Canon

# Service Manual

ENGLISH EDITION

## CANON LENS

## EF400mm 1:2.8L
## (C21-8282)



CY8–1200–076

# TECHNICAL INFORMATION



# REPAIR INSTRUCTIONS



# ADDITIONAL INFORMATION

# TECHNICAL INFORMATION

## 1. Development Objectives

The EF400mm f/2.8L has been developed as a high-performance L lens with high picture quality and superior operability to meet the strict demands of professional photographers.

## 2. Features

- Two UD glass elements in the optical system enable the EF400mm f/2.8L to superbly compensate chromatic aberration (secondary spectrum) and obtain high image quality.
- Optimum power layout and appropriate selection of glass materials provide sharp imaging for the entire aperture range, even at the maximum aperture.
- Large maximum aperture of f/2.8 allows focusing with the vertical sensor of the EOS-1's Cross-type BASIS.
- 400mm focal length and large f/2.8 aperture combination provides a beautiful blur effect.
- Built-in USM and inner focusing system realize high-speed autofocus.
- Manual focusing possible using the electronic manual focusing ring. The ring is positioned to provide excellent balance for hand-held shooting.
- Use of the 1.4X or 2X extender enables AF shooting at 560mm f/4 or 800mm f/5.6.

## 3. Specifications

| | | |
|---|---|---|
| 1. | Format | 24 x 36 mm |
| 2. | Focal length / Aperture Ratio | 400mm; 1:2.8 |
| 3. | Optical system construction | 11 elements in 9 groups (G-2, G-3: UD glass. Lens construction includes filter, Super Spectra Coating). |
| 4. | Angle of view (at ∞) | Diagonal (43.2mm) 6 ° 10'<br>Vertical (24mm) 3 ° 30'<br>Horizontal (36mm) 5 ° 10' |
| 5. | AF | |
| | Drive system | USM |
| | Drive speed | 0.7 sec. (drive speed between ∞ and closest shooting distance) |
| | Manual focusing | Manual focusing ring. Rotation angle switch varies speed in three steps (1/2X, 1X, and 2X) according to rotation angle. |
| | Shooting distance range switch | Three zones selectable using shooting distance range switch. (Zone 1: 4m to ∞, Zone 2: 4m to 9.5m, Zone 3: 9.5m to ∞) |
| 6. | Focus Adjustment | Inner focusing, rotating cam system |
| | Shooting distance range | 4m to infinity |

Rotation angle / Extension amount

| Conditions | Rotation angle | Extension amount |
|---|---|---|
| 4m to ∞ | 97 ° 39' | 19.8mm |
| ∞ overrun | 6 ° 17' | 1.2mm |

Distance scale

(fluorescent green)
(metallic gray)

Maximum magnification and field of view

| Conditions | Magnification (times) | Field of view |
|---|---|---|
| 4m | 0.11 | 209mm x 302mm |

Focus preset

**1 Distance memory:** When the focus preset switch is turned On, the lens position at that point is memorized.

**2 Read out:** When the | playback ring is turned left or right, the lens is moved to the memorized distance position.

**3 Signal beeper:** An electronic beeper beeps once when the lens position is memorized and beeps twice when the position is recalled. The beeper can be turned on/off by a switch.

**7.** Mount Type

Canon EF mount

Data communication function

EOS system, using the following five signals (no absolute distance data):

1. Lens condition
2. Lens type
3. Metering data
4. Focal length
5. AF drive data

**8.** Diaphragm mechanism
Diaphragm control system

Pulse control system using EMD (electromagnetic diaphragm) (Simultaneous control of AF lens drive possible.)

Aperture values / indication

Maximum aperture: f/2.8 (indicated on lens barrel);
Minimum aperture: f/32 (no indication)

Number of diaphragm blades

Eight

Depth-of-field scale

Provided (f/16, 32)

Infrared focusing index

Provided

**9.** Filter diameter / Maximum acceptable number of filters

Diameter = 48mm; P = 0.75mm; Rear drop-in type; Maximum acceptable number of filters = 1

**10.** Dimensions / Weight

167mm (diameter) x 348mm /6,100g

**11.** Related products

Hood

ET-161B (Detachable - type exclusive - use hood, reverse mounting possible)

Lens cap

E-180B

| | |
|---|---|
| Lens case | Purpose- built carrying case for EF400mm f/2.8L |
| Rear dust cap | Dust cap common to all EF lenses |

**12.** Other

| | |
|---|---|
| Tripod seat | Fixed to bottom of lens barrel.<br>Tripod socket: 3 sockets of CU 1/4" x 20 |
| Revolving mechanism | 360 ° free revolving mechanism with click stops every 90 ° from normal position. Can be locked in position by tightening the lock knob. |

**13.** Specifications When Used with an Extender

| | | With 1.4X Extender | With 2X Extender |
|---|---|---|---|
| Focal length / Aperture ratio | | 560mm f/4 | 800mm f/5.6 |
| Angle of View | Diagonal | 4 ° 25' | 3 ° 06' |
| | Vertical | 2 ° 27' | 1 ° 40' |
| | Horizontal | 3 ° 41' | 2 ° 35' |
| Focusing | | AF possible | AF possible |
| Drive speed * | | Approx. 1/1.5 the drive speed of the lens alone | Approx. 1/4 the drive speed of the lens alone |
| Aperture values ** | | Max.: f/4, Min.: f/45 | Maximum: f/5.6, Minimum: f/64 |
| Dimensions / Weight | | $\phi$ 167 x 375.3mm / 6200g. | $\phi$ 167 x 398.5mm / 6240g. |

*Drive speed: When the AF prediction capability is exceeded (worst case value). Also the drive speed varies according to the EOS body in use.

**Aperture values: The minimum depends on the minimum aperture that can be set on the body.

## 4. External Design and Operation

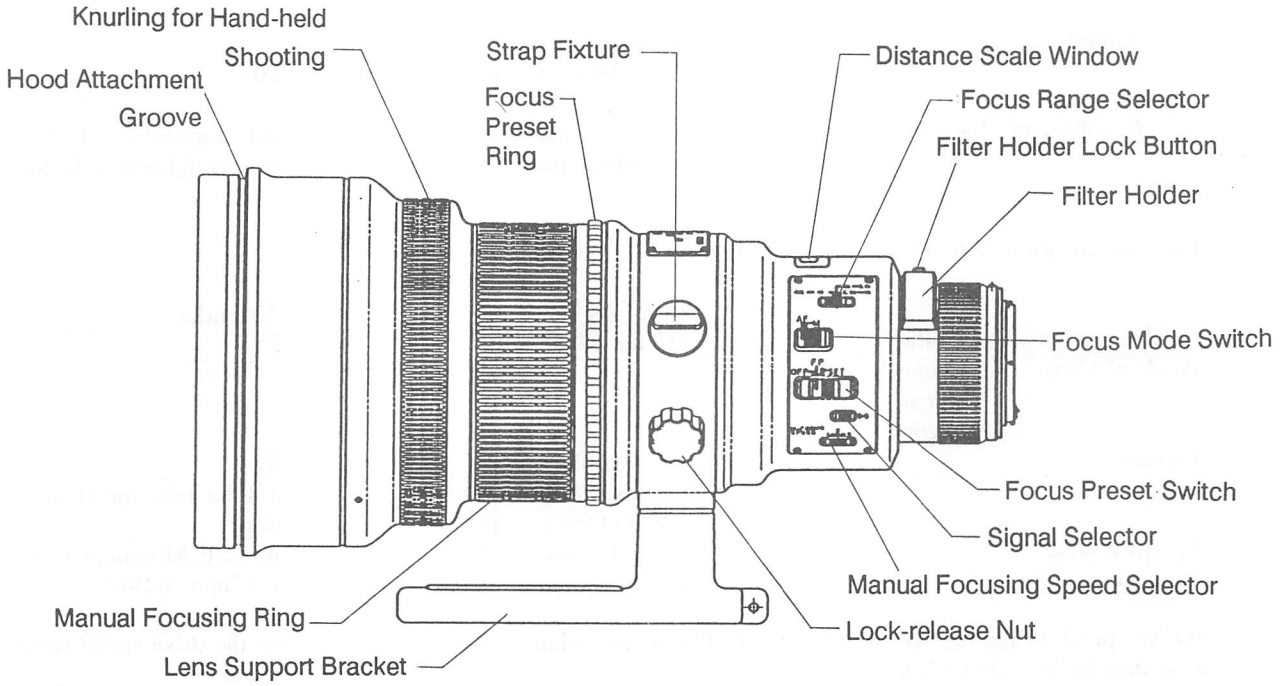
The design and operation of the EF400mm f/2.8L follows that of the EF200mm f/1.8L, EF300mm f/2.8L, and EF600mm f/4L.

## 5.Optical Performance Description

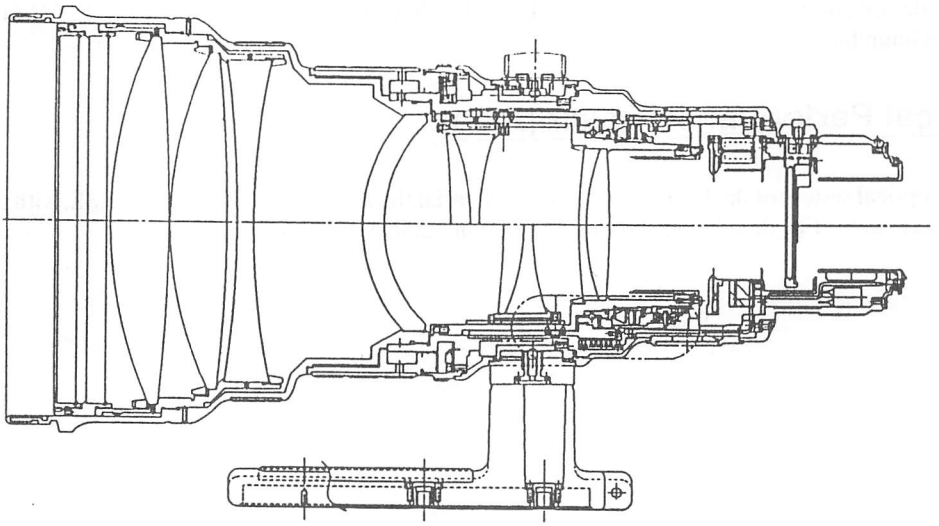
The optical system of the EF400mm f/2.8L is essential the same as the FD400mm f/2.8L, with the same optical performance. For details, refer to the FD400mm f/2.8L Service Manual.

## 6. Nomenclature/Cross Sectional View/Optical System Diagram/ Dimensions

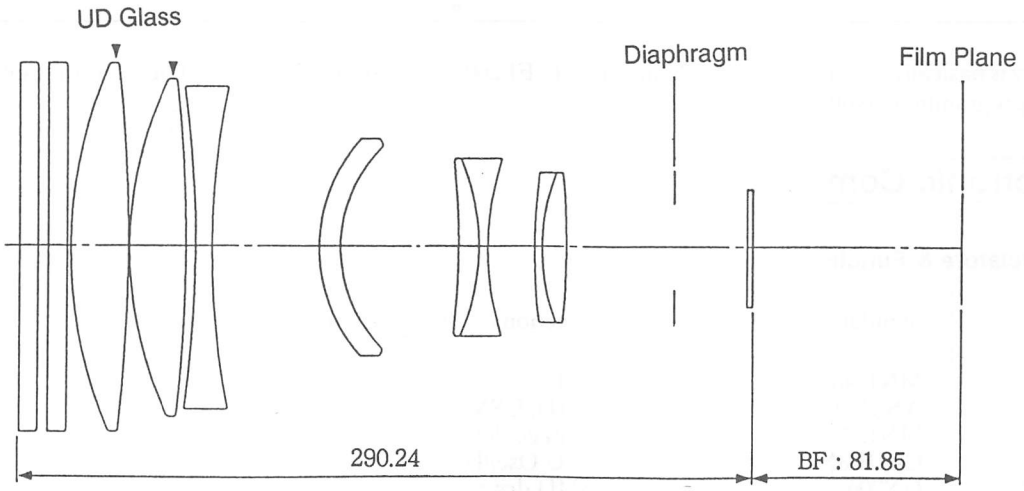
### Nomenclature



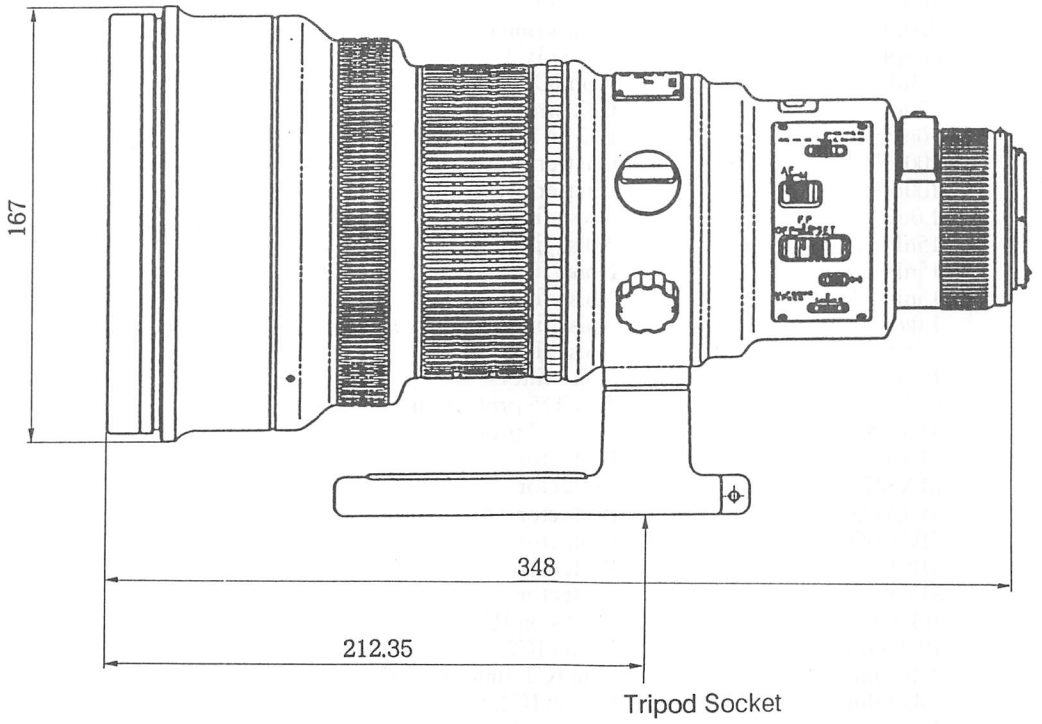

### Cross Sectional View



## Optical System Diagram




## Dimensions



# Electrical Explanation

Circuitry is basically the same as the EF200mm f/1.8L, EF200mm f/2.8L or EF600mm f/4.0L. The only differences are the programming (software) of IC1 (CPU).

## Electronic Components

### Nomenclature & Function

| Symbol | Standard | Function or (IC Connection) |
|---|---|---|
| IC1 | MN17481-AX76A | CPU |
| IC2 | AN8329 | EMD, USM control |
| IC3 | MN12821 | Voltage detect |
| OSC | C4CB-8M02 | CPU Oscillator |
| TALY2 | UN206 | EMD drive |
| TALY3 | UN206 | EMD drive |
| C1 | 4.7μF | Noise filter |
| C2 | 4.7μF | Noise filter |
| C3 | 1.0μF | Filter capacitor |
| C4 | 1.0μF | Noise filter |
| C5 | 10nF | US on IC2 |
| C6 | 220nF | Chattering prevention |
| C7 | 680pF | CF on IC2 |
| C8 | 3.3nF | F on IC2 |
| C9 | 220pF | C32 on IC2 |
| C10 | 10nF | F32 on IC2 |
| C11 | 100pF | Chatter prevention |
| C12 | 100pF | Chatter prevention |
| C13 | 1.0uF | Noise filter |
| C14 | 15nF | Noise filter |
| C15 | 15nF | Noise filter |
| C16 | 15nF | Noise filter |
| C17 | 1.0μF | Noise filter |
| C18 | 3.3μF | Noise filter |
| C19 | 10nF | Noise filter |
| D1 | MA-157A | Tr4, Tr5 protection |
| D2 | MA-157A | Tr6, Tr7 protection |
| ZD1 | MA3075WA | Protector |
| ZD2 | MA3075WA | Protector |
| ZD3 | MA3075WA | Protector |
| ZD4 | SB01-05CP | Protector |
| ZD5 | SB01-05CP | Protector |
| ZD6 | SB01-05CP | Protector |
| R1 | 10k Ohm | UAIN on IC2 |
| R4 | 100k Ohm | FV on IC2 |
| R5 | 8.2k Ohm | F on IC2, time constant |
| R7 | 2.4k Ohm | F32 on IC2, time constant |
| R10 | 16k Ohm | DAC on IC2 |
| R11 | 2.4k Ohm | Tr5 base resistor |
| R12 | 2.4k Ohm | Tr7 base resistor |
| R13 | 6.8k Ohm | /LCLK stabilizer |
| Tr4 | 2SD1511R | USM drive |
| Tr5 | 2SB766AR | USM drive |
| Tr6 | 2SD1511R | USM drive |
| Tr7 | 2SB766AR | USM drive |
| Tr8 | UN212Y | IC2 E1 power supply |
| VR2 | 20k Ohm | Inhibit voltage adjustment |
| VR3 | 4.0k Ohm | USM reference frequency adjustment |
| VR8 | 20k Ohm | PR1 output adjustment |
| VR9 | 20k Ohm | PR3 output adjustment |

## IC Pin Explanation

### 1. IC1 (MPU)

| Pin | Symbol | I/O | A/D | Voltage | Function |
|---|---|---|---|---|---|
| 1 | D1 | I/O | D | 0-VDD | Parallel communications port |
| 2 | D2 | I/O | D | 0-VDD | Parallel communications port |
| 3 | D3 | I/O | D | 0-VDD | Parallel communications port |
| 4 | $\overline{AD}$ | O | D | 0-VDD | Address / Data switching signal |
| 5 | $\overline{WR}$ | O | D | 0-VDD | Read / Write switching signal |
| 6 | $\overline{SYNC}$ | O | D | 0-VDD | Synchronizing signal |
| 7 | P2 | I | D | 0-VDD | Photo Interrupter PR2 signal (from IC2) |
| 8 | P1 | I | D | 0-VDD | Photo Interruptor PR1 signal (from IC2) |
| 9 | $\overline{RST}$ | I | D | | CPU reset signal |
| 17 | AFADJ0 | I | D | 0-VDD | Best focus compensation. CPU contains |
| 18 | AFADJ1 | I | D | 0-VDD | several best focus compensations. |
| 21 | H-SPEED | I | D | 0-VDD | Manual focusing speed SW -high speed |
| 22 | L-SPEED | I | D | 0-VDD | Manual focusing speed SW -low speed |
| 23 | INF | I | D | 0-VDD | Detect focusing position infinity limit |
| 24 | NEAR | I | D | 0-VDD | Detect focusing position near limit |
| 25 | EXT0 | I | D | 0-VDD | Detect extender |
| 26 | EXT1 | I | D | 0-VDD | Detect extender |
| 29 | Z2 | I | D | 0-VDD | Detect focusing position |
| 30 | Z3 | O | D | 0-VDD | Detect focusing position |
| 33 | COM1 | O | D | VDD | Common pin |
| 34 | COM2 | O | D | | Focus mode SW - autofocus |
| 35 | COM3 | O | D | | Focus mode SW - manual |
| 36 | COM8 | I | D | | Focus preset SW -common |
| 39 | MUTE | I | D | 0-VDD | Beeper mute |
| 40 | AF/MANU | I | D | | Focus mode SW - common |
| 41 | FP-SET | I | D | | Focus preset SW - memory set |
| 42 | FP-PLAY | I | D | | Focus preset SW - setmemory position |
| 43 | PZ0 | I | D | | Range limit sensor SW - infinity |
| 44 | PZ1 | I | D | | Range limit sensor SW - near |
| 45 | $\overline{P3}$ | I | D | | Max. aperture sensor input |
| 46 | ENC0 | I | D | | Detect E0 brush signal |
| 47 | ENC1 | O | D | | Detect E0 brush signal |
| 49 | COM4 | O | D | | Detect E0 brush signal |
| 49 | COM5 | O | D | | Detect E0 brush signal |
| 50 | COM6 | O | D | | Detect E0 brush signal |
| 51 | COM7 | O | D | | Detect E0 brush signal |
| 52 | COM9 | O | D | | Range limit sensor - common |
| 53 | BZ | O | D | | Beeper |
| 55 | $\overline{LCLK}$ | I/O | D | 0-VDD | Communication clock pulse |
| 56 | DLC | O | D | 0-VDD | Lens to camera data line |
| 57 | DCL | I | D | 0-VDD | Camera to lens data line |
| 58 | GND | V | - | 0 | MPU power supply device ground |
| 59 | OSC2 | V | - | 8MHz | Oscillator crystal |
| 60 | OSC1 | V | - | 8MHz | Oscillator crystal |
| 61 | VDD | V | - | 5.5 | MPU power supply |
| 62 | E1ON | O | D | 0-5.5 | Power switch for IC2. When "low", Tr8 goes on and E1 is applied to IC2. |
| 63 | PSM | O | D | 0-VDD | Pulse to IC2 to control EMD. |
| 64 | DO | I/O | D | 0-VDD | Parallel communications port |

Notes: I/O = Input / Output; A/D = Analog / Digital;
V = Voltage(neither input nor output)

## IC2 (Control IC)

| Pin | Symbol | I/O | A/D | Voltage | Function |
|---|---|---|---|---|---|
| 1 | VBAT | V | - | 6.0 | Battery input from camera |
| 2 | SM4 | O | D | 0-VBAT | Control pin for the EMD transistor array. "High" turns on the transistor. |
| 3 | SM1 | O | D | 0-VBAT | Control pin for the EMD transistor array. "Low" turns on the transistor. |
| 4 | SM2 | O | D | 0-VBAT | Same as pin 3, SM1 |
| 5 | SM3 | O | D | 0-VBAT | Same as pin 2, SM4 |
| 6 | SM8 | O | D | 0-VBAT | Same as pin 2, SM4 |
| 7 | SM5 | O | D | 0-VBAT | Same as pin 3, SM1 |
| 8 | SM6 | O | D | 0-VBAT | Same as pin 3, SM1 |
| 9 | SM7 | O | D | 0-VBAT | Same as pin 2, SM4 |
| 11 | UBOUT | O | A | 0-VBAT | USM "B" phase drive signal |
| 12 | US | I | A | - | USM "S" phase input |
| 13 | U-GND | V | - | 0 | USM device ground |
| 14 | UAIN | I | A | - | Input USM "A" phase |
| 15 | UAOUT | O | A | 0-VB | USM "A" phase drive signal |
| 16 | VB | V | - | 0-29 | Input DC/DC output voltage ($V_B$) |
| 17 | KVC | V | - | 2.0 | Check IC |
| 18 | A-GND | V | - | 0 | Analog device ground |
| 19 | INH | V | - | 2.5 | Adjust inhibit voltage |
| 20 | Cf | I/O | A | - | USM reference frequency oscillator cap. |
| 21 | $L_R$ | O | A | - | Adjust USM reference frequency |
| 22 | fv | O | A | - | Connected to USM oscillator resistor |
| 23 | F | I/O | A | - | Connected to USM osc. R/C network |
| 24 | LED3 | I | A | - | Connected to max. aperture sensor LED |
| 25 | /P3 | O | D | 0-E1 | Max. aperture sensor output to CPU |
| 26 | PR3 | I | A | - | Maximum aperture sensor input to IC2 |
| 27 | PR3 ADJ | I | A | - | PR3 threshold level adjustment |
| 28 | VC1 | V | - | 1.25 | Check C-IC reference voltage |
| 29 | C32 | I/O | A | - | Connected to USM oscillator capacitor |
| 30 | F32 | I/O | A | - | Connected to USM osc. R/C network |
| 31 | PR1ADJ | I | A | - | Threshold level adjustment |
| 32 | PR2ADJ | I | A | - | Threshold level adjustment |
| 33 | DAC | O | A | - | Reads voltage of Cf capacitor |
| 34 | LED1 | I | A | - | Connected to photo interrupter LED1,2 |
| 35 | PR2 | I | A | - | Input from focusing photo interrupter2 |
| 36 | PR1 | I | A | - | Input from focusing photo interrupter1 |
| 37 | GND1 | V | - | 0 | Digital device ground |
| 38 | P1 | O | D | 0-E1 | Output photo interrupter signal PR1 |
| 39 | P2 | O | D | 0-E1 | Output photo interrupter signal PR2 |
| 40 | /SYNC | I | D | 0-E1 | Input synchronizing signal |
| 41 | /WR | I | D | 0-E1 | Input write / read changeover signal |
| 42 | /AD | I | D | 0-E1 | Input address / data changeover signal |
| 43 | D3 | I | D | 0-E1 | Parallel 4-bit communications port |
| 44 | D2 | I | D | 0-E1 | Parallel 4-bit communications port |
| 45 | D1 | I | D | 0-E1 | Parallel 4-bit communications port |
| 46 | D0 | I | D | 0-E1 | Parallel 4-bit communications port |
| 47 | PSM | I | D | 0-E1 | EMD control pulse from the lens CPU |
| 48 | E1 | V | - | 5.5 | Power supply, controlled from CPU |

## IC3 (Reset)

| Pin | Symbol | I/O | A/D | Voltage | Function |
|---|---|---|---|---|---|
| 1 | RESET | O | D | 0-VDD | CPU reset by voltage from pin2, VDD |
| 2 | VDD | - | V | VDD | Power Supply |
| 3 | DGND | - | V | 0 | Digital Ground |

# Circuit Explanation

## Lens mounted on camera

1. When the lens is mounted, VDD is applied through the mount pins to the lens MPU activating the clock oscillator (OSC). The MPU is reset by C3 and voltage sensor IC3. After a series of initial communications, the MPU goes into HALT mode.

2. When the camera and lens communicate, the lens MPU applies a low to the E1ON pin turning Tr8 on thus applying E1 to the C-IC.

3. The camera requests lens data from the lens through DCL line.

4. The lens sends the data through DLC line. With this data, camera determines if diaphragm fully open. If it is not fully open, the camera sends diaphragm (EMD) drive command to the lens.

5. When the lens receives the EMD drive command, current flows through SM1-SM8 terminals of C-IC turning the transistor array ICs (TALY2, TALY3) on to drive EMD.

6. When the diaphragm is fully open, the max. aperture sensor PR3 sends the $\overline{P3}$ signal to the MPU.

7. As in steps (3) and (4), the camera again request and the lens sends the diaphragm open data.

8. After the MPU determines the diaphragm is still not fully open, the camera decides that the diaphragm is inoperative and initiates the BC warning signal when SW2 is closed.

9. If the camera determines the diaphragm is not fully open, the camera decides that the diaphragm is inoperative and initiates the BC warning signal when SW2 is closed.

## Switches operated

When the Focus mode Switch (SW3), Focus preset switch (SW5), Playback switch (SW6) or Manual focusing sensor switch (SW8, 9) is operated, lens MPU turns DLC to "low" regardless of $\overline{LCLK}$, and sends communication request (WAKE UP) activating camera DC/DC converter. After this, procedure in the same as above from step 2.

## Camera SW1 on

10. When the camera SW1 is turned on, the camera DC/DC converter is activated, and lens MPU receives VDD, lens DC/DC converter and VBAT (for the DC/DC converter). At this time, the lens MPU applies a low to the E1ON pin turning Tr8 on which supplies E1 to the C-IC.

## Focusing (USM) Drive

11. When the drive signal comes from the camera, the lens MPU starts the USM Drive sequence.

12. If the camera send both the drive command and focus data, the MPU drives the USM with this data; but, if the command is received without data, the MPU uses the previous focusing data.

13. The lens MPU sends the $\overline{SYNC}$, $\overline{WR}$, and $\overline{AD}$ signals on exclusive lines and focusing direction data on the 4-bit data lines D0 through D3. Also the LED on data is sent.

14. When C-IC receives the focus direction signal, it issues out-of-phase square wave signals UAOUT and UBOUT signals which cause Tr arrays Tr4-5 and Tr6-7 to generate out-of-phase signals.

15. The outputs of the Tr arrays are applied to the USM through coils as sine waves.

16. As the USM turns, light from LEDs 1 and 2 is "chopped" so pulses are felt by PR1 and PR2, received by C-IC and sent to the MPU by lines P1 and P2. These pulses contain both position and direction data.

17. The pulses are counted by the MPU and focusing continues until the correct focus is reached.

18. When it is reached, the USM stop signal is sent to stop the focusing.

## Diaphragm (EMD) drive

19. When the lens gets EMD drive signal from the camera MPU, the lens sends a "busy" ($\overline{LCLK}$ = L) signal.

20. When the drive command and amount data are simultaneously received, the diaphragm is stopped down in accordance with the data.

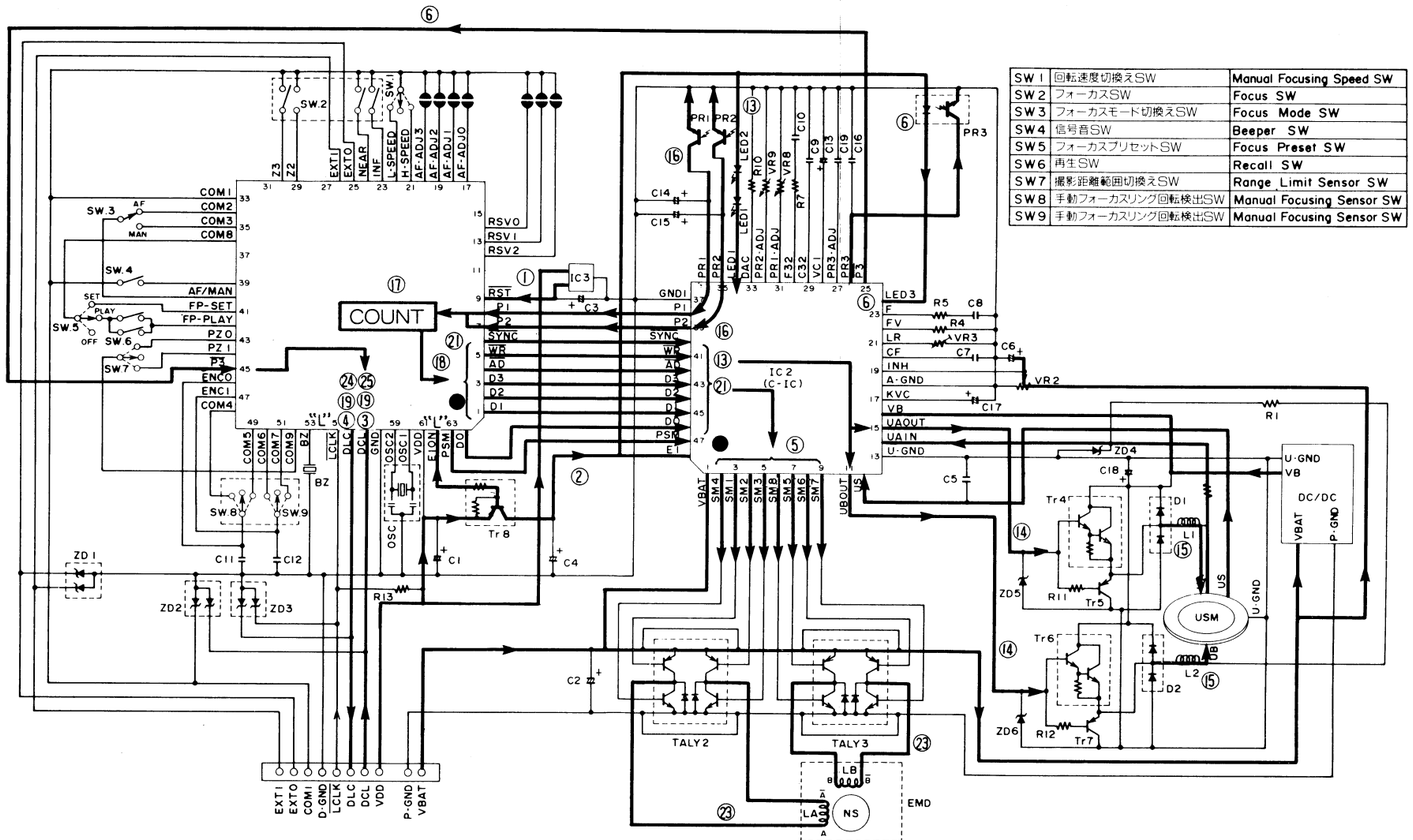
21. The MPU sends the aperture drive command to C-IC via the $\overline{SYNC}$, $\overline{WR}$, $\overline{AD}$ and D0-D3 lines, instructing C-IC to drive the diaphragm.

22. The CPU sends the amount data at the clock rate on the PSM line to the C-IC.

23. The C-IC uses this data to send an 8-bit signal over lines SM1-SM8 which energize the Tr arrays TALY2 and TALY3. The output of the Tr arrays establish the current directions in coils LA and LB to stop down the diaphragm.

24. After the last pulse is sent from the MPU to the C-IC, the busy signal is removed from the $\overline{LCLK}$ line.

25. The camera sends the diaphragm stop signal through DCL to the lens MPU which sends it on over the $\overline{SYNC}$, $\overline{WR}$, $\overline{AD}$ and D0-D3 lines to remove the power from SM1 through SM8.




| | | |
|---|---|---|
| SW 1 | 回転速度切換えSW | Manual Focusing Speed SW |
| SW 2 | フォーカスSW | Focus SW |
| SW 3 | フォーカスモード切換えSW | Focus Mode SW |
| SW 4 | 信号音SW | Beeper SW |
| SW 5 | フォーカスプリセットSW | Focus Preset SW |
| SW 6 | 再生SW | Recall SW |
| SW 7 | 撮影距離範囲切換えSW | Range Limit Sensor SW |
| SW 8 | 手動フォーカスリング回転検出SW | Manual Focusing Sensor SW |
| SW 9 | 手動フォーカスリング回転検出SW | Manual Focusing Sensor SW |

# MEMO

# REPAIR INSTRUCTIONS

## Precautions

### For Disassembly / Assembly

Threaded parts are staked during assembly. When disassembling them be careful not to mar the screw heads or spanner points.

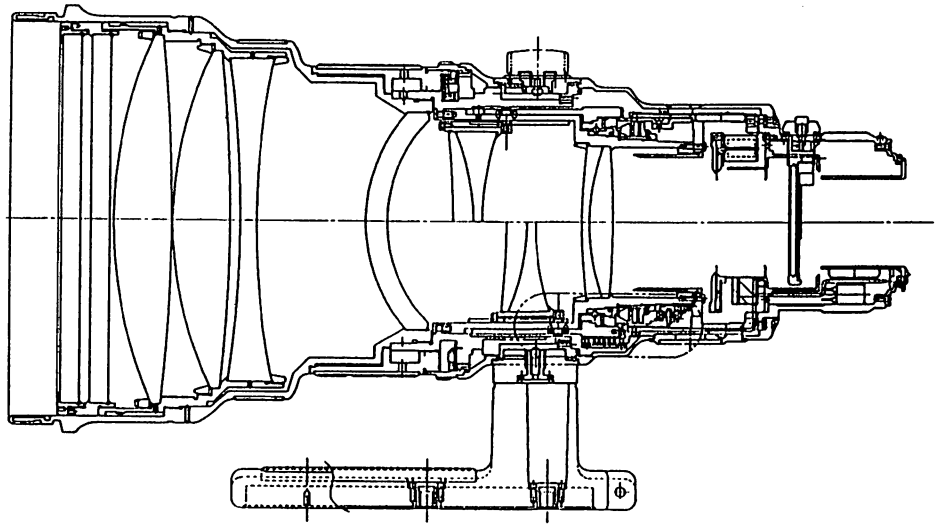
Some interior portions of certain external parts are coated with oil retardant. Try not to touch these parts. The retardant loses its efficiency if touched, and must be renewed.

### For Adjustment

**Special Optical Adjustment:** Centering: **No**
Tilt **No**

If optical components are disassembled or changed, perform the focus adjustments and the focus compensation.

When the main flex is replaced, the pulse adjustment must be done and the focus adjusting pads and the USM frequency checked.

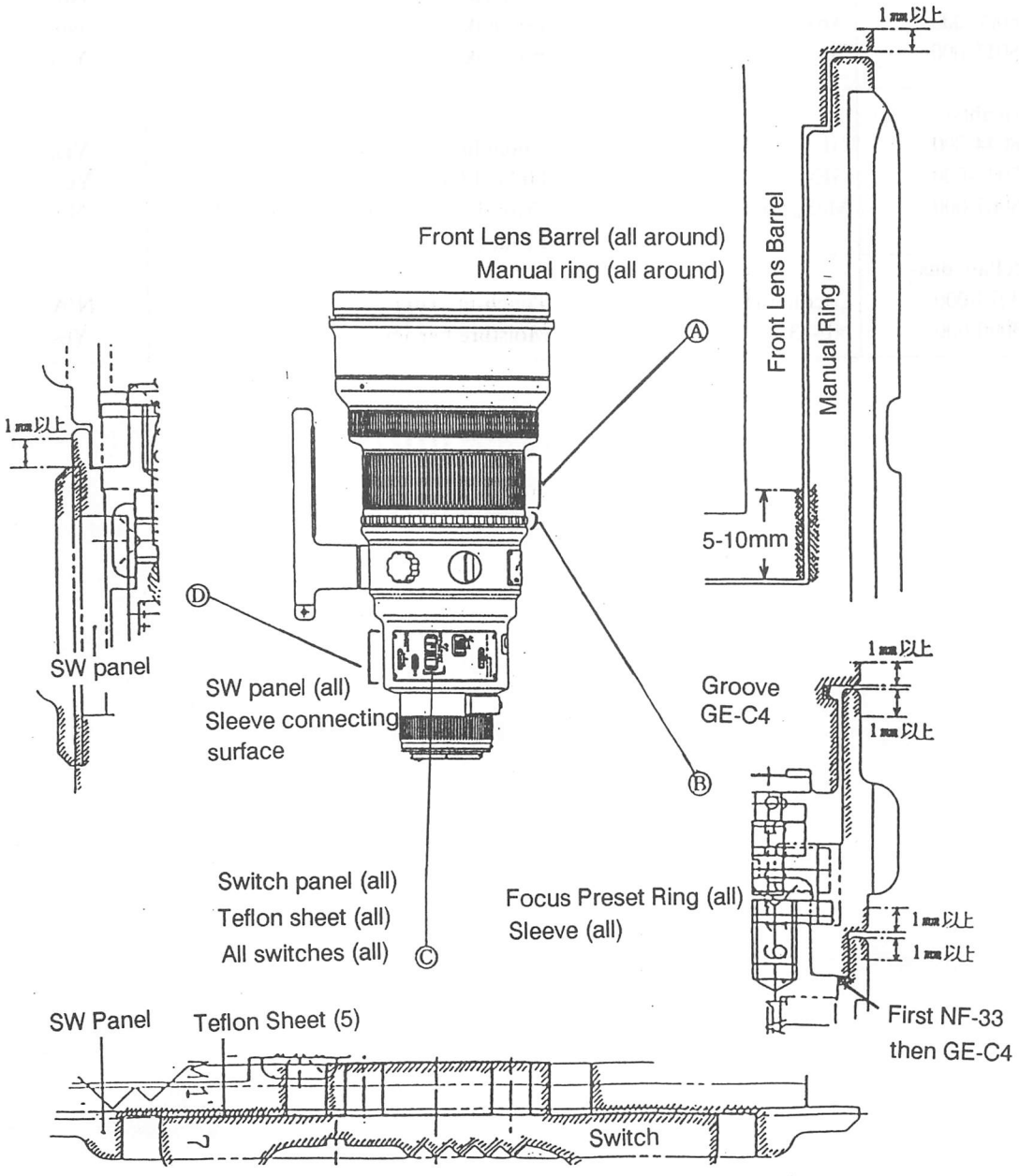


## Expendables

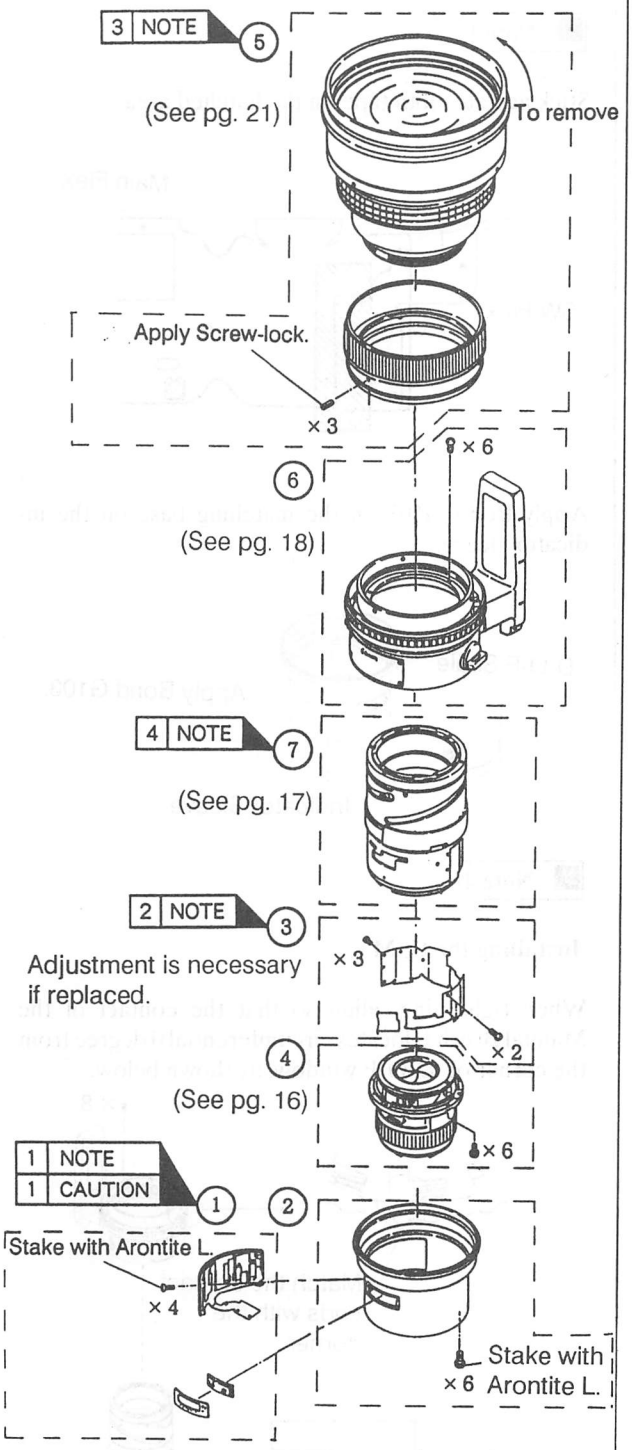
| Part No. | Name | Remarks | Plastic Safe? |
|---|---|---|---|
| -Adhesives- | | | |
| CY4-9102-000 | Acetate cloth tape 570F | Holding leads and flex, replaces double-stick tape | Yes |
| CY9-8002-000 | Bond G103 | General purpose bond | No |
| CY9-8008-000 | Arontite L | For staking screws | No |
| CY9-8011-000 | Screw-lock | For staking screws | Yes |
| -Lubricants- | | | |
| CY9-8044-000 | GE-X8 | Zoom helicoid mix (metal OK) | Yes |
| CY9-8045-000 | GE-C4 | Helicoid & cam (Metal OK) | Yes |
| CY9-8067-000 | $MoS_2$ grease | Tripod socked ring knob, G1 and Front lens ass'y screw | No |
| -Miscellaneous- | | | |
| CY9-8078-000 | Lacquer (L. gray) | Touch-up paint | N/A |
| CY9-8090-000 | NF-33 | Moisture barrier | Yes |

## Dust and Waterproofing

In the areas marked (A) through (D), paint the hatched areas with NF-33 waterproofing, and the cross-hatched with GE-C4 grease against dust.



# DISASSEMBLY & ASSEMBLY

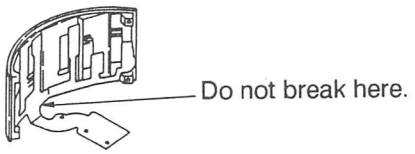



## Disassembly Notes

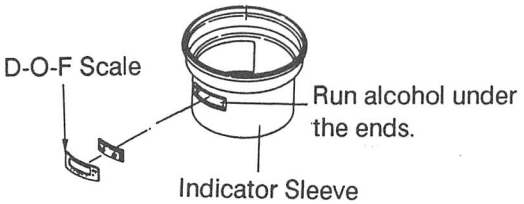
| | Removal order | Remarks |
|---|---|---|
| 1 | SW panel<br>D-O-F window | 4 screws<br>Comb connection |
| 2 | Indicator sleeve | 6 screws |
| 3 | Main flex assembly | 5 screws, leads, flexes |
| 4 | EMD, fixed barrel | 6 screws |
| 5 | Front lens ass'y<br>Manual focus ring<br>Ring rubber | 3 screws<br>Use Allen wrench (1.5mm) |
| 6 | Tripod ring | 8 screws |
| 7 | USM unit | |

**Caution 1**

Be careful not to break SW flex comb connection when removing it.




To remove the bonded scale window, run alcohol under the ends. Do not scratch.

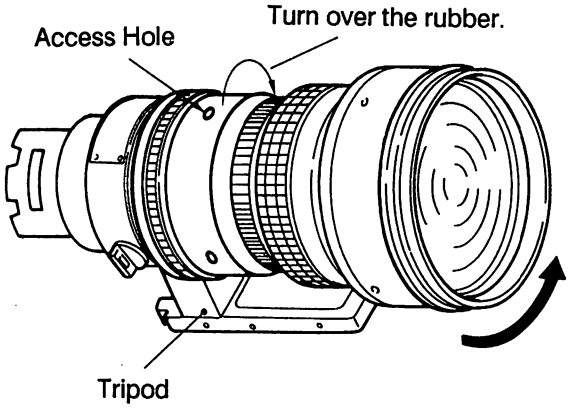


# External Disassembly

## Disassembly Notes

**Note 3**

To remove Front Lens Unit Assembly: remove three setscrews with a 1.5mm Allen wrench through holes on the manual focus ring under the ring rubber, and turn Tripod Ring CCW.



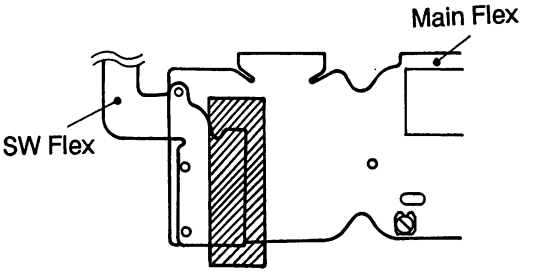

**Note 2-1**

If Main Flex Unit is replaced, check the waveform, the USM reference frequency and AF adjusting pads.

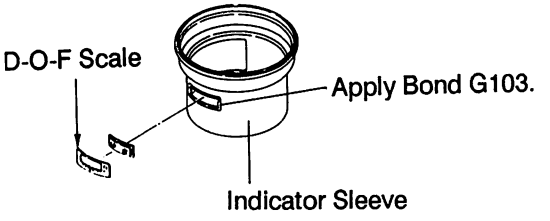
## Assembly Notes

**Note 1**

Stick acetate cloth tape on the hatched area.



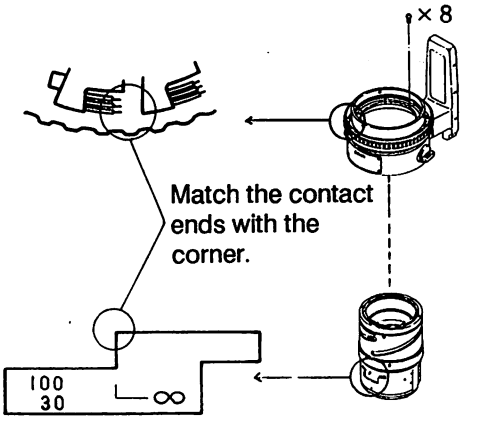

Apply Bond G103 on the matching base on the indicator sleeve.




**Note 4**

**Installing the USM**

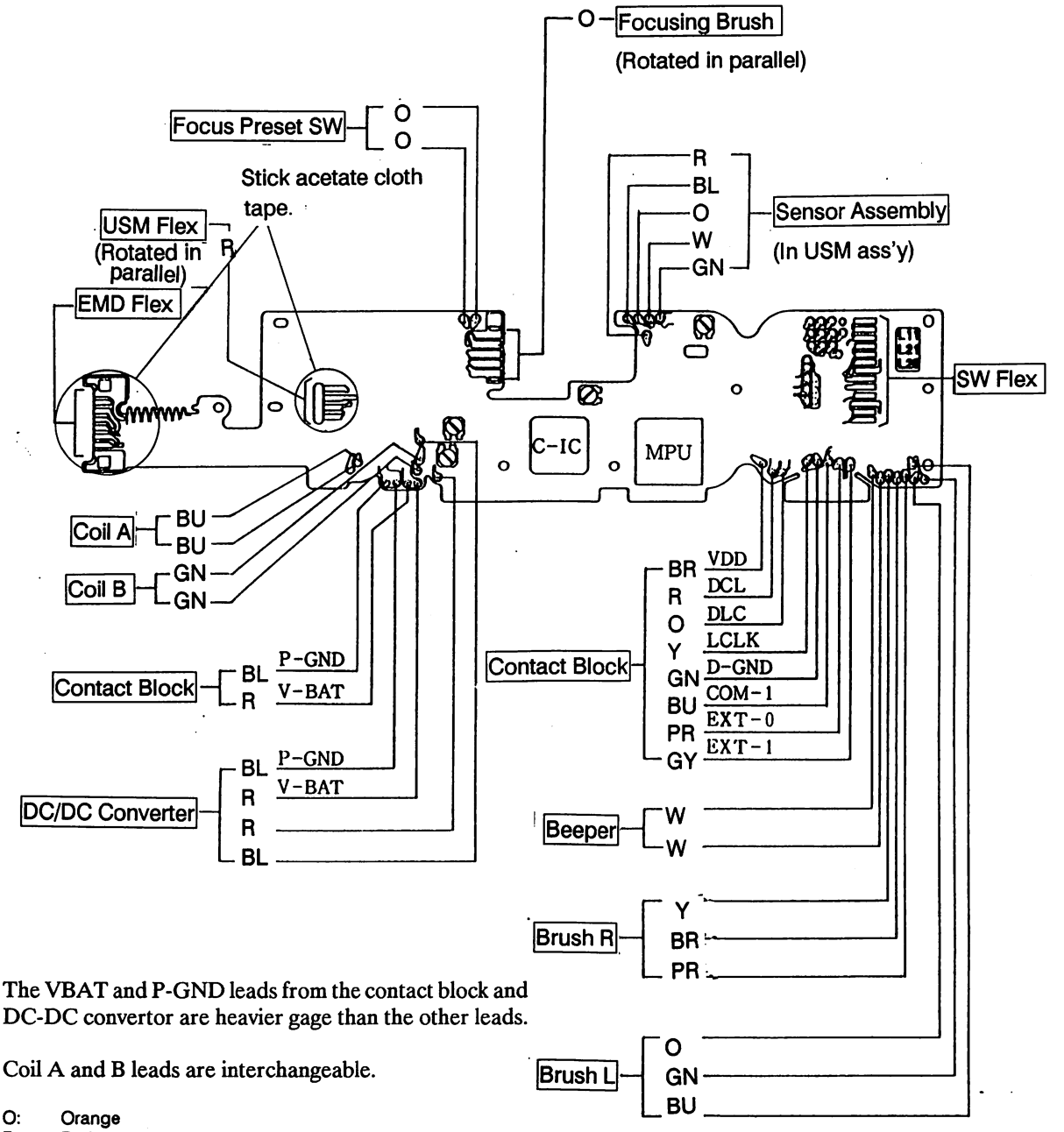
When tightening, align so that the contact of the Manual Brush L locates circumferential 0 degree from the corner of D-O-F window, as shown below.



## ■ Note 2-2

**Leads, Soldering and Tape**

Check the color and routing before disoldering leads.

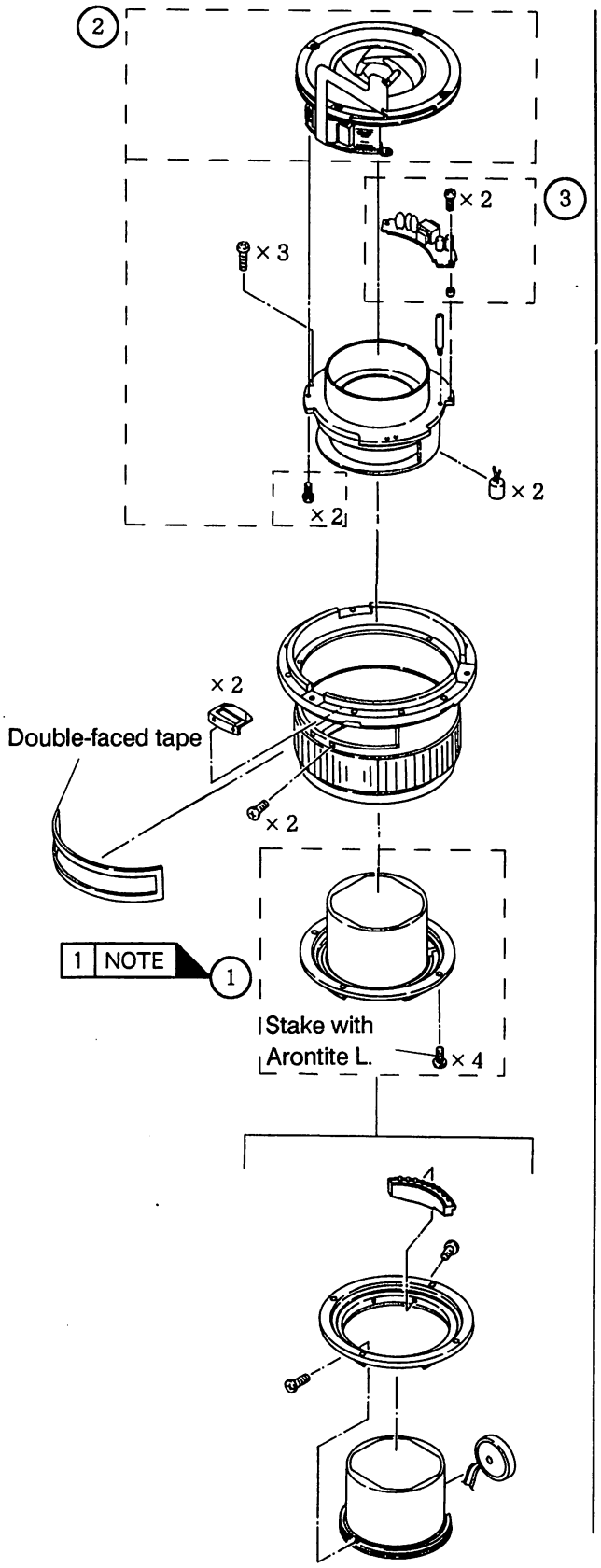



The VBAT and P-GND leads from the contact block and DC-DC convertor are heavier gage than the other leads.

Coil A and B leads are interchangeable.

O: Orange
R: Red
BU: Blue
GN: Green
BL: Black
W: White
BR: Brown
Y: Yellow
PR: Purple
GY: Gray

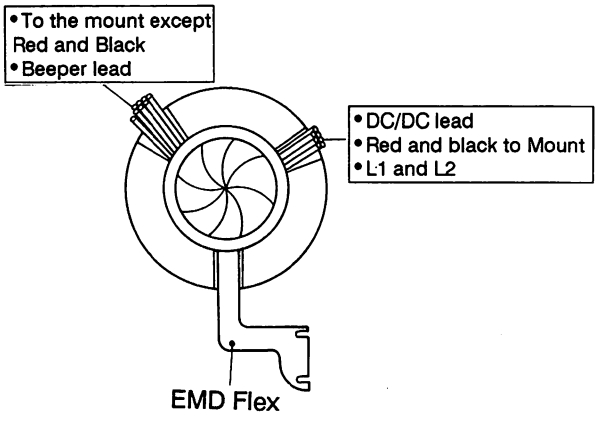
# EMD Unit, DC-DC Convertor Removal



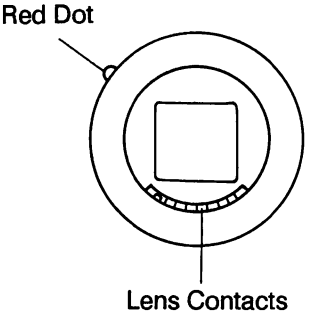

## Assembly Notes

**Note 1**

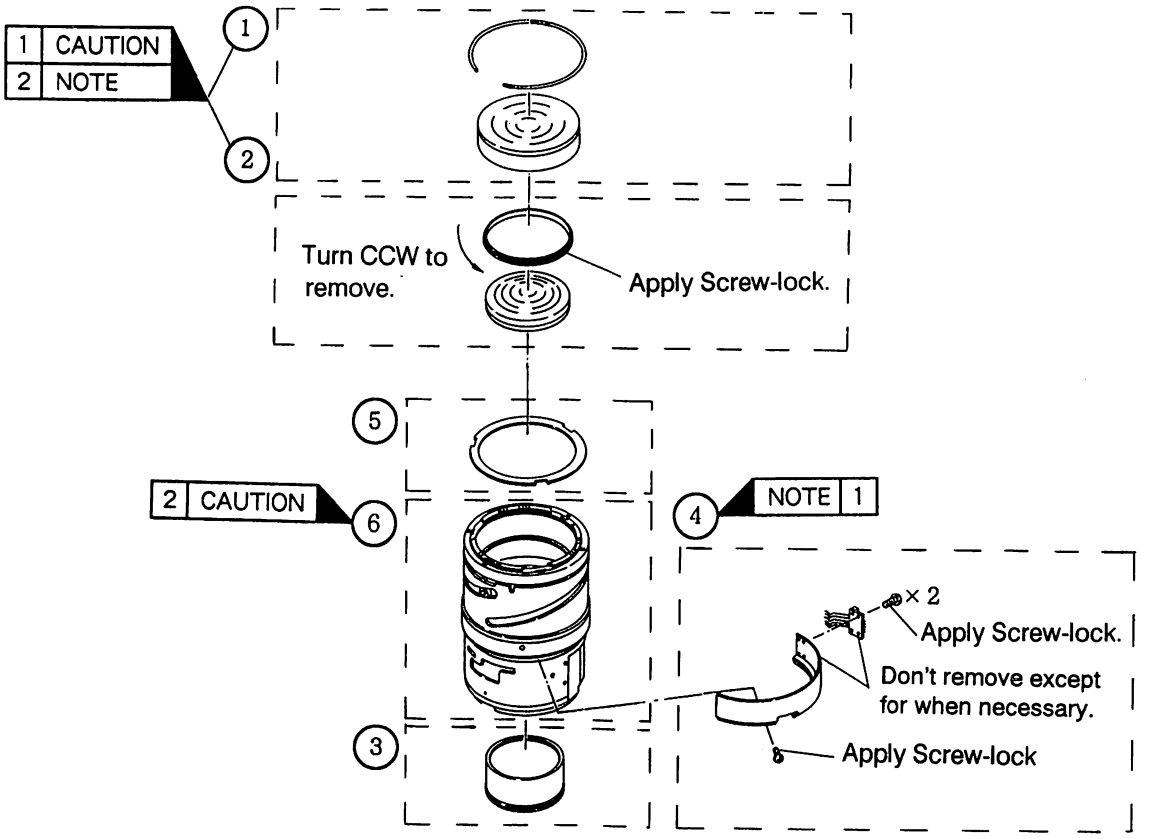
**EMD Flex and Lead Routing**




**Relative position between Red Indicator and Lens Contacts**



# USM Unit Removal




## Disassembly Notes

**Caution 1**

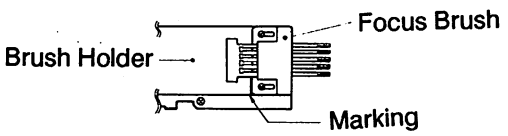
Check focus position when replacing or removing. (See pg. 26)

**Caution 2**

Do not disassemble USM Unit.

**Note 1**

Scribe the position of the focus brush before removing it to facilitate infinity adjustment. To adjust the index, see the focus adjustment.

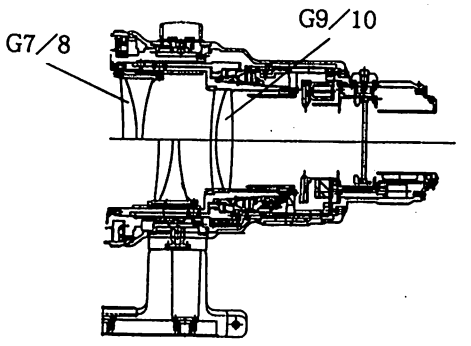



## Assembly Notes

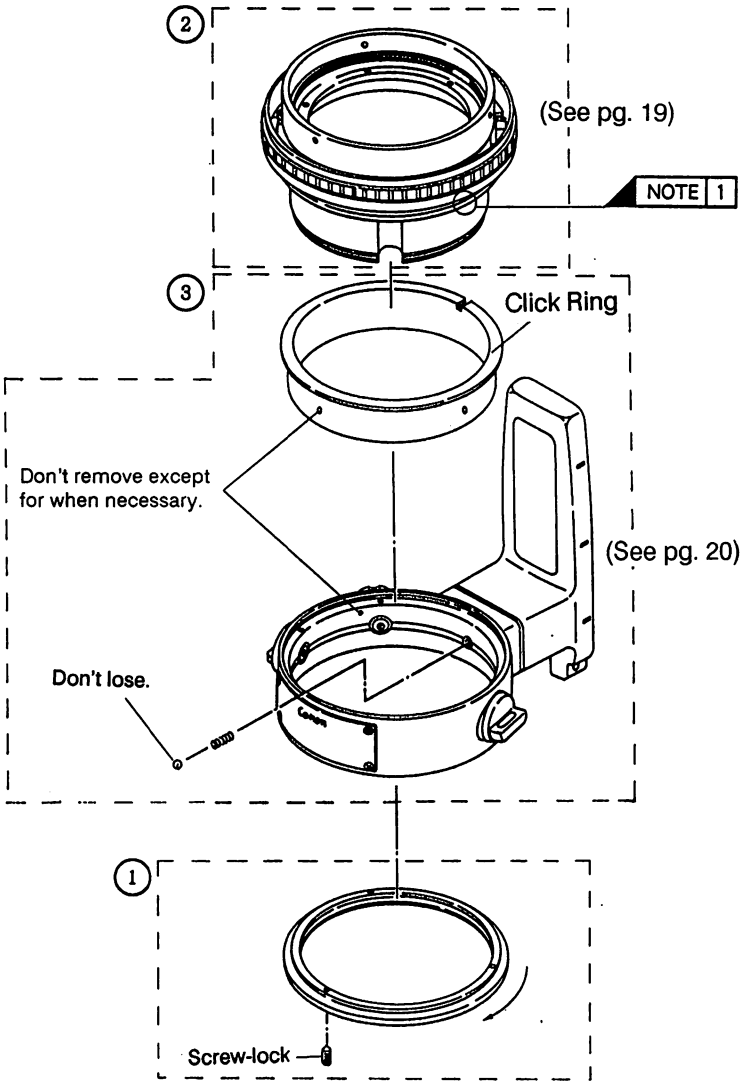
**Note 2**

**G6/7 and G8/9 Construction**

G7/8 assembling affects focusing functions. Check that they are assembled tight.

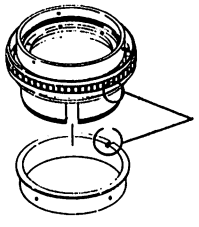


# Focus Preset Ring Unit Removal



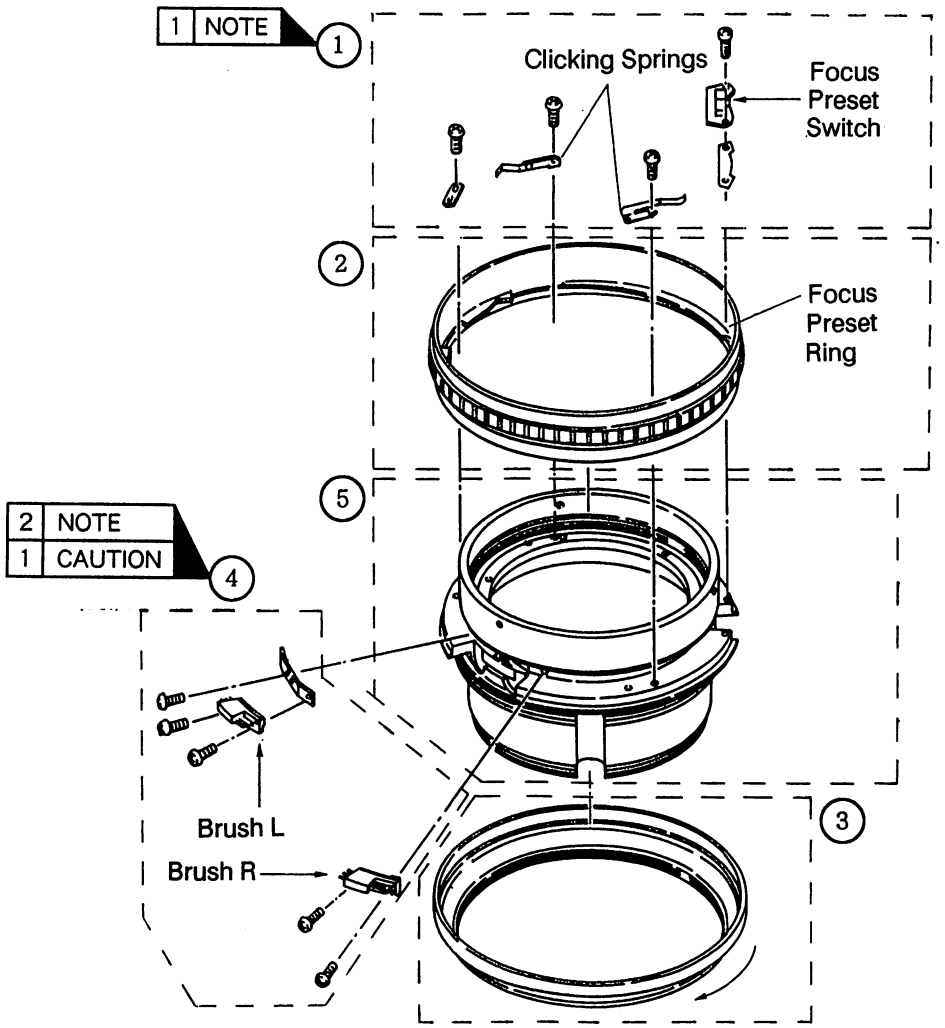

## Assembly Notes

**Note1**



Place the tripod screw head on the notch of the ring.

# Focus Preset Disassembly



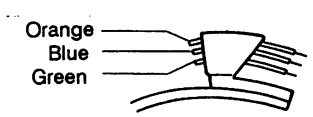

## Disassembly Notes

**Caution 1**

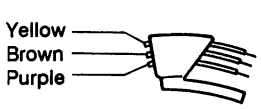
Manual Focus Brush Position Adjustment will be necessary if the Brush L and R are removed. If the adjustment is not done properly , reverse focusing or excessive hunting are the most likely results.

**Note 2**

Leads to Brush L and R




Brush L



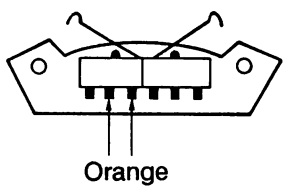

Brush R

## Assembly Notes

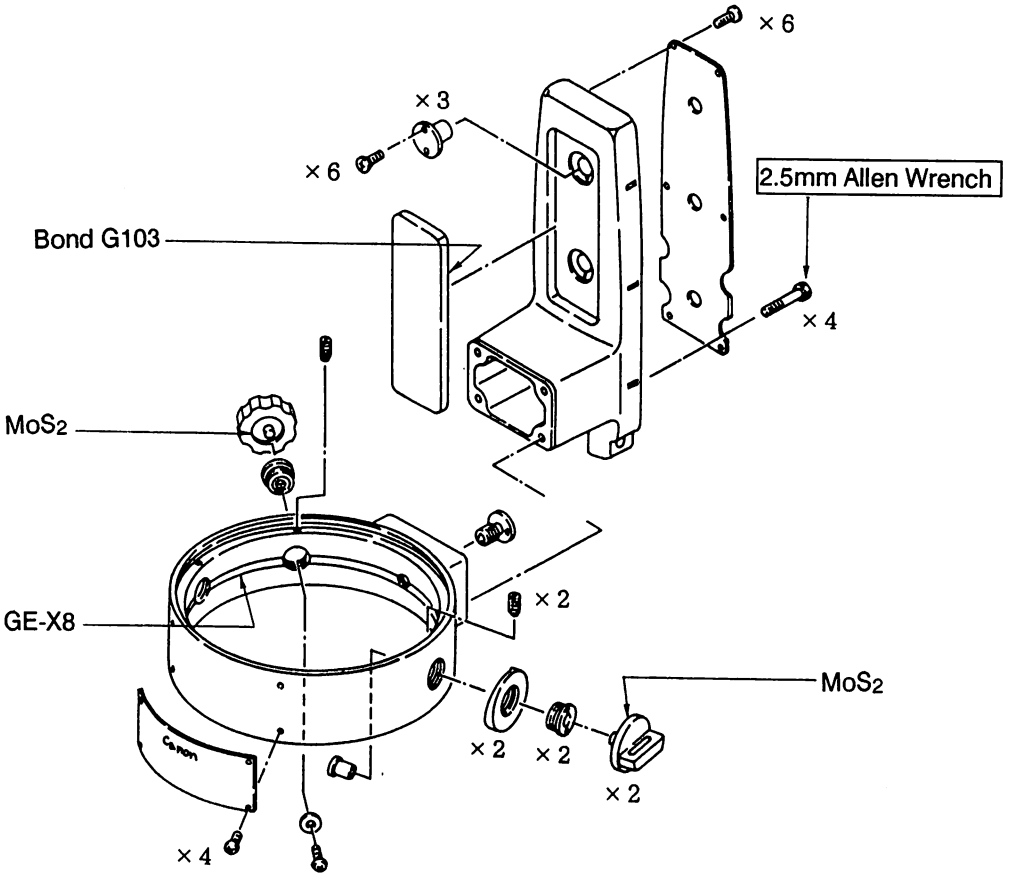
**Note 1**

After assembling (1), turn the Focus Preset Ring and check if the focus preset switch works.

Leads to Focus Preset Switch



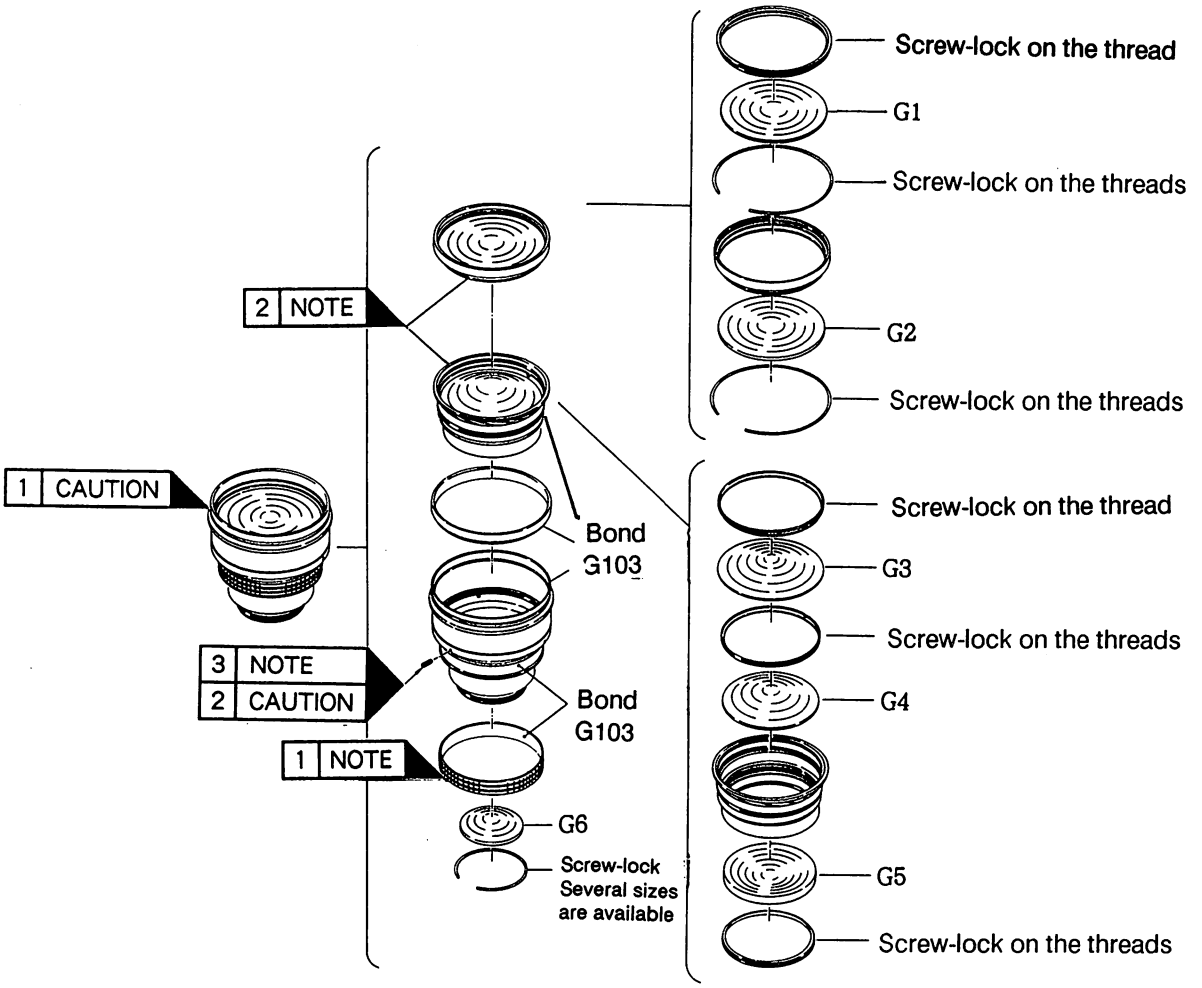
# Tripod Ring Disassembly




## Disassembly Notes

All screws are staked with Arontite L. Take care not to chip the heads when removing them.

# Front Lens Unit Disassembly




## Disassembly Notes

**Caution 1**

If a lens barrel or lens is replaced, check the infinity focus position. See pg. 26 for further information.

Each assembly collar is staked with Screw-lock. Run the alcohol to disolve it before removing.

**Note 2**

**Dust Prevention $MoS_2$ Grease**

All around the threads

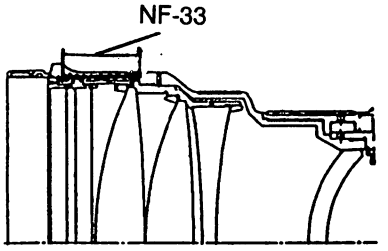
## Assembly Notes

**Caution 2**

If this setscrew is loosened, tilt or poor focus may occur. Apply screw lock after tightening it.

**Note 3**

**Water Protector NF-33 Applying Point and G1-G5 Construction**



# Adjustments

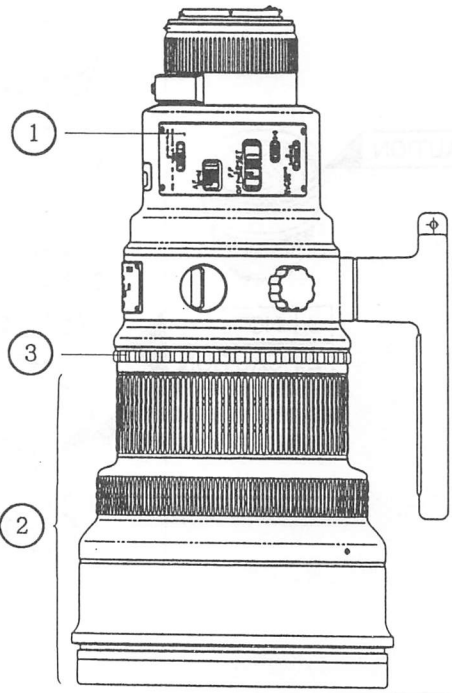
## Manual Focus Brush Position Adjustment

This adjustment is necessary if the Brush L or R is replaced or erratic manual focusing occurs.

**Purpose** — Adjust the phase for manual focus ring operation.

**Tools** — Dual trace oscilloscope, EOS camera

**Standard** — 90° ± 45°




1. Remove (1) and (3).

| | | |
|---|---|---|
| 1 | SW panel | 4 Screws<br>Comb connector |
| 2 | Front lens unit<br>Manual focus ring unit | 3 screws<br>Use a 1.5mm Allen wrench<br>(See pg. 14) |
| 3 | Click Spring<br>Focus preset ring | Screws<br>(See pg. 19) |

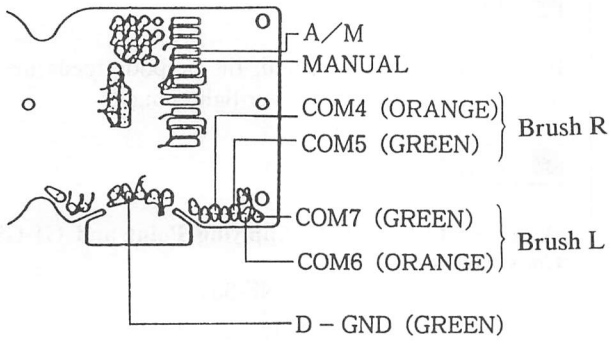
■ **Note 1**

1 NOTE

Assemble the Manual Focus Ring Unit (2) after removing the Focus Preset Ring (3).

2. Attach test leads to the main flex at COM4 through COM7 and D-GND.

3. Short the A/M and MANUAL pads once to set manual focus, attach a camera.



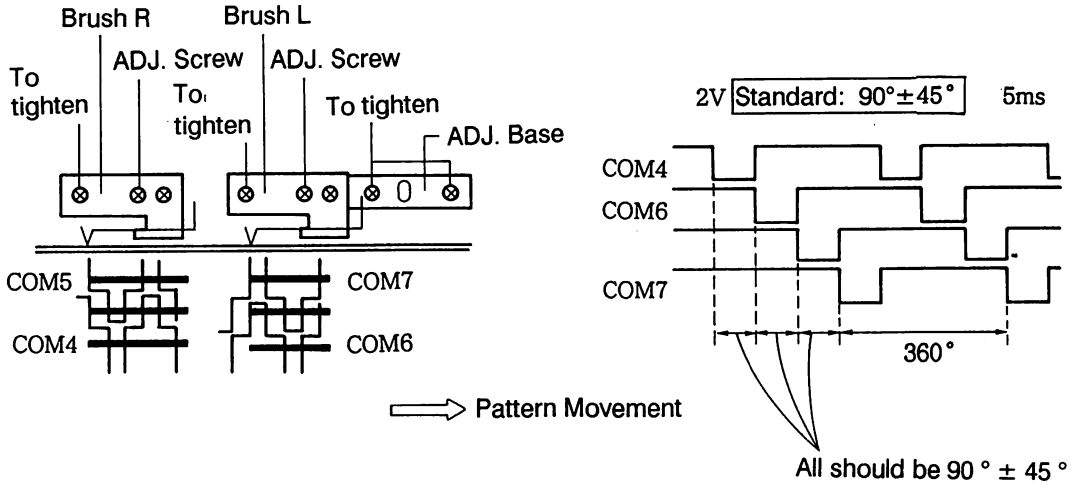
## Adjustment

Adjust at the screw on Brush R first then the adjusting base under Brush L.

1. Attach COM4 test lead to CH1 and COM5 test lead to CH2 of a dual-trace scope. Turn the manual ring slowly while monitoring the scope. Adjust the screw on Brush R (SW8) until the pulses are 180° out of phase. Disconnect the leads.

2. Attach the COM6 and COM7 test leads and adjust Brush L (SW9) the same way.

3. Attach the COM4 and COM6 test leads. Turn the manual ring slowly while monitoring the scope. Adjust the adjusting base under Brush L so the pulses are 90° out of phase. This completes the adjustment.




4. After adjustment apply screw-lock on the fixing screws, the adjusting screws and the adjusting base.

## Pulse Adjustment

- Adjust if main flex unit or USM unit is changed. If not adjusted, USM may work correctly at normal temperatures but fail at high or low temperatures.

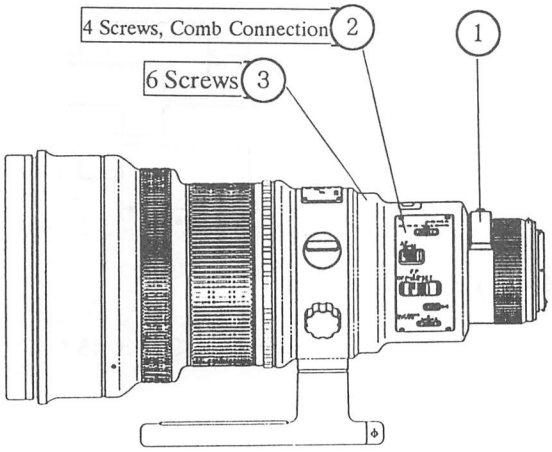
**Purpose** To adjust the duty cycle for maximum power output

**Tools** Oscilloscope, EOS camera

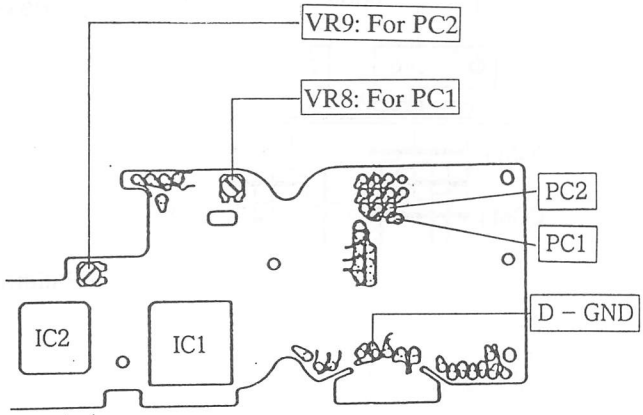
**Standard** "T" and "t" times should be equal, within 10%.
$0.9T \leq t \leq 1.1T$

**Preparation**

1. Remove (1) - (3).

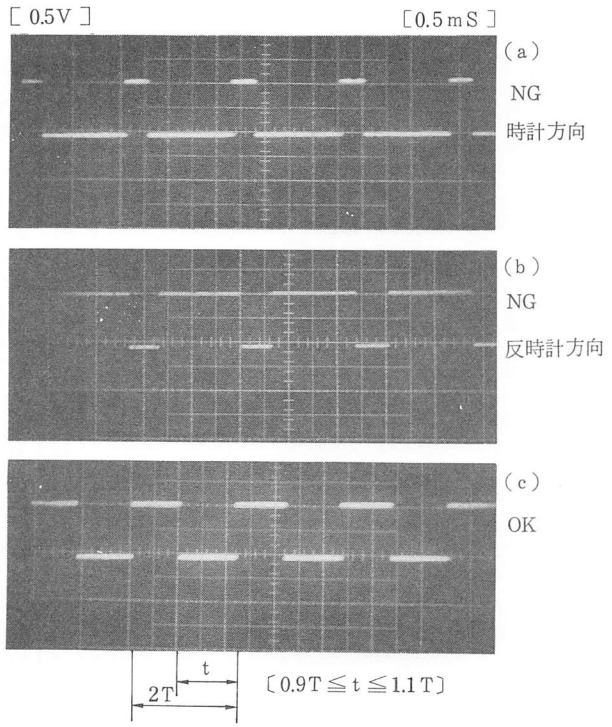



2. Attach test leads to the main flex at PC1, PC2 and D-GND.




### Adjustment

1. Attach the PC1 lead and D-GND lead to the oscilloscope.
2. Press the shutter button, and adjust VR8 so the waveform matches the one.
3. Next, repeat with the PC2 lead adjusting VR9.



## USM Reference Frequency Adjustment

The USM / Helicoid Unit supplied as a service part is pre-adjusted at the factory. This adjustment is included for reference.

If compared to lenses of the same model, focusing speed is too high, too slow, or makes unusual noises, especially at extreme temperatures, check and adjust as necessary.

**Purpose** — To set the reference frequency for the ultrasonic focusing motor.

**Equipment** — Frequency Counter, EOS Camera with depth - of - field preview, except EOS 620

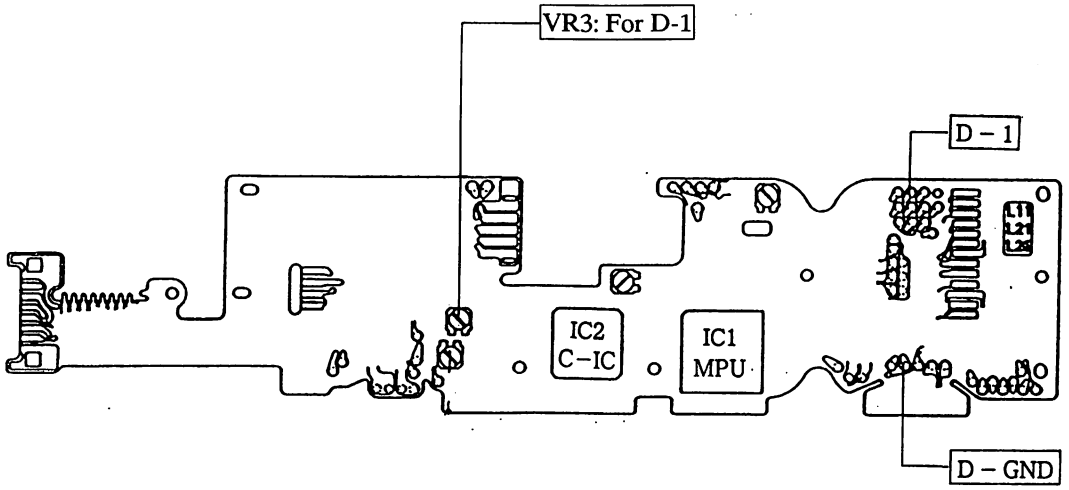
**Standard** — 29.6 ± 0.05kHz

**Preparation** — Disassemble as the same as the Pulse Adjustment (See pg. 24).

### Adjustment

1. Install test leads at D-1 and D-GND and connect to them to the frequency counter.
2. Mount the lens on a camera, press the D-O-F button, and read the frequency.

   If you adjust with EOS 620 camera, press the EL button instead of the D-O-F button.
3. It should be in the value shown in standard. If not, adjust VR3.



# Focus Adjustment

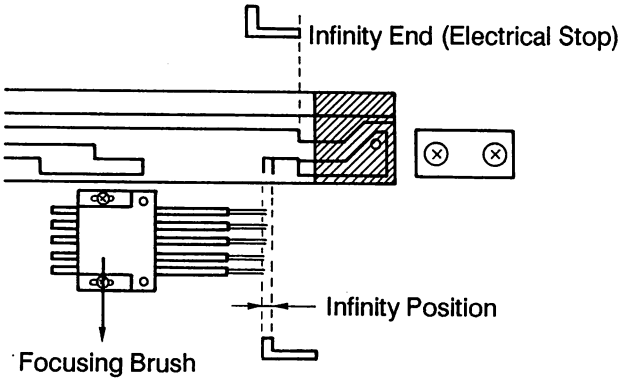
This adjustment is necessary if the optics have been disturbed, or if the index doesn't align properly when manually focusing at infinity.

When the lens is focused on an infinity target: the bottom contact of the focus brush is on the "infinity" position of the contact flex, and; the edge of the 2mm hole is flush with the edge of the notch in the barrel, the lens is correctly adjusted for infinity focus.

**Purpose** To adjust infinity focus.

## 1. Focus Stopper Adjustment (Electrical Stop Position)

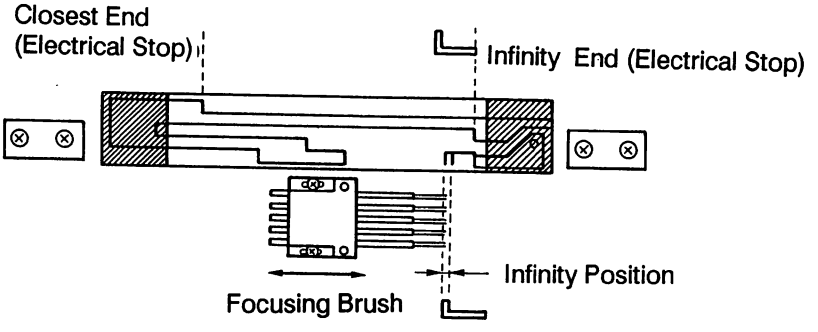
### Standard




### Adjustment

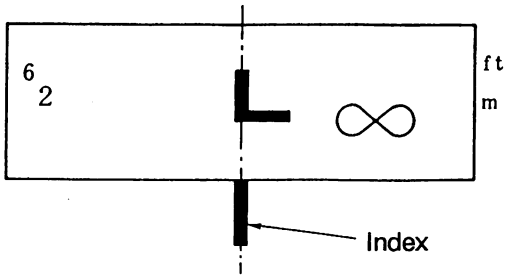
1. Manually focus on an infinity target, as disyant as conditions allow (100f² is thcorctically corrcct, but practically impossible in most situations).

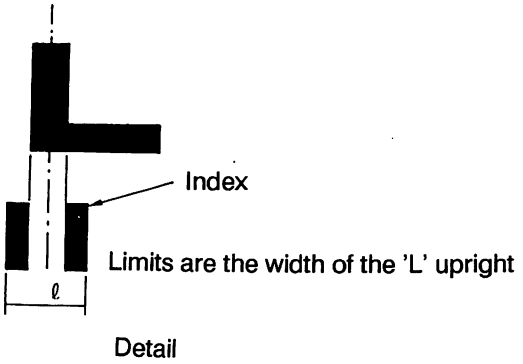
2. Set the focus brush so the bottom contact fall within the width of the infinity pattem. (Note: In the drawing, the focusing brush is shown below the focusing pattern hor clarity.)



## 2. Focusing Scale

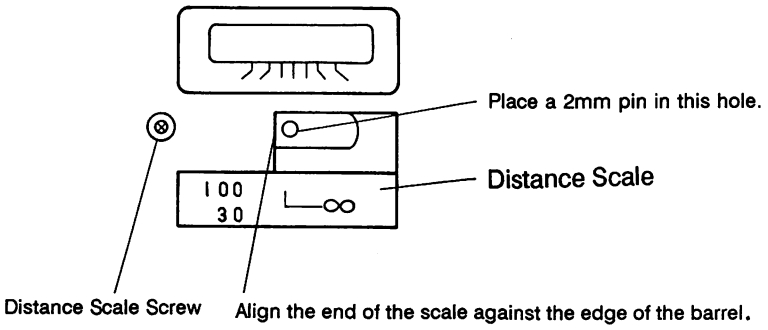
### Standard




### Adjustment

To align the upright of the infinity "L" mark with the index when it is installed later, place a 2mm diameter pin in the hole at the end of the scale and place it hard against the edge of the barrel. Tighten and stake the screw heads with screw-lock.




### Reference

Resolution Chart

| Image height | 0 mm | 4 mm | 8 mm | 12 mm | 16 mm | 20 mm |
|---|---|---|---|---|---|---|
| S | 100 | 100 | 100 | 100 | 100 | 100 |
| M | | 100 | 100 | 63 | 63 | 40 |

## Focus Compensation

**Purpose**

To align the autofocus points as chose as possible to the lenses actual best focus point.

**Notes**

At the factory, this correction is written into each individual lens' ROM with an expensive tool. This tool is much too costly for field use so service will use the following procedures instead.

1. If the Main Flex is replaced, check the AF ADJ0 through AF ADJ3 pads on the flex being replaced and bridge the new flex in the same way.

2. For other repairs, make no changes to the pads.

3. For customer complaints, determine the model of camera being used and adjust using one of the following two methods.

   AF ADJ2, and 3 Pads: The EOS-1 also has a vertical sensor which measures in the zone between f/2.8 and 3.8. It is effective for lenses of f/2.8 and faster, so lenses in this category must have compensation for the V-BASIS sensor also. (The V-BASIS sensors in the EOS-10 do not operate in this zone.)

### Adjustment 1

If front defocus, increase plus correction. If rear defocus, increase negative correction.

### Adjustment 2

Make actual photographic test at with the pads in all four possible combinations. Make five or six negatives for each combination. Examine the negatives closely to determine which combinations is best.

Test Conditions:

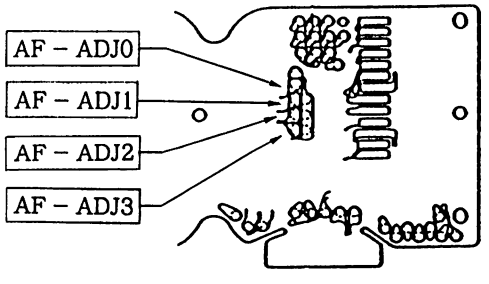
Distance: 15m

Target: Casual Resolution Chart with the AF standard bar chart in center.

Aperture: Maximum

Focusing: Return lens to infinity after each exposure and autofocus on bar chart.

Camera: EOS with Aperture Priority (AV) Mode



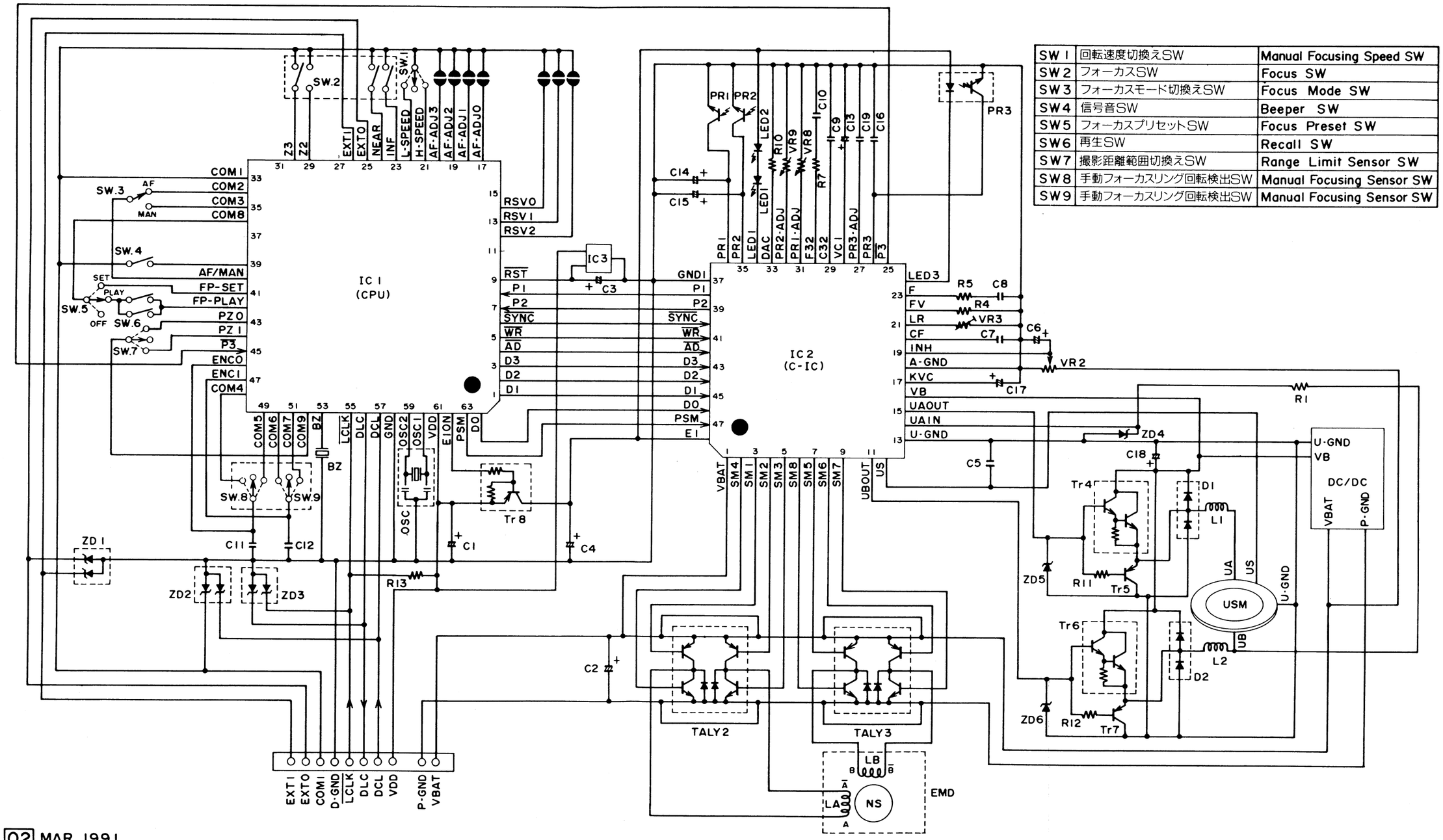

| | H-Basis | | V-Basis | |
|---|---|---|---|---|
| | AF – ADJ0 | AF – ADJ1 | AF – ADJ2 | AF – ADJ3 |
| – 3/4F δ | 1 | 0 | 1 | 0 |
| – 1/4F δ | 0 | 0 | 0 | 0 |
| + 1/4F δ | 1 | 1 | 1 | 1 |
| + 3/4F δ | 0 | 1 | 0 | 1 |

F: Max. f/no. 0: Closed
δ: Circle of confusion 1: Open

# CANON LENS EF 200 mm 1:1.8L
# EF 300 mm 1:2.8L (NEW)
# EF 600 mm 1:4.0L
# EF 400 mm 1:2.8L

REF. NO. C21-8272
C21-8252
C21-8292
C21-8282

## SCHEMATIC DIAGRAM



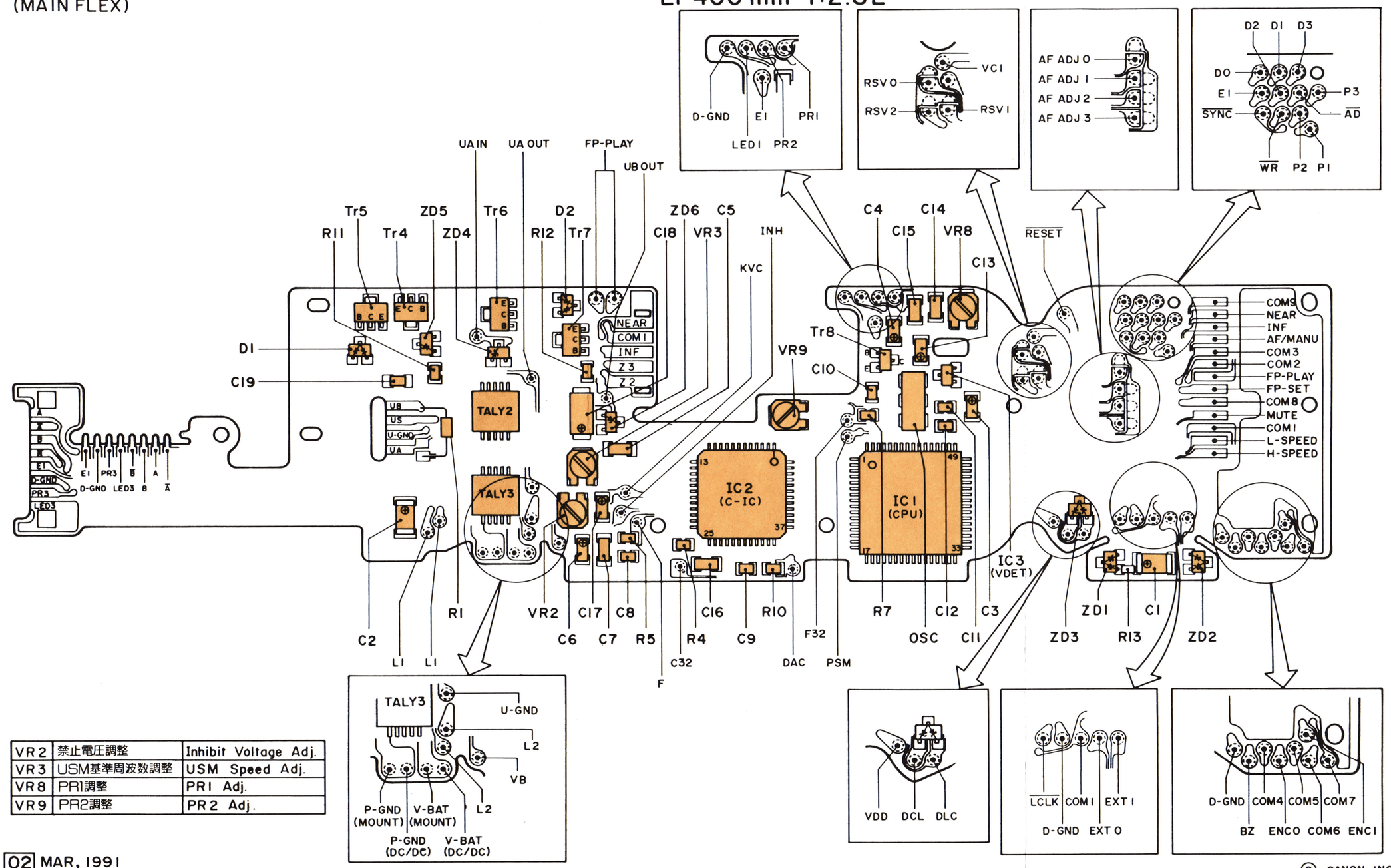

| | | |
|---|---|---|
| SW1 | 回転速度切換えSW | Manual Focusing Speed SW |
| SW2 | フォーカスSW | Focus SW |
| SW3 | フォーカスモード切換えSW | Focus Mode SW |
| SW4 | 信号音SW | Beeper SW |
| SW5 | フォーカスプリセットSW | Focus Preset SW |
| SW6 | 再生SW | Recall SW |
| SW7 | 撮影距離範囲切換えSW | Range Limit Sensor SW |
| SW8 | 手動フォーカスリング回転検出SW | Manual Focusing Sensor SW |
| SW9 | 手動フォーカスリング回転検出SW | Manual Focusing Sensor SW |

02 MAR, 1991

REF. NO. C21-8272
C21-8252
C21-8292
C21-8282

# CANON LENS EF200mm 1:1.8L
# EF300mm 1:2.8L (NEW)
# EF600mm 1:4.0L
# EF400mm 1:2.8L

P.C.B. DIAGRAM
(MAIN FLEX)



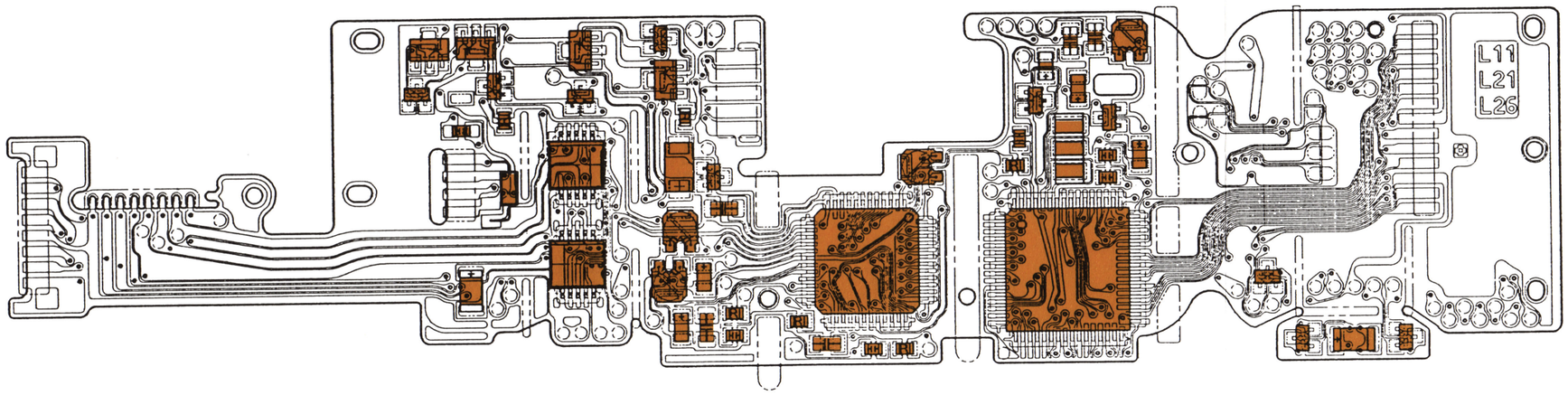

| | | |
|---|---|---|
| VR2 | 禁止電圧調整 | Inhibit Voltage Adj. |
| VR3 | USM基準周波数調整 | USM Speed Adj. |
| VR8 | PR1調整 | PR1 Adj. |
| VR9 | PR2調整 | PR2 Adj. |

02 MAR, 1991

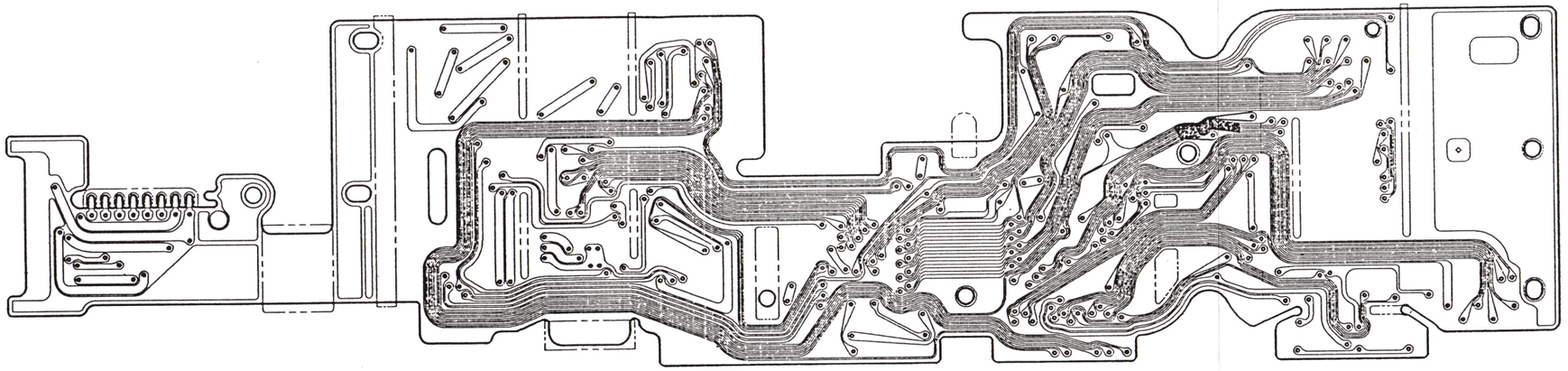
REF. NO. C21-8272
C21-8252
C21-8292
C21-8282

# CANON LENS EF200mm 1:1.8L
# EF300mm 1:2.8L (NEW)
# EF600mm 1:4.0L
# EF400mm 1:2.8L

P.C.B. DIAGRAM
(MAIN FLEX)




(Thru View)



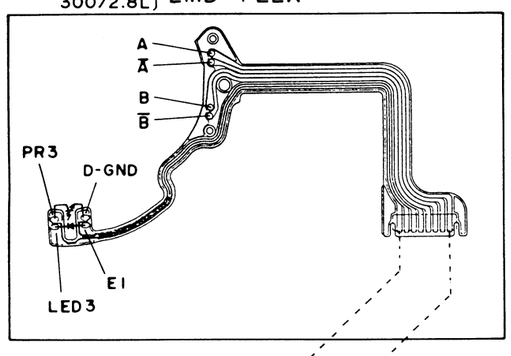
02 MAR, 1991

REF. NO. C21-8272
C21-8252
C21-8292
C21-8282

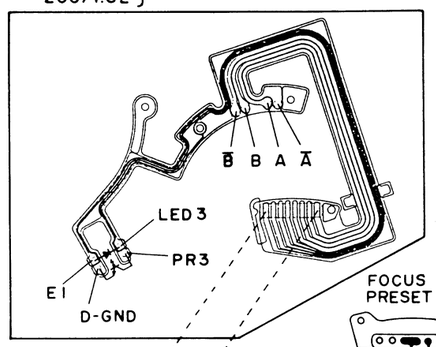
# CANON LENS EF 200 mm 1:1.8L
# EF 300 mm 1:2.8L (NEW)
# EF 600 mm 1:4.0L
# EF 400 mm 1:2.8L

## WIRING & P.C.B. DIAGRAM

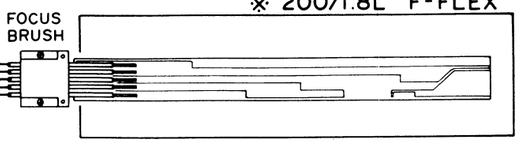
400/2.8L, 300/2.8L } EMD-FLEX



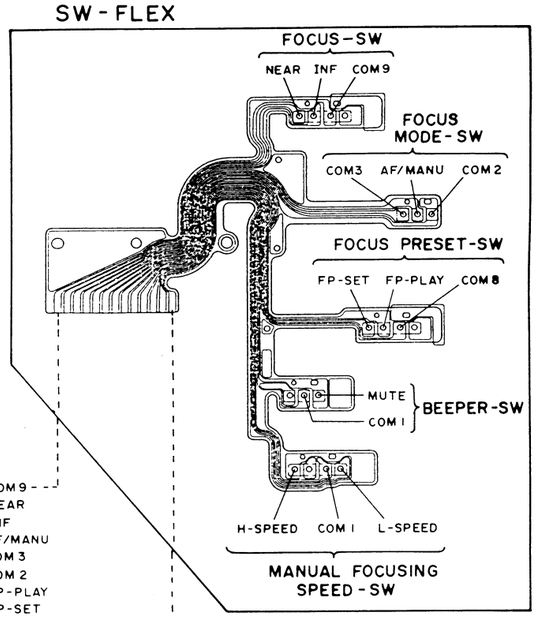

600/4.0L, 200/1.8L } EMD-FLEX




※ 200/1.8L F-FLEX




SW-FLEX



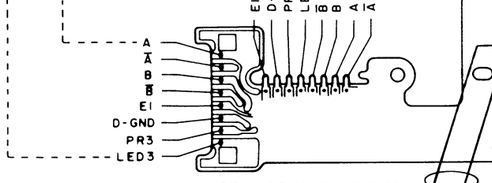

(ORANGE)

FOR 400/2.8L 600/4.0L ONLY

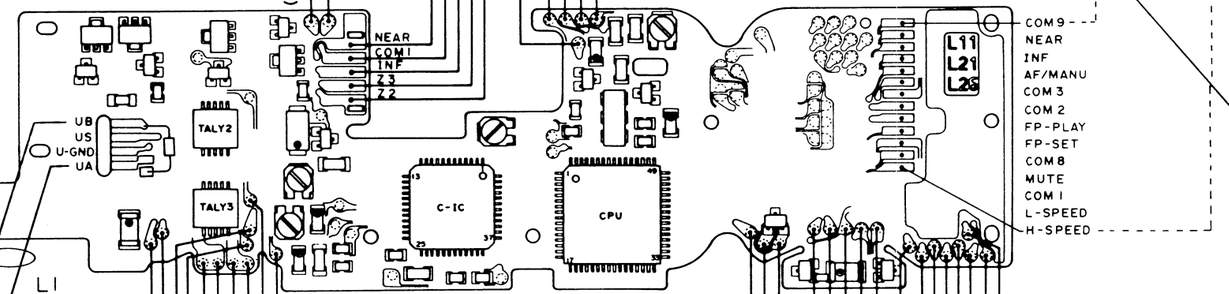
< > : 400/2.8L ONLY

FOCUS PRESET SWITCH

E1 (RED)
D-GND (BLACK)
LED (ORANGE)
PR2 (GREEN) < WHITE >
PR1 (WHITE) < GREEN >
} FOR SENSOR UNIT

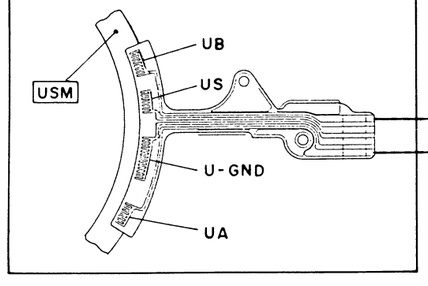



FOR 400/2.8L ONLY (RED)




< > : 400/2.8L ONLY

U-FLEX




L1
(BLUE)
(BLUE)

L2
(GREEN)
(GREEN)

V-BAT (RED)
P-GND (BLACK)

U-GND (BLACK)
VB (RED)

P-GND (BLACK)
V-BAT (RED)

DC/DC CONVERTER

VDD (BROWN)
DCL (RED)
DLC (ORANGE)
LCLK (YELLOW)
D-GND (GREEN)
COM1 (BLUE)
EXT0 (PURPLE)
EXT1 (GRAY)

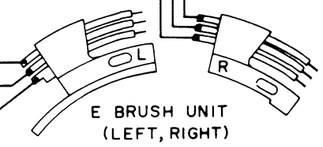
MOUNT CONTACT

D-GND (WHITE)
BZ (WHITE)

BZ

COM4 (ORANGE) < YELLOW >
ENC0 (BLUE) < BROWN >
COM5 (GREEN) < PURPLE >

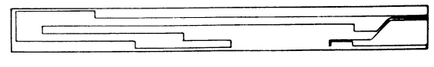
COM6 (ORANGE)
COM7 (GREEN)
ENC1 (BLUE)



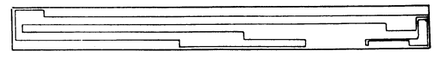

E BRUSH UNIT (LEFT, RIGHT)

※ F-FLEX

300/2.8L F-FLEX



400/2.8L, 600/4.0L F-FLEX



## LEAD PARTS NO.

(V-BAT, P-GND, UA, UB, US, U-GND)
Y11-50XX
(OTHER)
Y11-39XX — COLOR CODE

| COLOR | WHITE | BLACK | RED | ORANGE | YELLOW | GREEN | BLUE | PURPLE | BROWN | GRAY |
|---|---|---|---|---|---|---|---|---|---|---|
| COLOR CODE | 01 | 02 | 03 | 06 | 07 | 09 | 11 | 12 | 13 | 14 |

02 MAR, 1991

# CANON LENS EF 400 mm 1:2.8L

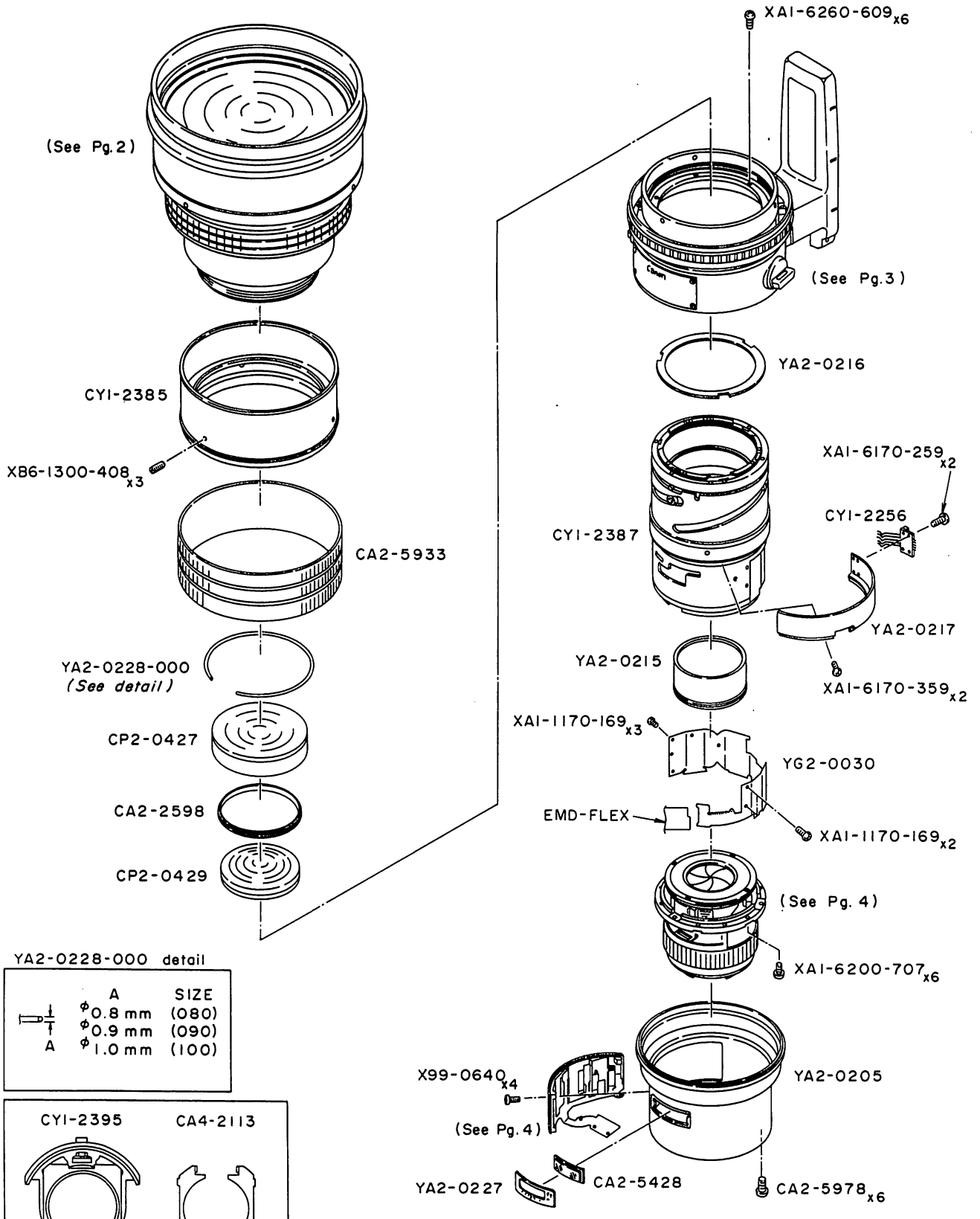
## REF. NO. C21-8282

## CANON LENS HOOD

## ET-161B FOR EF 400 mm 1:2.8L

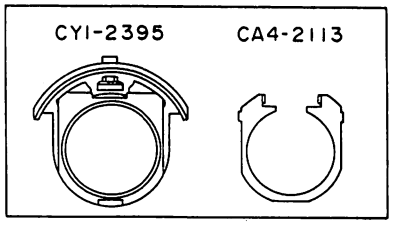
REF. NO. C44-8151

# CANON LENS EF 400 mm 1:2.8L

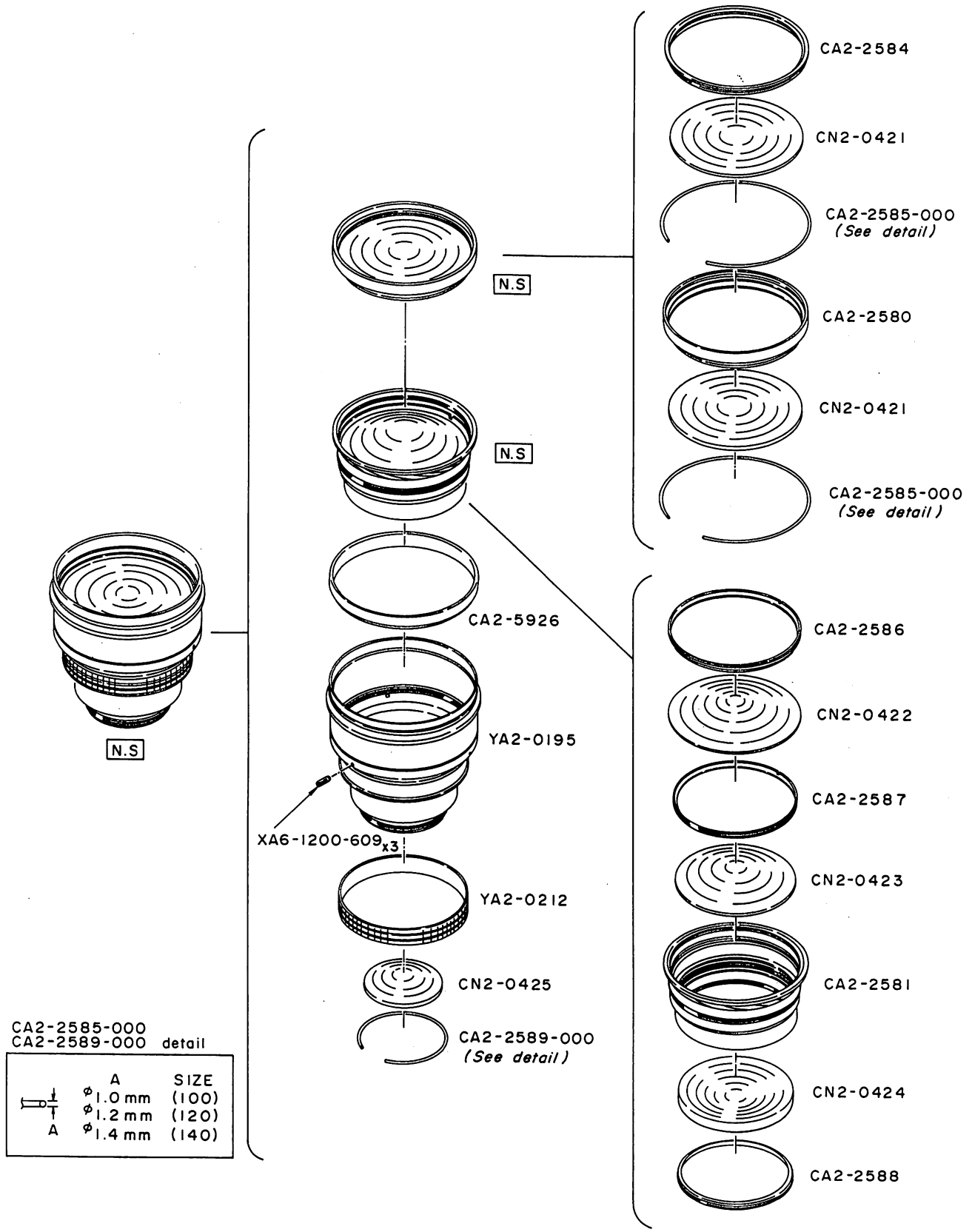



YA2-0228-000 detail

| A | SIZE |
|---|---|
| φ0.8 mm | (080) |
| φ0.9 mm | (090) |
| φ1.0 mm | (100) |



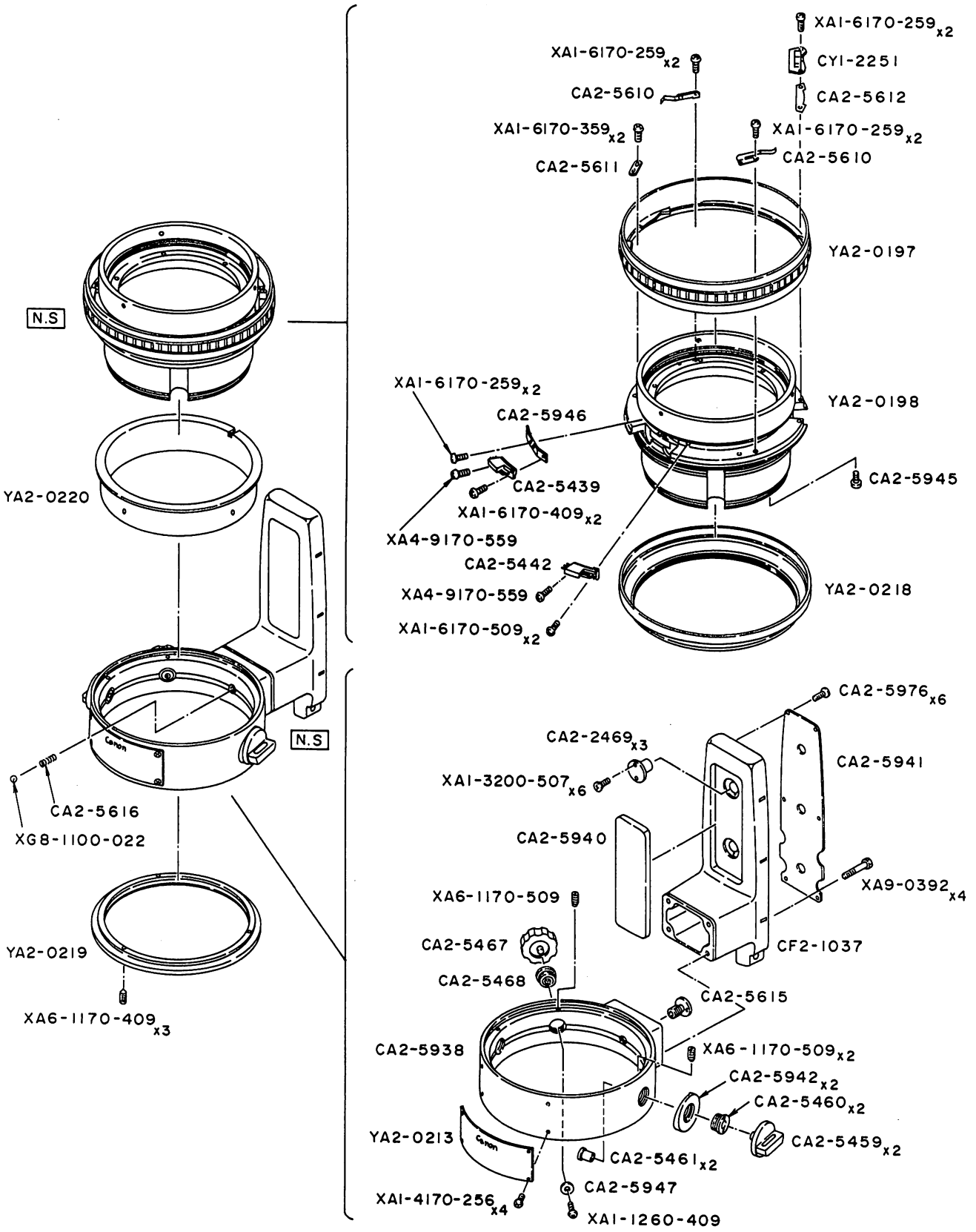
# CANON LENS EF 400 mm 1:2.8L




CA2-2585-000
CA2-2589-000 detail

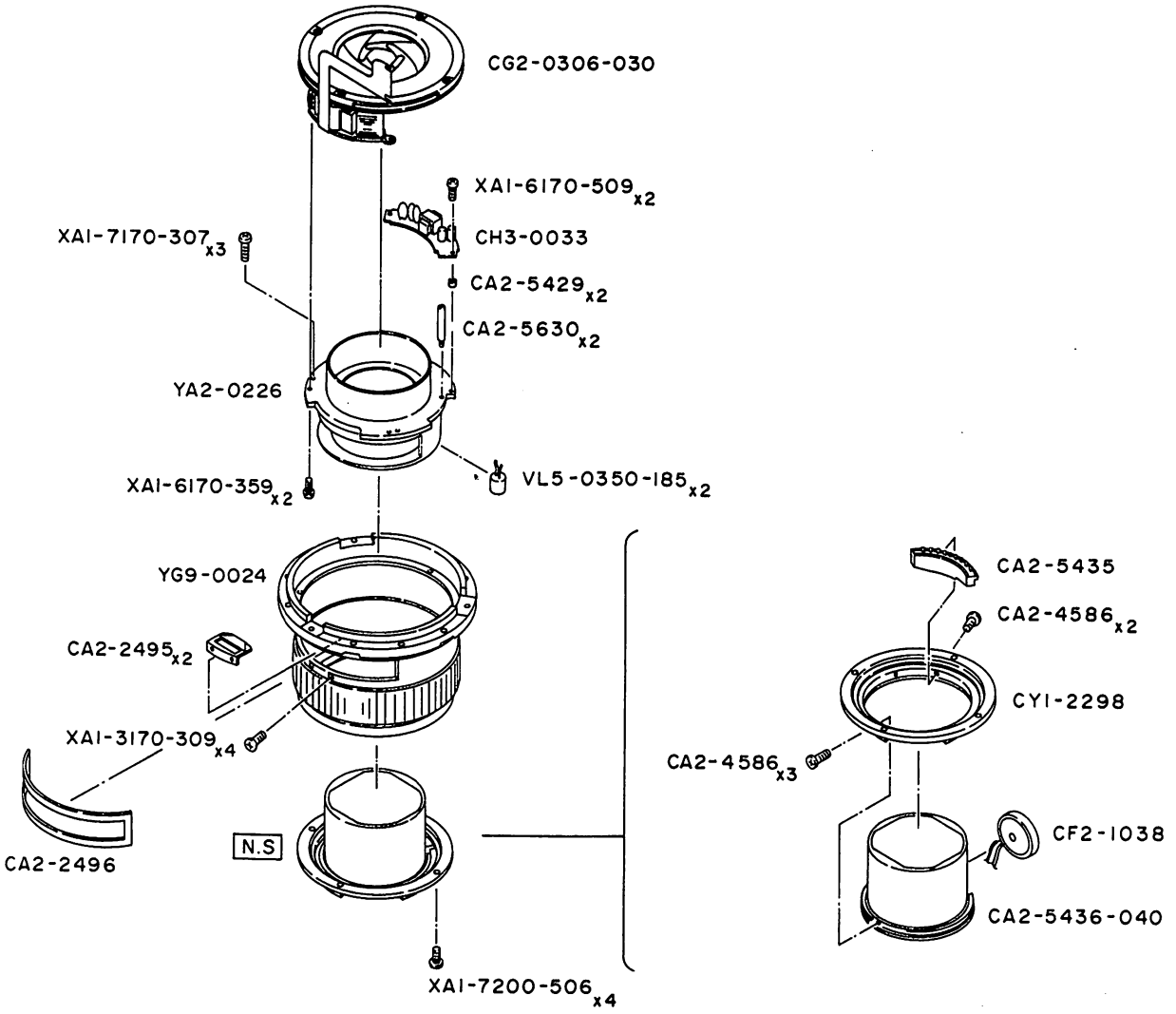
| | A | SIZE |
|---|---|---|
| A | φ1.0 mm | (100) |
| | φ1.2 mm | (120) |
| | φ1.4 mm | (140) |

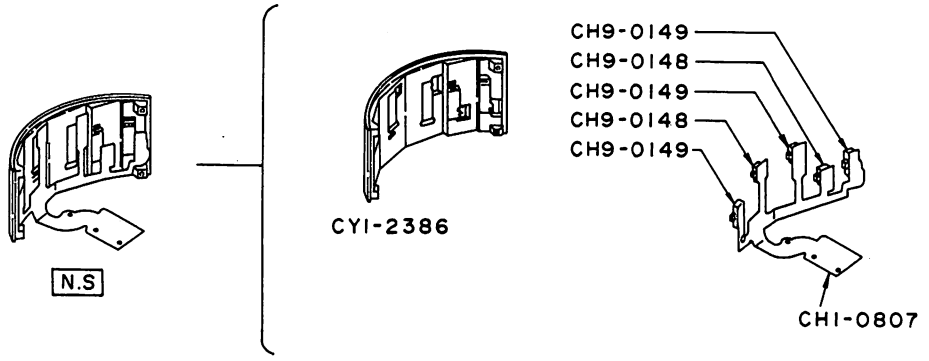
# CANON LENS EF 400 mm 1:2.8L



REF. NO. C21-8282

# CANON LENS EF 400 mm 1:2.8L



EF 400mm1:2.8L
REF. NO. C21-8282

| NEW | PART NO. | CLASS | QTY | DESCRIPTION | | PAGE |
|---|---|---|---|---|---|---|
| | CA2-2469-000 | D | 3 | SOCKET, TRIPOD | 三脚ネジ | 3 |
| | CA2-2495-000 | D | 2 | GUIDE, FILTER | フィルターガイド | 4 |
| | CA2-2496-000 | C | 1 | SEAL, RUBBER | フィルターゴム | 4 |
| | CA2-2580-000 | E | 1 | FRAME, LENS | 中間保護ガラス鏡筒 | 2 |
| | CA2-2581-000 | E | 1 | BARREL, FRONT | 前群鏡筒 | 2 |
| | CA2-2584-000 | E | 1 | FRAME, LENS | G1鏡筒 | 2 |
| | CA2-2585-000(XXX) | E | 2 | RING, SNAP | C リング | 2 |
| | CA2-2586-000 | E | 1 | COLLAR, ASSEMBLY | G3押え環 | 2 |
| | CA2-2587-000 | E | 1 | COLLAR, ASSEMBLY | G4押え環 | 2 |
| | CA2-2588-000 | E | 1 | COLLAR, ASSEMBLY | G5押え環 | 2 |
| | CA2-2589-000(XXX) | E | 1 | RING, SNAP | G6押え環 | 2 |
| | CA2-2598-000 | E | 1 | COLLAR, ASSEMBLY | G9/10 押え環 | 1 |
| | CA2-4586-000 | E | 5 | SCREW | 接点ブロック止メビス | 4 |
| | CA2-5428-000 | E | 1 | WINDOW, DEPTH OF FIELD | 距離窓 | 1 |
| | CA2-5429-000 | E | 2 | SPACER | DC/DC スペーサー | 4 |
| | CA2-5435-000 | D | 1 | CONTACT ASS'Y | 接点ブロック | 4 |
| | CA2-5436-040 | D | 1 | COVER, BACK | 裏蓋 | 4 |
| | CA2-5439-000 | E | 1 | CONTACT L | E ブラシ L | 3 |
| | CA2-5442-000 | E | 1 | CONTACT R | E ブラシ R | 3 |
| | CA2-5459-000 | D | 2 | LUG, STRAP | ストラップ金具 | 3 |
| | CA2-5460-000 | E | 2 | NUT | ストラップ金具 | 3 |
| | CA2-5461-000 | E | 2 | NUT, SLEEVE | ストラップ受け | 3 |
| | CA2-5467-000 | D | 1 | KNOB | 三脚座ロックナット | 3 |
| | CA2-5468-000 | E | 1 | NUT, LOCK | 三脚座ロックナット座 | 3 |
| | CA2-5610-000 | E | 2 | SPRING, PLATE | 中点バネ | 3 |
| | CA2-5611-000 | E | 1 | STOPPER, F.P. RING | 中点ストッパー | 3 |
| | CA2-5612-000 | E | 1 | SPACER | SW受け台 | 3 |
| | CA2-5615-000 | E | 1 | HOLDER, BALL | クリックホルダ | 3 |
| | CA2-5616-000 | E | 1 | SPRING, COIL | クリックバネ | 3 |
| | CA2-5630-000 | E | 2 | STUD | EMD 支柱 | 4 |
| | CA2-5926-000 | D | 1 | PROTECTOR | ガードゴム | 2 |
| | CA2-5933-000 | | 1 | | マニュアルリングゴム | 1 |
| | CA2-5938-000 | D | 1 | RING, TRIPOD | 三脚本体 | 3 |
| | CA2-5940-000 | E | 1 | GRIP | 三脚ゴム | 3 |
| | CA2-5941-000 | D | 1 | BASE PLATE | 三脚足フタ | 3 |
| | CA2-5942-000 | E | 2 | GUARD, LUG | ストラップガード | 3 |
| | CA2-5945-000 | E | 1 | SCREW | 三脚位置決めビス | 3 |
| | CA2-5946-000 | E | 1 | ADJUSTING BASE, CONTACT L | ブラシ調整台 | 3 |
| | CA2-5947-000 | E | 1 | WASHER | 三脚ロックナット抜け止め | 3 |
| | CA2-5976-000 | D | 6 | SCREW, SLSUM | 三脚足フタビス | 3 |

EF 400mm1:2.8L
REF. NO. C21-8282

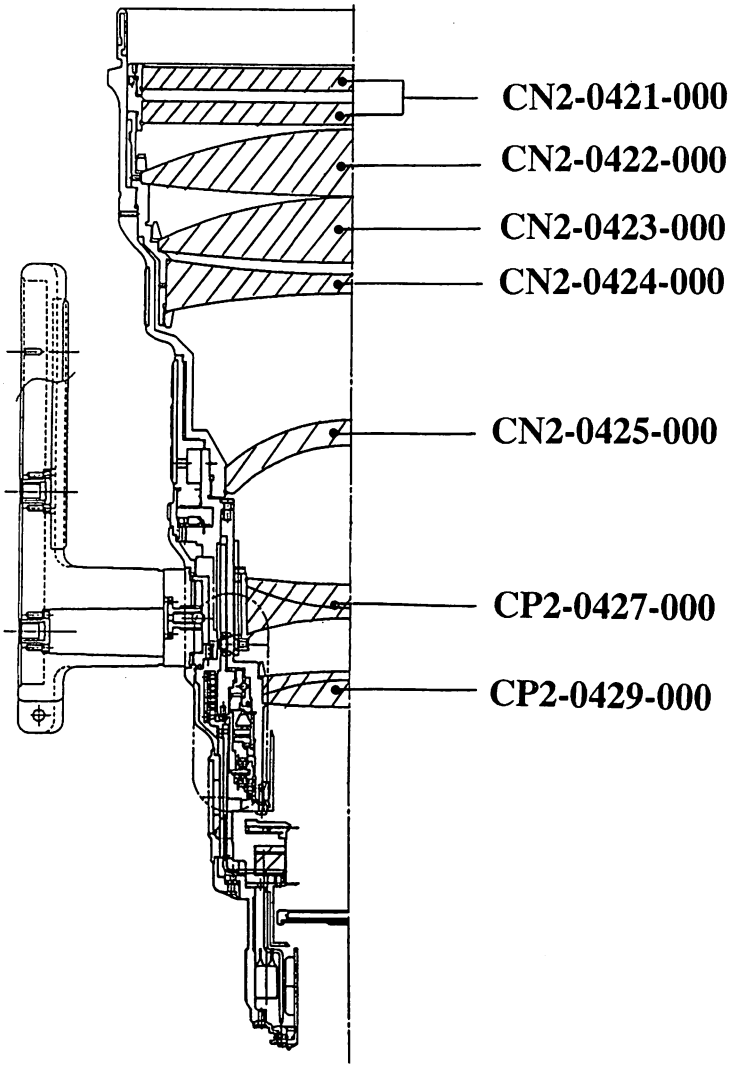
| NEW | PART NO. | CLASS | QTY | DESCRIPTION | | PAGE |
|---|---|---|---|---|---|---|
| | CA2-5978-000 | D | 6 | SCREW, SLSUM | 外筒止めビス | 1 |
| * | CA4-2113-000 | | 1 | | ゼラチン押え板 | 1 |
| | CF2-1037-000 | D | 1 | BASE, TRIPOD | 三脚足 | 3 |
| | CF2-1038-000 | E | 1 | BEEPER | ブザー | 4 |
| | CG2-0306-030 | D | 1 | POWER DIAPHRAGM UNIT | EMD ユニット | 4 |
| | CH1-0807-000 | E | 1 | SW-FLEX | SW-FLEX | 4 |
| | CH3-0033-000 | E | 1 | CONVERTER, DC/DC | DC/DC コンバーター | 4 |
| | CH9-0148-000 | E | 2 | SWITCH, SLIDE | スライドスイッチ | 4 |
| | CH9-0149-000 | E | 3 | SWITCH, SLIDE | スライドスイッチ | 4 |
| | CN2-0421-000 | C | 2 | LENS, G1,G2 | G1, G2レンズ | 2 |
| | CN2-0422-000 | E | 1 | LENS, G3 | G3レンズ | 2 |
| | CN2-0423-000 | E | 1 | LENS, G4 | G4レンズ | 2 |
| | CN2-0424-000 | E | 1 | LENS, G5 | G5レンズ | 2 |
| | CN2-0425-000 | E | 1 | LENS, G6 | G6レンズ | 2 |
| | CP2-0427-000 | E | 1 | LENS, G7/8 | G7/G8 レンズ | 1 |
| | CP2-0429-000 | E | 1 | LENS, G9/10 | G9/G10レンズ | 1 |
| | CY1-2251-000 | E | 1 | PRESET SWITCH UNIT | フォーカスプリセットSWユニット | 3 |
| | CY1-2256-000 | D | 1 | FOCUSING CONTACT UNIT | フォーカスブラシユニット | 1 |
| | CY1-2298-000 | D | 1 | MOUNT, LENS | レンズマウント | 4 |
| * | CY1-2385-000 | D | 1 | RING, MANUAL FOCUSING | フォーカスダイヤルユニット | 1 |
| * | CY1-2386-000 | E | 1 | SWITCH PANEL UNIT | スイッチパネルユニット | 4 |
| * | CY1-2387-000 | E | 1 | FOCUSING UNIT | ヘリコイド/USMユニット | 1 |
| * | CY1-2395-000 | D | 1 | FILTER HOLDER UNIT | ゼラチンホルダーユニット | 1 |
| | VL5-0350-185 | E | 2 | COIL | コイル | 4 |
| | XA1-1170-169 | | 5 | SCREW, CROSS-RECESS, PH | | 1 |
| | XA1-1260-409 | | 1 | SCREW, PH M2.6X4 | | 3 |
| | XA1-3170-309 | | 4 | SCREW, CROSS-RECESS, FCH | | 4 |
| | XA1-3200-507 | | 6 | SCREW, FTH2X5 | | 3 |
| | XA1-4170-256 | | 4 | SCREW, CROSS-RECESS, OCH | | 3 |
| | XA1-6170-259 | | 10 | SCREW, CROSS-RECESS, PH | | 1,3 |
| | XA1-6170-359 | | 6 | SCREW, CROSS-RECESS, PH | | 1,3,4 |
| | XA1-6170-409 | | 2 | SCREW, CROSS-RECESS, PH | | 3 |
| | XA1-6170-509 | | 4 | SCREW, CROSS-RECESS, PH | | 3,4 |
| | XA1-6200-707 | | 6 | SCREW, PH2X7 | | 1 |
| | XA1-6260-609 | | 6 | SCREW, CROSS-RECESS, PH | | 1 |
| | XA1-7170-307 | | 3 | SCREW, CROSS-RECESS, PH | | 4 |
| | XA1-7200-506 | | 4 | SCREW, CROSS-RECESS, PH | | 4 |
| | XA4-9170-559 | | 2 | SCREW, CROSS-RECESS, PH | | 3 |
| | XA6-1170-409 | | 3 | SETSCREW, SLOTTED, HLCP | | 3 |

EF 400mm1:2.8L
REF. NO. C21-8282

| NEW | PART NO. | CLASS | QTY | DESCRIPTION | | PAGE |
|---|---|---|---|---|---|---|
| | XA6-1170-509 | | 3 | SETSCREW, SLOTTED, HLCP | | 3 |
| | XA6-1200-609 | | 3 | SETSCREW, SLOTTED, HLCP | | 2 |
| | XA9-0392-000 | | 4 | BOLT, HEXAGON SOCKET | | 3 |
| | XB6-1300-408 | | 3 | SCREW HEX SOCKET | | 1 |
| | XG8-1100-022 | | 1 | BALL, STEEL | | 3 |
| | X99-0640-000 | | 4 | SCREW, CROSS-RECESS, PH | | 1 |
| * | YA2-0195-000 | D | 1 | BARREL, FRONT LENS | 前群継筒 | 2 |
| * | YA2-0197-000 | D | 1 | RING, FOCUS PRESET | FPリング | 3 |
| * | YA2-0198-000 | E | 1 | BARREL, INTERMEDIATE | 三脚保持台 | 3 |
| * | YA2-0205-000 | D | 1 | SLEEVE, INDICATOR | 外筒 | 1 |
| * | YA2-0212-000 | D | 1 | RING, RUBBER | 前群ゴム | 2 |
| * | YA2-0213-000 | D | 1 | NAME PLATE | 銘板 | 3 |
| * | YA2-0215-000 | E | 1 | BAFFLE | 遮光筒 | 1 |
| * | YA2-0216-000 | E | 1 | SEAL, MASK | 防視板 | 1 |
| * | YA2-0217-000 | E | 1 | HOLDER, BRUSH | ブラシ保持台 | 1 |
| * | YA2-0218-000 | E | 1 | RING | 本体カバー | 3 |
| * | YA2-0219-000 | E | 1 | COLLAR, ASSEMBLY | 三脚押えリング | 3 |
| * | YA2-0220-000 | E | 1 | RING, CLICK | 三脚固定筒 | 3 |
| * | YA2-0226-000 | E | 1 | SLEEVE, IRIS | 固定絞り筒 | 4 |
| * | YA2-0227-000 | D | 1 | SCALE, DEPTH OF FIELD | カバー | 1 |
| * | YA2-0228-000(XXX) | E | 1 | RING, SNAP | G6/7押えリング | 1 |
| * | YG2-0030-000 | D | 1 | MAIN FLEX CBA | メインフレキユニット | 1 |
| * | YG9-0024-000 | D | 1 | BARREL, FIXED | 固定筒ユニット | 4 |

# CANON LENS EF 400 mm 1:2.8L

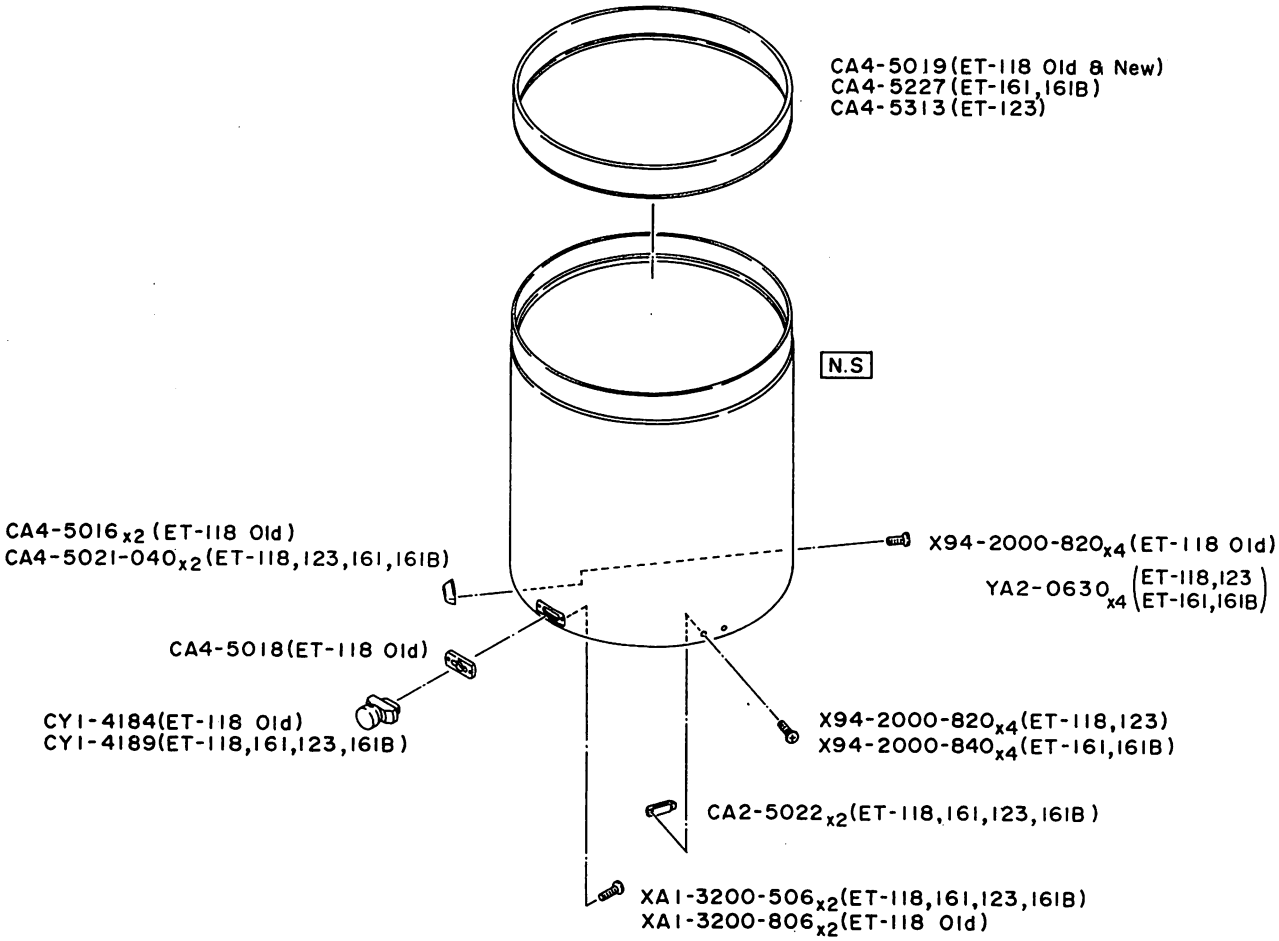
REF. NO. C21-8282



# CANON LENS HOOD

ET-118 FOR EF 300 mm 1:2.8L (OLD & NEW)
ET-161 FOR EF 600 mm 1:4.0L
ET-123 FOR EF 200 mm 1:1.8L
ET-161B FOR EF 400 mm 1:2.8L

REF. NO. C44-8121
C44-8131
C44-8141
C44-8151




| PART NO. | DESCRIPTION | ET-118(Old) | ET-118(New) | ET-161 | ET-123 | ET-161B | |
|---|---|---|---|---|---|---|---|
| CA4-5016-000 | TAB,HOOD | O | | | | | |
| CA4-5018-000 | SPACER | O | | | | | |
| CA4-5019-000 | PROTECTOR | O | O | | | | |
| CA4-5021-040 | TAB-1,HOOD | | O | O | O | O | |
| CA4-5022-000 | TAB-2,HOOD | | O | O | O | O | |
| CA4-5227-000 | PROTECTOR | | | O | | O | |
| CA4-5313-000 | PROTECTOR | | | | O | | |
| CY1-4184-000 | LOCK UNIT | O | | | | | |
| CY1-4189-000 | LOCK UNIT | | O | O | O | O | |
| XA1-3200-506 | SCREW | | O | O | O | O | |
| XA1-3200-806 | SCREW | O | | | | | |
| X94-2000-820 | SCREW | O | O | | O | | |
| X94-2000-840 | SCREW | | | O | | O | |
| YA2-0630-000 | SCREW | | O | O | O | O | |

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Canon

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