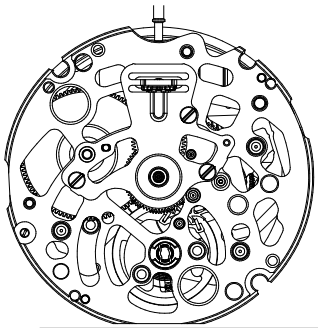
PARTS LIST / TECHNICAL GUIDE

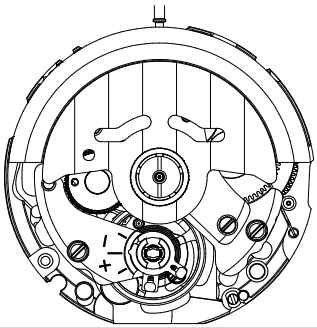
Automatic Cal.4R71A

[SPECIFICATION]

Item \ Cal. No.	4R71A







・3 Hands (Hour, Minute and Second hands)

Movement Size
・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 would 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				

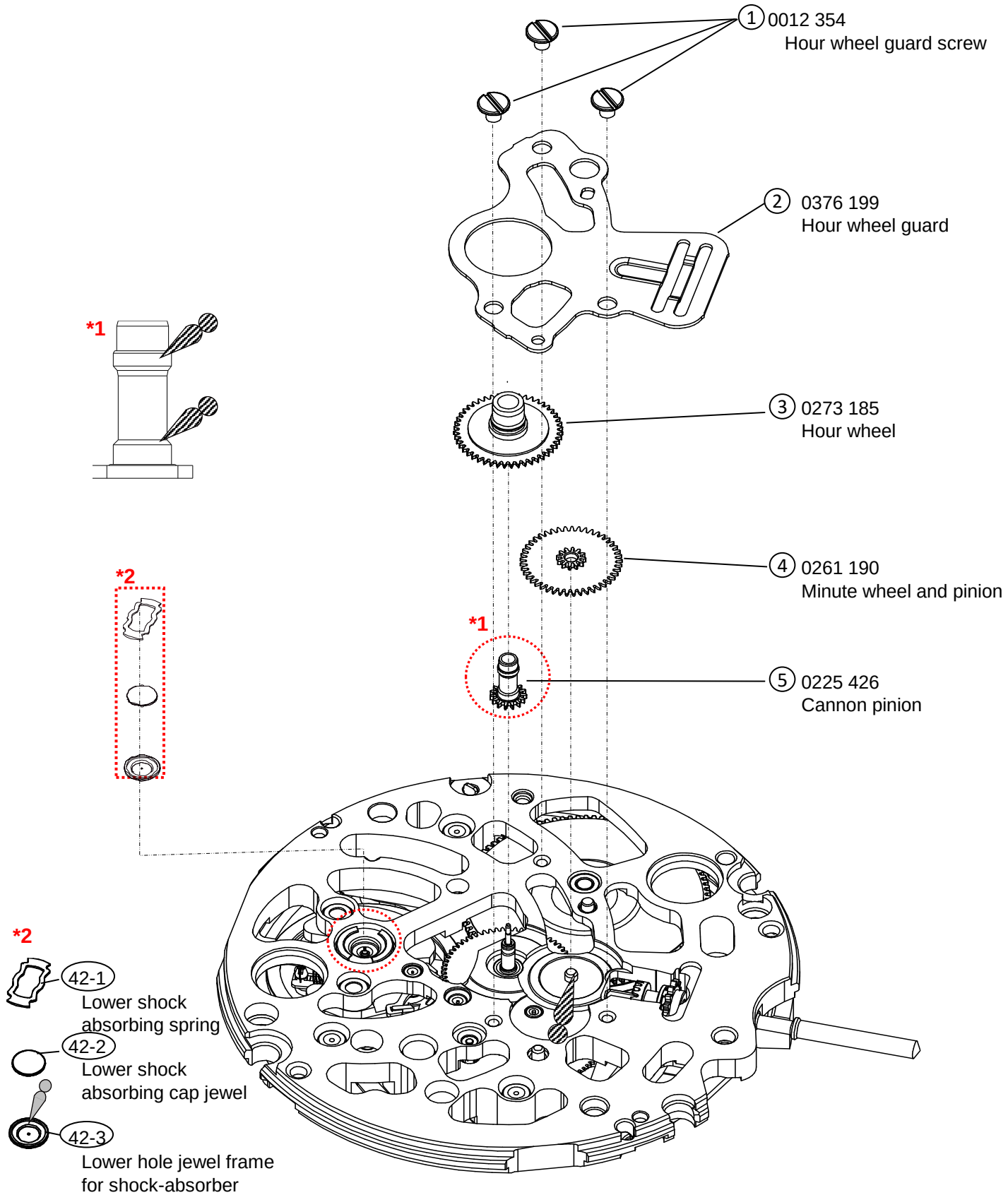
PARTS LIST

Cal. 4R71A

Type of oil
AO-3(Moebius A)

S-6
S-4

Oil quantity mark
NORMAL QUANTITY
SUFFICIENT QUANTITY



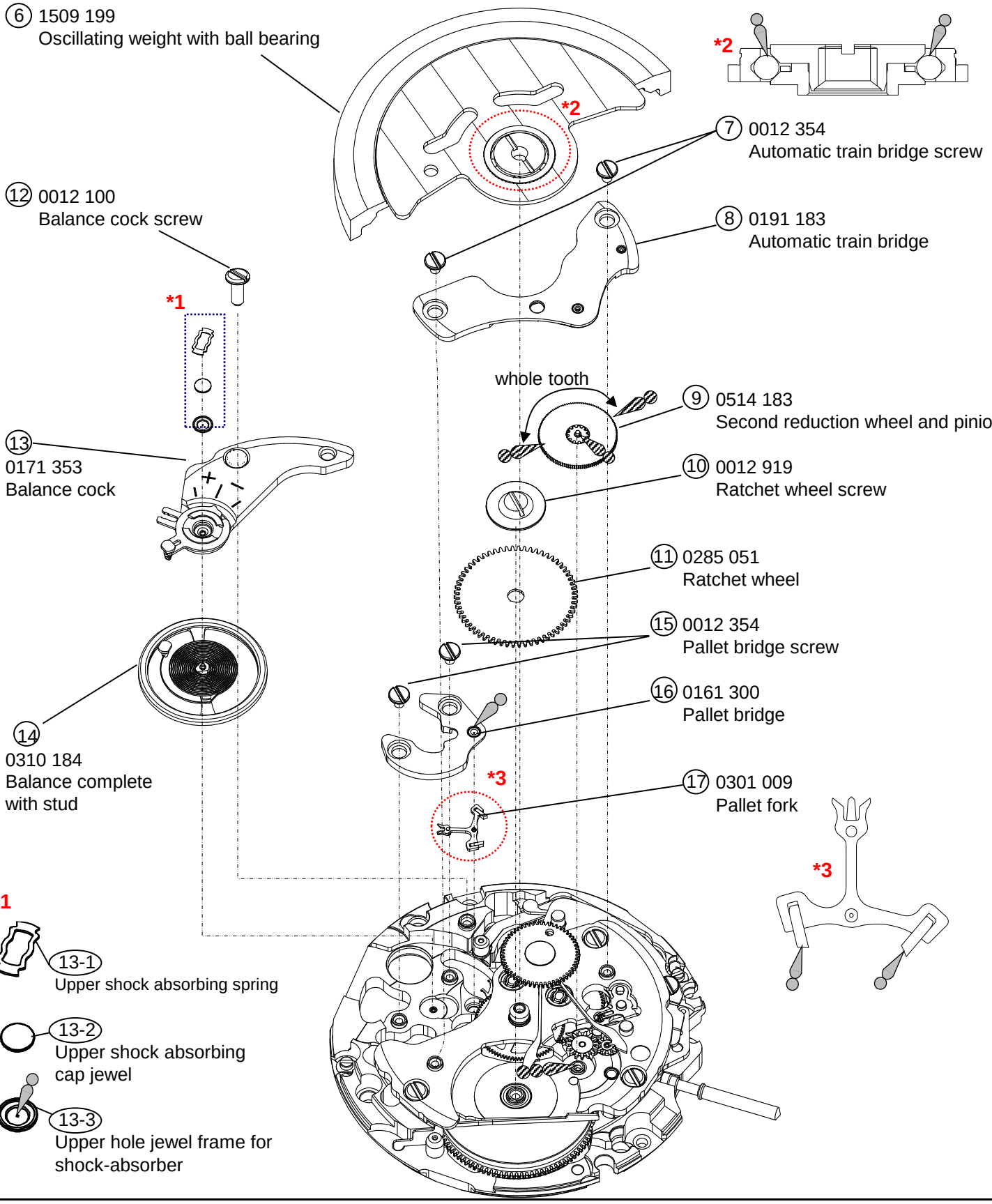
PARTS LIST

Cal. 4R71A

Type of oil
AO-3(Moebius A)

S-6
S-4

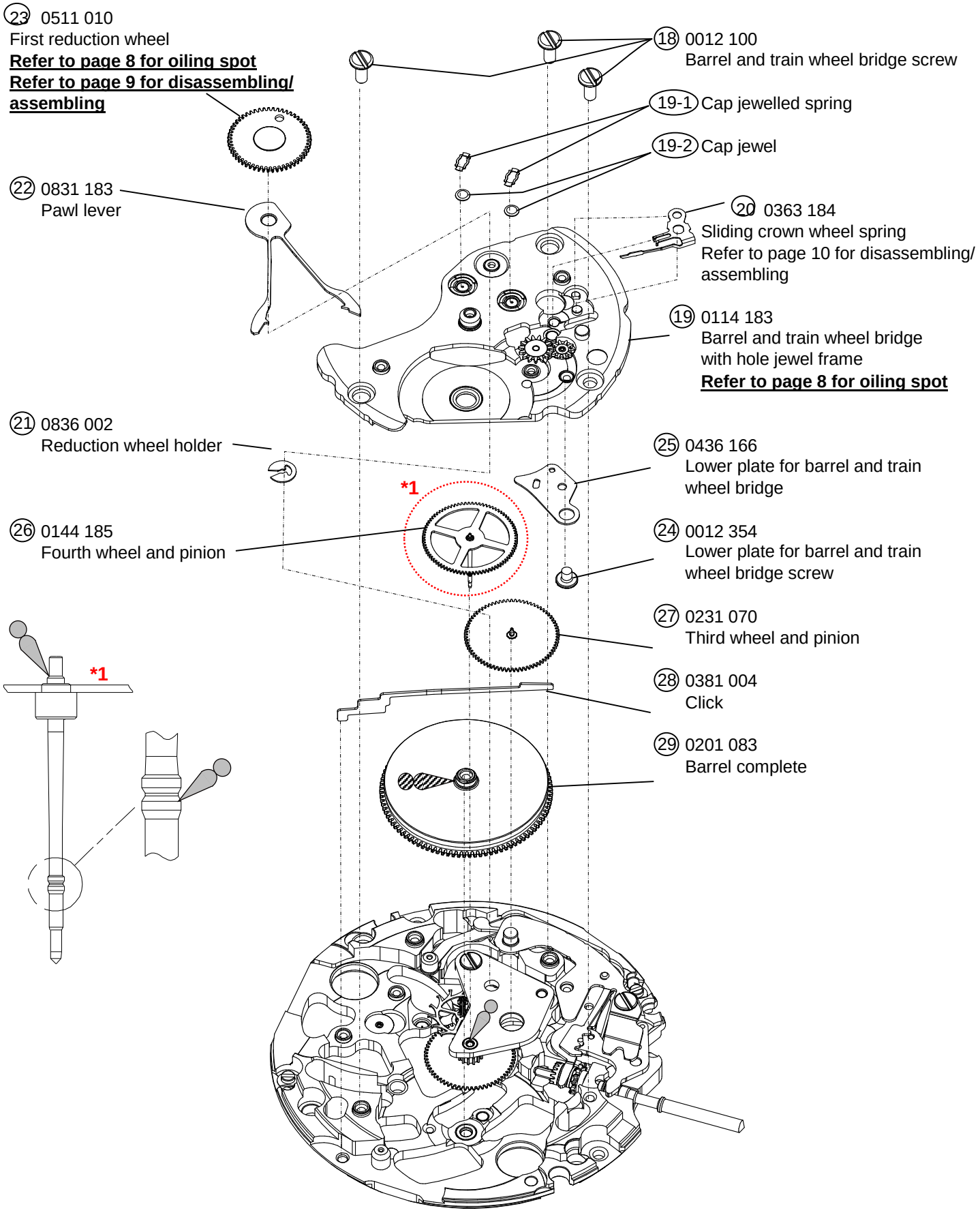
Oil quantity mark
NORMAL QUANTITY
SUFFICIENT QUANTITY



PARTS LIST

Cal. 4R71A

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



(23) 0511 010
First reduction wheel
Refer to page 8 for oiling spot
Refer to page 9 for disassembling/ assembling

(22) 0831 183
Pawl lever

(21) 0836 002
Reduction wheel holder

(26) 0144 185
Fourth wheel and pinion

(18) 0012 100
Barrel and train wheel bridge screw

(19-1) Cap jewelled spring

(19-2) Cap jewel

(20) 0363 184
Sliding crown wheel spring
Refer to page 10 for disassembling/ assembling

(19) 0114 183
Barrel and train wheel bridge with hole jewel frame
Refer to page 8 for oiling spot

(25) 0436 166
Lower plate for barrel and train wheel bridge

(24) 0012 354
Lower plate for barrel and train wheel bridge screw

(27) 0231 070
Third wheel and pinion

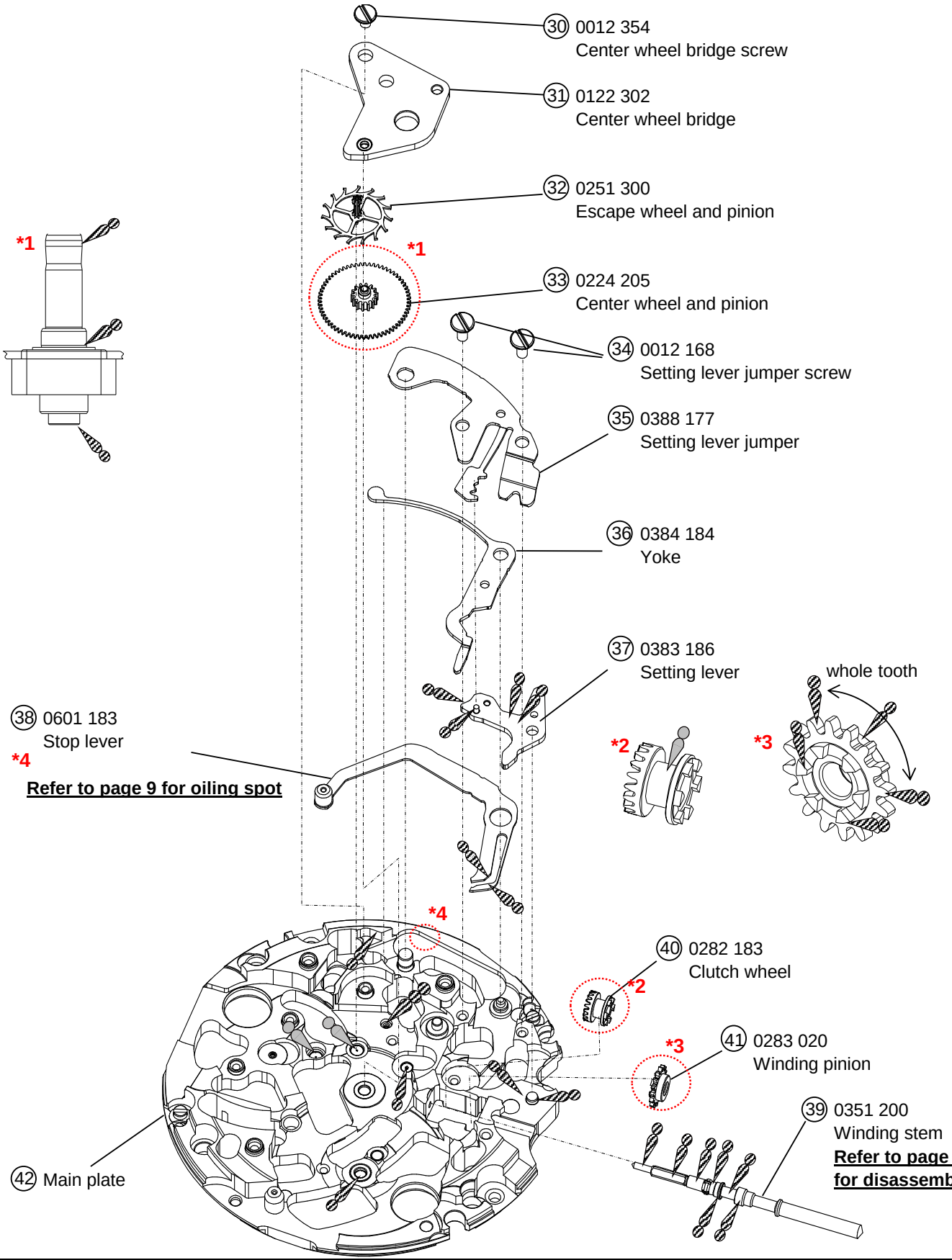
(28) 0381 004
Click

(29) 0201 083
Barrel complete

PARTS LIST

Cal. 4R71A

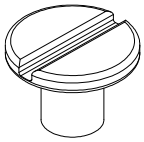
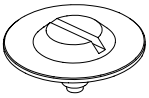
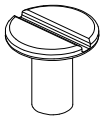
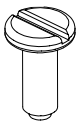
Type of oil
AO-3(Moebius A)
S-6
S-4
Oil quantity mark
NORMAL QUANTITY
SUFFICIENT QUANTITY



PARTS LIST

Cal. 4R71A

● LIST OF SCREWS

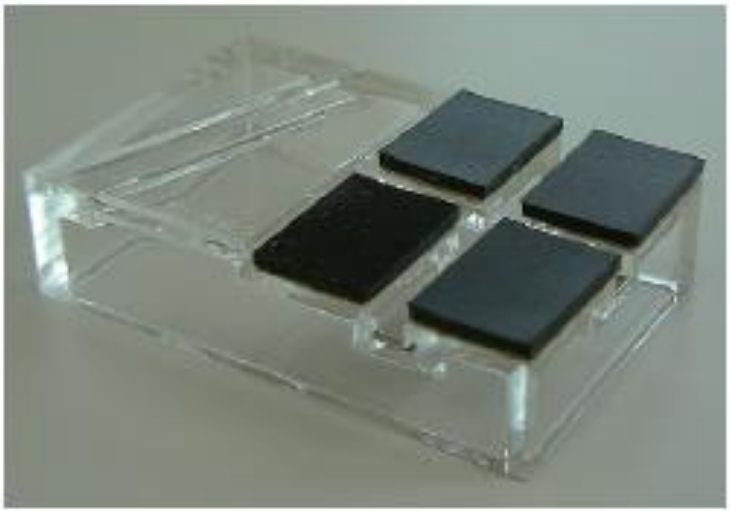
Parts No	Name	Parts No	Name	Parts No	Name
0012 354 	① Hour wheel guard screw (×3) ⑦ Automatic train wheel bridge screw (×2) ⑮ Pallet bridge screw (×2) ㉔ Lower plate for barrel and train wheel bridge screw ㉚ Center wheel bridge screw	**0012 919** 	⑩ Ratchet wheel screw	**0012 168** 	㉞ Setting lever jumper screw (×2)
		0012 100 	⑫ Balance cock screw ⑱ Barrel and train wheel bridge screw (×3)		

● 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			

● 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

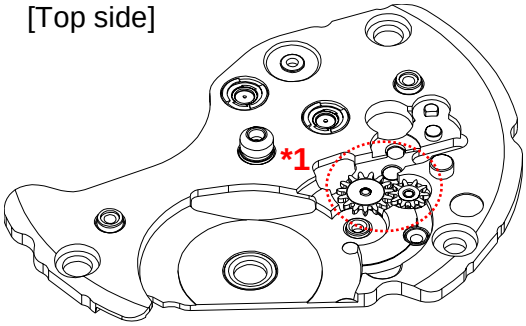


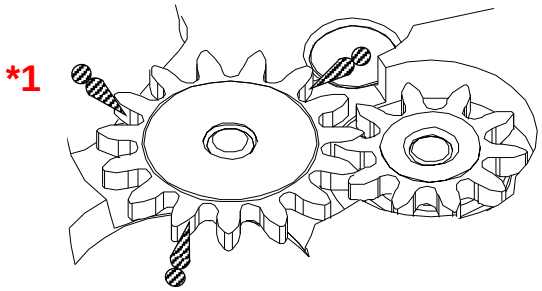
Type of oil		Oil quantity mark
AO-3(Moebius A)	S-6 S-4	NORMAL QUANTITY SUFFICIENT QUANTITY

1. Oiling spot

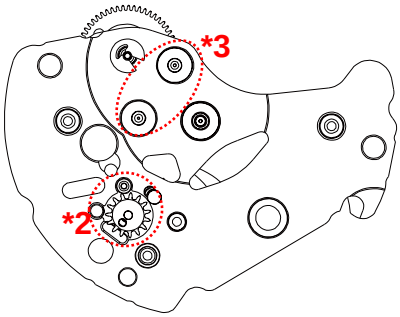
⑲ Barrel and train wheel bridge

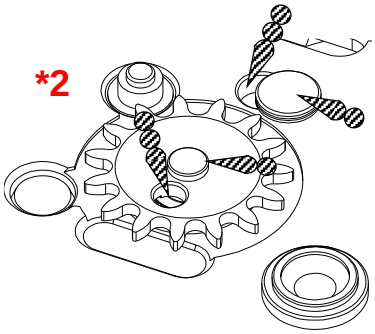
[Top side]

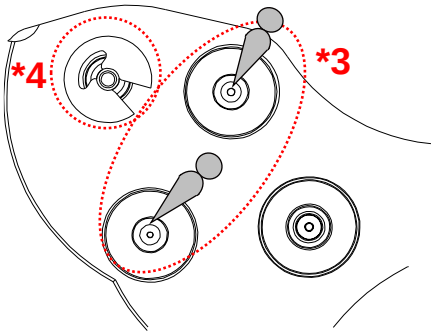




[Back side]

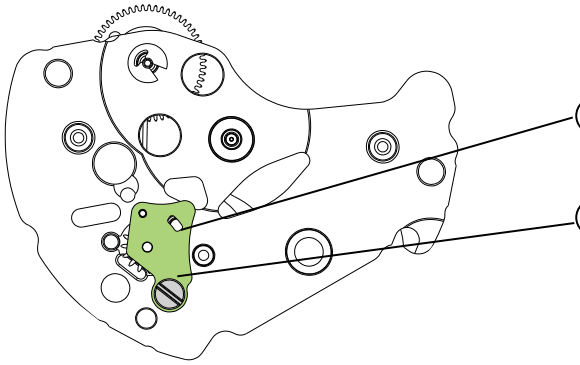






Note:

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

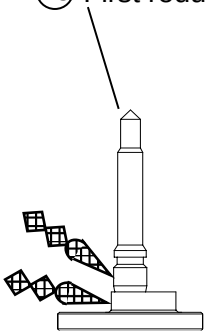


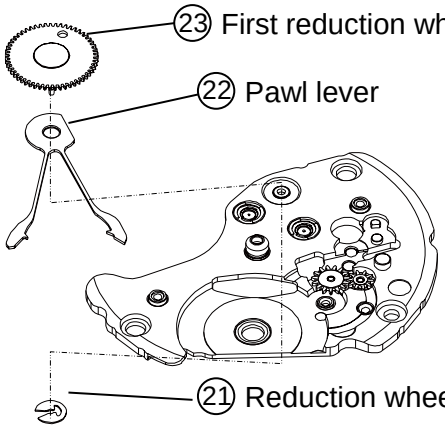
⑮ Lower plate for barrel and train wheel bridge

⑭ Lower plate for barrel and train wheel bridge screw

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

⑬ First reduction wheel



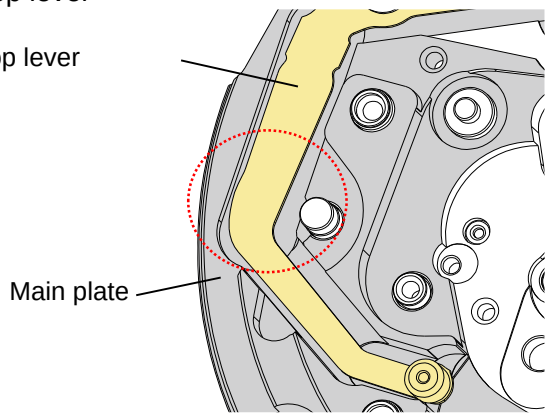


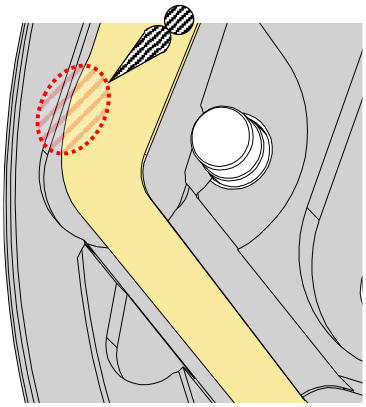
⑬ First reduction wheel

⑫ Pawl lever

⑪ Reduction wheel holder

㊳ Stop lever

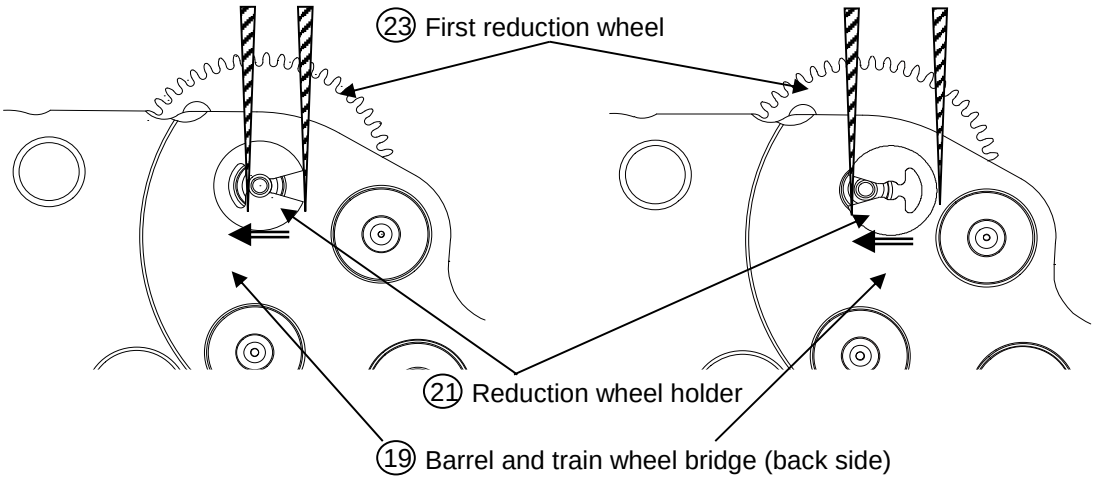




Contact part of main plate and balance stop lever

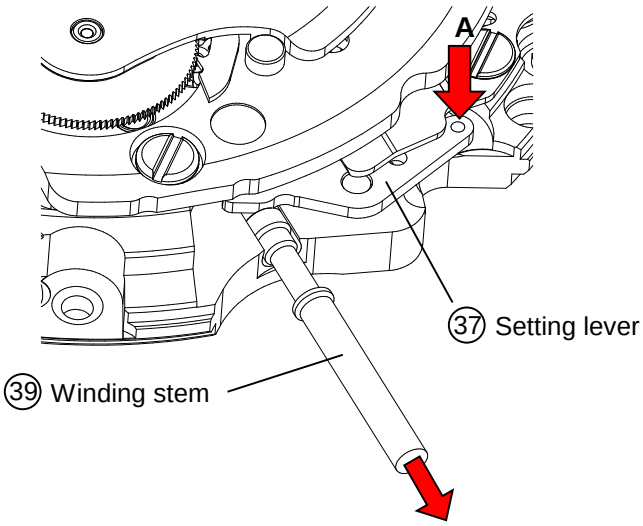
2. Disassembling / assembling of the First reduction wheel

<< Disassembling >> **<< Assembling >>**



3. Disassembling of the winding stem

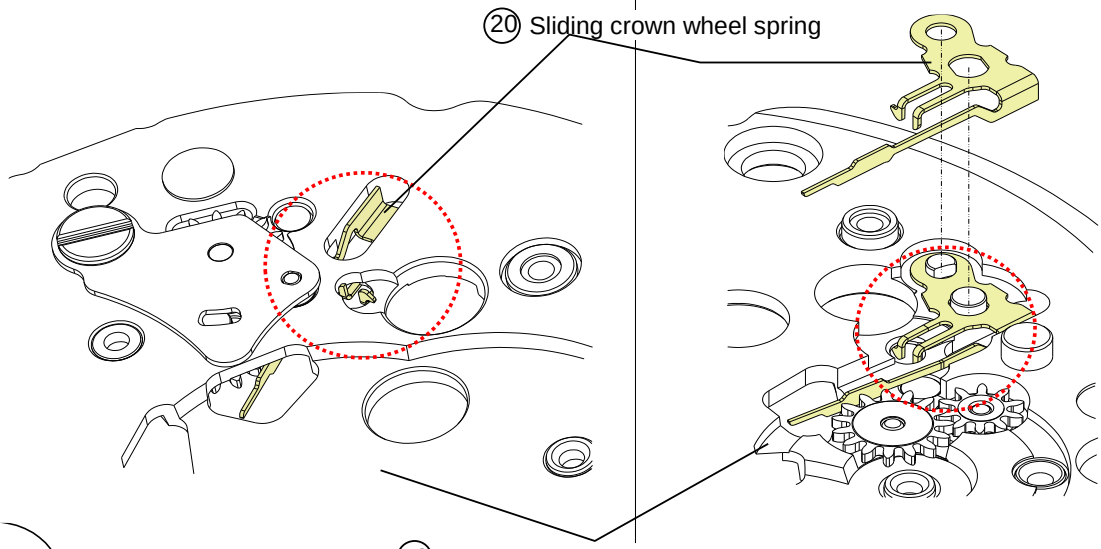
1) Set the winding stem to the normal position
2) Pull out the winding stem, while pushing "A"

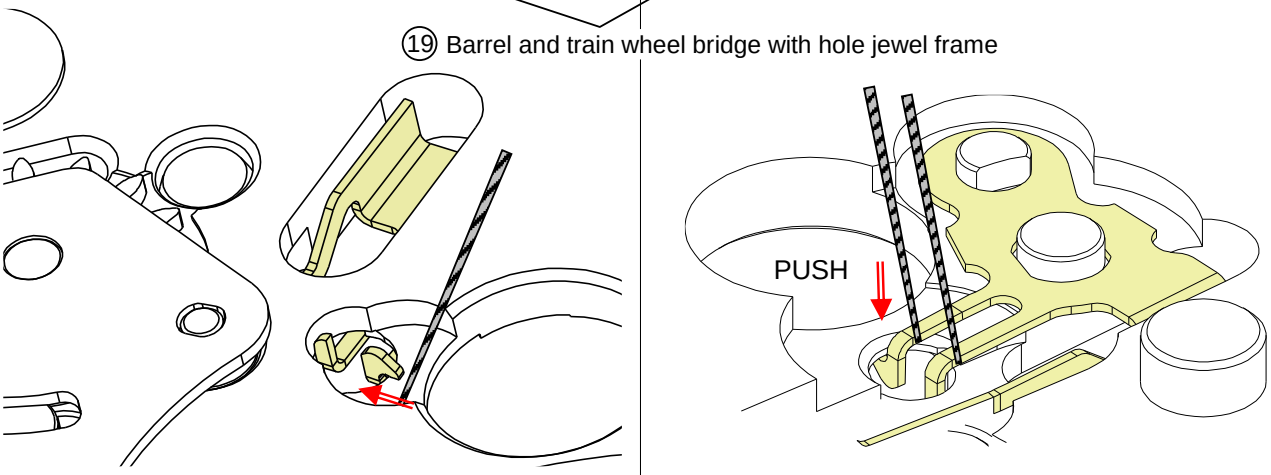


4. Disassembling / assembling of the Sliding crown wheel spring

<< Disassembling >>

<< Assembling >>



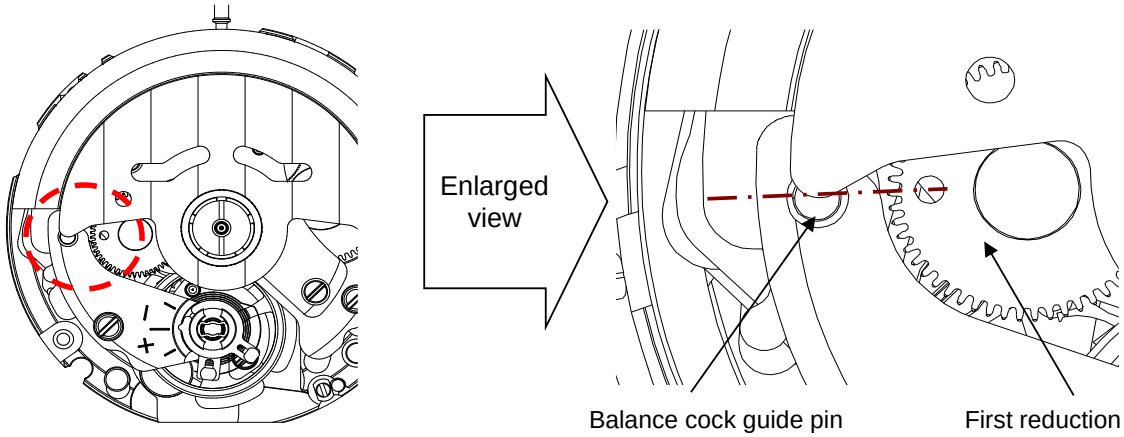


Remove the hook of the Sliding crown wheel spring from the Barrel and train wheel bridge with hole jewel frame.

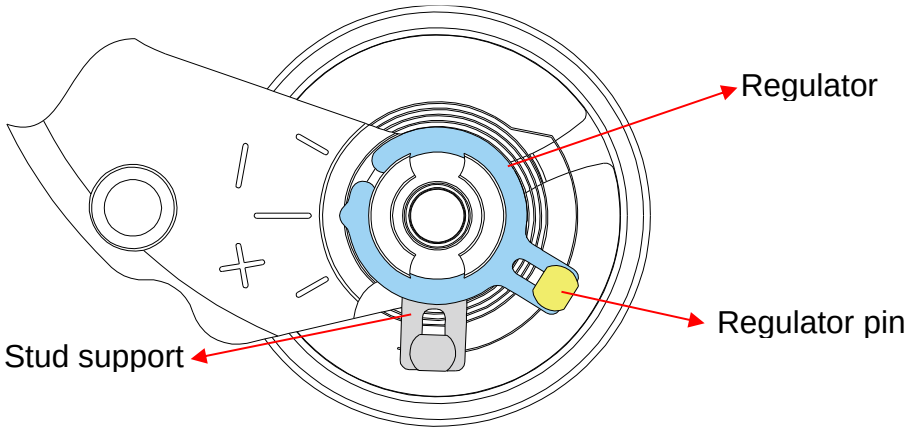
Set the part to the Barrel and train wheel bridge and push the hook from the top with tweezers so that it will be engaged securely.

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.

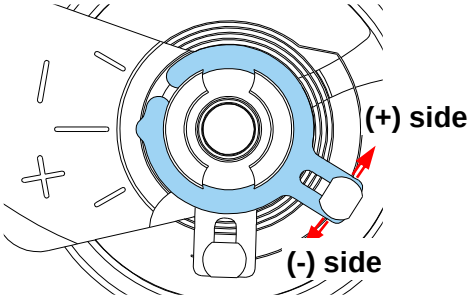


6. Accuracy adjustment

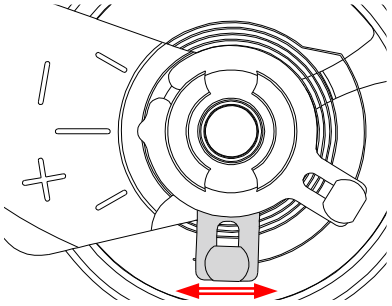


Note:

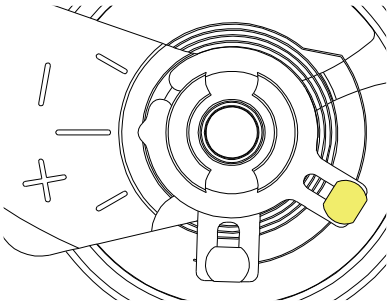
- **Regulator … Time adjustment**



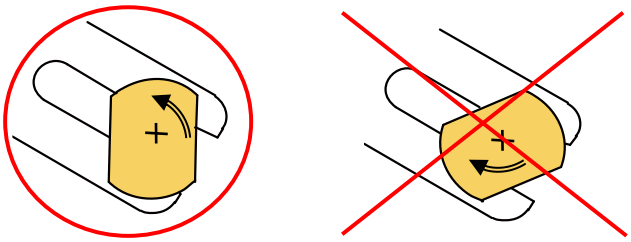
- **Stud support … Beat error adjustment**



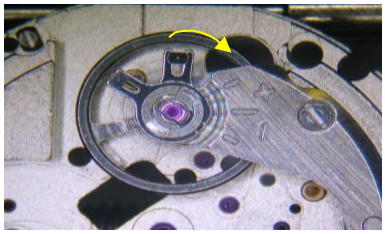
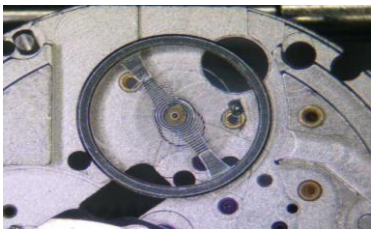
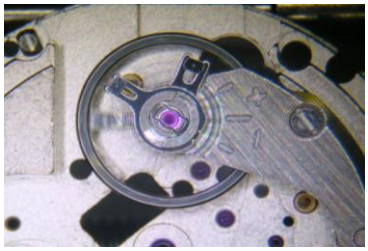
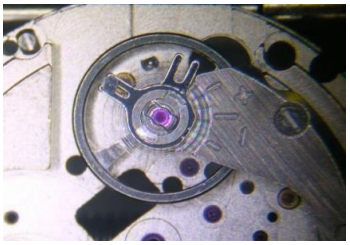
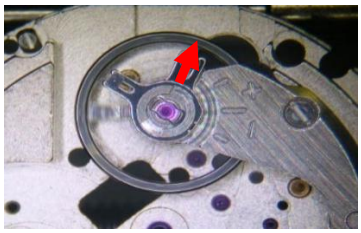
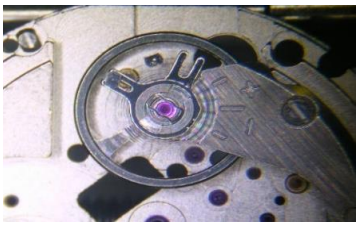
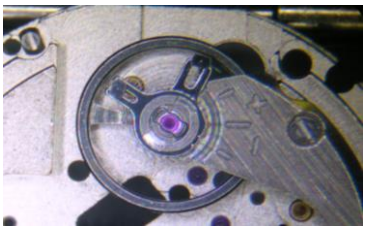
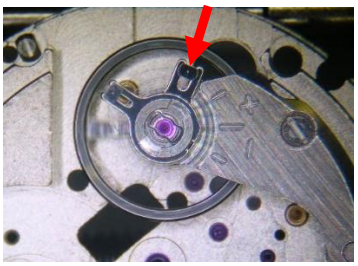
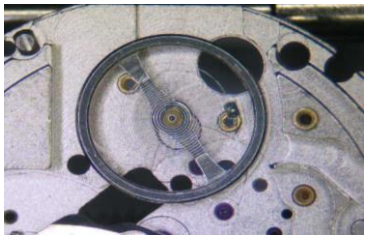
- **Regulator pin … Gap adjustment of Balance spring and Regulator pin**



Counterclockwise rotation **No clockwise rotation**



● How to remove and install the Balance complete with stud

How to remove	How to install
1. Initial phase Move the stud support toward the arrow marked direction until it touches the balance cock. 	1. Initial phase Set a new balance complete with stud to the main plate. 
2. Make sure that the outer coil is not removed from the regulator arm. 	2. Set the Balance cock and tighten the balance cock screw. 
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.  	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.  
4. Unscrew the Balance cock screw and remove the Balance cock. 	

● 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.

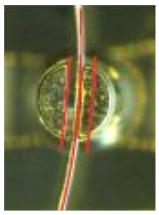
1) Make sure that the Regulator pin is aligned in a vertical position to the Regulator and the balance-spring passes parallel through the slot of the Regulator pin before fine-tuning the STUD and the Regulator pin.

REGULATOR PIN

Top side view



Back side view



Angled view



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.

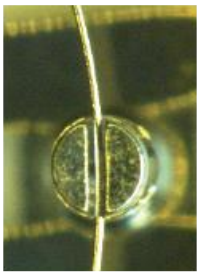
STUD

REGULATOR PIN

Top side view



Back side view

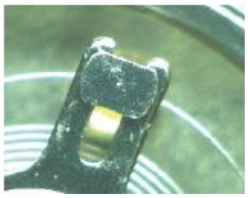


3) Rotate the REGULATOR PIN counterclockwise in order to fine-tune the clearance of the balance-spring passing through the slot of it. Set it to moderate gap to get the stable trend.

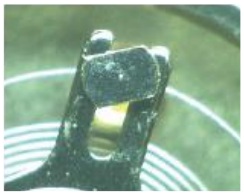
REGULATOR PIN

Top side view

Before rotating

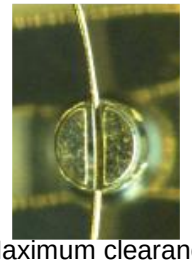


After rotating



Back side view

Before rotating



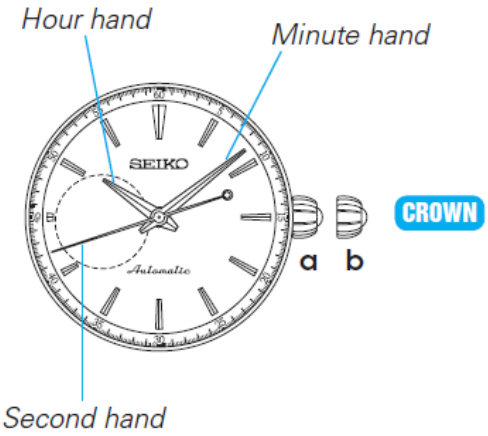
(Maximum clearance)

After rotating



(Minimum clearance)

【4R71A Operation Manual】



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

● 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.

		Instantaneous rate at T0 (Fully would condition)			Isochronous fault
Standard rate for measurement	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

● 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 controlsthe 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 loss/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 ㎡10/16
condition with the dial-up position. Make sure that the watch runs approximately 41 hours until it stops.