

# TECHNICAL GUIDE

## AND PARTS LIST

CAL. V031A

# COMBINATION QUARTZ

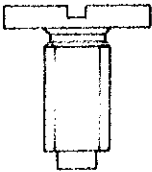
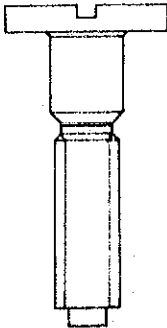
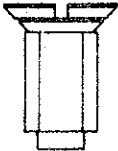
### CONTENTS

I. SPECIFICATIONS .....	1
II. LIST OF SCREWS USED .....	1
III. OPERATION .....	2
IV. DISASSEMBLING, REASSEMBLING AND LUBRICATING .....	3 ~ 4
V. CHECKING AND ADJUSTMENT .....	5 ~ 8
VI. PARTS LIST .....	9

I. SPECIFICATIONS

Cal. No.		V031A	
Item		Analogue Section	Digital Section
Display medium		Three Hands	Nematic Liquid Crystal, FEM (Field Effect Mode)
Driving system		Step motor	Multiplex driving system
Display system			● Calendar display ● Time display ● Alarm display ● Stopwatch display (up to 60 minutes)
Additional mechanism		● Electronic circuit reset switch ● Second setting device	● Alarm test function ● Illuminating light
Loss/gain		Monthly Rate: Less than 15 seconds at normal temperature range	
Movement size	Casing diameter	26.5 mm (6 - 12 H), 25.0 mm (3 - 9 H)	
	Height	3.9 mm	
Regulation system		Trimmer condenser	
Quartz Tester measuring gate		10 - second gate	
Battery		● SEIKO (SEIZAIKEN) SR41W, MAXELL SR41W, U.C.C. 392, SONY EVEREADY 392 Battery life: Approx. 2 years for SEIKO (SEIZAIKEN) SR41W, U.C.C. 392 and SONY EVEREADY 392 Approx. 1.5 years for MAXELL SR41W Voltage: 1.55 V	
Jewels		0 jewel	

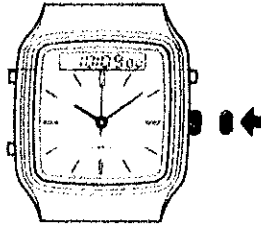
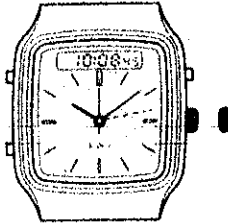
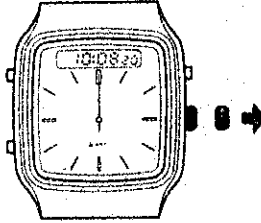
II. LIST OF SCREWS USED

		
012 168	012 061	012 785
● Coil block screw (1 pce.) ● Train wheel bridge screw (2 pcs.)	Switch spring screw (6 pcs.)	Circuit block screw (1 pce.)

III. OPERATION

HOW TO SET THE ANALOGUE TIME

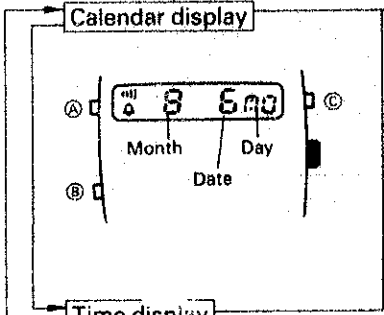
1. Pull out the crown when the second hand is at the 12: 00 position.
2. Turn the crown to adjust the hour and minute hands.
3. Push back the crown in accordance with a time signal so as to start the second hand at the exact time.



\* When setting the minute, advance the minute hand four or five minutes ahead and turn back it to the exact minute.

HOW TO USE THE DIGITAL FUNCTION

Each time when button (A) is pressed, the display changes as following order.



\* When button (C) is kept pressed, the light illuminates.

< HOW TO SET THE CALENDAR, TIME, ALARM DISPLAY >

- Press button (B) for 2 to 3 seconds to activate the setting function.
- Selection of the digits to be adjusted is made by pressing button (B).
- One digit (flashing) is advanced by each depression of button (C).

How to engage and disengage

Alarm:

\* Each time when button (C) is pressed, the alarm mark appears/disappears.

ON	⏰	Appears.
OFF		Disappears.

Hourly time signal:

\* In the time or calendar display, the hourly time signal can be engaged and disengaged alternately by pressing buttons (B) and (C) simultaneously.

ON	🔊	Appears.
OFF		Disappears.

Pattern segment checking mode

Press buttons (B) for 2 to 3 seconds in the stopwatch display. To disengage the pattern segment checking mode, press any of buttons (A) or (C).

Split/  
Split  
release  
Reset

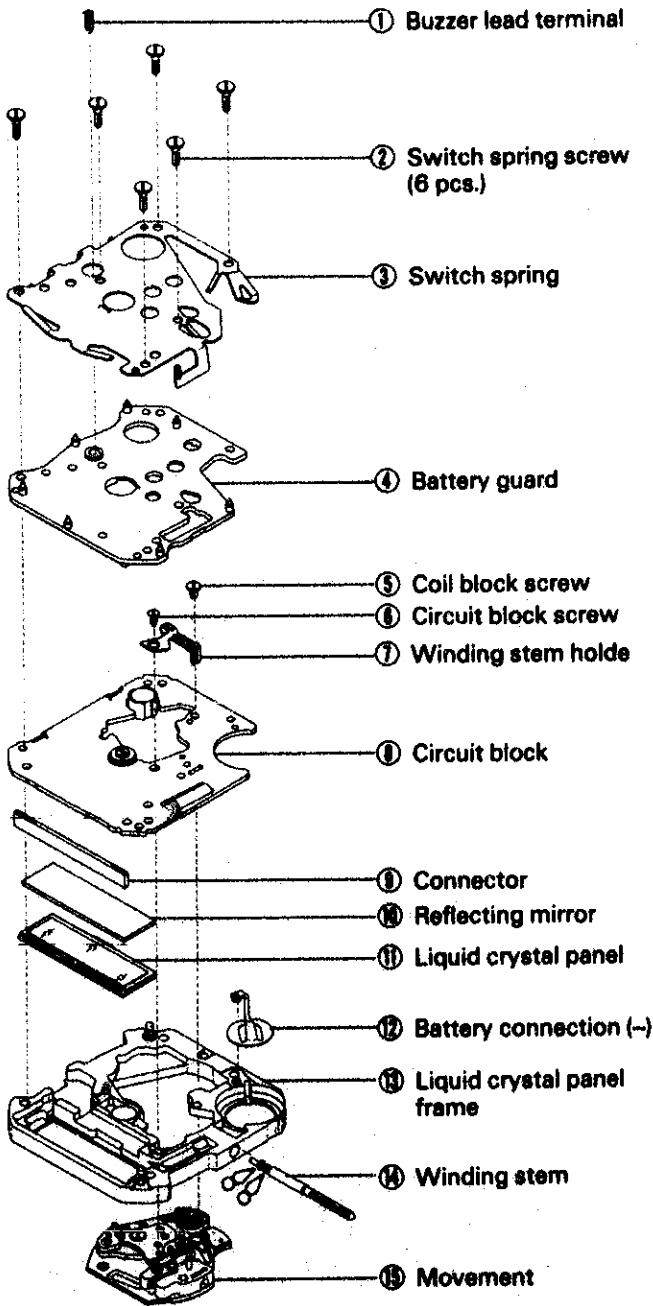
IV. DISASSEMBLING, REASSEMBLING AND LUBRICATING

Disassembling procedures: Figs. ① ~ ⑫  
Reassembling procedures: Figs. ⑫ ~ ①

Lubricating:

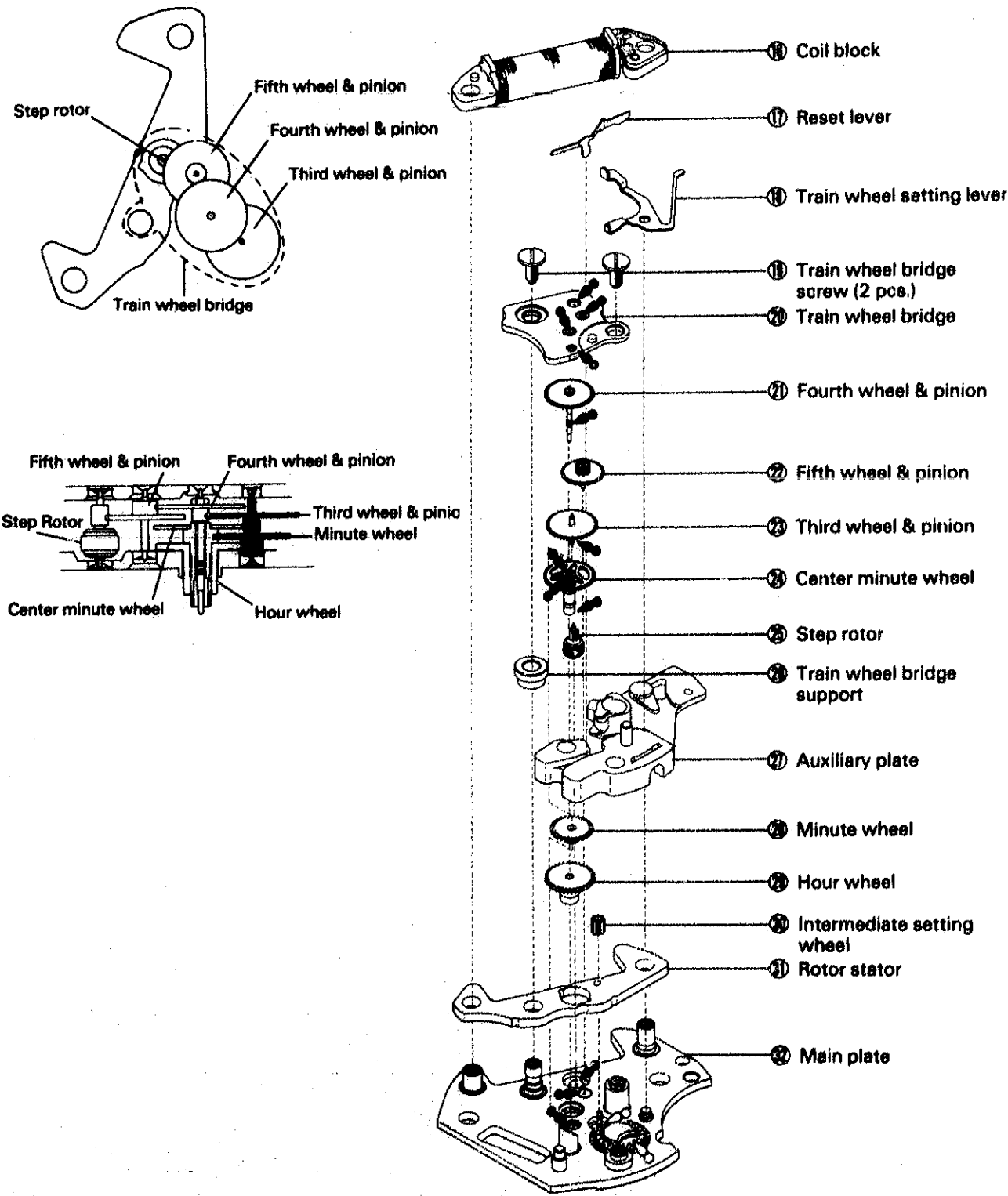
Types of oil	Oil quantity
● Moebius A	Standard ∞
∞ SEIKO watch oil S-6	Small ∞

● Buzzer lead terminal ~ Movement

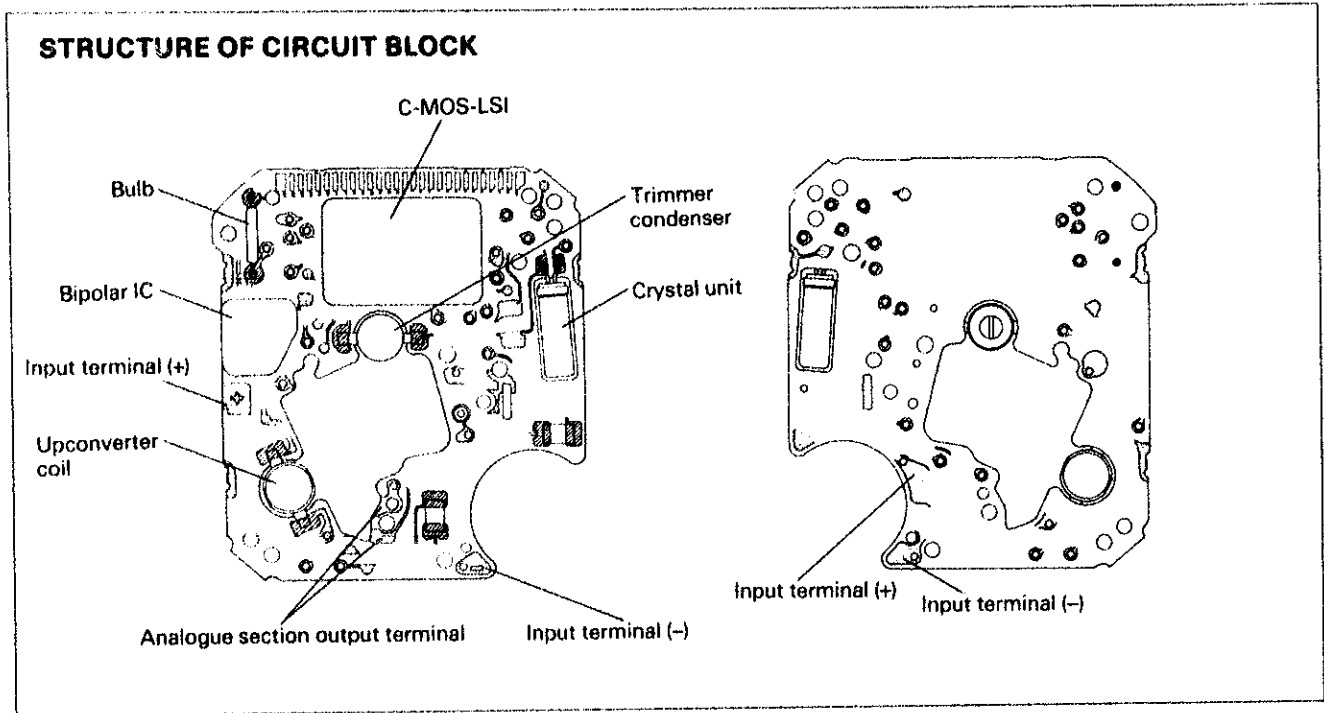


● Coil block ~ Mainplate

\* Train wheel set position



V. CHECKING AND ADJUSTMENT



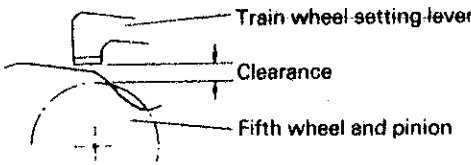
● This section only gives the checking and adjustment procedure which is exclusive for cal. V031A.  
For the normal checking and adjustment, refer to the "TECHNICAL GUIDE GENERAL INSTRUCTION, for digital watches and for analogue watches for details.

OUTPUT SIGNAL	
1. Use the Quartz Tester. 2. Turn the measuring gate selection to "10-second" gate.	Result: Output signal: Normal No output signal: Defective
BATTERY VOLTAGE	
Use the SEIKO Digital Multi Tester S-840A Range to be used: DC V	Result: More than 1.57V: Normal Less than 1.57V: Defective
COIL BLOCK	
Check the coil block for broken wire and short circuit using the SEIKO Digital Multi Tester S-840A. Range to be used: $\Omega$	Result: 3.0 ~ 3.4k $\Omega$ : Normal Less than 3.0k $\Omega$ (short circuit): Defective More than 3.4k $\Omega$ (broken wire): Defective

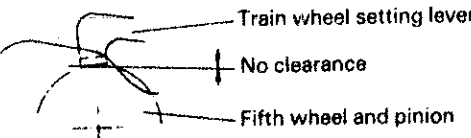
**RESET CONDITION**

With the movement installed, check that the reset condition is normal.  
1. Check the clearance between the train wheel setting lever and fifth wheel and pinion.

(1) The crown at the normal position



(2) The crown at the first click position.



Result:  
Clearance: Normal  
No clearance: Defective  
Replace the train wheel setting lever or confirm that the train wheel setting lever is guided by the train wheel setting lever pin.

Result:  
Clearance: Defective  
No clearance: Normal  
Replace the train wheel setting lever or confirm that the train wheel setting lever is guided by the train wheel setting lever pin.

2. Check the output signal with battery installed.

(1) The crown at the normal position.

Result:  
Output signal: Normal  
No output signal: Defective

(2) The crown at the first click position

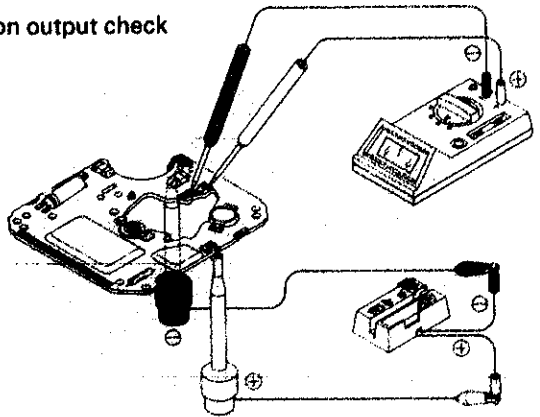
Result:  
Output signal: Defective  
No output signal: Normal

**CONDUCTIVITY BETWEEN C-MOS-LSI AND LIQUID PANEL**

**LIQUID CRYSTAL PANEL - CIRCUIT BLOCK**

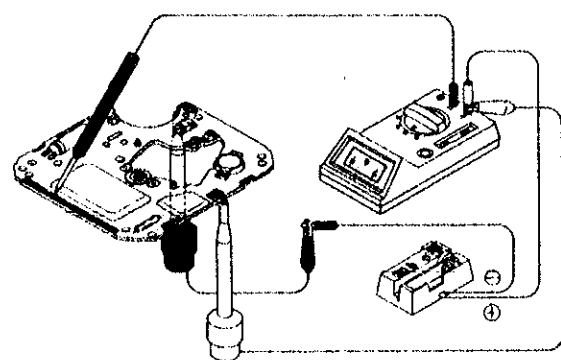
● Use the SEIKO Digital Multi Tester (S-840A).  
Range to be used: DCV

1. Analogue section output check



Result:  
The display changes every one second: Normal (Output signal)  
The display does not change: Defective

## 2. Digital section output check

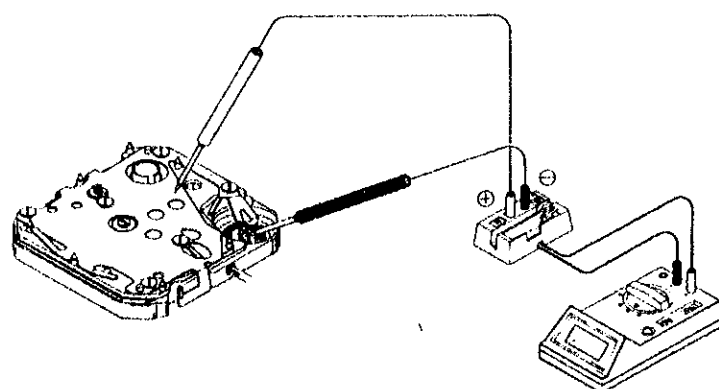


Result:  
More than 1.2V: Normal  
Less than 1.2V: Defective  
Replace the circuit block.

## CURRENT CONSUMPTION

- Use the SEIKO Digital Multi Tester S-840A.  
Range to be used:  $\mu A$

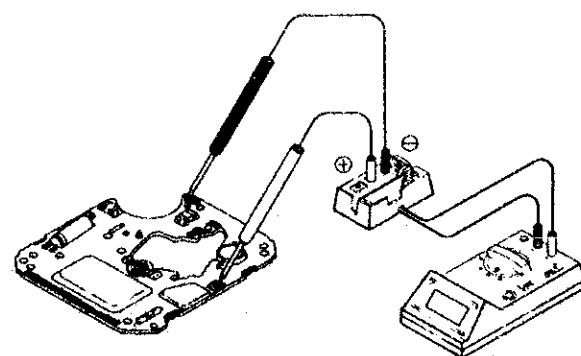
1. Check current consumption for the whole of the movement (module).  
Red probe: Switch spring  
Black probe: Battery connection  $\ominus$



Result:  
Less than  $3.0 \mu A$ : Normal  
More than  $3.0 \mu A$ : Defective

2. If the current consumption is more than  $3.0 \mu A$ , check the current consumption for the circuit block alone.

Red probe: Input terminal  $\oplus$   
Black probe: Input terminal  $\ominus$

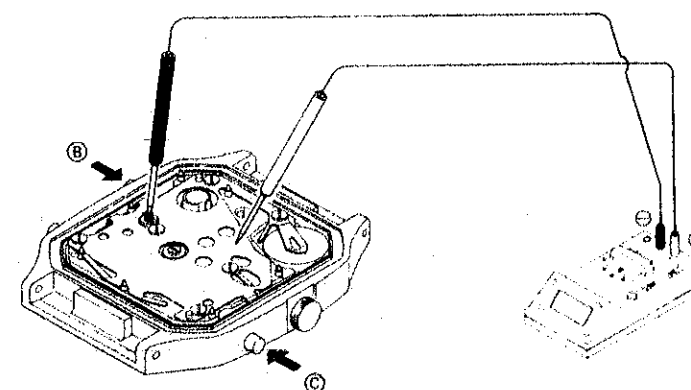


Result:  
More than  $2.0 \mu A$ : Defective  
less than  $2.0 \mu A$ : Normal  
Replace the circuit block or  
Liquid crystal panel

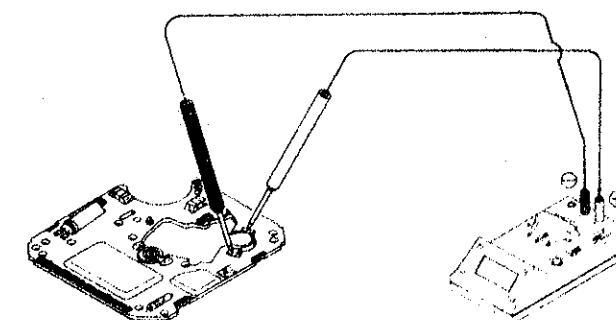
## ALARM CONDITION

In the time or calendar display, check to see if the alarm rings by pressing buttons  $\textcircled{B}$  and  $\textcircled{C}$  simultaneously.  
When the alarm does not ring, go through this procedure.

- ① Check to see if the alarm output signal correctly transmitted from the circuit block.  
Keep buttons  $\textcircled{B}$  and  $\textcircled{C}$  pressed simultaneously in the time or calendar display and check that the alarm output signal is output.
- Use the SEIKO Digital Multi Tester (S-840A).  
Range to be used: DCV  
Red probe: Switch spring  
Black probe: Buzzer lead terminal



- ② Check upconverter coil  
● Use the SEIKO Digital Multi Tester (S-840A)  
Range to be used:  $\Omega$



- ③ Check the appearance of piezoelectric element.  
If items No. ① and ② above are normal, check the piezoelectric element for crack or peel off.

Result:  
The output voltage is displayed  
intermittently: Normal  
(The alarm output signal is output.)

The digits displayed remain  
"00.0": Defective  
Check the upconverter coil.

Result:  
 $130\Omega - 170\Omega$ : Normal  
Less than  $130\Omega$  } Defective  
More than  $170\Omega$  }  
Replace the circuit block.

PATTERN SEGMENT MODE	
Keep button Ⓑ pressed for 2 to 3 seconds in the stopwatch display.	Result: All the segments displayed: Normal Some segments not displayed: Defective Replace the liquid crystal panel or check the circuit block.
BULB CONDITION	
Press button Ⓒ in the time or calendar display.	Result: Lights up: Normal Lights dimly: Defective Replace the battery. Does not light: Defective Replace the bulb or check the circuit block.

## VI. PARTS LIST

Cal. V031 A	
PARTS NO.	PARTS NAME
102 010	Auxiliary plate
125 478	Train wheel bridge
231 461	Third wheel & pinion
*241 481	Fourth wheel & pinion
*241 482	Fourth wheel & pinion
261 481	Minute wheel
*270 481	Center minute wheel
*270 482	Center minute wheel
*271 064	Hour wheel
*271 082	Hour wheel
*351 098	Winding stem
391 482	Train wheel setting lever
426 480	Train wheel bridge support
701 481	Fifth wheel & pinion
735 025	Winding stem holder
805 481	Intermediate setting wheel
4000 083	Circuit block
4002 481	Coil block
4146 480	Step rotor
4239 481	Rotor stator
* 4245 083	Switch spring
4246 027	Buzzer lead terminal
4270 056	Battery connection (-)
4313 045	Connector
4395 015	Battery guard
4455 481	Reset lever
*4510 009	Liquid crystal panel
4512 011	Liquid crystal panel frame
4521 031	Reflecting mirror
4530 230	Bulb
4589 650	Piezoelectric element
012 061	Switch spring screw
012 168	Train wheel bridge screw
012 168	Coil block screw
012 785	Circuit block screw
017 203	Tube for train wheel bridge (A)
017 206	Tube for train wheel bridge (B)
017 334	Tube for circuit block screw
032 031	Tube for coil block screw (B)
032 033	Tube for liquid crystal panel frame screw
032 040	Tube for coil block screw (A)
032 041	Tube for circuit block
SEIKO (SEIZAIKEN) SR41W	Battery
MAXELL SR41W	
U.C.C. 392	
SONY EVEREADY 392	

### Remarks:

\* Fourth wheel & pinion, Center minute wheel, Hour wheel

There are two different types as specified below.

Combination:

*Type	Fourth wheel & pinion	Center minute wheel	Hour wheel
L	241 482	270 482	271 082
M	241 481	270 481	271 064

\*abbreviation L.....Long type  
(Movement type) M.....Standard type

\* Winding stem

The type of winding stem is determined based on the design of case.

\* Liquid crystal panel

4510 009

(Silver)

4510 092

(Gold)

Be sure that combination between the color of panel cover and liquid crystal panel should be matched according to the "Casing Parts Catalogue".

\*SWITCH SPRING FOR PULSAR WATCHES

4245076 (Pulsar marking)