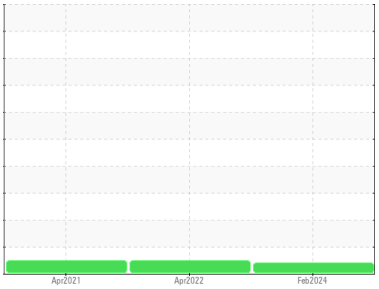
# OIL ANALYSIS REPORT

Sample Rating Trend




VISCOSITY

Machine Id
**125009-829**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (--- GAL)**

## DIAGNOSIS

**Recommendation**
Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

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

**Contamination**
Fuel content negligible. There is no indication of any contamination in the oil.

**Fluid Condition**
The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **GFL0061037** | GFL0030388 | GFL0018785 |
| Sample Date | | Client Info | | **19 Feb 2024** | 08 Apr 2022 | 29 Apr 2021 |
| Machine Age | hrs | Client Info | | **9147** | 7351 | 6296 |
| Oil Age | hrs | Client Info | | **570** | 1055 | 0 |
| Oil Changed | | Client Info | | **Changed** | Changed | Changed |
| Sample Status | | | | **ATTENTION** | NORMAL | NORMAL |

| 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 | >100 | **7** | 22 | 8 |
| Chromium | ppm | ASTM D5185m | >20 | **<1** | 2 | <1 |
| Nickel | ppm | ASTM D5185m | >4 | **0** | <1 | 0 |
| Titanium | ppm | ASTM D5185m | | **31** | 10 | 68 |
| Silver | ppm | ASTM D5185m | >3 | **0** | 0 | <1 |
| Aluminum | ppm | ASTM D5185m | >20 | **2** | 5 | <1 |
| Lead | ppm | ASTM D5185m | >40 | **3** | 9 | <1 |
| Copper | ppm | ASTM D5185m | >330 | **<1** | 1 | <1 |
| Tin | ppm | ASTM D5185m | >15 | **<1** | <1 | <1 |
| Antimony | ppm | ASTM D5185m | | **---** | --- | 0 |
| Vanadium | ppm | ASTM D5185m | | **<1** | 0 | <1 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **52** | 27 | 96 |
| Barium | ppm | ASTM D5185m | 0 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | **39** | 37 | 11 |
| Manganese | ppm | ASTM D5185m | 0 | **<1** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | 1010 | **708** | 533 | 420 |
| Calcium | ppm | ASTM D5185m | 1070 | **1284** | 1817 | 1696 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **977** | 788 | 942 |
| Zinc | ppm | ASTM D5185m | 1270 | **1119** | 966 | 1060 |
| Sulfur | ppm | ASTM D5185m | 2060 | **3086** | 2214 | 3101 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **7** | 14 | 4 |
| Sodium | ppm | ASTM D5185m | | **4** | 7 | 5 |
| Potassium | ppm | ASTM D5185m | >20 | **4** | 11 | 6 |
| Fuel | % | ASTM D3524 | >5 | **0.3** | <1.0 | <1.0 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **0.3** | 0.7 | 0.3 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **8.6** | 13.8 | 10 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **19.7** | 27.2 | 22.3 |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **15.4** | 28.0 | 18.2 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **8.2** | 7.3 | 8.2 |

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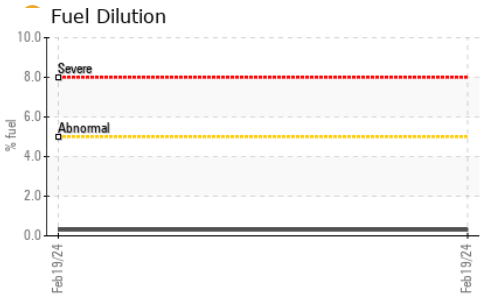
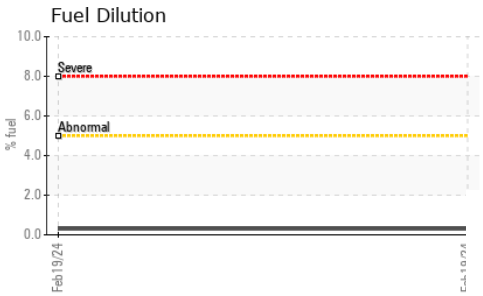
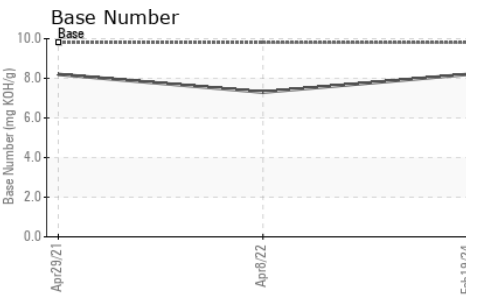


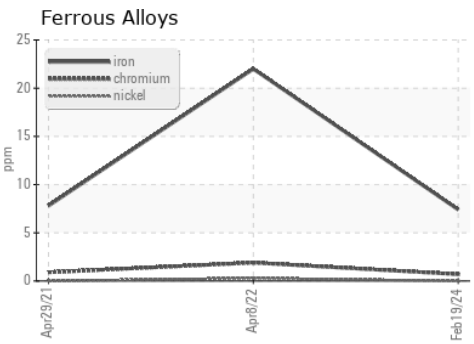



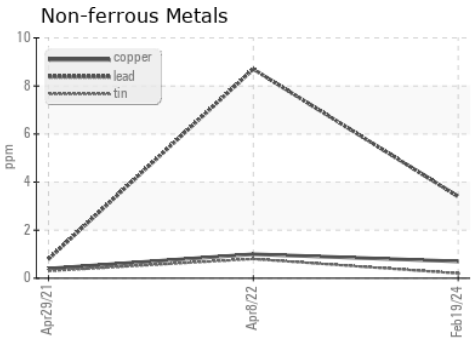



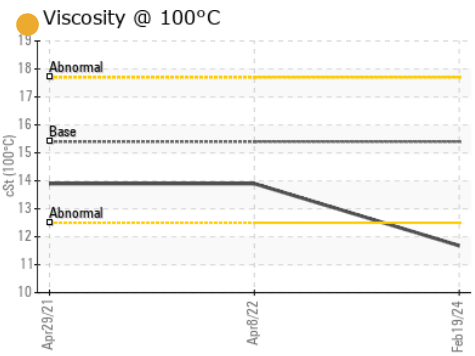

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

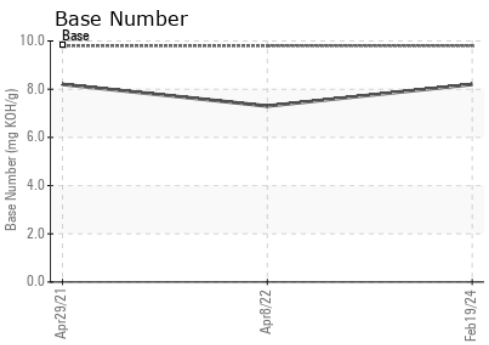
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | **11.68** | 13.9 | 13.9 |

## GRAPHS




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0061037
**Lab Number** : 06099831
**Unique Number** : 10898061
**Test Package** : FLEET ( Additional Tests: FuelDilution, PercentFuel )

**Received** : 26 Feb 2024
**Tested** : 01 Mar 2024
**Diagnosed** : 01 Mar 2024 - Jonathan Hester

**GFL Environmental - 634 - Kalamazoo**
2510 Saidla Dr
Kalamazoo, MI
US 49001
Contact:
T:
F:

*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)*