MOB II WEAR CHECK

# OIL ANALYSIS REPORT

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

Area
**RIG 5**
Machine Id
**CATERPILLAR 3512 R5-G-04 NKL**
Component
**Diesel Engine**
Fluid
**{not provided} (--- GAL)**

## RECOMMENDATION

Resample at the next service interval to monitor.

## WEAR

All component wear rates are normal.

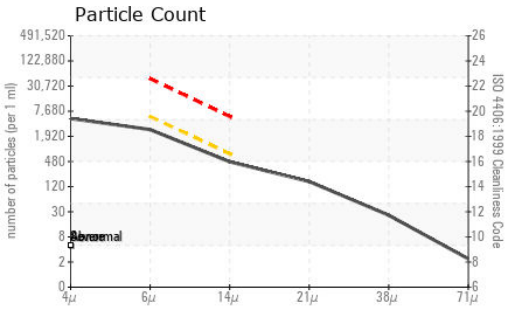
## CONTAMINATION

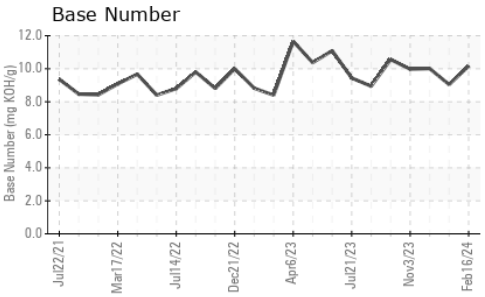
The amount and size of particulates present in the system are acceptable. There is no indication of any contamination in the oil.

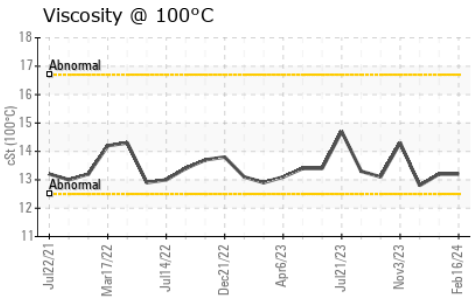
## FLUID CONDITION

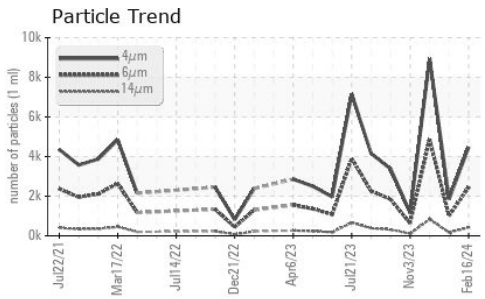
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

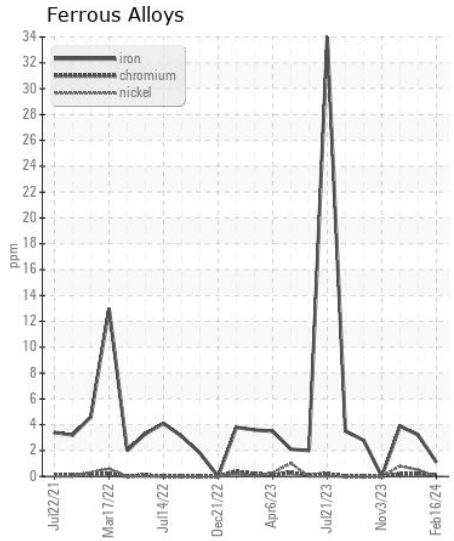
| Test | UOM | Method | Limit/Abn | Current | History1 | History2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | KL0013840 | KL0013192 | KL0013980 |
| Sample Date | | Client Info | | 16 Feb 2024 | 11 Jan 2024 | 12 Dec 2023 |
| Machine Age | days | Client Info | | 45338 | 45303 | 45272 |
| Oil Age | days | Client Info | | 0 | 0 | 0 |
| Filter Age | days | Client Info | | 0 | 0 | 0 |
| Oil Changed | | Client Info | | N/A | N/A | N/A |
| Filter Changed | | Client Info | | N/A | N/A | N/A |
| Sample Status | | | | NORMAL | ABNORMAL | ATTENTION |
| Iron | ppm | ASTM D5185m | >100 | 1 | 3 | 4 |
| Chromium | ppm | ASTM D5185m | >20 | <1 | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >2 | 0 | <1 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | 0 | <1 | <1 |
| Silver | ppm | ASTM D5185m | >2 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >25 | 4 | 3 | 2 |
| Lead | ppm | ASTM D5185m | >40 | <1 | <1 | 1 |
| Copper | ppm | ASTM D5185m | >330 | 6 | 1 | 1 |
| Tin | ppm | ASTM D5185m | >15 | <1 | <1 | <1 |
| Vanadium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Silicon | ppm | ASTM D5185m | >25 | 10 | ▲ 93 | 14 |
| Potassium | ppm | ASTM D5185m | >20 | 2 | 1 | 2 |
| Fuel | | WC Method | >5 | <1.0 | <1.0 | <1.0 |
| Water | | WC Method | >0.2 | NEG | NEG | NEG |
| Glycol | | WC Method | | NEG | NEG | NEG |
| Soot % | % | *ASTM D7844 | >3 | 0.2 | 0.1 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 6.6 | 6.8 | 7.8 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 22.8 | 23.4 | 23.5 |
| Particles >4µm | | ASTM D7647 | | 4472 | 1852 | 8935 |
| Particles >6µm | | ASTM D7647 | >5000 | 2436 | 1009 | 4867 |
| Particles >14µm | | ASTM D7647 | >640 | 415 | 172 | ● 828 |
| Particles >21µm | | ASTM D7647 | >160 | 140 | 58 | ● 279 |
| Particles >38µm | | ASTM D7647 | >40 | 22 | 9 | ● 43 |
| Particles >71µm | | ASTM D7647 | >10 | 2 | 1 | 4 |
| Oil Cleanliness | | ISO 4406 (c) | >19/16 | 18/16 | 17/15 | ● 19/17 |
| 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 |
| Sodium | ppm | ASTM D5185m | | <1 | 0 | 0 |
| Boron | ppm | ASTM D5185m | | 306 | 363 | 356 |
| Barium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | 119 | 122 | 130 |
| Manganese | ppm | ASTM D5185m | | <1 | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | | 629 | 652 | 704 |
| Calcium | ppm | ASTM D5185m | | 1432 | 1471 | 1586 |
| Phosphorus | ppm | ASTM D5185m | | 692 | 737 | 715 |
| Zinc | ppm | ASTM D5185m | | 836 | 809 | 871 |
| Sulfur | ppm | ASTM D5185m | | 2418 | 2771 | 2894 |
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 16.8 | 16.9 | 18.0 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | | 10.16 | 9.04 | 10.01 |
| Visc @ 100°C | cSt | ASTM D445 | | 13.2 | 13.2 | 12.8 |

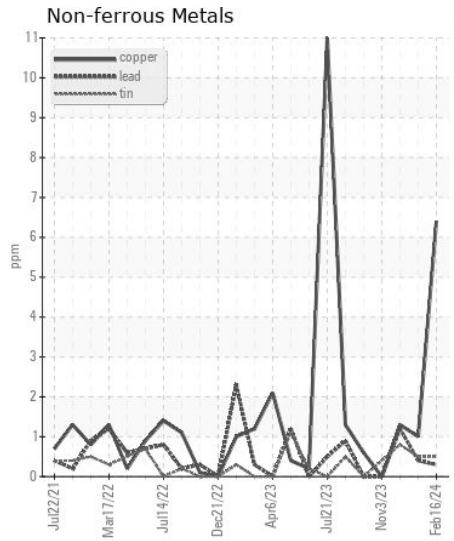


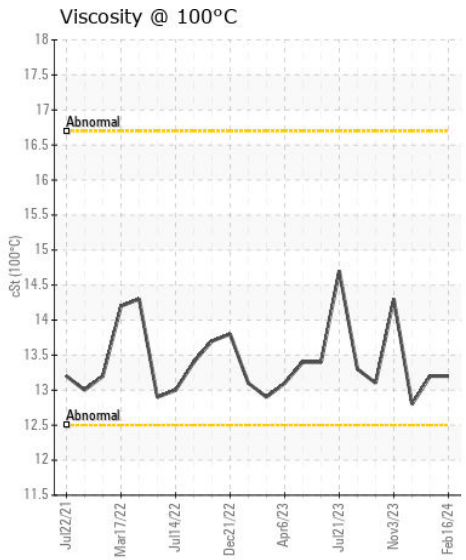



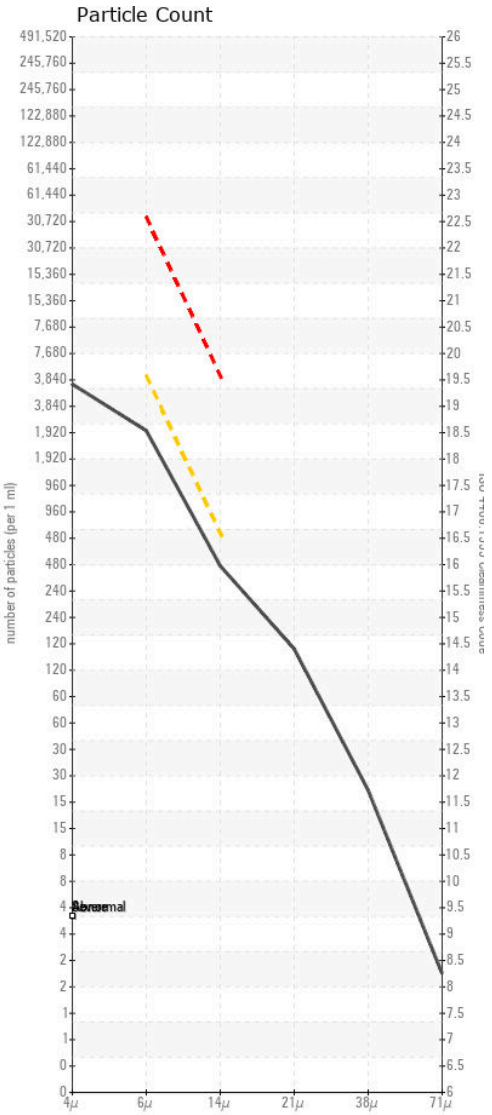



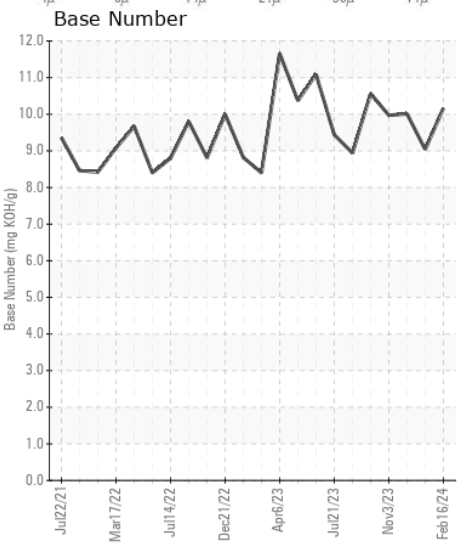





**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : KL0013840
**Lab Number** : 06105410
**Unique Number** : 10903640
**Test Package** : MOB 2 ( Additional Tests: PrtCount )
**Received** : 29 Feb 2024
**Tested** : 06 Mar 2024
**Diagnosed** : 06 Mar 2024 - Jonathan Hester

Certificate L2367


*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)*


**CITADEL DRILLING**
7550 W I20
ODESSA, TX
US 79763
Contact: MIKE COMBDEN
mcombden@citadeldrilling.com
T: (780)955-5509
F: