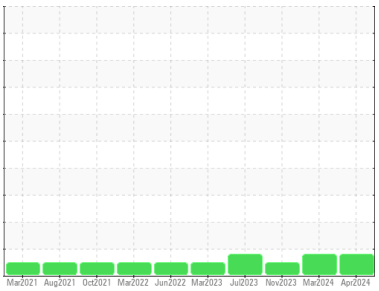
# OIL ANALYSIS REPORT

Sample Rating Trend




**WEAR**

Machine Id
**427039-751**
Component
**Diesel Engine**
Fluid
**CHEVRON DELO 400 XLE 15W40 (5 GAL)**

## DIAGNOSIS

**Recommendation**
Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor.

**Wear**
The aluminum level is abnormal. All other 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 | | **GFL0104664** | GFL0096245 | GFL0096269 |
| Sample Date | | Client Info | | **02 Apr 2024** | 01 Mar 2024 | 28 Nov 2023 |
| Machine Age | hrs | Client Info | | **12719** | 12674 | 12400 |
| Oil Age | hrs | Client Info | | **12674** | 12003 | 0 |
| Oil Changed | | Client Info | | **Changed** | Changed | Not Changd |
| Sample Status | | | | **ABNORMAL** | ABNORMAL | NORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Fuel | | WC Method | >2.0 | **<1.0** | <1.0 | <1.0 |
| 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 | **87** | 80 | 34 |
| Chromium | ppm | ASTM D5185m | >20 | **2** | 2 | <1 |
| Nickel | ppm | ASTM D5185m | >4 | **<1** | <1 | 0 |
| Titanium | ppm | ASTM D5185m | | **10** | 10 | 10 |
| Silver | ppm | ASTM D5185m | >3 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | ▲ **22** | ▲ 23 | 14 |
| Lead | ppm | ASTM D5185m | >40 | **<1** | 0 | 0 |
| Copper | ppm | ASTM D5185m | >330 | **1** | 2 | <1 |
| Tin | ppm | ASTM D5185m | >15 | **<1** | 0 | 0 |
| Vanadium | ppm | ASTM D5185m | | **<1** | <1 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | | **59** | 60 | 90 |
| Barium | ppm | ASTM D5185m | | **0** | 0 | 2 |
| Molybdenum | ppm | ASTM D5185m | | **53** | 56 | 50 |
| Manganese | ppm | ASTM D5185m | | **<1** | <1 | 0 |
| Magnesium | ppm | ASTM D5185m | | **678** | 692 | 630 |
| Calcium | ppm | ASTM D5185m | | **1559** | 1557 | 1385 |
| Phosphorus | ppm | ASTM D5185m | 760 | **690** | 649 | 639 |
| Zinc | ppm | ASTM D5185m | 830 | **809** | 790 | 759 |
| Sulfur | ppm | ASTM D5185m | 2770 | **3252** | 2785 | 3068 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **7** | 10 | 6 |
| Sodium | ppm | ASTM D5185m | | **7** | 8 | 2 |
| Potassium | ppm | ASTM D5185m | >20 | **25** | 6 | 6 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **2.2** | 2.2 | 1.5 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **13.2** | 13.3 | 10.9 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **26.0** | 26.6 | 21.8 |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **18.6** | 18.3 | 15.6 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 10.7 | **7.5** | 7.0 | 8.6 |

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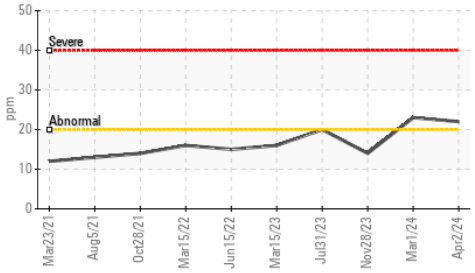
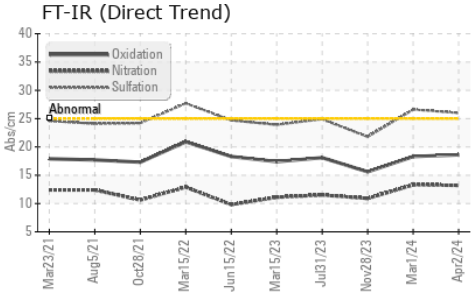
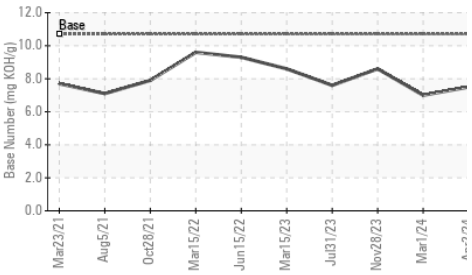
Aluminum (ppm)



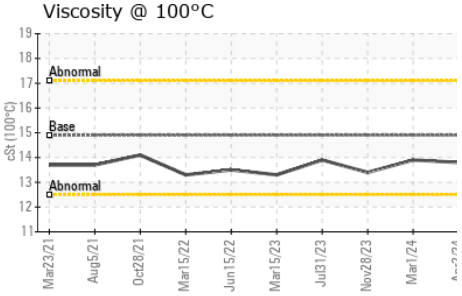

FT-IR (Direct Trend)




Base Number




Viscosity @ 100°C

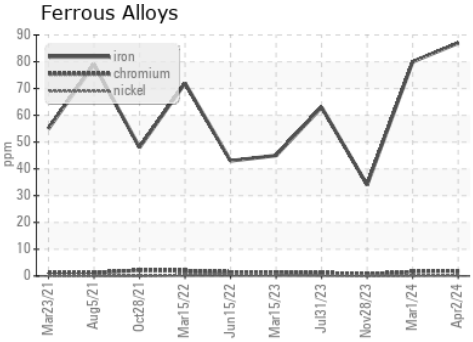



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

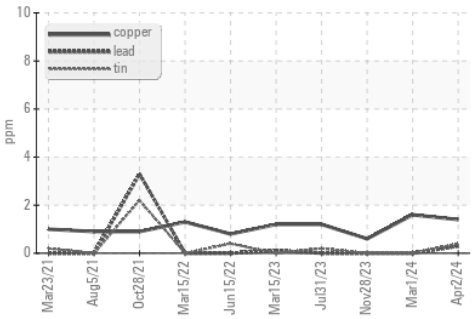
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 14.9 | **13.8** | 13.9 | 13.4 |

## GRAPHS

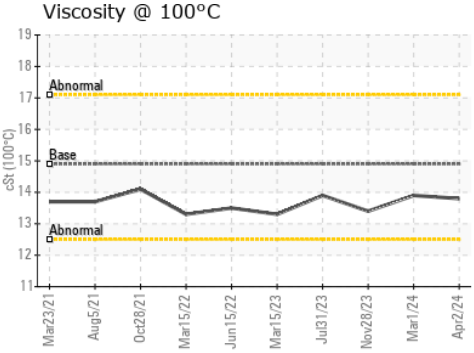
Ferrous Alloys



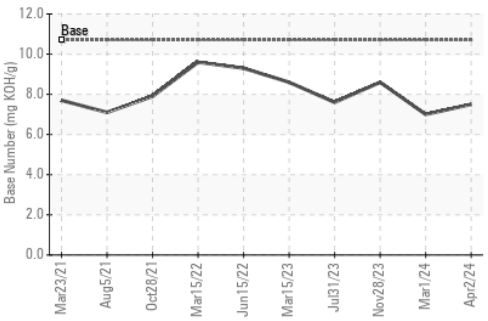

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0104664
**Lab Number** : 06150951
**Unique Number** : 10981029
**Test Package** : FLEET

**Received** : 16 Apr 2024
**Tested** : 17 Apr 2024
**Diagnosed** : 19 Apr 2024 - Don Baldridge

**GFL Environmental - 624 - Elmira Hauling**
10164 M-32
Elmira, MI
US 49730
Contact: ANDY GROBASKI
andyg@americanwaste.org
T: (989)370-2941
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*To discuss this sample report, contact Customer Service at 1-800-237-1369.*
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*Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)*