

TECHNICAL GUIDE

CAL. Y10 SERIES
CAL. Y11 SERIES

(Y100A, Y101A, Y102A, Y112A, Y113A)

ANALOGUE QUARTZ

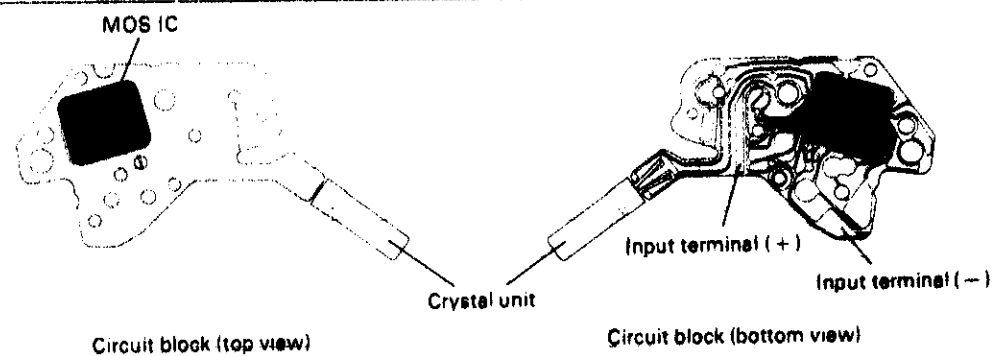
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I. SPECIFICATIONS

Item	Cal. No.	Y113A	Y112A	Y102A	Y101A	Y100A
Time indication		Three hands	Three hands	Three hands	Three hands	Two hands
Additional mechanism		Day and Date	Date	Date	--	--
		Day and date quick resetting device	Date quick resetting device		--	--
		Second setting device (stops at every second)				
		Electric circuit reset switch				
Loss/gain		Loss/gain at normal temperature range Monthly rate: less than 20 seconds				
Casing diameter		φ26.4 × 23.5 × 23.5 mm		φ24.0 × 19 × 21 mm		
Mechanism diameter		φ25.6		φ23.3		
Height		3.32 mm	2.94 mm		2.53 mm	
Regulation system		Non				
Measuring gate		10 second gate				
Battery life		Approx. 5 years		Approx. 3 years		
Battery		MAXELL SR1120SW SEIZAIKEN TR1120SW Voltage: 1.55V		MAXELL SR920SW Voltage: 1.55V		
Jewels		3 jewels				

II. CIRCUIT BLOCK SCHEMATIC

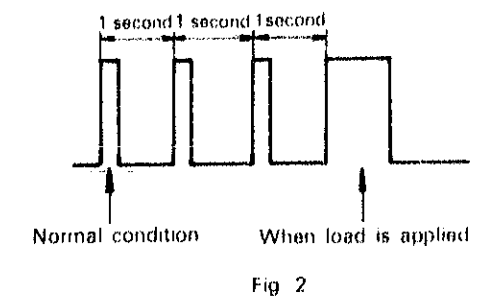
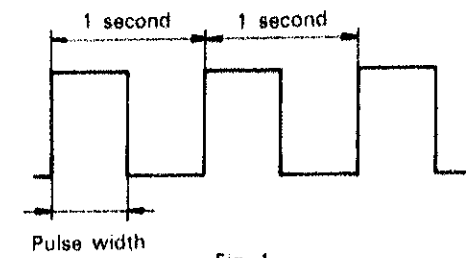


III. LIST OF SCREWS USED

Type	Part No.	Part Name
LT	022 411	Train wheel bridge screw (2 pcs) Battery connection (+) screw (4 pcs) Battery connection (-) screw (1 pc) Setting lever spring screw
	022 491	Datedial guard screw (3 pcs)

IV. STEP MOTOR COMPENSATION DRIVE PULSE SYSTEM (Special motor drive circuit with a low power consumption)

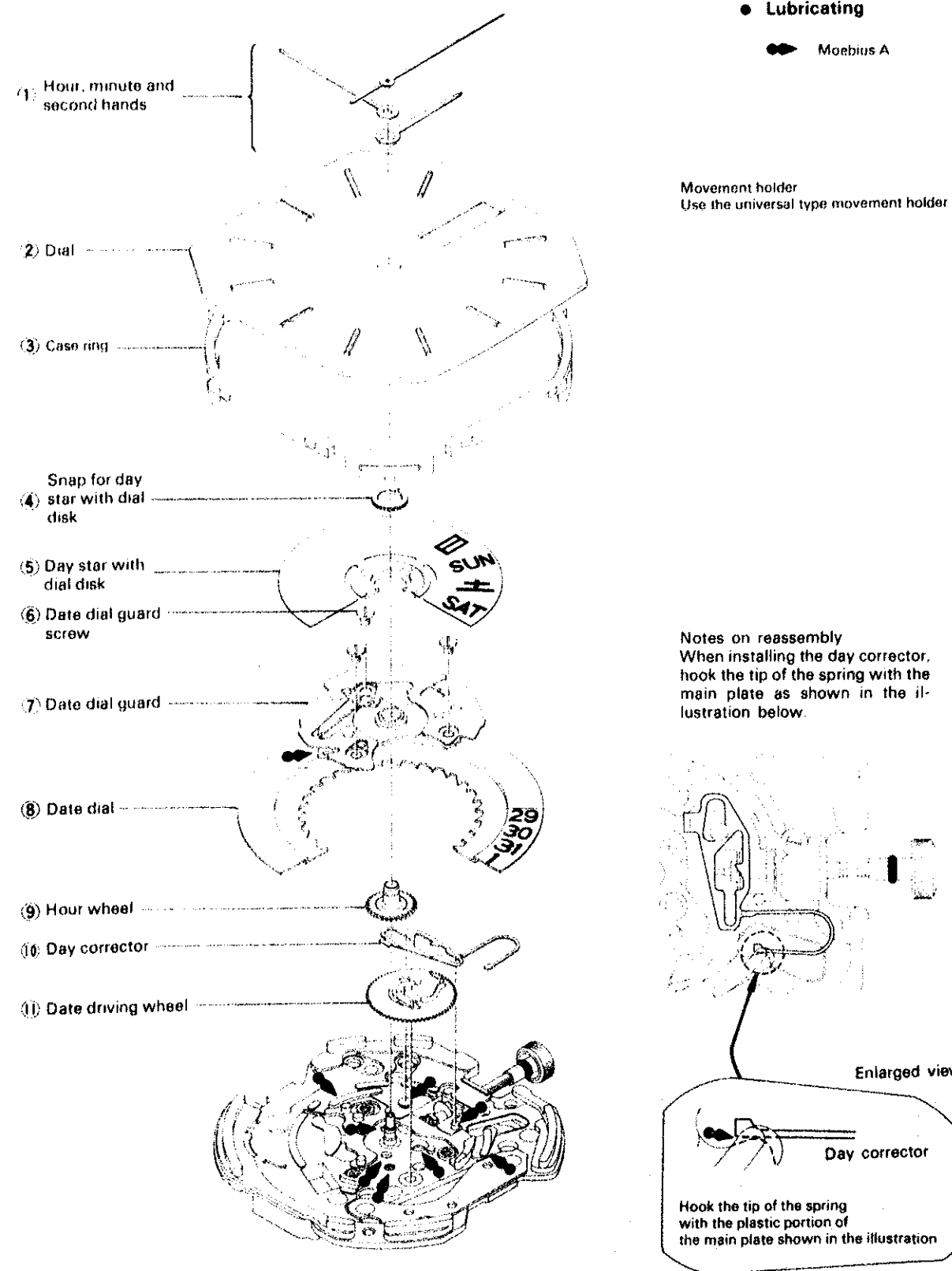
- With the former quartz circuit, the pulse width supplied from the electric circuit to step motor is constant (Fig. 1).
- In the Cal. Y11 and Y10, the drive pulse width changes according to the load required to drive the step motor. In the normal conditions, the circuit supplies the minimum power to drive the hands. If the extra load is applied (to drive calendar, or at a low ambient temperature), an enough pulse is supplied to overcome the load (Fig. 2).
- As the minimum pulse width is required to drive the step rotor in normal conditions, the minimum power consumption results. (For checking of the current consumption, refer to page 11.)



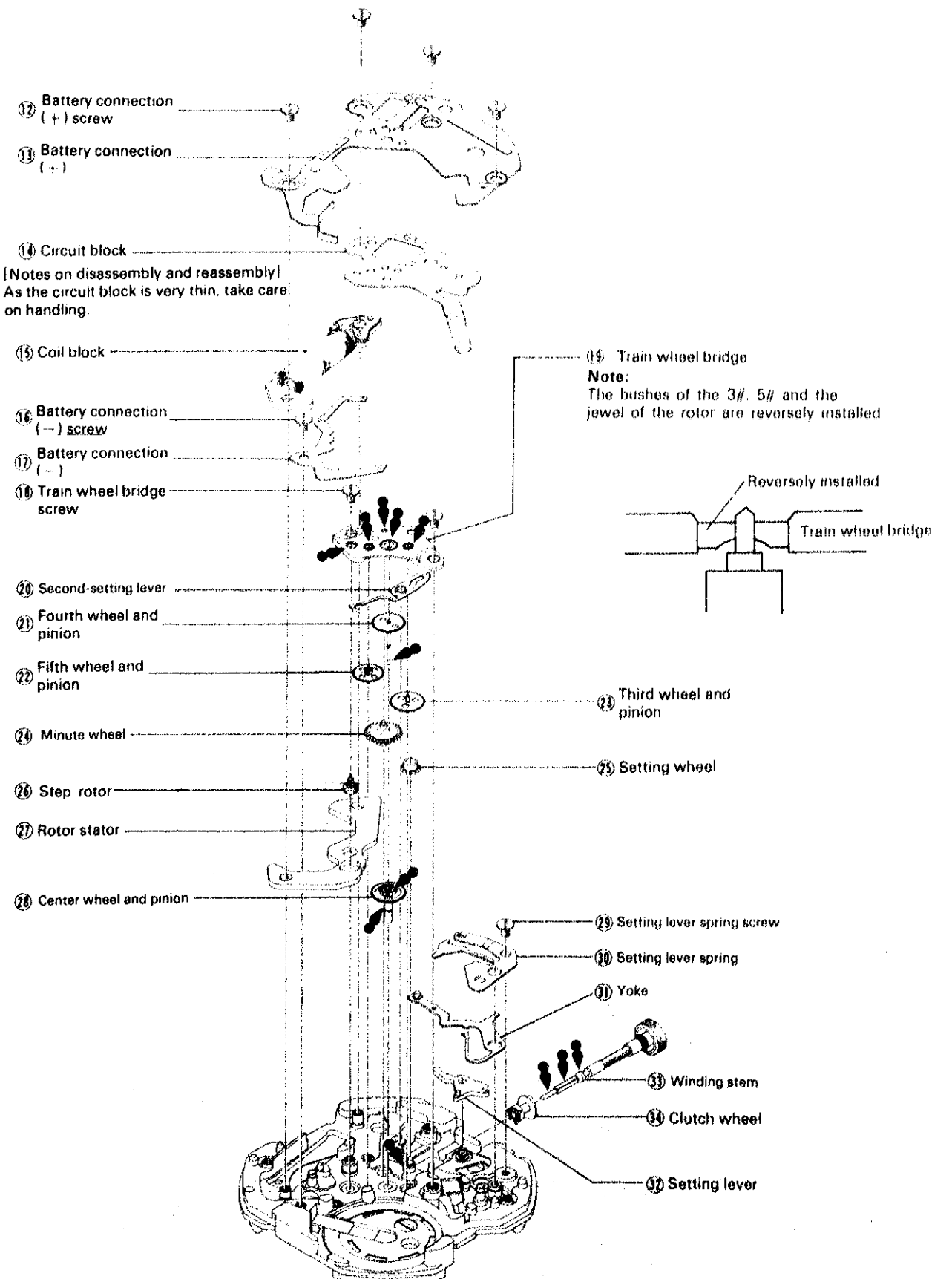
V. DISASSEMBLING, REASSEMBLING AND LUBRICATING

Disassembly procedures: Figs. ① ~ ⑩
 Reassembly procedures: Figs. ⑩ ~ ①



(1) Calendar mechanism



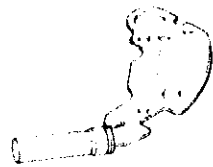
(2) Circuit block, drive coil, train wheel bridge



(3) Cleaning

Name of Parts	Cleaning	Drying	Solution	Remarks
<ul style="list-style-type: none"> ● Main plate  ● Step rotor  ● Plastic parts 	Rinse or wash with a soft brush.	Warm air	Benzine or alcohol	<ul style="list-style-type: none"> ● Be careful not to deform or remove the parts fixed to the main plate. ● 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 benzene, 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 or hot air drying	Benzine or trichloroethylene	

Parts that must not be cleaned



Circuit block



Coil block

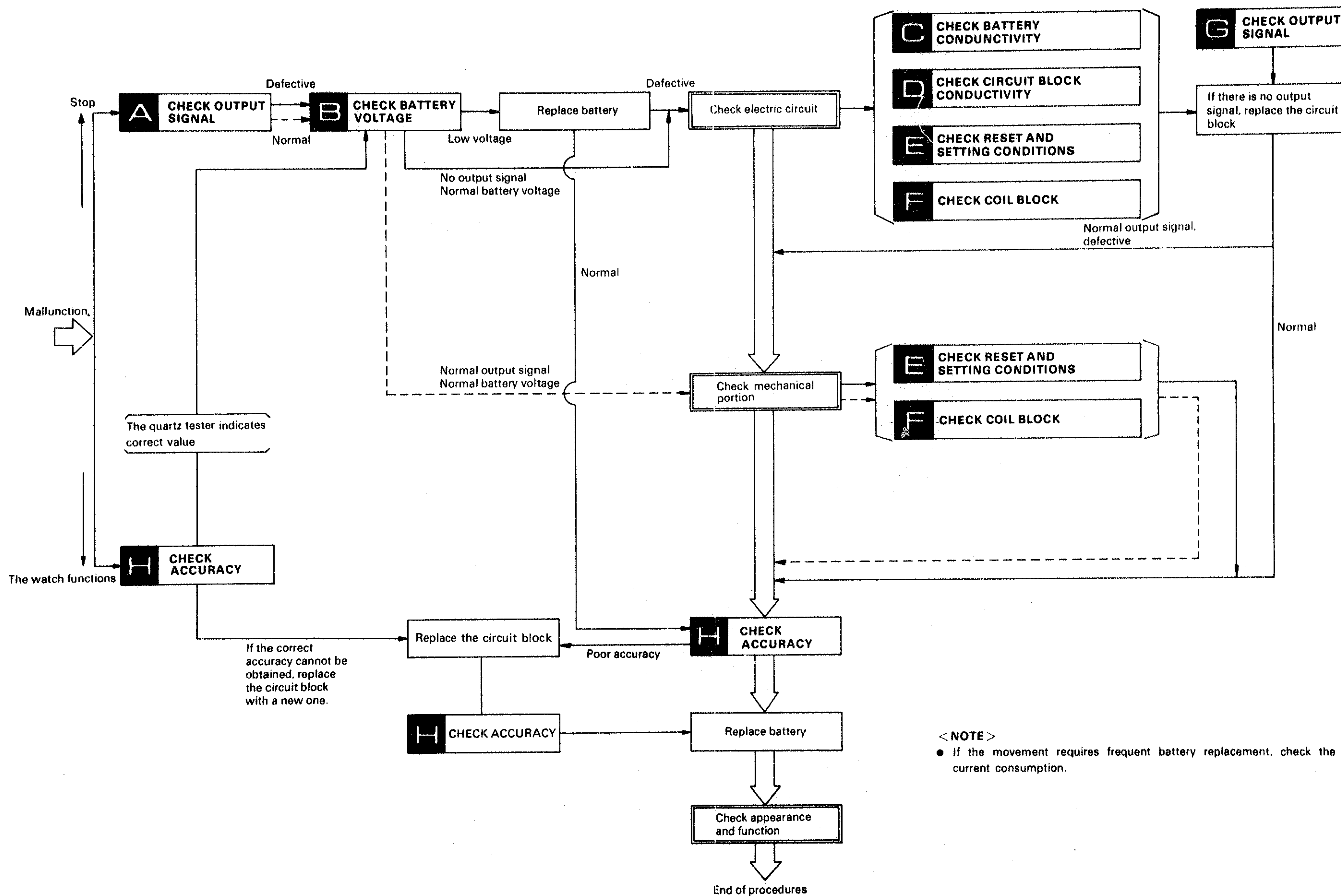


Battery

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

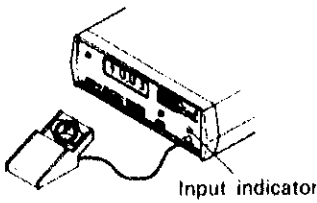
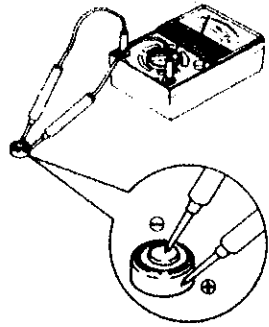
VI. CHECKING AND ADJUSTMENT

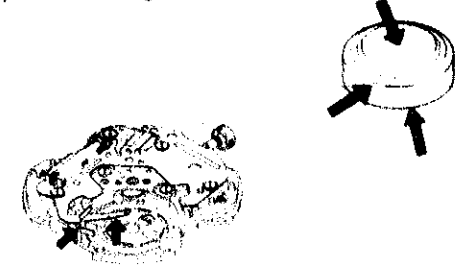
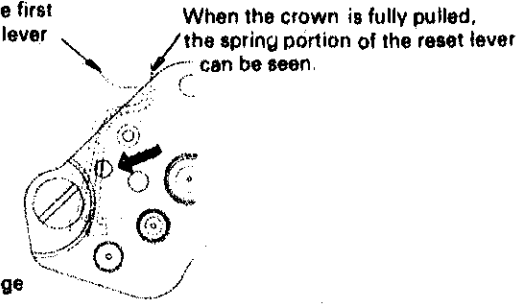
1. Guide table for checking and adjustment

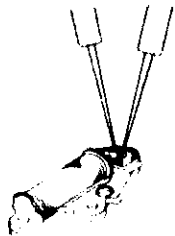


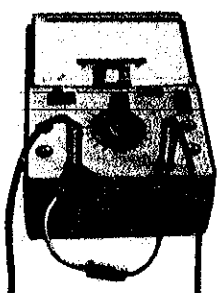
< NOTE >

- If the movement requires frequent battery replacement, check the current consumption.

	Procedure	Result and repair
△ CHECK OUTPUT SIGNAL	<p>Check for output signal.</p> <ol style="list-style-type: none"> 1 Set up the Quartz Tester. 2 Checking Check for blinking input indicator.  <p>[NOTE]</p> <ul style="list-style-type: none"> • Check the output signal with the crown in the normal position. • An ultrasonic microphone cannot be used. 	<p>One-second blinking: Normal Proceed to B</p> <p>No one-second blinking: Defective Proceed to B</p>
U CHECK BATTERY VOLTAGE	<p>Check battery voltage.</p> <ol style="list-style-type: none"> 1 Set up the Volt-ohm-meter. Range to be used: DC3V  <ol style="list-style-type: none"> 2 Measuring <ul style="list-style-type: none"> • Red probe ⊕ Battery surface ⊕ • Black probe ⊖ Battery surface ⊖ <p>[NOTE] When handling the battery, use plastic or bamboo tweezers or finger-cots.</p>	<p>More than 1.5V: Normal</p> <ul style="list-style-type: none"> • Proceed to "CHECK MECHANICAL PORTION" if the input indicator blinks correctly. • Proceed to "CHECK CIRCUIT BLOCK" if defects were found in A. <p>Less than 1.5V: Defective</p> <ul style="list-style-type: none"> • If the watch operates after battery replacement, proceed to I. • If the watch does not operate after battery replacement, proceed to "CHECK CIRCUIT BLOCK".
HOW TO REPAIR THE MOVEMENT WHEN BATTERY ELECTROLYTE LEAKAGE OCCURS	<p>Procedure</p> <ol style="list-style-type: none"> 1. Remove the movement from the case. 2. Wipe off battery electrolyte on the circuit block. <ol style="list-style-type: none"> 1 Wipe off battery electrolyte on the circuit block with a cloth moistened with distilled water. If distilled water is not available, use tap water. 2 Wipe the circuit block with a cloth moistened with alcohol. (If the cleaned portions remain wet with water, they will corrode with rust.) 3 Dry with warm air by using a dryer. 3. Clean other parts which come into contact with the battery electrolyte. 4. Reassemble the movement. (Replace the battery with a new one.) 5. Check that the watch functions and the current consumption is normal. 	

	Procedure	Result and repair
□ CHECK BATTERY CONDUCTIVITY	<p>Check that the battery current flow to the circuit block is normal</p> <ol style="list-style-type: none"> 1. Check the tightness of battery connection ⊕ screw. 2. Check for any contamination on battery surface, battery connection ⊖ and battery connection ⊕. 	<p>No loose screw: Normal Proceed to C.</p> <p>Loosened screw: Defective Retighten the screw.</p> <p>No contamination: Normal Proceed to D.</p> <p>Contaminated: Defective Wipe off any foreign matter.</p>
U CHECK CIRCUIT BLOCK CONDUCTIVITY	<p>Check the defective conductivity of the conductive portions of the circuit block.</p> <ol style="list-style-type: none"> 1. Check the tightness of battery connection ⊕ screw. 2. Check for poor soldering, short circuit or contamination on the conductive portions. 	<p>No loose screw: Normal Proceed to E.</p> <p>Loosened screw: Defective Retighten the screw.</p> <p>No poor conductivity: Normal Proceed to E.</p> <p>Poor conductivity: Defective Wipe off any foreign matter. For other problems, replace the circuit block with a new one.</p>
 CHECK RESET AND SETTING CONDITIONS	<p>Check for normal reset and setting conditions.</p> <ol style="list-style-type: none"> 1. Check that the second hand stops immediately after the crown is pulled fully and it starts promptly after one second when the crown is pushed in to the normal position. (Check with the input indicator of the Quartz tester or the second hand installed.) 2. The setting condition of the reset lever can be seen through the hole in the train wheel bridge as shown in the right illustration. <ul style="list-style-type: none"> • When the crown is fully pulled, the spring portion of the reset lever can be seen through the hole in the train wheel bridge. • When the crown is pushed in to the normal position, the reset lever cannot be seen through the hole. 3. When the crown is fully pulled, check the output signal of the Quartz tester. <p>When the crown is in the first click position, the reset lever cannot be seen.</p> <p>When the crown is fully pulled, the spring portion of the reset lever can be seen.</p>  <p>Train wheel bridge</p>	<p>Stops completely and starts after one second: Normal</p> <p>Does not stop or moves irregularly: Defective Proceed to I 2.</p> <p>The reset lever moves as shown in the left: Normal</p> <p>The reset lever does not move as shown in the left: Defective Replace the reset lever.</p> <p>No output signal: Normal</p> <p>Signal is output: Defective Replace the circuit block.</p>

	Procedure	Result and repair
CHECK COIL BLOCK	<p>Check the coil block for short circuit and broken wire.</p> <ol style="list-style-type: none"> 1 Set up the Volt-ohm-meter. Range to be used: OHMS R × 100 2 Checking Apply red and black probes of the Volt-ohm-meter to the coil block leads. (Either red or black probes will do.) 	<p>2.3 ~ 2.8 kΩ: Normal Proceed to ■ or ■.</p> <p>More than 2.8 kΩ (broken wire): Defective</p> <p>Less than 2.3 kΩ (short circuit): Defective</p> <p>Replace the coil block with a new one.</p>
CHECK OUTPUT SIGNAL	<p>Check for output signal.</p> <ol style="list-style-type: none"> 1 Set up the Quartz tester. 2 Checking For checking procedure, refer to ▲. 	
CHECK ACCURACY	<p>Check gain and loss of time.</p> <ol style="list-style-type: none"> 1 Set up the Quartz tester. 2 Checking For checking procedure, refer to ▲. 	

	Procedure	Result and repair
CHECK CURRENT CONSUMPTION	<p>If frequent battery change is required, a current consumption test is recommended.</p>  <p>Procedure</p> <ol style="list-style-type: none"> 1 Set up the Volt-ohm-meter. Range to be used: DC12μA (DC0.03 mA) 2 Connect the condenser kit of 200 ~ 500μF to the Volt-ohm-meter as shown in the illustration. 3 Place the battery on the train wheel bridge with its ⊖ surface up. 4 Measurement Red probe ⊕ Battery connection ⊖ Black probe ⊖ Battery surface ⊖ <p>The current consumption should be measured in the normal hand driving condition (when extra load is not applied). Before measuring the current consumption, pull the crown several times to reset the watch while the probes are applied.</p> <p>< NOTE ></p> <ul style="list-style-type: none"> ● If the pointer of the Volt-ohm-meter swings over the maximum value when DC12μA is used, change the range to a greater one (Example: DC30mA). Then, return to the original range (DC12μA or 0.03mA) while applying the probes to the measuring points. 	<p>Results</p> <p>Less than 1.3μA: Normal 1.3μA or more: Defective Check the circuit block</p>