

LIEBHERR

CONSTRUCTION EQUIPMENT



LIEBHERR LH110 155976-1227 - Diesel Engine

Sample No: LH0280572

Oil Type: DIESEL ENGINE OIL SAE 15W40



KINDER MORGAN
4301 IVERSON
TRINITY, AL
US 35601
Contact: CHIP OAKES

T: (256)350-0006
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Diagnosis

Resample at the next service interval to monitor. Metal levels are typical for a new component breaking in. 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.



SAMPLE INFORMATION

| Sample Number | LH0280572 | LH0280572 | LH0280569 | LH0280558 |
|---------------|---------------|-------------|-------------|-------------|
| Sample Date | 23 Feb 2024 | 15 Feb 2024 | 30 Jan 2024 | 09 Jan 2024 |
| Machine Hours | 995 | 874 | 534 | 166 |
| Oil Hours | 0 | 0 | 0 | 0 |
| Oil Changed | Changed | Not Changd | Changed | Not Changd |
| Sample Status | NORMAL | NORMAL | ABNORMAL | ATTENTION |



OIL CONDITION

| Visc @ 100°C | cSt | 12.6 | 12.8 | 12.1 | 12.0 |
|------------------|----------|------|------|------|------|
| Base Number (BN) | mg KOH/g | 6.9 | 7.1 | 5.7 | 7.1 |
| Oxidation (PA) | % | 79 | 73 | 180 | 193 |



CONTAMINATION

| Water | % | NEG | NEG | NEG | NEG |
|----------------|-----|------|------|------|-----|
| Soot % | % | 0.1 | 0.1 | 0.1 | 0.1 |
| Nitration (PA) | % | 67 | 59 | 90 | 73 |
| Sulfation (PA) | % | 62 | 61 | 101 | 108 |
| Glycol | % | NEG | NEG | NEG | NEG |
| Fuel | % | <1.0 | <1.0 | <1.0 | 1.0 |
| Silicon | ppm | 9 | 9 | 11 | 8 |
| Sodium | ppm | 2 | 3 | 2 | 3 |
| Potassium | ppm | <1 | 2 | 3 | 2 |



WEAR METALS

| | | | | | |
|------------|-----|----|----|-----|----|
| Iron | ppm | 6 | 5 | 8 | 4 |
| Copper | ppm | 28 | 22 | 141 | 16 |
| Lead | ppm | 0 | <1 | 0 | <1 |
| Tin | ppm | <1 | <1 | 0 | <1 |
| Aluminum | ppm | 3 | 3 | 2 | 2 |
| Chromium | ppm | <1 | <1 | <1 | <1 |
| Molybdenum | ppm | 82 | 79 | 55 | 42 |
| Nickel | ppm | <1 | <1 | 0 | <1 |
| Titanium | ppm | <1 | <1 | 0 | 0 |
| Silver | ppm | 0 | 0 | 0 | 0 |
| Manganese | ppm | <1 | <1 | 0 | <1 |
| Vanadium | ppm | 0 | <1 | 0 | 0 |



ADDITIVES

| | | | | | |
|------------|-----|------|------|------|------|
| Calcium | ppm | 1270 | 1152 | 1251 | 1202 |
| Magnesium | ppm | 488 | 439 | 858 | 808 |
| Zinc | ppm | 1201 | 1060 | 938 | 794 |
| Phosphorus | ppm | 950 | 863 | 686 | 693 |
| Barium | ppm | 2 | 36 | 32 | 15 |
| Boron | ppm | 299 | 335 | 142 | 140 |

Depot: KINTRI
Unique No: 10902251
Signed: Wes Davis
Report Date: 29 Feb 2024



GRAPHS

