

TECHNICAL GUIDE AND PARTS LIST

CAL. Y541A

DIGITAL QUARTZ

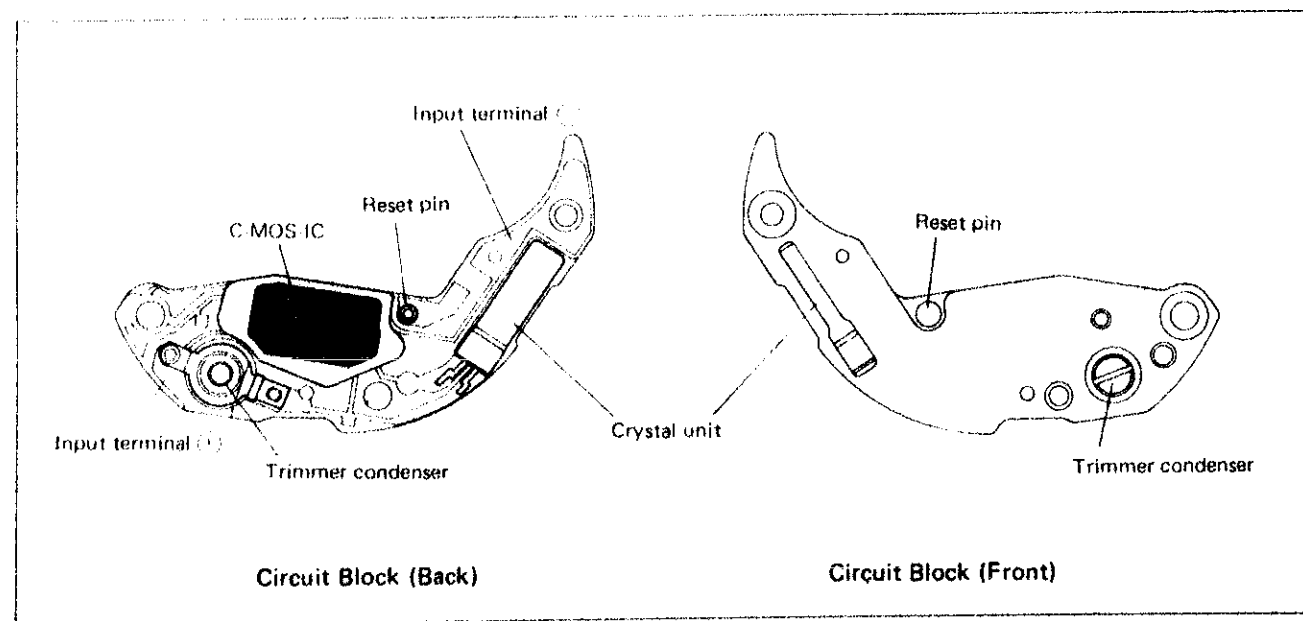
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I. SPECIFICATIONS

Item	Cal. No.	Y541A
Time indication		3 hands
Additional mechanism		<ul style="list-style-type: none"> • Second setting device (stops at every second) • Battery life indicator • Electronic circuit reset switch
Loss/gain		Loss/gain at normal temperature range Monthly rate: less than 15 seconds
Movement size		φ 18.2 mm (15.3 mm between 3 o'clock and 9 o'clock sides)
Casing diameter		17.8 mm (between 6 o'clock and 12 o'clock sides)
Height		3.0 mm
Regulation system		Trimmer condenser
Measuring gate by Quartz Tester		Any gate is available.
Battery		Maxell SR726SW or U.C.C. 397 Battery life: approx. 2 years Voltage: 1.55V
Jewels		6 jewels

II. STRUCTURE OF THE CIRCUIT BLOCK



III. DISASSEMBLING, REASSEMBLING, LUBRICATING AND CLEANING

1. Disassembling, Reassembling and Lubricating

Disassembling procedures Figs.: ① → ③⑥

Reassembling procedures Figs.: ③⑥ → ①

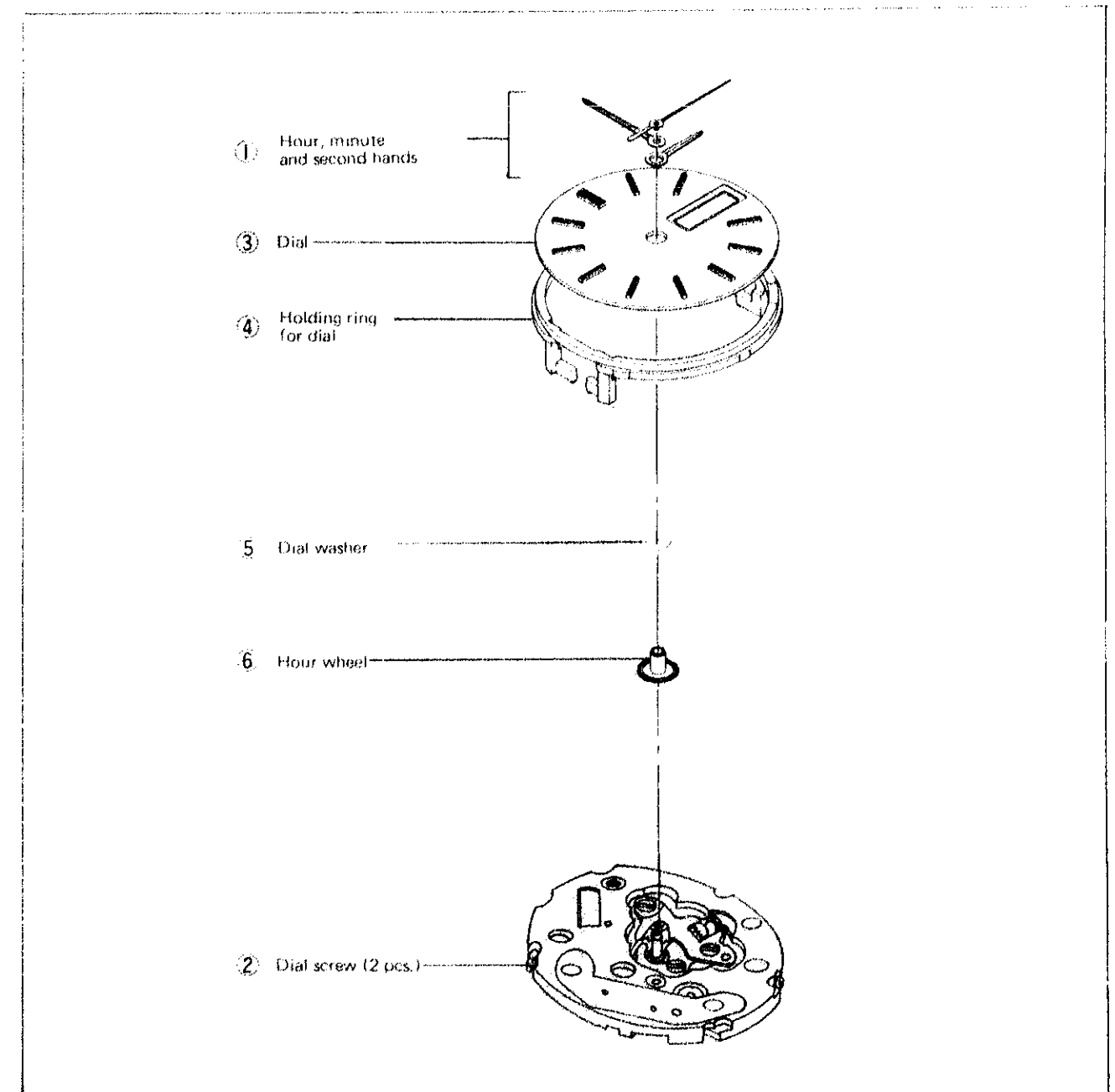
• Lubricant

● Moebius A

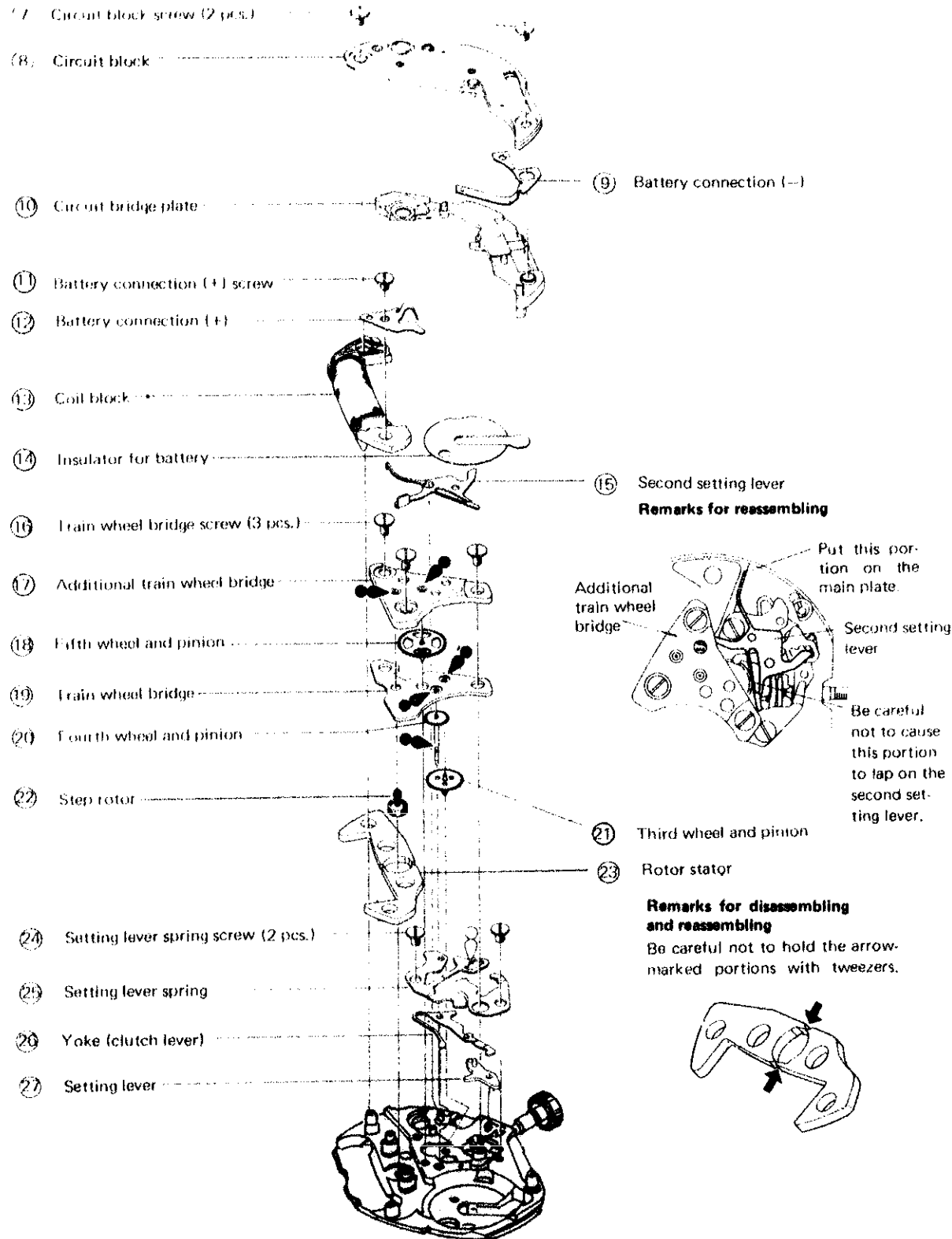
○ Moebius V

- Use the movement holder S-648 for disassembling and reassembling.

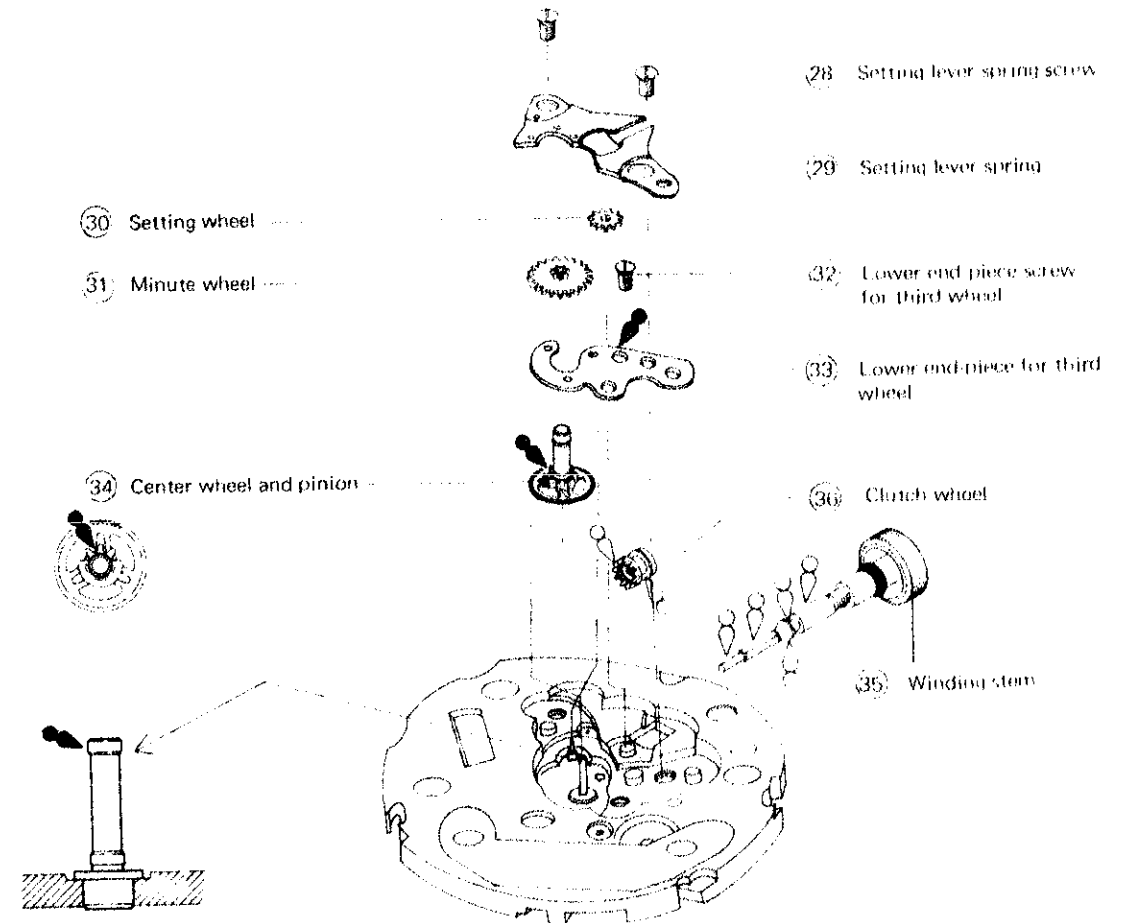
(1) Disassembling and reassembling of the second hand ~ hour wheel



(2) Circuit block, coil block and gear train




(3) Setting mechanism



• List of screws used

Shape	Parts No.	Parts Name
	022 241	Train wheel bridge screw (3 pcs.) Battery connection (+) screw (1 pc.) Circuit block screw (2 pcs.) Setting lever spring screw (2 pcs.)
	022 754	Setting lever spring screw (2 pcs.) Lower end-piece screw for third wheel (1 pc.)
	022 764	Dial screw (2 pcs.)

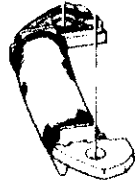
2. Cleaning

Name of parts	Cleaning	Drying	Solution	Remarks
Step rotor  Plastic parts Circuit bridge plate Insulator for battery	Rinse or scrub with a soft brush.	Warm air drying	Benzine or alcohol	<ul style="list-style-type: none"> • Use a clean solution as the step rotor is magnetized and may attract foreign metal particles. Any foreign matter which cannot be removed by cleaning should be removed with rodico. • When cleaning with benzine, the cleaning time should be minimized.
Other parts (excluding parts that must not be cleaned)	Clean with a cleaner, rinse or gently scrub with a soft brush.	Warm air drying	Benzine, alcohol or trichloroethylene	

PARTS THAT MUST NOT BE CLEANED



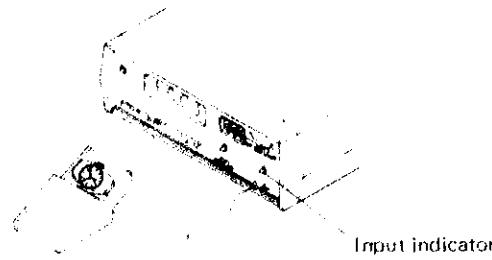
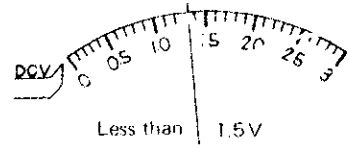
Circuit block


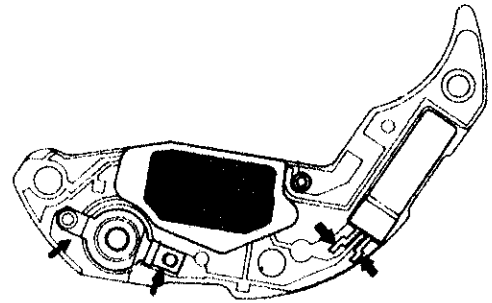
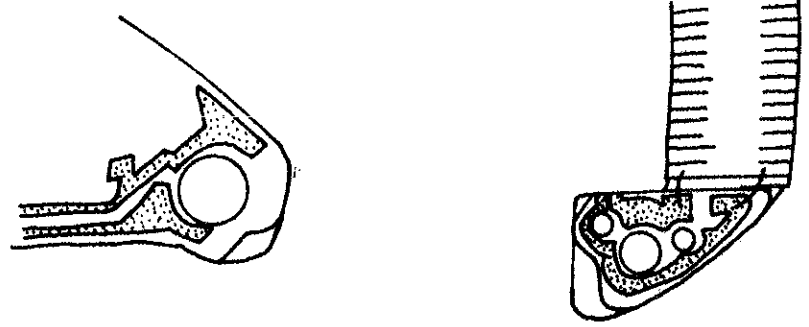


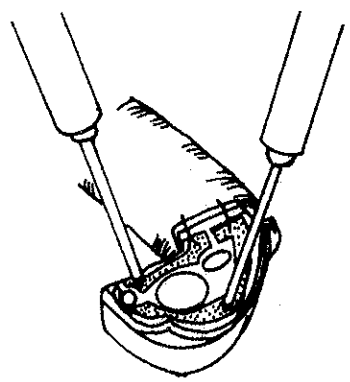
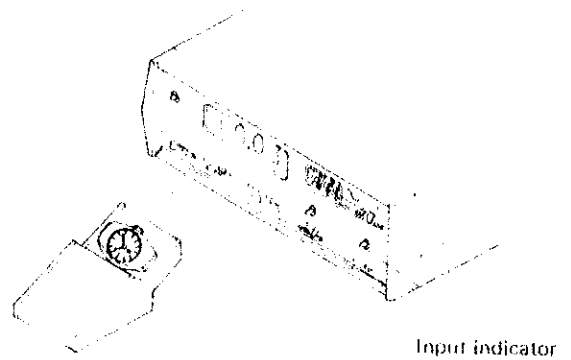
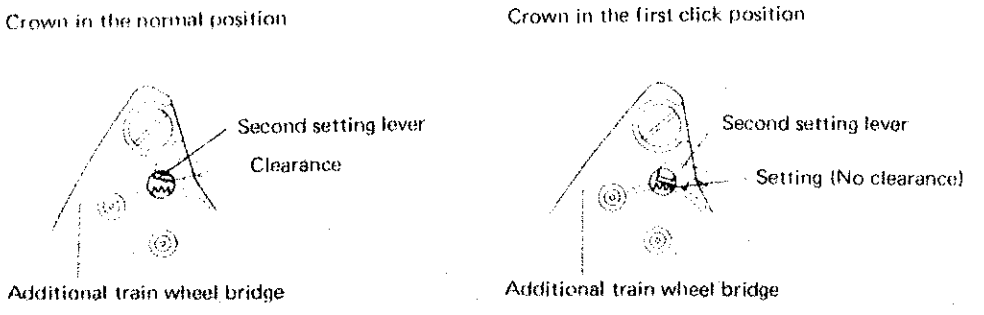
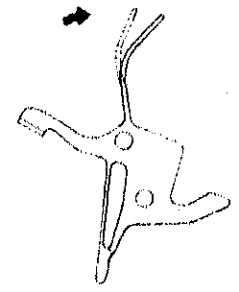
Coil block

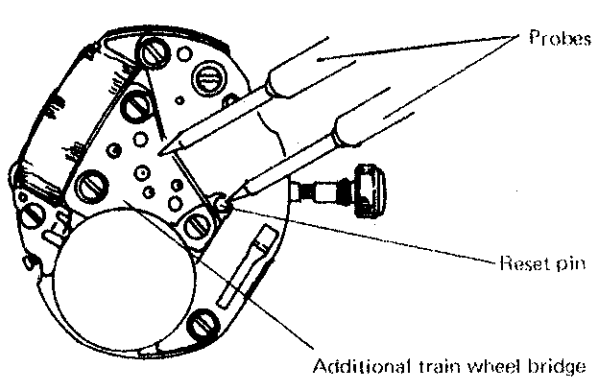
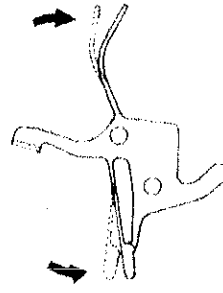
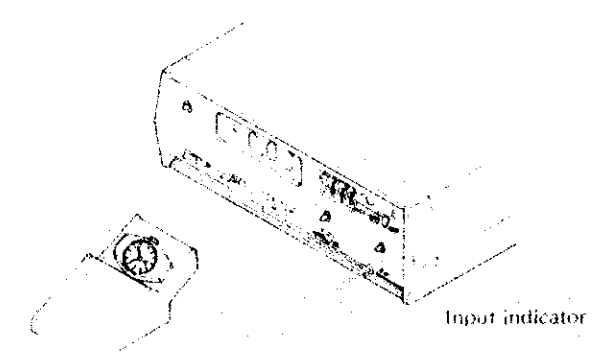
- Be sure to clean only stains on the conductive portions (circuit block, etc.) with a cloth moistened with benzine or alcohol and dry them with warm air.

2. Procedure for checking and adjustment

	Procedure	Result	Adjustment and Repair
CHECK OUTPUT SIGNAL	<p>Check output signal.</p> <p>(1) Set up the Quartz Tester.</p> <p>(2) Checking</p> <p>Check for blinking input indication light.</p>  <p>Note: The checking must be made when the crown is in the normal position.</p>	<p>One second blinking Normal</p> <p>No one-second blinking Defective</p>	<p>Proceed to B</p>
CHECK BATTERY VOLTAGE	<p>Use the following procedures to check battery voltage.</p> <p>(1) Set up the Volt-ohm-meter. Range to be used: DC3V</p> <p>(2) Measuring</p> <p>Probe Red (+) Battery surface (+) Probe Black (-) Battery surface (-)</p> <p>Note: When handling the battery, use non-metallic tweezers or fingercot.</p> <p>When there is battery electrolyte leakage, refer to "HOW TO CHECK BATTERY ELECTROLYTE LEAKAGE AND REPAIR" below for repairing.</p>	<p>More than 1.5V Normal</p> <p>Less than 1.5V Defective</p> 	<p>Proceed to Check mechanical portion if one-second blinking is found.</p> <p>Proceed to Check circuit block if one-second blinking is not found.</p> <ul style="list-style-type: none"> If two-second blinking is found, replace the circuit block with a new one. <p>Proceed to Replace the battery</p> <ul style="list-style-type: none"> If the watch functions after battery replacement, proceed to 7 If the watch does not function, proceed to Check circuit block
HOW TO CHECK BATTERY ELECTROLYTE LEAKAGE AND REPAIR	<ol style="list-style-type: none"> Remove the movement from the case. Disassemble the movement. Wipe off battery electrolyte on the circuit block. <p>(1) Wipe off battery electrolyte with a cloth moistened with distilled water. (If distilled water is not available, use tap water.)</p> <p>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.</p> <p>Note: Replace the circuit block with a new one if it is rusted to the extent that it cannot be used and if it cannot be remedied by cleaning.</p>		<ol style="list-style-type: none"> Wipe the cleaned portions with a cloth moistened with alcohol. (If they remain wet with water, they will corrode with rust.) Dry with warm air by using a dryer. Wipe off battery electrolyte on the other parts by following the procedures on page 5. Reassemble the movement. (Replace the battery with a new one.) Check to see if the time setting functions and the current consumption are normal.

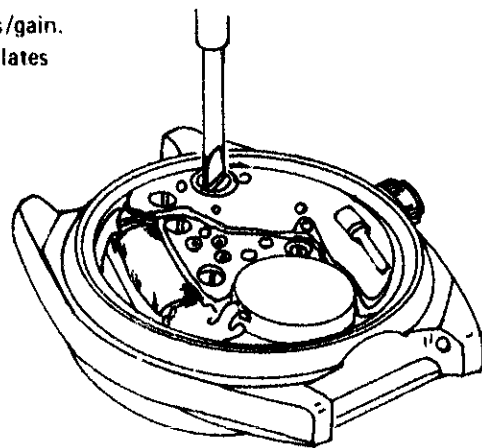
	Procedure	Result	Adjustment and Repair
CHECK BATTERY CONDUCTIVITY	<p>Check to see if the battery current flow to the circuit is normal.</p> <p>(1) Check for any foreign matter on the connecting portions of the battery, the plus terminal of battery connection and the battery connection.</p> 	<p>Uncontaminated Normal →</p> <p>Contaminated Defective →</p>	<p>Proceed to 1</p> <p>Wipe off any foreign matter.</p> <div style="border: 1px solid black; padding: 5px;"> <p>Note: Be careful not to bend the plus terminal of the battery connection and the battery connection.</p> </div>
CHECK CIRCUIT BLOCK CONDUCTIVITY	<p>Check for any short circuit and defective conductivity of the conductive portions of the circuit block. Disassemble the circuit block and check conductivity of the arrow-marked portions by using a microscope.</p> 	<p>No short circuit or defective conductivity . . . Normal →</p> <p>Short circuit and defective conductivity . . . Defective →</p>	<p>Proceed to 1</p> <p>Replace the circuit block with a new one.</p>
CHECK CIRCUIT BLOCK OUTPUT TERMINAL CONDUCTIVITY	<p>Check the contacting portions of the circuit block output terminal and the coil block. Check to see if there are any stains on the circuit block output terminal and the coil lead terminal.</p> 	<p>Uncontaminated Normal →</p> <p>Contaminated Defective →</p>	<p>Proceed to 1</p> <p>Wipe off any foreign matter.</p>

	Procedure	Result	Adjustment and Repair
III CHECK COIL BLOCK	<p>Check for broken coil wire and short circuit of the coil block after disassembling the circuit block.</p>  <p>(1) Set up the Volt-ohm-meter. Range to be used: OHMS R x 100</p> <p>(2) Checking Apply the probes of the Volt-ohm-meter to the coil lead terminal as shown in the illustration on the right.</p>	<p>Pointer of the Volt-ohm-meter swings Normal →</p> <p>Broken coil wire (Pointer of the Volt-ohm-meter hardly swings) Defective →</p> <p>Short circuit (Pointer of the Volt-ohm-meter swings excessively) Defective →</p>	<p>Proceed to 6 if the electronic circuit block must be checked.</p> <p>Proceed to 4 if the mechanical portion must be checked.</p> <p>Replace the coil block with a new one.</p>
G CHECK OUTPUT SIGNAL	<p>Check for output signal.</p> <p>(1) Set up the Quartz Tester.</p> <p>(2) Checking Follow the same procedures as in A</p> 	<p>One-second blinking → Functioning →</p> <p>One-second blinking → Not functioning →</p> <p>No one-second blinking Defective →</p>	<p>Proceed to 1</p> <p>Proceed to Check mechanical portion 11</p> <p>Replace the circuit block with a new one.</p>
I CHECK SECOND SETTING AND RESET CONDITIONS	<p>Check the second setting condition and reset condition.</p> <p>1. Check to see if the second setting lever functions correctly.</p> <p>(1) Check to see if there is clearance between the second setting lever and the fifth wheel and pinion when the crown is in the normal position. Also, check to see if the second setting lever touches the fifth wheel and pinion when the crown is in the first click position. (Check through the hole of the additional train wheel bridge by using a microscope.)</p> 	<p>Functions Normal →</p> <p>Does not function Defective →</p>	<p>Proceed to 11 2.</p> <ul style="list-style-type: none"> Check the shape of the second setting lever. If it is deformed, correct it.  <ul style="list-style-type: none"> Replace the second setting lever with a new one if it cannot be corrected.

	Procedure	Result	Adjustment and Repair
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">I</p>	<p>2. Check the reset condition after the circuit block and the battery are reassembled.</p> <p>(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.</p> <p>(2) Check to see if the conductivity between the reset pin and the main plate is normal when the crown is pulled out completely.</p> <p>(1) Set up the Volt-ohm-meter. Range to be used: OHMS R x 1</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Note: Be careful not to use the range other than R x 1. The circuit might be damaged if another range is used.</p> </div> <p>(2) Checking Measure the resistance by applying one of the probes of the Volt-ohm-meter to the third wheel bridge and the other probe to the reset pin.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Any probes will do.</p> </div> 	<p>Stops completely and starts moving after one second . . . Normal →</p> <p>Does not stop or moves irregularlyDefective →</p> <p>Less than 10Ω Normal →</p> <p>More than 10ΩDefective →</p>	<p>Proceed to I .</p> <p>Proceed to I 2.</p> <ul style="list-style-type: none"> • Replace the circuit block with a new one. • The reset pin and second setting lever touch incorrectly. Correct it as follows: <p>(1) Check the shapes of the second setting lever and reset pin. If they are deformed, correct them.</p>  <p>(2) Check to see if there are any contaminations on the contacting portions of the reset pin and the second setting lever. If there are any contaminations, wipe them off.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">I</p>	<p>Check for loss/gain.</p> <p>(1) Set up the Quartz Tester.</p> <p>(2) Checking Follow the same procedures as in A</p> 	<p>Normal →</p> <p>Defective →</p>	<p>See the Guide Table for checking and adjustment on page 6.</p> <p>Proceed to Time accuracy adjusting</p>

Adjust time accuracy by turning the trimmer condenser as shown in the illustration below.

- Before time accuracy adjusting, be sure to check loss/gain. The turning direction of the trimmer condenser regulates loss/gain.

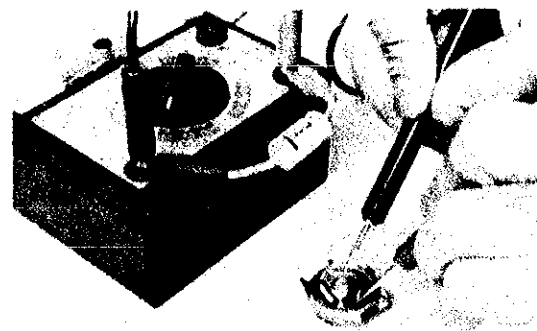


- Remarks for the trimmer condenser

- (1) When turning the trimmer condenser, be careful not to apply excessive force to it.
- (2) The trimmer condenser is a precision part, take utmost care not to turn it unnecessarily.

In case a frequent battery change is required, make a current consumption test by following the procedures below. Use the Micro Test or the Volt-ohm-meter for measuring current consumption. In the following case, the Volt-ohm-meter is used.

- (1) Set up the Volt-ohm-meter.
 - Range to be used: DC 12 μ A or DC 0.03 mA
 - Set up the condenser kit of 200 ~ 500 μ F as shown in the photo.



- (2) Prepare the watch.
 - Place the battery with its (-) side up on the third wheel bridge.

- (3) Measuring
 - Probe Red (+) Battery connection
 - Probe Black (-) Battery surface (-)

Note: Be sure to measure the current consumption with the crown in the normal position.

If the pointer of the Volt-ohm-meter swings over the maximum value, change over the measuring range to DC 30mA and turn it back to DC 12 μ A or DC 0.03mA with the probes touched to the specified portions.

Result	Adjustment and Repair
Less than 2.5 μ A Normal →	• Current consumption is normal.
More than 2.5 μ A Defective →	• Replace the circuit block with a new one.

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

V. PARTS LIST

PART NO.	PART NAME	PART NO.	PART NAME
125 546	Train wheel bridge	4242 545	Battery connection (+)
126 992	Additional train wheel bridge	4270 545	Battery connection (-)
221 546	Center wheel & pinion	4408 545	Insulating spacer for circuit block
231 545	Third wheel & pinion	011 542	Upper hole jewel for fourth wheel
241 546	Fourth wheel & pinion	011 547	Upper hole jewel for third wheel
261 545	Minute wheel	011 547	Upper hole jewel for fifth wheel
271 546	Hour wheel	011 547	Upper hole jewel for step rotor
281 545	Setting wheel	011 547	Lower hole jewel for step rotor
282 546	Clutch wheel	011 550	Lower hole jewel for fifth wheel
354 546	Winding stem	022 241	Train wheel bridge screw
383 545	Setting lever	022 241	Battery connection (+) screw
384 545	Yoke (Clutch lever)	022 241	Circuit block screw
386 546	Minute wheel bridge	022 241	Setting lever spring screw
388 546	Setting lever spring	022 754	Minute wheel bridge screw
391 545	Second setting lever	022 754	Lower end-piece screw for third wheel
436 546	Lower end-piece for third wheel	022 764	Dial screw
491 546	Dial washer	023 397	Guide pin for lower end-piece for third wheel
701 545	Fifth wheel & pinion	027 051	Tube for battery connection (+)
884 677	Holding ring for dial	027 867	Yoke pin
4001 974	Circuit block	027 868	Minute wheel pin
4002 545	Coil block	027 869	Second setting lever pin
4146 545	Step rotor	027 870	Setting lever pin
4216 545	Insulator for battery	*U.C.C. 397	} Silver oxide battery
4239 545	Rotor stator	*Maxell SR726SW	

Remarks:

Battery

- * U.C.C. 397
- * Maxell SR726SW

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

• → Please see remarks.