



AIRCRAFT REPORT

LAB NUMBER: D70629
REPORT DATE: 7/25/2018
CODE: 22/16

UNIT ID: NSSSS7
CLIENT ID: 28751
PAYMENT: CC: Visa

You'll need your client ID if you want to log on to www.blackstone-labs.net and view your reports.

This is a good place to identify things like cylinder type, oil screen, recent repairs, etc.

UNIT	EQUIP. MAKE/MODEL:	Lycoming IO-360-A1A	OIL TYPE & GRADE:	Aeroshell 15W/50
	FUEL TYPE:	Gasoline (leaded)	OIL USE INTERVAL:	25 hours
	ADDITIONAL INFO:	Cessna 172 Eng. S/N 000001		

CLIENT	OSCAR HUFF	PHONE:	(828) 123-5897
	OSCAR'S WORKSHOP	FAX:	(828) 123-1547
	132 PERIWINKLE RD	ALT PHONE:	(828) 123-1564
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	SWANNANOVA, NC 18752		

COMMENTS

OSCAR: Note aluminum. This level is reading higher than it was back in October and it's higher than universal averages for this type of engine. This is a reading at the beginning of a piston or ring problem. The oil analysis shows that the oil analysis is good, so the oil filtration system is working well. Air filtration looks good too (see silicon). The engine has been flown frequently, so corrosion is not the problem. We suggest a compression check and borescope. If those turn out okay and the filter is free of metal, we suggest resampling for another look. This is a cautionary report.

Sample report

The amount of oil you added between oil changes.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	40	UNIT / LOCATION AVERAGES	35	25	30	29	UNIVERSAL AVERAGES
	MI/HR on Unit	416		376	341	311	282	
	Sample Date	12/02/15		10/08/15	07/12/15	05/21/15	04/16/15	
	Make Up Oil	4 qts		3 qts	2 qts	2 qts	5 qts	
ALUMINUM	31	17	18	3	3	3	9	
CHROMIUM	4	3	2	2	2	2	4	
IRON	151	31	69	40	31	33	23	
COPPER	2	2	2	2	2	3	3	
LEAD	3591	3599	3621	3012	2989	3014	3058	
TIN	0	1	0	1	2	2	1	
MOLYBDENUM	0	0	0	0	0	0	0	
NICKEL	1	1	1	1	0	1	1	
MANGANESE	0	0	0	0	0	1	0	
SILVER	0	0	0	0	0	0	0	
TITANIUM	0	0	0	0	0	0	0	
POTASSIUM	0	0	0	1	0	0	1	
BORON	0	0	0	1	0	1	32	
SILICON	9	14	11	8	9	13	11	
SODIUM	4	3	3	3	3	4	3	
CALCIUM	2	3	2	1	2	2	1	
MAGNESIUM	0	0	0	0	0	0	0	
PHOSPHORUS	697	765	746	823	678	766	877	
ZINC	3	3	3	4	3	2	2	
BARIUM	0	0	0	0	0	0	2	

This is the average wear for this particular type of engine for you or your business.

This column shows average wear for all the samples we've seen from this type of engine.

The additives in this column are a mix of all different types of oil, so you can't compare them to your sample.

Values Should Be*

From left to right, these are your past samples.

The tests in the Properties box look at the physical condition of the oil.

PROPERTIES	SUS Viscosity @ 210°F	91.9	82-105	100.9	103.7	102.4	102.8
	cSt Viscosity @ 100°C	17.74	16.0-21.8	18.85	20.79	19.16	19.29
	Flashpoint in °F	455	>440	445	455	465	460
	Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	1.0
	Antifreeze %	-	0.0	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.5	<0.6	0.5	0.5	0.5	0.5
	TBN						
	TAN						
	ISO Code						

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

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Aircraft Report Element Explanation

Averages: Both the universal and unit averages are running averages and change with the number of samples analyzed.

Elements: Elements are quantified in the oil at part per million levels (PPM). This list shows the most common sources of the elements from an aircraft engine. They are grouped by category. Following each element is a description of where it comes from.

Wear Metals

Aluminum: Pistons, piston pin plugs, bearings, and the case

Chromium: Rings, (replacement) cylinders, steel alloy, valve stems

Iron: Cylinders, rotating shafts, the valve train, and any steel part sharing the oil

Copper: Brass or bronze parts, bushings, bearings, oil coolers

Lead: Primarily leaded gas blow-by, bearings (but lead from bearings is usually masked by 100LL)

Tin: Bearings, bronze parts (with copper), anti-wear coatings

Nickel: Valve guides, replacement cylinders, trace element in steel

Trace Elements

Manganese: Grease additive

Silver: Trace element in some types of bearings

Titanium, Potassium, Boron: Trace elements

Molybdenum: Anti-scuff piston coating, some cylinder types

Contaminants

Silicon: Abrasive dirt (via intake air), silicone sealers, and gaskets

Sodium: Antifreeze and brine-filled valves

Oil Additives

Calcium/Magnesium: Oil additives, rare in aircraft engine oils

Phosphorus: Oil additive

Zinc: Component of brass (with copper), oil additive common to auto engine oils

Barium: Oil additive, not commonly used in aircraft oil

Physical properties:

Viscosity/Flashpoint: If fuel is present in the oil, the viscosity and flash point will often be lower than what is stated in the "Values Should Be" line. A high viscosity may show oil stress from heat or contamination.

Fuel %: Indicates the amount of volatile gas found in the oil.

Water %: Indicates the amount of moisture found in the oil.

Insolubles %: Insolubles are solid materials present in the oil. They are typically free carbon from the oxidation of the oil itself, along with blow-by products past the rings.