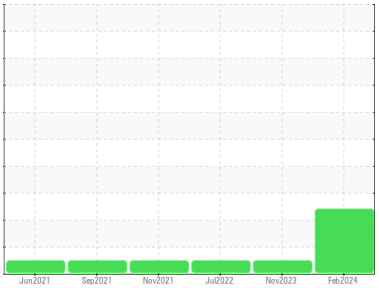
# OIL ANALYSIS REPORT

Machine Id
**602M**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (9 GAL)**

Sample Rating Trend




**GLYCOL**

## DIAGNOSIS

**Recommendation**
We advise that you check for possible coolant leak. Check for low coolant level. We advise that you check the fuel injection system. 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. There is a moderate amount of fuel present in the oil.

**Fluid Condition**
Fuel is present in the oil and is lowering the viscosity. 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 | | **GFL0106705** | GFL0097712 | GFL0055105 |
| Sample Date | | Client Info | | **14 Feb 2024** | 02 Nov 2023 | 26 Jul 2022 |
| Machine Age | hrs | Client Info | | **14899** | 14606 | 13376 |
| Oil Age | hrs | Client Info | | **293** | 700 | 11438 |
| Oil Changed | | Client Info | | **Changed** | Changed | Changed |
| Sample Status | | | | **ABNORMAL** | NORMAL | NORMAL |

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

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >120 | **13** | 6 | 8 |
| Chromium | ppm | ASTM D5185m | >20 | **<1** | 0 | <1 |
| Nickel | ppm | ASTM D5185m | >5 | **0** | 0 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | **0** | 0 | 0 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | 1 |
| Aluminum | ppm | ASTM D5185m | >20 | **2** | 2 | 1 |
| Lead | ppm | ASTM D5185m | >40 | **<1** | 0 | 2 |
| Copper | ppm | ASTM D5185m | >330 | **<1** | 9 | 1 |
| Tin | ppm | ASTM D5185m | >15 | **0** | 0 | 1 |
| Antimony | ppm | ASTM D5185m | | **---** | --- | --- |
| Vanadium | ppm | ASTM D5185m | | **<1** | <1 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **7** | 4 | 4 |
| Barium | ppm | ASTM D5185m | 0 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | **64** | 62 | 59 |
| Manganese | ppm | ASTM D5185m | 0 | **0** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | 1010 | **977** | 976 | 922 |
| Calcium | ppm | ASTM D5185m | 1070 | **1000** | 1111 | 1128 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **1044** | 972 | 911 |
| Zinc | ppm | ASTM D5185m | 1270 | **1258** | 1253 | 1208 |
| Sulfur | ppm | ASTM D5185m | 2060 | **3008** | 2689 | 3041 |

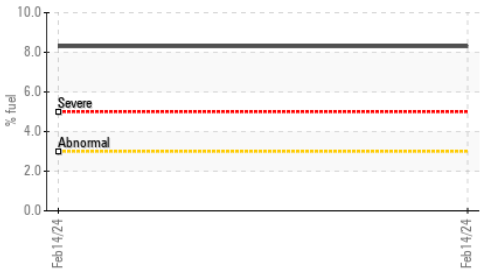
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **8** | 6 | 4 |
| Sodium | ppm | ASTM D5185m | | ▲ **202** | 7 | 3 |
| Potassium | ppm | ASTM D5185m | >20 | **2** | 0 | 0 |
| Fuel | % | ASTM D3524 | >3.0 | ▲ **8.3** | <1.0 | <1.0 |
| Glycol | % | *ASTM D2982 | | **NEG** | NEG | NEG |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >4 | **0.2** | 0.3 | 0.6 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **9.8** | 7.5 | 8.9 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **20.7** | 19.9 | 22.0 |

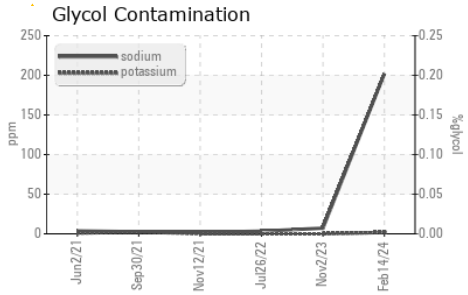
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **19.3** | 15.4 | 17.6 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **8.1** | 7.6 | 7.8 |

# OIL ANALYSIS REPORT

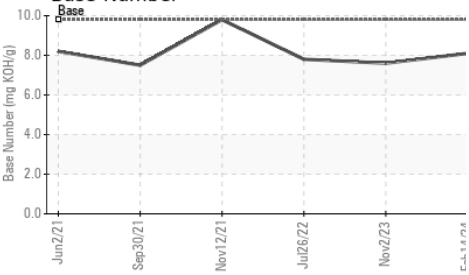
Fuel Dilution



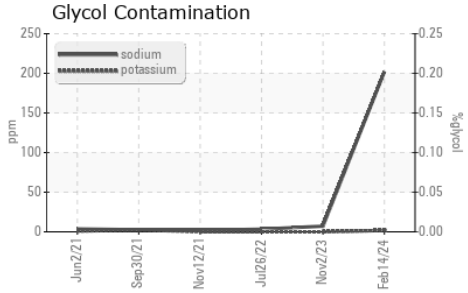

Glycol Contamination




Base Number




Glycol Contamination

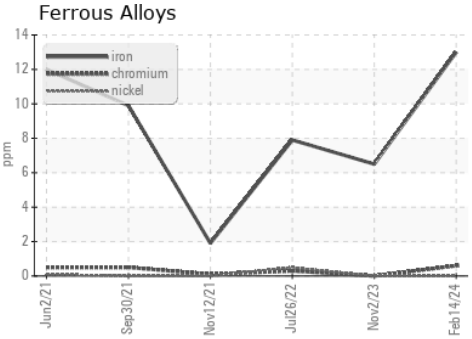



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

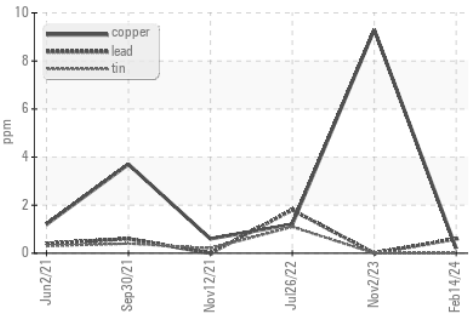
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | ▲ **12.3** | 13.8 | 13.8 |

## GRAPHS

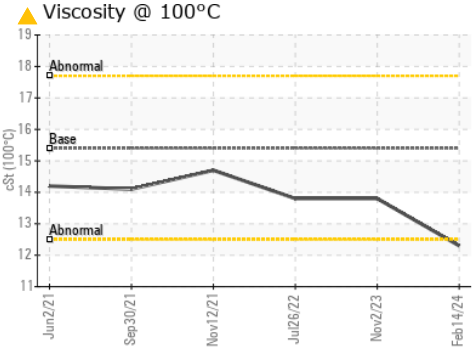
Ferrous Alloys



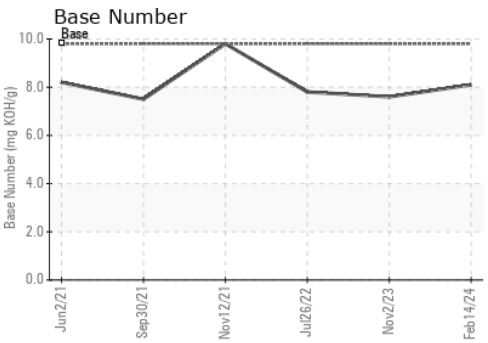

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0106705
**Lab Number** : 06092657
**Unique Number** : 10885510
**Test Package** : FLEET ( Additional Tests: FuelDilution, Glycol, PercentFuel )

**Received** : 19 Feb 2024
**Tested** : 22 Feb 2024
**Diagnosed** : 22 Feb 2024 - Jonathan Hester

**GFL Environmental - 405 - Arbor Hills**
7400 Napier Rd
NORTHVILLE, MI
US 48168
Contact: Anthony Hopkins
ahopkins@gflenv.com
T:
F:

*To discuss this sample report, contact Customer Service at 1-800-237-1369.*
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*Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)*