

STANDBY SYSTEMS

NOTE: The following conditions are necessary for all tests that follow. Your life, your safety, and the life of your test equipment depend on paying attention to these details.

- 1) All resistance checks are done with the unit STOPPED!
- 2) All voltage checks are with the engine running.
- 3) Always start with the highest voltage scale. (600 Volt scale minimum)
- 4) Check for residual voltage before any disassembly.
- 5) Don't disassemble any more than necessary.
- 6) Mark leads for reassembly
- 7) Disconnect loads before residual voltage checks
- 8) Write down all your readings
- 9) Record Model #, Serial #, M Spec #, and P/N before calling.

General Information

Efficient troubleshooting will rapidly narrow the number of possible causes of malfunction with the minimum of checks. To do this a general understanding of the total system operation is necessary. Each system component has unique input and output characteristics that provide clear messages that properly interpreted will point directly to the cause of the malfunction. Verify defect and repair or replace as required.

Check for loose wires, loose connectors, and hardware malfunctions whenever the engine or generator control panels are opened. If the troubleshooting chart from the installation and operation manual indicates a particular component discrepancy, proceed to that portion of the test procedure.

To properly check out electronic components and generator wiring, they must be isolated from associated circuitry. Always mark leads disconnected to insure correct reconnection after testing of components is complete.

Test equipment required to accomplish the static and operational tests.

1. Volt-ohmmeter - 20,000 ohms per volts (or higher).
2. Frequency meter - 58 to 62 hertz (cycles per second).
3. Clamp-on Ammeter - 0-300 ampere range.

Problem Isolation

Malfunctions are generally classified and described by symptoms. The systems point to the causes. Start failure, poor speed regulation, high voltage, low voltage, etc., are only SYMPTOMS. To find and correct CAUSES of these malfunctions, it is necessary to isolate the problem to one of the basic system components.

1. Engine - including fuel and cranking systems.
2. Generator - including voltage regulator.
3. Control panel - auto or manual start.
4. Other external influences - such as load, fuel, battery, accessory equipment (remote control panels, exhaust systems, etc).

TROUBLESHOOTING TABLES

DIESEL GENSETS WITH BASLER DGC CONTROL PANEL

ENGINE:

1. Engine will not crank when the power fails.
 - Digital Genset Controller not in "AUTO".
 - Transfer control switch not in "AUTOMATIC" position.
 - Incorrect wiring between transfer switch and generator.
 - Defective control relay in the transfer switch.
 - Fuse(s) blown in the Digital Genset Controller.
 - Defective Digital Genset Controller
 - Loose or dirty battery terminals.
 - Defective starter.
 - Defective start solenoid.
2. Engine will not crank with Generator run push-button depressed.
 - Dead battery.
 - Blown DC fuses on the Digital Genset Controller.
 - Defective Digital Genset Controller.
 - Loose or dirty battery terminals
 - Defective "Run/Auto" switch on generator.
 - Defective starter.
 - Defective start solenoid.
 - Locked up engine genset.
3. Engine cranks but will not start
 - Improper fuel delivery to the unit.
 - Fuel supply shut off.
 - Fuel tank empty. (Diesel or LP systems)
 - Air in the injection system. (Diesel systems)
 - Engine fuel rack has not opened. (Diesel systems)
 - Defective CANBus on the engine.
4. Engine starts and then stops and alarm light comes on.
 - Engine is low on oil.
 - Engine has high water temperature.
 - Engine has overspeed.
 - Engine has gone into over crank.
 - No output from AC generator.

- Loss of speed signal.
 - Loss of run signal.
5. Engine will not come up to speed after it starts.
 - Insufficient fuel volume getting to the unit.
 - Too small of fuel line.
 - Fuel racks not opened properly.
 - Governor is defective.
 - AC short in generator components.

GENERATOR:

1. Voltage ok no load - voltage drops under load.
 - Verify that the generator is operating within its nameplate load range.
 - Check load leads with an ammeter.
 - Check engine - low on HP.
 - Check generator AVR (automatic voltage regulator).

2. No Output Voltage
 - Defective rectifier.
 - Defective voltage regulator.
 - Defective rotor.
 - Defective stator.
 - Defective exciter rotor.
 - Defective exciter stator.
 - AC short in the output leads.
 - Defective field circuit breaker.
 - Wiring error.

CONTROL SYSTEM:

The control systems are simplified to minimize control components. The normal control relays in the automatic units are replaced by a single board with microprocessor control and isolated pilot relay power control output. The control power supply is designed to operate from 12VDC and 24VDC power supplies. It has multiple input circuits to monitor ac and dc voltage, ac current, resistive and switch inputs for engine and system parameters. The three power relay outputs include basic engine start and run control with programmable pre-start delay features and a third relay available to be programmed for other operational requirements.

CONTROL PANEL - FAULT CODES

1. HWT (High Water Temperature)
 - Low coolant level.
 - Obstructed cooling system
 - Engine malfunction.

- Defective sensor.
 - ECM (Engine Control Module) defective.
2. LOP (Low Oil Pressure)
 - Oil leak.
 - Excessive oil consumption.
 - Internal engine malfunction.
 - Defective sensor
 - ECM defective.
 3. OS (Overspeed)
 - Speed adjustment error on engine.
 - Sensor adjustment error on ECM.
 - Engine governor malfunction.
 - ECM defective.
 4. OC (Over crank)
 - Dead battery.
 - Air in fuel.
 - Defective battery charging alternator.
 - Broken sensing lead from alternator.
 - ECM malfunction.

ATS PANEL

1. ATS panel will not transfer to emergency supply (Generator).
 - No AC generator output from generator.
 - Defective ATS control board. See applicable Transfer Switch Manual
 - Circuit breaker between generator and transfer switch is either open or defective.
2. ATS panel will not retransfer to normal power.
 - Proper normal line power not available at line terminals in ATS panel.
 - Defective ATS Control Board. See applicable Transfer Switch manual.

GENERATOR END TESTING PROCEDURES:

REFER TO GENERATOR END MANUFACTURERS MANUALS.

THESE ARE LOCATED IN THE MANUAL SECTION OF STANDBY GEN-SETS.