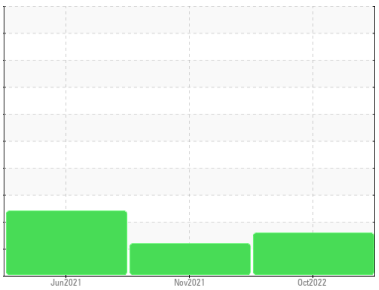
# OIL ANALYSIS REPORT

Sample Rating Trend




**WEAR**

Machine Id
**801186**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (--- GAL)**

## DIAGNOSIS

**Recommendation**
The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

**Wear**
Iron ppm levels are abnormal. Cylinder, crank, or cam shaft wear is indicated.

**Contamination**
Light fuel dilution occurring. No other contaminants were detected in the oil.

**Fluid Condition**
The oil is no longer serviceable as a result of the abnormal and/or severe wear.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **GFL0054672** | GFL0035413 | GFL0024395 |
| Sample Date | | Client Info | | **30 Oct 2022** | 18 Nov 2021 | 13 Jun 2021 |
| Machine Age | hrs | Client Info | | **15346** | 13099 | 183197 |
| Oil Age | hrs | Client Info | | **1256** | 600 | 6000 |
| Oil Changed | | Client Info | | **Changed** | Changed | Changed |
| Sample Status | | | | **ABNORMAL** | ABNORMAL | SEVERE |

| 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 |
|---|---|---|---|---|---|---|
| PQ | | ASTM D8184* | | **0** | --- | --- |
| Iron | ppm | ASTM D5185(m) | >100 | ▲ **102** | 31 | 51 |
| Chromium | ppm | ASTM D5185(m) | >20 | **4** | 1 | 2 |
| Nickel | ppm | ASTM D5185(m) | >4 | **<1** | <1 | <1 |
| Titanium | ppm | ASTM D5185(m) | | **<1** | 0 | 0 |
| Silver | ppm | ASTM D5185(m) | >3 | **0** | <1 | <1 |
| Aluminum | ppm | ASTM D5185(m) | >20 | **6** | 2 | 4 |
| Lead | ppm | ASTM D5185(m) | >40 | **<1** | <1 | 2 |
| Copper | ppm | ASTM D5185(m) | >330 | **5** | 6 | 65 |
| Tin | ppm | ASTM D5185(m) | >15 | **<1** | <1 | <1 |
| Antimony | ppm | ASTM D5185(m) | | **<1** | <1 | 0 |
| Vanadium | ppm | ASTM D5185(m) | | **<1** | 0 | <1 |
| Beryllium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Cadmium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185(m) | 0 | **4** | 4 | 4 |
| Barium | ppm | ASTM D5185(m) | 0 | **0** | 0 | <1 |
| Molybdenum | ppm | ASTM D5185(m) | 60 | **60** | 53 | 51 |
| Manganese | ppm | ASTM D5185(m) | 0 | **1** | <1 | 1 |
| Magnesium | ppm | ASTM D5185(m) | 1010 | **982** | 883 | 803 |
| Calcium | ppm | ASTM D5185(m) | 1070 | **1106** | 942 | 1014 |
| Phosphorus | ppm | ASTM D5185(m) | 1150 | **1074** | 868 | 842 |
| Zinc | ppm | ASTM D5185(m) | 1270 | **1242** | 1071 | 1097 |
| Sulfur | ppm | ASTM D5185(m) | 2060 | **2324** | 2241 | 1994 |
| Lithium | ppm | ASTM D5185(m) | | **<1** | <1 | <1 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185(m) | >25 | **14** | 7 | 9 |
| Sodium | ppm | ASTM D5185(m) | | **14** | 7 | 8 |
| Potassium | ppm | ASTM D5185(m) | >20 | **4** | 2 | 3 |
| Fuel | % | ASTM D7593* | >5 | ▲ **2.6** | ▲ 7.1 | ▲ 8.1 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | ASTM D7844* | >3 | **1.7** | 0.5 | 0.9 |
| Nitration | Abs/cm | ASTM D7624* | >20 | **19.5** | 13.3 | 14.6 |
| Sulfation | Abs/.1mm | ASTM D7415* | >30 | **38.5** | 28.1 | 29.1 |

# OIL ANALYSIS REPORT

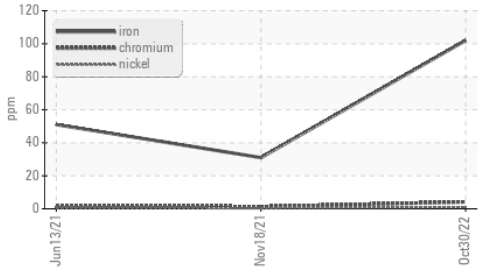
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | ASTM D7414* | >25 | **40.2** | 30.3 | 32.8 |

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Emulsified Water | scalar | Visual* | >0.2 | **NEG** | NEG | NEG |
| Free Water | scalar | Visual* | | **NEG** | NEG | NEG |

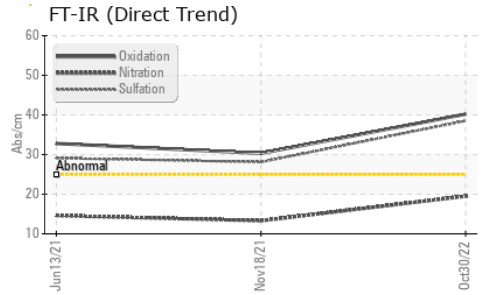
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D7279(m) | 15.4 | **15.5** | ▲ 11.9 | ▲ 11.8 |

## GRAPHS

▲ Ferrous Alloys

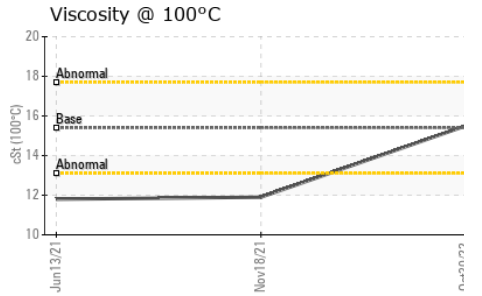



FT-IR (Direct Trend)



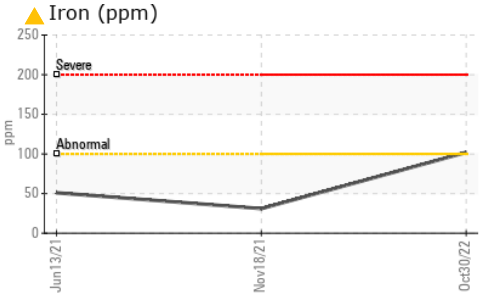

PQ


Viscosity @ 100°C

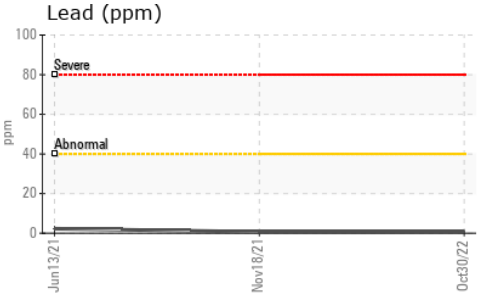



PQ

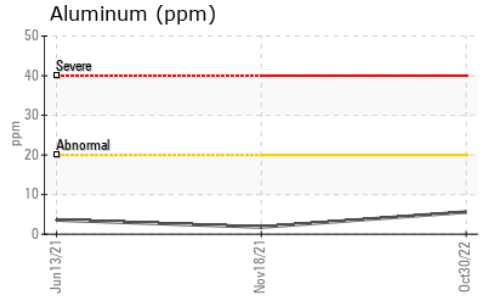

▲ Iron (ppm)



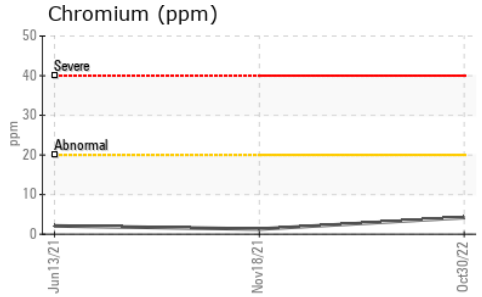

Lead (ppm)



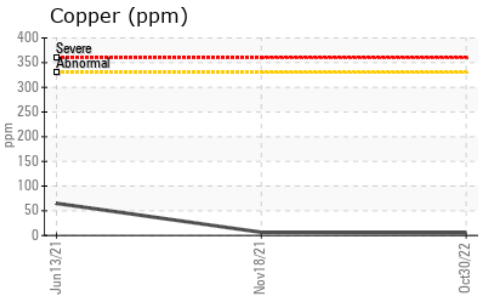

Aluminum (ppm)



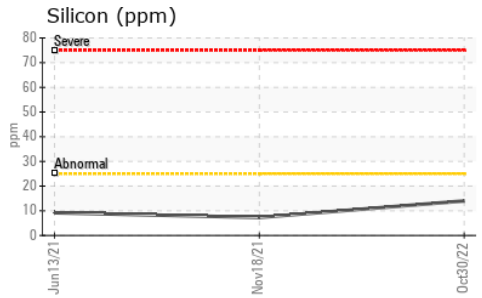

Chromium (ppm)



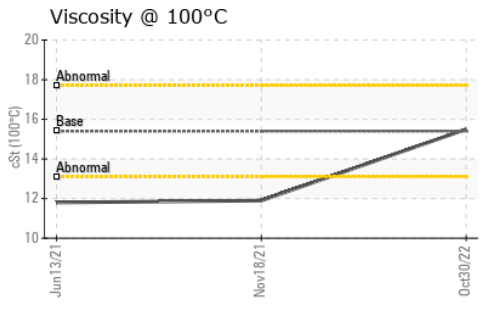

Copper (ppm)



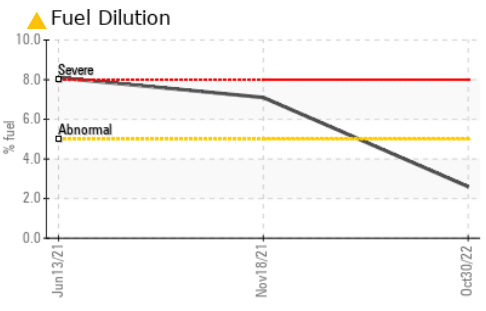

Silicon (ppm)




Viscosity @ 100°C




▲ Fuel Dilution




ISO 17025:2017 Accredited Laboratory

**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
**Sample No.** : GFL0054672
**Lab Number** : 02522733
**Unique Number** : 5487714
**Test Package** : MOB 1 ( Additional Tests: PercentFuel, PQ )

**Received** : 15 Nov 2022
**Tested** : 16 Nov 2022
**Diagnosed** : 16 Nov 2022 - Kevin Marson

*To discuss this sample report, contact Customer Service at 1-800-268-2131.*
*Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.*
*Validity of results and interpretation are based on the sample and information as supplied.*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