

SEIKO

QUARTZ

Cal. 14A

PARTS LIST

Cal. 14A



121 140



131 140



☆224 140



231 140



241 140



261 140



☆271 140



282 140



☆351 142



☆351 143



383 140



384 140



387 140



388 140



391 140



490 140



491 140



493 160



4001 140



4002 140



4146 140



☆4225 140



4239 140



☆4242 140



☆4242 143



4270 140



4446 140



011 326



011 541



☆SEIKO SB-DG

| | | | | | | | | |
|---------|----------|---------|---------|----------|----------|----------|---------|----------|
| | | | | | | | | |
| 012 155 | ☆012 156 | 012 157 | 012 208 | ☆012 374 | ☆012 461 | ☆012 464 | 012 777 | ☆012 783 |
| | | | | | | 2/1 | | |
| 017 146 | 017 147 | 017 148 | 017 150 | 017 151 | 017 160 | | | |

Cal. 14A

Characteristics

Casing diameter: 15.1 mm × 13.0 mm
 Maximum height: 2.3 mm without battery
 Jewels: 6 j
 Frequency of quartz crystal oscillator: 32,768 Hz (Hz=Hertz Cycles per second)
 Driving system: Step motor system (2 poles)
 Regulation system: Trimmer condenser

| PART NO. | PART NAME | PART NO. | PART NAME |
|----------|--|----------------|--------------------------------------|
| 121 140 | Center wheel bridge | 4001 140 | Circuit block |
| 131 140 | Third wheel bridge | 4002 140 | Coil block |
| ☆224 140 | Center wheel with cannon pinion (3.39 mm) | 4146 140 | Step rotor |
| ☆224 141 | Center wheel with cannon pinion (3.49 mm) | ☆4225 140 | Holding ring for battery |
| ☆224 142 | Center wheel with cannon pinion (3.61 mm) | 4239 140 | Rotor stator |
| ☆224 143 | Center wheel with cannon pinion (3.86 mm) | ☆4242 140 | Plus terminal of battery connection |
| ☆224 144 | Center wheel with cannon pinion (4.27 mm) | ☆4242 143 | Plus terminal of battery connection |
| 231 140 | Third wheel & pinion | 4270 140 | Battery connection |
| 241 140 | Fourth wheel & pinion | 4446 140 | Crystal unit cushion |
| 261 140 | Minute wheel | 011 326 | Upper hole jewel for third wheel |
| ☆271 140 | Hour wheel (0.85 mm, silver) | 011 326 | Lower hole jewel for third wheel |
| ☆271 141 | Hour wheel (0.95 mm, gold) | 011 326 | Lower hole jewel for fourth wheel |
| ☆271 142 | Hour wheel (1.00 mm, silver) | 011 541 | Upper hole jewel for fourth wheel |
| ☆271 143 | Hour wheel (1.32 mm, silver) | 011 541 | Upper hole jewel for step rotor |
| ☆271 144 | Hour wheel (1.73 mm, silver) | 011 541 | Lower hole jewel for step rotor |
| 282 140 | Clutch wheel | 012 155 | Dial screw |
| ☆351 142 | Winding stem (14.10 mm) | 012 156 | Coil block screw |
| ☆351 143 | Winding stem (17.60 mm) | ☆012 156 | Circuit block screw A |
| 383 140 | Setting lever | 012 156 | Center wheel bridge screw |
| 384 140 | Yoke (Clutch lever) | 012 157 | Third wheel bridge screw |
| 387 140 | Minute wheel bridge | 012 208 | Setting lever spring screw |
| 388 140 | Setting lever spring | ☆012 374 | Screw for holding spring for battery |
| 391 140 | Second setting lever | ☆012 461 | Circuit block screw D |
| 490 140 | Center wheel friction spring | ☆012 464 | Circuit block screw C |
| 491 140 | Dial washer | 012 777 | Minute wheel bridge screw |
| 493 160 | Hour wheel ring (Thickness 0.03 mm, gold) | ☆012 783 | Circuit block screw B |
| 493 161 | Hour wheel ring (Thickness 0.05 mm, silver) | 017 146 | Tube for center wheel bridge screw |
| 493 162 | Hour wheel ring (Thickness 0.07 mm, gold) | 017 147 | Tube for third wheel bridge screw |
| | | 017 148 | Tube for setting lever |
| | | 017 150 | Tube for coil block |
| | | 017 151 | Tube for circuit block A |
| | | 017 160 | Tube for circuit block B |
| | | ☆SEIKO TR621SW | Silver peroxide battery |
| | | ☆SEIKO SB-DG | |
| | | ☆Toshiba W1V | |
| | | ☆Maxell SR41SW | |

Remarks: Winding stem.....Refer to the photograph on the front page.
 ☆351 142.....Short winding stem (Thread is provided completely on the crown portion.)
 ☆351 143.....Long winding stem (Thread is provided only on the end of the crown portion.)
 If the combination of the winding stem and case is unknown, check the case number and refer to
 "SEIKO Quartz Casing Parts List" to choose a corresponding winding stem.

Battery

☆SEIKO TR621SW } The applied battery for this calibre might be added the substitutive in the
 ☆SEIKO SB-DG } future. In that case, please refer to separate "BATTERIES FOR
 SEIKO QUARTZ WATCHES".

☆⇒Please see remarks.

Part numbers in light letters are not shown in photos.

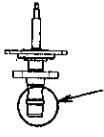

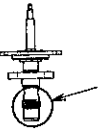

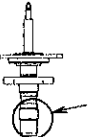

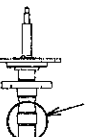

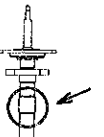

Cal. 14A

Remarks:

Center wheel with cannon pinion, Hour wheel

There are five different types as specified below.

Combination:

| Type | Center wheel with cannon pinion | Hour wheel |
|------|---|---|
| a |  | Silver  |
| | ☆224 140 | ☆271 140 |
| b |  | Gold  |
| | ☆224 141 | ☆271 141 |
| c |  | Silver  |
| | ☆224 142 | ☆271 142 |
| d |  | Gold  |
| | ☆224 143 | ☆271 143 |
| e |  | Silver  |
| | ☆224 144 | ☆271 144 |

Holding ring for battery, Plus terminal of battery connection, Circuit block screw A, B, C and D, Screw for holding spring for battery

There are two different types as specified below

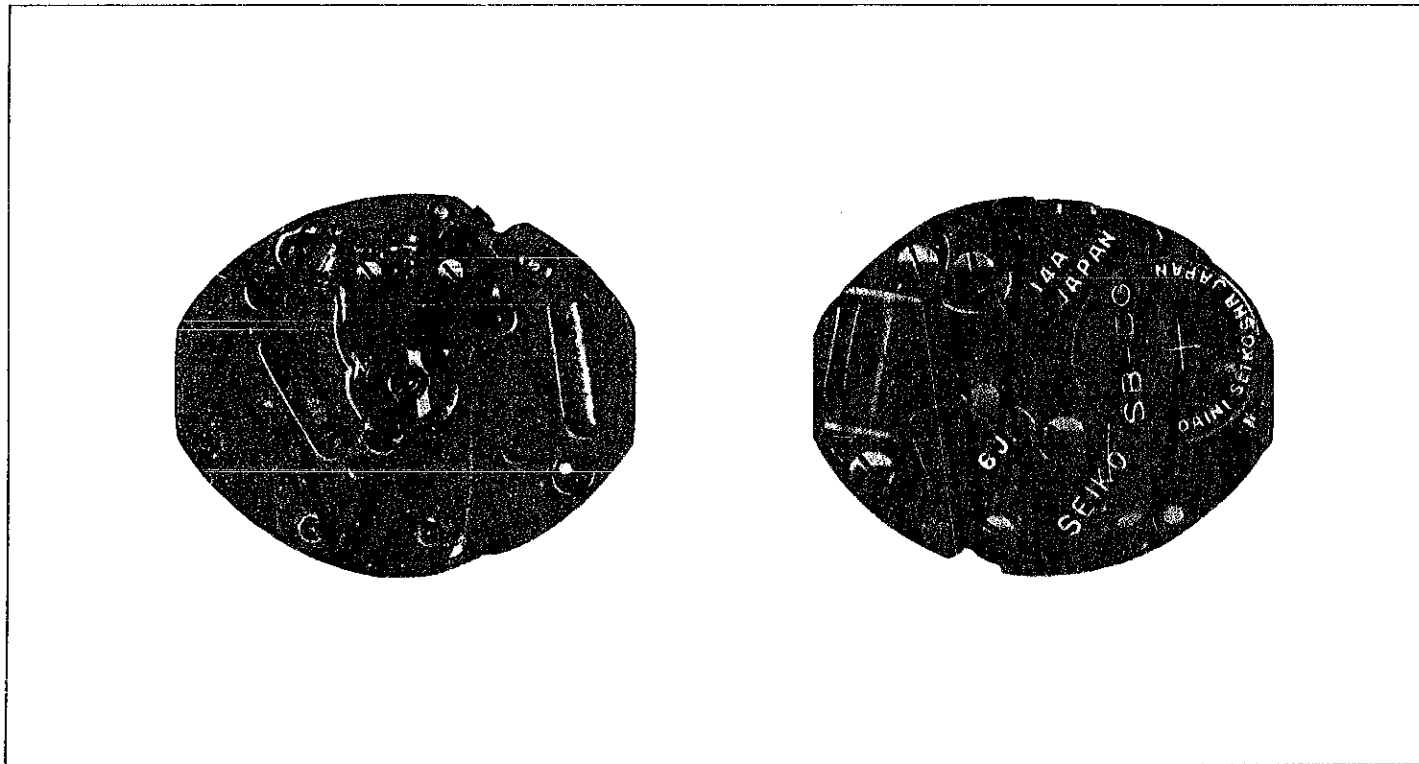
Combination:

| Type | Holding ring for battery | Plus terminal of battery connection | Screw for holding spring for battery | Circuit block screw A, B, C and D |
|--|--------------------------|-------------------------------------|--------------------------------------|--|
| The model with holding ring for battery | ☆4225 140 | ☆4242 143 | ☆012 374 | ☆012 156(A) ☆012 461(D) ☆012 464(C) ☆012 783(B) |
| The model without holding ring for battery | — | ☆4242 140 | — | ☆012 156(A) (2 pieces) ☆012 464(C) ☆012 783(B) |

TECHNICAL GUIDE

SEIKO
QUARTZ

CAL.14A



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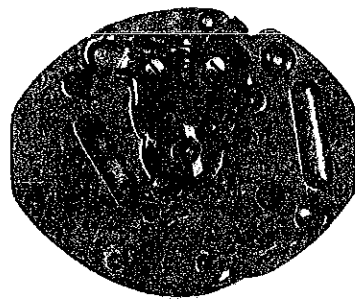
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I. SPECIFICATIONS

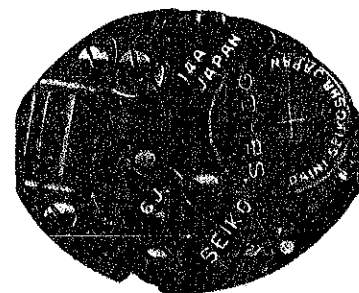
| Item | Calibre No. | 14A |
|-------------------------------|-------------|---|
| Time indication | | 2-hand time indication (hour & minute) |
| Additional mechanism | | Electronic circuit reset switch |
| Crystal oscillator | | 32,768 Hz (Hz = Hertz . . . Cycle per second) |
| Loss/gain | | Loss/gain at normal temperature range Monthly rate : less than 15 seconds (Annual rate : less than 3 minutes) |
| Casing diameter | | 15.1 mm x 13.0 mm |
| Height | | 2.3 mm without battery |
| Operational temperature range | | -10°C ~ +60°C (14°F ~ 140°F) |
| Driving system | | Step motor system (2 poles: steps once every 10 seconds) |
| Regulation system | | Trimmer condenser |
| Battery power | | Silver oxide battery SB-DG Battery life is approximately 3 years. Voltage: 1.55V |
| Jewels | | 6 jewels |

- SEIKO Quartz Cal. 14A is a thin and compact dress type ladie's crystal oscillator watch.

Movement



Dial Side



Circuit Side

II. DISASSEMBLING, REASSEMBLING AND LUBRICATING



- Disassembling and reassembling



Disassembling procedures Figs. ① → ③④


Reassembling procedures Figs. ③④ → ①

- Lubricating

Types of oil

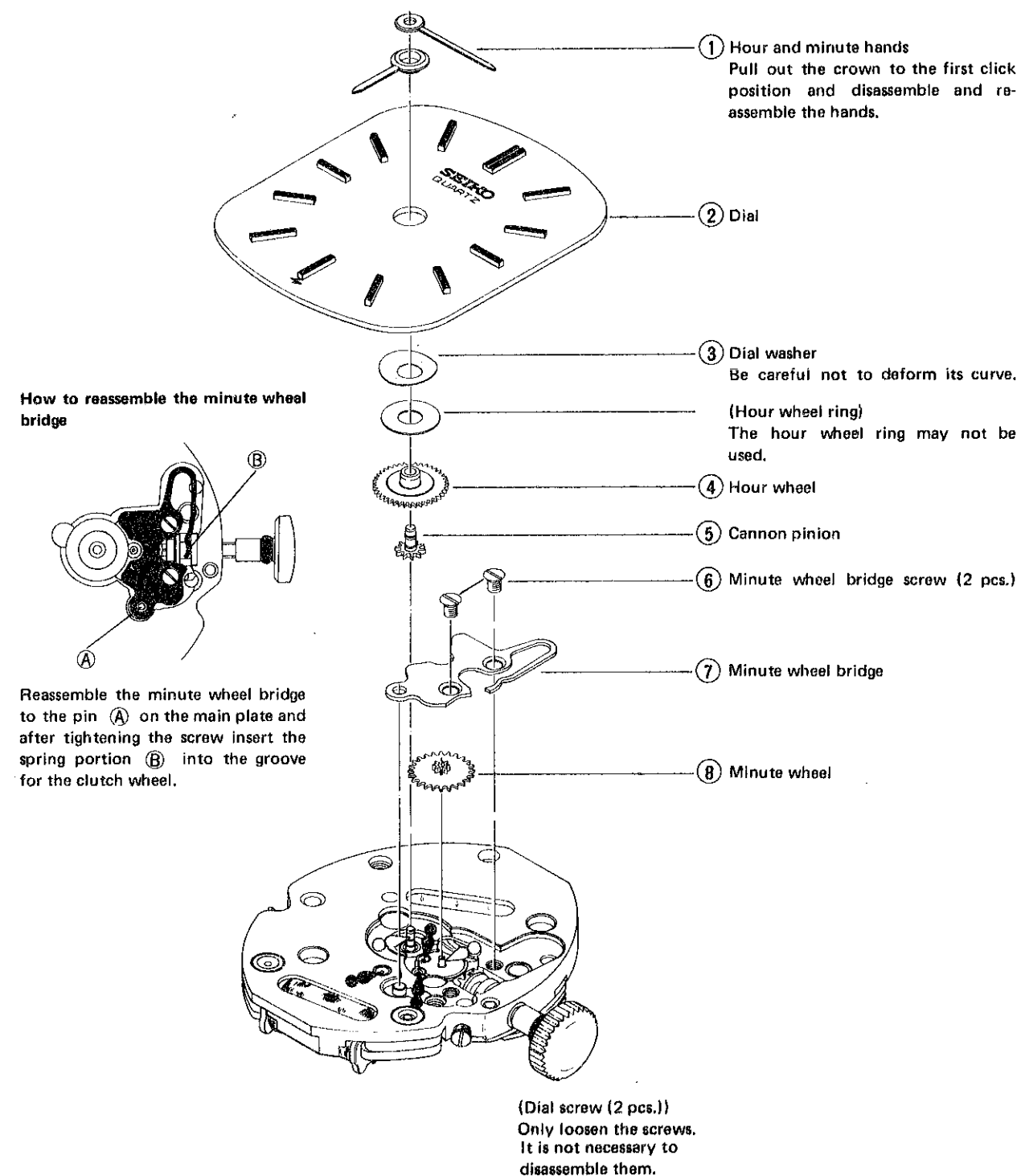
Moebius A  Liberal 

SEIKO Watch Oil S-6  Normal 

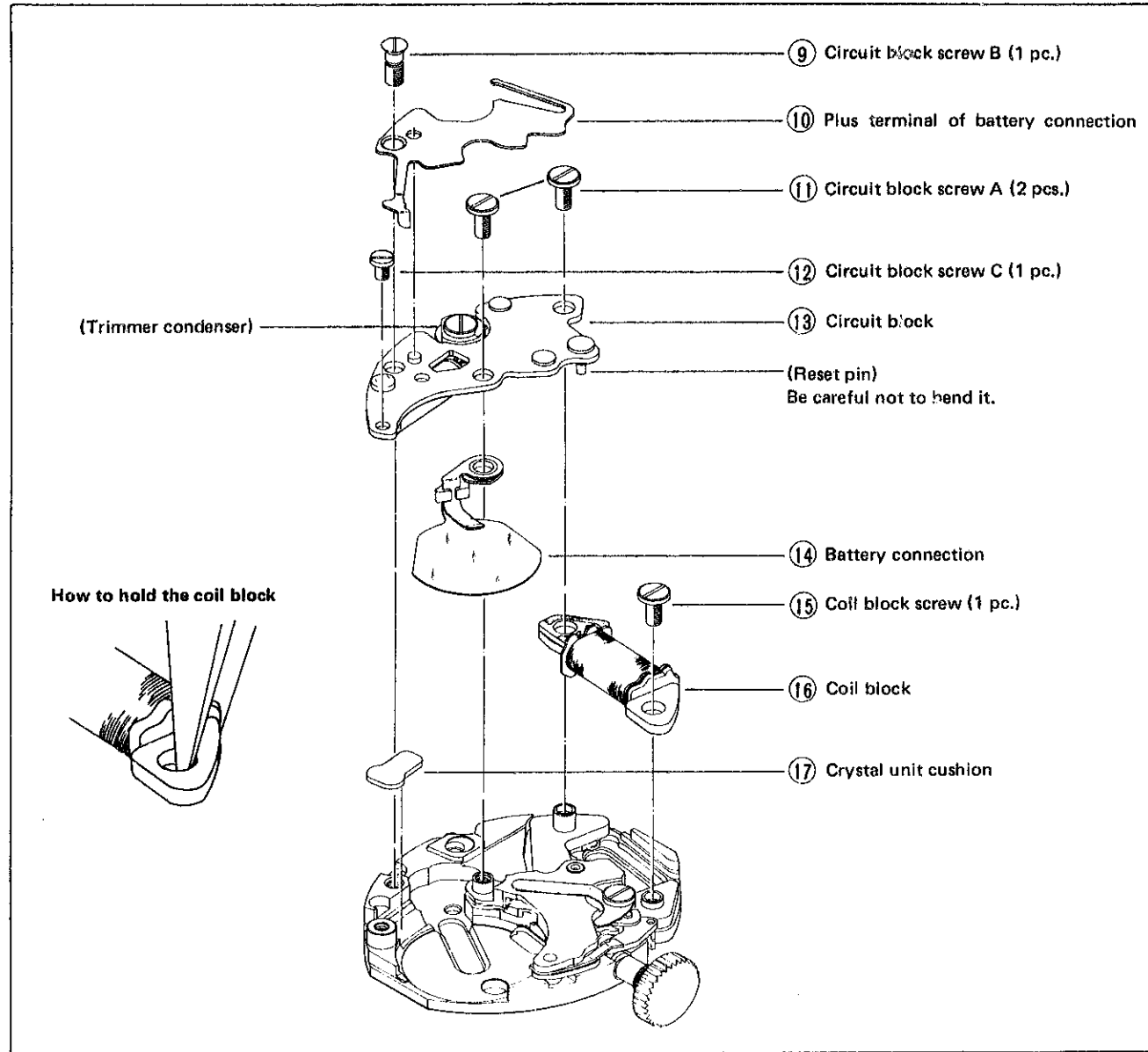
Extremely small 

- Use the movement holder S-664 for Cal. 16.

1. Indicating mechanism



2. Electronic circuit



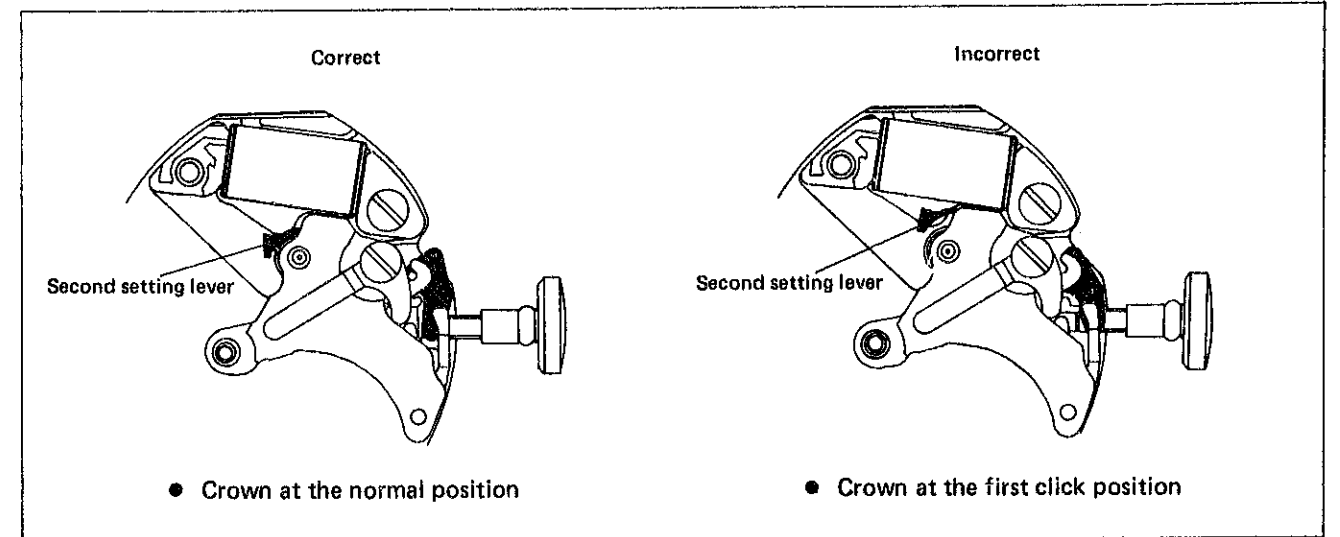
• List of screw used

| | | | | | | |
|--|-----------------------|-----------------------|--------------------------|----------------------------|---------------------------|------------|
| | | | | | | |
| Center wheel bridge screw Circuit block screw A Coil block screw | Circuit block screw B | Circuit block screw C | Third wheel bridge screw | Setting lever spring screw | Minute wheel bridge screw | Dial screw |
| 4 pieces | 1 piece | 1 piece | 1 piece | 1 piece | 2 pieces | 2 pieces |

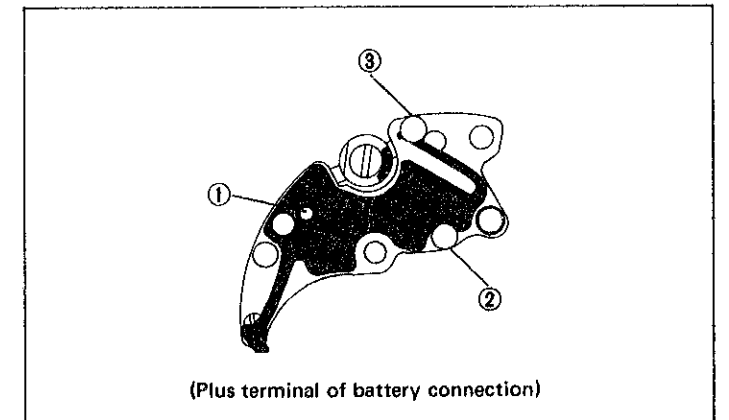
• Remarks for disassembling and reassembling

Circuit block ⑬

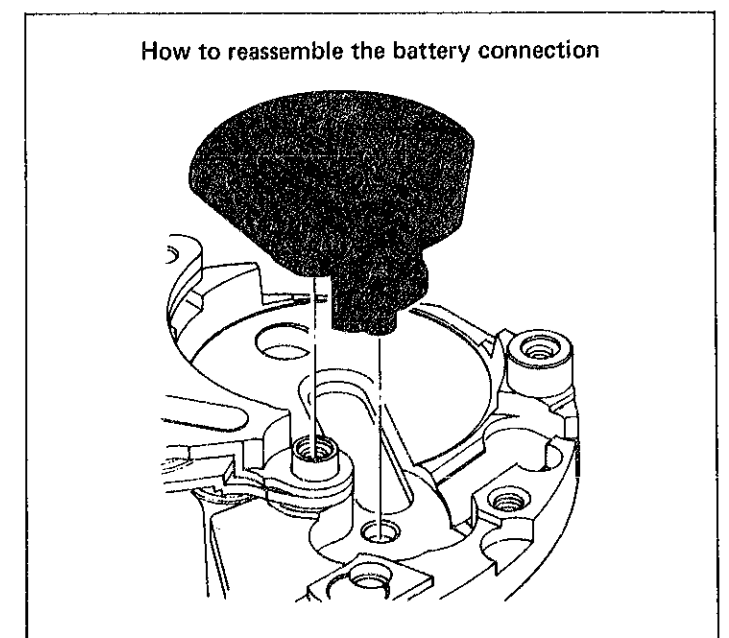
When disassembling and reassembling the circuit block, be careful that the reset portion of the second setting lever does not touch the reset pin with the crown at the normal position.



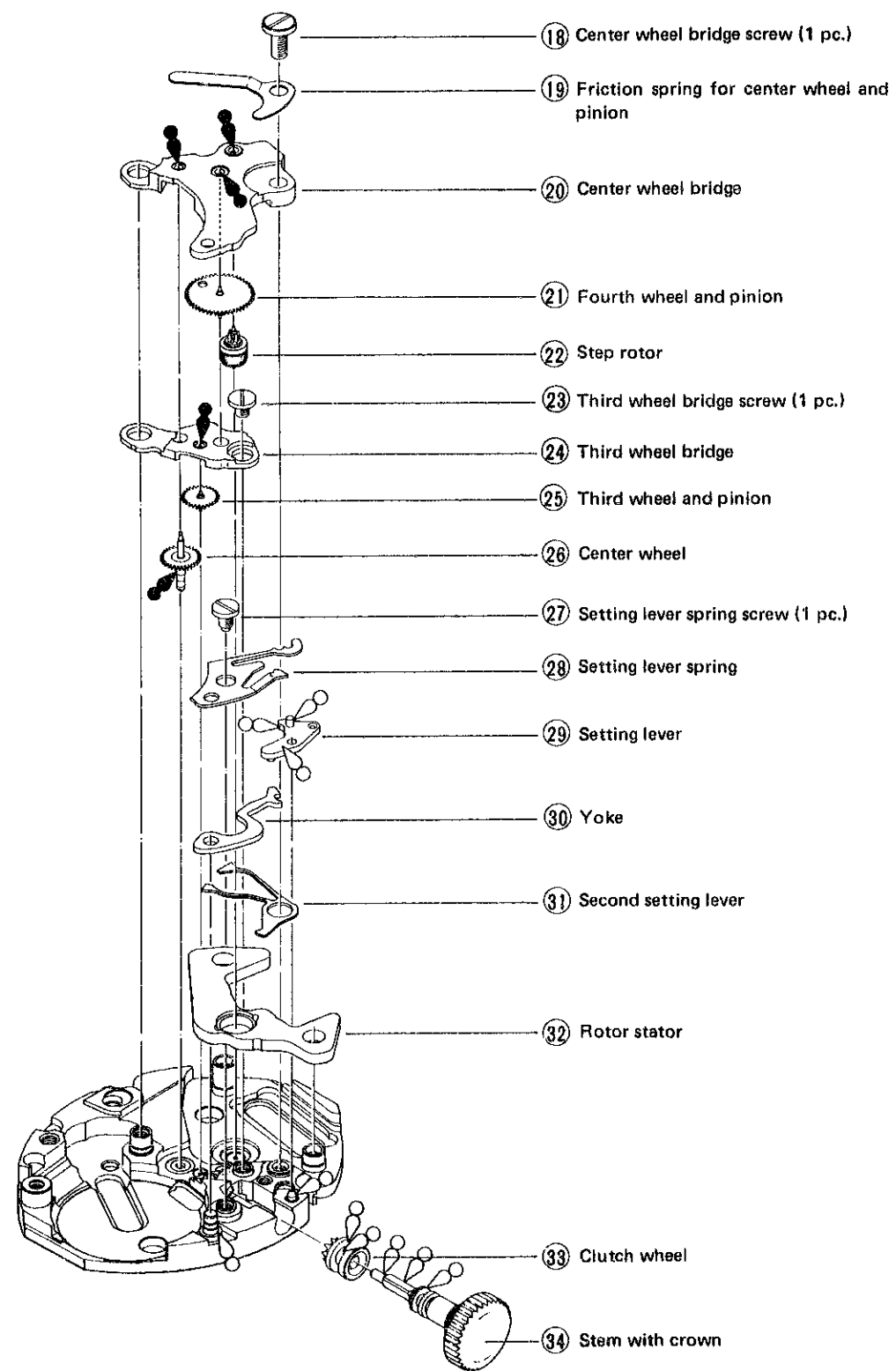
When the plus terminal of battery connection has been replaced, reassemble it in numerical order and lastly hook its spring portion ③ inside the pin.



Battery connection ⑭

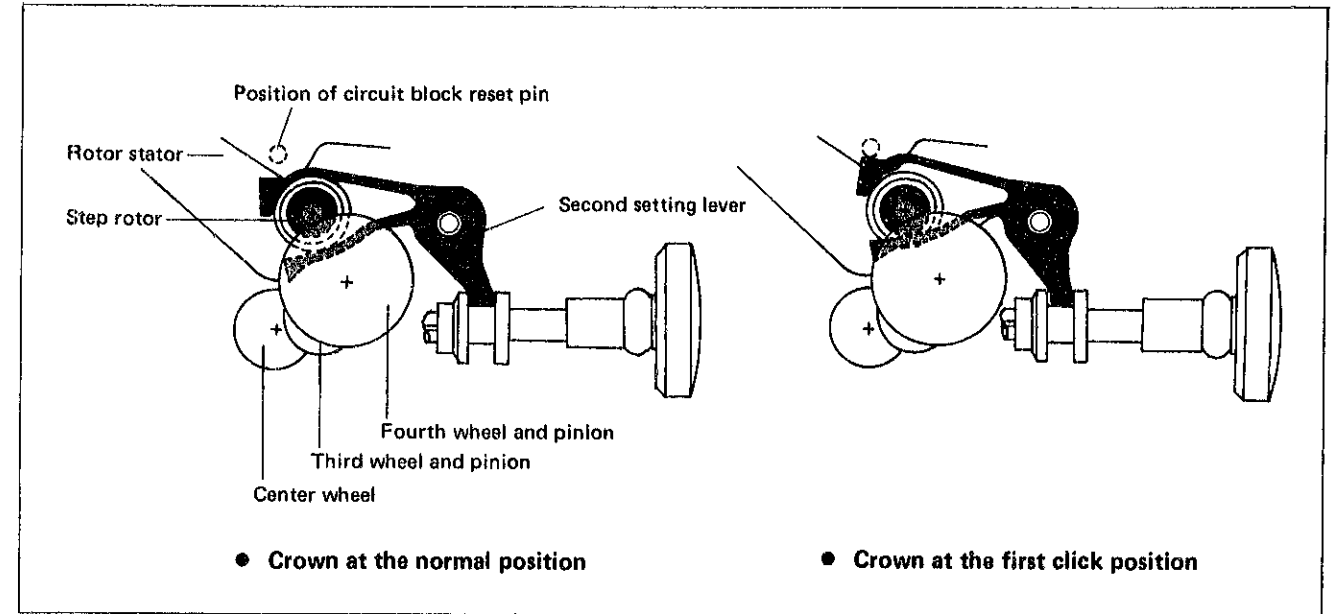


3. Gear train and setting mechanism



• Remarks for disassembling and reassembling

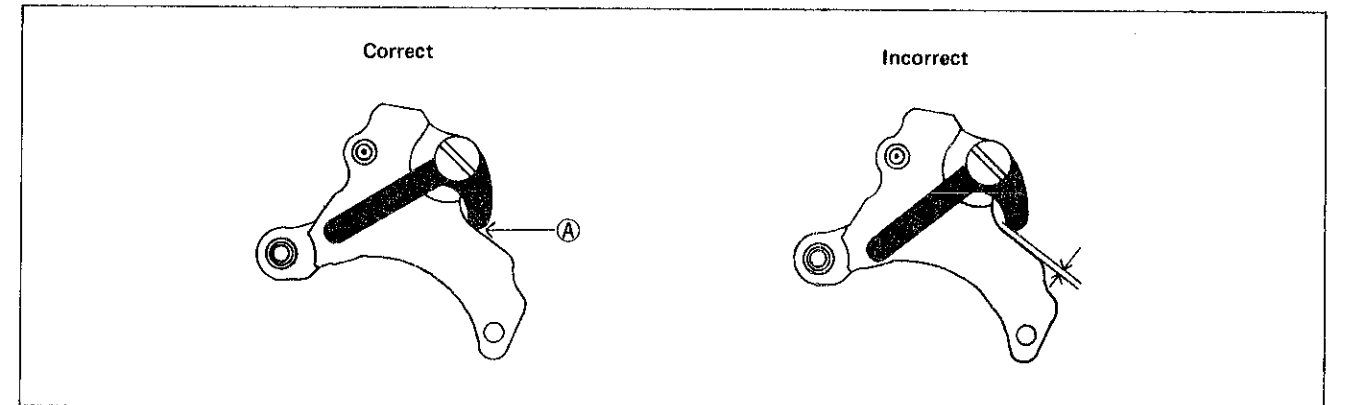
Functions of the gear train and the second setting lever ②① ~ ③①



- When the crown is pulled out to the first click position, make sure that the second setting lever sets securely the step rotor and at the same time it touches the reset pin.

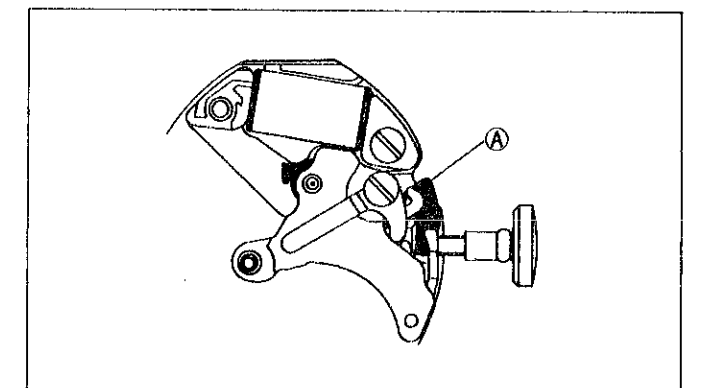
Friction spring for center wheel and pinion ①⑨

First make sure that the portion ①A touches the side of the center wheel bridge and then tighten the center wheel bridge screw.



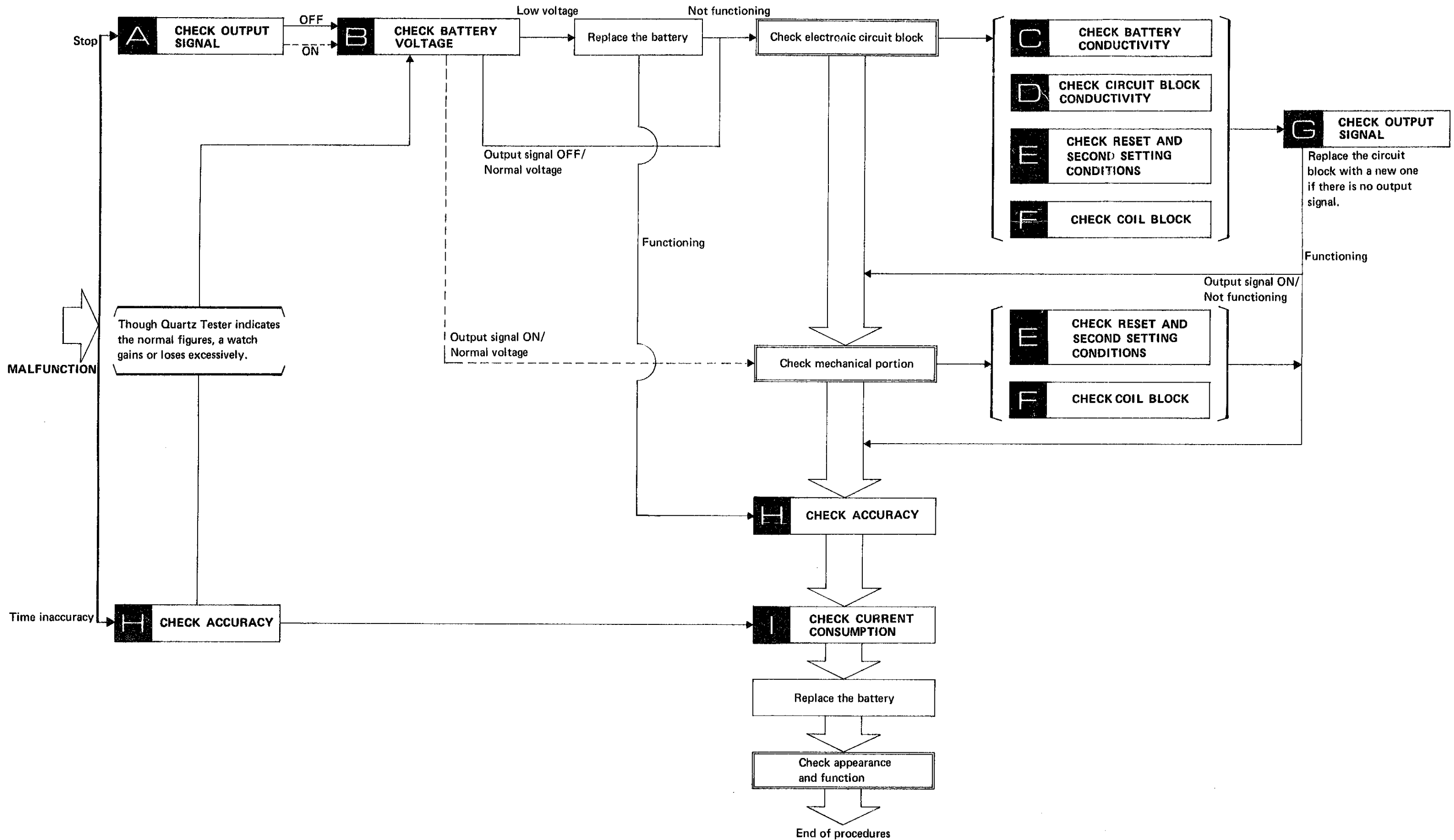
• How to pull out the stem with crown

Pull out the stem with crown while pushing the portion ①A of the setting lever with the crown at the normal position.

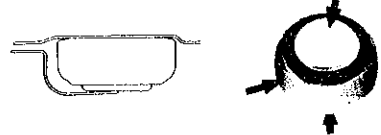
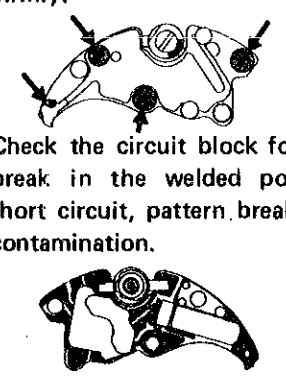


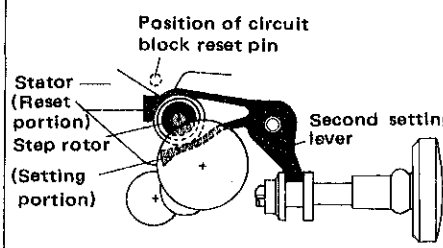
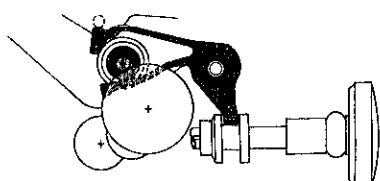
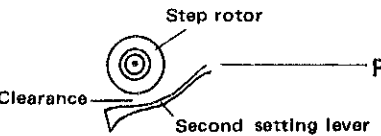



III. CHECKING AND ADJUSTMENT

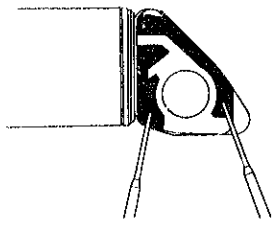
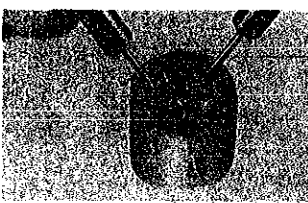
1. Guide table for checking and adjustment



2. Procedures for checking and adjustment

| | Procedures | Results | Adjustment and repair |
|----------------------------------|---|---|-----------------------|
| CHECK OUTPUT SIGNAL | <p>Check output signal. Set up the Quartz Tester. Turn the measuring time selection switch to the "10 second" position.</p> | <p>Ten-second blinking → Proceed to B.</p> <p>No ten-second blinking → Proceed to B.</p> | |
| CHECK BATTERY VOLTAGE | <p>Check battery voltage.</p> | <p>More than 1.5V → In procedure A if ten-second blinking is found, proceed to Check mechanical portion. → In procedure A if ten-second blinking is not found, proceed to Check electronic circuit block.</p> <p>Less than 1.5V → Proceed to Replace the battery. If a watch operates after battery replacement, proceed to H. If a watch does not operate after battery replacement, proceed to Check electronic circuit block.</p> | |
| CHECK BATTERY CONDUCTIVITY | <p>Check battery conductivity.</p> <ol style="list-style-type: none"> Make sure that the circuit block screws are tightened firmly. Check for any contamination on the connecting portion of battery, the battery connection and the plus terminal of battery connection.  | <p>No loosened screws → Proceed to C 2.</p> <p>Loosened screws → Retighten the screws.</p> <p>Uncontaminated → Proceed to D.</p> <p>Contaminated → Wipe off carefully.</p> | |
| CHECK CIRCUIT BLOCK CONDUCTIVITY | <p>Check circuit block conductivity.</p> <ol style="list-style-type: none"> Check to see if the circuit block screws (4 pcs.) are tightened firmly. Check the circuit block for any break in the welded portion, short circuit, pattern break and contamination.  | <p>No loosened screws → Proceed to D 2.</p> <p>Loosened screws → Retighten the screws.</p> <p>No break in the welded portion, short circuit, pattern break or contamination → Proceed to E.</p> <p>Break in the welded portion, short circuit or pattern break → Replace the circuit block.</p> <p>Contaminated → Wipe off carefully.</p> | |

| | Procedures | Results | Adjustment and repair |
|---|---|--|-----------------------|
| CHECK RESET AND SECOND SETTING CONDITIONS | <p>Check reset and second setting conditions.</p> <ol style="list-style-type: none"> Check to see if the second hand stops immediately after the crown is pulled out to the first click position and if it starts promptly after ten seconds when the crown is pushed in to the normal position. Check for the clearance between the tip of the second setting lever (reset portion) and the reset pin (with the circuit block removed). <p>① With the crown at the normal position</p>  <p>② With the crown at the first click position</p>  <p>③ With the crown at the normal position</p>  <p>④ With the crown at the first click position</p>  <p>⑤ With the crown at the normal position</p>  <p>⑥ With the crown at the first click position</p>  | <p>Stops completely and starts after ten seconds → Proceed to F.</p> <p>Does not stop or moves irregularly → Proceed to F 2.</p> <p>Position of circuit block reset pin</p> <p>(Reset portion) → Proceed to F 2. ②</p> <p>Stator → The tip of the second setting lever is located inside the stator.</p> <p>→ Replace the second setting lever.</p> <p>→ The tip of the second setting lever is located outside the stator.</p> <p>→ Proceed to F 3.</p> <p>→ Replace the second setting lever.</p> <p>Step rotor</p> <p>Clearance → Proceed to F 3. ②</p> <p>Second setting lever</p> <p>No clearance → Replace the second setting lever.</p> <p>→ Proceed to F.</p> <p>→ Replace the second setting lever.</p> | |

| | Procedures | Results | Adjustment and repair |
|---------------------------|--|---|---|
| CHECK COIL BLOCK | Check coil block.  | $1.5k\Omega \sim 3.5k\Omega$ Less than $1.5k\Omega$ Short circuit More than $3.5k\Omega$ Broken coil wire | Electronic circuit block is being checked. Proceed to G . Mechanical portion is being checked. Proceed to H . Replace the coil block. |
| CHECK OUTPUT SIGNAL | Check output signal. Checking Follow the same procedures as in A . | Ten-second blinking No ten-second blinking | Functioning → Proceed to H . Not functioning → Proceed to Check mechanical portion . Replace the circuit block. |
| CHECK ACCURACY | Check accuracy. Set up the Quartz Tester. Turn the measuring time selection switch to the "10 second" position. | Normal Defective | Replace the battery. Adjust time accuracy. |
| CHECK CURRENT CONSUMPTION | Check current consumption. Place the battery on the plus terminal of battery connection with its (-) surface faced up. Probe red (+) Battery connection Probe black (-) . . . Battery surface (-)  | Less than $0.5\mu A$ More than $0.5\mu A$ | Normal Proceed to Check electronic circuit block . Note: If the pointer of the volt-ohm-meter scales out and the current consumption cannot be measured, reset its range, e.g. at DC 30mA. Next, when the pointer is stabilized with the probes of the volt-ohm-meter applied as shown in the left illustration, return the range to DC $12\mu A$ (or DC 0.03mA) and read the value indicated. |
| | Precautions: <ul style="list-style-type: none"> As this watch moves at 10-second intervals, the pointer of the volt-ohm-meter swings once every 10 seconds when measuring the current consumption. When the (+) and (-) probes of the volt-ohm-meter are applied as shown in the illustration, the pointer swings slightly, indicating that the current is flowing in the IC. After 10 seconds, the pointer swings again and the motor driving current flows besides the current flowing in the IC. The current consumption is calculated as follows: | | |
| | [Example] Assuming that IC current = $0.3\mu A$ and IC current + motor driving current = $1.0\mu A$, the driving current required only for the motor is $0.7\mu A$, which shows the value when the watch moves at 10-second intervals. Therefore, the value is required to be converted into the value measured at 1-second intervals in order to obtain the current consumption. Reduce the value ($0.7\mu A$) into 1/10 and the current consumption necessary only for driving the motor is $0.07\mu A$. Accordingly the value of current consumption by this watch is as follows: $0.3\mu A + 0.07\mu A = 0.37\mu A$. | | |