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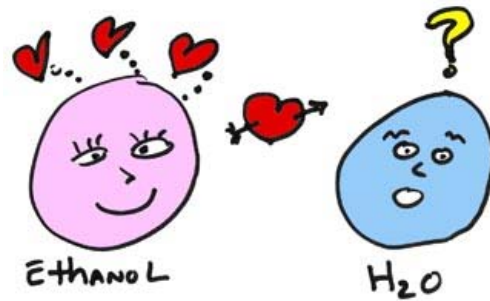
## Ethanol/E10—Back to the Future, with Care

By Vincent Pica

Did you know that Henry Ford's first car ran on pure ethanol – not the Model-Ts that our grandparents drove – but the "Quadricycle" of 1896? Of course, in those days, engines were far simpler and would run on just about any hydro-carbon. Now engines are almost unbelievably complex – and we're going back to ethanol, at least in part to save the environment and ourselves.

### What Is It and Why Are We Changing?

Government mandates to reduce carbon monoxide admissions (see "Silent and Odorless – a Killer") have resulted in the oil companies "diluting" gasoline with other substances that "oxygenate" the exhaust. For many years, the additive was MTBE – methyl tertiary-butyl ether – and it did a good job. Then someone noticed that it was a carcinogen. So, the hunt went on to get that out of the equation. Back to the future – ethanol was back in vogue and "E10" was created – 10 percent ethanol and 90 percent gasoline. Ethanol is made from corn, not oil from unreliable overseas sources. It is not a carcinogen, is made in the USA and is better for the environment. Everybody wins – almost.



### The Panic Sets In

Ethanol is, basically, a solvent. It will dissolve varnish, sludge and other assorted crud inside your fuel system – tanks, lines and filters. It truly cleans while it works its way through the power plant. Perfect – almost. It also dissolves rubber and certain resins, like the fiberglass that older fuel tanks are made of. Images of gallons of E10 fuel sloshing around outside the fuel tank, which is now a mass of goeey gunk, is certainly a cause for panic.

### The Reality

To the best of anyone's research, any engine made in the last 15 years has neither rubber hoses nor fiber glass fuel tanks. So, the chances of someone with a 20-year-old engine worrying about 20-year-old rubber hoses still being in place has got to be zero. Those rubber hoses have been replaced three or four times over 20 years. The fuel tank is another matter, of course. That just might be sitting down there, dutifully executing its assigned job. While E10 won't dissolve it overnight, the tank has to go. Steel or plastic. No fiberglass—and no aluminum (see the "Real Problem," below). The expense will be non-trivial – so maybe here's your excuse for a new boat!

## The Real Problem

First, you'd better replace your standard fuel filters with "10-micron water separator filters designed for ethanol." Those are the words you use when you order them. They fit exactly where the old filters went. Order plenty of them. Until E10 is finished cleaning the gunk out of your fuel system a little bit at a time, you'll be changing those filters a couple of times a summer. Eventually, the system will be cleaned of years of crud and everything gets normal again. Except for the new problem: water.

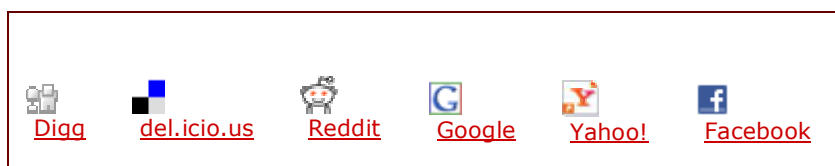
E10 absorbs 10 times more water than MTBE does. This gets carried with your fuel into the engine where, hopefully, it gets burned away. If it sits in an aluminum fuel tank, it can cause corrosion and now there are little bits of metal moving through the system – clogging the fuel filters and damaging injectors, carburetors, etc. And if the water/E10 ratio gets too high, the water pulls the ethanol out of the E10 – leaving plain ol' gasoline on top (with slightly less octane than the E10 combine) and water and ethanol sinking below. The lower octane isn't good and no ethanol is getting burned with the gasoline – not good for the engine nor the environment. If enough water/ethanol collects in the fuel tank, it will eventually reach the engine. Neither water nor pure ethanol is good for an engine.

## What to Do?

Well, use a marina that pumps lots of gas. You don't want to put his problem in your tank. Two, you'd better be using your boat more since this water build-up and separation risk is amplified by fuel just sitting there. (Here's a perfect excuse for not mowing the lawn!) Three, in direct contrast to the "old days," when you lay her up for the winter, take the fuel out (work with your dock master on this one.) Lastly, use a "non-alcohol-based additive" (those are the words) to preserve the fuel. Starbrite's Startron and Gold Eagle's Sta-Bil are examples. A clean environment is worth it.

**About the Author:** *Vincent Pica is a coxswain and the Commander of Flotilla 18-06 East Moriches. He was a navigator in a brown-water and blue-water sailboat racing crew for eight seasons. From the "iron sails" side, he is a licensed US Coast Guard Master of Steam and Diesel Powered Vessels, carries a Radar Observer endorsement, Unlimited, on his license and is certified in Marine Diesel Engine Operation and Maintenance.*

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