
BOATING / BY BOB STEARNS

# **Fuel** Foul-Ups

An outboard is **only as good** as its **gas.**

**Flowing fuel: All gasoline may seem the same to you, but your outboard has more discriminating taste. Some fuels degrade quickly and gum up the carburetor. Others cause carbon buildup that can damage the powerhead.**

CAN YOU RUIN A PERFECTLY GOOD OUTBOARD motor by using poor fuel? You bet, and it happens all the time. It can be an extremely painful lesson with the current cost of engines. Worst of all, the process may not take very long—sometimes less than one busy season.

The most common problem starts with the carburetor. Today's gasoline seems to deteriorate faster than the stuff we used 25 years ago, sometimes gumming up the carburetor in just a couple of weeks if the engine hasn't been run during that time. David Greenwood, quality research supervisor for Suzuki outboards, agrees. "Most of this is caused by the increase in EPA-required fuel additives. The result is a gradual degradation in gasoline quality and performance until it is eventually no longer usable."

For years I'd been using 89 octane gasoline rather than 87 in my outboards because it seemed more stable, but carburetor problems would still show up; they just took a few weeks longer. Recently, however, I've discovered a fuel additive that preserves gasoline stability and reduces carburetor problems (see sidebar).

### Jacked Rings

Most outboard manufacturers recommend 87 or 89 octane gasoline; none recommend using high-test (91 or higher). Some even warn that these high-octane fuels contain oxygenates that raise cylinder-head temperatures significantly. Avoid them and gasoline with added alcohol, also a temperature-raising oxygenate that can damage some outboard fuel systems.

In order to squeeze more horsepower out of current two-cycles, the design of piston rings has been steadily improved to contain combustion pressure more effec-

tively. The higher tolerances of these rings make them more susceptible to carbon buildup in the piston's grooves—a problem since today's fuels often do not burn cleanly in two-cycle engines. When too much carbon accumulates, the rings are pushed higher and higher. It's called *ring jacking*. Friction between the rings and cylinder walls increases considerably, elevating temperatures and accelerating wear. Eventually this causes very costly damage to the powerhead. Because it burns more cleanly and thus helps reduce carbon buildup, all of the major two-cycle outboard makers recommend using the highest-quality outboard oil (TC-W3). Most companies offer a separate carbon-reducing additive, too.

### Water and Gasoline Don't Mix

Water in gasoline is another serious problem. It causes carburetor corrosion (even with freshwater, but of course the salty stuff is a lot worse). Moreover, the engine won't even run if there is too much water in the fuel system. Destroying the powerhead is also a possibility—especially if water gets into an oil-injection system reservoir.

While there are some additives on the market that use alcohol to absorb a small amount of water, the only sure way to get water out of a tank is to pump or siphon it out. Water, being heavier than oil or gasoline, will always go to the bottom of the tank. Once it has been completely removed, the rest of the fuel is fine. Then you must also pump clean gas through the fuel lines until they are completely flushed.

A fuel filter with a water-separating element is a good idea, but unfortunately, none of these will always keep all of the water out. Once there's enough water in the bottom of the tank to submerge the pickup tube, the engine's fuel pump will always manage to pull enough through to get to the carburetor. I prefer filters with a removable bowl or drain on the bottom so that I can regularly check for water in the fuel.

The best way to avoid water problems is to keep it out of the fuel in the first place. Always keeping the tank full to eliminate moisture condensation is a good start. However, boats must have water under the hull to run, so if the fuel vent is not properly placed, water can get into the tank. That little clamshell outlet on the side of the hull should always be located as high as possible, with its opening pointed down and just a little aft so that it cannot scoop water as the boat plows through a wave. A boat I once used had its fuel vent pointed forward like a scoop, and in rough seas, it quickly put many gallons of seawater in the gas tank. What a mess! You can bet I check the fitting on my own boat regularly.

## fuel additives


I've always viewed fuel additives for boats—other than those offered by the outboard companies—with a jaundiced eye. Some are definitely not good for outboards. But for the last year now, **I've been using an additive called PRI-G** (it's new for recreational boats but has been used commercially for many years). PRI-G has many benefits for marine gasoline engines.

Most important, **it stabilizes fuel for at least two years**—even in the carburetor, which makes it unnecessary to run the carb dry if the engine won't be used for up to a year. It also reduces cylinder-head combustion temperatures as well as inhibits both carbon buildup and corrosion. And it helps keep the fuel system clean, while reducing harmful emissions. It even has been successfully used to restore gasoline that is several years old.

A pint, which costs around $14, treats 256 gallons of gasoline (at about 6¢ per gallon). That's cheaper than the current difference between 87 and 89 octane you pay at the pump, and the benefits are much greater.

**It is critical to mix PRI-G exactly in the manner prescribed by the manufacturer** so that it reacts with all of the fuel in the tank within 15 to 20 minutes. Until untreated fuel in the lines and carburetor has been burned off and replaced with treated, those components won't be protected.

The best way to start is with an empty or partially filled tank. Add enough PRI-G to treat the total capacity of the tank, immediately before you add gasoline. After that, it is only necessary to add enough to treat the amount of gas needed to refill the tank.

Here are some retail outlets that carry PRI-G: West Marine (800-262-8464), Boater's World (800-826-2628), and Camping World (800-626-5944). For more information on PRI-G or PRI-D (the diesel version), contact Power Research Inc., Dept. FS, 3750 Hacienda Blvd., Ste. A&B, Davie, FL 33314; 954-581-6600; www.priproducts.com.—B.S.

"Honey, it's the fly tyer from next door. He wants to borrow some urine-stained fur from the belly of a vixen fox..."