

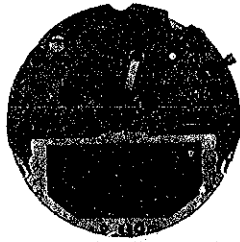
SEIKO

QUARTZ

Cal. H239A

PARTS LIST

Cal. H239A



125 003



☆221 025



231 135



241 303



261 017



☆271 054



354 065



491 004



735 007



4001 307



4002 130



4146 130



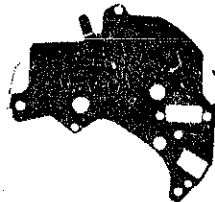
4216 304



4238 480



4239 300



4245 300



4247 136



4256 003



☆4256 004



4270 300



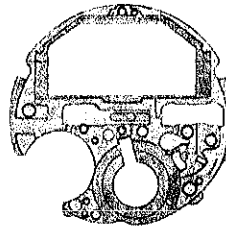
4271 300



4282 131



4313 028



4398 300



4398 303



☆4398 304



4408 023



4408 024



4450 134



4510 090



☆4580 300



4580 301



☆4991 002



4991 003



011 409



011 541



☆Toshiba SR1130W



012 292



012 470



012 483



017 213



017 214



017 216



017 217



017 252

2/1

Cal. H239A

Characteristics

Casing diameter : ϕ 30.0 mm
 Maximum height : 3.1 mm without battery
 Jewels : 2 j
 Frequency of quartz crystal oscillator : 32,768 Hz (Hz Hertz . . . Cycles per second)
 Analogue indication : Two hand time indication (Hour and minute)
 Hand setting system : Automatic electronic-hand-setting by crown (turning the crown clockwise or counter clockwise)
 Digital time display : Hour (24 hour indication or 12 hour indication), minute, second and "A.M." "P.M." (displayed only in the 12 hour indication.)
 Digital calendar function : Date and day of the week. (The month is displayed only when the calendar is adjusted.)
 Digital alarm display : Can be set to operate at any desired hour and minute.
 Digital stop watch display : Digital display system showing minute, second and 1/10 second up to 30 minutes.
 Digital "Local" time display : Hour, minute, "A.M." "P.M." mark (displayed only in the 12-hour indication) and local (L) mark.
 Driving system : Step motor (2 poles)
 Regulation system : Trimmer condenser
 Display medium : Nematic Liquid Crystal, FE-Mode.
 Time signal : It can be set to ring every hour on the hour.
 Battery life indicator : All the digits in the display begin flashing.

PART NO.	PART NAME	PART NO.	PART NAME
125 003	Train wheel bridge	017 216	Tube for circuit block screw (B)
☆221 025	Center wheel & pinion (2.92 mm)	017 216	Tube for battery connection (-) screw
☆221 301	Center wheel & pinion (3.12 mm)	017 217	Tube for circuit block
☆221 302	Center wheel & pinion (3.22 mm)	017 252	Tube for circuit block screw (C)
231 135	Third wheel & pinion	☆ Toshiba SR1130W	Silver oxide battery
241 303	Fourth wheel & pinion	☆ U.C.C. 389	
261 017	Minute wheel	☆ Maxell SR1130W	
☆271 054	Hour wheel (1.38 mm, silver)	☆ Toshiba WG10	
☆271 301	Hour wheel (1.48 mm, silver)		
☆271 302	Hour wheel (1.58 mm, gold)		
354 065	Winding stem		
491 004	Dial washer		
735 007	Winding stem holder		
4001 307	Circuit block		
4002 130	Coil block		
4146 130	Step rotor		
4216 304	Insulator for circuit block		
4238 480	Switch lever spring		
4239 300	Rotor stator		
4245 300	Switch spring		
4247 136	Bush for contact point lever		
☆4256 003	Speaker block fixing spring		
☆4256 004	Speaker block fixing spring		
4270 300	Battery connection (-)		
4271 300	Battery connection (+)		
4282 131	Contact point lever		
4313 028	Connector		
4398 300	Liquid crystal panel frame		
4398 303	Speaker block frame		
☆4398 304	Speaker block frame		
4408 023	Circuit board washer		
4408 024	Friction washer for contact point lever		
4450 134	Switch lever		
4510 090	Liquid crystal panel		
☆4580 300	Speaker block		
4580 301	Speaker block		
☆4991 002	Speaker gasket		
4991 003	Speaker gasket		
011 409	Upper hole jewel for step rotor		
011 541	Lower hole jewel for step rotor		
012 292	Train wheel bridge screw		
012 292	Circuit block screw (B)		
012 292	Battery connection (+) screw		
012 470	Circuit block screw (C)		
012 483	Circuit block screw (A)		
017 213	Tube for train wheel bridge		
017 214	Tube for circuit block screw (A)		

☆⇨ Please see remarks on the reverse page.



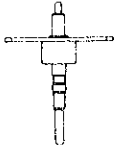
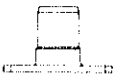
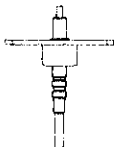

Part numbers in light letters are not shown in photos.

Cal. H239A

Remarks :

Center wheel & pinion, Hour wheel.

There are three different types as specified below.
Combination

Type	Center wheel & pinion	Hour wheel
a	 ☆221 025	Silver  ☆271 054
b	 ☆221 301	Silver  ☆271 301
c	 ☆221 302	Gold  ☆271 302

Speaker block fixing spring, Speaker block frame, Speaker block, Gasket for speaker block.

☆4256 004 }
 ☆4398 304 } The parts designated with these parts numbers are manufactured specially for the
 ☆4580 300 } water resistant case of a pressure of 10 atmospheres (100 meters or 300 feet).
 ☆4991 002 } Be sure to use these parts for maintaining high water-resistant quality.

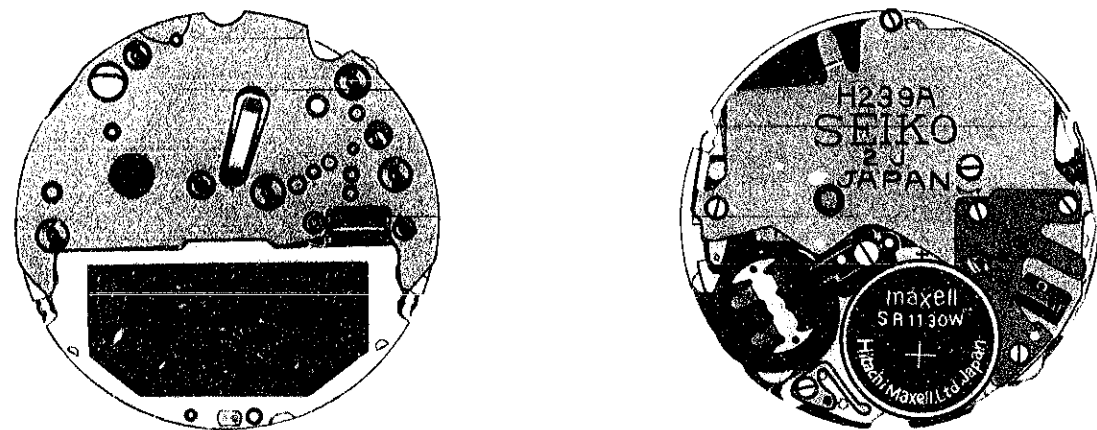
Battery

☆U.C.C. 389 }
 ☆Maxell SR1130W } The substitutive battery might be added to the applied battery in the future.
 ☆Toshiba WG10 } In that case, please refer to separate "BATTERY LIST FOR SEIKO
 ☆Toshiba SR1130W } QUARTZ WATCHES".

TECHNICAL GUIDE

SEIKO
QUARTZ

CAL. H239A



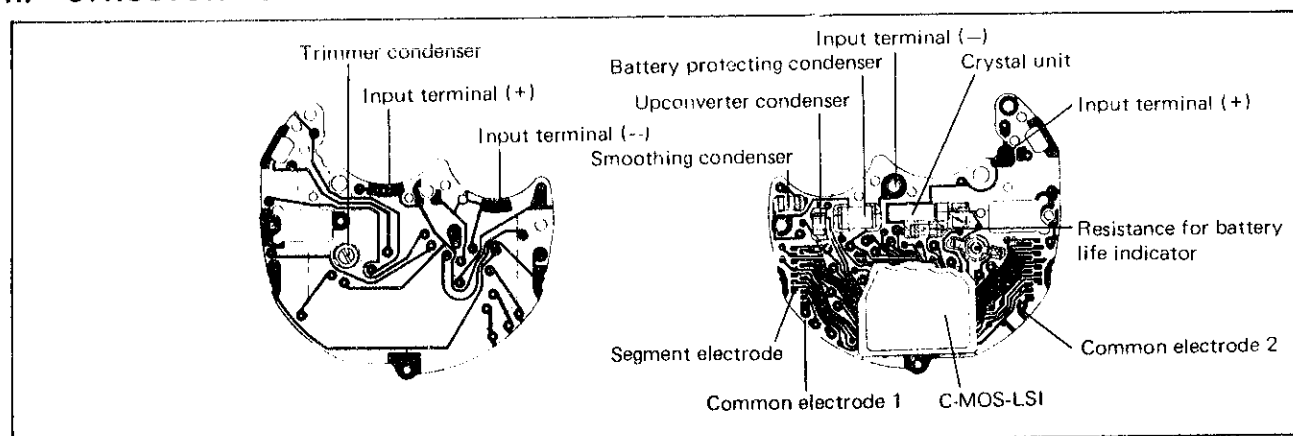
CONTENTS

	Page
I. SPECIFICATIONS	1
II. STRUCTURE OF THE CIRCUIT BLOCK	1
III. DISASSEMBLING, REASSEMBLING AND LUBRICATING	2
1. Disassembling and reassembling of the case	2
2. Indicating mechanism	3
3. Electronic circuit and liquid crystal panel	4
4. Gear train and switch mechanism	5
IV. CHECKING AND ADJUSTMENT	6
• Check battery voltage	6
• Check battery conductivity	6
• Check output signal	6
• Check conductivity of liquid crystal panel, circuit block, coil block and connectors	6
• Check circuit block and liquid crystal panel	6
• Check coil block	7
• Check current consumption	8
• Check speaker block	9
• Check conductivity of switch components	9
• Check accuracy	9
• Check functioning and adjustment	10

I. SPECIFICATIONS

Cal. No.		H239A
Item		
Analogue Function	Time indication	Two-hand time indication (Hour and minute)
	Additional mechanism	Automatic electronic-hand setting by crown
Digital Function	Digital display	Nematic Liquid Crystal, FEM (Field Effect Mode)
	Liquid crystal driving system	Multiplex driving system
	Display system	<ul style="list-style-type: none"> • Home time function • Calendar function • Alarm function • Local time function • Stopwatch function
	Additional mechanism	<ul style="list-style-type: none"> • Alarm test system • Time signal • Battery life indicator
Loss/gain		Loss gain at normal temperature range Monthly rate: less than 10 seconds (Annual rate: less than 2 minutes)
Outside diameter		φ 30.0 mm
Height		3.1 mm without battery
Regulation system		Trimmer condenser
Measuring gate by Quartz Tester		Any gate is available. (Measure at the analogue function.)
Battery		U.C.C. 389, Maxell SR1130W, Toshiba WG-10 or Toshiba SR1130W. Battery life is approximately 3 years. Voltage: 1.55V
Jewels		2 jewels

II. STRUCTURE OF THE CIRCUIT BLOCK



III. DISASSEMBLING, REASSEMBLING AND LUBRICATING

1. Disassembling and reassembling of the case

Disassembling procedures Figs.: ④ - ①

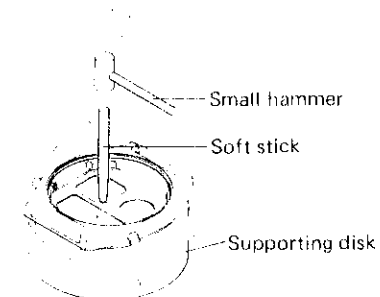
Reassembling procedures Figs.: ① - ④

Ex.) In the case of the model which is provided with a water-resistant cap.

Note:

- Be sure to replace the water-resistant cap with a new one when replace the glass.
- It is possible to use the speaker pipe continually when replacing the glass.

- How to disassemble the glass
Put a soft stick against the surface of the glass from inside the casebezel as shown in the illustration below and disassemble the glass by hitting on the top of the soft stick with the small hammer.



Note: Be careful not to push the dial ring and the water-resistant cap.

- Disassembling and reassembling of the water-resistant cap

How to disassemble

Support the glass by the supporting disk with an inside diameter which permits to support it without touching the water-resistant cap and disassemble the water-resistant cap by pushing it from outside surface of the glass with the soft stick.

How to reassemble

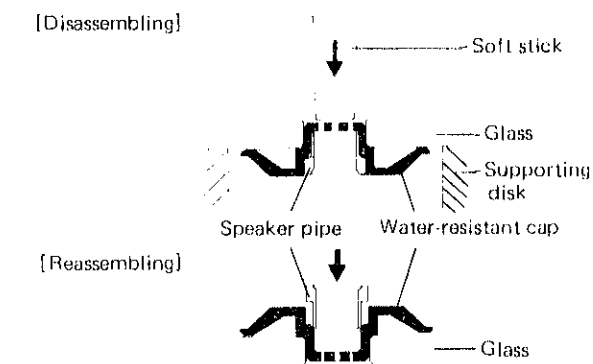
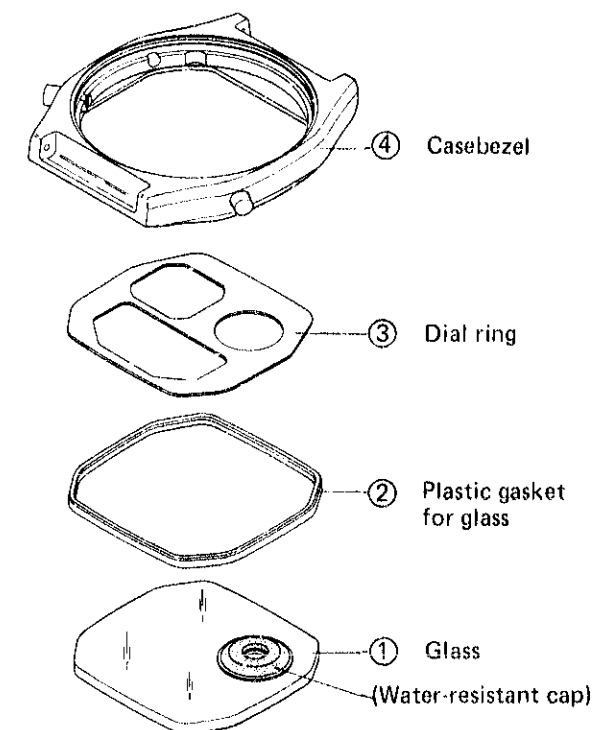
Place the glass on a level plate with its inside surface up and after setting the water-resistant cap in position, push the speaker pipe in.

Note: When reassemble the speaker pipe, be sure to push it in horizontally.

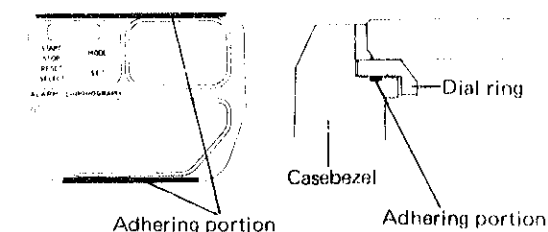
Ex.) In the case of the model which is not provided with a water-resistant cap.

The disassembling and reassembling of the glass is the same as that of mentioned above, but be sure that the dial ring is set to the casebezel correctly before setting the glass. In case the dial ring is protruding out of the inside of the casebezel, adhere the dial ring and the casebezel together with the SEIKO adhesive S-310 and reset the glass after its hardening.

Note: The adhesive requires approximately 24 hours to harden.



- The places for applying adhesive.
Apply the adhesive to the 6 o'clock and 12 o'clock position of back side of the dial ring.

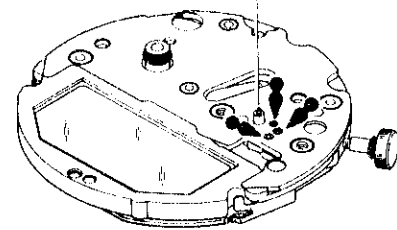
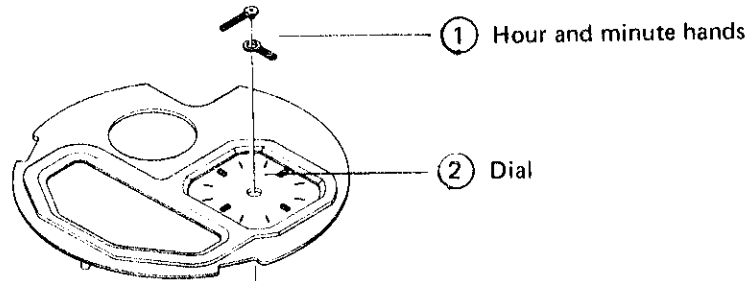


Disassembling procedures Figs.: ① ~ ③⑤
 Reassembling procedures Figs.: ③⑥ ~ ①

• Lubricating
 Type of oil
 ● Moebius A
 ○ SEIKO Watch Oil S-6

Oil quantity
 ○ Liberal
 ○ Normal
 ○ Extreme small

2. Indicating mechanism



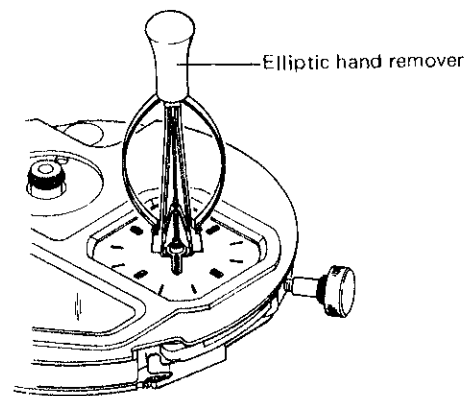
① Hour and minute hands

• How to disassemble

Use the elliptic hand remover to remove the hands. When removing the hands, be careful that the support of the elliptic hand remover does not come on to the bar for hour mark on the dial. Be sure to use the elliptic hand remover with a polished tip so as not to scratch the dial.

• How to reassemble

When reassembling the hands, support the movement (module) on a level plate and set the hands. Be careful not to use a universal movement (module) holder, etc.

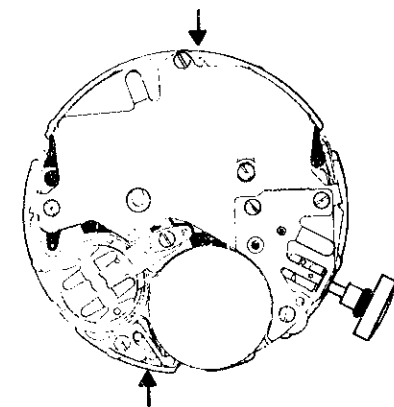


② Dial

• The dial is reassembled simply by pushing the dial leg into the main plate. The dial screw, etc., is not used.

• When disassembling the dial, pry it up at the groove on the main plate and liquid crystal panel frame (arrow-marked at 2 portions) alternately with a screwdriver, etc. so as not to deform the dial and disassemble it.

• When reassembling the dial, push it in so that it may stand level while taking care not to bend the dial leg.



3. Electronic circuit and liquid crystal panel

④ Speaker block

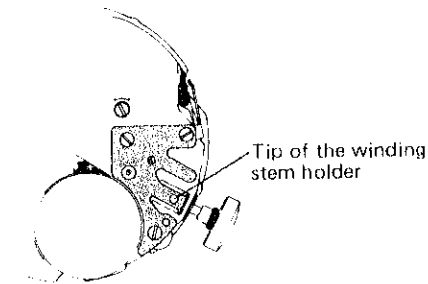
• Disassemble the speaker block from the main plate while lifting up its circumference gradually with tweezers.

• Be careful not to lift up the speaker block lead terminal with tweezers. Otherwise deformation and broken wire may occur on it.

• In case the speaker block is disassembled, be sure to reassemble it so that any dust and lint may not enter the inside of it.

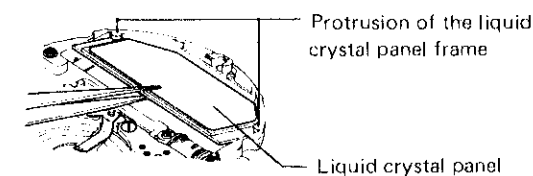
⑤ Winding stem

• Pull out or push in the winding stem while depressing the tip of the winding stem holder.



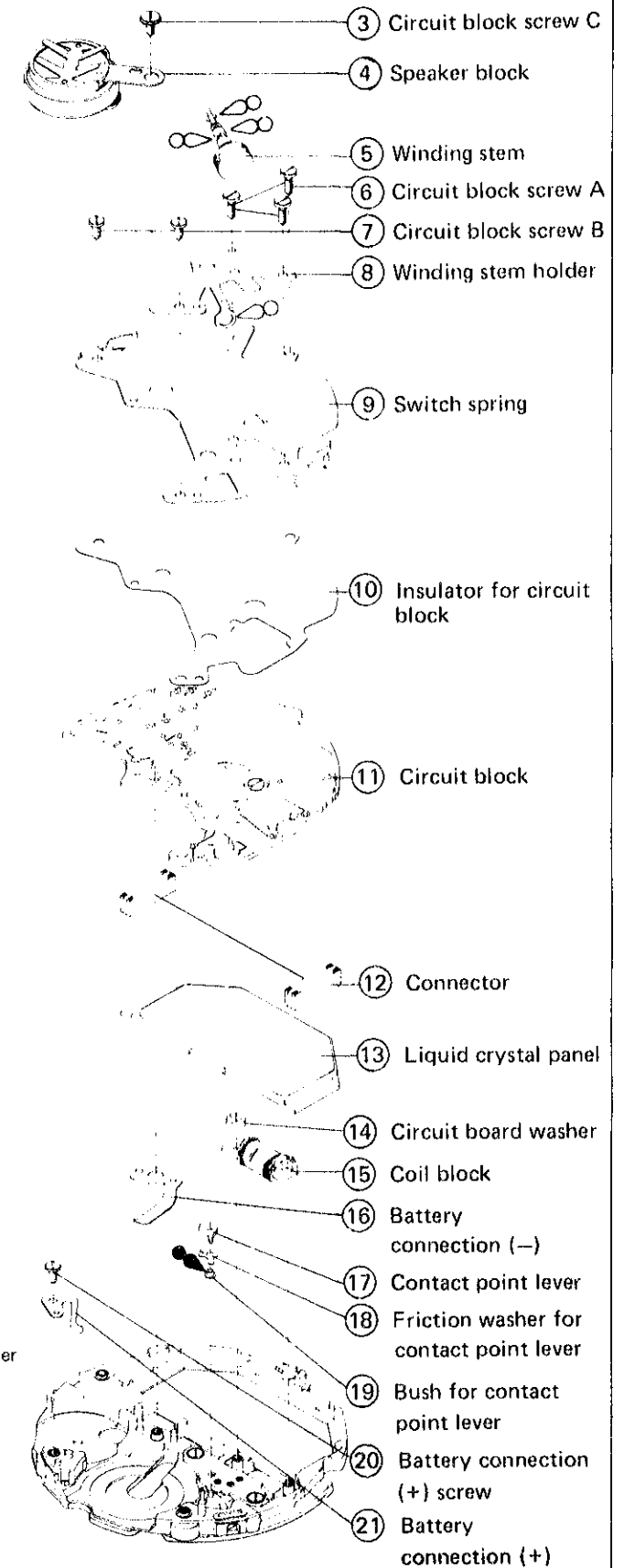
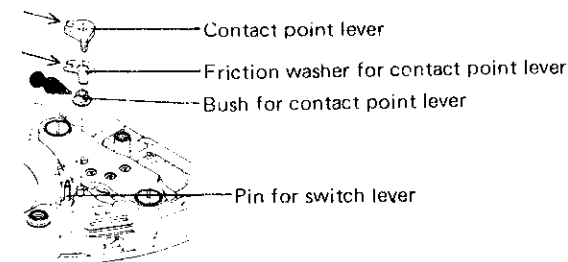
⑬ Liquid crystal panel

• When reassembling the liquid crystal panel, put it slantly under the two protrusions of the liquid crystal panel frame as shown in the illustration below and then lift its top up a little to be reassembled on the liquid crystal panel frame.



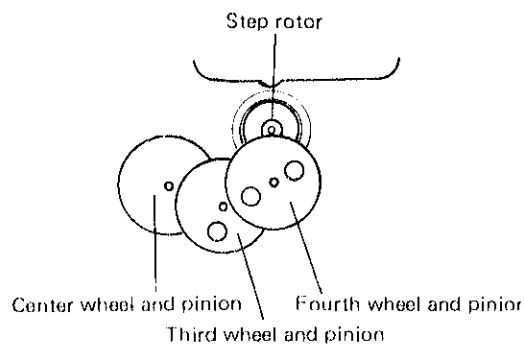
⑰ Contact point lever

• Set the notches (arrow-marked) of the contact point lever and the friction washer for contact point lever to the pin for switch lever which protrudes from the liquid crystal panel frame.

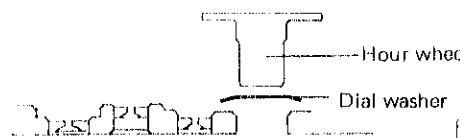


4. Gear train and switch mechanism

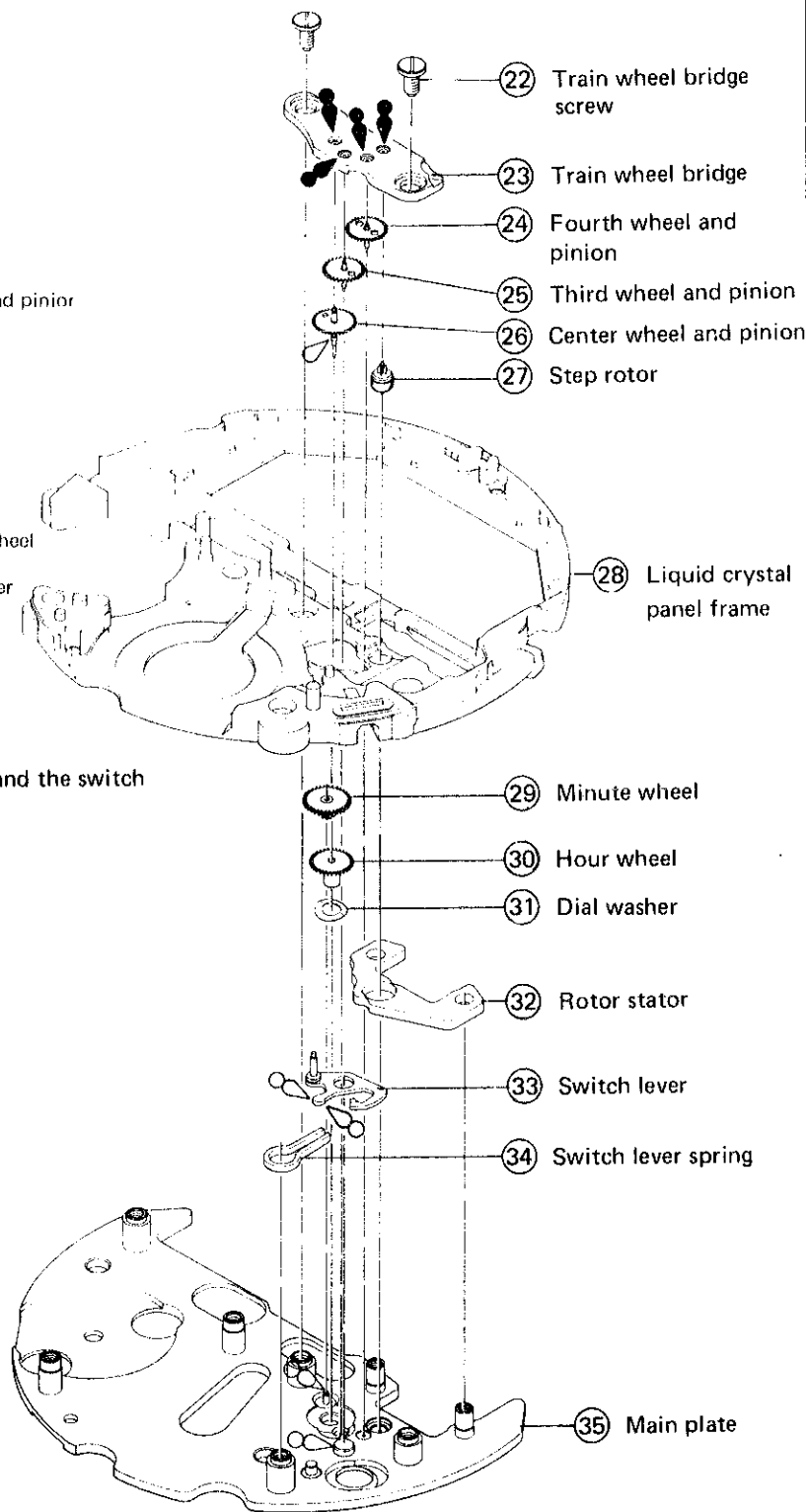
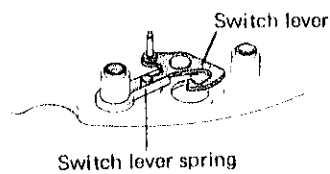
- Setting position of the gear train



- Setting position of the dial washer



- How to reassemble the switch lever and the switch lever spring



• Refer to the "SEIKO QUARTZ TECHNICAL GUIDE, GENERAL INSTRUCTION" for Digital Watches for details.

IV. CHECKING AND ADJUSTMENT

Procedures

CHECK BATTERY VOLTAGE

Result:
More than 1.5V: Normal
Less than 1.5V: Defective

CHECK BATTERY CONDUCTIVITY

CHECK OUTPUT SIGNAL

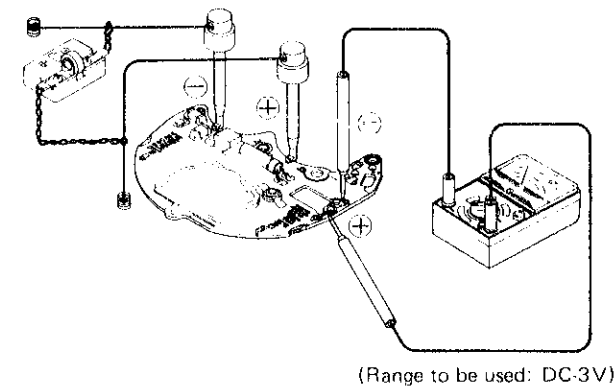
Be sure to check the output signal with the Quartz Tester set under the crown.

Result:
Output signal is transmitted:
Normal
Output signal is not transmitted:
Defective

CHECK CONDUCTIVITY OF LIQUID CRYSTAL PANEL, CIRCUIT BLOCK, COIL BLOCK AND CONNECTORS

CHECK CIRCUIT BLOCK AND LIQUID CRYSTAL PANEL

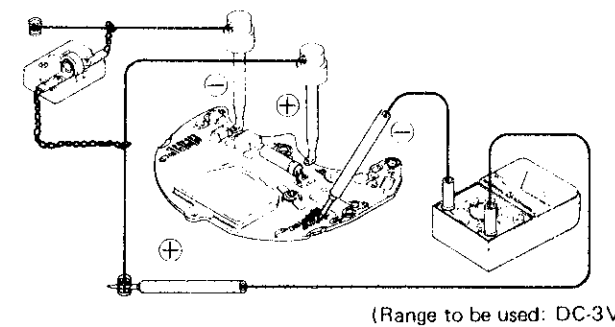
Output of analogue function



Result:
Pointer of the Volt-ohm-meter swings every 10 seconds: Normal
Pointer of the Volt-ohm-meter does not swing every 10 seconds: Defective
* Replace the circuit block with a new one.

Note: The output can also be checked at range:
DC - 12μA.

Output of digital function



At the rate, the pointer of the Volt-ohm-meter swings slightly every 2 seconds on detection of the pulse for measuring the daily rate. Check to see if the pointer of the Volt-ohm-meter swings greatly every 10 seconds.

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

Procedures



- Check to see if there are any broken wire, short circuit, etc. in the liquid crystal panel.

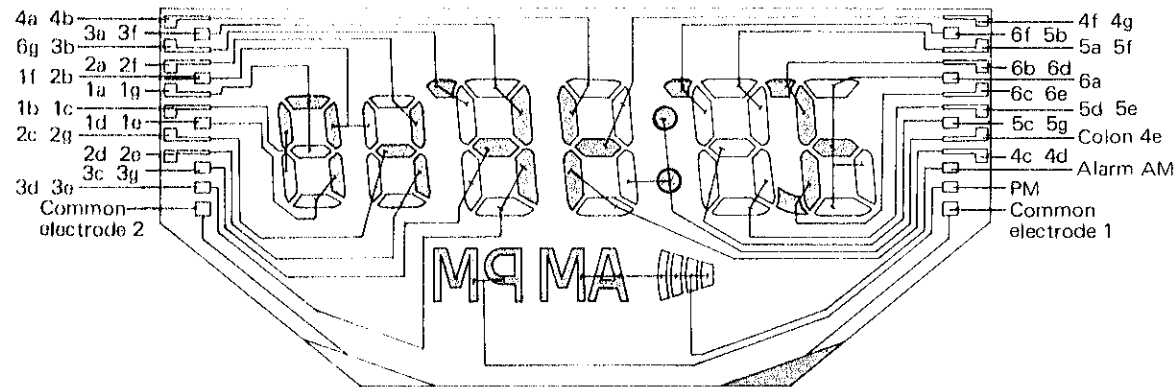
Result:

Lights up: Normal
Does not light up: Defective

* Replace the liquid crystal panel with a new one.

Liquid crystal panel electrode

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



CHECK COIL BLOCK

Result:

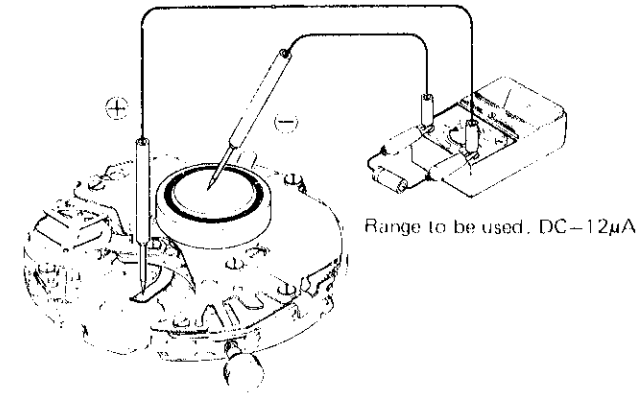
2.2kΩ – 2.6kΩ: Normal

Less than 2.2kΩ (Short circuit)
More than 2.6kΩ (Broken wire) — Defective

* Replace the coil block with a new one.

Procedures

CHECK CURRENT CONSUMPTION



Result:

Less than 2.0μA: Normal
More than 2.0μA: Defective

- When the probe (+) of the Volt-ohm-meter is applied as shown in the illustration above, the pointer of the Volt-ohm-meter swings slightly, indicating that the current is flowing through the IC (including the liquid crystal panel). And also the Volt-ohm-meter swings greatly once every 10 seconds, since more current flows to drive the step motor in addition to the current running through the IC (including the liquid crystal panel).

- Calculate the current consumption as follows:

Ex.) Suppose that IC current = 1.5μA, IC current + step motor driving current = 1.8μA, then the current only for driving the step motor is 0.3μA. However, it is the value at 10-second stepping. Therefore, it is required to convert 0.3μA into the value at 1-second stepping. Reduce the value (0.3μA) into 1/10, and the current consumption only for the step motor is 0.03μA. Accordingly the current consumption for this watch is calculated as: 1.5μA + 0.03μA = 1.53μA.

* How to check if the liquid crystal panel or the circuit block is defective when the current consumption is more than 2.0μA.

[1] Check the current consumption with the coil block disassembled from the movement.

Result:

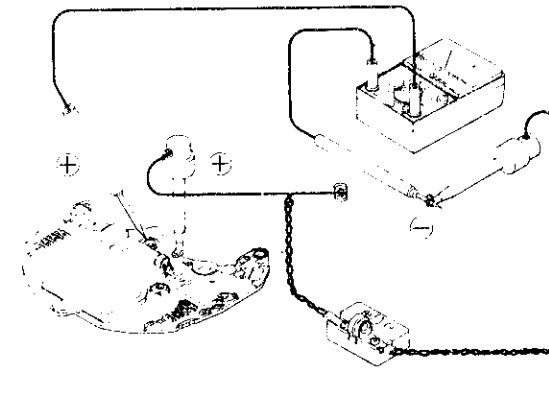
Less than 1.8μA: Normal

Check to see if the gear train and the step motor are set correctly and if there are dust, lint, etc.

More than 1.8μA: Defective

Proceed to [2]

[2] Check the current consumption with the circuit block alone.



Result:

Less than 1.5μA: Normal

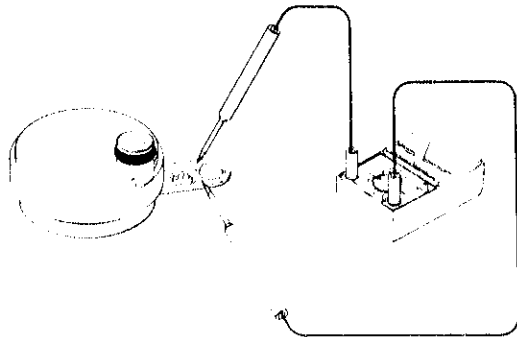
Replace the liquid crystal panel.

More than 1.5μA: Defective

Replace the circuit block.

Procedures

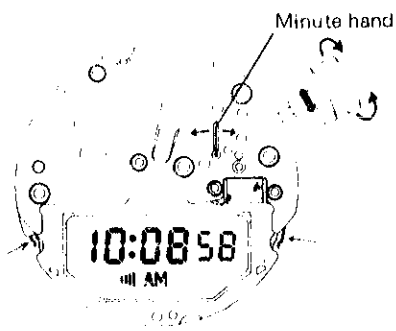
CHECK SPEAKER BLOCK



- Check with the speaker block turned over.

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

CHECK CONDUCTIVITY OF SWITCH COMPONENTS



- * Check after reassembling the battery and the minute hand to the movement (module).

(Digital function)
 Check it by pushing the switch spring with tweezers.

Result:
 Functions correctly: Normal
 Does not function correctly: Defective
 * If it can not be corrected, replace the switch spring with a new one.

(Analogue function)
 Pull out the crown and turn it clockwise and counterclockwise.

Result:
 When turned, it clicks and the hand moves: Normal
 When turned, it does not click and the hand does not move: Defective
 * Check switch lever and switch spring.
 * Check contact point lever and friction washer for contact point lever.
 * Check dust and contamination on the circuit block.

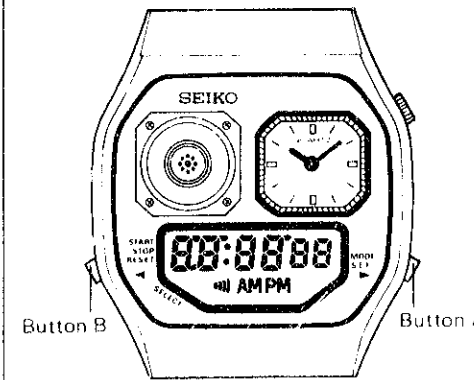
CHECK ACCURACY

- * Check accuracy according to the accuracy measuring method for analogue quartz watches. (When accuracy is measured by the accuracy measuring method for digital quartz watches, it cannot be checked stably.)
- * Check accuracy with the crown side down.

Procedures

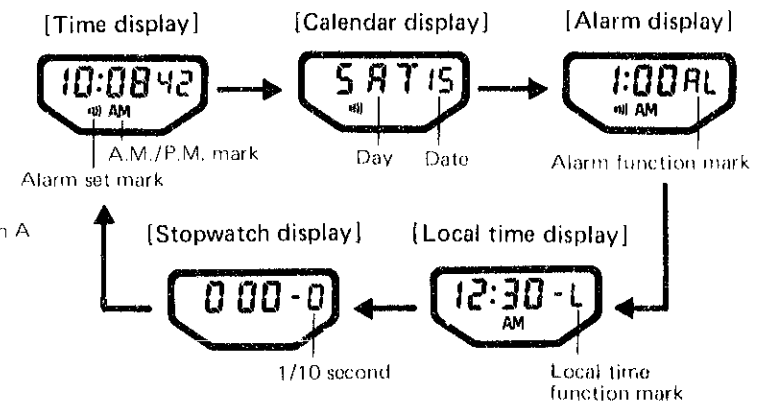
CHECK FUNCTIONING AND ADJUSTMENT

Check the digital function



Result:

- Check to see if the display changes in the following order by each depression of the button A.



- Check to see if when the button B is depressed for 3 to 4 seconds in each display except in the stopwatch display a part of the display starts flashing with chime and if the flashing part changes by each depression of the button B.
- Check to see if the digit or the day advances one by one at the flashing display by each depression of the button A.

Check the analogue function.

Result:

- Check to see if one hour is adjusted when the crown is turned clockwise or counterclockwise 2 clicks within 1/2 second with the crown at the first click position.
- Check to see if 30 seconds is adjusted when the crown is turned clockwise or counterclockwise 1 click with the crown at the first click position.

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