

# LIEBHERR

## CONSTRUCTION EQUIPMENT



### LIEBHERR A934C 030061-1007 - Diesel Engine

Sample No: LH0273252

Oil Type: CONOCO PHILLIPS GUARDOL ECT 15W40



#### SAMPLE INFORMATION

| Sample Number | LH0273252   | LH0244853   | LH0244856   | LH0244862   |
|---------------|-------------|-------------|-------------|-------------|
| Sample Date   | 06 Mar 2024 | 08 Jan 2024 | 27 Nov 2023 | 03 Oct 2023 |
| Machine Hours | 33017       | 32124       | 32547       | 32729       |
| Oil Hours     | 250         | 250         | 300         | 300         |
| Oil Changed   | Changed     | Changed     | Changed     | Changed     |
| Sample Status | NORMAL      | NORMAL      | NORMAL      | NORMAL      |

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#### OIL CONDITION

| Visc @ 100°C     | cSt      | 13.0 | 13.1 | 12.8 | 12.4 |
|------------------|----------|------|------|------|------|
| Base Number (BN) | mg KOH/g | 7.9  | 8.5  | 8.4  | 7.5  |
| Oxidation (PA)   | %        | 51   | 47   | 47   | 43   |

#### 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.



#### CONTAMINATION

| Water          | %   | NEG  | NEG  | NEG  | NEG |
|----------------|-----|------|------|------|-----|
| Soot %         | %   | 1.5  | 0.4  | 1    | 0.9 |
| Nitration (PA) | %   | 64   | 45   | 54   | 51  |
| Sulfation (PA) | %   | 55   | 49   | 52   | 49  |
| Glycol         | %   | NEG  | NEG  | NEG  | NEG |
| Fuel           | %   | <1.0 | <1.0 | <1.0 | 0.4 |
| Silicon        | ppm | 6    | 6    | 6    | 6   |
| Sodium         | ppm | <1   | 1    | <1   | 2   |
| Potassium      | ppm | 0    | 4    | 2    | 2   |



#### WEAR METALS

|            |     |    |    |    |    |
|------------|-----|----|----|----|----|
| Iron       | ppm | 11 | <1 | 5  | 7  |
| Copper     | ppm | 1  | <1 | 0  | <1 |
| Lead       | ppm | 0  | <1 | <1 | <1 |
| Tin        | ppm | 0  | <1 | <1 | <1 |
| Aluminum   | ppm | <1 | 2  | 1  | <1 |
| Chromium   | ppm | <1 | <1 | 0  | <1 |
| Molybdenum | ppm | 33 | 36 | 33 | 31 |
| Nickel     | ppm | 0  | <1 | <1 | <1 |
| Titanium   | ppm | 9  | 6  | 8  | 4  |
| Silver     | ppm | 0  | 0  | 0  | 0  |
| Manganese  | ppm | <1 | <1 | <1 | <1 |
| Vanadium   | ppm | 0  | <1 | <1 | <1 |



#### ADDITIVES

|            |     |      |      |      |      |
|------------|-----|------|------|------|------|
| Calcium    | ppm | 1383 | 1330 | 1571 | 1466 |
| Magnesium  | ppm | 592  | 639  | 536  | 463  |
| Zinc       | ppm | 1139 | 1191 | 1277 | 1053 |
| Phosphorus | ppm | 969  | 1018 | 1070 | 902  |
| Barium     | ppm | 0    | 0    | 0    | 3    |
| Boron      | ppm | 34   | 43   | 45   | 35   |

Depot: NILNIL

Unique No: 10928884

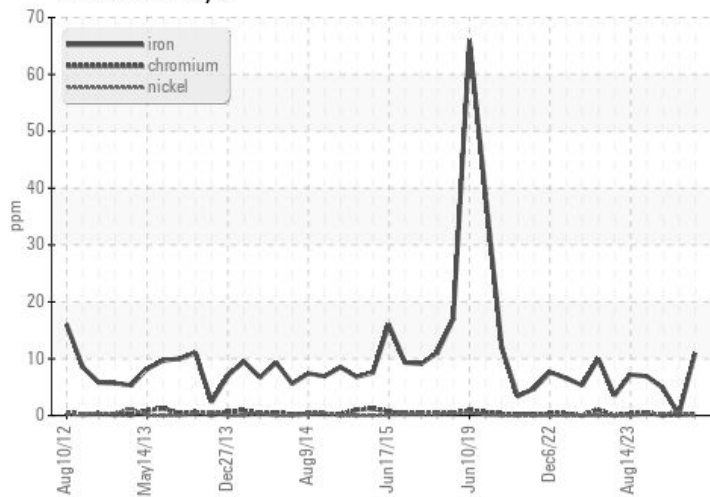
Signed: Wes Davis

Report Date: 19 Mar 2024

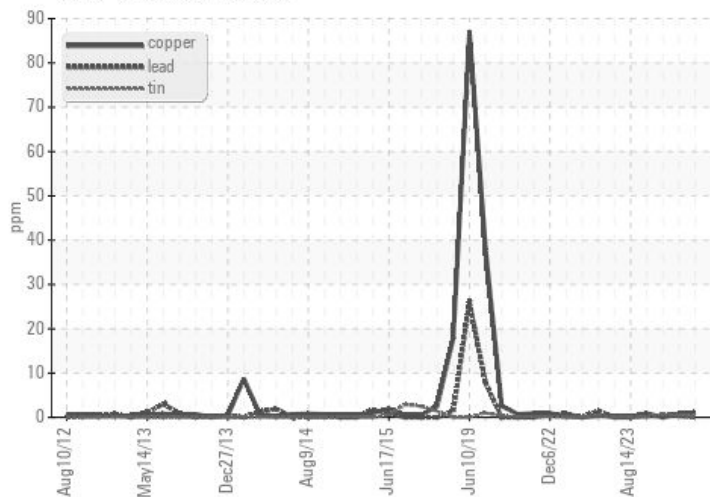


### GRAPHS

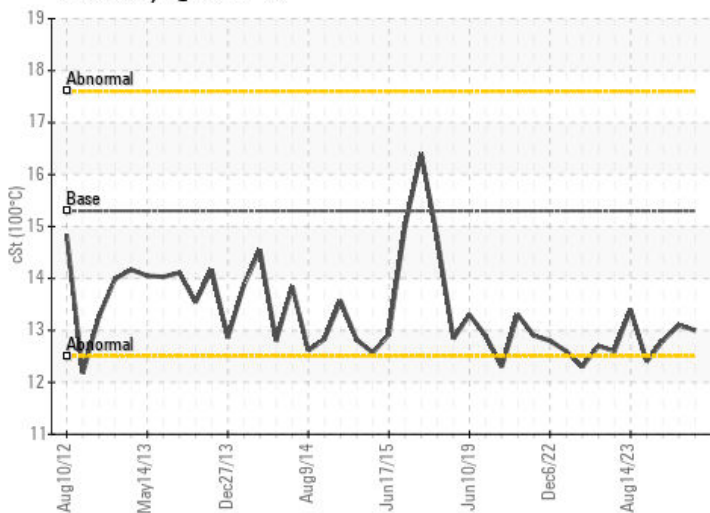
Ferrous Alloys



Non-ferrous Metals



Viscosity @ 100°C



Base Number

