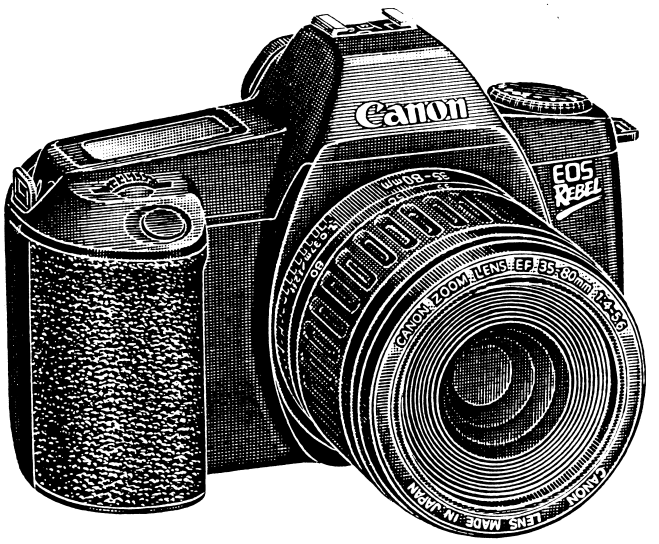
Canon

Service Manual

ENGLISH EDITION

CANON EOS REBEL
EOS 1000
EOS 1000 QD
SPEEDLITE 200E



C12-8191
C12-8192
C13-8193
C50-0691

CY8—1200—072

EOS REBEL, 1000, 1000QD (C12 – 8191, 2, 3)

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1. GENERAL INFORMATION

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FEATURES

This new EOS, known as the Rebel, 1000, or 1000QD depending on the market area, is "The new Basic Standard AF-SLR for the '90's". It is designed to combine "function, performance, and reliability" in a compact, lightweight, perfectly balanced package. (The EOS 1000QD has data imprinting and built-in flash in addition to the features shared with the other two models.)

AF

- High-speed autofocus as fast as the EOS 10, 630, and 700.
- Automatic selection of One-shot or AI Servo AF

AE

- Simplified Factor 3 SPD and "New Evaluative Metering"
- Eight autoexposure mode, and manual metering

Film Transport

- Prewind system, like EOS 750, 850, and 700

Flash

- Dedicated Speedlite hot shoe
- EOS 1000QD has manual operation built-in flash

Miscella-neous

- Compact lightweight all injection-molded body (including mirror box and lens mount). It is the lightest full-frame SLR on the market at time of going to press.
- Large easy-to-read LCD Panel.

SPECIFICATIONS

☒ mark: EOS 1000QD specifications only

1. Type Classification

1-1	**Type**	35 mm single-lens reflex electronically controlled focal plane (vertical drive) shuttered automatic exposure and focusing camera with built-in motor drive (with built-in flash for EOS 1000QD)
1-2	**Format**	24 mm x 36 mm
1-3	**Lens**	Canon EF lenses
1-4	**Standard lens**	EF35 to 80 mm f/4-5.6, EF 50 mm f/1.8
1-5	**Lens mount**	Canon EF mount

2. Autofocus

2-1 Type

TTL-SIR* system (TTL secondary image-formation phase shift detection) (* SIR: Secondary Imaged Registration)

2-2 Focusing modes

① Autofocus
The autofocus mode is automatically set according to the selected shooting mode (manual setting is not possible). Both modes operate as focus priority modes (initial shutter release cannot be carried out until AF completion).

①-1 One-shot AF mode
AF operation is completed after in-focus → AF lock

①-2 One-shot AF/AI Servo AF auto switching mode
Subject movement is tracked continuously until focus is obtained, if subject is in motion.

② Manual focusing
By setting the lens focusing switch to M and then operating the manual focusing ring.

* There is no function provided that automatically enables manual focusing after AF in-focus when using USM lenses without switching the lens' focus mode switch.

2-3 AF operation

Activated by pressing the shutter button halfway.

2-4 AF operation speed

Approx 0.45 seconds (from EV12, ∞ → 1 m, T) with EF 35 ~ 80 mm f/4-5.6 lens

2-5 AF in-focus indication

Indicated on the LCD inside the viewfinder and by beeper, which cannot be turned OFF.

2-6 AF working range

EV +1 ~ 18 (ISO 100)

2-7 AF auxiliary light

☒ (1) Built-in AF auxiliary light (left side of retractable flash head)
The near infrared (peak wavelength: 695 nm) fires automatically if necessary. Effective distance: 1 ~ 4 m

☒ (2) Automatic fire conditions
Fired automatically when the subject is "low contrast/low luminance" (EV 3 ~ 5/ISO 100 or less) if the flash is extended.

☒ (3) Fire time/fire count
320 ms or less/1 ~ 5 times (Flash firing stops during in-focus signal detection.)

☒ (4) Light source
Superhigh luminance LED

☒ (5) Pattern
Random stripe (horizontal)

(6) When using the 430EZ, 300EZ, or (200E), AF auxiliary light emission is carried out as with the EOS 650.

3. Viewfinder

3-1 Type

Fixed eye-level pentaprism single lens reflex without condenser lens

3-2 Focusing screen

Fixed, "New Laser Matte" screen with AF frame/partial metering area mark

3-3 Power

–1 dpt (eye point: 20 mm)

3-4 Field of view

90% vertical and horizontal

3-5 Magnification

0.75x (with 50 mm lens at infinity)

3-6 Information

Below viewing area: Alphanumeric display via seven-segment LCD (yellow-green)

① Shutter speed (Blinks at 2 Hz for camera shake and out-of-coupling-range warning.)

② Aperture value (Blinks at 2 Hz to give out-of-coupling-range warning.)

③ Exposure level

④ Depth-of-Field AE mode (dEP 1 , dEP2)

Below viewing area: Masked LCD Symbol display (yellow-green)

⑤ * : AE lock indicator (display only in partial metering mode)

⑥ ϟ : Flash charge completion indicator (Pop-up recommendation: Blinks at 2 Hz.)

⑦ ● : AF in-focus indicator (When AF is not possible: Blinks at 8 Hz.)

Indicating information in the vewfinder: OFF impossible

3-7 Mirror

Quick-return mirror
360 ms or less at viewfinder lost time TV = 1/60 s or more

3-8 Mirror blockage

None with 200 mm f/5.6 (EF80 to 200 mm f/4.5-5.6 TELE end) (except EF50 mm f/1.0L)

3-9 Depth of field check

None

3-10 Eyepiece shutter

None (See 3-11.)

3-11 Other

Angle finder, magnifier, or dioptric adjustment lens Eb can be attached to the eyepiece. A removable eyecap is built into the strap (shared with EOS 750).

4. Exposure control

4-1 Metering system

TTL full-aperture metering using a 3-zone SPD; the following two metering modes can be selected:

① Evaluative metering
② Partial metering (diameter: 9 mm approx. 9.5% of the center of the picture area)
(* Partial metering is combined with AE lock automatically selected with PIC - Close-up mode)

4-2 AE modes

The following eight AE modes and Manual can be selected:

① Intelligent program AE (shiftable)
② Shutter-priority AE (without safety shift)
③ Aperture-priority AE (without safety shift)
④ Depth-of-Field AE (related to ① , shift)
⑤ Full Auto mode
Intelligent program AE (shiftless)
⑥ Image Select mode
(1) Portrait (2) Landscape
(3) Close-up (4) Sports
⑦ TTL program flash AE
⑧ A-TTL program flash AE (when 430EZ or 300EZ is used)
⑨ Manual (metered manual)

4-3 Metering range

EV2 ~ 20 (at normal temperature and humidity; with hypothetical 50 mm f/1.4 lens at ISO 100)

4-4 Out-of-coupling range warning

LCD digital indicators blink at 2 Hz in the external and viewfinder displays.

4-5 Exposure preview

Displayed when shutter button is pressed halfway (A six-second metering timer is activated when the shutter button is released from the halfway position.)

4-6 Film speed

DX code range: ISO 25 ~ 5000, in 1/3 stops.
Manual: ISO 6 ~ 6400, in 1/3 stops.
The ISO speed set previously flashes when a NON-DX code file is loaded and the switch is set to ISO.

4-7 Exposure compensation

Can be manually set within the range of ± 2 stops in 0.5 stop increments.
(* Flash output level compensation using the 430EZ is also possible.)

4-8 AE lock

By a dedicated AE lock button (metering system automatically switches to partial metering when the AE lock button is pressed)
(When using evaluative metering, AE lock occurs simultaneous ly with AF lock)

4-9 Multiple exposure operation

Number of exposures is preset before shooting. Up to nine exposures can be preset at one time (can be reset during shooting). Automatically canceled after the specified number of exposures has been shot. Manual cancellation in mid-operation is also possible.

5. Shutter

5-1 Type

Vertical-travel focal plane shutter with all speeds electronically controlled. Curtain operation controlled by attraction electromagnet (curtain travel time: 6.8 ms/ 24 mm)

5-2 Shutter speed

1/1000 to 30 s, bulb X = 1/90 s
Shutter speed can be set at 1/2 stops in either shutter-priority AE mode or Manual mode.

5-3 Shutter release system

Soft-touch electromagnetic release system (no cable release socket provided)

5-4 Release time-lag

Release time-lag excluding AF operation time:
(1) Following a pause after SW-1 is switched ON, from SW-2 ON to beginning of exposure.....144 ms
(2) From simultaneous pressing of SW-1 and SW-2 ON to beginning of exposure.....200 ms

5-5 Self-timer mode

Electronically 10 second timer
When self-timer mode is set, and SW1 closed, Program AE is set. After autofocusing (one-shot AF) exposure is determined. When the shutter button is pressed to the second stop (SW2), the 10 second delay starts (self-timer will not start until AF operation is completed, even if shutter button is pressed).
Indicated by beeper tone which beeps at 2 Hz for the first eight seconds and at 8 Hz for the last two seconds. This is also substraction digital display in seconds on the LCD panel.

5-6 Camera-shake warning

Provided in Intelligent Program AE (Green Zone) mode and the Programmed Image Control modes. The shutter speed display blinks at 2 Hz when the shutter speed falls below "1/focal length" sec. minus 0 ~ 0.5 stop. No warning is provided in other modes.

6. Film transport

6-1 Type

Prewind system

6-2 Film loading and prewind

Film is automatically loaded using a fixed toothed spool.
After the film is positioned and the back cover is closed, the entire length of the film is automatically wound onto the spool (prewind) while the number of available frames is counted. (The pre-wind operation requires 9 seconds for a 24-EX. roll.)

6-3 Prewind completion confirmation

OK: Winding automtaically stops and the available number of frames is displayed on the frame counter.
NG: The cartridge symbol in the LCD display blinks at 2Hz and shutter release is locked.

6-4 Film winding

Film is advanced automatically by a built-in miniature motor.

6-5 Film transport modes

Single-frame or continuous, automatically set by the shooting mode

6-6 Start of film winding

Film winding begins when the exposure completion signal is received.

6-7 Continuous shooting speed

Approx. 1 frame/s in AF lock state

6-8 Film transport confirmation

By watching film counter

6-9 Shooting capacity

Using new 2CR5 battery, 24EX film, and EF35 ~ 80 mm f/4-5.6.

Temperature	Shooting conditions		
	AE100%: Flash 0%	AE100%: Flash 50%	AE0%: Flash 100%
Normal (+20°C)	75	☒ 40	☒ 15
Low (–10°C)	45	☒ 25	☒ 10

6-10 Leader Rewind

After final frame (#1), leader automatically rewinds into the cartridge.

6-11 Mid-roll rewinding

Possible (Remove the lens and set the selector dial to the ISO position. Press the partial metering/AE lock button and exposure compensation button at the same time to start rewinding.

6-12 Rewind completion confirmation

The film counter is blink and the cartridge symbol blinks.

6-13 Film check

(1) Indicated by cartridge symbol on LCD panel.
(2) Visual check using film check window

6-14 Film counter

Count-down electronic counter displayed digitally on the LCD panel (counts up during pre-wind).

7. Integral flash (EOS 1000 QD only)

7-1 Type

Retractable TTL automatic flash housed in the pentaprism. By-pass control system.

7-2 Flash switch

None. Flash is manually popped up or retracted when necessary (user is advised to use the flash when the camera shake warning occurs or when the ϟ mark blinks at 2 Hz in the viewfinder).
Popped up: Flash ready mode.
Retracted: Flash-off mode.
Blinking: ϟ mark: Indicates backlit or low-light conditions (BV4.5 or less)

7-3 Guide number 12 (ISO 100; in meters)

7-4 Flash recycling time Approx. 2 seconds: ϟ mark lights in the viewfinder

* When flash is not charged, the ϟ mark remains extinguished and shutter release is locked.

7-5 Flash coverage angle Covers the field of a 35 mm lens. Parallax correction: 2° downward

7-6 Flash firing conditions Flash fires if extended and the following conditions are met.

Shooting mode		Automatic firing		Forced firing	Remarks
		Low light	Backlighting		
① Program AE				●	
② Shutter-priority AE	1/1000~30			●	
	BULB			●	
③ Apperture-priority AE				●	
④ Depth-of-Field AE				●	DEP canceled
⑤ Green zone		●	●		
⑥ PIC-Portrait		●	●		
⑦ PIC-Landscape		●	●		
⑧ PIC-Close-up		●	●		
⑨ PIC-Sports		●	●		
⑩ Manual				●	
⑪ Self-timer				●	

6-7 Aperture value for flash control

Flash aperture value is set according to the shooting mode as follows.

Shooting mode		AVset	AVauto		Remarks
			TTLP	TV-AE	
① Program AE			●		
② Shutter-priority AE	1/1000~30			●	
	BULB	●			
③ Apperture-priority AE		●			
④ Depth-of-Field AE			●		Shooting results are the same as for ①.
⑤ Green zone			●		
⑥ PIC-Portrait			●		
⑦ PIC-Landscape			●		
⑧ PIC-Close-up			●*		Restricted by PL at large aperture.
⑨ PIC-Sports			●		Results are the same as for ①
⑩ Manual		●			
⑪ Self-timer			●		

* PL: PIC Program Low

7-8 Synch shutter speeds Maximum = 1/90 s

7-9 Flash system Metering of light reflected off the film surface/TTL automatic flash firing

7-10 Flash exposure level control Automatic reduction control during reverse light detection automatic flash

7-11 Flash coupling range

[m]

	EF 35 ~ 80mm f/4-5.6			
	WIDE: 35mm		TELE: 80mm	
ISO	Negative film	Reversal film	Negative film	Reversal film
100	0.7~4.3	1~3	0.7~3	1~2.1
400	0.7~8.5	1.5~6	1~6	1.5~4.3

7-12 Out-of-coupling-range warning None

7-13 Flash firing indication None

7-14 Flash duration/ color temperature 1 ms or less/equivalent to daylight color

7-15 Distance to optical axis Flash center ~ lens optical axis: 70.5 mm

7-16 Power source Shared with camera battery

7-17 Other When an external flash is attached, it has priority and built-in flash operation is inhibited.

8. Camera body

8-1 Back cover Opened via the back-cover opening lever. Cannot be removed. Provided with film-loaded check window (but no memo holder).

8-2 Flash contacts X contact; Accessory shoe equipped with direct coupling contacts

8-3 Automatic flash With camera set to Green Zone (Intelligent Program AE) or Program AE mode:

(1) TTL automatic flach using built-in flash:
The shutter speed is automatically set to the X-sync speed (1/90 sec) upon flash charge completion. The flash control aperture is then set automatically, determined by average metering (not evaluative) and the camera's TTL program. Flash output is controlled automatically via measurement of the light reflected off the film plane. Automatic fill-in flah is also possible.

(2) A-TTL automaic flash using the 430EZ or 300EZ:
The shutter speed is automatically set to the X-sync speed (1/90 sec) upon flash charge completion. The optimim flash control aperture is then set automatically according to the

shooting distance and lighting conditions determined by average metering (not evaluative), the camera's A-TTL program, and a near-infrared pre-flash emitted from the flash unit. Flash output is controlled automatically via measurement of the light reflected off the film plane. Automatic fill-in flash is also possible. (There is no out-of-flash-coupling range warning.)

(3) With ML-3 (TTL automatic flash) Same control as for (1).

* In (1), (2), and (3) above, it is possible for the photographer to optionally select a shutter speed of 1/90 s or slower (in 0.5 stop increments) in shutter-priority mode, or to optionally select an aperture in aperture-priority mode.

(4) Other

1) T and A series flash units should be used in manual mode.

* Shutter speed: Must be manually set to 1/90 ~ 30 s B.

* Aperture: Aperture on camera body must be manually set to match the aperture of the flash unit.

2) General-use flash

Ordinary miniature flash: Synchronous shooting is possible at 1/90 s or less.

Large studio flashs: Synchronous shooting is possible at 1/60 s or less (confirmation is required).

8-4 Power source One 2CR5 6 V lithium battery is installed in the grip.

8-5 Main switch Camera is OFF when the mode selector is set to "L" (Lock).

8-6 Battery check Battery condition is checked automatically and indicated by a four step display (battery mark) on the LCD panel during film-loading, main switch operation, or automatic check for each shooting.

8-7 External display By LCD panel and selector dial

8-8 Tripod socket 1/4" 20P standard thread

8-9 Remote control Impossible

8-10 Grip replacement Impossible (Extension Grip available)

8-11 Material Glass-fiber reinforced polycarbonate

8-12 Body color Black (Semi-gloss, matte, and pebble grain finishes)

8-13 Dimensions and weight (without battery, battery adds 40 g to total weight)
REBEL, EOS 1000: 148.0 (W) x 96.3 (H) x 68 (D) mm 400g
EOS 1000QD: 148.0 (W) x 99.8 (H) x 69 (D) mm 460g

9. QD

☒ All specifications for the quarts date are the same as for the EOS 750, 700.

10. Main accessories

10-1 New accessories and related products

(1) Extension Grip
(2) Semi-hard case
(3) Speedlite 200E
(4) EF35 - 80 mm f/4-5.6
(5) EF80 - 200 mm f/4.5-5.6

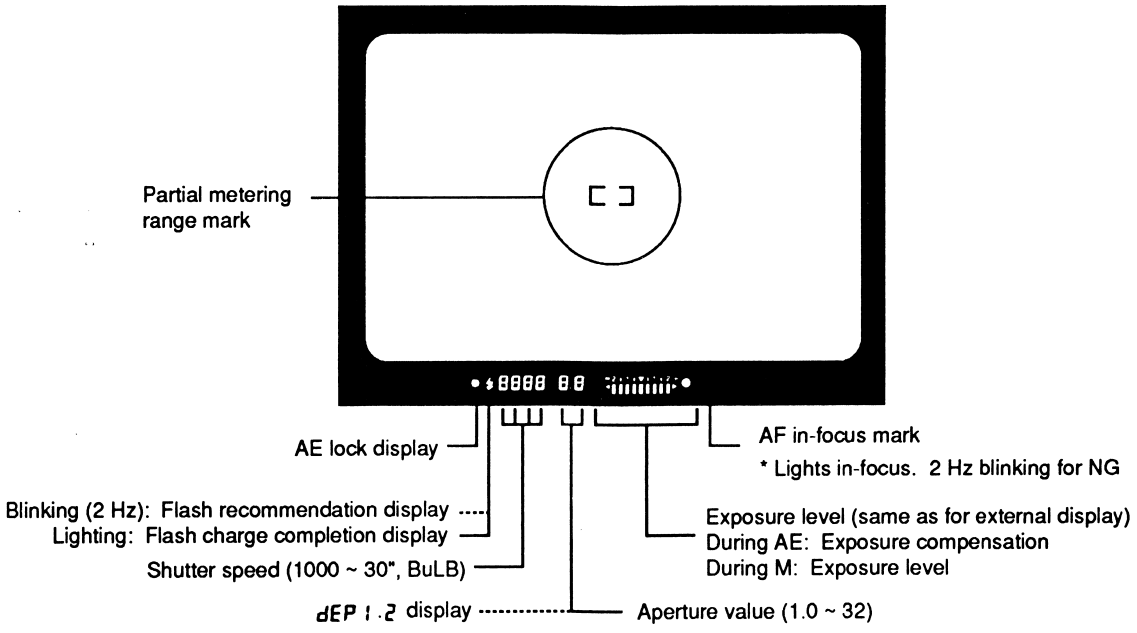
10-2 Existing accessories

In principle, all EOS system general-use accessories can be used except remote control-related accessories.
See "EOS system accessory compatibility list" and "F-1, A, and T series SLR system accessory compatibility list."

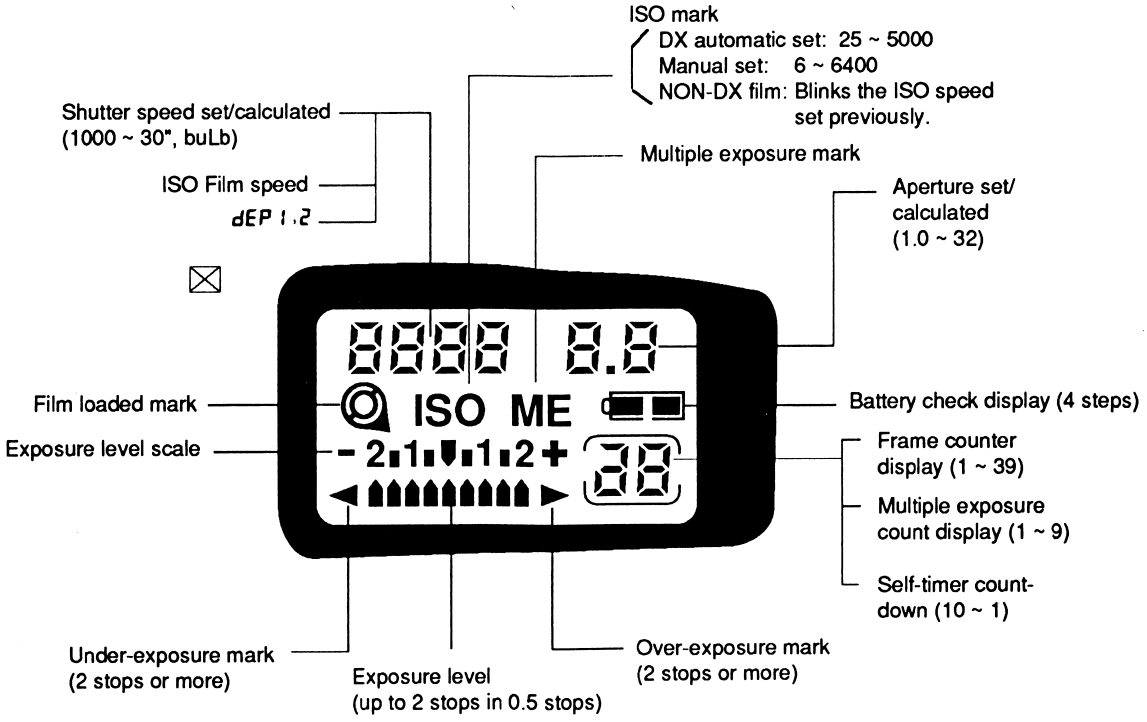
FINDER & LCD INFORMATION

* QD panel display of EOS 1000QD quartz date-back is deleted here because it is the same as for 750.

Viewfinder information



LCD display



FINDER AND LCD WARNINGS

- The [ ] mark indicates 2 Hz blinking.
- AVO = lens maximum f/No; AVmin = lens minimum aperture
- TVset, AVset = manually set shutter speed, aperture
- TVauto, AVauto = shutter speed, aperture calculated by the camera and set automatically
- * all shooting modes.
- Used at EF50 mm f/1.8, ISO 100.

1. Viewfinder Warning Table

Warning	Mode	Viewfinder Indication		Remarks
AF Failure	*	AF Mark ● Blinking (2 Hz)		
		TV Display	AV Display	
Out of Coupling Range - Low Luminance	P Mode, Full Auto DEP, Image Select Mode	TV auto [30"]	AV auto AV 0	①
	TV Priority	TV set	AV auto [AV 0]	②
	AV Priority	TV auto [30"]	AV set	③
	Manual			④
Out of Coupling Range - High Luminance	P Mode, Full Auto DEP, Image Select Mode	TV auto [1000]	AV auto [AV min]	⑤
	TV Priority	TV set	AV auto [AV min]	⑥
	AV Priority	TV auto [1000]	AV set	⑦
	Manual			⑧
DEPTH	DEP	TV auto 30"	[AV auto]	⑨
Camera Shake Warning	Full Auto, Image Select Mode	[TV auto]	AV auto	⑩
Flash Recommendation (During Back Light and Low Luminance)	Full Auto, Image Select Mode	ϟ Mark Blinking (2 Hz)		⑪

2. LCD Warning Display Table

Warning	LCD Display	Remarks
AL, Prewind NG	Cartridge Mark Blinking (2 Hz)	⑪
Rewind Completed	Cartridge Mark Blinking (2 Hz)	
Transport NG (Film Tension)	Battery Mark Blinking (2 Hz)	⑫
Battery Replacement	Battery Mark Blinking (2 Hz)	⑬
System NG	Battery Mark Blinking (2 Hz)	⑭

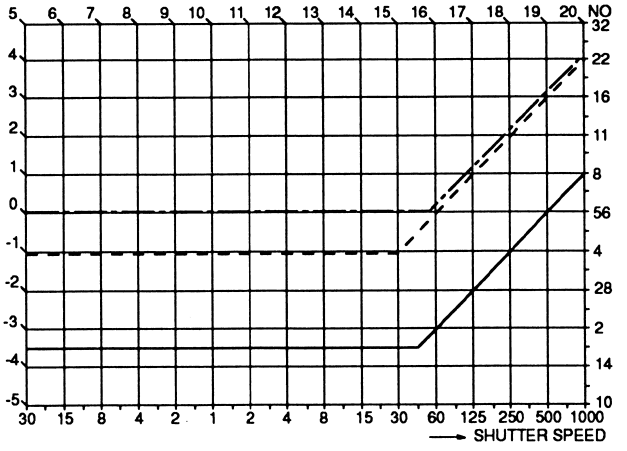
3. Remarks

① Use flash shooting, add artificial illumination, or use a faster film.
② Reduce specified shutter speed until aperture stops flashing.
③ Open specified aperture until shutter speed stops flashing.
④ Open aperture until correct exposure is indicated or reduce shutter speed.
⑤ Use ND filter or shower film.
⑥ Increase specified shutter speed until aperture stops flashing.
⑦ Close specified aperture until shutter speed stops flashing.
⑧ Close aperture or increase shutter speed until correct exposure is indicated.
⑨ The requested depth of field is impossible. Give up or use faster film.
⑩ Use a tripod or flash shooting.
⑪ Reinstall film correctly.
⑫ Rewind halfway. (Set ISO mode and press SW2 ON plus AE lock button for approximately two seconds to start operation.)
⑬ Change the battery.
⑭ Indicates system fault and no user response.

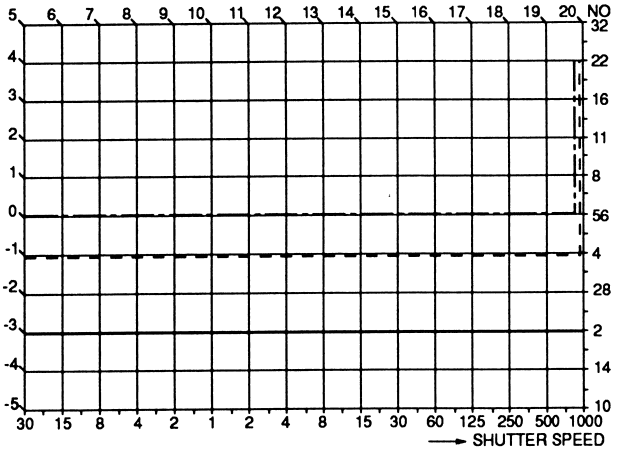
PROGRAM DIAGRAMS

——— : Uses EF50 mm f/1.8.
- - - - - - - - - : Uses EF35 to 80 mm f/4-5.6 when 35 mm f/4.
——-——-— : Uses EF35 to 80 mm f/4-5.6 when 80 mm f/5.6.

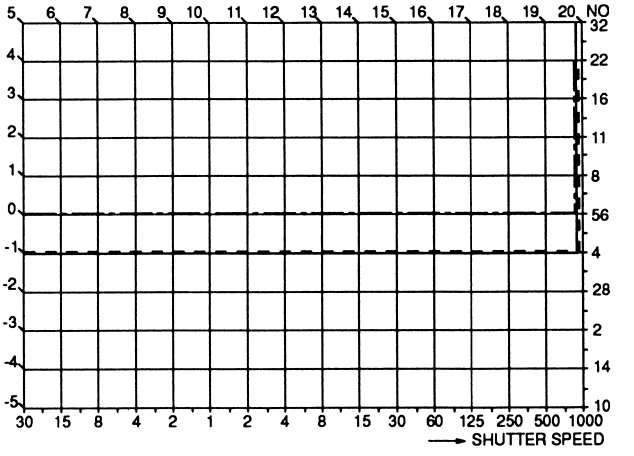
• PS (standard program AE, full auto, self-timer)



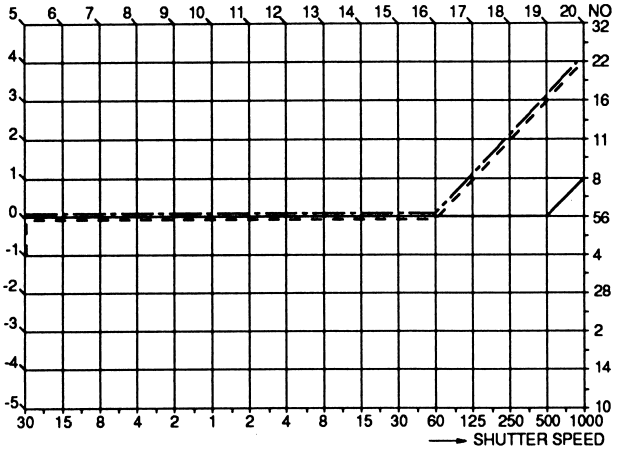
• PH-2 (portrait)



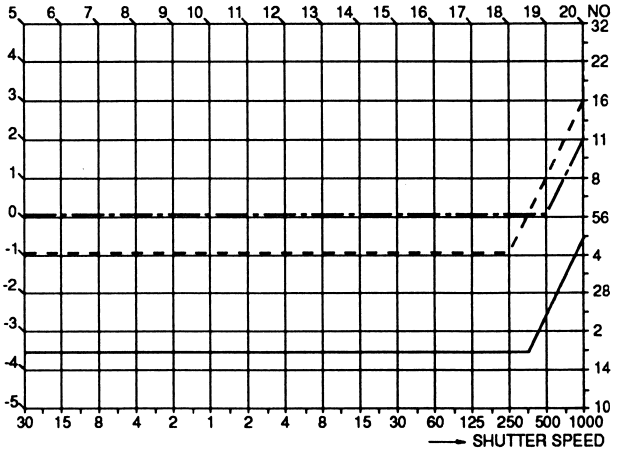
• PL (close-up)



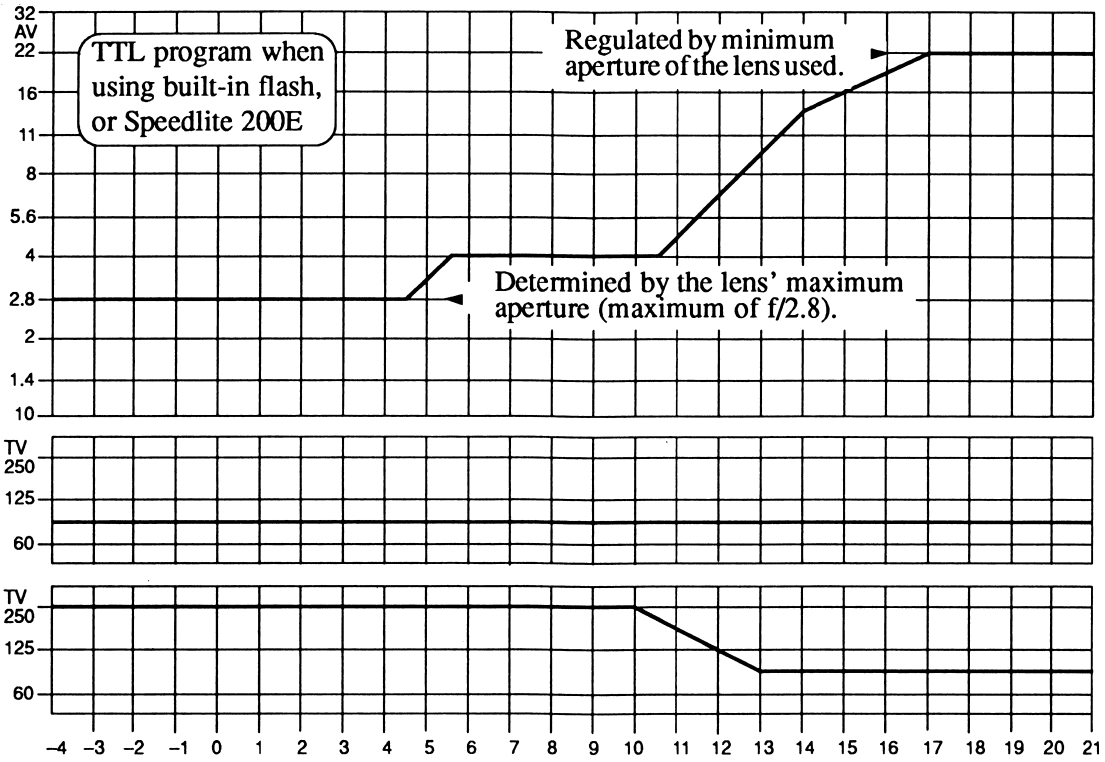
• (portrait)

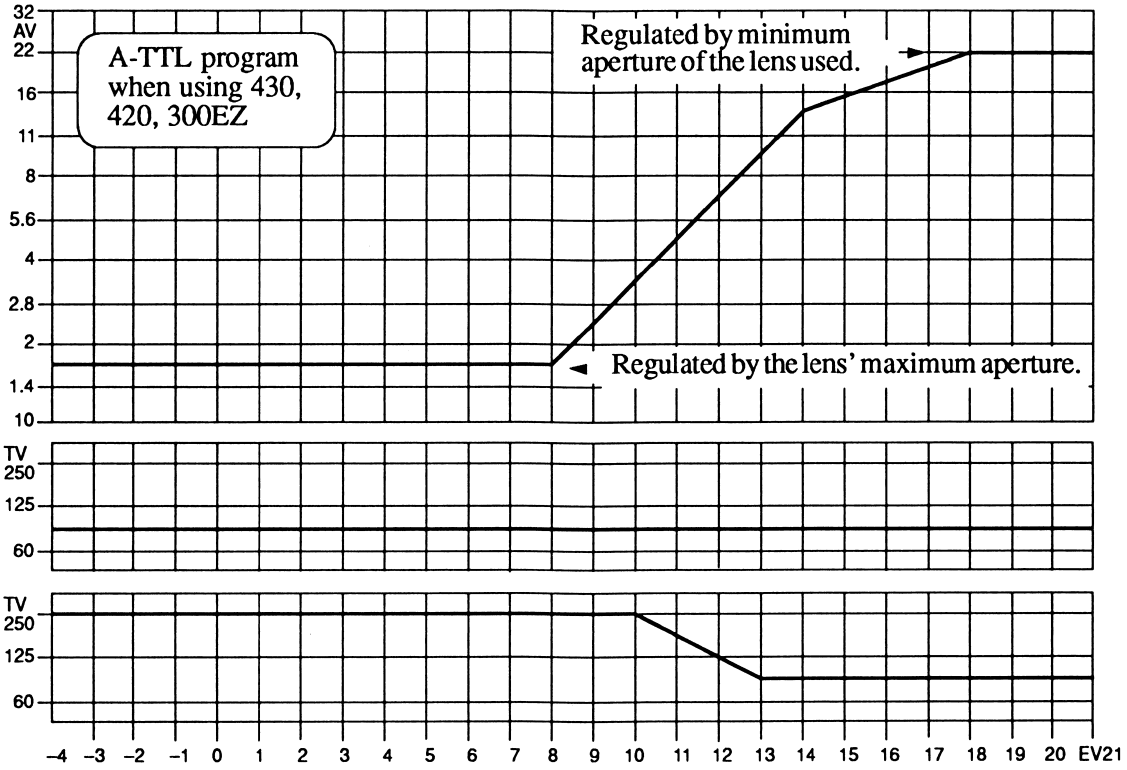


• PH-1 (sports)



Using EF 50 mm f/1.8, ISO 100





COMBINATION OF SHOOTING MODES AND FUNCTIONS

- Optimum combinations of AF, transport, metering, and AE are automatically set in all shooting modes.

(AF) O: One shot
O/S: One shot/AI servo automatic switching

(Transport) S: Single shooting
C: Continuous shooting

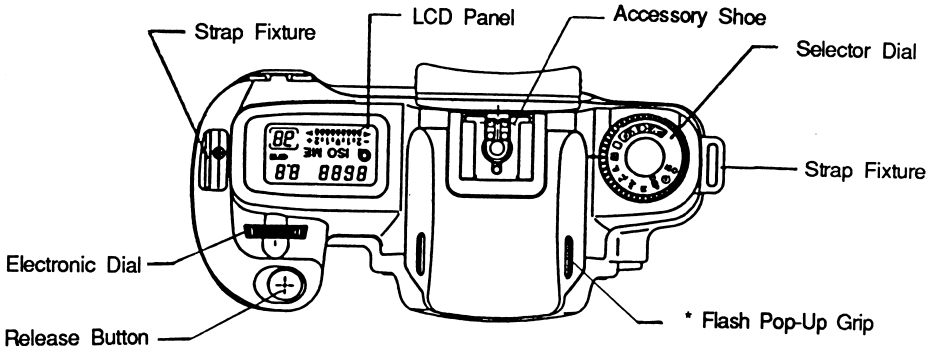
(Metering) Evaluation: Evaluative metering
Partial: Partial metering
Average: Center-weighted average metering

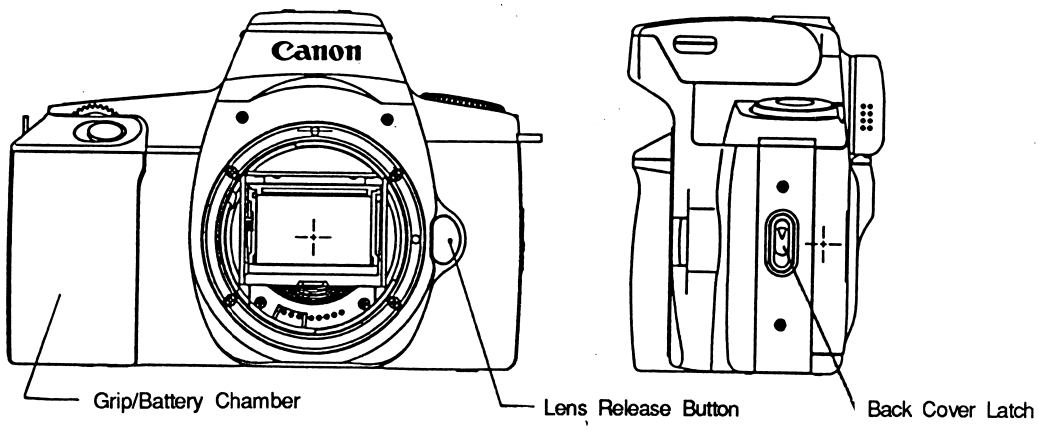
Shooting mode		Combination of functions											Possible by operation			
		AF		Transport		Metering			Program AE				Exposure compensation	Multiple exposure	P shift	AE lock
		O	O/S	S	C	Evaluation	Average	Partial	PH-1	PH-2	PS	PL				
① Program AE			●		●	●					●		●	●	●	●
② Shutter-priority AE	1/1000~30		●		●								●	●	—	●
	BULB		●		●	●							—	●	—	—
③ Apperture-priority AE			●		●	●							●	●	—	●
④ Depth-of-Field AE		●		●		●							●	●	●	●
⑤ Green zone			●	●		●					●					
⑥ PIC-Portrait		●			●	●				●						
⑦ PIC-Landscape		●		●								●				
⑧ PIC-Close-up		●		●				●				●				
⑨ PIC-Sports			●		●	●			●							
⑩ Manual			●		●		●		—				—	●	—	—
⑪ Self-timer		●			●	●					●		●	●	●	●

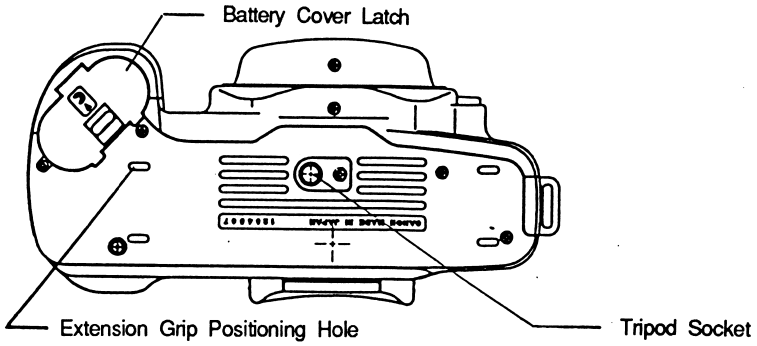
* AE lock: Pressing the AE lock button in metering state sets AE lock in partial metering.
* See the program diagrams (page 15) for program AE control.

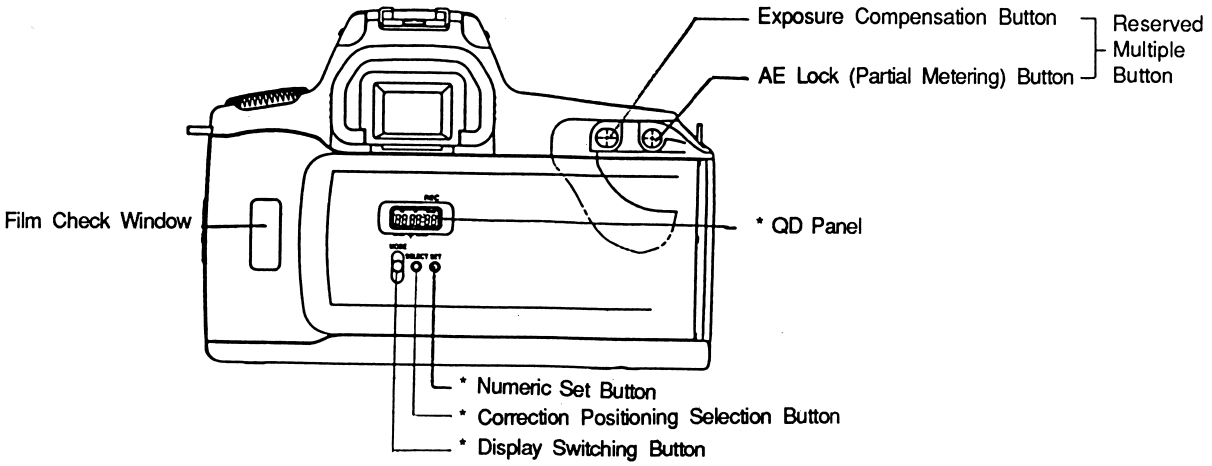
NOMENCLATURE

The * mark indicates EOS 1000 QD specifications.



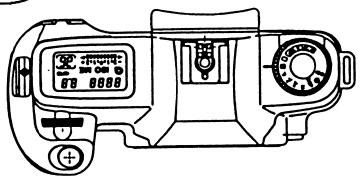


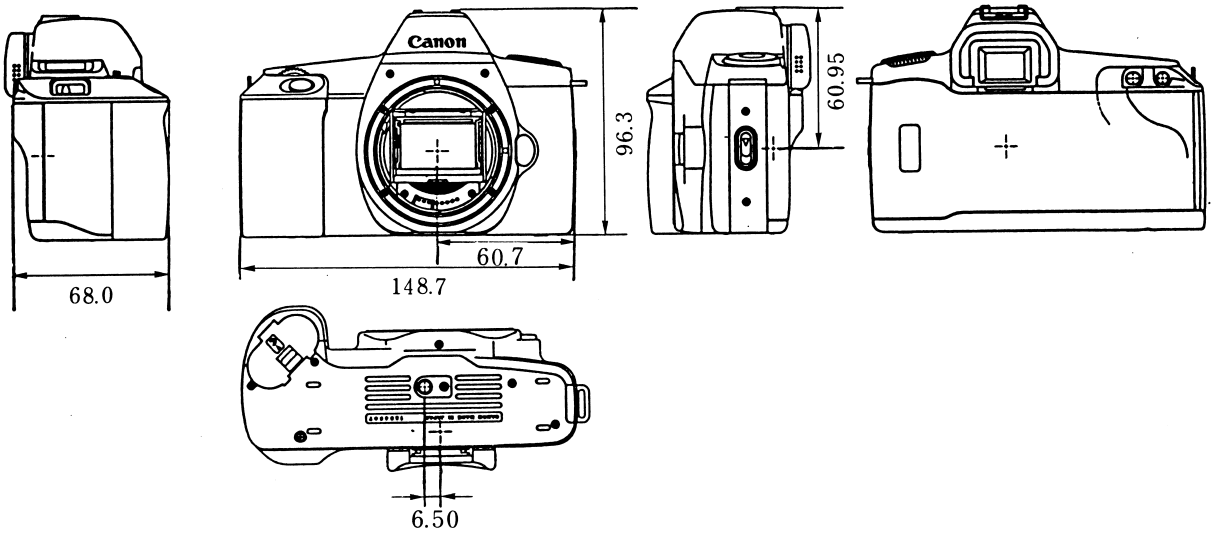




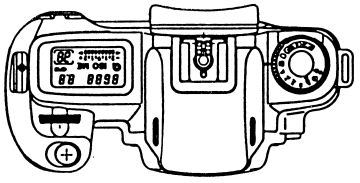
EXTERIOR

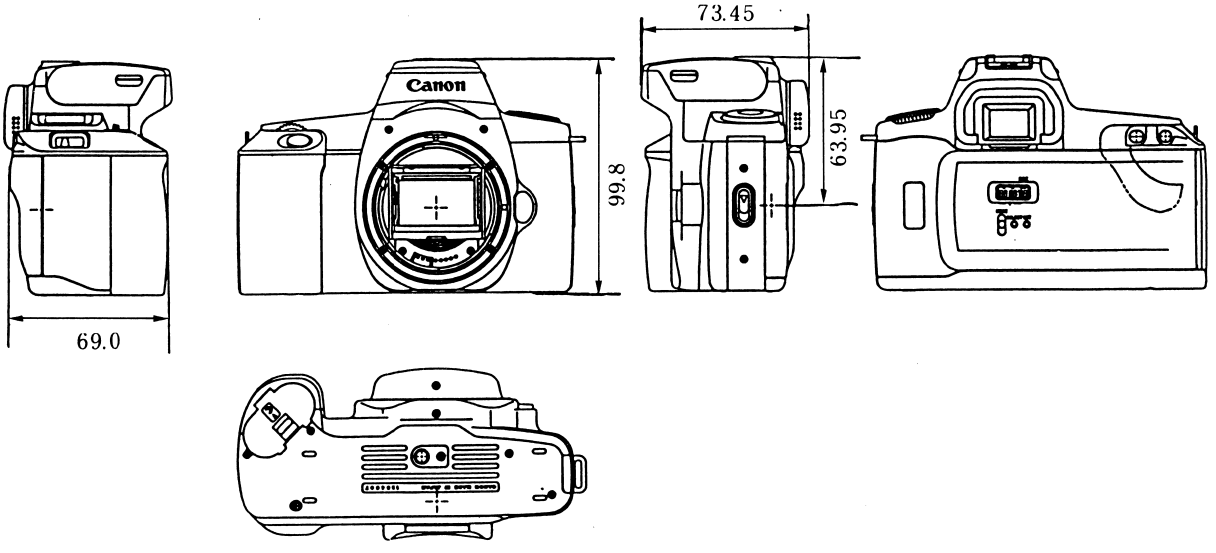
EOS REBEL,1000





EOS 1000 QD • Dimensions, where different from the EOS REBEL, 1000.





NOTES CONCERNING USE

★ mark: Notes on EOS 1000QD only → Troubleshooting

	No.	Cautions	Explanations
	1.	Prewind is impossible when a film is reloaded after the back cover is opened and a film is pulled out forcibly during shooting. (Rewinding the film with release blinks the ⊂⊐ mark on the LCD panel.)	By design → Close the back cover and release once before a new film is loaded. (Loading the film without release causes rewind. Releasing switches the internal mechanism.)
★	2.	Restrictions during SW-1 ON or flash charging when the built-in flash is used (1) USM electronic ring manual focusing is impossible. (2) Soft focus cannot be corrected after infocus when EF135 mm/f2.8 SF is used. (3) Power zooming is impossible when using with EF35-80 mm f/4-5.6 POWER ZOOM.	Because the power cannot be supplied at the same time due to design → Turn SW-1 on after manual focus. → Determine the desired softners before AF → Determine composition with zoom, then operate SW-1 ON for shooting.
★	3.	The AF auxiliary light cannot only be used.	Because the metering method differs between flash ON and OFF, working and metering are performed again if the flash is off after metering with the AF auxiliary light. → After working with the AF auxiliary light, switch focus mode to manual and turn the flash off for shooting.
★	4.	Notes when the built-in flash is used. (1) Remove the lens hood. (2) A shadow is made at the bottom of the screen at the TELE end even without the hood when using with the EF20 ~ 35 mm lens.	Because the flash's light is obstructed by the hood (a shadow is made at the bottom of the screen) for all EF lenses. Because of the obstructed flash light. Be careful with it.
★	5.	When the external flash is used, mount it with the built-in flash down.	If the external flash is mounted with the integral flash up, the AF auxiliary light of the external flash hits the cover of the built-in flash. If the external flash is pushed in forcibly, the up/down feature of the built-in flash will be damaged.
	6.	If the selector dial is in L position, prewind will not operate.	By design. → Use a position other than the L position. (Reference: Prewind is possible in the L position for EOS 750 and 700.)

No.	Cautions	Explanations
7.	The specified number or more of frames can be shot depending on the set length of the film leader.	By design
8.	If one of the following lenses is used, the camera cannot be set on larger tripods. (1) EF 50 mm f/1.0L (2) EF 80 mm f/1.2L (3) EF 28 to 80 mm f/2.8-4L	Because the lens projects below the bottom of the camera and locates against the tripod head.
9.	There are no display panel and ISO sensitivity display during film loading or prewinding.	For several reasons Set the position of the selector dial/manual ISO for confirmation.

2. TECHNICAL INFORMATION

Contents

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• MOTOR DRIVE SYSTEM 22
[ELECTRIC]
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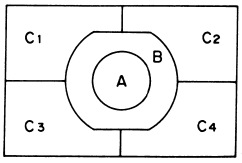
METERING SYSTEM

Outline

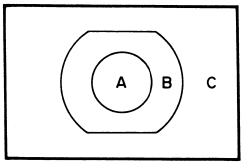
Three metering systems (evaluative, partial, and center weighted average) are used. Evaluative metering is conducted by the mewly developed three-division metering sensor. See page 17 for details on switching the metering systems.

1 Three-division metering sensor

The original EOS metering sensor was the 6-zone sensor with 4 peripheral zones, an intermediate ring, and the central zone. This camera, however, uses the 3-zone sensor with a single peripheral zone.
The new algorithm determines exposure compensation by the luminance difference of [C–B] to obtain the same optimum exposure as earlier 6-zone EOS's with just 3 areas.



Conventional 6-zone metering sensor



New 3-zone metering sensor

2 Metering system when using the flash

Metering is performed by Center-weighted average metering when the EOS 1000QD built-in flash, TTL automatic flash, or EZ series external flash is used or A-TTL/TTL automatic flash is performed. (Earlier EOS's, use peripheral metering and the TTL program diagram for TTL and peripheral metering, A-TTL program diagram, and distance information obtained by pre-flash firing for A-TTL to determine the flash value.)

Body characteristics during flash shooting

EOS/model name		Using built-in flash		Using EZ series/external flash	
		Center-weighted average metering	Peripheral metering	Center-weighted average metering	Peripheral metering
Cameras with built-in flash	EOS10	●			●
	EOS750	●			●
	EOS700	●			●
	EOS1000QD	●		●	
Cameras with no built-in flash	EOS – 1	–			●
	EOS620				●
	EOS630				●
	EOS650				●
	EOS850				●
	EOS REBEL EOS1000			●	

* Center-weighted average metering: Metering system with no screen total metering/evaluative.
* Peripheral metering: Metering system only by output of the peripheral (C). area.
* EOS 750, 850 + 160E are external types, but performs the same metering as for the built-in flash.

MOTOR DRIVE SYSTEM

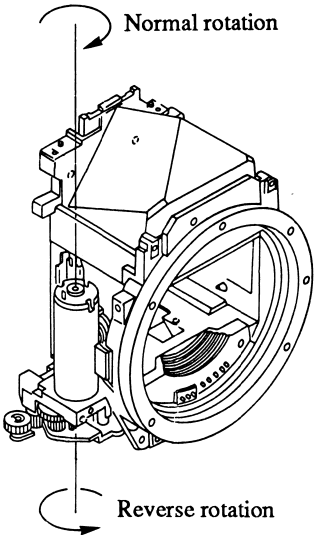
Outline

One single axis motor controls all mirror up/down, shutter charge, prewind, and rewind. (Control is performed by switching the direction of moter rotation and the position of the stop lever.)

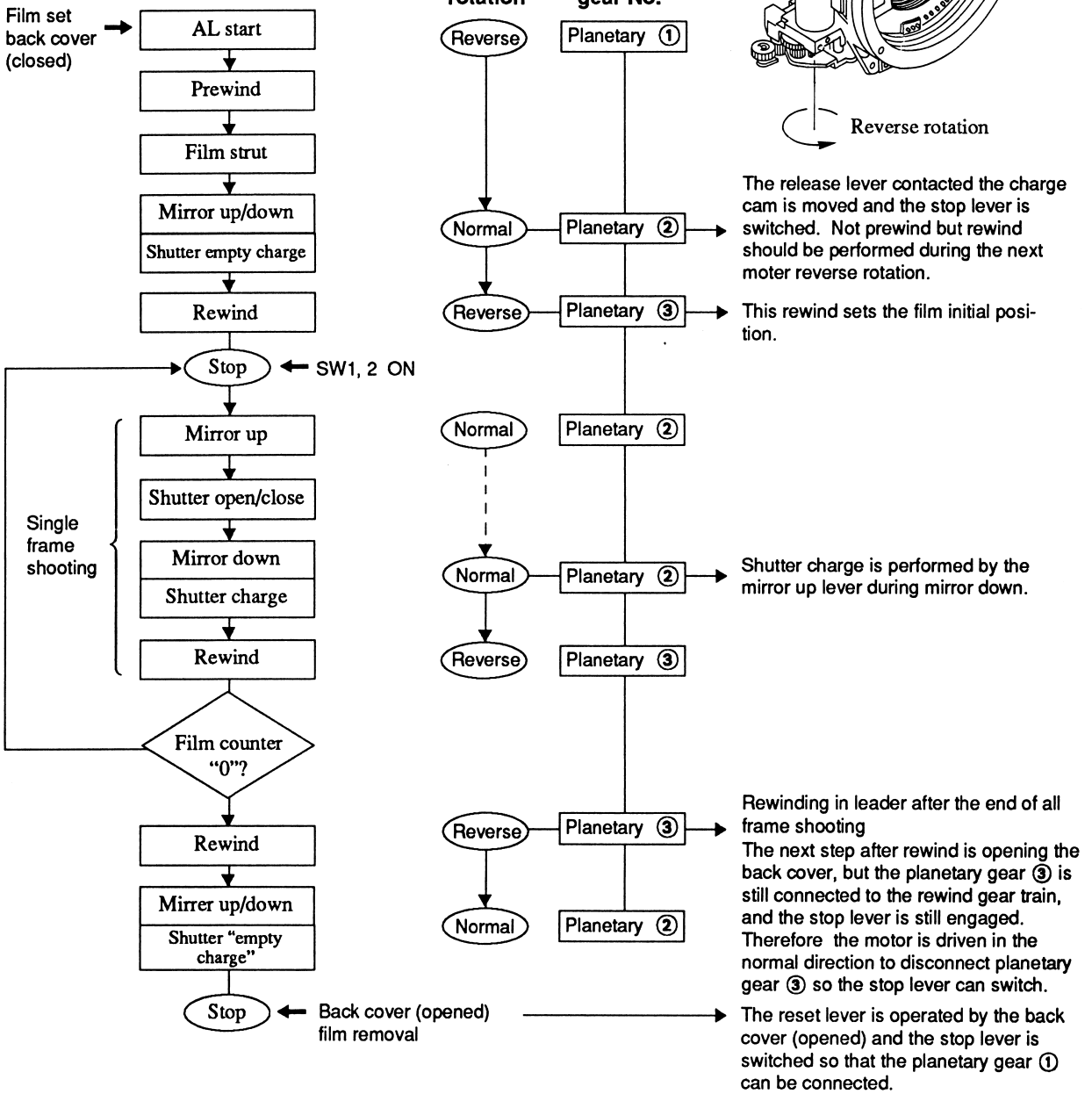
1 Direction of motor rotation and movement

Normal rotation — Mirror up/down, shutter charge

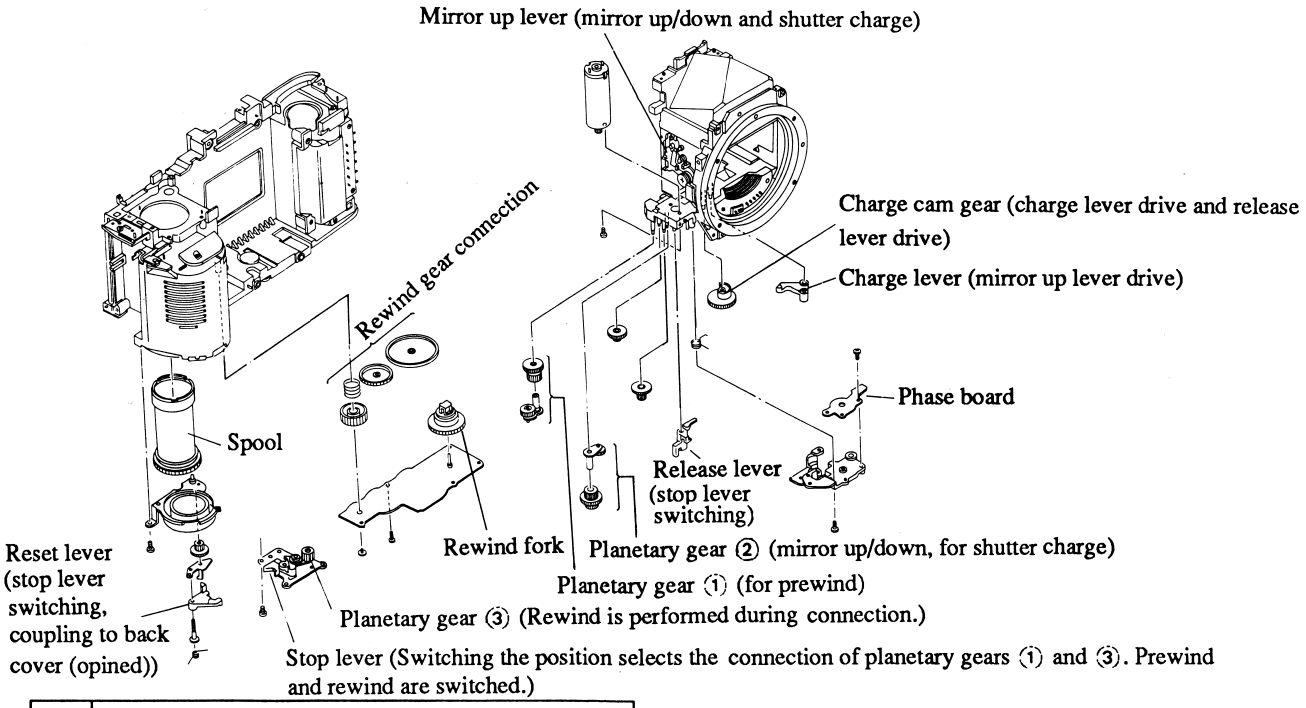
Reverse rotation — Prewind, rewind
(* Switch the prewind or rewind with the stop lever.)



2 Motor drive flowchart

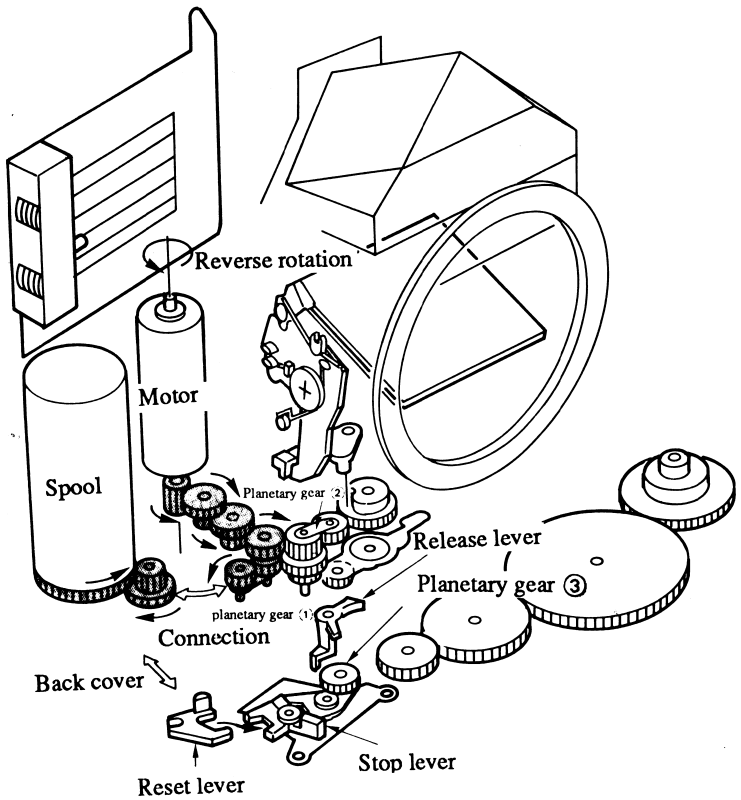


3 Parts name and function



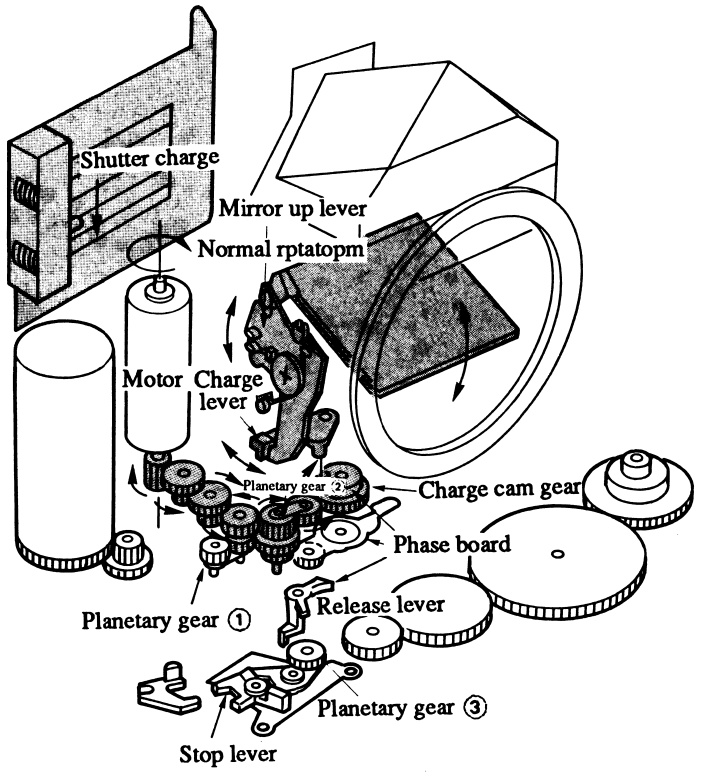
4 Function of gears for each operation

[AL•Prewind] (Motor reverse rotation)



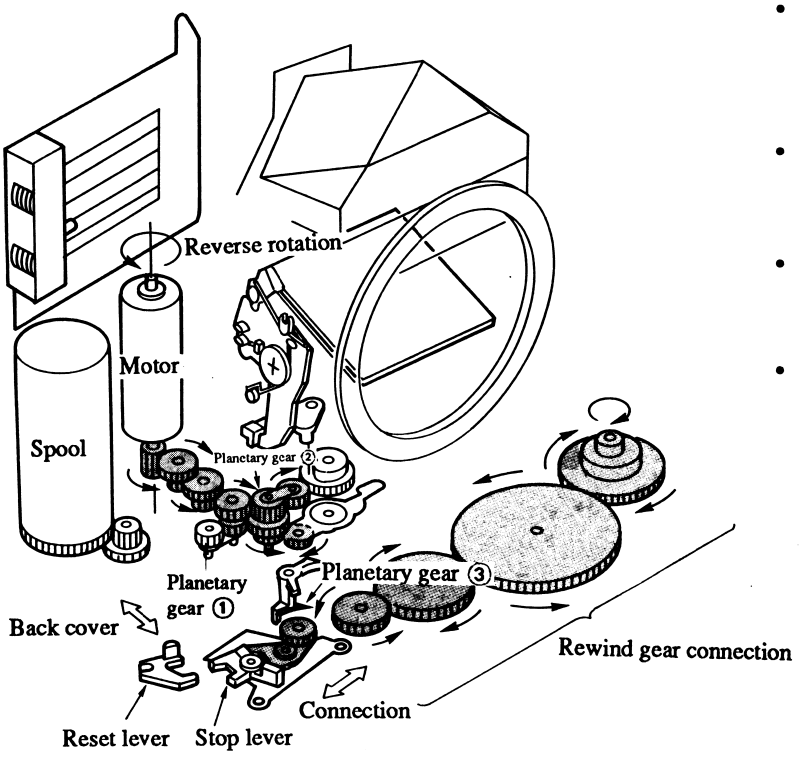
- When the film is set and the back cover is closed, the planetary gear ① is connected to the spool by motor reverse rotation, and prewind following AL starts.
- In this case, the planetary gear ② is not connected to the shutter cam gear and runs idle.
- The stop lever also prevents the planetary gear ③ from connection to the rewind gears.

[Mirror up/down, shutter charge] Motor normal rotation



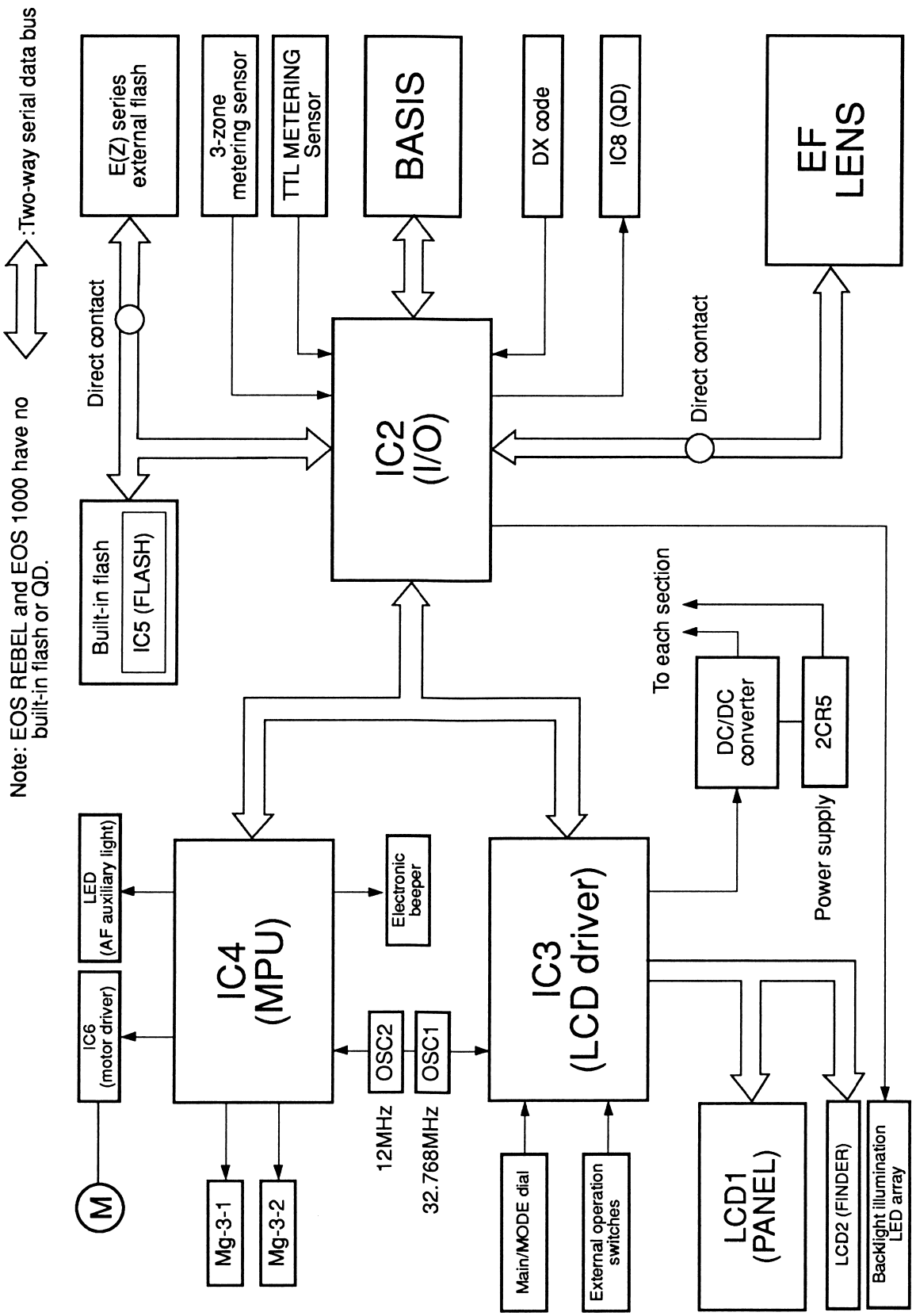
- When the film comes under tension occurs after AL-prewind is terminated, the motor rotates normally and the planetary gear ② is connected to the charge cam gear.
- The charge lever is operated by the rotation of the charge cam gear and the mirror up lever is pressed.
- The mirror up lever performs mirror up and down.
- The shutter charge is performed by the mirror up lever during mirror down.
- The stop lever is switched by the release lever connected to the charge cam gear.
- The planetary gears ① and ③ run idle.
- The phase switch at the bottom of the charge cam gear performs phase control.
- The same operation is performed during shooting or after film rewind termination.

[Rewind] Motor reverse rotation



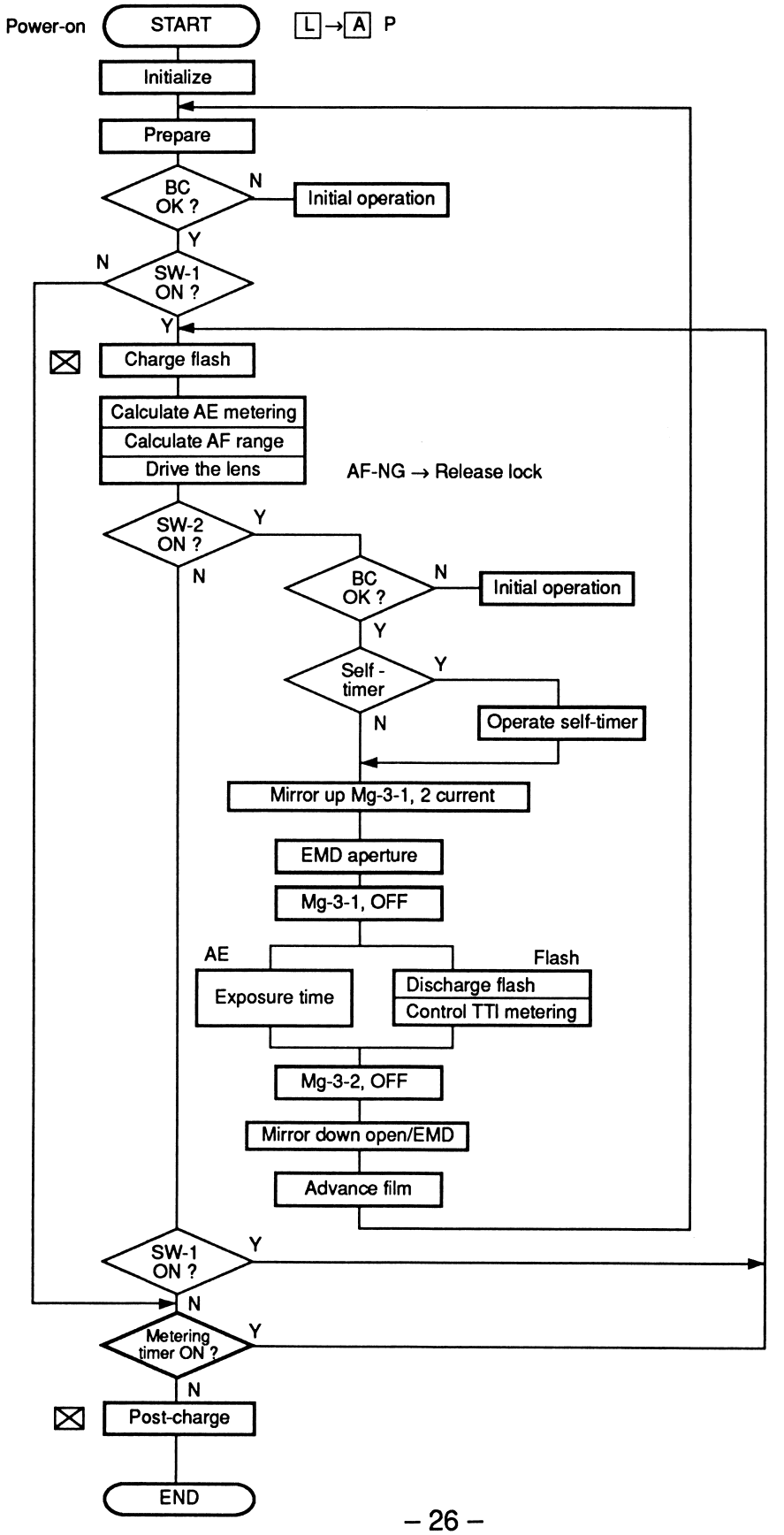
- The motor rotates in reverse direction and the planetary gear ③ is connected to the rewind gears for rewind.
- The stop lever prevents the planetary gear ① from connecting to the spool gear.
- The planetary gear ② is not connected to the charge cam gear and runs idle.
- If the back cover is opened after film rewind termination, the reset lever is operated, the stop lever is released from rewind, and the planetary gear ① can be connected to the spool gear.

BLOCK DIAGRAM



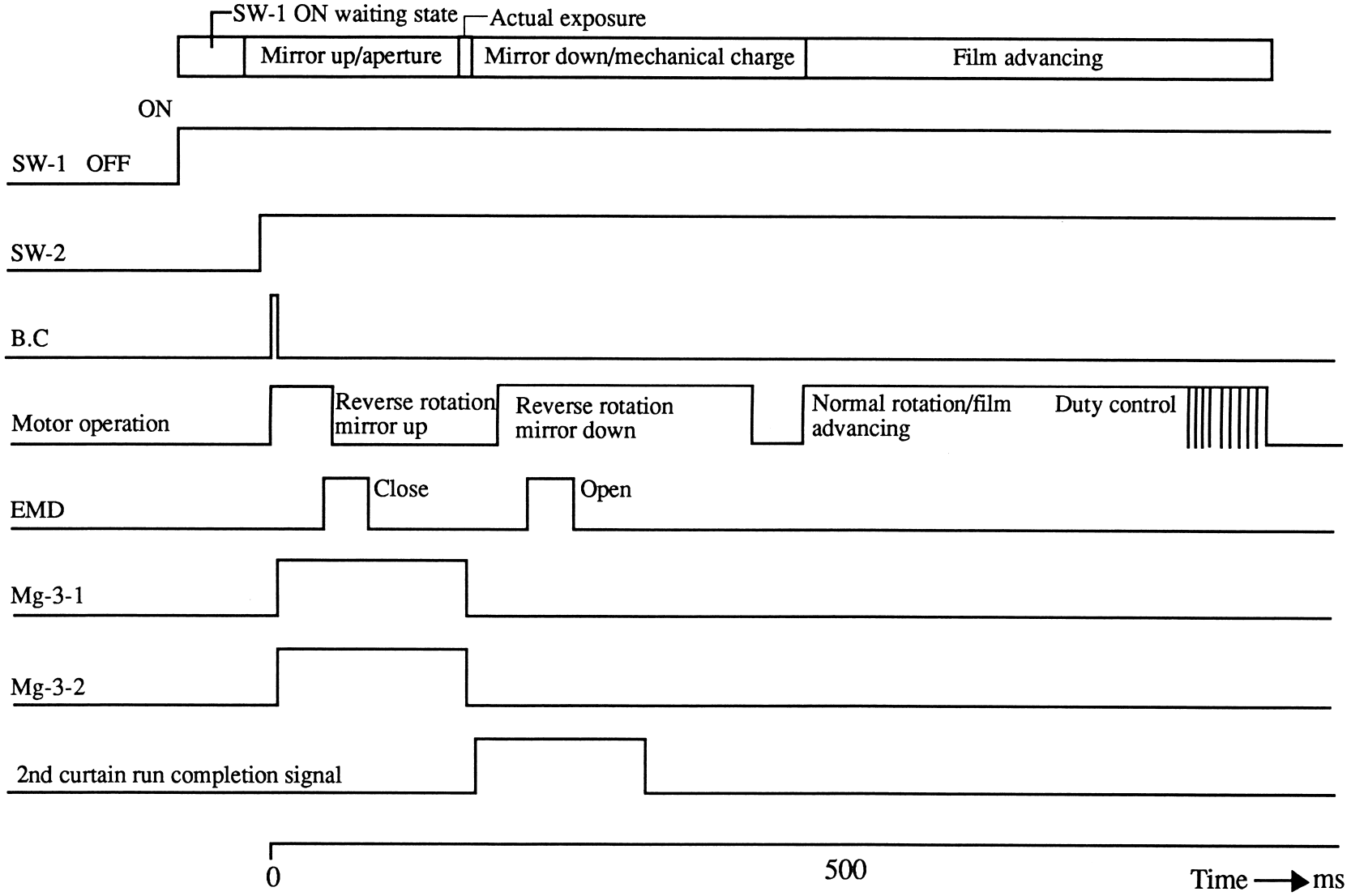
TOTAL OPERATION SEQUENCE FLOWCHART

☒ : EOS 1000 QD with Flash up



OPERATION TIME CHART

Conditions: New battery/EF50 mm f/1.8/1/125 s/f /5.6



SWITCH NAMES AND FUNCTIONS

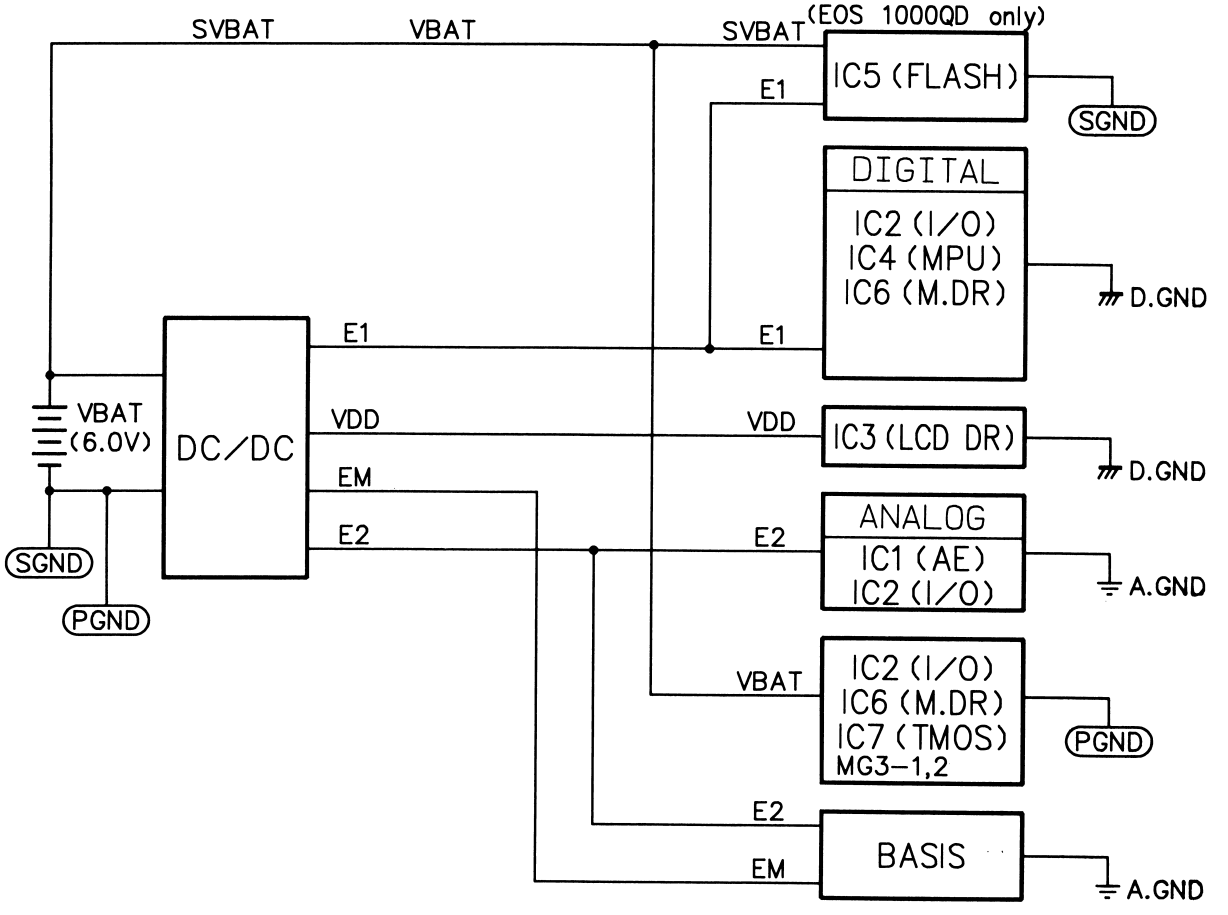
★: Operational switch

	No.	Symbol	Name	Function
★	1.	SW1	Ranging & metering switch	ON → Ranging and metering
★	2.	SW2	Release switch	ON → Shooting start
★	3.	Main/Mode SW (Self SW)	Main/mode switch (self switch)	Shooting mode selection and power off function. Self-start begins by turning the switch on in self mode.
	4.	Back SW	Back cover switch	Back cover (open)→ ON, backcover (close) → OFF AL and prewind starts if the cartridge switch is on (with film) when the back cover is closed.
★	5.	E-COMP SW	Exposure compensation switch	ON → Exposure compensation value can be selected. Compensation up to two stops can be selected and set in 1/2 stops by the dial switch.
★	6.	AEL SW	AE lock switch	ON → AE lock after partial metering
★	7.	Dial SW	Dial switch	The following six items can be set with other switches: • Program shift • Exposure compensation value • Shutter speed • ISO sensitibity • Aperture • Number of multiexposure
	8.	Lens SW	Lens switch	Detects the attachment and removal of the lens. Attachment → ON (VDD) Removal→ OFF (OPEN)
	9.	Reset SW	Reset switch	The electric circuit is reset with the battery is installed. Battery installation → OFF (OPEN)
	10.	CART-SW	Cartridge switch	Detects whether there is a film. Film → ON (GND)
	11.	Pop End SW	Flash extended switch	Charging starts if Flash is extended completely.
	12.	CN2	Back curtain switch	Detects the completion of second curtain travel. Travel completion → ON (GND)
	13.	X SW	Flash firing switch	ON (GND) → Firing
	14.	CHG1 SW CHG2 SW	Shutter phase switch	Detects the shutter charge and mirror up/down condition.
	15.	FF1 FF2	Film phase switch	Controls film transport.
	16.	DX1 DX2 DX3 DX4 DX5	DX code switch	Detects film ISO sensitivity by DX code.

CIRCUIT EXPLANATIONS

Power Supply

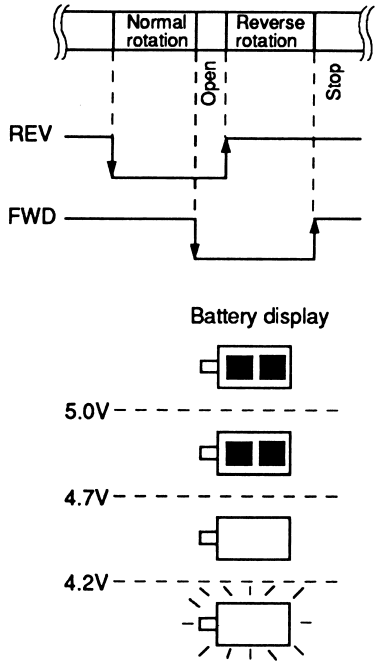
1. Battery supply
   - VBAT: power circuits (6.0 V)
   - SVBAT: Flash circuits (6.0 V)
2. DC/DC convertor supply
   - E1: IC drive (5.5 V)
   - E2: Analog power (5.5 V)
   - VDD: IC3 (LCD.DR) drive (5.5 V)
   - EM: BASIS drive (–2.0 V)
3. IC2 (I/O) supply
   - VREF: BASIS reference voltage (1.9 V)
   - VRH: IC4 (MPU) A/D conversion reference voltage (3.2 V)



Battery Check

Battery check is divided into two checks:
① Battery check with power applied to drive motor
② Battery check without motor current (software check)

<Battery check with motor current>



- Determine whether VBAT is greater than inhibit voltage (4.2 V) or less when the motor is rotated in the normal and reverse directions.
  N.G.: Inhibits release and displays flickering battery mark, cleared with SW1 ON after the battery is replaced.

<Battery check without motor current supply>
Software Check

Battery Loading

(Camera conditions: When Main/Mode SW is at [L])

① When the batteries are loaded in the camera, power is supplied as follows:
VBAT → DC/DC, IC2 (I/O IC), IC6 (M Driver)
SBAT → IC5 (FLASH IC)

② When VBAT is applied, VDD (5.5 V) is output and supplied to IC3 (LCD Driver).

③ Several milliseconds after the loading of batteries, the PUS (P22) of IC3 (LCD Driver) changes from low to high, and activates the IC3 (LCD Driver).

④ $\overline{\text{E1ON}}$ (P12) of IC3 (LCD Driver) changes from high to low, and activates DC/DC, and then supplies E1 and E2 to each IC.

⑤ IC2 (I/O IC) sets E1 voltage to monitor. When E1 voltage becomes 4.2 V or more, IC2(I/O IC) changes RES2 (P12) from low to high and sends it to LC3 (LCD Driver).
IC3 (LCD Driver) changes $\overline{\text{RES2}}$ (P17) from low to high and sends it to IC4 (MPU IC) to activate IC4 (MPU IC).
Then 12 MHz occurs in IC4 (MPU IC). It is divided to 3 MHz and send from ECLK (P29) to IC2 (I/O IC).

⑥ IC4 (MPU IC) communicate with I/O in CSIO C ~ CSIO A (P10 ~ p12) and commands to change IC2 (I/O IC) IOAD output to VBAT to check batteries.

⑦ IC2 (I/O IC) outputs a VBAT measured voltage value to IC4 (MPU IC) through IOAD (P56). The MPU outputs a drive command to IC6 (MDR) to rotate the motor in the normal and reverse directions (battery check with load).

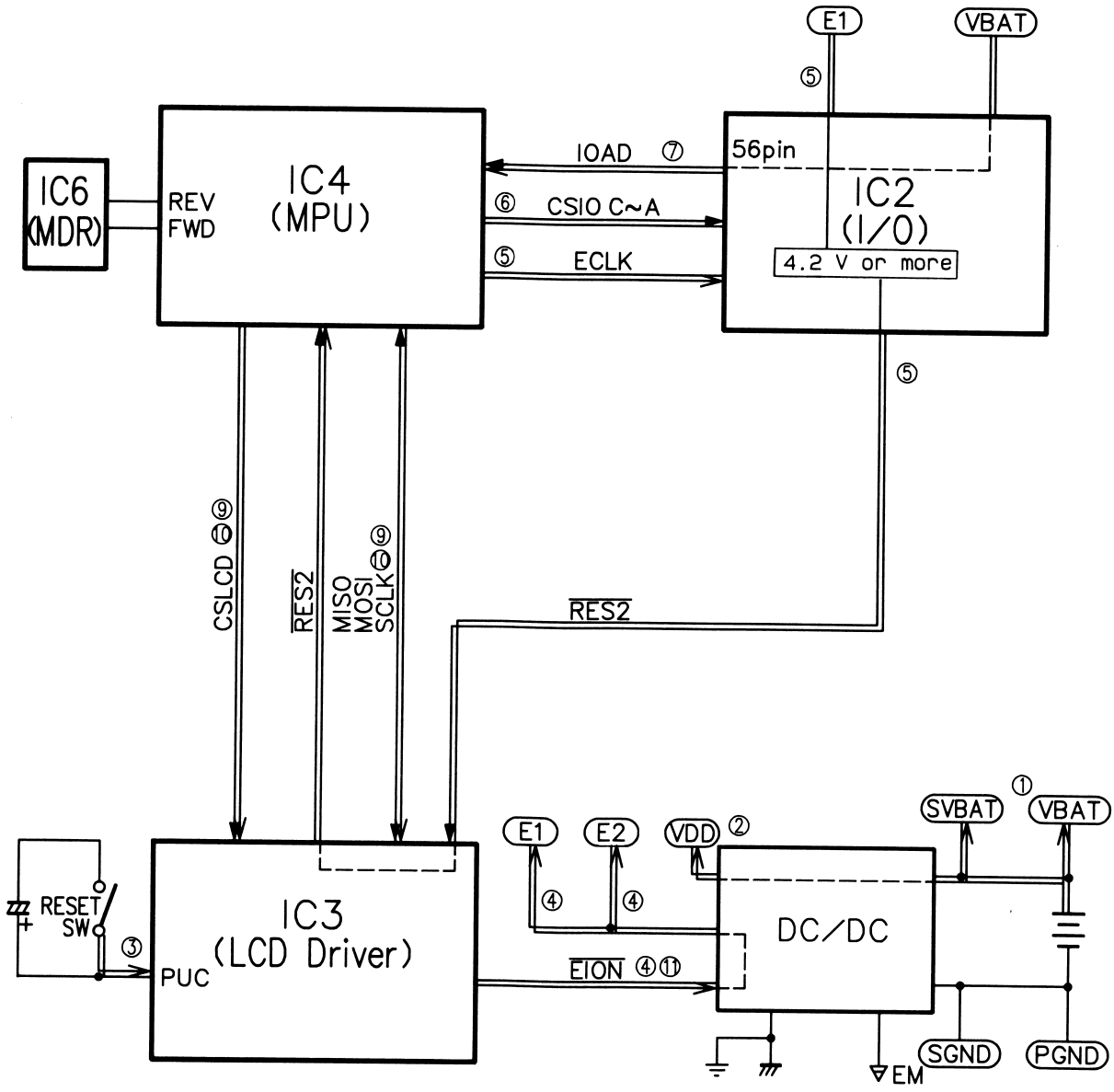
⑧ IC4 (MPU IC) conducts A/D conversion of the input voltage value to check whether it is 4.2 V (release inhibit) or less. If N.G., system N.G. occurs and the battery mark flickers, and release is inhibit. After batteries are replaced, it is cleared.
Go to the next sequence if 4.2 V or more.

⑨ IC4 (MPU IC) changes CSLCD (P9) from low to high and selects IC3 (LCD Driver) to check the input switch condition through MISO (P51), MOST (P52), and SCLK(P53).

⑩ IC3 (LCD Driver) sends the lack switch inputs to IC4 (MPU IC) through MOSI (P18), SCLK (P19), and MISO (P20).
IC4 (MPU IC) selects IC3 (LCD Driver) through CSLCD (P9) and commands to turn DC/DC off through MISO (P51), MOSI (P52), and SCLK (P53).

⑪ IC3 (LCD Driver) changes $\overline{\text{RES2}}$ (P17) from high to low and E10N from low to high and turns DC/DC off.

Battery loading



Prewinding

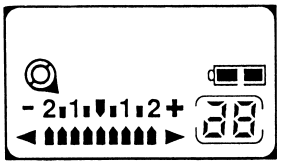
(Main/Mode SW [L] → [P])

① When Main/Mode SW changes from [L] →[P] , IC3 (LCD Driver) detects SW input change, changes $\overline{\text{E1ON}}$ from high to low, activates DC/DC, and supplies E1, E2 to each IC.
Then the same operation as for battery loading ⑤ and ⑥ is performed when power is turned on.

② IC3 (LCD Driver) sends th at Main/Mode SW changed from [L] → [P] IC4 (MPU IC) through MOSI, SCLK, and MISO (P18 ~ P19). Perform B.C by the normal and reverse rotation of the motor.

③ IC4 (MPU IC) selects IC3 (LCD Driver) with CSLCD (P9) and commands to display LCD through MISO (P51), MOSI (P52), and SCLK (P53).

④ IC3 (LCD Driver) displays on LCD1 (panel) as commanded.



⑤ After several milliseconds, DC/DC is once turned off, but IC3 (LCD Driver) remains to be in standby state because LCD1 (panel) display does not change.

(Film loading (cartridge switch, back cover switch ON))

⑥ DC/DC is activated by turning on CART SW (cartridge switch) and BACK SW (back cover switch).

⑦ IC4 (MPU IC) selects IC3 (LCD Driver) with CS LCD (P9) and checks the switch input condition through MISO (P51), MOSI (P52), and SCLK (P53).

⑧ IC3 (LCD Driver) informs that CART SW (cartridge switch) and BACK SW (back cover switch) were turned on to IC4 (MPU IC) through MOSI (P18), SCLK (P19), and MISO (P20).

⑨ Determining the front panel condition. If IC4 (MPU IC) CHG1 (P15) and CHG2 (P16) is "low", "high" (shutter charge completion), AL prewinding is started. For other cases, AL prewinding is started after false charge*.

⑩ IC4 (MPU IC) selects IC3 (LCD Driver) with CSLCD and commands LCD1 (panel) to flicker the cartridge mark through MISO (P51), MOSI (P52), and SCLK (P53).

⑪ IC4 (MPU IC) commands to change IC2 (I/O IC) IOAD output to DX through CSIO C ~ CSIO A (P10 ~ P12) and MISO (P51), MOSI (P52), and SCLK (P53).

⑫ IC2 (I/O IC) supplies a weak current to the DX contacts, detects non-conductive and conductive sections, and sends to IC4 (MPU IC) through IOAD (P56).

⑬ IC4 (MPU IC) conducts A/D conversion of the data to read ISO sensitivity (data is stored in EPROM when power is off.)

⑭ IC4 (MPU IC) commands to switch IC2 (I/O IC) IOAD output to VBAT for battery check through CSIO C ~ CSIO A (P10 ~ P12) and MISO (P51), MOSI (P52), and SCLK (P53).

⑮ IC4 (MPU IC) makes REV (P5) become low and FWD (P6) become high to rotate the motor in the reverse direction with high, low for several milliseconds, and stop it with high, high.

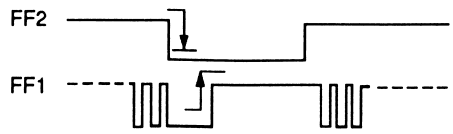
⑯ The same operation as for items ⑦ and ⑧ is performed when power is turned on.

⑰ To perform AL prewinding, IC4 (MPU IC) changes REV (P5) and FWD (P6) from high to low, "high" and sends it to IC6 (M Driver). IC6 (M Driver) changes FSRD (P11) and RSFD (P13) with "low", "high" to rotate the motor in the forward direction.

* A "false charge" involves cycling the mirror and charging the stutter to shift the planetary gearset.

⑱ IC4 (MPU IC) checks the change of the film transport detection switch with FF2 (P17) and FF1 (P18) during auto loading when the prewind count is 1 ~ 3. IC4 (MPU IC) determines an AL failure and stops the motor if the first FF1 (flickering) does not come when 2.9s elapses from the start of auto loading, or if FF1 (flickering) change does not occur within 300 ms for the second and subsequent FF1s.
The frame number is not displayed on LCD1.
For other cases, prewinding is started after AL termination.

⑲ In IC4 (MPU IC), the prewind count is added, the prewind count becomes 3, and the frame counter shows [1] on LCD1 if FF2 (P17) and FF1 (P18) change from L to ⅂ . Thus, IC4 (MPU IC) selects IC3 (LCD Driver) with CSLCD (P9) and commands to set the frame number of films to [1] in LCD (1 is stored in the electric counter).



⑳ IC3 (LCD Driver) displays frame number [1] on LCD1.

㉑ IC4 (MPU IC) detects tension during prewinding with FF2 (P17) and FF1 (P18). Film tensions occurs and the motor is stopped if FF1 (flickering) does not change within 300 ms from the start of prewinding.
For other cases, repeat ⑲ and ⑳ until film tension occurs.

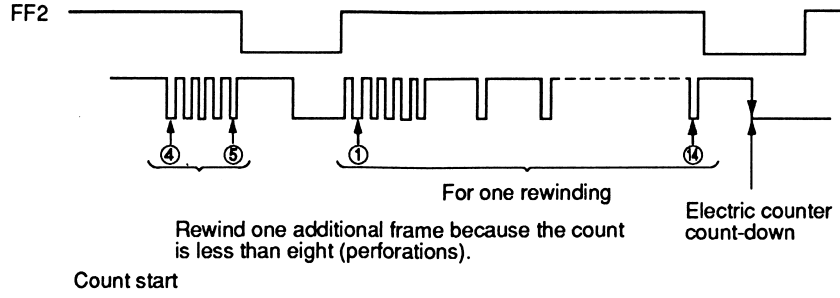
㉒ Perform false changing is performed to switch the transport gear chain from the prewinding side to the winding side. IC4 (MPU IC) changes REV (P5) and FWD (P6) from high, high to low to inform it to IC6 (M Driver).

㉓ IC6 (M Driver) makes FSRD (P11) become high and SFD (P13) become low, and rotates the motor in the reverse direction to start false charging (mirror up, down shutter charge).

㉔ IC4 (MPU IC) checks the change of the shutter phase switch with CHG1 (P15) and CHG2 (P16). When CHG1, CHG2 changes from high to low, high, IC4 (MPU IC) changes REV (P5) and FWD (P6) to high and stops the motor.

㉕ IC4 (MPU IC) changes REV (P5) and FWD (P6) and sends it to IC6 (M Driver) to rewind from the end of the roll IC6 (M Driver) changes FSRD (P11) and RSFD (P13) from low to high and rotates the motor in the normal direction to rewind one frame.

㉖ In IC4 (MPU IC), the electric counter is subtracted if FF2 (P17) and FF1 (flickering) does not occur seven times or more, another one film is rewound.

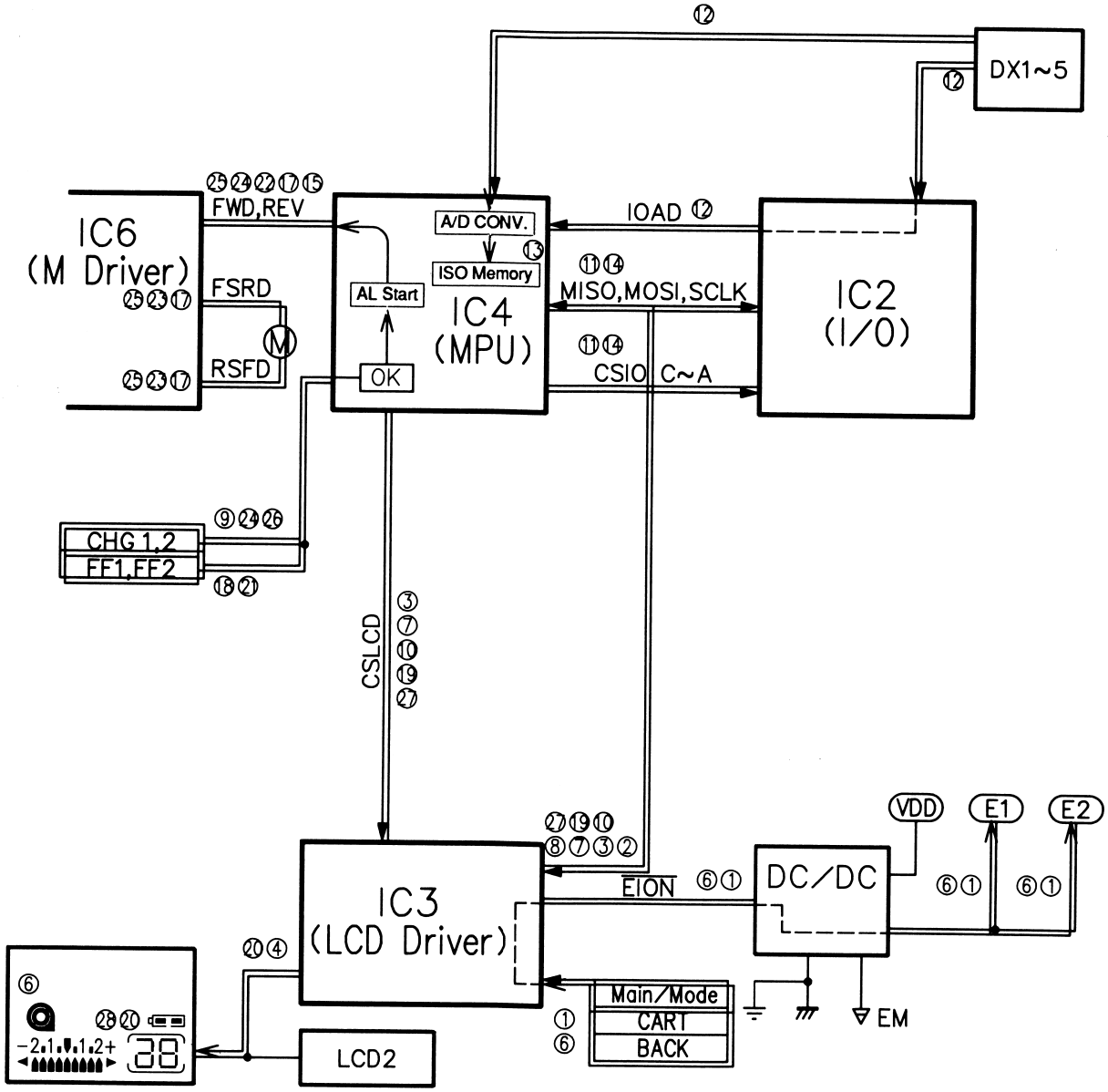


㉗ In IC4 (MPU IC) , the electric counter is subtracted if FF2 (P17) and FF1 (P18) changes from low to high.
However , if FF1 (flickering) does not occur seven times or more, another frame is rewound.

㉑ IC4 (MPU IC) selects IC3 (LCD Driver) with CSLCD (P9) and commands to subtract one frame on LCD with MISO (P51), MOSI (P52), and SCLK (P53).

㉑ IC3 (LCD Driver) displays the frame number (one subtracted) on LCD.

Prewinding


⑫
DX1~5
⑫
㉕㉔㉒⑰⑮
FWD,REV
IC6
(M Driver)
㉕㉓⑰
FSRD
㉕㉓⑰
RSFD
M
A/D CONV.
⑬
ISO Memory
AL Start
IC4
(MPU)
OK
IOAD ⑫
⑪⑭
MISO,MOSI,SCLK
⑪⑭
CSIO C~A
IC2
(I/O)
⑨㉔㉖
CHG 1,2
FF1,FF2
⑱㉑
CSLCD
③⑦⑩⑲㉗
㉗⑲⑩
⑧⑦③②
IC3
(LCD Driver)
EION ⑥①
DC/DC
VDD
E1
E2
⑥①
⑥①
⑥
㉘⑳
-2.1.0.1.2+
㉐④
LCD2
①
⑥
Main/Mode
CART
BACK
EM

SW1 ON (metering)

① SW1 ON information is input to IC3 (LCD Driver).
When SW1 is turned on, IC4 (MPU IC) selects IC3 (LCD Driver) with CSLCD (P9) and checks switch change through MISO (P51), MOSI (P52), and SCLK (P53).

② IC3 (LCD Driver) informs that SW1 was turned on through MOSI (P18), SCLK (P19), and MISO (P20). IC4 (MPU IC) reselects IC3 (LCD Driver) with CSLCD (P9) and commands to activate DC/DC though MISO (P51), MOSI (P52), and SCLK (P53) .
The operation in battery loading ④ to ⑧ is performed when power is turned on (except Battery Check by motor current supply).

③ IC4 (MPU IC) checks the mirror box condition. If shutter charging is not completed, it performs false charging. For other cases, go to the next sequence.

④ IC4 (MPU IC) selects an IC1 (AE IC) metering area through SO (P39) and S1 (P40) and them commands to switch the output of IC2 (I/O IC) IOAD (P56) IOAD to AEout through CSIO C ~ CSIO A (P10 ~ P12). MISO (P51), MOSI (P52), and SCLK (P53).

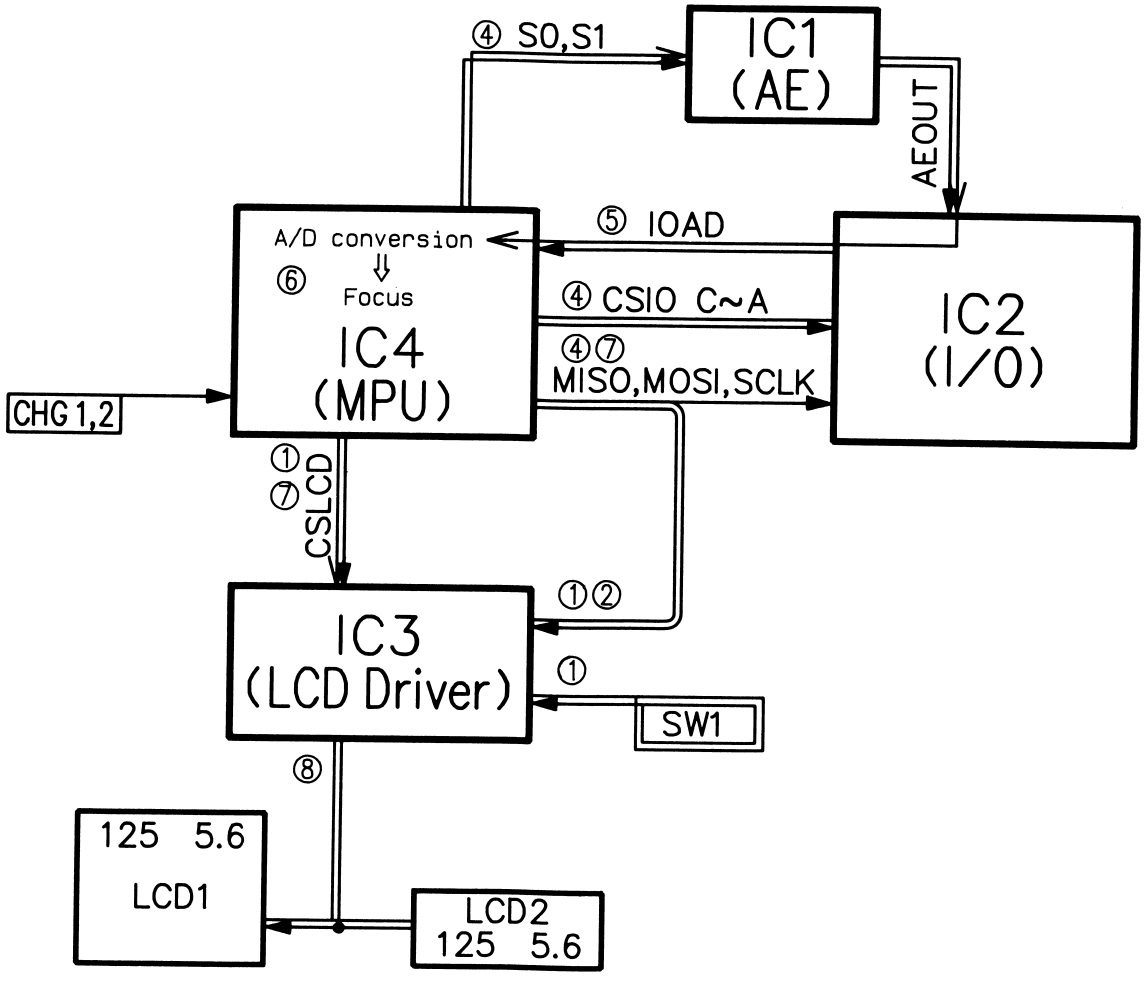
⑤ IC2 (I/O IC) outputs metering data for each area input from AEout (P57) from IOAD (P56) to IC4 (MPU IC).

⑥ IC4 (MPU) conducts A/D conversion of metering data internally to calculate the metering data internally to calculate the metering value.

⑦ IC4 (MPU) selects IC3 (LCD Driver) with CSLCD (P9) and commands to display the metering value through MISO (P51), MOSI (P52), and SCLK (P53).

⑧ IC3 (LCD Driver) displays the metering value on LCD1, LCD2.

SW1 ON (Metering)



SW1 ON (AF Operation)

① IC4 (MPU IC) commands to switch the output of IC2 (I/0 IC) IOAD (P56) to AFAD with CSIO C ~ DSIO A (P10 ~ P12). IC4 (MPU IC) changes $\overline{\text{Tint}}$ (P34) to "high" to set the metering state and informs metering starts to IC2 (I/O IC) through MOSI (P51), MOSI (P52), and SCLK (P53).

② IC4 (MPU IC) sends the BASIS driving clock to IC2 (I/O IC) through BASI (P36) and BAS2 (P37). IC2 (I/O IC) generates BASIS driving signals F1~ F10 internally and outputs them to BASIS through P30 ~ P39.
Thus BASIS starts ranging.

③ BASIS sends the range data to IC2 (I/O IC) through VIDMIN (P2), VIDMAX (P3), and VIDEO (P18). IC2 (I/O IC stops accumulation when the lever with a VIDMAX – VIDMIN input value is reached, changes $\overline{\text{Tint}}$ (P15) from high to "low", and informs accumulation completion.

④ IC2 (I/O IC) outputs range image data to IC4 (MPU IC) through IOAD (P56). IC4 (MPU IC) conducts A/D conversion internally and calculates the amount of defocus.

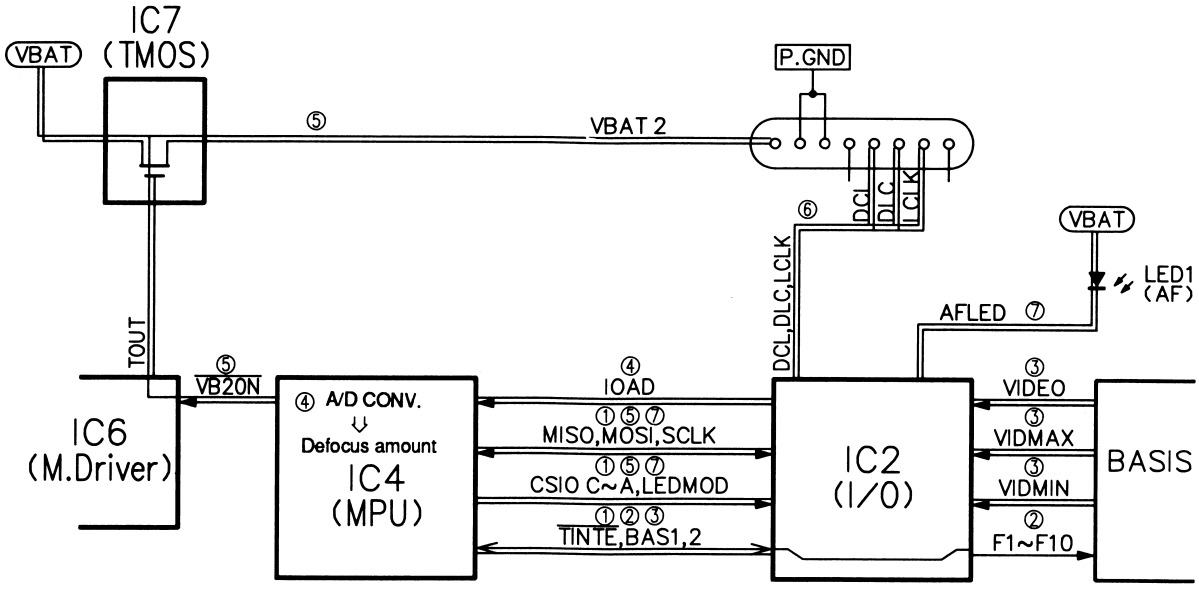
⑤ IC4 (MPU IC) changes $\overline{\text{VB2ON}}$ (P41) from high to low, turns on TMOS, and supplies the source power VBAT2 to the lens. IC4 (MPU IC) commands to communicate with the lens through CSIO C ~ CSIO A (P10 ~ P12), MISO (P51), MOSI (P52), and SCLK (P53).

⑥ IC2 (I/O) sends the amount of focus movement through LCLK (P26), DLC (P27), and DCL (P28), to shift the lens focus the correct amount.

⑦ IC2 (I/O IC) selects IC2 (I/O IC) through CSIO C ~ CSIO A (P10 ~ P12) to light or flicker the AF in-focus mark, and issues a lighting, flickering command through MISO (P51), MOSI (P52), and SCLK (P53).
Next, the drive signal is output for lighting or flickering through LEDMOD (P58), and IC2 (I/O IC) lights or flickers LED1 (if focus not achieved, N.G.).

⑧ If the lens focuses correctly, go to the next sequence. ① to ⑥ are repeated if N.G.

SW1 ON (AF Operation)



SW2 ON (Release)

① SW2 ON information is input to IC4 (MPU IC) (P1).
② IC4 (MPU IC) commands IC2 (I/O IC) to turn off LED1 (AF), LED2 (AE) through CSIO C ~ CSIO A (P10 ~ P12), MISO (P51), MOSI (P52), and SCLK (P53).
Thus LED1, 2, LCD2, are turned off.
③ IC4 (MPU IC) makes REV (P5) become low and FWD (P6) become high for normal rotation, become low, low for opening, and become high, low for reverse, rotation for several milliseconds. IC4 (MPU IC) checks the battery by supplying the current to the motor.
If the battery is under 4.2 V, the system goes N.G. and the battery mark flickers.
④ IC4 (MPU IC) makes REV (P5) become high and FWD (P6) become low, which makes the motor to rotate in the normal rotation, and makes the mirror go up.
IC4 (MPU IC) makes the mirror go up.
IC4 (MPU IC) makes Mg3-2 (P59) and Mg3-1 (P62) become high, turns Trl, Tr2 on, and supplies the current to the shutter magnet.
⑤ IC4 (MPU IC) checks CN2 (P63) to confirm no ON. If ON, the system becomes N.G. and battery mark flickers to make the mirror go up.
⑥ IC4 (MPU IC) selects communication with the lens through CSIO C ~ CS10 A (P10 ~ P12), and commands to see the lens condition through MISO (P51), MOSI (P52), and SCLK (P53).
⑦ IC2 (I/O IC) communicates with the lens through LCLK (P26), DLC (P27), and DCL (P28), and checks if the EMD is open. If the EMD is not open, the system becomes N.G. and the battery mark flickers to make the mirror go up.
⑧ IC4 (MPU IC) selects communication with lens through CSIO C ~ CSIO A (P10 ~ P12), and commands to step down the aperture to the required value through MISO (P51), MOSI (P52), and SCLK (P53).
IC2 (I/O IC) drives the lens through LCLK (P26), PLC (P27), and DCL (P28) to stop down to the required aperture.
⑨ IC4 (MPU IC) determines the mirror-up completion state and REV (P5) and FWD (P6) are changed to high to stop the M2 motor if shutter phase switches CHG1 (P15) AND CHG2 (P16) changes from low, high to low.
⑩ IC4 (MPU IC) makes Mg3-1 (P62) to change from high to low to cut off the current supply. The IC4 (MPU IC) releases drive lever so the first curtain runs and exposure starts.
At this point, when the internal or external flash is in the ready condition for firing, the shutter X contact closes firing the shutter.
⑪ After the required exposure time, IC4 (MPU IC) makes Mg3-2 (P59) change from high to low to stop the current supply and the second curtain runs. When the second curtain completes its run, CN2 switch is turned on.
⑫ When CN2 is input to IC4 (MPU IC), REV (P5) becomes high and FWD (P6) becomes low, making the motor rotate in the reverse direction, and mirror down and shutter charge begin.
⑬ IC4 (MPU IC) communicates with IC2 (I/O IC) through CSIO C ~ CSIOA (P10 ~ P12) and MISO (P51), MOSI (P52), and SCLK (P53), and command to open the diaphragm.
⑭ IC4 (MPU IC) determines mirror-down completion and REV (P5) and FWD (P6) are changed to high to stop the motor if shutter phase switches CHG1 (P15) and CHG2 (P16) changed from high to low, high.
⑮ IC4 (MPU IC) changes REV (P5) and FWD (P6) from high to low, high and rotates the motor in the normal direction to switch from the prewinding side to winding side and going winding,
⑯ IC4 (MPU IC) checks the change of the film transport detection switch through FF2 (P17) and FF1 (P18). It determines winding tension and the battery mark flickers it FF1 (flickering) does not change when 1.5 s elapses after winding start or FF1 (flickering) does not also change within 300 ms after the second time. (The lens is released with SW1 ON, only one frame of film is wound and stopped by seeing FF1, and one frame number is subtracted.)
⑰ In IC4 (MPU IC), winding count is subtracted and the number of frames is displayed on LCD1 if FF2

(P17) and FF1 (P18) are changed from low, high to low. Thus IC4 (MPU IC) selects IC3 (LCD Driver) through CSLCD (P9), and commands display the frame number (one subtracted) on LCD through MISO (P51), MOSI (P52), and SCLK (P53).

⑱ ① to ⑰ are repeated until the frame number becomes [1].

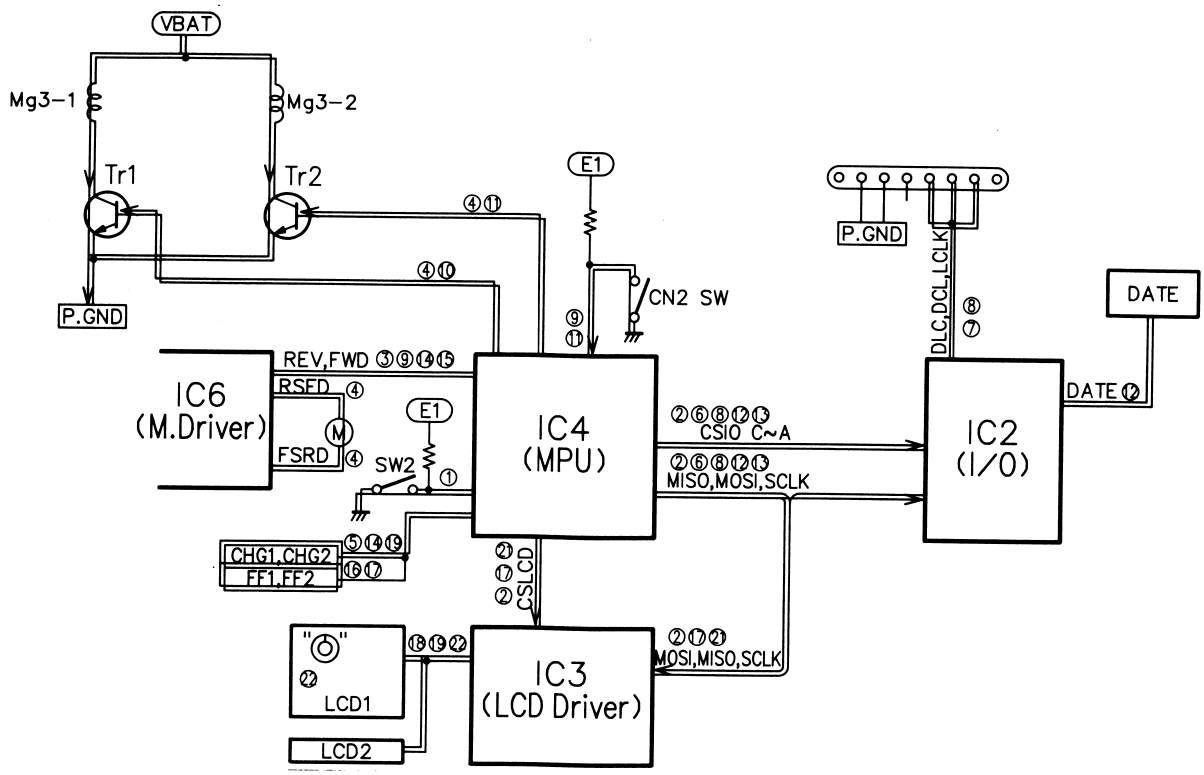
⑲ The number of films becomes [1] and ① ~ ⑮ to are operated.
After winding is started and one frame is wound normally, the current is supplied to motor's normal operation for 1.5 s to rewind the film leader into the cartridge if the first FF1 (flickering) does not come after 1.5 s or the second or subsequent FF1 (flickering does not occur within 300 ms).

⑳ As usual, IC4 (MPU IC) performs false charging and stops the motor.

㉑ A IC4 (MPU IC) selects IC3 (LCD Driver) through CSLCD (P9), and commands to flicker the cartridge mark for rewinding completion through MISO (P51), MOSI (P52), and SCLK (P53).

㉒ Thus IC3 (LCD Driver) flickers the cartridge mark on LCD1.

SW2 ON (Release)



Built-in Flash Firing (EOS 1000 QD only)

Camera conditions: When Main/Mode SW is [L]

① If the built-in flash is lifted, pop DOWN SW ON ("low") is input to IC3 (LCD Driver).

② IC3 (LCD Driver) makes $\overline{\text{E1ON}}$ (P12) become "low" activates DC/DC, and supplies E1 and E2 to each IC. IC4 (MPU IC) selects IC3 (LCD Driver) through CSLCD (P9) and checks the input state of the switch through MISO (P51), MOSI (P52), and SCLK (P53).

③ IC3 (LCD Driver) informs pop DOWN SW ON to IC4 (MPU IC). IC4 (MPU IC) makes EFCG (P7) become "high" and outputs it to IC5 (FLASH IC).

④ IC5 (FLASH IC) makes OSC (P5) become "high". Tr4 and Tr3 are turned on, T1 begins oscillation, and charging of C27 (main capacitor) is started.

⑤ IC5 (FLASH IC) checks the charging state of the main capacitor with voltage divider R/16 and R17. When it becomes 2.55 V or more, a 250 μA current flows to inform firing voltage to IS2 (I/O IC). In this case, IC2 (I/O IC) always monitors VBAT. When VBAT (P1) input voltage becomes 2.3 V or less, PWR (P2) is set to "low", IC5 (FLASH IC) OSC (P5) is set to low to stop charging (charging inhibited.)

⑥ IC4 (MPU) communicates with IC (I/O IC) through CSIO C ~ CSIO A (P10 ~ P12) and MISO (P51), MOSI (P52), and SCLK (P53), and checks firing voltage.
Normally (SW1 ON state), IC4 (MPU) selects IC3 (LCD Driver) through CSLCD (P9) and lights the charge completion mark through MISO (P51), and LCLK (P53), but in this case, display is not performed because SW1 is not turned on.

⑦ The charge completion mark lights (in this case, it does not light because SW1 is not on), but because charging is not complete, charging continues, When 2 seconds elapses, OSC (P5) is set to "allow" to stop oscillation and complete charging.

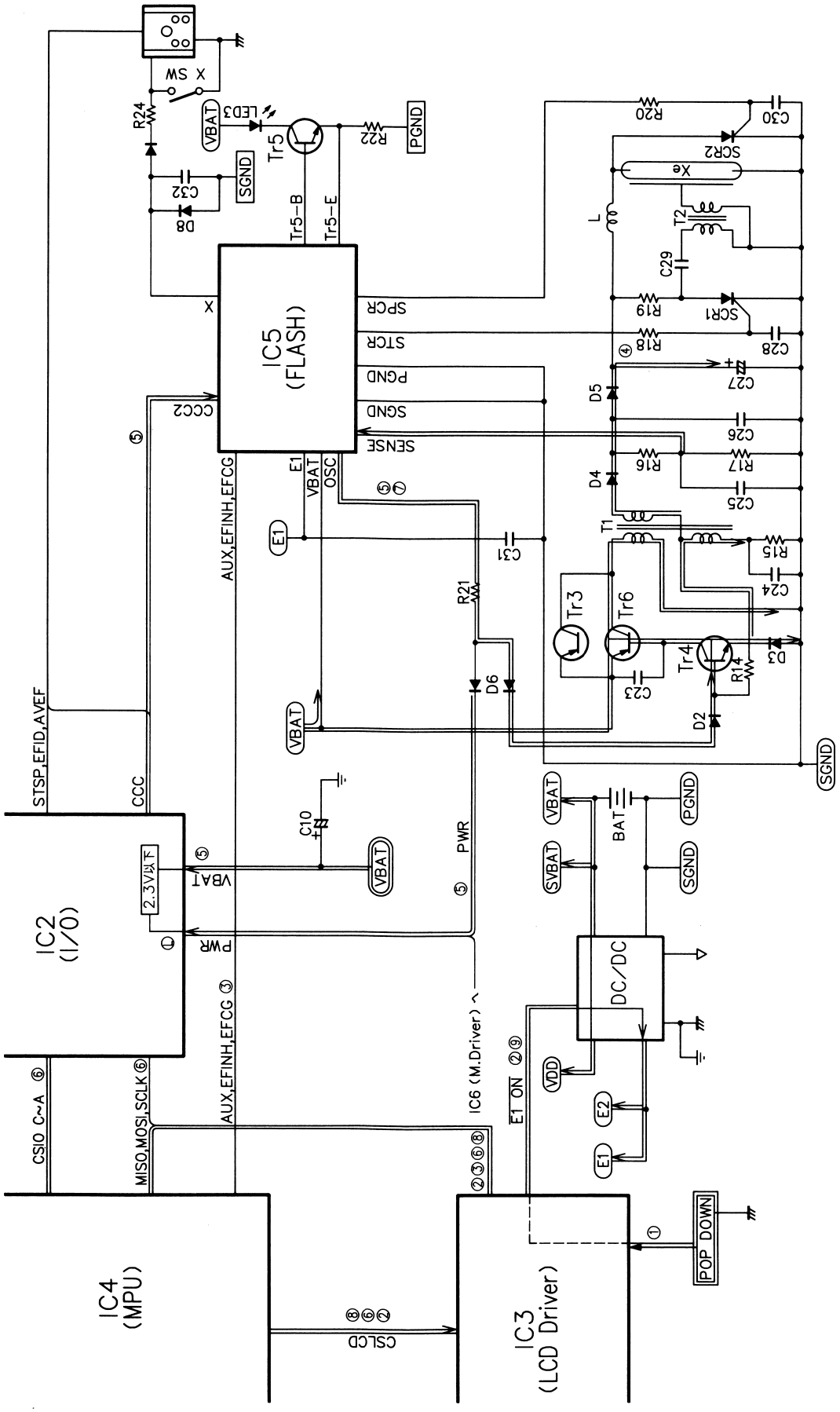
⑧ IC4 (MPU IC) selects IC3 (LCD Driver) through CSLCD (P9), and checks that there are other switch input through MISO (P51), MOSI (P52), and SCLK (P53). If there is no input, DC/DC is turned off. If there is, of to the next sequence.

⑨ IC3 (LCD Driver) makes $\overline{\text{E1ON}}$ (P12) become "high" with $\overline{\text{RES2}}$ = L and DC/DC off.

Camera conditions: When Main/Mode SW is other than [L] in flash firing mode, and in forced firing mode

The above is omitted because it is the same as for the EOS 700.

Built-in flash firing



ELECTRICAL PARTS

• Main flex unit

Pin No.	Spec./MFG.#	Function
IC1 (AE)	LC3072	Metering (three-section metering sensor)
IC2 (I/O)	TB1106F	Controlled by the MPU with an interface between the MPU and the lens, flash, back cover, BASIS as the main function.
IC4 (MPu)	MC68HC-11A8FU	Sequence control of entire system • Control of AF operation, communication with the lens, BASIS, shutter, DX read, film transport SW detection, LCD1, and LCD2
IC5 (FLASH) (EOS10QD only)	LC4067A	Used only for the EOS 1000QD camera with the same IC as for the EOS 10 camera. Controls the flash circuit and lighting of the AF auxiliary light.
IC6 (M. Driver)	MPC1710A	Controls the motor with the same IC as for the EOS camera.
IC7 (T-MOS)	SFX-10	Switch IC for supplying the power (VBAT2) to the lens.
Tr1, Tr2	RN1406	Switching transistor for control of first and second curtain magnets
Tr5	2SC2982	For ignition of the AF auxiliary light
R1, R2, R3, R4, R5 R6, R7, R8	—	For noise prevention
R9, R10	—	For pull-up
C4, C5, C6, C7 C8, C10, C12, C13 C14, C15, C31	—	For stabilizing the power supply
C33, C34	—	For noise prevention
OSC 2	12MHZ	Clock for operating and controlling the MPU

• LCD flex unit

Pin No.	Spec./MFG.#	Function
IC3 (LCD Driver)	SN103931	Switch detector and driver for LCD1 and LCD2
OSC 1	32KHZ	Clock for driving IC3
C16, C17, C18, C20, C21	—	Time constant
C22	—	For stabilizing VDD

• AF unit

Pin No.	Spec./MFG.#	Function
BASIS	LC4016	Autofocus sensor

• Flash Circuit Board

Pin No.	Spec./MFG.#	Function
Tr3, Tr4, Tr6	—	Controls the start and stop of flash charging
T1	—	Transformer for charging the flash
C27	—	Main capacitor
SCR2	—	For built-in flash termination
R16, R17, C25	—	Elements for detecting charging completion

• Pentaprism Circuit Board

Pin No.	Spec./MFG.#	Function
SCR 1	CR02AM-8	For starting the firing of the built-in flash
R19	1MΩ	Current limiter
C28	1000PF	Noise prevention

IC TERMINALS

IC1 (AE IC)

Pin No.	Symbol	I/O	Function
1	N.C.	—	Unused
2	SO	I	Three-zone sensor selection
3	A GND	V	Analog ground
4	AE OUT	O	AE output
5	E2	V	Power supply
6~7	N.C.	—	Unused
8	VC	V	AE output standard voltage
9	N.C.	—	Unused
10	SI	I	Three-zone sensor selection

IC2 (I/O)

Pin No.	Symbol	I/O	Function
1	VBAT	V	For checking VBAT voltage
2	/PWR	O	Inhibits motor and flash if VBAT is 2.3 V or less
3	N.C.	—	Unused
4	N.C.	—	Unused
5	VC	V	Reference voltage
6	VRH	V	IC4 A/D converter voltage
7	CT	I	Connects metering integral capacitor
8	ANOD	O	Connects metering sensor (anode)
9	CATD	I	Connects metering sensor (cathode)
10	N.C.	—	Unused
11	DATE	O	Data imprint
12	/RES2	O	Resets IC4 when E1 goes low
13	BAS2	O	Clock for driving BASIS
14	BAS1	O	Clock for driving BASIS
15	/TINTE	O	Starts and ends BASIS storage
16	ECLK	I	IC2 reference clock
17	LEDMOD	I	LED luminance modulation input

Pin No.	Symbol	I/O	Function
18	CSIOC	I	Determines IO communication partner by this combination
19	CSIOB	I	
20	CSIOA	I	
21	E1	V	Power supply
22	SCLK	I	IC4 communication clock
23	DGND	V	Digital ground
24	MOSI	I	IC4 communication input
25	MISO	O	IC4 communication output
26	LCLK	I	Lens clock
27	DLC	I	Lens communication output terminal
28	DCL	I	Lens communication input terminal
29	N.C.	—	Unused
30	F10	O	BASIS drive signal
31	F1	O	BASIS drive signal
32	F8	O	BASIS drive signal
33	F7	O	BASIS drive signal
34	F9	O	BASIS drive signal
35	F3	O	BASIS drive signal
36	F2	O	BASIS drive signal
37	F6	O	BASIS drive signal
38	F4	O	BASIS drive signal
39	F5	O	BASIS drive signal
40	AELED	O	AELED lighting
41	AFLED	O	AFLED lighting
42	STSP2	O	Flash firing stop
43	STSP	O	Flash communication clock
44	EFID	O	Flash communication terminal output
45	AVEF	O	Flash communication terminal input
46	CCC	O	Flash charge completion detection Preissuance, auxiliary light firing
47	TEMP	O	Diode connection (anode)
48	IREF	I	VC occurrence reference terminal
49	VREF	V	BASIS reference voltage
50	VIDMIN	I	BASIS image input (dark level)
51	VIDMAX	I	BASIS image input (peak level)
52	VIDEO	I	BASIS video signal input
53	AGND	V	Analog ground

Pin No.	Symbol	I/O	Function
54	QVC	V	Time constant
55	E2	V	Analog power in IC2
56	IOAD	O	Analog signal output
57	AEOUT	I	Metering sensor signal input
58	DX1	I	DX code input
59	DX2	I	DX code input
60	DX3	I	DX code input

IC3 (LCD-Dr)

Pin No.	Symbol	I/O	Function
1	SW1	I	Ranging & metering switch
2	LENS	I	Lens switch
3	N.C.	—	Unused
4	N.C.	—	
5	N.C.	—	
6	N.C.	—	
7	N.C.	—	
8	N.C.	—	
9	DIAL2	I	Dial switch 2
10	DIAL1	I	Dial switch 1
11	DGND	V	Digital ground
12	/E1ON	O	Start DC/DC
13	N.C.	—	Unused
14	/TRAP	I	Input time (L) when E1 is 4.2 V or more
15	CSLCD	I	LCD-Dr selection terminal
16	N.C	—	Unused
17	/RES2	O	Reset I/O, MPU
18	MOSI	I	Serial communication input terminal
19	SCLK	I	Serial communication synchronous signal
20	MISO	O	Serial communication input terminal Communicate with MPU, I/O1, and I/O2 by DMS, DSM, and SCLK
21	N.C.	—	Unused
22	/PUC	I	Reset LCD driver
23	N.C.	—	Unused
24	-CPLL	—	
25	N.C.	—	Unused

Pin No.	Symbol	I/O	Function
26	CLK8M	O	
27	N.C.	—	Unused
28	N.C.	—	Unused
29	XTAL1	I	LCD-Dr clock
30	XTAL2	I	
31	CCOM	—	External capacitor common terminal
32	VL	I	Triple booster voltage
33	VM	I	Double booster voltage
34	VH	I	Reference voltage
35	CHP3	I	Capacitor terminal to generate each voltage
36	CHP2	I	
37	CHP1	I	
38	VDD	V	LCD-Dr power
39~64	SEG	O	Segment driver connection terminals
65~67	COM3,2,1	I	Common driver connection terminals
68	DLC	I	Switch sensing (communication request from the lens)
69	AEL	I	Switch sensing (AE lock switch)
70	MAIN	I	Switch sensing (main/mode switch)
71	MAIN2	I	Switch sensing (main/mode switch)
72	MAIN1	I	Switch sensing (main/mode switch)
73	MAIN3	I	Switch sensing (main/mode switch)
74	N.C.	I	Unused
75	CART	I	Switch sensing (Cartridge Switch)
76	POP DOWN	I	Switch sensing (pop-down switch)
77	E-COMP	I	Switch sensing (exposure compensation switch)
78	N.C.	—	Unused
79	BEEP	O	Beeper control
80	N.C.	—	Unused

IC4 (MPU)

Pin No.	Symbol	I/O	Function
1	SW2	I	SW2 input detection
2~4	N.C.	—	Unused
5	REW	O	Transport detection / Brake / Normal rotation / Reverse rotation REV / 1 / 0 / 0 FWD / 1 / 1 / 0
6	FWD	O	
7	EFCG	O	Built-in flash charging start signal
8	EFINH	O	Inhibit built-in flash, AF auxiliary light firing
9	CSLCD	O	LCD driver selection signal
10	CSIOC	O	Determines IO communication partner by this signal combination
11	CSIOB	O	
12	CSIOA	O	
13	IOAD	I	IO analog value input terminal
14	N.C.	—	Unused
15	CHG1	I	Mirror up/down/shutter charge completion detection switch
16	CHG2	I	
17	FF2	I	Film control detection switch
18	FF1	I	
19	DX5	I	Reads the number of films by DX code
20	DX4	I	
21	VRL	V	Analog ground
22	VRH	V	Reference voltage 3.2 V
23	DGND	V	Digital ground
24	DGND	V	Digital ground
25	MODB	—	Tool communication terminal
26	N.C.	—	Unused
27	MODA	—	Tool communication terminal
28	N.C.	—	Unused
29	ECLK	V	Outputs IO clock
30	N.C.	—	Unused
31	EXTAL	V	12 MHz oscillator
32	N.C.	—	Unused
33	XTAL	V	12 MHz oscillator
34	TINTE	O	BASIS storage start, end signal
35	N.C.	—	Unused
36	BAS1	O	Reference clock to create BASIS drive clock
37	BAS2	O	Reference clock to create BASIS drive clock

Pin No.	Symbol	I/O	Function
38	CAGC	O	BASIS drive control
39	S0	O	Switches metering sensor output
40	S1	O	Switches metering sensor output
41	VB2ON	O	Terminal to control power supply to the lens
42	N.C.	—	Unused
43	RESET	I	MPU reset terminal
44	N.C.	—	Unused
45	XIRQ	—	Unused
46	IRQ	—	Unused
47	RXD	—	Tool communication setting terminal
48	N.C.	—	Unused
49	DGND	V	Digital ground
50	TXD	—	Tool communication setting terminal
51	MISO	I	Serial communication input terminal
52	MOSI	O	Serial communication output terminal
53	SCLK	I/O	Serial communication synchronous terminal
54	N.C.	—	Unused
55	E1	V	Power (5.5 + 0.4 V)
56	AUX	O	Auxiliary light firing start signal
57	BEEP	O	Beeper control
58	LEDMD	O	LED luminance modulation
59	MG3-2	O	Second curtain current supply signal
60	N.C.	—	Unused
61	N.C.	—	Unused
62	MG3-1	O	First curtain current supply signal
63	CN2	I	Second curtain running completion signal
64	DGND	V	Digital ground

IC5 (FLASH) (uses IC7 from EOS 10)

Pin No.	Symbol	I/O	Function
1	AUX-E	I	AF auxiliary illuminator lighting signal
2	N.C.	—	Unused
3	GND	—	Ground
4	N.C.	—	Unused
5	OSC	O	Control of oscillation start and stop
6	EFCG	I	Built-in flash charging start signal
7, 8	N.C.	—	Unused
9	SENSE	I	Charging voltage detect
10	/CCC2	I/O	Built-in flash charge complete detect signal output
11	X	I	X signal
12	EFINH	I	Built-in flash inhibit (prohibits when "H")
13	STCR	O	Built-in flash discharge start signal output terminal
14	P GND	V	Power ground
15	SPCR	O	Built-in flash discharge stop signal output terminal
16	VBAT	V	Power supply
17	STSP2	I	Built-in flash discharge stop signal
18	E1	V	Digital system power supply, 5.3 V
19	AUX3	O	AF illuminator start signal output terminal
20	AUX	I	AF illuminator start signal input terminal

IC6 (MOTOR DRIVER) (uses IC8 from EOS 10)

Pin No.	Symbol	I/O	Function
1	C2L	V	For driving IC6, IC7
2	C1H	V	For driving IC6, IC7
3	C1L	V	For driving IC6, IC7
4	VBAT	V	Motor 1 drive power supply
5	E1	V	IC6 drive power supply 5.3 V
6	FWD	I	Motor 1 drive power input
7	REV	I	Motor 1 drive power input
8	/PWR	I	Reset signal input
9	DGND	V	Digital ground
10	/VB2ON	I	TMOS ON signal input
11	FSRD	O	Motor 1 drive signal output
12	P GND	V	Power ground

Pin No.	Symbol	I/O	Function
13	RSFD	O	Motor 1 drive signal output
14	TOUT	O	Output lens drive voltage BAT2
15	VPP	V	
16	C2H	V	For driving IC6, IC7

BASIS (Uses BASIS from EOS 750)

Pin No.	Symbol	I/O	Function
1	E2	V	Sensor analog power supply
2	VIDMIN	O	BASIS image output dark level
3	VIDMAX	O	BASIS image output peak level
4	F4	I	BASIS drive signal
5	F5	I	
6	F2	I	
7	N.C.	—	Unused
8	F3	I	BASIS drive signal
9	F6	I	
10	CAGC	I	BASIS compensation gain input
11	AGND	V	Analog ground
12	DGND	V	Digital ground
13	EM	V	BASIS minus power
14	F10	I	BASIS drive signal
15	F8	I	
16	F7	I	
17	F9	I	
18	VIDEO	O	BASIS video signal output
19	VDD	V	Sensor digital power
20	EM	V	BASIS minus power
21	F2	V	Sensor analog power
22	F1	I	BASIS drive signal

3. REPAIR INFORMATION

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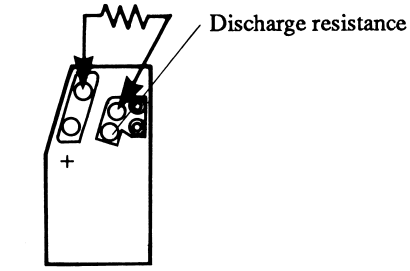
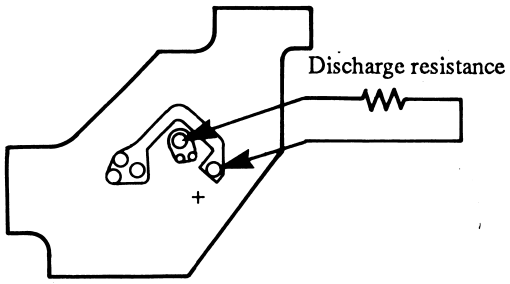
PREPARATIONS FOR REPAIR

Discharging EOS 1000QD flash capacitor

Be sure to discharge the main capacitor before disassembly because the main circuit might be charged. Discharge it at the location on the pentaprism board or bottom board, as shown in the figure below.



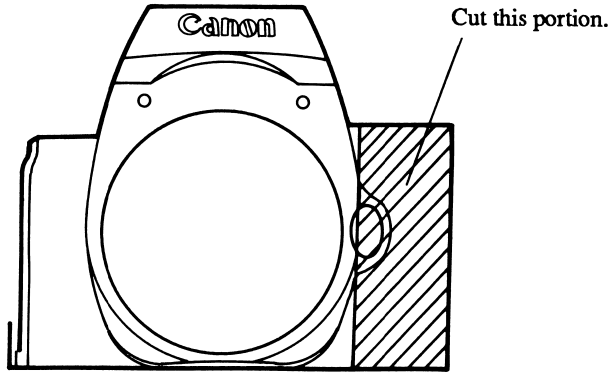
(Pentaprism board)



(Bottom board)

Tool apron for electric adjustment

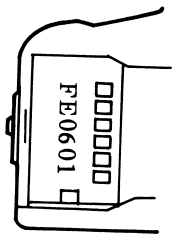
Manufacture a tool apron by cutting as shown in the right figure because accurate AF data cannot be obtained without the apron during AF electric adjustment.

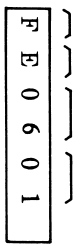


Apron

Classification number

The classification number is stamped in the cartridge chamber. The meanings are as follows:





F E 0 6 0 1	Plant	F: Fukushima Plant, C: Taiwan Plant
	Year	1990: E~
	Month	01 (January) to 12 (December)
	Change number	

CURRENT CONSUMPTION

Metering conditions

Lens: EF50 mm/1.8

Power source: Constant voltage power 5.4 V, 0.7Ω

New lithium battery 2CR5 (within three months after production)

Film: New Tri-X (36EX) (during prewind or winding check).

Note: * Without lens.

	Product standard	Actual measured range
* Standby (including LOCK)	50μA or less	20 ~ 25μA
* SW1 ON	150mA or less	65 ~ 75mA
* Self timer	200mA or less	65 ~ 75mA
Prewind (measuring the 20th frame with the film counter)	700mA or less	250 ~ 330mA
Winding (measuring not immediately after start but during stability)	500mA or less	200 ~280mA

* There is little difference of current consumption between EOS 1000QD and EOS REBEL, 1000.

TOOLS AND EXPENDABLES LIST

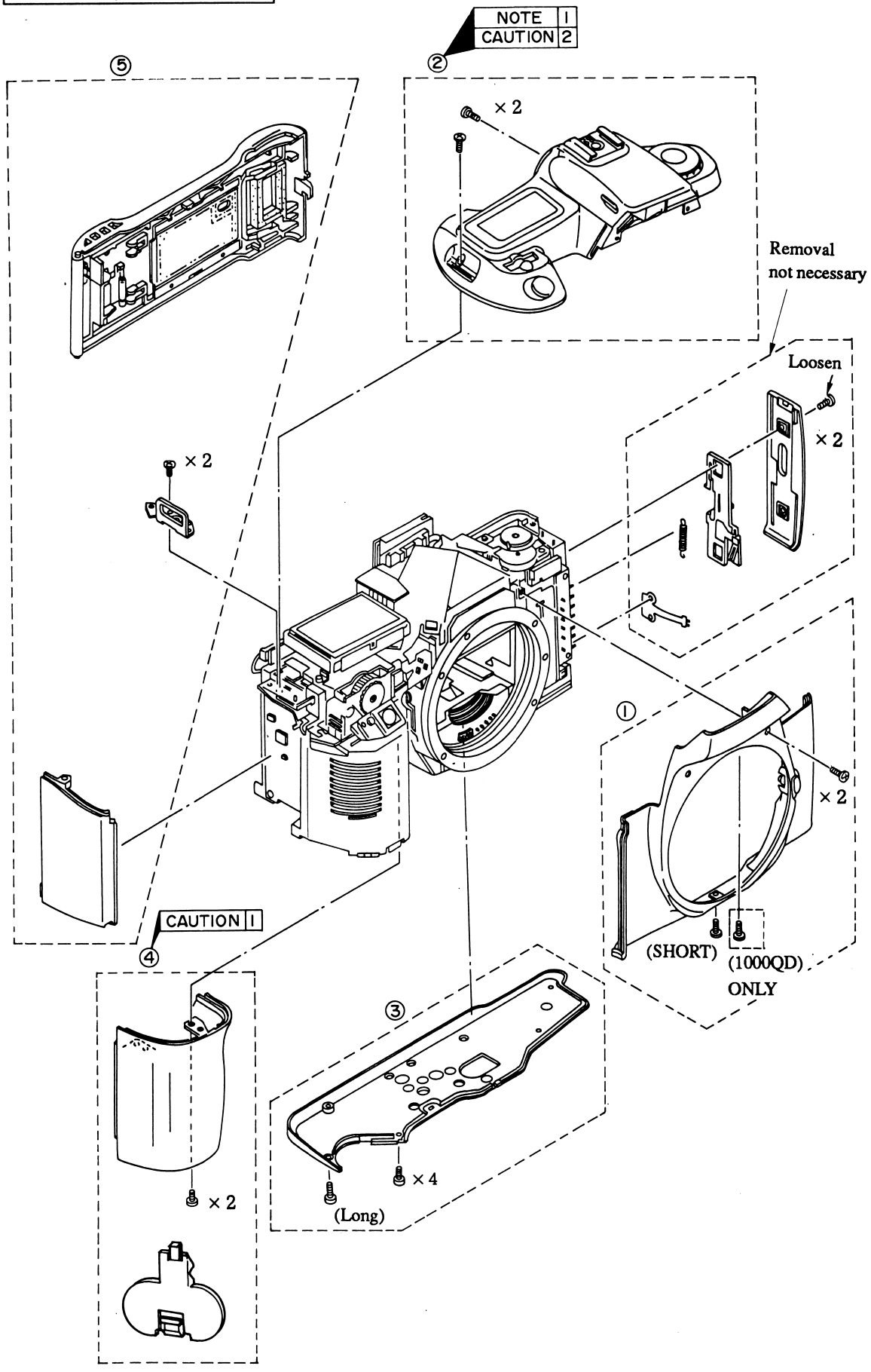
● Tools for service

New	Test Equipment	Part No.	Adjustment
	Multiple tool	CY9-7072-000	• Shutter adjustment • Exposure adjustment • AE adjustment • Inhibit voltage adjustment • AF adjustment
☆	Multiple tool contact adapter	CY9-7072-004	
	High-speed multi-camera tester EF-8000	CY9-7073-000	• Shutter adjustment (EF 8000 only) • SPD positioning • Exposure adjustment • AE accuracy adjustment • AF basic adjustment • AE shift
	Multi-camera tester EF-500	CY9-7020-000	
	EF 5300 shutter tester	CY9-7066-000	• Shutter adjustment
	DIR 201 direct metering optical sensor	CY9-7067-000	• Exposure adjustment
	Universal 90° collimator-3	CY9-7077-000	• Sub-mirror 45° angle adjustment
	Sub-mirror gage (45°)	CY9-7077-004	
	Hex key 1.3 mm	CY9-7059-002	
	Universal 500 mm collimator	CY9-7057-000	• Viewfinder focus adjustment
	DC power supply (532C model)	CY9-7038-000	• All electric adjustments
	Dial gage 2mm auxiliary ring Block gage (44.14 mm) Optical flat	CY9-1001-006 CY9-1001-008 CY9-1001-007 CY9-1001-003	• FFD adjustment • AF focus adjustment
	18% gray paper		• Exposure adjustment
	Reflectance paper 2% 64% 90%	CY9-1066-000 CY9-1067-000 CY9-7076-000	• AF adjustment

● Expendables

New	Expendables	Part No.	Use
	Bond G103	CY9-8002-000	• Joining of front panel light shields screen • Joining of hot shoe spring, and screws • Fixing of trigger coil
	Aron Alpha 201	CY9-8007-000	• Fixing of metering sensor (SPD)
	Three bond 1401B	CY9-8012-000	• AF sensor fixing screw
	PL015JG	CY9-8073-000	• Spool • Prewind base
	ED-16	CY9-8075-000	• Back cover latch pawl
	H-26	CY9-8079-000	• Pop-up torque spring • Main/mode dial • Release button shaft • Front panel unit shaft
	Silicon KE 347B	CY9-8073-000	• Pentaprism fixing
	Arontite L	CY9-8073-000	• Flash fixing screw
	Insulation tape (No. 315)	CY9-8073-000	Main flex.

External parts removal



EXTERNAL PARTS REMOVAL

Disassembly Notes

Removal order

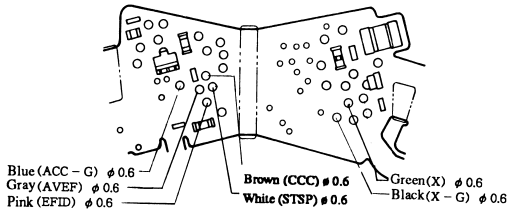
Loosen 2 screws of end plate and back cover.

①	Apron	3 screws (REBEL, 1000) 4 screws (1000 QD)
②	Top cover	3 screws 7 leads (REBEL, 1000) 13 leads (1000 QD) NOTE 1
③	Bottom cover	5 screws
④	Grip Battery cover	2 screws in battery box CAUTION 1
⑤	Strap fixture Back cover unit Hinge cover	2 white screws

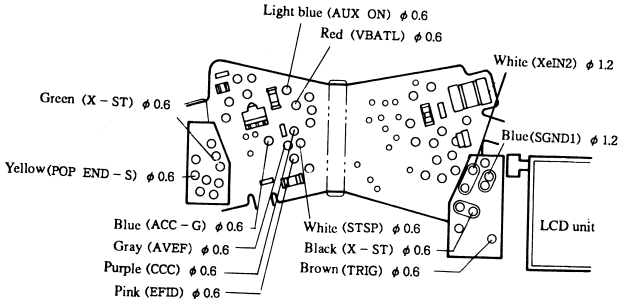
NOTE 1

Removal of top cover leads

EOS REVEL,1000 (7)



EOS 1000QD (13)



CAUTION 1

Slide the grip down to remove it.

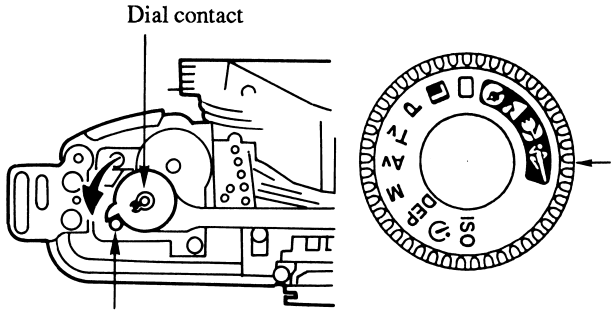
Assembly notes

CAUTION 2

Note the following points when the top cover is mounted:

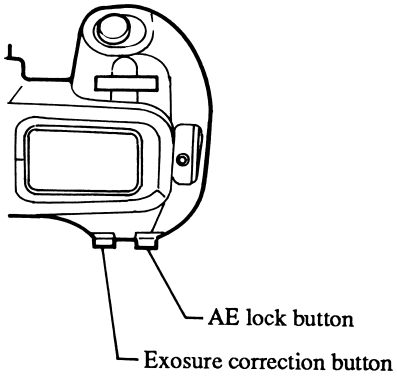
Positioning of mode dial

Mount the top cover with the top cover mode dial of "" at the position of mode contact butted counterclockwise.



Exposure correction and AE lock button

Mount the top cover with the button pushed from inside or the button removed. Be sure to insert the removed button after the cover is mounted.



MIRROR BOX UNIT REMOVAL

* The LCD flex and main flex cannot be removed individually before the mirror box unit is removed. Order for removing the mirror box unit is shown below. Parts to be removed are not numbered but work order is numbered.

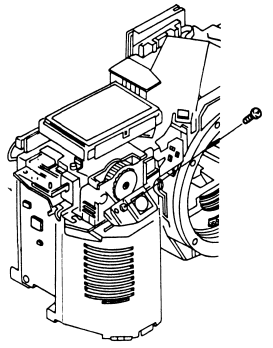
Disassembly Notes

Disassembly order

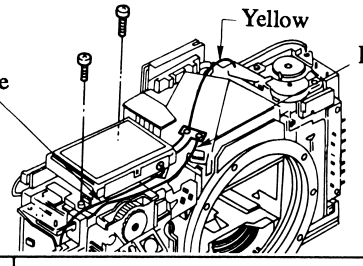
① Bottom plate unit — 4 screws

② Switch rubber

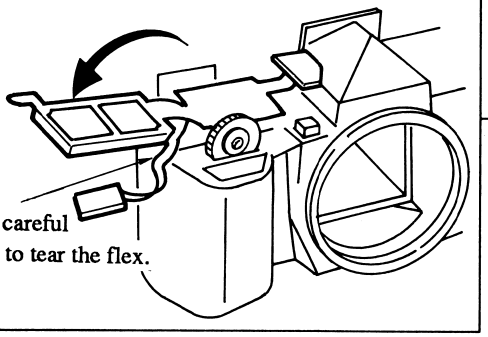
③ LCD flex release board



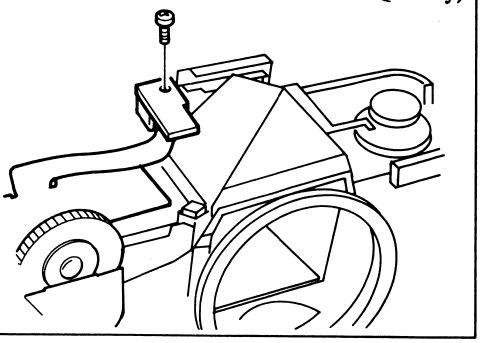
④ Remove 2 LCD unit screws, leads [light blue (puc), purple (ESD), and yellow (POP END S, 1000QD only).



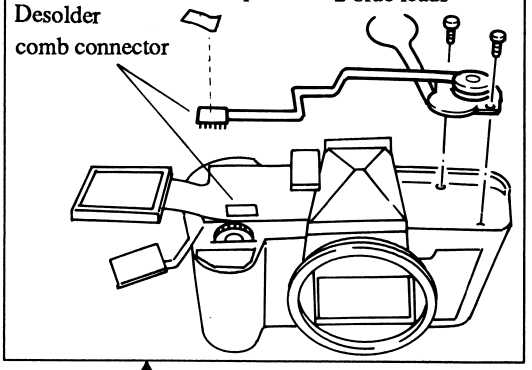
⑤ Remove the switch board and LCD flex thru-holes, and bend the LCD unit.

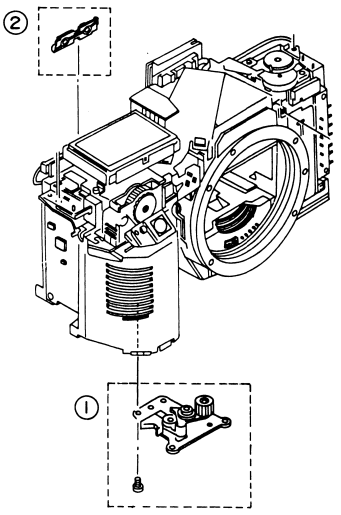


⑥ Remove screw to raise the pentaprism board. (EOS 1000QD only)



⑦ Remove mode dial board. (Remove comb connector, 2 screws for mode dial board Remove two leads)

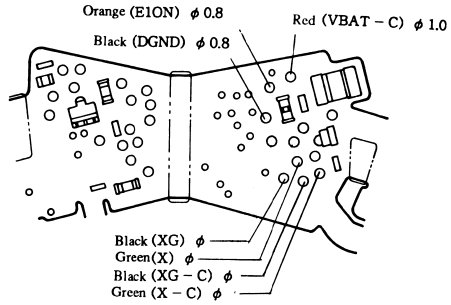




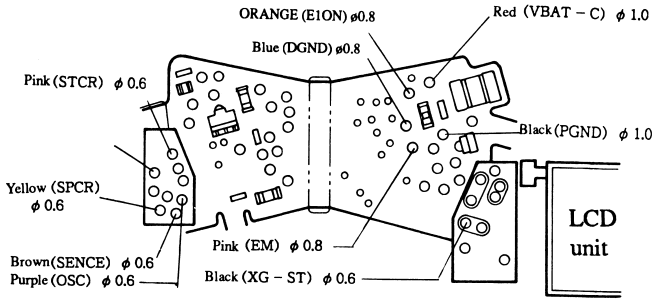
⑧

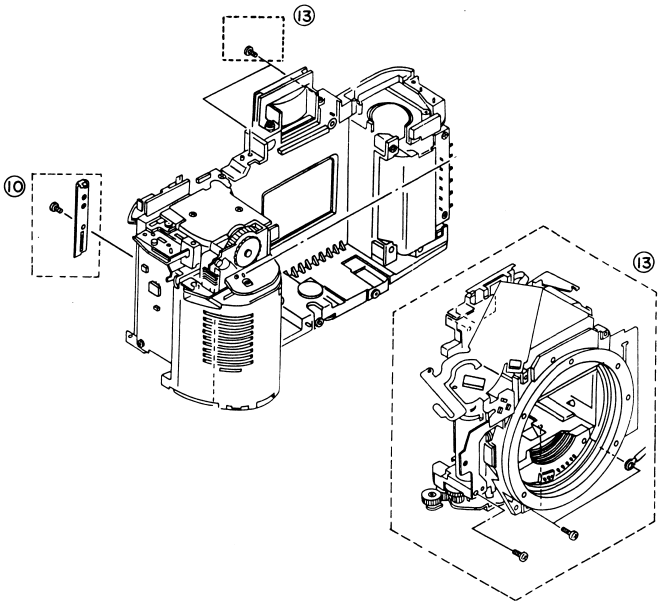
Removal of main flex leads

EOS REBEL, 100



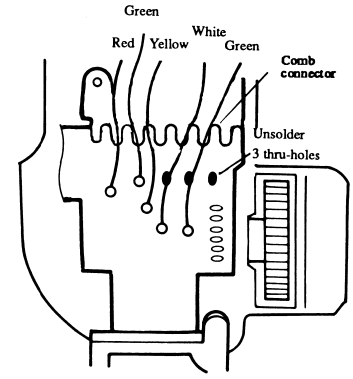
EOS REBEL, 100





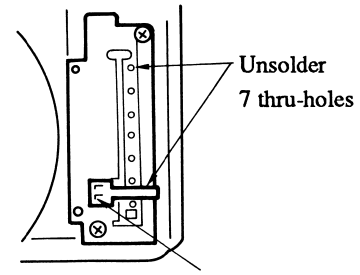
⑨

LCD flex leads, main flex thru-holes



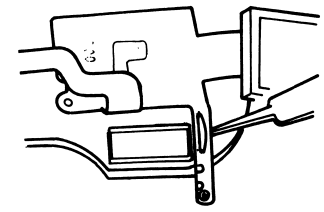
⑩

DX contact thru-holes, comb connector

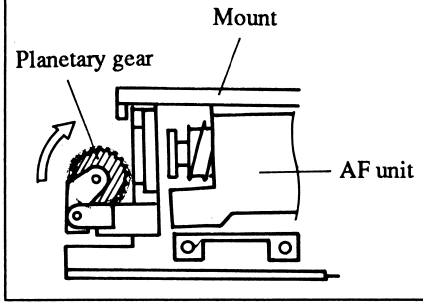


⑪ DATE contact cover 1 screw

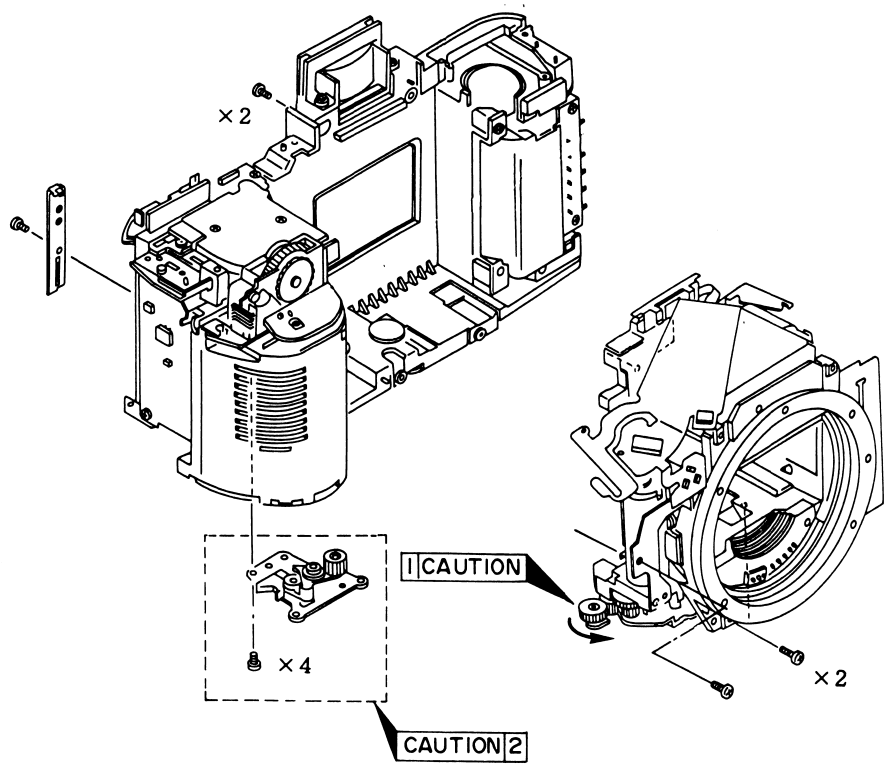
⑫ **Pull out the LCD flex back cover contact.**



⑬ **Remove the front panel unit (5 screws)**
Remove the front panel unit while escaping the gear to the arrow direction as shown in the figure.



FRONT PANEL UNIT ASSEMBLY

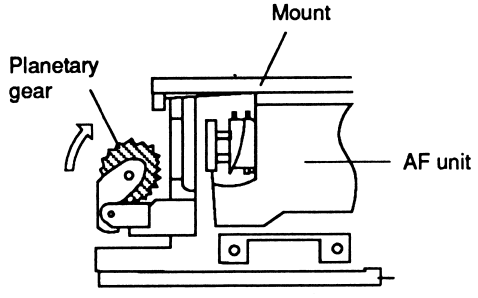


Assembly notes

CAUTION 1

Planetary gear aside

To assemble the front panel unit, push the planetary gear aside in the arrow direction shown in the figure.

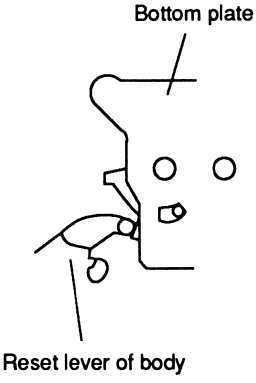


CAUTION 2

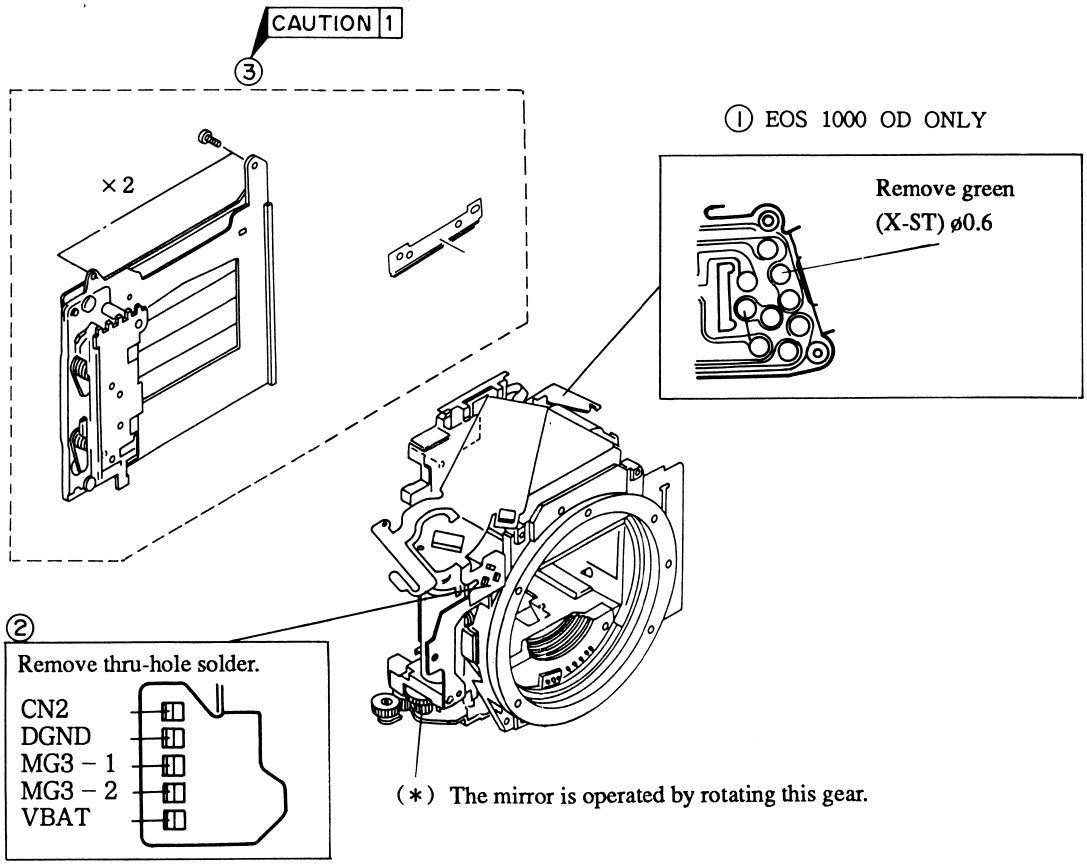
Position of bottom plate lever

When the bottom plate unit is assembled, the reset lever of the body must be positioned as shown in the figure.

If it is not assembled correctly, rewind will not work.



SHUTTER UNIT REMOVAL



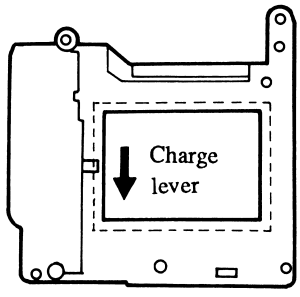
Assembly notes

CAUTION 1

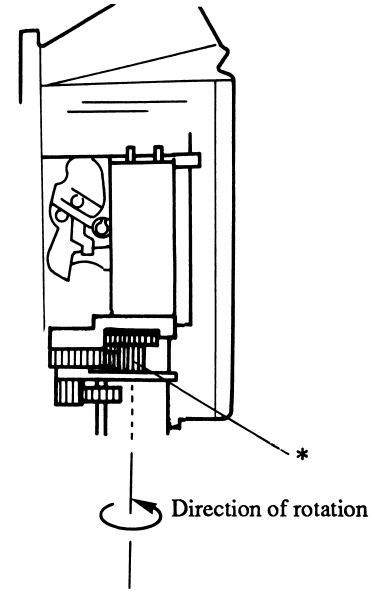
Assembly of shutter unit

Install the shutter unit with it charged and with the mirror lowered.

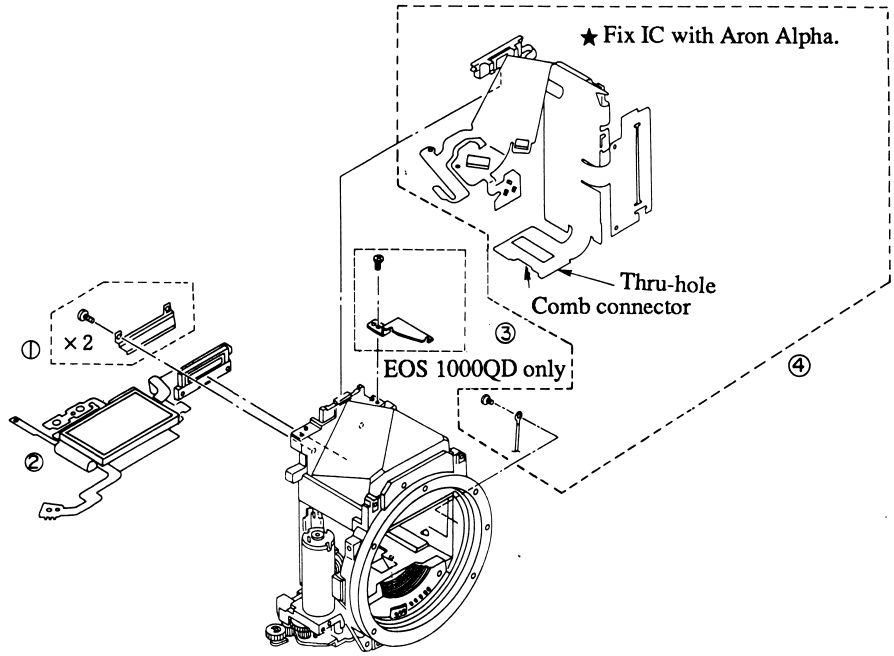
The shutter is charged by pushing the charge lever down in the arrow direction.



The mirror is operated by rotating the gear marked with (*).



LCD FLEX AND MAIN FLEX REMOVAL

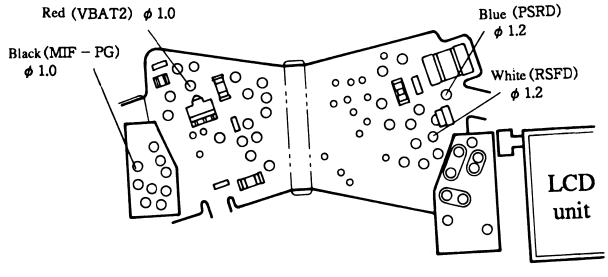


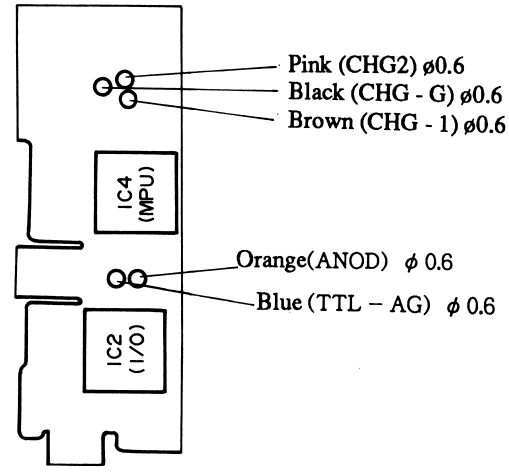
Disassembly Notes

Disassembly order

①	ILC holder	2 screws
②	LCD flex	Removal of comb connector solder
③	ILC holder	EOS 1000 QD only 1 screw
④	Main flex	9 leads 1 comb connector 5 thru-holes Remove Aron Alpha 1 screw (GND lead)

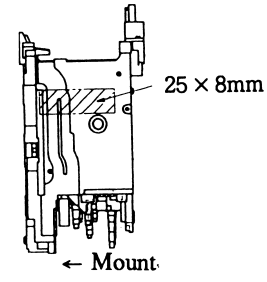
Removal of main flex leads





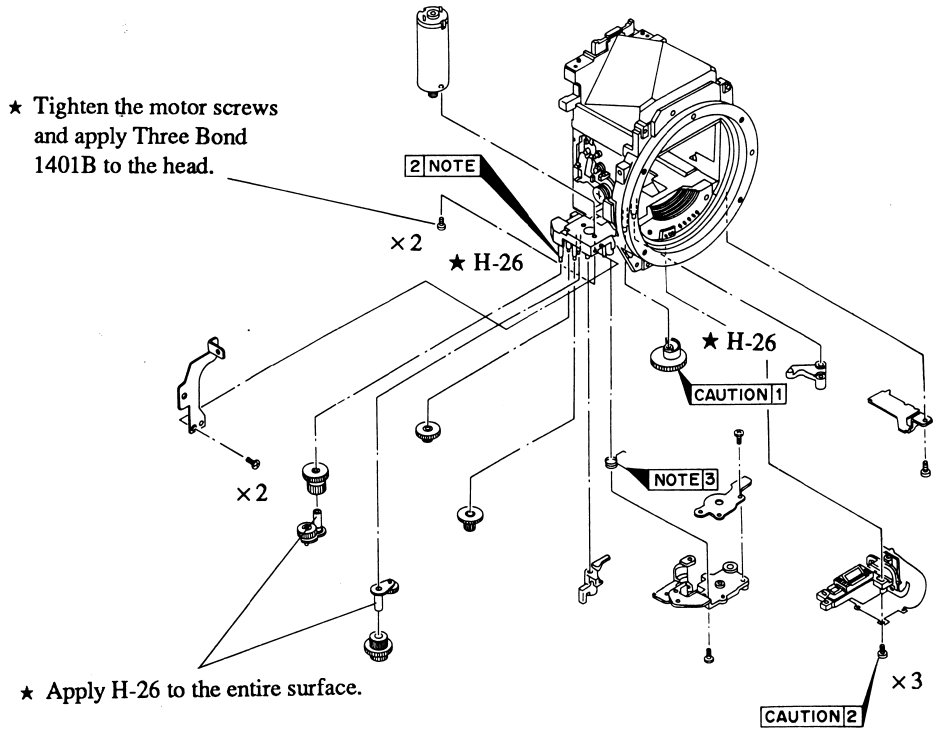
Assembly notes

Application of double-sided adhesive tape



To assemble the main flex, fix it by applying double-sided adhesive tape at locations on the front panel shown in the figure.

FRONT PANEL UNIT DISASSEMBLY <1>

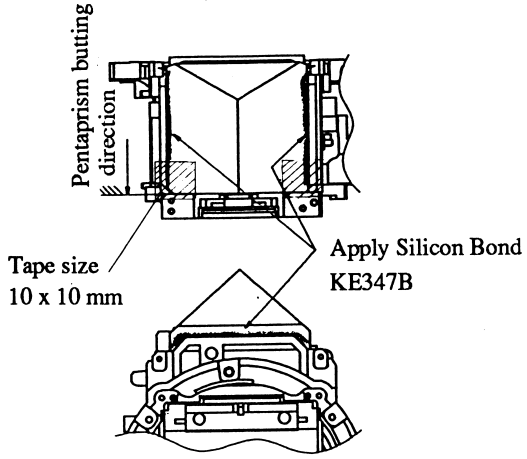


Assembly notes

NOTE 1

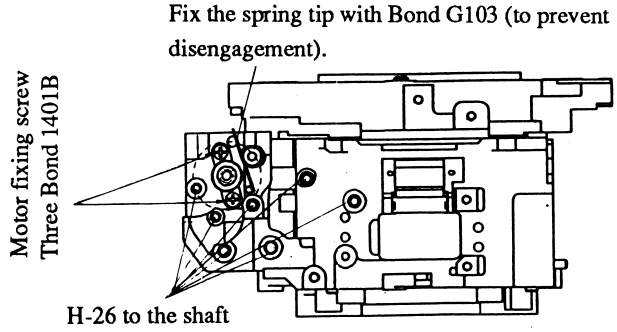
Mounting pentaprism

Put the pentaprism in the arrow direction, and bond the three sides shown in the figure with Silicon Bond KE347W. Then apply insulation tape to the shaded (▨) area (viewfinder dust prevention measures).



NOTE 2 3

Application of H-26 to gear shaft and bond to tip of spring



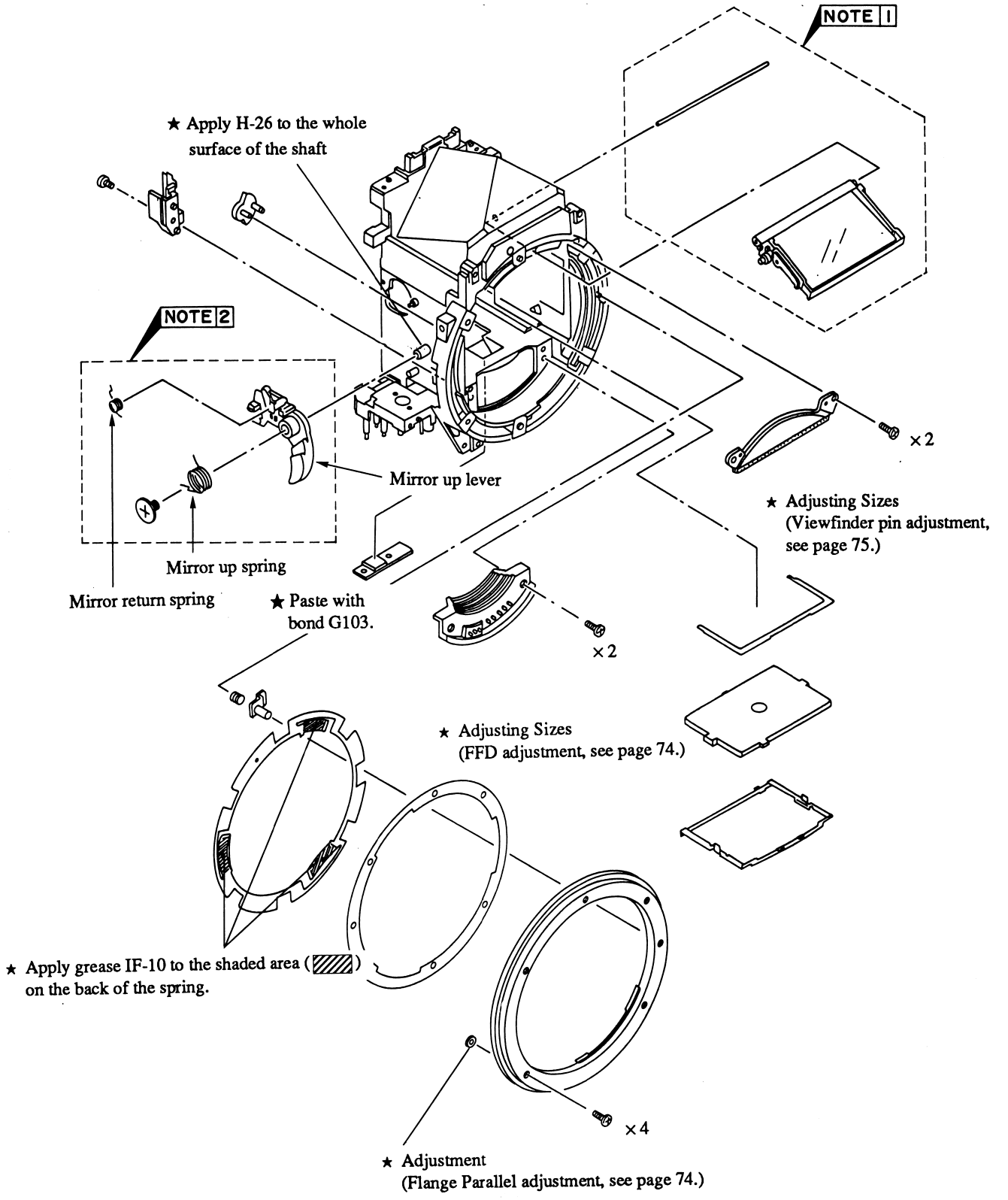
CAUTION 1

Check for broken or bent contact when the charge cam gear unit is assembled. If the contact is defective, shutter "empty charging" will occur. Apply H-26 to the entire cam surface.

CAUTION 2

The AF sensor must be positioned when the AF unit is removed. After adjustment, apply Three Bond 1401B to the head of the screw (see page 73).

Front panel unit disassembly <2>



FRONT PANEL UNIT DISASSEMBLY <2>

Disassembly Notes

NOTE 1

Removal of mirror unit

Be sure to adjust the sub-mirror 45° (vertical) when the mirror unit is disassembled or replaced (see page 72).

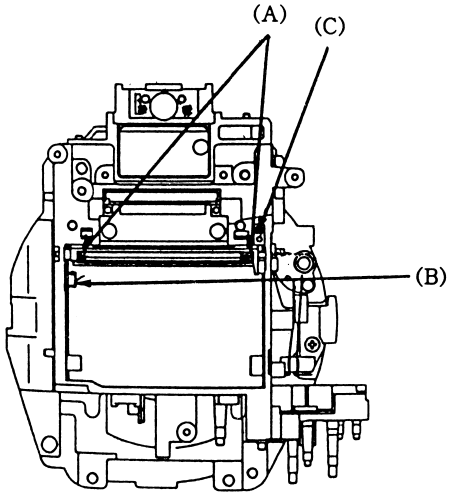
Remove the mirror unit in the following procedure:

① Remove the bond on both ends of the mirror shaft with alcohol and pull out the mirror shaft (A).

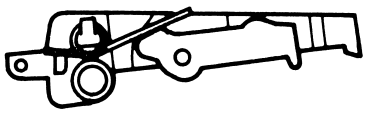
② Remove the mirror up spring so the mirror cycles down (to prevent hitting on the mirror up lever).

③ Remove the mirror from the (B) dowel to the lower side, and take it out from the mount.

* If it cannot be removed by the above method, remove the pasted (C) hinge spacer before removing the mirror unit.



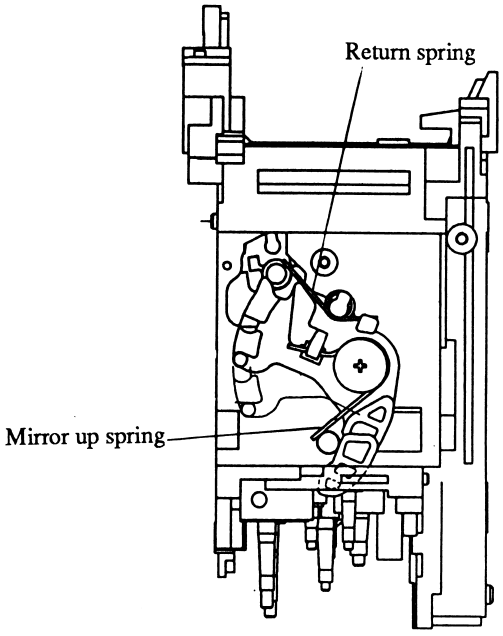
Hanging position of sub-mirror spring



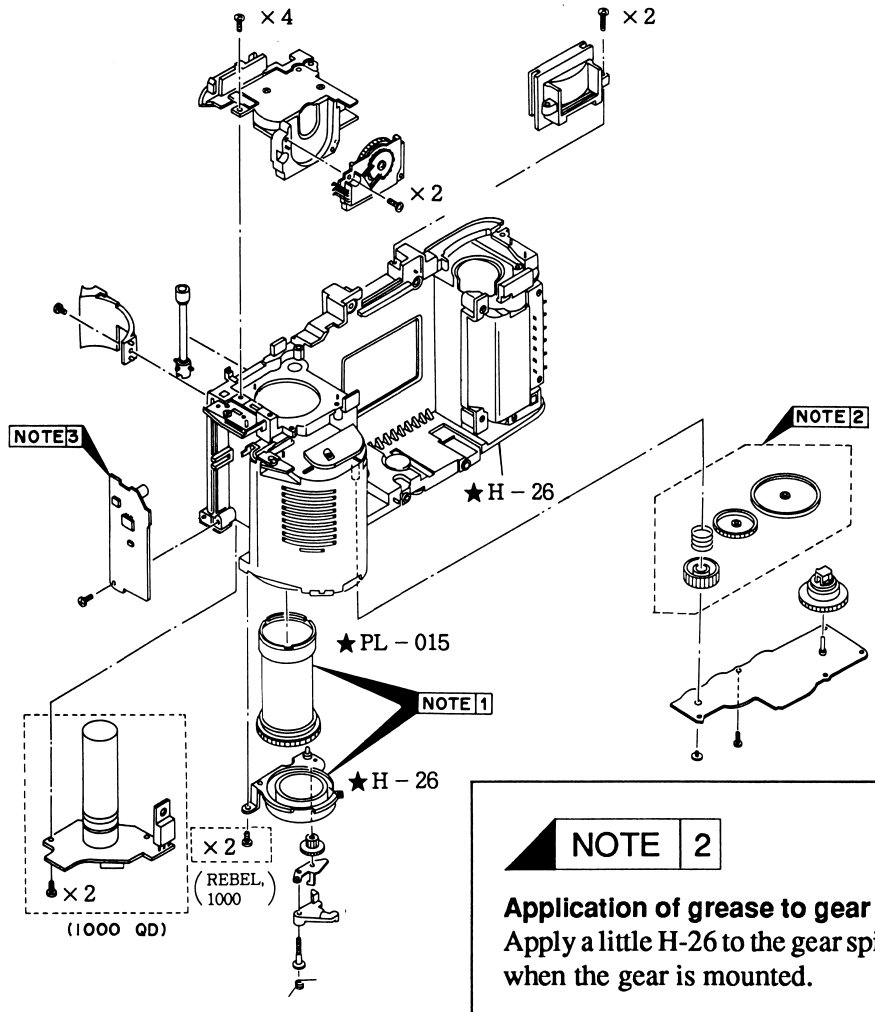
Assembly notes

NOTE 2

Hanging position of mirror up, return spring



BODY DISASSEMBLY

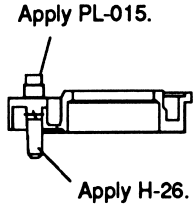


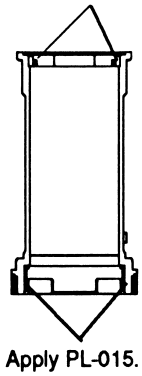
Assembly notes

NOTE 1

Application of grease

(rewind base)

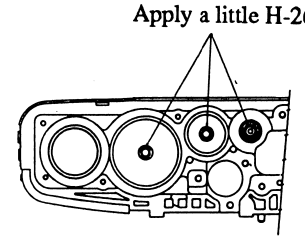




NOTE 2

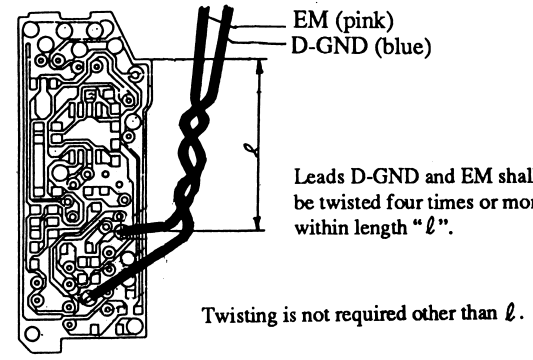
Application of grease to gear spindles

Apply a little H-26 to the gear spindles of the body when the gear is mounted.

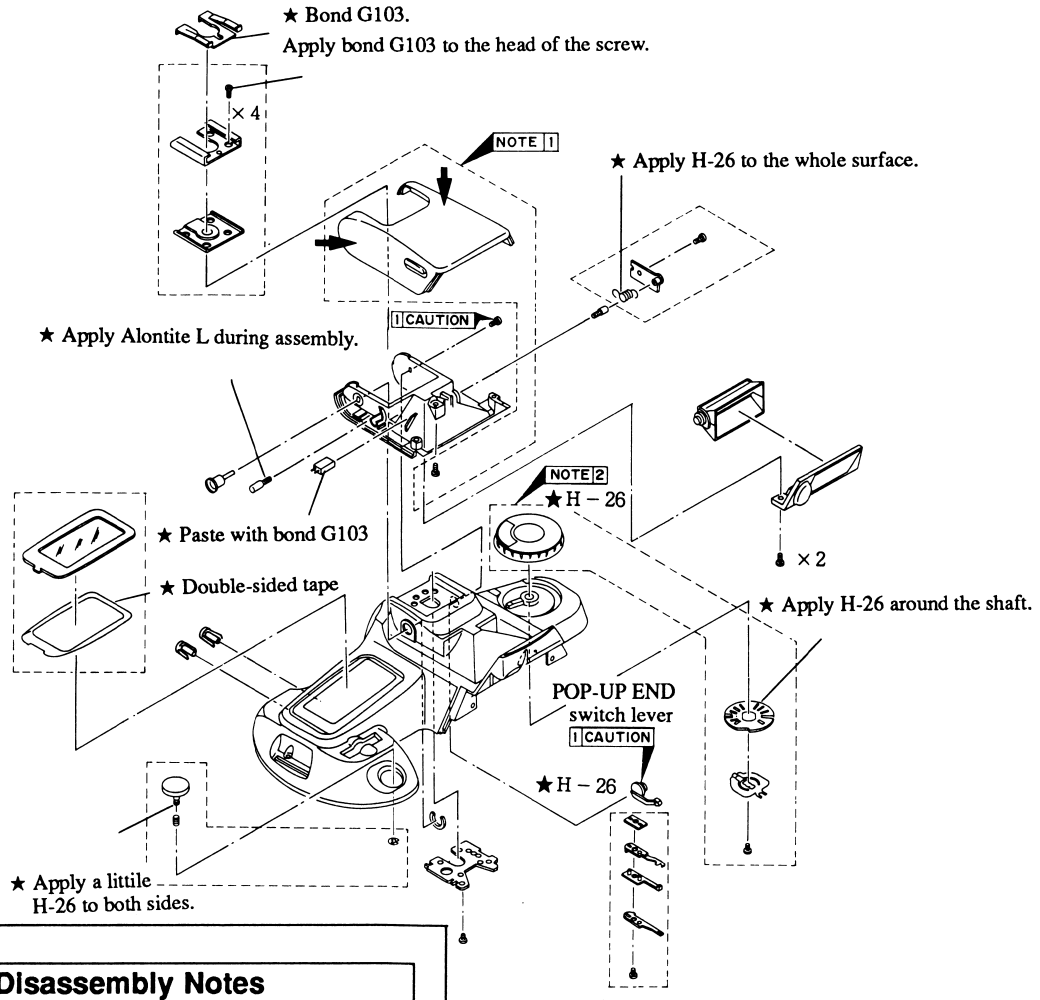


NOTE 3

Handling of DC/DC unit leads



EOS 1000QD TOP COVER UNIT DISASSEMBLY



Disassembly Notes

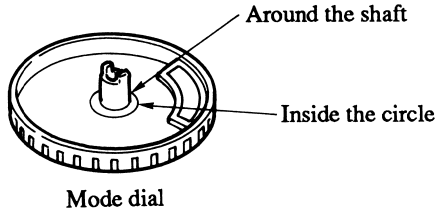
NOTE 1

Removal of flash cover

Remove screw from the lower side, then remove two hooks inside the arrow section.

NOTE 2

Application of H-26 to inside of mode dial



Assembly notes

CAUTION 1

Mounting POP-UP END switch lever

The tip of the lever is flatted. Securely insert the tip into the mating hole, then fasten the screws. Apply H-26 to the friction surfaces.

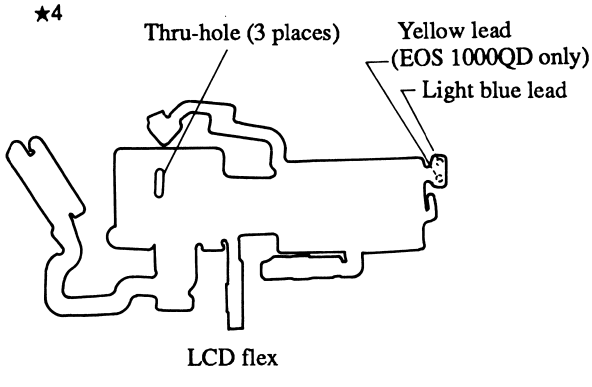
SHUTTER UNIT QUICK REMOVAL ORDER

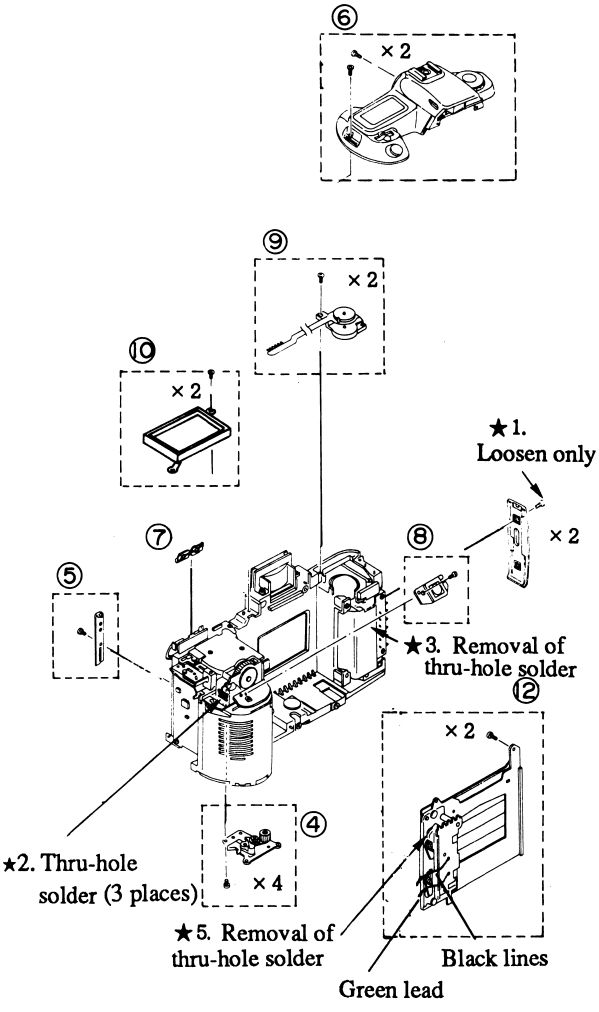
* This sectien shows the order for replacing the shutter unit without removing extra parts or leads.

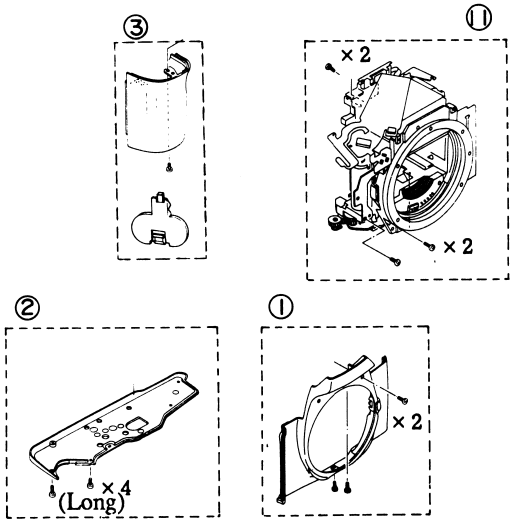
★1
Loosen 2 screws in the end plate latch cover.

①	Apron	3 screws (REBEL, 1000) 4 screws (1000 QD)
②	Bottom cover	5 screws
③	Grip Battery cover	2 screws
④	Bottom plate unit	4 screws
⑤	DATE contact cover	1 screw Open the back cover.
⑥	Top cover	3 screws
⑦	Switch rubber	
⑧	Release board	
	★2	Removal of electronic dial unit thru-hole solder (3 places)
	★3	Removal of DX contact thru-hole
⑨	Mode Base Assy	2 screws
⑩	LCD flex	2 screws ★4 Removal of thru-hole solder (3 places) 2 leads (EES 1000QD) 1 lead (REBEL, 1000)
⑪	Front panel unit	5 screws
⑫	Shutter unit Shield curtain	2 screws ★5 2 leads Removal of thru-hole solder

★4







SUB-MIRROR 45° ANGLE ADJUSTMENT

* Adjust the angle of the sub-mirror when the front panel unit or mirror unit is disassembled or replaced. The main mirror is not adjustable.

Purpose

To adjust the sub-mirror vertically to obtain the mirror angle (45°). (Horizontal alignment is checked only.)

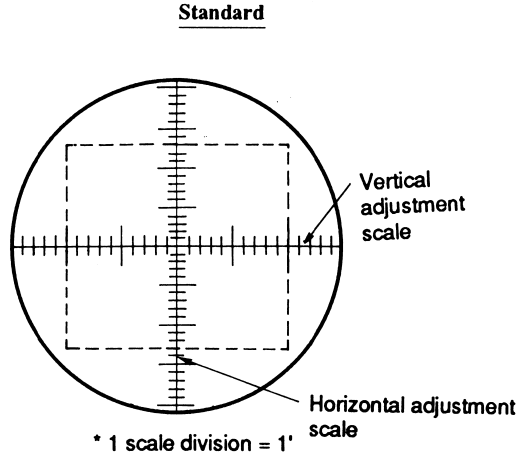
Tools

- Universal 90° Collimator-3
- Sub-mirror gage (45°)
- Hex key 1.2 mm

Standard

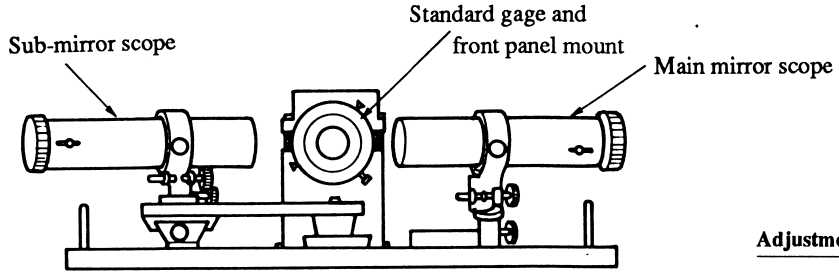
- Vertical 45° ± 10'
- Horizontal 45° ± 13'

* Horizontal alignment is checked only. If the mirror unit does not meet the standard, replace it.



Preparations

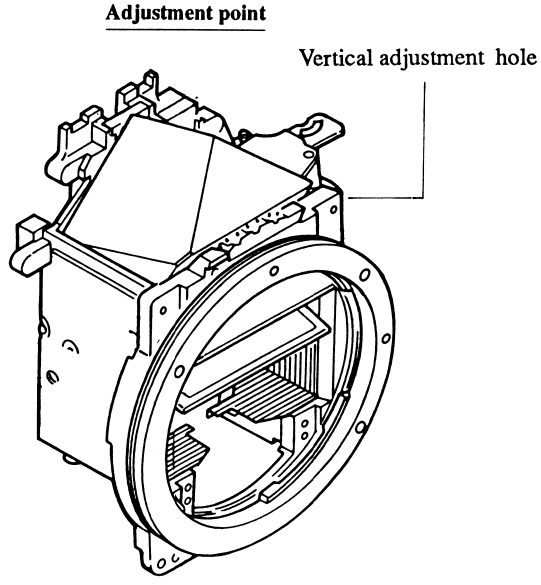
Attach the sub-mirror gage (45°) to the universal 90° Collimator-3 to calibrate the sub-mirror magnifier. (Refer to the Universal 90° Collimator Operating Instructions for details on calibration.)



Universal 90° Collimator-3

Adjustment

1. Attach the front panel unit to be tested with the mirror unit and no AF sensor unit to the universal 90° Collimator-3.
2. For vertical adjustment, use the hex key to turn the eccentric dowel in the vertical adjustment hole, as shown in the right figure.
3. After adjustment, directly connect constant voltage power to the M2 motor. Apply 2 to 3 V for several seconds, so the mirror cycles up and down to check that it is within the standard.
4. If it is not within the standard, readjust it.



AF SENSOR POSITIONING (HORIZONTAL)

* Position the AF sensor when the AF sensor unit is replaced. Adjustment is basically similar to the previous EOS cameras.

Purpose

To align the center position of the AF sensor with the optical axis. (Horizontal adjustment is checked only.)

Tools

• EF50 mm/1.8 (product) Pen light or illuminator

Standard

The center of the sensor must be inside the central AF frame, but adjust so it is as close to centered in the center focus frame as possible.

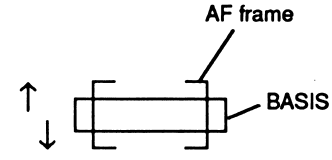


Figure 1

Preparations

1. Use the body of the EOS series camera to stop down the EF50 mm/1.8 lens to F8.
   - When EOS 10QD is used: Mount EF50 mm/1.8 and set the bulb aperture to F8 in the shooting mode "manual". Remove the lens while holding SW2 on.
   - When EOS-1/650/620/630/RT is used: Mount EF50 mm/1.8 and set the aperture to F8 in the shooting mode "manual". Remove the lens while pressing the depth-of-field confirmation button.
2. Set the distance scale of the lens to the end (to make the AF frame to be seen easily).

Adjustment

1. Install EF50 mm/1.8 to the front panel with the mirror unit, focusing screen, and AF sensor unit (temporary).
2. Illuminating the AF sensor unit with a pen light to look in the lens can see the AF frame and a BASIS image as shown in Figure 2.

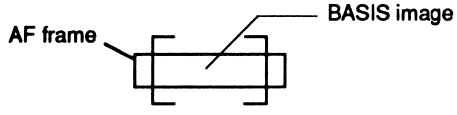
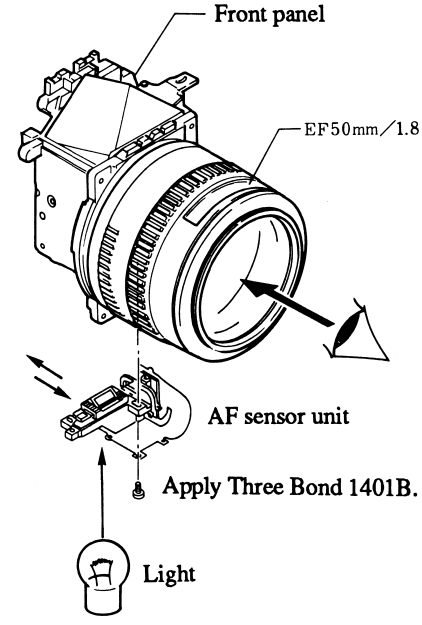


Figure 2

3. Move the AF sensor unit vertically to adjust the position of the sensor to the center of the AF frame.
4. Slightly tighten the screws in the AF sensor unit and apply Three Bond 1401B to the head of the screws.

Figure 3 Adjustment



FLANGE TO FOCAL PLANE ADJUSTMENT

* Adjust FFD when the front panel unit or mount was replaced. After adjustment, check the viewfinder focus.

Purpose

Adjust FFD to 44.14 mm.

Tools

- Dial gage • Auxiliary ring (2 mm) • Optical flat
- Flanging gage (44.14 mm or 42.14 mm)

Standard

FFD: 44.14 ± 0.05 mm
Pressure plate center: 44.17 ± 0.05 mm
Parallelism: ±0.03mm (difference of measured values at four corners)

* Use data on the pressure plate center (medium quantity) for electric adjustment AF basic adjustment.

Preparations

1. Insert the auxiliary ring (2 mm) between the leg of the dial gage and the contact (Figure 1).
   * This is because the dial gage was designed for the FD lens (42.14 mm) standard.
2. Use the flange back gage (44.14 mm or 42.14 mm) and optical flat to adjust the dial gage to "0" (Figure 2)

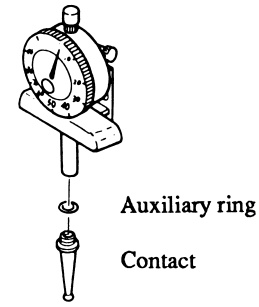


Figure 1

Check that the inside small scale indicates as shown in the figure below. Then adjust the outside scale to "0".

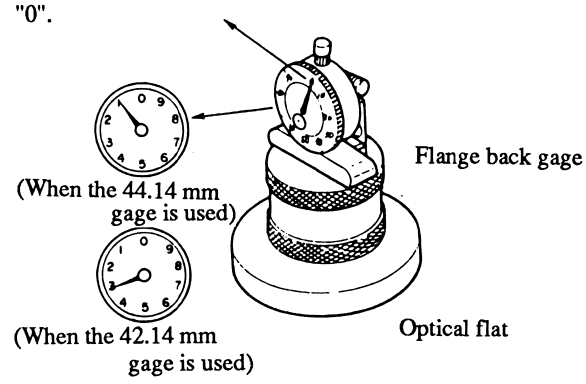
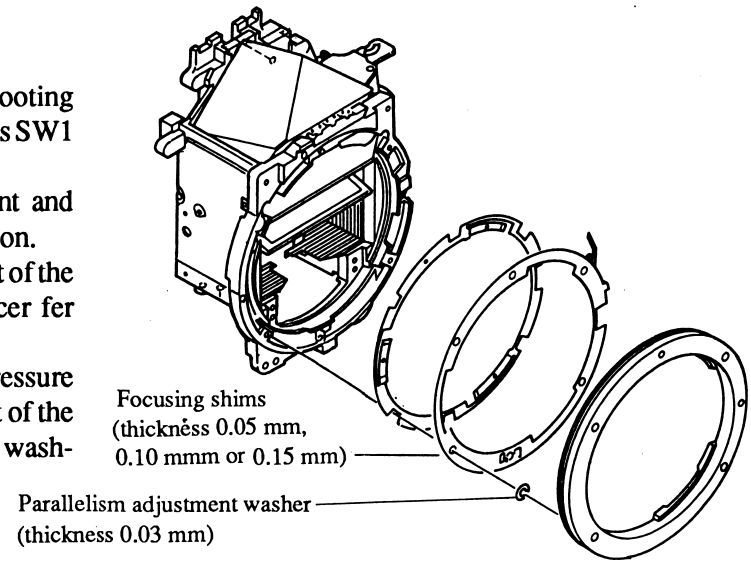


Figure 2

Adjustment

1. Set the display te bulb in the shooting mode "manual". Continue to press SW1 ON for adjustment.
2. Place the dial gage on the mount and measure the flange back dimension.
3. If the flange back dimension is out of the standard, change the mount spacer fer adjustment.
4 Measure the four corners of the pressure plate te see parallelism. If it is out of the standard, change the adjustment washers for adjustment.



VIEWFINDER FOCUS ADJUSTMENT

* Be sure to adjust viewfinder focus after flange back adjustment.

Purpose

Match the position of the film focus with the position of the viewfinder focus.

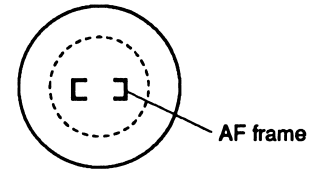
Tools

- Magnifier AD-S • EF50 mm/1.8 (product)
- Universal 500 mm Collimator

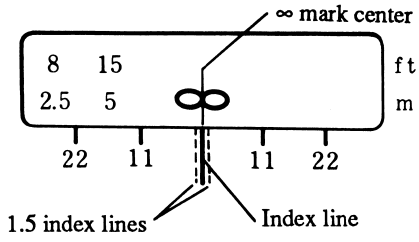
Adjustment

1. Install the magnifier on the eyepiece of the camera and adjust it to your eyesight.
   (The lens should not be installed at this point.)
   - Eyesight adjustment procedure
     Aim the camera at a bright reflection subject (EV12 white wall or light source of shutter tester) and turn the eyesight adjustment ring of the magnifier until the focusing frame is as sharp as possible.
2. Install EF50 mm/1.8 to set the focusing scale to in manual.
   (The center of the mark may be in 1.5 index lines.)
3. Find a distant target at least 250 meters distant (lightning red or chimney if possible) and select the sharpest focus washer.
   If the collimater is used, select a focus washer in which the sharpest scale of the collimater can be seen.
   - Focus washer replacement
     As shown in the figure below, pulling the focusing screen frame toward you can remove the focus washer with the focusing screen.

Viewfinder



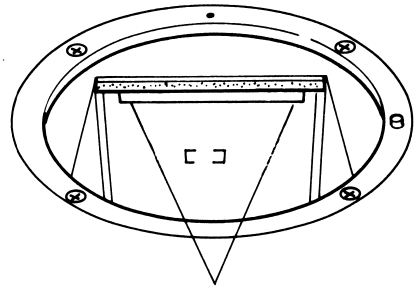
Lens focusing scale



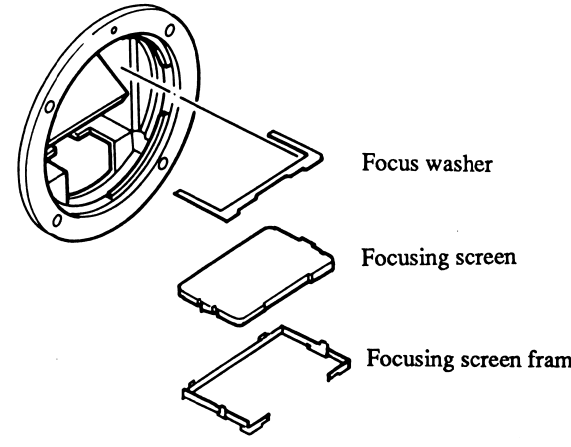
Focusing washers

A	SIZE
0.05mm	(005)
0.10mm	(010)
0.15mm	(015)
0.20mm	(020)
0.25mm	(025)
0.30mm	(030)
0.35mm	(035)

Mount (From below)

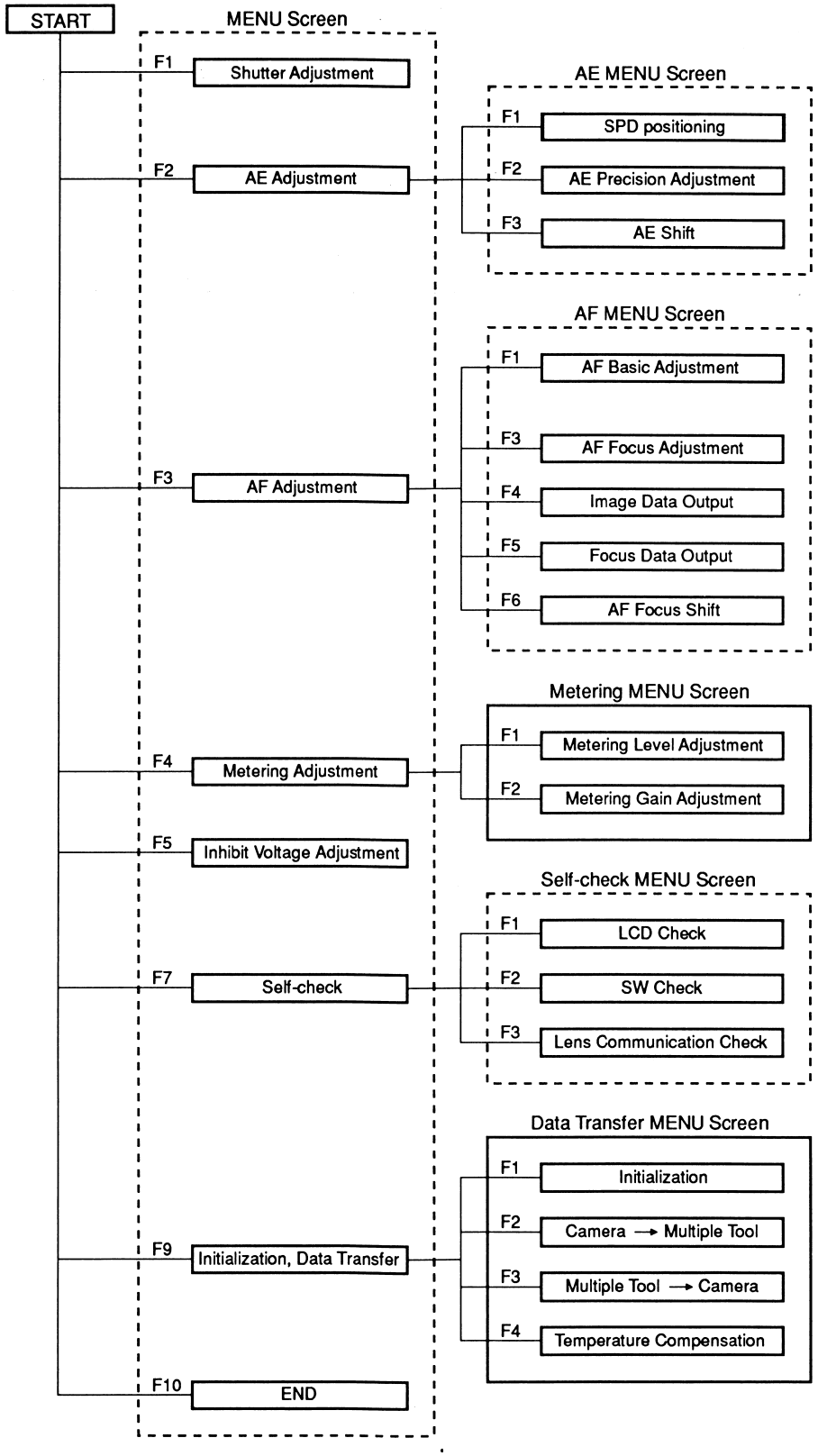


Pull the focusing screen toward you.



ADJUSTMENT ITEMS TABLE

EOS 1000QD



ADJUSTMENTS NECESSARY AFTER PARTS REPLACEMENT

EOS 1000QD

Note: Perform ▲ if necessary.

Adjustment / Parts Replaced	Shutter	AE			AF			OTF Adjustment	Inhibit Voltage	Temperature Compensation
		SPD	Accuracy	Shift	Accuracy	Focus	Focus Sift			
Main Flex (Data not readable)	●	●	●	▲	●	●		●	●	●
Main Flex (Data readable)		●	●	▲				●	●	●
AF Unit					●	●				
Shutter Unit	●									
Mirror Unit						●				

TOOLS FOR LOCAL FABRICATION

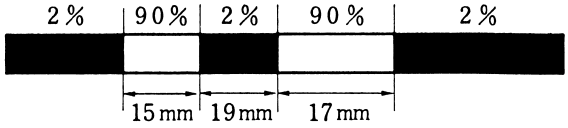
Material for making charts is available from Camera Service in A4 sheets.

Reflectance	Color	Part No.
2%	Black	CY9-1066-000
90%	White	CY9-3053-000

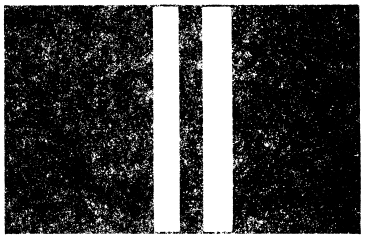
Ideally, charts should be flat with perfectly straight junctions of the different reflective materials. In practice, the darker materials can be applied over the lighter material.

All charts are A4 size. Dimensions are in mm.

AF Standard Chart



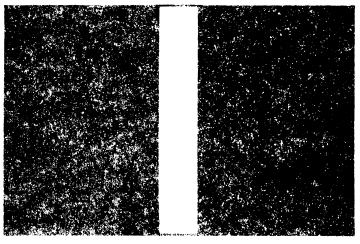
A 4



16mm Single-bar Chart

On a black (2%) base, apply a 16mm white strip in the center.

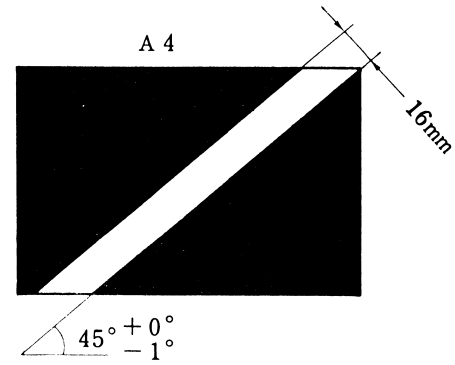
A 4



45° Bar Chart

<!!> As "C", but with the 16mm white strip running diagonally from the lower right to upper left corner.

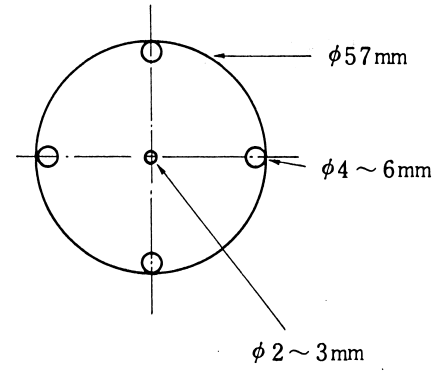
Angle: $45° \begin{smallmatrix}+0\\-1\end{smallmatrix}$



SPC Positioning Mask

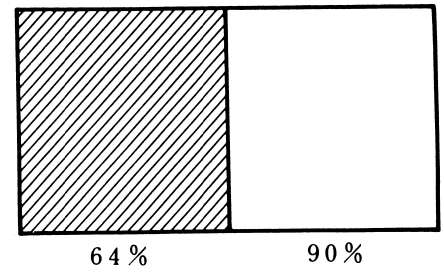
Using a piece of opaque plastic or the like about 100mm square*, draw a circle of 28.5mm radius. At each of the four quadrants, cut identical 4 to 6mm diameter holes touching the circle. Drill a 2 to 3mm diameter hole at the center, also.

*: This mask is used in front of a light source such as the light source of the EV tester. The mask should be large enough to cover the light.



Low Contrast Chart

Make a half and half chart of 64% light gray and 90% white chart paper.



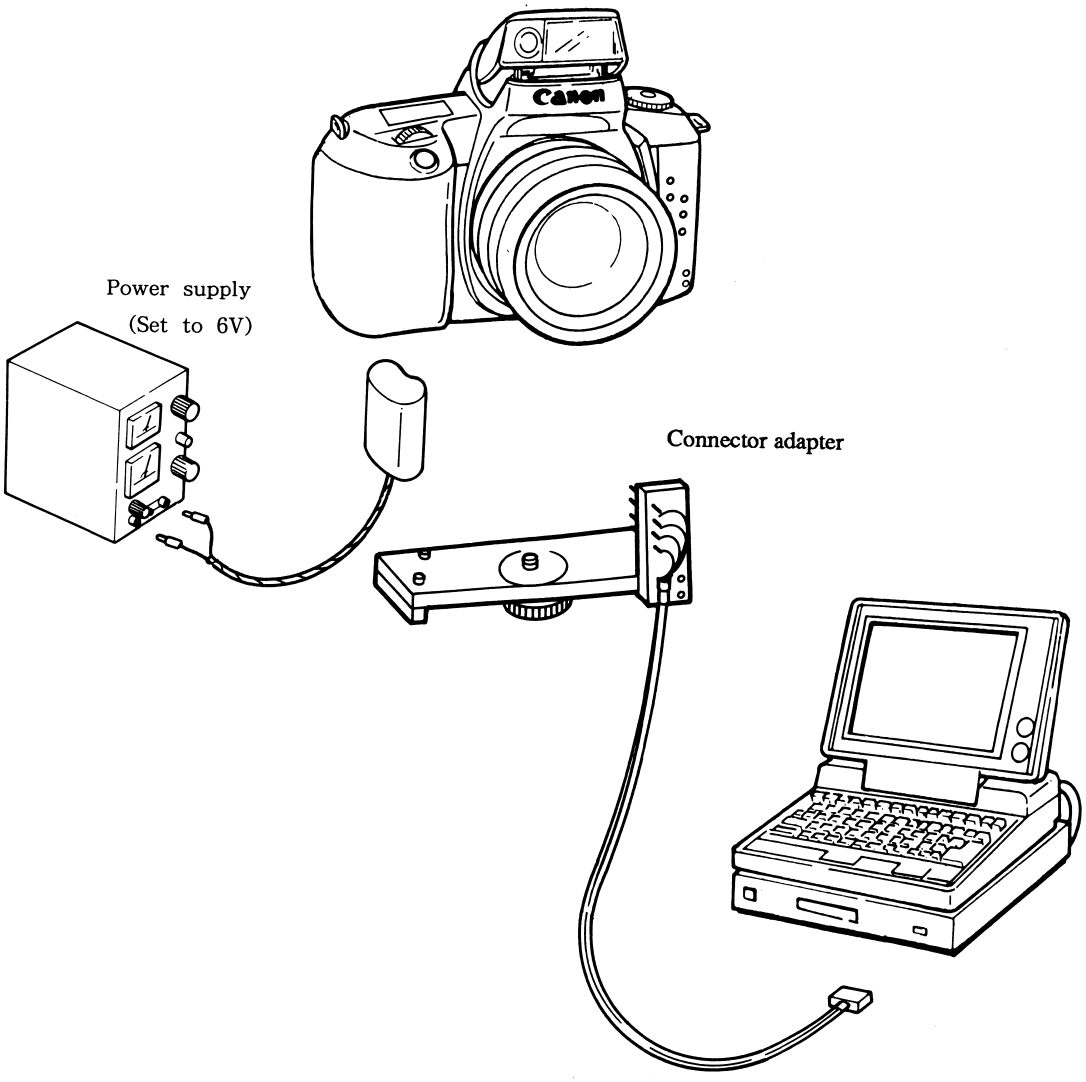
CONNECTING THE MULTIPLE TOOL

1. Remove the grip and attach the connector adapter to the camera .

2. Connect the contact adaptor power cord to the regulated power supply. On standby, adjust the power supply to 6V and turn the power on.

3. Check that the shutter releases.

4. Turn on the power switches on the personal computer (PC) and multiple tool (MT) and load the adjustment program. AFTER the program is loaded, connect the connector adapter to the tool. (If camera is connected before program is loaded, improper operation may occur).



MULTIPLE TOOL START-UP PROCEDURES

Caution: DO NOT attach the Connector Adaptor plug until the screen in step 3 appears. (Doing so can cause incorrect operation.)

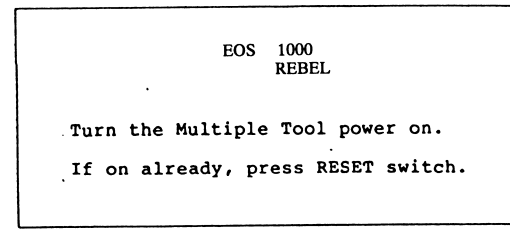
1. Install the floppy disk in the computer(PC) and turn the PC power switch on. If it is already on, hit the reset switch.

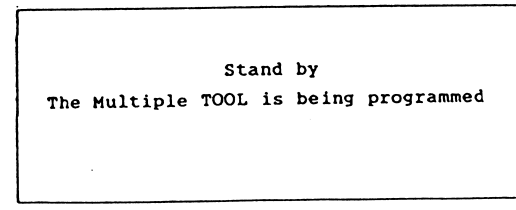
2. After a short wait, the screen at the right appears. Follow the instructions. If the multiple tool (MT) is already on, press the reset switch.

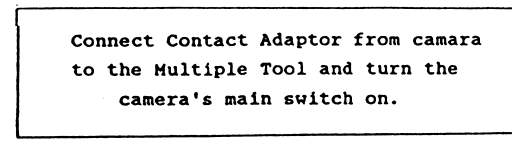
3. When the MT is turned on, this screen appears and a count will appear at the top right of the screen and the Multiple Tool's program will be loaded.
(While the program is loading, a counter appears in the upper right-hand corner of the screen.)

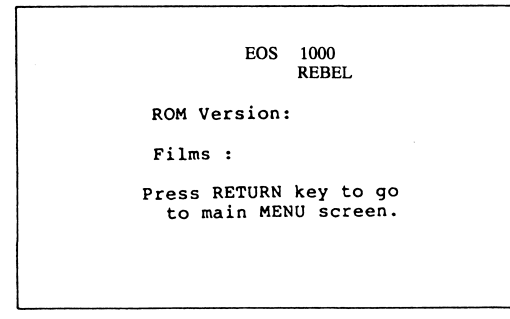
4. When loading is complete this screen appears. Do as it says.

5. When RETURN is pressed, the communications screen appears followed by a screen like the one at the right.

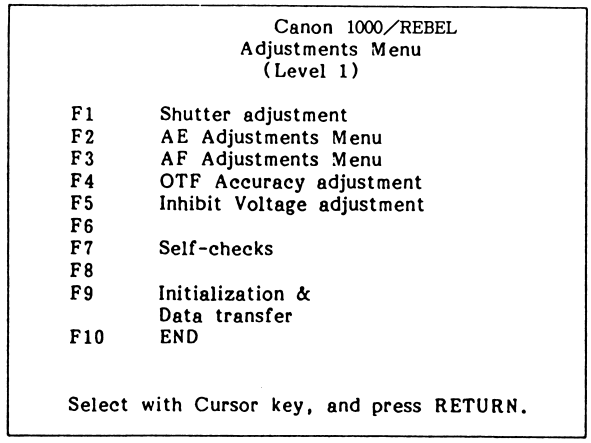








6. When return is pressed, the main MENU screen appears.

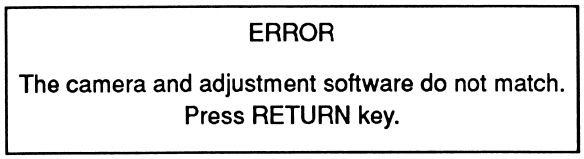


Error Screen

During steps 1. through 5. the following error screen may appear.
If the adjustment software differs from the type of connected camera.

Cause:
- Adjustment software floppy disk to confirm type name.

Insert correct software and retry from the beginning.



* Error codes Nos. 100 and 105 may appear other than the above.See "Error codes" for details and action.

SHUTTER ADJUSTMENTS

--- PURPOSE ---

This procedure adjust the maximum shutter speed.

--- TOOLS ---

EF-8000 or FS5300
EF50mm f/1.8 lens, shop-standard (for use with EF-8000)

--- STANDARD ---

Item	EOS 1000/REBEL
Shutter Speed	(1/1000) 0.977ms
Limits	0.740~1.289ms

--- PREREQUISITES ---

Check curtain travel time before this adjustment. Check at the maximum shutter speed.

Curtain Travel Time (milliseconds)

Curtain	EOS 1000/REBEL
Frist	6.0 ± 0.2ms
Second	6.0 ± 0.2ms

The shutter curtains are factory adjusted in cameras and service parts, and are not adjustable in field, (If out of tolerance, change shutter unit)

--- PREPARATIONS ---

Attach the lens if EF-8000 is used, set manual mode and the shutter speed and aperture to maximum, and place on the testers stand.

--- ADJUSTMENT ---

1. Call up the main MENU screen.

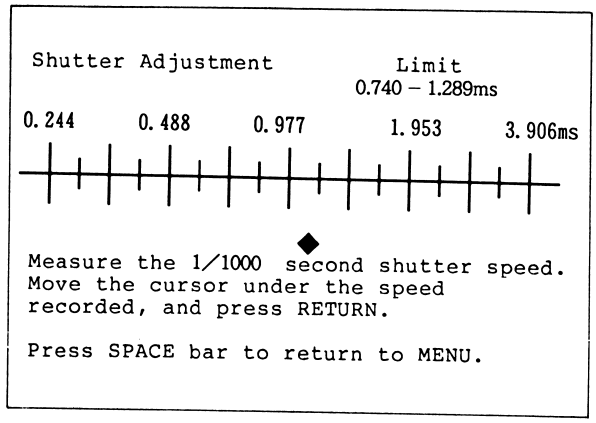
MENU

2. Set the light source to LV15.

3. Press Function Key F1. The screen at the right appears. Check the shutter speed several times and average the results. Move the cursor under the average and press the return key.

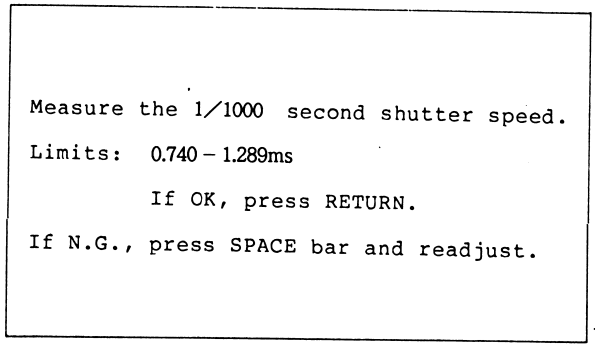
<!!> Read the tester 'B' line.

<!!> Screen varies with camera model.

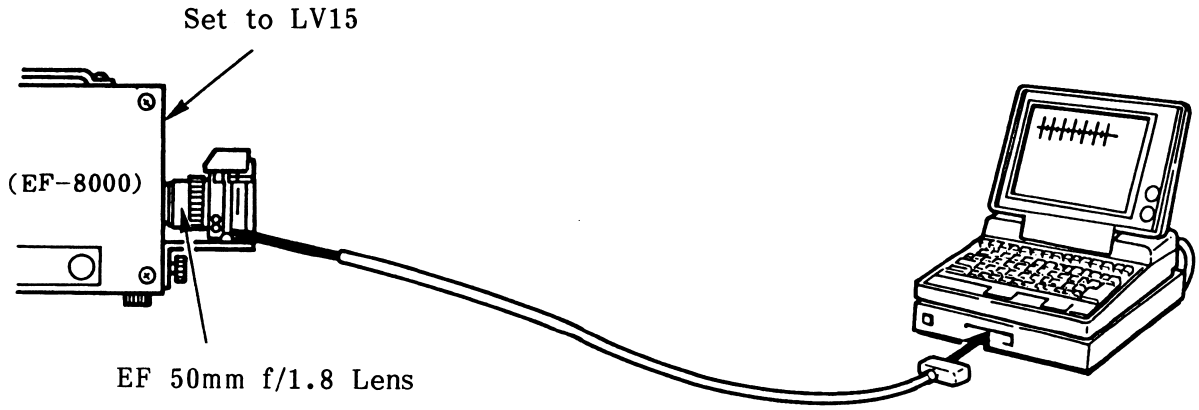


4. When RETURN is pressed and after communications is finished, the screen at the right appears. Check the shutter speed again, and if OK press the return key. If not press the SPACE bar, and perform the adjustment again.

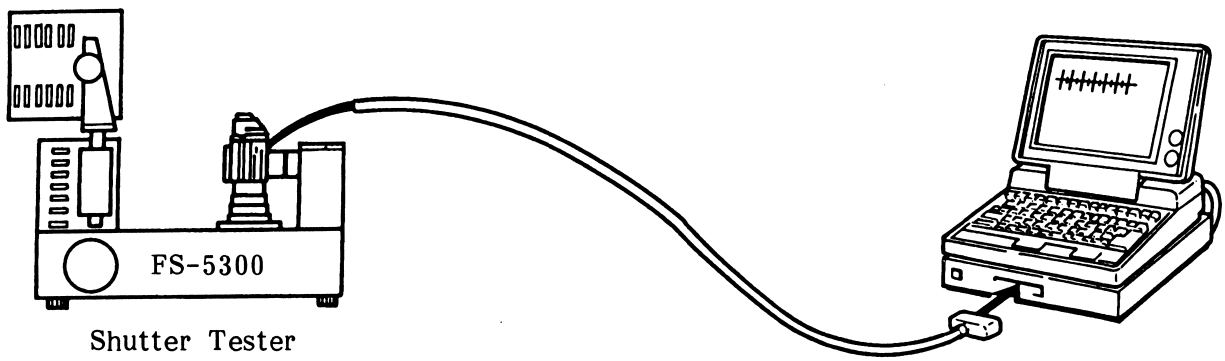
<!!> Screen varies with camera model.



EF-8000 Set-up



FS-5300 Set-up



Flash Sync Speed Changeover Check (not adjustable)

Mount any of the compatible flashes (430EZ, etc.) and check that the shutter speed changes to the correct one.

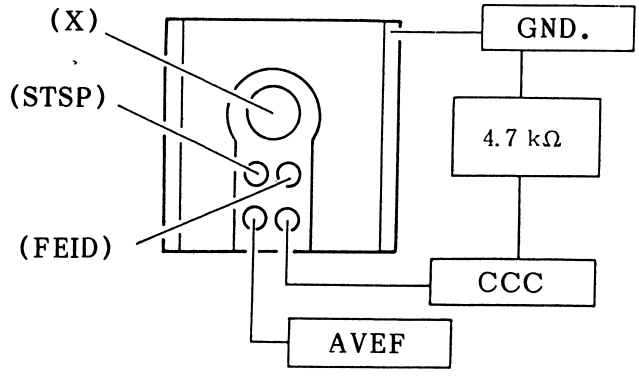
Sync Speeds	EOS 1000/REBEL
	1/90

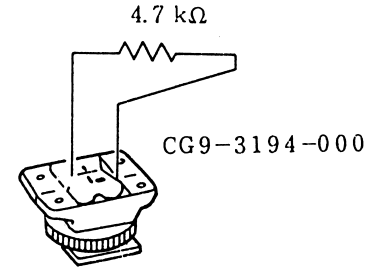
4-B X sync time lag check (not adjustable)

Set to shutter priority or manual. Use a hotshoe adaptor, wired with a 4.7Kohm resistor between CCC and GND to set the X sync speed, and test leads connected to X and GND, to connect to the EV tester.

X Sync Shutter Speed	A Value (ms)	B Value (ms)
EOS 1000/REBEL	0.33 or over	2.50 or over

Test kludge: Hotshoe from a 277T (CG9-3194) with a 4.7KOhm resistor from CCC to ground, and test leads wired to X and GND.





AE ADJUSTMENT

--- PURPOSE ---

The AE adjustment adjust the level, gain and offset and the SPC position adjustment to insure proper exposure.

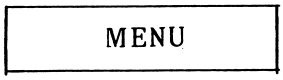
--- ADJUSTMENT CONTENTS ---

SPC position:	Adjusts IC1 position to align the SPC with the optical axis on the lens system.
AE Accuracy:	Adjust the level, gain and offset of IC-1.
AE Shift:	Level adjustment to adjust to individual customers idea of what correct exposure is.

<!!> If IC-1 has been disturbed, always perform the SPD positioning adjustment prior to the accuracy and shift adjustments.

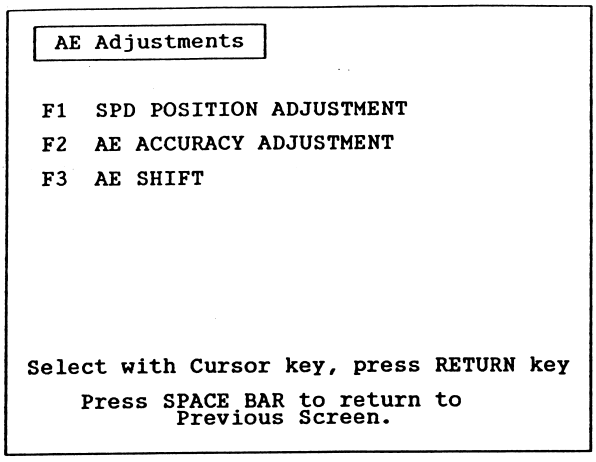
--- ADJUSTMENT ---

1. Call up the MENU screen.



2. Press Function Key F2 to call up the AE MENU screen.

3. Press the function key for the desired adjustment and proceed to that adjustment.



1. SPC Positioning

--- PURPOSE ---

This procedure adjusts the position of IC-1 to align the SPC with the optical axis on the lens system.

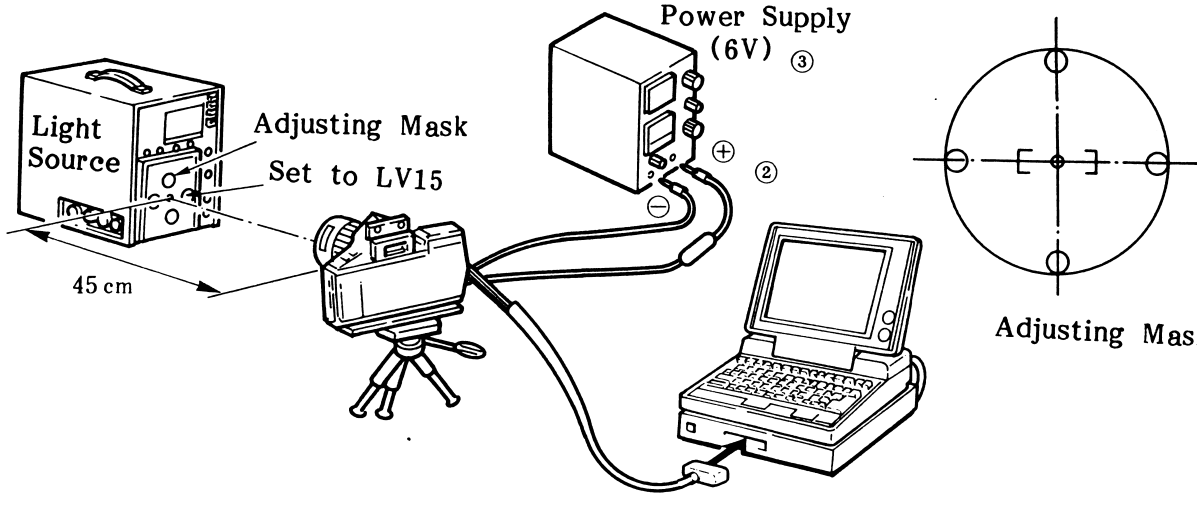
--- TOOLS ---

EF-8000 or EF-500, five-hole mask
EF 50mm f/1.8 shop standard lens
Tripod and Micro Slider

--- PREPARATIONS ---

1. Place the mask over the screen of the light source and set the light source to LV15.

2. Place the camera square with and 45cm from the light source mask and adjust so the focusing frame is aligned on the mask as shown. Set the lens to manual focus and focus on the mask (45cm).



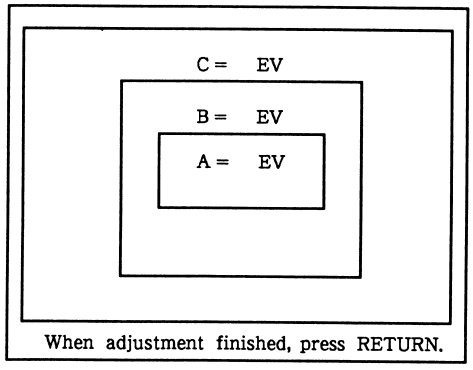
3. Clean the old adhesive from both the AE sensor box and the pentaprism box with a knife or sandpaper.

--- ADJUSTMENT ---

1. Call up the AE MENU screen.

AE MENU

2. Press Function Key F1 to call up the screen at the right, which indicates the output of each area of the SPC.



3. Adjust the position as outlined below. When completed, press the return key to return to AE MENU screen.

Positioning Procedure

<!!> Cover the SPC or darken the room.

A. Shield four of the five holes (including the center hole), and read the SPC center reading (A). Do this for all four outer holes.

B. Adjust the SPC holder so all four readings are within two EV.

Fig. 1

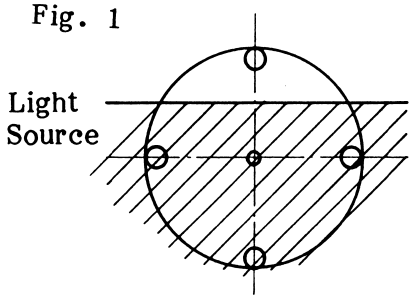
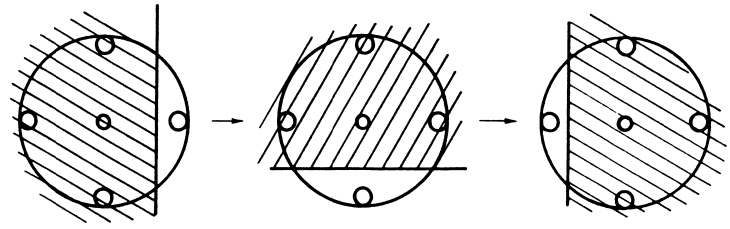
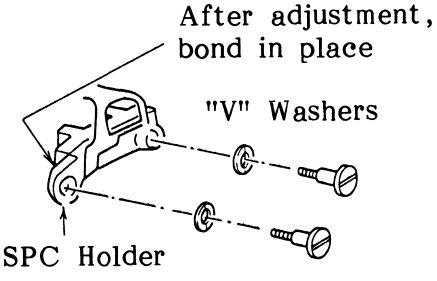


Fig. 2



C. After the position is correct, bond the SPC holder and AE Sensor Lens Unit as shown. After reinstalling the covers, recheck the position once more.



2. AE Accuracy Adjustment

--- PURPOSE ---

This procedure adjusts the "offset", "level", and "gain" of IC-1.

--- TOOLS ---

EF-8000 or EF-500
EF50mm f/1.8 shop standard lens

--- PREREQUISITES ---

Shutter adjustment, SPD Positioning

--- STANDARD ---

AE Accuracy (Film Plane Illumination)

	Limit
EV 9	0 ±0.5EV
EV 12	0 ±0.5EV
EV 15	+0.5±0.5EV

EV Tester (K: 12.5)
EV9 : 64 nit
EV12: 512 nit
EV15: 4096 nit

--- PREPARATIONS ---

Install the EF 50mm f/1.8 lens on the camera and place the camera on the EV Tester. Shield the camera from extraneous light.

--- ADJUSTMENT ---

1. Call up the AE MENU screen.

AE MENU

2. Press Function Key F2 to call up the screen at the right. Set the light source to LV9 and press the return key.

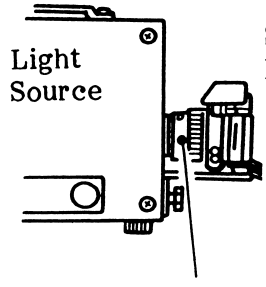
AE Adjustment

Set EV Tester as follows:

LV 9

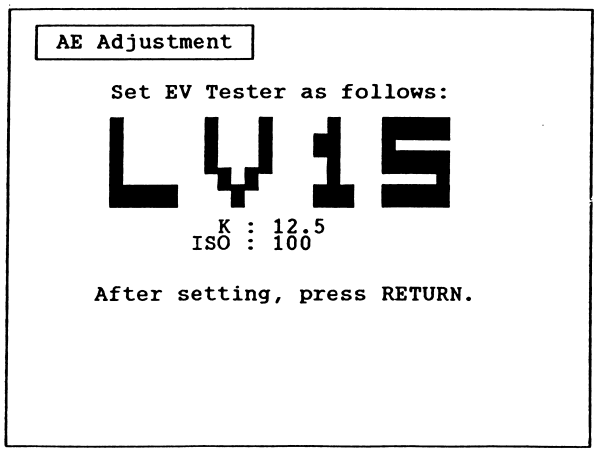
K : 12.5
ISO : 100

After setting, press RETURN.
Press SPACE bar to return to AE MENU.



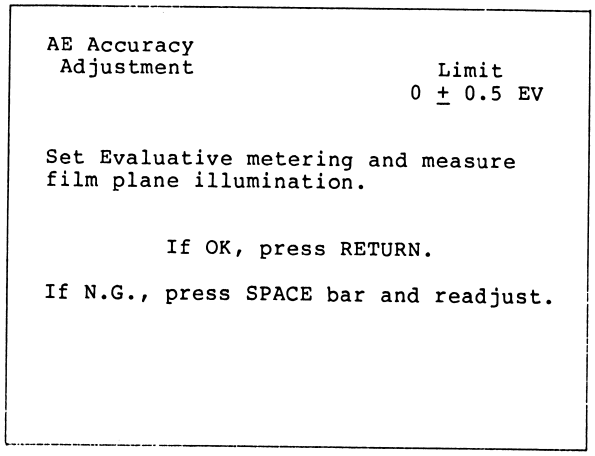
EF 50mm f/1.8 Lens

(3) This screen will appear. Set the tester to EV15, and press the RETURN key again.



(4) This screen should appear. Check the exposure level, and press the RETURN key.

(5) After confirming exposure, press the RETURN key to return to the AE Menu screen.



3. AE Shift

--- PURPOSE ---

This procedure shifts the center exposure value to the user's preference.

--- TOOLS ---

EF-8000 or EF-500
EF50mm f/1.8 shop-standard lens

--- PREPARATIONS ---

Install the EF 50mm f/1.8 lens on the camera and place the camera on the EV Tester. Shield the camera from extrnaeous light.

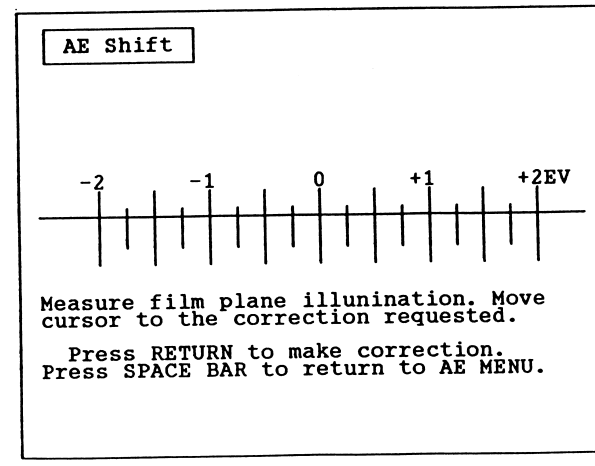
--- ADJUSTMENT ---

1. Call up the AE MENU screen.

AE MENU

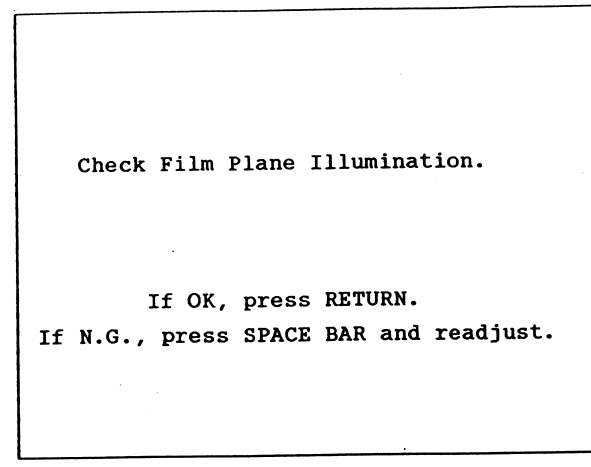
2. Press Function Key F3 to call up the screen at the right.

3. Move the cursor, with the lateral cursor keys, to the amount of correction desired. Each step is 0.25EV.



<!!> If it is necessary to set to a value greater than ± 2EV, set do the adjustment in two stages, setting + or - 2 first and pushing the Space Bar, and then repeating for the remainder.

4. After setting the cursor, press the RETURN key. After the data is read into the camera this screen is displayed. Recheck AE accuracy. It should not read "0EV". It should read the amount of correction you have entered.



5. After confirming the correction press the RETURN key. The AE MENU screen will appear.

AF ADJUSTMENT

--- PURPOSE ---

The Autofocus (AF) adjustment consist of the accuracy adjustments (dark current, AGC, etc.), sensor / viewfinder parallax, and AF focus.

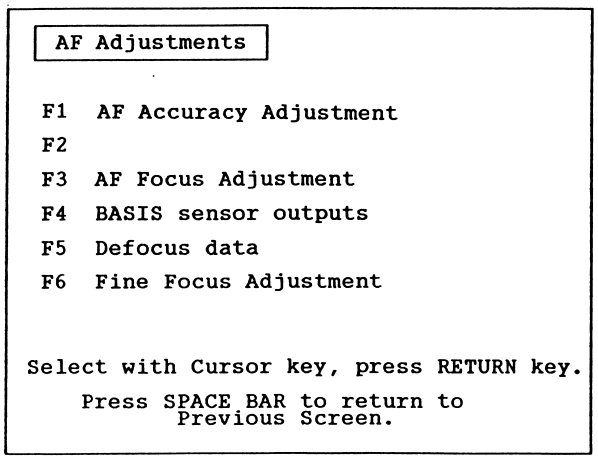
--- ADJUSTMENT CONTENTS ---

Item	Object
AF Accurcy Adjustment	Dark current, AGC, and sensor balance
AF focus adjustment	Adjust AF focus electrically to match the mechanical FFD adjustment performed earlier. The FFD must be input into the multiple tool before this adjustment can be made.
Sensor graph output	The displays the output of the sensor(s). It is used to insure even lighting of the charts, and check for dust specs, etc. on the sensor(s).
Defocus output	This is used as the final check of AF adjustments
AF Focus Shift	This adjustment is included to correct possible focus errors when using lenses with extremely shallow depth of focus, such as the EF50mm f/1.0L.

--- ADJUSTMENT ---

(1) Call up the main MENU screen.

(2) Press function key F3 to display the AF MENU screen.



(3) Press the function key for the desired adjustment and proceed.

Adjustment Order:

After AF unit replacement:

Accuracy ⟶ AF Focus

AF Focus Check

Defocus output ⟶ As necessary (See AF section 7 for details)

Chart Illumination Adjustment

Sensor Graph Output

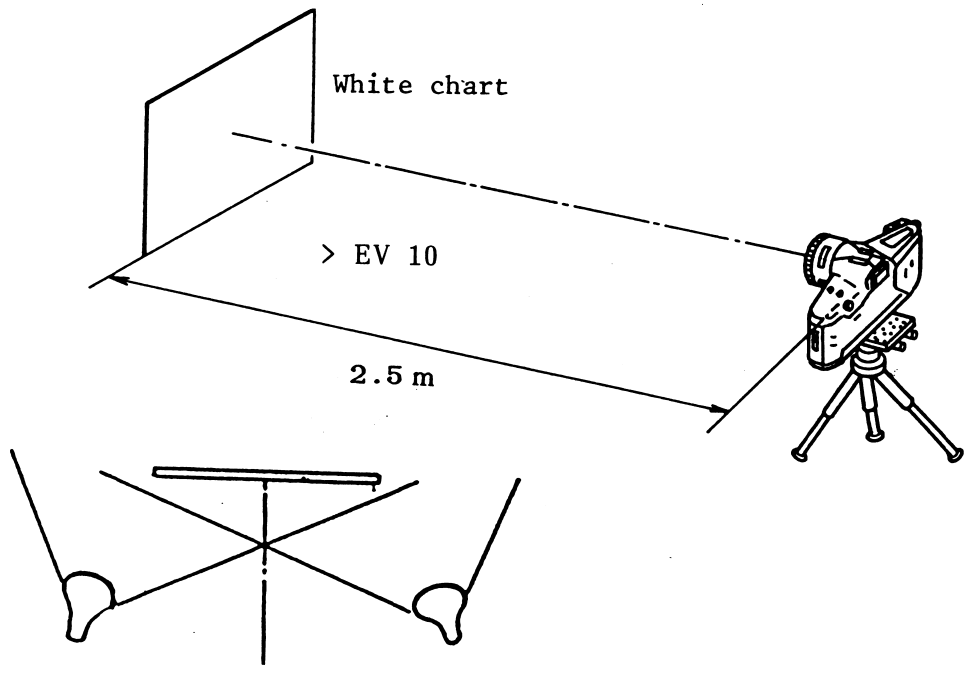
Slight focus errors with very large aperture lenses (50/1.0, 85/1.2)

AF Focus Shift

Chart Illumination:

Chart illumination, for all adjustments that use charts, must be even over the area of the chart and above EV10. A DC power source is also best, but not absolutely necessary. Lighting from both sides at 45° with tungsten or quartz lighting (no fluorescent lights) works best, but a single strong light (about 500W) can be used if it provides even illumination.

Adjust the balance on the chart surface by referring to AF section 4 (sensor graph output).



1. AF Accuracy adjustment

--- PURPOSE ---

This adjustment sets dark current compensation, AF AGC, and compensates for optically and electronically caused bit-to-bit variations of the "BASIS" sensor, called 'shading'.

--- TOOLS ---

EV Tester (EF-8000 or EF-500)
Changing (Dark) bag

--- ADJUSTMENT CONTENTS ---

Dark Current:	Compensates for 'dark current' of BASIS sensor.
AGC:	Adjusts automatic gain control to assure optimum AF sensing at all light levels.
Shading:	Compensates for bit-to-bit variations in sensor output.

--- PREPARATIONS ---

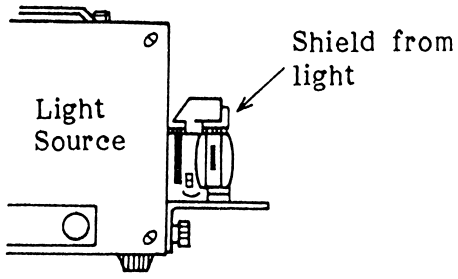
Before this adjustment, do the mechanical AF Sensor Position adjustment. Be sure main and sub mirrors and the sensor surface are free of dust. Place the camera body on the EV tester stand. Cover the eyepiece to minimize light entering through the eyepiece.

--- ADJUSTMENT ---

1. Call up the AF MENU screen, and press function key F2.

2. After communications are complete, the screen at the right appears. Place the camera in a dark bag and press RETURN.

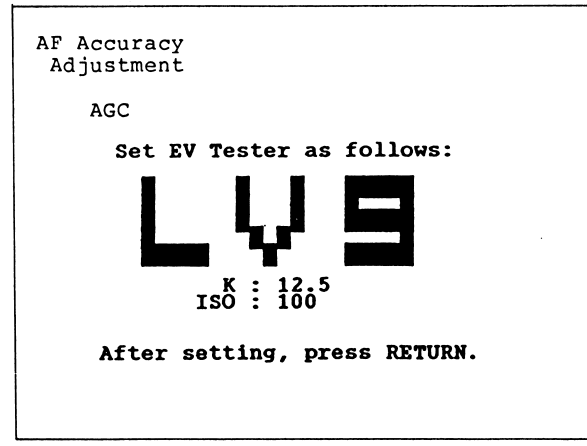
3. After communications are complete, the screen at the right appears. Remove the camera from the dark bag, reset the light source to LV15 and again press RETURN.



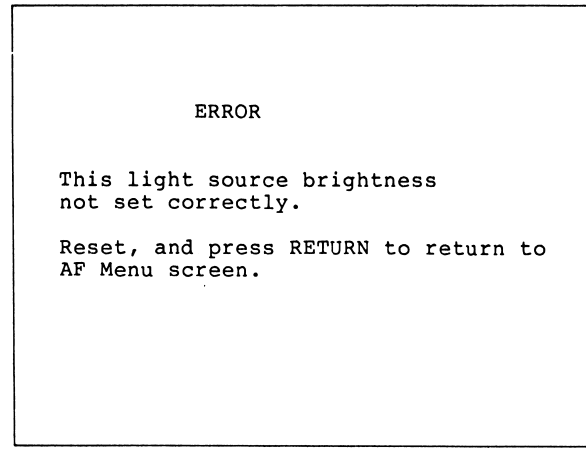

```
AF Accuracy
 Adjustment

    Dark


    Place camera in the dark bag.


    After setting, press RETURN.
    Press SPACE bar to return to
    AF MENU screen.
```

```
AF Accuracy
 Adjustment

      Set EV Tester as follows:

          LV15

          K : 12.5
      ISO : 100

      After setting, press RETURN.
```

4. After communications are complete, the screen at the right appears. Reset the light source to LV9 and Press RETURN again.

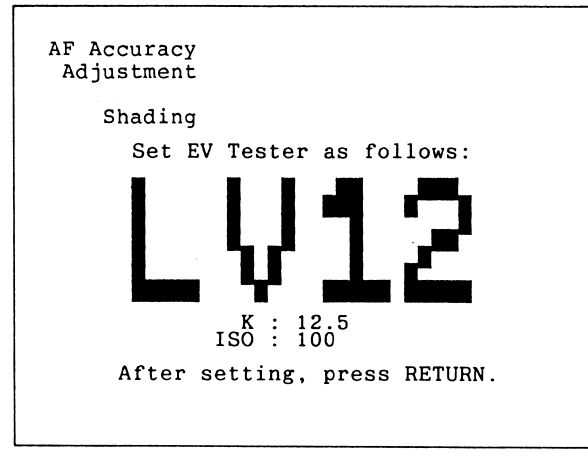


<!!> If the light value is incorrectly set in steps 3 or 4, this error screen appears. Press RETURN and start over from the AF MENU screen.



5. After communications are complete, the screen at the right appears. Reset the light source to LV12 and Press RETURN again.

6. This completes this adjustment. Press RETURN to call up the AF MENU screen and proceed.



2. AF Focus Adjustment

--- PURPOSE ---

The purpose of the AF focus adjustment is to match the AF sensor focus with the film focus. Before this adjustment can be made, the FFD to the recessed center of the pressure plate must be measured.

--- TOOLS ---

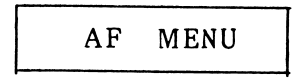
44.14mm gauge set (See mechanical adjustments)
AF Standard Tool Lens
AF Standard Chart, 90% White Chart, Chart Illumination
Tripod / Macro Slider

--- PREPARATIONS ---

Measure and record the flange to pressure plate center distance.

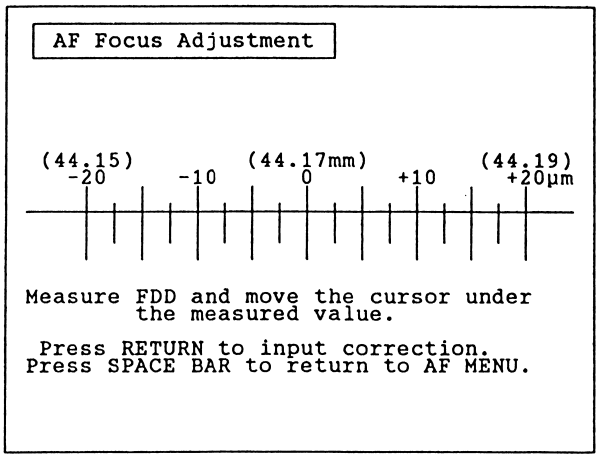
--- ADJUSTMENT ---

1. Call up the AF MENU screen.



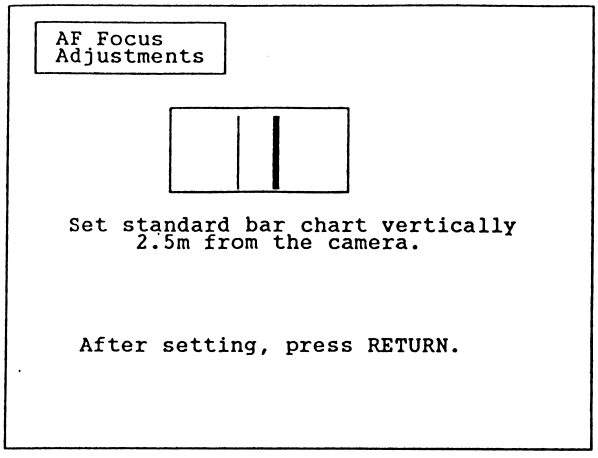
2. Press Function Key F3 to display the screen at the right. Set the cursor under the flange to pressure plate distance measured earlier, and press RETURN.

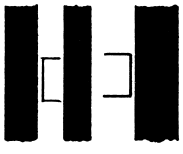
   Limit: 44.17 ± 0.02mm



3. Adjust the chart illumination (For details, see 'Sensor Graph Output').

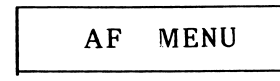
4. Press the RETURN key and the screen at the right will appear. Set the AF Standard Chart and the camera at 2.5m ± 10mm from it. Move the helicoid to infinity and then back to the scribed line at 2.5m. Aligned the focus frame on the chart as shown and press RETURN.





5. When return is pressed, the AF MENU screen will be displayed.

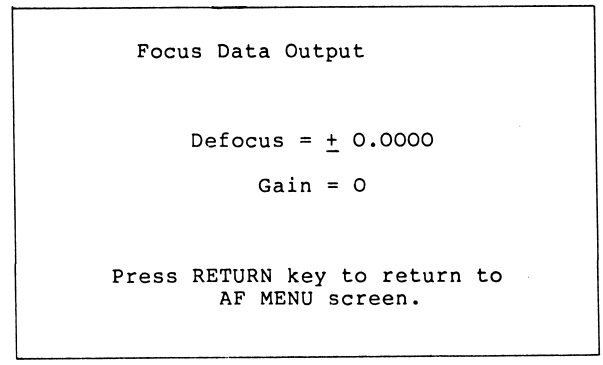
<!!> If your tool lens has a back focus variation label reading other than zero, continue as outlined below.



6. Press Function Key F5 to call in the defocus data.

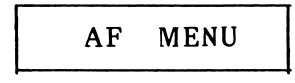
   Focus the lens from infinity back toward the scribed line until the defocus indicated is equal, but opposite sign, from the variation marked on the lens.

Example: If the lens is marked +0.03, focus so the defocus indicated is -0.03.

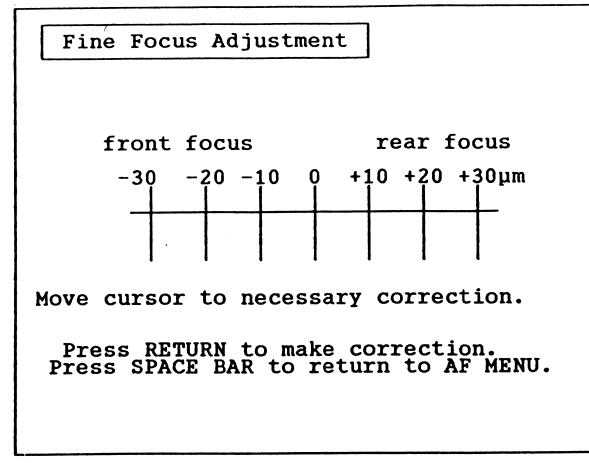


   If you overrun the point, return completely to infinity and come back.

7. Press the return key. The AF MENU screen will reappear.



8. Press Function Key F3. Reset the cursor under the FFD previously recorded. Press RETURN.



9. Repeat steps 3 and 4.

3. Sensor graph output

--- PURPOSE ---

This is not an adjustment in itself. It is mainly used to insure the lighting on the chart is even. It will also indicate if there is dust on the image sensor.

--- TOOLS ---

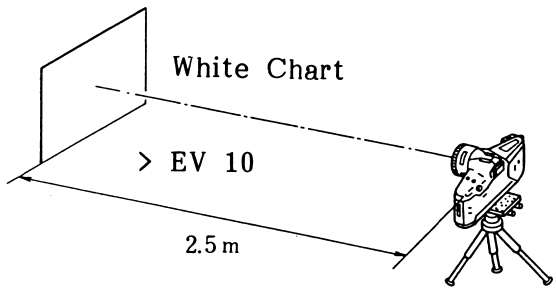
AF Standard Tool Lens
AF Standard Chart, 90% White Chart, Chart Illumination
Tripod / Macro Slider

<!!> Do not use a camera that has not had the AF accuracy adjustment to adjust chart illumination.

--- ADJUSTMENT ---

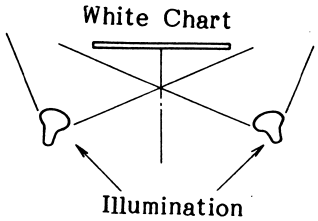
1. Set the standard check 2.5m ± 10mm from the camera and focus the lens on the chart.

2. Replace the standard chart with the white chart.



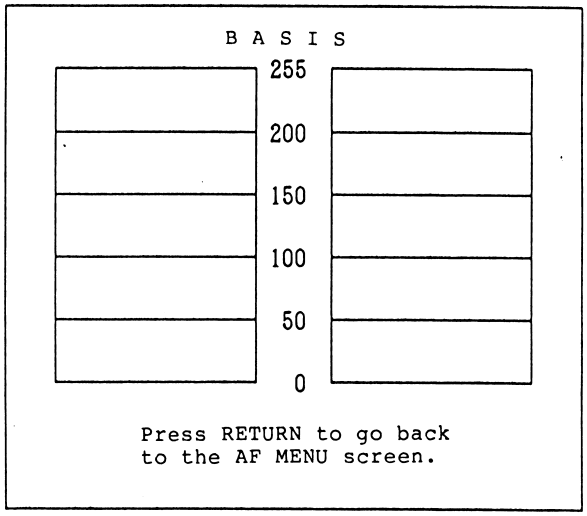
3. Call up the AF MENU screen.

4. Press Function Key F4. The sensor graph screen will appear. Adjust the illumination so the graph is as flat as possible.



5. Press RETURN and the AF MENU screen will reappear.

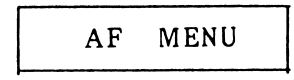
AF MENU



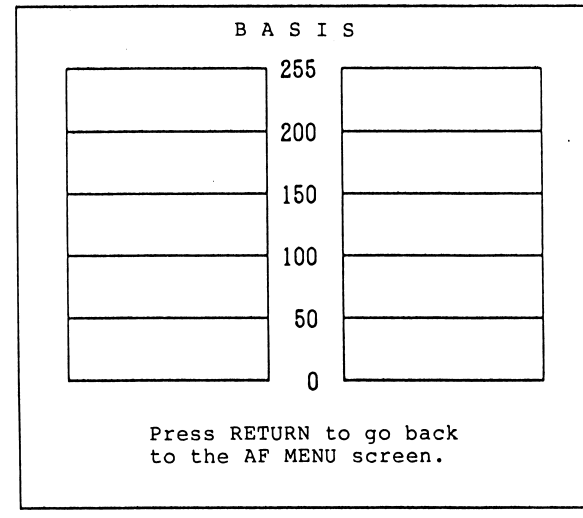
Sensor Dust Check:

1. Set the camera, without a lens attached, directly against the light source screen. Set the light source to EV12 and shield the camera from the ambient light.

2. Call up the AF MENU screen.

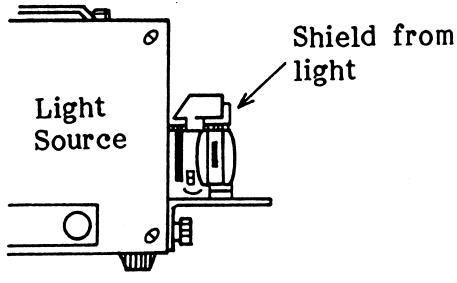


3. Press Function Key F4. The sensor graph MENU screen will appear.



4. Check that the graph is as flat as possible. If there are sharp dips, there is dust somewhere in the AF optical system.

5. Press RETURN and the AF MENU screen will reappear.



4. Defocus Output Check

--- PURPOSE ---

This operational procedure is used to check focusing accuracy.

--- TOOLS ---

AF Standard Tool Lens
AF Standard Chart, 90% White Chart, Chart Illumination
Tripod / Macro Slider

--- PREREQUISITES ---

This procedure is used to check focusing accuracy after autofocus has been adjusted. It is only reliable on adjusted cameras.

--- ADJUSTMENT ---

1. Call up the AF MENU screen.

AF MENU

2. Press Function Key F5. The defocus output screen will appear.

   If focus is correct the defocus will be 0.

   This procedure is used in AF section 6 to determine if the AF system is operating correctly.

Focus Data Output

Defocus = ± 0.0000

Gain = 0

Press RETURN key to return to AF MENU screen.

3. Press the return key to return to the AF Menu screen.

Table 1: DEFOCUS limits by Maximum Aperture

	Standard bar chart	Single bar chart	45° bar chart
Standard Tool lens	± 0.060	± 0.090	± 0.105
Interchangeable Lenses			
Brighter than f/2.0	± 0.100	± 0.125	± 0.145
Brighter than f/2.8	± 0.115	± 0.140	± 0.155
Brighter than f/4.0	± 0.115	± 0.145	± 0.150
Brighter than f/5.6	± 0.140	± 0.160	± 0.180
f/5.6 or darker	± 0.180	± 0.200	± 0.210

This chart is for a ±0 tool lens. Add variation to find you lens' limits.

If results are N.G. on a certain chart, perform the adjustment(s) listed.

1. Standard Bar chart ——> AF Focus Adjustment
2. Single Bar Chart ——> AF Accuracy, Parallax, Focus Adjustments
3. 45° Bar Chart ——> Replace AF sensor and do all adjustments

5. AF Focus Shift

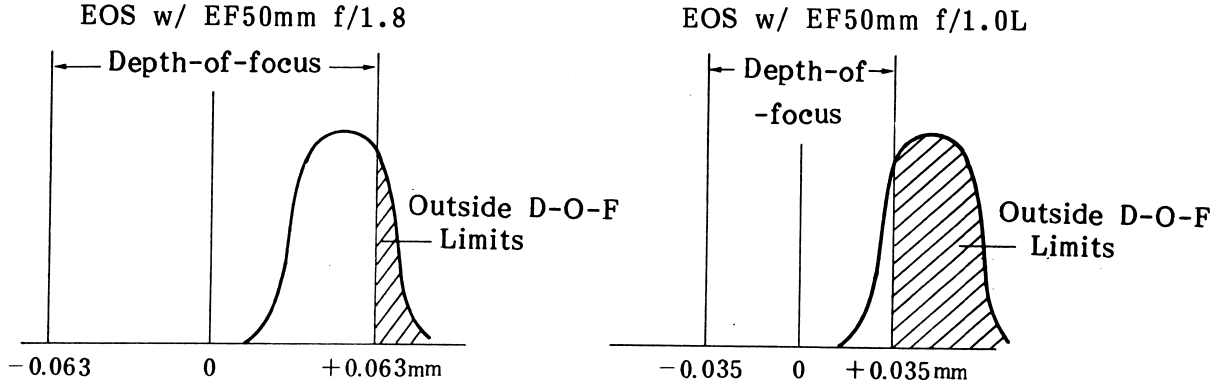
--- PURPOSE ---

This procedure is used to correct minute focus errors when using lenses with extremely shallow depth of focus, such as the EF50mm f/1.0L and EF85mm f/1.2L. It is not to be used to shift focus for other lenses.

--- Minute Focusing Errors ---

The EOS system is designed around focusing limits of 0.02mm (body) and 0.03mm (lenses). With the EF50mm f/1.0L and EF85mm f/1.2L lenses at maximum, if both camera and lens are at the same edge of the tolerance limits, the focus can fall outside the depth of focus.

Ex: These diagrams show the focusing envelope when both body and lens are at the + limits (0.02 & 0.03mm) with 50mm f/1.8 and f/1.0L lenses.



The hatched portion shows the possibility that the focus position may fall outside the depth of focus of the lens.

--- PRECAUTIONS ---

This procedure should only be used to make a fine focus adjustment on a customer's camera EOS body and EF50mm f/1.0L or EF85mm f/1.2L lens. Both body and lens must be correctly adjusted prior to making this adjustment.

If a customer complains of poor focus but the test show '0' shift to be best, the other possibilities are difficult subjects which tend to cause focus variations or objects moving slightly after SW2 is activated.

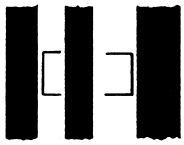
--- TOOLS ---

Casual Resolution Chart* with AF Standard Bar Chart in the center.
90° White Chart (Illumination Adjustment)
Chart Illumination
Tripod / Macro Slider

*: A "Casual Resolution Chart" is a flat chart made up of newsprint, photographs, etc. Most service facilities have such a chart.

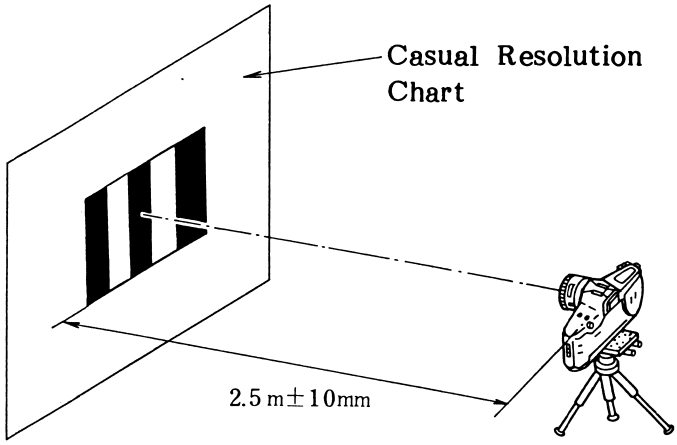
--- PREPARATIONS ---

1. Adjust the illumination with the white chart.
2. Install the Casual / AF Std. chart, and set the camera's focal plane mark 2.5m ± 10mm. Align as indicated below. Install film to check the resolution and set aperture priority, maximum aperture.



Adjust focus frame as shown

Adjust focus frame as shown



--- ADJUSTMENT ---

1. Call up the AF MENU screen.

AF MENU

2. Press Function Key F6. The AF Focus shift screen will appear.

3. Use the cursor key to move the cursor to -30, and press RETURN. (This shifts the focus -30u).

   Now, set lens against the infinity stopper. Press SW1 to focus and SW2 to photograph the chart. Repeat this operation 10 times.

4. Press the SPACE bar to return to the focus shift screen.

5. Use the cursor key to move the cursor under +30, and press RETURN. (This returns the camera to 0 shift). Repeat steps 3 & 4.

6. Use the cursor key to set the cursor to +30, and press RETURN. Repeat steps 3 and 4.

7. Repeat step 3 (-30) once more to return the shift to 0.

8. Develop and study the film to determine optimum shift. Repeat above procedure to set shift.

<!!> If the adjustments are exceeded, this error screen will appear.

Fine Focus Adjustment

front focus rear focus

-30 -20 -10 0 +10 +20 +30µm

Move cursor to necessary correction.

Press RETURN to make correction.
Press SPACE BAR to return to AF MENU.

To readjust, press SPACE bar.

Press RETURN to return to AF MENU.

ERROR

Further compensation is impossible.

Press RETURN to return to AF Menu screen.

6. AF precision checks

--- PURPOSE ---

The purpose of these checks is to determine if the system is working correctly, and if not which component (body or lens) needs further adjustment.

Two series of checks are included.
1. Customer's body and lens.
2. Customer's body with AF Standard Tool Lens.

--- PREPARATIONS ---

Set up and illuminate the chart as in AF section 4 (Sensor Graph Output).

Check that the output of the BASIS sensor is flat and normal.

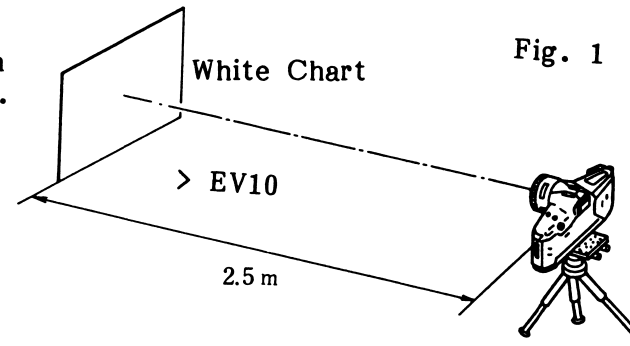


Fig. 1

Press SW1. The camera should not focus on the evenly lit white chart.

Replace the white chart with the the AF Standard double bar chart.

--- PROCEDURE ---

7-1 CUSTOMER'S SYSTEM TEST
(Test camera and lens)

1. Call up the AF MENU screen.

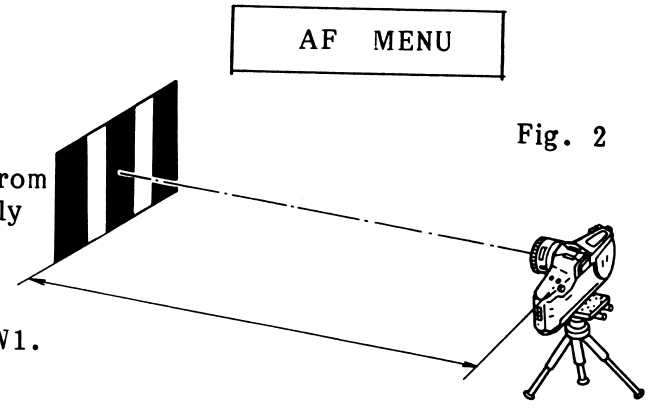


Fig. 2

2. Set the camera 50 focal lengths (2.5 meters for a 50mm lens) from the chart. Set the lens manually to infinity and align the range-finder frame on the chart.

3. Set the lens to AF and press SW1.

4. Press Function Key F5. The defocus output screen will appear. (Refer to AF section 5 if necessary). Record the defocus amount.

5. Press RETURN key to go back to the AF MENU screen.

6. Repeat steps 1 through 5 as necessary. If not within limits, check the body with the AF Standard Tool Lens.

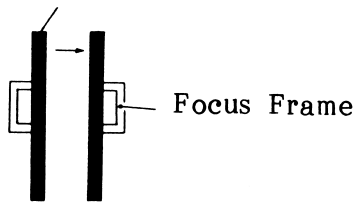
```
Focus Data Output

Defocus = ± 0.0000

Gain = 0

Press RETURN key to return to
AF MENU screen.
```

--- Single Bar Chart Check ---

1. Replace the chart with the single bar chart (16mm), and align the bar on the left bracket of the focus frame.

2. Repeat as outlined for the Standard Bar chart, but shift the camera slightly in about five steps until the bar is aligned on the right side of the frame. If focus is not acceptable, check the body with the AF Standard Tool Lens.

Fig. 3



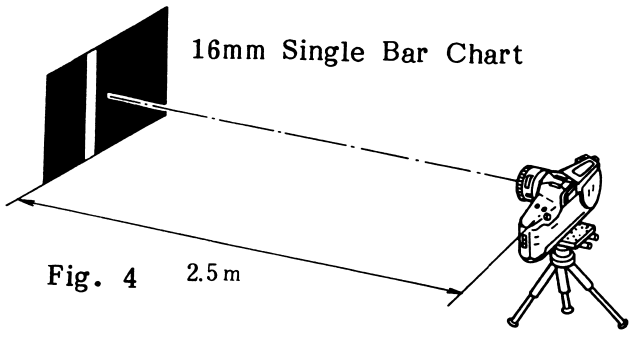


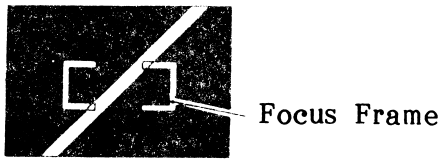
Fig. 4

--- 45° Bar Chart ---

1. Set the 45° bar chart and align as indicated.

2. Repeat as outlined for the Standard Bar chart. If focus is not acceptable, check the body with the AF Standard Tool Lens.

Fig. 5



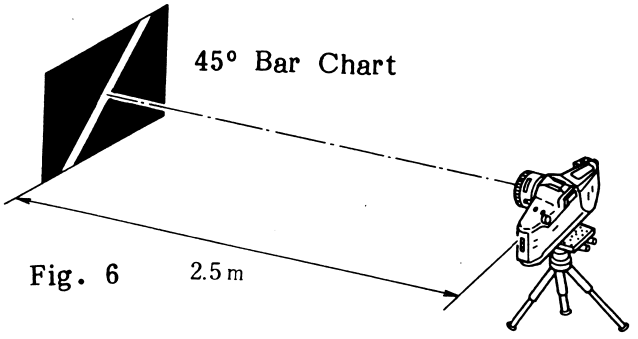


Fig. 6

7-2 TEST BODY with STANDARD TOOL LENS

<!!> Remember to include the variation of your tool lens in all calculation.

Ex: If your lens has a +0.03mm correction

AF Standard Bar Chart:	-0.030 to +0.090
Single Bar Chart:	-0.060 to +0.120
45° Chart:	-0.075 to +0.135

1. Illuminate the chart in accordance with AF section 4 (Sensor Graph output), install the EF Standard Tool Lens, set the AF Standard bar chart. Set the camera 2.5 meters from the chart and align the focus frame on the chart as shown in Fig. 2.

2. Place the Multiple Tool in the "defocus output" mode (AF Defocus mode).

3. On the EF tool standard lens, move the focusing ring to infinity and then return it to the reference mark on the focusing scale.

4. The defocus output should be 0 ± 0.060 + the variation of the AF Standard Tool Lens. If not, do the FFD and AF focus adjustments.

5. Replace the chart with the single bar chart (16 mm), and align the bar on the left bracket of the rangefinder frame (Fig. 3).

6. Check the defocus output. It should be 0 ± 0.090 + the variation of the tool lens.

7. Shift the bar toward the right in at least five increments and check that the defocus remains within tolerances at all points.

8. If any position is not within the limits, either the initial adjustment is incorrect or there is dust on the main or sub mirror, or the sensor. Clean them with a blower and readjust.

9. Replace the chart with the 45° bar chart, set as shown (Fig. 5).

10. Check the defocus output. It should be 0 ± 0.105 + the variation of the tool lens. If not, the AF sensor is bad.

Unresolved focusing problems

If a camera and lens has been brought to service with a specific claim of poor autofocusing, but all data in the previous test proves normal, the two most probable causes are:

1. Difficult subjects for autofocus
2. Defective sensor (shock damage or dust)

(1) Difficult subjects for autofocus

If the customers photographs are available, check them for difficult subjects as outlined on the next page (and in the Instruction Book). Explain the limitations of the system to the customer, so these types of subjects can be avoided or dealt with.
If all else fails, replace the AF sensor.

(2) As a final check of the sensor, substitute the 45° chart for the standard chart and check the defocus with the standard tool lens. The defocus should be 0 ± 0.120. If it is within the limits, substitute the 90:64 low contrast and test again. If no problem is found, the body is OK, and it is likely that dust was on the sensor and has been removed. Clean the sensor and try again.

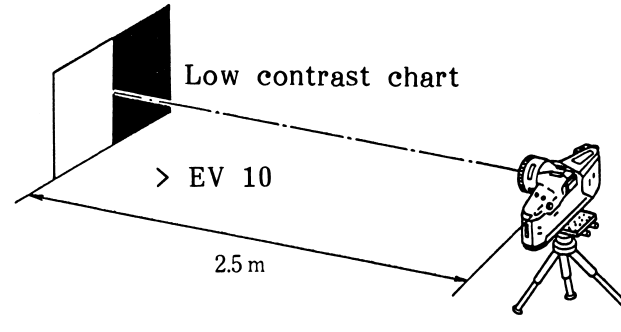


Table: Difficult Subjects for Autofocus

Focusing Impossible

Subject condition	Cause
Subject has no, or very low contrast	Subject image cannot be detected. This is the same situation as trying to focus your eyes on a blank wall.
Subject is very dark (brightness within AF frame is EV 1 or less).	It is impossible to detect the range of image, because the intensity of subject is below the minimum intensity of range sensor.
Subject has no vertical lines.	Because the line sensor is located to detect the horizontal contrast only.
Subject has no vertical lines.	BASIS sensor detects only the horizontal contrast of the subject.
Subject has high reflection factor. (like a mirror)	Range can not be measured. Computed signal becomes error signal, because the balance between images is influenced by the extreme reflecting light.
Subject is strongly backlit.	Range can not be measured. Computed signal becomes error signal, because the balance between images is influenced by the extreme backlight.

Focusing on Intended Subject is Difficult

Subject condition	Cause
More than one subject at different distances.	AF cannot determine which subject to focus on
Subject has many vertical lines at equal spaces. (lens < f/2.8)	Phase differential cannot be detected by H-BASIS sensor.
Subject moving fast directly toward or away from the camera.	Speed exceeds processors capacity.

OTF ACCURACY ADJUSTMENT

--- PURPOSE ---

OTF Level: Adjust at ISO100 for correct flash film plane exposure.
OTF Gain: Adjust at IOS 100 and 400 to balance the flash exposure.

--- TOOLS ---

EF-8000 or EF-500 Tester (with DIR-201 adaptor)
SPEEDLITE 300EZ, 420EZ, or 430EZ
18% gray chart
Normal EF50mm f/1.8 lens
Tripod

--- STANDARD ---

Standard: Average $\pm$ 1EV

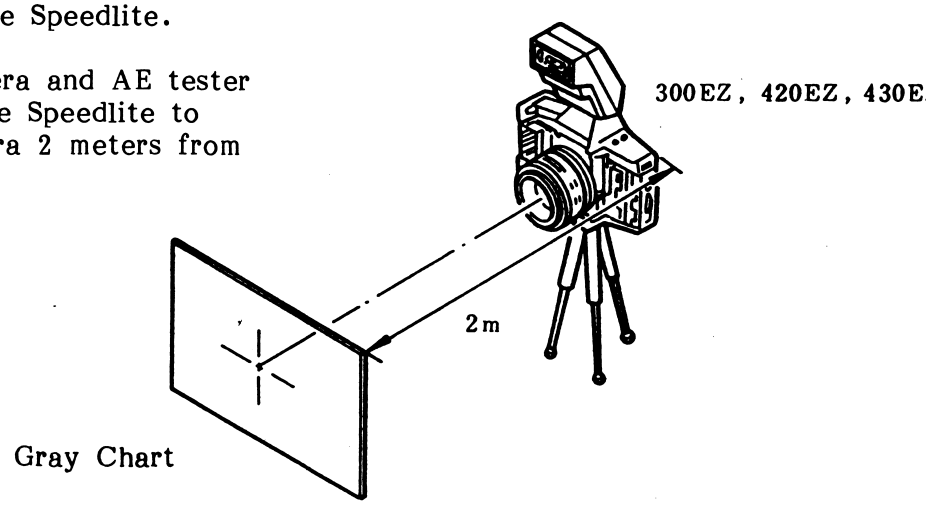
--- PRECAUTION ---

Ambient light should be under EV3, especially for the ISO 400 gain adjustment. If a dark room is not available, establish a test area with stable conditions and no highly reflective objects. Test about ten cameras from stock and establish an average.

--- PREPARATIONS ---

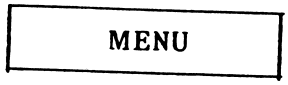
1. Place the camera with lens on the tripod and attach the Speedlite.

2. Set the ISO of camera and AE tester to ISO 100. Set the Speedlite to ATTL and the camera 2 meters from the gray chart.



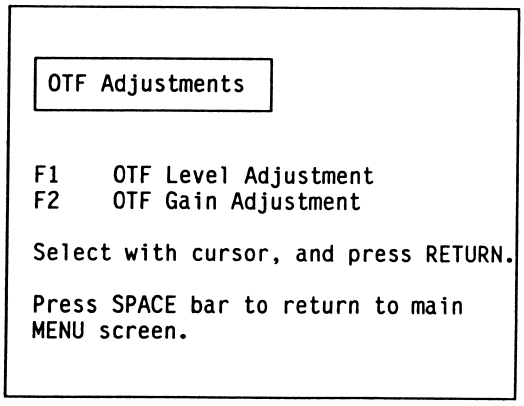
--- ADJUSTMENT Selection ---

1. Call up the MENU screen.



2. Press Function Key F4 to call in the OTF Accuracy MENU screen.

   The screen at the right will appear.

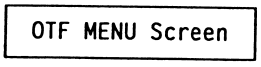


3. Select the adjustment desired with the function key.

OTF Level Adjustment

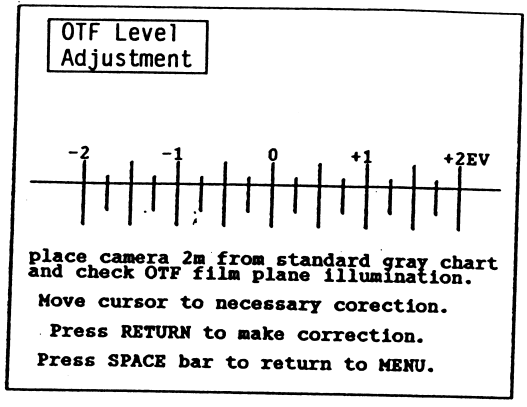
--- ADJUSTMENT ---

1. Call up the OTF Adjustment MENU screen.



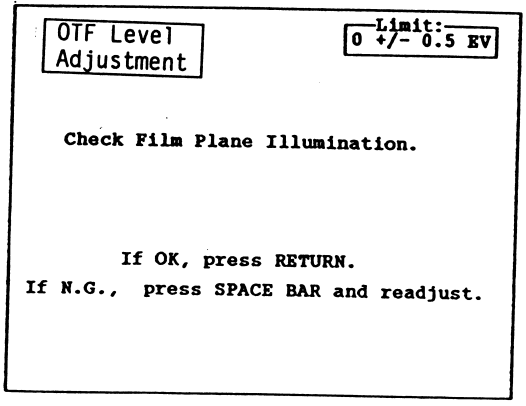
2. Press Function Key F1 to call in the OTF Level screen. Check that the tester ISO is set to 100.

   Check the accuracy ten times and average the results. Move the cursor under the necessary correction. press RETURN.



3. When the RETURN key is pressed, the correction is made and then this screen appears. Check the flash again.

   If OK, press RETURN. If not, press the SPACE bar and readjust.



4. When RETURN is pressed, the main MENU screen appears.

OTF Gain Adjustment

--- ADJUSTMENT ---

1. Call up the OTF Adjustment MENU screen.

2. Press Function Key F2 to call in the OTF Gain screen. Check that the tester ISO is set to 100.

   Check the accuracy ten times and average the results. Record the average and then press RETURN.

3. After communications, the screen at the right will appear. Check that the tester ISO is set to 400.

   Check the accuracy ten times and average the results. Subtract the ISO 400 results from the ISO 100 results and move the cursor under the result. Press RETURN.

4. When the RETURN key is pressed, after communications this screen appears. Check the flash at ISO 400.

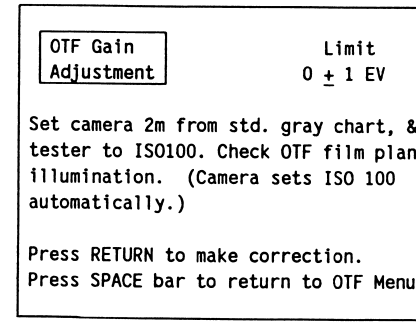
   If OK, press RETURN. If not, press the SPACE bar and readjust.

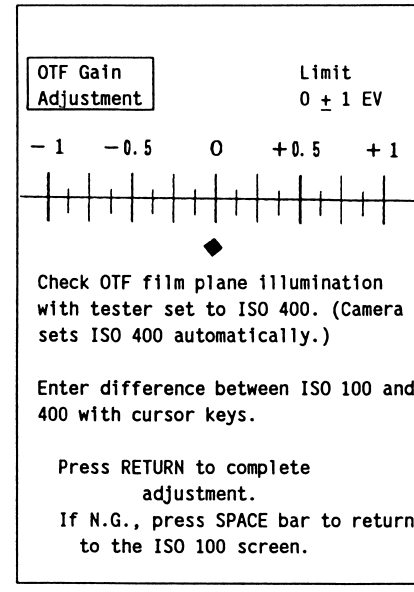
5. When the RETURN key is pressed, after communications this screen appears. Check the flash at ISO 100.

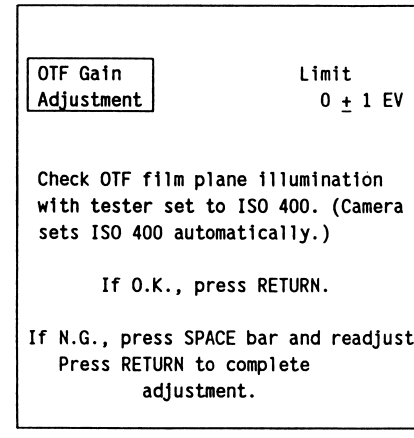
   If OK, press RETURN. If not, press the SPACE bar and readjust.

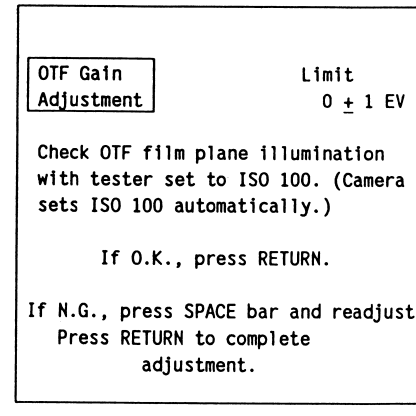
6. When RETURN is pressed, the OTF Adjustment MENU screen appears.

OTF MENU Screen









INHIBIT VOLTAGE ADJUSTMENT

--- PURPOSE ---

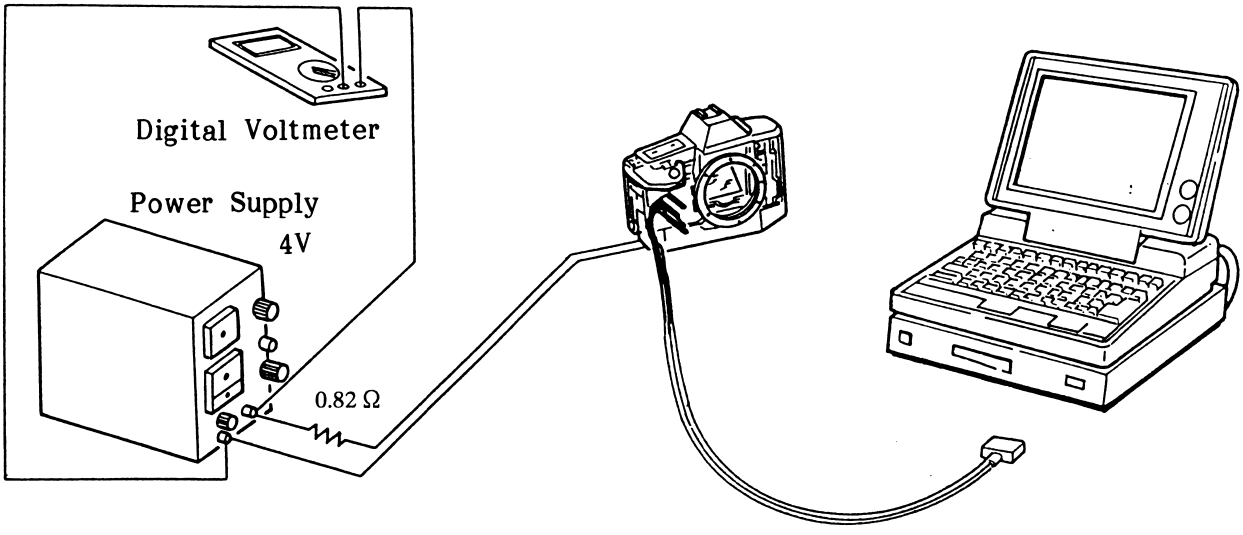
The inhibit voltage is the lowest operating voltage. If the voltage drops below the inhibit voltage, the camera will not operate. If it is set too high, useful battery energy will be wasted. If it is set too low, proper operation of the camera cannot be guaranteed.

--- TOOLS ---

DC constant voltage power supply (LVPS)
Digital Multimeter
Multiple Tool
0.82 Resistor

--- PREPARATIONS ---

Set up the equipment as shown.



--- ADJUSTMENT ---

1. Call up the MENU screen.

2. Press Function Key F5 to display the screen at the right. Adjust the voltage of the power supply to exactly 4.0 ± 0.2V and press RETURN.

   <!!> If an incorrect voltage is set and RETURN pressed, the same screen will reappear. Reset the voltage and press RETURN.

MENU

INHIBIT VOLTAGE ADJUSTMENT

Set POWER SUPPLY as follows:

4.0

4.0 ± 0.2V

When set, press RETURN.

Press SPACE bar to return to MENU.

<!!> If an incorrect voltage is set and RETURN pressed, the screen at the right will appear. Reset the voltage and press RETURN.

```
ERROR

Install a 0.82 Ohm resistor, set
power supply to 4.0V.  Press
RETURN to return to main MENU.
```

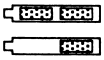
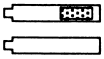
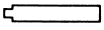
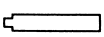
3. When RETURN is pressed and communication is complete, this screen will appear. Check the voltage levels listed below and if they are correct, press RETURN. If not press the SPACE bar and re-adust.

```
Check Inhibit Voltage.

If OK, press RETURN.
If N.G., press SPACE BAR and readjust.
```

4. When RETURN is pressed, the MENU screen appears.

--- Inhibit Voltage Check ---

After adjusting the inhibit voltage check the following voltage points and indications.

Model	EOS 1000 QD 1000 / REBEL
	Battery capacity display on LCD
	5.0V or more 
	4.7 to 5.0V 
	4.2 to 4.7V 
	2V or less 

SELF CHECK

--- PURPOSE ---

1. LCD Check — To check all the segments of the LCD(s).
2. Switch Check — To check the condition of all switches.
3. Lens Communication Check — To determine if lens is communication with the camera in a meaningful manner.

--- CHECK METHOD ---

1. Call up the main MENU screen.

2. Press function key F7 to call in the Self Check MENU Screen.

	Contents
F1	LCD Check
F2	Switch Check
F3	Lens Communication Check

3. Press the desired function key.

```
Self Check

    F1        LCD Segment Check
    F2        Switch Check
    F3        Lens Communication Check

Select with Cursor key; press RETURN.
     Press SPACE bar to return to
           main MENU screen.
```

LCD Check

1. Call up the Self Check MENU screen.

2. Press Function Key F1. The screen at the right will appear. All the LCD segments should light. If one does not, it is defective.

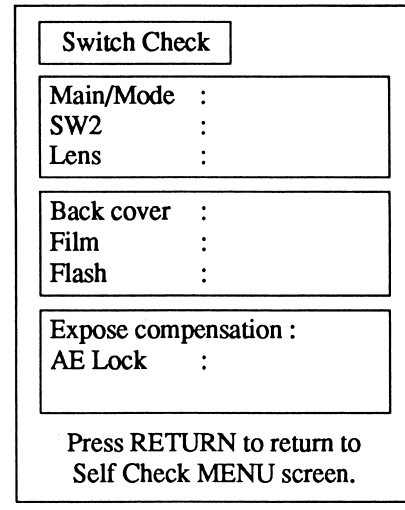
```
LCD Check

Check that all LCD segments are lit.

Check Self-timer LED, Finder
Information, beeper, etc.
If some segments are not lit, LED elas-
tic connector, or cracks in LCD are pro-
bable causes.

       Press RETURN to return to
       Self Check MENU screen.
```

3. Press RETURN to call back the Self Check MENU screen.

Switch Check

1. Call up the Self Check MENU screen.

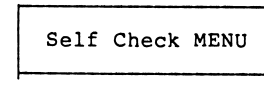
2. Press Function Key F2. The screen at the right will appear. The conditions of the switches will be displayed. If the actual condition does not match the indication, the switch is defective.



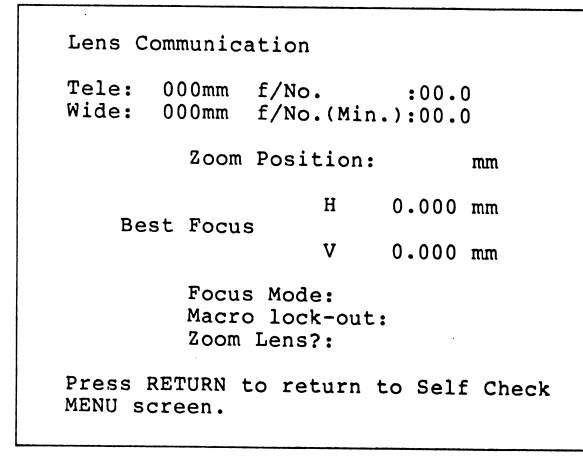
3. Press RETURN to call back the Self Check MENU screen.

F3: Lens Communication Check

1. Call up the Self Check MENU screen.



2. Press Function Key F3. The screen at the right will appear. The condition of the lens will be displayed. If the actual condition does not match the indication, something is defective.



3. Press RETURN to call back the Self Check MENU screen.

INITIALIZATION AND DATA TRANSFER

PURPOSE

1. Initilization: This clears all old data so new data can be written.
2. Camera to Multiple Tool This is used to temporarily store the camera's data in the EOS tool, so the data is not lost. If the data is lost, every adjustment must be done.
3. Multiple Tool to Camera This reloads the data back into the camera from the Multiple Tool.
4. Temperature Compensation The built in temperature compensation resistor is not used so the compensation is written in during adjustment. (This corrects the built-in thermometer).

OPERATION

1. Call up the MENU screen.
2. Press Function Key F9 to display the Data Transfer MENU Screen.
3. Press the function key for the required operation.

MENU

Data Transfer

F1 Initialization
F2 Camera → Multiple Tool
F3 Multiple Tool → Camera
F4 Temperature Compensation

Select with cursor key, and press RETURN.
Press SPACE bar to return to previous screen.

1. Initialization EOS 750/850/700.

OPERATION

1. Call up the Data Transfer MENU Screen.
2. Press Function Key F1. The screen at right will appear. Select the model and press RETURN.
3. When RETURN is pressed, the main flex will be initialized and then the Data Transfer MENU screen reappears.

ATTENTION

Do you wish to INITIALIZE?
<CAMERA DATA WILL BE DESTROYED>

To initialize, press RETURN.

If not required, press SPACE bar to return to DATA TRANSFER Menu.

2. Camera → Multiple Tool Data Transfer

PURPOSE

This mode transfers data from the camera into the Multiple Tool prior to replacing the main flex.

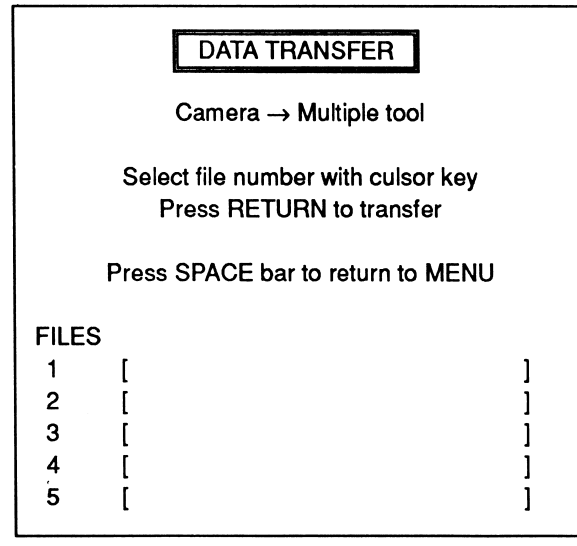
OPERATION

1. Call up the Data Transfer MENU Screen.

2. Press Function Key F2. The screen at right will appear. Use the cursor key to select an empty file. Press RETURN and the cursor will move to the 'comment' area. Type in your comment (up to 10 characters) and press RETURN again.

3. When RETURN is pressed, the data will be transferred into the Multiple for storage until repair is finished. When repair is finished, return the data to the camera using the next procedure.

DATA TRANSFER MENU



3. Multiple Tool → Camera Data Transfer

PURPOSE

This mode transfers data back to the camera from the Multiple Tool where it was stored prior to repair.

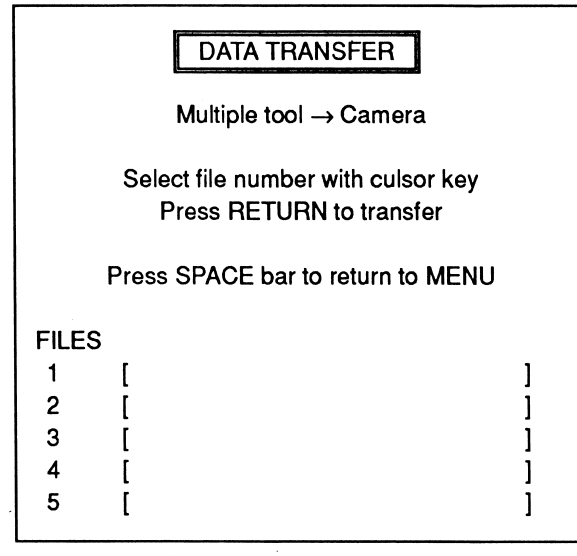
OPERATION

1. Call up the Data Transfer MENU Screen.

2. Press Function Key F3. The screen at right will appear. Use the cursor key to select the file you wish to retrieve. Press RETURN.

3. When RETURN is pressed, the data will be transferred back into the camera. You may now proceed with the necessary adjustments.

DATA TRANSFER MENU



4. Temperature Compensation

--- OPERATION ---

1. Call up the Data Transfer MENU Screen.

2. Press Function Key F4. The screen at right will appear. The temperature sensed by the Multiple Tool (Room) and by the camera will be shown.

   If the difference is greater than 3°C, press RETURN and compensation will be performed.

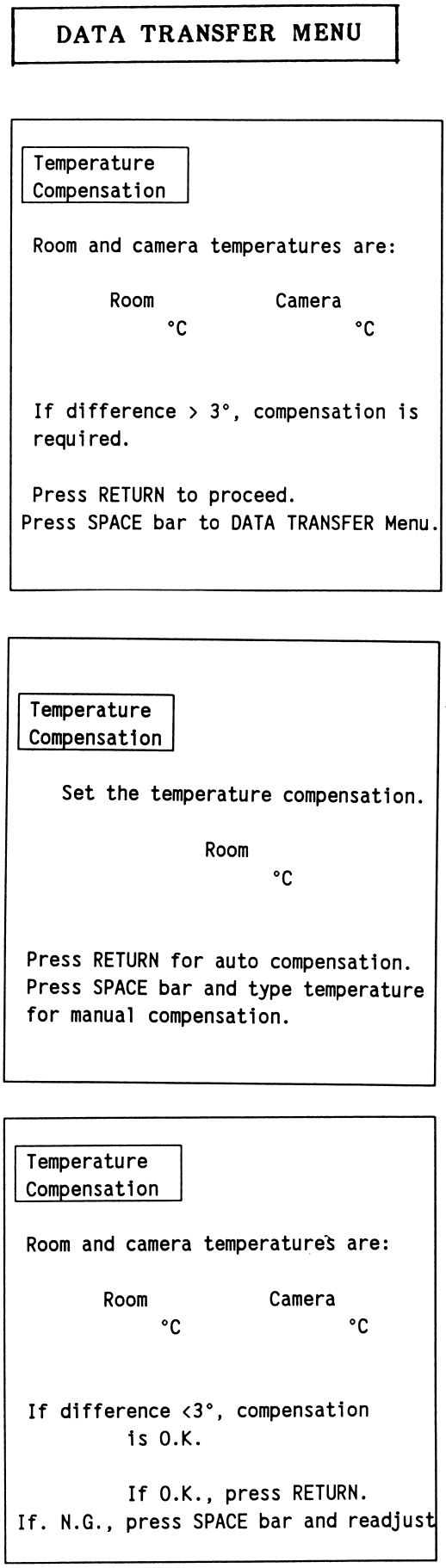
3. When RETURN is pressed, the screen at right appears indicating the Multiple Tool temperature. Check that it is reasonable, and press RETURN.

   If the temperature displayed is not correct, press the SPACE ba and the cursor will go into the box. Check the temperature wit separate thermometer and type in the correct reading.

4. When RETURN is pressed, this screen reappears. Check that the readings are within 3°C.

   If they are, press RETURN. If not, press the SPACE bar and readjust.

5. When return is pressed, the Data Transfer MENU screen reapperas.



4. ADDITIONAL INFORMATION

Contents

- EOS SYSTEM ACCESSORY COMPATIBILITY 116
- COMPETITIVE PRODUCTS COMPARISON CHART ... 117
- MULTIPLE TOOL SECTION
- PARTS CATALOG ILLUSTRATIONS

EOS SYSTEM ACCESSORY COMPATIBILITY

○: Best fit to the body and no problems
●: Can be used with conditions. Conditions are all right. Limited compatibility as indicated by note number.
×: Cannnot be used.

1. Interchangeable lenses

No.	Product name	Compatibility	Note
1	EF 15mm f/2.8 FE	○	
2	EF 24mm f/2.8	○	
3	EF 28mm f/2.8	○	
4	EF 50mm f/1.0 L	○	
5	EF 50mm f/1.8	○	
6	EF 50mm f/2.5 MACRO	○	
7	EF 85mm f/1.2 L	○	
8	EF 100mm f/2.8 MACRO	○	
9	EF 135mm f/2.8 SF	○	
10	EF 200mm f/1.8 L	○	
11	EF 300mm f/2.8 L	○	
12	EF 600mm f/4 L	○	
13	EF 20 ~ 35mm f/2.8 L	○	
14	EF 28 ~ 70mm f/3.5–4.5 II	○	
15	EF 28 ~ 80mm f/2.8–4 L	○	
16	EF 35 ~ 70mm f/3.5–4.5	○	
17	EF 35 ~105mm f/3.5–4.5	○	
18	EF 35 ~135mm f/4–5.6 U	○	
19	EF 50 ~200mm f/3.5–4.5	○	
20	EF 50 ~200mm f/3.5–4.5 L	○	
21	EF 70 ~210mm f/4	○	
22	EF 70 ~210mm f/3.5–4.5 U	○	
23	EF 80 ~200mm f/2.8 L	○	
24	EF 100~300mm f/5.6	○	
25	EF 100~300mm f/5.6 L	○	
26	EF 100~300mm f/4.5–5.6 U	○	
27	EF 35 ~ 70mm f/3.5–4.5 A	○	
28	EF 35 ~ 80mm f/4–5.6 PZ	○	
29	EF 100~200mm f/4.5 A	○	
30	EXT EF 2×	○	
31	EXT EF 1.4×	○	
32	LIFE SIZE CONVERTER EF	○	
33	LENS CONVERTER FD-EOS	●	*1

2. Speedlites

No.	Product name	Compatibility	Note
1	430EZ	○	
2	420EZ	○	
3	300EZ	○	
4	160E	●	*2
5	F069	○	
6	ML-3 Set	○	
7	Multi-flash ACC	○	

3. Interchangeable grip

No.	Product name	Compatibility
1	GR10 (650)	×
2	GR20 (with remote control terminal/620)	×
3	GR50 (750/850/700)	×
4	GR60 (extended GR for 10)	×
5	GR-819 extended GR	○

4. Viewfinder accessories

No.	Product name	Compatibility	Note
1	Eyecup E (650, 620)	●	*3
2	Eyecup E (750, 850)	○	
3	Eyecup Ec (EOS-1)	●	*3
4	Dioptric compensation lens E (10 types)	●	*3
5	Dioptric compensation lens Eb(10 types)	○	
6	Lubber frame Eb	○	
7	Lubber frame Ec (EOS-1)	●	*3
8	Focusing screen E (seven types)	×	
9	Focusing screen Ec (seven types)	×	

5. Data backs

No.	Product name	Compatibility
1	Quartz date back E	×
2	Technical back E	×
3	Keyboard unit TB	×
4	Interface unit TB	×

6. Filters (new) (old: ○ other than color filers)

No.	Product name	Compatibility
1	Circular polarizing filters PL-C48mm	○
2	Circular polarizing filters PL-C52mm	○
3	Circular polarizing filters PL-C58mm	○
4	Circular polarizing filters PL-C72mm	○

7. General purpose EOS cases

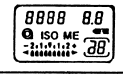
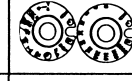
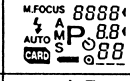
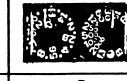
No.	Product name	Compatibility
1	Snap case SA-4	○
2	Snap case SB-4	○
3	EOS 650 and 620 series cases	×
4	EOS 750 and 850 series cases	×
5	EOS-1 cases	×
6	EOS 1000 series cases	○

*1: AE shooting is possible with AV-AE, f/1.0 setting.
*2: The flash is fired every shooting.
*3: The shape of the bender section does not match.

*: The list of F-1, A, and T series SLR accessory compatibility conforms to the EOS 750, so refer to the EOS 750 Service Manual.

COMPETITIVE PRODUCTS COMPARISON CHART

△C: Card

↓ Item	→ Maker / → Model	CANON REBEL, 1000	CANON 1000QD	CANON 700	MINOLTA α-5700i	MINOLTA α-3700i	NIKON F-401S
AF	One-shot/AI servo AF	●/●	←	←	●/●	●/●	●/–
	O/S automatic switch	●	←	←	●	●	–
	Maual	●	←	(●)	●	●	●
	AF speed	★★★★	←	←	★★★	★★★	★★
	AF metering area	[–]	←	←	[–]	[–]	[–]
	In-focusing indication LED/beeper	●/●	←	←	●/●	●/●	–/●
	Working range (EV)	+1 ~ 18	←	←	0 ~ 18	0 ~ 18	–1 ~ 18
	Built-in AF auxiliary light	–	●	●	●	–	–
View finder	Magnification/eye point (mm)	0.75/20	←	0.8/16	0.75/	0.75/	0.8/
	Pentaprism	Glass	←	←	Hollow	Hollow	Glass
	Viewfinder indication	* 8888 8.8 ◀ ▶ ●	←	P●	● ● ◀ ▶	● ● ◀	●+○–
	Screen interchange	–	←	←	–	–	–
Full auto mode	Standard program	●	←	←	●	●	●
	Depth-priority AE	●	←	←	△C	–	–
	Landscape	●	←	←	–	–	–
	Portrate	●	←	←	△C	–	–
	Close-up	●	←	←	–	–	–
	Sports	●	←	←	–	–	–
Metering	Evaluative metering (division)	●(3)	←	●(6)	▲(2)	▲(2)	●(3)
	Central point average/partial	–/●	←	–/–	–/–	–/–	●/–
	Metering range (EV-normal temperature)	2 ~ 20	←	0 ~ 20	1 ~ 20	1 ~ 20	1 ~ 19
	Film sensitivity: DX automatic	25 ~ 5000(1/3)	←	25 ~ 3200(1)	25 ~ 5000(1/3)	32 ~ 3200(1/3)	25 ~ 5000(1/3)
	Film sensitivity: Manual	6 ~ 6400(1/3)	←	–	–	–	–
External operation component	Input measure	Electronic and mechanical dial	←	Mechanical dial	UP/DOWN button	Push botton	Mechanical dial x 2
	External indication						
Exposure control	Shutter-priority	●	←	←	△C	–	●
	Aperture-priority	●	←	–	△C	–	●
	Intelligent program AE	●	←	←	▲(3)	▲(3)	▲(2)
	Manual exposure	●	←	–	Fixed point matching	–	Fixed point matching
	AE lock AF coupling/M	●/●	←	●/–	●/●	●/–	●/●
	Shutter speed (sec)	1/1000~30,B(1/2)	←	1/2000~1/2,B(1)	1/2000~4,B(1)	1/1000~4	1/2000~1,B(1)
	During X-sync speed (sec)	1/90	←	1/125	1/90	1/60	1/100
	Exposure compensation/step (steps)	● ± 2/ 1/2	←	–	–	–	–
	Multiple exposure (reserved)	●	←	–	–	–	–
Film transport (24E)	Transport system/full auto	Prewind/●	←	←	Normal/●	Normal/●	Normal/REW•SW
	Winding speed (f/s)	1	←	1.2		1.2	2.5
	Rewind speed (sec)	13 (prewind)	←	14 (prewind)	12	12	16
	Battery life AE/FA50%	75/–	75/30	75/30	65/25	200/–	75/30
Flash In parentheses ( ): Best match	Built-in	–	●	●	●(zoom)	–	●
	Gno (ISO 100m)	(20)	12	12	14 ~ 16	(14)	12
	UP/DOWN automatic/M	–/–	–/●	●/–	Fixed	(●)	–/●
	Low/reverse automatic flash firing	–	●	●	●	(●)	Alarm
	Metering coupling range (m)	(1.0 ~ 7.1)	1.0 ~ 4.3	1.0 ~ 4.3		(0.5 ~ 5.7)	1.4 ~ 4.2
	Charging time (sec)	(5)	2	2	5	(6)	4.5
	Slow sync	●	←	←	●	–	●
	Lens optical axis/ flash axis offset	(144 mm)	70.5 mm	70.5 mm	56 mm	(85 mm)	70 mm
	Power body supply	–	●	●	●	–	●
Self-timer		●	←	●	●	●	●
Power source		2CR5 x 1	2CR5 x 1	2CR5 x 1	2CR5 x 1	2CR5 x 1	Size AA batteryx4
Dimensions (W x H x D) mm		148 x 96.3 x 68	148 x 99.8 x69	149.3x102.2x71	148.5x97.5x66.5	142x88.5x60.5	154x102x65.5
Weight (without batteries) g		400	460	615	510	420	645
Release date		September 1990	September 1990	March 1990	August 1989	September 1989	April 1989
Price (Japan)			¥47,000	¥59,800 (QD)	¥62,000 (QD)	¥46,000 (QD)	¥66,000 (QD)

Multiple Tool Section

CONTENTS

Page

Features 1
Specifications 1
Nomenclature 2
Preparations 2
Set-up 3
Adjustment Software Disk Assembly 4
Error Codes 8
Cautions 12

FEATURES

One tool for practically all models, both SLR and Compacts (L/S).
Operates with original software disk in PC disk drive.
Compatible with IBM PC/XT/AT† or compatible models.
2-Way Power Source:

External	12-16VDC (>0.7A) input; AC Adapter can be purchased locally and adapted if necessary using input plug supplied with the tool.
Internal	NiCd battery for 4 hours operation (Automatic charging by AC adapter)

Simple oscilloscope functions for voltage / current measurements
Thin design with similar 'footprint' to many PCs.

† IBM and PC/XT/AT,are trademarks of International Business Machines Corporation

SPECIFICATIONS

1. Power Source 12-16VDC, Two Way

   AC: xxx VAC to 12-16VDC Adapter (Not included)
   DC: Built-in NiCd battery with automatic charging circuit when AC Adapter is connected.

Charging time:	15 hours	(Trickle charge (30uA) after battery is fully charged)
Operating time:	4 hours	

2. Applicable Products All Canon camera products with EEPROM

3. Communications RS232C industry standard

Speed:	9600 bit/s
Start bit	1 bit
Data bit	8 bit
Stop bit	1 bit

4. Oscilloscope Functions:

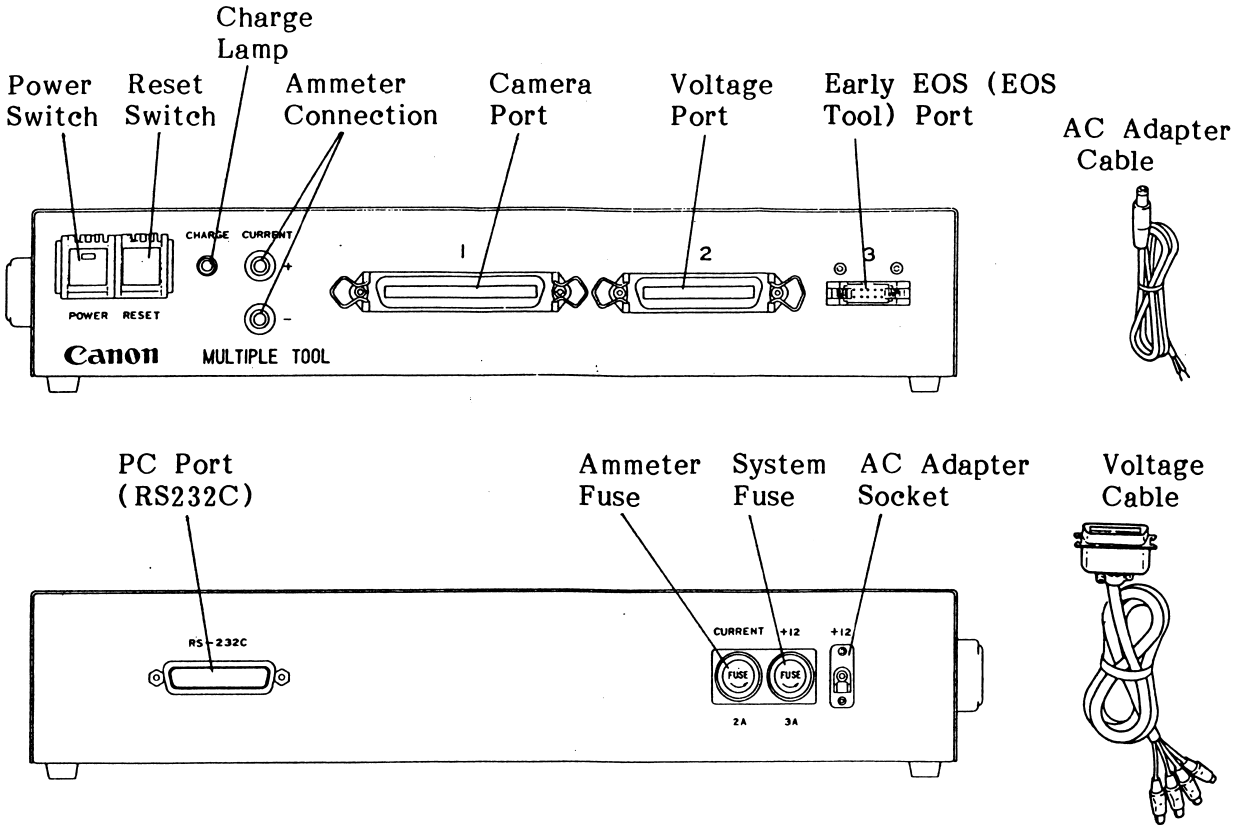
Current:	± 2A, Sensitivity: 1mA
Voltage:	± 15V, Sensitivity: 5mV

5. Temperature Range: 0 to 50°C

6. Charge Lamp:

w/ AC Adapter:	Power Switch on -- Lamp off
	Power Switch off - Lamp on (red or green)
w/ NiCd battery:	Battery OK -- Lamp on (green)
	Battery low - Lamp on (red)

NOMENCLATURE



PREPARATIONS

The following ancillaries are necessary to use this tool.

1. Personal Computer (see detail requirements below)
2. RS232C cable
3. MS-DOS (or PC-DOS) System (Version 3. 1 x or later)
4. AC Adapter (12 - 16VDC output, 1A capacity)
   (compatible connector furnished with Multiple Tool)
5. Voltage cable (furnished with Multiple Tool)
6. Connector Adapter for Camera to be tested
7. Camera to be tested

Compatible Personal Computers

IBM PC/XT/AT with at least 640 kByte of memory, a RS232C communications port, at least two disk drives (one must be compatible with the 2D software disk) and a CGA or better display.

NEC PC98Series: Software for these domestic machines is available only in Japanese.

SET-UP

1. Connection

TURN OFF all POWER SWITCHES

1. Connect the PC and Multiple Tool with the RS232C cable. (The RS232C port on some machines is marked COM1.)

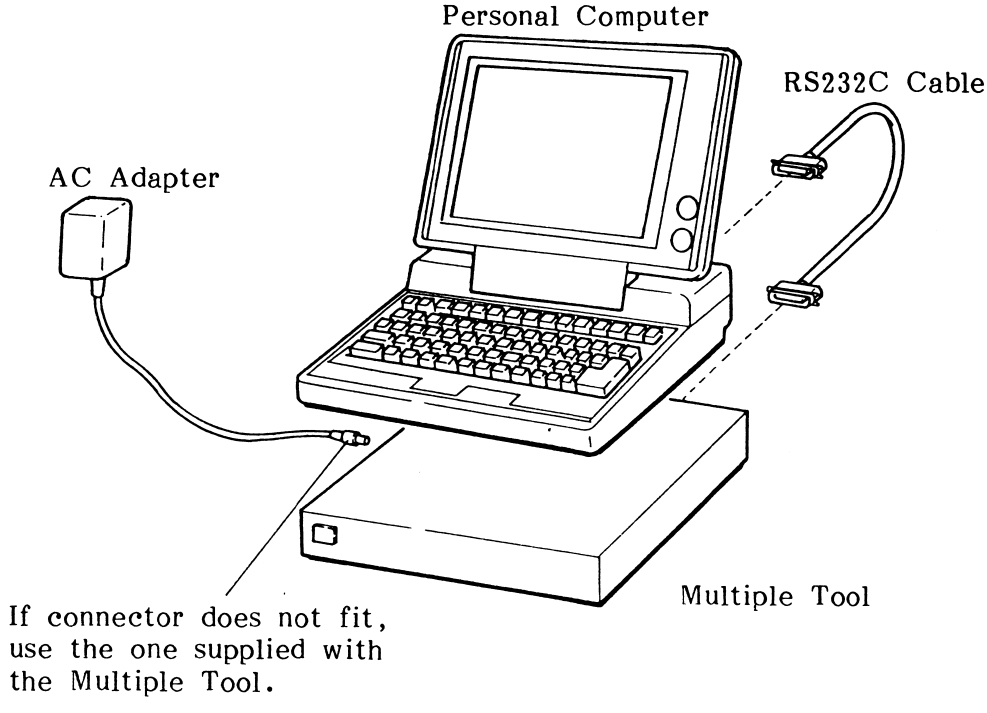
2. Attached the AC Adapter to the Multiple Tool. (If the adapter does not have the correct plug, replace it with the one supplied with the Multiple Tool. Polarity is not important).

3. When the AC Adapter is connected, the charge lamp will light regardless of whether the Multiple Tool switch is on or not. It will light green if the NiCd battery is charged and red if the battery is low.

CAUTION: DO NOT place the Multiple Tool near heat sources! The tool contains a ambient temperature sensor which is an important part of the adjustment process. If the tool is at a different temperature than the camera being tested, results will be incorrect.

4. Activate the PC. Firing up the PC varies. Follow your machines instructions. If your PC has no RS232C port, the 'IBM Asynchronous Communications Adaptor' is required.

Laptop PC Set-up



ADJUSTMENT SOFTWARE DISK ASSEMBLY

Introduction

The adjustment software disk (IBM PC type, 5" 2D or 3.5" 2DD) that Canon supplies for use with the Multiple Tool does not include the MS-DOS† operating program, for several reasons including copyright restrictions, and differences in hardware and software for various PCs. It is necessary to combine the adjustment software provided by Canon and your MS-DOS system software onto a work disk.

The steps are different for floppy disk and hard disk, so follow the correct instructions.

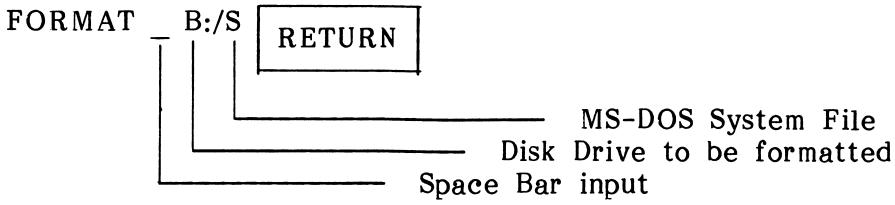
IBM PC

1. Floppy Disk (Double Disk Drive) Instructions

1-1 Install the MS-DOS disk in Disk Drive A and turn the power on.

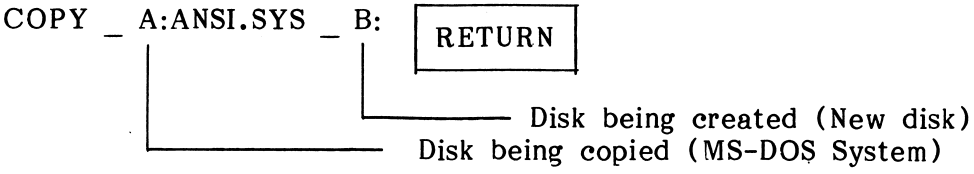
1-2 When the system is loaded, install a new blank disk in Disk Drive B.

1-3 Format the new disk in drive B.



Follow any prompts that appear. (Refer to the MS-DOS manual if necessary).

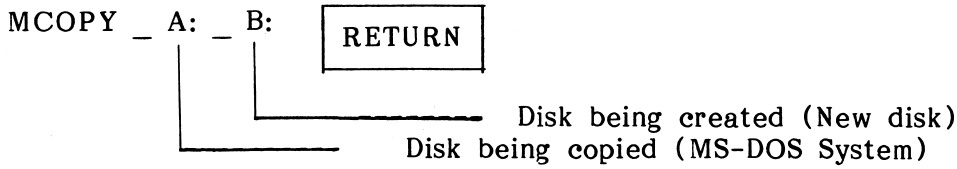
1-4 When formatting is completed, there is one more file in the MS-DOS disk that must be copied. This file, ANSI.SYS, is necessary to drive the Adjustment software. [File Name: ANSI.SIS (Extended Screen and Keyboard Control)] Type as follows:



1-5 When formatting is completed, remove the MS-DOS disk from Disk Drive A and install the original Adjustment software disk supplied by Canon.

† MS-DOS is a trademark of Microsoft Corporation

1-6 Type in the following prompt to copy the original Adjustment software disk onto the disk in Disk Drive B.



The disk in Disk Drive B now contains both the MS-DOS system software and the original Adjustment software. To check, turn off the power and type in:

EOS 1000
REBEL
RETURN

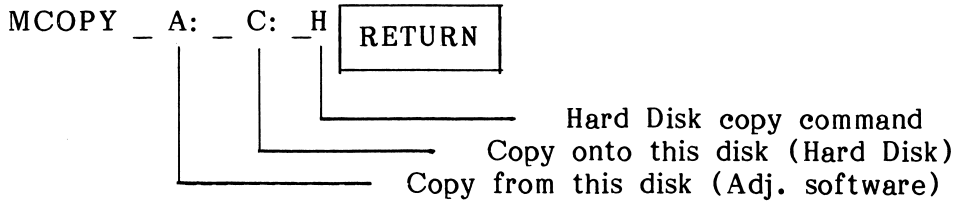
The first screen of the camera's adjustment sequence should appear.

Note: Remove the original adjustment software disk and store it in a safe place.

2. Hard Disk Drive Instructions

2-1 Place the original adjustment software disk in Disk Drive A. (A>) should appear.

2-2 Type in the following command (assuming that your hard disk is position C).



H: The H command allows all files except the AUTOEXEC.BAT and the CONFIG.SYS files on the original adjustment disk to be copied onto the hard disk.

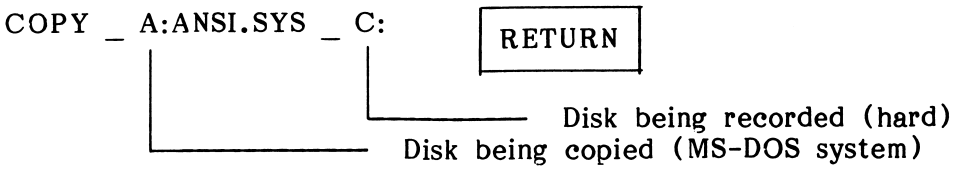
2-3 Next, to check if the following files exist, type in the following:

File Names: ANSI.SYS (Extended Screen and Keyboard Control)
CONFIG.SYS

C: RETURN

DIR RETURN

2-4 If the ANSI.SYS file exist, proceed to step 2-5. If not, put the MS-DOS system disk in drive A and type in the following:



2-5 If the CONFIG.SYS file exist, check its contents by typing the following:

TYPE _ CONFIG.SYS [RETURN]

If the file does not exist, go to step 2-10.

2-6 Make a note of the contents of the file as displayed on the screen.

```
FILES=20
BUFFERS=10
DEVICE=ATOK6A.SYS /T=1
DEVICE=ATOK6B.SYS
```

Note: If you using a PC with editing software or word processing function, you can skip 2-7 through 2-9 steps. Add the command DEVICE=ANSI.SYS to the end of the displayed files and next press RETURN key. The work disk is now complete. Skip to the closing note after step 2-10.

2-7 To rewrite the file, type the following:

COPY _ CON _ CONFIG.SYS [RETURN]

2-8 Type in the file information which you noted, and add the following information to the end of the file.

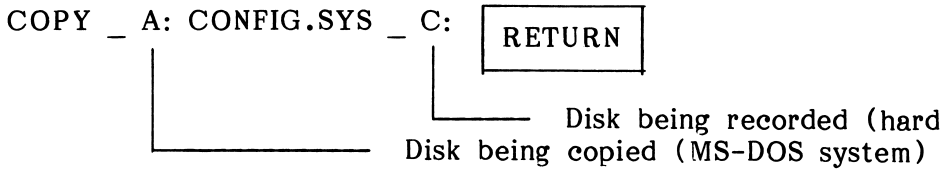
DEVICE = ANSI.SYS [RETURN]

2-9 Hold down the CONTROL key and press the Z key. This is the "end" mark. It will appear on the screen as follows. press RETURN.

^Z RETURN

The work disk is now complete. If you wish to check it, see the closing note after step 2-10.

2-10 If the CONFIG.SYS does not exist, copy it from the original Adjustment software disk as follows. Type in:



Note: The work disk is now complete. If you wish to check it, turn the power off or reset the PC. (If this is not done, the program will not operate properly). Turn the power back on. After the system comes up, type in the adjustment software name.

EOS 1000
REBEL RETURN

The adjustment software program will load, and the first screen will appear.

ERROR CODES

--- INTRODUCTION ---

There are many different possibilities for errors in the Multiple Tool system, so we have devised a system to classify and display a error code when something goes wrong.

--- ERROR CLASSIFICATION ---

A. Setting Error : This is a human error, or "finger trouble" like improperly setting the light source.

B. Software Error : This is a problem with the adjustment software.

C. Hardware Error : This is a problem in the hardware, somewhere in the computer or multiple tool.

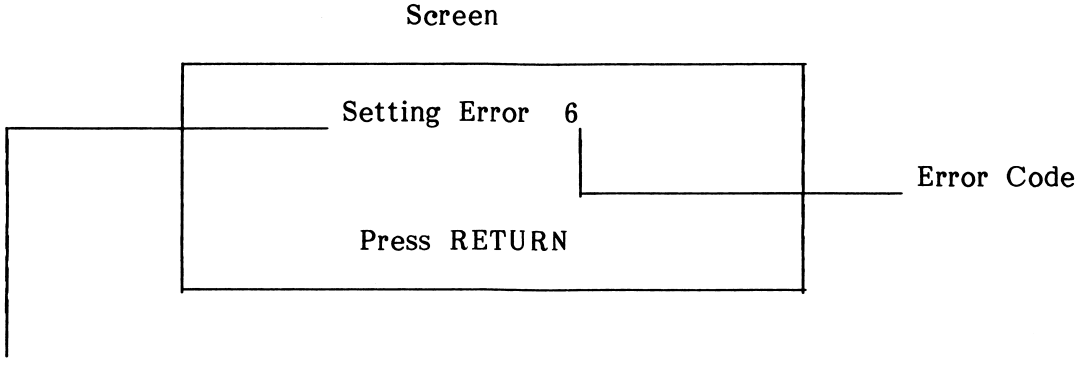
D. Error : This is a miscellaneous error which doesn't fit into one of the above categories.

In addition to these errors, there is a possibility of a system error within the PC, which has its own error detection system. The error note could look something like this:

Illegal function call in line 0 of module XXXX at address xxxx:xxxx

If this happens, make a copy of the inquiry page at the end of this manual, fill it in and send it to your regional headquarters.

--- TYPICAL ERROR SCREEN ---



Error Code	Cause of Error	Remedy
6	The calculations produce an impossible result.	1. The brightness or voltage is not set properly. Reset and resume procedure. 2. Camera sensor may be faulty. Change camera and try again to determine where fault lies.

--- ERROR CODE TABLES ---

Setting Errors

<!!> If remedy fails to resolve the problem, fill in a copy of the inquire page and send to your regional headquarters.

Error Code	Cause of Error	Remedy
6	The calculations produce an impossible result.	1. The brightness or voltage is not set properly. Reset and resume procedure. 2. Camera sensor may be faulty. Change camera and try again to determine where fault lies.
7	Not enough memory in	1. Check memory capacity of PC. 640Kbyte is required. Capacity should appear on screen when PC is switched on. 2. Some other program is occupying disk memory (mainly a hard disk problem).
11	The calculations produce an impossible result.	1. The brightness or voltage is not set properly. Reset and resume procedure. 2. Camera sensor may be faulty. Change camera and try again to determine where fault lies.
53	File cannot be located	Adjustment software work disk is faulty. Make a new work disk.
68	No RS232C interface	1. Check PC manual is see if RS232C is included. 2. If not included, consult with your PC supplier.
73	Work disk was formatted with early MS-DOS(prior to Ver. 3-1)	Acquire MS-DOS Version 3-1 or later and make a new work disk with it.
76	File cannot be located	Adjustment software work disk is faulty. Make a new work disk.

Setting Errors (cont.)

Error Code	Cause of Error	Remedy
100 105	Communications error between camera and multiple tool	1. Check if camera is on. 2. Check if camera has VBAT. 3. Check connector adaptor connections. 4. Camera is faulty. Check adjustment with a known-good camera. 5. The adjustment software does not match the attached camera. Remove the disk and install the correct one. 6. Possible multiple tool error. Turn off for at least a minute and restart. 7. EOS700 may be set to shutter priority. Reset to a P.I.C. mode and restart.
101	Illegal data from camera	1. Check connector adaptor connections. 2. Camera is faulty. Check adjustment with a known-good camera.
102 103 104	Mistake in communications of program or data from PC<—>MT.	Check connection between PC and MT.
200 201	File cannot be located	Adjustment software work disk is faulty. Make a new work disk.
202	Work disk is faulty	Adjustment software work disk is faulty. Make a new work disk.

Software Errors

<!!> If a software error occurs, fill in a copy of the inquire page and send to your regional headquarters.

Hardware Errors

Error Code	Cause of Error	Remedy
150	Multiple Tool failure	1. Check connection between PC and MT. 2. If error is not cleared, request assistance from regional headquarters.
151	Multiple tool memory failure	Request assistance from regional headquarters.
152	Multiple tool program will not run properly	1. The MT program is on the adjustment software work disk, which is probably faulty. Make a new work disk. 2. Same as Error code 150.
153	Multiple tool thermom-eter failure	Request assistance from regional headquarters.

Errors, Miscellaneous

Error Code	Cause of Error	Remedy
58	File name exist on disk - cannot record	Use a different file name.
61	Disk too near full	Use one disk for each model. Disk do not have enough memory for several programs.
64	Improper file name	Use a different file name.
70	Cannot write on disk	The disk is Write Protected" Set it in "Write Enable" mode.
71	Disk drive is not ready	Close the disk drive door and try again.

<!!> CAUTION <!!>

1. Always apply power to the PC and Multiple Tool and load the program before attaching the camera to the Multiple Tool.

2. Do not site the Multiple Tool near a heat source (such as the PC's exhaust). (It may be positioned under the PC.)

3. Refer to the PC's Owners Manual for details on its operation.

4. A 9V AC Adapter will power the Multiple Tool, but it will not fully charge the built-in NiCd battery. Use a 12 to 16 volt, 1A AC Adapter.

5. When operating on the built-in battery, attach the AC Adapter as soon as possible after the charge light turns red. You have approximately 30 minutes of power remaining, but if the Multiple Tool is used when the battery is quite low, erroneous data may be recorded in the camera's memory.

ERROR INQUIRY

To: Canon

Camera Technical Dept.

From: _____

_____

_____

Date: _____

Adjustment Software

Model: _____ (E) (J)

Soft Version # _____

MS-DOS Version # _____

Personal Computer

Make & Model: _____

Memory: _____ Kbyte

Peripherals: (Hard dish, etc.)

Category

		Error #
☐ Error enquiry	☐ Setting Error	[ ]
☐ Software suggestion	☐ Software Error	[ ]
☐ Manual suggestion	☐ Hardware Error	[ ]
☐ Other	☐ Error	[ ]
	☐ Other	[ ]

COMMENTS : [PLEASE TYPE OR PRINT CLEARLY IN BLOCK LETTERS]

Canon Inc.

Camera Technical Service Department

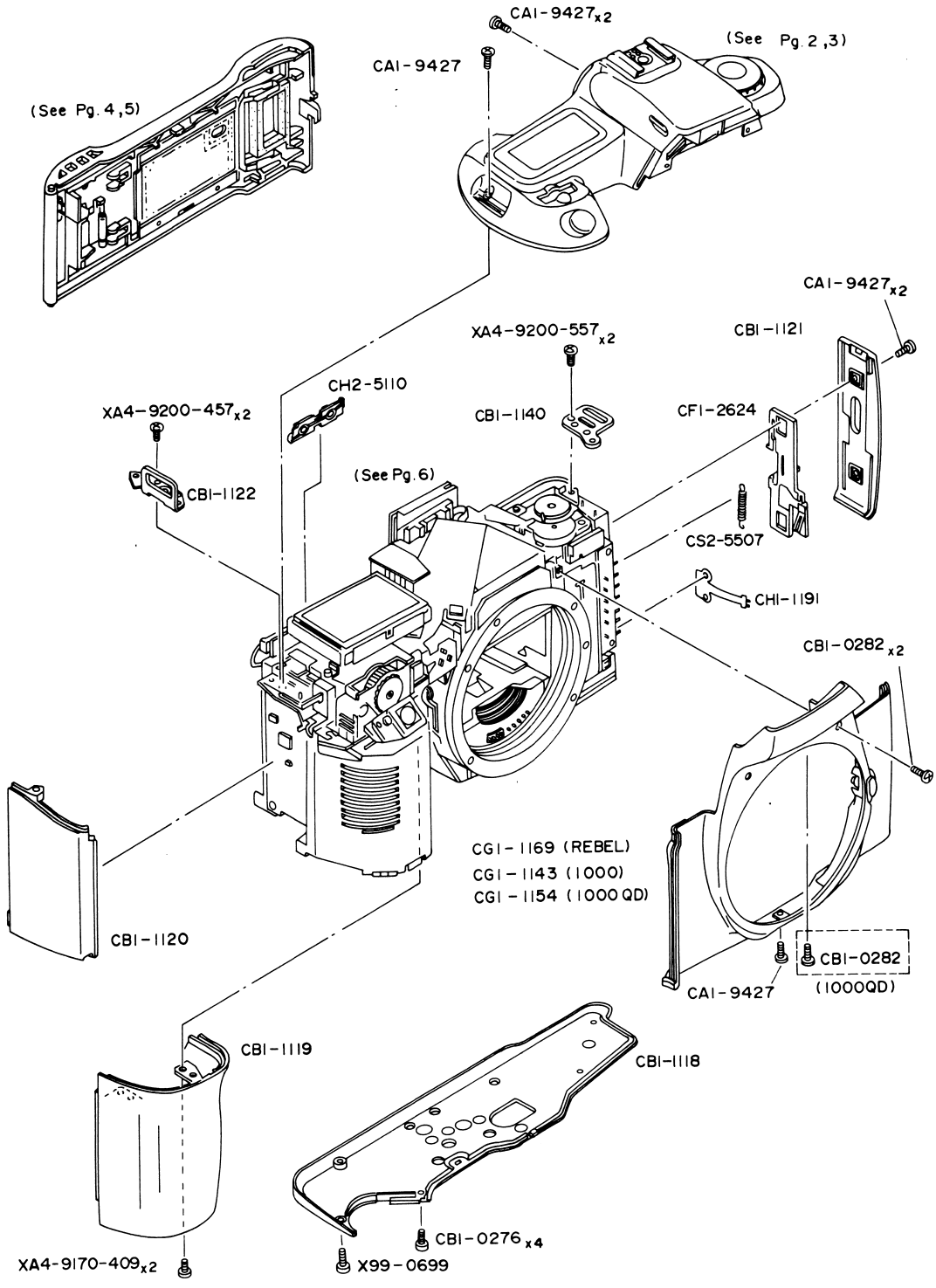
Software Mgr. _____

Manual Mgr. _____

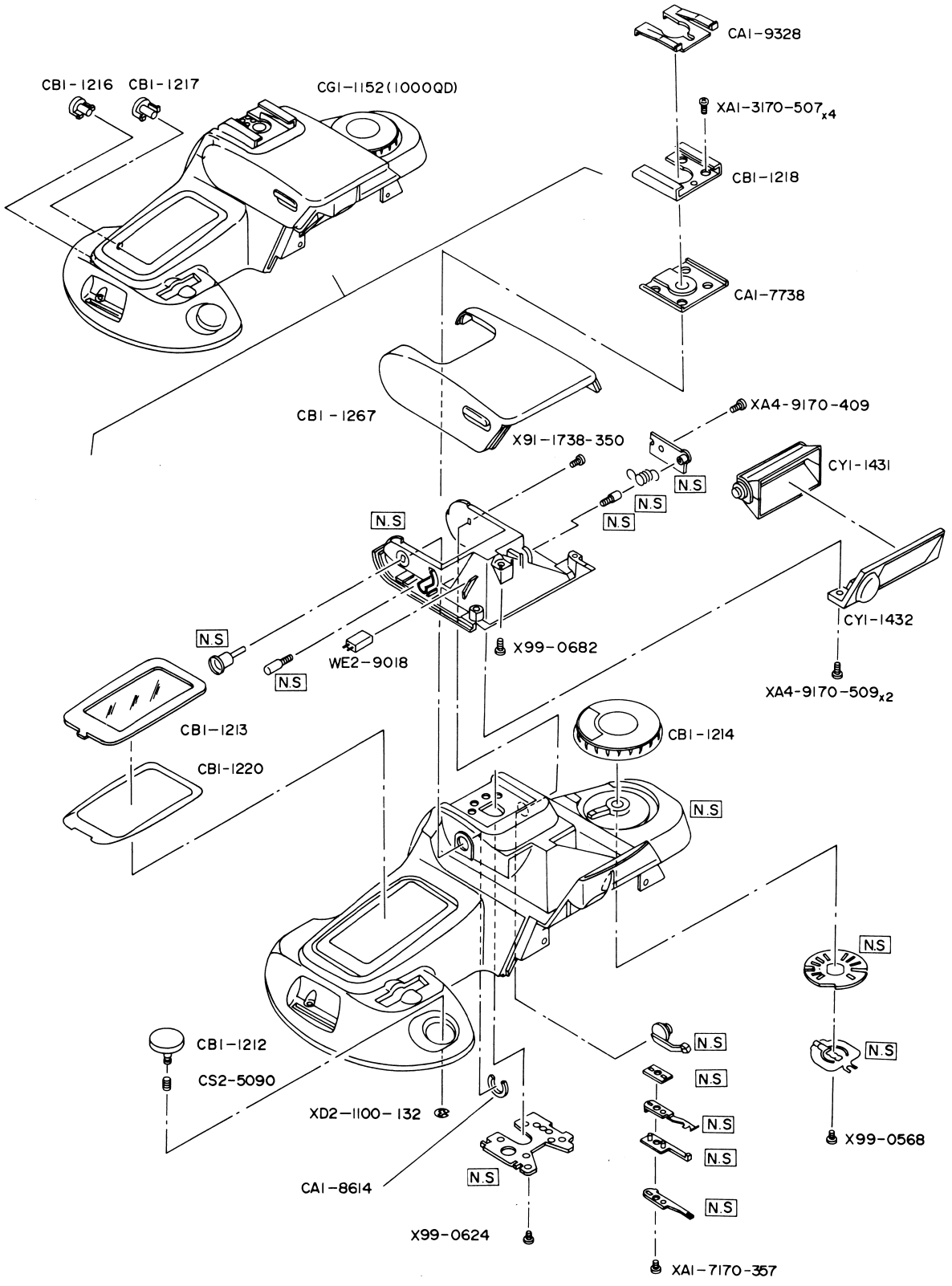
Date rcvd. : _____

Date action taken: _____

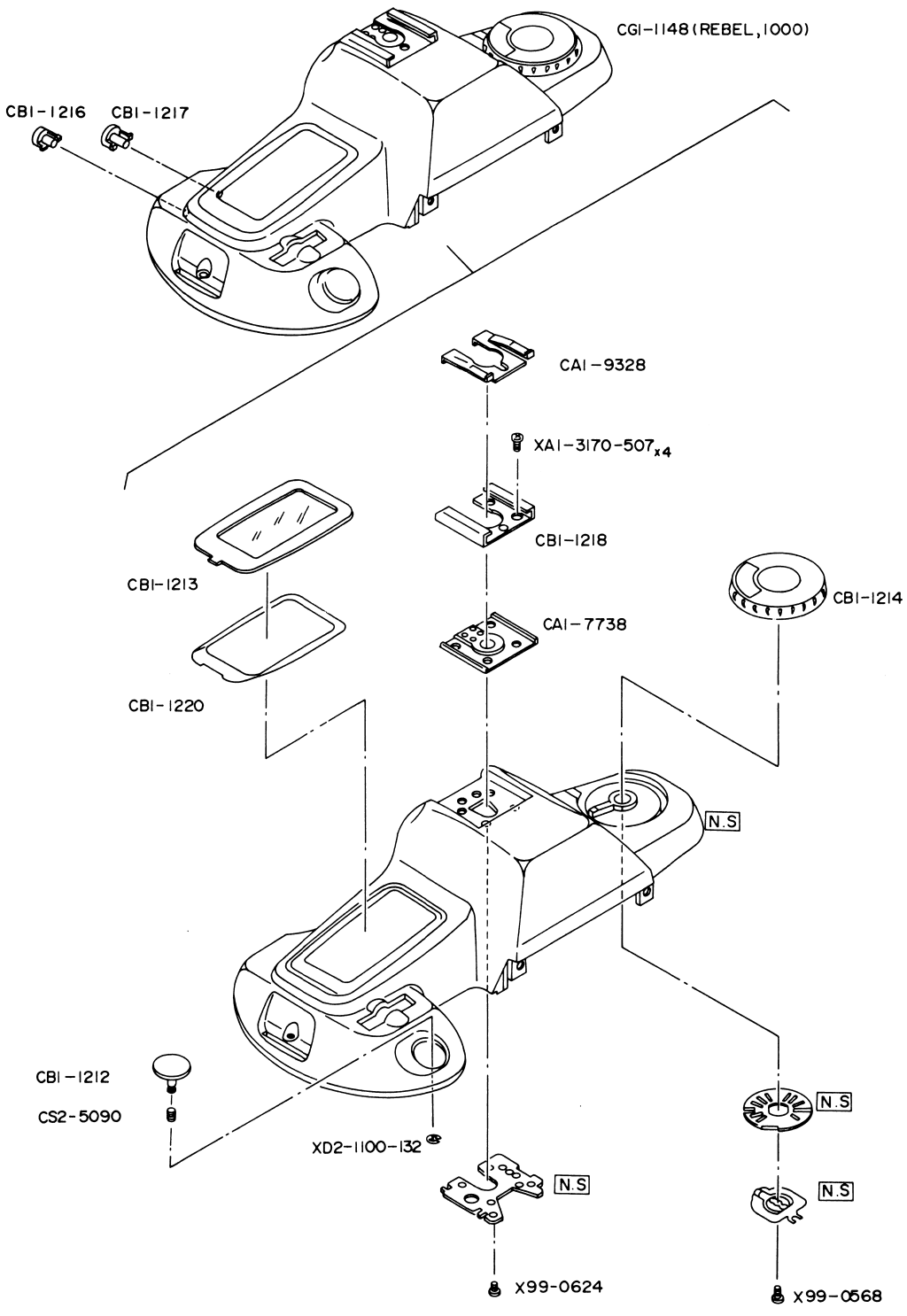
CANON EOS REBEL, 1000, 1000QD



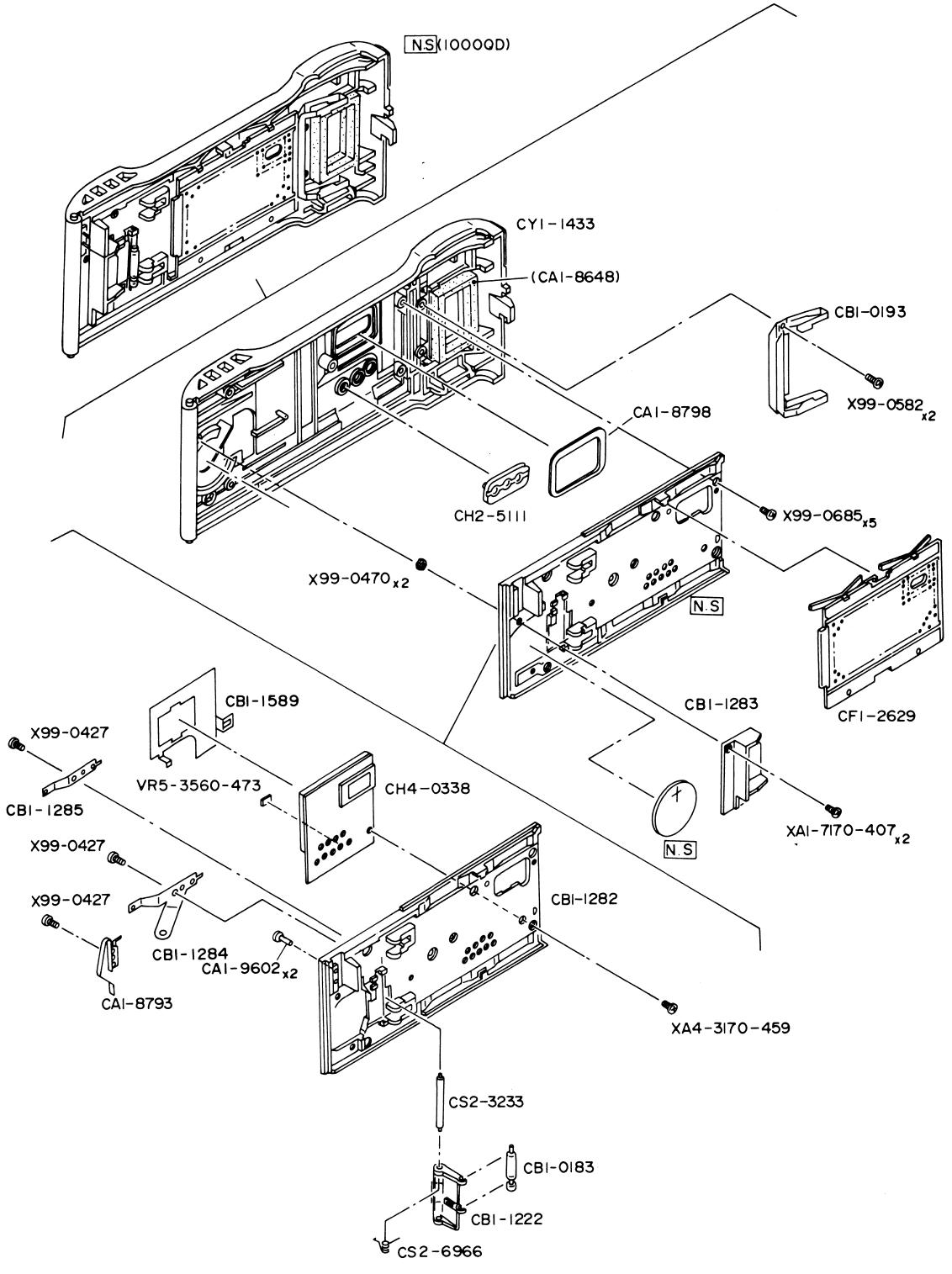
CANON EOS REBEL, 1000, 1000QD



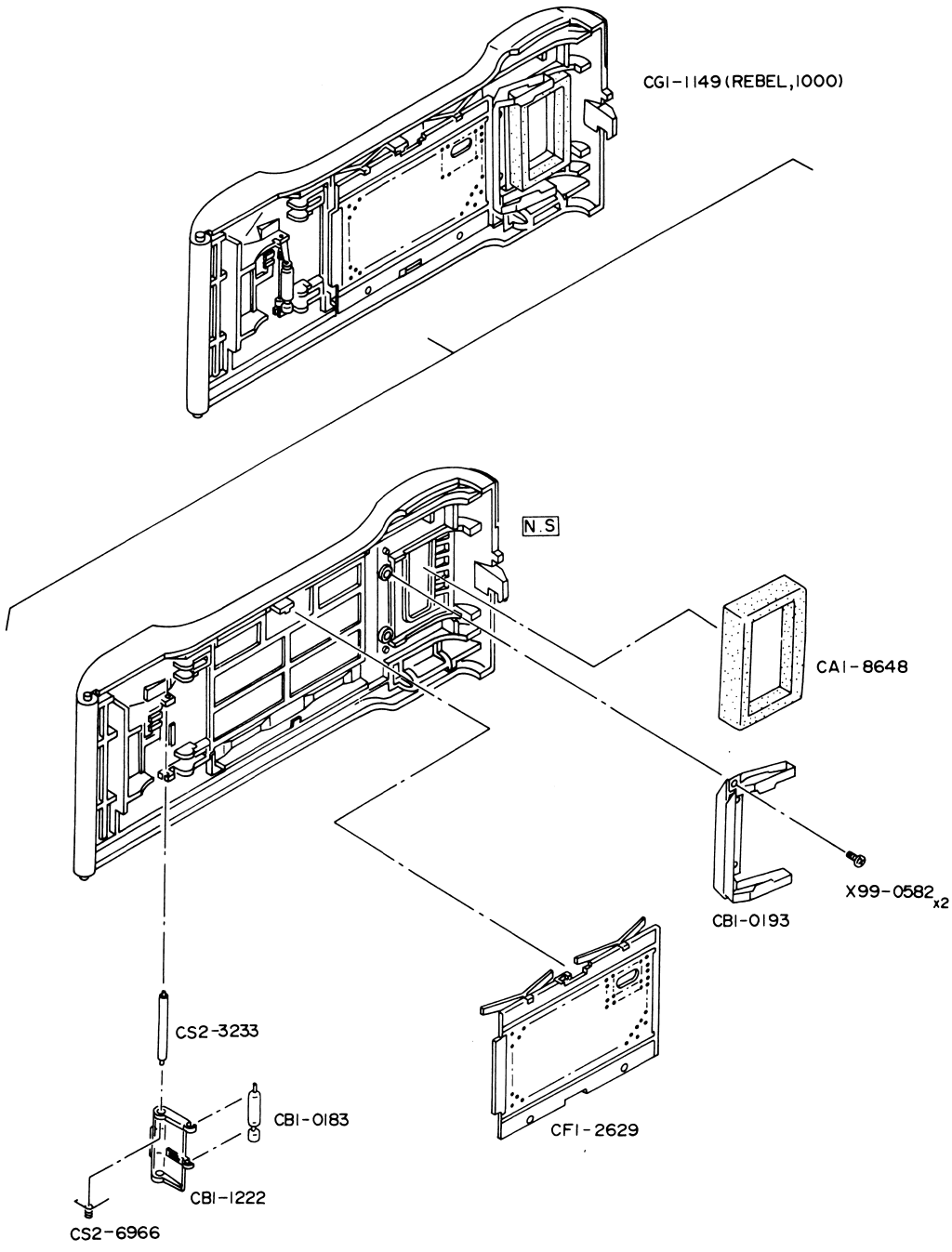
CANON EOS REBEL, 1000, 1000QD



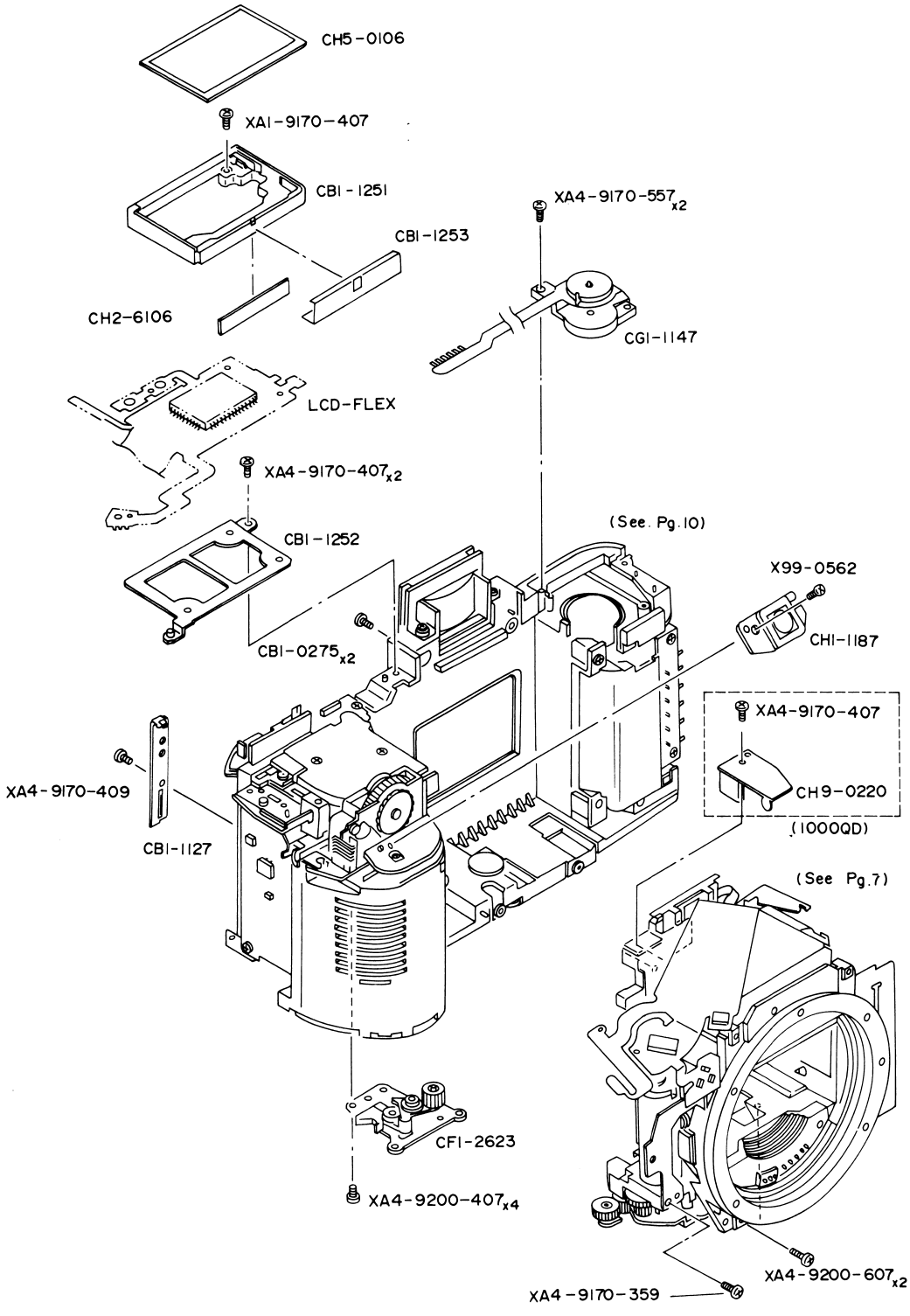
CANON EOS REBEL, 1000, 1000QD



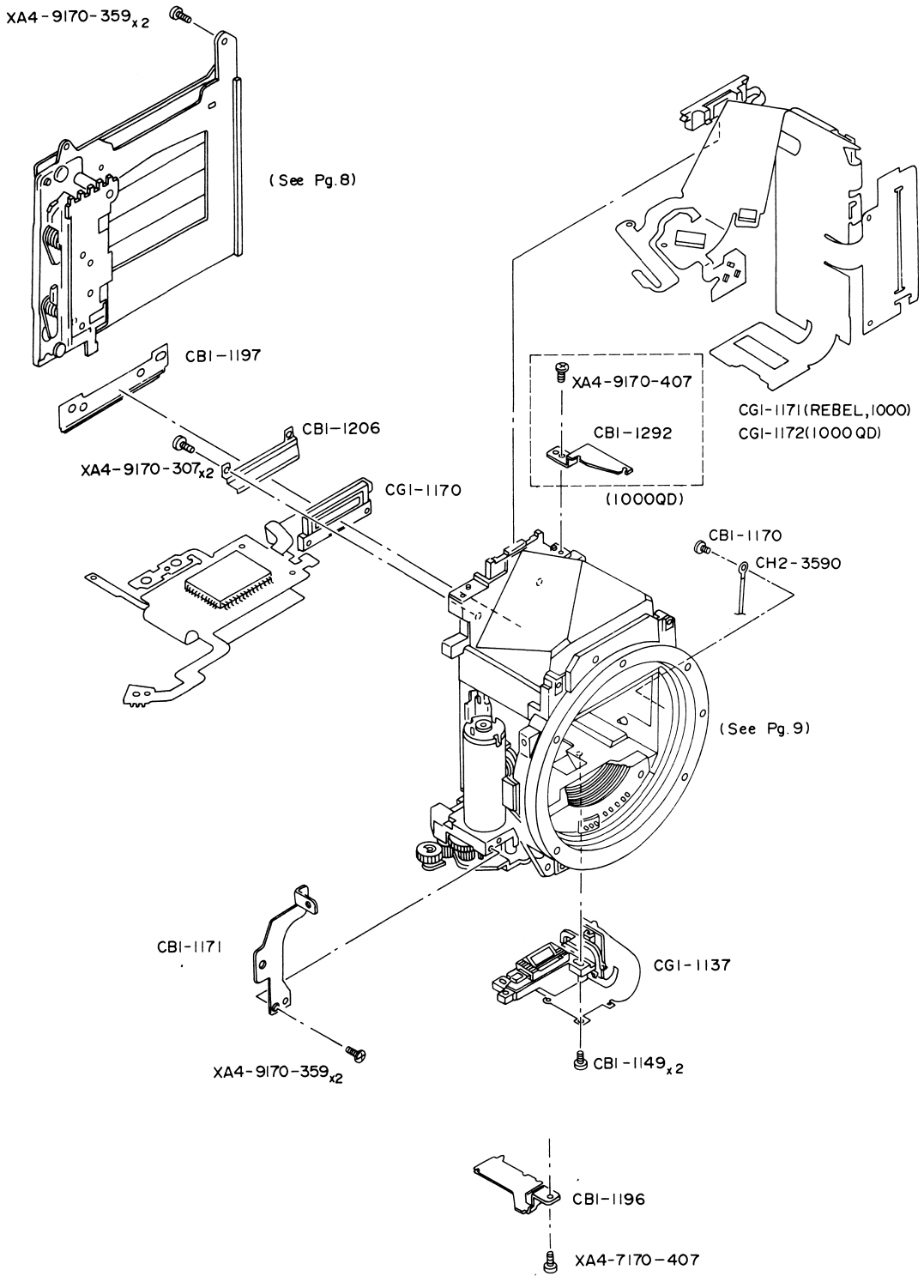
CANON EOS REBEL, 1000, 1000QD



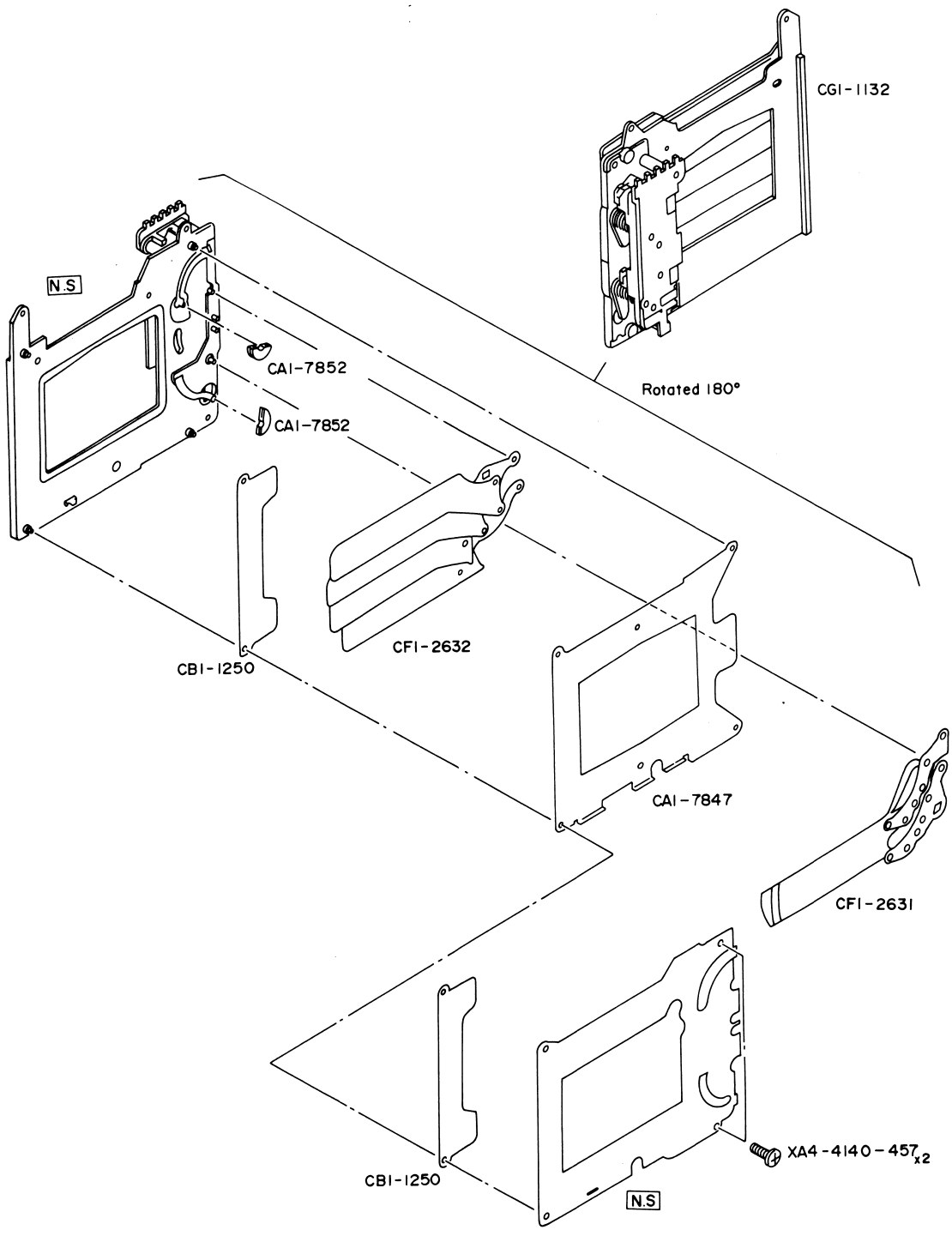
CANON EOS REBEL, 1000, 1000QD



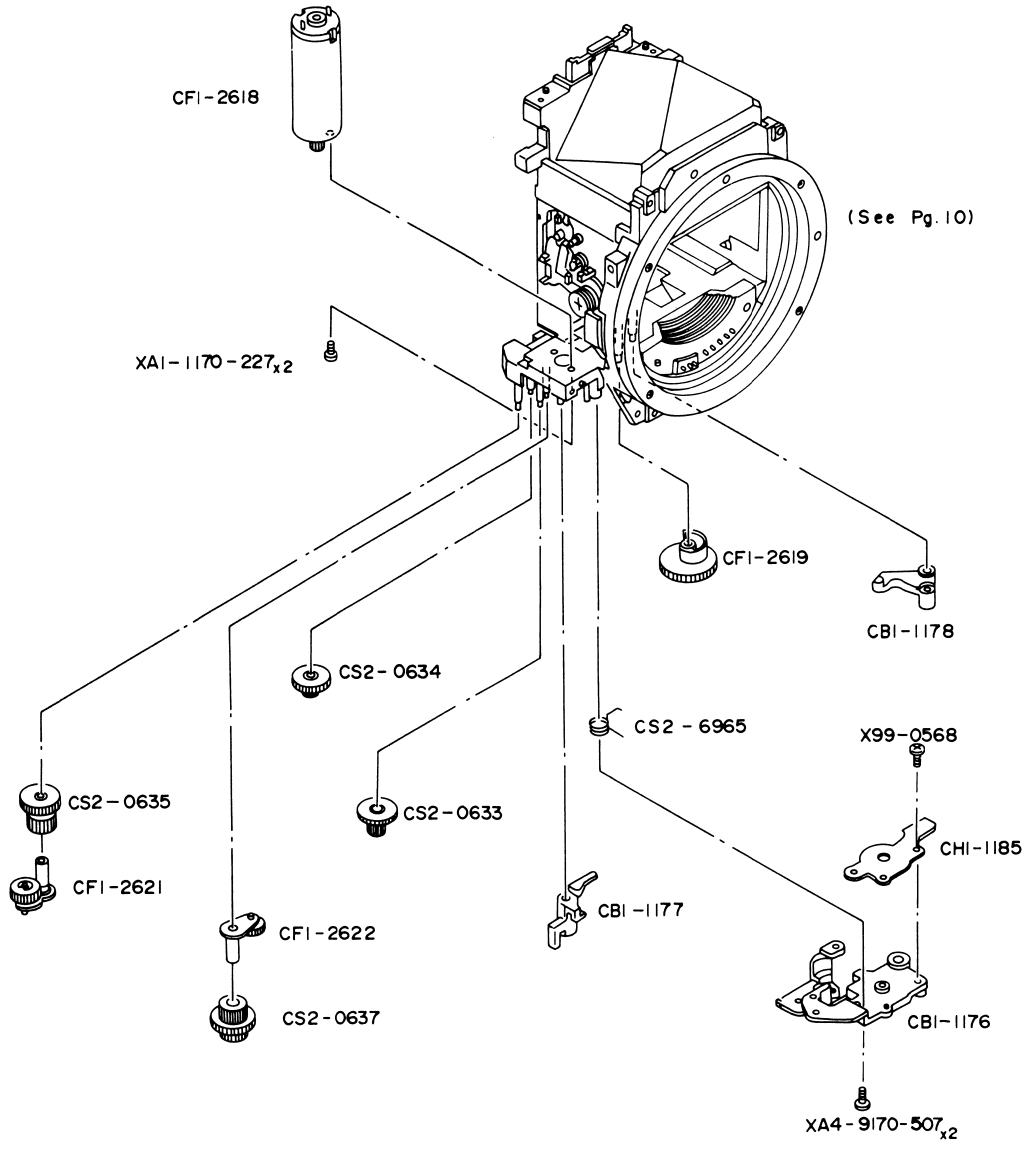
CANON EOS REBEL, 1000, 1000QD

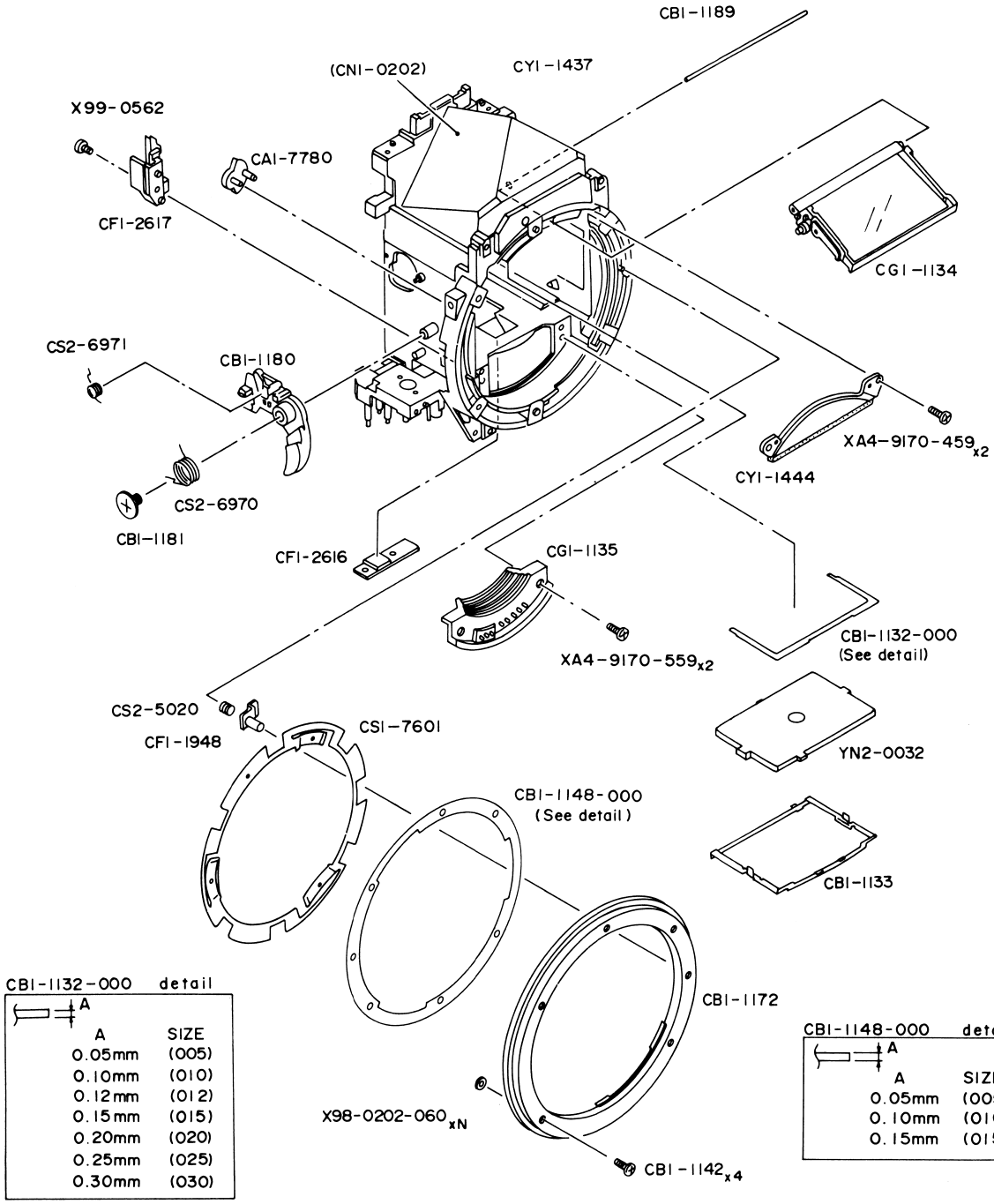


CANON EOS REBEL, 1000, 1000QD



CANON EOS REBEL, 1000, 1000QD





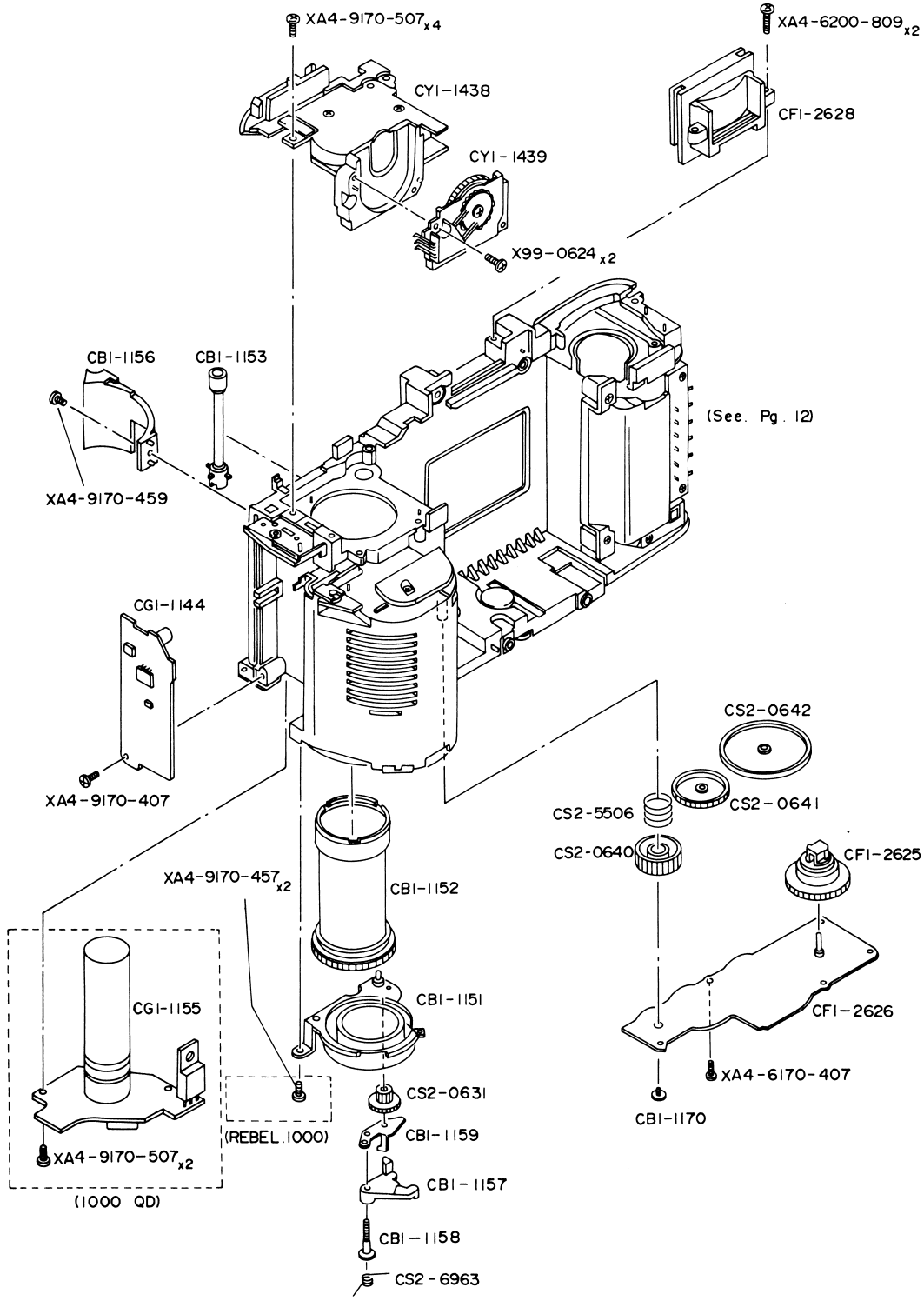
CBI-1132-000 detail

A	SIZE
0.05mm	(005)
0.10mm	(010)
0.12mm	(012)
0.15mm	(015)
0.20mm	(020)
0.25mm	(025)
0.30mm	(030)

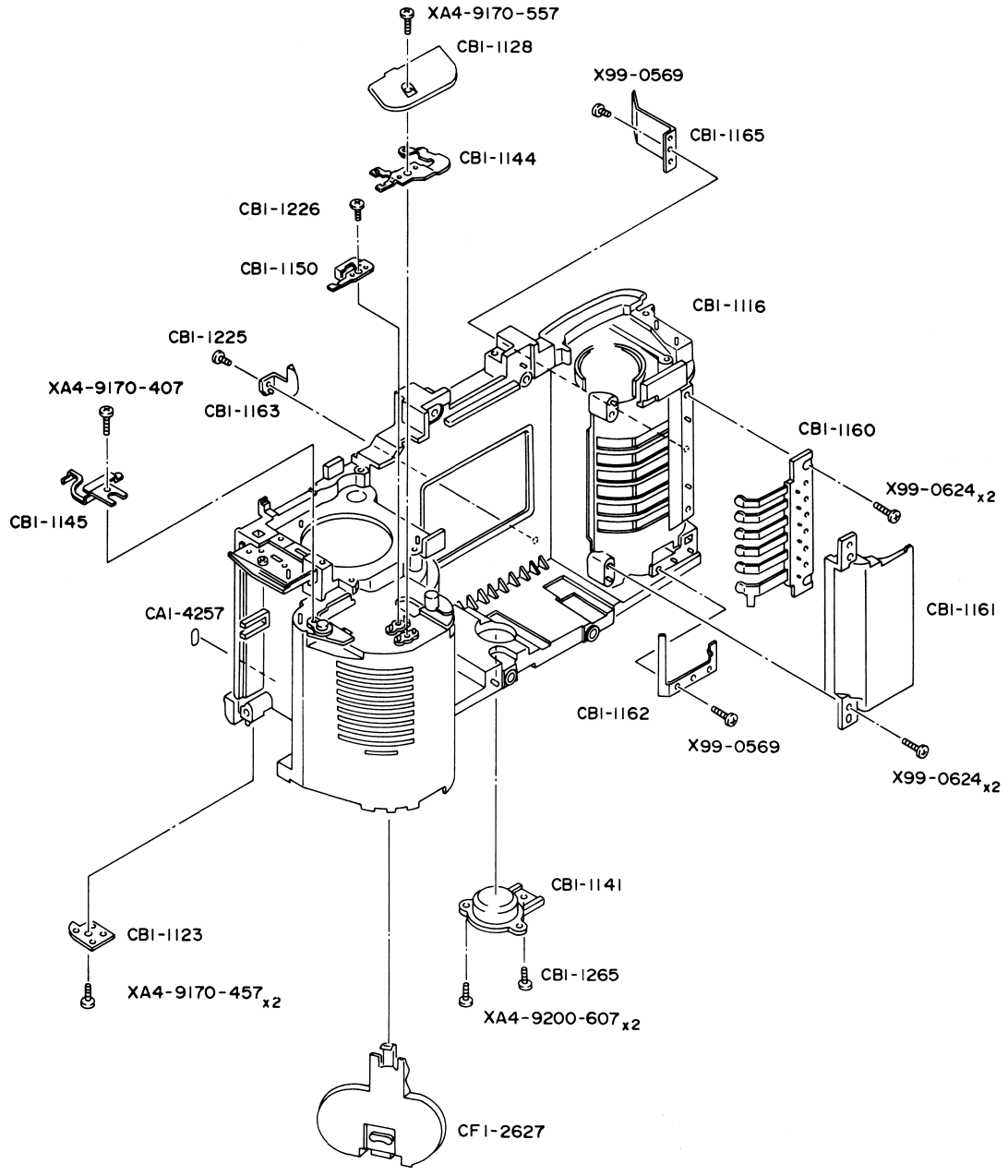
CBI-1148-000 detail

A	SIZE
0.05mm	(005)
0.10mm	(010)
0.15mm	(015)

CANON EOS REBEL, 1000, 1000QD

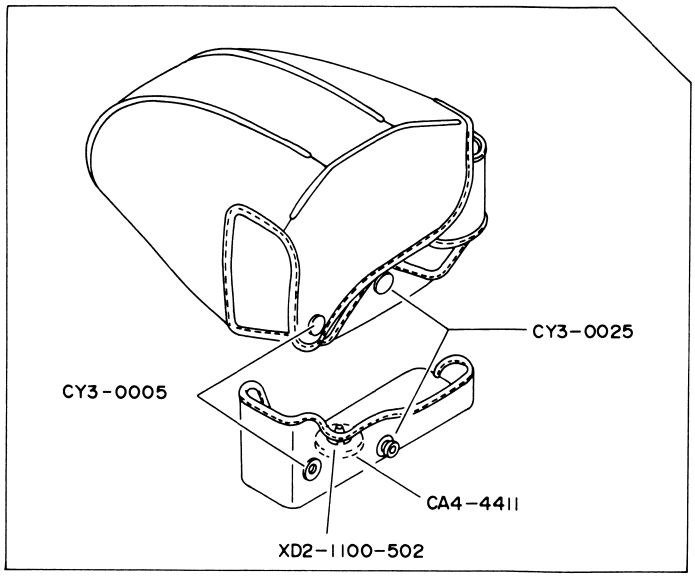


CANON EOS REBEL, 1000, 1000QD

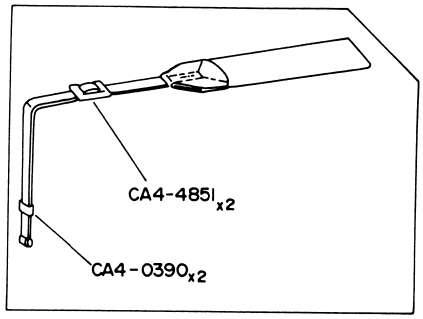


CANON EOS REBEL, 1000, 1000QD (ACC)

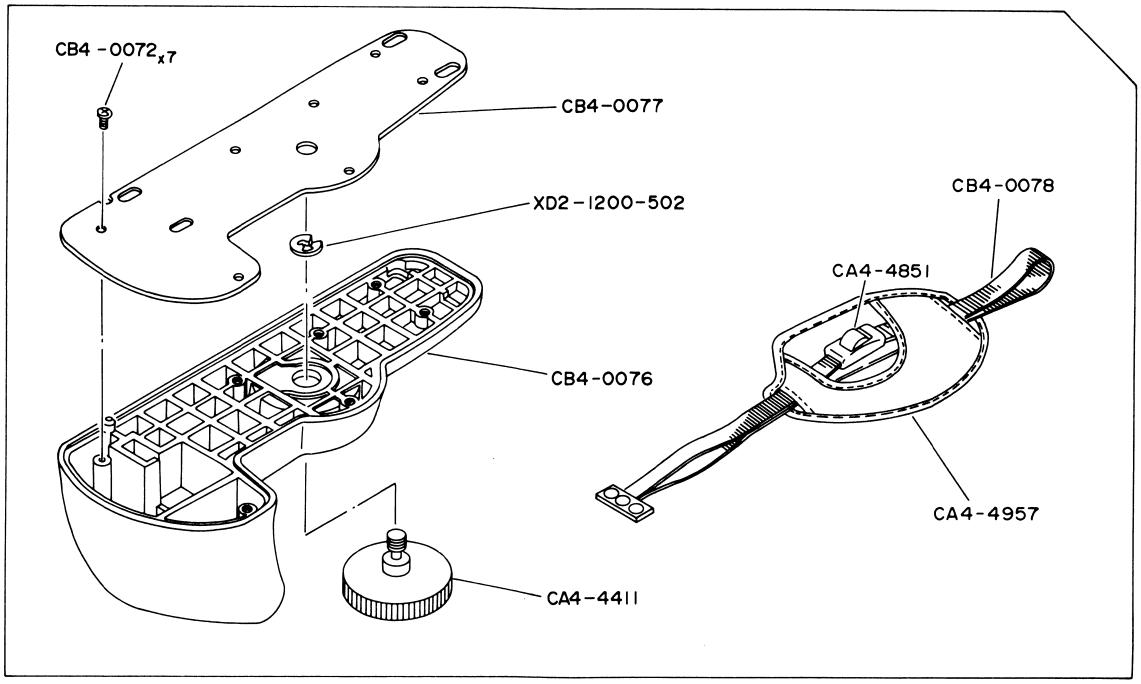
C46 - 1641 SEMI HARD CASE EH5



C56 - 1462 WIDE STRAP EW-2



C51-9991 GRIP EXTENSION GR-70



5. ELECTRICAL DIAGRAMS

Contents

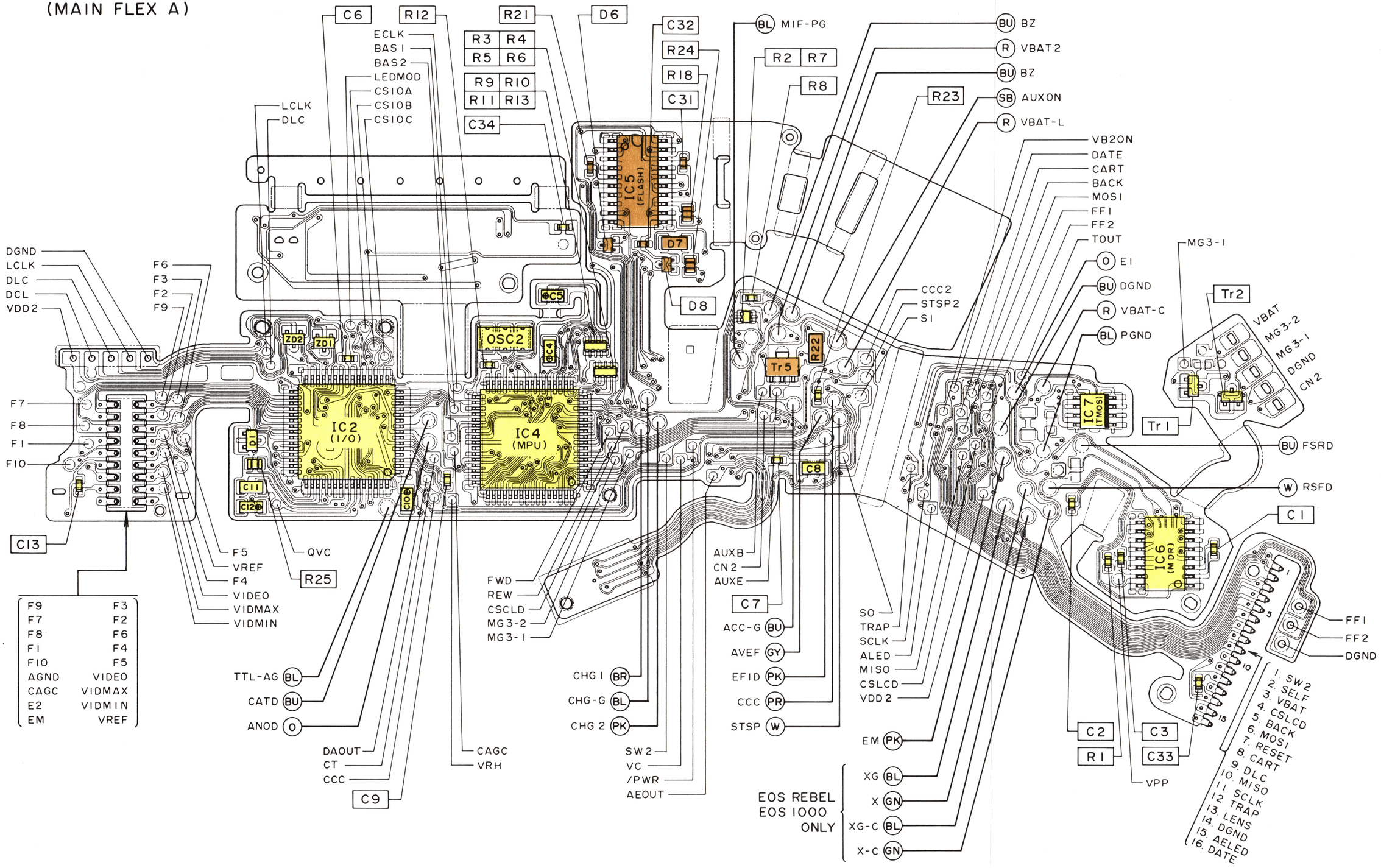
- PATTERN DIAGRAMS
- SCHEMATIC DIAGRAM
- WIRING DIAGRAM

P. C. B. DIAGRAM

PARTS ▭ ARE ONLY FOR EOS 1000 Q.D.

REF. NO. C12-8191
C12-8192
C12-8193

(MAIN FLEX A)

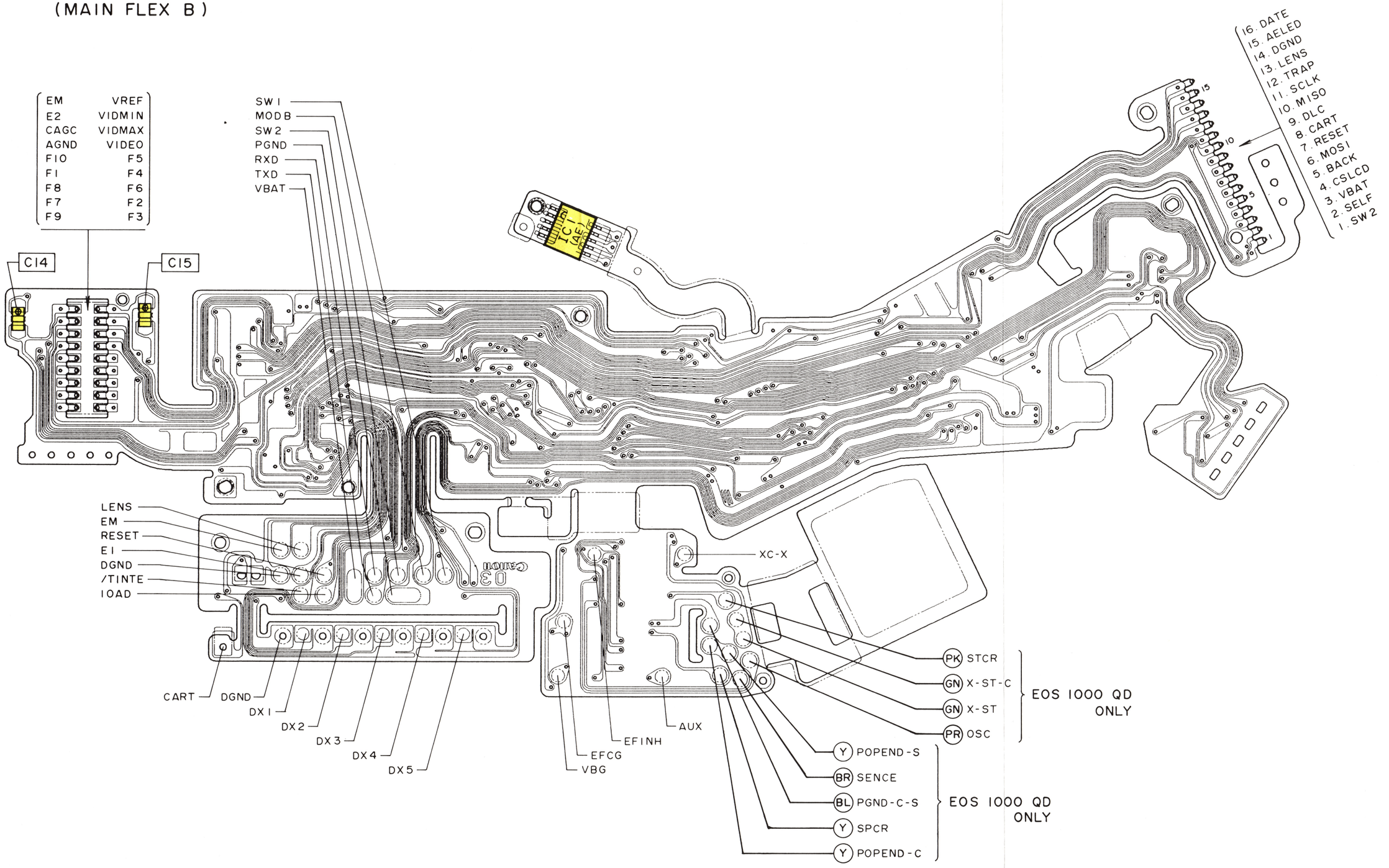


01 SEP, 1990

P.C.B. DIAGRAM

(MAIN FLEX B)

REF. NO. C12-8191
C12-8192
C12-8193

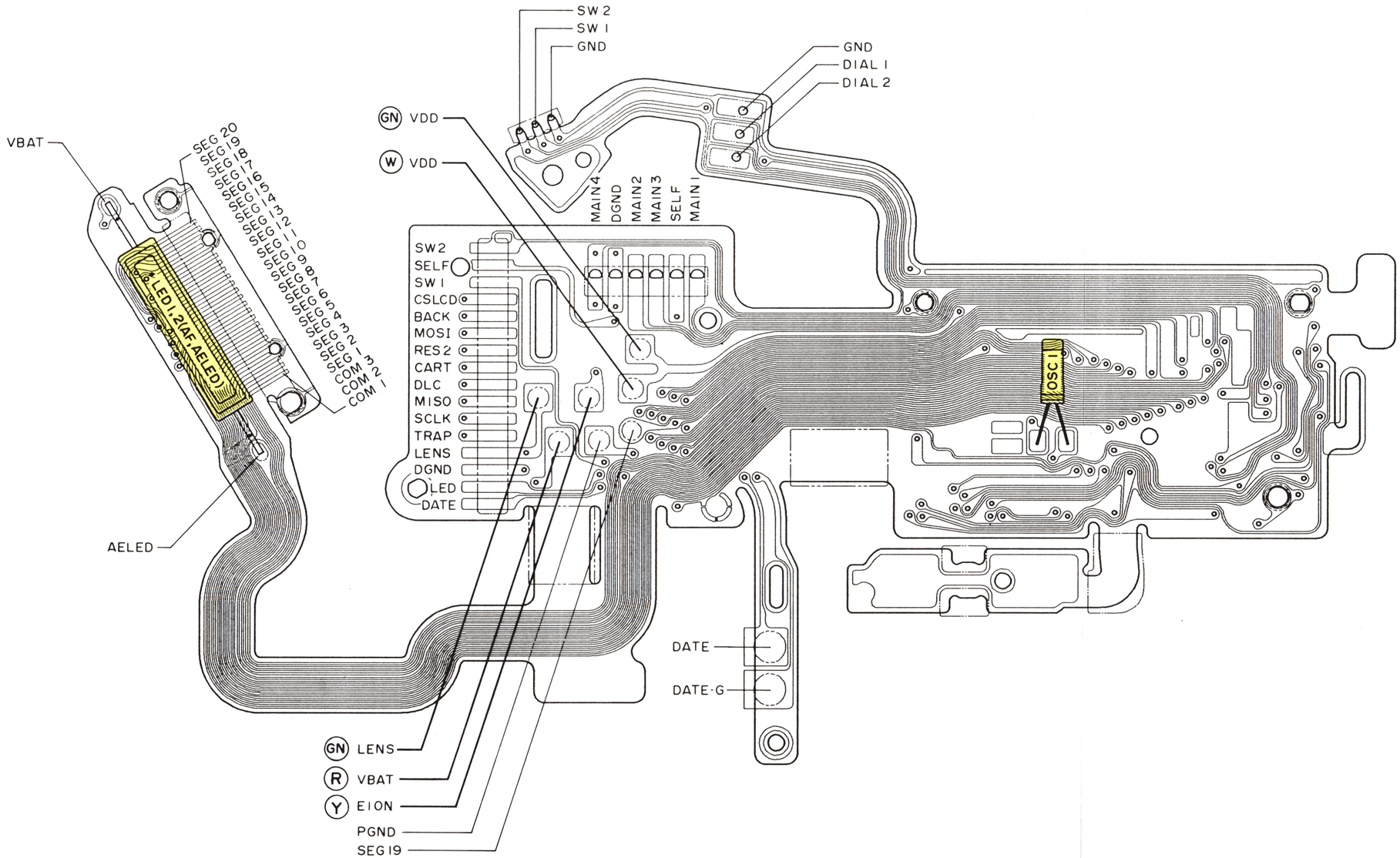


01 SEP, 1990

P. C. B. DIAGRAM

REF. NO. C12-8191
C12-8192
C12-8193

(LCD FLEX A)

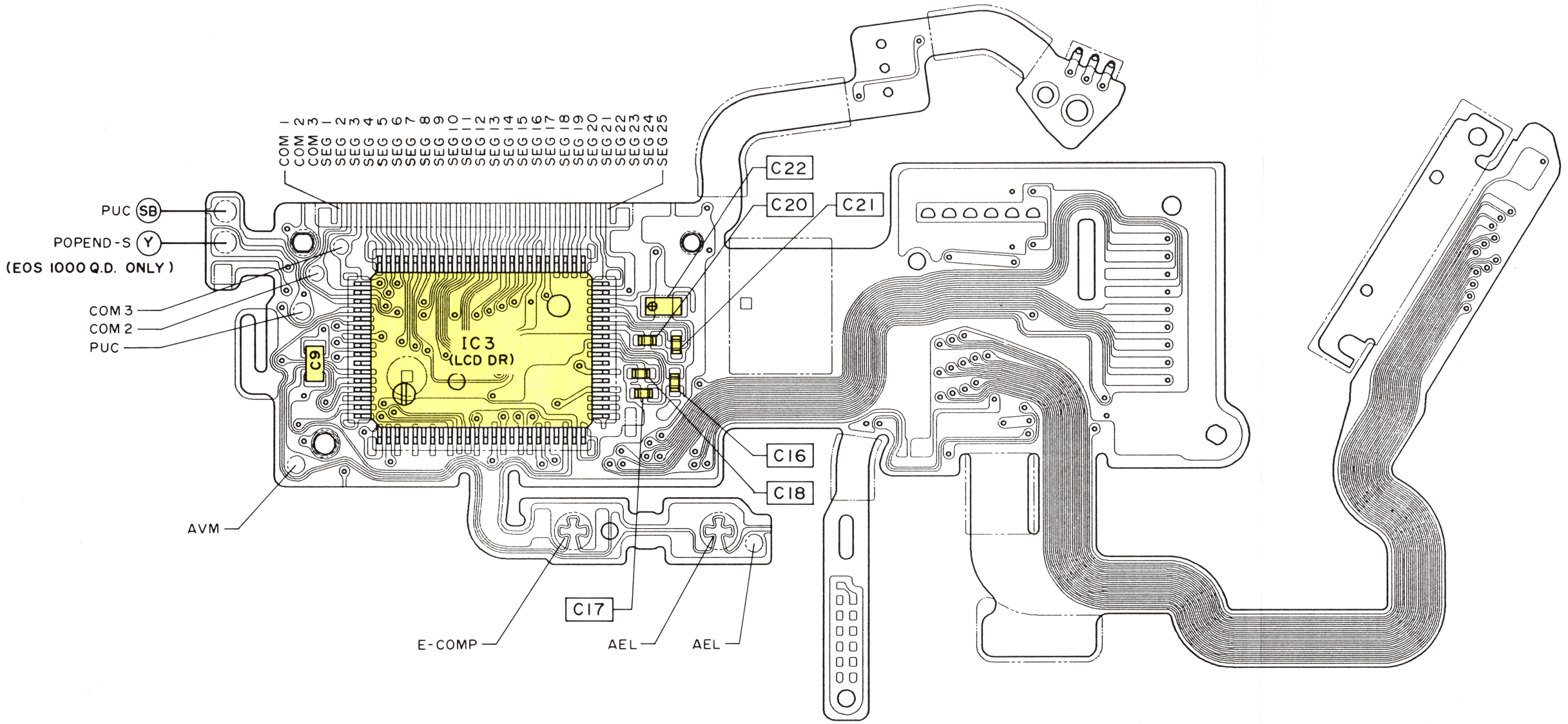


01 SEP, 1990

P. C. B. DIAGRAM

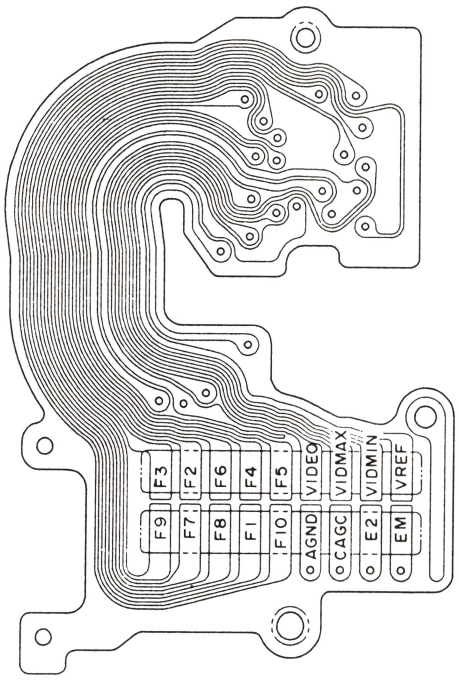
REF. NO. C12-8191
C12-8192
C12-8193

(LCD FLEX B)

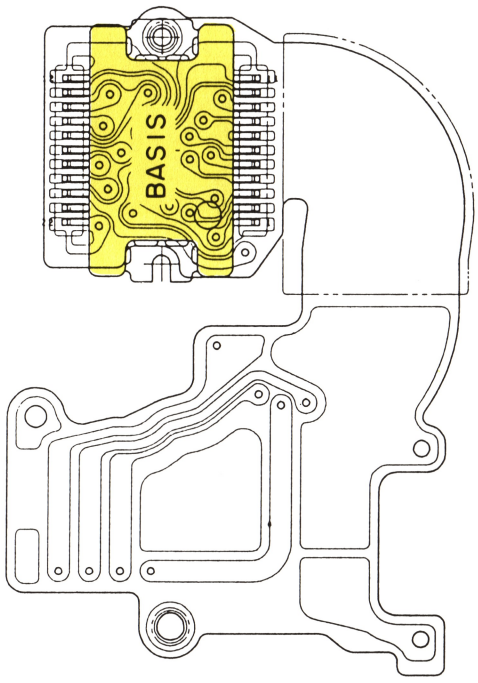


REF. NO. C12-8191
C12-8192
C12-8193

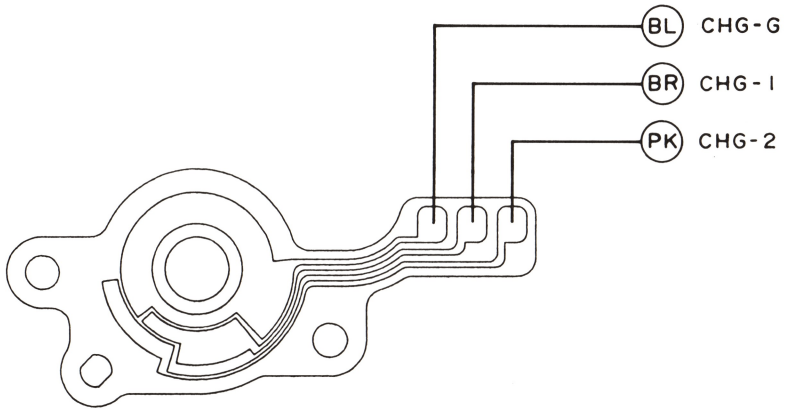
(BA FLEX A)



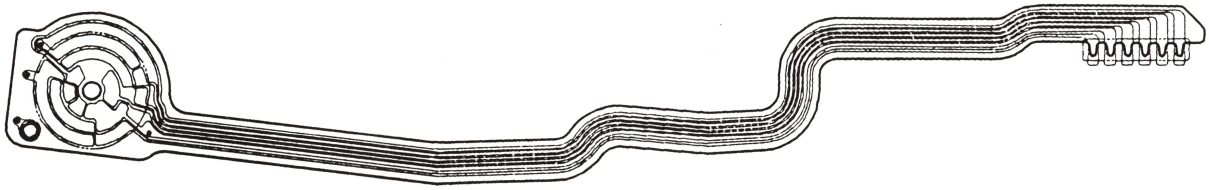
(BA FLEX B)



(PHASE BOARD)



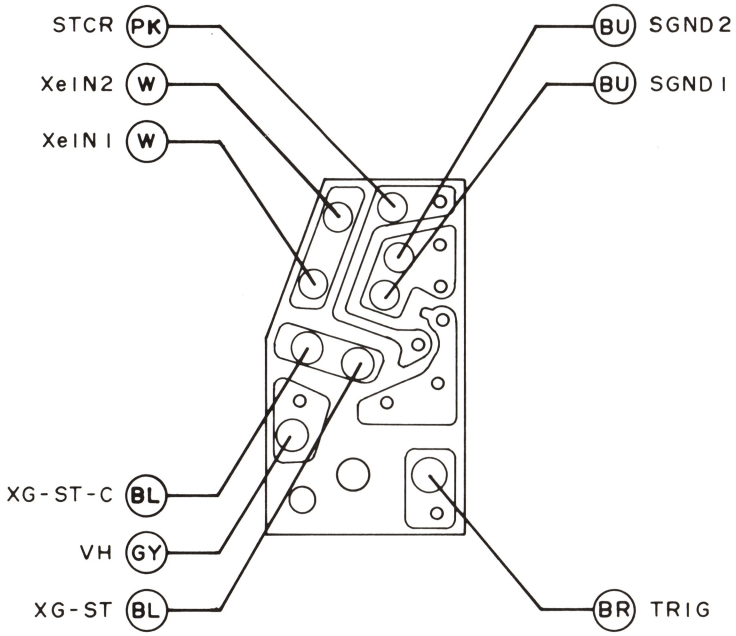
(MODE FLEX)



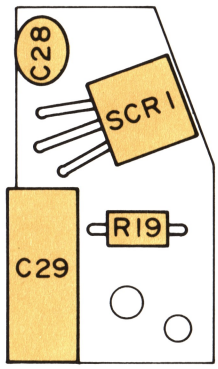
P. C. B. DIAGRAM
(EOS 1000 Q.D. ONLY)

REF. NO. C12-8193

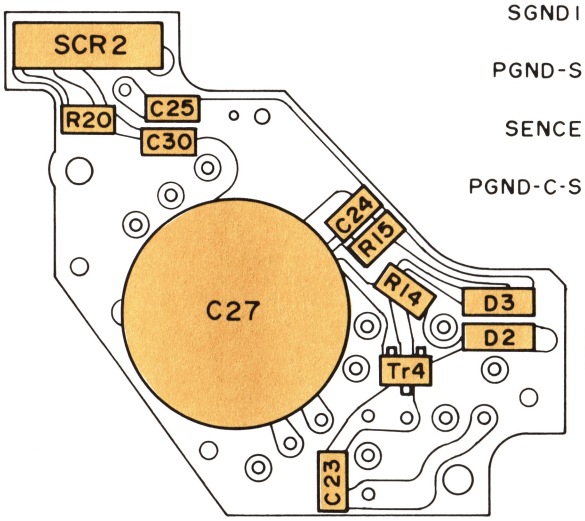
(PENTA BOARD A)



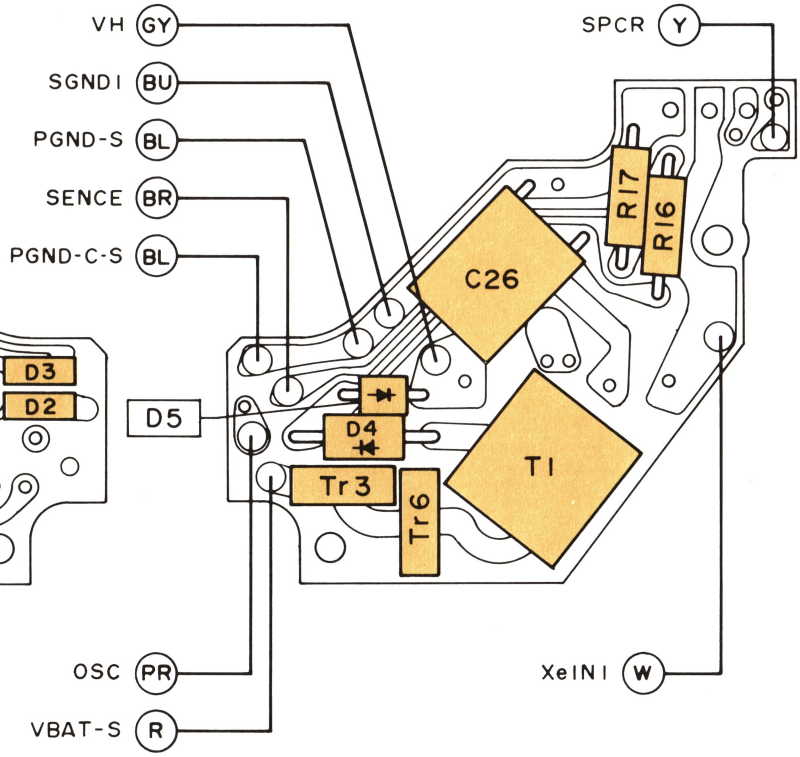
(PENTA BOARD B)



(BOTTOM BOARD A)



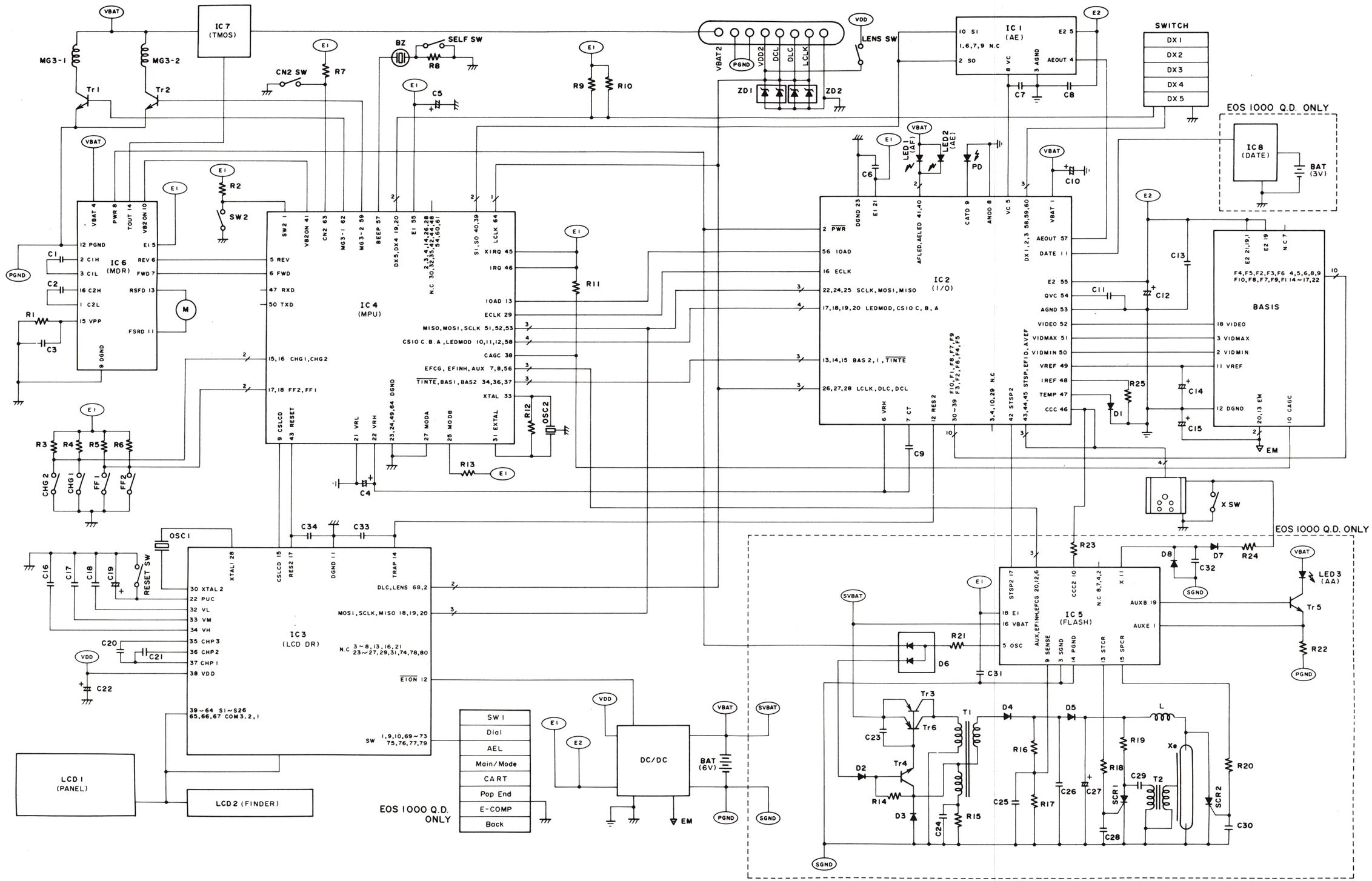
(BOTTOM BOARD B)



01 SEP, 1990

SCHEMATIC DIAGRAM

REF. NO. C12-8191,2,3

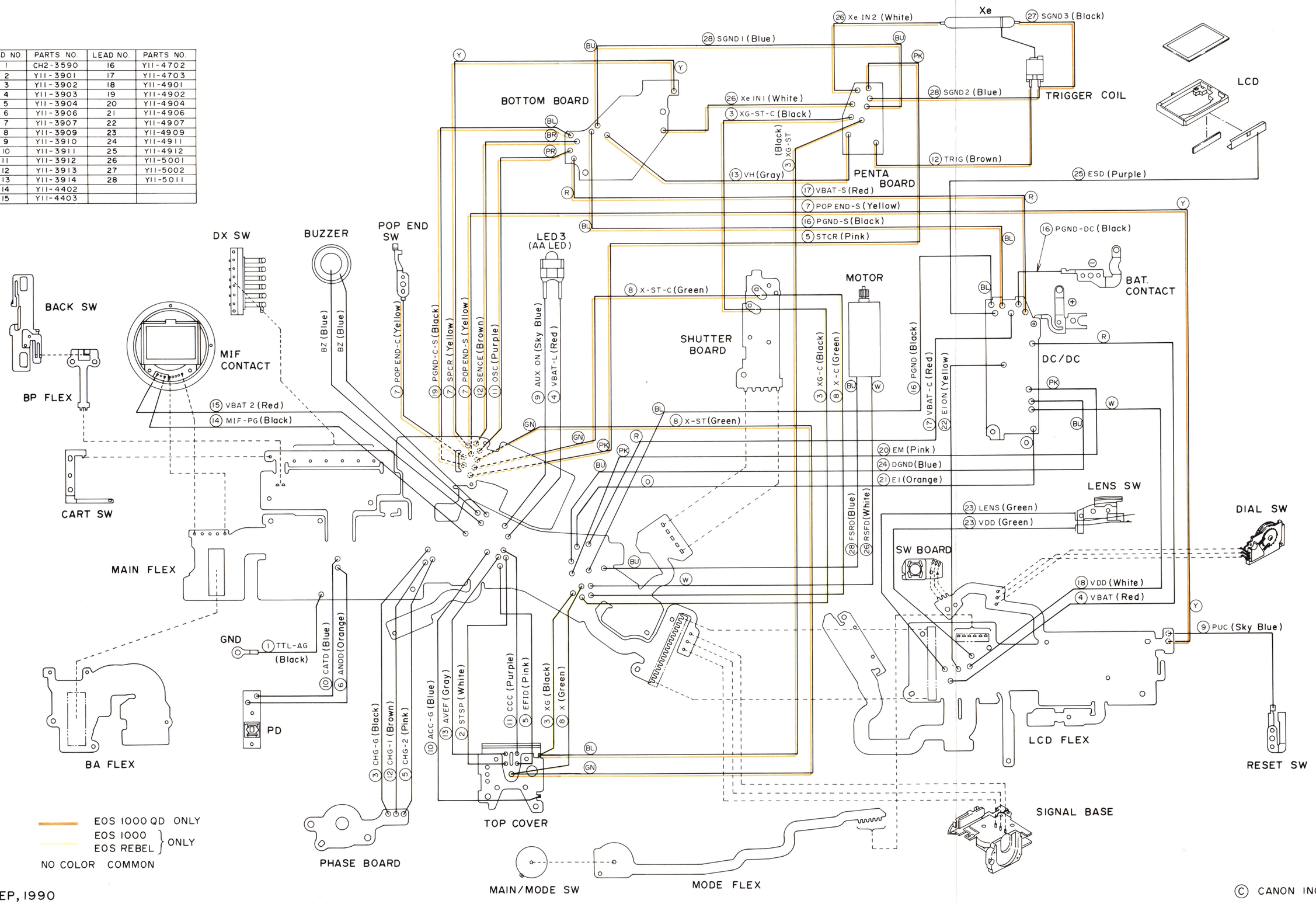


01 SEP, 1990

WIRING DIAGRAM

REF. NO. C12-8191,2,3

LEAD NO.	PARTS NO.	LEAD NO.	PARTS NO.
1	CH2-3590	16	Y11-4702
2	Y11-3901	17	Y11-4703
3	Y11-3902	18	Y11-4901
4	Y11-3903	19	Y11-4902
5	Y11-3904	20	Y11-4904
6	Y11-3906	21	Y11-4906
7	Y11-3907	22	Y11-4907
8	Y11-3909	23	Y11-4909
9	Y11-3910	24	Y11-4911
10	Y11-3911	25	Y11-4912
11	Y11-3912	26	Y11-5001
12	Y11-3913	27	Y11-5002
13	Y11-3914	28	Y11-5011
14	Y11-4402		
15	Y11-4403		



01 SEP, 1990

[1. GENERAL INFORMATION]

SPEEDLITE 200E VS SPEEDLITE 160E

The SPEEDLITE 200E has a higher guide number than the 160E, and the power source has been changed from a lithium battery to four size AA dry cells. A new, simple shoe lock has been added. The following table lists the comparisons between the SPEEDLITE 200E and then 160E:

Item		200E	160E
G No. (ISO100•m)		20	16
Wide angle diffusion		●	–
Flash firing modes	Normal	●	●
	Quick flash	–	●
Recycling time	Normal	0.5 to 4 s	0.3 to 1.7 s
	Quick flash	–	0.3 to 0.7 s
Flashes per battery		400 to 4000	400 to 4000
AF auxiliary light		●	●
Shoe lock		●	–
Power source		Size AA x 4	2CR5 x 1
Power switch		●	–
Dimensions (W x H x D) mm		64 x 104 x 41	59 x 82.4 x 27.5
Weight (without batteries) g		130	85

SPECIFICTIONS

1. Type Classification

1-1 Type

Dedicated hot-shoe TTL automatic flash (built-in AF auxiliary light, serial control system)
Consists of the flash and wide-angle diffuser

1-2 Usable ON

All EOS series models

2. Guide Number

ISO 100, meters : 20, with diffuser : 14

3. Flashes per battery and Recycle time

Power source	LR-6 (Alkaline)	KR15/51 (Ni-Cd)
Flash	400 ~ 4000 times	150 ~ 1500 times
Recycle time	0.5 ~ approx. 4 s	0.5 ~ approx. 3 s

* No quick flash firing

4. Flash Coverage Angle

Covers the field of view of a 35 mm lens
with wide diffuser: Covers the field of view of a 28 mm lens.

5. Control System

5-1 Firing mode

Automatic only

5-2 Aperture setting

Determined automatically by the Camera's TTL program.

5-3 Speed setting

Synch speed set automatically

5-4 Exposure control

TTL automatic flash

5-5 Fill-in flash:

Adjustment for synchro-sunlight

5-6 Flash coupling range **[m]**

(**Note:** The far limits for negative film are calculated to - IEV in consideration of film latitude.)

ISO	EF 35 ~ 80 mm f/4-5.6 used/no wide panel			
	WIDE: 35mm		TELE: 80mm	
	Negative	Reversal	Negative	Reversal
100	0.7 ~ 7	1 ~ 5	0.7 ~ 5	0.7 ~ 3.6
400	0.7 ~ 14	1.5 ~ 10	0.7 ~ 10	1.5 ~ 7

ISO	EF 35 ~ 80 mm f/4-5.6 with wide diffuser			
	WIDE: 35mm		TELE: 80mm	
	Negative	Reversal	Negative	Reversal
100	0.7 ~5	0.7 ~ 3.5	0.7 ~ 3.5	0.7 ~ 2.5
400	0.7 ~ 10	1.5 ~ 7	0.7 ~ 7	1.5 ~ 5

5-7 Out-of-coupling range warning

None

6. Charging completion Display: Red (LED)

7. Synchro Timing: First curtain synchro

8. Flash duration/ Color Temperature: 1 ms or less/equivalent to a daylight color

9. Film speed Not required because setting is controlled by the camera.
* The flash coupling distance varies with filmspeed.

10. AF Auxiliary Light

10-1 Light Source Ultra - bright red LED

10-2 Pattern Random vertical stripes

10-3 Effective range: 1 ~ 5 m in total darkness

11. Power Source: Four size AA alkaline dry cells/ LR6 -6V
Size AA Ni-Cd cells can be also used.

12. Power Switch Available

13. Camera Interface:

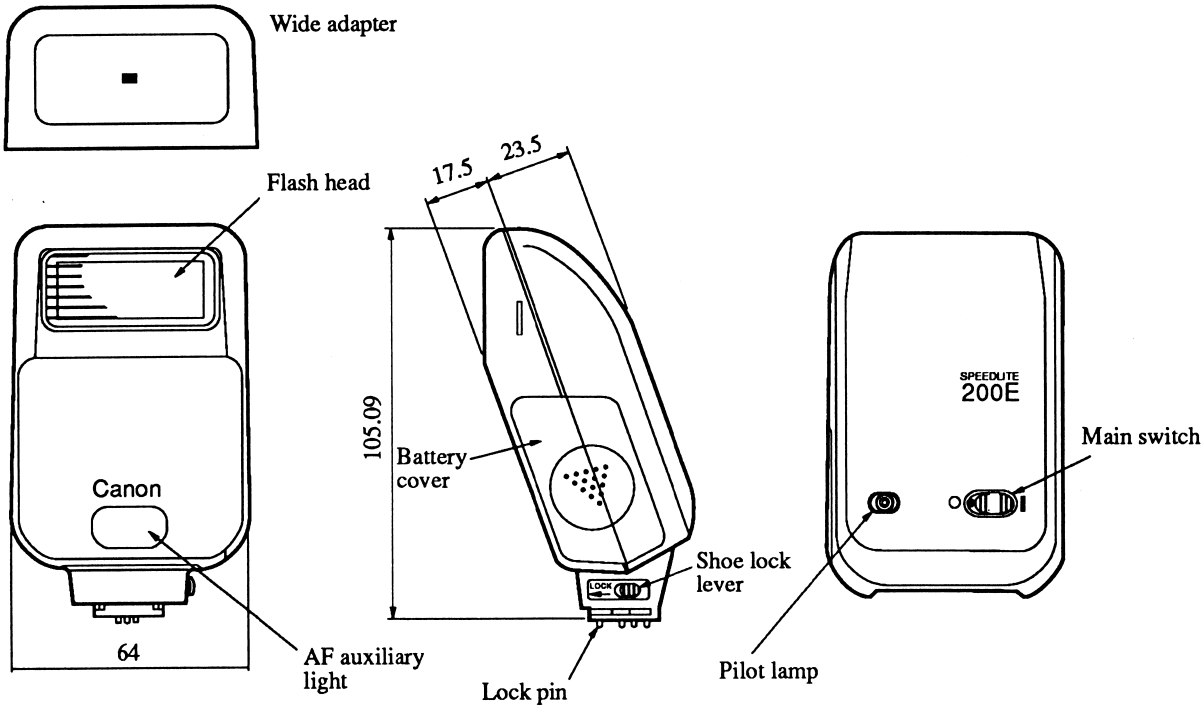
13.1 Mechanical: Fixed, Locking, hot=shoe mount

13.2 Electrical: Canon EOS coupling (center X contact, ground, and four dedicated contacts.

14. Dimensions and Weight Body: 64 (W) x 104 (H) x 41 (D/ thickness) mm/130 g
(*Battery adds 100 g to total weight.)
Wide adapter: 68 (W) x 37 (H) x 15.5 (D) mm/7.5 g

15. New Accessories
(1) Wide adapter
(2) Soft case

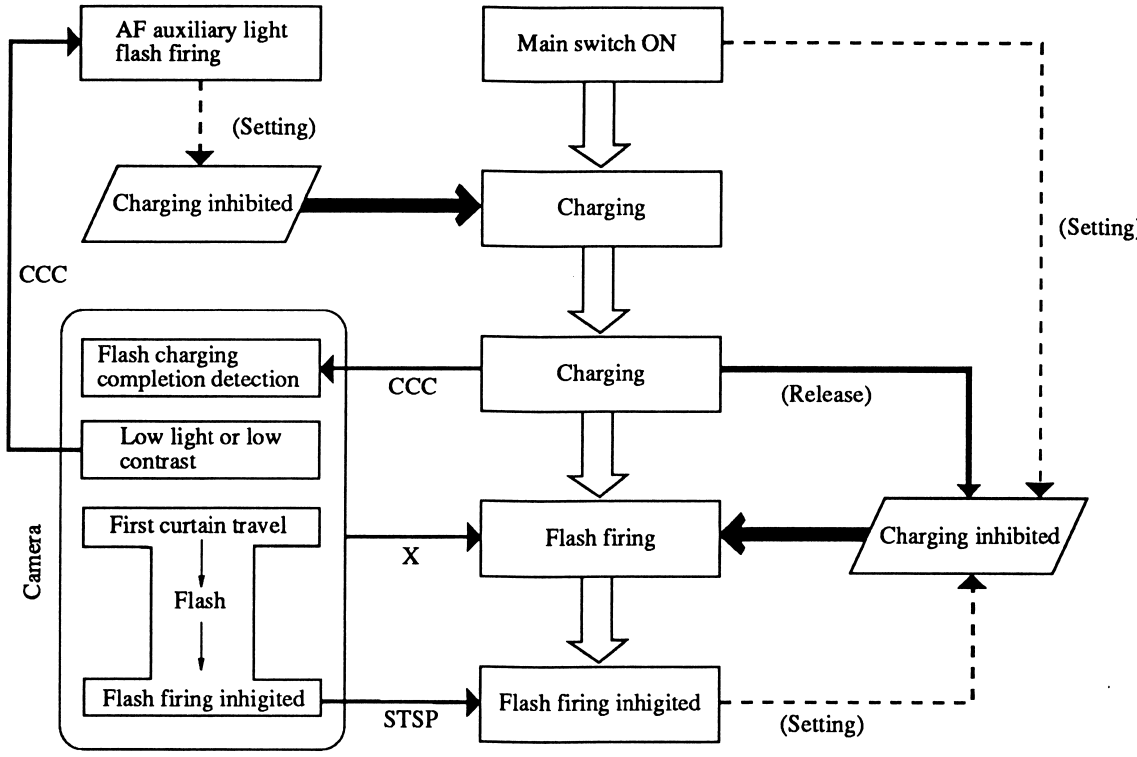
DIMENSIONS AND NOMENCLATURE



[2. TECHNICAL INFORMATION]

CIRCUIT OPERATION FLOW CHART

The following flow chart shows basic operation, communication wit the camera, and charging, flash firing inhibited at the flash circuit:

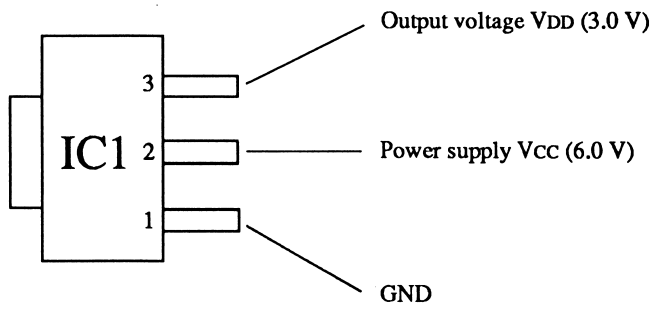


- If the main switch is turned on,. flash firing is inhibited and released for charging.
- After flash firing, flash firing is inhibited again by the flash firing stop signal.
- Charging is inhibited during AF auxiliary light flash firing.

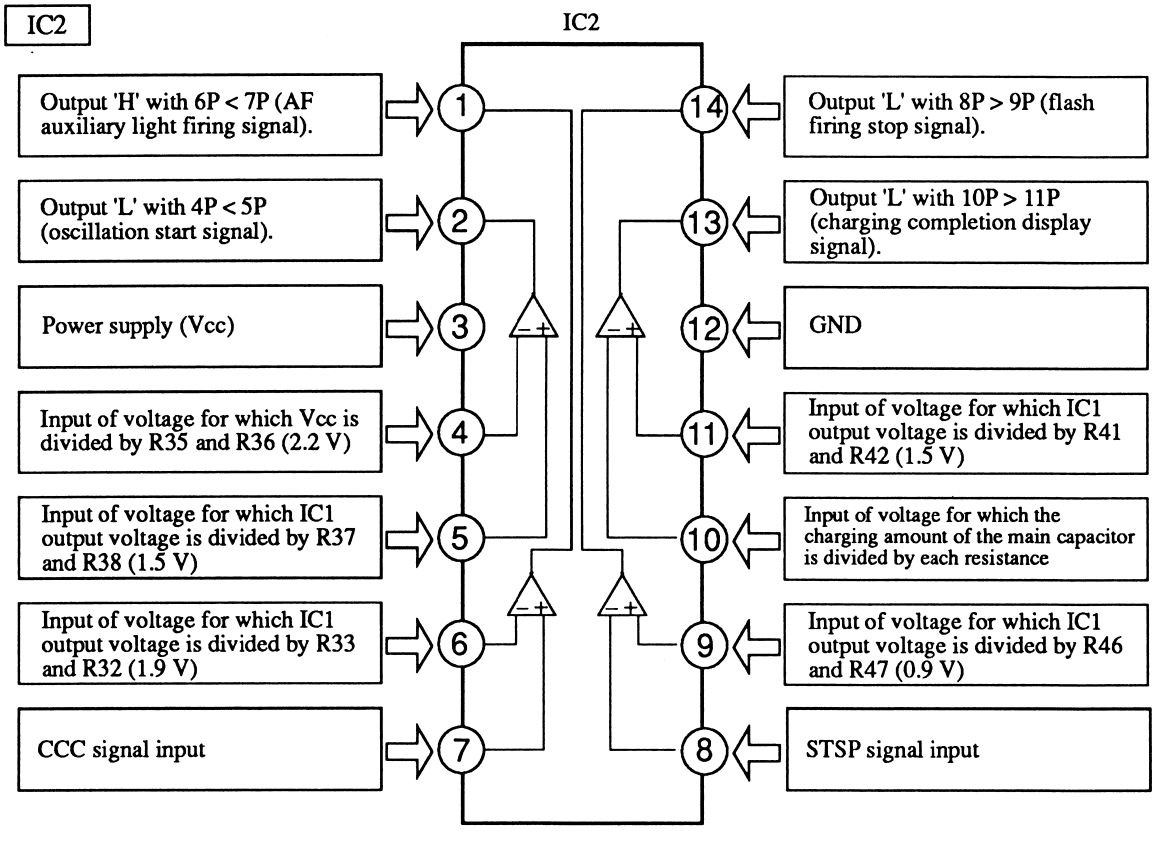
IC TERMINAL EXPLANATIONS

Two IC's are used. One is for constant voltage control (IC1) and the other is for operation control (IC2)

IC1



IC2



CIRCUIT EXPLANATIONS

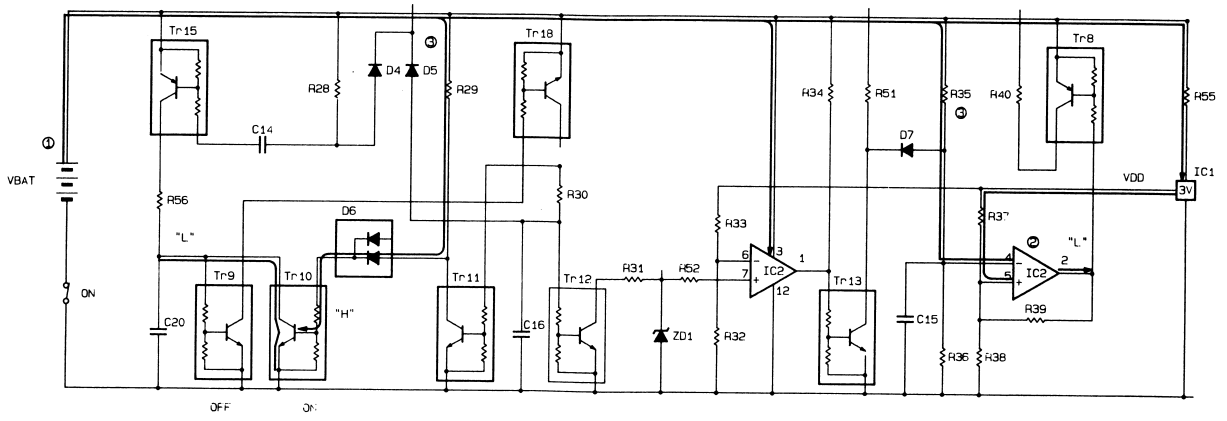
1. Power Supply

① Turning SW1 (main switch) on supplies Vcc (6 V) to IC1 and IC2. IC1 OUTPUTS VDD (3 V) by supplying Vcc.

② Vcc and VDD are divided. They are input from IC2, pin 4, pin 5. "L" is output from pin 2 under the conditions of pin 4 or pin 5. (Vcc> VDD) (oscillation start signal).

To Section 2. "Charging".

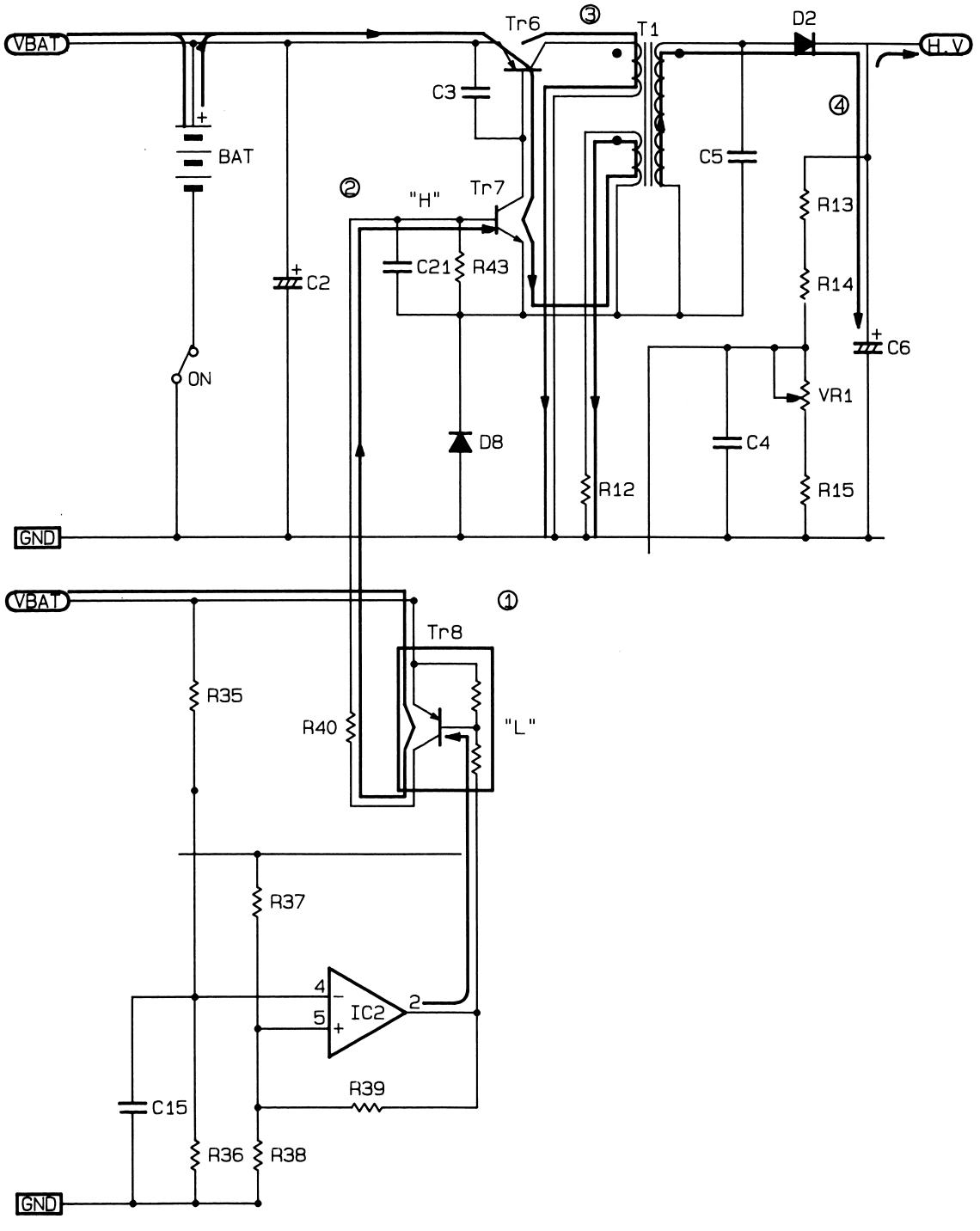
③ If Vcc is supplied, Tr10 is turned on through R29 D6.
Turning Tr10 on always turns Tr9 off. The flash firing start signal from the X terminal is inhibited here (flash firing inhibited).



2. Charging

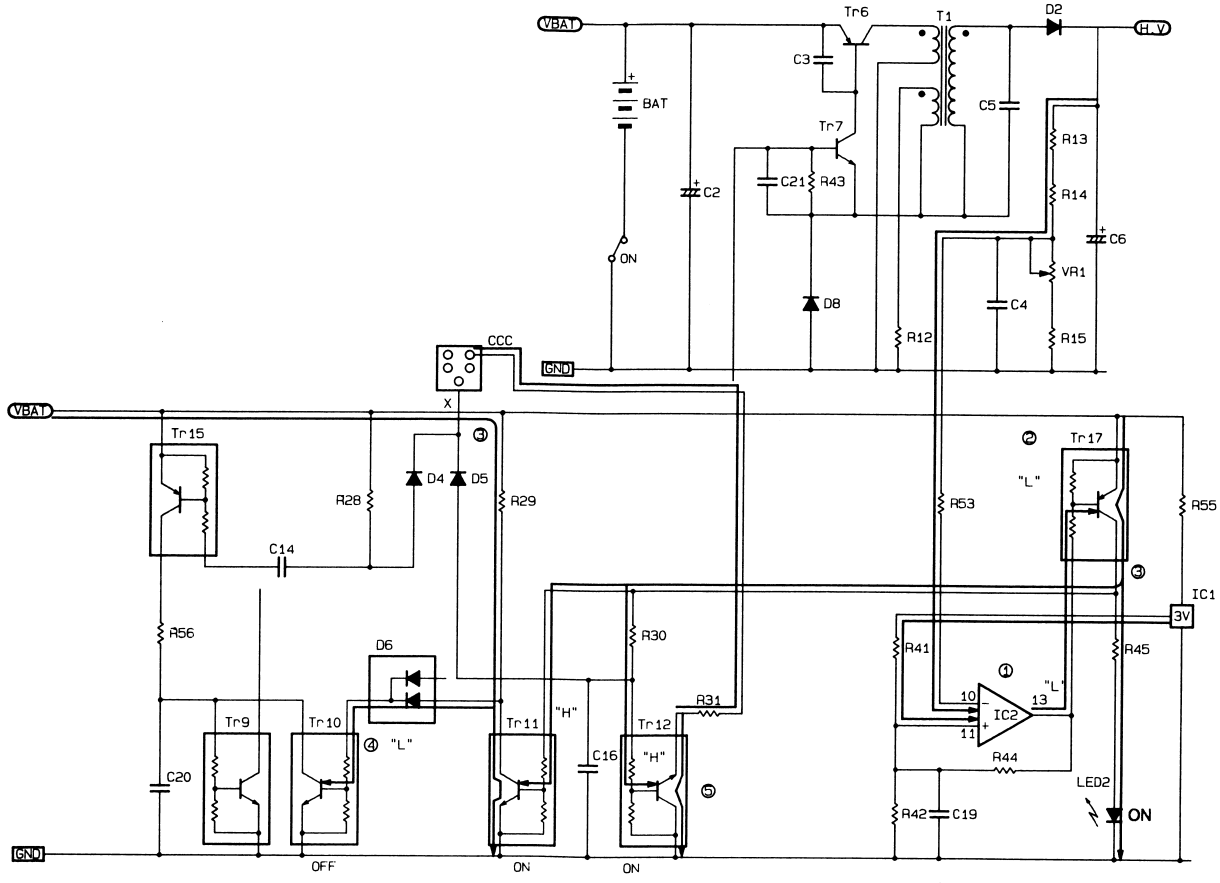
① If "L" is output from IC2 pin 2, Tr8 is turned on.
② Turning Tr8 on turns Tr7 on.
③ Turning Tr7 on turns Tr6 on. A current flows to the primary side of T1 to start oscillation.
④ The high voltage alternating current occurring on the secondary side of T1 is rectified by D12 and charges main capacitor C6.

To Section 3. Charging Completion



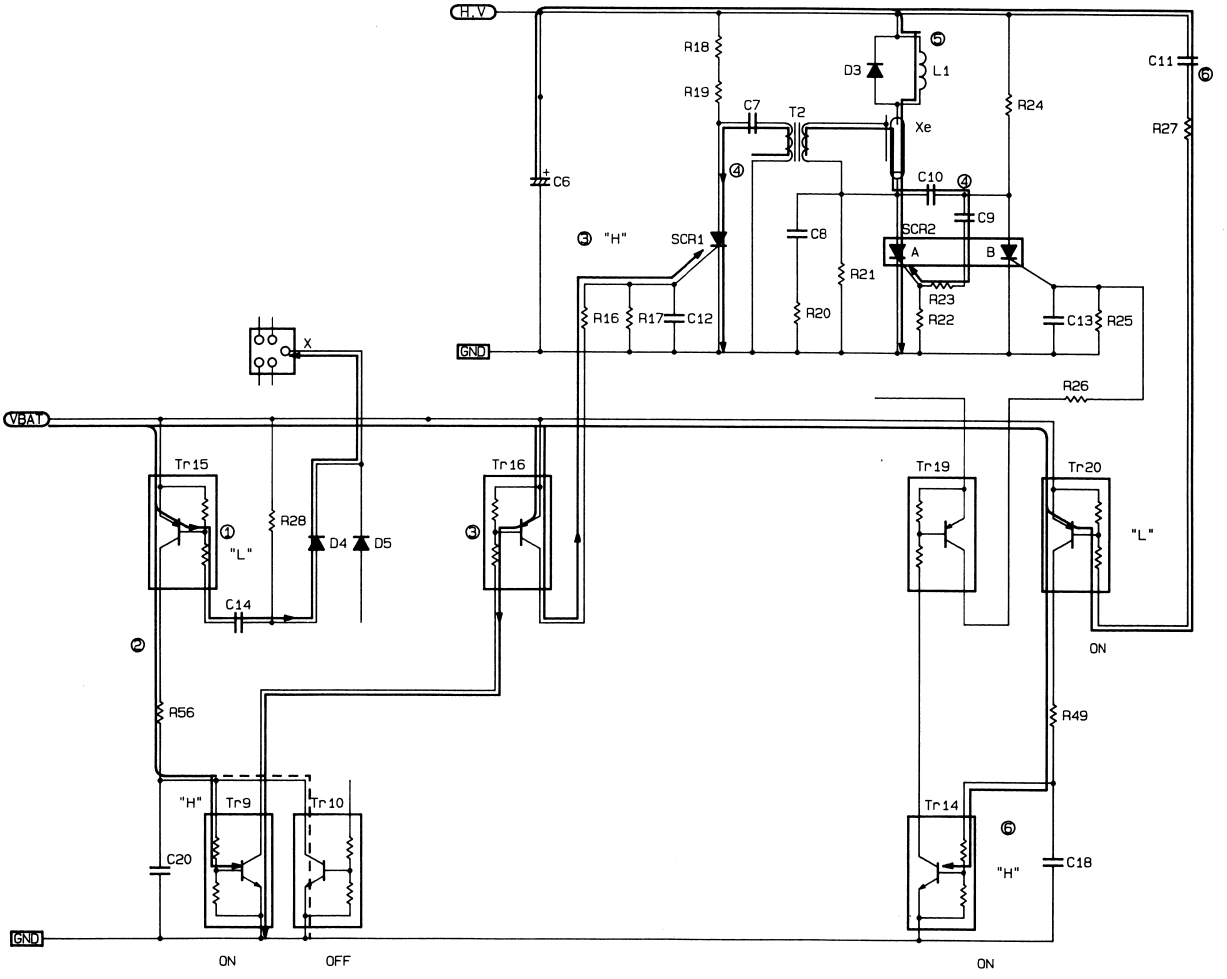
3. Charging completion

① A voltage proportional to VHV (main capacitor charging voltage) is taken from the voltage divider and input to IC2 pin 10, a comparitor. "L" is output from pin 13 when pin 10 > pin 9 (VHV > 265 V) (charging completion display signal).
② If "L" is output from ICS pin 13, Tr17 is turned on.
③ Turning Tr17 on flashes LED 2 (pilot lamp) and turns Tr11 and Tr12 on.
④ Turning Tr11 on turns Tr10 off. Turning Tr10 off releases /flash firing inhibited/ set during power supply or flash firing stop.
(See "Flash firing" on page 10)
⑤ Turning Tr12 on pulls a current of approximately 250 μA from the CCC terminal (charging completion signal: flash → camera).



4. Flash Firing

① After first curtain travel has been completed in the camera, "L" is output from the X terminal (flash firing start signal).
After "L" is output from the X terminal, TR15 is turned on.
② If Tr10 is turned off (/flash firing inhibited/ release), Tr15 and Tr9 are turned on.
③ If Tr9 is turned on, Tr16 is turned on and SCR1 is turned on.
④ Turning SCR1 on discharges C7 and flows a current to the T2 primary side. High voltage occurs on the T2 secondary side and trigger voltage is applied to the Xe tube. SCR2-A is turned on by this trigger voltage and a current flowing in the Xe tube.
⑤ Turning SCR2-A discharges main capacitor (C6) through the Xe tube and starts flash firing.
⑥ Flash firing in the Xe tube discharges C11 and turns Tr20 on. Turning Tr20 on turns Tr14 on.



Flash firing inhibited

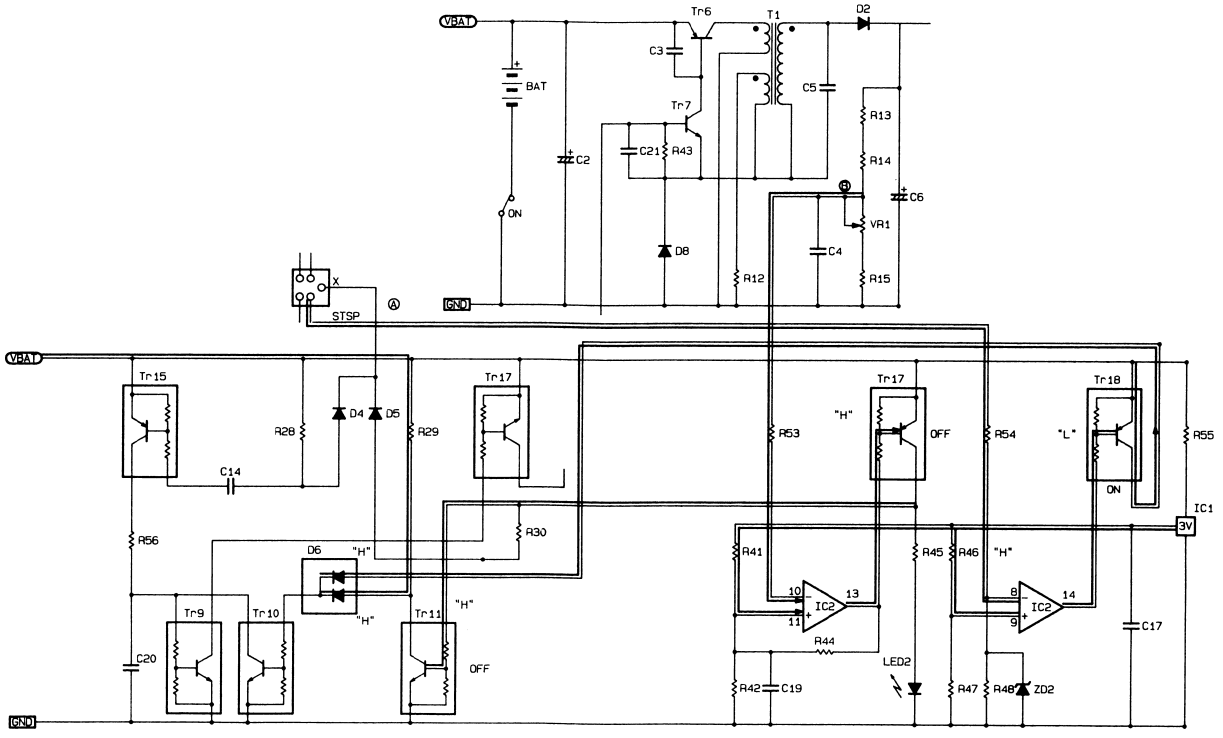
Tr10 ON → Flash firing inhibited
Tr10 OFF → Flash firing inhibited release state

- Turning Tr10 on and turning Tr9 off cut off the flash firing signal from the X terminal. That is, flash firing is inhibited.

- Tr10 ON (flash firing inhibited) conditions
  ① STSP should be "H".
  ② No charging completion

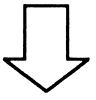
If either of the above two conditions is established, flash firing is inhibited.

* If flash firing is not required with the results of camera metering even in flash charging completion state, STSP stays "H" for "flash firing inhibited" and the shutter is released. The flash does not fire.



5. Flash Firing Inhibited

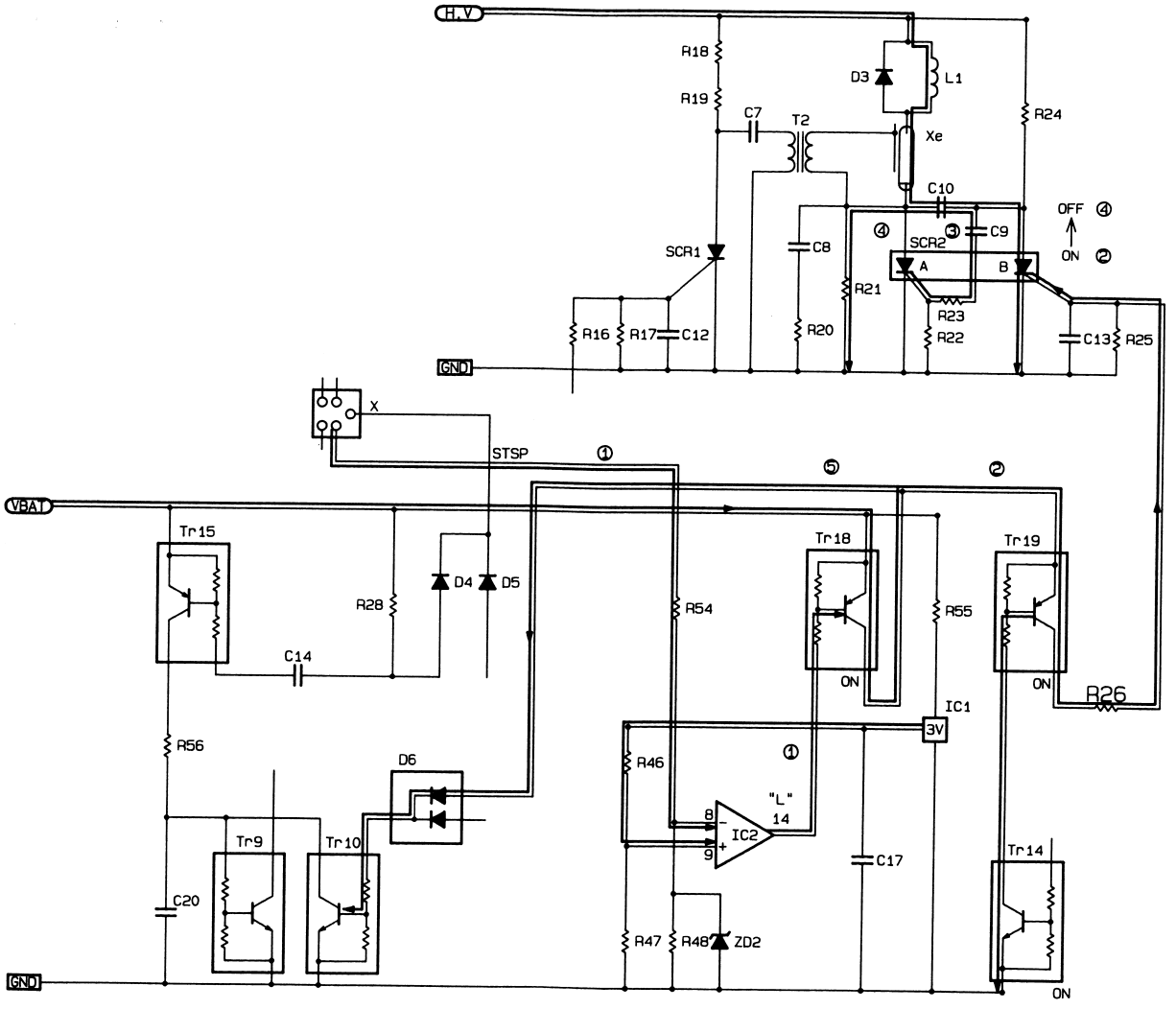
① After flash in the camera, "H" is output from the STSP terminal (flash firing stop signal). "H" is input from the STSP terminal to IC2 pin 8. "L" is output from pin 14 under the conditions of pin 8 > pin 9 (STSP terminal > 2.0 V).
If "L" is output from IC2 pin 14, Tr18 is turned on.
② Turning Tr18 on turns Tr19 on under the conditions of Tr14 ON (after flash firing start).
Turning Tr19 on turns SCR2-B on.
③ Turning SCR2-B on discharges C9.10 and turns SCR2-A off.
④ After C10 has completed charging, the Xe tube is turned off. C10 starts charging through R21, so SCR2-B is turned off.



To Section 2. Charging

⑤ Turning Tr18 on turns Tr10 on (/flash firing inhibited/).

Flash firing stop

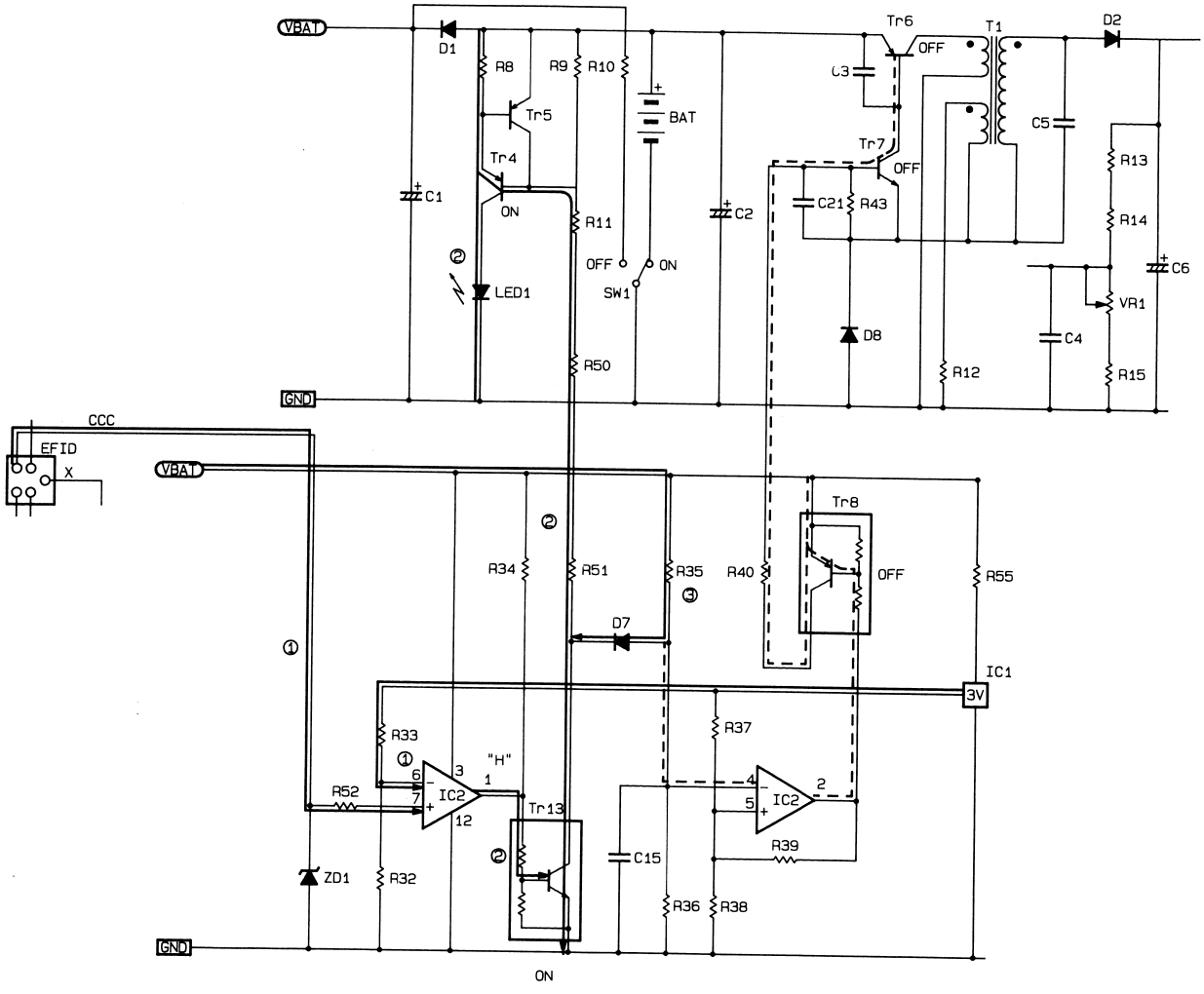


6. AF Auxiliary Light Firing

① If the camera requires the AF auxiliary light, "H" is output from the CCC terminal (AF auxiliary light flash firing signal).
"H" is input from the CCC terminal to IC2 pin 7. "H" is output from pin 1 under the conditions of pin 6 < pin 7 (CCC terminal > 2 V).

② If "H" is output from IC2 pin 1, Tr13 is turned on.
Tr4 is turned on and LED1 flashes by Tr13 ON.

③ By Tr13 ON, D7 is turned on, IC2 output does not become "L", and Tr8 is turned off.
By Tr8 OFF, Tr7 and Tr6 are turned off and oscillation is stopped temporarily.

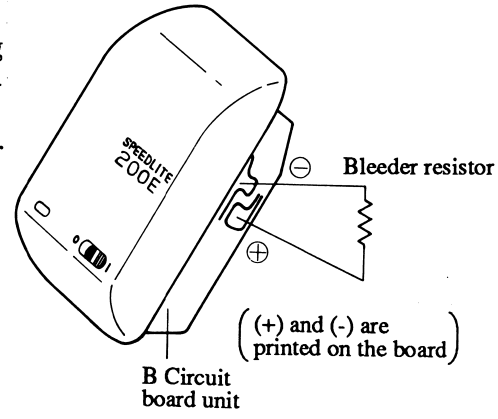


[3. REPAIR INFORMATION]

PREPARATIONS FOR REPAIR

Discharging the main capacitor

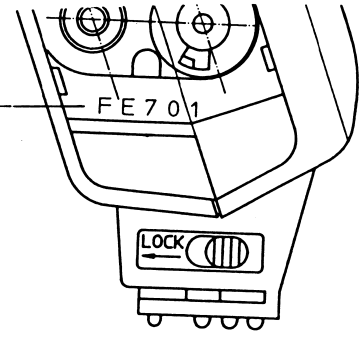
First, be sure to discharge the main capacitor during disassembly. Perform discharging with a main capacitor ⊕ ⊖ pattern on the circuit board.
The main capacitor ⊕ ⊖ is visible when the front cover is removed.



Classification No.

The classification number is stamped at the bottom of the battery compartment.

F E 7 0 1
- Change Number
- Month code: October is X, November is Y, and December is Z.
- Year code: E is 1990



PILOT LAMP LIGHTING VOLTAGE ADJUSTMENT

* This adjustment is necessary if the main C.B. is replaced.

Purpose

To adjust the ignition point of the ready lamp.

Tools

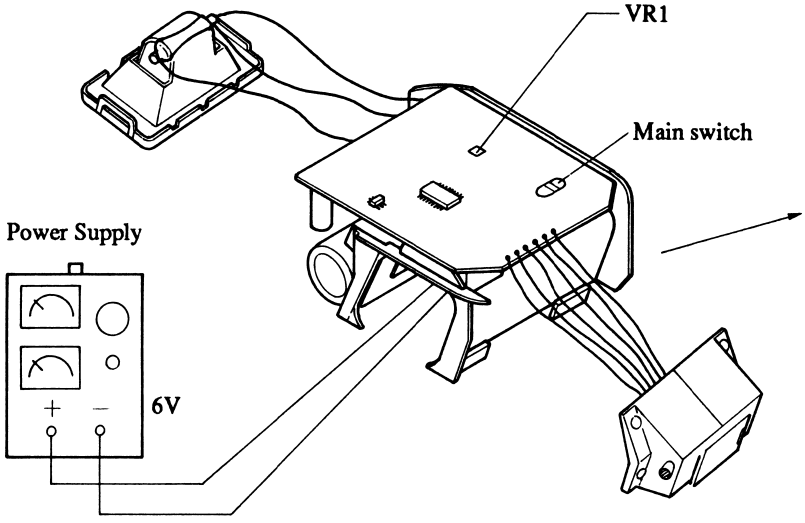
- Regulated power supply
- Multimeter
- Bleeder resistor

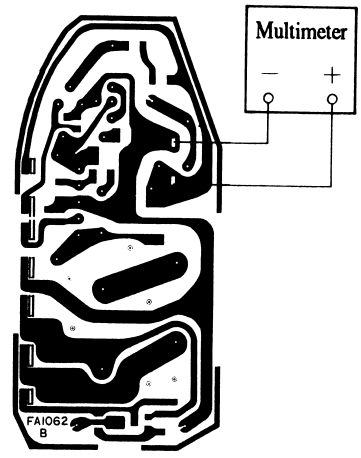
Standard

263 to 265 V

Preparation

1) Discharge the main capacitor.
2) Remove the external cover and connect the power supply and multimeter as shown in the figure below.
3) Set the power supply to 6 V.





B Circuit board

Adjustment

① Turn the main switch of the flash on to start charging.
② Read voltage when the pilot lamp lights.
③ If the voltage is not within the limits, adjust VR1.

Clockwise rotation increases ignition voltage.

CHECK STEP

Power switch ON

Oscillation sound → NO

YES

Pilot lamp lighting → NO

YES

Flash firing → NO

YES

Flash firing → NO

YES

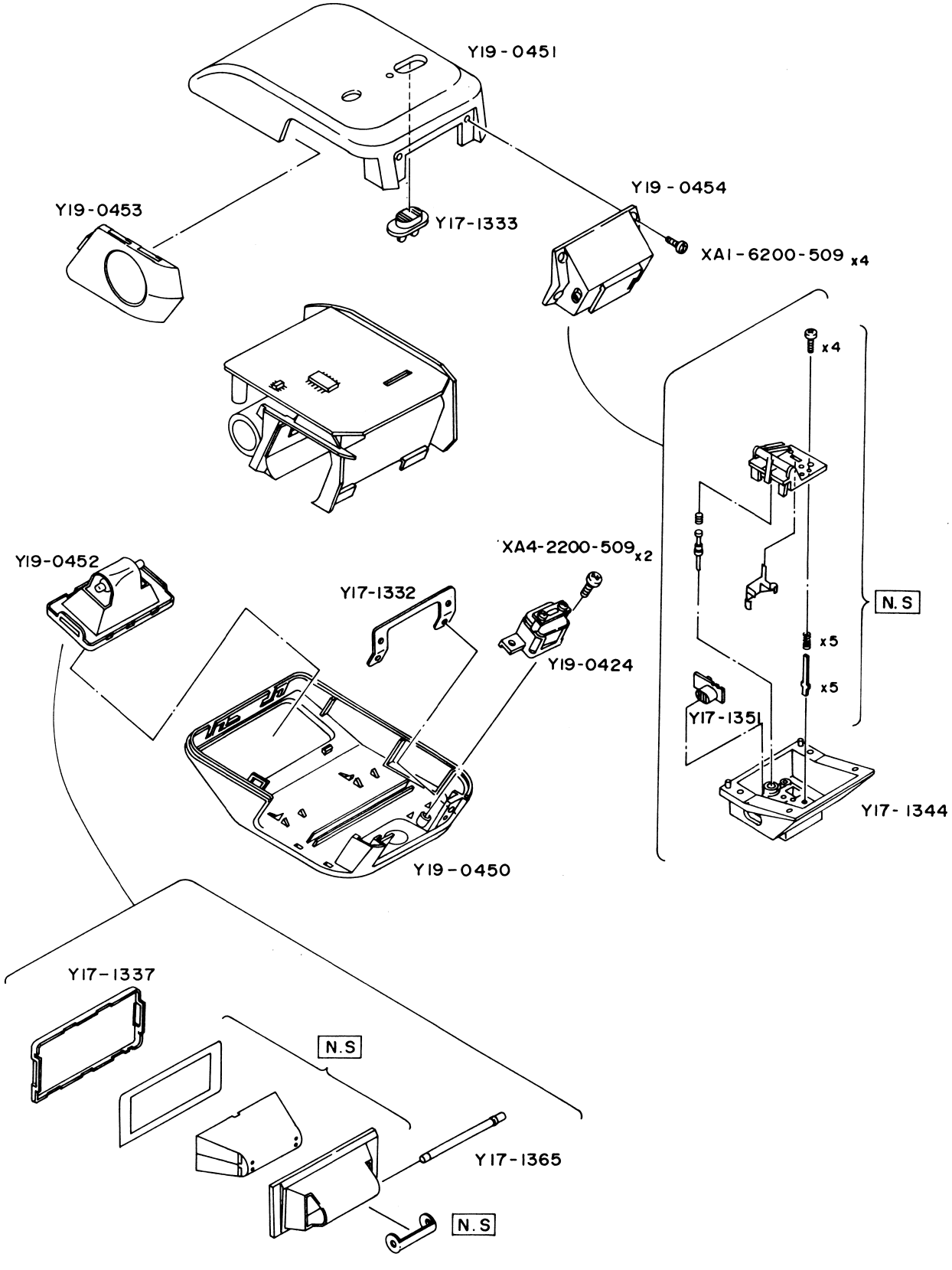
AF auxiliary light flash firing → NO

Check		Problem		Checkpoint
Using the power supply		The ammeter needle does not swing.	①	Defective D1 Excess solder in the connection of the M and B circuit board. Defective IC1
		The ammeter needle swings a little.	②	Defective T1 IC2-pin 2 operation check Tr6, 7, and 8 operation check Defective D1
Not lighting	Measure the main capacitor voltage.	0V	③	Defective D2
		260 V or less	④	C6 leak or short SCR2 short C10 leak or short
		265 V or less	⑤	IC2-pin 13 operation check Defective Tr17 Defective LED2
Slow lighting	Measure the main capacitor voltage.	The ready lamp does not light at 265 V.	⑥	Improper VR1 adjustment Defective IC1 output voltage
Instantaneous short between the SCR1 anode and cathode		No flash firing	⑦	Defective Xe Defective SCR2 Defective T2 Defective C7
		Flash firing	⑧	Defective SCR1 Defective Tr15, Tr16 Defective Tr9, Tr10
SCR2 operation check		No operation	⑨	SCR2 open IC2-pin 14 operation check Defective Tr18, 19 Defective Tr14, 20
		Operation	⑩	SCR2 short Defective C9, 10
IC2-pin 1 operation check		No operation	⑪	Shoe lead check Defective ZD1 Defective IC2
		Operation	⑫	Tr4 open Tr5 jumper Defective Tr13 Cold solder joint at the leads of the AF auxiliary light

PARTS CATALOG ILLUSTRATIONS

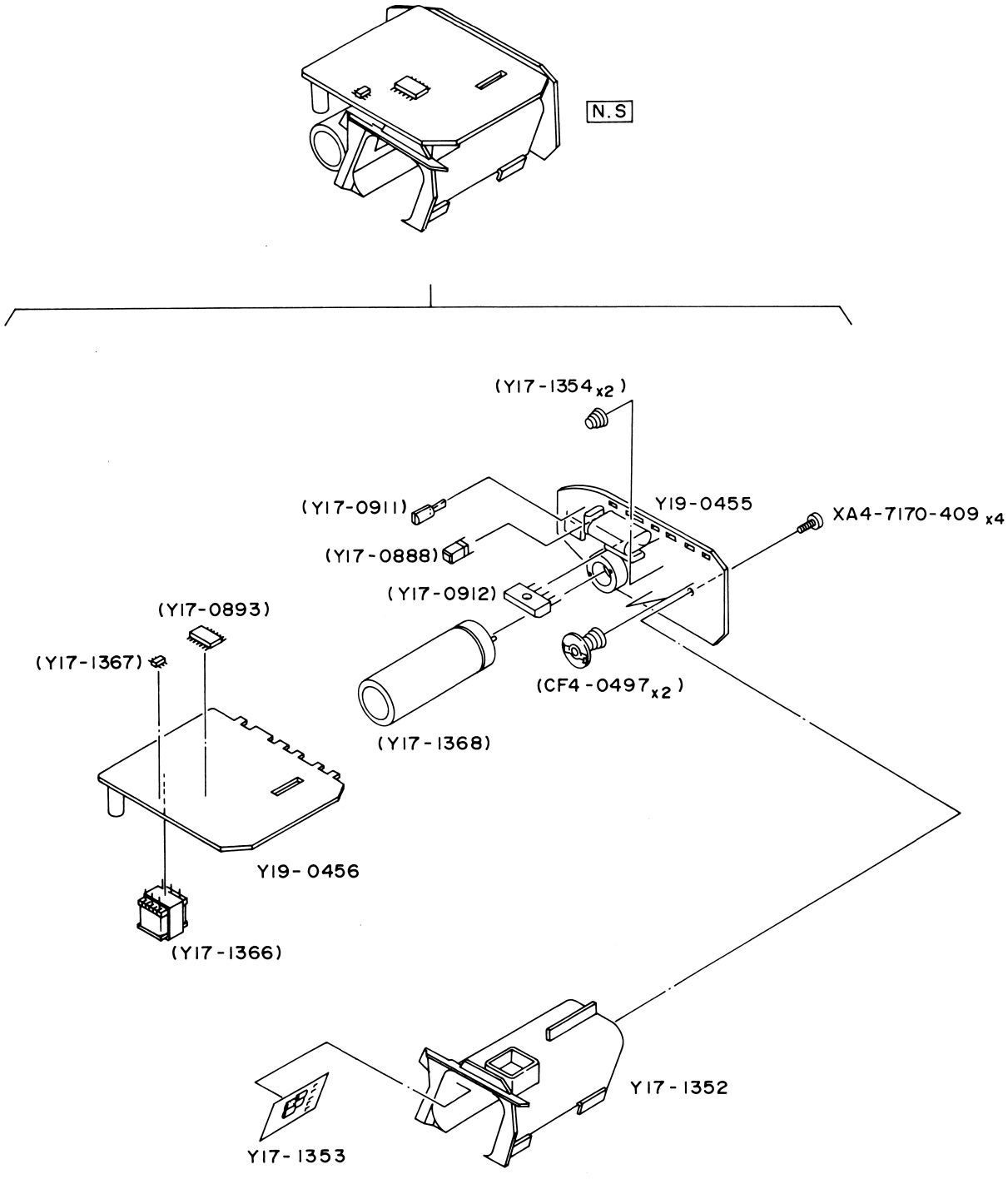
CANON SPEEDLITE 200E

REF. NO. C50-0691



REF. NO C50-0691

CANON SPEEDLITE 200E



SPEEDLITE 200E
(C50 – 0691)

Contents

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- SPECIFICATIONS 2
- DIMENSIONS AND NAMES 4

2. TECHNICAL INFORMATION

- CIRCUIT OPERATION FLOW CHART 5
- IC TERMINAL EXPLANATIONS 6
- CIRCUIT EXPLANATIONS 7

3. REPAIR INFORMATION

- PREPARATIONS FOR REPAIR 15
- PILOT LAMP LIGHTING VOLTAGE ADJUSTMENT 16
- CHECK STEP 17

4. ADDITIONAL INFORMATION

- PARTS CATALOG ILLUSTRATION

5. ELECTRICAL DIAGRAMS

- CIRCUIT DIAGRAM

[1. GENERAL INFORMATION]

SPEEDLITE 200E VS SPEEDLITE 160E

The SPEEDLITE 200E has a higher guide number than the 160E, and the power source has been changed from a lithium battery to four size AA dry cells. A new, simple shoe lock has been added. The following table lists the comparisons between the SPEEDLITE 200E and then 160E:

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Wide angle diffusion		●	–
Flash firing modes	Normal	●	●
	Quick flash	–	●
Recycling time	Normal	0.5 to 4 s	0.3 to 1.7 s
	Quick flash	–	0.3 to 0.7 s
Flashes per battery		400 to 4000	400 to 4000
AF auxiliary light		●	●
Shoe lock		●	–
Power source		Size AA x 4	2CR5 x 1
Power switch		●	–
Dimensions (W x H x D) mm		64 x 104 x 41	59 x 82.4 x 27.5
Weight (without batteries) g		130	85

SPECIFICTIONS

1. Type Classification

1-1 Type

Dedicated hot-shoe TTL automatic flash (built-in AF auxiliary light, serial control system)
Consists of the flash and wide-angle diffuser

1-2 Usable ON

All EOS series models

2. Guide Number

ISO 100, meters : 20, with diffuser : 14

3. Flashes per battery and Recycle time

Power source	LR-6 (Alkaline)	KR15/51 (Ni-Cd)
Flash	400 ~ 4000 times	150 ~ 1500 times
Recycle time	0.5 ~ approx. 4 s	0.5 ~ approx. 3 s

* No quick flash firing

4. Flash Coverage Angle

Covers the field of view of a 35 mm lens
with wide diffuser: Covers the field of view of a 28 mm lens.

5. Control System

5-1 Firing mode

Automatic only

5-2 Aperture setting

Determined automatically by the Camera's TTL program.

5-3 Speed setting

Synch speed set automatically

5-4 Exposure control

TTL automatic flash

5-5 Fill-in flash:

Adjustment for synchro-sunlight

5-6 Flash coupling range **[m]**

(**Note:** The far limits for negative film are calculated to - IEV in consideration of film latitude.)

ISO	EF 35 ~ 80 mm f/4-5.6 used/no wide panel			
	WIDE: 35mm		TELE: 80mm	
	Negative	Reversal	Negative	Reversal
100	0.7 ~ 7	1 ~ 5	0.7 ~ 5	0.7 ~ 3.6
400	0.7 ~ 14	1.5 ~ 10	0.7 ~ 10	1.5 ~ 7

ISO	EF 35 ~ 80 mm f/4-5.6 with wide diffuser			
	WIDE: 35mm		TELE: 80mm	
	Negative	Reversal	Negative	Reversal
100	0.7 ~5	0.7 ~ 3.5	0.7 ~ 3.5	0.7 ~ 2.5
400	0.7 ~ 10	1.5 ~ 7	0.7 ~ 7	1.5 ~ 5

5-7 Out-of-coupling range warning

None

6. Charging completion Display: Red (LED)

7. Synchro Timing: First curtain synchro

8. Flash duration/ Color Temperature: 1 ms or less/equivalent to a daylight color

9. Film speed Not required because setting is controlled by the camera.
* The flash coupling distance varies with filmspeed.

10. AF Auxiliary Light

10-1 Light Source Ultra - bright red LED

10-2 Pattern Random vertical stripes

10-3 Effective range: 1 ~ 5 m in total darkness

11. Power Source: Four size AA alkaline dry cells/ LR6 -6V
Size AA Ni-Cd cells can be also used.

12. Power Switch Available

13. Camera Interface:

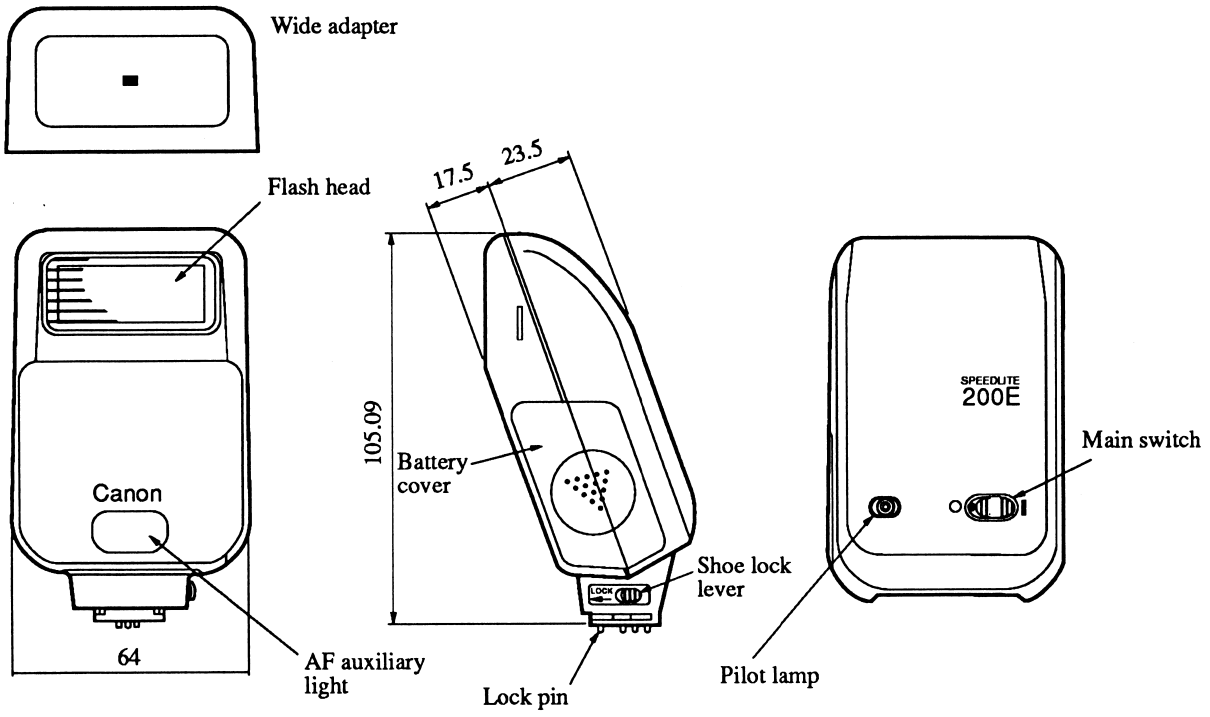
13.1 Mechanical: Fixed, Locking, hot=shoe mount

13.2 Electrical: Canon EOS coupling (center X contact, ground, and four dedicated contacts.

14. Dimensions and Weight Body: 64 (W) x 104 (H) x 41 (D/ thickness) mm/130 g
(*Battery adds 100 g to total weight.)
Wide adapter: 68 (W) x 37 (H) x 15.5 (D) mm/7.5 g

15. New Accessories
(1) Wide adapter
(2) Soft case

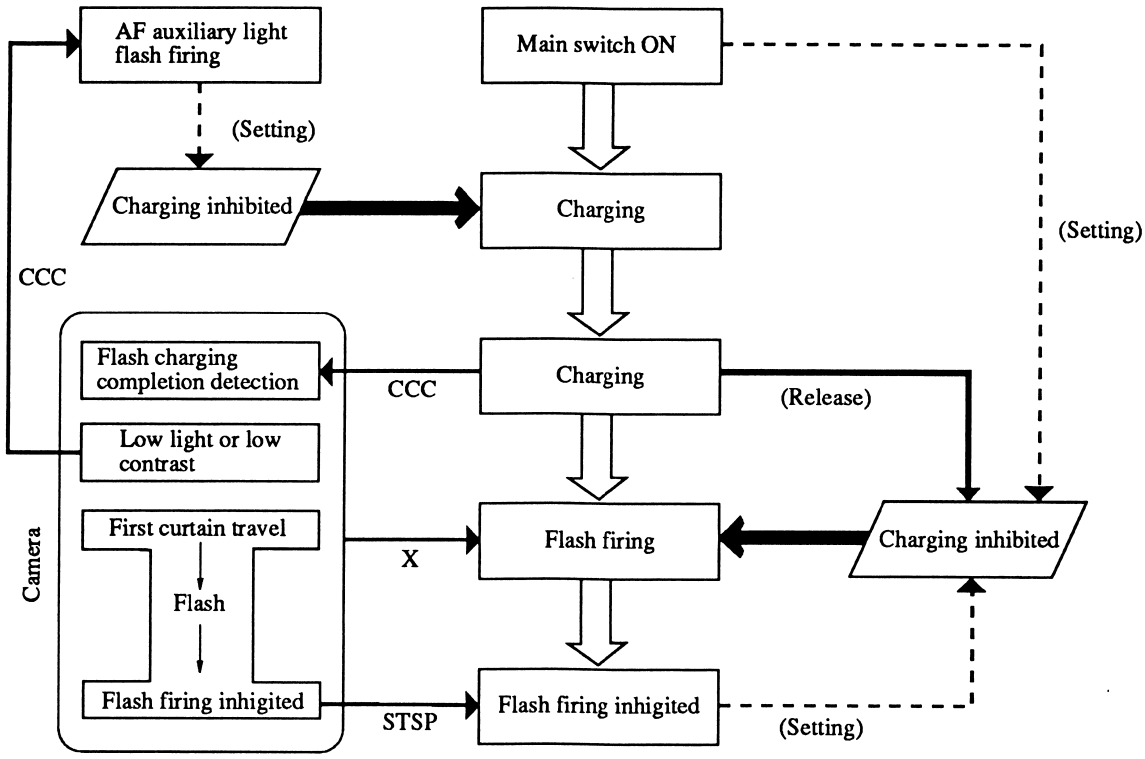
DIMENSIONS AND NOMENCLATURE



[2. TECHNICAL INFORMATION]

CIRCUIT OPERATION FLOW CHART

The following flow chart shows basic operation, communication wit the camera, and charging, flash firing inhibited at the flash circuit:

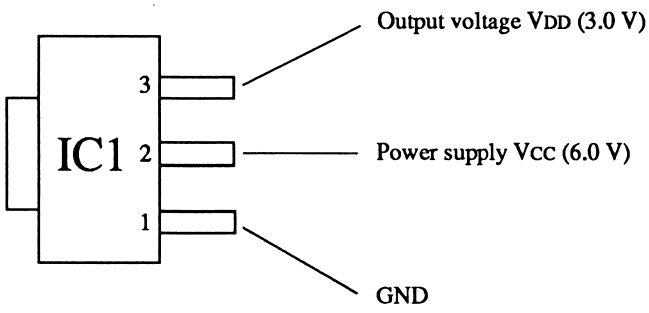


- If the main switch is turned on,. flash firing is inhibited and released for charging.
- After flash firing, flash firing is inhibited again by the flash firing stop signal.
- Charging is inhibited during AF auxiliary light flash firing.

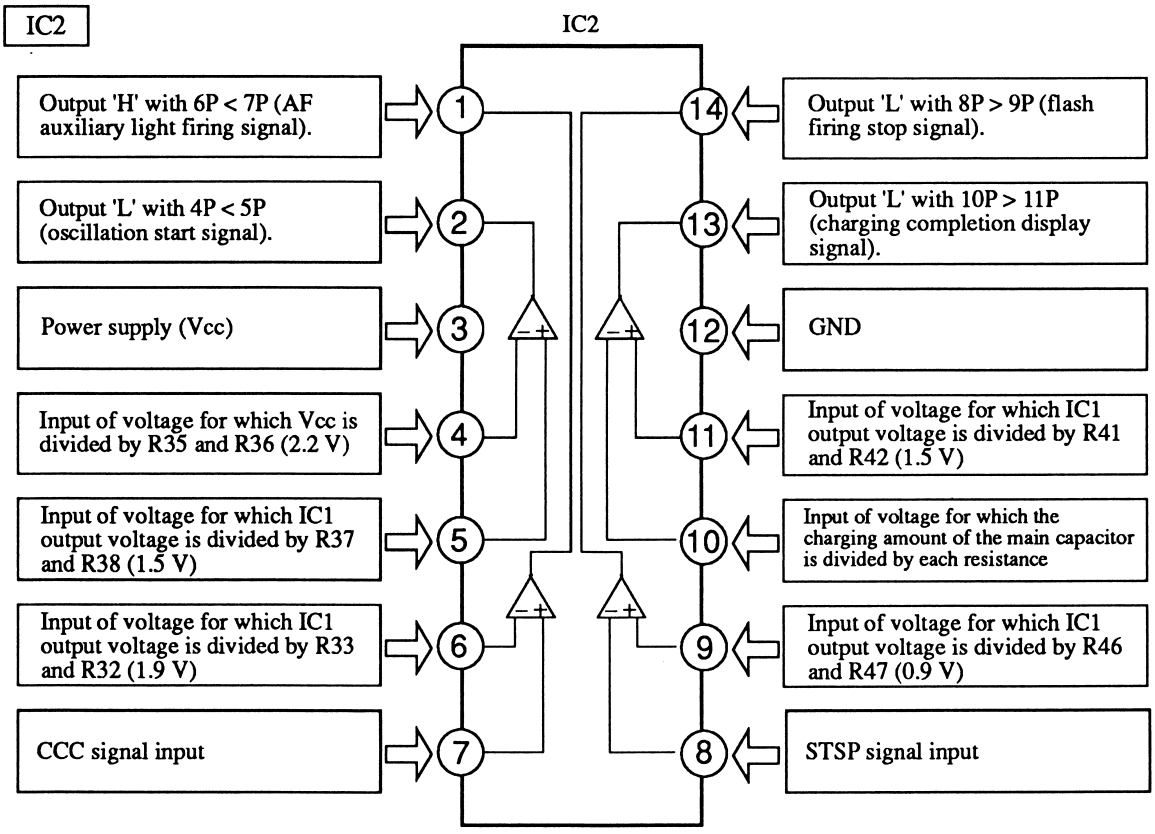
IC TERMINAL EXPLANATIONS

Two IC's are used. One is for constant voltage control (IC1) and the other is for operation control (IC2)

IC1



IC2



CIRCUIT EXPLANATIONS

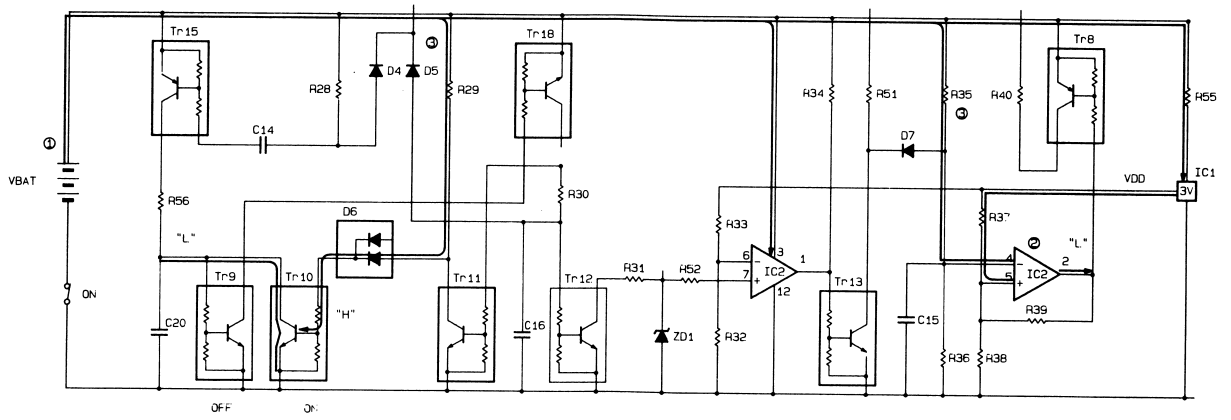
1. Power Supply

① Turning SW1 (main switch) on supplies Vcc (6 V) to IC1 and IC2. IC1 OUTPUTS VDD (3 V) by supplying Vcc.

② Vcc and VDD are divided. They are input from IC2, pin 4, pin 5. "L" is output from pin 2 under the conditions of pin 4 or pin 5. (Vcc> VDD) (oscillation start signal).

To Section 2. "Charging".

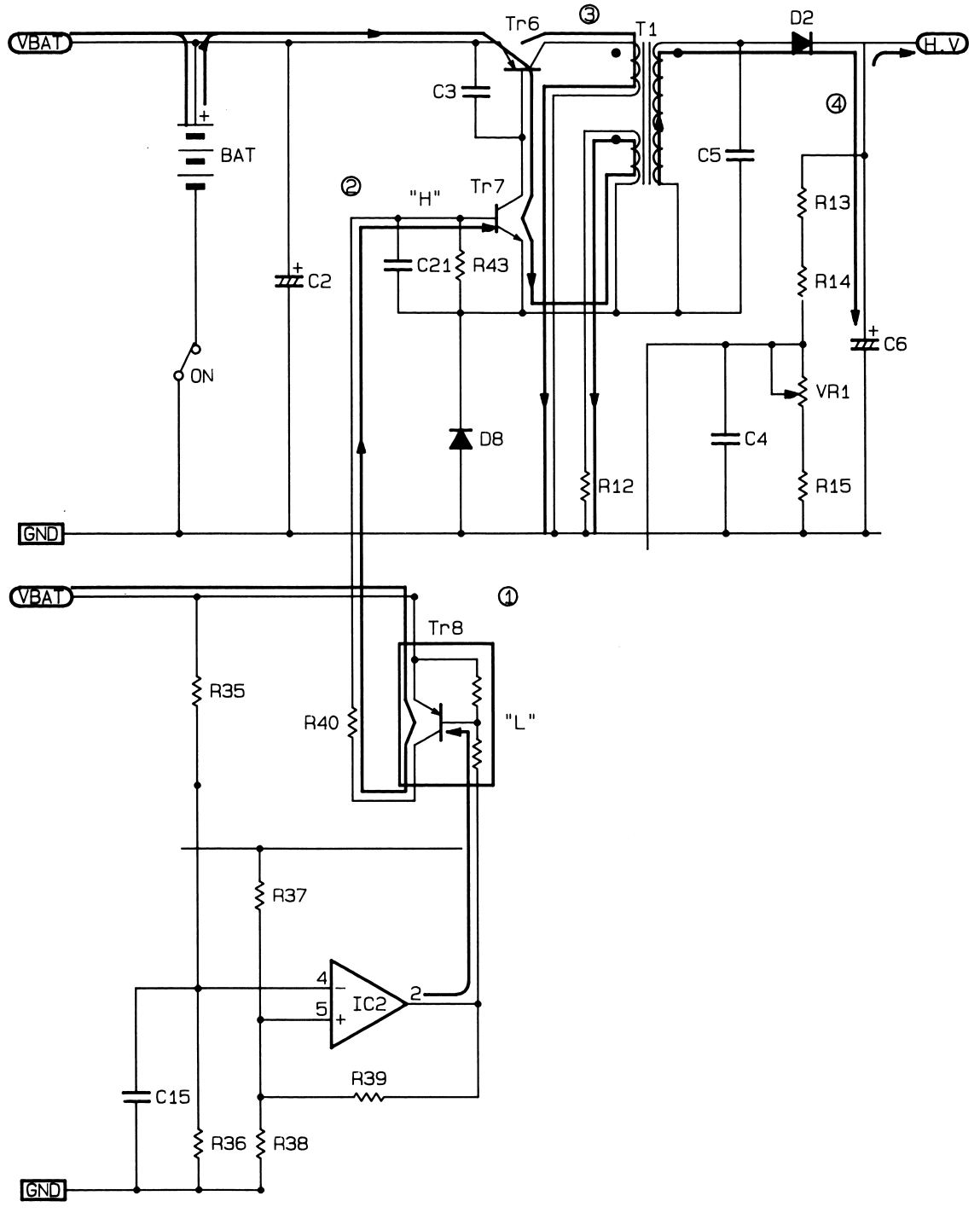
③ If Vcc is supplied, Tr10 is turned on through R29 D6.
Turning Tr10 on always turns Tr9 off. The flash firing start signal from the X terminal is inhibited here (flash firing inhibited).



2. Charging

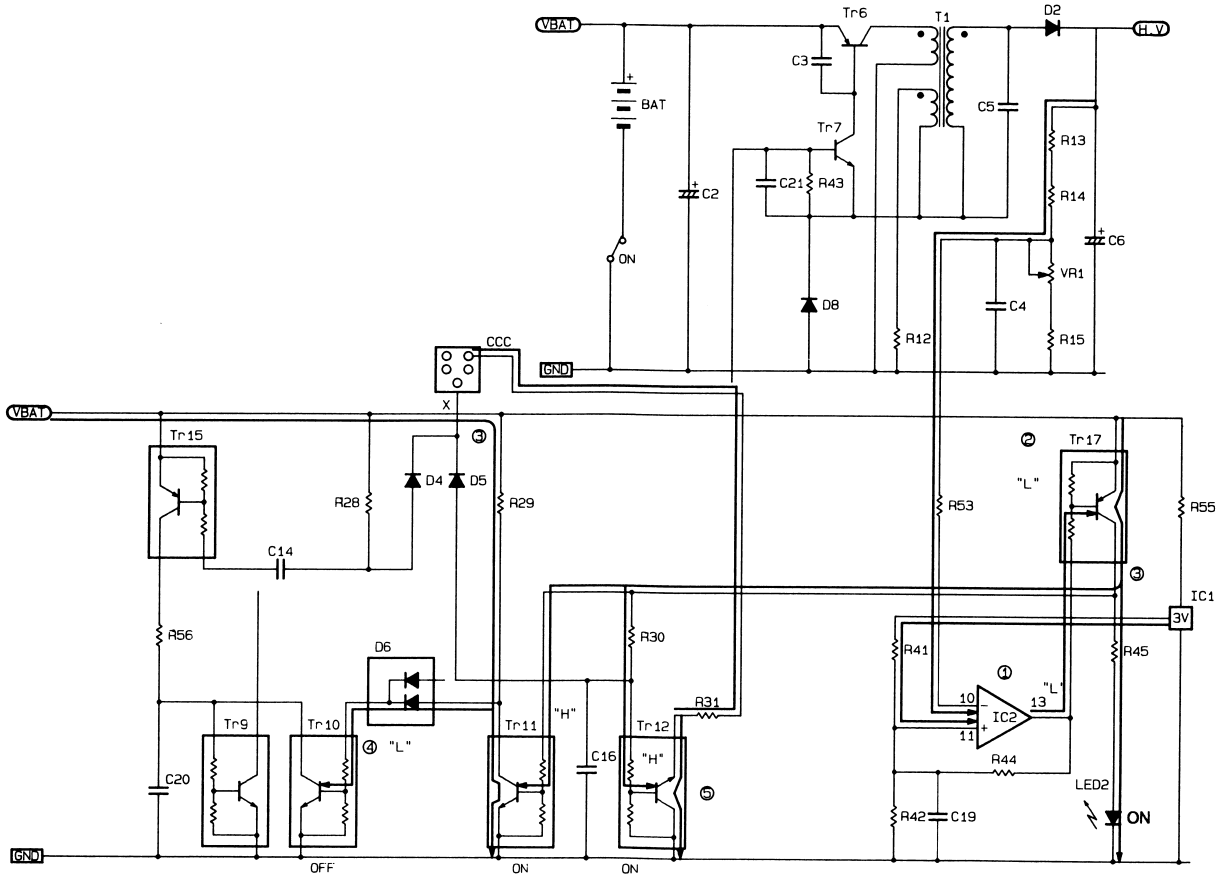
① If "L" is output from IC2 pin 2, Tr8 is turned on.
② Turning Tr8 on turns Tr7 on.
③ Turning Tr7 on turns Tr6 on. A current flows to the primary side of T1 to start oscillation.
④ The high voltage alternating current occurring on the secondary side of T1 is rectified by D12 and charges main capacitor C6.

To Section 3. Charging Completion



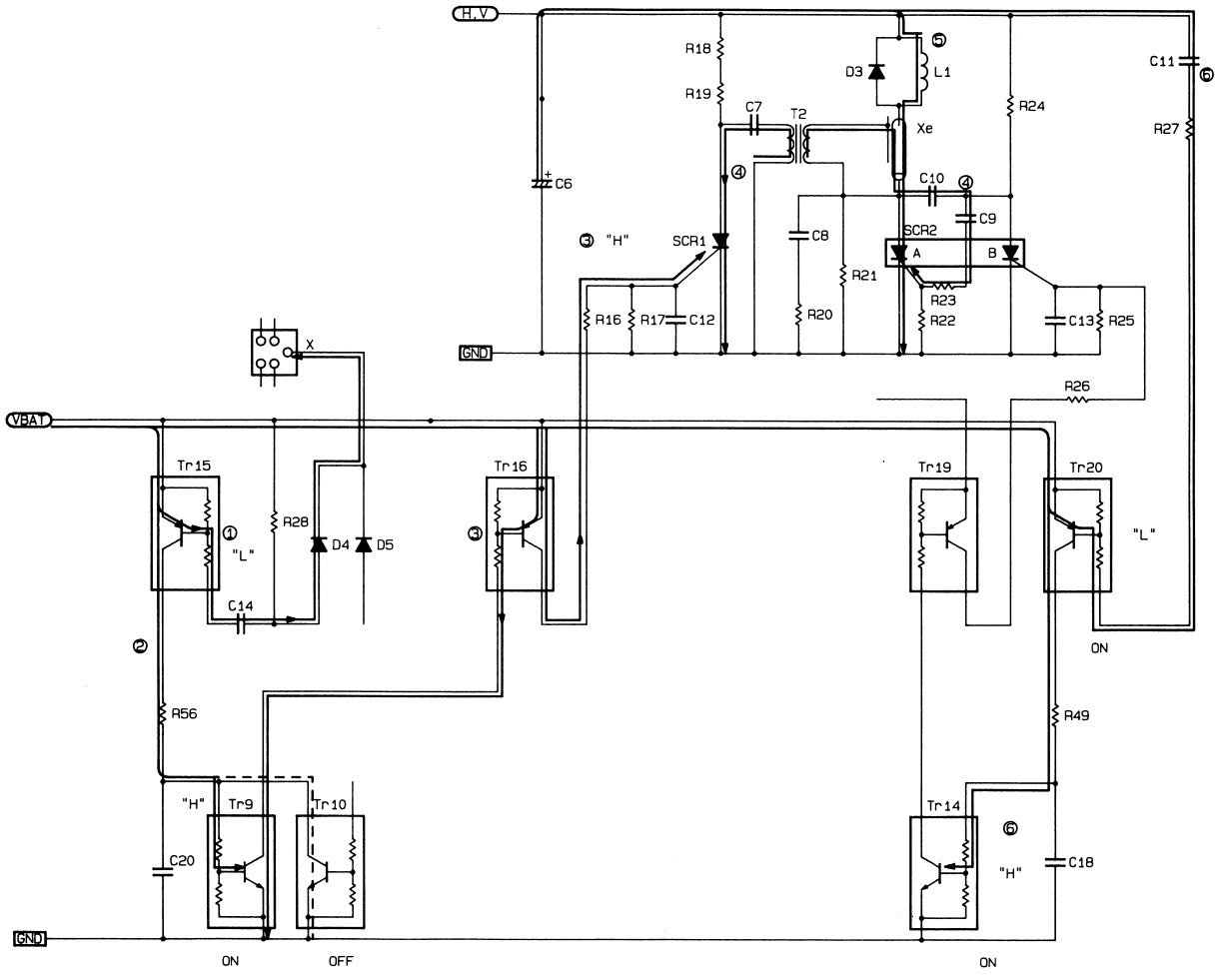
3. Charging completion

① A voltage proportional to VHV (main capacitor charging voltage) is taken from the voltage divider and input to IC2 pin 10, a comparitor. "L" is output from pin 13 when pin 10 > pin 9 (VHV > 265 V) (charging completion display signal).
② If "L" is output from ICS pin 13, Tr17 is turned on.
③ Turning Tr17 on flashes LED 2 (pilot lamp) and turns Tr11 and Tr12 on.
④ Turning Tr11 on turns Tr10 off. Turning Tr10 off releases /flash firing inhibited/ set during power supply or flash firing stop.
(See "Flash firing" on page 10)
⑤ Turning Tr12 on pulls a current of approximately 250 µA from the CCC terminal (charging completion signal: flash → camera).



4. Flash Firing

① After first curtain travel has been completed in the camera, "L" is output from the X terminal (flash firing start signal).
After "L" is output from the X terminal, TR15 is turned on.
② If Tr10 is turned off (/flash firing inhibited/ release), Tr15 and Tr9 are turned on.
③ If Tr9 is turned on, Tr16 is turned on and SCR1 is turned on.
④ Turning SCR1 on discharges C7 and flows a current to the T2 primary side. High voltage occurs on the T2 secondary side and trigger voltage is applied to the Xe tube. SCR2-A is turned on by this trigger voltage and a current flowing in the Xe tube.
⑤ Turning SCR2-A discharges main capacitor (C6) through the Xe tube and starts flash firing.
⑥ Flash firing in the Xe tube discharges C11 and turns Tr20 on. Turning Tr20 on turns Tr14 on.



Flash firing inhibited

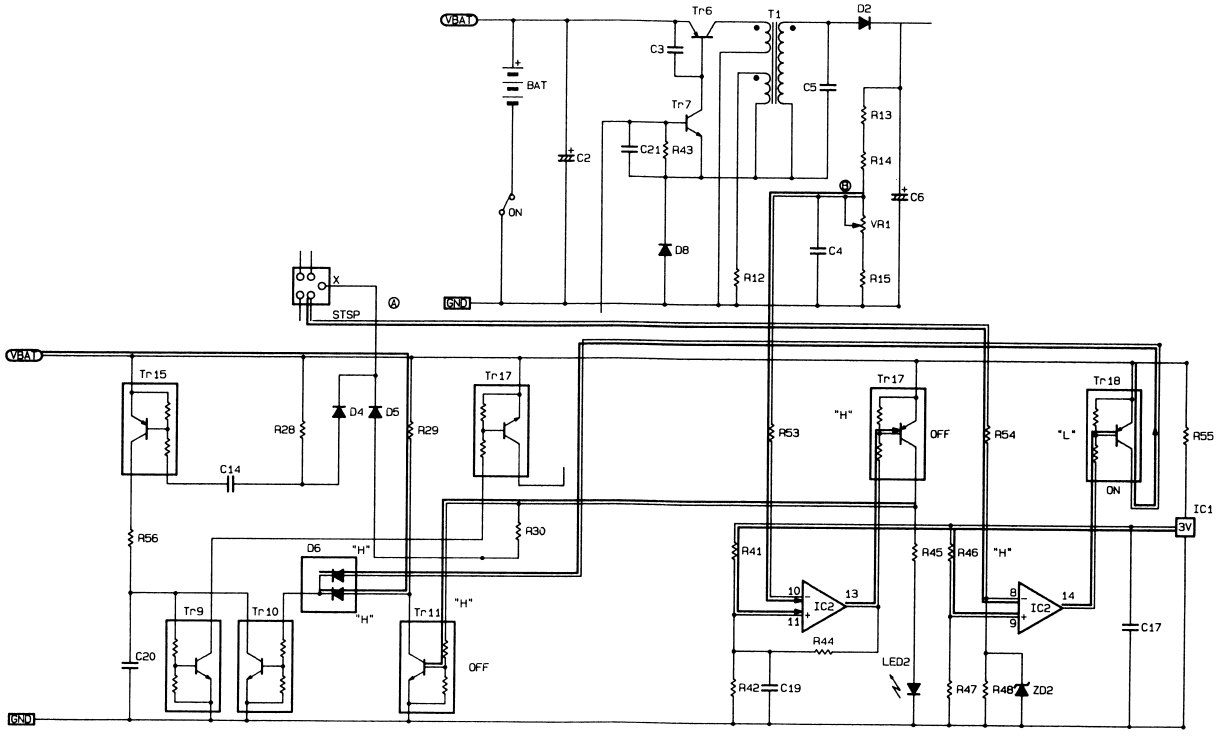
Tr10 ON → Flash firing inhibited
Tr10 OFF → Flash firing inhibited release state

- Turning Tr10 on and turning Tr9 off cut off the flash firing signal from the X terminal. That is, flash firing is inhibited.

- Tr10 ON (flash firing inhibited) conditions
  ① STSP should be "H".
  ② No charging completion

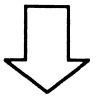
If either of the above two conditions is established, flash firing is inhibited.

* If flash firing is not required with the results of camera metering even in flash charging completion state, STSP stays "H" for "flash firing inhibited" and the shutter is released. The flash does not fire.



5. Flash Firing Inhibited

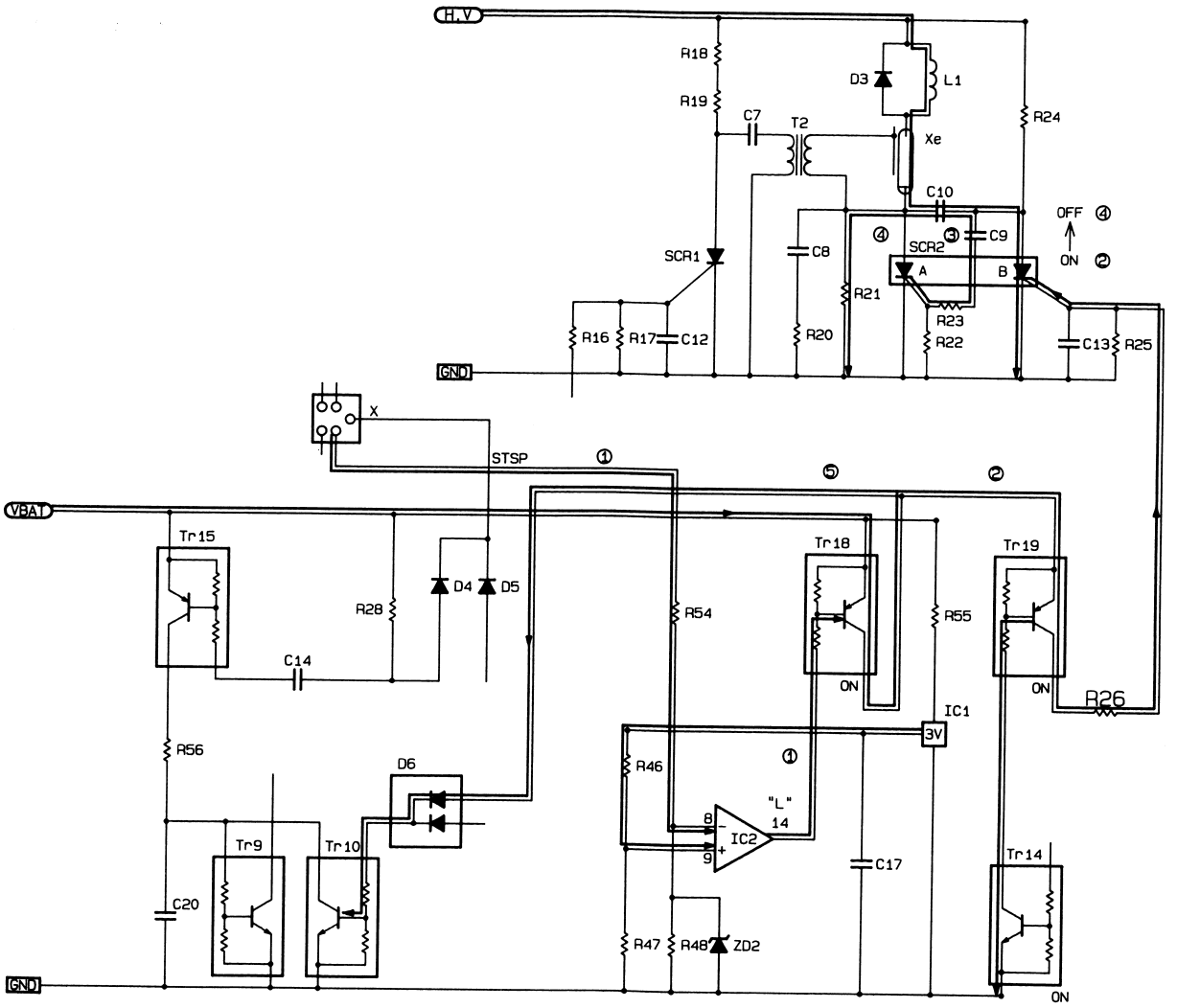
① After flash in the camera, "H" is output from the STSP terminal (flash firing stop signal). "H" is input from the STSP terminal to IC2 pin 8. "L" is output from pin 14 under the conditions of pin 8 > pin 9 (STSP terminal > 2.0 V).
If "L" is output from IC2 pin 14, Tr18 is turned on.
② Turning Tr18 on turns Tr19 on under the conditions of Tr14 ON (after flash firing start). Turning Tr19 on turns SCR2-B on.
③ Turning SCR2-B on discharges C9.10 and turns SCR2-A off.
④ After C10 has completed charging, the Xe tube is turned off. C10 starts charging through R21, so SCR2-B is turned off.



To Section 2. Charging

⑤ Turning Tr18 on turns Tr10 on (/flash firing inhibited/).

Flash firing stop

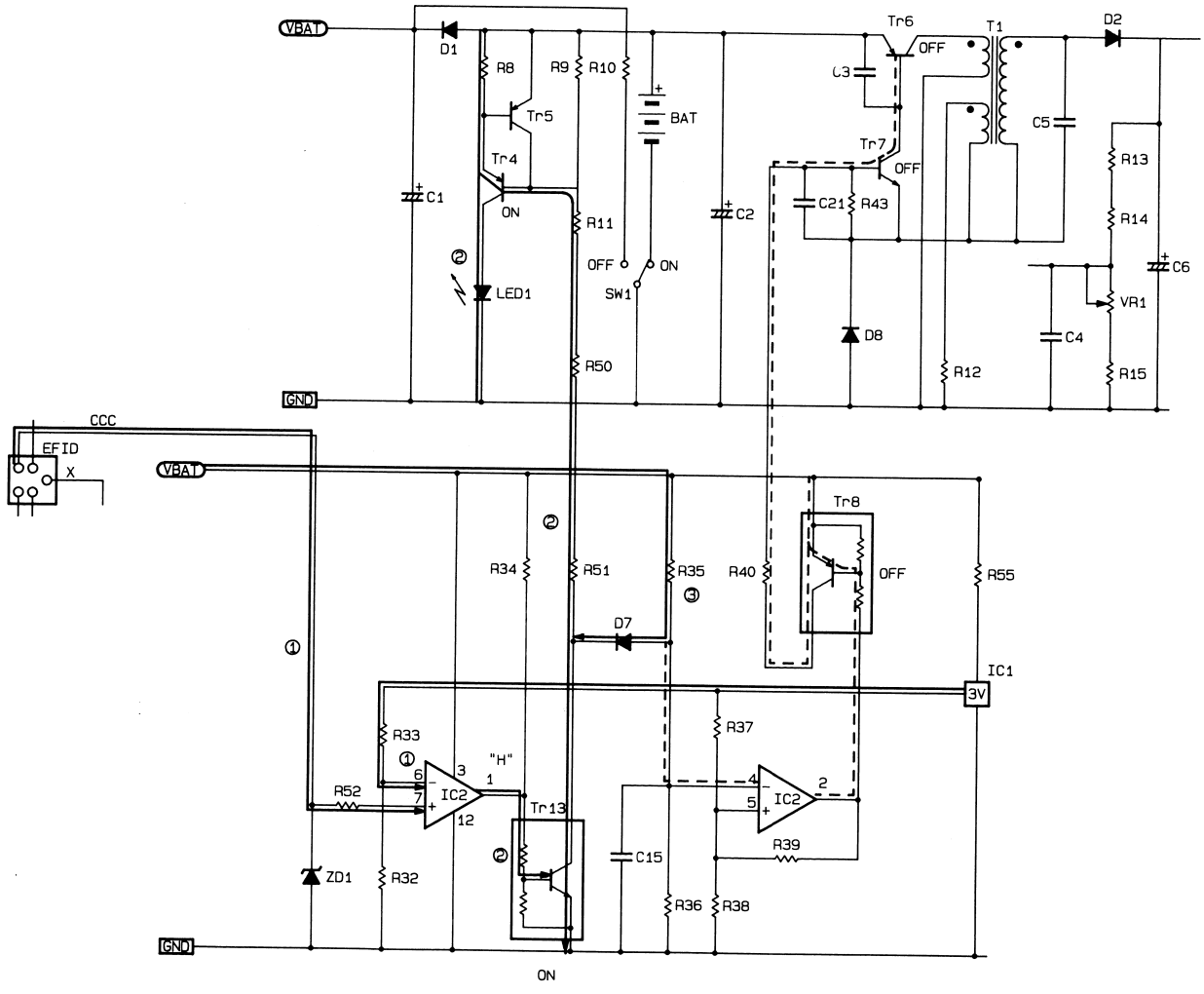


6. AF Auxiliary Light Firing

① If the camera requires the AF auxiliary light, "H" is output from the CCC terminal (AF auxiliary light flash firing signal).
"H" is input from the CCC terminal to IC2 pin 7. "H" is output from pin 1 under the conditions of pin 6 < pin 7 (CCC terminal > 2 V).

② If "H" is output from IC2 pin 1, Tr13 is turned on.
Tr4 is turned on and LED1 flashes by Tr13 ON.

③ By Tr13 ON, D7 is turned on, IC2 output does not become "L", and Tr8 is turned off.
By Tr8 OFF, Tr7 and Tr6 are turned off and oscillation is stopped temporarily.

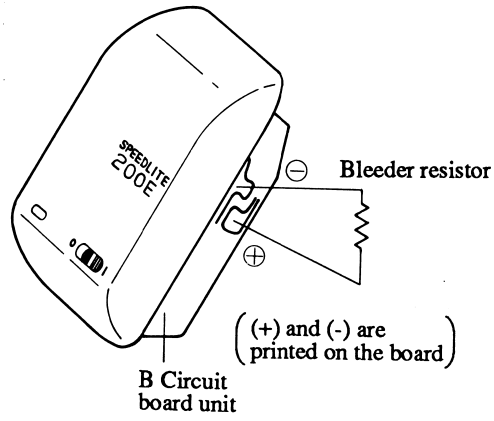


[3. REPAIR INFORMATION]

PREPARATIONS FOR REPAIR

Discharging the main capacitor

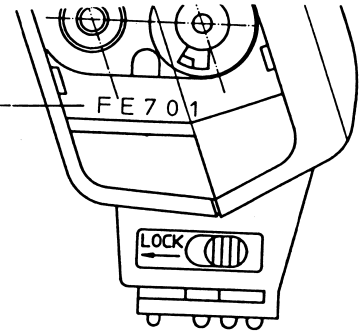
First, be sure to discharge the main capacitor during disassembly. Perform discharging with a main capacitor ⊕ ⊖ pattern on the circuit board.
The main capacitor ⊕ ⊖ is visible when the front cover is removed.



Classification No.

The classification number is stamped at the bottom of the battery compartment.

F E 7 0 1
- Change Number
- Month code: October is X, November is Y, and December is Z.
- Year code: E is 1990



PILOT LAMP LIGHTING VOLTAGE ADJUSTMENT

* This adjustment is necessary if the main C.B. is replaced.

Purpose

To adjust the ignition point of the ready lamp.

Tools

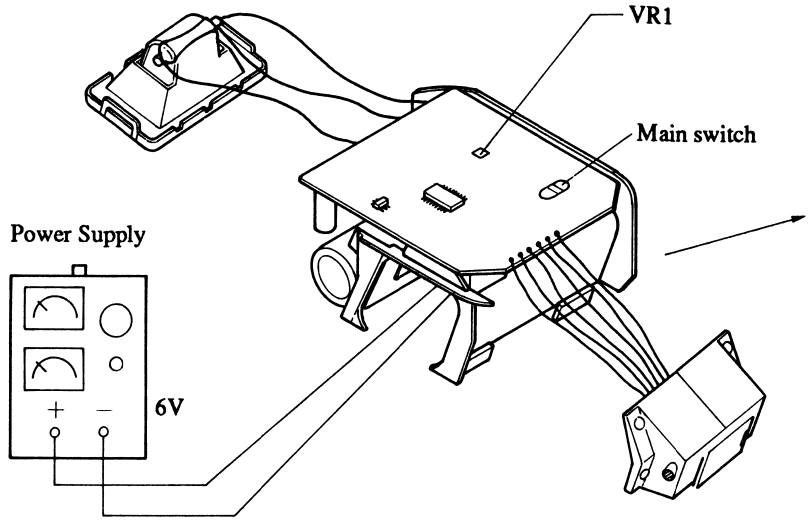
- Regulated power supply
- Multimeter
- Bleeder resistor

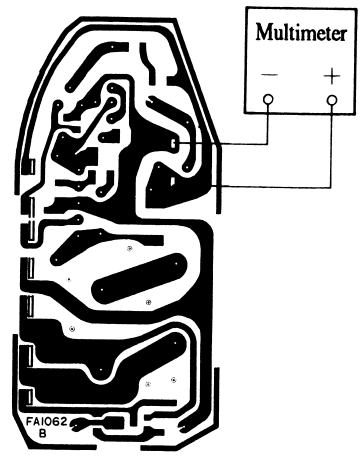
Standard

263 to 265 V

Preparation

1) Discharge the main capacitor.
2) Remove the external cover and connect the power supply and multimeter as shown in the figure below.
3) Set the power supply to 6 V.





B Circuit board

Adjustment

① Turn the main switch of the flash on to start charging.
② Read voltage when the pilot lamp lights.
③ If the voltage is not within the limits, adjust VR1.

Clockwise rotation increases ignition voltage.

CHECK STEP

Power switch ON

Oscillation sound → NO

Check	Problem		Checkpoint
Using the power supply	The ammeter needle does not swing.	①	Defective D1 Excess solder in the connection of the M and B circuit board. Defective IC1
	The ammeter needle swings a little.	②	Defective T1 IC2-pin 2 operation check Tr6, 7, and 8 operation check Defective D1

YES

Pilot lamp lighting → NO

	Check	Problem		Checkpoint
Not lighting	Measure the main capacitor voltage.	0V	③	Defective D2
		260 V or less	④	C6 leak or short SCR2 short C10 leak or short
		265 V or less	⑤	IC2-pin 13 operation check Defective Tr17 Defective LED2
Slow lighting	Measure the main capacitor voltage.	The ready lamp does not light at 265 V.	⑥	Improper VR1 adjustment Defective IC1 output voltage

YES

Flash firing → NO

Check	Problem		Checkpoint
Instantaneous short between the SCR1 anode and cathode	No flash firing	⑦	Defective Xe Defective SCR2 Defective T2 Defective C7
	Flash firing	⑧	Defective SCR1 Defective Tr15, Tr16 Defective Tr9, Tr10

YES

Flash firing → NO

Check	Problem		Checkpoint
SCR2 operation check	No operation	⑨	SCR2 open IC2-pin 14 operation check Defective Tr18, 19 Defective Tr14, 20
	Operation	⑩	SCR2 short Defective C9, 10

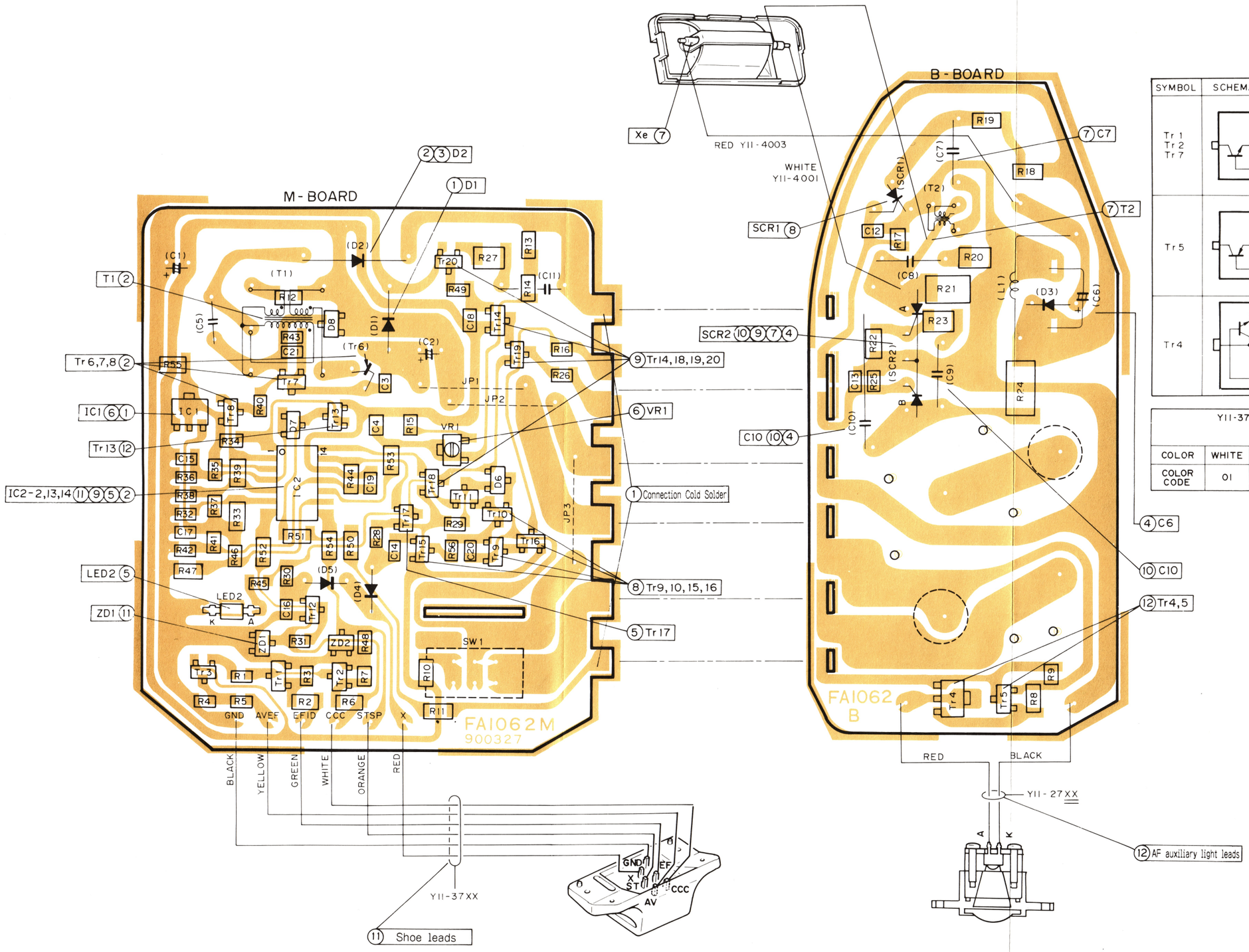
YES

AF auxiliary light flash firing → NO

Check	Problem		Checkpoint
IC2-pin 1 operation check	No operation	⑪	Shoe lead check Defective ZD1 Defective IC2
	Operation	⑫	Tr4 open Tr5 jumper Defective Tr13 Cold solder joint at the leads of the AF auxiliary light

CHECK STEP

REF. NO. C50-0691



SYMBOL	SCHEMATIC	SYMBOL	SCHEMATIC
Tr 1 Tr 2 Tr 7		Tr 3 Tr 8 Tr 15 Tr 16 Tr 17 Tr 18 Tr 19 Tr 20	
Tr 5		Tr 9 Tr 10 Tr 11 Tr 12 Tr 13 Tr 14	
Tr 4			

Y11-37XX Y11-27XX
COLOR CODE

COLOR	WHITE	BLACK	RED	ORANGE	YELLOW	GREEN
COLOR CODE	01	02	03	06	07	09

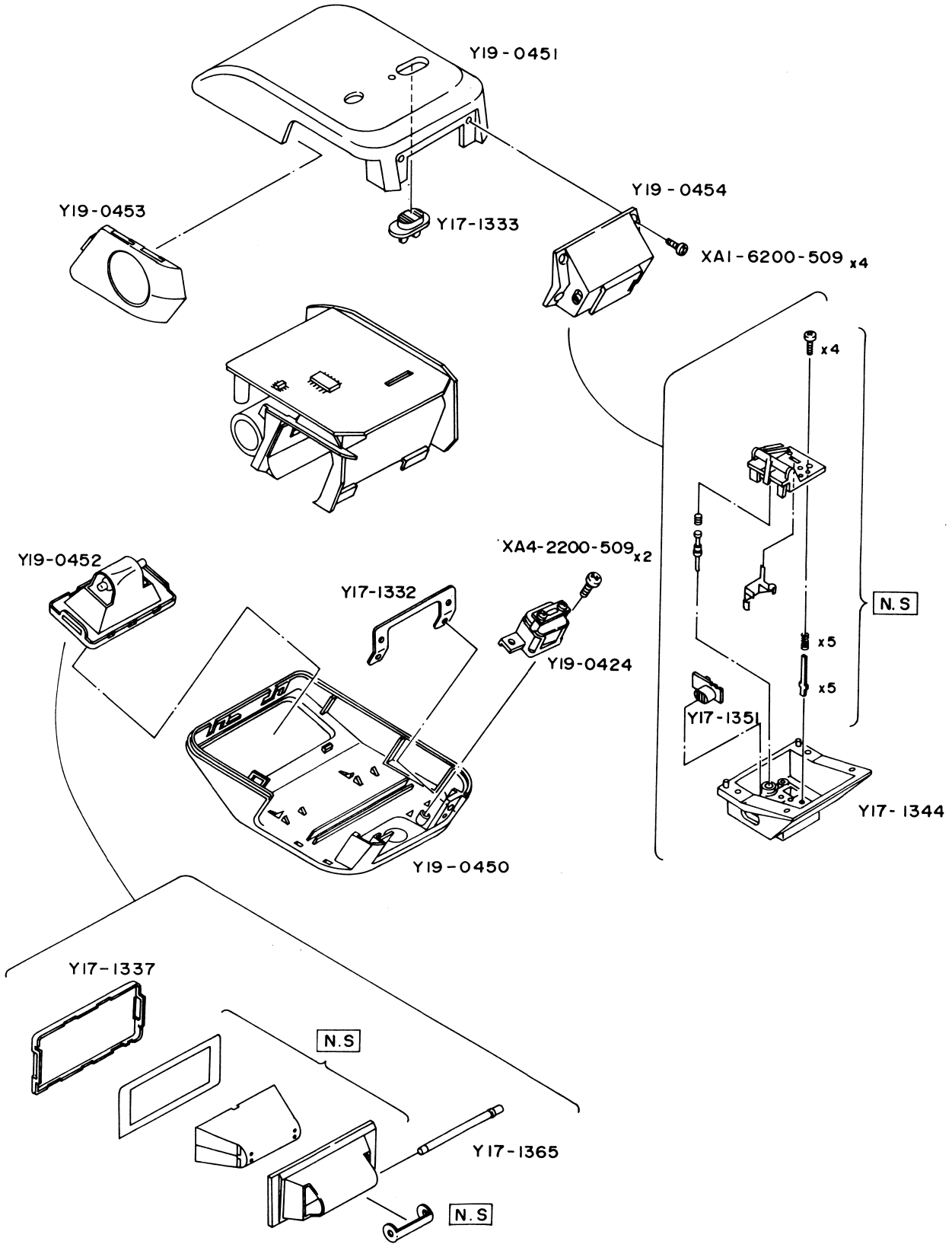
01 SEP, 1990

[4 ADDITIONAL INFORMATION]

PARTS CATALOG ILLUSTRATIONS

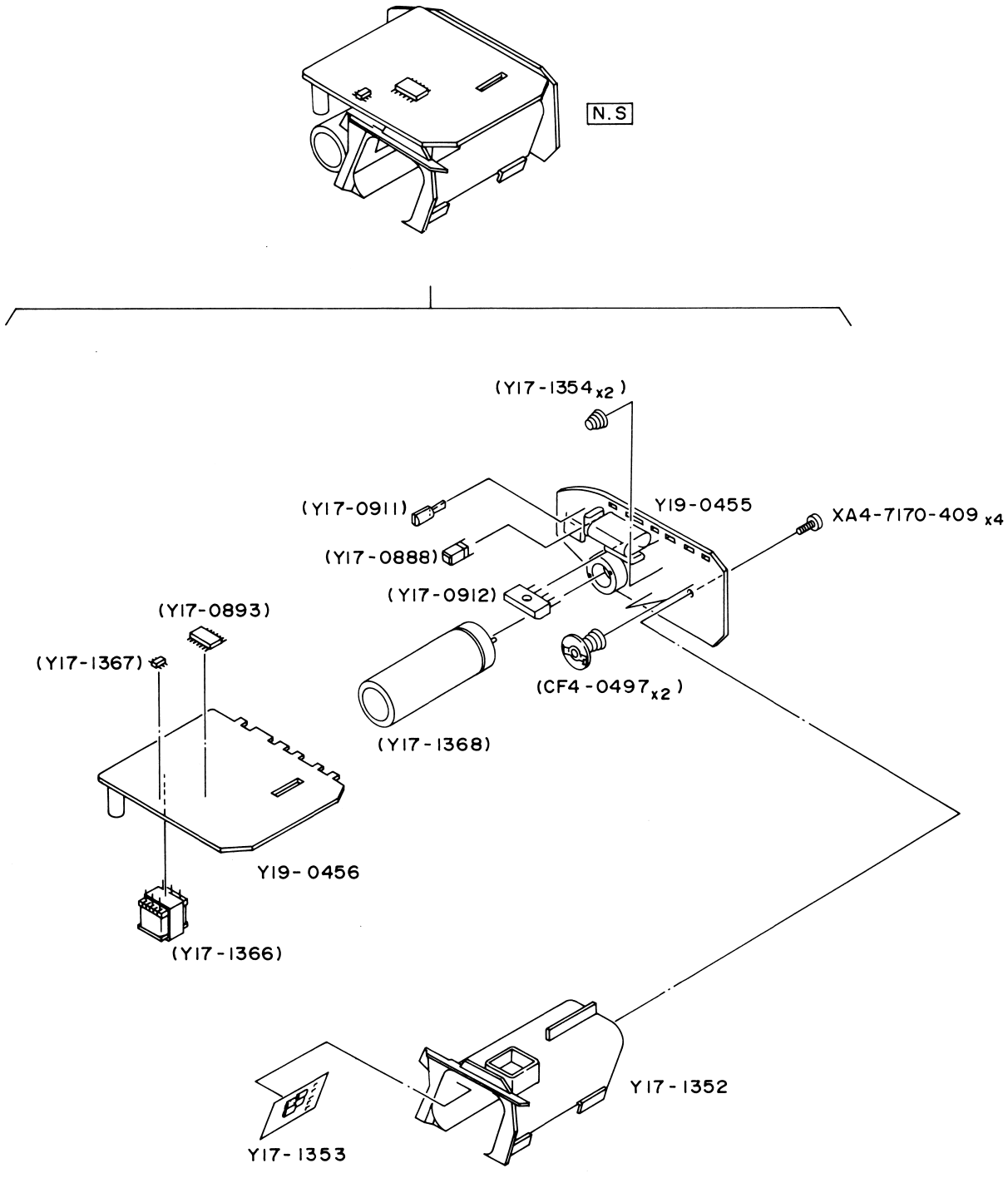
CANON SPEEDLITE 200E

REF. NO. C50-0691



REF. NO C50-0691

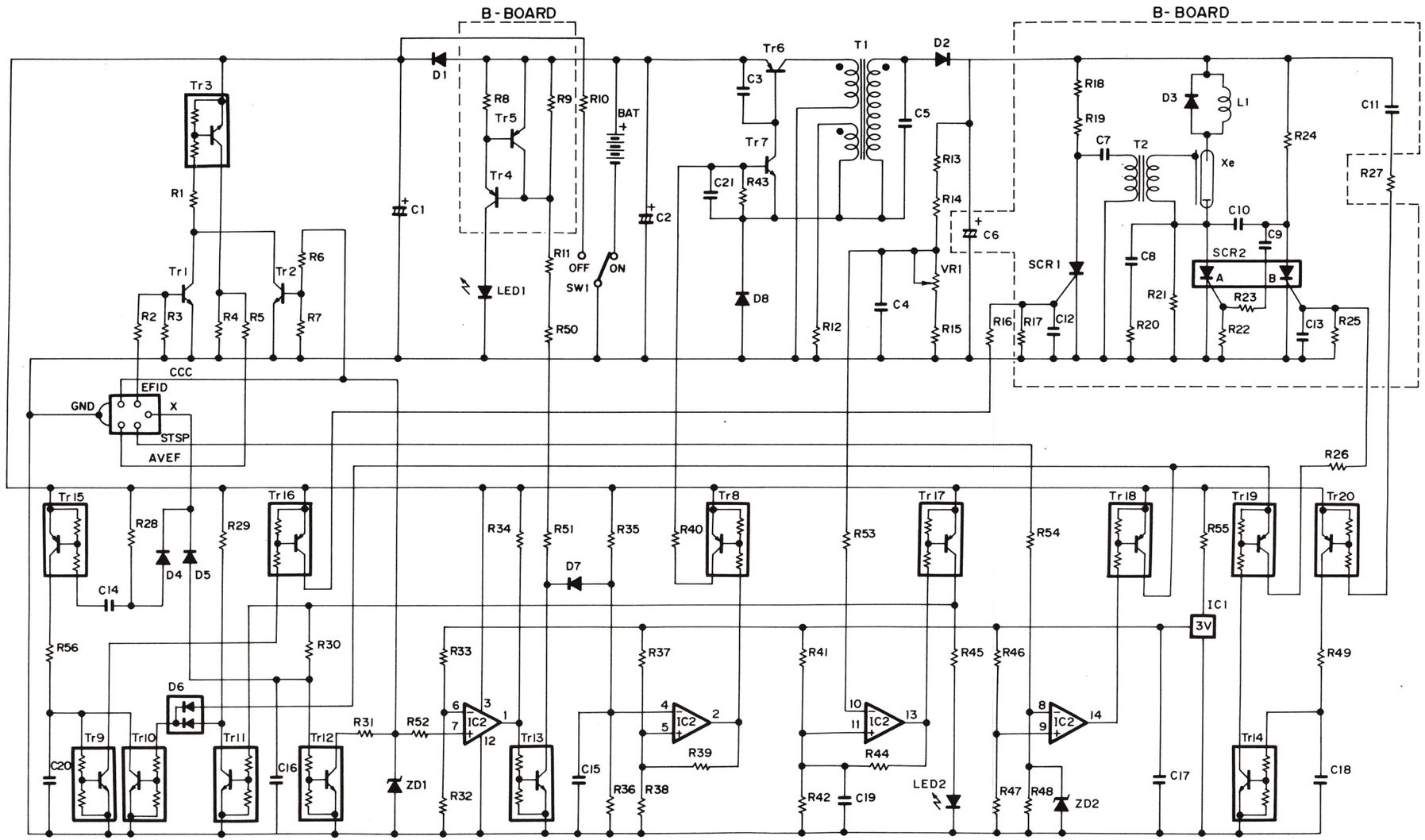
CANON SPEEDLITE 200E



[5 ELECTRICAL DIAGRAM]

SCHEMATIC DIAGRAM

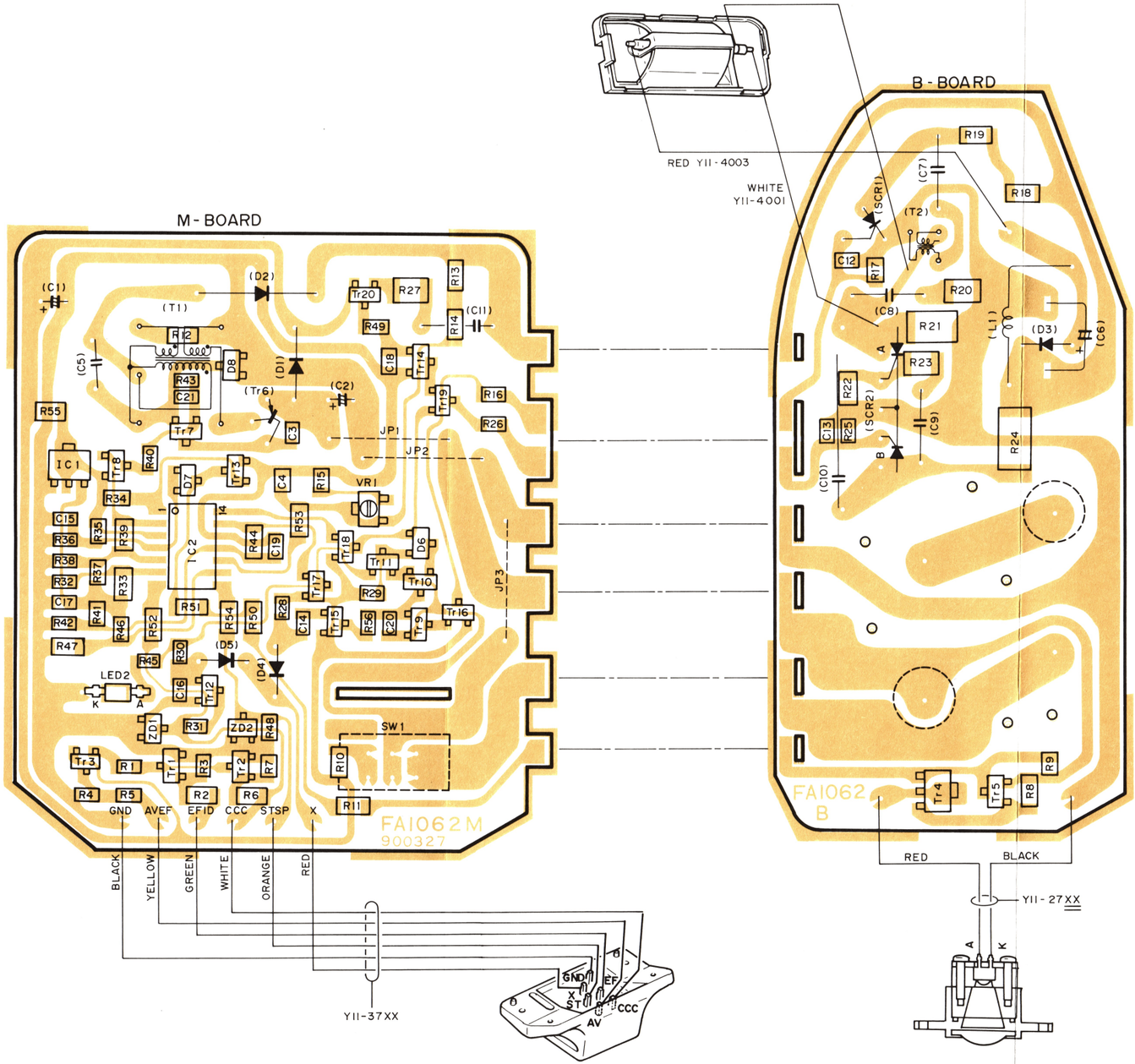
REF. NO. C50-0691



01 SEP, 1990

P.C.B & WIRING DIAGRAM

REF. NO. C50-0691



SYMBOL	SCHEMATIC	SYMBOL	SCHEMATIC
Tr 1 Tr 2 Tr 7		Tr 3 Tr 8 Tr 15 Tr 16 Tr 17 Tr 18 Tr 19 Tr 20	
Tr 5		Tr 9 Tr 10 Tr 11 Tr 12 Tr 13 Tr 14	
Tr 4			

Y11-37XX Y11-27XX
COLOR CODE

COLOR	WHITE	BLACK	RED	ORANGE	YELLOW	GREEN
COLOR CODE	01	02	03	06	07	09

01 SEP, 1990

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