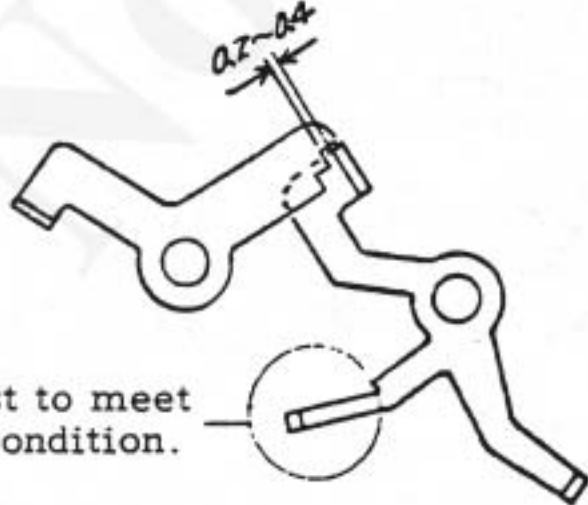


9. Shutter not released (mechanical fault)

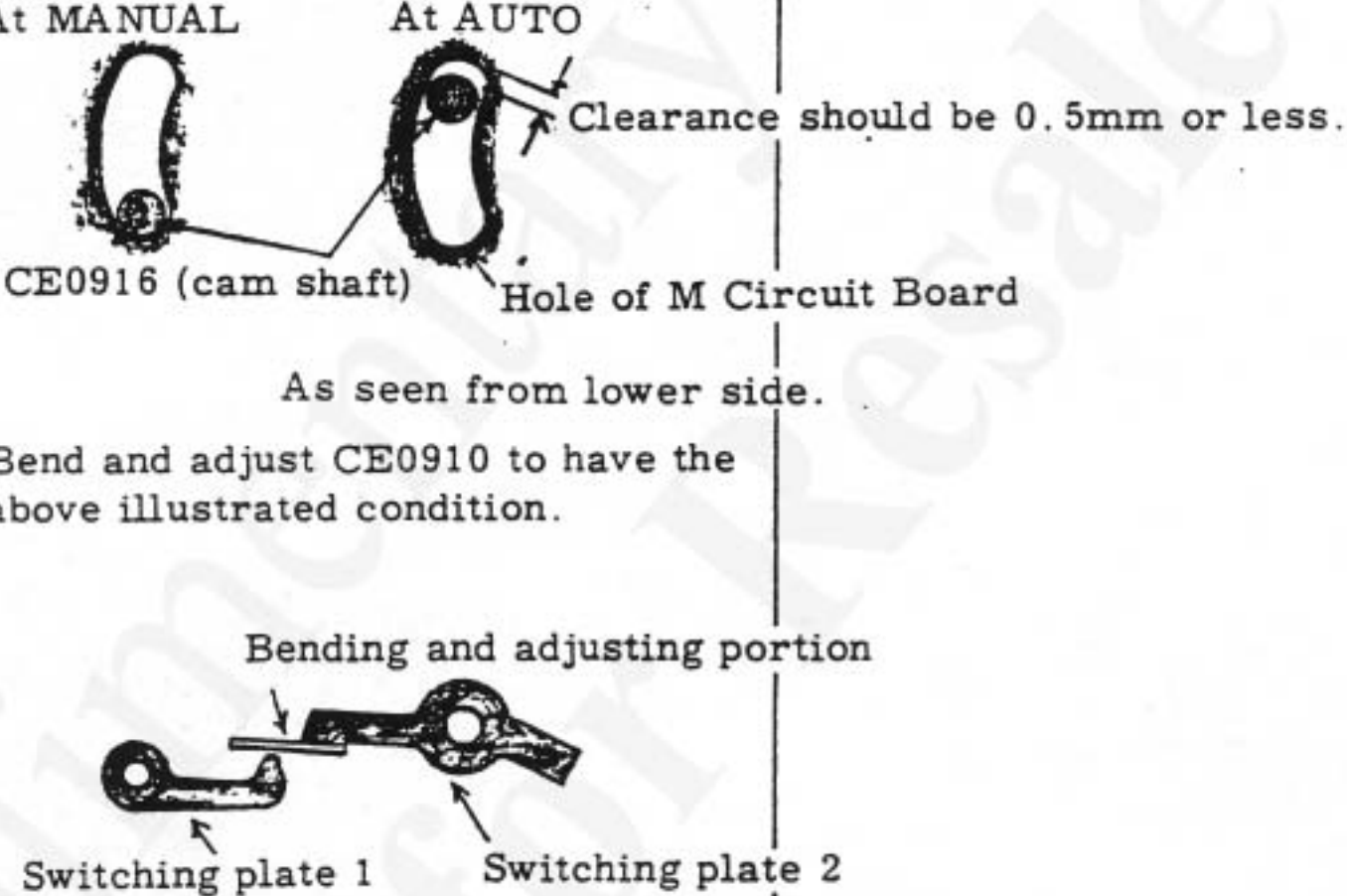
Cause	Remedy	Checkup
1) Defective mirror movement	<p>a. There is no backlash in the left- and -right direction of CE0870 (M frame).</p> <p>Loosen the screw of side plate and adjust the position.</p>	
2) Insufficient CE0886 (release plate B) force	<p>a. Disengaging force of CE0832 (opening claw A) excessive.</p> <p>b. CE0886 operates improperly.</p>	
3) Insufficient CA8439 (S-release) force	<p>a. Tensile force of CA8447 (M spring) is insufficient.</p> <p>Replace it.</p> <p>b. CA8439 rubs against the body.</p> <p>Adjust the position.</p>	
4) Excessive disengaging force of CE0885 (release plate A)	<p>a. Absence of lubricant at the hooking portion with CE0886 (release plate B)</p> <div data-bbox="652 1597 1736 2078" data-label="Diagram"> </div> <p>Apply Rocol Paste to CE0885 for about 1mm (B1).</p> <p>b. Tensile force of CE0891 (release spring A) is excessive.</p> <p>c. Surface finish accuracy of the hooking portion of CE0885 is insufficient.</p>	

Cause	Remedy	Checkup
	d. CE0885 operates improperly.	CE0885 should operate smoothly and return with the spring force.

10. Defective shutter speed at AUTO


Cause	Remedy	Checkup
1) Defective CE0942 (switching board)	a. Poor soldering of CE0942. b. AUTO/MANUAL switching is defective.	
2) Defective CE0914 (M circuit board)	a. CE0935 (K-contact piece) is disconnected. b. IC is defective. c. SBC is defective. d. Poor soldering on FET.	
3) Defective CE0645 (AR circuit board)	a. CE0636 and CE0637 (A-contact piece 1, 2) are shortcircuited. b. Resistors of CE0645 is short-circuited with body. c. CE0630 (A lever 2) is submerged.	
4) Defective CE0885/0886 (releasing plates) engagement	<p>a. Insufficient charge due to improper adjustment of CE0886.</p>  <p>Bend and adjust to meet the following condition.</p> <p>When the wind lever is advanced and CE0886 is set to the 1st step of CE0885, there should be 0.2 - 0.4 mm allowance.</p>	<p>When wound, CE0886 should surely hook on the 1st step of CE0885 with the allowance described at left.</p> <p>There should be allowance between CE0886 and the body.</p>

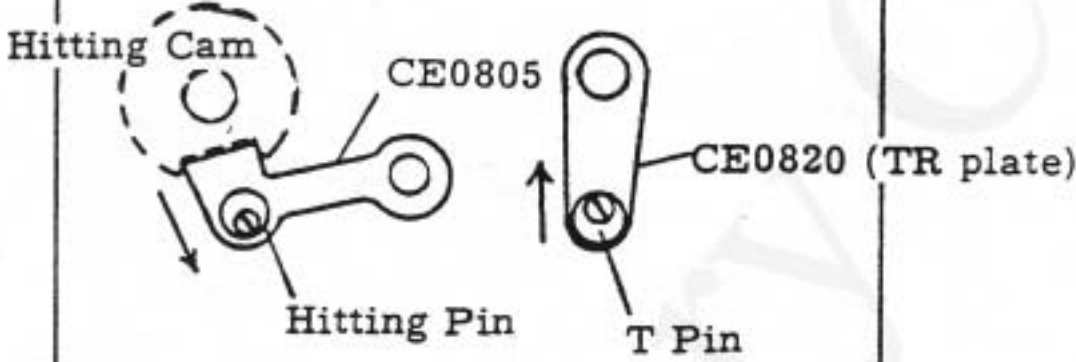
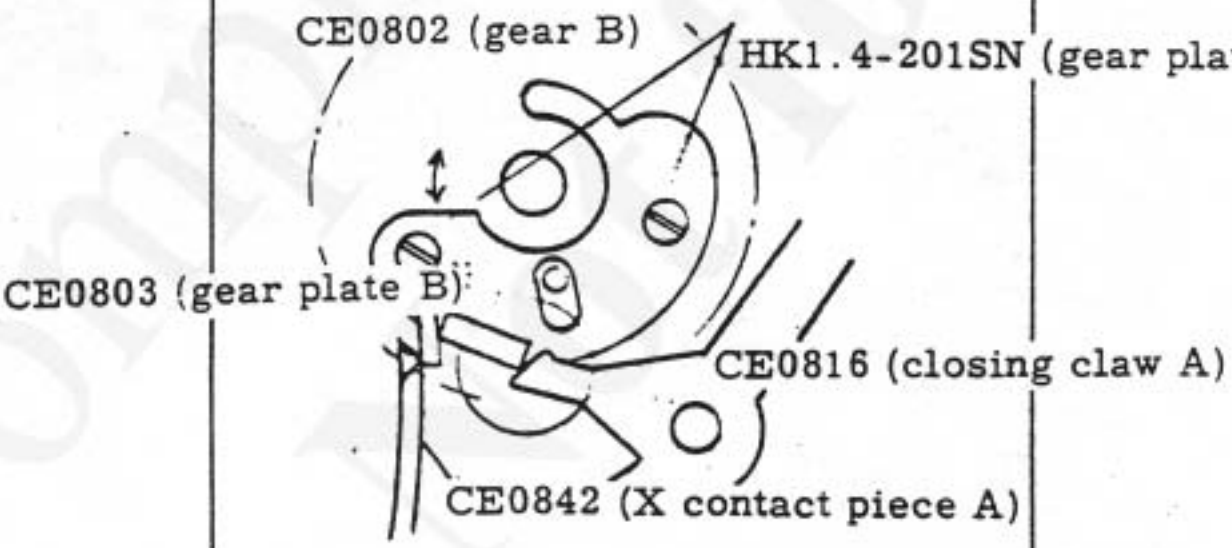
11. Defective shutter speed at MANUAL

Cause	Remedy	Checkup
<p>1) Defective CE0910 (switching plate) of CE0942 (switching board)</p>	<p>a. Poor soldering of CE0942. Solder it sufficiently.</p> <p>b. CE0910 operates improperly.</p> <p>At MANUAL At AUTO</p>  <p>CE0916 (cam shaft) Hole of M Circuit Board</p> <p>Clearance should be 0.5mm or less.</p> <p>As seen from lower side.</p> <p>Bend and adjust CE0910 to have the above illustrated condition.</p> <p>Bending and adjusting portion</p> <p>Switching plate 1 Switching plate 2</p>	
<p>2) Defective CE0885/0886 (release plates) engagement</p>	<p>a. CE0886 is charged insufficiently. See Section II-10-4).</p>	
<p>3) MG related parts</p>	<p>a. MG attractive force is too weak. The surface of CE0811 (attractive plate) is soiled or scratched. Clean or replace CE0811.</p> <p>Note: CE0811 and CE0813 are finished into a mirror surface to increase attractive force. The force lowers considerably if the surface is smudged or scratched.</p>	<p>The attractive force should be 60grs or more at 1.8V. See Section II-3-2)-d.</p>

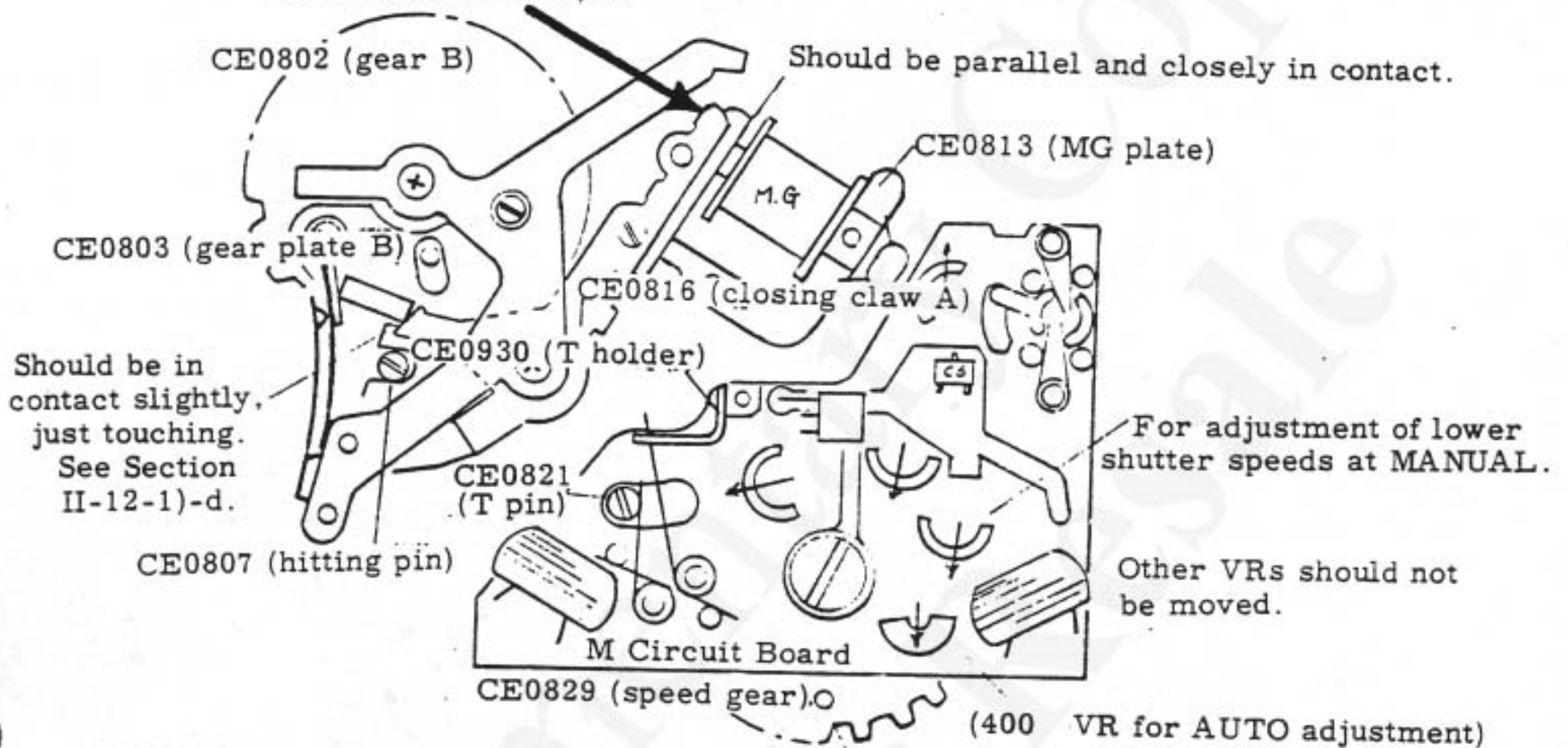
Cause	Remedy	Checkup
4) Defective main switch	a. CE0871 and CE0872 (M contact piece 1. 2) are contacted improperly. See page 74.	
5) Defective M circuit board	a. Poor soldering on FET. Correct soldering. b. CE0925 (speed plate) and CE0915 (shutter speed circuit board) are contacted improperly. Clean CE0915 or replace CE0925. c. Pattern to K shaft is broken. The soldered spot of white LW coming from CE0915. d. Shortcircuit between CE0913 (switching plate 3) and C101 (condenser for MANUAL). e. CE0935 (K contact piece) is detached.	

12. Manual shutter speed adjustment

Cause	Remedy	Checkup
1) Preparation for adjustment	a. Power supply voltage is $3.10 \pm 0.04V$. b. When CE0503 (top plate) is removed, insulate CE0524 (S base) from CE0526 (S-contact piece). 	Silver-oxide batteries may be used as the power supply.


Cause	Remedy	Checkup
	<p>c. Adjust the eccentrics of the hitting pin of CE0805 and the T pin of CE0820 (TR plate).</p>  <p>Locate the screw head of eccentrics in the arrowed direction.</p> <p>d. Adjust the clearance between CE0803 (gear plate B) and CE0816 (closing claw A). Loosen CE0803 and fix it in such a degree that it is contacted to CE0816 by the pressure of CE0842 (X contact piece A).</p> 	<p>After winding, carefully return CE0816 (closing claw A) in the spring force effecting direction.</p> <p>Improper if 0816 moves even slightly when it is pressed against MG. Make re-adjustment.</p> <p>See next page.</p>

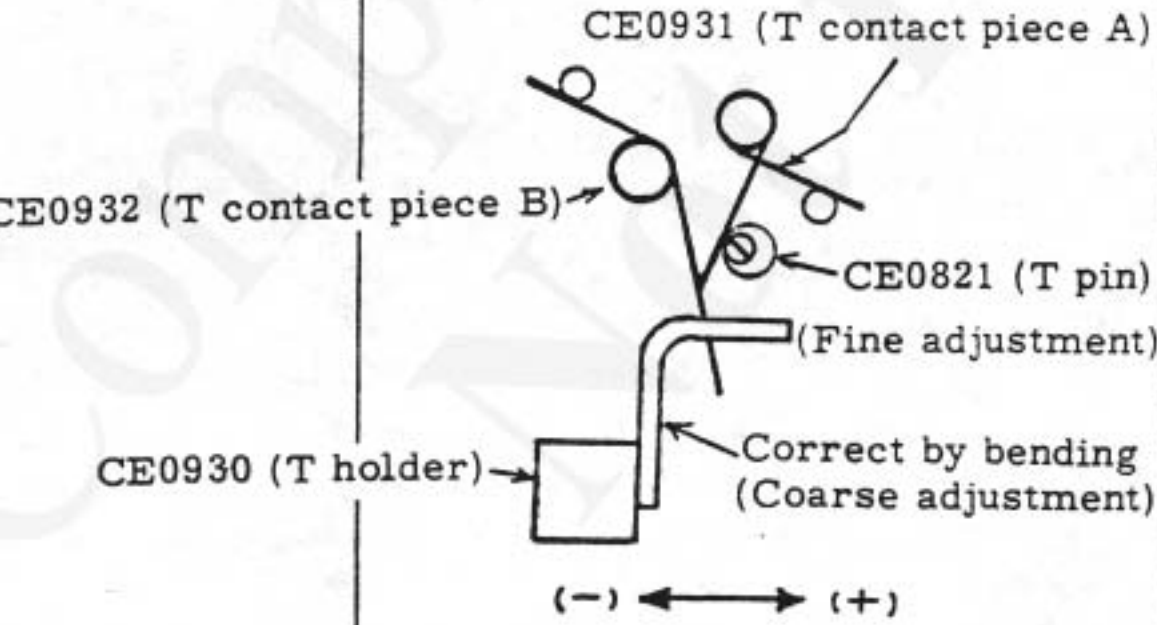
Should not move when pressed in the arrow direction after winding.
See Section II-12-1)-d.




CE0821 (T pin) and CE0930 (T holder) are for the adjustment of higher shutter speeds at MANUAL.

See Section II-6-3)-d for the position of each shutter speed hole.

Cause	Remedy	Checkup
2) Temporary setting of curtain speed	Set the shutter speed to 1/8 sec. (See Section II-6-3)-d if the shutter dial is not attached.) Turn CA8531 (tension nut) of cylinder shafts C & D to have the curtain speed described at right. See the OM-1 Repair Manual. 20-I-D18.	The curtain speed should be 11.5 ± 0.2 ms for both the opening and closing curtains. (The speed of opening curtain is recommendably faster.)
3) Setting to 1/8 sec. (Adjustment for lower speeds)	Adjust to 125 ± 5 ms with the 30K Ω VR of CE0914 (M circuit board). 	125 ± 5 ms

Cause	Remedy	Checkup
4) Adjust- ment of 1/500 sec.	a. Verify the difference between each shutter speed of 1/500, 1/1000 and 1/250.	2ms between 1/500 sec. and 1/250 sec. 1ms between 1/500 sec. and 1/1000 sec. Note: If the difference is less 2ms between 1/250 sec. and 1/500 sec.. it is acceptable if there is not 1ms difference between 1/500 sec. and 1/1000 sec. (Influence of mini shutter speed. 0.5 - 1.42ms at AUTO)
	b. Adjustment of curtain speed at 1/500 sec. Adjust as described at right with CA8531.	11.5 ± 0.1ms The opening curtain should run faster than the closing curtain. The difference should be 0.15ms or less.
	c. Adjustment of 1/500 sec. shutter speed 	1.96 ± 0.1ms (Adjust to 2 ± 0.5ms coarsely with CE0830 (T holder) and then make fine adjustment with CE0821 (T pin).) See Section II-6-2) for the locational relations between CE0832. CE0831 (T contact pieces A. B) and CE0830. Caution: CE0830 (T holder) is easy to become loose. and thus care should be taken when bending.
	d. Inspect 1/8 sec. if 1/8 sec. is out of 125 ± 5ms. re-adjust with the 30K α VR and then adjust 1/500 sec. again.	

Cause	Remedy	Checkup
5) Check of 1/1000 sec.	<p>a. If the difference is greater than 1/1000 between 1/500 sec. and 1/1000 sec.:</p> <p>Minimize the engagement and clearance between CE0816 (closing claw A) and CE0803 (gear plate B).</p> <p>Make the engaging extent to 0.4 - 0.5mm.</p>	See Section II-12-1)-d.
	<p>b. When the difference is smaller than 1/1000 due to smaller mini shutter speed:</p> <p>Adjust with the hitting pin of CE0805.</p> <p>See Section II-12-1)-c.</p> <p>c. When the difference between 1/500 sec. and 1/1000 sec. is smaller than 1/1000:</p>	
	6) Adjust-ment of mini shutter speed	<p>Set to the AUTO mode and short-circuit yellow and white ASA lead wires by placing a 1KΩ resistor in-between.</p>  <p>The hitting pin is an eccentric.</p>	Should be within 0.5 - 1.42ms. (Make 0.8ms as a target.) Fluctuations are acceptable if they are within the shutter speed standards.
7) Check of 1/1000 sec. and 1/500 sec.	Measure 1/8 sec.. high shutter speeds, curtain speeds and mini shutter speed for more than 5 times.	See Specification Standards on the next page.

Specification Standards for Manual Shutter Speed

1. Shutter Curtain Speed

The curtain speed should be 11.5 ± 0.1 ms for both opening and closing curtains. The difference in the curtain speed at 1/1000 sec. should be $0^{+0.15}_{-0}$, and the opening curtain should be faster.

2. Exposure Time

Shutter Speed	Unit	Guaranteed Quality	Standard
1/1	1000 ms	871 - 1148 ms	± 0.2 EV
1/2	500 "	436 - 574 "	"
1/4	250 "	218 - 287 "	"
1/8	125 "	109 - 144 "	"
1/15	62.5 "	54.5 - 71.8 "	"
1/30	31.2 "	27.2 - 35.9 "	"
1/60	15.6 "	13.6 - 17.9 "	"
1/125	7.81 "	6.81 - 8.97 "	"
1/250	3.91 "	3.40 - 4.49 "	"
1/500	1.95 "	1.59 - 2.40 "	± 0.3 EV
1/1000	0.98 "	0.77 - 1.43 "	$\pm 0.1 \pm 0.45$ EV

3. Exposure Unevenness

- a. At 1/1000, the difference between MAX and MIN of the channels A, B and C should be 0.4EV or less (in the range).
- b. At 1/500, 0.3EV or less.
- c. At 1/250 - 1/1, 0.15EV or less.

4. Fluctuations

- a. Should be 0.55EV or less in the 1/1000 range.
- b. Should be 0.3EV or less in the 1/500 - 1/1 range.

5. Mini Shutter Speed

- a. 0.5ms or faster for all channels A, B and C.
- b. Exposure time should be 0.5 - 1.42ms (for channel B).
- c. Exposure unevenness should be 0.6EV or less.

13. Automatic shutter speed adjustment

Cause	Remedy	Checkup
1) Preparation for adjustment	<p>a. Manual shutter speed adjustment should have been completed.</p> <p>b. Power voltage should be $3.10 \pm 0.04V$.</p> <p>c. Mount an F5.6 jig lens.</p> <p>d. Install CE0955 (mat).</p> <p>e. When CE0503 (top plate) is removed, insulate the 2nd synch terminal.</p>	<p>Silver-oxide batteries may be used as the power supply.</p> <p>When using a constant voltage power supply, NEVER turn on and off the power switch, after the power supply is wired to the camera.</p>
2) Adjustment at BV 11	<p>Make the adjustment with the 400Ω VR of CE0914 (M circuit board) to $0 \pm 0.1EV$.</p> <div data-bbox="718 1337 1404 1795" style="text-align: center;"> <p style="text-align: center;">(-) (+) 400 Ω VR for AUTO</p> </div> <p>Do not move other VRs.</p>	<p>Within $0 \pm 0.1EV$</p>
3) Adjustment at BVs 14 and 15		<p>BV 14: Within $0 \pm 0.2EV$</p> <p>BV 15: Within $0 \pm 0.4EV$</p>
4) Adjustment at BVs 8 and 4		<p>Within $0 \pm 0.3EV$</p>

Cause	Remedy	Checkup
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5) ASA conversion accuracy

Check at BV 8.

ASA	12	50	100	200	400	800	1600
Accuracy (EV)	0±0.25	0±0.25	Reference	0±0.3	0±0.45	+0.2±0.5	+0.5±0.5
Stage Difference	↑ 0.7EV or greater			↑↑ 0.5 or greater		↑↑ 0.3 or greater	

6) Check of current consumption	Remove the battery compartment cover and place an ampere meter between the bottom plate and the battery.	The current should be 9mA or less at AUTO BV 4 and 13mA or less at Bulb (B).
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7) High luminance EV faulty at high ASA settings	<p>This is caused by displacement of OFF set of CE0914 (M circuit board). Readjust the OFF set.</p> <p>Then, conduct the manual shutter speed adjustment and subsequently auto shutter speed adjustment.</p> <ul style="list-style-type: none"> ◦ See Section of "Adjustment of CE0914 OFF Set". ◦ See Section of "Adjustment of Manual Shutter Speed". 	
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14. Diagnostic chart for defective shutter (electronic parts)

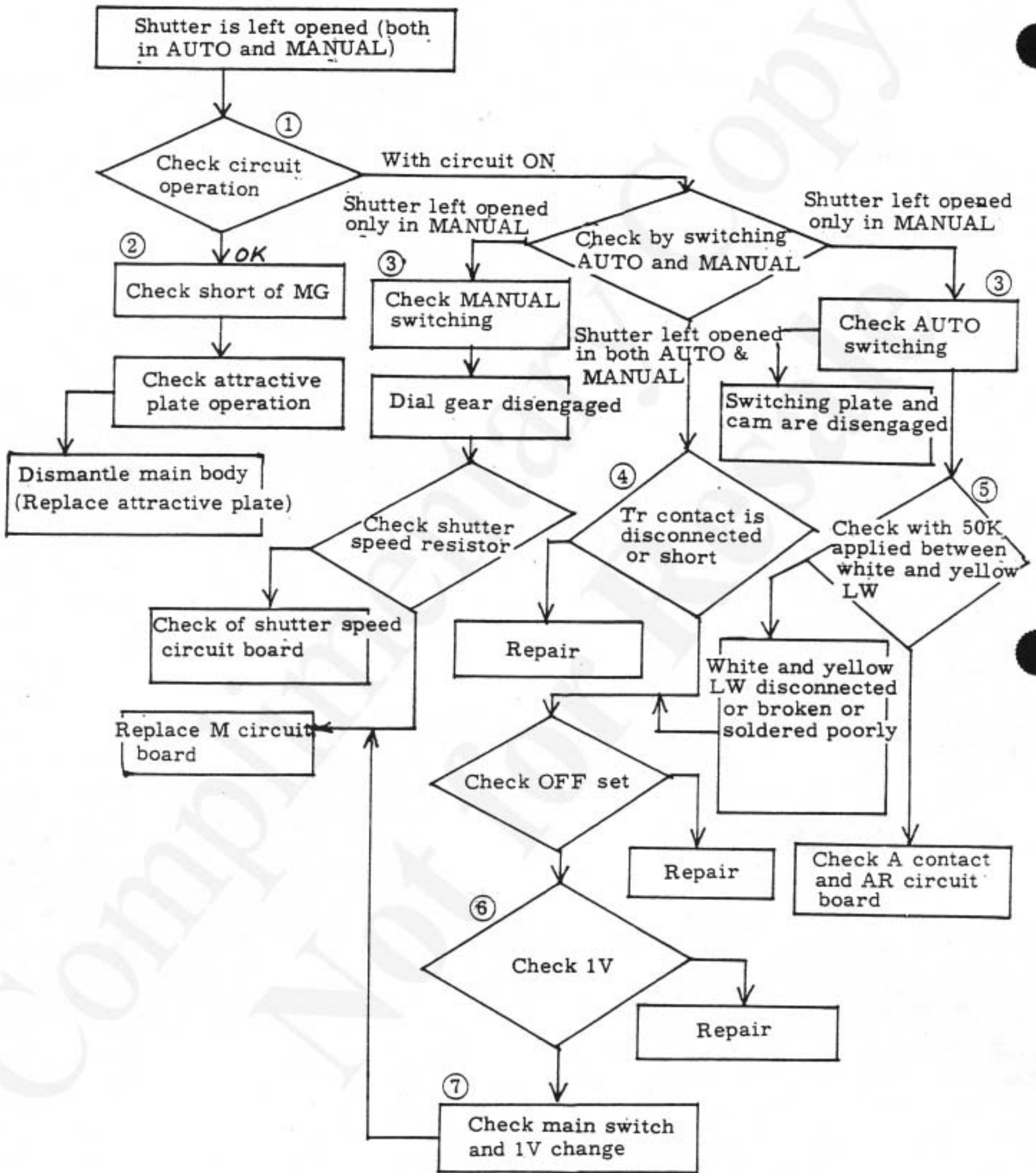
Main possible causes and diagnostic procedures to locate defective parts are given in the following charts.

Interpretation of Chart and Cautions

(1) When each diagnosis (check point) is normal, go downward: go to the lateral step (to right or to left) following the arrow mark if abnormal.

(2) The number in ○ above the check point describes caution, method, adjustment, etc. below the chart.

(3) For other procedures, see "OUTLINE OF REPAIRS".



① Checking of circuit operation

Checking by current consumption.

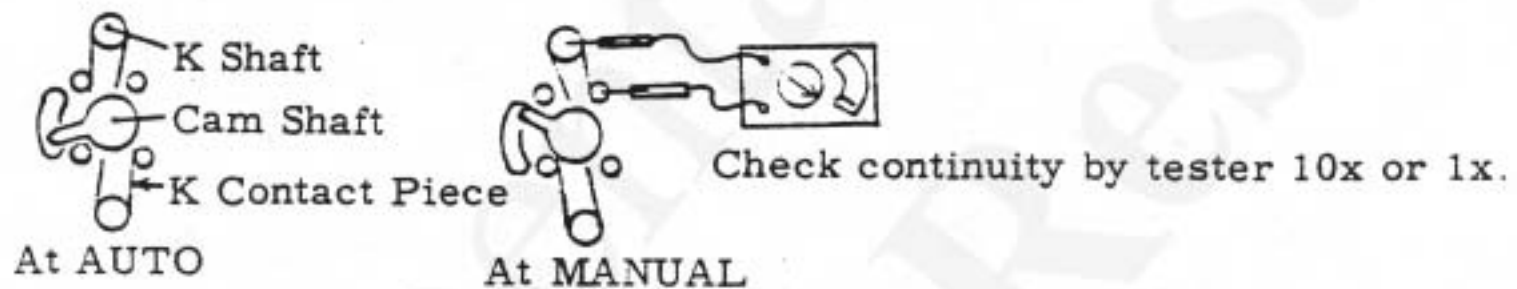
MG ON 8 - 9mA OFF 11 - 13mA

② Shorting part of MG

- o 10K Ω sensor and S base
- o MG coil end and body
- o Purple LW and body
- o Others

③ Check of accurate Auto/Manual switching

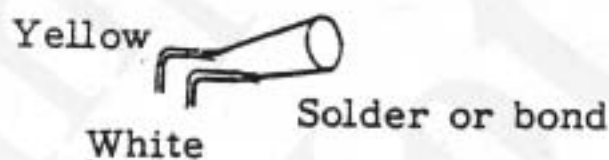
Check contact of K contact piece at S lever switching.



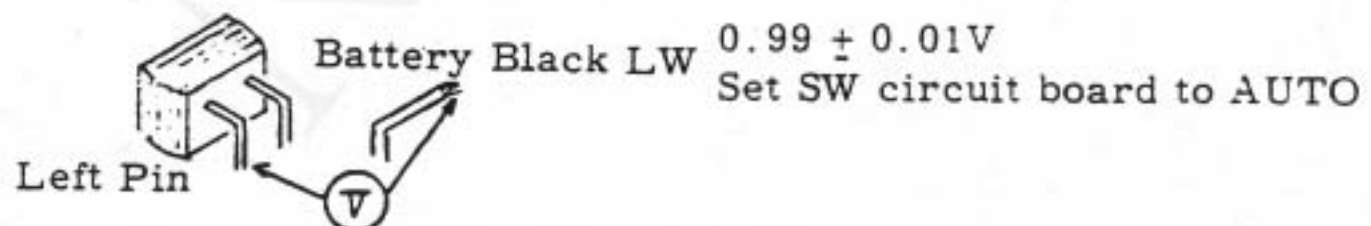
④ Tr. contact disconnected or short



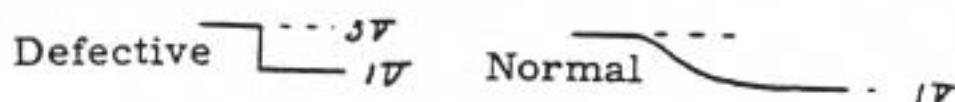
⑤ Disconnect white and yellow LW from circuit board A. and connect 50K resistor in-between.

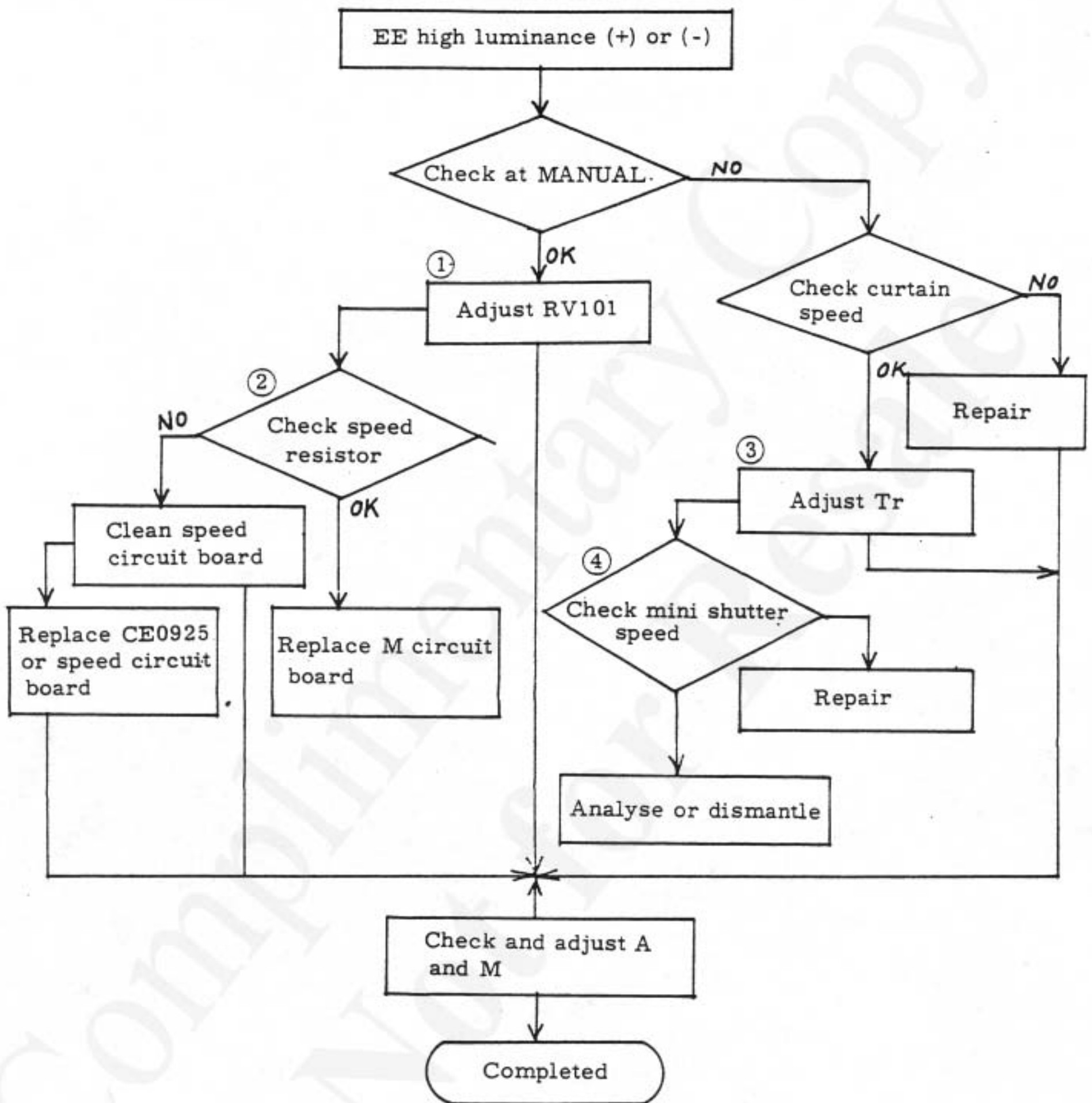


⑥ Check 1V



⑦ Connect a synchroscope instead of V in 6 and operate main switch to see 1V switching.



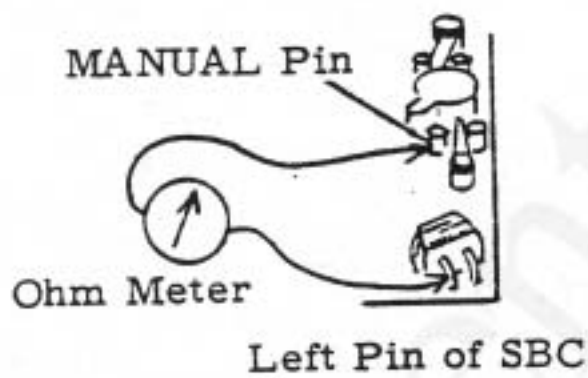


① Adjustment of RV101 (AUTO)



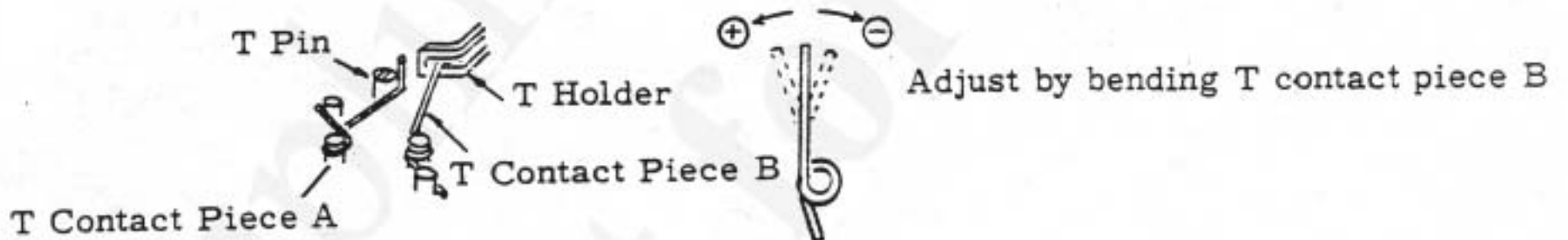
② Check of speed resistor

Set selector switch to AUTO, and measure between left pin (1V) of SBC and MANUAL pin.



1/1000	.....	12 (K Ω)
1/500	.....	24
1/250	.....	48
1/125	.....	96
1/60	.....	192
1/30	.....	384
1/15	.....	768
1/8	.....	1.5 (M Ω)
1/4	.....	3
1/2	.....	6
1/1	.....	12

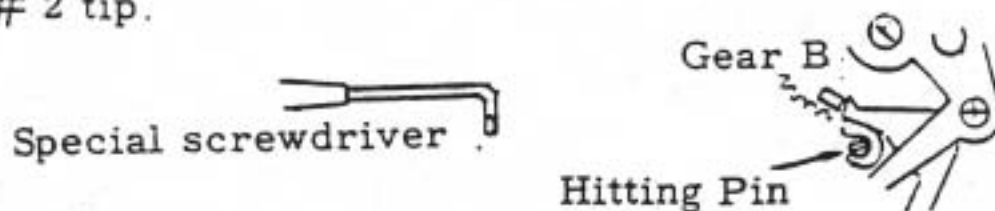
③ Tr adjustment

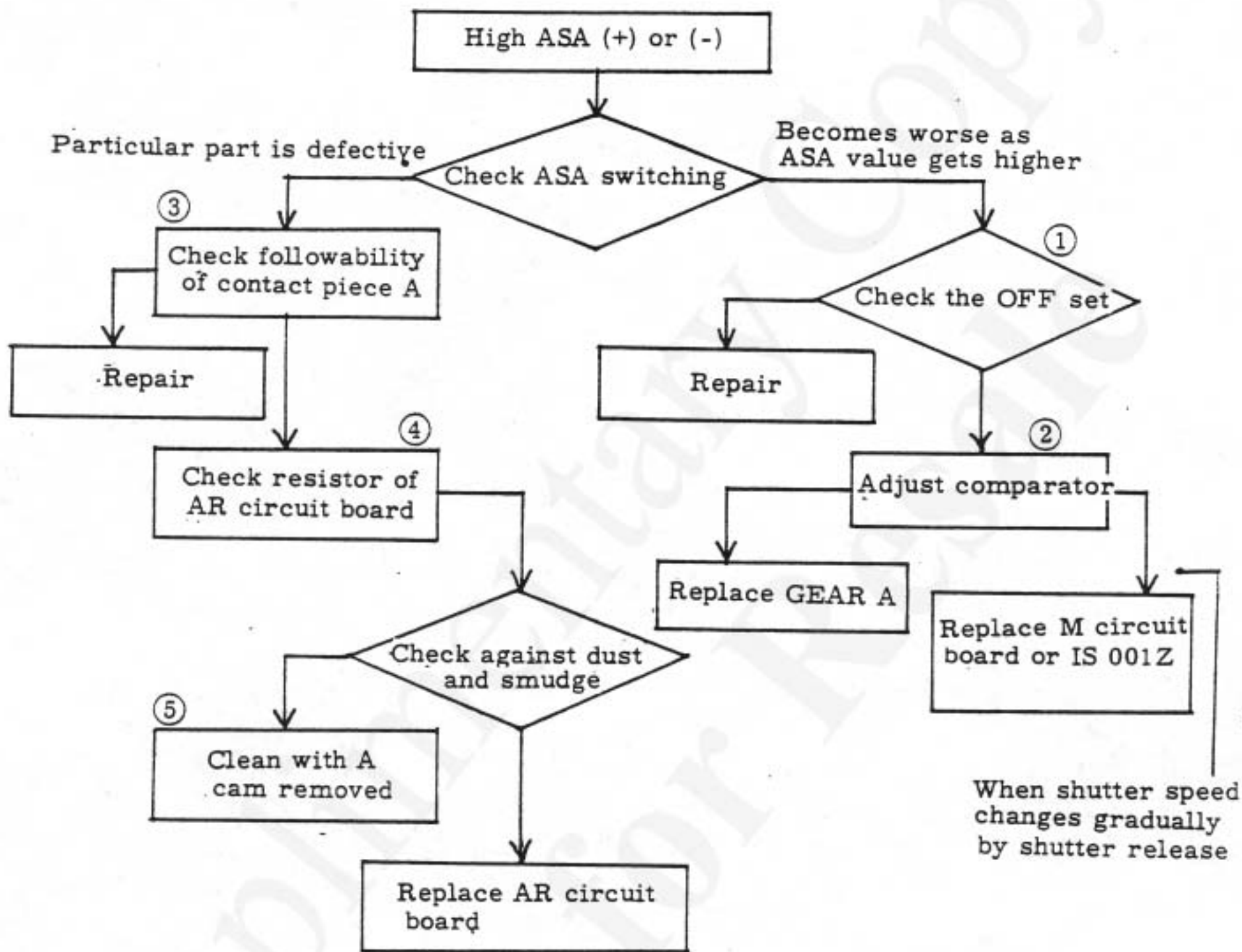


- o When fluctuation becomes excessive due to tampering with contact piece, replace and adjust it.
- o After adjustment by bending, there should be a clearance (at second step of opening claw) between T holder and T contact piece B.
- o When wound, T contact piece B should not hit T pin.

④ Adjustment of mini shutter speed

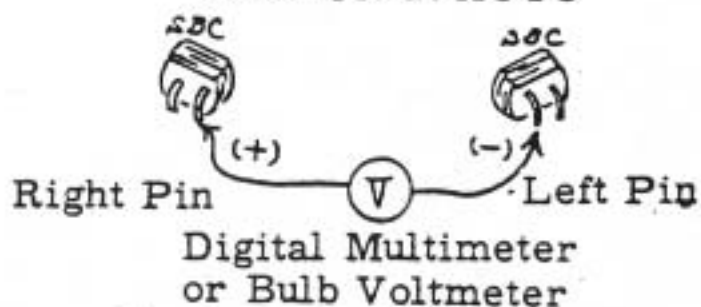
Adjust hitting pin with a special screwdriver.
Bend # 2 tip.





① Check of OFF set of preamplifier

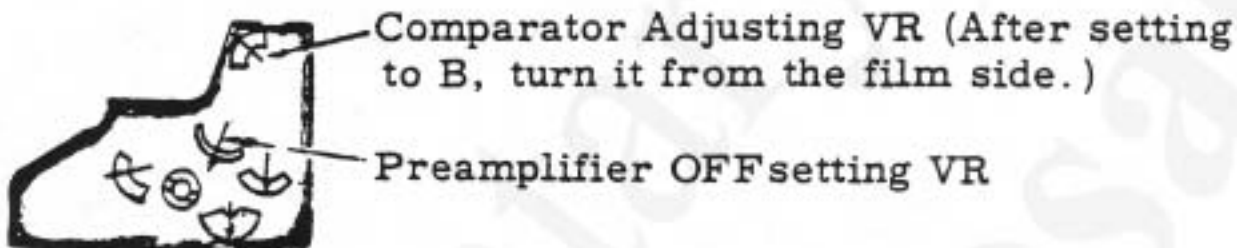
Tr is ON at AUTO



- o Should be $\pm 1.5\text{mV}$ or less.
- o Adjustment should be made to $\pm 0.5\text{mV}$ or less.
- o The power supply (-) should be connected with black LW. (Otherwise, load batteries after locking the shutter.)

Caution: For checking, matching board may not be used. But it should be used for adjustment.

② Adjustment of comparator



Comparator Adjusting VR (After setting to B, turn it from the film side.)

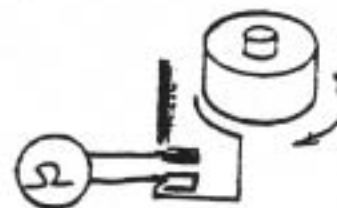
Preamplifier OFF setting VR

③ Check of contact piece A follow-ability

Contact piece A should be in contact with AR circuit board (by spring pressure) even when the contact piece A is moved slightly up and down.

④ Check of resistor of AR circuit board

Disconnect white and yellow LW, apply ohm meter and check while turning A cam.



Resistance Value ($\text{K}\Omega$)

ASA 1600	800	400	200	100	50	25	12
0.64	1.02	1.79	3.58	7.16	14.3	28.6	57.2

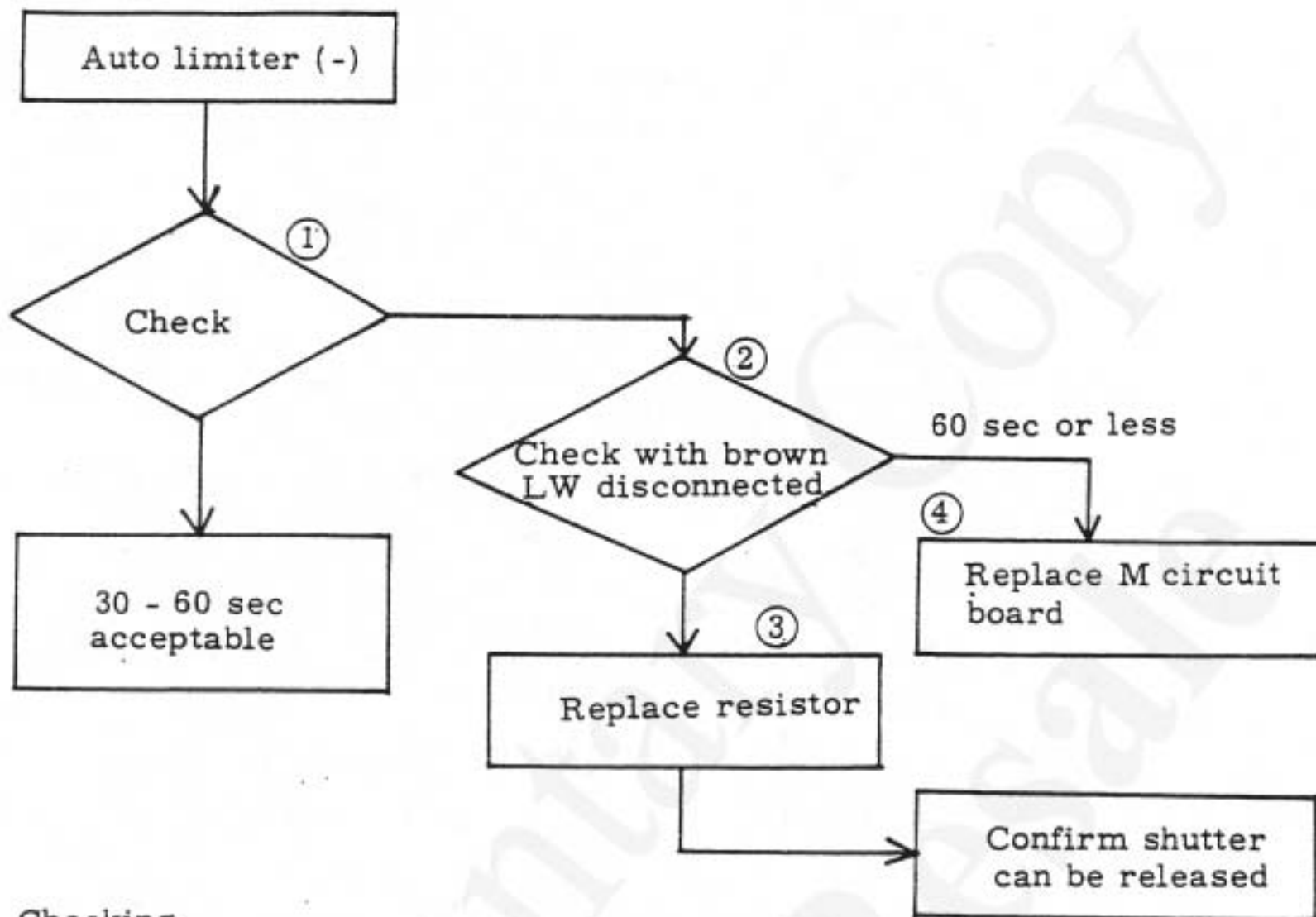
⑤ Removal of A cam

- a. Remove C ring. (Turn it clockwise about 30° .)
- b. Loosen A contact piece fastening screw (left-hand screw), and remove the contact piece from AR circuit board.

c. Remove A cam.

Precautions for assembling

- a. A lever should be brought to bear on the side surface of the A cam. (Displace A lever outwardly, and mount A cam in position.)
- b. Tighten the screw taking care to the contacting state of A contact piece.



① Checking

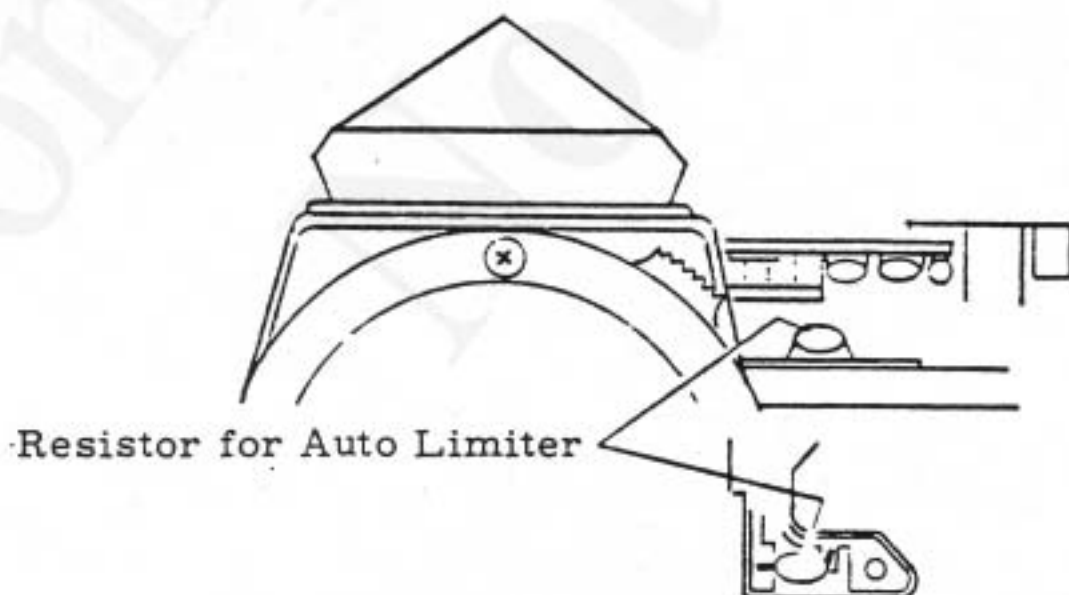
Mirror should flip down after 60 seconds or longer when shutter is released after dark condition of 3 minutes.

Acceptable if the mirror lowers after longer than 30 seconds and less than 60 seconds.

- o "Dark condition" means the state that the body cap is applied and the eyepiece frame is faced downward.

② Remove bottom plate, desolder brown LW and check ① .

③ Remove the resistor for auto limiter, and replace it by a 1M Ω resistor. (Use the soldering iron with a pointed tip.)



④ Protection against leakage current from M circuit board.

III. CE0914 (M circuit board)

1. Precautions for repairing CE0914

1) As the ICs blow out by static electricity, be sure to ground the work desk, soldering iron, pincette, nipper, operator's body, etc. when the IC and FET are handled as a single body.

(The pins ③ and ⑤ of MOS FET are particularly weak and may be destroyed by static electricity of 100V. Generally, the human body is supposed to have static electricity of 1500 - 10000V.)

2) Use rubber fingerstalls.

(Use fingerstalls on the thumb, forefinger and middle finger of both hands.)

3) Be sure to use silver containing, sparkle solder (Senju Kinzoku Kogyo Co., S 256. 0.8φ) for soldering.

(Since the pattern of CE0914 contains silver, if an ordinary solder is used, the silver component may be absorbed into the solder in a long period and the solder may become unstuck.)

4) Use non-acid paste and clean it with DAIFLON S-3E.

(It is sold under the name of Du Pont "FREON-TE" in the overseas market. Chemical Formula $C_2CL_3F_3 + C_2H_2OH$. $C_2CL_3F_3$ 96%. C_2H_5OH 4%)

5) As electrical elements are weak against heat, avoid to heat them for long in soldering.

The standard time for soldering is 3 sec. for one spot.

6) Dust and smudges (particularly, on flux and paste) should be absent because it lowers insulation resistance. (Particularly, insulation resistance of $10^{12}\Omega$ or greater is necessary for lower luminance levels. When smudged, brush and clean with DAIFLON S3-E, and then check with the SZ (binocular stereo microscope). Check particularly the pins of SBC, trigger switch and auto-side contact piece of cam shaft, etc.)

7) When the constant voltage power supply is connected, never turn on and off the power switch. Turn the power switch after disconnecting the wire of CE0914 (M circuit board).

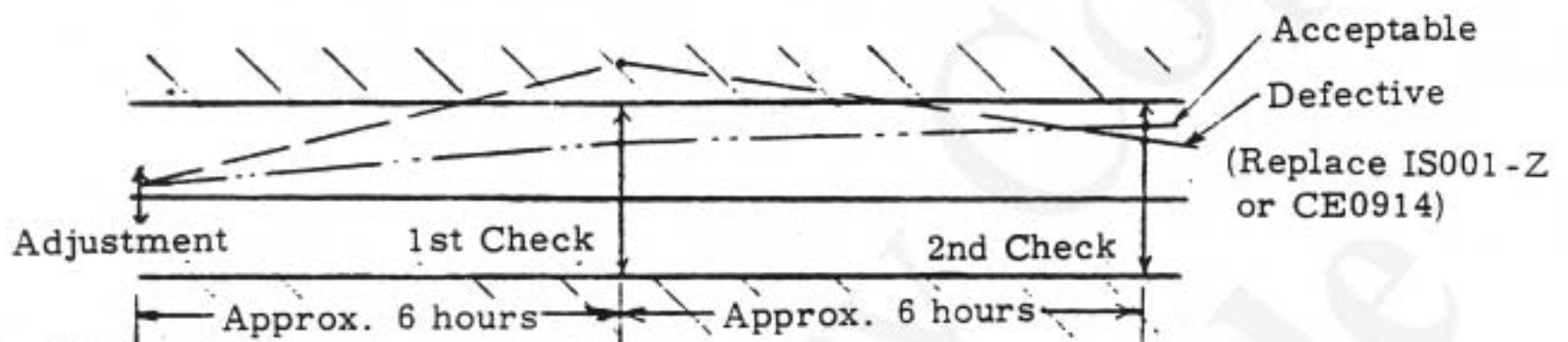
(Turning on and off of the power switch momentarily generates 60 - 70V.)

8) Confirm grounding of each component once a day or at the start of working hours by means of a tester.

(Acceptable if the tester needle deflects by the extent equivalent to the voltage of wall outlet AC between the grounding wire and the AC wall outlet.)

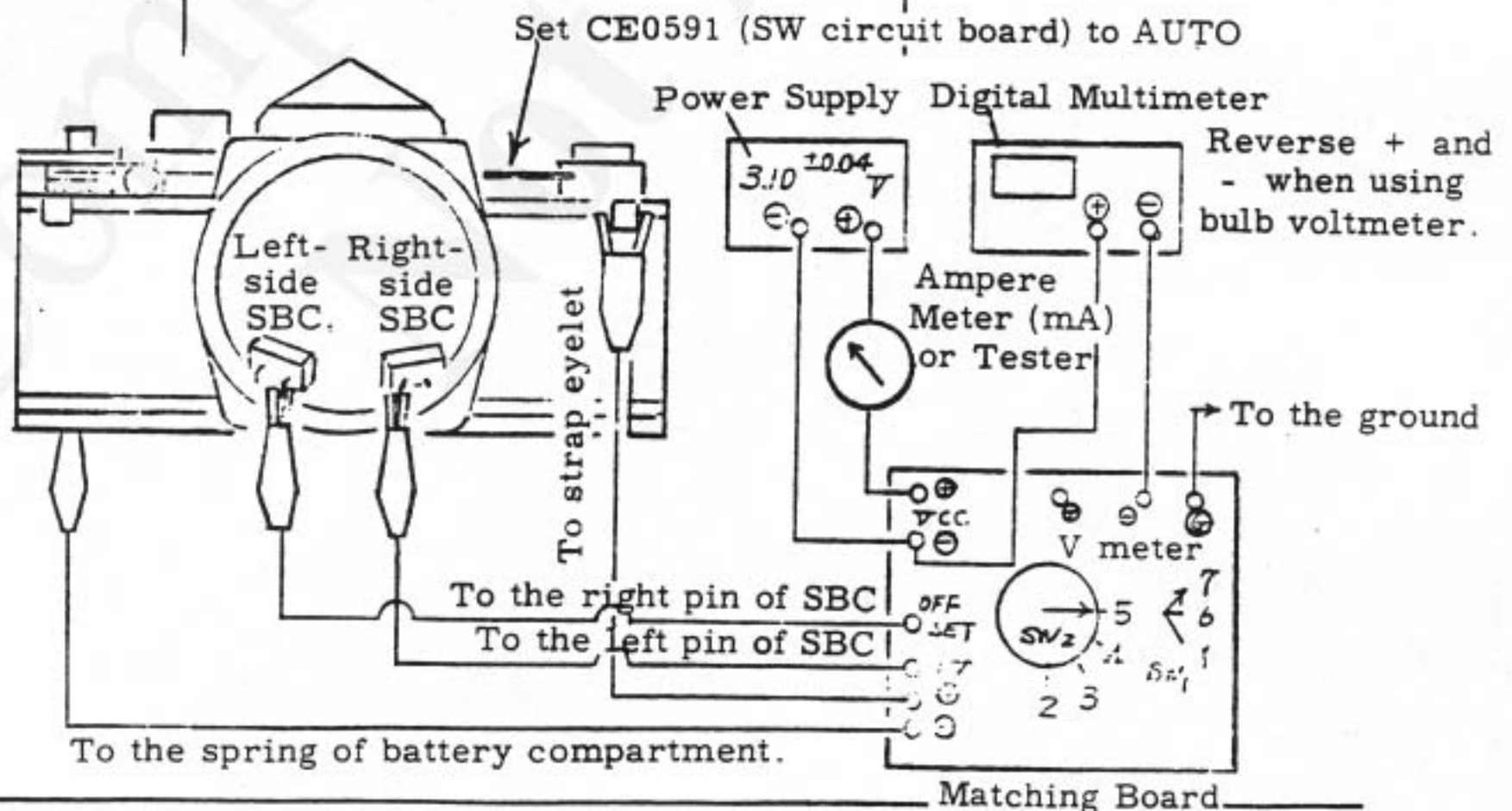
9) Take special care not to heat teflon over 450°C to prevent generation of toxic gas.

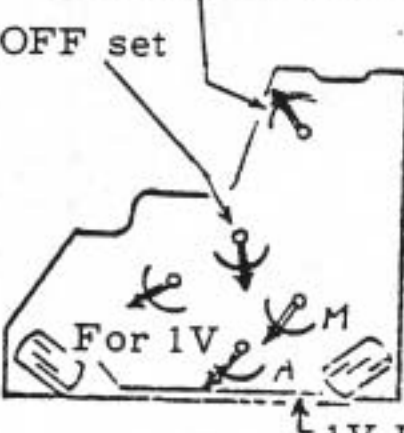
- 10) When the OFF set of the preamplifier is changed beyond 1.5mV, adjust it to $\pm 0.5\text{mV}$ or lower; thereafter repeat the OFF set checking two times at a 6-hour interval. The measured value at each checking should be within $\pm 1.5\text{mV}$. If adjustment is impossible, replace the IC of IS001-Z or CE0914.



- 11) The variable resistor should be locked using adhesive, after adjustment.
 12) Never fail to ground the pincette (tweezers) and the repairman's body when touching the trigger switch contact piece and SBC.
 2. Adjustment of CE0914 (M circuit board)

Items	Method	Remarks
1) Preparation	a. Remove CE0951 (bottom cover), CE0955 (mat) and CE0503 (top plate). b. Release the shutter and lock it with the battery unloaded. (Main switch and trigger switch → ON) c. Set CE0591 (SW circuit board) to AUTO. d. Set the power voltage to $3.10 \pm 0.04\text{V}$. e. Make the wiring as follow.	The powder switch should have been turned on before wiring and must not be turned off and on after the power supply is wired to camera. (If the switch is operated, high voltage is generated.)

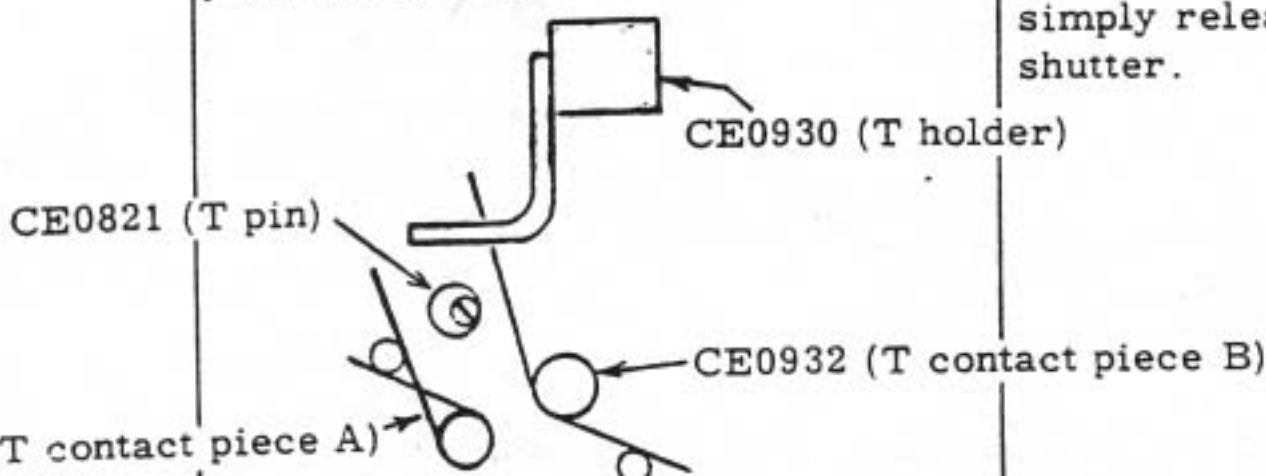
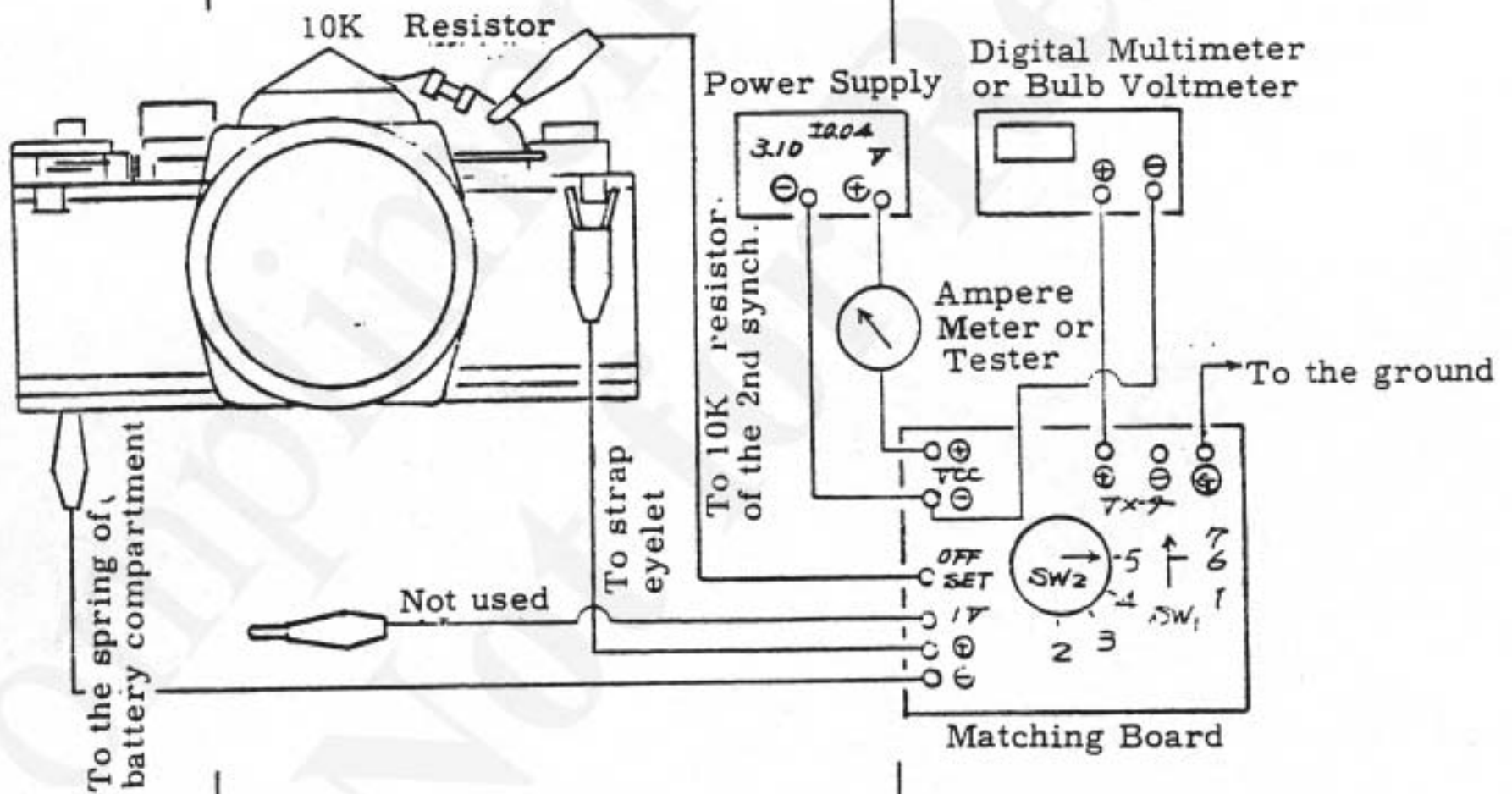


Items	Method	Remarks
	<p>* When CE0502 (front plate) is removed.</p> <ol style="list-style-type: none"> 1. Connect the clip wired to the battery compartment to the black LW on the bottom. 2. Advance the wind lever and turn on the trigger switch. <p>** When CE0914 is to be adjusted as a single body.</p> <ol style="list-style-type: none"> 1. Connect the clip wired to the strap eyelet to CE0920 (sylinder) of CE0914. 2. Connect the clip wired to the battery compartment to the black LW. 3. Turn on the trigger switch. 4. Turn the cam shaft to AUTO side. See Section III-3-2). 	<p>Note:</p> <ol style="list-style-type: none"> a. The wiring of SBCs should be as above. b. Ampere meter of 1 - 15mA is most recommendable, but a tester of DC50mA range is acceptable.
<p>2) 1V adjustment</p>	<ol style="list-style-type: none"> a. Set switches of the matching board to 5 and 7. respectively. b. ASA = 12 c. Adjust to $0.99 \pm 0.01V$ with the VR for 1V (1.2KΩ). ($-0.99 \pm 0.01V$ at above wiring of the digital multimeter.) <p>*** The ASA rating is irrelevant when CE0502 (front plate) is removed and CE0914 is to be checked as a single body.</p>	<p>For comparator OFF set</p> <p>For preamplifier OFF set</p>  <p>Each VR is as above.</p>
<p>3) Elimination of static electricity from each part</p>	<p>(1) Connect (+) of the digital multimeter to (+) of the voltmeter. (When bulb voltmeter is in use, (+) of the bulb voltmeter to (+) of the voltmeter and (-) to (-). respectively.)</p>	

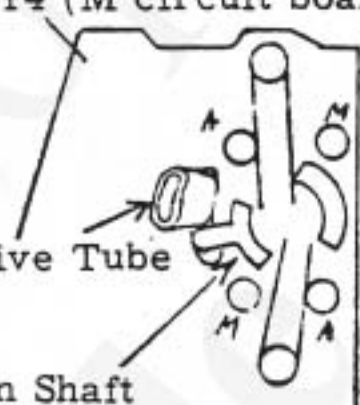
Items	Method	Remarks
	<p>(2) Turn the Switch 1 in the sequence 7 → 6 → 1. Turn the Switch 2 in the sequence 5 → 4 → 3 → 2.</p> <p>(3) Turn the Switch 2 in the sequence 2 → 3 → 4 → 5. Turn the Switch 1 in the sequence 1 → 6 → 7.</p>	<p>Note: The SW circuit board should be surely set to AUTO upon the OFF set adjustment of preamplifier.</p>
<p>4) Off set adjustment of preamplifier</p>	<p>(1) The switches on the matching board are set to 5 and 7.</p> <p>(2) Adjust to $0 \pm 0.5\text{mV}$ or less with the OFF set VR ($2\text{K}\Omega$) for the preamplifier.</p>	<p>When the OFF set value is out of $\pm 1.5\text{mV}$, measure two times at every 6 hours: should be within $\pm 1.5\text{mV}$. See Section III-1-10).</p>
<p>5) Off set adjustment of comparator</p>	<p>(1) Disconnect the clip from the left pin of the right-side SBC.</p> <p>(2) Connect the left pin of the above SBC with the white LW of CE0640 (circuit board A) underneath the exposure meter by means of an LW with a clip at each end. (Take care not to shortcircuit the white LW.)</p> <p>(3) The switches on the matching board are set to 5 and 7.</p> <p>(4) Adjust to the current changing point using the OFF set VR for comparator ($10\text{K}\Omega$).</p> <p>Approx. $8\text{mV} \rightarrow 12\text{mV}$</p>	<p>** When the CE0914 is checked as a single body. $4.5\text{mA} \rightarrow 12\text{mA}$</p> <p>Adjustment is completed.</p>

3. Operation check of CE0914 (M circuit board)

Checking Items	Checking Procedure	Remarks
<p>1) Preparation</p>	<p>(1) Before starting the operation check, confirm that CE0914 is properly adjusted. (See Section III-2 "Adjustment of CE0914".)</p> <p>(2) Release the shutter and lock it with the battery unloaded. (Main switch turns on.)</p> <p>(3) Set the power voltage to $3.10 \pm 0.04V$.</p> <p>(4) Make the wiring as illustrated below.</p>	<p>Note 1: The power switch should be previously turned on before wiring and must not be turned off and on once wired.</p> <p>Note 2: CE0951 (bottom cover), CE0950 (mat) and CE0503 (top plate) should be removed.</p>
	<p>(5) Disengage CE0931 (T contact piece A) as shown below</p>	<p>* When CE0502 (front plate) is removed, simply release the shutter.</p>



Checking Items	Checking Procedure	Remarks
	<p>* When CE0502 (front plate) is removed:</p> <p>① Connect the clip wired to the battery compartment shown in the preceding page to the black LW on the body bottom.</p> <p>② Shortcircuit the white LW and yellow LW of CE0914 (M circuit board) by means of a resistor of about 50KΩ.</p> <p>** When CE0914 is to be checked as a single body:</p> <p>① Shortcircuit (+) and (-) of the digital multimeter (or bulb voltmeter) by means of a resistor of about 500 - 1KΩ.</p> <p>② Shortcircuit the white LW and yellow LW of CE0914 by means of a resistor of about 50KΩ.</p> <p>③ Connect the clip wired to the 2nd synch shown in the preceding page to the purple LW of CE0914.</p> <p>④ Connect the clip wired to the battery compartment to the black LW of CE0914.</p> <p>⑤ Connect the clip wired to the strap eyelet to CE0920 (cylinder) of CE0914.</p>	
2) Check of automatic operation	<p>(1) The switches on the matching board are set to 5 and 7.</p> <p>(2) Set the SW circuit board to AUTO.</p> <p>(3) The following conditions should be obtained when trigger switch is turned on and off.</p>	<p>** When CE0914 is a single body.</p> <p>Insert a thermo-constrictive tube or similar material between CE0914 and cam shaft as shown below to set to AUTO.</p>

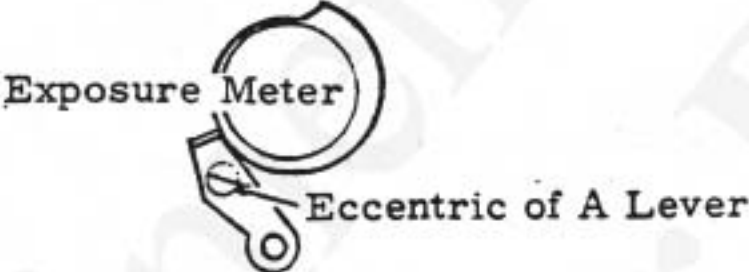
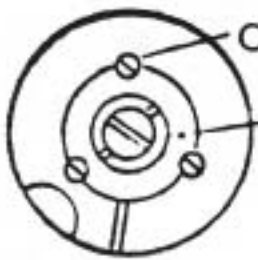
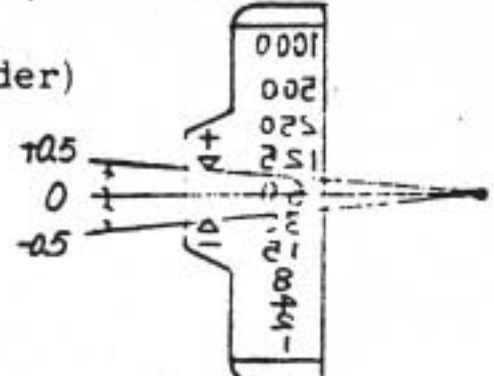
Checking Items	Checking Procedure	Remarks
	Tr SW ON: Digital multimeter (or bulb voltmeter) 2.8 - 2.9V Ampere Meter Approx. 8mA Tr SW OFF: Digital multimeter (or bulb voltmeter) 0V Ampere Meter Approx. 12mA	CE0914 (M circuit board)  Thermo-constrictive Tube Cam Shaft
3) Check of manual operation	(1) The switches on the matching board are set to 5 and 7. (2) Set the SW circuit board to MANUAL. (3) Make the same operation as (3) above. When same values as in AUTO are obtained, normal.	

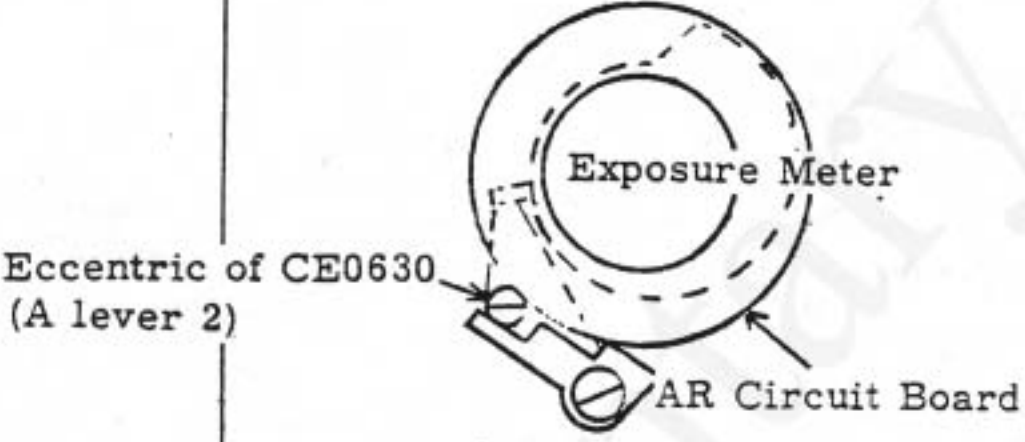
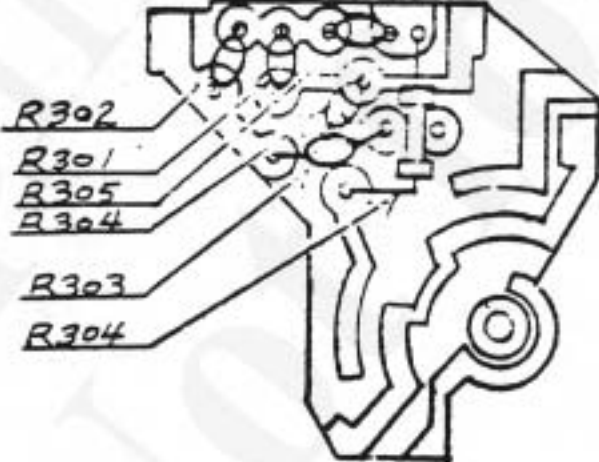
IV. EXPOSURE METER

1. Meter needle stuck

Cause	Remedy	Checkup
1) Disconnected CE0622 (teflon tube)	Teflon tube (CE0622) inserted into the needle holder may become detached. After taking out the fallen tube from inside the camera, insert a new tube into the needle holder without applying adhesive. Cautions: o Take care not to deform needle holder. o Do not use adhesive, because it is ineffective with teflon.	1. One CE0622 should be provided on the lower luminance side. 2. The meter needle should not get stuck with the shutter dial set to 1/2 at AUTO. EV 8 (ASA100). Check by shifting the switch lever from OFF to AUTO and vice versa.

2. Indication accuracy improper

Cause	Remedy	Checkup
<p>1) Zero point of meter off-positioned</p> <p>(Power voltage is $3.15 \pm 0.005V$)</p>	<p>If off-positioned when confirming in the manner described at right, adjust as follow.</p> <p>(1) Coarse adjustment</p> <p>a. Preparation for adjustment</p> <ol style="list-style-type: none"> 1 ASA = 100 2 f/stop = 2.8 3 Current = $121\mu A$ 4 Set the eccentric position of A lever to the center, and do not use it in the coarse adjustment.  <p>Exposure Meter</p> <p>Eccentric of A Lever</p> <p>Slitting faces slightly upward</p> <ol style="list-style-type: none"> 5 There should be about 1mm clearance between CA8997 (spring gear) and CA8978 (lower boss). <p>b. Adjustment</p> <p>Loosen three pulley screws fixing CA8981 (pulley holder) to adjust by slightly moving CA8981.</p> <ul style="list-style-type: none"> o When zero point is to (+) side: Turn the pulley clockwise. o When zero point is off to (-) side: Turn the pulley counterclockwise. 	<p>(1) Disconnect the black lead wire of the meter movable section from CE0591 (SW circuit board).</p> <p>(2) Set the camera as follow.</p> <ol style="list-style-type: none"> 1 ASA = 100 (2 wires of CE0645 AR circuit board) 2 f/stop = 2.8 <p>(3) Connect the blue lead wire of the resistor box to the black lead wire of the meter movable section. Connect the white lead wire of the resistor box to (-) of the ammeter and (+) of the ammeter to the camera body to take the earth.</p> <p>(4) Adjust the resistor box to $121\mu A$. The meter needle should then be within the following range (power voltage is $3.15 \pm 0.005V$).</p> <p>Reference: $0 \begin{matrix} +0.3EV \\ -0EV \end{matrix}$</p> 

Cause	Remedy	Checkup
<p>(2) Fine adjustment</p> <p>Set the camera as described at right, and adjust by moving the eccentric of CE0630 (A lever 2).</p>	<p>(2) Fine adjustment</p> <p>Set the camera as described at right, and adjust by moving the eccentric of CE0630 (A lever 2).</p>  <p>Eccentric of CE0630 (A lever 2)</p> <p>AR Circuit Board</p>	<p>① ASA = 100</p> <p>② Shutter speed = 1/2 sec.</p> <p>③ f/stop = F2.8 jig lens</p> <p>④ Set to MANUAL.</p> <p>o At BV 4:</p> <p>When CE0503 (top plate) removed: $-0.1 \pm 0.1EV$</p> <p>When CE0503 not removed: $0 \pm 0.1EV$</p> <p>Cautions:</p> <p>a. The lens should be closely in contact with diffusion plate.</p> <p>b. Extraneous light should not enter.</p>
<p>2) Defective at low luminance (BV 8)</p>	<p>Adjust by changing resistor R301 of CE0591 (SW circuit board).</p>  <p>R302</p> <p>R301</p> <p>R305</p> <p>R304</p> <p>R303</p> <p>R304</p> <p>After the adjustment, confirm BV 4 and adjust BV 11 and 16.</p>	<p>o Set the camera as follow.</p> <p>① ASA = 100</p> <p>② Shutter speed = 1/30 sec.</p> <p>③ f/stop = F2.8 jig lens</p> <p>④ Set to MANUAL.</p> <p>o At BV 8:</p> <p>CE0503 removed: $-0.1 \pm 0.1EV$</p> <p>CE0533 not removed: $0 \pm 0.1EV$</p> <p>Cautions:</p> <p>a. The lens should be closely in contact with diffusion plate.</p> <p>b. Extraneous light should not enter.</p>

Cause	Remedy	Checkup
<p>3) Defective at high luminance (BV 11)</p>	<p>Adjust by changing resistor R303 of CE0591. If the adjustment is impossible with R303 (at minus side), adjust to -0.1 - 0.2 with R301. Thereafter, check BV 8 and adjust to $-0.1 \pm 0.1\text{EV}$ with R304 to compensate for the above.</p> <p>After the adjustment, reconfirm BV 4 and make the adjustment at BV 16.</p> <p>See the above illustration for the position of each resistor.</p>	<p>o Set the camera as follow.</p> <p>① ASA = 100 ② Shutter speed = 1/60 sec. ③ f/stop = F5.6 (jig lens) ④ Set to MANUAL.</p> <p>o At BV 11: CE0503 removed: $-0.1 \pm 0.1\text{EV}$ CE0503 not removed: $0 \pm 0.1\text{EV}$</p> <p>Cautions: 1. The lens should be closely in contact with diffusion plate. 2. Extraneous light should not enter.</p>
<p>4) Defective at high luminance (BV 16)</p>	<p>Adjust by changing resistor R304 of CE0591 (SW circuit board).</p> <p>See 2) of preceding page for the position of resistors.</p>	<p>o Set the camera as follow.</p> <p>① ASA = 100 ② Shutter speed = 1/500 sec. ③ f/stop = F 11 (jig lens) ④ Set to MANUAL.</p> <p>o At BV 16: CE0503 removed: $-0.1 \pm 0.1\text{EV}$ CE0503 not removed: $0 \pm 0.1\text{EV}$</p>

Cause	Remedy	Checkup
5) Meter matching	<p>(1) Preparation for matching (Constant voltage should be $3.15V \pm 0.005$.)</p> <p>① Jig lens, pentaprism and focusing screen should be attached.</p> <p>② Set the Manual.</p> <p>③ Take care not let light other than that from the luminance box into the CdS.</p> <p>④ Turn the shutter dial from 1/1000 side.</p> <p>⑤ Turn the f/stop of the jig lens from F16 side.</p>	

Combination and Reference Value

BV	ASA	S.S.	FNO	Matching Resistance	Reference (EV)
4	100	1/2	2.8	(Eccentric of A Lever)	-0.1
8	"	1/30	2.8	301 30K Ω	-0.1 ± 0.1
11	"	1/60	5.6	303, 302 12K Ω	"
16	"	1/500	11	304 27K Ω	"

Reference Resistance

Note: The reference is -0.1EV with CE0503 removed, and is zero with CE0503 unremoved.

(2) Matching procedure


① Adjust the meter needle zero position.

Set to BV 4 and adjust with the eccentric of A lever.

If adjustment by A lever 2 is ineffective, slightly move the position of CA8981 (pulley holder).
See

See above table for combination of camera settings.

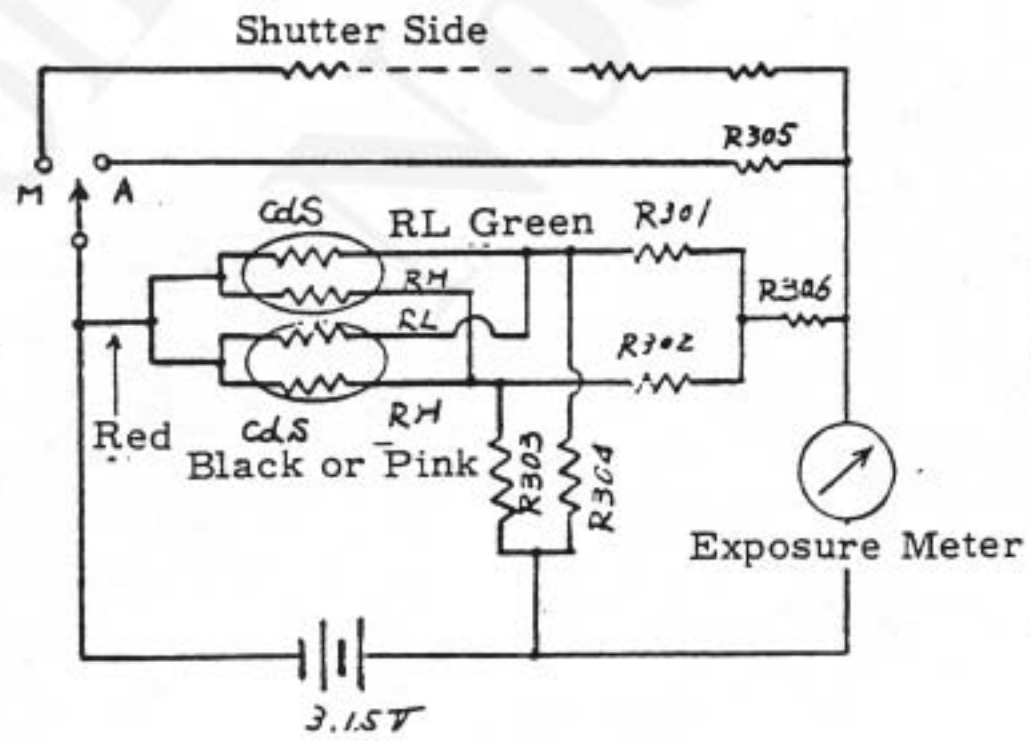
-0.1EV when CE0503 is removed.

Cause	Remedy	Checkup
<p>(See Section IV-2-2))</p>	<p>② Adjustment at BV 8 Set the luminance to BV 8 and adjust by changing resistor R301 of CE0591 (SW circuit board).</p> <p>③ Re-confirm BV 4.</p> <p>④ Adjustment at BV 11: Set the luminance to BV 11, and adjust by changing resistor R303 of CE0591. When R303 adjustment is ineffective (at minus side), adjust to -0.1 - -0.2 with R301.</p> <p>⑤ Check at BV 8 Compensate the value added by the above adjustment with R304.</p> <p>⑥ Check at BV 4.</p> <p>⑦ Adjustment at BV 16: Set the luminance to BV 16, and adjust by changing resistor R302 of CE0591.</p> <p>⑧ Confirm at BV 16 - BV 4.</p>	<p>See the table in the previous page for combination of camera settings.</p> <p>-0.1±0.1EV with CE0503 removed.</p> <p>-0.1±0.1EV with CE0503 removed.</p> <p>-0.1±0.1EV with CE0503 removed.</p> <p>-0.1±0.1EV with CE0503 removed.</p>
<p>6) Defective resistance of CE0555 (circuit board B)</p>	<p>Each resistance value should be within the range shown below. If the resistance value becomes out of the range, replace the whole set of CE0555.</p> 	<p>The resistance values should be as indicated in the table next page when confirmed with a tester (digital) after CE0546 (SL contact piece) is mounted. (Wire the yellow and blue LWs to the digital multimeter.)</p>

Cause		Remedy		Checkup
	S. S.	Resist- ance value	Tolerance Range	Insulation check: a. Between yellow LW and die-casting of CE0502 (front plate). b. Between blue LW and die-casting of CE0502 (other than at B) c. Eyelet hole of CE0555 (circuit board B) and die-casting of CE0502 (other than at B). d. Solder of CE0555 and the die-casting of CE0502 (other than at B). Continuity check: When the shutter dial is set to "B". blue LW and die-casting of CE0502 should be conductive. Caution: Make the test with CE0546 (SL contact piece) installed.
1	1/1000	∞		
2	1/500	298 K Ω	283 - 312.9 K Ω	
3	1/250	143 "	138.8 - 150.1 "	
4	1/125	94.4 "	78.9 - 99.1 "	
5	1/60	71.7 "	68.1 - 75.3 "	
6	1/30	57.3 "	54.4 - 60.17 "	
7	1/15	47.7 "	45.3 - 50.0 "	
8	1/8	41.3 "	39.2 - 43.4 "	
9	1/4	36.2 "	34.4 - 38.0 "	
10	1/2	32.1 "	30.5 - 33.7 "	
11	1/1	28.7 "	27.26 - 30.14 "	
12	B	∞		

Exposure Meter Circuit Diagram and Role of Each Resistor

1. Circuit Diagram



MDS Revised	MDS
R301	R1
R302	R2
R303	R3
R304	R4

2. Role of Each Resistor

R301: For correction of low luminance side (EV 8) $\approx 30K\Omega$

R302: For correction of low luminance side (EV 4 - 8) $\approx 27K\Omega$

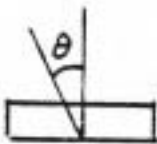
R303: For correction of high luminance side (EV 11) $\approx 12K\Omega$

R304: For correction of high luminance side (EV 14 - 16) $\approx 12K\Omega$

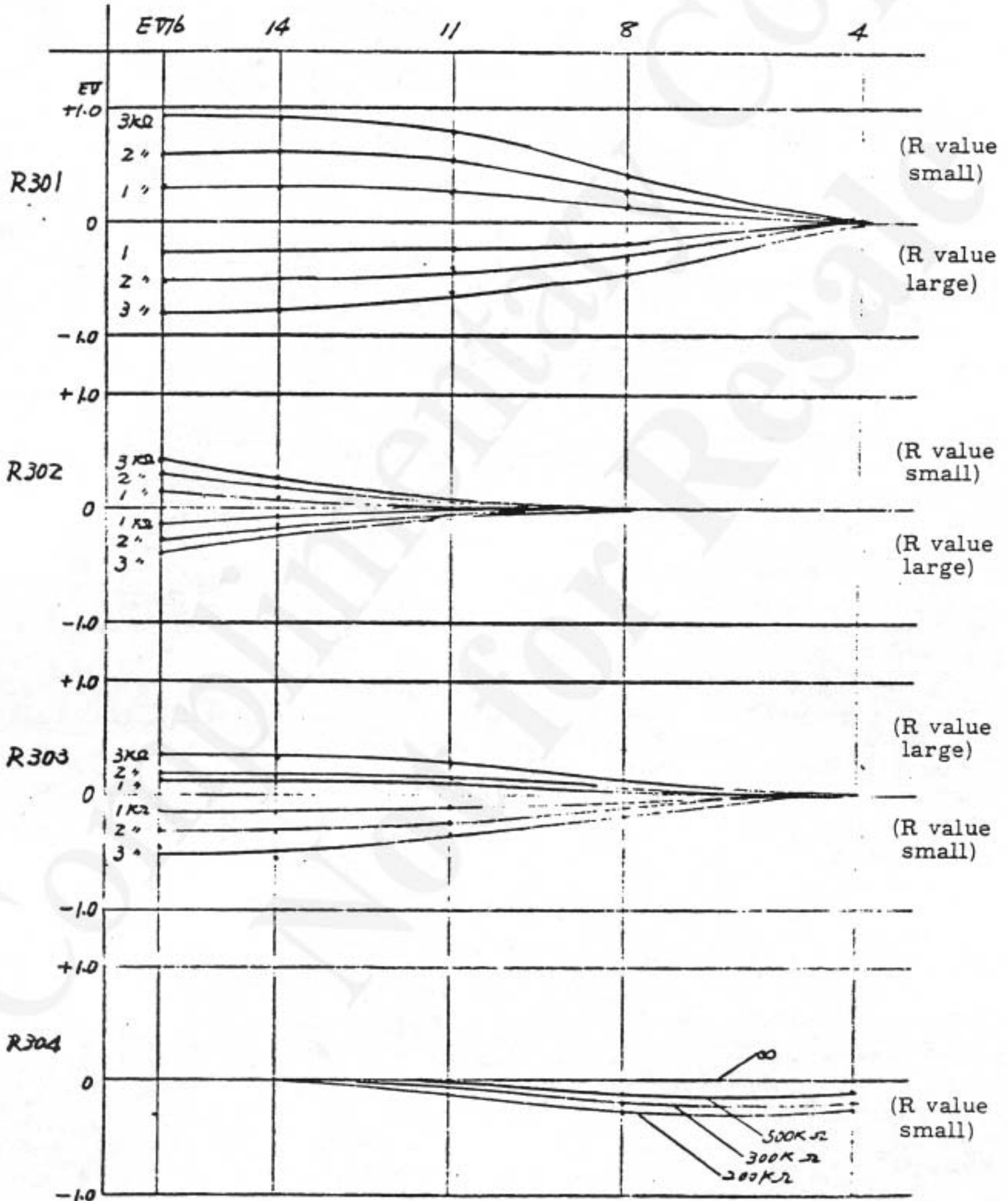
R305: Resistance value is same as at shutter speed of 1/60 sec (68.3K Ω)

R306: For correction of internal resistance of the meter movable section (2.4K Ω)

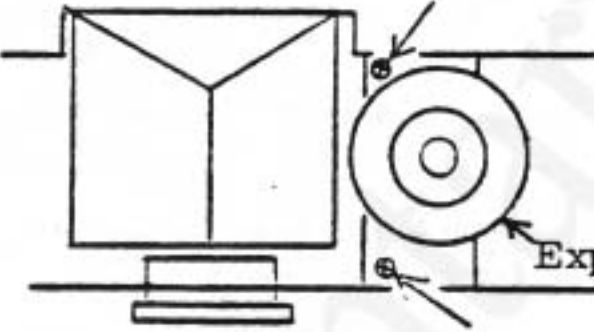
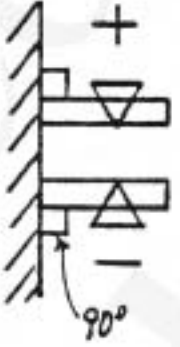
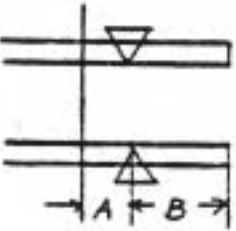
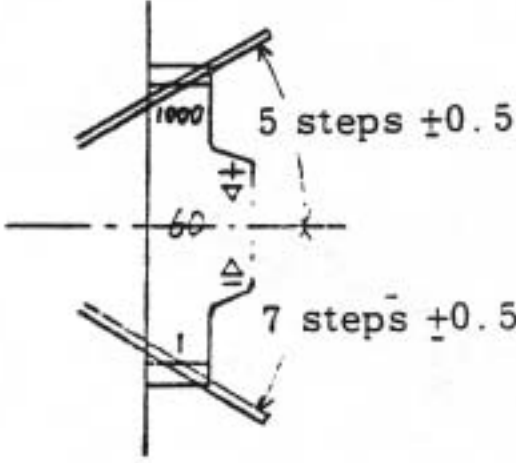
Comparison with MDS

		MDS Revised	MDS	
Coupling	Aperture Ring	Cord	Cord	
	Shutter Dial	Current (CE0555 circuit board B)	Cord	
Movable Section	Deflection Angle of BV 2 	$\theta = 55\mu A$	$\theta = 15\mu A$	
Check Point	ASA = 100	BV	SD	FNO
		16	1/500	11
		14	1/125	11
		11	1/60	5.6
		8	1/30	2.8
		4	1/2	2.8

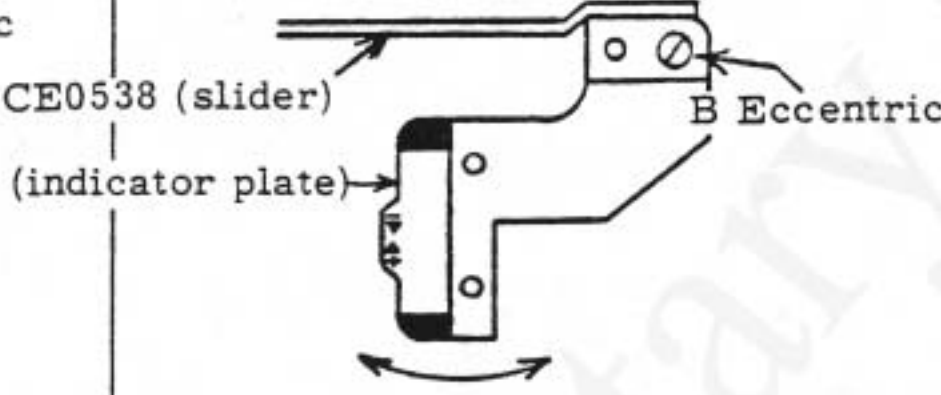
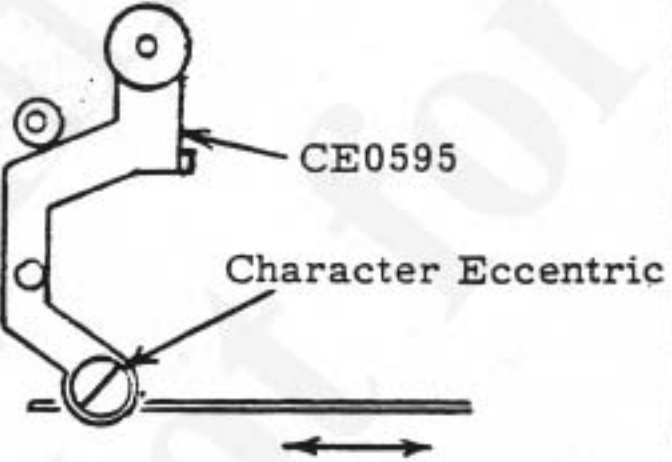
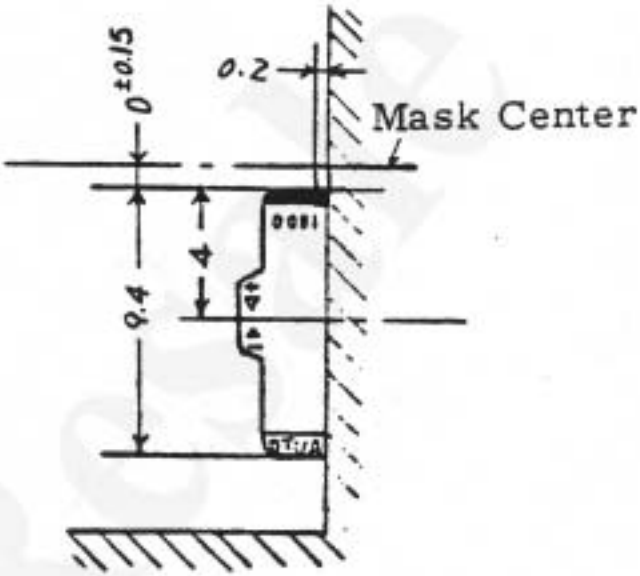
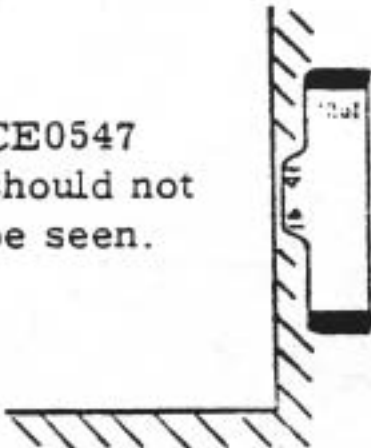
Matching Resistance and Change in Meter Deflection



3. Improper position of meter needle

Cause	Remedy	Checkup
<p>1) Tilted meter needle</p>	<p>Re-tighten two PUK1.7 x 2SO screws of the meter so that, at either one of the (+) or (-) side, the meter needle is rectangular to the side of the mask when an edge of the needle is aligned to the center of the triangle mark.</p>  <p style="text-align: right;">Exposure Meter</p>	 <p>The angle should be 90° either on the (+) or (-) triangle center.</p>
<p>2) Length of meter needle</p>	<p>The length of meter needle should be as shown at right.</p> $B \doteq 2A$ <p>Re-tighten PUK1.7 x 2SO of the meter.</p>	
<p>3) Working range of meter needle</p>	<p>The meter needle stop positions at AUTO should be within the range shown at right.</p> <p>Adjust by bending CE0641 (needle holder).</p> <p>Take care not to lose CE0622 (teflon tube)</p>	
<p>4) Vertical displacement of meter needle</p>	<p>The meter needle must not contact CE0547 (viewfinder indication plate), prism, etc.</p> <p>Adjust by bending the meter needle or CE0547.</p>	

4. Improper position of CE0547 (viewfinder indication plate)

Cause	Remedy	Checkup
<p>1) Improper adjustment of B eccentric and character eccentric</p>	<p>After correcting the tilting with B eccentric of CE0538 (slider), adjust the position with character eccentric of CE0595 (character lever).</p>  <p>The B eccentric adjustment should be made with CE0502 (front plate) removed.</p> <p>Adjustment of character eccentric of CE0595 (character lever)</p>  <p>When adjustment only for character eccentric is to be made, remove CE0503 (top plate); the eccentric will be seen underneath CE0591 (SW circuit board).</p> <p>Caution: Use RIGROIN or DAIFLON S3-E for the cleaning of CE0547. Never use mixed solution. (It may be erase the characters.)</p>	<p>a. Tilting There should be no unsightly tilting.</p> <p>b. Position at AUTO</p>  <p>c. At OFF</p>  <p>d. At MANUAL</p> 