

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
017 146	017 147	017 148	017 150	017 151	017 160			3/4

☆ ⇨ Please see remarks on the next page.

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 } ☆SEIKO SB-DG } ☆Toshiba W1V } ☆Maxell SR41SW }	Silver peroxide battery

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.

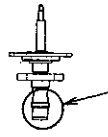

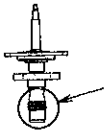

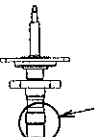

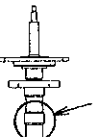

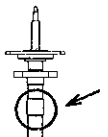

Cal. 14A

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

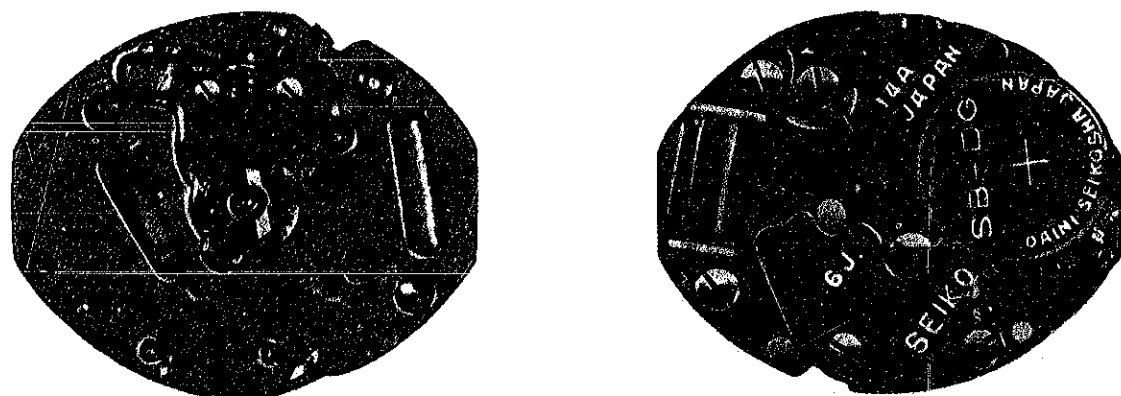
Combination:

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



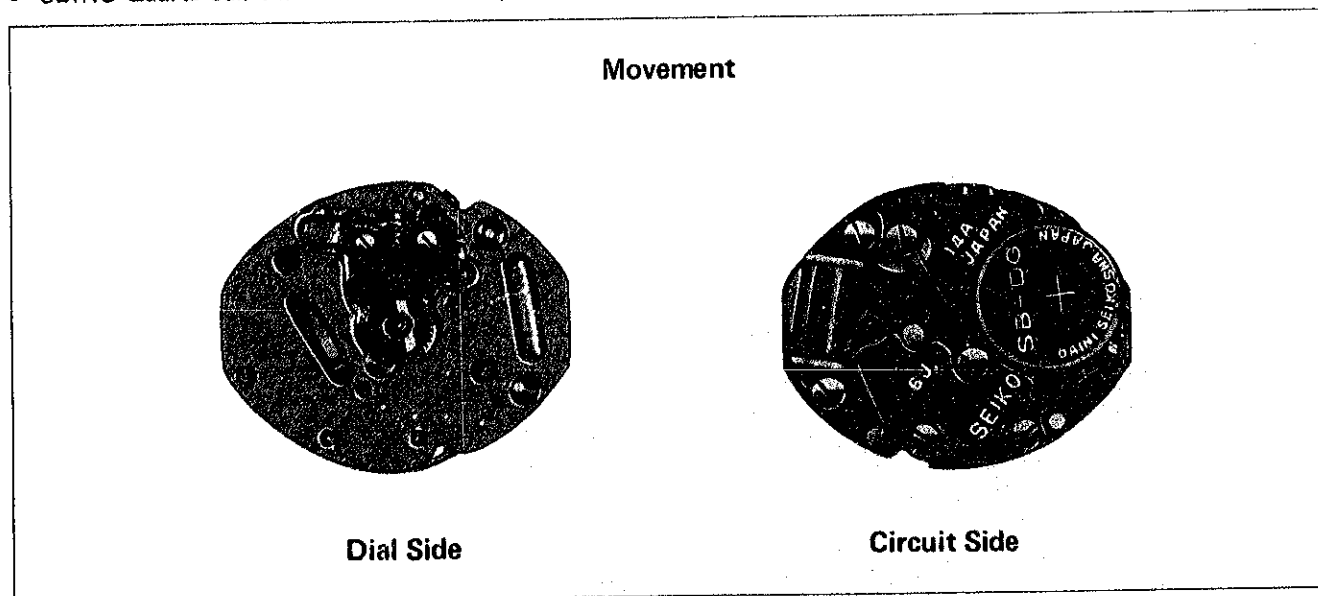
CONTENTS

I. SPECIFICATIONS	1
II. DISASSEMBLING, REASSEMBLING AND LUBRICATING	2
1. Indicating mechanism	2
2. Electronic circuit	3
3. Gear train and setting mechanism	5
III. CHECKING AND ADJUSTMENT	8
1. Guide table for checking and adjustment	8
2. Procedures for checking and adjustment	9
A : Check output signal	9
B : Check battery voltage	9
C : Check battery conductivity	9
D : Check circuit block conductivity	9
E : Check reset and second setting conditions	10
F : Check coil block	11
G : Check output signal	11
H : Check accuracy	11
I : Check current consumption	11

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.



II. DISASSEMBLING, REASSEMBLING AND LUBRICATING

Disassembling and reassembling

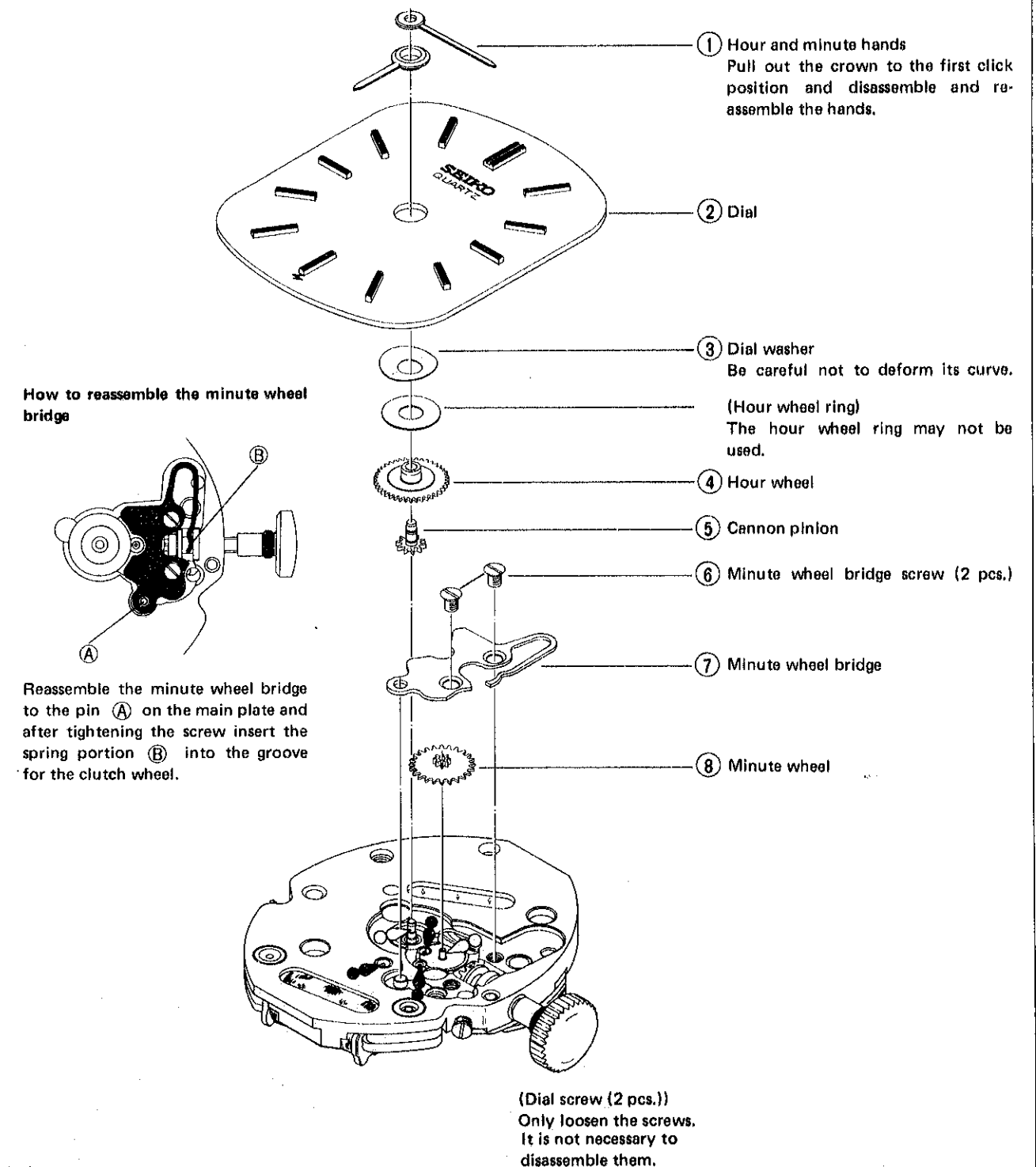
- Disassembling procedures Figs. ① → ③④
 Reassembling procedures Figs. ③④ → ①

Lubricating

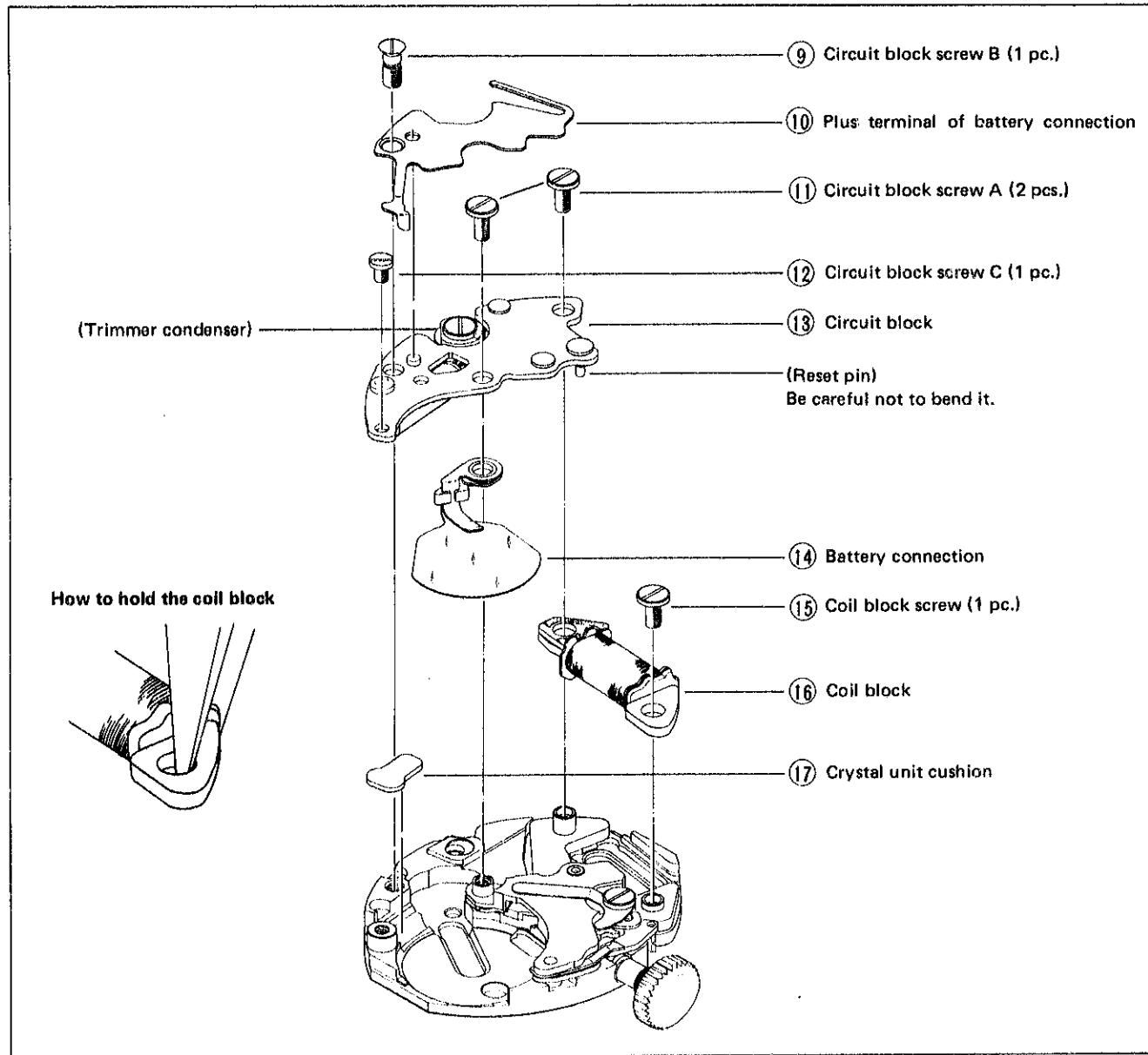
- Types of oil
 ● Moebius A
 ○ SEIKO Watch Oil S-6
- Oil quantity
 ○ Liberal
 ○ Normal
 △ Extremely small

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

1. Indicating mechanism



2. Electronic circuit



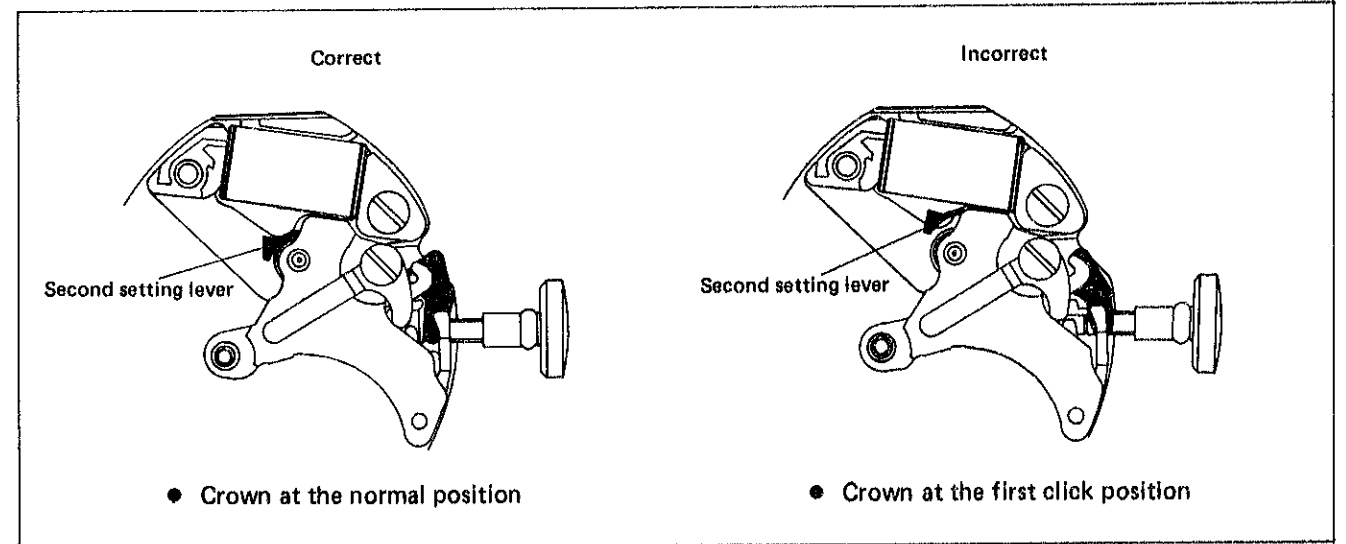
• List of screw used

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

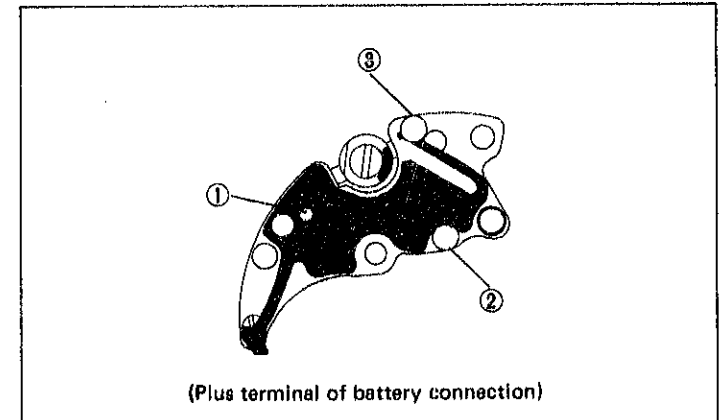
• Remarks for disassembling and reassembling

Circuit block ⑬

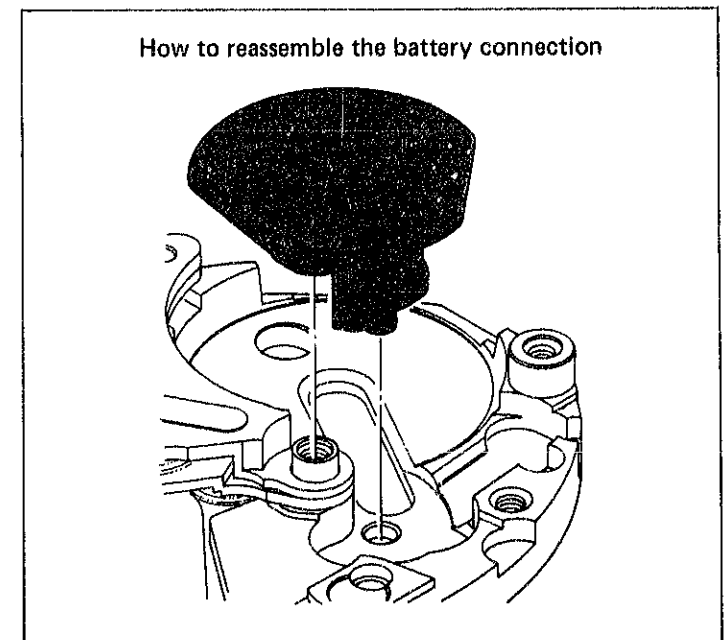
When disassembling and reassembling the circuit block, be careful that the reset portion of the second setting lever does not touch the reset pin with the crown at the normal position.



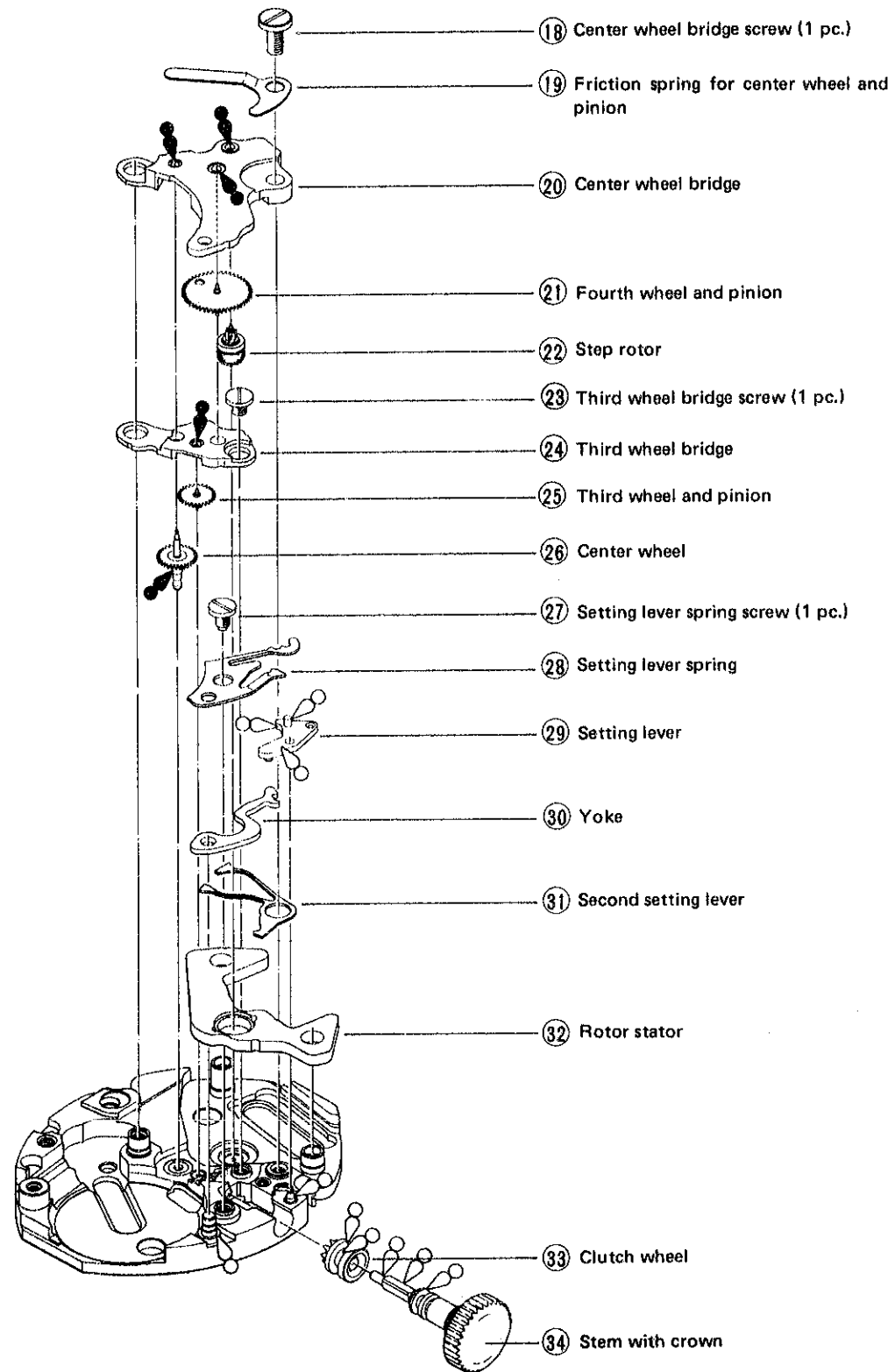
When the plus terminal of battery connection has been replaced, reassemble it in numerical order and lastly hook its spring portion ⑨ inside the pin.



Battery connection ⑭

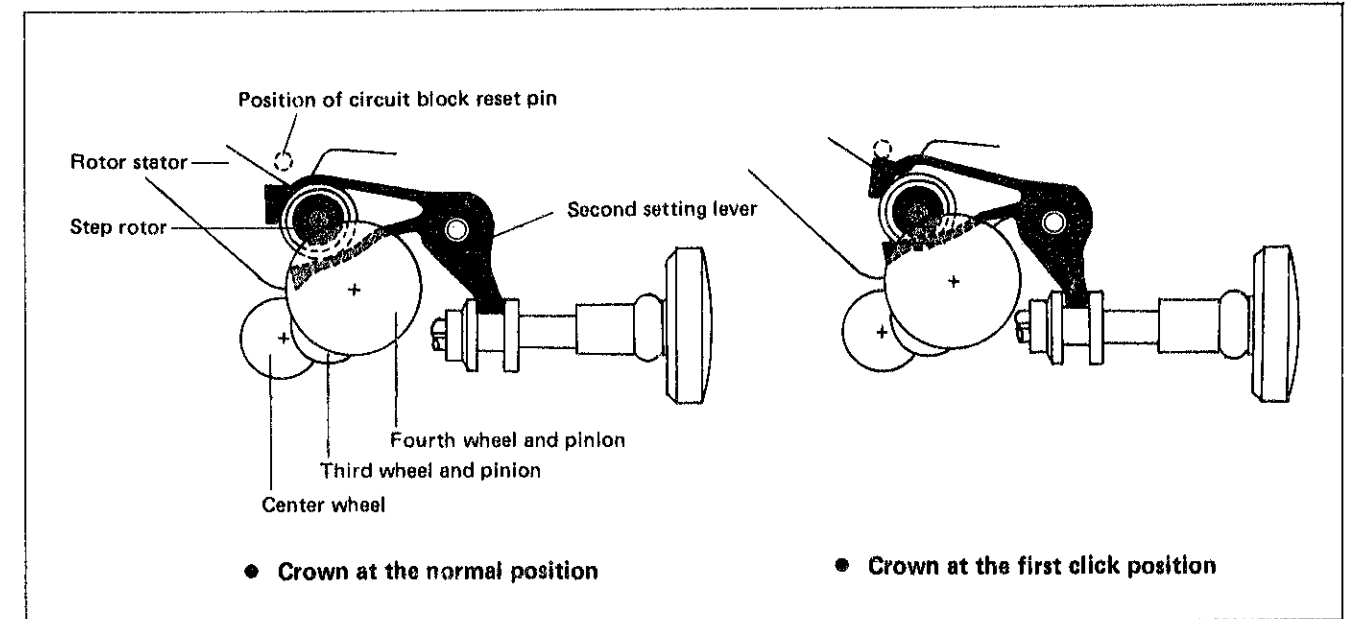


3. Gear train and setting mechanism



• Remarks for disassembling and reassembling

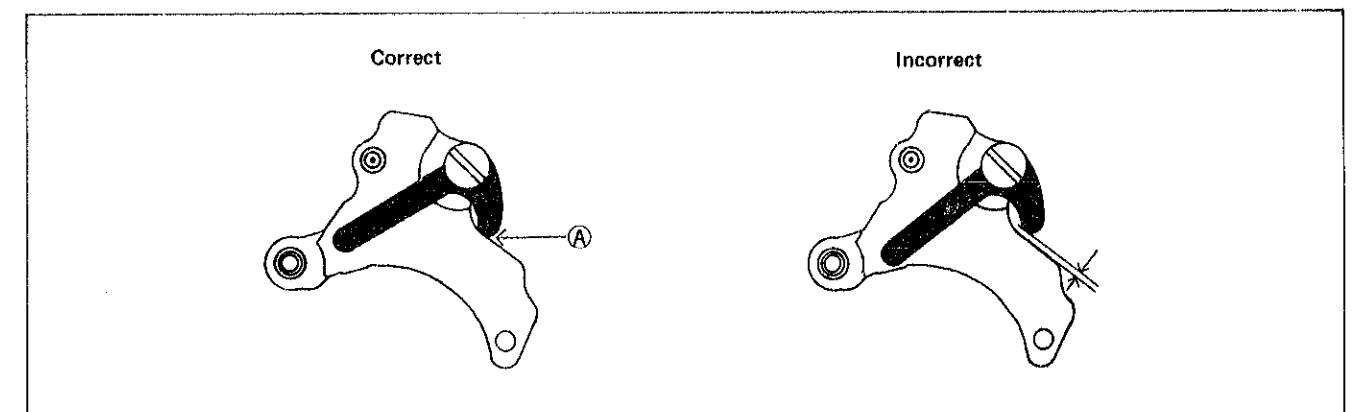
Functions of the gear train and the second setting lever ⑳ ~ ㉑



- 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.

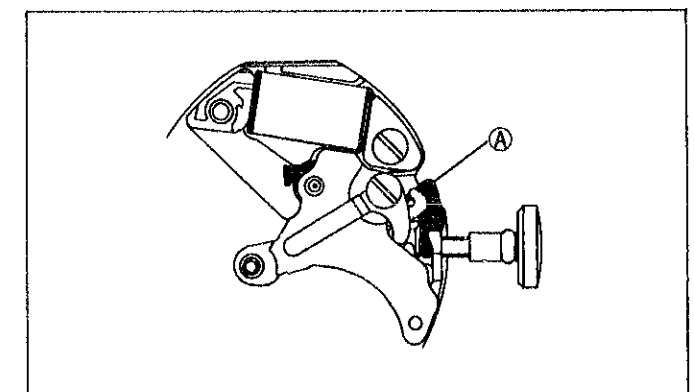
Friction spring for center wheel and pinion ㉑

First make sure that the portion ㉑ touches the side of the center wheel bridge and then tighten the center wheel bridge screw.



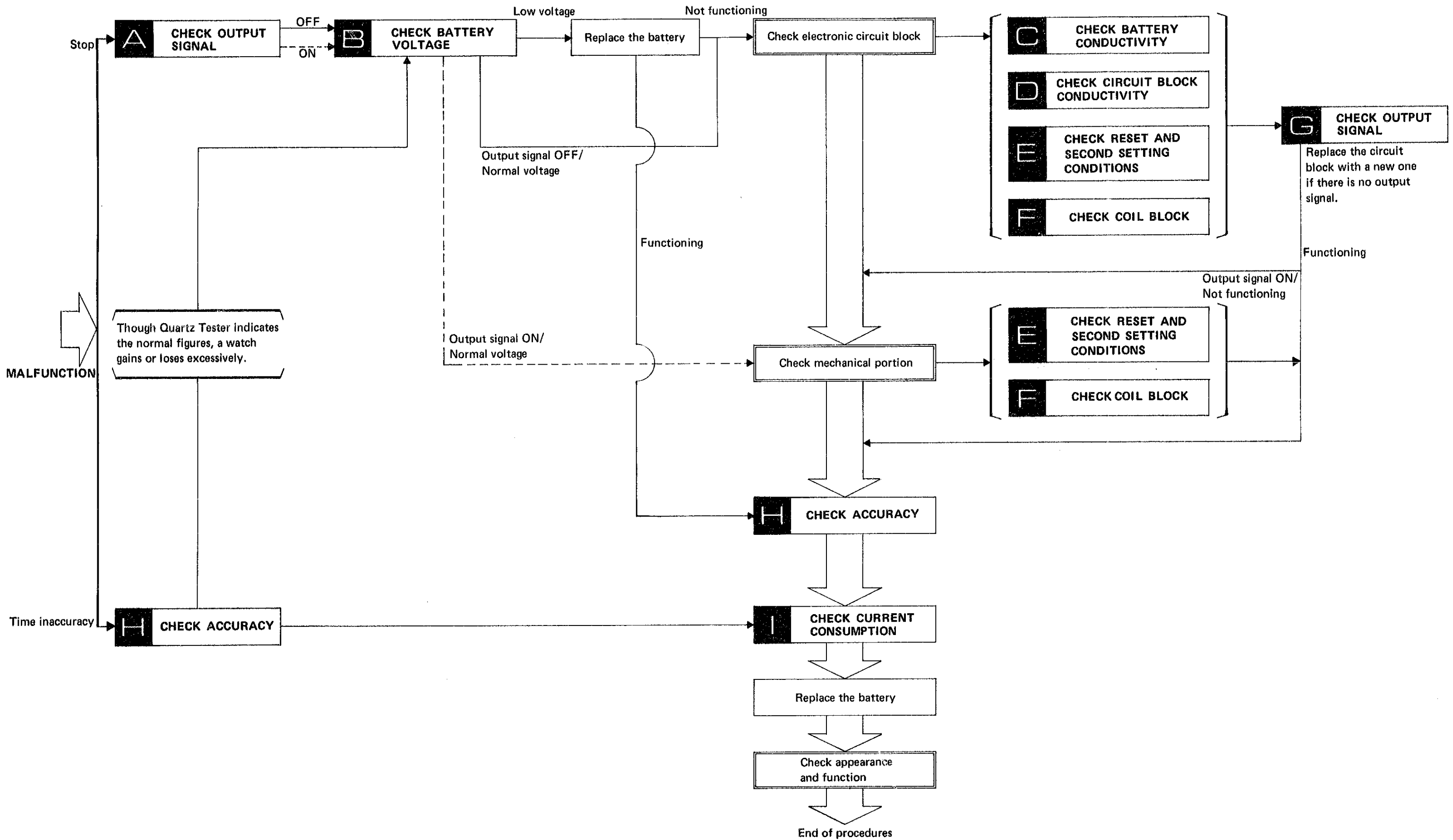
• How to pull out the stem with crown

Pull out the stem with crown while pushing the portion ㉑ of the setting lever with the crown at the normal position.

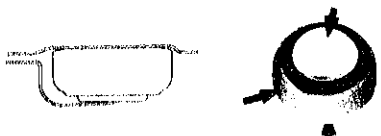




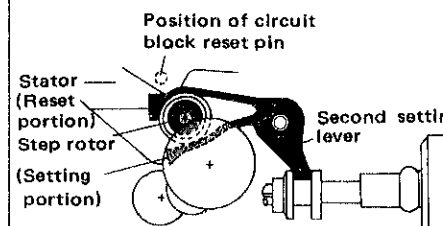
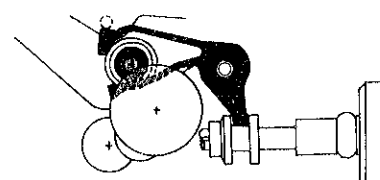
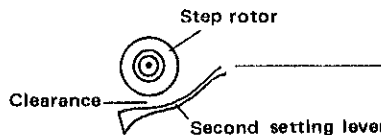
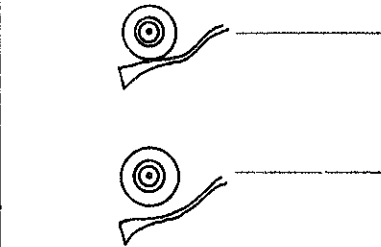
III. CHECKING AND ADJUSTMENT

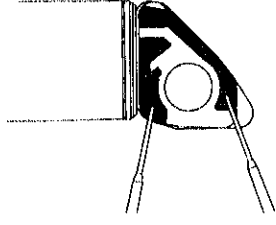
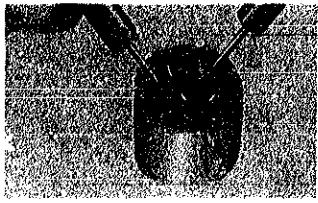
1. Guide table for checking and adjustment



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</p> <p>No ten-second blinking</p>	<p>→ Proceed to B.</p> <p>→ Proceed to C.</p>
CHECK BATTERY VOLTAGE	<p>Check battery voltage.</p>	<p>More than 1.5V</p> <p>Less than 1.5V</p>	<p>→ In procedure A if ten-second blinking is found, proceed to Check mechanical portion.</p> <p>→ In procedure A if ten-second blinking is not found, proceed to Check electronic circuit block.</p> <p>→ Proceed to Replace the battery.</p> <p>If a watch operates after battery replacement, proceed to B.</p> <p>If a watch does not operate after battery replacement, proceed to Check electronic circuit block.</p>
CHECK BATTERY CONDUCTIVITY	<p>Check battery conductivity.</p> <p>1. Make sure that the circuit block screws are tightened firmly.</p> <p>2. Check for any contamination on the connecting portion of battery, the battery connection and the plus terminal of battery connection.</p> 	<p>No loosened screws</p> <p>Loosened screws</p> <p>Uncontaminated</p> <p>Contaminated</p>	<p>→ Proceed to C 2.</p> <p>→ Retighten the screws.</p> <p>→ Proceed to D.</p> <p>→ Wipe off carefully.</p>
CHECK CIRCUIT BLOCK CONDUCTIVITY	<p>Check circuit block conductivity.</p> <p>1. Check to see if the circuit block screws (4 pcs.) are tightened firmly.</p>  <p>2. Check the circuit block for any break in the welded portion, short circuit, pattern break and contamination.</p> 	<p>No loosened screws</p> <p>Loosened screws</p> <p>No break in the welded portion, short circuit, pattern break or contamination.</p> <p>Break in the welded portion, short circuit or pattern break</p> <p>Contaminated.</p>	<p>→ Proceed to D 2.</p> <p>→ Retighten the screws.</p> <p>→ Proceed to E.</p> <p>→ Replace the circuit block.</p> <p>→ Wipe off carefully.</p>

	Procedures	Results	Adjustment and repair
CHECK RESET AND SECOND SETTING CONDITIONS	<p>Check reset and second setting conditions.</p> <p>1. 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.</p> <p>2. Check for the clearance between the tip of the second setting lever (reset portion) and the reset pin (with the circuit block removed).</p> <p>① With the crown at the normal position</p>  <p>② With the crown at the first click position</p>  <p>3. Check for the clearance between the setting portion of the second setting lever and the step rotor (with the circuit block removed).</p> <p>① With the crown at the normal position</p>  <p>② With the crown at the first click position</p> 	<p>Stops completely and starts after ten seconds</p> <p>Does not stop or moves irregularly</p> <p>Position of circuit block reset pin</p> <p>(Reset portion)</p> <p>Stator</p> <p>Second setting lever</p> <p>Stator (Reset portion)</p> <p>Step rotor (Setting portion)</p> <p>Clearance</p> <p>No clearance</p> <p>Step rotor</p> <p>Second setting lever</p>	<p>→ Proceed to F.</p> <p>→ Proceed to E 2.</p> <p>→ Proceed to F 2. ②</p> <p>→ Replace the second setting lever. 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>→ Proceed to F 3. ②</p> <p>→ 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: $0.3\mu A + 0.07\mu A = 0.37\mu A$.		