

SEIKO

DIGITAL QUARTZ

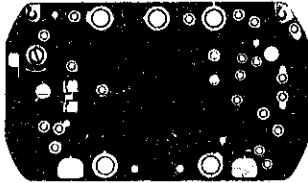
Cal. S023A

PARTS LIST

Cal. S023A



(Cal. S023A: The module parts are assembled to the case bezel, so that the module can not be disassembled from the case bezel.)



4001 442



4245 022



4245 023



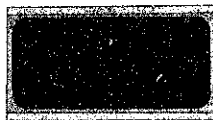
4270 442



4313 442



4446 011



4510 321



☆Toshiba WG3



012 924

$\frac{2}{1}$

Cal. S023A

Characteristics

Diameter of case : 60.0 mm x 54.0 mm
 Height of case : 15.0 mm
 Frequency of quartz crystal oscillator : 32,768 Hz (Hz=Hertz Cycles per second)
 Stopwatch display : Digital Display System showing minute, second and 1/100 second up to 60 minutes.
 The lap time is displayed by depressing a side button.
 Time display : Digital Display System showing hour, minute, second, day of the week and A.M./P.M.
 Calendar display : Digital Display System showing month, date and day of the week.
 Display medium : Nematic Liquid Crystal, FE-Mode
 Regulation system : Trimmer condenser
 Battery life indicator : All the digits in the display begin flashing.

PART NO.	PART NAME	PART NO.	PART NAME
4001 442	Circuit block		
4245 022	Side switch spring		
4245 023	Front switch spring		
4270 442	Battery connection (-)		
4313 442	Connector		
4446 011	Crystal unit cushion		
4510 321	Liquid crystal panel		
012 924	Circuit block screw		
☆Toshiba WG3	Silver oxide battery		
☆SONY EVEREADY392			
☆U.C.C. 392			
☆Maxell SR41W			

Remarks :

Battery

- ☆ Toshiba WG3
- ☆ SONY EVEREADY 392
- ☆ U.C.C. 392
- ☆ Maxell SR41W

..... The applied battery for this calibre might be added the substitutive in the future.
 In that case, please refer to separate "BATTERIES FOR SEIKO QUARTZ WATCHES".

☆ ⇨ Please see remarks.

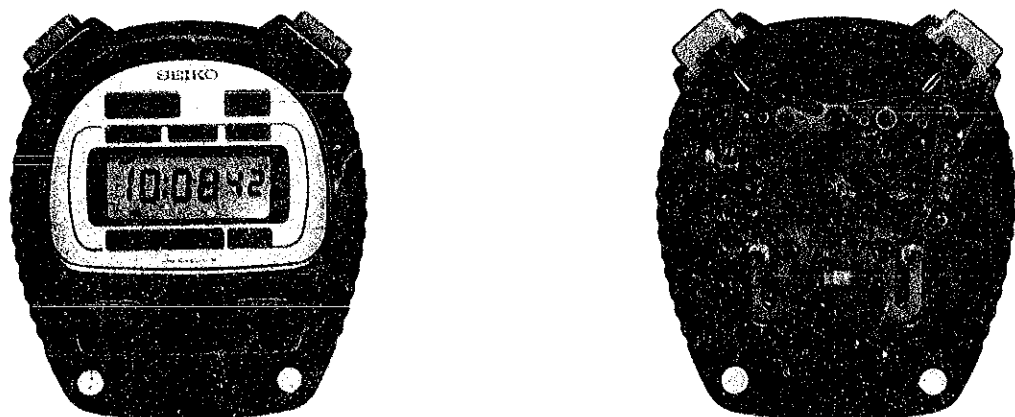
Part numbers in light letters are not shown in photos.

TECHNICAL GUIDE

SEIKO

DIGITAL QUARTZ

CAL. S023A



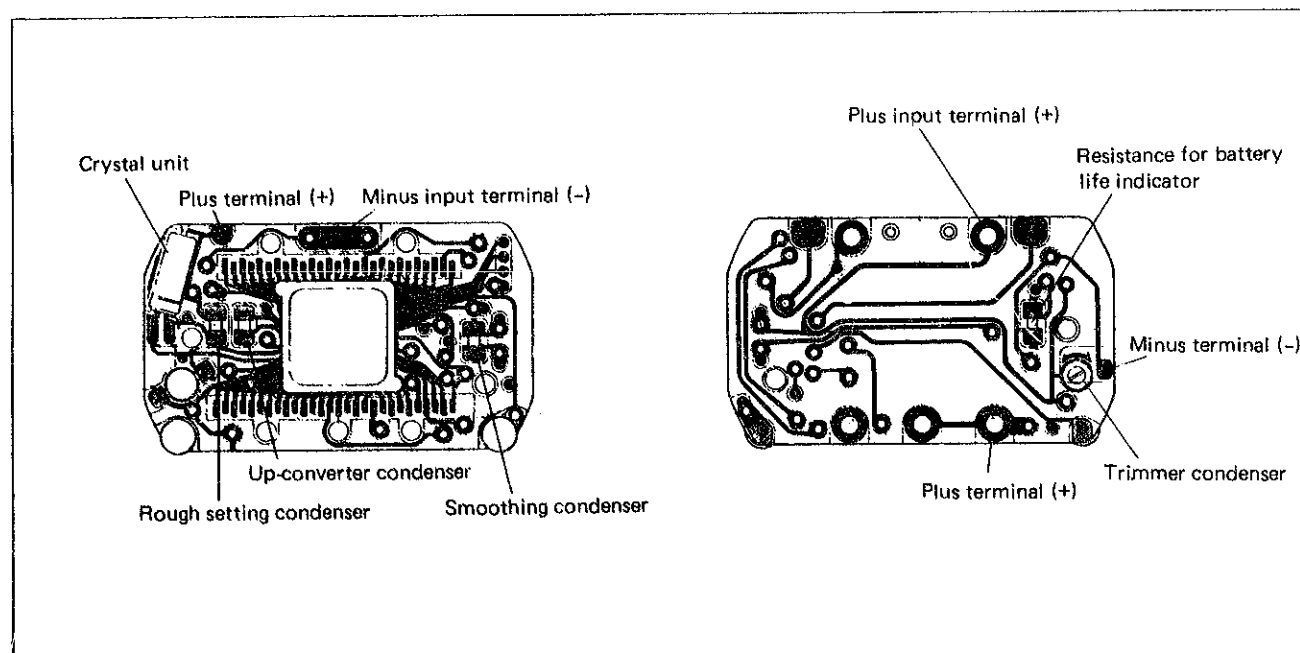
CONTENTS

I. SPECIFICATIONS	1
II. STRUCTURE OF CIRCUIT BLOCK	1
III. DISPLAY FUNCTION	2
IV. DISASSEMBLING, REASSEMBLING AND LUBRICATING.....	3
1. Disassembling, reassembling and lubricating of the case	3
2. Disassembling, reassembling and lubricating of the module.....	5
3. Segment (Liquid crystal panel electrode)	7
V. CHECKING AND ADJUSTMENT.....	8
• Check battery voltage.....	8
• Check conductivity of liquid crystal panel, circuit block and connector	8
• Check liquid crystal panel and circuit block.....	8
• Check current consumption	9
• Check accuracy	9
• Check adjustment and functioning.....	9
• Check conductivity of switch components.....	9

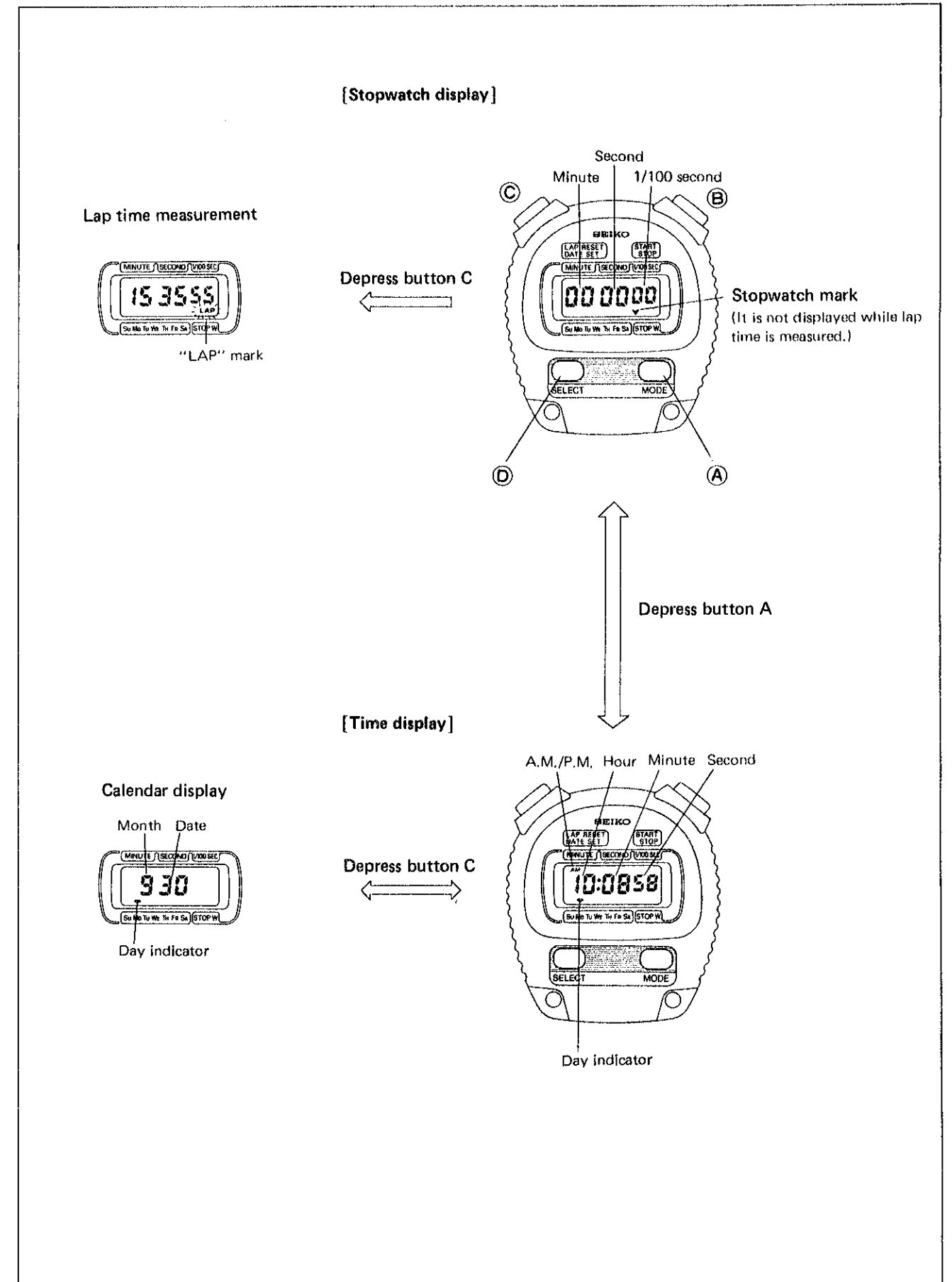
I. SPECIFICATIONS

Item	Cal. No.	S023A
Display medium		Nematic Liquid Crystal, FEM (Field Effect Mode)
Display system		<ul style="list-style-type: none"> • Stopwatch display • Time and calendar display
Additional mechanism		<ul style="list-style-type: none"> • Battery life indicator
Loss/gain		Loss/gain at normal temperature 99.9992% (equivalent to the mean monthly rate of less than 20 seconds)
Diameter of watch case		60.0mm, between 12 o'clock and 6 o'clock sides 54.0mm, between 3 o'clock and 9 o'clock sides
Height of watch case		15.0mm
Regulation system		Trimmer condenser
Measuring gate by Quartz Tester		Any gate is available.
Battery		Toshiba SR41W or WG3, Maxell SR41W, SONY EVEREADY 392 or U.C.C. 392 Battery life is approximately 2 years. Voltage: 1.55 V

II. STRUCTURE OF CIRCUIT BLOCK



III. DISPLAY FUNCTION



IV. DISASSEMBLING, REASSEMBLING AND LUBRICATING

1. Disassembling, reassembling and lubricating of the case

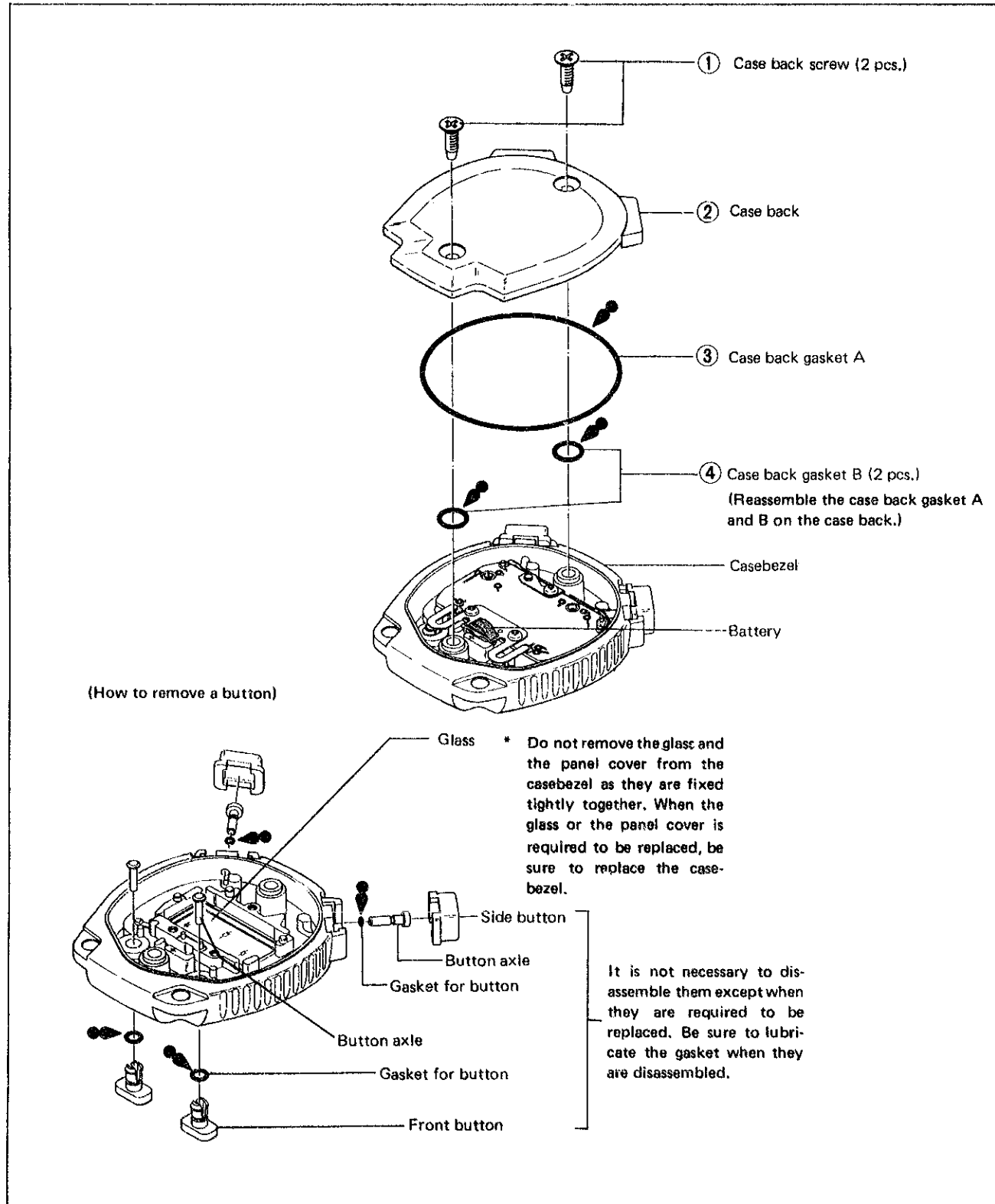
Disassembling procedures Figs. : ① → ④

Reassembling procedures Figs. : ④ → ①

● Lubricating

Silicone grease 500,000 c.s.

Normal quantity 



Remarks for disassembling and reassembling

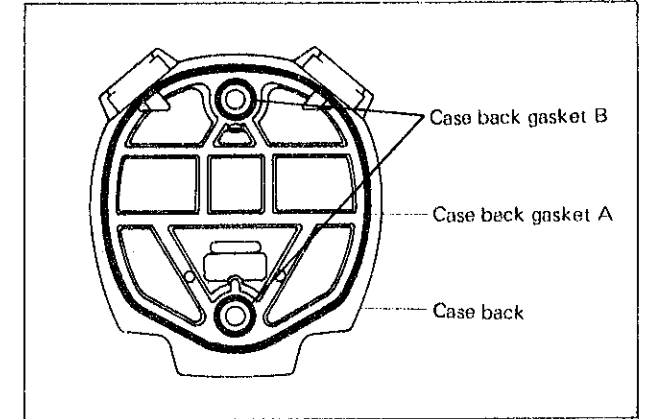
① Case back screw

Use the plus thread screw driver. (The circuit block screw is also plus thread.)

*Be careful not to turn the case back screw excessively. Be sure to check if there is an opening between the case back and the case bezel.

③ ④ Case back gasket A and B

Set the case back gasket A and B as shown in the illustration on the right.



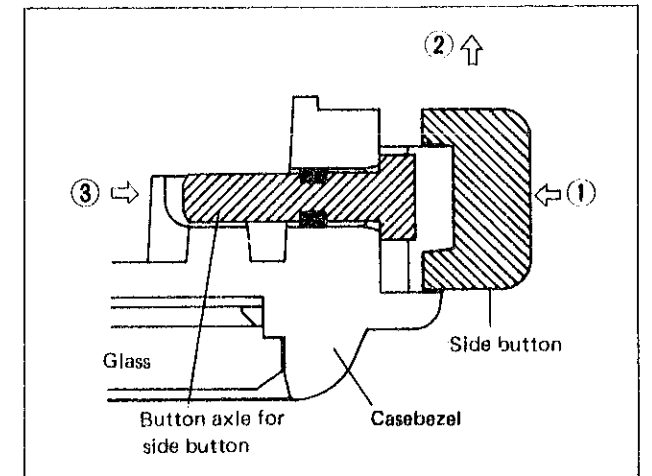
● Disassembling and reassembling of button

- Disassembling and reassembling of the side button and the front button must be performed after removing the side switch spring and the front switch spring.

[Disassembling procedures of the side button]

- Depress the button to the case bezel.
- Push the button up to remove from the case bezel.
- Push the tip of the button axle for side button with tweezers from inside the case bezel and remove it.

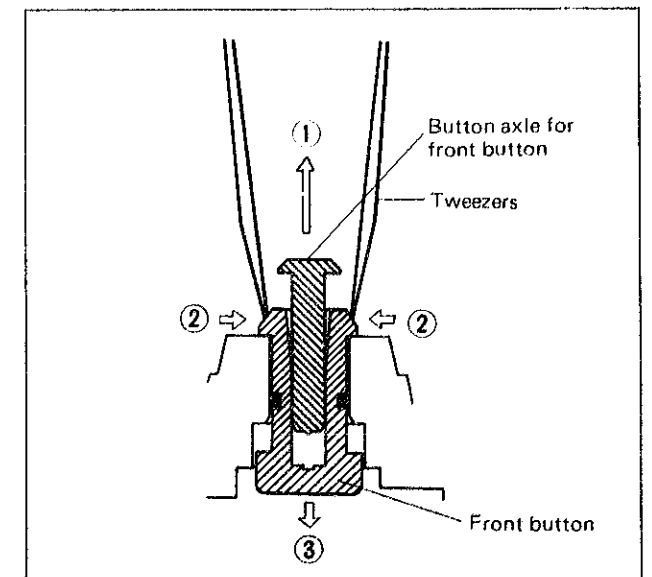
Note: Follow the reverse procedures to reassemble the side button.



[Disassembling procedures of the front button]

- Disassemble the button axle for front button. (Button axle for front button is put in the front button as shown in the illustration on the right, and it is easily removed. Be careful not to lose it.)
- Push the tip of the button inside with tweezers as shown in the illustration on the right.
- Remove it by pushing the front button down.

Note: Set the front button by pushing it from the glass side with your finger and reassemble the button axle for front button.




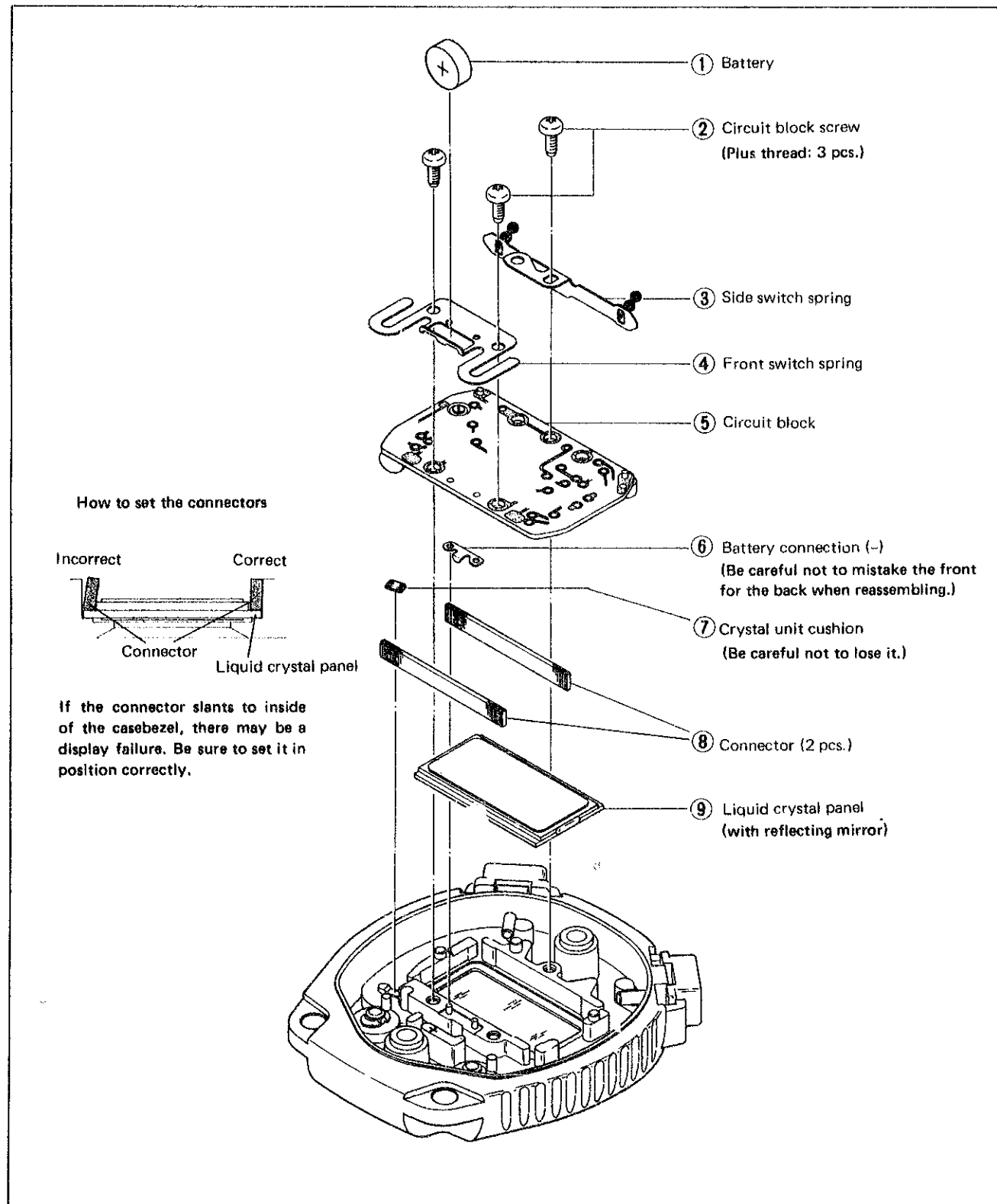
V. DISASSEMBLING AND REASSEMBLING

2. Disassembling, reassembling and lubricating of the module

Disassembling procedures Figs. : ① → ⑨

Reassembling procedures Figs. : ⑨ → ①

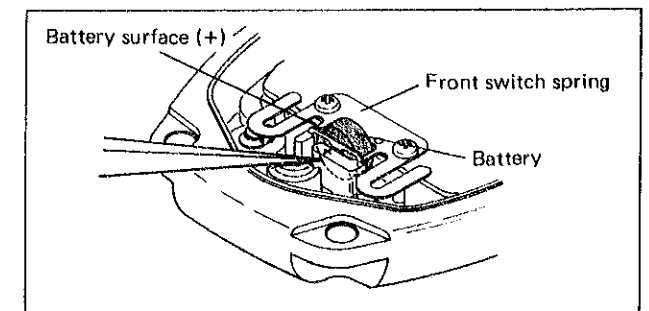
- Lubricating
SEIKO Watch Oil S-6
Normal quantity 



Remarks for disassembling and reassembling

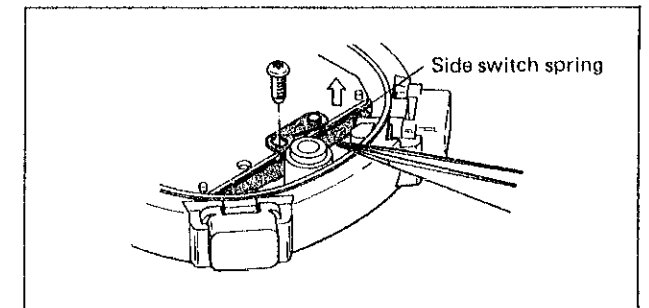
① Battery

Put the tip of tweezers under the battery as shown in the illustration and push it up to remove the battery. And when setting the battery, be careful no to mistake the (+) side for the (-) side.



③ Side switch spring

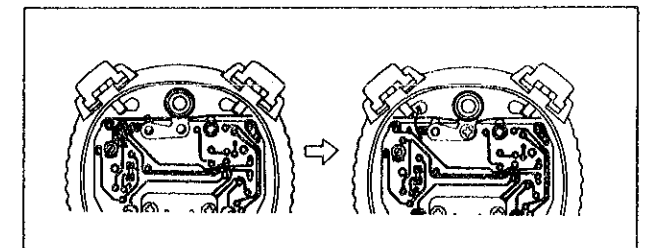
- How to disassemble
Pry up the side switch spring with tweezers after the circuit block screw is removed.



- How to reassemble

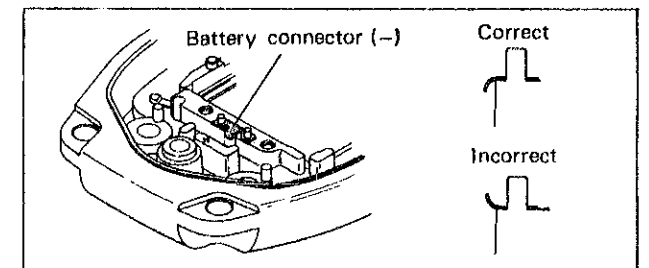
- ① Push out the button axle of the side button.
- ② Set the one side of the side switch spring between the casebezel and the circuit block.
- ③ Set the other side while holding the end of side switch spring (arrow-marked position) by your fingers.

*Be careful not to deform the side switch spring.



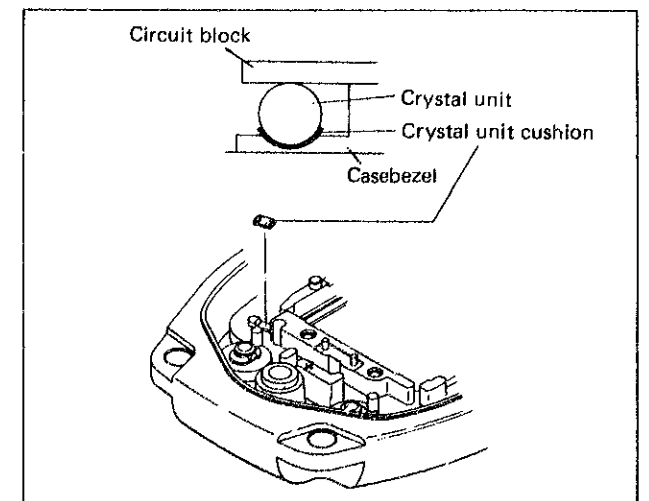
⑥ Battery connection (-)

Set the battery connection (-) as shown in the illustration on the right.



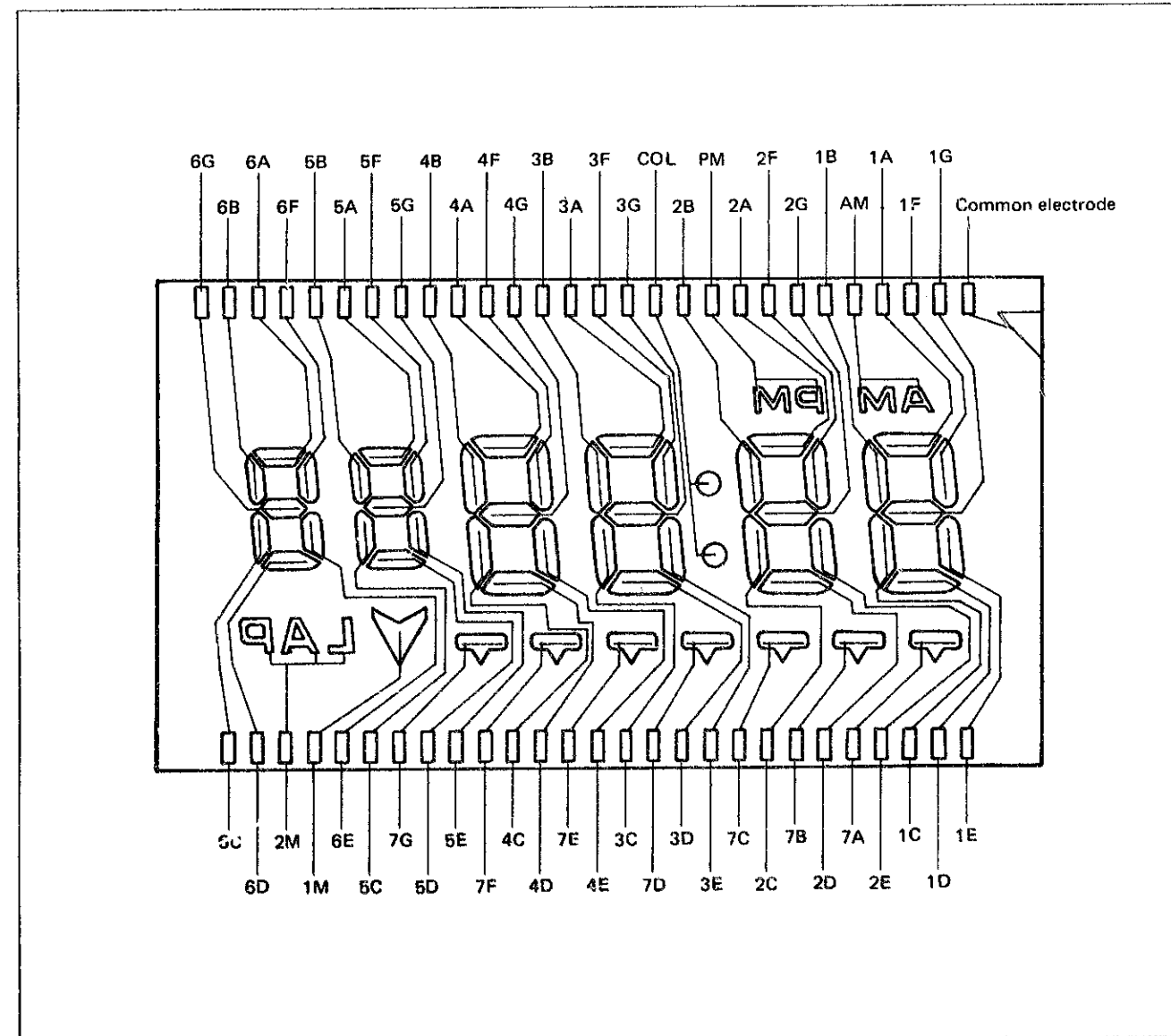
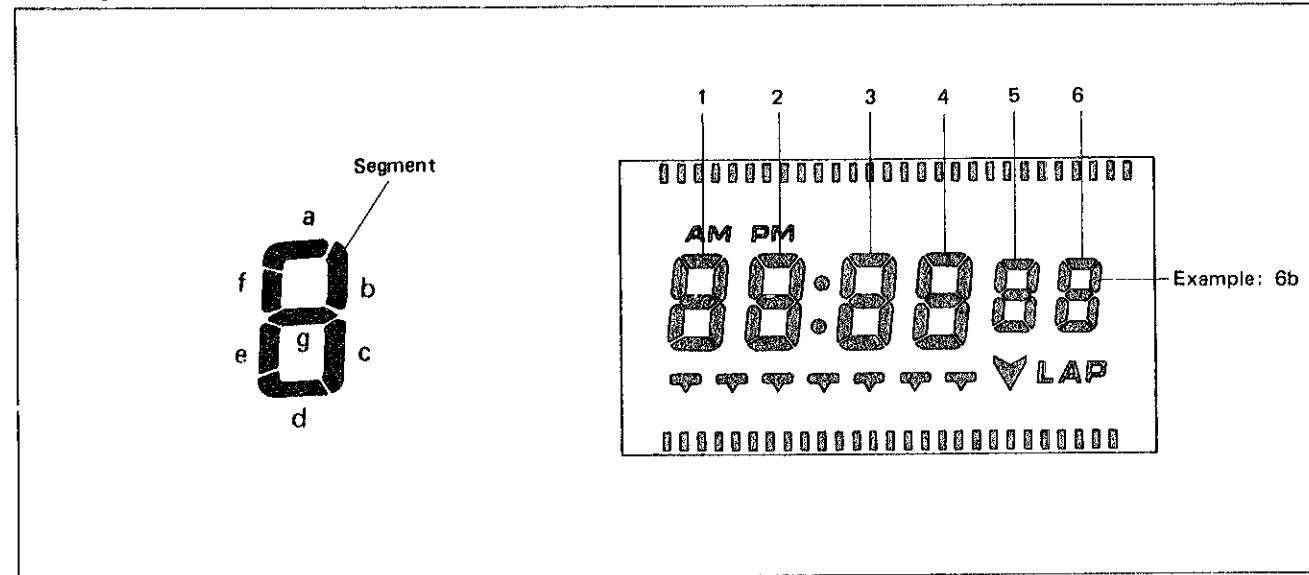
⑦ Crystal unit cushion

Set the crystal unit cushion to the casebezel correctly as shown in the illustration on the right.



3. Segment (Liquid crystal panel electrode)

- Designation of segment



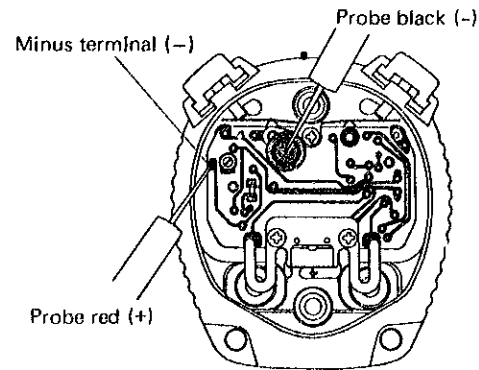
V. CHECKING AND ADJUSTMENT

- Refer to the "SEIKO QUARTZ TECHNICAL GUIDE, GENERAL INSTRUCTION FOR DIGITAL WATCHES" for details.

Procedure	
CHECK BATTERY VOLTAGE	<p>Result: More than 1.5V: Normal Less than 1.5V : Defective Replace the battery with a new one.</p>
CHECK CONDUCTIVITY OF LIQUID CRYSTAL PANEL, CIRCUIT BLOCK AND CONNECTOR	
CHECK LIQUID CRYSTAL PANEL AND CIRCUIT BLOCK	
<p>Current supplier S-833</p> <p>Probes of the Volt-ohm-meter</p>	<ul style="list-style-type: none"> • Check to see if the electric signal comes out from the circuit block correctly. <p>Result: More than 0.8V: Normal Less than 0.8V : Defective Replace the circuit block with a new one.</p>
<p>Segment electrode</p> <p>Common electrode</p>	<ul style="list-style-type: none"> • Check for short circuit, broken panel pattern, etc. of the liquid crystal panel. <p>Result: Lights up: Normal Does not light up: Defective Replace the liquid crystal panel with a new one.</p>

Procedure

CHECK CURRENT CONSUMPTION



- Volt-ohm-meter
Probe red (+) Minus terminal (-)
Probe black (-) Battery surface (-)

Result:
Less than $2.5\mu\text{A}$: Normal
* More than $2.5\mu\text{A}$: Defective

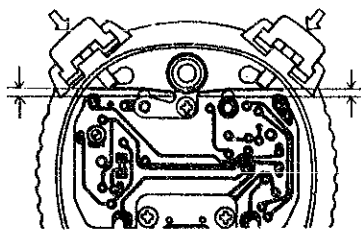
* How to check if the liquid crystal panel or the circuit block is defective when the current consumption is more than $2.5\mu\text{A}$.
Disassemble the liquid crystal panel and the connector. Measure the current consumption after fixing the circuit block with screws.

Result:
Less than $1.7\mu\text{A}$
(circuit block): Normal
Replace the liquid crystal panel with a new one.
More than $1.7\mu\text{A}$
(circuit block): Defective
Replace the circuit block with a new one.

CHECK ACCURACY

CHECK ADJUSTMENT AND FUNCTIONING

CHECK CONDUCTIVITY OF SWITCH COMPONENTS

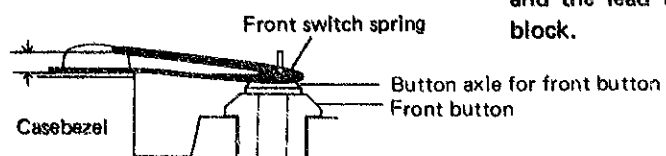


- **Check the side switch spring.**
Check to see if the side switch spring touches the circuit block electrode when the side switch button is depressed and there is a clearance between the side switch spring and the circuit block electrode when the side switch button is released.

Result:
Functions correctly: Normal

Does not function correctly:
Defective
Replace the switch spring with a new one.

- **Check the front switch spring.**
Push the front button down and check to see if there is a clearance between the front switch spring and the lead terminal of circuit block.



All procedures of Disassembling, Reassembling, Checking and Adjustment are completed.