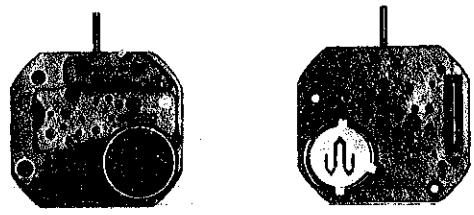
SEIKO

QUARTZ

Cal. 93A

PARTS CATALOGUE

Cal. 93A



113 950

☆221 951

231 950

241 950

261 950

☆271 950

281 950

282 950

☆354 950

383 950

384 950

386 950

604 950

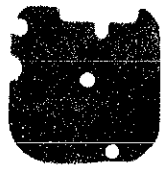
766 950

4001 951

4002 950

4146 950

4216 950

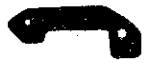


4216 983

4219 950

4239 950

4242 950

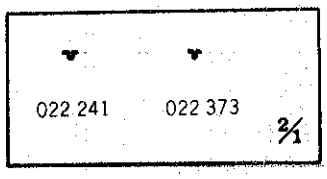


4259 950

4270 950

4446 950

☆Maxell SR916SW



☆⇨Please see remarks on the next reverse page.

Cal. 93A

Characteristics

Casing diameter : ϕ 24.0 mm

Maximum height : 1.5 mm without battery

Jewels : 8 j

Frequency of quartz crystal osillator : 32,768 Hz (Hz = Hertz . . . . . Cycles per second)

Driving system : Step motor system (2 poles)

Regulation system : Rotary step switch type

PART NO.	PART NAME
113 950	Train wheel bridge
☆**221 951**	Center wheel & pinion (1.6 mm)
☆221 954	Center wheel & pinion (2.3 mm)
☆221 956	Center wheel & pinion (1.8 mm)
231 950	Third wheel & pinion
241 950	Fourth wheel & pinion
261 950	Minute wheel
☆**271 950**	Hour wheel (0.9 mm)
☆271 953	Hour wheel (1.6 mm)
☆271 955	Hour wheel (1.1 mm)
281 950	Setting wheel
282 950	Clutch wheel
☆**354 950**	Winding stem
☆354 951	
383 950	Setting lever
384 950	Yoke (Clutch lever)
386 950	Setting lever spring
604 950	Setting wheel plate complete
766 950	Intermediate minute wheel
4001 951	Circuit block
4002 950	Coil block
4146 950	Step rotor
4216 950	Insulator for battery
4216 983	Insulator
4219 950	Battery connection insulator
4239 950	Rotor stator
4242 950	Battery connection (+)
4259 950	Anti-magnetic shield plate
4270 950	Battery connection (−)
4446 950	Crystal unit cushion
011 552	Upper hole jewel for third wheel
011 552	Lower hole jewel for third wheel
011 552	Upper hole jewel for fourth wheel
011 552	Lower hole jewel for fourth wheel
011 552	Upper hole jewel for step rotor
011 552	Lower hole jewel for step rotor
011 552	Upper hole jewel for minute wheel
011 552	Lower hole jewel for minute wheel
022 241	Anti-magnetic shield plate screw
022 373	Train wheel bridge screw
022 373	Setting wheel plate complete screw
022 373	Circuit block screw
023 343	Battery connection (+) pin
027 059	Tube for circuit block
027 839	Rotor stator fixing pin
027 877	Tube for train wheel bridge

PART NO.	PART NAME
027 877	Tube for setting wheel plate complete screw
☆Maxell SR916SW	Silver oxide battery

☆ ⇨ Please see remarks on the reverse page.

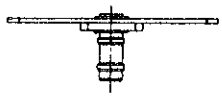
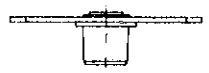
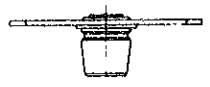
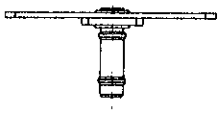
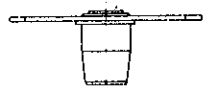
Part numbers in light letters are not shown in photos.

Cal. 93A

Remarks :

Center wheel & pinion, Hour wheel

There are three kinds of Dial, Hour wheel, and Center wheel & pinion as specified below.
Further, it can be distinguished between the dial designed for thick models and the dial designed for thin models whether it has a printing on the reverse side of the dial or not. (On the reverse side of the dial designed for thick models, "30t" is printed near the center of it however the one for thin models there is no printing on it.)
Combination:

Type	Center wheel & pinion	Hour wheel
a. (Dials for thin type models)	 ☆221 951	 ☆271 950
b. (Dials for thick type models)	 ☆221 956	 ☆271 955
c. (Dials with index jewels)	 ☆221 954	 ☆271 953

Winding stem

☆354 950 }
☆354 951 } ..... 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 List"** to choose a corresponding winding stem.

Battery

☆Maxell SR916SW ..... The applied battery for this calibre might be added the substitutive in the future. In that case, please refer to separate **"BATTERIES FOR SEIKO QUARTZ WATCHES"**.

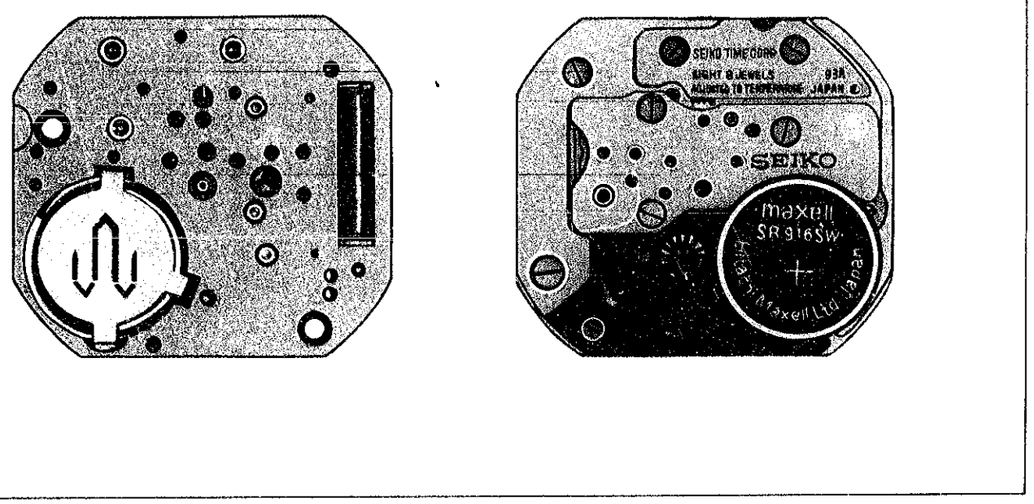
80. 5
82. 5 Revised
Printed in Japan

TECHNICAL GUIDE

SEIKO

QUARTZ

CAL. 93A

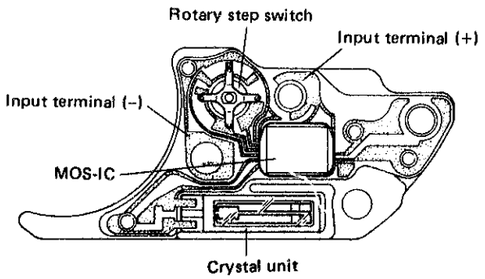


CONTENTS

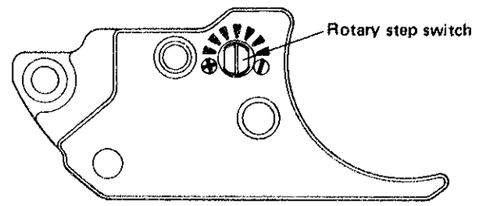
I. SPECIFICATIONS

Item \ Cal. No.	93A
Time indication	Two-hand time indication (The hand moves every 20 seconds.)
Loss/gain	Loss/gain at normal temperature range Monthly rate: less than 15 seconds (Annual rate: less than 3 minutes)
Movement size	ϕ24.6 mm (20 mm between 3 o'clock and 9 o'clock sides) (22 mm between 12 o'clock and 6 o'clock sides)
Casing diameter	ϕ24.0 mm (20 mm between 3 o'clock and 9 o'clock sides) (22 mm between 12 o'clock and 6 o'clock sides)
Height	1.5 mm (1.6 mm wtih battery)
Regulation system	Rotary step switch
Measuring gate by Quartz Tester	The gate of 10 seconds is available.
Battery	Maxell SR916SW Battery life is approximately 2 years. Voltage: 1.55V
Jewels	8 jewels

II. STRUCTURE OF CIRCUIT BLOCK



Circuit block (back)



Circuit block (front)

III. DISASSEMBLING, REASSEMBLING AND LUBRICATING

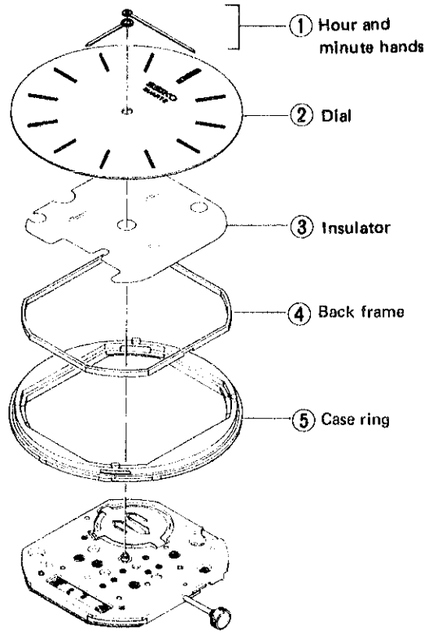
Disassembling procedures: ① → ㉜

Reassembling procedures: ㉜ → ①

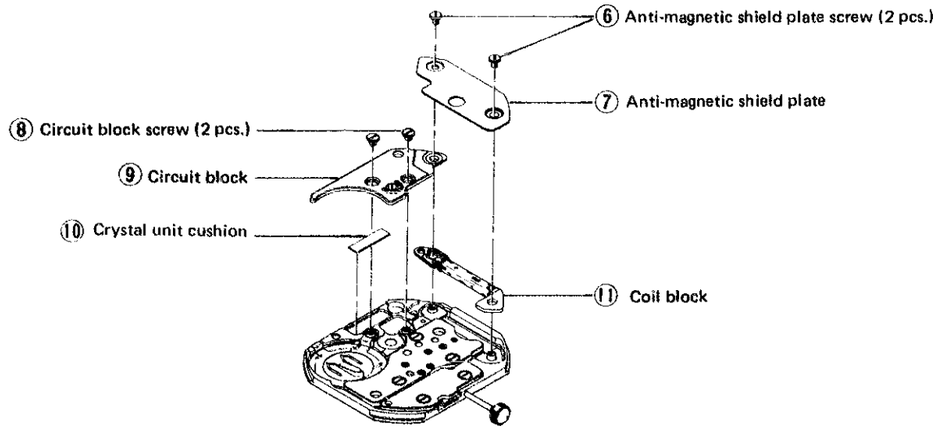
(1) Disassembling and reassembling of ① Minute hand ~ ⑤ Case ring

The following types of screws are used.

Shape	Parts No.	Name
	022 373	Train wheel bridge screw (3 pcs.) Setting wheel plate complete screw (2 pcs.) Circuit block screw (2 pcs.)
	022 241	Anti-magnetic shield plate screw (2 pcs.)



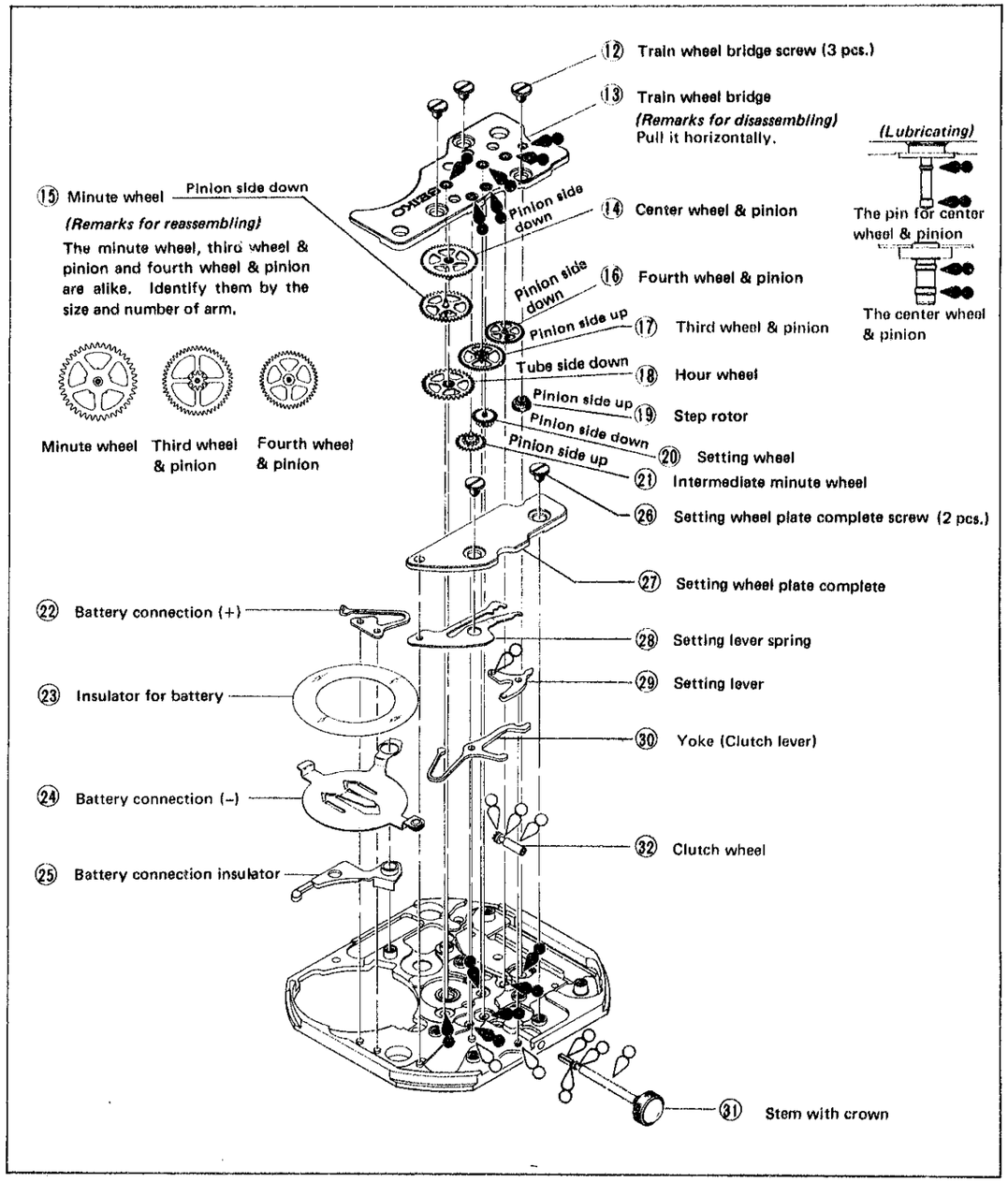
(2) Disassembling and reassembling of ⑥ Anti-magnetic shield plate screw ~ ⑪ Coil block



(3) Disassembling, reassembling and lubricating of ⑫ Train wheel bridge screw ~ ㉜ Clutch wheel

- **Lubricating**

Types of oil	Oil quantity
Moebius A	Normal quantity
SEIKO Watch Oil S-6	



IV. CHECKING AND ADJUSTMENT

- Refer to the "SEIKO QUARTZ TECHNICAL GUIDE, GENERAL INSTRUCTION for ANALOGUE WATCHES" for details.

Procedure

CHECK OUTPUT SIGNAL

If it flashes 5 seconds, 5 seconds, 10 seconds and 5 seconds, 5 seconds, 10 seconds . . . . . .Normal
When it does not flash at the above intervals . . . . . .Defective

CHECK HAND SETTING CONDITION

CHECK BATTERY VOLTAGE

More than 1.5V . . . . . .Normal
Less than 1.5V. . . . . .Defective

CHECK CIRCUIT BLOCK CONDUCTIVITY

CHECK COIL BLOCK

Required value:
1.5KΩ ~ 3.5KΩ. . . . . .Normal
Less than 1.5KΩ, More than 3.5KΩ . . . . . Defective

CHECK GEAR TRAIN MECHANISM

CHECK ACCURACY

Refer to the Technical Guide of Cal. 2320A (page 2), "Time accuracy adjusting".

CHECK CURRENT CONSUMPTION

The second hand moves every 20 seconds. Be sure to measure the current consumption for 3 minutes or so in order to obtain a stable value.
Measure the current consumption while the hand is moving and while it is not moving, and take the average which must be compaired with the value specified below.

Required value:
Less than 0.8μA . . . . . .Normal
More than 0.8μA . . . . . .Defective

CHECK APPEARANCE AND FUNCTIONING

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