LIEBHERR
CONSTRUCTION EQUIPMENT

MS20 - Diesel Engine

Sample No: LH0244797

Oil Type: DIESEL ENGINE OIL SAE 40

OSCAR WINSKI CO. INC
2407 N. 9TH STREET
LAFAYETTE, IN
US 47904
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Sample Information

Sample Number		**LH0244797**	LH0244825	LH0244841	---
Sample Date		**29 Jun 2024**	09 Mar 2024	14 Dec 2023	---
Machine Hours		**4907**	4046	3388	---
Oil Hours		**0**	500	0	---
Oil Changed		**Changed**	N/A	Changed	---
Sample Status		**NORMAL**	NORMAL	NORMAL	---

Oil Condition

Visc @ 100°C	cSt	**12.6**	13.1	13.4	---
Base Number (BN)	mg KOH/g	**7.7**	7.6	6.0	---
Oxidation (PA)	%	**63**	59	75	---

Contamination

Water	%	**NEG**	NEG	NEG	---
Soot %	%	**0.5**	0.3	0.7	---
Nitration (PA)	%	**72**	63	78	---
Sulfation (PA)	%	**56**	53	61	---
Glycol	%	**NEG**	NEG	NEG	---
Fuel	%	**<1.0**	<1.0	<1.0	---
Silicon	ppm	**3**	3	6	---
Sodium	ppm	**<1**	2	7	---
Potassium	ppm	**2**	0	2	---

Wear Metals

Iron	ppm	**16**	14	27	---
Copper	ppm	**1**	2	2	---
Lead	ppm	**0**	0	0	---
Tin	ppm	**0**	<1	0	---
Aluminum	ppm	**2**	<1	2	---
Chromium	ppm	**<1**	<1	<1	---
Molybdenum	ppm	**61**	59	82	---
Nickel	ppm	**0**	0	0	---
Titanium	ppm	**<1**	0	0	---
Silver	ppm	**0**	0	0	---
Manganese	ppm	**0**	<1	<1	---
Vanadium	ppm	**<1**	0	0	---

Additives

Calcium	ppm	**1164**	1167	2300	---
Magnesium	ppm	**958**	895	508	---
Zinc	ppm	**1273**	1242	1615	---
Phosphorus	ppm	**1052**	1016	1149	---
Barium	ppm	**0**	0	0	---
Boron	ppm	**5**	8	56	---

Diagnosis

Resample at the next service interval to monitor. Please specify the component make and model with your next sample. Please specify the brand, type, and viscosity of the oil on your next sample.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.

Depot: OSCLAF
Unique No: 11123533
Signed: Wes Davis
Report Date: 15 Jul 2024

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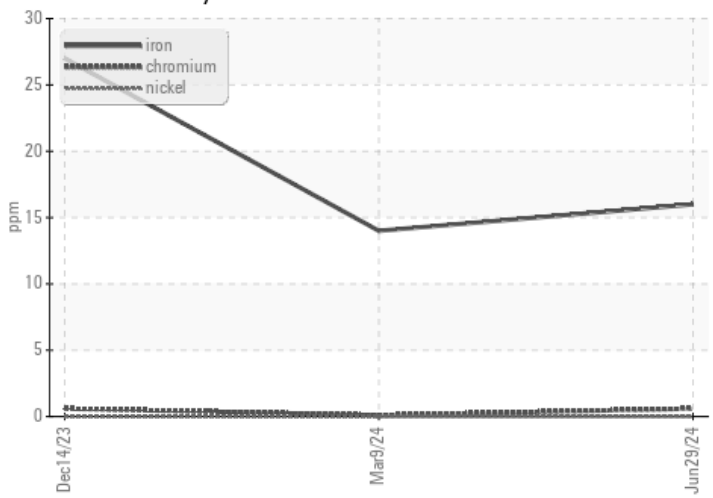
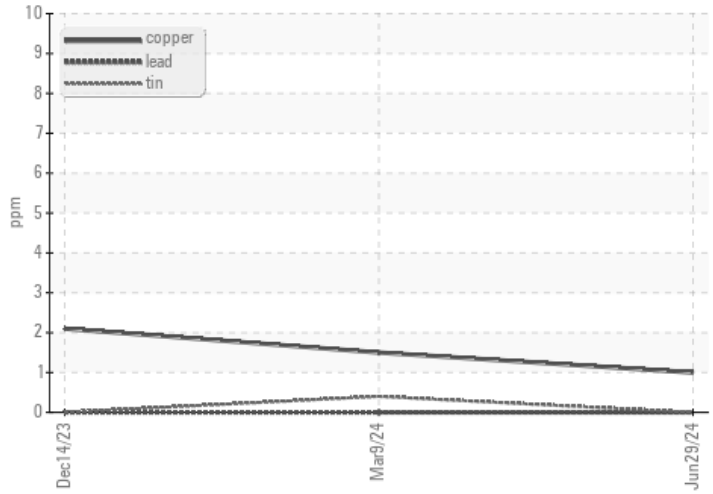
Graphs

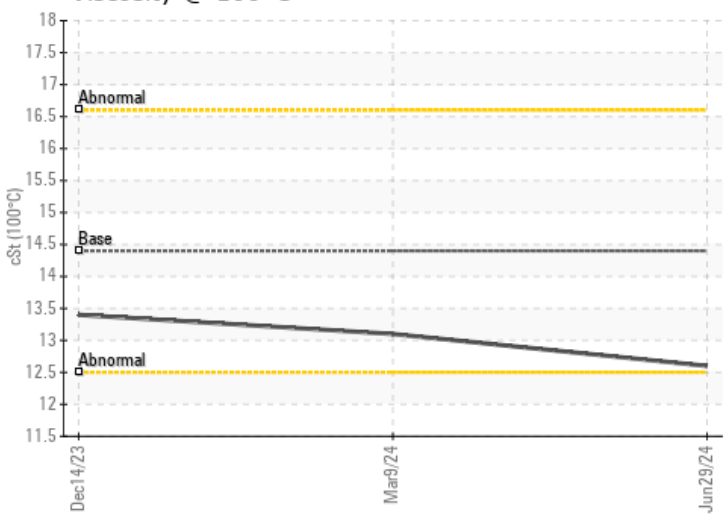
Ferrous Alloys



Non-ferrous Metals



Viscosity @ 100°C



Base Number