

WHITE PAPER – EU7000is Low Battery Start Kit

Purpose

The Honda EU7000is EFI generator is among the elite portable generators on the market. This is much a result of its state-of-the-art electronic fuel injection system. This technology allows for quick and efficient start ups in temperatures as low as -35C (-30F). This makes the generator an excellent choice for off-grid and home backup applications. The generator does however commonly exhibit a no crank condition if the battery is not at full capacity. This can be due to a depleted battery, a failed battery or extreme cold temperatures. A depleted battery can be a result of simply a long sit time as batteries will self-discharge at a rate of around 20% per month. This condition may cause the generator display panel to light up normally during it's start procedure but when it attempts to crank it will not. Owners may hear a click, may see the control panel flash on and off or an error code E-00 may appear on the display as the generator attempts to start.

Background

The condition relates directly to the starter solenoid control and load circuitry. The starter solenoid control circuit is solid state and integral to the generator electronic control unit (ECU). The main panel start button generates a signal to the generator ECU to begin the pre-programmed crank sequence. The starter solenoid load circuit is also solid state and integral to the generator electronic control unit (ECU). The starter solenoid load wire itself runs directly between the starter solenoid and the generator ECU. The generator ECU main power supply and all its electronics including starter solenoid control and load is fed by one single circuit protected with a 15A fuse. During a low battery start attempt circuit voltage drops rapidly as the starter solenoid is actuated. This low voltage may cause solid state electronics to not operate normally thus resulting with no crank. Furthermore, low voltage = high amperage and the circuit may overload also resulting in no crank or open circuit of the generator main 15A fuse.

EU7000is Low Battery Start Kit

In addition to the possible causes of low battery capacity described in the Purpose section of this paper, an aftermarket wireless remote start system may also contribute. Wireless receivers remain active while generators are not in use and will drain some current from to the generator battery. Although this may be very little, 20 milli-amp drain or less, over time the battery will be depleted. The EU7000is Low Battery Start Kit was designed to improve upon this no crank condition. The kit introduces a starter relay to isolate the high current starter solenoid load circuit from the generator electronic control unit (ECU) system. This type of circuit design has been in use in the automotive industry for decades. The kit converts the generators original crank circuit to be a relay control circuit only. Currents of 15 amps or more in the original ECU starter solenoid circuitry are now reduced to 150 milli-amps thus eliminating the possibility of circuit overload and greatly reducing the possibility of low voltage to the ECU and solid-state components as a result of this load. The starter solenoid load circuit is re-routed through the introduced starter relay and fed directly from the battery thus bypassing the generator ECU.

Summary

The EU7000is Low Battery Start Kit's ability to improve upon this no crank condition is proven. Subsequent testing on generators that would not start from the generator control panel could easily be started by jumping directly between the starter solenoid of the same generator and its depleted battery. Generator owners depend greatly on their generators to start correctly especially in off-grid and backup applications. The EU7000is Low Battery Start Kit greatly improves this reliability and has been a welcomed upgrade.

