

Olson Marketing Monthly

January 2024 - Issue #149

in partnership with Insane Oil of Omaha

Your AMSOIL Information News Source

Product Highlight: AMSOIL Signature Series Motor Oil

The focus of this month's newsletter is Extended Oil Change Intervals. Simply put, this concept means that you don't follow the manufacturers recommendations on how often to change your oil.

Old school rules say to change your oil every 3 months or 3,000 miles. Nowadays, manufacturers are typically saying to change your oil somewhere between 5,000 and 10,000 miles or 6-12 months. Thus, even manufacturers are promoting extended drain intervals, or at least changing the definition of "standard drain intervals."

Dating back to the late 1960s and early 1970s, AMSOIL has always promoted extended drain intervals. Moreover, they have built their entire business on the concept of engineering a higher quality motor oil that protects the engine better, and for longer periods of time.

The secret to extended drain intervals has less to do with time, driving style, climate, geographical area, type of vehicle, size of engine, type of engine, or disci-

pline in performing the preventative maintenance tasks on your vehicle than it does the oil. All of these are important pieces of the puzzle but the secret to extended drain intervals first begins with the quality of motor oil being able to withstand the harsh environment within the engine.

The motor oil must be able to meet the demands of extended drain intervals.



What's Inside This Issue?

I Forgot To Change My Oil -Introduction	p. 2
I Forgot To Change My Oil -The Good	p. 3
I Forgot To Change My Oil -The Bad	p. 4
I Forgot To Change My Oil -The UGLY	p. 5-6
Shop Talk with Dr. Olson - Wrap up with I Forgot to Change...	p. 7
Congratulations	p. 7

Dealer Contact

Lincoln - Olson Marketing

Don & Peg Olson
ZO Referral# 4901
402-310-6414
<http://om.shopamsoil.com>
lubedealerdon@gmail.com

Omaha - Insane Oil

Dr. Jonathan D. & Stacey L. Olson
ZO Referral# 10458
402-990-7940 (text or call)
<http://insaneoil.com>
info@insaneoil.com

I Forgot To Change My Oil...Introduction

In last month's newsletter ([Issue #148 - December 2023](#)) I shared about a customer that accidentally doubled the oil change interval. I was able to pull and oil sample and send it in to the lab to check the health of both the oil and the engine. The results indicated the oil was no longer able to effectively protect the engine. Furthermore, the oil which began as 5w-20 was now more like 15w-40. I would say this scenario is an eye-opener for the importance of tracking your preventative maintenance.

Last month, I also made a comment that I sometimes forget to do some of the preventative maintenance tasks on the equipment that I am responsible for. Typically it is by accident, but sometimes I just get lazy.

So the next question that arises after last month's information is:

What if I accidentally wait a little bit too long and go beyond AMSOIL's recommended oil change interval?

I had another customer with a similar, yet not so severe situation. This story begins much like the last in that a customer called me up asking to help them with an oil change. It had been many years since they did an oil change and just wanted some additional support. I agreed to help them out.

The vehicle had been purchased new in 2020. With the purchase

of the vehicle, the customer received a specified quantity of free oil changes through the dealership. After those free oil changes were used up they had a choice to change the oil themselves, continue taking it back to the dealership at a cost of \$100-\$150 per oil change, or take it to another oil change shop every three months. This led to the conversation with me, occurring in August of 2022.

The oil change went very well and I learned that the Mazda engineers did an excellent job in thinking about the oil change service of this particular vehicle. It was hands-down the easiest oil change that I have ever done on any vehicle. The full video can be accessed by clicking on the link to the bottom right of this page.

In the top corner of the windshield I put a sticker with the date, mileage, and recommended next service.

Towards the end of October 2023 I had another conversation with this customer and somehow the

conversation circled around to going an oil change. At the time, they couldn't remember what the sticker said and I had them check when they got back to their vehicle.

After doing a little math, it turns out that it had been almost 15 months since the oil had been changed. I again was curious about what the Oil Analysis results might yield so I offered to change their oil if they would allow me to send in a sample to check on the health of the engine as well as the oil. They agreed.

I pulled an oil sample and the oil and oil filter replacement was completed. Although the customer was very concerned that they had exceeded the time interval of 12 months, I was substantially less concerned in comparison to the customer discussed in [last month's newsletter](#). Although this customer had exceeded the time interval by 3 months, the mileage accrued in 15 months was only 6,173 (well below the 15,000 mile recommendation).

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Forgetting to Change Your Oil...The Good

The results from the oil analysis report indicated an overall severity of Upper Level-Abnormal.

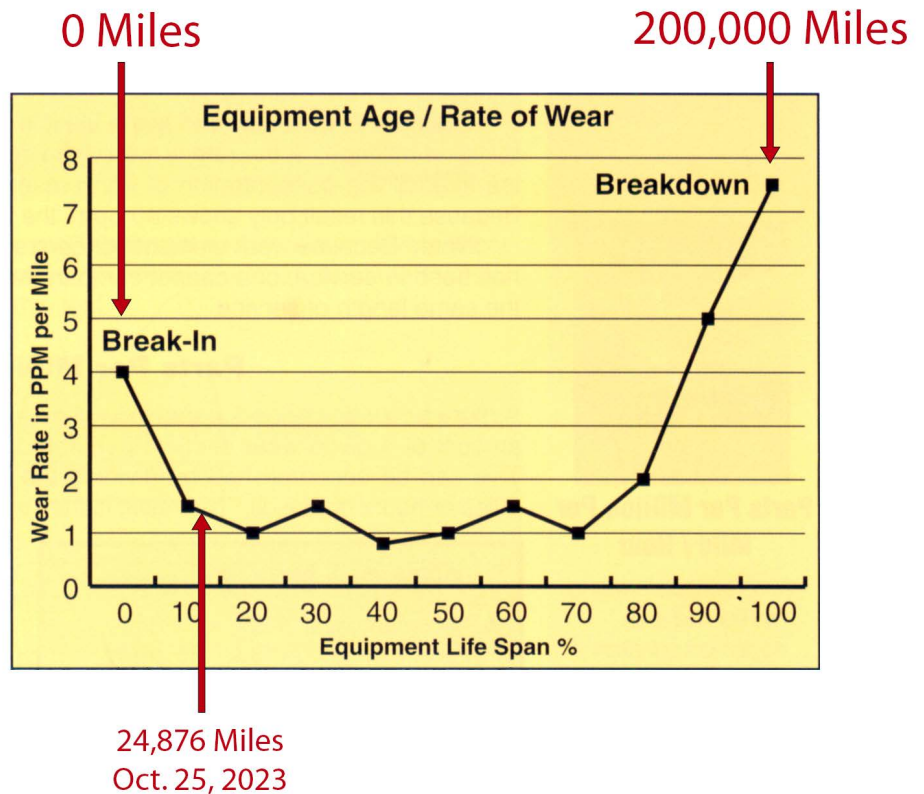
0	1	2	3	4
NORMAL		ABNORMAL		CRITICAL

Overall report severity based on comments.

This overall severity level is actually what I could classify as "Typical" for the same oil that has been run in a vehicle for an entire year under severe service conditions.

However, the overall service level is not a clear indication of the major issue that seems to keep coming up as I continue to learn more and more about the various new technologies that have been integrated into the engines of today. But we'll delve in to that on the succeeding pages. Right now we will take a look at "The Good."

At the bottom of this page I have included a portion of the report. Beginning with wear metals, there is virtually no wear. At the time of the oil change, the vehicle had a current mileage of 24,876. This means the vehicle is well past the break-in cycle. According to www.rayskillmannortheastmazda.com, it is very common for Mazdas to last 200,000 to 250,000 miles. If we do a little math and assume this vehicle will



last 200,000 miles, we can see that our vehicle should be beyond the break-in cycle and on our way to a very low rate of wear for many years.

I did a little digging into other reports I have ran and I don't think I have every had a vehicle come back with this low of wear after running the same oil for an entire year...or in this case 15 months. It is obvious the oil is still protecting the engine from wear.

The contaminant metals identified are also low and do not raise any

red flags. Furthermore, the Additive Metals are indicated as being just fine which means the additive package that is mixed in with the base oil is still doing its job. Similar to the active ingredients in your pharmacy medication, the additive package in motor oil can "quit" doing its job over time or "wear-out." This sample shows that it is still working properly and of appropriate concentrations with no major issues cited. Next, we will take a look at the less desirable numbers.

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	Wear Metals (ppm)										Contaminant Metals (ppm)			Multi-Source Metals (ppm)						Additive Metals (ppm)				
Sample #	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
1	10	0	0	3	2	0	1	0	0	0	14	4	1	0	86	0	1	0	48	941	1186	0	649	743

Forgetting to Change Your Oil...The Bad

Continuing on I want to focus on some of the numbers that appear to be "bad."

Multi-Source Metals (ppm)

0	1	2	3	4
NORMAL		ABNORMAL	CRITICAL	

Molybdenum	Boron
86	48

Under the category of Multi-Source Metals, Molybdenum and Boron were flagged as low-abnormal. Both Molybdenum and Boron are additives in AMSOIL motor oil. Boron and Molybdenum is used to make the oil "slicker" to reduce friction. The values start at a high number and as the oil is "used" throughout the year, the elements are depleted. Without giving you an in-depth chemistry lesson, on a molecular level these additive elements will lose one or more electrons becoming a free-radical and wanting to join with anything else it can find (water or oxygen in many cases). Once joined with something else, it is no longer Boron (or Molybdenum). Rather, it becomes a sludge particle.

After running the same oil for a year (or 15 months in this scenario), it is expected that these levels have decreased. If the numbers get to zero, it is not to say that the oil won't do its job because there are other additives that assist with oil performance. However, if the numbers get to zero, the oil is not performing as it was designed to.

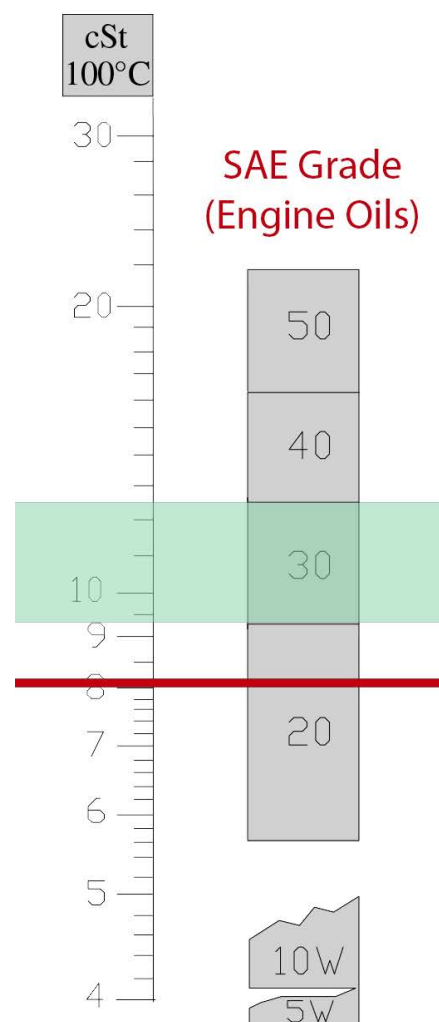
Fluid Properties

Viscosity 100 °C	Base No. D4739
cSt	mg KOH / g
8.4	3.21

The total base number was flagged as "Normal" and is of no concern knowing that this oil has been ran for 15 months. Similar to Boron and Molybdenum, the Total Base Number starts high (around 11) and works its way down to zero. When it hits zero, the oil is no longer protecting your engine in its ability to neutralize acids formed during engine operation.

Also, the viscosity was identified as low-abnormal. Taking a look at our Viscosity Chart (at top right). Our oil, that was once 5w-30 (highlighted in green) is now more like 5w-20 (identified by the red line).

Kinematic Viscosities



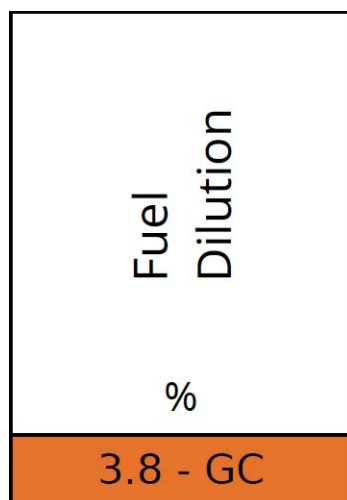
The reason for the viscosity decrease is most likely due to what I am going to call "The Ugly" reason, discussed on the next page of this newsletter. In general, this quantity of viscosity decrease is not of a critical nature. However, on a hot summer day, the oil is a bit more "liquidy" than what the engine needs. Let's now delve in to "Forgetting to Change Your Oil - The Ugly."

continued on next page...

Forgetting to Change Your Oil...The UGLY

The only other item on the entire report that was noted as being abnormal was Fuel Dilution.

Contaminants



I call Fuel Dilution "The UGLY" because it is an ugly problem that vehicle manufacturers cannot seem to solve.

Over the past several years I have been getting back more and more vehicle oil analysis reports with high Fuel Dilution percentages. Although the reasoning can vary between engines and driving styles...the common denominator when assessing these reports typically comes down to the manufacturer's incorporation of a Turbo with Gasoline Direct Injection on an engine.

Gasoline direct injection delivers accurate and rapid distribution of atomized gasoline. While traditional fuel-injection systems spray fuel into a manifold, GDI systems locate the injectors in the combustion chamber, which enables much more control over the

amount of fuel injected and timing of fuel injection, improving combustion efficiency. Spraying the fuel directly into the chamber also provides in-cylinder cooling, which helps allow higher compression ratios, increasing efficiency. GDI engines use a mixture of 40 parts (or more) air to one part fuel during light loading, while traditional gasoline engines use a mixture close to 14.7 parts air to one part fuel. The 40:1 ratio means less fuel is burned during combustion, resulting in better fuel economy.

The major side-effect of this technology is the increased risk of fuel dilution. As fuel is sprayed into the combustion chamber, it can wash past the rings and down the cylinder walls, into the oil sump. Fuel dilution can cause a number of problems:

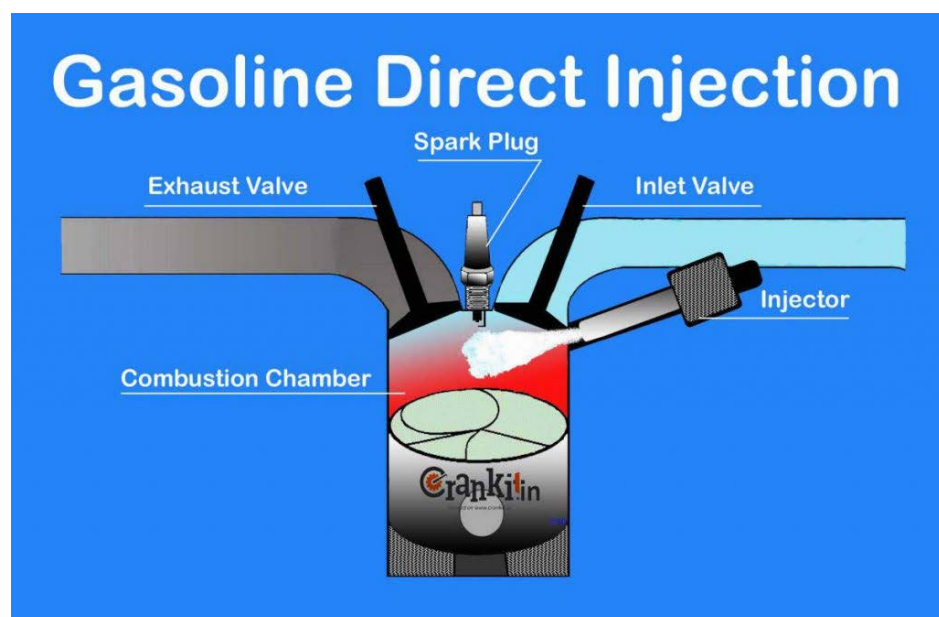
- Reduced oil viscosity interferes with formation of a durable lubricating film, inviting wear. Combustion-zone parts are es-

pecially prone to wear, including the pistons, rings and liners. Reduced viscosity also negatively affects the oil's ability to function as a hydraulic fluid, which is critical in engines with variable valve timing.

- Fuel can wash oil from the cylinder wall, causing higher rates of ring, piston and cylinder wear.
- Reduced effectiveness of detergent additives limits the oil's ability to guard against deposits.
- Increased oil volatility results in higher oil consumption, requiring more frequent top-offs.
- Accelerated oxidation reduces the oil's service life and requires more frequent oil changes.

The customer's vehicle (associated with this oil analysis report) is a 2020 Mazda CX-9 has both a turbo and Gasoline Direct Injection.

continued on next page...



Forgetting to Change Your Oil...The UGLY

Given that the vehicle we have been discussing meets the requirements of one that has been associated with high Fuel Dilution readings we ask the next question:

What can be done?

If the cause of the fuel dilution is the Gas Direct Injection technology, then nothing can really be done to prevent it from occurring. We can, however, mitigate the problem with a couple solutions:

1. Changing the oil more frequently will remove the Fuel Diluted oil and replace it with new, non-fuel diluted oil.
2. Ensuring the oil used is a quality oil that will continue protecting the engine even if it becomes diluted with fuel.
3. Perform half-cycle oil sampling to check the fuel dilution rates.

How much is too much?

According to Amsoil, up to 2.4% in gas engines and 3.4% in diesel engines is an acceptable limit for fuel dilution. (<https://blog.amsoil.com/what-is-fuel-dilution-and-why-is-it-bad/>)

According to Fluid Life, the limit for some engines can be as high as 4%. (<https://www.fluidlife.com/blog-fuel-dilution-example-effects-recommendations/>)

Others suggest much higher quantities, even up to 5% as the cautionary limit, pending your wear

metals rates are okay. <https://bobistheoilguy.com/forums/threads/average-fuel-dilution.275890/>

Savant Labs also uses the same numbers as Amsoil of up to 2.4% in gas engines and 3.4% in diesel engines. <https://www.savantlab.com/testing-highlights/fuel-dilution-cause-effect-and-detection/>

Did I Damage My Engine?

Going back to the concern from my customer at the beginning of this lengthy article...Did I damage my engine by waiting 15 months to change my oil instead of changing it at 12 months?

The simple answer is, "No" for several reasons:

1. Extremely limited presence of wear metals.
2. Acceptable levels of additive package metals.
3. Although Fuel Dilution is abnormally high and viscosity is slightly low, it is not at the point where the lubricant is no longer protecting the metal on metal surfaces....but it was heading in that direction.
4. The use of [Amsoil Signature Series 5w-30](#) motor oil is designed for this application and ensured the engine remained protected.

In last month's newsletter, I discussed another oil sample result where the customer accidentally double the oil change interval,

waiting 24 months and 28,000 miles. That engine was not a Gas Direct Injection engine and there was no presence of fuel in the oil, however the oil viscosity had started getting thick, which could be said to correlate to very high iron wear as indicated in the report results.

Sample #	Iron	Viscosity 100 °C cSt
BL	0	9.1
1	155	12.7



Shop Talk...

with Dr. Jonathan D. Olson, EdD
(Independent Amsoil Dealer #10458)

Next month, I am going to delve more into the topic of Fuel Dilution as it is becoming more prevalent with manufacturer's shifting to the use of Gas Direct Injection technology in more and application.

In general, you want to follow the oil manufacturer's recommendation for your oil change interval. However, you also want to consider the vehicle manufacturer's recommendations. Additionally, as we will see next month, there is a third element to determining when you should change your oil...that third element is the behavior of your engine.

I have again included a link to my Monthly Auto Maintenance Inspection Report (at center-bottom). These are the checks that I go through every month for each one of my vehicles. The hope is that I can catch a problem before it becomes a big problem.

When I change my oil I circle the number 12 as the interval month at the top of the report. Then thereafter, each month I circle the next number. Thus, if I am 7 months after having changed the oil, I know that the oil has been running for 7 months inside of my engine. When I get to 11, I know that I need to order my oil and filter and when I get to 12, I know it is time for an oil change. It helps me keeps straight the preventative maintenance of all four of my vehicles.

Congratulations to NEW Amsoil Opportunists and Enthusiasts!

Congratulations:

New Catalog Customers

Jesus Alvarez
Tampa, FL

Sean Cleary
Novato, CA

Lucas Hogan
Tunnel Hill, IL



Congratulations:

New Preferred Customers

Ha Long
Orlando, FL

Brian Burianek
Pleasant Dale, NE

Dale Jeantet
Decatur, GA

Jeffrey Cobb
Columbia, MS

Hans Reindel
Cheshire, OR

JP Moulin
Honolulu, HI

Monthly Auto Maintenance Inspection Report

ADDITIONAL NOTES ON BACK OF THIS PAGE

INTERVAL MONTH		1 2 3 4 5 6 7 8 9 10 11 12											
VEHICLE		MILEAGE		DATE									
OK	ADDED	FLUID LEVELS		NOTICE		ELECTRICAL		WORKING		PROBLEM			
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HOT OIL LEVEL													
<div><div></div><div>LOW</div><div>FULL</div></div>													
TIRE TREAD & PRESSURE													
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