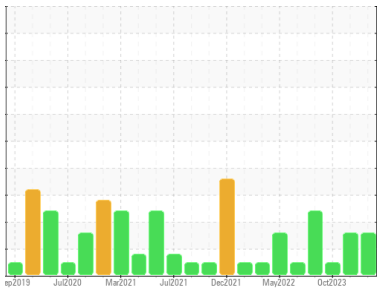
# OIL ANALYSIS REPORT

Sample Rating Trend



WEAR

Area
## (YA152770) GFL035
Machine Id
## 12061
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (32 QTS)**

## DIAGNOSIS

**Recommendation**
No corrective action is recommended at this time. Resample at the next service interval to monitor.

**Wear**
Cylinder, crank, or cam shaft wear is indicated. 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 acceptable for the time in service.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **GFL0116467** | GFL0116430 | GFL0071631 |
| Sample Date | | Client Info | | **25 Apr 2024** | 01 Apr 2024 | 27 Oct 2023 |
| Machine Age | hrs | Client Info | | **17020** | 17020 | 17020 |
| Oil Age | hrs | Client Info | | **600** | 600 | 600 |
| Oil Changed | | Client Info | | **Not Changd** | Not Changd | Changed |
| Sample Status | | | | **ABNORMAL** | ABNORMAL | 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 |
| Glycol | | WC Method | | **NEG** | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >75 | ▲ **92** | ▲ 126 | 56 |
| Chromium | ppm | ASTM D5185m | >5 | ▲ **5** | ▲ 7 | 4 |
| Nickel | ppm | ASTM D5185m | >4 | **<1** | 2 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | **<1** | <1 | <1 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | <1 |
| Aluminum | ppm | ASTM D5185m | >15 | **7** | 9 | 8 |
| Lead | ppm | ASTM D5185m | >25 | **2** | 2 | 2 |
| Copper | ppm | ASTM D5185m | >100 | **6** | 8 | 7 |
| Tin | ppm | ASTM D5185m | >4 | **2** | 1 | 2 |
| Vanadium | ppm | ASTM D5185m | | **0** | <1 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **3** | 2 | 7 |
| Barium | ppm | ASTM D5185m | 0 | **0** | <1 | 4 |
| Molybdenum | ppm | ASTM D5185m | 60 | **66** | 67 | 66 |
| Manganese | ppm | ASTM D5185m | 0 | **<1** | 1 | <1 |
| Magnesium | ppm | ASTM D5185m | 1010 | **1026** | 998 | 889 |
| Calcium | ppm | ASTM D5185m | 1070 | **1263** | 1266 | 1036 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **1138** | 1100 | 1112 |
| Zinc | ppm | ASTM D5185m | 1270 | **1404** | 1390 | 1212 |
| Sulfur | ppm | ASTM D5185m | 2060 | **3720** | 3517 | 2689 |

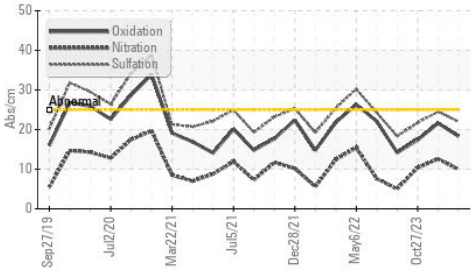
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **18** | 23 | 19 |
| Sodium | ppm | ASTM D5185m | | **6** | 8 | 7 |
| Potassium | ppm | ASTM D5185m | >20 | **<1** | 2 | 2 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >6 | **1.1** | 1.5 | 1.4 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **9.9** | 12.6 | 10.4 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **22.0** | 24.5 | 21.7 |

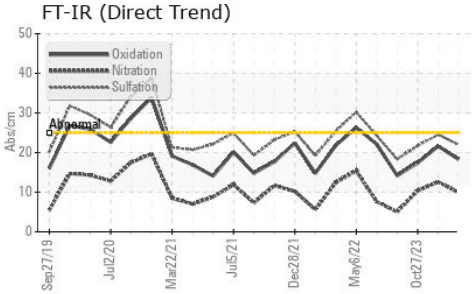
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **18.3** | 21.6 | 17.4 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **8.2** | 6.3 | 7.4 |

# OIL ANALYSIS REPORT

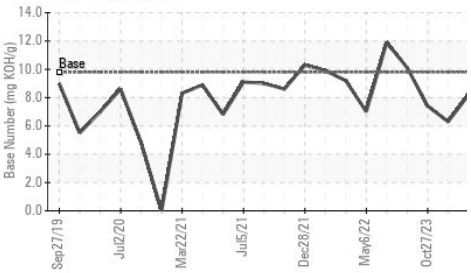
FT-IR (Direct Trend)



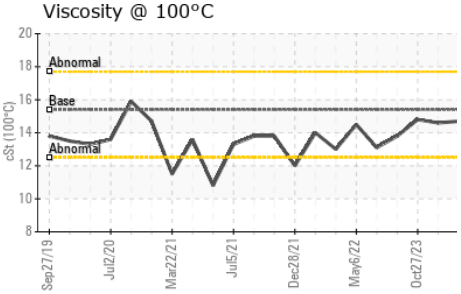

FT-IR (Direct Trend)




Base Number




Viscosity @ 100°C

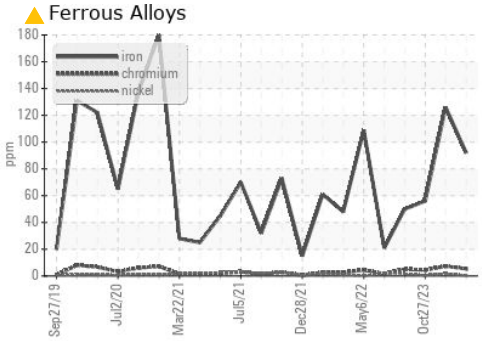



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

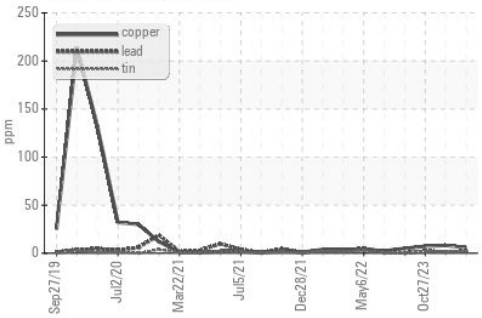
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | **14.7** | 14.6 | 14.8 |

## GRAPHS

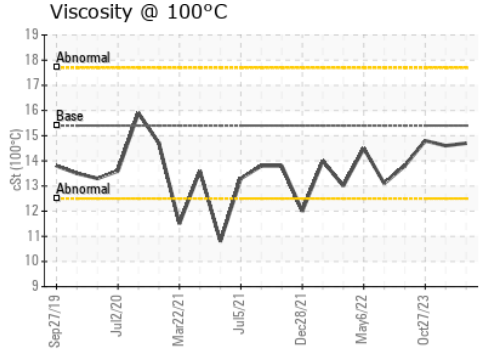
Ferrous Alloys



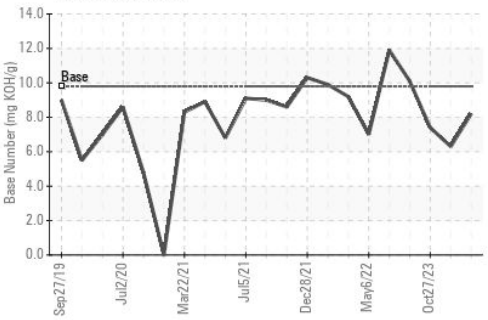

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0116467
**Lab Number** : 06161149
**Unique Number** : 10996572
**Test Package** : FLEET

**Received** : 26 Apr 2024
**Tested** : 26 Apr 2024
**Diagnosed** : 29 Apr 2024 - Don Baldridge

*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 - 035 - Greensboro**
1236 Elon Place
High Point, NC
US 27263
Contact: JORGE COSTA
jorge.costa@gflenv.com
T: (336)668-3712
F: