LIEBHERR
CONSTRUCTION EQUIPMENT

LIEBHERR LH80C 097852-1529 - Diesel Engine

Sample No: LH0258432

Oil Type: LIEBHERR MOTOROIL 10W-40 LOW ASH

HEAVY MACHINES INC
7651 THEODORE DAWES RD
THEODORE, AL
US 36582
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Sample Information

Sample Number		**LH0258432**	LH0254288	LH0190360	LH0190800
Sample Date		**17 Apr 2024**	20 Jul 2023	11 Oct 2021	13 Aug 2021
Machine Hours		**8867**	7409	3416	5190
Oil Hours		**0**	0	0	0
Oil Changed		**Changed**	N/A	Changed	Changed
Sample Status		**ABNORMAL**	ABNORMAL	SEVERE	NORMAL

Oil Condition

Visc @ 100°C	cSt	**11.2**	11.9	3.3	11.4
Base Number (BN)	mg KOH/g	**4.2**	4.8	---	---
Oxidation (PA)	%	**108**	104	39	71

Contamination

Water	%	**NEG**	NEG	NEG	NEG
Soot %	%	**0.2**	0.3	0	0.1
Nitration (PA)	%	**117**	113	53	85
Sulfation (PA)	%	**75**	75	40	56
Glycol	%	**NEG**	NEG	NEG	NEG
Fuel	%	**5.8**	5.4	47.5	<1.0
Silicon	ppm	**8**	14	4	6
Sodium	ppm	**6**	28	0	3
Potassium	ppm	**6**	17	6	2

Wear Metals

Iron	ppm	**24**	49	3	5
Copper	ppm	**11**	28	1	3
Lead	ppm	**0**	5	<1	<1
Tin	ppm	**<1**	1	<1	<1
Aluminum	ppm	**2**	5	3	0
Chromium	ppm	**<1**	3	<1	<1
Molybdenum	ppm	**27**	71	22	43
Nickel	ppm	**0**	<1	0	0
Titanium	ppm	**0**	<1	<1	<1
Silver	ppm	**0**	<1	0	<1
Manganese	ppm	**1**	2	<1	<1
Vanadium	ppm	**0**	0	0	0

Additives

Calcium	ppm	**1615**	1665	709	1539
Magnesium	ppm	**613**	593	284	567
Zinc	ppm	**881**	929	460	906
Phosphorus	ppm	**708**	713	381	767
Barium	ppm	**0**	0	0	<1
Boron	ppm	**38**	49	21	25

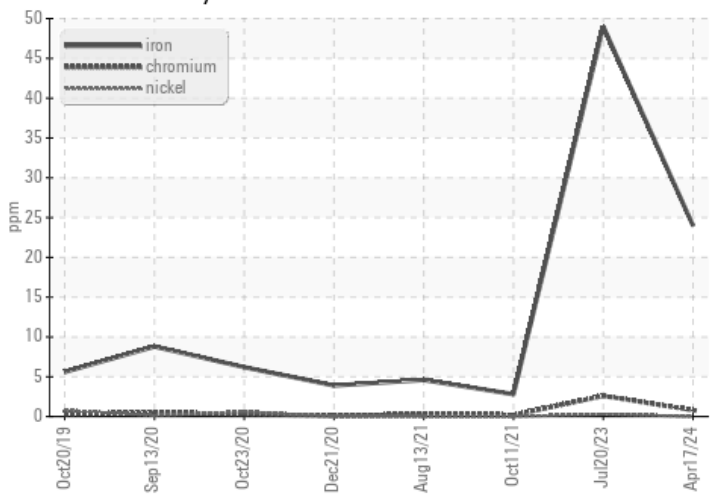
Diagnosis

We advise that you check the fuel injection system. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.All component wear rates are normal. There is a moderate amount of fuel present in the oil. Fuel is present in the oil and is lowering the viscosity. The BN result indicates that there is suitable alkalinity remaining in the oil.

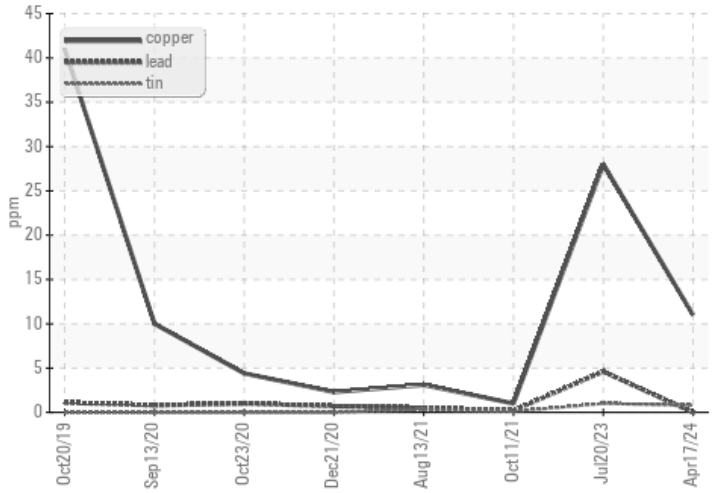
Depot: HEATHE
Unique No: 10993764
Signed: Sean Felton
Report Date: 25 Apr 2024

Graphs

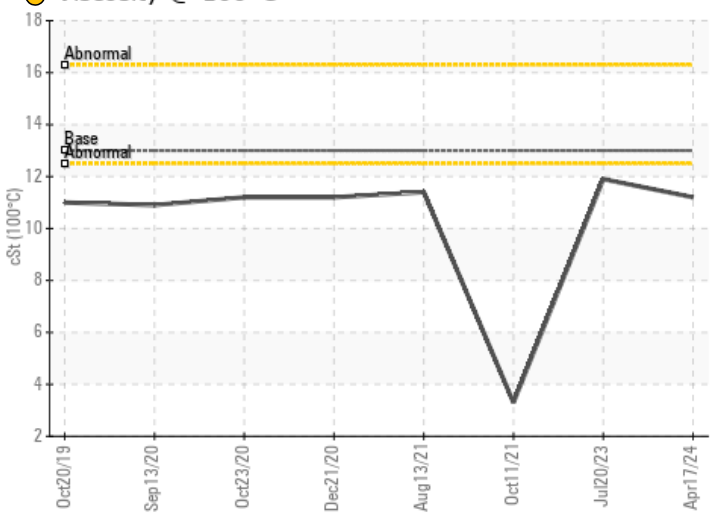
Ferrous Alloys



Non-ferrous Metals



Viscosity @ 100°C



Base Number