

This Continental O-300-A had a problem. What is it?
To learn where the elements are coming from,
[click here](#) and scroll down.

UNIT	MAKE/MODEL: Continental O-300-A	OIL TYPE & GRADE: Aeroshell 100 Mineral
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 19 Hours
	ADDITIONAL INFO: Cessna 172, Millennium Cyls	

COMMENTS Thanks for the note about the overhaul. High metals and silicon are typical to find in the first few samples after an overhaul. The high metals are from wear-in of new parts, and silicon is from sealers/lubes used during the work. Iron (from steel parts) seems a little high even for an overhaul, but if the engine is making full power and temps are normal, we'll just look for iron, the other metals, and silicon to improve as wear-in washes out. Decreasing oil filter metal (if any) and stabilizing oil consumption will be signs of successful cylinder break-in on your end.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	19	UNIT / LOCATION AVERAGES	31	38	23	21	UNIVERSAL AVERAGES
	MI/HR on Unit	19		1,079	1,048	1,011	972	
	Sample Date	12/24/2021		1/17/2021	5/28/2020	10/2/2019	3/31/2019	
	Make Up Oil Added	3 qts		2 qts	4 qts	1.5 qts	1 qt	
ALUMINUM	7	37	140	10	7	23	8	
CHROMIUM	6	5	5	3	3	10	4	
IRON	118	59	31	19	21	108	36	
COPPER	29	17	25	10	10	10	9	
LEAD	1547	1636	912	1374	1380	2965	2124	
TIN	4	2	1	2	1	2	1	
MOLYBDENUM	3	1	0	0	0	2	1	
NICKEL	2	1	1	1	1	2	2	
MANGANESE	2	1	1	0	0	1	1	
SILVER	0	0	0	0	0	0	0	
TITANIUM	0	0	0	0	0	0	0	
POTASSIUM	0	0	0	0	0	0	1	
BORON	1	1	0	2	0	0	1	
SILICON	42	21	8	10	13	30	7	
SODIUM	4	3	3	3	2	2	1	
CALCIUM	3	60	53	62	82	98	19	
MAGNESIUM	8	17	28	26	10	14	10	
PHOSPHORUS	8	194	87	99	330	446	430	
ZINC	8	17	27	30	14	7	5	
BARIUM	0	0	0	0	0	0	0	

Values
Should Be*

PROPERTIES	SUS Viscosity @ 210°F	93.9	82-105	93.6	85.8	88.8	84.3
	cSt Viscosity @ 100°C	18.92	16.0-21.8	18.84	16.97	17.70	16.59
Flashpoint in °F	490	>440	410	480	475	444	
Fuel %	<0.5	<1.0	1.0	<0.5	<0.5	<0.5	
Antifreeze %	-		-	-	-		
Water %	0.0	0.0	0.0	0.0	0.0	0.0	
Insolubles %	0.3	<0.6	0.3	0.2	0.3	0.5	
TBN							
TAN							
ISO Code							



After receiving the 1/21 analysis with very high aluminum and finding a “loaded” oil filter, the owner had the engine inspected. He found excessive piston pin plug wear (see the picture above) as well as a worn front thrust bearing.

The December sample is post-overhaul and shows a much happier engine, with iron, copper, and silicon from normal wear-in.