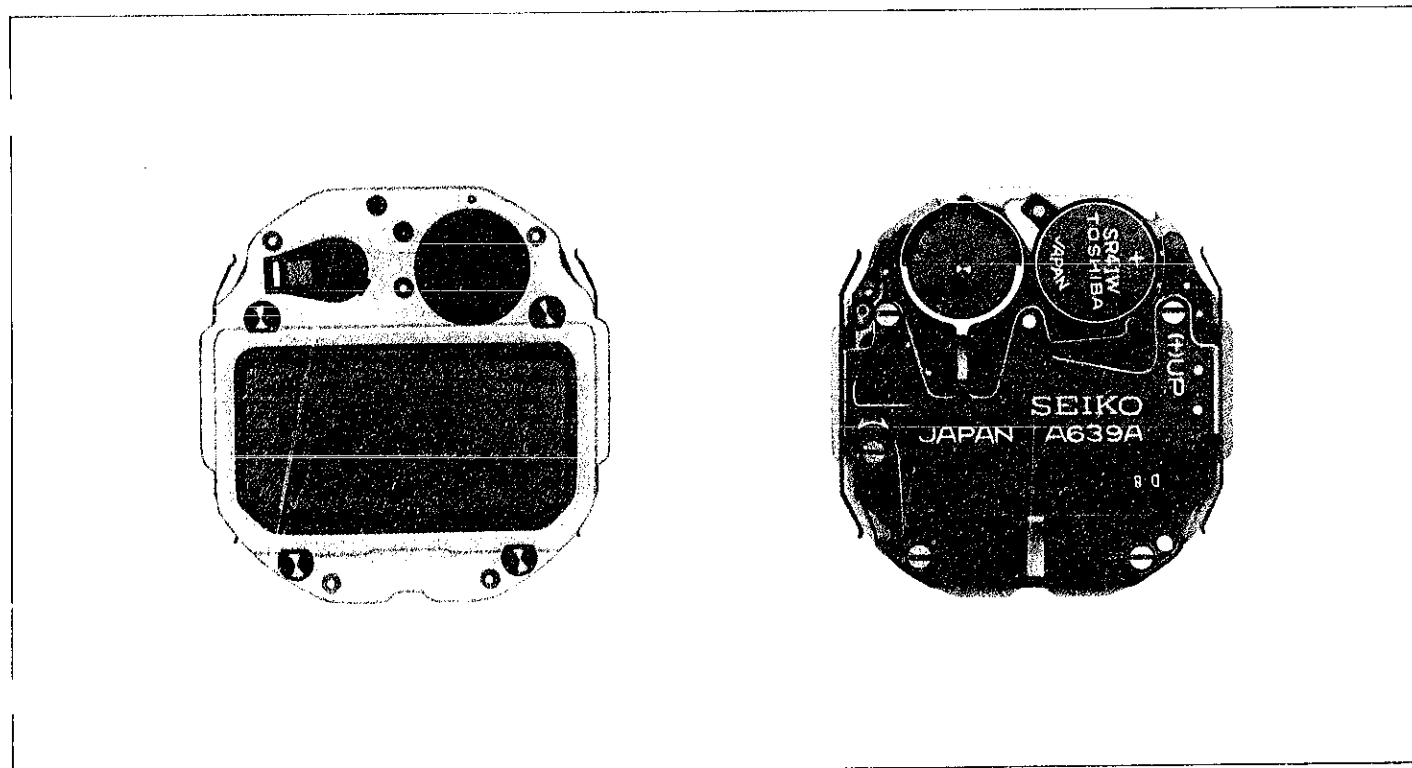


TECHNICAL GUIDE

SEIKO DIGITAL QUARTZ

CAL. A638A
CAL. A639A

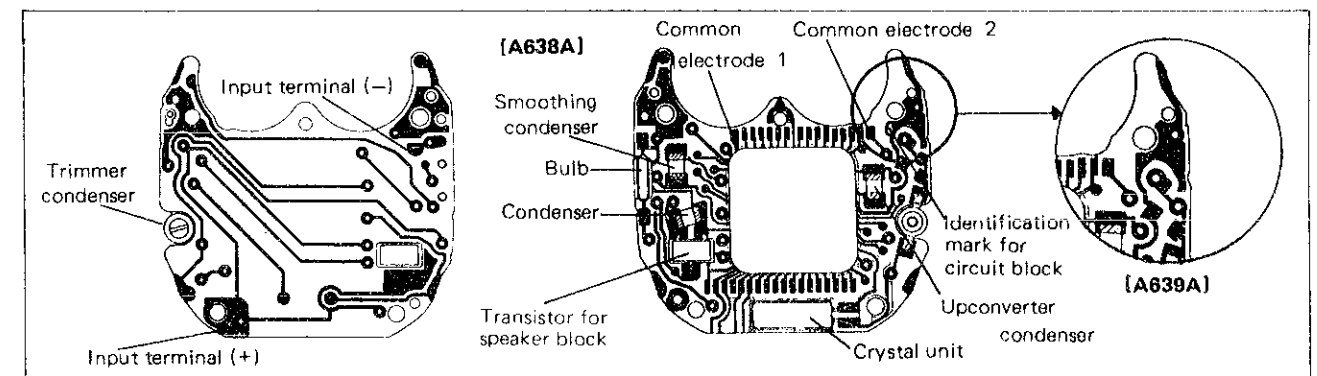


I. SPECIFICATIONS

Item	Cal. No.	A638A	A639A
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 • Alarm display 	<ul style="list-style-type: none"> • Stopwatch display
Additional mechanism		<ul style="list-style-type: none"> • Time signal • Alarm test system • Illuminating light 	
Loss/gain		Loss/gain at normal temperature range Monthly rate: less than 15 seconds (Annual rate: less than 3 minutes)	
Outside diameter		ϕ 27.0 mm (25.4 mm between 6 o'clock and 12 o'clock sides) (25.1 mm between 3 o'clock and 9 o'clock sides)	
Height		4.0 mm without battery	
Regulation system		Trimmer condenser	
Measuring gate by Quartz Tester		Any gate is available.	
Battery		Toshiba SR41W (or Toshiba WG3), U.C.C. 392, Maxell SR41W, or SONY EVEREADY 392 Battery life is approximately 2 years. Voltage: 1.55 V	

II. STRUCTURE OF THE CIRCUIT BLOCK

- The circuit block of Cal. A638A and Cal. A639A has the same appearance and attachments, but the IC and part of the electrodes differ. When disassembling and reassembling, take good care.



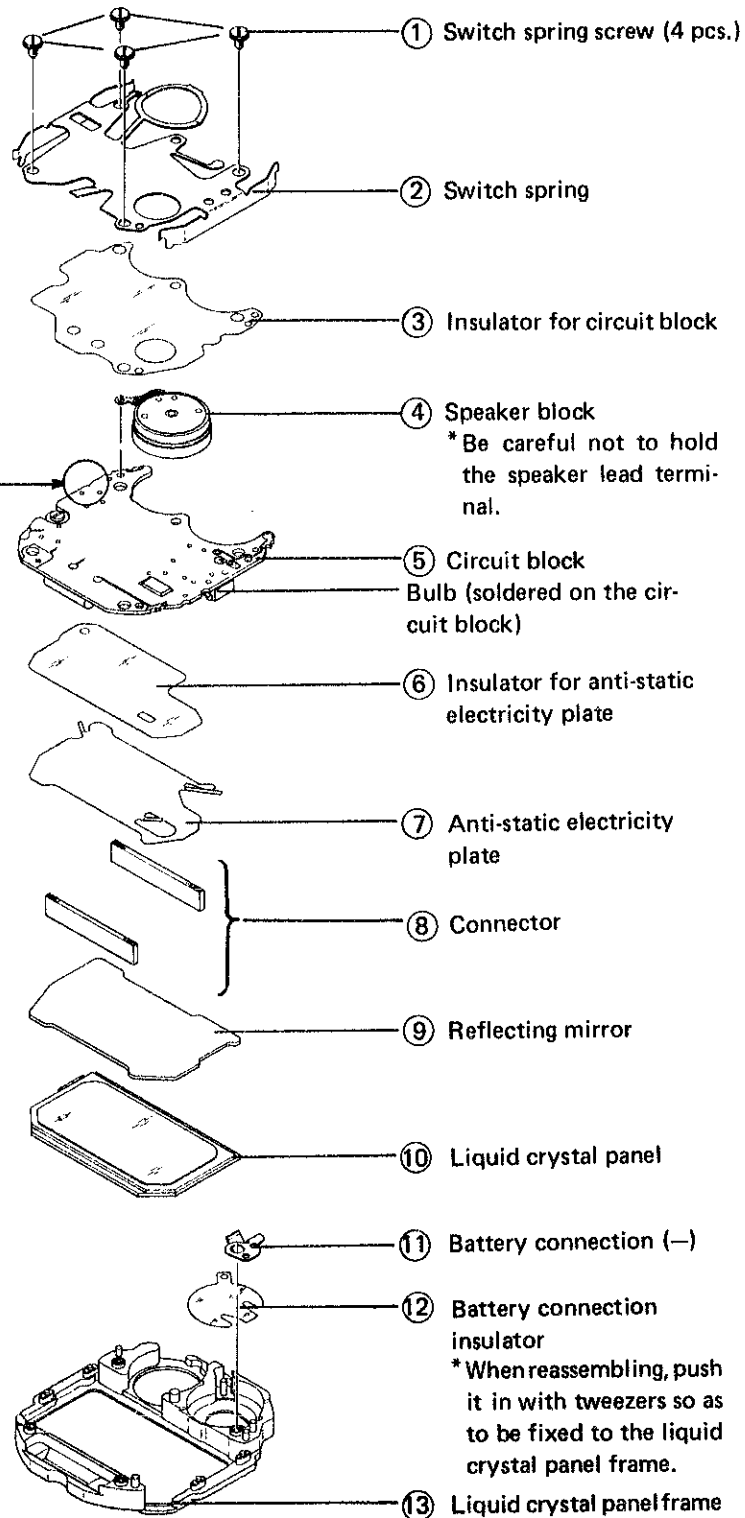
III. DISASSEMBLING AND REASSEMBLING

Disassembling procedures Figs.: ① → ⑬

Reassembling procedures Figs.: ⑬ → ①

- Use the inserting disk S-173 as the module holder so as not to catch the speaker pipe.

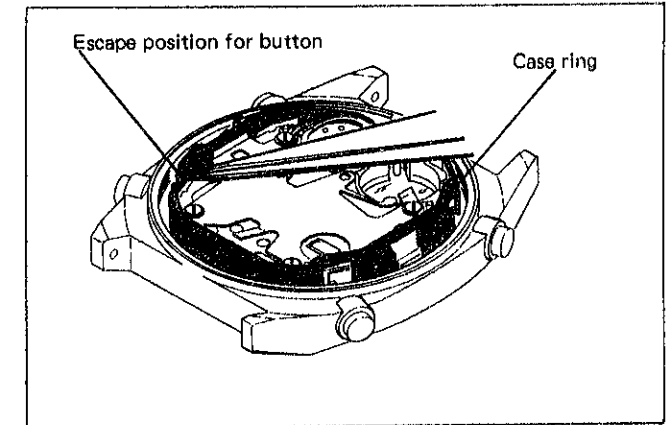
When disassembling and reassembling, be sure to hold this part.



Remarks for disassembling and reassembling

- Remarks for disassembling the case

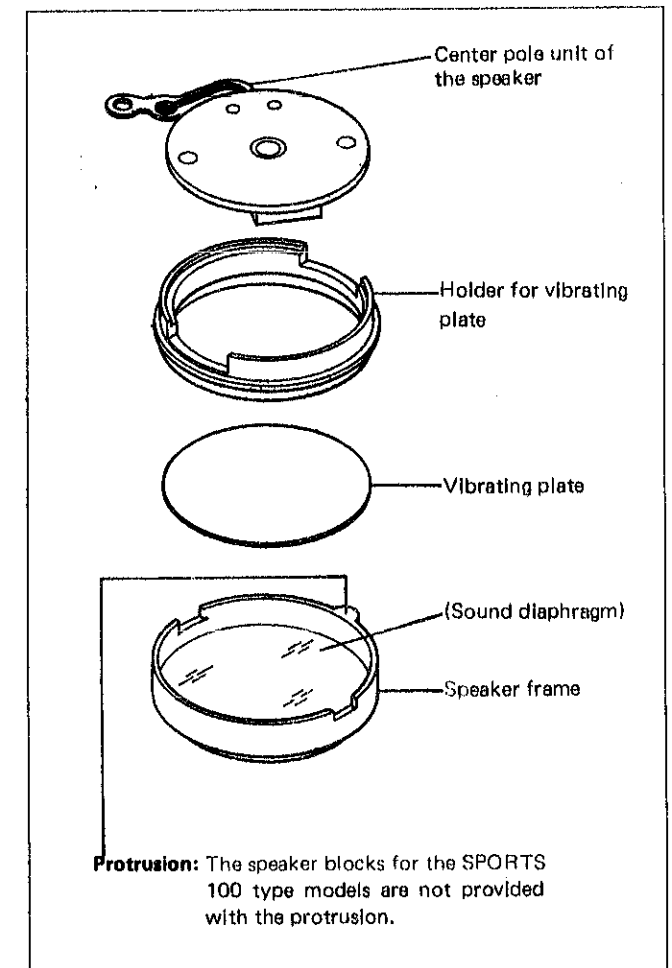
When disassembling the case ring from the middle with bezel, be sure to hold the case ring at four notches (escape position for button). Be careful not to scratch the notch of the case ring as it is thin.



④ Speaker block

It is not necessary to disassemble the speaker block except when the parts are required to be replaced.

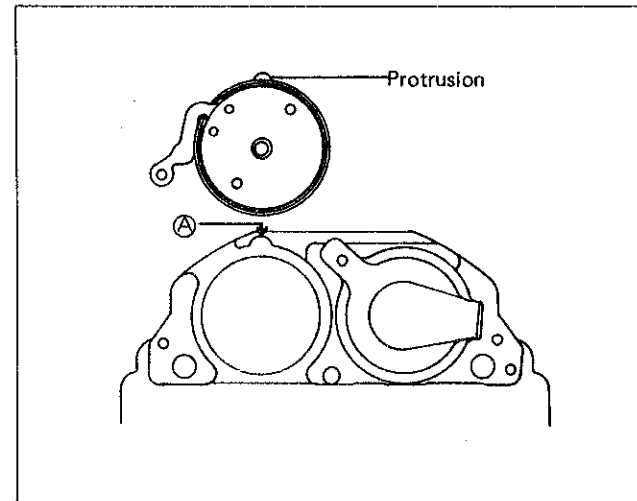
- If the speaker block has been disassembled, be sure to reassemble it so that dust may not enter its inside.
- Handle the vibrating plate and sound diaphragm carefully so as not to deform them, or the alarm may vary in tone and volume.



• Reassembling position of the speaker block

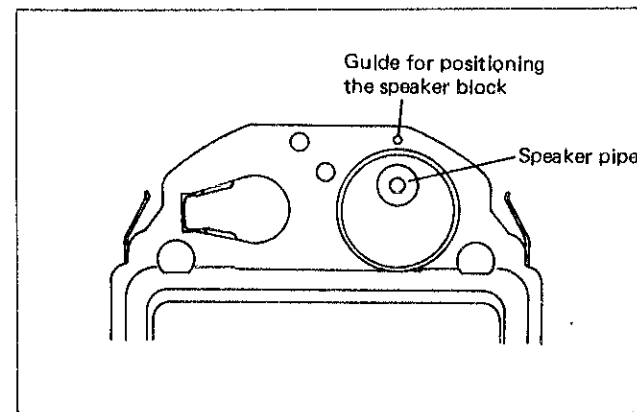
(1) For models of water resistant case:

Fit the protrusion of the speaker frame to the notch (A) in the illustration) of the liquid crystal panel frame.



(2) For SPORTS 100 type models (Reinforced water resistant case):

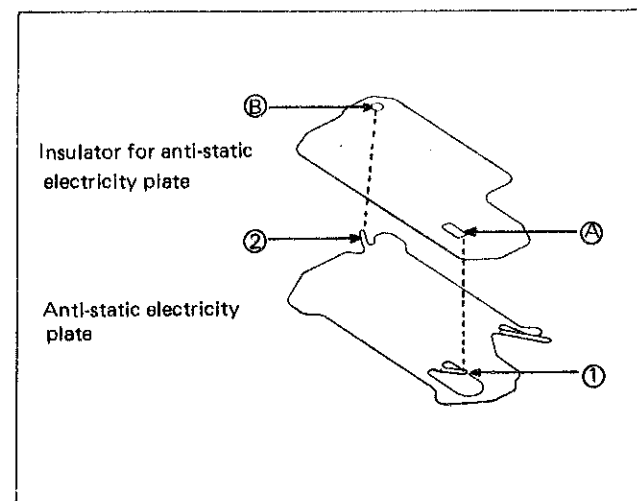
After reassembling the speaker block, align the speaker pipe to the guide for positioning the speaker block on the liquid crystal panel frame.



⑥ ⑦ Insulator for anti-static electricity plate, anti-static electricity plate

Insert the portion ① of the anti-static electricity plate into the portion A of the insulator for anti-static electricity plate.

Then put the portion ② into the portion B.



IV. CHECKING AND ADJUSTMENT

• Refer to the "SEIKO QUARTZ TECHNICAL GUIDE, GENERAL INSTRUCTION" for digital watches for details.

Procedure	
CHECK BATTERY VOLTAGE	Result: More than 1.5V: Normal Less than 1.5V: Defective
CHECK BATTERY CONDUCTIVITY	
CHECK CURRENT CONSUMPTION	
<p>(1) Current consumption for the whole of the module</p> <p style="text-align: right;">S-831</p> <p style="text-align: right;">Range to be used: DC 12μA</p>	<p>Result: Less than 2.2μA: Normal More than 2.2μA: Defective</p> <p>Replace the liquid crystal panel or the circuit block. Proceed to (2).</p>
<p>(2) Current consumption for the circuit block alone</p> <p style="text-align: right;">Input terminal \ominus</p> <p style="text-align: right;">Input terminal \oplus</p>	<p>Result: Less than 2.0μA: Normal More than 2.0μA: Defective</p> <p>Replace the liquid crystal panel with a new one. Replace the circuit block with a new one.</p>

Procedure

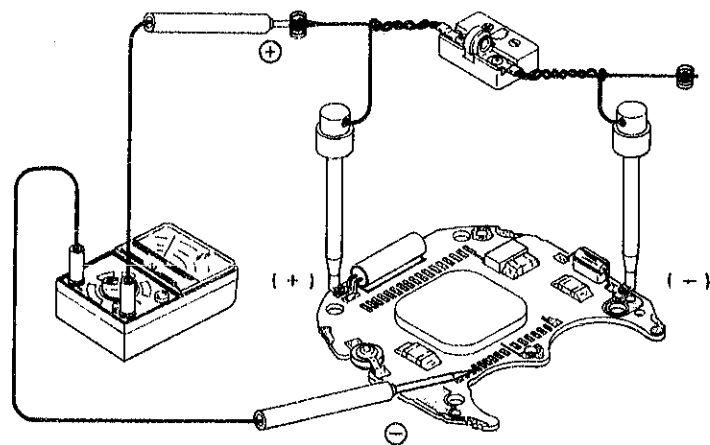
CHECK WATER RESISTANCE

CHECK CONTACT OF C-MOS-LSI ~ LIQUID CRYSTAL PANEL

CHECK CIRCUIT BLOCK AND LIQUID CRYSTAL PANEL

(1) Check the output voltage of the circuit block.

Range to be used: DC3V



Result:

More than 0.8V: Normal
 Less than 0.8V: Defective
 Replace the circuit block with a new one.

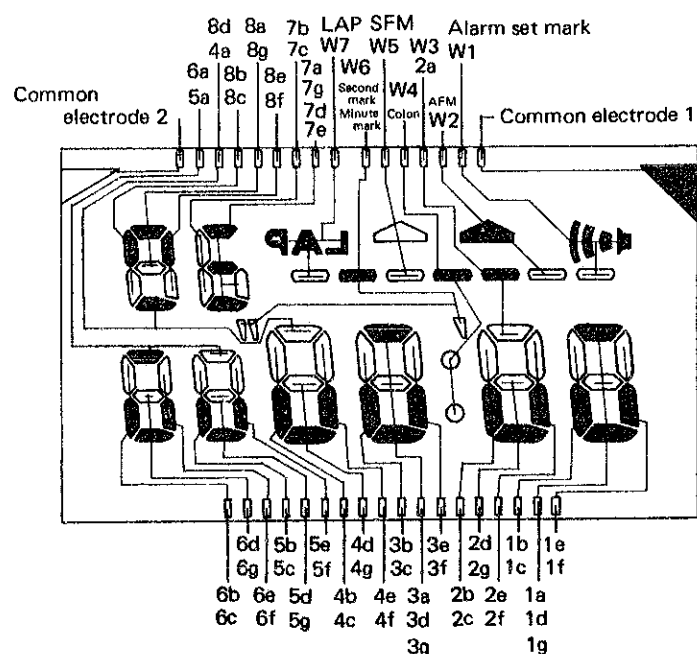
(2) Check for broken wire, short circuit, etc. of the liquid crystal panel.

Common electrode 1 is electrically connected with segments .
 Common electrode 2 is electrically connected with segments .

Note: The same liquid crystal panel is used in Cal. A638A and Cal. A639A. Consequently, when checking the liquid crystal panel alone of Cal. A638A which does not function as the stopwatch, the minute mark, second mark, LAP, and stopwatch function mark will be displayed. The liquid crystal panel of Cal. A638A, however, do not light up these marks when it is reassembled in the module.

[Marks]

SFM: Stopwatch function mark
 AFM: Alarm function mark
 W: Week mark



Procedure

CHECK ACCURACY

Set the digits to "0 000" in the stopwatch function. That will facilitate checking accuracy.

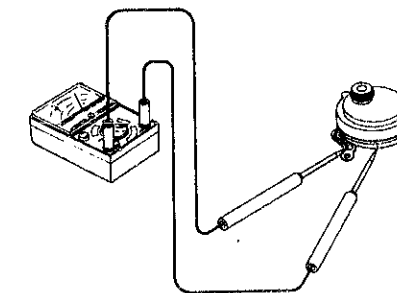
CHECK ALARM TEST SYSTEM

In the time and calendar display depress button C to set the colon flashing and lit alternately. With the colon lit depress button C and the alarm rings. (see page 8.)

CHECK CONDUCTIVITY OF SWITCH COMPONENTS

CHECK SPEAKER BLOCK

Range to be used: OHMS R x 1



Result:

120Ω ~ 140Ω: Normal
 Less than 120Ω (Short circuit) } Defective
 More than 140Ω (Broken wire) }
 Replace the speaker block with a new one.

CHECK BULB CONDITION

• How to replace the bulb

Be sure to use the soldering copper of low heat capacity with as fine a tip as possible.

Thickness of the tip: approx. φ1 mm

Heat capacity: 5W ~ 20W of power consumption

Procedure

(1) Remove the defective bulb.
Hold the defective bulb gently with tweezers, apply the soldering copper to the bulb lead terminal and lift the lead of the bulb to remove it.

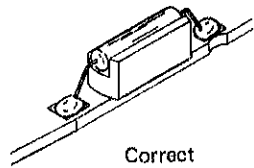
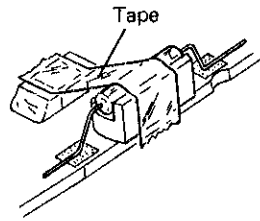
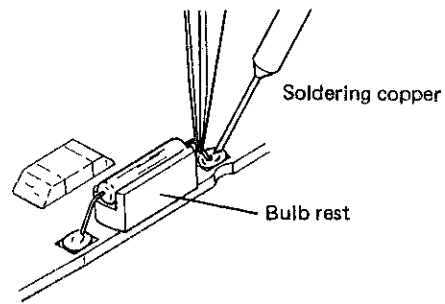
(2) Check to see if the new bulb is normal.
Use the volt-ohm meter and check to see if the bulb lights up.
Range to be used: OHMS R x 1

(3) Fix the bulb to the bulb rest with a tape, etc. It will facilitate the soldering of the bulb.

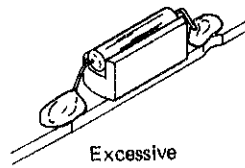
(4) Bend the lead of the bulb as shown in the illustration on the right and cut it off properly with pliers or scissors.

(5) Solder the bulb.

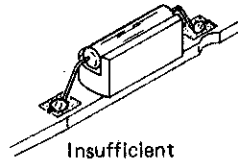
Note: (1) If the soldering copper is applied too long, the circuit block may be damaged. Be sure to apply the soldering copper only to such an extent that the solder is melted uniformly at the connection (for approx. 1 second).
(2) Be careful not to touch the bulb rest (plastic part) with the soldering copper.



Correct



Excessive

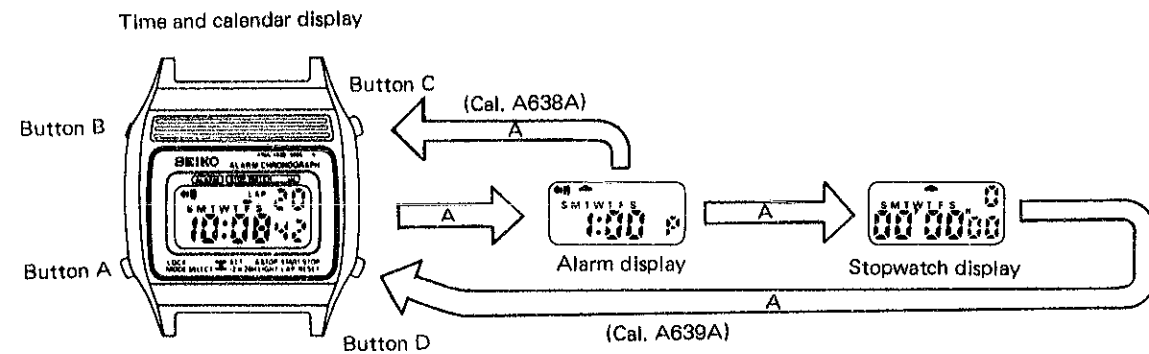


Insufficient

(5) Check the bulb condition again.

Range to be used: OHMS R x 1

CHECK FUNCTIONING AND ADJUSTMENT



- Check to see if the display changes as shown above by each depression of button A.
- Check to see if the time and calendar setting function and the alarm setting function is activated by depressing the button B.
- Check to see if the alarm function and the stopwatch function are activated correctly.
- The illuminating light is activated by depressing button D.

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