



OIL ANALYSIS REPORT

WEAR	SEVERE
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL

Machine Id
LYCOMING TIO-540
Component
Piston Aircraft Engine
Fluid
{not provided} (--- LTR)

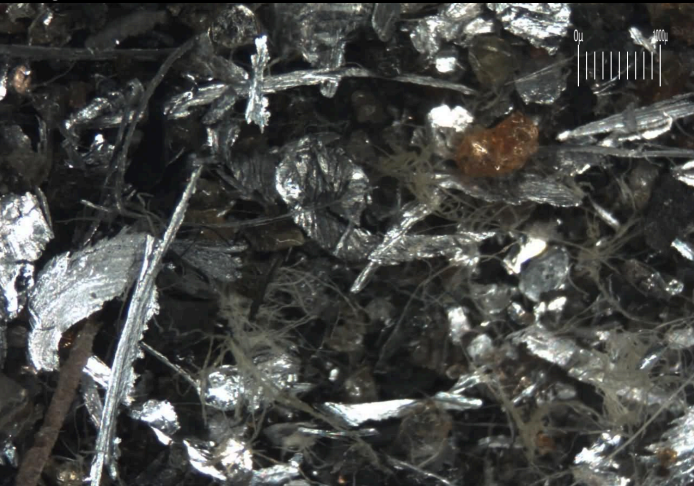
RECOMMENDATION

We advise that you check the engine magneto timing. We advise that you check for a possible too-lean mixture, or an over-advanced ignition timing. We advise that you perform a compression test, and a borescope exam. We recommend that you drain the oil from the component if this has not already been done. An inspection for the source(s) of wear may be warranted at this time. We recommend an early resample to monitor this condition. Please specify the brand, type, and viscosity of the oil on your next sample.

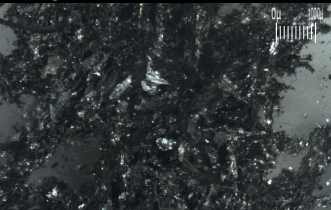
WEAR

The wear metals levels (ppm values) are normal, however, wear particle analysis indicates that the ferrous sliding and nonferrous sliding particles are severe and that the ferrous rolling, nonferrous cutting, nonferrous rubbing and ferrous rubbing particles are abnormal. Cylinder wear is indicated. High Aluminum (Al) level indicates abnormal bearing wear.

Magn: 10x Illum: RW



Magn: 10x Illum: RW



Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		PP	---	---
Sample Date		Client Info		22 Apr 2024	---	---
TSN	hrs	Client Info		0	---	---
TSO	hrs	Client Info		0	---	---
Oil Age	hrs	Client Info		0	---	---
Filter Age	hrs	Client Info		0	---	---
Oil Changed		Client Info		N/A	---	---
Filter Changed		Client Info		N/A	---	---
Sample Status				SEVERE	---	---
PQ		ASTM D8184*		34	---	---
Iron	ppm	ASTM D5185(m)	>90	31	---	---
Chromium	ppm	ASTM D5185(m)	>20	4	---	---
Nickel	ppm	ASTM D5185(m)	>15	4	---	---
Titanium	ppm	ASTM D5185(m)		0	---	---
Silver	ppm	ASTM D5185(m)	>5	0	---	---
Aluminum	ppm	ASTM D5185(m)	>25	21	---	---
Lead	ppm	ASTM D5185(m)	>20000	1253	---	---
Copper	ppm	ASTM D5185(m)	>25	6	---	---
Tin	ppm	ASTM D5185(m)	>30	<1	---	---
Vanadium	ppm	ASTM D5185(m)		0	---	---
White Metal	scalar	Visual*	NONE	VLITE	---	---
Yellow Metal	scalar	Visual*	NONE	NONE	---	---
Ferrous Rubbing	Scale 0-10	ASTM D7684*		5		
Ferrous Sliding	Scale 0-10	ASTM D7684*		5		
Ferrous Cutting	Scale 0-10	ASTM D7684*				
Ferrous Rolling	Scale 0-10	ASTM D7684*		3		
Ferrous Break-in	Scale 0-10	ASTM D7684*				
Ferrous Spheres	Scale 0-10	ASTM D7684*				
Ferrous Black Oxides	Scale 0-10	ASTM D7684*				
Ferrous Red Oxides	Scale 0-10	ASTM D7684*				
Ferrous Corrosive	Scale 0-10	ASTM D7684*				
Ferrous Other	Scale 0-10	ASTM D7684*				
Nonferrous Rubbing	Scale 0-10	ASTM D7684*		4		
Nonferrous Sliding	Scale 0-10	ASTM D7684*		5		
Nonferrous Cutting	Scale 0-10	ASTM D7684*		3		
Nonferrous Rolling	Scale 0-10	ASTM D7684*				
Nonferrous Other	Scale 0-10	ASTM D7684*				
Patch Weight	mg	ASTM D7684*		1207	---	---

CONTAMINATION

There is no indication of any contamination in the oil.

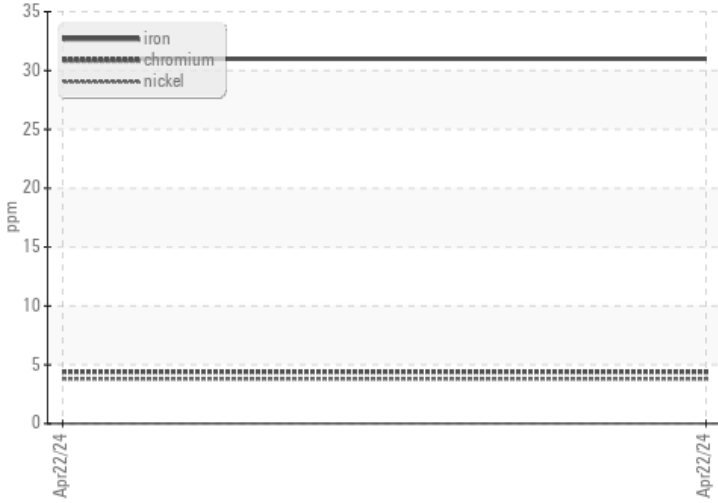
Silicon	ppm	ASTM D5185(m)	>15	11	---	---
Potassium	ppm	ASTM D5185(m)	>20	0	---	---
Fuel		WC Method	>4.0	<1.0	---	---
Water		WC Method	>0.1	NEG	---	---
Glycol		WC Method		NEG	---	---
Silt	scalar	Visual*	NONE	NONE	---	---
Debris	scalar	Visual*	NONE	VLITE	---	---
Sand/Dirt	scalar	Visual*	NONE	NONE	---	---
Appearance	scalar	Visual*	NORML	NORML	---	---
Odor	scalar	Visual*	NORML	NORML	---	---
Emulsified Water	scalar	Visual*	>0.1	NEG	---	---
Sand/Dirt	Scale 0-10	ASTM D7684*		2		
Fibres	Scale 0-10	ASTM D7684*		2		
Spheres	Scale 0-10	ASTM D7684*				
Other	Scale 0-10	ASTM D7684*				

FLUID CONDITION

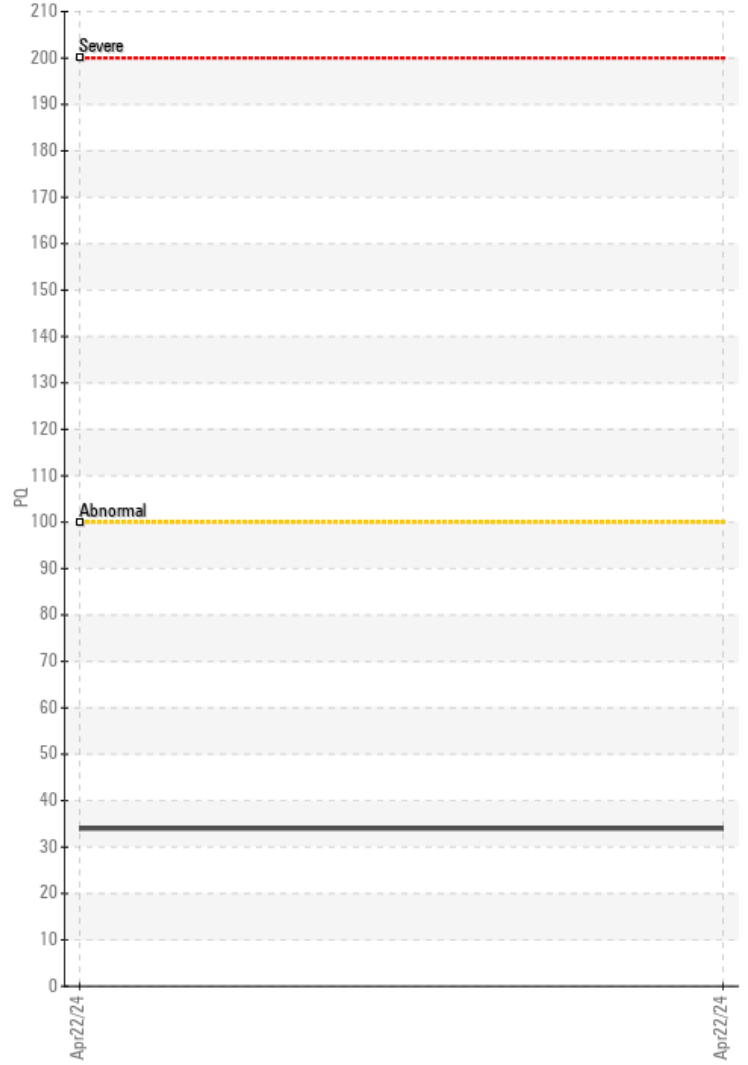
The AN level is acceptable for this fluid. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

Sodium	ppm	ASTM D5185(m)		<1	---	---
Boron	ppm	ASTM D5185(m)		0	---	---
Barium	ppm	ASTM D5185(m)		0	---	---
Molybdenum	ppm	ASTM D5185(m)		0	---	---
Manganese	ppm	ASTM D5185(m)		0	---	---
Magnesium	ppm	ASTM D5185(m)		2	---	---
Calcium	ppm	ASTM D5185(m)		10	---	---
Phosphorus	ppm	ASTM D5185(m)		20	---	---
Zinc	ppm	ASTM D5185(m)		5	---	---
Sulfur	ppm	ASTM D5185(m)		918	---	---
Acid Number (AN)	mg KOH/g	ASTM D974*		0.23	---	---
Visc @ 100°C	cSt	ASTM D7279(m)		19.4	---	---

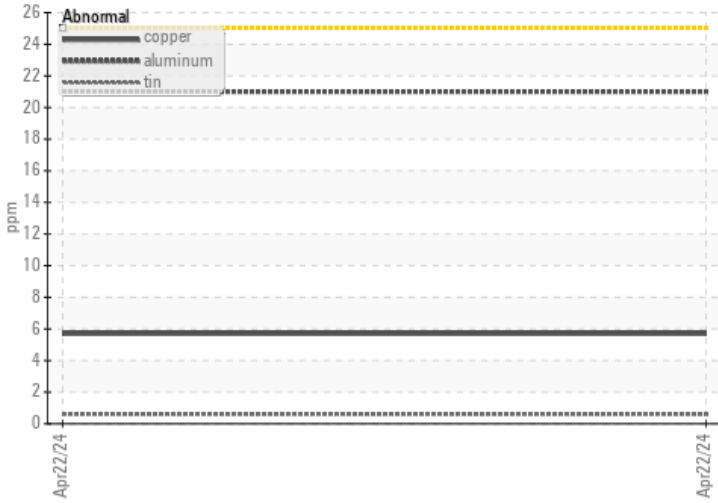
Ferrous Alloys



PQ



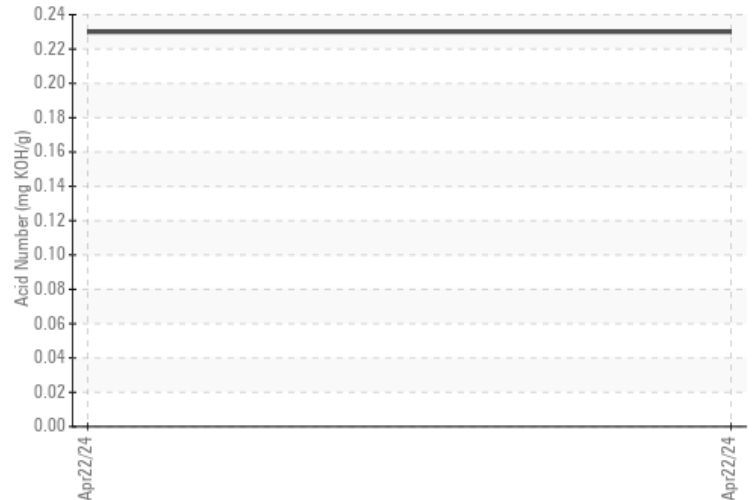
Copper/Aluminum/Tin



Viscosity @ 100°C



Acid Number



Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : PP
Lab Number : 02630930
Unique Number : 5772083
Test Package : AVI 2 (Additional Tests: PQ)
Received : 23 Apr 2024
Tested : 23 Apr 2024
Diagnosed : 01 May 2024 - Bill Quesnel

BIRCH HILLS AVIATION
 P.O. BOX 21, HANGAR 18
 BIRCH HILLS, SK
 CA S0J 0G0
 Contact: Service Manager
 mx.bha@outlook.com

To discuss this sample report, contact Customer Service at 1-800-268-2131.
 Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.
 Validity of results and interpretation are based on the sample and information as supplied.

T:
F:

This page left intentionally blank