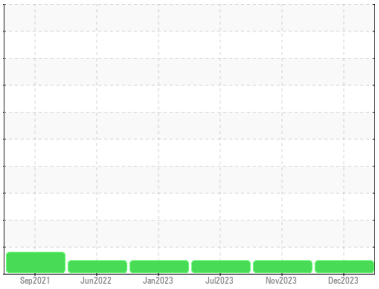
# OIL ANALYSIS REPORT

Sample Rating Trend




**NORMAL**

Machine Id
**924038-23**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (--- LTR)**

## 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 | | **GFL0023444** | GFL0085529 | GFL0060405 |
| Sample Date | | Client Info | | **22 Dec 2023** | 07 Nov 2023 | 09 Jul 2023 |
| Machine Age | hrs | Client Info | | **306872** | 12373 | 11671 |
| Oil Age | hrs | Client Info | | **12483** | 0 | 0 |
| Oil Changed | | Client Info | | **Changed** | Changed | 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 | >120 | **4** | 18 | 31 |
| Chromium | ppm | ASTM D5185m | >20 | **<1** | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >5 | **0** | <1 | 1 |
| Titanium | ppm | ASTM D5185m | >2 | **0** | <1 | <1 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | **2** | 3 | 4 |
| Lead | ppm | ASTM D5185m | >40 | **0** | 0 | <1 |
| Copper | ppm | ASTM D5185m | >330 | **<1** | 2 | 5 |
| Tin | ppm | ASTM D5185m | >15 | **0** | 0 | <1 |
| Vanadium | ppm | ASTM D5185m | | **0** | <1 | <1 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | <1 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **7** | 0 | <1 |
| Barium | ppm | ASTM D5185m | 0 | **0** | 0 | <1 |
| Molybdenum | ppm | ASTM D5185m | 60 | **52** | 58 | 63 |
| Manganese | ppm | ASTM D5185m | 0 | **0** | 0 | 1 |
| Magnesium | ppm | ASTM D5185m | 1010 | **784** | 860 | 924 |
| Calcium | ppm | ASTM D5185m | 1070 | **1012** | 1035 | 1159 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **912** | 952 | 979 |
| Zinc | ppm | ASTM D5185m | 1270 | **1119** | 1203 | 1276 |
| Sulfur | ppm | ASTM D5185m | 2060 | **3014** | 3159 | 3671 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **3** | 5 | 6 |
| Sodium | ppm | ASTM D5185m | | **<1** | 6 | 8 |
| Potassium | ppm | ASTM D5185m | >20 | **2** | 2 | 2 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >4 | **0.3** | 1.1 | 1.8 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **5.6** | 9.5 | 10.6 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **17.1** | 20.3 | 20.5 |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **12.6** | 14.9 | 14.2 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **8.5** | 6.9 | 6.6 |

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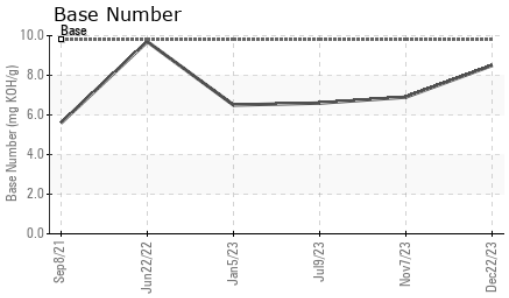
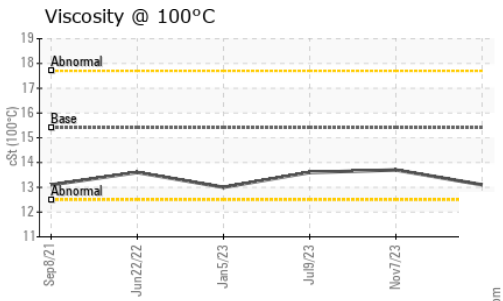
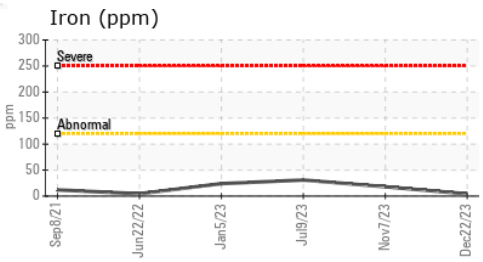


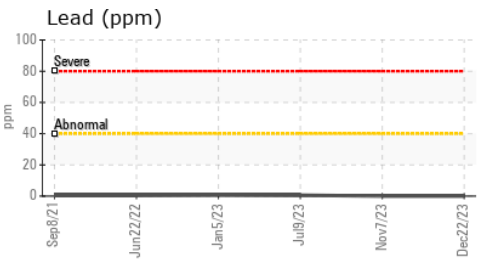



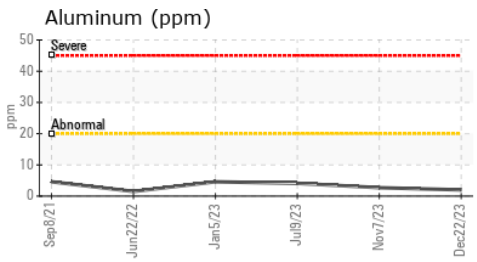

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

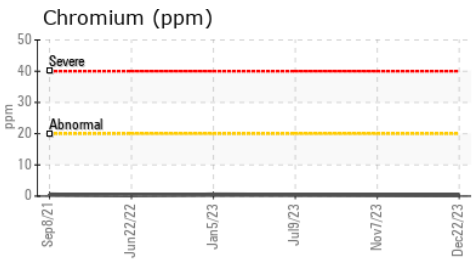
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | **13.1** | 13.7 | 13.6 |

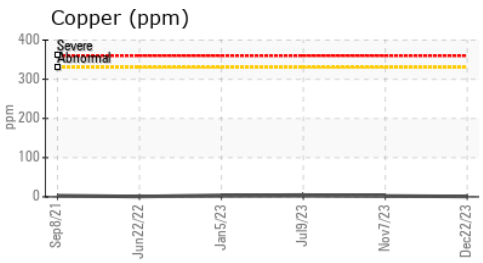
## GRAPHS

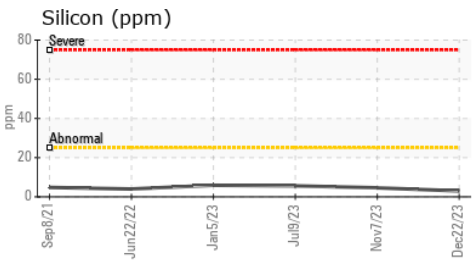


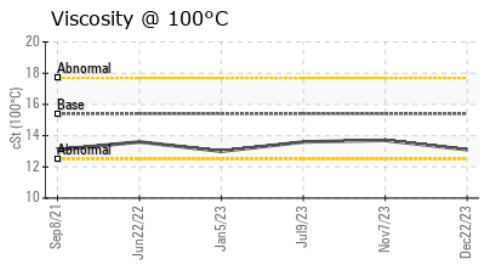



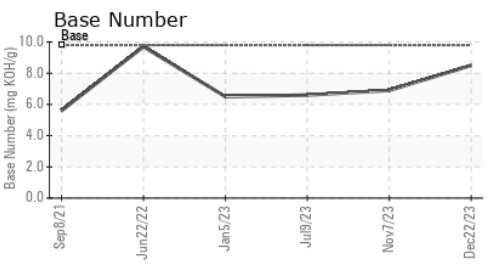




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0023444
**Lab Number** : 06045825
**Unique Number** : 10806433
**Test Package** : MOB1+

**Recieved** : 27 Dec 2023
**Diagnosed** : 28 Dec 2023
**Diagnostician** : Wes Davis

**GFL Environmental - 660S - Roanoke**
2045 LEE HWY
Cloverdale, VA
US 24077
Contact: DELBERT BEASLEY
T:
F:

*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)*