

TECHNICAL GUIDE AND PARTS LIST

CAL. W040A

DIGITAL QUARTZ

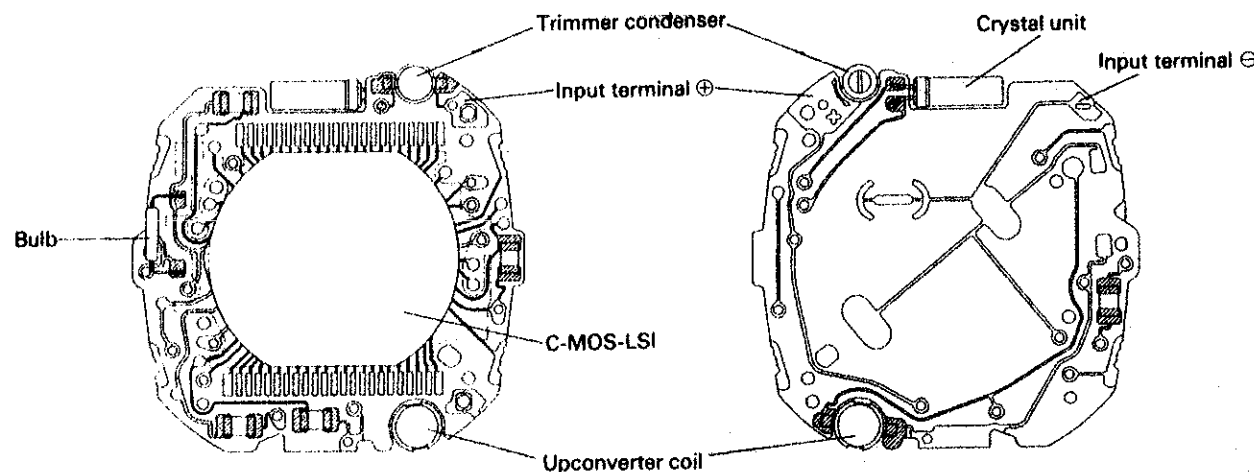
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I. SPECIFICATIONS

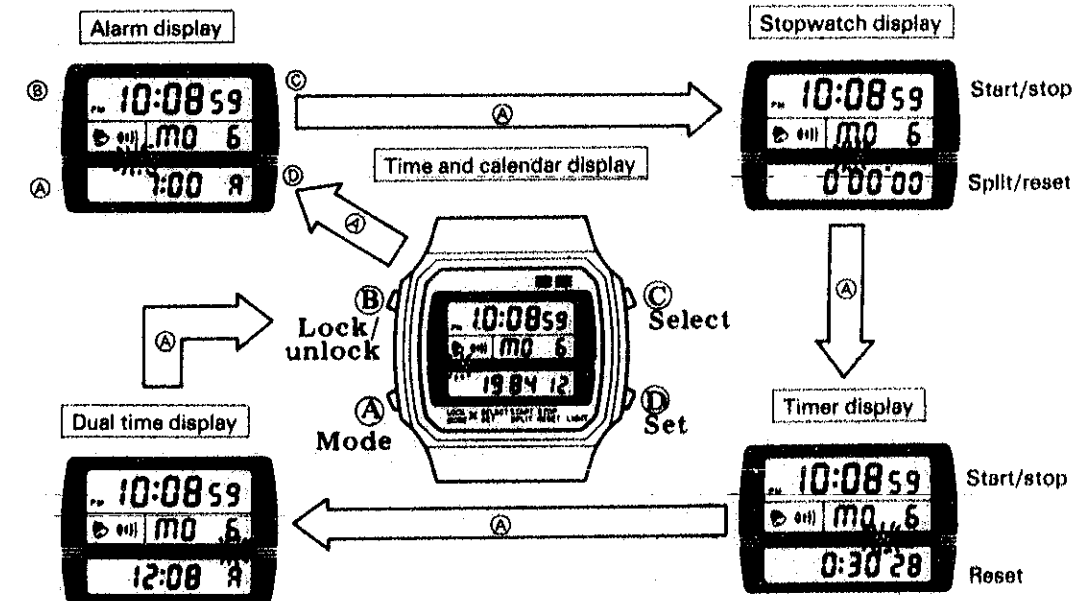
| Item | | Cal. No. | W040A |
|-------------------------------|-----------------|---|--|
| Display medium | | | Nematic Liquid Crystal, FEM (Field Effect Mode) |
| Liquid Crystal Driving System | | | Multiplex driving system |
| Display system | | | <ul style="list-style-type: none"> ● Time and calendar display (12-hour/24-hour indication) ● Alarm display (alarm time: 20 seconds) ● Stopwatch display (up to 12 hours) ● Timer display (up to 11 hours and 59 minutes) ● Dual time display |
| Additional mechanism | | | <ul style="list-style-type: none"> ● Hourly time signal ● Sound demonstration function ● Illuminating light ● Full auto calendar |
| Loss/gain | | | Monthly Rate: Less than 20 seconds at normal temperature range |
| Module size | Casing diameter | φ29.3 mm (6 - 12H: 26.0 mm/3 - 9H: 26.0 mm) | |
| | Height | 4.8 mm | |
| Regulation system | | | Trimmer condenser |
| Quartz Tester measuring gate | | | Any gate is available |
| Battery | | | <ul style="list-style-type: none"> ● SEIKO (SEIZAIKEN) ● MAXELL ● SANYO ● MATSUSHITA |
| | | | CR2016 BR2016 Battery life: Approx. 5 years Voltage: 3.0V |

II. STRUCTURE OF CIRCUIT BLOCK



III. DISPLAY FUNCTION

- Each time when button (A) is pressed, the display changes as follows.



[How to set the TIME/CALENDAR, ALARM, TIMER, DUAL TIME]

The displays except the stopwatch display can be set as follows.

- ① Press button (A) to select the respective display (TIME/CALENDAR, ALARM, TIMER, DUAL TIME).
 - ② Press button (B) for about 1 second to activate the setting mode.
 - ③ Press button (C).
- The digit to be set can be selected (select.)
- ④ Press button (D).
- Each time when button (D) is pressed, one digit (flashing) except seconds is advanced (set.)
- ⑤ After all adjustments are completed, press button (B) to return to the respective first display ①.

Note:

- In the 24-hour indication (24-H mark is displayed), the alarm display and the dual time display are also set to 24-hour indication.
- The digit (flashing) except the seconds are advanced quickly by keeping button (D) pressed in the setting function.

How to engage and disengage

Alarm:

In the alarm display, the alarm can be engaged and disengaged alternately by pressing buttons (C) and (D) simultaneously.

Hourly time signal:

In the time and calendar display, the hourly time signal can be engaged and disengaged alternately by pressing buttons (C) and (D) simultaneously.



Pattern segment checking mode

Press buttons (C) and (D) simultaneously in the set mode of the time and calendar display. To disengage the pattern segment checking mode, press one of buttons (A), (B), (C), or (D).

IV. DISASSEMBLING, REASSEMBLING AND LUBRICATING OF THE CASE

Disassembling procedures: Figs. ① ~ ③
 Reassembling procedures: Figs. ③ ~ ①

Lubricating:

| Types of oil | Oil quantity |
|--|--|
| Silicon oil  | Standard  |

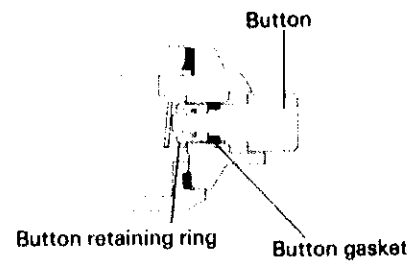
● How to remove/install push buttons

Don't remove the buttons except when the button does not function correctly due to dust or lint.

(Removal)

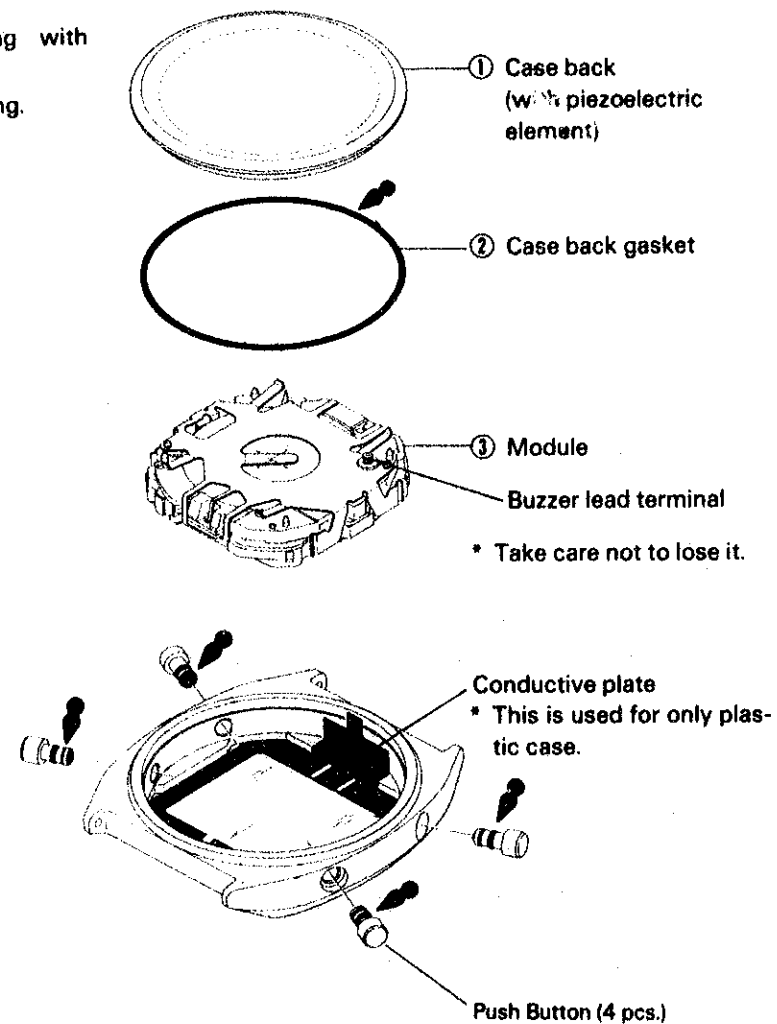
While holding the button retaining ring with tweezers, push it outward.

* Do not disassemble the button retaining ring.



(Installation)

Press in the button to the case.





V. DISASSEMBLING AND REASSEMBLING OF THE MODULE

Disassembling procedures: Figs. ① ~ ⑪
 Reassembling procedures: Figs. ⑪ ~ ①

① Buzzer lead terminal

To remove the buzzer lead terminal, turn it to align the tip with notch in the battery guard.

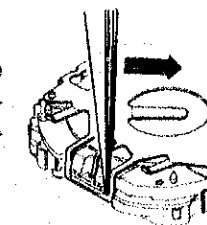
* Two types of buzzer lead terminals are used according to the construction of the case back as follows.

| Construction of the case back | Mounting direction | |
|-------------------------------|--|---|
| | Case back side | Circuit side |
| Screw type |  4246 020 |  |
| Other than screw type | Either is possible 4246 028 | |

② Battery clamp

(Removal)

Insert the tweezers into the battery clamp at 6 o'clock position as shown in the right figure and pry it out.



(Installation)

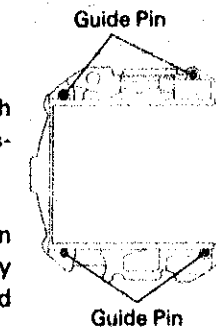
Set the battery clamp at 12 o'clock position first, then set the 6 o'clock position.

④ Battery guard

The battery guard is fixed with 4 guide pins on the liquid crystal panel frame.

(Removal)

Insert a screw driver between the circuit block and battery guard near the guide pin and repeatedly pry out.

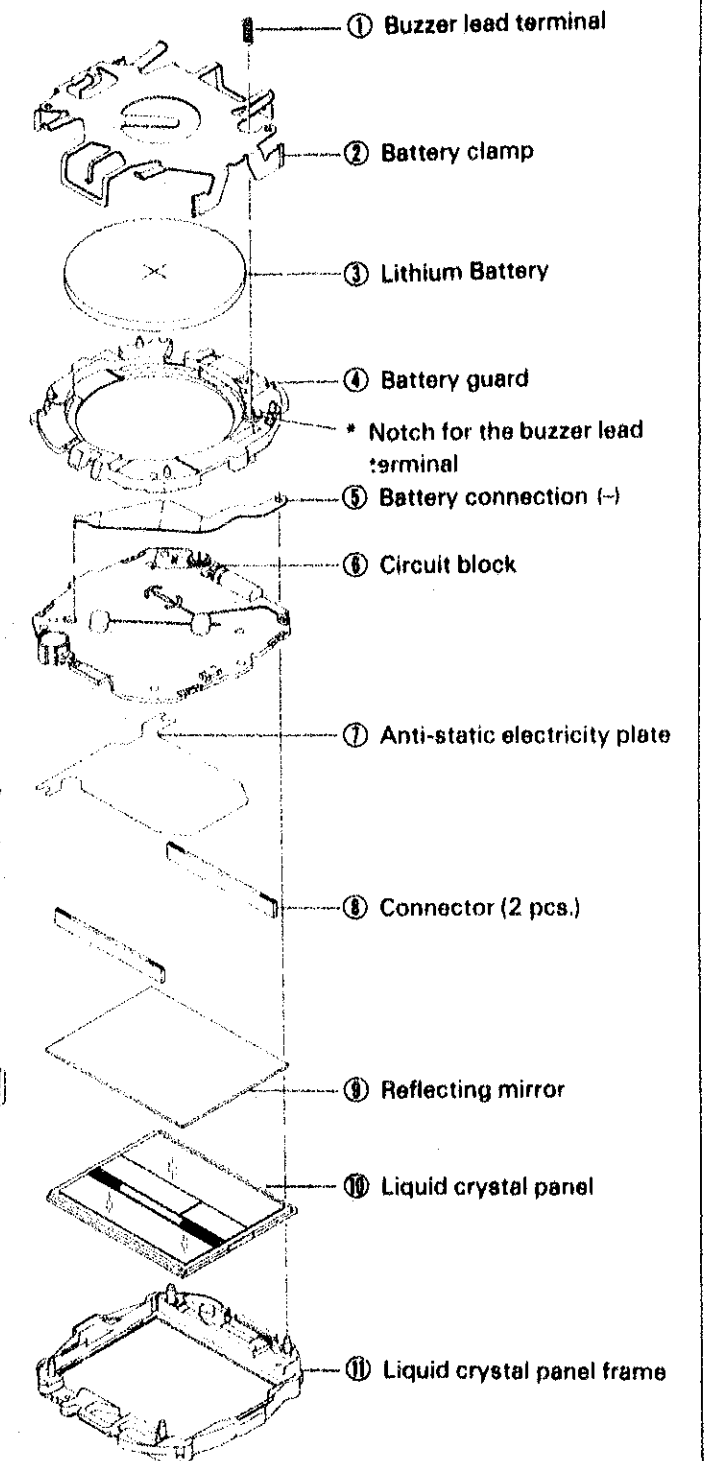


(Installation)

Uniformly press in the battery guard so that there is no gap between the circuit block, liquid crystal panel frame and battery guard.

⑦ Anti-static electricity plate

Set the anti-static electricity plate in the guide pin of the liquid crystal panel frame.



VI. CHECKING AND ADJUSTMENT

- This section only gives the checking and adjustment procedure which is exclusive for cal. W040A.
For the normal checking and adjustment, refer to the "TECHNICAL GUIDE GENERAL INSTRUCTION, Digital Quartz".

BATTERY VOLTAGE

Use the SEIKO Digital Multi Tester S-840A
Range to be used: DC V

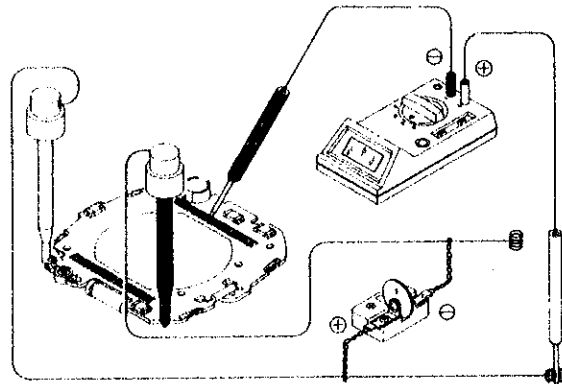
Result:
● CR2016 battery
More than 2.9V: Normal
Less than 2.9V: Defective

● BR2016 battery
More than 2.8V: Normal
Less than 2.8V: Defective

CIRCUIT BLOCK

Check that the circuit block outputs normal signals as illustrated below.
● Use the SEIKO Digital Multi-Tester (S-840A) and the Current Supplier (S-833) with lithium battery (CR2016).

Range to be used: DCV



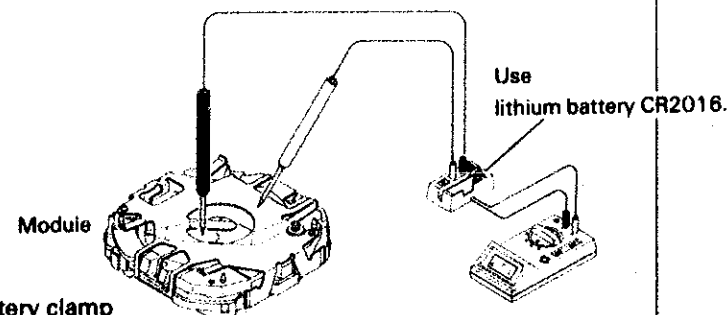
Result:
More than 1.2V: Normal
Less than 1.2V: Defective
Replace the circuit block.

CURRENT CONSUMPTION

Use the SEIKO Digital Multi Tester S-840A and the Multi Adaptor MA-40 with Lithium battery (CR2016).

Range to be used: μA

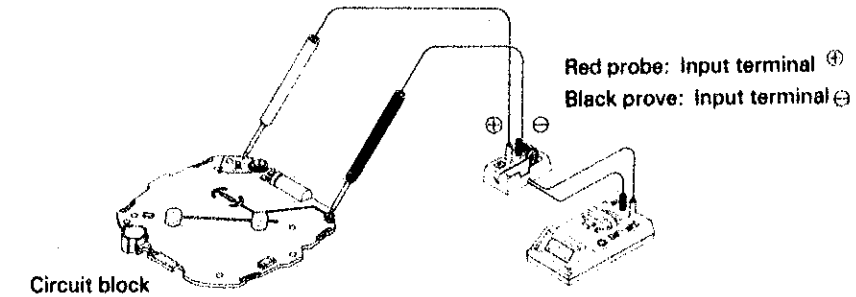
- ① Check total current consumption of the module.



Red Probe: Battery clamp
Black probe: Battery connection ⊖

Result:
More than $1.4\mu A$: Normal
Less than $1.4\mu A$: Defective

- ② If the current consumption is more than $1.4\mu A$, check the current consumption for the circuit block alone.

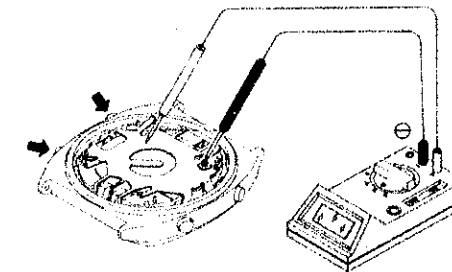


Result:
Less than $0.8\mu A$: Normal
More than $0.8\mu A$: Defective
Replace the circuit block.

ALARM CONDITION

In the time/calendar display and alarm display, check to see if the alarm rings by pressing buttons C and D simultaneously.
When the alarm does not ring, go through this procedure.

- ① Check to see if the alarm signal correctly transmitted from the circuit block.
Keep buttons C and D pressed simultaneously in the time and calendar display or alarm display and check that the alarm signal is output.
● Use the SEIKO Digital Multi Tester (S-840A).
Range to be used: DCV



Result:
the output voltage is displayed intermittently: Normal
(The alarm signal is output.)

The digits displayed remain "00.0V": Defective
Check the Upconverter coil.

- ② Check the Upconverter coil.
range to be used: Ω

- ③ Check the appearance of piezoelectric element.
If items No. ① and ② above are normal, check the piezoelectric element for crack or peel off.

Result:
 $130\Omega - 170\Omega$: Normal
Less than 130Ω } :Defective
More than 170Ω }
Replace the circuit block.

PATTERN SEGMENT MODE

| | |
|---|--|
| <p>Press buttons Ⓢ and Ⓜ simultaneously in the set mode of the time and calendar display.</p> | <p>Result: All the segments displayed: Normal Some segments not displayed : Defective Replace the liquid crystal panel or check the circuit block.</p> |
|---|--|

BULB CONDITION

| | |
|--|--|
| <p>Press button Ⓜ in the time/calendar display and the alarm display.</p> | <p>Result: Lights up: Normal Lights dimly: Defective Replace the battery. Does not light: Defective Replace the bulb or check the circuit block.</p> |
|--|--|

VII. PARTS LIST

| Cal. W040 A | |
|--------------------------|--|
| PARTS NO. | PARTS NAME |
| 4000 067 | Circuit block |
| 4225 080 | Battery clamp |
| *4246 020 | Buzzer lead terminal (for screw type case back) |
| *4246 028 | Buzzer lead terminal |
| 4257 012 | Anti-static electricity plate |
| 4270 058 | Battery connection (-) |
| 4313 056 | Connector |
| 4395 013 | Battery guard |
| *4510 095 | Liquid crystal panel (silver) |
| 4512 002 | Liquid crystal panel frame |
| 4521 030 | Reflecting mirror |
| 4530 230 | Bulb |
| 4589 003 | Piezoelectric element |
| SEIKO (SEIZAIKEN) CR2016 | } LITHIUM BATTERY |
| SANYO CR2016 | |
| MAXELL CR2016 | |
| MATSUSHITA BR2016 | |

Remarks:

* Speaker lead terminal

- * 4246 020..... The type of Buzzer lead terminal is determined based on the design of cases.
- * 4246 028

* Liquid crystal panel

- * 4510 095.....
(Silver)
 - * 4510 039.....
(Gold)
- Be sure that combination between the color of panel cover and liquid crystal panel should be matched according to the "Casing Parts Catalogue".