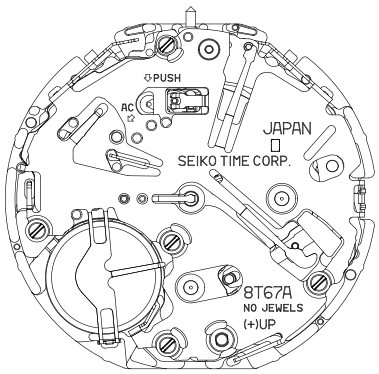
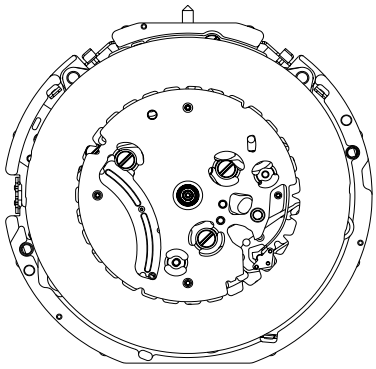
PARTS CATALOGUE / TECHNICAL GUIDE

Cal.8T67A

Item \ Cal. No.		8T67A





・3 Hands: Hour, Minute, and 1/5 second chronograph hand
・Small Second : Small second hand(6H), Minute chronograph hand (12H), Hour chronograph hand(9H)

Movement Size
・Outside diameter: 30.8 mm
・Casing diameter 29.0 mm
・Height: 5.1 mm

Driving system		Step motor 2 pieces
Additional function		・Stopwatch function up to 12 hours in 1/5 second ・Date display with quick correction. ・Energy depletion forwarding function (The second hand moves at two-second intervals.)
Crown operation	Normal position	Free
	1st click position	Date setting (clockwise)
	2nd click position	Time setting, Resetting the circuit
Loss/Gain (Monthly rate)		Less than 15 seconds at normal temperature range
Frequency of crystal oscillator		32,768 Hz
Operational temperature range		-5℃ ~ +50℃
Regulation system		Nil
Gate time for rate measurement		Use 10-second gate
Current consumption		・Movement: Less than 2.7μA ・Circuit block: Less than 0.7μA
Coil resistance		・4002054（Coil block A): 1.45 - 1.65KΩ for chronograph ・4002055（Coil block B): 1.65 - 1.85KΩ for time display
Power supply	Battery No.	SR936SW (Silver oxide battery)
	Battery voltage	1.55V
	Battery life	Approximately 3 years
Jewels		0 jewel

Disassembling procedures Figs. ① → 62

Reassembling procedures Figs. 62 → ①

Type of oil

AO-3(Moebius A)

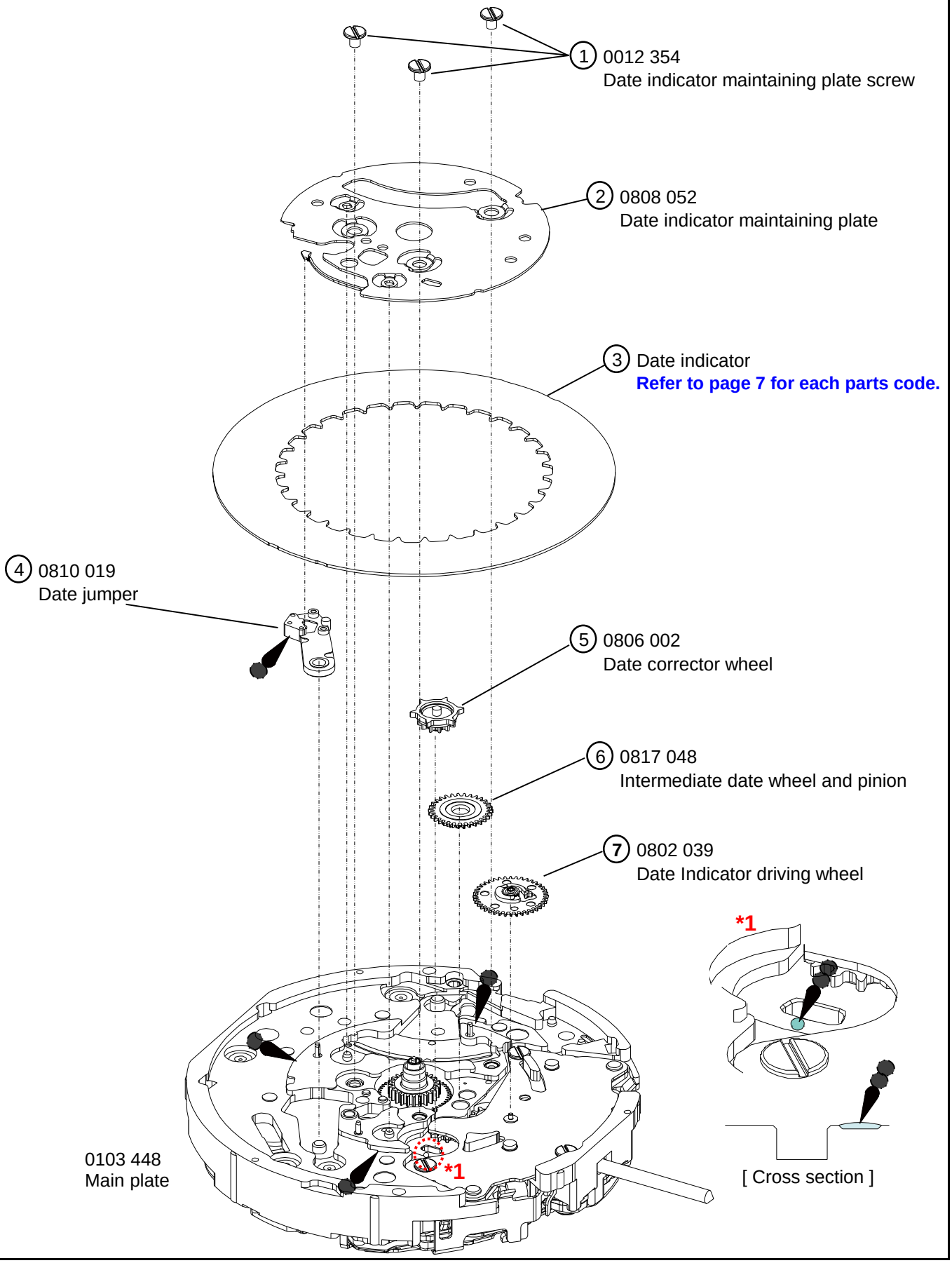
AO-2(Moebius F)

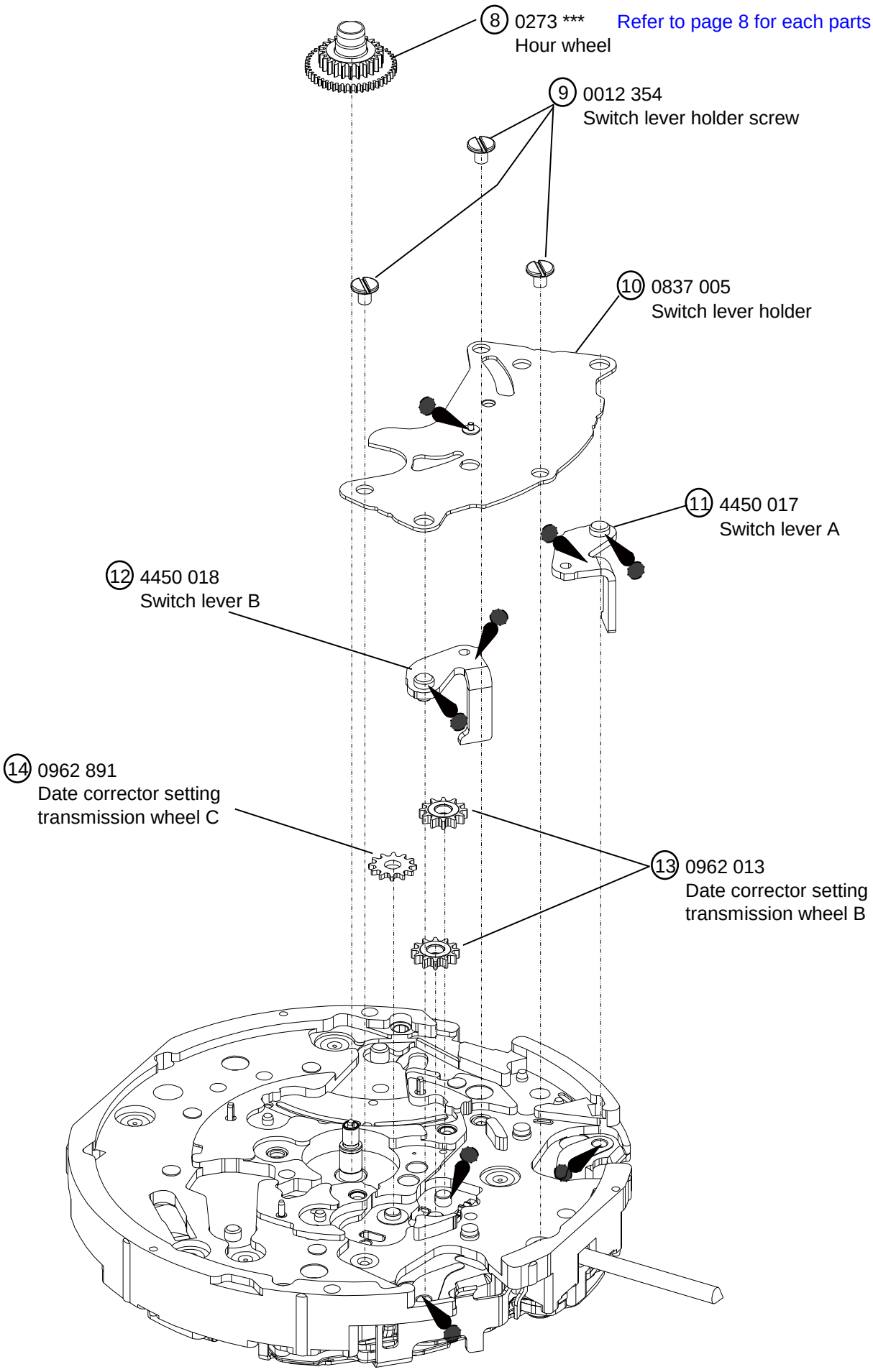
S-6

Oil quantity mark

NORMAL QUANTITY

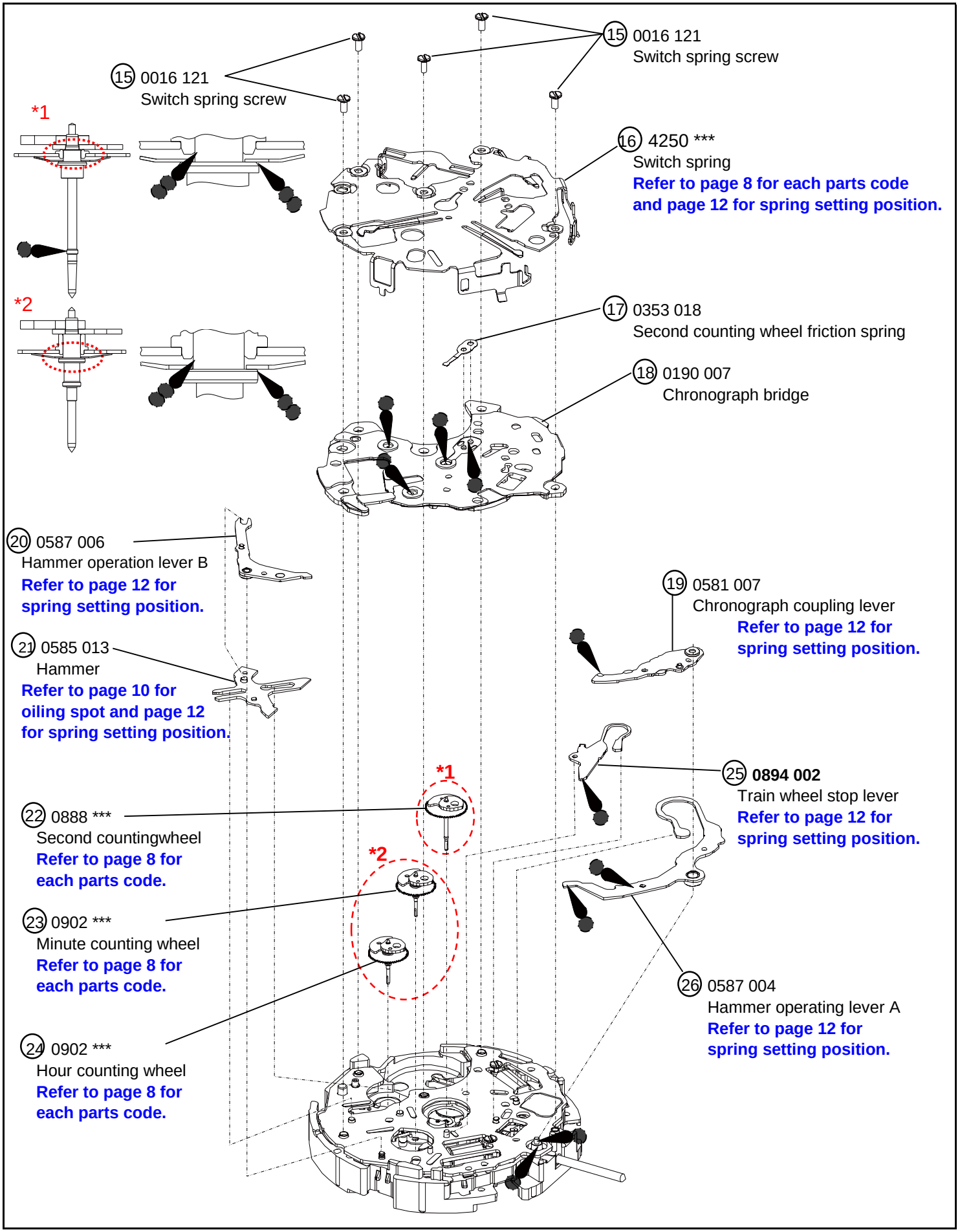
SUFFICIENT QUANTITY




8 0273 ***
Hour wheel
Refer to page 8 for each parts code.
9 0012 354
Switch lever holder screw
10 0837 005
Switch lever holder
11 4450 017
Switch lever A
12 4450 018
Switch lever B
14 0962 891
Date corrector setting
transmission wheel C
13 0962 013
Date corrector setting
transmission wheel B

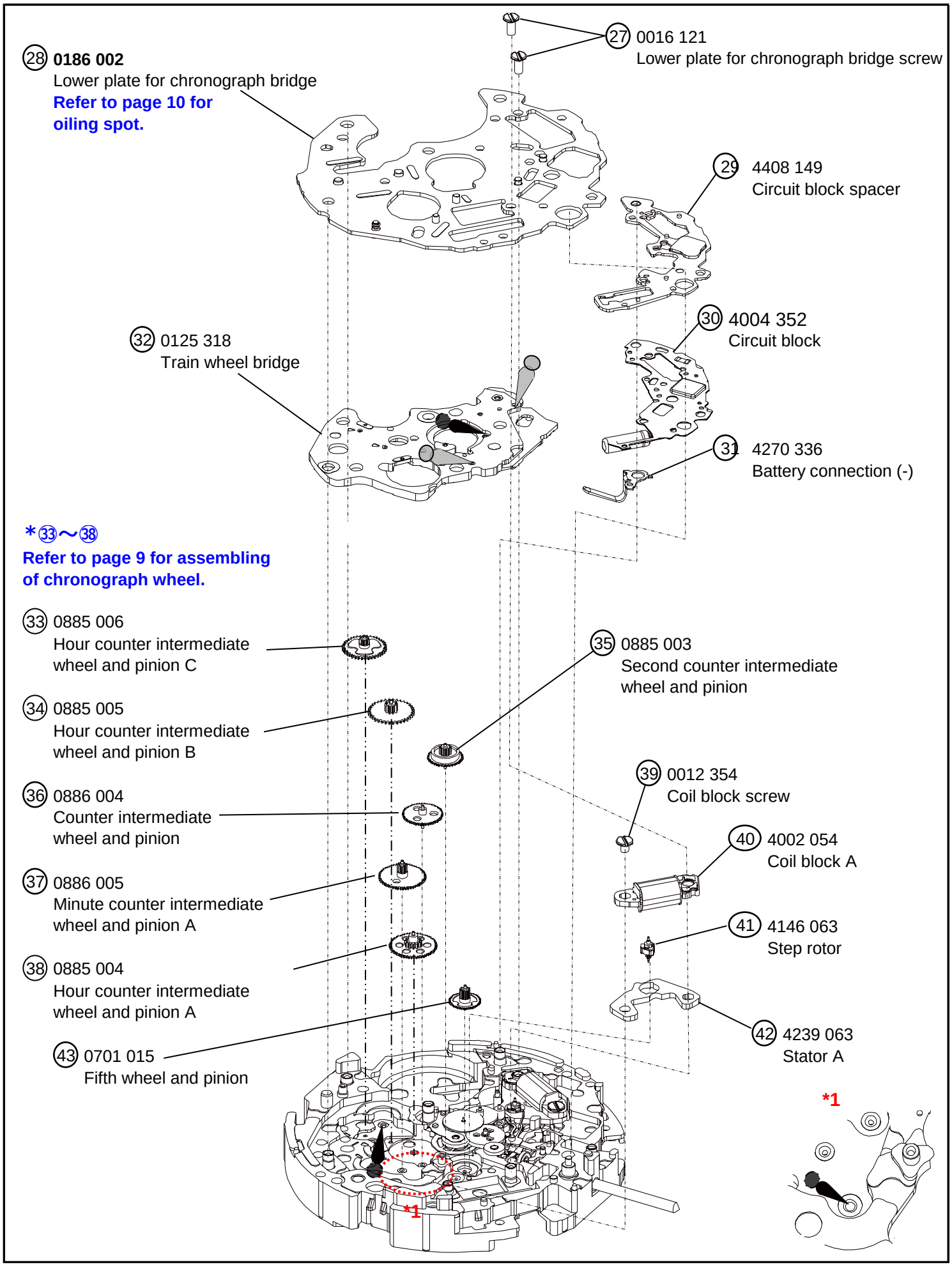
PARTS CATALOGUE

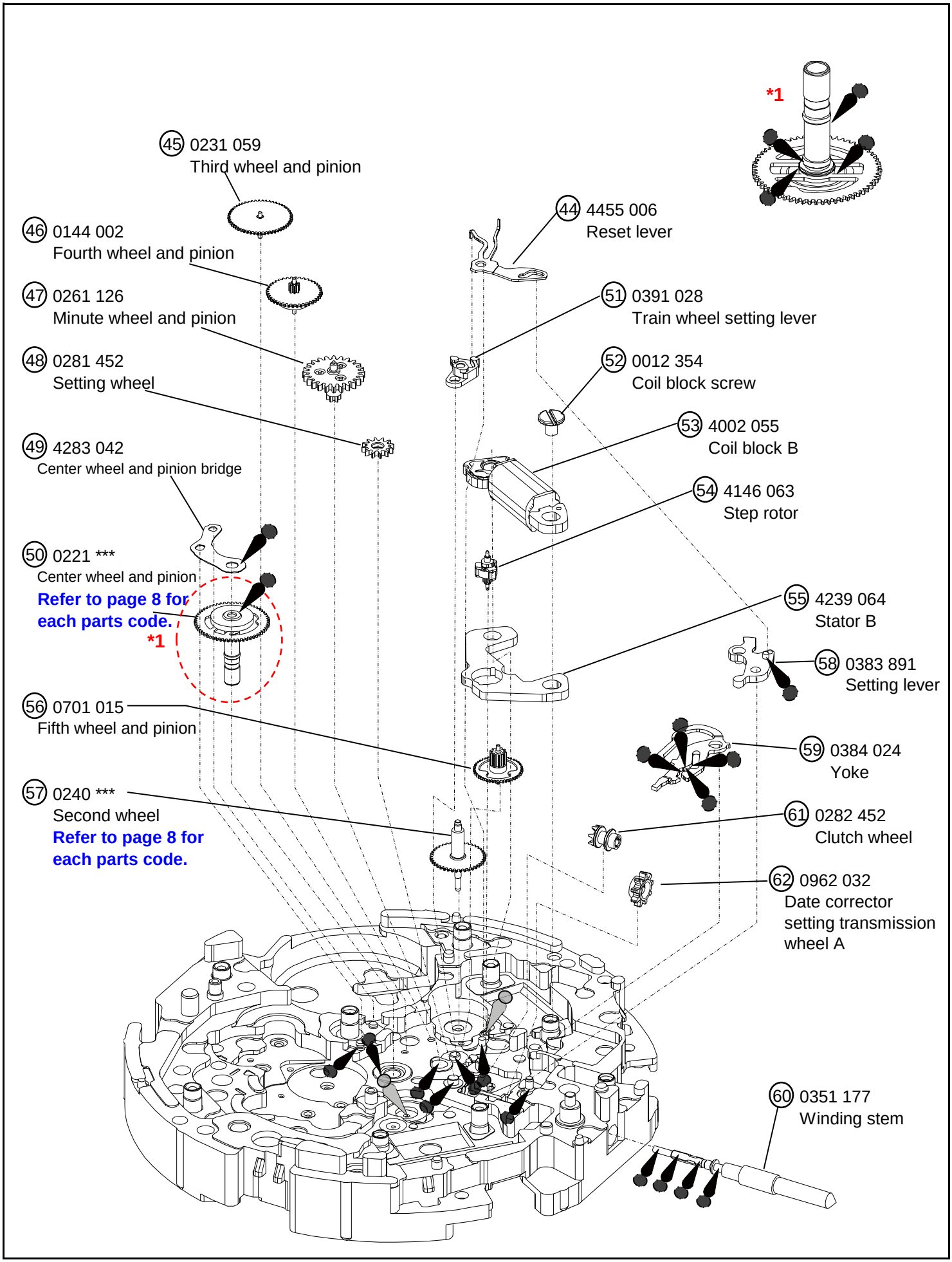
8T67A



PARTS CATALOGUE

8T67A

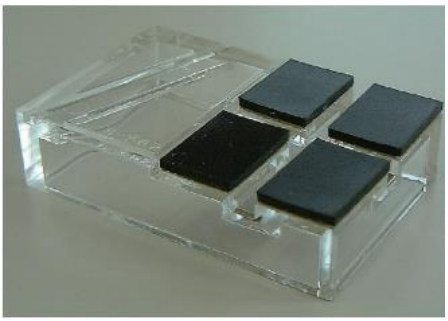



*1
45 0231 059
Third wheel and pinion
46 0144 002
Fourth wheel and pinion
47 0261 126
Minute wheel and pinion
48 0281 452
Setting wheel
49 4283 042
Center wheel and pinion bridge
50 0221 ***
Center wheel and pinion
Refer to page 8 for each parts code.
*1
56 0701 015
Fifth wheel and pinion
57 0240 ***
Second wheel
Refer to page 8 for each parts code.
44 4455 006
Reset lever
51 0391 028
Train wheel setting lever
52 0012 354
Coil block screw
53 4002 055
Coil block B
54 4146 063
Step rotor
55 4239 064
Stator B
58 0383 891
Setting lever
59 0384 024
Yoke
61 0282 452
Clutch wheel
62 0962 032
Date corrector setting transmission wheel A
60 0351 177
Winding stem

●Tools and consumables required for disassembling/reassembling

・Movement Holder

UNIVERSAL MOVEMENT HOLDER (S-682)



・Watch oils

SEIKO watch oil AO-2, AO-3 and S-6

AO-2

AO-3

S-6

REMARKS ON DISASSEMBLING AND REASSEMBLING THE MOVEMENT

Remarks:

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

Please refer to the following table in order to find the correct part number of each wheel according to the hand installation height. The numeral 2 or 4 is printed on the DIAL.

		Caliber code	
		8T6720A	8T6740A
No	Parts name	Parts code	Parts code
⑧	Hour wheel	0273 038	0273 042
⑯	Switch spring	4250 088 (marking "2")	4250 090 Marking "4"
㉒	Second counting wheel	0888 028	0888 029
㉓	Minute counting wheel	0902 017	0902 018
㉔	Hour counting wheel	0902 017	0902 018
㊿	Center wheel and pinion	0221 087	0221 092
⑤	Second wheel	0240 018	0240 019

③ Date indicator

Parts code	Crown position	Date Position	Color of figure	Color of background
0878 328	3H	3H	Black	White
0878 329	3H	3H	White	Black

*** All parts code are subject to change without notice.**

● How to assemble chronograph wheel

There is a mark on parts. Parts are set in order of the mark as shown in the table below.

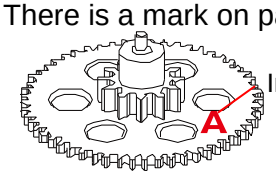
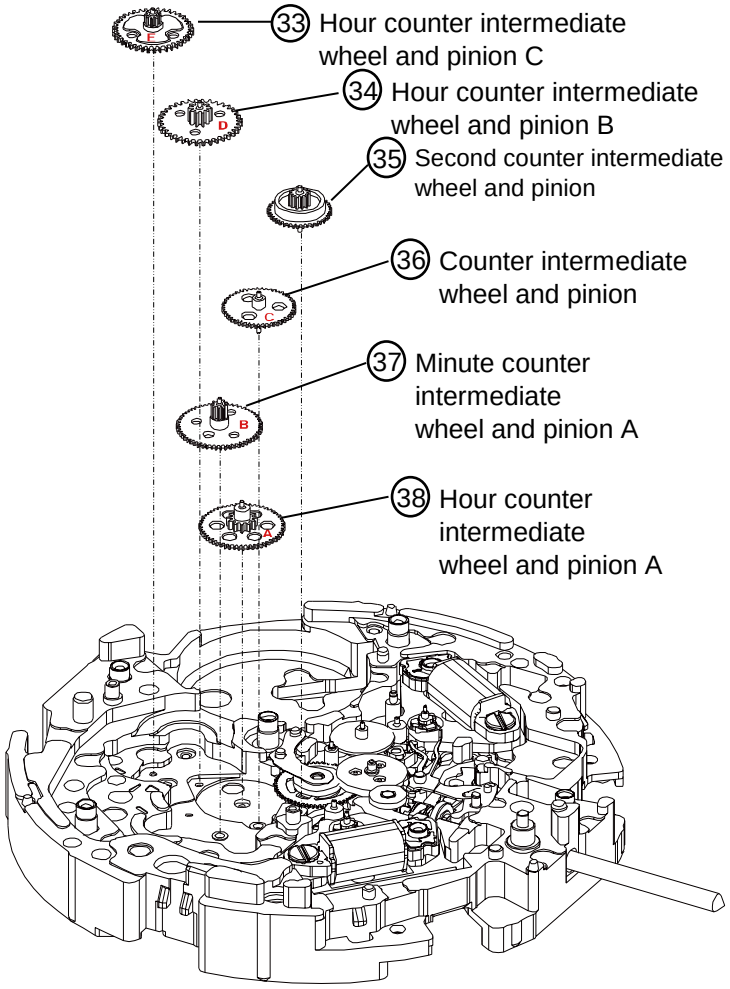


Image example of the mark

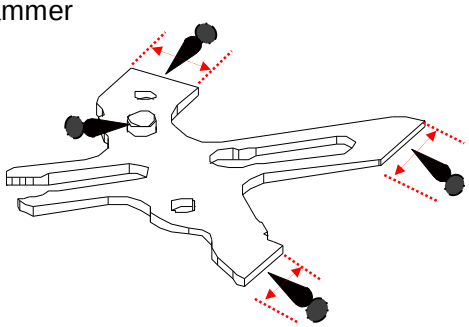
Mark	Parts name
A	(38) Hour counter intermediate wheel and pinion A
B	(37) Minute counter intermediate wheel and pinion A
C	(36) Counter intermediate wheel and pinion
Nil	(35) Second counter intermediate wheel and pinion
D	(34) Hour counter intermediate wheel and pinion B
E	(33) Hour counter intermediate wheel and pinion C



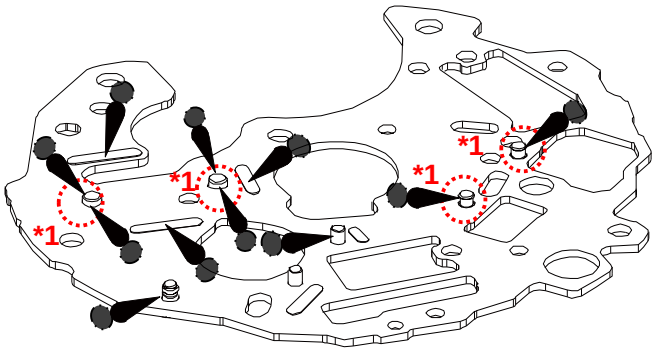
Type of oil	Oil quantity mark
AO-3(Moebius A)	NORMAL QUANTITY
AO-2(Moebius F)	SUFFICIENT QUANTITY
S-6	

● **Remarks for the lubrication**

㉑ Hammer



㉗ Lower plate for chronograph bridge

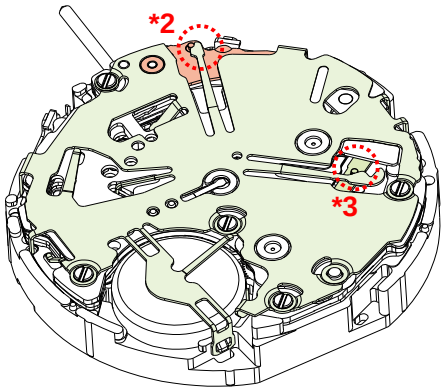


Note:

*1: Lubricate on the pointed spot.

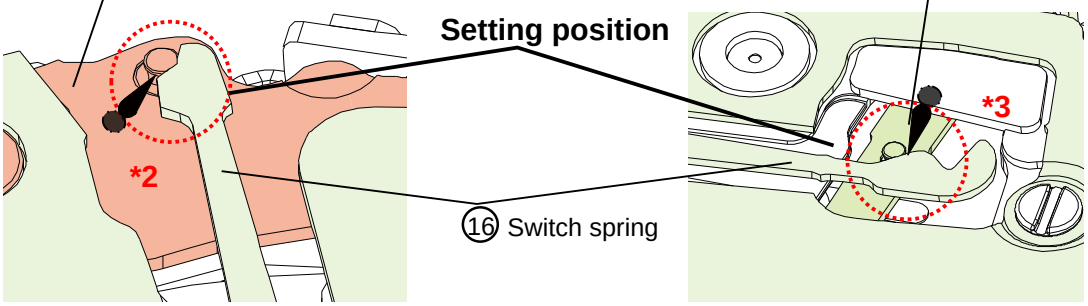
⑯ Switch spring

Oiling spot and spring setting position are below;



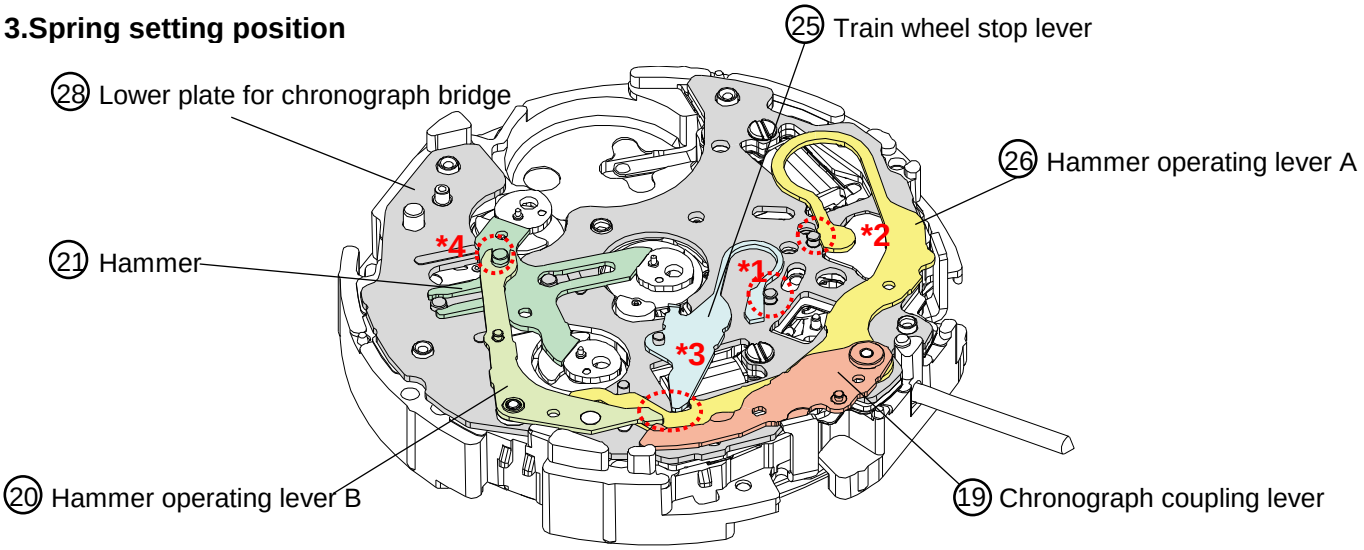
⑲ Chronograph coupling lever

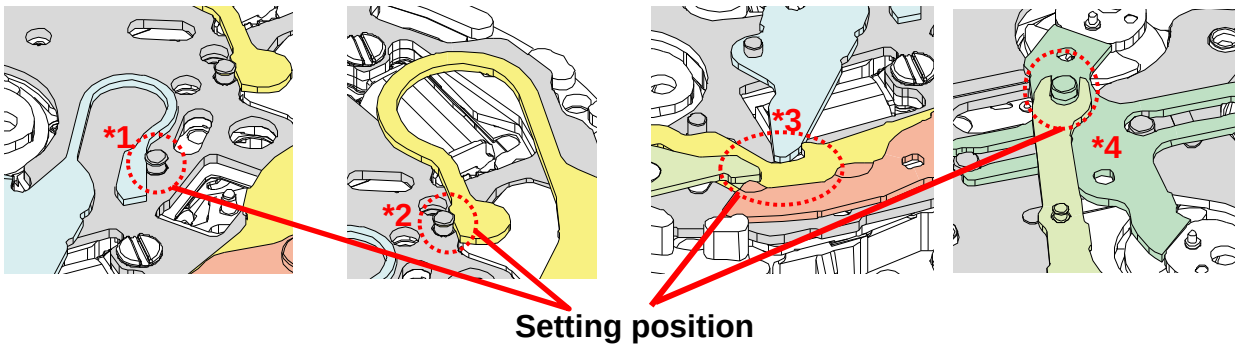
⑳ Hammer operating lever B



***Lubricate on the contact spot of the spring and the pin.**

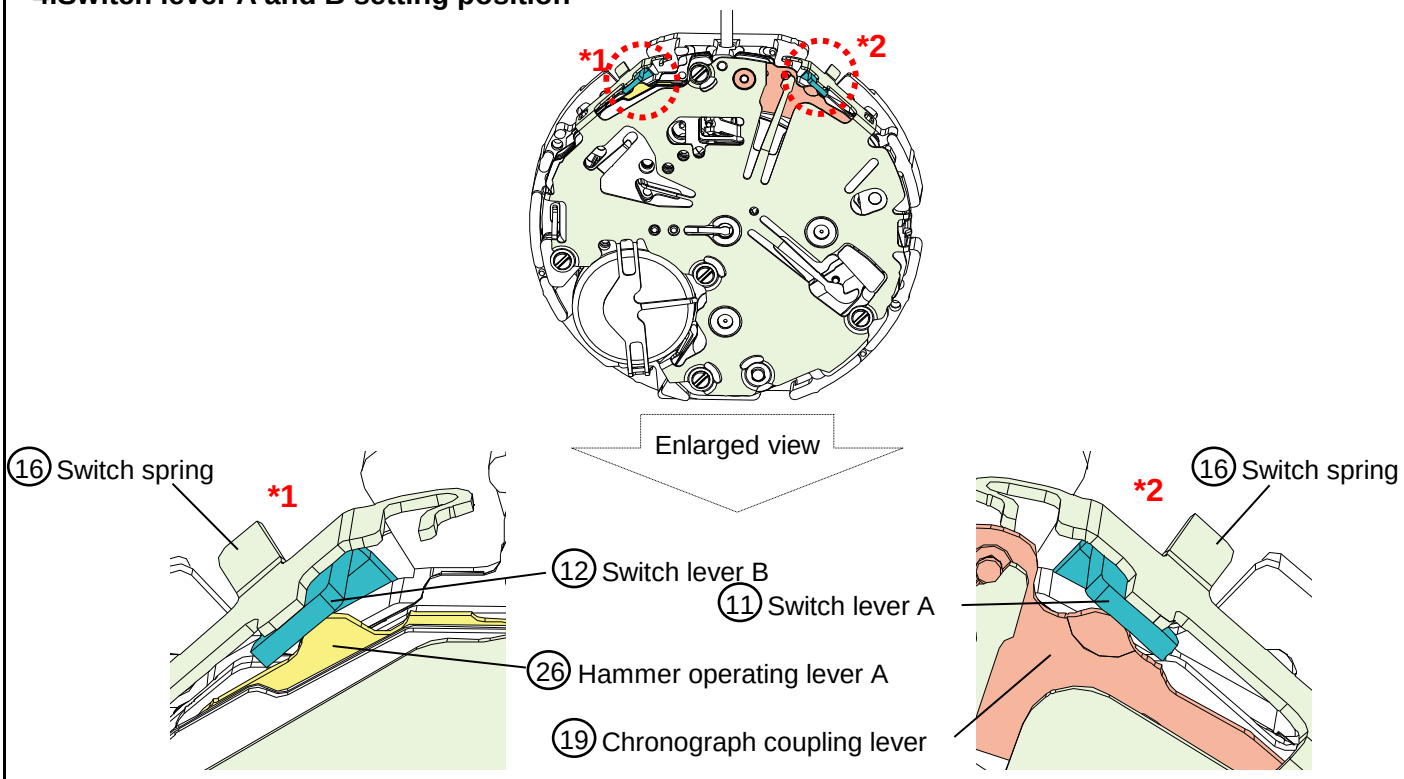
3.Spring setting position





Setting position

4.Switch lever A and B setting position

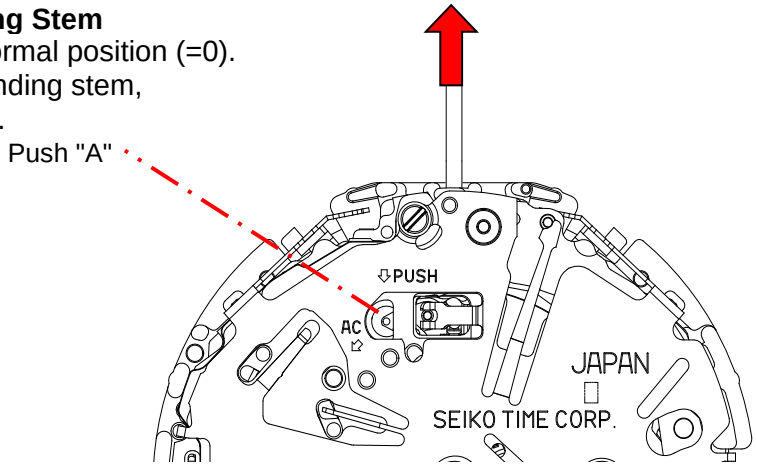


Switch lever B is set between the switch spring and hammer operating lever A .

Switch lever A is set between the switch spring and chronograph coupling lever.

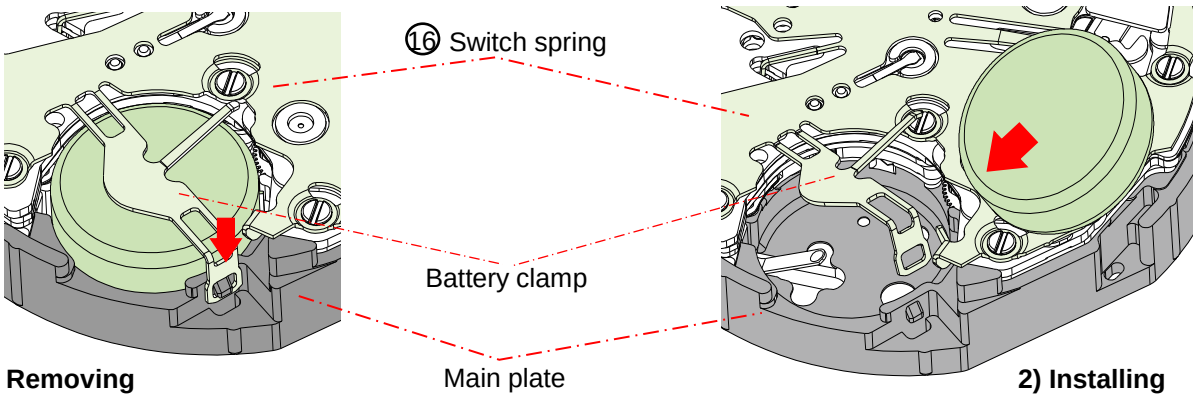
● **How to remove the Winding Stem**

1) Set the winding stem to normal position (=0).
2) Pull out the Crown with winding stem, while pushing "A" carefully.



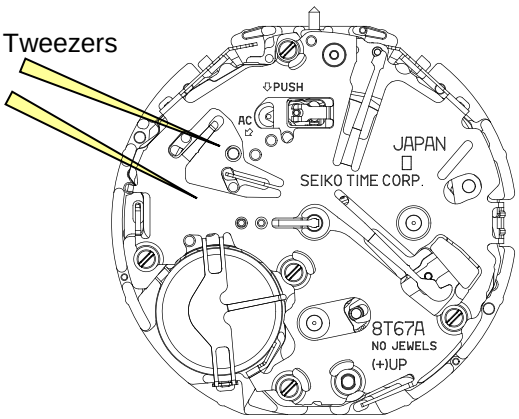
● **How to remove or install the Battery**

1) Remove the hook of the Switch Spring's Battery Clamp as illustrated in the drawing 1).
2) Insert the battery sideways as illustrated in the drawing 2) , and have the hook of the Switch Spring's Battery Clamp catch the main plate.



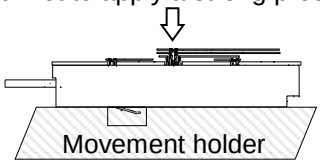
● **Remarks on installing the Battery**

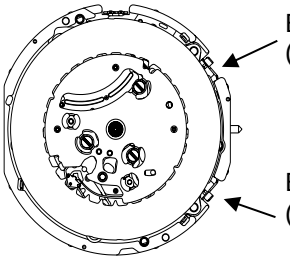
After replacing the battery with a new one, or reinstalling, be sure to touch the AC terminal of circuit block and the switch spring with conductive tweezers to reset the circuit as illustrated.



● How to install Chronograph hands

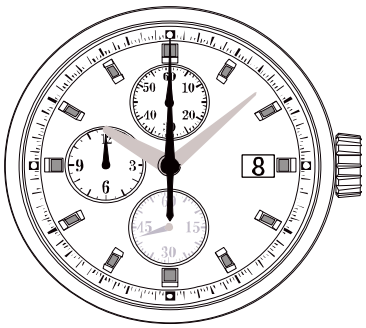
Place the movement on the movement holder.
Be careful not to apply a strong pressure to the movement





(1) Push button A (Chronograph start)
(2) Push button A (Chronograph stop)
(3) Push button B (Chronograph reset)
(4) After (1)-(3), Install the chronograph hands at the positions as shown below;

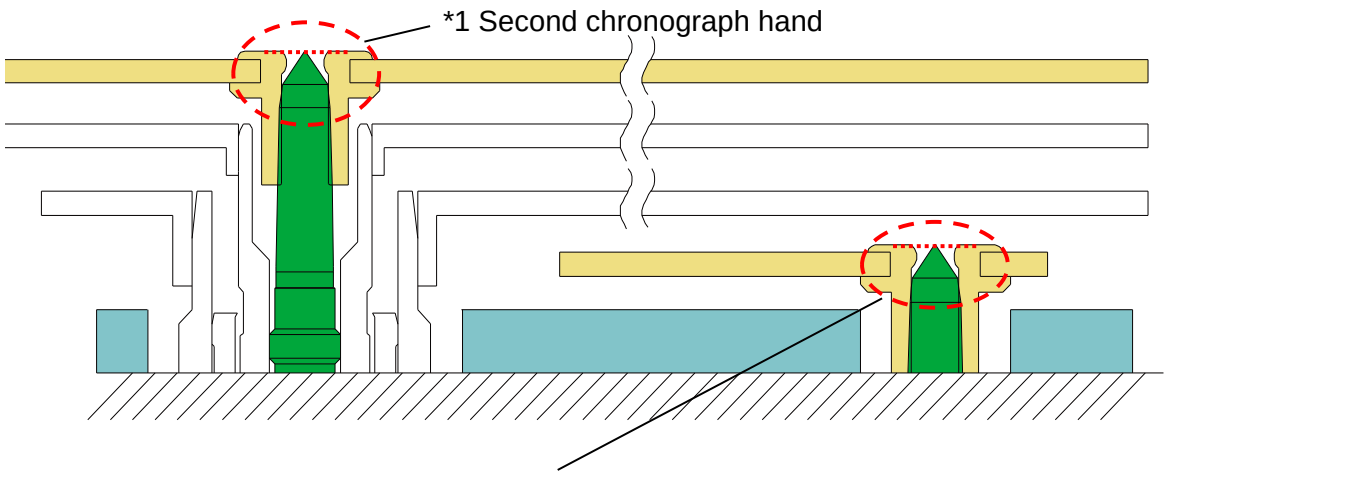
Second chronograph	"12" o'clock of the center dial
Minute chronograph	"60" minute of the sub dial at 12h position
Hour chronograph	"12" hour of the sub dial at 9h position



***Once the chronograph hands are detached, the reuse of them is not available.**
Please replace them with new hands.

● How to check the hands setting

***The hand's top surface should be set perpendicular with the axis tip , as shown below.**



REMARKS ON INSPECTION AND MEASUREMENT

● How to measure the current consumption for the whole movement

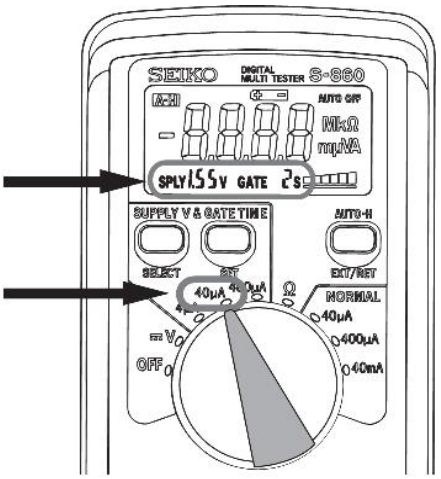
1. To measure the current consumption for the whole movement, connect the (-) probe to the battery connection (-) and (+) probe to the other metal part of the movement, such as battery clamp or circuit block cover.

 ∗ 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).

2. Connect the AC component to the positive terminal for 2 seconds until a short circuit occurs to reset the integrated circuit.

3. After the integrated circuit is reset, wait approximately for 10 seconds until a stable measurement is obtained, and then read the measurement.

4. Make sure the read value is less than 2.7 μ A.



● How to measure the current consumption for the CIRCUIT BLOCK alone

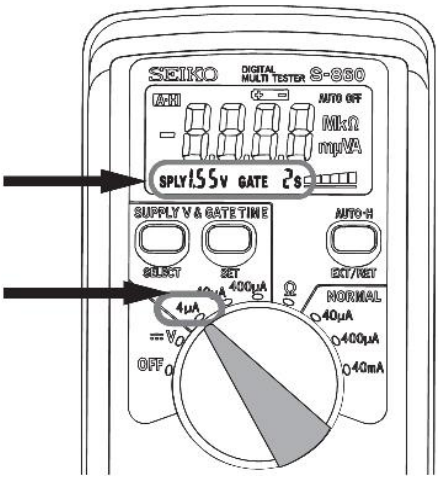
1. To measure the current consumption for the CIRCUIT BLOCK alone, connect each probe to the appropriate positive (+) or negative (-) input terminal of the CIRCUIT BLOCK (please refer to “Structure of the CIRCUIT BLOCK”).

 ∗ When measuring the current consumption using the SEIKO Multi-Tester S-860, use the range of 4 μ A of SUPPLY V (= 1.55 V) & GATE TIME (2 S).

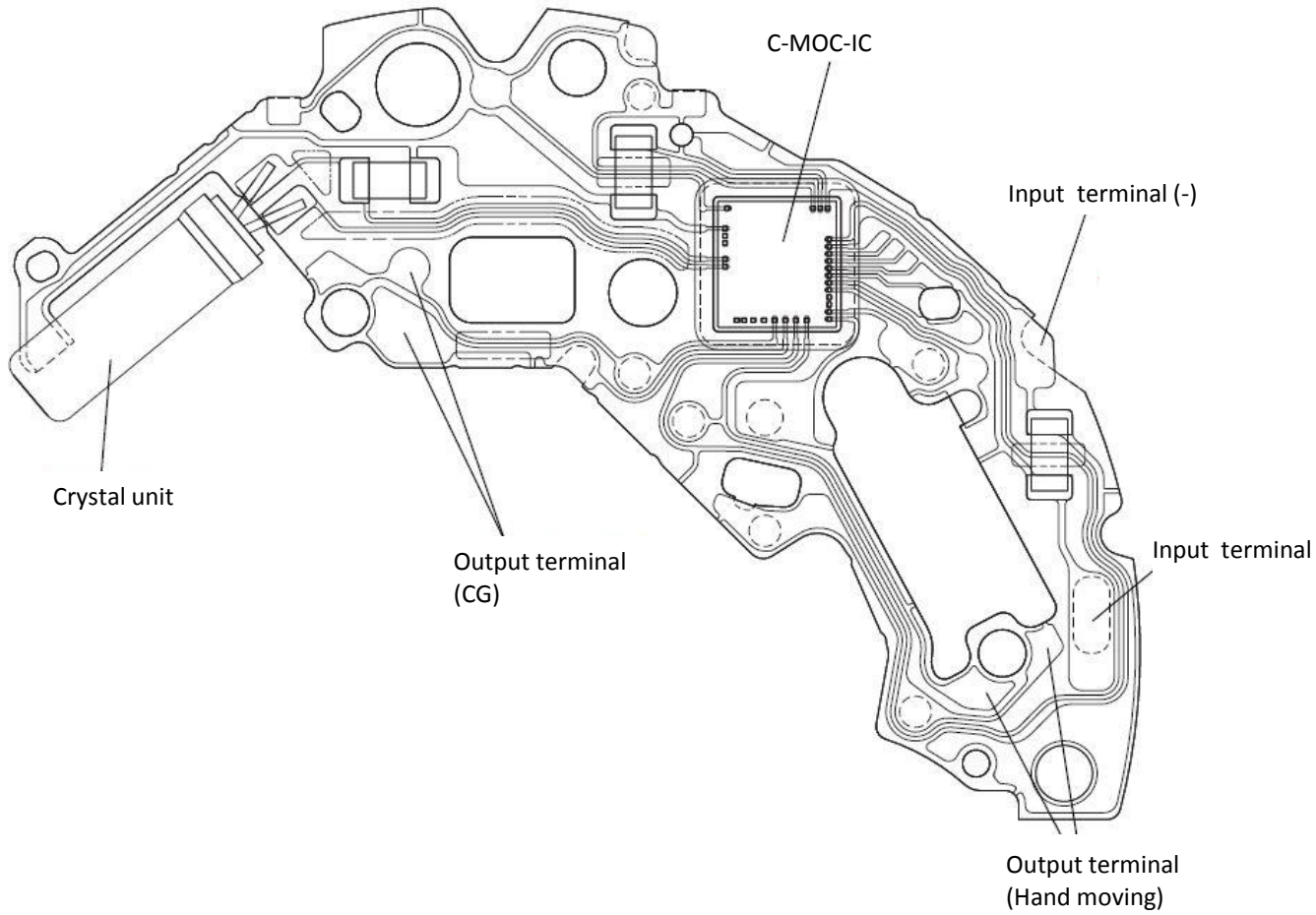
2. Repeat the same procedures as 2. and 3. of measuring current consumption for the whole movement above.

 ∗ When measuring the current consumption for the circuit block alone, be careful not to damage or deform the pattern of the circuit block.

3. Make sure the read value is less than 0.7 μ A.



〔STRUCTURE OF THE CIRCUIT BLOCK〕

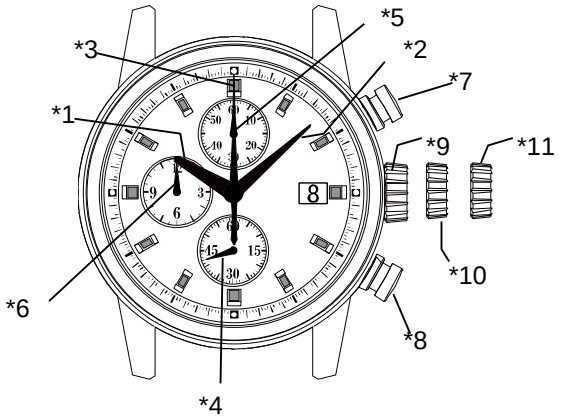


● **Value checking -coil reistance (coil block)**

Check the resistance of each coil block if they are within the range in the following table.

COIL BLOCK (A)	4002054	1.45 - 1.65KΩ
COIL BLOCK (B)	4002055	1.65 - 1.85KΩ

DISPLAY AND CROWN / BUTTON OPERATION



Note

*1: Hour hand	*5: Chronograph minute hand (60 minute)	*9: Crown at normal position
*2: Minute hand	*6: Chronograph hour hand (12 hour)	*10: Crown at first position (Date setting)
*3: Chronograph second hand	*7: Button A (START / STOP)	*11: Crown at second position (Time setting)
*4: Small second hand	*8: Button B (RESET)	

1.How to set the time

1) Pull out the crown to the second click position.
2) Turn the crown to set hour and minute hands.
   (Check that AM / PM is set correctly.)
3) Push the crown back into the normal position.

[Note]

If the crown is pulled to the second position while the chronograph is started, the chronograph hands will continue to move. This is not a malfunction.

2.How to set the date

1) Pull out the crown to the first click position.
2) Turn the crown clockwise for date setting.
   *Do not set the date between 9:00 P.M. and 3:00 A.M. as this will cause a malfunction.
3) Push the crown back into the normal position.

3.How to reset (after battery change)

It is possible to reset by the following two methods.

Method 1
1) Set the crown to the normal position.
2) Touch the AC terminal of circuit block and the switch spring with conductive tweezers to reset the circuit.
3) The small second hand will move at two-second interval for 10 seconds.

Method 2
1) Pull out the crown to the second click position.
2) Press the button B for two seconds and release the button.
3) Push the crown back to the normal position.
4) The small second hand will move at two-second interval for 10 seconds.

* If the crown is operated within this 10 seconds, the two-second interval movement will not activate.

[Note]

It is not necessary to set the chronograph hands after the battery is exchanged.
If the chronograph hands position are incorrect, following below procedure all the chronograph hands will be reset to "0" position.

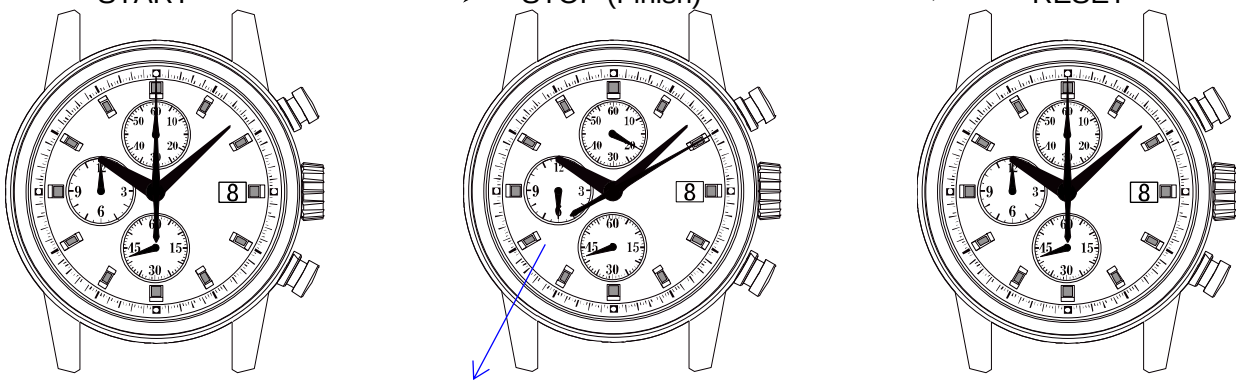
Button A (START) ⇨ Button A (STOP) ⇨ Button B (RESET)

HOW TO USE THE CHRONOGRAPH

[Standard measurement]

Press the buttons in the following order : A → A → B

START → STOP (Finish) → RESET



Showing the measurement result:
6 hours 20 minutes 10 seconds

- Press button A to start the chronograph. The chronograph second hand will start moving.
- Press button A again to stop the chronograph. The chronograph hands stop to indicate the elapsed time.
- Press button B to reset the chronograph. All the chronograph hands will be reset to "0" position.

Note

The chronograph can measure up to 12 hours.
The chronograph stops after a measurement for 12 hours.

***Restart in the following procedure.**

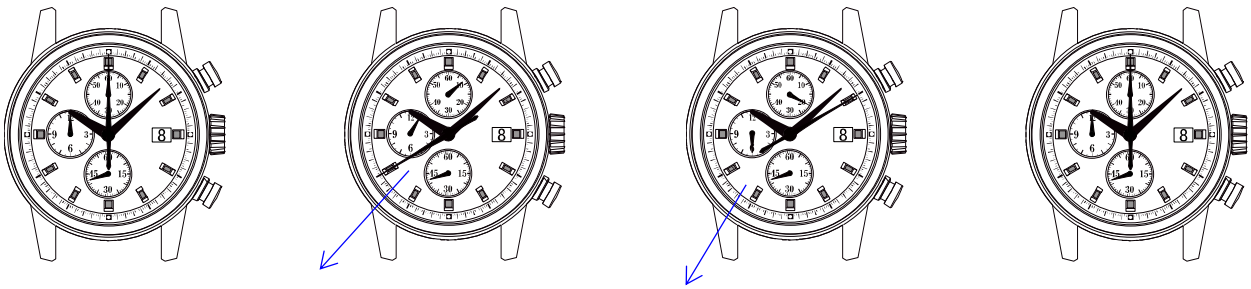
Button B (RESET) ⇨ Button A (START)

*During the chronograph operation, button B (reset) can be pushed. There is no problem with the function.

[Accumulated elapsed time measurement]

Press the buttons in the following order : A → A / A ⋯ → A → B

START → STOP / RESTART → STOP → RESET



Showing the measurement result: 1 hour 8 minutes 40 seconds

Showing the measurement result: 6 hours 20 minutes 10 seconds

*Restart and stop of the chronograph can be repeated as many times as necessary by pressing button A

●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 leak test	3 BAR
WATER RESIST 5BAR	Water pressure test	5 BAR
WATER RESIST 10BAR		10 BAR
WATER RESIST 15BAR	Condensation test	15 BAR
WATER RESIST 20BAR		20 BAR
SCUBA DIVERIS （AIR DIVERIS）150 m	Condensation test	18.75 BAR ＝150(m)times 0.125
SCUBA DIVERIS (AIR DIVERIS)200 m		25 BAR ＝200(m)times 0.125
He-GAS DIVERIS 300 m	Water pressure test	37.5 BAR ＝300(m)times 0.125
He-GAS DIVERIS 600 m		75 BAR ＝600(m)times 0.125
He-GAS DIVERIS1000m	Condensation test	125 BAR ＝1000(m)times 0.125

TROUBLESHOOTING

	Symptom	Possible causes	Solutions
Movement	The watch stops operating.	The battery has been depleted.	Measure the battery voltage. Replace the battery with a new one.
		The hour wheel and the pinion of the minute wheel are not properly engaged. (Or the teeth of the hour wheel and/or minute wheel have been broken.)	Check the relevant parts, and replace the damaged parts with new ones.
		The hooking portions of the circuit block cover are not properly engaged, resulting in poor conductivity. The coil is broken.	Securely attach the hooks of the circuit block cover to the main plate. Measure the coil block resistance. Replace the coil with a new one.
		One or more wheels have been contaminated with dirt, dust or other particles. An excessive amount of oil in the movement has caused adhesive forces among the parts. (wringing)	Remove dirt or dust and clean the contaminated wheels. Be careful so as not to damage the teeth of the plastic parts while cleaning.
	The current consumption for the whole movement exceeds the standard value.	Dirt, dust or foreign particles are adhered to the movement. The driving pulse is generated in order to compensate the excessive load applied to the wheels. (The oil has deteriorated, leaked or run out.)	Remove dirt, dust or foreign particles and clean the movement. 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.	The light f rom out side the movement is affecting the measurement. There is a defect in the IC (integrated circuit) .	Shut out the light, and make the measurement again. Replace the circuit block with a new one.

TROUBLESHOOTING

	Symptom	Possible causes	Solutions
STOPWATCH	One or more STOPWATCH hands have stopped moving or show an abnormal move-ment.	The relevant coil is broken.	Measure the coil block resistance. Replace the coil with a new one if necessary.
		An excessive load is being applied to the chronograph wheels due to dust or foreign par ticles adhering to them or oil starvation.	Clean the relevant parts and lubr icate with an adequate amount of oil.
	The step motor shows an abnormal movement.	There is a crack on the circuit block switch pattern.	Replace the circuit block with a new one.
		The step motor has been deformed.	Replace the stator with a new one.
	The buttons do not operate normally.	The amount of oil around the buttons is insufficient. The circuit block pat tern has been broken or bent.	Clean the buttons and lubricate appropriately. Adjust the circuit block pattern or replace the circuit block with a new one.
Exterior Parts	The crown falls off.	The winding stem is not securely installed. (The setting lever and yoke are disengaged.)	Check the main plate, winding stem, set ting lever and yoke. Replace the defective parts with new ones.
	The current consumption exceeds the standard value.	An excessive load is being applied due to friction among the hour, minute and STOP-WATCH hands.	Adjust or remount the relevant hands.
	Small amount of water/ blur inside of the glass persists.	Water resistance is deteriorated. The watch has been subjected to water pressure that exceeds the guaranteed degree.	Investigate the causes to take necessary measures , while cleaning inside of the watch.