
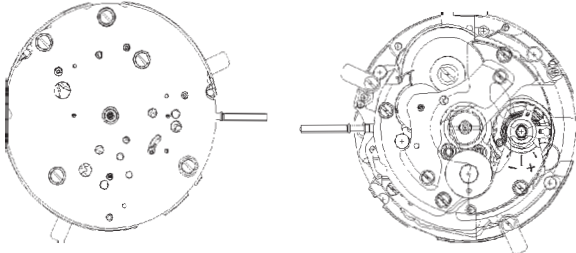
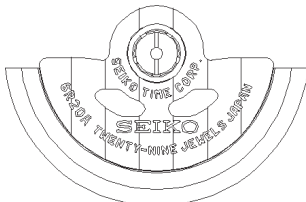


PARTS LIST/TECHNICAL GUIDE

Automatic Cal. 6R20/6R21

[SPECIFICATIONS]

Item	Cal. No.	6R20/6R21				
						
<ul style="list-style-type: none"> • 3 hands (hour, minute and second hands) • Date/Day indication • Power reserve indicator 		Movement size <ul style="list-style-type: none"> • Diameter Outside: Ø 27.4 mm • Casing: Ø 27.0 mm • Height: 6.15 mm 				
Driving system		Automatic winding with manual winding mechanism				
Time indication		<ul style="list-style-type: none"> • 3 hands (Hour, Minute and Small Second hands) • Day indicator (3 o'clock position) • Date indicator (6 o'clock position) 				
Additional function		<ul style="list-style-type: none"> • Power reserve indicator (6R20: center aspect) (6R21: 9 o'clock aspect) • Day / date correction function • Second hand stop function 				
Crown operation	Normal position	Manual winding (clockwise only)				
	1st click position	Date setting (counterclockwise) / Day setting (clockwise)				
	2nd click position	Time setting (Hour and minute) Second hand stop				
Vibration per hour		28,800 (8 beats per second)				
Loss/Gain	Daily rate worn on the wrist at temperature-range between 5 °C and 35 °C)	Between + 25 and - 15 seconds				
	Standard rate for measurement	Mainspring wind up status	Fully wind up			After 24 hours from fully wind up
		Testing positions	Dial upward: T0 (CH)	6 o'clock at the top	9 o'clock at the top	Dial upward : T24 (CH)
	Measurement (daily rate in seconds:s/d)	± 10 s/d	± 10 s/d	± 15 s/d	(Isochronism fault: T24-T0) ± 10 s/d	
Regulation system		ETACHRON system				
Lift angle of the escapment		52 °				
Power reserve		From fully wound to stoppage: Approximately 45 hours				
Number of jewels		29 jewels				

SEIKO WATCH CORPORATION

FEATURES

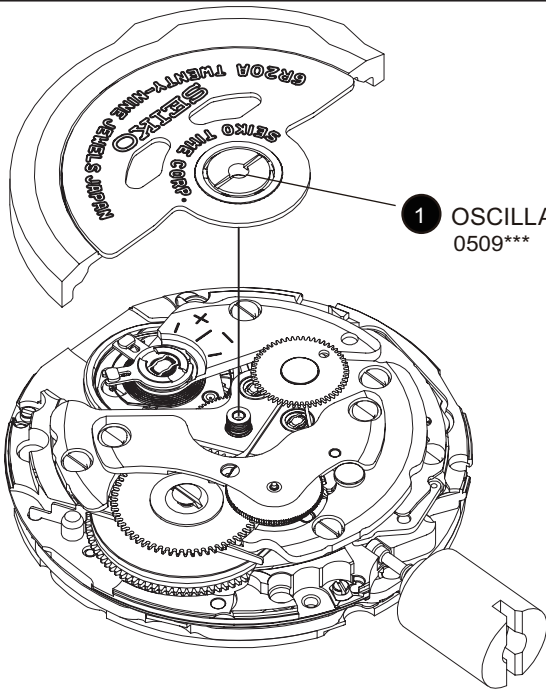
SEIKO Automatic Mechanical Cal. 6R20/6R21 is developed by a modular design combining the basic movement of the Cal. 6R15 and newly designed power reserve indicator and day-date indicator unit. Also, Cal. 6R20/6R21 is equipped with the 8 beats balance instead of the 6 beats one for Cal. 6R15.

CHARACTERISTICS OF A MECHANICAL WATCH

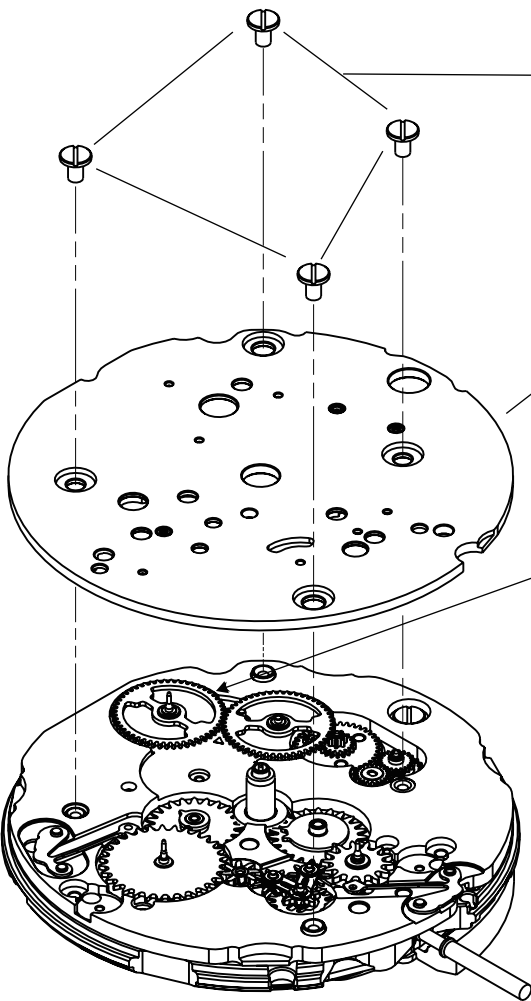
1. This mechanical watch operates using power obtained from a mainspring.
2. While loss/gain of a quartz watch is indicated by a monthly or annual rate, accuracy of a mechanical watch is normally indicated by a daily rate (loss/gain per day).
3. Normal usage accuracy of a mechanical watch varies according to conditions of use (time period that the watch is worn on the wrist, temperature environment, hand movement, and winding state of the mainspring).
4. When the watch is affected by strong magnetism, it temporarily gains or loses time. If the watch encounters a strong magnetic field, the parts of the watch may be magnetized. In this case, repairs such as removal of magnetism are required.

PARTS LIST

Cal. 6R20/6R21



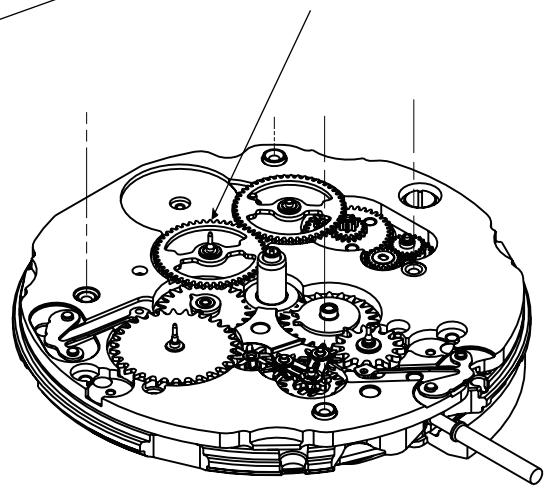
1 OSCILLATING WEIGHT
0509***



2 CALENDAR TRAIN BRIDGE
SCREW
0012201

3 CALENDAR TRAIN BRIDGE
0126030

*POWER RESERVE INDICATOR
WHEEL
1019002



6R20

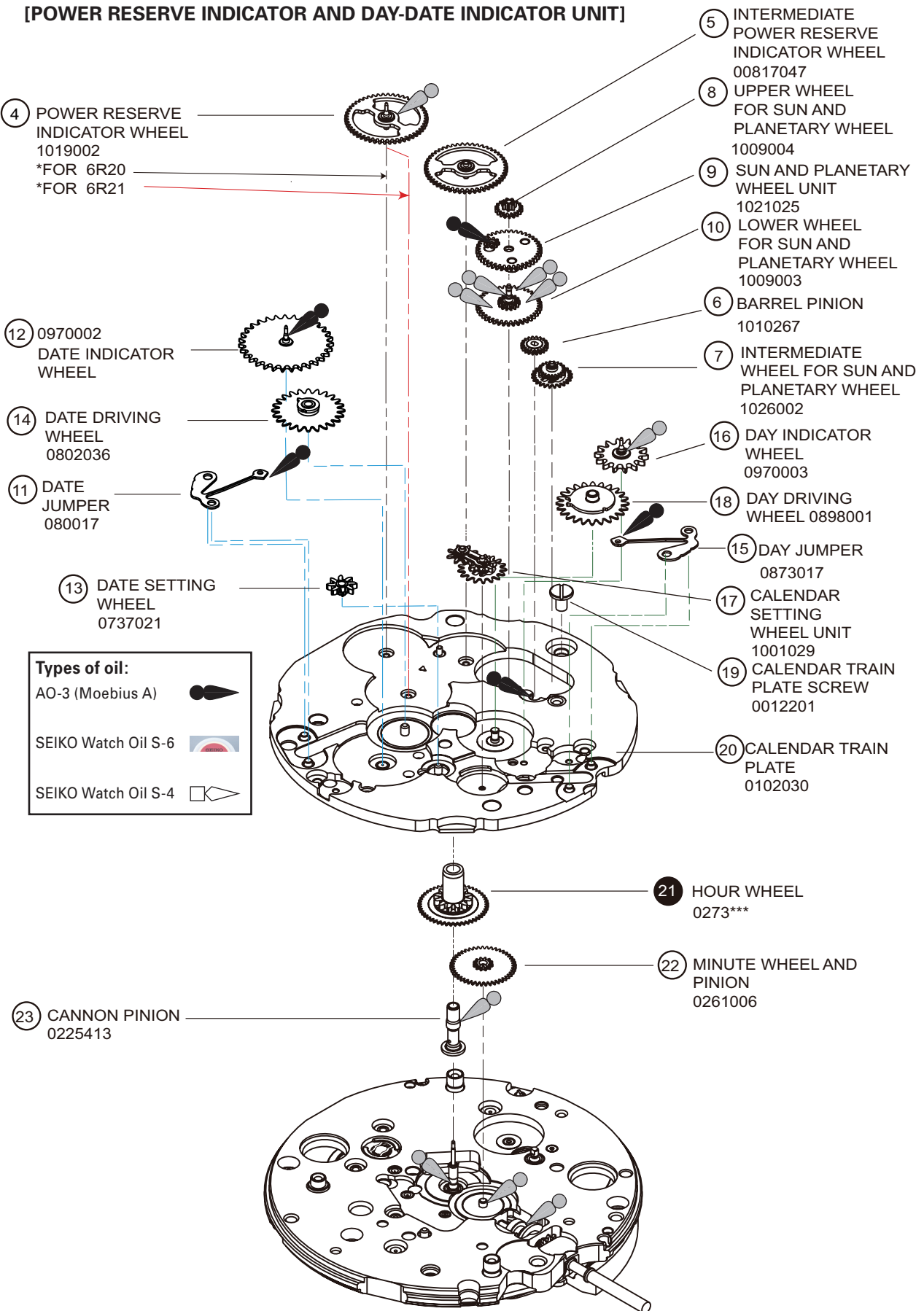
6R21

*For parts 1, refer to page 9.

PARTS LIST

Cal. 6R20/6R21

[POWER RESERVE INDICATOR AND DAY-DATE INDICATOR UNIT]



*For parts 21, refer to page 9.

PARTS LIST

Cal. 6R20/6R21

[BALANCE AND ESCAPEMENT]

24 SHOCK ABSORBING SPRING
0014577

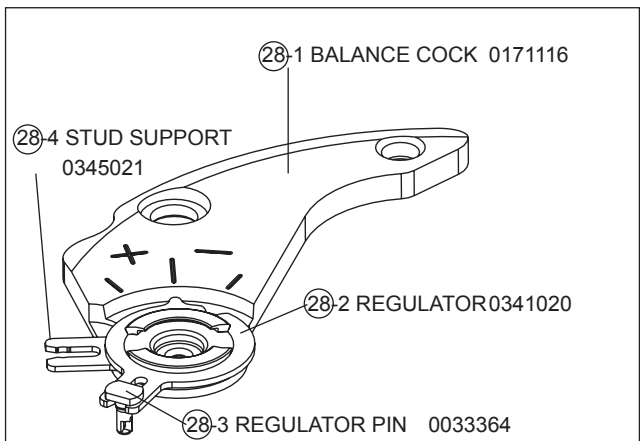
25 SHOCK ABSORBING CAP
JEWEL 0011220

27 BALANCE COCK SCREW
0012420

26 HOLE JEWEL
FRAME FOR SHOCK
ABSORBER 0014295

28 BALANCE COCK
WITH
REGULATOR
0171198

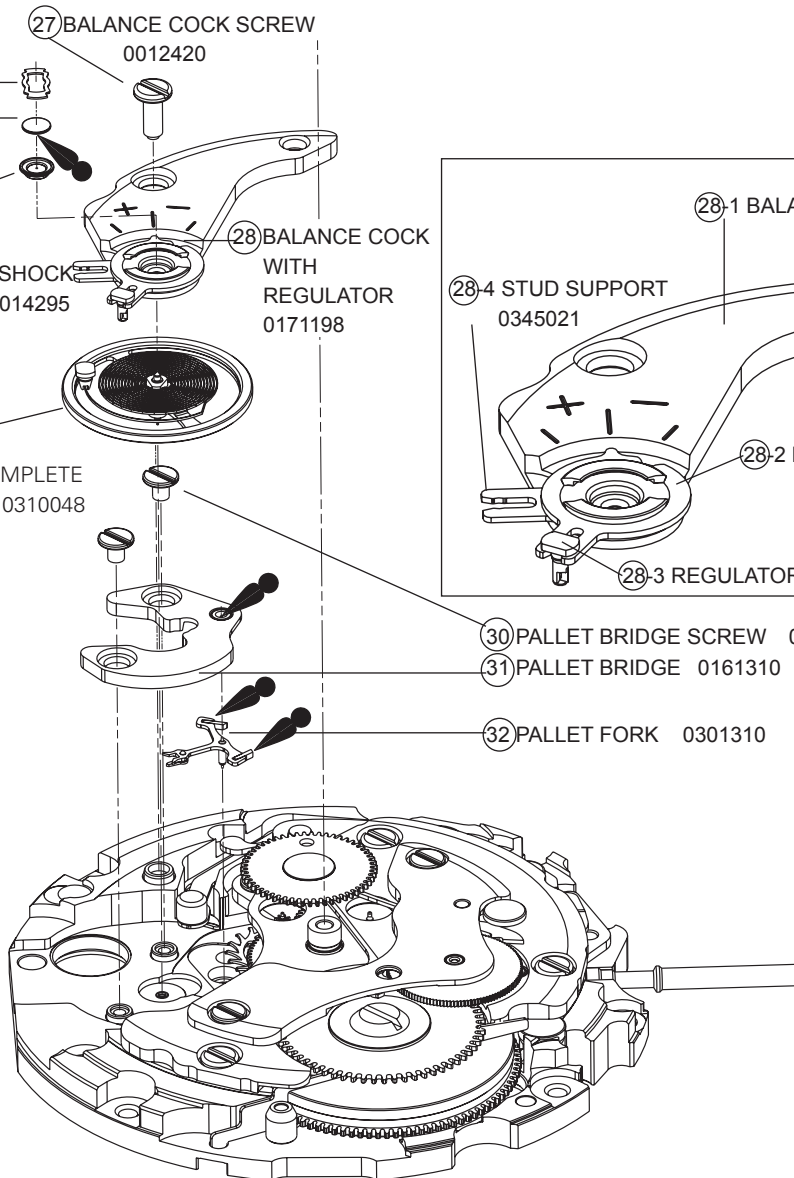
29 BALANCE COMPLETE
(WITH STUD) 0310048



30 PALLET BRIDGE SCREW 0012354

31 PALLET BRIDGE 0161310

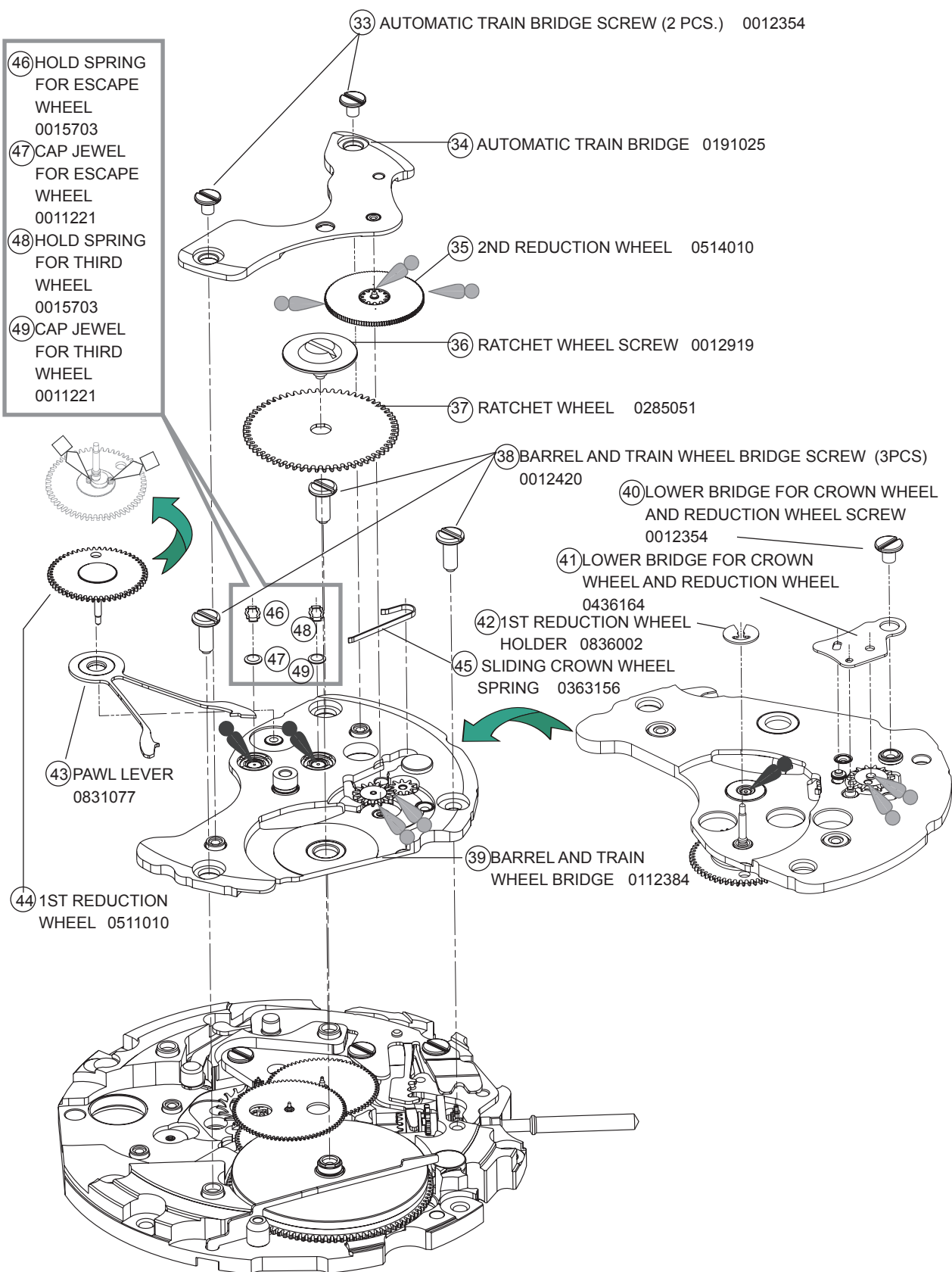
32 PALLET FORK 0301310



PARTS LIST

Cal. 6R20/6R21

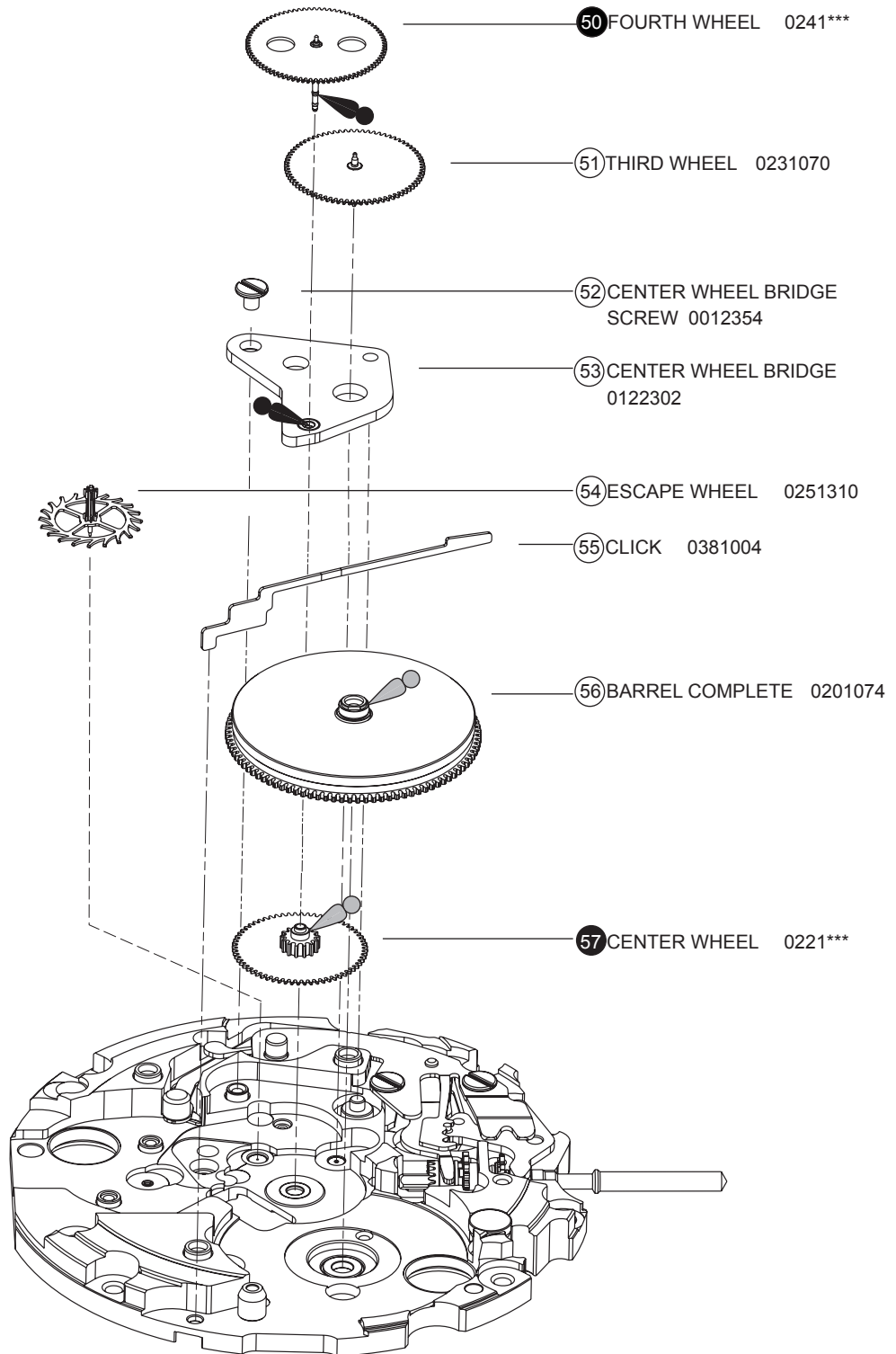
[WINDING MECHANISM]



PARTS LIST

Cal. 6R20/6R21

[GEAR TRAIN MECHANISM]

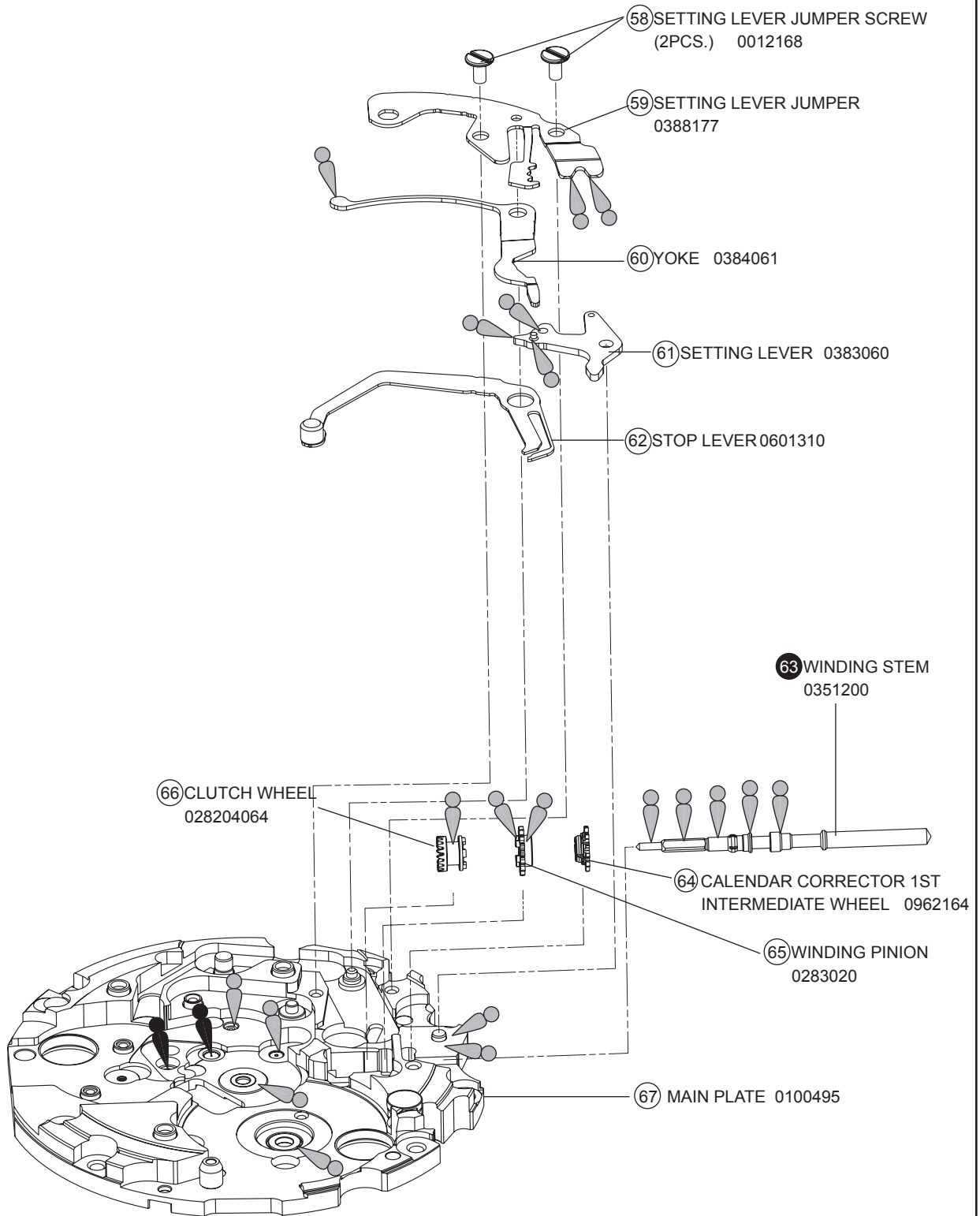


*For parts 50 and 57, refer to page 10.

PARTS LIST

Cal. 6R20/6R21

[SETTING MECHANISM]



* For parts 63, refer to page 10.

PARTS LIST

Cal. 6R20/6R21

● **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.

- ① OSCILLATING WEIGHT
 - 6R20 0509266
 - 6R21 0509281
 - 0509293 (for ANANTA)

- ⑥③ WINDING STEM 0351200

* For screw down crown models, the stem is assembled to the crown and is not available separately.

- ②① HOUR WHEEL 0273***
- ⑤① FOURTH WHEEL 024***
- ⑤⑦ CENTER WHEEL 022***

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 3 is printed on the DIAL.

	②① HOUR WHEEL	⑤① FOURTH WHEEL	⑤⑦ CENTER WHEEL
2	0273029	0247216	0221085

Example:



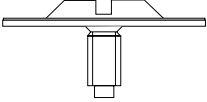
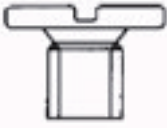
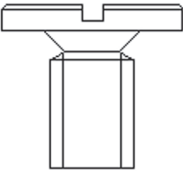


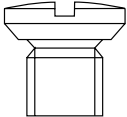
6R21-00C0

T2
↳ Hand installation height

PARTS LIST

Cal. 6R20/6R21

CROSS-SECTION VIEW OF THE SCREW PARTS

Parts code	Parts name
 <p>0012 919</p>	<p>③⑥ RATCHET WHEEL SCREW</p>
 <p>0012 354</p>	<p>④⑩ LOWER BRIDGE FOR CROWN WHEEL AND REDUCTION WHEEL SCREW ⑤② CENTER WHEEL BRIDGE SCREW ③⑩ PALLET COCK SCREW (2 pcs) ③③ AUTOMATIC TRAIN WHEEL SCREW (2 pcs)</p>
 <p>0012 201</p>	<p>② CALENDAR TRAIN BRIDGE SCREW (4 pcs) ①⑨ CALENDAR TRAIN PLATE SCREW</p>
 <p>0012 168</p>	<p>⑤⑧ SETTING LEVER JUMPER SCREW (2 pcs)</p>
 <p>0012 420</p>	<p>③⑧ BARREL AND TRAIN WHEEL BRIDGE SCREW (3 pcs) ②⑦ BALANCE COCK SCREW</p>
 <p>0012 067</p>	<p>CASING CLAMP SCREW (2 pcs)</p>

PARTS LIST

Cal. 6R20/6R21

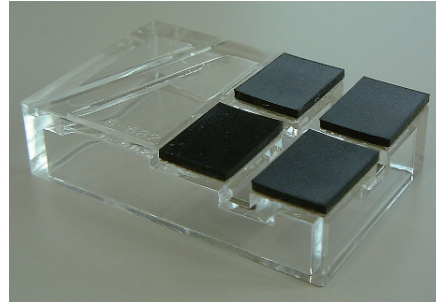
● Location of the jewels

		Upper		Lower	
		Cap jewel	Hole jewel	Cap jewel	Hole jewel
GEAR TRAIN MECHANISM	⑤⑩ FOURTH WHEEL	—	○	—	—
	⑤① THIRD WHEEL	○	○	—	○
	⑤④ ESCAPE WHEEL	○	○	—	○
	⑤⑥ BARREL COMPLETE (WITH MAINSPRING)	—	—	—	○
	⑤⑦ CENTER WHEEL	—	○	—	○
WINDING MECHANISM	③⑤ 2ND REDUCTION WHEEL	—	○	—	○
	CROWN WHEEL (Assembled to the ③⑨ BARREL AND TRAIN WHEEL BRIDGE)	—	○	—	—
	④④ 1ST REDUCTION WHEEL	—	○	—	○
POWER RESERVE INDICATOR / CALENDAR UNIT	⑩ LOWER WHEEL FOR SUN AND PLANETARY WHEEL UNIT	—	○	—	○
	⑦ REDUCTION WHEEL FOR SUN AND PLANETARY WHEEL UNIT	—	○	—	○
	⑫ DATE INDICATOR WHEEL	—	—	—	○
BALANCE AND ESCAPEMENT	②⑨ BALANCE COMPLETE (WITH STUD)	○	○	○	○
	③② PALLET FORK	—	○	—	○
	ENTRY PALLET JEWEL			○	
	EXIT PALLET JEWEL			○	
	ROLLER JEWEL			○	
TOTAL NUMBER OF JEWELS		29 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



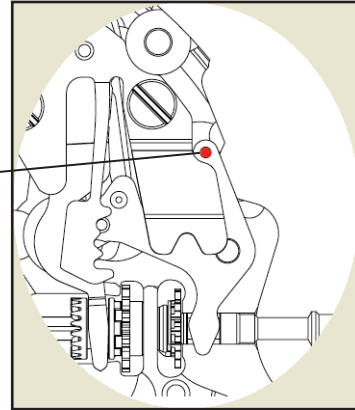
REMARKS ON DISASSEMBLING AND REASSEMBLING THE MOVEMENT

● HOW TO REMOVE THE SETTING STEM BEFORE DISMANTLING THE MOVEMENT

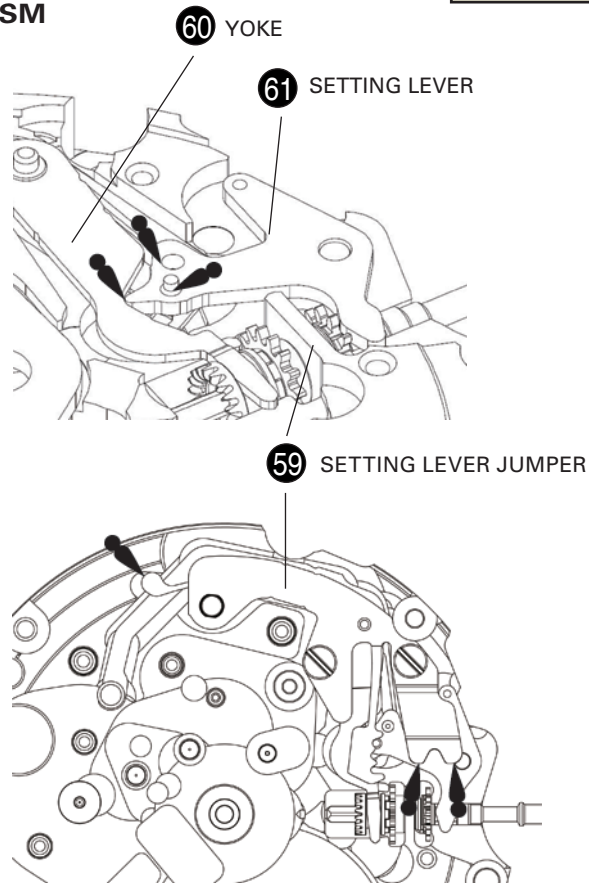
Crown position: 0 position

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.

Push here



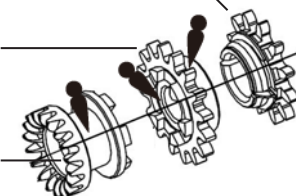
● SETTING MECHANISM



64 CALENDAR CORRECTOR 1ST INTERMEDIATE WHEEL

65 WINDING PINION

66 CLUTCH WHEEL



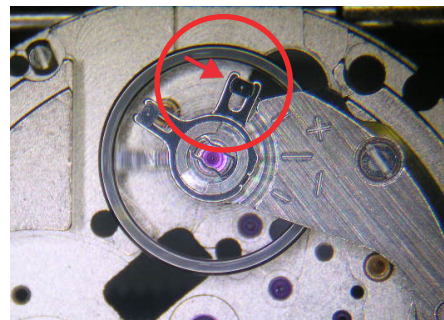
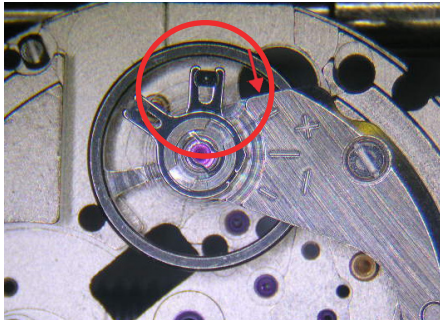
● BALANCE AND ESCAPEMENT

How to disassemble/reassemble the BALANCE and BALANCE COCK

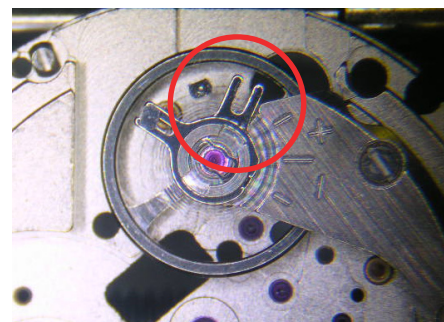
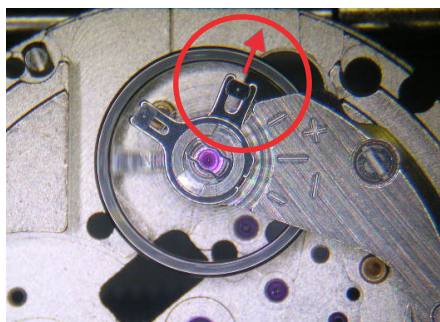
• Disassembling

- 1) Rotate the STUD SUPPORT until it touches to the BALANCE COCK.

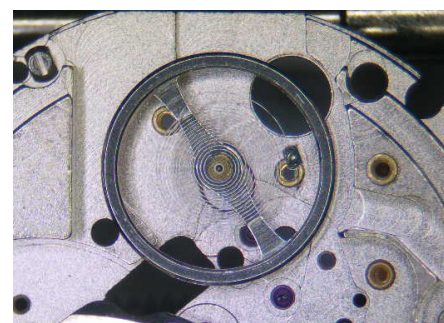
When doing so, make sure that the second bend of the balance-spring does not touch the REGULATOR PIN.



- 2) Push out the stud parallel to the slit of the STUD SUPPORT (the direction also shown by the red arrow in the illustration) in order to remove it from the STUD SUPPORT.



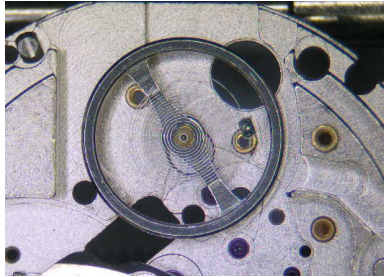
- 3) Unscrew the BALANCE COCK SCREW and remove the BALANCE COCK WITH REGULATOR.



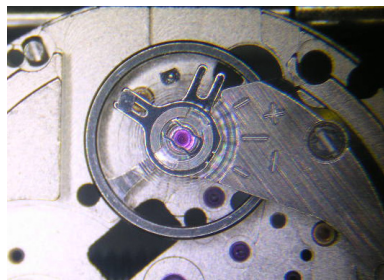
- 4) Remove the BALANCE COMPLETE WITH STUD.

- **Reassembling**

1) Install the BALANCE COMPLETE WITH STUD to the MAIN PLATE.

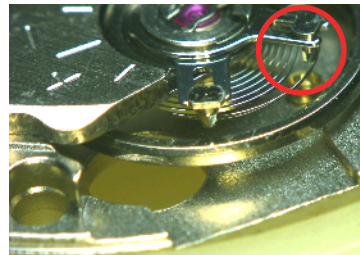
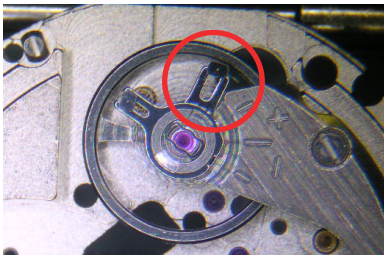


2) Set the BALANCE COCK WITH REGURATOR and tighten the BALANCE COCK SCREW.

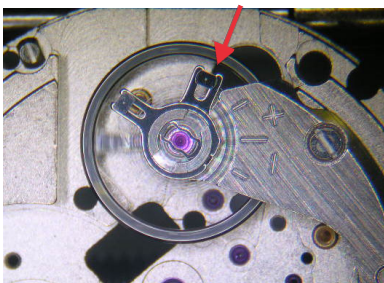


3) Temporarily set the stud to the STUD SUPPORT.

Do not engage the balance-spring to the REGULATOR PIN. The balance-spring passes outside of the REGULATOR-PIN at this stage.



4) Push back the stud parallel to the slit of the STUD SUPPORT.



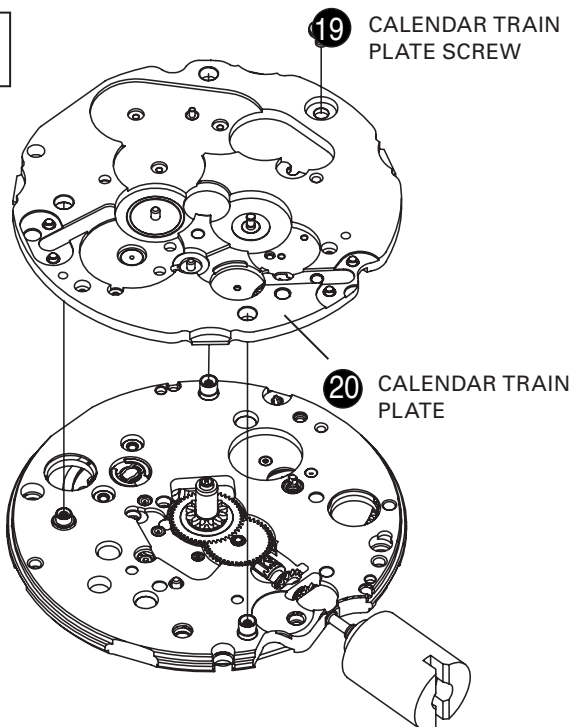
5) Engage the balance-spring with the slit of the REGULATOR PIN.



* When assembling the BALANCE COMPLETE, pay great attention not to deform the balance-spring, especially at the second bend.

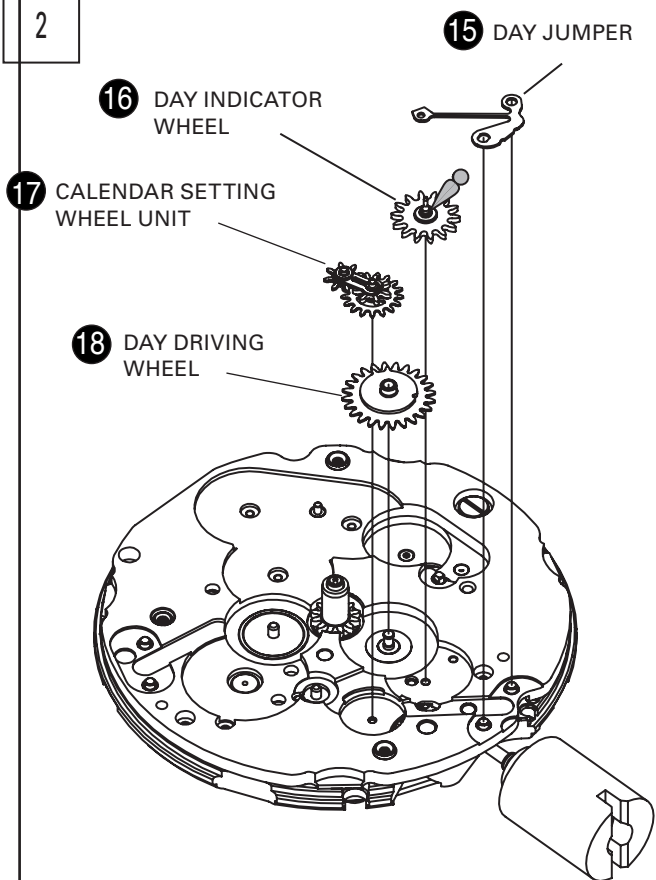
HOW TO REASSEMBLE THE CALENDAR AND POWER RESERVE INDICATOR UNIT

1



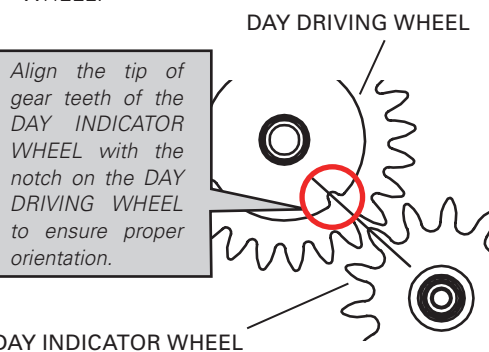
1. Set the CALENDAR TRAIN PLATE.
2. Tighten the CALENDAR TRAIN PLATE SCREW.

2



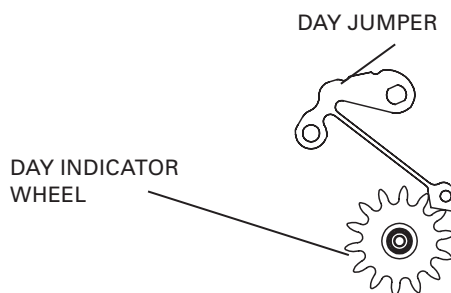
1. Set the DAY DRIVING WHEEL.
2. Set the CALENDAR SETTING WHEEL UNIT.
3. Set the DAY INDICATOR WHEEL.

* Lubricate the shaft of the DAY INDICATOR WHEEL.



DAY INDICATOR WHEEL

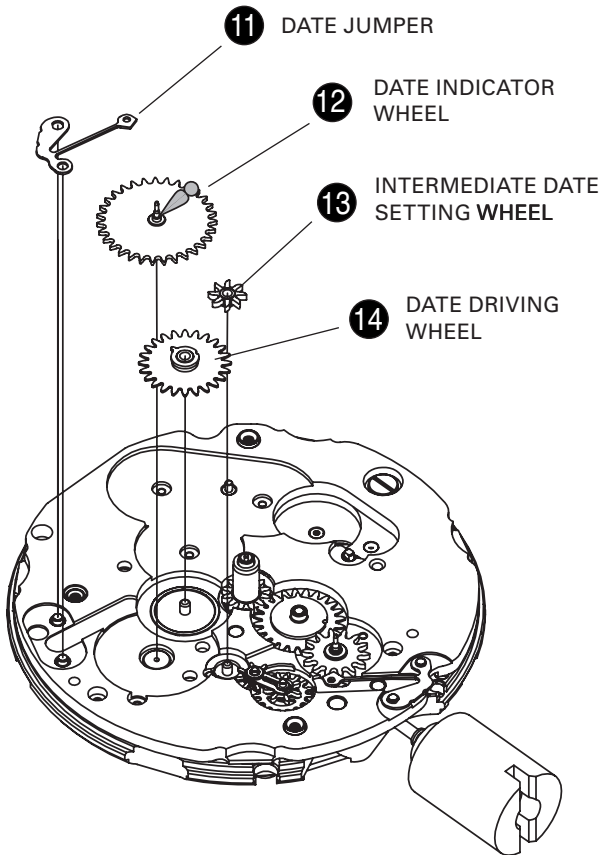
4. Set the DAY JUMPER.
- * Make sure that the DAY JUMPER and the DAY INDICATOR WHEEL are correctly engaged as shown in the illustration.




DAY INDICATOR WHEEL

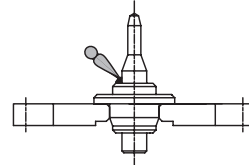
HOW TO REASSEMBLE THE CALENDAR AND POWER RESERVE INDICATOR UNIT

3



5. Lubricate the shaft of the DATE INDICATOR WHEEL as illustrated.

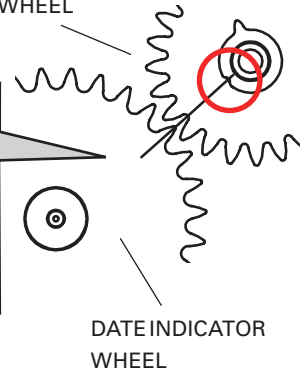
Type of oil: S-6 



1. Set the DATE DRIVING WHEEL.
 2. Set the INTERMEDIATE DATE SETTING WHEEL.
 3. Set the DATE INDICATOR WHEEL.
- * Make sure that the DATE DRIVING WHEEL and DATE INDICATE WHEEL are correctly engaged as shown in the illustration.

DATE DRIVING WHEEL

Align the tip of gear teeth of the DATE INDICATOR WHEEL with the notch on the DATE DRIVING WHEEL to ensure proper orientation.




DATE INDICATOR WHEEL

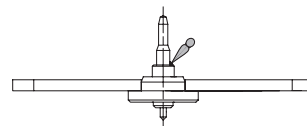
4. Set the DATE JUMPER.
- * Make sure that the DATE JUMPER and DATE INDICATOR WHEEL are correctly engaged as shown in the illustration.

DATE INDICATOR WHEEL

DATE JUMPER

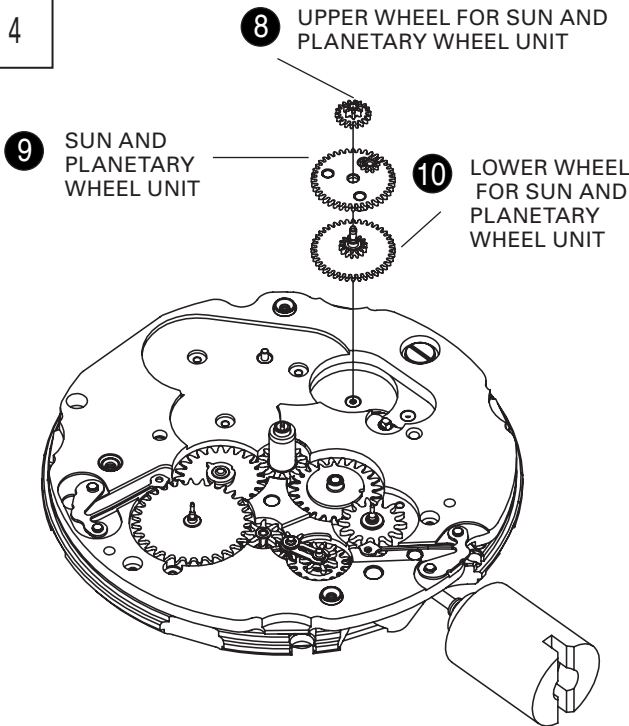
5. Lubricate the shaft of the DATE INDICATOR WHEEL as illustrated.

Type of oil: S-6 




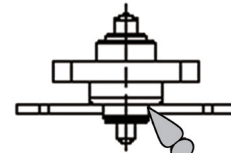
HOW TO REASSEMBLE THE CALENDAR AND POWER RESERVE INDICATOR UNIT

4



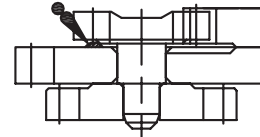
1. Set the LOWER WHEEL FOR SUN AND PLANETARY WHEEL UNIT.
2. Lubricate the LOWER WHEEL FOR SUN AND PLANETARY WHEEL UNIT as WHEEL illustrated. (4 points)

Type of oil: S-6 



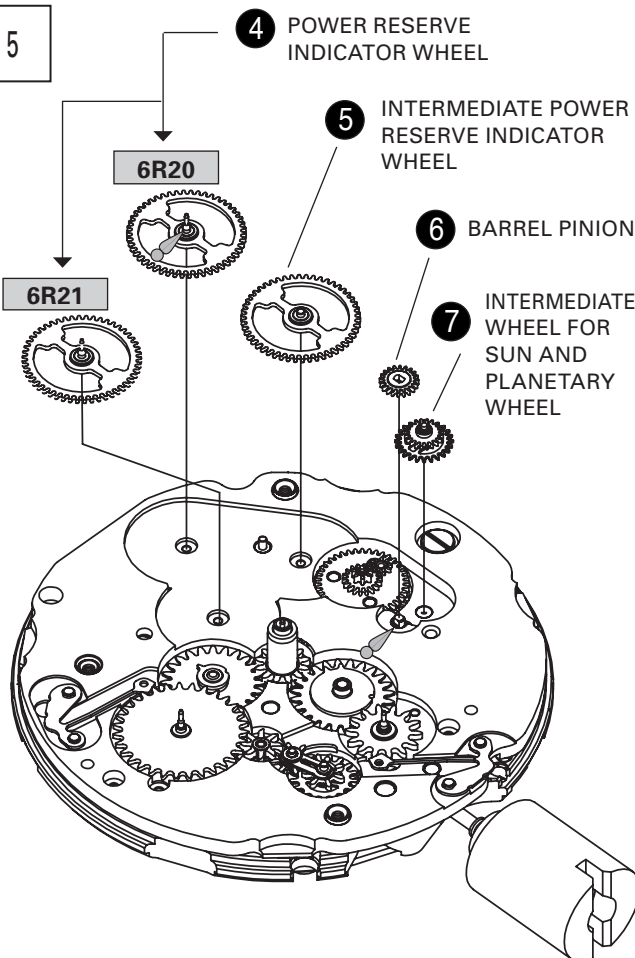
3. Set the SUN AND PLANETARY WHEEL UNIT.
4. Lubricate the SUN AND PLANETARY WHEEL UNIT as illustrated.

Type of oil: AO-3 (Moebius A) 




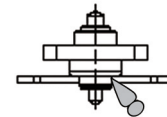
5. Set the UPPER WHEEL FOR SUN AND PLANETARY WHEEL UNIT.

5




1. Set and lubricate the INTERMEDIATE WHEEL FOR SUN AND PLANETARY WHEEL as illustrated.


Type of oil: S-6 

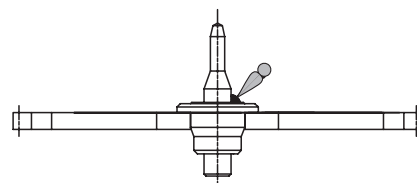


2. Set the BARREL PINION.
3. Lubricate the pinion of the BARREL PINION.

Type of oil: S-6 

4. Set the INTERMEDIATE POWER RESERVE INDICATOR WHEEL.
5. Set the POWER RESERVE INDICATOR WHEEL.
* Please note that the setting position are different for Cal. 6R20 and 6R21.
6. Lubricate the shaft of the POWER RESERVE INDICATOR WHEEL as illustrated.

Type of oil: S-6 

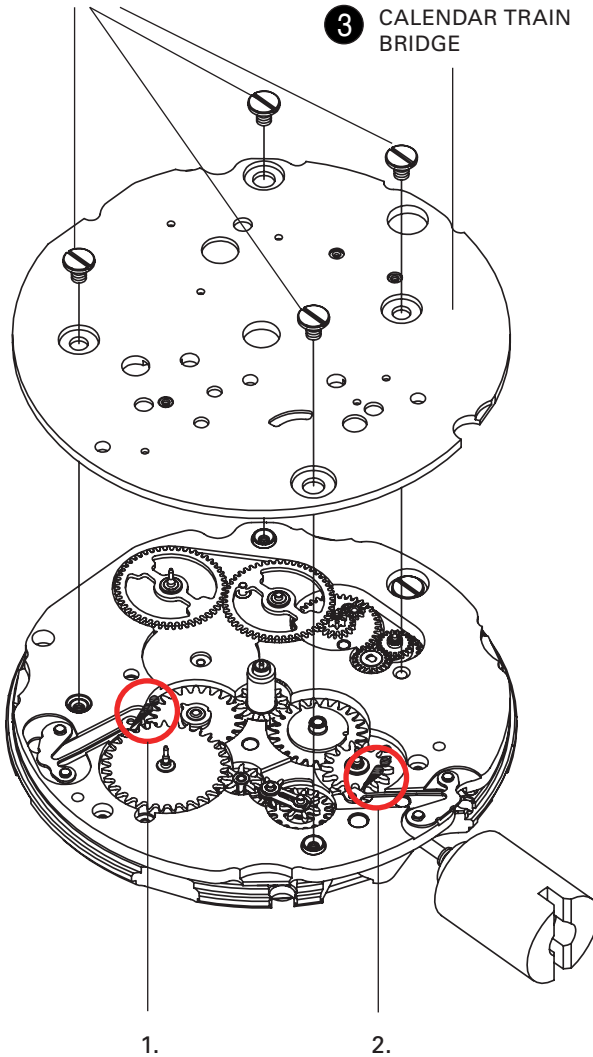


HOW TO REASSEMBLE THE CALENDAR AND POWER RESERVE INDICATOR UNIT


6

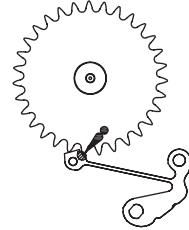
2 CALENDAR TRAIN BRIDGE SCREW

3 CALENDAR TRAIN BRIDGE




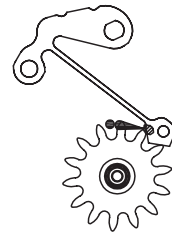
1. Lubricate the DATE JUMPER as illustrated.

Type of oil: AO-3 (Moebius A) 



2. Lubricate the DAY JUMPER as illustrated.

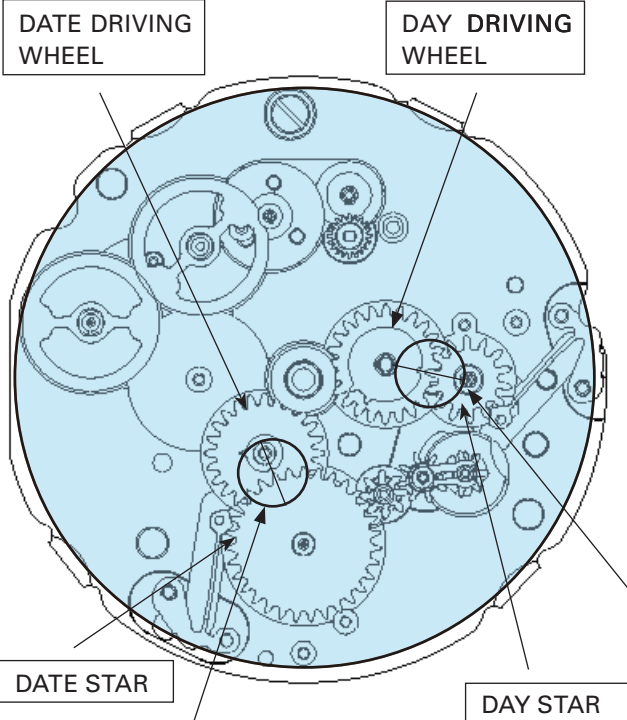
Type of oil: AO-3 (Moebius A) 



3. Set the CALENDAR TRAIN BRIDGE.

4. Tighten the CALENDAR TRAIN BRIDGE SCREW. (4 pcs)

HOW TO REASSEMBLE THE HANDS AND THE DIAL



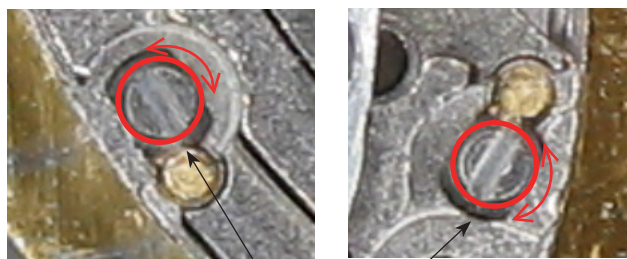
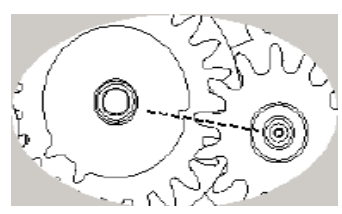
The correct setting position of the DATE DRIVING WHEEL and DATE INDICATOR WHEEL.



1. Pull out the crown to the second click. While turning the crown clockwise to turn the hands, look through the circular holes of CALENDAR TRAIN BRIDGE (refer to the illustration at left) to check that the notch on the date driving wheel and the tip of gear teeth of the date star are aligned and that the notch on the day driving wheel and the tip of gear teeth of the day star are aligned, as shown in the left illustration.

- * If they are correctly aligned, the day hand moves after the date hand is correctly aligned. If not, the day hand and the date hand do not move in the proper order.
- * If they are not correctly aligned, remove the CALENDAR TRAIN BRIDGE and reset so that the date star and date driving wheel are correctly engaged and that the day star and day driving wheel are correctly engaged.

The correct setting position of the DAY DRIVING WHEEL and DAY INDICATOR WHEEL.



DIAL LOCKING PIN

1. After checking the alignment, set the dial to the movement and turn the movement over.
2. Turn the dial locking pin to hold the feet of the dial (at two points).

HOW TO REASSEMBLE THE HANDS AND THE DIAL



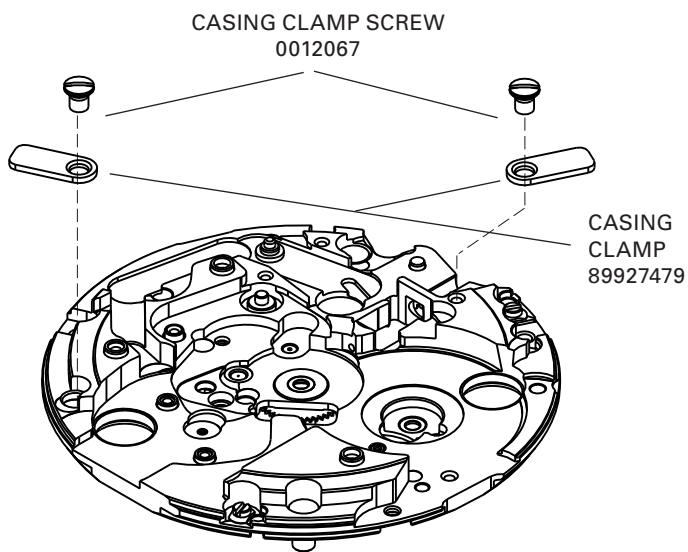
1. Set the power reserve indicator hand.
 - * Wind the mainspring of the barrel complete fully, and then set the power reserve indicator with pointing its tip to the "full" position of the power reserve indication on the dial.



1. Set the day / date hands.



HOW TO REASSEMBLE THE MOVEMENT INTO THE CASE



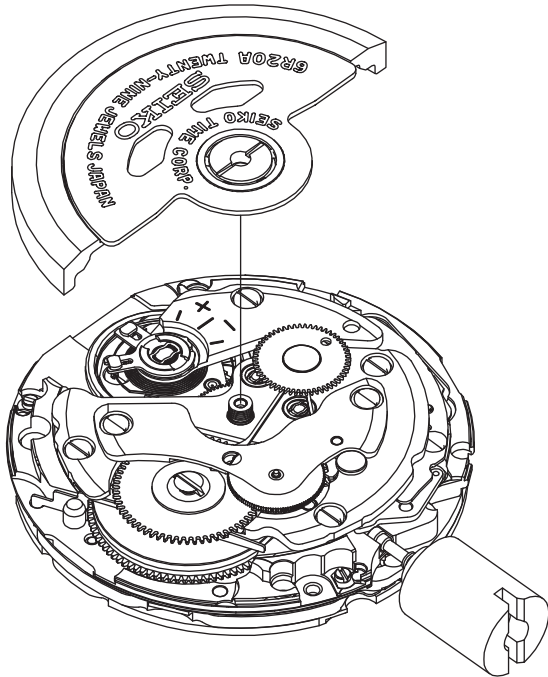
1. Take off the WINDING STEM (refer to Page 13/28).
 2. Set the movement with dial to the case.
 3. Set the case ring.
 4. Set the WINDING STEM to the crown.
 5. Set the CASING CLAMP and screw it with the CASING CLAMP SCREWS (2 pcs.) as the right illustration.
- * Do not assemble up side down as it has the top side and back side.

Top side has cutting around the screw hole

Back side has no cutting

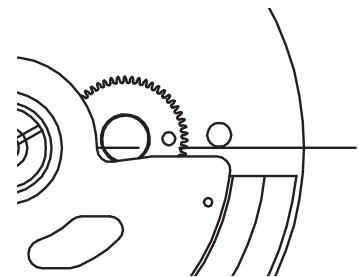
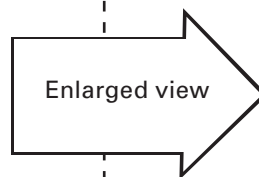
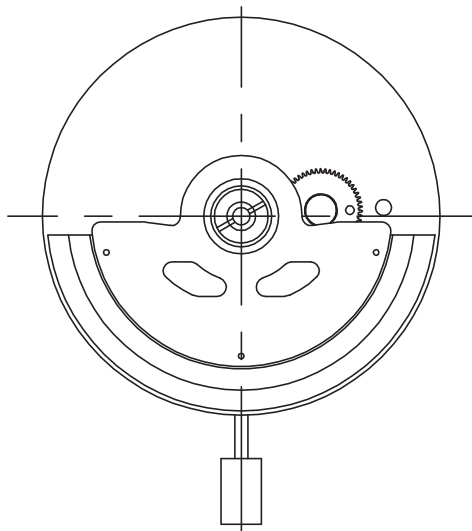


HOW TO REASSEMBLE OSCILLATING WEIGHT



OSCILLATING WEIGHT

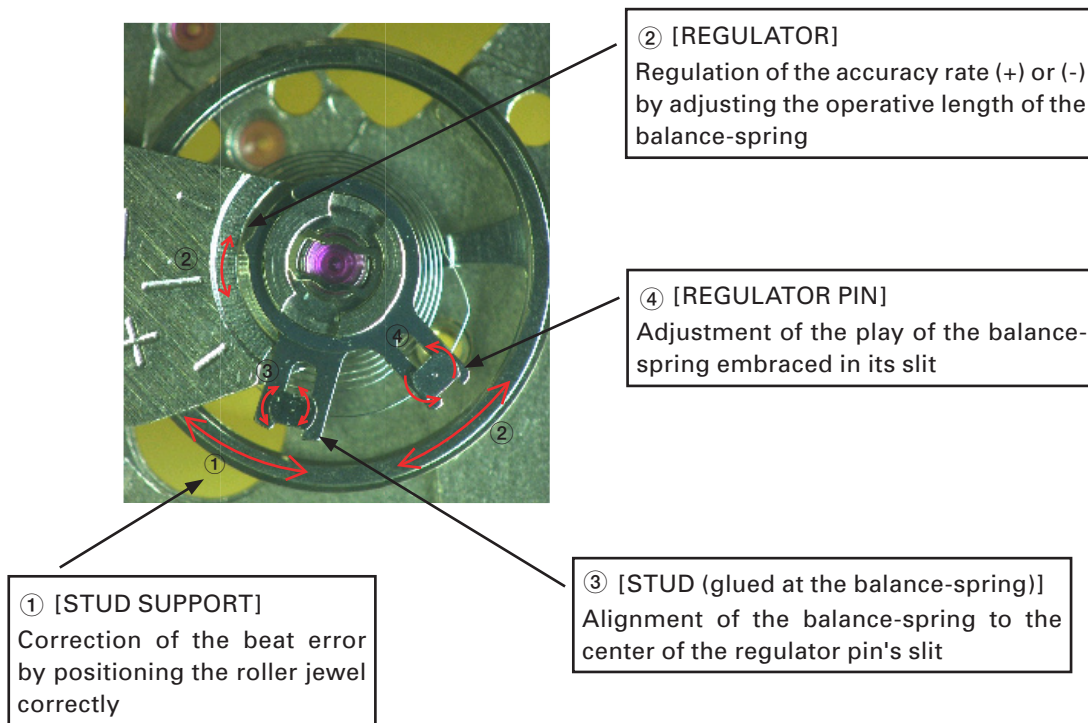
When fixing the OSCILLATING WEIGHT, an alignment with the FIRST REDUCTION WHEEL is necessary in order to wind the MAINSPRING most efficiently.



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.

REGULATION

● Names of the parts for regulation and their functions



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

This caliber has the Etachron system for fine regulation of the isochronism fault, which is the same design used for both Cal. 7S-B series.

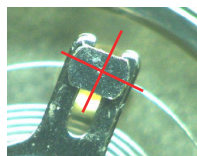
When an amplitude of the balance becomes weak, the watch shows time loss, in general.

By making a clearance of the balance-spring smaller, the decline curve of the instantaneous rate gets shallower.

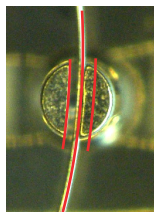
1) Make sure that the REGURATOR PIN is aligned in a vertical position to the REGURATOR and the balance-spring passes parallel through the slot of the REGULATOR PIN before fine-tuning the STUD and the REGULATOR PIN.

REGULATOR PIN

top side view



back side view



angled view

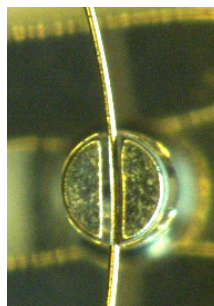


2) Rotate the STUD in order to align the position of the balance-spring passes through the center of the slot of the REGULATOR PIN.

STUD
top side view

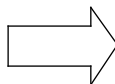
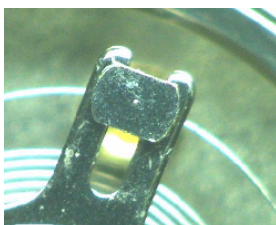


REGULATOR PIN
back side view



3) Rotate the REGULATOR PIN counterclockwise in order to fine-tune the clearance of the balance-spring passing through the slot of it.

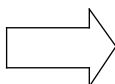
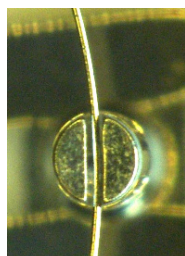
REGULATOR PIN
top side view
Before rotating



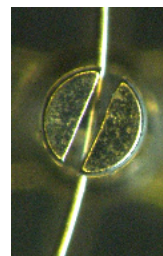
After rotating



back side view
Before rotating



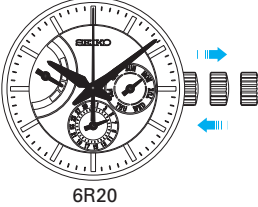

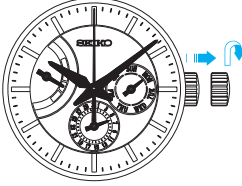
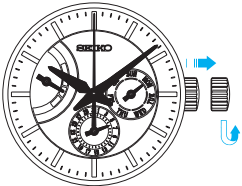
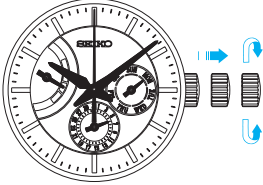
After rotating



(Maximum clearance)




(Minimum clearance)

● **Function check**

Operation	Function	Checkpoint
 <p>Pull out the crown to the 2nd click and push it back in to the normal position. Repeat the same several times.</p>	<p>Setting mechanism switching the function of the time setting.</p>	<p>Make sure that it has a click at each position and the stem is not pulled off.</p>
 <p>Turn the crown clockwise at the 0 click.</p>	<p>Hand winding function. Power reserve indicator function.</p>	<p>Make sure that the main-spring can be wound by turning the crown clockwise, and power reserve indicator shows properly.</p>
 <p>Pull out the crown to the 1st click, then turn it clockwise.</p>	<p>Calendar mechanism - correcting the day.</p>	<p>Make sure that the day changes smoothly.</p>
 <p>Pull out the crown to the 1st click, then turn it counterclockwise.</p>	<p>Calendar mechanism - correcting the date.</p>	<p>Make sure that the date changes smoothly.</p>
 <p>Pull out the crown to the 2nd click, then turn it.</p>	<p>Second hand stop function.</p>	<p>Make sure that the second hand stops when the crown is pulled out to the 2nd click.</p>
	<p>Setting mechanism - hour and minute hand setting.</p>	<p>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>Hands installation.</p>	
<p>calendar mechanism - date change.</p>	<p>Make sure that the date changes when the hour and minute hands pass around midnight.</p>	

● **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	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; text-align: center;">Water pressure test</div>  <div style="border: 1px solid black; border-radius: 10px; padding: 5px; text-align: center;">Condensation test</div>	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		Condensation test
SCUBA DIVER'S (AIR DIVER'S) 200 m		25 BAR = 200 (m) times 0.125
He-GAS DIVER'S 300 m		<div style="border: 1px solid black; border-radius: 10px; padding: 5px; text-align: center;">Water pressure test</div>
He-GAS DIVER'S 600 m		75 BAR = 600 (m) times 0.125
He-GAS DIVER'S 1000 m		<div style="border: 1px solid black; border-radius: 10px; padding: 5px; text-align: center;">Condensation test</div>

● 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	Mainspring wind up status	Fully wind up (T0)			After 24 hours from fully wind up (T24)
	Testing positions	Dial upwards: T0 (CH)	6 o'clock at the top	9 o'clock at the top	Dial upwards: T24 (CH)
	Measurement (daily rate in seconds:s/d)	±10 s/d	±15 s/d	±15 s/d	(Isochronism fault: T24-T0) ±10 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 self-winding 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 mainspring is fully wound up and leave it on natural condition with the dial-up position. Make sure that the watch runs **more than 45 hours** until it stops.