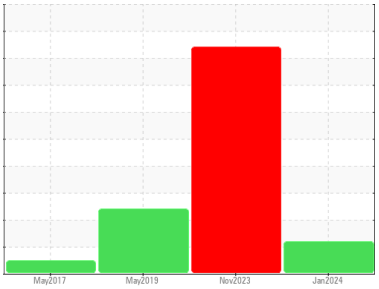
# OIL ANALYSIS REPORT

Area
## DE Samples - CAT LAB
Machine Id
## CATERPILLAR 420 FST BACKHOE 6010 (S/N SKR04232)
Component
**Diesel Engine**
Fluid
**TULCO LUBSOIL DIESEL TURBO CJ4 15W40 (--- GAL)**

Sample Rating Trend




**GLYCOL**

## DIAGNOSIS

▲ **Recommendation**
No corrective action is recommended at this time. Resample at the next service interval to monitor.

**Wear**
All component wear rates are normal.

**Contamination**
Sodium and/or potassium levels remain high. Test for glycol is negative.

▲ **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.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **TO10003074** | TO10002850 | TO1005952 |
| Sample Date | | Client Info | | **08 Jan 2024** | 14 Nov 2023 | 13 May 2019 |
| Machine Age | hrs | Client Info | | **13137** | 12883 | 5200 |
| Oil Age | hrs | Client Info | | **254** | 573 | 300 |
| Oil Changed | | Client Info | | **Not Changd** | Changed | Changed |
| Sample Status | | | | **ATTENTION** | SEVERE | ABNORMAL |

| 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 | **7** | 40 | 35 |
| Chromium | ppm | ASTM D5185m | >20 | **<1** | <1 | 3 |
| Nickel | ppm | ASTM D5185m | >2 | **0** | 0 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | **0** | 2 | <1 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >25 | **4** | 11 | ▲ 18 |
| Lead | ppm | ASTM D5185m | >40 | **0** | <1 | 0 |
| Copper | ppm | ASTM D5185m | >330 | **2** | 2 | 5 |
| Tin | ppm | ASTM D5185m | >15 | **0** | <1 | <1 |
| Antimony | ppm | ASTM D5185m | | **---** | --- | 0 |
| 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 | 1 | **14** | 10 | 9 |
| Barium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 40 | **65** | 87 | 62 |
| Manganese | ppm | ASTM D5185m | | **<1** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | 935 | **890** | 977 | 1015 |
| Calcium | ppm | ASTM D5185m | 1234 | **1085** | 1230 | 1536 |
| Phosphorus | ppm | ASTM D5185m | 1089 | **1050** | 1165 | 974 |
| Zinc | ppm | ASTM D5185m | 1090 | **1259** | 1411 | 1078 |
| Sulfur | ppm | ASTM D5185m | 3700 | **3259** | 3640 | 3423 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **5** | 14 | ▲ 39 |
| Sodium | ppm | ASTM D5185m | | ▲ **87** | ▲ 560 | 2 |
| Potassium | ppm | ASTM D5185m | >20 | **5** | ▲ 39 | 2 |
| Glycol | % | *ASTM D2982 | | **NEG** | ⬢ 0.10 | NEG |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **0.2** | 0.7 | 0.2 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **6.7** | 10.8 | 7.5 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **18.5** | 21.9 | 18.5 |

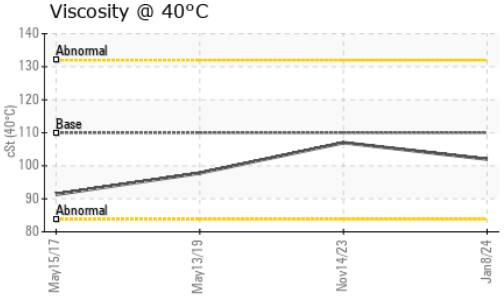
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **14.2** | 16.9 | 14.4 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 8.21 | **11.31** | 11.41 | 10.3 |

Report Id: ANCTUL [WUSCAR] 06061376 (Generated: 01/17/2024 15:43:35) Rev: 1

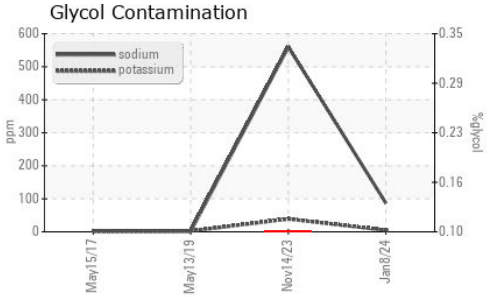
Submitted By: SKIP SAENGERHAUSEN

# OIL ANALYSIS REPORT

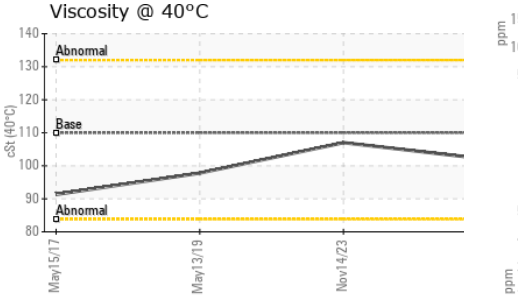
Viscosity @ 40°C



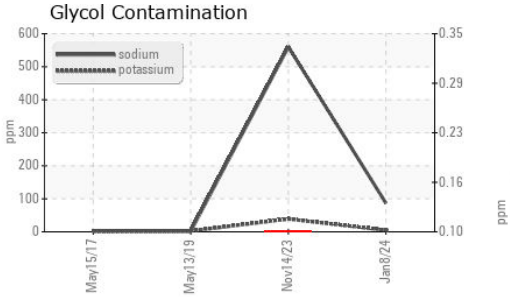

Glycol Contamination




Viscosity @ 40°C




Glycol Contamination

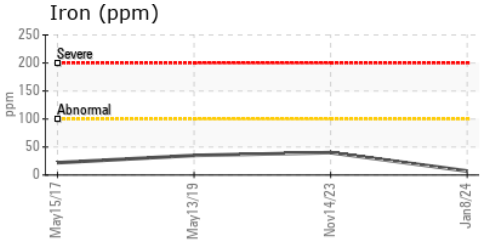



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

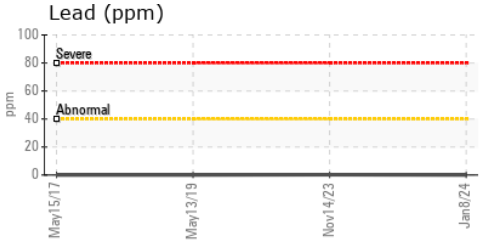
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 40°C | cSt | ASTM D445 | 110 | **102** | 107 | 97.8 |
| Visc @ 100°C | cSt | ASTM D445 | 15 | **13.6** | 14.0 | 13.5 |
| Viscosity Index (VI) | Scale | ASTM D2270 | 143 | **133** | 131 | 138 |

GRAPHS

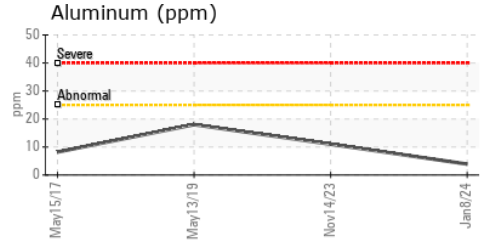
Iron (ppm)



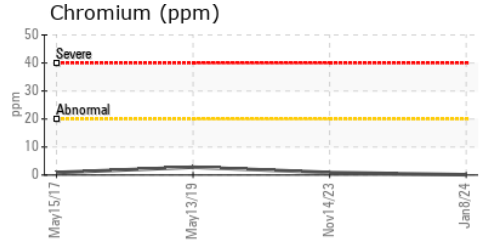

Lead (ppm)



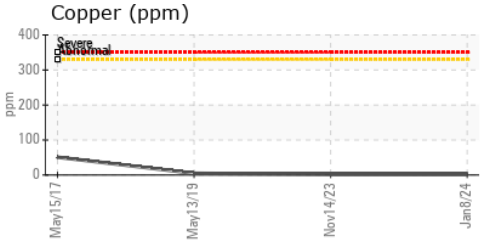

Aluminum (ppm)



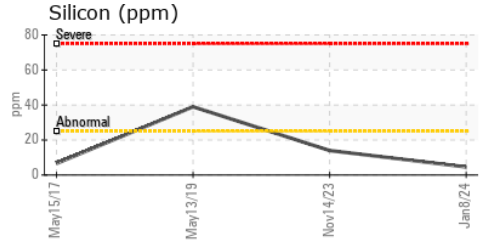

Chromium (ppm)



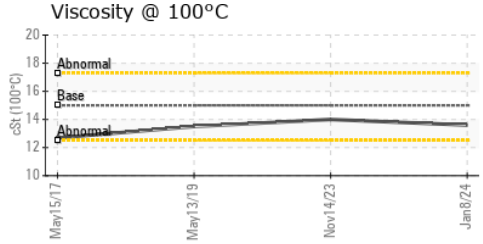

Copper (ppm)



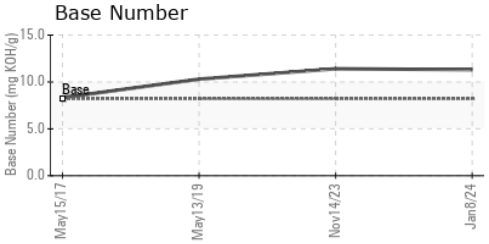

Silicon (ppm)




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : TO10003074 **Recieved** : 16 Jan 2024
**Lab Number** : 06061376 **Diagnosed** : 17 Jan 2024
**Unique Number** : 10832758 **Diagnostician** : Jonathan Hester
**Test Package** : MOB 2 ( Additional Tests: KV40, VI )

*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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