The Oil Report
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Oil the News that's Fit to Print!

Viscosity: Going Down!

by Ryan Stark

April of 2017 will mark my 20th year here at Blackstone and in that time a lot of changes have taken place. I'm a big fan of change myself. Long ago I got some advice from my Uncle Dan who said, "The only thing that's constant in life is change." I decided that his words were the truth, and it seems to me like change should be embraced because there is no stopping it, and also for the most part change is good. It might not seem good at the outset, but if you give it some time, things eventually work out. After a bit of reflection on the changes in the oil industry, I've decided that one of the best ones has been the trend to lower viscosity oils.

The thin oil trend

I started changing my own oil on a regular basis in the early '90s, and at that time 10W/30 was the oil of choice in my 1981 Chevy Citation. I didn't think that much about it. It said right on the oil cap use 10W/30, so I bought whatever was on sale and went along fat, dumb, and happy. At that time 5W/30 oil was starting to be as common as 10W/30 on the shelves, but I never went with it because it wasn't what GM said to use. However, my wife's first car (1994 Buick Skylark) recommended 5W/30, so that was a sign that thinner oils were starting to come into favor. Again, I didn't think much about it, and basically just stuck with what was recommended when I changed her oil.

Then, in the early 2000s I noticed that we were starting to see a lot of samples from Ford V-8 engines that were running 5W/20 oil. This was a bit of a surprise since that's pretty thin oil, but it was hard to argue with the results. Those engines produced some of the best wear we would see on a regular basis, so it quickly became obvious to me that this was a change for the better. And if you think about it, it makes sense.

Wear at start-up

For years, it was taken as fact by a lot of people that most of the wear in an engine happens at start-up. Now I haven't done any studies myself to see if that was true, but that statement didn't seem out of line from what I know about engines. So assuming it's true, why would just starting an engine cause wear? Well, I believe the answer is the oil isn't flowing over all of the parts like it does shortly after start-up. I do know that engines have virtually no metals parts touching one another without a thin film of oil providing a lubrication barrier, at least once oil pressure has been established. I also know that thin oil pumps easier than thick oil, so it

seems obvious that the quicker you can get the oil to the parts, the less wear an engine will produce. From then on I was sold on thin oil.

So what's the problem here? Well, when I first started at Blackstone, I was told that thick oil is good for the bearings, and I didn't have cause to doubt that statement until I saw these Ford V-8s producing virtually no wear, and I knew some of them were work trucks that were hauling heavy loads. So could it be that the bearings didn't need thick oil to survive? The answer is a resounding yes.

Even for diesels?

That trend toward thinner oil has proven true everywhere except for diesel engines. For years and years and even today, the oil of choice in a diesel has been 15W/40. But, if a heavy-duty gas engine can run light oil, why can't a diesel? We would occasionally see diesel samples from Alaska that were running 5W/30 and they would look fine, so why not use it down here in the lower 48? In colder weather, it was acceptable for diesel to run thin oil, but that really only matters on start-up. But the oil doesn't get thicker as it heats up -- it thins out. So could it be that thin oil does fine even when it get gets up to operating temperature? The answer to me was another resounding yes, and I wondered when the day would come that 15W/40 would no longer be the manufacturer's choice for diesel engines. Well, that time has come!

Today we are starting to see more diesel fleets going to 10W/30, and I'm here to tell you that this change is good. Not only will the bearings do just fine, but the engines will start up better (especially in the cold). And this change might eliminate the need for plugging your diesel in at night. Now, there will always be some people who are resistant to change. In fact there are whole countries that are. The German vehicle manufacturers have yet to embrace thin oil, though I think that change will happen some day.

Yes, change is good and I have yet to see a change happen that leaves hundreds of thousands of vehicles stuck along the side of the road. The sulfur has been virtually removed from diesel fuel and your old tractor still runs fine.* Additive levels have been lowered in engine oil and the old flat-tappet engines still run great. And now thinner oils are here to stay. I'm excited to see what the changes the next 20 years might bring and I believe that I'll embrace it, unless it involves getting rid of oil altogether!

*Note: Don't get mad at me. I wasn't in charge of that change and your injectors/fuel pump were probably on their way out anyway!

Cholesterol follow-up

Back in August 2015 I wrote about cholesterol testing and its parallels to oil analysis (read it here). I'm sure you're all wondering how my health has been, so this is a follow up to that. In the article I stated that there appears to be a connection between Vitamin D and cholesterol and I am here to tell you that I might have been wrong.

My final blood test was on August 7, 2015 and at the time I was taking a Vitamin D supplement to see if it would lower my cholesterol. Well, the supplement worked: my Vitamin D increased to 33, which was an all-time high; however my cholesterol also increased. So barring any sort of lab error that might have occurred, I'm not sure if there is a connection or not.

That article received a lot of feedback and I enjoyed all of the comments from our customers, but was especially intrigued by one e-mail I received. He pointed me towards the book "The Great Cholesterol Con," by Malcolm Kendrick, and while it wasn't the easiest read I've ever come across, it did change my life.

The book states that cholesterol levels aren't related to heart disease at all and that I should eat anything I like. Well, I'm 43 now and can make up my mind on what I do, and I have to say, I really liked the sound of that. It was the first time I had ever heard anyone say that your diet isn't related to heart disease and he had that data in his book to back it up.

I'll admit I never read any of the studies he talked about, though apparently they are all available on the Internet. As for what causes heart disease, well, I won't spoil the book for you -- ha ha just kidding, I'll spoil it: stress! Reduce that in your life and you'll be better off. Who can argue with that? Plus now that I don't have to feel bad about putting butter on my toast, my life just got less stressful.

--Ryan Stark

Date: August 7, 2015
Total cholesterol: 208
Bad cholesterol: 136
Good cholesterol: 46
Tri-Glicerides: 128
Vitamin D: 33

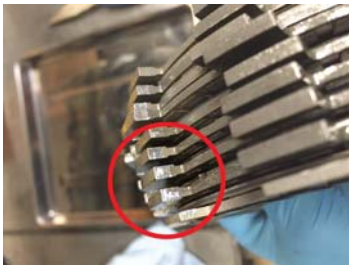
Report of the Month

Motorcycles have problems too, and this Yamaha YZF-R6 engine isn't wearing all that well. Can you tell where the problem is?

To learn more about where the elements are coming from, click here.

ELEMENTS IN PARTS PER MILLION

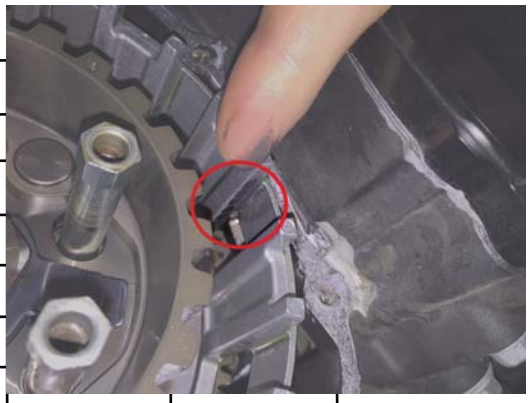
		UNIT/ LOCATION AVERAGES					UNIVERSAL AVERAGES
MI/HR on Oil	600		480	174			
MI/HR on Unit			12,104	11,731			
Sample Date	9/5/2016		6/14/2016	11/25/2015			
ALUMINUM	60	30	24	5			15
CHROME	1	1	1	0			1
IRON	24	20	24	13			26
COPPER	4	4	3	6			11
LEAD	3	1	0	0			2
TIN	1	1	1	0			1
MOLYBDENUM	30	23	26	13			64
NICKEL	1	1	1	1			1
POTASSIUM	2	4	2	7			2
BORON	4	15	10	32			86
SILICON	35	26	34	9			11
SODIUM	4	3	4	2			5
CALCIUM	2396	2367	2481	2224			1932
MAGNESIUM	11	11	13	9			394
PHOSPHORUS	1091	1039	1044	981			1082
ZINC	1248	1197	1278	1066			1237
BARIUM	1	1	1	0			0



Note the wear on the clutch discs. The owner suspects the discs were wearing on the clutch housing (below), causing the high aluminum.

PROPERTIES

		Values Should Be*				
SUS Viscosity @210°F	76.2	79-92	64.7	69.0		
cSt Viscosity @ 100°C	14.56	15.3-18.7	11.54	12.68		
Flashpoint in °F	425	>385	440	410		
Fuel %	<0.5	<2.0	<0.5	<0.5		
Antifreeze %	0.0	0.0	0.0	0.0		
Water %	0.0	0.0	0.0	0.0		
Insolubles %	0.2	<0.5	0.1	0.1		
TBN						



When the owner of this bike got our report, it prompted him to cut open the filter, which contained visible aluminum flakes. As you may know, any metal that you can actually see is metal that's too large for our spectrometer to read. When he saw the metal, the owner suspected something was going on so he pulled the clutch. It revealed substantial wear on the clutch housing and friction plates -- see the pictures above. He suspects this is where the metal came from. He said he races the bike with very hard downshifting into corners. This is, according to the owner, the likely cause for the excess wear.