

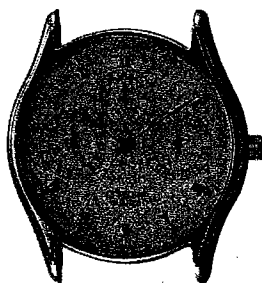
# *TECHNICAL INFORMATION*

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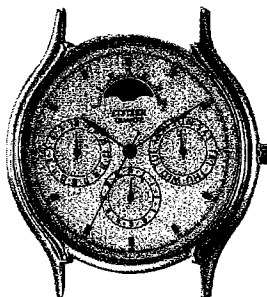
## CITIZEN QUARTZ

**Cal. No. 43❖❖❖**

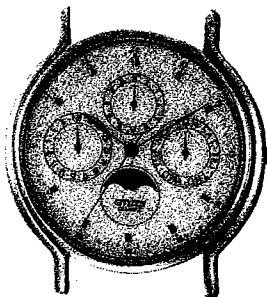
(Excepto No. de Cal. 438/439❖❖)



(Cal. No. 4300❖)



(Cal. No. 4310❖)



(Cal. No. 4330❖)

## S1. OUTLINE

- Cal. No. 4300※

This is an analog multi-hand quartz watch with three analog hands (hour, minute, second) and three small hands indicating date, day and dual time.

- Cal. No. 4310※

This is an analog multi-hand quartz watch with three analog hands (hour, minute, second) and three small hands indicating date, day and time of the 24-hour system. This watch also indicates the age of the moon.

- Cal. No. 4330※

This analog multi-hand quartz watch has the Sun & Moon dial in the direction of six o'clock, as well as the functions of Cal. No. 4300※.

## S2. SPECIFICATIONS

Caliber No.	4300A-01	4310A-01	4330A-01	
Type	Analog quartz watch with a sweep second plus 3 small hands			
Module size (mm)	φ23.7 x 22.6 x 3.7 t			
Accuracy	±20 sec/month (at normal temperature)			
Oscillation	32,768 Hz			
Integrated circuit	C/MOS-LSI (1 unit)			
Effective temperature range	-10°C ~ +60°C (14°F ~ 140°F)			
Converter	Bipolar step motor			
Adjustment of time rate	Digital frequency control (in factory only)			
Measurement of time rate	10 seconds			
Additional functions	Date display (with quick setting device)	Installed (Small hand)	←	←
	Day display	Installed (Small hand)	←	←
	Dual time display	Installed (Small hand)	Not installed	Installed (Small hand)
	24-hour system display	Not installed	Installed (Small hand)	Not installed
	Indication of age of the moon (with quick setting device)	Not installed	Age of the moon dial rotating one turn every 59 days	Not installed
	Indication with picture dial	Not installed	←	Installed (Sun & moon)
	Second and stopping device	Installed		
	Power saving switch	Installed		
Power cell	Part No.: 280-39 Cell No.: SR626SW	Size (mm): φ6.8 x 2.6 t Voltage: 1.55 V	Capacity: 26 mAH Lifetime: Approx. 2 years	

### 53. HANDLING INSTRUCTION

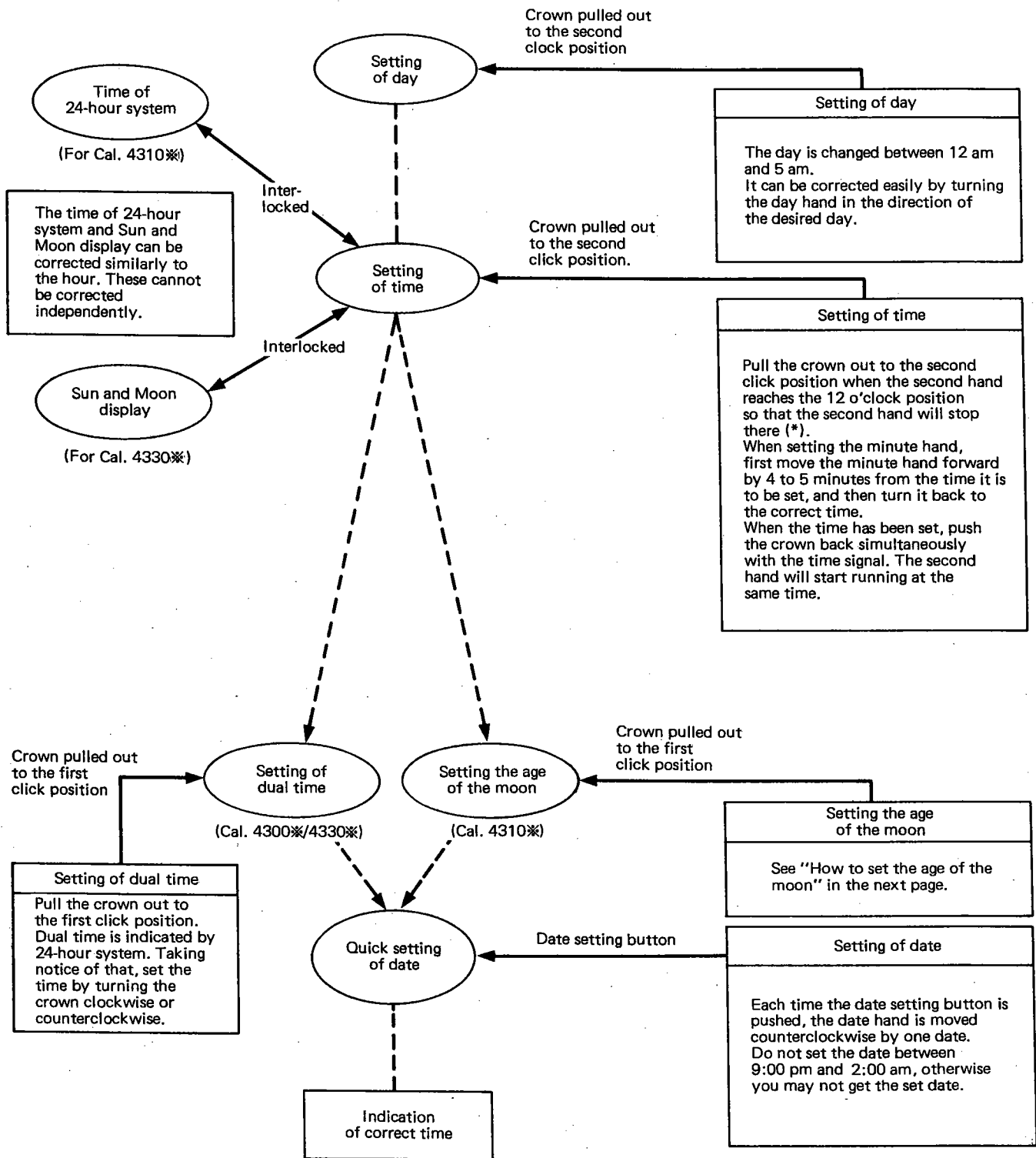
#### 3-1. Name of each part

Cal. 4300X	<p>Dual time (24-hour system)</p> <p>Date setting button</p> <p>Date</p> <p>Day</p> <p>Crown</p>
Cal. 4310X	<p>Age of the moon</p> <p>Date setting button</p> <p>Date</p> <p>Time of 24-hour system</p> <p>Day</p> <p>Crown</p>
Cal. 4330X	<p>Dual time (24-hour system)</p> <p>Date setting button</p> <p>Day</p> <p>Sun and Moon display</p> <p>Date</p> <p>Crown</p>

#### 3-2. How to see each indication

	Day	Date	Time on the 24-hour system	Dual time	Age of the moon
Normal					
Setting					

### 3-3. Setting each indication



- \* This function is called the second hand stopping device used as the power saving switch, too.
- \* After each indication is set, push the crown in to the normal position.

● **How to set and read age of the moon (Cal. 4310※)**

- \* This function indicates the age of the moon, but does not display the shape of the moon.
- \* Use the moon dial only as a guide to the age and phase of the moon when reading and setting the watch.

**1) Setting the age of the moon**

- In case the watch is equipped with the age of the moon scale

(1) Confirming today's or tomorrow's age of the moon

Check today's or tomorrow's age of the moon with a newspaper.  
If tomorrow's age of the moon is found, subtract one day from it.

(2) Setting the age of the moon (Example: age of the moon: 4.4)







Pull the crown to the first click position and rotate the moon mark clockwise until the center of the moon comes to around the position of 4.4 of the age of the moon scale.

- In case the watch is not equipped with the age of the moon scale

In this case, when the age of the moon shown in a newspaper, is 0, 7, 15 or 22, set the moon mark to the corresponding position of the age of the moon as shown in 2) "How to read the age of the moon" below.

The age of the moon can be set more accurately if it is set when it is 0 (New moon) or 15 (Full moon).

**2) How to read age of the moon (Example of indication)**

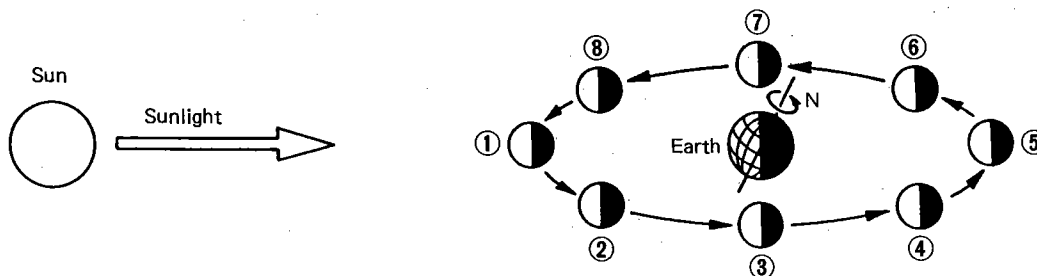
1	New moon Age of the moon: 0 (Spring tide)	3	First quarter moon Age of the moon: Approx. 7 (Neap tide)
			
5	Full moon Age of the moon: Approx. 15 (Spring tide)	7	Last quarter moon Age of the moon: Approx. 22 (Neap tide)
			

- \* The level of the tide can be seen from the indicated age of the moon.
- The age of the moon can be set more accurately if it is set when it is the New moon (the moon mark cannot be see at all — Age of the moon: 0) or the Full moon (the moon mark is at the top (position of 12 o'clock) — Age of the moon: 15).

### 3) What is the age of the moon

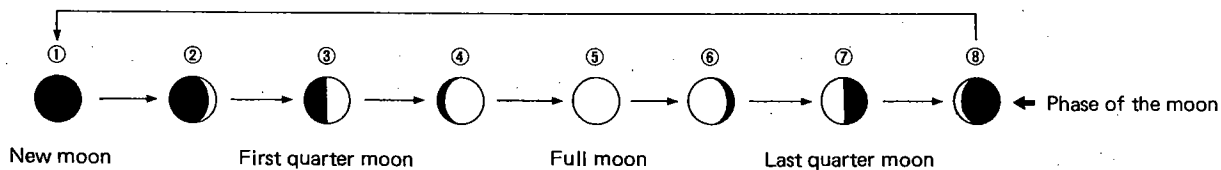
- Waxing and waning of the moon

The waxing and waning of the moon are caused by the change of the positions of the sun and moon viewed from the earth.



When the moon is at position (1) shown above (the sun and moon are in the same direction), the moon viewed from the earth is illuminated from its back. The moon is called the new moon at this time.

The moon can be seen at various positions as shown below.



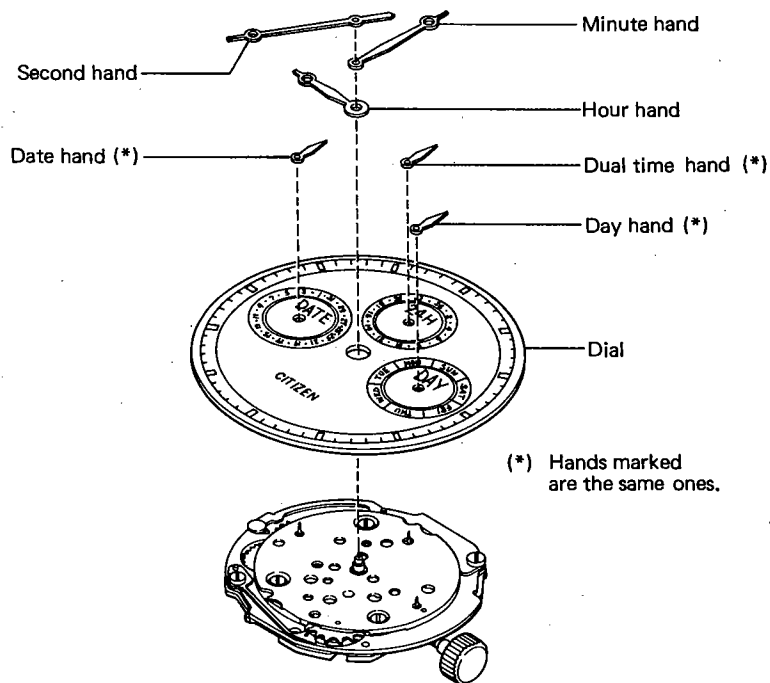
The moon waxes and wanes repeatedly in order of (1) – (8) – (1).

- The age of the moon

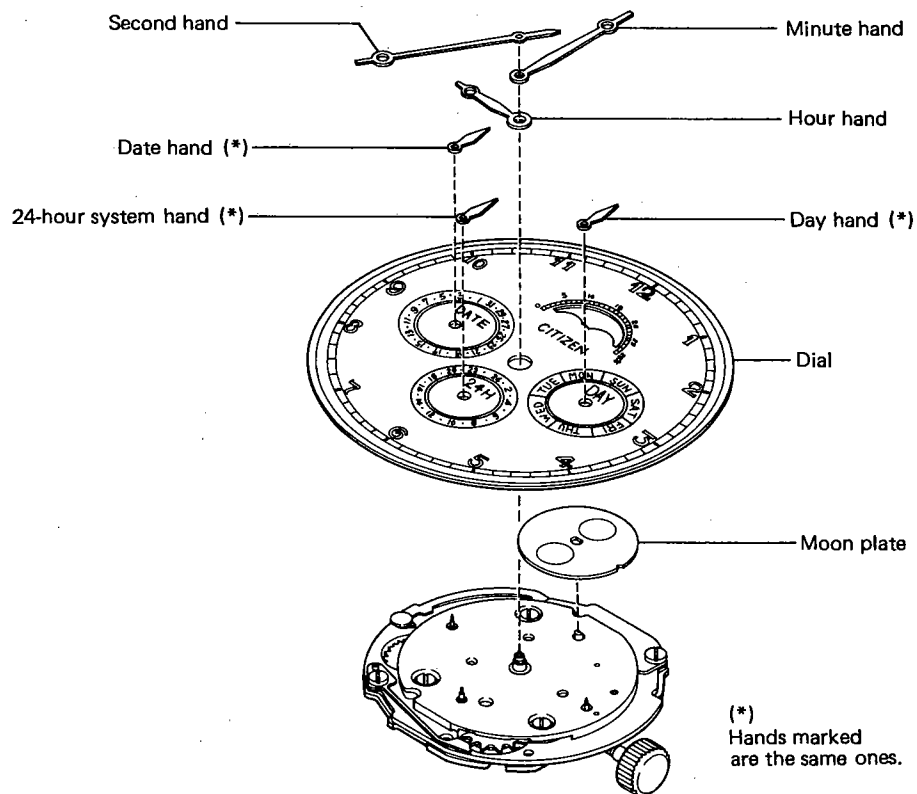
The age of the moon is indicated in units of days. The average period from a new moon to the next new moon is equivalent to about 29.5 days.

54. ASSEMBLY DRAWING OF HANDS AND DIAL OF  
CAL. 4300/4310/4330

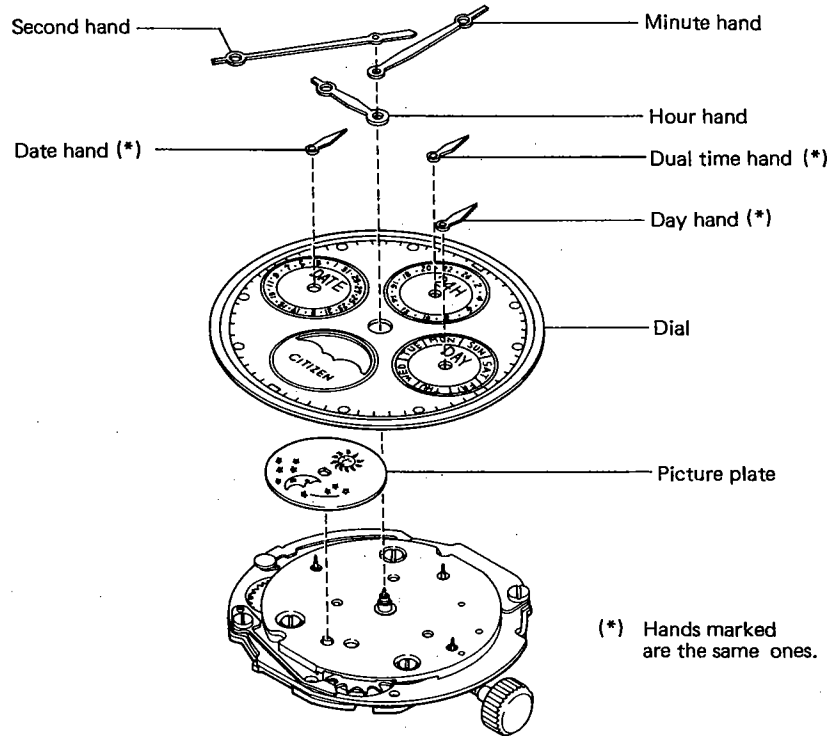
Cal. 4300\*



Cal. 4310\*



Cal. 4330※



**§5. MOUNTING OF APPEARANCE (DIALS – HANDS)**

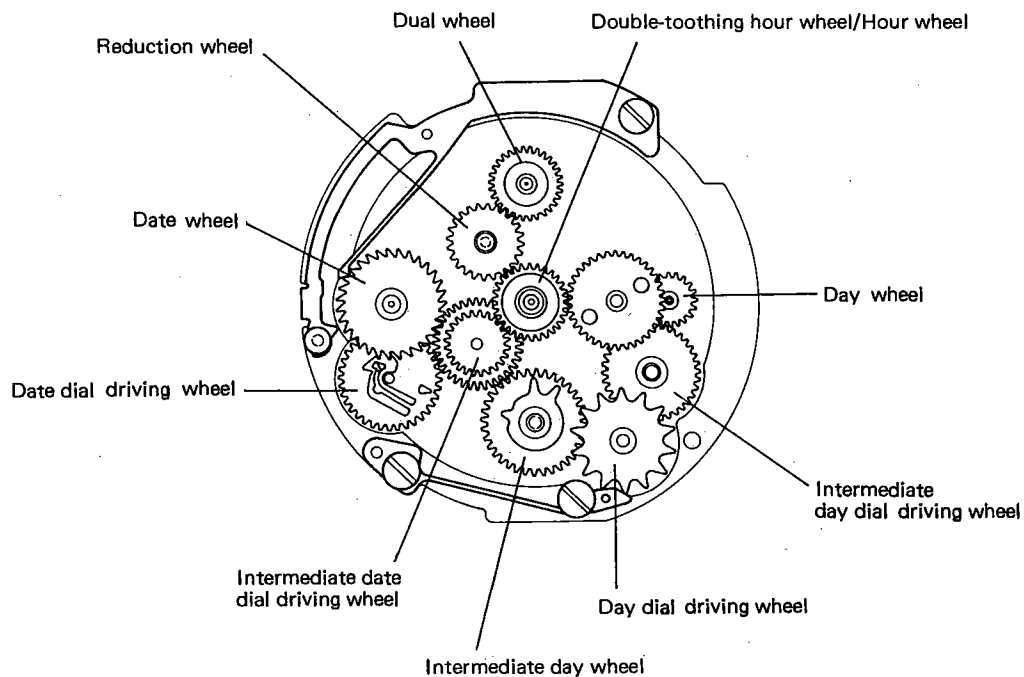
Item	Precautions	Applicable Cal. No.
1 Moon dial	Any position *1	4310X
2 Hands	Install 24-hour system hand (4310X) and picture plate (Sun mark, 4330X) to position of 12 o'clock (Noon) similarly to hour and minute hands.	4310X 4330X
	Set dual time hand to any position. *1	4300X 4330X

\*1: The month dial and dual time hand can be set independently with the crown.

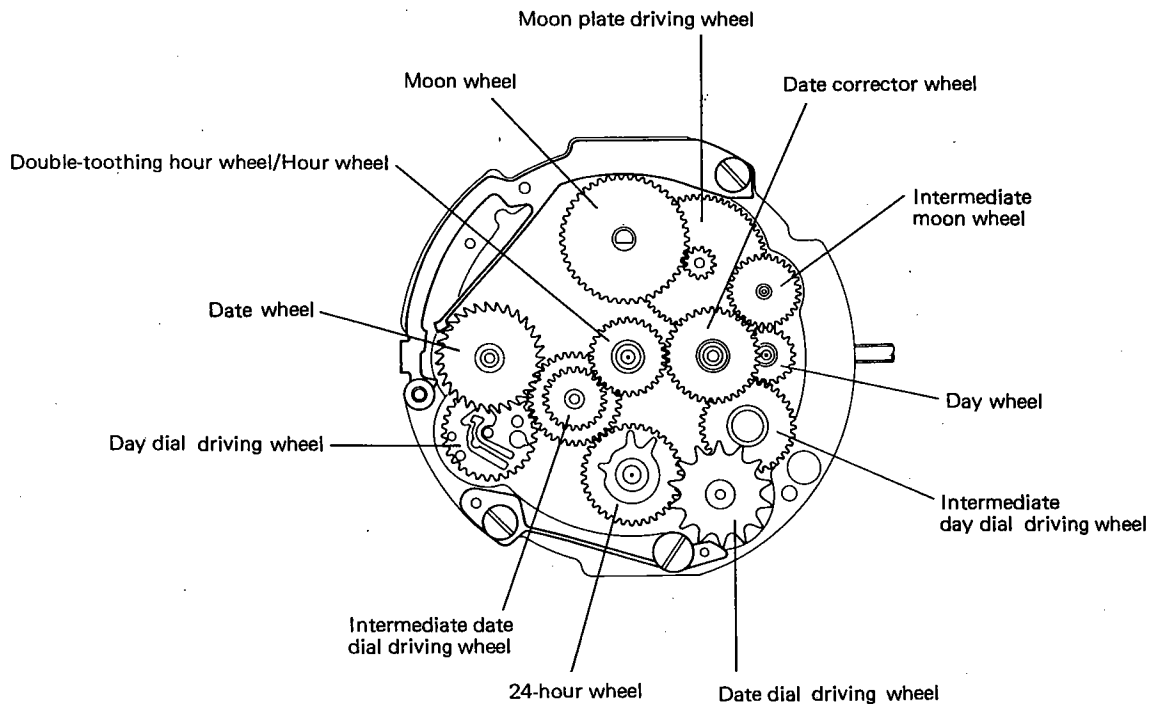


# 56. ARRANGEMENT OF REAR TRAIN WHEELS (DIAL SIDE)

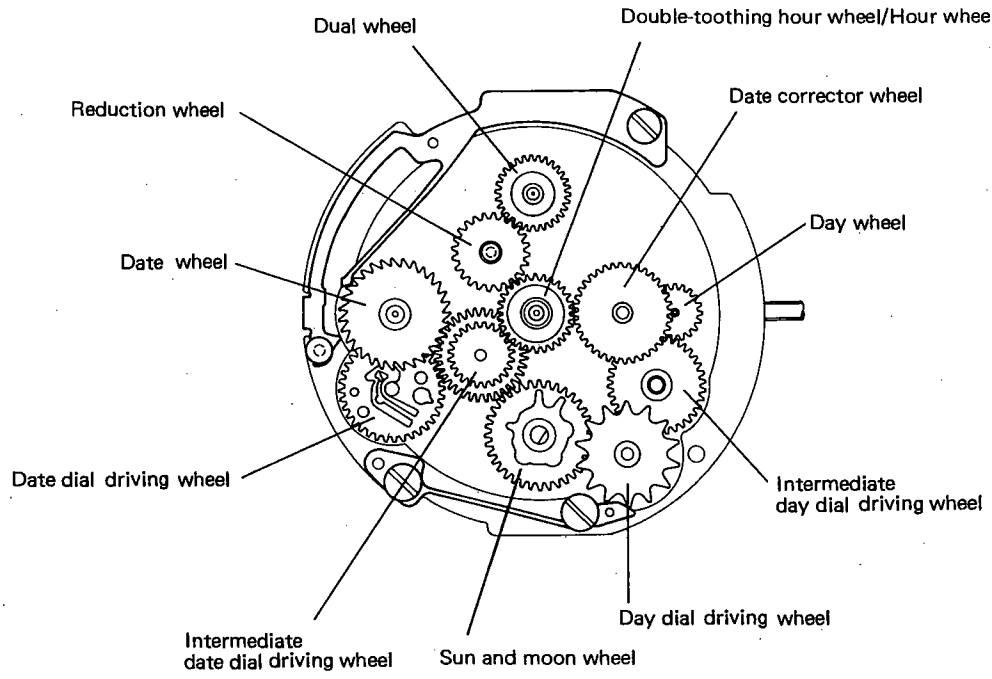
Cal. 4300\*



Cal. 4310\*



Cal. 4330\*

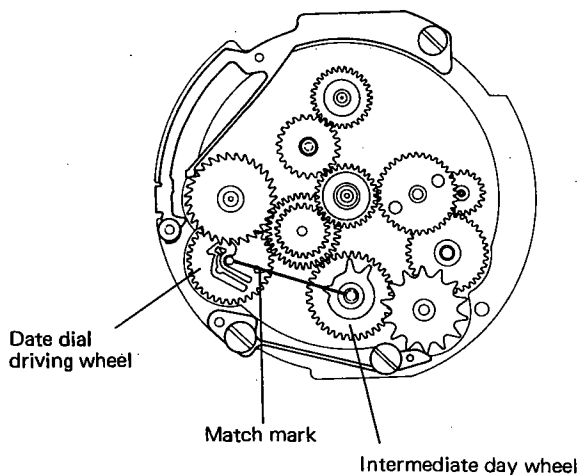


## 57. PRECAUTIONS FOR DISASSEMBLY AND ASSEMBLY OF MODULE

### Mounting of rear train wheel (Cal. 4300※/4310※/4330※)

The day hand of the following caliber starts changing from around 0:00 am and finishes changing around 5:00 am. To prevent this day change time band from deviating largely, observe the following when mounting the rear train wheel.

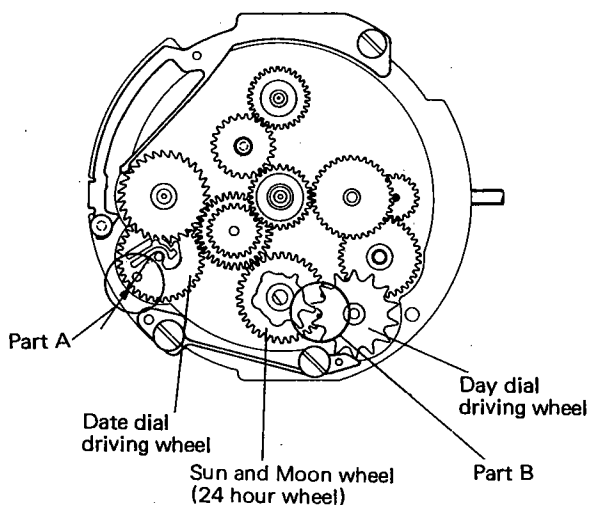
< Cal. 4300※ >



When mounting the date dial driving wheel and intermediate day wheel, align the match mark (▷) of the date dial driving wheel with the claw (⌋) of the intermediate day wheel as shown at left.

- If the claw (⌋) of the intermediate day wheel is deviated by one tooth from the above position clockwise, the day is changed about 30 minutes earlier. If the former is deviated by two teeth, the latter is changed about one hour earlier.

< Cal. 4310※/4330※ >



Mount the rear train wheel as shown at parts A and B in the figure at left.

Part A: Align the match mark of the date dial driving wheel (○ mark) with that of the date jumper support ring (△ mark), then

Part B: Set the day dial driving wheel so that it will come in contact with the claw of the sun dan moon wheel (24-hour wheel) while it is jumping.

\* The figure at left shows Cal. 4330※. It is the same as Cal. 4310※ except the wheels related to the age of the moon.

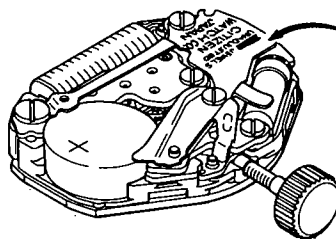
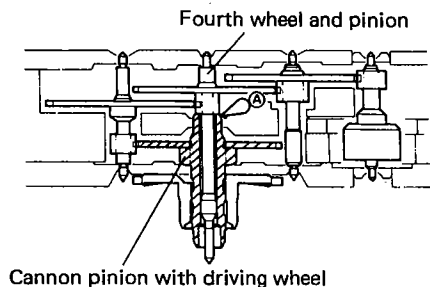
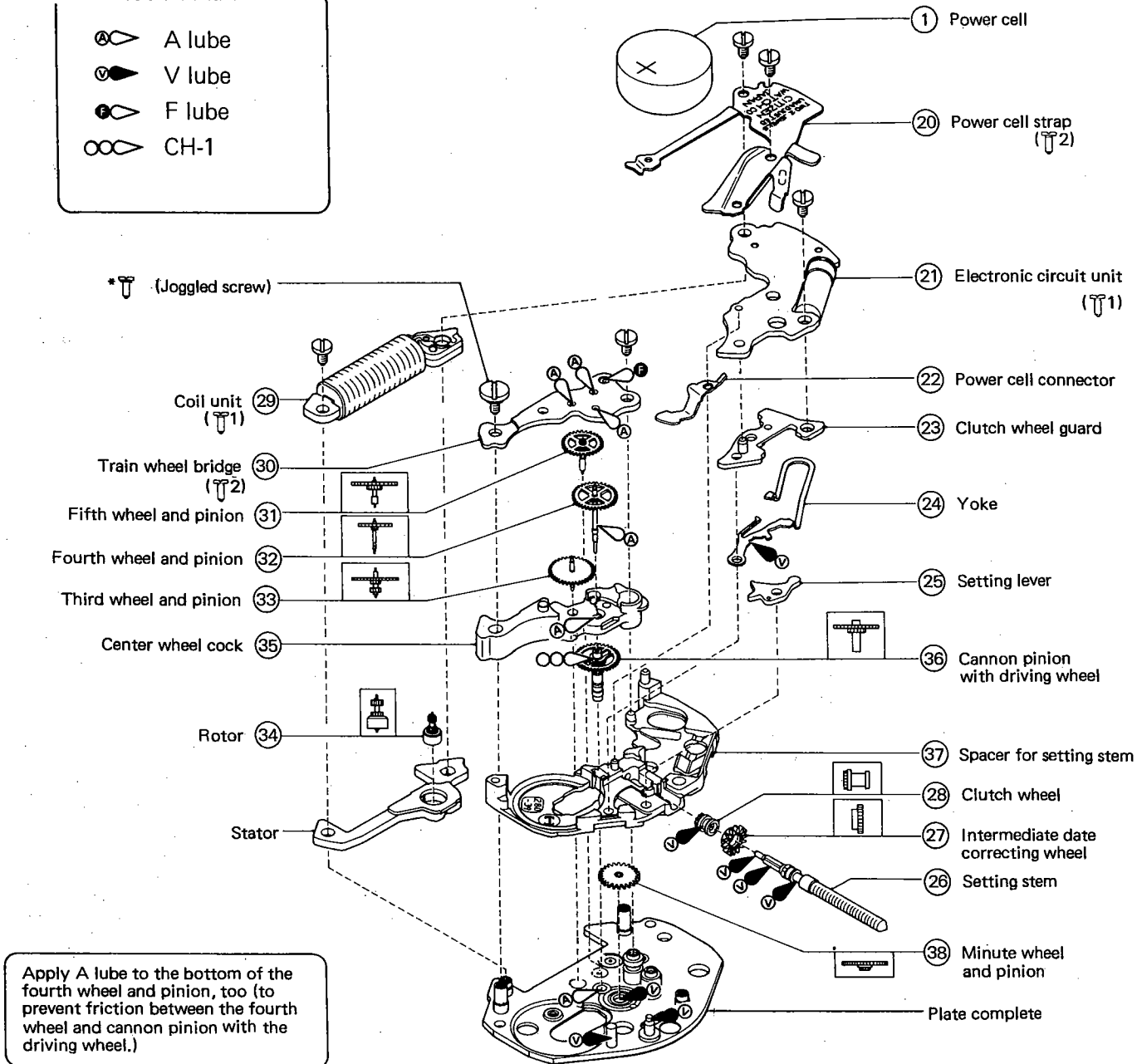
## 57. DISASSEMBLY AND ASSEMBLY OF MODULE

Disassemble the parts in order of ① ~ ③⑧, and reassemble in the reverse order.

The following procedure is for Cal. 4300X. It must be changed slightly depending on each caliber.

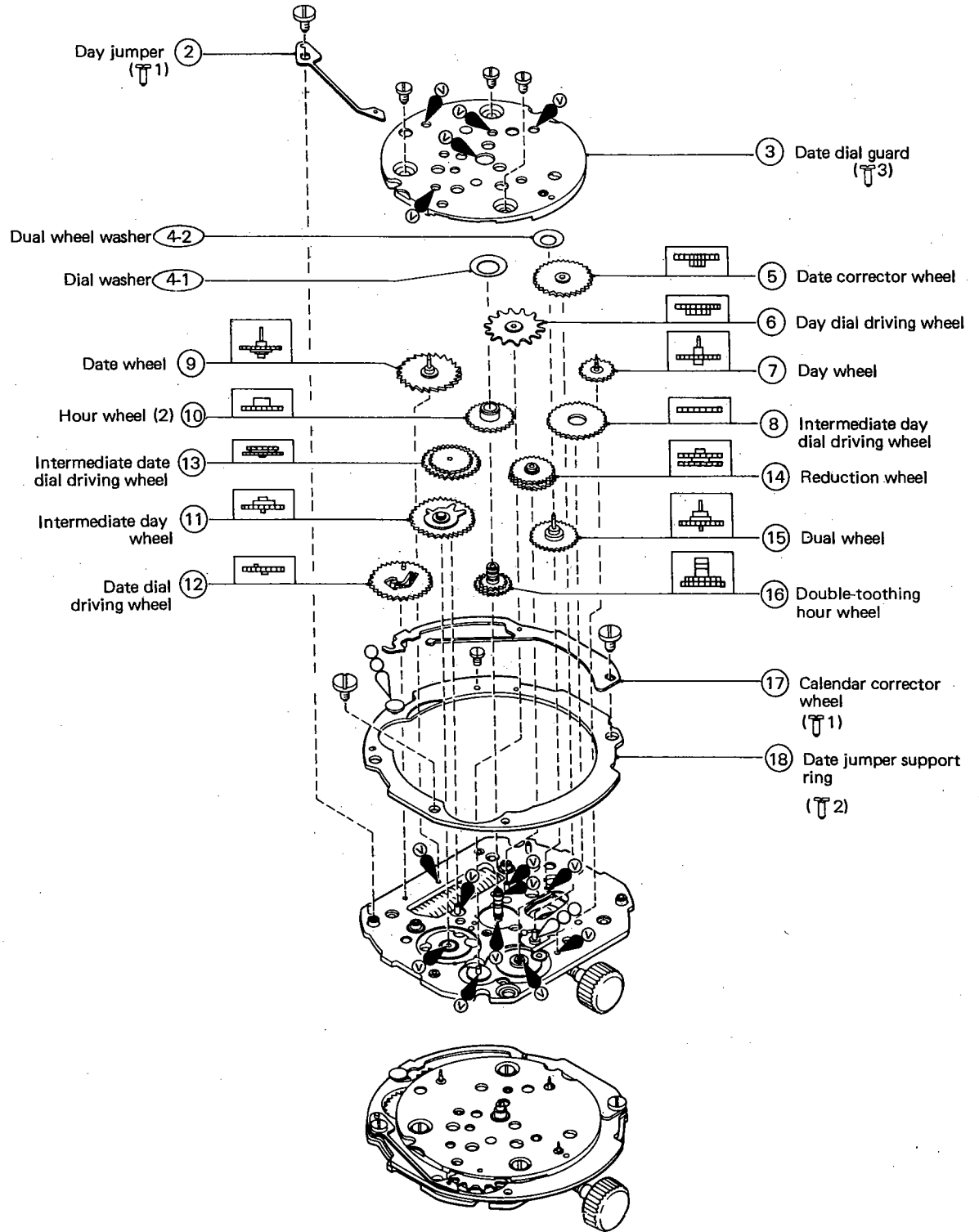
### Lubrication mark

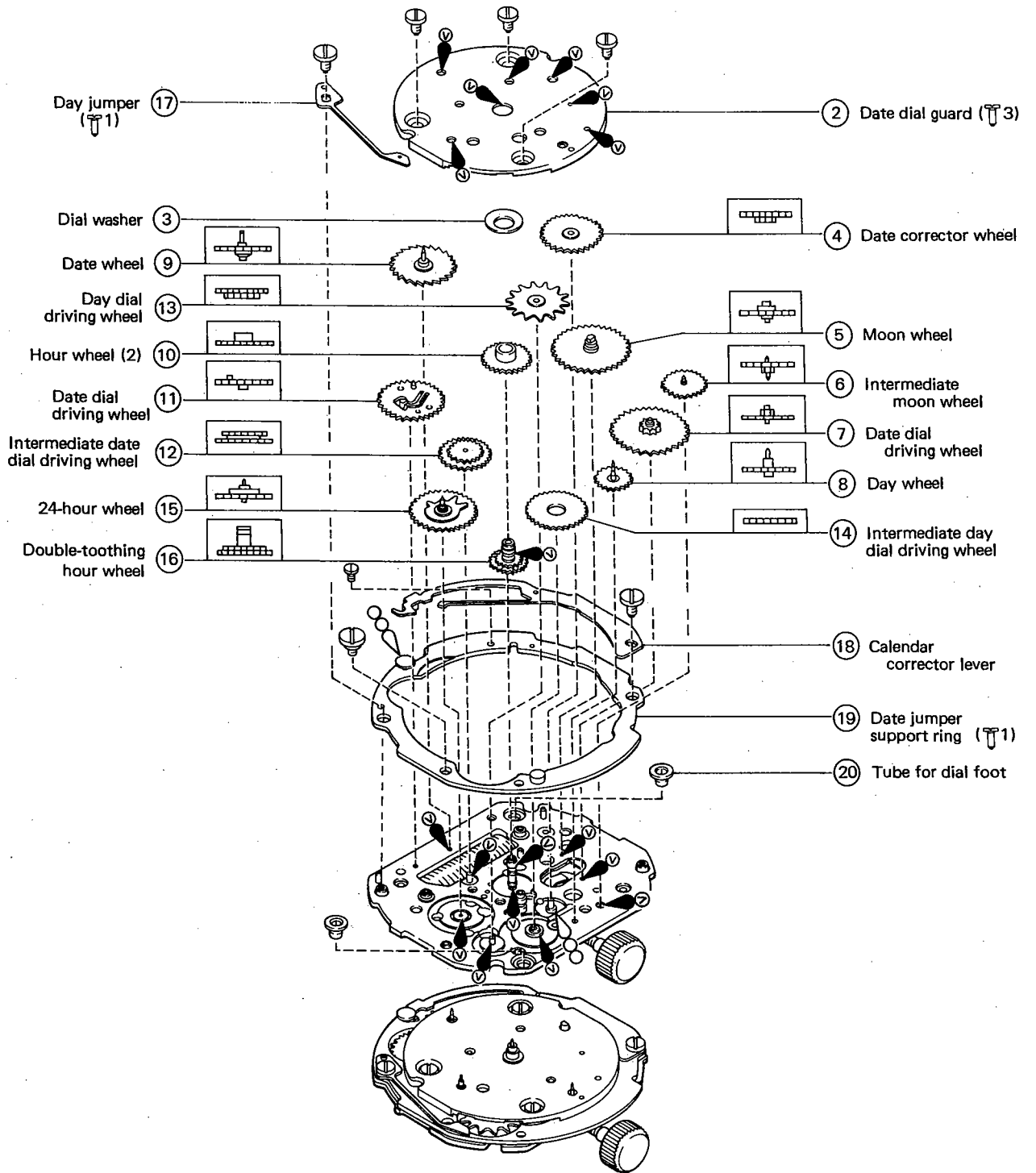
- Ⓐ A lube
- Ⓥ V lube
- ⓕ F lube
- ∞ CH-1

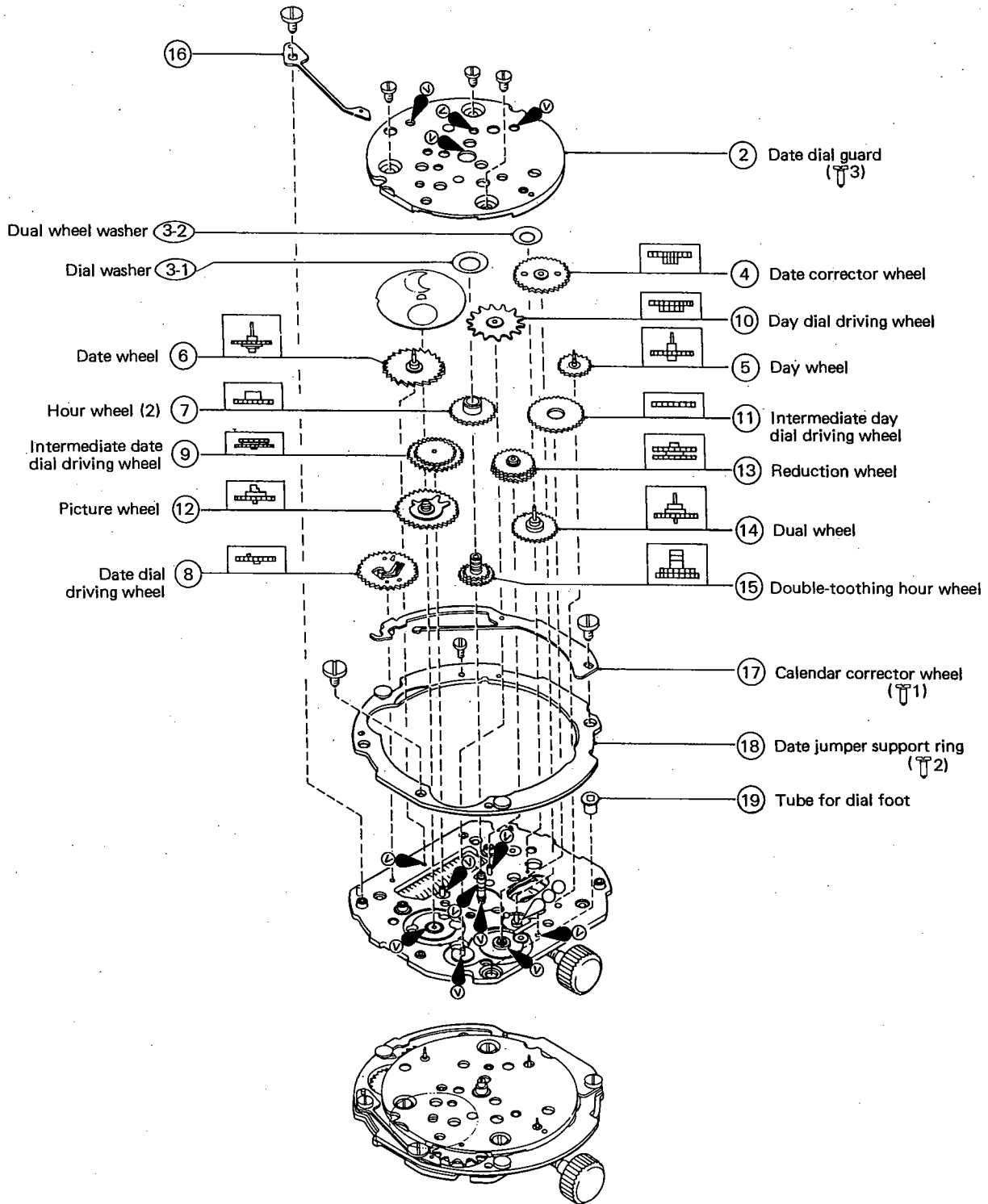


Note: Handling of setting stem  
The setting stem can be fixed securely only when the power cell strap is installed. When disassembling or assembling, if the power cell strap is not installed, keep the setting stem pushed in.

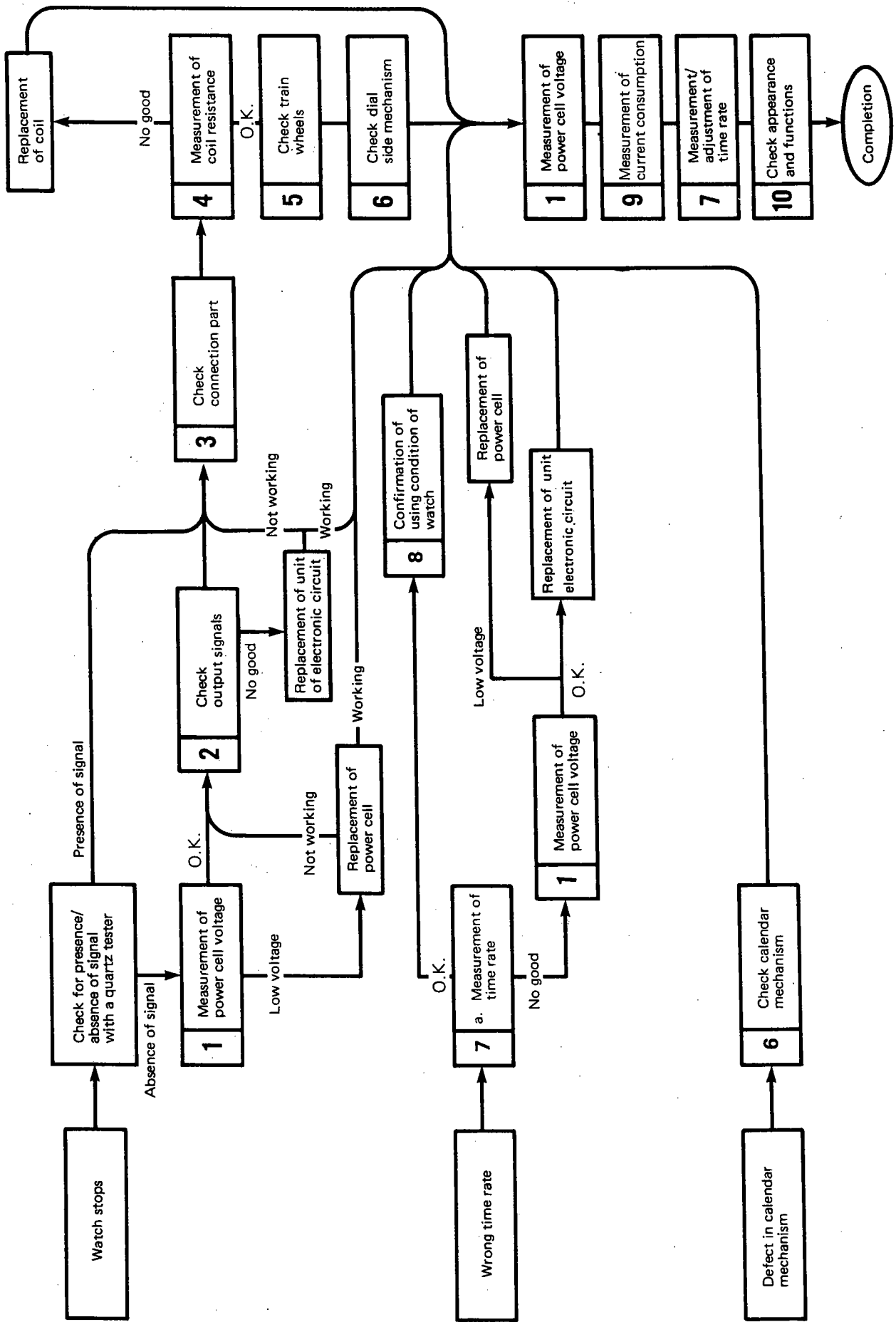
- The module of Cal. 4300X, 4310X, 4330X and 4360X are based on Cal. 20. Therefore, the power cell side of these modules is almost the same as Cal. 20.



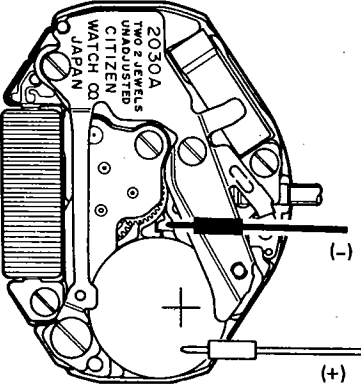
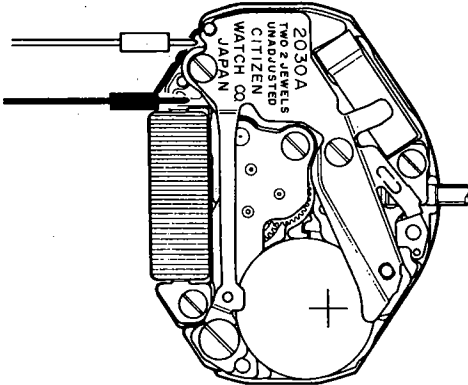


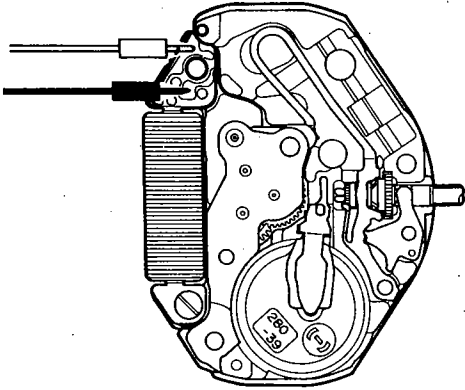


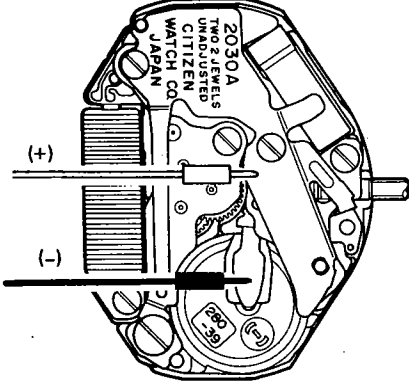
# S8. TROUBLESHOOTING AND ADJUSTMENT





Check Items	Check Method	Results and Treatment
<p>① Measurement of power cell voltage</p>	<p>[ Refer to Technical Manual, Basic Course II-1-a for the setting procedure of the tester.]</p> <p>&lt; Tester range: D.C. 3V &gt;</p> 	<p><b>Over 1.5V</b> → Non-defective</p> <p><b>Under 1.5V</b> → Replace the power cell</p>
<p>② Check output signal</p>	<p>[ Refer to Technical Manual, Basic Course II-1-b for the setting procedure of the tester.]</p> <p>&lt; Tester range: D.C. 0.3V &gt;</p> 	<p>The tester pointer swings every second. → Non-defective</p> <p>The tester pointer does not swing. → Check the connections.</p> <p>The connections are normal → Replace the electronic circuit unit.</p>
<p>③ Check connection part</p>	<p>[ Refer to Technical Manual, Basic Course II-2-a.] Confirm that there are no loose screws, dust or stains in the connections.</p> <p>a) A loose screw in the electronic circuit unit may prevent the transmission of the driving signals.</p> <p>b) Dust or stains on the coil or the pattern of the electronic circuit unit will prevent the circuit from conducting.</p>	

Check Items	Check Method	Results and Treatment
<p>④ Measurement of coil resistance</p>	<p>[ Refer to Technical Manual, Basic Course II-1-c for the setting procedure of the tester.]</p> <p>○ Remove the electronic circuit unit when measuring the resistance.</p> <p>&lt; Tester range: R x 10Ω &gt;</p> 	<p><b>1.8kΩ ~ 2.2kΩ</b> → Non-defective</p> <p>Outside range of 1.8kΩ ~ 2.2kΩ → Replace the coil unit.</p>
<p>⑤ Check train wheels.</p>	<p>[ Refer to Technical Manual, Basic Course II-2-b.]</p>	
<p>⑥ Check dial-side mechanism</p>	<p>[ Refer to Technical Manual, Basic Course II-2-c.]</p> <p>* Refer to "6. Precautions for Disassembly and Assembly of Module".</p>	
<p>⑦ Measurement of time rate</p>	<p>[ Refer to Technical Manual, Basic Course II-2-d.]</p> <p>○ Since this watch uses the D.F.C. (digital frequency control) method and has no control terminal, there is no way of adjusting its time rate in the field. (Measurement is made in a 10-second range.)</p>	<p>The watch loses or gains a substantial amount of time → Replace the electronic circuit unit.</p>
<p>⑧ Confirmation of using condition of watch</p>	<p>[ Refer to Technical Manual, Basic Course II-2-e.]</p>	

Check Items	Check Method	Results and Treatment
<p>9 Measurement of current consumption</p>	<p>[ Refer to Technical Manual, Basic Course II-1-f for the setting procedure of the tester.]</p> <p>&lt; Tester range: D.C. 12<math>\mu</math>A &gt; Place the power cell in the adapter.</p>  <div data-bbox="509 982 1073 1209" style="border: 1px solid black; padding: 5px; margin-top: 20px;"> <p>Influence of light</p> <p>Avoid measuring current consumption under an incandescent lamp or the direct rays of the sun, because it may cause the current value to increase.</p> <p>The light of a fluorescent lamp has no influence on the current value.</p> </div>	<ul style="list-style-type: none"> <li>● Current consumption of the module <ul style="list-style-type: none"> <li><b>Under 1.7<math>\mu</math>A</b></li> <li>→ Non-defective</li> <li><b>Over 1.7<math>\mu</math>A</b></li> <li>→ Measure the electronic circuit unit separately.</li> </ul> </li> <li>● Measurement of the separate electronic circuit unit <ul style="list-style-type: none"> <li><b>Under 0.6<math>\mu</math>A</b></li> <li>→ Non-defective</li> <li><b>Over 0.6<math>\mu</math>A</b></li> <li>→ Replace the electronic circuit unit.</li> </ul> </li> </ul> <div data-bbox="1138 716 1490 1073" style="border: 1px solid black; padding: 5px; margin-top: 20px;"> <p>When the current consumption of the module shows a high value, but that of the separate electronic circuit unit is normal → There may be a problem somewhere outside the circuit. Therefore, inspect the watch for stains, lubrication conditions and deformed parts, and remove the cause of the high load.</p> </div>
<p>10 Check appearance and functions</p>	<p>[ Refer to Technical Manual, Basic Course II-2-f.]</p>	

# **CITIZEN WATCH CO., LTD.**

Tokyo, Japan