

LIEBHERR

CONSTRUCTION EQUIPMENT



LIEBHERR LH40M 1202-69200 - Diesel Engine

Sample No: LH0254499

Oil Type: LIEBHERR MOTOROIL 5W-30 LOW ASH



SAMPLE INFORMATION

Sample Number	LH0254499	LH0190835	LH0190795	LH0172191
Sample Date	11 Jul 2023	16 Nov 2021	15 Jun 2021	08 Feb 2021
Machine Hours	17245	13455	12675	12132
Oil Hours	0	0	0	0
Oil Changed	N/A	N/A	Changed	Changed
Sample Status	SEVERE	SEVERE	ABNORMAL	ABNORMAL

HEAVY MACHINES INC

7651 THEODORE DAWES RD

THEODORE, AL

US 36582

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OIL CONDITION

Visc @ 100°C	cSt	13.3	12.8	12.1	12.0
Base Number (BN)	mg KOH/g	10.7	---	---	---
Oxidation (PA)	%	73	76	67	60



CONTAMINATION

Soot %	%	3.8	1.1	1	1.2
Nitration (PA)	%	160	111	112	105
Sulfation (PA)	%	92	71	70	72
Glycol	%	0.12	0.06	NEG	NEG
Fuel	%	<1.0	<1.0	<1.0	0.6
Silicon	ppm	99	17	13	12
Sodium	ppm	2275	725	910	607
Potassium	ppm	147	16	25	20



WEAR METALS

Iron	ppm	49	42	33	33
Copper	ppm	5	9	7	8
Lead	ppm	5	7	5	5
Tin	ppm	<1	<1	<1	<1
Aluminum	ppm	49	37	26	34
Chromium	ppm	2	2	1	2
Molybdenum	ppm	21	51	33	19
Nickel	ppm	<1	<1	<1	<1
Titanium	ppm	<1	<1	<1	<1
Silver	ppm	0	<1	<1	<1
Manganese	ppm	<1	<1	<1	<1
Vanadium	ppm	<1	<1	<1	0



ADDITIVES

Calcium	ppm	1440	1757	1982	2354
Magnesium	ppm	679	489	268	90
Zinc	ppm	884	966	979	1042
Phosphorus	ppm	647	890	844	952
Barium	ppm	0	<1	0	0
Boron	ppm	52	35	23	14

Diagnosis

We advise that you check for the source of the coolant leak. Check for low coolant level. We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. We recommend that you drain the oil and perform a filter service on this component if not already done. We recommend an early resample to monitor this condition. All component wear rates are normal. Sodium and/or potassium levels are high. Test for glycol is positive. Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress. There is an abnormal amount of solids and carbon present in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.

Depot: HEATHE

Unique No: 10561949

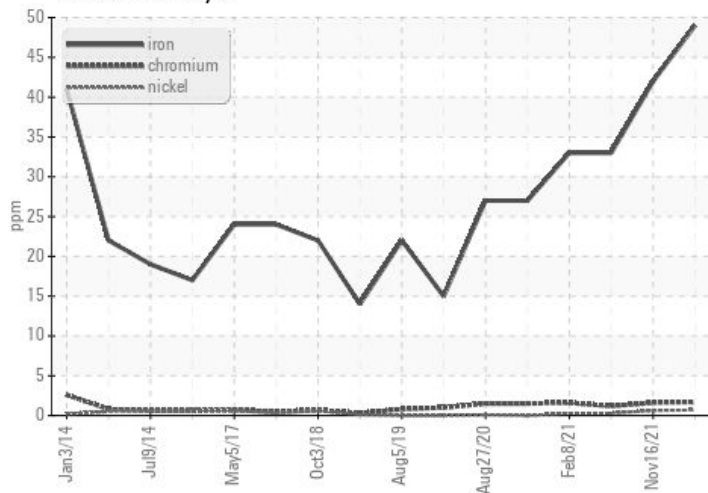
Signed: Jonathan Hester

Report Date: 20 Jul 2023

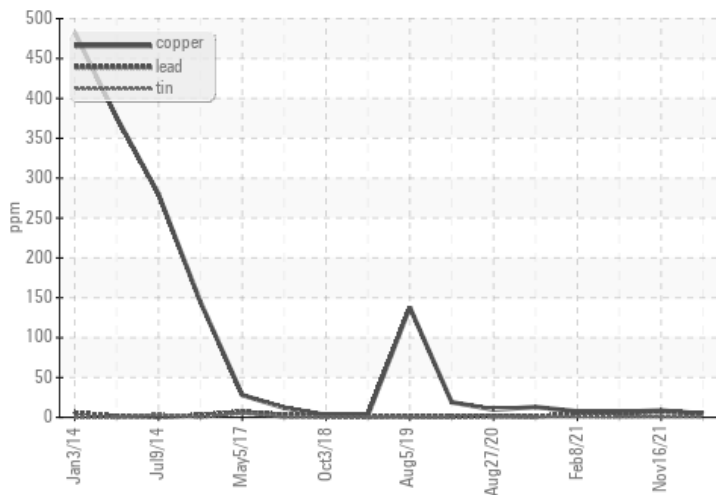


GRAPHS

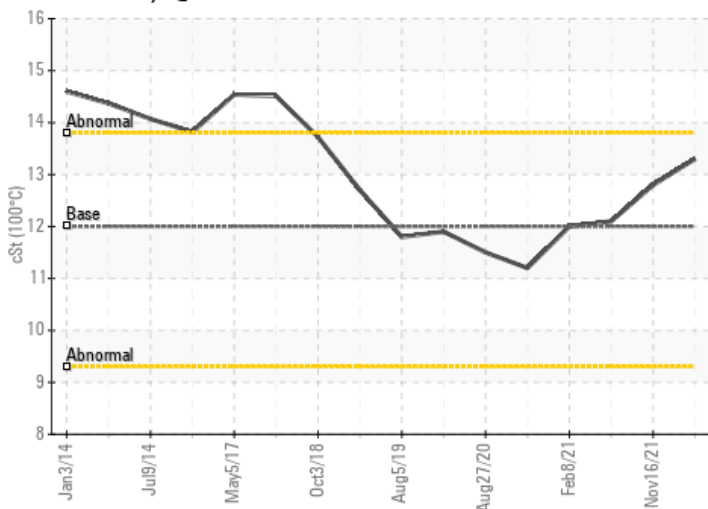
Ferrous Alloys



Non-ferrous Metals



Viscosity @ 100°C



Base Number

