


PERFORMANCE TECHNICIAN

IT'S EITHER MARKETING OR ENGINEERING - IT CAN'T BE BOTH

-Greg McConiga



BREAKDOWN MAINTENANCE OR PREVENTATIVE MAINTENANCE?



This really won't translate directly to the high-performance field since every racer knows enough to keep the engine oil clean and check the filters frequently for signs of distress, but it might apply to your tow vehicles — assuming that you're foolish enough to buy into the factory hype about extended oil drain intervals.

There is a distressing trend out there that strongly suggests that the marketing teams have overridden the engineers when it comes to routine maintenance and the proper care of a modern car or light truck. Let's face it, the job of a car or truck manufacturing company is to sell more cars and trucks. The prime financial mover for a manufacturing concern is more units sold and more market share. As we've moved from an agrarian society where folks interacted with their machinery every day and saw the direct results of

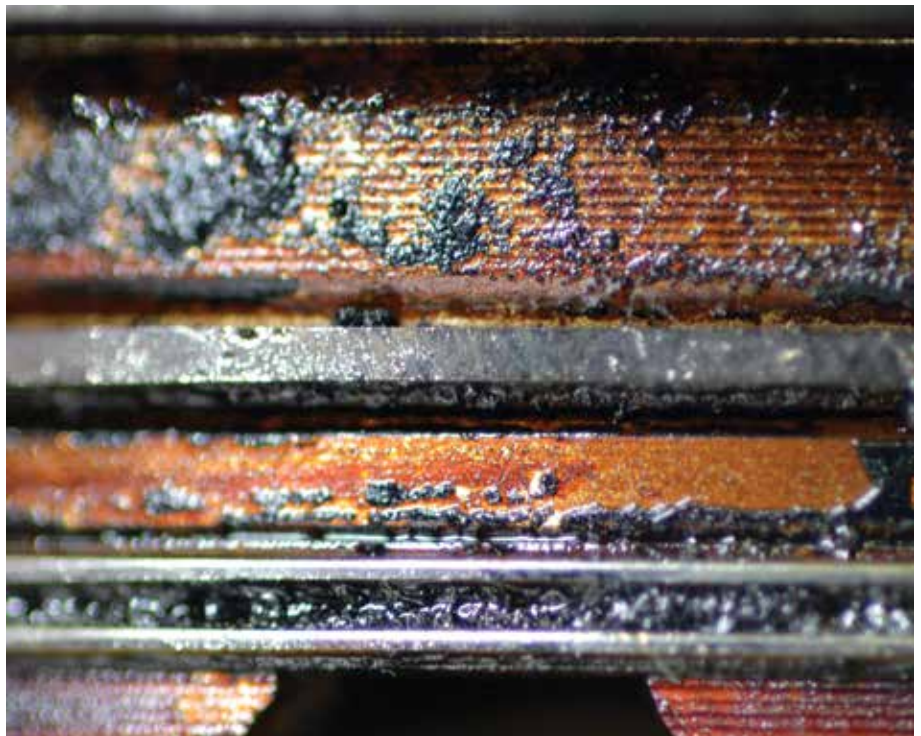
This piston is from a 75,000-mile engine that had its synthetic engine oil changed every 10,000 miles whether it needed it or not. I think it's safe to say that it exhibits every oil-related failure one can imagine, all in one small package. The skirt is badly worn, the wrist pin and pin bore are worn, the oil control ring is filled with sludge, and the top ring and second ring are stuck in their grooves. It's intuitively obvious to the casual observer that extended oil drain intervals are a resounding success! Okay, that was a little cynical.

failing to maintain a piece of equipment, the marketing people seized on this disconnect and began telling everyone that through some miracle they had perfected the lifetime sealed unit so that the working fluids or filters no longer needed to be changed.

Just to make sure I understand, there is no more break-in period, no swarf or shrapnel generated as new parts scrub into one another, no heat, no condensation, no oxidation, no shear, no contamination by minute quantities of combustion products making their way into the crankcase?

There's no condensation on cold cylinder walls, no short-interval driving, no freezing cold winter and no blazing hot summers. We are now supposed to assume that even though the owner's manuals of every manufacturer out there contain a "get out of jail free" clause that states that oil consumption of up to a quart in a thousand miles (or less!) is "normal," there is no leakage the other direction, from combustion chamber into the crankcase. Oil from a low-pressure crankcase can find its way into a high-pressure chamber, but high pressure can't make its way into a lower pressure? The laws of physics are suspended simply by declaring it so.

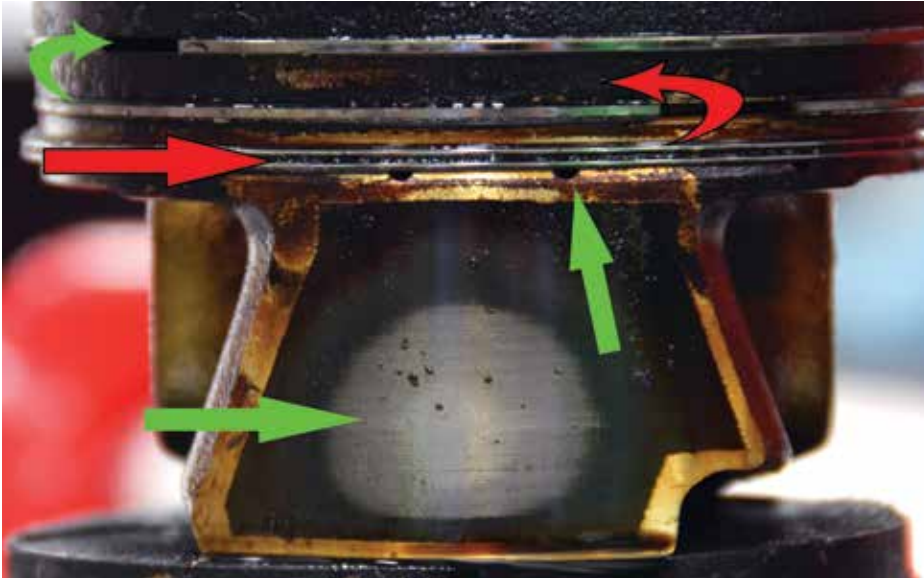
I don't know about you, but I'm offended by this bovine excrement. Every engine uses oil; it is designed to use a minute amount. It has to to keep the rings lubricated. If the crankcase level remains constant, the volume of condensation, blow-by or contamination finding its way into the crankcase is equal to the consumption and the level doesn't drop, but the crankcase is now fouled and must be drained! Yes, it's true: Oil does not wear out. But it does become contaminated and it is subject to breakdown and chemical attack. Your oil change interval is dictated by the capacity of the sump and the volume



In this close-up, you can't even see the oil control ring center or the drain slots. The color just above the second ring tells you that the top ring is no longer working to seal in the combustion gases and the second ring is firmly stuck, which means it can't do its job, primarily fine oil control. The oil control ring is for gross oil control, the second ring for fine oil control, and the top ring for compression control. If you have to rely on the second ring for compression control, you don't have an engine anymore.

of oil it can hold, which determines both the total additive content (10- 20% of every quart is an additive of some kind) and the mass over which the accumulating contaminants can safely be spread while still maintaining proper engine lubrication.

In my experience, you can only safely run approximately 1,000 miles per quart of crankcase capacity, assuming you use top-shelf synthetic engine oil. The 10,000 mile interval is a fairy tale, and I've got the pictures to prove it.



The groove for the top ring is so full of carbonized oil and sludge that it's not working. I dug out a significant amount of hard carbon from the groove behind the ring. In order for a top ring to seal, you must allow combustion gas in behind the ring to push it out into the wall. The ring groove must be clean, the floor of the groove must be smooth, and there must be enough side and back clearance for gases to move over the top of the ring and enter in behind to "activate" it and push it out into the cylinder wall. If you fill the groove with crud, the ring fails to seal up the chamber and combustion gases escape down the side of the piston, which is why this piston has as much dark color below the top ring as it does above it. Once stuck, the problem accelerates as the ring can no longer spin and self-clean. The oil control ring is so plugged up that it's stopped functioning, the slot indicated by the green arrow no longer feeds a consistent oil flow over the skirt and the skirt wear is accelerated. If pictures are worth a thousand words, then this picture tells you all you need to know about extended drain intervals; they are suggested as a means to make vehicle ownership more attractive due to "reduced upkeep costs" and have nothing to do with keeping the car on the road longer and saving you the expense of unnecessary replacement.

The pistons shown are from an import vehicle that mandates full synthetic, 10,000 mile oil drain intervals, and these are just a few of the pistons that have been quietly replaced (if and when the customer complains of excessive oil consumption) under a little-known factory program.

You can clearly see that the top ring has stopped working and that the entire body of the piston is heavily sludged up. If you cant the top ring into its bore and twist you can dig out a pile of hard, carbonized oil that has taken up the back and side clearance and seized the ring. With the rings seized, there's no rotation and no self-cleaning action. The second ring is in just as bad condition, and the oil ring is completely clogged. The top ring is no longer sealing as evidenced by all the color on the land between the top and second rings. The oil control ring

has two strategically placed drain slots in the bottom of the groove that were supposed to drain the scraped-down oil over the skirt and provide a more consistent oil film, but once plugged that oil flow stopped and the skirts show the result of that with increased wear.

This isn't the first time or the first complaint I've seen or heard about excessive wear or oil consumption or even engine failure directly attributable to "factory recommended" extended oil drain intervals. In fact, there's a real problem out there that no one wants to talk about. Engines that should run 250,000 trouble-free miles are failing long before that because owners believe the guy with a vested financial interest in selling you another car or truck when he says "Just run it! Trust me! You'll be fine!"

My advice is to ignore the factory and change your oil at 1,000 miles per quart of crankcase capacity as an absolute maximum interval, and your other fluids and filters when you see shifts in color and odor. Are you going to waste some of your money? Yes you are. Unless you're willing to spend \$25-\$75 per sample and have your fluids analyzed to determine when they should be changed, you'll waste a few bucks. But I guarantee that the few dollars you waste will be a fraction of the dollars you'll spend installing or rebuilding an engine, or a high-tech electronic transmission, or buying expensive power steering parts and brake traction or stability control components.

Breakdown maintenance is done at the convenience of the repair shop at the price they dictate; the car or truck owner has no control over any part of the repair process. Preventative maintenance is done at your convenience and on your schedule and you can budget what you choose to have done, spreading the cost over several months if you need to. The choice seems pretty clear to me. ■

This is what the oil control ring should look like. I had to use a pick, mineral spirits, carb cleaner, and a brass-bristled brush and it still took me a half hour to get this ring clean enough to photograph. There is no reason that this kind of problem need occur. This is pure ignorance in my opinion. Used waste oil is now being collected and re-refined into a number of products, so the argument that we need to conserve by extending oil change intervals isn't necessarily true. If we have the technology to refine crude, then refining waste oil is a walk in the park by comparison. It is true that the output from waste oil recycling can't be used in some applications because some additives and chemicals remain after refining that interfere with its use in some products, but nearly all of the refining output finds a use somewhere.

