

## Before you turn the key

### Tips to a trouble free start up

1. Lube oil: pull the dipstick and verify oil level before start up. We all know what to do if the level is low, but If the level looks higher than expected, loosen the drain plug or pull a sample from the lube oil pump to check for water. It's not unusual for water to enter the engine from the exhaust, leaking liner o-rings, or gasket over time. If you start the engine you'll be mixing water and oil like a blender and pumping it throughout the engine. If there is water sitting on top the cylinders you'll likely hydro-lock the engine and bad stuff happens, like bent connecting rods, bent push rods and even broken cranks.
2. Fuel: Check that the fuel feed and return line valves are open. Make sure the fuel settlement bowls are void of water, change the fuel filters if it wasn't done at the end of the season. It's difficult to inspect a filter looking at the outside it may appear to be clean, but fuel enters from the inside and exits the perimeter of fuel filters. The filter can be plugged and still look fine externally. The only way to tell for sure is to cut it open or measure the fuel vacuum.
3. Coolant: The anti-freeze characteristics in your coolant are only a small part of its contribution to engine health. Coolant is also a lubricant. It protects the water pump from early failure. It raises the boiling temperature and protects metal surfaces from electrolysis, corrosion, and erosion. Test the PH and coolant additive chemistry, inspect for contamination. Consult the log. Don't expect even extended life coolant to last more than 6 years. The sacrificial additives in the coolant that protect the metal surfaces in the engine are depleted over time. Add coolant additives as needed and replace the coolant every 5-6 years per the manufacturers recommendation.
4. Electricity and water don't mix: Get the water out before you energize the windings. Generator winding insulation picks up dust and dirt over time. Dust and dirt is a magnet for moisture in the atmosphere. Every spring we replace too many generators that shorted to the case at 6 O'clock on the stator windings due to moisture build up. Save yourself a bundle of money and headache. Dry out the windings before you start up your generator. An inexpensive electric heater with a fan blowing into the generator air intake for 12-24 hrs. will assure the windings are moisture free. Some generators have winding heaters installed. If so, make sure they are operational for a minimum of 24 hrs. before start up.
5. Loose connections: give all your electrical lugs and terminals the tug test, check for corrosion of the terminal connections and deterioration in the wiring insulation. Short circuits inside the connection box are a major cause of generator failure. Vibration and the heating cooling cycles over time will work to loosen connections. Tighten lug terminals as needed and replace corroded connectors. Check for chaffing on wiring insulation run all the generator connection leads through your bare hands, feel for cracks and breaks, add chaffing material as needed to prevent erosion of the wiring insulation. It only takes a split second to let the smoke out of a generator from a short circuit.