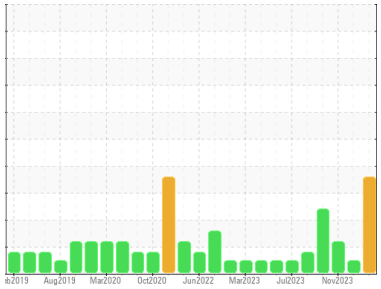
# OIL ANALYSIS REPORT

Sample Rating Trend



**DIRT**

Machine Id
## 425061-402314
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (--- GAL)**

## DIAGNOSIS

**Recommendation**

We advise that you check for the source of the coolant leak. Check for low coolant level. We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

**Wear**

All component wear rates are normal.

**Contamination**

Sodium and/or potassium levels are high. Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress.

**Fluid Condition**

The BN result indicates that there is suitable alkalinity remaining in the oil.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **GFL0103271** | GFL0099946 | GFL0099900 |
| Sample Date | | Client Info | | **26 Jan 2024** | 29 Nov 2023 | 22 Nov 2023 |
| Machine Age | hrs | Client Info | | **24937** | 24768 | 24736 |
| Oil Age | hrs | Client Info | | **600** | 600 | 0 |
| Oil Changed | | Client Info | | **Changed** | Changed | Not Changd |
| Sample Status | | | | **ABNORMAL** | NORMAL | ABNORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Fuel | | WC Method | >5 | **<1.0** | <1.0 | <1.0 |
| Water | | WC Method | >0.2 | **NEG** | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >100 | **39** | 16 | 52 |
| Chromium | ppm | ASTM D5185m | >20 | **1** | <1 | 2 |
| Nickel | ppm | ASTM D5185m | >4 | **1** | <1 | 1 |
| Titanium | ppm | ASTM D5185m | | **<1** | 0 | <1 |
| Silver | ppm | ASTM D5185m | >3 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | ▲ **13** | 2 | 7 |
| Lead | ppm | ASTM D5185m | >40 | **0** | 5 | <1 |
| Copper | ppm | ASTM D5185m | >330 | **0** | 1 | 1 |
| Tin | ppm | ASTM D5185m | >15 | **<1** | <1 | <1 |
| Vanadium | ppm | ASTM D5185m | | **<1** | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | <1 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **41** | 11 | 13 |
| Barium | ppm | ASTM D5185m | 0 | **<1** | 2 | 1 |
| Molybdenum | ppm | ASTM D5185m | 60 | **115** | 76 | 65 |
| Manganese | ppm | ASTM D5185m | 0 | **<1** | 0 | 1 |
| Magnesium | ppm | ASTM D5185m | 1010 | **854** | 1082 | 845 |
| Calcium | ppm | ASTM D5185m | 1070 | **1005** | 1393 | 1157 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **958** | 1215 | 922 |
| Zinc | ppm | ASTM D5185m | 1270 | **1187** | 1474 | 1129 |
| Sulfur | ppm | ASTM D5185m | 2060 | **2970** | 4978 | 2918 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | ▲ **29** | 11 | 11 |
| Sodium | ppm | ASTM D5185m | | ▲ **1807** | 4 | ▲ 183 |
| Potassium | ppm | ASTM D5185m | >20 | **8** | 5 | 3 |
| Glycol | % | *ASTM D2982 | | **NEG** | NEG | NEG |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **1.7** | 0.4 | 2.9 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **14.6** | 9.5 | 14.9 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **22.7** | 21.3 | 28.0 |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **16.2** | 18.3 | 23.5 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **14.7** | 7.8 | 6.7 |

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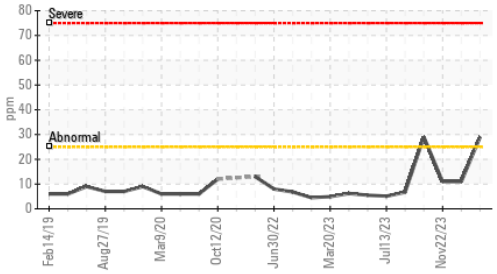
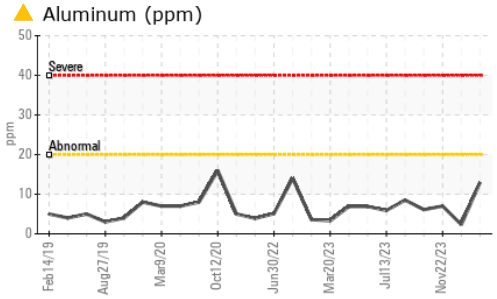
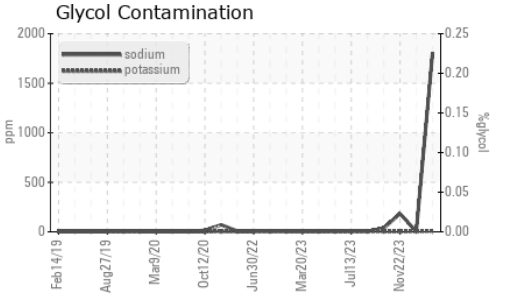
Silicon (ppm)



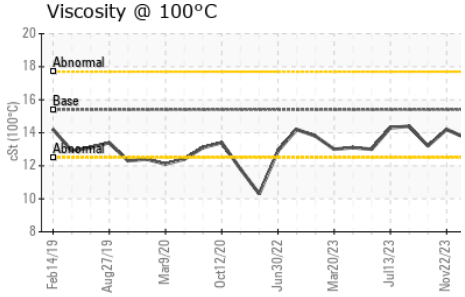

Aluminum (ppm)



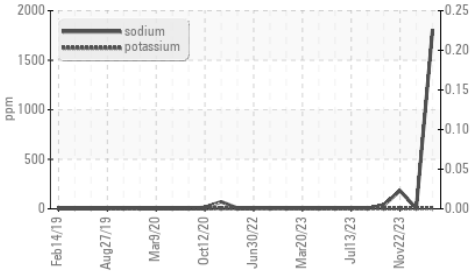

Glycol Contamination




Viscosity @ 100°C




Glycol Contamination

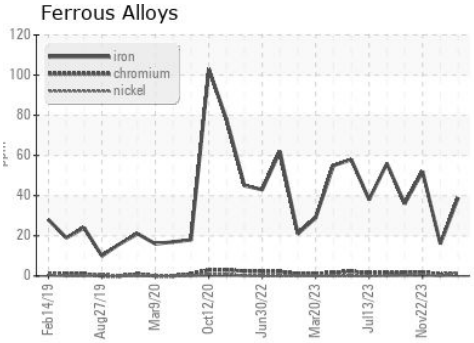



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

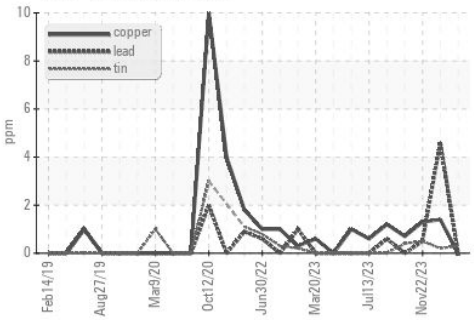
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | **14.2** | 13.7 | 14.2 |

## GRAPHS

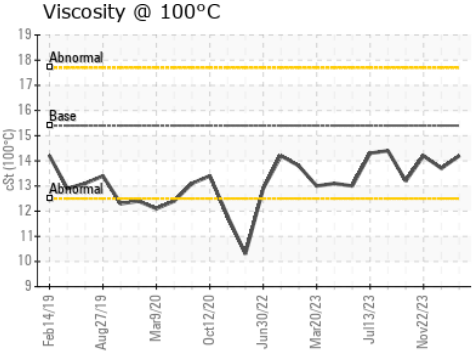
Ferrous Alloys



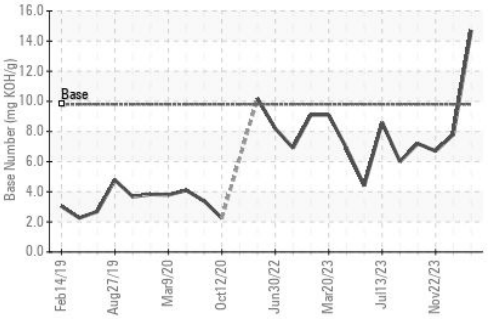

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0103271 **Recieved** : 30 Jan 2024
**Lab Number** : 06074414 **Diagnosed** : 01 Feb 2024
**Unique Number** : 10856505 **Diagnostician** : Jonathan Hester
**Test Package** : FLEET ( Additional Tests: Glycol )

*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)*

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