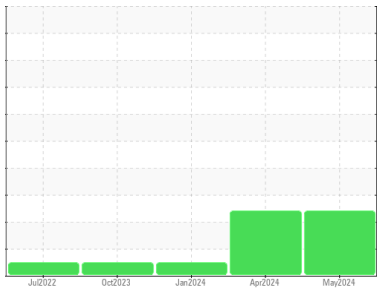
# OIL ANALYSIS REPORT

Sample Rating Trend




**DIRT**

Area
**(41429UA)**
Machine Id
**829095**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (--- GAL)**

## DIAGNOSIS

**Recommendation**
We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Resample at the next service interval to monitor.

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

**Contamination**
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. The condition of the oil is suitable for further service.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **GFL0111908** | GFL0116617 | GFL0108313 |
| Sample Date | | Client Info | | **03 May 2024** | 23 Apr 2024 | 24 Jan 2024 |
| Machine Age | hrs | Client Info | | **8976** | 8910 | 8835 |
| Oil Age | hrs | Client Info | | **8901** | 8910 | 8835 |
| Oil Changed | | Client Info | | **Not Changd** | Not Changd | Changed |
| Sample Status | | | | **ABNORMAL** | ABNORMAL | NORMAL |

| 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 |
| Glycol | | WC Method | | **NEG** | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >100 | **43** | 36 | 17 |
| Chromium | ppm | ASTM D5185m | >20 | **2** | 1 | <1 |
| Nickel | ppm | ASTM D5185m | >4 | **<1** | 0 | 0 |
| Titanium | ppm | ASTM D5185m | | **<1** | 0 | 0 |
| Silver | ppm | ASTM D5185m | >3 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | **8** | 7 | 3 |
| Lead | ppm | ASTM D5185m | >40 | **0** | 0 | 0 |
| Copper | ppm | ASTM D5185m | >330 | **2** | 1 | 0 |
| 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 | **8** | 10 | 8 |
| Barium | ppm | ASTM D5185m | 0 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | **58** | 57 | 58 |
| Manganese | ppm | ASTM D5185m | 0 | **<1** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | 1010 | **870** | 931 | 1002 |
| Calcium | ppm | ASTM D5185m | 1070 | **1060** | 1130 | 1135 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **1005** | 1023 | 1079 |
| Zinc | ppm | ASTM D5185m | 1270 | **1161** | 1233 | 1306 |
| Sulfur | ppm | ASTM D5185m | 2060 | **2982** | 3332 | 3398 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **36** | 33 | 10 |
| Sodium | ppm | ASTM D5185m | | **5** | 3 | 3 |
| Potassium | ppm | ASTM D5185m | >20 | **12** | 5 | 10 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **0.5** | 0.4 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **7.9** | 7.2 | 5.0 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **19.3** | 18.8 | 17.5 |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **14.8** | 14.6 | 13.1 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **8.2** | 8.7 | 8.7 |

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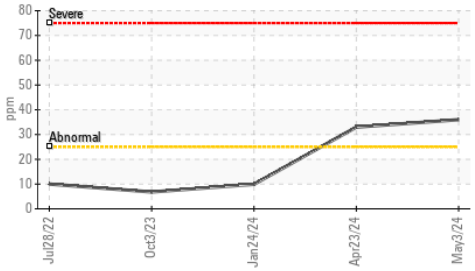
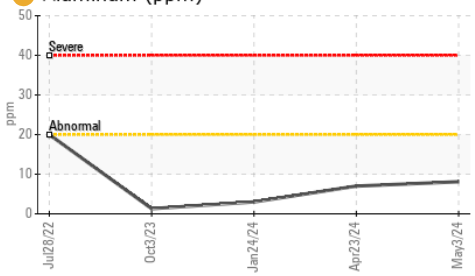
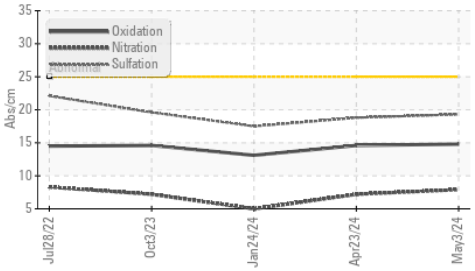
Silicon (ppm)



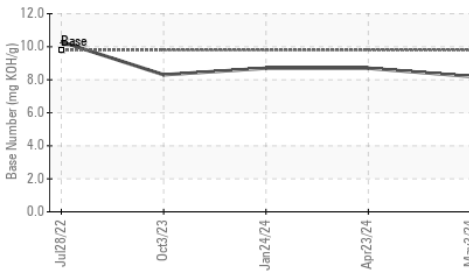

Aluminum (ppm)



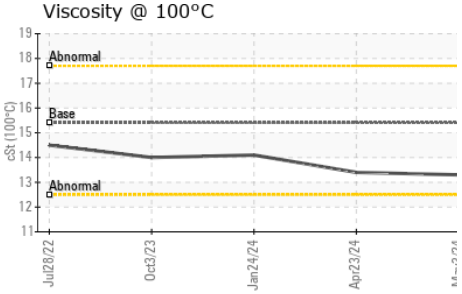

FT-IR (Direct Trend)




Base Number




Viscosity @ 100°C

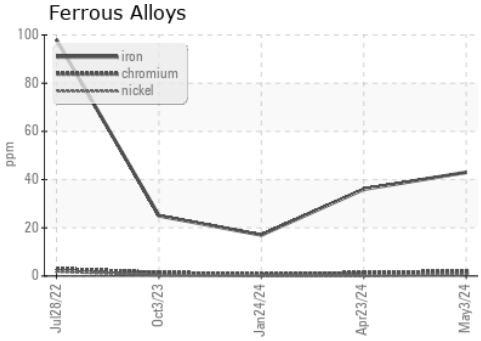



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

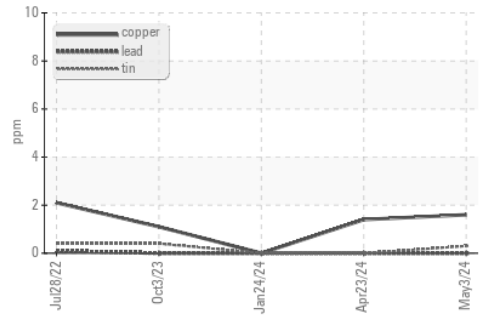
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | **13.3** | 13.4 | 14.1 |

## GRAPHS

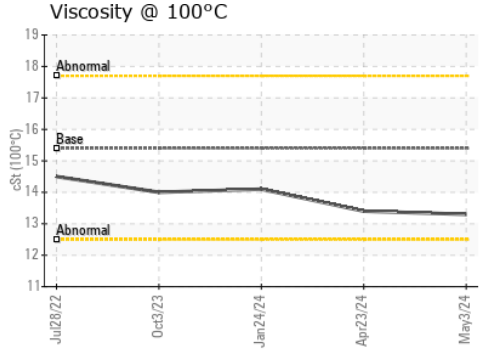
Ferrous Alloys



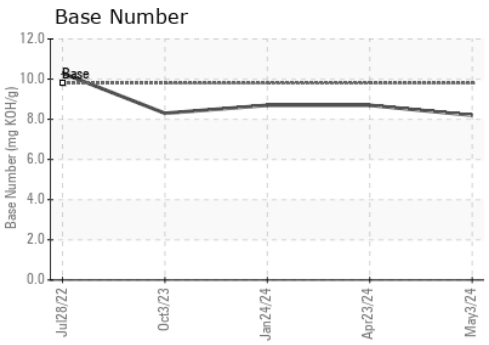

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0111908
**Lab Number** : 06174939
**Unique Number** : 11020992
**Test Package** : FLEET

**Received** : 09 May 2024
**Tested** : 10 May 2024
**Diagnosed** : 13 May 2024 - Don Baldridge

*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: GFL652 [WUSCAR] 06174939 (Generated: 05/13/2024 14:45:09) Rev: 1

Submitted By: TECHNICIAN ACCOUNT