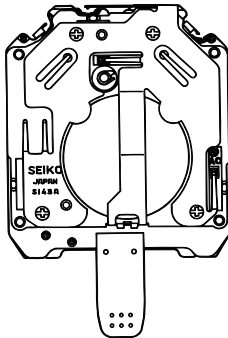
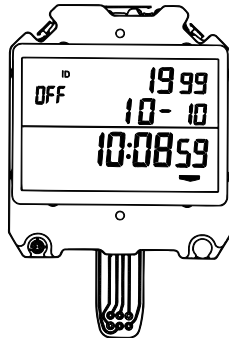


PARTS CATALOGUE/TECHNICAL GUIDE

Cal. S140A, S143A

[SPECIFICATIONS]

Item		Cal. No.	S140A	S143A
Module				
			The illustrations refer to Cal. S143A. (x 0.7)	
Module size	Outside diameter		49.3 mm between 6 o'clock and 12 o'clock sides 43.0 mm between 3 o'clock and 9 o'clock sides	
	Casing diameter		-	
	Height		8.75 mm	
Display medium			Nematic Liquid Crystal, FEM (Field Effect Mode)	
Liquid crystal driving system			1/4 multiplex driving system	
Display system			<ul style="list-style-type: none"> • Stopwatch display (Up to 10 hours) <ul style="list-style-type: none"> • Split time/lap time measurement • Total time measurement/lap time measurement in progress • Time/calendar display • Stroke display (Only for Cal. S140A) 	
Additional mechanism			<ul style="list-style-type: none"> • Memory function: Up to 300 measurements • Memory capacity indicator • Confirmation sound for watch operation • Contrast adjustment function • Battery life indicator • Printout function (Only for Cal. S143A) 	
Loss/gain			$\pm 0.0006\%$ at normal temperature range (corresponds to a loss/gain (monthly rate) of less than 15 seconds)	
Regulation system			Nil	
Measuring gate by quartz tester			Any gate can be used.	
Battery			SEIKO CR2430, Sony CR2430 Battery life is approximately 3 years. (When the stopwatch is used for 3 hours a day or less) Voltage: 3.0 V	




PARTS CATALOGUE

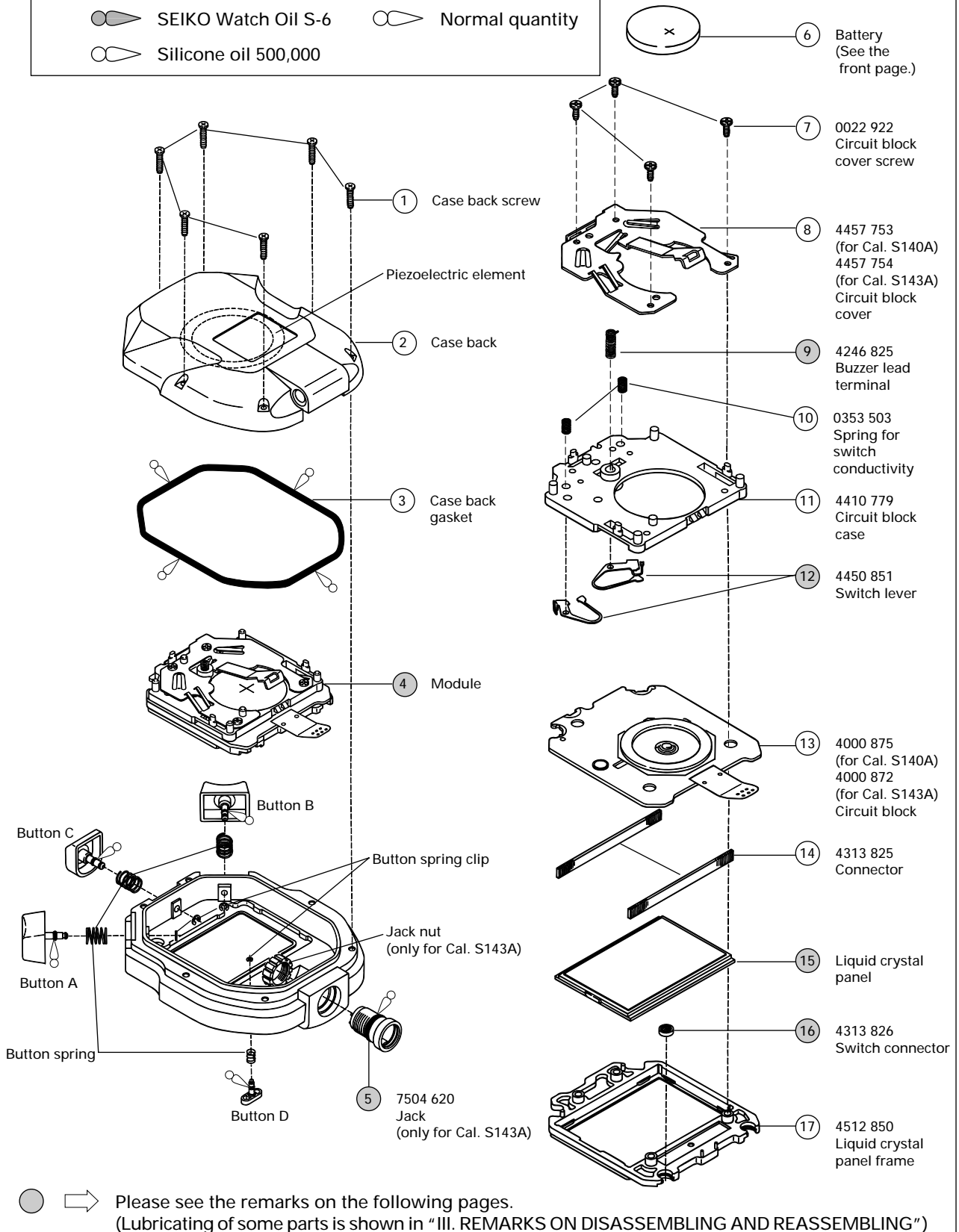
Cal. S140A, S143A

Disassembling procedures Figs. : ① → ⑰

Reassembling procedures Figs. : ⑰ → ①

Lubricating: Types of oil Oil quantity

-  SEIKO Watch Oil S-6
-  Normal quantity
-  Silicone oil 500,000



Remarks:

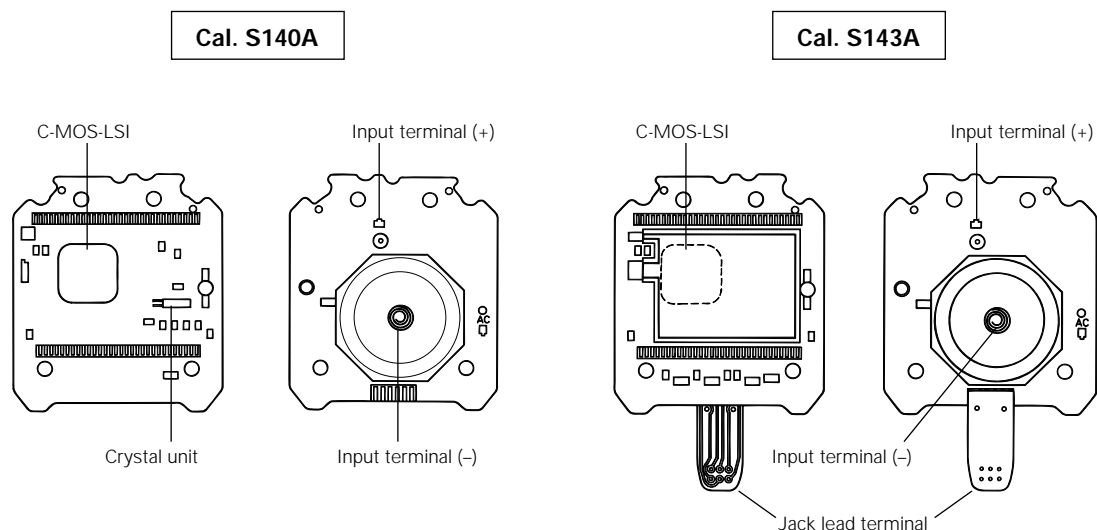
- ⑮ Liquid crystal panel 4520 504

The type of liquid crystal panel is determined based on the design of cases. Check the case number and refer to "SEIKO Casing Parts Catalogue" to choose a corresponding liquid crystal panel.

TECHNICAL GUIDE

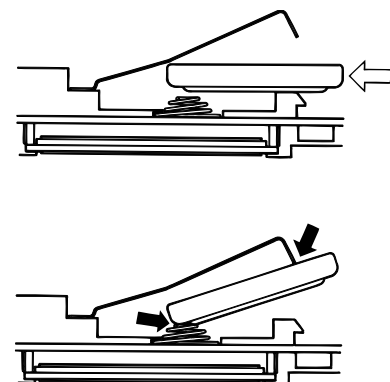
- The explanation here is only for the particular points of Cal. S140A and S143A.
- For the repairing, checking and measuring procedures, refer to the "TECHNICAL GUIDE, GENERAL INSTRUCTIONS".

I. STRUCTURE OF THE CIRCUIT BLOCK



II. REMARKS ON BATTERY REPLACEMENT

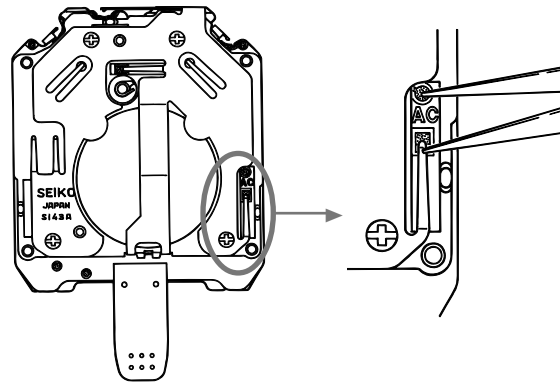
- **Remarks on installing the battery**
 - Keep the battery level while installing it lest it should touch the circuit block cover.
 - Be careful not to short-circuit the battery connection (-) and the circuit block cover. In that case, the display may remain blank after the battery is installed.
- * If the display remains blank, wait until the battery voltage returns to the normal level. The normal display will return.



Example of short circuit

- **Remarks after 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 circuit block cover with conductive tweezers for more than 2 seconds as illustrated at right to reset the circuit.



III. REMARKS ON DISASSEMBLING AND REASSEMBLING

Use the universal movement holder for disassembling and reassembling.

④ Module (Only for Cal. S143A)

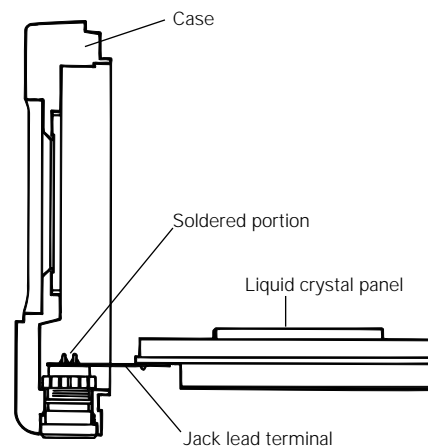
The jack and the jack lead terminal are soldered together.

- **How to remove**

Unsolder them with a soldering iron, soak up the melted solder completely with a solder wick or the like, and then, remove the jack lead terminal.

- **How to install**

Set the jack lead terminal to the jack pin, taking care not to set it upside down. Then, re-solder them with the soldering iron.



Note: When using the soldering iron, take utmost care not to deform or damage the case and other parts by the heat of the soldering iron.

⑤ Jack

The jack is only available for supply with the nut.

- **How to install**

To reassemble the jack, set the notch of the jack to the groove of the case.

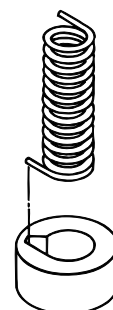
⑨ Buzzer lead terminal

- **How to remove**

Remove the buzzer lead terminal after detaching the circuit block case from the circuit block.

- **How to install**

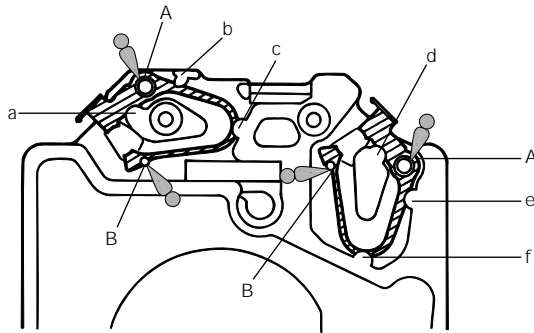
To install the buzzer lead terminal, set the end portion of the buzzer lead terminal to the groove of the circuit block case, and then, turn the buzzer lead terminal slightly so that it does not come off.



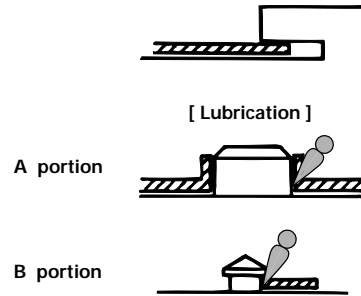
⑫ Switch lever

• **Setting position and lubricating**

Lubricate the switch levers as shown in the illustrations below and set them on the rear of the circuit block case.



Set the switch lever so that the portions from "a" to "f" are positioned under the collar of the circuit block.



⑮ Liquid crystal panel

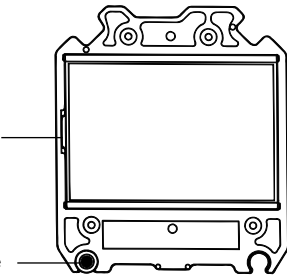
⑯ Switch connector

• **How to install**

Set the liquid crystal panel and switch connector as shown in the illustration at right.

Set the stopper of the liquid crystal panel to the groove of the liquid crystal panel frame.

Set the switch connector with the conductive portion (black) up.



IV. VALUE CHECKING

• **Current consumption**

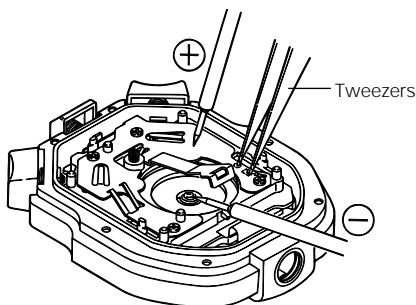
For the whole module : Less than 12 μ A (with voltage of 3.0 V supplied from a battery)

For the circuit block alone : Less than 10 μ A (with voltage of 3.0 V supplied from a battery)

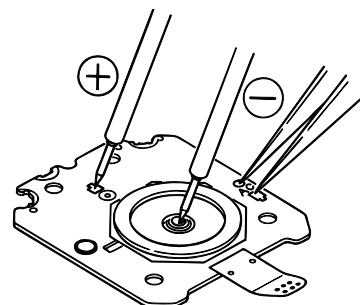
How to measure the current consumption

While applying the probe of the tester as shown in the illustrations below, reset the circuit with conductive tweezers for more than 2 seconds. Then, measure the current consumption.

For the whole module



For the circuit block alone

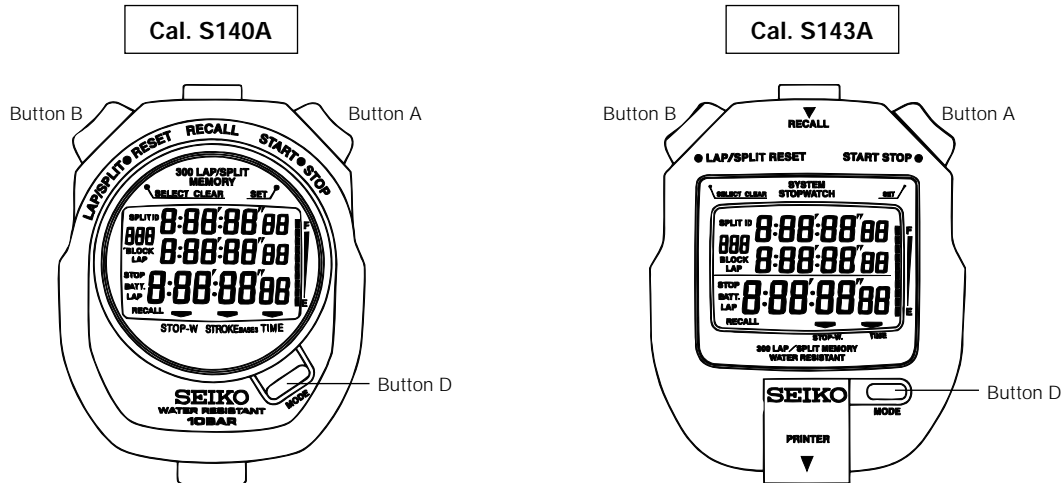


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Cal. S140A, S143A

- All the segments lit up

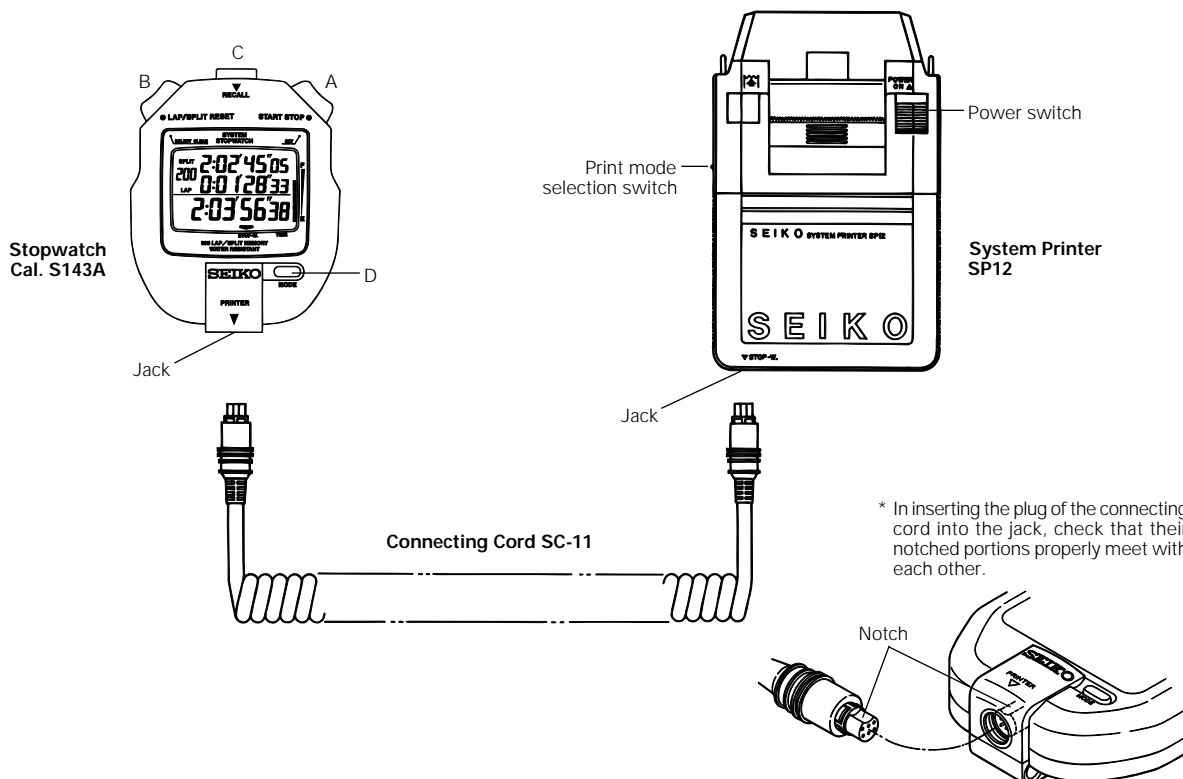
1. Press the mode button (button "D") to show the TIME/CALENDAR mode.
2. Press button "B" to show the TIME/CALENDAR SETTING display.
3. Press buttons "A" and "B" at the same time. All the segments of the display will light up.
4. Check if the displays below appear for the respective watches.



- * If the stopwatch is left untouched with all the segments lit up, it will automatically return to the TIME/CALENDAR mode in 1 to 2 minutes. To return to the TIME/CALENDAR mode manually, press button "D".
- * To measure the time accuracy with the quartz tester, light up all the segments of the display.

- Connection with the System Printer SP12 (Only for Cal. S143A)

How to connect



* In inserting the plug of the connecting cord into the jack, check that their notched portions properly meet with each other.

Switch operation of the System Printer SP12

Print mode selection switch: Split time and lap time are printed out while the switch is set at "LAP. SPLIT".

Power switch : The switch turns on and off the printer. (When the switch is set to "ON", the roll paper will be advanced by one line.)

• Checking the operation of the Stopwatch Cal. S143A and the System Printer SP12

Printout during the measurement

1. Turn on the power switch of the printer.
2. Slide the print mode selection switch of the printer to "LAP. SPLIT".
3. Press button "D" to show the STOPWATCH mode.
4. Press button "A" to start the measurement. The block number, for example, "BLOCK : 1" will be printed out.
 - * If the stopwatch is counting, press button "A" to stop the measurement, press button "B" to reset the digits to "00", and then press button "A" again to start the measurement.
5. Press button "B" repeatedly. With each press of the button, the split/lap number, split time and lap time will be printed out.

Printout of the stored data

* Measure the split and lap times without connecting the stopwatch and the printer.

1. Press button "A" to start the measurement.
2. Press button "B" repeatedly to measure split and lap times.
3. Press button "A" to stop the measurement.
4. Connect the stopwatch with the printer, turn on the power switch of the printer, and then, slide the print mode selection switch of the printer to "LAP. SPLIT".
5. Press and hold button "C" for 2 to 3 seconds. "PRINT ALL" will be displayed.
6. Release button "C". All the stored data will automatically be displayed and then printed out successively.

Printout of the elapsed time

1. In the STOPWATCH mode, press button "B" to reset the digits to "00".
2. Press button "D" to show the TIME/CALENDAR mode.
3. Press button "A" to start the measurement. The year, month, date and starting time will be printed out.
4. With each press of button "B", the time and number of measurements are printed out.
 - * The elapsed time cannot be printed out by pressing button "C".
 - * If the digits have not been reset to "00", the time cannot be printed out.

If the measurement data are not printed out properly, check the following points for the cause of failure.

1. Check if the connecting cord (SC-11) is broken, by using the tester.
2. If the batteries of the printer have run down, replace them with new ones.
3. Check if the soldered portion of the jack lead terminal of the stopwatch is damaged to cause short circuit.
 - * If the printer will not operate properly after correcting the above conditions, take both the printer and the stopwatch to a SEIKO SERVICE CENTER for repair.
 - * Please be informed that the repairs of the System Printer SP12 will be made only at the SEIKO factory.

BUTTONS AND DISPLAYS

Cal. S140A

Cal. S140A

[TIME/CALENDAR mode]

Button C (CONTRAST)
Activation/deactivation of the contrast adjustment function

Button B (SELECT)
Selection of the digits to be adjusted

Button A (SET)
Setting the digits to be adjusted

Identification number



Year

Month and date

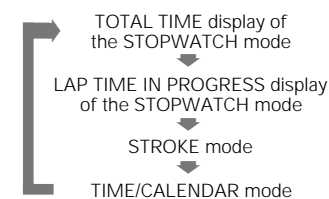
Time

It is displayed in the 24-hour indication.

TIME/CALENDAR mode indicator

Button D (CHANGEOVER OF MODES)

With each press of the button, the mode changes over in the following order.



[STROKE mode]

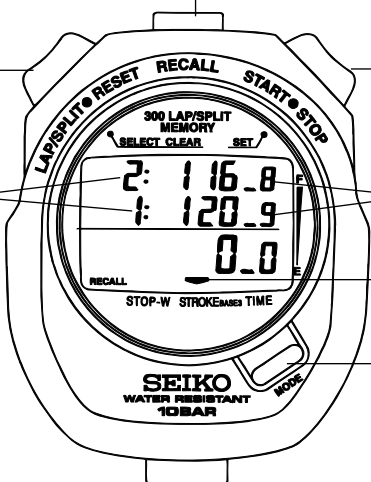
Button C (MEMORY RECALL)

Button B (RESET)

Button A (START/STOP)

Restart and stop of the stroke measurement is repeated by pressing the button.

Memory number



Number of strokes per minute

STROKE mode indicator

Button D (CHANGEOVER OF MODES)

[STOPWATCH mode]

Button C (MEMORY RECALL)

Button B (LAP/SPLIT, RESET)

With each press of the button after the measurement is started, split time and lap time are measured.

By pressing the button to end the measurement, the new block number for the next measurement is displayed.

Button A (START/STOP)

Restart and stop of the stopwatch can be repeated by pressing the button.

Split/lap number



Split time
(Hour, minutes, seconds and 1/100 seconds)

Lap time
(Hour, minutes, seconds and 1/100 seconds)

Total time
(Hour, minutes, seconds and 1/100 seconds)

Memory capacity indicator
Indication of the available memory

Button D (CHANGEOVER OF MODES)

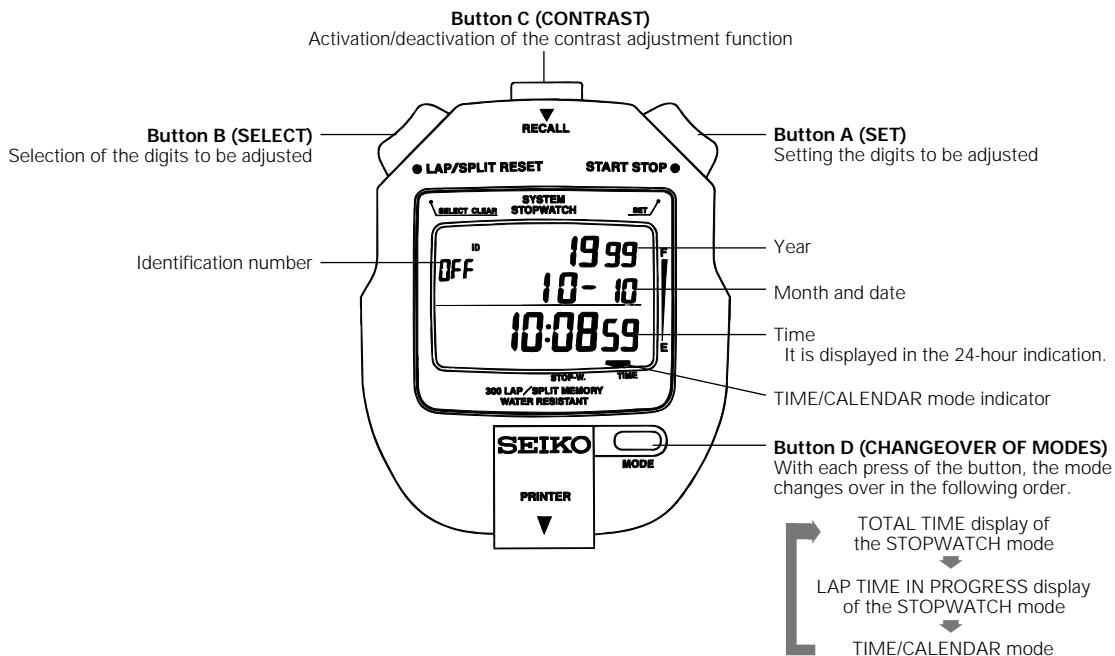
STOPWATCH mode indicator

BUTTONS AND DISPLAYS

Cal. S143A

Cal. S143A

[TIME/CALENDAR mode]



[STOPWATCH mode]

