TECHNICAL
INFORMATION

CITIZEN QUARTZ
Cal. No. P 020

⬤CITIZEN

P020

CONTENTS

■1. OUTLINE

This is a popular LC digital watch for gentlemen designed as a thinly structured type with an alarm/stop function.

■2. SPECIFICATIONS

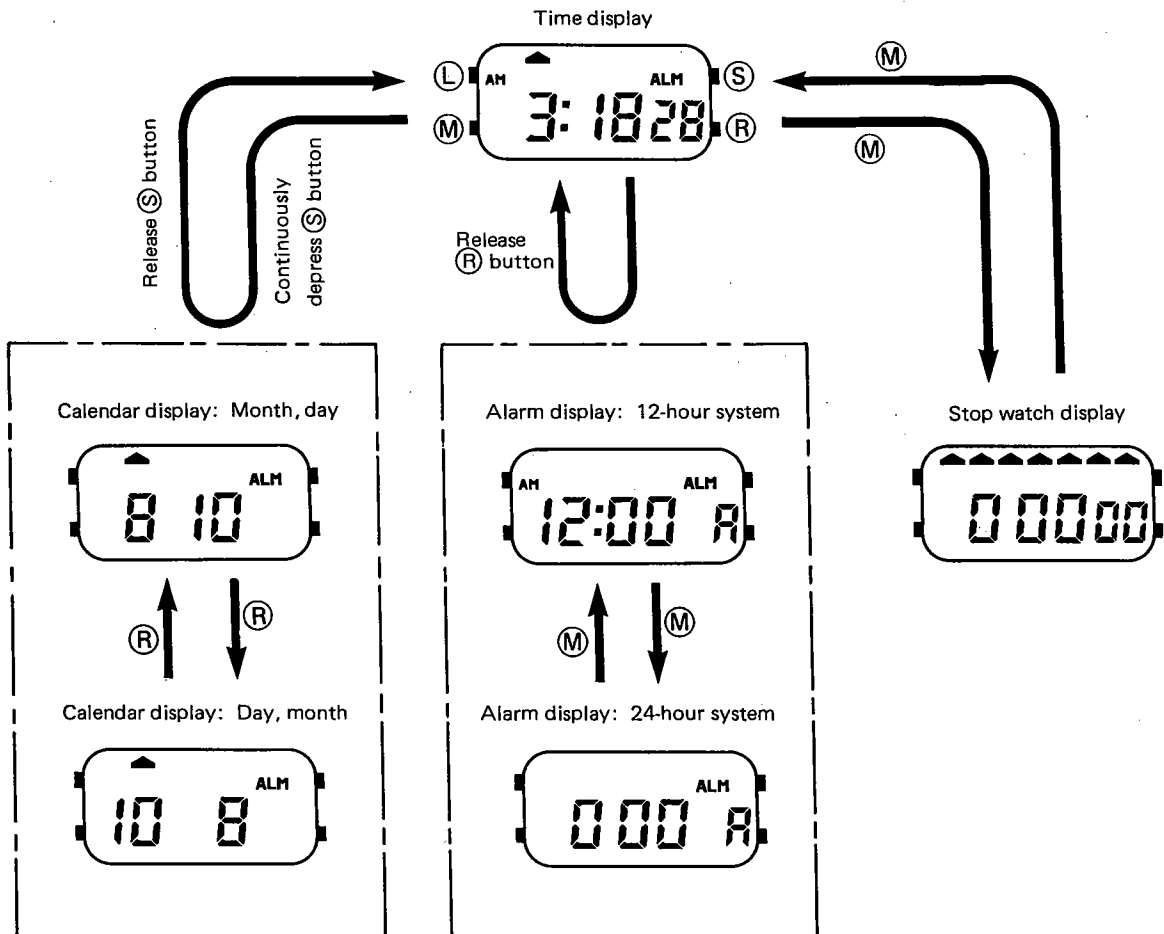| Caliber No.		P020
Type		Digital liquid crystal watch
Size of module		26.0mm in diameter, 3.35mm thick
Accuracy		±30 seconds/month at normal temperature
Oscillation		32,768Hz
Display method		FE twist nematic liquid crystal display
Integrated circuit		C/MOS-LSI (1 unit)
Effective temperature range		0°C ~ +55°C (32°F ~ 131°F)
Adjustment of time rate		None
Measurement of time rate		2 seconds
Display function	Time	Hour, Minute, Second, AM/PM, Day
	Calendar	Month, Date, Day
	Alarm	Hour, Minute, ALM (alarm set mark), A/P (AM/PM of alarm), AM/PM (12-hour display only)
	Stop watch	Minute, second, 1/100, and hour minute, second after pass of 30 minutes (24-hour watch)
	Chime	CHI (chime mark)
Additional function		12/24-hour display switching, light, chime, sound monitor, instant manual return, automatic calendar (February 28)
Power cell	Parts No.	280-52
	Maker code	SR726W
	Size	7.9mm in diam. x 2.6mm thick
	Nominal voltage	1.55V
	Nominal capacity	28mmAH
	Life time	Approx. 20 months (alarm: 20 sec/day, lamp: 3 sec/day, chime: 24-time hourly)
Current consumption		Under 1.5μA by module
Remarks		

■3. HANDLING INSTRUCTIONS

(1) Name of Each Control

· CHI : Chime set mark
· ALM : Alarm set mark

Day flag

Light button (L)   AM CHI   ALM   (S) Selector button
Mode button (M)   **12:3828**   (R) Lead/set button

(2) Display Switching

Time display

(L) AM   ALM (S)
(M) **3:1828** (R)

Release (S) button

Continuously depress (S) button

(M) ← (M)

Release (R) button

(M) (M)

Calendar display: Month, day

▲
8 10 ALM

(R) ↑   ↓ (R)

Calendar display: Day, month

▲
10 8 ALM

Alarm display: 12-hour system

AM **12:00 A** ALM

(M) ↑   ↓ (M)

Alarm display: 24-hour system

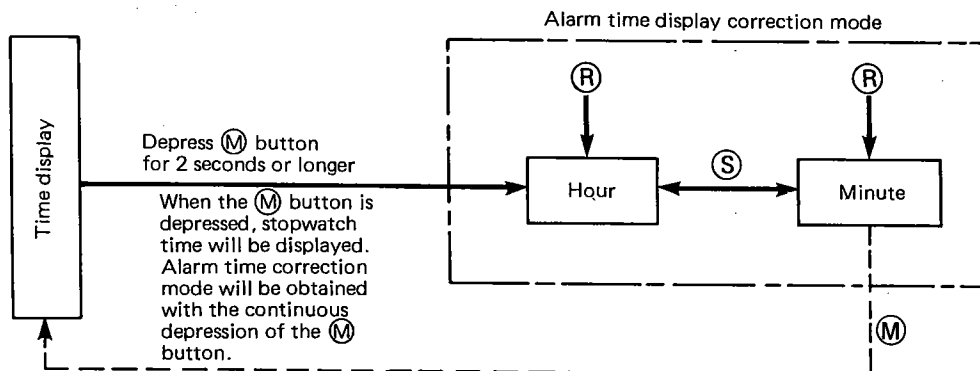**000 A** ALM

Stop watch display

00000

Notes: 1. For operation put in ⌐ _ _ _ ⌐ , depress the (R) button (calendar) while depressing the (S) button or depress the (M) button (alarm) depressing the (R) button to switch display.

2. To switch 12-hour/24-hour display, the (M) button may be depressed while depressing the (S) button. During that period of time, the calendar is displayed, and the time after switching will be displayed when the (S) and (M) buttons are released.

(3) Correcting Current Time and Calendar

Time display

Continuously depress
M for longer than
2 seconds.

Alarm time correction mode
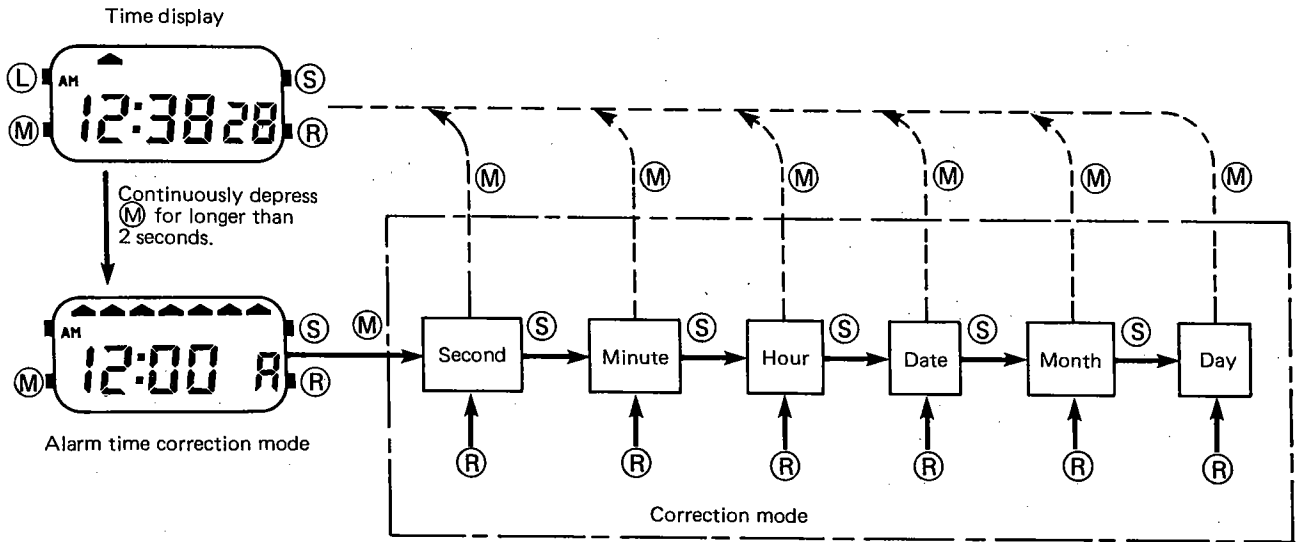
Correction mode

*1. When the Ⓜ button is depressed in alarm time correction mode, SECOND of the time is selected and (a) SECOND digit(s) flash(es). MINUTE, HOUR, ... and DAY are selected whenever the Ⓢ button is depressed.
   A digit to be corrected flashes at that time.
   ● A digit to be corrected is changed with every depression of the Ⓡ button. A depression of the Ⓡ button for 2 seconds or longer will allow fast forward run of digits.
   ● In correction mode of SECOND, MINUTE and HOUR, the day flag is lit excepting the case that it flashes on Tuesday.
   ● In correction mode of DATE and MONTH the on state of the DAY flag before correction is kept.
   ● In correction mode of DAY, the on state of the DAY flag before correction is kept.
   ● Time display will appear when the Ⓜ button is depressed in each correction mode (instant manual return).

(4) Correcting Alarm Time

Alarm time display correction mode

Time display

Depress Ⓜ button
for 2 seconds or longer

When the Ⓜ button is depressed, stopwatch time will be displayed. Alarm time correction mode will be obtained with the continuous depression of the Ⓜ button.
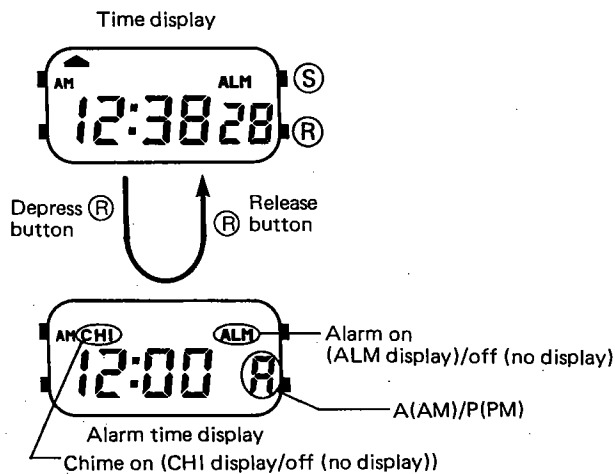
● A digit will be changed whenever the Ⓡ button is depressed in each correction mode. Depressing the Ⓡ button for 2 seconds or longer will permit fast forward run of digits.

● Display contents

HOUR correction mode . . . . . .   Digits of HOUR and A(AM)/P(PM) flash and the day flags are all lit excepting the case that the Monday flag flashes.

MINUTE correction mode . . . .   Digits of MINUTE flash and all day flags excepting the Monday flag (flashing) are lit.

Note: The 12-Hour/24-hour switching function in alarm time mode is interlocked with the 12-hour/24-hour switching function in time mode. Set the alarm time taking care of AM/PM.

(5) On/Off of Alarm/Chime

Time display

Depress ® button   Release ® button

Alarm on (ALM display)/off (no display)

A(AM)/P(PM)

Alarm time display

Chime on (CHI display/off (no display))

● The following sequential depressions of the Ⓢ button while depressing the ® button will permit selection of the alarm and chime on/off actions.

Ⓢ button	Alarm	Chime
1st depression	OFF	OFF
2nd depression	OFF	ON
3rd depression	ON	ON
4th depression	ON	OFF

a. Alarm

An alarm sounding time is about 20 seconds. Depress the ® button to stop sounding halfway.

Simultaneously depress the Ⓢ and ® button to check the alarm function for sounding (sound monitor). Any one of the following three types of display modes will be selected in accordance with a timing of depressing the button at that time.

1. Alarm time display (in the order of ® and Ⓢ)

2. Calendar display (in the order of Ⓢ and ®)

3. Full-segment glow (simultaneous depression of Ⓢ and ®)

b. Chime

When the chime mark CHI is lit, the chime sounds every hour.

(6) Operating Stop Watch
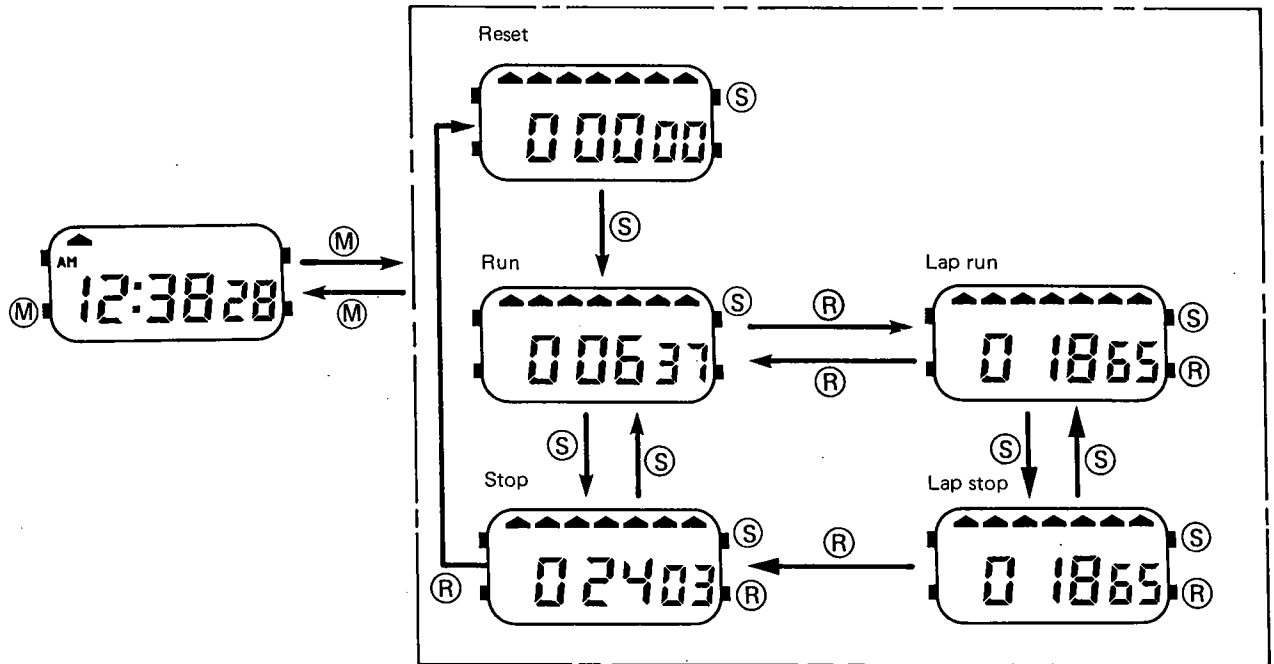
1. The above diagram shows time counts up to 29 , 59 99/100.
   Display from 30 , 00 00/100 is as follows.
   - 0 , 00 00   (0 minute, 00 second, 00/100, the colon does not glow)
   - 29 , 59 99   (29 minutes, 59 seconds, 99/100, the colon does not glow)
   - 0 , 30 00   (0 hour, 30 minutes, 00 second, the colon does not glow)
   - 23 , 59 59   (23 hours, 59 minutes, 59 seconds, the colon does not glow)

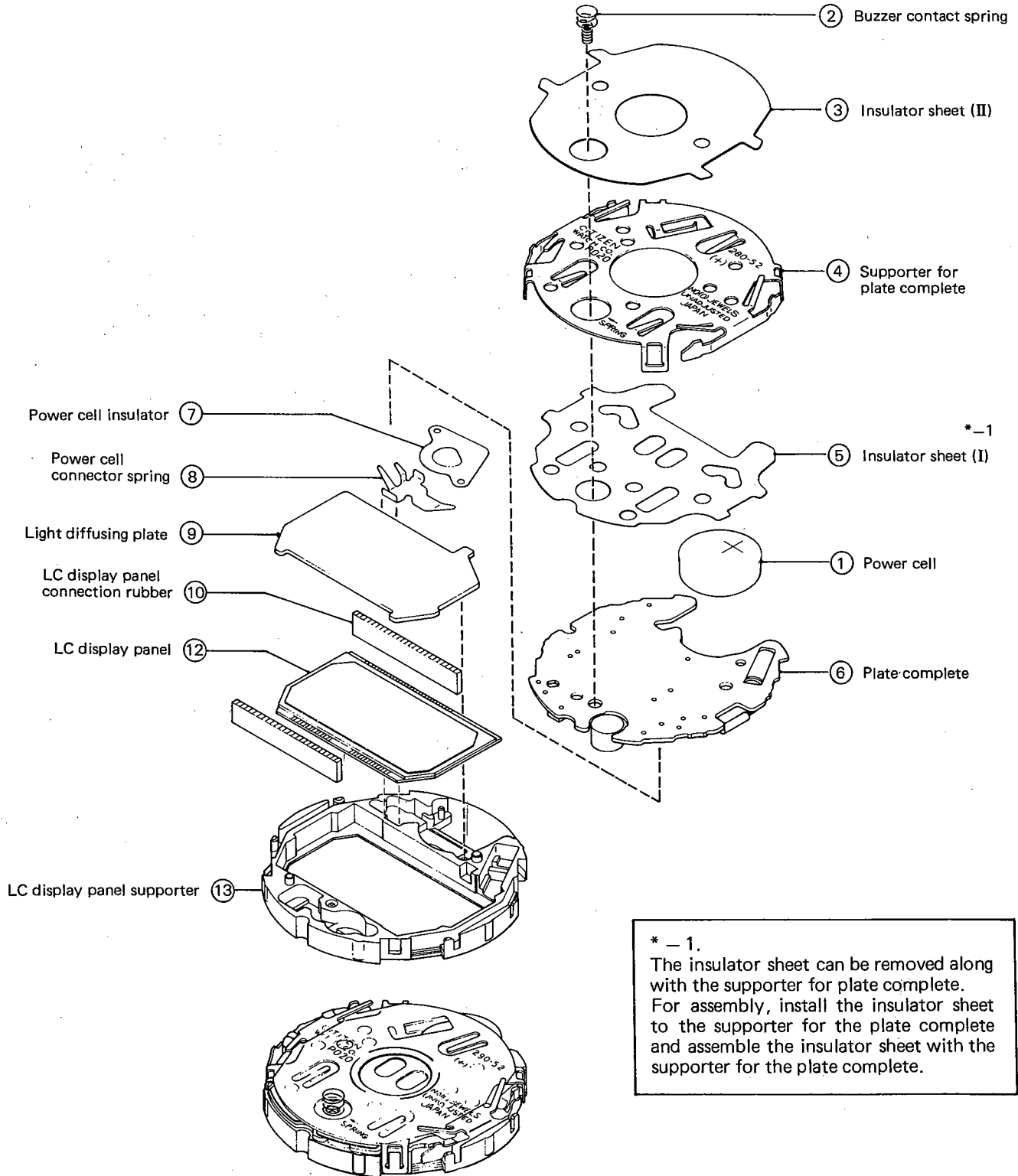   Display digits can be checked by glowing or not of the colon like the above.

2. Display contents during time counting
   The day flag is in full-segment glow in each display mode.

Display Mode		Display Contents
Reset	————————	Only the Sunday and Saturday flags flash and the colon goes out.
Run	Up to 29, 59 99/100	Only the Sunday and Saturday flags flash and the colon goes out.
	0:30:59 or more	Only the Sunday flag flashes and the colon comes on.
Lap run	Up to 29, 59 99/100	The Sunday, Thursday and Saturday flags flash and the colon goes out.
	0:30:59 or more	Only the Sunday and Thursday flags flash and the colon comes on.
Lap stop	Up to 29, 59 99/100	The Sunday, Thursday, Friday and Saturday flags flash and the colon goes out.
	0:30:59 or more	The Sunday, Thursday and Friday flags flash and the colon comes on.
Stop	Up to 29, 59 99/100	The Sunday, Friday and Saturday flags flash and the colon goes out.
	0:30,59 or more	The Sunday and Friday flag only flash and the colon comes on.

■4. DISASSEMBLY/ASSEMBLY OF MODULE

For disassembly, be in accordance with the order of (1) to (13), and for assembly, be in accordance with the order of (13) to (1).

② Buzzer contact spring

③ Insulator sheet (II)

④ Supporter for plate complete

Power cell insulator ⑦

Power cell connector spring ⑧

Light diffusing plate ⑨

LC display panel connection rubber ⑩

LC display panel ⑫

LC display panel supporter ⑬

*-1

⑤ Insulator sheet (I)

① Power cell

⑥ Plate complete

*-1.
The insulator sheet can be removed along with the supporter for plate complete.
For assembly, install the insulator sheet to the supporter for the plate complete and assemble the insulator sheet with the supporter for the plate complete.

■5. NOTES ON DISASSEMBLY/ASSEMBLY

1. Removing and mounting the power cell

Power cell

Tweezers

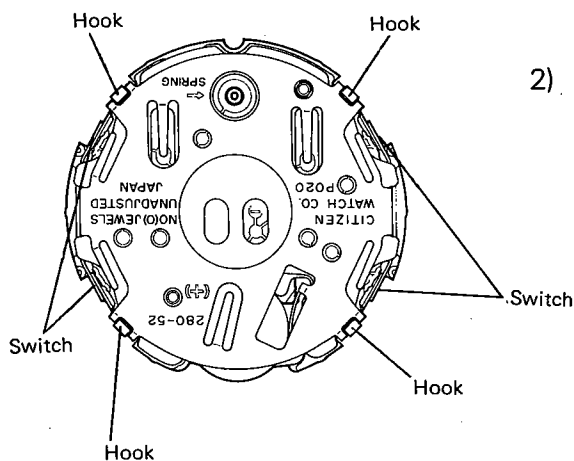For quick replacement of the power cell in this watch, proceed as follows.

1) Remove the module from the case.

2) Insert tweezers into the space in the support for the complete plate as shown left and slightly push them in the direction of an left, and the power cell will be removed from the module. To assemble the power cell, slide it in from the sideway taking care of its polarity.
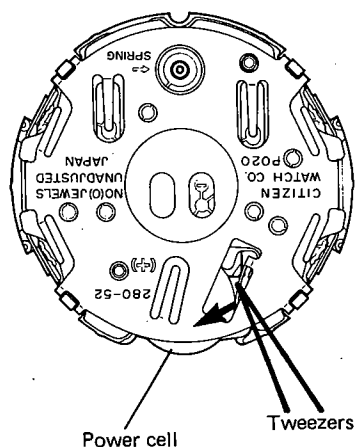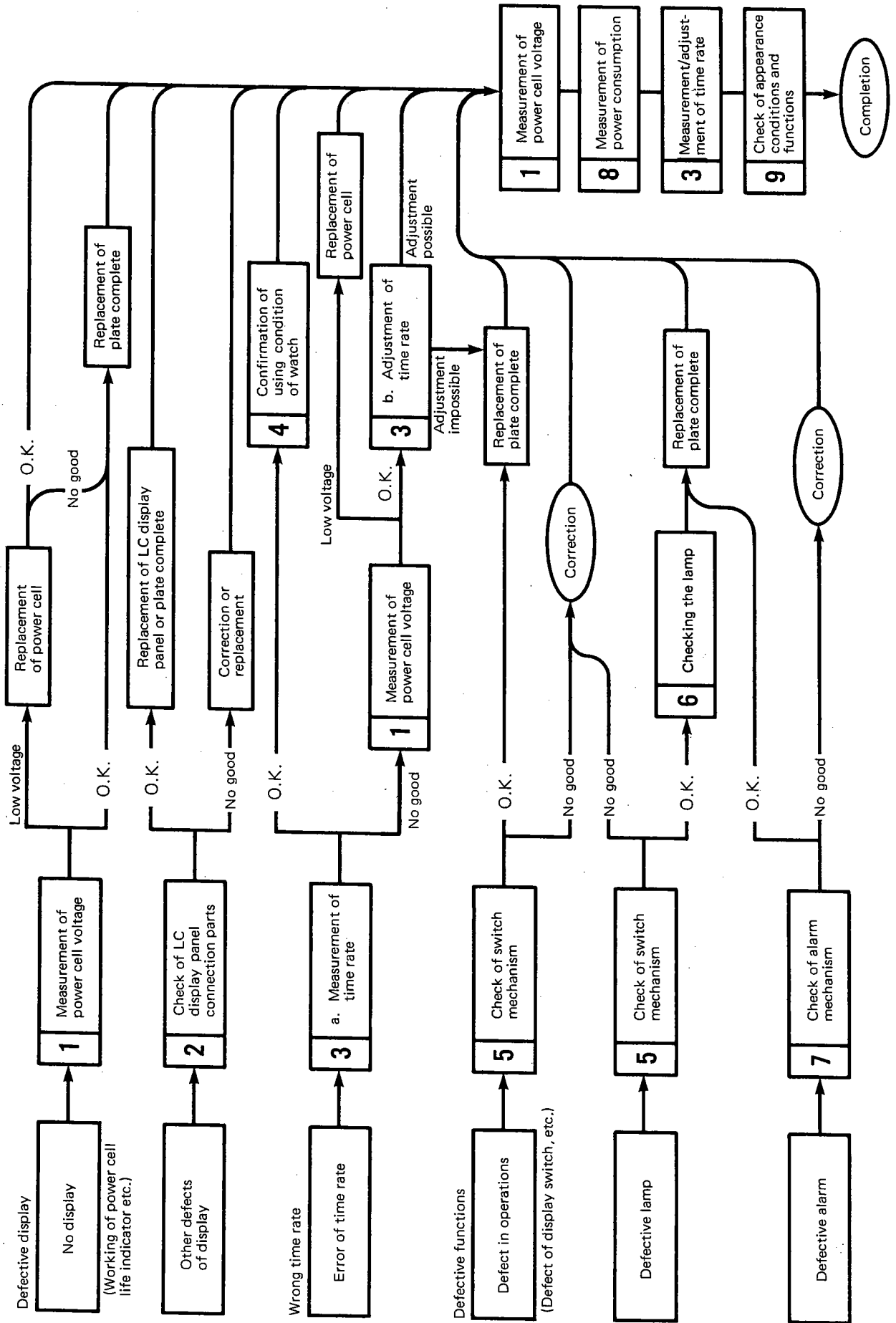
   At that time, check to ensure that the power cell connector spring exactly contacts the negative terminal of the power cell.
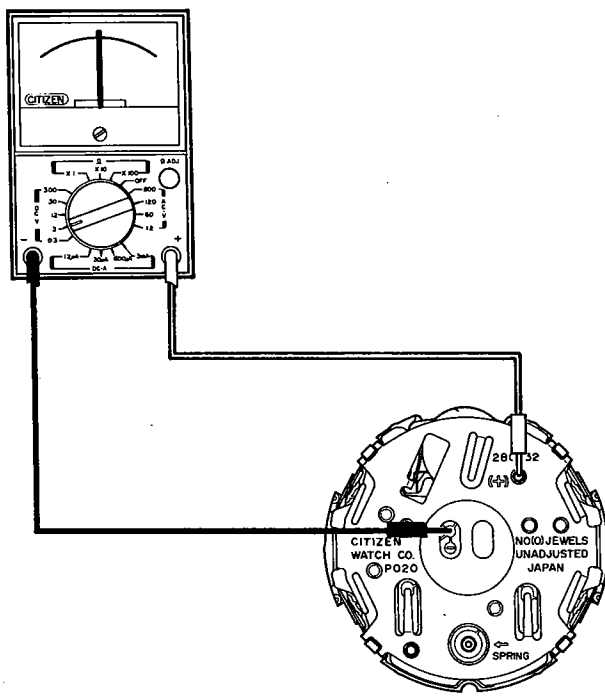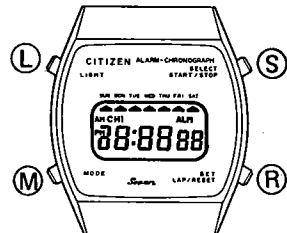
2. Precaution

Hook   Hook

Switch

Switch

Hook

Hook
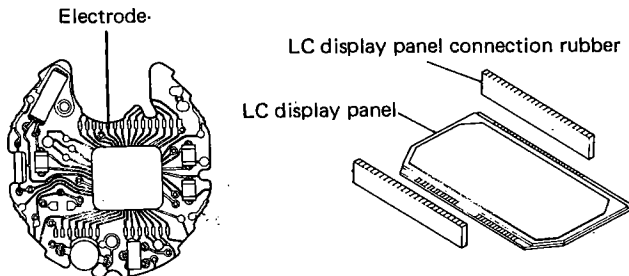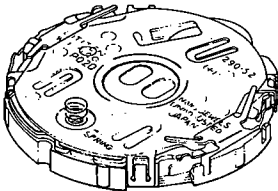
1) The LC display panel connection rubber is positioned to be assembled to the light diffusing plate. Be sure to assemble the light diffusing plate before assembly of the LC display panel connection rubber.

2) This module is clamped by four hooks of the supporter for the complete plate. Check to be sure that the switch spring and these hooks fit exactly.
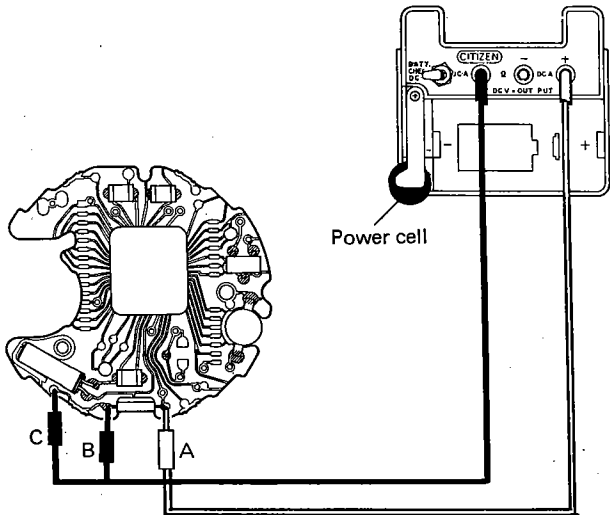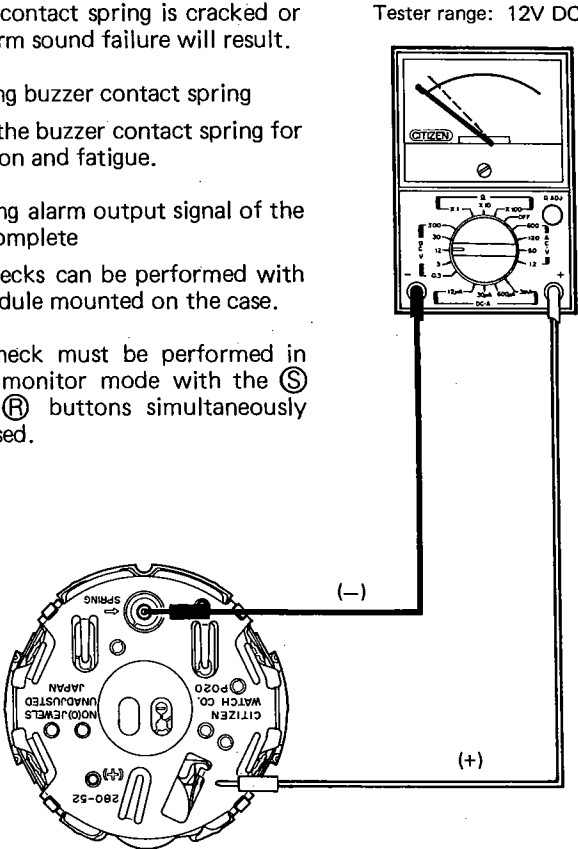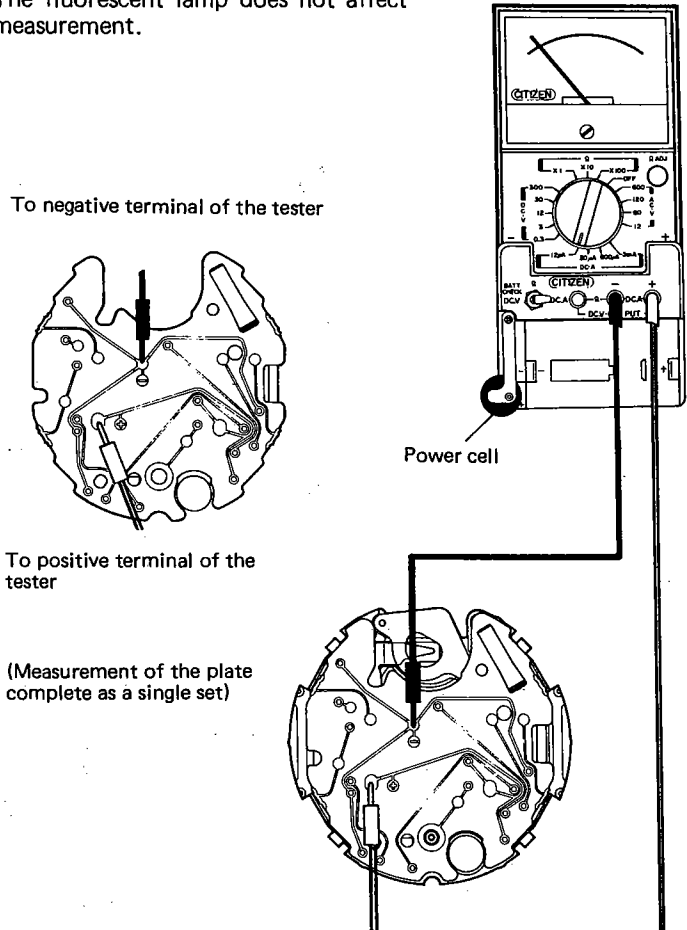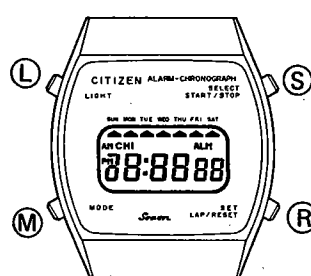
■6. TROUBLESHOOTING AND ADJUSTMENT

Defective display

No display
(Working of power cell life indicator etc.)

1 Measurement of power cell voltage

Low voltage → Replacement of power cell

O.K. / No good

O.K. → Replacement of plate complete

Other defects of display

2 Check of LC display panel connection parts

O.K. → Replacement of LC display panel or plate complete

No good → Correction or replacement

Wrong time rate

Error of time rate

3 a. Measurement of time rate

O.K. → **4** Confirmation of using condition of watch

No good → **1** Measurement of power cell voltage

Low voltage → Replacement of power cell

O.K. → **3** b. Adjustment of time rate

Adjustment possible

Adjustment impossible → Replacement of plate complete

Defective functions

Defect in operations
(Defect of display switch, etc.)

5 Check of switch mechanism

O.K. → Replacement of plate complete

No good → Correction

Defective lamp

5 Check of switch mechanism

No good → Correction

O.K. → **6** Checking the lamp

O.K. → Replacement of plate complete

Defective alarm

7 Check of alarm mechanism

O.K. → Correction

No good

1 Measurement of power cell voltage

8 Measurement of power consumption

3 Measurement/adjustment of time rate

9 Check of appearance conditions and functions

Completion

Checking items	How to check	Result and treatment
1 Measurement of power cell voltage	Tester range: 3V DC	**1.5V or more:** ⟶ Acceptable **Less than 1.5V:** ⟶ Replace the power cell with a new one
2 Check of LC display panel connection parts	**1) Check of full-segment glow** Simultaneously depress the Ⓢ and Ⓡ buttons in current time display mode, and full-segment glow state is formed while depressed. Under that condition, check segments for a fault. If alarm time/calendar display mode is set with the Ⓢ and Ⓡ buttons simultaneously depressed, redepress them until the full-segment glow state is observed. **2) Check of LC display panel, connection rubber and plate complete for continuity.** Electrode· LC display panel connection rubber LC display panel	●Check respective parts for exact assembling. Reassemble them if required. ●Check conductors for dust, contaminants, cuts, scores, etc. Remove dust and con-taminants if any. Replace cut or scored conductors with new ones if any.

Checking items	How to check	Result and treatment
3 Measurement of time rate	a) Time measurement Time can be measured in a 2-second range. b) Time adjustment The time cannot be adjusted in this caliber. Replace the plate complete with a new one if a great gain/loss is noted.	
4 Confirmation of using condition of watch	Check to ensure that the customer uses his watch in any working condition. Example: Check for mishandling.	
5 Check of switch mechanism	a) Check the switch mechanism with the module assembled. ●Check to ensure that the LC display panel supporter is exactly latched by hooks of the supporter for the plate complete. ● Check to ensure that the pattern of the plate complete can exactly contact the switch actuating spring. b) Check push-buttons ●Check push-buttons on the case for distortion and contaminants. * Be sure to coat the push-button packing with silicon oil. This is intended to maintain water resistant insulation and smooth button actions.	

Checking items	How to check	Result and treatment
6 Checking the lamp	Set the power cell to the multi tester adaptor and use the DC V and OUTPUT terminal (free from polarity). Power cell C B A	● Check between A and B. **Comes on:** ➞ Normal **Does not come on:** ➞ Replace the complete plate with a new one. ● Check between A and C. **Comes on:** ➞ Normal **Does not come on:** ➞ Replace the plate complete with a new one.
7 Check of alarm mechanism	a) Checking piezo-electric element This is a white piezo-electric element directly attached to the case back. If the part that contacts the buzzer contact spring is cracked or cut, alarm sound failure will result. b) Checking buzzer contact spring Check the buzzer contact spring for distortion and fatigue. c) Checking alarm output signal of the plate complete The checks can be performed with the module mounted on the case. This check must be performed in sound monitor mode with the Ⓢ and Ⓡ buttons simultaneously depressed. Tester range: 12V DC (−) (+)	Pointer deflecting: ➞ Acceptable No deflection: ➞ Replace the plate complete with a new one.

Checking items	How to check	Result and treatment
8 Measurement of power consumption	Note: Current consumption may increase in measurement near the incandescent lamp or in exposure to the sun-light. The fluorescent lamp does not affect measurement. Tester range: 12μA DC To negative terminal of the tester Power cell To positive terminal of the tester (Measurement of the plate complete as a single set)	● **Less than 1.5μA:** → Acceptable ● **1.5μA or more:** → Measure power consumption of the plate complete as a single. Measure power consumption of the plate complete as a single complete set. ● **Less than 1.2μA:** → Replace the LC display panel with a new one ● **1.2μA or more:** → Replace the plate complete with a new one
9 Check of appearance conditions and functions	Check the following points with throughout checks of the watch being acceptable. ● Display is normal. ● Each button action is normal. CITIZEN ALARM-CHRONOGRAPH	

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Tokyo, Japan