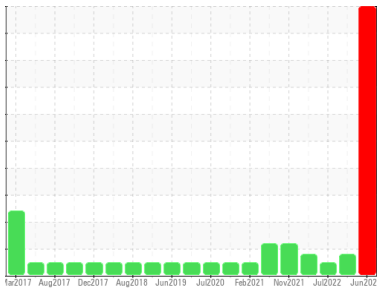
# PROBLEM SUMMARY

Area
**RMR-Newport**
Machine Id
**1203-88007 LIEBHERR LH50M 1203-88007**
Component
**Diesel Engine**
Fluid
**DIESEL ENGINE OIL SAE 5W30 (--- GAL)**

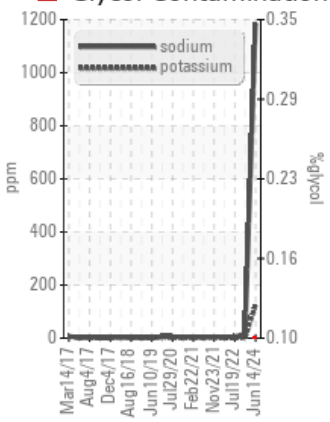
**Sample Rating Trend**



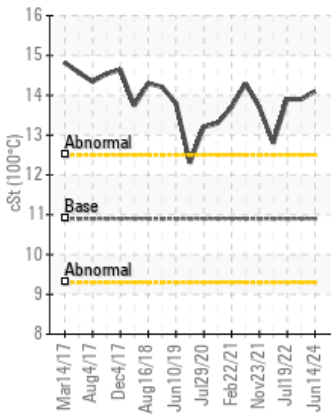
**GLYCOL**

## COMPONENT CONDITION SUMMARY

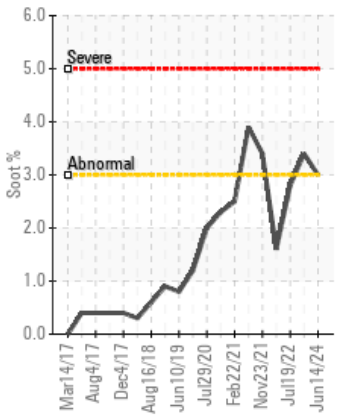
▲ Glycol Contamination



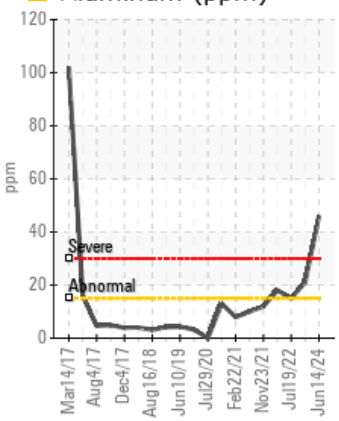

▲ Viscosity @ 100°C




▲ Soot %




▲ Aluminum (ppm)




## RECOMMENDATION

We advise that you check for the source of the coolant leak. Check for low coolant level. We advise that you check for faulty combustion, plugged air filters, or aftercoolers. We recommend you service the filters on this component. We recommend an early resample to monitor this condition.

## PROBLEMATIC TEST RESULTS

| Sample Status | | | | SEVERE | ABNORMAL | NORMAL |
|---|---|---|---|---|---|---|
| Aluminum | ppm | ASTM D5185m | >15 | ▲ **46** | 21 | 15 |
| Sodium | ppm | ASTM D5185m | | ▲ **1184** | 17 | 6 |
| Potassium | ppm | ASTM D5185m | >20 | ▲ **127** | 2 | 0 |
| Glycol | % | *ASTM D2982 | | ▲ **0.10** | NEG | NEG |
| Soot % | % | *ASTM D7844 | >3 | ▲ **3** | ▲ 3.4 | 2.8 |
| Visc @ 100°C | cSt | ASTM D445 | 10.9 | ▲ **14.1** | 13.9 | 13.9 |

**Customer Id:** RIVNEW
**Sample No.:** DJJ0018095
**Lab Number:** 06214439
**Test Package:** MOBCE

*To manage this report scan the QR code*

*To discuss the diagnosis or test data:*
Jonathan Hester +1 919-379-4092 x4092
jhester@wearcheckusa.com

*To change component or sample information:*
Customer Service +1 1-800-237-1369
customerservice@wearcheck.com

## RECOMMENDED ACTIONS

| Action | Status | Date | Done By | Description |
|---|---|---|---|---|
| Change Filter | --- | --- | ? | We recommend you service the filters on this component. |
| Resample | --- | --- | ? | We recommend an early resample to monitor this condition. |
| Check Combustion | --- | --- | ? | We advise that you check for faulty combustion, plugged air filters, or aftercoolers. |
| Check Glycol Access | --- | --- | ? | We advise that you check for the source of the coolant leak. |

## HISTORICAL DIAGNOSIS

SOOT

**05 Dec 2022 Diag: Jonathan Hester**
Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.All component wear rates are normal. There is an abnormal amount of solids and carbon present in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

view report

NORMAL

**19 Jul 2022 Diag: Jonathan Hester**
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 BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

view report

WEAR

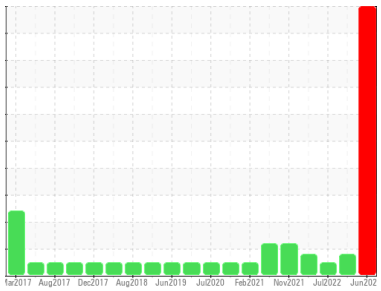
**03 Mar 2022 Diag: Don Baldridge**
Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor.The aluminum level is abnormal. All other component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

view report

# OIL ANALYSIS REPORT

Area
**RMR-Newport**
Machine Id
**1203-88007 LIEBHERR LH50M 1203-88007**
Component
**Diesel Engine**
Fluid
**DIESEL ENGINE OIL SAE 5W30 (--- GAL)**

Sample Rating Trend




**GLYCOL**

## DIAGNOSIS

**Recommendation**
We advise that you check for the source of the coolant leak. Check for low coolant level. We advise that you check for faulty combustion, plugged air filters, or aftercoolers. We recommend you service the filters on this component. We recommend an early resample to monitor this condition.

**Wear**
The aluminum level is abnormal. All other component wear rates are normal.

**Contamination**
Sodium and/or potassium levels are high. Test for glycol is positive. There is an abnormal amount of solids and carbon present in the oil.

**Fluid Condition**
The oil viscosity is higher than normal. The BN result indicates that there is suitable alkalinity remaining in the oil.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **DJJ0018095** | DJJ0016428 | DJJ0016414 |
| Sample Date | | Client Info | | **14 Jun 2024** | 05 Dec 2022 | 19 Jul 2022 |
| Machine Age | hrs | Client Info | | **12052** | 10444 | 9816 |
| Oil Age | hrs | Client Info | | **0** | 0 | 0 |
| Oil Changed | | Client Info | | **Changed** | Changed | Changed |
| Sample Status | | | | **SEVERE** | ABNORMAL | NORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Fuel | | WC Method | >5 | **<1.0** | <1.0 | <1.0 |
| Water | | WC Method | >0.2 | **NEG** | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >100 | **40** | 46 | 33 |
| Chromium | ppm | ASTM D5185m | >5 | **2** | 1 | <1 |
| Nickel | ppm | ASTM D5185m | >5 | **0** | 0 | 0 |
| Titanium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Silver | ppm | ASTM D5185m | >3 | **0** | <1 | 0 |
| Aluminum | ppm | ASTM D5185m | >15 | ▲ **46** | 21 | 15 |
| Lead | ppm | ASTM D5185m | >30 | **4** | 4 | <1 |
| Copper | ppm | ASTM D5185m | >125 | **4** | 9 | 3 |
| Tin | ppm | ASTM D5185m | >5 | **<1** | 1 | <1 |
| Vanadium | ppm | ASTM D5185m | | **0** | <1 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 250 | **16** | 36 | 24 |
| Barium | ppm | ASTM D5185m | 10 | **0** | 2 | 0 |
| Molybdenum | ppm | ASTM D5185m | 100 | **46** | 50 | 57 |
| Manganese | ppm | ASTM D5185m | | **1** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | 450 | **649** | 873 | 626 |
| Calcium | ppm | ASTM D5185m | 3000 | **1353** | 1381 | 1463 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **638** | 689 | 761 |
| Zinc | ppm | ASTM D5185m | 1350 | **836** | 961 | 949 |
| Sulfur | ppm | ASTM D5185m | 4250 | **3136** | 2765 | 2977 |

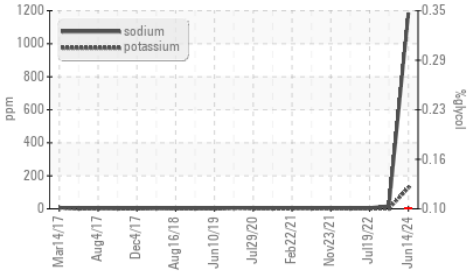
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >60 | **15** | 8 | 6 |
| Sodium | ppm | ASTM D5185m | | ▲ **1184** | 17 | 6 |
| Potassium | ppm | ASTM D5185m | >20 | ▲ **127** | 2 | 0 |
| Glycol | % | *ASTM D2982 | | ▲ **0.10** | NEG | NEG |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | ▲ **3** | ▲ 3.4 | 2.8 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **17.3** | 15.6 | 15.2 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **27.3** | 27.7 | 27.4 |

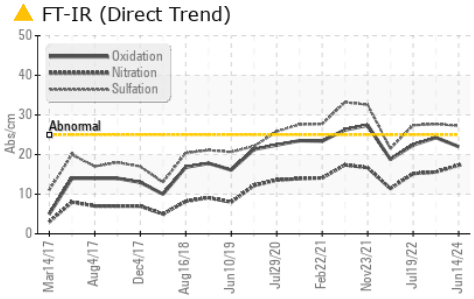
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **22.0** | 24.3 | 22.4 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 8.5 | **11.8** | 7.5 | 9.7 |

# OIL ANALYSIS REPORT

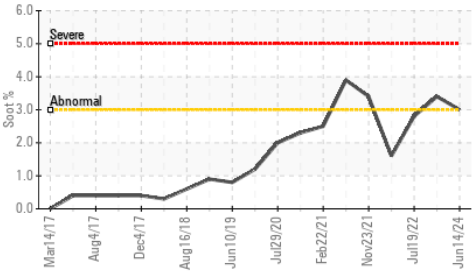
Glycol Contamination



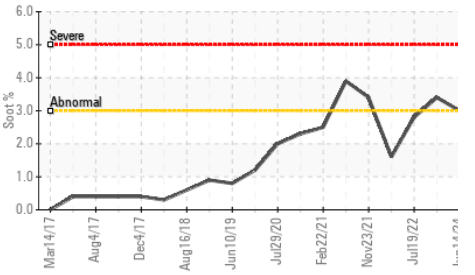

FT-IR (Direct Trend)



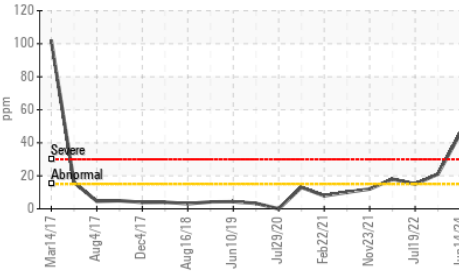

Soot %




Soot %




Aluminum (ppm)

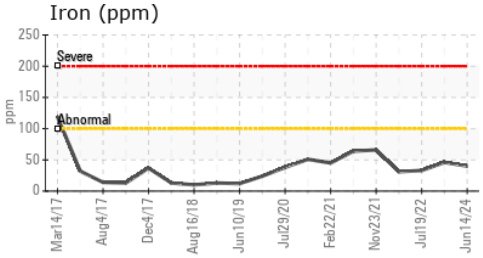



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| 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 |
| Free Water | scalar | *Visual | | **NEG** | NEG | NEG |

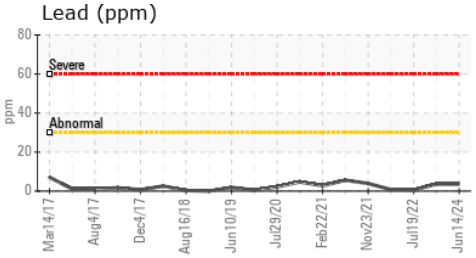
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 10.9 | ▲ **14.1** | 13.9 | 13.9 |

GRAPHS

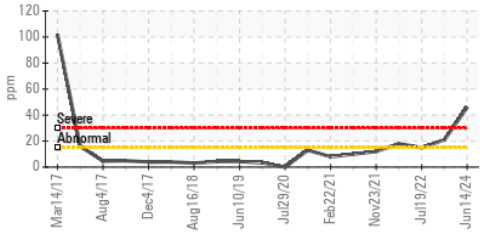
Iron (ppm)



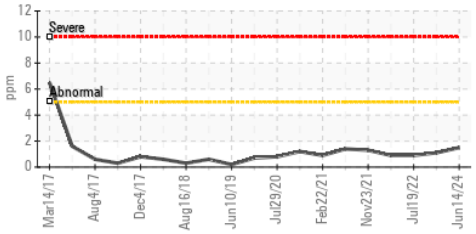

Lead (ppm)



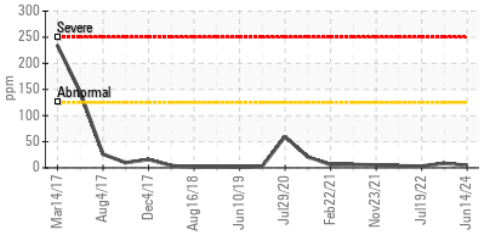

Aluminum (ppm)



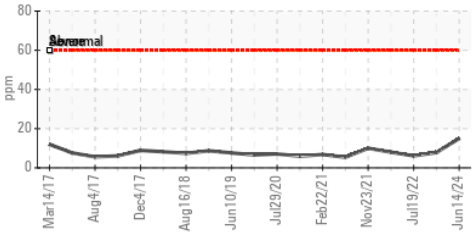

Chromium (ppm)



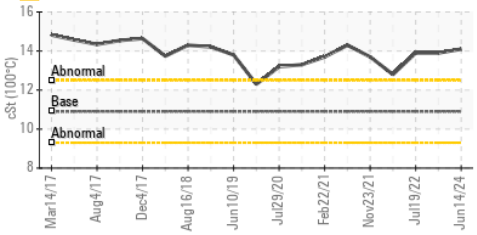

Copper (ppm)



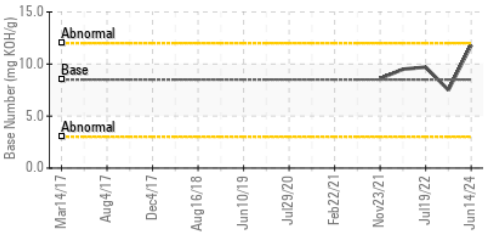

Silicon (ppm)




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : DJJ0018095
**Lab Number** : 06214439
**Unique Number** : 11087303
**Test Package** : MOBCE ( Additional Tests: Glycol, TBN )

**Received** : 19 Jun 2024
**Tested** : 24 Jun 2024
**Diagnosed** : 24 Jun 2024 - Jonathan Hester

**RIVER METALS RECYCLING - NEWPORT**
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US 41072
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F: (859)291-0086

*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)*