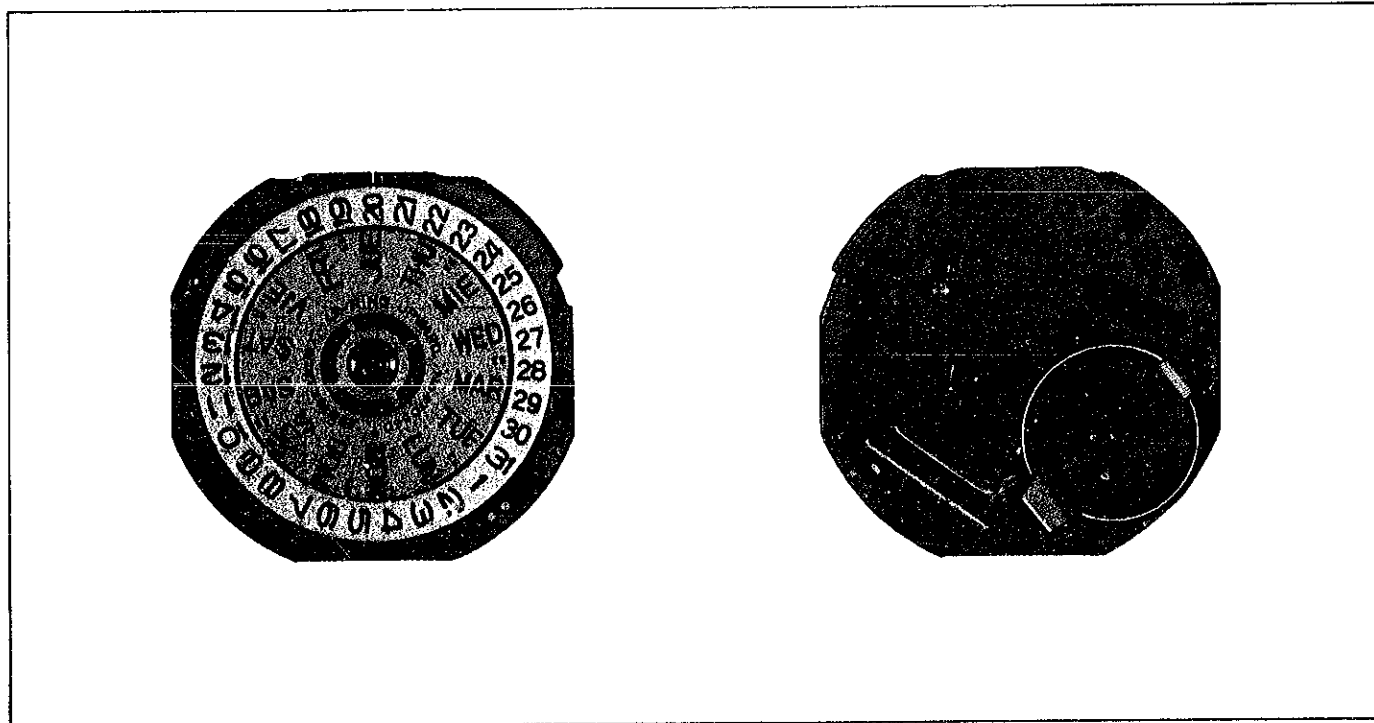


TECHNICAL GUIDE

SEIKO LASSALE

QUARTZ

CAL. 9442A
CAL. 9443A



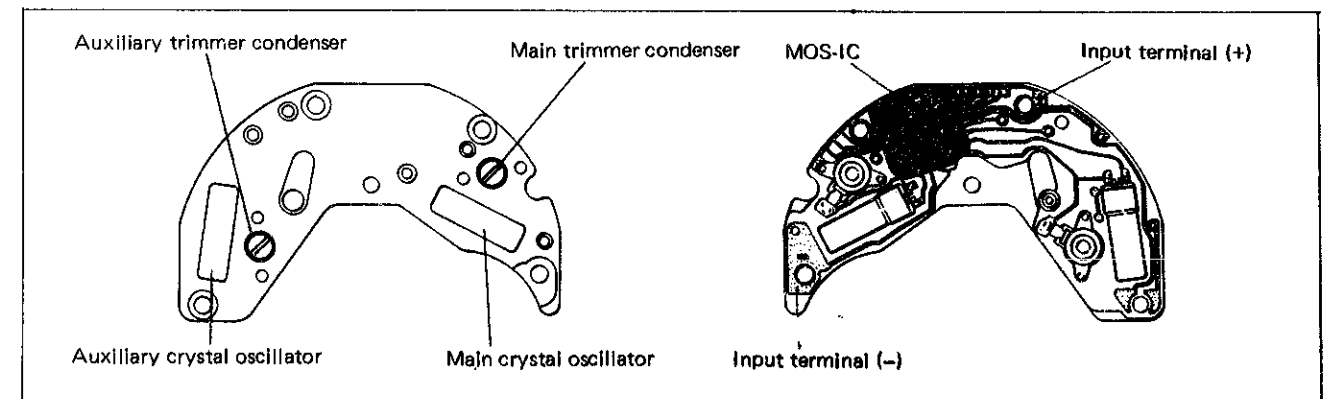
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I. SPECIFICATIONS

Cal. No.	9442A	9443A
Item		
Time indication	3 hands	
Additional mechanism	Date	Day and date
	Electronic circuit reset switch Train wheel setting device Battery life indicator	
Crystal oscillator	Main crystal oscillator : 32,768 Hz Auxiliary crystal oscillator : 40,960 Hz (Hz = Hertz . . . Cycles per second)	
Loss/gain	When the watch is worn on the wrist for 8 hours or more per day at normal temperature (5°C ~ 35°C) (40°F ~ 95°F), the annual loss/gain is approx. ±20 seconds. However, up to 4 seconds of loss/gain per month may be caused depending on wearing conditions.	
Casing diameter	φ25.6mm	
Height	2.8mm without battery	3.1mm without battery
Regulation system	Trimmer condenser	
Measuring gate by Quartz Tester	QT-99: Channel CH-1 Together with QT Adaptor: Channel Cal. 99 (It is impossible to check accuracy without using QT-99 or QT Adaptor.)	
Battery	SEIKO (SEIZAIKEN) TR1120SW or SB-DS, Maxell SR1120SW U.C.C. 381 Battery life is approximately 2 years. Voltage: 1.55V	
Jewels	8 jewels	

II. STRUCTURE OF CIRCUIT BLOCK



III. DISASSEMBLING, REASSEMBLING AND LUBRICATING

Disassembling procedures Figs.: ① ~ ④⑥

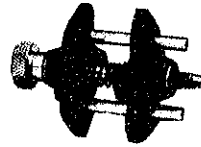
Reassembling procedures Figs.: ④⑥ ~ ①

● Lubricating

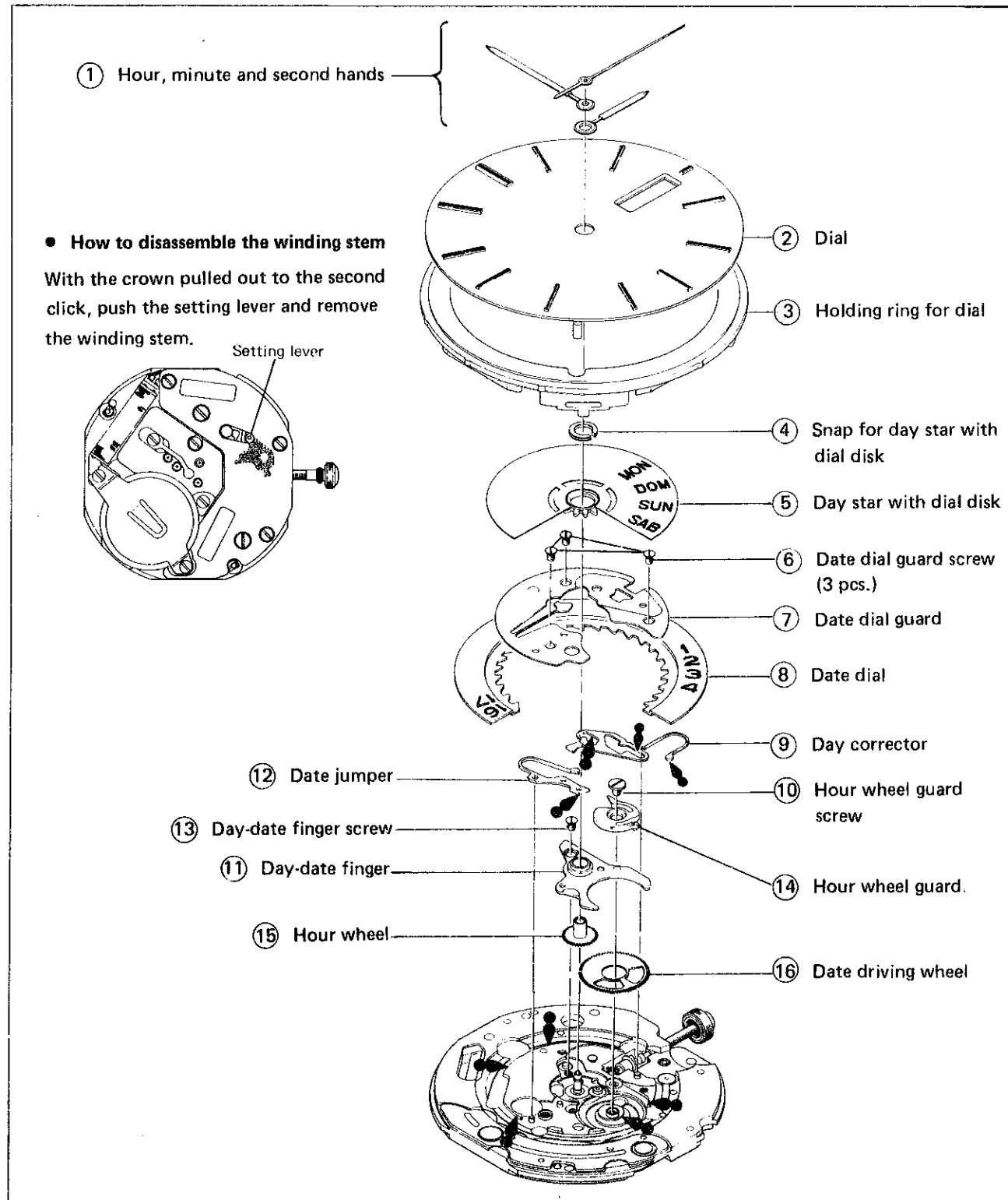
- Moebius A
- SEIKO Watch Oil S-6

● Movement holder

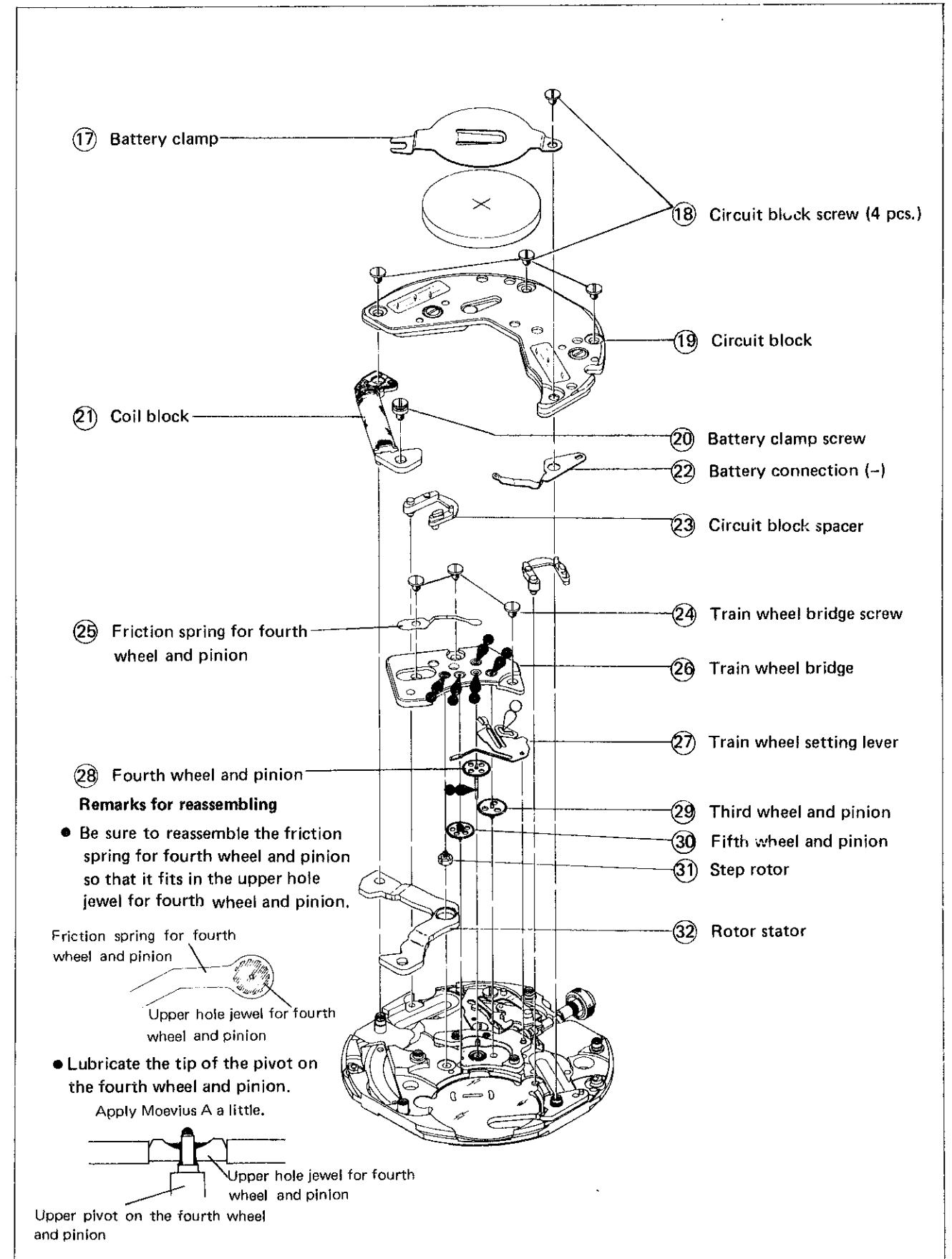
Use the universal movement holder.



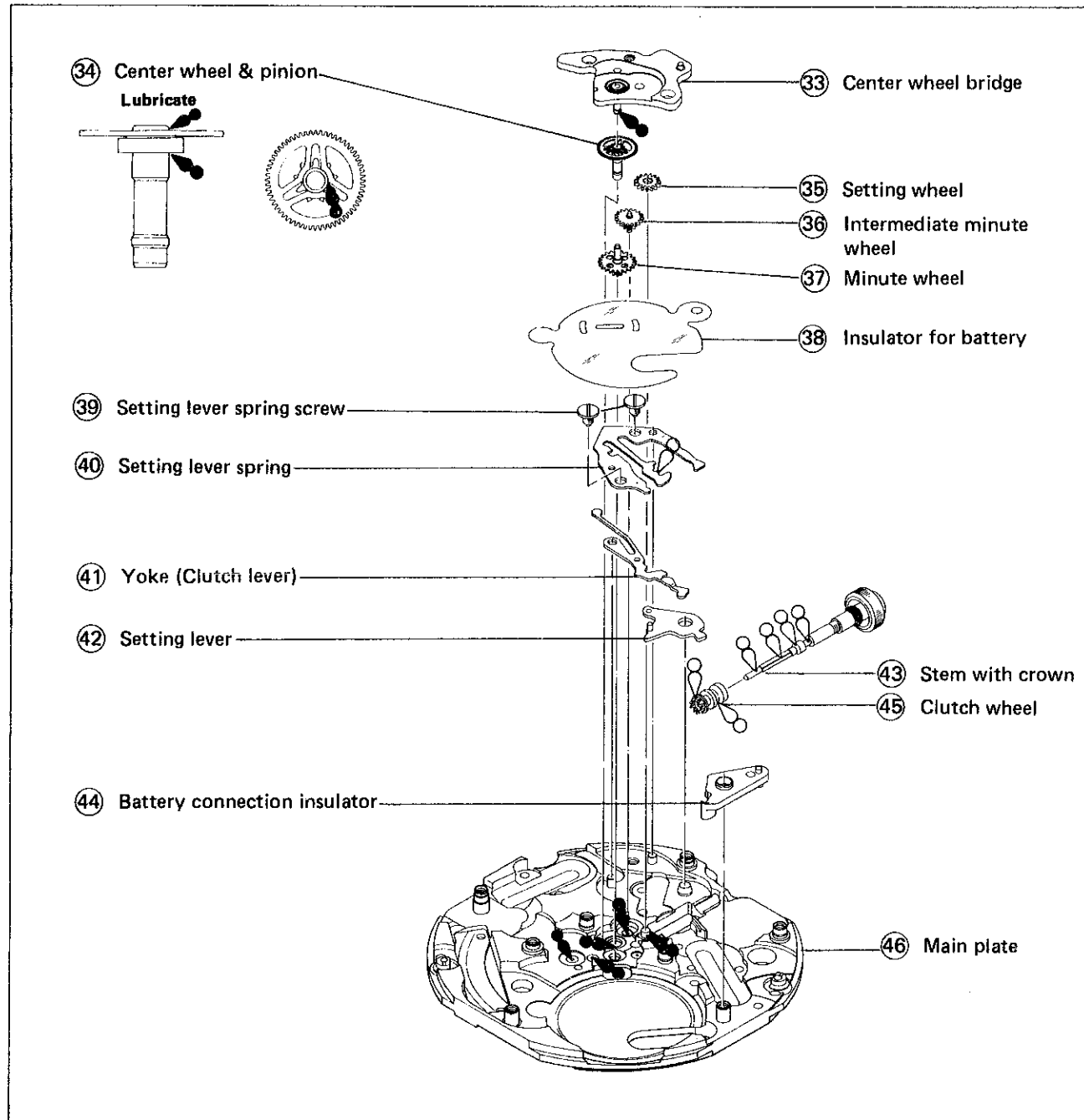
(1) Calendar mechanism







(2) Circuit block, coil block and gear train



(3) Disassembling, reassembling and lubricating of the setting mechanism



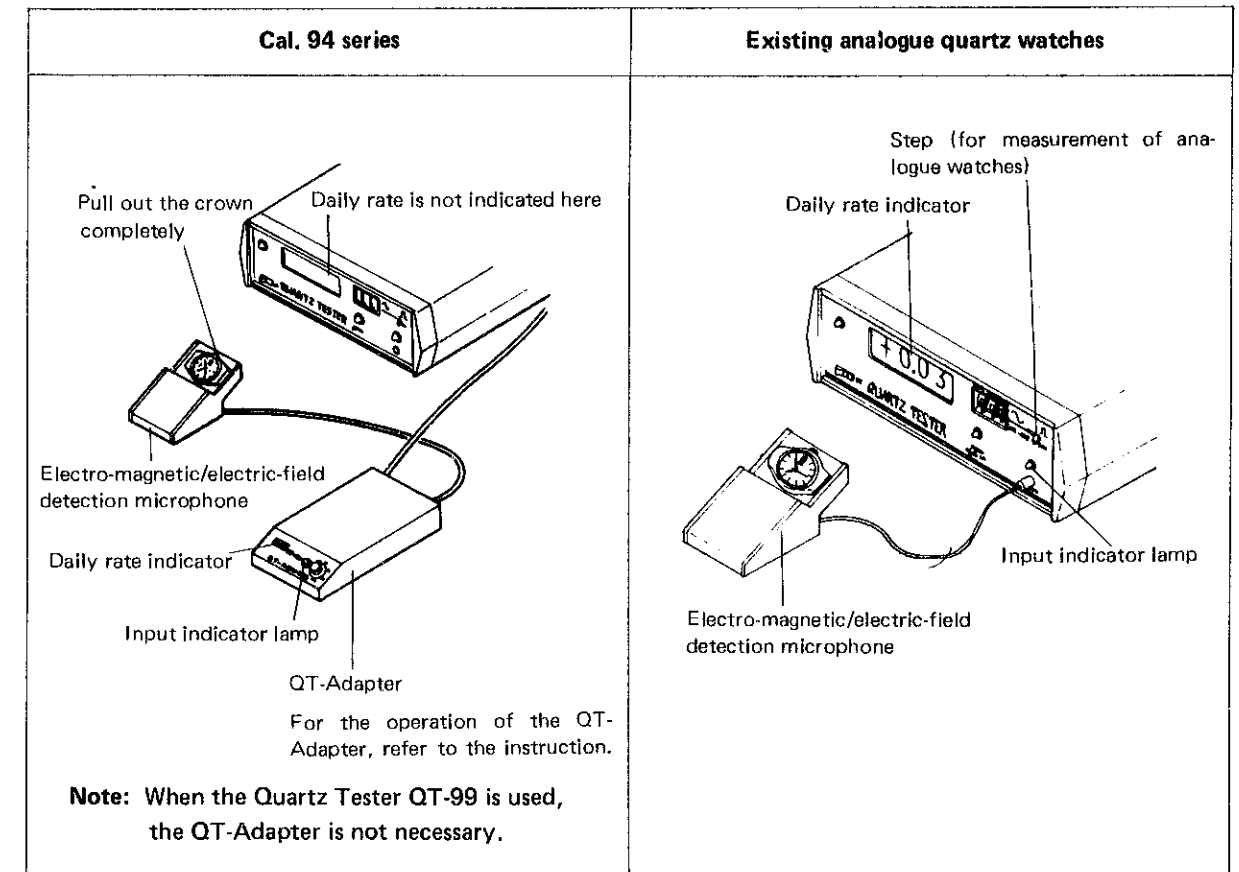
• LIST OF SCREWS USED

Shape	Parts No.	Parts Name	Shape	Parts No.	Parts Name
	022 424	Train wheel bridge screw Circuit block screw Setting lever spring screw		022 754	Date dial guard screw Hour wheel guard screw
	022 903	Battery clamp screw		022 411	Day-date finger screw

IV. CHECKING AND ADJUSTMENT

1. How to check time accuracy of Cal. 94 series. (For time accuracy adjustment, refer to page 8.)

(1) Difference in the time accuracy measurement between Cal. 94 series and the existing analogue quartz watches.



(2) Remarks for measuring time accuracy of Cal. 94 series

- Use the QT-Adapter or Quartz Tester QT-99

Cal. 94 series employ a twin quartz crystal oscillators to produce an extra-high timing accuracy that hampers the measuring efforts in an ordinary way using the conventional timing instruments. Therefore, in measuring its accuracy the detection and computation of the signals from twin quartz crystal oscillators are needed.

- Pull out the crown completely

When the crown is pulled out to the second click position, there will be given signals which will be computed by the QT Adapter or Quartz Tester QT-99. While the watch is operating, it is impossible to measure its daily rate accurately.

Notes: If Cal. 94 series is measured in the same way as with the existing analogue quartz watches:

- There will be scatter in measurable value.
- The value displayed does not indicate correct daily rate.

2. Procedure for checking and adjustment

- Refer to the "SEIKO QUARTZ TECHNICAL GUIDE GENERAL INSTRUCTION" for analogue watches for details.

Procedure

CHECK OUTPUT SIGNAL

- ① Set up the Quartz Tester QT-99 or Quartz Tester together with QT-Adapter.

Range to be used: (QT-99 CH-1)
(QT-Adapter Cal. 99)

Result:
Indicator not blinking: Defective
Indicator blinking: Normal

- ② Pull out the crown to the second click and place the watch on the microphone.

Notes: Unlike the existing analogue quartz watches, Cal. 94 series gives signals at an irregular cycle.
Ultrasonic microphone (US-32) can't be used.

CHECK BATTERY VOLTAGE

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

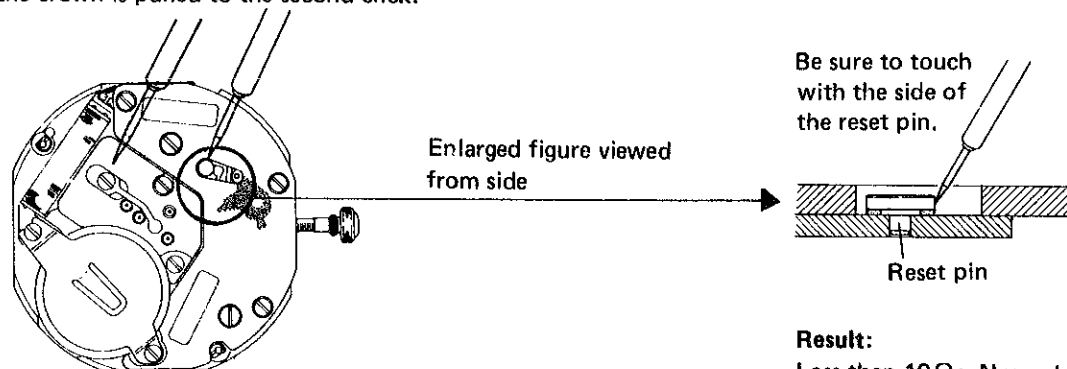
CHECK BATTERY CONDUCTIVITY

CHECK CIRCUIT BLOCK CONDUCTIVITY

CHECK RESET CONDITION AND TRAIN WHEEL SETTING CONDITION

- Check reset condition

- ① Check to see if the second hand stops promptly when the crown is pulled out to the second click and if it starts promptly after one second when the crown is pushed back the normal position.
- ② Check to see if the conductivity between the reset pin and the train wheel bridge is normal when the crown is pulled to the second click.

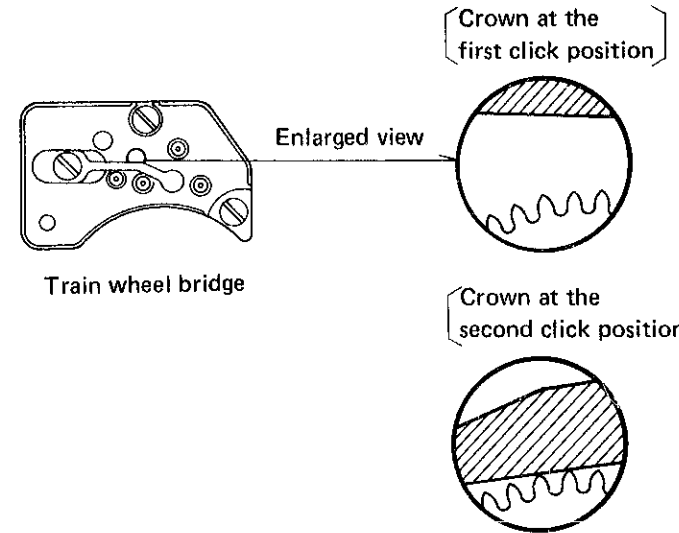


Result:
Less than 10Ω: Normal
More than 10Ω: Defective

Procedure

- Check train wheel setting condition

Check the clearance between the train wheel setting lever and the fifth wheel and pinion.



Clearance:
No clearance: Defective
Replace the train wheel setting lever.

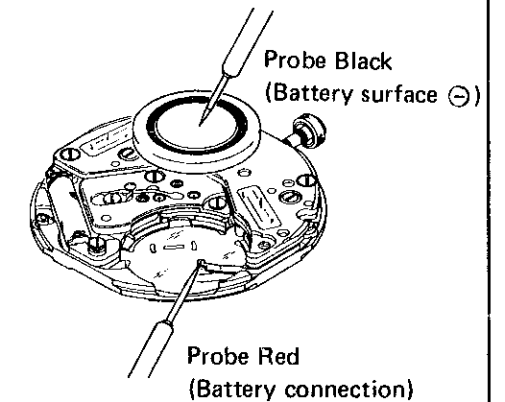
No clearance: Normal
Clearance: Defective
Replace the train wheel setting lever.

CHECK COIL BLOCK

Result:
1.5kΩ ~ 3.5kΩ: Normal
More than 3.5kΩ } Defective
Less than 1.5kΩ }

CHECK CURRENT CONSUMPTION

- Set up the Volt-ohm-meter
Range to be used: DC 12μA
- Set up the condenser kit of 200 ~ 500μF.
- Set the battery on the circuit block upside the minus surface as shown in the illustration on the right.



Result:
Less than 2.5μA: Normal
More than 2.5μA: Defective

Note: If the pointer of the Volt-ohm-meter swings over the maximum value, change over the measuring range to DC 30mA and turn it back to DC 12μA with the probes touched to the specified portions.

Procedure

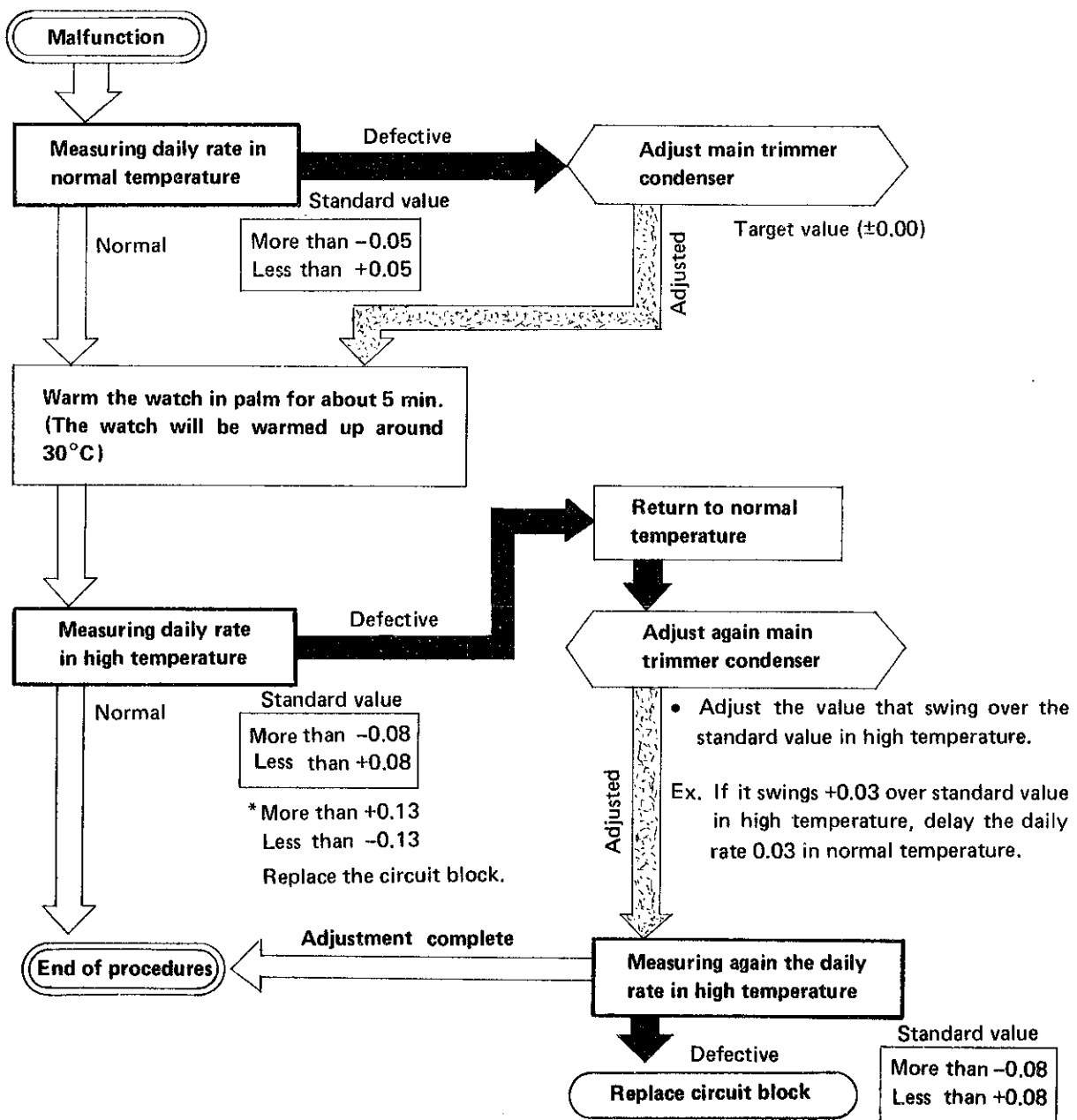
CHECK ACCURACY AND ADJUSTMENT

I. In case, the user does not indicate the loss or gain, or the adjustment of time accuracy is necessary such as when the circuit block being replaced.

① Set up the Quartz Tester QT-99 or Quartz Tester together with QT-Adapter.

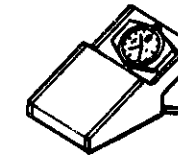
Range to be used QT-99 CH-1
 QT-Adapter Cal. 99

② Checking and adjustment should be performed in accordance with the following procedures.



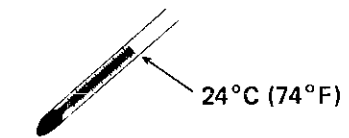
Remarks for checking accuracy and adjustment

- Set the watch on the microphone with the crown side up.

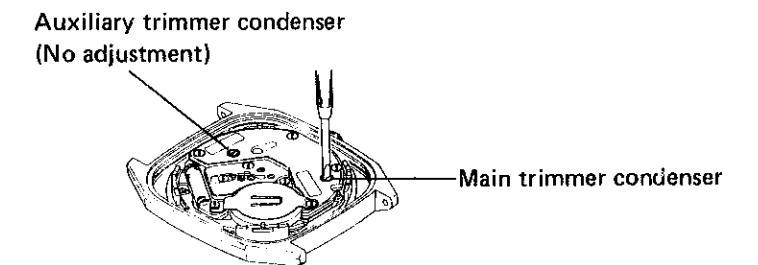


- Measure the daily rate over 5 times and take its average value.

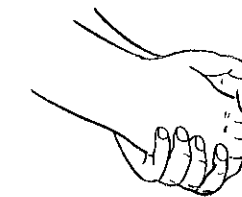
- Measure the daily rate in the normal temperature around 24°C (74°F).



- Be sure to adjust the time accuracy only by turning the main trimmer condenser. (Being different from Cal. 99 series, no adjustment for auxiliary trimmer condenser is needed.)



- When warming the watch, be sure to close the case back and warm it by palm.



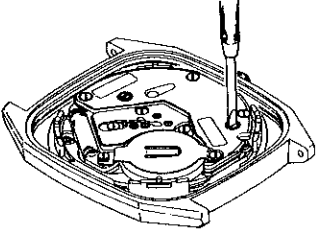
- Time accuracy must be adjusted to 1/100 second. So turn the main trimmer condenser little by little.

- When the battery is replaced with a new one, measure the daily rate several minutes later until the frequency of crystal oscillator is set stable.

Procedure

II. In case, the loss and gain is indicated by the user

- Adjustment shall be performed in accordance with the following procedures.

Procedure	Example
1. Exchange the indicated loss or gain to daily rate.	If it is told to gain 3 seconds per month, it will be calculated as follows: $3 \text{ sec.} \div 30 \text{ days} = 0.10 \text{ sec./day}$ It gains 0.10 second per day.
2. Measure the daily rate by Quartz Tester in normal temperature. Quartz Tester – QT99 Quartz Tester together with QT-Adapter	If it is indicated +0.12 sec./day (More than +0.13 Less than -0.13 Replace the circuit block)
3. Adjust accuracy by turning the main trimmer condenser.	This watch gains 0.10 second per day, so it will do the purpose by delaying to that degree. Quartz Tester indicates that it gains 0.12 second per day, so delay 0.10 sec./day and adjust the indicating figure of Quartz Tester to 0.02 sec./day. 

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