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LIEBHERR

OIL ANALYSIS REPORT

WEAR	ABNORMAL
CONTAMINATION	ABNORMAL
FLUID CONDITION	NORMAL

Area
BDT EQUIPMENT
Machine Id
LIEBHERR R938 52175-1650
Component
Right Final Drive
Fluid
LIEBHERR GEAR BASIC 90 LS (--- GAL)

RECOMMENDATION

We advise that you check all areas where dirt can enter the system. The oil change at the time of sampling has been noted. Confirm the source of the lubricant being utilized for top-up/fill. We recommend an early resample to monitor this condition.

WEAR

Chromium and iron ppm levels are abnormal. Aluminum ppm levels are noted. The low ferrous density (PQ) index indicates the wear metal levels are due to corrosion.

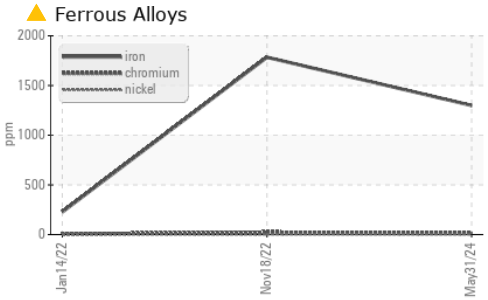
CONTAMINATION

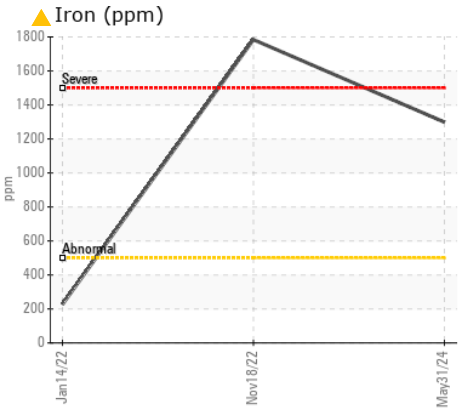
Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress. High amount of ingressed dirt has caused abrasive wear to the component.

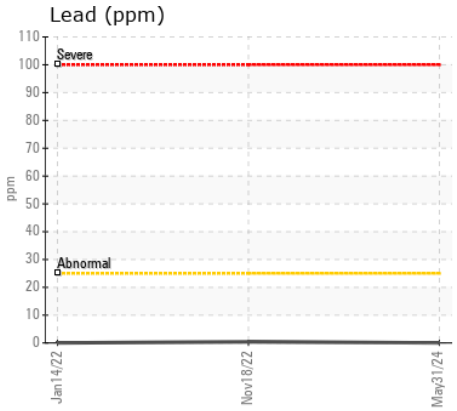
FLUID CONDITION

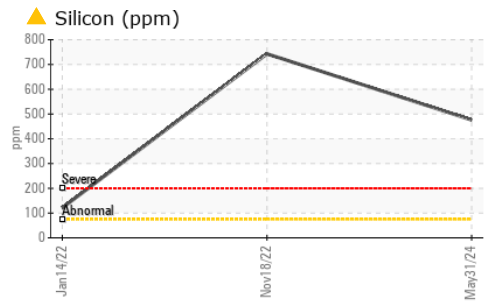
Additive levels indicate the addition of a different brand, or type of oil. Viscosity of sample indicates oil is within SAE 75W90 range, advise investigate. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

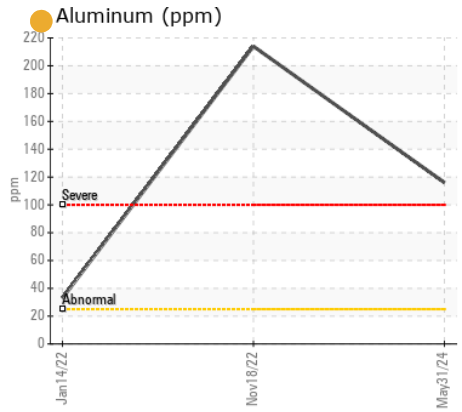
Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		LH0290973	LH0247209	LH
Sample Date		Client Info		31 May 2024	18 Nov 2022	14 Jan 2022
Machine Age	hrs	Client Info		3501	1930	1036
Oil Age	hrs	Client Info		0	0	0
Filter Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		Changed	Changed	Changed
Filter Changed		Client Info		N/A	N/A	None
Sample Status				ABNORMAL	ABNORMAL	NORMAL
PQ		ASTM D8184*		74	78	---
Iron	ppm	ASTM D5185(m)	>500	▲ 1299	▲ 1784	227
Chromium	ppm	ASTM D5185(m)	>10	▲ 18	▲ 24	6
Nickel	ppm	ASTM D5185(m)	>10	<1	<1	<1
Titanium	ppm	ASTM D5185(m)		6	▲ 11	2
Silver	ppm	ASTM D5185(m)		0	0	<1
Aluminum	ppm	ASTM D5185(m)	>25	● 116	● 214	33
Lead	ppm	ASTM D5185(m)	>25	0	<1	0
Copper	ppm	ASTM D5185(m)	>50	<1	<1	<1
Tin	ppm	ASTM D5185(m)	>10	0	0	0
Vanadium	ppm	ASTM D5185(m)		0	<1	<1
White Metal	scalar	Visual*	NONE	NONE	VLITE	NONE
Yellow Metal	scalar	Visual*	NONE	NONE	NONE	NONE
Silicon	ppm	ASTM D5185(m)	>75	▲ 476	▲ 743	121
Potassium	ppm	ASTM D5185(m)	>20	44	81	16
Water		WC Method	>0.2	NEG	NEG	NEG
Silt	scalar	Visual*	NONE	LIGHT	VLITE	NONE
Debris	scalar	Visual*	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	Visual*	NONE	NONE	NONE	VLITE
Appearance	scalar	Visual*	NORML	NORML	NORML	NORML
Odor	scalar	Visual*	NORML	NORML	NORML	NORML
Emulsified Water	scalar	Visual*	>0.2	NEG	NEG	NEG
Sodium	ppm	ASTM D5185(m)		23	33	6
Boron	ppm	ASTM D5185(m)	0	259	252	250
Barium	ppm	ASTM D5185(m)	0	1	1	3
Molybdenum	ppm	ASTM D5185(m)	0	<1	1	<1
Manganese	ppm	ASTM D5185(m)	0	12	19	3
Magnesium	ppm	ASTM D5185(m)	<1	219	202	60
Calcium	ppm	ASTM D5185(m)	<1	596	634	171
Phosphorus	ppm	ASTM D5185(m)	2143	1199	1295	1335
Zinc	ppm	ASTM D5185(m)	<1	15	24	13
Sulfur	ppm	ASTM D5185(m)	23468	20187	22355	22378
Visc @ 40°C	cSt	ASTM D7279(m)	170	97.8	98.8	107

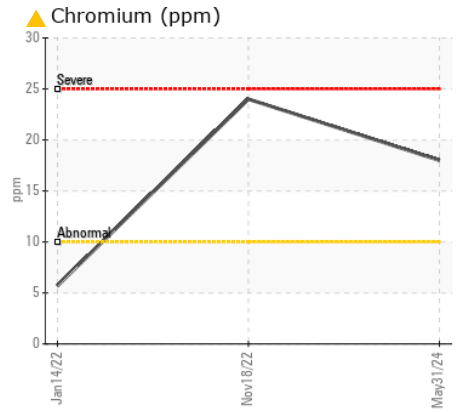


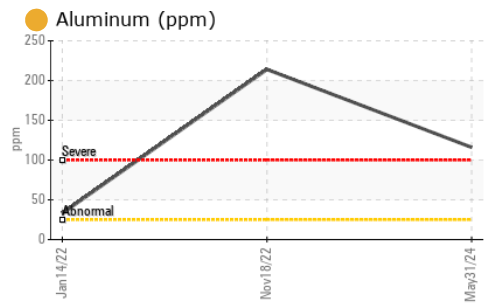


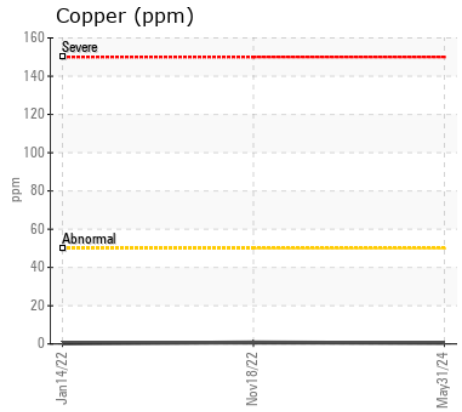


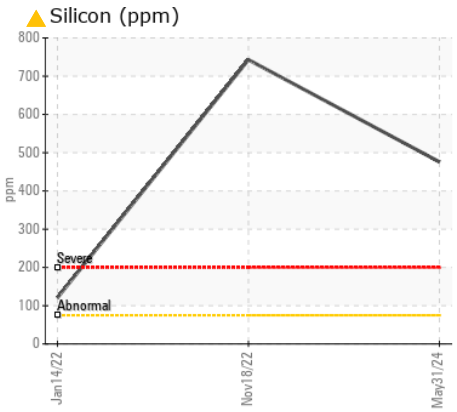


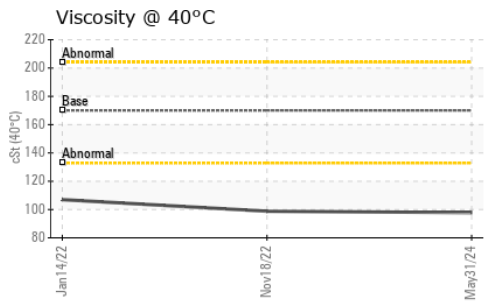


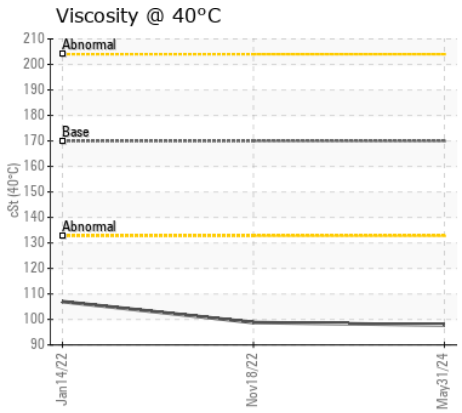


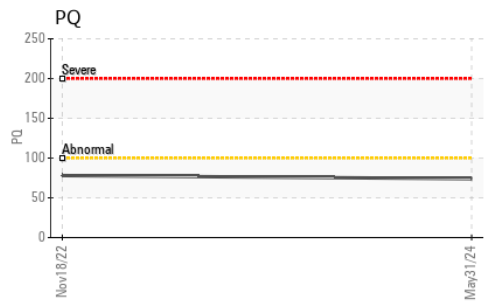


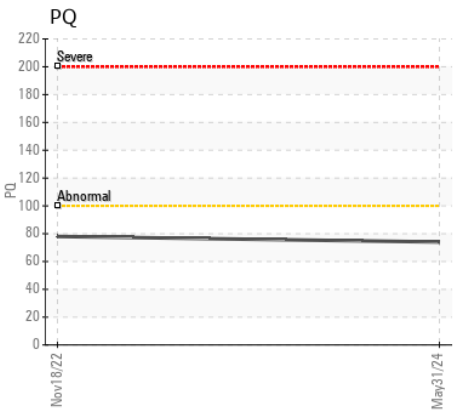












CALA
ISO 17025:2017 Accredited Laboratory

Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : LH0290973
Lab Number : 02639681
Unique Number : 5788843
Test Package : MOB 1 (Additional Tests: PQ)

Received : 04 Jun 2024
Tested : 05 Jun 2024
Diagnosed : 06 Jun 2024 - Kevin Marson

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: