

VOLTS, AMPS AND WHERE TO STORE THEM

Written by Marty Ellison

The muscle we use to start our cars has not changed much since the first “horseless carriage” appeared. In the beginning, was the “Armstrong” starter which consisted of a steel crank and a person with a strong arm, and probably damaged knuckles from the occasional kick-back. Other methods of starting those early engines were wind up springs and even gunpowder which burned in a special cylinder. The first US patent issued for an electric starter was issued to Clyde Coleman in 1903. Since that time, all automotive starters have been powered by lead-acid batteries.

As a simplified explanation, a battery is a chemical machine that both consumes and releases energy through chemical reaction. Think of it as a box that stores electrical energy for starting the motor, run-ning the lights, radio and other accessories. The box contains two sets of lead plates surrounded by an electrolyte, sulfuric acid. When the battery is fully charged, the plates connected to the negative terminal are all lead, those connected to the positive plates are lead dioxide. Both plates are fully surrounded by sulfuric acid. When fully discharged, both plates become lead sulfate, and the electrolyte becomes mostly water. As a result, batteries neglected over the winter months are vulnerable to freezing and damage as water expands when frozen and can crack the battery case. “Flooded” batteries, those that have removable caps to gain access to the battery well, require occasional servicing to maintain the electrolyte at a

proper level. Since the caps are vented, the sulfuric acid electrolyte can spill onto the battery tray if overcharged or mishandled.

Most batteries sold today are sealed and do not require servicing with acid or water. Absorbent Glass Mat (AGM) batteries use a higher purity lead, separated by a fiberglass mat which is soaked with electrolyte. This design provides more surface area in contact between the electrolyte and the plates. Because they are sealed, they can be mounted in any orientation and handled without concern for spillage of acid.



One battery very popular today is the Optima, a product of Johnson Controls International. It’s distinguishing feature is the “six-pack” cylinder molded from virgin polypropylene. A tightly rolled “cinnamon roll” assembly of lead/glass mat/lead sheet is pressed into each cylinder with each lead sheet connected to a neighboring cylinder in series. The positive sheet of one connected to the negative sheet of the other in series. Each cylinder produces about 2.15 volts and when all are joined, the battery produces just under 13 volts when fully charged. Optima also produces a

“three-pack” for those of us driving 6 volt cars.

One characteristic of the Optima battery is that it has much lower internal resistance. This will be noticeable the first time you turn your engine over as it will spin much faster. Under load, the voltage drop at the battery terminals will be less, so there will be more amps available to your starter. Something to consider if you’re sorting out fuel/carburetor problems. Grinding away on the starter for prolonged periods can cause damage from overheating of the starter.

As fine a battery as these new AGM wonders are, they don’t look anything like the old “tar-top” batteries our classics came with from the factory. Several vendors offer “sealed” AGM batteries in black ABS cases which are then “badged” to simulate early Delco, Autolite, or other OEM batteries. One such company, Specialty Battery Sales, made a presentation to the PNR members at the August meeting. Kirk White, President brought along a selection of battery boxes

modified to fully contain an Optima Redtop 34/78 battery. The box cover has holes drilled for the Optima terminals to protrude and is then sealed. Holes are drilled in the appropriate location to duplicate the vent caps which Kirk has 3D printed with appropriate detailing. Many of the early tar-top batteries had lead crossover ties that join one cell to an adjacent cell. Kirk has these crossovers 3D printed from a gray looking plastic that duplicates the lead crossovers. The result is a potent power pack in a convincing period package.

