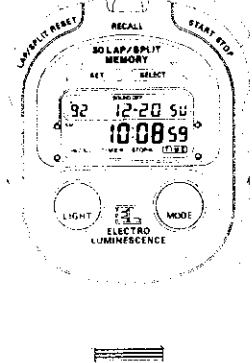
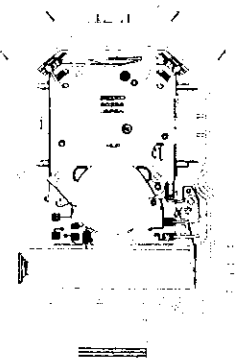


PARTS CATALOGUE / TECHNICAL GUIDE

Cal. S033A

[SPECIFICATIONS]

Item		Cal. No.	S033A
Complete		  <p style="text-align: center;">(x 0.5)</p>	
Module size	Outside diameter	49.9mm between 6 o'clock and 12 o'clock sides 40.8mm between 3 o'clock and 9 o'clock sides	
	Casing diameter	-	
	Height	6.9mm (10.1mm including the battery portion)	
Display medium		Nematic Liquid Crystal, FEM (Field Effect Mode)	
Liquid crystal driving system		Multiplex driving system	
Display system		<ul style="list-style-type: none"> • Stopwatch display (Up to 10 hours in 1/100 second increments) <ul style="list-style-type: none"> • Lap time measurement Lap time, accumulated elapsed time, lap No. • Split time measurement Split time, accumulated elapsed time, split No. • Memory recall: Lap time/split time and lap/split No. (Up to "30") • Countdown timer display <ul style="list-style-type: none"> • Hour, minutes, seconds (Up to 9 hours, 59 minutes and 59 seconds can be set in seconds.) • No. of times the timer repeatedly counts down the set time: (Up to "99") • Current time (hour and minutes) • Time/calendar display <ul style="list-style-type: none"> • Year, month, date, day, hour, minutes and seconds (The AM/PM mark is also displayed in the 12-hour indication.) 	
Additional mechanism		<ul style="list-style-type: none"> • Illuminating light (electroluminescent panel) • Time/calendar <ul style="list-style-type: none"> • Sound on/off : Sounds for button operation confirmation and timer warning can be switched on and off as required. • 12- or 24-hour indication • Automatic calendar (from 1992 to 2041) • Battery life indicator 	
Accuracy		±0.0012% at normal temperature range (corresponds to a loss/gain (monthly rate) of less than 30 seconds)	
Regulation system		Nil	
Measuring gate by quartz tester		Any gate can be used.	
Battery		For stopwatch: SEIKO CR2032, Maxell CR2032, Matsushita CR2032 Battery life is approximately 3 years. Voltage: 3.0V	For illuminating light: IEC R03/A: VSI AAA manganese dry battery Battery life is approximately 1 year. Voltage: 1.5V

PARTS CATALOGUE

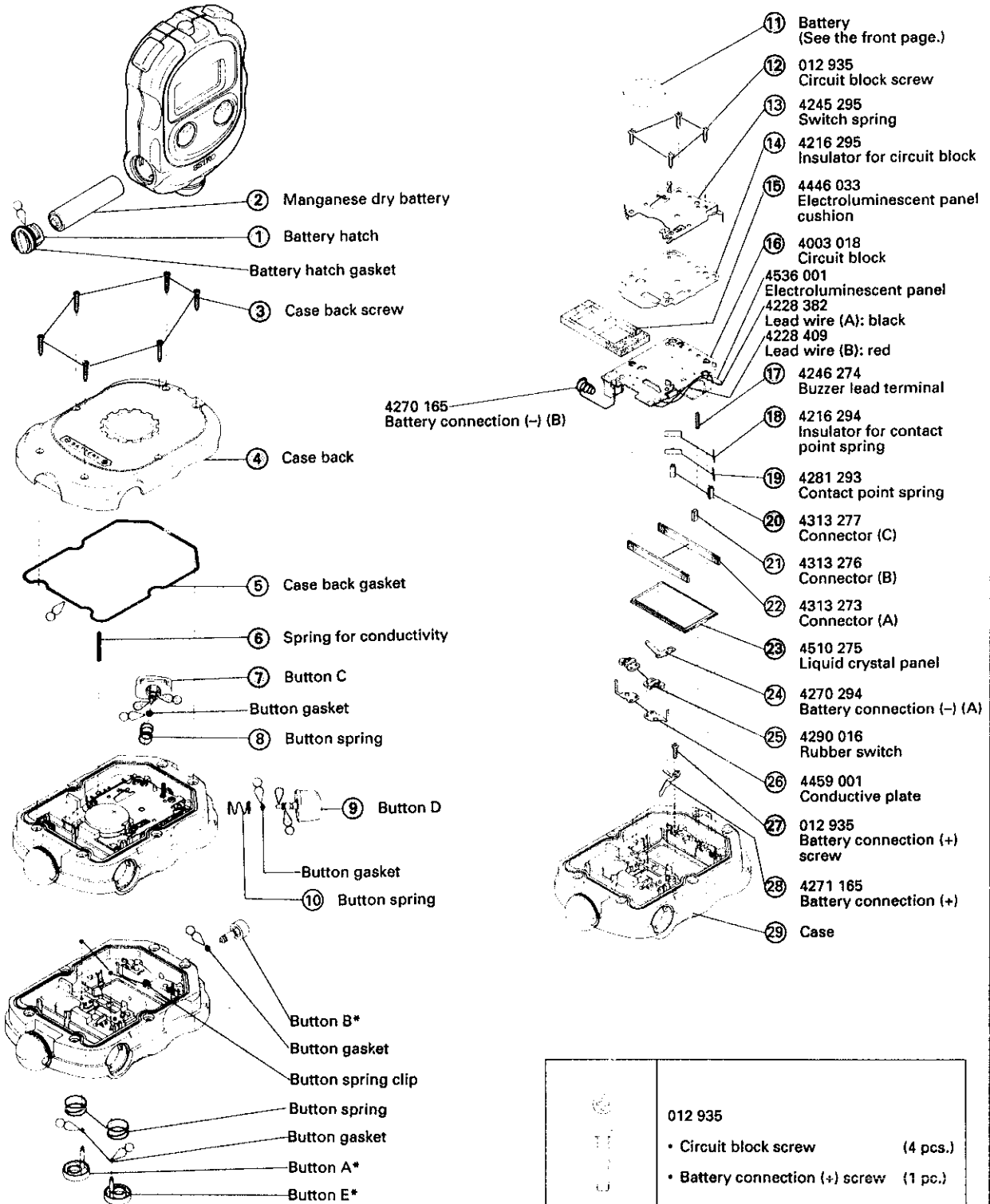
Cal. S033A

Disassembling procedures Figs. : ① → ②⑨

Reassembling procedures Figs. : ②⑨ → ①

Lubricating: Types of oil

○ Silicone oil 500,000 c.s.	○ Normal quantity
○ SEIKO Watch Oil S-6	○ Extremely small



○	012 935	
○	• Circuit block screw	(4 pcs.)
○	• Battery connection (+) screw	(1 pc.)

*Do not disassemble buttons A, B and E except when they need to be replaced.

○ → Please see the remarks on the following pages.

Remarks:

• Other parts

Piezoelectric element 4589 020

Adhesive tape 4447 013

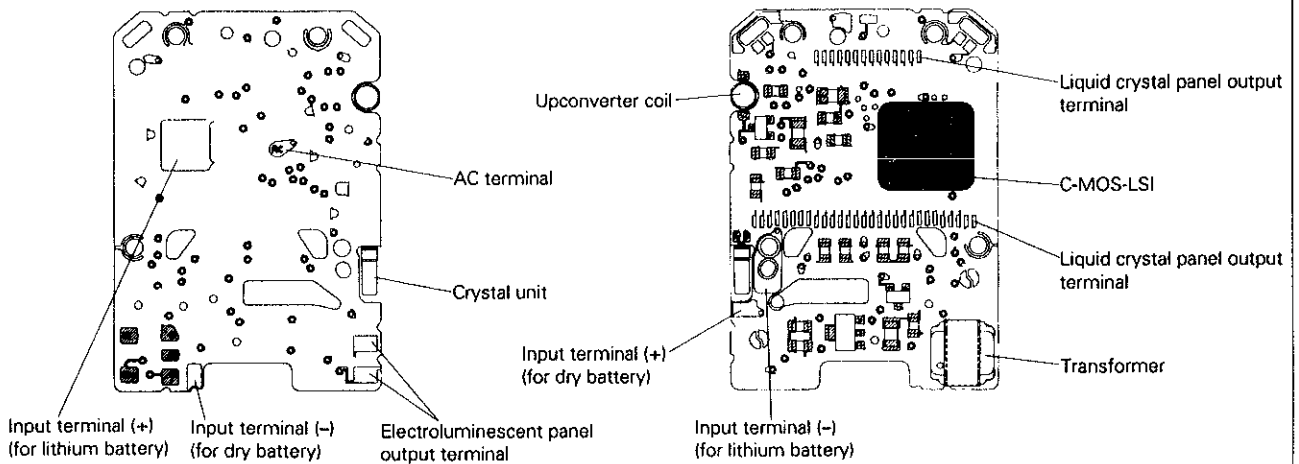
The tape is used to fix the piezoelectric element to the case back. For details, refer to "④ Case back

• How to install the piezoelectric element with vibrating metal plate" on page 5.

TECHNICAL GUIDE

- The explanation here is only for the particular points of Cal. S033A.
- For the repairing, checking and measuring procedures, refer to the "TECHNICAL GUIDE, GENERAL INSTRUCTIONS".

I. STRUCTURE OF THE CIRCUIT BLOCK

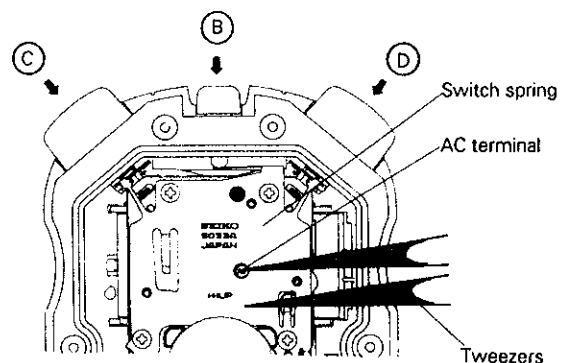


II. REMARKS ON INSTALLING THE BATTERY

- After the battery is replaced with a new one, or after the battery is re-installed following the repairing procedures, be sure to short-circuit the AC terminal of the circuit block and the switch spring (or battery (+) surface) with conductive tweezers to reset the circuit.

Note: When measuring the current consumption, make sure that the power is supplied externally before resetting the circuit.

* To reset the circuit with the case back installed, keep buttons "B", "C" and "D" pressed at the same time for approximately 3 seconds. The display will become blank, and "92 1-1 WE AM 12:0000" will be shown as the buttons are released, indicating that the resetting of the circuit has been completed.



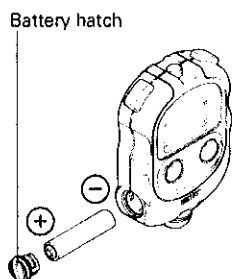
III. REMARKS ON DISASSEMBLING AND REASSEMBLING

- ① Battery hatch
- ② Manganese dry battery

• How to open and close the battery hatch



① Turn the battery hatch 90° clockwise to remove it.



② Insert the dry battery into the battery holder, checking that the (+) and (-) terminals are properly aligned.



③ Turn the battery hatch 90° counterclockwise while pressing it.
* Before doing so, align the "O" marks on the battery hatch and case with each other.

- ③ Case back screw
- ⑫ Circuit block screw
- ⑳ Battery connection (+) screw

As the case back screw and the circuit block screw/battery connection (+) screw differ from each other in shape, refer to the illustration below for distinction.
Be careful not to tighten the screws excessively.

[Case back screw]

- Head diameter: small
- Length : long



[Circuit block screw/battery connection (+) screw]

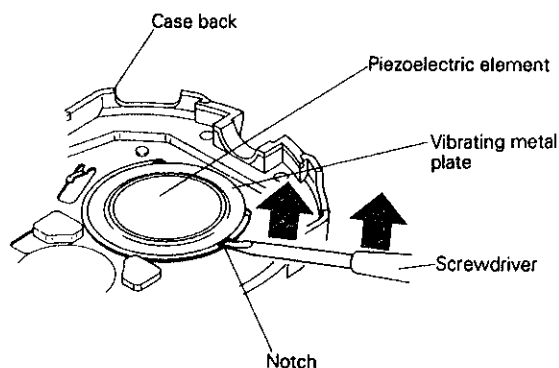
- Head diameter: large
- Length : short



- ④ Case back

• How to remove the piezoelectric element with vibrating metal plate

- (1) While holding the case back, insert the tip of the screwdriver into the notch of the protruding portion of the case back.
- (2) Pry up the piezoelectric element by raising the screwdriver as shown in the illustration.

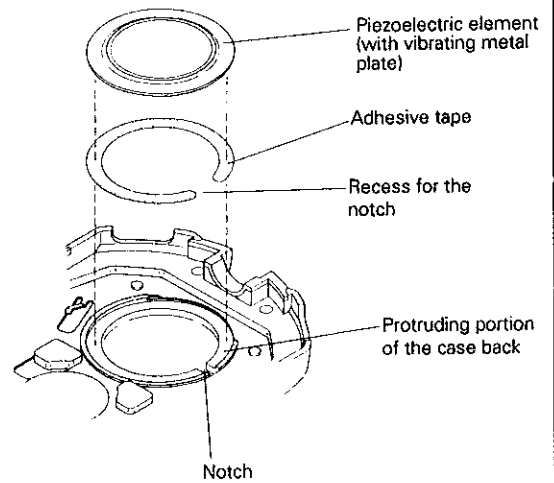


Note: Do not use the rim of the case back as the fulcrum to pry up the piezoelectric element. Otherwise, the case back will be deformed.

• How to install the piezoelectric element with vibrating metal plate

- (1) Apply the adhesive tape to the protruding portion of the case back, checking that the tape does not cover the notch. Then, peel the white protective seal off the tape.
- (2) Set the piezoelectric element on the tape.
- (3) Press down the vibrating metal plate (outer circumference) of the piezoelectric element with the sharpened tip of a thin wooden stick or the like to make sure that it is securely fixed to the case back.

Note: Never press down the piezoelectric element (white portion) as this may break it.



• How to install the case back

- When installing the case back, take care not to get the lead wires (A) and (B) of the electroluminescent panel caught between the case and case back.
- If buttons "C" and "D" touch the case back, preventing it from being installed smoothly, install it while keeping the buttons pressed.

• Note on the cushion for case back

Do not remove the cushion from the case back, as it is adhered to the case back.

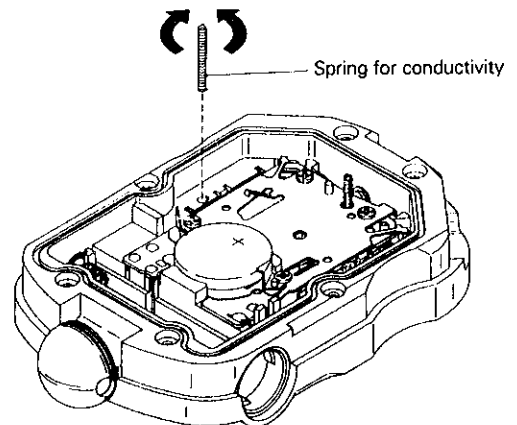
⑥ Spring for conductivity

• How to remove

Turn the spring for conductivity counterclockwise to release its end portion from the groove of the case.

• How to install

Set the end portion of the spring for conductivity into the groove of the case, and then turn it clockwise to fix it.

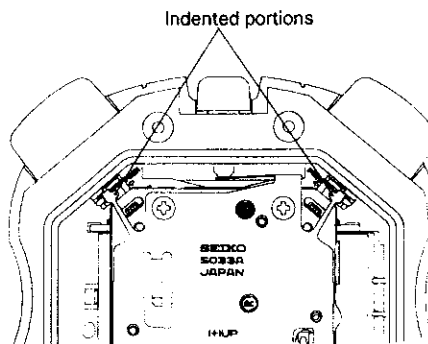
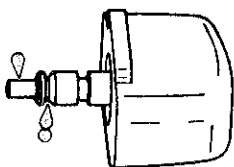


⑦ Button C

⑨ Button D

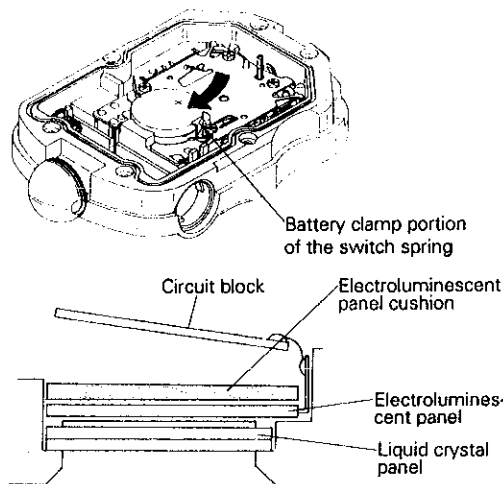
When removing or installing the buttons, press the indented portions of the switch springs. In doing so, hold the buttons with fingers. Otherwise, the buttons will spring out of the case.

• Lubricating (contact portion with the switch spring)



⑪ Battery

To install the battery, slip the battery sideways into the gap under the battery clamp portion of the switch spring.



⑮ Electroluminescent panel cushion

Set the electroluminescent panel cushion between the circuit block and electroluminescent panel. To do so, first set the electroluminescent panel to the case, and then slip the cushion sideways on the panel. Finally, install the circuit block in the case.

⑯ Circuit block

When removing or installing the circuit block, handle it with care as the lead wires (A) and (B) are soldered to the circuit block and the electroluminescent panel, and the battery connection (-) (B) is soldered to the circuit block.

Do not remove the soldered parts except when they need to be replaced.

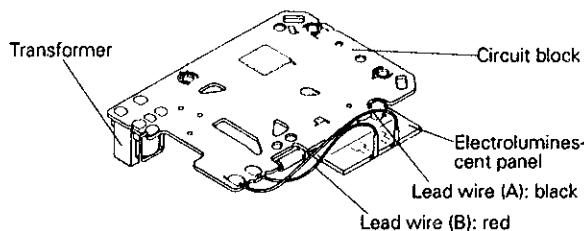
• How to solder the lead wires (A) and (B) and battery connection (-) (B)

- Circuit block ~ lead wires (A) and (B) ~ electroluminescent panel

Solder the lead wires (A) and (B) to the circuit block and the electroluminescent panel as shown in the illustration at right.

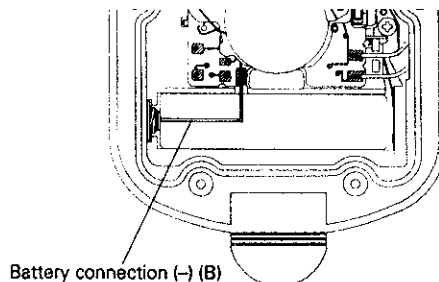
- Circuit block ~ battery connection (-) (B)

First, temporarily fix the circuit block to the case with the circuit block screws. Then, solder the battery connection (-) (B) to the circuit block.



• Note on the transformer cushion

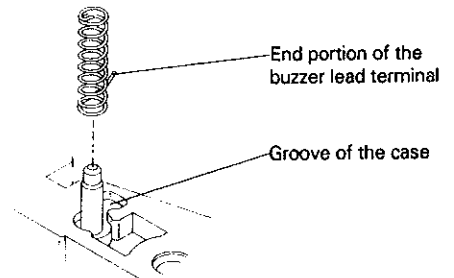
Do not remove the cushion, as it is adhered to the transformer.



⑰ Buzzer lead terminal

• **How to install**

Set the end portion of the buzzer lead terminal into the groove of the case.



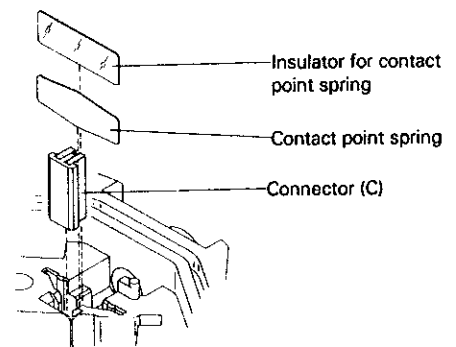
⑱ Insulator for contact point spring

⑲ Contact point spring

⑳ Connector (C)

• **How to install**

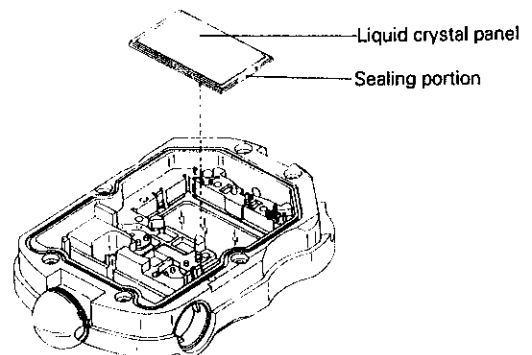
Set the insulator for contact point spring, contact point spring and connector (C) into the groove of the case, checking that the contact point spring is placed between the insulator for contact point spring and connector (C). Note that the insulator for contact point spring may be slightly tight for the groove of the case.



㉓ Liquid crystal panel

• **How to install**

Set the liquid crystal panel with its sealing portion on the right-hand side as shown in the illustration at right.



IV. VALUE CHECKING

• Time accuracy

To measure accuracy, light up all the segments of the display. To do so, press buttons "C" and "D" at the same time in the TIME/CALENDAR SETTING display.

After the measurement, press button "A", "B", "C", "D" or "E" to return to the TIME/CALENDAR.

• Upconverter coil resistance

120Ω ~ 180Ω

• Current consumption

For the whole module

- When the electroluminescent panel is not used : Less than 6.5μA
- When the electroluminescent panel is used : Less than 50mA

Note: Before measuring current consumption, be sure to reset the circuit. Otherwise, the display will become disordered, and as a result, current consumption cannot be measured properly.

• Troubleshooting for the electroluminescent panel

If the electroluminescent panel will not light, check the following points for the cause of the failure:

Cause-1: IEC R03/ANSI AAA manganese dry battery

Check the voltage of the dry battery.

Cause-2: Defective contact of the parts with the dry battery

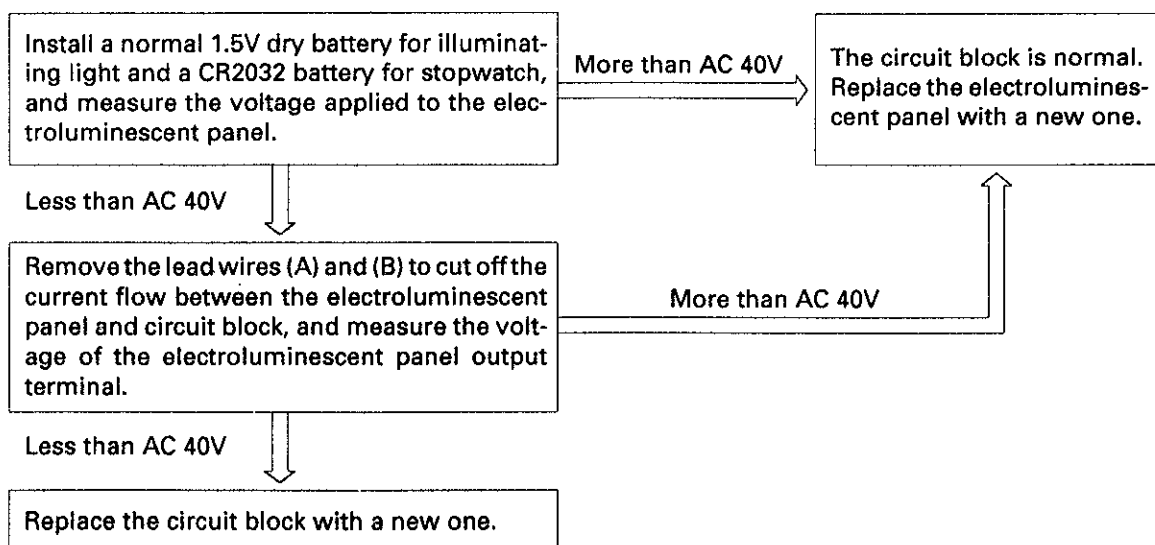
Check if the battery hatch (conductive plate), battery connection (+) and battery connection (-) (B) are securely in contact with the battery.

Cause-3: Defective contact of button "E"

Check if the rubber switch and circuit block are soiled with dust.

Cause-4: Defective circuit block or electroluminescent panel

Check the voltage taking the following steps.



SUPPLEMENT
TO
PARTS CATALOGUE / TECHNICAL GUIDE or PARTS CATALOGUE
CAL. S03 SERIES
(S031A, S032A, S033A, S038A & S039A)

For the S03 series models, originally some conducting parts were used in order to protect the watches from static electricity. This has been done since the first S031A models were introduced in 1990.

However, our examination proved all S03 series models without these conducting parts to be safe and function properly. Consequently, we have eliminated them from all models supplied from May 1995 as follows:

○ - used X - eliminated

Upper-Supplied until April	Lower-Supplied after May ↓	Casing parts			Movement part
		Conducting plate (A) *	Conducting plate (B) *	Conducting spring Part No.8135 779	Conducting plate Part No.4459 001
Cal.					
S031A, S032A S038A, S039A	~95/4 95/5~	○ X	○ X	○ X	○ X
S 0 3 4 A **	~95/4 95/5~	X X	○ X	X X	○ X

Conducting plate (A) *, (B) * ... These parts were attached to the case and were originally not available for supply as spare parts.

** The technical guide for Cal.S034A was issued excluding the part numbers in question which were used only for the initial lot (~95/4).

As for the S033A model, it will soon be discontinued and we decided to continue using the above 4 parts in question as an exception.

Due to the modification, our service center keeps 2 kinds of cases for all S03 series models which include or exclude the conducting plates (A) & (B). Consequently, they supply you 2 kinds of cases for the time being. Please disregard whether the parts in question are attached to the case or not. When repairing these models, it is not necessary for you to remove the parts in question specially as it is safe in leaving them as they are.

Please attach this sheet to PARTS CATALOGUE / TECHNICAL GUIDES or PARTS CATALOGUES for Cal. S031A, S032A, S033A, S038A, and S039A to keep it for ready reference.