BATTERY TESTING GUIDE

STEP 1: Carry out a visual test

1A  Is the battery leaking?

YES  Continue to 1B.

NO  Battery with caps: continue to Step 2. Battery without caps: continue to Step 3A.

1B  Are there any signs of impact, shock or excess pressure around the area of the leak?

YES  The battery cannot be returned to us. Check for potential problems such as the wrong voltage or excess dust or dirt on the battery surface.

NO  There isn’t a “No” option in the copy doc.

STEP 2: Check the specific gravity

In a well-functioning battery, the specific gravity should be the same in every cell. Before checking, please take a few minutes to read the charger and battery instructions.

2A  Has the specific gravity fallen sharply in one of the cells?

YES  The battery cannot be returned to us. Check for potential problems such as the wrong voltage or excess dust or dirt on the battery surface.

NO  There isn’t a “No” option in the copy doc.

2B  Is the acid a muddy brown colour and is water consumption consistently high?

YES  Continue to 2C.

NO  Charge the battery and continue to 2D.

2C  Is the specific gravity equal in all cells and greater than 1.25 kg/dm³?

YES  Charge the battery and follow the above.

NO  Charge the battery and continue to 2D.

<table>
<thead>
<tr>
<th>Specific gravity in kg/dm³ at a temperature of 27°C</th>
<th>State of charge of the battery</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.25 – 1.28</td>
<td>Charged</td>
<td>Consider checking</td>
</tr>
<tr>
<td>1.20 – 1.24</td>
<td>Half charged</td>
<td>Charging recommended</td>
</tr>
<tr>
<td>1.19 or less</td>
<td>Insufficiently charged</td>
<td>Charge immediately</td>
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2D  Is the power consumption equal to at least one twentieth of the nominal capacity? (E.g. for a 100 Ah battery: 100 Ah x 1/20 = 5 A.)

YES  The battery is in good working order.

NO  The battery is damaged by negligent and improper storage, usage or installation.

STEP 3: Do a high rate discharge test

Only conduct this test if the specific gravity is even and at least 1.25 kg/dm³; otherwise charge the battery first. Refer to the battery tester’s instruction manual when testing.

For discharge testers with adjustable resistances: test the battery at approximately three times the battery’s nominal capacity for around 10 seconds (e.g. a 12 V, 45 Ah battery should be tested with a load current of approx. 135 A). During the test, there should be no significant fluctuations in voltage.

3A  Does the high rate discharge test show that the battery is faulty or needs replacing?

YES  Replace the battery and return it to us.*

NO  The battery is in good working order.

3B  Has the specific gravity fallen sharply in one of the cells?

YES  Fully charge the battery and continue to either Step 3A or 3B. If the specific gravity reading is still 1.24 kg/dm³, the battery is fully charged; it cannot be returned as the reduced reading is the result of normal wear and tear.

NO  The battery cannot be returned to us. Check for potential problems such as the wrong voltage or excess dust or dirt on the battery surface.

3C  Is the specific gravity equal in all cells and greater than 1.25 kg/dm³?

YES  The battery is fully charged and ready to use.

NO  Charge the battery and then repeat the test. If the same message appears after the second test, replace the battery.*

4A  Are any signs of impact, shock or excess pressure around the area of the leak?

YES  The battery cannot be returned to us. Check for potential problems such as the wrong voltage or excess dust or dirt on the battery surface.

NO  There isn’t a “No” option in the copy doc.

4B  Is the acid a muddy brown colour and is water consumption consistently high?

YES  Continue to 4C.

NO  Charge the battery and continue to 4D.

4C  Is the specific gravity equal in all cells and greater than 1.25 kg/dm³?

YES  Charge the battery and continue to 4D.

NO  Charge the battery and continue to 4D.

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4D  Is the power consumption equal to at least one twentieth of the nominal capacity? (E.g. for a 100 Ah battery: 100 Ah x 1/20 = 5 A.)

YES  The battery is fully charged and ready to use.

NO  Charge the battery and then repeat the test. If the same message appears after the second test, replace the battery.*

Interpreting results

<table>
<thead>
<tr>
<th>Reading</th>
<th>Result</th>
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<tr>
<td>GOOD</td>
<td>The battery is fully charged and ready to use.</td>
</tr>
<tr>
<td>GOOD + RECHARGE</td>
<td>Once the battery has been charged, it will be ready to use.</td>
</tr>
<tr>
<td>CHARGE + RETEST</td>
<td>Charge the battery and then repeat the test. If the same message appears after the second test, replace the battery.*</td>
</tr>
<tr>
<td>REPLACE THE BATTERY</td>
<td>Battery replacement recommended.*</td>
</tr>
<tr>
<td>No reading given</td>
<td>First, check that the measuring cable is properly connected. If it is, the battery may be deeply discharged. Charge the battery and repeat the test. If conducting the test in the vehicle, turn off all electrical devices.</td>
</tr>
<tr>
<td>No reading given after</td>
<td>Replace the battery.*</td>
</tr>
<tr>
<td>following the above</td>
<td></td>
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</table>

General points to remember about testing devices:

The device calculates the results as “good” or “replace” based on the state of charge and the available starting power. This means a battery with 45% starting power can be rated as good and a battery with 75% starting power as needing replacement.

The starting power represents the difference between the low-temperature testing current entered into the machine and the current that the machine actually measures. It can exceed 100%.

*About returns: You can get the full return procedure and warranty conditions from your VARTA representative, but the key points to remember are:
  1. Battery replacements under warranty can’t be made as result of:
     • Normal wear and tear.
     • Failure to follow the instruction manual.
     • Negligent and improper storage, usage or installation.
     • Unauthorized modifications to the battery.

  2. Of course, the period of use, temperature and the application of the battery play a crucial role in determining whether it reaches its maximum service life. We’ll bear this in mind when authorising a return.