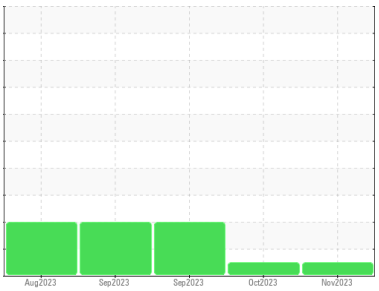
# OIL ANALYSIS REPORT

Sample Rating Trend




NORMAL

Machine Id
**414063**
Component
**Diesel Engine**
Fluid
**DIESEL ENGINE OIL SAE 15W40 (--- GAL)**

## DIAGNOSIS

**Recommendation**
Resample at the next service interval to monitor. Please specify the brand, type, and viscosity of the oil on your next sample.

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

**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 | | **GFL0098456** | GFL0086333 | GFL0078679 |
| Sample Date | | Client Info | | **07 Nov 2023** | 19 Oct 2023 | 28 Sep 2023 |
| Machine Age | hrs | Client Info | | **757** | 611 | 456 |
| Oil Age | hrs | Client Info | | **757** | 611 | 456 |
| Oil Changed | | Client Info | | **N/A** | N/A | Not Changd |
| Sample Status | | | | **NORMAL** | NORMAL | ABNORMAL |

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

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >120 | **6** | 5 | 28 |
| Chromium | ppm | ASTM D5185m | >20 | **<1** | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >5 | **0** | <1 | 2 |
| Titanium | ppm | ASTM D5185m | >2 | **<1** | <1 | <1 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | <1 |
| Aluminum | ppm | ASTM D5185m | >20 | **4** | 3 | 12 |
| Lead | ppm | ASTM D5185m | >40 | **<1** | 0 | 0 |
| Copper | ppm | ASTM D5185m | >330 | **30** | <1 | 141 |
| Tin | ppm | ASTM D5185m | >15 | **<1** | <1 | 2 |
| 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 | **93** | 88 | 247 |
| Barium | ppm | ASTM D5185m | 10 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 100 | **82** | 64 | 120 |
| Manganese | ppm | ASTM D5185m | | **<1** | 0 | 4 |
| Magnesium | ppm | ASTM D5185m | 450 | **878** | 726 | 721 |
| Calcium | ppm | ASTM D5185m | 3000 | **1250** | 1134 | 1367 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **1017** | 916 | 709 |
| Zinc | ppm | ASTM D5185m | 1350 | **1183** | 1073 | 882 |
| Sulfur | ppm | ASTM D5185m | 4250 | **2858** | 3512 | 2599 |

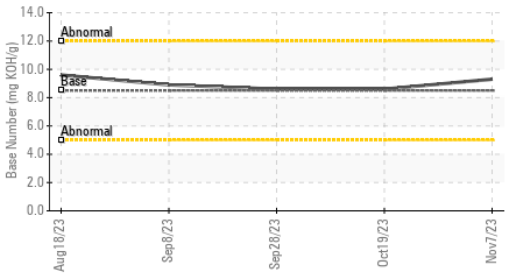
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **9** | 4 | ▲ 66 |
| Sodium | ppm | ASTM D5185m | >158 | **2** | 4 | 5 |
| Potassium | ppm | ASTM D5185m | >20 | **6** | 4 | 27 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >4 | **0.1** | 0.2 | 0.2 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **6.4** | 6.4 | 8.0 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **19.3** | 19.1 | 24.2 |

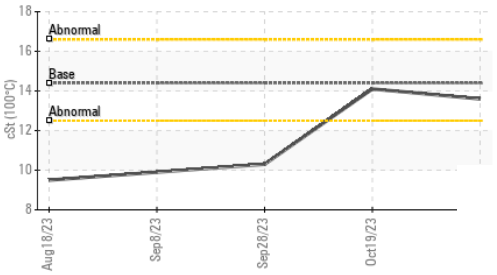
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **14.5** | 14.8 | 21.2 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 8.5 | **9.3** | 8.6 | 8.6 |

# OIL ANALYSIS REPORT

Base Number




Viscosity @ 100°C

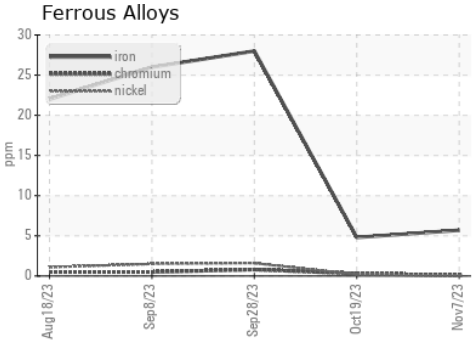



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

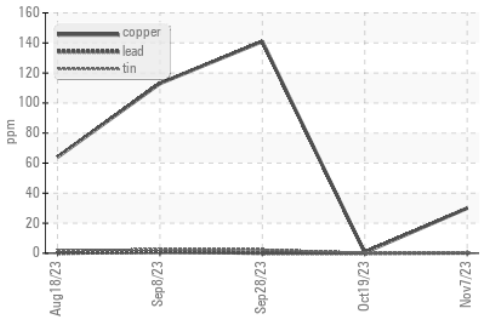
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 14.4 | **13.6** | 14.1 | ▲ 10.3 |

## GRAPHS

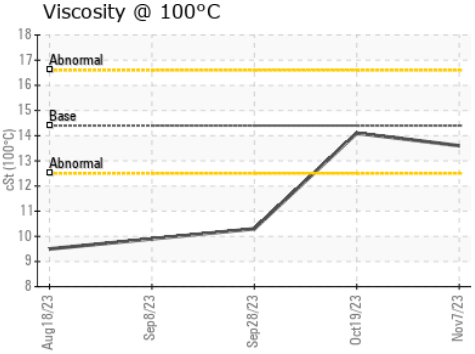
Ferrous Alloys



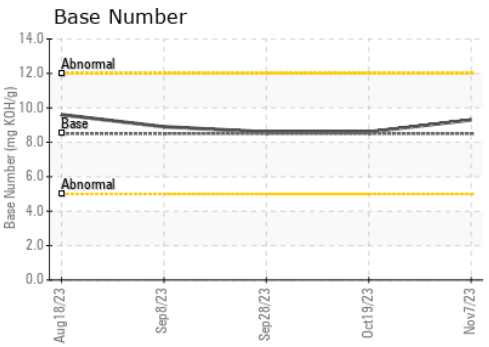

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0098456
**Lab Number** : 06003991
**Unique Number** : 10737753
**Test Package** : FLEET

**Received** : 10 Nov 2023
**Diagnosed** : 10 Nov 2023
**Diagnostician** : Wes Davis

*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)*

**GFL Environmental - 180 - Tuscaloosa Hauling**
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T:
F:

Report Id: GFL180 [WUSCAR] 06003991 (Generated: 11/12/2023 06:53:26) Rev: 1

Submitted By: see also GFL868 - Chelsea Bryan