LIEBHERR
CONSTRUCTION EQUIPMENT

LIEBHERR LH40M 087885-1202 - Diesel Engine

Sample No: LH0258375

Oil Type: 10W30 LOW ASH

HEAVY MACHINES INC
7651 THEODORE DAWES RD
THEODORE, AL
US 36582
Contact: DAVID MIANO
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Sample Information

Sample Number		**LH0258375**	LHMC155045	---	---
Sample Date		**28 Apr 2024**	21 Nov 2019	---	---
Machine Hours		**15270**	0	---	---
Oil Hours		**0**	500	---	---
Oil Changed		**N/A**	Changed	---	---
Sample Status		**SEVERE**	ABNORMAL	---	---

Oil Condition

Visc @ 100°C	cSt	**12.3**	13.1	---	---
Base Number (BN)	mg KOH/g	**4.4**	---	---	---
Oxidation (PA)	%	**22**	89	---	---

Contamination

Water	%	**NEG**	NEG	---	---
Soot %	%	**0.2**	1.8	---	---
Nitration (PA)	%	**33**	111	---	---
Sulfation (PA)	%	**42**	72	---	---
Glycol	%	**NEG**	NEG	---	---
Fuel	%	**2.1**	<1.0	---	---
Silicon	ppm	**53**	12	---	---
Sodium	ppm	**2**	8	---	---
Potassium	ppm	**<1**	2	---	---

Wear Metals

Iron	ppm	**4534**	56	---	---
Copper	ppm	**2987**	169	---	---
Lead	ppm	**31**	51	---	---
Tin	ppm	**231**	2	---	---
Aluminum	ppm	**8**	6	---	---
Chromium	ppm	**45**	2	---	---
Molybdenum	ppm	**12**	83	---	---
Nickel	ppm	**7**	<1	---	---
Titanium	ppm	**1**	<1	---	---
Silver	ppm	**0**	<1	---	---
Manganese	ppm	**35**	2	---	---
Vanadium	ppm	**<1**	0	---	---

Additives

Calcium	ppm	**84**	1509	---	---
Magnesium	ppm	**36**	601	---	---
Zinc	ppm	**173**	846	---	---
Phosphorus	ppm	**474**	667	---	---
Barium	ppm	**1**	35	---	---
Boron	ppm	**59**	16	---	---

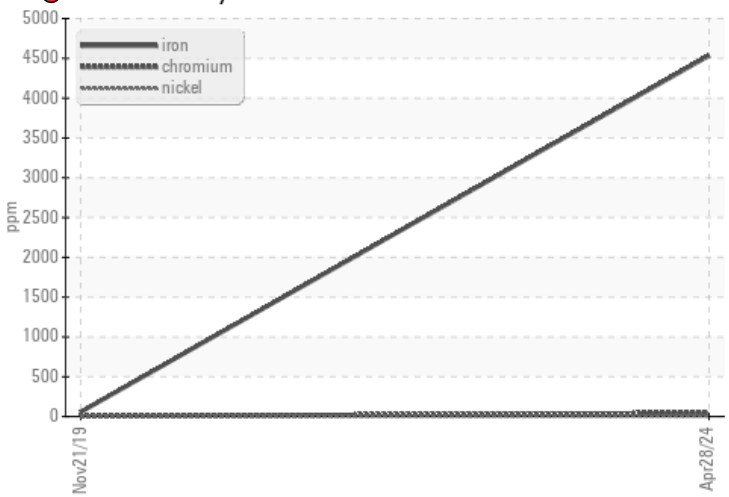
Diagnosis

We recommend that you drain the oil and perform a filter service on this component if not already done. We advise that you inspect for the source(s) of wear. We recommend an early resample to monitor this condition.Piston, ring and cylinder wear is indicated. Bearing and/or bushing wear is indicated. Light fuel dilution occurring. The oil viscosity is lower than normal. Additive levels indicate the addition of a different brand, or type of oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

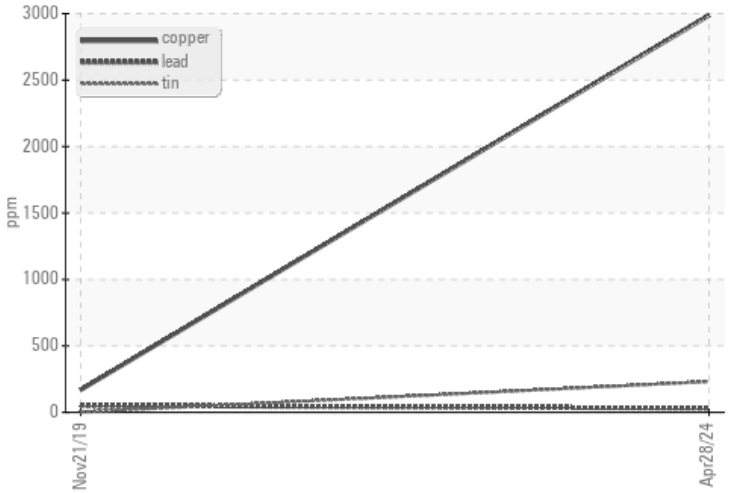
Depot: HEATHE
Unique No: 11009969
Signed: Jonathan Hester
Report Date: 08 May 2024

Graphs

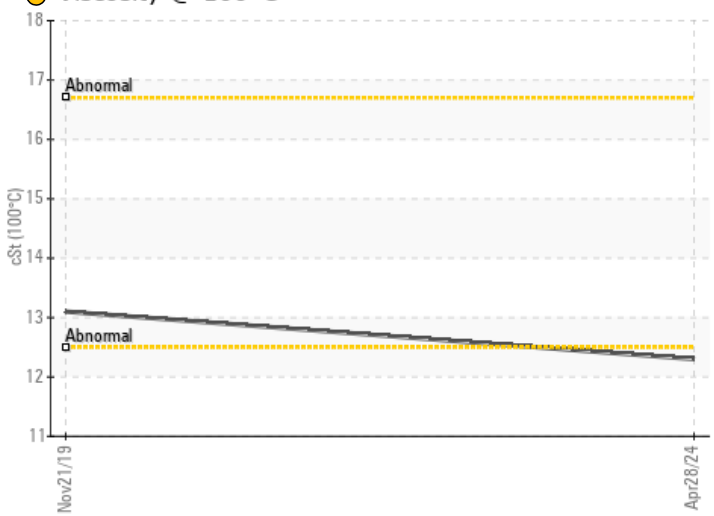
Ferrous Alloys



Non-ferrous Metals



Viscosity @ 100°C



Base Number