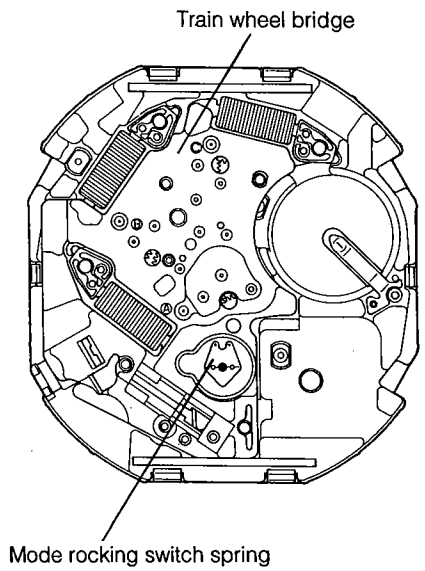
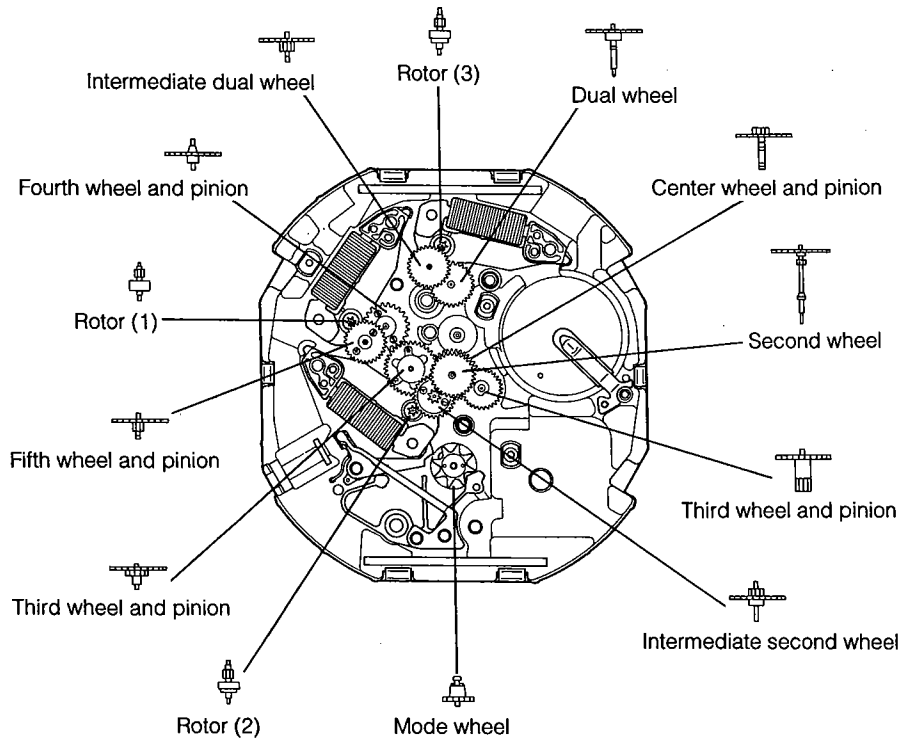
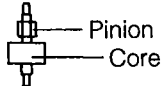


# HAND INSTALLATION PROCEDURE

Step	C310	C320
<p>① All-reset operation</p>	<p>(1) Pull out the <b>M</b> button.            (2) Press and hold the <b>A</b>, <b>B</b> and <b>C</b> buttons simultaneously for 2 seconds.            (3) Push in the <b>M</b> button to the normal position.</p>	<p>(1) Pull out the <b>M</b> button.            (2) Press and hold the <b>A</b>, <b>B</b> and <b>C</b> buttons simultaneously for 2 seconds.            (3) Push in the <b>M</b> button to the normal position.</p>
<p>② Confirmation of display of &lt;TME&gt; mode</p>	<p>(1) Press the <b>M</b> button and find out the &lt;TME&gt; mode and check the display. (Time/Calendar is displayed on the digital section.)</p>	<p>(1) Press the <b>M</b> button and find out the &lt;TME&gt; mode and check the display. (Time/Calendar is displayed on the digital section.)</p>
<p>③ Mounting of mode hand (For only Cal. C320)</p>		<p>Mount the mode hand to the center of print of "TME".</p>
<p>④ Positioning</p>	<p>(1) Press the <b>M</b> button and set the watch in the &lt;CHR&gt; mode.            (2) Pull out the <b>M</b> button.</p>	<p>(1) Press the <b>M</b> button and set the watch in the &lt;CHR&gt; mode.            (2) Pull out the <b>M</b> button.</p>
<p>⑤ Mounting of each hand</p>	<p>Mount each hand.</p> <ul style="list-style-type: none"> <li>• Function hand: 0 position (12-o'clock position)</li> <li>• 24-hour hand: 24-hour position</li> <li>• Hour and minute hands: 12:00 position</li> <li>• Second hand: 00-second position (12-o'clock position)</li> </ul> <p>After mounting the hands, press the <b>M</b> button into the normal position.</p>	<p>Mount each hand.</p> <ul style="list-style-type: none"> <li>• Function hand: 0 position (12-o'clock position)</li> <li>• 24-hour hand: 24-hour position</li> <li>• Hour and minute hands: 12:00 position</li> <li>• Second hand: 00-second position (12-o'clock position)</li> </ul> <p>After mounting the hands, press the <b>M</b> button into the normal position.</p>
<p>⑥ Confirmation of 0 position</p>	<p>(1) Set the watch in the &lt;CHR&gt; mode.            (2) Pull out the <b>M</b> button.</p> <p>If any hand is not at the 0 position, correct it by operating the buttons.</p>	<p>(1) Set the watch in the &lt;CHR&gt; mode.            (2) Pull out the <b>M</b> button.</p> <p>If any hand is not at the 0 position, correct it by operating the buttons.</p>

# PRECAUTIONS FOR DISASSEMBLY AND ASSEMBLY

Explanatory illustration	Precautions
 <p>Train wheel bridge</p> <p>Mode rocking switch spring</p>	<p>The "Mode rocking switch spring" is set to the two dowels of the mode wheel when assembling, confirm that the two holes of the "Mode rocking switch spring" are set to the two dowels of the mode wheel.</p>
 <p>Intermediate dual wheel</p> <p>Rotor (3)</p> <p>Dual wheel</p> <p>Center wheel and pinion</p> <p>Second wheel</p> <p>Third wheel and pinion</p> <p>Intermediate second wheel</p> <p>Mode wheel</p> <p>Rotor (2)</p> <p>Third wheel and pinion</p> <p>Fifth wheel and pinion</p> <p>Rotor (1)</p> <p>Fourth wheel and pinion</p>	<p>I Take every care when handling plastic parts.</p> <p>&lt;Cal. C310&gt;  Rotor (1):  Pinion: White, Core: Gold  Rotors (2) (3):  Pinion: White, Core: White</p>  <p>Pinion</p> <p>Core</p> <p>Coil unit (1) (3): Red  Coil unit (2): Blue  Stator (1) (2) (3):  All of common</p> <p>&lt;Cal. C320&gt;  Rotor (1):  Pinion: White, Core: White  Rotor (2) (3):  Pinion: White, Core: Gold  Coil unit (1) (3): Blue  Coil unit (2): Red  Stator (1) (2) (3):  All of common.</p>

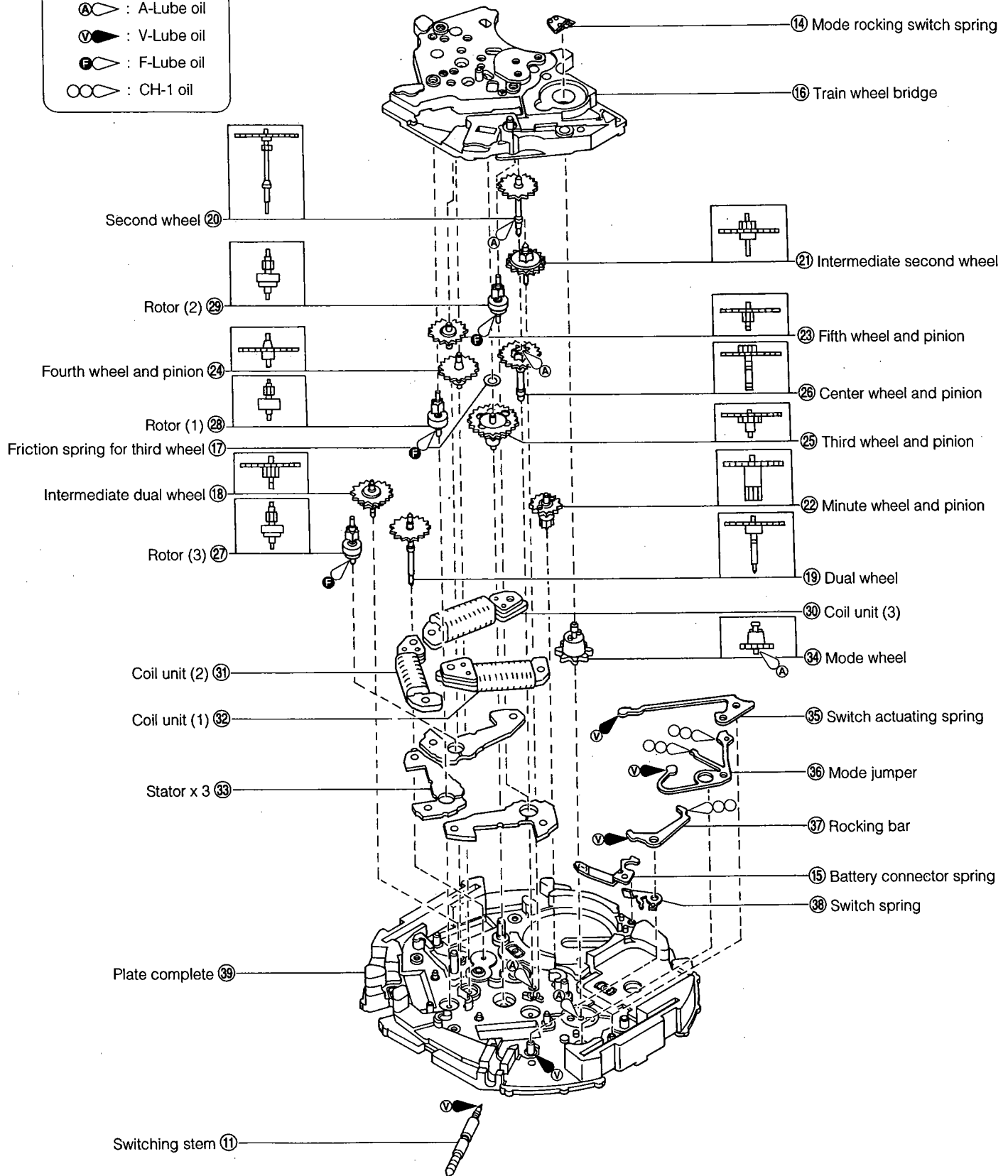
# DISASSEMBLY AND ASSEMBLY OF MOVEMENT

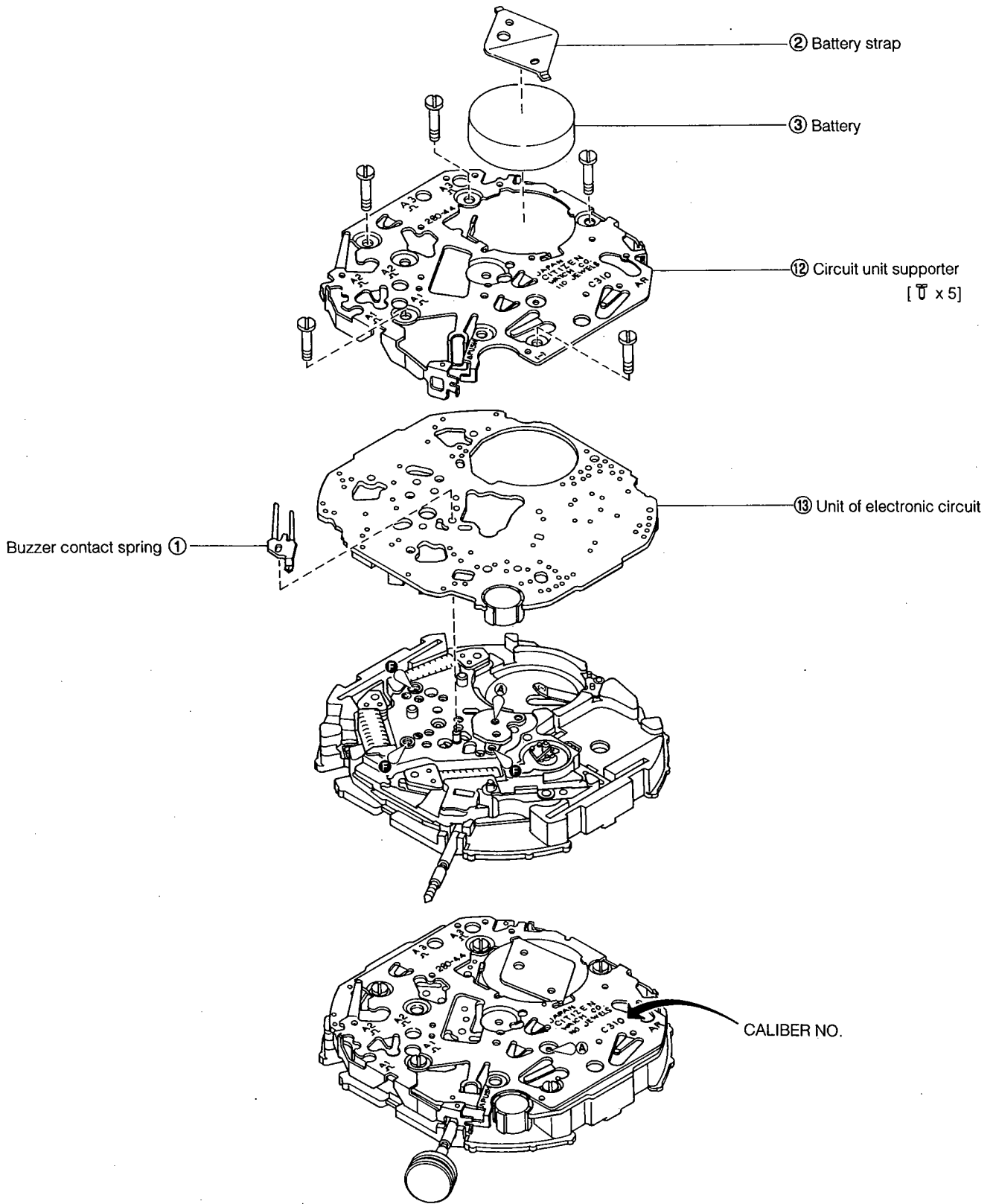
Disassembly procedure: ① → ③⑨

Assembling procedure: ③⑨ → ①

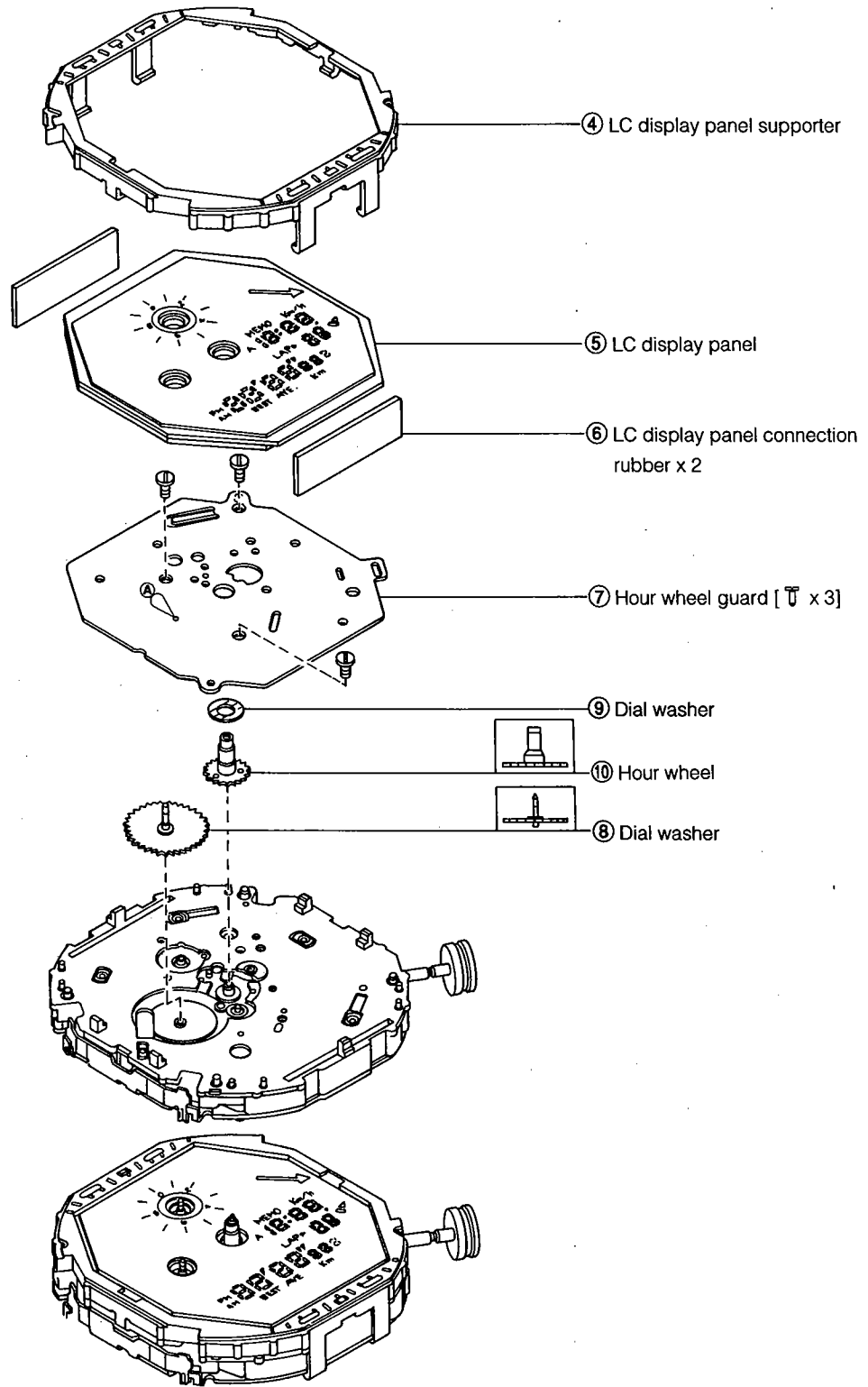
● Lubrication mark

▲ : A-Lube oil  
 ▼ : V-Lube oil  
 ● : F-Lube oil  
 ○○ : CH-1 oil

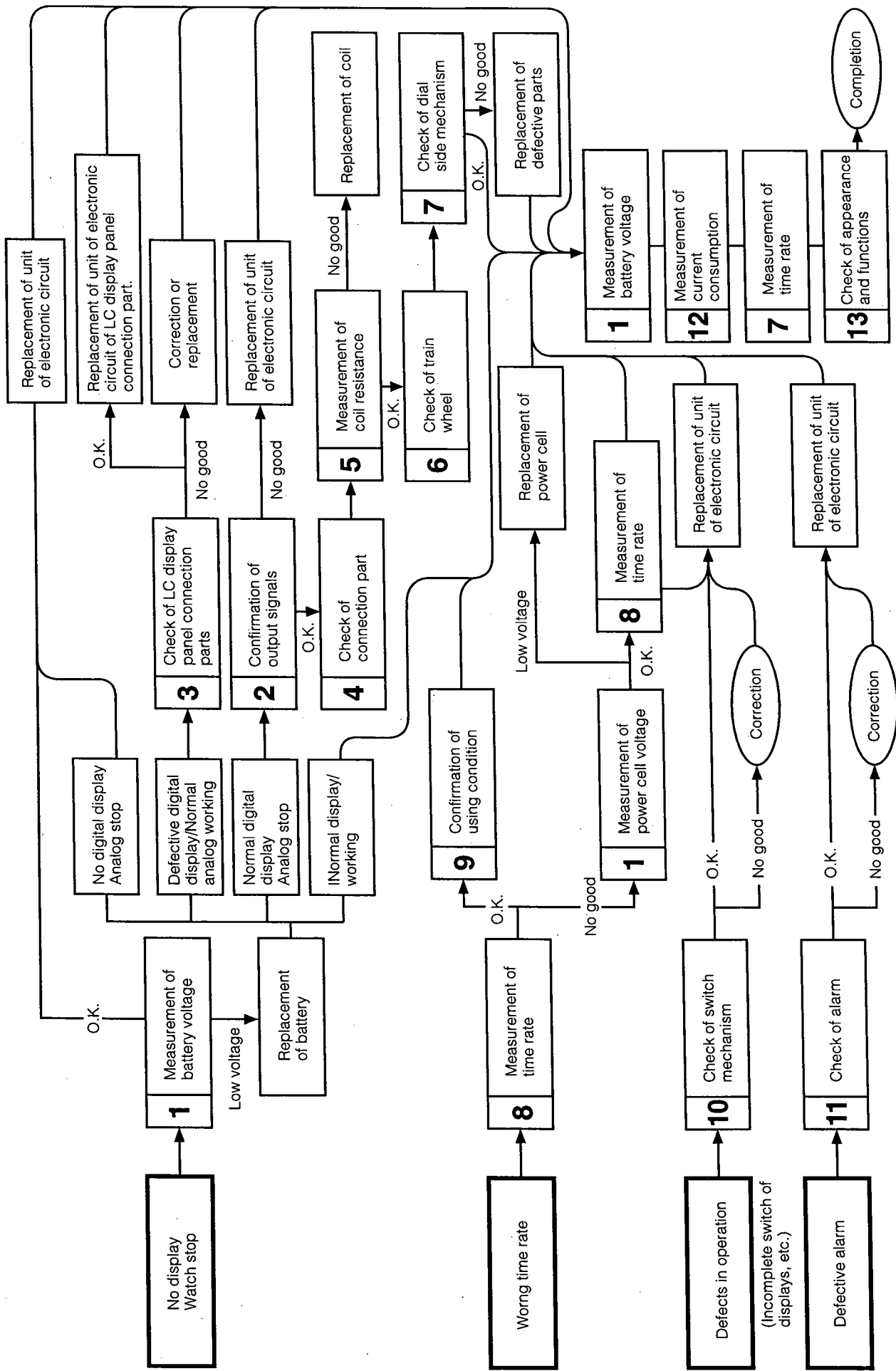


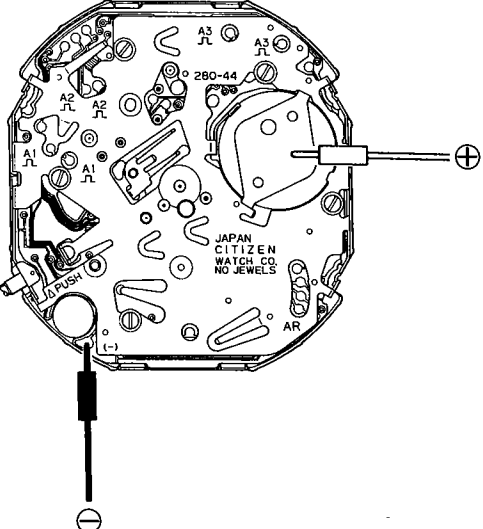
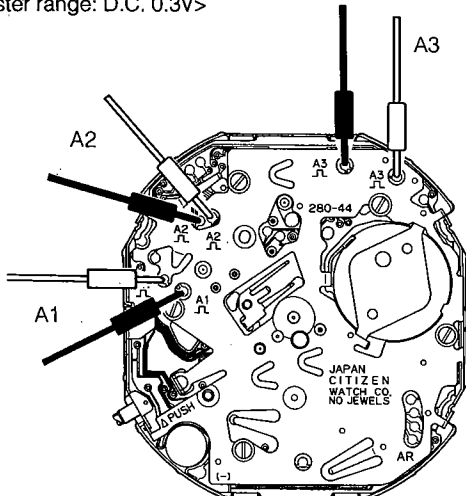


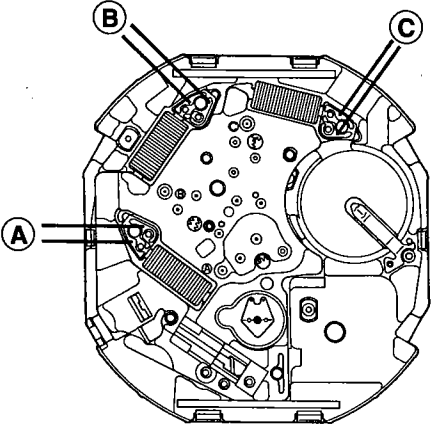
• Use the movement holder Cal. C30.



# TROUBLESHOOTING AND ADJUSTMENT

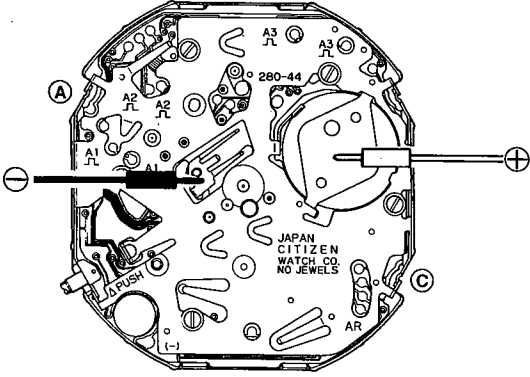


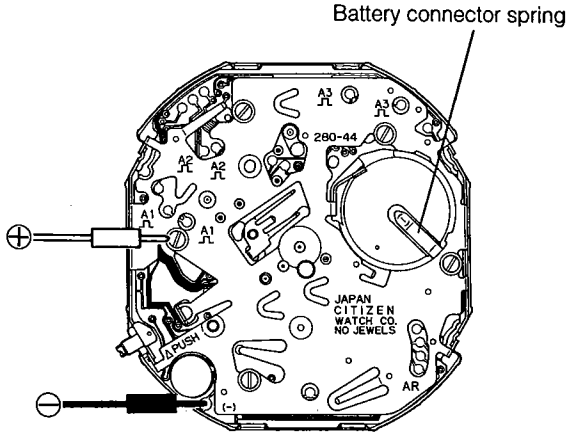
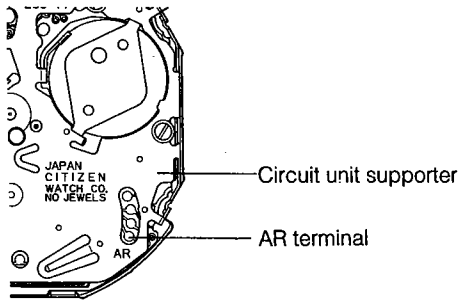
Check Items	How to Check	Results and Treatment
<p>① Measurement of battery voltage</p>	<p>* Refer to Technical Manual Basic Course II-1-a. &lt;Tester range: D.C. 3V&gt;</p> <ul style="list-style-type: none"> <li>• Common to CAL. C310 and C320</li> </ul> 	<p><b>Over 1.5 V</b> → Non defective</p> <p><b>Under 1.5 V</b> → Replace the battery</p>
<p>② Confirmation of output signal</p>	<p>* Refer to Technical Manual Basic Course II-1-b. &lt;Tester range: D.C. 0.3V&gt;</p> <ul style="list-style-type: none"> <li>• Common to CAL. C310 and C320</li> </ul> <p>Confirmation of A1 and A2 output signals</p> <ol style="list-style-type: none"> <li>① Press the <b>M</b> button and set the watch in the "TME" mode.</li> <li>② Confirm the output signals by the A1 and A2 patterns shown in the figure below. A1: Output signal of second hand motor (1 time/sec) A2: Output signal of hour/minute hand motor (1 time/20 sec)</li> </ol> <p>Confirmation of A3 output signals</p> <ol style="list-style-type: none"> <li>① Press the <b>M</b> button and set the watch in the "CHR" mode.</li> <li>② Press the <b>A</b> button to start the chronograph.</li> <li>③ Confirm the output signal by the A3 pattern shown in the figure below. A3: Output signal of function hand motor (Continuous output: Within 1 minute after start)</li> </ol> <p>&lt;Tester range: D.C. 0.3V&gt;</p>  <p>(The tester lead pins have no polarity)</p>	<p><b>Tester pointer swings.</b> → Non defective</p> <p><b>Tester pointer does not swing.</b> → Check of conection part</p>

Check Items	How to Check	Results and Treatment
<p>③ Check of LC display panel connection parts</p>	<p>* Refer to Technical Manual Basic Course II-2-a, Digital section.</p> <p>— Preparation for check —</p> <p>Pull the <b>(M)</b> button and press the <b>(A)</b>, <b>(B)</b> and <b>(C)</b> buttons at the same time, and all the segments light up. (If the <b>(M)</b> button is returned, this condition is reset.)</p> <p>— Check —</p> <ul style="list-style-type: none"> <li>• Check of all segments Check all the segments for a defect.</li> <li>• Check of continuity of LC display panel, its connection rubber and plate complete Check each part for stain, breakage, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• The LC display panel, its connection rubber or plate complete is not installed normally → Re-install</li> <li>• There is dirt or stain → Remove dirt and stain</li> <li>• A part is cut, broken or scratched → Replace defective parts</li> </ul>
<p>④ Check of connection part</p>	<p>* Refer to Technical Manual Basic Course II-1-a, Analog section.</p>	
<p>⑤ Measurement of coil resistance</p>	<p>* Refer to Technical Manual Basic Course II-1-c.</p> <p>— Preparation for measurement —</p> <ul style="list-style-type: none"> <li>• Remove the electronic circuit to measure the coil resistance.</li> </ul> <p>— Measurement —</p> <ul style="list-style-type: none"> <li>• The tester lead pins have no polarity.</li> </ul>  <p style="text-align: right;">&lt;Tester range: R x 10&gt;</p>	<p>Cal. C310</p> <ul style="list-style-type: none"> <li>• Resistance of each of coils <b>(A)</b> and <b>(C)</b> is <b>1.9 kΩ ~ 2.3 kΩ</b> → Nondefective</li> <li>• Resistance of coil <b>(B)</b> is <b>1.1 kΩ ~ 1.6 kΩ</b> → Nondefective</li> <li>• Out of above range → Replace the coil unit.</li> </ul> <p>Cal. C320</p> <ul style="list-style-type: none"> <li>• Resistance of each of coils <b>(A)</b> and <b>(C)</b> is <b>1.1 kΩ ~ 1.6 kΩ</b> → Nondefective</li> <li>• Resistance of coil <b>(B)</b> is <b>0.5 kΩ ~ 0.9 kΩ</b> → Nondefective</li> <li>• Out of above range → Replace the coil unit.</li> </ul>
<p>⑥ Check of train wheel</p>	<p>* Refer to Technical Manual Basic Course II-2-b.</p> <ul style="list-style-type: none"> <li>• Check the gears and rotors for dust and oil.</li> <li>• Check the plastic parts and pinions for crashing, deformation, bend of shaft, etc.</li> </ul>	



Check Item	How to Check	Results and Treatments
<b>7</b> Check of dial-side mechanism	<ul style="list-style-type: none"> <li>* Refer to Technical Manual Basic Course II-2-c.</li> <li>• Check the parts for deformation and confirm that they are lubricated well.</li> </ul>	
<b>8</b> Measurement of time rate	<ul style="list-style-type: none"> <li>* Refer to Technical Manual Basic Course II-2-d. &lt;Measurement range: Analog 10 seconds&gt;</li> <li>• The time rate cannot be adjusted.</li> </ul>	This time gains or loses largely. → Replace the electronic circuit unit.
<b>9</b> Confirmation of using condition	<ul style="list-style-type: none"> <li>* Refer to Technical Manual Basic Course II-2-e.</li> </ul>	
<b>10</b> Check of alarm mechanism	<ul style="list-style-type: none"> <li>① Check of movement             <ul style="list-style-type: none"> <li>• Push the switch return spring of the circuit unit supporter with tweezers, etc. to bring it contact with the pattern of the plate complete to confirm the switching function.</li> <li>• Check for removal of the pattern from the electronic circuit and the switch return spring for deformation.</li> </ul> </li> <li>② Check of push buttons             <ul style="list-style-type: none"> <li>• Check the push buttons for deformation and dirt.</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>Caution:</b> Apply silicone oil to the packings of the push buttons without fail. It is necessary for maintenance of water resistance and smooth operation.</p> </div>	<ul style="list-style-type: none"> <li>• No problems in switch mechanism → Check the push buttons</li> <li>• Any push button is dirty or deformed → Clean or replace the push button</li> </ul>

Check Item	How to Check	Results and Treatments
<p>① Check of alarm</p>	<p>* Refer to Technical Manual Basic Course II-1-d.</p> <p>— Preparation for check —</p> <p>① Set the movement in the case with the case back removed.</p> <p>② Press the <b>M</b> button to select "ALM" mode.</p> <p>— Check —</p> <p>③ Apply the positive <math>\oplus</math> lead pin to the battery surface and the negative <math>\ominus</math> lead pin to the buzzer contact spring, and push and hold the <b>A</b> and <b>C</b> buttons simultaneously. (In the case of Cal. C310, press and hold the <b>C</b> button.)</p>  <p style="text-align: center;">&lt;Tester range: D.C. 0.3V&gt;</p> <p>④ If the alarm output is normal, perform the following checks.</p> <ul style="list-style-type: none"> <li>• Check the piezo-electric element of the vibrating plate for cracking and breakage.</li> <li>• Check the buzzer contact spring for bend and deformation.</li> </ul>	<ul style="list-style-type: none"> <li>• Tester pointer does not swing → Replace the unit of electronic circuit</li> <li>• Tester pointer swings → Nondefective</li> </ul> <p style="text-align: center;">↓ Go to ④. ↓</p> <p>If no defects are found, install the buzzer contact spring correctly.</p>

Check Item	How to Check	Results and Treatments
<p>⑫ Measurement of current consumption</p>	<p>* Refer to Technical Manual Basic course II-1-f.</p> <p>— Preparation for measurement —</p> <ol style="list-style-type: none"> <li>① Set the battery to the tester.</li> <li>② Press the <b>M</b> button to select "TME" mode.</li> <li>③ Set the test lead pins to the movement.</li> </ol>  <p style="text-align: center;">Battery connector spring</p> <p>* Use the minus pattern of the movement. If the battery connector spring is pushed too strongly, it will be shorted to the 24-hour wheel and current consumption cannot be measured correctly.</p> <p>— Measurement —</p> <ul style="list-style-type: none"> <li>• Short the AR terminal to the circuit unit supporter to perform the all-reset operation.</li> </ul> <p style="text-align: right;">&lt;Tester range: D.C. 10μA&gt;</p>  <p style="text-align: center;">Circuit unit supporter AR terminal</p> <p>* Precautions for measurement of current consumption.</p> <ol style="list-style-type: none"> <li>① When the tester lead pins are applied, abnormally large current flows and the meter exceeds the maximum point for a moment. This does not indicate a trouble. In this case, start the measurement with the tester at a higher range, then change the range one step by one.</li> <li>② If the movement is exposed to the light of an incandescent lamp or the sun, more current may be consumed and the watch may not function normally.</li> </ol>	<p>&lt;Common to CAL. C310 and C320&gt;</p> <ul style="list-style-type: none"> <li>• Current consumption of the movement</li> </ul> <p><b>Under 3.0 μA</b> → Non defective</p> <p><b>Over 3.0 μA</b> → Check and clean the train wheel and dial-side mechanism.</p> <p style="text-align: center;">↓</p> <ul style="list-style-type: none"> <li>• Current consumption measured again</li> </ul> <p><b>Over 3.0 μA</b> → Replace the electronic circuit.</p>
<p>⑬ Check of appearance and functions</p>	<p>* Refer to Technical Manual Basic course II-2-f.</p> <ul style="list-style-type: none"> <li>• Check the inside of the case for dirt.</li> <li>• Confirm that each correcting switch works normally.</li> <li>• Confirm that all the segments are normal.</li> </ul>	