

BATTERY STORY

So what is the purpose of this article? To offer some suggestions on how to maximise the life and performance of your car battery. I assume you know about electrical hygiene, ie keeping the earth points and the insides of the battery terminal clamps clean, since a hard insulating layer can build up where copper meets lead or steel.

Just as the doctor checks your "resting" blood pressure, so battery voltages should only be checked after a battery has rested, or more correctly, stabilised, which must be after at least 5 or 6 hours, although some batteries may take up to 12 hours to stabilise. If you have a fleet, it is interesting to charge each battery (in the car) then check the voltage of each after 12 hours. You will see the differences, the very good, the good, the average and the suspects.

The generally accepted voltage for a good battery rested overnight is 12.7 volts, a few will show 12.8 due to rounding up, ie 1251 rounds up to 12.8.

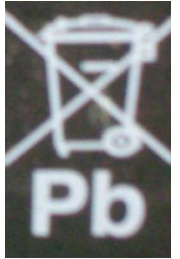
In an ideal world an SLI (Starting, Lighting, Ignition) battery should not be discharged more than 40%, ie 60% charge remaining, which equates to a resting voltage of about 12.2. Some say dropping to 40% charge (around 12.0 volts) would do negligible harm. Leaving the battery partly discharged speeds up the deterioration. Remember each time the battery is used some deterioration takes place, otherwise it would last forever. Deep cycle batteries can be 80 to 90% discharged, then safely charged back up again. Batteries are tested (random samples) to see how many cycles of charge and discharge they will tolerate until they will only hold 80% of their new capacity. If on a long trip, you stop for a meal break and on returning to the car find the lights still on and the car failing to start, turn everything off, wait 20 to 30 minutes and 9 times out of 10 the battery will have recovered (stabilised) enough to start the car.

Chargers. The old school charger with an ampmeter on the front is a constant voltage charger, when the battery voltage was low a high current flowed, and as the battery recovered the current dropped until charger and battery voltage matched so no current flowed (charger must have higher voltage than the battery to force the electrons into the battery). There are those who have branded the modern mobile phone "the smart phone" similarly, the modern charger has been called the "smart charger". These have a processor that checks the condition and type of battery, then they send pulses of constant current (supposedly to agitate the lazy electrons) and automatically switch to float mode when the battery seems full (by measuring its voltage). Most operate in 3 to 6 stages, some claiming to have a "rejuvenation" cycle to revive sick batteries. Personally I would rather buy a new battery, than try to squeeze another week's life out of an old, suspect battery.

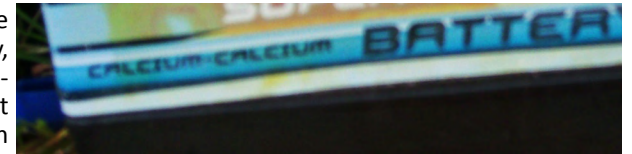
There are a couple of disadvantages to the smart charger. For the same AMP rating, the smart charger will charge much slower than the old school charger, because the smarty is pulsing on and off, not a continuous flow like the old charger. If you come home and accidentally leave a door partly closed so the interior light is left on and drains the battery completely, the smart charger will conclude "no volts no battery connected to me". So you will have to drag out old faithful to put some charge in the battery to fool the smart charger into action..

Batteries. A plastic version of the traditional lead acid battery with a removable cap on each

cell to top up the electrolyte with distilled water, is on the way out because of health and environmental reasons, although some Asian manufacturers have used them on budget models up until recently. They are denoted by the symbol for lead (Pb) over or under a crossed out image of a rubbish bin, indicating users should not just throw them away. The reason they are still available is that in many less developed countries the people can only afford the lowest cost battery, as well as having some rough and ready vehicles whose charging system might not be very kind to the more sophisticated batteries.



The most common battery around now is the so called "calcium" battery, it only has a tiny amount of calcium added to the lead. It is denoted by the word calcium on its label or the calcium symbol (Ca) again over the image of the crossed out rubbish bin. The advantage of the calcium battery is that it suffers from much less gassing ie water in the electrolyte being turned into hydrogen and oxygen, and so it begat the maintenance free battery (which has hidden vents to release pressure) that does not need topping up. A disadvantage is that it needs a more sophisticated charging system, since it is harder to push the electricity into a calcium battery, the system needs a higher charging voltage. The other issue is that it does not like overcharging which would cause the water to be lost and destroy the battery, as a result it should not be used on older cars with generators, because of their crude mechanical regulators. If you own a modern classic car with an alternator with a sealed non adjustable regulator, then a calcium battery will never be fully charged (because the charging system's voltage is too low and cannot be raised).



The rarest battery is the Optima style (several other manufacturers also make them), these are a sealed spiral wound AGM (Absorbed Glass Mat) battery. These also need a higher charging voltage but are almost shock resistant, can be used in any position. The lead/lead calcium batteries can lose up to 1% of their charge each day even when disconnected, so if you are not using your car you should charge the battery every 5 or 6 weeks to keep it from going under the 50% charge level. The Optima type battery on the other hand has almost zero self discharge, and so is often used in harvesting machines used once a year, where providing they have been left disconnected, they are ready to start the machine 11 months later. This might seem ideal for a classic car, but they are even fussier about their charging regime than the calcium battery. Many classics have minor leaks in the electrical circuit, which means switching off an Optima after every use, the last downside is that they are very expensive and like all batteries there are some early failures. Most smart chargers have an AGM charge setting at a higher voltage than the calcium setting.



So what is the suggestion for the classic car? Go to a battery specialist such as Battery World or Every Battery, they often offer 3 grades of the common batteries, go for the middle grade and buy a smart charger, then look after the battery by giving it a top up charge the day after each run or every 6 weeks. Battery specialists also offer high quality German batteries for double the price or American Military Spec batteries for 6 times the price, but in a seldom used classic I don't think they are worth the expense. Although they might last a bit longer,

they will still need just as much looking after. Running the engine for 5 minutes each week is bad for the engine and almost useless for the battery.

One interesting problem can occur when charging a well used battery with a smart charger, the problem is that the charging process seems to go on and on, never reaching the final or float (maintenance) stage. The battery voltage rises as it is charged, but if the battery is degraded and can only accept half its charge, then the voltage never rises far enough to trip the smart charger to the next stage. .

Trickle charging is leaving a smart or a small smart charger on the car 24/7, these go into float mode when the battery is fully charged, just topping it up as it slowly self discharges. Having suffered the terror of a garage fire (and burnt hands from putting out the fire) I refuse to leave batteries connected or any electrical appliance (cordless drill chargers etc) on while the garage is unattended. However the choice is yours.

Starting. What could there be to learn about that? If you have a later classic petrol car with fuel injection just like your modern, you can extend the battery life by pausing for a few seconds in the ignition on phase before turning further to the start position. This gives the fuel pump in the fuel tank time to pressurise the system, allowing an instant start instead of just churning the engine over while the pressure is building up, (if your hearing is good and the radio is not on you can hear the pump run for a few seconds prior to the first start). If you start the car, then realise you have forgotten your phone or whatever, and so turn the engine off after a few seconds, it may not start on your return 30 or 40 seconds later. This is because the engine computer sets things up for another cold start, thus overfueling the engine. Do not churn away at the starter or call the RACV. Simply press the accelerator to the floor then try again, holding until the engine catches. Obviously you lift your foot when the engine starts. Hearing someone trying to start a car to the point where they have exhausted the battery, so that the starter groans to a stop then just make clicking sounds, irritates me. If you have a reluctant starter, then you have poor connections or a sick battery. You may be getting fed up with this rant about starting, but if a car take 10 seconds to start it is degrading the battery 5 times faster than one which starts in 2 seconds. As I said at the start the aim of this article is to maximise battery life

Desperados. Should you be lucky enough to stumble across the proverbial "barn find" where the owner has forgotten when it was last used, and you are desperate to know what state the oily bits are in. You should check if the engine turns over and it has clean fuel and spark. If it still will not start (possibly stuck piston rings), one solution is to collect some decent battery cables (battery to starter, not jumper leads), isolate the starter circuit from the ignition circuit, then add another battery in series (to get 24 volts in the starter circuit). The car should start almost instantly (if it is going to start at all) and it does far less harm to the starter or the batteries compared to grinding away for half an hour on 12 volts, hoping for a miracle.

The most I have ever used to start an old car was 42 volts (I ran out of more batteries). PS I take no responsibility if you mess it up and put 24 volts through the whole system.

Moderns. Yes we all have one. Many cars, but not all, built this century have smart (that word again) alternators controlled by the computer. These go to maximum charge when braking or coasting and or are optimised to have the minimum output under the conditions of the mandated fuel consumption tests, in the quest for a lower figure on the fuel consumption sticker.

The car computer also recognises the battery, so a new battery must be properly installed, to avoid damage from overcharging when the computer applies the old battery's charging regime. The other issue is that many modern cars including some Citroëns do not have a radio code card in the glove box like the old days, but must be returned to the dealer and put on their computer to reprogram the radio. The point is, the days of buying a new battery at Repco or wherever are gone for most modern cars. You need to go back to the dealer or a battery specialist, who will connect a slave battery to keep your electrics alive while the old battery is replaced, saving all those setting of radio, seats, mirrors etc.

Nomads. If you have hooked the Jayco onto the Prado, but wondered why that new battery in the caravan never seems to live up to expectations, your outfit might have a budget wiring system. If it has a relay/isolator under the bonnet so the second battery circuit does not drain the main battery, that will work ok, if the second battery is under the bonnet. If the second battery is at the end of 20 metres of copper wire, (in the caravan) it will never ever be fully charged because of the voltage drop across the wire. The more expensive solution is a DCtoDC charger near the second battery. This takes whatever voltage is offered to it, and through an inverter boosts it up to about 20 volts then reduces it back down to the correct voltage for the type of battery connected to it.

Life. If you are a city slicker it is probable that your battery needs a top up 3 or 4 times a year. I recently replaced 2 batteries that had installation dates on them, one died at 9 years 1 month, the other, installed in something else, is still functional at 10 years and 7 months.

Look after your batteries. Russell Wade Editor..

.....