EMMYWATCH

VINTAGE RESTORATIONS

Seiko 7A28A Movement Parts (1)

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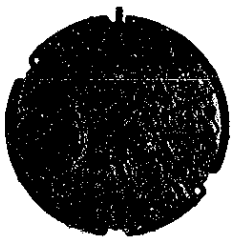
SEIKO

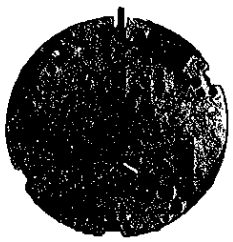
QUARTZ

Cal. 7A28A

PARTS CATALOGUE

Cal. 7A28A

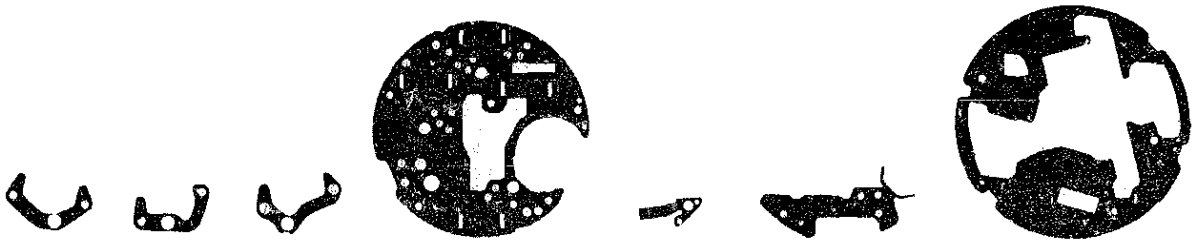




125 725 190 725 190 726 190 727 221 725 231 725 240 725 241 725 261 725 271 725

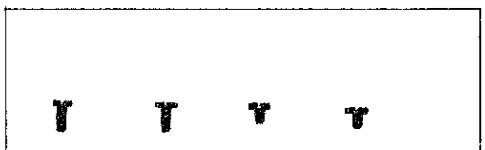
281 725 282 946 353 725 ☆354 726 383 725 384 725 388 725 491 725 701 725 766 725

885 725 885 726 885 727 888 725 888 726 888 727 4001 725 4002 725 4002 726 4146 725 4146 727



4239 725 4239 726 4239 727 4259 725 4270 725 4271 725 4408 725

4408 726 4450 725 4450 727 4450 855 ☆Maxell SR936SW



022 233 022 286 022 341 022 424 2/1

Cal. 7A28A

Characteristics

Casing diameter : ϕ 29.0 mm
Maximum height : 3.5 mm without battery
Jewels : 15 j
Frequency of quartz crystal oscillator : 32,768 Hz (Hz = Cycles per second)
Driving system : Step motor (2 poles)
Regulating system : Rotary step switch
Train wheel setting
Chronograph
Battery life indicator

PART NO.	PART NAME
125 725	Train wheel bridge
190 725	Chronograph second bridge
190 726	Chronograph minute bridge
190 727	Chronograph 5/100 second bridge
221 725	Center wheel & pinion
231 725	Third wheel & pinion
240 725	Small second wheel
241 725	Fourth wheel & pinion
261 725	Minute wheel
271 725	Hour wheel
281 725	Setting wheel
282 946	Clutch wheel
353 725	Friction spring for second counting wheel
☆**354 726**	Winding stem
383 725	Setting lever
384 725	Yoke
388 725	Setting lever spring
491 725	Dial washer
701 725	Fifth wheel & pinion
766 725	Intermediate minute wheel
885 725	Second-counting intermediate wheel
885 726	Minute-counting intermediate wheel
885 727	5/100 second-counting intermediate wheel
888 725	Second counting wheel
888 726	Minute counting wheel
888 727	5/100 second counting wheel
4001 725	Circuit block
4002 725	Coil block A (for time indication)
4002 725	Coil block B (for chronograph second)
4002 726	Coil block C (for chronograph minute)
4002 726	Coil block D (for chronograph 5/100 second)
4146 725	Step rotor A (for time)
4146 725	Step rotor C (for minute)
4146 725	Step rotor D (for 5/100 second)
4146 727	Step rotor B (for second)
4239 725	Rotor stator A (for time)
4239 726	Rotor stator C (for chronograph minute)
4239 726	Rotor stator D (for chronograph 5/100 second)
4239 727	Rotor stator B (for chronograph second)
4259 725	Anti-magnetic shield plate
4270 725	Battery connection (−)

PART NO.	PART NAME
4271 725	Battery connection (+)
4408 725	Circuit block spacer
4408 726	Setting wheel spacer
4450 725	Change-over switch lever
4450 727	Switch lever
4450 855	Rotary step switch
011 151	Lower hole jewel for 5/100 second conting wheel
011 306	Upper hole jewel for minute counting wheel
011 306	Upper hole jewel for 5/100 second counting wheel
011 542	Upper hole jewel for fifth wheel
011 542	Upper hole jewel for 5/100 second-counting intermediate wheel
011 542	Lower hole jewel for 5/100 second-counting intermediate wheel
011 552	Lower hole jewel for step rotor
011 552	Lower hole jewel for step rotor (Chronograph minute)
011 552	Lower hole jewel for step rotor (Chronograph second)
011 552	Lower hole jewel for step rotor (Chronograph 5/100 second)
011 568	Upper hole jewel for rotor stator
011 568	Upper hole jewel for rotor stator (Chronograph minute)
011 568	Upper hole jewel for rotor stator (Chronograph second)
011 568	Upper hole jewel for rotor stator (Chronograph 5/100 second)
011 739	Upper hole jewel for center minute wheel
022 233	Dial screw
022 286	Anti-magnetic shield plate screw
022 286	Battery connection (+) screw
022 341	Chronograph second bridge screw
022 424	Train wheel bridge screw
022 424	Chronograph minute bridge screw
022 424	Chronograph 5/100 second bridge screw
022 424	Coil block screw
022 424	Setting lever spring screw
023 337	Tube for setting lever spring screw
023 351	Guide tube for setting lever spring screw
027 138	Tube for train wheel bridge

☆ ⇨ Please see remarks on the reverse page.
Part numbers in light letters are not shown in photos.

Cal. 7A28A

PART NO.	PART NAME	PART NO.	PART NAME
027 136	Tube for chronograph minute bridge	027 146	Tube for chronograph second bridge
027 138	Tube for chronograph 5/100 second bridge	027 758	Setting lever pin
		027 759	Switch lever axle
027 139	Tube for yoke screw	027 760	Switch lever pin
027 140	Tube for coil block screw	027 761	Switch pin
☆027 141	Tube for anti-magnetic shield plate screw (A)	☆ Maxell SR936SW	Silver oxide battery
027 141	Tube for battery connection (+) screw (A)		
☆027 143	Tube for anti-magnetic shield plate screw (B)		
027 143	Tube for battery connection (+) screw (B)		
☆027 144	Tube for anti-magnetic shield plate screw (C)		

Remarks :

Winding stem

☆354 726·····Refer to the photograph on the front page.
If the combination of the winding stem and case is unknown, check the case number and refer to **"SEIKO Quartz Casing Parts Catalogue"** to choose a corresponding stem.

Tube for anti-magnetic shield plate (A), (B), (C)

☆027 141
☆027 143 } ·····Refer to the illustration on the right.
☆027 144

☆027 141 ☆027 143 ☆027 144

Battery

☆Maxell SR936SW·····The substitutive battery might be added to the applied battery in the future. In that case, please refer to separate **"BATTERY LIST FOR SEIKO QUARTZ WATCHES."**

☆ ⇨Please see remarks on the reverse page.

83. 3 Printed in Japan

TECHNICAL GUIDE

SEIKO

QUARTZ

CAL. 7A28A

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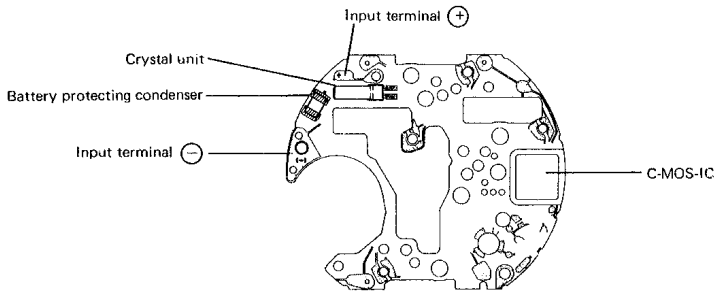
I. SPECIFICATIONS

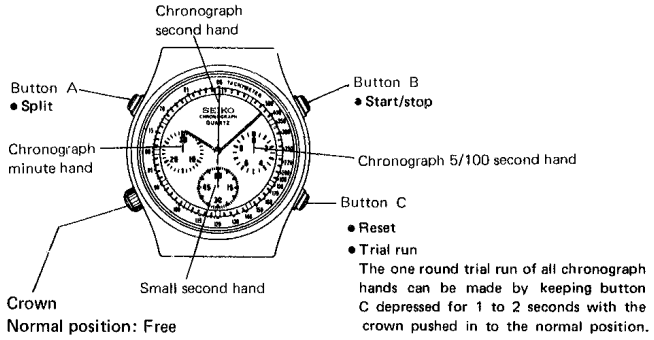
Item \ Cal. No.		7A28A
Time indication		Hour, minute and small second hands
Stopwatch function		Minute, second and 5/100 second
Additional mechanism		• Counter function • Electronic circuit reset switch • Train wheel setting device • Battery life indicator
Loss/gain		Monthly rate at normal temperature range: less than 15 seconds
Movement size	Outside diameter	ϕ31.1 mm
	Casing diameter	ϕ29.0 mm
	Height	3.5 mm without battery
Regulation system		Rotary step switch
Measuring gate by quartz tester		Use the 10-second gate.
Battery		U.C.C. 394, Maxell SR936SW Battery life is approximately 2 years. Voltage: 1.55V
Jewels		15 jewels

II. STRUCTURE OF CIRCUIT BLOCK



III. DESIGNATION AND OPERATION

1. Names of the parts and their functions



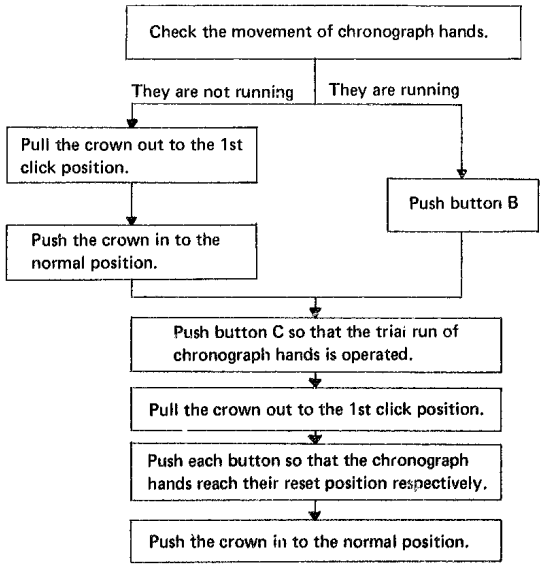
1st click: Counter

The chronograph hands can be used as counter scales by each depression of button A, B or C.
To reset the hands, depress respective buttons until the hands reach their reset position.

2nd click: Time setting

By turning the crown clockwise or counterclockwise, the hour and minute hands can be turned back or advanced respectively.

When the chronograph hands are not reset, follow the chart below.



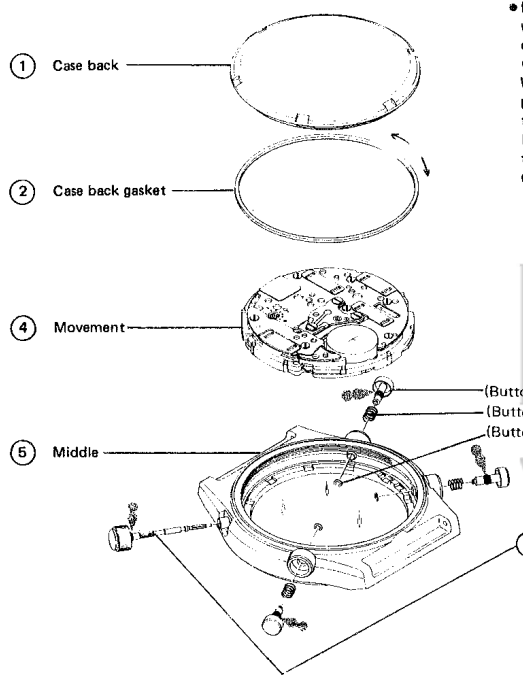
IV. DISASSEMBLING, REASSEMBLING AND LUBRICATING

1. Disassembling, reassembling and lubricating of the case

- Disassembling procedures Figs. : (1) → (5)
- Reassembling procedures Figs. : (5) → (1)

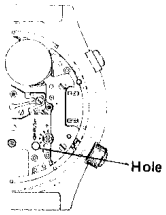
Types of oil

- Silicone grease 500,000 c.s.
- Moebius A
- SEIKO watch oil S-6

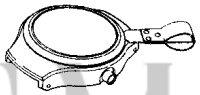


It is not necessary to disassemble them in the normal disassembling and reassembling procedures.

Remarks on disassembling
Pull the crown to the second click, and remove the stem with crown by pushing the setting lever through the arrow marked hole.

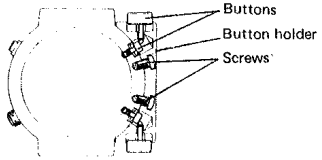


• How to remove the bezel and dial ring (for the watches of case No. 7A28-702 and 7A28-703, with case construction mark A4 , and watches with the case construction marks A5 and A6 .)
When the bezel gasket or dial ring needs to be replaced, pry the bezel up at the opening notch with the case opener and remove the bezel and dial ring. If the inside of the dial ring is pushed with the disk, the dial ring may be deformed or damaged. Be sure not to push the dial ring from inside.

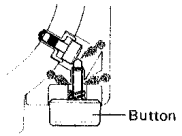


• How to replace the button and button holder for case No. 7A28-7000

<Disassembling>
1. Loosen the screws with a screwdriver with care not to damage the case and remove the button holder.
2. Remove the button spring clip for the button to be replaced and push the button out.

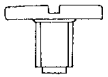
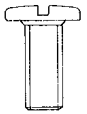
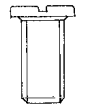


<Reassembling>
1. Lubricate the buttons before they are set.
2. Put a small quantity of rubberized adhesive to the screw hole of the case.
3. Set the buttons in to the case or the button holder, and fix them with the button spring clip.
4. Finally set the button holder and fasten the screws.



2. Disassembling, reassembling and lubricating of the movement

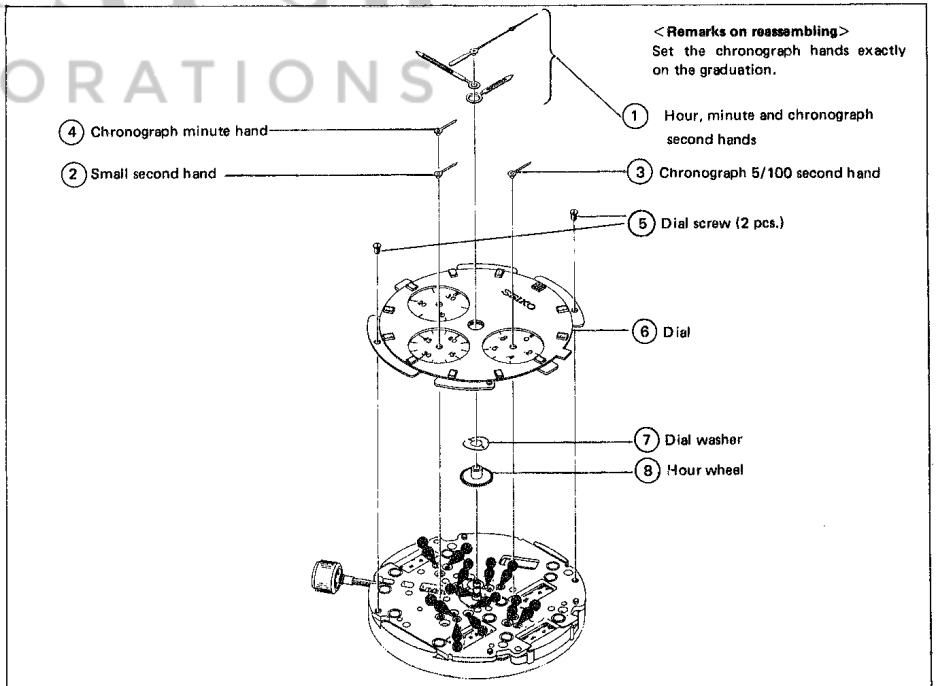
- List of screws used

Shape	Part No.	Part Names	Shape	Part No.	Part Names
	022 424	Train wheel bridge screw (2 pcs.) Chronograph minute bridge screw (1 pc.) Chronograph 5/100 second bridge screw (1 pc.) Coil block screw (4 pcs.) Setting lever spring screw (1 pc.)		022 341	Chronograph second bridge screw (3 pcs.)
				022 286	Antimagnetic shield plate screw (5 pcs.) Battery connection (+) screw (2 pcs.)
				022 233	Dial screw (2 pcs.)

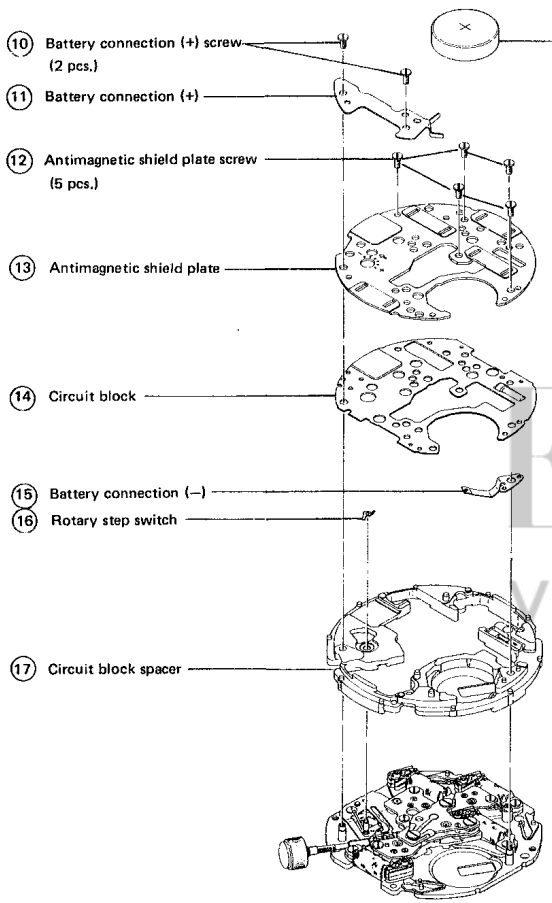
- Disassembling procedures Figs.: (1) → (63)
- Reassembling procedures Figs. : (63) → (1)

- Use the universal movement holder for disassembling and reassembling.

(1) Disassembling, reassembling and lubricating of the chronograph second hand ~ Hour wheel



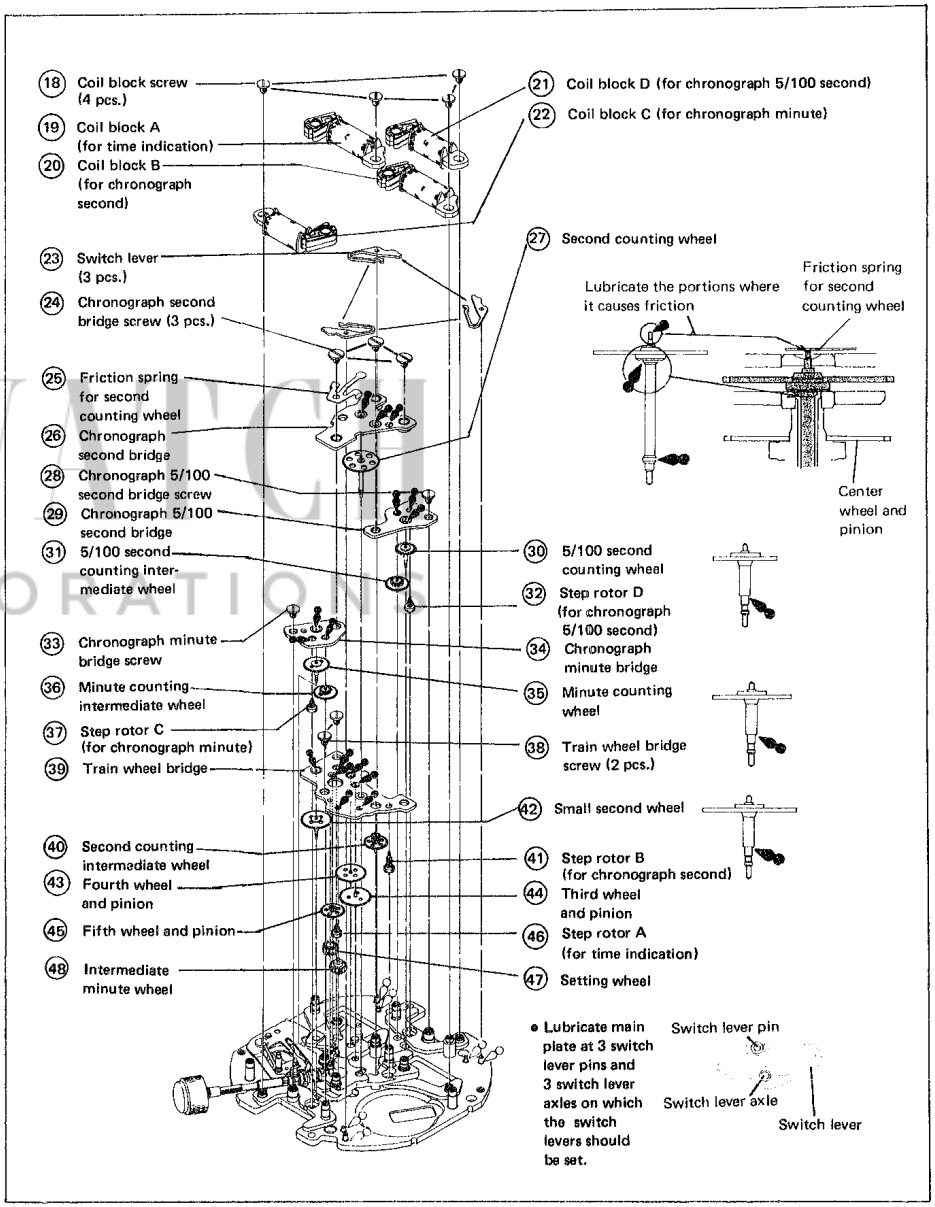
(2) Battery ~ Circuit block spacer



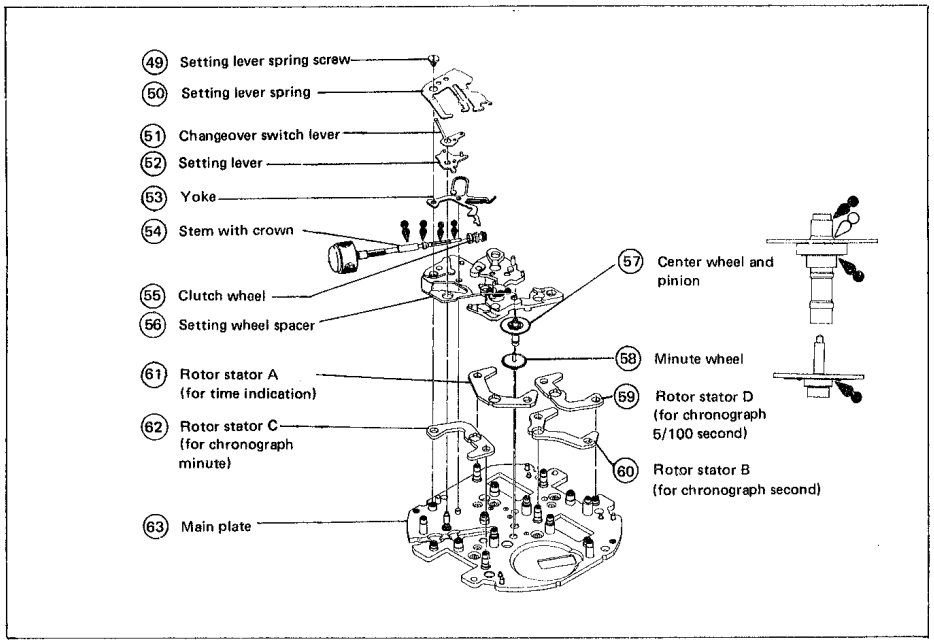
Install the battery with the crown at the normal position. If the battery is installed with the crown pulled out, the movement of the chronograph hands may become out of order. In this case re-install the battery and reset the hands by referring to "When the chronograph hands are not reset" on page 2.

(3) Coil block screw ~ Intermediate minute wheel

There are many kinds of bridges, wheels and pinions, step rotors and coil blocks. The setting position of gear train is illustrated on page 7. Be sure not to set them by mistake. Refer to the chart on page 8 for identifying them.

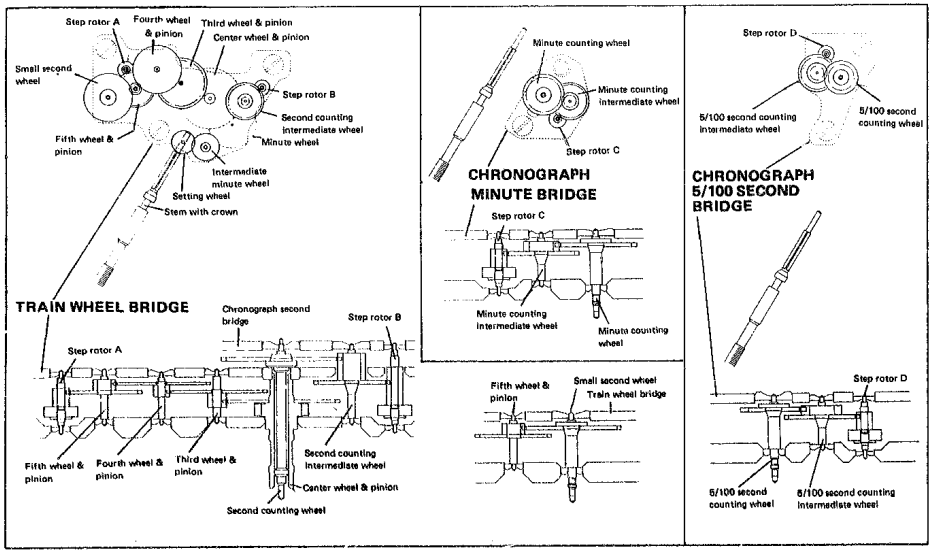


(4) Setting lever spring screw ~ Main plate



- **Setting position of gear train**

  Upper hole jewel for step rotor is set upside down in the train wheel bridge to facilitate assembly of the step rotor.



- **Chart of the parts of the gear train mechanism and the setting mechanism**

	Bridge	Train wheel bridge														Chronograph minute bridge		Chronograph 5/100 second bridge		Chronograph second bridge
		Second counting intermediate wheel		Small second wheel		Fifth wheel & pinion		Fourth wheel & pinion		Third wheel & pinion		Setting wheel				Minute counting intermediate wheel	Minute counting wheel	5/100 second counting intermediate wheel	Chronograph 5/100 second wheel	Second counting wheel
Wheel & pinion		●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●
Step rotor		Step rotor B (for chronograph second)		Step rotor A (for time indication)												Step rotor C (for chronograph minute)		Step rotor D (for chronograph 5/100 second)		—
				(the same as step rotors B, C, and D)																
Rotor stator & coil block		Coil block B		Coil block A										Rotor stator A		Rotor stator C	Coil block C	Stator D	Coil block D	—
		Rotor stator B																		
		620mm	the same as coil block A	620mm															540mm	

V. CHECKING AND ADJUSTMENT

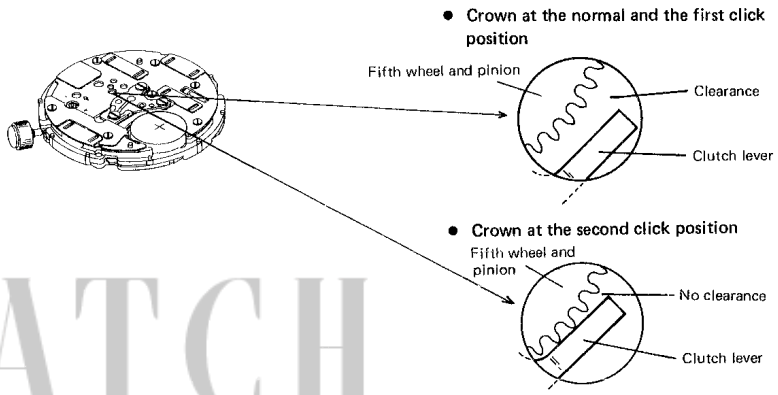
- The explanation here is only for the particular points of Cal. 7A28A.

Refer to the "TECHNICAL GUIDE, GENERAL INSTRUCTION" for SEIKO Analogue Quartz for details.

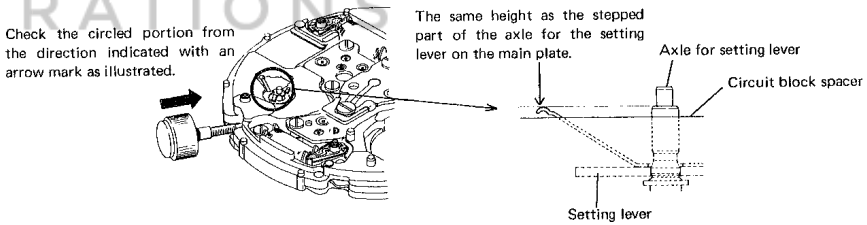
Procedure	
CHECK OUTPUT SIGNAL	
Use the Quartz Tester. Range to be used: 10-second gate	**Result:** Normal: Input indicator blinks every second. Defective: Input indicator does not blink every second.
CHECK HAND CONDITION	
CHECK BATTERY VOLTAGE	
Set up the Volt-ohm-meter. Range to be used: DC 3V	**Result:** Normal: More than 1.5V Defective: Less than 1.5V
CHECK BATTERY CONDUCTIVITY	
CHECK CIRCUIT BLOCK CONDUCTIVITY	
CHECK COIL BLOCK	
Set up the Volt-ohm-meter. Range to be used: OHMS x 100	**Result:** For coil blocks A and B Normal: 2.4kΩ ~ 3.0kΩ Defective — Less than 2.4kΩ (Short circuit) Defective — More than 3.0kΩ (Broken wire) For coil blocks C and D Normal: 1.8kΩ ~ 2.4kΩ Defective — Less than 1.8kΩ Defective — More than 2.4kΩ

Procedure
CHECK RESET AND TRAIN WHEEL SETTING CONDITION

1. Check to see if the small second hand is sure to stop when the crown is pulled out to the second click position and it starts advancing one second after the crown is pushed back to the normal position.
2. Check the clearance between the fifth wheel and pinion and the clutch lever through the inspection hole on the antimagnetic shield plate.



3. Remove the antimagnetic shield plate and the circuit block, and check the changeover switch lever for its tip height.



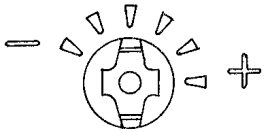
CHECK GEAR TRAIN MECHANISM

Procedure

CHECK 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.
- Do not check accuracy under an incandescent lamp since a strong light adversely affects time accuracy.



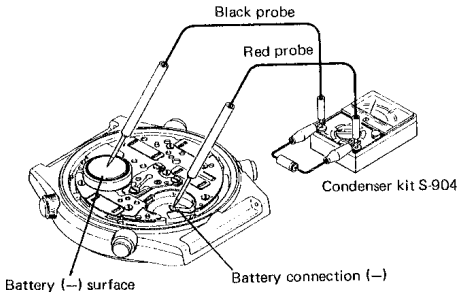
Adjusting time accuracy

- When adjusting time accuracy, do not activate stopwatch function.
- Turn the rotary step switch with tweezers and make correspond either end of it with a graduation on circuit bridge plate.
- The rotary step switch regulates 0.26 sec./day/step.

CHECK CURRENT CONSUMPTION

Set up the Volt-ohm-meter.
Range to be used: DC 12μA or DC 300μA

- Be sure to protect C-MOS-IC from light with case back or black paper, etc. while measuring.
  Do not check current consumption under an incandescent lamp since a strong light causes a watch to consume excess current.



Result:
When stopwatch function is not activated.
Normal: Less than 1.8μA
Defective: More than 1.8μA

When stopwatch function is activated.
Normal: Less than 75μA
Defective: More than 75μA

CHECK WATER RESISTANCE

CHECK CONDUCTIVITY OF SWITCH COMPONENTS

CHECK BATTERY LIFE INDICATOR

CHECK APPEARANCE AND FUNCTIONING

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