



# LIEBHERR

## OIL ANALYSIS REPORT

WEAR	<b>ABNORMAL</b>
CONTAMINATION	<b>NORMAL</b>
FLUID CONDITION	<b>NORMAL</b>



Machine Id  
**042990-1491**  
Component  
**Hydraulic System**  
Fluid  
**TOTAL BIOHYDRAN SE 46 (--- GAL)**

### RECOMMENDATION

We recommend that you drain the oil from the component if this has not already been done. Confirm the source of the lubricant being utilized for top-up/fill. We recommend an early resample to monitor this condition.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		<b>LH0202820</b>	LH0277803	LH0247050
Sample Date		Client Info		<b>12 Jan 2024</b>	27 Nov 2023	16 Feb 2023
Machine Age	hrs	Client Info		<b>7070</b>	6947	6512
Oil Age	hrs	Client Info		<b>0</b>	0	0
Filter Age	hrs	Client Info		<b>0</b>	0	0
Oil Changed		Client Info		<b>Not Changd</b>	Not Changd	Not Changd
Filter Changed		Client Info		<b>N/A</b>	N/A	N/A
Sample Status				<b>ABNORMAL</b>	ABNORMAL	SEVERE

### WEAR

Iron ppm levels are abnormal. The low ferrous density (PQ) index indicates the wear metal levels are due to corrosion.

PQ		ASTM D8184*		<b>0</b>	0	1
Iron	ppm	ASTM D5185(m)	>50	<b>▲ 78</b>	▲ 68	▲ 68
Chromium	ppm	ASTM D5185(m)	>15	<b>3</b>	2	3
Nickel	ppm	ASTM D5185(m)	>5	<b>&lt;1</b>	<1	<1
Titanium	ppm	ASTM D5185(m)		<b>0</b>	0	0
Silver	ppm	ASTM D5185(m)		<b>0</b>	<1	0
Aluminum	ppm	ASTM D5185(m)	>8	<b>1</b>	<1	<1
Lead	ppm	ASTM D5185(m)	>5	<b>&lt;1</b>	<1	<1
Copper	ppm	ASTM D5185(m)	>15	<b>4</b>	3	4
Tin	ppm	ASTM D5185(m)	>5	<b>1</b>	<1	2
Vanadium	ppm	ASTM D5185(m)		<b>0</b>	0	0
White Metal	scalar	Visual*	NONE	<b>NONE</b>	NONE	▲ LIGHT
Yellow Metal	scalar	Visual*	NONE	<b>NONE</b>	NONE	NONE

### CONTAMINATION

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

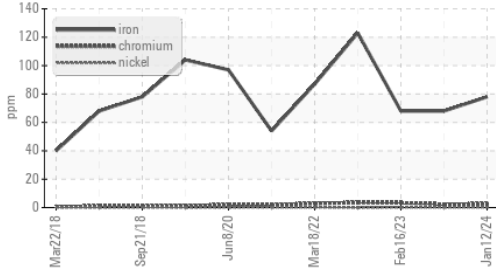
Silicon	ppm	ASTM D5185(m)	>25	<b>1</b>	1	2
Potassium	ppm	ASTM D5185(m)	>20	<b>&lt;1</b>	<1	<1
Water		WC Method	>0.1	<b>NEG</b>	NEG	NEG
Particles >4µm		ASTM D7647	>20000	<b>1492</b>	11311	▲ 136946
Particles >6µm		ASTM D7647	>5000	<b>153</b>	1636	● 44611
Particles >14µm		ASTM D7647	>640	<b>11</b>	82	154
Particles >21µm		ASTM D7647	>160	<b>3</b>	18	16
Particles >38µm		ASTM D7647	>40	<b>0</b>	1	0
Particles >71µm		ASTM D7647	>10	<b>0</b>	1	0
Oil Cleanliness		ISO 4406 (c)	>21/19/16	<b>18/14/11</b>	21/18/14	● 24/23/14
Silt	scalar	Visual*	NONE	<b>NONE</b>	NONE	NONE
Debris	scalar	Visual*	NONE	<b>NONE</b>	NONE	NONE
Sand/Dirt	scalar	Visual*	NONE	<b>NONE</b>	NONE	NONE
Appearance	scalar	Visual*	NORML	<b>NORML</b>	NORML	NORML
Odor	scalar	Visual*	NORML	<b>NORML</b>	NORML	NORML
Emulsified Water	scalar	Visual*	>0.1	<b>NEG</b>	NEG	NEG

### FLUID CONDITION

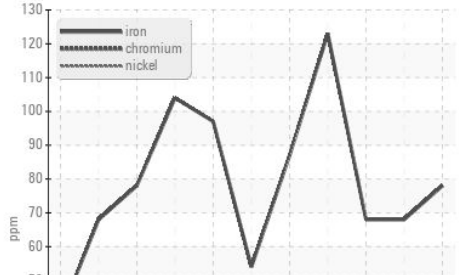
Additive levels indicate the addition of a different brand, or type of oil. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

Sodium	ppm	ASTM D5185(m)		<b>&lt;1</b>	1	1
Boron	ppm	ASTM D5185(m)	0	<b>1</b>	<1	<1
Barium	ppm	ASTM D5185(m)	0	<b>0</b>	0	0
Molybdenum	ppm	ASTM D5185(m)	0	<b>0</b>	0	0
Manganese	ppm	ASTM D5185(m)	0	<b>&lt;1</b>	0	1
Magnesium	ppm	ASTM D5185(m)	0	<b>&lt;1</b>	<1	1
Calcium	ppm	ASTM D5185(m)	0	<b>7</b>	5	14
Phosphorus	ppm	ASTM D5185(m)	0	<b>367</b>	353	399
Zinc	ppm	ASTM D5185(m)	0	<b>38</b>	36	44
Sulfur	ppm	ASTM D5185(m)	1100	<b>1762</b>	1625	1888
Visc @ 40°C	cSt	ASTM D7279(m)	48.5	<b>45.4</b>	45.5	45.5

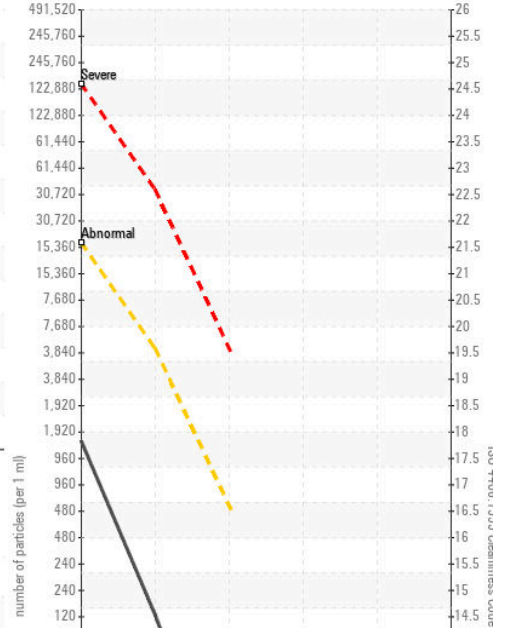
**▲ Ferrous Alloys**



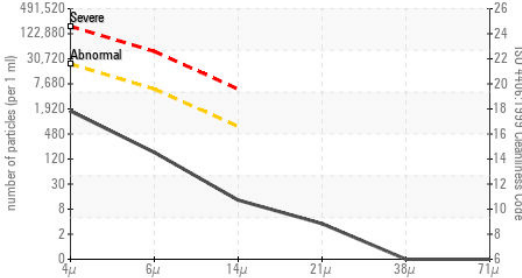
**▲ Ferrous Alloys**



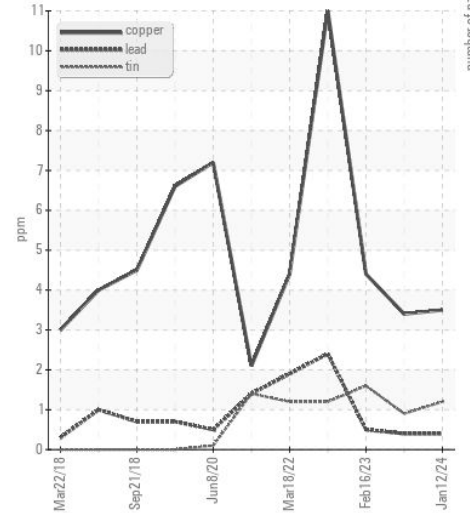
**Particle Count**



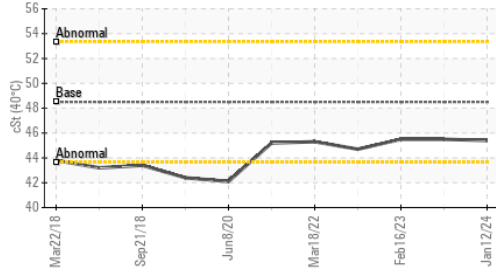
**Particle Count**



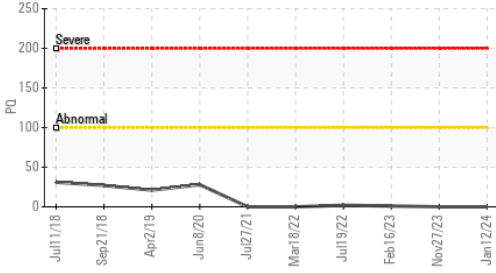
**Non-ferrous Metals**



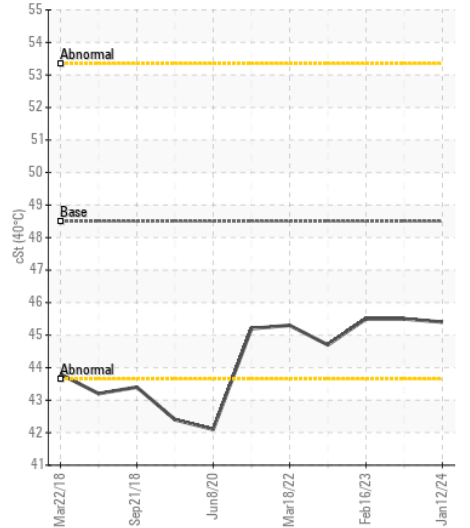
**Viscosity @ 40°C**



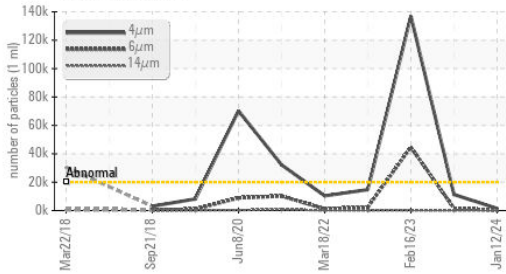
**PQ**



**Viscosity @ 40°C**



**Particle Trend**



**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9  
**Sample No.** : LH0202820 **Received** : 16 Jan 2024  
**Lab Number** : 02609020 **Diagnosed** : 17 Jan 2024  
**Unique Number** : 5710106 **Diagnostician** : Kevin Marson  
**Test Package** : MOB 1 ( Additional Tests: PQ, PrtCount )

**Delsan - American Iron and Metal**  
 2187 Montee Masson  
 Laval, QC  
 CA H7B 0A6  
 Contact: MANNY MARQUES  
 mmarques@delsan-aim.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.