

## **Facts to keep in mind when planning a twin battery setup.**

Many workshops fit twin batteries to a vehicle, usually in parallel, and then expect the alternator to keep both batteries charged. This will not work for long, because either one of the batteries, or the alternator, will fail.

There are only two ways of doing it so that the batteries have enough charge, and do not suffer premature failure.

### **Coupling the batteries**

The main problem results from the fact that the batteries should not be connected in series (positive to negative) because then you'll have double the voltage of one battery.

This means that to keep the original voltage the batteries have to be connected in parallel (positive to positive and negative to negative). This creates a charging problem, because no two batteries will be identical with regard to state of charge, as shown by the specific gravity of the electrolyte, as well as the internal resistance, so that the alternator will not always be able to charge the one that needs it most.

- The least expensive way is to mount the batteries next to each other, and manually swap the battery cables from one battery to the next, as required. This becomes irritating after a while, but is completely safe, as long as it is always done when the engine is not running.
- This would be a problem on a number of modern vehicles, where the electronic control systems have to be reset whenever the battery is disconnected. However, some automotive accessory counters sell an auxiliary power cable that connects the cigarette lighter socket to an external battery, and this will safeguard the settings. Unfortunately, this means you'll need three batteries every time you make a changeover.
- The best (but expensive) way is to fit a dual battery insulator combined with a management unit. This will automatically connect the alternator to the battery that needs the charge most, but maintain the correct voltage in the other unit. These units costs well over R1000.
- A further refinement is to fit a special alternator regulator that will override the standard regulator, to increase the charge at low engine speeds. This becomes necessary when travelling the whole day a slow speed, combined with frequent stopping, such as when viewing game.
- Such a regulator may also become necessary if both batteries are calcium/calcium, because these batteries require a higher charging voltage.

## **Battery types**

There are essentially two types of battery being used in the motor industry.

- The ordinary car battery is called a starter battery. It is designed to supply enough current to the starter to get the engine going, and top up the charge lost during the starting process, but once the engine is running the alternator must supply the required current to drive all the accessories. Such a battery can supply a current draw of over 300 amps for a short while, but it gets discharged fairly quickly. When nearly fully discharged it cannot be fully charged by the car's alternator, but will need an external charger to supply a small current (one-tenth of the amp-hour capacity) for ten or twelve hours.
- The caravan or deep-cycle battery has the opposite characteristics. It will be quickly depleted by a heavy current draw, but will be quite happy delivering five or six amps for many hours. It can be recharged by an external charger even when fully discharged.

## **Choosing the correct battery**

When considering a twin-battery set-up, you'll have to decide what you want the extra power for. The vehicle will need a starter battery, but the choice of the other battery depends on your needs.

- If you're going to power the accessories in a caravan, or use it for anything else with a low current draw, then the second battery should be a deep-cycle type.
- If you're fitting a winch that could be drawing more than 300 amps for a short while then you must fit another starter battery, possibly one that has a higher amp.hr rating than the one on the vehicle.