FORCE Outboards

service bulletin

No. 95-5

Reformulated Gasoline (USA)

All Models

Using Reformulated Gasoline

Reformulated gasoline is required in certain "non attainment" areas of the USA as of January 1, 1995. This requirement results in a two-part change to the fuel that helps lessen gasoline's contribution to atmospheric pollution. They are; 1) control some of the fuel's "properties" and 2) "oxygenate" the fuel.

1. By controlling some "properties" of the fuel more closely, its toxic effects are reduced. This should be beneficial to outboard engines because it will be a cleaner burning fuel containing fewer deposit forming components. Vapor pressure and the evaporation rate at any given temperature of this fuel is closely controlled. This again should help engines because it will make the fuel more consistent.
2. "Oxygenate" the gasoline. By doing this, the carbon monoxide (CO) present in the engine's exhaust is converted to carbon dioxide (CO_2). Adding either a) ether or b) ethanol (alcohol) to the fuel accomplishes this. Both contain oxygen, while gasoline is composed primarily of hydrogen and carbon with no oxygen. The different oxygenates are blended at different percentages based on their relative amount of oxygen.
    a. The "ether" that is usually used is in the form of MTBE, (Methyl Tertiary Butyl Ether), which has been used primarily as an octane booster for several years already. There is a small amount of ETBE (Ethyl Tertiary Butyl Ether) being used in some fuels. MTBE ether is blended at 8-15%. Do Not confuse MTBE with Methanol. MTBE is made from Methanol BUT it is an entirely different chemical compound.
    b. Ethanol (alcohol) is the same that has been used in most Gasohol fuels available in different parts of the USA for several years already. Primarily promoted as a renewable fuel source. Ethanol is blended at 6-10%.
    c. Methanol is not being used in "Oxygenated" fuels.
    d. Ether and Ethanol will mostly boost the "research" octane number of the fuel. Marine products respond more to the motor octane number so they will receive little benefit from the "Oxygenated" fuel.
    e. "Oxygenates" contain less energy than the gasoline that they replace. This results in reduced fuel economy and a slightly leaner running engine. This should not cause any problems with Mercury Marine products providing they haven't been "altered" and the fuel system is in good operating condition.
    f. Ether and Ethanol can cause deterioration of some plastics and rubber products. Outboard products produced after 1979 should not have any problems. Products produced before that time should have the fuel system components inspected regularly for leaks and/or deterioration.
    g. These "oxygenates" may dissolve some of the dirt present in fuel systems which will cause the filters to clog. Changing the fuel filters more frequently until a fuel system has "cleaned" itself will help.
    h. Ethanol and any water that is in the fuel tank will separate from the gasoline and sink to the bottom of the tank if left setting over a long period of time. To prevent this, drain all fuel systems before storing. Add a gasoline stabilizer to the fuel tank (after draining).
    i. Ethanol changes how temperature affects the fuel. In cooler weather, it can cause hard starting. In the late spring and summer when temperatures rise, it can cause vapor locking.

The ethanol or the ethers used in these new reformulated gasolines are not something new. Both have been around several years. If you follow the information that has been put out into the field by Mercury

provided by http://www.crowleymarine.com

Marine, other marine engine manufacturers and the automotive industry over the last few years concerning the use of fuels containing alcohol, problems should be kept at a minimum.

Mercury Marine Products

Mercury Marine products produced since 1980 are designed to be used with any commercially available regular grade lead free gasoline, including those containing oxygenates. The oxygenated fuels containing less energy cause the engines to run slightly leaner. If for any reason an engine has been modified to lean out the fuel supply, or if the engine has not been tuned up recently there may be cause for concern. The results of running too lean can lead to detonation related problems or scuffed pistons.

ANY MAJOR BRAND OF UNLEADED (LEAD-FREE) AUTOMOTIVE GASOLINE WITH A MINIMUM PUMP POSTED OCTANE RATING (R+M÷2) OF 87 IS SATISFACTORY FOR THESE OUTBOARDS. Outboards may use gasoline containing up to 10% ethanol, but the addition of a Quicksilver Water Separating Fuel Filter* is recommended. Midgrade AUTOMOTIVE GASOLINE advertised to contain fuel injector cleaning agents is recommended for added internal engine cleanliness. Hi-Performance models-refer to the gasoline recommendations furnished with these engines.

**The water separating fuel filter will trap water and dissolved deposits and debris. The filter DOES require periodic maintenance. Ask your dealer for maintenance and installation details.*

1979 and older:

Additional inspection of the fuel system is required to detect and correct deterioration of elastomer and plastic parts (such as hoses, seals, and gaskets) caused by the alcohol and acids in the gasolines.

Refer to Force Service Bulletin 93-1 for the complete USA and Canada fuel recommendation.

provided by http://www.crowleymarine.com