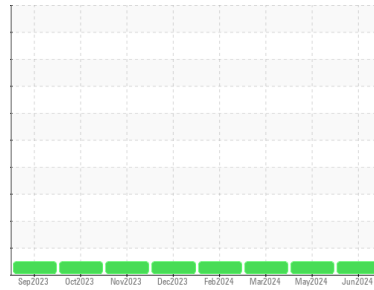




OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Machine Id

1010

Component

Diesel Engine

Fluid

DIESEL ENGINE OIL SAE 15W40 (--- GAL)

DIAGNOSIS

Recommendation

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

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|--------------------|-------------|-------------|------------|--------------------|-------------|-------------|
| Sample Number | Client Info | | | WC0897828 | WC0897840 | WC0894050 |
| Sample Date | Client Info | | | 02 Jun 2024 | 01 May 2024 | 28 Mar 2024 |
| Machine Age | mls | Client Info | | 0 | 0 | 0 |
| Oil Age | mls | Client Info | | 0 | 0 | 0 |
| Oil Changed | Client Info | | | N/A | Changed | Changed |
| Sample Status | | | | NORMAL | NORMAL | NORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---------------|-----------|--------|------------|----------------|----------|----------|
| Fuel | WC Method | >3.0 | | <1.0 | <1.0 | <1.0 |
| Water | WC Method | >0.2 | | NEG | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|-------------|-----|-------------|------------|--------------|----------|----------|
| Iron | ppm | ASTM D5185m | >90 | 18 | 16 | 11 |
| Chromium | ppm | ASTM D5185m | >20 | <1 | 1 | <1 |
| Nickel | ppm | ASTM D5185m | >2 | 0 | <1 | 0 |
| Titanium | ppm | ASTM D5185m | >2 | 0 | <1 | 0 |
| Silver | ppm | ASTM D5185m | >2 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | 2 | 2 | 1 |
| Lead | ppm | ASTM D5185m | >40 | 0 | <1 | 0 |
| Copper | ppm | ASTM D5185m | >330 | 4 | 2 | <1 |
| Tin | ppm | ASTM D5185m | >15 | <1 | <1 | <1 |
| Vanadium | ppm | ASTM D5185m | | 0 | <1 | 0 |
| Cadmium | ppm | ASTM D5185m | | 0 | <1 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|------------|-----|-------------|------------|--------------|----------|----------|
| Boron | ppm | ASTM D5185m | 250 | 1 | 0 | 2 |
| Barium | ppm | ASTM D5185m | 10 | 0 | 2 | 0 |
| Molybdenum | ppm | ASTM D5185m | 100 | 63 | 65 | 61 |
| Manganese | ppm | ASTM D5185m | | <1 | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | 450 | 1029 | 974 | 985 |
| Calcium | ppm | ASTM D5185m | 3000 | 1174 | 1175 | 1092 |
| Phosphorus | ppm | ASTM D5185m | 1150 | 1082 | 1159 | 1073 |
| Zinc | ppm | ASTM D5185m | 1350 | 1386 | 1299 | 1298 |
| Sulfur | ppm | ASTM D5185m | 4250 | 3491 | 3302 | 3413 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|--------------|-----|-------------|------------|------------|----------|----------|
| Silicon | ppm | ASTM D5185m | >25 | 15 | 19 | 10 |
| Sodium | ppm | ASTM D5185m | >158 | 8 | 3 | 4 |
| Potassium | ppm | ASTM D5185m | >20 | 13 | 9 | 4 |
| Glycol | % | *ASTM D2982 | | NEG | NEG | NEG |

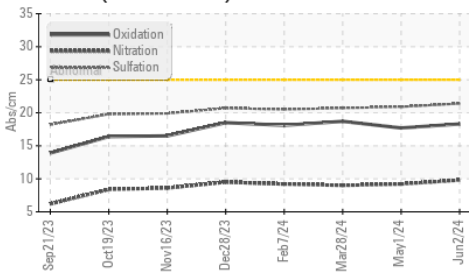
| INFRA-RED | | method | limit/base | current | history1 | history2 |
|-----------|----------|-------------|------------|-------------|----------|----------|
| Soot % | % | *ASTM D7844 | >6 | 0.9 | 0.6 | 0.5 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 9.8 | 9.2 | 9.0 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 21.4 | 20.9 | 20.7 |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|-------------------|----------|-------------|------------|-------------|----------|----------|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 18.3 | 17.7 | 18.7 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 8.5 | 7.2 | 7.8 | 7.5 |

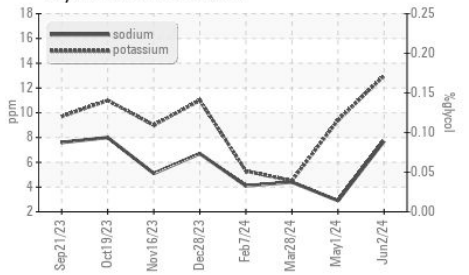


OIL ANALYSIS REPORT

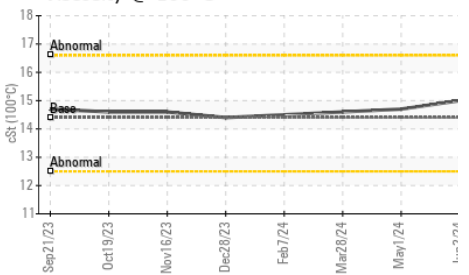
FT-IR (Direct Trend)



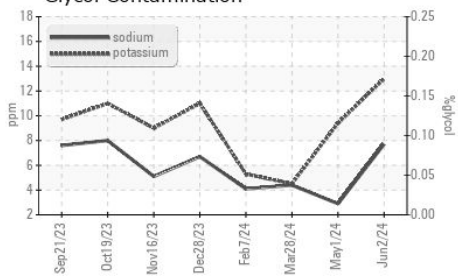
Glycol Contamination



Viscosity @ 100°C



Glycol Contamination



Viscosity @ 100°C

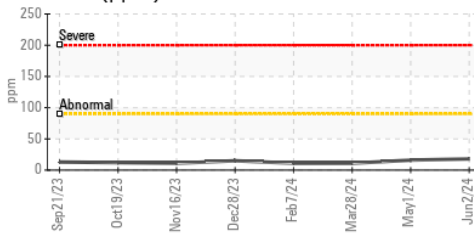


| VISUAL | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| White Metal | scalar | *Visual | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | NONE | NONE |
| Silt | scalar | *Visual | NONE | NONE | NONE |
| Debris | scalar | *Visual | NONE | NONE | NONE |
| Sand/Dirt | scalar | *Visual | NONE | NONE | NONE |
| Appearance | scalar | *Visual | NORML | NORML | NORML |
| Odor | scalar | *Visual | NORML | NORML | NORML |
| Emulsified Water | scalar | *Visual | >0.2 | NEG | NEG |
| Free Water | scalar | *Visual | | NEG | NEG |

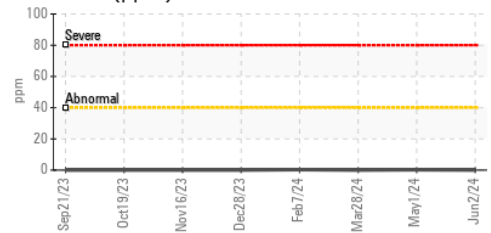
| FLUID PROPERTIES | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| Visc @ 100°C | cSt | ASTM D445 | 14.4 | 15.0 | 14.7 |

GRAPHS

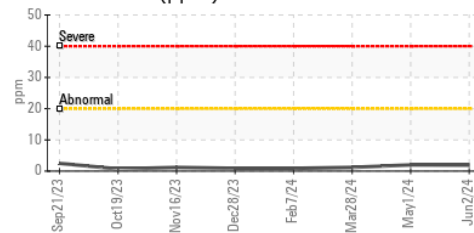
Iron (ppm)



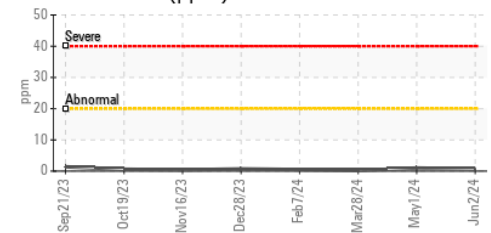
Lead (ppm)



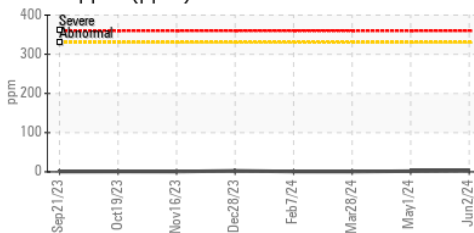
Aluminum (ppm)



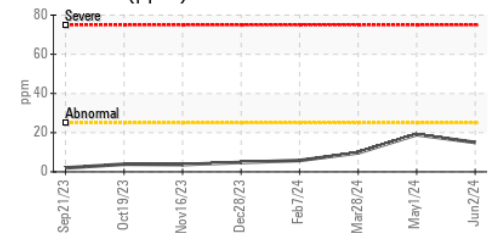
Chromium (ppm)



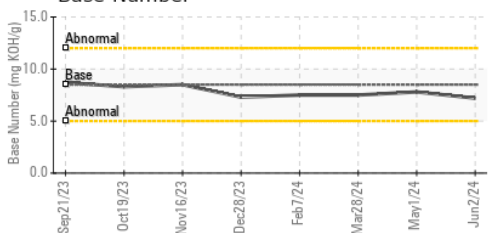
Copper (ppm)



Silicon (ppm)



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0897828 **Received** : 12 Jun 2024
Lab Number : 06208332 **Tested** : 14 Jun 2024
Unique Number : 11075793 **Diagnosed** : 14 Jun 2024 - Don Baldrige
Test Package : MOB 1 (Additional Tests: Glycol, TBN)

GO DURHAM - RAPT
 1903 FAYETTEVILLE ST
 DURHAM, NC
 US 27701

Contact: Robert Iosiniecki
 Robert.iosiniecki@ratpdev.com

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)

T:
F: