

Bonding, Lubrication, and Heavy Metal

Jim Ball

Now I know what some of you are thinking, but I had to come up with a catchy title, because I am told most people don't read the articles in the Daymarker. You can put away the Mazola Oil and turn off the rock music, because this article is about our other loves - boats and their engines.

Boats engines aren't like car engines which you start up and run nearly every day and keep them regularly lubricated with oil. There is a big difference in the engine wear because our boats sit for long periods without running. Remember last Fall when you fogged your engines? You did that so a coating of oil would protect the cylinder walls and other parts of the engine all winter while the engines aren't regularly splashing oil around to keep things from rusting. Soon, the Spring winds will blow and we will start those puppies up and the air will fill with blue smoke and away will go all that protection. Then, after you leave your boat sitting for a week or two and go to start it up, guess what? It's metal on metal again until the oil starts splashing - the most terrible time for an engine. If you are truly bonded with your engines (see last month's article) you can feel their unhappiness when you start them.

Because of this unhappiness, I decided to look into various oil additives that would coat engine surfaces with something that would prevent wear, especially during startup. I was very wary of adding anything to my engine oil so I did some research. Some of the 40-plus additives on the market contain PFTE (Teflon) particles in an oil suspension which will slick things up for a while, but PFTE doesn't bond with metal until it gets to 750oF. Now that's good for frying pans, but if you get your engine that hot, you won't be going very far. (Besides, frying pans are where you are supposed to use the Mazola oil). The PFTE has to be replaced at each oil change, so you add more. The real problem with these additives is if you use too much for too long, PFTE likes to bond with itself, and that can cause your oil passages to clog up and fry your engine. Tests on oil additives containing PTFE conducted by the NASA Lewis Research Center reported, "In the types of bearing surface contact we have looked at, we have seen no benefit. In some cases we have seen detrimental effect. The solids in the oil tend to accumulate at inlets and act as a dam, which simply blocks the oil from entering. Instead of helping, it is actually depriving parts of lubricant".

There are some other additives out there that contain chlorinated paraffin that are featured in late night infomercials where an engine frozen in a block of ice (at 32oF) starts readily cause it has wax in it (so what?). Problem with this stuff is that it's an unstable compound, and moisture accumulation (H₂O) in marine engines combined with the Chlorine (Cl) in it...well, it doesn't take a chemist to figure out what forms inside your engine - not a pretty picture.

Out of all of the stuff that's out there, the one that I found most interesting was a metal bonding technology that originated with the racing industry, and is now used extensively by the military. The stuff is called MILITEC-1. I noticed it at the boat show in Annapolis a few years ago. I watched the demonstration, asked a bunch of questions, and read the technical reports. The demonstration and the technical reports from the Materials Science laboratory the University of Florida convinced me - this stuff bonds to the surface of the metal, prevents wear and corrosion, and doesn't go away for a long, long time.

MILITEC-1 is a synthetic metal conditioner, it doesn't contain acid-causing chemicals, solvents, resins, or PFTE, and it is not an oil treatment. It uses the oil as a medium to get to the engine parts, and bonds with them, creating a corrosion proof covalent bond with the metal and a very slippery surface. The stuff lasts for 15,000 miles of normal driving in an automobile engine, so using one treatment per oil change for a boat engine is more than enough to protect against a lot of unforeseen problems as well as disasters, like losing all of your oil.

I also checked MILITEC-1 out with a friend of mine who is both an OYC member, and with a federal service which prefers to remain undisclosed (it's the one that hauls the big guy, his staff, and visiting potentates around). They put MILITEC-1 in one of their old armored limos after an oil change. Since they were going to junk it anyway, they also used it for firing practice for armor piercing bullets while it was running (glad I wasn't driving it). The bullets pierced the block and the oil drained out along the track where it was running, and, like the Energizer Bunny, the limo just kept on going and going, and going all afternoon - with no oil! They finally shut it down when they left for the day. The next morning, they started it up and drove it away. They now require it to be used in all of their cars.

Boat exhaust systems and internal gaskets that keep out cooling water can fail internally due to rust and heat. The result can be found when one day your engine overheats and you find your crankcase is full of frothy oil. If you have saltwater intrusion, your engine is most likely going to be ruined. That is, unless it has been treated with this MILITEC-1 stuff. I am told that the owner of a boat that was treated with it found the frothing in his crankcase, but his engine was not overheating. He called the people who make MILITEC-1, and they told him to just keep running it until he could get it fixed, then change the oil and add another 8 oz of MILITEC-1. The boater did it and hasn't had a problem one. This stuff also, by the way, improves performance and gas mileage because the engines are better lubricated and run more efficiently. They also produce less pollution.

What I have learned convinced me to spend a few extra bucks a season to protect my engines from the wear that comes from starting after sitting a long time, and against the possibility that I could have water intrusion from either a failed part or a full bilge. I just realized that I need to put this in my generator also. Don't use it in the transmission unless you are sure it doesn't work on a friction principle. The stuff is environmentally approved for use in Navy submarine systems for good reason, and the Coast Guard uses it too. So why not your boat, just in case you, the next hurricane, or some terrorists try to sink it? Several auto stores and Military Exchanges carry it; if you can't find it, call the company at 877-222-5512. Do it for your engines, they'll thank you for it; and save the Mazola for other recreational uses.

For more information, check out their web site;

www.militec-1.com

Cheers!

Jim Ball