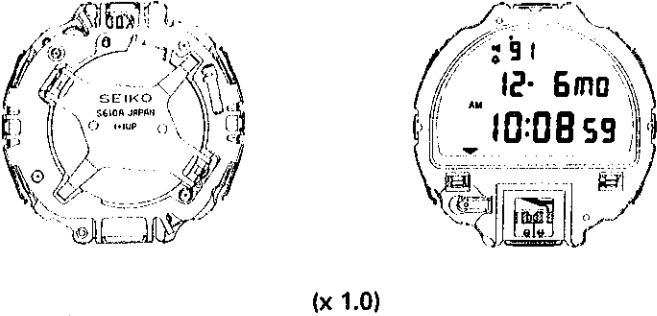


PARTS CATALOGUE / TECHNICAL GUIDE

Cal. S610A

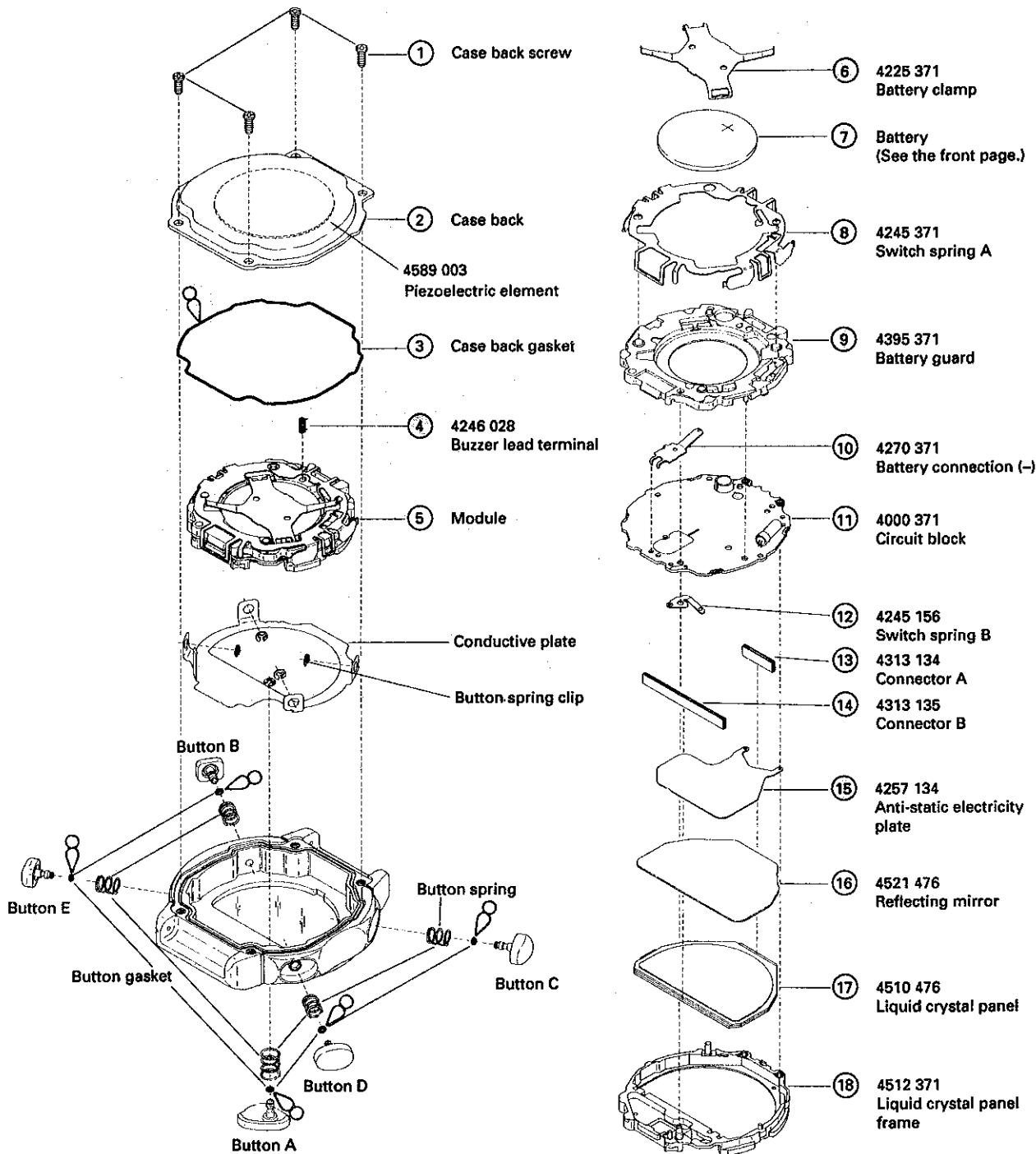
[SPECIFICATIONS]

Item		Cal. No.	S610A
Module		 <p>(x 1.0)</p>	
Module size	Outside diameter	31.4mm between 6 o'clock and 12 o'clock sides 32.0mm between 3 o'clock and 9 o'clock sides	
	Casing diameter	-	
	Height	5.2mm	
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/calendar display <ul style="list-style-type: none"> • Year, month, date, day, AM/PM mark, hour, minutes, seconds, 12- or 24-hour indication and automatic calendar (from the year 1991 up to 2040) • Stopwatch display (Up to 10 hours in 1/100 seconds) <ul style="list-style-type: none"> • Current time: Hour and minutes • Lap time/split time measurement: Lap time/split time, accumulated elapsed time and lap/split No. (Up to "99" and "00" for 100th lap time/split time) • Memory recall: Lap time/split time and lap/split No. (Up to "30") • Timer display (10-hour countdown timer) <ul style="list-style-type: none"> • Timer 1: Hour, minutes and seconds (Up to 9 hours, 59 minutes and 59 seconds can be set.) • Timer 2: Hour, minutes and seconds (Up to 9 hours, 59 minutes and 59 seconds can be set.) • No. of times the timers repeatedly count down the set time: Up to "99" ("00" for 100th countdown) • Alarm display <ul style="list-style-type: none"> • Can be set on a 24 hour basis. • AM/PM mark, hour and minutes 	
Additional mechanism		<ul style="list-style-type: none"> • Illuminating light • Confirmation sound for watch operation • Battery life indicator • Warning sound for the timers 	
Loss/gain		Monthly rate at normal temperature range: less than 20 seconds	
Regulation system		Nil	
Measuring gate by quartz tester		Any gate can be used.	
Battery		SEIKO CR2016, Maxell CR2016, SONY CR2016, Matsushita CR2016, EVEREADY CR2016 Battery life is approximately 2 years. Voltage: 3.0V	

PARTS CATALOGUE

Cal. S610A

Disassembling procedures Figs. : ① → ⑱
 Reassembling procedures Figs. : ⑱ → ①
 Lubricating: Types of oil Oil quantity
 ○ Silicone oil 500,000 c.s. Normal quantity



* Note: Do not disassemble the buttons and conductive plate except when they need to be replaced.

○ → Please see the remarks on the following pages.

PARTS CATALOGUE

Cal. S610A

Remarks:

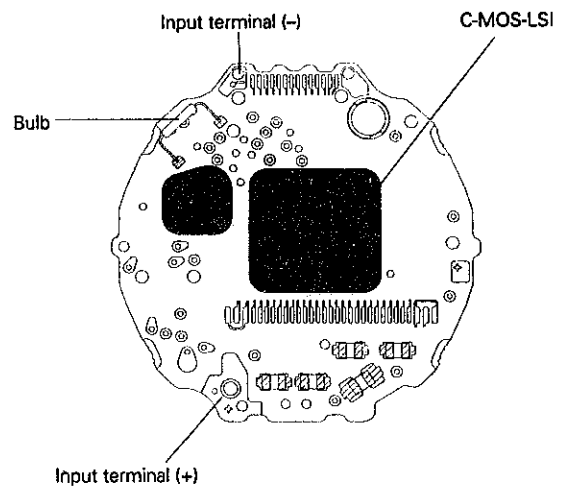
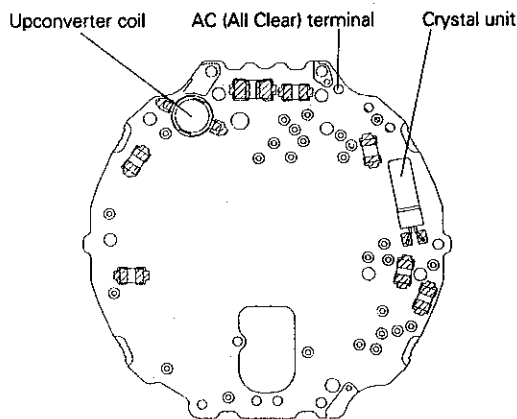
- Other parts
 - Bulb 4530 018
The bulb is available for supply separately from the circuit block, though they are soldered together.
 - Piezoelectric element 4589 003
The piezoelectric element, which is adhered to the case back, is available for supply separately from the case back.

TECHNICAL GUIDE

Cal. S610A

- The explanation here is only for the particular points of Cal. S610A.
- For the repairing, checking and measuring procedures, refer to the "TECHNICAL GUIDE, GENERAL INSTRUCTIONS".

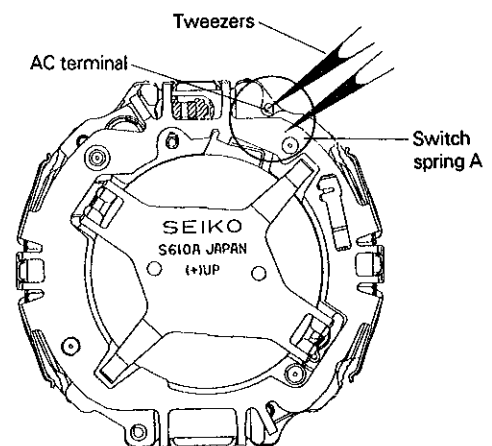
I. STRUCTURE OF THE CIRCUIT BLOCK



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 A with conductive tweezers as illustrated to reset the circuit.

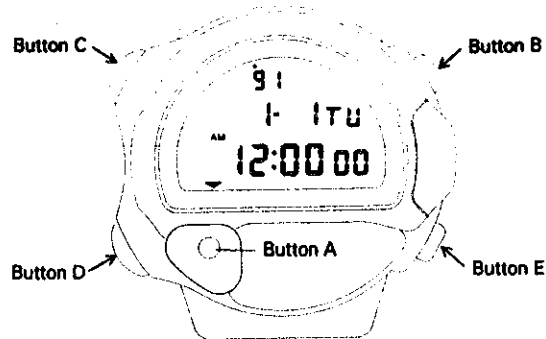
Note: When measuring the current consumption, make sure that the power is supplied externally before resetting the circuit.



TECHNICAL GUIDE

Cal S610A

- To reset the circuit with the case back installed, keep buttons B, C, D and E (or A, B, C and D) pressed for 2 to 3 seconds. "12:00 AM TU, January 1, '91" will be shown on the display.



III. REMARKS ON DISASSEMBLING AND REASSEMBLING

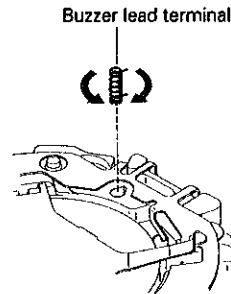
④ Buzzer lead terminal

- **How to remove**

Turn the buzzer lead terminal to release its end portion from the groove of the battery guard, then remove it.

- **How to install**

Set the end portion of the buzzer lead terminal into the groove of the battery guard, then turn it to fix it.



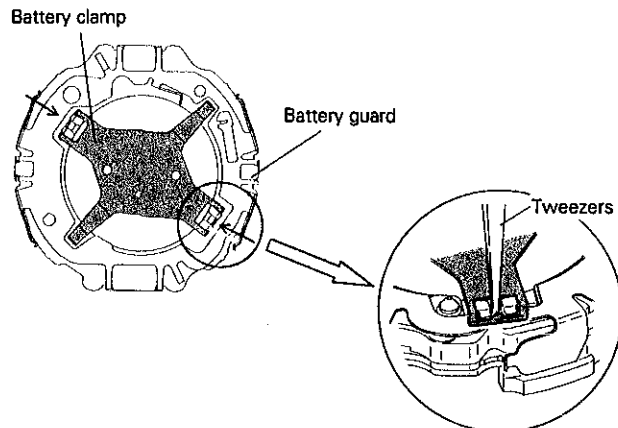
⑥ Battery clamp

- **How to remove**

Pry up with the tip of the tweezers the two protrusions of the battery clamp hooked to the notches of the battery guard.

- **Checking after installation**

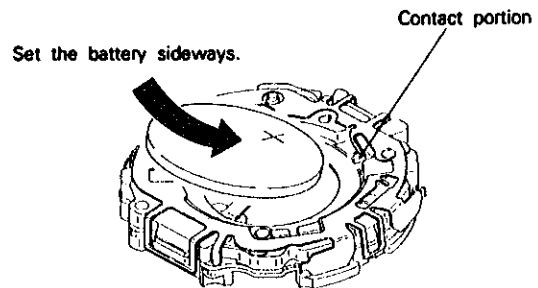
After installing the battery clamp, check that the battery guard is securely caught by the two protrusions of the battery clamp.



⑦ Battery

• How to install

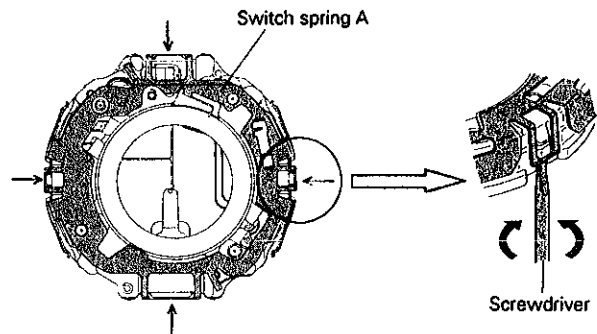
Install the battery sideways as shown in the illustration lest it should press down the battery contact portion.



⑧ Switch spring A

• How to remove

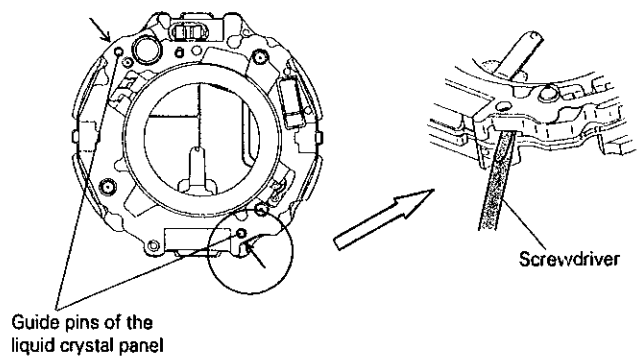
Pry up the four hooking portions of the switch spring A with the tip of the screwdriver to remove it.



⑨ Battery guard

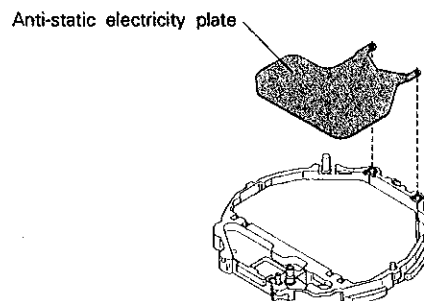
• How to remove

The battery guard is fixed to the liquid crystal panel frame by means of interference between the guide pins of the liquid crystal panel frame and the guide holes of the battery guard. To remove the battery guard, insert the tip of the screwdriver into the two notched portions near the guide pins of the liquid crystal panel frame as indicated by the arrows in the illustration, and lightly pry up the battery guard. In doing so, take care not to damage the battery guard, as it is made of plastics.



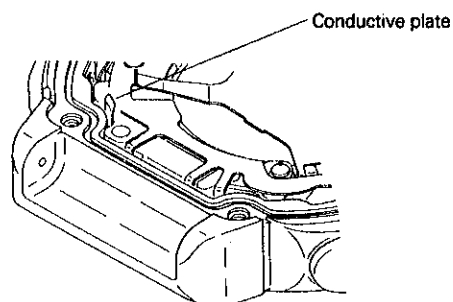
⑮ Anti-static electricity plate

Take care not to set the anti-static electricity plate up side down.



- **Remarks on installing the module to the case**

When closing the case back, check that the conductive plate is placed in position within the case and comes in contact with the case back.



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 display.

- **Upconverter coil resistance**

120Ω ~ 180Ω

- **Current consumption**

For the whole of the module: less than 4.7μA

For the circuit block alone : less than 3.5 μA

Notes: • Before measuring the current consumption, be sure to reset the circuit. (Refer to the "REMARKS ON INSTALLING THE BATTERY".) Otherwise, all the segments will light up or the display will be disordered, and as a result, current consumption cannot be measured correctly.

• When measuring the current consumption, take care not to expose the module to light. Light will increase the current consumption, and as a result, correct measurement cannot be obtained.