

***TECHNICAL
INFORMATION***

**CITIZEN QUARTZ
Cal.No.892※※**

§ 1. OUTLINE



This "Ana-Digi" watch is another Citizen's unique product which follows the "Digi-Ana" watch already on the market with a favorable reception of users. This watch is constituted based mainly on the analog mechanism along with the digital display added suitably, thus meeting well the diversified requirements of the contemporary gentlemen. It excels in the controllability making best use of the crown's advantages, also featuring a high-grade sense of the design as well as the function of high performance.

§ 2. FEATURES

- 1) Analog-based function
This is an analog-based quartz crystal watch with the center second plus the digital display multi function.
- 2) Digital correction possible with crown operation
The correction is simplified for the digital display by turning the crown at the first click stop position.
- 3) Multiple functions incorporated into compact digital part
 - (1) Six functions: Time, calendar, chime, alarm, stopwatch and timer.
 - (2) Display selection possible between 12-hour and 24-hour periods (in both time and alarm).
 - (3) The "mode mark" gives a quick reference to the using state of each function (♦).
 - (4) The sound giving mechanisms: The buzzer with the alarm the timer and the confirmation tone for the stopwatch and the timer.
- 4) Power cell life indicator
The replacement of the power cell is announced previously through the 2-second step movement of the analog hand and the flashing of the digital colon.
- 5) Fully automatic calendar (incl. leap year)
The 40 years (1970–2009) are memorized in the circuit, and as a result the day of the week is set automatically by setting the year, month and date.
- 6) A long-life operation by just one unit of power cell
Just one unit of the power cell ensures an accurate operation for about 2 years in case the illumination is lit up 5 seconds plus 90 seconds of buzzer ringing per day.
- 7) The illumination lamp facilitates an easy readout of the time and calendar even in the dark.

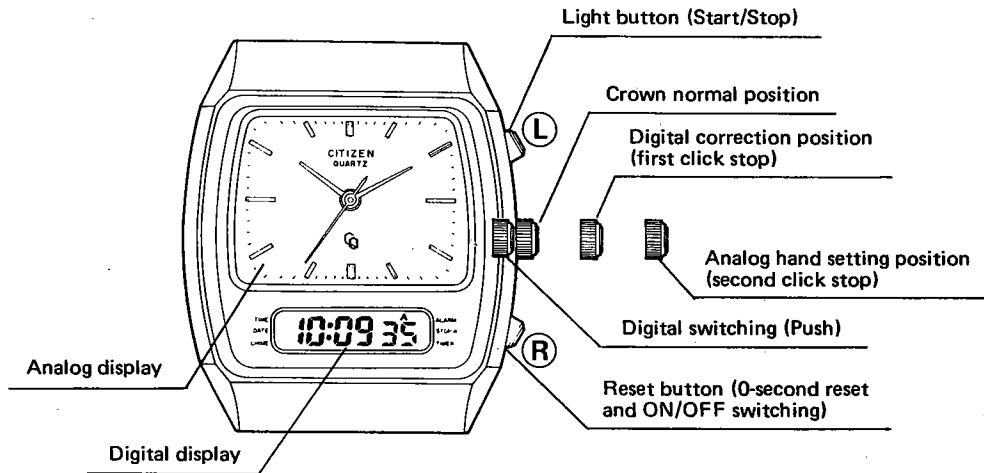
§3. SPECIFICATIONS

Caliber No.	8920-08B	
Type	Analog-Digital simultaneous display quartz crystal watch	
Movement	Size: 30.0mm ϕ Thickness: Analog 3.4mm (incl. power cell part 3.65mm) Digital 4.9mm (incl. power cell part 5.15mm)	
Accuracy	± 10 sec. per month at normal temperatures	
Oscillation	32,768Hz	
Display system	Analog: Time indication by 3 hands (hour, minute and second) with 1-second step movement Digital: FE twist-type nematic liquid crystal display	
Digital display	Time	12-hour display: Hour, minute, second and A/P (AM/PM) 24-hour display: Hour, minute and second
	Calendar	Month, date and day (Month, date and year at correcting time)
	Chime	:00 ON/OFF
	Alarm	12-hour display: Hour, minute, A/P and ON/OFF 24-hour display: Hour, minute and ON/OFF
	Stopwatch	Minute, second and 1/100 sec. After 60 min.: Hour, minute and second (24-hour clocking)
	Timer	Hour, minute and second (Setting possible up to 23:59 59)
Correction of display	By operation of crown (or push-button partially)	
Converter	Step motor	
Effective temperature range	0°C ~ +60°C (32°F ~ 140°F)	
Integrated circuit	C/MOS-LSI (1 unit)	
Additional devices	<ul style="list-style-type: none"> ●Power saving switch (Analog) ●Power cell life indicator (Analog/Digital) ●Fully automatic calendar (1970-2009) (Digital) ●Illumination Lamp (Digital) 	
Power cell	<p>Small-size silver oxide power cell (1 unit)</p> <ul style="list-style-type: none"> ●Parts No. : 280-15 ●Nominal voltage : 1.55V ●Capacity : 75mAH ●Dimensions : 11.6mmϕ x 3.1mm^t ●Life time : About 2 years (5 sec. lamp lighting and 90 sec. buzzer ringing per day) 	

§4. HANDLING INSTRUCTIONS

1) Nomenclature and functions

- The flashing areas are shown in red color in the diagram.

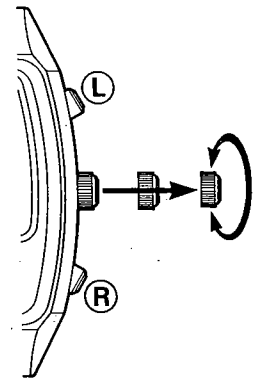


2) Handling method

Analog

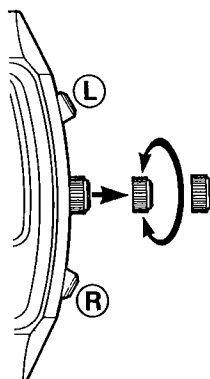
- (1) The handling method is identical to the conventional watches with center second.
- (2) Pull out the crown to the second click stop to set the time and also to secure the power saving state simultaneously. (Refer to page 10 for the details.)
- (3) Set the time.
- (4) Push in the crown lightly to its normal position. And the watch starts.

*When the crown is set to the hand setting position, the digital part has an automatic switch to the time mode. The manipulation of the crown gives no effect at all to the digital display time.



Crown pulled out 2 steps.

Digital

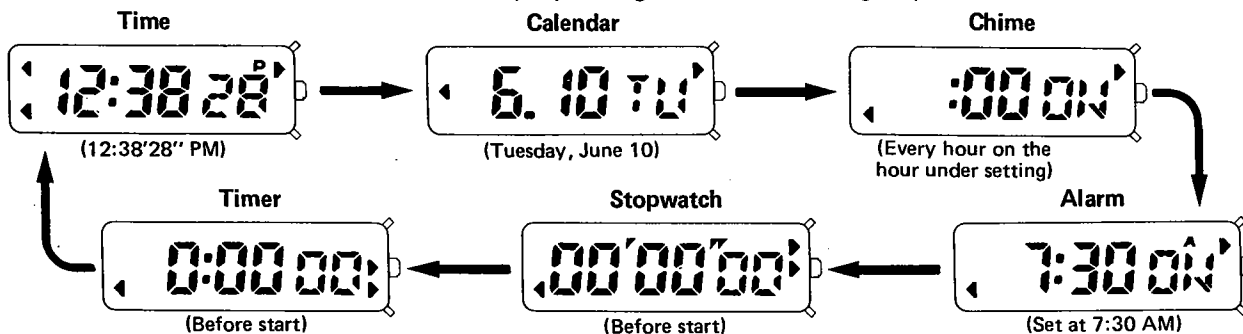


Crown pulled out 1 step.

<p>Ⓛ Light button •(Start/Stop)</p>	<p>•Second-setting state at the time of using a timer.</p>
<p>Crown •Push: Mode switching •First click stop: Correction mode</p>	
<p>Ⓡ Reset button •At time correction: 0-second resetting •At stopwatch function: Lap and reset •At correction of chime and alarm: ON/OFF switching •At timer function: Return and flyback</p>	

1. Mode switching (The flashing areas are shown in the red color.)

With every push of the crown, the display changes in the following sequence.

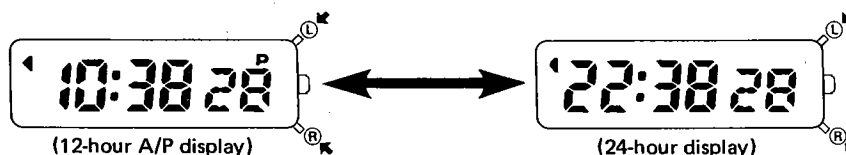


*The mode mark (◀) flashes at every switching time of display.

*With displays of the stopwatch and the timer, the different display from those shown above may sometimes be given.

2. 12/24-hour display switching

With simultaneous push of (L) and (R) buttons in the normal time display mode, a switch is given between the 12-hour and 24-hour displays. In this case, the buzzer rings once for the sound monitoring.



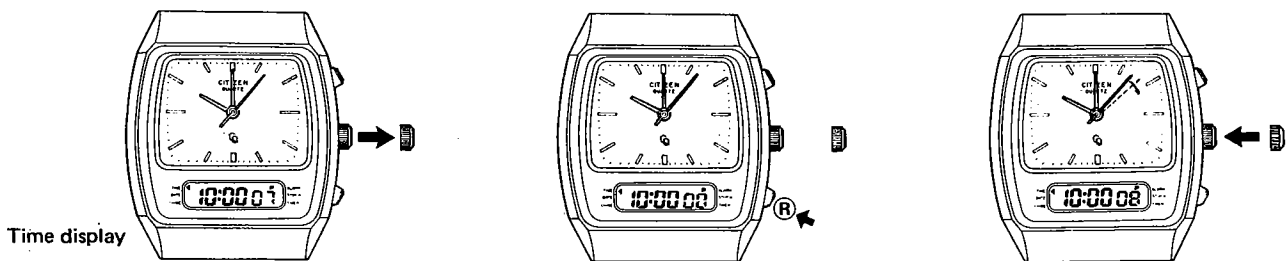
3. Setting to 0-second

- 1) The time display mode is called out with push of the crown.
- 2) With pull-out of the crown to the first click stop position (digital correction position), the hour (A/P), minute and second have flashing to indicate they are ready to be corrected.
- 3) With push of (R) button, the digital second is reset to zero along with correction of the analog time.

With push of (R) button when the second of the digital display reads 0–29 seconds, the digital time is reset to 0-second and the analog time is connected after counting the gained amount of the second standby state. In the same way, if (R) button is pushed during 30–59 seconds, the digital time is carried by one minute through the 0-second resetting and the analog time is given a quick setting for the delayed amount of the second respectively.

- 4) The crown is returned to the normal position to complete the time correction.

(Ex.) For synchronization with 10-o'clock time signal:



① Digital correction possible with flashing of hour (A/P), minute and second.

② 0-second resetting (digital) and 7-second standby (analog). Analog start after 7-second standard with correction of time.

③ Completion of time correction

4. Correction/operation method of each mode

With every push of the crown, the display is changed in the sequence of ① ~ ⑥.

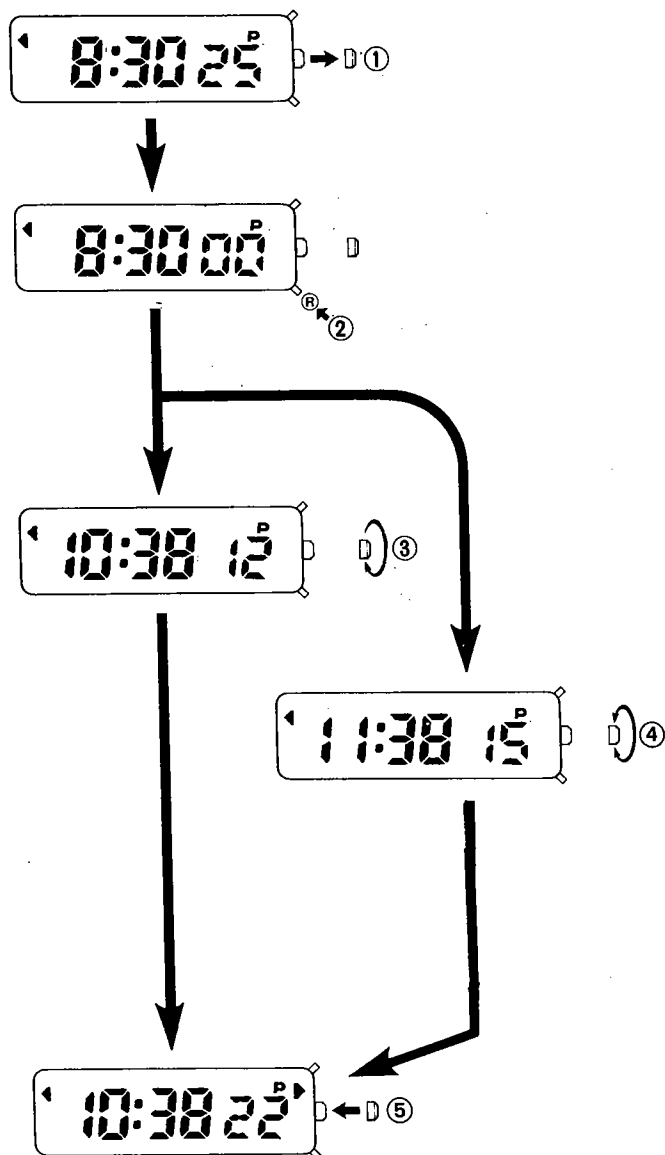
- | | | |
|-----------------|--|------------------|
| ① Time mode |  | ④ Alarm mode |
| ② Calendar mode | | ⑤ Stopwatch mode |
| ③ Chime mode | | ⑥ Timer mode |

Time setting method

• Push the crown to call out the time display mode.

(Ex.) Correction from "8:30'25" PM" to "10:38 PM"

(The following illustration is based on the 12-hour display.)



① With pull-out of the crown to the first click stop position, the mode mark, hour (A/P), minute and second have flashing to be ready for correction.

② With push of (R) button, the time is reset to 0-second to make the watch start immediately. If (R) button is pushed while the second reads 30-59, the minute is carried with the second reset to zero respectively.

*Set the crown to the normal position when the correction is given only to the second. In this case, the analog time is corrected simultaneously.

③ Unlike the conventional method, the "hour" and "A/P" are corrected in couple by correcting the "minute" with turn of the crown. Therefore, the crown is turned in the addition direction () clockwise) for the time correction.

One turn of crown: Quick setting of about 45 min. possible.

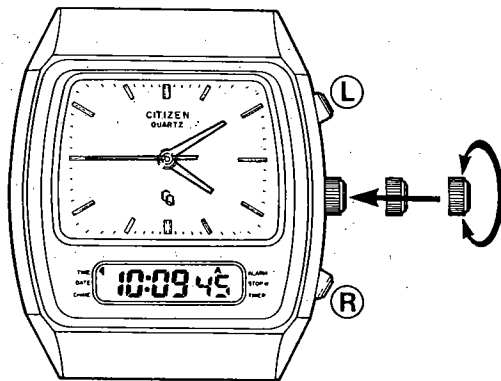
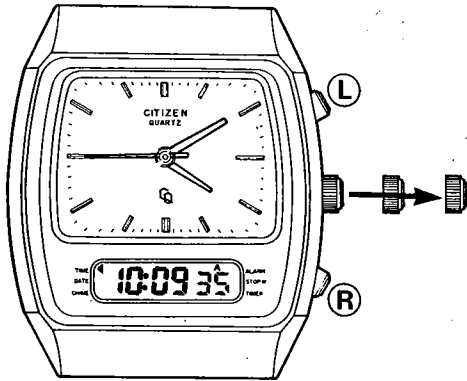
④ In case an overturn is given to the crown or the turn-back of the time is required, the crown is turned in the subtraction direction () counterclock-wise) to set the correct time.

This is identical to the analog hand setting.

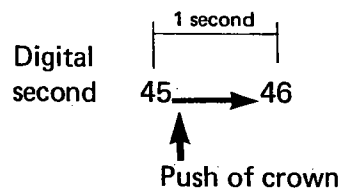
⑤ Push lightly the crown into the normal position to complete the time setting.

Synchronization between analog second hand and digital second

The crown is pulled out to the second click stop, and then the analog's second hand is set to the digital time (second).



- 1) The second hand stops when the crown is pulled out to the second click stop.
(The digital watch returns to the time display and continues the operation.)
- 2) In case the analog watch is set, for example, to "4:09" and if the second hand stops at 45 seconds with the crown pulled out to the second click stop, the explanation is given as follows.
- 3) First, the crown is turned to set the time to "4:09". Then the crown is pushed into the normal position at the moment when the digital second synchronizes with the position where the analog second hand stops.



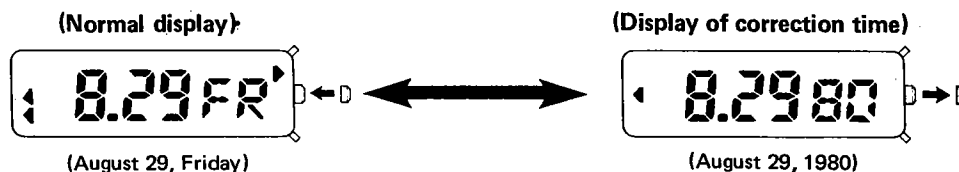
(Note)

Push in the crown after making sure that the digital second shows 45 seconds.
If the crown is pushed a little bit before synchronization with 45 seconds, the analog time may some times gains by one second.

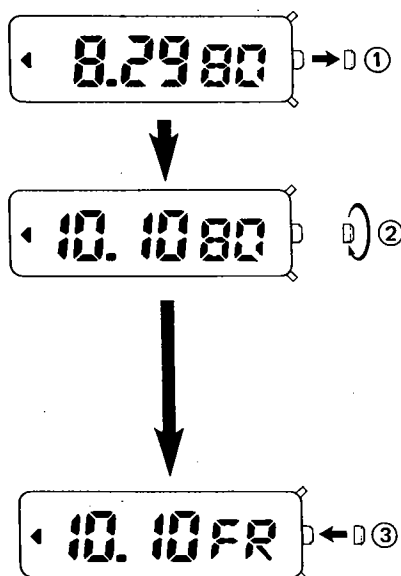
Calendar setting method

Push the crown to call for the calendar display mode.

The normal display and the display of the correction time are as shown below.



*The year is displayed in the last two figures.



① With pull-out of the crown to the first click stop, the month, date, year plus the mode mark begin flashing to be ready for correction.

② With forward and backward turns of the crown, the "date" is set quickly in a coupled correction* with the "month" and "year". Here the crown is turned clockwise to set the calendar to "October 10".

(In case an overturn is given to the crown or the turn-back is required for the "year", "month" or "date", the subtraction correction is given by turning the crown counter-clockwise for the correct setting.)

One turn of crown: Quick setting of about 45 days possible

③ When the correction is over for the "year", "month" and "date", the crown must be returned to the original normal position to complete the setting procedure. (When the normal time display is reset, the "year" disappears and the "day" is set and displayed automatically.)

•The day of the week are abbreviated for display as follows.

Sunday	SU
Monday	MO
Tuesday	TU
Wednesday	WE
Thursday	TH
Friday	FR
Saturday	SA

*Coupled correction

•Date correction: Crown pulled out to first click stop.
DATE
(1 ↔ 31)

•Month correction:
Month ← DATE
(1 : Jan. ↔ 12 : Dec.)

•Year correction:
Year ← Month ← DATE
(1970 ↔ 2009)

•Day correction: The day is set automatically with correction of the year, month and date.

Set/reset of chime

Push the crown to call out the chime display mode.



① With pull-out of the crown to the first click stop, the ON/OF (set/reset) begins flashing to be ready for switching.



② The ON/OF switching is possible with push of (R) button.
ON: Set
OF: Reset (Cancel)



③ The crown is set to the original normal position.

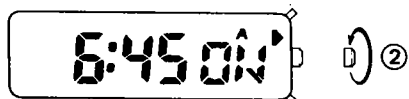
[*With setting of the chime, the buzzer rings twice at every hour on the hour.]

Alarm setting method

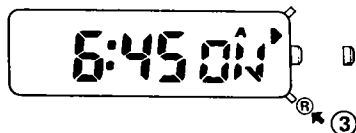
Push the crown to call out the alarm display mode.



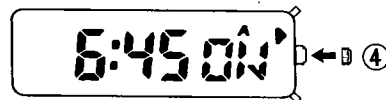
① With pull-out of the crown to the first click stop, the mode mark plus hour (A/P), minute and ON/OF begin flashing to be ready for correction.



② With turning of the crown, the "minute" is set quickly to give the coupled correction to the hour and A/P.



③ The ON and OF switch alternately with every push of (R) button.
ON: Set
OF: Reset (Cancel)



④ Push the crown lightly into the normal position to complete the setting.

*With setting of the alarm, the buzzer rings for one minute at the set time. And the ringing of the buzzer can be stopped any time by pushing an optional push-button (including the crown).

*The flashing areas are shown in the red color.

How to use stopwatch

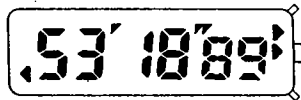
LAP : Lap mark (showing part-way time)

▀▀ : Used for display of under 60 minutes, indicating the minute (') and second (") each.

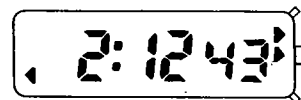
(Note) In the stopwatch display mode, the illumination lamp does not glow even with push of (L) button.

1) Push the crown to call out the stopwatch display mode.

*The "display of under 60 min." and the "display of over 60 min." are available.



Display of under 60 min.

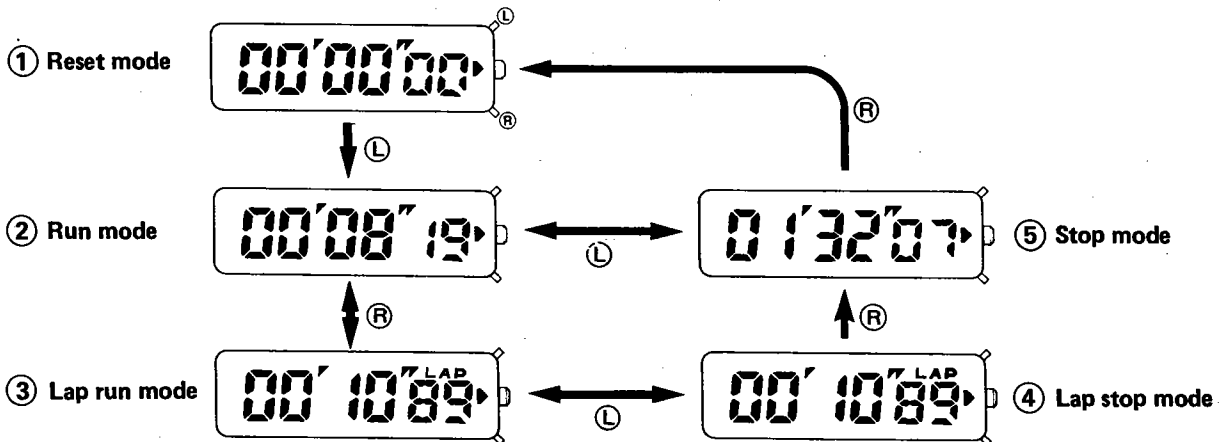


Display of over 60 min. (until 23:59'59")

The time shifts to show the hour, minute and second (23 h. 59 min. 59 sec.) after 59'59"99.

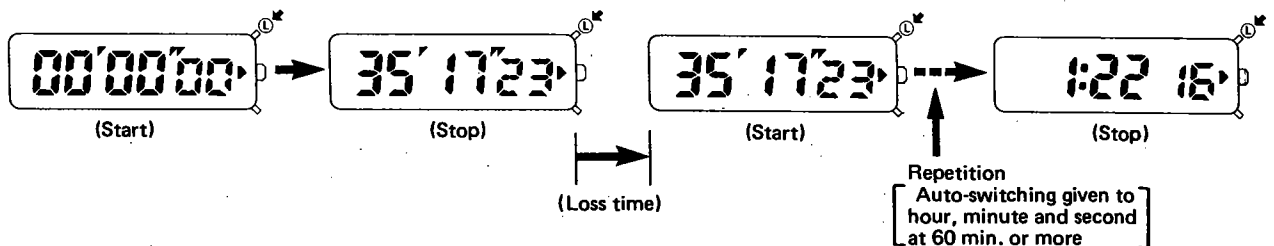
2) Resetting method (The following illustration is based on the "display of under 60 min.")

In the stopwatch display mode, the following five displays (① ~ ⑤) may be given. Thus the stopwatch must be used after resetting.

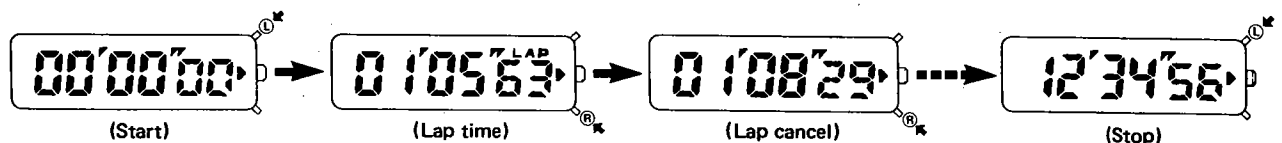


3) Counting method

① Simple and Cumulative counting



② Lap time (Part-way time)

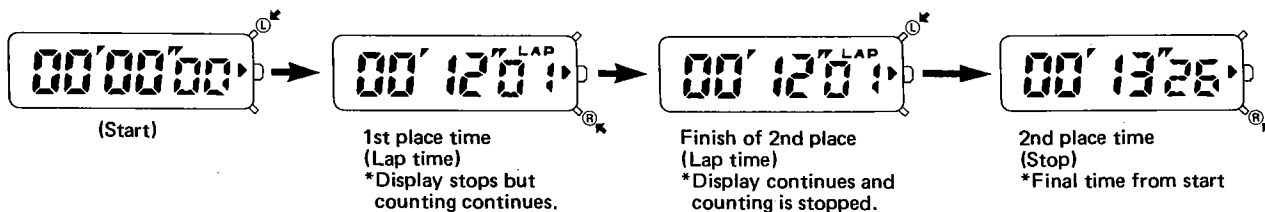


*Display stops but counting continues.

*Cumulative time since start

*Final time

③ Simultaneous counting of 1st and 2nd place times

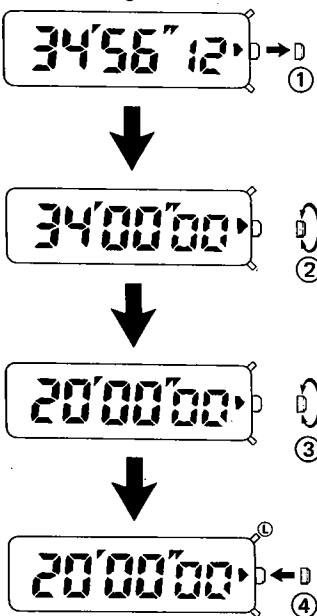


④ If the crown is pulled out to the first click stop under display of the stopwatch, the flashing is given to the "minute" at under 60 min. and to the "hour" and "minute" at over 60 min. each to secure the "Preset mode".

(Presetting method)

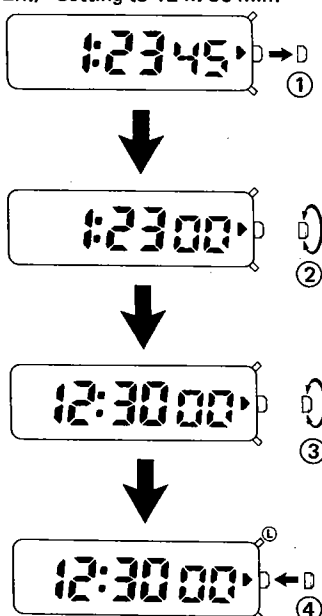
(Counting of under 60 min.)

(Ex.) Setting to 20 min.



(Counting of over 60 min.)

(Ex.) Setting to 12 h. 30 min.



- ① With pull-out of the crown to the first click stop under timing of the stopwatch, the flashing is given to the "minute" at under 60 min. and to the "hour" and "minute" at over 60 min. each to indicate the correction enable state.
- ② With turning of the crown, the "second" and "1/100 sec." are reset to zero. At the same time, the time stop mode is given under counting.
- ③ With turning of the crown, the "minute" plus the "hour" coupled to the "minute" can be corrected to be set to an optional time.
- ④ Push the crown lightly into the normal position. After this, the same operation is available as that of the stopwatch.

*The presetting is possible even at the resetting time (00'00'00).

*It is impossible to use both the stopwatch and the timer at one time. If the stopwatch is used (start or preset) under use of the timer, the timer counting and the set time are rest (0:0000).

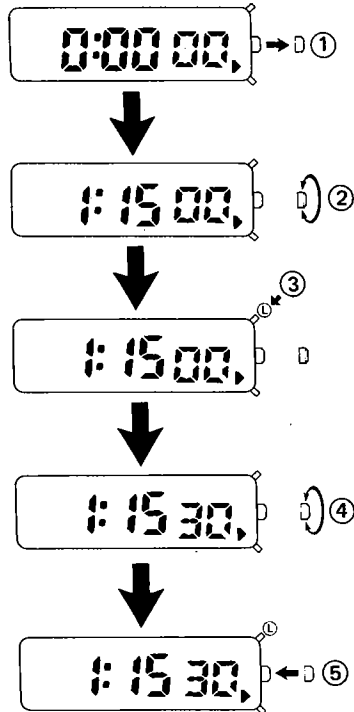
*The sound of confirmation rings once at the start/stop time.

*The flashing areas are shown in the red color.

How to Use Timer

The timer display mode is secured by pushing the crown.
(While using the stopwatch, 0:00.00 is displayed.)

1) Resettting method



- ① With pull-out of the crown by one step, the "hour" and "minute" begin flashing (including the following examples) to be ready for setting. As for the following examples, the set time is reset as soon as the crown is pulled out by one step.

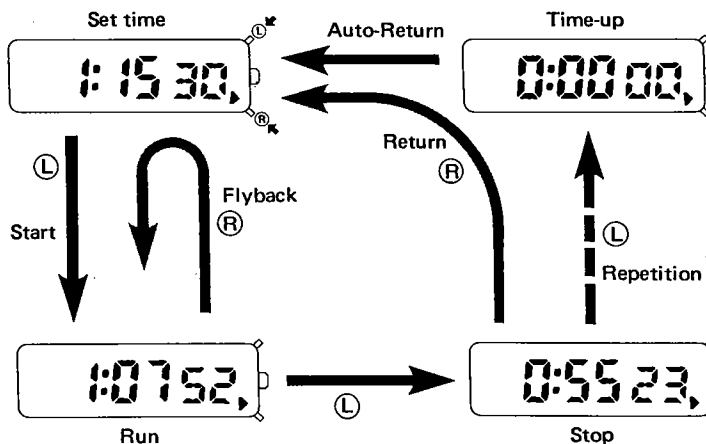
(Ex.) 1:15.30 (Holding at set time)
1:07.52 (Under timing)
0:55.23 (Timing stop)

- ② An optional desired time is set by turning the crown. In case no "second" setting is desired, the crown must be turned to the original place. The button operation for the timer is identical to the stopwatch.
- ③ When the "second" setting is desired, the "second" begins flashing with push of (L) button to be ready for setting.

- ④ An optional desired second is set by turning the crown.

- ⑤ After setting the timer time, the crown must be returned to the original place.

2) How to use



Flyback:

With push of (R) button under counting of the timer, the set time is reset to start immediately.

Return:

With push of (R) button when the timer is stopped temporarily, the set time is reset to stand by in that state.

Time-up:

With start after setting the time, the alarm rings for 10–20 sec. simultaneously with the 0-second detection to announce the "time-up".

Auto-return:

After ringing of the alarm, the set time is reset automatically to stand by in that state.

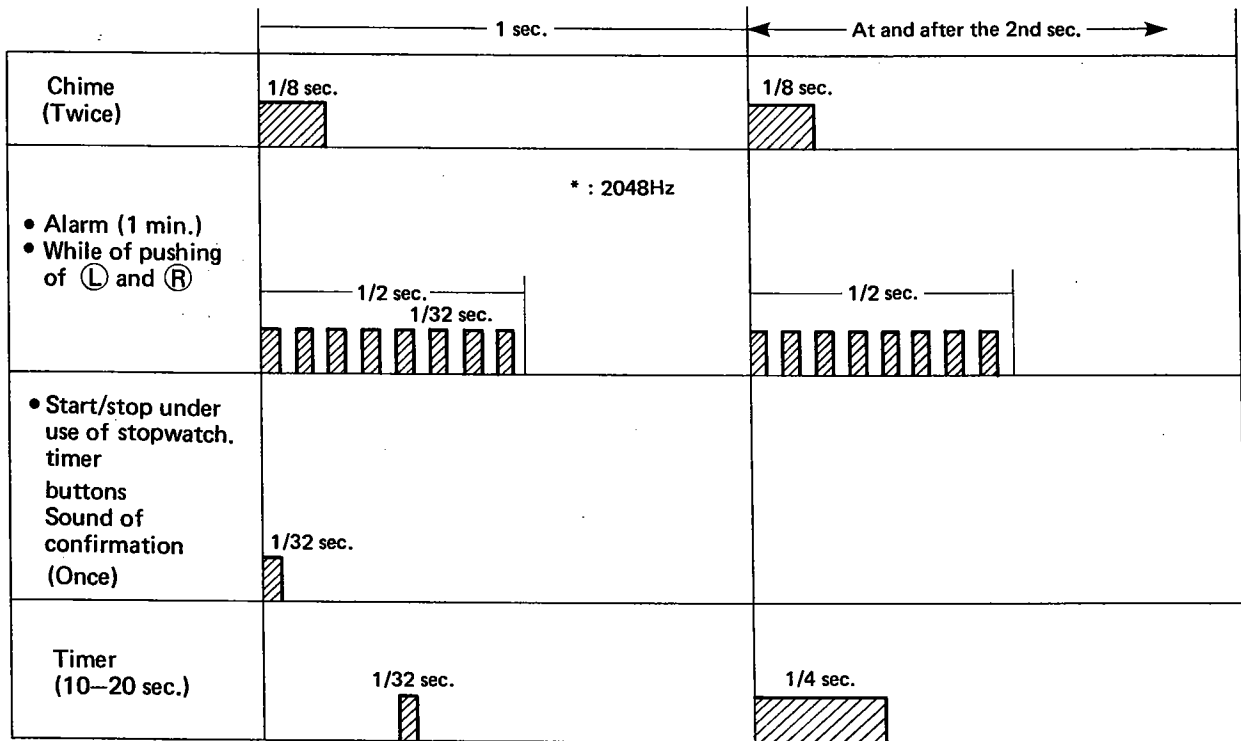
*It is impossible to use both the timer and the stopwatch simultaneously.

*The ringing can be stopped by pushing any button (including the crown).

5. Way of alarm ringing

The way of alarm ringing differs according to the functions as follows.

The diagram below shows the pulse tone duration of the 1-second ringing.



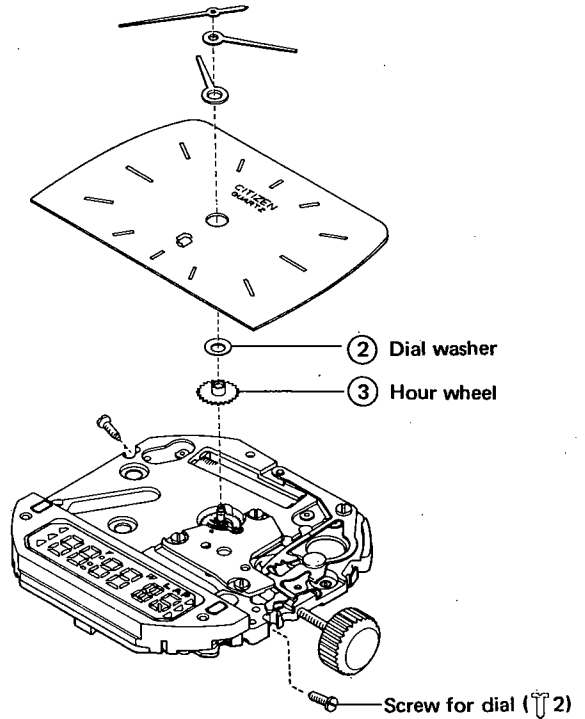
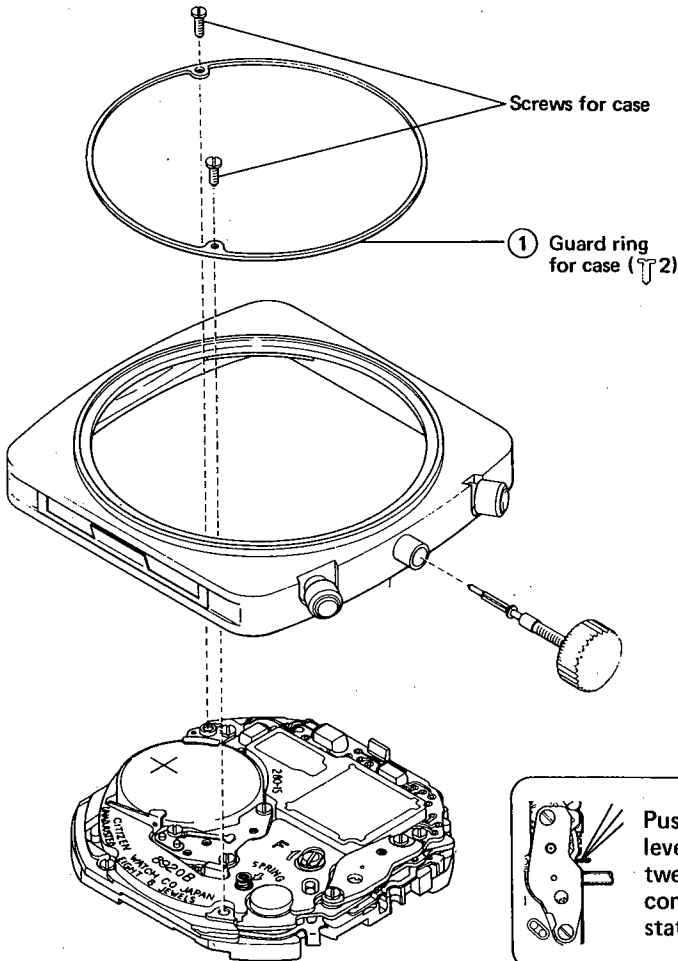
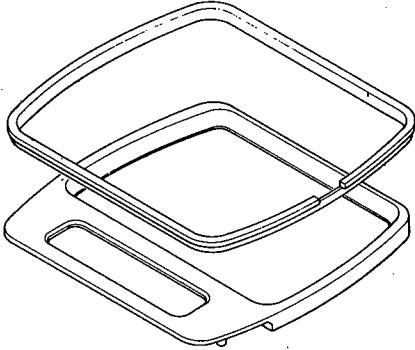
The alarm ringing and timer can be stopped with push of any push-button (including the crown). (Priority given to stoppage of ringing)

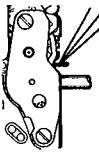
§ 6. DISASSEMBLING/ASSEMBLING PLUS LUBRICATION

1) Dial (display) side – Power cell side

Disassembling sequence: ① ~ ③⑧
 Assembling sequence: ③⑧ ~ ①

Lubrication marks
 (A) : Synt-A-Lube oil
 (V) : Synta-V-Lube oil
 (O) : Citizen watch oil CH-1

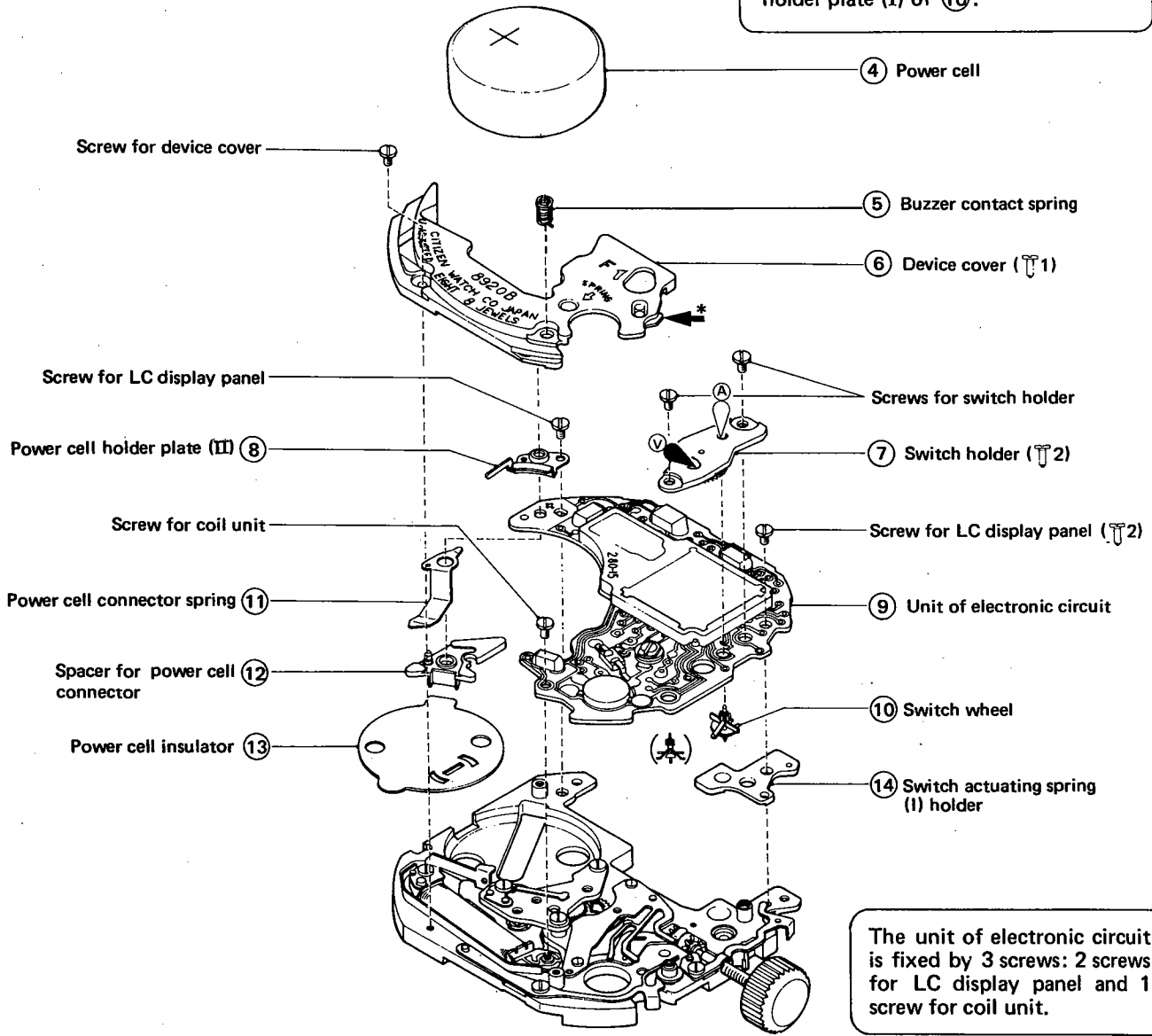


 Push down the setting lever with a pair of tweezers, and it will come off. Two-step state.

Note:
 No washing is required for the electronic parts. The dust or stains must be removed to avoid the defective contact.

2) Power cell side

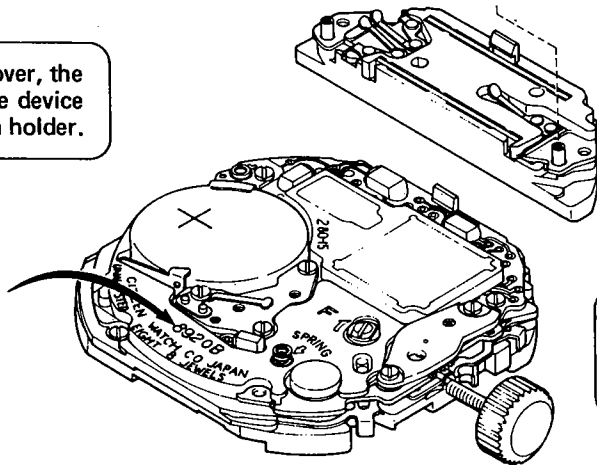
The power cell can be removed easily by shifting laterally the power cell holder plate (I) of ⑧.



*When assembling the device cover, the collar (arrow mark part) of the device cover is slided under the switch holder.

The unit of electronic circuit is fixed by 3 screws: 2 screws for LC display panel and 1 screw for coil unit.

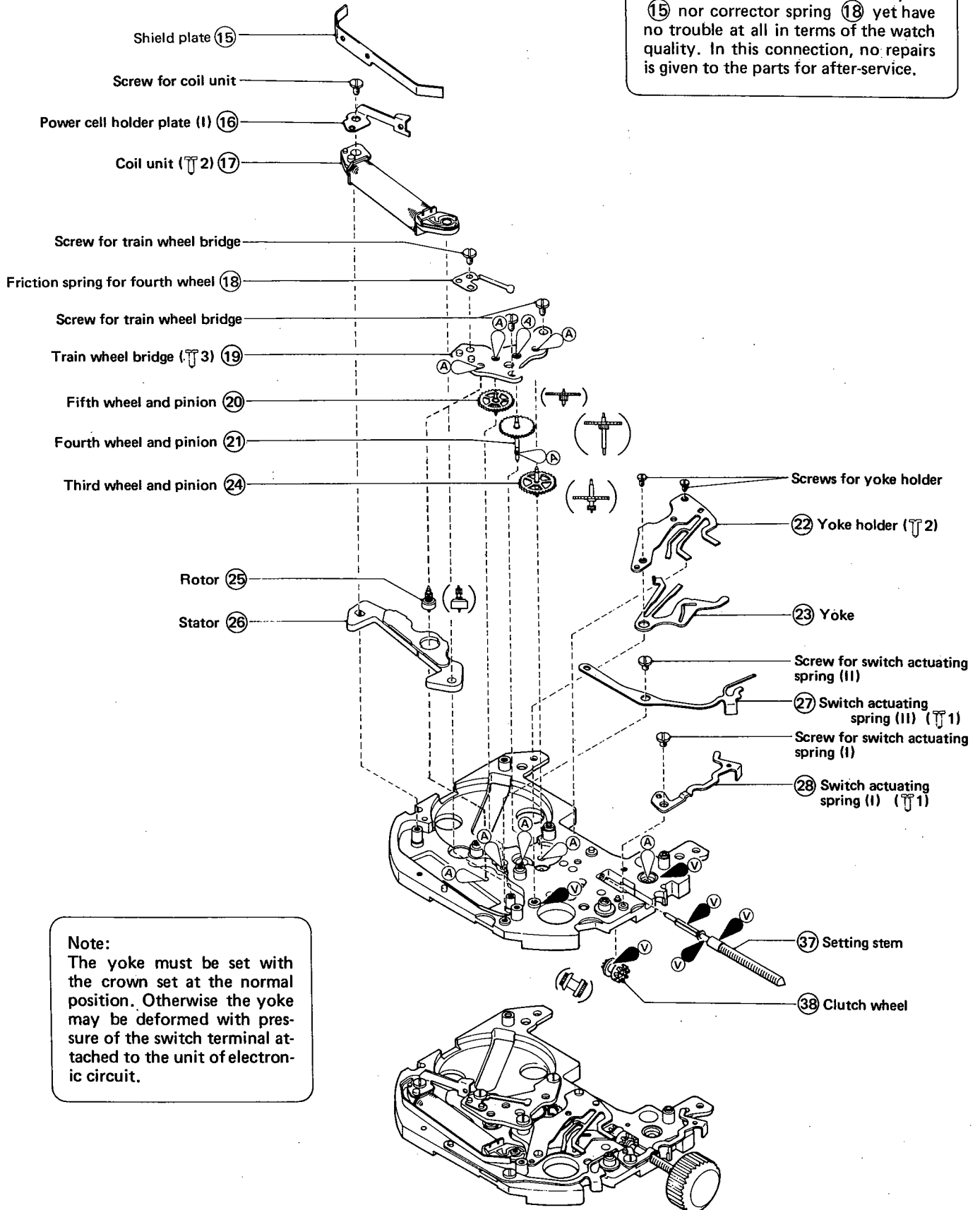
CALIBER NO.



The digital part is handled as a block in the procedure of disassembling and assembling.

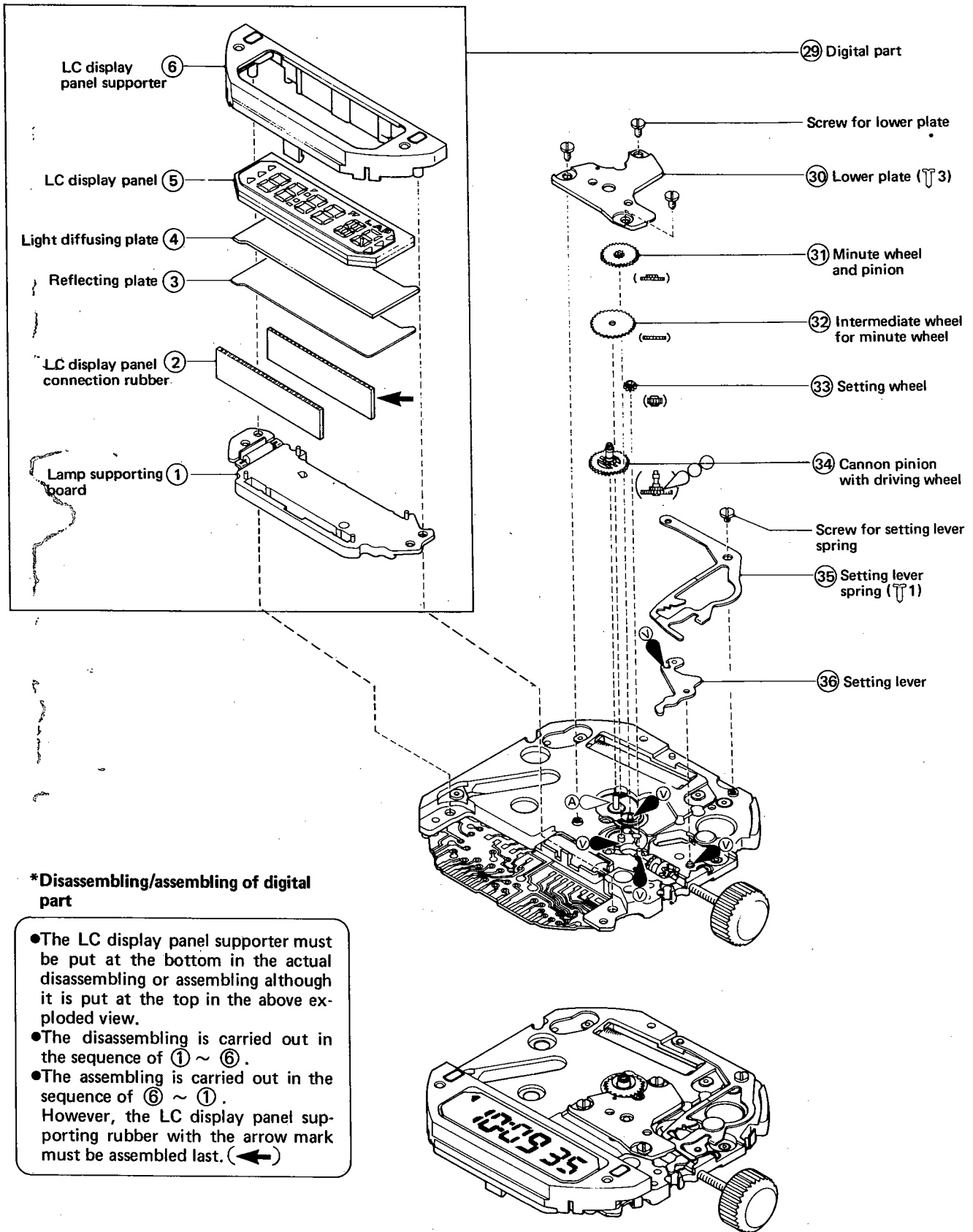
3) Power cell side

Some calibers include no shield plate (15) nor corrector spring (18) yet have no trouble at all in terms of the watch quality. In this connection, no repairs is given to the parts for after-service.



Note:
The yoke must be set with the crown set at the normal position. Otherwise the yoke may be deformed with pressure of the switch terminal attached to the unit of electronic circuit.

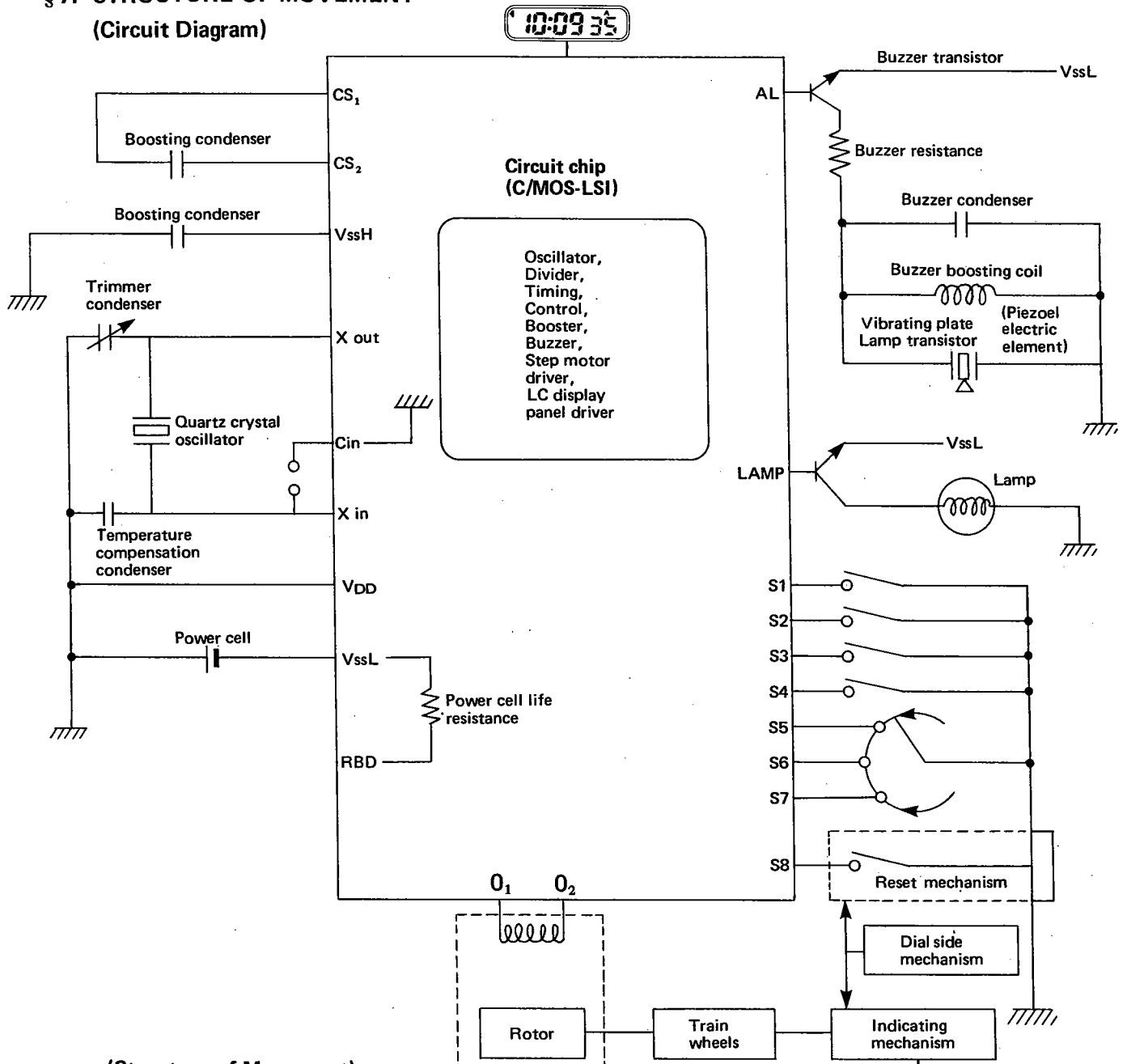
4) Dial (Display) side



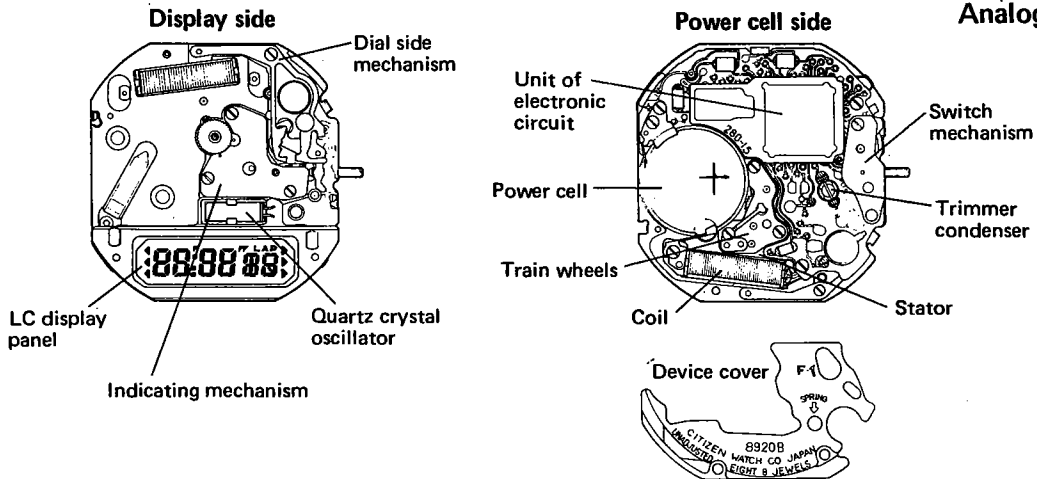
***Disassembling/assembling of digital part**

- The LC display panel supporter must be put at the bottom in the actual disassembling or assembling although it is put at the top in the above exploded view.
- The disassembling is carried out in the sequence of ① ~ ⑥.
- The assembling is carried out in the sequence of ⑥ ~ ①. However, the LC display panel supporting rubber with the arrow mark must be assembled last. (←)

§ 7. STRUCTURE OF MOVEMENT
(Circuit Diagram)

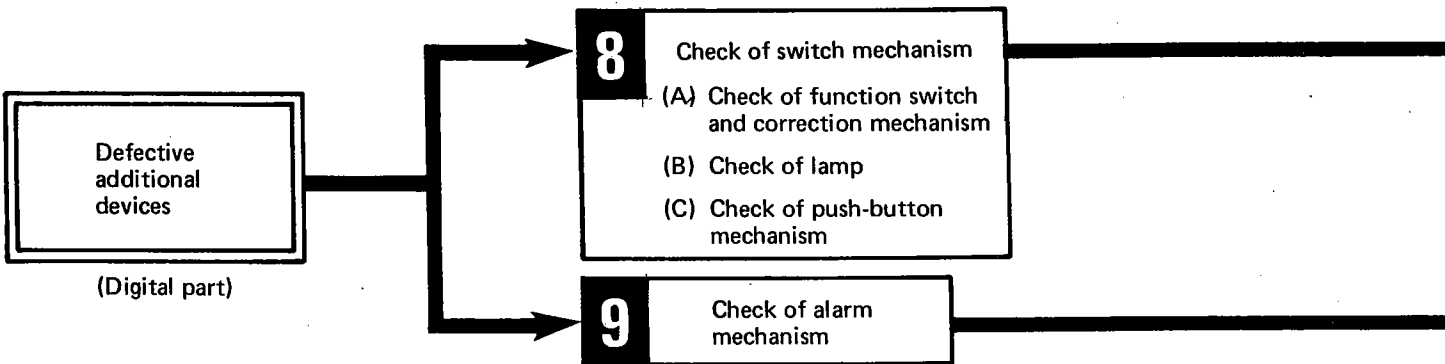
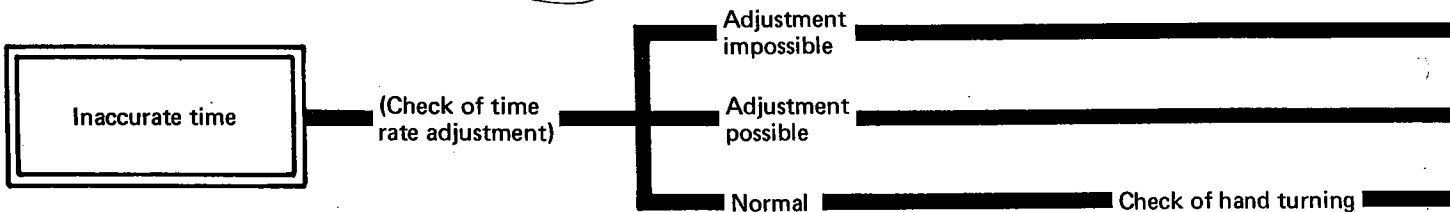
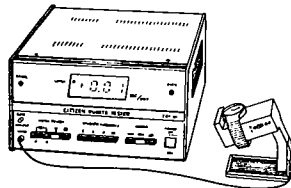
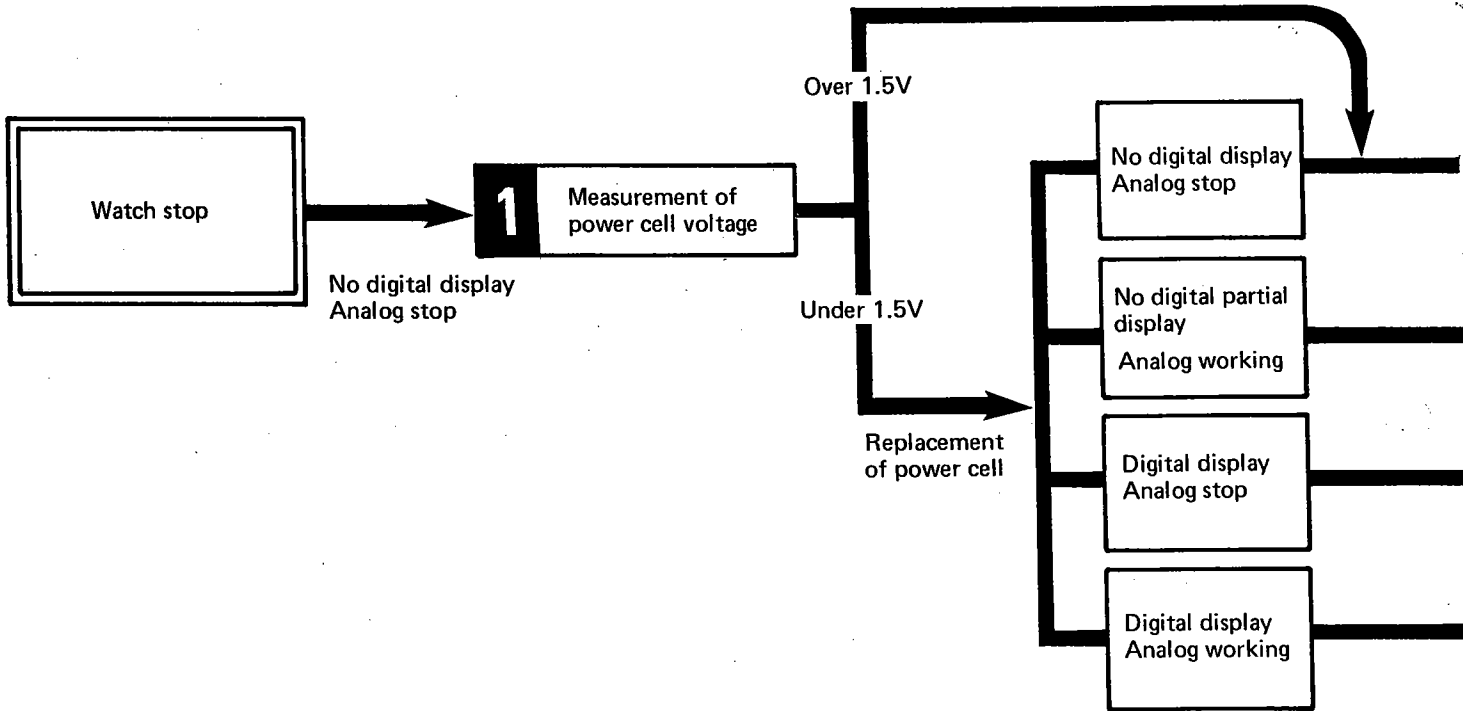


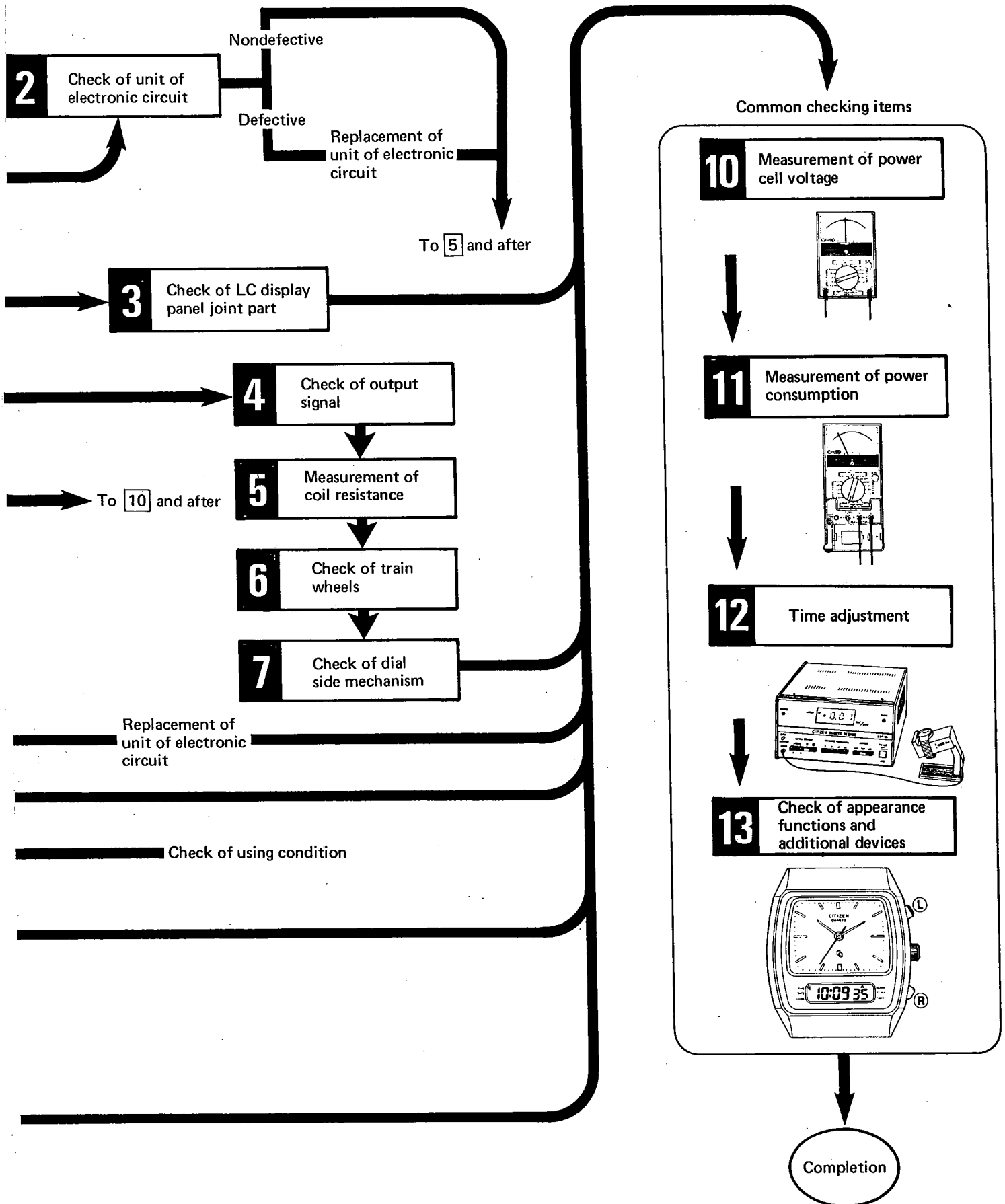
(Structure of Movement)



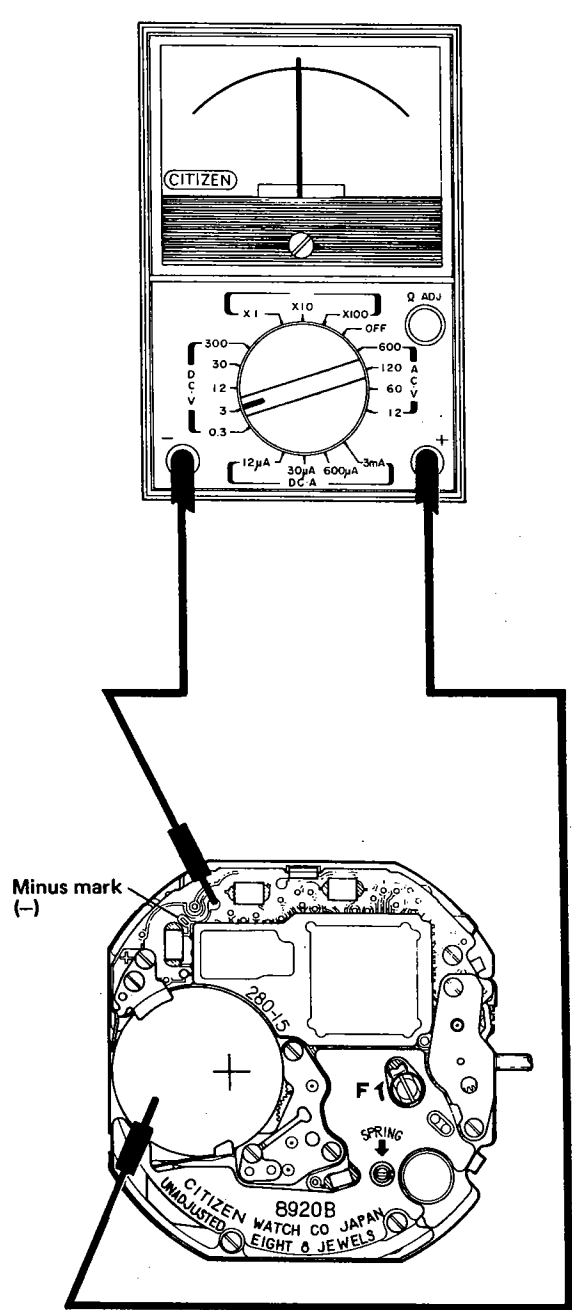
§ 8. TROUBLESHOOTING AND ADJUSTMENT

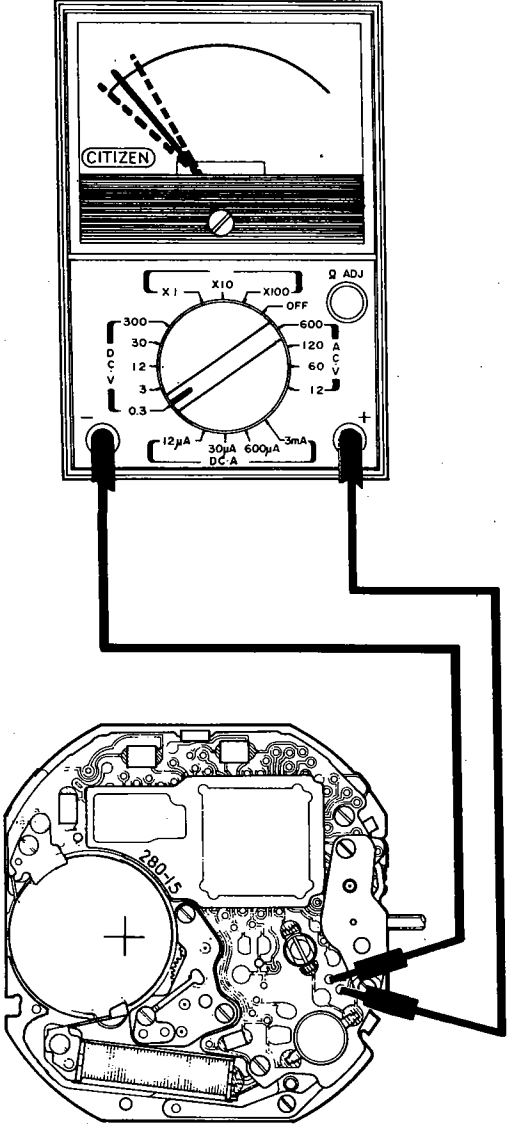
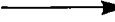
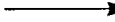
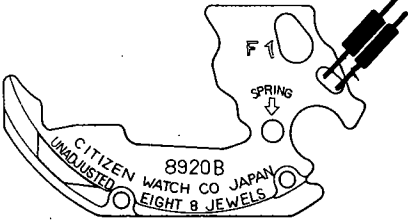
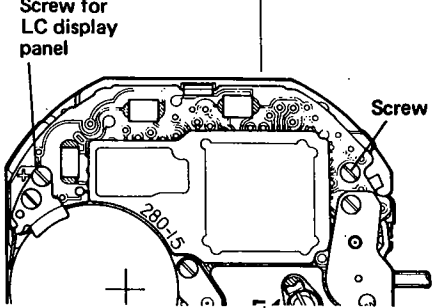


1) Flow chart of troubleshooting and adjustment

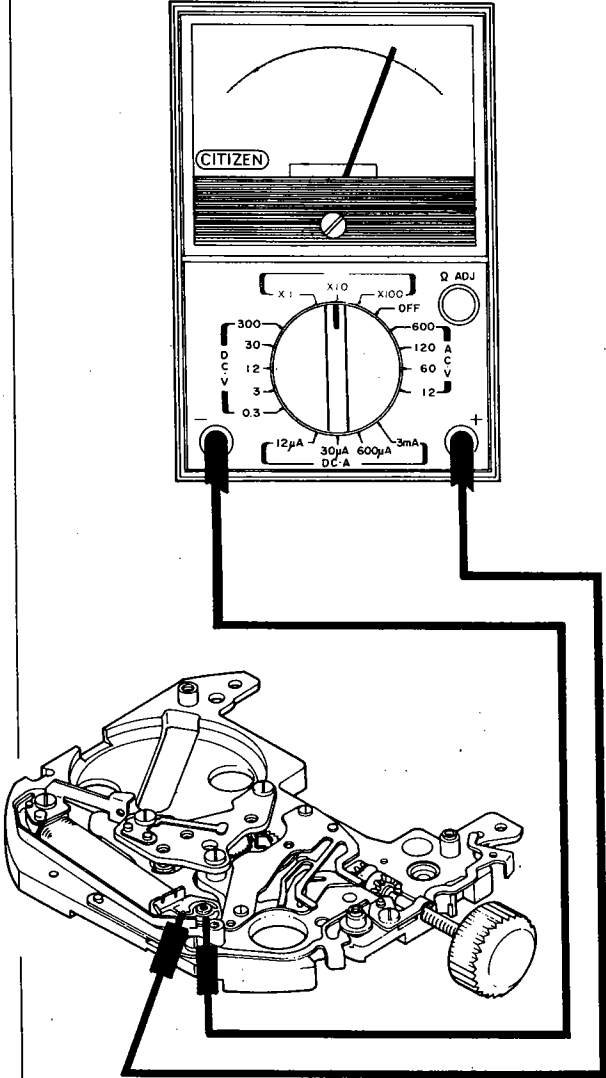
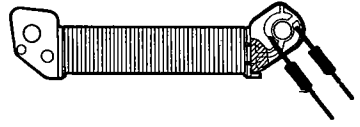
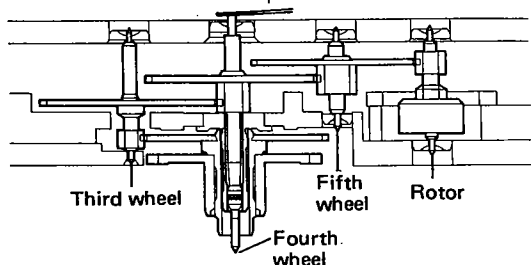


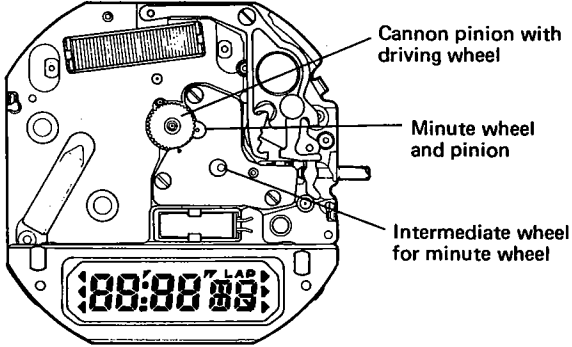
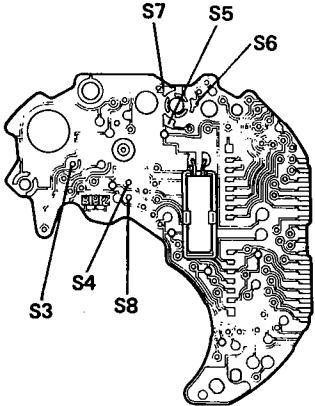


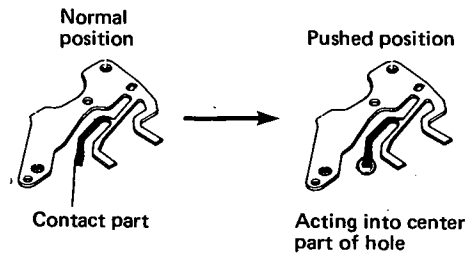
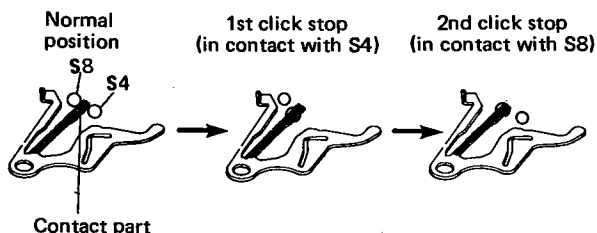
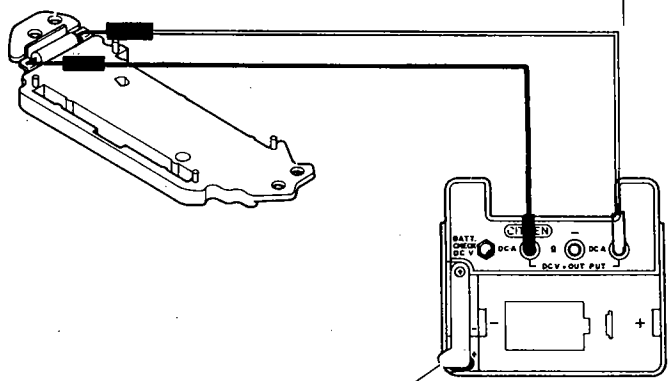
No digital display – Analog stop

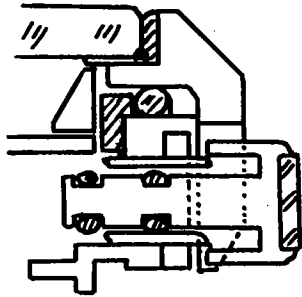
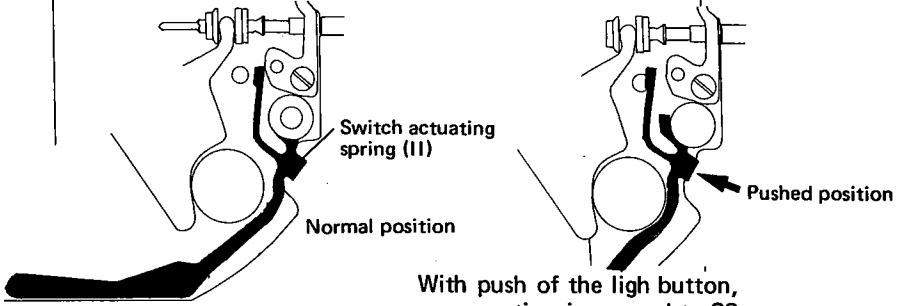
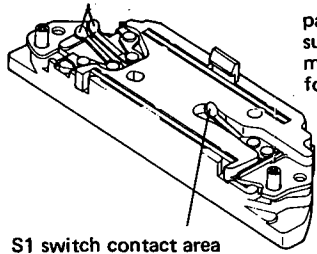
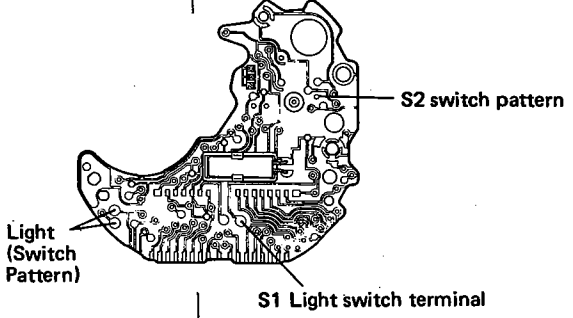
Checking items	How to check	Results & treatment
<p>1 Measurement of power cell voltage</p>		<p>Over 1.5V</p> <p>→ 2 Check of unit of electronic circuit. (Repair or replacement)</p> <p>Under 1.5V</p> <p>→ Replacement of power cell.</p> <p>Check the contact part of the power cell in case the power cell voltage reads the output of under 1.5V although the power cell itself shows more than 1.5V output.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 20px;"> <p>Note</p> <p>If the watch measured has been used more than two years, the power cell must be replaced with a new one although the old power cell shows more than 1.5V output.</p> </div>
<p>2 Check of unit of electronic circuit</p>	<p>For the check of the unit of electronic circuit in its single unit state, the tools are required for replacement or repair of the quartz crystal osillator, the condenser and others.</p> <p>Here the following points are checked for the unit of electronic circuit.</p> <p>(1) Whether each element has a contact to another.</p> <p>(2) Whether the pattern has some dirt, and others.</p>	

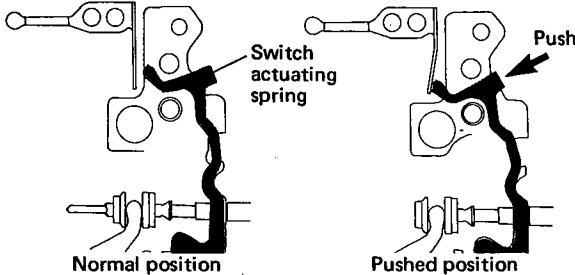
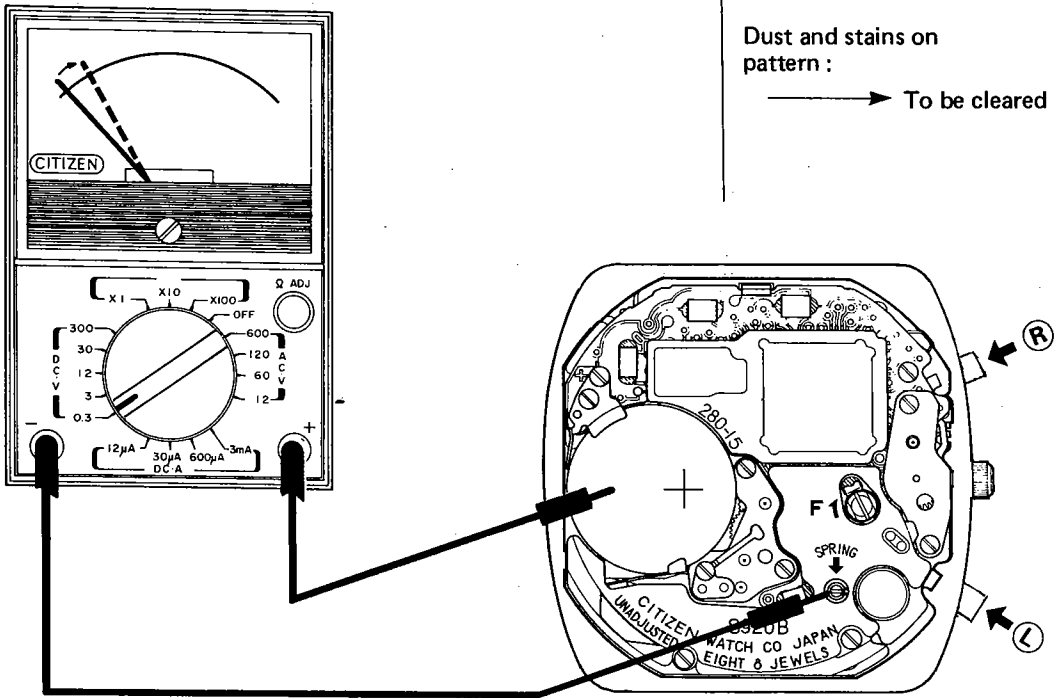
Checking items	How to check	Results & treatment
<p>3 Check of output signal</p>	<p>The tester's terminals are applied to the output terminals of the unit of electronic circuit.</p> 	<p>Pointer swinging every second centering on OV:  Normal</p> <p>Otherwise:  Replacement of unit of electronic circuit.</p> <p>(Tester terminals)</p>  <p>The measurement is also possible even through the upper surface of the device cover, but is more facilitated with the device cover removed.</p>
<p>4 Check of LC display panel joint part</p>	<p>If the contact is not steady between the electrode of the LC display panel and the pattern of the unit of electronic circuit, the segment breaks. Check the following points.</p> <ol style="list-style-type: none"> (1) Whether the screws for the LC display panel are tightened completely. (2) Whether the LC display panel connection rubber is fixed completely. (3) Whether some dust, stains and other foreign substances stick to the LC display panel, the LC display panel connection rubber or the electrode pattern of the unit of electronic circuit. 	<p>Screw loosened:  Retightening</p> <p>Dust or stains stuck:  Clearing</p>

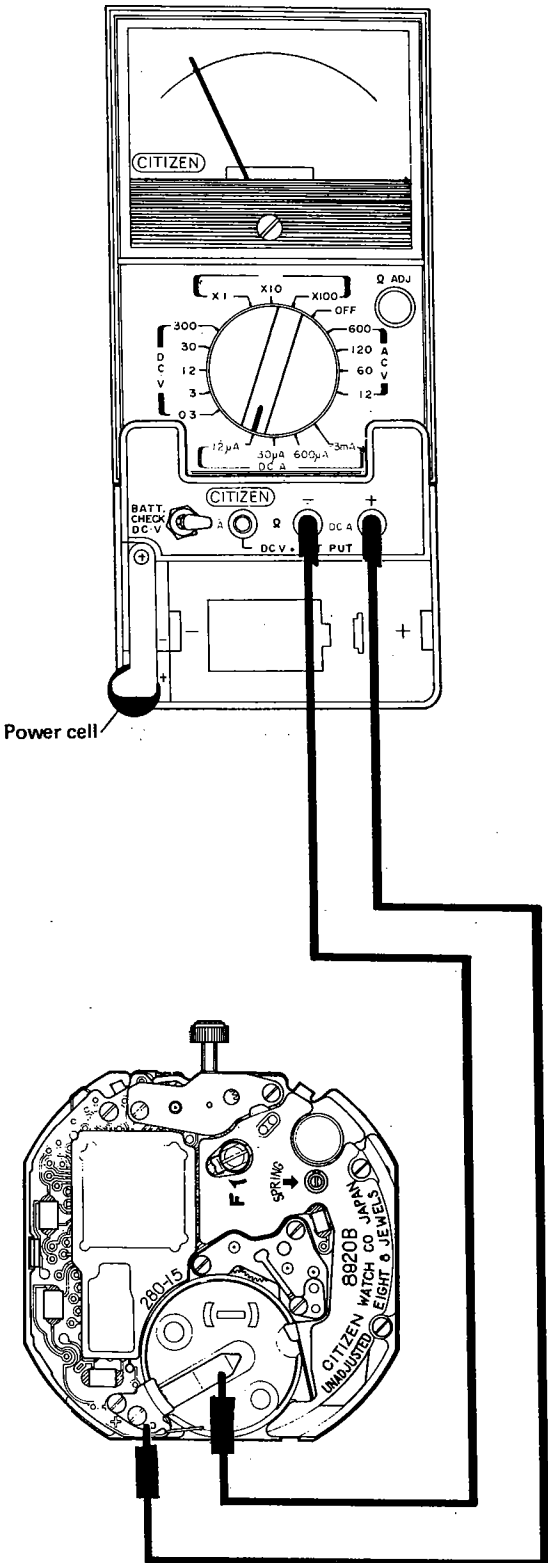
Checking items	How to check	Results & treatment
<p>5 Measurement of coil resistance</p>	<p>The measurement of the coil resistance must be carried out with the single unit of the coil unit or with no connection to the unit of electronic circuit.</p>  <p>The diagram shows a Citizen ohmmeter with its dial set to the 300 Ω range. The meter is connected to a mechanical unit, likely a train wheel assembly, via two test leads. The meter's scale ranges from 0.3 to 300 Ω, with sub-scales for 12 μA, 30 μA, 600 μA, and 3 mA. The dial also includes settings for X1, X10, X100, and OFF, and a Ω ADJ knob.</p>	<p>Resistance value within:</p> <p>2.5 ~ 3.0KΩ</p> <p>→ Normal</p> <p>Outside:</p> <p>→ Replacement of coil unit.</p>  <p>The diagram shows a small, rectangular coil unit with a metal casing and two electrical terminals on one side.</p>
<p>6 Check of train wheels</p>	<p>(1) Give the thorough inspection to the rotor as to the following points.</p> <ul style="list-style-type: none"> ●The clearance must be appropriate. ●The rotor pinion must be normal. ●The rotor must be free from the iron filings and other dust. ●The lubrication must be appropriate. <p>(2) The same inspection must be given to other wheels.</p>	<p>No clearance secured :</p> <p>→ Clearance to be adjusted by moving jewel position at train wheel bridge side.</p> <p>Iron filings and dust :</p> <p>→ To be cleared away.</p>  <p>The diagram is a cross-sectional view of the train wheel assembly. It shows the Third wheel, Fourth wheel, Fifth wheel, and the Rotor. The rotor is positioned between the fifth and fourth wheels. The diagram illustrates the mechanical components and their relative positions.</p>

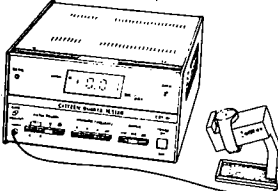
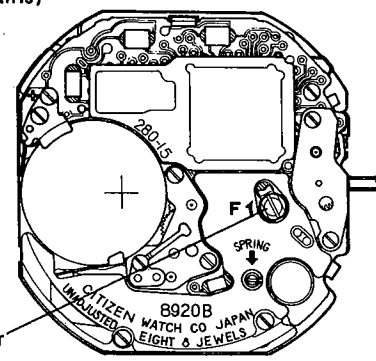
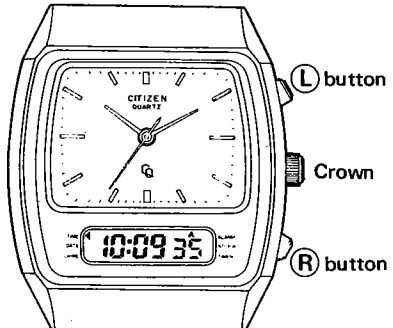
Checking items	How to check	Results & treatment
<p>7 Check of dial side mechanism</p>	<p>Check whether the intermesh is complete between the wheels with a smooth movement and whether the dust or other foreign substances stick to each wheel.</p>  <p>Cannon pinion with driving wheel Minute wheel and pinion Intermediate wheel for minute wheel</p>	<p>Dust or other foreign matters: → To be cleared away.</p>
<p>8 Check of switch mechanism</p>	<p>(A) Check of function switch and correction mechanism</p> <ul style="list-style-type: none"> ● Function switch impossible (Contact to S3) <ol style="list-style-type: none"> 1) Whether the yoke guard has some malformation. 2) Whether the function switch terminal (S3) of the unit of electronic circuit has some deformation, breakage and other defects. ● In case the correctable state is not obtained with correction impossible. ● Switching impossible to the time mode with crown pulled out to second click stop (Contact to S8) <ol style="list-style-type: none"> 1) Whether the contact part of the yoke has some deformation. 2) Whether the switch terminals (S4, S8) of the unit of electronic circuit has deformation or breakage. 3) Whether the patterns of S5, S6 and S7 have the defective conduction due to the dust or stains. 4) Whether the spring of the switch wheel has some deformation.  <p>S3: Function switch terminal S4: Correctable state correction terminal S5, S6, S7: Correction patterns 5 → 6 → 7 (Up) 7 → 6 → 5 (Down) S8: Auto-switch terminal to be time mode</p>	<p>Malformation or breakage of parts: → Repair or replacement of parts.</p> <p>Malformation or breakage at unit of electronic circuit part: → To be repaired or replacement of unit of electronic circuit.</p> <p>Dust and stains: → To be cleared away.</p>

Checking items	How to check	Results & treatment
	<p>Positioning between yoke guard and plate</p>  <p>Normal position → Pushed position</p> <p>Contact part Acting into center part of hole</p> <p>Positioning between yoke and plate (The function of the contact part can be confirmed with removal of the yoke guard.)</p>  <p>Normal position 1st click stop (in contact with S4) 2nd click stop (in contact with S8)</p> <p>Contact part</p> <p>(B) Check of lamp The check is given with the lamp alone (attached to the lamp supporting board).</p>  <p>Power cell</p> <p>*The lamp has neither plus (+) nor minus (-) polarity.</p>	<p>Normal lamp lighting:</p> <p>→ Nondefective.</p> <p>However, in case the unit of electronic circuit has the defective transistor, the lamp does not glow although no defect is detected through the check of the lamp itself. In that case, the unit of electronic circuit must be replaced with a new one.</p> <p>No lamp lighting:</p> <p>→ Replacement of lamp supporter.</p>

Checking items	How to check	Results & treatment
	<p>(C) Check of push-button mechanism. If some dust or other foreign substances stick to the push-buttons, the additional devices become defective owing to the insufficient stroke even though no defect is detected with the switch actuating springs (I) and (II), the switch terminal (S2) of the unit of electronic circuit, and the switch spring of the lamp supporting board.</p> <p>The stroke must be confirmed after checking whether the pushing force is too strong along with some dust or stains sticking for the push-buttons.</p>  <p>Check of joint part to push-buttons (Light button)</p> <ol style="list-style-type: none"> (1) Check whether the switch actuating spring (II) has some malformation. (2) Check whether the switch terminal (S2: contact to lamp) has some malformation or breakage.  <p>Normal position</p> <p>Pushed position</p> <p>With push of the light button, a connection is secured to S2 (switch terminal) of the unit of electronic circuit.</p> <div style="border: 1px dashed black; padding: 5px; margin-top: 10px;"> <p>Lamp contact spring (To be connected to pattern of unit of electronic circuit)</p>  <p>*The spring (contact part) of the lamp supporting board must be checked for its shape.</p> <p>S1 switch contact area</p> </div>	<p>Dust and stains : → To be cleared away.</p> <p>Malformation or breakage of switch actuating spring (I) : → To be repaired or replaced.</p>  <p>S2 switch pattern</p> <p>Light (Switch Pattern)</p> <p>S1 Light switch terminal</p> <p>Malformation or breakage of switch actuating spring : → To be cleared away.</p>

Checking items	How to check	Results & treatment
	<p>(Reset button)</p> <p>(1) Check whether the switch actuating spring (I) has some malformation.</p> <p>(2) Check whether the pattern (S1) of the unit of electronic circuit has some defective conduction.</p> 	<p>Malformation or break of switch actuating spring (I)</p> <p>→ To be corrected or replaced</p>
<p>9 Check of alarm mechanism</p>	<p>(1) The alarm (the collector side output of transistor) must be confirmed with the case back removed.</p> <p>a) The rotary switch is set at DC0.3V.</p> <p>b) The red ⊕ lead and the black ⊖ lead wires are applied to the power cell upper face and the buzzer contact spring respectively.</p> <p>c) Both (L) and (R) buttons are pressed at one time with the lead wires being applied, and thus the tester pointer swings (every second) in the same duration as the ringing tone.</p> <p>(2) In case no alarm ringing is secured, the following points must be checked.</p> <p>a) The mechanism of the push-button</p> <p>b) The crack of the piezoelectric element on the vibrating plate</p> <p>c) The contact condition between the buzzer contact spring and the vibrating plate along with the dirt and malformation.</p> <p>d) The dust and stains on the pattern of the unit of electronic circuit.</p> 	<p>Pointer swinging secured :</p> <p>→ Nondefective unit of electronic circuit Mechanical check of 2.</p> <p>No swing of pointer:</p> <p>→ Replacement of unit of electronic circuit.</p> <p>Crack of vibrating plate :</p> <p>→ To be replaced.</p> <p>Malformation or dirt of buzzer contact spring :</p> <p>→ To be replaced.</p> <p>Dust and stains on pattern :</p> <p>→ To be cleared away.</p>

Checking items	How to check	Results & treatment
<p>10 Measurement of power cell voltage</p>		<p>Refer to 1.</p>
<p>11 Measurement of power consumption</p>	 <p>The diagram illustrates the setup for measuring power consumption. A multimeter is connected to a power cell and a watch case. The multimeter's range is set to DC current (DC A) with a scale of 12µA, 30µA, and 60µA. The watch case is labeled 'CITIZEN WATCH CO. JAPAN' and '8920B'. A power cell is connected to the watch case terminals.</p>	<p>The power consumption is measured by the tester and in the state of the complete module.</p> <p>Under 4.0µA → Nondefective</p> <p>Over 4.0µA → Measurement of power consumption of analog section with digital section removed.</p> <p>Power consumption at analog section:</p> <p>Under 3.5µA → 4 Check of contact part between LC display panel and unit of electronic circuit.</p> <p>Over 3.5µA → Check with crown pulled out by two steps.</p> <p>Power consumption with crown pulled by two steps:</p> <p>Under 2.0µA → 6 Check of train wheels.</p> <p>Over 2.0µA → Replacement of unit of electronic circuit.</p>

Checking items	How to check	Results & treatment												
<p>12 Time adjustment</p> 	<p>The time rate is measured by CQT-101, and then the time is adjusted by turning the trimmer condenser. (Clockwise turn: Gains)</p>  <p>Trimmer condenser</p>	<p>Adjustment possible : → 13</p> <p>Adjustment impossible : → Replacement of unit of electronic circuit.</p>												
<p>13 Check of appearance functions and additional devices</p>	 <p>The check must be given in the state of the watch complete.</p> <p>(Time display)</p> <ol style="list-style-type: none"> Check whether the lamp lights up with push of L button. Check whether the switching is possible between the A/P 12 and 24 hour displays and whether the buzzer rings. <p>(Display switch)</p> <ol style="list-style-type: none"> Check whether the switching is given in the following circulation. ↻ Time → Calendar → Chime Timer ← Stopwatch ← Alarm ↻ Check whether the flashing indicating the correctable state is given for every display by pulling out the crown to the first click stop position. Check whether the analog second hand is stopped and the digital time display is given by pulling out the crown to the second click stop position. <p>(Others)</p> <ol style="list-style-type: none"> Check whether some dust or stains stick onto the dial or the display frame. Check whether the all-reset is possible with simultaneous push of both L and R buttons after pulling out the crown by two steps. <p>(Display of each mode)</p> <table border="0"> <tr> <td>(Time)</td> <td>12:00:00</td> <td>(Alarm)</td> <td>12:00:0F</td> </tr> <tr> <td>(Calendar)</td> <td>1 1TU</td> <td>(Stop-watch)</td> <td>00'00:00</td> </tr> <tr> <td>(Chime)</td> <td>:00:0F</td> <td>(Timer)</td> <td>0:00:00</td> </tr> </table> <ol style="list-style-type: none"> Push down the crown to see if it returns smoothly. 	(Time)	12:00:00	(Alarm)	12:00:0F	(Calendar)	1 1TU	(Stop-watch)	00'00:00	(Chime)	:00:0F	(Timer)	0:00:00	
(Time)	12:00:00	(Alarm)	12:00:0F											
(Calendar)	1 1TU	(Stop-watch)	00'00:00											
(Chime)	:00:0F	(Timer)	0:00:00											

CITIZEN WATCH CO., LTD.
Tokyo, Japan