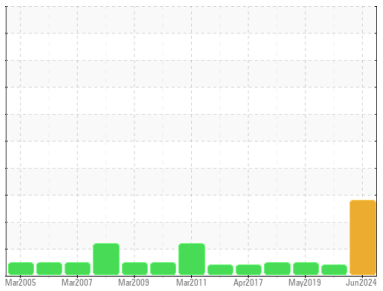
# OIL ANALYSIS REPORT

Sample Rating Trend




**FUEL**

Machine Id
## CLARKE FIRE PUMP
Component
**Diesel Engine**
Fluid
**CHEVRON URSA SUPER PLUS EC 15W40 (7 GAL)**

## DIAGNOSIS

**▲ Recommendation**
We advise that you check the fuel injection system. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

**Wear**
Metal levels are typical for a new component breaking in.

**▲ Contamination**
There is a high amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

**▲ Fluid Condition**
The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **WC0827473** | WC0452548 | WC0338285 |
| Sample Date | | Client Info | | **25 Jun 2024** | 05 May 2020 | 02 May 2019 |
| Machine Age | hrs | Client Info | | **659** | 200 | 173 |
| Oil Age | hrs | Client Info | | **0** | 0 | 28 |
| Oil Changed | | Client Info | | **Changed** | N/A | Changed |
| Sample Status | | | | **SEVERE** | ATTENTION | NORMAL |

| 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 | **<1** | 4 | 3 |
| Chromium | ppm | ASTM D5185m | >20 | **0** | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >4 | **0** | 0 | 0 |
| Titanium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Silver | ppm | ASTM D5185m | >3 | **0** | 0 | <1 |
| Aluminum | ppm | ASTM D5185m | >20 | **2** | 2 | <1 |
| Lead | ppm | ASTM D5185m | >40 | **<1** | <1 | <1 |
| Copper | ppm | ASTM D5185m | >330 | **4** | 2 | 1 |
| Tin | ppm | ASTM D5185m | >15 | **<1** | <1 | <1 |
| Antimony | ppm | ASTM D5185m | | **---** | 0 | 0 |
| Vanadium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | | **177** | 294 | 49 |
| Barium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | **39** | 95 | 18 |
| Manganese | ppm | ASTM D5185m | | **<1** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | | **220** | 532 | 1106 |
| Calcium | ppm | ASTM D5185m | | **1398** | 1156 | 443 |
| Phosphorus | ppm | ASTM D5185m | 1200 | **730** | 632 | 940 |
| Zinc | ppm | ASTM D5185m | 1300 | **889** | 717 | 1062 |
| Sulfur | ppm | ASTM D5185m | | **3083** | 2246 | 3576 |

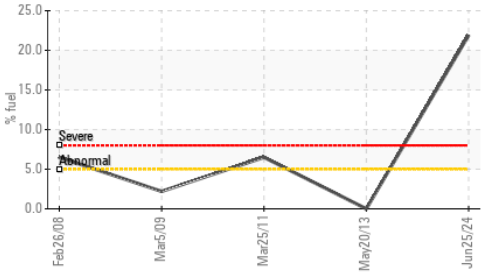
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **4** | 7 | 4 |
| Sodium | ppm | ASTM D5185m | | **1** | 9 | 56 |
| Potassium | ppm | ASTM D5185m | >20 | **3** | <1 | 2 |
| Fuel | % | ASTM D3524 | >5 | **▲ 21.9** | <1.0 | <1.0 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **0** | 0.2 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **5.7** | 5.1 | 4 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **16.4** | 19.2 | 13 |

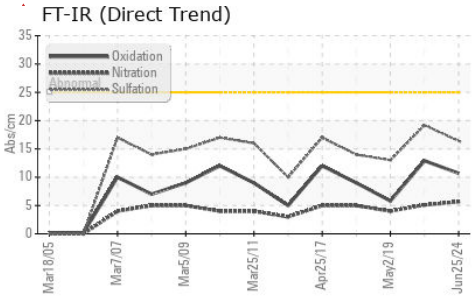
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **10.7** | 12.9 | 5.8 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 8.0 | **6.8** | --- | --- |

# OIL ANALYSIS REPORT

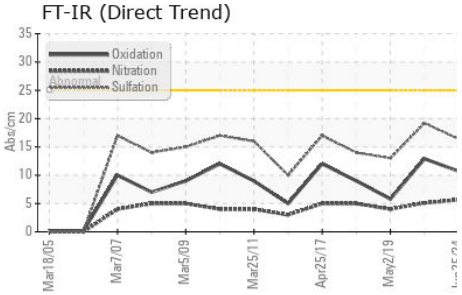
▲ Fuel Dilution



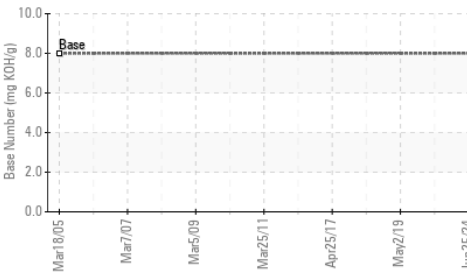

FT-IR (Direct Trend)




FT-IR (Direct Trend)




Base Number

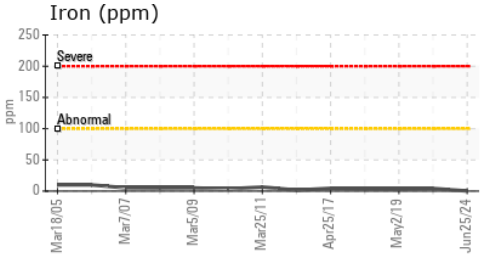



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

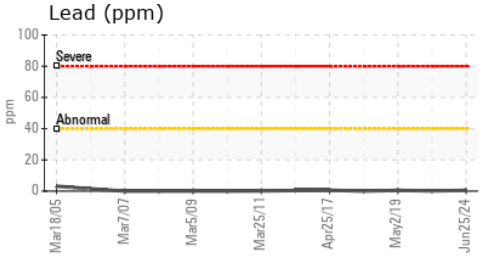
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | ▲ **7.1** | 11.6 | 12.2 |

## GRAPHS

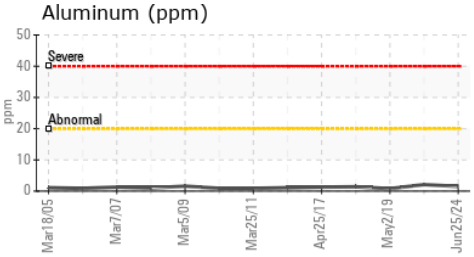
Iron (ppm)



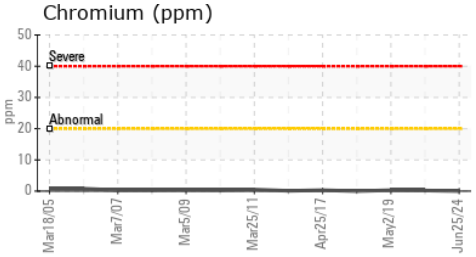

Lead (ppm)



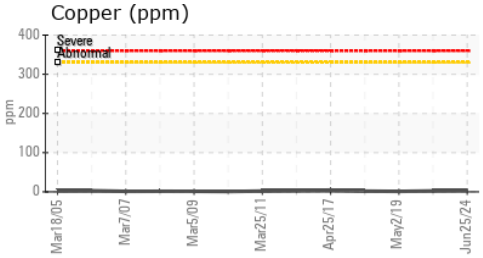

Aluminum (ppm)



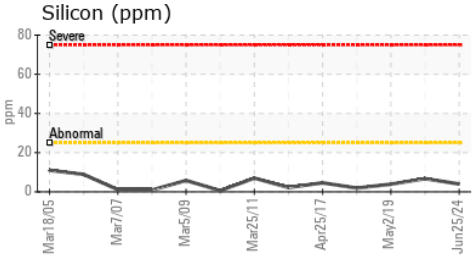

Chromium (ppm)



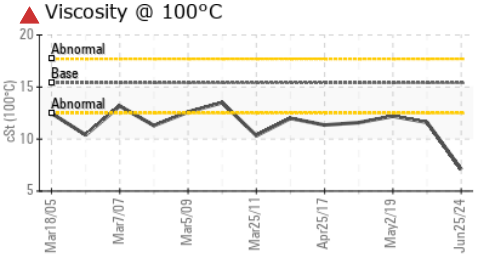

Copper (ppm)



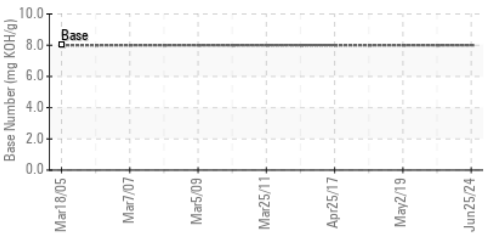

Silicon (ppm)




▲ Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : WC0827473 **Received** : 25 Jun 2024
**Lab Number** : 06220583 **Tested** : 28 Jun 2024
**Unique Number** : 11098780 **Diagnosed** : 28 Jun 2024 - Wes Davis
**Test Package** : MOB 1 ( Additional Tests: FuelDilution, PercentFuel, 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)*

**UNIVAR USA INC.**
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Report Id: UNIMOR [WUSCAR] 06220583 (Generated: 06/28/2024 11:16:58) Rev: 1
Contact/Location: TODD EVANS - UNIMOR