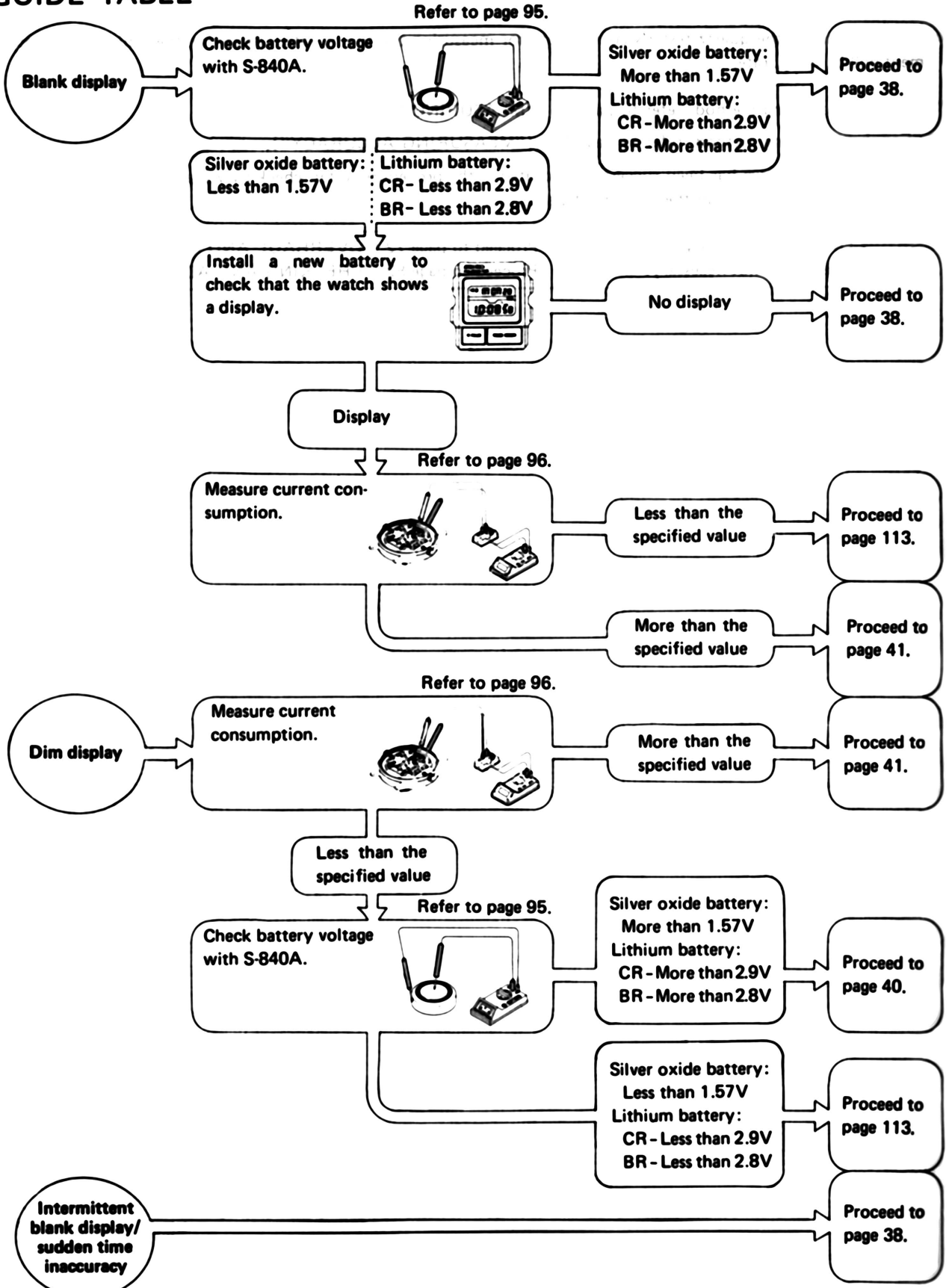
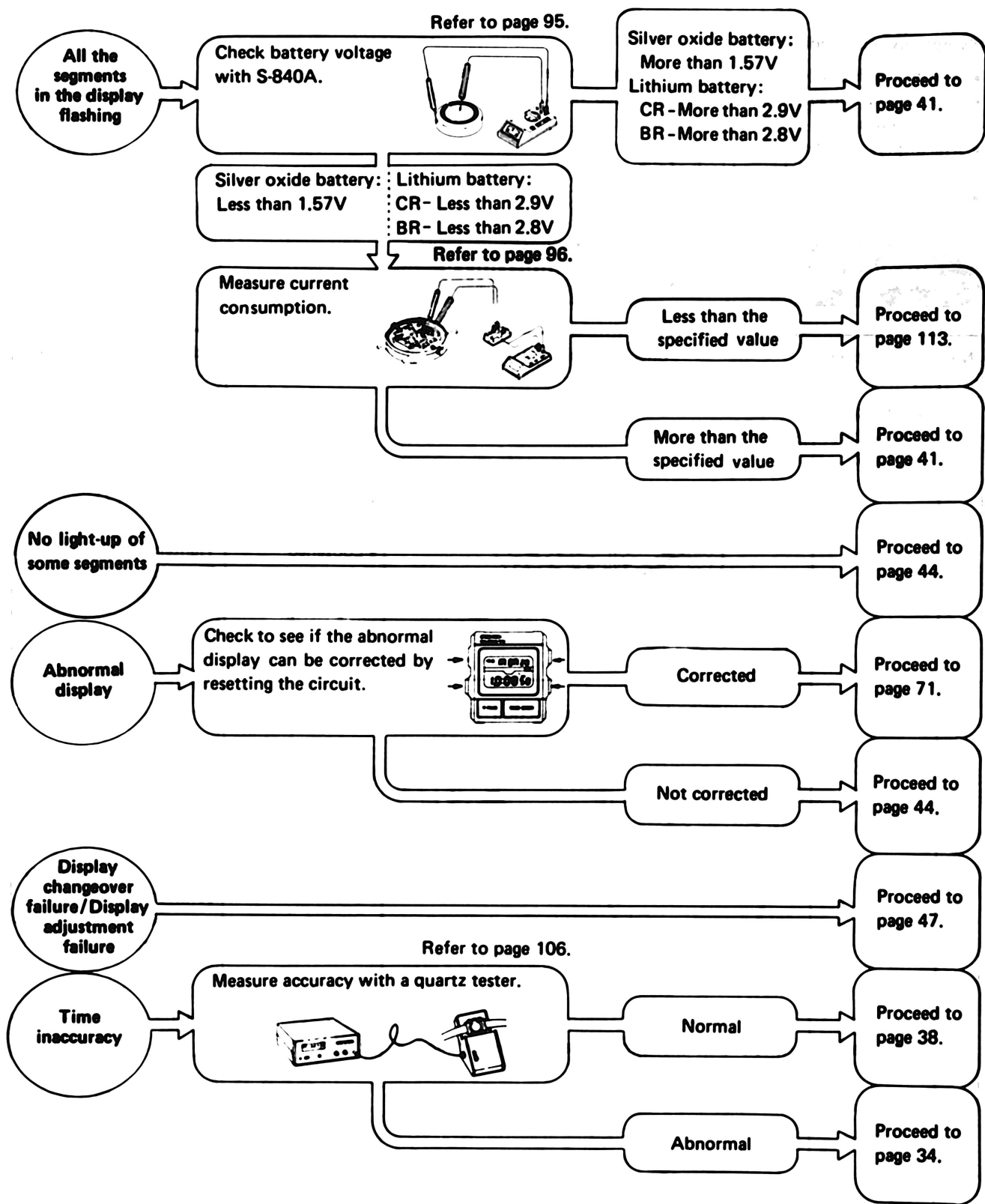


### III. DIGITAL QUARTZ CHECKING/REPAIRING PROCEDURE

etol

#### GUIDE TABLE





**Note:**

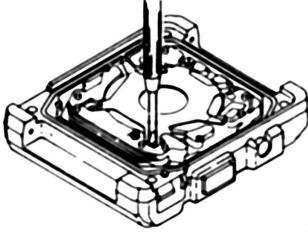


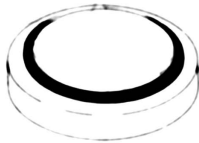
- For the respective measuring methods, refer to Chapter 5 "MEASUREMENT".
- For the specified standard values, refer to the "PARTS CATALOGUE/TECHNICAL GUIDE" by caliber or "DIGITAL QUARTZ VALUE CHECKING LIST".

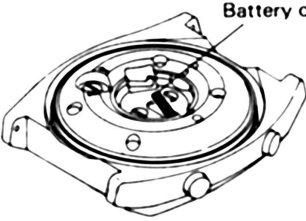

## 6. BLANK DISPLAY/INTERMITTENT BLANK DISPLAY/SUDDEN TIME INACCURACY

### [Symptoms and Conditions]

- The display is blank, but the battery voltage is more than the specified value.
- The battery voltage is less than the specified value, and the display remains blank even after the battery is replaced with a new one.
- The display sometimes appears blank.
- The watch suddenly skips a block of time.
- After a momentary blank on the display, the time changes indiscriminately.

### CHECK AND REPAIR BATTERY CONDUCTIVITY

No.	Preparation	Checking points	Result	Adjustment and Repair
①	Watch complete without case back	<p>Check that the circuit block screw or the battery clamp screw is not loosened.</p> 	<ul style="list-style-type: none"> <li>• Not loosened</li> <li>• Loosened</li> </ul>	<p>Proceed to ② .</p> <p>Tighten up the screw. Then, proceed to ② .</p>
②		<p>Check that the battery connection (+) is not deformed or broken.</p>  	<ul style="list-style-type: none"> <li>• Neither deformed nor broken</li> <li>• Deformed or broken</li> </ul>	<p>Proceed to ③ .</p> <p>Replace the battery connection (+) with a new one. Then, proceed to ③ .</p>
③	Battery alone	<p>Check that the battery has not leaked and is not rusted or contaminated.</p> 	<ul style="list-style-type: none"> <li>• No leakage, and neither rusted nor contaminated</li> <li>• Leaked, rusted, or contaminated</li> </ul>	<p>Proceed to ④ .</p> <p>Replace the battery with a new one. Then, proceed to ④ .</p>

No.	Preparation	Checking points	Result	Adjustment and Repair
④	Watch complete without case back and battery	<p>Check that the battery connection (-) is not permanently set in fatigue or broken.</p> 	<ul style="list-style-type: none"> <li>• Neither permanently set in fatigue nor broken</li> <li>• Permanently set in fatigue or broken</li> </ul>	<p>Proceed to ⑤ .</p> <p>Replace the battery connection (-) with a new one. Then, proceed to ⑤ .</p>
⑤	Watch complete without case back and battery	<p>Check that the battery connections (+) and (-) are not rusted or contaminated.</p>	<ul style="list-style-type: none"> <li>• Neither rusted nor contaminated</li> <li>• Rusted</li> <li>• Contaminated</li> </ul>	<p>Proceed to ⑥ .</p> <p>Replace the rusted connection with a new one. Then, proceed to ⑥ .</p> <p>Wipe off contamination with a nylon cloth moistened with alcohol. Then, proceed to ⑥ .</p>
⑥		<p>Install a new battery, and check that the display condition is normal.</p> 	<ul style="list-style-type: none"> <li>• Normal</li> <li>• Blank display</li> </ul>	<p>End of procedure *1</p> <p>Proceed to 7 on page 40.</p>

**Note:** Some calibers may show an abnormal display or no display after a battery is installed. To reset it, refer to Watch Service Bulletin No. 10 "SYSTEM RESET INFORMATION WHEN CHANGING A BATTERY" or "REMARKS ON BATTERY REPLACEMENT" in each caliber's "PARTS CATALOGUE/TECHNICAL GUIDE".

\*1. If the trouble source has been successfully located in the procedure so far, proceed to page 82 ("CHECKING AND ADJUSTMENT").

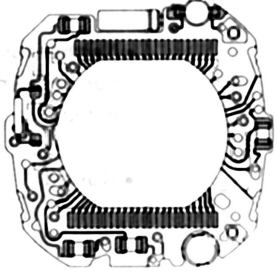
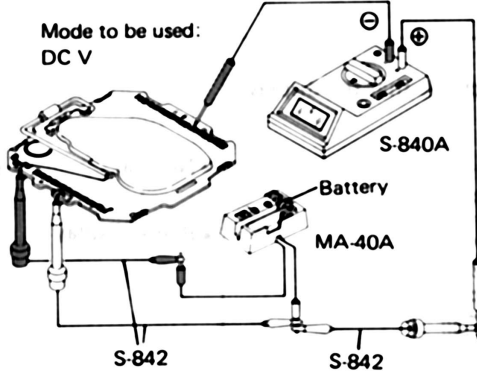


## 7. BLANK DISPLAY/DIM DISPLAY

### [Symptoms and Conditions]

- The display is blank, but the battery voltage is more than the specified value.
- The battery voltage is less than the specified value, and the display remains blank even after the battery is replaced with a new one.
- The display is dim, and the current consumption is less than the specified value, while the battery voltage is more than the specified value.

### CHECK AND REPAIR CIRCUIT BLOCK

No.	Preparation	Checking points	Result	Adjustment and Repair
①	Circuit block alone	<p>Check that the circuit block's pattern portions are not contaminated or rusted.</p> 	<ul style="list-style-type: none"> <li>• Neither contaminated nor rusted</li> <li>• Contaminated</li> <li>• Rusted</li> </ul>	<p>Proceed to ② .</p> <p>Wipe off contamination with a nylon cloth moistened with alcohol. Then, proceed to ② .</p> <p>Replace the circuit block with a new one. This is the end of procedure. *2</p>
②		<p>Check output signal of the circuit block. *1</p> 	<ul style="list-style-type: none"> <li>• Output signal</li> <li>• No output signal</li> </ul>	<p>Replace the liquid crystal panel with a new one. This is the end of procedure. *2</p> <p>Replace the circuit block with a new one. This is the end of procedure. *2</p>

#### Note:

- Do not check output signal of the circuit block under an incandescent lamp since strong light may cause the oscillation to stop.  
Be sure to protect the IC from light with a black cloth, etc. while measuring.
- Circuit blocks that have film-like thin plates are easily deformed. Handle them with care. Utmost care should be taken not to bend them especially when their pattern portions are clasped with IC clips. Also be careful not to scratch their pattern portions with IC clips.

\*1. For the measuring method, refer to page 100 ("Measuring digital output signal of the circuit block").

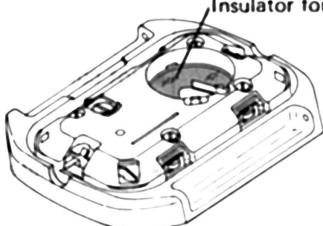
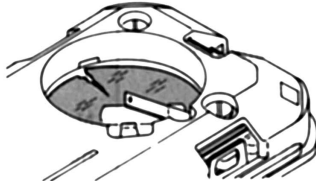
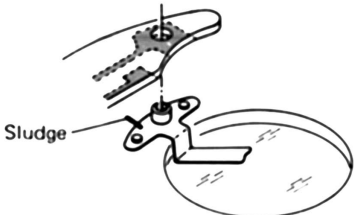
\*2. If the trouble source has been successfully located in the procedure so far, proceed to page 82 ("CHECKING AND ADJUSTMENT").

## 8. BLANK DISPLAY/DIM DISPLAY/SEGMENTS IN THE DISPLAY FLASHING


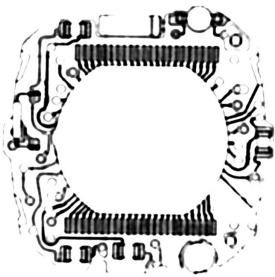
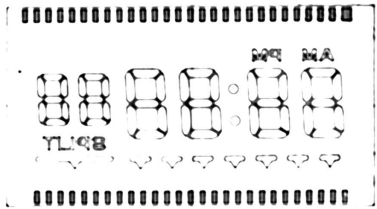
### [Symptoms and Conditions]

- The blank display is corrected by replacing the battery with a new one, but the current consumption exceeds the specified value.
- The display is dim, and the current consumption exceeds the specified value.
- The segments in the display flash, but the battery voltage is more than the specified value.
- The segments in the display flash, and the current consumption exceeds the specified value.

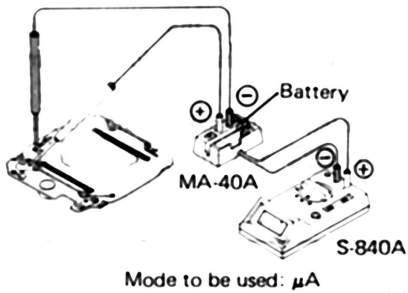
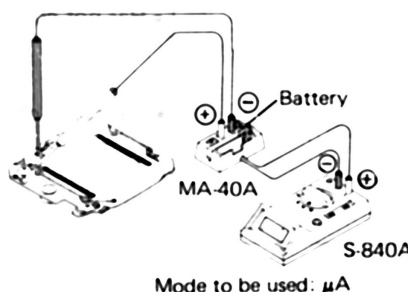
### 8-a: CHECK AND REPAIR BATTERY AREA

No.	Preparation	Checking points	Result	Adjustment and Repair
①	Watch complete without case back and battery	<p>Check that the insulator for battery is properly installed.</p> 	<ul style="list-style-type: none"> <li>• Properly installed</li> <li>• Not properly installed</li> </ul>	<p>Proceed to ② .</p> <p>Reset the insulator for battery in position. Then, proceed to ② .</p>
②		<p>Check that the insulator for battery and the insulator for circuit block, etc. are not broken.</p> 	<ul style="list-style-type: none"> <li>• Not broken</li> <li>• Broken</li> </ul>	<p>Proceed to ③ .</p> <p>Replace the broken insulator with a new one. Then, proceed to ③ .</p>
③	Module without circuit block	<p>Check that there is no short circuit between the circuit block and the battery connection (+) or (-).</p> 	<ul style="list-style-type: none"> <li>• No short</li> <li>• Short</li> </ul>	<p>Proceed to 8-b .</p> <p>Repair the short. Then, proceed to 8-b .</p>

## 8-b: CHECK AND REPAIR CONNECTOR AREA

No.	Preparation	Checking points	Result	Adjustment and Repair
①	Connector alone	Check that the connector is not contaminated.  	<ul style="list-style-type: none"> <li>● Not contaminated</li> <li>● Contaminated</li> </ul>	Proceed to ② .  Wash the connector in alcohol. Then, proceed to ② .
②	Circuit block alone	Check that the circuit block electrode is not contaminated.  	<ul style="list-style-type: none"> <li>● Not contaminated</li> <li>● Contaminated</li> </ul>	Proceed to ③ .  Wipe off contamination with a nylon cloth moistened with alcohol. Then, proceed to ③ .
③	Liquid crystal panel alone	Check that the liquid crystal panel electrode is not contaminated.  	<ul style="list-style-type: none"> <li>● Not contaminated</li> <li>● Contaminated</li> </ul>	Proceed to 8-c .  Wipe off contamination with a nylon cloth moistened with alcohol. Then, proceed to 8-c .

## 8-c: CHECK CURRENT CONSUMPTION FOR THE CIRCUIT BLOCK ALONE

No.	Preparation	Checking points	Result	Adjustment and Repair
①	Circuit block alone	Measure current consumption for the circuit block alone. *1 	<ul style="list-style-type: none"> <li>• Less than the specified value *2</li> <li>• More than the specified value *2</li> </ul>	Replace the liquid crystal panel with a new one. This is the end of procedure. *3  Proceed to ②.
②		Check that the circuit block is not contaminated.	<ul style="list-style-type: none"> <li>• Not contaminated</li> <li>• Contaminated</li> </ul>	Replace the circuit block with a new one. This is the end of procedure. *3  Wipe off contamination with a nylon cloth moistened with alcohol. Then, proceed to ③.
③		Measure current consumption for the circuit block alone again. 	<ul style="list-style-type: none"> <li>• Less than the specified value *2</li> <li>• More than the specified value *2</li> </ul>	End of procedure *3  Replace the circuit block with a new one. This is the end of procedure. *3

**Note:**

- Do not check current consumption under an incandescent lamp since strong light may cause the watch to consume excessive current.  
Be sure to protect the IC from light with a black cloth, etc. while measuring.
- Circuit blocks that have film-like thin plates are easily deformed. Handle them with care. Utmost care should be taken not to bend them especially when their pattern portions are clasped with IC clips. Also be careful not to scratch their pattern portions with IC clips.

- \*1. For the measuring method, refer to page 98 ("MEASURING CURRENT CONSUMPTION FOR THE CIRCUIT BLOCK ALONE").
- \*2. For the specified standard value of current consumption for the circuit block alone, refer to "DIGITAL QUARTZ VALUE CHECKING LIST".
- \*3. If the trouble source has been successfully located in the procedure so far, proceed to page 82 ("CHECKING AND ADJUSTMENT").

## 9. NO LIGHT-UP OF SOME SEGMENTS/ABNORMAL DISPLAY

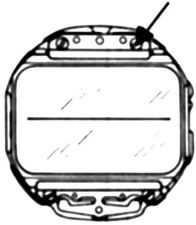
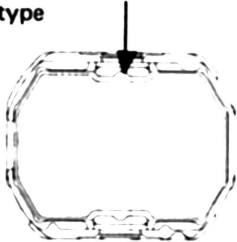
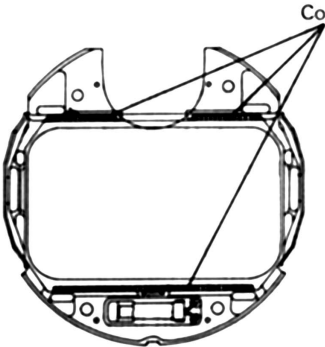
### [Symptoms and Conditions]

- Some segments do not light up.
- Abnormal display is not corrected by resetting the circuit.

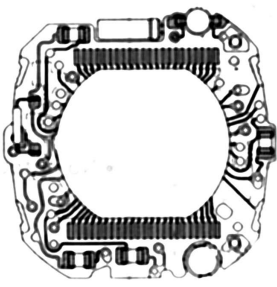
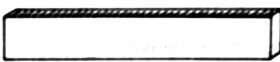
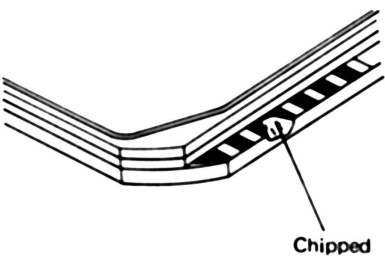
### 9-a: CHECK AND ADJUST INSTALLATION CONDITION

In a digital quartz watch there is a high density pattern interconnecting the circuit block and the liquid crystal panel via electrical connectors. Even a slight misalignment in installation, contamination, or damage may lead to various display failures.

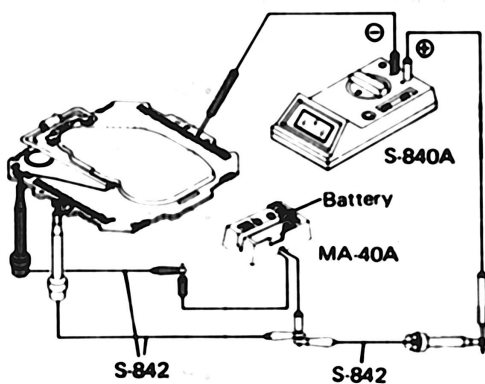
An easy or hasty way of movement disassembly may consequently make it difficult to locate the trouble source. To find out the right cause, go through the procedure up to 9-c and then make necessary adjustments or repairs as required.

No.	Preparation	Checking points	Result	Adjustment and Repair (to be made at the end of the procedure up to 9-c)
①	Module alone	<p>Check that the liquid crystal panel frame, the battery clamp, and the battery guard are installed properly.</p> <p>(1) Screw type</p>  <p>(2) Hook type</p> 	<ul style="list-style-type: none"> <li>• Screw(s) not loosened</li> <li>• Screw(s) loosened</li> <li>• Has not come off</li> <li>• Has come off</li> </ul>	<p>Proceed to ② .</p> <p>Tighten up the screw(s). Then, proceed to ② .</p> <p>Proceed to ② .</p> <p>Reset the liquid crystal panel in position. Then, proceed to ② .</p>
②	Remove the liquid crystal panel or the circuit block from the module for checking.	<p>Check that the connectors are installed properly.</p> 	<ul style="list-style-type: none"> <li>• Properly installed</li> <li>• Fallen or slipped</li> </ul>	<p>Proceed to 9-b .</p> <p>Reset the connector(s) in position. Then, proceed to 9-b .</p>

## 9-b: CHECK AND REPAIR CONDUCTIVITY BETWEEN CIRCUIT BLOCK AND LIQUID CRYSTAL PANEL

No.	Preparation	Checking points	Result	Adjustment and Repair
①	Circuit block alone	<p>Check that the circuit block electrode is not contaminated or rusted.</p> 	<ul style="list-style-type: none"> <li>• Neither contaminated nor rusted</li> <li>• Contaminated</li> <li>• Rusted</li> </ul>	<p>Proceed to ② .</p> <p>Wipe off contamination with a nylon cloth moistened with alcohol. Then, proceed to ② .</p> <p>Replace the circuit block with a new one. Then, proceed to ② .</p>
②	Connector alone	<p>Check that the connector is not contaminated.</p> 	<ul style="list-style-type: none"> <li>• Not contaminated</li> <li>• Contaminated</li> </ul>	<p>Proceed to ③ .</p> <p>Wash the connector in alcohol. Then, proceed to ③ .</p>
③	Liquid crystal panel alone	<p>Check that the liquid crystal panel electrode is not contaminated or chipped.</p> 	<ul style="list-style-type: none"> <li>• Neither contaminated nor chipped</li> <li>• Contaminated</li> <li>• Chipped</li> </ul>	<p>Proceed to 9-c .</p> <p>Wipe off contamination with a nylon cloth moistened with alcohol. Then, proceed to 9-c .</p> <p>Replace the liquid crystal panel with a new one. Then, proceed to 9-c .</p>

## 9-c: CHECK AND REPAIR CIRCUIT BLOCK

No.	Preparation	Checking points	Result	Adjustment and Repair
①	Circuit block alone	<p>Check output signal of the circuit block. *1 Mode to be used: DC V</p> 	<p>• Output signal</p> <p>• No output signal</p>	<p>Replace the liquid crystal panel with a new one. This is the end of procedure. *2</p> <p>Replace the circuit block with a new one. This is the end of procedure. *2</p>

\* For the relationship between the segment (liquid crystal panel electrode) and the C-MOS-LSI output terminal, refer to the "PARTS CATALOGUE/TECHNICAL GUIDE" by caliber.

### Note:

- Do not check output signal of the circuit block under an incandescent lamp since strong light may cause the oscillation to stop.  
Be sure to protect the IC from light with a black cloth, etc. while measuring.
- Circuit blocks that have film-like thin plates are easily deformed. Handle them with care. Utmost care should be taken not to bend them especially when their pattern portions are clasped with IC clips. Also be careful not to scratch their pattern portions with IC clips.

- \*1. For the measuring method, refer to page 100 ("Measuring digital output signal of the circuit block").
- \*2. When the checking procedure is completed up to 9-c, make necessary adjustments or repairs on the basis of the checking results. If the trouble source has been successfully located, proceed to page 82 ("CHECKING AND ADJUSTMENT").

# 10. DISPLAY CHANGEOVER FAILURE/DISPLAY ADJUSTMENT FAILURE





## [Symptoms and Conditions]

- The display is not changed over to another by operating buttons, the rotating bezel, or the crown.
- The display is not adjusted by operating buttons or the crown.


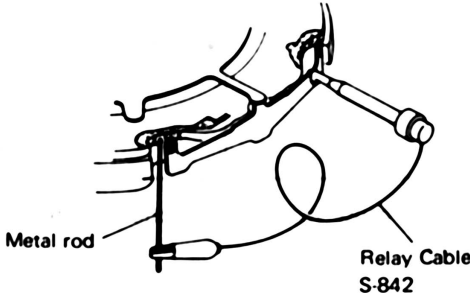
## CHECK AND REPAIR CONDUCTIVITY OF SWITCH COMPONENTS

The switch component differs, depending on each caliber.

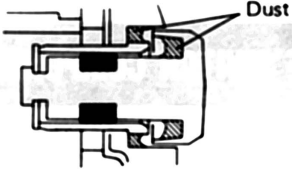
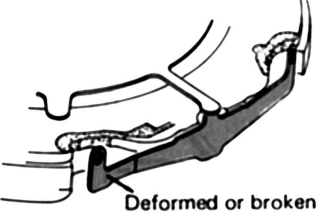
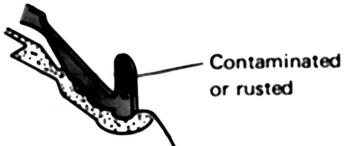
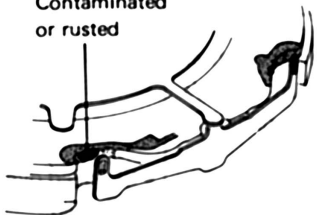
There are the following four major types. Identify the switch component type of the watch and read the corresponding item for check and repair.

Side button type	Front button type	Crown type	Rotating bezel type
			

### • Side button type

No.	Preparation	Checking points	Result	Adjustment and Repair
①	Watch complete without case back	<p>Check that the switch spring touches the switch pattern portion of the circuit block when a button is pressed.</p> 	<ul style="list-style-type: none"> <li>• Touches</li> <li>• Does not touch</li> </ul>	<p>Proceed to ② .</p> <p>Proceed to ③ .</p>
②	Module alone	<p>Check that the display is changed over to another or adjusted by conducting the circuit block's switch pattern portion to the battery connection (+).</p>  <p>Metal rod</p> <p>Relay Cable S-842</p>	<ul style="list-style-type: none"> <li>• Changed over or adjusted</li> <li>• Neither changed over nor adjusted</li> </ul>	<p>Proceed to ④ .</p> <p>Replace the circuit block with a new one. This is the end of procedure. *1</p>



No.	Preparation	Checking points	Result	Adjustment and Repair
③	Buttons and case together	<p>Check that there is no dust accumulation on the buttons and in the button holes of the case.</p> 	<ul style="list-style-type: none"> <li>• No dust accumulation</li> <li>• Dust accumulation</li> </ul>	<p>Proceed to ④ .</p> <p>Remove dust accumulation. Then, proceed to ① .</p>
④	Module alone	<p>Check that the switch springs are not deformed or broken.</p> 	<ul style="list-style-type: none"> <li>• Neither deformed nor broken</li> <li>• Deformed or broken</li> </ul>	<p>Proceed to ⑤ .</p> <p>Replace the defective switch spring with a new one. Then, proceed to ⑥ .</p>
⑤		<p>Check that the switch springs are not contaminated or rusted.</p> 	<ul style="list-style-type: none"> <li>• Neither contaminated nor rusted</li> <li>• Contaminated</li> <li>• Rusted</li> </ul>	<p>Proceed to ⑥ .</p> <p>Wash off contamination. Then, proceed to ⑥ .</p> <p>Replace the rusted switch spring with a new one. Then, proceed to ⑥ .</p>
⑥		<p>Check that the circuit block's switch pattern portions are not contaminated or rusted.</p> 	<ul style="list-style-type: none"> <li>• Neither contaminated nor rusted</li> <li>• Contaminated</li> <li>• Rusted</li> </ul>	<p>End of procedure *1</p> <p>Wipe off contamination with a nylon cloth moistened with alcohol. This is the end of procedure. *1</p> <p>Replace the circuit block with a new one. This is the end of procedure. *1</p>

**Note:** If any button does not work normally, this may cause switch malfunctions. After checking, therefore, be sure to lubricate the button gaskets with silicone oil.

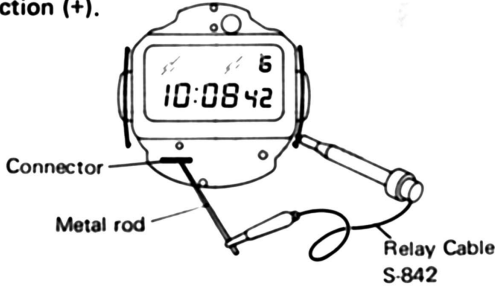
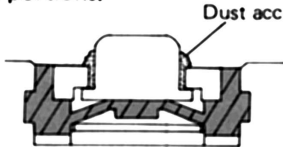
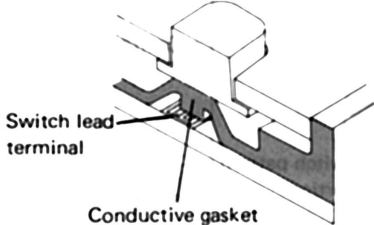
\*1. If the trouble source has been successfully located in the procedure so far, proceed to page 82 ("CHECKING AND ADJUSTMENT").

● **Front button type (Conductive gasket is used)**

The front button type can be divided into two subtypes, depending on the switch constructions: the one using switch springs and the other using conductive gaskets.

To repair those watches using switch springs, refer to the checking procedures for the side button type.

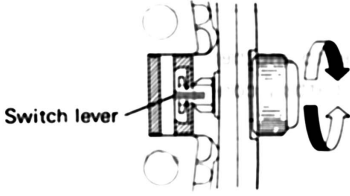
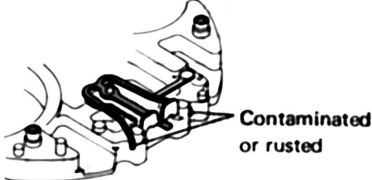
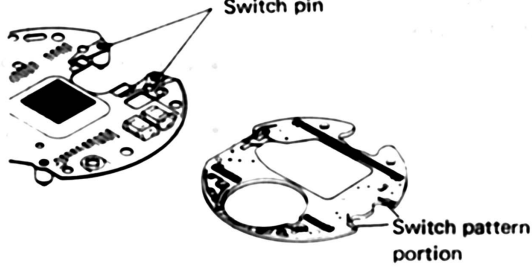

The following is the checking procedure for those watches using conductive gaskets.

No.	Preparation	Checking points	Result	Adjustment and Repair
①	Module alone	Check that the display is changed over to another by connecting the connector to the battery connection (+). 	<ul style="list-style-type: none"> <li>● Changed over</li> <li>● Not changed over</li> </ul>	Proceed to ② .  Replace the circuit block with a new one. This is the end of procedure. *1
②	Buttons and case together	Check that there is no dust accumulation on the button portions. 	<ul style="list-style-type: none"> <li>● No dust accumulation</li> <li>● Dust accumulation</li> </ul>	Proceed to ③ .  Remove dust accumulation. Then, proceed to ③ .
③	Module alone	Check that there is no dust on the contact surfaces between the switch lead terminal and the switch plate or the conductive gasket. 	<ul style="list-style-type: none"> <li>● No dust</li> <li>● Dust</li> </ul>	Proceed to ④ .  Wipe off dust with a nylon cloth moistened with alcohol. Then, proceed to ④ .
④	Connector and circuit block together	Check that the connector and the circuit block's contact surface with the connector are not contaminated.	<ul style="list-style-type: none"> <li>● Not contaminated</li> <li>● Contaminated</li> </ul>	End of procedure *1  <ul style="list-style-type: none"> <li>• Connector Wash the connector in alcohol. This is the end of procedure. *1</li> <li>• Circuit block Wipe off contamination with a nylon cloth moistened with alcohol. This is the end of procedure. *1</li> </ul>

\*1. If the trouble source has been successfully located in the procedure so far, proceed to page 82 ("CHECKING AND ADJUSTMENT").

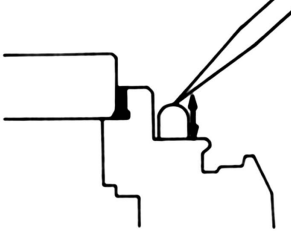
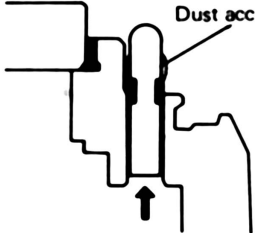


● Crown type

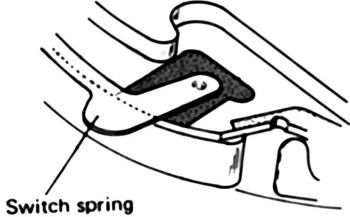
● Front button type (Conductive gasket is used)

No.	Preparation	Checking points	Result	Adjustment and Repair
①	Watch complete without case back	<p>Check that the switch lever is not deformed or broken.</p> <ul style="list-style-type: none"> <li>• Turn the crown to see if the switch lever works normally.</li> </ul> 	<ul style="list-style-type: none"> <li>• Neither deformed nor broken</li> <li>• Deformed or broken</li> </ul>	<p>Proceed to ② .</p> <p>Replace the switch lever with a new one. Then, proceed to ③ .</p>
②	Module or switch lever alone	<p>Check that the switch lever is not contaminated or rusted.</p> 	<ul style="list-style-type: none"> <li>• Neither contaminated nor rusted</li> <li>• Contaminated</li> <li>• Rusted</li> </ul>	<p>Proceed to ③ .</p> <p>Wash off contamination. Then, proceed to ③ .</p> <p>Replace the switch lever with a new one. Then, proceed to ③ .</p>
③	Module or circuit block alone	<p>Check that the circuit block's switch pins and pattern portions are not contaminated or rusted.</p> 	<ul style="list-style-type: none"> <li>• Neither contaminated nor rusted</li> <li>• Contaminated</li> <li>• Rusted</li> </ul>	<p>Proceed to ④ .</p> <p>Wipe off contamination with a nylon cloth moistened with alcohol. Then, proceed to ④ .</p> <p>Replace the circuit block with a new one. This is the end of procedure. *1</p>
④	Watch complete	<p>Check that the display is changed over to another by turning the crown.</p> 	<ul style="list-style-type: none"> <li>• Changed over</li> <li>• Not changed over</li> </ul>	<p>End of procedure *1</p> <p>Replace the circuit block with a new one. This is the end of procedure. *1</p>

\*1. If the trouble source has been successfully located in the procedure so far, proceed to page 82 ("CHECKING AND ADJUSTMENT").

● Rotating bezel type

No.	Preparation	Checking points	Result	Adjustment and Repair
①	Watch complete without rotating bezel	<p>Check that the transmission pins work normally.</p> <ul style="list-style-type: none"> <li>• Push down the transmission pins with tweezers to see if they work smoothly.</li> </ul> 	<ul style="list-style-type: none"> <li>• Normally work</li> <li>• Do not work normally</li> </ul>	<p>Proceed to ⑤ .</p> <p>Proceed to ② .</p>
②	Transmission pins and case together	<p>Check that there is no dust accumulation on transmission pin portions.</p> <ul style="list-style-type: none"> <li>• Push the transmission pins out of the case from inside to see if there is any dust accumulating on them.</li> </ul> 	<ul style="list-style-type: none"> <li>• No dust accumulation</li> <li>• Dust accumulation</li> </ul>	<p>Proceed to ③ .</p> <p>Remove dust accumulation. Then, proceed to ③ .</p>
③	Transmission pins alone	<p>Check that the transmission pin gaskets are well lubricated with silicone oil.</p> 	<ul style="list-style-type: none"> <li>• Well lubricated with silicone oil</li> <li>• Lack of silicone oil</li> </ul>	<p>Proceed to ④ .</p> <p>Lubricate them with silicone oil. Then, proceed to ④ .</p>
④	Module alone	<p>Check that the switch springs are not deformed or broken.</p> 	<ul style="list-style-type: none"> <li>• Neither deformed nor broken</li> <li>• Deformed or broken</li> </ul>	<p>Proceed to ⑤ .</p> <p>Replace the switch spring with a new one. Then, proceed to ⑤ .</p>

No.	Preparation	Checking points	Result	Adjustment and Repair
⑤	Module alone	<p>Check that the contact surfaces of the circuit block's switch pattern portion and of the switch springs are not contaminated or rusted.</p> 	<ul style="list-style-type: none"> <li>• Neither contaminated nor rusted</li> <li>• Contaminated</li> <li>• Rusted</li> </ul>	<p>If the transmission pins have been found normal in operation in step ①, replace the circuit block with a new one.</p> <p>This is the end of procedure. *1</p> <ul style="list-style-type: none"> <li>• Switch springs: Wash off contamination.</li> <li>• Circuit block: Wipe off contamination with a nylon cloth moistened with alcohol.</li> </ul> <p>This is the end of procedure. *1</p> <p>Replace the rusted part with a new one.</p> <p>This is the end of procedure. *1</p>

\*1. If the trouble source has been successfully located in the procedure so far, proceed to page 82 ("CHECKING AND ADJUSTMENT").