作成承認印	配布許可印
ニコン カメラ CS推進部 GM	計画課 M

AF Zoom Micro-Nikkor ED 70-180/4.5-5.6D

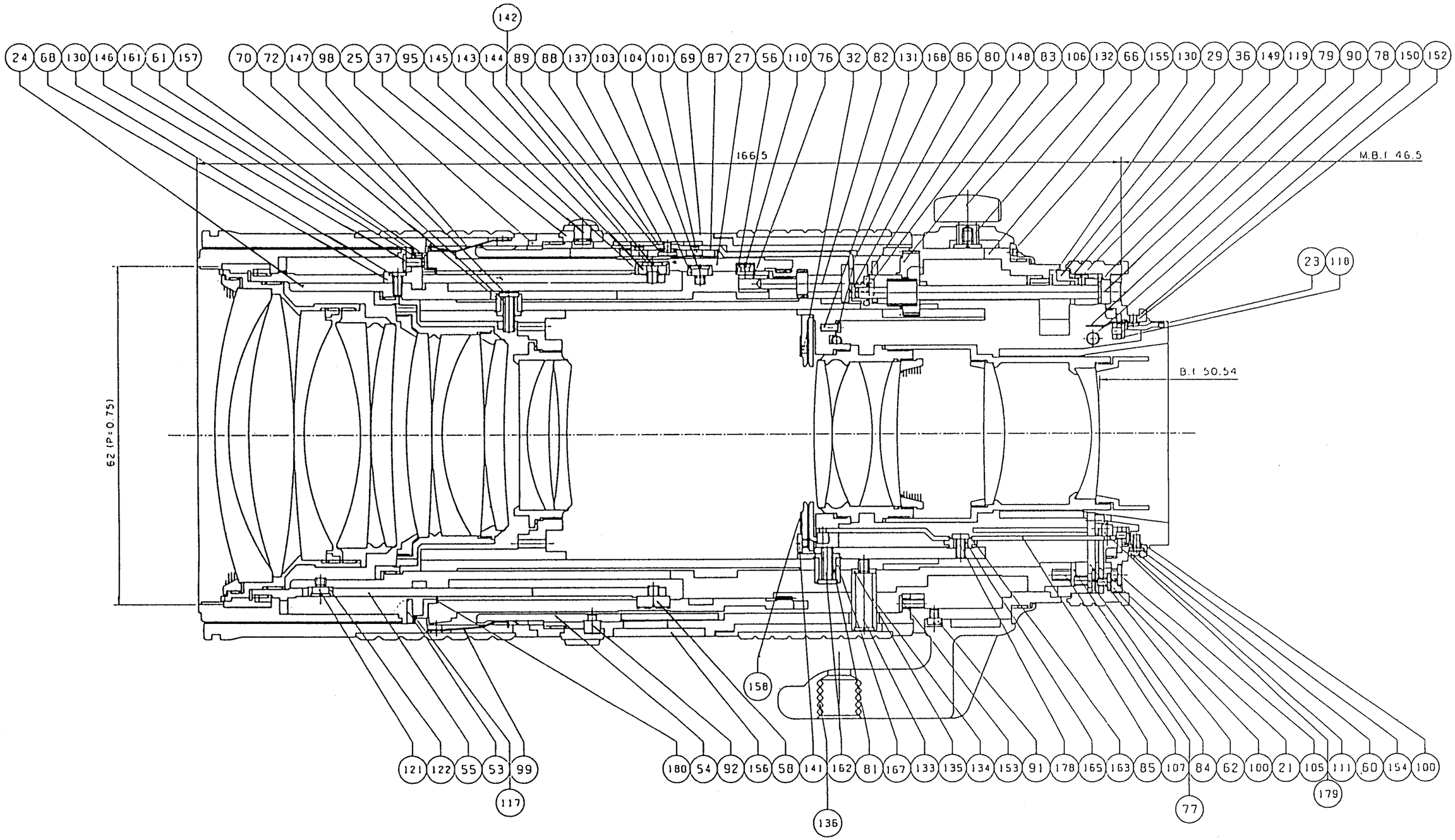
Ai-S

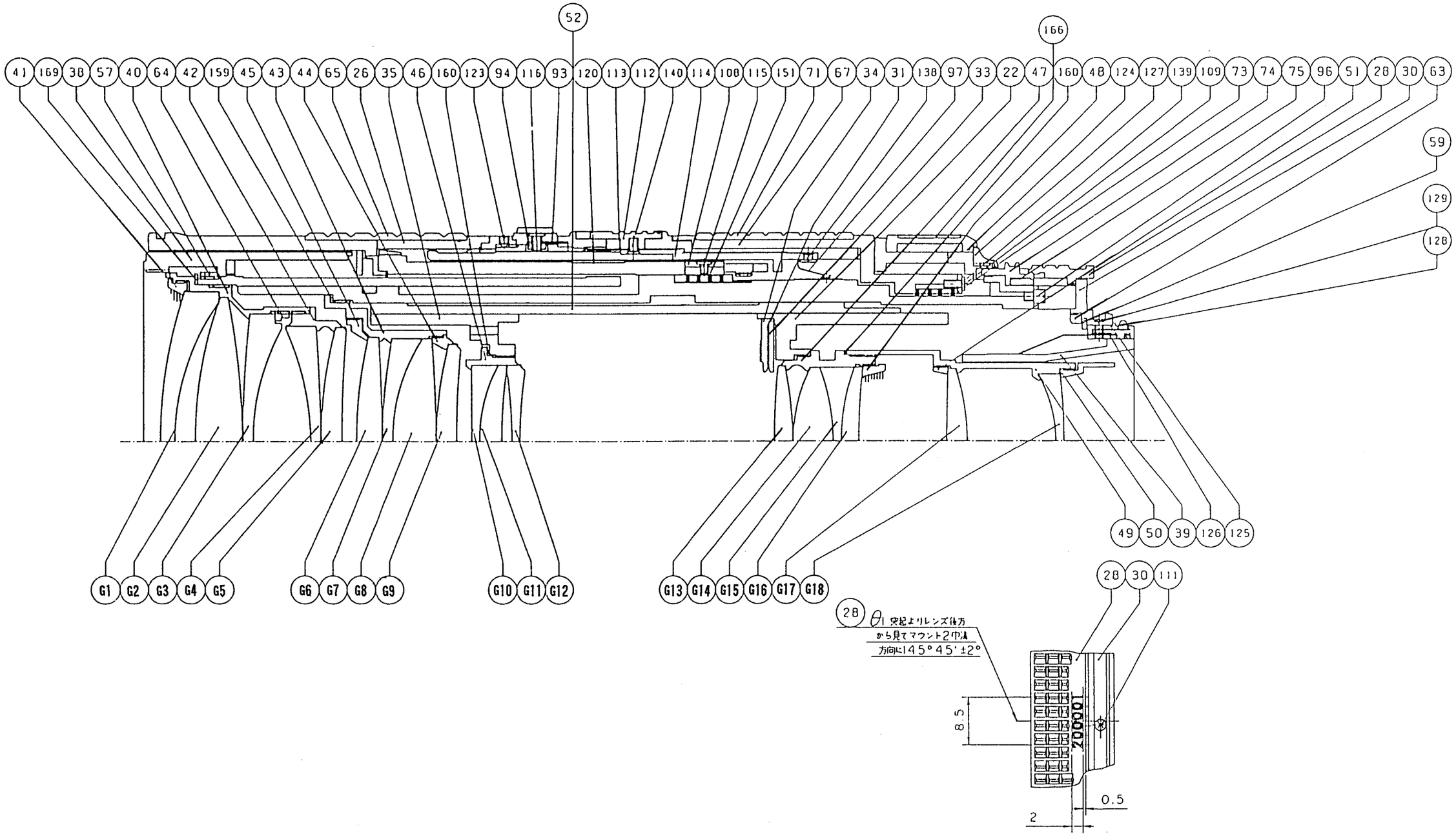
REPAIR MANUAL

Nikon | NIKON CORPORATION
Tokyo, Japan

Printed in Japan September 1997

組立図 Structure of the Lens

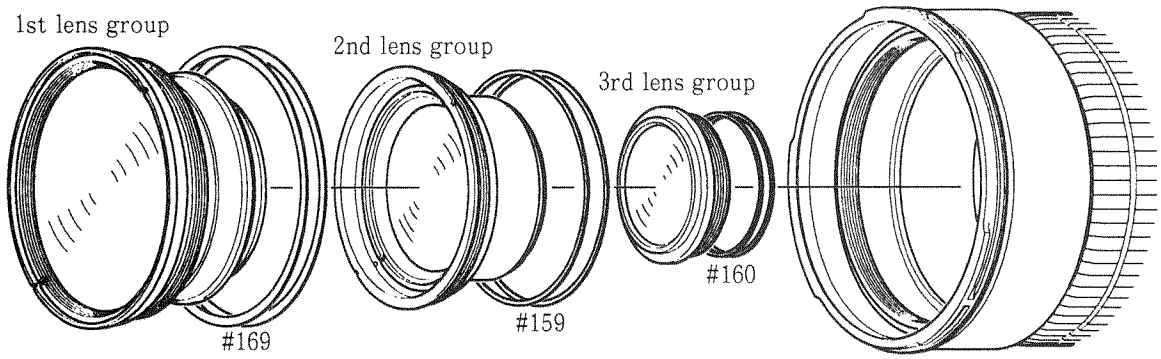



52
166
41 169 38 57 40 64 42 159 45 43 44 65 26 35 46 160 123 94 116 93 120 113 112 140 114 108 115 151 71 67 34 31 138 97 33 22 47 160 48 124 127 139 109 73 74 75 96 51 28 30 63
59
129
128
49 50 39 126 125
G1 G2 G3 G4 G5
G6 G7 G8 G9
G10 G11 G12
G13 G14 G15 G16 G17 G18
28 30 111
28 θ1 突起よりレンズ体方から見てマウント2中心方向に145°45'±2°
8.5
20.002
0.5
2

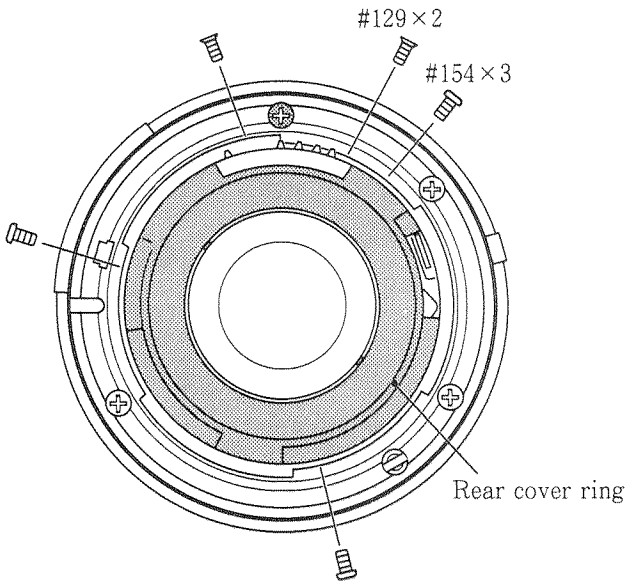
DISASSEMBLING／ASSEMBLING／ADJUSTMENT

1. DISASSEMBLING

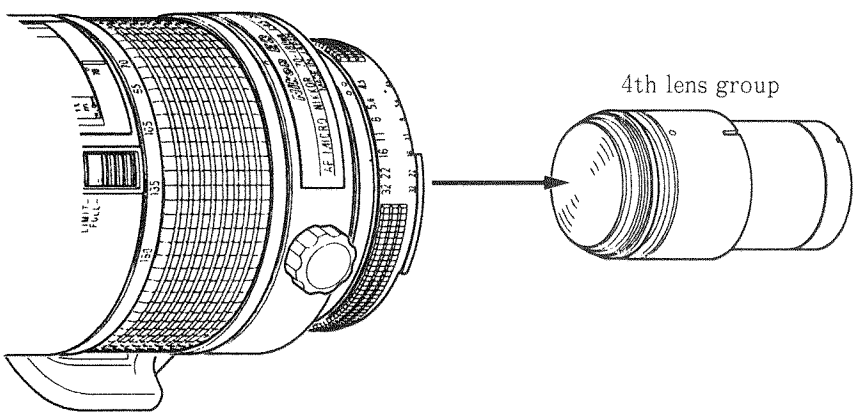
1st ～3rd LENS GROUP



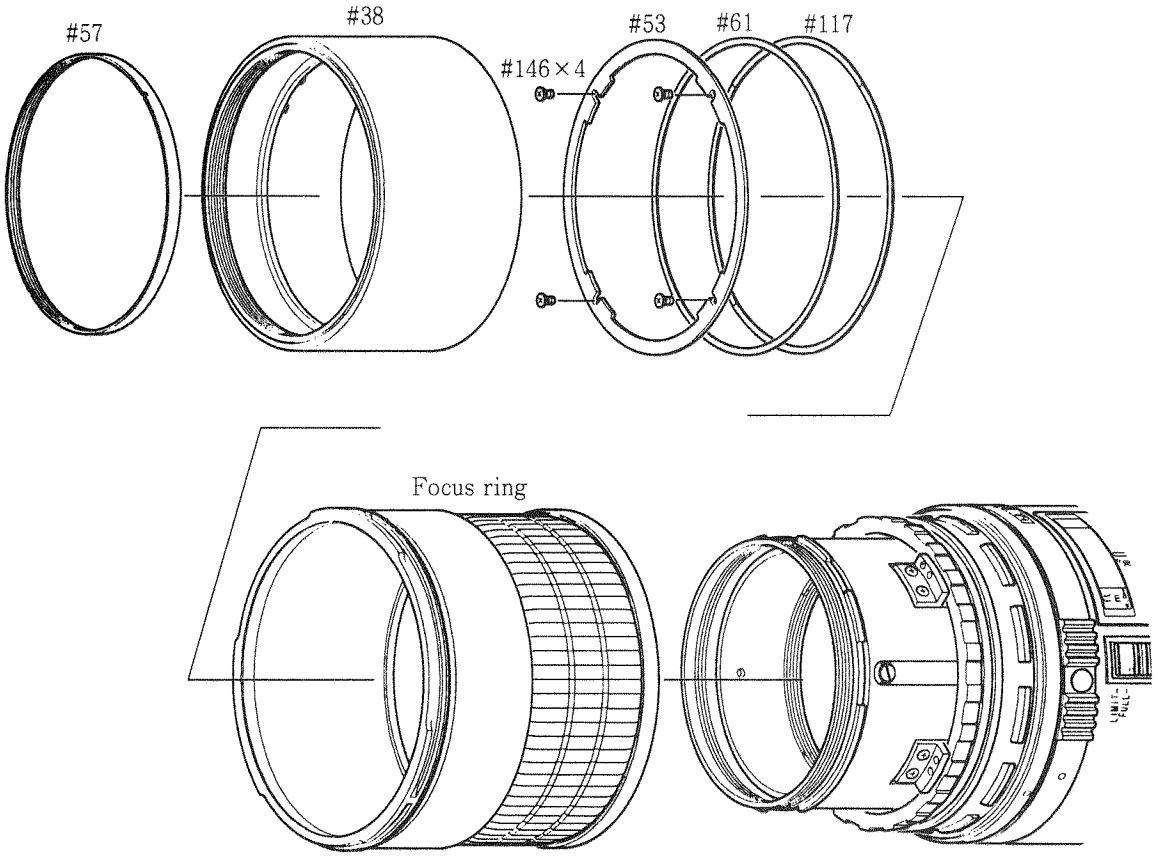
REAR COVER RING



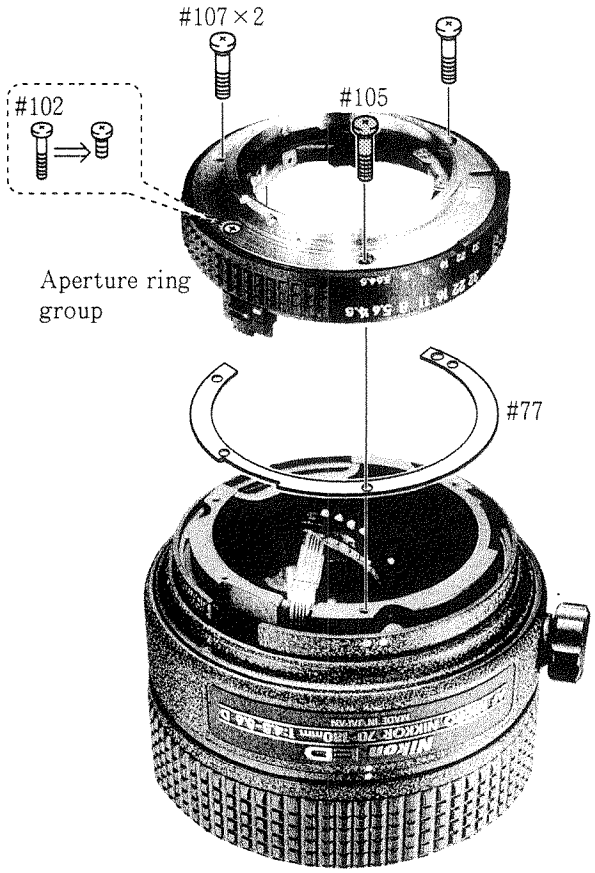
4th LENS GROUP



RING #38, FOCUS RING



APERTURE RING GROUP



《***Reference***》

For the purpose of increasing its strength, 4 screws are used for further fixing the aperture ring of lens and the bayonet mount. In order to make its disassembly easy, by following the procedures explained below, it is possible to remove the aperture ring as a unit.

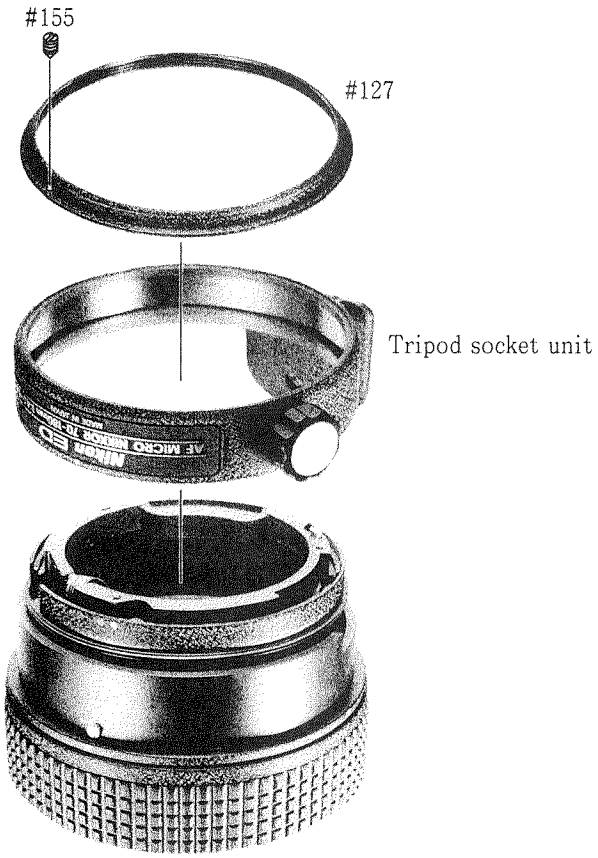
① Prepare the screw M2 in the length of around 4 mm as a temporary screw.

② Remove the screw #102 and replace to the temporary screw.

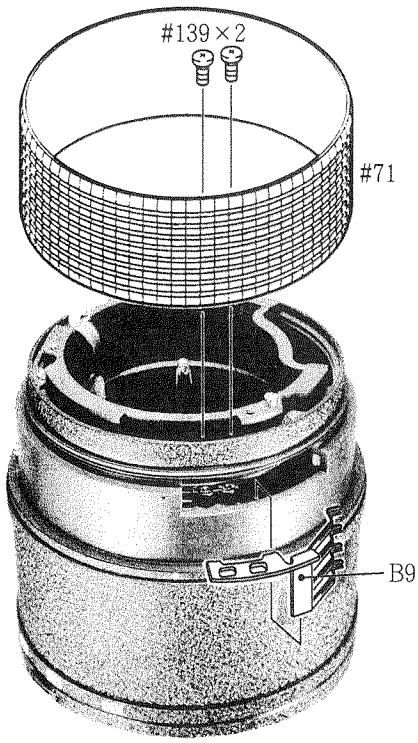
③ Remove the screw #105 and 2 pieces of the screw #107.

④ Then, the bayonet mount and the aperture ring together can be readily removed from the body.

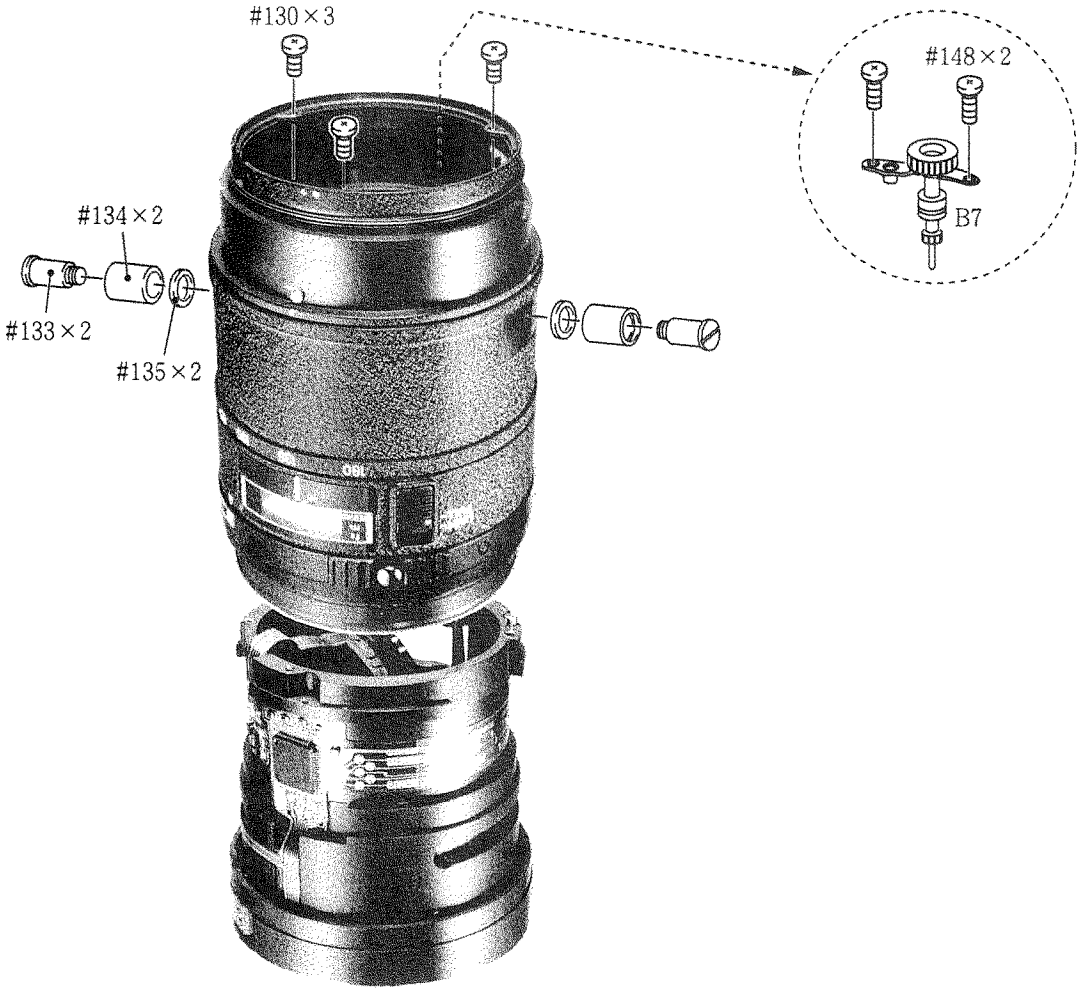
TRIPOD SOCKET UNIT



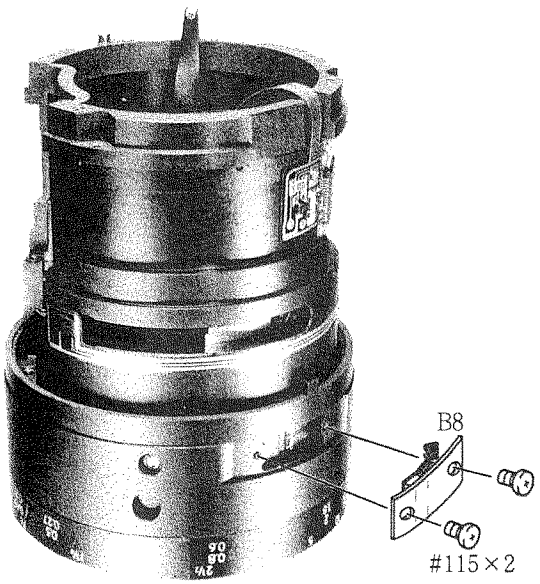
ZOOM ENCODER BRUSH, RUBBER RING #71



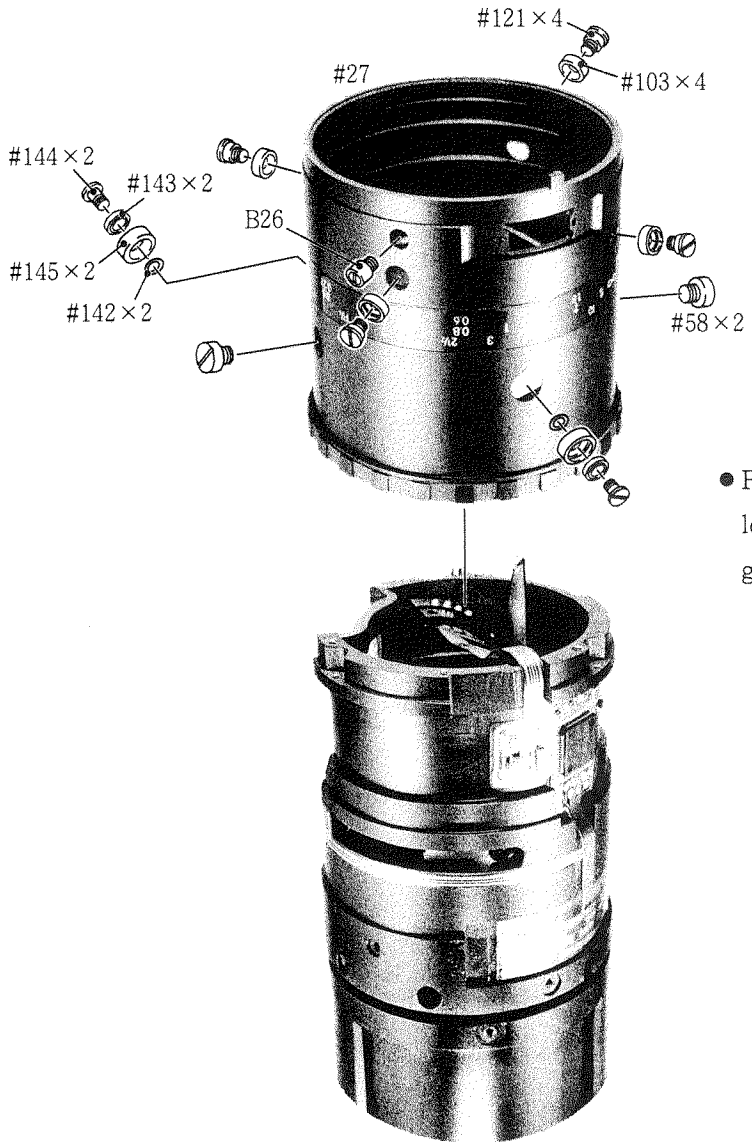
ZOOM RING, INDEX RING GROUP



DISTANCE ENCODER BRUSH

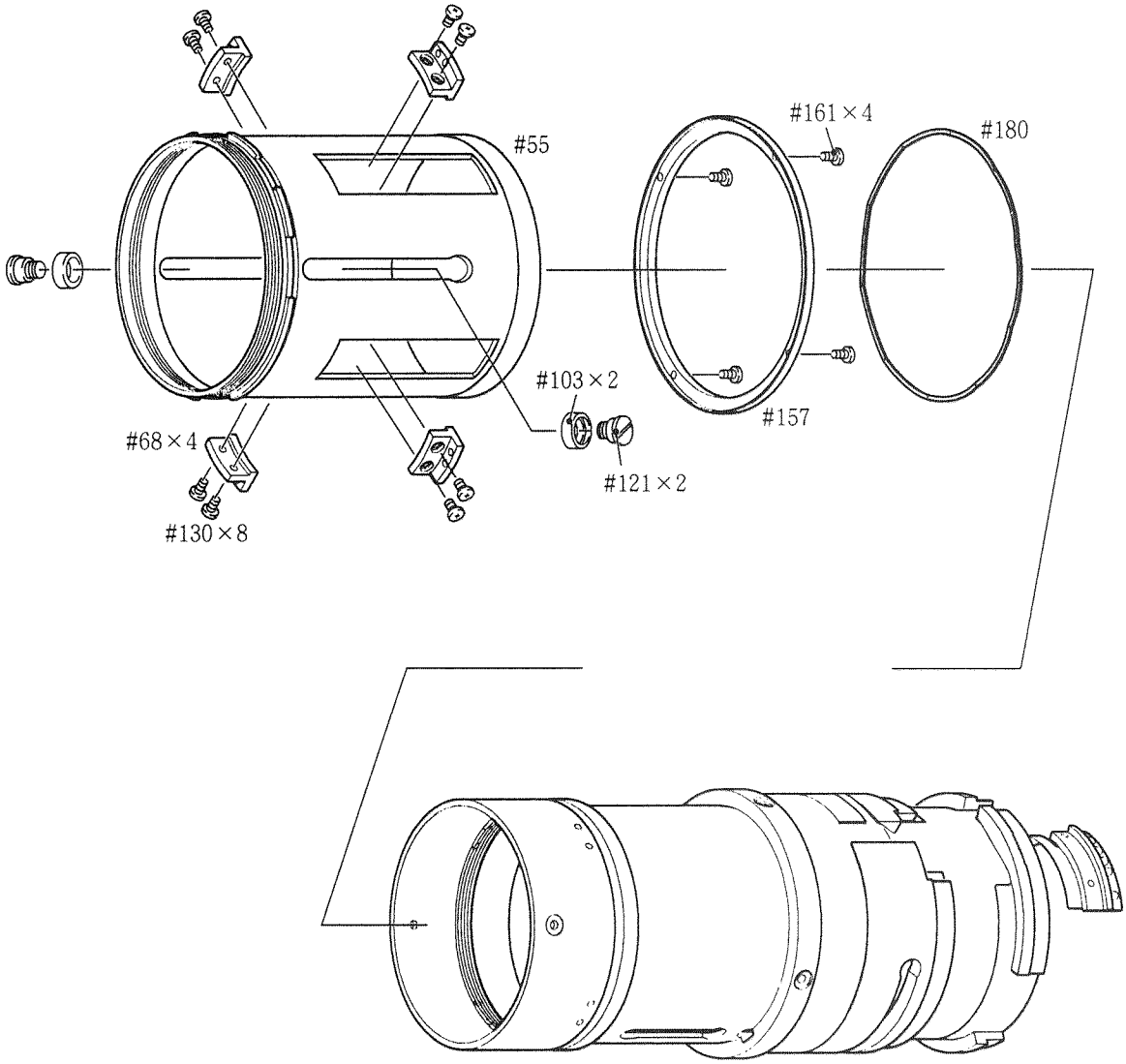


LEAD GROOVE RING #27

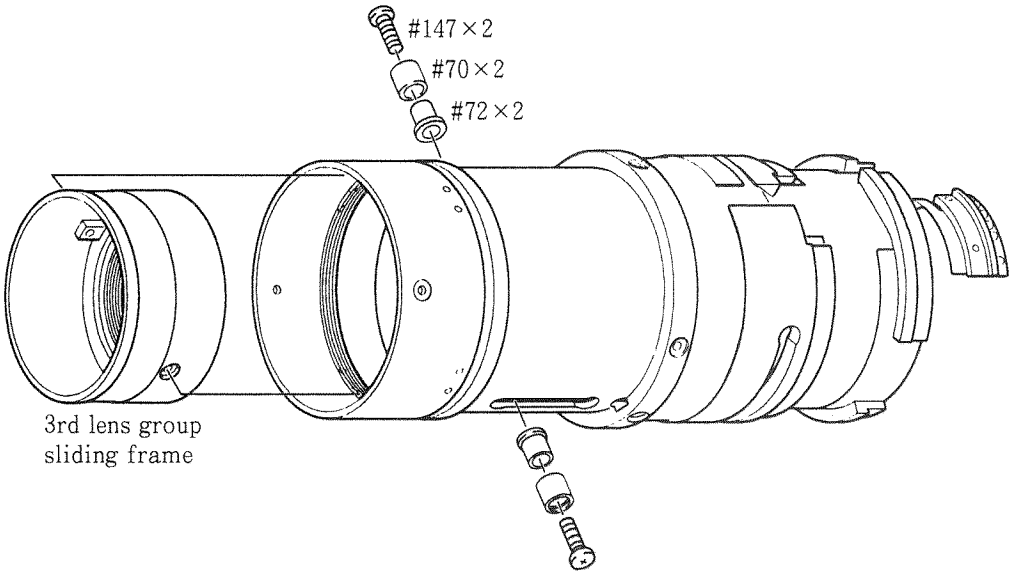


● Rotate the lead groove barrel #27, let the hole position to meet each guide roller to remove them.

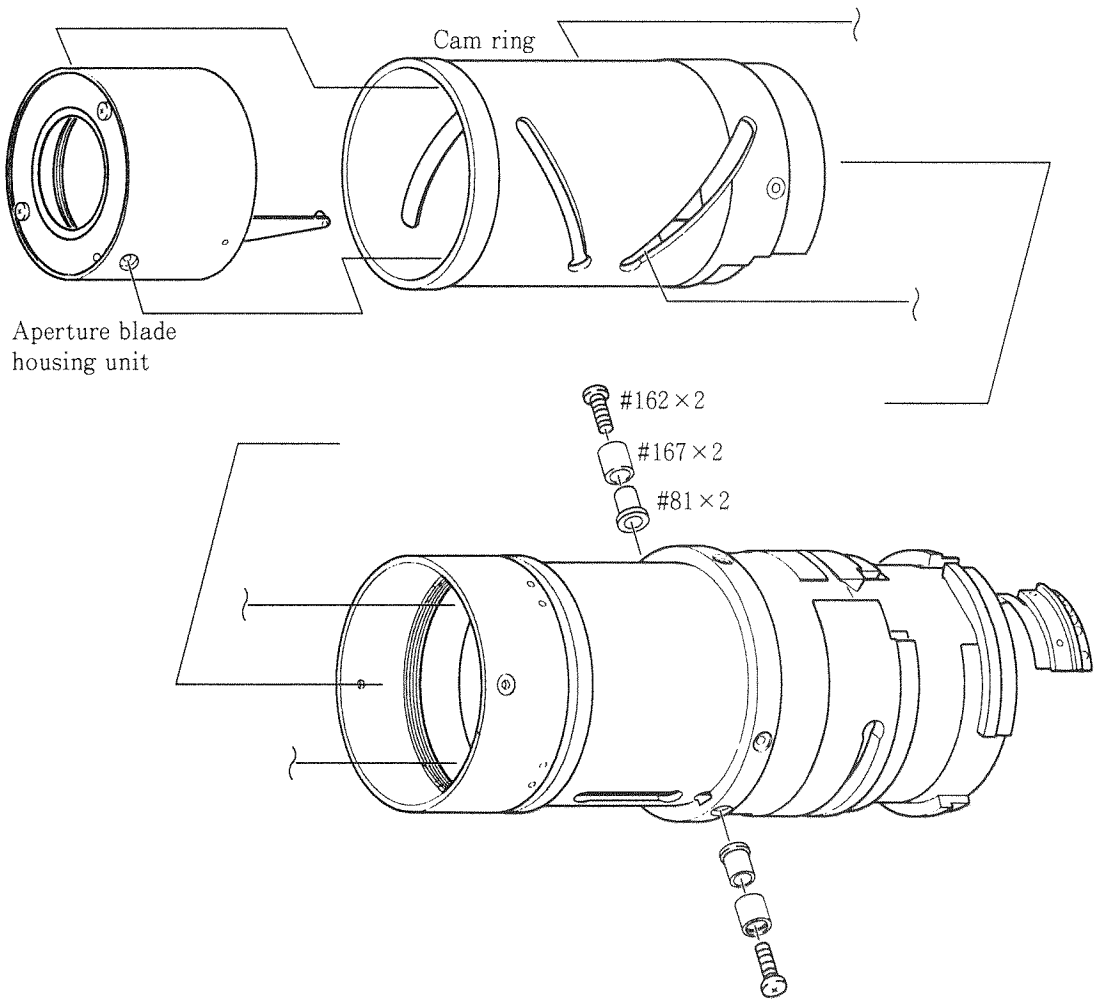
STRAIGHT GROOVE RING #55



3rd LENS GROUP SLIDING FRAME

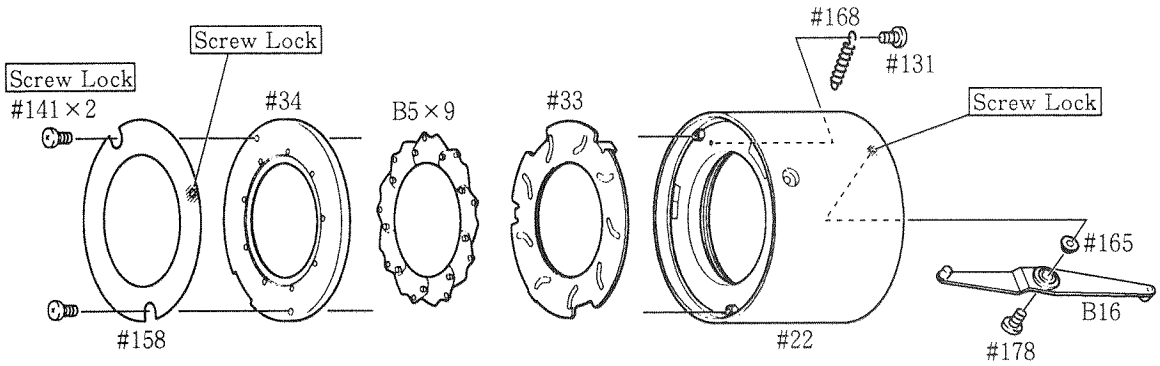


CAM RING, APERTURE BLADE HOUSING UNIT

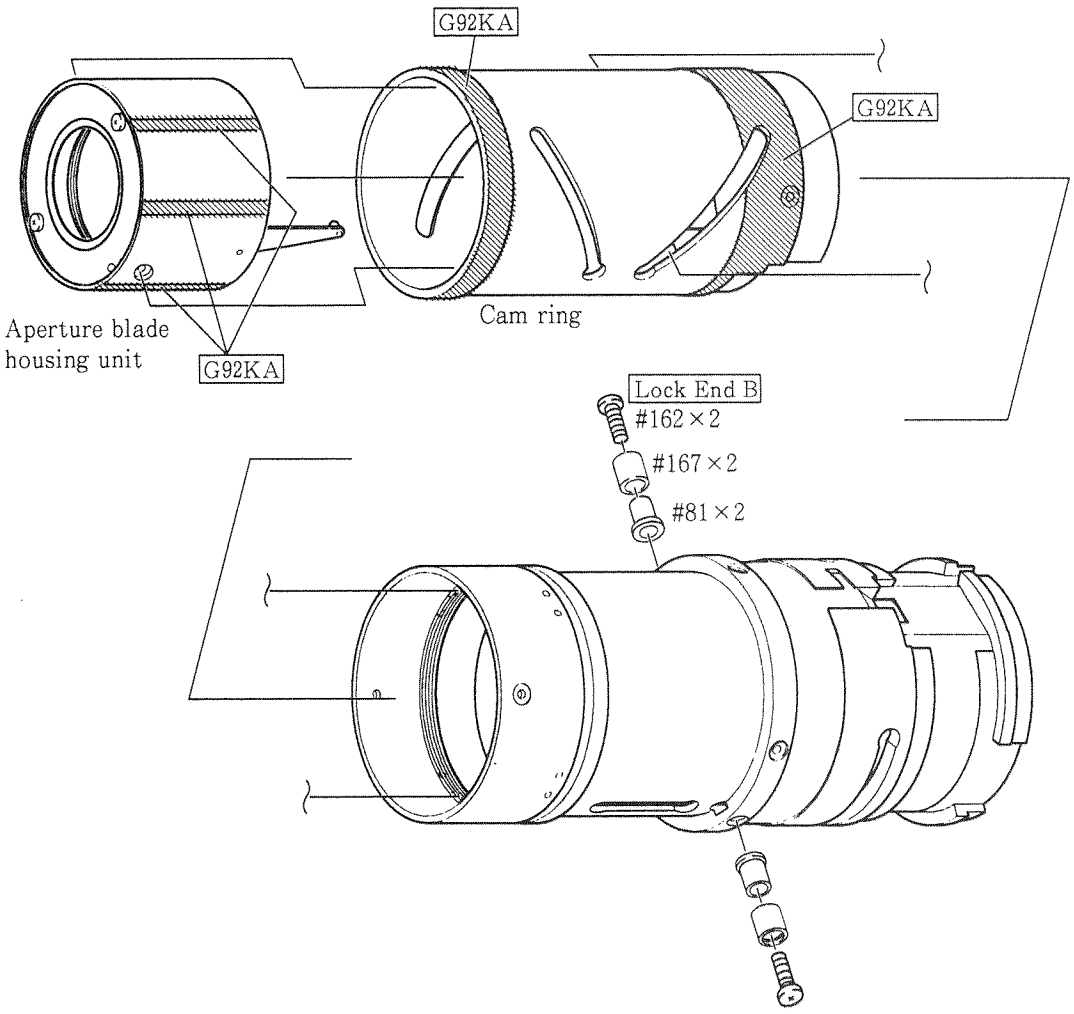


2. ASSEMBLING／ADJUSTMENT

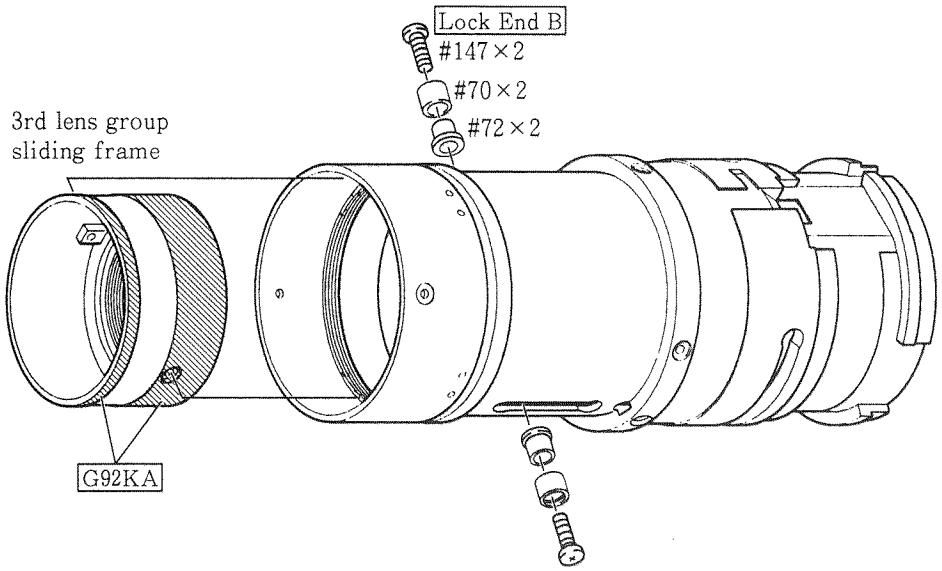
APERTURE BLADE GROUP



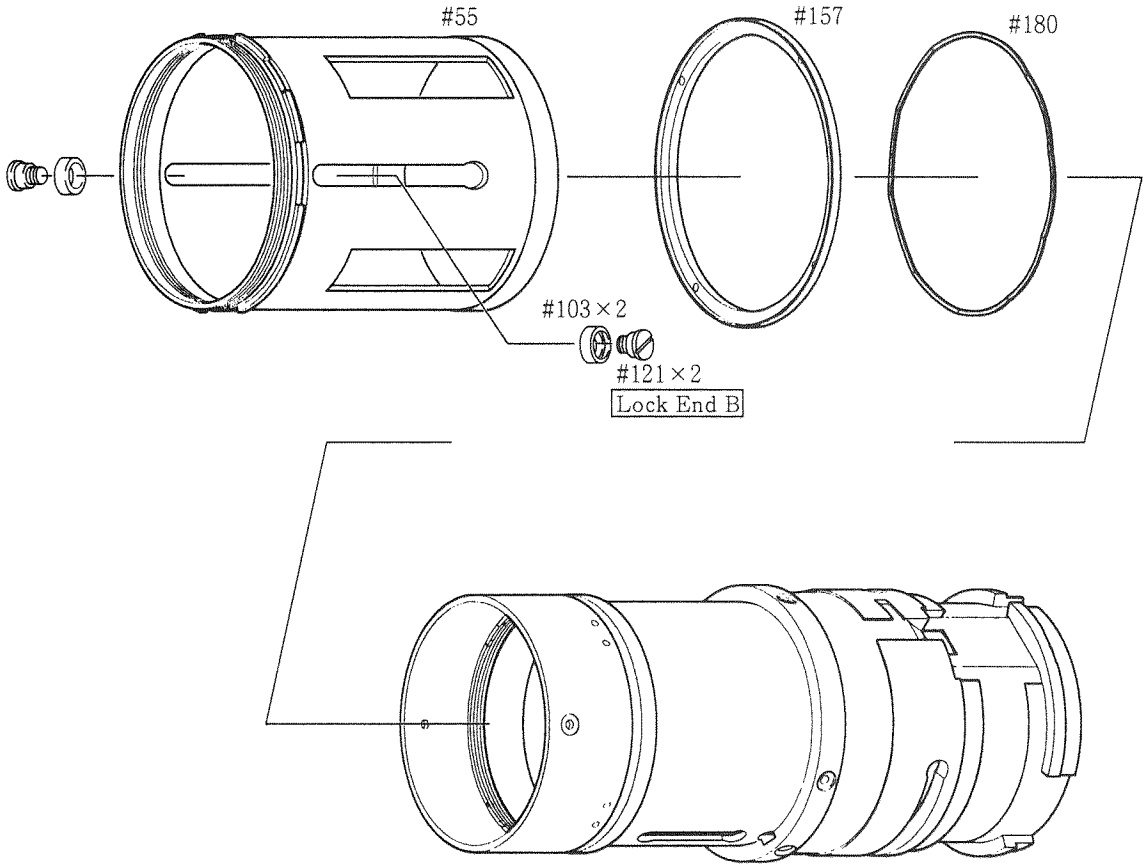
CAM RING, APERTURE BLADE HOUSING UNIT

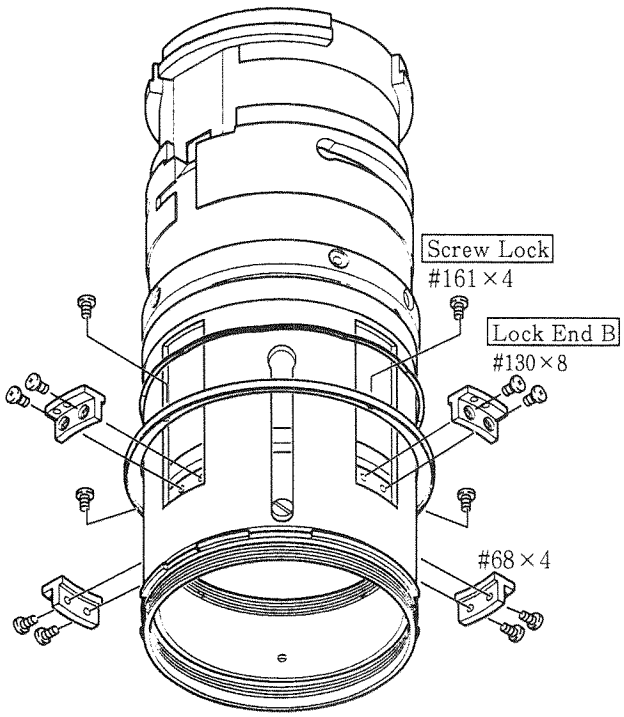


3rd LENS GROUP SLIDING FRAME

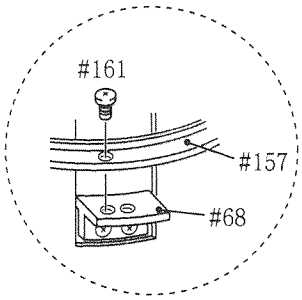


STRAIGHT GROOVE RING #55

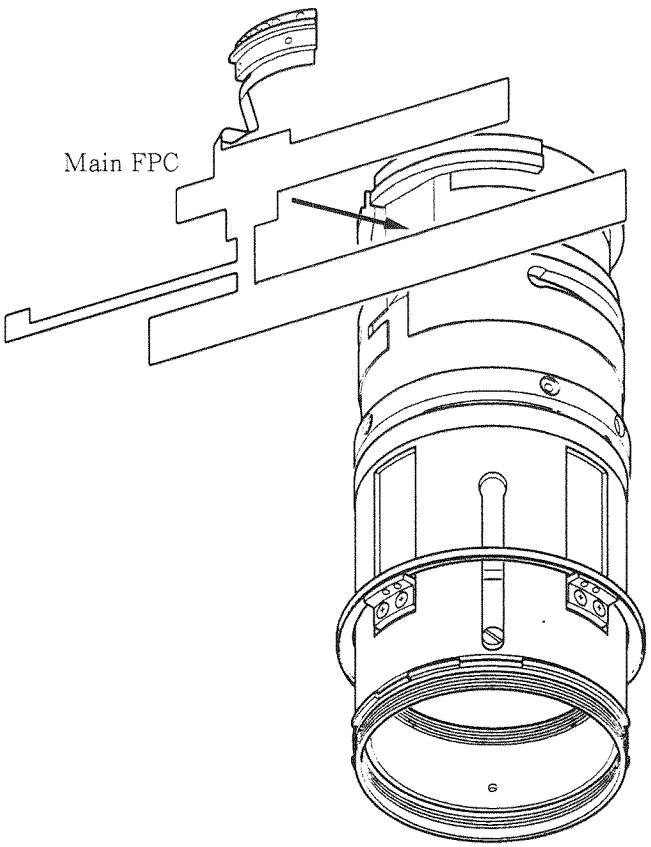


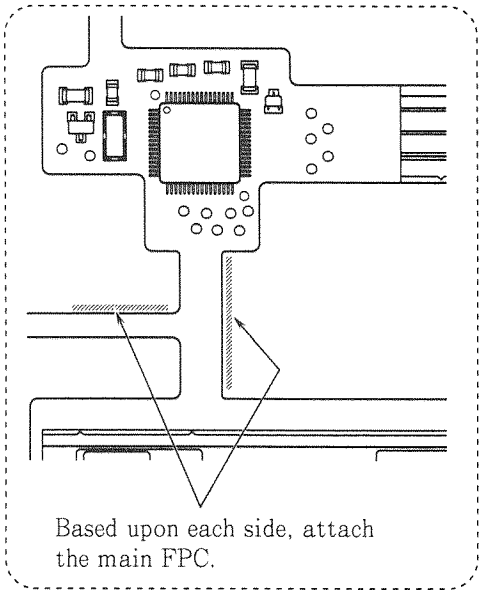


Note : Be sure to fix 4 pieces of the screw #161 as advised below.

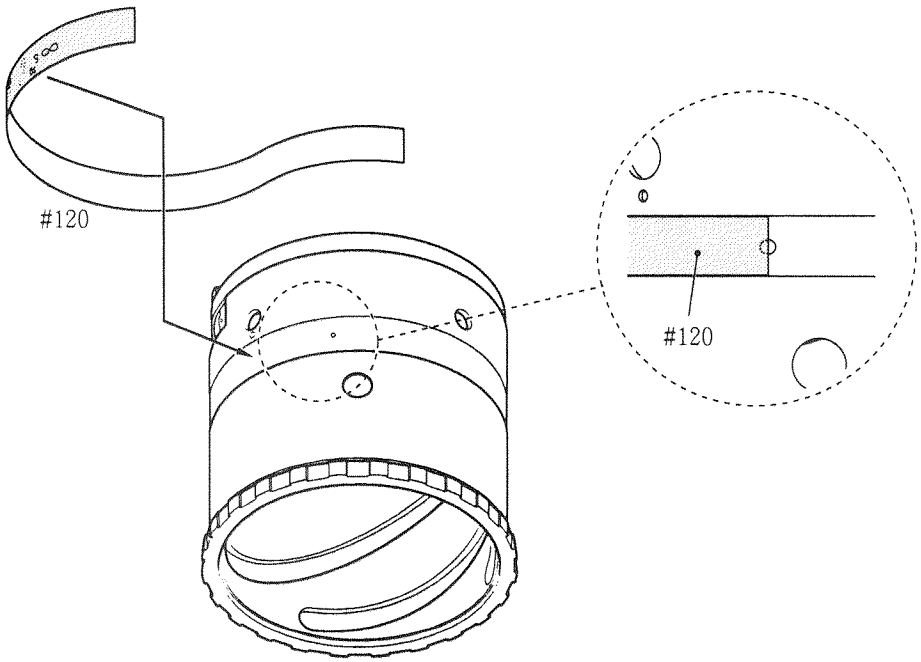


MAIN FPC

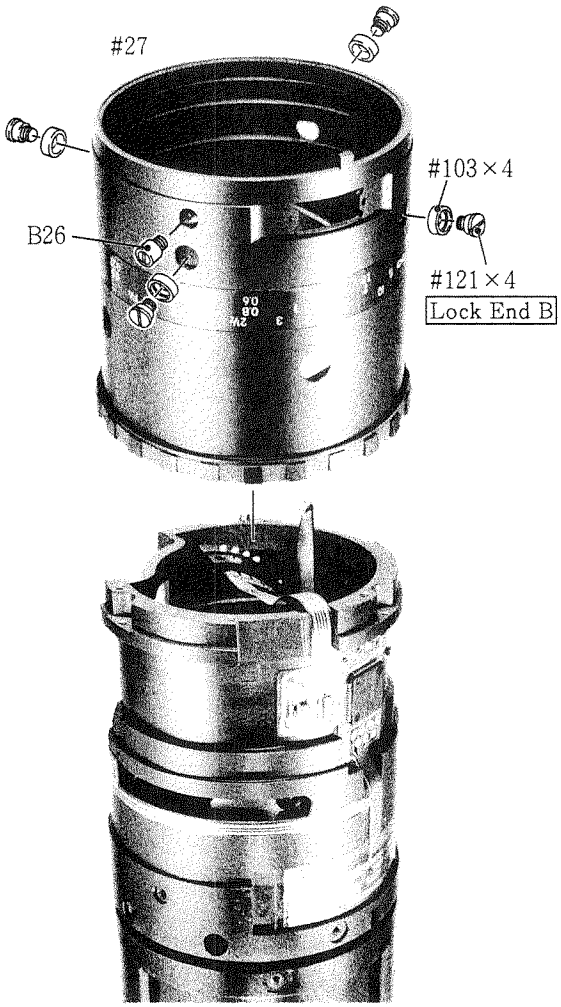




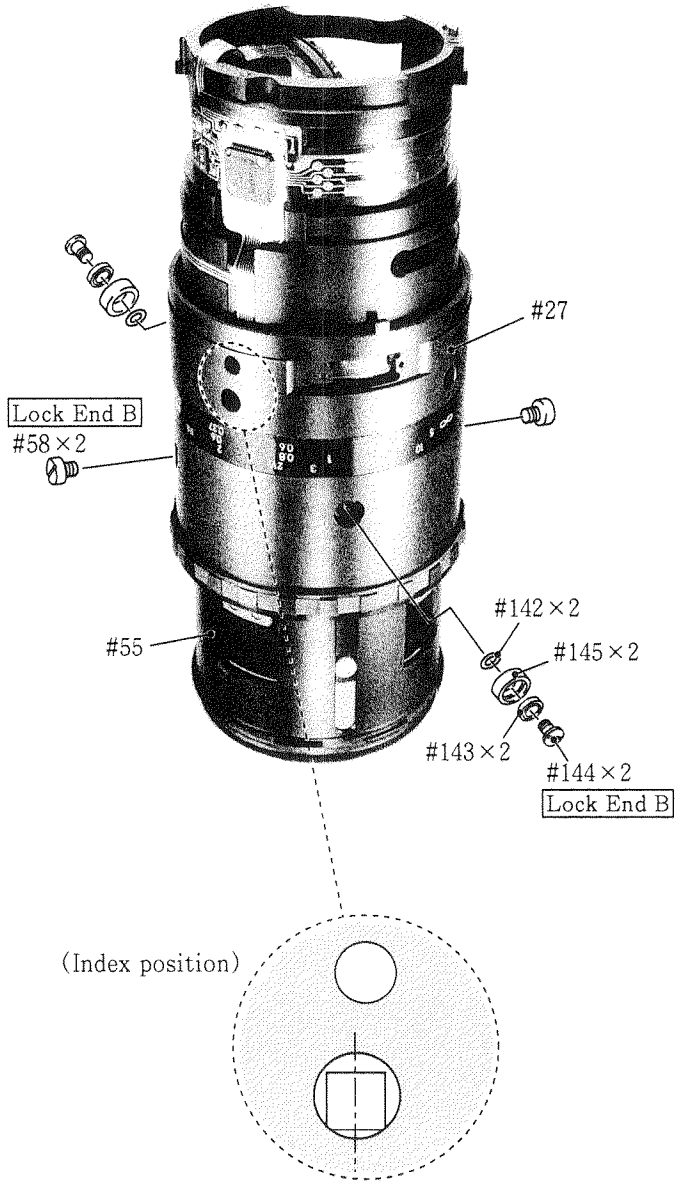
ADHESION OF THE DISTANCE SCALE



LEAD GROOVE RING #27



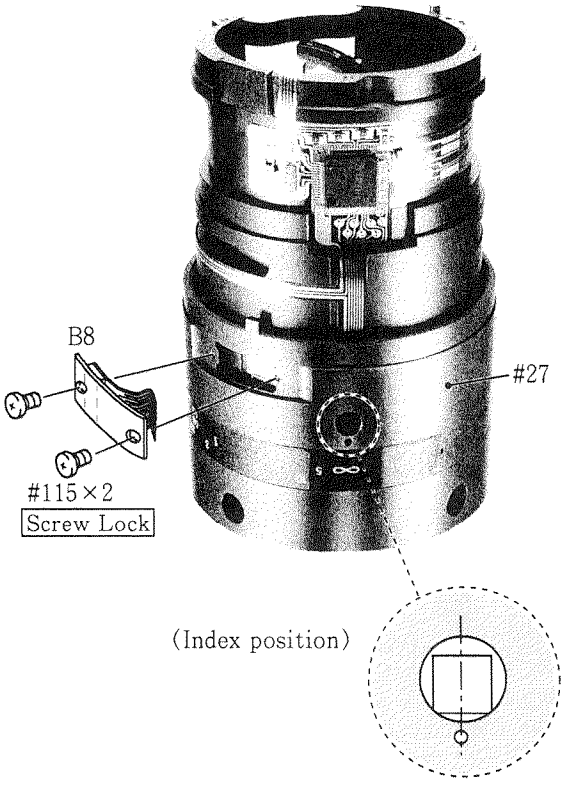
● Apply the grease G92KA to each lead groove and the gear area inside the lead groove barrel #27.



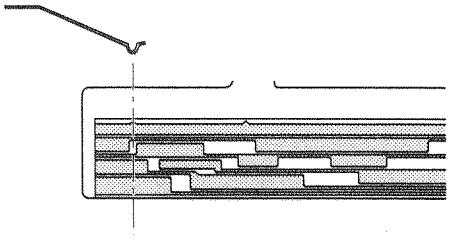
① Rotate #27 and let the hole to meet the index position as shown left.

② Let #55 to meet the screw hole in order to fix the guide roller.

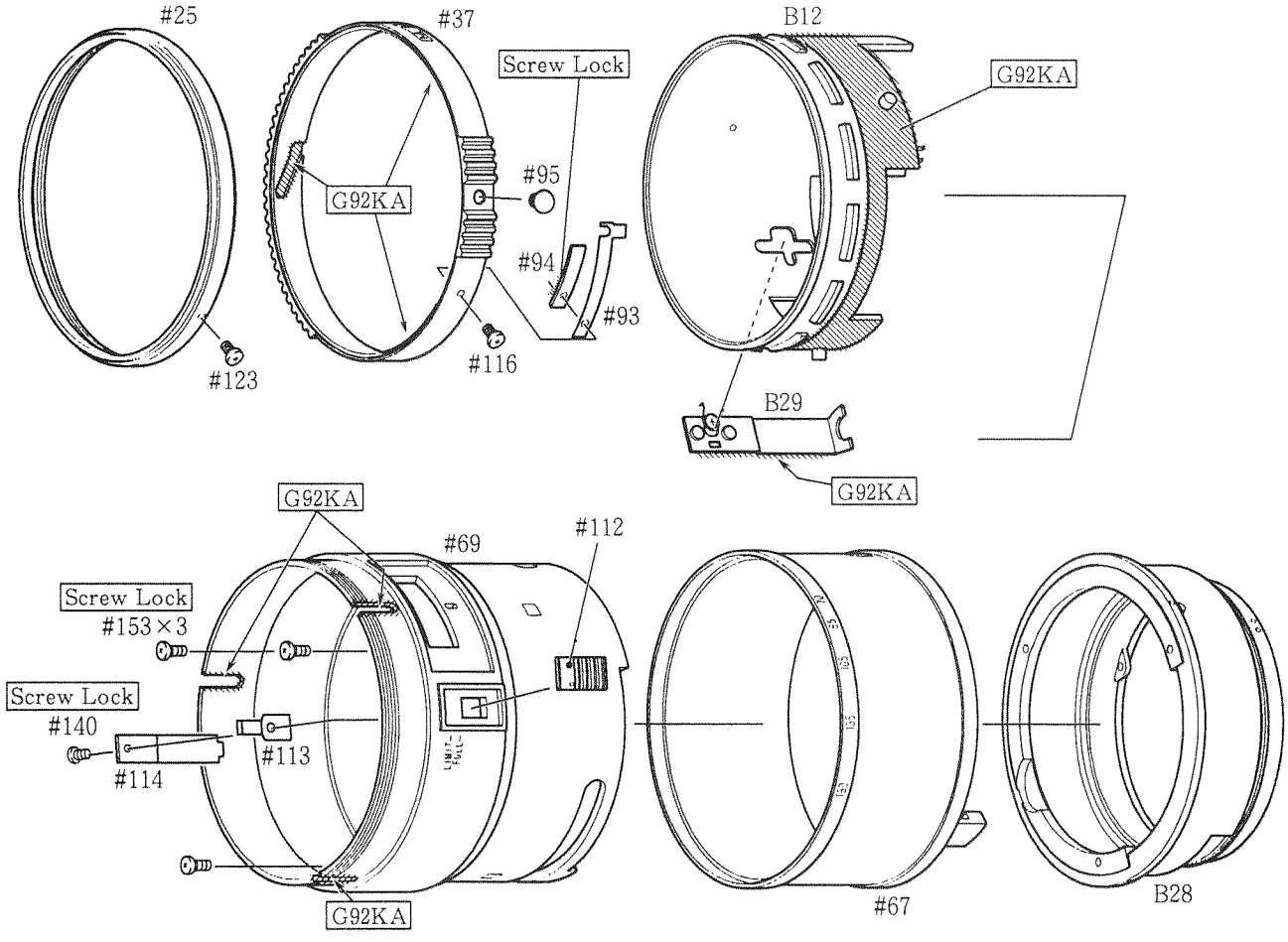
ADJUSTMENT OF DISTANCE ENCODER BRUSH POSITION



① Rotate #27 to let its hole to meet the index position as shown left.
② Unfasten screws #115×2 and let the brush tip come into contact with the line as shown in the figure.
③ Fasten screws #115×2 and turn the #27 several times to check the location of the brush.
④ Secure screws #115×2 using Screw Lock.

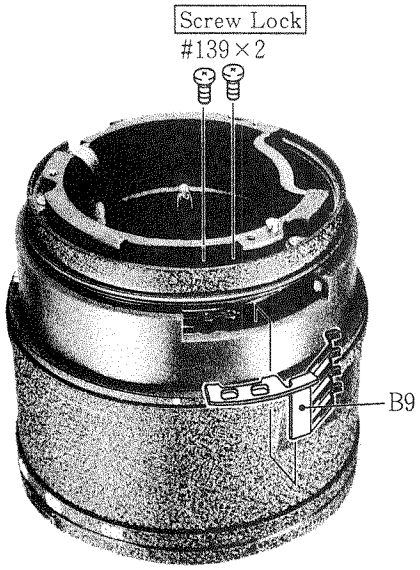


ZOOM RING, INDEX RING GROUP



- Mount the gear unit B7 on the A-M switching lever inside the combination of zoom and index ring, and then fix it onto the lens barrel unit.

ADJUSTMENT OF ZOOM ENCODER BRUSH POSITION

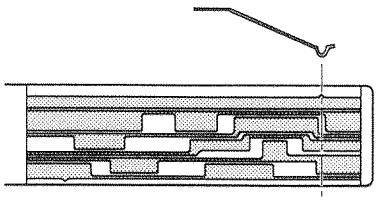


① Contact the zoom ring with the stopper of the WIDE side.

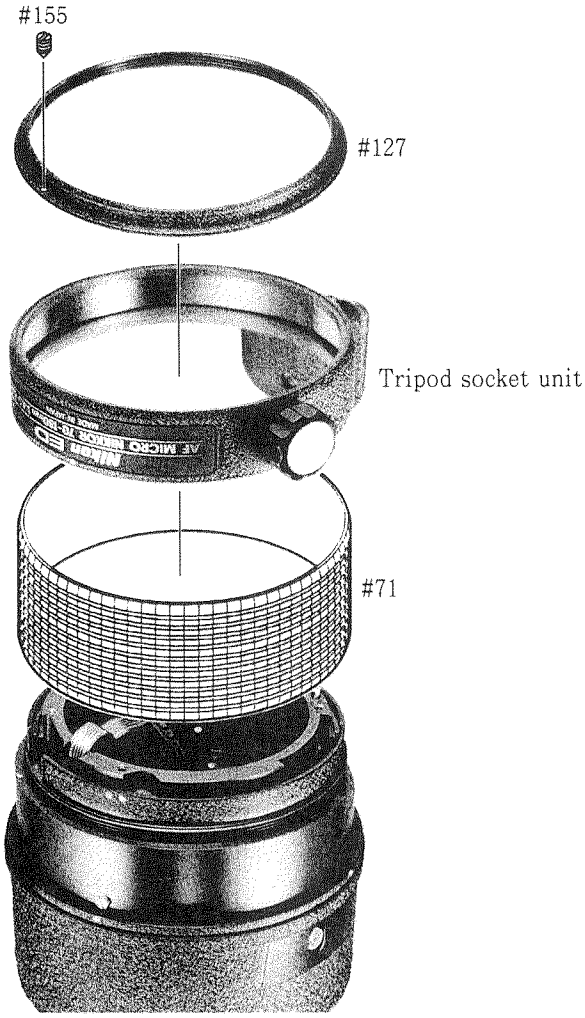
② Unfasten screws #139×2 and let the brush tip come into contact with the line as shown in the figure.

③ Fasten screws #139×2 and turn the zoom ring several times to check the location of the brush.

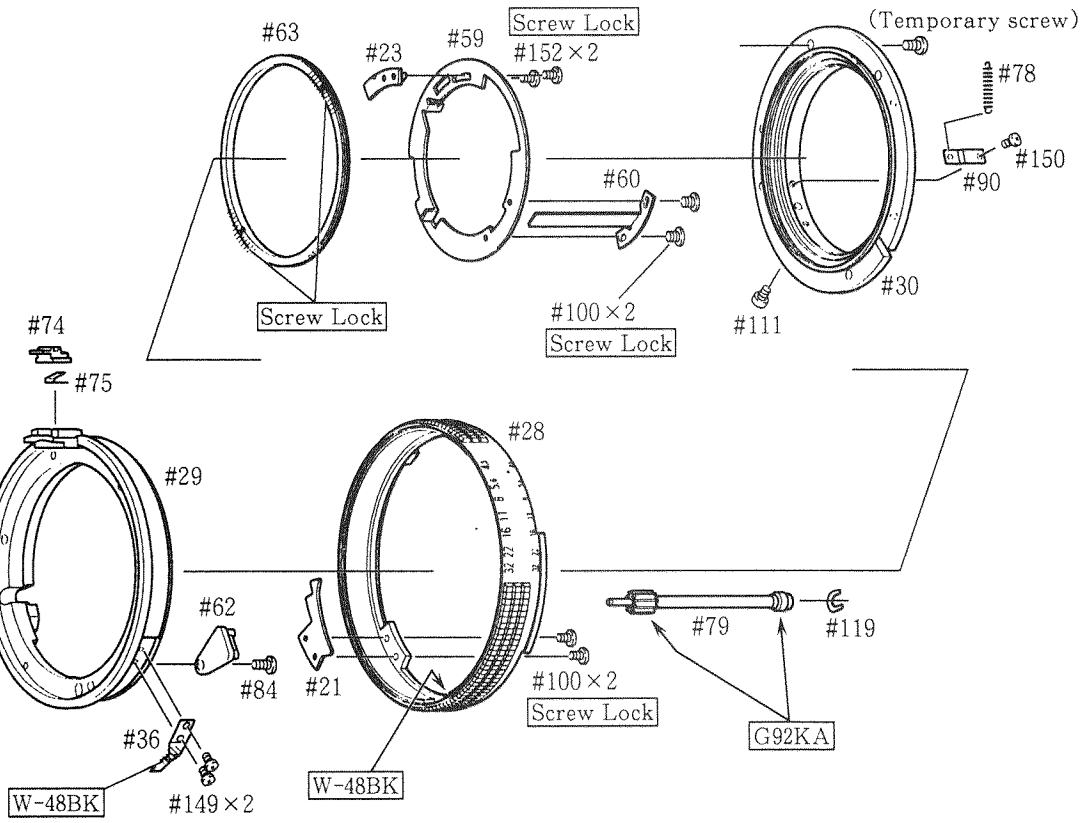
④ Secure screws #139×2 using Screw Lock.



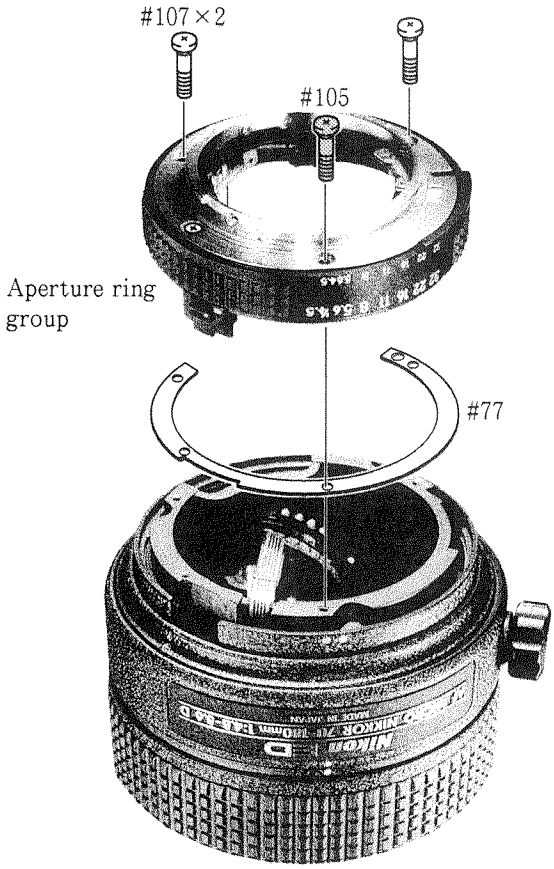
TRIPOD SOCKET UNIT, RUBBER RING #71



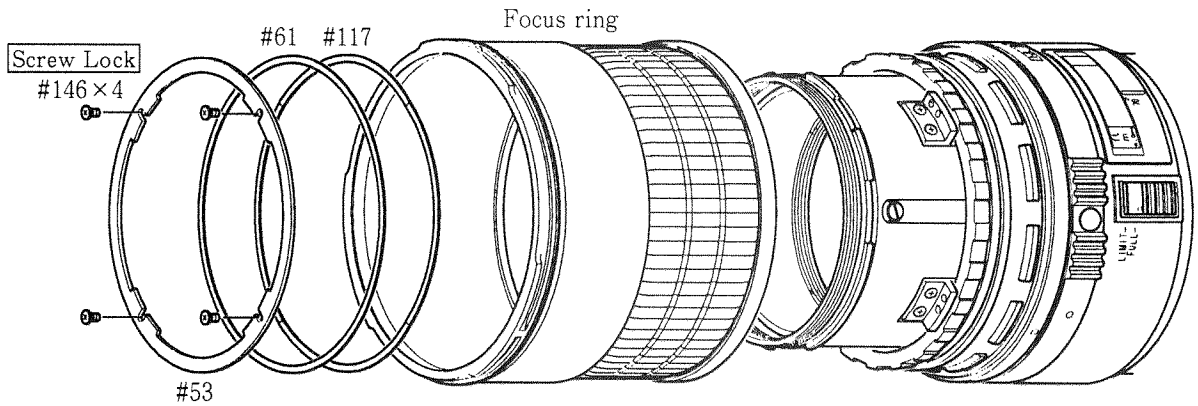
BAYONET MOUNT, APERTURE RING



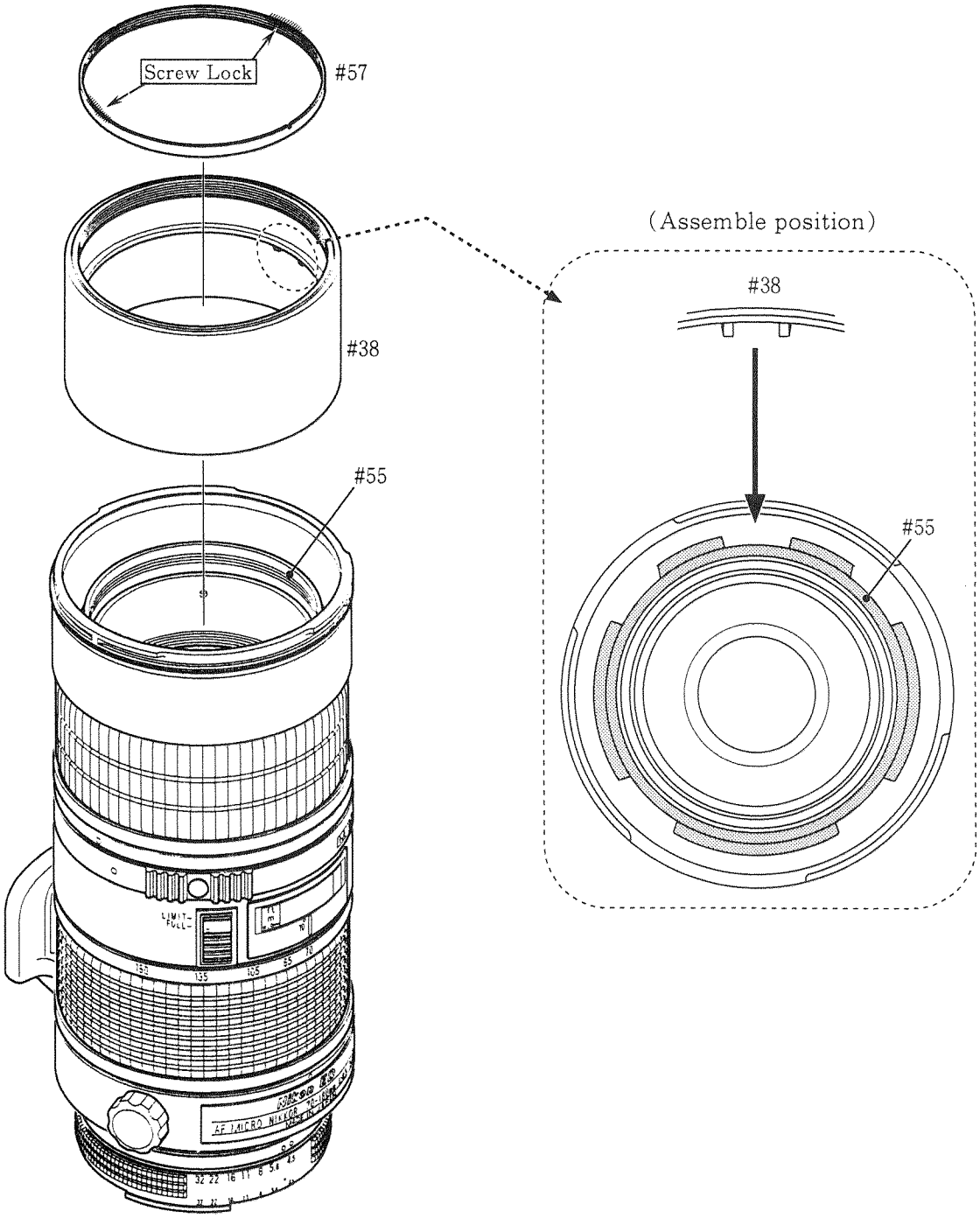
APERTURE RING GROUP



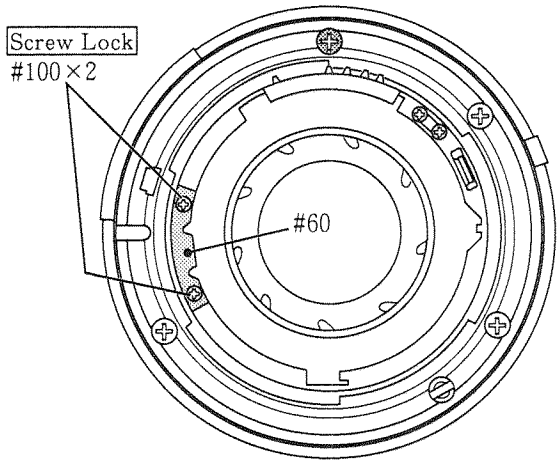
FOCUS RING



RING #38



ADJUSTMENT OF APERTURE OPENING



① Turn the zoom ring until it stops at the Wide side stopper.

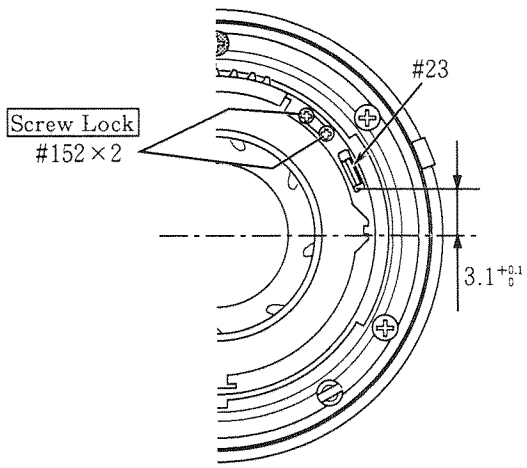
② Unfasten screws #100×2 and move part #60 to adjust the aperture diameter.
As a guide to adjustment, the full aperture (f/4.5) should be the same size as the inside aperture of part #33.

- Aperture diameter should be within the allowable range when the diaphragm ring is rotated forward and backward.
- Aperture lever should be within the allowable range when the aperture lever is snapped by your finger.

③ After adjustment, secure screws #100×2 using Screw Lock.

Aperture setting	Inscribed circle diameter (mm)	Toleance (mm)
4.5	24.79	26.47 ～ 23.31
5.6	19.68	22.09 ～ 17.53
8	13.86	15.56 ～ 12.35
11	9.75	11.37 ～ 8.36
16	6.91	8.06 ～ 5.92
22	4.83	5.63 ～ 4.14
32	3.41	3.98 ～ 2.92

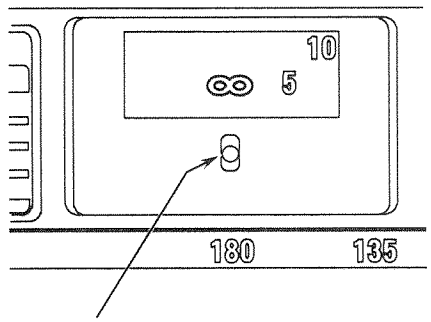
ADJUSTMENT OF APERTURE LEVER POSITION



Unfasten screws #152×2 to adjust the position of the aperture lever #23 so that it comes into the rated value of $3.1^{+0.1}_{0}$ to bring the aperture diameter whitin rated value at full aperture.
After adjustment, fix screws #152×2 using Screw Lock.

Reference : When adjusting the rated value of $3.1^{+0.1}_{0}$, set the aperture ring to f/4.5 and mount the tool J18004-1 on the bayonet mount. If becomes much easier to adjust if you mount the aperture lever #23 based on the groove of the tool as a reference.

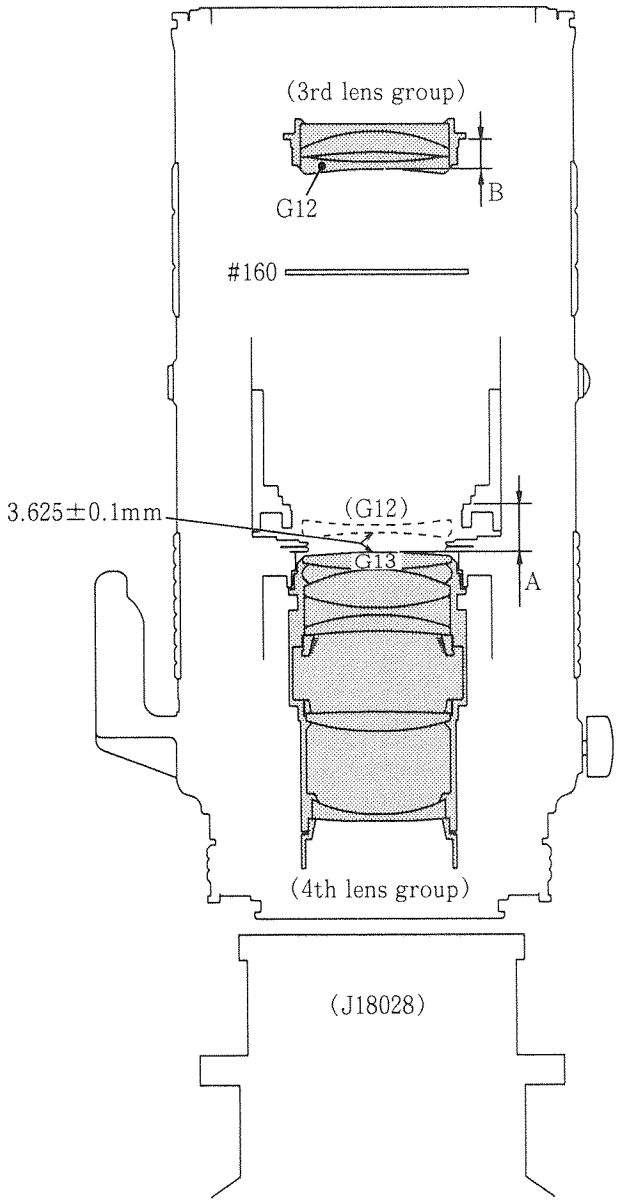
HOW TO TAKE DISTANCE BETWEEN EACH 2nd, 3rd AND 4th LENS



Put the hole position on another's.

① Rotate the focus ring to set it to the infinite position, where meets the hole position after removing the acrylic window.

② Set the zoom ring to 180 mm and its aperture to open.



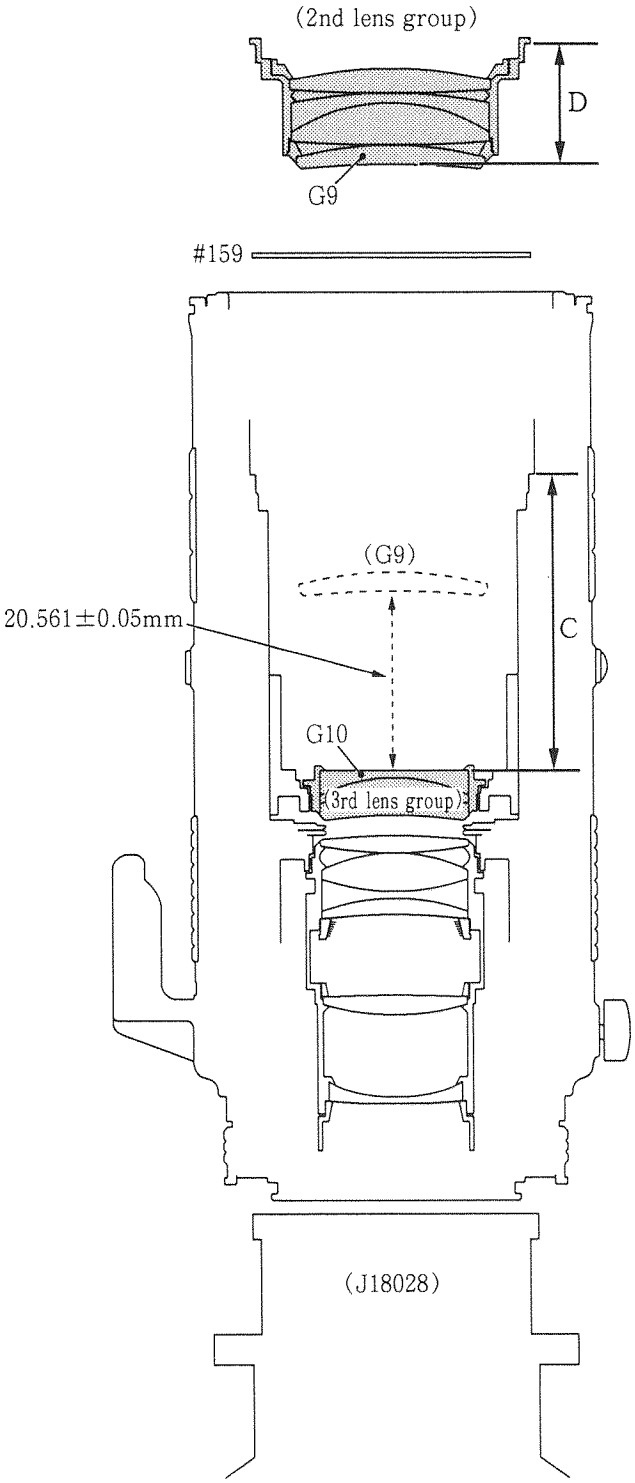
③ Fix the 4th lens group, settle it on the back focus stand J18028, and then set it onto the flat table for the digital micrometer.

④ Measure the distance A by with the digital micrometer as shown in the left figure.

⑤ As well as the above, measure the distance B by with the digital micrometer.

⑥ Calculate in accordance with the formula below. (size : mm)
A－(3.625＋B)＝the thickness of washer #160.

⑦ Fix the washer #160 and the 3rd lens group together.



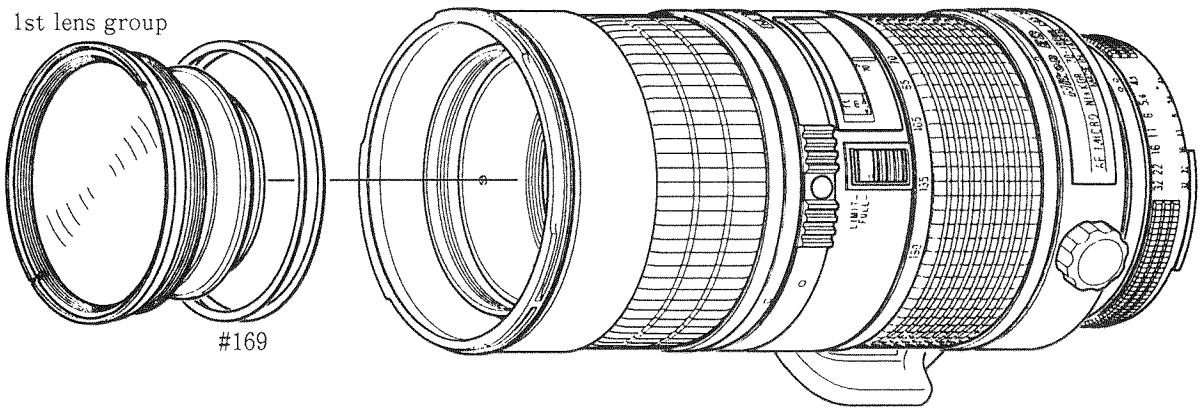
⑧ Measure the distance C by with the digital micrometer.

⑨ Measure the distance D by with the digital micrometer.

⑩ Calculate in accordance with the formula below. (size : mm)
C－(20.561＋D)＝the thickness of washer #159.

⑪ Fix the washer #159 and the 2nd lens group together.

1st LENS GROUP



ADJUSTMENT OF SHIFT FOCUS (TELE AND WIDE)

1. Align the ∞ mark on focus ring to index. Set aperture to full aperture.
2. Read the value on both Wide and Tele sides respectively.
3. Calculate the following equation.

$$(A-B)\div 3.0=C$$

A＝Value of Tele side (mm)
B＝Value of Wide side (mm)
C＝Amount (mm) of adjustment of 1st lens group washer #169

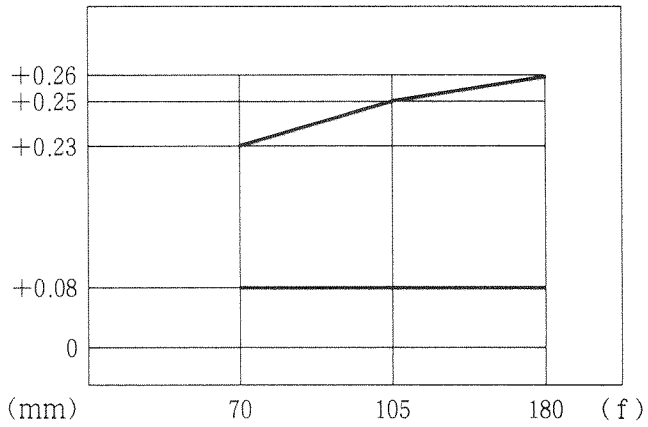
4. Adjust the thickness of washer #169 by the value C calculated from the above equation.
   If the value C is positive, thicken the washer by the value, and if negative, thin the washer.

Note : Insert thin washer between thick washers when mounting washer #169.

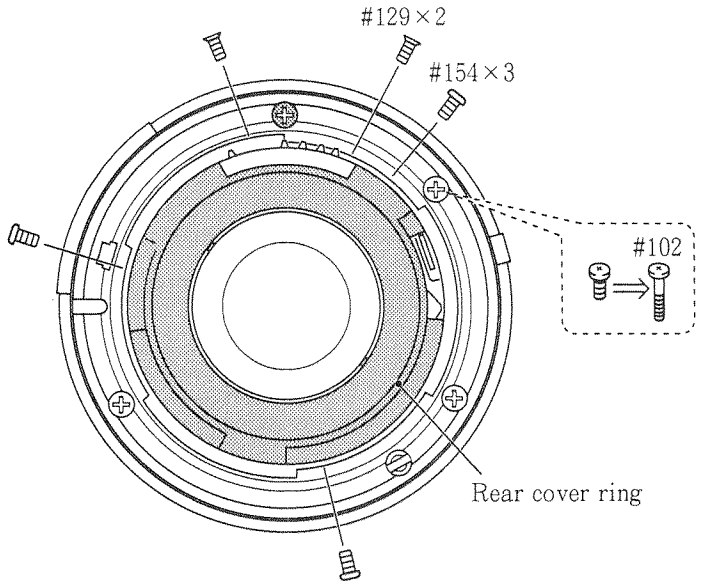
ADJUSTMENT OF BACK FOCUS

1. Align the ∞ mark on focus ring to index. Set aperture to full aperture.
2. Readout values at either Wide or Tele side.
3. Remove the aperture ring.
4. If the value is above the standard, increase the thickness of the washer, otherwise decrease it.
5. Confirm that the value is within the standard range.
   (Refer to page L16.)

Focal lenght (f)	Standard (mm)
70mm	+0.08 ～ +0.23
105mm	+0.08 ～ +0.25
180mm	+0.08 ～ +0.26

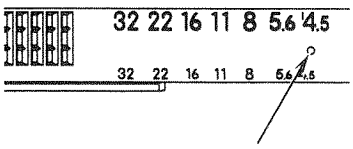


REAR COVER RING



Note : Remove the temporary screw, replace it to the screw #102 and fix it.

ATTACHING METER COUPLING SHOE



Make hole on this concave portion

(1) Take out aperture ring #28.

(2) Make a hole (ϕ1.1) at the concave portion of aperture ring.
Mount meter coupling shoe on the aperture ring and make another hole (ϕ1.1) based on the hole of meter coupling shoe.

Meter coupling shoe	1K406-011	×1
Screw	1K010-002-1	×2

(3) Mount meter coupling shoe.

(4) Assembling.

INSPECTION OF ENCODER SIGNAL

※Use an F70 (N70) camera body and AF nikkor lens inspection program for F70／N70 to display encoder signal on the computer monitor when making an inspection.

Inspection method

- Start the AF nikkor lens inspection program for F70／N70 and select " 1. READING OF LENS ENCODER SIGNAL". Make inspection according to instructions as shown on the display.

- Encoder signals should be as described in the table below when the zoom and distance scale are set to specified positions.

MF mode

Zoom ring / Distance scale position	f＝70mm			f＝85mm			f＝135mm			f＝180mm		
	Encoder signal											
	1	2	3	1	2	3	1	2	3	1	2	3
∞	D7h	66h	73h	62h	66h	73h	72h	66h	73h	93h	66h	73h
0.8m	D7h	78h	73h									
Most close distance position	D7h	FCh	73h									

AF mode

Zoom ring / Distance scale position	f＝70mm			f＝85mm			f＝135mm			f＝180mm		
	Encoder signal											
	1	2	3	1	2	3	1	2	3	1	2	3
∞	D7h	64h	73h									

◎If encoder signal values are different from those shown in the table, following causes moust be considered.

Distance brush is mounted in the wrong position, distance brush or FPC is defective, encoder patterns on the FPC are contaminated, or the FPC is fixed in the wrong position.