

TECHNICAL GUIDE AND PARTS LIST

CAL. V220A

ANALOGUE QUARTZ




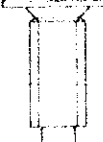
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I. SPECIFICATIONS

Item		Cal. No.	V220A
Indication system		Two hands (hand moves at 20 sec. intervals).	
Driving system		Step motor (fixed pulse system)	
Additional mechanism		Electronic circuit reset switch Train wheel setting device	
Loss/gain		Monthly rate: less than 20 seconds at normal temperature range	
Movement size	Outside diameter	15.5 mm (6H - 12H) x 8.4 mm (3H - 9H)	
	Casing diameter	15.1 mm	
	Height	2.2 mm	
Regulation system		None	
Quartz tester measuring gate		Use for 10-second gate	
Battery		SEIZAIKEN TR 521 SW Voltage: 1.55 V Battery life: Approx. 3 years	
Jewels		1 jewel	

II. LIST OF SCREWS USED

Shape	Part No.	Name	Shape	Part No.	Name
	012 792	Circuit block screw (5 pcs.)		012 038	Train wheel bridge screw (1 pc.)
	012 824	Setting lever spring screw (1 pc.)		012 039	Battery clamp screw* (1 pc.)

* The battery clamp screw is not used in some models.

III. DISASSEMBLING, REASSEMBLING AND LUBRICATING

Disassembling procedures: Figs ① ~ ③
Reassembling procedures: Figs ④ ~ ①

Use a universal movement holder for disassembling and reassembling

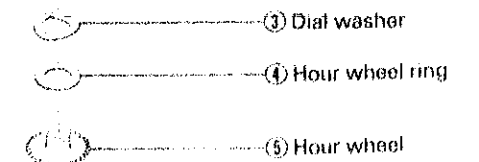
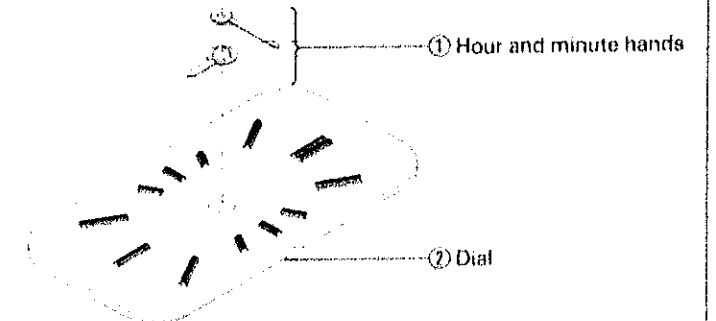
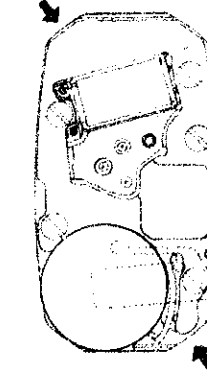
● Hour and minute hands ~ Hour wheel

② Dial

The dial is fixed with its 2 legs inserted into the dial leg holes in the circuit block spacer A ⑫ and the battery connection (-) spacer ⑪.

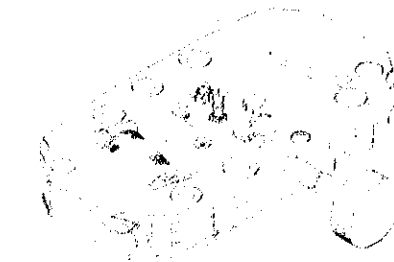
● **Removing the dial**
Insert a screwdriver in the gaps between the dial and the main plate (➡), and carefully pry out the dial.

● **Installing the dial**
Press in the dial so that there is no gap left between the dial and the main plate.








④ Hour wheel ring

As the hour wheel ring is in case for fluctuation adjustment of the hour wheel, it is sometimes not used.



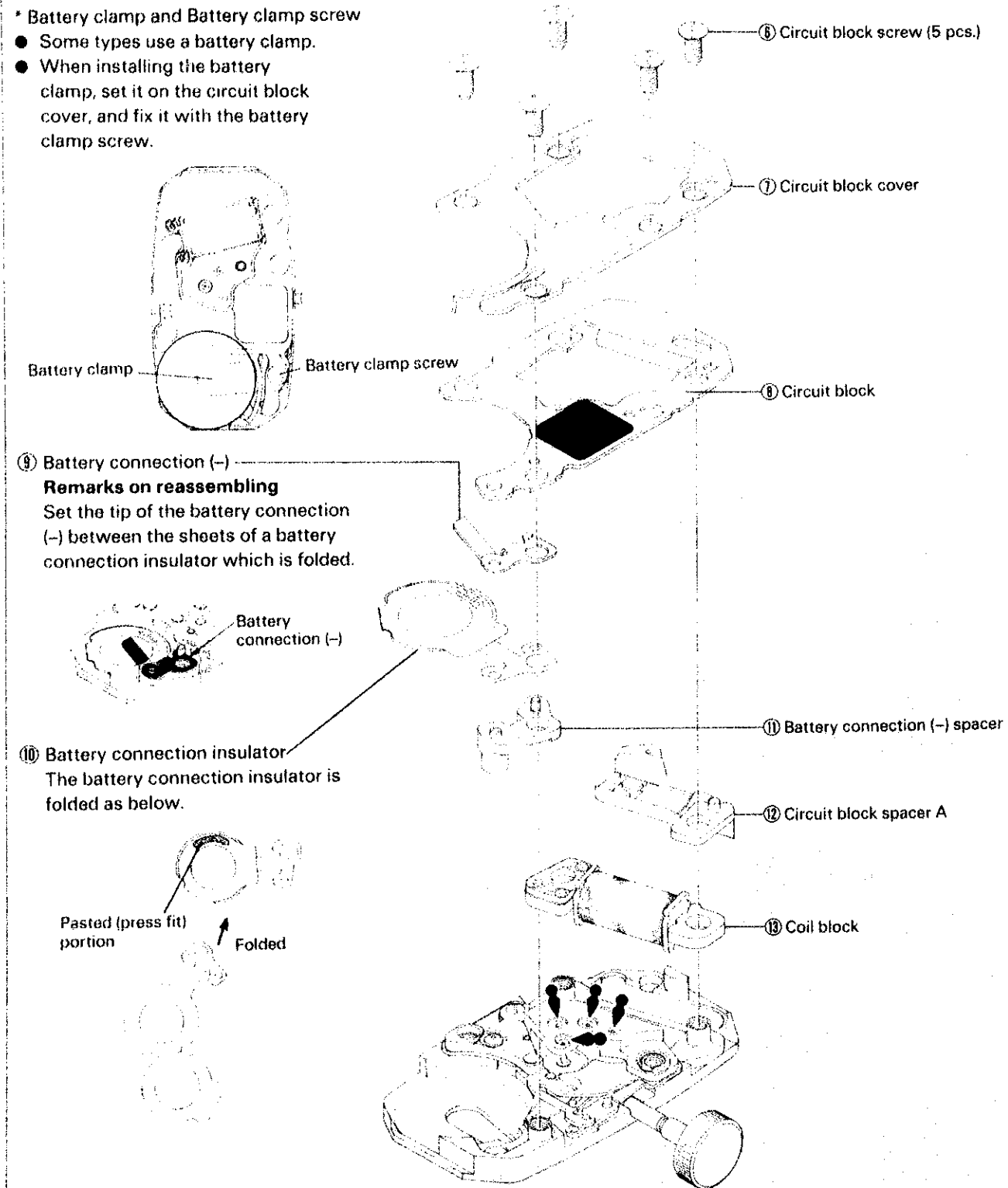
Lubricating:

Types of oil	Oil quantity
Moebius A 	Small 
Seiko watch oil S-6 	Standard 
	Large 

● Circuit block screw ~ Coil block

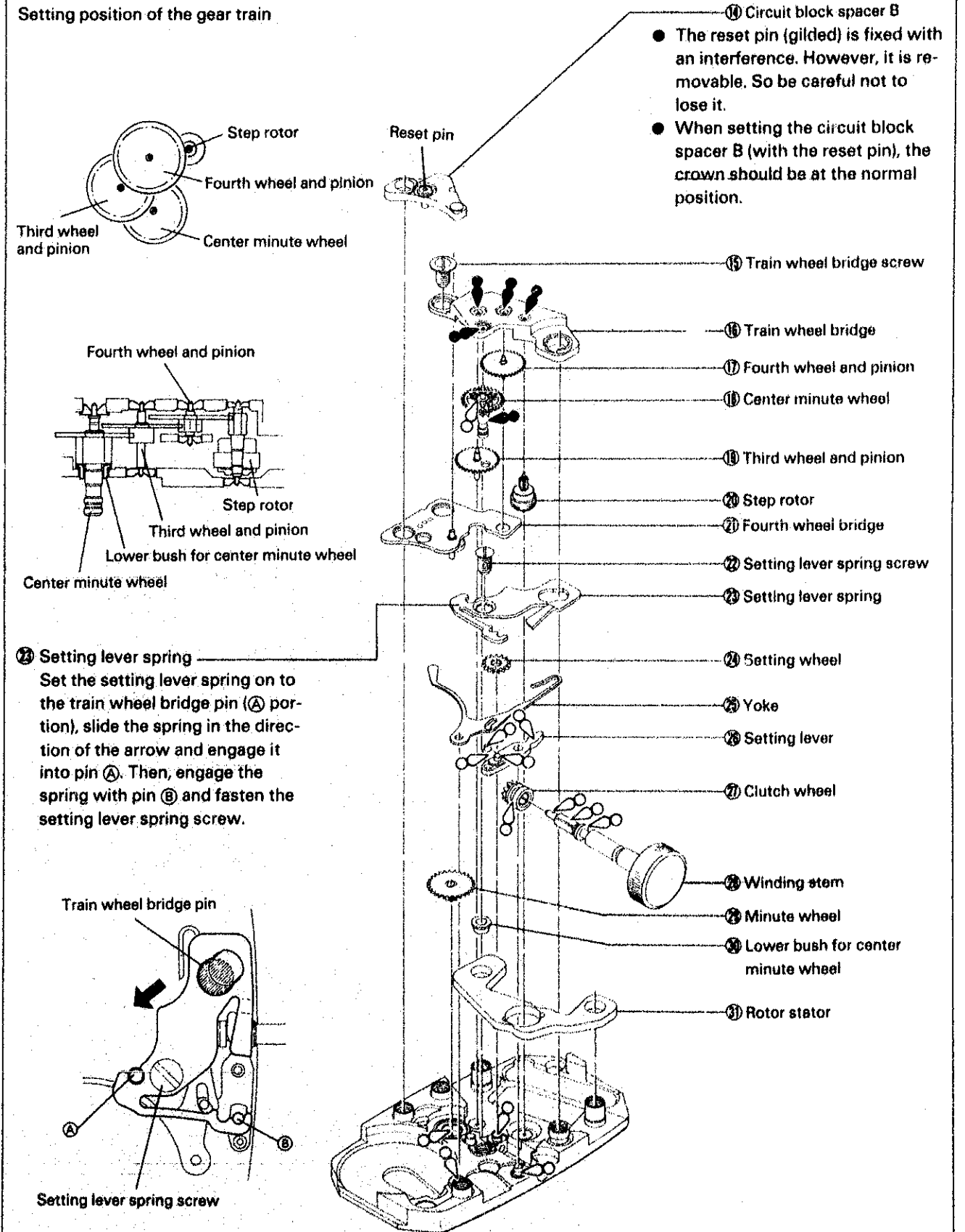
* Battery clamp and Battery clamp screw

- Some types use a battery clamp.
- When installing the battery clamp, set it on the circuit block cover, and fix it with the battery clamp screw.



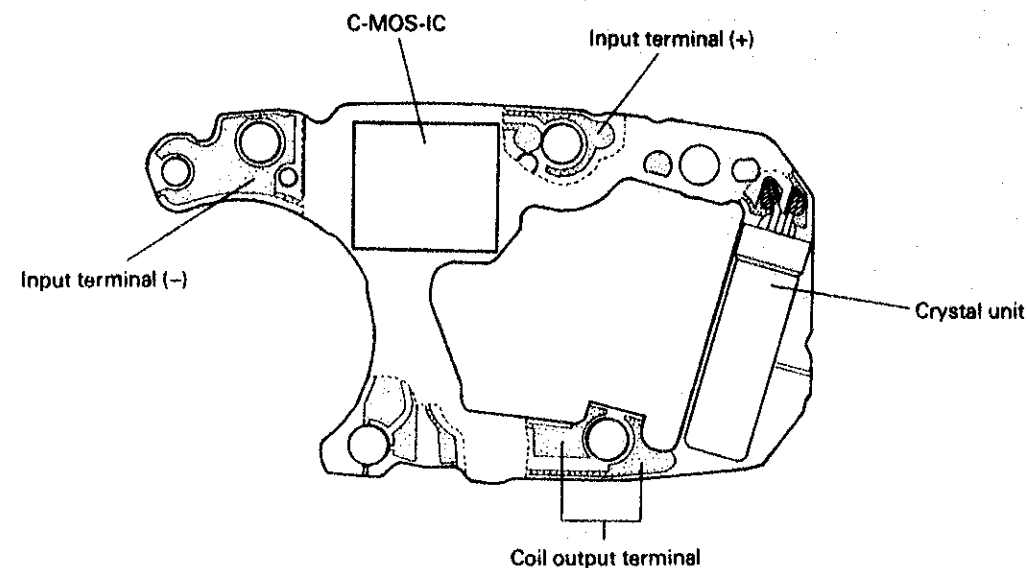
● Circuit block spacer B ~ Rotor stator

Setting position of the gear train



IV. CHECKING AND ADJUSTMENT

1. Structure of circuit block



2. Procedure for checking and adjustment

- This section only gives the checking and adjustment procedure which is exclusive for this watch.
- For the normal checking and adjustment, refer to the "TECHNICAL GUIDE GENERAL INSTRUCTION, Analogue Quartz".
- The page numbers in the item correspond to those in the "TECHNICAL GUIDE GENERAL INSTRUCTION, Analogue Quartz".

CHECK OUTPUT SIGNAL p.6	Result: Output signal: Normal No output signal: Defective
BATTERY VOLTAGE	Result: 1.57V or more: Normal Less than 1.57V: Defective Replace the battery.
Use the Digital Multi Tester S-840A Range to be used: DC V	
NOTE: Before measuring, short circuit the probes and confirm that the tester reads AUTO 00.0 mV or AUTO 00.1 mV.	
BATTERY CONDUCTIVITY p.9	
Check to see if the battery current flow to the circuit block is normal.	
CIRCUIT BLOCK CONDUCTIVITY p.9	
Check for short circuit and defective conductivity of the conductive portions of the circuit block.	

COIL BLOCK

Check the coil block for broken wire and short circuit.
Use the Digital Multi Tester S-840A.
Range to be used: Ω

Result:
1.4 ~ 2.0 k Ω : Normal
Less than 1.4 k Ω (Short circuit):
More than 2.0 k Ω (Broken wire):
Defective
Replace the coil block.

NOTE:

- Before measuring, short circuit the probes and check to see if the tester sounds and reads from AUTO 00.2 Ω to AUTO 00.4 Ω . The actual resistance can be obtained by subtracting the initial value (00.2 - 00.4) from the measured value.
- When measuring, take care not to break the coil block leads.

FRONT GEAR TRAIN MECHANISM p.11

Check the front gear train mechanism for play of rotor and wheels and pinions, mis-installation, dust, lint, foreign matter, lubrication, etc.

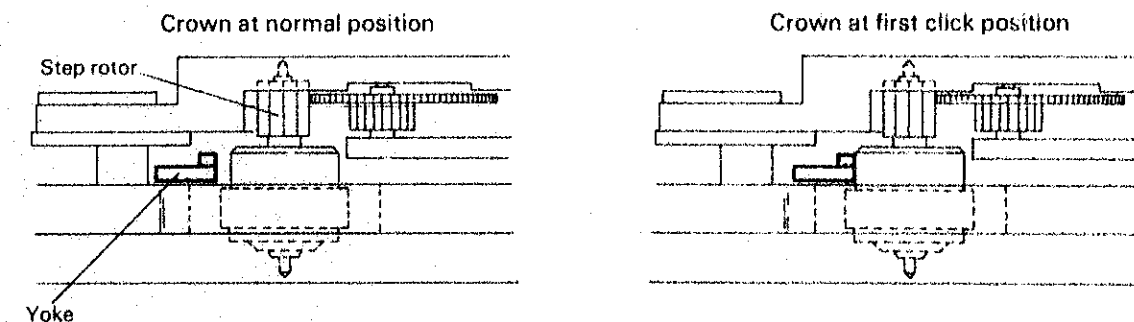
BACK GEAR TRAIN MECHANISM p.11

Check the back gear train mechanism for lubrication leakage, play, dust, lint, etc.

RESET CONDITION

Check the step rotor completely stops when the crown is pulled and starts moving exactly 20 seconds after the crown is set to the normal position again.

- (1) Remove the circuit block and the coil block. Check the setting condition viewing it from the coil side.



- (2) Install the circuit block, coil block and the battery, and check the presence of the output signal.

- Check the output signal with the crown set to the normal position.

Result:
Output signal: Normal
No output signal: Defective
Replace the yoke

- Check the output signal with the crown set to the first click position

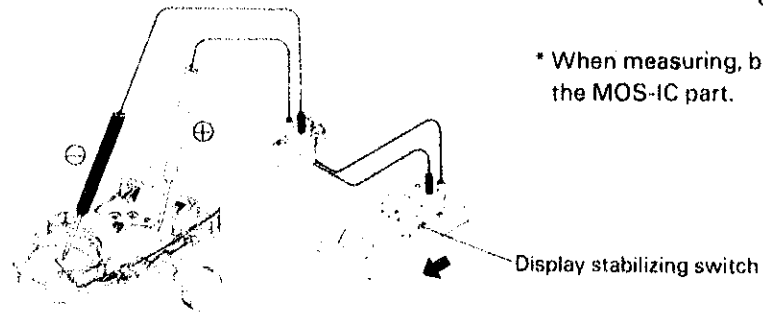
Result:
No output signal: Normal
Output signal: Defective
Replace the yoke

CURRENT CONSUMPTION

- Digital Multi-Tester (S-840A)
Mode: μA

Red probe : Circuit block cover
Black probe: Battery connection (-)

Result:
Less than $0.6 \mu\text{A}$: Normal
 $0.6 \mu\text{A}$ or more: Defective



* When measuring, block the light with a black paper from the MOS-IC part.

* Notes on the current consumption measurement

- (1) Set the display stabilizing switch to B position. (in the direction of the arrow shown in the above figure).
- (2) Apply the red (+) and black (-) probes of the tester to circuit block cover (+) and battery connection (-) as shown in the above figure. The tester displays a value, indicating that electric current is flowing in the IC.
- (3) In addition to above, the measured value increases once every 20 seconds, since the step motor drive pulse is supplied to move the hand.
- (4) After approximately 60 seconds, the maximum figure at this time (hand moves every 20 seconds) indicates the average current consumption.

ACCURACY

Measuring time accuracy

- Use the 10-second gate of the Quartz Tester.
- Be sure to protect the C-MOS-IC from light with case back or black paper, etc. while measuring, since strong light as an incandescent lamp adversely affects time accuracy.
- When the accuracy is largely defective, replace the circuit block.

V. PARTS LIST

Cal. V220 A			
PARTS NO.	PART NAME	PARTS NO.	PARTS NAME
125 202	Train wheel bridge	4146 203	Step rotor
141 202	Fourth wheel bridge	4219 210	Battery connection insulator
231 202	Third wheel & pinion	4225 210	Battery clamp
241 202	Fourth wheel & pinion	4239 202	Rotor stator
261 202	Minute wheel	4270 210	Battery connection (-)
270 205	Center minute wheel	4408 208	Circuit block spacer (A)
271 205	Hour wheel	4408 209	Circuit block spacer (B)
281 202	Setting wheel	4408 210	Battery connection (-) spacer
282 202	Clutch wheel	*4457 204	Circuit block cover
351 208	Winding stem	011 566	Upper hole jewel for step rotor
351 228	Winding stem	012 038	Train wheel bridge screw
383 202	Setting lever	012 039	Battery clamp screw
384 202	Yoke	012 792	Circuit block screw
388 202	Setting lever spring	012 824	Setting lever spring screw
491 202	Dial washer	017 779	Lower bush for center minute wheel
493 201	Hour wheel ring (0.03 mm)	032 015	Tube for train wheel bridge (A)
493 202	Hour wheel ring (0.05 mm)	032 016	Tube for train wheel bridge (B)
493 203	Hour wheel ring (0.07 mm)	032 017	Tube for coil block
4000 208	Circuit block	032 018	Tube for circuit block
4002 202	Coil block	SEIZAIKEN TR521SW	Battery

Remarks:

* The type of winding stem is determined based on the design of case.

* Circuit block cover for Pulsar Watches

4457203 (Pulsar marking)