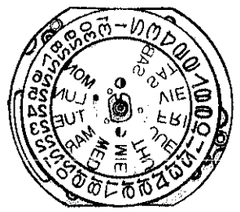
TECHNICAL GUIDE

SEIKO

QUARTZ

CAL. 2A22A
CAL. 2A23A
CAL. 2A29A
CAL. 2A32A

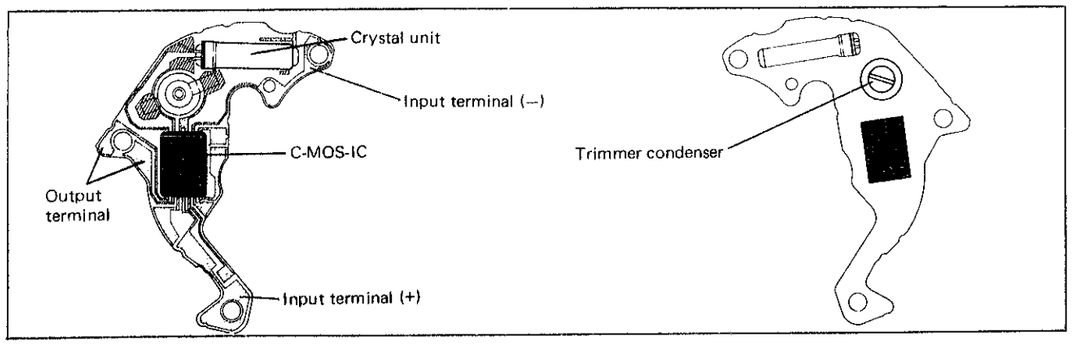


CONTENTS

I. SPECIFICATIONS

Item \ Cal. No.		2A22A	2A23A	2A29A	2A32A
Time indication		3 hands		2 hands	3 hands
Additional mechanism		Date			
		–	Day of the week	–	
		Instant date setting device			
		–	Instant day setting device	–	
		Train wheel setting device			
		Electronic circuit reset switch			
		Battery life indicator		–	Battery life indicator
Loss/gain		Monthly rate at normal temperature range: less than 15 seconds			
Movement size	Outside diameter	ϕ18.3 mm 16.3 mm between 3 o'clock and 9 o'clock sides			ϕ20.7 mm
	Casing diameter	ϕ17.6 mm			ϕ20.0 mm
	Height (without battery)	2.3 mm	2.7 mm	2.3 mm	2.5 mm
Regulation system		Trimmer condenser			
Measuring gate by quartz tester		Any gate is available.			
Battery		SEIKO (SEIZAIKEN) TR621SW, Maxell SR621SW, SONY EVEREADY 364 Battery life is approximately 2.5 years. Voltage: 1.55V			
Jewels		2 jewels			

II. STRUCTURE OF THE CIRCUIT BLOCK



III. DISASSEMBLING, REASSEMBLING, AND LUBRICATING

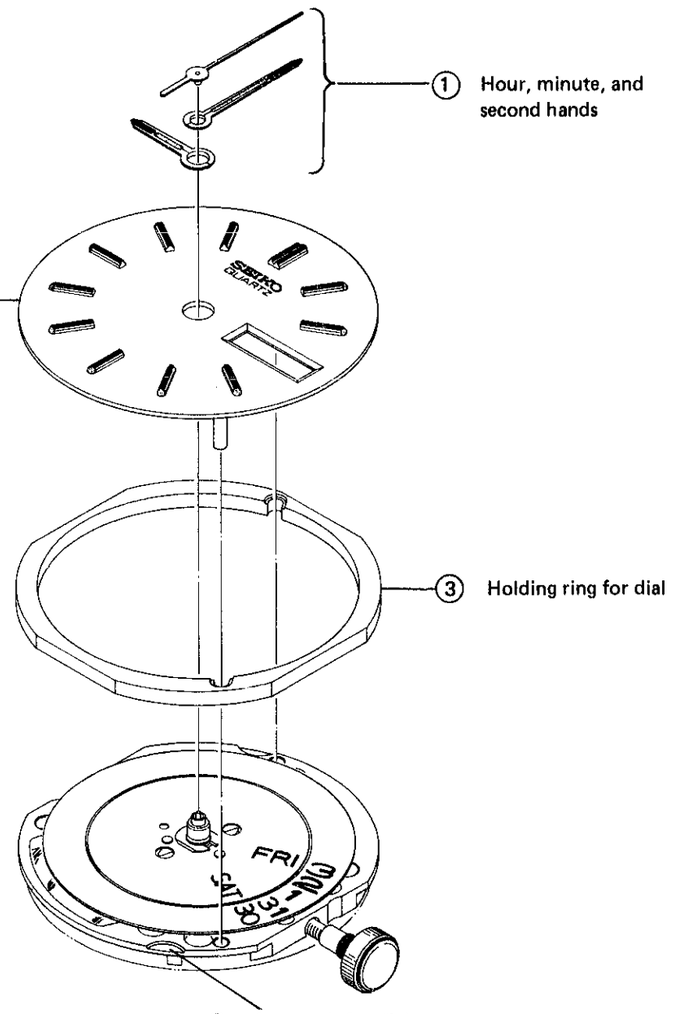
Disassembling procedures Figs.: ① → ㊹
Reassembling procedures Figs.: ㊹ → ①

Lubricating:

Types of oil	Oil quantity
∞ Moebius A	∞ Normal
●∞ SEIKO Watch Oil S-6	∞ Extremely small

1. Hour, minute, and second hands ~ Holding ring for dial

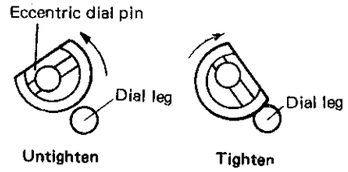
Ex. Cal. 2A23A



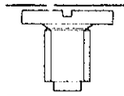
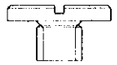
How to remove
Insert a screwdriver into the notches at the 4 o'clock and 11 o'clock positions and remove the dial from the main plate by prying it up from the both ends.

How to set
Put the dial legs into the holes of the main plate.

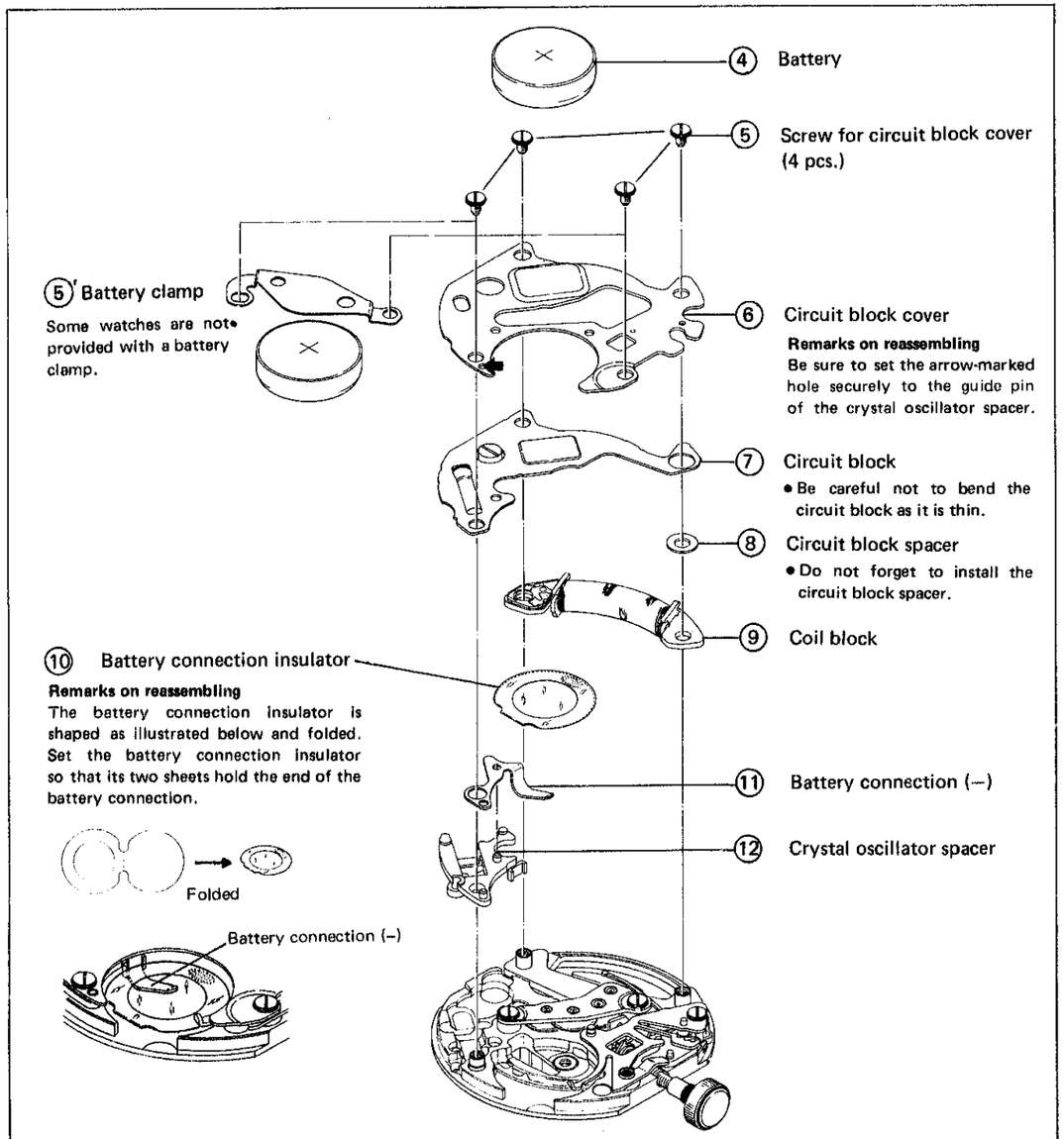
In Cal. 2A32A:
The dial legs are fixed on the main plate with eccentric dial pins.



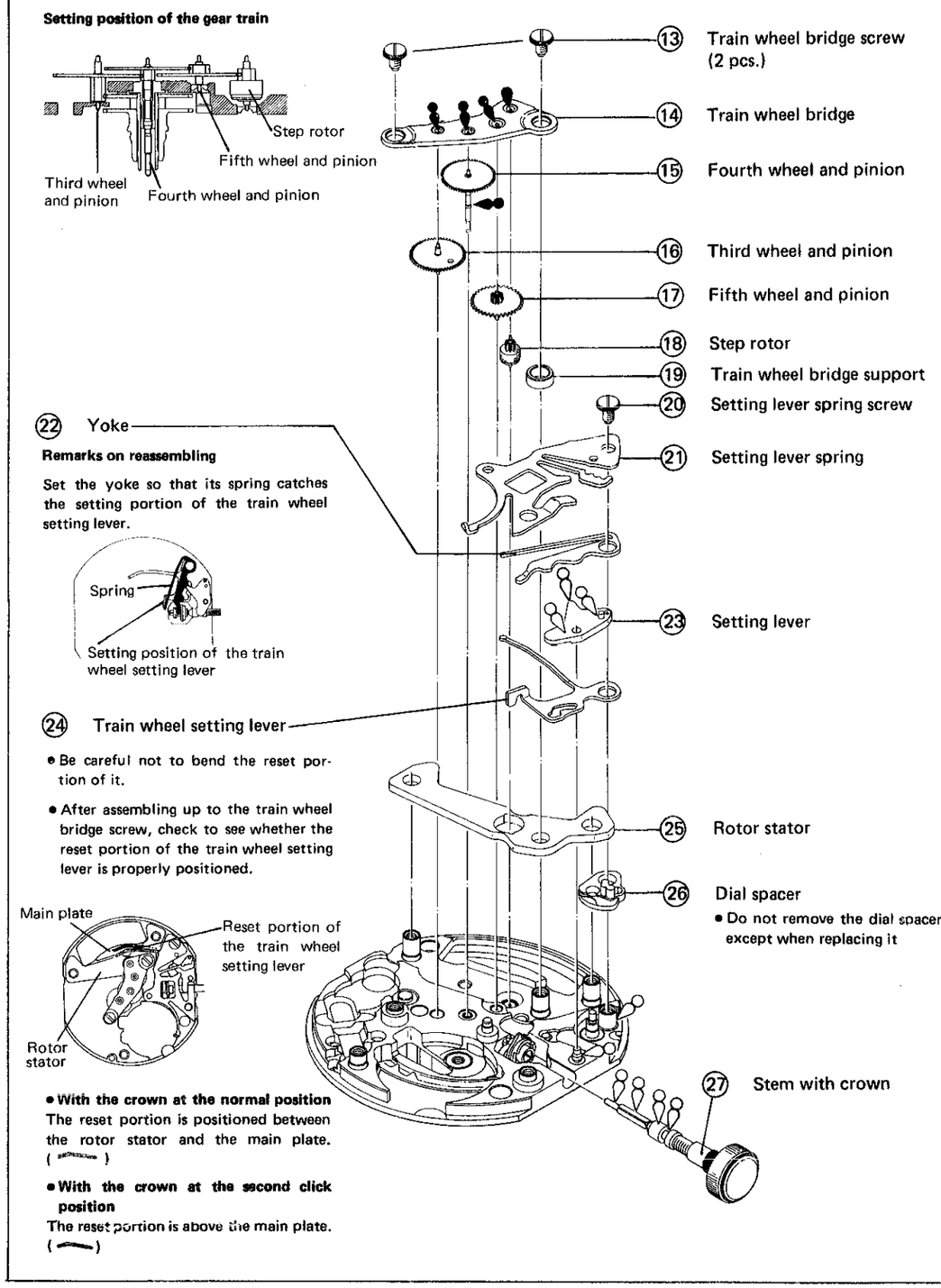
List of the screws used

Shape	Part No.	Name	Shape	Part No.	Name
	012 005	Train wheel bridge screw Screw for circuit block cover Setting lever spring screw		012 006	Date dial guard screw A
	012 008	Date driving wheel screw		012 007	Date dial guard screw B

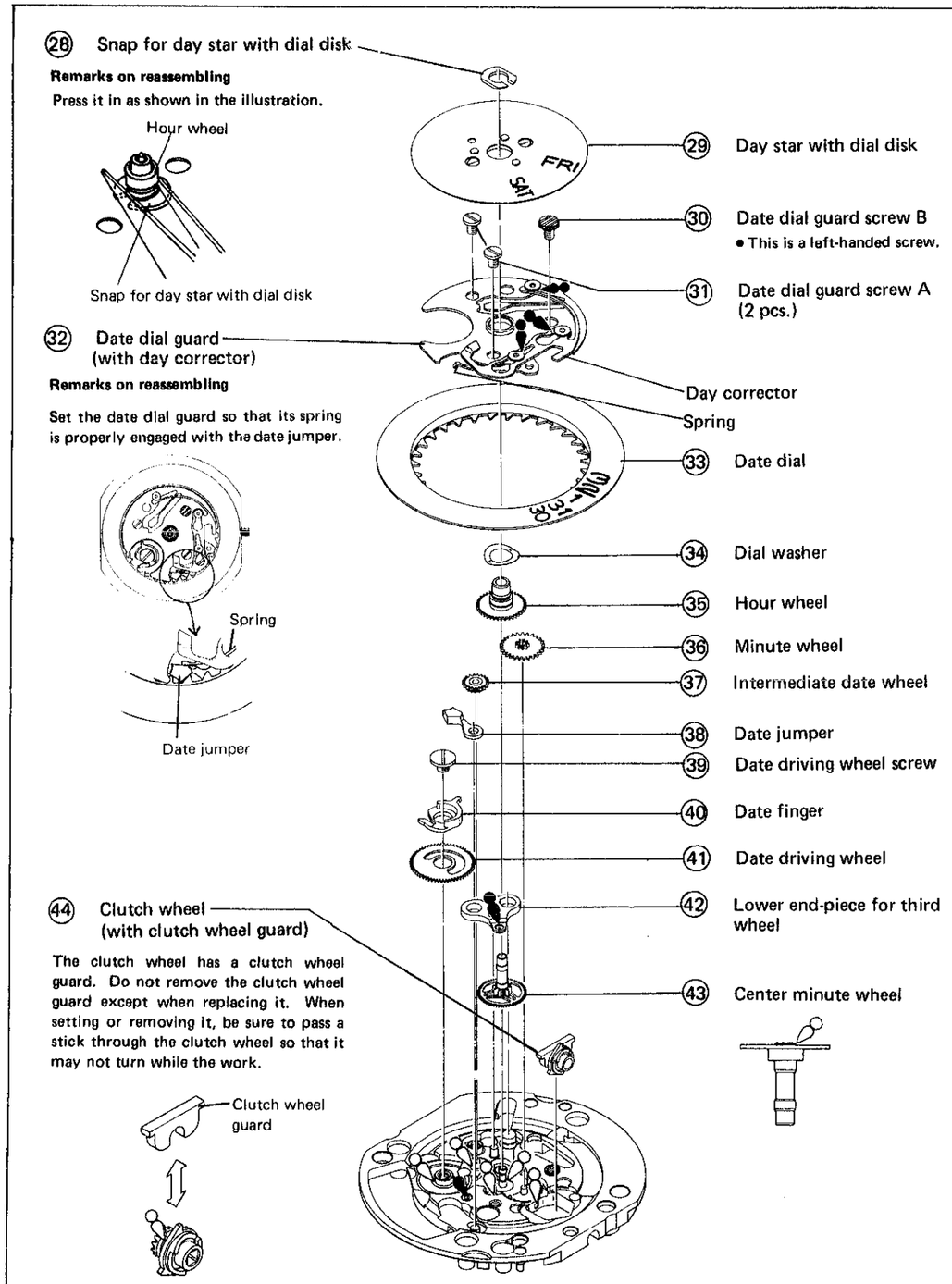
2. Battery ~ Crystal oscillator spacer



3. Train wheel bridge screw ~ Stem switch crown



4. Snap for day star with dial disk ~ Clutch wheel



IV. CHECKING AND ADJUSTMENT

- The explanation here is only for the particular points of Cals. 2A22A, 2A23A, 2A29A and 2A32A. Refer to the "TECHNICAL GUIDE, GENERAL INSTRUCTION" for SEIKO Analogue Quartz for details.

Procedure

CHECK OUTPUT SIGNAL

Result:
Normal: Input indicator blinks every second.
Defective: Input indicator does not blink every second.

CHECK BATTERY VOLTAGE

Use the volt-ohm-meter.
Range to be used: DC 3V

Result:
Normal: More than 1.5V
Defective: Less than 1.5V
Replace the battery with a new one.

CHECK BATTERY CONDUCTIVITY

Check to see if the battery voltage is transmitted to the circuit block.

CHECK CONDUCTIVITY OF CIRCUIT BLOCK

Check for any short circuit or defective conductivity of the conductive portions of the circuit block.

CHECK COIL BLOCK

Check for any broken wire or short circuit of the coil block. Use the volt-ohm-meter, and be sure to make a zero-ohm adjustment.

Range to be used: OHMS x 100

Result:
Normal: 2.8KΩ ~ 3.4KΩ
Defective
- Less than 2.8KΩ (Short circuit)
- More than 3.4KΩ (Broken wire)

Replace the coil block with a new one.

CHECK GEAR TRAIN MECHANISM

Check alignment and play in the step rotor and in the wheels, and also check to see whether the gear train is contaminated with dust or lint and whether it is properly lubricated.

CHECK SETTING MECHANISM

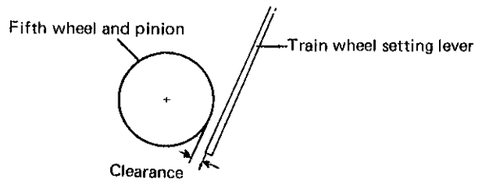
Check alignment and play in the wheels, and also check to see whether the setting mechanism is contaminated with dust or lint and whether it is properly lubricated.

CHECK RESET AND TRAIN WHEEL SETTING CONDITION

With the movement assembled, check to see whether the reset and train wheel setting condition is normal.

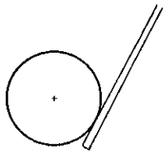
(1) Check train wheel setting condition.
Check the clearance between the train wheel setting lever and the fifth wheel and pinion.

- **With the crown at the normal position**



Result:
Normal: Clearance
Defective: No clearance
Replace the train wheel setting lever with a new one.

- **With the crown at the second click position**



Result:
Normal: No clearance
Defective: Clearance
Replace the train wheel setting lever with a new one.

(2) Check reset condition.
Reset condition can be confirmed by checking output signal with a battery installed.

- **With the crown at the normal position**

Result:
Normal: Input indicator blinks every second.
Defective: Input indicator does not blink every second.
Replace the train wheel setting lever with a new one.

- **With the crown at the second click position**

Result:
Normal: Input indicator does not blink every second.
Defective: Input indicator blinks every second.
Replace the train wheel setting lever with a new one.

CHECK CURRENT CONSUMPTION

- Do not check current consumption under an incandescent lamp since strong light may cause a watch to consume excess current.
- Be sure to protect the movement from light with a black cloth, etc. while measuring.

Use the Digital Multi-Tester S-840A.
Set the A-V switch of the multi-adapter to the "A" position and the mode switch of the tester to the "μA".
The tester's value-averaging calculation function automatically takes average of a maximum and a minimum current consumption values.
Read the figure displayed after one minute to attain the averaged value.

Check current consumption for the whole of the movement.
Place the battery on the train wheel bridge, and then check current consumption.

Probe red. . . . . .Battery connection (−)
Probe black . . . . . .Battery (−) surface

Result:
Normal : Less than 1.0μA
Defective: More than 1.0μA

***How to find defects when the current consumption is more than 1.0μA**
Check current consumption for the circuit block alone with the crown at the second click position.

Result:
Normal (Circuit block): Less than 0.55μA
Check the gear train mechanism.
Defective (Circuit block): More than 0.55μA
Replace the circuit block with a new one.

CHECK ACCURACY

Use the electromagnetic detection microphone.

CHECK BATTERY LIFE INDICATOR

Check to see whether the second hand moves at 2-second intervals when the output voltage is set on 1.30V ~ 1.48V.

CHECK WATER RESISTANCE

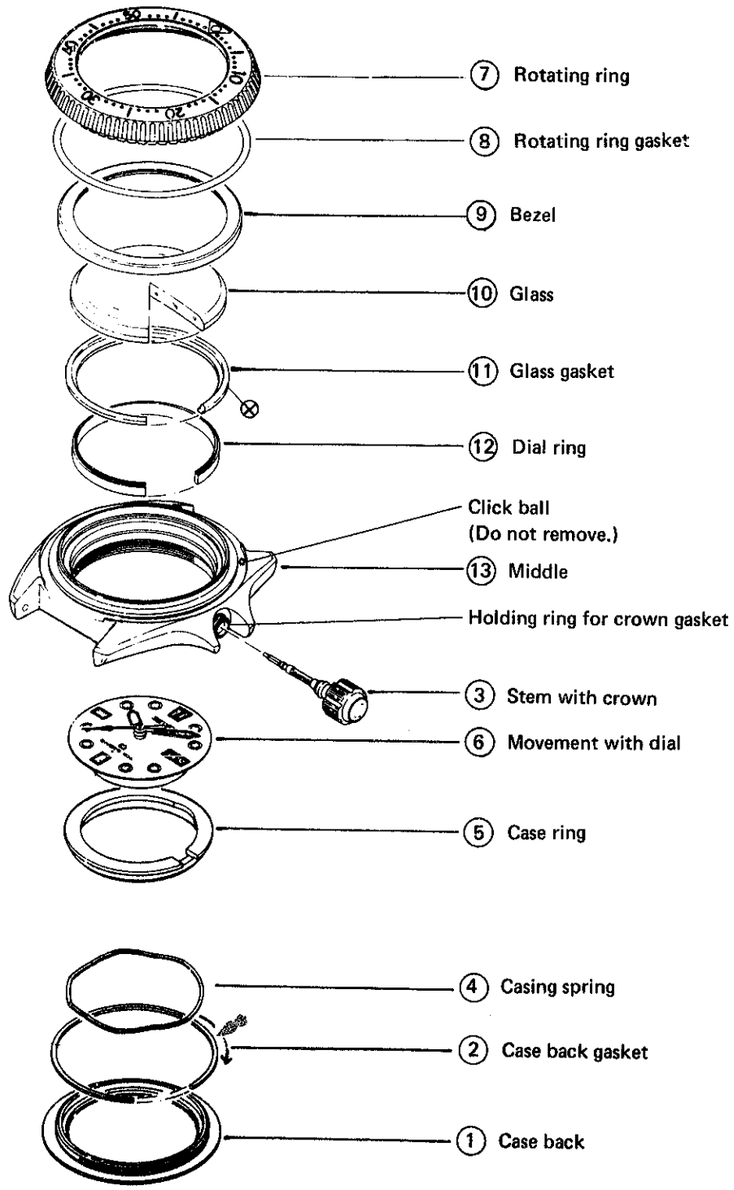
CHECK APPEARANCE AND FUNCTIONING

V. DISASSEMBLING AND REASSEMBLING OF THE CASE FOR CAL. 2A22A DIVER'S WATCH

Disassembling procedures Figs.: ① ⟶ ⑬

Reassembling procedures Figs.: ⑬ ⟶ ①

Lubricating: Silicone grease (500,000 c.s.) ⓧ Do not lubricate



Remarks on disassembling and reassembling

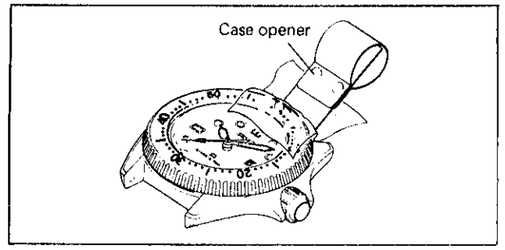
In view of the special requirements of a diver's watch, be sure to follow the notes below when the watch is repaired.

1. Dry the parts completely before reassembling and reassemble the watch in a room without dust and lint, and with low humidity.
2. Be sure to check that the hands move smoothly.
3. Be sure to check if there are any glass defect and loosened screws.
4. After repair, conduct a water resistance test.
5. Be sure to check that the strap is fixed to the middle correctly. (Push pin, buckle.)

⑦ Rotating ring

How to disassemble

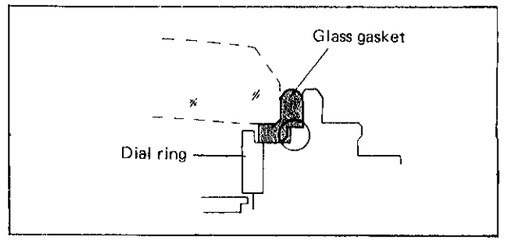
Put the case opener into the opening notch of the rotating ring to remove.



⑪ Glass gasket

How to reassemble

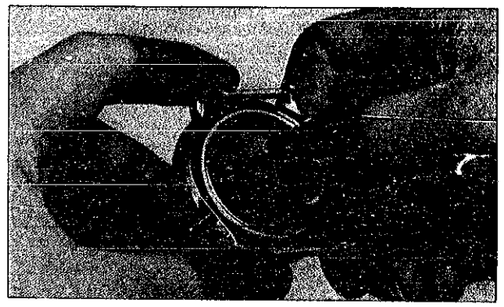
Make sure that the glass gasket is placed in position correctly. Check the place marked with a circle as shown in the illustration on the right.
Do not apply silicone grease (500,000 c.s.).



⑩ Glass

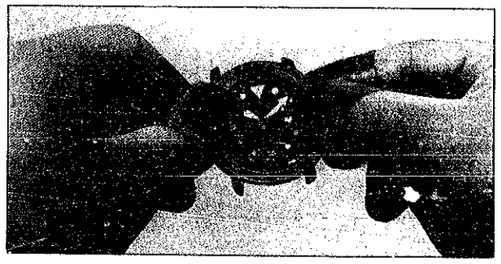
How to disassemble

After removing the bezel, push the glass from inside to remove. As the back surface of the glass is specially coated, remove the glass by pushing it with a fingercot or by using a chamois sheet so as not to scratch or stain the surface. If there is any stain, wipe it off with a soft, clean cloth. Clean dust and lint with a soft brush.



How to reassemble

Place the glass stably by pushing it on both ends directly from above. While pushing the glass, be sure that the glass gasket is placed in position correctly.



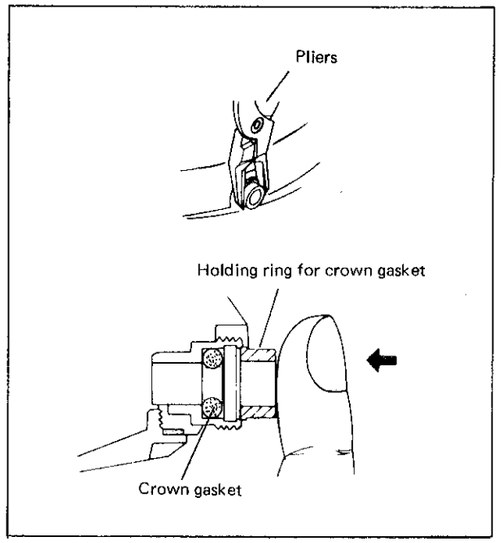
When replacing the crown gasket, follow the procedure below.

How to disassemble the holding ring for crown gasket

Squeeze the holding ring for crown gasket with pliers and remove it.
(Be sure to replace the holding ring for crown gasket with a new one.)

How to reassemble the holding ring for crown gasket

Be sure to apply silicone grease (500,000 c.s.) to the crown gasket.
Put a new holding ring for crown gasket in position with a finger or tweezers.



Replacing battery and Periodic check

"●" mark shows that the battery should be replaced from April to June, 1994.

Each dot of the scale represents three months.

Cal. 2A22A diver's watch has information inscribed on the case back to show when the battery should be replaced. When replacing the battery, be sure to perform a periodic check in accordance with the procedures below.

Note:
The following measuring instruments are necessary to perform a periodic check.
1. Microscope
2. Micro Test
3. Quartz Tester
4. Water Resistance Testing Machine

Reception → **Battery change** → **Check movement** → **Check functioning** → **Check accuracy** → **Check appearance of casing parts** → **Assembly and check performance** → **End of procedures**

Conduct the whole checks below:

1. Check the movement for dust and lint and oil condition.
   (Check the movement, giving particular care to the gear train by using a microscope.)
2. Check the battery life indicator.
   (Check to see whether the second hand moves at 2-second intervals when the output voltage is set on 1.30V ~ 1.48V.)
3. Check the operational turn-off voltage.
   (Check the minimum voltage at which the watch keeps functioning correctly by using the Micro Test Standard Value 1.3V or less.)
4. Check current consumption.
   (Standard value 1.0μA or less)

If any defects and malfunctions are found:

In case of 1 : Clean and lubricate every part of the movement.

In case of 2 : Replace the circuit block with a new one.

In case of 3, 4: Clean and lubricate the gear train, and if further malfunctions are found, replace the circuit block with a new one.

1. Check the movement of the hands.
2. Check train wheel setting condition.
3. Check date setting function.

If any malfunctions are found in the above check, check the gear train and setting mechanism to replace abnormal parts with new ones.

Check to see if the casing parts have scratches and breaks.
And be sure to replace the gaskets and push pins with new ones.
(Don't replace the crown gasket if no malfunction is found.)

1. Check appearance and functions.
   [Check the operation of the crown and the rotating ring.]
2. Water resistance test.

After checking, be sure to inscribe the "●" mark on the case back showing the expected time of the next battery replacement. (Punch a mark or make a noticeable inscription.)

[Example]
Next battery change should be performed from April to June, 1985.