When to Replace Your Car Battery?

By Les Waganer and Matt Miller

We all rely on a 6-volt or a 12-volt battery in our Corvette to reliably start our engines and keep all our electrical systems functional. It is a minor disaster when you go to start your car and all you hear is “click – click”. On the other hand, it is a minor inconvenience to actually replace a battery. So how do you know when your battery is about to fail?

Short answer: you will not know when it will fail.

Will the car voltmeter help? The newer Corvettes have a voltmeter in the car that shows the voltage at the battery connections. You can also use a hand-held voltmeter on the battery terminals. A fully charged, healthy 12-Volt lead-acid automotive battery will usually put out around 12.7 to12.8 volts with the generator or the alternator not running (stopped engine). I believe the C1 Corvettes employed generators and the C2s and higher used alternators. Below are the voltage levels versus the percentage of full charge for 12-Volt automotive batteries. To obtain a true reading, it is suggested to turn on your headlights for a few seconds to bleed off a surface charge. The battery voltage can be best determined with a hand-held digital multimeter or voltmeter. The voltage read will indicate the battery state of charge, not the health of the battery.

Voltage	Percentage of Full Charge
12.7	100%
12.46	80%
12.32	60%
12.12	40%
11.98	20%

To determine the health of the charging system, have the car running and the car’s voltmeter should read around 14.5 V if the battery is not at full charge – that is the voltage supplied by a healthy charging system. If the voltage is not around 14.5 V, the alternator may be bad or the belt on the alternator belt might be loose or the voltage regulator may be bad. As the battery becomes more fully charged from the charging system, the charging voltage is reduced to not overcharge the battery.

The next step is the battery load test - The most accurate way to measure the health of the battery is to do a load test on it periodically, but even that will not predict a sudden failure in all instances. Most automotive parts stores will do a free battery load test. So this is a good test if you think you have a battery or charging system problem.

Check the terminal connections – Checking all the battery and charging system cable connections should be one of the first things to be checked. First visually check the battery terminal connections as they can corrode and cause a poor connection. Check with the voltmeter on both sides of the connection and both sides should have the same voltage – if not, you may have found the problem. Clean and retighten, then recheck the connection.

Checking all the remaining charging system connections is more difficult and an unlikely source of your problem, but it should be checked as the last resort.

What other problems could cause a no-start condition? – A failing battery or charging system are the two most likely suspects when your car fails to crank. However, it is also possible that a malfunctioning electrical component is draining your car's battery while it is parked. For example, if the A/C clutch relay sticks in the closed position, the car may continue to send electrical power to the compressor clutch even after you shut it off. If your car will not crank, but the battery and charging system both check out as "good," then it is time to check for wayward current draw on the battery when the car is shut off. While some do-it-yourselfers have the equipment and knowledge to check for this, most people will refer this problem to a qualified mechanic.

When should I change my battery? – Assuming your battery is OK, but old, and your car's charging system is working fine, when should you remove your old battery that still seems to do the job and purchase a new battery?

If you want to reduce the likelihood of getting stuck with a dead battery, carry a portable power pack with you, and charge the car battery when the car battery cannot start the car. However, this is your wakeup call to check the charging and electrical system and if no other problems are identified, you may need to get a new battery.

Of course, it is still a judgment call as to when to replace a "perfectly good" car battery.

- If you are a very risk-averse person, then replace it when it's around four years old.
- If you're only moderately risk-averse, you may wish to change it at five years.
- If you're rather daring but don't want to go to extremes, replace it at six.

These recommendations assume the battery is well cared for, and that the enviromental conditions are pretty nominal. If you have an unfortunate habit of occasionally doing something that completely drains the battery, its lifespan will probably be shortened – so plan accordingly. And if the car is kept someplace that experiences extreme temperatures, that will likely reduce its useful life as well.

Which replacement battery is best – This topic is a very personal decision and there are a lot of discussions devoted to this subject. Therefore this topic will be reserved for another day.