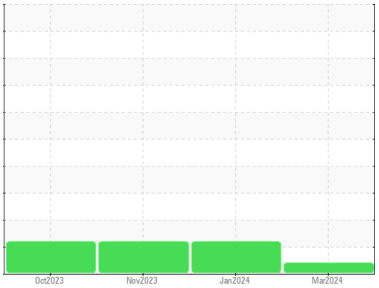
# OIL ANALYSIS REPORT

Area
**MINING**
Machine Id
**ME-66 CATERPILLAR 980M MK700460**
Component
**Diesel Engine**
Fluid
**CAT DEO ULS 15W40 (10 GAL)**

Sample Rating Trend




**VISCOSITY**

## 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**
There is no indication of any contamination in the oil.

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

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **WC0909669** | WC0880671 | WC0880656 |
| Sample Date | | Client Info | | **12 Mar 2024** | 22 Jan 2024 | 30 Nov 2023 |
| Machine Age | hrs | Client Info | | **5546** | 5015 | 4480 |
| Oil Age | hrs | Client Info | | **500** | 500 | 500 |
| Oil Changed | | Client Info | | **N/A** | Changed | Changed |
| Sample Status | | | | **ATTENTION** | ABNORMAL | ABNORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Water | | WC Method | >0.2 | **NEG** | NEG | NEG |
| Glycol | | WC Method | | **NEG** | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >100 | **19** | 19 | 18 |
| Chromium | ppm | ASTM D5185m | >20 | **0** | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >2 | **0** | 0 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | **0** | <1 | 0 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | <1 |
| Aluminum | ppm | ASTM D5185m | >25 | **<1** | 1 | 2 |
| Lead | ppm | ASTM D5185m | >40 | **0** | 1 | 1 |
| Copper | ppm | ASTM D5185m | >330 | **3** | 4 | 4 |
| Tin | ppm | ASTM D5185m | >15 | **0** | 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 | | **16** | 21 | 18 |
| Barium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | **38** | 40 | 39 |
| Manganese | ppm | ASTM D5185m | | **0** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | | **495** | 421 | 479 |
| Calcium | ppm | ASTM D5185m | | **1763** | 1686 | 1703 |
| Phosphorus | ppm | ASTM D5185m | 1000 | **942** | 862 | 972 |
| Zinc | ppm | ASTM D5185m | 1090 | **1077** | 1007 | 1148 |
| Sulfur | ppm | ASTM D5185m | 3000 | **3519** | 2509 | 3041 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **5** | 5 | 6 |
| Sodium | ppm | ASTM D5185m | | **8** | 9 | 7 |
| Potassium | ppm | ASTM D5185m | >20 | **0** | <1 | <1 |
| Fuel | % | ASTM D3524 | >5 | **<1.0** | ▲ 3.6 | ▲ 4.6 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **0.5** | 0.4 | 0.4 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **10.1** | 10.0 | 9.8 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **22.3** | 22.2 | 22.5 |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **21.4** | 21.7 | 21.4 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 10.4 | **9.1** | 8.8 | 8.5 |

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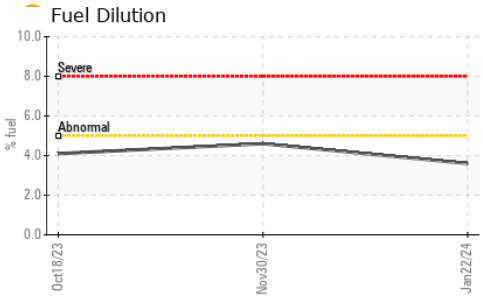
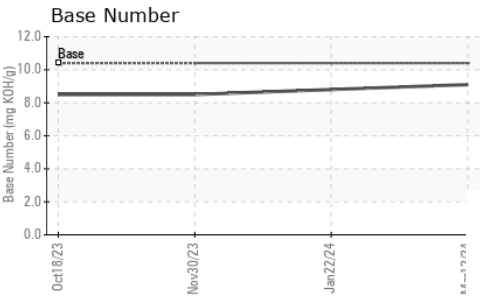
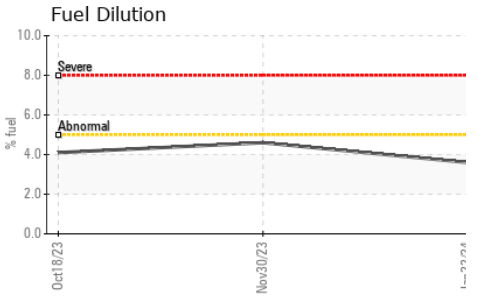


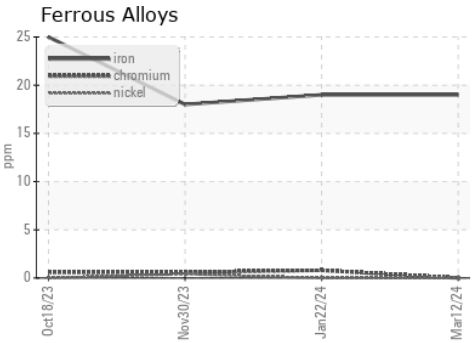



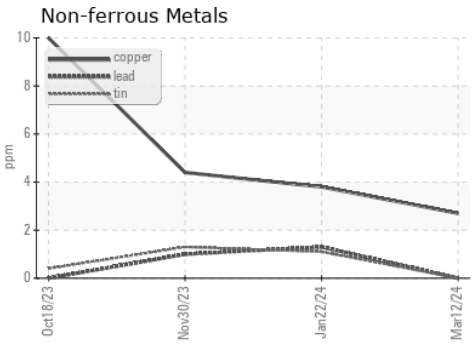



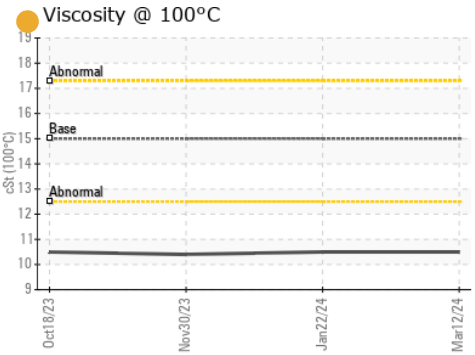

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

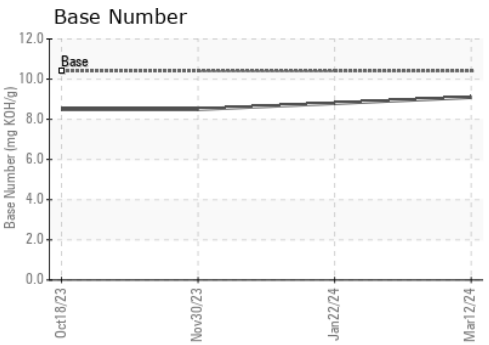
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.0 | **10.5** | 10.5 | 10.4 |

## GRAPHS




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : WC0909669 **Received** : 19 Mar 2024
**Lab Number** : 06122053 **Tested** : 21 Mar 2024
**Unique Number** : 10936204 **Diagnosed** : 21 Mar 2024 - Jonathan Hester
**Test Package** : CONST ( Additional Tests: FUELDILUTION, 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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