TECHNICAL INFORMATION

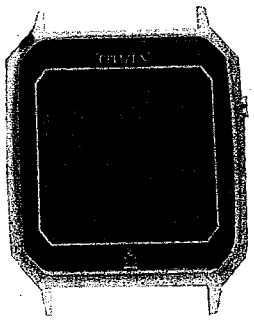
CITIZEN QUARTZ

Cal. No. 927※※

CITIZEN

CONTENTS

§1. OUTLINE



This is a digital quartz crystal watch for gentlemen, which has been developed based on a new conception of men's dandyism. It uses a wide cell for the display screen. With addition of this new caliber, a group of Citizen digital watches has been more enriched.

§2. FEATURES

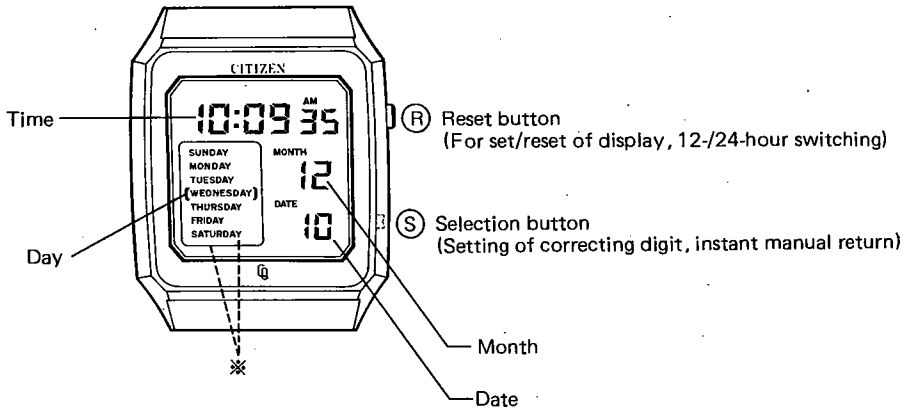
1) A large-size LC display panel (wide cell) with clear display.
No button operation is required unless the contents of display is corrected or set newly, with a constant display of the time and the calendar.

2) A clear-cut design with thin fringe design
A clear-cut design is possible not only by a neat display screen but the shortened stroke of the push-buttons.

3) No screw is used at all owing to the structure of module applying a hook-type.

4) The power cell has a lifetime of about 3 years with a thin-gage measurements.

§3. SPECIFICATIONS

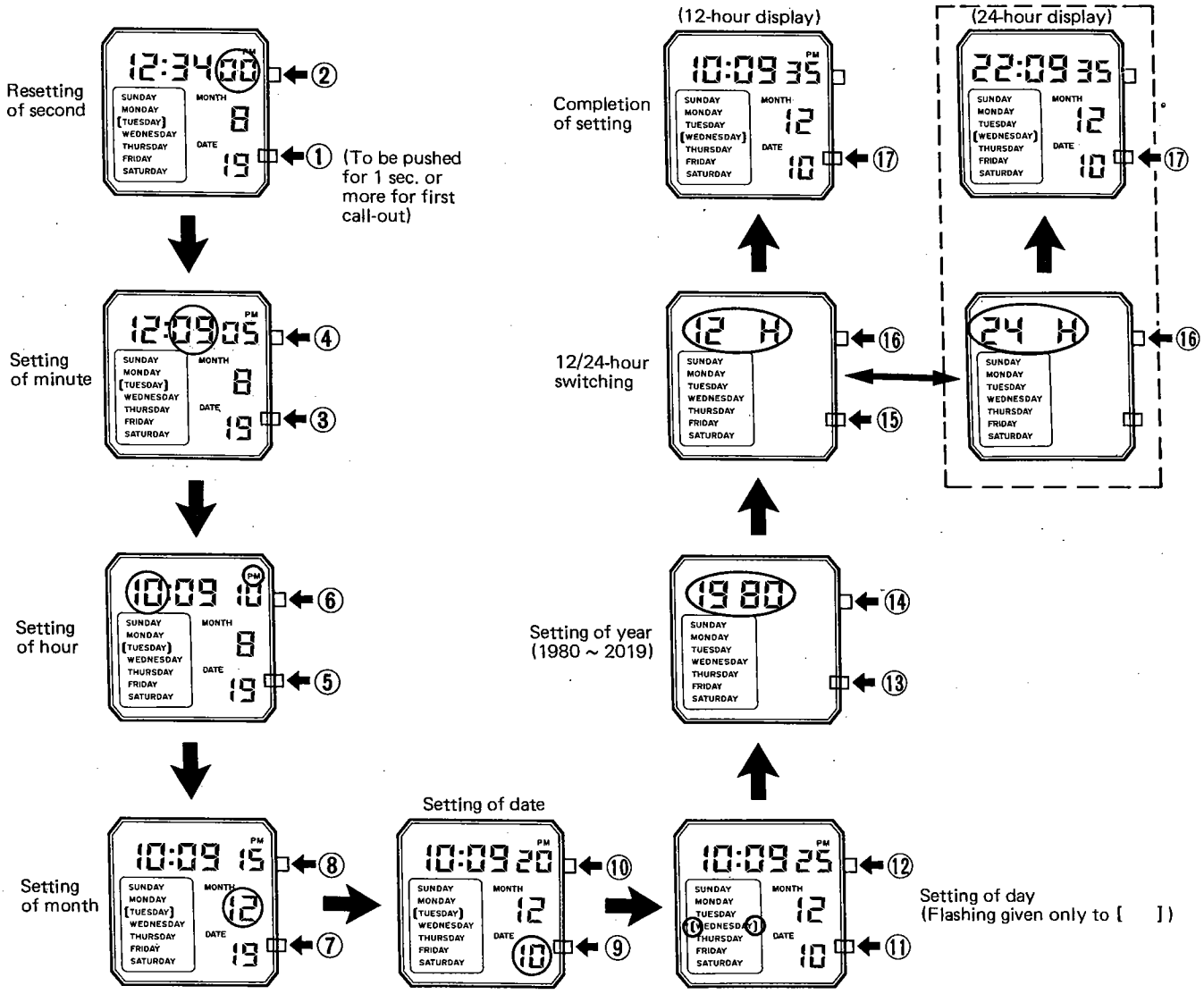
Caliber No.	9270A, B, C, D, E
Type	Digital quartz crystal watch
Size of module (mm)	25.8 (12h-6h) x 23.2 (3h-9h) x 3.82 t (Power cell part 3.92 t)
Accuracy	±10 sec./month at normal temperatures
Oscillation	32,768 Hz
Display method	FE twist nematic LC with static driving
Integrated circuit	C/MOS-LSI (1 unit)
Effective temperature range	±0°C ~ +55°C (32°F ~ 131°F)
Adjustment of time	By trimmer condenser
Method of correction/setting	By push-buttons
Power cell (Silver oxide cell) (Ag_2O/NaOH)	Parts No. : 280–46 (1 unit) Cell code : SR1116SW Nominal voltage : 1.55V Capacity : 29 mAH Size (mm) : 11.6 ϕ x 1.6 t Life time : About 3 years
Additional functions	Power cell life indicator Fully automatic calendar (1980 ~ 2019) Instant manual return Auto-return 12-/24-hour switching function
Display functions	12-hour display : Hour, minute, second, AM/PM, month, date & day 24-hour display : Hour, minute, second, month, date & day
External appearance & notations	
	※The days of the week and the border line are printed on the reflecting plate.
Others (Color specifications)	9270A (Gold): 9270B (Silver); 9270C (Brown); 9270D (Blue); 9270E (Green)

§4. HANDLING INSTRUCTIONS (The flashing areas are shown by ○)

This watch has a constant display of time and calendar with no operation required for switching of the displays.

Correction/setting of time and calendar:

- The digit of correction is called out with Ⓢ button, and then the setting is carried out with Ⓡ button.
- The Ⓡ button functions to perform the 0-second resetting, the time/calendar setting and the switching between 12-/24-hour displays each.
- **The "instant manual return" ensures the completion of setting with push of Ⓢ button for 2 seconds or more and in any setting mode after setting of the second.**
  And the completion of setting is secured by the "Auto-return" in 1 or 2 minutes after push of Ⓢ or Ⓡ buttons.
- The setting is carried out in the order of ①→ ⑰ as shown below. The area to be corrected is indicated by ○.



§5. ASSEMBLY OF MODULE INTO CASE

In this caliber of component parts of module, i.e., the LC display panel supporter doubles a function to fix the push-buttons, although the push-buttons in other conventional watches are fixed (to prevent pull-out of buttons) via the snap ring, the O-ring and the like. And the module is assembled into the case as described below.

1) Setting of push-buttons

As shown in Fig. 1, the two push-buttons are set in until they stop.
The push-button set into the case must have the face Ⓐ set at the same level as the inner side of the case (Fig. 2). For this purpose, the push-button is pushed back with a tweezers or the like to give an adjustment.

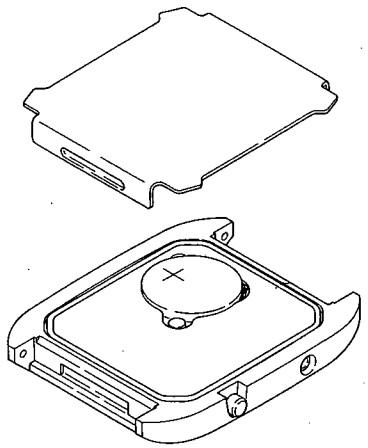


Fig. 1

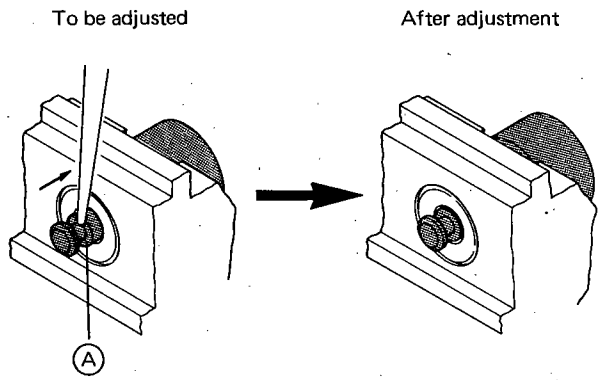


Fig. 2

2) Setting of module

The module is tilted slightly, and then the notched area at the tip of the push-button. After the setting of the switch actuating spring and the push-button, the opposite side of the module is pressed with your fingers to set the module into the case.
(Setting sequence is ① → ② as shown in Fig. 3.)
After assembling of the module, the push-button is pressed to make sure that a correct setting is secured between the switch actuating spring and the tip of the push-button and also that the push-button has a correct working.
When removing, the module can be detached easily by prying and open the module with a tweezers or the like and in the 6-o'cklock or 12-o'clock direction.

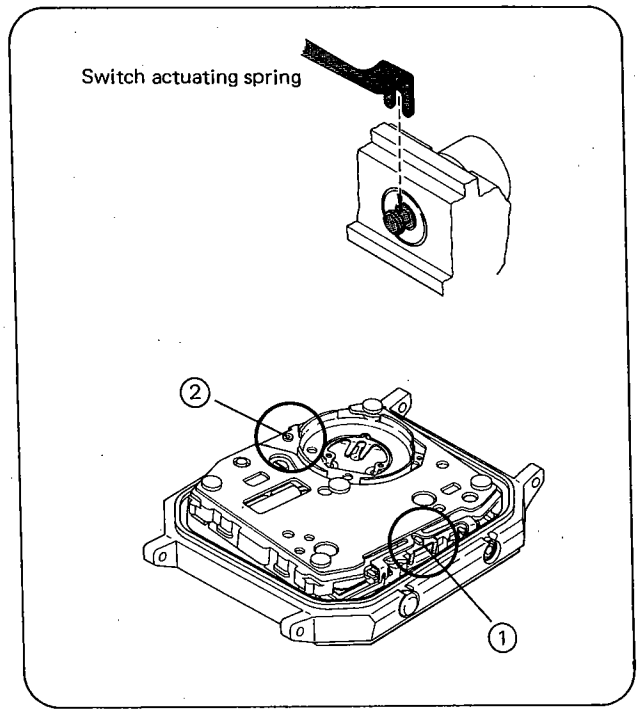


Fig. 3

3) Setting of device cover and O-ring

The device cover and then the O-ring are set as illustrated in Fig. 4. The power cell strap for checking, if used, must be removed without fail before setting of the device cover.

4) Setting of power cell

The power cell is set into the module with the minus (—) side turned down and as if it were pressed to the power cell holder.

5) The case back is closed.

6) Confirmation

A confirmation is given whether the push-buttons work in a smooth and correct way or other functions work satisfactorily and other points.

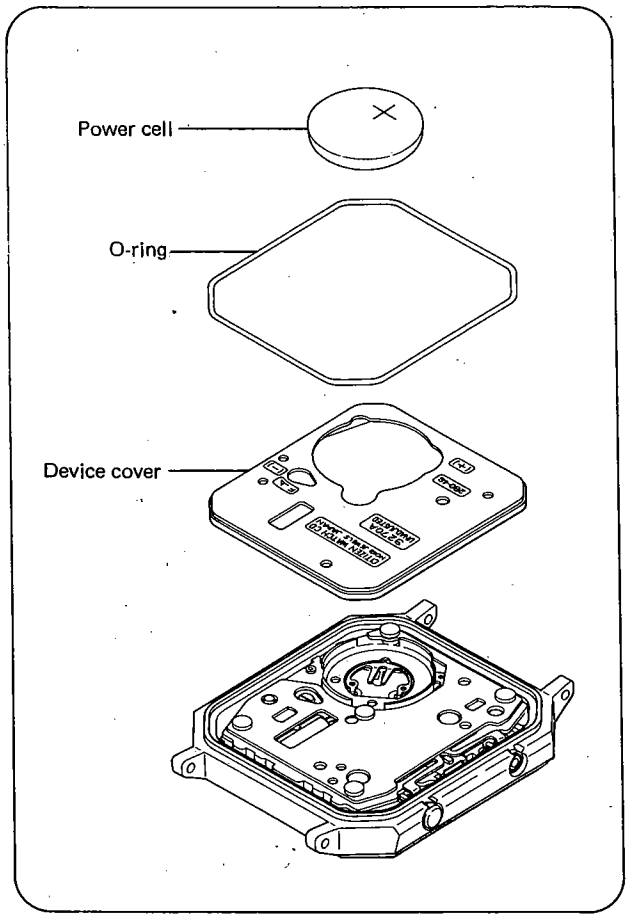
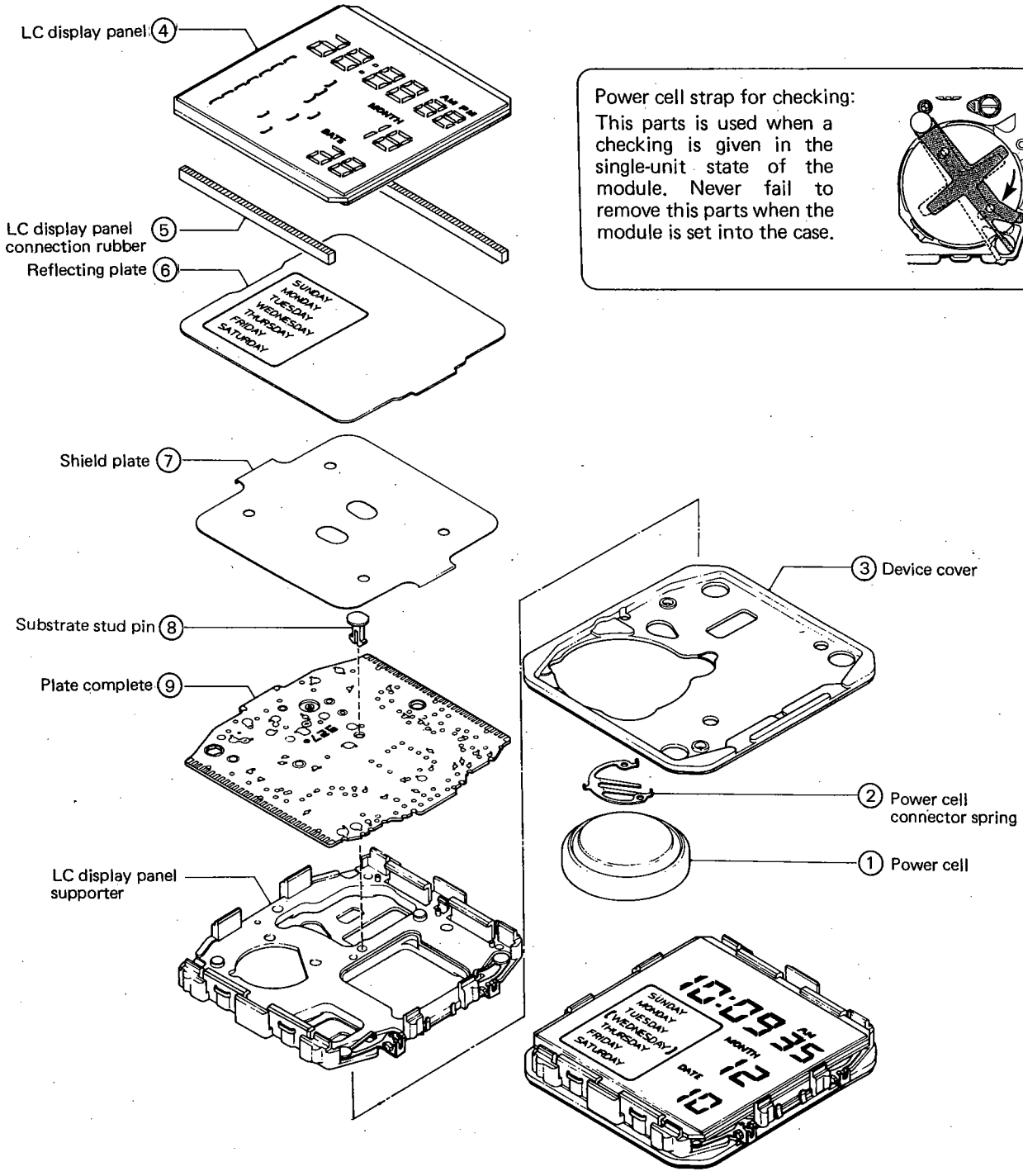


Fig. 4

§6. DISASSEMBLY/ASSEMBLY OF MODULE

Disassembling procedure: ① → ⑨
Assembling procedure: ⑨ → ①



Power cell strap for checking:
This parts is used when a checking is given in the single-unit state of the module. Never fail to remove this parts when the module is set into the case.

Notes on Disassembly/Assembly

1) Handling of LC display panel

a) Disassembly
The hooked parts (4 areas) of the LC display supporter are removed by pulling them in the direction of arrow in Fig. 5. In this case, never fail to use a driver.

b) Assembly
The hooking is given by pressing light the upper face (close to the hooking part) of the LC display panel after making sure both the 3~9 o'clock and 12~6 o'clock directions as well as the upper and rear surfaces of the LC display panel.

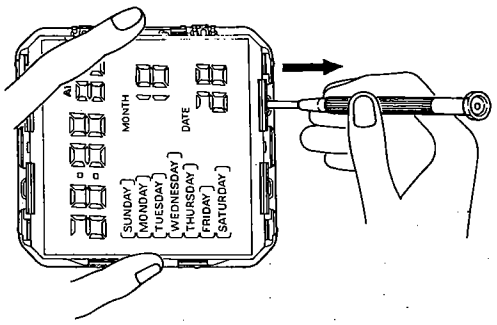


Fig. 5

The driver is put into the outer groove of the hook part.

2) Handling of rivet for substrate

As illustrated in Fig. 6, the hook part of the rivet is held by a tweezers and then pushed downward. Thus the rivet can be removed. (The sequence of removal is shown in Fig. 7).

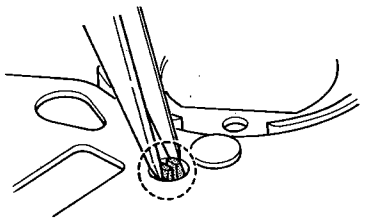


Fig. 6

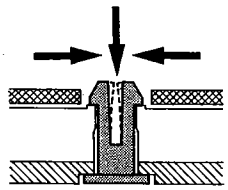


Fig. 7

3) Shield plate

When setting the shield plate, an attention must be given to the bend at the circled area in Fig. 8. At the same time, make sure that a complete contact is secured between the earth spring (Fig. 9) attached to the LC display panel supporter and the shield plate.

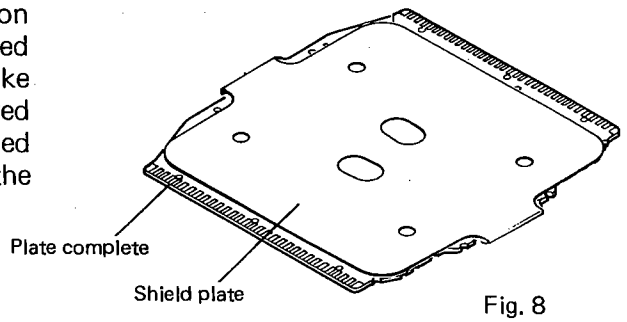


Fig. 8

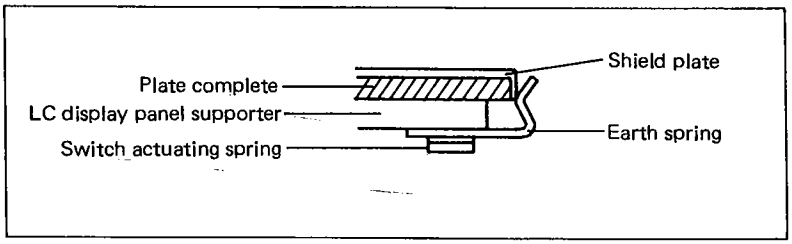
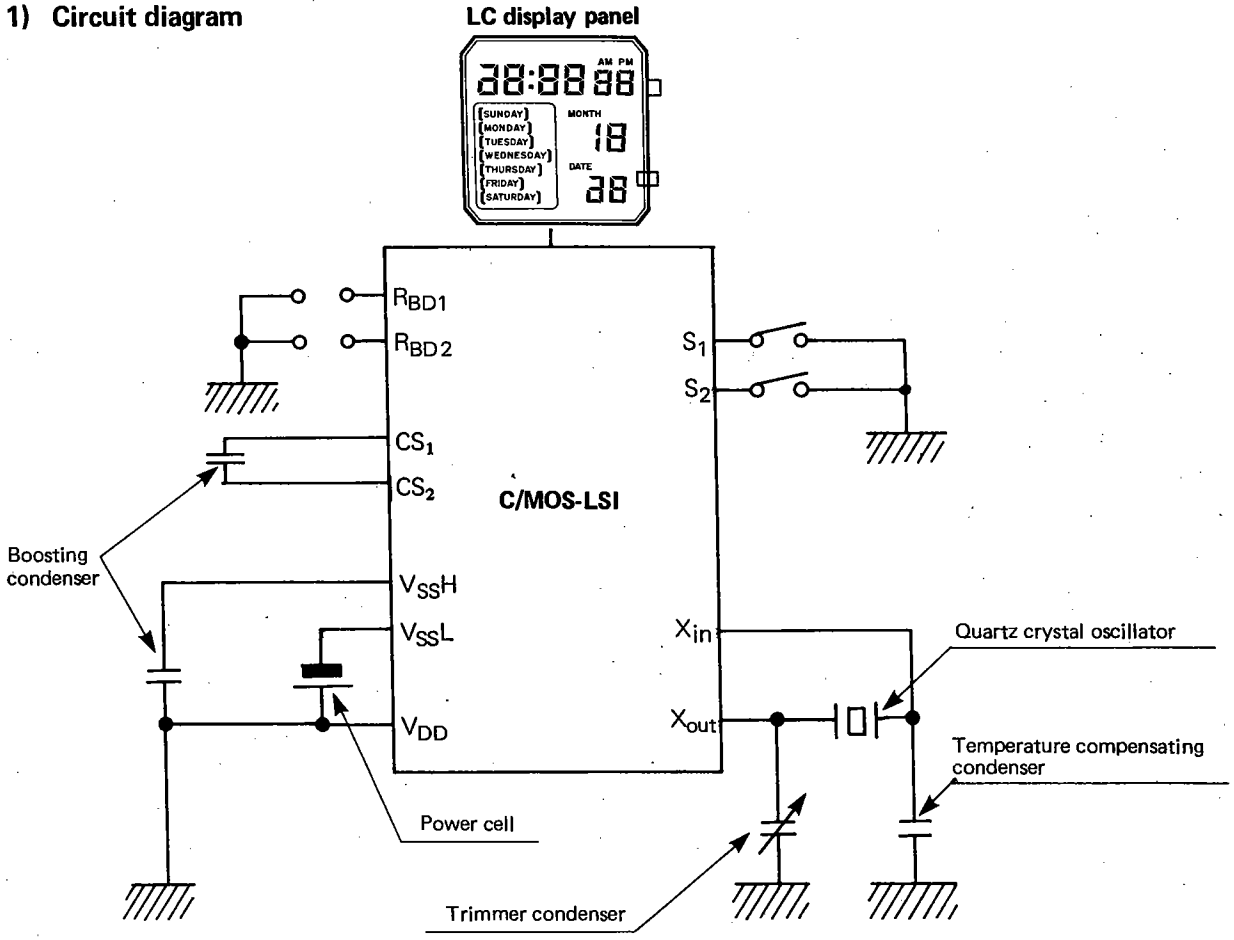


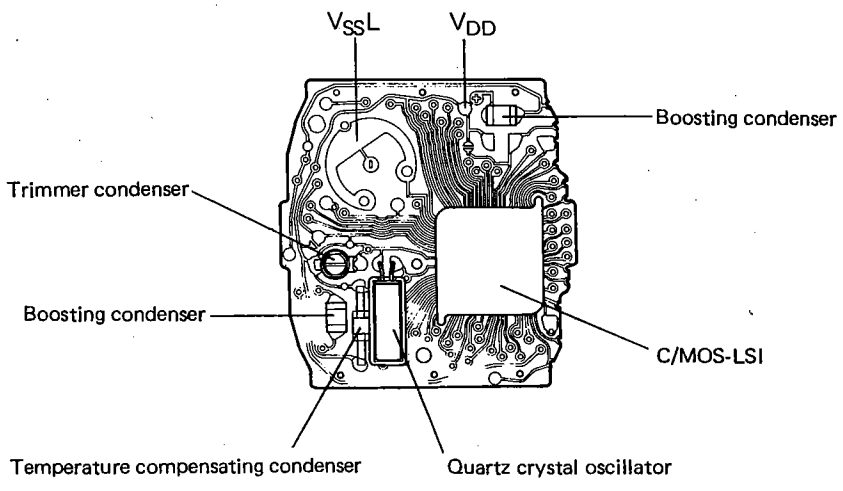
Fig. 9

§7. STRUCTURE OF MODULE

1) Circuit diagram

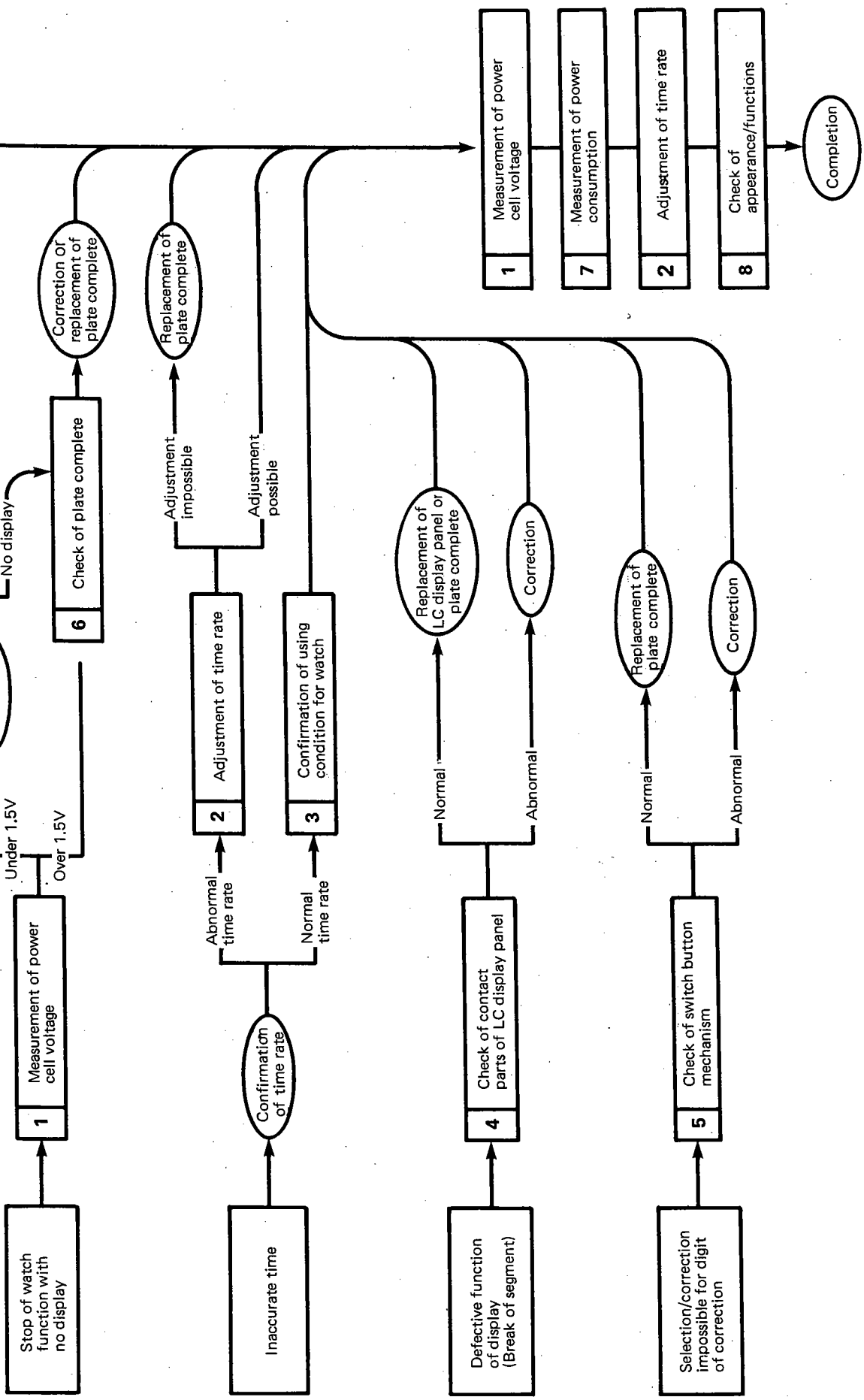


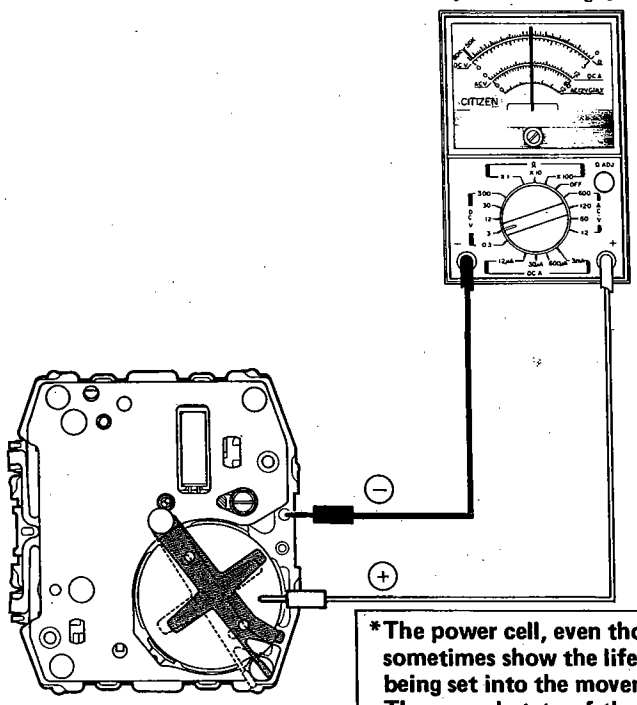
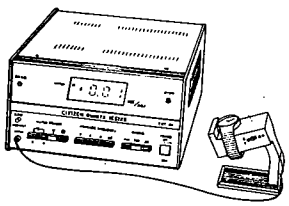
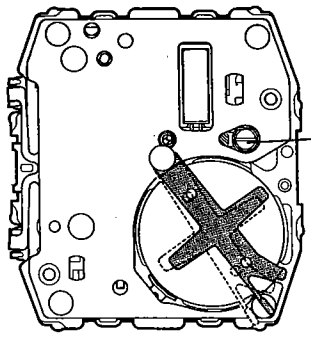
2) Structure of plate complete

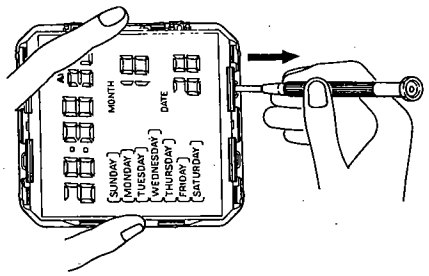
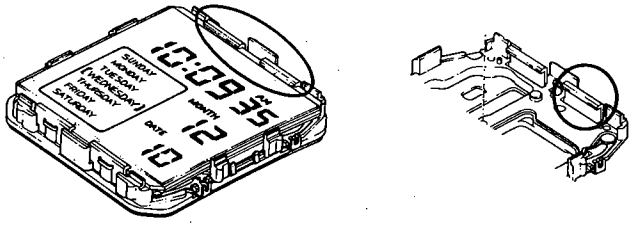
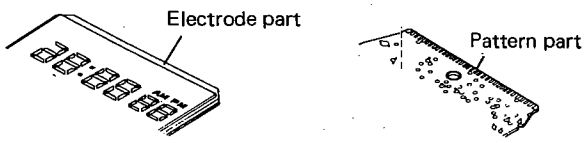


§8. TROUBLESHOOTING AND ADJUSTMENT

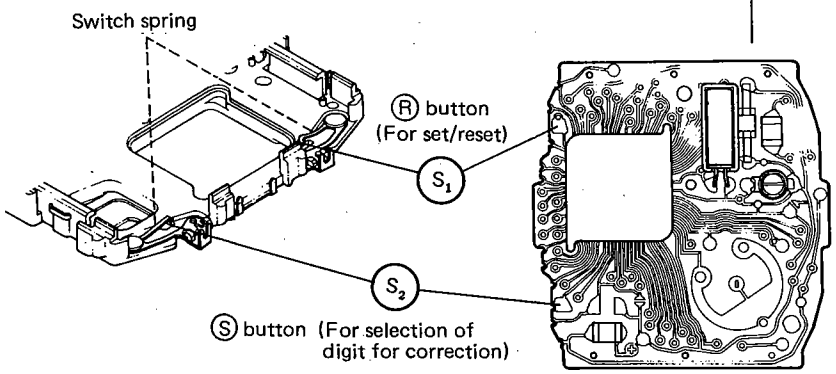
1) Flow chart of troubleshooting and adjustment



Checking items	How to check	Result and treatment
1 Measurement of power cell voltage	[DC 3V Range]  ***The power cell, even though it is nondefective, may sometimes show the life time indicating mode after being set into the movement. The nomal state of the power cell will be secured again in about one minute.**	**Over 1.5V** → Normal **Under 1.5V** → Replacement of power cell
2 Adjustment of time rate	An adjustment is given to the time after measurement of time rate through the **CQT-101.** The time gains by turning the trimmer condenser clockwise.   Trimmer condenser	Adjustment impossible → Replacement of plate complete
3 Confirmation of using condition for watch	1) Check whether the watch has been handled in a wrong way. 2) Check whether the watch has been used in an extreme temperature (outside the effective temperature range). 3) Other factors of using conditions for the watch.	

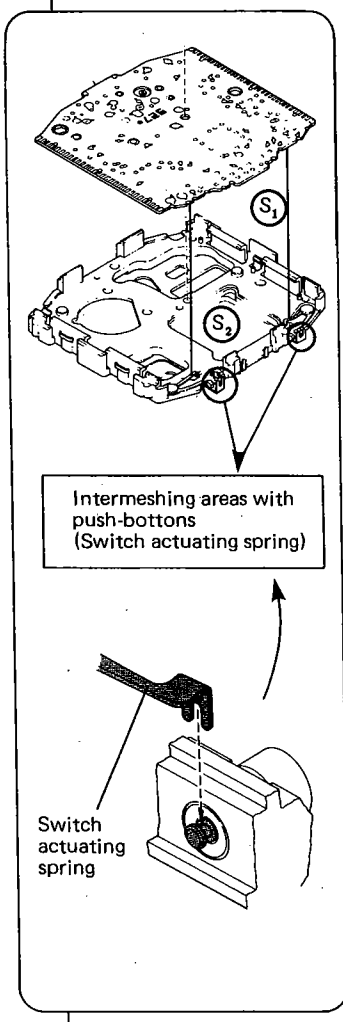
Checking items	How to check	Result and treatment
4 Check of contact parts of LC display panel	The break of segment will occur easily in case the contact is incomplete or unsteady between the pattern of the plate complete and the electrode of the LC display panel. Accordingly, the following points are checked.	
	1) Check whether the LC display panel connection rubber and the LC display panel are assembled in a correct way. 	Some shift recognized in positioning → To be assembled again
	2) Check whether the hook part of the LC display supporter has some defect. 	Defective setting → To be set again Breakage or malformation detected → Replacement of LC display supporter
	3) Check whether the LC display panel connection rubber has some wear, stains, dust and other defects.	Dust or stains attached → To be cleared away
	4) Check whether the electrode part of the LC display panel or the pattern part of the plate complete has some crack, stains and other defects. 	Dust or stains attached → To be cleared away Crack or pattern break detected → Replacement of LC display panel or plate complete
	The dust or stains, if attached, must be wiped off with use of the alcohol since the space between electrodes is small.	No defect detected through above inspections → Replacement of LC display panel or plate complete

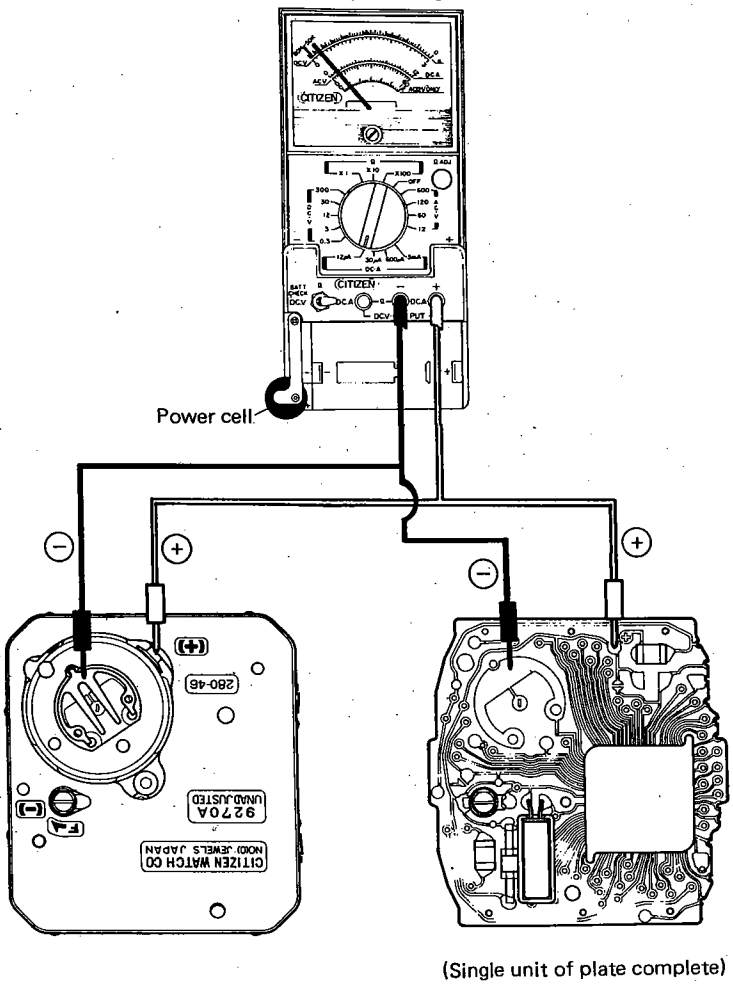
Checking items	How to check	Result and treatment
5 Check of switch button mechanism		



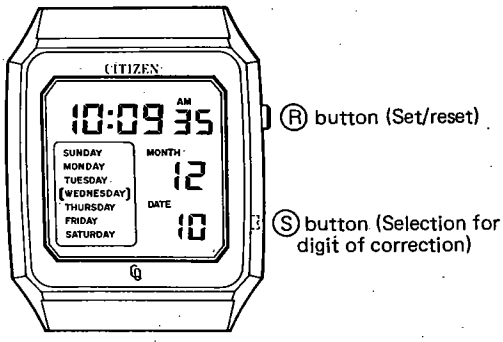
In case both the selection of digit for correction and the correction (Set/Reset) are impossible, the following points.

1) As inspection is given the presence or absence of the dust or rust and the correct setting in case no movement is obtained for the pushbutton or the stroke of the push-button is not sufficient.
   → Removal of dust or rust and reassembly of push-button
2) Check whether the switch spring or the switch actuating spring set into the LC display panel supporter has some malformation, breakage or other defects.
   → Correction or replacement of LC display panel supporter
3) Check whether the patterns (S1) and (S2) of the plate complete have some dust or stains, disconnection and other defects.
   → Removal of dust or stains or replacement of plate complete

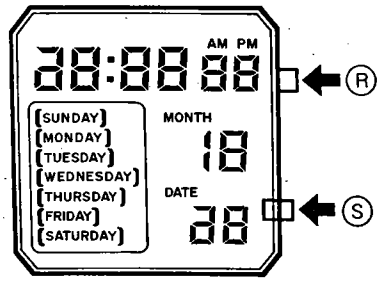


Checking items	How to check	Result and treatment
6 Check of plate complete	1) Check whether the pattern of the plate complete has some disconnection or stains. 2) Check whether each element (quartz crystal oscillator, trimmer condenser and other accessory parts) has some defect such as the breakage, out-of-position, etc.	Dust or stains attached → To be cleared away Disconnection or defect of each element detected → Replacement of plate complete
7 Measurement of power consumption	[DC 12μA Range]  (Single unit of plate complete)	**With module complete** **2.0μA or less** → Normal **2.0μA or more** → Measurement to be given again with single unit of plate complete **With single unit of plate complete** **1.5μA or less** → Reassembly of LC display panel **2μA or more even after reassembly** → Replacement of LC display panel connection rubber or LC display panel **1.5μA or more** → Replacement of plate complete

Checking items	How to check	Result and treatment
8 Check of appearance/ functions	1) Make sure that the appearance and function parts are free from any dust or stains. 2) Make sure that the selection and setting are possible for the digit of correction. 3) Make sure that no segment is broken. With a simultaneous push of both Ⓡ and Ⓢ buttons, all contents of display glow up for easy checking of the segment break.	



(All-lighting)



CITIZEN WATCH CO., LTD.

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