

HOW TO EcoTrek Battery Guide



EcoTrek Power Battery Guide

The EcoTrek Power Battery



Jump starting an EcoTrek 200. Note: the left bank is off.

EcoTrek Power Batteries are installed in increments of 200. Each EcoTrek 200 Power Battery is roughly the equivalent of a pair and a half of golf-cart batteries, however there are significant differences between the lead-acid batteries and lithium batteries. Lead acid batteries typically lose voltage and current as they get depleted. You see lights dim or fans turn slower as the batteries discharge. Lithium batteries provide relatively steady voltage and current across much of their usable range. Lead-acid batteries should not be discharged below about 50% of their capacity on a regular basis as this will shorten their life. Lithium batteries can be discharged to about 10% or 20% of their capacity on a regular basis. In practical terms this means that an EcoTrek 200 Power Battery holds almost twice the usable energy of a pair of golf cart batteries. Lastly, lead acid batteries have a life cycle of about 200-500 charge/discharge cycles and lithium batteries have a life cycle of up to 2000 charge/discharge cycles.

This means that for RV owners who trade every few years, lithium batteries are a lifetime investment as they will last over 6 years in typical use. Much like tires, they are still a maintenance item and a long term owner should budget for replacement.

Using the EcoTrek Power Batteries

Lithium batteries require a battery management system. This system protects the batteries from overcharging, excessive discharge and operation outside of their operating temperature range. The best way to think about the EcoTrek Power Batteries is to consider them an appliance, much the same as a toaster or a TV. Turn on only the batteries you need, and turn them off when you don't need them. In other words, if all you need is to run some lights, you only need one EcoTrek Power Battery powered up. If you need a high power appliance, turn on more batteries as you need them.

- Turn off the EcoTrek Power Batteries when you don't need them.
- Turn on the EcoTrek Power Batteries when you want to charge them or use them.

EcoTrek Control Panel

Each EcoTrek 200 Power Battery has its own control. A single EcoTrek 200 will have one lit rocker switch at the bottom and one momentary rocker switch at the top of the panel. An EcoTrek 400 will have two sets of switches, and so on.

The lower rocker switch turns on the bank. In normal operation, the lower switch should be lit (light on), and reset if the switch is not on and when you want to use the battery. This powers the battery management system, which manages all functions of the EcoTrek 200, including charging, voltage protection and the battery heaters when it gets cold.

The battery management system will turn off the batteries when they are run down to near empty. The system will still accept charge, but will no longer provide power.

Switch Positions for Using the EcoTrek Power Batteries

Driving

While driving, you have plenty of power from the underhood generator. Normally, you can turn on all battery banks to charge them. If the batteries are depleted, charge one at a time. You can have the battery disconnect switch on to power the coach if needed. The inverter does not need to be on for the batteries to charge while driving.

Boondocking

Turn on only the batteries you need. If you're running just lights or watching TV, turn on one EcoTrek battery. If you want to run the air conditioner or microwave, turn on at least 2 EcoTrek Power Batteries. The battery disconnect must be on to power the coach. The inverter does not need to be on unless you need household appliances.

Shore Power

The inverter must be on to charge the batteries using shore power. It is best if you turn on only one battery at a time for fastest charging. If the batteries have shut off due to high state of discharge, to turn them on, start the engine.

Turning on the Power Batteries

Press the lower rocker switch to turn it on, then press and hold the reset button for up to 20 seconds to power up the Battery Management System.

If the Power Batteries Will Not Turn On

Start the engine. Turn on the EcoTrek Power Batteries. Allow about 30 seconds for the batteries to start. If necessary, press and hold the Reset button on top of the panel. Once the batteries are on, plug into shore power if desired (to perform this, the inverter must be on) and turn off the engine.

When not in use, turn the Power Batteries off. When storing the Power Batteries for extended periods, lithium batteries should be stored at about half state of charge, about 13.1V resting voltage.



In cold weather, the battery management system will start the battery heaters first to warm up the batteries. Depending on the temperature, it could be a while until the batteries are at a temperature where they can operate. It takes approximately 60-90 minutes to warm up the batteries if the batteries have been shut off, depending on outside temperatures.



If you have more than one EcoTrek 200 and all have been depleted, start one first, allow it to charge for 30 minutes or an hour, then bring up the others. The current draw is the highest when you start charging and this allows the charging system to keep up. Strictly speaking this is not necessary but it is a useful guideline.

Protections Built into the Battery Management System

The Battery Management System will turn off the Power Battery under specific conditions, designed to protect the batteries from damage. These conditions are explained in the following sections.

Overtemperature

If the battery temperature exceeds 130-140°F or 55-60°C the Power Battery will turn off.

Under Temperature

If the battery temperature falls below 32 °F or 0°C, the Power Battery will turn off. Note that normal use of the Power Battery will provide heating to keep the batteries operating. If the Power Batteries are turned off and allowed to freeze, the battery heaters will turn on once the engine is running and the Power Batteries are turned on. It may be several hours before the Battery Management System allows charging and discharging.

Undercharge or Excessive Discharge

The Power Battery will shut off and prevent further discharge if their state of charge falls below approximately 20% (80% discharged).

Overcharge

If the Battery Management System detects an overcharge condition, it will shut off the Power Battery and prevent further charging. Normal discharge will still occur.

Charging the EcoTrek Power Batteries

By far the fastest and most efficient way to charge your EcoTrek Power Battery is by driving at normal highway speeds. At idle, the Power Batteries will charge somewhat slower than at driving speeds. Charging from shore power is the slowest method.



If you have an EcoTrek 800 or EcoTrek 1600 (warp core) package, you must connect to an RV 30 amp outlet. A 15 or 20 amp outlet cannot provide the power needed to charge the Power Batteries.