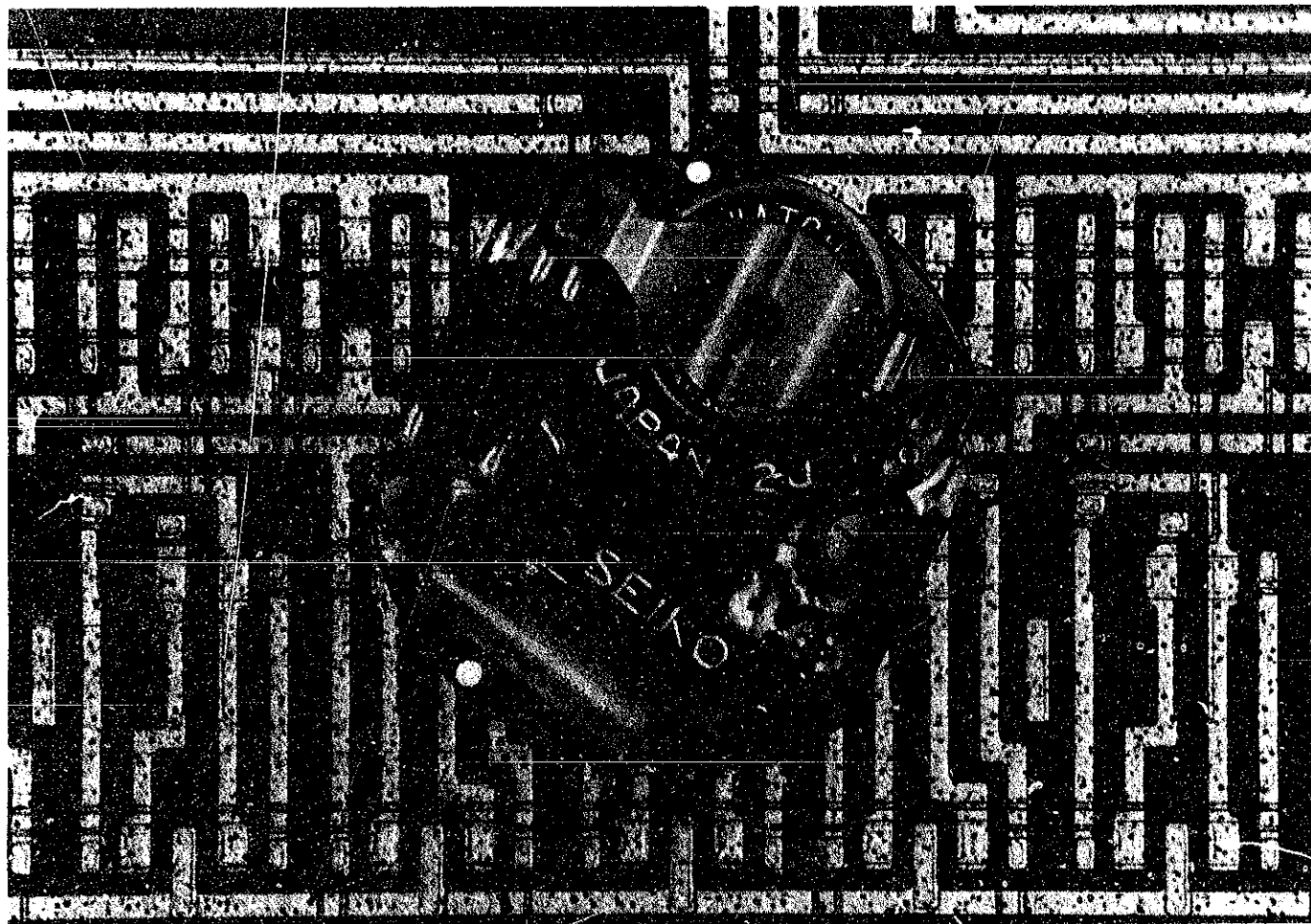


TECHNICAL GUIDE

SEIKO
QUARTZ

CAL.43A & 4303A



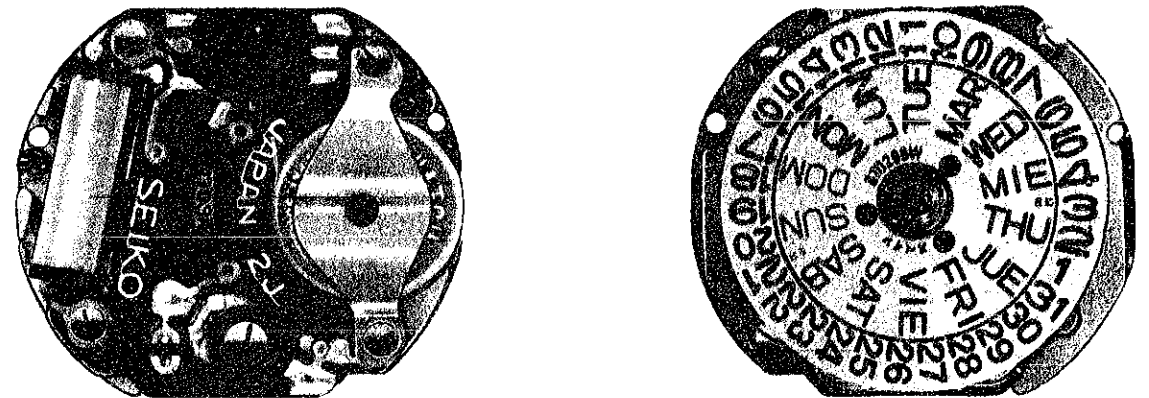
CONTENTS

1. Specifications	2
2. After-sale servicing instruments and materials	3
3. Disassembling, reassembling, lubricating and cleaning	3
1) Case	3
2) Calendar mechanism	4
3) Electronic circuit and gear train mechanism	6
4) Setting mechanism	8
5) Cleaning	10
4. Checking and adjustment	11
Guide for checking and adjustment	11
A. Check output signal	12
B. Check battery voltage	12
C. Check battery conductivity	12
D. Check circuit block conductivity	12
E. Check reset condition	14
F. Check coil block	14
G. Check output signal	14
H. Check accuracy	14
• Time accuracy adjustment	16
• Checking current consumption	16

SEIKO QUARTZ CALIBRES 43A & 4303A

SEIKO QUARTZ Calibre 43-series is a thin and compact quartz crystal oscillator watch which has similar accuracy and mechanism of other SEIKO Quartz Crystal watches.

Calibre 4303A

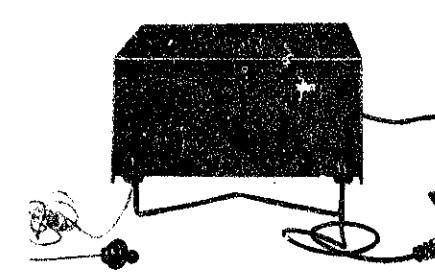


Movement

1. Specifications

Item	Calibre	43A	4303A
Time indication		Hour & minute hands	Hour, minute & second hands
Additional mechanism			Calendar (day & date)
			Bilingual change-over system for the day of the week
			Instant day and date setting
			Second setting device
		Electronic circuit reset switch	
Crystal oscillator		32,768 Hz. (Hz = Hertz . . . cycles per second)	
Loss/gain		Loss/gain at normal temperature Monthly rate: less than 15 seconds (Annual rate: less than 3 minutes)	
Casing diameter		φ 18.0mm (3 o'clock—9 o'clock direction—16.0mm; 12 o'clock—6 o'clock direction—17.8mm)	
Height		3.5mm	4.2mm
Operational temperature range		-10°C ~ +60°C (14°F to 140°F)	
Driving system		Step motor system (2 poles)	
Regulation system		Trimmer condenser	
Battery power		Silver oxide battery (U.C.C. 384) Battery life is over one year Voltage, 1.5V	
Jewels		2 jewels	

2. After-sale servicing instruments and materials



Quartz Tester QT-10



Volt-ohm-meter



Movement holder S-661

3. Disassembling, reassembling, lubricating and cleaning

• Disassembling and reassembling

Disassembling procedures Figs.: ①~⑤①

Reassembling procedures Figs.: ⑤①~①

• Lubricating

Type of oil: ● Moebius A
∞ SEIKO Watch Oil S-6

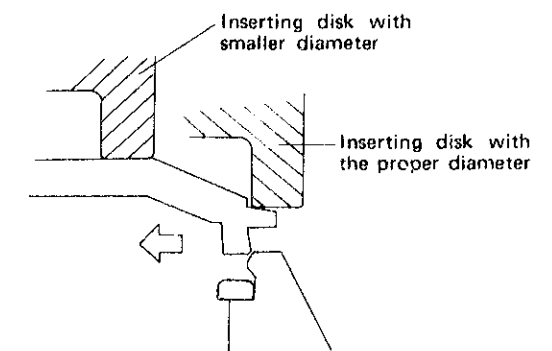
Oil quantity: ∞∞ Liberal quantity
∞ Normal quantity
∞ Extremely small quantity

1) Case

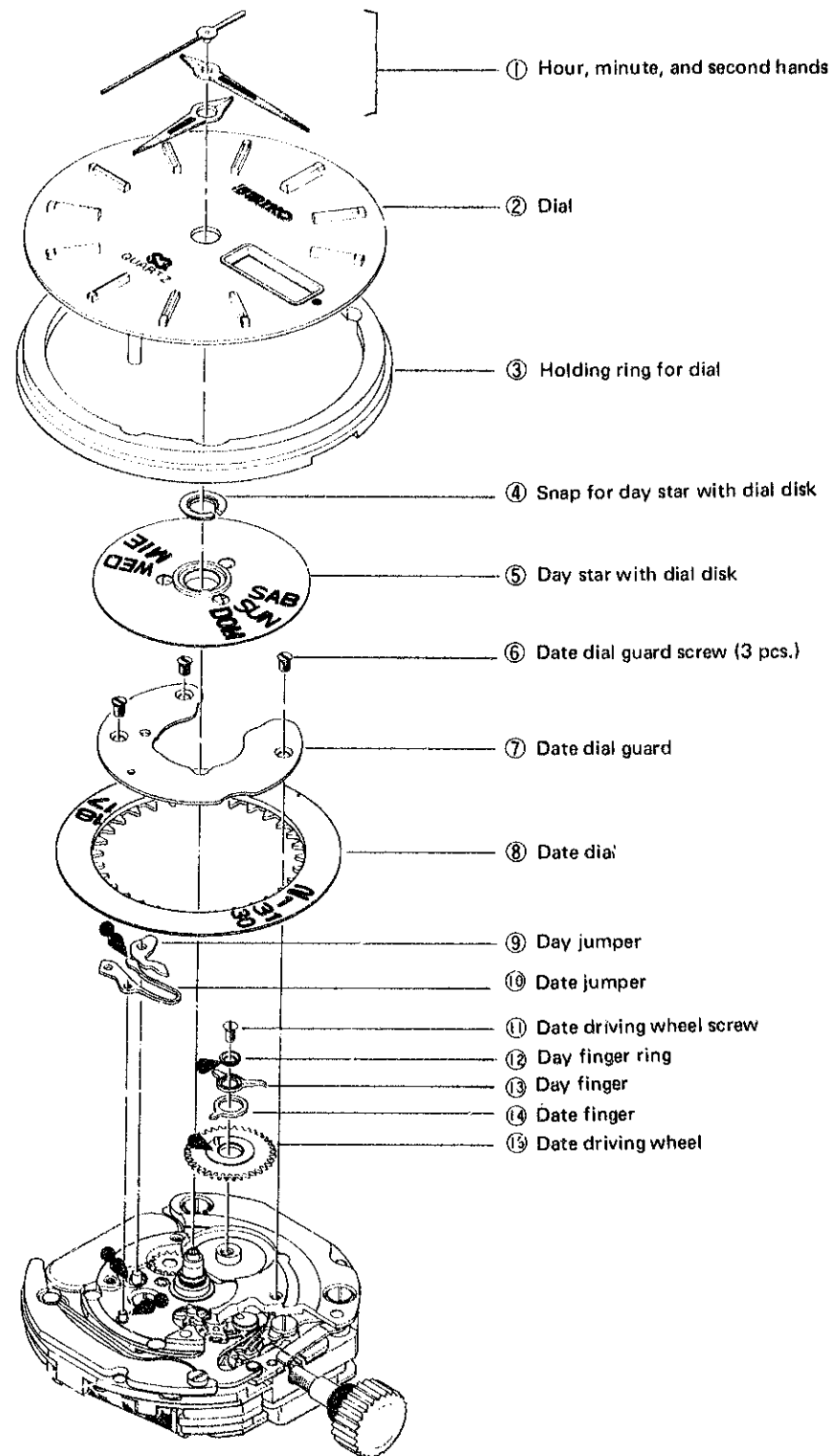
Note for closing the case back (in case of the Snap Type model)

• When the inserting disk is used:—

Select a suitable inserting disk. Use an inserting disk with a diameter of from 20.0mm to 22.5 mm. If an inserting disk with a smaller diameter is used, sometimes the case back cannot be snapped closed.



2) Calendar mechanism



Remarks for disassembling and reassembling

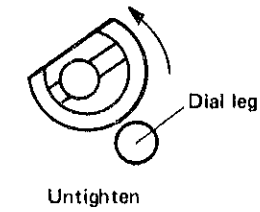
• How to remove and mount the hands ①

When removing or mounting the hands always pull the crown out to the second click first. The second hand must be placed just in line with a second dot (even-numbered or odd-numbered second dot, whichever is preferred).

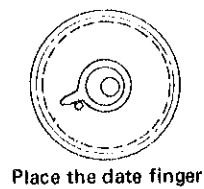
• Removing and replacing the dial ②

After turning the eccentric dial pin between 90° and 150°, removing and replacing the dial is possible.

When turning the eccentric dial pin on the coil side, be careful not to touch the coil with the blade of the screw driver.



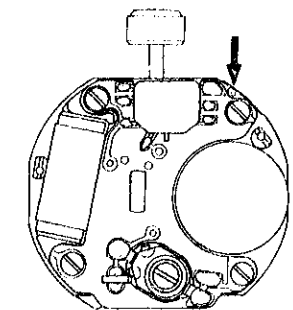
• How to fix the date finger and the day finger ⑬ ⑭



How to remove the winding stem

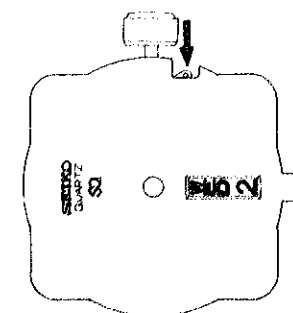
From the case back side

A part of setting lever for unlocking stem is seen from the arrow-marked position as shown in the illustration. Push it down, and remove the winding stem. (Removing is possible in whichever click position the crown is in.)

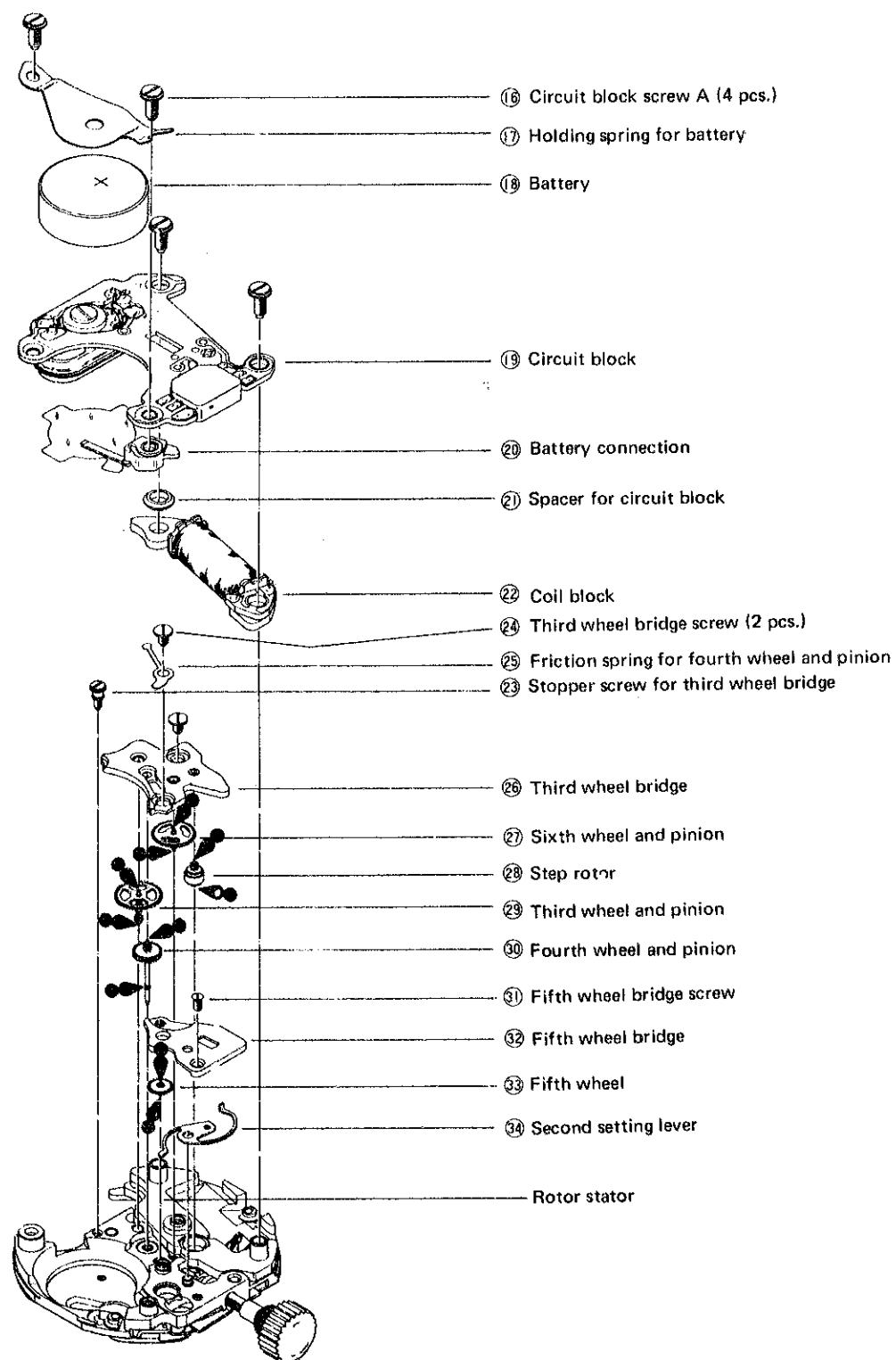


From the dial side

When the crown is at the normal position a part of the setting lever is seen from the arrow-marked position as shown in the illustration. Push it down, and remove the winding stem.



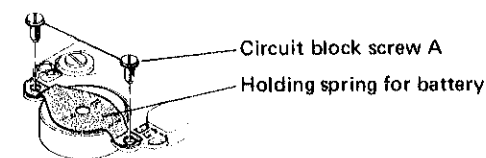
3) Electronic circuit and gear train mechanism



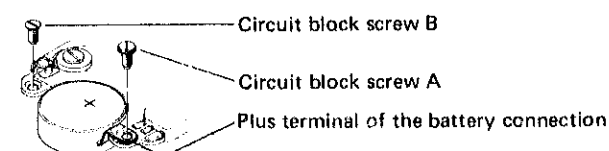
Remarks for disassembling and reassembling

- How to use the holding spring for battery and the plus terminal of the battery connection ①⑦
 If the model is provided with the holding spring for battery, the plus terminal of the battery connection is not used.

- When the holding spring for battery is used:—



- When the plus terminal of the battery connection is used:—

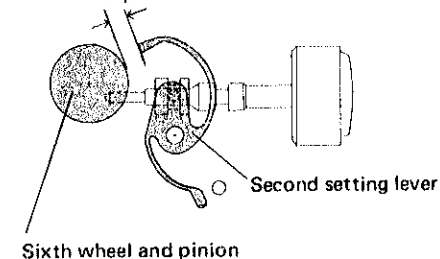


- Rotor stator

The rotor stator is fixed to the main plate, and cannot be removed. Be careful not to scratch or bend it.

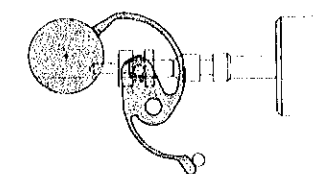
- Check to be sure that there is clearance between the second setting lever and the sixth wheel and pinion ②⑰

- Normal position and first click of the crown



A clearance must be provided between the sixth wheel and pinion and the second setting lever.

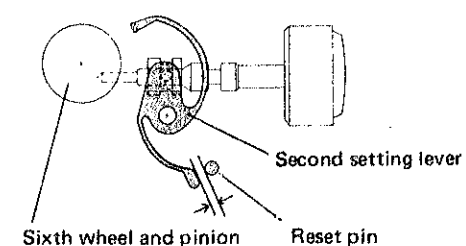
- Second click of the crown



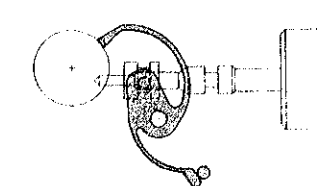
The sixth wheel and pinion and the second setting lever must be in contact with each other.

- Make sure that there is clearance between the second setting lever and the reset pin ③⑱

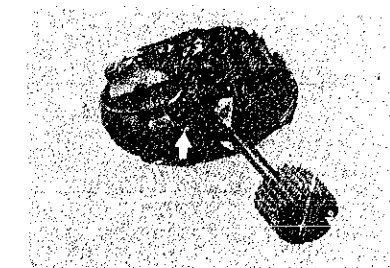
- Normal position and first click of the crown
- Second click of the crown



A clearance must be provided between the reset pin and the second setting lever.



The reset pin and the second setting lever must be in contact with each other.

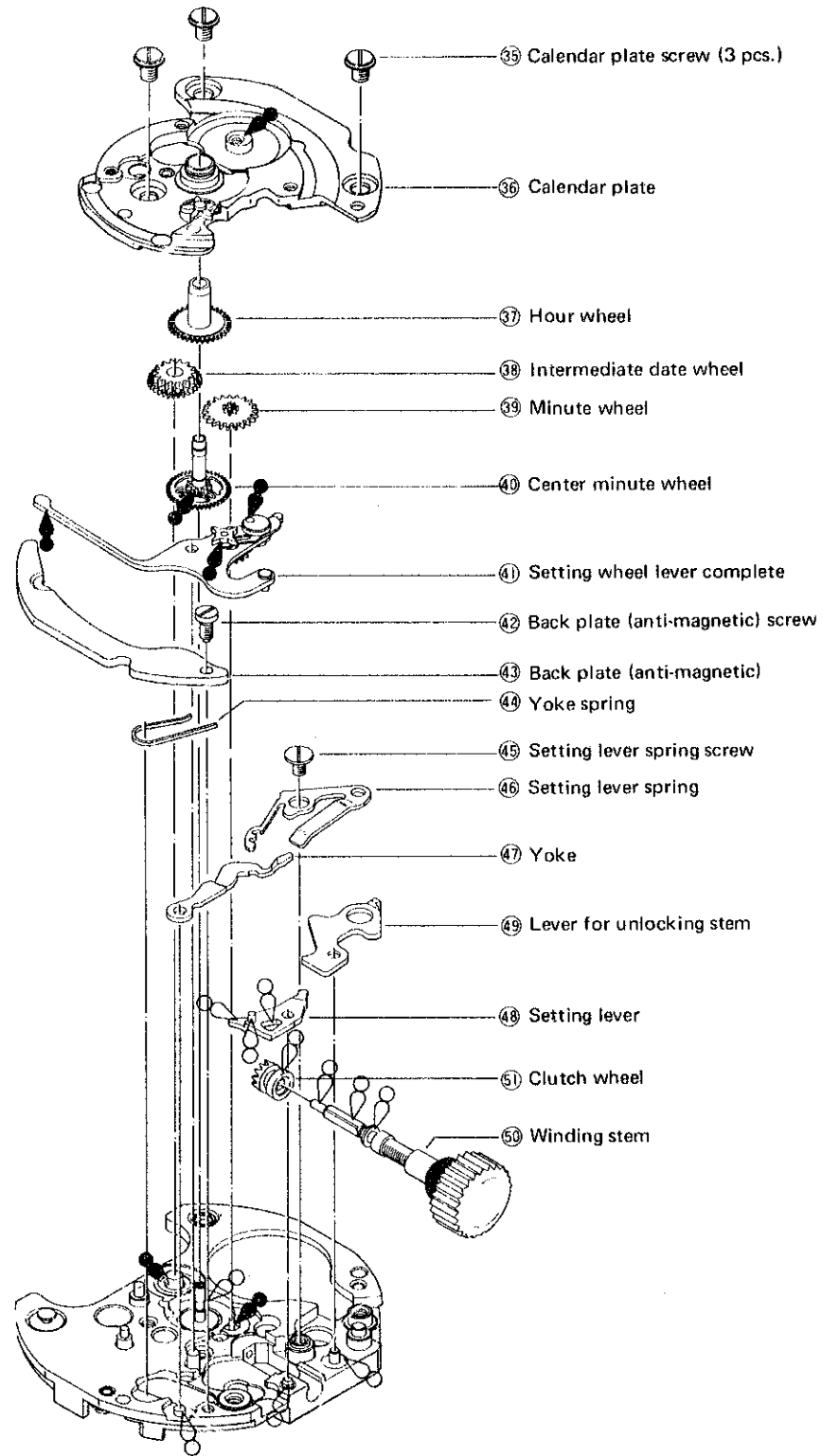
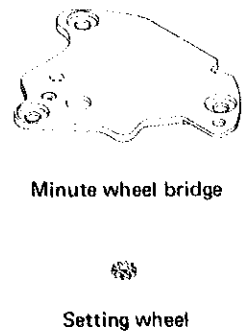


• The reset pin and the second setting lever are seen from the arrow-marked position as shown in the photo.

4) Setting mechanism

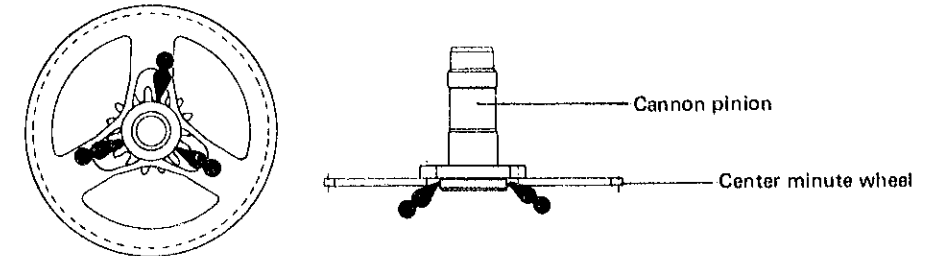
- Calibre 43A
(Difference from
Calibre No. 4303A)

- (1) The calendar mechanism consists of the hands, dial, and the holding ring for dial.
- (2) The electronic circuit and gear train mechanism do not have the friction spring for the fourth wheel and pinion and stopper screw for third wheel bridge and has its fourth wheel axle cut short.
- (3) The setting mechanism does not have the calendar plate and the setting wheel lever complete, but instead it is provided with the minute wheel bridge and setting wheel. The center minute wheel, back plate (anti-magnetic), setting lever spring, yoke and setting lever are slightly changed in shape.

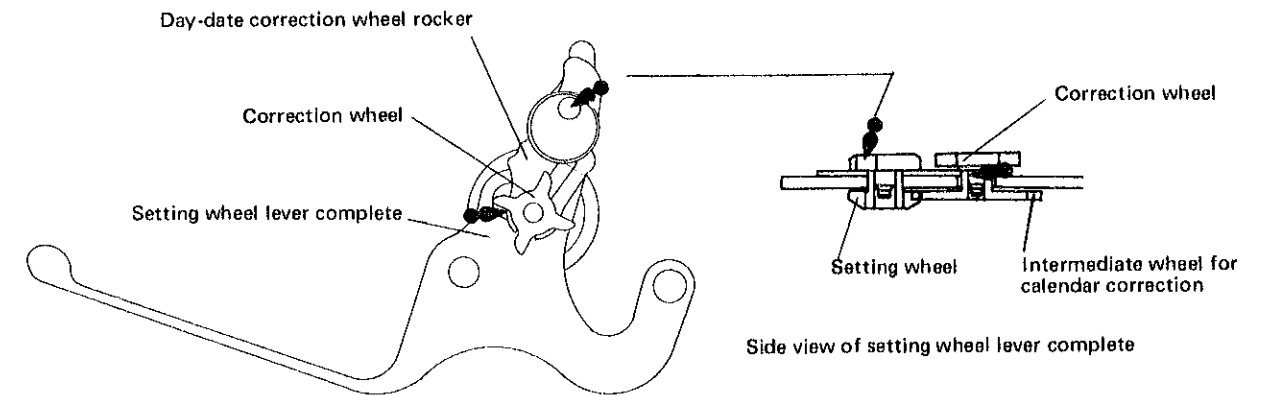


Remarks for disassembling and reassembling

- Lubrication of the center minute wheel ④⑩
Don't separate the cannon pinion from the center minute wheel.

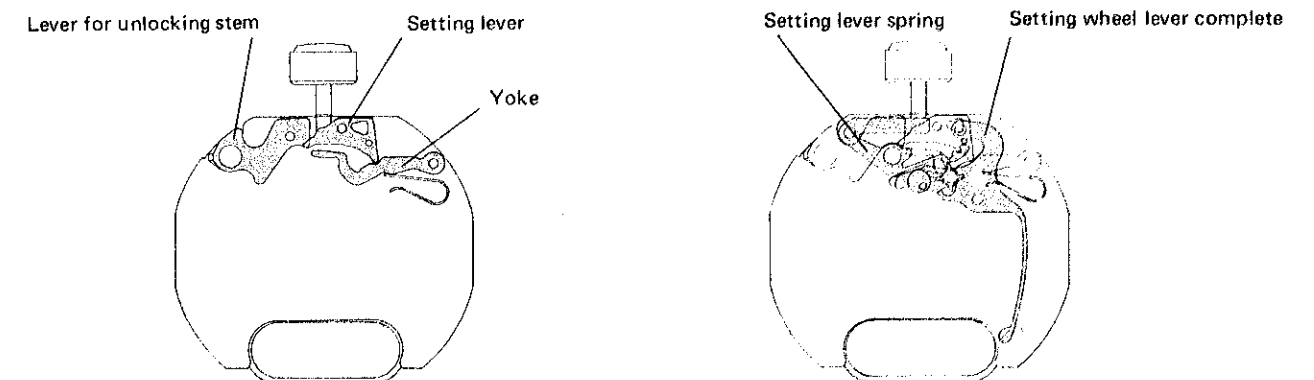


- Lubrication of the setting wheel lever complete ④①



Pull out the crown to the first click and turn; check to see if the day-date correction wheel rocker moves smoothly. If it does not move smoothly, clean it and lubricate again.

- Diagram for reassembling procedures of the setting mechanism

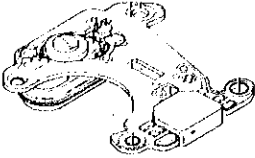
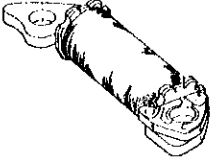
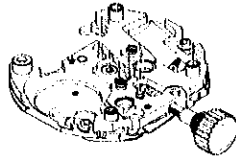



Illustrations of the reverse side of the movement

5) Cleaning

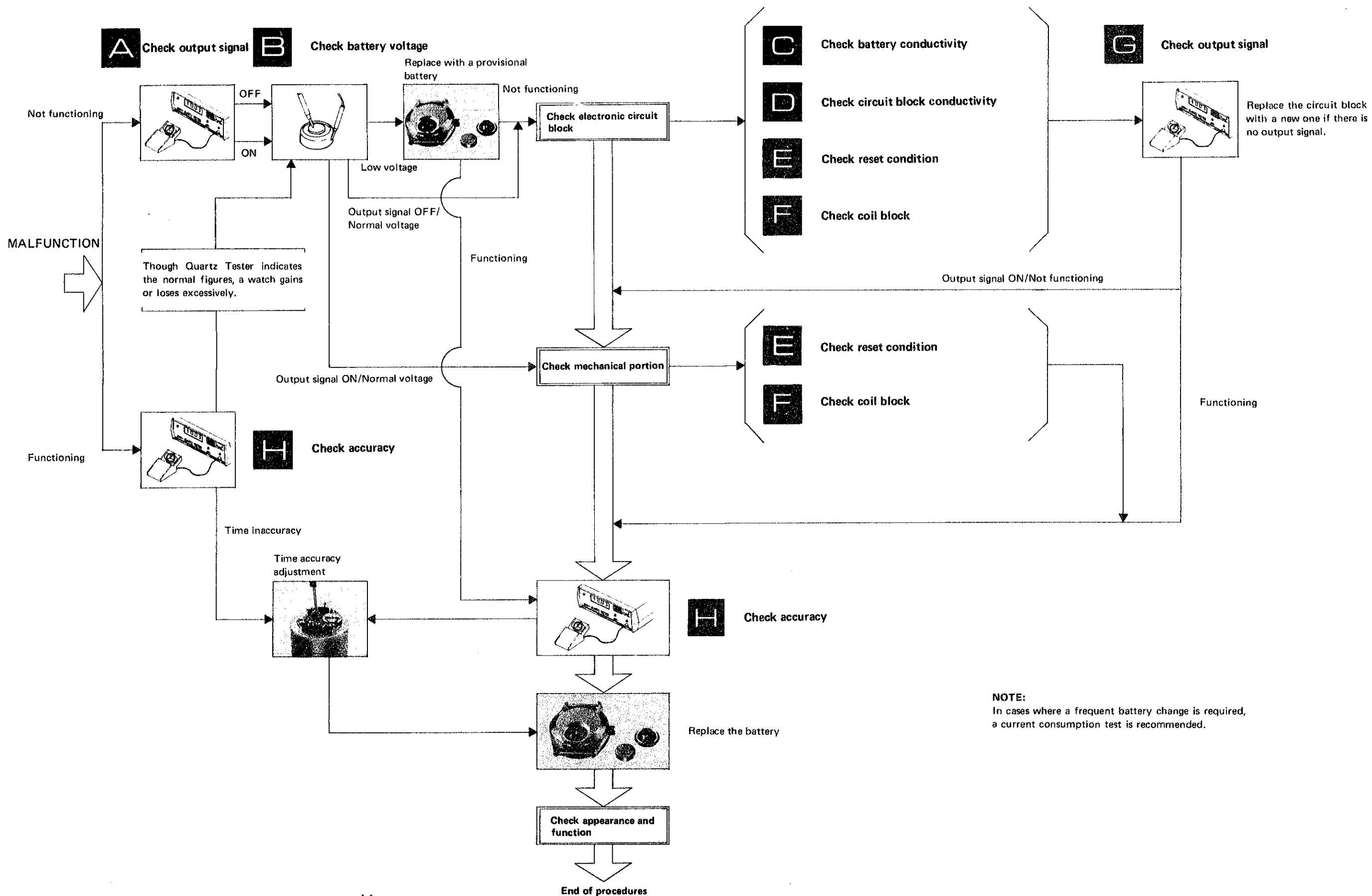
Since several special parts (electronic parts, etc.) used in the SEIKO Quartz Cal. 43 series differ from conventional mechanical watches, use the following cleaning methods when cleaning.

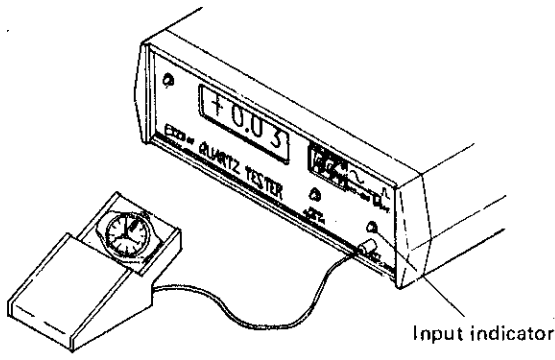
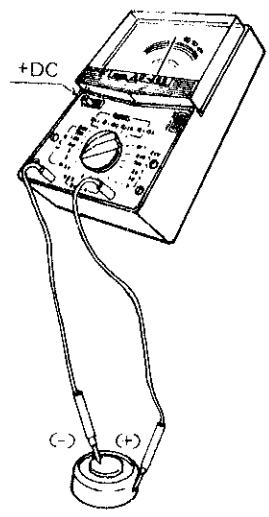
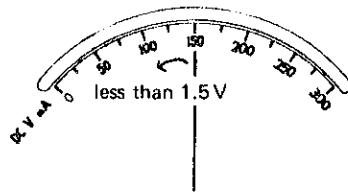
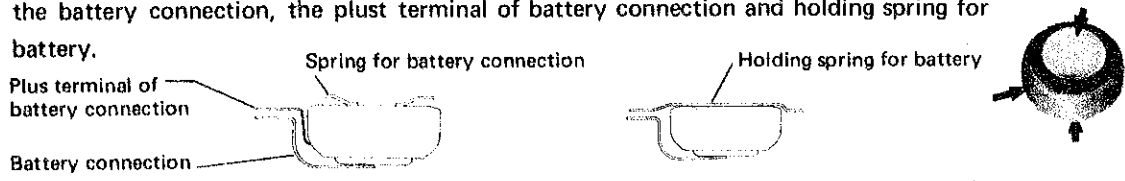
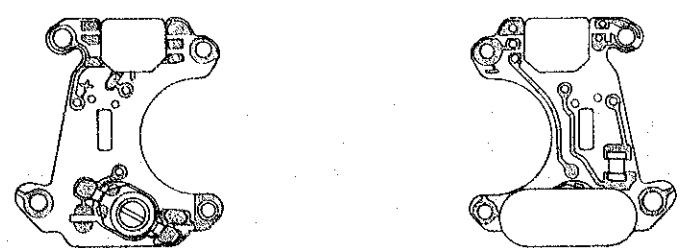
CLEANING METHOD

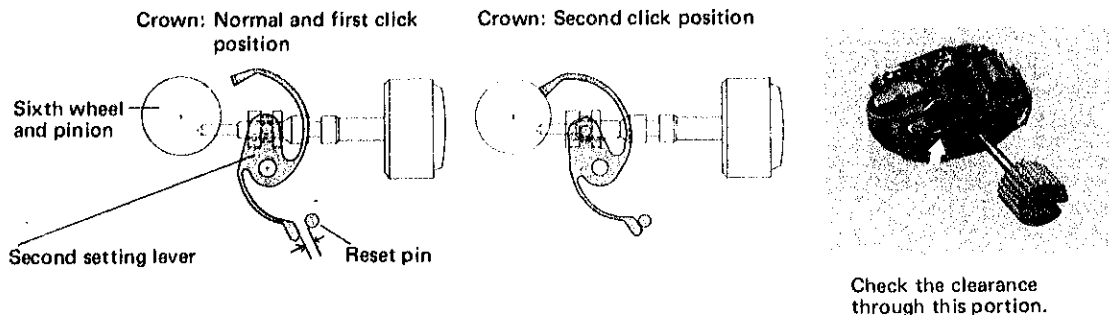
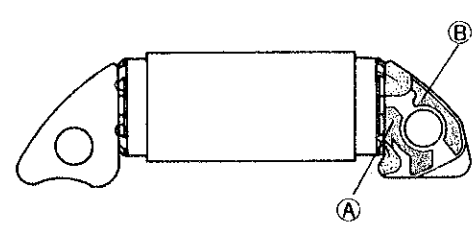


Name of parts	Cleaning	Drying	Solution	Remarks
Circuit block  Coil block 	DO NOT CLEAN			Conductive portion <u>ONLY</u> may be cleaned with a cloth moistened with benzine or alcohol. Dry in <u>COOL</u> air.
Main plate  Step rotor 	Rinse or gently scrub with a brush.	Cool air drying	Benzine	<ul style="list-style-type: none"> Do not disassemble the parts bonded to the main plate. Use a clean solution as the step rotor has a magnet. Use adhesive tape or Rodico to remove dust and fillings which cannot be cleaned with the solution.
Plastic parts	Rinse or gently scrub with a brush.	Cool air drying	Alcohol	
Parts other than above	Clean with cleaner, rinse or gently scrub with a brush.	Cool or hot air drying	Benzine or trichloroethylene	

4. Checking and adjustment

Guide for checking and adjustment

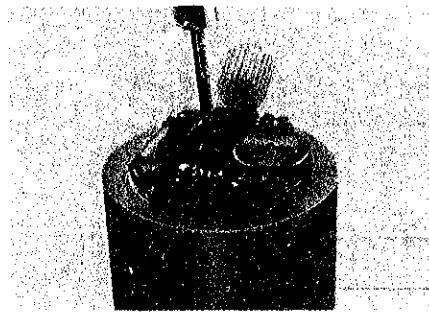


	Procedures		Results	Adjustment and Repair
CHECK OUTPUT SIGNAL	<p>Check output signal</p> <ol style="list-style-type: none"> 1. Set up the Quartz Tester and connect the power supply cord to the electric outlet. 2. Checking Check for output signal. 		<p>One-second blinking →</p> <p>No one-second blinking →</p>	<p>Proceed to B</p>
CHECK BATTERY VOLTAGE	<p>Use the following procedures to check battery voltage.</p> <ol style="list-style-type: none"> 1. Set up the Volt-ohm-meter Range to be used DC 3V 2. Measuring <ul style="list-style-type: none"> • Probe Red (+) Battery surface (+) • Probe Black (-) Battery surface (-) <p><i>Note:</i> When handling the battery, use non-metallic tweezers or a finger cot.</p> 		<p>More than a 1.5V reading indicates →</p> <p>Less than a 1.5V reading indicates →</p> 	<p>In procedure A if one-second blinking is found, check the Mechanical Portion.</p> <p>In procedure A if one-second blinking is not found, check the Electronic Circuit Block.</p> <p>Replace with a provisional battery</p> <ul style="list-style-type: none"> • If a watch operates after battery replacement, proceed to H • If a watch does not operate, check the Electronic Circuit Block.
CHECK BATTERY CONDUCTIVITY	<p>Check to see if the battery current flow to the circuit is normal.</p> <ol style="list-style-type: none"> 1. Make sure that both screws of the holding spring for battery and the plus terminal screw of the battery connection (circuit block screw A) is tightened firmly. 2. Check for any stain on the connecting point of the battery, spring for battery connection, the battery connection, the plus terminal of battery connection and holding spring for battery. 		<p>No loosened screw →</p> <p>Loosened screw →</p> <p>Untaminated →</p> <p>Contaminated →</p>	<p>Proceed to C 2</p> <p>Retighten screw.</p> <p>Proceed to D</p> <p>Wipe off carefully.</p>
CHECK CIRCUIT BLOCK CONDUCTIVITY	<p>Check for short circuit and defective conductivity of the circuit block conductive portion.</p> <ol style="list-style-type: none"> 1. Check the circuit block screw A (2 pcs.) for looseness. 2. Check for defective soldered portion of the circuit block, short circuit, pattern break and contamination. 		<p>No loosened screw →</p> <p>Loosened screw →</p> <p>No defective soldered portion, short circuit, broken lead pattern, or contamination. →</p> <p>Defective soldered portion, short circuit, broken lead pattern or contamination. →</p>	<p>Proceed to D 2</p> <p>Retighten screw.</p> <p>Proceed to E</p> <ul style="list-style-type: none"> • Replace the circuit block, if there is defective soldered portion, short circuit, broken lead pattern or contamination. • Wipe off carefully if contaminated.

	Procedures		Results	Adjustment and Repair
CHECK RESET CONDITION	<p>Check the reset condition after the circuit block is assembled.</p> <ol style="list-style-type: none"> 1. Check if the second hand stops immediately when the crown is pulled out the second click position and if it starts promptly one second after the crown is returned to normal position. <i>Method:</i> Make sure of the above by checking the output signal with Quartz tester or after positioning the second hand on the movement. 2. Check the clearance between the second setting lever and reset pin.  <p>Check to see if there is clearance between the reset pin and the second setting lever when the crown is at the normal position and when it is pulled out to the first click. And check also to see if the second setting lever and reset pin touch each other when the crown is pulled out to the second click.</p>		<p>Stops completely and starts moving after one second. → Proceed to F</p> <p>Does not stop or moves irregularly. → Proceed to E₂</p> <p>Clearance when the crown is at the normal position and when it is pulled out to the first click, and no clearance when the crown is pulled out to the second click. → Proceed to F</p> <p>No clearance when the crown is at the normal position and when it is pulled out to the first click, or clearance when the crown is pulled out to the second click. → Replace the second setting lever.</p>	<p>Proceed to F</p> <p>Proceed to E₂</p> <p>Proceed to F</p> <p>Replace the second setting lever.</p>
CHECK COIL BLOCK	<p>Check for broken coil wire and short circuit.</p> <ol style="list-style-type: none"> 1. Set up the Volt-ohm-meter Range to be used OHMS RX100. 2. Checking Apply the red and black probes of the Volt-ohm-meter to two lead terminals A and B of the coil block. 		<p>2.5 KΩ ~ 4.5 KΩ →</p> <p>Less than a 2.5 KΩ reading indicates (short circuit) →</p> <p>More than a 4.5 KΩ reading indicates (broken coil wire) →</p>	<ul style="list-style-type: none"> • Electronic Circuit Block is being checked. → Proceed to G • Mechanical Portion is being checked. → Proceed to H <p>Replace the coil block.</p>
CHECK OUTPUT SIGNAL	<p>Check for output signal.</p> <ol style="list-style-type: none"> 1. Set up the Quartz Tester. 2. Checking Follow the same procedure as in A 		<p>One blink per second → Watch functioning → Proceed to H</p> <p>One blink per second → Not functioning → Check the Mechanical Portion</p> <p>No blinking → Replace the circuit block</p>	<p>Proceed to H</p> <p>Check the Mechanical Portion</p> <p>Replace the circuit block</p>
CHECK ACCURACY	<p>Check gain and loss of time</p> <ol style="list-style-type: none"> 1. Set up the Quartz Tester 2. Checking Read the daily rate accuracy indicated on the display. 		<p>Normal → Replace the Battery</p> <p>Defective → Adjust Time Accuracy</p>	<p>Replace the Battery</p> <p>Adjust Time Accuracy</p>

Time accuracy is adjusted by turning the trimmer condenser.

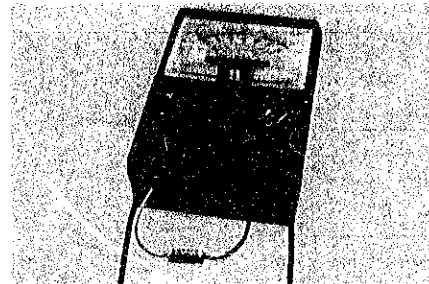
- The watch will gain or lose according to the direction in which the trimmer condenser is turned.
Adjustment should therefore be made after ascertaining with the Quartz Tester whether the watch tends to gain or lose.
- Note for handling the trimmer condenser
Avoid excessive depressing and turning of the trimmer condenser.



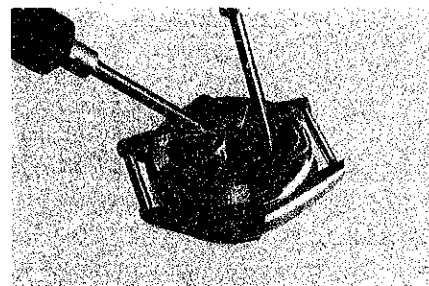
In case where a frequent battery change is required, a current consumption test is recommended.

Use the following procedures:

1. Set up the Volt-ohm-meter
 - Range to be used: DC 0.03 mA
 - Set up the condenser kit of 200 ~ 500 μ F as shown in a photo.



2. Measurement
 - Watch with a battery hatch:
 - Probe red (+) Battery connection
 - Probe black (-) Battery surface (-)



- Watch without a battery hatch:
 - Remove the holding spring for battery and the battery connection for plus terminal. Place a vinyl sheet in between the battery and the third wheel bridge to insulate electric current.
 - Probe red (+) Battery surface (+)
 - Probe black (-) Circuit block screw A

