TECHNICAL GUIDE

CAL. Y551A

CAL. Y552A

CAL. Y553A

ANALOGUE QUARTZ

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I. SPECIFICATIONS

	Cal. No.	Y651A	Y552A	Y553A		
Time indication		3 hands	3 hands	3 hands		
	Date		- 0			
Ę	Day	-		0		
chanis	Bilingual change-over system for the day of the week			0		
Additional mechanism	Instant day setting device			0		
ditton	Instant date setting device		0	0		
Aq	Second setting device (Stops at every second)	0	0	0		
	Electronic circuit reset switch	0	0	0		
Crystal oscillator Loss/gain		32.768 Hz (Hz == Hertz Cycles per second) Loss/gain at normal temperature Monthly rate: less than 15 seconds (Annual rate: less than 3 minutes)				
Heig	ght (excluding battery portion)	3.3 mm	3.8 mm	3.9 mm		
Оре	rational temperature range	10°C ~ + 60°C (14°F ~ 140°F)				
Driving system Regulation system Battery power		Step motor system (2 poles) Trimmer condenser				
		Jew	els	5 jewels		

II. HOW TO SET THE TIME AND CALENDAR

CROWN POSITION

Normal position: Free

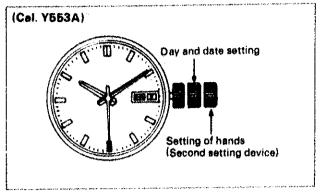
1st click: Change of day and date

Date change ... clockwise (turn away from you.)

Day change ... counterclockwise (turn towards)

you.)

2nd click: Hand setting, reset switch and second set-



1. To set the hour

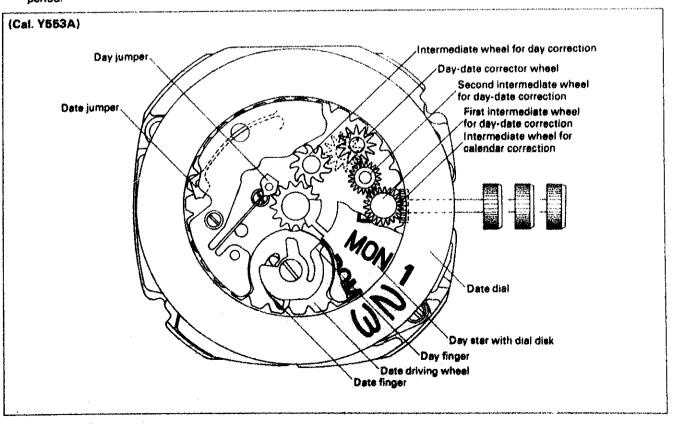
(1) Pull out the crown to the second click position

The second hand stops on one of the second markers.

- (2) Turn the crown and set the time of the hour hand and minute hand.
 - First turn the hour hand past the 12 o'clock position to see if the date changes, then set the time correctly. (Allow for the AM and PM period so that the date will change at midnight.)
 - As the torque of the gear train is transmitted reversely, the time is set accurately by turning the hands between 5 to 10 minutes shead and then turning it back to the desired time.
- (3) Push in the crown in accordance with a time signal, and the time can be set as accurately as to the second.

2. Resetting calendar

• Pull the crown out to the 1st click.
Select the desired language as two languages appear alternately when setting the day of the week.
If the setting of the calendar is made when the hour hand is pointing to the time between 10:30 pm and 3:30 am, sometimes the calendar will not change to the next day. The setting must therefore be made before or after this time period.



2

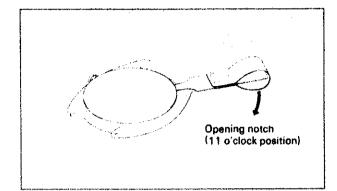
III. DISASSEMBLING, REASSEMBLING, LUBRICATING AND CLEANING

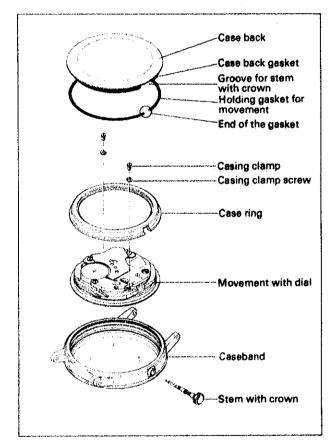
1. Remarks for handling the case

(1) Snap type

Remarks for disassembling

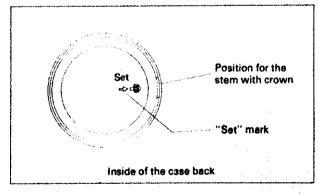
- Pry open the case back by using the case opener while supporting it by the case lug.
 (Be careful not to damage the case back gasket by inserting the tip of the case opener too deep.)
- The holding gasket for movement is cut so that it does not prevent the stem with crown from being set in position. The holding gasket for movement should have the cut to hold the stem with crown.
- The case back gasket is set in the case back.
- Be sure that the stem with crown is in the first click position when it is disassembled.
 (The yoke and the setting lever overlap each other if the stem with crown is disassembled from the pulled out position.)





Remarks for reassembling

- Be sure that the groove of the case back is set to the proper position for the stem with crown when pushing the case back in position.
- (There is the positioning mark inside the case back.)
- Be sure to wipe fillings off the case back gasket if there is any.



(2) Square type

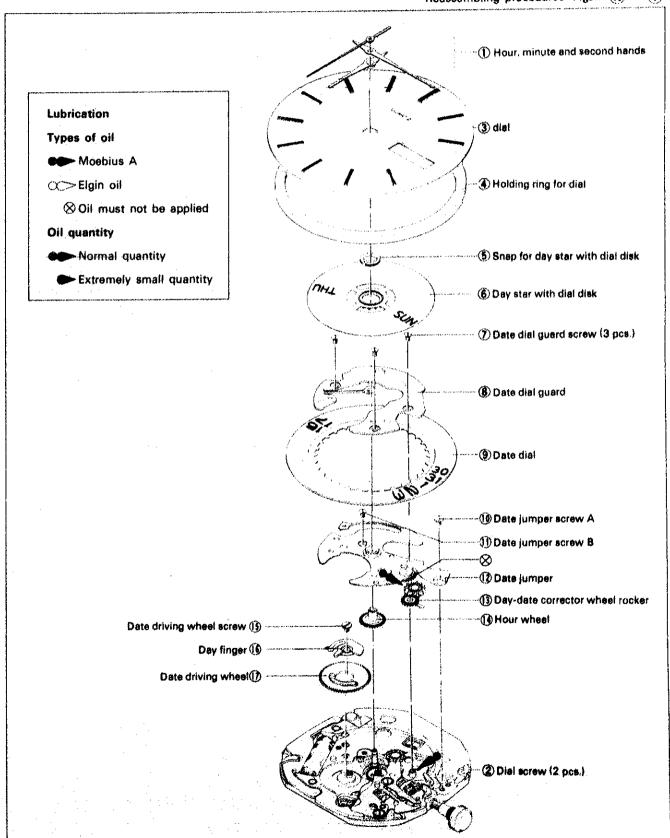
The remarks for disassembling and reassembling are the same as those for the existing square type calibres.

2. Disassembling, reassembling, and lubricating of the module (Cal. Y553A)

(1) Disassembling, reassembling and lubricating of the calendar mechanism.

Disassembling procedures Figs.: (1) - (1)

Reassembling procedures Figs.: (1) - (1)



Remarks for disassembling and reassembling

(1) Hour, minute and second hands

Remarks for disassembling and reassembling

- Pull out the crown to the second click position for disassembling and reassembling.
- Be sure to assemble the second hand exactly on the second mark.

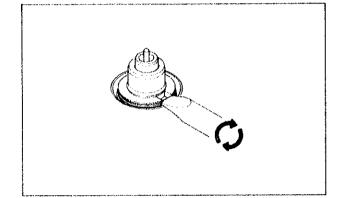
(Both odd and even second marks will do.)

• When reassembling, be careful that the hands do not touch each other as the watch is so thin that the clearance between the hands is less than that for ordinary type watches.

(5) Snap for day star with dial disk

Remarks for disassembling

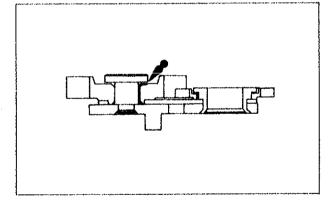
 Push the thin tip of a screw driver into the groove of the snap for day star with dial disk.



Day-date corrector wheel rocker

Remarks for reassembling

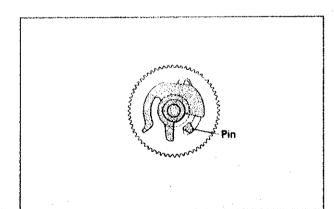
- Lubricate the day-date corrector wheel as shown in the illustration.
- Pull out the crown to the first click position and reassemble.



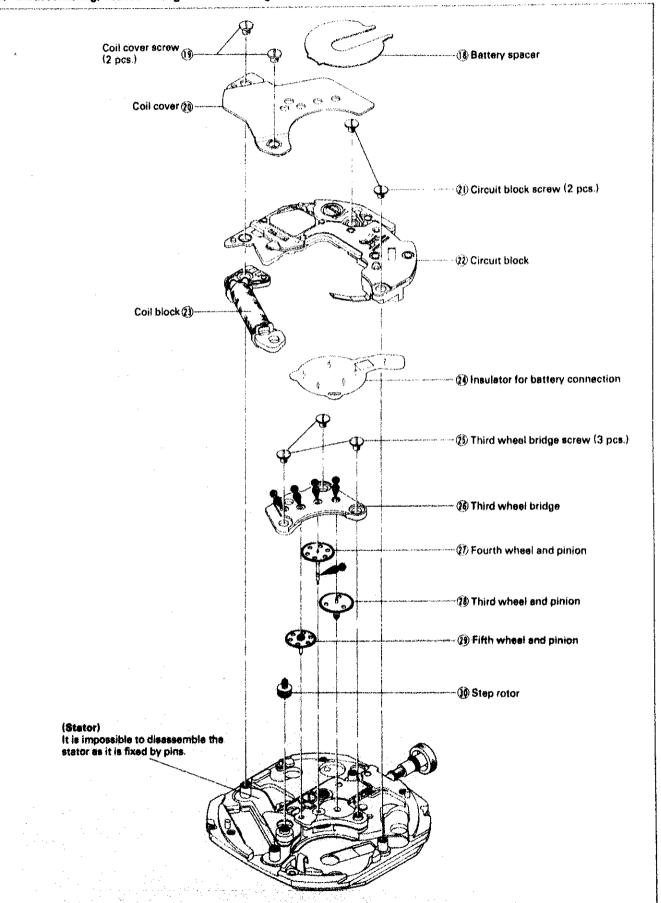
Day finger

Remarks for reassembling

 Reassemble so that the pin of the date driving wheel is positioned as shown in the illustration on the right.

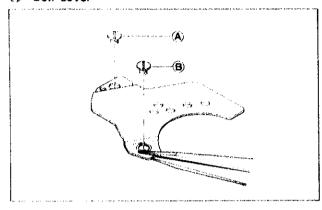


(2) Disassembling, reassembling and lubricating of the circuit block, coil block and gear train.



Remarks for disassembling and reassembling

20 Coil cover



Remarks for disassembling and reassembling

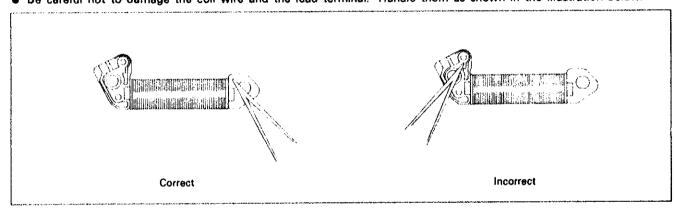
- Disassemble by holding the portion with tweezers as shown in the illustration on the left.
- Be careful in handling as the coil cover is easy to bend.
- Be sure to tighten the coil cover screw first and then ext.

(If (B) is tightened first, it will be difficult to tighten (A) as (A) portion of the coil cover lifts up.)

(2)) Coll block

Remarks for disassembling and reassembling

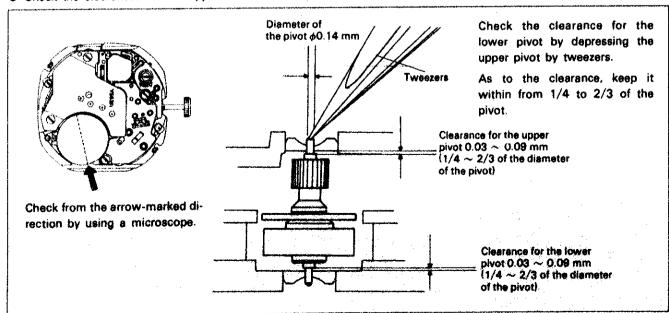
• Be careful not to damage the coil wire and the lead terminal. Handle them as shown in the illustration below.



Step rotor

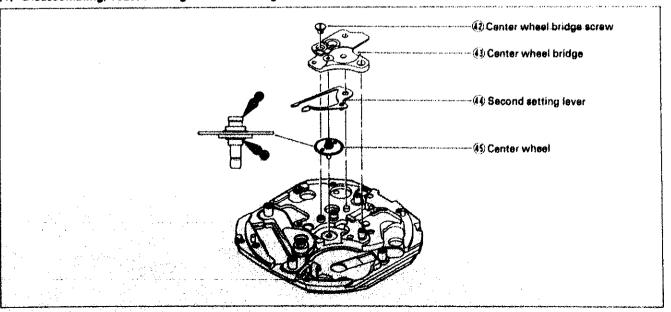
Remarks for reassembling

• Check the clearances for the upper and the lower pivots for the step rotor after reassembling the coil cover.



(3) Disassembling, reassembling and lubricating of the setting mechanism. (2 pcs.) Setting lever spring screw (2 pcs.) (3) Setting lever spring (3) Minute wheel 3) Setting wheel 35) Yoke 36 Setting lever -এঁট Setting lever axle Cannon pinion (1)-(9) Clutch wheel Intermediate wheel for calendar correction /38 Stem with crown

(4) Disassembling, reassembling and lubricating of the center wheel bridge \sim the center wheel.

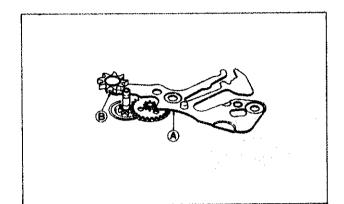


Remarks for disassembling and reassembling

(i) Setting lever spring

Remarks for disassembling

 Pry up the arrow-marked portion (A) slightly and remove the arrow-marked pin (B) (positioned under the setting lever spring.). Then pry up the setting lever spring for disassembling by holding the portion (A).



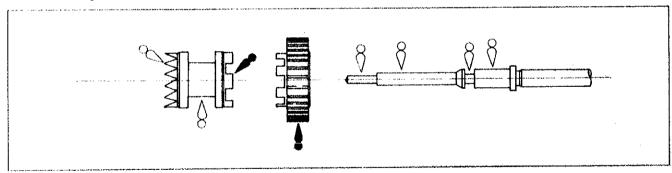
38 Stem with crown

39 Clutch wheel

(i) Intermediate wheel for calendar correction

Remarks for reassembling

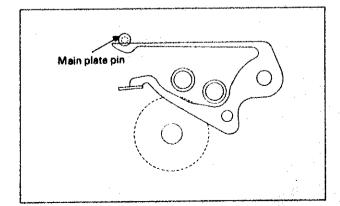
- Reassemble after reassembling the center wheel bridge.
 (It is difficult to reassemble the clutch wheel and the intermediate wheel for calendar correction if the center wheel bridge is not reassembled.)
- Refer to the illustration below for the direction of reassembling and the lubricating.



Second setting lever

Remarks for reassembling

- Hook the spring portion to the main plate pin as shown in the illustration on the right.
- Be sure to pull out the winding stem all the way and then reassemble the second setting lever when the setting mechanism is already reassembled.



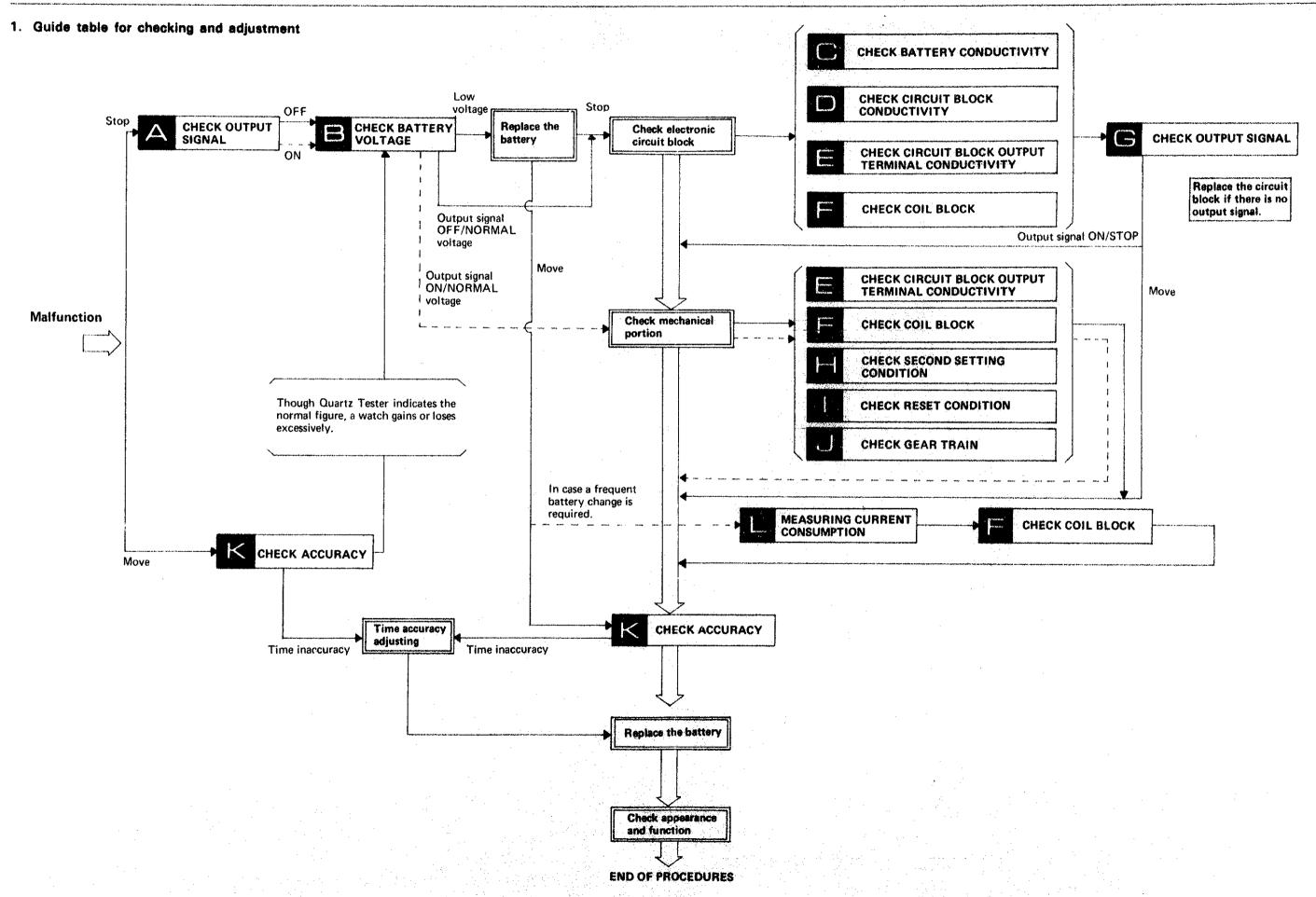
3. Cleaning

Since several special parts (electronic, etc.) used in the Cal. Y551A, Y552A and Y553A differ from conventional mechanical watches, use the following cleaning methods when cleaning.

HOW TO CLEAN

Name of parts	Cleaning	Drying	Solution	Remarks
(1) Circuit block Coil block	DO NOT CLEAN			Conductive portion ONLY may be cleaned with a cloth moistened with benzine or alcohol. Dry in COOL air.
(2) Main plate Step rotor Plastic parts Battery spacer Date driving wheel	Rinse or scrub with a soft brush	Cool air drying	Benzine, alcohol	 Be careful not to remove the parts fixed to the main plate. Use a clean solution as the step rotor is magnetized. Any foreign matter which cannot be removed by cleaning should be removed with rodico or adhesive tape. When cleaning with benzine, the cleaning time should be minimized.
insulator for battery connection (3) Others	Clean with the cleaner, rinse or gently scrub with a soft brush.	Cool or hot air drying	Benzine, trichloro- ethylene, alcohol	Be careful not to bend the coil cover.

IV. CHECKING AND ADJUSTMENT



2. Procedures for checking and adjustment

SIGNAL

OUTPUT

VOLTAGE BATTERY

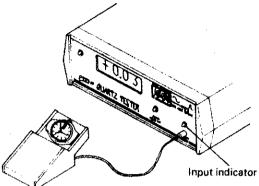
ELECTROLYTE HOW TO CHECK BATTERY LEAKAGE AND REPAIR

Check output signal

- (1) Set up the Quartz Tester.
- (2) Checking

Check for blinking input indication light.

The checking must be made when the crown is in the normal position.



Result

One-second blinking...... Normal

No one-second blinking...... Defective-

More than 1.5V...... Normal-

Proceed to

blinking is found.

one-second blinking is not found.

Proceed to Replace the battery

electronic circuit block

proceed to K.

Use the following procedures to check battery voltage.

(1) Set up the volt-ohm-meter

Range to be used: DC3V

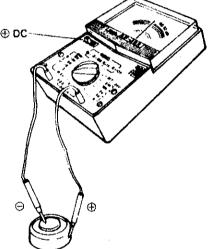
(2) Measuring

Probe Red...... Battery surface (1) Probe Black Battery surface (

< Note >

When handling the battery, use non-metallic tweezers or a

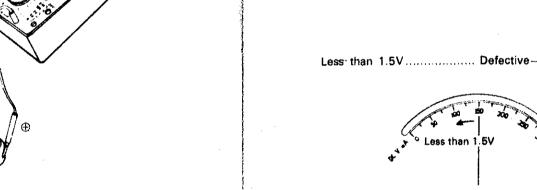
When there is battery electrolyte leakage, refer to "HOW TO CHECK BATTERY ELECTROLYTE LEAKAGE AND REPAIR" below for repairing.



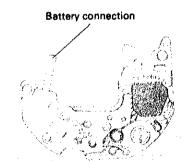
- 1. Remove the movement from the case.
- 2. Disassemble the movement.
- 3. Wipe off battery electrolyte on the circuit block.
- (1) Wipe off battery electrolyte on the circuit block with a cloth moistened with distilled water. (If distilled water is not available, use ordinary water.) (Do not use cloths which give off lint such as gauze, flannel, etc.)

Procedure

Do not expose the trimmer condenser to water or alcohol, and if it is exposed, there may be a change in its condenser capacity and eventually in the time accuracy.



Be sure to clean the battery connection.



(2) Wipe with a cloth moistened with alcohol. (If the cleaned portions remain wet with water, they will corrode with rust.)

Adjustment and Repair

Proceed to Check mechanical portion if one-second

Proceed to Check electronic circuit block if

• If the watch operates after battery replacement,

• If the watch does not operate, proceed to Check

- (3) Dry with cool air by using a dryer.
- 4. Wipe off battery electrode on the other parts by referring to page 10.

(Clean the insulator for battery connection with water.)

- 5. Reassemble the movement. (Replace the battery with a new one.)
- 6. Check to see if the time setting functions and the current consumption are normal.

	Procedure	Result	Adjustment and Repair
	Check the second setting condition. Check to see if there is clearance between the second setting lever and the fifth wheel when the crown is in the normal and the first click positions. Also, check to see if the second setting lever touches the fifth wheel when the crown is in the second click position. (Check through the hole for the third wheel bridge and the coil cover by using a microscope.)	Function Normal———	Proceed to
CHECK SECOND SETTING CONDITION	(Check through the hole for the third wheel bridge Hole for the third wheel bridge Fifth wheel	Do not function Defective	Correct the bend of the second setting lever.
1	Check the reset condition after the circuit block and the battery are reassembled. 1. Check to see if the second hand stops immediately when the crown is pulled out completely and if it starts promptly one second after the crown is pushed in to the normal position.	Stops completely and starts moving after one	Proceed to C.
RESET CONDITION	2. Check to see if the conductivity between the reset pin and the main plate is normal when the crown is pulled out completely.		
CHECK	(1) Set up the Volt-ohm-meter Range to be used: OHMS R × 1. <note></note>	Less than 10Ω	
	Be careful not to use the range other than R × 1. The circuit might be damaged if another range is used. (to be continued on page 20)		page 21.

Adjustment and Repair Result Procedure In case where a frequent battery change is required, a current consumption test is recommended. Use the following procedures: Proceed to 1. Set up the Volt-ohm-meter Less than 2.5 µA-● Range to be used: DC 0.03 mA ullet Set up the condenser of 200 \sim 500 μF as shown in a photo. Proceed to ... When the coil block is found normal. More than 2.5 µAreplace the circuit block with a new 2. Measurement one. • Place the battery on the anti-magnetic shieldplate with its minus side up. Probe Red Battery connection Probe Black ⊝ Battery surface ⊝ Remarks: Be sure to measure with the crown in the pushed in There might be a slight difference in the measured value depending upon the type of volt-ohm-meter. When judging the condition of the circuit block, be sure to take this into consideration.

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

PARTS LIST

ANALOGUE QUARTZ Cal. Y551A

Characteristics

Casing diameter:

a 23.3 mm

Maximum height:

3.3 mm without battery

Jewels:

Frequency of quartz crystal oscillator: 32,768 Hz (Hz=Hertz..... Cycle per second)

Driving system: Step motor system (2 poles) Regulation system: Trimmer condenser

Second setting device

PART NO.	PART NAME	PART NO.	PART NAME
122 781	Center wheel bridge	4001 982	Circuit block
131 982	Third wheel bridge	4002 781	Coil block
221 781	Center wheel & pinion	4146 781	Step rotor
☆225 781	Cannon pinion (1.51 mm)	4216 781	Insulator for battery connection
☆225 783	Cannon pinion (2.14 mm)	4242 780	Plus terminal of battery connection
231 781	Third wheel & pinion	4408 982	Battery spacer
☆241 781	Fourth wheel & pinion (4.20 mm)	4462	Coil cover
☆241 783	Fourth wheel & pinion (4.83 mm)	022 426	Casing clamp screw
261 781	Minute wheel	022 468	Center wheel bridge screw
☆271 781	Hour wheel (0.95 mm)	022 468	Third wheel bridge screw
☆271 783	Hour wheel (1.55 mm)	022 468	Cail cover screw
281 589	Setting wheel	022 468	Circuit block screw
282 781	Clutch wheel	022 491	Setting lever spring screw
354 780	Winding stem	022 764	Dial screw
383 780	Setting lever Yoke (Clutch lever)	027 492	Pin for plus terminal of battery connection
386 781	Setting lever spring	011 324	Upper hole jewel for fifth wheel
	Setting lever spring	011 324	Lower hole jewel for fifth wheel
390 780	• • •	011 404	Upper hole jewel for fourth wheel
391 781	Second-setting lever	011 537	Upper hole jewel for step rotor
399 780	Casing clamp	011537	Lower hole jewel for step rotor
491 589	Dial washer	☆U.C.C. 395	•
701 781 ☆884 710	Fifth wheel & pinion Holding ring for dial	Maxell SRY14SW	Silver oxide battery

Remarks :

Cannon pinion, Fourth wheel & pinion, Hour wheel

There are two different types as specified below. Combination

Туре	Cannon pinion	Fourth wheel & pinion	Hour wheel
a	☆225 781	☆241781	☆271781
Ь	★225783	☆24178 3	☆271 783

Holding ring for dial

\$884.710.....The type of holding ring for dial is determined based on the design of case and dials.

Battery

The applied battery for this calibre might be added the substitutive in the future.

PARTS LIST

ANALOGUE QUARTZ Cal. Y552A

Characteristics

Casing diameter:

ø 23.3 mm

Maximum height:

3.8 mm without battery

Jewels:

Frequency of quartz crystal oscillator: 32,768 Hz (Hzss Hertz..... Cycle per second)

Driving system: Step motor system (2 poles) Regulation system: Trimmer condenser

Second setting device

Calendar (Date)

Instant date setting

PART NO.	PART NAME	PART NO.	PART NAME
122 781	Center wheel bridge	981 781	Day-date corrector wheel rocker
131 982	Third wheel bridge	4001 982	Circuit block
221 781	Center wheel & pinion	4002 782	Coil block
☆225 783	Cannon pinion (2.14 mm)	4146 781	Step rotor
☆225 784	Cannon pinion (2.47 mm)	4216 781	Insulator for battery connection
231 781	Third wheel & pinion	4242 780	Plus terminal of battery connection
☆241 783	Fourth wheel & pinion (4.83 mm)	4408 982	Battery spacer
☆241 784	Fourth wheel & pinion (5.16 mm)	4462	Coil cover
261 781	Minute wheel	022 426	Casing clump screw
☆271 783	Hour wheel (1.55 mm)	022 468	Center wheel bridge screw
☆271 784	Hour wheel (1.88 mm)	022 468	Third wheel bridge screw
281 589	Setting wheel	022 468	Coil cover screw
282 782	Clutch wheel	022 468	Circuit block screw
354 781	Winding stem	022 491	Setting lever spring screw
383 780	Setting lever	022 491	Date jumper screw A
384 781	Yoke (Clutch lever)	022 754	Date jumper screw B
386 783	Setting lever spring	022 754	Date dial guard screw
390 780	Setting lever axle	022 764	Dial screw
391 781 399 780	Second setting lever Casing clump	027 492	Pin for plus terminal of battery connection
701,781	Fifth wheel & pinion	011 324	Upper hole jewel for fifth wheel
801 783	Date dial	011 324	Lower hole jewel for fifth wheel
802 782	Date driving wheel	011 404	Upper hole jewel for fourth wheel
808 782	Date dial guard	011 537	Upper hole jawel for step rotes
810 782	Date jumper	011 537	Lower hole jewel for step rotor
☆884 695	Holding ring for dial	쇼 U.C.C. 395)	
962 781	Intermediate wheel for calendar correction	☆ Maxell SR126SW	Silver oxide battery

Remarks :

Cannon pinion, Fourth wheel & pinion, Hour wheel

There are two different types as specified below. Combination

Туре	Cannon pinion	Fourth wheel & pinion	Hour wheel
а	⇒225 783	☆241 783	☆271783
ь	☆225 784	☆241 784	☆271 784

\$884 695......The type of holding ring for dial is determined on the design of case and dials.

Battery

The applied battery for this calibre might be added the substitutive in the future.

80. 3 Printed in Japan

PARTS LIST

ANALOGUE QUARTZ Cal. Y553A

Characteristics

Casing diameter:

ø 23.3 mm

Maximum height:

3.9 mm without battery

Frequency of quartz crystal oscillator: 32,768 Hz (Hz=Hertz..... Cycle per second)

Driving system: Step motor system (2 poles)

Regulation system: Trimmer condenser

Second setting device

Calendar (day & date)

Instant setting device for day & date calendar Bilingual change-over system for day of week

PART NO.	PART NAME	PART NO.	PART NAME
122 781 131 982 221 781 ☆225 784 ☆225 788 231 781 ☆241 788 241 788 261 781 ☆271 788 281 589 282 781 383 781 384 781 386 782 391 781 387 781 801 781 802 781 808 781 808 781	Center wheel bridge Third wheel bridge Center wheel & pinion Cannon pinion (2.47 mm) Cannon pinion (2.72 mm) Third wheel & pinion Fourth wheel & pinion (5.16 mm) Fourth wheel & pinion (5.41 mm) Minute wheel Hour wheel (1.88 mm) Hour wheel (2.13 mm) Setting wheel Clutch wheel Winding stem Setting lever Yoke (Clutch lever) Setting lever spring Setting lever axle Second-setting lever Casing clamp Day star with dial disk Fifth wheel & pinion Date dial Date driving wheel Date dial guard Date jumper	022 491 022 754 022 754 022 764 027 492 011 324 011 324 011 537 011 537 ≎U.C.C. 395 ☆ Maxell SRMI6SW	Day finger screw Date jumper screw B Date dial guard screw Dial screw Pin for plus terminal of battery connection Upper hole jewel for fifth wheel Lower hole jewel for fourth wheel Upper hole jewel for step rotor Lower hole jewel for step rotor Silver oxide battery
☆884 693 962 781	Holding ring for dial Intermediate wheel for calendar correction Snap for day star with dial disk		
963 781 981 781 4001 982 4002 782 4146 781 4216 781	Day-date corrector wheel rocker Circuit block Coil block Step rotor Insulator for battery connection		
4242 780 4408 982 4462 · · · 022 426 022 468 022 468	Plus terminal of battery connection Battery spacer Coil cover Casing clamp screw Center wheel bridge screw Third wheel bridge screw		
022 468 022 468 022 491 022 491	Coil cover screw Circuit block screw Setting lever spring screw Date jumper screw A		

Cal. Y553A

Remarks:

Cannon pinion, Fourth wheel & pinion, Hour wheel

There are two different types as specified below. Combination

1	Туре	Cannon pinion	Fourth wheel & pinion	Hour wheel
	a	☆225 784	☆241 784	★271 784
Ì	ь	★225 788	☆241 788	★271 788

Day star with dial disk

470 785 (English-Spanish, Black figures on white background)

470 783 (English-French, Black figures on white background)

470 789 (English-Italian, Black figures on white background)

470 795 (English-German, Black figures on white background) 470 781 (English-Japanese, Black figures on white background)

Holding ring for dial

★884 693.....The type of holding ring for dial is determined based on the design of cases and dials.

The applied battery for this calibre might be added the substitutive in the future.