



# LIEBHERR

## OIL ANALYSIS REPORT

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



Machine Id  
**LIEBHERR LH110 1227-155752**  
Component  
**Diesel Engine**  
Fluid  
**DIESEL ENGINE OIL SAE 15W40 (--- GAL)**

### RECOMMENDATION

Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		<b>LH0280580</b>	LH0280569	LH0280561
Sample Date		Client Info		<b>20 Feb 2024</b>	30 Jan 2024	11 Jan 2024
Machine Age	hrs	Client Info		<b>1022</b>	863	507
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>Changed</b>	Not Changed	Changed
Filter Changed		Client Info		<b>Changed</b>	Not Changed	Changed
Sample Status				<b>NORMAL</b>	NORMAL	ATTENTION

### WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>100	<b>6</b>	4	5
Chromium	ppm	ASTM D5185m	>5	<b>&lt;1</b>	<1	<1
Nickel	ppm	ASTM D5185m	>5	<b>&lt;1</b>	0	<1
Titanium	ppm	ASTM D5185m		<b>&lt;1</b>	0	<1
Silver	ppm	ASTM D5185m	>3	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m	>15	<b>3</b>	2	2
Lead	ppm	ASTM D5185m	>30	<b>&lt;1</b>	0	2
Copper	ppm	ASTM D5185m	>125	<b>7</b>	6	29
Tin	ppm	ASTM D5185m	>5	<b>&lt;1</b>	0	1
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

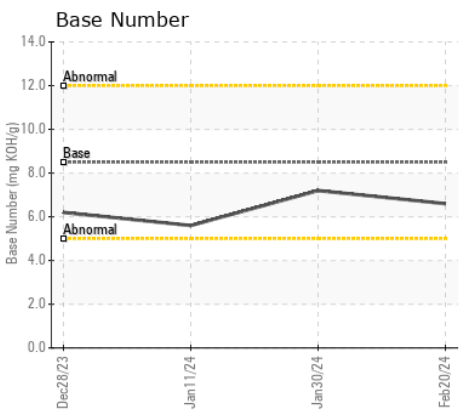
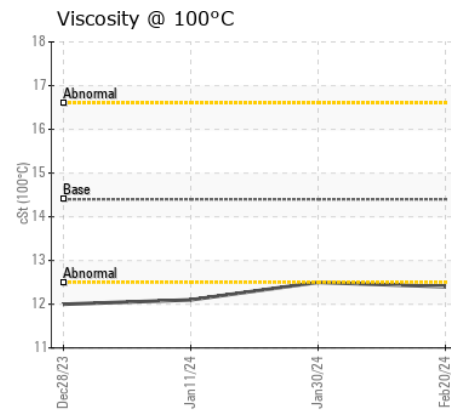
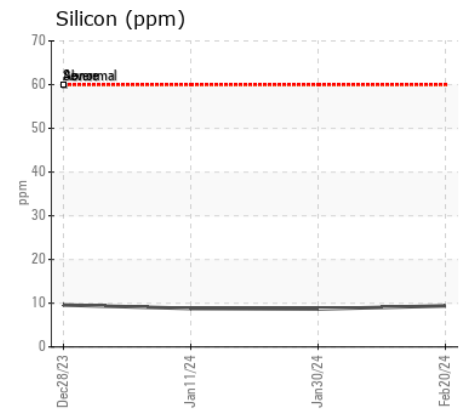
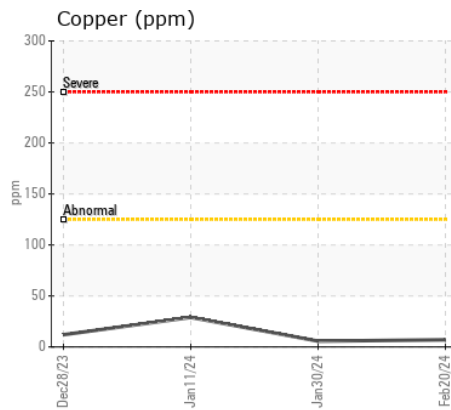
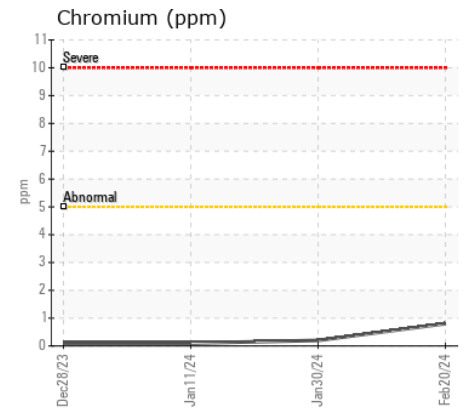
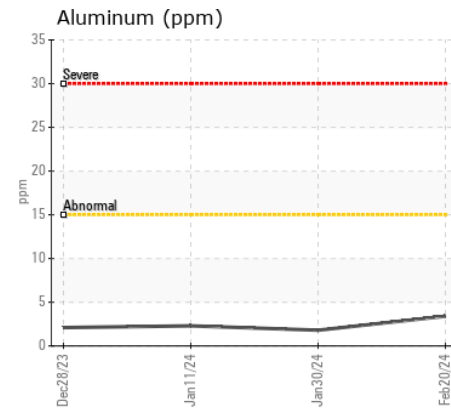
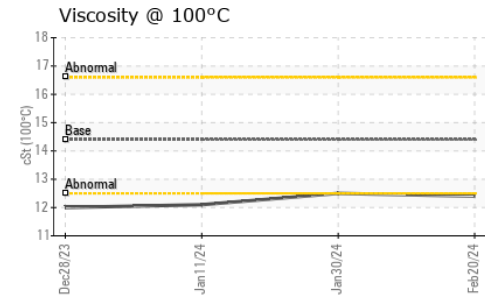
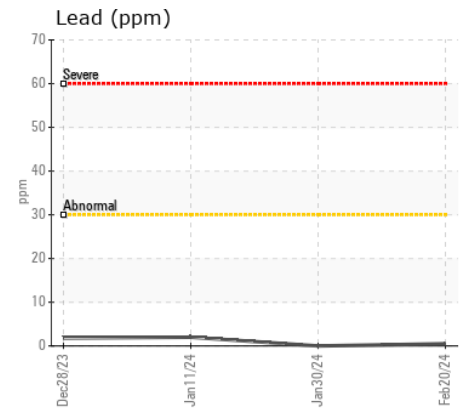
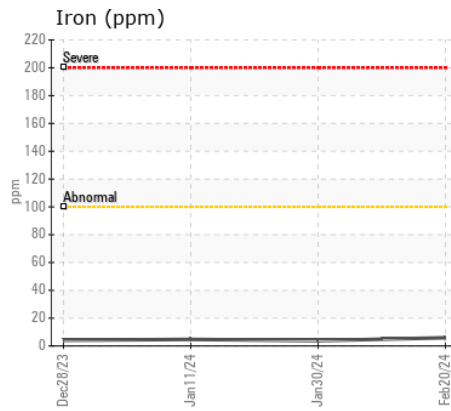
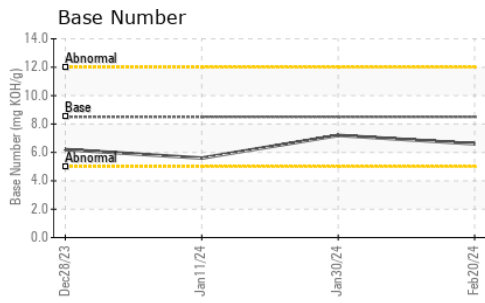
There is no indication of any contamination in the oil.

Silicon	ppm	ASTM D5185m	>60	<b>9</b>	9	9
Potassium	ppm	ASTM D5185m	>20	<b>2</b>	2	3
Fuel		WC Method	>5	<b>&lt;1.0</b>	<1.0	1.2
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>8.3</b>	7.4	10.6
Sulfation	Abs/.1mm	*ASTM D7415	>30	<b>22.4</b>	22.1	36.3
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	>158	<b>2</b>	0	3
Boron	ppm	ASTM D5185m	250	<b>309</b>	360	153
Barium	ppm	ASTM D5185m	10	<b>38</b>	9	25
Molybdenum	ppm	ASTM D5185m	100	<b>81</b>	83	48
Manganese	ppm	ASTM D5185m		<b>&lt;1</b>	0	<1
Magnesium	ppm	ASTM D5185m	450	<b>436</b>	478	771
Calcium	ppm	ASTM D5185m	3000	<b>1150</b>	1235	1196
Phosphorus	ppm	ASTM D5185m	1150	<b>858</b>	860	723
Zinc	ppm	ASTM D5185m	1350	<b>1063</b>	1131	853
Sulfur	ppm	ASTM D5185m	4250	<b>3006</b>	3094	2083
Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>20.0</b>	18.6	44.8
Base Number (BN)	mg KOH/g	ASTM D2896	8.5	<b>6.6</b>	7.2	5.6
Visc @ 100°C	cSt	ASTM D445	14.4	<b>12.4</b>	12.5	▲ 12.1



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : LH0280580 **Received** : 26 Feb 2024  
**Lab Number** : 06099911 **Tested** : 27 Feb 2024  
**Unique Number** : 10898141 **Diagnosed** : 27 Feb 2024 - Wes Davis  
**Test Package** : MOBCE ( Additional Tests: TBN )

**KINDER MORGAN**  
 4301 IVERSON  
 TRINITY, AL  
 US 35601  
 Contact: CHIP OAKES

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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