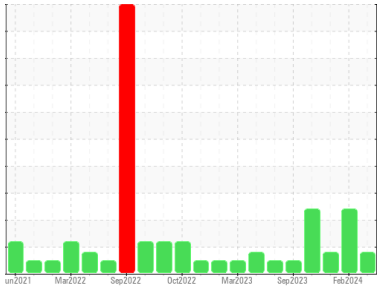
# OIL ANALYSIS REPORT

Sample Rating Trend



**FUEL**

Machine Id
**923012-565**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (28 QTS)**

## DIAGNOSIS

**Recommendation**
No corrective action is recommended at this time. Resample at the next service interval to monitor. ( Customer Sample Comment: Sampled oil )

**Wear**
All component wear rates are normal.

**Contamination**
Light fuel dilution occurring.

**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 | | **GFL0110297** | GFL0110280 | GFL0102811 |
| Sample Date | | Client Info | | **05 Mar 2024** | 27 Feb 2024 | 01 Dec 2023 |
| Machine Age | hrs | Client Info | | **23217** | 23205 | 22829 |
| Oil Age | hrs | Client Info | | **12** | 580 | 22625 |
| Oil Changed | | Client Info | | **Not Changd** | Changed | Not Changd |
| Sample Status | | | | **MARGINAL** | SEVERE | MARGINAL |

| 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 | >90 | **15** | 58 | 23 |
| Chromium | ppm | ASTM D5185m | >20 | **<1** | 3 | 1 |
| Nickel | ppm | ASTM D5185m | >2 | **0** | 0 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | **<1** | 0 | 0 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | <1 |
| Aluminum | ppm | ASTM D5185m | >20 | **4** | 3 | 2 |
| Lead | ppm | ASTM D5185m | >40 | **0** | 1 | <1 |
| Copper | ppm | ASTM D5185m | >330 | **<1** | 2 | 1 |
| Tin | ppm | ASTM D5185m | >15 | **<1** | <1 | <1 |
| Vanadium | ppm | ASTM D5185m | | **<1** | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **12** | 7 | 6 |
| Barium | ppm | ASTM D5185m | 0 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | **81** | 55 | 60 |
| Manganese | ppm | ASTM D5185m | 0 | **0** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | 1010 | **1183** | 800 | 890 |
| Calcium | ppm | ASTM D5185m | 1070 | **1383** | 947 | 1037 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **1224** | 936 | 1014 |
| Zinc | ppm | ASTM D5185m | 1270 | **1554** | 1107 | 1227 |
| Sulfur | ppm | ASTM D5185m | 2060 | **4023** | 2515 | 2978 |

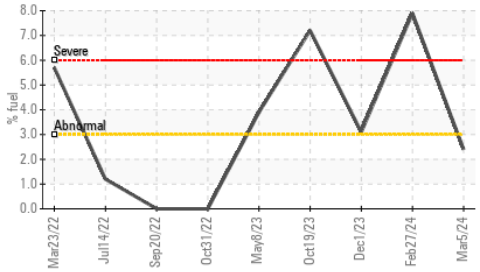
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **5** | 7 | 5 |
| Sodium | ppm | ASTM D5185m | | **7** | 11 | 7 |
| Potassium | ppm | ASTM D5185m | >20 | **2** | 1 | <1 |
| Fuel | % | ASTM D3524 | >3.0 | ▲ **2.4** | ▲ 7.9 | ▲ 3.1 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >6 | **0.2** | 1.3 | 0.6 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **5.5** | 10.5 | 7.2 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **17.3** | 21.3 | 18.8 |

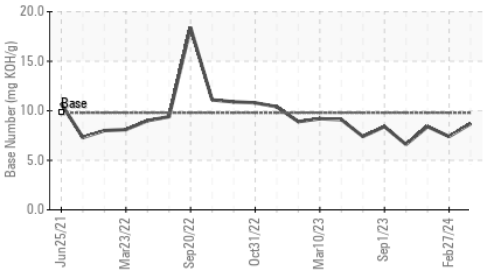
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **12.6** | 17.7 | 13.7 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **8.7** | 7.4 | 8.4 |

# OIL ANALYSIS REPORT

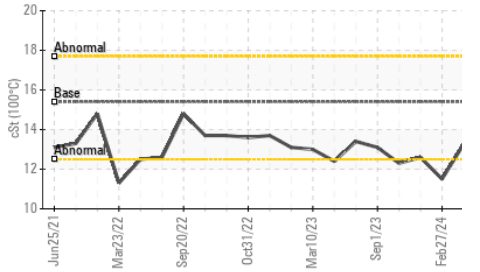
Fuel Dilution




Base Number




Viscosity @ 100°C

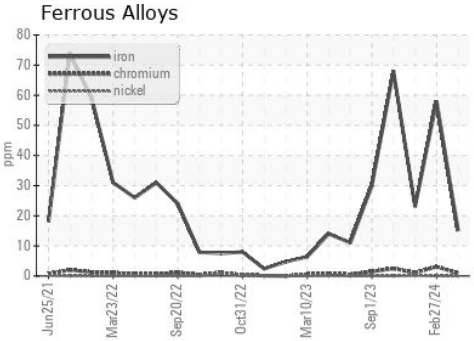



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

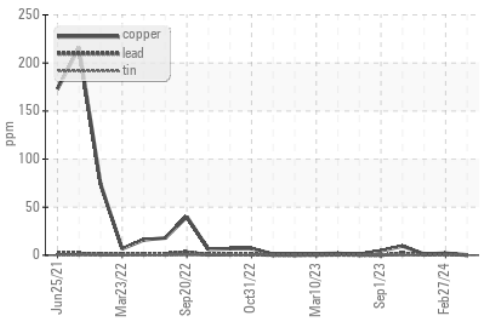
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | **13.26** | ▲ 11.5 | 12.6 |

## GRAPHS

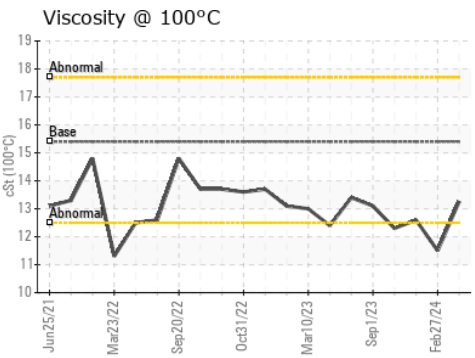
Ferrous Alloys



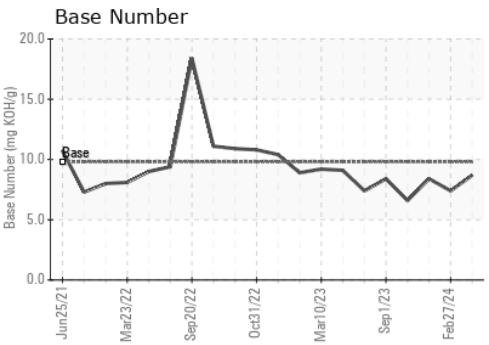

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0110297
**Lab Number** : 06113411
**Unique Number** : 10916908
**Test Package** : FLEET ( Additional Tests: PercentFuel )

**Received** : 08 Mar 2024
**Tested** : 13 Mar 2024
**Diagnosed** : 13 Mar 2024 - Jonathan Hester

**GFL Environmental - 622 - Traverse City Hauling**
160 Hughes Dr
Traverse City, MI
US 49686
Contact: GARY BREWER

*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: