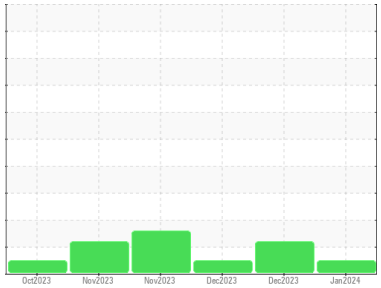
# OIL ANALYSIS REPORT

Sample Rating Trend




NORMAL

Area
**RIG 258**
Machine Id
**R258-MP-01**
Component
**Gearbox**
Fluid
**GEAR OIL ISO 320 (--- GAL)**

## DIAGNOSIS

**Recommendation**
Resample at the next service interval to monitor. The fluid was not specified, however, a fluid match indicates that this fluid is (GENERIC) GEAR OIL ISO 320. Please confirm.
Please specify the component make and model with your next sample.

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

**Contamination**
The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The system and fluid cleanliness is acceptable.

**Fluid Condition**
The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **KL0013950** | KL0013944 | KL0013947 |
| Sample Date | | Client Info | | **07 Jan 2024** | 28 Dec 2023 | 12 Dec 2023 |
| Machine Age | hrs | Client Info | | **0** | 0 | 0 |
| Oil Age | hrs | Client Info | | **0** | 0 | 0 |
| Oil Changed | | Client Info | | **N/A** | N/A | N/A |
| Sample Status | | | | **NORMAL** | ABNORMAL | NORMAL |

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

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >200 | **20** | 26 | 26 |
| Chromium | ppm | ASTM D5185m | >10 | **0** | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >10 | **0** | <1 | <1 |
| Titanium | ppm | ASTM D5185m | | **0** | <1 | <1 |
| Silver | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >25 | **<1** | 1 | 1 |
| Lead | ppm | ASTM D5185m | >50 | **0** | <1 | <1 |
| Copper | ppm | ASTM D5185m | >200 | **9** | 11 | 12 |
| Tin | ppm | ASTM D5185m | >10 | **0** | <1 | <1 |
| Vanadium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | <1 | <1 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 50 | **5** | 4 | 4 |
| Barium | ppm | ASTM D5185m | 15 | **0** | 5 | 4 |
| Molybdenum | ppm | ASTM D5185m | 15 | **0** | <1 | <1 |
| Manganese | ppm | ASTM D5185m | | **<1** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | 50 | **<1** | 2 | 3 |
| Calcium | ppm | ASTM D5185m | 50 | **19** | 25 | 24 |
| Phosphorus | ppm | ASTM D5185m | 350 | **168** | 170 | 170 |
| Zinc | ppm | ASTM D5185m | 100 | **6** | 9 | 10 |
| Sulfur | ppm | ASTM D5185m | 12500 | **8460** | 8977 | 8880 |

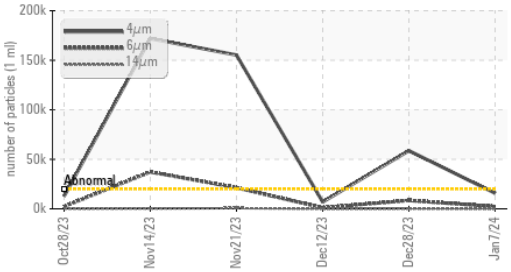
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >50 | **5** | 6 | 6 |
| Sodium | ppm | ASTM D5185m | | **12** | 17 | 12 |
| Potassium | ppm | ASTM D5185m | >20 | **1** | <1 | <1 |

| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Particles >4µm | | ASTM D7647 | >20000 | **15735** | ▲ 58702 | 6907 |
| Particles >6µm | | ASTM D7647 | >5000 | **2293** | ▲ 8462 | 1080 |
| Particles >14µm | | ASTM D7647 | >640 | **45** | 204 | 44 |
| Particles >21µm | | ASTM D7647 | >160 | **9** | 38 | 8 |
| Particles >38µm | | ASTM D7647 | >40 | **1** | 1 | 1 |
| Particles >71µm | | ASTM D7647 | >10 | **1** | 0 | 0 |
| Oil Cleanliness | | ISO 4406 (c) | >21/19/16 | **21/18/13** | ▲ 23/20/15 | 20/17/13 |

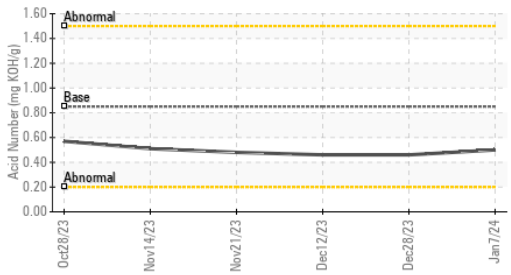
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 0.85 | **0.50** | 0.46 | 0.46 |

# OIL ANALYSIS REPORT

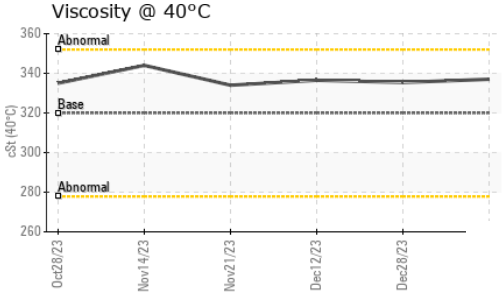
Particle Trend



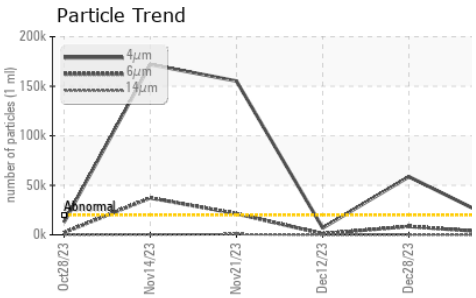

Acid Number




Viscosity @ 40°C



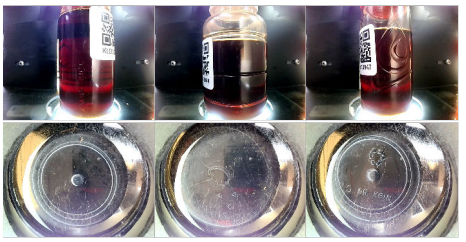

Particle Trend




| 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 |

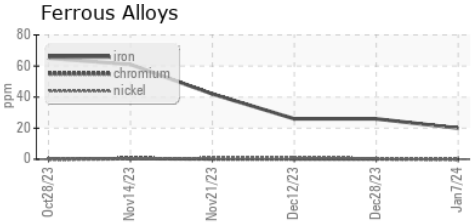
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 40°C | cSt | ASTM D445 | 320 | **337** | 335.4 | 336.5 |

| SAMPLE IMAGES | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|
| Color | | | | | |
| Bottom | | | | | |

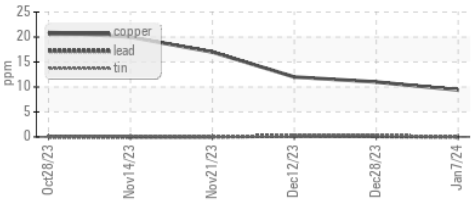


## GRAPHS

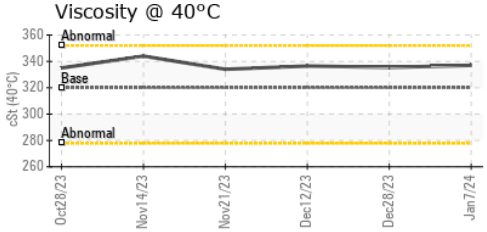
Ferrous Alloys



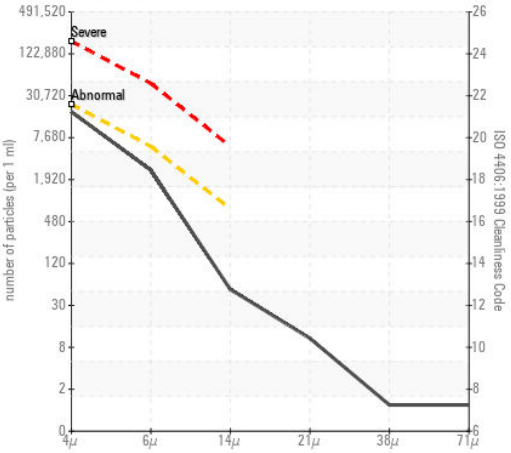

Non-ferrous Metals



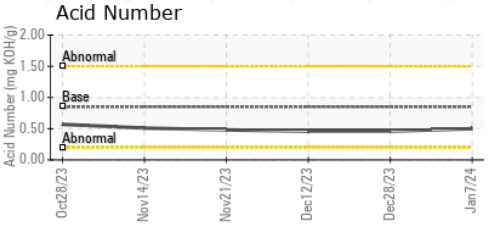

Viscosity @ 40°C




Particle Count




Acid Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : KL0013950 **Recieved** : 10 Jan 2024
**Lab Number** : 06056638 **Diagnosed** : 11 Jan 2024
**Unique Number** : 10822587 **Diagnostician** : Wes Davis
**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)*

**PATTERSON - UTI DRILLING**
9915 WEST INDUSTRIAL
MIDLAND, TX
US 79706
Contact: RICKY MATA
ricky.mata@patenergy.com
T: (832)219-4559
F: (432)561-9388