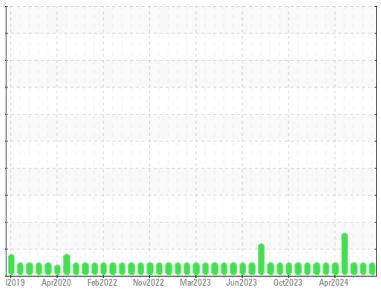
# OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL

Area
**(16KM0A)**
Machine Id
**429049-402451**
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 | | **GFL0124080** | GFL0120145 | GFL0117231 |
| Sample Date | | Client Info | | **10 Jul 2024** | 28 May 2024 | 13 May 2024 |
| Machine Age | hrs | Client Info | | **16750** | 16396 | 16235 |
| Oil Age | hrs | Client Info | | **0** | 0 | 600 |
| Oil Changed | | Client Info | | **Not Changd** | Not Changd | Changed |
| Sample Status | | | | **NORMAL** | NORMAL | 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 | >165 | **16** | <1 | 3 |
| Chromium | ppm | ASTM D5185m | >5 | **<1** | 0 | 0 |
| Nickel | ppm | ASTM D5185m | >4 | **0** | 0 | 0 |
| Titanium | ppm | ASTM D5185m | >2 | **0** | 0 | 0 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | **3** | 0 | 2 |
| Lead | ppm | ASTM D5185m | >150 | **2** | 0 | 0 |
| Copper | ppm | ASTM D5185m | >90 | **2** | 0 | 0 |
| Tin | ppm | ASTM D5185m | >5 | **0** | 0 | <1 |
| Vanadium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **4** | 3 | 2 |
| Barium | ppm | ASTM D5185m | 0 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | **64** | 55 | 59 |
| Manganese | ppm | ASTM D5185m | 0 | **0** | 0 | <1 |
| Magnesium | ppm | ASTM D5185m | 1010 | **974** | 909 | 969 |
| Calcium | ppm | ASTM D5185m | 1070 | **1194** | 1038 | 1091 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **935** | 975 | 1090 |
| Zinc | ppm | ASTM D5185m | 1270 | **1268** | 1175 | 1284 |
| Sulfur | ppm | ASTM D5185m | 2060 | **2679** | 3321 | 3716 |

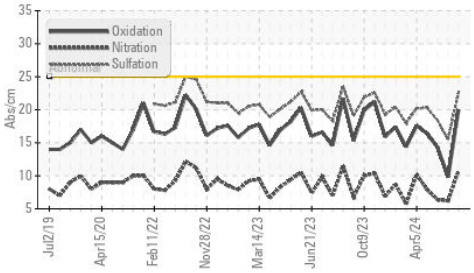
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >35 | **8** | 10 | 14 |
| Sodium | ppm | ASTM D5185m | | **<1** | 2 | 3 |
| Potassium | ppm | ASTM D5185m | >20 | **7** | 0 | 2 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >7.5 | **0.6** | 0.5 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **10.8** | 6.2 | 6.4 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **22.6** | 15.5 | 18.4 |

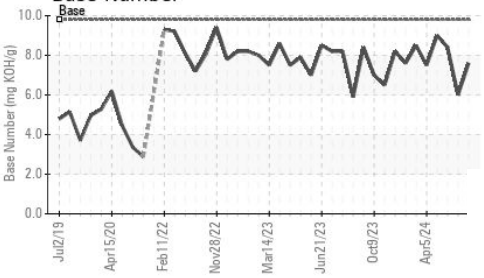
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **20.0** | 9.8 | 14.3 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **7.6** | 6.0 | 8.4 |

# OIL ANALYSIS REPORT

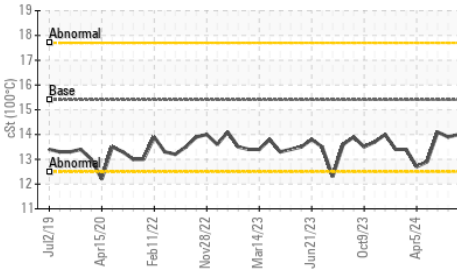
FT-IR (Direct Trend)




Base Number




Viscosity @ 100°C

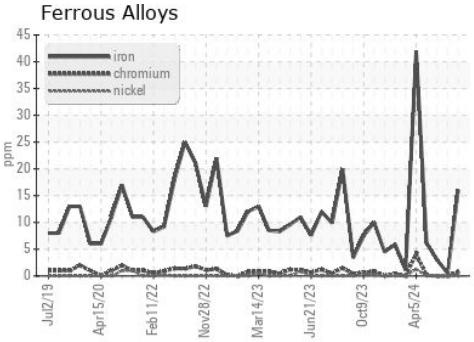



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

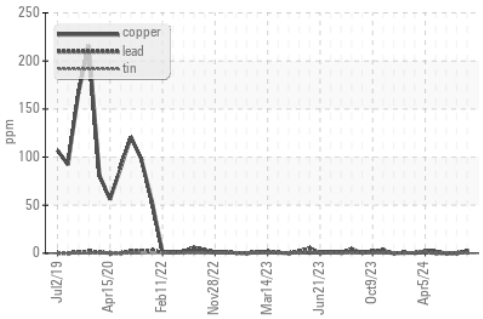
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | **14.0** | 13.9 | 14.1 |

## GRAPHS

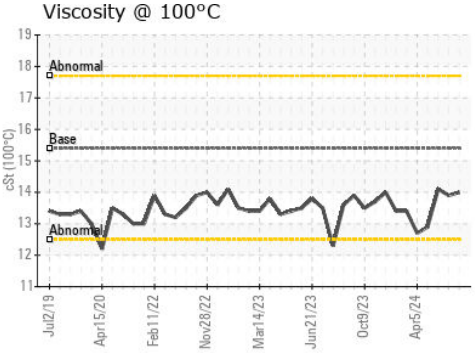
Ferrous Alloys



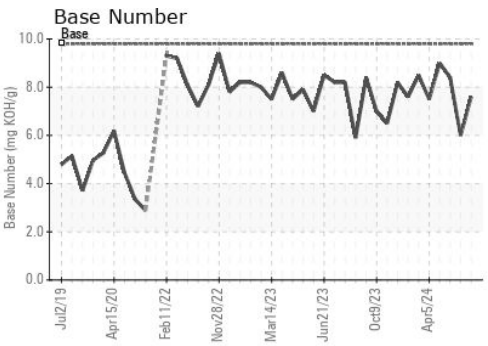

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0124080
**Lab Number** : 06237586
**Unique Number** : 11126420
**Test Package** : FLEET

**Received** : 16 Jul 2024
**Tested** : 17 Jul 2024
**Diagnosed** : 17 Jul 2024 - Wes Davis

**GFL Environmental - 836 - Kansas City Hauling**
7801 East Truman Road
Kansas City, MO
US 64126
Contact: Loyce Stewart
loyce.stewart@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)*