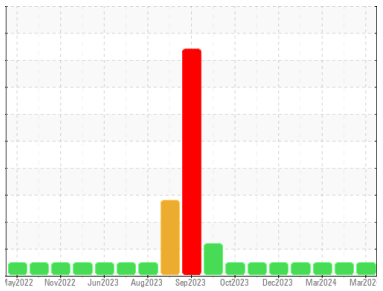
# OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL

Machine Id
**223031-10**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (--- GAL)**

## DIAGNOSIS

**Recommendation**
Resample at the next service interval to monitor.

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

**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 suitable for further service.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **GFL0110542** | GFL0110582 | GFL0110553 |
| Sample Date | | Client Info | | **27 Mar 2024** | 25 Mar 2024 | 12 Mar 2024 |
| Machine Age | hrs | Client Info | | **45659** | 27127 | 455340 |
| Oil Age | hrs | Client Info | | **600** | 200 | 0 |
| Oil Changed | | Client Info | | **Changed** | Not Changd | Not Changd |
| Sample Status | | | | **NORMAL** | 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 | **14** | 11 | 13 |
| Chromium | ppm | ASTM D5185m | >20 | **<1** | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >4 | **<1** | <1 | <1 |
| Titanium | ppm | ASTM D5185m | | **<1** | 0 | 0 |
| Silver | ppm | ASTM D5185m | >3 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | **2** | 2 | 2 |
| Lead | ppm | ASTM D5185m | >40 | **<1** | 0 | 0 |
| Copper | ppm | ASTM D5185m | >330 | **2** | 2 | 1 |
| Tin | ppm | ASTM D5185m | >15 | **<1** | 2 | <1 |
| Vanadium | ppm | ASTM D5185m | | **<1** | <1 | 0 |
| Cadmium | ppm | ASTM D5185m | | **<1** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **77** | 84 | 3 |
| Barium | ppm | ASTM D5185m | 0 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | **62** | 54 | 61 |
| Manganese | ppm | ASTM D5185m | 0 | **<1** | <1 | 0 |
| Magnesium | ppm | ASTM D5185m | 1010 | **830** | 764 | 948 |
| Calcium | ppm | ASTM D5185m | 1070 | **1473** | 1526 | 1071 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **995** | 909 | 1019 |
| Zinc | ppm | ASTM D5185m | 1270 | **1208** | 1137 | 1176 |
| Sulfur | ppm | ASTM D5185m | 2060 | **3126** | 3435 | 3031 |

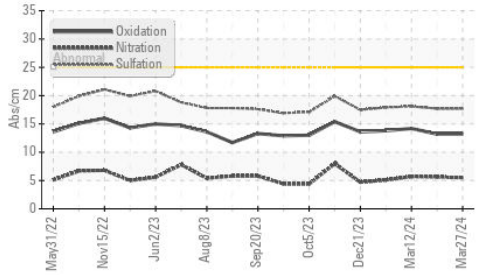
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **5** | 3 | 3 |
| Sodium | ppm | ASTM D5185m | | **<1** | 3 | <1 |
| Potassium | ppm | ASTM D5185m | >20 | **5** | 4 | 4 |
| Fuel | % | ASTM D3524 | >2.0 | **<1.0** | <1.0 | 0.4 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **0.2** | 0.2 | 0.2 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **5.5** | 5.6 | 5.7 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **17.7** | 17.7 | 18.1 |

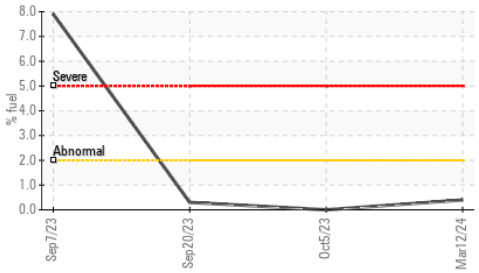
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **13.2** | 13.2 | 14.2 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **8.8** | 8.4 | 8.7 |

# OIL ANALYSIS REPORT

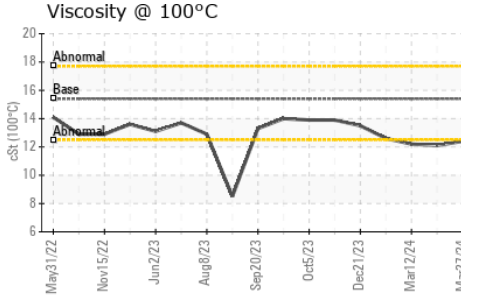
FT-IR (Direct Trend)



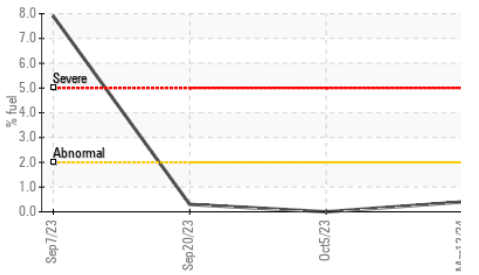

Fuel Dilution




Viscosity @ 100°C




Fuel Dilution

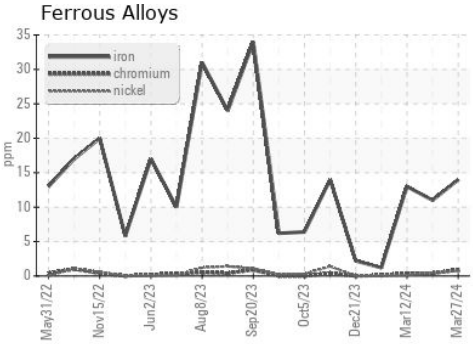



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

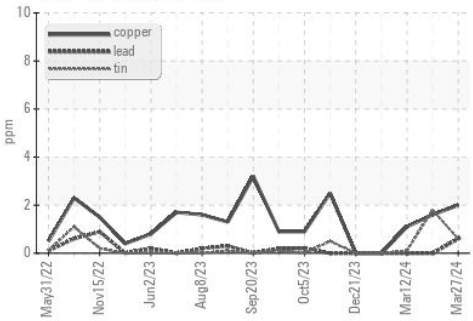
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | **12.4** | 12.1 | 12.2 |

## GRAPHS

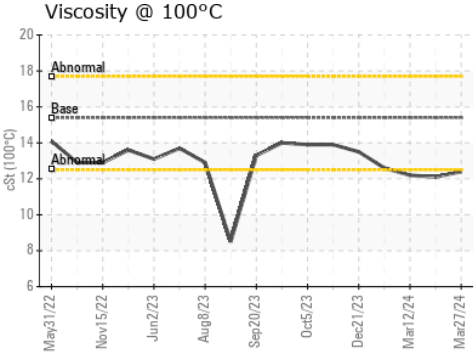
Ferrous Alloys



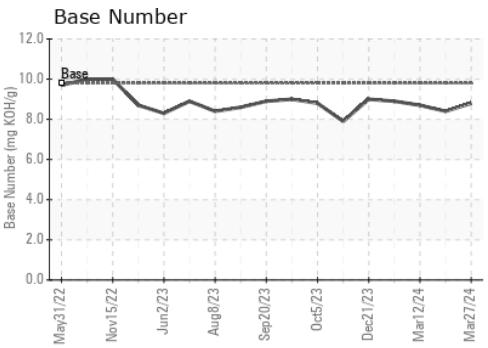

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0110542
**Lab Number** : 06140915
**Unique Number** : 10965723
**Test Package** : FLEET ( Additional Tests: FuelDilution )

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

**GFL Environmental - 166 - Phenix City**
18 Old Brickyard Rd
Phenix City, AL
US 36869
Contact: DEAN PEACE JR
dean.peace@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)*