LIEBHERR

CONSTRUCTION EQUIPMENT



Sample No: LH0264337

Oil Type: LIEBHERR HYDRAULIC-GEAR ATF

| Sample Date 08 Aug 2023 28 Apr 2023 24 Mar 2022 14 Sep 2 Machine Hours 9297 8817 7403 6606 Oil Hours 500 500 500 1000 Oil Changed Not Changd Not Changd Not Changd Changed Sample Status ABNORMAL SEVERE ABNORMAL NORMAL CONTAMINATION Silicon ppm 6 11 5 2 Sodium ppm 2 5 0 4 Potassium ppm <1 0 14 25 Copper ppm 13 30 14 25 Copper ppm 2 4 1 <1 <1 Lead ppm <1 0 <1 0 0 <1 0 0 Tin ppm 61 114 40 2 <1 0 <1 0 <1 < | | _ | | | |
|---|-------------|-------------------|-------------|-------------|-------------|
| Sample Date 08 Aug 2023 28 Apr 2023 24 Mar 2022 14 Sep 2 | FORMATION | SAMPL | | | |
| Sample Date 08 Aug 2023 28 Apr 2023 24 Mar 2022 14 Sep 2 | LH0264337 | Sample Number | LH0174209 | LH0216939 | LH0204348 |
| Machine Hours 9297 8817 7403 6606 Oil Hours 500 500 500 1000 Oil Changed Not Changd Not Changd Not Changd Changed Sample Status ABNORMAL SEVERE ABNORMAL NORMAL CONTAMINATION Silicon ppm 6 11 5 2 Sodium ppm 6 11 5 2 Sodium ppm 2 5 0 4 Potassium ppm 13 30 14 25 Copper ppm 2 4 1 <1 | 08 Aug 2023 | | 28 Apr 2023 | 24 Mar 2022 | 14 Sep 2021 |
| Oil Hours 500 500 500 1000 Oil Changed Not Changd Not Changd Not Changd Not Changd Changed Sample Status ABNORMAL SEVERE ABNORMAL NORMAL OIL CONDITION Visc @ 40°C cSt 30.9 32.0 29.6 28.8 CONTAMINATION Silicon ppm 6 11 5 2 Sodium ppm 2 5 0 4 Potassium ppm 0 1 0 0 WEAR METALS Iron ppm 0 1 0 1 0 WEAR METALS Iron ppm 0 1 0 1 0 0 Copper ppm 0 1 0 1 0 0 Lead ppm 0 0 0 0 0 0 Chromium | | | | 7403 | |
| Sample Status | | | | | |
| Sample Status | Not Changd | Oil Changed | Not Changd | Not Changd | Changed |
| OIL CONDITION CONTAMINATION CONTAMINATION Silicon ppm 6 11 5 2 Sodium ppm 2 5 0 4 Potassium ppm 13 30 14 25 Copper ppm 2 4 1 <1 <1 Lead ppm 2 4 1 <1 <1 Tin ppm 0 0 0 0 0 Aluminum ppm 61 114 40 2 2 Chromium ppm 0 0 0 0 0 Molybdenum ppm 0 1 0 0 0 Nickel ppm 0 1 0 0 0 Titanium ppm 0 0 0 0 0 Molybdenum ppm 0 1 | | • | | | NORMAL |
| Visc @ 40°C cSt 30.9 32.0 29.6 28.8 CONTAMINATION Silicon ppm 6 11 5 2 Sodium ppm 2 5 0 4 Potassium ppm 1 0 1 0 WEAR METALS Iron ppm 13 30 14 25 Copper ppm 2 4 1 <1 <1 Lead ppm 0 1 0 <1 0 Tin ppm 0 0 0 0 0 Tin ppm 0 0 0 0 </td <td></td> <td><u> </u></td> <td></td> <td></td> <td></td> | | <u> </u> | | | |
| CONTAMINATION Silicon | TION | OIL COI | | | |
| Silicon ppm 6 11 5 2 Sodium ppm 2 5 0 4 Potassium ppm <1 | ○ 30.9 | Visc @ 40°C | 32.0 | 29.6 | 28.8 |
| Silicon ppm 6 11 5 2 Sodium ppm 2 5 0 4 Potassium ppm 1 0 1 0 WEAR METALS Iron ppm 13 30 14 25 Copper ppm 2 4 1 <1 | - | -4 | | | |
| Sodium | AATION | CONTA | | | |
| Sodium | O 6 | Silicon | O 11 | O 5 | 02 |
| Potassium ppm O 1 0 WEAR METALS Iron ppm 13 30 14 25 Copper ppm 2 4 1 <1 | - | | 0 | | |
| WEAR METALS Iron ppm ○ 13 ○ 30 ○ 14 ○ 25 Copper ppm ○ 2 ○ 4 ○ 1 ○ <1 | | | _ | _ | _ |
| Iron | - | | | | |
| Copper ppm 2 4 1 <1 Lead ppm <1 | ALS | WEAR | | | |
| Lead ppm <1 | 13 | lron p | ○ 30 | O 14 | O 25 |
| Tin ppm 0 0 0 0 0 Aluminum ppm 61 114 40 2 Chromium ppm 0 0 0 <1 Molybdenum ppm 2 0 0 0 0 Nickel ppm <1 0 0 0 Titanium ppm 0 <1 0 0 Silver ppm 0 0 0 0 0 Manganese ppm <1 1 <1 <1 | 2 | Copper | 4 | 1 | O <1 |
| Aluminum ppm 61 114 40 2 Chromium ppm 0 0 0 <1 | <1 | Lead p | 0 | <1 | O 0 |
| Chromium ppm 0 0 0 <1 Molybdenum ppm 2 0 0 0 0 Nickel ppm 0 < 1 | 0 | Tin p | 0 | O 0 | 0 |
| Molybdenum ppm 2 0 0 0 Nickel ppm <1 0 0 0 Titanium ppm 0 <1 0 0 Silver ppm 0 0 0 0 Manganese ppm <1 1 <1 <1 | <u> </u> | Aluminum p | 114 | 40 | O 2 |
| Nickel ppm Image: square squa | 0 | Chromium p | 0 | 0 | O <1 |
| Titanium ppm 0 <1 0 0 Silver ppm 0 0 0 0 0 Manganese ppm <1 1 <1 <1 | 2 | Molybdenum p | O 0 | 0 | 0 |
| Silver ppm 0 0 0 0 0 Manganese ppm 0 <1 | 0 <1 | Nickel p | 0 | 0 | 0 |
| Manganese ppm | 0 | Titanium p | <1 | 0 | 0 |
| | 0 | Silver | 0 | 0 | 0 |
| Vanadium ppm 0 0 | ○ <1 | Manganese p | 1 | O <1 | <1 |
| - Carradiani | 0 | Vanadium p | 0 | 0 | 0 |
| ADDITIVES | | ADDITI | | | |
| Calcium ppm ⊗ 802 ○ 790 ○ 861 ○ 793 | ○ 802 | Calcium p | 790 | ○ 861 | 793 |
| Magnesium ppm 3 0 | 3 | Magnesium p | 0 | 0 | O 2 |
| Zinc ppm Q 4 Q 0 Q 0 | 4 | Zinc p | 0 | O 0 | 15 |
| Phosphorus ppm ○ 160 ○ 177 ○ 165 | 160 | Phosphorus p | 177 | 165 | 147 |
| Barium ppm ② 2 ○ 0 ○ 0 | 2 | Barium p | O 0 | O 0 | O 0 |
| Boron ppm 244 238 225 | 244 | Boron | O 238 | O 225 | O 225 |



LIEBHERR EQUIPMENT SOURCE

8200 FAYETTEVILLE ROAD RALEIGH, NC US 27603

Contact: TRAVIS EGAN travis.egan@liebherr.com

T:

F: (919)329-0084

Diagnosis

The filter change at the time of sampling has been noted. Resample at the next service interval to monitor. The aluminum level has decreased, but is still abnormal. Clutch wear is indicated. There is no indication of any contamination in the fluid. The condition of the fluid is acceptable for the time in service.

Depot:LIEBHERRNCUnique No:10602511Signed:Don BaldridgeReport Date:14 Aug 2023

LIEBHERR

CONSTRUCTION EQUIPMENT





GRAPHS

