

***TECHNICAL  
INFORMATION***

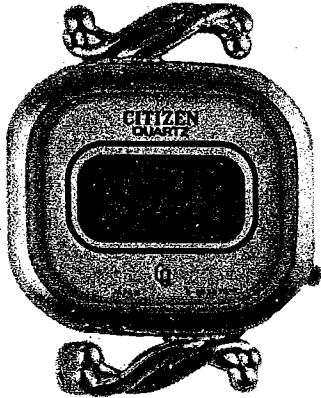
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**CITIZEN QUARTZ**

**Cal. No. 921 ※ ※**

 **CITIZEN**

## §1. OUTLINE



This is a digital quartz crystal watch for ladies, featuring an extremely thin-gauge movement structure. It has been developed in response to the recent market requirements to enrich the varieties of fashionable and dressy bracelet watches for ladies' use.

**§2. FEATURES**

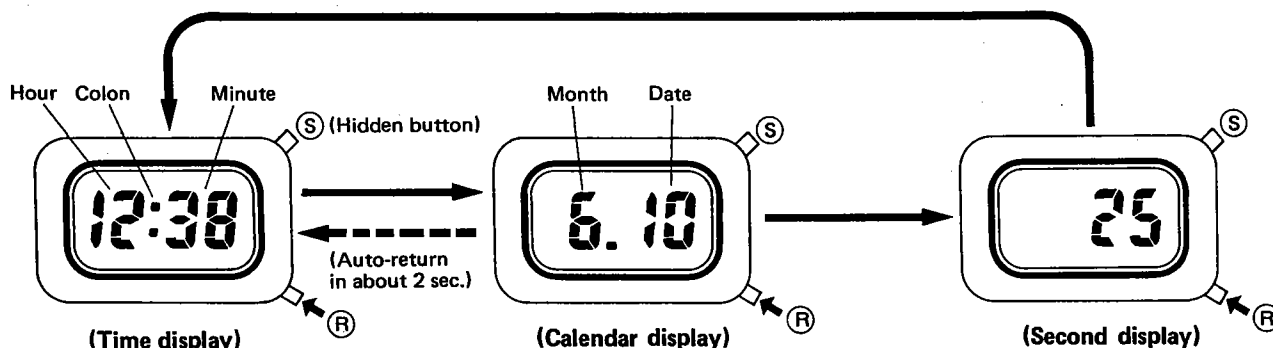
- 1) The movement measures only 13 mm x 15.8 mm (max. diameter 16 mm) in size and 3.98 mm (power cell part 4.03 mm) in thickness. With such extremely thin and compact measurements, the design varieties are further increased for the bracelet- and dress-watches for ladies.
  - 2) The color-patterned reflecting plates are added newly and thus can be used in combination with the colors of the watchcases, that is, the gold-color reflecting plate is used suitably with the GP case and the silver-color one with the SS case respectively. As a result, the more colorful designs become available along with the compact and thin-gage movement.
  - 3) The two units of the push-button facilitate an easy operation for display switching and correction.
  - 4) The calendar (month and date) can be set automatically including the leap years after set once correctly, thus omitting the manual correction each time.
  - 5) The movement uses only two pieces of screws in all with much reduced number of the component parts, thus facilitating an easy disassembling and assembling.
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## §3. SPECIFICATIONS

Caliber No.	9210A
Type	Digital-type quartz crystal watch with LC (liquid crystal) display
Movement	Size: 13mm x 15.8mm Thickness: 3.98mm
Oscillation	32,768Hz
Accuracy	±15 sec./month under normal temperatures
Display system	FE twist-type nematic LC display
Display information	Constant digital display of "hour" and "minute" Switching display of "month" and "date" Switching display of "second"
Effective temperature range	0°C ~ +60°C (32°F ~ 140°F)
Integrated circuit	C/MOS-LSI (1 unit)
Additional mechanisms	Fully automatic calendar (including leap year)
Power cell	Small-size silver oxide power cell (1 unit) Parts No. : 280-34 Nominal voltage : 1.55V Capacity : 15mAH Size : 6.8mmφ x 2.15mm Life : 1 year

§4. HANDLING INSTRUCTIONS

1) How to read time/calendar and display switch

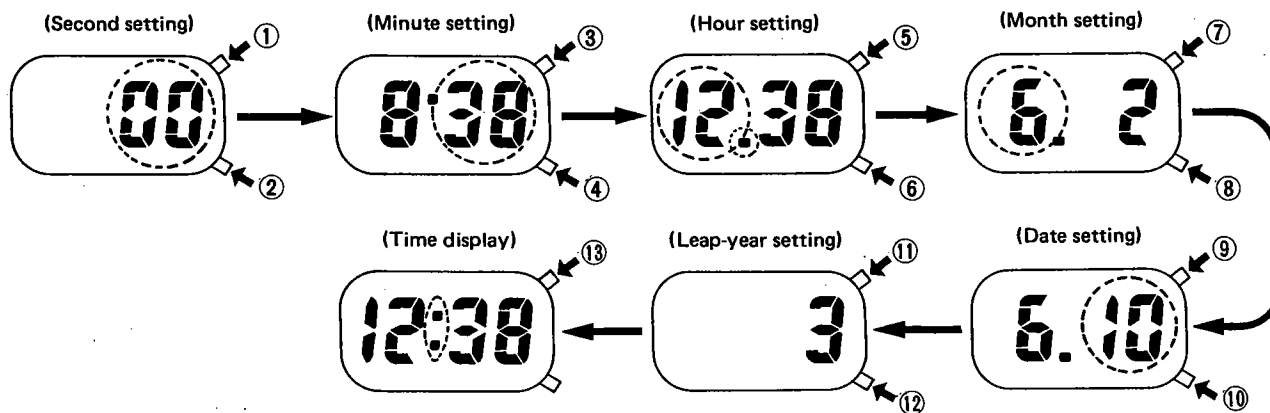


- Ⓜ button (Read/Set button): Display switch/Time & calendar setting
- Ⓢ button (Select button): Selection for setting digit

With push of the Ⓜ button, the time display is changed to the calendar display. The calendar display is then switched to the second display with another push of the Ⓜ button before "autoreturn". The calendar display is returned automatically to the time display in about 2 seconds (Auto-return). But the auto-return does not operate to change from the second display to the time display, so the Ⓜ button must be pushed once more to secure the time display in that case.

2) Setting method of displays

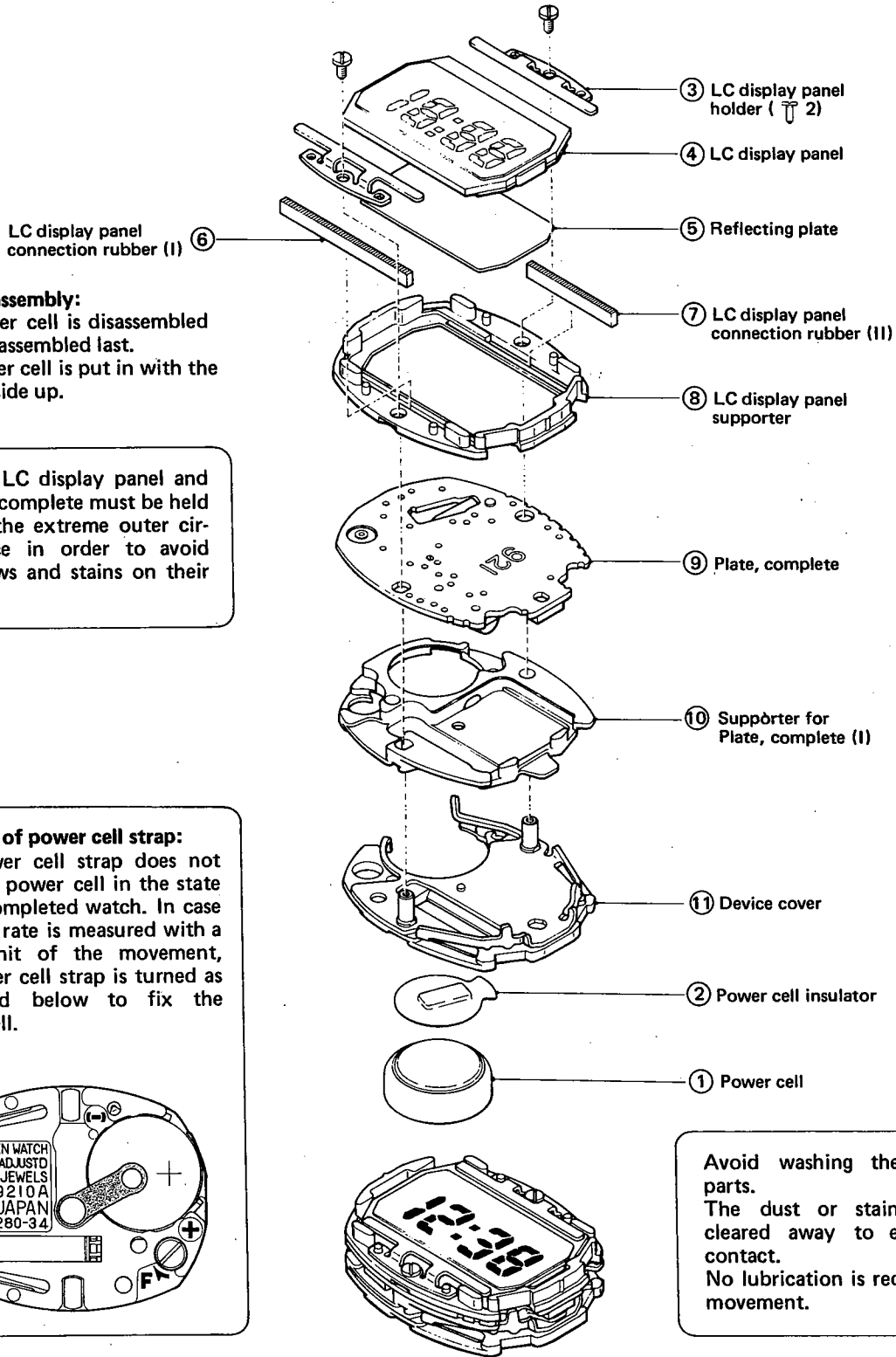
With operation of both Ⓢ and Ⓜ buttons, the display area to be corrected can be called out and then set independently. The digit to be corrected, flashes to indicate the correction in that order of "second", "minute", "hour", "month", "date" and "leap year". The date changes as "1 - 31 - 1" and "1 - 30 - 1" for the 31-day month and the 30-day month respectively ("1 - 29 - 1" for February). The area to be corrected is called out with push of the Ⓢ button and set with push of the Ⓜ button. In the diagrams below, the setting procedure is given in that order of ①-②-③ and so on (the area to be corrected is shown by the flashing symbol of dotted circles).



- \* If the second was between 30 and 59, when Ⓜ button was pressed. One minute will be added to the minute display.
- \* Never fail to switch to the time display with push of the Ⓢ button after setting the time or the calendar.
- \* The leap year is indicated by "0", and figures "1", "2" and "3" indicate the number of the year counted from the leap year. Only the display of "0" has flashing.
- \* The upper dot of the colon shows AM and the lower dot indicates PM respectively in the hour setting.

§ 5. DISASSEMBLING/ASSEMBLING PROCEDURE OF MOVEMENT

Disassembling procedure: ① ~ ⑪  
 Assembling procedure: ⑪ ~ ①  
 The number of screws coming with the parts shown by the symbol like ( ② ).  
 The replacement of the power cell can be given by opening the caseback.



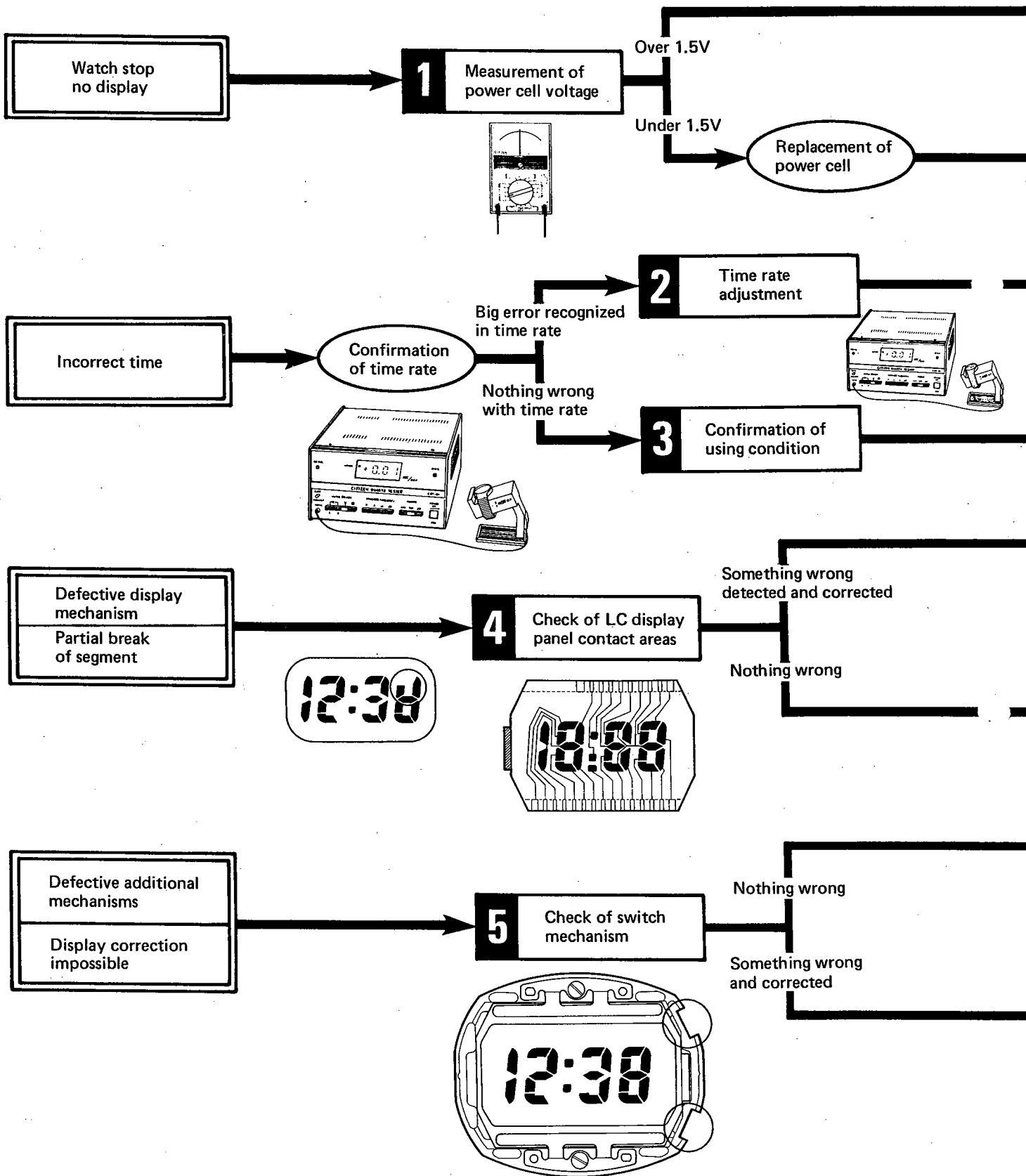
**Notes on assembly:**  
 • The power cell is disassembled first and assembled last.  
 • The power cell is put in with the plus (+) side up.

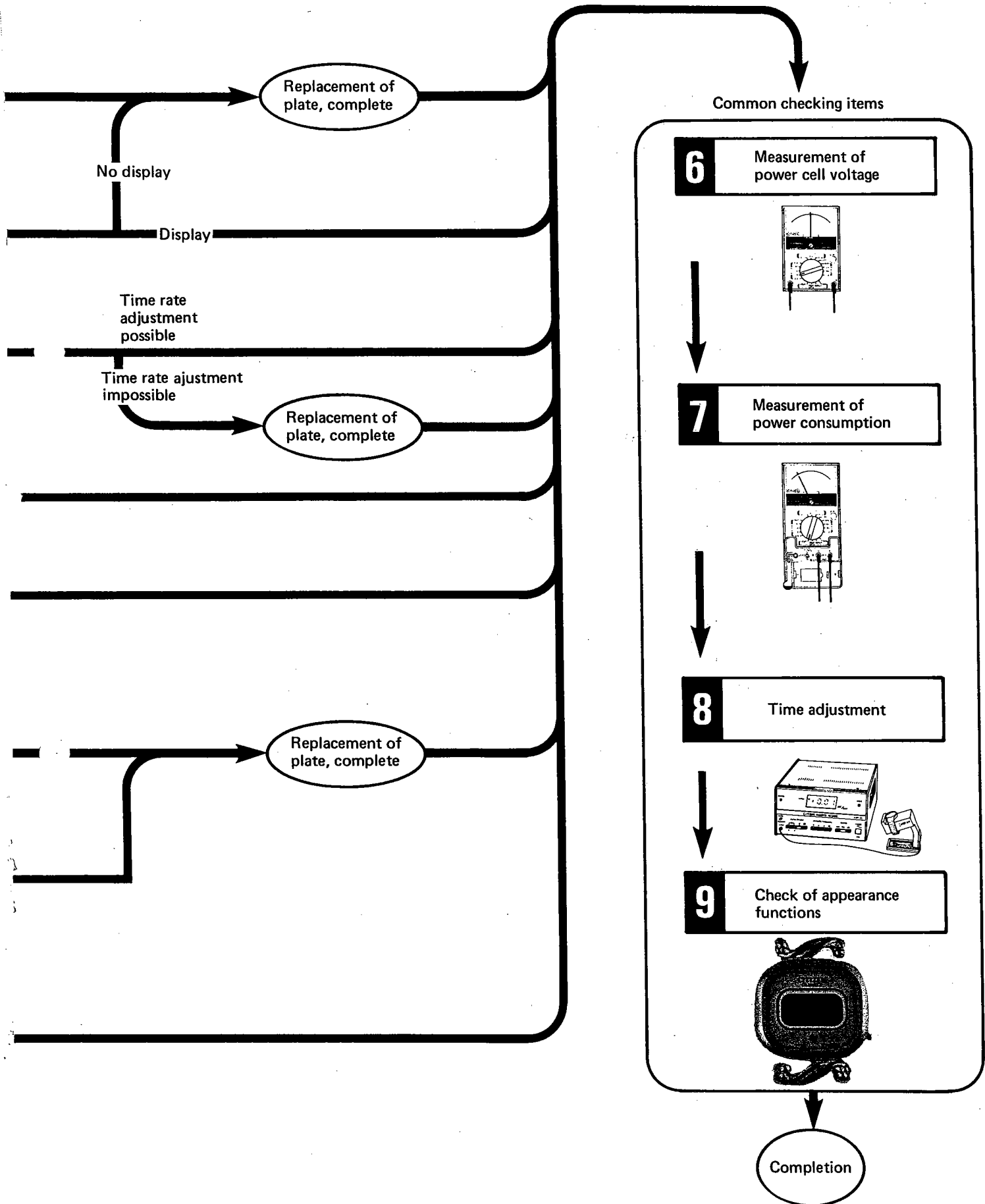
Both the LC display panel and the plate, complete must be held softly at the extreme outer circumference in order to avoid giving flaws and stains on their surfaces.

**Handling of power cell strap:**  
 The power cell strap does not hold the power cell in the state of the completed watch. In case the time rate is measured with a single unit of the movement, the power cell strap is turned as illustrated below to fix the power cell.

Avoid washing the electronic parts.  
 The dust or stains must be cleared away to ensure good contact.  
 No lubrication is required to the movement.

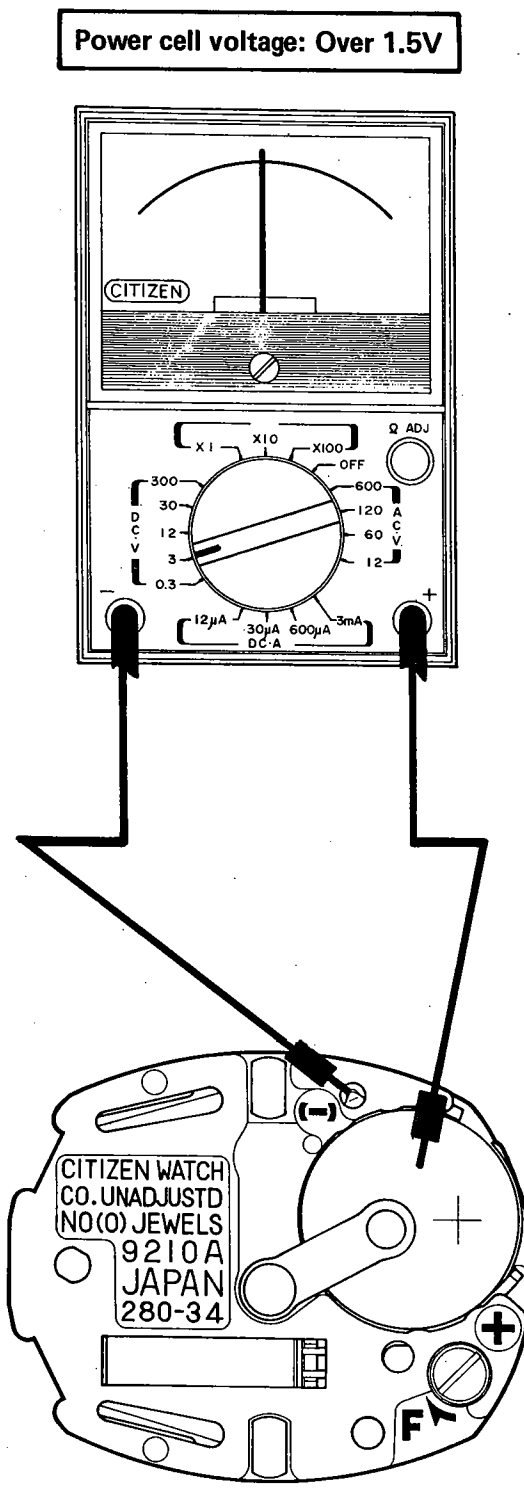
§ 6. TROUBLESHOOTING AND ADJUSTMENT



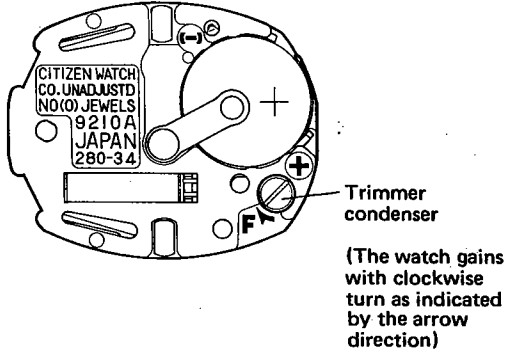




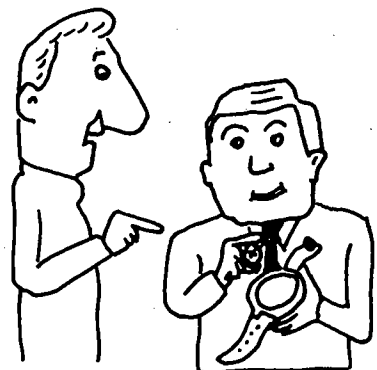
## Watch stop – No display at all

Checking items	How to check	Results and treatment
<p><b>1</b> Measurement of power cell voltage</p>	<p style="text-align: center;"><b>Power cell voltage: Over 1.5V</b></p>  <p style="text-align: center;">*In case the measured value is not stable or OV with the power cell incorporated and the measured value shows more than 1.5V with a single unit of the power cell, the contact is sometimes imperfect between the power cell connector and the minus terminal of the power cell. So the dust or stains must be cleared away on the contact surface.</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p><b>Over 1.5V</b></p> <ul style="list-style-type: none"> <li>• No display of LC display panel</li> <li>→ Replacement of plate, complete</li> </ul> </div> <div style="border: 1px solid black; padding: 5px;"> <p><b>Under 1.5V</b></p> <p>After replacement of power cell:</p> <ul style="list-style-type: none"> <li>• Display of LC display panel</li> <li>→ ⑦ Measurement of power consumption</li> <li>• No display of LC display panel</li> <li>→ Replacement of plate, complete</li> </ul> </div>

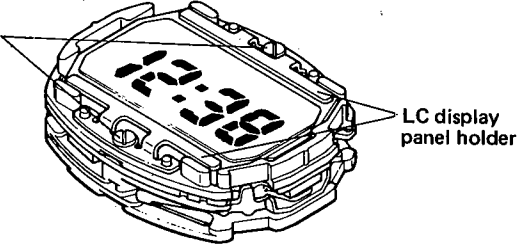
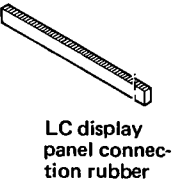
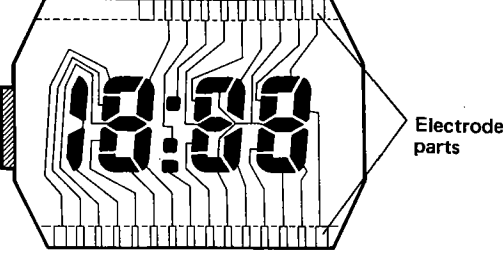
**Big error recognized in time rate**

Checking items	How to check	Results and treatment
<p>2 Confirmation of time rate</p>	<p>In case the time is incorrect (big error recognized in time rate), the frequency has big aberrations for the quartz crystal oscillator attached to the plate, complete.</p> <p>Thus, the trimmer condenser is turned clockwise or counterclockwise to adjust the time.</p>  <p>*In case the time rate has a big error or the time rate does not change at all even with the turn of the trimmer condenser, the trimmer condenser has some fault.</p>	<ul style="list-style-type: none"> <li>• Time adjustment possible                     <ul style="list-style-type: none"> <li>→ Common checking items</li> </ul> </li> <li>• Time adjustment impossible                     <ul style="list-style-type: none"> <li>→ Replacement of plate, complete</li> </ul> </li> </ul>

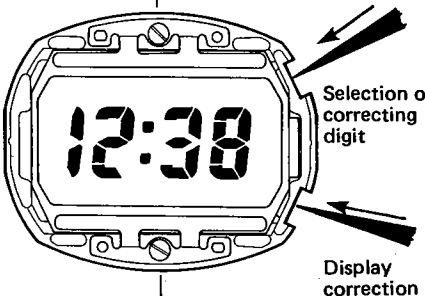
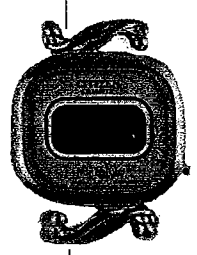
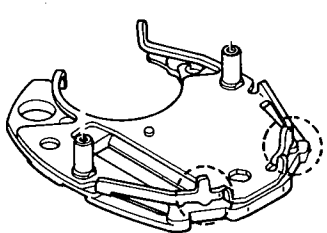
**Nothing wrong with time rate**

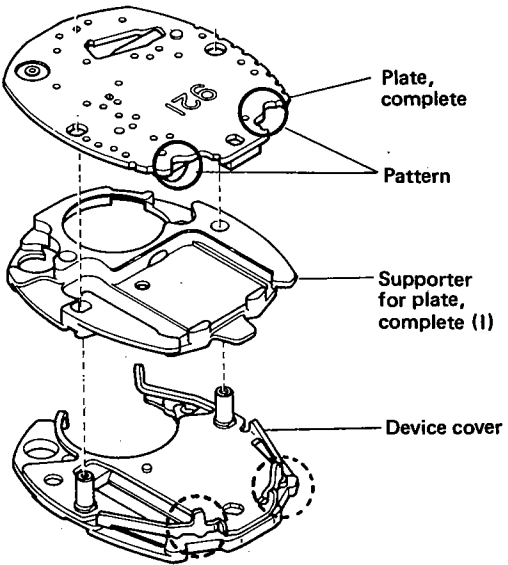
Checking items	How to check	Results and treatment
<p>3 Confirmation of using condition</p>	<p>How the customer has been used his watch must be confirmed as follows.</p>  <ol style="list-style-type: none"> <li>(1) Check whether the customer handled his watch in a wrong way.</li> <li>(2) Check whether the watch was used in the extreme temperatures, i.e., outside the effective temperature range.</li> <li>(3) Check how many days have passed since the watch had the time adjustment last.</li> </ol>	

**Defective display mechanism — Partial break of segment**

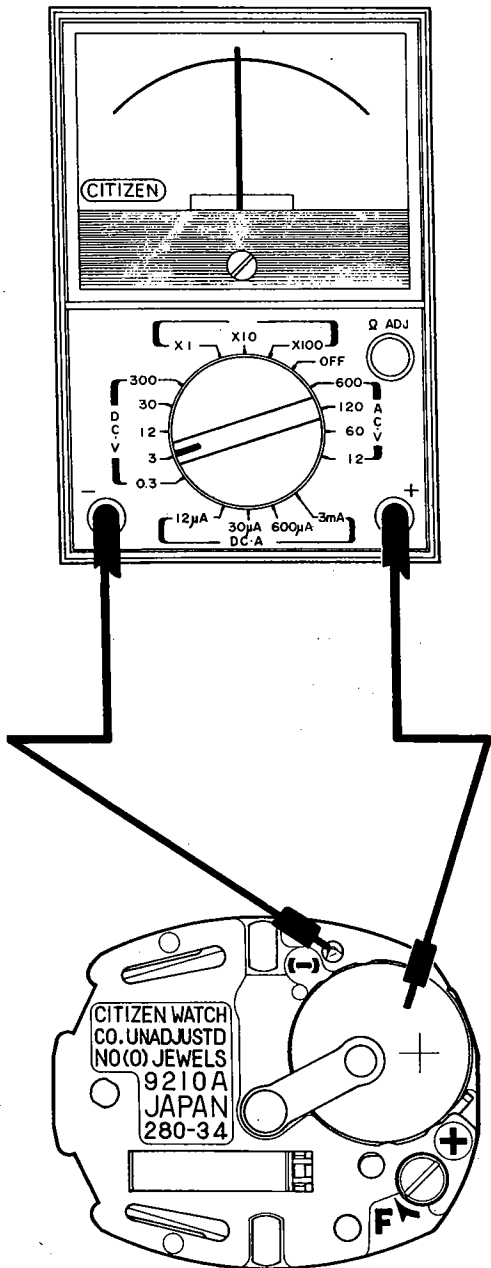
Checking items	How to check	Results and treatment
<p><b>4</b> Check of LC display panel contact areas</p>	<p>In case the partial break occurs for the segment, the two factors are possible: the contact is imperfect between the LC display panel and the electronic circuit; and the LC display panel and the electronic circuit have some fault. And the former factor (imperfect contact) is conceivable in more cases than the latter factor. So the contact areas must be checked carefully.</p> <p>1. Check of LC display panel holder mechanism</p> <p>(1) Check whether the screws for LC display panel holder is broken or loose.</p> <p>(2) Check whether the LC display panel holder is holding the LC display panel evenly or whether the LC display panel holder has some deformation.</p>  <p>2. Check of LC display panel connection rubber</p> <p>(1) Check whether the rubber is twisted.</p> <p>(2) Check whether the rubber is worn out or stretched out extremely.</p> <p>(3) Check whether some stains or dust stick to the rubber.</p>  <p>3. A careful inspection is given to the electrode part where the segment break is detected to check the electrode part of the LC display panel has some cracks and dust or stains stuck.</p>  <p><b>*Point of checking</b> The peripheral area of the segment is pushed with a finger softly as illustrated in the left diagram. In this case if the broken segment gives display, it is known that the fault is caused by the imperfect contact.</p> <p><b>Note:</b> Avoid pushing the LC display panel too strongly to prevent the glass cracking.</p>	<p>Screws broken → Replacement</p> <p>Screws loosened → To be Retightened</p> <p>No even holding given → To be assembled again</p> <p>LC display Panel holder deformed → Replacement</p> <p>Rubber twisted or worn out → Replacement</p> <p>Dust or stains stuck → Clearing</p> <p>LC display Panel cracked → Replacement</p> <p>Dust or stains stuck → Clearing</p> <p>No fault detected through above checking → Replacement of LC display panel</p> <p>Correction impossible yet → Replacement of plate, complete</p>

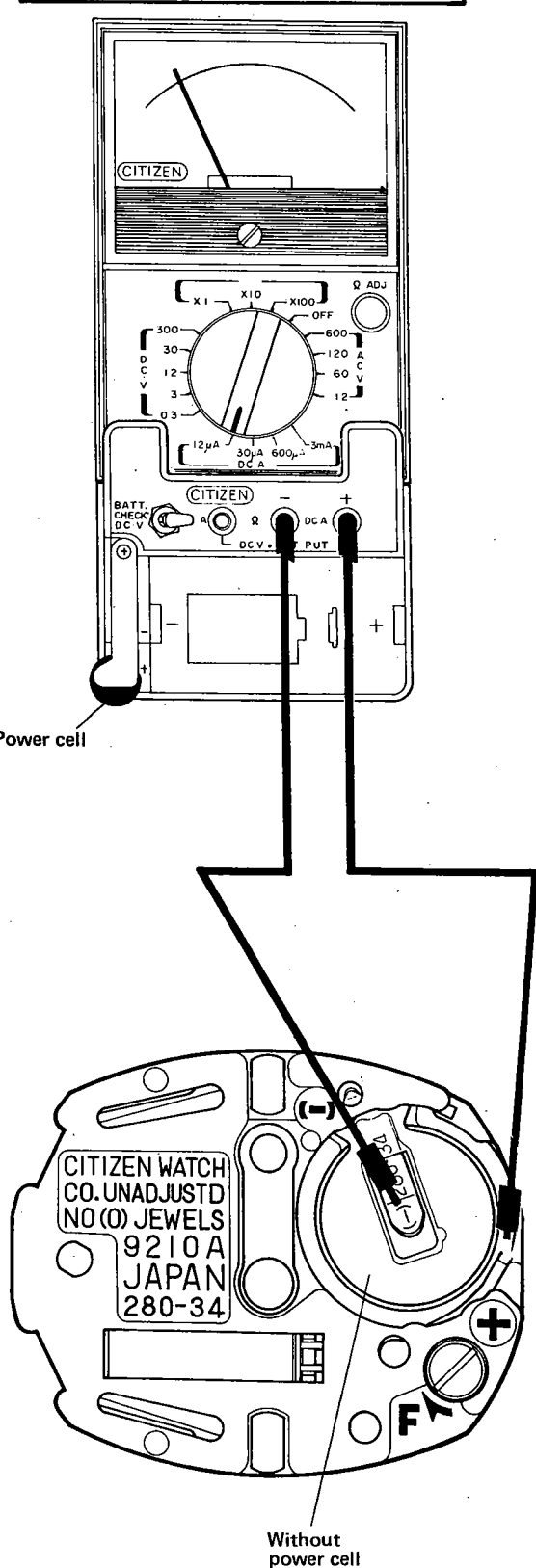
**Defective additional mechanisms – Display correction impossible**

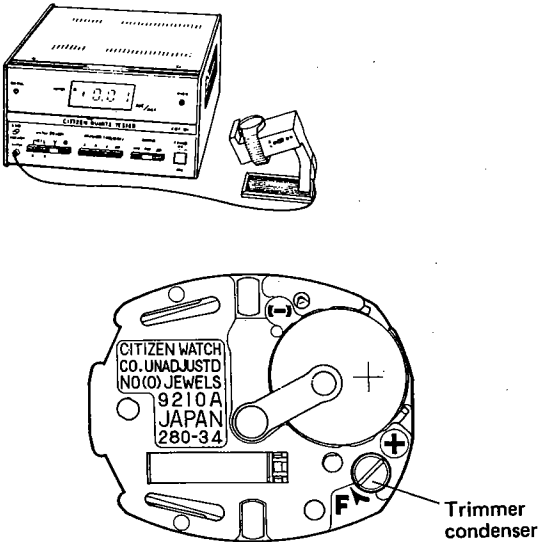
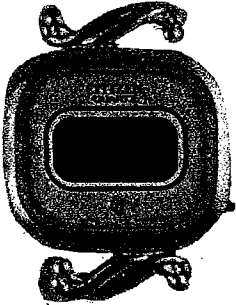
Checking items	How to check	Results and treatment
<p><b>5</b> Check of switch mechanism</p>	<p><b>1. The movement is taken out of the watchcase.</b></p> <p>The each switch part is pushed with tweezers as illustrated left to check whether the selection of correcting digits and the display correction are possible or not.</p>  <p><b>2. Check of push-buttons</b></p> <p>Each of the push-buttons is taken out of the watchcase.</p>  <ol style="list-style-type: none"> <li>(1) Check whether each push-button can be operated smoothly.</li> <li>(2) Check whether some dust or stains stick to the push-buttons as well as to the areas of the watchcase where the push-buttons are set.</li> <li>(3) Check whether the push-buttons have some bend.</li> </ol> <p>(The silicon oil is applied to the packing of each push-button.)</p> <p><b>3. Check of switch spring mechanism</b></p> <ol style="list-style-type: none"> <li>(1) Check whether each switch spring of the supporter for plate, complete unified with the device cover is deformed or broken.</li> </ol>  <p>Device cover</p>	<p>Nothing wrong with operation          → <b>2. Check of push-buttons</b></p> <p>Something wrong detected with operation          → <b>3. Check of switch spring mechanism</b></p> <p>Dust or stains stuck          → <b>Clearing</b></p> <p>Buttons deformed or broken          → <b>Replacement</b></p> <p>Switch spring deformed or broken          → <b>Replacement of device cover</b></p>

Checking items	How to check	Results and treatment
	<p>(2) Each switch spring is pushed with the tweezers with both the supporter for plate, complete (I) and the plate, complete incorporated into the device cover. Thus, whether or not a correct contact is secured to the pattern on the plate, complete.</p> 	<p>Nothing wrong          → Replacement of plate, complete</p>

Common checking items

Checking items	How to check	Results and treatment
<p>6 Measurement of power cell voltage</p>	 <p>The diagram illustrates the procedure for measuring the power cell voltage of a watch. A multimeter is shown with its dial set to the DC-V (Direct Current Voltage) mode, specifically the 3V scale. The watch movement is shown with the multimeter probes connected to the positive (+) and negative (-) terminals of the power cell. The watch movement is labeled with 'CITIZEN WATCH CO. UNADJUSTD NO.(O) JEWELS 9210A JAPAN 280-34'.</p>	<div style="border: 1px solid black; padding: 5px;"> <p><b>Over 1.5V</b></p> <p>→ ⑦ Measurement of power consumption</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>Under 1.5V</b></p> <p>→ ⑦ Measurement of power consumption after replacement of power cell</p> </div>

Checking items	How to check	Results and treatment
<p>7 Measurement of power consumption</p>	<p style="text-align: center;"><b>Power consumption: Under <math>3.0\mu A</math></b></p>  <p style="text-align: center;">Without power cell</p>	<p>1. Measurement under time display</p> <p style="text-align: center;"><b>Under <math>3.0\mu A</math></b></p> <p>→ ⑧ Time adjustment</p> <p style="text-align: center;"><b>Over <math>3.0\mu A</math></b></p> <p>→ 2. Measurement of power consumption at electronic circuit part</p> <p>2. Measurement of power consumption at electronic circuit with LC display panel removed</p> <p style="text-align: center;"><b>Under <math>2.0\mu A</math></b></p> <p>→ Replacement of LC display panel connection rubber or LC display panel</p> <p>*A careful inspection must be given to the dust or stains stuck to the contact areas</p> <p style="text-align: center;"><b>Over <math>2.0\mu A</math></b></p> <p>→ Replacement of plate, complete</p>

Checking items	How to check	Results and treatment
<p>8 Time adjustment</p>	<p>The time rate is measured using the timing machine to carry out time adjustment.</p>  <p>The top diagram shows a timing machine with a digital display showing '0.00'. The bottom diagram shows the back of a watch movement with a trimmer condenser labeled 'F' and a '+' sign. An arrow indicates the clockwise direction for adjustment. Text on the movement includes: 'CITIZEN WATCH CO. UNADJUSTED NO. (O) JEWELS 9210A JAPAN 280-34'.</p> <p>*The watch gains with clockwise turn of the trimmer condenser as indicated by the arrow direction.</p>	
<p>9 Check of appearance functions</p>	<p>The appearance functions are checked lastly when all the above inspections are over.</p> <ol style="list-style-type: none"> <li>1. Make sure nothing wrong is detected with the figures displayed.</li> <li>2. Make sure each operation is possible in a correct and smooth way.</li> <li>3. Make sure no dust nor stains attached to each function part, and others.</li> </ol>  <p>Ⓢ Select button (Selection of digits)</p> <p>Ⓡ Read/Set button (Digit correction Display switch)</p>	



**CITIZEN WATCH CO., LTD.**  
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