

4.0 Maintenance and Troubleshooting

The following information is provided to help you keep your MS Series inverter/charger in optimum operational condition.

4.1 Recommended Inverter and Battery Care

The MS Series inverter/charger is designed to provide you with years of trouble-free service. Even though there are no user-serviceable parts, it is recommended that every 6 months you perform the following maintenance steps to ensure optimum performance and extend the life of your batteries.



WARNING: Prior to performing any checks, switch OFF both the AC and DC circuits.

- Visually inspect the batteries for cracks, leaks, or swelling – replace if necessary
- Use baking soda to clean and remove any electrolyte spills or buildups
- Check and tighten all battery hold-down clamps (if applicable)
- Clean and tighten all battery terminals and connecting cables [10 to 12 ft lbf (13.6 to 16.3 N-m)]
- Check and fill battery water levels (liquid lead acid batteries only)
- Check individual battery voltages (load test those that have a voltage difference of more than 0.3 VDC from each other) – replace if necessary
- Check all cable runs for signs of chafing – replace if necessary
- Check the inverter's cooling vents – clean as necessary
- Check and tighten the inverter's internal AC terminal block connections [16 in lbf (1.8 N-m)]

4.2 Storage for Mobile Installations

When placing the RV, boat or truck into storage, it is recommended that you perform the following to ensure the system is properly shut down (or properly configured for storage). This is especially important for maintaining the batteries.

- Perform the recommended maintenance steps listed in Section 4.1.
- Fully charge the batteries.
- Connect AC power (if available) and verify that the breaker to the inverter's input is switched ON (to allow battery charging).
- Verify the inverter is switched OFF.
- Switch OFF all unnecessary AC and DC loads.
- Disable the AGS (if installed) when the RV, boat, or truck is in a confined storage area.



WARNING: If an AGS were to start and run the generator for an extended period of time in a confined area, a potentially fatal level of CO (Carbon Monoxide) could accumulate.

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4.3 Troubleshooting

The MS Series inverter/charger is a fairly simple device to troubleshoot. The following chart is designed to help you quickly pinpoint the most common inverter failures.

Table 4-1, Basic Troubleshooting

Symptom	Possible Cause	Recommended Solution
No output power. Inverter LED is OFF	Inverter is switched OFF	Switch the inverter ON.
	Battery voltage is too low. The battery voltage level has dropped below the Low Battery Cutout (LBCO) set-point for more than one minute.	Check fuses/circuit-breakers and cable connections. Check battery voltage at the inverter's terminals. Your batteries may need to be charged, this fault condition will automatically clear when the battery voltage exceeds the LBCI voltage.
	The battery voltage is too high. The inverter automatically resets and resumes operation when the battery voltage drops to the HBCI voltage or lower.	This condition usually only occurs when an additional charging source (alternator, solar panels, or other external charging sources) is used to charge the battery bank. Reduce or turn off any other charger to the inverter batteries to allow the voltage level to drop.
	Over-temperature condition: The internal temperature of the inverter has risen above acceptable limits; caused by loads too great for the inverter to operate continuously, or by lack of ventilation to the inverter. When the unit has cooled, it will automatically reset and resume operation.	Reduce the number of electrical loads that you are operating, this will avoid a repeat over-temp shutdown if the cause was too many loads for the ambient conditions.
		Check ventilation around the inverter, ensure cool air is available to pass-thru the inverter (refer to the ventilation requirements in Section 2.1.3).
	AC overload condition: The inverter has turned off because the connected loads are larger than the inverter's output capacity, or the output wires are shorted.	Reduce the AC loads connected to the inverter, or remove all AC output wiring and restart the inverter.
Internal fault: This fault occurs when an internal fault is detected.	To clear this fault, an inverter reset is required. Remove DC power to the inverter, or press and hold down the power switch on the inverter for 15 seconds (until the green Status LED comes on). If this fault does not clear, the unit will need to be serviced.	
No output power. Green LED is flashing.	Unit is in Search mode, which means load is too small for Search mode circuit detection.	Turn on a load greater than 5 watts to bring inverter to full output power, or turn off search with remote.
Low output or surge power. Green LED is flashing.	Loose or corroded battery cables.	Clean and tighten all cables.
	Low batteries.	Recharge or replace batteries.
	Loose AC output connections.	Tighten AC output connections.
	Battery cables are the wrong length or gauge.	Verify recommended cable lengths and gauges from the manual. Replace cables as necessary.
Low charging rate when connected to AC power.	Charge rate set too low.	Adjust charge rate or SHORE settings on remote.
	Low AC voltage (< 90 VAC).	Check AC input wiring.
Low charging rate when using a generator.	Generator output is too low to power both load and charger.	Reduce the load, increase the generator's RPMs.
		Check the SHORE settings (if remote connected).
Charger does not charge.	Loose or corroded battery cables.	Clean and tighten battery cables.
	Defective batteries.	Replace batteries.
	Wrong charger settings.	Adjust the charger settings, ensure the unit is not in charger standby.
	Wrong AC input voltage.	Verify proper AC input voltage and frequency.
While charging, the DC charge voltage is higher or lower than expected.	If the Battery Temperature Sensor (BTS) is installed, the DC voltage will increase or decrease depending on the temperature around the BTS.	This is normal; see Section 3.5 (Battery Temperature Sensor Operation) for more information.

4.4 Performing an Inverter Reset

Certain faults require that the inverter be reset. To perform an inverter reset (also known as a soft reset), press and hold the Power ON/OFF button (see Figure 4-1) for approximately fifteen (15) seconds until the Charging/Inverting Status LED comes on and flashes rapidly. Once the rapid flashing has begun, release the Power ON/OFF button. The Status LED will go off after the button is released.

After the inverter reset is completed, press the Power ON/OFF button to turn the inverter ON.

Some older inverter models do not allow an inverter reset. If the inverter reset fails, you will need to perform a power reset using the procedure below. In either case, if an internal fault does not clear, the inverter will require repair at a Magnum Authorized Service Center (ASC).



Info: The Power ON/OFF pushbutton is a small *momentary* type switch which operates by lightly pressing and releasing. Be careful not to apply too much force when pushing or the switch might break.

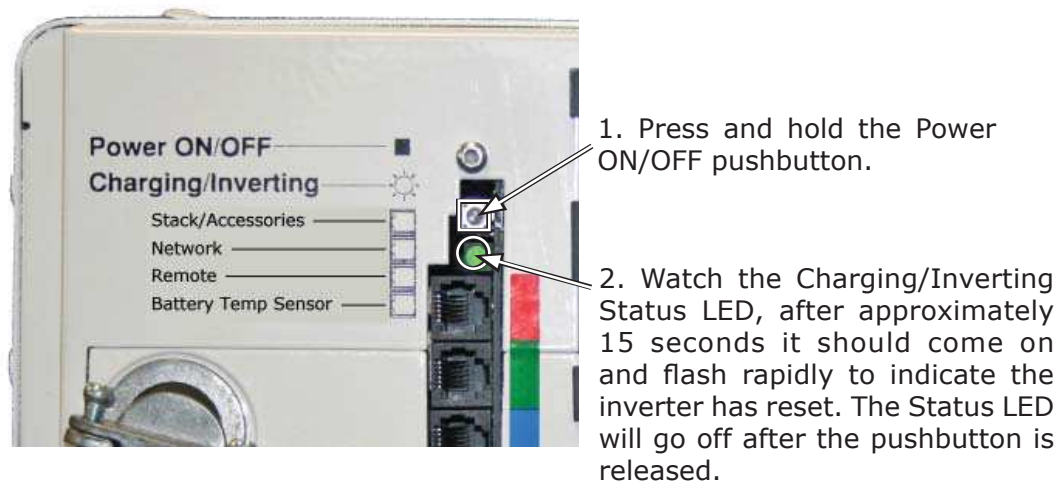


Figure 4-1, Performing an Inverter Reset

4.5 Performing a Power Reset

To perform a power reset (also known as a hard reset):

1. Remove all AC power (utility or generator power) to the inverter.
2. Open all the inverter DC disconnects (or disconnect the positive battery cable to the inverter).
3. Ensure the inverter(s) and the remote are disconnected from all AC and DC power (the remote display will be blank).
4. After the inverter(s) has been disconnected from all power for 30 seconds, reconnect the inverter DC disconnects (or reconnect the positive battery cable) and resume operation.



Info: If DC disconnects are not used, there may be a momentary spark when the positive battery cable is connected to the inverter's terminal. This is normal and indicates that the inverter's internal capacitors are being charged.