

LIEBHERR

CONSTRUCTION EQUIPMENT



LIEBHERR LH110 155976-1227 - Diesel Engine

Sample No: LH0267531

Oil Type: DIESEL ENGINE OIL SAE 15W40



KINDER MORGAN

4301 IVERSON

TRINITY, AL

US 35601

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Sample Information

Sample Number	LH0267531	LH0258471	LH0280572	LH0280572
Sample Date	18 Apr 2024	27 Mar 2024	23 Feb 2024	15 Feb 2024
Machine Hours	1623	1266	995	874
Oil Hours	628	271	0	0
Oil Changed	Changed	Not Changd	Changed	Not Changd
Sample Status	NORMAL	NORMAL	NORMAL	NORMAL



Oil Condition

Visc @ 100°C	cSt	12.5	12.8	12.6	12.8
Base Number (BN)	mg KOH/g	6.6	7.5	6.9	7.1
Oxidation (PA)	%	71	63	79	73



Contamination

Water	%	NEG	NEG	NEG	NEG
Soot %	%	0.2	0.1	0.1	0.1
Nitration (PA)	%	70	56	67	59
Sulfation (PA)	%	59	56	62	61
Glycol	%	NEG	NEG	NEG	NEG
Fuel	%	<1.0	<1.0	<1.0	<1.0
Silicon	ppm	10	10	9	9
Sodium	ppm	<1	3	2	3
Potassium	ppm	3	1	<1	2



Wear Metals

Iron	ppm	6	4	6	5
Copper	ppm	72	6	28	22
Lead	ppm	1	<1	0	<1
Tin	ppm	<1	<1	<1	<1
Aluminum	ppm	3	4	3	3
Chromium	ppm	<1	<1	<1	<1
Molybdenum	ppm	86	87	82	79
Nickel	ppm	<1	<1	<1	<1
Titanium	ppm	<1	<1	<1	<1
Silver	ppm	0	0	0	0
Manganese	ppm	<1	<1	<1	<1
Vanadium	ppm	<1	<1	0	<1



Additives

Calcium	ppm	1348	1348	1270	1152
Magnesium	ppm	403	431	488	439
Zinc	ppm	1179	1204	1201	1060
Phosphorus	ppm	1080	1096	950	863
Barium	ppm	1	0	2	36
Boron	ppm	391	427	299	335

Diagnosis

Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Depot: KINTRI

Unique No: 11031036

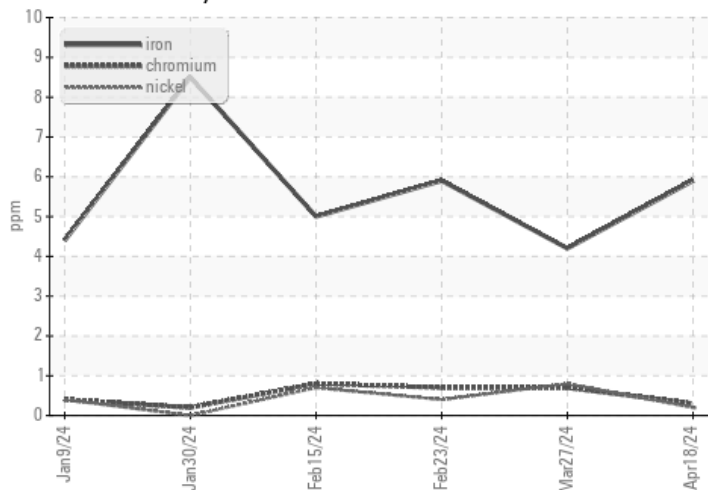
Signed: Sean Felton

Report Date: 17 May 2024

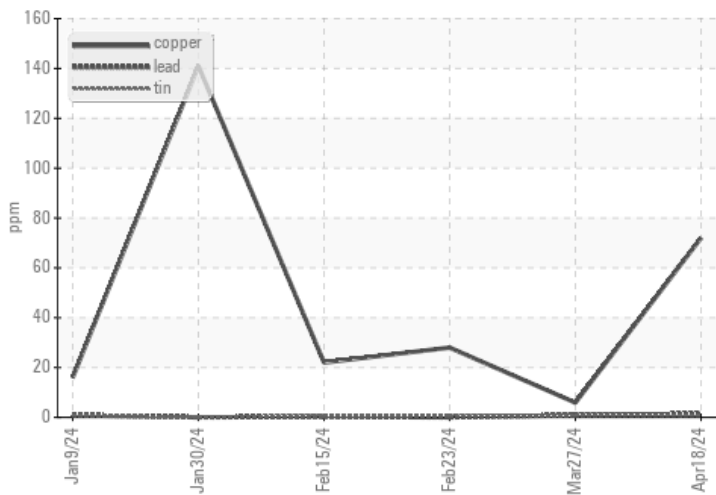


Graphs

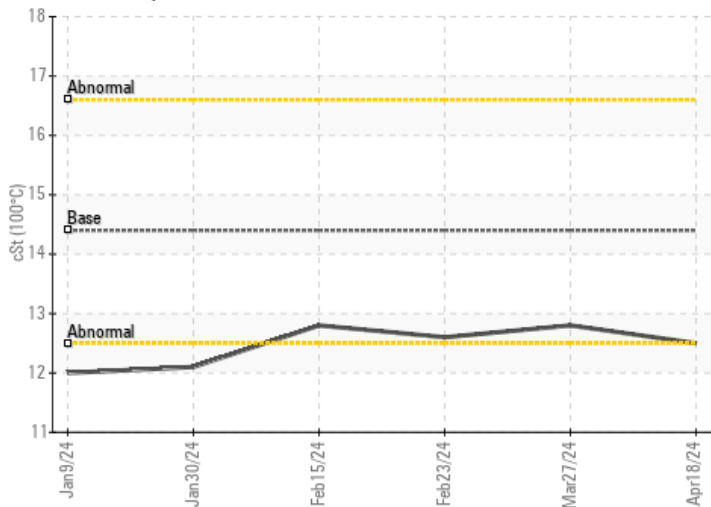
Ferrous Alloys



Non-ferrous Metals



Viscosity @ 100°C



Base Number

