



# 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. Please specify the brand, type, and viscosity of the oil on your next sample.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		<b>LH0267550</b>	LH0280583	LH0258470
Sample Date		Client Info		<b>06 May 2024</b>	18 Apr 2024	24 Mar 2024
Machine Age	hrs	Client Info		<b>2262</b>	1980	1781
Oil Age	hrs	Client Info		<b>231</b>	0	273
Filter Age	hrs	Client Info		<b>231</b>	0	273
Oil Changed		Client Info		<b>Not Changd</b>	Changed	Not Changd
Filter Changed		Client Info		<b>Not Changd</b>	Changed	Not Changd
Sample Status				<b>NORMAL</b>	NORMAL	NORMAL

### WEAR

All component wear rates are normal.

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

### CONTAMINATION

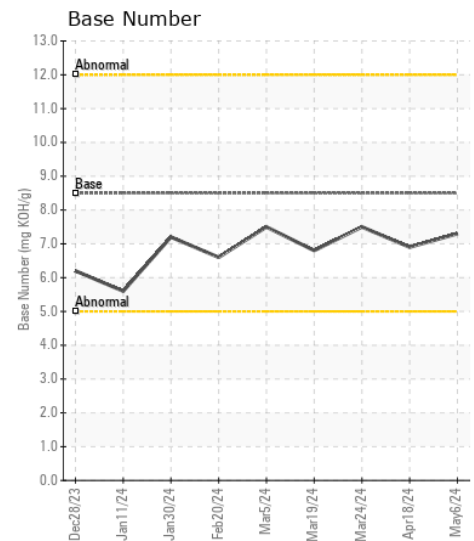
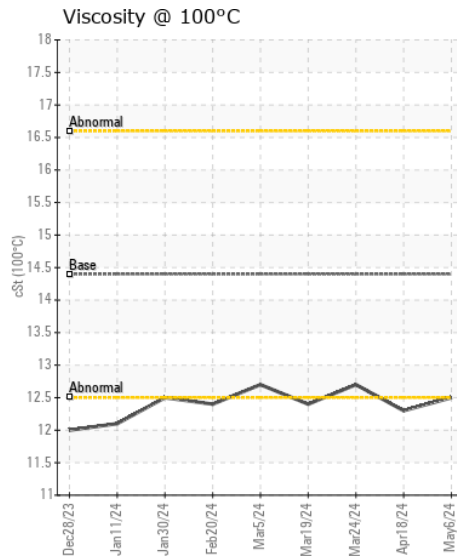
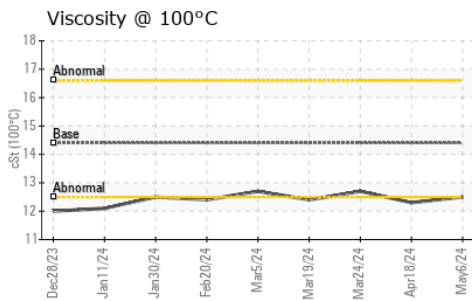
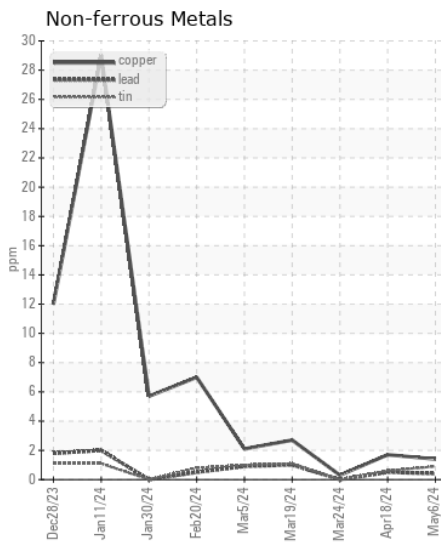
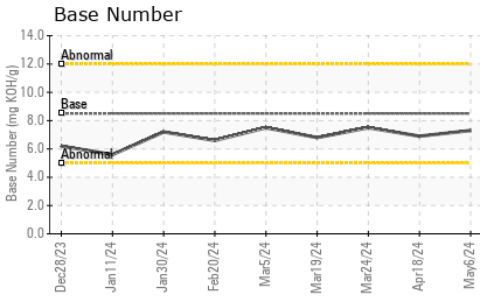
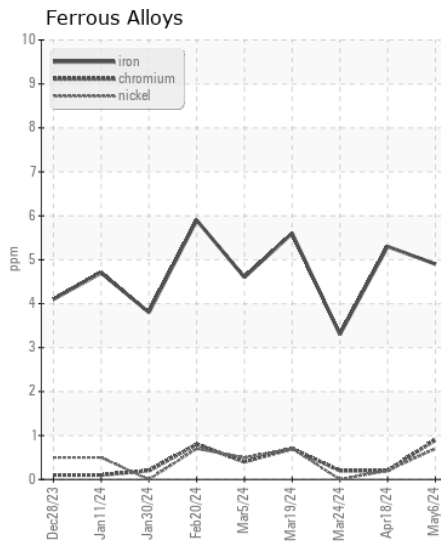
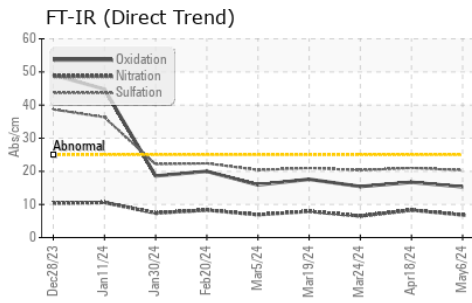
There is no indication of any contamination in the oil.

Silicon	ppm	ASTM D5185m	>60	<b>10</b>	10	8
Potassium	ppm	ASTM D5185m	>20	<b>3</b>	3	2
Fuel		WC Method	>5	<b>&lt;1.0</b>	0.6	<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>	0.2	0.1
Nitration	Abs/cm	*ASTM D7624	>20	<b>6.8</b>	8.3	6.5
Sulfation	Abs/.1mm	*ASTM D7415	>30	<b>20.3</b>	21.0	20.3
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>3</b>	<1	<1
Boron	ppm	ASTM D5185m	250	<b>380</b>	421	375
Barium	ppm	ASTM D5185m	10	<b>1</b>	<1	0
Molybdenum	ppm	ASTM D5185m	100	<b>83</b>	84	83
Manganese	ppm	ASTM D5185m		<b>&lt;1</b>	<1	0
Magnesium	ppm	ASTM D5185m	450	<b>397</b>	413	401
Calcium	ppm	ASTM D5185m	3000	<b>1279</b>	1341	1382
Phosphorus	ppm	ASTM D5185m	1150	<b>921</b>	1140	1084
Zinc	ppm	ASTM D5185m	1350	<b>1097</b>	1204	1204
Sulfur	ppm	ASTM D5185m	4250	<b>3090</b>	3802	3364
Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>15.3</b>	16.7	15.4
Base Number (BN)	mg KOH/g	ASTM D2896	8.5	<b>7.3</b>	6.9	7.5
Visc @ 100°C	cSt	ASTM D445	14.4	<b>12.5</b>	12.3	12.7



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : LH0267550 **Received** : 28 May 2024  
**Lab Number** : 06192005 **Tested** : 29 May 2024  
**Unique Number** : 11048757 **Diagnosed** : 29 May 2024 - Wes Davis  
**Test Package** : CONST ( Additional Tests: TBN )

**KINDER MORGAN**  
 4301 IVERSON  
 TRINITY, AL  
 US 35601

Contact: RICKY JOHNSON  
 ricky\_johnson@kindermorgan.com

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)

T:  
 F: (256)355-5250