TECHNICAL GUIDE

CAL. Y433 A

QUARTZ

CONTENTS

1. SPECIFICATIONS

Quartz Cal. Y433A

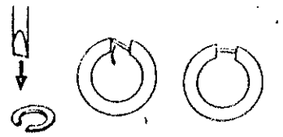
Item \ Cal. No.	Y433A
Time indication	3 hands
Additional mechanism	Date Day Bilingual change over system for the day of the week. Instant day setting device. Instant date setting device. Second setting device (stops at every second). Electronic circuit reset switch.
Crystal oscillator	32,768Hz (Hz - Hertz . . . Cycle per second)
Loss/gain	Loss/gain at normal temperature. Monthly rate: less than 15 seconds (Annual rate: less than 3 minutes)
Casing diameter	ϕ 17.6mm (16.00mm between 3 o'clock and 9 o'clock sides)
Height (excluding battery portion)	3.6mm
Operational temperature range	-10°C ~ +60°C (14°F ~ 140°F)
Driving system	Step motor system (2 poles)
Regulating system	Trimmer condenser
Battery power	Silver oxide battery U.C.C. 384 Battery life is approximately 2 years. Voltage: 1.55V
Jewel	2 jewels

II. DISASSEMBLING, REASSEMBLING, LUBRICATING AND CLEANING

- **Disassembling and reassembling**
  Disassembling procedures Figs. ① ~ ㊻
  Reassembling procedures Figs. ㊻ ~ ①
- **Use the movement holder S-661.**

- **Lubricating**
  Types of oil
  ●● Moebius A
  ○ Watch Oil S-6
  Oil quantity
  ●●● Liberal
  ●● Normal
  ● Extremely small

(1) Calendar and setting mechanism



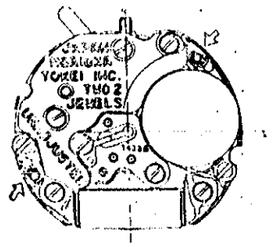
- How to remove the snap for day star with dial disk
  Extend the groove of the snap for day star with dial disk with the tip of a screwdriver as shown in the illustration and remove it by lifting up the screwdriver. Be sure to avoid inserting the tip of the screwdriver between the snap for day star with dial disk and the day star with dial disk.

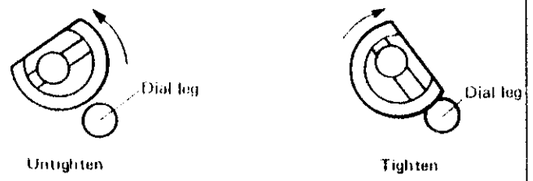
* Setting lever
Use according to the case models.

Remarks for disassembling and reassembling

- How to disassemble and reassemble the hands (1)
  When disassembling or reassembling, always pull the crown out to the second click position. The second hand must be placed just in line with a second mark. (Either odd or even second mark will do.)
- How to disassemble and reassemble the dial (2)
  After turning the eccentric dial pin between 90° and 150°, it is possible to remove and replace the dial.

How to turn the eccentric dial pin





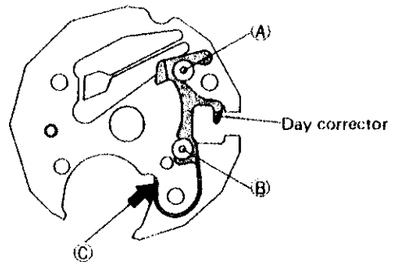
Be careful the eccentric dial pin does not come in contact with the stator.

- Date dial guard (7)

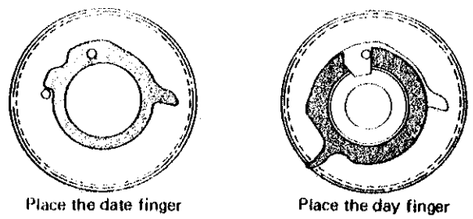
Handle the day corrector together with the date dial guard except when its replacement is required.

- *How to reassemble the day corrector*

1. Hook the day corrector on the pins for the date dial guard in the order of (A) and (B).
2. Place the day corrector spring portion (C) (arrow-marked) under the backside of the date dial guard.

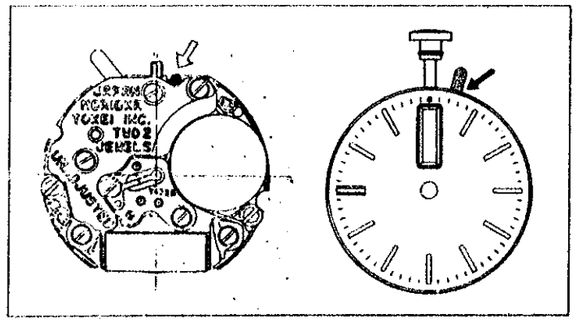


- How to reassemble the date finger and the day finger (22), (23)



- How to remove the winding stem (25)

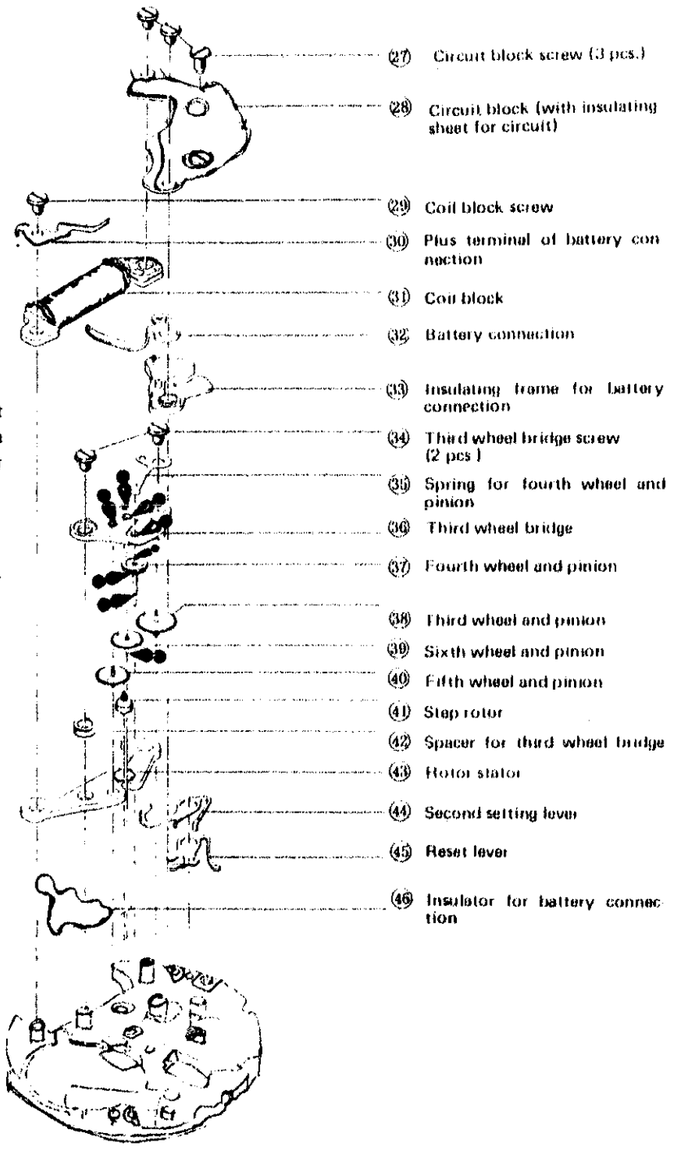
- *From the circuit block side*
  A part of the setting lever is seen in the hole of the main plate (arrow-marked) in the second click position of the crown. Push it down to remove the winding stem.
- *From the dial side*
  A part of the lever for unlocking stem is seen at the outer circumference of the dial. Push it down to remove the winding stem.



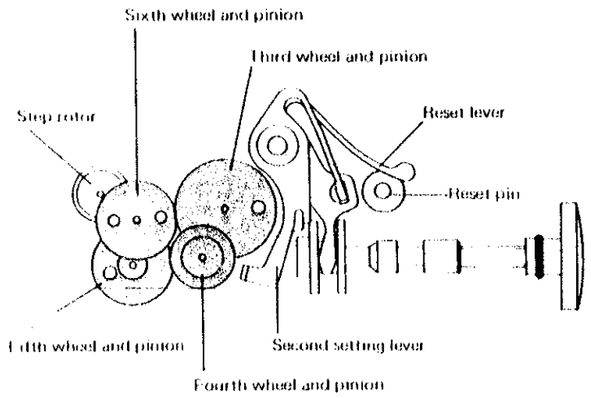
(2) Electronic circuit and gear train mechanism

How to hold the coil block

- **Lubricating the tip of the pivot for fourth wheel and pinion**
  Lubricate the tip of the pivot for fourth wheel and pinion.



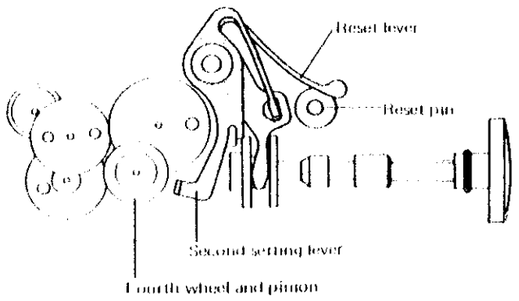
- How to reassemble the gear train, reset lever and second setting lever (37) ~ (45)



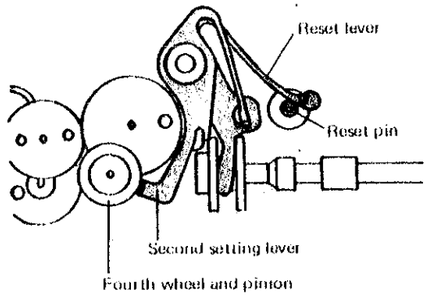
- Functions of the gear train, reset lever and second setting lever (37) ~ (45)

  - When the crown is pulled out to the second click position, make sure that the second setting lever sets securely the fourth wheel and pinion and at the same time the reset lever touches the reset pin.

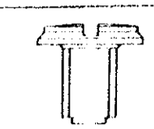
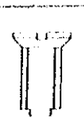
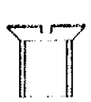
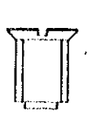
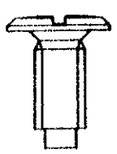
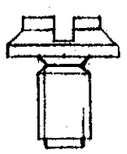
    - Normal and first click positions of the crown



    - Second click position of the crown



- List of screws used

 Third wheel bridge screw Coil block screw	 Date driving wheel screw	 Setting lever axle spring screw	 Date dial guard screw	 Circuit block screw B	 Case screw (occasionally used according to the case models)
3 pieces	1 piece	1 piece	3 pieces	3 pieces	2 pieces

3. Cleaning

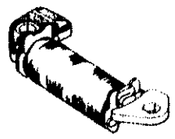
Since several parts (electronic parts, etc.) of Cal. Y433A differ from those of the conventional mechanical watches, use the following method when cleaning.

1) HOW TO CLEAN

Name of parts	Cleaning	Drying	Solution	Remarks
Main plate  Step rotor 	Rinse or wash with a soft brush ditto	Warm air	Benzine	• Be careful not to remove or deform 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.
Plastic parts	Rinse or wash with a soft brush	Warm air	Alcohol or benzine	
Other parts (excluding the parts that must not be cleaned)	Clean with the cleaner, rinse or gently scrub with a soft brush.	Warm or hot air	Benzine or trichloroethylene	

2) PARTS THAT MUST NOT BE CLEANED

Circuit block

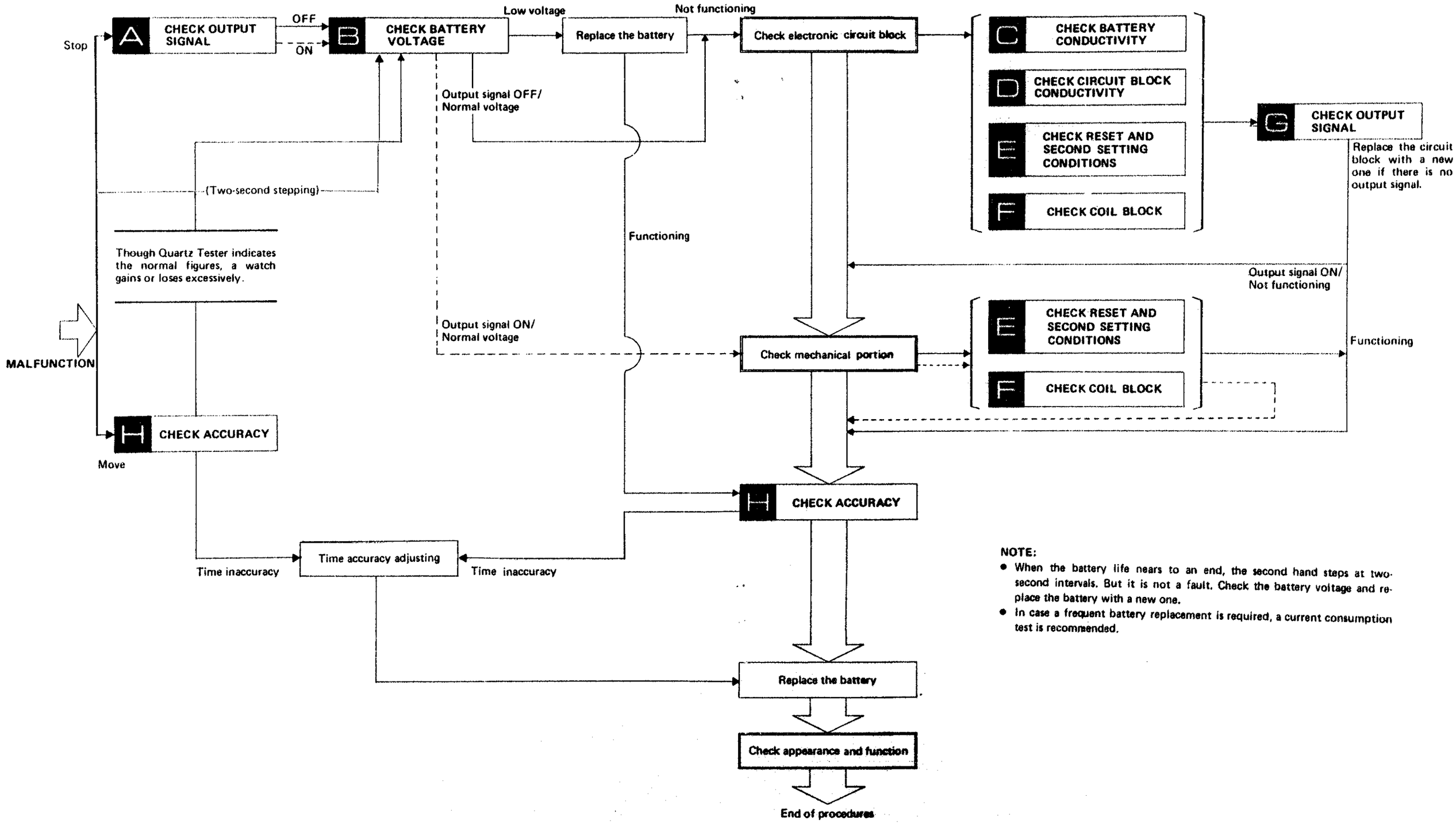


Coil block

- Be sure to clean only stains on the conductive portions with a cloth moistened with benzine or alcohol and dry them with warm air.

III. CHECKING AND ADJUSTMENT

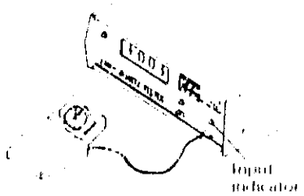
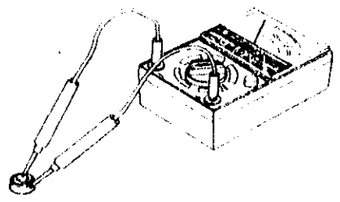
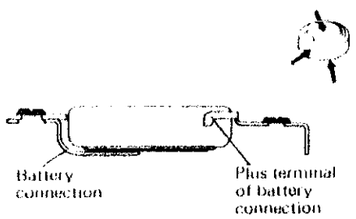
(1) Guide table for checking and adjustment

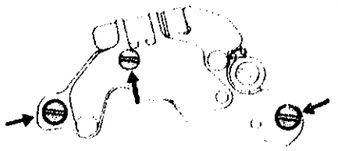
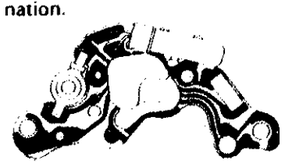


NOTE:

- When the battery life nears to an end, the second hand steps at two-second intervals. But it is not a fault. Check the battery voltage and replace the battery with a new one.
- In case a frequent battery replacement is required, a current consumption test is recommended.

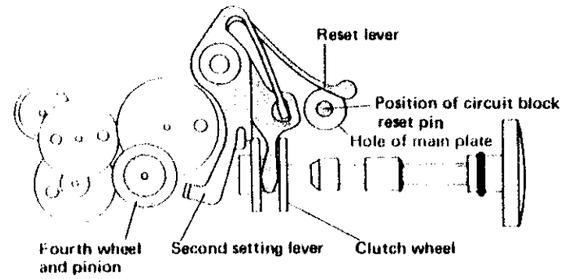
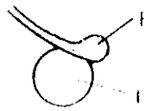
(2) Procedures for checking and adjustment

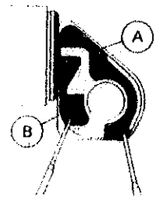
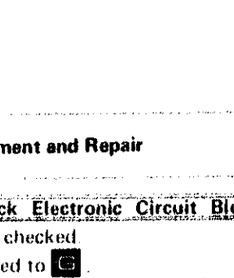
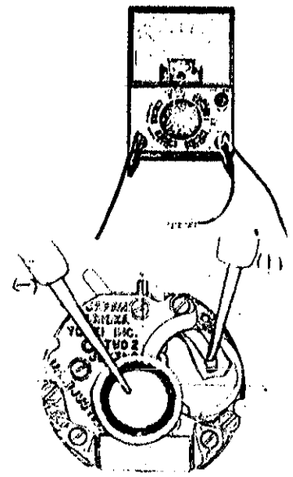
	Procedures	Results	Adjustment and Repair
A CHECK OUTPUT SIGNAL	Check output signal 1. Set up the Quartz Tester. 2. Checking Check for blinking input indication lamp. Note: Push in the crown to the normal position. 	One-second blinking	Proceed to B
		No one-second blinking	Proceed to B
B CHECK BATTERY VOLTAGE	Check battery voltage. 1. Set up the Volt-ohm-meter. Range to be used: DC 3V 2. Measuring • Probe Red (+) . . . Battery surface (+) • Probe Black ( ) . . . Battery surface ( ) 	More than 1.55V	In procedure A if one-second blinking is found, proceed to **Check mechanical portion**. In procedure A if one-second blinking is not found, proceed to **Check electronic circuit block**.
		Less than 1.55V	Proceed to **Replace the battery**. If a watch operates after battery replacement, proceed to B. If a watch does not operate after battery replacement, proceed to **Check electronic circuit block**.
C CHECK BATTERY CONDUCTIVITY	Check battery conductivity 1. Make sure that the coil block screw is tightened firmly. 2. Check for any contamination on the connecting portion of battery, the battery connection, the plus terminal of battery connection and holding spring for battery. 	No loosened screw	Proceed to C 2.
		Loosened screw	Retighten the screws.
		Uncontaminated	Proceed to D.
		Contaminated	Wipe off carefully.

	Procedures		
HOW TO CHECK BATTERY ELECTROLYTE LEAKAGE AND REPAIR	* How to check battery electrolyte leakage and repair 1. Remove the movement from the case. 2. Wipe off battery electrolyte on the circuit block. (1) Wipe off battery electrolyte with a cloth moistened with distilled water. (If distilled water is not available, use tap water.) Note: Do not expose the trimmer condenser to water or alcohol. If it is exposed, there may be a change in the condenser capacity and eventually in the time accuracy. • Replace the part with a new one if the part is rusted to the extent that it is impossible to use. (2) Wipe them with a cloth moistened with alcohol. (3) Dry with hot air by using a dryer. (If the cleaned portions remain wet with water, they will corrode with rust.) 3. Wipe off battery electrolyte on the other parts. (Rinse the insulator for battery connection with water.) 4. Reassemble the movement. (Replace the battery with a new one.) 5. Check to see if the time setting functions and the current consumption are normal.		
D CHECK CIRCUIT BLOCK CONDUCTIVITY	Check circuit block conductivity 1. Check to see if the circuit block screws (3 pcs.) are tightened firmly.  2. Check the circuit block for any break in the welded portion, short circuit, pattern break and contamination. 	No loosened screw	Proceed to D 2.
		Loosened screw	Retighten the screw.
		No break in the welded portion, short circuit, pattern break, or contamination	Proceed to E.
		Break in the welded portion, short circuit, pattern break	Replace the circuit block.
		Contaminated	Wipe off carefully.

CHECK RESET AND SECOND SETTING CONDITIONS

E

Procedures	Results	Adjustment and Repair
Check reset and second setting conditions 1. Check to see if the second hand stops immediately after the crown is pulled out to the second click position and if it starts promptly one second after the crown is pushed in to the normal position. 2. Check for the clearance between the reset lever and the reset pin (with the circuit block removed).	Stops completely and starts after one second	Proceed to **F**.
	Does not stop or moves irregularly	Proceed to **E** 2.
(1) Crown position: Normal, first click		
	 Reset lever Hole of main plate	Proceed to **E** 2. (2)
(2) Crown position: Second click		Replace the reset lever.
		Proceed to **E** 3.
		Replace the reset lever.
3. Check for the clearance between the second setting lever and the fourth wheel and pinion (with the circuit block removed).	 Clearance	Proceed to **E** 3. (2)
(1) Crown position: Normal, first click	 No clearance	Replace the second setting lever.
(2) Crown position: Second click	 No clearance	Proceed to **F**.
	 Clearance	Replace the second setting lever.

	Procedures	Results	Adjustment and Repair
F CHECK COIL BLOCK	Check coil block Check the coil block for broken wire and short circuit.  1. Set up the Volt-ohm-meter. Range to be used: OHMS R x 100 2. Measuring Apply the two probes of the Volt-ohm-meter to the two lead terminals of the coil block, (A) and (B).	2.0 KΩ ~ 4.0 kΩ	Check Electronic Circuit Block is being checked. Proceed to **G**. Check Mechanical Portion is being checked Proceed to **H**.
		Less than 2.0 KΩ Short circuit More than 4.0 KΩ Broken coil wire	Replace the coil block.
G	Check for output signal 1. Set up the Quartz Tester. 2. Checking Follow the procedures in **A**.	One-second blinking	Functioning Proceed to **H** Not functioning Proceed to Check mechanical portion.
		No one-second blinking	Replace the circuit block.
H	Check accuracy 1. Set up the Quartz Tester. 2. Checking Read out the daily rate.	Normal	Replace the battery.
		Defective	Adjust time accuracy
TIME ACCURACY ADJUSTING	Be sure to adjust time accuracy by turning the trimmer condenser. • Before adjusting time accuracy, check loss or gain with the Quartz Tester. The time gains or losses by turning the trimmer condenser clockwise or counterclockwise. Remarks for handling the trimmer condenser 1. When turning the trimmer condenser, be careful not to apply too much pressure to it. 2. The trimmer condenser is a precision part. Be careful not to turn it excessively.		
CHECK CURRENT CONSUMPTION	In case a frequent battery replacement is required, a current consumption test is recommended. 1. Set up the Volt-ohm-meter. Range to be used: DC 12μA (DC 0.03mA) 2. Set up the condenser kit of 200 ~ 500μF as shown in the photo. 3. Measuring Probe Red (+) . . . Battery connection Probe Black (−) . . . Battery surface (−) 4. Result Less than 2.0μA . . . Normal More than 2.0μA . . . Check electronic circuit block. Note: If the pointer of the Volt-ohm-meter scales out and the current consumption cannot be measured, reset its range, e.g. at DC 30mA. Next, when the pointer is stabilized with the probes of the Volt-ohm-meter applied as shown in the illustration, return the range to DC 12μA (or DC 0.03mA) and read the value indicated.		

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

No. _____

PARTS LIST FOR CAL. Y433A

PARTS NO.	PARTS NAME	PARTS NO.	PARTS NAME
131267	Third wheel bridge	4146260	Step rotor
231260	Third wheel & pinion	4216260	Insulator for battery
241264	Fourth wheel & pinion	4219260	Insulator for battery connection
261260	Minute wheel	4239260	Rotor stator
270264	Center minute wheel with cannon	4242260	Plus terminal of battery connection
	pinion	4270260	Battery connection
271264	Hour wheel	4455260	Reset lever
281260	Setting wheel	011409	Upper hole jewel for step rotor
282260	Clutch wheel	011409	Lower hole jewel for step rotor
*354260	Winding stem	012151	Third wheel bridge screw
*354262	Winding stem	012151	Coil block screw(Screw for plus
372260	Joint stem (Movement portion)		terminal of battery connection)
373250	Joint stem (Case portion)	012459	Case screw
*383260	Setting lever	012462	Circuit block screw
*383265	Setting lever	012768	Setting lever axle spring screw
384260	Yoke(Clutch lever)	012770	Date driving wheel screw
389260	Setting lever axle spring	012781	Date dial guard with day corrector
391260	Second setting lever		screw
436260	Lower end-piece for thrid wheel	017125	Tube for circuit block A
*470043	Day star with dial disk	017126	Tube for circuit block B
495260	Spacer for third wheel bridge	017127	Tube for circuit block C
499260	Day finger ring	017128	Second setting lever pin
556260	Date finger	017129	Tube for third wheel bridge screwA
560260	Friction spring for fourth	017130	Tube for third wheel bridge screwB
	wheel & pinion	017131	Tube for coil block screw
701260	Fifth wheel & pinion	017936	Eccentric dial pin
706260	Sixth wheel & pinion	SEIKO (SEIZAIKEN)	TR41SW
719260	Day corrector	MAXELL	SR41SW } Silver oxide battery
*801260	Date dial	U.C.C.	384
802260	Date driving wheel	SONY EVEREADY	384
808260	Date dial guard(with day corrector)		
810260	Date jumper		
817260	Intermediate date wheel		
868260	Day finger		
* 884264	Holding ring for dial		
963260	Snap for day star with dial disk		
4001269	Circuit block		
4002261	Coil block		

Remarks:

Winding stem

☆354 260 ·····Short winding stem (Thread is provided completely on the crown portion.)
☆354 262 ·····Long winding stem (Thread is provided only on the end of the crown portion.)
If the combination of the winding stem and case is unknown, check the case number and refer to "Casing Parts List" to choose a corresponding winding stem.

Setting lever

☆383 260 ☆383 265 ..... There are two types of setting lever. 383 260 can be used as it is. 383 265 can be used by cutting its tail. The size of a setting lever is determined based on the design of cases. When adjusting the length of the setting lever by cutting its tail, be sure that the tail partly comes out of the dial. If the tail is hidden from view by the dial, it will be difficult to disassemble the winding stem.
If the combination of the setting lever and case is unknown, check the case number and refer to "Casing Parts List" to choose an appropriate setting lever.

Day star with dial disk

☆470 043(English ⟷ Spanish, black figures on white background)
Used when both the crown and the calendar frame are located at 3 o'clock position.
If any other type of day star with dial disk is required, specify the number printed on the disk.

Date dial

☆801 085(White figures on black background)
☆801 086(Black figures on gold background)
☆801 260(Black figures on white background) ..... Used when both the crown and the calendar frame are located at 3 o'clock position.
☆801 087(White figures on black background)
☆801 088(Black figures on gold background)
☆801 264(Black figures on white background) ..... Used when the crown is located at 3 o'clock position and the calendar frame at 6 o'clock position.
If any other type of date dial is required, specify ① Cal. No. ② Jewels ③ The crown position ④ The calendar frame position and ⑤ Dial No.

Holding ring for dial

The type of a holding ring for dial is determined based on the design of cases and dials. , please refer to "Casing Parts List" to choose a corresponding holding ring for dial.