



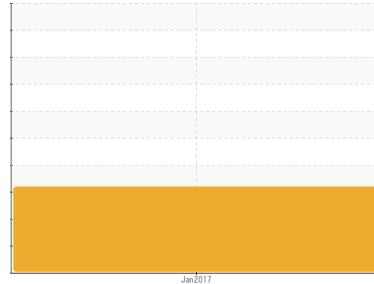
OIL ANALYSIS REPORT

Sample Rating Trend

ISO



Area
MUD BAY [E04012017I]
 Machine Id
BOART LONGYEAR C05-019
 Component
Hydraulic System
 Fluid
PANOLIN HLP SYNTH 46 (450 LTR)



DIAGNOSIS

Recommendation

We advise that you check all areas where contaminants can enter the system. We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. Confirm the source of the lubricant being utilized for top-up/fill. Resample in 30-45 days to monitor this situation.

Wear

All component wear rates are normal.

Contamination

Particles >4µm are severely high. Oil Cleanliness is severe. Particles >14µm are abnormally high. Particles >21µm are abnormally high. Particles >6µm are abnormally high. There is a light concentration (4.2%) of mineral oil present in the fluid.

Fluid Condition

Additive levels indicate the addition of a different brand, or type of oil. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

SAMPLE INFORMATION

method	limit/base	current	history1	history2
Sample Number	Client Info	WC	---	---
Sample Date	Client Info	13 Jan 2017	---	---
Machine Age	hrs Client Info	50	---	---
Oil Age	hrs Client Info	0	---	---
Oil Changed	Client Info	N/A	---	---
Sample Status		SEVERE	---	---

CONTAMINATION

method	limit/base	current	history1	history2
Water	WC Method >0.1	NEG	---	---

WEAR METALS

method	limit/base	current	history1	history2
Iron	ppm ASTM D5185(m) >20	2	---	---
Chromium	ppm ASTM D5185(m) >10	0	---	---
Nickel	ppm ASTM D5185(m)	0	---	---
Titanium	ppm ASTM D5185(m)	<1	---	---
Silver	ppm ASTM D5185(m)	0	---	---
Aluminum	ppm ASTM D5185(m) >10	<1	---	---
Lead	ppm ASTM D5185(m) >10	<1	---	---
Copper	ppm ASTM D5185(m) >75	1	---	---
Tin	ppm ASTM D5185(m) >10	1	---	---
Antimony	ppm ASTM D5185(m)	0	---	---
Vanadium	ppm ASTM D5185(m)	0	---	---
Beryllium	ppm ASTM D5185(m)	0	---	---
Cadmium	ppm ASTM D5185(m)	0	---	---

ADDITIVES

method	limit/base	current	history1	history2
Boron	ppm ASTM D5185(m) 0	<1	---	---
Barium	ppm ASTM D5185(m) 0	<1	---	---
Molybdenum	ppm ASTM D5185(m) 0	<1	---	---
Manganese	ppm ASTM D5185(m) 0	0	---	---
Magnesium	ppm ASTM D5185(m) 0	<1	---	---
Calcium	ppm ASTM D5185(m) 0	6	---	---
Phosphorus	ppm ASTM D5185(m) 1700	1514	---	---
Zinc	ppm ASTM D5185(m) 0	▲ 34	---	---
Sulfur	ppm ASTM D5185(m) 1350	1416	---	---
Lithium	ppm ASTM D5185(m)	<1	---	---

CONTAMINANTS

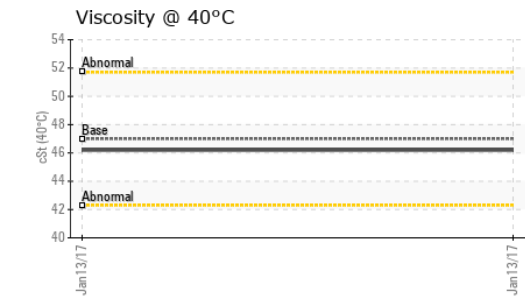
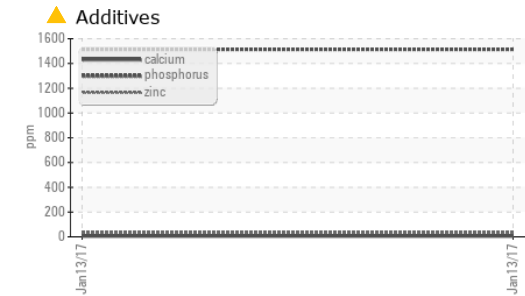
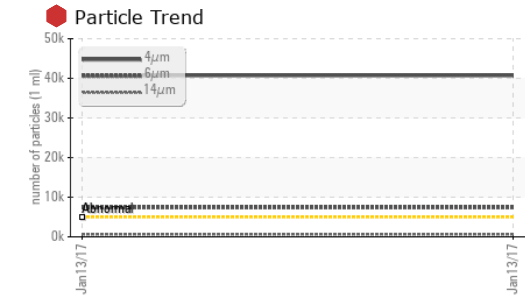
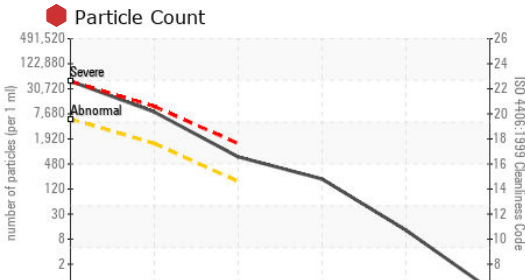
method	limit/base	current	history1	history2
Silicon	ppm ASTM D5185(m) >20	2	---	---
Sodium	ppm ASTM D5185(m)	<1	---	---
Potassium	ppm ASTM D5185(m) >20	<1	---	---

INFRA-RED

method	limit/base	current	history1	history2
Soot %	% ASTM D7844*	0	---	---
Nitration	Abs/cm ASTM D7624*	2.2	---	---
Sulfation	Abs/.1mm ASTM D7415*	24.7	---	---
Mineral Oil Content	% ASTM D7418* <5.0%	4.16	---	---



OIL ANALYSIS REPORT



FLUID CLEANLINESS	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647	>5000	40707	---	---
Particles >6µm	ASTM D7647	>1300	7400	---	---
Particles >14µm	ASTM D7647	>160	623	---	---
Particles >21µm	ASTM D7647	>40	184	---	---
Particles >38µm	ASTM D7647	>10	11	---	---
Particles >71µm	ASTM D7647	>3	0	---	---
Oil Cleanliness	ISO 4406 (c)	>19/17/14	23/20/16	---	---

FLUID DEGRADATION	method	limit/base	current	history1	history2
Oxidation	Abs./1mm	ASTM D7414*	18.7	---	---

VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	---	---
Yellow Metal	scalar	Visual*	NONE	---	---
Precipitate	scalar	Visual*	NONE	---	---
Silt	scalar	Visual*	NONE	---	---
Debris	scalar	Visual*	NONE	---	---
Sand/Dirt	scalar	Visual*	NONE	---	---
Appearance	scalar	Visual*	NORML	---	---
Odor	scalar	Visual*	NORML	---	---
Emulsified Water	scalar	Visual*	>0.1	---	---
Free Water	scalar	Visual*	NEG	---	---

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	47.0	46.2	---

SAMPLE IMAGES	method	limit/base	current	history1	history2
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Color					no image	no image
Bottom					no image	no image



Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : WC
Lab Number : 02122131
Unique Number : 4444513
Test Package : MOB 2
Received : 17 Jan 2017
Diagnosed : 18 Jan 2017
Diagnostician : Kevin Marson

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 Quebec, QC
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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.



MINERAL OIL CONTENT REPORT

PASS

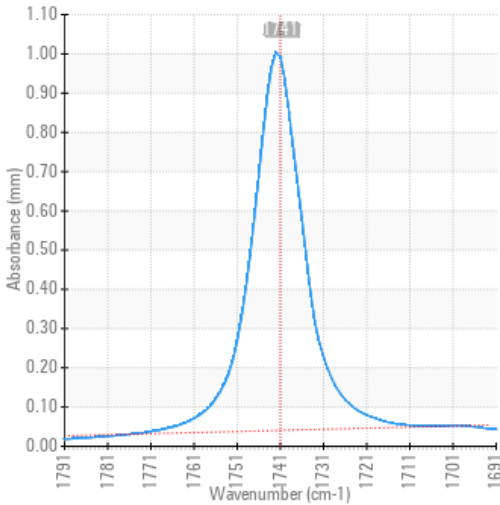


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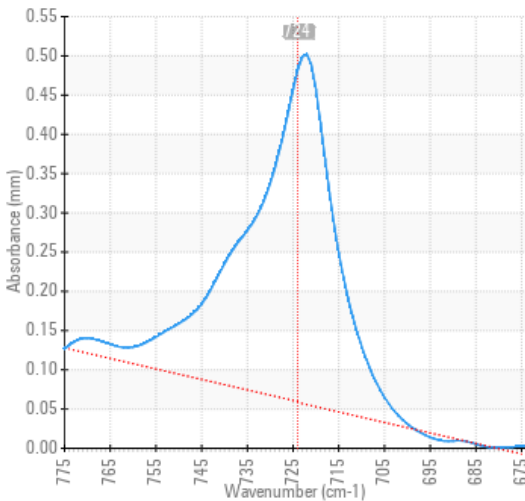
SPECTRAL ANALYSIS

		method	limit/base	current	history1	history2
Zinc	ppm	ASTM D5185(m)	0	▲ 34	---	---
Mineral Oil Content	%	ASTM D7418*	<5.0%	4.16	---	---

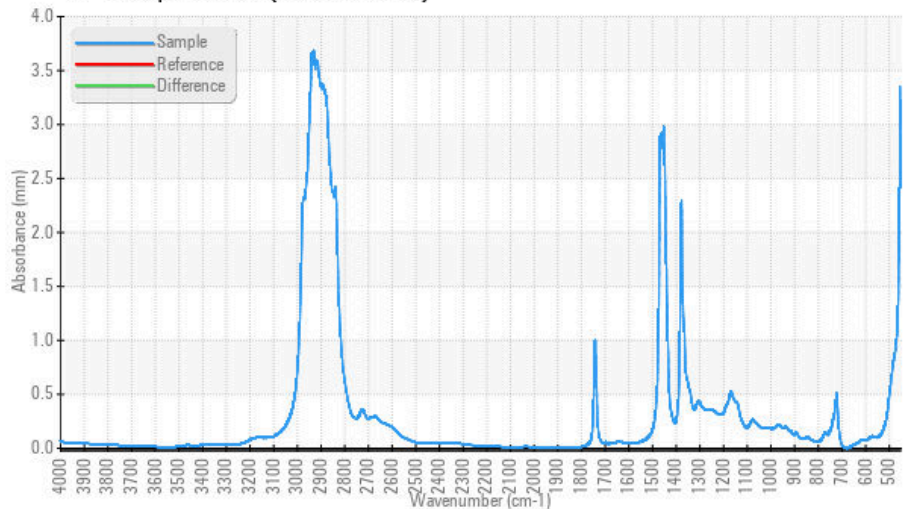
FT-IR - Esters I



FT-IR - Esters II



FT-IR Spectrum (Absorbance)



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