



This 2000 Expedition has a problem. What is it?  
To learn where the elements are coming from,  
[click here](#) and scroll down.

<b>UNIT</b>	MAKE/MODEL: Ford 4.6L V-8	OIL TYPE & GRADE: Motorcraft Semi-Synthetic 5W/20
	FUEL TYPE: Gasoline (Unleaded)	OIL USE INTERVAL: 6,828 Miles
	ADDITIONAL INFO:	

**COMMENTS** JIM: There's a lot of aluminum in this sample (4.6L V-8 averages are based on a ~5,300-mile run). Excess aluminum in these engines can be from a timing chain tensioner problem, and that may be the case for yours. We're not sure if that would be of any relation to the puff of smoke you see every now and then, but this level of aluminum is cautionary so we suggest you have the engine inspected as soon as possible before a potential failure occurs. Note copper (brass/bronze) and silicon (usually from either sealer/lube or dirt) are also elevated. Resample in 3K miles if all is well.

<b>ELEMENTS IN PARTS PER MILLION</b>	MI/HR on Oil	6,828	<b>UNIT / LOCATION AVERAGES</b>	4,784			<b>UNIVERSAL AVERAGES</b>
	MI/HR on Unit	232,669		92,012			
	Sample Date	4/5/2021		2/10/2005			
	Make Up Oil Added	3 qts		0.5 qt			
ALUMINUM	386	4	4	4		4	
CHROMIUM	1	1	1	1		1	
IRON	26	15	15	15		15	
COPPER	17	12	12	12		4	
LEAD	1	0	0	0		2	
TIN	0	0	0	0		1	
MOLYBDENUM	23	5	5	5		67	
NICKEL	1	1	1	1		1	
MANGANESE	1	0	0	0	The left side of the timing chain is not riding on the guide, it's down <i>in</i> the guide.	2	
SILVER	0	0	0	0		0	
TITANIUM	2	0	0	0		2	
POTASSIUM	0	0	0	0		2	
BORON	82	0	0	0		58	
SILICON	53	7	7	7		15	
SODIUM	8	4	4	4		40	
CALCIUM	1543	1761	1761	1761		1917	
MAGNESIUM	787	49	49	49		237	
PHOSPHORUS	820	772	772	772		710	
ZINC	956	974	974	974		828	
BARIUM	0	0	0	0		1	

The owner writes: Over the winter my low oil pressure light stayed on after a cold start for about 10 seconds - this was really the reason I decided to send in an oil sample. Then again in April on a return trip home, my low oil pressure light came on twice for about 3-4 seconds each time. At this point I had already received your report and knew I had to do something. With 233K on the clock, my motor was stone quiet, ran great, and from what I had been reading, I really didn't think my tensioners/chains were the problem.

Anyway, reluctantly I started the process of tearing it down, knowing I'd be fighting 21 years of living in the rust belt, in search of the problem. Took me about 10 hrs to get the oil pan off thanks to all the pan bolts being rusted and rounded off. Finally got the pan off, very little "slime" in the bottom of the pan but when you touched it, you could tell it was aluminum 'paste'. Oil pickup was clean - I was starting to worry as I was expecting to find a plugged oil pickup. Took me about 12-13 hrs to get both valve covers off as almost half the studs and bolts were a rusted mess (I had to weld nuts to them to get them off).

Once I had the covers off, everything looked intact, but I did notice the tensioner arms looked like maybe the plastic was worn. Had the front cover off in about 30 min and as you can see from the pics, my tensioners still had tension on the chains, but the chains had worn through the arms, and actually were starting to wear into the tensioner pistons. The chains looked pretty good (we estimated they had stretched maybe 1/4" total). The guides looked brand new too, and I thought for 233k miles the engine was extremely clean inside. The DS tensioner piston had a slight amount of side to side play in it, and if you squeezed it moderately hard, you could depress it about 1/4".

I'm hoping this was the cause of my intermittent low oil pressure light (either that or my pressure sensor switch is on its way out). I replaced the chains, guides, arms, tensioners and oil pump (for peace of mind). Got it all buttoned up and after priming the oil pump, it started right up. All back together now, and runs great with no leaks! Call me crazy, but I think the engine is even quieter now! Thanks for the great heads up in my oil report, without it I would have kept driving it, as there was no indication anything was wrong.