



Ralph Seekins

From lawnmowers to the family wagon, our family – like most American families – has a number of vehicles with electrical systems. And, in each case, the vehicle has at least one battery – my truck has two. Most of those batteries are of what is called the “lead-acid” type. Let’s see if I can provide a general explanation of how these batteries work.

The typical vehicle battery is made up of a number of galvanic cells hooked together in series inside a polypropylene case to provide a specified voltage. Each galvanic cell provides about 2.1 volts of electricity when charged. So what we call a 6 volt battery would have three cells and what we call a 12 volt battery would have 6 cells.

Each galvanic cell in a lead-acid battery contains a solution made up of about 35% sulfuric acid and 65% water with a measurable specific gravity of 1.270 at 60 degrees Fahrenheit. This solution is called an electrolyte. Then, suspended in the electrolyte are lead plates (negative) and lead dioxide plates (positive) of approximately the same size. The

Battery Health

plates in the electrolyte causes a chemical reaction that produces electrons by converting chemical energy into electrical energy. As electrons are pulled out of the battery, the sulfur in the acid is deposited on the lead plates and the electrolyte becomes more water than acid. As the battery is recharged, the sulfur goes back into solution and the electrolyte regains its maximum acid condition.

One of my early mechanic instructors described a battery as a sort of a piggy bank. It starts out with a bunch of coins in it but, if you keep taking them out without putting anything back in, pretty soon there’s nothing there. And, since a vehicle’s entire electrical system runs off the battery, when the piggy bank is empty, you’re in big trouble.

So, keeping your vehicle’s battery in good condition is vital – particularly in the cold weather months as you and I many times are drawing a lot of power for the headlights, heater motor, rear defroster, radio and more while driving at slower speeds. In that case, we are drawing down the battery and, as discussed above, we are turning an acid solution that doesn’t easily freeze into a more water solution that will freeze. When 40% charged, the electrolyte will freeze at about -16F. Fully charged it won’t freeze until approximately -92F. And, when the electrolyte freezes, it can cause internal damage that cannot be repaired.

Today, because of the high electrical use modern vehicles demand, batteries are larger with greater capacity than in years past. However, average battery life has become shorter because of that same increased demand. If you have a battery in a car or truck in Interior Alaska that is three years old, think seriously about replacing it. Statistics show that less than 30% of all batteries remain good up to 48 months.

Here’s what I advise. When you are in for scheduled maintenance, make sure you ask for battery maintenance and a check of your vehicle’s battery condition – particularly before the first snows hit the ground. Many automotive service facilities – such as our Quicklane Auto and Tire Center – will check your battery every time it is brought to them and will alert you to any abnormality. You would probably be surprised how many “no-start” conditions are brought to our service department that trace directly to a failed or aged battery. The cost of the tow in most cases, would have been more than enough to have bought several new batteries. If you are a do-it-yourselfer, stay tuned. We’ll talk about getting your car or truck ready for winter in just a few short weeks.

Ralph Seekins has more than 41 years' experience in the automotive industry. He started as a mechanic, worked in sales, and for the past 34 years, has been the owner of Seekins Ford Lincoln.