



How To: More on Two-Cycle Oil and Gasoline

By Dick Ray

A recent long conversation with a member (Kent) who works for a major outboard motor corporation has largely confirmed what we had previously learned on the subject of oil. The best oil is TCW3 from a recognized manufacturer. Forget those claiming to give equal performance or lubrication, and forget any four-cycle motor oil especially.

I learned some new things also, which is a by-product of listening and trying to keep an open mind. Kent described testing outboard motors using TCW2 and older oils. Using gasoline from Supplier A, engines gave satisfactory service in WOT (wide open throttle) life tests. However, gasoline from Supplier B was found to cause engine failures very early (I would like to stress that cause and effect were established with the proper scientific methods, not simply that if "A" preceded "B" then "A" caused "B".)

This discovery was responsible for the development of TCW3 oil. The older oils were satisfactory but the gasoline formula changed. Even if you buy the same brand of gas, you get whatever comes down the pipeline. The multiple variations of non-reformulated gas which are sold in some locations some of the time means you never know what is in the tank.

Oil is much more carefully controlled and can be expected to be uniform.

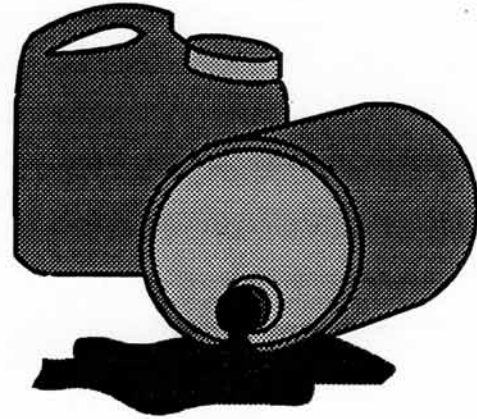
Our two-cycle engines are stressed much lower than high-output outboard engines so we may never see an engine failure. However, we expect our engines to run forever and not wear the cylinder. Rod bearing wear can be adjusted for, but wrist pin and cylinder wear cannot.

I also learned from Kent that the detergents to keep the inside of the engine clean and to prevent carbon build-up are in the oil. Operators who use less oil in their gas gain nothing except a slight reduction in fuel cost. The difference between 16:1 and 32:1 is about \$1 for a 120-mile run. Kent confirmed that more oil is better so long as the plugs and ports don't foul, which we always suspected. More oil keeps the engine cleaner and free of carbon.

My own engine does not smoke at 16:1 and the ports remain clean. I plan to go to 12:1 by putting 1 1/3 quarts of oil into a five-gallon can with four gallons of gas added.

Another member had been advised by someone to add a lead substitute to his gas. This is not needed, of course, because the lead substitute is for preserving valves and seats and the two-cycle engines have none. Who knows what harm it might do. I have no information on the long-term effects of lead-free gasoline on older Onan engines but I would expect that Onan has changed their valve and seat design to cope with it.

One last item on modern gasoline is that after years of having no dirt in my fuel bowl, a large amount appeared unexpectedly. Unfortunately, some also got into the needle and seat area of the carb, causing flooding and, worst of all, bad publicity. Where did this dirt come from? It wasn't from any of my gas cans because that was the first thing I checked. Under a magnifying glass it looked like the gas had sediment and rust flecks that are common when an old car is put into service again.



I saw this again in October in a previously sediment-free car. Others, including Kent, have confirmed that this is a common occurrence when the fuel is oxygenated, especially with ethanol. The alcohol dissolves the deposits which were undissolved by non-oxygenated fuels. I wonder also about the chemical reaction of the new gas with the plastic poppet valves.

A solution is to buy lots of gas before October and store it through the winter. I plan to take empty gas cans when I go to areas not yet using oxygenated fuels and to bring back "user-friendly" gasoline.

The glass bowl on the fuel tank is an excellent filter for the sediment and for water. We have long recommended that plastic fuel filters not be used in two-stroke cars because of the lack of pressure. Experience has shown that these get plugged up with no warning, unlike the glass bowl, and no one carries a spare even if we could diagnose the problem within a few minutes.