



# LIEBHERR

## OIL ANALYSIS REPORT

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

Machine Id  
**141701**  
Component  
**Diesel Engine**  
Fluid  
**LIEBHERR MOTOROIL 10W-40 LOW ASH (--- GAL)**

### RECOMMENDATION

Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		<b>LM0000284</b>	LM0000281	LM0000443
Sample Date		Client Info		<b>19 Mar 2024</b>	28 Feb 2024	03 Jan 2024
Machine Age	hrs	Client Info		<b>12015</b>	11698	10943
Oil Age	hrs	Client Info		<b>500</b>	500	0
Filter Age	hrs	Client Info		<b>500</b>	0	0
Oil Changed		Client Info		<b>Changed</b>	Not Changd	Changed
Filter Changed		Client Info		<b>Changed</b>	Not Changed	N/A
Sample Status				<b>NORMAL</b>	NORMAL	NORMAL

### WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>100	<b>9</b>	7	6
Chromium	ppm	ASTM D5185m	>5	<b>&lt;1</b>	<1	<1
Nickel	ppm	ASTM D5185m	>5	<b>0</b>	0	0
Titanium	ppm	ASTM D5185m		<b>0</b>	0	0
Silver	ppm	ASTM D5185m	>3	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m	>15	<b>2</b>	2	2
Lead	ppm	ASTM D5185m	>30	<b>&lt;1</b>	<1	0
Copper	ppm	ASTM D5185m	>125	<b>5</b>	4	8
Tin	ppm	ASTM D5185m	>5	<b>&lt;1</b>	<1	0
Vanadium	ppm	ASTM D5185m		<b>&lt;1</b>	0	0
White Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE

### CONTAMINATION

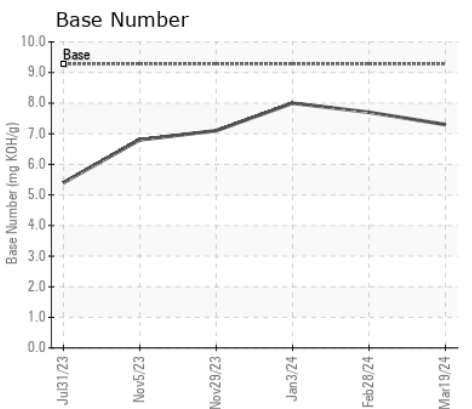
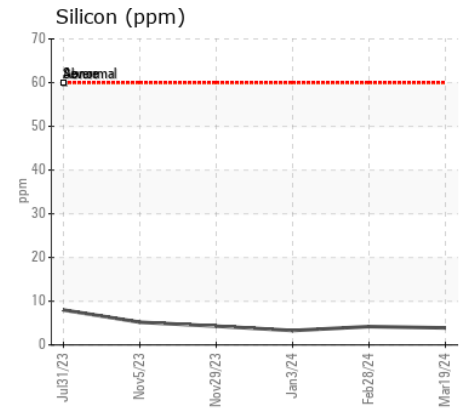
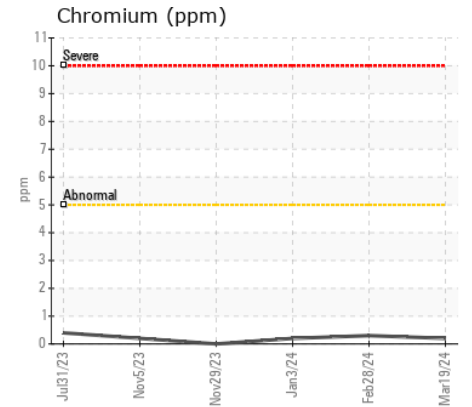
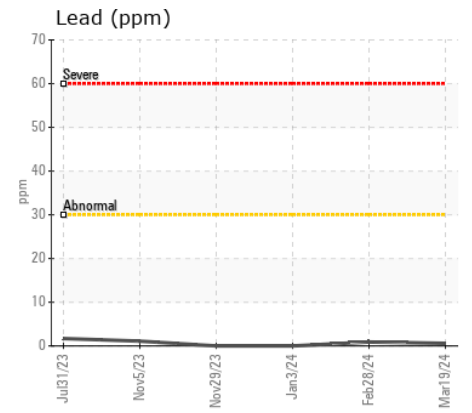
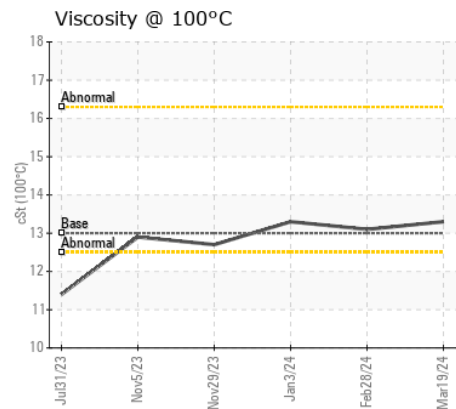
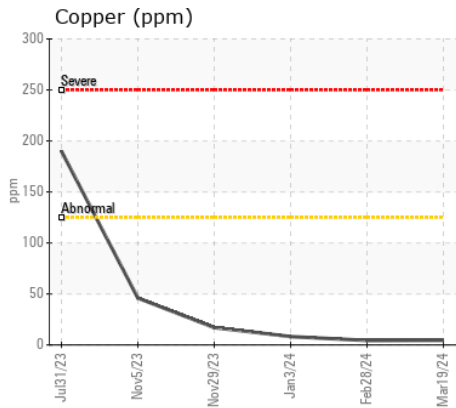
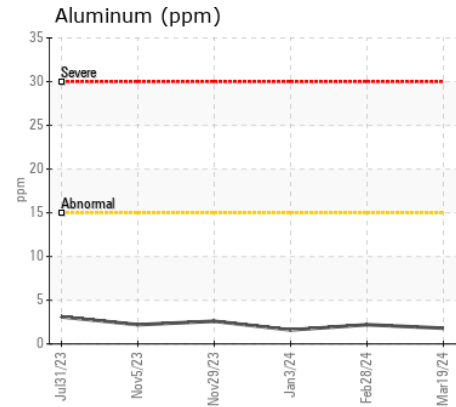
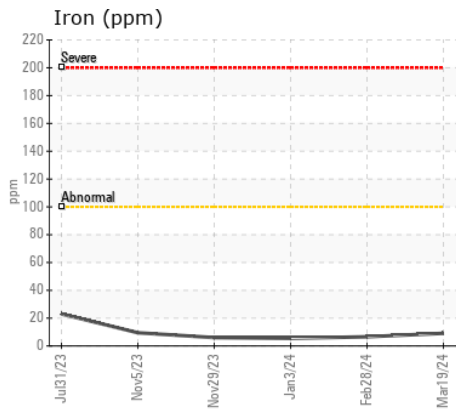
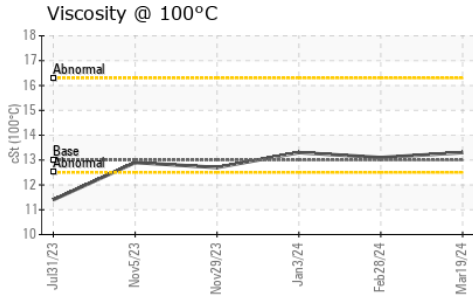
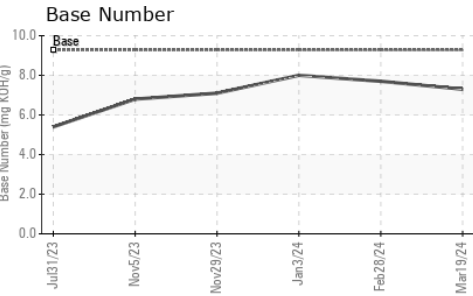
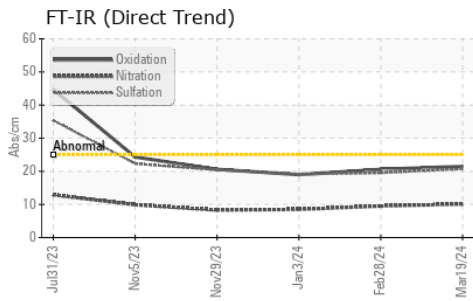
There is no indication of any contamination in the oil.

Silicon	ppm	ASTM D5185m	>60	<b>4</b>	4	3
Potassium	ppm	ASTM D5185m	>20	<b>19</b>	4	3
Fuel		WC Method	>5	<b>&lt;1.0</b>	<1.0	<1.0
Water		WC Method	>0.2	<b>NEG</b>	NEG	NEG
Glycol		WC Method		<b>NEG</b>	NEG	NEG
Soot %	%	*ASTM D7844	>3	<b>0.1</b>	0.1	0.1
Nitration	Abs/cm	*ASTM D7624	>20	<b>10.1</b>	9.5	8.5
Sulfation	Abs/.1mm	*ASTM D7415	>30	<b>20.7</b>	19.5	19.1
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	>0.2	<b>NEG</b>	NEG	NEG

### FLUID CONDITION

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sodium	ppm	ASTM D5185m		<b>6</b>	2	<1
Boron	ppm	ASTM D5185m	169	<b>71</b>	97	185
Barium	ppm	ASTM D5185m	0	<b>&lt;1</b>	0	0
Molybdenum	ppm	ASTM D5185m	2	<b>2</b>	2	2
Manganese	ppm	ASTM D5185m	<1	<b>&lt;1</b>	0	0
Magnesium	ppm	ASTM D5185m	724	<b>821</b>	802	853
Calcium	ppm	ASTM D5185m	1323	<b>1442</b>	1375	1396
Phosphorus	ppm	ASTM D5185m	678	<b>812</b>	796	802
Zinc	ppm	ASTM D5185m	776	<b>908</b>	924	944
Sulfur	ppm	ASTM D5185m	2859	<b>4614</b>	4103	4271
Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>21.5</b>	20.6	19.0
Base Number (BN)	mg KOH/g	ASTM D2896	9.28	<b>7.3</b>	7.7	8.0
Visc @ 100°C	cSt	ASTM D445	13.0	<b>13.3</b>	13.1	13.3



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : LM0000284  
**Lab Number** : 06150900  
**Unique Number** : 10980978  
**Test Package** : MOBCE ( Additional Tests: TBN )

**LIEBHERR USA CO - Maritime Cranes**  
 15101 NW 112TH AVE  
 HIALEAH GARDENS, FL  
 US 33018

To discuss this sample report, contact Customer Service at 1-800-237-1369.

\* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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