

AF Zoom-Nikkor ED 80-200mm f/2.8D

REPAIR MANUAL

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Tokyo, Japan

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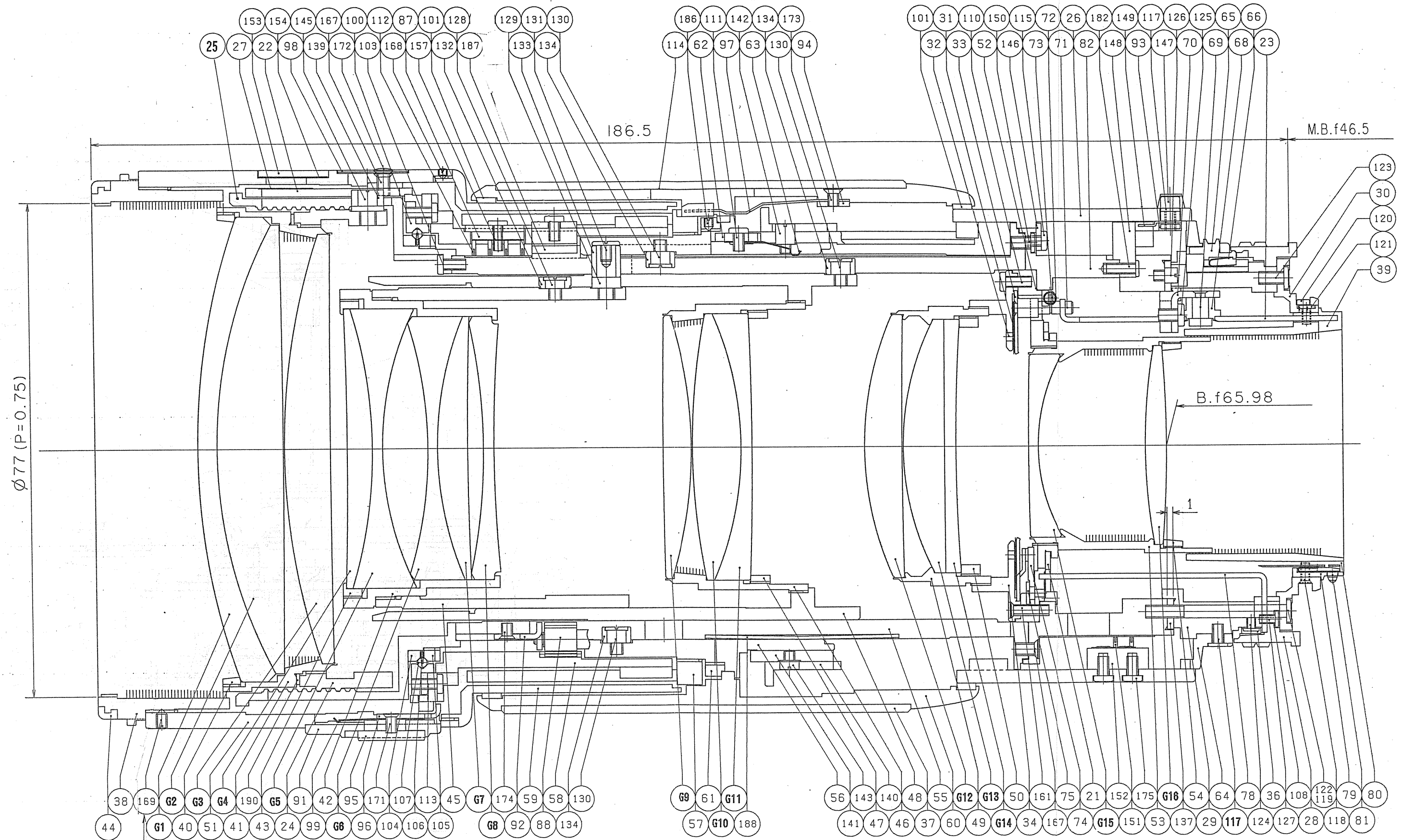
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〔 3 〕 部品对照表 Parts Reference Table

補助番号 Auxiliary No.	部品番号 Part Number	補助番号 Auxiliary No.	部品番号 Part Number	補助番号 Auxiliary No.	部品番号 Part Number
G1	1G257-048	40	1K520-873	79	1K680-643-1
G2	1G114-073-1	41	1K500-830	80	1K680-651-1
G3	1G156-037	42	1K500-657	81	1K240-469-1
G4	1G154-069	43	1K520-874	82	1K641-142
G5	1G210-026-1	44	1K117-394	83	1K260-607
G6	1G210-027	45	1K630-783	84	1K277-131
G7	1G152-045	46	1K500-658	85	1K277-132
G8	1G213-025	47	1K520-875	86	1K260-608
G9	1G114-074	48	1K540-146-3	87	1K681-443
G10	1G111-037	49	1K500-659	88	1K260-349-3
G11	1G252-027	50	1K520-876	89	1K601-164
G12	1G154-070	51	1K630-784	90	1K601-165
G13	1G153-044	52	1K641-140	91	1K681-444
G14	1G257-049	53	1K500-660-1	92	1K610-995
G15	1G247-045	54	1K520-877	93	1K610-997
G16	1G113-059	55	1K307-026	94	1K610-996
		56	1K530-062	95	1K206-082
21	1K300-078	57	1K630-785	96	1K611-704
22	1K641-138	58	1K260-606	97	1K240-547-1
23	1K314-311-1	59	1K641-141	98	K087-412
24	1K535-408	60	1K630-786	99	1K240-615-1
25	1K535-409	61	1K520-880-1	100	1K641-143
26	1K475-485	62	1K680-790-1	101	1K115-817
27	1K470-090	63	1K240-453-2	102	1K117-395
28	1K475-486	64	1K485-202	103	B1-17035FR
29	1K641-139	65	1K208-097	104	1K641-144
30	1K404-078-5	66	1K240-563	105	1K521-159
31	1K570-012			106	1K347-016
32	1K370-004-2	68	1K340-143	107	T1-01500SX
33	1K572-124	69	1K371-098	108	1K160-683-1
34	1K574-151	70	1K610-992	109	1K120-021
		71	1K370-933	110	B1-17040FB
	1K240-020-1	72	1K225-089	111	B1-17028FA
	1K240-021-1	73	1K130-188-1	112	1K240-797
36	1K240-188-1	74	1K680-688	113	B1-17040FA
	1K240-790	75	1K370-052	114	1K600-551
37	1K110-373	76	1K371-704	115	B1-17025FA
38	1K400-340	77	1K681-442	117	1K120-219
39	1K540-144	78	1K610-993	118	1K010-089

J A A 7 4 2 5 1 - R . 3 2 9 9 . A

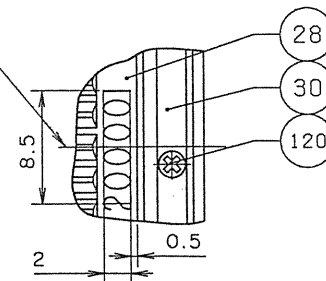
補助番号 Auxiliary No.	部品番号 Part Number	補助番号 Auxiliary No.	部品番号号 Part Number	補助番号 Auxiliary No.	部品番号 Part Number
119	1K120-361	145	1K130-494	185	1K116-533
120	1K120-012	146	1K600-702	186	K2-14020FA
121	1K010-002-1	147	1K208-094	187	1K601-166
122	1K120-254	148	1K680-801	188	1K240-416-1
123	1K120-010-1	149	1K240-549	190	1K161-177
124	1K120-162	150	A1-20030FA		
125	B1-20030FB	151	1K240-550	B23	1B314-153-1
126	1K126-051	152	1K680-802	B24	1B535-166
127	1K120-086	153	1K480-025	B32	1B570-013-2
128	1K130-326	154	1K116-311	B55	1B002-014
129	1K146-157	155	1K314-312	B56	1B002-013
130	1K130-328	156	1K611-012	B63	1B240-051-2
131	1K120-335	157	1K010-083	B71	1B572-040
132	1K116-442	158	1K371-108	B75	1B999-491
	1K116-443	159	1K426-003	B81	1B060-489
	1K116-444	160	1K136-067-1	B90	1B600-065
	1K116-445	161	A2-17060FB	B97	1B240-052-1
133	1K116-661-1	162	1K230-240-2	B112	1B240-086
133	1K116-662-1	163	1K611-706	B139	1B999-492
133	1K116-663-1	164	1K230-377	B151	1B240-053
134	1K116-450	165	1K426-002	B155	1B314-154
134	1K116-451	166	1K371-705	B158	1B610-060
134	1K116-452	167	A2-20035FB	B159	1B002-016
134	1K116-453	168	K2-14015FB	B160	1B999-395
137	1K160-734	169	K2-17030FB		
137	1K160-735			Z41	1B100-627
137	1K160-736	171	G2-17030FA	Z46	1B100-432
137	1K160-737	172	A3-20040FS	Z49	1B100-433
137	1K160-738	173	B2-17028FA	Z53	1B100-434-2
137	1K160-739	174	A2-17025FB		
137	1K160-740	175	H1-17030FS	L1	1G016-048-1
137	1K160-741	176	1K050-016	L2	1G024-016-1
137	1K160-742	176	1K050-203	L3	1G026-031
139	1K117-396	176	1K050-379	L4	1G017-070
139	1K117-397	176	1K050-380	L5	1G015-034
139	1K117-398	179	S1-02000SX		
139	1K117-399	180	1K370-117		
140	1K530-040-1	181	B1-17060FA		
141	1K640-767-1	182	A1-17045FA		
142	1K126-067	183	1K116-824		
143	1K123-119	184	1K116-533		



モソツ

Note) When ordering the repair parts, please use the parts numbers stated on the Repair Parts Lost. Please note that some of those numbers stated on the Parts Number Reference Table, the Exploded Drawings and the Lubricant and Binding Agent Chart are not included in the Repair Parts List since they are not available as the individual repair parts.

(28) ①突起よりレンズ後方
から見てマウント2中溝
方向に145°45'±2°



注) 部品対照表、組立図、接着給油図には部品要求出来る番号と要求出来ない番号と記載されています。部品要求の際は、部品表で確認の上、要求して下さい。部品表に記載されていない部番は部品要求出来ません。

Fig. 3

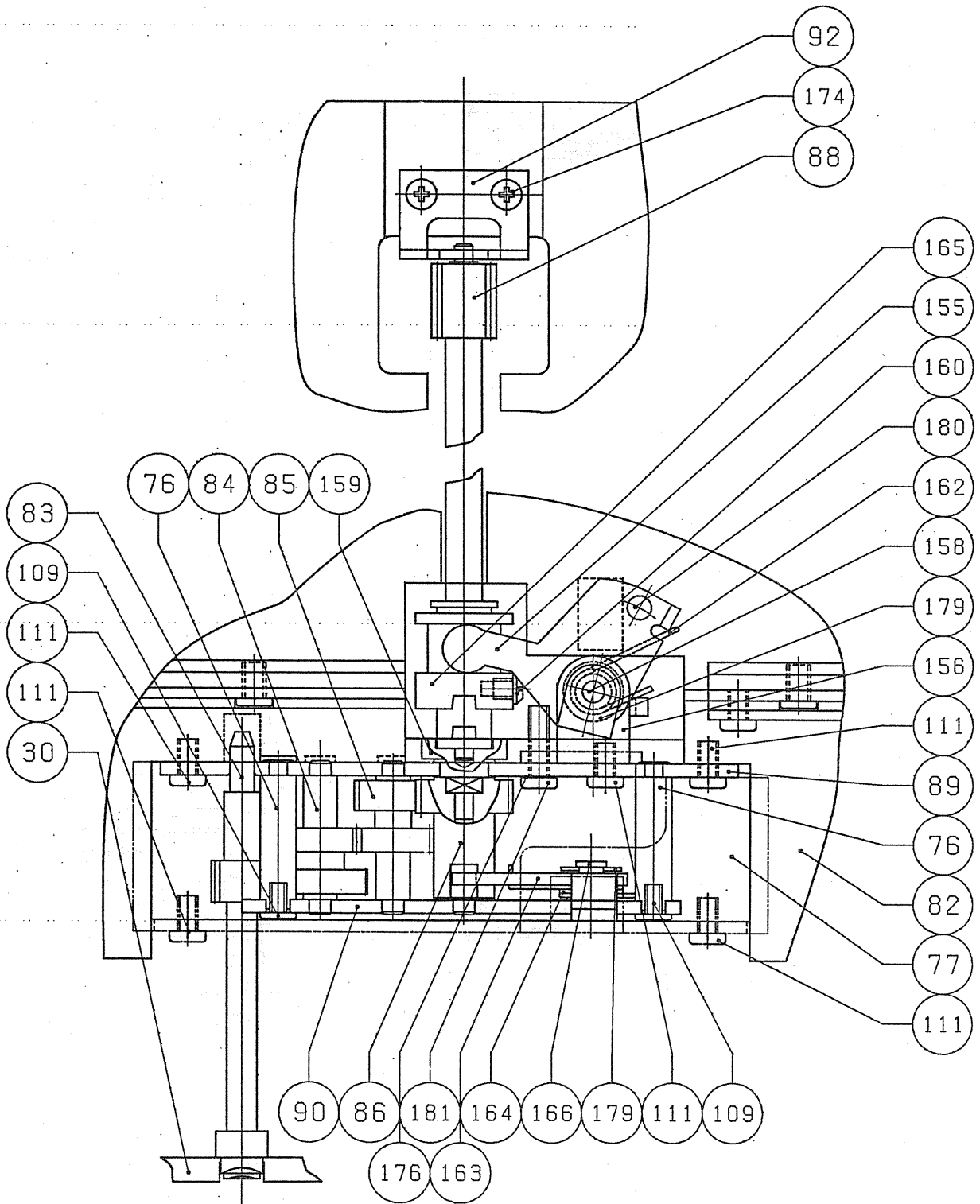
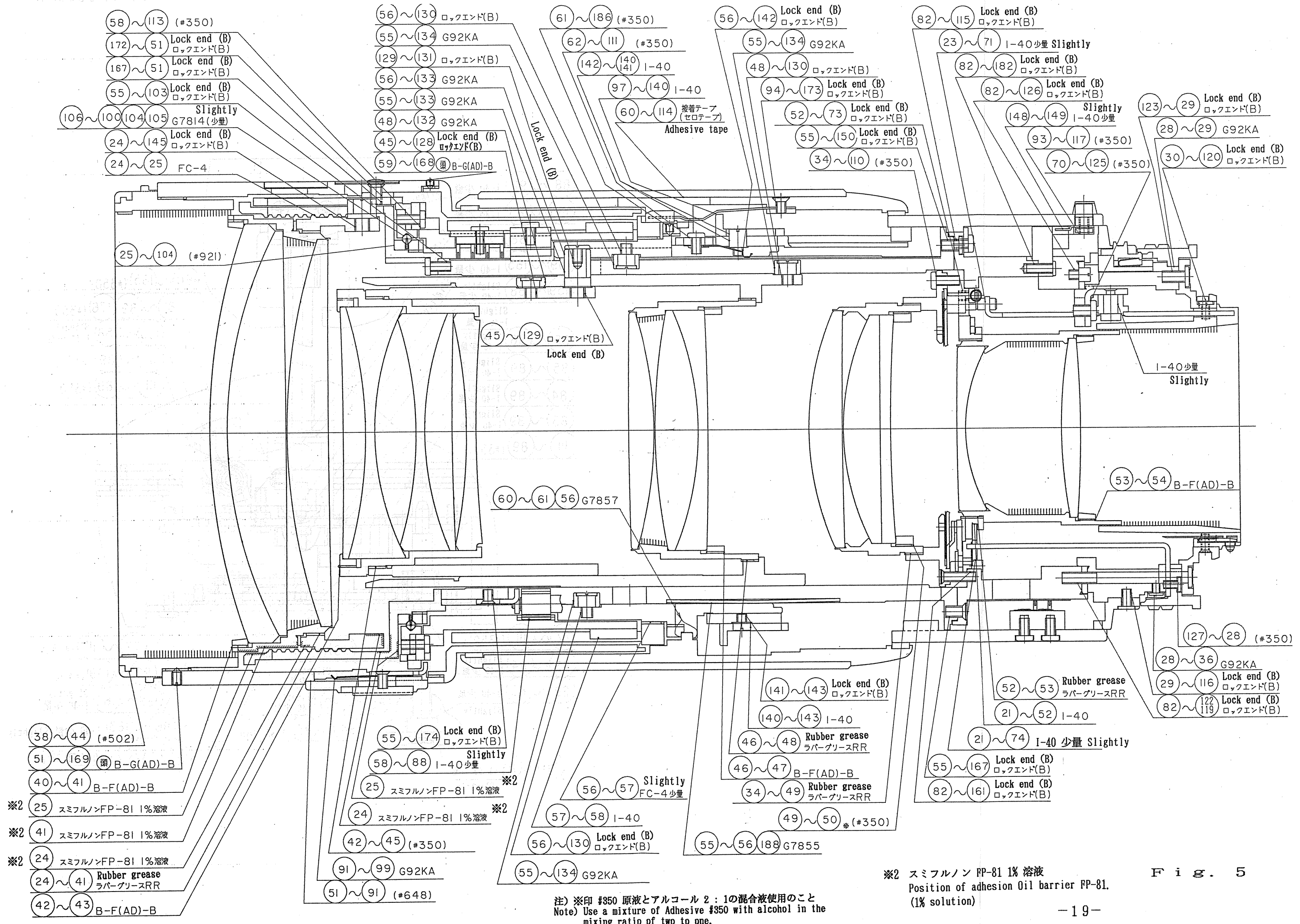


Fig. 4

(6) 接着給油図 Lubricant and binding Agent Chart



58~113 (#350)
 172~51 Lock end (B) ロックエンド(B)
 167~51 Lock end (B) ロックエンド(B)
 55~103 Lock end (B) ロックエンド(B)
 106~100, 104, 105 Slightly G7814 (少量)
 24~145 Lock end (B) ロックエンド(B)
 24~25 FC-4

56~130 ロックエンド(B)
 55~134 G92KA
 129~131 ロックエンド(B)
 56~133 G92KA
 55~133 G92KA
 48~132 G92KA
 45~128 Lock end (B) ロックエンド(B)
 59~168 頭 B-G(AD)-B

61~186 (#350)
 62~111 (#350)
 142~140, 141 I-40
 97~140 I-40
 60~114 接着テープ (セロテープ) Adhesive tape

56~142 Lock end (B) ロックエンド(B)
 55~134 G92KA
 48~130 ロックエンド(B)
 94~173 Lock end (B) ロックエンド(B)
 52~73 Lock end (B) ロックエンド(B)
 55~150 Lock end (B) ロックエンド(B)
 34~110 (#350)

82~115 Lock end (B) ロックエンド(B)
 23~71 I-40 少量 Slightly
 82~182 Lock end (B) ロックエンド(B)
 82~126 Lock end (B) ロックエンド(B)
 148~149 I-40 少量 Slightly
 93~117 (#350)
 70~125 (#350)

123~29 Lock end (B) ロックエンド(B)
 28~29 G92KA
 30~120 Lock end (B) ロックエンド(B)

25~104 (#921)

45~129 ロックエンド(B)
 Lock end (B)

60~61, 56 G7857

I-40 少量 Slightly

53~54 B-F(AD)-B

127~28 (#350)
 28~36 G92KA
 29~116 Lock end (B) ロックエンド(B)
 82~122 Lock end (B) ロックエンド(B)
 82~119 Lock end (B) ロックエンド(B)

141~143 Lock end (B) ロックエンド(B)
 140~143 I-40
 46~48 Rubber grease ラバーグリースRR
 46~47 B-F(AD)-B
 34~49 Rubber grease ラバーグリースRR
 49~50 (#350)

52~53 Rubber grease ラバーグリースRR
 21~52 I-40
 21~74 I-40 少量 Slightly

55~167 Lock end (B) ロックエンド(B)
 82~161 Lock end (B) ロックエンド(B)

38~44 (#502)
 51~169 頭 B-G(AD)-B
 40~41 B-F(AD)-B
 ※2 25 スミフルノンFP-81 1%溶液
 ※2 41 スミフルノンFP-81 1%溶液
 ※2 24 スミフルノンFP-81 1%溶液
 24~41 Rubber grease ラバーグリースRR
 42~43 B-F(AD)-B

55~174 Lock end (B) ロックエンド(B)
 Slightly
 58~88 I-40 少量
 ※2 25 スミフルノンFP-81 1%溶液
 ※2 24 スミフルノンFP-81 1%溶液
 42~45 (#350)
 91~99 G92KA
 51~91 (#648)

56~57 Slightly FC-4 少量
 57~58 I-40
 56~130 Lock end (B) ロックエンド(B)
 55~134 G92KA

55~56, 188 G7855

注) ※印 #350 原液とアルコール 2 : 1の混合液使用のこと
 Note) Use a mixture of Adhesive #350 with alcohol in the mixing ratio of two to one.

※2 スミフルノン FP-81 1% 溶液
 Position of adhesion Oil barrier FP-81.
 (1% solution)

Fig. 5

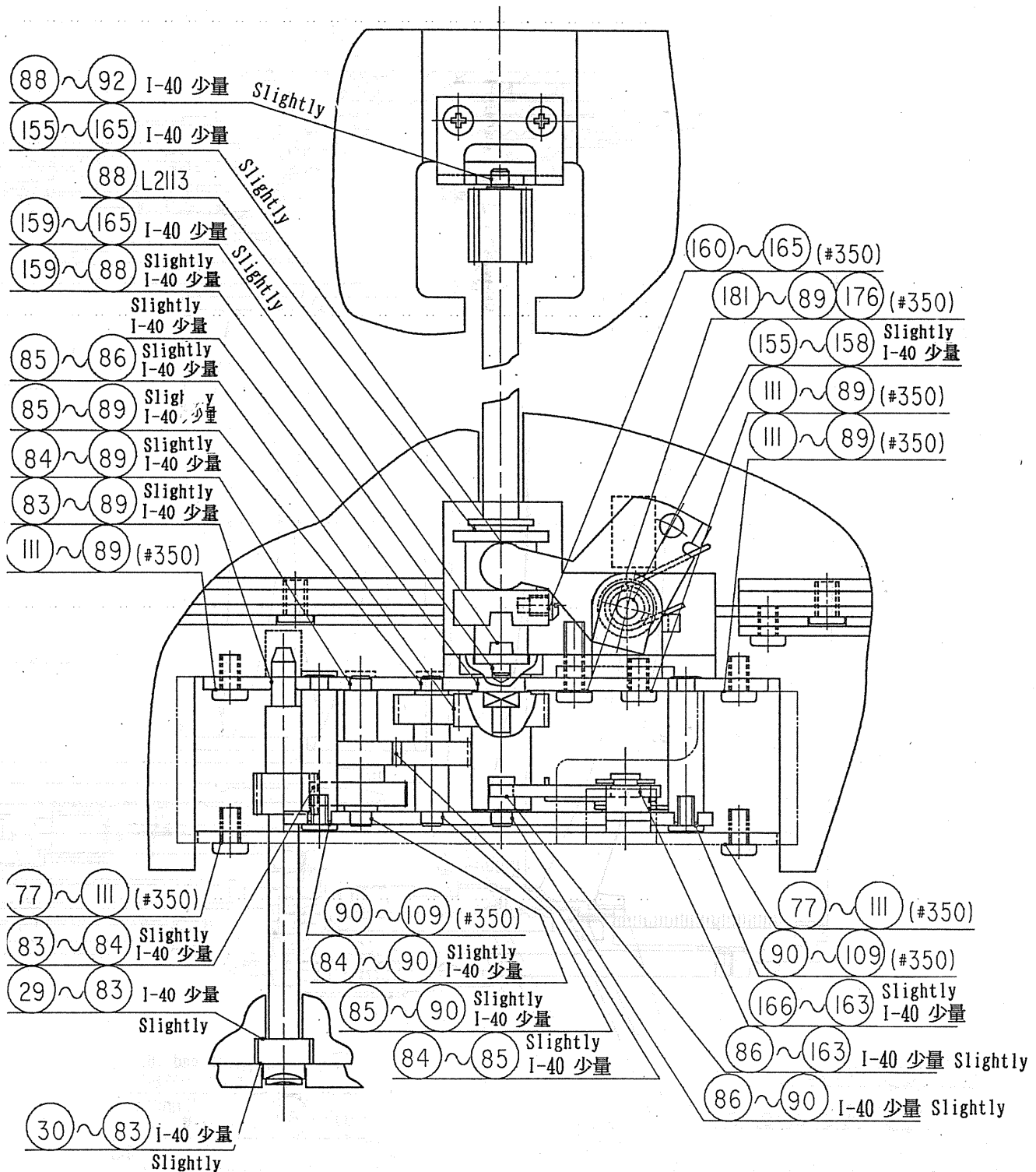
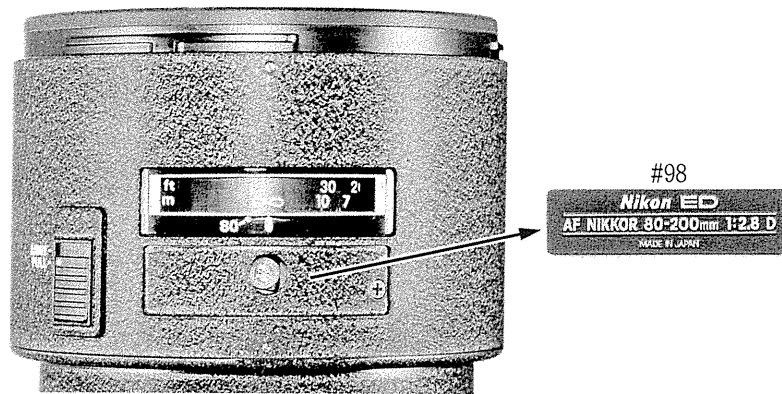


Fig. 6

[6] DISASSEMBLING / ASSEMBLING

1. DISASSEMBLING

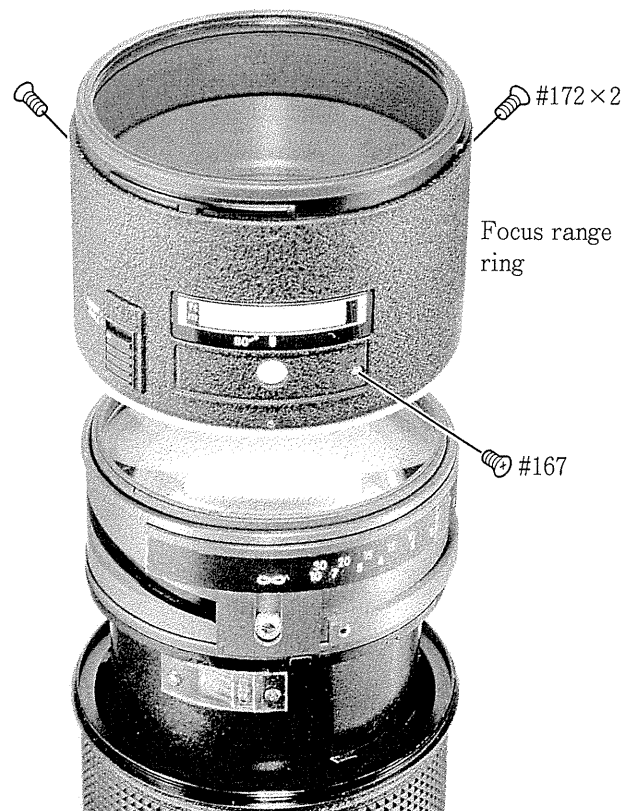
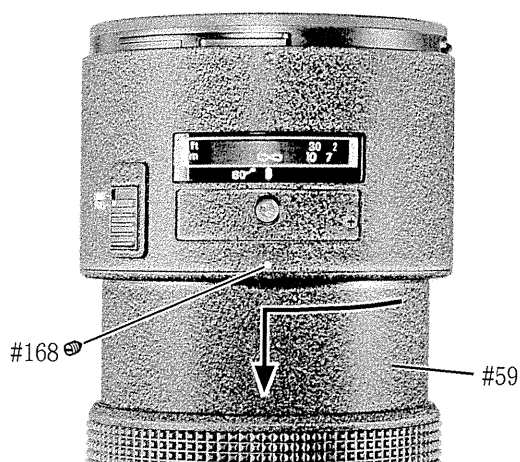
NAME PLATE #98



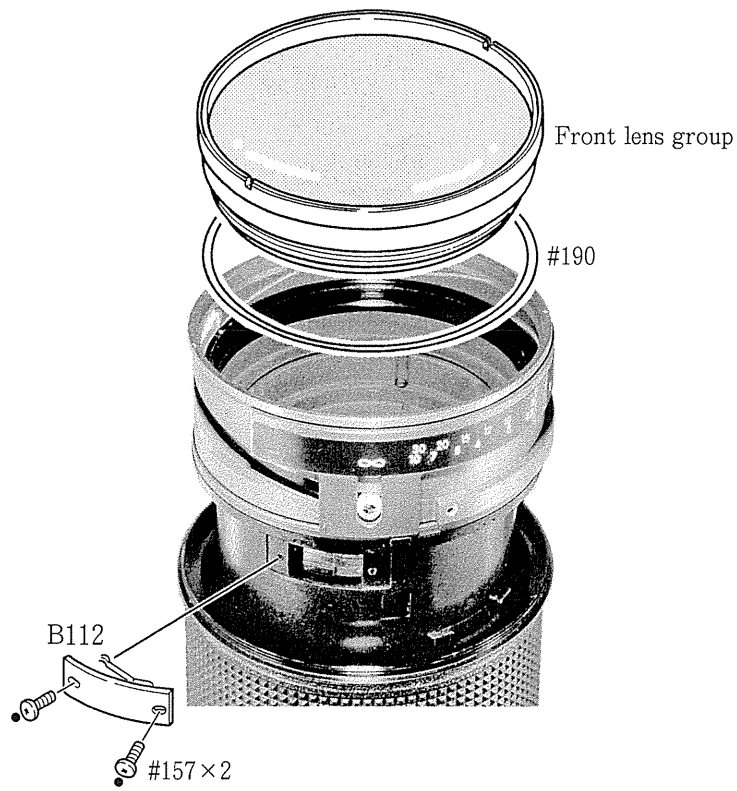
FOCUS RANGE RING

- Remove set screw #168 and remove external ring #59 from the focus range ring.

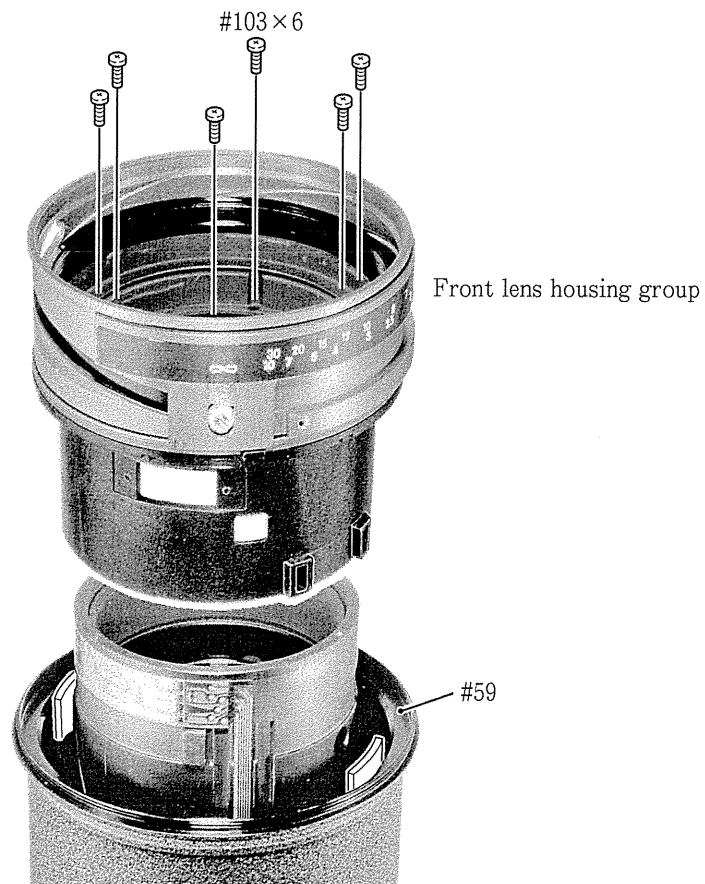
- Set the index to the ∞ (infinity) mark and remove the focus range ring.



FRONT LENS GROUP, DISTANCE BRUSH



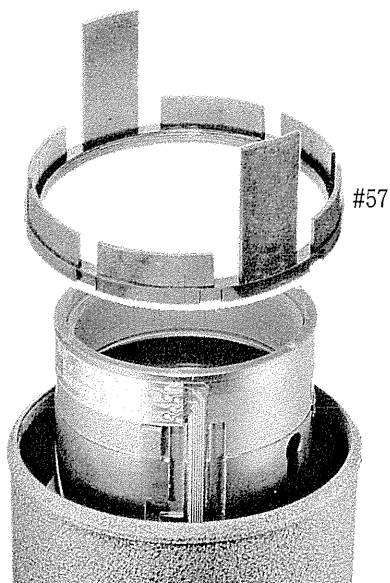
FRONT LENS HOUSING GROUP, EXTERNAL RING #59



2nd LENS GROUP

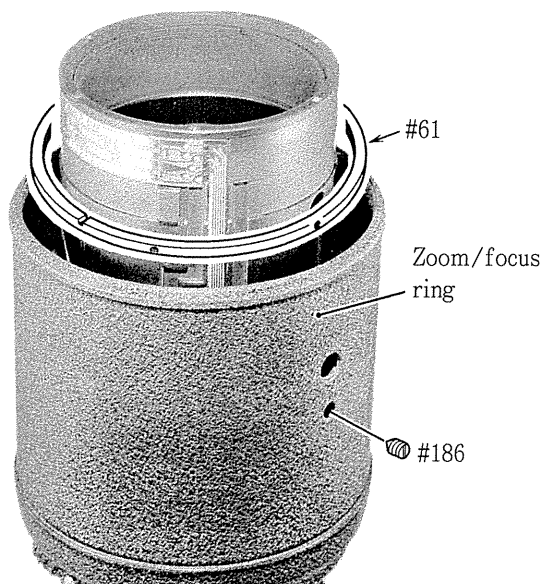


MANUAL FOCUS DRIVING RING #57



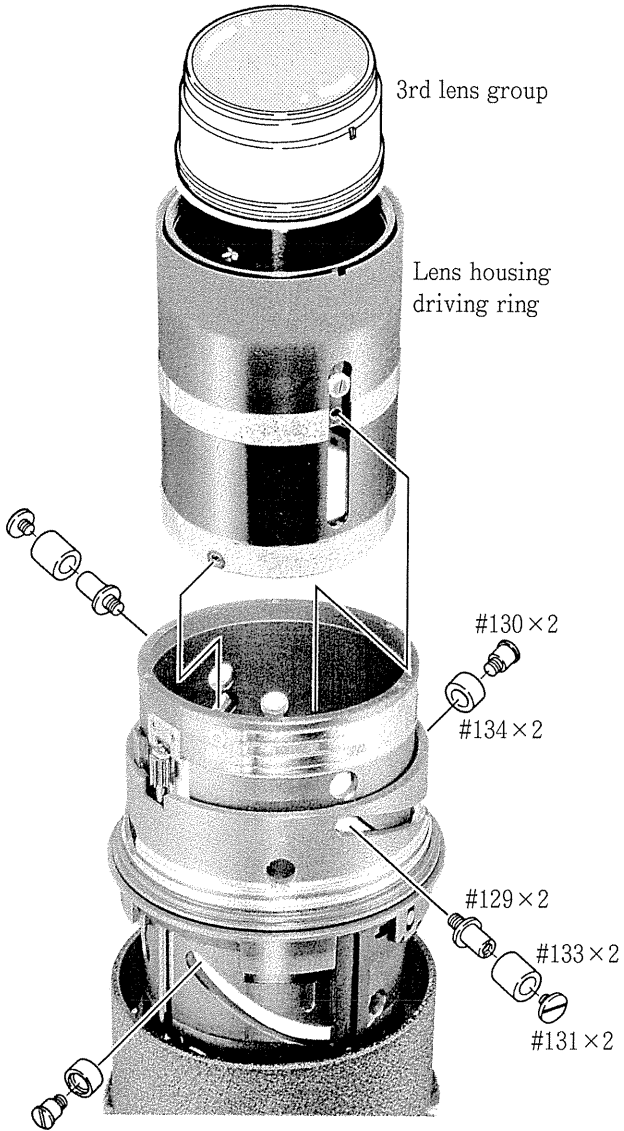
- Set the A-M ring to "A". Then remove the manual focus driving ring #57.

ZOOM/FOCUS RING



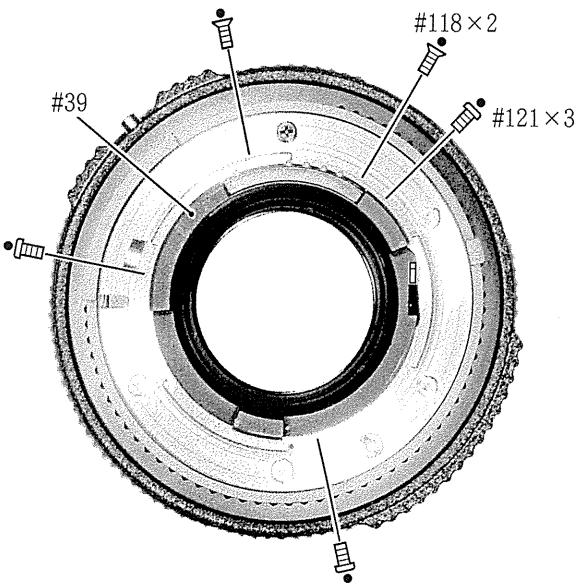
- ① Remove the rubber ring #37.
- ② Remove screw #186 from the hole in the zoom/focus ring.
- ③ Remove the retaining ring #61 using tool J11201.
- ④ Remove the zoom/focus ring.

LENS HOUSING DRIVING RING, 3rd LENS GROUP

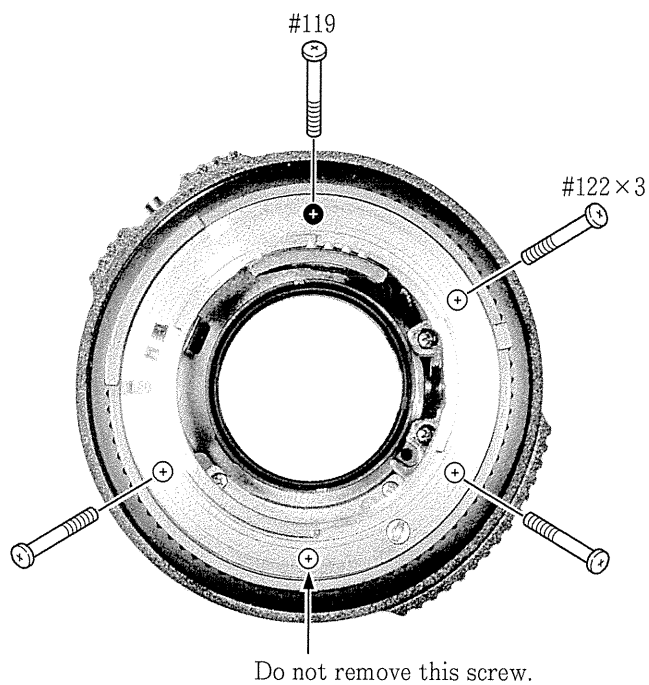


● Use tool J11195A to remove the 3rd lens group.

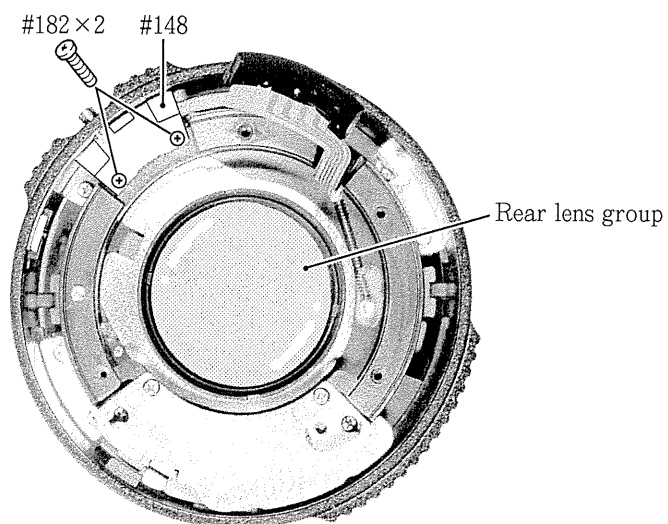
REAR COVER RING #39



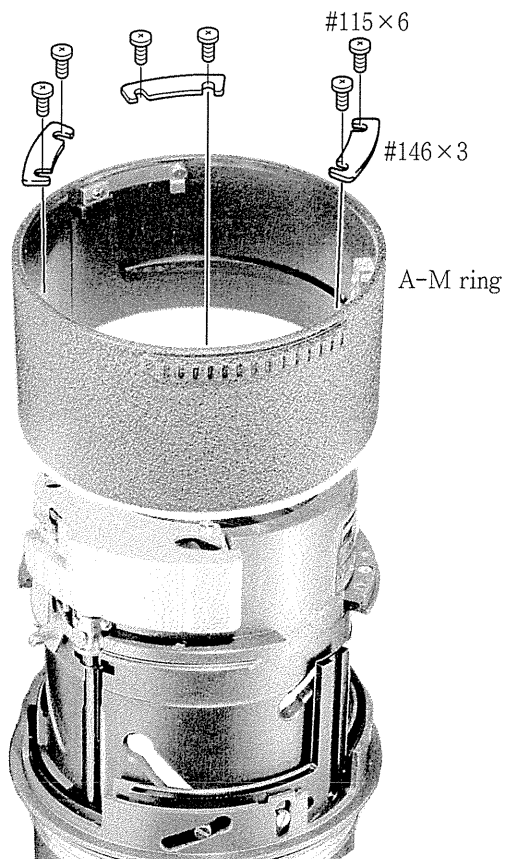
BAYONET MOUNT GROUP



REAR LENS GROUP, A-M BLOCK #148

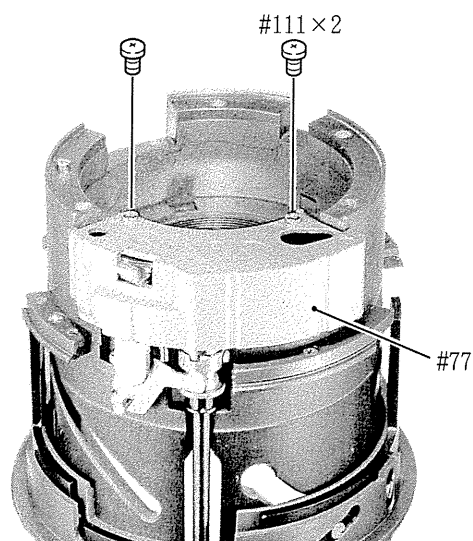


A-M RING

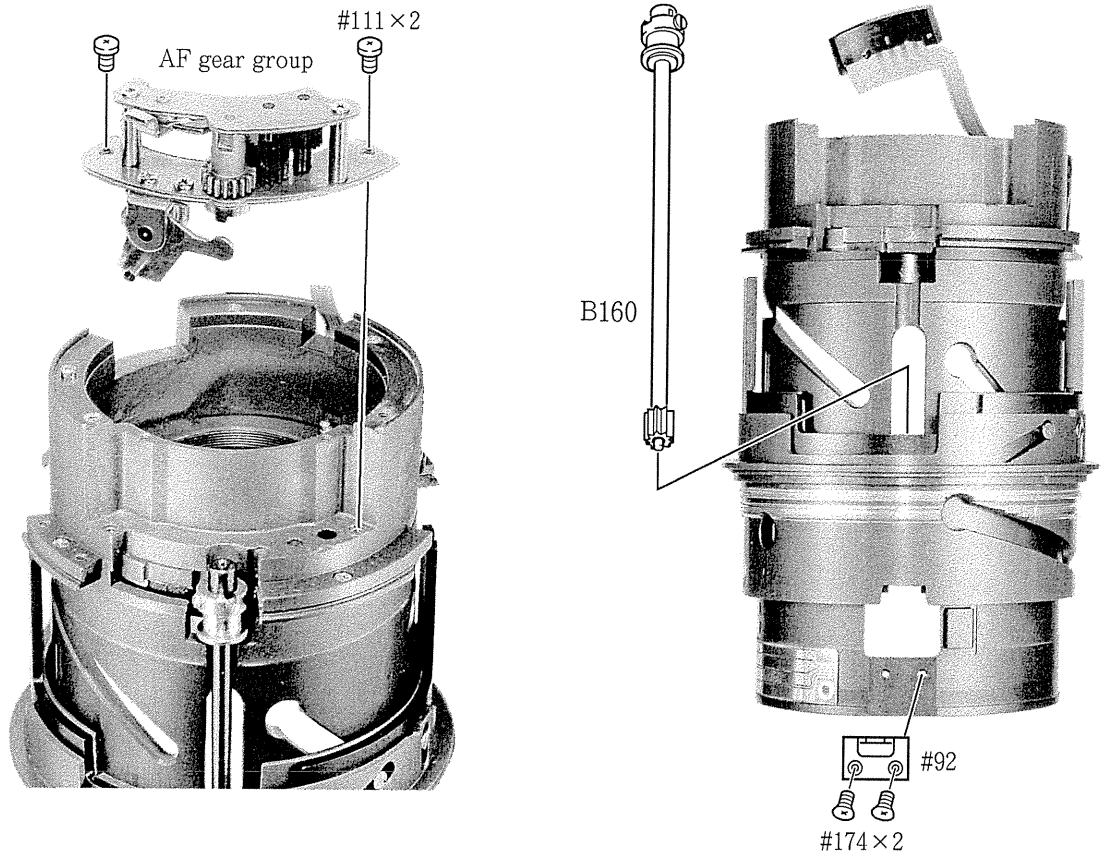


Note: Be sure not to bend the A-M brush.

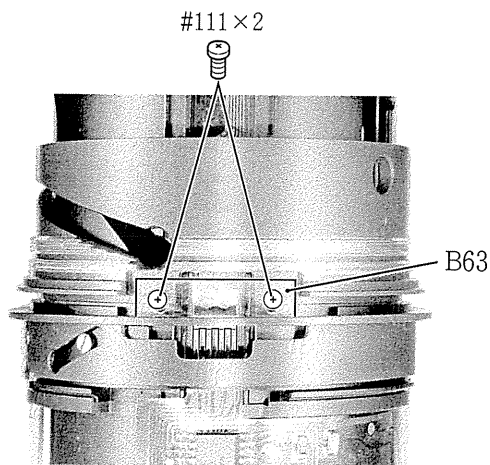
GEAR COVER #77



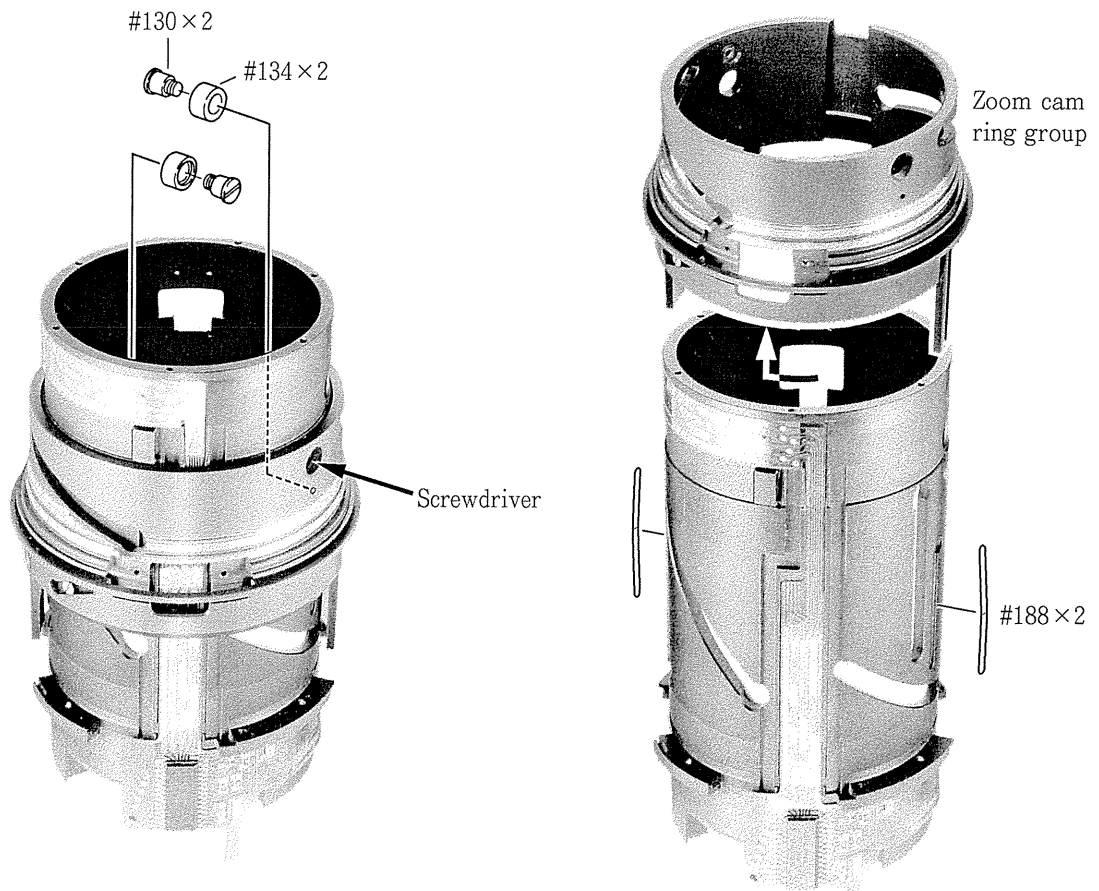
AF GEAR GROUP



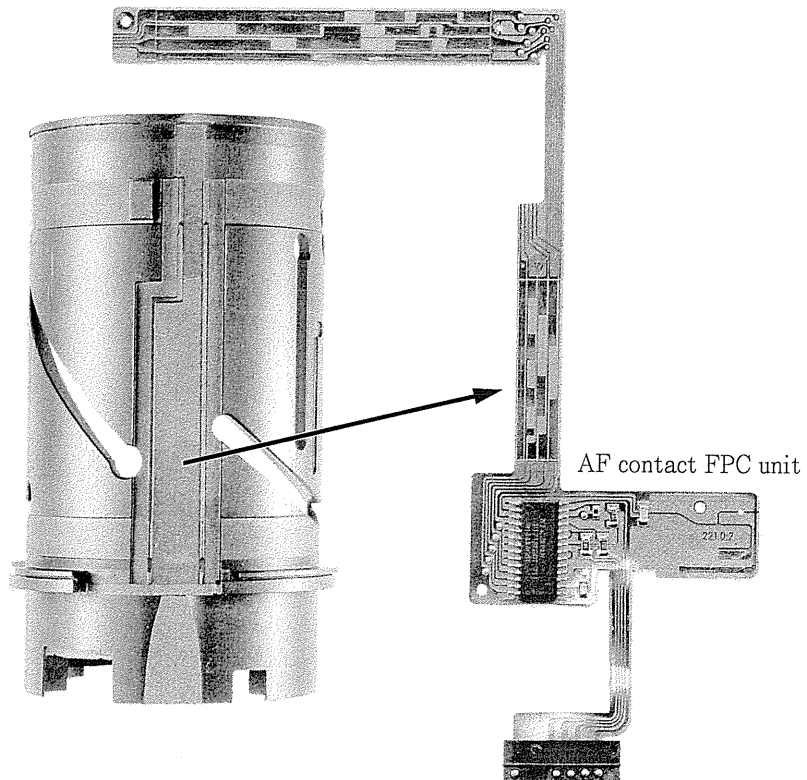
ZOOM BRUSH B63



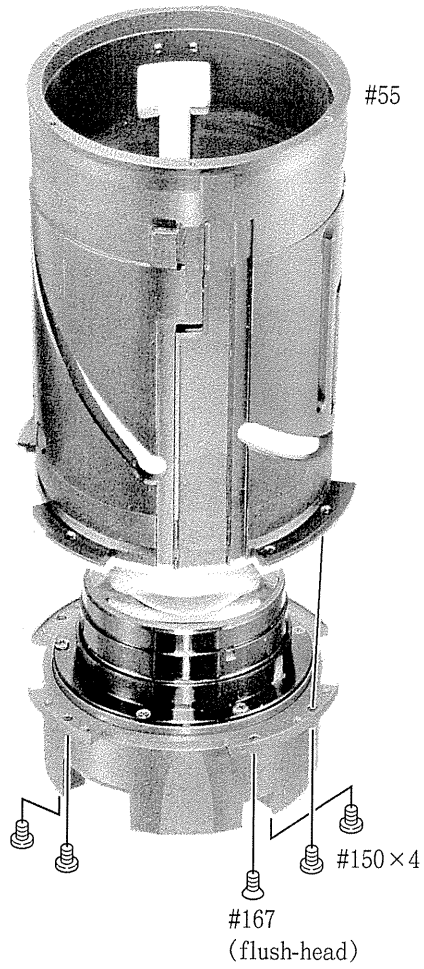
ZOOM CAM RING GROUP



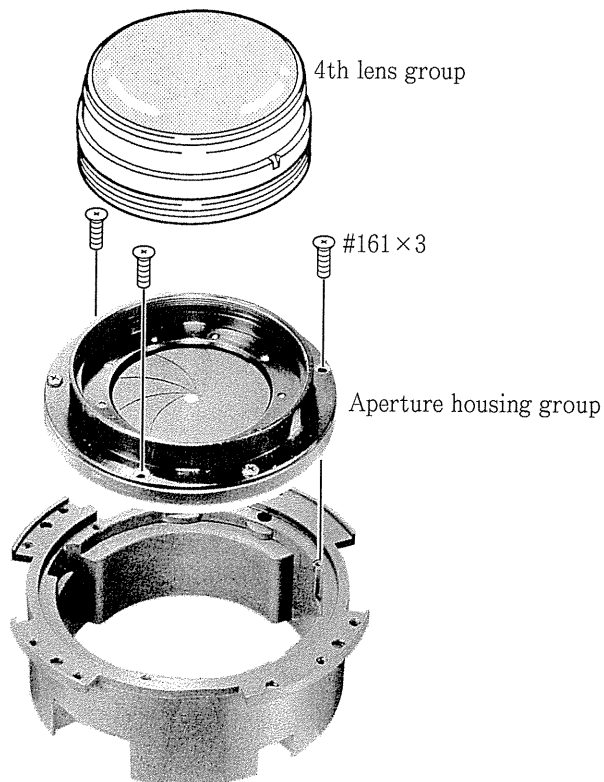
AF CONTACT FPC UNIT



LENS BARREL #55



4th LENS GROUP, APERTURE HOUSING GROUP

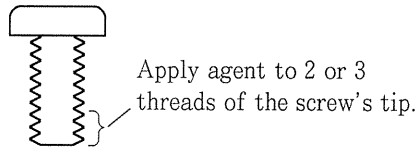


2. ASSEMBLING

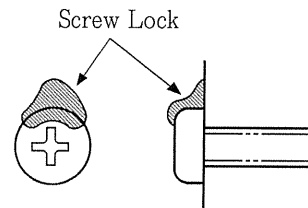
◆ Before assembling

- Refer to the following figures when applying Lock End B or Screw Lock #350 agent (used to prevent screws from working loose).

Lock End B

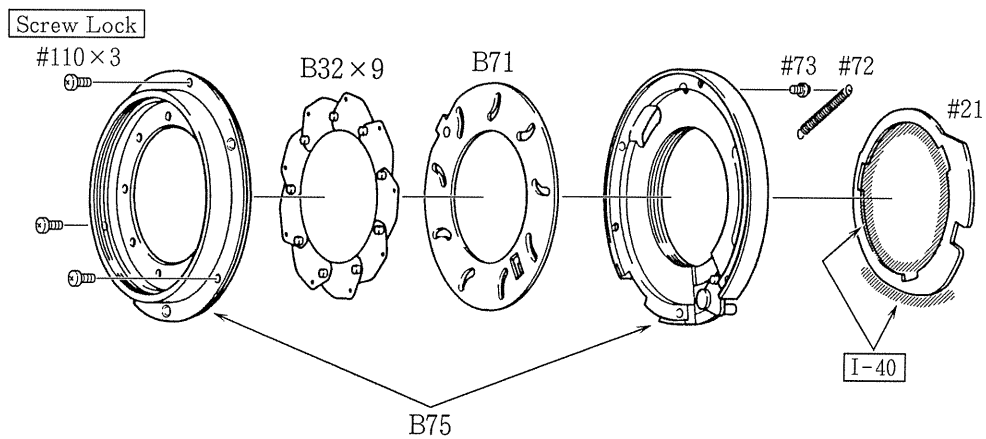


Screw Lock



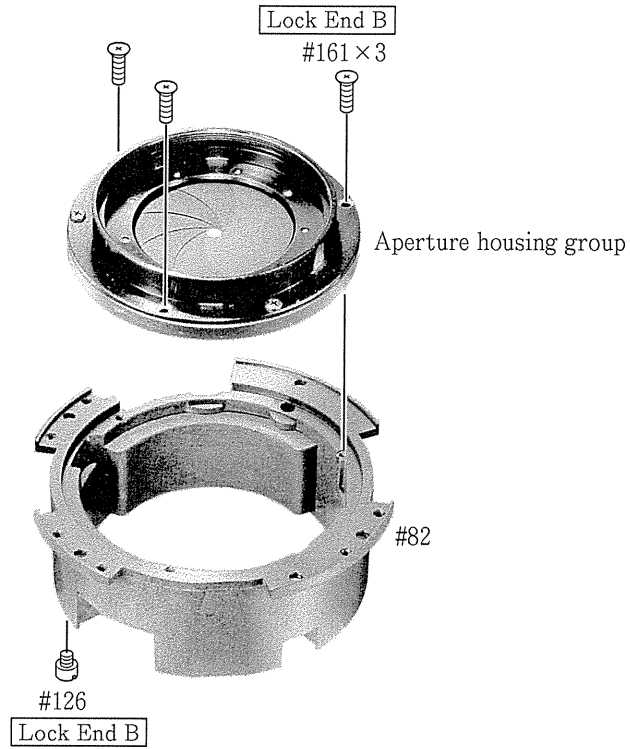
- If it is hard to obtain Lock End B locally, you can use Lock Tight (purple) instead. Make sure not to use the more powerful yellow, red or blue Lock Tight or you will not be able to remove the screw again easily.
- Remove all traces of old Lock End B or Screw Lock agent before reapplying.

APERTURE HOUSING GROUP

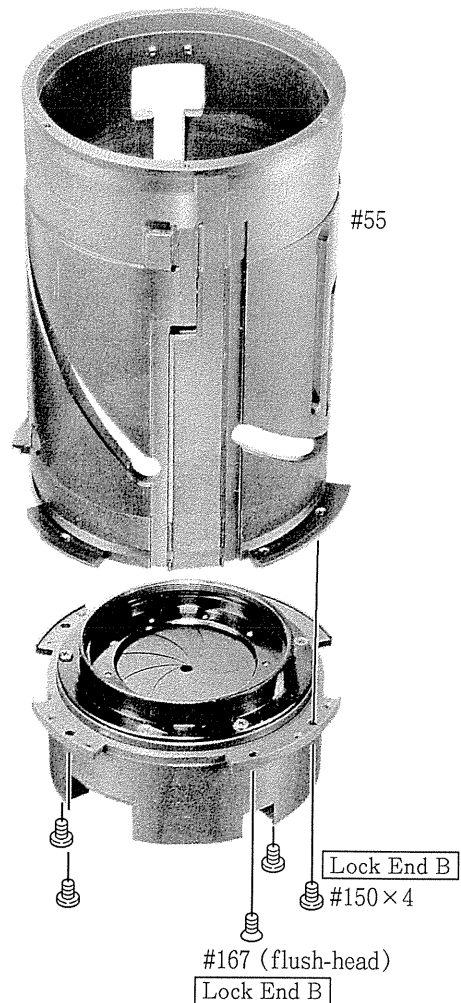


Inspection: Check aperture operation by moving the #21 and B71.

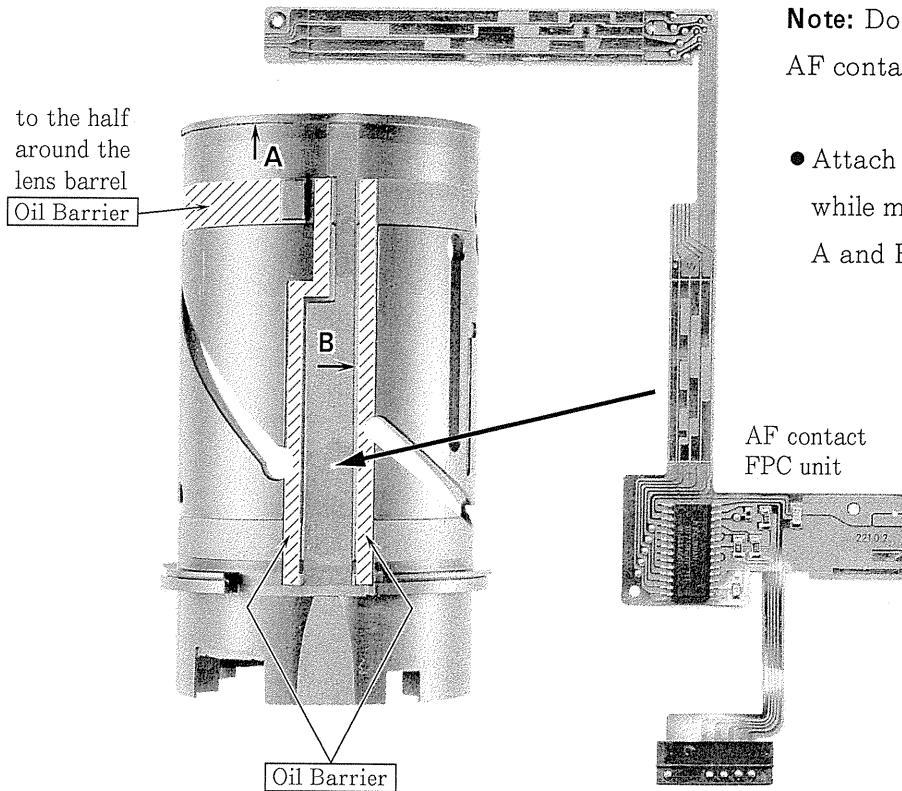
MOUNT THE APERTURE HOUSING GROUP



LENS BARREL #55



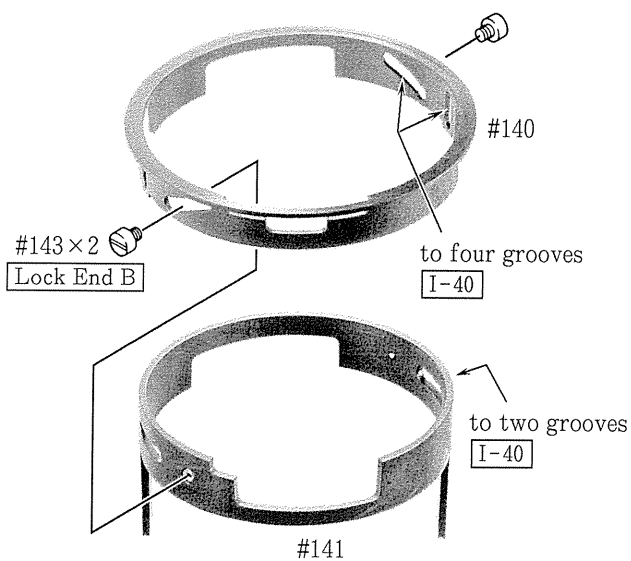
AF CONTACT FPC UNIT



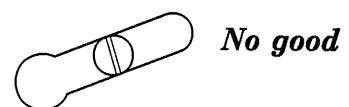
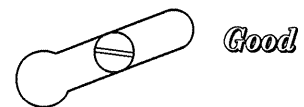
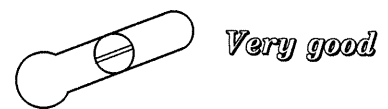
Note: Do not reuse the peeled-off AF contact FPC unit .

- Attach the AF contact FPC unit while moving it toward portions A and B.

CAM RING #140 & #141



- The slot position of guide screw #143 for the groove should be as shown in the following figures.



ZOOM CAM RING #56



- The slot position of guide screw #142 for the groove should be as shown in the following figures.



Very good

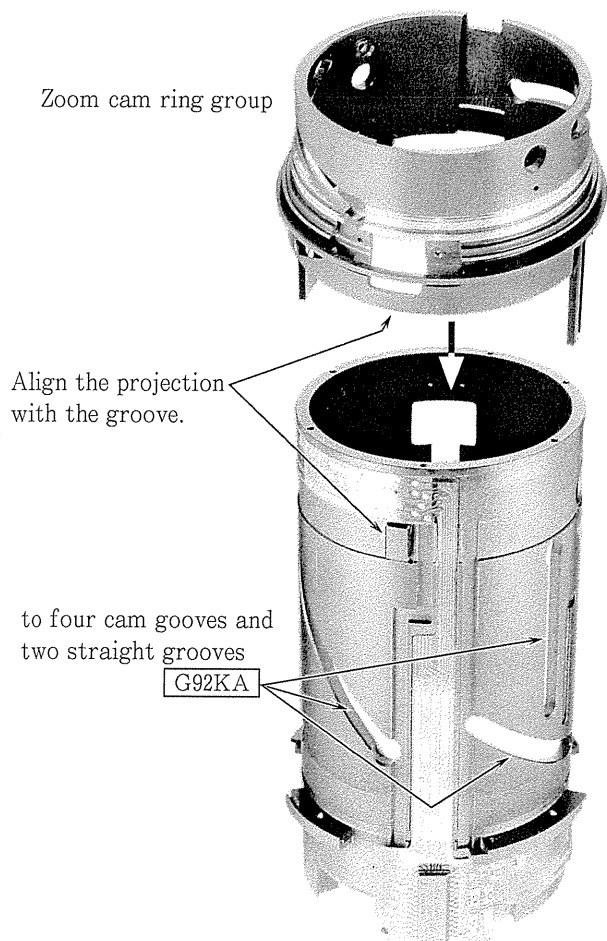


Good

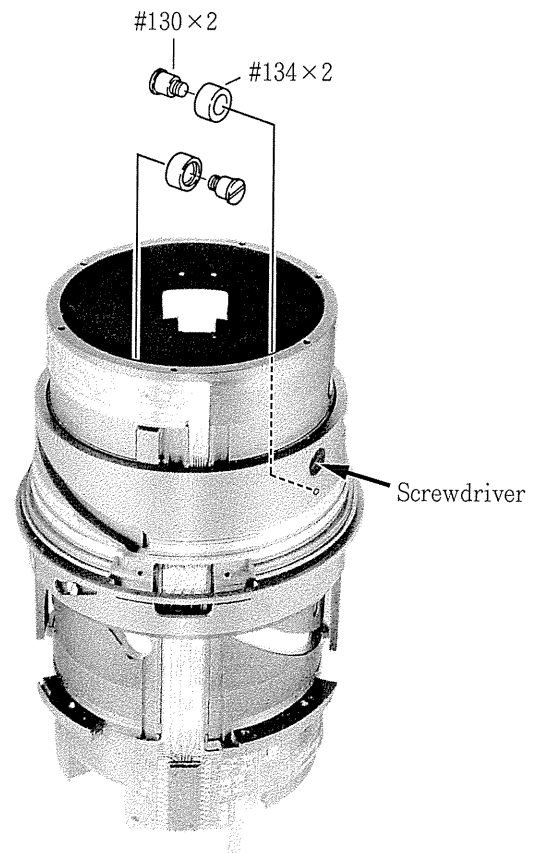


No good

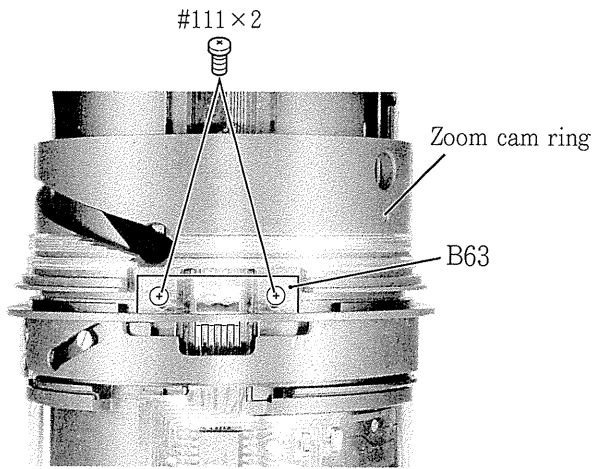
ASSEMBLE THE ZOOM CAM RING GROUP



Inspection: Move the zoom cam ring group vertically to check operation.



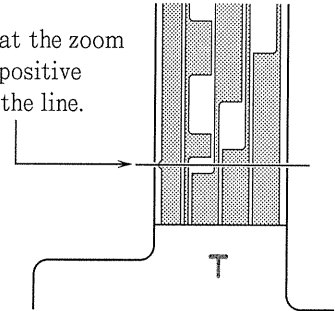
ZOOM BRUSH B63



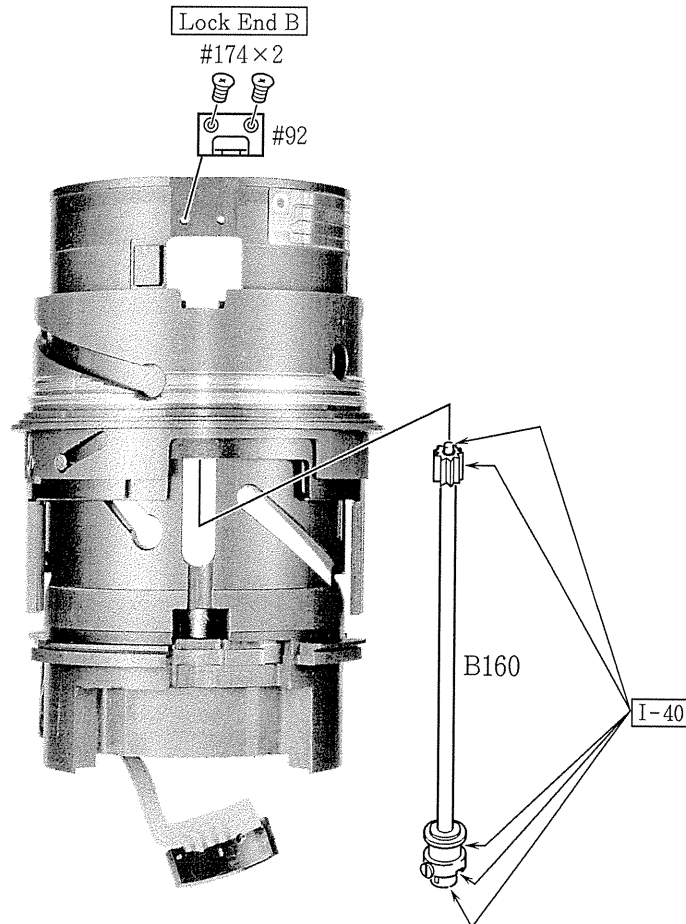
● Adjustment of zoom brush position

- ① Move the zoom cam ring until it comes to a stop at the stopper on the Tele (f=200) side.
- ② Adjust the position of the zoom brush B63 so that the zoom brush comes into contact with the line as shown in the figure below.
- ③ Move the zoom cam ring vertically several times to check that the brush is correctly positioned.
- ④ Secure screws #111x2 using Screw Lock.

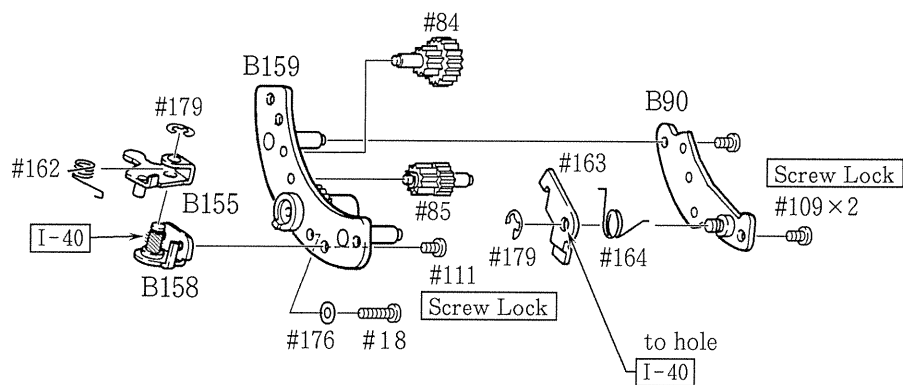
Make sure that the zoom brush makes positive contact with the line.



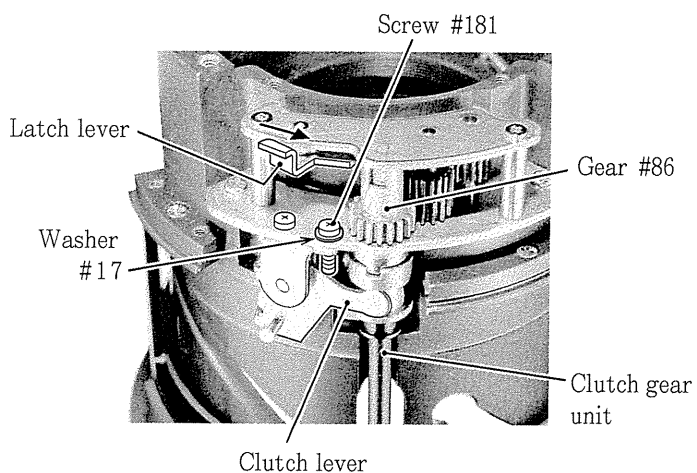
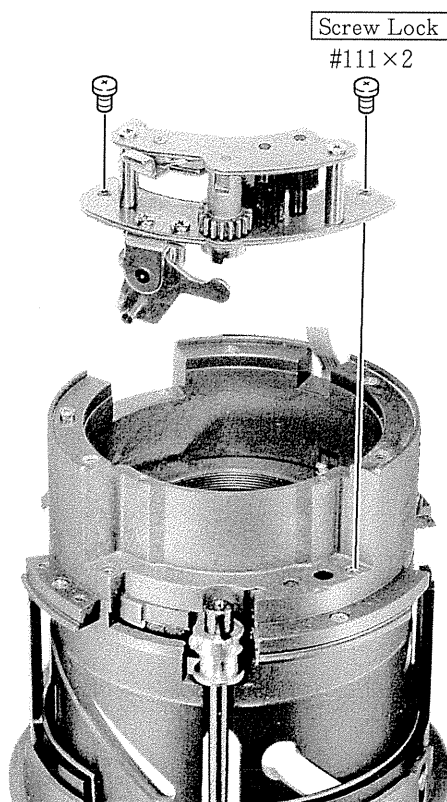
CLUTCH GEAR UNIT B160



AF GEAR GROUP



● Apply grease I-40 to each gear and gear shaft.

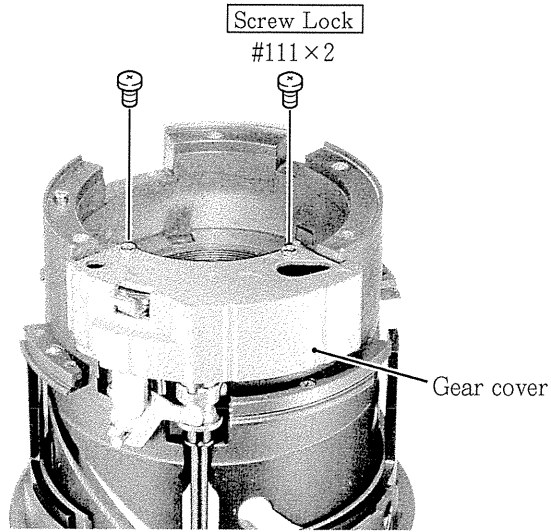


- Adjust the position of the clutch lever
 - ① Move the latch lever in the direction of the arrow. And rotate gear #86 or clutch gear unit to check operation.
 - ② If operation is abnormal, change the thickness of washer #176 to adjust the position of clutch lever.

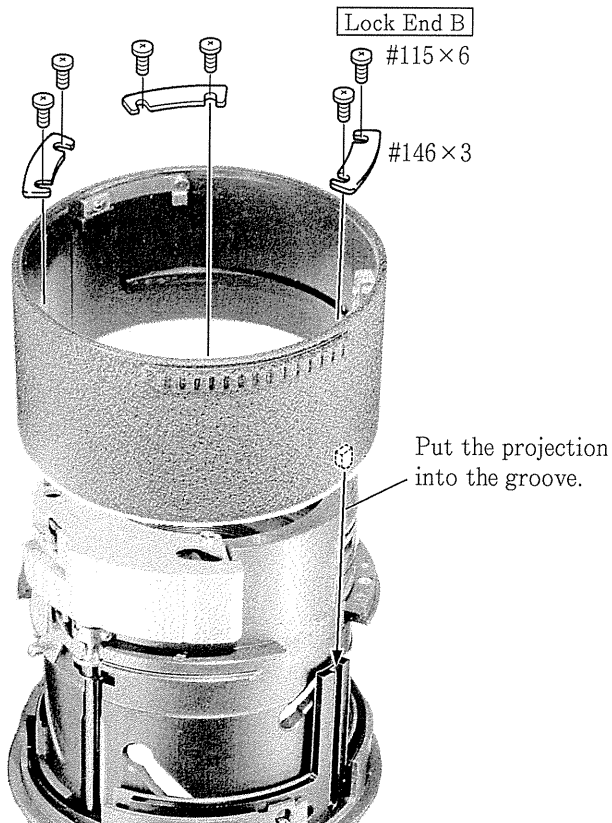
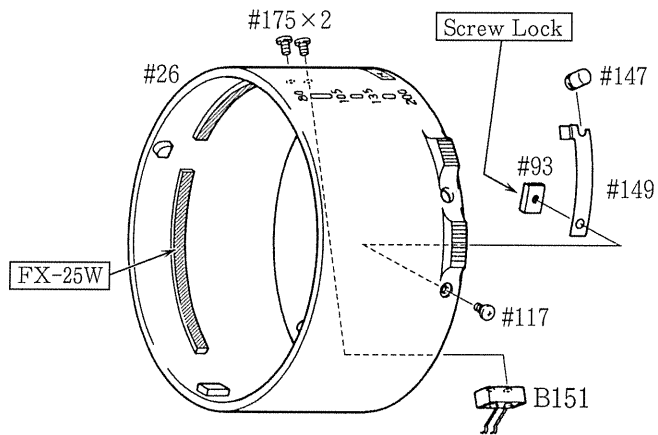
Note: Make sure that gear #86 and clutch gear unit are positively interlocked.

 - ③ Secure screw #181 using Screw Lock.

GEAR COVER #77



A-M RING #26

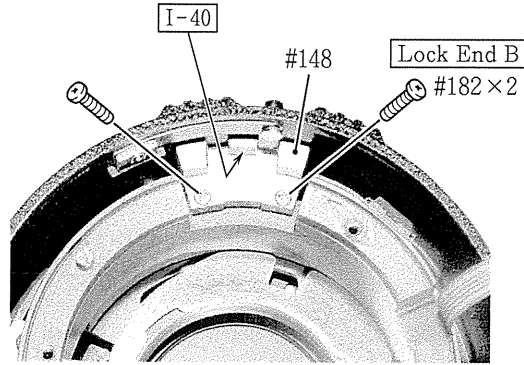


Note:

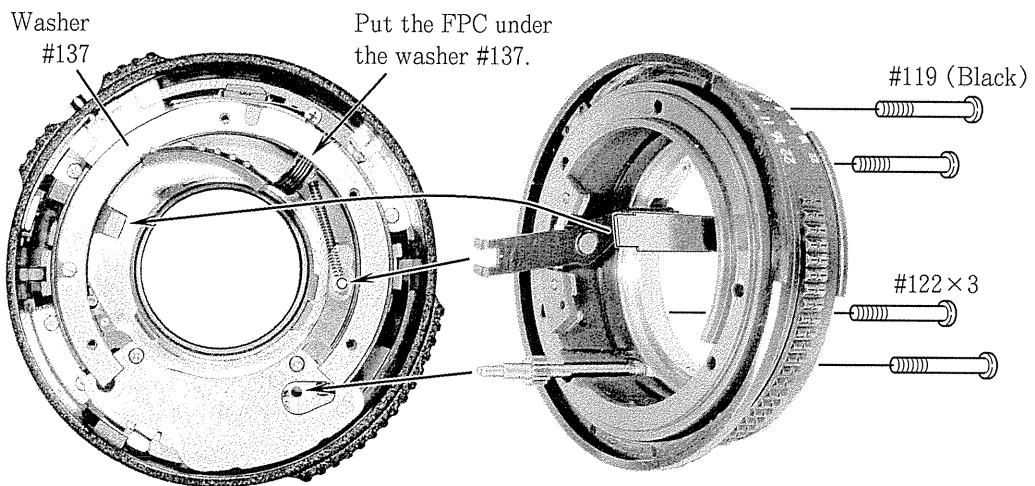
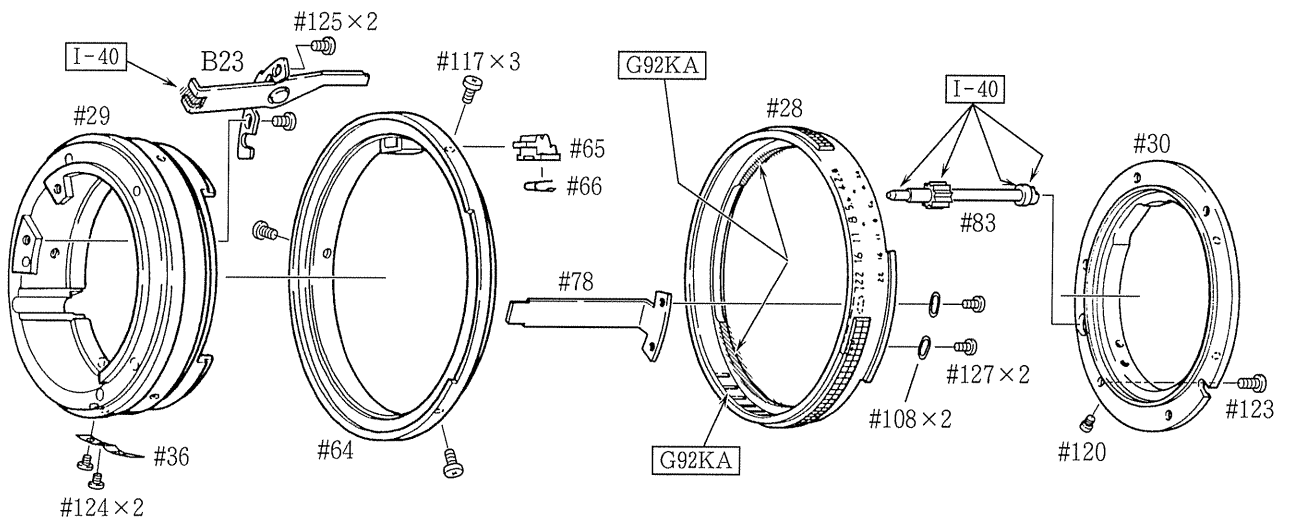
- ① Do not bend brush B151 when installing the A-M ring.
- ② Install retaining plates #146×3 with the flash surface facing upward.

Inspection: Rotate the A-M ring to check operation and A-M changeover operation.

A-M BLOCK #148



BAYONET MOUNT GROUP

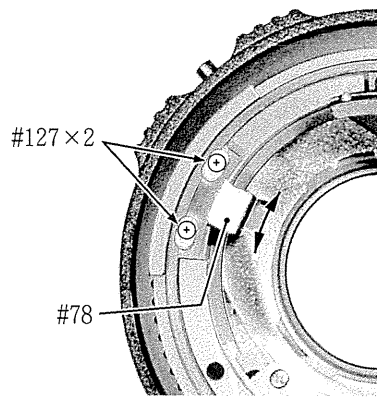


Note: If several #137 washers are to be used, insert thin washers between thick ones.

Inspection:

- ① Check operation of aperture by moving aperture lever and aperture ring.
- ② After setting the A-M ring to "A", rotate coupling gear #83 to check operation of

ADJUSTMENT OF APERTURE OPENING



- ① Remove the bayonet mount #30 only.
- ② Unfasten the screws #127×2 and adjust the aperture diameter by moving the lever #78.

Reference:

- (a) In the full aperture (f/2.8), let the aperture diameter be slightly larger than the inside diameter of B71 (28.5mm).
- (b) In the minimum aperture (f/22), the 3mm-rod should pass through the aperture diameter and the 4mm-rod should not pass through it.

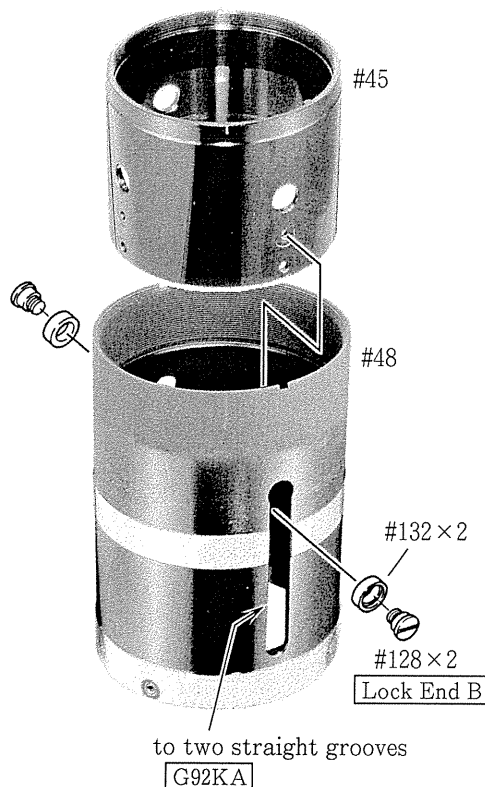
Inspection:

- (a) Check to see that the aperture diameter stays within allowable range when the aperture ring is moved forward and backward.
- (b) Check to see that the aperture diameter stays within allowable range when the aperture lever is 'snapped', (using your finger), or when not 'snapped'.

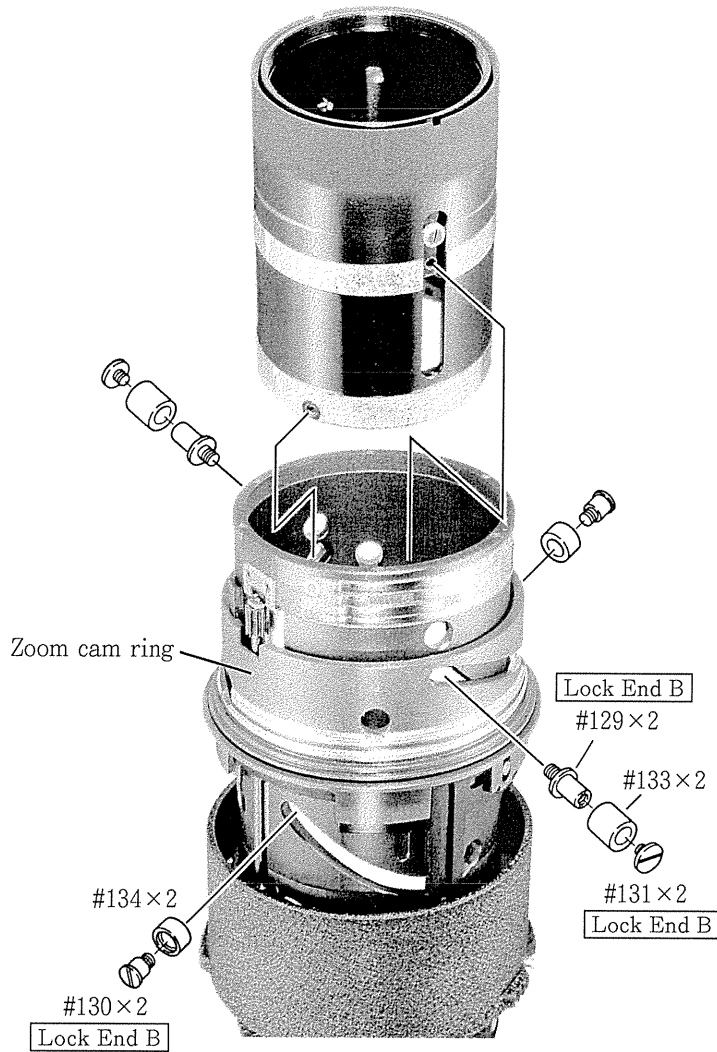
Aperture setting	Inscribed circle diameter (mm)	Tolerance (mm)
2.8	28.98	30.49 ~ 27.48
4	19.57	21.14 ~ 18.12
5.6	13.62	15.29 ~ 12.13
8	9.56	10.73 ~ 8.52
11	6.74	7.86 ~ 5.78
16	4.76	5.55 ~ 4.08
22	3.36	3.92 ~ 2.88

- ③ After adjustment, secure screws #127×2 using

LENS HOUSING DRIVIN RING #45 & #48

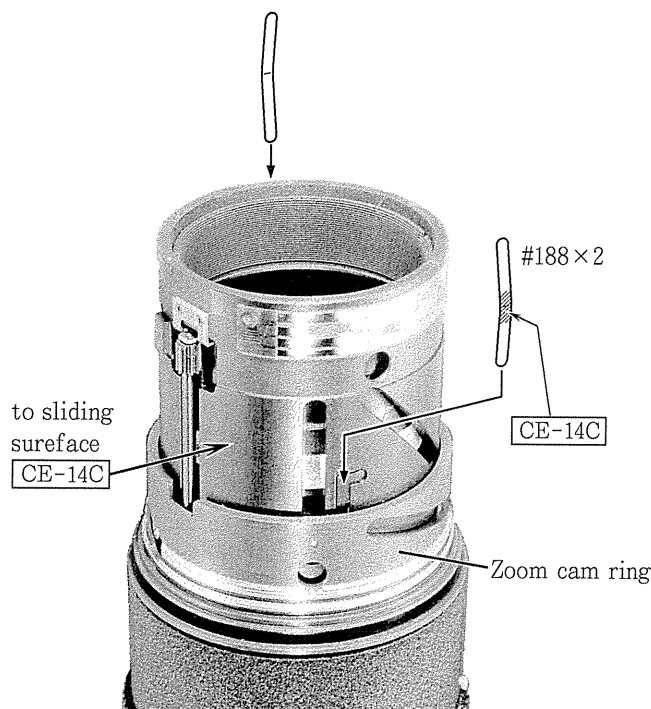


- Insert #45 into #48 and attach the guide rings at the optimum operating position.



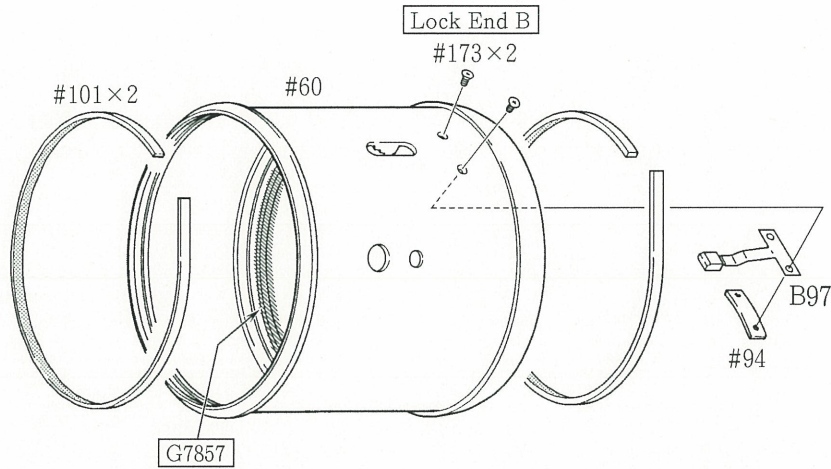
- Attach guide rings #130 and #134 in the first place. Then attach guide rings #129, #131, and #133 from the top of the zoom cam ring.


Inspection: Move the zoom cam ring vertically to check operation.



Inspection: Move the zoom cam ring vertically to check operation.

ZOOM/FOCUS RING #60



- Use tool  J11201 to mount retaining ring #61.

Note: There are two screw holes in the retaining ring #61. Insert one set screw into the screw hole in the ring in the portion other than "A".

Inspection: Move the zoom/focus ring to check operation.

*Be sure to make a mark the set screw using a $\phi 1.1$ drill.

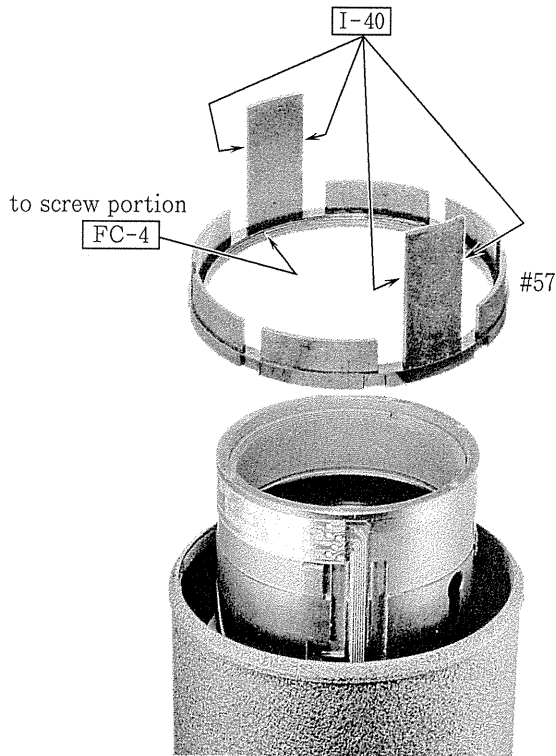
 ×1

Change page (差し替え)

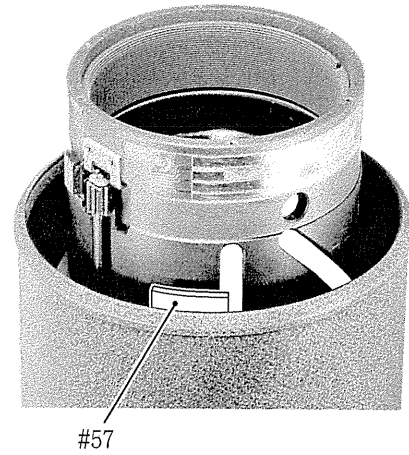


Feb. 28 1994

MANUAL FOCUS DRIVING RING #57

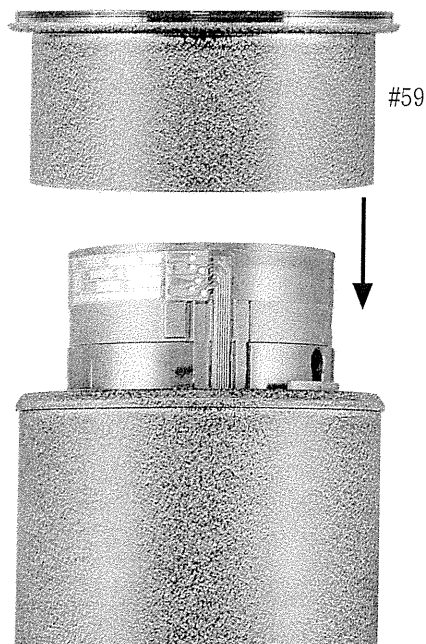


- ① Set the A-M ring to "A".
- ② Lightly screw in #57 as far as it will go.
Rotate the ring by approximately 270° (3/4 turn) reversely so that #57 comes to the position as shown in the picture below.



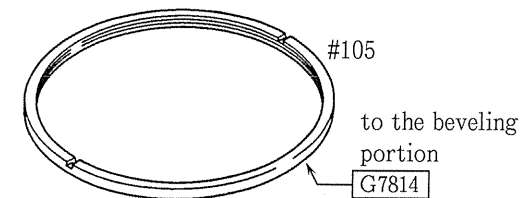
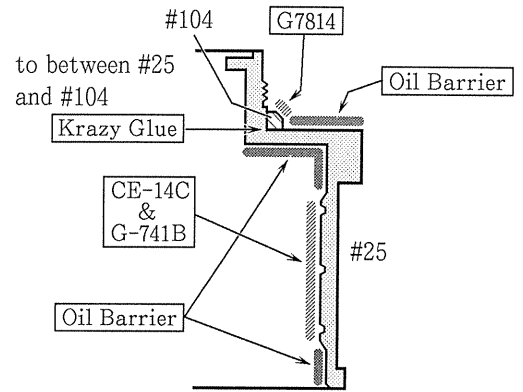
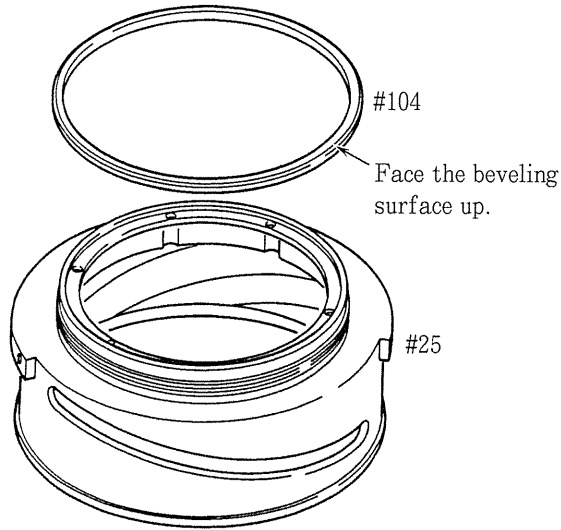
Note: Do not move #57 from the position as shown above until the front lens housing group has been mounted.

EXTERNAL RING #59

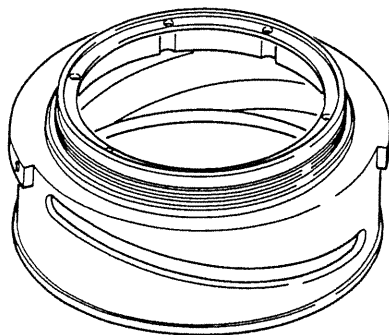
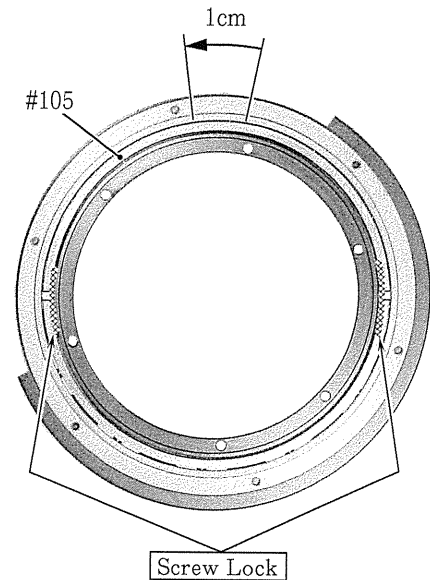
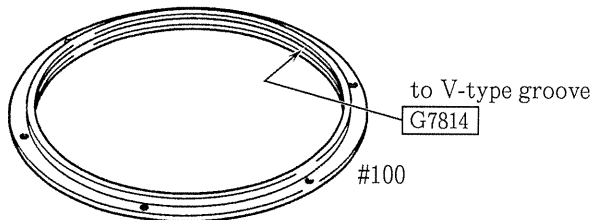
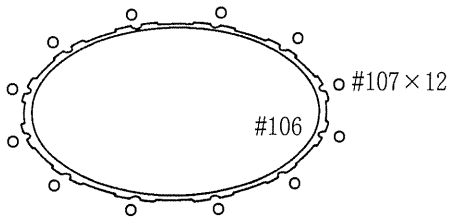


FRONT LENS HOUSING GROUP

1. Mounting ball bearing

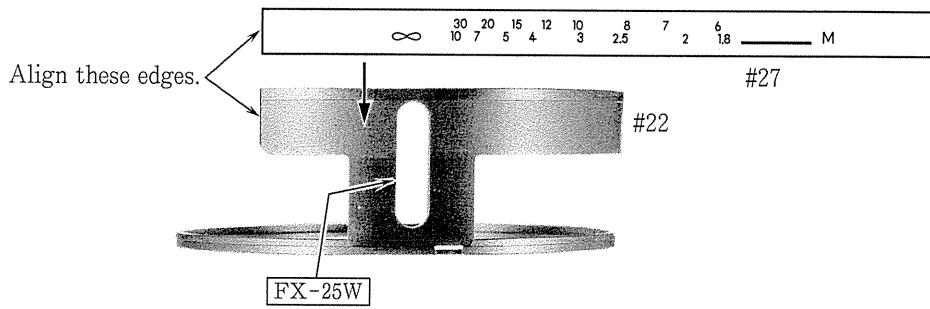


- Lightly screw in #105 as far as it will go. Rotate it by approximately 1cm (external circumference) reversely. (Refer to the picture below.)

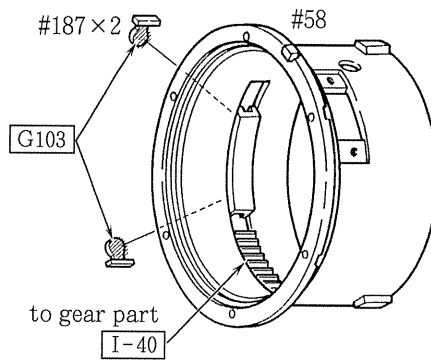


Inspection: Rotate #100 to check operation. After checking, secure #105 using Screw Lock.

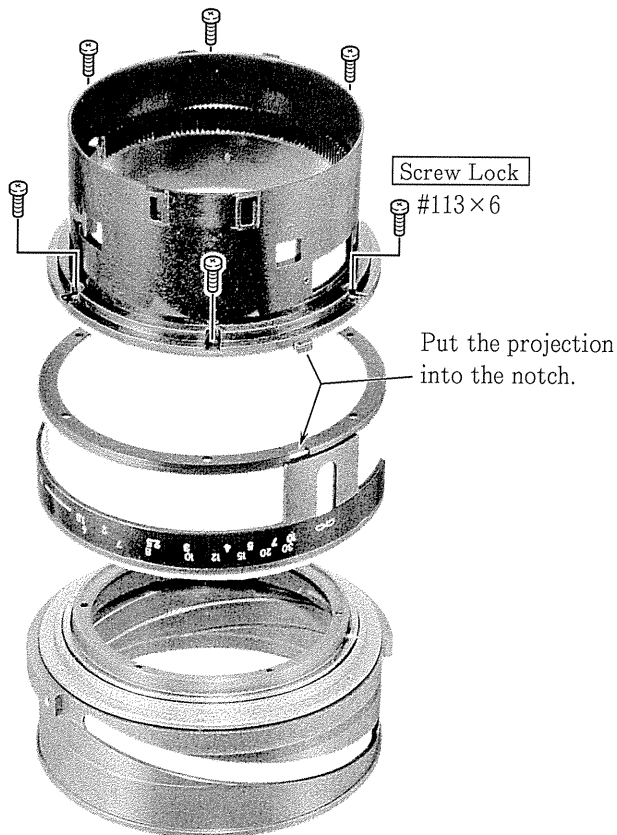
2. Attach the distance scale plate #27



3. Gear ring #58

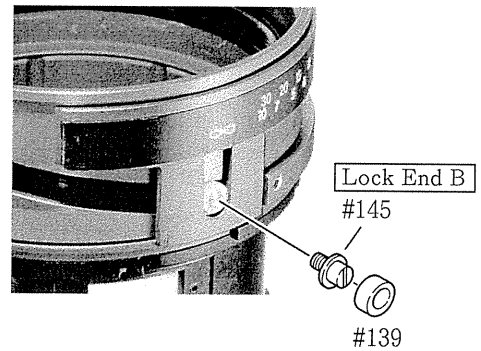
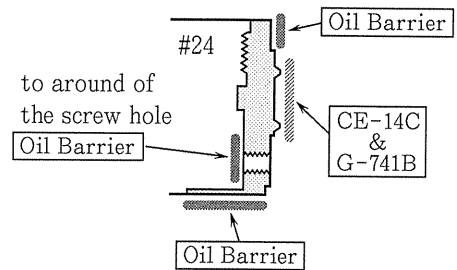
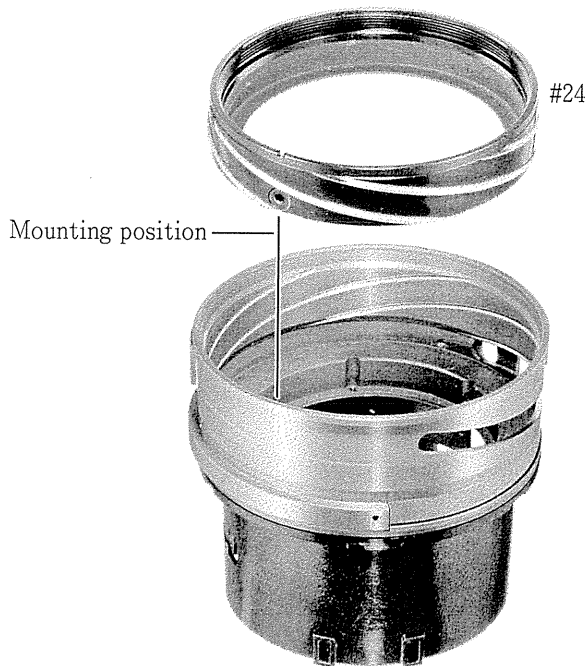


4. Assemble

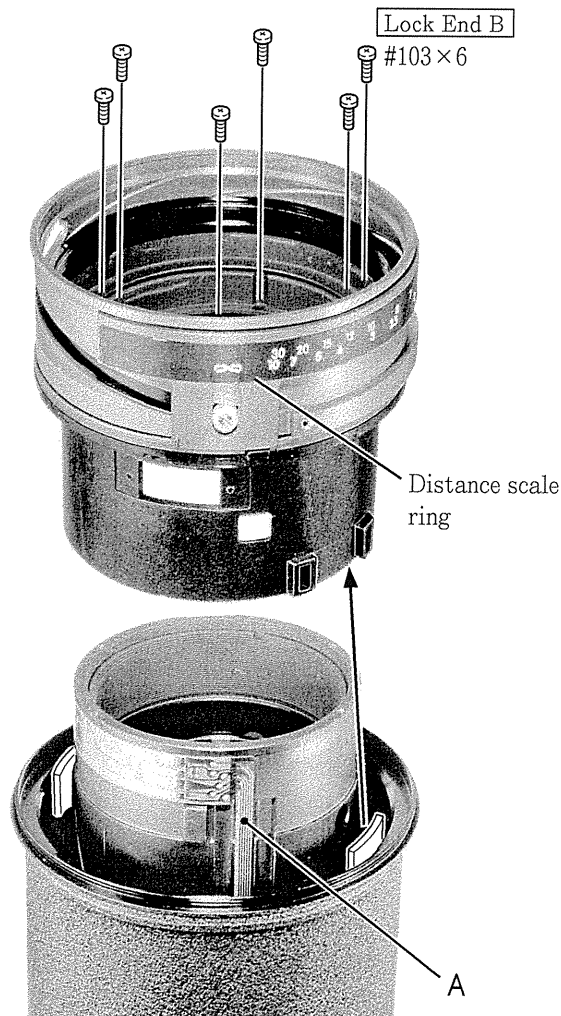


Inspection: Rotate the gear ring #58 to check operation.

5. Front lens driving ring #24



6. Mount the front lens housing group



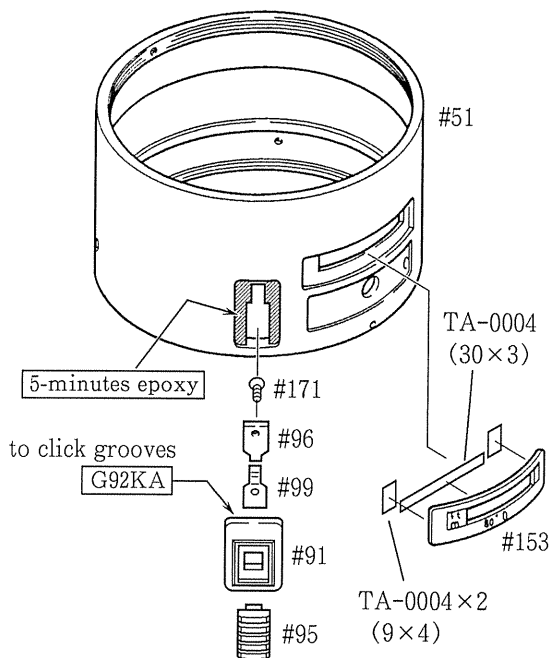
- Set the distance scale ring to the position as shown in the picture. And mount the front lens housing group.

Note:

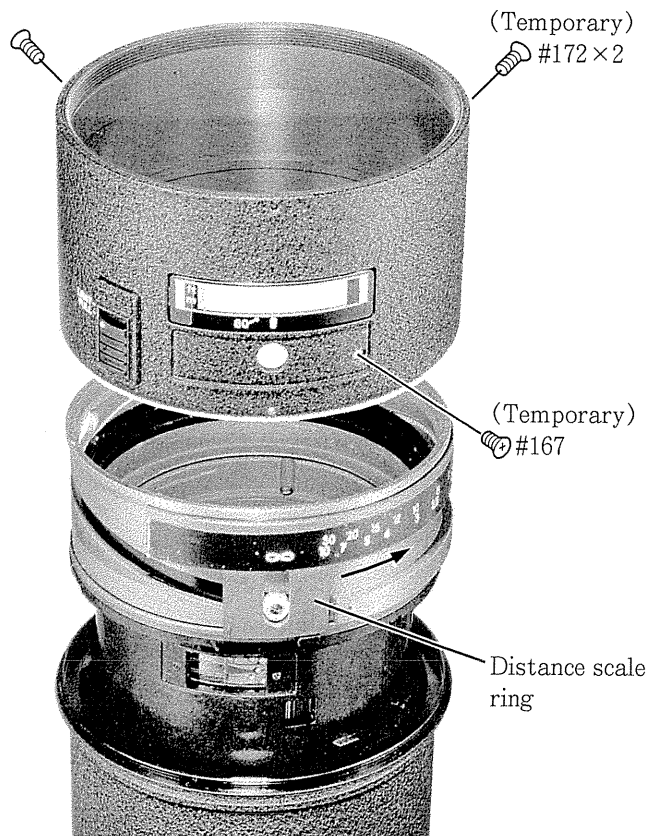
- ① Portion "A" on FPC should not lift off. If portion "A" lifts off, the front lens housing group might come into contact with the FPC with resulting damaging to the FPC.
- ② Do not apply grease to the FPC encoder when mounting the front lens housing group.

Inspection: Set the A-M ring to "M". And rotate the zoom/focus ring to check operation.

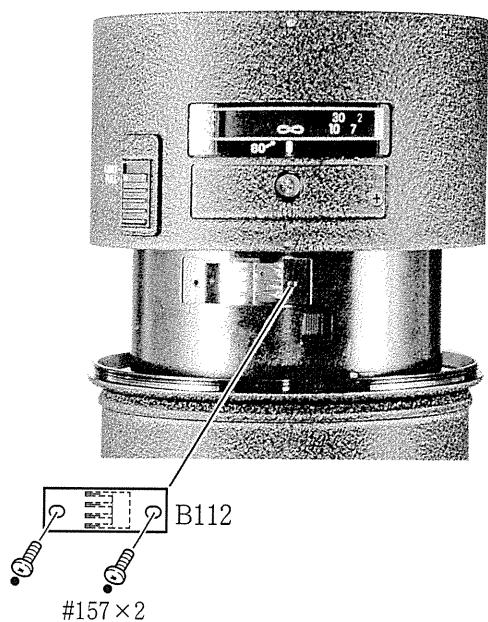
FOCUS RANGE RING #51



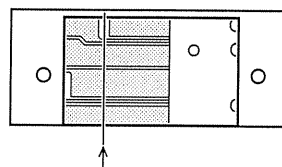
Note: Move the distance scale ring in the direction of the arrow since #96 might easily come into contact with the distance scale causing damage during mounting.



DISTANCE BRUSH B112



- Adjusting distance brush position
 - ① Set the index to the ∞ (infinity) mark.
 - ② Attach the distance brush B112 with screws #157x2 so that the distance brush comes into contact with the line, as shown in the figure below, when in the above state.



Make sure that the distance brush makes positive contact with the line.

- ③ Secure screws #157x2 using Screw Lock.

INSPECTION OF LENS DATA AND ENCODER SIGNAL

*Use an F90 camera body and checking & adjustment program for F90/N90 to display lens data and encoder signal on the computer monitor when making an inspection.

Inspection method

1. Screw external ring #59 (refer to page 41) into the focus range ring.
2. Start the checking & adjustment program for F90/N90 and select "E. Checking of AF lens communication". Make inspection according to instructions as shown on the display.

3. Lens data

Lens data should be as described below even when the zoom and distance scale are at any positions.

- ID number of the lens : 2 4
- CPU version of the lens: 1 a

4. Encoder signal

Encoder signal should be as described in the table below when the zoom and distance scale are set to specified positions. Encoder signal 3 and blanks are excluded for inspection.

(1) When A-M ring is set to "M":

Zoom position Distance scale position	f = 8 0 mm		f = 1 0 5 mm		f = 2 0 0 mm	
	80		105 Center of the number "105".		200	
	Encoder signal		Encoder signal		Encoder signal	
	1	2	1	2	1	2
Most infinity position	1 9	c 2	7 9	c 2	c 9	c 2
∞					c 9	c 3
4 m					c f	c 3
Most close distance position					c c	c 2

: Adjusting position of zoom brush and distance brush.

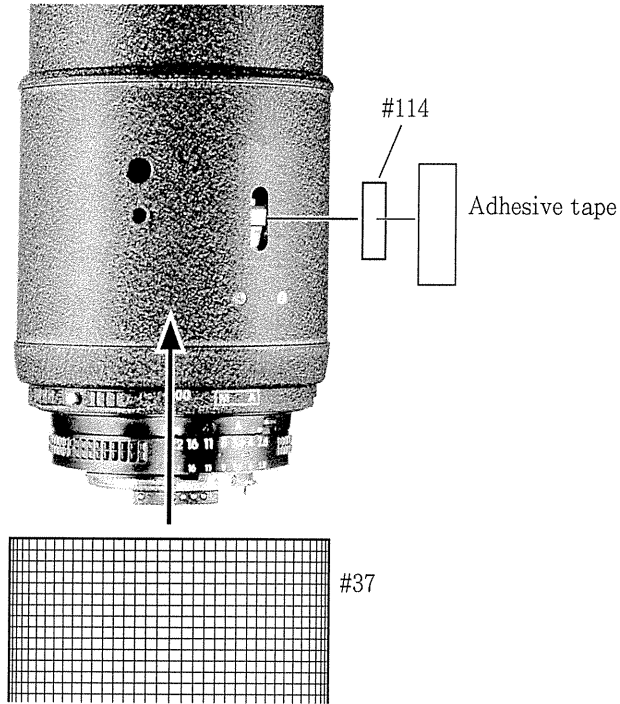
(2) When A-M ring is set to "A":

Zoom position Distance scale position	f = 8 0 mm		f = 1 0 5 mm		f = 2 0 0 mm	
	80		105 Center of the number "105".		200	
	Encoder signal		Encoder signal		Encoder signal	
	1	2	1	2	1	2
Most infinity position	1 9	d e	7 9	d e	c 9	d e

5. If lens data or encoder signal values are different from those shown in the table, following causes must be considered.

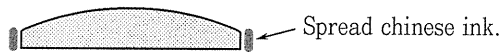
- (1) In case of lens data; Incorrect CPU is mounted on the FPC.
- (2) In case of encoder signal values; Encoder brush is mounted in the wrong position, brush or FPC is defective, encoder patterns on the FPC are contaminated, or the FPC is fixed in the wrong position.

RUBBER RING #37

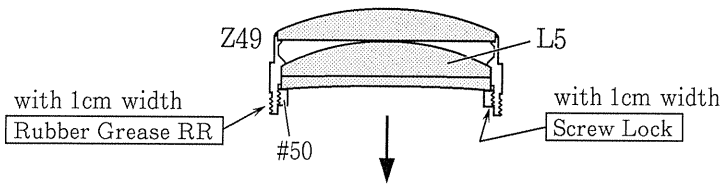


SPREAD CHINESE INK

- Spread chinese ink (black frosted ink) on the sides of L1, L2, L3, L4, G8 and G16 lenses.



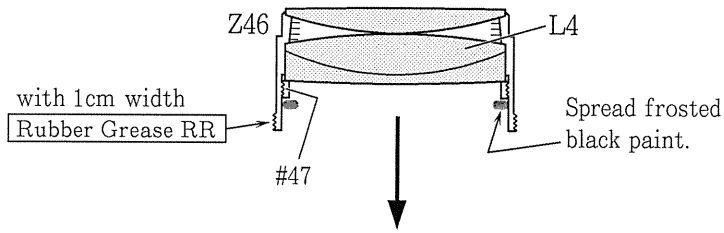
4th LENS GROUP



- Attach the 4th lens group using tool J11195B.



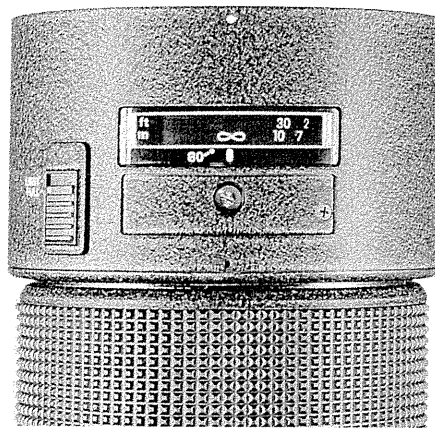
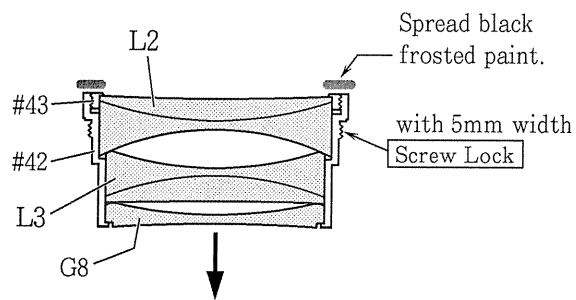
3rd LENS GROUP



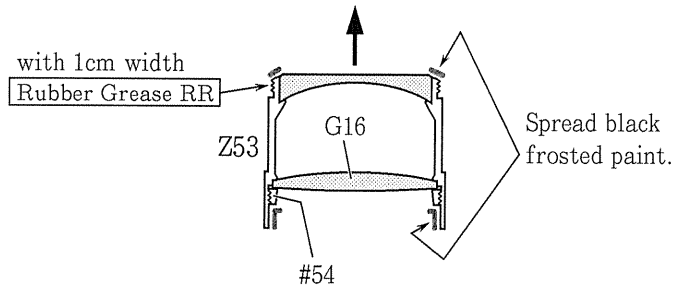
- Attach the 3rd lens group using tool J11195A.



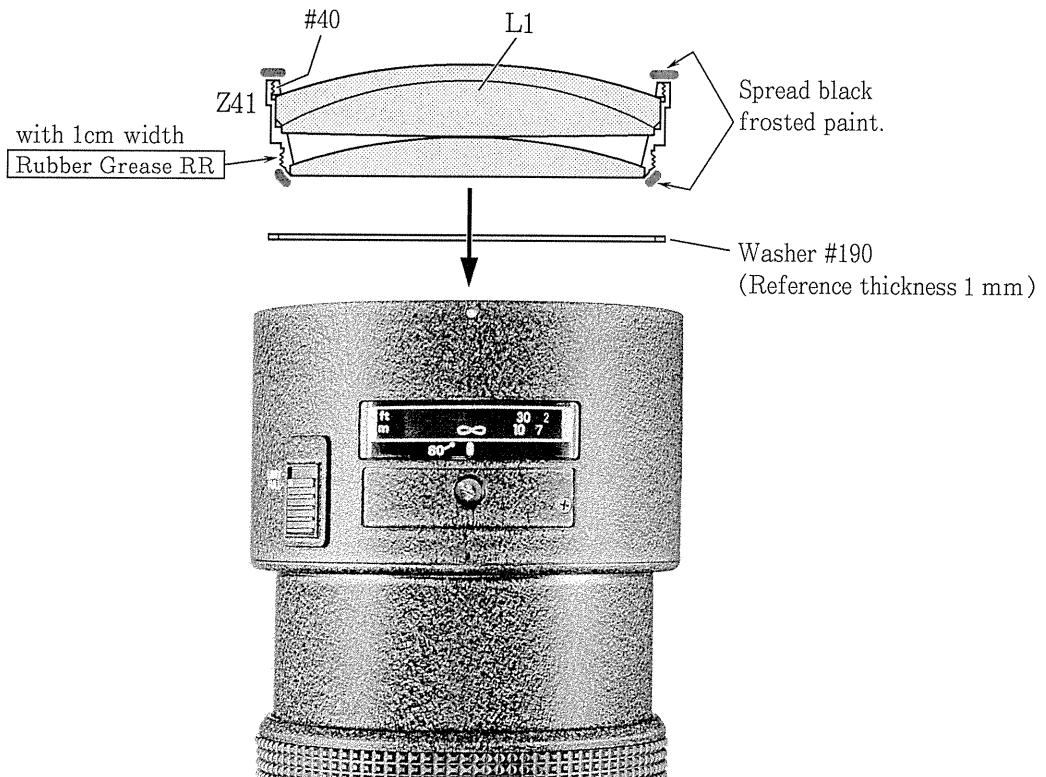
2nd LENS GROUP



REAR LENS GROUP



FRONT LENS GROUP



ADJUSTMENT AT BOTH ENDS OF FOCAL LENGHT

- ① Set the index to the ∞ (infinity) mark. Set the aperture to f/2.8.
- ② Read out the values at both Wide (f=80mm) and Tele (f=200mm) sides.

Note: The index and the ∞ (infinity) mark should align exactly.

- ③ Calculate the following equation.

$$\frac{T - W}{2.08} = A$$

where

T: Tele side value (mm)

W: Wide side value (mm)

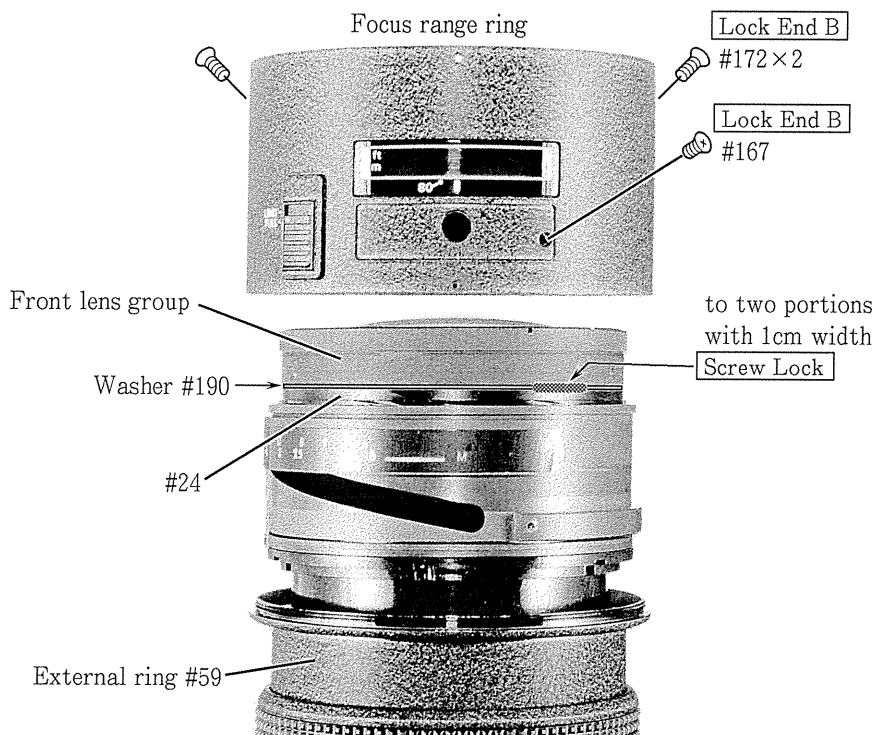
A: Adjusted amount of washer #190 (mm)

- ④ Adjust the thickness of washer #190 by the amount of value “A” obtained from the above equation. If the value is positive, decrease the thickness of the washer by that value and if it is negative, increase the thickness by that value.

Note: Insert a thin washer between thick washers.

- ⑤ Mount the front lens group and washer #190. And confirm that the difference between Wide and Tele side values is within 0.15mm.

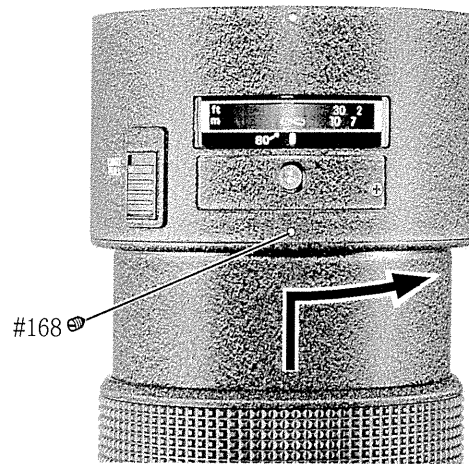
- ⑥ Remove external ring #59 from the focus range ring. Next remove the focus range ring. Check to see if washer #190 is securely inserted between the front lens group and #24. After confirmation, secure the front lens group and washer #190 using ScrewLock. (Refer to the picture below.)



- ⑦ Mount the focus range ring. Make sure to apply Lock End B to screws #167 and #172x2.

Note: Take care not to damage the distance scale.

- ⑧ Screw external ring #59 in to the focus range ring, and attach set screw #168.



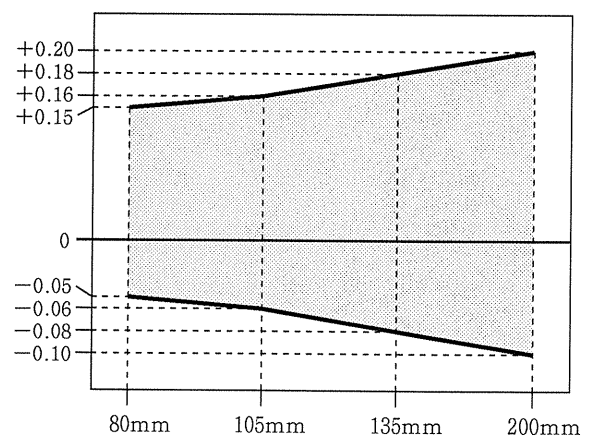
ADJUSTMENT OF SHIFT (BACK FOCUS)

- ① Set the zoom/focus ring to Wide ($f=80\text{mm}$).
- ② Set the index to the ∞ (infinity) mark and set the aperture to $f/2.8$, and read M.B.f value.
- ③ If the readout value is greater than the standard value, increase thickness of the washer #137 by the difference, decrease the thickness of the washer #137 by the difference if the readout value is smaller than the standard one.

Remove bayonet mount group to adjust the thickness of the washer #137. (Refer to page 37.)

- ④ Check to see that the value is within the standard value range.

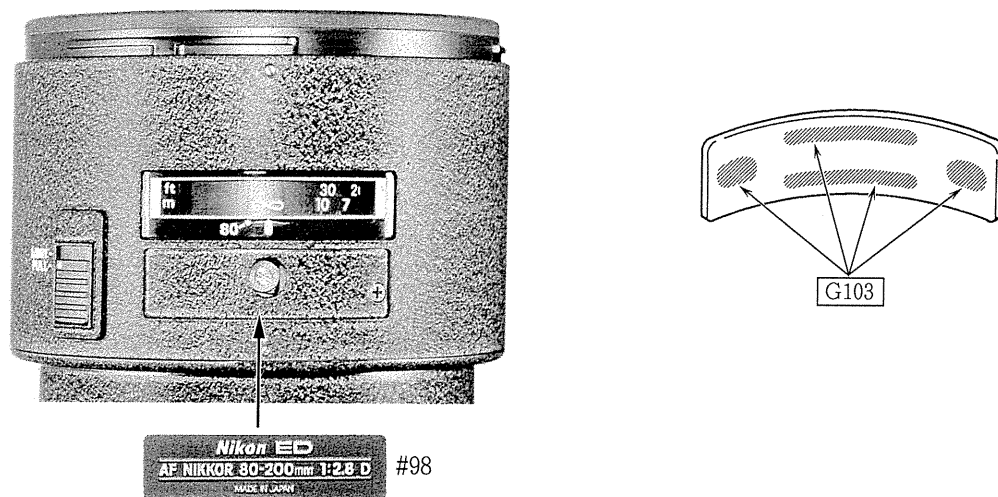
Focal length	Standard (mm)
80mm	-0.05 ~ +0.15
105mm	-0.06 ~ +0.16
135mm	-0.08 ~ +0.18
200mm	-0.10 ~ +0.20



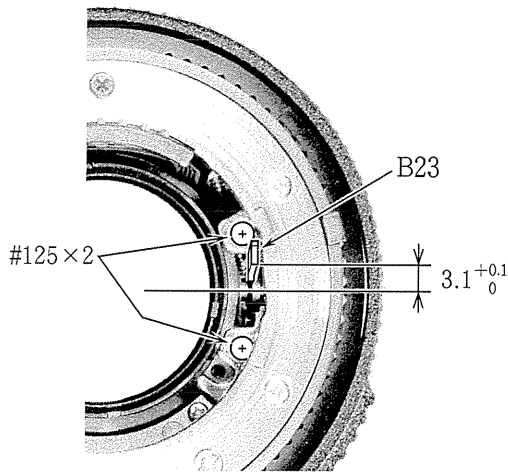
FILTER RING #38



NAME PLATE #98



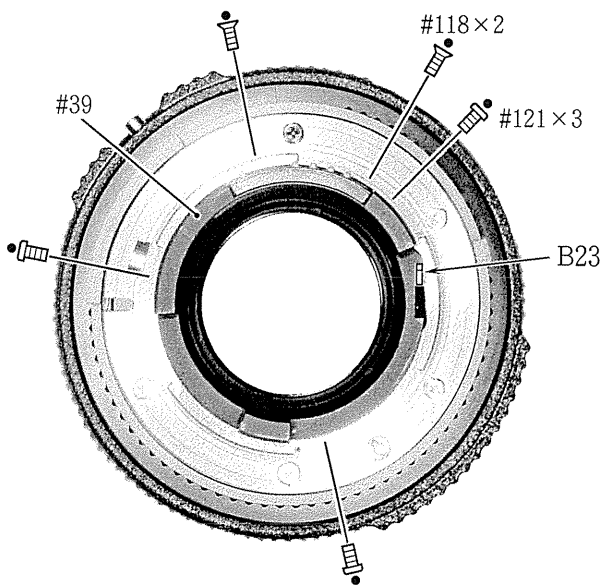
ADJUSTMENT OF APERTURE LEVER B23 POSITION



- Unfasten screws #125×2 to adjust the position of the aperture lever B23 so that it comes into the rated value of $3.1^{+0.1}_0$ to bring the aperture diameter within rated value at full aperture. Together with this, adjust the horizontal position so that it does not come in contact with the bayonet mount and rear cover ring. After adjustment, secure screws #125×2 using Screw Lock.

Reference: When adjusting the rated value of $3.1^{+0.1}$, set the aperture ring to f/2.8 and mount the tool J18004-1 on the bayonet mount. It becomes much easier to adjust if you mount the aperture lever B23 based on the groove of the tool as a reference.

REAR COVER RING #39



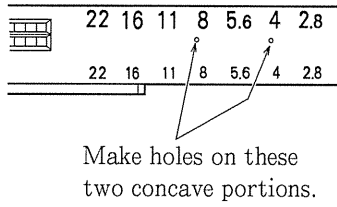
- Mount the rear cover ring #39 so that it becomes the full aperture stopper (the height of the aperture lever is $3.1^{+0.1}$ mm) of the aperture lever B23.

SPREAD BLACK PAINT



- Spread black gloss paint onto the heads of set screws #168 and #169.

ATTACHING METER COUPLING SHOE



- ① Remove the aperture ring #28.
- ② Make two holes $\phi 1.1\text{mm}$ in the concave portions of the aperture ring #28.
- ③ Attach the meter coupling shoe.

Meter coupling shoe	1K406-029	× 1
Screws	1K010-002-1	× 2

- ④ Assembling.



INSPECTION OF ENCODER SIGNAL

※ Use an F90 (N90) camera body and checking & adjustment programs for F90/N90 to display encoder signal on the computer monitor when making an inspection.

Inspection method

- Start the checking & adjustment programs for F90/N90 and select " E. Checking of AF lens communication ". 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.

*No. 400001~

● MF mode

Zoom ring \ Distance scale position	f = 80 mm			f = 105 mm			f = 200 mm		
	Encoder signal								
	1	2	3	1	2	3	1	2	3
Most infinity position	19h	C2h		79h	C2h		C9h	C2h	
Infinity position							C9h	C3h	
4 m							CFh	C3h	
Most close distance position							CCh	C2h	

● AF mode

Zoom ring \ Distance scale position	f = 80 mm			f = 105 mm			f = 200 mm		
	Encoder signal								
	1	2	3	1	2	3	1	2	3
Most infinity position	19h	DEh		79h	DEh		C9h	DEh	

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

