The Oil Report
July 2014

Oil the News that's Fit to Print!

What's in a name? Lots of humor, at least from our customers. Sometimes people don't know what we mean when we ask for a Unit ID, but once they catch on we get some funny ones. See the article on the next page to read some of them!

Does it Matter What Oil I Use?

by Iris Saltus

We get a lot of calls and e-mails from people asking for recommendations on types of oil. As you probably already know, we don't give out any recommendations, since we find that any oil tends to do just fine in a well-running engine. We seem to give out this information pretty nonchalantly, maybe not realizing the deep-seated inner conflict the person on the other line may be going through.

I experienced that deep-seated inner conflict this year when I bought just one quart of off-brand oil to round out a fill for my MINI, and again when I tried a new brand of oil altogether for the entire fill. Even though I know from working here that my choice in oil was inconsequential (as long as there's oil in my engine, it'll be fine), it was still difficult to go against everything I've heard my entire life: that brand matters. When I went to the store to acquire the needed fluid, oils ranging from $5 to $10 per quart lined the shelves, staring back at me. There were oils designed for improved gas mileage, and others made for high-mileage engines. Some spoke of high performance on their fancy labels, and some just stated 5W/30 synthetic. My gut was freaking out and my brain's decision-making mechanisms were just as panicked. What if the oil breaks my engine? What if gunk and grime clogs everything up?

Good news: my engine didn't break, and it's wearing just fine. After coming to realization that my engine is perfectly peachy in every way with or without fancy oil in place, I wanted to do a little more research into how various oils compared in terms of wear.

Down & Dirty with Numbers

The plan was to present some helpful data using what we've seen from the

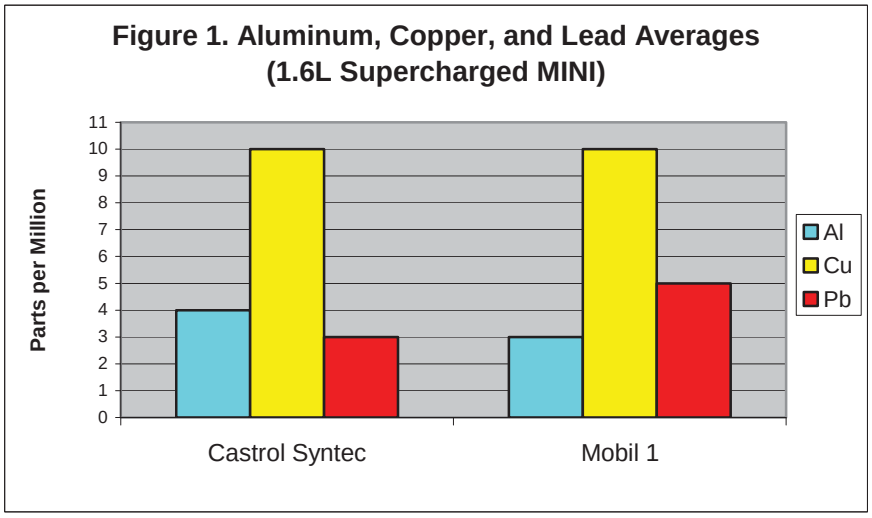

Figure 1: For consistency, only 5W/30 oils are represented. Castrol Syntec includes 17 samples, and Mobil 1 includes 27 samples.

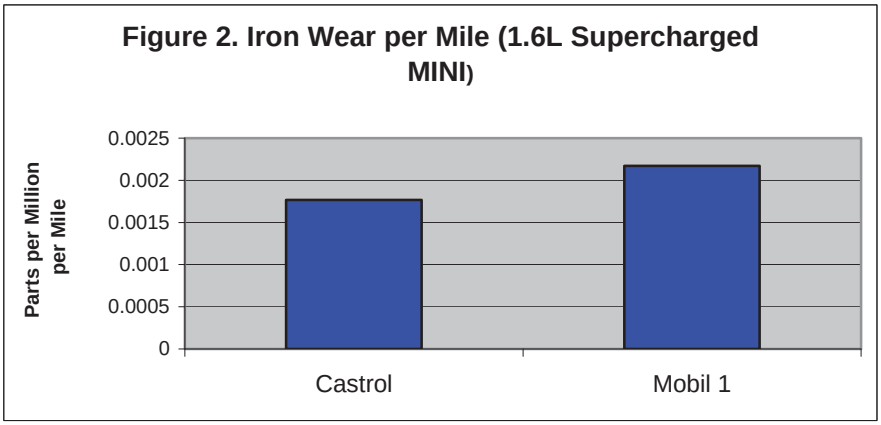

Figure 2: The average number of miles on the oil for Castrol Syntec was ~7,900 miles; for Mobil 1 the average number of miles on the oil was ~6,600 miles.

supercharged MINI engine, since that's my engine and I'm curious. However, we don't have a ton of samples from MINIs, and a lot of those samples didn't say what type of oil was in use. There was only a sizable sample group for Castrol Syntec and Mobil 1. Figure 1 is what we found.

There is very little difference between the two oils. The average level of copper was exactly the same across the two oils. And while aluminum and lead differed slightly, a 1-2 part per million difference is not significant. Also, iron wear per mile was very, very similar among the two brands as well (Figure 2).

I wanted more data, though, so I turned to an engine that we have more data for -- the naturally aspirated Subaru EJ25 engine. Once the data was culled for wear-in samples, coolant leaks, and air filtration problems, Figure 3 is what turned up.

Not much difference here either. Aluminum averaged the same for all the oils. There was a little bit of variation in the copper and lead readings for the Subaru, but 1-2 ppm is still not a significant difference. Steel wear (iron) was also a bit more spread out across the brands in the Subaru (Figure 4), but that's probably because we had more oils to choose from with that engine. These differences are extremely small though, varying by less than 0.001 ppm per mile.

Woo! I KNEW It!

"Hey, thanks for the charts, Blackstone! Now I'm going go to run to my friends and tell them that you've proved Oil Brand X is better than Oil Brand Y!" Not so fast, buckaroo. I have tried to exclude samples that had an obvious problem (like if there was coolant in the oil). Differences in use were more difficult

The Name Game

We get a lot of questions about what a "Unit ID" is -- it's what you call your car, truck, boat, etc. Lots of people stick with something safe ("2011 Subaru") but we also get some memorable monikers. One of our analysts (okay, it's Alex) named his wife's Honda Fit Ivy Plumberry and is mercilessly teased by those of us who think that sounds like a Cabbage Patch Kid.

Tim McAlicher had a Dodge caravan named Coffeemobile, but then he upgraded to a Ram named CoffeeProMaster. There are no less than a dozen Subaru WRXs and Foresters named "Scooby" or some variation thereof. Probably our favorite is "Scooby Joo," owned by Michael Joo.

Rob Pickett has a Porsche 911, so he wrote the Unit ID as CMXI (911 in Roman numerals). We also liked the Jeep that was named Fe2Ox3, which is the chemical formula for iron oxide -- rust. (Well, there shouldn't be an "x" but we suspect maybe he used it for his license plate number.)

And who could forget Gregory Michael's much-maligned 2006 Corolla? It's actually not something that's appropriate for a newsletter. But if you can imagine the stain you might find in your undies after being terrified, you're imagining the Corolla (which actually looked fine in analysis).

Star Wars fans make themselves known (Darth Tater, Darth Volvo, and Darth Bug). Karen Kraus relives the middle ages every time she gets in her Camaro (Black Death). Robert S. has a Porsche with a suspected IMS bearing issue: Robert's Sick Baby. Josh Perry's 2005 Legacy also is making some noise, so it was christened Knock Knock. Long ago we did a sample on our favorite knock name: the Knockarado. That truck hasn't been sampled in years, may it rest in peace.

There are two Fordzillas and a Quadzilla roaming the streets of the U.S., as well as a MacDaddy, BigDaddy, and 1 MacDaddy Word. We do a Mercury Marine engine known as the Tooth Ferry. We have a Blue Eagle, a Gold Eagle, a Screamin' Eagle, and

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to take into account. If someone takes their Legacy or MINI out to autocrosses all the time, that engine will likely produce more metal than others that don't see that kind of hard use.

It is important to note, either way, that not one single oil contained the outright lowest (or highest) levels of all four metals. For the MINI, Mobil 1 had the lower level of aluminum, but showed the higher level of lead, while the opposite was true for Castrol. With the Subaru, Pennzoil had the lowest wear rate for iron, yet tied for the highest level of copper. Castrol had the lowest level of copper, but nothing spectacular for the wear rate of iron.

If your heart is set on using Mobil 1 until you're dead and gone, there's nothing wrong with that. If Castrol happens to be on sale when you're buying oil, there's nothing wrong with switching to that one. There's nothing wrong with using Valvoline or Royal Purple or Napa or AutoZone oil either (they just weren't as popular for the two engines we looked at here). The same goes for conventional versus semi-synthetic versus synthetic oils. Your engine is going to be fine as long as there's some lubrication getting on all those moving parts, so stop beating yourself up about what oil type to use. We hereby grant you oil freedom for the rest of your days!

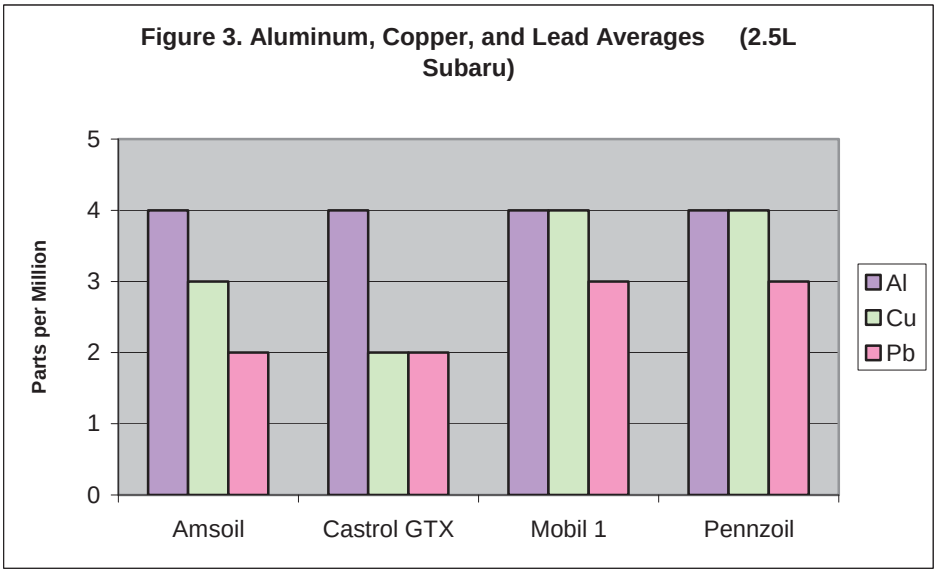

Figure 3: 5W/30 oils are represented here. Amsoil averages contain 28 samples, Castrol GTX averages contain 69 samples, Mobil 1 averages contain 155 samples, and Pennzoil averages contain 22 samples.

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a Double Eagle, as well as a Bulldog, a Sea Dog, an Under Dog, and an Easy Rhino. Lots of people sample their moms' cars, though our favorite might be Mom's Big Rig. And last but not least, we shouldn't forget the Senior Moment (port & starboard)!

Now, there's nothing wrong with a plain vanilla Unit ID -- when you get right down to it, calling your Subaru "05 STi" probably tells us more about it than "Chewy 3" -- but there's plenty of room for the make, model, and year on the back of the slip. If you like your comments to be more personalized, maybe include a bit of humor (or at least, an attempt at it). Nothing gets our creative juices flowing like an interesting Unit ID.

Whatever you call your vehicle, just be sure to use the same ID each time. That'll ensure that we're tracking trends consistently so we can give you the best analysis possible, and keep "Blue Thunder," "White Lightning," and all those other engines rolling for a long time to come.

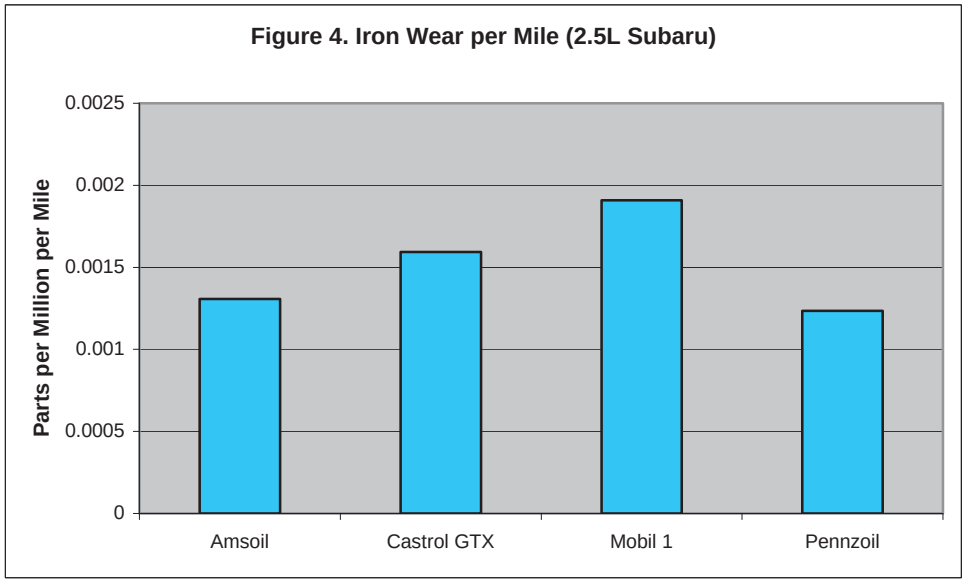

Figure 4: The average number of miles on the oil for Amsoil was ~6,100 miles, for Castrol GTX was ~4,400 miles, for Mobil 1 was ~5,500 miles, and for Pennzoil was ~6,200 miles.

Report of the Month

What went wrong for this '07 Expedition's 5.4L V-8 engine? Take a look at the data, then read the caption below to see what happened.

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

ELEMENTS IN PARTS PER MILLION								
	MI/HR on Oil	6,000	UNIT/ LOCATION AVERAGES					UNIVERSAL AVERAGES
	MI/HR on Unit	121,922						
	Sample Date	01/07/13						
	ALUMINUM	4	4					3
	CHROME	5	5					1
	IRON	106	106					19
	COPPER	2	2					3
	LEAD	0	0					0
	TIN	3	3					1
	MO LYBDENUM	72	72					74
	NICKEL	1	1					1
	PO TASSIUM	2	2					2
	BORON	45	45					60
	SILICON	11	11					14
	SODIUM	9	9					54
	CALCIUM	1150	1150					2161
	MAGNESIUM	738	738					107
	PHOSPHORUS	730	730					713
	ZINC	744	744					812
	BARIUM	1	1					2

PROPERTIES			Values Should Be*				
	SUS Viscosity @210°F	52.3	48-57				
	cSt Viscosity @ 100°C	7.98	6.7-9.7				
	Flashpoint in °F	395	>355				
	Fuel %	<0.5	<2.0				
	Antifreeze %	0.0	0.0				
	Water %	0.0	0.0				
	Insolubles %	0.3	<0.6				
	TBN	2.7	>1.0				
	TAN						
	ISO Code						

*THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

Typically chrome and iron are from a ring/cylinder interface, but in this case a rocker arm went bad. According to the owner, it got so hot that it turned the steel around the roller bearing blue. "When it went bad," he said, "it started beating on the camshaft and scored a lobe," which led to the high iron. When he got the engine disassembled, the cam looked like someone had taken 80 grit sandpaper to it. He got it fixed at the dealer and while the dealer couldn't tell him why it happened, they did say they've seen it before and it's relatively rare but that it does happen. All's well that ends well: the engine now runs beautifully.