

# Battery testing — state of charge versus capacity

*Two different questions, two different tests, and why a fully charged battery can still fail the one that matters.*

## PROCEDURE

- 1 Remove the surface charge**  
Headlights on for a minute or two, then off, then wait a few minutes before reading.
- 2 Read open circuit voltage**  
Compare to the state of charge table below.
- 3 Charge first if needed**  
Below about 75%, charge before testing capacity or you will condemn a good battery.
- 4 Load or conductance test**  
Half of CCA for 15 seconds, watching that voltage stays above about 9.6 V at room temperature.
- 5 Test bank members separately**  
Disconnect them from each other first, or a good battery will mask a bad one.

## NUMBERS

|                  |                             |                                            |
|------------------|-----------------------------|--------------------------------------------|
| 12.6 V or higher | <b>100% charged</b>         | at rest, surface charge removed            |
| 12.4 V           | <b>about 75%</b>            | charge before capacity testing             |
| 12.2 V           | <b>about 50%</b>            |                                            |
| 12.0 V           | <b>about 25%</b>            | sulfation risk if left here                |
| Load test pass   | <b>above 9.6 V at 70 °F</b> | half CCA for 15 s; lower limit in the cold |
| Cranking minimum | <b>above 9.6 V</b>          | measured at the battery while cranking     |

## COMMON MISTAKES

- Testing capacity on a discharged battery and condemning it.
- Reading voltage straight off the charger and calling it fully charged.
- Testing a parallel bank as one unit, so a good battery hides a failing one.
- Replacing one battery in an aged bank and expecting it to last.

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