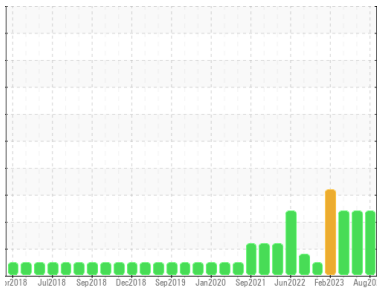
OIL DIAGNOSTICS

# OIL ANALYSIS REPORT

Sample Rating Trend



**FUEL**

Area
## Plymouth & Brockton
Machine Id
## 11412
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (39 QTS)**

## DIAGNOSIS

**Recommendation**

We advise that you check the fuel injection system. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

**Wear**

All component wear rates are normal.

**Contamination**

There is a high amount of fuel present in the oil.

**Fluid Condition**

Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **PCA0090631** | PCA0090668 | PCA0090605 |
| Sample Date | | Client Info | | **30 Aug 2023** | 19 May 2023 | 22 Apr 2023 |
| Machine Age | mls | Client Info | | **462835** | 456112 | 578101 |
| Oil Age | mls | Client Info | | **24000** | 6000 | 12000 |
| Oil Changed | | Client Info | | **Changed** | Changed | Changed |
| Sample Status | | | | **SEVERE** | SEVERE | SEVERE |

| CONTAMINATION | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|
| Glycol | WC Method | | **NEG** | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >200 | **63** | 30 | 60 |
| Chromium | ppm | ASTM D5185m | >10 | **2** | 1 | 2 |
| Nickel | ppm | ASTM D5185m | >4 | **0** | <1 | 0 |
| Titanium | ppm | ASTM D5185m | >2 | **0** | <1 | <1 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >30 | **0** | 0 | 2 |
| Lead | ppm | ASTM D5185m | >30 | **<1** | 3 | 5 |
| Copper | ppm | ASTM D5185m | >30 | **1** | <1 | 1 |
| Tin | ppm | ASTM D5185m | >4 | **5** | <1 | 1 |
| Vanadium | ppm | ASTM D5185m | | **0** | 0 | <1 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **5** | 6 | 4 |
| Barium | ppm | ASTM D5185m | 0 | **5** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | **54** | 55 | 50 |
| Manganese | ppm | ASTM D5185m | 0 | **<1** | <1 | 1 |
| Magnesium | ppm | ASTM D5185m | 1010 | **937** | 859 | 797 |
| Calcium | ppm | ASTM D5185m | 1070 | **1041** | 990 | 1009 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **962** | 912 | 861 |
| Zinc | ppm | ASTM D5185m | 1270 | **1196** | 1112 | 1082 |
| Sulfur | ppm | ASTM D5185m | 2060 | **3508** | 2970 | 2817 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >30 | **19** | 4 | 7 |
| Sodium | ppm | ASTM D5185m | | **1** | 1 | 3 |
| Potassium | ppm | ASTM D5185m | >20 | **<1** | <1 | 0 |
| Fuel | % | ASTM D3524 | >3.0 | **5.0** | 5.2 | 8.4 |

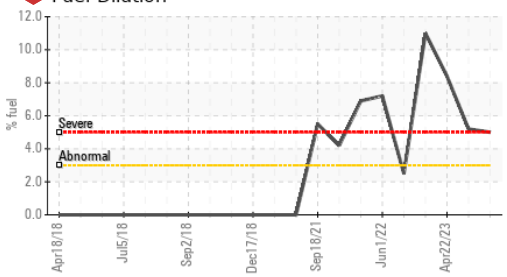
| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **1.5** | 1.4 | 2.3 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **8.5** | 7.9 | 10.5 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **20.6** | 20.3 | 22.2 |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **14.1** | 13.5 | 15.8 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **9.54** | 9.79 | 7.63 |

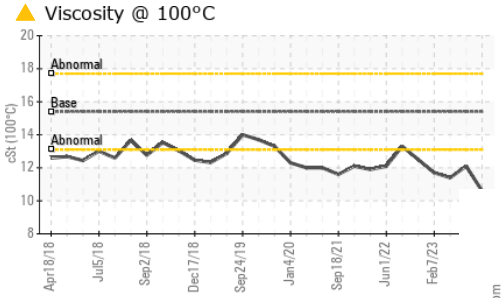
# OIL ANALYSIS REPORT

OIL DIAGNOSTICS

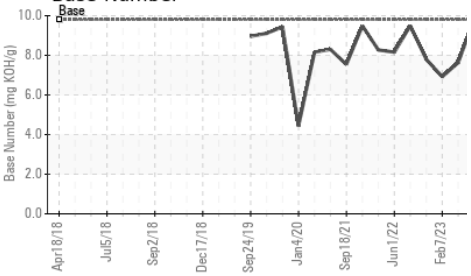
Fuel Dilution




Viscosity @ 100°C




Base Number

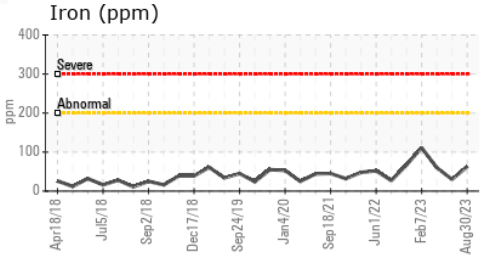



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

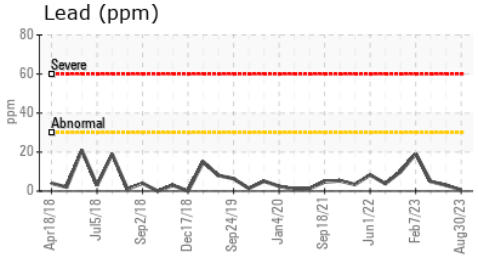
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | ▲ **10.6** | ▲ 12.1 | ▲ 11.4 |

## GRAPHS

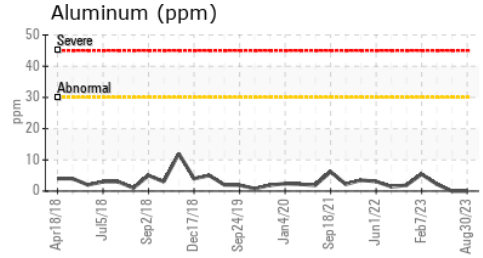
Iron (ppm)



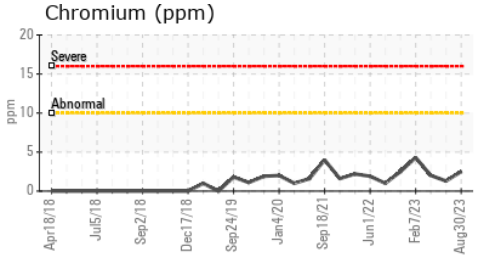

Lead (ppm)



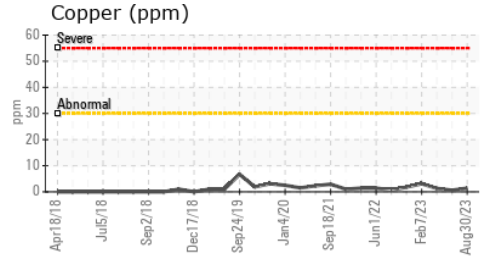

Aluminum (ppm)



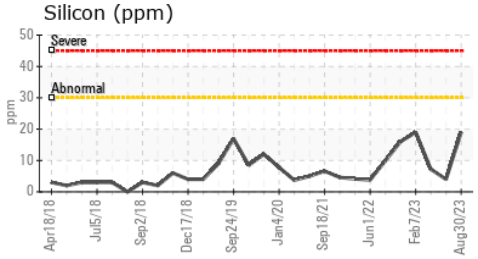

Chromium (ppm)



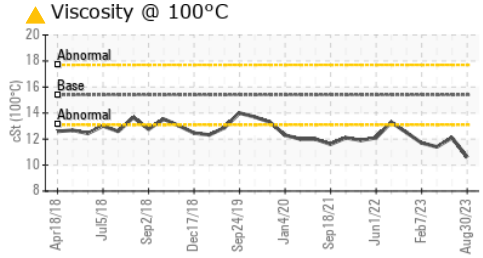

Copper (ppm)



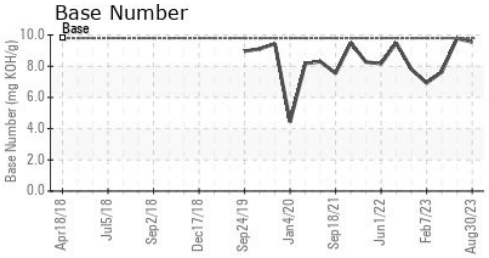

Silicon (ppm)




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : PCA0090631 **Received** : 14 Sep 2023
**Lab Number** : 05951606 **Diagnosed** : 19 Sep 2023
**Unique Number** : 10647565 **Diagnostician** : Don Baldridge
**Test Package** : MOB 2 ( Additional Tests: PercentFuel )

*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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