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Which Dual Battery System Do I Need?

Part 1 – Smart Battery Isolator

If you are heading off road in your 4wd and going camping one of the must haves to keep your food and drinks cold and your gadgets powered is a dual battery system. Unfortunately, you can't just come on in and purchase a 2nd battery and plug your fridge and devices into it, as you run the risk of running it flat and worse still running your starting battery flat so your car won't start.

When looking at buying a dual battery system, we recommend that you do some serious research and planning before you install it, you need to ensure that you have enough power to keep your fridge cold and still start the car.

One of the most common questions we get asked when chatting to customers about dual battery systems is what is the difference between a Smart Isolator, DC-DC Charger and Battery Management System. We have put together a series of three articles explaining what each option is and the pros and cons to each of them. For the next 3 weeks we will cover off each one to help you decide which type of dual battery system is right for you.

The easiest and simplest option is the Battery Isolator. The most common type of isolator is a Voltage Sensitive Solenoid or Voltage Sensitive Relay. We usually recommend either the Redarc SBI12 or the Enerdrive ePower VSR.

The battery isolator monitors the voltage of the starting battery. When the isolator identifies that your car is turned on and the alternator is charging (via an increase in voltage), the isolator connects the two batteries together, allowing your auxiliary battery to charge off the alternator.

When you turn the car off, the isolator continues to monitor the voltage of the batteries and when they reach a certain level, it will separate the two batteries from each other. This is how it gets its name as it is isolating the starting battery. This device allows you to power accessories like your fridge from your auxiliary battery while also protecting your starting battery from going flat.

The battery isolator can be mounted anywhere in the vehicle, preferably but not necessarily in a dry area. We usually mount them under the bonnet near the starting battery.

In newer vehicles, that have a computer controlled alternator using a Battery Isolator will not work effectively to charge your auxiliary battery. These vehicles usually have a charging algorithm that will regularly drop the charging voltage below the cut off voltage of the isolator. This means the isolator will think the car is turned off when it's not and will separate the two batteries and the auxiliary battery won't fully charge. If you have a car with a computer controlled alternator you will need to look at installing a DC to DC Charger.

If powering a fridge and a couple of small accessories, you will generally get about 2 days of power out of an auxiliary battery (depending on battery size). One downside to the battery isolator is that it will only charge your auxiliary battery when the vehicle is turned on. If your auxiliary battery goes flat will usually need to run your vehicle for several hours, sometimes a full day, to re-charge the battery.

Another downside is your car alternator is not designed to charge a deep cycle battery. Most auxiliary batteries are AGM batteries that require multi stage charging so the alternator can usually only charge the auxiliary AGM battery to roughly 80%. This means if you have a 100Ah battery that is only charged to 80% you will only have 80Ah of power available to use.

That's a bit of a run down on smart battery isolators and how they work in a basic dual battery system. Make sure you keep an eye out for the next two articles in this series over the coming weeks as we explain the DC-DC Charger and Battery Management System.

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