

SERVICE BULLETIN

E10 Service Bulletin – Westerbeke Corporation - Caution

Date: 17 October 2006

Service Bulletin # 251

Models: All Gas Generators

Since 1990 the U.S. government has mandated the use of oxygenated fuels to reduce the amount of CO emission into the atmosphere. Congress had previously mandated the use of MTBE (methyl tertiary butyl ether) as this oxygenate. This legislation expired in May 2006 because MTBE is a known carcinogen and is also a ground water contaminant. Since then, Congress's new energy bill now mandates the use of ethanol as the oxygenate to be used. Ethanol is a more environmentally friendly product, an alcohol based product produced from corn. E10 is a blend of 10% ethanol and gasoline and is the mixture now offered at most fuel stations. The use of E10 in your car should have no real effect on its operation. The use of E10 in the marine market place however, will cause us to take some precautions.

Ethanol, being an alcohol-based product, is quite different from MTBE which is an ether-based product. Ethanol is sort of a double-edged sword when it comes to its ability to mix with water. E10 can hold up to four teaspoons of water per gallon and can hold only .15 teaspoons of water in solution per gallon. This is good, as it will allow your engine to burn water that finds its way into your fuel tank up to this 4-teaspoon per gallon limit. The problem comes when one gets beyond this limit. As was the case with MTBE fuel, E10 will also phase separate when we get beyond the saturation point. "Phase separation" occurs when the gasoline and water actually separate and the gasoline floats on top of the water. With MTBE one could simply pump the water out from under the fuel or let the filters remove it and burn the gasoline left behind. MTBE reacts quite differently with water than does ethanol. For this reason the two fuel blends should not be mixed during our transition from MTBE to E10.

Ethanol is a solvent and tends to clean any dirt or contaminants with which it comes into contact. For the consumer, this means that any dirt currently in the fuel system will be mixed into solution and scrubbed out by the fuel filters. This results in the need for the consumer to change fuel filters frequently.

The shelf life of E10 is only 60-90 days. This means it will start to break down over time and leave deposits in the fuel system. E-10 will also lose its volatility very quickly. We recommend using a NON-ALCOHOL based fuel stabilizer in your fuel all the time. The reason we are recommending a non-alcohol based stabilizer is to avoid adding even more alcohol to the fuel. There are several good petroleum based products on the market.

Another characteristic of E10 is its ability to absorb water. E10's alcohol base allows it to absorb water directly from the atmosphere through your boat tank's open vent system. In just 100 days at 70% humidity, E10 can absorb enough water to reach its phase separation point. To avoid this from occurring, one should use up the fuel as quickly as one can. Try to plan on turning the fuel over as quickly as possible by running the tank low before any extended periods of non-use. Then fill up just before the next trip out. Avoid having E10 fuel sit unused for any extended period of time.

Part # 052947

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The following is a list of informational points that may help to answer any questions and to let you know of some precautions to consider.

- Do not mix MTBE fuel with E10 fuel.
- Keep water out of your fuel tank.
- Run a non-alcohol based fuel stabilizer additive at all times.
- The more you use your boat the less likely you are to have problems. Don't leave large loads of fuel in the boat for any lengthy periods of time.
- There is approximately 5-8% less btus in E10 (less power per gallon).
- Have a good water separating fuel filter installed if you don't already have one.
- Keep several spare filters on board, and the means to change them. A kit in a sealable bucket (that will seal up old filters and gas for safety) with the correct tools to change your filter, and spare filters. E10 fuel will clean your fuel system and consequently clog filters early on after the change over.
- Be aware of potential points of water intrusion into fuel tanks. Check deck fill cap o-rings, and fuel vents.
- When buying fuel, ask Marinas if they have switched to E10 fuel.
- Rubber fuel lines older than the mid to late eighties may need to be replaced.
- Carburetors may need to be cleaned.

Damage caused by contamination from water, foreign particles, sludge, or gums entering or forming in the engine or fuel system is not covered by the Westerbeke Corporation's limited warranty.