# PARTS LIST/TECHNICAL GUIDE
# KINETIC Cal. 7D56A

[SPECIFICATIONS]

| Item \ Cal. No. | | 7D56A |
|---|---|---|
|  <br>• 3 hands (Hour/Minute/Second )<br>• Big calendar (Date)<br>• Year /Month indicator<br>• 24 hour indicator | | **Movement**<br>   <br>• Diameter<br>Outside : Ø 32.0 mm Casing : Ø 30.0 mm<br>• Height: 6.10 mm |
| **Driving system** | | Stepping motor 2 pieces and 1 piezoelectric motor for calendar |
| **Additional function** | | • Perpetual calendar function up to 28 Feb 2100<br>• Power save function<br>• Time relay function<br>• Energy depletion forewarning function<br>• Overcharge prevention function<br>• Electronic circuit reset function<br>• Date correction function<br>• Second hand stop function |
| **Crown operation** | Normal position | Free |
| | 1st click position | Calendar setting |
| | 2nd click position | Time setting |
| **Loss/Gain** | | Monthly rate: less than 15 seconds (worn on the wrist at temperature range between 5 °C and 35 °C) |
| **Regulation system** | | Nil |
| **Gate time for rate measurement** | | Use 10-second gate |
| **Current consumption** | | Movement: less than 0.70 µA<br>Circuit block: less than 0.40 µA<br>Circuit block for calendar: less than 0.40 µA |
| **Coil resistance** | | Second coil block: 2.00 - 2.45 KΩ<br>Hour and minute coil block:<br>Coil for driving hands: 1.00 KΩ - 1.25 KΩ<br>Coil for detecting generation: 270Ω - 330 KΩ<br>Generating coil block: 360 - 420Ω |
| **Power supply** | Power generator | Automatic generating system |
| | Rechargeable battery | MT920 Manganese titanium lithium rechargeable battery |
| | Operating voltage range | 0.45V - 2.50V |
| | Duration of charge | Validity of time relay function: approximately 4 years (from full charge) |
| **Number of jewels** | | 16 jewels |

SEIKO WATCH CORPORATION

## FEATURES

SEIKO Kinetic Perpetual Cal. 7D56 is developed based on the design of SEIKO Kinetic Auto Relay Cal. 5J series with a newly designed perpetual calendar mechanism featuring a unique big date display.

Although Cal.7D series features new functions, the experience of repairing the existing KINETIC series watches will be helpful. In repairing Cal. 7D series, you are requested to have the full knowledge of its functions and strictly observe the repairing and checking instructions provided in this guide so that the watch will be repaired correctly.

### ● POWER SAVE FUNCTION AND TIME RELAY FUNCTION

In order to conserve the stored electrical energy, the watch automatically enters power save mode to stop the hands from moving approximately 24 hours after the watch is taken off the wrist. When you decide to wear the watch again, simply swinging the watch several times will awaken it and the hands will indicate the correct time to resume normal operation.

* *The time retrieved by the time relay function may include a certain amount of time loss or gain within the range of accuracy of the watch (15 seconds per month).*

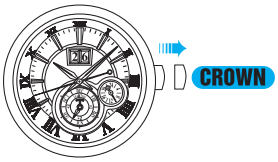
* *In a case that the fully charged watch enters the power save mode, the time relay function of the watch remains operable for approximately four years.*

<Remarks on Power Save Function>

- When the watch is left untouched for approximately 24 hours (approximately one day), the power save function is automatically activated.
  - * *While the second hand is moving at two-second intervals, the power save function cannot be activated.*
- When the power save function is activated, the hour, minute, second and 24-hour hands will stop moving.
  - * *While the watch is in power save mode, the calendar continues to function normally.*
  - * *When the watch is left untouched in power save mode and if the date does not change correctly, the stored electrical energy is being depleted. Recharge the watch until the watch resumes the usual one-second interval movement, and then reset the time and calendar before starting to wear it again.*
  - * *When the watch wakes up from power save mode while it is running on extremely low electrical power, the second hand starts moving at two-second intervals.*

### ● PERPETUAL CALENDAR FUNCTION

- Once set, the calendar automatically adjusts for odd and even months including February of leap years. (Exceptionally, the manual adjustment at the end of February is required for the years that are divisible by four but are not leap years, which comes only once every hundred years, for example, the year 2100.)
  - * *It takes approximately two seconds for the calendar to change its display. However, it may take two minutes if the temperature is low or the stored electrical energy is being depleted.*
- While the watch is in power save mode, the perpetual calendar continues to function.
- Even if the watch is completely stopped due to a shortage of stored electrical energy, the calendar can be manually adjusted by simple procedures.




1. *Each calendar item should be adjusted in sequence of year, month and then date.*

   *Pull out the crown to the first click.*

   * *If your watch has a screw lock type crown, unscrew the crown first, and then pull it out to the first click.*
2. Turn the crown until the year becomes adjustable.
   - * *Each calendar item becomes adjustable in sequence of date, month and then year, by turning the crown.*
   - * *The calendar can be adjusted by turning the crown in either direction upward or downward.*
   - * *The year indicator shows the number of the year(s) past since the last leap year. When setting the year, check whether the year you are going to set is a leap year or not, if it is not a leap year, check how many years have passed (1, 2 or 3) since the last leap year.*

| Year indicator | | | | |
|---|---|---|---|---|
| CAL. 7D56 |  |  |  |  |
| *Year Indication* | L.Y. | +1 | +2 | +3 |
| *Number of the years passed since the last leap year* | *Leap Year* | *One year* | *Two Years* | *Three Years* |
| *Year* | 2008<br>2012<br>⋮<br>2092<br>2096 | 2009<br>2013<br>⋮<br>2093<br>2097 | 2010<br>2014<br>⋮<br>2094<br>2098 | 2011<br>2015<br>⋮<br>2095<br>2099 |

* *The design of the year indicator may vary depending on the model.*

## HOW TO CHARGE THE WATCH

### 1. By swinging the watch

1. Swing the watch from side to side rhythmically at a rate of twice a second as shown in the illustration below.

   This movement will recharge the watch to start moving at the normal one-second intervals from the two-second interval movement. If you find the second hand moving at two-second intervals after swinging the watch, swing it further until the second hand moves at the normal one-second intervals.

   ✶ *After swinging the watch, check that the second hand is moving at one-second intervals.*

2. It is recommended that the watch be swung further until it can reserve enough power to run the watch for approximately one day.

   As a guideline, 200 swings will generate the power to run the watch for approximately one day.

   The second hand will start moving at one-second intervals.

   * *To charge the rechargeable battery efficiently, swing the watch from side to side rhythmically at a rate of twice a second, making an arc of about 20 cm.*

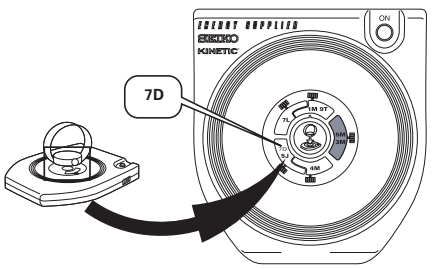
   * *No additional benefit is obtained by swinging the watch more quickly or with greater vigor.*

   * *When the electrical energy stored in the rechargeable battery is completely depleted after the watch is left untouched for a long time, the watch requires at least 450 swings to generate power to resume the normal operational movement.*

### 2. By using the KINETIC Energy Supplyer YT02A

Set the crown to the 7D position.

- Make sure that the watch is correctly positioned as it may affect the amount of power generated.
- The amount of power generated may vary depending the models of the watch.



## HOW TO SET THE PERPETUAL CALENDAR

- Date, month and year are interlocked on the perpetual calendar. To set the month or year, advance the date by turning the crown until the month or year becomes adjustable.
  * *The calendar can be adjusted by turning the crown in either direction upward or downward at the first click position.*

<Remarks on month, year settings>

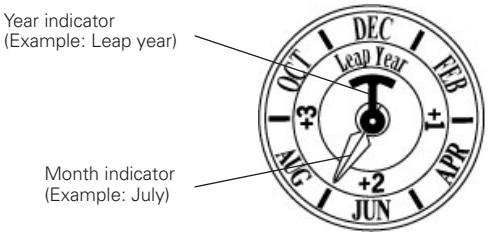
When the date advances to change to "1 ," the month indicator rotates for one month to indicate the following month. When the date advances further until the month indicator moves forward from December (DEC) to January (JAN), the year indicator rotates to show the following year.

CAUTION

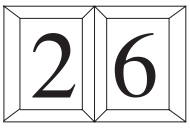
- When setting the calendar in the direction backward, put the date back for one or two days behind the date you wish to set, and then advance it to the desired date.
  * *Follow the above procedure for setting the calendar in the direction backward, otherwise the date numeral may not appear in the center of the calendar frame. Even though this happens, the date display will be aligned correctly the following day.*
  * *When setting the calendar backward to dates in December, the year indicator may not be correctly aligned. In that case, set the calendar back to November then forward it to the correct date in December.*

3. Turn the crown to rotate the year/month indicator until the desired indication appears. Continue to turn the crown until the month becomes adjustable.

*Year/Month indicator*




4. Turn the crown to set the month display hand to indicate the correct month. Then continue to turn the crown to set the date.



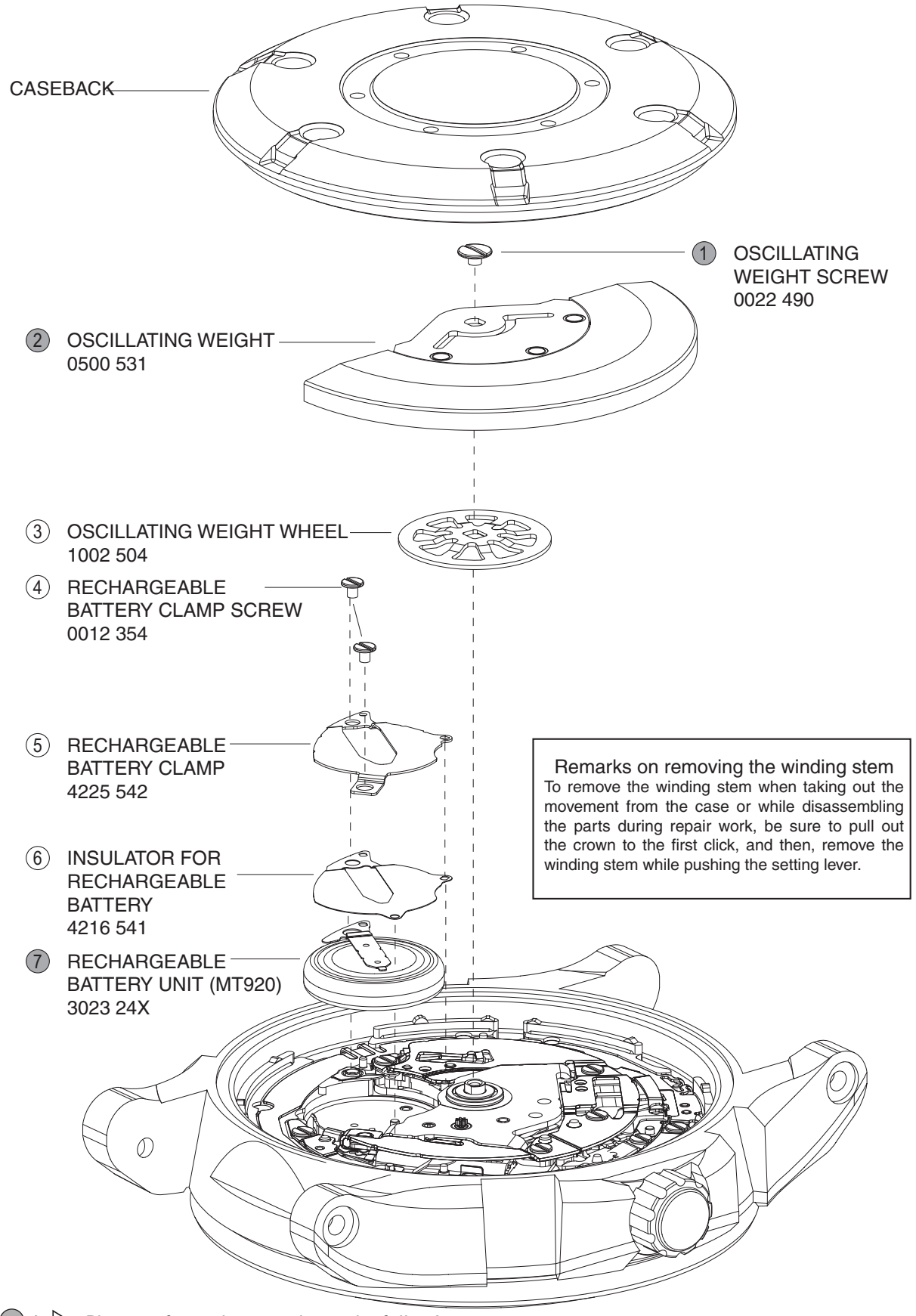

Example: Date display of the 26th

5. Upon completion of the calendar adjustment in sequence of year, month and date, push the crown back into the originalposition.

# PARTS LIST

**Cal. 7D56A**

**[AUTOMATIC GENERATING MECHANISM]**

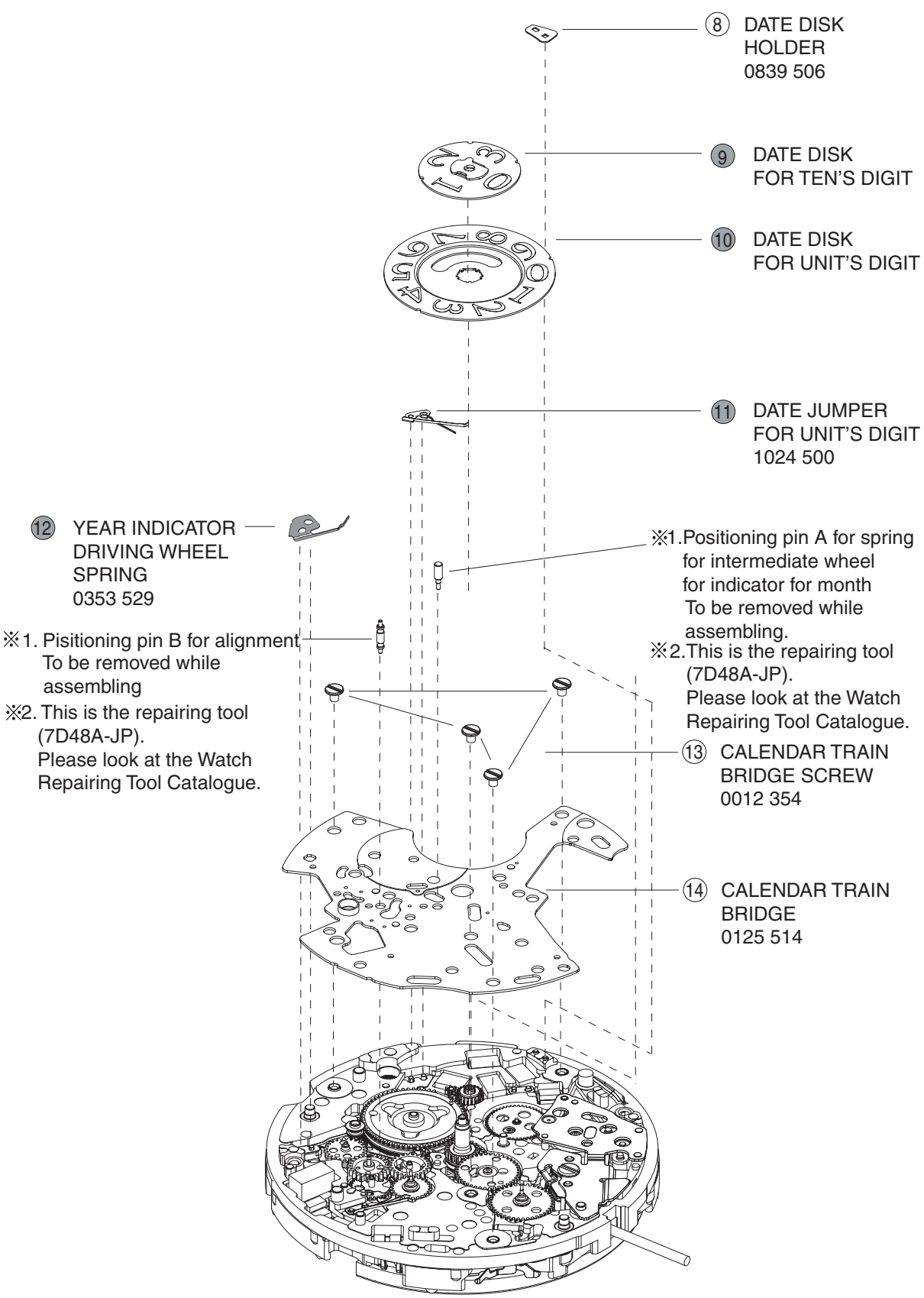



**Remarks on removing the winding stem**

To remove the winding stem when taking out the movement from the case or while disassembling the parts during repair work, be sure to pull out the crown to the first click, and then, remove the winding stem while pushing the setting lever.

Please refer to the remarks on the following pages.
Lubricating of some parts is shown in " REMARKS ON DISASSEMBLING AND REASSEMBLING THE MOVEMENT."

**[CALENDAR UNIT (1)]**




Please refer to the remarks on the following pages.
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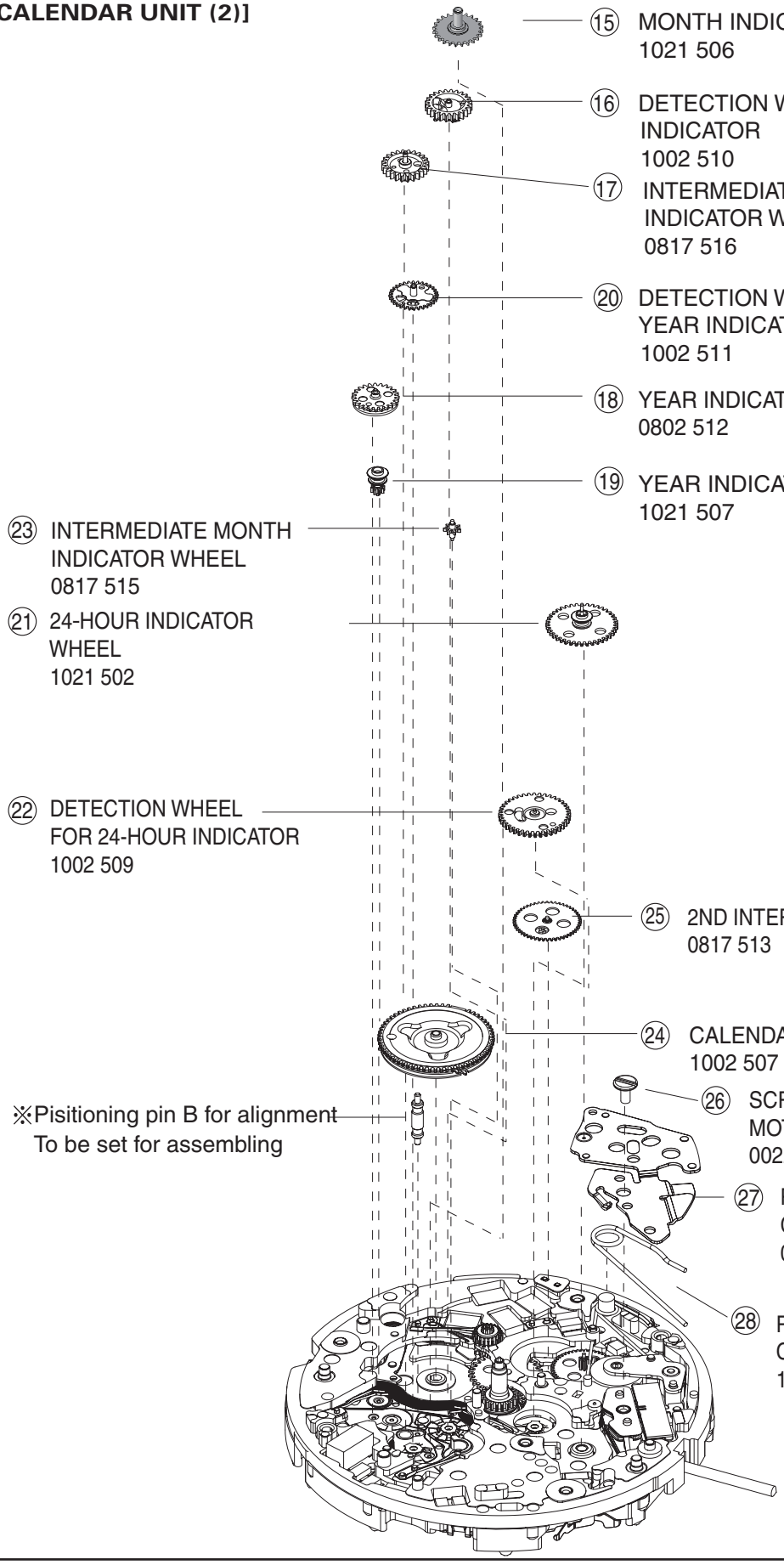
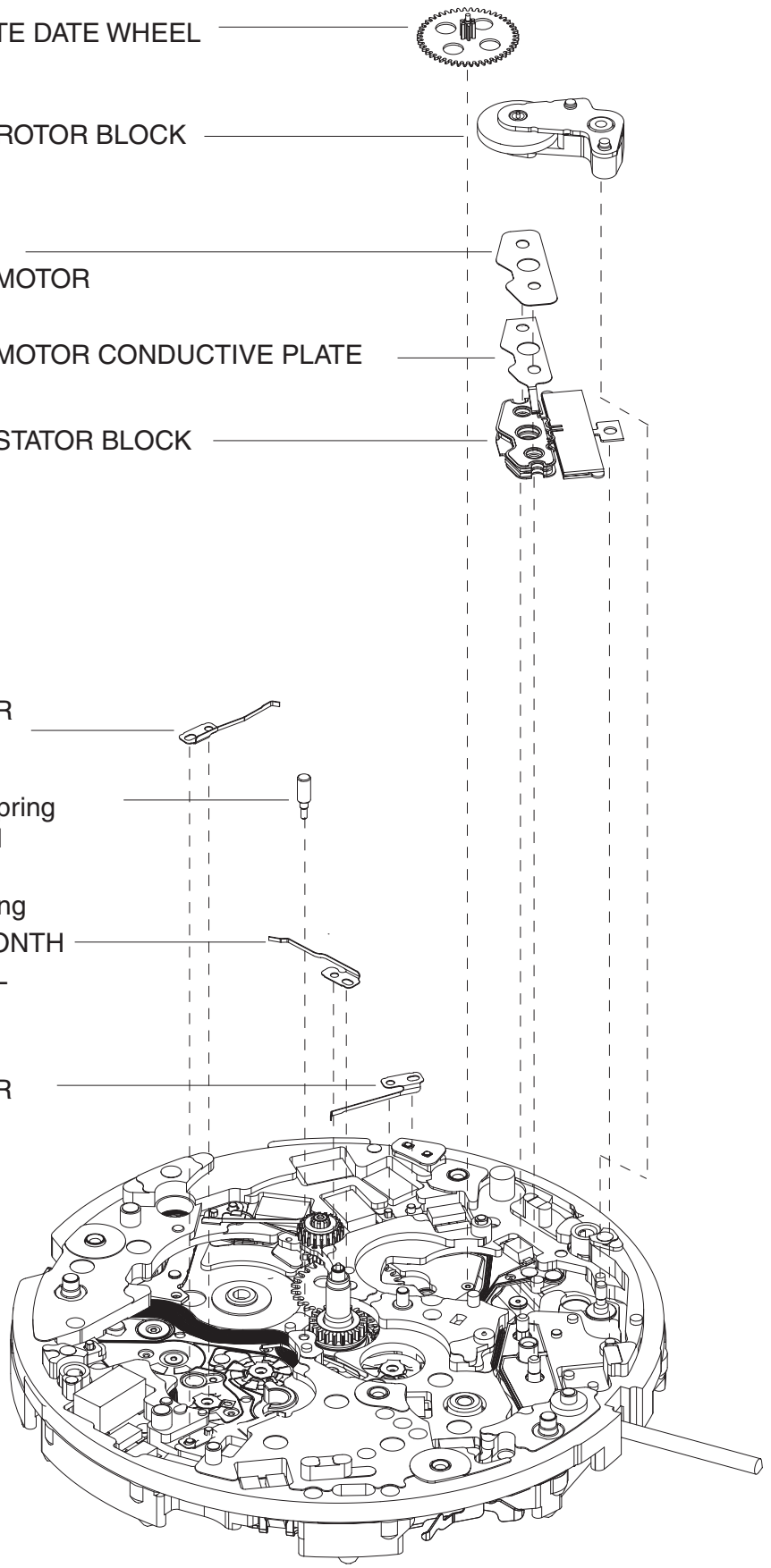
**[CALENDAR UNIT (2)]**



**[CALENDAR UNIT (3)]**



㉙ 1ST INTERMEDIATE DATE WHEEL
0817 512

㉚ PIEZOELECTRIC ROTOR BLOCK
4146 514

㉛ INSULATOR FOR PIEZOELECTRIC MOTOR
4216 540

㉜ PIEZOELECTRIC MOTOR CONDUCTIVE PLATE
0105 502

㉝ PIEZOELECTRIC STATOR BLOCK
4583 500

㉞ MONTH INDICATOR WHEEL JUMPER
1024 504

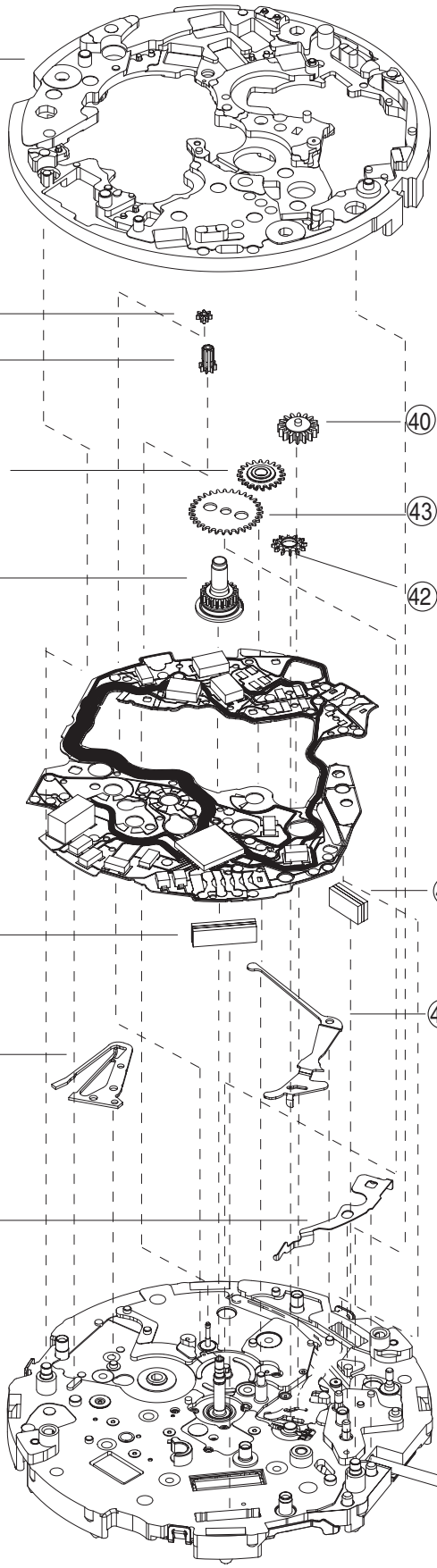
※ Positioning pin A for spring for intermediate wheel for indicator for month
To be set for assembling

㉟ INTERMEDIATE MONTH INDICATOR WHEEL SPRING
1024 503

㊱ DATE JUMPER FOR TEN'S DIGIT
1024 501

Please refer to the remarks on the following pages.
Lubricating of some parts is shown in " REMARKS ON DISASSEMBLING AND REASSEMBLING THE MOVEMENT."

**[CALENDAR UNIT (4)]**



37 CALENDAR PLATE
4408 563

38 DATE DRIVING WHEEL FOR TEN'S DIGIT
0802 506

39 DATE PINION FOR TEN'S DIGIT
1013 504

40 CALENDAR CORRECTOR 3RD INTERMEDIATE WHEEL
0962 501

41 CALENDAR CORRECTOR 4TH INTERMEDIATE WHEEL
0962 502

43 3RD INTERMEDIATE DATE WHEEL
0817 514

42 CALENDAR CORRECTOR 2ND INTERMEDIATE WHEEL
0962 559

44 HOUR WHEEL
0271 564

45 CIRCUIT BLOCK FOR CALENDAR
4000 669

46 CONNECTOR B
4313 582

47 CONNECTOR A
4313 581

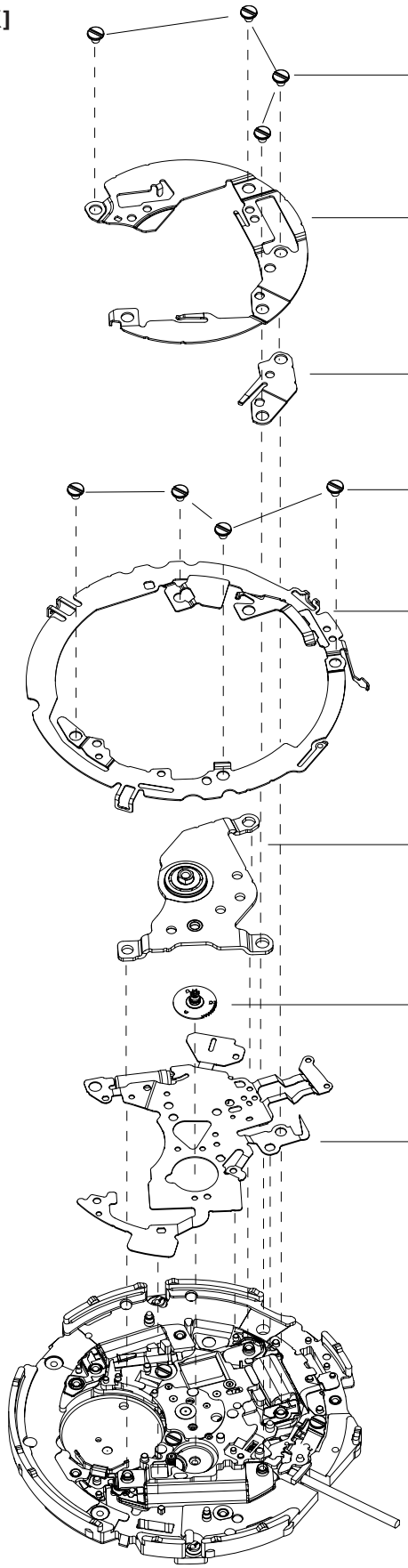
48 PIEZOELECTRIC MOTOR SETTING LEVER
0981 500

49 CONTROL WHEEL JUMPER
1024 502

50 EARTHING SPRING
4281 510

● ⇨ Please refer to the remarks on the following pages.
Lubricating of some parts is shown in " REMARKS ON DISASSEMBLING AND REASSEMBLING THE MOVEMENT."

**[CIRCUIT BLOCK]**



51 SCREW FOR CIRCUIT BLOCK COVER A
0012 354

52 CIRCUIT BLOCK COVER A
4457 505

53 CIRCUIT BLOCK COVER D
4457 774

54 SCREW FOR CIRCUIT BLOCK COVER C
0012 354

55 CIRCUIT BLOCK COVER C
4457 966

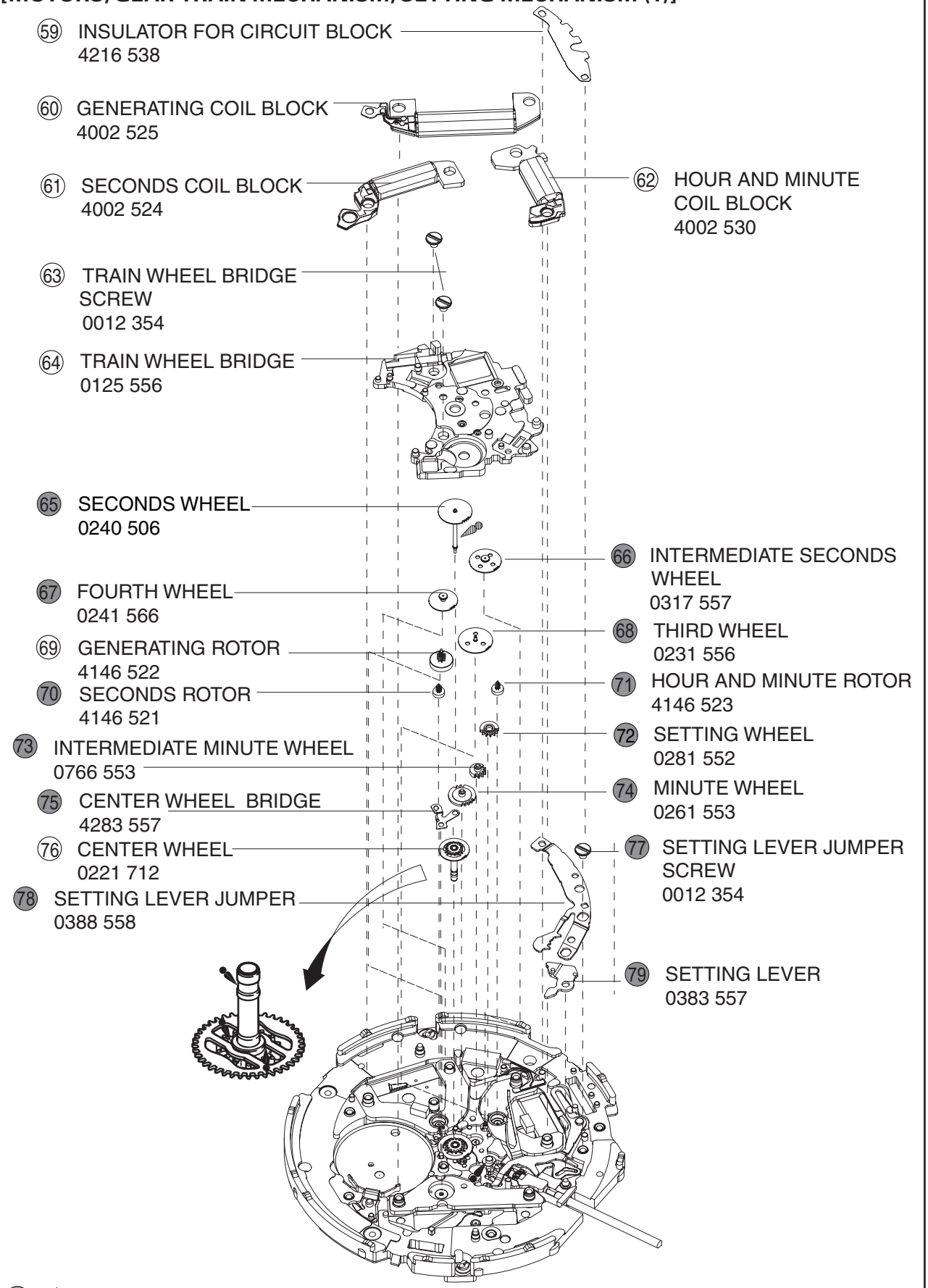
56 OSCILLATING WEIGHT BRIDGE
0198 503

57 INTERMEDIATE WHEEL FOR AUTOMATIC GENERATING
1002 505

58 CIRCUIT BLOCK
4000 594

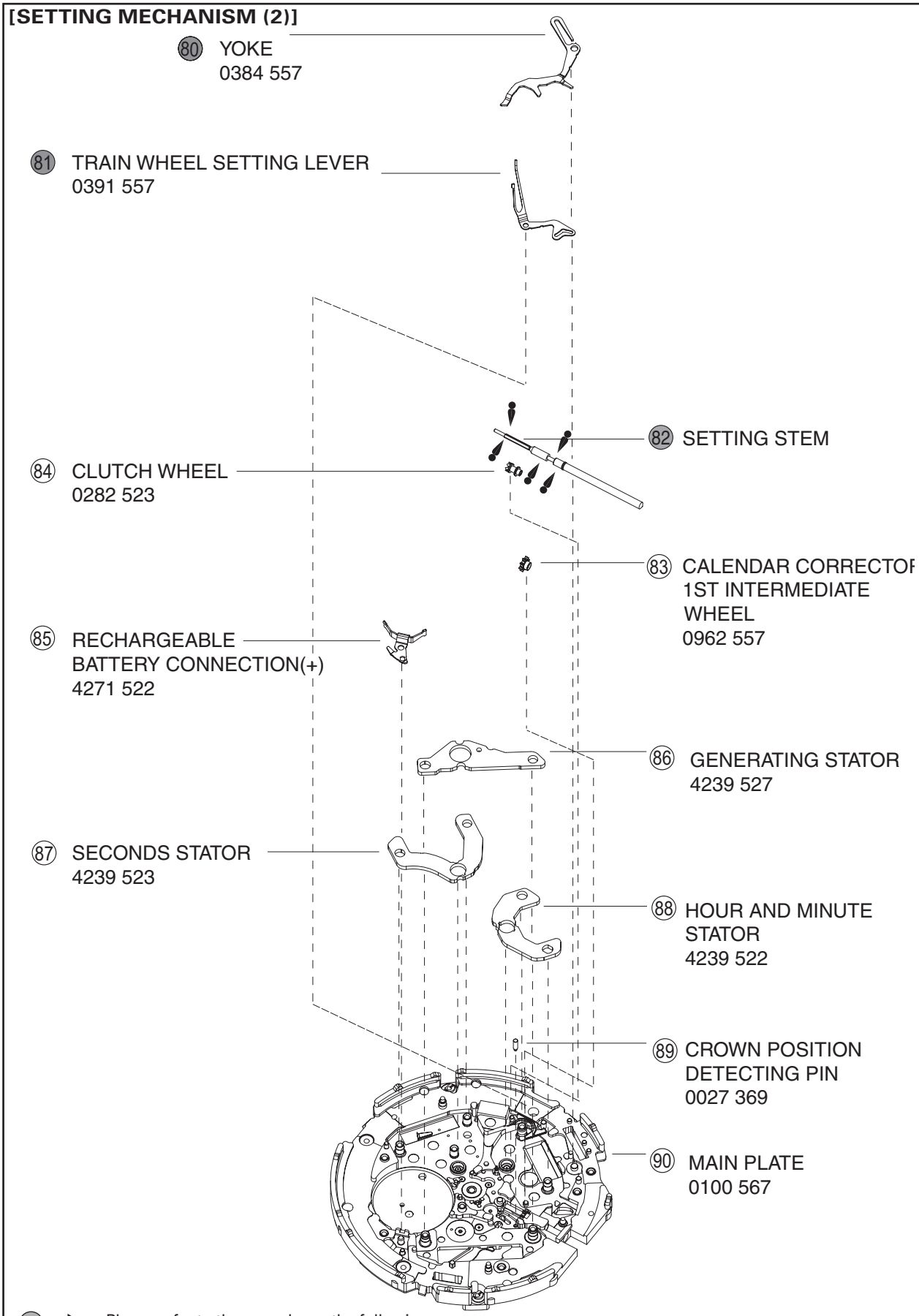
● ⇨ Please refer to the remarks on the following pages.
Lubricating of some parts is shown in " REMARKS ON DISASSEMBLING AND REASSEMBLING THE MOVEMENT."

## [MOTORS/GEAR TRAIN MECHANISM/SETTING MECHANISM (1)]




Please refer to the remarks on the following pages.
Lubricating of some parts is shown in " REMARKS ON DISASSEMBLING AND REASSEMBLING THE MOVEMENT."

**[SETTING MECHANISM (2)]**




Please refer to the remarks on the following pages.
Lubricating of some parts is shown in " REMARKS ON DISASSEMBLING AND REASSEMBLING THE MOVEMENT."

**Remarks**

## ● 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.

(9) DATE DISK FOR TEN'S DIGIT (10) DATE DISK FOR UNIT'S DIGIT

| Code for DATE DISK FOR UNIT'S DIGIT | Code for DATE DISK FOR TEN'S DIGIT | Color of figure | Color of back-ground |
|---|---|---|---|
| 0878 A90 | 0878 A91 | Black | White |
| 0878 B06 | 0878 B05 | White | Black |

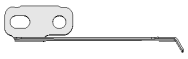
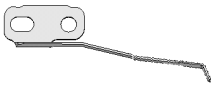
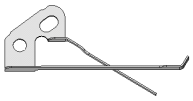
(82) SETTING STEM

## ● How to discriminate resembled parts

HOUR AND MINUTE ROTOR and SECONDS ROTOR

JUMPERS

DISTINCTION AMONG THE DIFFERENT TYPES OF JUMPERS

| | |
|---|---|
| ㊱ DATE JUMPER FOR TEN'S DIGIT 1024501 |  |
| ㉞ MONTH INDICATOR WHEEL JUMPER 1024504 |  |
| ㉟ IMMEDIATE MONTH INDICATOR WHEEL SPRING 1024503 |  |
| ⑪ DATE JUMPER FOR UNITS DIGIT 1024500 |  |
| ⑫ YEAR INDICATOR DRIVING WHEEL SPRING 0353529 |  |

Distinction between the hour and minute rotor and the seconds rotor

71 Hour and minute rotor

4146 523

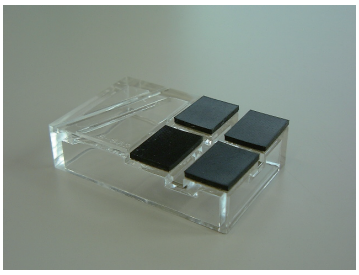
70 Seconds rotor

4146 521

## ● Tools and consumables required for disassembling/reassembling

### • Movement holder

Universal movement holder (S-682)



### • Watch oils

SEIKO watch grease (S-6) and watch oils (AO-3 and AO-2)

S-6


AO-3


AO-2


* **The Cal. 7D series requires a precise alignment of its calendar train wheels, jumpers and springs. These two positioning pins will increase an efficiency of assembling them in correct positions.**

**7D48A-JP**

Positioning pin set (set of 2pins) for Cal.7D series.

Positioning pin B

Positioning pin A

## REMARKS ON DISSASEMBLING AND REASSEMBLING THE MOVEMENT

### ● How to remove the SETTING STEM before dismantling the movement

Crown position: 1st CLICK 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 the stem completely.

* *After dismantling the movement from the case, push back the crown with the SETTING STEM to the movement.*

## ● Setting mechanism

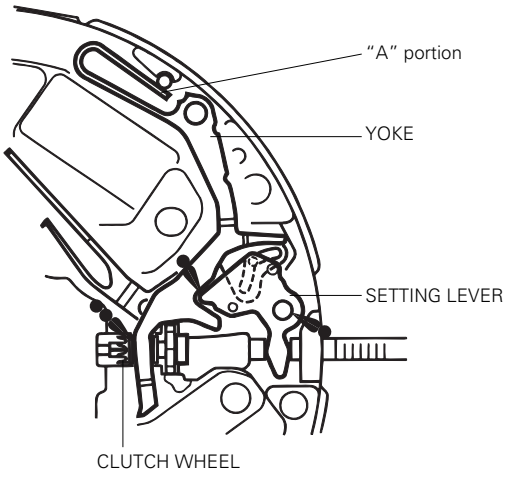
(79) SETTING LEVER

(80) YOKE

(81) TRAIN WHEEL SETTING LEVER

- Make sure that the spring portion of the YOKE ("A" in the illustration) makes secure contact with the pin.

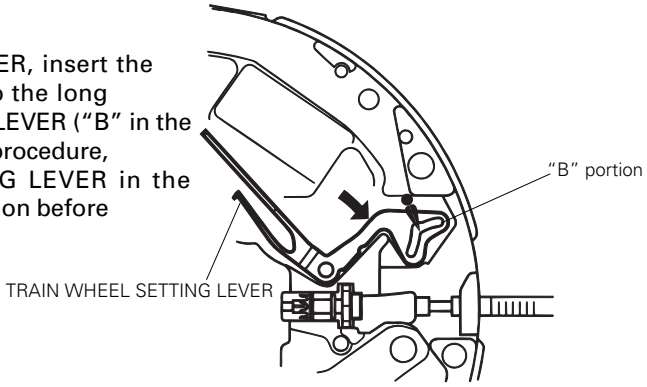
  **Note:** If a defective contact occurs between the spring portion of the YOKE and the pin, the manual power save function may not be activated.




- **Lubricating**

  See the illustration at right.

- When installing the SETTING LEVER, insert the tube on its underside properly into the long slot of the TRAIN WHEEL SETTING LEVER ("B" in the illustration). To facilitate the setting procedure, push the TRAIN WHEEL SETTING LEVER in the direction of the arrow in the illustration before installing the SETTING LEVER.

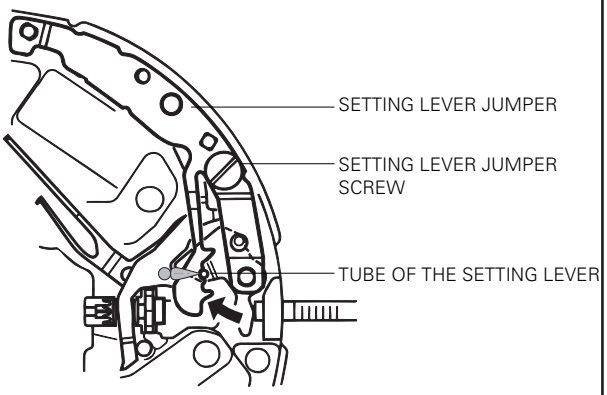



(77) SETTING LEVER JUMPER SCREW

(78) SETTING LEVER JUMPER

- **How to install**
  - Check that the SETTING LEVER JUMPER is securely set in position before tightening the SETTING LEVER JUMPER SCREW.
  - Then, gently bend the spring portion of the SETTING LEVER JUMPER so that it catches the tube of the setting lever.

  **Note:** Take care not to bend the spring portion more than necessary.




- **Lubricating**

  See the illustration at right.

## ● Gear train mechanism

(43) CENTER WHEEL BRIDGE

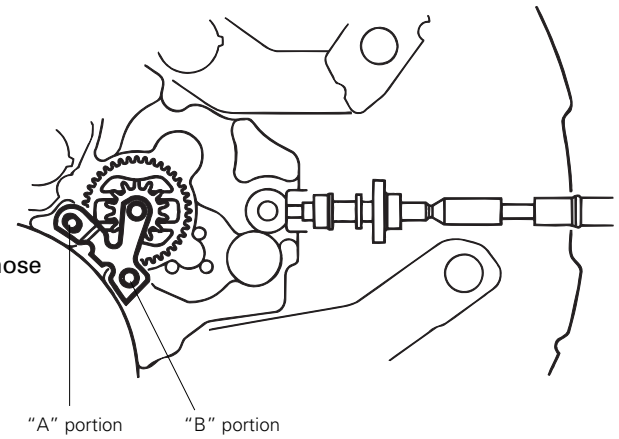
- **Setting position**

  See the illustration at right.

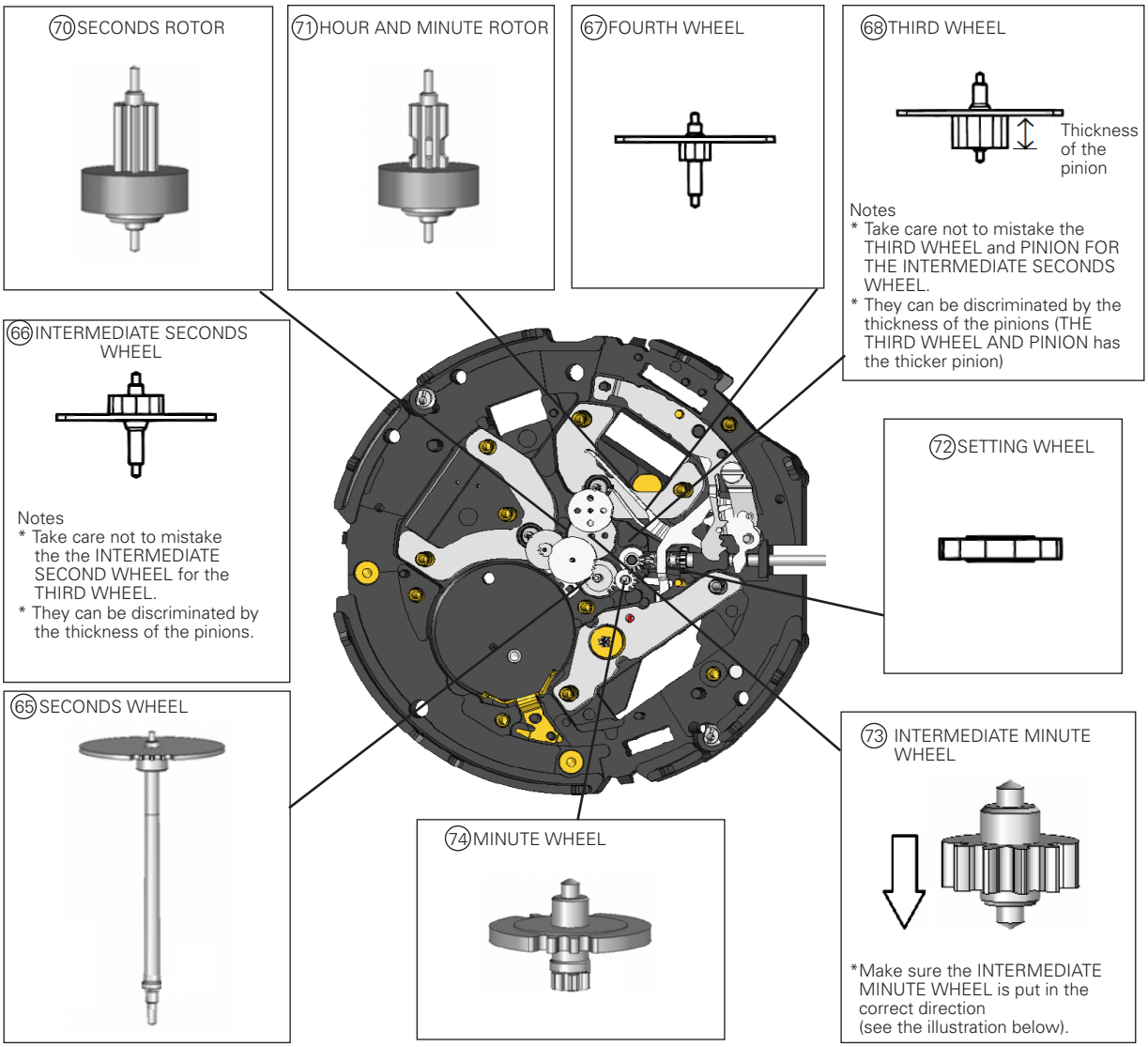
- **How to install**

  "A" and "B" portions have elasticity and are made tight for the guide tubes to which they are set. After setting the spacer for CENTER WHEEL AND PINION, press down those portions so that it is well seated in position.

  **Note:** Take utmost care not to deform or damage the portion that makes contact with the CENTER WHEEL AND PINION.



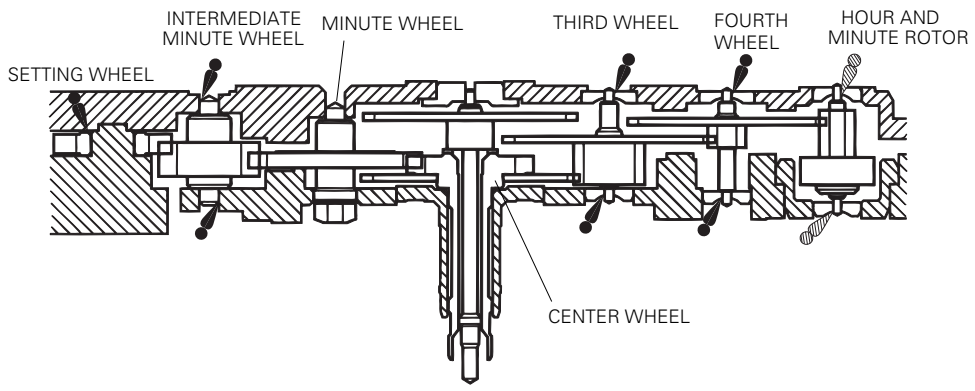
For the discrimination and setting position of the parts, refer to the table below.



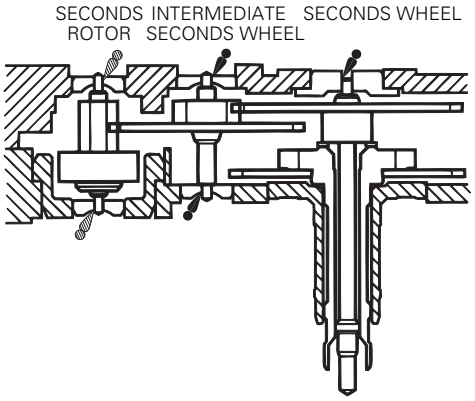

- **Lubricating**

  For the lubrication of these parts, refer to the illustrations below.

  **Note:** Be sure to observe the position, type of oil and quantity of lubrication specified in the illustration.

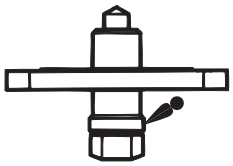



**Lubricating:** :AO-3 :AO-2




**Notes:**

* Lubricate the MINUTE WHEEL before reassembling it to the TRAIN WHEEL BRIDGE. When lubricating it, take care not to stain the pinion with oil.



* Do not lubricate the lower pivots of the THIRD WHEEL and INTERMEDIATE SECONDS WHEEL excessively. Be sure to observe the specified quantity.

## ● Calendar mechanism

Refer to pages 21 to 31.

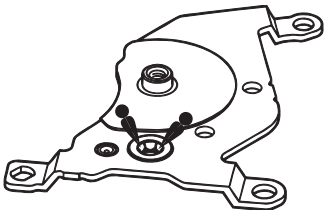
## ● Automatic generating mechanism

(56) OSCILLATING WEIGHT BRIDGE

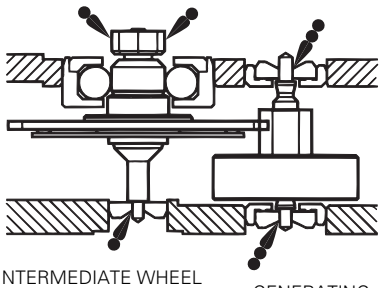
(57) INTERMEDIATE WHEEL FOR AUTOMATIC GENERATING

(69) GENERATING ROTOR

- Lubricate the ball-bearing of the OSCILLATING WEIGHT BRIDGE as shown below before reassembling it to the MAIN PLATE.
- Lubricate the upper and lower pivots and other portions of the GENERATING ROTOR and INTERMEDIATE WHEEL FOR AUTOMATIC GENERATING as shown in the illustration.

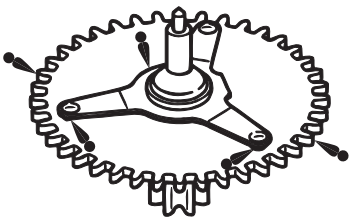


OSCILLATING WEIGHT BRIDGE



INTERMEDIATE WHEEL FOR AUTOMATIC GENERATING

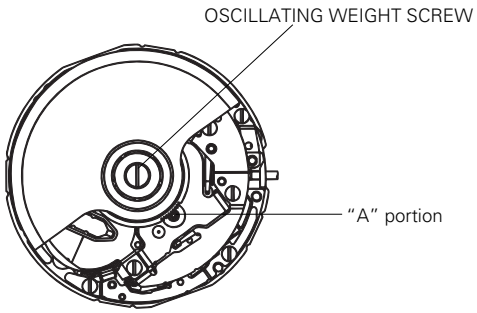
GENERATING ROTOR



INTERMEDIATE WHEEL FOR AUTOMATIC GENERATING

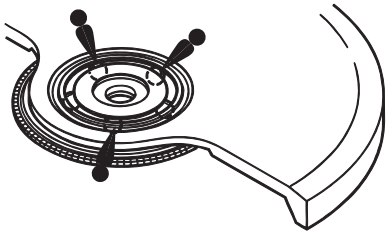
**Note:** Be sure to observe the position, type of oil and quantity of the lubrication specified in the illustration.

## ① OSCILLATING WEIGHT SCREW




- Before tightening the OSCILLATING WEIGHT SCREW, check that the gear of the OSCILLATING WEIGHT WHEEL securely engages with the pinion of the INTERMEDIATE WHEEL FOR GENERATING ROTOR ("A"portion in the illustration).
- Tighten the OSCILLATING WEIGHT SCREW firmly, applying more force than usual. If the OSCILLATING WEIGHT SCREW becomes loose, electricity generation will be defective.

## ② OSCILLATING WEIGHT

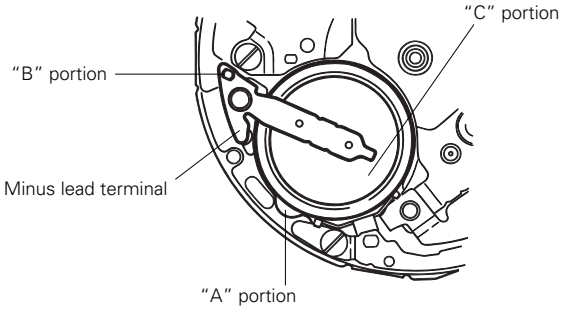


- **Lubricating**

  Lubricate the BALL-BEARING of the OSCILLATING WEIGHT as shown in the illustration at right.

  **Note:** Be sure to lubricate at the position and in the quantity specified in the illustration.

## ⑦ Rechargeable battery unit




- **How to remove**

  Insert the tip of the tweezers into the "A" portion gap in the illustration, and pry up the rechargeable battery unit to remove it.

- **How to install**

  Set the minus lead terminal to the guide post "B" in the illustration, push "C" portion down vertically so that the rechargeable battery unit is well seated in position.

**Notes:**

* Take utmost care not to short-circuit the (+) and (–) terminals, as this will deteriorate the battery unit.

* Never clean the rechargeable battery unit, as it is an electronic part containing an IC.

| No. | PROCESS | ILLUSTRATION AND SPECIAL INSTRUCTIONS |
|---|---|---|
| | [CALENDAR CIRCUIT BLOCK AND PIEZOELECTRIC MOTOR] | |
| 50 | Set the EARTHING SPRING. | |
| | ↓ | |
| 49 | Set the CONTROL WHEEL JUMPER and secure it. | |
| | ↓ | |
| | Pull out the crown to the 1st click position. | |
| | ↓ | |
| 48 | Set the PIEZOELECTRIC MOTOR SETTING LEVER and secure it. | |

<49> Set the CONTROL WHEEL JUMPER and secure it.

Make sure that the jumper is secured with guide pins of the MAIN PLATE and its tail of the spring is engaged with a lead pin (see Fig 1-2).

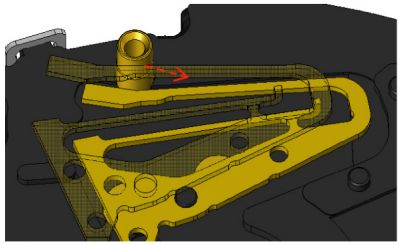


Fig. 1-2

<50> Set the EARTHING SPRING.

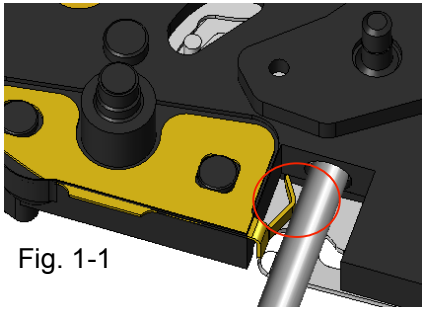
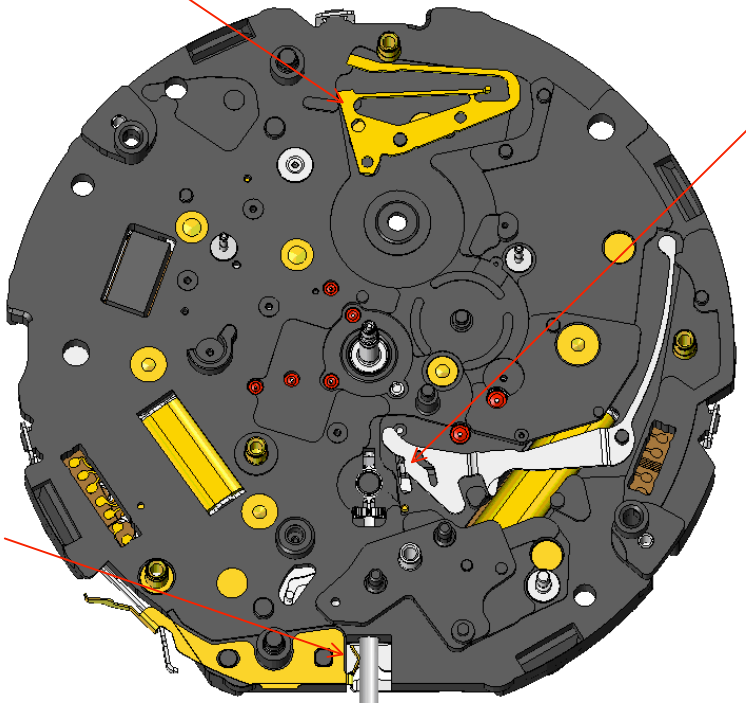


Fig. 1-1

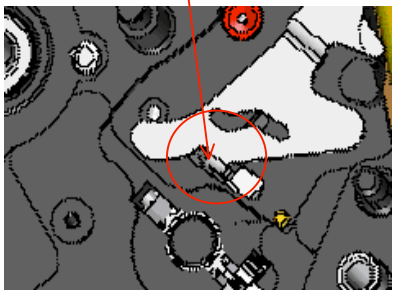
*Make sure that the spring has a good contact with the SETTING STEM (see Fig. 1-1).



<48> Set the PIEZOELECTRIC MOTOR SETTING LEVER.

Make sure that the tip of the lever is securely engaged inside of the yoke (see Fig. 1-3).

Fig. 1-3



Secure the spring part of the lever to the MAIN PLATE (see Fig. 1-4).

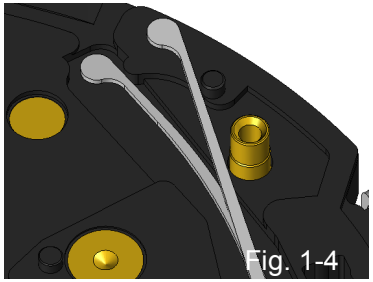
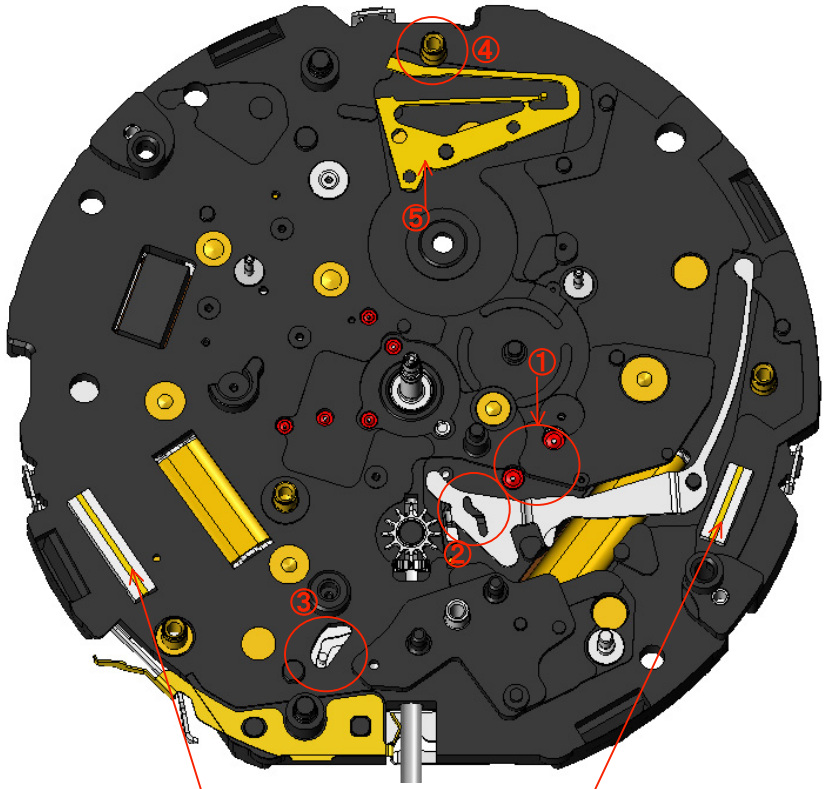


Fig. 1-4

No. 2

| No. | PROCESS | ILLUSTRATION AND SPECIAL INSTRUCTIONS |
|---|---|---|
| | Lubrication | |
| | Lubricate 1 to 5 as illustrated. | |
| | ↓ | |
| 47 | Assemble the CONNECTOR A. | |
| 46 | Assemble the CONNECTOR B. | |




<47> Set the CONNECTOR A.
Gently hold the lateral sides of the connector so as not to bed or deform the gold layer inside (Fig. 2-4).

<46> Set the CONNECTOR B.

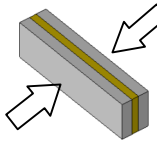
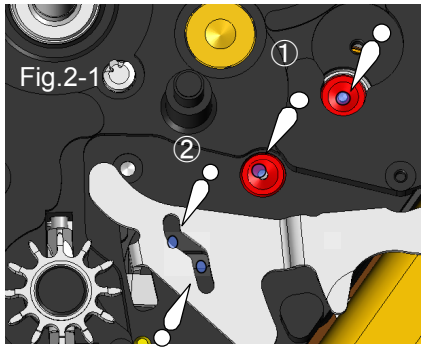


Fig.2-4

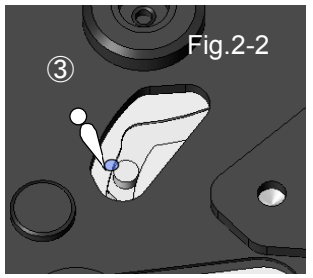
Lubricate 1 to 5 as illustrated.

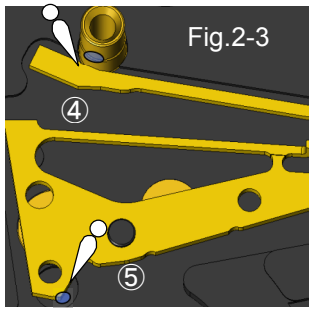
①Lower pivots of the GENERATING ROTOR and the intermediate wheel (see Fig. 2-1).
②A guiding slit of the PIEZOELECTRIC MOTOR SETTING LEVER (See Fig. 2-1.).
③A guiding slit of the SETTING LEVER (see Fig. 2-2).
④Contact point of the CONTROL JUMPER and the post with a screw hole for the CALENDAR TRAIN BRIDGE SCREW (See Fig. 2-3).
⑤Contact point of the CONTROL JUMPER and the CALENDAR CONTROL WHEEL (See Fig. 2-3).

Type of oil: AO-3




Lower pivots of the GENERATING ROTOR and the Intermediate wheel



| No. | PROCESS |
|---|---|
| 45 | Assemble the CIRCUIT BLOCK FOR CALENDAR. |
| | ↓ |
| 44 | Assemble the HOUR WHEEL. |
| | ↓ |
| 43 | Assemble the 3RD INTERMEDIATE DATE WHEEL. |
| | ↓ |
| 42 | Assemble the CALENDAR CORRECTOR 2ND INTERMEDIATE WHEEL. |
| | ↓ |
| 41 | Assemble the CALENDAR CORRECTOR 4TH INTERMEDIATE WHEEL. |
| | ↓ |
| 40 | Assemble the CALENDAR CORRECTOR 3RD INTERMEDIATE WHEEL. |
| | ↓ |
| 39 | Assemble the DATE PINION FOR TEN'S DIGIT. |
| | ↓ |
| 38 | Assemble the DATE DRIVING WHEEL FOR TEN'S DIGIT. |

## ILLUSTRATION AND SPECIAL INSTRUCTIONS

<45> Assemble the CIRCUIT BLOCK FOR CALENDAR.
Do not touch gilt printed pattern directly and make sure that the nine posts are securely engaged (see illustration).

<38> Assemble the DATE DRIVING WHEEL FOR TEN'S DIGIT (see Fig. 3-3).

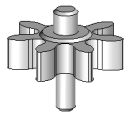
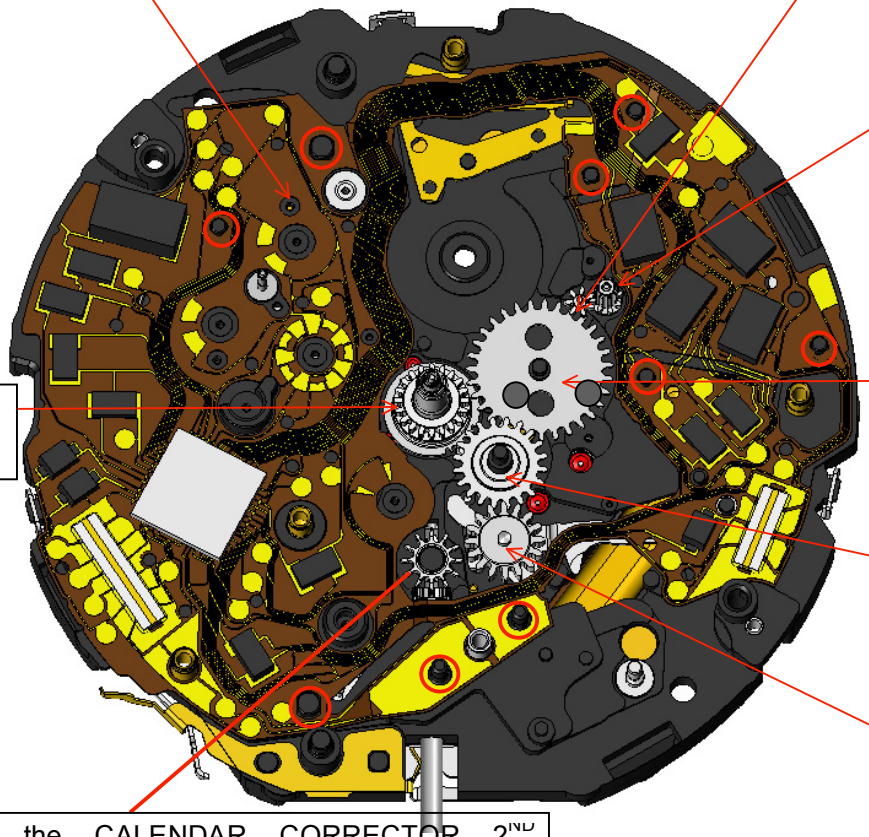


Fig.3-3

<39> Assemble the DATE PINION FOR TEN'S DIGIT.



<43> Assemble the 3RD INTERMEDIATE DATE WHEEL.

<44> Assemble the HOUR WHEEL.

<41> Assemble the CALENDAR CORRECTOR 4TH INTERMEDIATE WHEEL.

<40> Assemble the CALENDAR CORRECTOR 3RD INTERMEDIATE WHEEL (see Fig. 3-2).

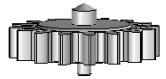


Fig.3-2

<42> Assemble the CALENDAR CORRECTOR 2ND INTERMEDIATE WHEEL

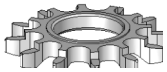


Fig.3-1

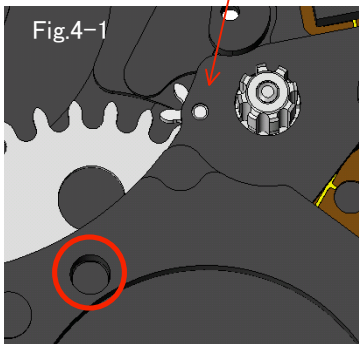
Make sure not to assemble the .wheels and pinions upside down (see Fig. 3-1)

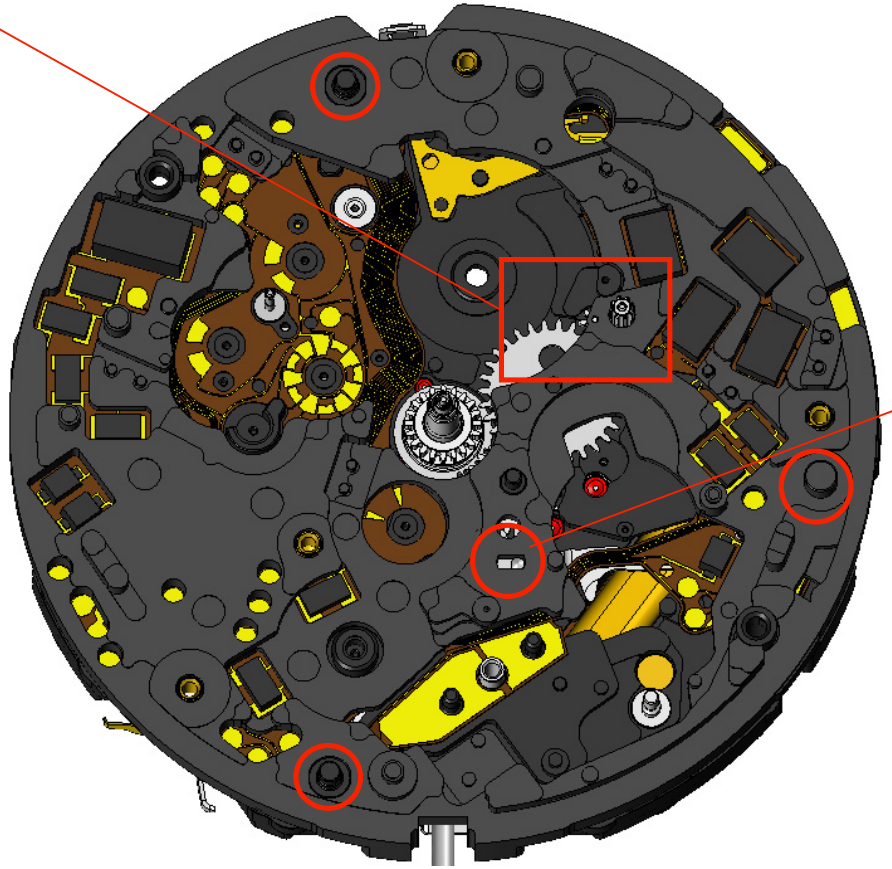
| No. | PROCESS | ILLUSTRATION AND SPECIAL INSTRUCTIONS |
|---|---|---|
| | | |
| 37 | Assemble the CALENDAR PLATE | |
| | | |
| | Lubricate the upper pivot of the CALENDAR CORRECTOR 3RD INTERMEDIATE WHEEL (see Fig.4-2) | |
| | Type of oil: AO-3 | |

<37> Assemble the CALENDAR PLATE

Make sure that the three posts are securely engaged (see illustration).

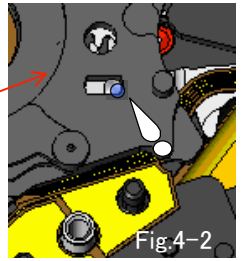
In order to catch the upper pivot of the DATE DRIVING WHEEL FOR TEN'S DIGIT, check if the pivot of the 3RD INTERMEDIATE DATE WHEEL falls in the relevant hole on the plate (see Fig. 4-1)



Lubricate the upper pivot of the CALENDAR CORRECTOR 3RD INTERMEDIATE WHEEL (see Fig.4-2)

Type of oil: AO-3



| No. | PROCESS |
|---|---|
| | |
| 36 | Set the DATE JUMPER FOR TEN'S DIGIT and engage it with the PINION FOR TEN'S DIGIT. |
| | ↓ |
| 35 | Set the INTERMEDIATE MONTH INDICATOR WHEEL SPRING. |
| | ↓ |
| | |
| | |
| | ↓ |
| 34 | Set the MONTH INDICATOR WHEEL JUMPER without engaging with any wheels. |

## ILLUSTRATION AND SPECIAL INSTRUCTIONS

<34> Set the MONTH INDICATOR WHEEL JUMPER without engaging with any wheels.

<35> Set the INTERMEDIATE MONTH INDICATOR WHEEL SPRING.

By using the POSITIONING PIN A, the spring can stay inside of the pivot hole of the INTERMEDIATE MONTH INDICATOR WHEEL (see Fig.5-2 a&b) .

Fig.5-2a

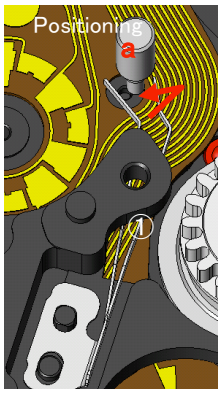
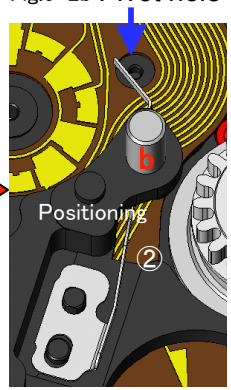
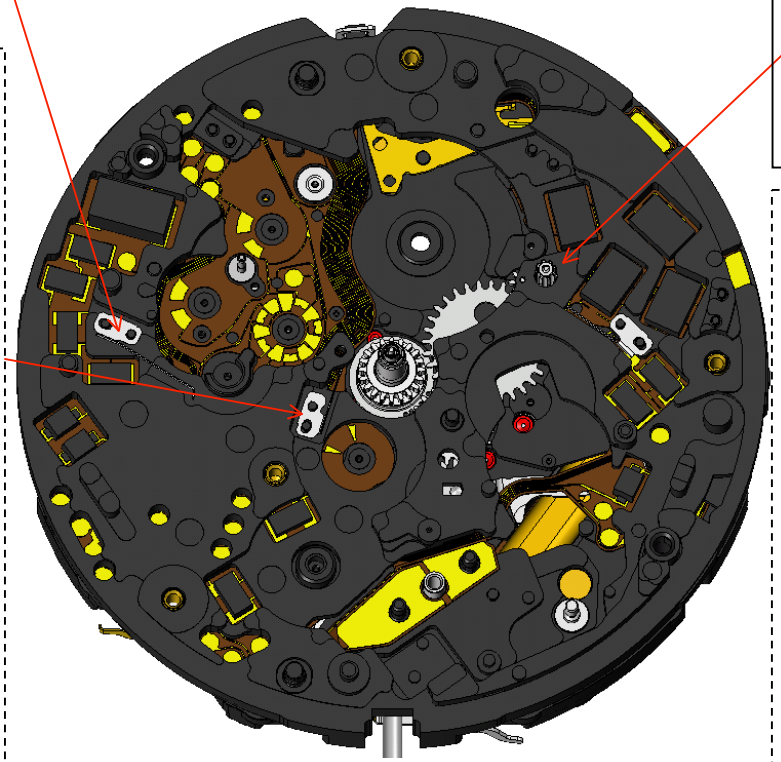



Fig.5-2b Pivot hole

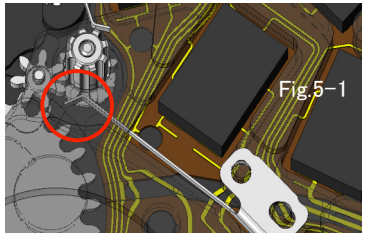


<36> Set the DATE JUMPER FOR TEN'S DIGIT and engage it with the PINION FOR TEN'S DIGIT.

Insert the jumper underneath the plate, then engage it with the pinion.

(see Fig.5-1). Check if the pinion rotates smoothly by rotating the DATE DRIVING WHEEL FOR TEN'S DIGIT.



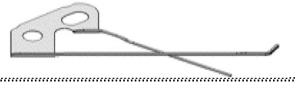

《 Distinction among the different types of jumpers》

<36> Date jumper for ten's digit (1024501)

<34> Month Indicator wheel jumper (1024504)

<35> Intermediate month indicator wheel spring (1024503)

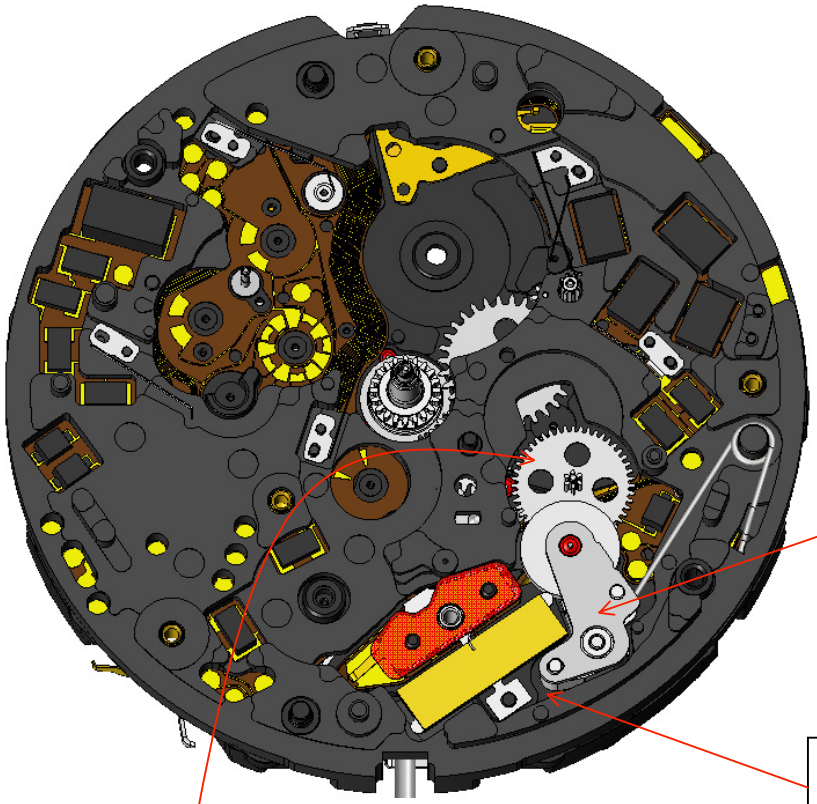
<11> Date jumper for units digit (1024500)



<12> Year indicator wheel spring (0353529)

| No. | PROCESS |
|---|---|
| | |
| | |
| 33 | Assemble the PIEZOELECTRIC STATOR BLOCK. |
| | |
| 32 | Assemble the PIEZOELECTRIC MOTOR CONDUCTIVE PLATE. |
| | |
| 31 | Assemble the INSULATOR FOR PIEZOELECTRIC MOTOR. |
| | |
| 30 | Assemble the PIEZOELECTRIC ROTOR BLOCK. |
| | |
| 29 | Assemble the 1ST INTERMEDIATE DATE WHEEL underneath the Piezoelectric rotor. |
| | |
| | |
| 28 | Set the PIEZOELECTRIC MOTOR SPRING and secure it to the rotor block. |
| | |
| | |
| | |
| | |
| | |
| | |

## ILLUSTRATION AND SPECIAL INSTRUCTIONS



＜28＞Set the PIEZOELECTRIC MOTOR SPRING and secure it to the rotor block

1. While inserting the tip of the spring Into the hole of the plate, set it to The support pin of the plate.
2. Secure the spring to the rotor underneath the bridge part of the rotor block.

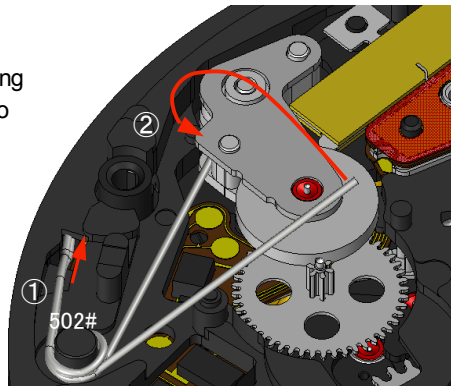



Fig. 6-4

＜30＞Assemble the PIEZOELECTRIC ROTOR BLOCK

Make sure that there are no scratches, dirt, dusts or stains on the surface of the rotor (see Fig.6-2).

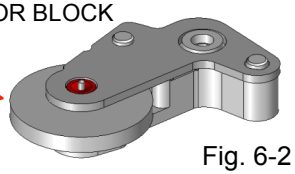
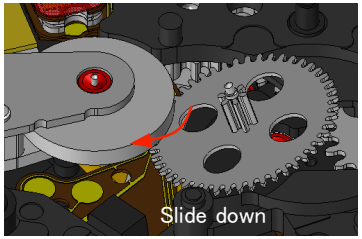


Fig. 6-2

＜29＞Assemble the 1ST INTERMEDIATE DATE WHEEL underneath the Piezoelectric rotor.

Fig. 6-3

Make sure that the pinion of the Rotor and the teeth of the wheel are properly meshed (Fig 6-3).




＜31～33＞

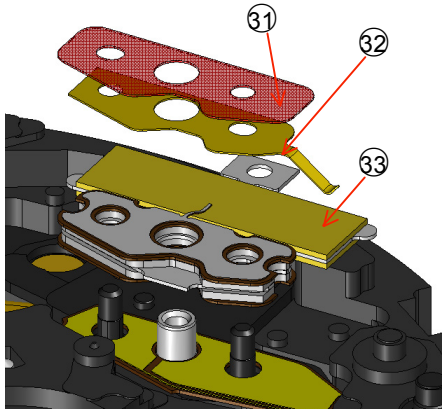
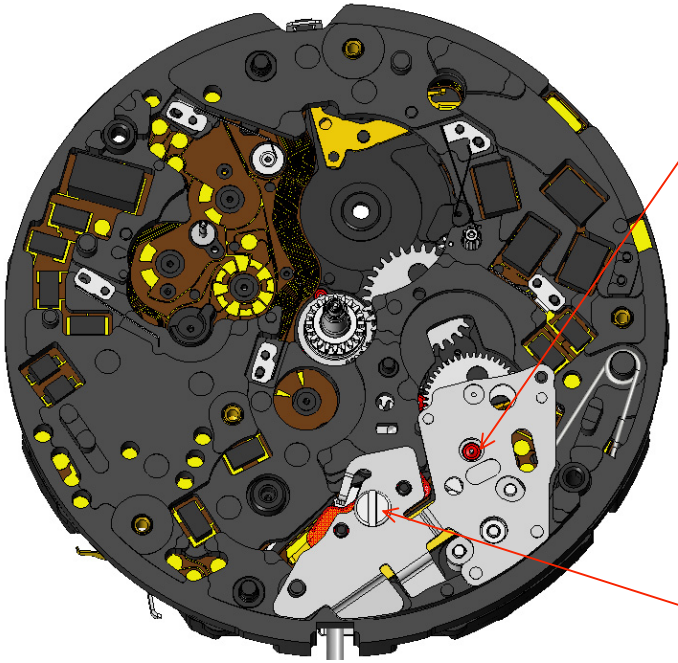



Fig. 6-1

Mount the stator block, the conductive plate and the insulator (Fig.6-1).
When assembling the stator block, do not touch the stator itself, but hold the conductive part so as not to distort or deform it.

| No. | PROCESS |
|---|---|
| | |
| 27 | Assemble the PIEZOELECTRIC MOTOR COVER. |
| | ↓ |
| 26 | Tighten the PIEZOELECTRIC MOTOR COVER SCREW. |
| | |
| | ↓ |
| | Push the crown back to the original position. |

ILLUSTRATION AND SPECIAL INSTRUCTIONS



<27> Assemble the PIEZOELECTRIC MOTOR COVER.

Insert the “a” portion of the cover to the slot of the plate and make sure that the pivot of the rotor falls to the pivot hole (see Fig.7-1).

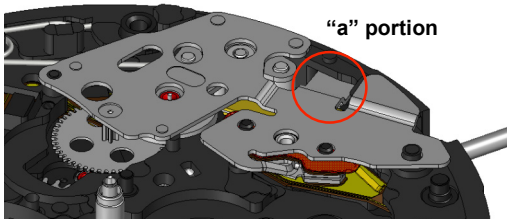



Fig. 7-1

<26> Tighten the PIEZOELECTRIC MOTORCOVER SCREW.

| No. | PROCESS |
|---|---|
| | |
| | |
| | [ CALENDAR TRAIN WHEEL ] |
| | |
| 25 | Assemble the 2ND INTERMEDIATE DATE WHEEL. |
| | |
| | ↓ |
| 24 | Assemble the CALENDAR CONTROL WHEEL and secure the jumper to it. |
| | ↓ |
| | |
| 23 | Assemble the INTERMEDIATE MONTH INDICATOR WHEEL. |
| | ↓ |
| 22 | Assemble the DETECTION WHEEL FOR 24 HOUR INDICATOR. |
| | ↓ |
| 21 | Assemble the 24 HOUR INDICATOR WHEEL. |

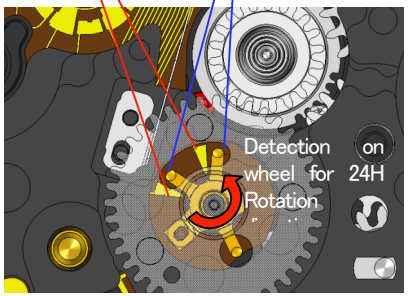
## ILLUSTRATION AND SPECIAL INSTRUCTIONS

<22> Assemble the DETECTION WHEEL FOR 24 HOUR INDICATOR.

Align the curved hole of the wheel and the triangle shaped detection patterns on the plate (the position where the detection spring of the wheel overlaps with the patterns) so that the 24 hour.

Detection patterns Detection springs

Fig.8-4




<21> Assemble the 24 HOUR INDICATOR WHEEL.

<23> Assemble the INTERMEDIATE MONTH INDICATOR WHEEL.

Set the wheel from outside (from the CALENDAR CONTROL WHEEL side) of the spring (see Fig.8-2).

Make sure not to assemble The wheel upside down (see Fig.8-3).

Fig.8-3

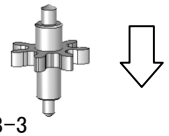
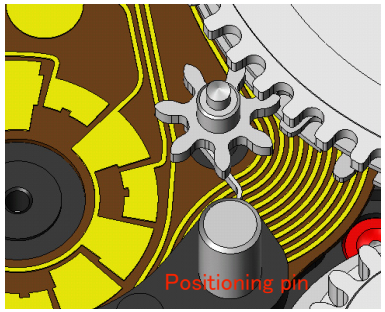
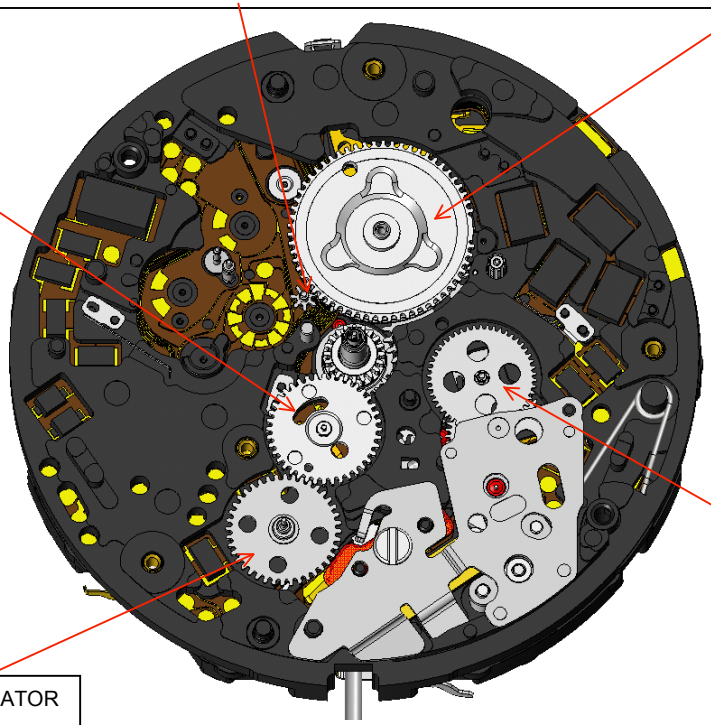


Fig.8-2

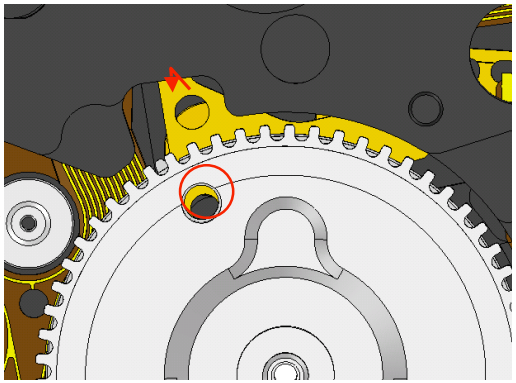


<24> Assemble the CALENDAR CONTROL WHEEL and secure the jumper to it.

Align the holes of both the wheel and the jumper when securing the jumper to the teeth of the wheel (see Fig. 8-1) .

Fig.8-1



OK NG

<25> Assemble the 2ND INTERMEDIATE DATE WHEEL.

| No. | PROCESS |
|---|---|
| | |
| | Set the POSITIONING PIN B |
| | ↓ |
| 20 | Assemble the DETECTION WHEEL FOR YEAR INDICATOR |
| | ↓ |
| 19 | Assemble the YEAR INDICATOR WHEEL |
| | ↓ |
| 18 | Assemble the YEAR INDICATOR DRIVING WHEEL |
| | ↓ |
| 17 | Assemble the INTERMEDIATE YEAR INDICATOR WHEEL |
| | ↓ |
| 16 | Assemble the DETECTION WHEEL FOR MONTH INDICATOR |
| | ↓ |
| 15 | Assemble the MONTH INDICATOR WHEEL |
| | |
| | |

## ILLUSTRATIONS AND SPECIAL INSTRUCTIONS

<20> Assemble the YEAR INDICATOR DRIVING WHEEL.

Align the two detection holes of the wheel and the two gilt cut BAUMKUCHEN shaped detection patterns on the plate (the position where the detection spring of the wheel overlaps with the patterns) so that the year detection works properly.

There are also the alignment marks in both the wheel and the plate to help your easy alignment.


<18> Assemble the DETECTION WHEEL FOR YEAR INDICATOR (see Fig.9-2).

Align the hole of the wheel and the gilt dot mark of the plate.


<16> Assemble the DETECTION WHEEL FOR MONTH INDICATOR. Align the hole of the wheel and the mark of the plate (see Fig.9-6).

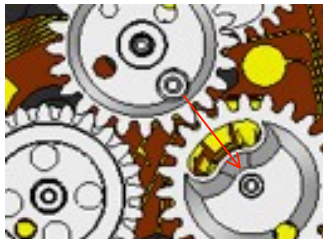
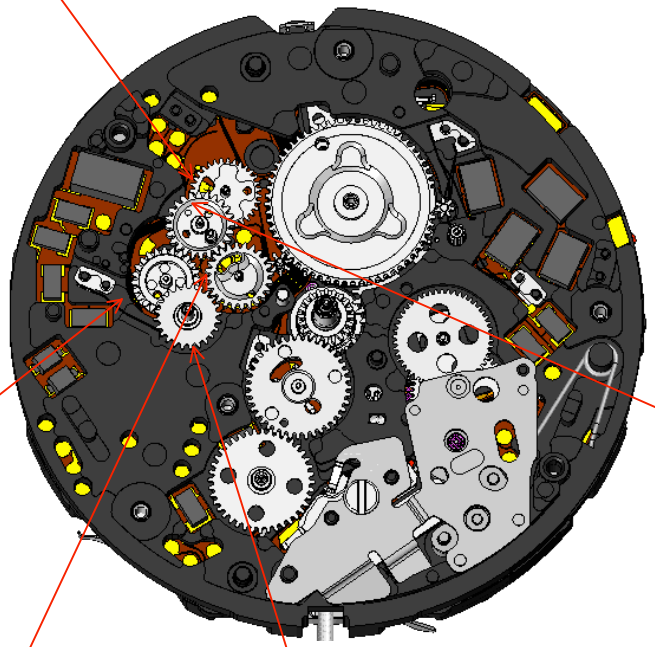


Fig. 9-6



<15> Set the MONTH INDICATOR WHEEL.

<19> Assemble the YEAR INDICATOR WHEEL.

Set the POSITIOINING PIN B

Set the pin to the hole next to the shaft for the INTERMEDIATE YEAR INDICATOR WHEEL (see Fig.9-1).

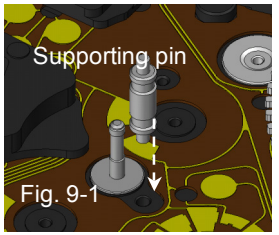



Fig. 9-1

<17> Assemble the INTERMEDIATE YEAR INDICATOR WHEEL.
Set the biggest hole of the wheel to the positioning pin to correctly align the wheel (see Fig. 9-4).

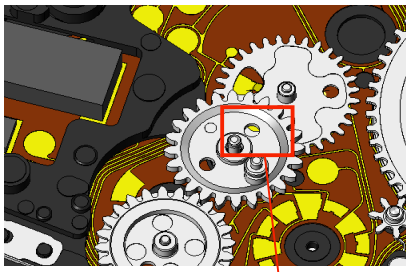


Fig. 9-4

Check if its pinion is properly meshed with the DETECTION WHEEL FOR YEAR INDICATOR (see Fig.9-5).

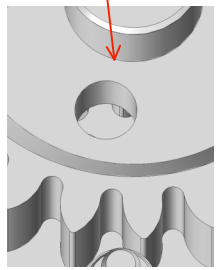


Fig. 9-5

| No. | PROCESS |
|---|---|
| | **Check the alignments of wheels before assembling the train bridge.** |
| 14 | Assemble the CALENDAR TRAIN BRIDGE |
| | ↓ |
| 13 | Tighten the CALENDAR TRAIN BRIDGE SCREW. |
| | ↓ |
| ◆ | Remove the POSITIONING PIN A and B. |
| | ↓ |
| ◆ | Lubricate the upper pivot of the 3rd intermediate wheel for calendar corrector. |
| | ↓ |
| 34 | Secure the MONTH INDICATOR WHELL JUMPER. |
| | ↓ |
| 12 | Set the YEAR INDICATOR DRIVING WHEEL SPRING and engage it. |
| | |
| 11 | Set the DATE JUMPER FOR UNIT'S DIGIT. |
| | |
| | |

## ILLUSTRATIONS AND SPECIAL INSTRUCTIONS

<14> Assemble the CALENDAR TRAIN BRIDGE.
Make sure that all the pivots fall in the relevant pivot holes.

<13>Tighten the CALENDAR TRAIN BRIDGE SCREW.

◆ Remove the POSITIONING PIN A and B.

<34> Secure the MONTH INDICATOR WHEEL JUMPER.
Secure the jumper to the teeth of the MONTH INDICATOR WHEEL underneath the bridge (See Fig.10-1).

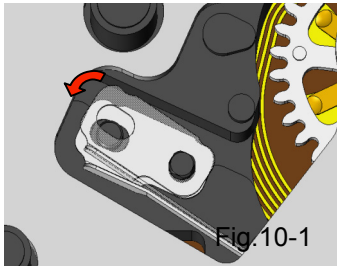
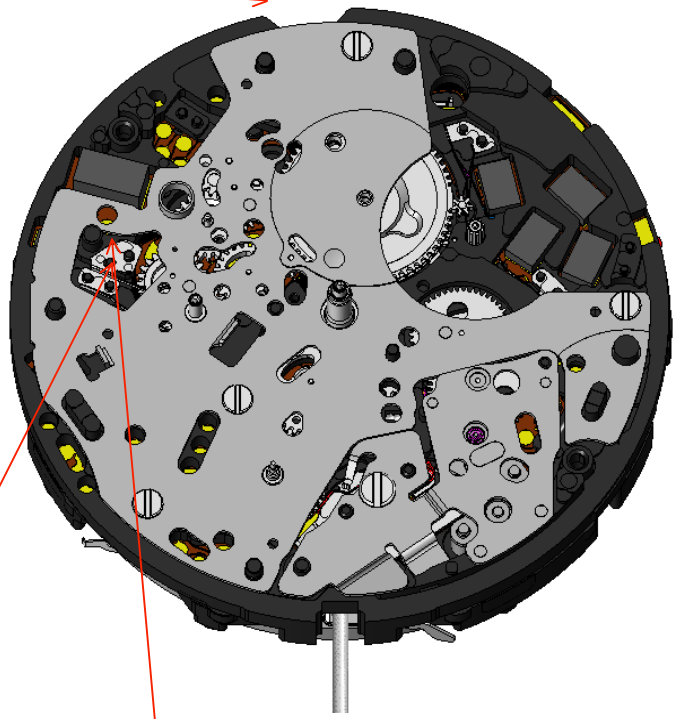


Fig.10-1

<12> Set the YEAR INDICATOR DRIVING WHEEL SPRING
Insert the spring underneath the bridge, then engage it with the arbor of the YEAR INDICATOR DRIVING WHEEL (see Fig. 10-2).



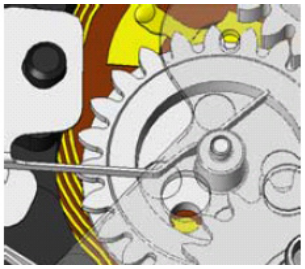


Fig. 10-2

<11> Set the DATE JUMPER FOR UNIT'S DIGIT.
Hook it to the arbor of the DATE DRIVING WHEEL FOR UNIT'S DIGIT which is pre-assembled to the CALENDAR PLATE (see Fig. 10-3).

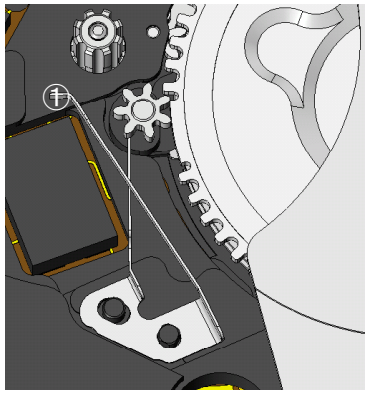



Fig. 10-3

Make sure that the wheel does not come off.

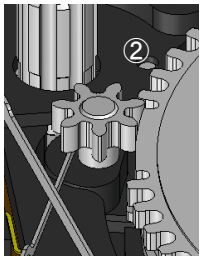



Fig. 10-4a

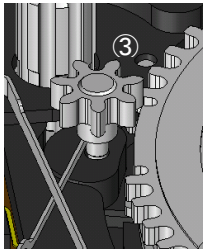
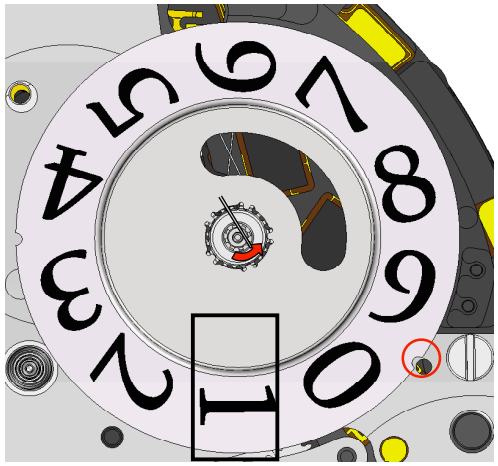



Fig. 10-4b

| No. | PROCESS | ILLUSTRATIONS AND SPECIAL INSTRUCTIONS |
|---|---|---|
| | | |
| 10 | Assemble the DATE DISK FOR UNIT' S DIGIT and secure the jumper to it. | |
| | ↓ | |
| 9 | Assemble the DATE DISK FOR TEN'S DIGIT. | |
| | ↓ | |
| 8 | Assemble the DATE DISK HOLDER. | |

<10> Assemble the DATE DISK FOR UNIT'S DIGIT and secure the jumper to it.
*Set "1" at the position of the date display, and then align the notch of the disk and a hole of the bridge. (See the illustration and Fig. 11-1).
*Push the jumper outwards to secure it to the teeth of the wheel assembled to the backside of the disk. (see Fig.11-1)



◆Remarks on handling the date dials
*Extra attention must be paid when handling The date dials. Scratches or stains on the Printed sides may cause malfunction.
*When removing the date dial for ten's digit, Insert a tool from the "2"direction of the date dial for ten's digit and from the directions other than the "6","7","8"or "9"of the date dial for units digit, and then remove the date dial for ten's digit. (To prevent any scratches to the backside, and damages to parts.)

<9> Assemble the DATE DISK FOR TEN`S DIGIT.
Set "0" at the position of the date display, and then align its notch of the unit's digit date and the bridge (see Fig.11-2).

Press the guide of the disk straight down to the same level of the upper end of the pinion (see Fig.11-3).
Do not press too strong so as to prevent friction between the two date disks.

Fig.11-2

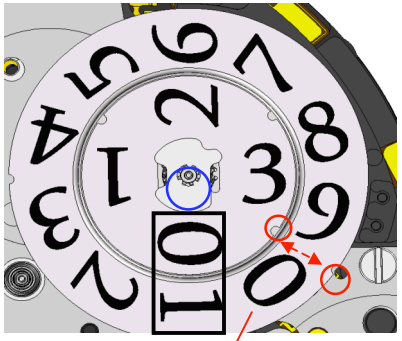
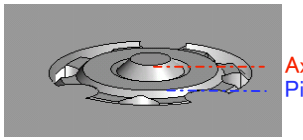
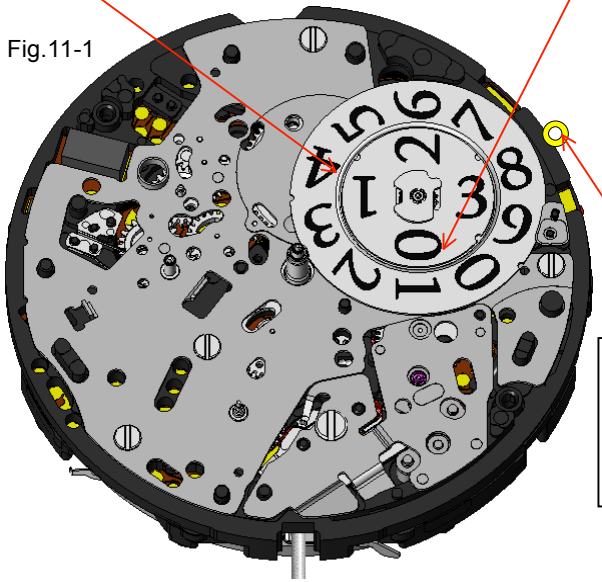


Fig.11-3




Guide of the DATE DISK FOR TEN'S DIGIT.

Fig.11-1



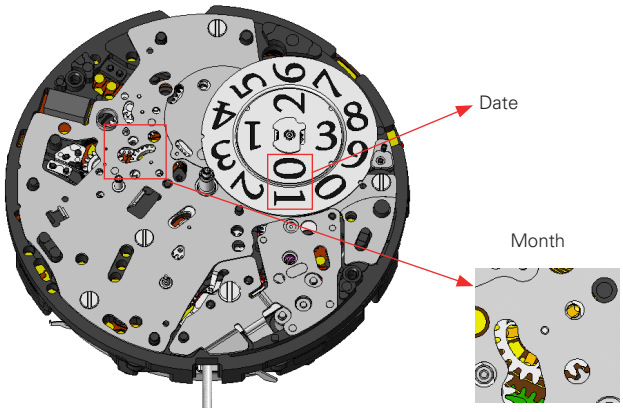
<8> Assemble the DATE DISK HOLDER
*Assemble the holder with the gilt circle pattern upside.

## REMARKS ON DECASING/CASING, DIAL AND HANDS SETTING

### ● How to install the hands

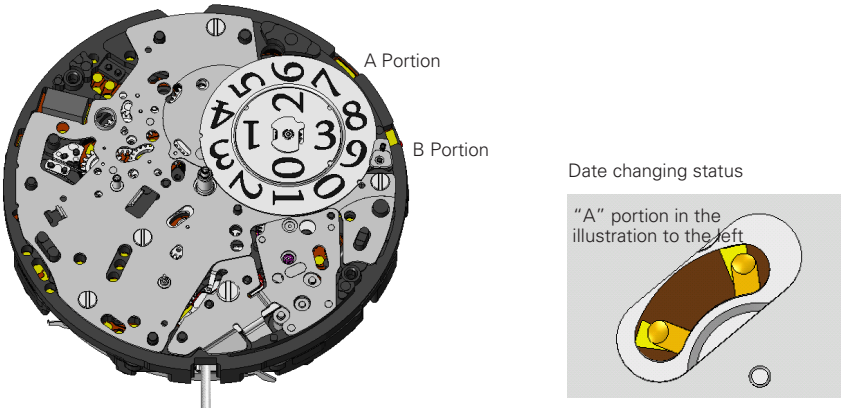
Cal. 7D56 features the perpetual calendar. Thus, the hands should be carefully mounted exactly as instructed below.

1. Pull out the SETTING STEM to the first click position, and set the calendar to " the leap year, January 1."




2. Pull out the SETTING STEM to the second click position, and turn the crown to set the 24H contact point as illustrated below (to correct the timing of date change).

* *Connect the probes of testers to "A" and " B" portions. The 24H contact point will be adjusted, allowing for a check of date changing status.*

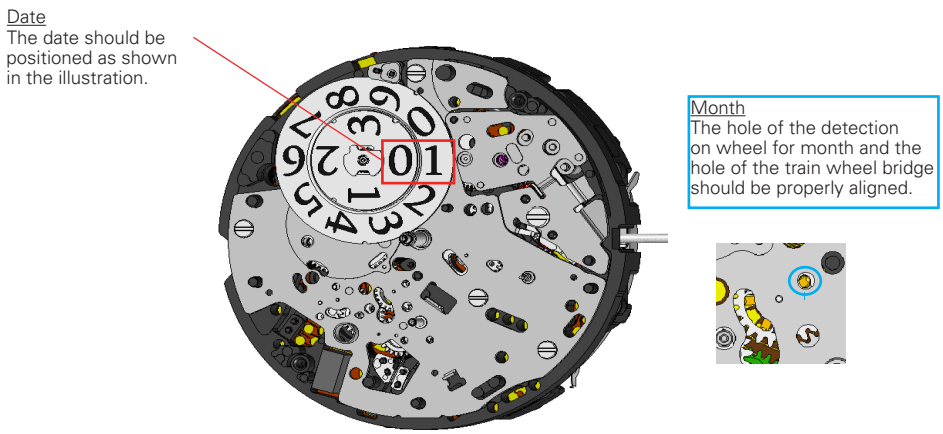



3. Keep the watch in this state when carrying out the installation of the hands in order of the 24-hour hand, month indicator, hour hand, minute hand and second hand.

* *When removing the hands during repair work, ensure that the calendar is set to " the leap year, January 1". If the hands are removed with the calendar set to a date other than " the leap year, January 1", the correct position of the year may be lost.*

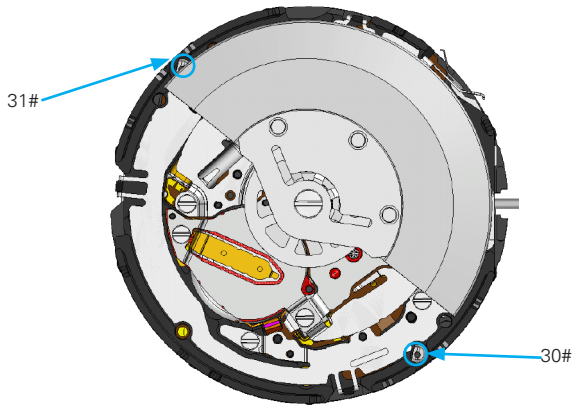
- **Set the movement.**

  Check the positions of date, month and year. (Ensure it is set to a leap year, January 1)

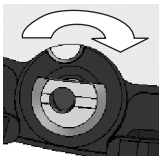


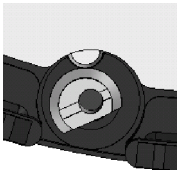

- **Set the dial.**

  Rotate the pins for dial fixing after setting the dial.




Rotation of the pins for dial fixing pins





Ensure that the pins for dial fixing are securely engaged with the dial without any celarance.

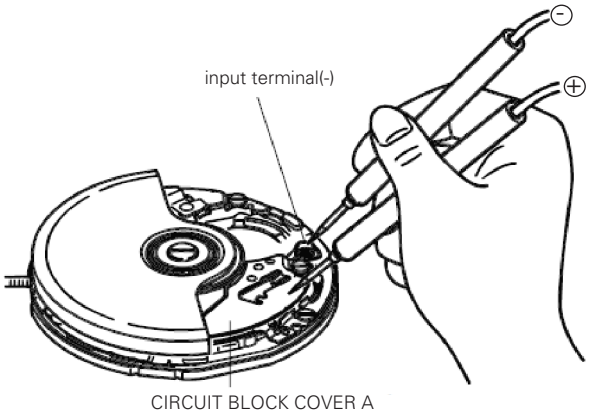
## REMARKS ON INSPECTION AND MEASUREMENT

### ● Value checking

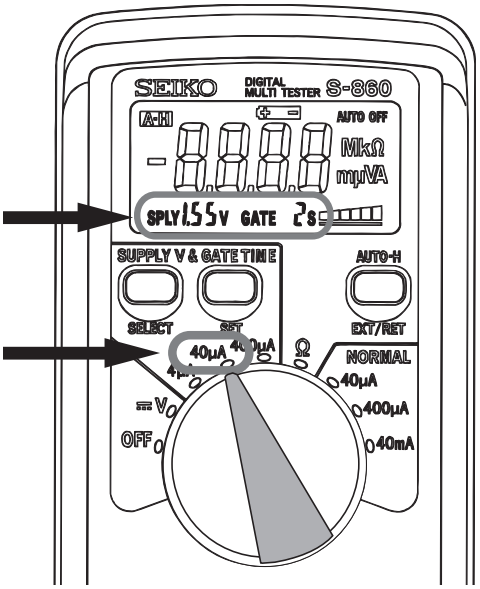
How to measure the current consumption for the whole movement

1. Remove the RECHARGEABLE BATTERY UNIT an INSULATOR and the BATTERY CLAMP WITH SCREWS. and then reassemble the OSCILLATING WEIGHT WHEEL and OSCILLATING WEIGHT, and tighten the SCREW temporary in order to make the movement ready for measurement.

2. Connect the (-) probe of the tester to the input terminal (-) of the CIRCUIT BLOCK and (+) probe to the CIRCUIT BLOCK COVER A.




* *When measuring the current consumption using the SEIKO digital multi-tester (S-860), use the range of* ***40 µ A*** *of* ***SUPPLY V (= 1.55 V)*** *&* ***GATE TIME (2 S)***

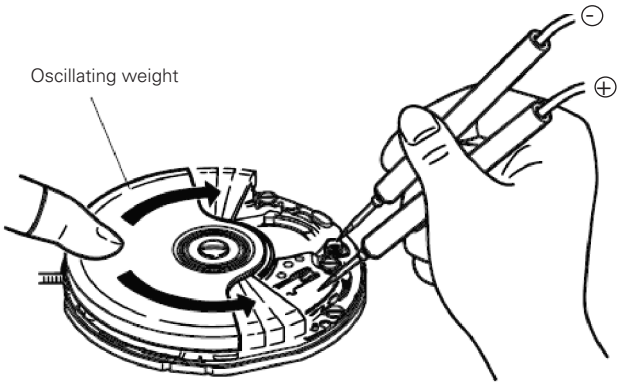



3. Swing the OSCILLATING WEIGHT as the Illustration for more than three seconds so that the movement detects the electricity generation and it turns to the normal hand movement mode.

   *Note: When swinging the OSCILLATING WEIGHT, take care so as not to touch the probes of the tester.*

4. Wait for more than 10 seconds until a stable measurement is obtained, and then read the measurement.

5. Make sure the read value is less than 0.70 µA.

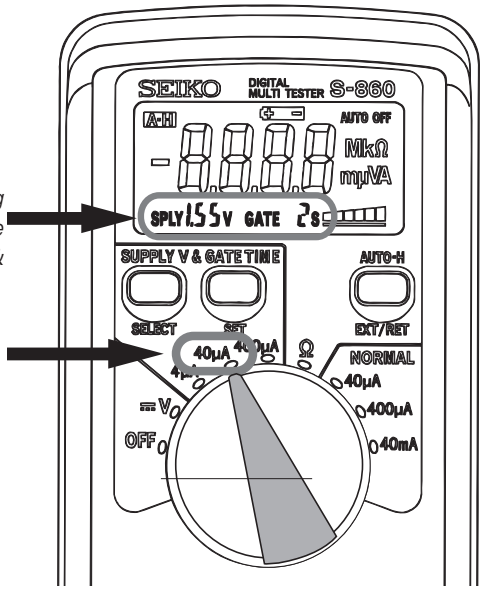


How to measure the current consumption for the CIRCUIT BLOCK alone

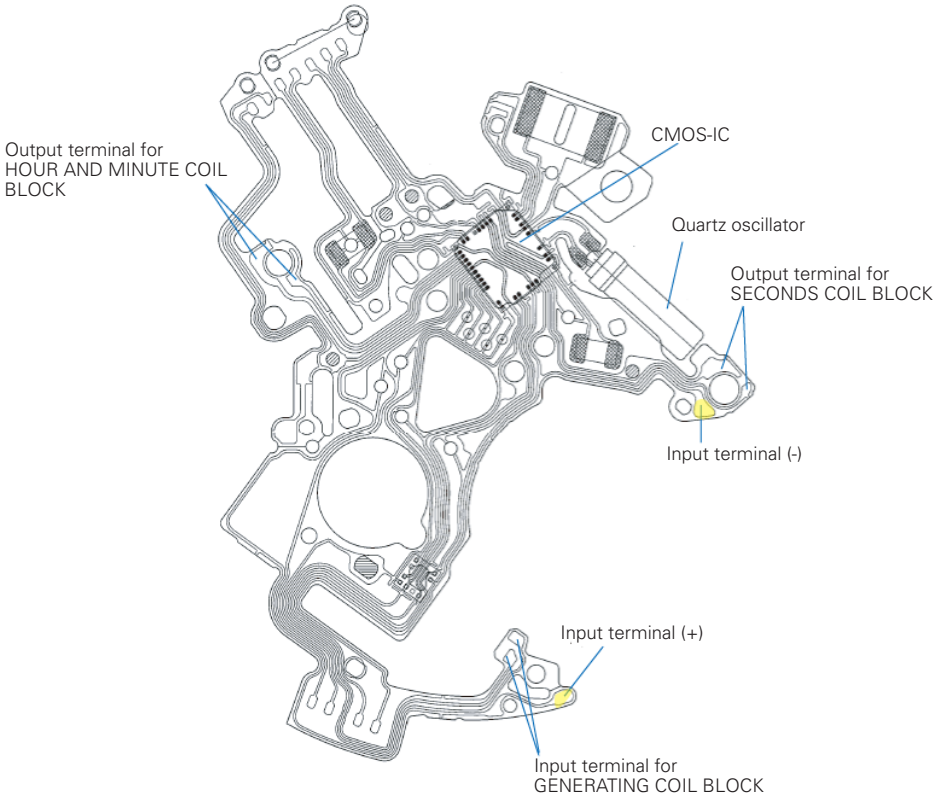
1. To measure the current consumption for the CIRCUIT BLOCK alone, connect each probe to the appropriate positive(+) or negative(-) input terminal of the CIRCUIT BLOCK (please refer to "Structure of the circuit block" below)."

   * *When measuring the current consumption using the SEIKO digital multi-tester (S-860), use the range of **40 µ A** of **SUPPLY V (= 1.55 V)** & **GATE TIME (2 S)***

2. Read the measurement when a stable measurement is obtained.
3. Make sure the read value is less than 0.40µA.




[Structure of the CIRCUIT BLOCK]



## ● Coil block resistance

(61) Seconds coil block: 2.00kΩ -– 2.45kΩ

(62) Hour and minute coil block:

Coil for driving hands: 1.00 kΩ -– 1.25 kΩ

Coil for detecting generation: 270 Ω-– 330 Ω

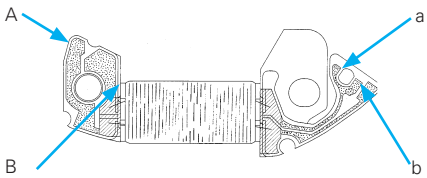
(60) Generating coil block: 360Ω -– 420Ω

*Note: Measure the coil block resistance after installing each coil block to the movement, checking that stable measurements are obtained.*

Remarks on checking the hour and minute coil block

* The motor driving the hour and minute hands uses a special driving system so that they move quickly to indicate the current time immediately after the time relay function is activated. The hour and minute coil block has two layers of coils, one for driving hands and the other for detecting generation, and it is necessary to measure the resistance of each layer of coil.
* The illustration below shows the patterns to which the probes of the tester should be applied to measure the resistance of the respective coils.

Pattern for checking the coil for driving hands




Pattern for checking the coil for detecting generation

## ● Checking for leakage between coil for driving hands and coil for detecting generation

* If the hour and minute hands do not move properly when the time relay function is activated, that is, if they remain stopped or will not move smoothly, check for the leakage between coil for driving hands and coil for detecting generation. This checking is required only if such a problem is found.

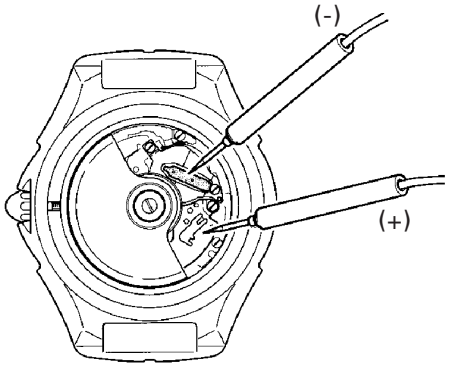
If leakage is detected, replace the hour and minute coil block with a new one.

## ● How to check the leakage

1. Make the tester ready for measuring the resistance.
2. Apply the probes of the tester to 1 "A" and "a", 2 "A" and "b", 3 "B" and "a", and 4 "B" and "b", respectively, to measure the resistance.
3. If the four measurements obtained are all infinitely great, that is, if the resistance was unable to be measured for all the four cases, there is no leakage between coil for driving hands and coil for detecting generation. As a guideline, there is a leakage if measurements of less than 2 kΩwere obtained.

## ● Checking the automatic generating system

1. Apply the (-) probe of the tester to the (-) terminal of the battery and (+) probe to the CIRCUIT BLOCK COVER (A). Then, measure the voltage of the RECHARGEABLE BATTERY. (The obtained voltage is called the " initial voltage.")




*Notes:*

* *When applying the* **(-)** *probe of the tester to the RECHARGEABLE BATTERY, take care not to short-circuit the lead terminal (-) and the RECHARGEABLE BATTERY CLAMP.*

* *If a short-circuit has occurred, leave the watch untouched for more than 10 minutes, and measure the voltage again, checking that a stable measurement is obtained.*

2. Close the case back tentatively, and swing the watch from side to side 200 times at a rate of 2 to 3 swings a second, making an arc of approximately 20 cm.

3. Within 3 minutes after swinging the watch, measure the voltage of the rechargeable battery in the same manner as in step " 1" above.
4. Refer to the table below, and decide whether the automatic generating system is normal or defective.

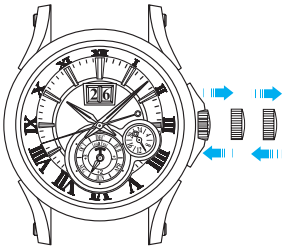
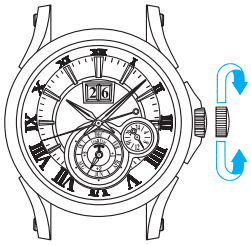
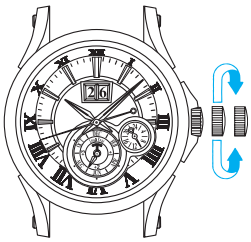
   [Initial voltage and guidelines of normal/defective decision]

| Initial voltage | Guidelines of normal/defective decision |
|---|---|
| **0.45-1.0 V** | After charging, the voltage of rechargeable battery has increased 0.1 V or more from the initial voltage. |
| **1.01-1.2V** | After charging, the voltage of rechargeable battery has increased 0.05 V or more from the initial voltage. |

* The guidelines specified in the above table apply only when the initial voltage is within the range between 0.45 V and 1.2 V.

* The amount of electricity generated by swinging the watch varies depending on the manner in which you swing it, such the rate of swinging and the size of the swinging arc. Please note, therefore, that checking through the procedure above provides only the guideline of normal/defective decision.

## ● Function check

| Operation | | Function | Checkpoint |
|---|---|---|---|
|  | Pull out the crown to the 2nd click and push it back in to the normal position. Repeat the same several times. | Setting mechanism - switching the function of the time setting | Make sure that it has a click at each position and the stem is not pulled off. |
|  | Pull out the crown to the 1st click, then turn it. | Calendar mechanism - correcting the date | Make sure that the date changes smoothly. |
|  | Pull out the crown to the 2nd click, then turn it. | Second hand stop function | Make sure that the second hand stops when the crown is pulled out to the 2nd click. |
| | | Setting mechanism - hour and minute hand setting | 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). |
| | | Hands installation | |
| | | Calendar mechanism - date change | Make sure that the date changes when the hour and minute hands pass around midnight. |

## ● Inspection of perpetual calendar and PTP operation in move state

Cal. 7D56A is equipped with a perpetual calendar which automatically advances the calendar up to February 28, 2100.

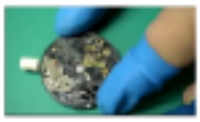
Here, an inspection is carried out if the "perpetual calendar" normally operates.

Note:

This inspection cannot be made when the watch is stopped. If the watch to be inspected has stopped, start the inspection after the second hand starts moving at 1-second interval by manually charging it and the amount of stored electrical energy reaches above 1.3v.

● Inspection method of PTP operation in move state

1. Recharge the rechargeable battery until the amount of stored electrical energy reaches above 1.3v.
2. After tightening the SCREW FOR PIEZOELECTRIC MOTOR COVER, pull out the crown from the "0" position to the first click position and leave it as it is for two seconds or longer. Then, "Pull the crown out and push it back in the order of the "0" position, first click position, "0" position, first click position and "0" position, and return it to the normal position. Carry out this operation within one second.
3. Check that the piezoelectric rotor rotates smoothly. (Normal operation)
   If it rotates smoothly, PTP operation is normal.



← Click photo and you can see the movie.

4. If it does not rotate smoothly, carry out the procedures from 1, and if it still does not rotate, overhaul the calendar assembly part.

* Be careful not to pull out the crown to the second click position.

- **Inspection method of perpetual calendar**

1. With the back case temporarily closed, recharge the watch until the amount of stored electrical energy in the rechargeable battery reaches above 1.3v.

2. Pull out the crown from the "0" position to the first click position, and leave it as it is for two seconds or longer.

   Then, pull the crown out and push it back in the order of the "0" position, first click position, "0" position, first click position and "0" position, and return it to the normal position." Carry out this operation within one second.

* Setting the date to December 30th and carrying out this operation allows for a check of the year, month and date change.

3. Check that the calendar automatically advances by "four days."

* If carrying out this check continuously, carry out re-checks at an interval of one minute or longer. Note that this is structured not to be electrically checked continuously.

4. Pull out the crown to the first click position and set the date to a non-existing date.

* February 30th, and 31st day of a shorter month

5. Push the crown back in to check that the date automatically changes to the "First day" of the next month.

6. If it does not automatically advance, carry out the procedures from 1, and if it still does not operate, overhaul the calendar assembly part.

(Note)

* Be careful not to pull the crown out to the second click position. If you have pull out the crown to the second click position, again carry out the procedures from 1.

* Be careful not to damage the crown.

## ● 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 → Condensation test | 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 → Water pressure test → Condensation test | 18.75 BAR = 150 (m) times 0.125 |
| SCUBA DIVER'S (AIR DIVER'S) 200 m | | 25 BAR = 200 (m) times 0.125 |
| He-GAS DIVER'S 300 m | | 37.5 BAR = 300 (m) times 0.125 |
| He-GAS DIVER'S 600 m | | 75 BAR = 600 (m) times 0.125 |
| He-GAS DIVER'S 1000 m | | 125 BAR = 1000 (m) times 0.125 |

## ● Accuracy test

Measure the rate and make sure the value shows within ±0.50 s/d.

Use 10 seconds gate of the tester.

## TROUBLESHOOTING

### ● The following are the tips on repairing Cal. 7D56A, which you will find helpful in working on the watch.

**• 1. Summary of important functions characteristic of Cal. 7D56A**

1) The power save function is activated after the watch is left untouched for approximately 24 hours.
2) The manual power save function is activated by pulling out the crown to the first click and pushing it in to the normal position within one second.
3) While the second hand is moving at two-second intervals, the power save function cannot be activated either automatically or manually.
4) If the crown is pulled out to the second click while the power save function is in operation, the time computed by the built-in IC will be canceled, thus disabling the time relay function.
5) The accuracy of the time computed by the built-in IC while the power save function is in operation is equivalent to that of conventional quartz watches. If the power save function has been active for a long term before the time relay function is activated, the time indicated by the hands may include a certain amount of time loss or gain that has accumulated during that time.
6) If the power reserve is depleted while the power save function is in operation, the time relay function may not be activated by swinging the watch. Instead, the second hand starts moving at two-second intervals.

## Problems, causes and methods of repair

| Problems | Possible causes | Methods of repair and checking |
|---|---|---|
| The quickness of the hand movement after the activation of the time relay function has reduced a little. | 1) The coil for detecting generation of the hour and minute coil block is broken. | 1) Check the resistance of the coil for detecting generation. Replace the hour and minute coil block if the coil is broken. |
| The oscillating weight rotates at an abnormally high rate, and no charging is made. | 1) The coil of the generating coil block is broken.<br><br>2) The pivot of the generating rotor is broken. (The pinion of the generating rotor and the gear of the intermediate wheel for generating rotor are out of mesh.) | 1) Check the resistance of the generating coil block. Replace the generating coil block if the coil is broken.<br><br>2) Remove the broken piece of the generating rotor, and replace and lubricate the generating rotor. (Overhaul and clean if necessary.) |
| The oscillating weight will not rotate. | 1) The gear of the oscillating weight and the pinion of the intermediate wheel for generating rotor are out of mesh.<br><br>2) The pivot of the generating rotor is broken. (The pinion of the generating rotor and the gear of the intermediate wheel for generating rotor engage with each other.) | 1) If the gear of the oscillating weight and the pinion of the intermediate wheel for generating rotor are intact, reassemble them to the movement.<br><br>2) Remove the broken piece of the generating rotor, and replace and lubricate the generating rotor. (Overhaul and clean if necessary.) |
| The current consumption for the whole of the movement exceeds the standard value. | 1) When the measurement is made, the IC is still in the quick start mode. (When the current consumption measures about 200μA, it is likely that the IC is in the quick start mode.)<br><br>2) The load applied on the gear train, etc. has increased, and the driving pulse to compensate it has been generated. | 1) After connecting the tester, move the oscillating weight more quickly for a longer period of time, and then, make the measurement again.<br><br>2) If the current consumption for the circuit block alone is within the standard value range, overhaul and clean the movement parts, and then, make the measurement again. |

| Problems | Possible causes | Methods of repair and checking |
|---|---|---|
| The current consumption for the circuit block alone exceeds the standard value. | 1) The light from outside the movement is affecting the measurement.<br><br>2) When the measurement is made, the IC is still in the quick start mode. (When the current consumption measures about 200μA, it is likely that the IC is in the quick start mode.)<br><br>3) The IC is out of order. | 1) Shut out the light, and make the measurement again.<br><br>2) Switch the IC to the normal mode, and make the measurement again.<br><br>3) Replace the circuit block. |
| Swinging the watch while the power save function is active will not activate the time relay function. (Swinging the watch starts the second hand moving at two-second intervals.) | The energy stored in the rechargeable battery has been depleted while the power save function is in operation. | Swing the watch until the second hand moves at one-second intervals, and activate the power save function manually to check if the time relay function can be activated. |
| Swinging the watch while the power save function is active will not activate the time relay function. (Swinging the watch will not start the second hand moving at all.) | There is electric leakage inside the hour and minute coil block. | Check for leakage of the hour and minute coil block. Replace the part if leakage is detected. |
| After the time relay function is activated, the hands do not make the quick movement smoothly, or the hands indicate a time that differs greatly from the correct time. | There is electric leakage inside the hour and minute coil block. | Check for leakage of the hour and minute coil block. Replace the part if leakage is detected. |

* For troubleshooting of defects that conventional quartz watches have in common, refer to the " TECHNICAL GUIDE, GENERAL INSTRUCTIONS."