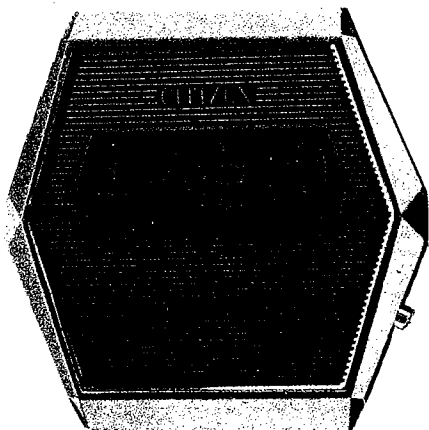


***TECHNICAL
INFORMATION***

CITIZEN QUARTZ

Cal.No.915※※

§ 1. OUTLINE



This is an ultra-slim type digital quartz crystal watch with LC display, which has been completed through Citizen's superb precision technique plus a long experience in the watch manufacture. In order to meet well the recent fashion-oriented requirements of the customers, it features a dressy and elegant design along with an extremely thin thickness.

§ 2. MAIN FEATURES

1 Ultra-slim type movement

The movement measures only 2.55mm thickness with 23.7mm diameter, thus being finished in 4.5mm appearance thickness to be finely fitted on the wrist.

2 High accuracy of ± 10 sec. per month

With adoption of a temperature compensation circuit in addition to a high-accuracy quartz crystal oscillator, the watch features a high accuracy of ± 10 sec. per month in the normal temperature.

3 Automatic calendar setting system

The calendar can be set automatically at the end of each month and year including the leap year.

4 Power cell life indicating device

The colons on the time screen will start to flash when the power cell requires replacement.

5 Easy disassembly and assembly

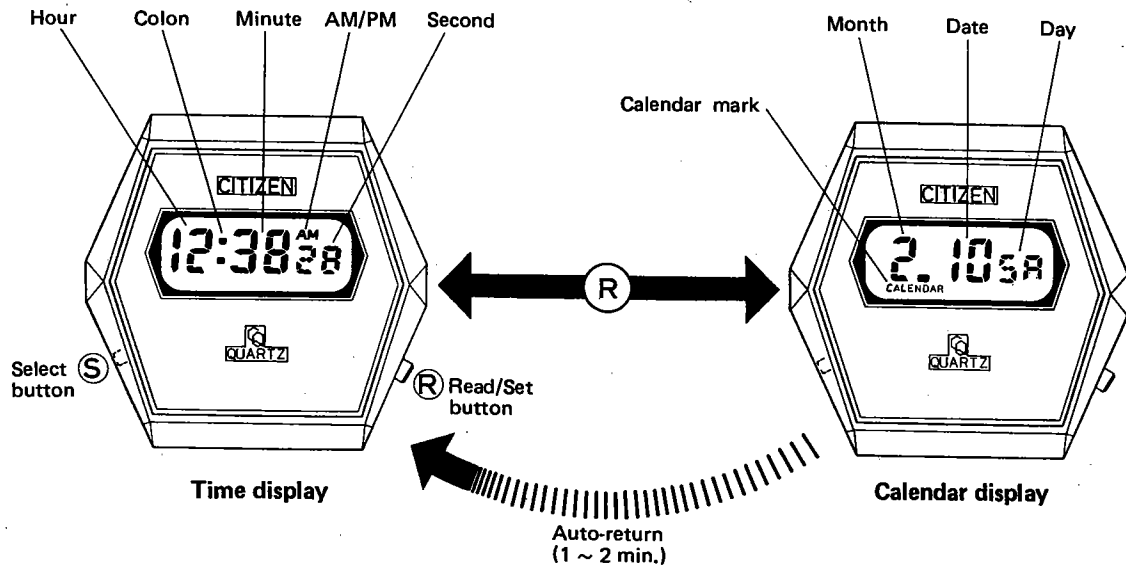
The number of the component parts is reduced with an extremely thin movement. Thus, the disassembly and assembly of the movement are facilitated greatly.

§3. SPECIFICATIONS

Caliber No.	9150A
Movement	Diameter: 23.7mm ϕ Thickness: 2.55mm
Oscillation	32,768Hz
Accuracy	± 10 sec./month in normal temperature
Display system	FE twist-type nematic LC display
Display information*	<ul style="list-style-type: none"> ●Normal time display "Hour", "minute", "second" and "AM/PM" ●Calendar display "Month", "date" and "day" ●The "year" is also displayed when the display is corrected.
Effective temperature range	0°C (32°F) ~ +60°C (140°F)
Integrated circuit	C/MOS-LSI (1 unit)
Additional mechanisms	<ul style="list-style-type: none"> ●Automatic calendar setting system ●Power cell life indicating device ●Auto-return system
Power cell	<p>Small-size silver oxide power cell (Unit of power cell)</p> <p>Parts No.: 280-29</p> <p>Voltage: 1.5V</p> <p>Capacity: 18mAH</p> <p>Life: 1 year</p>

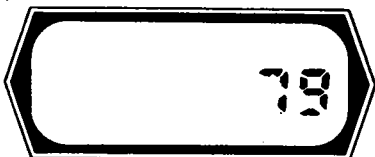
§4. HANDLING INSTRUCTIONS

1. Push-buttons and time/calendar display information



With push of (R) button, the time display and the calendar display switch alternately. The calendar display returns to the time display automatically in 1 ~ 2 minutes.

The year display information.



In addition to the above described display information, the "year" is also displayed in the last two digits. The year display can be set from "70" (1970) through "09" (2009) years.

2. How to set time and calendar



Second setting



Minute setting



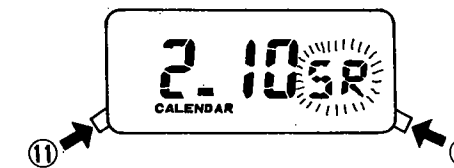
Hour setting



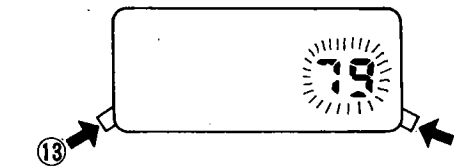
Month setting



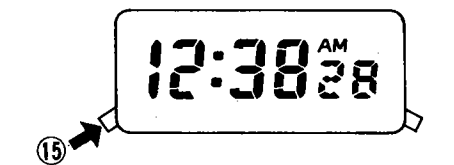
Date setting



Day setting



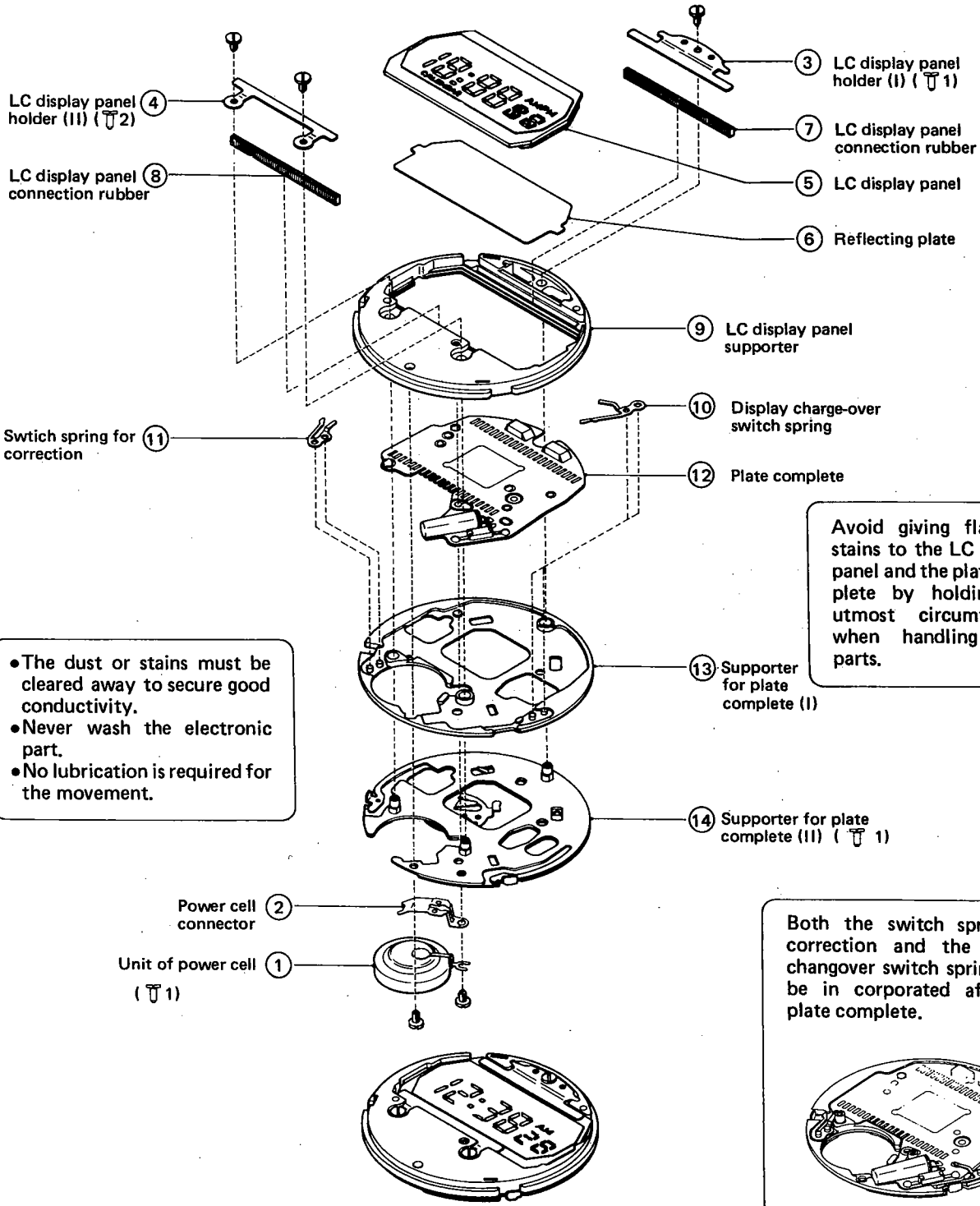
Year setting



- ① With push of **(S)** button, the "second" starts flashing to be set.
- ② With push of **(R)** button, the "second" reset to zero to start immediately. (One minute is carried while the second shows 30~59.)
- ③ With push of **(S)** button after setting the "second", the "minute" starts flashing to be set.
- ④ The "minute" advances one by one with every push of **(R)** button, so the "minute" can be set correctly.
- ⑤ The "hour" plus "AM/PM" start flashing.
- ⑥ The "hour" and "AM/PM" can be set. Make sure the "AM" or "PM".
- ⑦ The "month" starts flashing.
- ⑧ The "month" can be set.
- ⑨ The "date" starts flashing.
- ⑩ The "date" can be set.
- ⑪ The "day" starts flashing.
- ⑫ The "day" can be set.
- ⑬ The "year" starts flashing.
- ⑭ The "year" can be set. (The year can be set in a cycle of 70 (1970) ~ 09 (2009) years.)
- ⑮ The time screen returns to the normal time display.

§ 5. DISASSEMBLY/ASSEMBLY OF MOVEMENT

Disassembling procedure: ① ~ ①
 Assembling procedure: ⑭ ~ ⑭
 The number of screw necessary for parts is shown by the symbol like (T 1).



- The dust or stains must be cleared away to secure good conductivity.
- Never wash the electronic part.
- No lubrication is required for the movement.

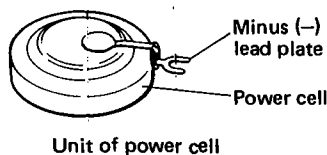
Avoid giving flaws or stains to the LC display panel and the plate complete by holding the utmost circumference when handling these parts.

Both the switch spring for correction and the display changover switch spring must be incorporated after the plate complete.

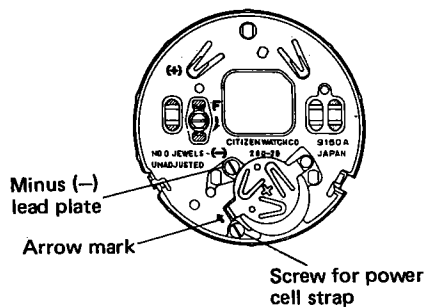
Notes:

1 How to replace power cell

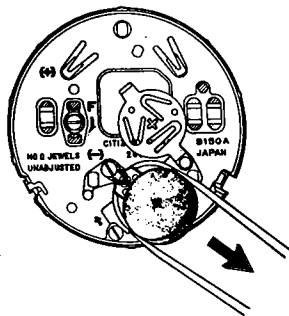
This watch uses a unit of power cell which is formed by welding a minus (-) lead plate to the conventional small-size silver oxide power cell (Fig. 1). The power cell is replaced in the following sequence.



(Fig. 1)



(Fig. 2)



(Fig. 3)

① The screws for the power cell strap and the minus (-) lead plate are unfastened.

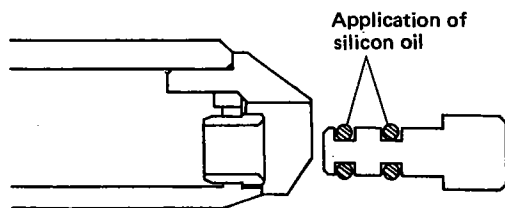
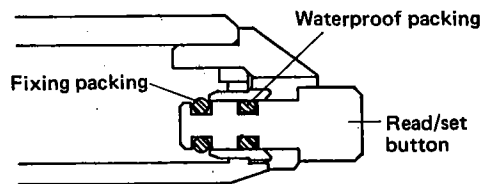
② The power cell strap is turned toward the arrow mark until the place indicated in Fig. 2. Then the power cell strap is lifted up to be released as shown in Fig. 3. The one side of the power cell strap cannot be removed.

③ The unit of power cell is removed. In this case, the detachment must be confirmed between the minus (-) lead plate and its screw because the lead plate is put under the screw (Fig. 3).

④ A new unit of power cell is put into the movement just in the opposite sequence to that for the removal of the unit of power cell.

Be careful not to cause the short circuit between the minus (-) lead plate and the supporter for plate complete (II) (+) when replacing the unit of power cell.

2 Handling of push-buttons (Double-packing system)



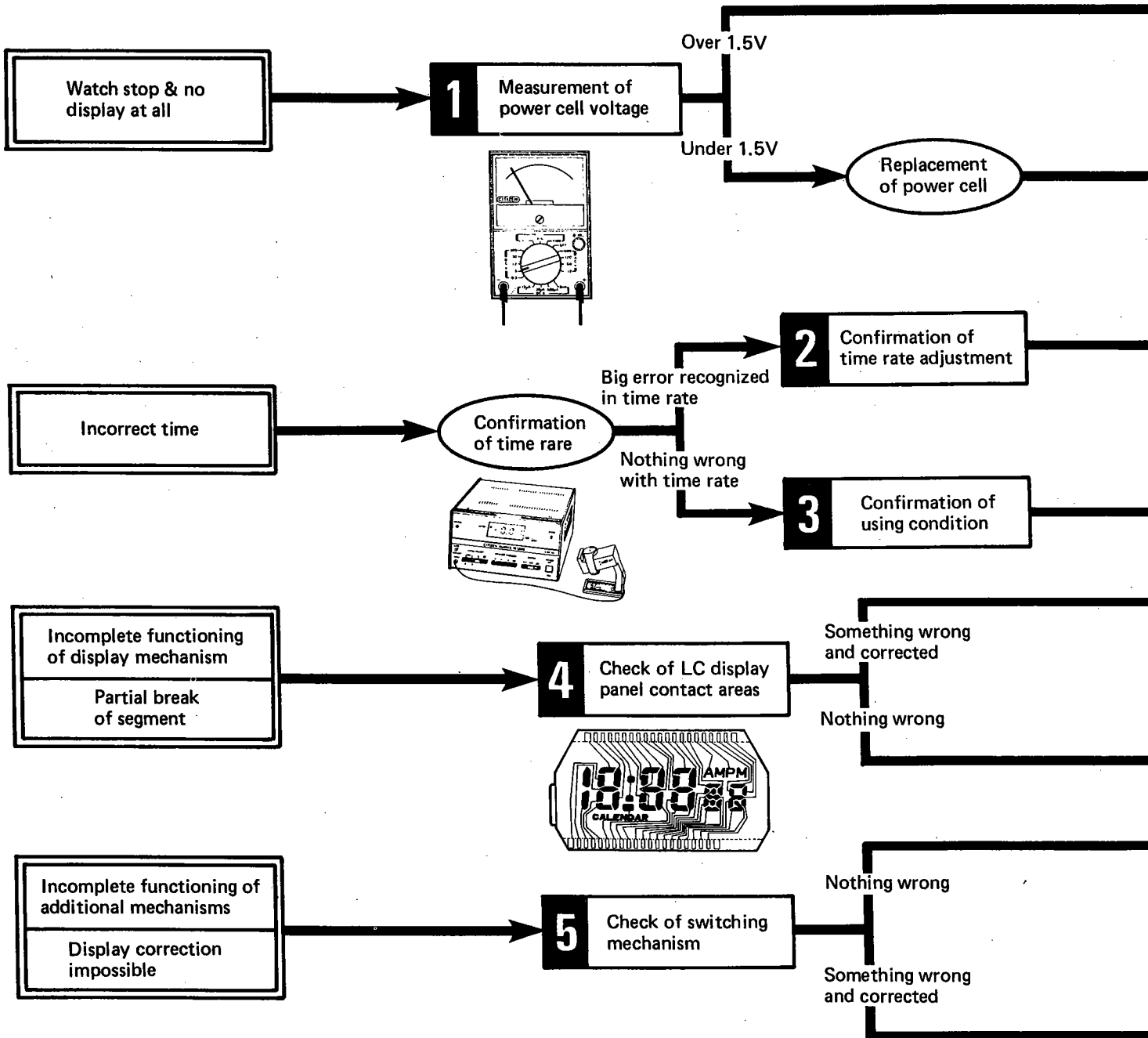
This watch applies the double-packing system for the read/set button in order to fix the push-button.

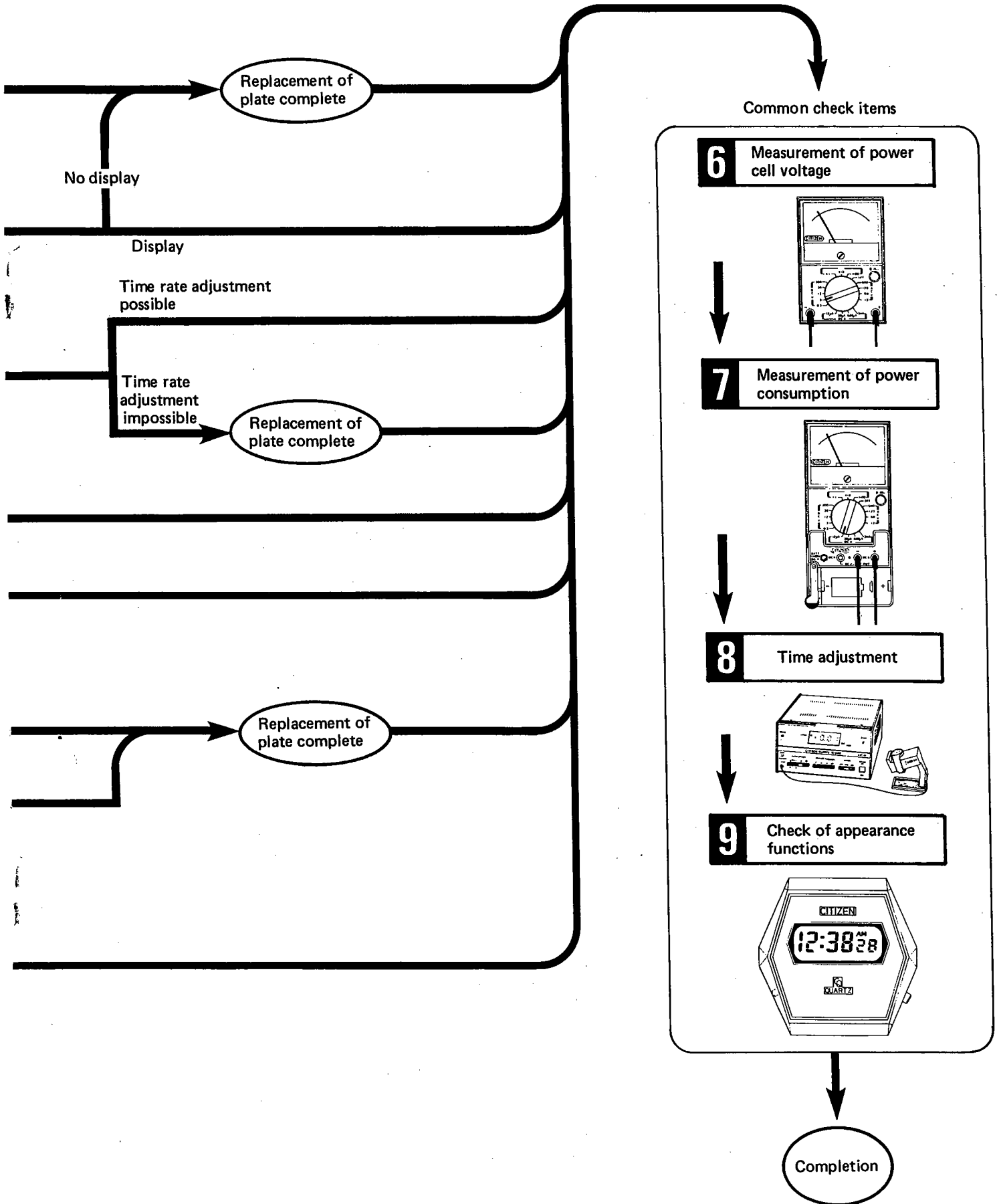
In addition to the conventional waterproof packing, another piece of packing is used in place of the snap ring which fixes the push-button.

When removing the push-button, the packing inside the case must be removed beforehand using a tweezers or the like.

The push-button is incorporated into the case after attaching the packing to the push-button. In this case, never fail to apply the silicon oil to the packings.

§6. TROUBLESHOOTING AND ADJUSTMENT

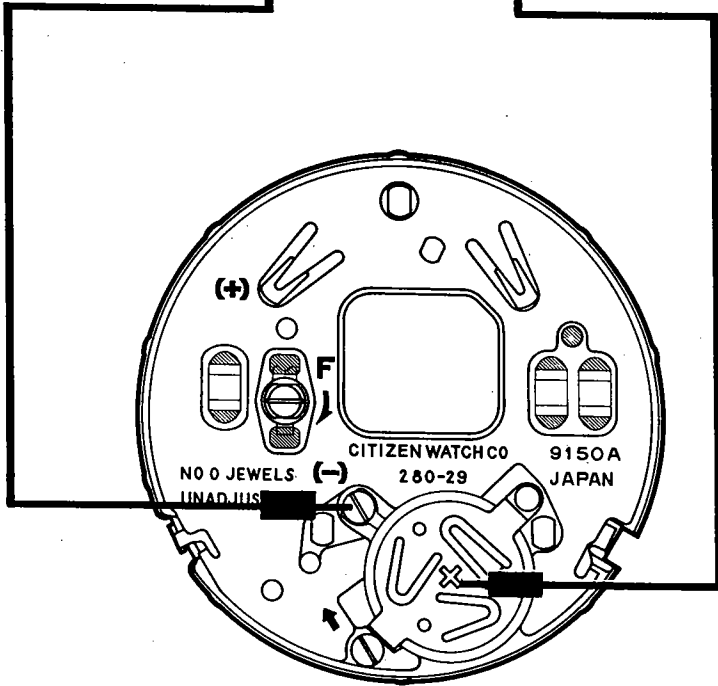
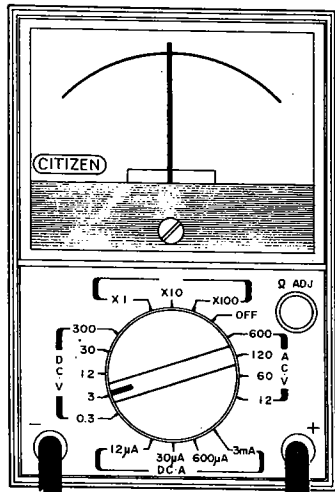




Watch stop — No display at all

- 1 Measurement of power cell voltage

Power cell voltage: Over 1.5V



Result and Treatment

Over 1.5V

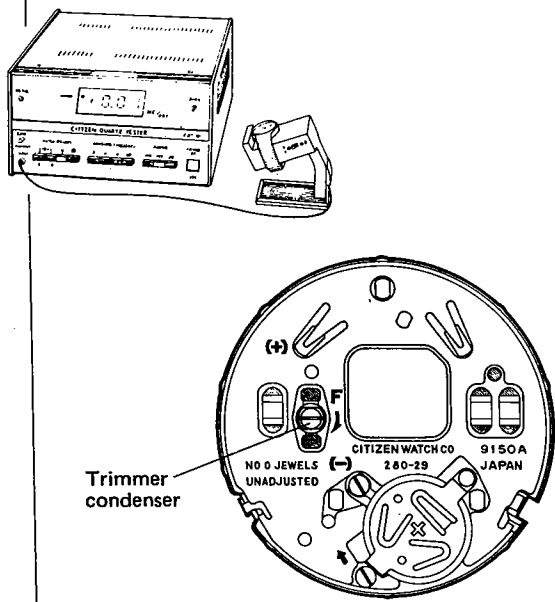
- Display of LC display panel
→ 7 Measurement of power consumption
- No display of LC display panel
→ Replacement of plate complete

Under 1.5V

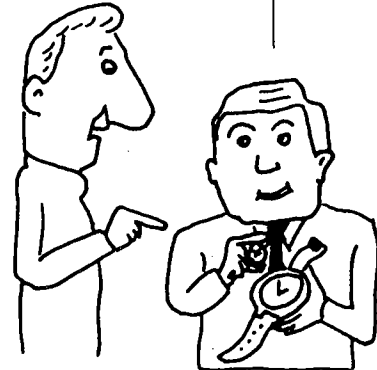
- After replacement of power cell:
- Display of LC display panel
→ 7 Measurement of power consumption
 - No display of LC display panel
→ Replacement of plate complete

If the watch has been used more than one year, the power cell must be replaced with new one even though it shows more than 1.5V output.

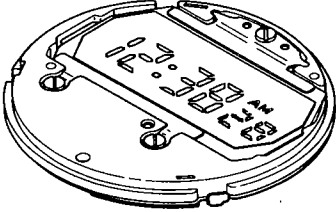
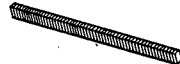
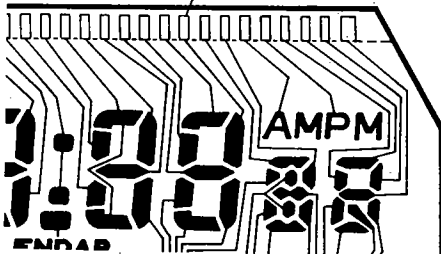
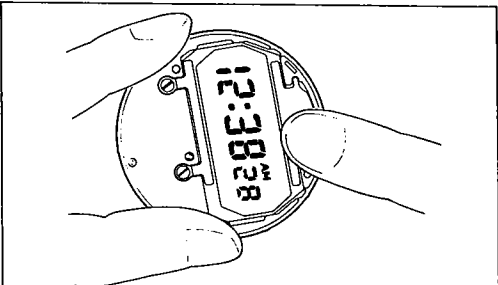
Big error recognized in time rate

Check items	How to check	Results	Treatment
<p>2 Confirmation of time rate adjustment</p>	<p>In case a big error is recognized in the time rate, the trimmer condenser is turned to adjust the time.</p>  <p>The time gains when the trimmer condenser is turned in the arrow direction (↘).</p> <p>If the time adjustment is impossible with turning of the trimmer condenser, the quartz crystal oscillator may have some fault. And when the time rate has no change at all, the trimmer condenser may be faulty.</p>	<p>Time adjustment possible →</p> <p>Time adjustment impossible →</p>	<p>Common check items</p> <p>Replacement of plate complete</p>

Nothing wrong in time rate

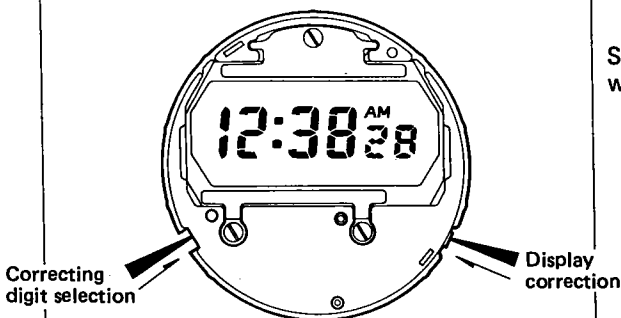
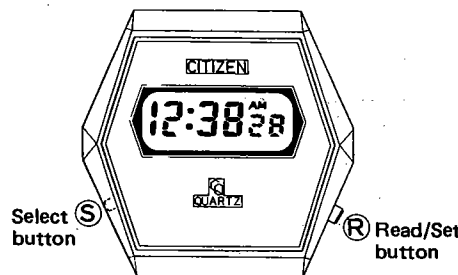
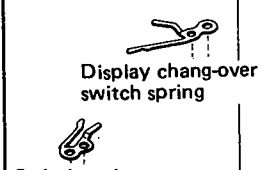
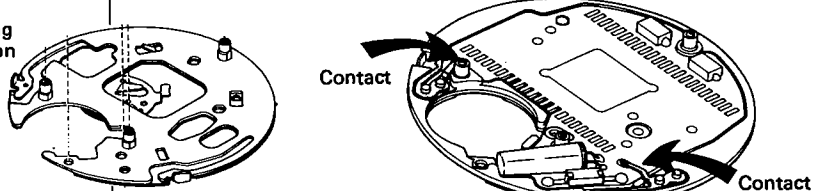
Check items	How to check	Results	Treatment
<p>3 Confirmation of using condition</p>	<p>How the watch has been used must be confirmed to the user.</p> <ol style="list-style-type: none"> 1) Did the user make any mistake in handling the watch? 2) Did he use the watch in an extreme change of the temperature, i.e., outside the effective temperature change? 3) How many days have passed since the time was adjusted last? 4) And other factors. 		

Incomplete functioning of display mechanism — Partial break of segment

Check items	How to check	Results	Treatment
<p>4 Check of LC display panel contact areas</p>	<p>The partial break of the segment may be caused first by a poor contact between the LC display panel and the electronic circuit and secondly by some fault within the electronic circuit. In this connection, the following checks are given.</p> <p>1. Check of screws for LC display panel</p> <ol style="list-style-type: none"> 1) Check whether the screw for the LC display panel is broken or loose. 2) Check whether the LC display panel holder (I) or (III) is holding the LC display panel evenly.  <p>2. Check of the LC display panel contact rubber</p> <ol style="list-style-type: none"> 1) Check whether the contact rubber is twisted. 2) Check whether the contact rubber is worn or stretched. 3) Check whether some dust or stains stick to the contact rubber.  <p>3. Check carefully whether the electrode part of the LC display panel has any crack as well as any dust or stains stuck. At the same time, give a meticulous inspection to the segment-broken electrode part.</p> <p>Electrode part</p>  <p>Check point: The segment-broken area is pushed softly with a finger as shown in the diagram below. If the broken segment is displayed, it is known that the contact is unsteady.</p> 	<p>Screw broken → Replacement</p> <p>Screw loosened → Retightening</p> <p>Panel held unevenly → Reassembly</p> <p>Deformation of panel holder → Replacement</p> <p>Rubber worn or stretched → Replacement</p> <p>Dust or stains stuck → Clearing</p> <p>Dust or stains stuck → Clearing</p> <p>Electrode part cracked → Replacement of LC display panel</p> <p>Nothing wrong with above checks → Replacement of LC display panel</p> <p>Correction impossible yet → Check of plate complete</p>	

(Note) Never press the LC display panel strongly to avoid the glass cracking.

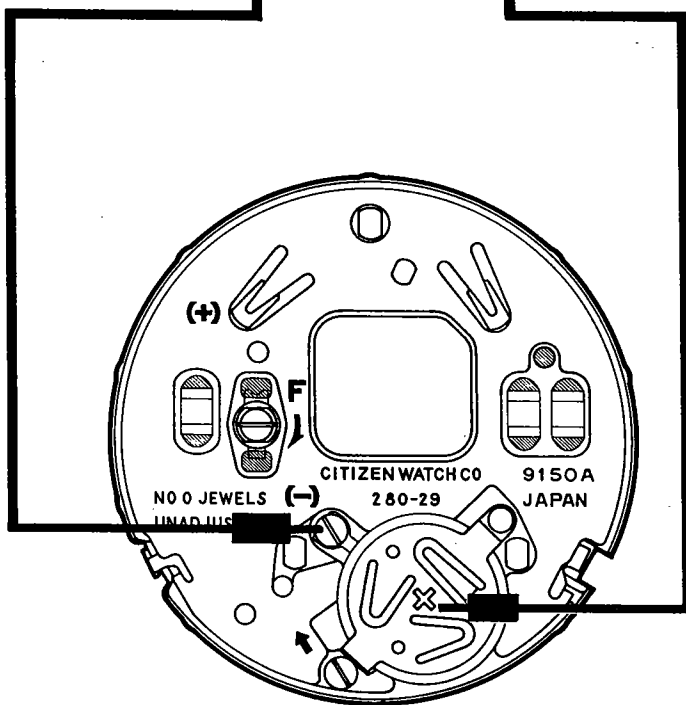
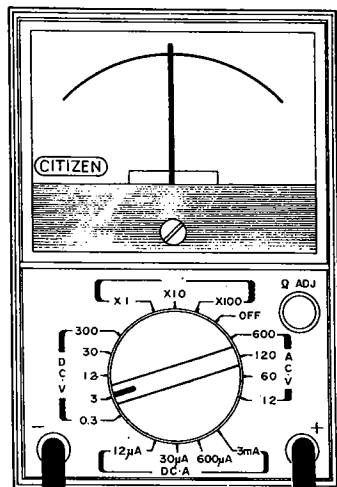
Incomplete functioning of additional mechanisms – Display correction impossible

Check items	How to check	Results	Treatment
<p>5 Check of switching mechanism</p>	<p>1. The movement is taken out of the watchcase. Press each switch part with a tweezers as shown in the diagram to check whether the correcting digit selection and the display correction are possible.</p>  <p>2. Check of push-buttons Each push-button is taken out of the watchcase. 1) Check whether the push-button has some bend. 2) Check whether any dust or stains stick to the push-button or the case after removal of push-buttons. 3) Check whether the push-buttons can be operated smoothly after they are set to the watchcase. (Apply the silicon oil to the packing of each push-button.)</p>  <p>•Never fail to clear away the dust or stains stuck to the push-buttons even in case the troubleshooting is given to other areas.</p> <p>3. Check of switch springs 1) Check whether the spring of the supporter for plate complete (II) corresponding to each push-button is deformed or broken or has a correct contact with each switch spring. 2) Check whether each switch spring is deformed or broken or has a correct contact with the pattern of the plate complete.</p>  	<p>Nothing wrong with operation →</p> <p>Something wrong with operation →</p> <p>Button deformed or broken →</p> <p>Dust or stains stuck →</p> <p>Spring deformed or broken →</p> <p>Nothing wrong →</p>	<p>2. Check of push-buttons</p> <p>3. Check of switch springs</p> <p>Replacement</p> <p>Clearing</p> <p>Replacement</p> <p>Replacement of plate, complete</p>

Common check items

6 Measurement of power cell voltage

Power cell voltage: Over 1.5V



Result and Treatment

Over 1.5V

→ 7 Measurement of power consumption

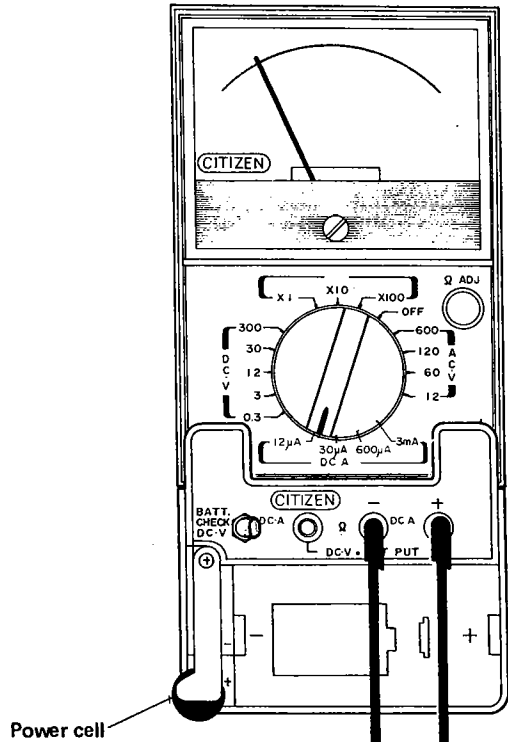
Under 1.5V

After replacement of power cell:
→ 7 Measurement of power consumption

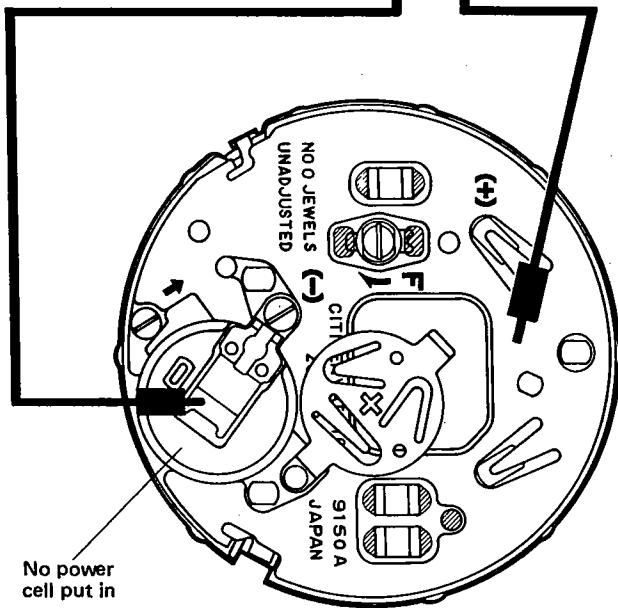
If the watch has been used more than one year, the power cell must be replaced with new one even through it shows more than 1.5V output.

7 Measurement of power consumption

Power consumption: Under $3.0\mu\text{A}$



Power cell



No power cell put in

Result and Treatment

1. Measurement under normal time display state

Under $3.0\mu\text{A}$

→ [8] Time adjustment

Over $3.0\mu\text{A}$

- 2. Measurement of power consumption at electronic circuit part

2. Measurement of power consumption at electronic circuit part with LC display panel removed

Under $2.0\mu\text{A}$

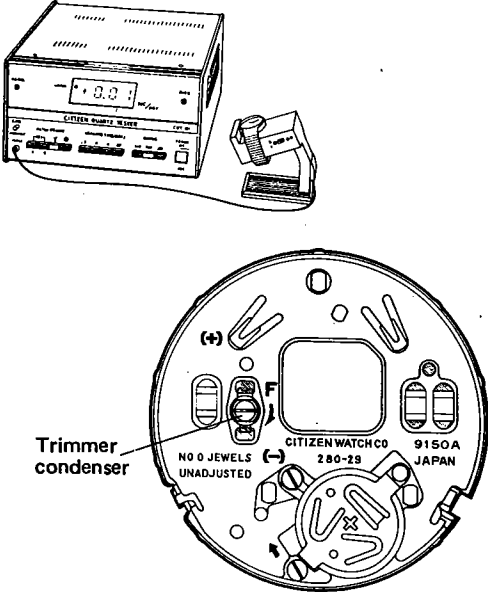
→ Replacement of LC display panel connection rubber or LC display panel (Dust or stains must be removed from conduction areas.)


Over $2.0\mu\text{A}$

→ Replacement of plate, complete

Note

Never fail to put a power cell of over 1.5V output into the power cell holder of the adaptor.

Check items	How to check	Results	Treatment
<p>8 Time adjustment</p>	<p>The time rate is measured using a timing machine to perform the time adjustment. The time rate can be adjusted by turning the screw of the trimmer condenser.</p>  <p>The timing machine is a digital device with a display showing '0.01'. The watch back view shows the trimmer condenser with an arrow indicating the adjustment direction. Text on the back includes 'NO 0 JEWELS UNADJUSTED', 'CITIZEN WATCH CO 280-28', and '9150A JAPAN'.</p> <p>The time gains when the trimmer condenser is turned in the arrow direction. ()</p>		

Check items	How to check	Results	Treatment
<p>9 Check of appearance functions</p>	<p>Finally, the following points are checked.</p> <ol style="list-style-type: none"> 1. The displayed figures have nothing wrong at all. 2. Each operation is carried out in a correct and smooth way. 3. No dust nor stains are stuck to each functioning part. 4. And others.  <p>The image shows a Citizen Quartz watch with a digital display showing '12:38 AM' and '28'.</p>		

CITIZEN WATCH CO., LTD.
Tokyo, Japan