

## SPECIAL FEATURE

& Caravans Tool) that a caravan battery rarely exceeds 70% charge. The company stated that 65% was more likely.

For some two decades, vendors produced voltage converters that were installed adjacent to the distant battery, and changed whatever came down the cable to a higher voltage. These helped a fair bit, but they were converters, not chargers, and produced a similarly constant voltage as does the alternator – and with the same limitations.

### THE DC-DC REVOLUTION

All this is now changing, not just due to the RV need but also because of the growing demands placed on the vehicle electrical system.

Today, even low-priced cars have more computing power than had early space craft. Their vehicle electronics are rugged enough, but typically require 13.8 volts to run, and some only 13.5 volts – far too low for charging. And they require that voltage to be stable. Further, adding an auxiliary battery bank may not necessarily cause problems, but is all but certain to be blamed if things go wrong. It may also invalidate the warranty.

The solution, the so-called DC-DC charger, is a box that is perceived by the car's electricians as simply another piece of add-on kit, like a 'doop doop' sound system or a pair of spotlights. This box electrically isolates the auxiliary battery from the alternator, compensates for any (reasonable) voltage drop and converts whatever comes in to the optimum charging voltage and regime for any specific size and type of auxiliary battery.

Whereas many other so-called solutions fix only marginally more problems than they introduce, this one really is a genuine technological breakthrough. In one go, it solves most of the electrical problems that have plagued caravanners for close to a century. In particular, it finally enables caravan batteries to be properly charged, and their fridges to work at a capacity a lot closer to that intended for them.

Some DC-DC units provide these adaptations. More sophisticated versions, such as Redarc's BMS1215 series, also have inbuilt solar regulation, multi-stage mains battery charging and remote readout. This simplifies adding solar and increases reliability by combining functions. This is because most electrical troubles are caused by poor connections and/or lack of 100% compatibility. Now,



Clockwise from top: The Redarc 12 volt DC-DC alternator charger charges at up to 20 amps; external views of the RanOx DC-DC multi-stage battery booster; Redarc's BMS1215 fitted for testing and appraisal in the author's Nissan 4.2 litre TD Patrol.

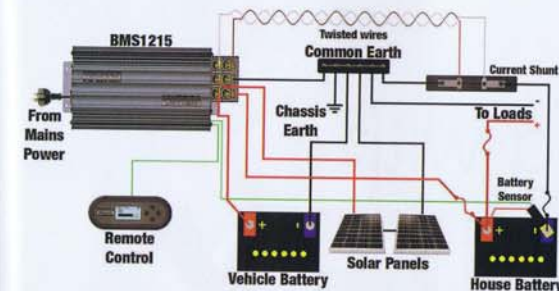


Diagram of the Redarc BMS1215. (courtesy Redarc)

many external connections are eliminated, and compatibility is built in. If a vehicle has solar modules, the Redarc unit, for example, will automatically select whichever source (alternator or solar) provides the greater charge.

In my regular technical column in the auto-sparky journal, *Automobile, Electrical and Air Conditioning News*, I suggested that DC-DC charging solved so many problems in one go that the industry should regard it as the preferred method of connection for any application where an alternator-connected battery needs to be charged fully.

I suggest here in *Caravan World* that it should also be seen as the routine way of connecting any battery mounted in a caravan, fifth wheel caravan or camper trailer.

### INSTALLATION

Installation is straightforward. The DC-DC unit is mounted as close as reasonably possible to the auxiliary battery/batteries via heavy cable. While these units do correct automatically for voltage drop in the cabling from the alternator, it is better not to exploit this unduly: voltage drop wastes energy (as heat) in that cabling.

Follow the sizes recommended by the unit supplier: typically a minimum of 8 gauge cable (ideally 13.5 sq mm). You will definitely need an Anderson connector as a DC-DC unit is able to draw 30 amps or more.

Right now, the approach is experiencing some opposition on the more rabid RV internet forums, mainly on the basis that a direct connection may charge a flat battery more quickly to 50% or so, but that battery is then unlikely ever to fully charge (and high current units are available anyway). It is also only feasible at all where the alternator operates around 14.4 volts. For trailers in particular, DC-DC charging is the more generally sensible approach.

The units are readily available from companies including ABR, Projects, Sterling, RanOx and Redarc to name a few, and prices range from \$350 upward. The more sophisticated units seem costly at first, but far less so if their various functions are taken into account; they are also much simpler to install.

I disclose that I had some minor (unpaid) involvement in the specifications of the Redarc BMS1215 and extensively tested the unit, but have no financial involvement of any kind with that company. The unit has since been returned to that company.

Collyn Rivers is the author and publisher of books on various aspects of RVs. His *Motorhome Electrics & Caravans Tool* has virtually become the auto-electrical text in Australia, New Zealand and now South Africa. [www.collynrivers.com.au](http://www.collynrivers.com.au)