

# **REPAIR MANUAL AND PARTS LIST**

**INTERCHANGEABLE LENS FOR ST701, ST801, ST901**

**EBC FUJINON—W 3.5/19mm**



**FUJI PHOTO FILM CO., LTD.**

26-30, Nishiazabu 2-chome, Minato-ku, Tokyo 106, Japan

# I N D E X

## I DISASSEMBLY

1. Mount ring .....	1
2. Aperture/helicoid assembly .....	1
2.1 Aperture assembly .....	1
2.2 Helicoid assembly .....	1

## II REPAIR AND ADJUSTMENT

1. Adjustment of flangeback .....	3
2. Aperture .....	5
2.1 Adjustment .....	5
2.2 Adjustment of time lag .....	7
2.3 Height and resistance of pin .....	7
2.4 Aperture blades jammed with oil .....	7
2.5 Aperture seat .....	9
3. Helicoid .....	11
4. Aperture selector ring .....	13
5. Aperture transmission pin .....	13

III PART LIST .....	16
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## I. DISASSEMBLY

### 1. Mount ring

- a. Remove three screws (89), and remove the mount ring assembly (51).
- b. Remove ring (91), and remove aperture selector ring (90).
- c. Remove two pins (88), and remove cam ring (82).
- d. Remove E-clip (52), and take out the component parts.

### 2. Aperture/helicoid assembly

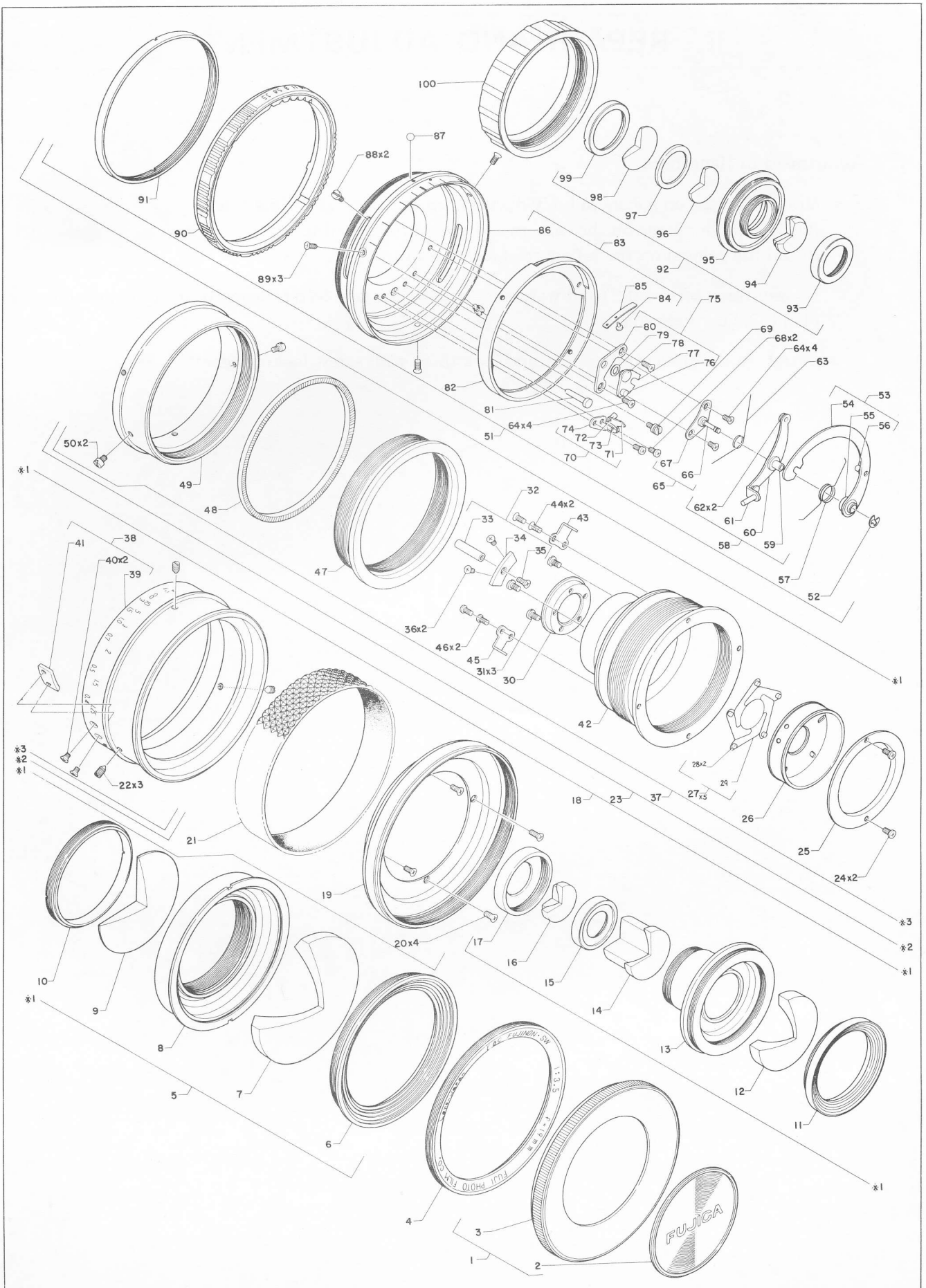
#### 2.1 Aperture assembly

- a. Remove name ring (4).
- b. Remove front lens assembly (5) and rear lens assembly (92).
- c. Remove three screws (89), and remove mount ring assembly (51).
- d. Remove two screws (36), and remove connecting plate (34).
- e. Remove two screws (24) and three screws (31), and remove components of the aperture assembly.

#### 2.2 Helicoid assembly (37)

- a. Remove the mount ring assembly (51) through steps 2.1-a, b and c above.
- b. Remove four screws (20), and remove filter ring (19).
- c. Remove rubber ring (21).
- d. Remove three screws (22), remove focusing ring (39), and remove component parts of the helicoid assembly (51).
- e. Remove component parts of the aperture assembly from male helicoid (42) through steps 2.1-d and e above.

Fig. 1

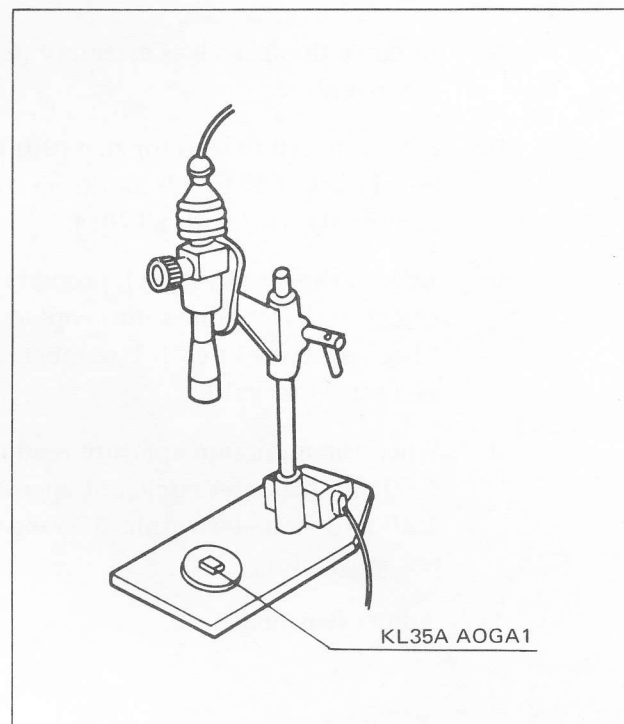


## II. REPAIR AND ADJUSTMENT

### 1. Adjustment of flangeback

- a. Mount the lens on a camera body having correct flangeback (45.45 mm).  
Install a cable release on the camera and set shutter speed to "B".  
Install the camera on the reflector of a lens tester.
- b. Loosen three screws (22) and watching focus in the lens tester, properly turn the helicoid ring (47) to adjust flangeback.
- c. Retighten the three screws (22), and lock them with screw locking agent.

Fig. 2



## 2. Aperture

### 2.1 Adjustment

- a. Remove the front lens assembly (5) and rear lens assembly (92) as described in I-2.1-a and b above.
- b. Set the aperture selector ring (90) to F22 (minimum aperture) in advance.  
Set the pin (81) to 5.9 mm from the flange surface by the use of a gauge (L52-GA2, commonly used with ST701).
- c. Loosen three screws (31), properly turn the ring (30), and adjust the minimum aperture (F22) so that it comes into contact with the circumference of a 1.40 mm diameter circle. Check aperture at each F number and see if it is within the permissible range by the use of a scaled magnifier.
- d. When the minimum aperture is adjusted and it is in contact with the circumference of a 1.40 mm diameter circle but aperture at other F number is unsatisfactory, adjust the 1.40 mm diameter within the range permitted for F22 so that apertures at all F numbers are satisfactory.
- f. Adjust flangeback.

Fig. 3

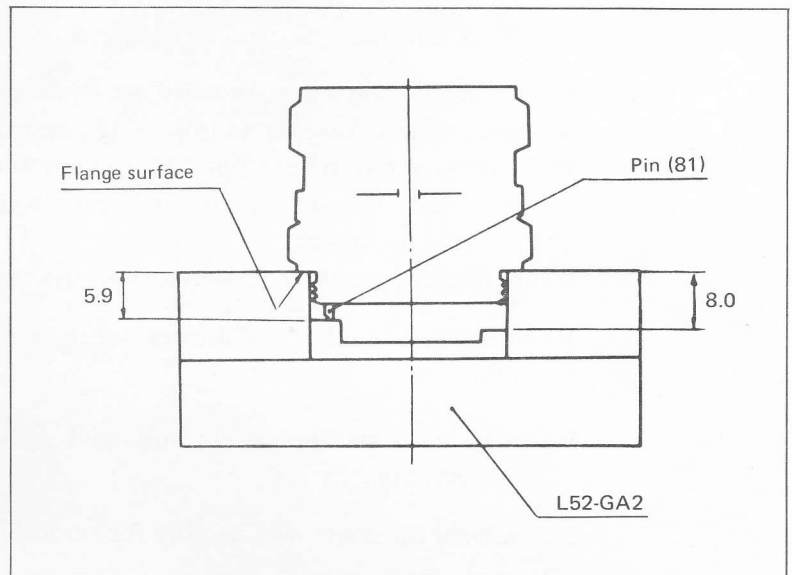


Fig. 4

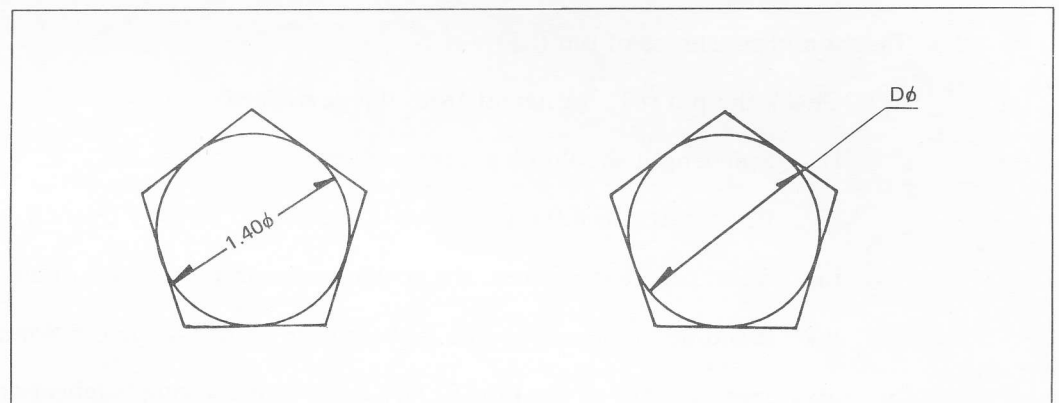


Fig. 5

F NO.	Permissible diameter range
5 · 6	4.96 – 6.25
8	3.47 – 4.37
11	2.48 – 3.12
16	1.74 – 2.19
22	1.25 – 1.57

When aperture is F3.5, the opening should be a true circle (circle of the lens barrel fitting), and no aperture blade should be seen in the circle.



## 2.2 Adjustment of time lag

- a. Mount the lens on a camera body, set shutter speed to 1/1,000 at the camera body, set the aperture selector ring and focusing ring respectively to F22 and minimum distance at the lens, watch the portion "A" and aperture on a straight line as seen in Fig. 6, release the shutter, and see if the first blind begins to run after the aperture is stopped down to the minimum.  
Insure that the aperture observed from the "B" side is the same as "A" side.
- b. When the first blind of the shutter begins to run before the aperture is stopped down to the minimum:
  - b-1 Check the series of levers employed in the mount ring assembly (51) for their operations.
  - b-2 Check the aperture assembly for smoothness of operation.
- c. When corrective actions are taken as the result of checkings described in 2.2-b above, adjust aperture and flangeback as described in II-1 and II-2-2.1 above.

## 2.3 Height and resistance of pin (81)

- a. Check the pin (81) for height from flange surface.
  - i) Free length should be 8.2 mm or less.
  - ii) When height is 8.0 mm, the aperture should be fully opened.
  - iii) When height is 5.9 mm, the aperture should be stopped down to the minimum.
  - iv) It should be possible to push the pin down to less than 5.8 mm.
- b. Measure resistance of the pin (81) by the use of a spring balancer and insure that:
  - i) It is 300 grams or less when turning the aperture selector ring to F3.5.
  - ii) It is 100 grams or less when turning the aperture selector ring to F22.

## 2.4 Aperture blades jammed with oil

- a. Remove the aperture blade assembly (27) as described in I-2.1 above.
- b. Thoroughly clean all the disassembled parts of the aperture assembly with perchloroethylene. In addition, wipe inner wall of the male helicoid (42) to which the parts of the aperture assembly are fitted with a piece of cloth or paper impregnated with perchloroethylene.
- c. Adjust aperture and flangeback as described in II-1 and II-2-2.1 above.

Fig. 6

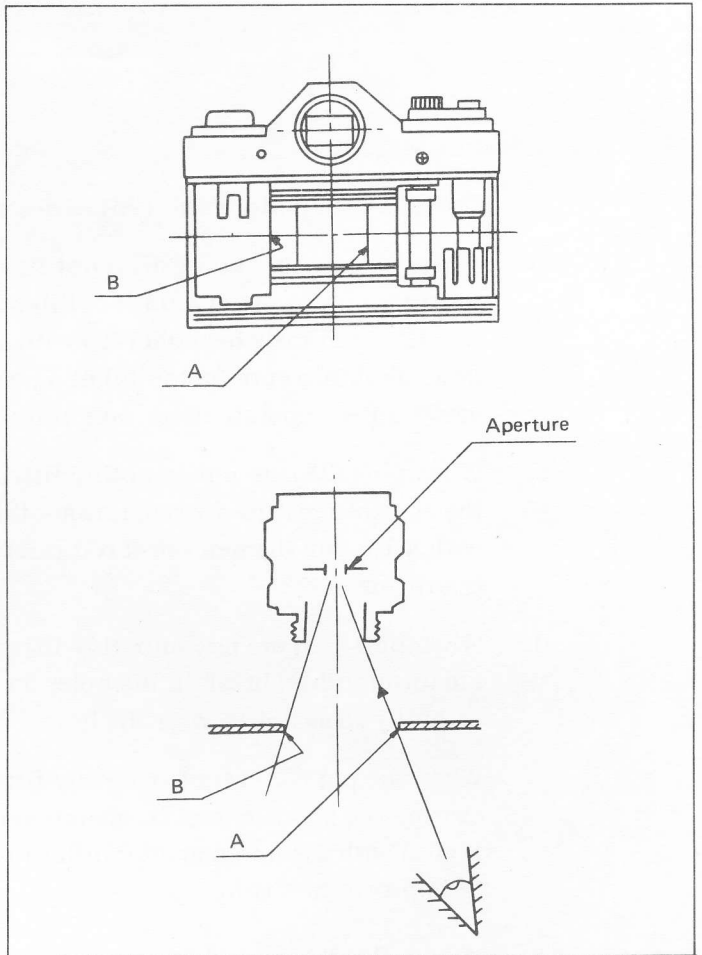
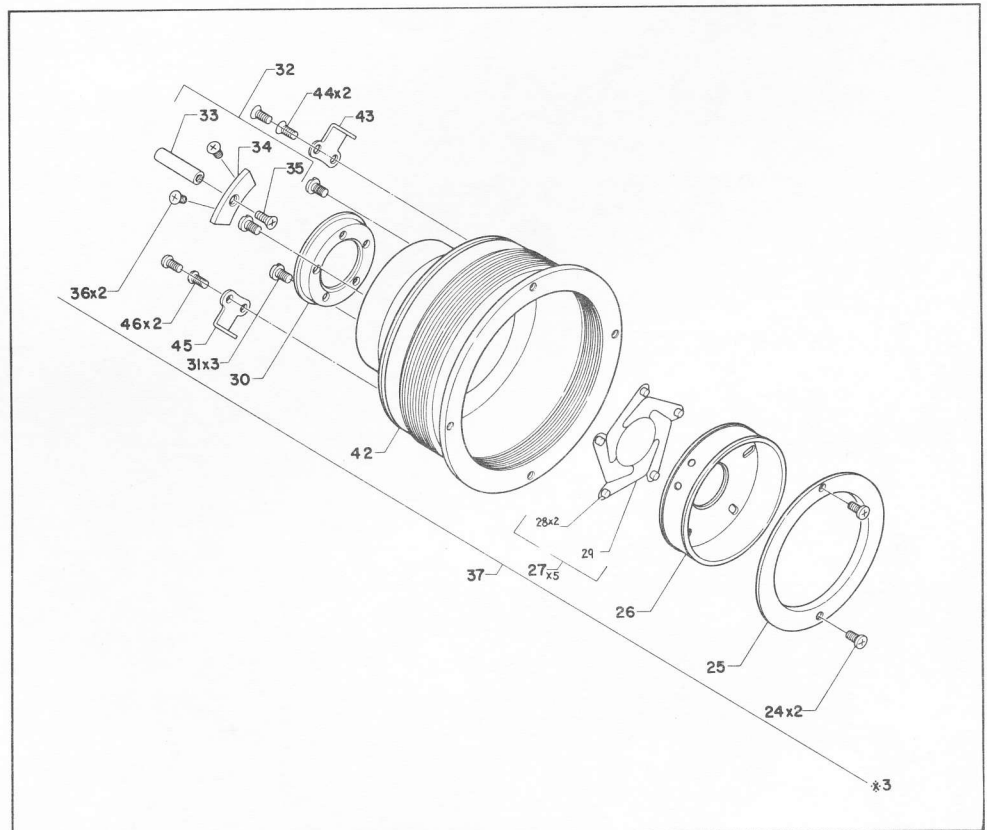


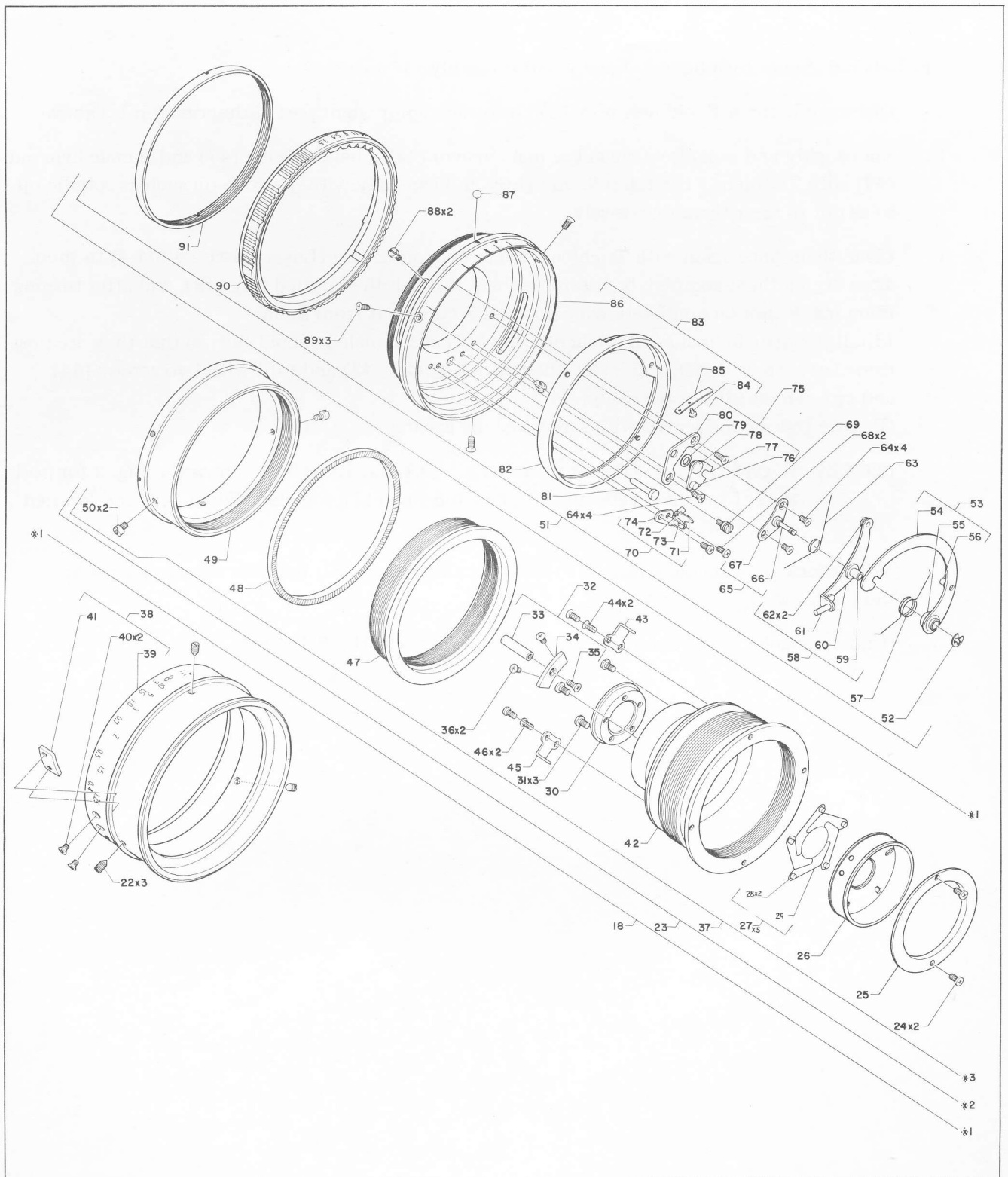
Fig. 7



## 2.5 Aperture seat (26)

- a. Remove the aperture seat (26) as described in I-2-2.1 above.
- b. When the aperture seat (26) is not fitted smoothly to the male helicoid (42), causing the aperture seat to operate unsmoothly, thoroughly clean the sliding surfaces of the aperture seat (26) and male helicoid (42) with a piece of cloth or paper impregnated with ether or alcohol, rub core (graphite) of a pencil against the surfaces, slide them each other many times, separate them, and blow out particles of the pencil core with a blower.
- c. When pins (28) are not smoothly fitted into the grooves on the aperture seat (26), causing the aperture seat to operate unsmoothly, break-in the grooves on the aperture seat (26) with a 1.5 mm diameter drill rod carefully so as not to wear them excessively, to improve the fitting.
- d. When pins (28) are not smoothly fitted to the ring (30), causing the aperture seat to operate unsmoothly, break-in the holes on the ring (30) with a 1.5 mm diameter drill rod carefully so as not to wear the holes excessively, to improve the fitting.
- e. When the pin (33) is not smoothly fitted into the groove on the rotary lever II (54), causing the aperture seat to operate unsmoothly, break-in the groove on the rotary lever II (54) with a 2 mm diameter drill rod carefully so as not to wear the groove excessively, to improve the fitting.
- f. Adjust flangeback and aperture.

Fig. 8



### 3. Helicoid

The helicoid should turn lightly, equally and smoothly. If not;

- a. Disassemble the helicoid assembly (37) into each component part as described in I-3 above.
- b. Thoroughly and separately clean the male helicoid (42), helicoid ring (47) and female helicoid (49) with Trichlene. Next, lap them lightly and carefully with machine oil such as spindle oil so as not to wear them excessively.
- c. Clean them once again with Trichlene, apply helicoid grease (Losoid grease 6304-4) to them after drying them completely, assemble them through the knurled ring (48), and after turning them many times, completely wipe out grease come out from them.

Install the male helicoid (42), helicoid ring (47) and female helicoid (49) so that they are positioned as seen in Fig. 9, and install the helicoid guides (43) and (45) with two screws (44) and two screws (46) respectively.

(Be sure to lock the screws with screw locking agent.)

(NOTE) Regard the installation tolerances  $1.5 \pm 0.1$  and  $19.5 \pm 0.375$  shown in Fig. 9 for position of the male helicoid (42), helicoid ring (47), female helicoid (49) and knurled ring (48).

Now, check the helicoid guides (43) and (45) and screws (50) for their relative positions shown in Fig. 9.

- d. Adjust flangeback and aperture as described in II-1 and II-2-2.1 above.

Fig. 9

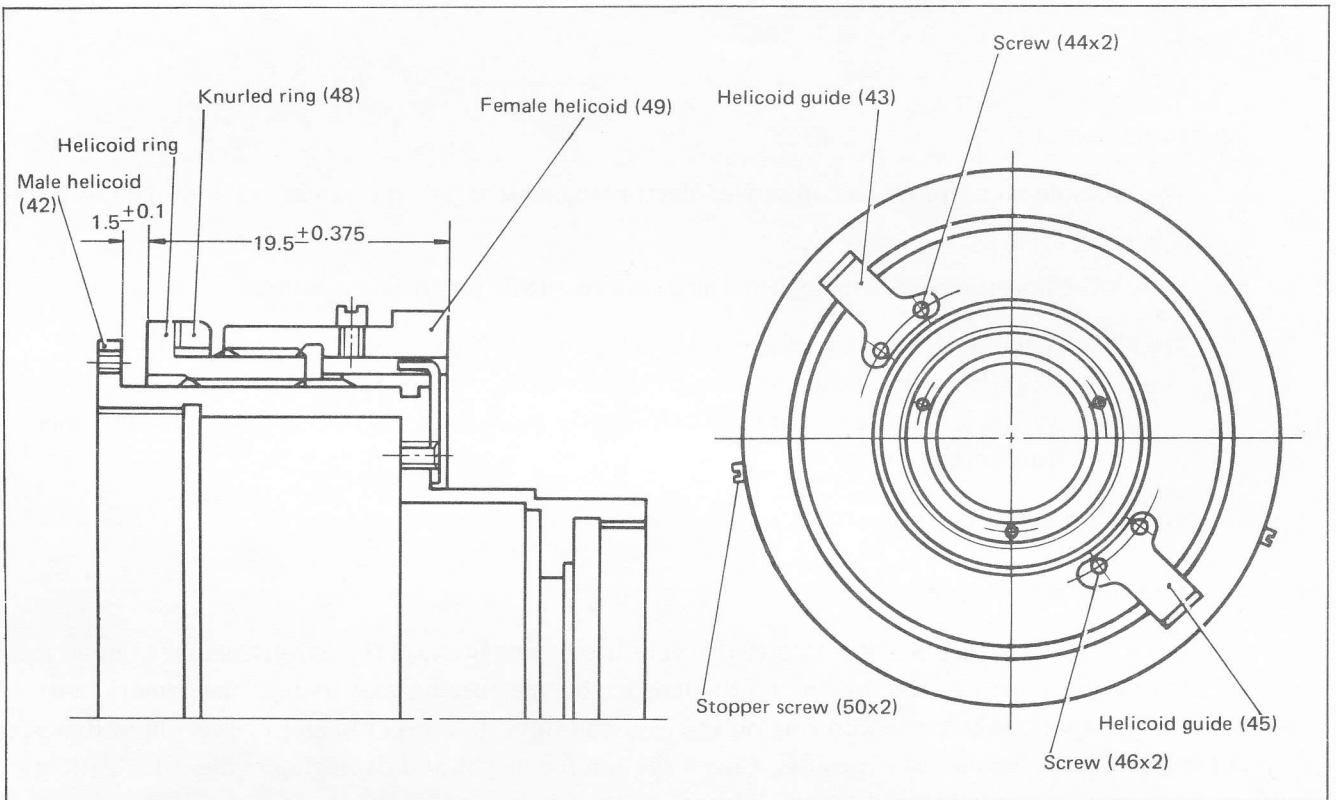
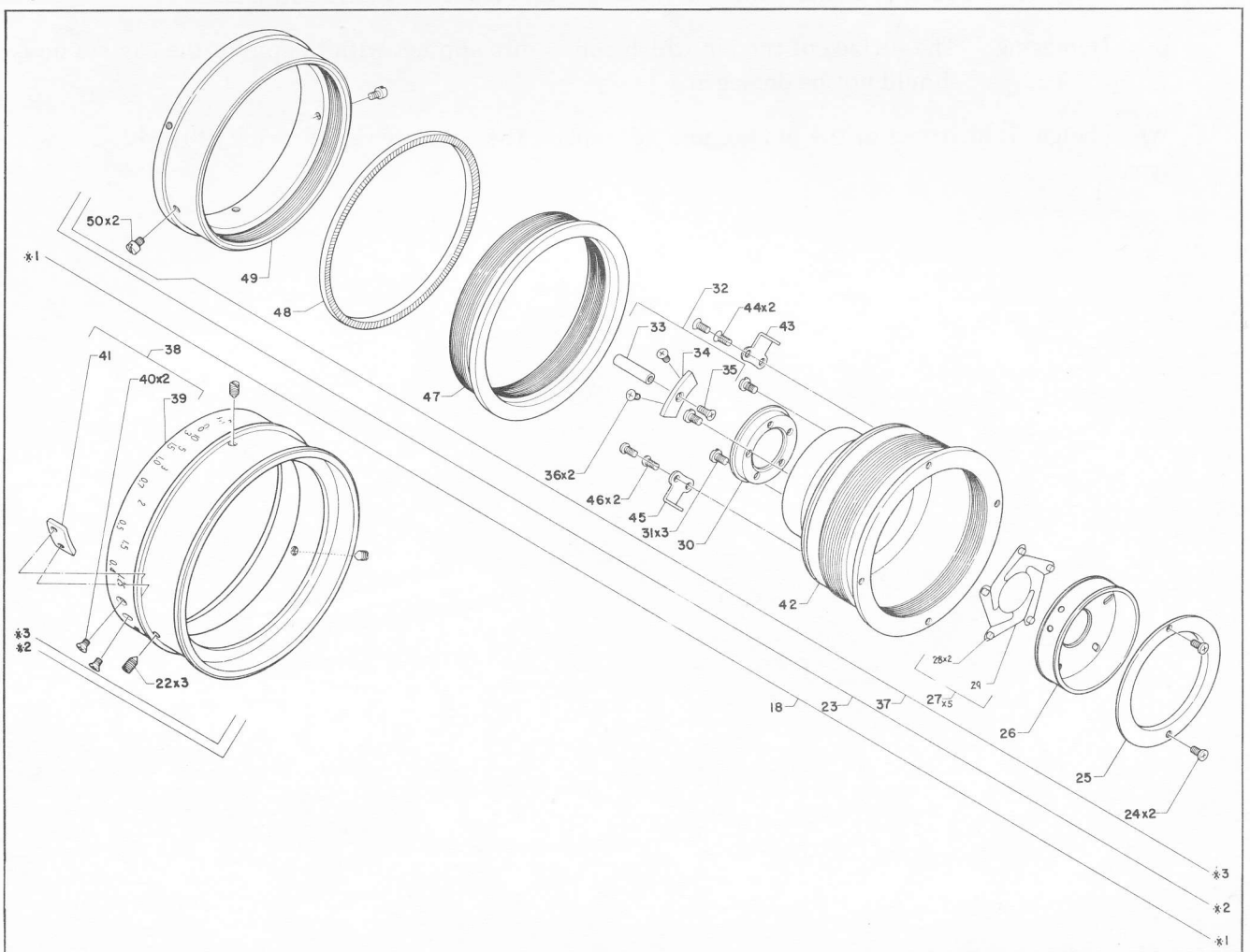


Fig. 10



#### 4. Aperture selector ring

- a. Disassemble and remove the aperture selector ring (90) and cam ring (82) as described in I-1-a, b and c above.

- b. Check the aperture selector ring (90) and cam ring (82) for their conditions.

(NOTE) When reassembling the aperture selector ring (90), apply Losoid grease (5019) slightly to the sliding portion of the aperture selector ring (90). Apply Losoid grease to V-groove (for clicking) slightly more than the sliding portion of the aperture selector ring.

- c. Adjust flangeback and aperture.

#### 5. Aperture transmission pin

This pin (on the aperture selector ring (9)) is very important because this pin transmits an aperture selected by the aperture selector ring on the lens to the aperture resistor built in the camera body through the aperture transmission ring on the camera body. In correct height of this pin or damaged pin may cause an erroneous exposure. Check the pin for height and damaging as described below.

- a. Height: Should be within range of 0.4 to 0.6 mm from the flange surface.
- b. Damaging: The surface of the pin which comes into contact with the pin of the camera body should not be damaged.

When height is incorrect or the pin is damaged, replace the aperture selector ring (90) with a new one.



Fig. 11

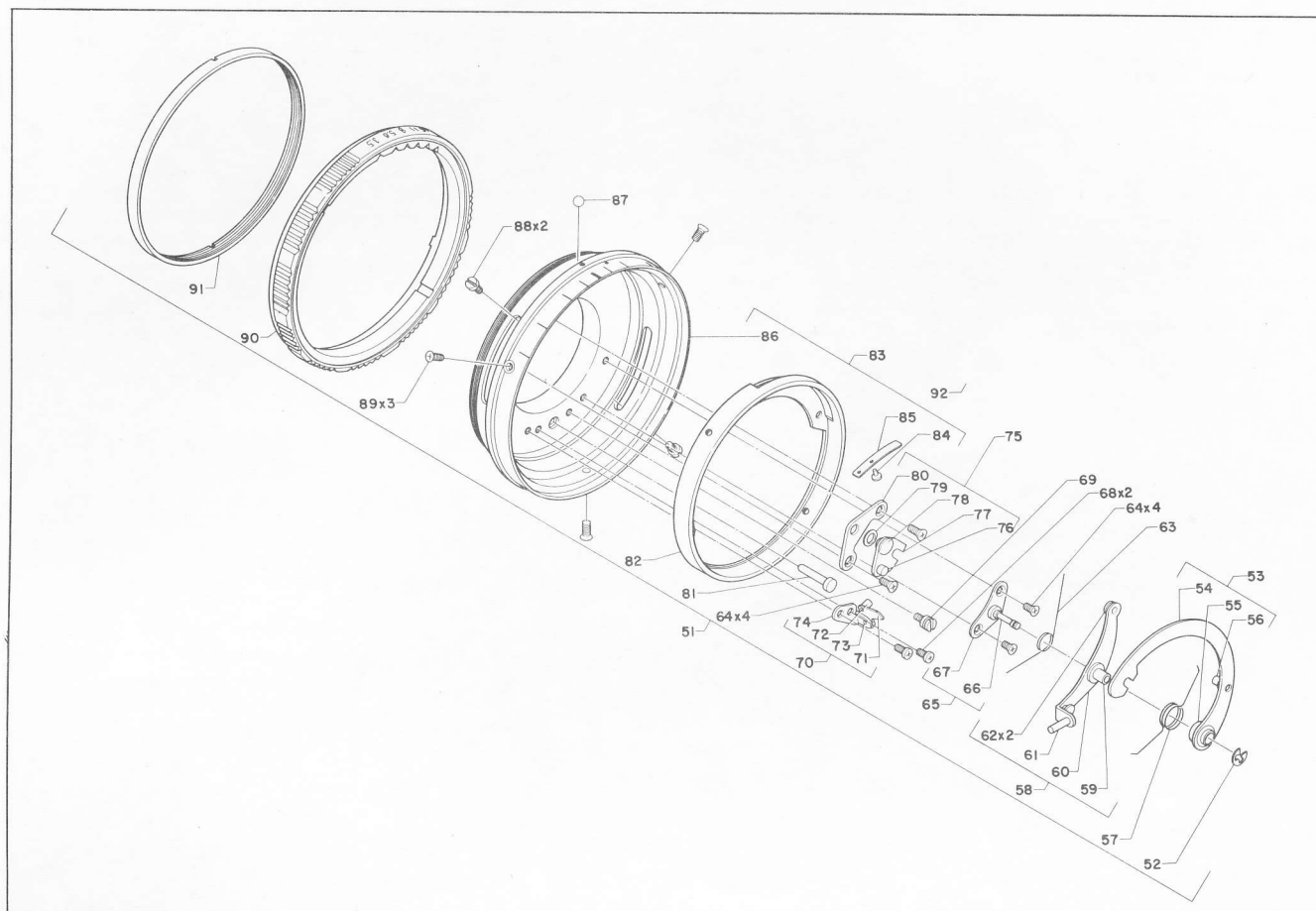


Fig. 12

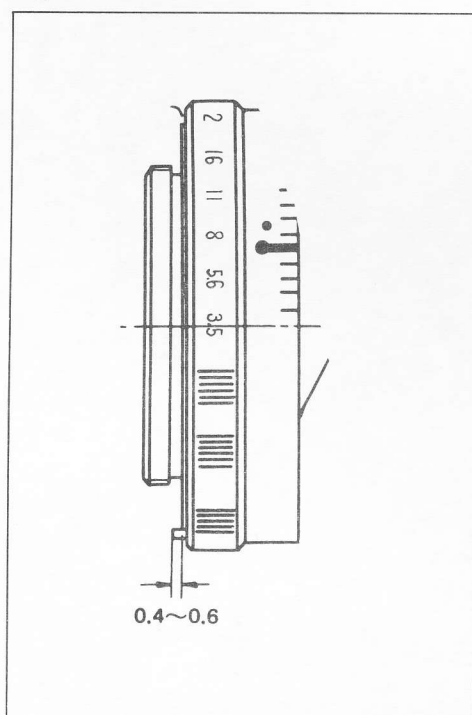
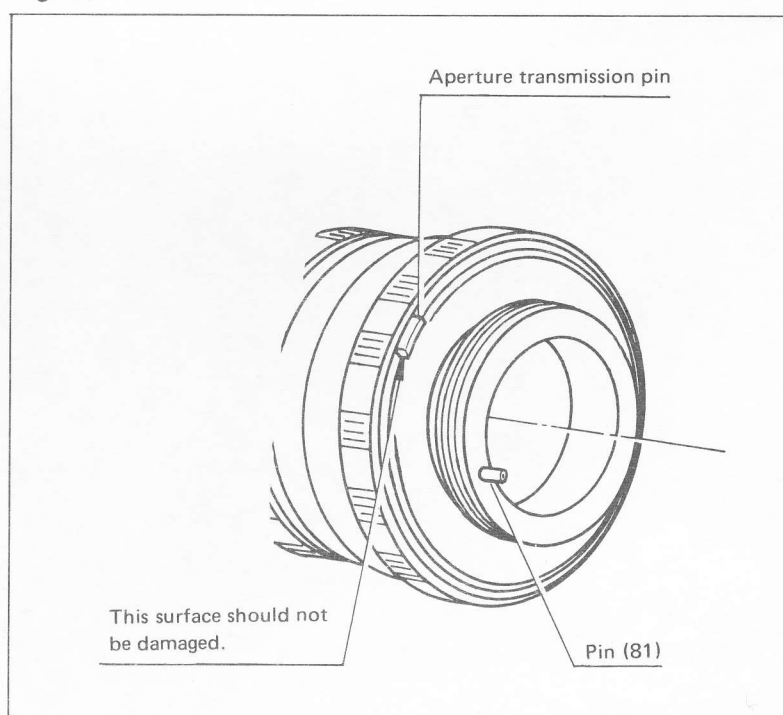


Fig. 13

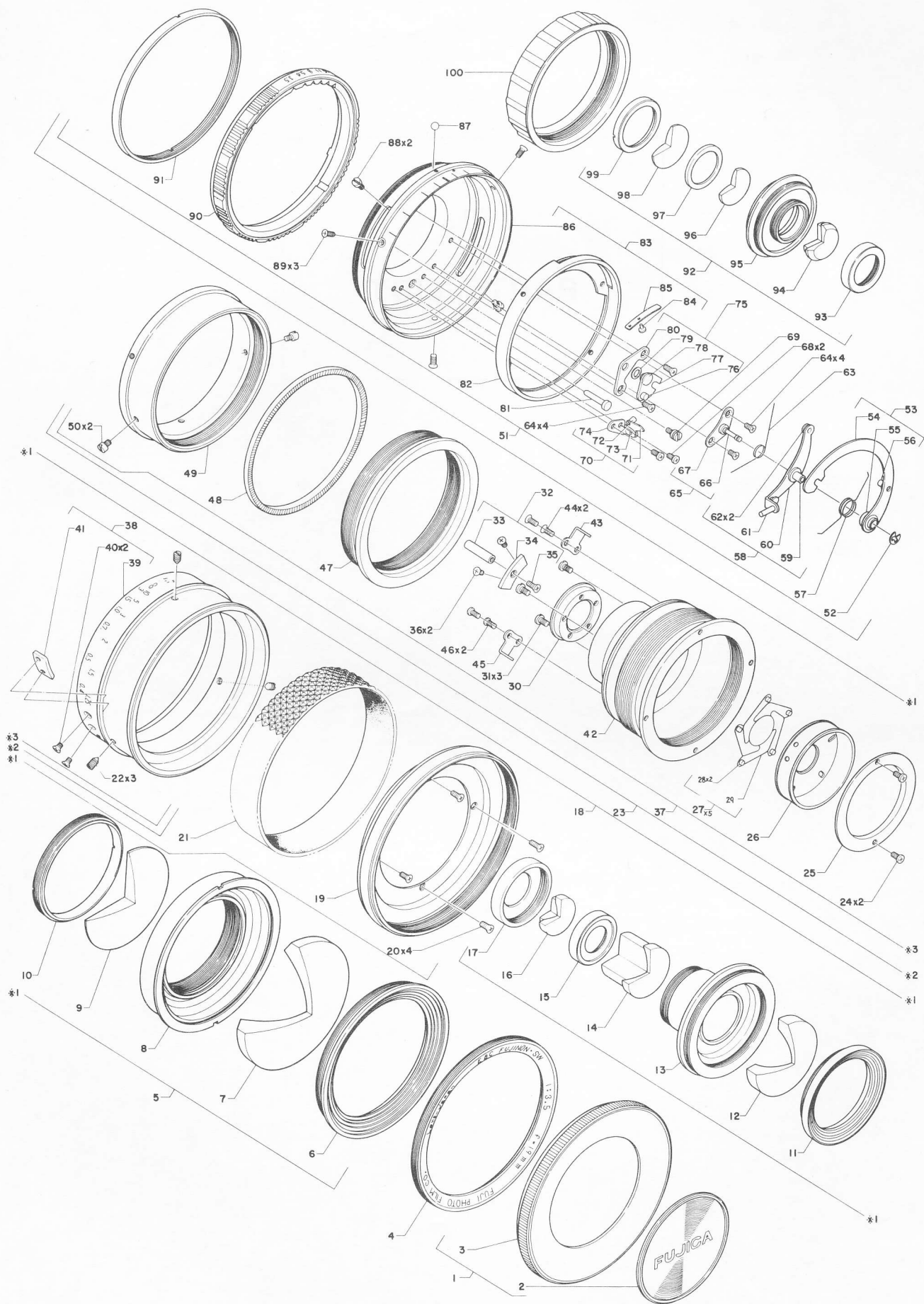




III.

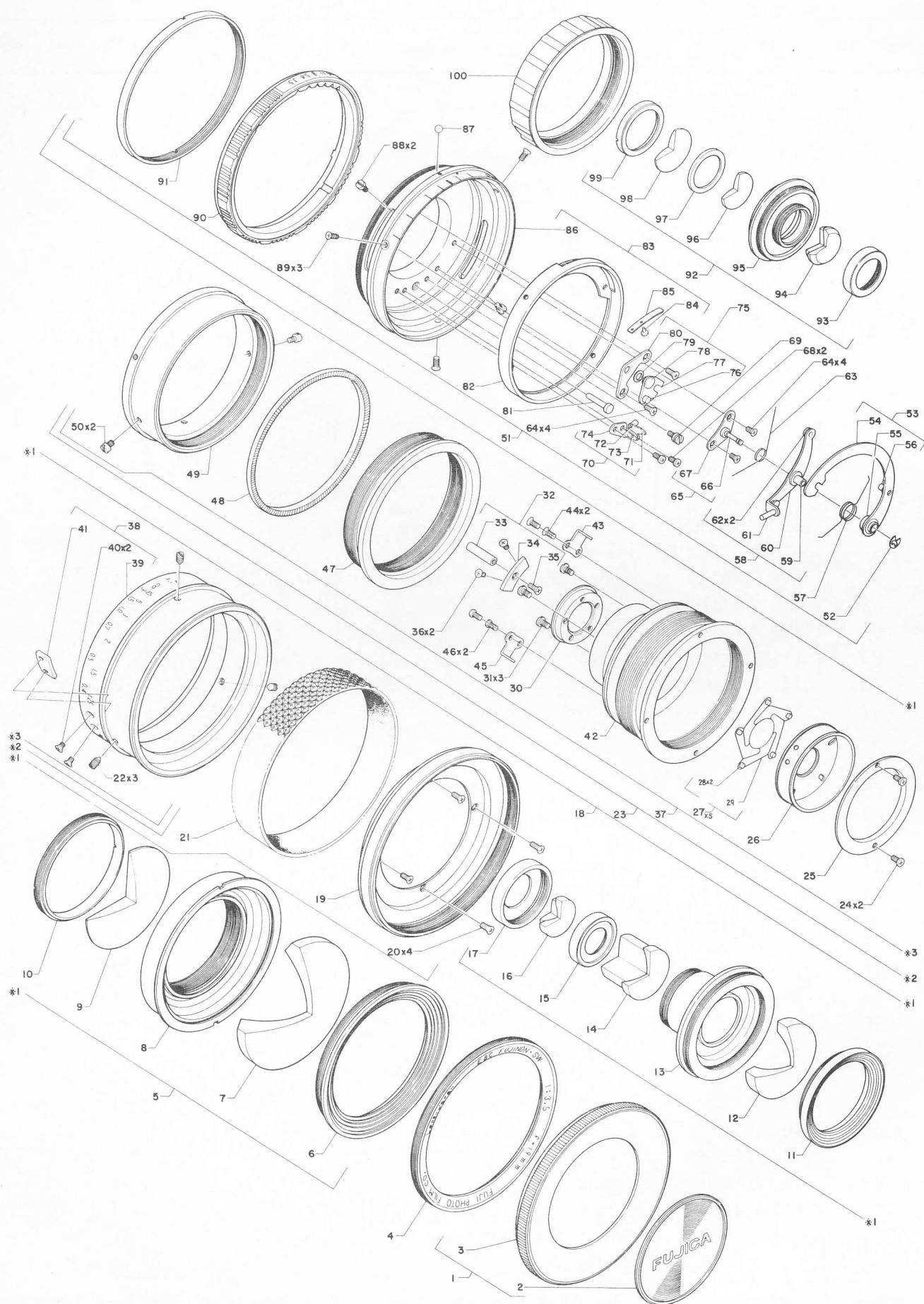
**PARTS LIST**

EBC FUJINON-W 3.5/19mm LENS FOR ST701 · ST801 · ST901



REF. NO.	PART NO.	PART NAME	ASSEMBLED REF. NO.	QTY	REMARKS
1	57A 183800	Lens cap assembly	2,3	1	
4	23B 183470	Name ring		1	
5	21A 183781	Front lens assembly	6 — 17	1	
18	324A 183990	Lens body assembly	19,20×4,22×3,23, 51,90×3	1	
19	23B 183370	Filter ring		1	
20	111M 170281S	Screw		4	
21	59B 183480	Rubber ring		1	
22	120M 200351S	Screw		3	
23	21A 183730	Aperture/helicoid assembly	24×2,25,26,27×5, 30,31×3,32,36×2, 37	1	
24	110M 140301S	Screw		2	
25	23B 116280	Hold ring		1	
26	22B 183420	Aperture seat		1	
27	26A 155510	Aperture blade assembly	28,29	5	
30	41B 183430	Ring		1	
31	110M 170223S	Screw		3	
32	47A 183720	Connecting plate assembly	33,34,35	1	
33	22B 183410	Pin		1	
34	47B 116290	Connecting plate		1	
35	111M 140351S	Screw		1	
36	111M 140251S	Screw		2	
37	21A 183710	Helicoid assembly	38,42,43,44×2,45, 46×2,47,48,49,50 ×2	1	
38	23A 183770	Focusing ring assembly	39,41,40×2	1	
39	23B 183380	Focusing ring		1	
40	112M 170351S	Screw		2	
41	87B 183390	Stopper plate		1	
43	30B 157130	Helicoid guide		1	
44	111M 170281S	Screw		2	
45	30B 159070	Helicoid guide		1	
46	110M 170281S	Screw		2	
48	23B 183320	Knurled ring		1	
50	87B 114780	Screw		2	
51	23A 183760	Mout ring assembly	52 — 91	1	
52	191M 12	E-clip		1	
53	47A 155590	Rotary lever assembly II	54 — 56	1	
57	50B 112690	Spring		1	
58	47A 155580	Rotary lever assembly I		1	
63	50B 112650	Spring		1	
64	111M 140251S	Screw		4	
65	85A 155570	Seat plate assembly	66,67	1	
68	110M 140253S	Screw		2	

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REF. NO.	PART NO.	PART NAME	ASSEMBLED REF. NO.	QTY	REMARKS
69	17B 112570	Pin		1	
70	48A 155600	Crank assembly	71 — 74	1	
75	47A 183750	Bellcrank assembly	76 — 80	1	
81	26B 146190	Pin		1	
82	35B 183440	Cam ring		1	
83	23A 183740	Leaf spring assembly	84 — 86	1	
87	200M 20	Steel ball		1	
88	17B 112750	Pin		2	
89	112M 170501S	Screw		3	
90	23B 183400	Aperture selector ring		1	
91	23B 131530	Ring		1	
92	21A 183791	Rear lens assembly	93 — 99	1	
100	57B 112791	Rear cap		1	