# LIEBHERR
## CONSTRUCTION EQUIPMENT

# LIEBHERR R944C R944C - Left Final Drive

**Sample No:** LH0224644

**Oil Type:** CATALYS 80W90


**CRAWFORD METAL CORPORATION**
300 COLLEGE STREET EAST
BELLEVILLE, ON
CA K8N 5B3
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## SAMPLE INFORMATION

| | | | | | |
|---|---|---|---|---|---|
| Sample Number | | **LH0224644** | LH0224639 | LH0178479 | LH0155575 |
| Sample Date | | **19 Oct 2023** | 23 Sep 2022 | 01 Oct 2021 | 13 May 2020 |
| Machine Hours | | **1000** | 1000 | 500 | 1005 |
| Oil Hours | | **0** | 0 | 0 | 0 |
| Oil Changed | | **Changed** | Changed | Changed | Changed |
| Sample Status | | **SEVERE** | ABNORMAL | NORMAL | SEVERE |

## OIL CONDITION

| | | | | | |
|---|---|---|---|---|---|
| Visc @ 40°C | cSt | **141** | 128 | 122 | 148 |

## CONTAMINATION

| | | | | | |
|---|---|---|---|---|---|
| Water | % | **0.254** | --- | --- | 1.912 |
| Silicon | ppm | **704** | 105 | 90 | 636 |
| Sodium | ppm | **48** | 8 | 25 | 40 |
| Potassium | ppm | **60** | 12 | 9 | 60 |

## WEAR METALS

| | | | | | |
|---|---|---|---|---|---|
| PQ | | **1616** | --- | --- | 1366 |
| Iron | ppm | **2421** | 246 | 434 | 1808 |
| Copper | ppm | **120** | 109 | 32 | 83 |
| Lead | ppm | **11** | 4 | 2 | 11 |
| Tin | ppm | **9** | 1 | 2 | 5 |
| Aluminum | ppm | **207** | 34 | 25 | 195 |
| Chromium | ppm | **29** | 3 | 6 | 41 |
| Molybdenum | ppm | **1** | 0 | <1 | 4 |
| Nickel | ppm | **11** | 3 | 4 | 5 |
| Titanium | ppm | **12** | 1 | 2 | 13 |
| Silver | ppm | **<1** | 0 | <1 | <1 |
| Manganese | ppm | **34** | 3 | 6 | 29 |
| Vanadium | ppm | **<1** | 0 | <1 | <1 |

## ADDITIVES

| | | | | | |
|---|---|---|---|---|---|
| Calcium | ppm | **2851** | 226 | 363 | 2923 |
| Magnesium | ppm | **91** | 13 | 17 | 90 |
| Zinc | ppm | **44** | 12 | 26 | 37 |
| Phosphorus | ppm | **427** | 358 | 691 | 264 |
| Barium | ppm | **35** | 33 | 221 | 1 |
| Boron | ppm | **16** | 7 | 72 | 21 |

## Diagnosis

We advise that you check for the source of water entry. We advise that you check all areas where dirt can enter the system. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.Nickel ppm levels are severe. PQ levels are severe. Tin and lead and copper and iron ppm levels are abnormal. Aluminum ppm levels are noted. Titanium ppm levels are marginal. Gear wear is indicated. Bearing and/or bushing wear is indicated. The very high ferrous density (PQ) index indicates that severe wear is occurring. There is a moderate concentration of water present in the oil. Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress. High amount of ingressed dirt has caused abrasive wear to the component. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

**Depot:** CRABEL
**Unique No:** 5668178
**Signed:** Kevin Marson
**Report Date:** 25 Oct 2023

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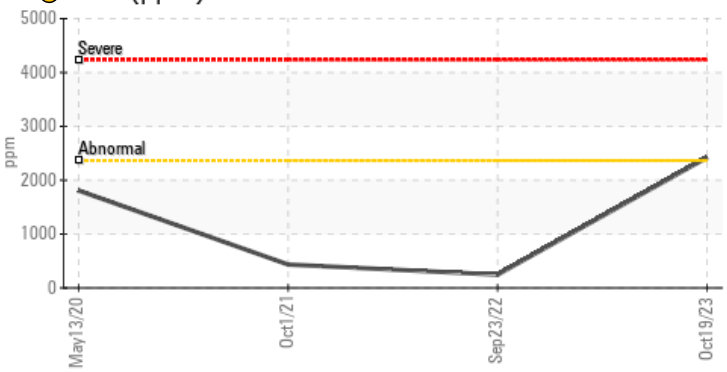
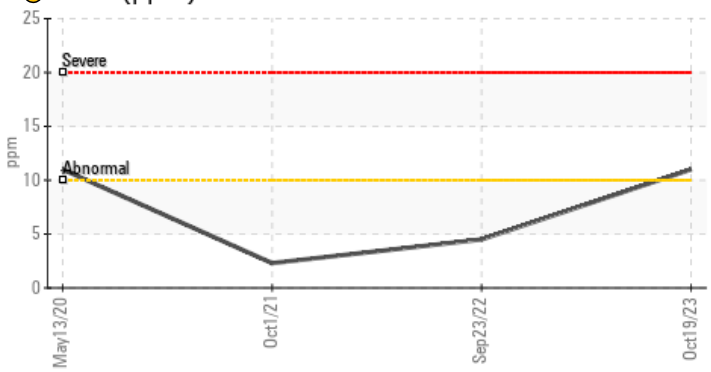
## GRAPHS

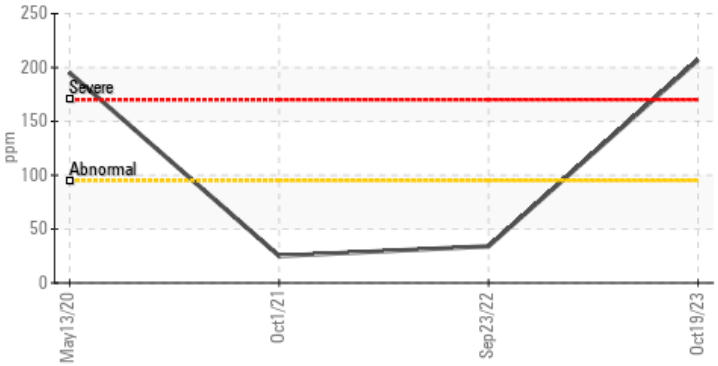
### Iron (ppm)



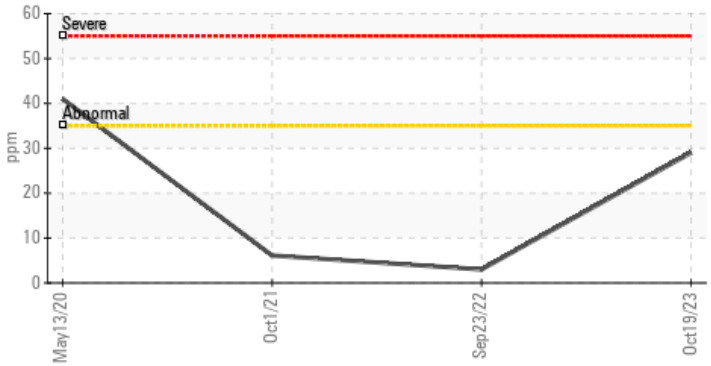

### Lead (ppm)



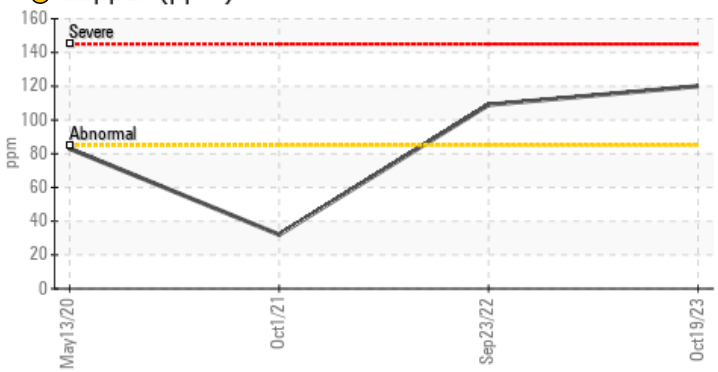

### Aluminum (ppm)



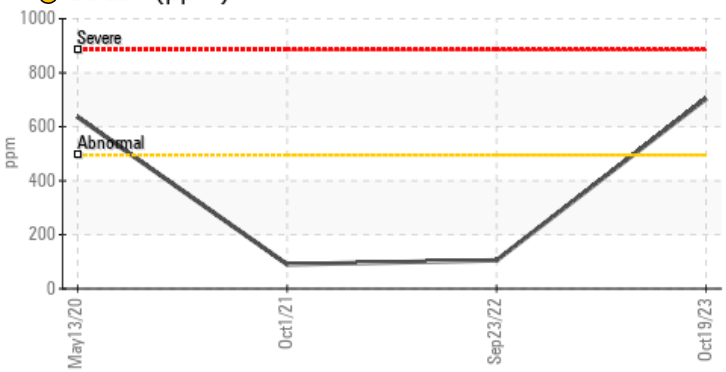

### Chromium (ppm)



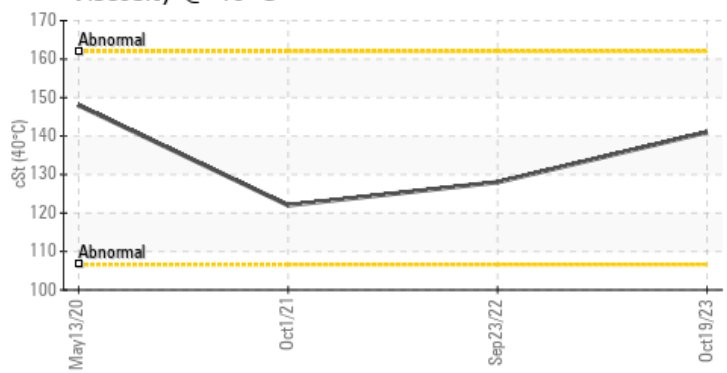

### Copper (ppm)




### Silicon (ppm)




### Viscosity @ 40°C




### Water