

“Oil the News That’s Fit to Print!”



Spotlight on... **Space Dust**

by **Jim Stark**

Coming Soon: On-Line Reports!

We are currently working on a program that will allow all Blackstone clients to access their current and past reports over the Internet. For the time being, we are still planning on emailing your



report to you when it's finished, though at some point in the future we may switch to sending an email that alerts you when your report is done. Then you can log in and view the report. If you have an opinion either way about whether you'd like to get an email with the actual report, or get an email letting you know it's ready, let us know! We want to know what works best for you. (Just reply to this email to let us know your thoughts.) Of course, hard copies will still be available to those who want them.

Here's a fact. Everything we turn up in analysis of your used oil had to get in there somehow. As obvious as that may appear, I hadn't really thought about it until I ventured into making my own oil. I built it up gradually, starting with a 10W base stock that was nothing more than refined mineral oil with nothing added. After running it a specific period and measuring the results, I started adding components, running the same miles, and repeating measurements. Eventually I ended up with a complete package that performed very nicely.

Every time I changed something in the oil, the results were measurable. That led to a low-level Eureka! — an affirmation of something I'd always known but hadn't given much thought: Everything we find in oil analysis had to get in the oil somehow. What we find in oil was put there by the oil blender, came from the engine, or came from the environment.

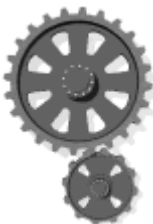
There are many factors and variables to consider in how long you can use oil in an engine and in how long an engine will last. The most important of all those variables is keeping the oil, regardless of type, as clean as possible. Your air and oil filtration systems are critical players in accomplishing this mission.

The Importance of Air Filtration

Leaving oil filtration for another article, just how important is air filtration? It is one of the most important factors in long-lived engines and long oil change intervals. It is a variable you can control.

Silicon is everywhere in the environment. We rarely think of it unless we see a dust storm in a desert or watch a farmer's tractor operating in a cloud of dust, but there is no such thing as clean environmental air. If you let rain drops dry on your car or truck, by the time they dry they will have collected enough dirt to leave spots on your paint.

Dirt exists everywhere because it comes from outer space. Have you ever wondered why the most important tool in archaeology is a



shovel? If a team of archaeologists went to study a 2000-year-old site, they probably would have to dig down 30 feet to find what they were looking for. The reason old things are buried so deeply is that the Earth is constantly being showered by extraterrestrial dirt. You can't escape it, even at high altitudes, and the only way you can prevent it from prematurely wearing out your engine is to collect it in an efficient air filtration system.

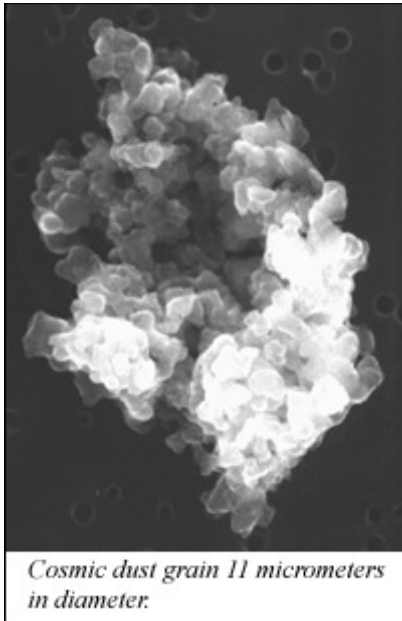


Photo courtesy of NASA.

Controlling the Dirt

I was recently speaking with a pilot about why his engine was wearing so poorly. He told me he liked to pull a little carb heat (in other words, unfiltered air) through his engine once he hit altitude because the air up there wasn't a problem. Once I looked at his report, I saw his silicon level was quite high. He was wrong about the air up there not being a problem. In fact, there is enough silicon in the air at any altitude to cause poor engine wear. It's important for any engine to filter the dirt out before it can do damage.

All engines wear and eventually wear out. Assuming a mechanical or contamination event doesn't cut short an engine's life, the amount of wear an engine's parts leave in the oil is predictive of how long that engine will last. One of the most destructive contaminants that gets into the oil is excessive silicon. The best wearing (longest lasting) engines we see have air filtration systems that keep silicon to a minimum in the oil. Regardless of the air filtration system manufacturers supplied for your engine, it is up to you to maintain it to perfection. Is your air filter up to snuff?

This article was inspired by the following from NASA: <http://www-curator.jsc.nasa.gov/curator/dust/dust.htm>

Report of the Month

The report below is a sample from a Jaguar 4.0L V8 engine. Although there's no history to look at, you might be able to figure out what went wrong by studying the data. Then check out the caption below to see if you were right.

(To learn where the various elements might be coming from, [click here.](#))

MI/HR ON OIL	28,676	UNIT/ LOCATION AVERAGES					UNIVERSAL AVERAGES
MI/HR ON UNIT	84,488						
SAMPLE DATE	7/4/05						
ALUMINUM	24	24					4
CHROMIUM	15	15					1
IRON	330	330					14
COPPER	21	21					5
LEAD	3	3					5
TIN	18	18					2
MOLYBDENUM	75	75					34
NICKEL	503	503					4
POTASSIUM	1	1					0
BORON	35	35					73

Elements in Parts Per Million	SILICON	353	353						10
	SODIUM	8	8						6
	CALCIUM	2171	2171						1756
	MAGNESIUM	837	837						429
	PHOSPHORUS	1016	1016						740
	ZINC	1458	1458						866
	BARIUM	1	1						0

Properties	TEST	cST VISCOSITY @ 40 C	SUS VISCOSITY@ 100 C	cST VISCOSITY@ 100 C	SUS VISCOSITY @ 210 F	FLASHPOINT IN F	FUEL %	ANTI- FREEZE %	WATER %	INSOLUBLES %
	VALUES SHOULD BE				56-64	>365	-<2.0	0.0	0.0	<0.6
	TESTED VALUES WERE				104.9	320	2.3	0.0	0.0	0.5

The main problem here is the long oil change interval. Unfortunately, not all engines are cut out for extended oil use. This Jaguar owner was using an oil that is advertised as being okay to use for many thousands of miles. You can see the results on his engine. Any oil, regardless of brand or grade, will accumulate wear metals when left in place for so long. As those metals build, they cause the oil to become abrasive, which causes even more wear. Another problem here is the extremely high silicon level. If this engine has a problem with the air filtration/induction system, abrasive dirt might be making the high wear accumulations even worse. The heat from the extended use has caused this oil, which started out as a 0W/30, to thicken up to nearly a 60W oil in viscosity. Not all engines look like this after such a long interval, but many do. If you plan on extending your oil change interval, we recommend taking a sample every 5000 miles to get an idea of what's going on in the engine as you increase your intervals.

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