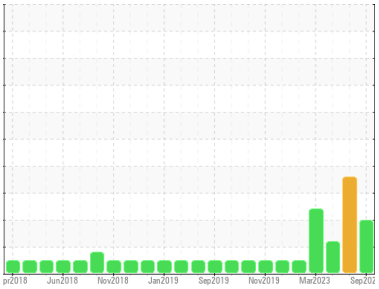
OIL DIAGNOSTICS

# OIL ANALYSIS REPORT

Sample Rating Trend



**FUEL**

Area
## Plymouth & Brockton
Machine Id
## 11411
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (39 QTS)**

## DIAGNOSIS

**Recommendation**

We advise that you check the fuel injection system. The oil 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. Tests confirm the presence of fuel in the oil.

**Fluid Condition**

The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **PCA0098695** | PCA0013383 | PCA0090507 |
| Sample Date | | Client Info | | **27 Sep 2023** | 17 Aug 2023 | 24 May 2023 |
| Machine Age | mls | Client Info | | **603723** | 598649 | 587760 |
| Oil Age | mls | Client Info | | **6000** | 24000 | 12000 |
| Oil Changed | | Client Info | | **Changed** | Changed | Not Changd |
| Sample Status | | | | **SEVERE** | SEVERE | ABNORMAL |

| 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 | **31** | 141 | 62 |
| Chromium | ppm | ASTM D5185m | >10 | **1** | 6 | 1 |
| Nickel | ppm | ASTM D5185m | >4 | **0** | 2 | 0 |
| Titanium | ppm | ASTM D5185m | >2 | **0** | 0 | <1 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >30 | **1** | 10 | 2 |
| Lead | ppm | ASTM D5185m | >30 | **2** | ▲ 34 | 9 |
| Copper | ppm | ASTM D5185m | >30 | **<1** | 5 | 4 |
| Tin | ppm | ASTM D5185m | >4 | **<1** | 4 | 2 |
| 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 | **7** | 1 | 3 |
| Barium | ppm | ASTM D5185m | 0 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | **54** | 58 | 57 |
| Manganese | ppm | ASTM D5185m | 0 | **<1** | 1 | <1 |
| Magnesium | ppm | ASTM D5185m | 1010 | **866** | 925 | 809 |
| Calcium | ppm | ASTM D5185m | 1070 | **1030** | 1087 | 1008 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **953** | 947 | 859 |
| Zinc | ppm | ASTM D5185m | 1270 | **1177** | 1202 | 1023 |
| Sulfur | ppm | ASTM D5185m | 2060 | **2913** | 3245 | 2758 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >30 | **4** | 17 | 12 |
| Sodium | ppm | ASTM D5185m | | **2** | 7 | 12 |
| Potassium | ppm | ASTM D5185m | >20 | **0** | 1 | 0 |
| Fuel | % | ASTM D3524 | >3.0 | ● **5.8** | ● 8.3 | ▲ 4.3 |

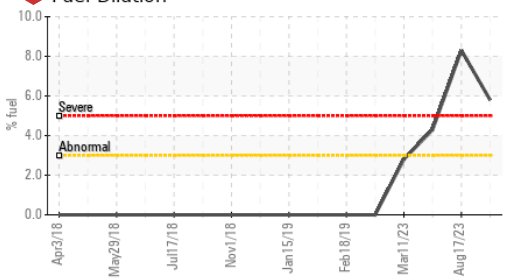
| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **1.8** | ▲ 5.5 | 2.5 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **9.6** | 20.5 | 12.6 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **23.1** | 40.5 | 27.5 |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **18.1** | 36.2 | 22.4 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **9.84** | 5.47 | 9.47 |

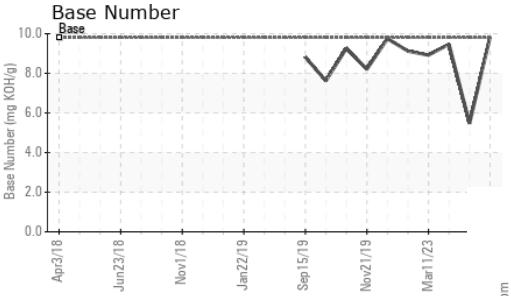
# OIL ANALYSIS REPORT

OIL DIAGNOSTICS

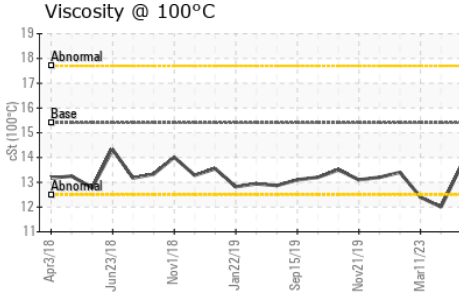
Fuel Dilution




Base Number




Viscosity @ 100°C

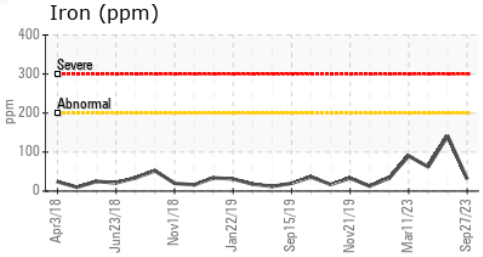



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

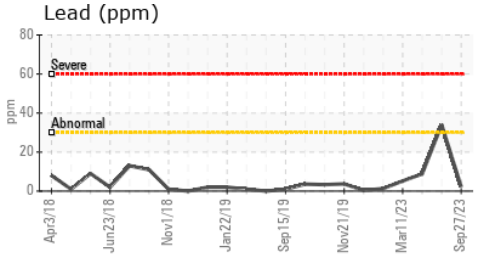
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | **12.8** | 13.7 | ▲ 12.0 |

## GRAPHS

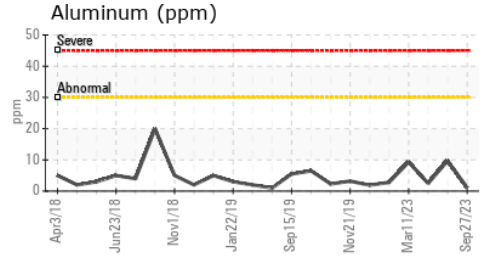
Iron (ppm)



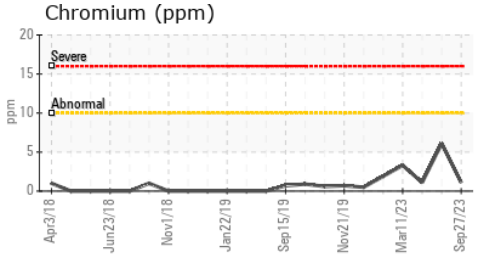

Lead (ppm)



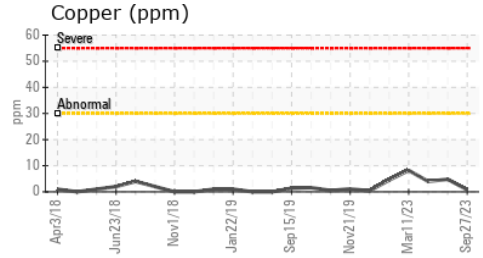

Aluminum (ppm)



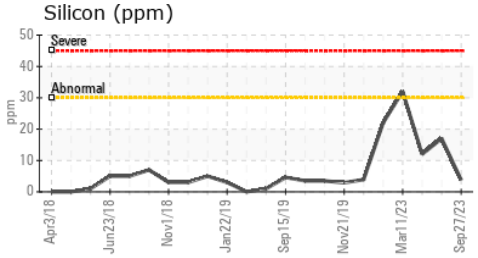

Chromium (ppm)



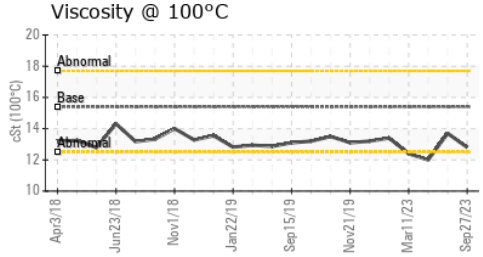

Copper (ppm)



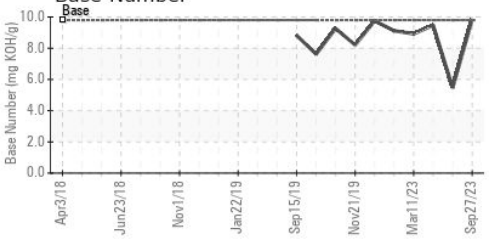

Silicon (ppm)




Viscosity @ 100°C




Base Number




ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY
Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : PCA0098695 **Received** : 05 Oct 2023
**Lab Number** : 05970515 **Diagnosed** : 09 Oct 2023
**Unique Number** : 10682465 **Diagnostician** : Wes Davis
**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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