
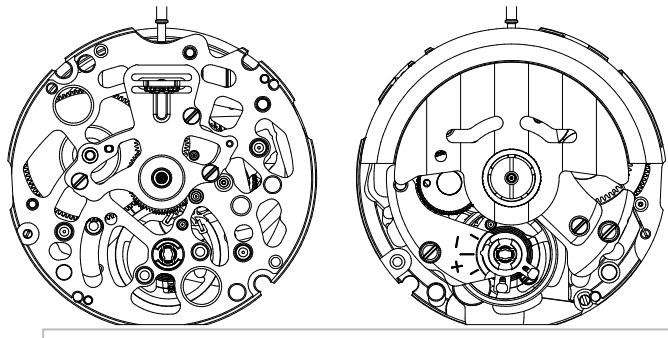


PARTS LIST / TECHNICAL GUIDE

Automatic Cal.4R71A

[SPECIFICATION]

Item		Cal. No.	4R71A			
						
<ul style="list-style-type: none"> •3 Hands (Hour, Minute and Second hands) 			Movement Size <ul style="list-style-type: none"> •Diameter Outside : ϕ27.4 mm Casing : ϕ27.0 mm •Height : 5.32 mm 			
Driving system		Automatic winding with manual winding mechanism				
Additional function		•Second hand stop function				
Crown operation	Normal position	Manual winding (clockwise only)				
	1st click	Time setting / Second hand stop function				
Vibration per hour		21,600 (6 beats per second)				
Loss/Gain	Daily Rate	Between +45 and -35 seconds per day (worn on the wrist at temperature range between 5°C and 35°C)				
	Standard rate for measurement	Instantaneous rate at T0 (Fully wound condition)			Isochronous fault	
		Testing positions	Dial upward	6 o'clock at the top	9 o'clock at the top	Dial upward
Measurement (Daily rate in seconds:s/d)		± 20 s/d	± 30 s/d	± 30 s/d	± 30 s/d	
Regulation system		ETACHRON system				
Lift angle of the escapement		53°				
Continuous operating time		From fully wound to stoppage: Approximately 41 hours				
Number of Jewels		24 Jewels				

SEIKO WATCH CORPORATION

PARTS LIST

Cal. 4R71A

Type of oil



AO-3(Moebius A)



S-6



S-4

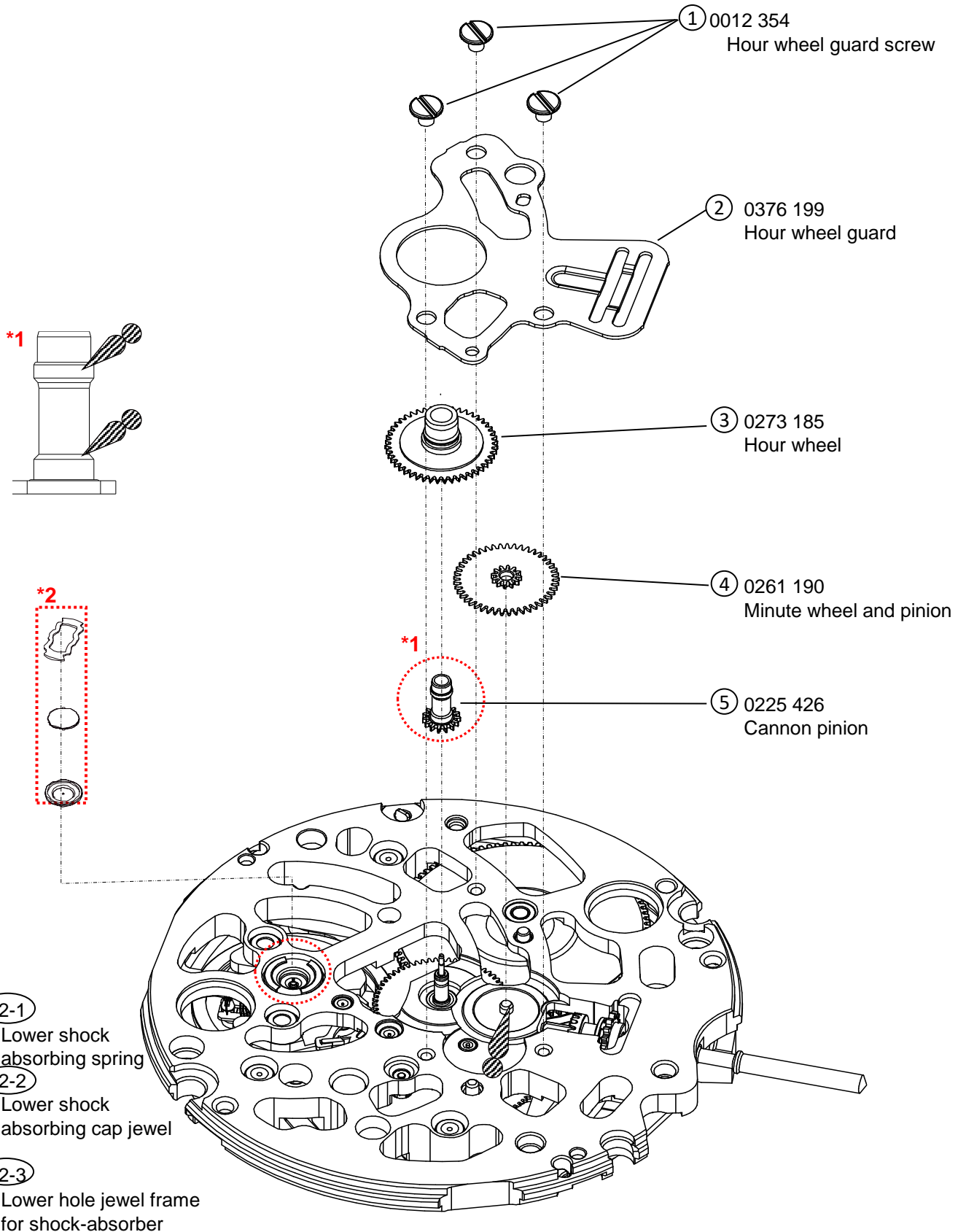
Oil quantity mark



NORMAL QUANTITY



SUFFICIENT QUANTITY



SEIKO WATCH CORPORATION

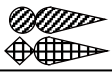
PARTS LIST

Cal. 4R71A

Type of oil



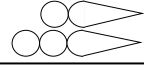
AO-3(Moebius A)



S-6

S-4

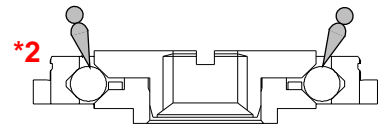
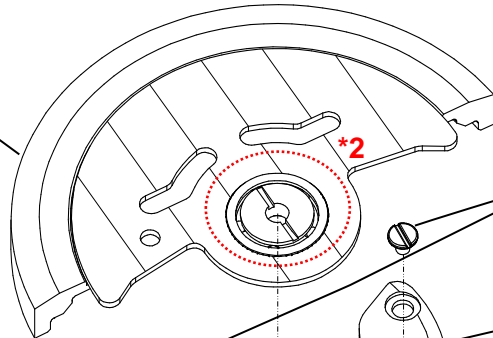
Oil quantity mark



NORMAL QUANTITY

SUFFICIENT QUANTITY

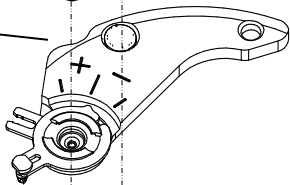
- ⑥ 1509 199 Oscillating weight with ball bearing



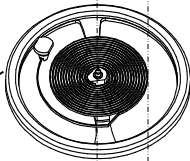
- ⑫ 0012 100 Balance cock screw



- ⑬ 0171 353 Balance cock



- ⑭ 0310 184 Balance complete with stud



- ⑦ 0012 354 Automatic train bridge screw

- ⑧ 0191 183 Automatic train bridge

whole tooth

- ⑨ 0514 183 Second reduction wheel and pinion

- ⑩ 0012 919 Ratchet wheel screw

- ⑪ 0285 051 Ratchet wheel

- ⑮ 0012 354 Pallet bridge screw

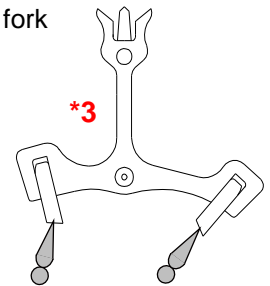
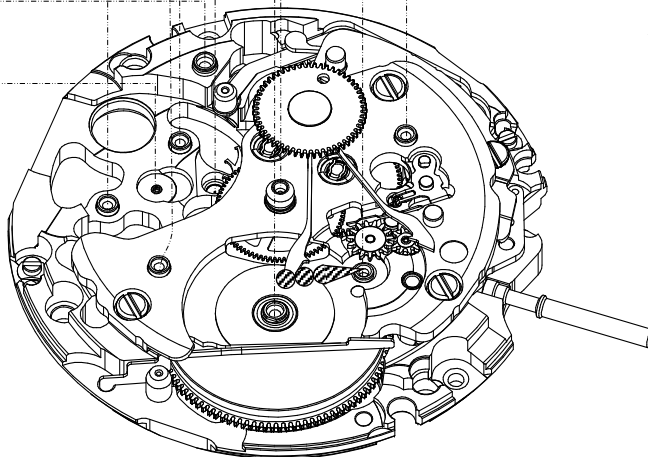
- ⑯ 0161 300 Pallet bridge

- ⑰ 0301 009 Pallet fork

- *1 ⑬-1 Upper shock absorbing spring

- ⑬-2 Upper shock absorbing cap jewel






- ⑬-3 Upper hole jewel frame for shock-absorber

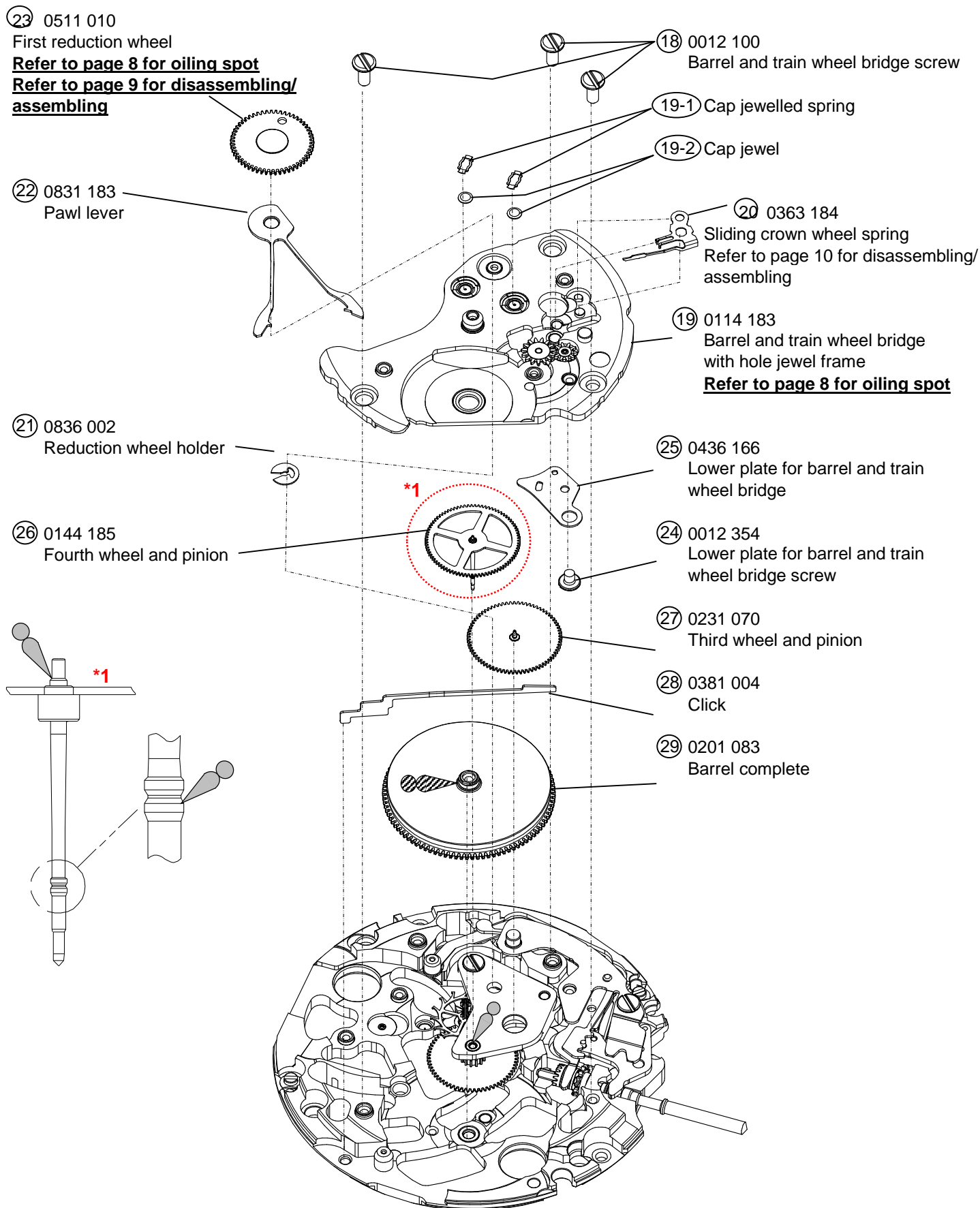


SEIKO WATCH CORPORATION

PARTS LIST

Cal. 4R71A

Type of oil		Oil quantity mark	
 AO-3(Moebius A)	 S-6	 NORMAL QUANTITY	
	 S-4	 SUFFICIENT QUANTITY	

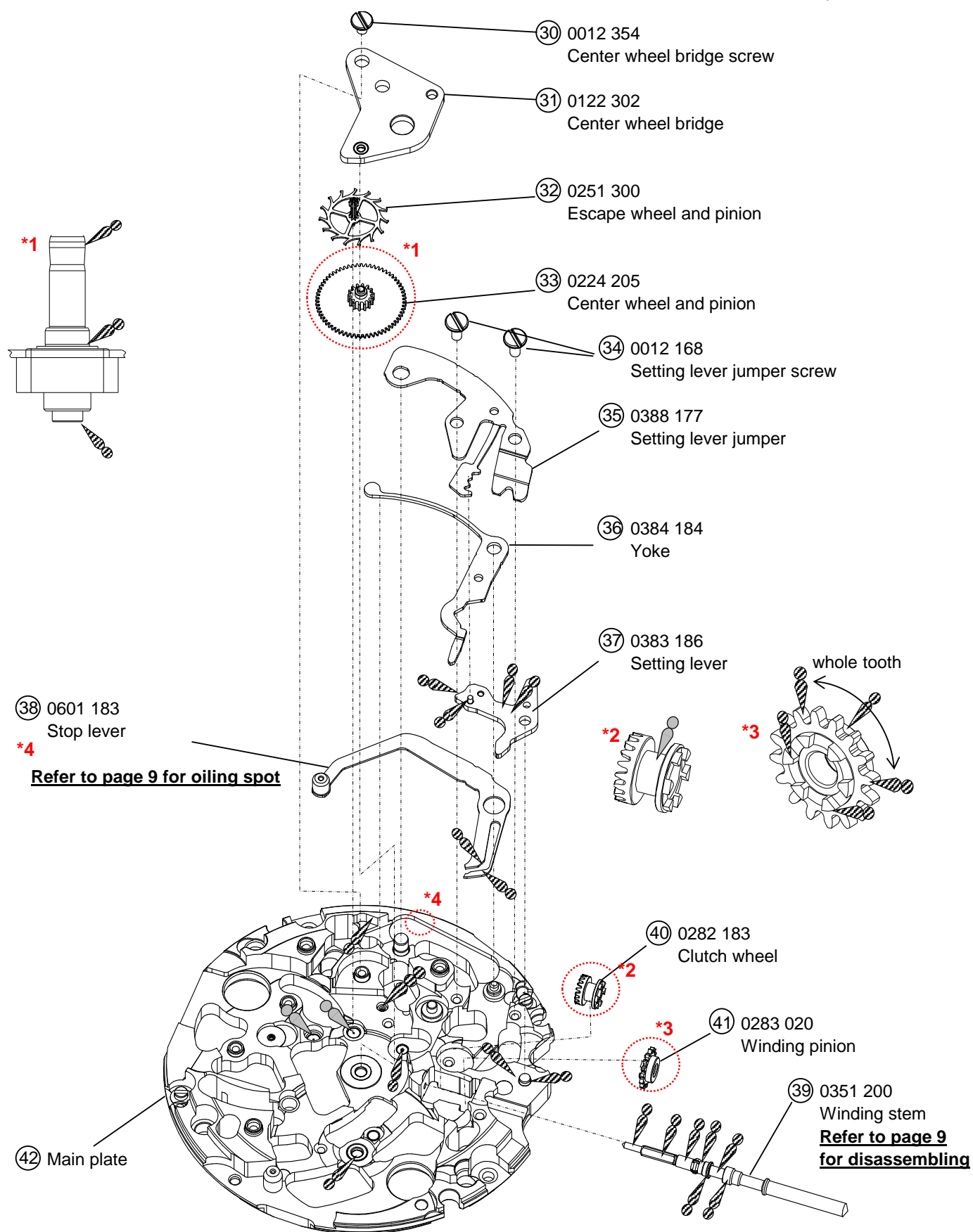


SEIKO WATCH CORPORATION

PARTS LIST

Cal. 4R71A

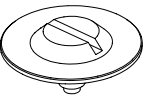
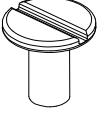
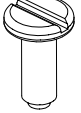
Type of oil		Oil quantity mark	
AO-3(Moebius A)			S-6
			S-4
			NORMAL QUANTITY
			SUFFICIENT QUANTITY



PARTS LIST

Cal. 4R71A

● LIST OF SCREWS

Parts No	Name	Parts No	Name	Parts No	Name
0012 354	① Hour wheel guard screw (x3)	0012 919	 ⑩ Ratchet wheel screw	0012 168	 ③④ Setting lever jumper screw (x2)
	⑦ Automatic train wheel bridge screw (x2)				
	⑮ Pallet bridge screw (x2)	0012 100	 ⑫ Balance cock screw		
	⑳ Lower plate for barrel and train wheel bridge screw				
	⑳ Center wheel bridge screw				

● LOCATION OF THE JEWELS

	Upper		Lower	
	Hole Jewel	Cap Jewel	Hole Jewel	Cap Jewel
Center wheel & pinion	○		○	
Forth wheel & pinion	○			
Third wheel & pinion	○	○	○	
Escape wheel & pinion	○	○	○	
Barrel complete			○	
Pallet fork	○		○	
Balance spring	○	○	○	○
Crown wheel	○			
First reduction wheel	○		○	
Second reduction wheel & pinion	○		○	
Entry pallet jewel			○	
Exit pallet jewel			○	
Roller jewel			○	
Total			24 jewels	

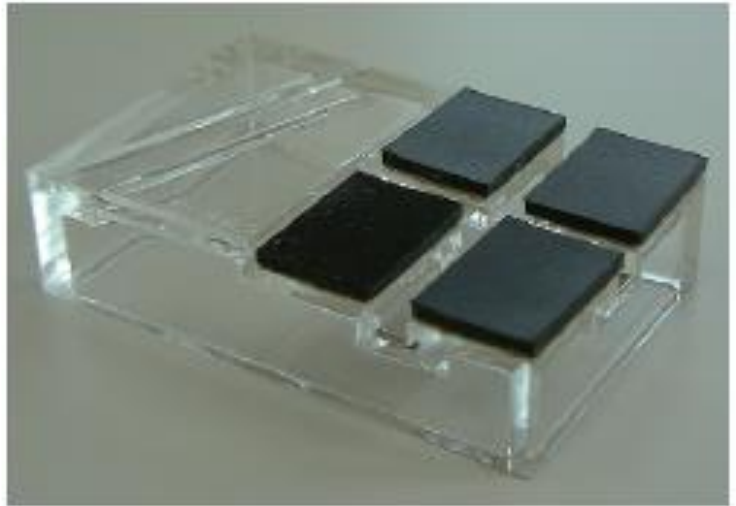
SEIKO WATCH CORPORATION

PARTS LIST

Cal. 4R71A

● Tools and consumables required for disassembling/reassembling

- Movement holder
UNIVERSAL MOVEMENT HOLDER
(S-682)



- Watch oils
SEIKO Watch grease S-6 and S-4. Watch oil AO-3 (or Moebius A)

S-6



AO-3








S-4



SEIKO WATCH CORPORATION

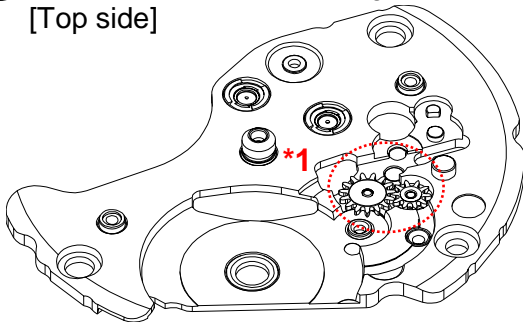
TECHNICAL GUIDE

Cal. 4R71A

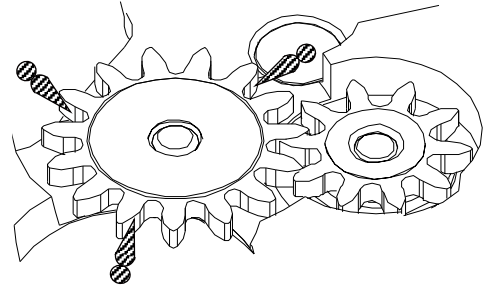
Type of oil				Oil quantity mark
	AO-3(Moebius A)		S-6	
			S-4	
				QUANTITY
				NORMAL QUANTITY
				SUFFICIENT

1. Oiling spot

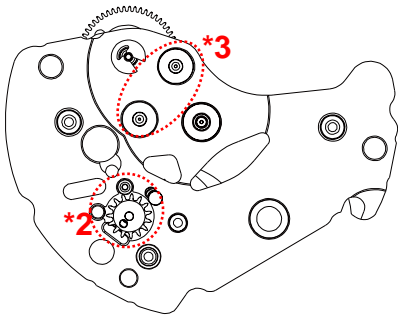
⑲ Barrel and train wheel bridge
[Top side]



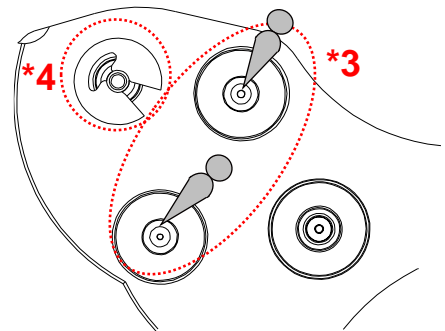
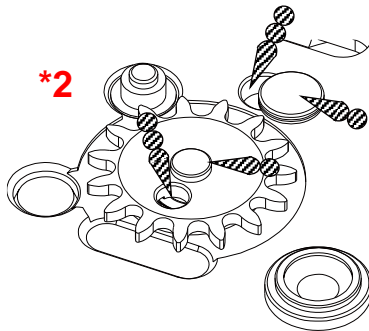
*1



[Back side]

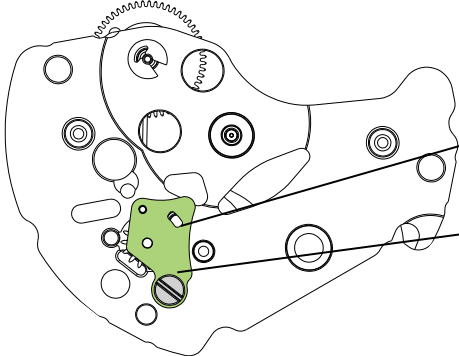


*2



Note:

After oiling *2, set Lower plate for barrel and train wheel bridge & screw.

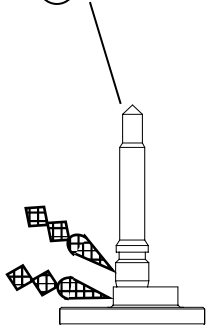


⑲ Lower plate for barrel and train wheel bridge

⑳ Lower plate for barrel and train wheel bridge screw

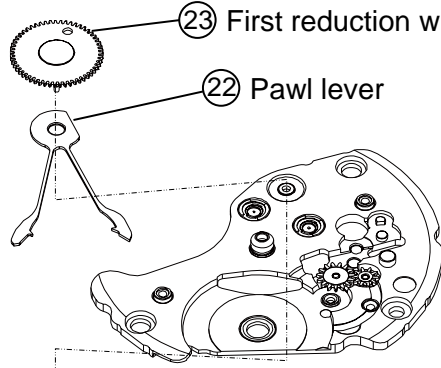
After oiling *4, set First reduction wheel & Pawl lever & Reduction wheel holder.

⑳ First reduction wheel



㉓ First reduction wheel

㉒ Pawl lever



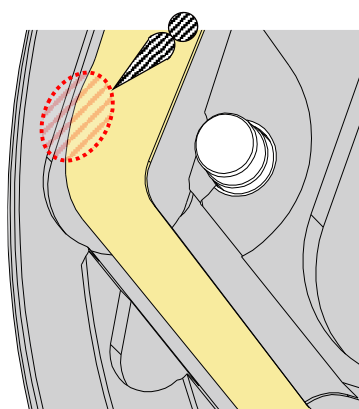
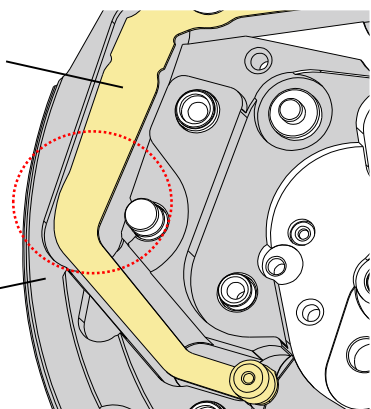
㉑ Reduction wheel holder

SEIKO WATCH CORPORATION

③⑧ Stop lever

Stop lever

Main plate

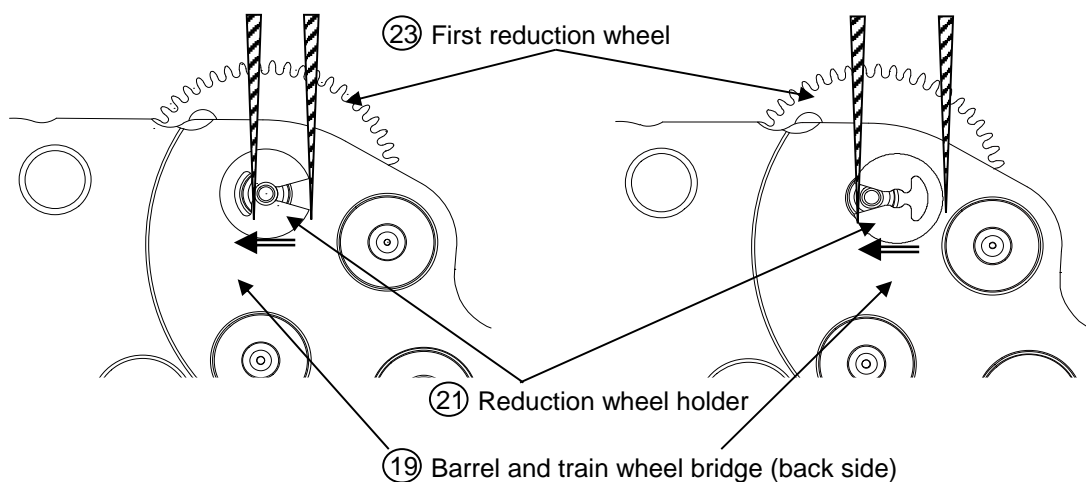


Contact part of main plate and balance stop lever

2. Disassembling / assembling of the First reduction wheel

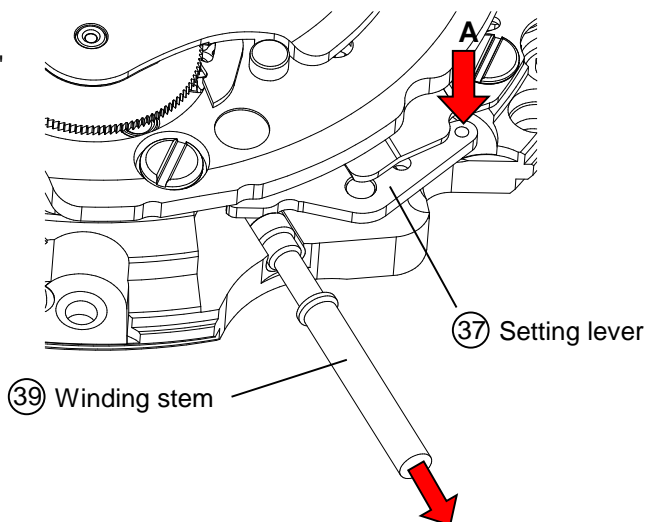
<< Disassembling >>

<< Assembling >>



3. Disassembling of the winding stem

- 1) Set the winding stem to the normal position
- 2) Pull out the winding stem, while pushing "A"

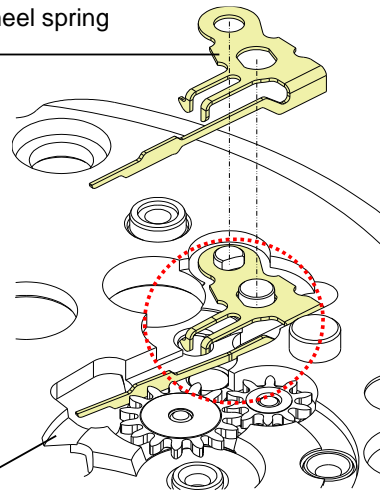
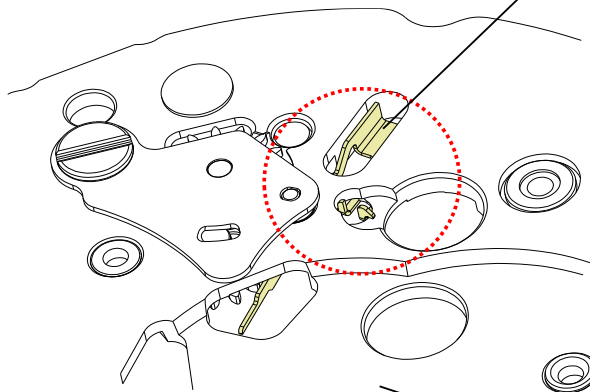


4. Disassembling / assembling of the Sliding crown wheel spring

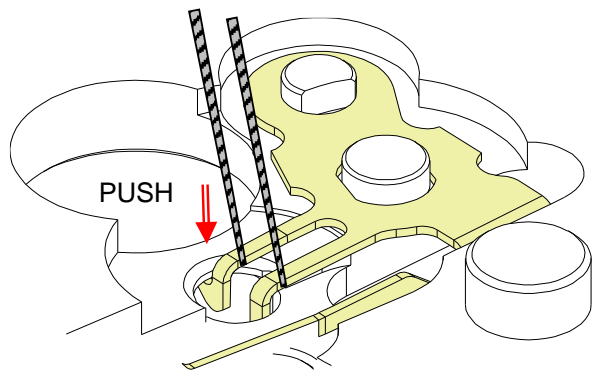
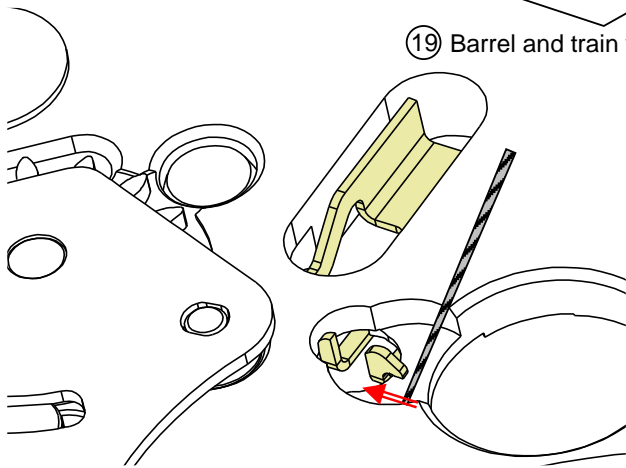
<< Disassembling >>

<< Assembling >>

⑳ Sliding crown wheel spring



㉑ Barrel and train wheel bridge with hole jewel frame

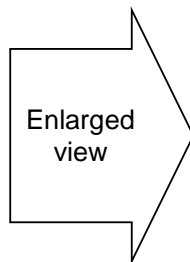
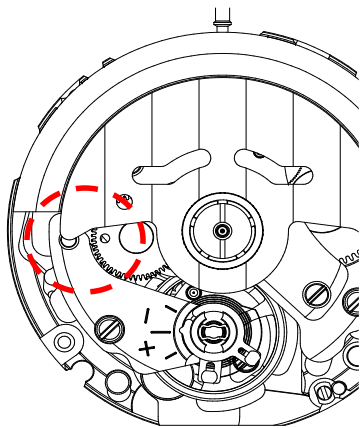


Remove the hook of the Sliding crown wheel spring from the Barrel and train wheel bridge with hole jewel frame.

Set the part to the Barrel and train wheel bridge and push the hook from the top with tweezers so that it will be engaged securely.

5. Setting position of Oscillating weight

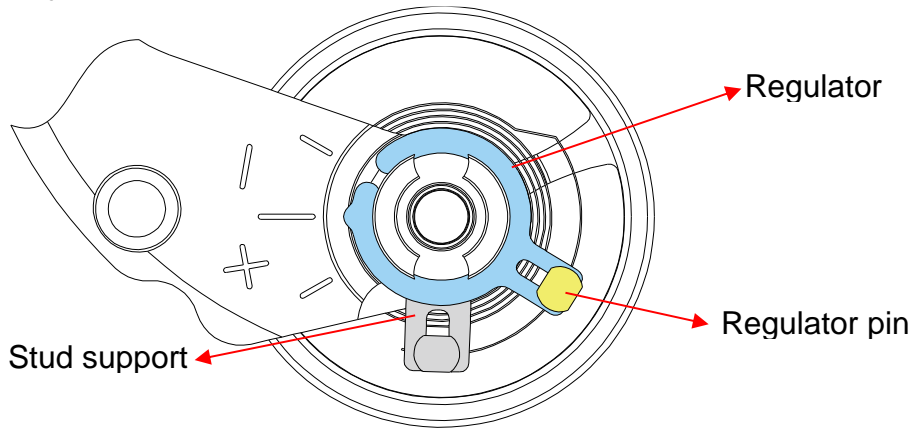
When fixing the Oscillating weight, an alignment with the First reduction wheel is necessary in order to wind the Mainspring most efficiently. Rotate the First reduction wheel manually until its hole aligns with the gilt dot on the Balance cock and set the Oscillating weight vertically at the stem side, and then tighten the screw. Refer to the figure below.



Balance cock guide pin

First reduction wheel gear

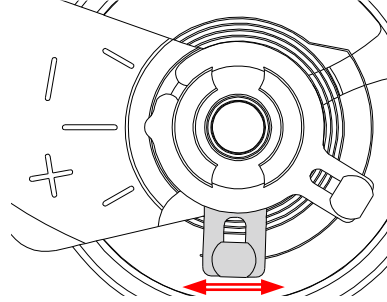
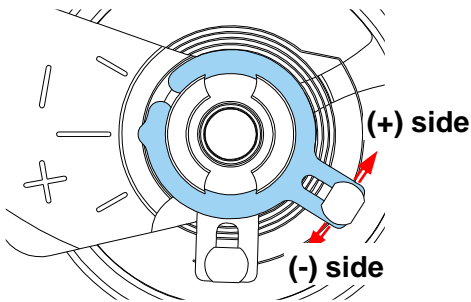
6. Accuracy adjustment



Note:

•Regulator ... Time adjustment

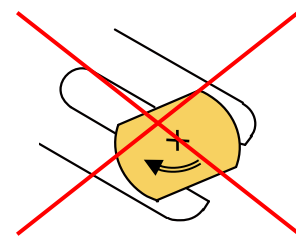
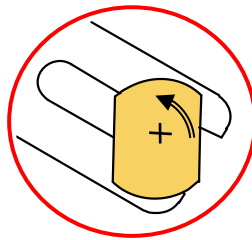
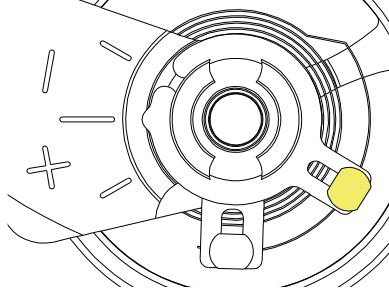
•Stud support ... Beat error adjustment



•Regulator pin ... Gap adjustment of Balance spring and Regulator pin

Counterclockwise rotation

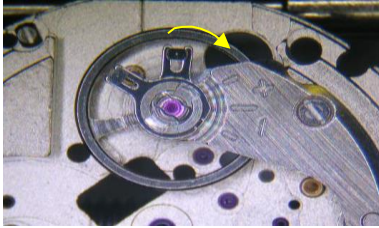
No clockwise rotation



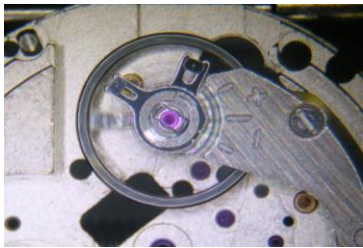
● How to remove and install the Balance complete with stud

How to remove

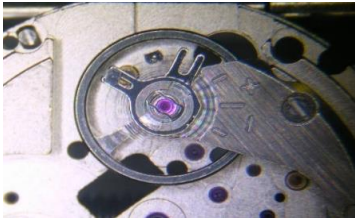
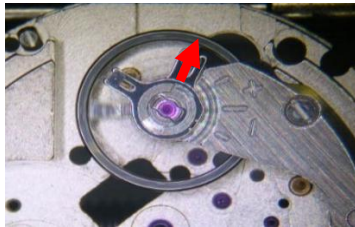
1. Initial phase
Move the stud support toward the arrow marked direction until it touches the balance cock.



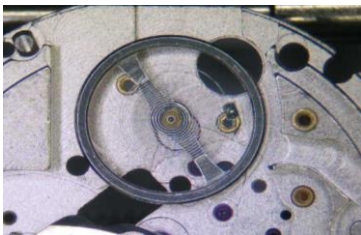
2. Make sure that the outer coil is not removed from the regulator arm.



3. Using sturdy tweezers, push the stud outward from the direction of the arrow shown in the illustration until it is removed from the stud support.

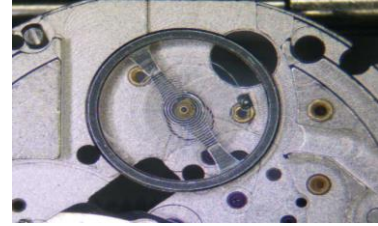


4. Unscrew the Balance cock screw and remove the Balance cock.

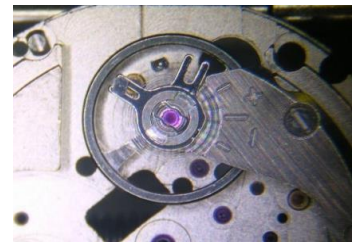


How to install

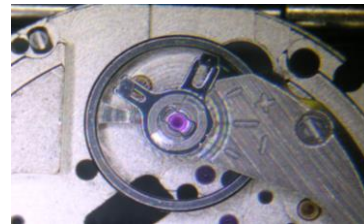
1. Initial phase
Set a new balance complete with stud to the main plate.



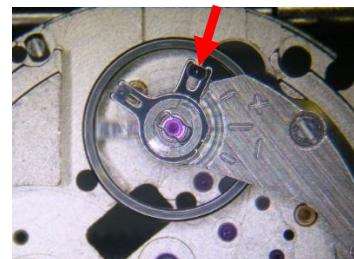
2. Set the Balance cock and tighten the balance cock screw.



3. Temporarily set the stud to the stud support. Make sure that the balance spring passes outside the regulator pin.
* Be careful not to damage the balance spring.



4. Using sturdy tweezers, set the stud to the stud support and press it down. Make sure that the outer coil passes through the regulator pin slot.
* Be careful not to damage the balance spring.



● How to regulate the isochronous fault by adjusting the position of the balance-spring

This caliber has the Etachron system for fine regulation of the isochronous fault. The watch shows a gain trend as amplitude decreases and loses time badly near the end of its useful power reserve. The isochronous fault can be adjusted easily by turning the Regulator pin to make the gap in the slot either larger or smaller.

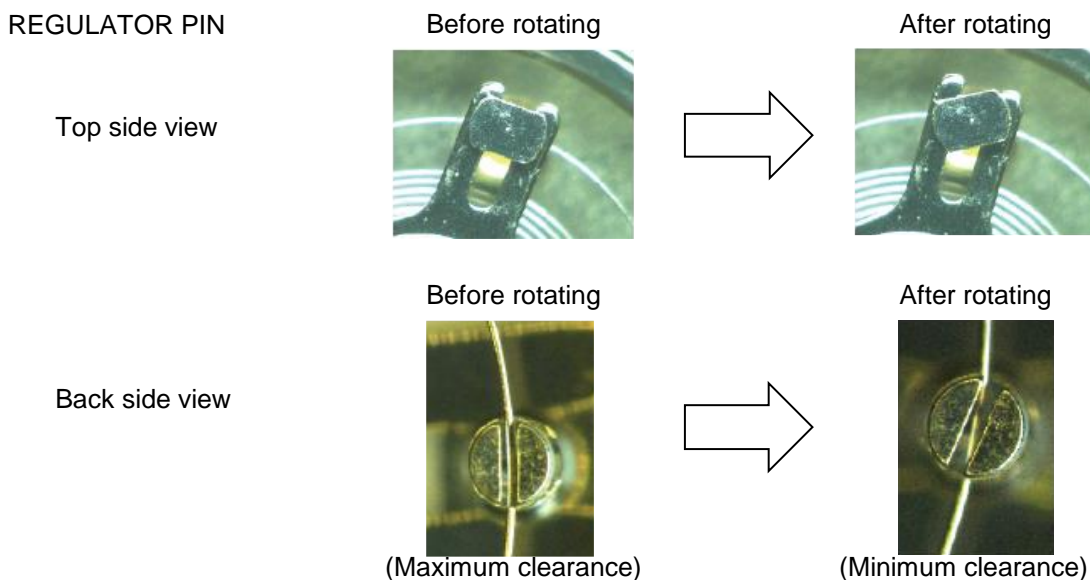
- 1) Make sure that the Regulator pin is aligned in a vertical position to the Regulator and the balance-spring passes parallel through the slot of the Regulator pin before fine-tuning the STUD and the Regulator pin.



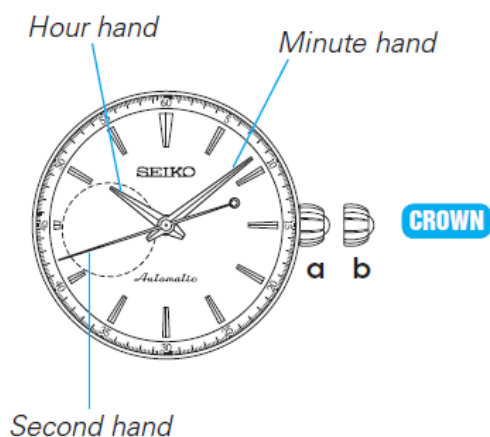
- 2) Rotate the STUD in order to align the position of the balance-spring passes through the center of the slot of the Regulator pin.



- 3) Rotate the REGULATOR PIN counterclockwise in order to fine-tune the clearance of the balance-spring passing through the slot of it. Set it to moderate gap to get the stable trend.



【4R71A Operation Manual】



1. How to set the time

- 1) Pull out the crown to the first click when the second hand is at the 12 o'clock position.
(The second hand stops on the spot.)
- 2) Turn the crown to set the hour and minute hands to the correct time.
 - * Do not set the date between 9:00 p.m. and 4:00 a.m. If you do, the date may not change properly / it may cause a malfunction.
- 3) Push the crown back in to the normal position in accordance with a time signal.

2. How to wind up the mainspring

- a) Manual winding ... Slowly turn the crown clockwise at normal position.
 - * If you wind by turning the ratchet wheel screw 8 times, it will start to move naturally after shaking slightly.
- b) Winding up with the winding machine.
Full wind up conditions are as follows:
 - Rotary speed : 30 rpm
 - Operating time : 60 minutes

● **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		15 BAR
WATER RESIST 20BAR	Condensation test	20 BAR
SCUBA DIVERIS (AIR DIVERIS) 150 m	Condensation test	$18.75 \text{ BAR} = 150(\text{m}) \times 0.125$
SCUBA DIVERIS (AIR DIVERIS) 200 m		$25 \text{ BAR} = 200(\text{m}) \times 0.125$
He-GAS DIVERIS 300 m	Water pressure test	$37.5 \text{ BAR} = 300(\text{m}) \times 0.125$
He-GAS DIVERIS 600 m		$75 \text{ BAR} = 600(\text{m}) \times 0.125$
He-GAS DIVERIS 1000m	Condensation test	$125 \text{ BAR} = 1000(\text{m}) \times 0.125$

● Accuracy test

Measure the rate in three different positions within 30 minutes after the watch is fully wound up (wait approximately for 5 minutes after winding up in order to get a stable oscillation of the balance) and make sure the value shows within the range in the table below.

Measure the rate in dial-up position after 24 hours from fully wound up (T24) and check the rate difference with the rate in dial-up position when it is fully wound up (T0). Make sure that the value of T24-T0 shows within the range of the isochronism in the table below.

Standard rate for measurement	Testing positions	Instantaneous rate at T0 (Fully wound condition)			Isochronous fault
		Dial upward	6 o'clock at the top	9 o'clock at the top	Dial upward
	Measurement (Daily rate in seconds : s/d)	± 20 s/d	± 30 s/d	± 30 s/d	±30 s/d

● Accuracy of Mechanical Watches

- ❖ The accuracy of mechanical watches is indicated by the daily rates of one week or so.
- ❖ The accuracy of mechanical watches may not fall within the specified range of time accuracy because of loss/gain changes due to the conditions of use, such as the length of time during which the watch is worn on the wrist, arm movement, whether the mainspring is wound up fully or not, etc.
- ❖ The key components in mechanical watches are made of metals which expand or contract depending on temperatures due to metal properties. This exerts an effect on the accuracy of the watches. Mechanical watches tend to lose time at high temperatures while they tend to gain time at low temperatures.
- ❖ In order to improve accuracy, it is important to regularly supply energy to the balance that controls the speed of the gears. The driving force of the mainspring that powers mechanical watches varies between when it is fully wound and immediately before it is unwound. As the mainspring unwinds, the force weakens. Relatively steady accuracy can be obtained by wearing the watch on the wrist frequently for the selfwinding type and winding up the mainspring fully everyday at a fixed time to move it regularly for the wind-up mechanical type.
- ❖ When affected by external strong magnetism, a mechanical watch may lose/gain time temporarily. The parts of the watch may become magnetized depending on the extent of the effect. In such a case, consult the retailer from whom the watch was purchased since the watch requires repair, including demagnetizing.

● Duration time test

Check the Power reserve of the watch after the r 10/16 condition with the dial-up position. Make sure that the watch runs approximately 41 hours until it stops.