

# LIEBHERR

## CONSTRUCTION EQUIPMENT



### LIEBHERR A944CHD 051846-194 - Diesel Engine

Sample No: LH0244855

Oil Type: CONOCO PHILLIPS GUARDOL ECT 15W40



#### SAMPLE INFORMATION

Sample Number	LH0244855	LH0190627	LH0207978	LH0244655
Sample Date	02 Oct 2023	14 Aug 2023	19 Jun 2023	11 May 2023
Machine Hours	26129	31920	31579	31320
Oil Hours	300	300	300	250
Oil Changed	Changed	Changed	Changed	Changed
Sample Status	ABNORMAL	NORMAL	NORMAL	NORMAL

**NILES IRON & METAL CO. INC.**

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#### OIL CONDITION

Visc @ 100°C	cSt	13.5	13.6	13.4	13.4
Base Number (BN)	mg KOH/g	7.5	7.8	8.2	7.6
Oxidation (PA)	%	54	49	52	51

#### Diagnosis

Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor. 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 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 acceptable for the time in service.



#### CONTAMINATION

Soot %	%	1.6	1.8	1.4	1.8
Nitration (PA)	%	75	72	69	84
Sulfation (PA)	%	60	57	57	59
Glycol	%	NEG	NEG	NEG	NEG
Fuel	%	<1.0	<1.0	<1.0	<1.0
Silicon	ppm	5	6	7	7
Sodium	ppm	7	2	2	3
Potassium	ppm	3	2	4	4



#### WEAR METALS

Iron	ppm	37	13	12	17
Copper	ppm	389	<1	<1	<1
Lead	ppm	<1	0	<1	1
Tin	ppm	1	<1	<1	<1
Aluminum	ppm	2	<1	1	2
Chromium	ppm	<1	<1	<1	<1
Molybdenum	ppm	23	13	23	22
Nickel	ppm	<1	0	0	0
Titanium	ppm	5	8	19	16
Silver	ppm	0	0	0	<1
Manganese	ppm	<1	<1	<1	1
Vanadium	ppm	<1	0	<1	0



#### ADDITIVES

Calcium	ppm	1498	1644	1866	1742
Magnesium	ppm	558	685	594	703
Zinc	ppm	1147	1308	1373	1466
Phosphorus	ppm	1008	1106	1145	1213
Barium	ppm	16	0	0	0
Boron	ppm	27	42	52	56

Depot: NILNIL

Unique No: 10698978

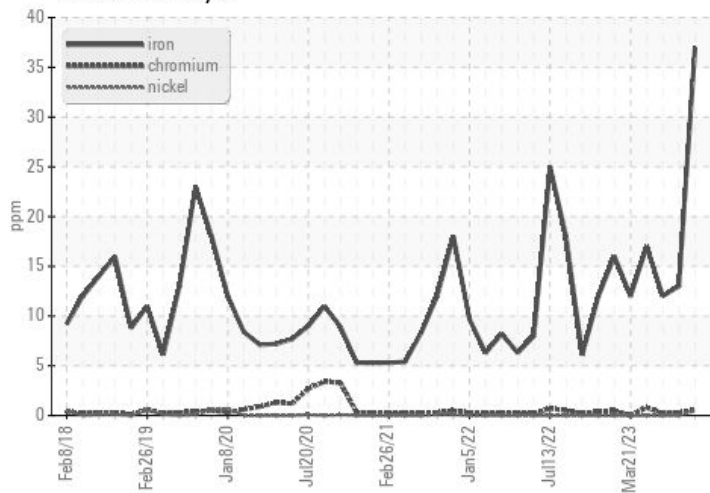
Signed: Don Baldrige

Report Date: 19 Oct 2023

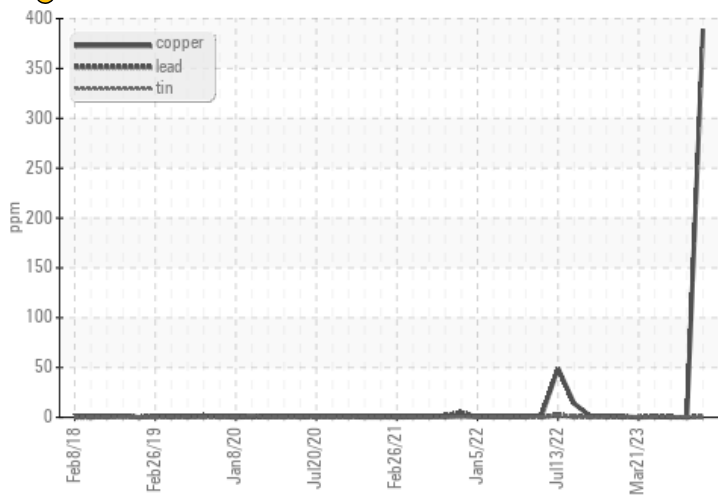


### GRAPHS

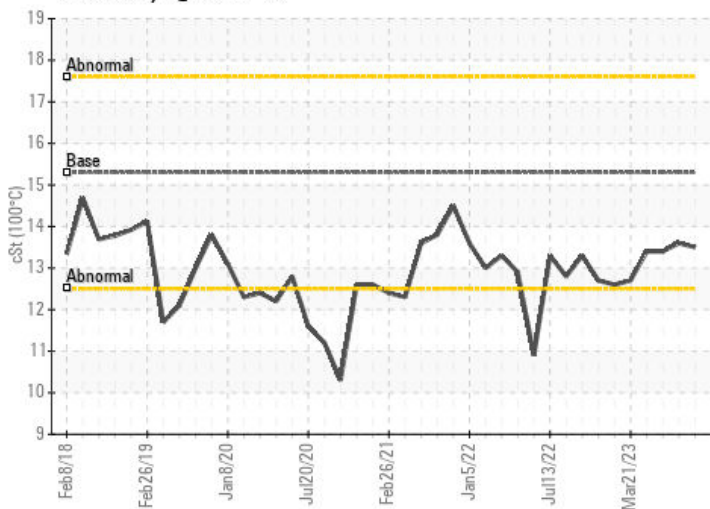
#### Ferrous Alloys



#### Non-ferrous Metals



#### Viscosity @ 100°C



#### Base Number

