

Technical Note**MSW Inverters**

512-0099-01-01 Rev 1

Appliances That May Not Operate Correctly on Modified Sine Wave Inverter Power**Introduction**

When operating on modified sine wave power from an inverter some appliances may not operate correctly due to an incompatibility between the appliance and the modified sine wave power.

Appliances with built-in clocks

Some models of appliances that have built-in clocks such as clock radios, alarm clocks, coffee makers, breadmakers, VCRs and microwave ovens may not keep time correctly. If they use their internal clocks for timing cycles during operation (such as a breadmaker or microwave) they may run either too long or not long enough. Digital clocks that employ their own internal time base (crystal oscillator) will keep accurate time. However, some clocks derive their time base from the incoming AC waveform because the frequency of utility/grid power is usually well regulated at 60Hz. These types of clocks will usually not keep accurate time when operated on modified sine wave power. Also, these types of clocks either count the number of peaks in the AC waveform or the number of times the waveform crosses zero volts. Clocks that count peaks usually keep accurate time. The circuitry to count the zero crossing events is less expensive and therefore more popular. Close comparison of the voltage waveform diagrams show that the "modified sine wave" waveform rests at zero for a short time, while sine wave voltage goes rapidly through zero. The longer zero cross time with modified sine wave can cause double clocking, therefore a faster running clock.

Battery-operated tools

Most battery chargers for cordless battery-operated tools work fine on modified sine wave; some do not. Makita chargers have been reported to work fine on modified sine wave. DeWalt chargers will fail prematurely due to an incompatibility between their power supply and modified sine wave. The best recommendation is to monitor the temperature of the charger while it is being powered by modified sine wave power for 10 to 15 minutes. If it begins to get warmer than it does when using shorepower, turn the device off and disconnect it from inverter power. This is an indication that the device should not be used with a modified sine wave inverter.

A device called a Line Tamer (model PCLC) is a ferroresonant line conditioner that can be used between the output of the inverter and the non-operational device.

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