SEIKO

DIGITAL QUARTZ

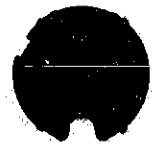
Cal. B004A

PARTS CATALOGUE

Cal. B004A

☆354 069

735 068



4001 216

4238 001

4246 015

4247 008

4256 006

4313 036

4398 213

4450 010

☆4510 062

4580 062

☆4991 002

☆Maxell SR721W

012 462

017 524

2/1

☆⇨Please see remarks on the next page.

Cal. B004A

Characteristics

Casing diameter : ϕ 17.5 mm
Maximum height : 4.4 mm without battery
Frequency of quartz crystal oscillator : 32,768 Hz (Hz=Hertz ..... Cycles per second)
Display medium : Nematic Liquid crystal, FE-Mode.
Regulation system : Trimmer condenser
Time and calendar display :
Alarm display :
Timer display :
Time signal function :
Sound demonstration :

PART NO.	PART NAME	PART NO.	PART NAME
☆**354 069**	Winding stem		
735 068	Winding stem holder		
4001 216	Circuit block		
4238 001	Switch lever spring		
4246 015	Lead terminal (+)		
4247 008 / ☆4247 009	Winding stem holder bush		
4256 006	Speaker block fixing spring		
4313 036	Connector		
4398 213 / ☆4398 335	Speaker block frame		
4450 010	Switch lever		
☆**4510 062**	Liquid crystal panel (Silver)		
☆4510 063	Liquid crystal panel (Gold)		
4580 062 / ☆4580 064	Speaker block		
☆**4991 002** / 4991 152	Speaker gasket		
012 462	Winding stem holder screw		
017 524	Switch lever pin		
☆Maxell SR721W / SEIKO TR721W	Silver oxide battery		

Remarks :

Winding system

☆354 069 ····· Refer to the photograph on the front page.
If the combination of the winding stem and case is unknown, check the case number and refer to **"SEIKO Quartz Casing Parts Catalogue"** to choose a corresponding winding stem.

Winding stem holder bush, Speaker block frame, Speaker block, Speaker gasket

☆4247 009
☆4398 335
☆4580 064
☆4991 002
····· The parts designated with these parts numbers are manufactured specially for the water resistant case of a pressure of 10 atmospheres (100 meters or 300 feet). Be sure to use these parts for keeping high-water resistant quality.

Liquid crystal panel

☆4510 062
☆4510 063
..... Be sure that combination between the color of panel cover and liquid crystal panel should be matched according to the **"SEIKO Quartz Casing Parts Catalogue."**

Battery

☆Maxell SR721W
☆SEIKO TR721W
..... The substitutive battery might be added to the applied battery in the future. In that case please refer to separate **"BATTERY LIST FOR SEIKO QUARTZ WATCHES".**

☆⇨Please see remarks.
Part numbers in light letters are not shown in photos.

TECHNICAL GUIDE

SEIKO

DIGITAL QUARTZ

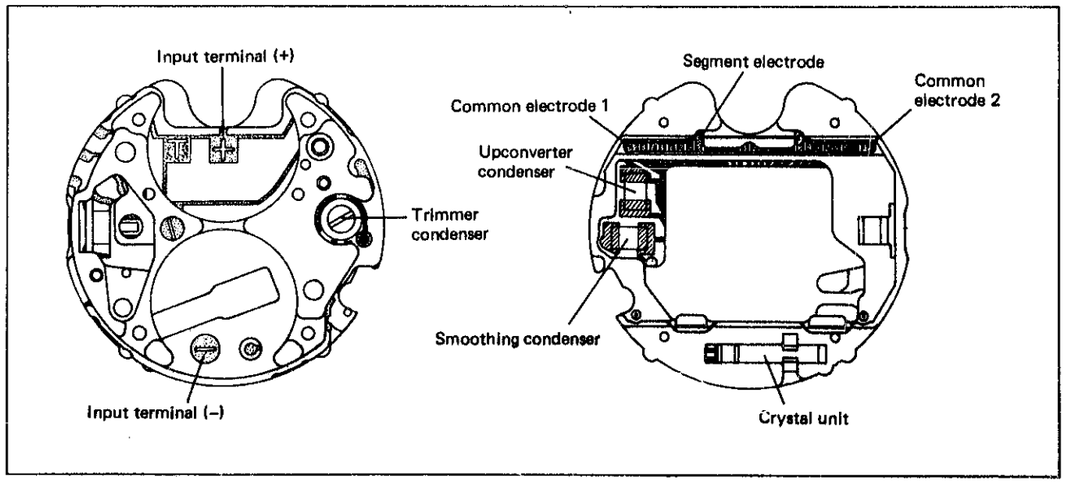
CAL. B004A

CONTENTS

I. SPECIFICATIONS

Item \ Cal. No.		B004A
Display medium		Nematic Liquid Crystal, FEM (Field Effect Mode)
Liquid crystal panel driving system		Multiplex driving system
Display system		Time function Calendar function Alarm function Timer function
Additional mechanism		Automatic calendar system Hourly time signal Alarm test system
Loss/gain		Monthly rate at normal temperature range: Less than 15 seconds
Module size	Outside diameter	ϕ17.5 mm
	Height	4.4 mm without battery
Regulation system		Trimmer condenser
Measuring gate by quartz tester		Any gate is available
Battery		SEIKO (SEIZAIKEN) TR721W, Maxell SR721W Battery life is approximately 2 years Voltage: 1.55V

II. STRUCTURE OF CIRCUIT BLOCK

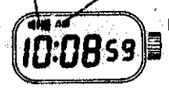


III. DISPLAY FUNCTION

Time display

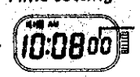
- Each time the crown is turned clockwise, the display will change in the order below.

Alarm mark AM/PM mark



Pull out the crown

Time setting



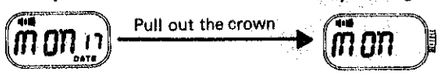
Second figures are reset to "00" by pulling out the crown.
Clockwise : gain
Counterclockwise: loss

Clockwise

- How to operate alarm test system
  In the time function, turn the crown clockwise and counterclockwise twice within 2.5 seconds.

Day and date display

Day setting



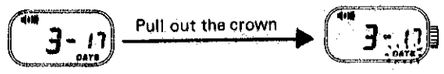
Pull out the crown

Clockwise : gain
Counterclockwise: loss

Clockwise

Month and date display

Month/Date setting



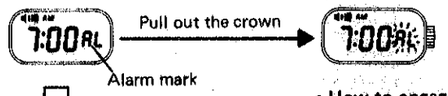
Pull out the crown

Clockwise : gain
Counterclockwise: loss

Clockwise

Alarm display

Alarm setting



Pull out the crown

Clockwise : gain
Counterclockwise: loss

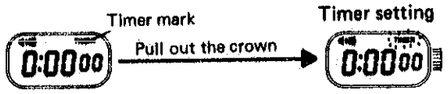
Alarm mark

Clockwise

- How to engage or disengage the alarm
  In the alarm function, the alarm mark appears and disappears alternately with each push of the crown and the alarm is engaged and disengaged respectively.
- How to stop the alarm from ringing
  Turn the crown once clockwise and counterclockwise.

Timer display

Timer mark



Pull out the crown

Timer setting

Clockwise : gain
Counterclockwise: loss

- How to start and stop timer
  Push in the crown to start it and pull out the crown to stop it.
- How to reset timer
  Turn the crown and set it to "0:00oo".

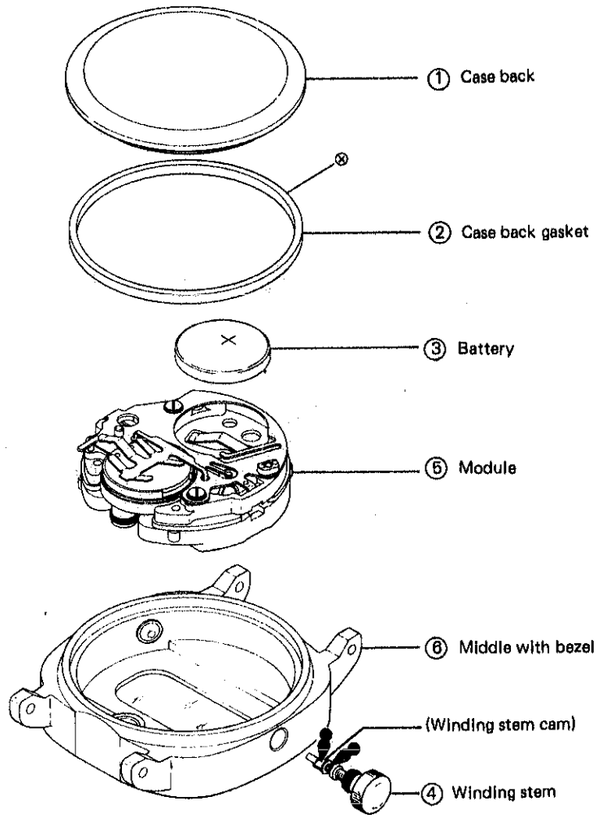
Note: Display changes quickly by turning the crown quickly.

IV. DISASSEMBLING REASSEMBLING AND LUBRICATING OF CASE

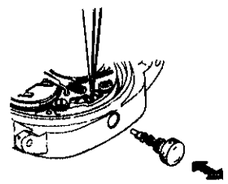
Disassembling procedures: Figs. ① → ⑥

Reassembling procedures: Figs. ⑥ → ①

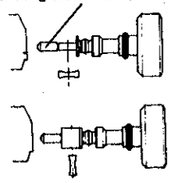
Lubricating: ●► SEIKO Watch Oil-S6
Never lubricate the portion marked ⊗



④ Winding Stem
When removing/installing winding stem, depress the punched part of the winding stem holder downward with tweezers. At the same time, pull out/insert the winding stem so that the cam is placed horizontally.



Winding stem cam portion

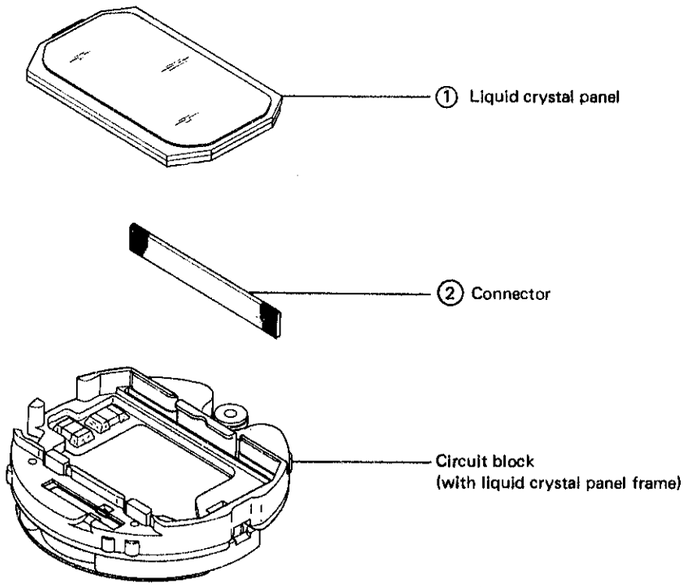


V. DISASSEMBLING AND REASSEMBLING

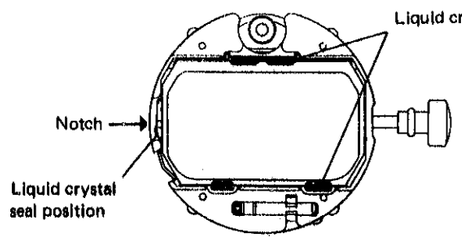
Disassembling procedures: Figs. ① → ⑪

Reassembling procedures: Figs; ⑪ → ①

1. Liquid crystal panel side

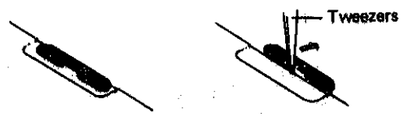


① Liquid crystal panel



How to remove

- Push the liquid crystal panel frame outward with tweezers and remove the liquid crystal panel, being careful not to scratch it.

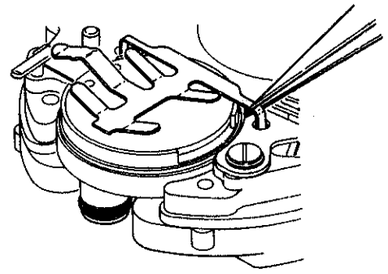


How to install

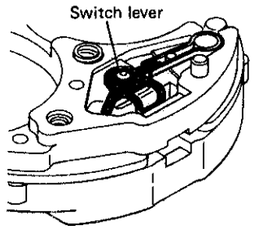
- Set the liquid crystal panel so that the liquid crystal seal position faces the notch of the liquid crystal panel frame.
- First, install the end of the liquid crystal panel (6 o'clock position). Then, insert the other end of the liquid crystal panel (12 o'clock position). After inserting the liquid crystal panel, depress the panel frame inward.

2. Battery side

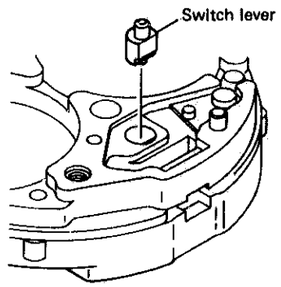
③ Speaker block fixing spring
When removing/installing the speaker block fixing spring, always hold the bent portion with tweezers.

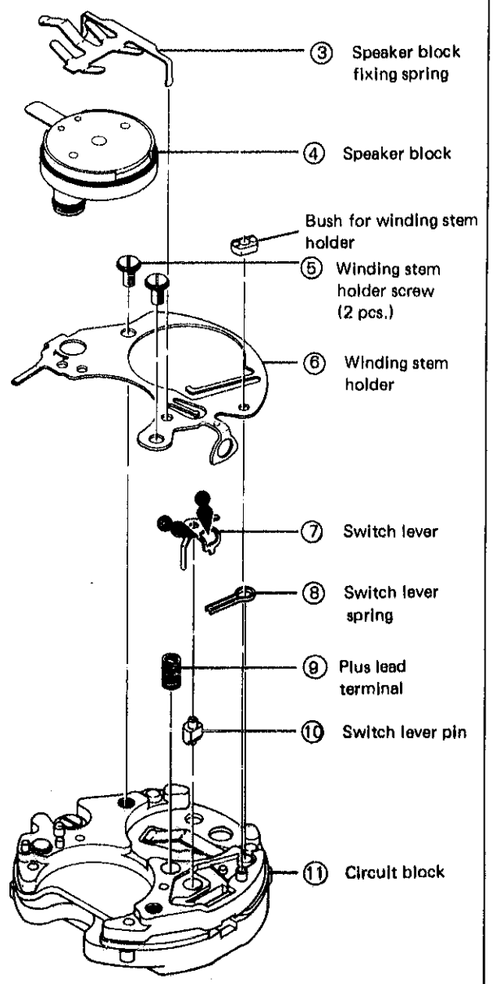


⑦ Switch lever
Install the switch lever as shown in the illustration below.

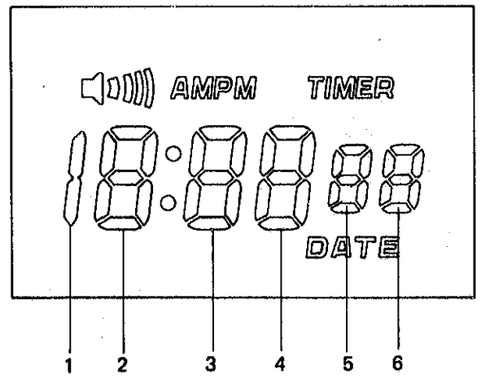


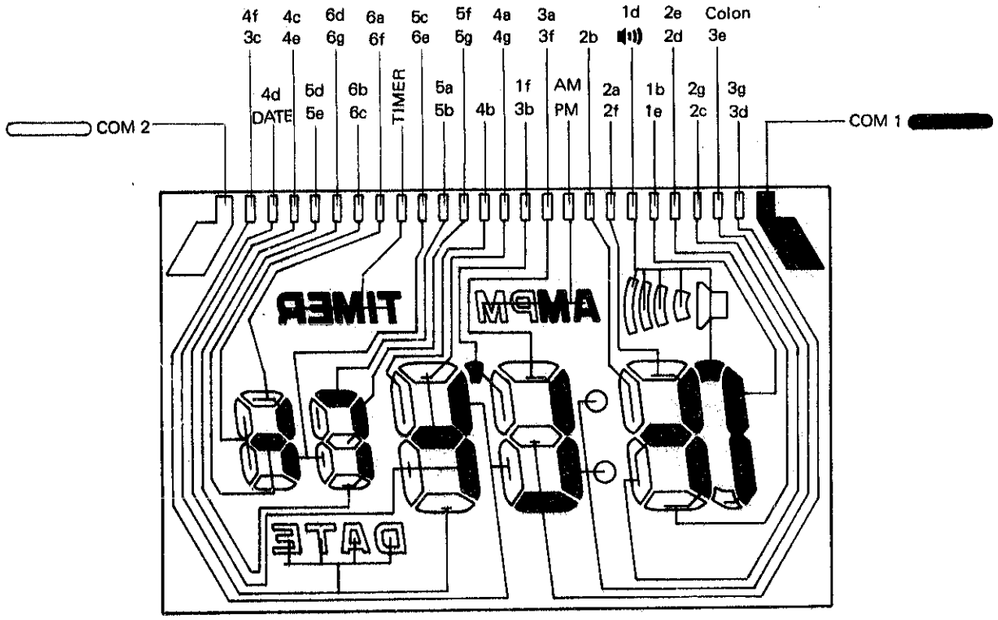
⑩ Switch lever pin
The switch lever pin has a flat portion. When installing the switch lever pin, align the flat portion of the switch lever pin with that of the circuit block.





3. Relationship between the segment (Liquid crystal panel electrode) and the C-MOS-LSI output terminal





VI. CHECKING AND ADJUSTMENT

The explanation here is only for the particular points of Cal. B004A.
Refer to the "TECHNICAL GUIDE, GENERAL INSTRUCTION" for SEIKO Digital Quartz for ordinary checking and adjustment.

Procedure

CHECK BATTERY VOLTAGE

Set up the Volt-ohm-meter.
Range to be used: DC3V

Red probe ⊕ ..... Battery surface ⊕
Black probe ⊖ ..... Battery surface ⊖

Result:

Normal : More than 1.5V
Defective : Less than 1.5V
Replace the battery.

CHECK BATTERY CONDUCTIVITY

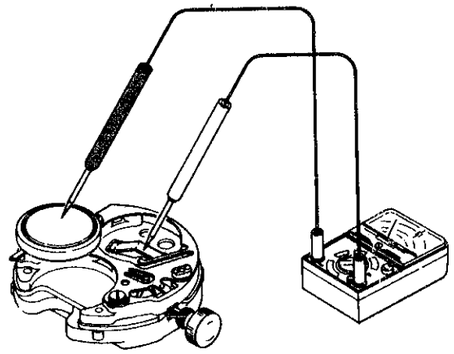
CHECK CURRENT CONSUMPTION

- Be sure to protect the C-MOS-LSI from light with black paper etc., while measuring.
  Do not check current consumption under an incadescent lamp, since strong light causes a watch to consume excess current.
- Set up the Volt-Ohm-meter.
  Range to be used: DC12μA

Red probe ⊕ ..... Battery connection ⊖
Black probe ⊖ ..... Battery surface ⊖

Result:

Normal : Less than 1.5μA
Defective : More than 1.5μA
*Replace circuit block or liquid crystal panel.



How to find defects when the current consumption is more than 1.5μA.
Measure the current consumption of circuit block alone.

Normal : Less than 1.3μA
Replace the liquid crystal panel.

Defective :
Replace the circuit block.

Procedure

CHECK WATER RESISTANCE

CHECK CONTACT BETWEEN C-MOS-LSI AND LIQUID CRYSTAL PANEL

Refer to "Relation between the segment and C-MOS-LSI output terminal" and check for poor conductivity of the liquid crystal panel, connector and C-MOS-LSI output terminal.

CHECK LIQUID CRYSTAL PANEL AND CIRCUIT BLOCK

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

Set up the Volt-ohm-meter
Range to be used: OHMS x1 – x1K

Result:

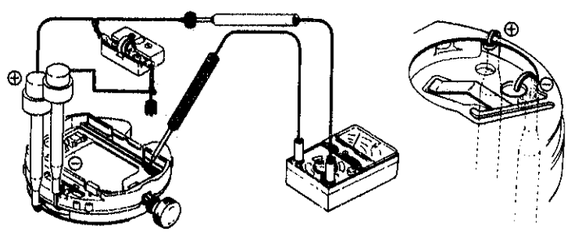
Normal : Lights up
Defective : Does not light up.
Replace the liquid crystal panel.

(2) Check to see if the electric signal is transmitted correctly from the circuit block.
When measuring, be sure to remove liquid crystal panel, connectors and speaker block.

Set up the Volt-ohm-meter.
Range to be used: DC3V

Result:

Normal : More than 0.8V
Defective : Less than 0.8V
Replace the circuit block.



CHECK ACCURACY

- When measuring time accuracy, set the watch in the timer function where the timer mark is not flashing and the display is reset to "0:00oo".
- Be sure to protect the C-MOS-LSI from light with case back or black paper, etc. while measuring.

Result:

Normal : Neither gain nor loss.
Defective : Either gain or loss.

CHECK FUNCTIONING

Procedure

CHECK ALARM TEST SYSTEM

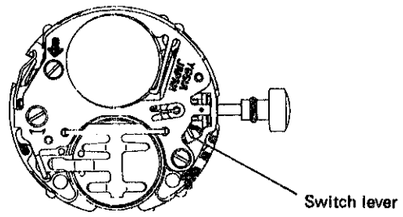
In the time display, turn the crown clockwise and counterclockwise twice within 2.5 seconds and the alarm will ring five times.

Result:

Normal : Alarm rings
Defective – Alarm does not ring
Check speaker block
Display disappear
Replace battery.

CHECK CONDUCTIVITY OF SWITCH COMPONENT

- Check to see if the contact points of switch lever touch the circuit block in fully assembled module.
- With the middle with bezel assembled check to see if the display changes correctly by turning crown clockwise and counterclockwise.



Result:

Normal : Operate correctly.
Defective : Do not operate correctly.

CHECK SPEAKER BLOCK

Set up the Volt-ohm-meter
Range to be used: OHMS x 100

Result:

Normal : 120Ω – 140Ω
Defective – Less than 120Ω (Short circuit)
More than 140Ω (Broken wire)
Replace speaker block.

OTHERS

If all segments are displayed and don't return to the normal display condition, open the case back and remove the battery. Then short circuit the battery connection (–) and winding stem holder with tweezers.

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