# *TECHNICAL INFORMATION*

## CITIZEN QUARTZ

## Cal.No.79※※※

CITIZEN

## §1. OUTLINE

(Except Cal. 7900※ )


The Cal. Nos 7930E (center second) and 7920E (excluding center second) are full-dress and high-ranking quartz crystal watches of analog type for gentlemen's use.
It features the highest level both in the function and the design as well as an ultra-slim structure of the movement.

## §2. MAIN FEATURES

1) **High-class and ultra-slim type analog quartz crystal watch for gentlemen**
The movement measures only 1.95mm thick, and the total thickness including the power cell is just 2.5mm.

2) **High accuracy produced by an ultra small-size quartz crystal oscillator**
A high accuracy of ±5 seconds per month (in normal temperatures) is ensured thanks to the high and stabilized oscillations produced by an ultra small-size quartz crystal oscillator plus the temperature compensation circuit.

3) **High-output step motor**
The step motor, manufactured through a new process, is small in size yet high in output of power.

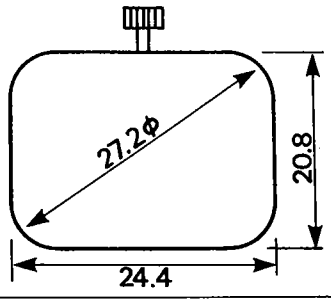
4) **About 2 years of power cell life**
A high-accuracy timekeeping is ensured about 2 years by just one unit of the small-size silver oxide power cell. This is possible thanks to the low power consumption of the electronic circuit and a high conversion efficiency of an excellent step motor.

5) **Power conservation switch**
When the crown is pulled out to the time-setting position, the reset switch functions to cut off the current supply to the converter although the quartz crystal oscillator keeps actuation. As a result, the amount of power consumption can be reduced down to a half or less.

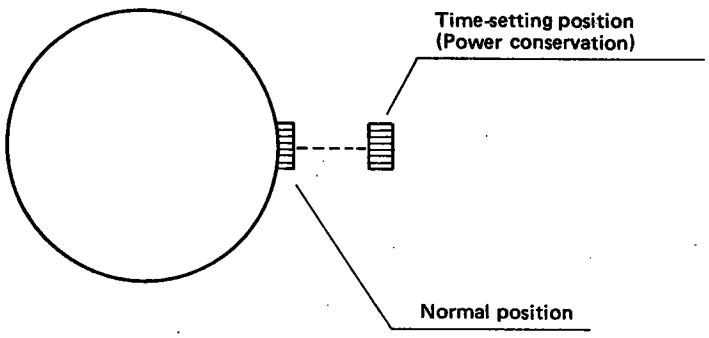
6) **Power cell life indicating device (only for 7930E)**
When the life of the power cell comes near its end, the normal 1-second step movement of the second hand changes to the 2-second step movement indicating the replacement of the power cell. In this case, however, the time is still kept correctly.

7) **Second hand stopping device (only for 7930E)**
The second hand stops at an optional position when the crown is set at the time-setting position, thus the correct time being set down to a second.

## §3. SPECIFICATIONS

| | |
|---|---|
| Caliber No. | 7920E/7930E (7 jewels) |
| Type | Analog-type quartz crystal watch: 7930E (center second); 7920E (excluding center second) |
| Movement | Size: 24.4 x 20.8 x 27.2ϕmm<br>Thickness: 1.95mm<br>2.5mm<br>(including power cell)<br>  |
| Accuracy | ±5 sec./month (in normal temperatures) |
| Oscillation | 32,768 Hz |
| Effective temperature range | −10°C ~ +60°C (14°F ~ 140°F) |
| Integrated circuit | C/MOS-LSI (1 unit) |
| Converter | Bipolar step motor |
| Additional mechanisms | •Power conservation switch<br>•Power cell life indicating device (only for 7930E)<br>•Second hand stopping device (only for 7930E) |
| Power cell | Small-size silver oxide power cell (1 unit)<br>Parts No. : 280–27<br>Voltage : 1.5V<br>Capacity : 38mAH<br>Size : 11.6ϕ x 2.1mm<br>Life : About 2 years |

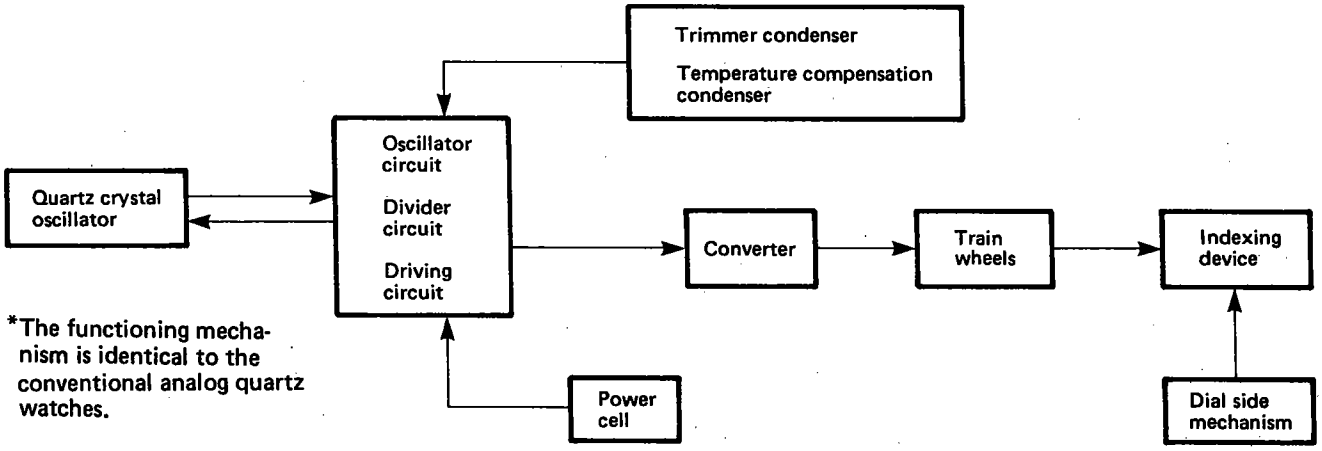
## §4. HANDLING INSTRUCTIONS



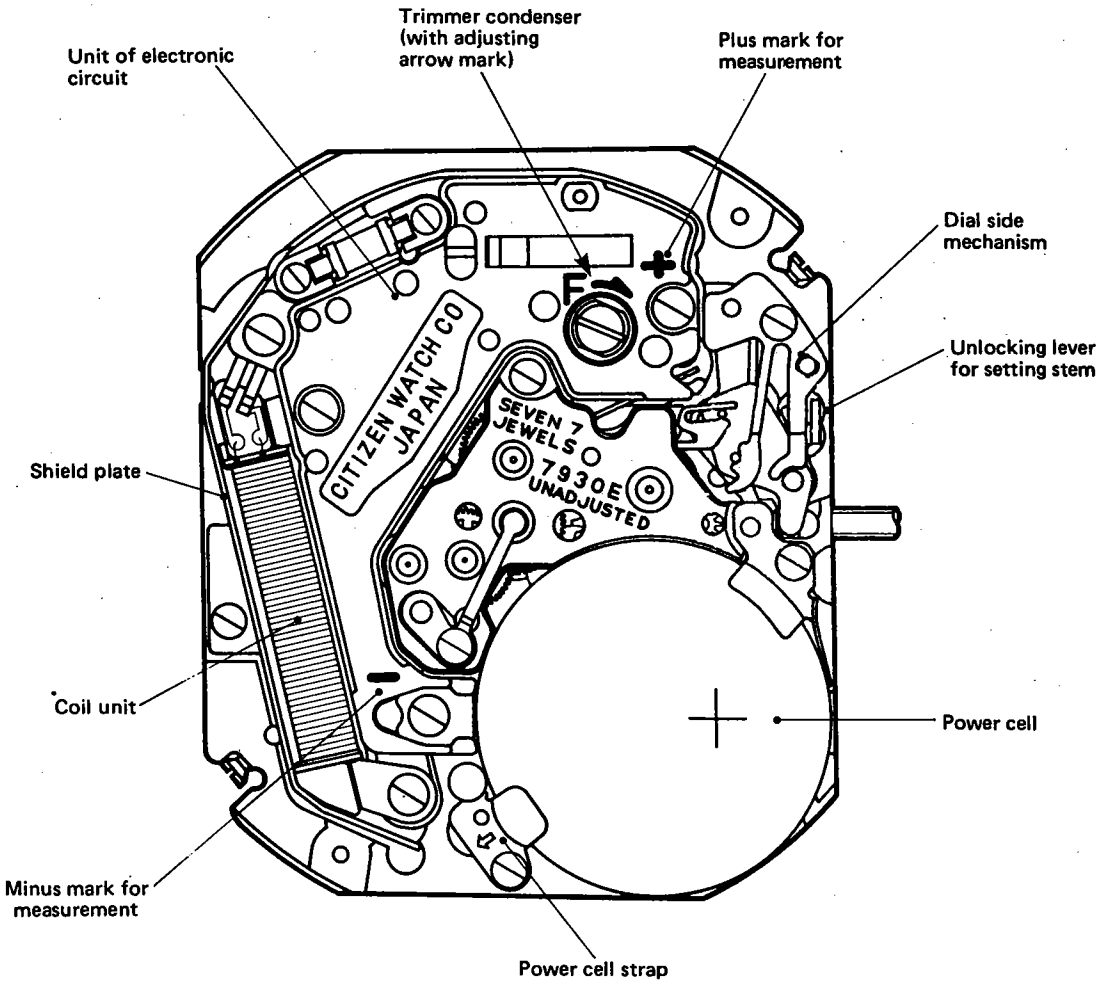

1) The handling method of these watches is just same as other analog-type quartz watches (center second or excluding center second).

2) The hands are set by pulling out the crown. In this position of the crown, the power conservation switch is also actuated.

## §5. STRUCTURE OF MOVEMENT




**(Block Diagram of Movement)**




**(Plan of Movement)**

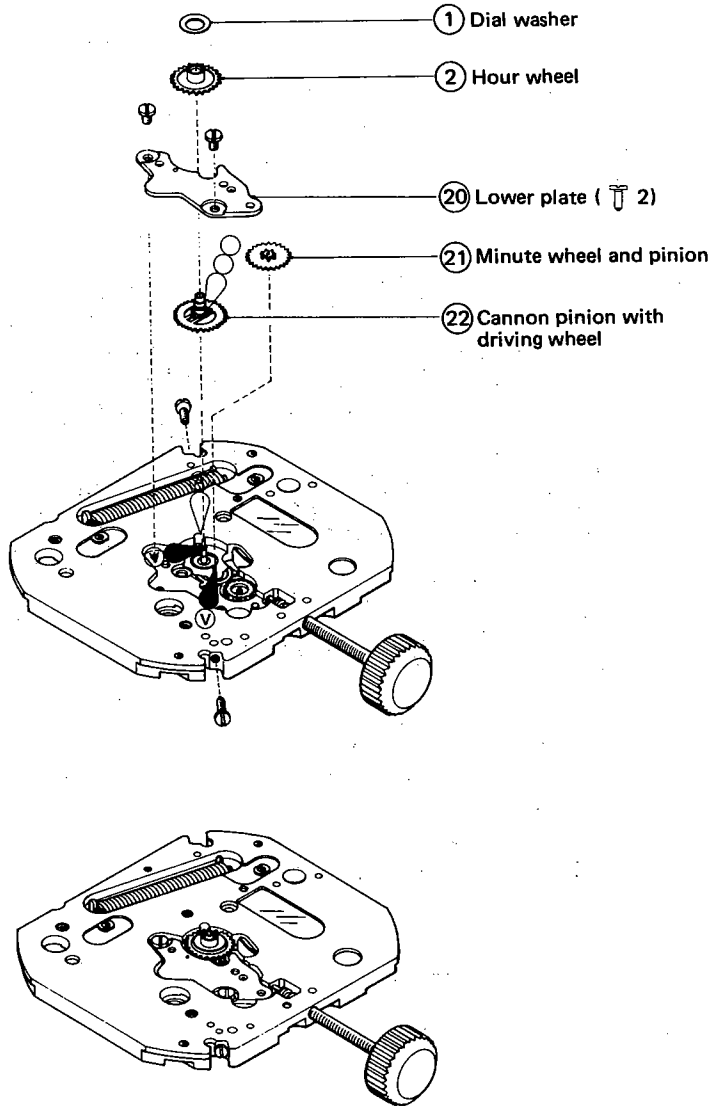
## §6. DISASSEMBLY AND ASSEMBLY OF MOVEMENT

### 1) Dial side

Disassembling sequence: ① ~ ㉘
Assembling sequence: ㉘ ~ ①
The number of the screw coming with the parts is shown by the symbol like ( T 1).

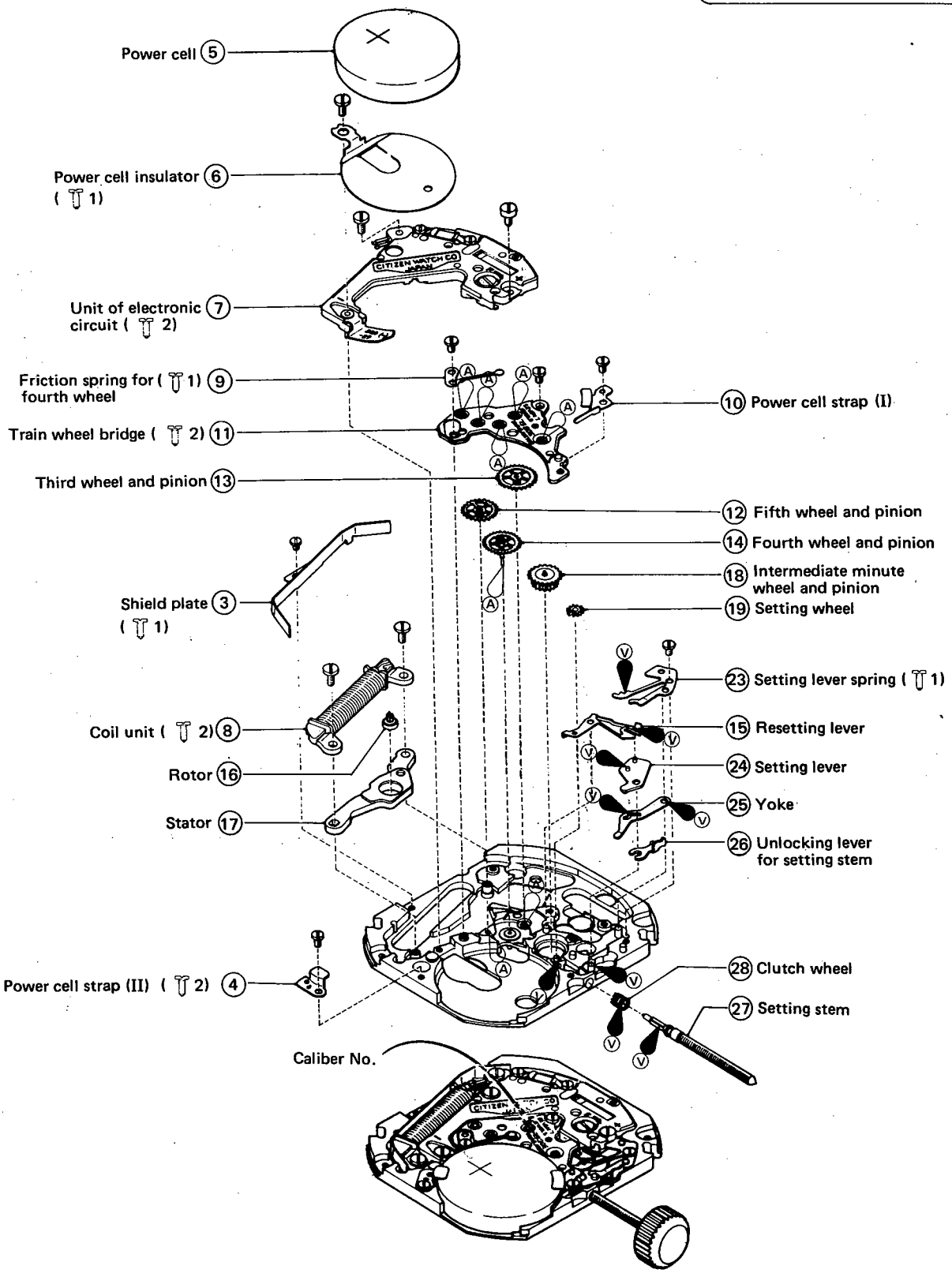
Lubrication mark:
- Ⓐ Synt-A-Lube oil
- Ⓥ Synt-V-Lube oil
- Citizen watch oil CH-1

**Note:**
Avoid washing the electronic parts. Clear away the dust and stains sticked to the parts to secure a good contact.



## 2) Power cell side

The power cell insulator is incorporated while being slided laterally after the notch part is fitted to the minus (−) lead plate.



## §7. TROUBLESHOOTING AND ADJUSTMENT

Watch stop

Confirmation of signal

Signal confirmed

No signal

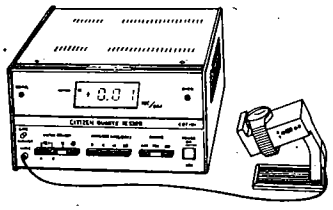
1 Measurement of power cell voltage

Over 1.5V

Under 1.5V (Replacement power cell)

No operation

Operation



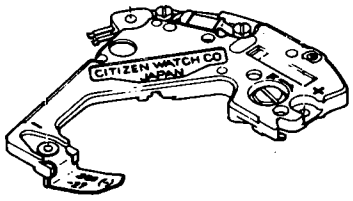
Incorrect time

Confirmation of time rate adjustment

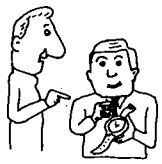
Confirmation of power cell voltage

Adjustment impossible

(Confirmation of unit of electronic circuit)




Adjustment possible

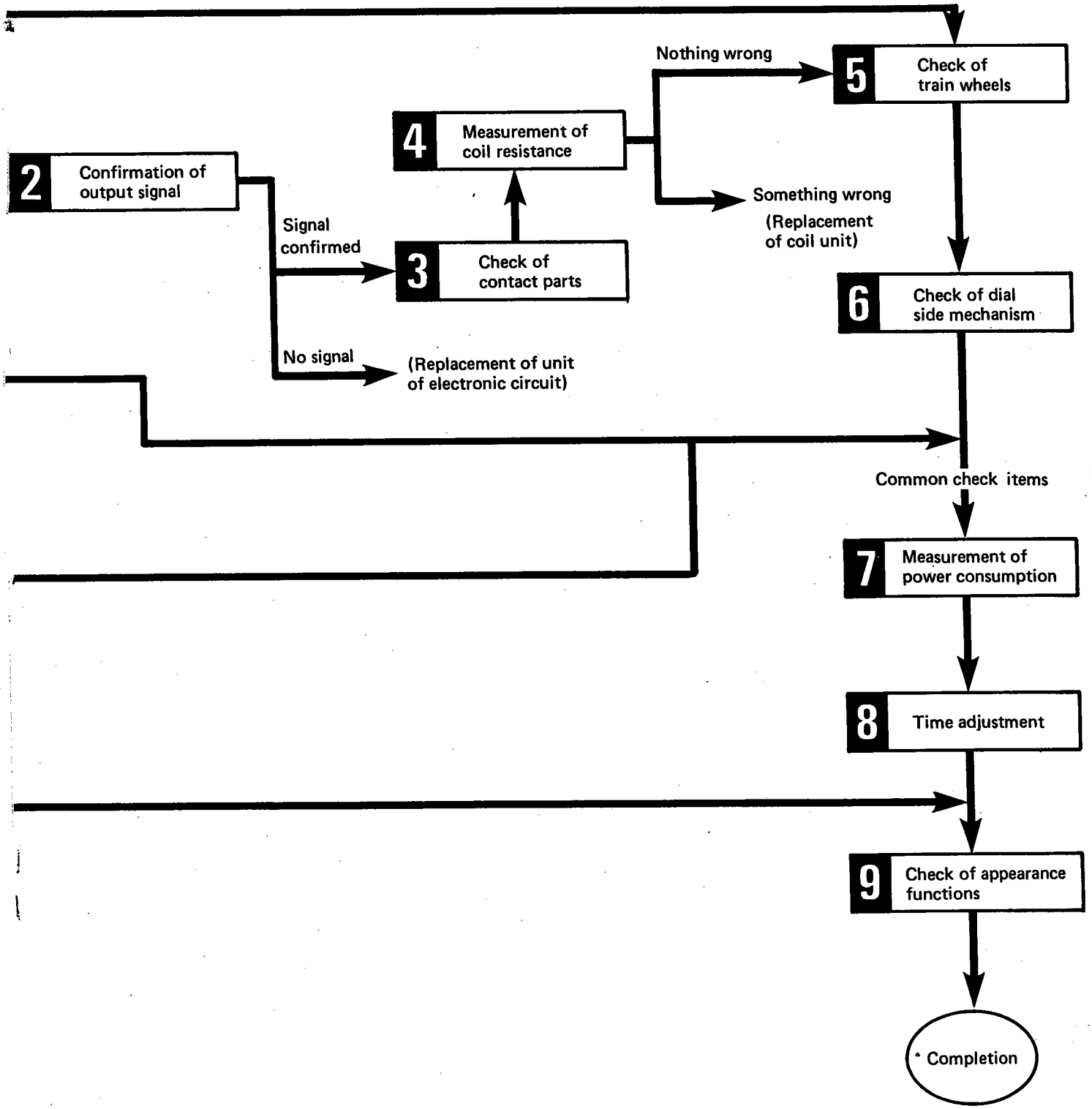


Nothing wrong with time rate

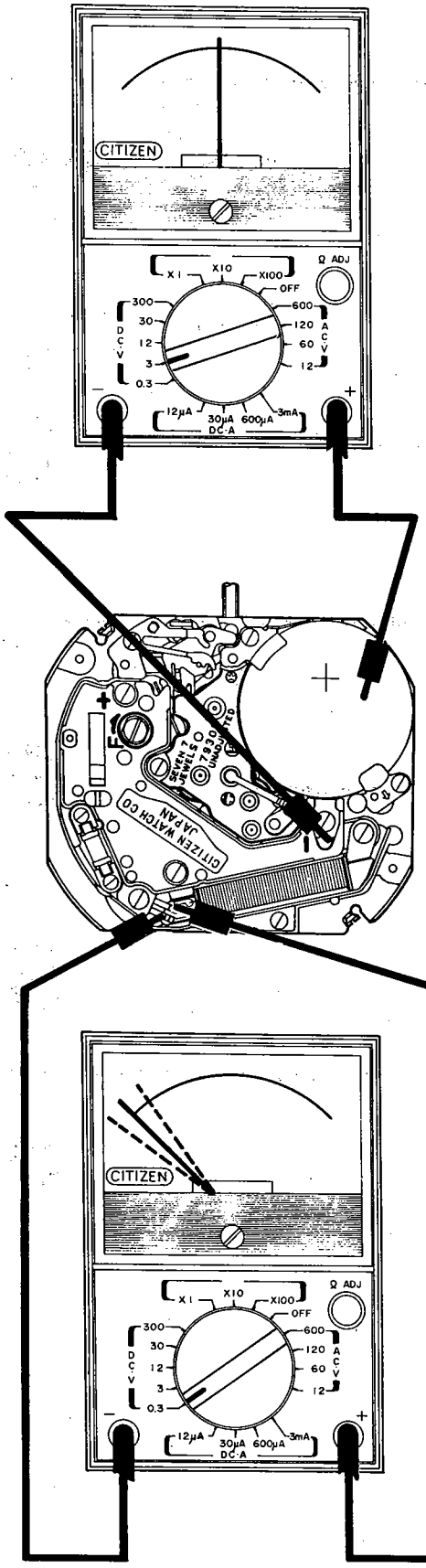
(Confirmation of hand-turning condition)

(Confirmation of using condition)

- Handling way
- Temperature care
- Impact care


2 Confirmation of output signal
Signal confirmed
No signal
(Replacement of unit of electronic circuit)
3 Check of contact parts
4 Measurement of coil resistance
Nothing wrong
Something wrong
(Replacement of coil unit)
5 Check of train wheels
6 Check of dial side mechanism
Common check items
7 Measurement of power consumption
8 Time adjustment
9 Check of appearance functions
Completion

**1** Measurement of power cell voltage




**Results and Treatment**

Over 1.5V

→ Nothing wrong

Under 1.5V

→ Replacement of power cell

**2** Confirmation of output signal

**Results and Treatment**

Confirmation of output signal with power cell incorporated:

Tester pointer goes and comes back every second.

→ Nothing wrong

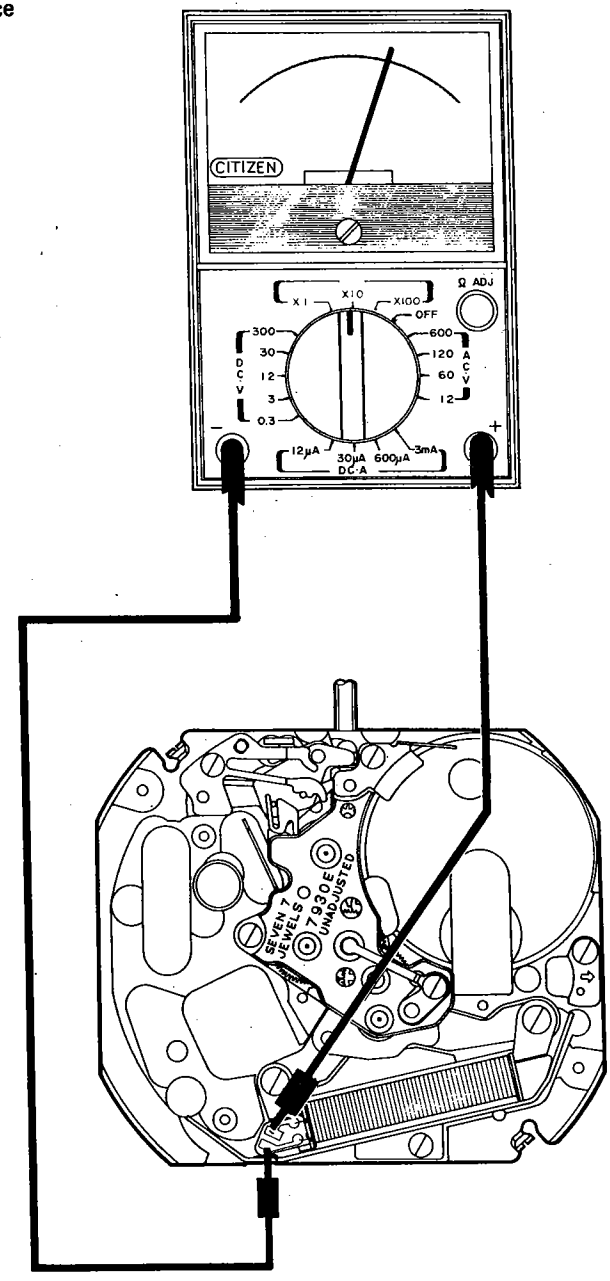
Something wrong recognized

→ Replacement of unit of electronic circuit

*The measurement becomes easy with the shield plate removed.

| Check items | How to check | Results | Treatment |
|---|---|---|---|
| 3 Check of contact parts | • Check whether any dust or stain stick to the contact between the coil terminal and the unit of electronic circuit.<br>• Check whether the screws are loose for the unit of electronic circuit. | Dust or stain sticked → | Clearing |
| | | Screws loosened → | Retightening |

**4** Measurement of coil resistance




**Results and Treatment**

**3.2 ~ 4.0KΩ**

→ Nothing wrong

Disconnection is conceivable in case measurements is ∞ Ω.

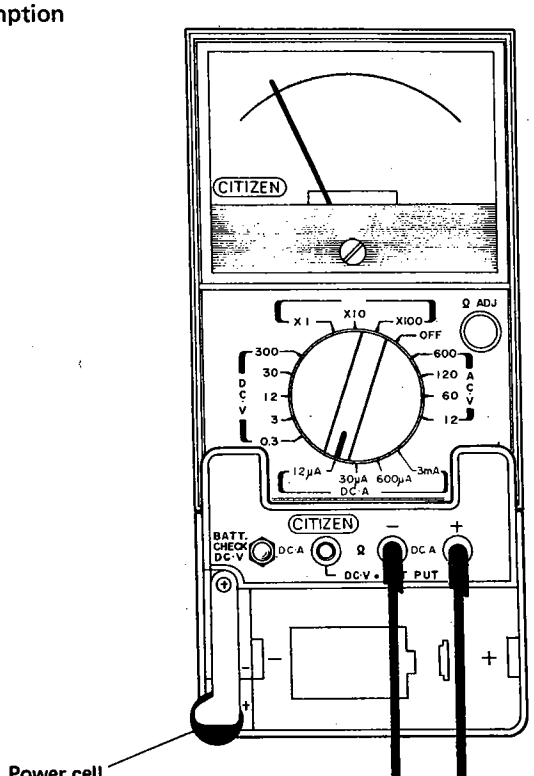
Short circuit is conceivable in case measurements is 0Ω.

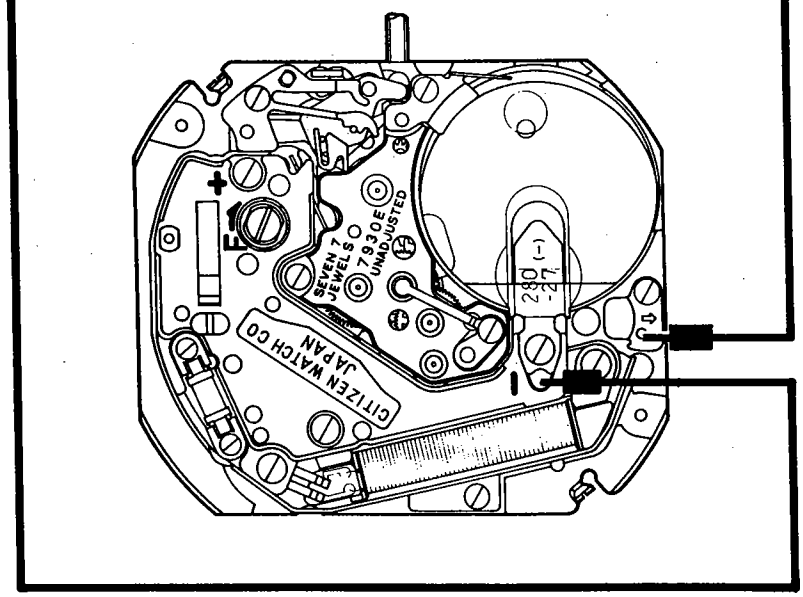
→ Replacement of coil unit in both cases

*When measuring the coil resistance, the unit of electronic circuit is removed and the tester terminals are applied as shown in the above diagram.

| Check items | How to check | Results | Treatment |
|---|---|---|---|
| 5 Check of train wheels | • Check whether the transmission is smooth or not with each wheel. (How about the play and creaking?)<br>• Check whether the amount of oil is appropriate.<br>• Check whether any dust or other foreign substances stick to wheels. | Creaking detected → | Replacement of wheel |
| | | Incorrect play → | make clearance |
| | | Dust and others sticked → | Clearing |
| 6 Check of dial side mechanism | • Check whether the cannon pinion with driving wheel has a proper slip. | Lack of oil → | Lubrication of CH-1 oil |
| | | Slip too strong → | Replacement of driving wheel |
| | | Slip too weak → | Replacement of driving wheel |

**7** Measurement of power consumption



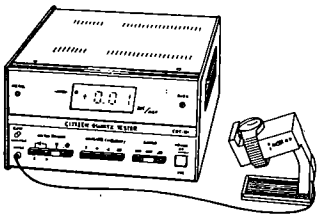
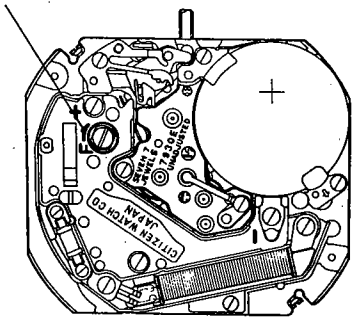

**Results and Treatment**

**Under 2.5μA**

→ Nothing wrong

Something wrong recognized

→ Replacement of unit of electronic circuit

| Check items | How to check | Results | Treatment |
|---|---|---|---|
| 8 Time adjustment | • The time rate is measured using a timing machine, and the time is adjusted by means of the trimmer condenser.<br>  <br>Trimmer condenser<br>(Clockwise turning: gain.)<br>  | | |
| 9 Check of appearance functions | • Check whether the second hand has an accurate step movement (only for 7930E).<br>• Make sure the minute hand moves after a little interval.<br>• Check whether any dust or other foreign substances stick to the movement or the dial.<br>• Check the additional mechanisms such as the second hand stopping device and others. | | |

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