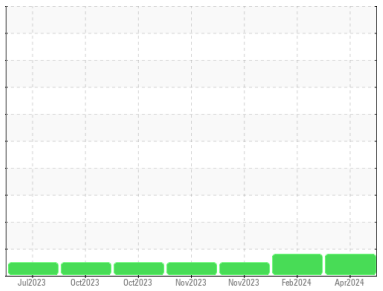
# OIL ANALYSIS REPORT

Sample Rating Trend




**WEAR**

Machine Id
**913063**
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**
Valve wear is indicated.

**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 | | **GFL0104487** | GFL0104347 | GFL0059281 |
| Sample Date | | Client Info | | **03 Apr 2024** | 28 Feb 2024 | 16 Nov 2023 |
| Machine Age | hrs | Client Info | | **20287** | 16572 | 17268 |
| Oil Age | hrs | Client Info | | **600** | 600 | 17268 |
| Oil Changed | | Client Info | | **Changed** | 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 | >120 | **15** | 4 | 73 |
| Chromium | ppm | ASTM D5185m | >20 | **2** | 0 | 3 |
| Nickel | ppm | ASTM D5185m | >5 | ▲ **9** | ▲ 8 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | **<1** | 0 | <1 |
| Silver | ppm | ASTM D5185m | >2 | **<1** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | **3** | <1 | 6 |
| Lead | ppm | ASTM D5185m | >40 | **<1** | 0 | <1 |
| Copper | ppm | ASTM D5185m | >330 | **31** | 26 | 3 |
| Tin | ppm | ASTM D5185m | >15 | **1** | 0 | 0 |
| Vanadium | ppm | ASTM D5185m | | **<1** | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | **<1** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **18** | 12 | 2 |
| Barium | ppm | ASTM D5185m | 0 | **0** | 2 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | **54** | 49 | 65 |
| Manganese | ppm | ASTM D5185m | 0 | **1** | 0 | <1 |
| Magnesium | ppm | ASTM D5185m | 1010 | **787** | 837 | 1063 |
| Calcium | ppm | ASTM D5185m | 1070 | **1142** | 976 | 1177 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **875** | 933 | 1065 |
| Zinc | ppm | ASTM D5185m | 1270 | **1121** | 1066 | 1347 |
| Sulfur | ppm | ASTM D5185m | 2060 | **2684** | 2501 | 2626 |

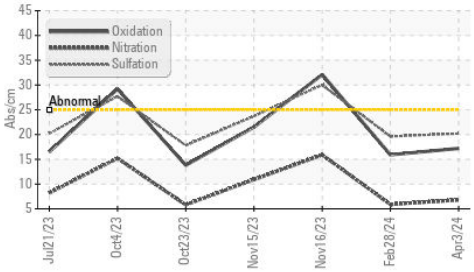
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **7** | 3 | 15 |
| Sodium | ppm | ASTM D5185m | | **25** | 8 | 11 |
| Potassium | ppm | ASTM D5185m | >20 | **4** | 0 | 3 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >4 | **0.3** | 0.2 | 1.3 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **6.8** | 5.9 | 15.9 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **20.2** | 19.6 | 30.0 |

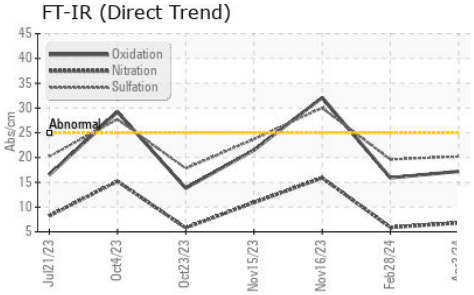
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **17.2** | 15.9 | 32.1 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **8.0** | 7.7 | 4.0 |

# OIL ANALYSIS REPORT

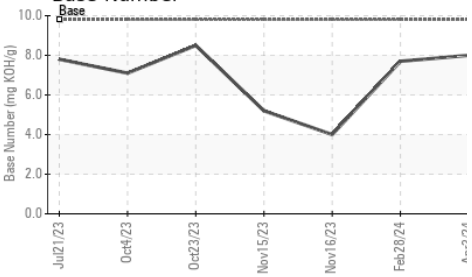
FT-IR (Direct Trend)



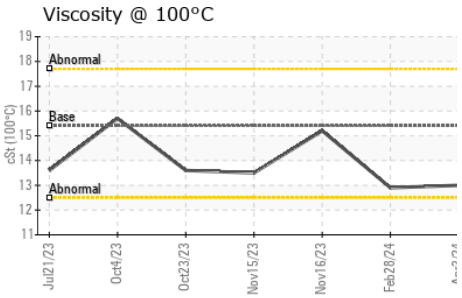

FT-IR (Direct Trend)




Base Number




Viscosity @ 100°C

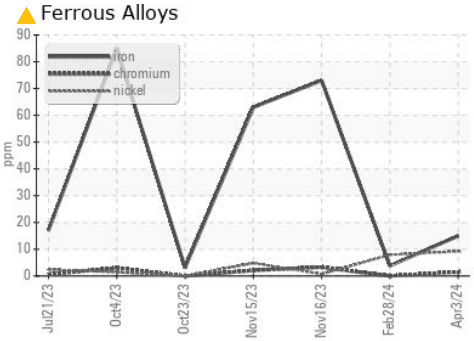



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

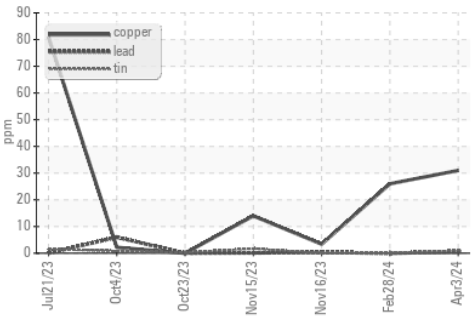
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | **13.0** | 12.9 | 15.2 |

## GRAPHS

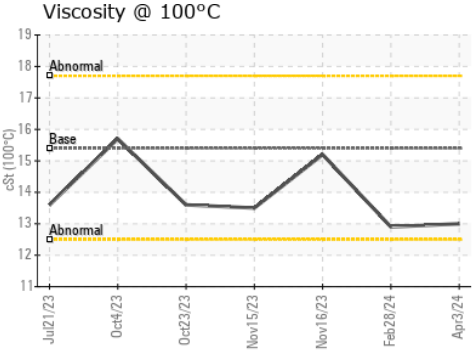
Ferrous Alloys



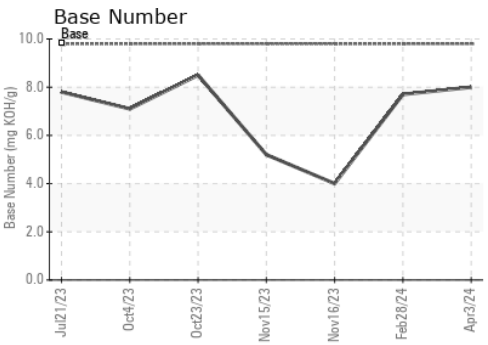

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0104487
**Lab Number** : 06140954
**Unique Number** : 10965762
**Test Package** : FLEET

**Received** : 08 Apr 2024
**Tested** : 08 Apr 2024
**Diagnosed** : 10 Apr 2024 - Jonathan Hester

*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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Report Id: GFL410 [WUSCAR] 06140954 (Generated: 04/10/2024 10:55:24) Rev: 1

Submitted By: seel also GFL468 - Laura Wilson