LIEBHERR
CONSTRUCTION EQUIPMENT

LIEBHERR R936 035770-1148 - Diesel Engine

Sample No: LH0267367

Oil Type: LIEBHERR MOTOROIL 10W-40 LOW ASH

ACECO
10119 RESIDENCY ROAD
MANASSAS, VA
US 20110
Contact: RON BROCK

T: (703)392-0111
F: (703)331-5604

SAMPLE INFORMATION

Sample Number		**LH0267367**	LHMC124806	LH0243946	LH0207411
Sample Date		**02 Oct 2023**	24 Mar 2023	17 Mar 2023	15 Jul 2022
Machine Hours		**9829**	9060	9047	8359
Oil Hours		**0**	0	688	500
Oil Changed		**Not Changd**	Not Changd	Changed	Changed
Sample Status		**ABNORMAL**	NORMAL	NORMAL	NORMAL

OIL CONDITION

Visc @ 100°C	cSt	**17.2**	13.9	14.3	14.6
Base Number (BN)	mg KOH/g	**0.0**	9.2	9.3	8.7
Oxidation (PA)	%	**99**	69	71	87

CONTAMINATION

Soot %	%	**5.1**	0.2	1.2	1.7
Nitration (PA)	%	**138**	57	88	107
Sulfation (PA)	%	**93**	51	54	66
Glycol	%	**NEG**	NEG	NEG	NEG
Fuel	%	**<1.0**	<1.0	<1.0	<1.0
Silicon	ppm	**11**	6	14	8
Sodium	ppm	**4**	2	3	2
Potassium	ppm	**5**	2	3	3

WEAR METALS

Iron	ppm	**80**	5	18	24
Copper	ppm	**5**	<1	2	2
Lead	ppm	**6**	0	<1	<1
Tin	ppm	**<1**	0	<1	<1
Aluminum	ppm	**17**	2	7	12
Chromium	ppm	**2**	<1	<1	<1
Molybdenum	ppm	**<1**	1	2	4
Nickel	ppm	**<1**	<1	0	0
Titanium	ppm	**<1**	0	<1	0
Silver	ppm	**0**	0	<1	<1
Manganese	ppm	**1**	<1	1	<1
Vanadium	ppm	**<1**	0	<1	<1

ADDITIVES

Calcium	ppm	**1582**	1283	1862	1275
Magnesium	ppm	**775**	776	781	714
Zinc	ppm	**1041**	932	988	838
Phosphorus	ppm	**923**	809	837	708
Barium	ppm	**0**	0	0	0
Boron	ppm	**53**	175	146	49

Diagnosis

We advise that you check for faulty combustion, plugged air filters, or aftercoolers. We recommend you service the filters on this component. We recommend an early resample to monitor this condition. NOTE: High solids (carbon/soot) in the sample have limited the accuracy of Infra-Red data including Total Base Number (TBN) value.All component wear rates are normal. There is an abnormal amount of solids and carbon present in the oil. The oil viscosity is higher than normal. The BN level is low.

Depot: ACEMAN
Unique No: 10713562
Signed: Don Baldridge
Report Date: 30 Oct 2023

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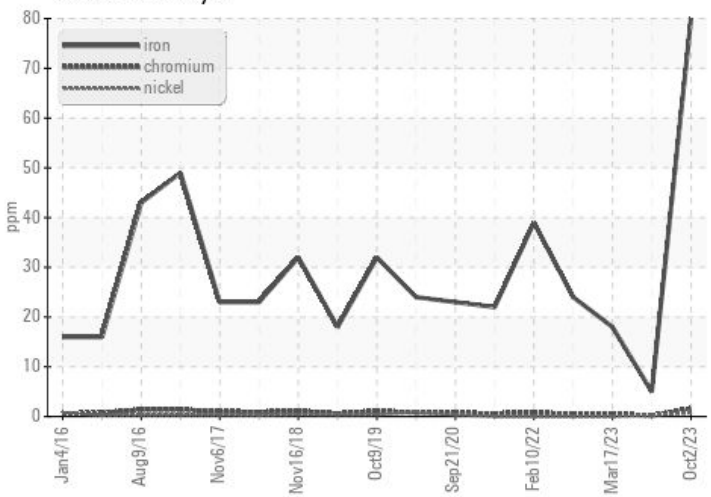
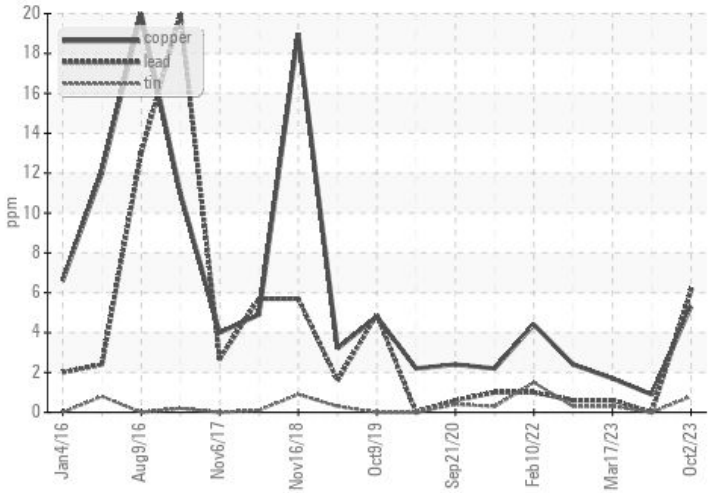
GRAPHS

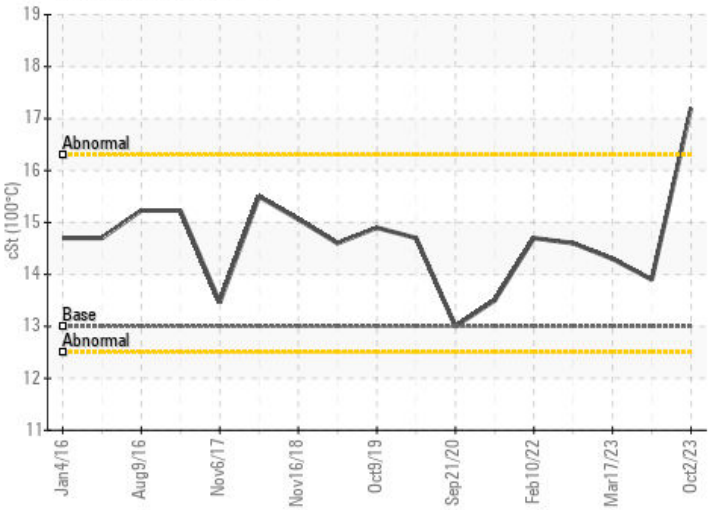
Ferrous Alloys



Non-ferrous Metals



Viscosity @ 100°C



Base Number