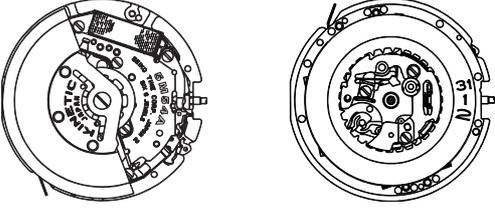


PARTS LIST/TECHNICAL GUIDE

KINETIC Cal. 5M54A

[SPECIFICATIONS]

Item	Cal. No.	5M54A
<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <ul style="list-style-type: none"> • 3 hands (Hour/Minute/Second) • Calendar Date (date dial) Day (retrograde day indicator) </div> <div style="text-align: center;"> <p>Movement</p>  <ul style="list-style-type: none"> • Deameter Outside : Ø 27.6 mm Casing : Ø 27.0 mm • Height: 4.3 mm </div> </div>		
Interval of hands movements		1 second
Driving system		Stepping motor 2 pieces
Additional function		<ul style="list-style-type: none"> • Power reserve indicator (second hand) • Energy depletion forewarning function • Overcharge prevention function • Electronic circuit reset function • Day and date correction function • Second hand stop function
Crown operation	Normal position	Free
	1st click position	Day and date setting
	2nd click position	Time setting (Hour and Minute)
Loss/Gain		Monthly rate: less than 15 seconds (worn on the wrist at temperature range between 5 and 35 °C)
Regulation system		Nil
Gate time for rate measurement		Use 10-second gate
Current consumption		Movement: less than 0.80 µA Circuit block: less than 0.20 µA
Coil resistance		Coil block: 1.70 - 2.10 KΩ Generating coil block: 280 - 380Ω
Power supply	Power generator	Automatic generating system
	Rechargeable battery	TC 920 Titanium carbon lithium rechargeable battery
	Operating voltage range	0.45V - 2.20V
	Duration of charge	From full charge to stoppage: approximately 6 months
Number of jewels		6 jewels

SEIKO WATCH CORPORATION

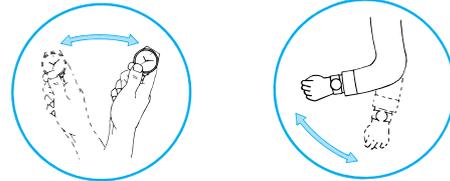
FEATURES

SEIKO KINETIC Cal. 5M54 is an analogue quartz watch equipped with the Kinetic technology developed by SEIKO. It generates the electric energy to power the watch, utilizing the movement of your body, and stores it in the rechargeable battery, which requires no periodical replacement unlike conventional button-type batteries.

HOW TO CHARGE THE WATCH

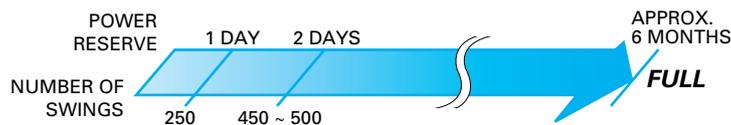
1. By swinging the watch

1. When the watch stops completely, or if you find the second hand moving at two-second intervals, swing the watch from side to side at a rate of twice a second.



2. 250 swings will reserve up to 1 day of power.

The second hand will start moving at one-second intervals.

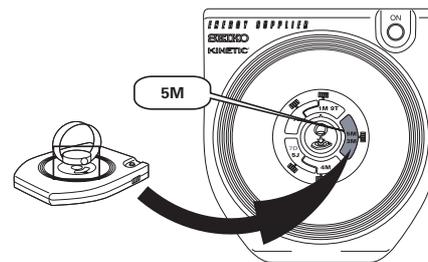


* It is recommended that the watch be swung further until 2 days of power is reserved. As a guideline of recharging, additional 200 to 250 swings, about 450 to 500 swings in total will reserve 2 days of power.

2. By using the KINETIC Energy Supplier YT02A

Set the crown to the 5M position.

- Make sure that the watch is correctly positioned as it may affect the amount of power generated.
- The amount of power generated may vary depending the models of the watch.



POWER RESERVE INDICATOR

Cal. 5M54A is equipped with a power reserve indicator. The current power reserve can be checked by reading the position of the second hand after pressing the button at the 2 o'clock position.

	5 seconds	10 seconds	20 seconds	30 seconds
QUICK MOVEMENT OF SECOND HAND				
POWER RESERVE	Between 1 and 7 days	Between 7 days and 1 month	Approx. 1 month	Approx. between 4 and 6 months

* To allow easy reading of the second hand, press the button when the second hand is at the 12 o'clock position.

* The second hand will resume normal movement after the indicated 5, 10, 20 or 30 seconds have elapsed.

PARTS LIST

Cal.5M54A

Disassembling procedures Figs. :  ① → ⑥5

Reassembling procedures Figs. :  ⑥5 → ①

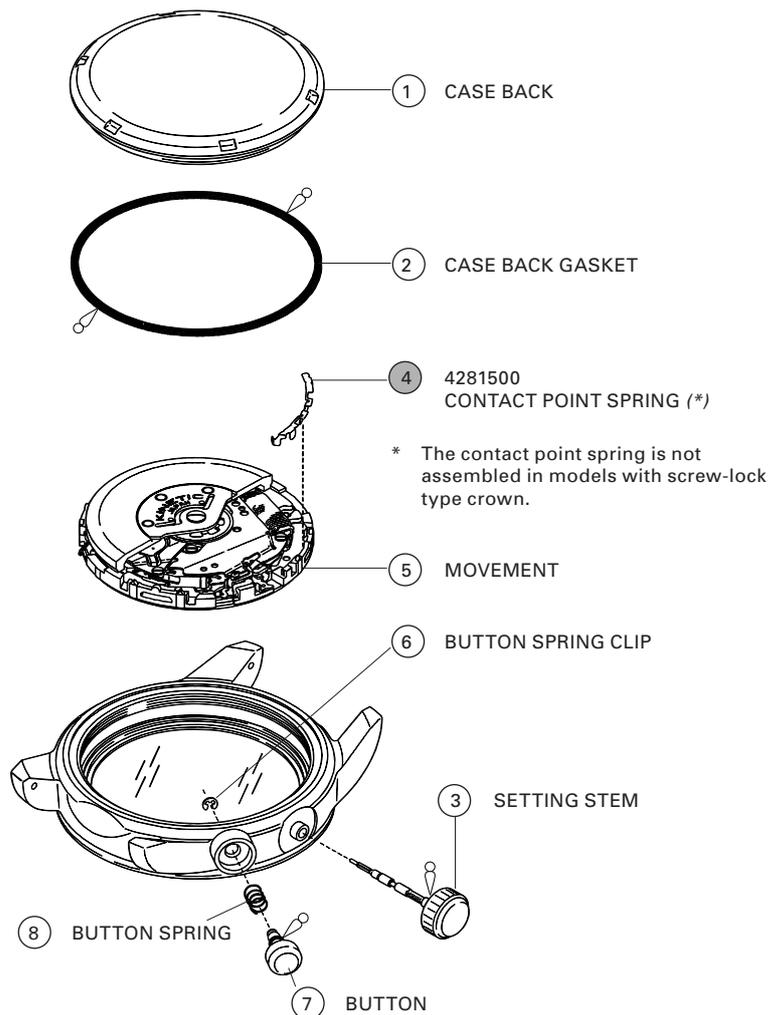
Lubricating: Types of oil

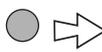
-  Watch Oil AO-3
-  Watch Oil AO-2
-  SEIKO Watch Oil S-6
-  Silicone oil 500,000 c.s.

Oil quantity

-  Normal quantity

[CASING PARTS ASSEMBLY]

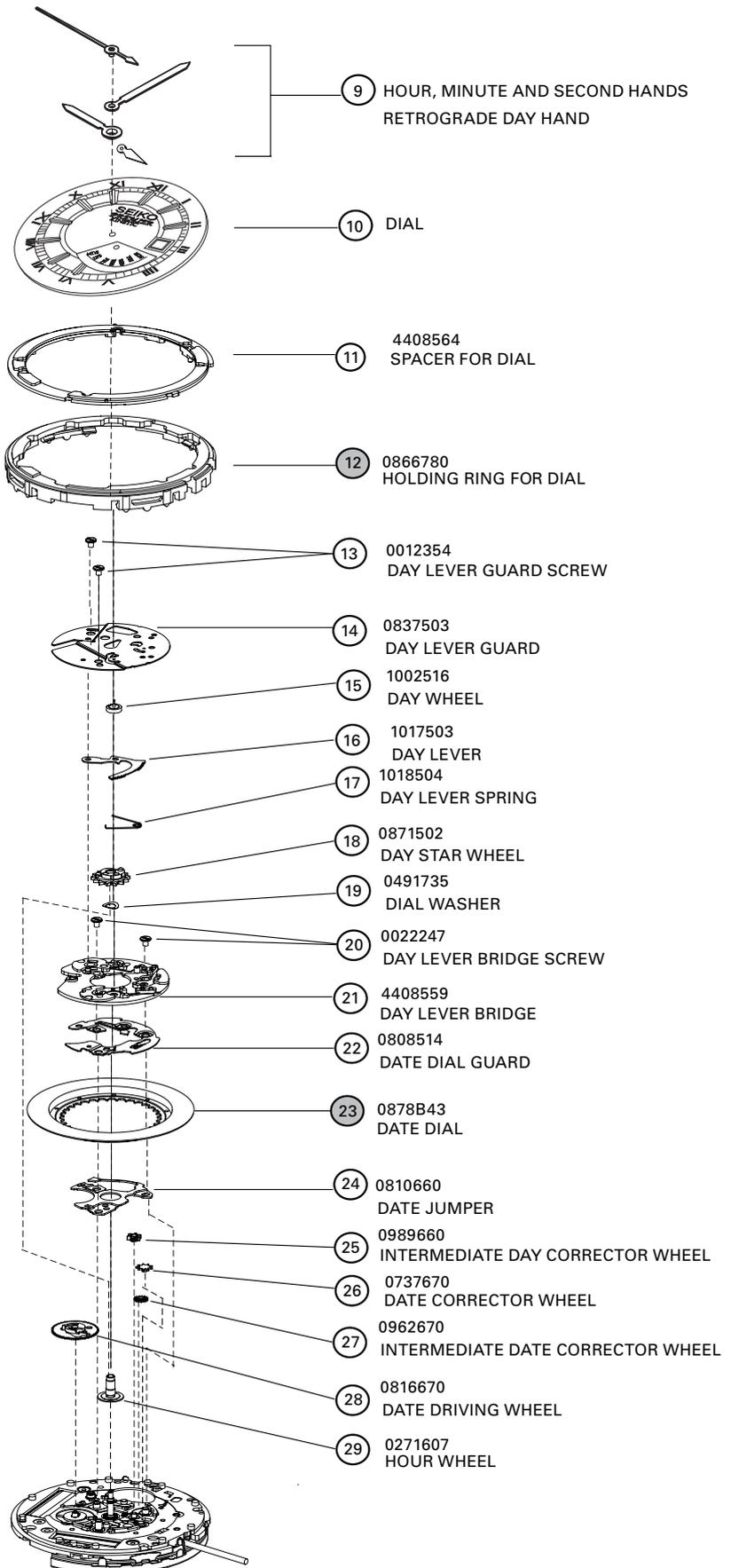


 Please see the remarks on the following pages.
Lubricating of some parts is shown in " II. REMARKS ON DISASSEMBLING AND REASSEMBLING".

PARTS LIST

Cal.5M54A

[CALENDAR MECHANISM/ DIAL AND HANDS SETTING]



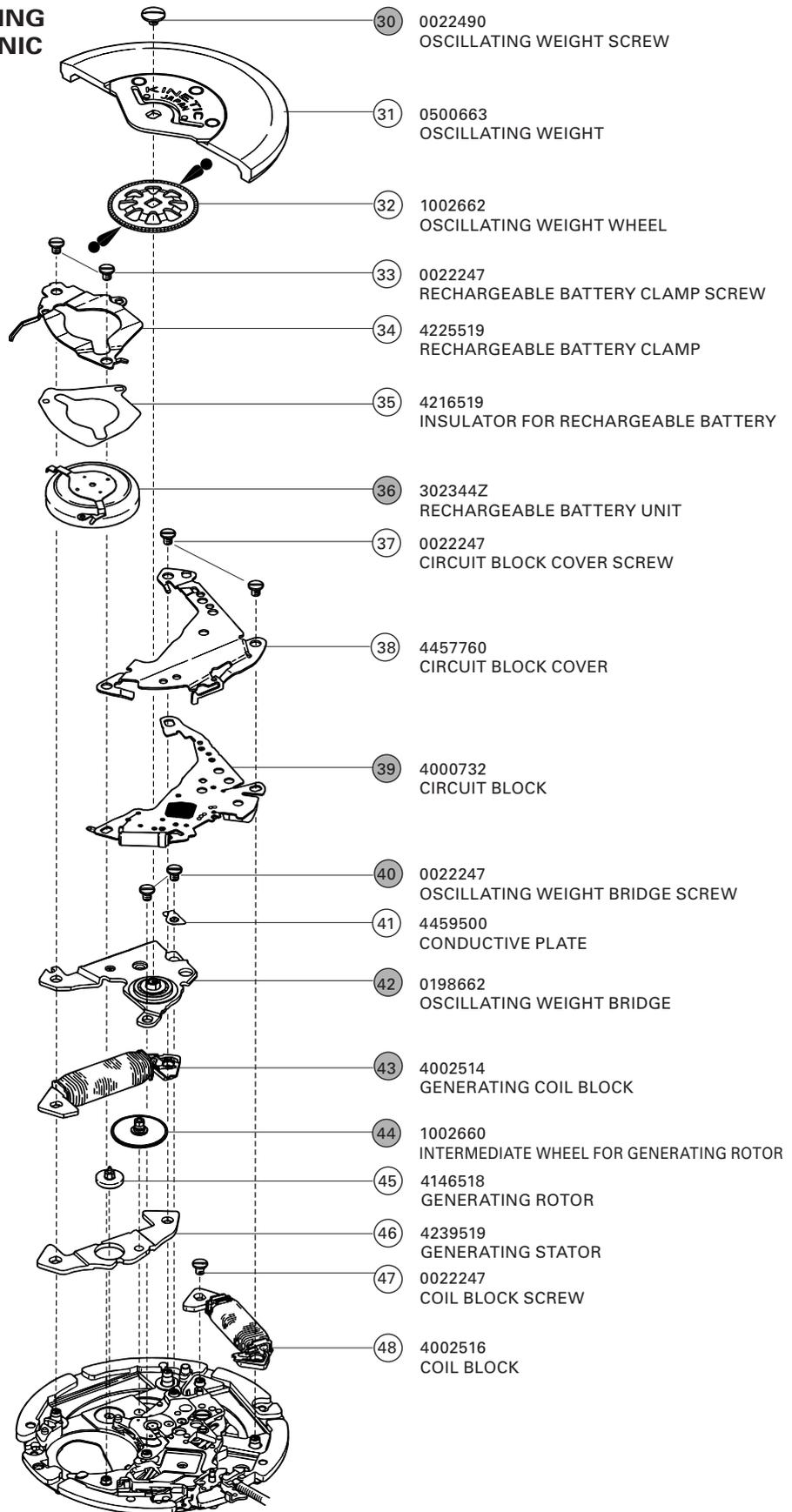
Please see the remarks on the following pages.

Lubricating of some parts is shown in " II. REMARKS ON DISASSEMBLING AND REASSEMBLING".

PARTS LIST

Cal. 5M54A

[AUTOMATIC GENERATING MECHANISM/ELECTRONIC CIRCUIT]

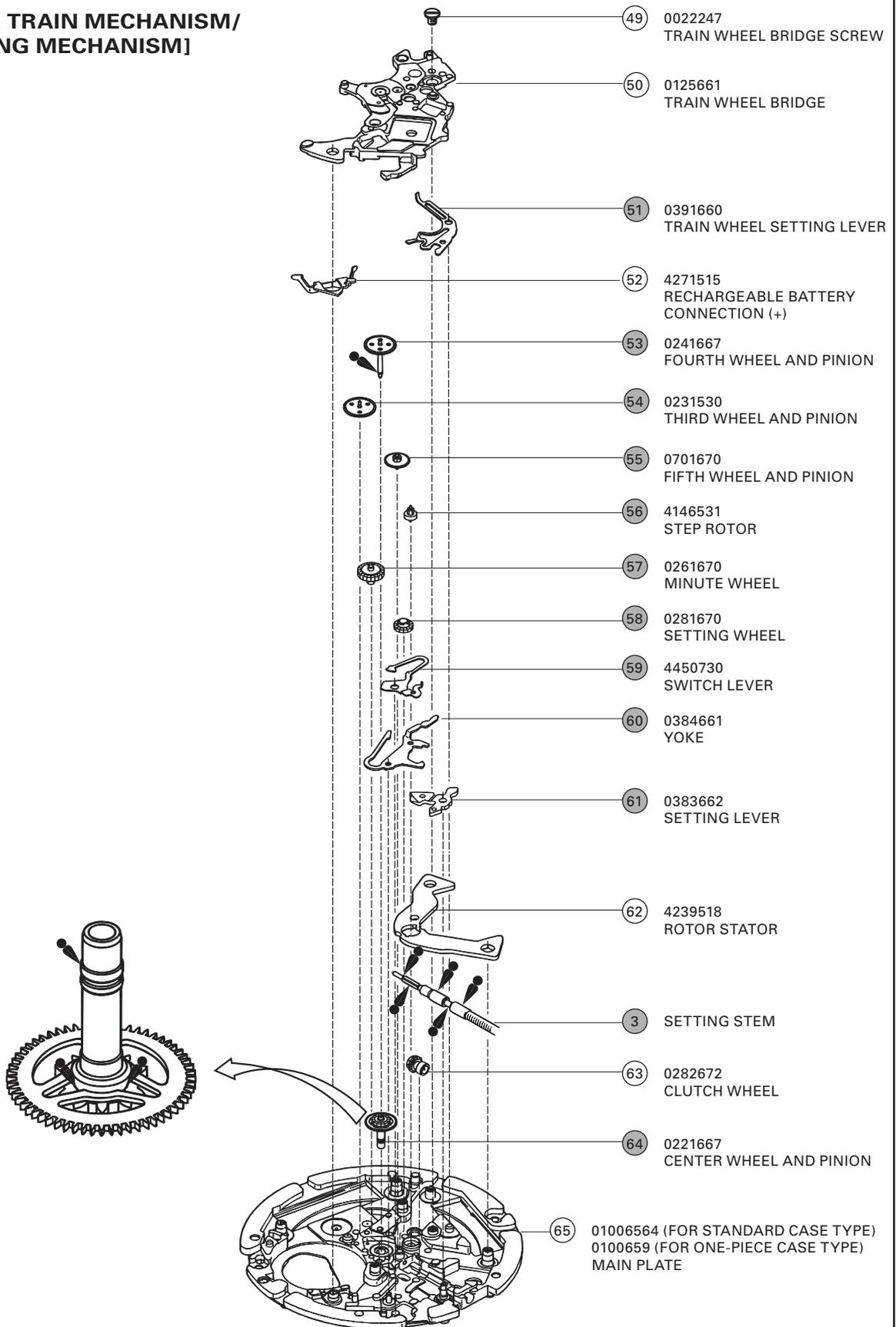


Please see the remarks on the following pages.
Lubricating of some parts is shown in " II. REMARKS ON DISASSEMBLING AND REASSEMBLING".

PARTS LIST

Cal. 5M54A

[GEAR TRAIN MECHANISM/ SETTING MECHANISM]



Please see the remarks on the following pages.

Lubricating of some parts is shown in "II. REMARKS ON DISASSEMBLING AND REASSEMBLING".

Remarks

● **How to find the correct parts, if not determined by 4 digit caliber number**

Following parts are determined based on the design of watches, such as hands height, dial color, and design of cases. Please refer to the SEIKO WATCH PARTS CATALOGUE in order to choose corresponding parts.

- ④ CONTACT POINT SPRING 4281500

The contact point spring is not assembled in models with screw-lock type crown.

- ⑫ HOLDING RING FOR DIAL 0866780

- ⑳ DATE DIAL

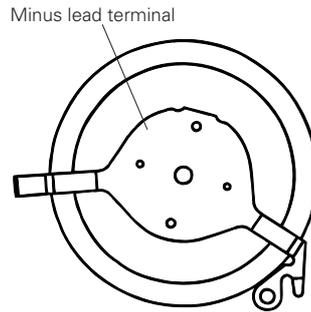
Part code	Position of crown	Position of calendar frame	Color of figure	Color of background
0878 B42	3 o'clock	3 o'clock	White	Black
0878 B43	3 o'clock	3 o'clock	Black	White
0878 B25	3 o'clock	6 o'clock	White	Black
0878 B26	3 o'clock	6 o'clock	Black	White

- ③ SETTING STEM 0351653

● **How to discriminate resembled parts**

③⑥ RECHARGEABLE BATTERY UNIT

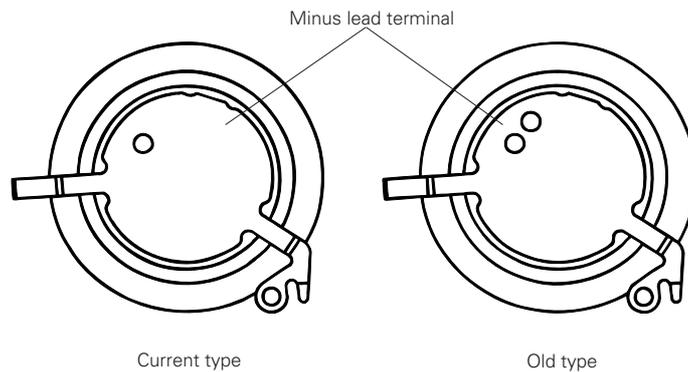
Though the RECHARGEABLE BATTERY UNIT for Cal. 5M54 and 5M6 Series is of a completely different type from the CAPACITOR UNIT for Cal. 5M4 Series, they have a close resemblance in shape. They can be discriminated by the shapes of their minus lead terminals as illustrated below. When repairing the RECHARGEABLE BATTERY UNIT, check the shape of its minus lead terminal to make sure you are using a RECHARGEABLE BATTERY UNIT properly.



[RECHARGEABLE BATTERY UNIT for Cal. 5M54 and 5M6 Series]

Part code: 302344Z

Marking on the battery: maxell TC920



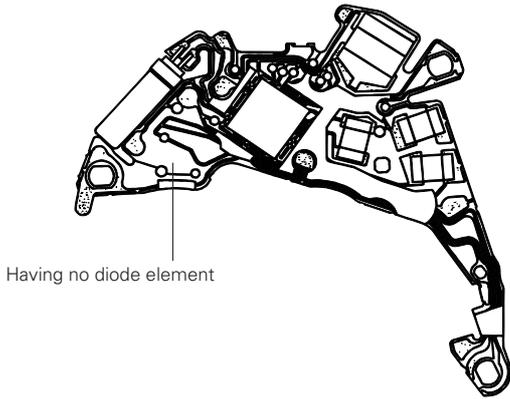
[CAPACITOR UNIT for Cal. 5M4 Series]

Part code: 3029113

Marking on the capacitor: SII SL920

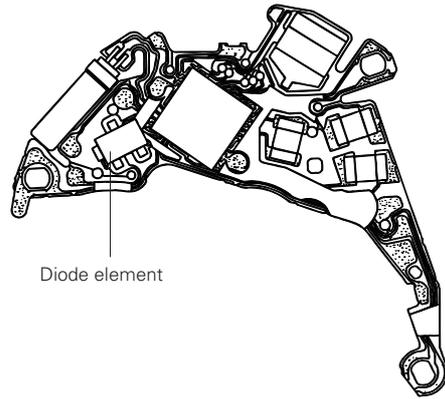
③⑨ CIRCUIT BLOCK 4000732

The CIRCUIT BLOCK for Cal. 5M54 and 5M6 Series and that for Cal. 5M4 Series have a close resemblance in shape. They can be discriminated in the point that the CIRCUIT BLOCK for Cal. 5M54 and 5M6 Series has no diode element unlike that for Cal. 5M4 Series. When repairing the CIRCUIT BLOCK, check that it has no diode element to make sure you are using the proper one.



Having no diode element

[CIRCUIT BLOCK for Cal. 5M54 and 5M6 Series]

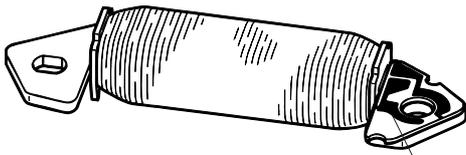


Diode element

[CIRCUIT BLOCK for Cal. 5M4 Series]

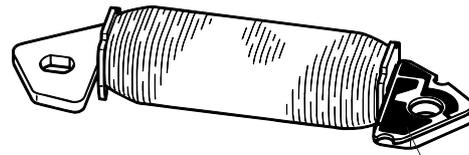
④③ GENERATING COIL BLOCK 4002514

The GENERATING COIL BLOCK for Cal. 5M54 and 5M6 Series and that for Cal. 5M4 Series have a close resemblance in shape. They can be discriminated by the size of the pattern on the lead terminal. If the GENERATING COIL BLOCK for Cal. 5M4 Series is assembled by mistake, no electricity will be generated. When repairing the GENERATING COIL BLOCK, check the size of the pattern on the lead terminal to make sure you are using the proper one.



Smaller pattern

[GENERATING COIL BLOCK for Cal. 5M54 and 5M6 Series]



Larger pattern

[GENERATING COIL BLOCK for Cal. 5M4 Series]

	<p>0022247</p> <ul style="list-style-type: none"> • DAY LEVER BRIDGE SCREW (3 PCS.) • RECHARGEABLE BATTERY CLAMP SCREW (2 PCS.) • CIRCUIT BLOCK COVER SCREW (2 PCS.) • OSCILLATING WEIGHT BRIDGE SCREW (2 PCS.) • COIL BLOCK SCREW (1 PC.) • TRAIN WHEEL BRIDGE SCREW (1 PC.)
	<p>0022490</p> <ul style="list-style-type: none"> • OSCILLATING WEIGHT SCREW (1 PC.)

- **Tools and consumables required for disassembling/reassembling**

- **Movement holder**

Universal movement holder (S-682)



- **Watch oils**

SEIKO watch grease (S-6) and watch oils (AO-3 and AO-2)

S-6



AO-3



AO-2

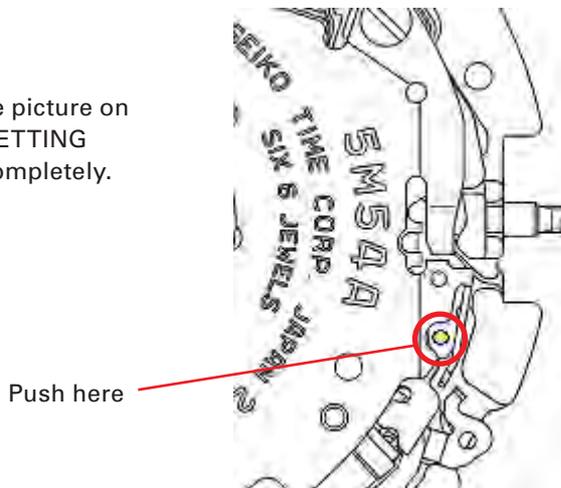


REMARKS ON DISSASSEMBLING AND REASSEMBLING THE MOVEMENT

● How to remove the SETTING STEM before dismantling the movement

Crown position: 1st click position

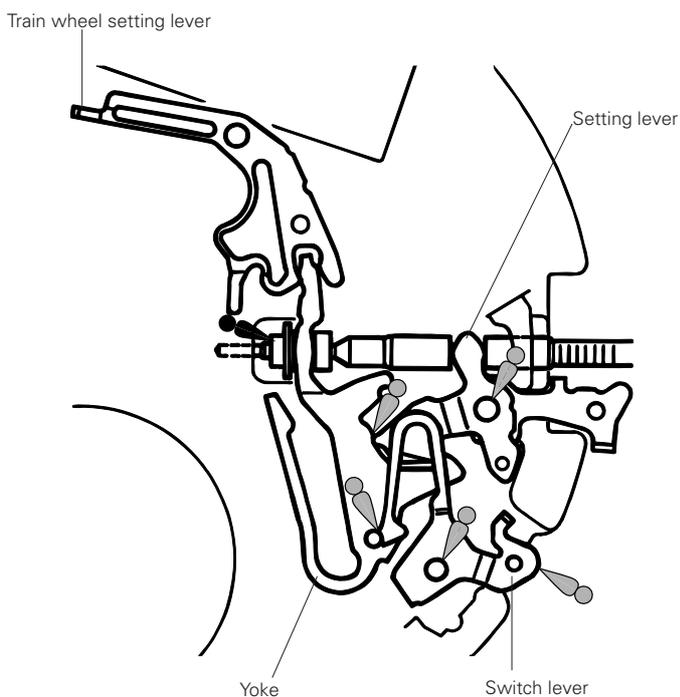
Push the SETTING LEVER gently (refer to the picture on the right) in order to disengage it from the SETTING STEM. Then pull out the crown with stem completely.



● SETTING MECHANISM

- ⑤1 TRAIN WHEEL SETTING LEVER
- ⑤9 SWITCH LEVER
- ⑥0 YOKE
- ⑥1 SETTING LEVER

- **Setting position and lubricating**
Refer to the illustration at right.

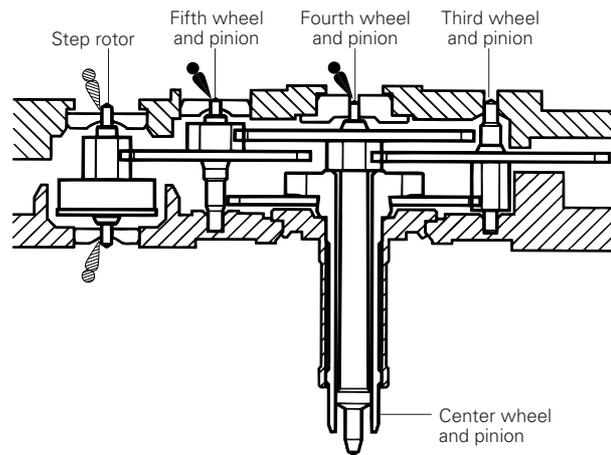
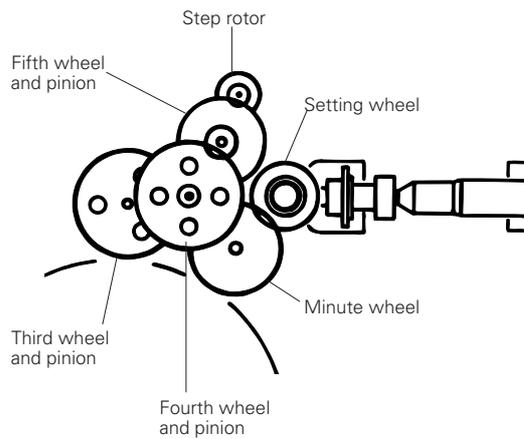


● **Gear train mechanism - train wheels, setting position and lubricating**

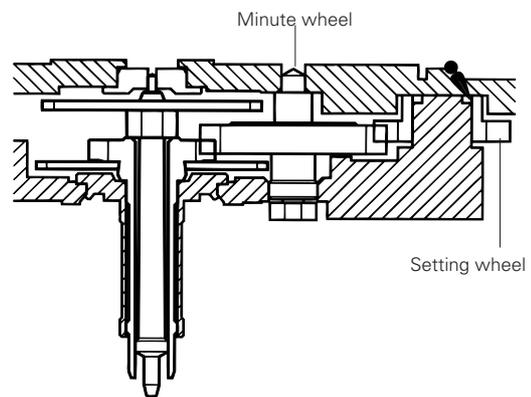
- ⑤3 FOURTH WHEEL AND PINION
- ⑤4 THIRD WHEEL AND PINION
- ⑤5 FIFTH WHEEL AND PINION
- ⑤6 STEP ROTOR
- ⑤7 MINUTE WHEEL
- ⑤8 SETTING WHEEL
- ⑥4 CENTER WHEEL AND PINION

• **Setting position and lubricating**

Refer to the illustrations below for the setting position and lubrication of the respective wheels.



Note: Be sure to observe the position, type of oil and quantity of lubrication specified in the illustration.



● Automatic generating mechanism

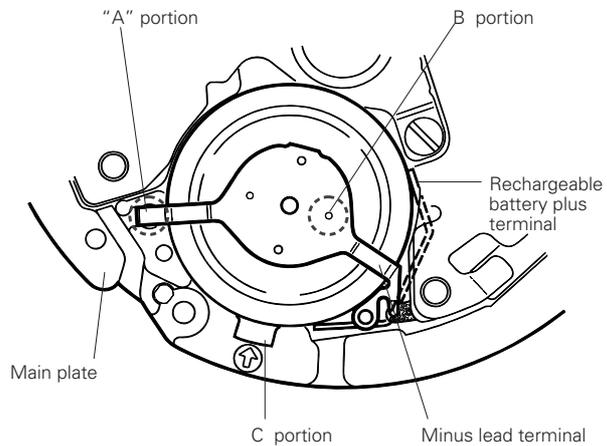
• How to remove

Insert the tip of tweezers into the "C" portion gap in the illustration at right, and pry up the RECHARGEABLE BATTERY UNIT to remove it.

• How to install

Set the "A" portion of the minus lead terminal to the hole of the MAIN PLATE, and push the "B" portion down vertically so that the RECHARGEABLE BATTERY UNIT is well seated in position.

Note: Take utmost care not to short-circuit the (+) and (-) terminals, as this will deteriorate the battery unit.



• Lubricating

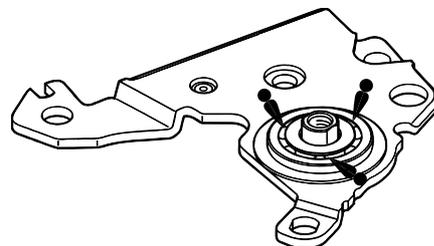
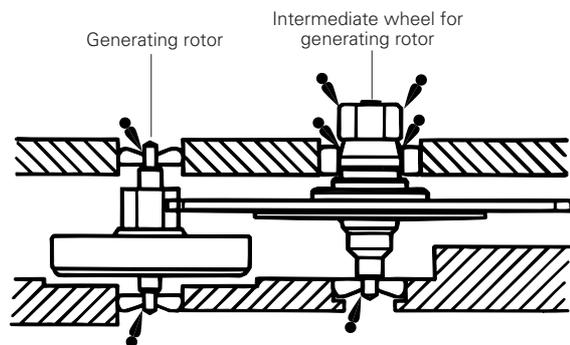
④① OSCILLATING WEIGHT BRIDGE SCREW

④② OSCILLATING WEIGHT BRIDGE

Before tightening the OSCILLATING WEIGHT bridge screw, check that the upper pivot of the GENERATING ROTOR is inserted properly into the pivot jewel.

Be sure to lubricate the upper and lower pivots of GENERATING ROTOR and INTERMEDIATE WHEEL FOR GENERATING ROTOR with the proper oil in the quantity specified in the illustration.

Lubricate the ball-bearing of the OSCILLATING WEIGHT BRIDGE as shown in the illustration at right.

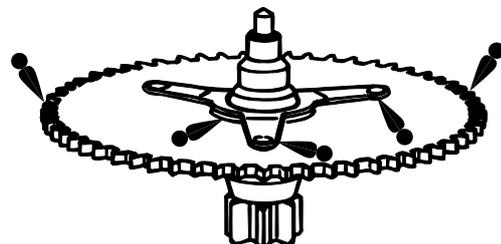


④④ INTERMEDIATE WHEEL FOR GENERATING ROTOR

• Lubricating

Refer to the illustration at right.

Note: Be sure to observe the position, type of oil and quantity of the lubrication specified in the illustration.

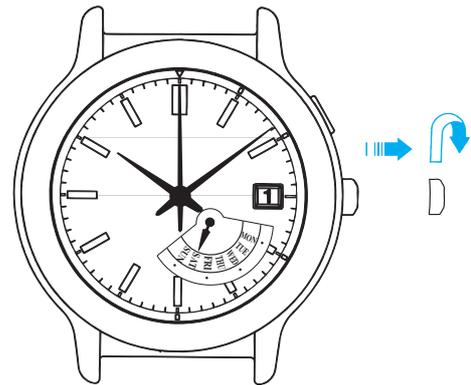


REMARKS ON DE-CASING/CASING/DIAL AND HAND SETTING

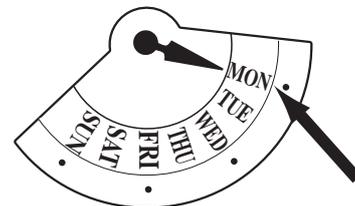
● How to set the retrograde day hand at the first day position

Make sure the DAY LEVER and the DAY STAR WHEEL are at the 1st day position by listening the sound when changing the day.

1. Turn the crown clockwise at the first click position until you hear the unique sound when changing from 7th day to 1st day.



2. Install the hand pointing to the 1st day (MON) position.



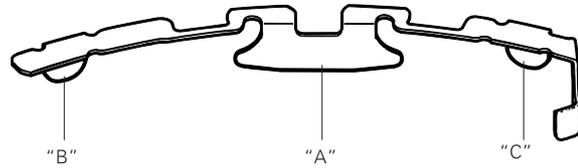
3. Make sure the day changes correctly and smoothly by turning the crown at the first click position.



● **How to remove/install the contact point spring**

④ CONTACT POINT SPRING

The CONTACT POINT SPRING has three hooking portions bent downward. It is fixed by inserting the hooking portion "A" into a gap between the MAIN PLATE and HOLDING RING FOR DIAL and inserting "B" and "C" into a gap between the HOLDING RING FOR DIAL and CASE.



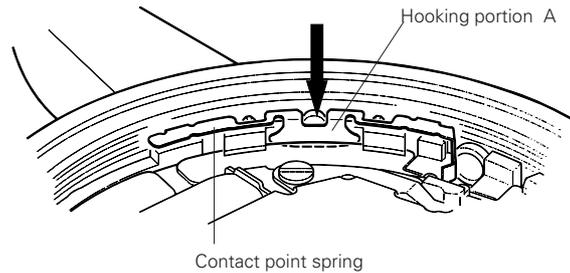
*** Before disassembling or assembling the CONTACT POINT SPRING, be sure to remove the SETTING STEM.**

• **How to remove**

Insert the tip of tweezers into the gaps between the hooking portions "A", "B" and "C" of the CONTACT POINT SPRING and HOLDING RING FOR DIAL, and pry up the CONTACT POINT SPRING slowly to remove it.

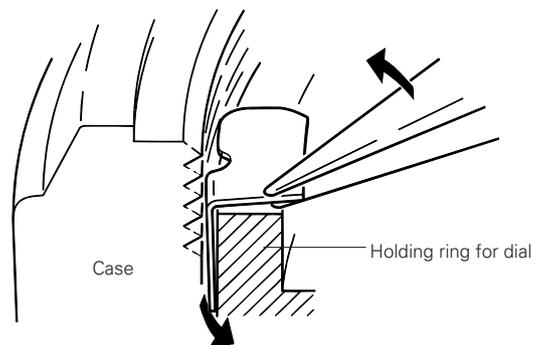
• **How to install**

1) Push the hooking portion "A" in the direction of the arrow in the illustration at right to insert it into a gap between the MAIN PLATE and HOLDING RING FOR DIAL.



2) Insert the hooking portions "B" and "C" into a gap between the HOLDING RING FOR DIAL and CASE.

In doing so, the installation will be made more easily by pushing down the CONTACT POINT SPRING while slightly lifting it up so that the tips of the hooking portions "B" and "C" are tilted toward the HOLDING RING FOR DIAL.



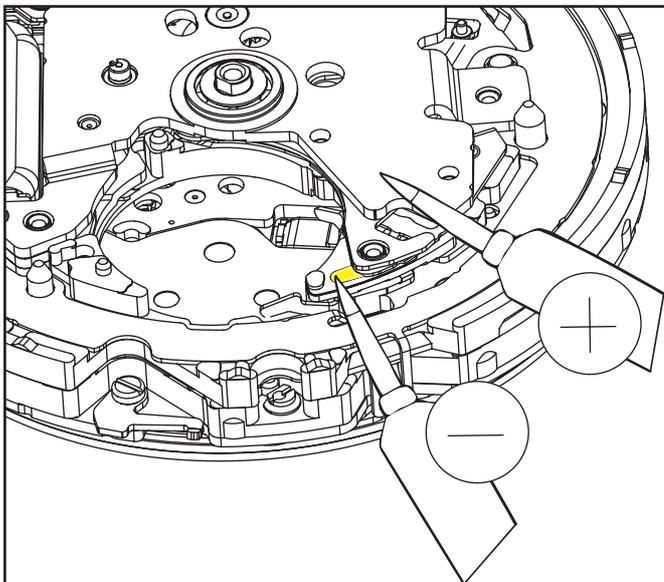
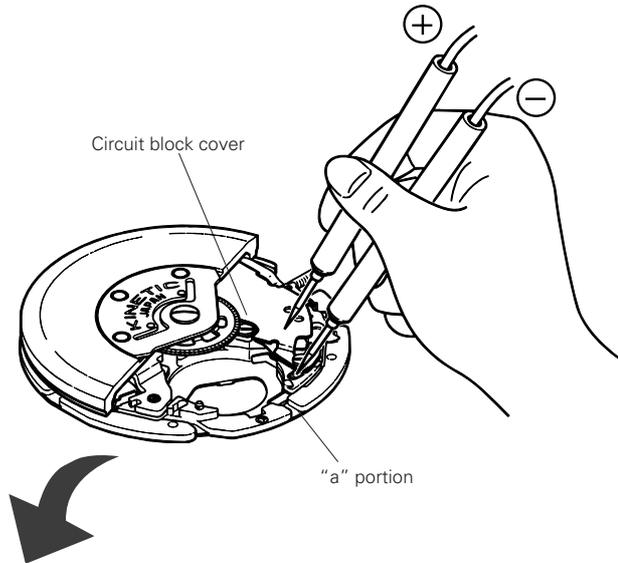
Note: When removing or installing the CONTACT POINT SPRING, take utmost care not to deform its shape.

REMARKS ON INSPECTION AND MEASUREMENT

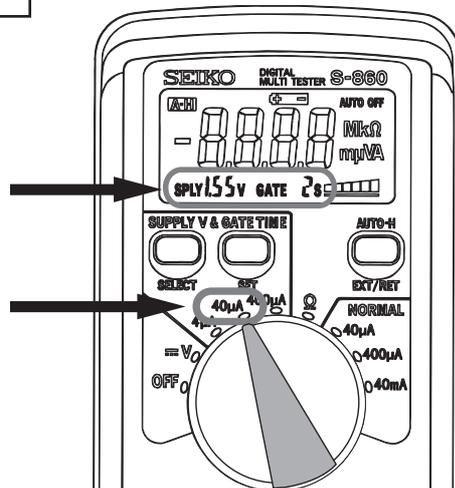
● Value checking

How to measure the current consumption for the whole movement

1. Remove the RECHARGEABLE BATTERY UNIT (36), an INSULATOR (35) and the BATTERY CLAMP WITH SCREWS (33) and (34), then reassemble the OSCILLATING WEIGHT WHEEL (32) and OSCILLATING WEIGHT (31) and tighten the SCREW (30) temporary in order to make the movement ready for measurement.
2. Connect the (-) probe of the tester to the input terminal (-) of the CIRCUIT BLOCK and (+) probe to the other metal part of the movement, such as CIRCUIT BLOCK COVER.

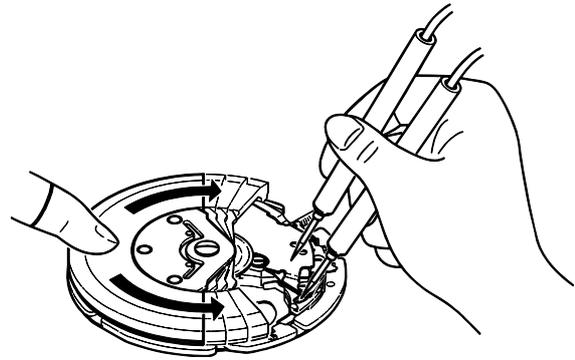


* When measuring the current consumption using the SEIKO digital multi-tester (S-860), use the range of **40 μ A** of **SUPPLY V (= 1.55 V)** & **GATE TIME (2 S)**



3. Swing the OSCILLATING WEIGHT as the illustration for more than three seconds so that the movement detects the electricity generation and it turns to the normal hand movement mode.

Note: When swinging the OSCILLATING WEIGHT, take care so as not to touch the probes of the tester.

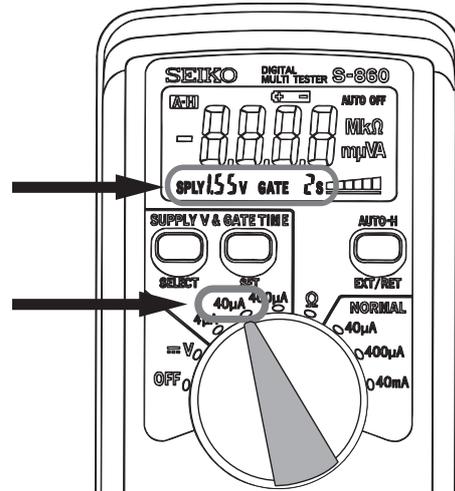


4. Wait for more than 10 seconds until a stable measurement is obtained, and then read the measurement.
5. Make sure the read value is less than **0.80 μA** .

How to measure the current consumption for the CIRCUIT BLOCK alone

1. To measure the current consumption for the CIRCUIT BLOCK alone, connect each probe to the appropriate positive (+) or negative (-) input terminal of the CIRCUIT BLOCK (please refer to "Structure of the circuit block" below).

* When measuring the current consumption using the SEIKO digital multi-tester (S-860), use the range of **40 μ A** of **SUPPLY V (= 1.55 V)** & **GATE TIME (2 S)**

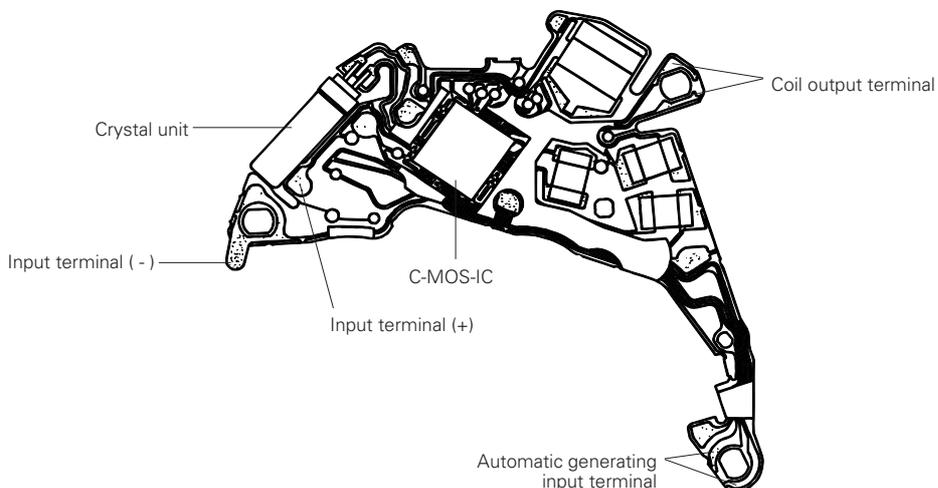


2. In order to turn the mode of the C-MOS-IC into the normal hand movement mode, short-circuit it by touching "A" portion and the input terminal (-) with tweezers for more than three seconds.

* When measuring the current consumption for the CIRCUIT BLOCK alone, be careful not to damage or deform the pattern of the CIRCUIT BLOCK.

3. Read the measurement when a stable measurement is obtained.
4. Make sure the read value is less than **0.20 μ A**.

[Structure of the CIRCUIT BLOCK]



● Value checking

• Coil resistance (coil blocks)

Check the resistance of each COIL BLOCK if they are within the range in the following table.

COIL BLOCK	4002516	1.7 K Ω - 2.1 K Ω
GENERATING COIL BLOCK	4002514	280 Ω - 380 Ω

● Function check

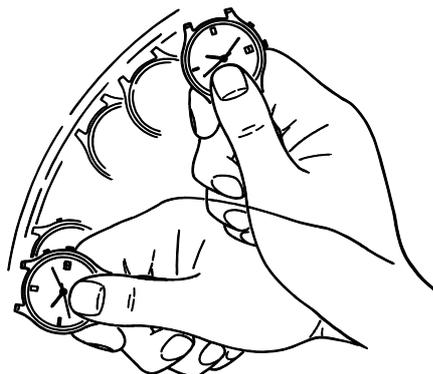
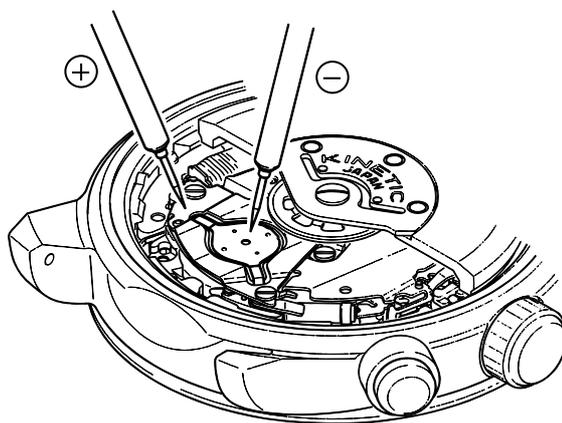
• Checking the automatic generating system

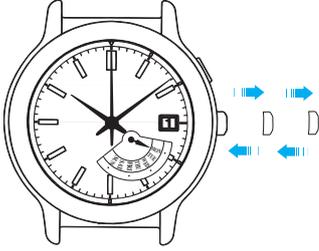
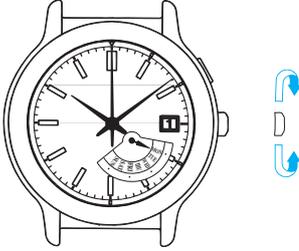
1. Apply the probes of the tester as shown in the illustration, and measure the voltage of the RECHARGEABLE BATTERY. The obtained voltage is called the "initial voltage".

Notes:

- * When applying the minus probe of the tester to the RECHARGEABLE BATTERY, take care not to short-circuit the lead terminal (-) and the RECHARGEABLE BATTERY CLAMP.
- * If a short-circuit has occurred, leave the watch untouched for more than 10 minutes, and measure the voltage again, checking that a stable measurement is obtained.

2. Close the case back tentatively, and swing the watch from side to side 200 times at a rate of 2 to 3 swings a second, making an arc of approximately 20 cm.



Operation	Function	Checkpoint
 <p data-bbox="643 383 847 633">Pull out the crown to the 2nd click and push it back in to the normal position. Repeat the same several times.</p>	<p data-bbox="871 450 1114 566">Setting mechanism - switching the function of the time setting</p>	<p data-bbox="1137 432 1385 584">Make sure that it has a click at each position and the stem is not pulled off.</p>
 <p data-bbox="643 768 847 857">Pull out the crown to the 1st click, then turn it.</p>	<p data-bbox="871 808 1098 960">Calendar mechanism - correcting the date (and day), if available</p>	<p data-bbox="1137 835 1361 925">Make sure that the date (and day) changes smoothly.</p>
 <p data-bbox="643 1144 847 1261">Pull out the crown to the 2nd click*, then turn it.</p>	<p data-bbox="871 1081 1086 1171">Second hand stop function (if available)</p>	<p data-bbox="1137 1081 1361 1171">Make sure that the second hand stops when the crown is</p>
	<p data-bbox="871 1193 1114 1249">Setting mechanism - hour and minute</p>	<p data-bbox="1137 1182 1385 1429">Make sure that the hour and minute hands move smoothly (without touching each other or touching the surface of the dial or inside of the glass).</p>
	<p data-bbox="871 1328 1086 1361">Hands installation</p>	
	<p data-bbox="871 1496 1086 1585">Calendar mechanism - date change</p>	<p data-bbox="1137 1462 1385 1619">Make sure that the date changes when the hour and minute hands pass around midnight.</p>

- If the watch does not have calendar mechanism, check the same with the crown at the 1st click position.

● **Water resistance test**

Check the water resistance according to the designated specification of the watch.

Marking on the case back	Test method	Applied pressure
WATER RESISTANT (WATER RESIST)	Air overpressure test	3 BAR
WATER RESIST 5BAR	Water overpressure test and condensation test	5 BAR
WATER RESIST 10BAR		10 BAR
WATER RESIST 15BAR		15 BAR
WATER RESIST 20BAR		20 BAR
SCUBA DIVER'S (AIR DIVER'S) 150 m	Water-tightness and water overpressure test and condensation tests before/ after water overpressure test	18.75 BAR = 150 (m) times 0.125
SCUBA DIVER'S (AIR DIVER'S) 200 m		25 BAR = 200 (m) times 0.125
He-GAS DIVER'S 300 m		37.5 BAR = 300 (m) times 0.125
He-GAS DIVER'S 600 m		75 BAR = 600 (m) times 0.125
He-GAS DIVER'S 1000 m		125 BAR = 1000 (m) times 0.125

● **Accuracy test**

Measure the rate and make sure the value shows within ± 0.50 s/d.

Use 10 seconds gate of the tester.

TROUBLESHOOTING

Problems	Possible causes	Methods of repair and checking
The OSCILLATING WEIGHT rotates at an abnormally high rate, and no charging is made.	<ol style="list-style-type: none"> 1) The COIL of the GENERATING COIL BLOCK is broken. 2) The pivot of the GENERATING ROTOR is broken. (The pinion of the GENERATING ROTOR and the gear of the INTERMEDIATE WHEEL FOR GENERATING ROTOR are out of mesh.) 	<ol style="list-style-type: none"> 1) Check the resistance of the GENERATING COIL BLOCK. Replace the GENERATING COIL BLOCK if the COIL is broken. 2) Remove the broken piece of the GENERATING ROTOR, and replace and lubricate the GENERATING ROTOR. (Overhaul and clean if necessary.)
The OSCILLATING WEIGHT will not rotate.	<ol style="list-style-type: none"> 1) The gear of the OSCILLATING WEIGHT and the pinion of the INTERMEDIATE WHEEL FOR GENERATING ROTOR are out of mesh. 2) The pivot of the GENERATING ROTOR is broken. (The pinion of the GENERATING ROTOR and the gear of the INTERMEDIATE WHEEL FOR GENERATING ROTOR engage with each other.) 	<ol style="list-style-type: none"> 1) If the gear of the OSCILLATING WEIGHT and the pinion of the INTERMEDIATE WHEEL FOR GENERATING ROTOR are intact, reassemble them to the movement. 2) Remove the broken piece of the GENERATING ROTOR, and replace and lubricate the GENERATING ROTOR. (Overhaul and clean if necessary.)
The current consumption for the whole of the movement exceeds the standard value.	<ol style="list-style-type: none"> 1) When the measurement is made, the IC is still in the quick start mode. (When the current consumption measures about 200μA, it is likely that the IC is in the quick start mode.) 2) The load applied on the gear train, etc. has increased, and the driving pulse to compensate it has been generated. 	<ol style="list-style-type: none"> 1) After connecting the tester, move the OSCILLATING WEIGHT more quickly for a longer period of time, and then, make the measurement again. 2) If the current consumption for the CIRCUIT BLOCK alone is within the standard value range, overhaul and clean the movement parts, and then, make the measurement again.
The current consumption for the CIRCUIT BLOCK alone exceeds the standard value.	<ol style="list-style-type: none"> 1) The light from outside the movement is affecting the measurement. 2) When the measurement is made, the IC is still in the quick start mode. (When the current consumption measures about 200μA, it is likely that the IC is in the quick start mode.) 3) The IC is out of order. 	<ol style="list-style-type: none"> 1) Shut out the light, and make the measurement again. 2) Switch the IC to the normal mode, and make the measurement again. 3) Replace the CIRCUIT BLOCK.