



CONVERTING CURRENTS

A GUIDE TO YOUR MAGNUM ENERGY RV INVERTER - WHAT IT DOES, HOW IT WORKS AND WHY YOU NEED IT.

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Recreational vehicle component upgrades are occurring across the board, and RV inverters are no exception. I recently sat down with Gary Baxter, vice president of sales and marketing for Magnum Energy, to discuss the new inverter technology now used inside many Holiday Rambler models.

“Our inverters were first introduced in 2004,” Baxter stated. “Starting with the 2006 model year, Magnum inverters have been in 100 percent of the Monaco Coach Corporation products.”

in your coach run from DC, such as lights and the water pump, larger items, including the television and a computer, require AC voltage to operate.

The inverter itself needs a power source to operate, which during a dry-camping situation, means increased draw on the house batteries. Not a huge draw, according to Baxter, but in concert with everything else running off the batteries, power drain can begin to add up. “The inverter is good to run small loads for a long time or large loads for a short time,” Baxter explained. “So if

residential refrigerator requiring the inverter to remain on at all times. In this instance, you can manage the battery load using Auto-Gen Start.

When shore power or the on-board generator is replenishing RV batteries, the inverter then becomes a charger. Using three charging stages known as Bulk, Absorb and Float, the inverter will provide the fastest charge rate possible without damaging the batteries. The best way to monitor a battery charging status in Liquid Lead Acid batteries is to test the electrolyte level in each cell with a battery hydrometer.

Manufacturing the voltage of alternating current produces a sine wave pattern. Two common types of sine wave are available in RV inverters — modified and pure. According to Baxter, a pure sine wave is the equivalent of shore or generator power, but modified sine wave will run close to 90 percent of all electronic loads. On modified sine wave, some larger loads may emanate a buzzing sound when running an item such as the microwave. Some loads may not run at all.

With normal use, you can expect your RV inverter to last eight to ten years. A self-protection system is built-in

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FOR THOSE COACH OWNERS WHO ARE A LITTLE UNCLEAR ABOUT WHAT THE INVERTER DOES, YOU'RE NOT ALONE. YOUR RV INVERTER TAKES DC (DIRECT CURRENT) VOLTAGE FROM THE BATTERIES AND CONVERTS IT TO AC (ALTERNATING CURRENT) VOLTAGE.

For those coach owners who are a little unclear about what the inverter does, you're not alone. Your RV inverter takes DC (direct current) voltage from the batteries and converts it to AC (alternating current) voltage. Why do you need AC voltage? Although some smaller appliances

you're running big loads for a long time, it's a good idea to engage the generator.” He also suggested that coach owners conserve power by treating the inverter like a light switch, turning the system off when it's not in use. There is an exception to this rule, however, and that's with the

Opposite: Magnum Energy 2800 watt inverter as seen inside the coach. (Unit is mounted to the bay ceiling.)

Below: Magnum 2000 watt Sine Wave inverter.



to shut down the system before it overheats. The inverter is located in a storage compartment and is moisture-proof, but not waterproof. It is recommended that coach owners keep the bay door closed during heavy rains and avoid spraying the inverter directly with water from a hose. Alternatively, when weather conditions are hot and dry, there's no harm in opening the outside bay door and treating the inverter to a little bit of airflow.

Damage can occur to the inverter system if the batteries are connected incorrectly. Gary Baxter advised that you pay close attention when batteries

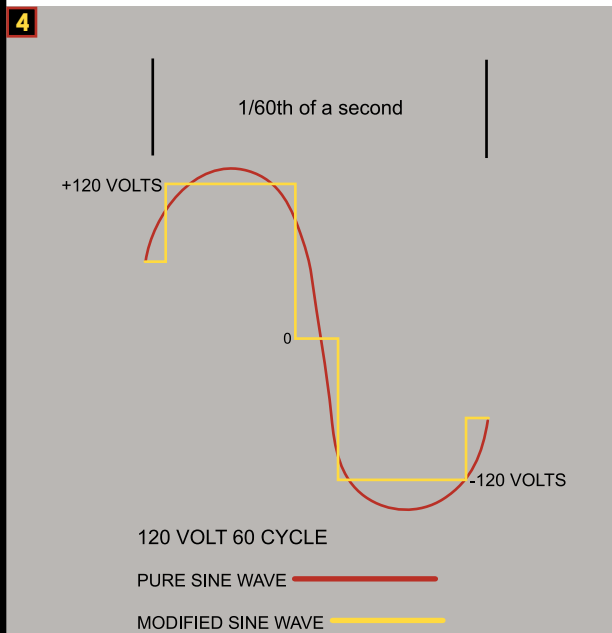
AFTERMARKET ADDITIONS ARE AVAILABLE FOR MOTORHOMES AND TOWABLES, AS LONG AS THE COMPONENT CAN BE SECURELY ATTACHED TO A STRUCTURAL PART OF THE VEHICLE. ALTHOUGH THE INVERTER CAN BE MOUNTED IN ANY POSITION, IT SHOULD BE SITUATED NEAR THE BATTERIES TO AVOID REDUCED POWER FROM LONG BATTERY CABLES.

are switched out. "The batteries are the inverter's fuel tank," Baxter said. He recommended coach owners maintain the battery bank by filling liquid lead acid cells with distilled water, keeping cables secure, and regularly cleaning the batteries to remove corrosion. He also recommended the use of a voltmeter. "It doesn't have to be digital," he added.

A frequent question that comes into the Magnum Energy call center is how to verify that the inverter is operating as designed. RVers can perform this simple test-run of the system by using the inverter remote panel:

1. Turn AC breakers off at the power pedestal.
2. Unplug the RV from shore power and go to the inverter remote panel.
3. Turn the generator off and the inverter off. The top line on the panel should now read "Off."
4. Check DC volts on the remote panel. There must be at least 11.5 volts available to run this test. If not, plug into shore power or run the generator for two hours to charge the batteries and start again at Step 1.

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1 Close-up of the Magnum Energy 2000 watt inverter, including the unit's ID label. 2 Control panel for the 2800 and 2000 watt inverters, respectively. 3 Magnum Automatic Generator Start (AGS) for 2800 and 2000 watt inverters. 4 Illustration depicting the difference between "pure sine wave" and "modified sine wave."

5. Press the Inverter On/Off button. The remote panel should read "Inverting." Green LED lights labeled "INV" and "PWR" should illuminate.
6. Turn on a large appliance (microwave, television) and check for operation. Leave the appliance on.
7. Plug into shore power or start the generator.
8. Green LED light labeled "CHG" should flash and then go solid. The remote panel should read "Charging." This indicates the transfer switch in the inverter has closed and the large appliance has switched over to incoming AC power.
9. The remote panel should change to read "Bulk" or "Float." Battery voltage will start to rise within 15 to 20 seconds.
10. Unplug shore power or turn off the generator. The LED labeled "CHG" will go off, but the AC appliance should remain on.
11. Press the Inverter On/Off button. The appliance should go off. The remote panel should read "Off," and all LED lights should be off.

If the above procedure works as indicated, the inverter and charger are operating.

You can help protect your coach's inverter through some simple guidelines at the shore power pedestal. Check the outlet with a meter before plugging in. Turn the breaker off before making a connection and perform regular upkeep on the shore cord.

Auto-Temp Start is a system designed to sense interior temperature and start the generator to engage the air conditioner when air reaches a pre-

determined level. To efficiently run this feature keep the air conditioner filters clean and the generator fueled when shore power is not available. Auto-Gen Start is a system that can be used to monitor battery voltage and start the generator when charging is necessary.

Located between the inverter and the remote panel is a remote communication cable. Without this cable, it would be necessary to go

DAMAGE CAN OCCUR TO THE INVERTER SYSTEM IF THE BATTERIES ARE CONNECTED INCORRECTLY. GARY BAXTER ADVISED THAT YOU PAY CLOSE ATTENTION WHEN BATTERIES ARE SWITCHED OUT. "THE BATTERIES ARE THE INVERTER'S FUEL TANK," BAXTER SAID.

outside to the inverter to turn the system on and off. The cable is protected by auto-reset fuses located inside the inverter. If there is a short in the cable, the inverter will not operate until the cable is unplugged. A good way to test whether the cable is causing a malfunction in the system is by using a standard telephone cable in place of the inverter cable. If the system works when the standard telephone cable is plugged in, the problem most likely lies in the remote communication cable.

Equalized charge is a controlled overcharge to remove sulfates from the bottom of the liquid lead acid battery plates. Equalization is a process of boiling battery acid and must be performed under careful observation. There are a number of things to consider before undertaking the equalization process, including voltage sensitive electronics not properly disconnected and battery acid spilling on paint or burning skin. "If you maintain the batteries,

equalization is usually unnecessary," Baxter stated. "But if it's going to be done, we recommend the procedure be performed by a trained technician."

Aftermarket additions are available for motorhomes and towables, as long as the component can be securely attached to a structural part of the vehicle. Although the inverter can be mounted in any position, it should be situated near the batteries to avoid

reduced power from long battery cables. Coach owners can also opt to upgrade a modified sine wave system to pure sine wave. Some smaller electrical needs can be met with a converter, which is designed to charge the batteries up to 13.5 volts. For more information on what size and type of inverter is best-suited for your Holiday Rambler, contact Magnum Energy directly.

"Most of the information you need to operate or troubleshoot the inverter is accessed through the monitor panel," Baxter advised. Magnum Energy offers technical support during business hours (8:00 am to 5:00 pm PST) at (424) 353-8833. When contacting Magnum Energy, have your inverter model number handy. The number can be found on the unit, or accessed via the remote panel. In conclusion, Gary Baxter wanted *Holidays* readers to know that Magnum Energy welcomes your calls, but if possible, call while standing in front of the inverter remote panel. This will help "streamline the process." ■