# LIEBHERR
## CONSTRUCTION EQUIPMENT


# MS19 - Diesel Engine

**Sample No:** LH0244651

**Oil Type:** DIESEL ENGINE OIL SAE 40

**OSCAR WINSKI CO. INC**
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## SAMPLE INFORMATION

| | | | | | |
|---|---|---|---|---|---|
| Sample Number | | **LH0244651** | LHMC131497 | --- | --- |
| Sample Date | | **08 Dec 2023** | 03 Aug 2023 | --- | --- |
| Machine Hours | | **3512** | 2706 | --- | --- |
| Oil Hours | | **0** | 0 | --- | --- |
| Oil Changed | | **Changed** | Changed | --- | --- |
| Sample Status | | **NORMAL** | NORMAL | --- | --- |

## OIL CONDITION

| | | | | | |
|---|---|---|---|---|---|
| Visc @ 100°C | cSt | **14.2** | 14.1 | --- | --- |
| Base Number (BN) | mg KOH/g | **6.7** | 7.5 | --- | --- |
| Oxidation (PA) | % | **78** | 77 | --- | --- |

## CONTAMINATION

| | | | | | |
|---|---|---|---|---|---|
| Water | % | **NEG** | NEG | --- | --- |
| Soot % | % | **0.4** | 0.4 | --- | --- |
| Nitration (PA) | % | **87** | 87 | --- | --- |
| Sulfation (PA) | % | **62** | 61 | --- | --- |
| Glycol | % | **NEG** | NEG | --- | --- |
| Fuel | % | **<1.0** | <1.0 | --- | --- |
| Silicon | ppm | **3** | 4 | --- | --- |
| Sodium | ppm | **0** | 1 | --- | --- |
| Potassium | ppm | **2** | 2 | --- | --- |

## WEAR METALS

| | | | | | |
|---|---|---|---|---|---|
| Iron | ppm | **20** | 18 | --- | --- |
| Copper | ppm | **2** | <1 | --- | --- |
| Lead | ppm | **0** | <1 | --- | --- |
| Tin | ppm | **0** | 0 | --- | --- |
| Aluminum | ppm | **2** | <1 | --- | --- |
| Chromium | ppm | **<1** | <1 | --- | --- |
| Molybdenum | ppm | **62** | 67 | --- | --- |
| Nickel | ppm | **0** | 0 | --- | --- |
| Titanium | ppm | **0** | <1 | --- | --- |
| Silver | ppm | **0** | 0 | --- | --- |
| Manganese | ppm | **0** | <1 | --- | --- |
| Vanadium | ppm | **0** | 0 | --- | --- |

## ADDITIVES

| | | | | | |
|---|---|---|---|---|---|
| Calcium | ppm | **1233** | 1960 | --- | --- |
| Magnesium | ppm | **917** | 572 | --- | --- |
| Zinc | ppm | **1283** | 1440 | --- | --- |
| Phosphorus | ppm | **977** | 1095 | --- | --- |
| Barium | ppm | **0** | 0 | --- | --- |
| Boron | ppm | **9** | 57 | --- | --- |

## Diagnosis

Resample at the next service interval to monitor. The fluid was not specified, however, a fluid match indicates that this fluid is (GENERIC) DIESEL ENGINE OIL SAE 40. Please confirm.

Please specify the component make and model with 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:** 10806502
**Signed:** Wes Davis
**Report Date:** 28 Dec 2023

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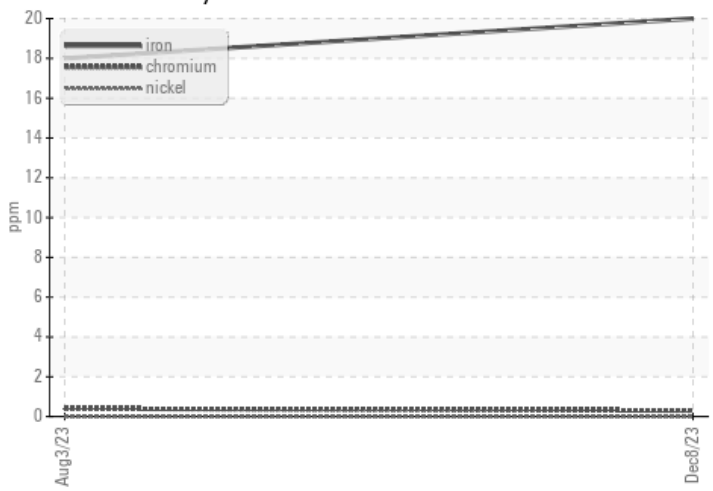
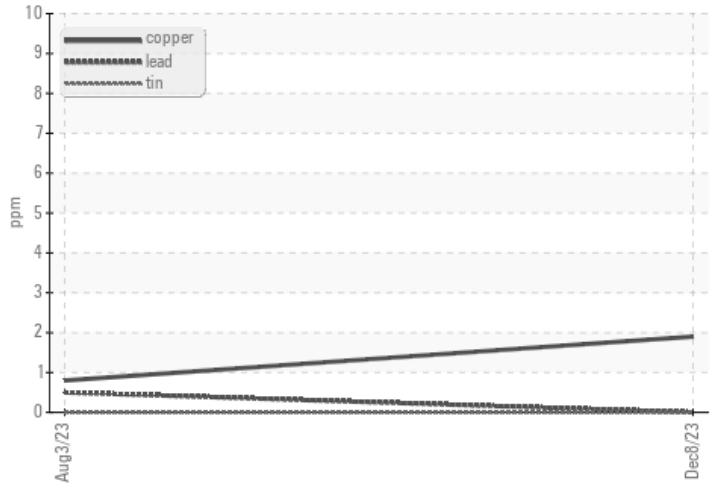
## CONSTRUCTION EQUIPMENT


## GRAPHS

Ferrous Alloys




Non-ferrous Metals




Viscosity @ 100°C


Base Number