

Univolts

This article prompted by Ernie Hindenlang, WBCCI #3973, concerns univolts and 12-volt electrical concerns. He asks how do you know that the univolt is putting a charge in the trailer batteries. Secondly, how are you sure your tow vehicle alternator is charging your trailer battery.

First, let us begin with a few words about the univolt. This piece of equipment is designed to take 120-volt shore power and transform it into 12-volt power for your ceiling/reading lights, heater blower motor, water pump, and electrical switching for some refrigerators and air conditioners. Even though air conditioners need 120 volts for their compressor/fan, on newer models their switches are 12 volt operated.

Without the univolt, tow vehicle alternator, and/or solar panel, the trailer battery power will be quickly depleted.

Second, lets assume that Ernie is having some electrical problems. Probably the battery seems not to be taking a recharge very readily. Or it becomes depleted when dry camping much sooner than it used to. Do remember that unless you dry camp frequently it is possible to run for several months or a year with a poorly functioning battery. If you always camp with shore power the univolt provides all the 12-volt power that you need. The battery is only used to run the water pump or ceiling light at the roadside rest during your trip to or from the campground or to run the electric jack when you unhitch. Perhaps you get home with a battery that is functioning well, but after several days not plugged in to shore power the battery is very depleted (there are no solar panels). If you have this symptom and it is not a bad battery, it is usually from something being left on that draws current all the time. To find these hidden current draws, keep shore power unplugged and remove the negative battery cable from the negative pole of the deep cycle battery. Then connect a test lamp between the negative pole and the removed battery cable. If the lamp lights, there is a current draw. Turn the refrigerator off to make sure it is not that switching mechanism. Then get someone else to help by watching the test lamp. You go to the 12-volt fuse box and pull one fuse at a time. If a pulled fuse does not extinguish the test lamp, put it back in the terminal and pull the next. Eventually one of the fuses will extinguish the lamp and indicate which circuit is drawing current all the time. Then it is your job to trace the problem on that circuit. Before correcting the problem just keep that fuse pulled and recharge the battery. Ernie asked how we know if the Univolt is working and is putting a charge in the trailer battery. I always tested the output of the univolt by disconnecting the battery or batteries, hooking the trailer up to shore power, then turning on all 12-volt lights. If they were lit, but dim, the univolt was not producing its full amps and needed repair or replacement. If they all lit with the usual intensity, the univolt was fine. If the univolt was fine the battery was getting a charge sent to it, but it might not be accepting the charge. Corrosion at the terminals, a dead plate, or a battery in need of replacement will not accept a charge very well. Some batteries on their last leg get hot when charged. This is from internal resistance and the heat may boil dry one or more cells so that adding water frequently is a symptom.

It is true when they say the correct tools make the job much easier! I recently bought a digital display Sears AutoRanging Multimeter, item 34-82139, that has

made this type of analysis much more convenient. When fully charged with the electricity plugged in, my deep cycle battery reads 13.13 volts. When I unhook shore power for the night, the next morning the battery reads 12.63 volts, which is its resting but fully charged voltage. Then I go in and turn on all 12-volt lights and the battery reads 12.17 volts. Finally when I reattach shore power with lights still on, the voltage jumps to 12.82, indicating a charging situation and a functioning univolt. Every several seconds the reading goes up 0.01 volt, showing that the shore power working through the univolt is taking the load for all the 12-volt lights and is charging the batteries at the same time. Eventually the battery will again read 13.13 volts and will remain at that voltage while plugged in to shore power. Analysis of the tow vehicle alternator question proceeds as we did above. Start the vehicle and back it up to the trailer. Get a digital reading at the trailer battery, say 12.63 volts. Go in the trailer and turn on all the lights and get a digital battery reading under load, say 12.17 volts. Then plug the trailer cable into the running tow vehicle. The voltage should jump up from 12.17 volts at the trailer battery indicating the alternator is assisting in charging the trailer battery. If it does not jump up it could be a poor connection where the trailer cable plugs into the tow vehicle. There are three spots for a poor connection at that point. Where the trailer wires screw to the back of the seven way plug, where the male side of the plug attaches to the female side of the plug, and where the tow vehicle wires screw to the back of the female seven way plug. It could also consist of a broken charge wire or lost ground. Each of these can be analyzed with the test lamp or multimeter.