TECHNICAL INFORMATION

CITIZEN QUARTZ

Cal. No. 6870

CITIZEN

Contents

§1. OUTLINE

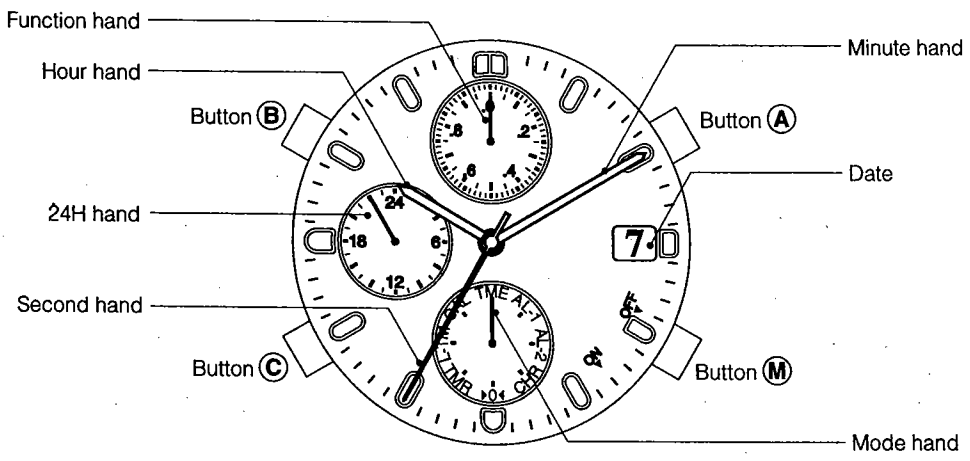
CAL. No. 6870 is the multi hands analog quartz watch with two modes of alarm, chronograph, timer, local time and calendar functions.

§2. SPECIFICATIONS

Caliber No.		**6870A**
Type		Analog quartz watch
Movement size (mm)		ø26.0 x 3.7t
Time accuracy (At normal temperature)		±20 Sec/month (at 5°C/41°F ~ 35°C/95°F)
IC		C/MOS-LSI, 1 unit
Operating temperature range		−10°C ~ +60°C (14°F ~ 140°F)
Converter		Bipolar step motor
Time adjustment		Not installed
Measurement gate		10 Second
Functions		• Time.....Hours, minutes, seconds, 24-hour clock • Alarm.....Quick set alarm (alarm duration: approx. 10 seconds) .....Daily alarm (alarm duration approx. 15 seconds) • Chronograph.....60 minute measurement, 1/20th second increments, split time measurement • Timer.....1 minute increments, can be set to a maximum of 59 minutes • Local time.....Time difference correction in 1 hour units • Calendar.....Month, date
Battery	Parts No.	280-44
	Code	SR927W
	Life	Approx. 2 years This battery life is based on the following conditions of use. • Alarm 1: 10 seconds/day • Alarm 2: 15 seconds/day • Chronograph measurement: 1 hour/day • Timer measurement: 59 minutes/day

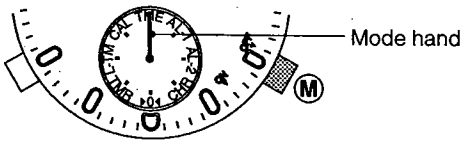
§3. HANDRING OF WATCH

1. Name of Parts



2. Mode (Dispaly Function) Switching

This watch is equipped with 8 modes consisting of time, alarm 1, alarm 2, chronograph, 0-position check, timer, local time and calendar modes. The mode changes each time the Ⓜ button is pressed. The current mode can be confirmed with the mode hand.

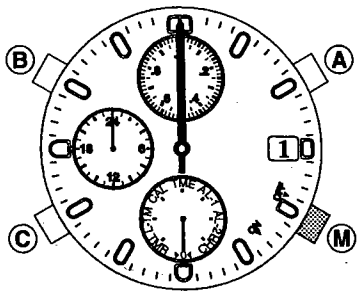


Display	Mode
TME	Current time
AL-1	Alarm 1
AL-2	Alarm 2
CHR	Chronograph
▶0◀	0-Position Check
TMR	Timer
L-TM	Local Time
CAL	Calendar

3. 0-Position Check (Inital set)

Check that the functions of the watch operate properly by performing the following procedure (0-position check).

0-Position: This refers to the base position of each hand that enables the watch to function properly.



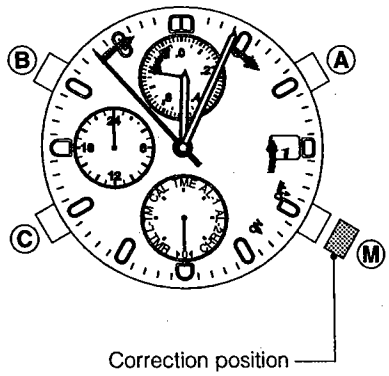
(1) Press button Ⓜ to switch the watch to the 0-postion check mode [▶0◀]. The hour hand, minute hand, 24H hand, second hand, date and function hand will advance rapidly to the 0-position (base position).

Hour, Minute and 24H hands.....00:00 (24:00)
Second hand .....00 seconds
Date 1st
Function hand.....0-position (12:00 postion)

* Perform the "0-Postion Correction" procedure when any hand is not at the 0-position. If this 0-position is not correct, the hands will not show the correct position (such as not returning to "00" when resetting the chronograph).

☆ When one of buttons Ⓐ, Ⓑ or Ⓒ is pressed while in the 0-position check mode, the hour, minute, second and function hands will move to the left and right following a demonstration program.

<0-Postion Correction Procedure>



(1) Pull button Ⓜ out while in the 0-position check mode.

(2) Press buttons Ⓐ, Ⓑ or Ⓒ to correct the 0-position of each hand.
The second hand can be corrected by pressing button Ⓐ.
The date and function hand can be corrected by pressing button Ⓑ.
* The date will be corrected by one day when the function hand completes 4 revolutions. The 12:00 position, immediately after the date has changed to "1", is the 0-position.
The hour, minute and 24H hands can be corrected by pressing button Ⓒ.

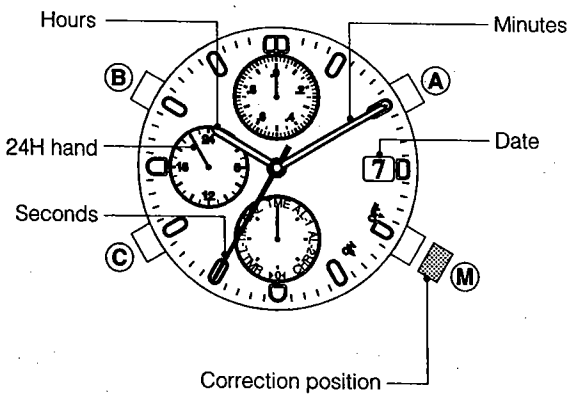
Corrections can be made rapidly by holding down any of the buttons.

(3) Push button Ⓜ in to the normal position.

* After correcting the 0-position of each hand, switch to each mode to reset the time, calendar, alarms and so forth.

4. Setting the Time [TME]

Press button Ⓜ to switch to the time mode [TME].



(1) Pull button Ⓜ out.

(2) Press button Ⓐ to reset seconds.
Simultaneous to pressing button Ⓐ, the second hand will return to the 0 seconds position and then start to move.

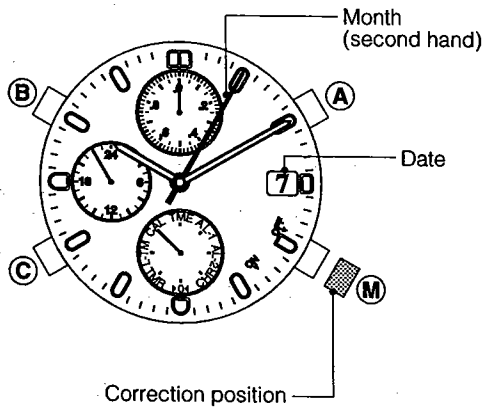
(3) Press button Ⓑ or Ⓒ to correct the hour, minute and 24H hands.
Corrections can be made one minute at a time in the clockwise direction each time button Ⓑ is pressed.
Corrections can be made one minute at a time in the counterclockwise direction each time button Ⓒ is pressed.
Corrections can be made rapidly by holding button Ⓑ or Ⓒ down.
Correct the time by moving the hands in the closest direction to the correct time.

(4) Push in button Ⓜ to the normal position.

* When setting the time, be careful that AM or PM is set correctly by referring to the 24H hand.

5. Setting the Calendar [CAL]

Press button Ⓜ to switch to the calendar mode [CAL].



(1) Pull button Ⓜ out.

(2) Press button Ⓐ to correct the month number.
Correction can be made by advancing by one month each time button Ⓐ is pressed.
The month number can be read directly from the normal hour positions.
(Example: 3:00 → March, 1:00 → January)
Correction can be made rapidly by holding button Ⓐ down.

(3) Press button Ⓑ to correct the date.
Correction can be made by advancing one day each time button Ⓑ is pressed.
Correction can be made rapidly by holding button Ⓑ down.

(4) Push button Ⓜ in to the normal position.

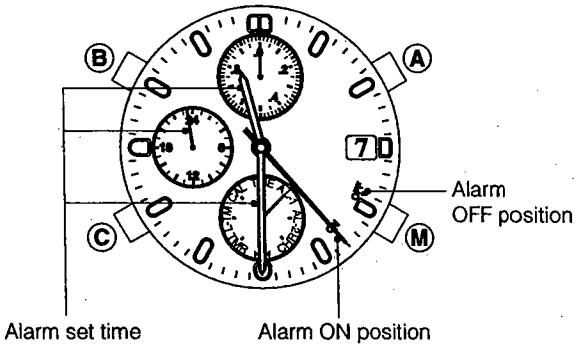
* Since the date and function hand are synchronized with each other, the function hand will turn when correcting the date.

* Date correction at the end of each month is not required. However, since February is set at 28 days, date correction must be performed for February only in leap years.

6. Use of Quick Set Alarm [AL-1]

The quick set alarm function uses a 24-hour clock. When the alarm set time is reached, an alarm sounds for 10 seconds. Once the alarm has stopped sounding, the alarm set time is canceled automatically (alarm OFF). The alarm can be stopped by pressing any of button Ⓐ, Ⓑ or Ⓒ.

<Quick Set Alarm ON Display>



Press button Ⓜ to switch to the alarm 1 [AL-1] mode.

- When the second hand is stopped at the ON position (23 second position), it indicates that the alarm is set (alarm ON). The hour, minute and 24H hands indicate the alarm set time.
- When the second hand is moving, it indicates that the alarm has been canceled (alarm OFF). The hour, minute and 24H hands indicate the time of the TME mode.

<Setting the Alarm Time>

Press button Ⓑ or Ⓒ to move the hour, minute and 24H hands to the time at which the alarm is desired to be set.

- Correction can be made one minute at a time, in the clockwise direction, each time button Ⓑ is pressed.
- Correction can be made one minute at a time, in the counterclockwise direction, each time button Ⓒ is pressed.
  Correction can be made rapidly by holding button Ⓑ or Ⓒ down.
  Correct the alarm set time by moving the hands in the closest direction to the desired alarm time.

* When setting the alarm time, be careful that AM or PM is set correctly by referring to the 24H hand.

<Canceling Alarm Set Time>

The alarm set time is canceled by pressing button Ⓐ when the alarm is ON.

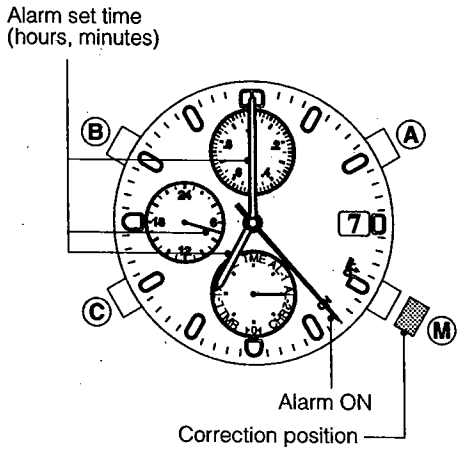
<Alarm Monitor>

The alarm sound can be monitored by pressing button Ⓐ in the alarm 1 mode when the alarm is OFF.

7. Use of Daily Alarm [AL-2]

The daily alarm also uses a 24-hour clock. Once the alarm is set, the alarm sounds for 15 seconds at the alarm set time, once a day. The alarm sound can be stopped by pressing any of button Ⓐ, Ⓑ or Ⓒ.

<Daily Alarm ON Display>



Press button Ⓜ to switch to the alarm 2 (AL-2) mode.
The second hand will indicate either ON (23 second position) or OFF (19 second position). In both cases, the hour, minute and 24H hands will indicate the alarm set time.

<Setting the Alarm Time>

(1) Pull button Ⓜ out.
The second hand will indicate the ON position.

(2) Press button Ⓑ or Ⓒ to move the hour, minute and 24H hands to the time at which the alarm is desired to be set.
- Correction can be made one minute at a time, in the clockwise direction, each time button Ⓑ is pressed.
- Correction can be made one minute at a time, in counterclockwise direction, each time button Ⓒ is pressed.
Correction can be made rapidly by holding button Ⓑ or Ⓒ down.
Correct the alarm set time by moving the hands in the closest direction to the desired alarm time.

(3) Push button Ⓜ in to the normal position

* When setting the alarm time, be careful that AM or PM is set correctly by referring to the 24H hand.

<Switching Between Alarm ON and OFF>

The alarm will switch between ON and OFF each time button Ⓐ is pressed with button Ⓜ pulled out.

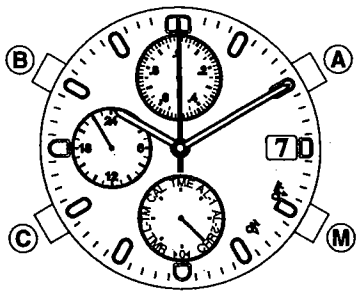
<Alarm Monitor>

The alarm sound can be monitored by pressing button Ⓐ in the alarm 2 mode when button Ⓜ is in the normal position.

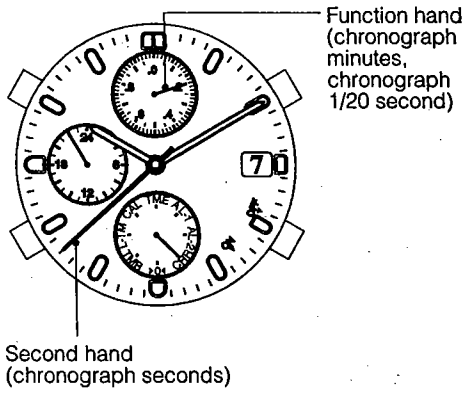
8. Use of Chronograph [CHR]

The chronograph is able to measure time up to a maximum of 59 minutes, 59 and 19/20th seconds in 1/20 second increments after which the chronograph returns to the chronograph reset display and stops. This chronograph is also able to measure split time. In the chronograph mode, the hour, minute and 24H hands as well as date indicate the currect time and date.

[Chronograph Reset]



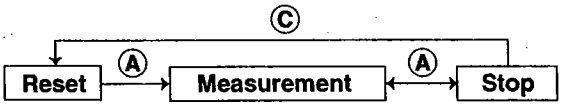
[During Chronograph Measurement]



<Explanation of Display>

Chronograph minutes: Read the function hand.
Chronograph seconds: Read the second hand.
Chrnograph 1/20 second: The function hand will change to the 1/20 second sidplay when button Ⓑ is pressed during the stop or split display. The value for 1/20 second is read at that time.

<Use of Accumulated elapsed Time Measurement>

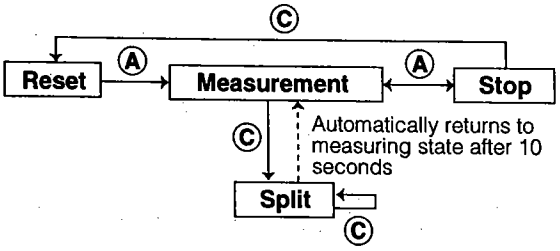


(1) The chronograph is started and stopped by pressing button Ⓐ. (Starting and stopping the chronograph can be repeated as many times as desired.)

(2) The chronograph is reset by pressing button Ⓒ when it is stopped.

☆ A confirmation beep will sound when either the start, stop or split operation is selected.

<Use of Split Time Measurement>



(1) The chronograph is started and stopped by pressing button Ⓐ.

(2) Pressing button Ⓒ, during measurement, displays the split time for 10 seconds. The next split time is displayed when button Ⓒ is pressed again during display of split time.

(3) The chronograph is reset by pressing button Ⓒ when it is stopped.

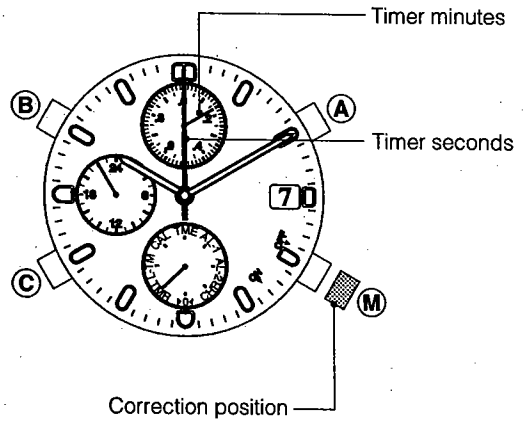
* The chronograph automatically returns to the measuring state after displaying the split time for 10 seconds.

☆ A confirmation beep tone will sound when either the start, stop or split operation is selected.

* Measurement will continue internally even when the watch is switched to a different mode during chronograph measurement. Measurement will be shown continuing when the watch is again returned to the chronograph mode. However, it returns to the reset display when 60 minutes have elapsed.

9. Use of Timer [TMR]

The timer can be set over a range of 1 to 59 minutes in 1 minute increments.
When measurement of the set time is completed, the watch beeps for 5 seconds indicating that the time is up. After the set time has elapsed, the timer will automatically return to the same set time. In the timer mode, the hour, minute and 24H hands as well as the date indicate the current time and date.



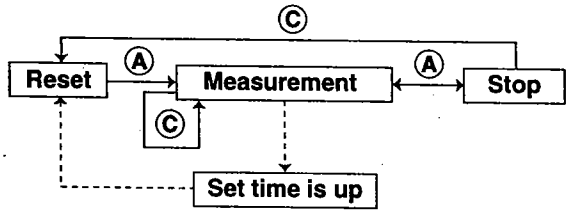
<Timer Setting Procedure>

Press button Ⓜ to switch to the timer mode [TMR].

(1) Pull button Ⓜ out.

(2) Press button Ⓑ or Ⓒ to set the timer to the desired time.
Correction can be made one minute at a time in the clockwise direction each time buttn Ⓑ is pressed.
Correction can be made one minute at a time in the counterclockwise direction each time button Ⓒ is pressed.
The hands can be advanced rapidly by holding button Ⓑ or Ⓒ down.

(3) Push button Ⓜ in to the normal position.



<Measuring Procedure>

(1) The timer is started and stopped by pressing button Ⓐ. When button Ⓐ is pressed after the timer is stopped, timer measurement will continue from the time remaining on the timer when it was stopped.

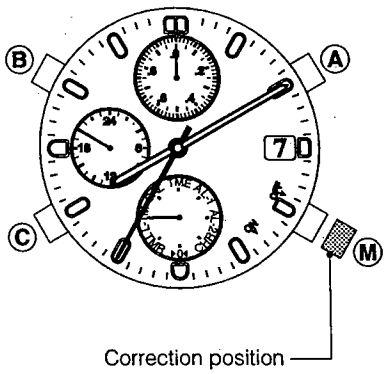
(2) Pressing button Ⓒ when the timer is stopped, returns the timer to the set time.

☆ When button Ⓒ is pressed during timer measurement, the timer returns to the set time and restarts (timer flyback (restart) function).

☆ A confirmation beep will sound when each of the timer start, stop, reset and repeat operations is selected.

10. Setting Local Time [L-TM]

The local time function enables the time in a different time zone to be set separately from the current time. Local time is set by performing a time difference correction in 1 hour units based on the current time (time of the TME mode). The minute and second hands move in coordination with the current time.



<Time Difference correction>

Press button Ⓜ to switch to the local time mode [L-TM].

(1) Pull button Ⓜ out.

(2) Press button Ⓑ or Ⓒ correct the time difference.
- Correction can be made one hour at a time in the clockwise direction each time button Ⓑ is pressed.
- Correction can be made one hour at a time in the counterclockwise direction each time button Ⓒ is pressed.
  Correction can be made rapidly by holding button Ⓑ or Ⓒ down.

(3) Push button Ⓜ in to the normal position.
* The range over which the time difference can be corrected is from +23 hours to –23 hours based on the current time (time of the TME mode).

11. What do to when the following case

[The hands do not indicate the correct positions in each mode]

- The hand base positions may shift after the watch has been subjected to a strong impact and so forth. When this happens, refer to [3. 0-Position Check] and perform the "0-Position Correction" procedure.

[The watch exhibits an abnormal display or operation]

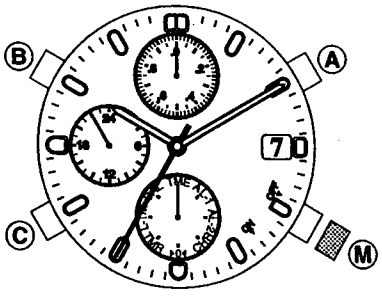
- In extremely rare situations, the watch may exhibit an abnormal display or erroneous operation (such as the alarm continuing to sound, or the hands turning continuously) as a result of being subjected to the effects of static electricity or strong impact and so forth. When this happens, perform the "12. All-Reset Procedure" while referring to the following page.
- Micro-computer IC is equipped in the watch. As the time of battery approachs, the watch may exhibit abnormal display. In this case, replace the battery.

[After Replacing the Battery]

- After the battery has been replaced, always make sure to perform the "All-Reset" procedure described on the following page. The watch may not run properly if this operation is not performed.

12. All-Reset Procedure

<All-Reset Procedure>



The all-reset procedure can be performed in any mode.

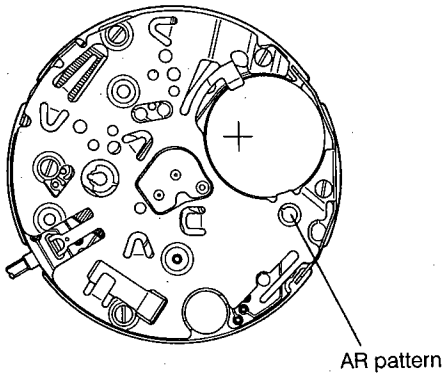
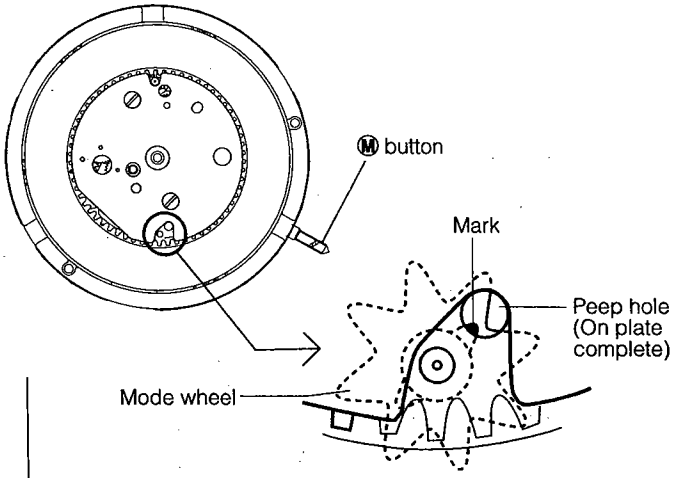
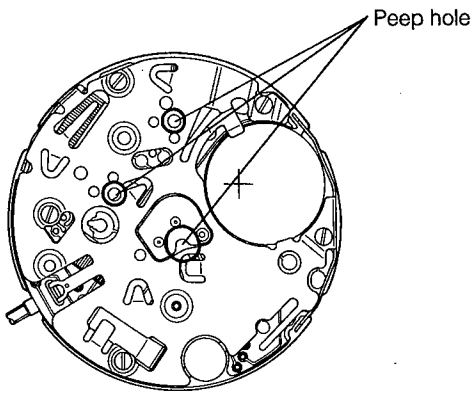
(1) Pull button Ⓜ out.

(2) Simultaneously press buttons Ⓐ, Ⓑ and Ⓒ. (The confirmation beep sounds at this time.)

(3) Return button Ⓜ to the normal position.

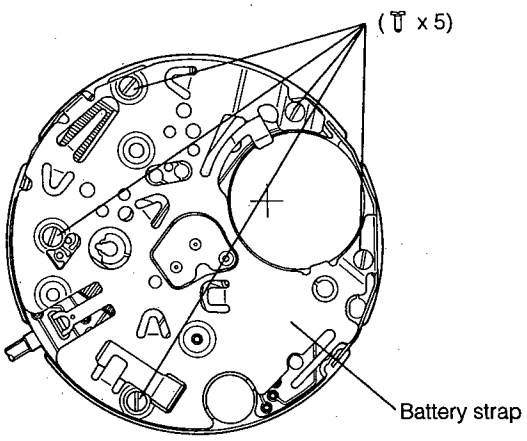
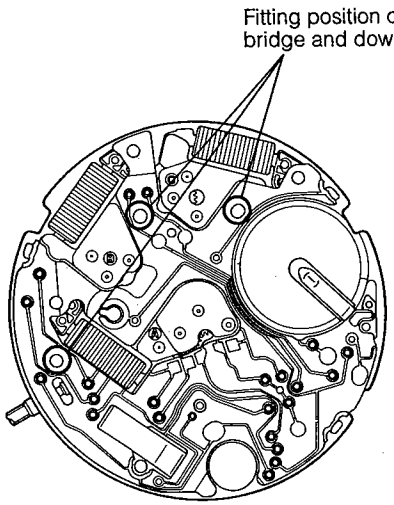
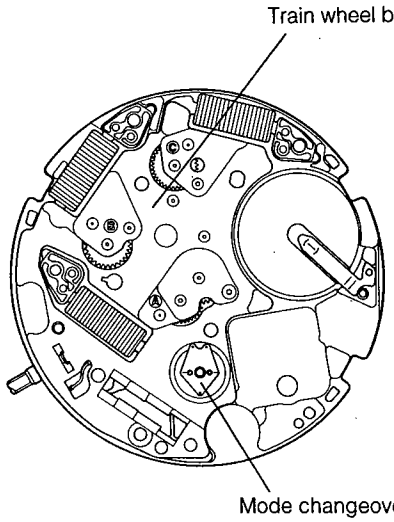
* After performing the all-reset procedure, always make sure to perform the "0-position correction" procedure while referring to [3. 0-Position Check] before resetting the watch to the correct time.

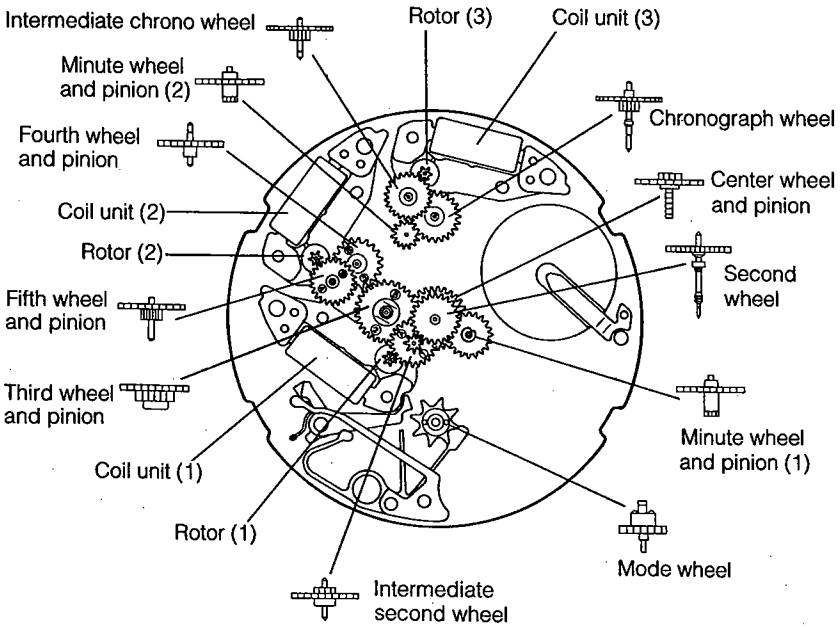
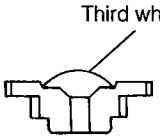
§4. FITTING PROCEDURE OF HANDS

Step/Explanatory illustration		Remarks
❶ Perform all reset	Short the top of the battery to the AR pattern with tweezers, etc. for at least 2 seconds.  	
❷ Set movement to "0" position check mode.	(1) Watch the mode wheel through the peep hole in the dial direction of the movement and press the Ⓜ button until the mark of the mode wheel comes to the position shown in the following figure.  	
	(2) Confirm that the all train wheels are stopped through the peep hole on the train wheel bridge side. (The watch is set in the "0" position check mode at this position.) If the train wheels are moving, the watch is in the time mode. In this case, press the Ⓜ button four times, then confirm the mark of the mode wheel again.  	* After setting in the "0" position check mode, do not press the Ⓜ button until the mode hand is installed.

Step/Explanatory illustration		Remarks
❸ Install dial washer (2) and dial.	Install dial washer (2), then install the dial without floating it.	Confirm that dial surface is free from dust and dirt.
❹ Install function hand.	Pull the Ⓜ button to the first click and press the Ⓑ button (Date correcting operation). When the date dial is moved forward perfectly, install the function hand and set it to the "0" position.	Since the function hand is interlocked with the date dial, install the former when the latter is moved forward perfectly. * If the function hand is installed just before or while the date dial is moved, the date will change while the former is moving (e.g. while the chronograph is used). Take care.
❺ Install the mode hand.	Install the mode hand to the center of the print of "▶0◀".	
❻ Install the hour, minute, second, and 24-hour hands.	Install each hand to the position of "24 hours, 00 minute, 00 second".	
❼ Check "0" position check mode.	With the Ⓜ button at the normal position, press the Ⓐ, Ⓑ, or Ⓒ button, and confirm that each hand moves for demonstration. * If each hand does not move for demonstration, the mode is wrong. In this case, find out the mode in which the hands move for demonstration and reinstall the mode hand to the correct position.	

§5. PRECAUTIONS FOR DISASSEMBLING AND ASSEMBLING

Explanatory illustration	Step/Precautions
	1) Remove the battery. 2) Remove the five mounting screw of the battery strap. * Note that the following items are removed if these screw are removed. • Battery strap • Electronic circuit • Train wheel bridge 3) Remove the battery strap
	4) Remove the unit of electronic circuit. * The unit of electronic circuit is fitted to the dowel pin of the train wheel bridge. Since the train wheel bridge is not secured with any screw, press it when removing the unit of electronic circuit.
	5) The two holes of the mode changeover switch spring are fitted to the two dowel pins on the mode wheel. * Fitting direction of the mode changeover switch spring is shown below. 

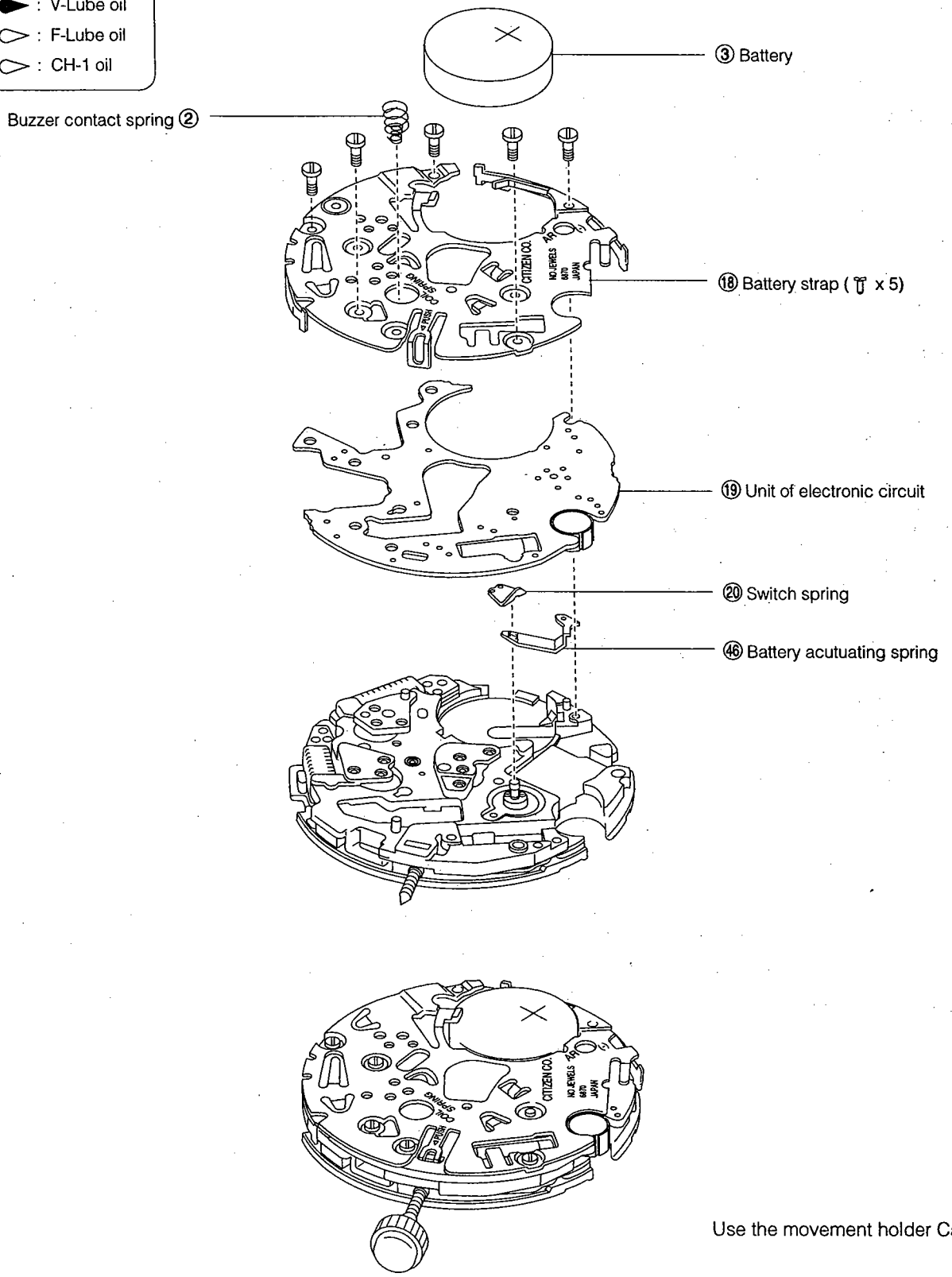
Explanatory illustration	Step/Precautions
	6) The train wheel unit is divided into the A-train wheel, B-train wheel, and C-train wheel. The identification marks of A1 and B2 ~ B4 are stamped on the gears from the center wheel and pinion and the second wheel at the center through each rotor. The chronograph wheel and intermediate chrono wheel of the C-train wheel do not have identification marks. Identify the coil units and rotors by their colors. • Coil unit (1) ··· Deep red • Rotor (1) ··· Pinion (White), washer (White) • Coil units (2), (3) ··· Light red • Rotors (2), (3) ··· Pinion (White), washer (Gold) 6) Fit the third wheel strap to the top of the third wheel and pinion as shown below.  **Note: Take care sufficiently when handling the plastic parts.**
(Note) • Rotor (3) is the same with Rotor (2) and these are compatible. • Coil unit (3) is the same with Coil unit (2) and these are compatible.	

§6. DISASSEMBLY AND ASSEMBLY OF THE MOVEMENT

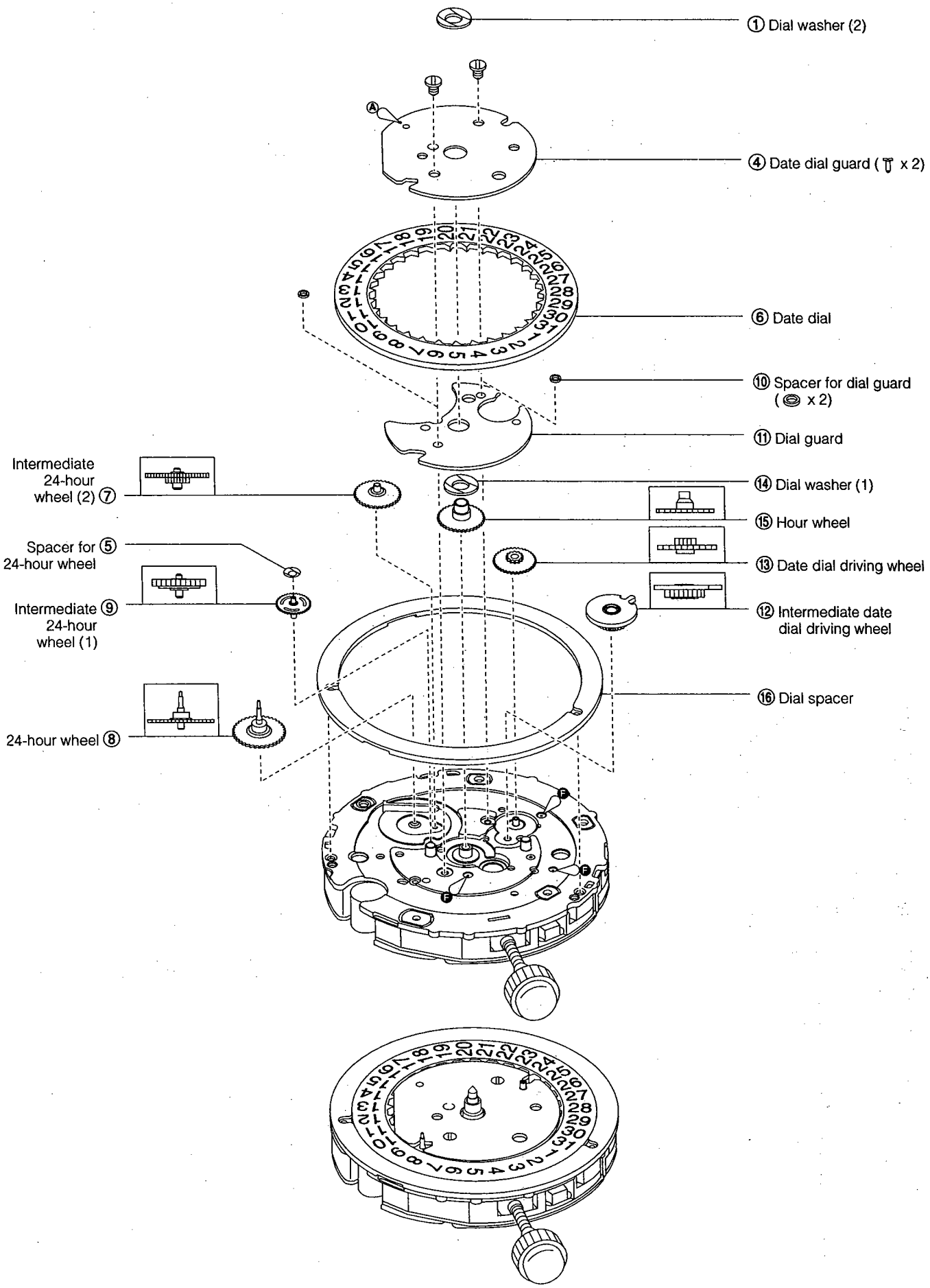
Disassembly procedure: ① → ㊼
Assembly procedure: ㊼ → ①

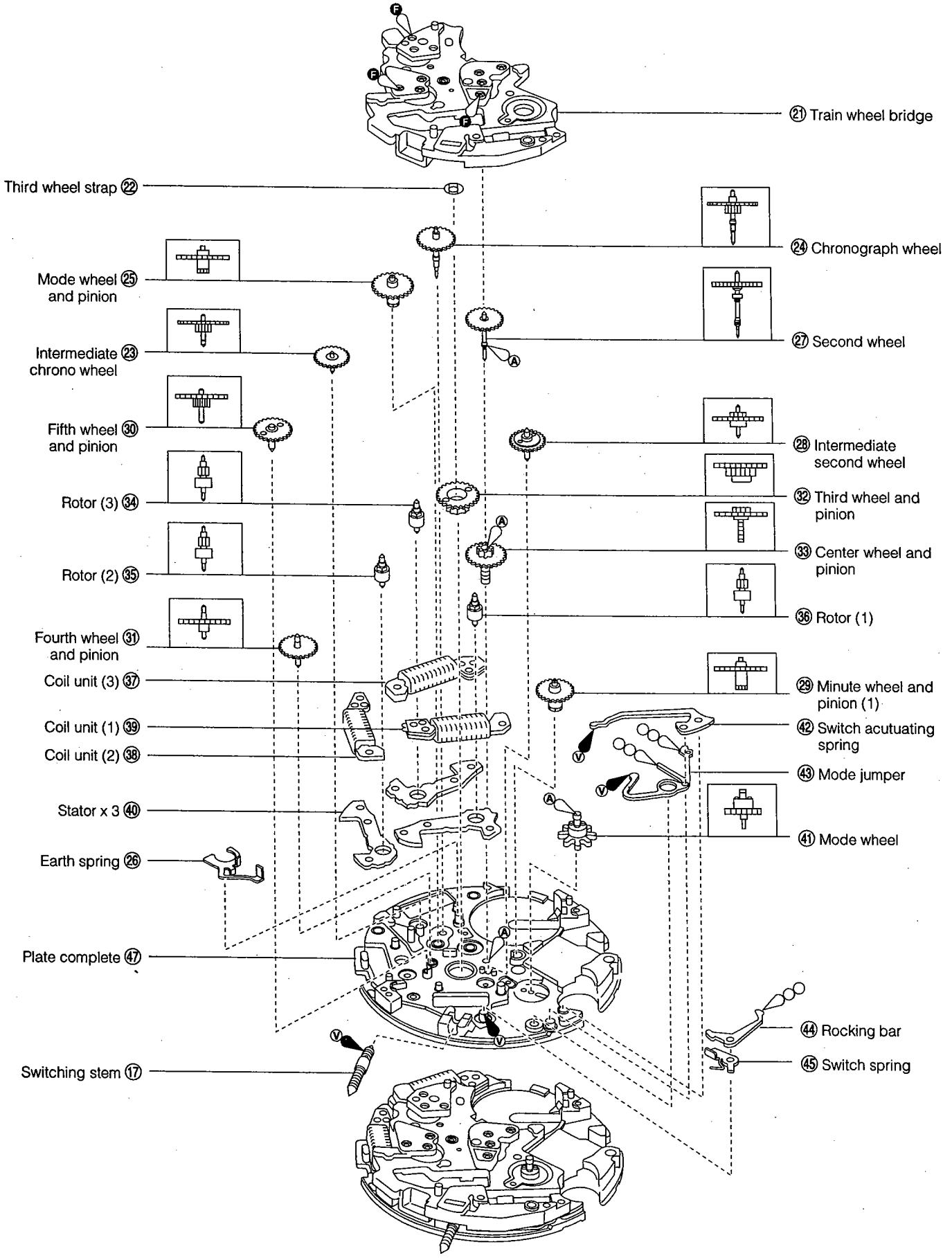
● Lubrication mark

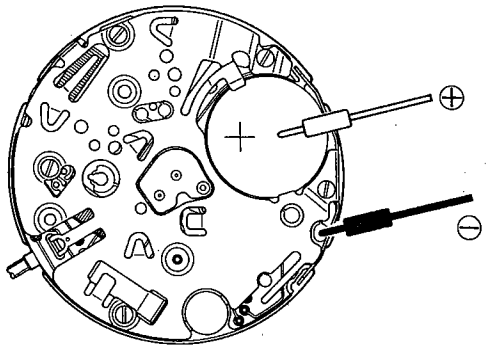
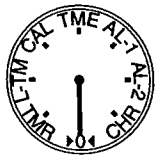
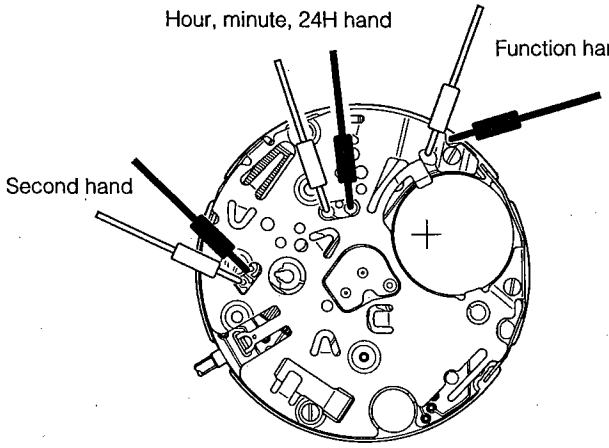
Ⓐ : A-Lube oil
Ⓥ : V-Lube oil
Ⓕ : F-Lube oil
: CH-1 oil



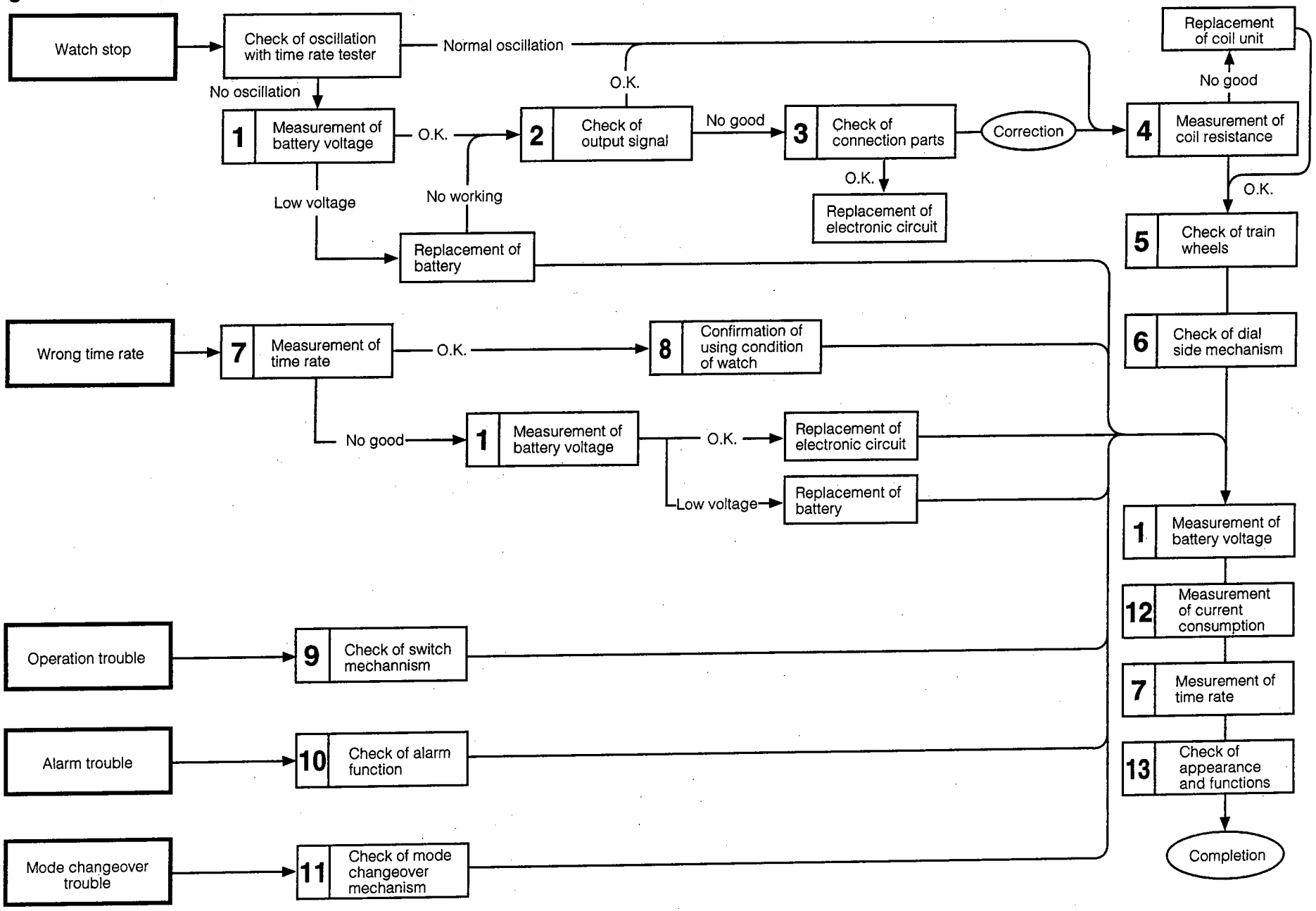
Use the movement holder Cal. 68.

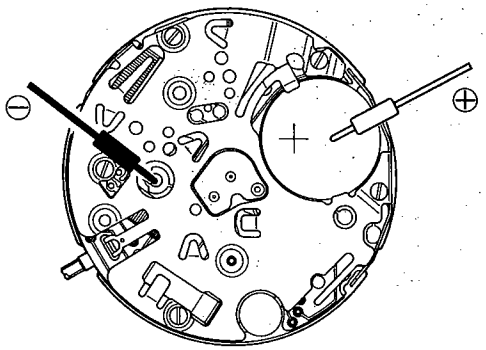

① Dial washer (2)
④ Date dial guard (x 2)
⑥ Date dial
⑩ Spacer for dial guard (x 2)
⑪ Dial guard
Intermediate 24-hour wheel (2) ⑦
⑭ Dial washer (1)
⑮ Hour wheel
Spacer for ⑤ 24-hour wheel
⑬ Date dial driving wheel
Intermediate ⑨ 24-hour wheel (1)
⑫ Intermediate date dial driving wheel
⑯ Dial spacer
24-hour wheel ⑧

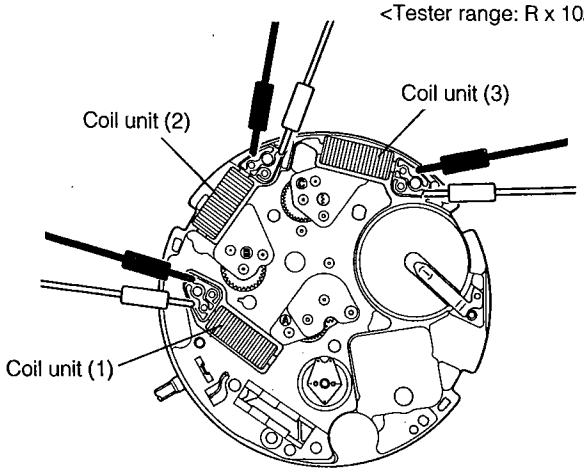

㉑ Train wheel bridge
Third wheel strap ㉒
㉔ Chronograph wheel
Mode wheel ㉕ and pinion
㉗ Second wheel
Intermediate ㉓ chrono wheel
Fifth wheel ㉚ and pinion
㉘ Intermediate second wheel
Rotor (3) ㉞
㉜ Third wheel and pinion
㉝ Center wheel and pinion
Rotor (2) ㉟
㊱ Rotor (1)
Fourth wheel ㉛ and pinion
Coil unit (3) ㊲
㉙ Minute wheel and pinion (1)
Coil unit (1) ㊴
㊷ Switch acutuating spring
Coil unit (2) ㊳
㊸ Mode jumper
Stator x 3 ㊵
㊶ Mode wheel
Earth spring ㉖
Plate complete ㊼
㊹ Rocking bar
Switching stem ⑰
㊺ Switch spring

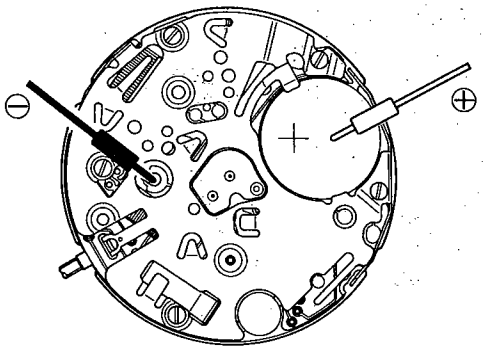
Check Points	How to Check	Results and Treatments
❶ Measurement of battery voltage	* Refer to Technical Manual, Basic Course: II-1-a. <Tester range: D.C. 3V> 	• **Over 1.5V** → OK • **Under 1.5V** → Replacement of battery
❷ Check of output signal	* Refer to Technical Manual, Basic Course: II-1-b. <Tester range: D.C. 0.3V> * Before starting measurement, press the Ⓜ button to set the watch in the "0" position check mode.  <Measuring method> • Check the output signal while the battery is installed. • Apply the tester lead pins to each terminal and press the Ⓐ, Ⓑ, or Ⓒ button. (Check the output while each hand is moving for demonstration.)  (The tester lead pins have no polarity)	Common to each output terminal • Tester pointer swings. → OK. • Tester pointer does not swing. → Check connecting parts. ⇩ Connecting parts are normal. → Replace the electronic circuit.
❸ Check of connection parts	* Refer to Technical Manual, Basic Course: II-2-a, Analog section.	

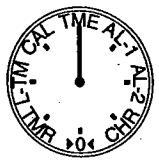
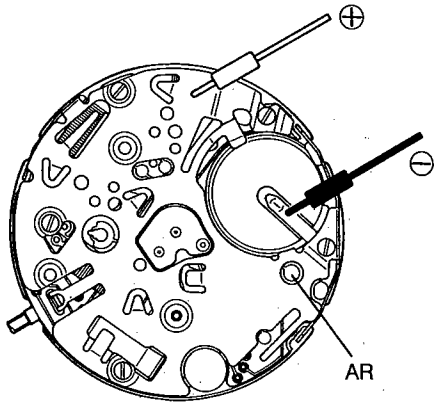
§7. TROUBLESHOOTING AND ADJUSTMENT



Check Points	How to Check	Results and Treatments
⑩ Check of alarm function	* Refer to Technical Manual, Basic Course: II-1-d. 1. Set the movement (with dial and hands) in the case, check the alarm output signal. ① Press the Ⓜ button to set the watch in the alarm 2 mode (AL-2). ② Apply the ⊕ tester lead pin to the top of the battery and the ⊖ one to the buzzer contact spring. ③ Keep pressing the Ⓐ button. (Check the alarm output signal while the alarm is monitored.) <Tester range: DC 0.3V>  2. If the alarm output signal is normal, perform the following checks. • Check the piezo-electric element of the vibrating plate for cracking and brakage. • Check the buzzer contact spring for bend and deformation. • Check the pattern of the electronic circuit for dust and dirt.	• Tester pointer does not swings. → Replace the electronic circuit. • Tester pointer swings. → Normal. ⇩ Go to ⑩-2. ⇩ If no defects are, the alarm is normal. • Cracking or breakage of piezo-electric eloement. → Replace the case. • Deformation or fatigue of buzzer contact spring. → Replace the buzzer contact spring. • Dust or dirt on electronic circuit. → Remove dust and dirt.
⑪ Check of mode changeover mechanism	If the Ⓜ button cannot be pressed or the mode hand does not move when the Ⓜ button is pressed, perform the following checks. 1. Check of appearance parts. • Check the button Ⓜ for rust, dust, and dirt. • Check the case pipe for bend and deformation. • Check the application of silicone oil. 2. Check of movement • Confirm that the mode changeover switch spring is installed normally. • Check the levers for removal (Mode jumper, switch acutuating spring, etc.) • Check the mode wheel for cracking and breakage, and check the levers for fatigue and deformation. • Check the electronic circuit pattern for dust and dirt.	• Dust or dirt on button Ⓜ. → Bend dust and dirt. • Bend or deformation of case pipe. → Repair or replace the case. • Solidification of silicone oil. → Wash and supply silicone oil newly. • Removal of lever or spring. → Re-assemble. • Fatigue and deformation of parts. → Replace the defective parts. • Dust or dirt. → Remove dust and dirt.

Check Points	How to Check	Results and Treatments
❹ Measurement of coil resistance	* Refer to Technical Manual, Basic Course: II-1-c. <Tester range: R x 10Ω>  (The tester lead pins have no polarity)	• Coil resistance Coil unit (1): **1.8 kΩ ~ 2.4 kΩ** Coil unit (2), (3): **1.0 kΩ ~ 1.4 kΩ** → OK • Out of above range. → Replace coil unit.
❺ Check of train wheel	* Refer to Technical Manual, Basic Course: II-2-b. • Check around the wheels and rotors for dirt, and confirm that they are lubricated normally. • Check the wheels and pinions for crush, deformation, bend of shaft, etc.	
❻ Check of dial side mechanism	* Refer to Technical Manual, Basic Course: II-2-c. • Check the parts for deformation and confirm that they are lubricated normally.	
❼ Measurement of time rate	* Refer to Technical Manual, Basic Course: II-2-d. (Measurement gate: Analog 10 sec.) • The time rate cannot be adjusted.	• The watch loses or gains substantial time. → Replace the electronic circuit.
❽ Confirmation of using condition	* Refer to Technical Manual, Basic Course: II-2-e.	
❾ Check of switch mechanism	1. Check of movement • Check the pattern of the electronic circuit for removal and check the switch spring of the battery strap for fatigue and deformation. 2. Check of push buttons • Check the push buttons for deformation and dirt. **(Note)** Apply silicone oil to the packings of the push buttons without fail. It is necessary for maintenance of water resistance and smooth operation.	• Removal of pattern of electronic circuit. → Replace the electronic circuit. • Fatigue and deformation of parts. → Replace the defective parts. • No problems in switch mechanism. → Check of push button. ⇩ • Any push button is dirty of deformed. → Crean or replace the push button.

Check Points	How to Check	Results and Treatments
⑩ Check of alarm function	* Refer to Technical Manual, Basic Course: II-1-d. 1. Set the movement (with dial and hands) in the case, check the alarm output signal. ① Press the Ⓜ button to set the watch in the alarm 2 mode (AL-2). ② Apply the ⊕ tester lead pin to the top of the battery and the ⊖ one to the buzzer contact spring. ③ Keep pressing the Ⓐ button. (Check the alarm output signal while the alarm is monitored.) <Tester range: DC 0.3V>  2. If the alarm output signal is normal, perform the following checks. • Check the piezo-electric element of the vibrating plate for cracking and brakage. • Check the buzzer contact spring for bend and deformation. • Check the pattern of the electronic circuit for dust and dirt.	• Tester pointer does not swings. → Replace the electronic circuit. • Tester pointer swings. → Normal. ⇩ Go to ⑩-2. ⇩ If no defects are, the alarm is normal. • Cracking or breakage of piezo-electric eloement. → Replace the case. • Deformation or fatigue of buzzer contact spring. → Replace the buzzer contact spring. • Dust or dirt on electronic circuit. → Remove dust and dirt.
⑪ Check of mode changeover mechanism	If the Ⓜ button cannot be pressed or the mode hand does not move when the Ⓜ button is pressed, perform the following checks. 1. Check of appearance parts. • Check the button Ⓜ for rust, dust, and dirt. • Check the case pipe for bend and deformation. • Check the application of silicone oil. 2. Check of movement • Confirm that the mode changeover switch spring is installed normally. • Check the levers for removal (Mode jumper, switch acutuating spring, etc.) • Check the mode wheel for cracking and breakage, and check the levers for fatigue and deformation. • Check the electronic circuit pattern for dust and dirt.	• Dust or dirt on button Ⓜ. → Bend dust and dirt. • Bend or deformation of case pipe. → Repair or replace the case. • Solidification of silicone oil. → Wash and supply silicone oil newly. • Removal of lever or spring. → Re-assemble. • Fatigue and deformation of parts. → Replace the defective parts. • Dust or dirt. → Remove dust and dirt.

Check Points	How to Check	Results and Treatments
⑫ Measurement of current consumption	* Refer to Technical Manual, Basic Course: II-1-f. <Tester range DC10μA> With the movement in the case, measure the current consumption. ① Press the Ⓜ button to set the watch in the time mode (TME). ② Apply the ⊕ tester lead pin to the top of the battery strap and the ⊖ one to the battery connector spring. At first, set the tester range to 10mA.   ③ With the tester lead pins applied as above, short the AR pattern to the battery strap with tweezers, etc. securely for at least 2 seconds (All reset operation). ④ After the tester pointer is stabilized, change the tester range to 10μA and read the current consumption. Influence of light Avoid measuring current consumption under an incandescent lamp of the direct sunlight, because it can increase the current consumption. The current consumption is not affected by a fluorescent lamp.	Current consumption by movement. • **Below 2.5μA** → Normal • **Above 2.5μA** → Check the train wheel and dial side mechanism → Remove dust and dirt and lubricate correctly. ⇩ • Current consumption measured again **Above 2.5μA** → Replace the electronic circuit.
⑬ Check of appearance and functions	* Refer to Technical Manual, Basic Course: II-2-f.	