 4) Turn the POWER switch of the camera to OFF.

4-7. BRUSH POSITION CHECK/ADJUSTMENT AND PATTERN CHECK

Note: If dialog box of error code appears during the checking or adjustment, check the reason of error referring to page 4-19.

4-7-1. Brush Position Check

Equipment

- Personal Computer (PC)
- Camera DSLR-A100
- USB Cord With Connector
- Lens Adjustment Program

Note: Lens Adjustment Program is downloadable from the ESI homepage.

1. Preparations

- 1) Connect the checking lens to the camera.
- 2) Start the lens adjustment program “LensAdjustment.exe” referring to “4-1-2. Lens Adjustment Program”.

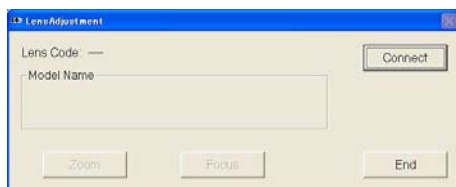


Fig. 4-7-1

2. Checking Method

- 1) Click the **Connect** button on the lens adjustment program.

Note: Click the **End** button to disconnect the USB connection, then lens adjustment program will terminate.

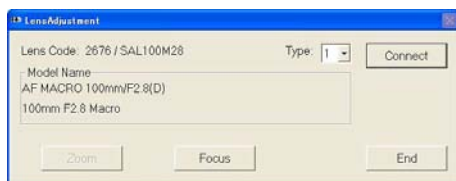


Fig. 4-7-2

- 2) Check that the “Type” is set to “1”, and click the **Focus** button on the lens adjustment program.
- 3) Set the focus position to infinity end, then check that the OK (Green) indicator of “Position” lights as shown in Fig. 4-7-3.

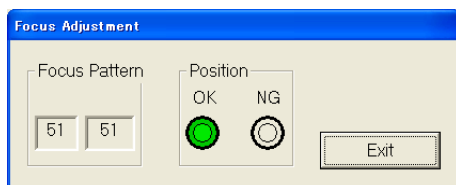


Fig. 4-7-3

If the NG (Red) indicator of “Position” lights, perform the “4-7-2. Brush Position Adjustment and Pattern Check”.

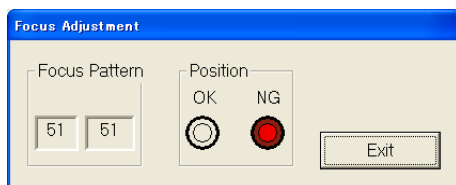


Fig. 4-7-4

- 4) Click the **Exit** button.
- 5) Click the **End** button to terminate the lens adjustment program.
- 6) Turn the POWER switch of the camera to OFF.

4-7-2. Brush Position Adjustment and Pattern Check

Equipment

- Personal Computer (PC)
- Camera DSLR-A100
- USB Cord With Connector
- Adhesive bond (B-10)
- Lens Adjustment Program

Note: Lens Adjustment Program is downloadable from the ESI homepage.

1. Preparations

- 1) Disassemble or assemble the checking lens into the state of the Fig. 4-7-5.
- 2) Turn the focus cam ring A to the infinity side until it stops at the focus stopper.

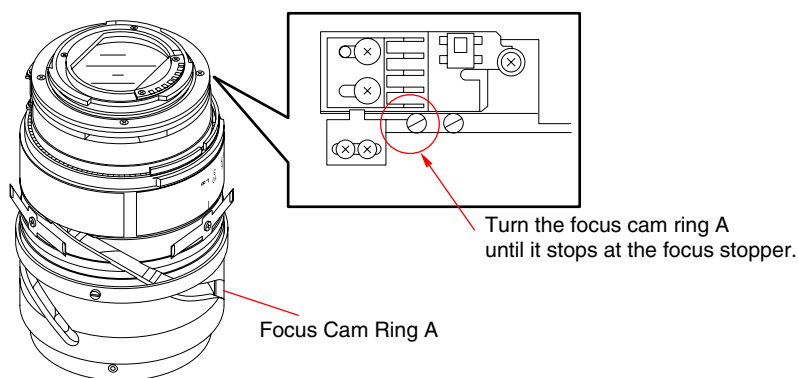


Fig. 4-7-5

2. Brush Position Adjustment

- 1) Loosen the four screws as shown in the Fig. 4-7-6.

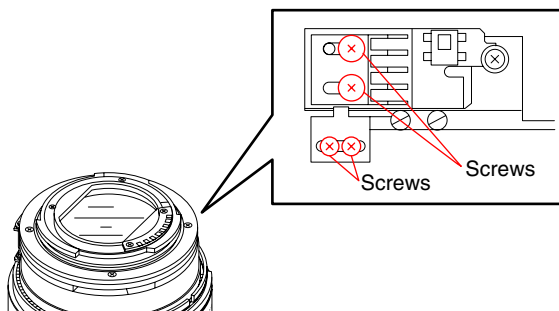


Fig. 4-7-6

- 2) Perform the "4-7-1. Brush Position Check", and adjust the A encoder brush position until the OK (Green) indicator of "Position" lights.

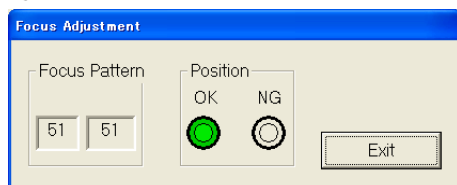


Fig. 4-7-7

- 3) Tighten the four screws loosened in step 1).

3. Pattern Check

Note: When the NG (Red) indicator of “Position” lights during checking, does not care about it (It is normal performance).

- 1) Turn the focus ring (focus cam ring A) slowly from the near end “Focus Pattern : 1” to the infinity end “Focus Pattern : 51” and check that the value of “Focus Pattern” change from 1 to 51 continuously.
- 2) Turn the focus ring (focus cam ring A) slowly from the infinity end “Focus Pattern : 51” to the near end “Focus Pattern : 1” and check that the value of “Focus Pattern” change from 51 to 1 continuously.

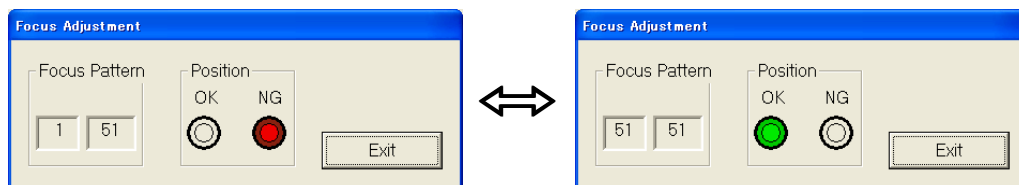


Fig. 4-7-8

- 3) Click the **Exit** button.
- 4) Click the **End** button to terminate the lens adjustment program.
- 5) Turn the POWER switch of the camera to OFF.
- 6) After the pattern check is completed, apply the adhesive bond (B-10) as shown in Fig. 4-7-9.

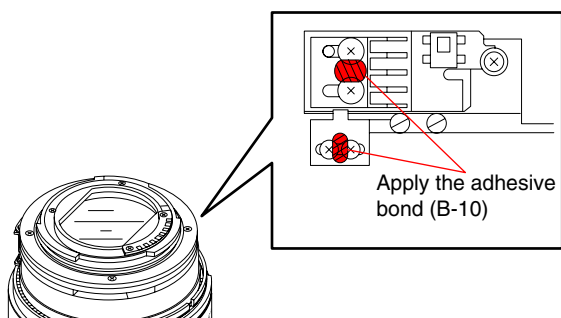
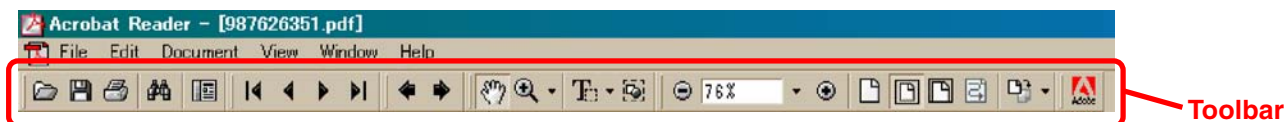


Fig. 4-7-9


4-8. ERROR CODE LIST

Error code		Description
Corrupt Data		Zoom/focus data of check pattern is out of sync with the number of check pattern.
Error, No Lens		Lens is not connected correctly.
Error, Unknown Lens		Unidentified lens is connected.
Communication Error,	Code#:E600	Communication error with the camera
	Code#:F000	Input data error to DLL file
	Code#:F100	Setting error of USB port
	Code#:2531	Communication error of main signal on the camera


[Description of main button functions on toolbar of the Adobe Acrobat Reader Ver5.0 (for Windows)]





Printing a text

1. Click the Print button .
2. Specify a printer, print range, number of copies, and other options, and then click [OK].

Application of printing:

To set a range to be printed within a page, select the graphic selection tool  and drag on the page to enclose a range to be printed, and then click the Print button.


Reversing the screens displayed once

- To reverse the previous screens (operation) one by one, click the .
- To advance the reversed screens (operation) one by one, click the .

Application to the Service Manual:

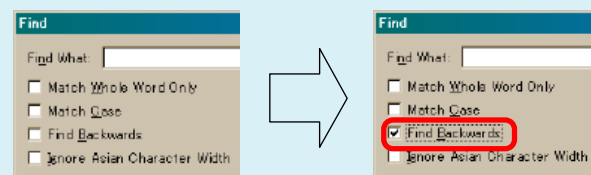
This function allows you to go and back between circuit diagram and printed circuit board diagram, and accordingly it will be convenient for the voltage check.

Finding a text

1. Click the Find button .
2. Enter a character string to be found into a text box, and click the [Find]. (Specify the find options as necessary)

Application to the Service Manual:

To execute "find" from current page toward the previous pages, select the check box "Find Backwards" and then click the "Find".








3. Open the find dialog box again, and click the [Find Again] and you can find the matched character strings displayed next. (Character strings entered previously are displayed as they are in the text box.)

Application to the Service Manual:


The parts on the drawing pages (block diagrams, circuit diagrams, printed circuit boards) and parts list pages in a text can be found using this find function. For example, find a Ref. No. of IC on the block diagram, and click the [Find Again] continuously, so that you can move to the Ref. No. of IC on the circuit diagram or printed circuit board diagram successively.


Note: The find function may not be applied to the Service Manual depending on the date of issue.

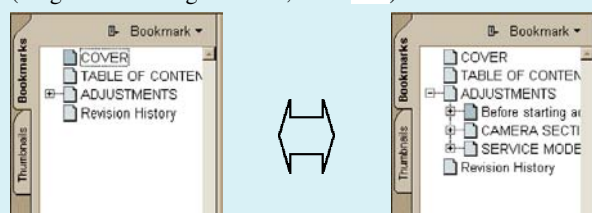
Moving with link

1. Select either palm tool , zoom tool , text selection tool , or graphic selection tool .
2. Place the pointer in the position in a text where the link exists (such as a button on cover and the table of contents page, or blue characters on the removal flowchart page or drawing page), and the pointer will change to the forefinger form .
3. Then, click the link. (You will go to the link destination.)

Moving with bookmark:



Click an item (text) on the bookmark pallet. and you can move to the link destination. Also, clicking  can display the hidden items.

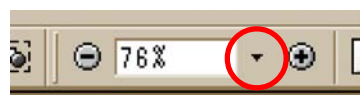
(To go back to original state, click )




Zooming or rotating the screen display

"Zoom in/out"

- Click the triangle button in the zoom control box to select the display magnification. Or, you may click  or  for zooming in or out.







"Rotate"

- Click rotate tool , and the page then rotates 90 degrees each.

Application to the Service Manual:

The printed circuit board diagram you see now can be changed to the same direction as the set.

Switching a page

- To move to the first page, click the .
- To move to the last page, click the .
- To move to the previous page, click the .
- To move to the next page, click the .

Revision History

Ver.	Date	History	Contents	S.M. Rev. issued
1.0	2006.06	Official Release	—	—
1.1	2007.02	Revised-1	<ul style="list-style-type: none"> • Change of Repair Parts (Section 1-5, Section 2, Section 3, Section 4) • Change of HELP31 • Addition of guide of [About the Lens Test Projector] (Cover) • Addition of HELP42 	Yes