LIEBHERR
CONSTRUCTION EQUIPMENT

LIEBHERR LH50M 145108-1216 - Diesel Engine

Sample No: LH0272120

Oil Type: DIESEL ENGINE OIL SAE 5W40

PCA
400 2ND STREET
INTERNATIONAL FALLS, MN
US 56649
Contact: SCOTT LINDVALL
scottlindvall@boisepaper.com
T: (218)285-5706
F:

SAMPLE INFORMATION

Sample Number		**LH0272120**	---	---	---
Sample Date		**21 Dec 2023**	---	---	---
Machine Hours		**1655**	---	---	---
Oil Hours		**1655**	---	---	---
Oil Changed		**Changed**	---	---	---
Sample Status		**ABNORMAL**	---	---	---

OIL CONDITION

Visc @ 100°C	cSt	**12.1**	---	---	---
Base Number (BN)	mg KOH/g	**3.5**	---	---	---
Oxidation (PA)	%	**203**	---	---	---

CONTAMINATION

Water	%	**NEG**	---	---	---
Soot %	%	**0.1**	---	---	---
Nitration (PA)	%	**118**	---	---	---
Sulfation (PA)	%	**103**	---	---	---
Glycol	%	**NEG**	---	---	---
Fuel	%	**1.5**	---	---	---
Silicon	ppm	**8**	---	---	---
Sodium	ppm	**2**	---	---	---
Potassium	ppm	**3**	---	---	---

WEAR METALS

Iron	ppm	**19**	---	---	---
Copper	ppm	**206**	---	---	---
Lead	ppm	**7**	---	---	---
Tin	ppm	**1**	---	---	---
Aluminum	ppm	**3**	---	---	---
Chromium	ppm	**2**	---	---	---
Molybdenum	ppm	**31**	---	---	---
Nickel	ppm	**0**	---	---	---
Titanium	ppm	**1**	---	---	---
Silver	ppm	**0**	---	---	---
Manganese	ppm	**1**	---	---	---
Vanadium	ppm	**<1**	---	---	---

ADDITIVES

Calcium	ppm	**1247**	---	---	---
Magnesium	ppm	**871**	---	---	---
Zinc	ppm	**866**	---	---	---
Phosphorus	ppm	**726**	---	---	---
Barium	ppm	**31**	---	---	---
Boron	ppm	**74**	---	---	---

Diagnosis

Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.The copper level is abnormal. In the absence of other significant wear metals, suspect copper due to sources other than wear (i.e. cooling core). All other metal levels are typical for a new component breaking in. Fuel content negligible. No other contaminants were detected in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

Depot: PCAINT
Unique No: 10844243
Signed: Doug Bogart
Report Date: 04 Feb 2024

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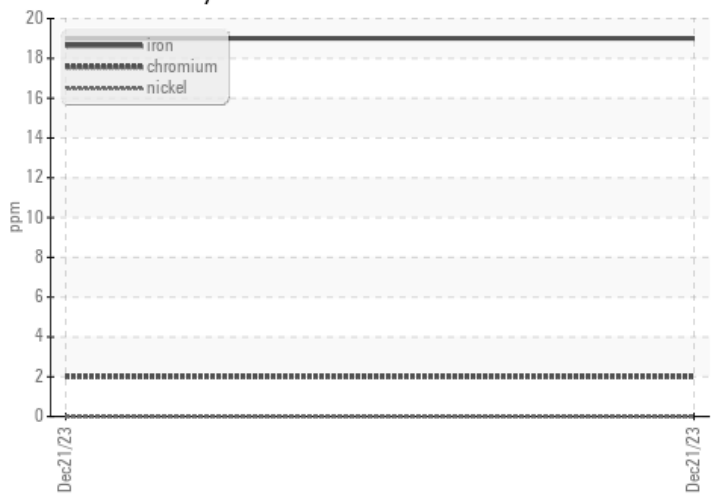
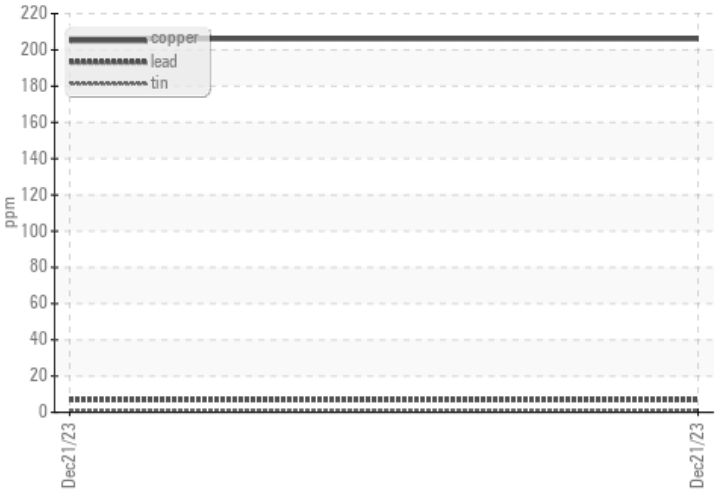
GRAPHS

Ferrous Alloys



Non-ferrous Metals



Viscosity @ 100°C

Base Number