

LIEBHERR

CONSTRUCTION EQUIPMENT



LIEBHERR R938 050294-1650 - Diesel Engine

Sample No: LH0172353

Oil Type: PETRO CANADA 15W40



SAMPLE INFORMATION

| Sample Number | LH0172353 | LH0172344 | LH0257075 | LH0234695 |
|---------------|-------------|-------------|-------------|-------------|
| Sample Date | 03 Jan 2024 | 11 Jul 2023 | 21 Mar 2023 | 10 Sep 2022 |
| Machine Hours | 4951 | 4478 | 4098 | 3452 |
| Oil Hours | 0 | 0 | 0 | 0 |
| Oil Changed | Changed | Changed | Changed | Changed |
| Sample Status | NORMAL | NORMAL | NORMAL | ABNORMAL |

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OIL CONDITION

| | | | | | |
|----------------|-----|------|------|------|------|
| Visc @ 100°C | cSt | 13.6 | 13.5 | 12.9 | 12.3 |
| Oxidation (PA) | % | 69 | 63 | 92 | 198 |



CONTAMINATION

| | | | | | |
|----------------|-----|------|------|------|-----|
| Water | % | NEG | NEG | NEG | NEG |
| Soot % | % | 0 | 0 | 0 | 0 |
| Nitration (PA) | % | 80 | 63 | 85 | 93 |
| Sulfation (PA) | % | 58 | 54 | 70 | 110 |
| Glycol | % | NEG | NEG | NEG | NEG |
| Fuel | % | <1.0 | <1.0 | <1.0 | 1 |
| Silicon | ppm | 7 | 6 | 7 | 8 |
| Sodium | ppm | 2 | 2 | 2 | 3 |
| Potassium | ppm | 4 | <1 | <1 | 3 |

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 condition of the oil is acceptable for the time in service.



WEAR METALS

| | | | | | |
|------------|-----|----|----|----|----|
| Iron | ppm | 4 | 5 | 9 | 9 |
| Copper | ppm | 10 | 31 | 87 | 94 |
| Lead | ppm | 1 | 1 | 4 | 5 |
| Tin | ppm | <1 | <1 | 1 | 1 |
| Aluminum | ppm | 3 | 1 | 2 | 2 |
| Chromium | ppm | <1 | <1 | <1 | <1 |
| Molybdenum | ppm | 84 | 56 | 58 | 42 |
| Nickel | ppm | <1 | 0 | <1 | 0 |
| Titanium | ppm | 0 | 0 | <1 | <1 |
| Silver | ppm | 0 | <1 | 0 | 0 |
| Manganese | ppm | 0 | <1 | <1 | 1 |
| Vanadium | ppm | 0 | 0 | 0 | 0 |



ADDITIVES

| | | | | | |
|------------|-----|------|------|------|------|
| Calcium | ppm | 2138 | 1059 | 1204 | 1492 |
| Magnesium | ppm | 80 | 974 | 973 | 860 |
| Zinc | ppm | 1103 | 1165 | 1157 | 904 |
| Phosphorus | ppm | 966 | 1017 | 973 | 853 |
| Barium | ppm | <1 | <1 | 3 | 19 |
| Boron | ppm | 27 | 4 | 7 | 83 |

Depot: MOOPAL
 Unique No: 5709230
 Signed: Wes Davis
 Report Date: 11 Jan 2024



GRAPHS

