

LIEBHERR

CONSTRUCTION EQUIPMENT



LIEBHERR R944CEW 035017-793 - Diesel Engine

Sample No: LH0268830

Oil Type: PENNZOIL 15W40



SAMPLE INFORMATION

Sample Number	LH0268830	LHMC120303	LHMC118435	LHMC111405
Sample Date	26 Jan 2024	24 Jan 2018	24 Oct 2017	01 Aug 2017
Machine Hours	15729	11966	11570	11096
Oil Hours	500	0	0	0
Oil Changed	Changed	N/A	Changed	Changed
Sample Status	NORMAL	NORMAL	NORMAL	ABNORMAL

MIDDLE RIVER MARINE
 1771 SOUTH TORRENCE AVE
 CHICAGO, IL
 US 60617
 Contact: Scott Molitor
 scottmolitor@gomiddleriver.com
 T:
 F:



OIL CONDITION

Visc @ 100°C	cSt	13.9	13.54	12.57	14.66
Base Number (BN)	mg KOH/g	5.2	---	---	---
Oxidation (PA)	%	70	48	44	28



CONTAMINATION

Water	%	NEG	NEG	NEG	NEG
Soot %	%	2.7	0.4	0.5	3.5
Nitration (PA)	%	94	50	50	58
Sulfation (PA)	%	73	50	36	64
Glycol	%	NEG	NEG	NEG	NEG
Fuel	%	<1.0	<1.0	<1.0	<1.0
Silicon	ppm	6	8	4	6
Sodium	ppm	2	4	4	5
Potassium	ppm	2	5	1	1

Diagnosis

Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.



WEAR METALS

Iron	ppm	36	9	14	18
Copper	ppm	5	5	6	5
Lead	ppm	2	0	<1	2
Tin	ppm	<1	0	0	7
Aluminum	ppm	2	2	1	2
Chromium	ppm	<1	<1	<1	<1
Molybdenum	ppm	27	74	37	6
Nickel	ppm	0	<1	<1	0
Titanium	ppm	0	0	0	0
Silver	ppm	0	0	0	0
Manganese	ppm	<1	<1	1	<1
Vanadium	ppm	0	0	0	0



ADDITIVES

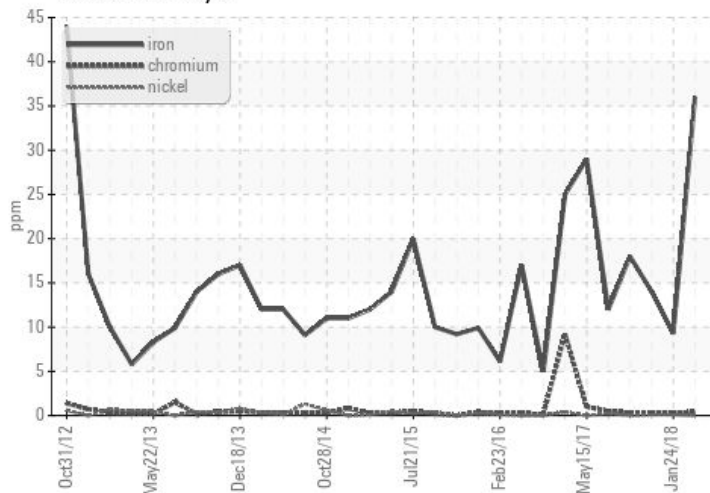
Calcium	ppm	1347	1282	925	1574
Magnesium	ppm	731	427	828	566
Zinc	ppm	923	1039	931	875
Phosphorus	ppm	805	752	857	713
Barium	ppm	<1	0	0	0
Boron	ppm	35	296	42	26

Depot: MIDCHIL
Unique No: 10875371
Signed: Wes Davis
Report Date: 14 Feb 2024

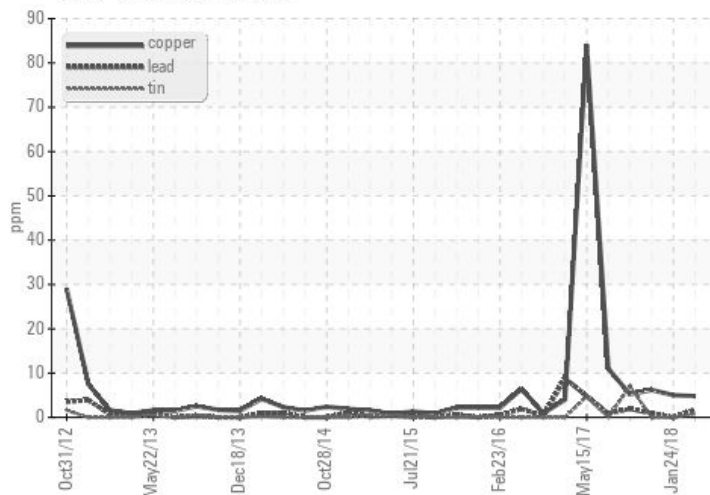


GRAPHS

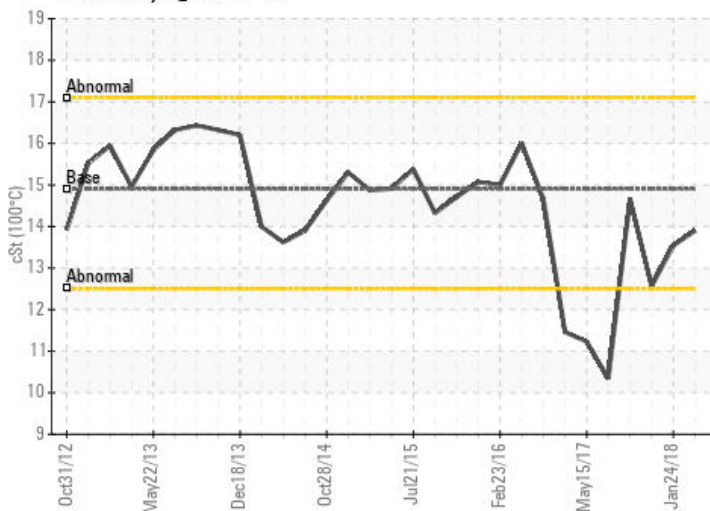
Ferrous Alloys



Non-ferrous Metals



Viscosity @ 100°C



Base Number

