



How to use dual batteries

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If you're an avid camper or off-roader, you know how important it is to have a reliable source of power when you're on the road. A dual battery system is an excellent way to ensure that you always have the power you need for your outdoor adventures.

A dual battery setup is an electrical system that allows you to power all of your essential equipment, including your camping fridge, lights, mobile devices, and more, without worrying about draining your car's battery.

With a dual battery system, you have two batteries in your vehicle: a primary battery that starts your engine and a secondary battery that powers your equipment. The secondary or auxiliary battery is connected to the primary battery through an isolator or DC-to-DC charger, which ensures that the secondary battery is charged while you drive. When the vehicle is not running, the secondary battery is automatically disconnected from the primary battery to prevent the primary battery from being drained.

Setting up a dual battery system may seem daunting at first, but with a little know-how, it can be a straightforward process. In this guide, we will walk you through each step of setting up a dual battery system, so you can get started in no time.

The first step in setting up a dual battery system is to determine your power needs. You should consider the number of devices you plan to power, as well as their individual power requirements. To calculate your power needs, you'll need to multiply the amp draw of each device by the number of hours you plan to use it before you can recharge your system.

For example, if you will be running only a fridge with a typical consumption of 3Ah, which runs generally 50% of the time (it turns on and off through the day), you will be using $3\text{Ah} \times 12\text{h} = 36\text{Ah}$ per day with your fridge.

It's important to note that these are just rough estimates and actual power consumption can vary depending on factors such as device model, usage patterns, and environmental conditions. It's always a good idea to check the specifications of your devices and do some testing to determine your actual power needs.

Once you've determined your power needs, you'll need to choose the appropriate battery. Deep cycle batteries are ideal for dual battery systems because they are designed to handle continuous discharging and recharging. AGM batteries are also a good choice because they are sealed, maintenance-free and provide a great cost-benefit.

Lithium-ion batteries offer the highest performance and longest lifespan, but they are more expensive. They are also lighter and more compact than other battery types, making them ideal for smaller vehicles.

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When choosing your battery, make sure it has enough capacity to meet your power needs. Keep in mind that lithium-ion batteries can generally discharge between 90 and 95%, which means that you can use almost all of the battery's capacity before needing to recharge it. On the other hand, AGM batteries can typically handle up to 50% of discharge, which means that you'll need a larger battery to meet your power needs. It's essential to consider the lifespan, weight, and cost of the battery when making your decision.

If you need more than 100Ah, you can get two batteries and wire them in parallel to double your power capacity. Wiring batteries in parallel will increase the overall capacity of the system while maintaining the same voltage. However, it's crucial to ensure that the batteries are of the same type, capacity, and age to avoid any issues.

If your vehicle is an older model with a traditional alternator, a battery isolator or a Voltage Sensitive Relay (VSR) is typically the best option. A battery isolator is a simple electrical device that ensures your starting battery and auxiliary battery are kept separate while the engine is off, preventing the starting battery from being drained. When the engine is running, the battery isolator allows the alternator to charge both batteries simultaneously.

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