MOB II WEAR CHECK

# OIL ANALYSIS REPORT

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

Area
**RIG 6**
Machine Id
**R6-G-02 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

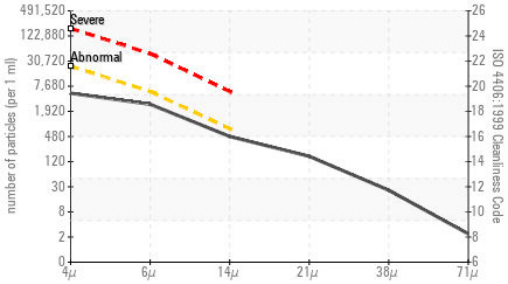
The amount and size of particulates present in the system are acceptable. There is no indication of any contamination in the oil.

## FLUID CONDITION

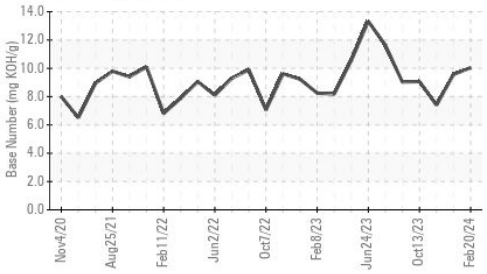
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| Test | UOM | Method | Limit/Abn | Current | History1 | History2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | KL0013894 | KL0013987 | KL0013181 |
| Sample Date | | Client Info | | 20 Feb 2024 | 05 Jan 2024 | 18 Nov 2023 |
| Machine Age | days | Client Info | | 45342 | 45297 | 45248 |
| 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 | NORMAL | NORMAL |
| Iron | ppm | ASTM D5185m | >100 | <1 | 3 | 2 |
| Chromium | ppm | ASTM D5185m | >20 | <1 | <1 | 0 |
| Nickel | ppm | ASTM D5185m | >4 | 0 | <1 | 0 |
| Titanium | ppm | ASTM D5185m | | 0 | <1 | 0 |
| Silver | ppm | ASTM D5185m | >3 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | 4 | 3 | 2 |
| Lead | ppm | ASTM D5185m | >40 | <1 | <1 | 0 |
| Copper | ppm | ASTM D5185m | >330 | <1 | 1 | <1 |
| Tin | ppm | ASTM D5185m | >15 | <1 | <1 | 0 |
| Vanadium | ppm | ASTM D5185m | | 0 | 0 | <1 |
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Silicon | ppm | ASTM D5185m | >25 | 7 | 8 | 6 |
| Potassium | ppm | ASTM D5185m | >20 | <1 | 1 | 0 |
| 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 | 0.1 | 0.1 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 6.6 | 6.9 | 6.9 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 23.4 | 23.5 | 23.5 |
| Particles >4µm | | ASTM D7647 | >20000 | 4550 | 4915 | 5194 |
| Particles >6µm | | ASTM D7647 | >5000 | 2479 | 2678 | 2829 |
| Particles >14µm | | ASTM D7647 | >640 | 422 | 456 | 482 |
| Particles >21µm | | ASTM D7647 | >160 | 142 | 154 | 162 |
| Particles >38µm | | ASTM D7647 | >40 | 22 | 24 | 25 |
| Particles >71µm | | ASTM D7647 | >10 | 2 | 2 | 3 |
| Oil Cleanliness | | ISO 4406 (c) | >21/19/16 | 19/18/16 | 19/19/16 | 20/19/16 |
| 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 | 1 |
| Boron | ppm | ASTM D5185m | | 329 | 363 | 339 |
| Barium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | 121 | 127 | 129 |
| Manganese | ppm | ASTM D5185m | | <1 | <1 | 0 |
| Magnesium | ppm | ASTM D5185m | | 649 | 659 | 681 |
| Calcium | ppm | ASTM D5185m | | 1451 | 1501 | 1567 |
| Phosphorus | ppm | ASTM D5185m | | 675 | 730 | 711 |
| Zinc | ppm | ASTM D5185m | | 821 | 827 | 844 |
| Sulfur | ppm | ASTM D5185m | | 2384 | 2730 | 2408 |
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 17.3 | 17.0 | 17.3 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | | 10.04 | 9.57 | 7.40 |
| Visc @ 100°C | cSt | ASTM D445 | | 13.4 | 13.5 | 13.6 |

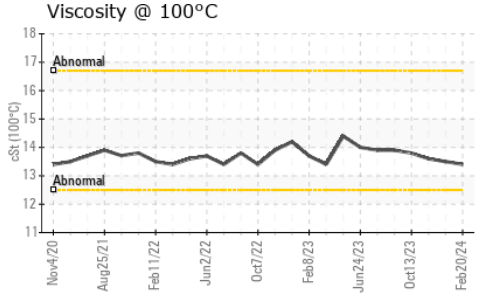
Particle Count



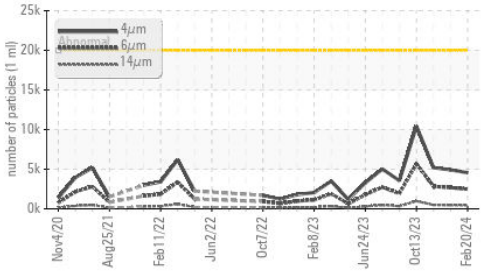

Base Number



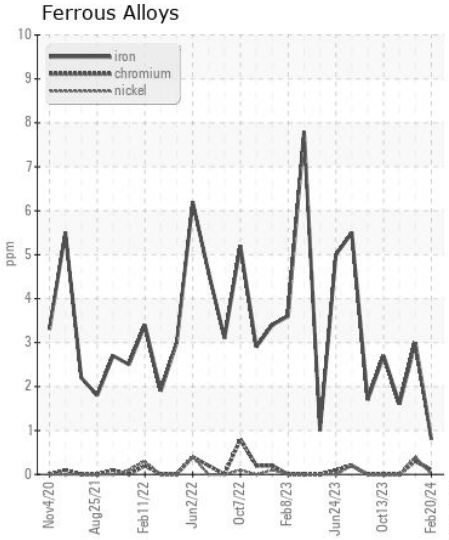

Viscosity @ 100°C



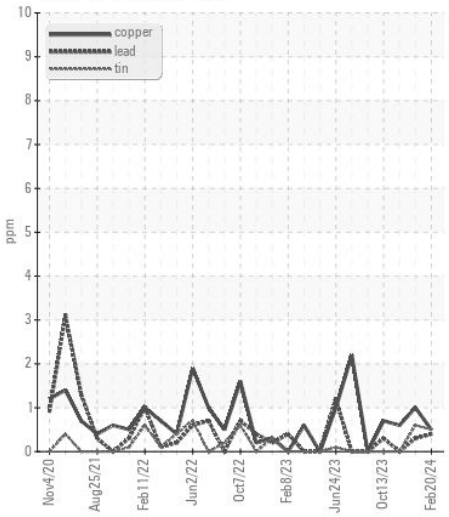

Particle Trend



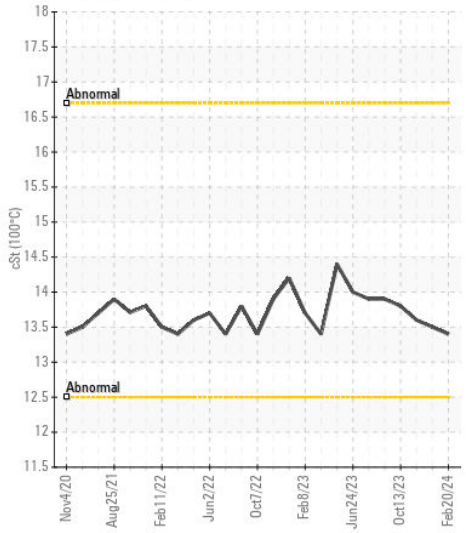

Ferrous Alloys



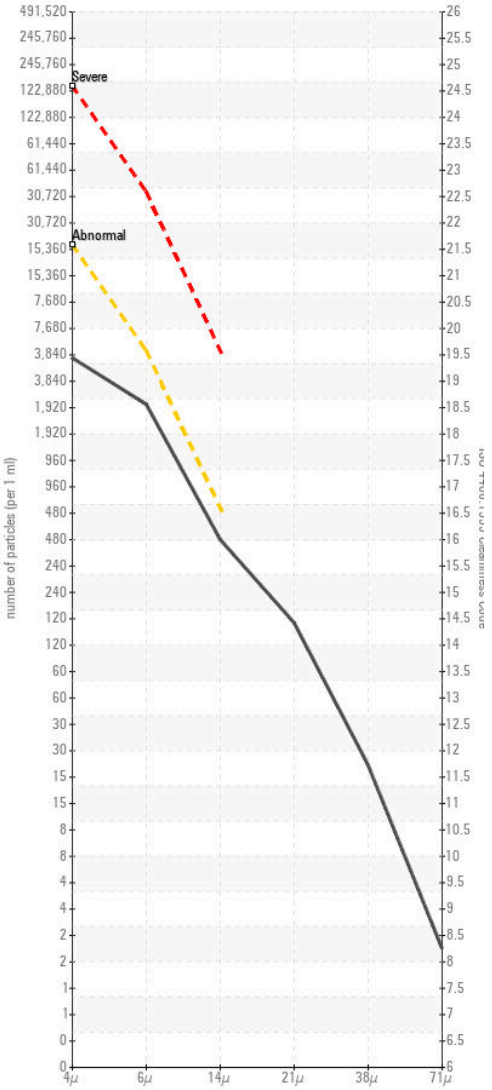

Non-ferrous Metals



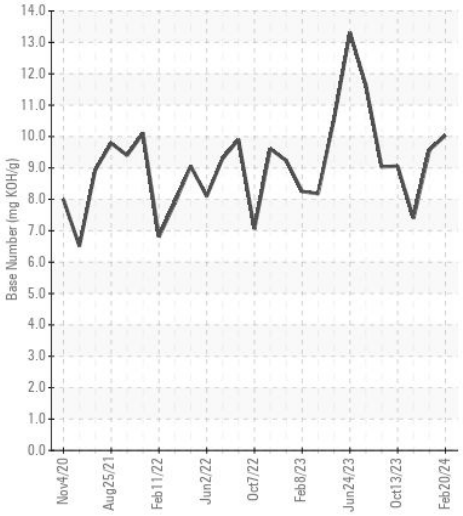

Viscosity @ 100°C




Particle Count




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : KL0013894 **Received** : 29 Feb 2024
**Lab Number** : 06105402 **Tested** : 06 Mar 2024
**Unique Number** : 10903632 **Diagnosed** : 06 Mar 2024 - Jonathan Hester
**Test Package** : MOB 2 ( Additional Tests: PrtCount )

*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: