



LIEBHERR

OIL ANALYSIS REPORT



Area
[KIMMER SCRAP IRON]
 Machine Id
LIEBHERR LH50 145582-1216
 Component
Diesel Engine
 Fluid
DIESEL ENGINE OIL SAE 5W30 (--- GAL)

| | |
|-----------------|---------------|
| WEAR | NORMAL |
| CONTAMINATION | NORMAL |
| FLUID CONDITION | NORMAL |

RECOMMENDATION

Resample at the next service interval to monitor. Please specify the brand, type, and viscosity of the oil on your next sample.

| Test | UOM | Method | Limit/Abn | Current | History1 | History2 |
|----------------|-----|-------------|-----------|--------------------|-------------|-------------|
| Sample Number | | Client Info | | LH0273656 | LH0272942 | LH0268523 |
| Sample Date | | Client Info | | 06 Jun 2024 | 20 Nov 2023 | 14 Sep 2023 |
| Machine Age | hrs | Client Info | | 3371 | 2062 | 1633 |
| Oil Age | hrs | Client Info | | 1000 | 0 | 0 |
| Filter Age | hrs | Client Info | | 0 | 0 | 0 |
| Oil Changed | | Client Info | | Not Changd | Changed | Not Changd |
| Filter Changed | | Client Info | | N/A | N/A | N/A |
| Sample Status | | | | NORMAL | ABNORMAL | ABNORMAL |

WEAR

All component wear rates are normal.

| | | | | | | |
|--------------|--------|-------------|------|--------------|-------|-------|
| Iron | ppm | ASTM D5185m | >66 | 15 | 23 | 19 |
| Chromium | ppm | ASTM D5185m | >4 | <1 | 1 | 1 |
| Nickel | ppm | ASTM D5185m | >4 | 0 | 0 | 0 |
| Titanium | ppm | ASTM D5185m | | <1 | 0 | <1 |
| Silver | ppm | ASTM D5185m | >3 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >8 | 3 | 4 | 5 |
| Lead | ppm | ASTM D5185m | >10 | 1 | 7 | 7 |
| Copper | ppm | ASTM D5185m | >74 | 19 | ▲ 162 | ▲ 160 |
| Tin | ppm | ASTM D5185m | >4 | 1 | 2 | 2 |
| Vanadium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |

CONTAMINATION

There is no indication of any contamination in the oil.

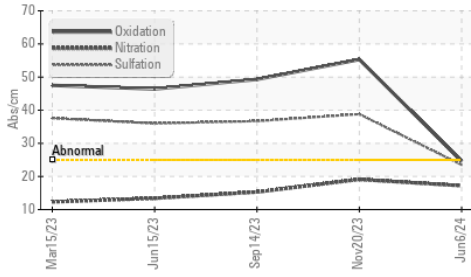
| | | | | | | |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon | ppm | ASTM D5185m | >15 | 8 | 10 | 9 |
| Potassium | ppm | ASTM D5185m | >20 | 4 | 6 | 4 |
| Fuel | | WC Method | >5 | <1.0 | <1.0 | 1.3 |
| Water | | WC Method | >0.2 | NEG | NEG | NEG |
| Glycol | | WC Method | | NEG | NEG | 0.0 |
| Soot % | % | *ASTM D7844 | >3 | 0.1 | 0.2 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 17.2 | 19.1 | 15.3 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 23.5 | 38.8 | 36.7 |
| Silt | scalar | *Visual | NONE | NONE | NONE | NONE |
| Debris | scalar | *Visual | NONE | NONE | NONE | NONE |
| Sand/Dirt | scalar | *Visual | NONE | NONE | NONE | NONE |
| Appearance | scalar | *Visual | NORML | NORML | NORML | NORML |
| Odor | scalar | *Visual | NORML | NORML | NORML | NORML |
| Emulsified Water | scalar | *Visual | >0.2 | NEG | NEG | NEG |

FLUID CONDITION

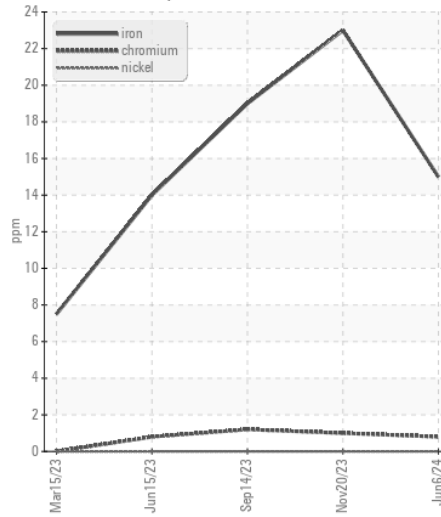
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| | | | | | | |
|------------------|----------|-------------|------|--------------|-------|-------|
| Sodium | ppm | ASTM D5185m | | 3 | 3 | 3 |
| Boron | ppm | ASTM D5185m | 250 | 169 | 85 | 81 |
| Barium | ppm | ASTM D5185m | 10 | 2 | 29 | 29 |
| Molybdenum | ppm | ASTM D5185m | 100 | 4 | 32 | 33 |
| Manganese | ppm | ASTM D5185m | | <1 | 2 | 2 |
| Magnesium | ppm | ASTM D5185m | 450 | 109 | 640 | 706 |
| Calcium | ppm | ASTM D5185m | 3000 | 3733 | 1815 | 1839 |
| Phosphorus | ppm | ASTM D5185m | 1150 | 1050 | 845 | 833 |
| Zinc | ppm | ASTM D5185m | 1350 | 1222 | 1039 | 1060 |
| Sulfur | ppm | ASTM D5185m | 4250 | 3041 | 2225 | 2449 |
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 24.6 | 55.3 | 49.3 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 8.5 | 8.2 | ▲ 1.6 | ▲ 2.7 |
| Visc @ 100°C | cSt | ASTM D445 | 10.9 | 12.0 | 13.3 | 12.3 |

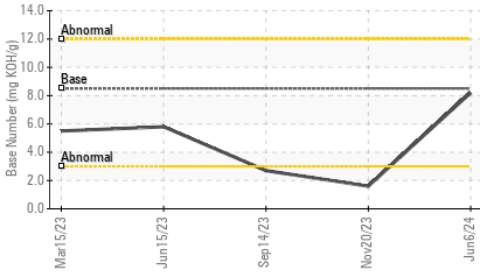
FT-IR (Direct Trend)



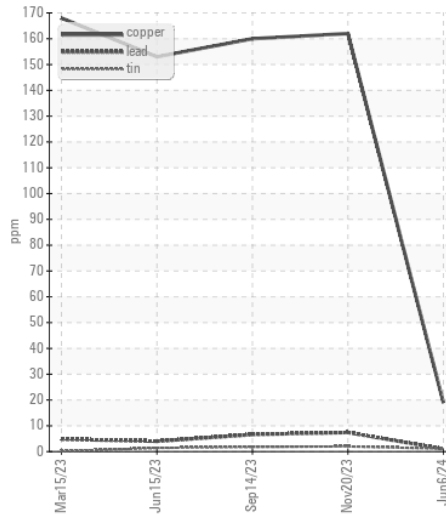
Ferrous Alloys



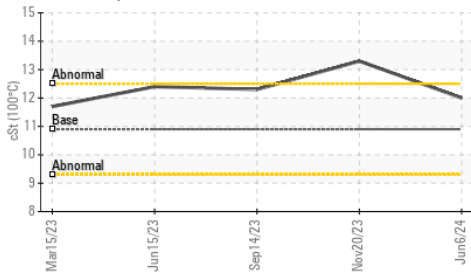
Base Number



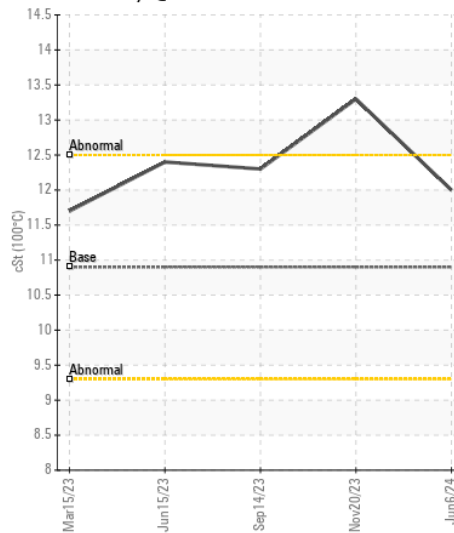
Non-ferrous Metals



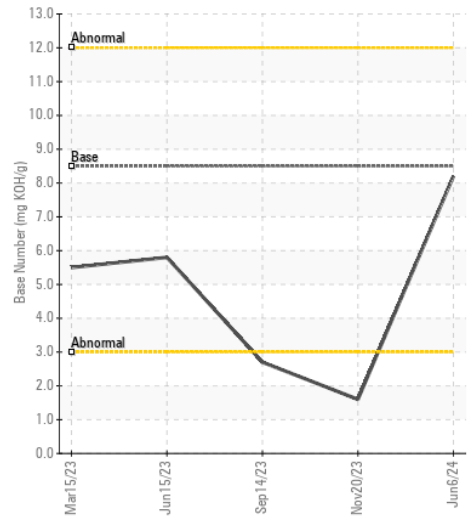
Viscosity @ 100°C



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : LH0273656 **Received** : 19 Jun 2024
Lab Number : 06214444 **Tested** : 20 Jun 2024
Unique Number : 11087308 **Diagnosed** : 20 Jun 2024 - Wes Davis
Test Package : CONST (Additional Tests: TBN)

To discuss this sample report, contact Customer Service at 1-800-237-1369.

* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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