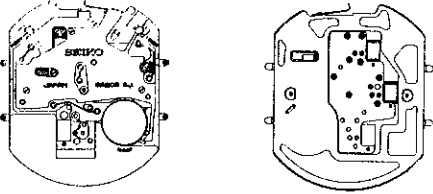
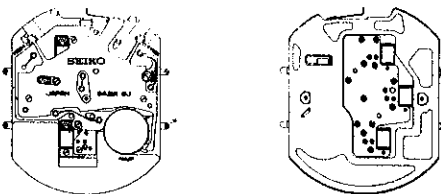


PARTS CATALOGUE

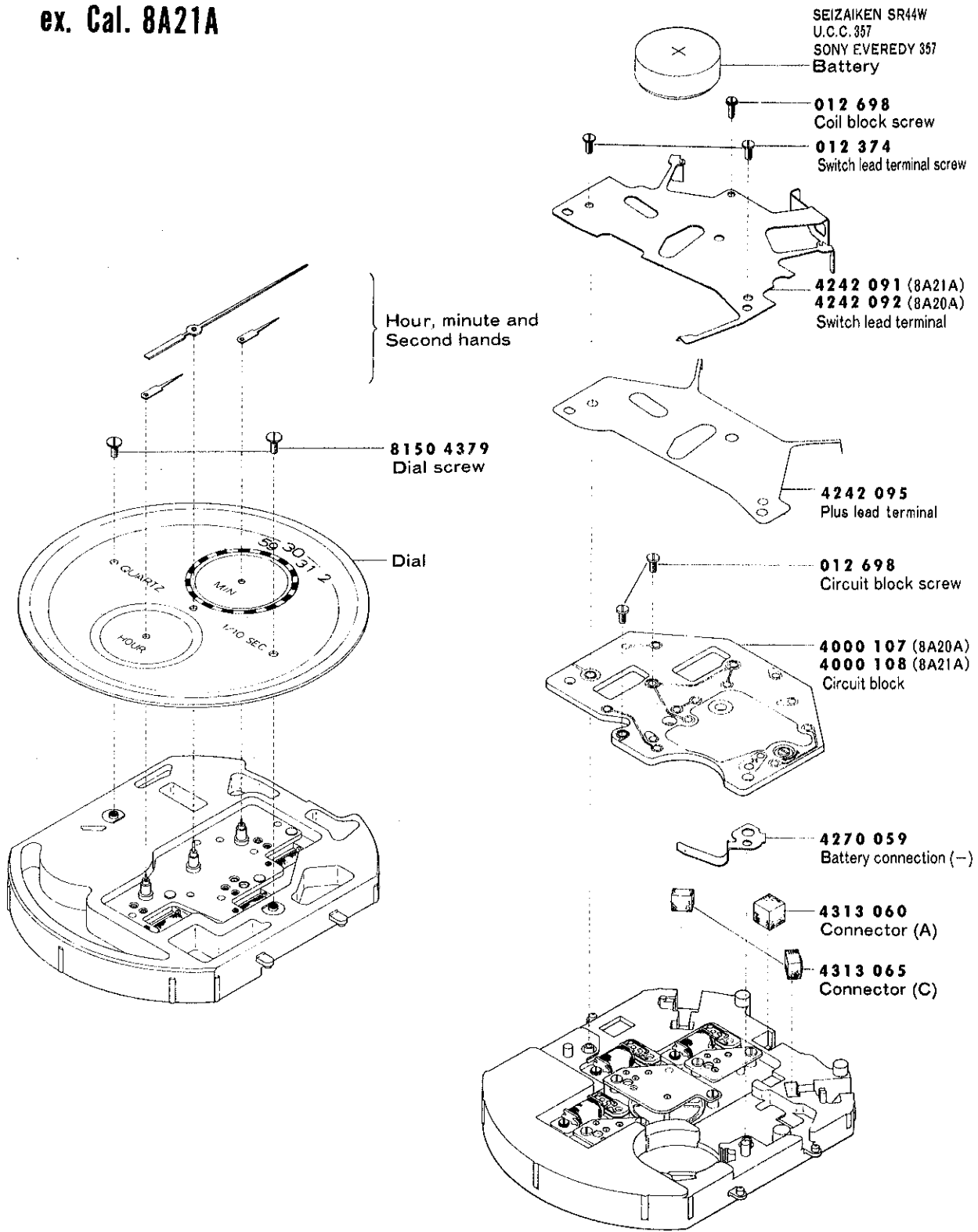
Cal. 8A20A, 8A21A

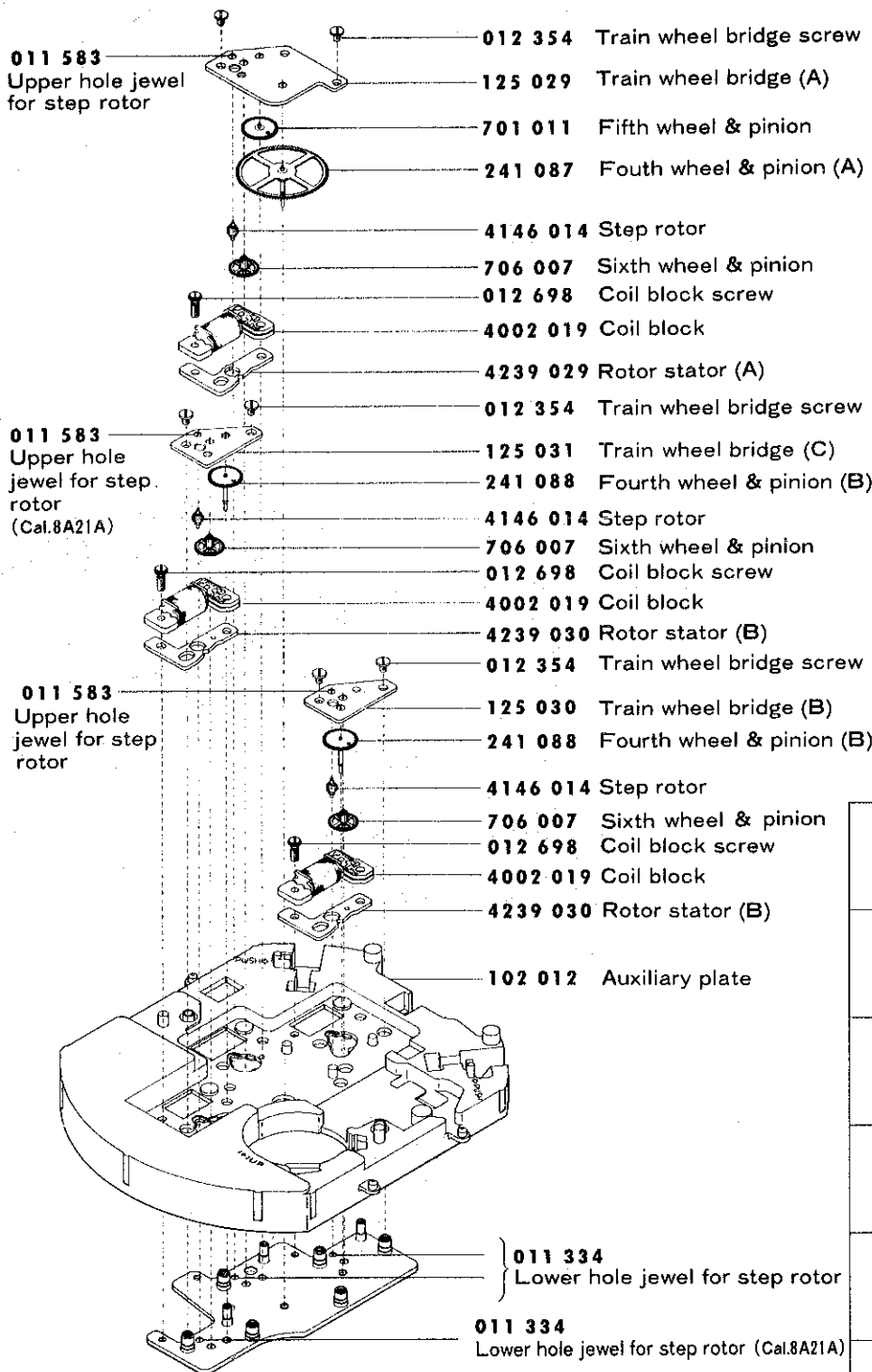
8A20A (4j)	8A21A (6j)
	

HATTORI SEIKO CO., LTD.








Cal. 8A20A/8A21A

ex. Cal. 8A21A





(8A21A)

	012 354 Train wheel bridge screw
	012 374 Switch lead terminal screw
	012 698 Coil block screw Circuit block screw
	032 037 Tube for train wheel bridge
	032 038 Tube for coil block screw Tube for circuit block screw (A)
	032 039 Tube for circuit block screw (B)
	8150 4379 Dial screw

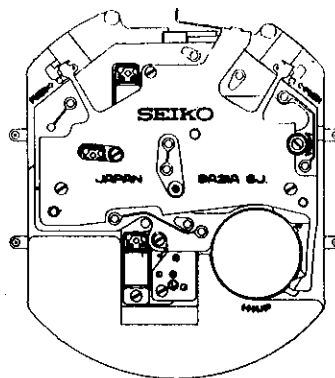
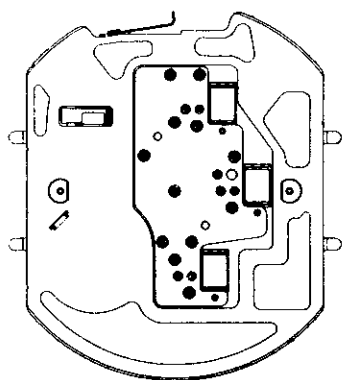
TECHNICAL GUIDE

SEIKO

QUARTZ

CAL. 8A20A

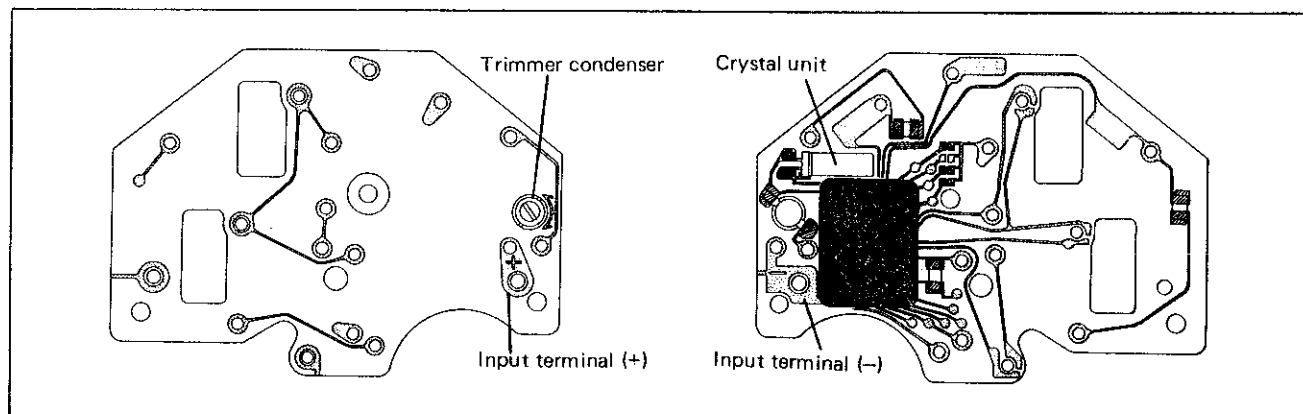
CAL. 8A21A



I. SPECIFICATIONS

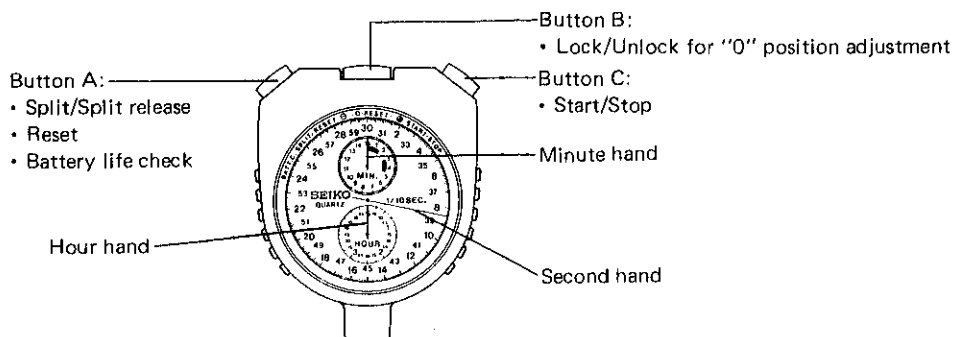
Item		Cal. No.	8A20A	8A21A
Chronograph indication			Minute and second hands	Hour, minute, and second hands
Driving system			Step motor, 2 pcs.	Step motor, 3 pcs.
Stopwatch function			<ul style="list-style-type: none"> Measurable up to 30 minutes in 1/5 seconds 	<ul style="list-style-type: none"> Measurable up to 5 hours in 1/10 seconds
			<ul style="list-style-type: none"> Accumulated elapsed time measurement 	
			<ul style="list-style-type: none"> Split time measurement 	
Additional mechanism			<ul style="list-style-type: none"> Battery life check function 	
			<ul style="list-style-type: none"> Hands 0-reset adjustment function 	
Loss/gain			Rate at a normal temperature range: less than $\pm 0.0006\%$ (equivalent to a monthly rate of less than ± 15 seconds)	
Movement size	Outside diameter		50.0 mm between 6 o'clock and 12 o'clock sides 39.0 mm between 3 o'clock and 9 o'clock sides	
	Height		5.5 mm	
Regulation system			Trimmer condenser	
Measuring gate by quartz tester			Use the 10-second gate.	
Battery			SEIKO (SEIZAIKEN) SR44W, U.C.C. 357, SONY EVEREADY 357 Voltage: 1.55V	
Battery life			Approx. 5 years (When the stopwatch is used for 8 hours a day)	Approx. 3 years (When the stopwatch is used for 8 hours a day)
Jewels			4 jewels	6 jewels

II. STRUCTURE OF THE CIRCUIT BLOCK

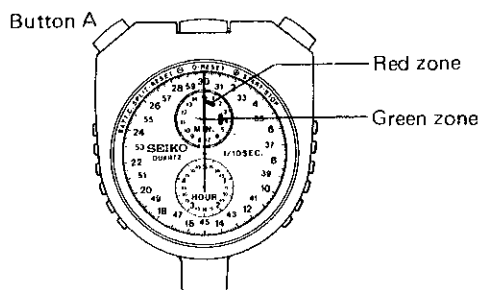


III. DISPLAY FUNCTION

Ex.: Cal. 8A21A



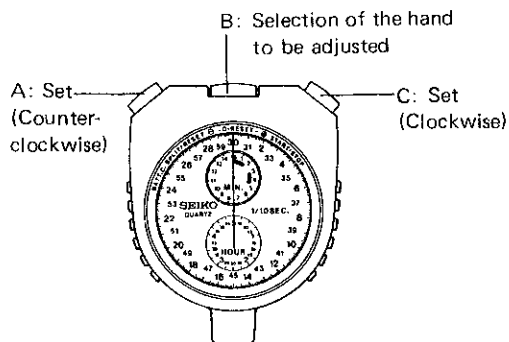
1. How to check the battery life



- 1) With all the hands on the "0" position, keep button A pressed.
- 2) While button A is pressed, the minute hand points at the red zone or the green zone to indicate the battery life.

Green zone : The battery is still operating.
Red zone : The battery life is coming to its end. Replace the battery.

2. How to adjust the "0" position of each button



When any one of the hands is not reset to the "0" position, follow the steps below:

- 1) Press button B for approx. 3 seconds.
The minute hand makes a full turn, indicating that the minute hand is ready to be adjusted.
- 2) Press button A or C to move the minute hand to the "0" position.
- 3) Press button B once, and the hour hand makes a full turn. Adjust it as in step 2).
- 4) Press button B once, and the second hand makes a full turn. Adjust it as in step 2).
- 5) Finally, press button B once, and all the hands make a full turn, indicating that all adjustments are completed.

* The hands are turned quickly by keeping button A or C pressed for approximately 3 seconds.

IV. DISASSEMBLING, REASSEMBLING, AND LUBRICATING OF THE CASE

Disassembling procedures Figs.: ① → ⑧

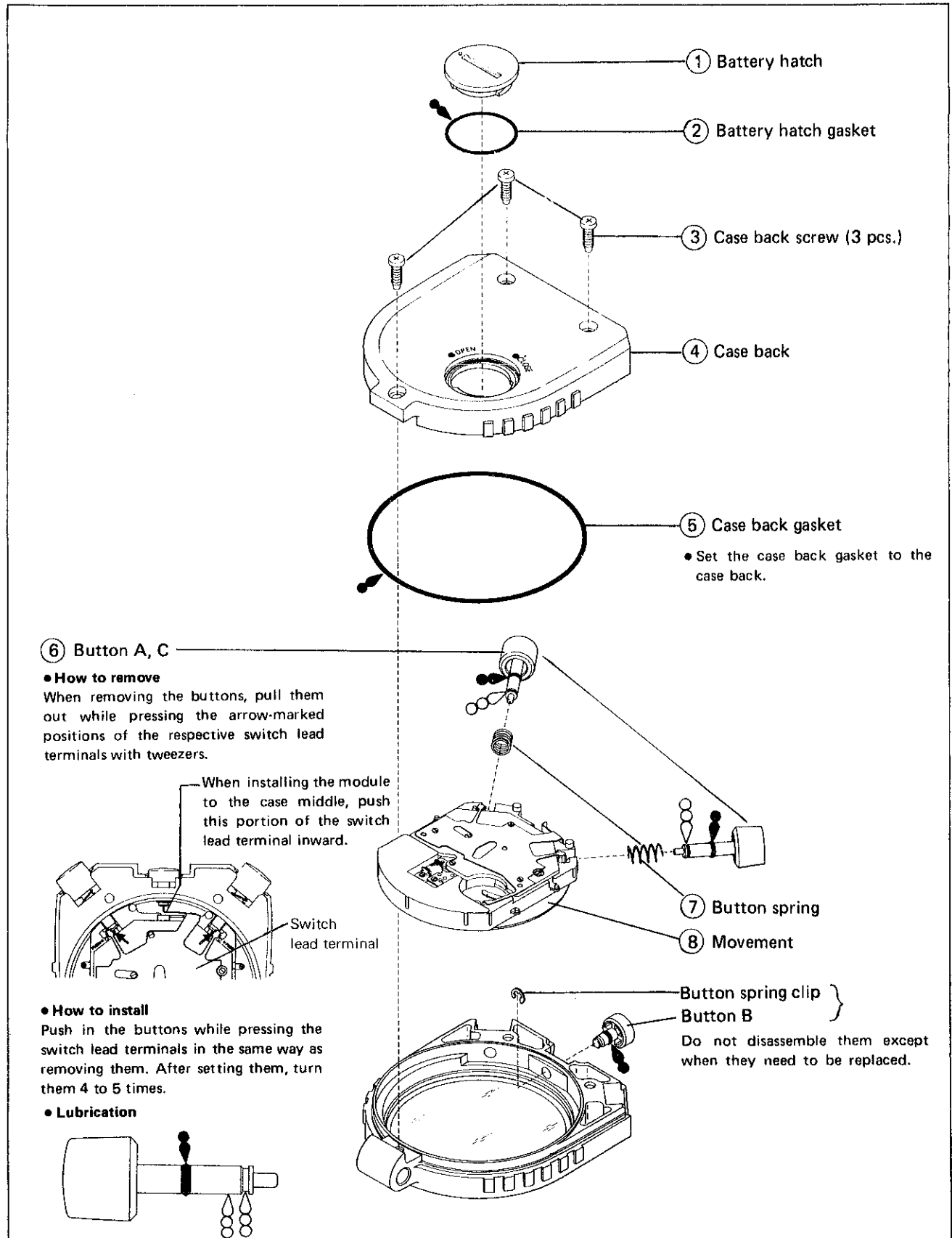
Reassembling procedures Figs.: ⑧ → ①

Lubricating: Types of oil

Oil quantity



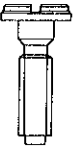
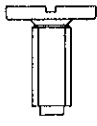
● Silicone grease 500,000 c.s.
 ○○ SEIKO Watch Oil S-6

Normal
 Liberal



V. DISASSEMBLING, REASSEMBLING, AND LUBRICATING OF THE MOVEMENT

List of the screws used


Shape	Part No.	Name	Shape	Part No.	Name
	012 354	Train wheel bridge screw (6 pcs.)		012 374	Switch lead terminal screw (2 pcs.)
	012 698	Coil block screw (4 pcs.) Circuit block screw (2 pcs.)		8150 4379	Dial screw (2 pcs.)

- Use a movement holder S-681 for disassembling and reassembling.
(Support the module so that the three tubes at the center of the main plate may not touch the holder.)

Disassembling procedures Figs.: ① → ④①

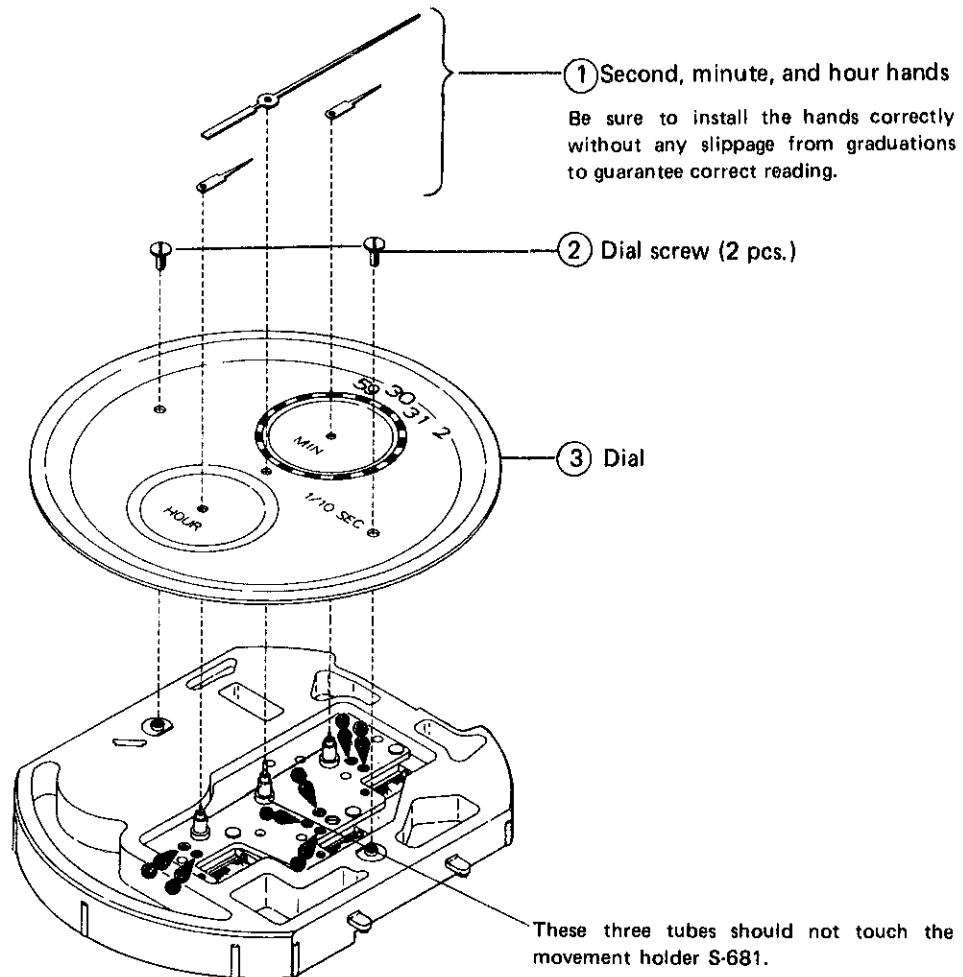
Lubricating:

Reassembling procedures Figs.: ④① → ①

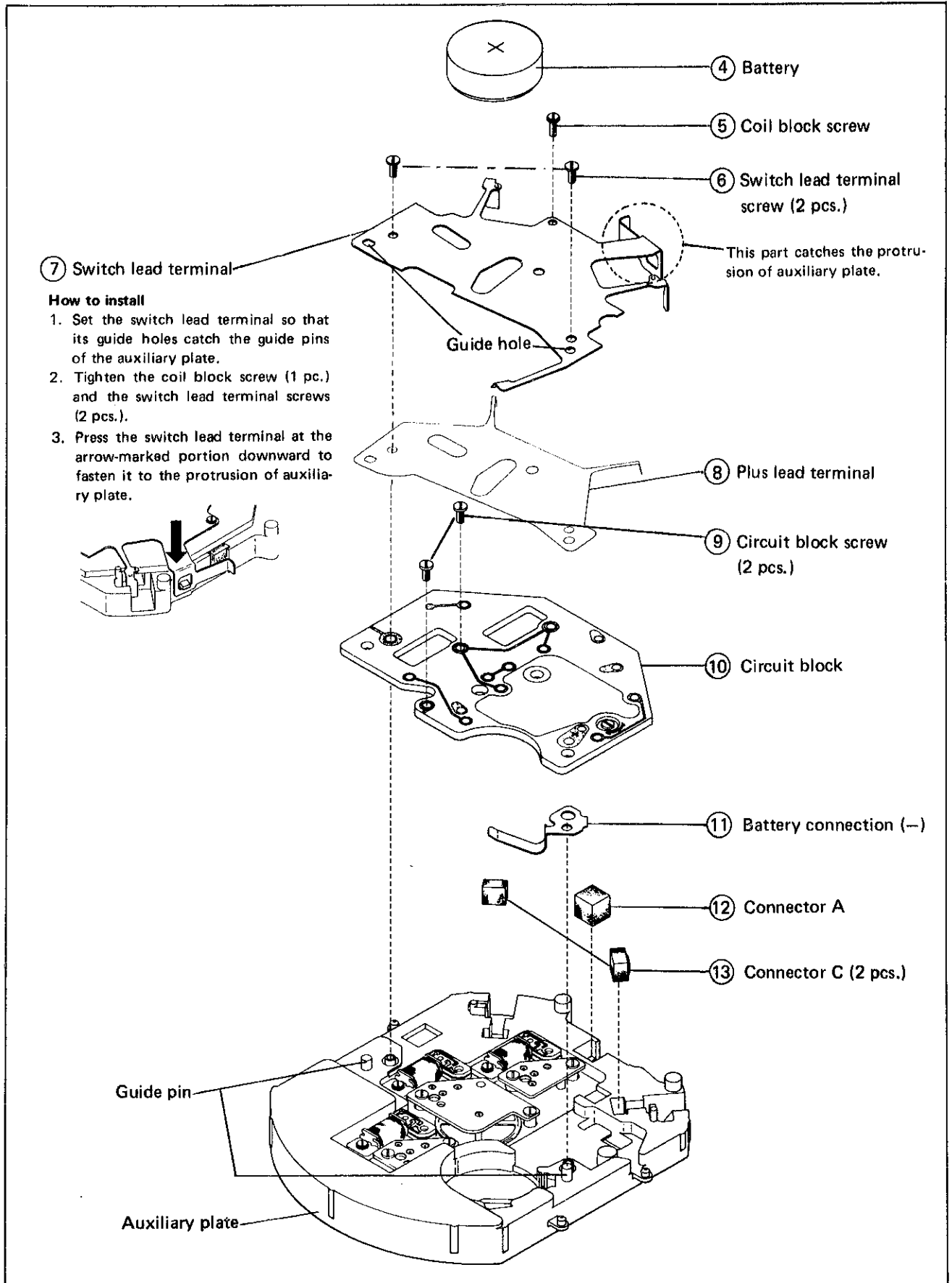
 Moebius A, Normal quantity

1. Second hand ~ Dial

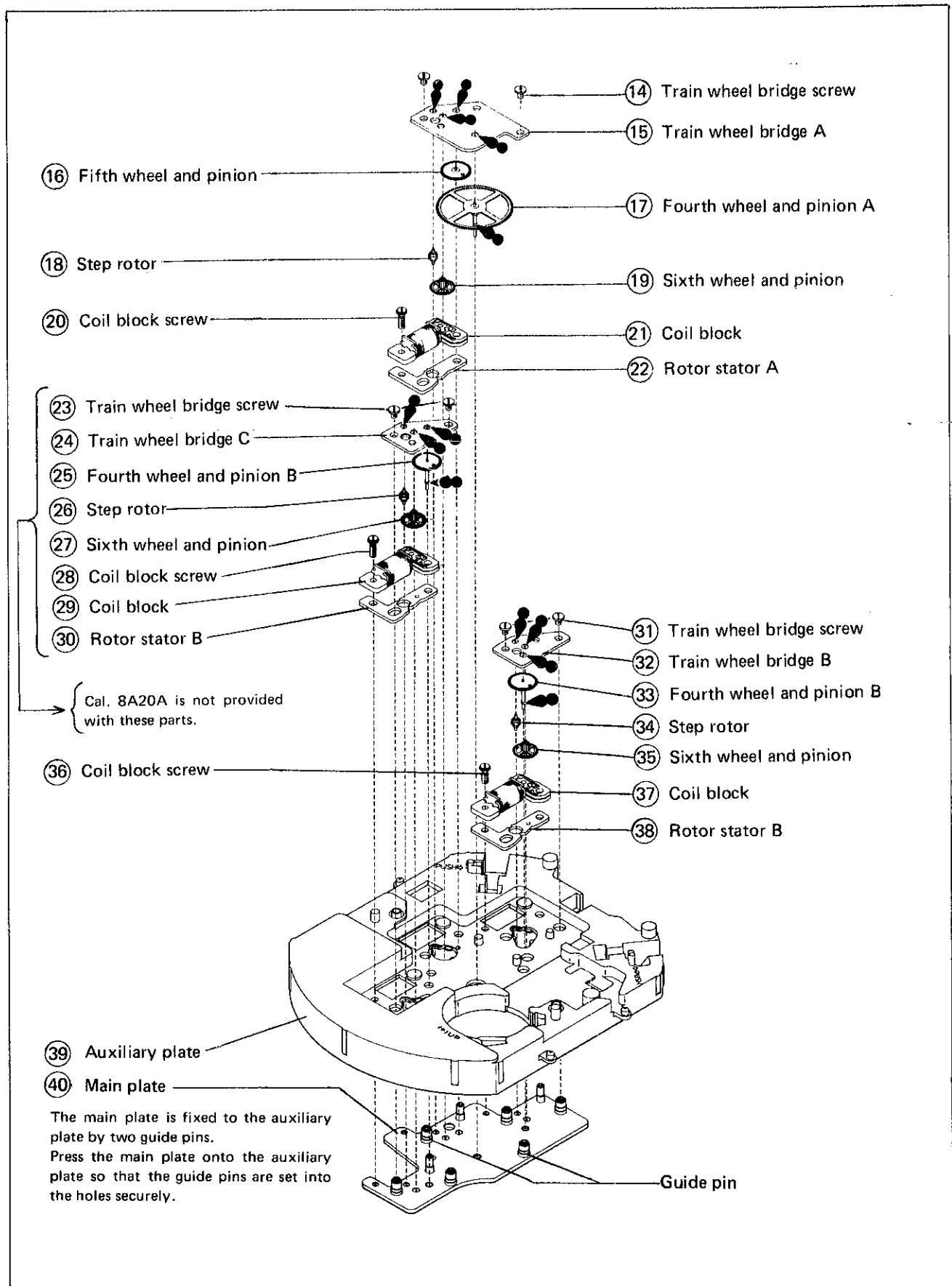
Ex: Cal. 8A21A



2. Battery ~ Connector C



3. Train wheel bridge screw ~ Main plate



Combination of the train wheel bridge, rotor stator and fourth wheel and pinion

Train wheel bridge A 125 029	Train wheel bridge B 125 030	Train wheel bridge C 125 031 (Cal. 8A21A only)
Rotor stator A 4239 029	Rotor stator B 4239 030	* Rotor stator B has a punched mark on the front.
Fourth wheel and pinion A 241 087	Fourth wheel and pinion B 241 088	

VI. CHECKING AND ADJUSTMENT

- The explanation here is only for the particular points of Cals. 8A20A and 8A21A. Refer to the "TECHNICAL GUIDE, GENERAL INSTRUCTION" for SEIKO Analogue Quartz for details.

Procedure	
<ul style="list-style-type: none"> • Remarks on replacing the battery After installing the battery, be sure to push all 3 buttons simultaneously. Then, adjust "0" position of each hand according to the procedures described on page 2.	
CHECK OUTPUT SIGNAL	<p>Note: Measure the output signal while the stopwatch is operating.</p> <p>Result: Normal : Input indicator blinks every second. Defective : Input indicator does not blink every second.</p>
CHECK BATTERY VOLTAGE	<p>Result: Normal : More than 1.57V Defective : Less than 1.57V</p>

Procedure

CHECK COIL BLOCK

Use the Digital Multi-Tester S-840A.
Mode to be used: Ω

Result:

Normal : $2.4K\Omega \sim 2.8K\Omega$
Defective — { Less than $2.4K\Omega$
(Short circuit)
More than $2.8K\Omega$
(Broken wire)

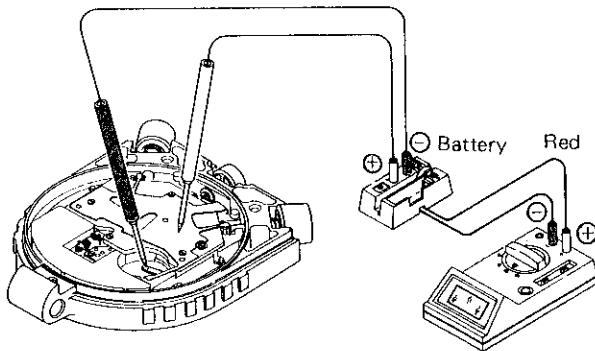
CHECK GEAR TRAIN MECHANISM

CHECK ACCURACY

- Use the 10-second gate of the quartz tester.
- Measure accuracy while the stopwatch is operating.
- Measure accuracy with the glass facing down. Otherwise, the measured value may fluctuate because of the large diameter of the stopwatch.

CHECK CURRENT CONSUMPTION

Use the Digital Multi-Tester S-840A.
Mode to be used: μA



Result:

[When the stopwatch is not operating]

Normal : Less than $1.5\mu A$
Defective : More than $1.5\mu A$

[When the stopwatch is operating]

Cal. 8A20A

Normal : Less than $10.0\mu A$
Defective : More than $10.0\mu A$

Cal. 8A21A

Normal : Less than $17.0\mu A$
Defective : More than $17.0\mu A$

All procedures of Disassembling, Reassembling, Lubricating, Checking and Adjustment are completed.