



LIEBHERR

OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	ABNORMAL



Machine Id
LIEBHERR LH50M 086015-1203
Component
Hydraulic System
Fluid
LIEBHERR HYDRAULIC HVI (--- GAL)

RECOMMENDATION

Confirm the source of the lubricant being utilized for top-up/fill. Resample at the next service interval to monitor. The fluid was specified as LIEBHERR HYDRAULIC HVI, however, a fluid match indicates that this fluid is ISO 32 AW Hydraulic Oil. Please confirm the oil type and grade on your next sample.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		LH0278355	LH0234499	LH0194941
Sample Date		Client Info		28 Nov 2023	27 Jun 2022	31 Aug 2021
Machine Age	hrs	Client Info		20736	17693	15905
Oil Age	hrs	Client Info		0	0	0
Filter Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		N/A	Not Chngd	Changed
Filter Changed		Client Info		N/A	N/A	Changed
Sample Status				ABNORMAL	ABNORMAL	ABNORMAL

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185(m)	>60	21	10	7
Chromium	ppm	ASTM D5185(m)	>40	2	<1	<1
Nickel	ppm	ASTM D5185(m)	>10	0	0	<1
Titanium	ppm	ASTM D5185(m)		0	0	0
Silver	ppm	ASTM D5185(m)		0	0	0
Aluminum	ppm	ASTM D5185(m)	>5	1	<1	<1
Lead	ppm	ASTM D5185(m)	>5	<1	<1	<1
Copper	ppm	ASTM D5185(m)	>15	2	1	<1
Tin	ppm	ASTM D5185(m)	>5	0	0	<1
Vanadium	ppm	ASTM D5185(m)		0	0	0
White Metal	scalar	Visual*	NONE	NONE	NONE	▲ VLITE
Yellow Metal	scalar	Visual*	NONE	NONE	NONE	▲ VLITE

CONTAMINATION

The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The system and fluid cleanliness is acceptable.

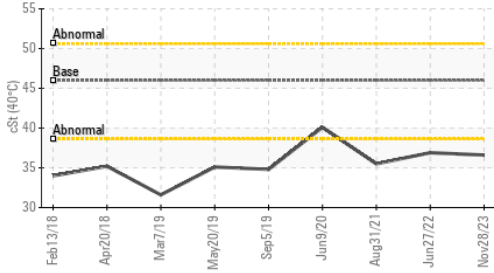
Silicon	ppm	ASTM D5185(m)	>15	2	1	<1
Potassium	ppm	ASTM D5185(m)	>20	<1	<1	<1
Water		WC Method	>0.1	NEG	NEG	NEG
Particles >4µm		ASTM D7647	>20000	4804	8347	▲ 53519
Particles >6µm		ASTM D7647	>5000	510	1262	▲ 14809
Particles >14µm		ASTM D7647	>640	13	39	▲ 1142
Particles >21µm		ASTM D7647	>160	4	7	▲ 279
Particles >38µm		ASTM D7647	>40	0	1	15
Particles >71µm		ASTM D7647	>10	0	0	0
Oil Cleanliness		ISO 4406 (c)	>21/19/16	19/16/11	20/17/12	▲ 23/21/17
Silt	scalar	Visual*	NONE	NONE	NONE	NONE
Debris	scalar	Visual*	NONE	NONE	NONE	VLITE
Sand/Dirt	scalar	Visual*	NONE	NONE	NONE	NONE
Appearance	scalar	Visual*	NORML	NORML	NORML	NORML
Odor	scalar	Visual*	NORML	NORML	NORML	NORML
Emulsified Water	scalar	Visual*	>0.1	NEG	NEG	NEG

FLUID CONDITION

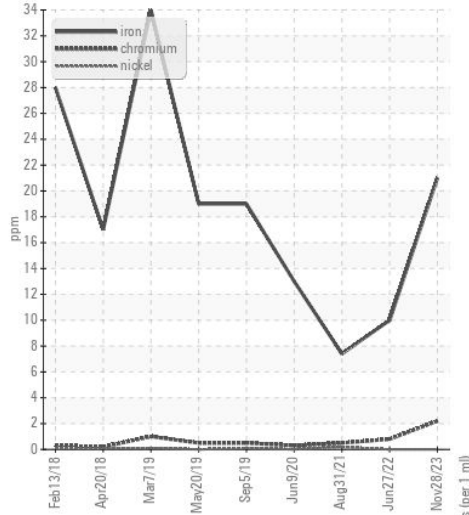
Viscosity of sample indicates oil is within ISO 32 range, advise investigate. This plus the additive levels indicates that this is not the same brand, or type of oil as reported. The condition of the oil is acceptable for the time in service.

Sodium	ppm	ASTM D5185(m)		<1	<1	<1
Boron	ppm	ASTM D5185(m)	0	<1	<1	<1
Barium	ppm	ASTM D5185(m)	0	0	0	0
Molybdenum	ppm	ASTM D5185(m)	0	0	0	<1
Manganese	ppm	ASTM D5185(m)	<1	0	<1	<1
Magnesium	ppm	ASTM D5185(m)	7	2	1	1
Calcium	ppm	ASTM D5185(m)	1317	58	65	70
Phosphorus	ppm	ASTM D5185(m)	611	273	270	300
Zinc	ppm	ASTM D5185(m)	696	326	334	350
Sulfur	ppm	ASTM D5185(m)	2574	2800	2345	1919
Visc @ 40°C	cSt	ASTM D7279(m)	46	▲ 36.6	▲ 36.9	▲ 35.5

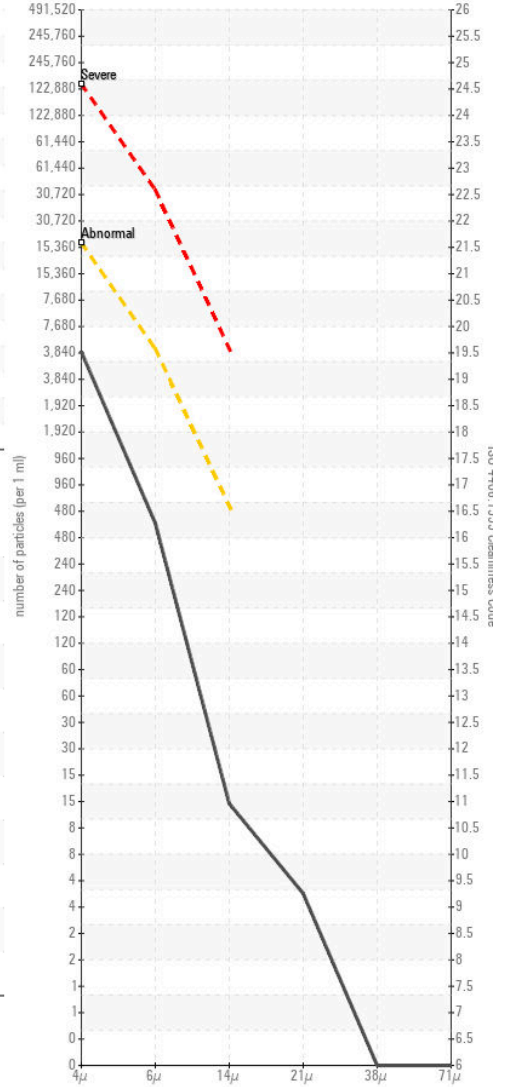
▲ Viscosity @ 40°C



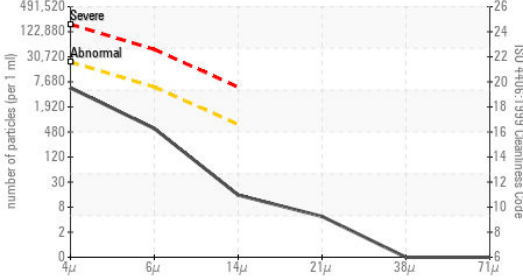
Ferrous Alloys



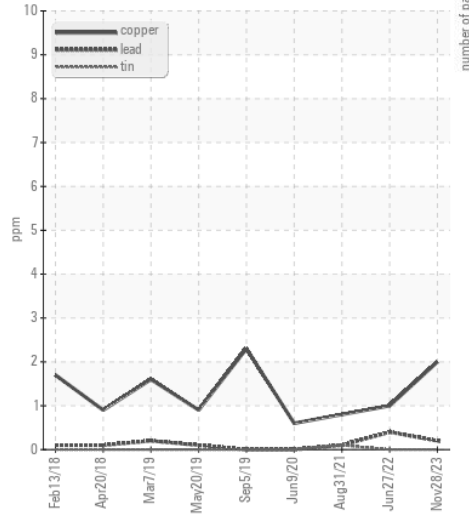
Particle Count



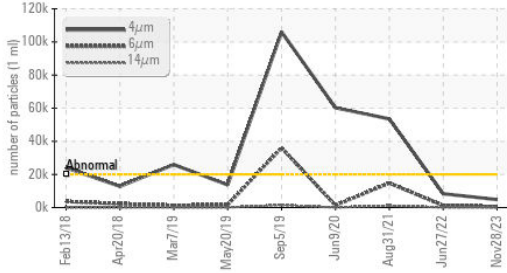
Particle Count



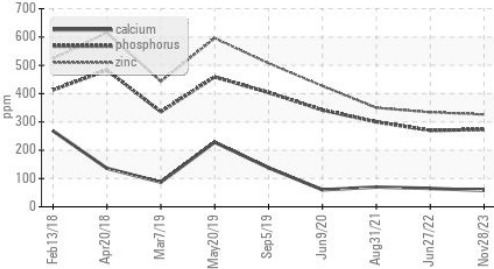
Non-ferrous Metals



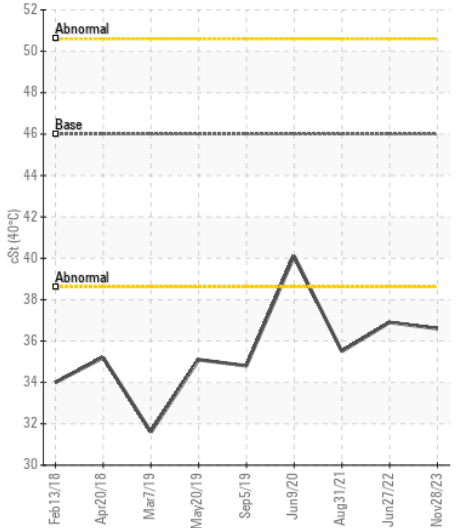
Particle Trend



Additives



▲ Viscosity @ 40°C



Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : LH0278355 **Received** : 10 Jan 2024
Lab Number : 02607866 **Diagnosed** : 12 Jan 2024
Unique Number : 5708952 **Diagnostician** : Kevin Marson
Test Package : MOB 1 (Additional Tests: PrtCount)

Dartmouth Metals & Bottle Ltd.
 14 Dawn Drive
 Dartmouth, NS
 CA B3B 1H9
 Contact: Service

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.

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F: