

LIEBHERR

CONSTRUCTION EQUIPMENT



LIEBHERR LH50 1203-77107 - Diesel Engine

Sample No: LH0272548

Oil Type: CHEVRON DELO LE 5W40



SAMPLE INFORMATION

| Sample Number | LH0272548 | LH0243353 | LH0254742 | LH0254031 |
|---------------|-------------|-------------|-------------|-------------|
| Sample Date | 28 Nov 2023 | 30 Aug 2023 | 16 Jun 2023 | 28 Mar 2023 |
| Machine Hours | 20037 | 19522 | 18994 | 18616 |
| Oil Hours | 0 | 0 | 0 | 0 |
| Oil Changed | Changed | Changed | Changed | Changed |
| Sample Status | ABNORMAL | NORMAL | NORMAL | ABNORMAL |

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OIL CONDITION

| Visc @ 100°C | cSt | 13.5 | 14.2 | 14.2 | 14.6 |
|------------------|----------|------|------|------|------|
| Base Number (BN) | mg KOH/g | 8.6 | 7.5 | 8.6 | 6.0 |
| Oxidation (PA) | % | 70 | 63 | 63 | 76 |



CONTAMINATION

| Water | % | NEG | NEG | NEG | NEG |
|----------------|-----|------|------|------|------|
| Soot % | % | 1.7 | 1.9 | 1.5 | 3.6 |
| Nitration (PA) | % | 112 | 100 | 99 | 128 |
| Sulfation (PA) | % | 66 | 66 | 60 | 76 |
| Glycol | % | NEG | NEG | NEG | NEG |
| Fuel | % | <1.0 | <1.0 | <1.0 | <1.0 |
| Silicon | ppm | 23 | 8 | 7 | 7 |
| Sodium | ppm | 1096 | 4 | 1 | 2 |
| Potassium | ppm | 97 | 2 | 2 | 2 |



WEAR METALS

| | | | | | |
|------------|-----|----|----|----|----|
| Iron | ppm | 35 | 31 | 22 | 57 |
| Copper | ppm | 32 | 5 | 5 | 33 |
| Lead | ppm | 4 | <1 | 0 | 2 |
| Tin | ppm | 1 | <1 | <1 | 1 |
| Aluminum | ppm | 11 | 7 | 4 | 7 |
| Chromium | ppm | 2 | 1 | <1 | 2 |
| Molybdenum | ppm | 8 | 11 | 21 | 43 |
| Nickel | ppm | 1 | 0 | <1 | 1 |
| Titanium | ppm | 92 | 78 | 61 | 26 |
| Silver | ppm | 0 | 0 | 0 | <1 |
| Manganese | ppm | 1 | <1 | <1 | 1 |
| Vanadium | ppm | 1 | <1 | <1 | <1 |



ADDITIVES

| | | | | | |
|------------|-----|------|------|------|------|
| Calcium | ppm | 1315 | 1371 | 1239 | 1092 |
| Magnesium | ppm | 615 | 788 | 804 | 837 |
| Zinc | ppm | 1098 | 1242 | 1250 | 1161 |
| Phosphorus | ppm | 909 | 1032 | 1004 | 908 |
| Barium | ppm | 11 | 0 | 0 | 0 |
| Boron | ppm | 27 | 24 | 41 | 14 |

Diagnosis

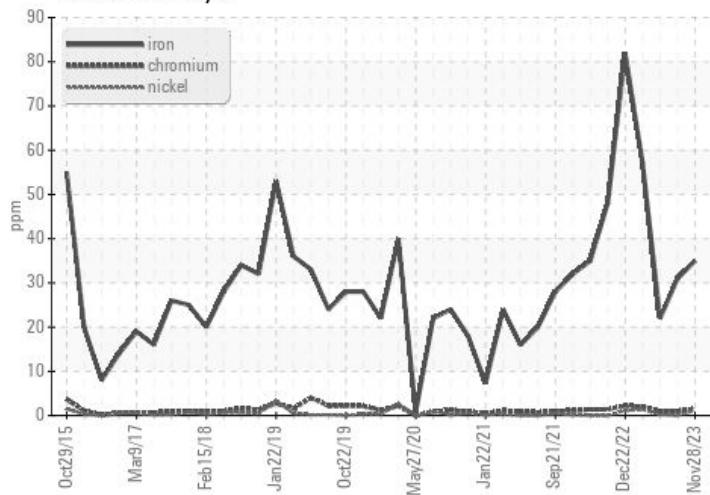
We advise that you check for the source of the coolant leak. Check for low coolant level. We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition. All component wear rates are normal. Sodium and/or potassium levels are high. Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress. The BN result indicates that there is suitable alkalinity remaining in the oil.

Depot: LEC0008
 Unique No: 10782475
 Signed: Jonathan Hester
 Report Date: 15 Dec 2023

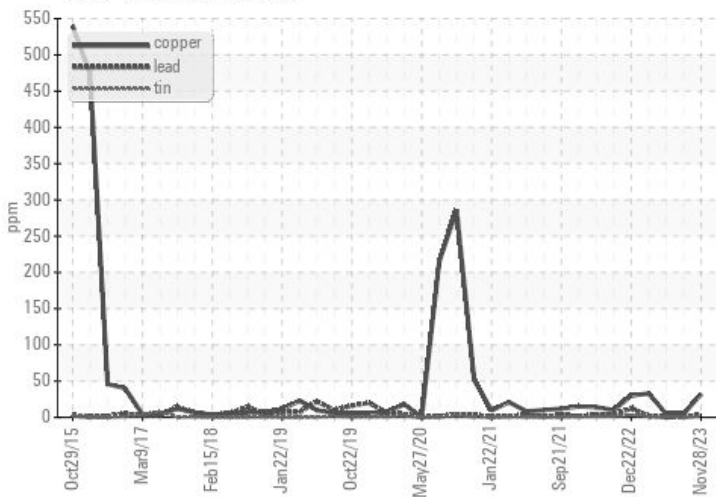


GRAPHS

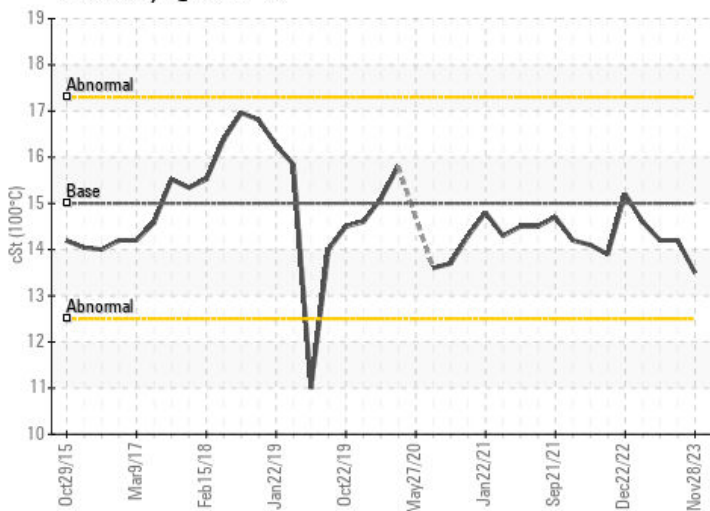
Ferrous Alloys



Non-ferrous Metals



Viscosity @ 100°C



Base Number

