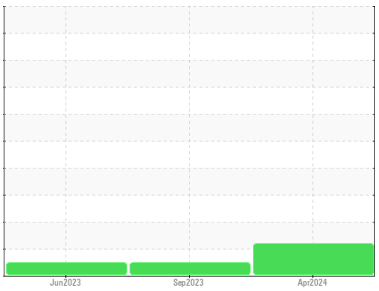
# OIL ANALYSIS REPORT

Sample Rating Trend




**DEGRADATION**

Machine Id
**639231**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 10W30 (--- QTS)**

## DIAGNOSIS

**Recommendation**
Oil and filter change at the time of sampling has been noted. 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 level is low. The condition of the oil is acceptable for the time in service.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **PCA0123235** | PCA0093341 | PCA0078760 |
| Sample Date | | Client Info | | **08 Apr 2024** | 21 Sep 2023 | 27 Jun 2023 |
| Machine Age | mls | Client Info | | **125781** | 83479 | 69341 |
| Oil Age | mls | Client Info | | **0** | 0 | 0 |
| Oil Changed | | Client Info | | **Changed** | Changed | Changed |
| Sample Status | | | | **ABNORMAL** | NORMAL | 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 | **44** | 16 | 29 |
| Chromium | ppm | ASTM D5185m | >20 | **1** | 0 | <1 |
| Nickel | ppm | ASTM D5185m | >4 | **<1** | 0 | <1 |
| Titanium | ppm | ASTM D5185m | | **4** | 6 | 5 |
| Silver | ppm | ASTM D5185m | >3 | **<1** | 0 | <1 |
| Aluminum | ppm | ASTM D5185m | >20 | **9** | 3 | 12 |
| Lead | ppm | ASTM D5185m | >40 | **<1** | 0 | <1 |
| Copper | ppm | ASTM D5185m | >330 | **7** | 3 | 6 |
| Tin | ppm | ASTM D5185m | >15 | **1** | 0 | <1 |
| Vanadium | ppm | ASTM D5185m | | **<1** | 0 | <1 |
| Cadmium | ppm | ASTM D5185m | | **<1** | 0 | <1 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 2 | **2** | 7 | 10 |
| Barium | ppm | ASTM D5185m | 0 | **0** | 12 | 0 |
| Molybdenum | ppm | ASTM D5185m | 50 | **38** | 59 | 50 |
| Manganese | ppm | ASTM D5185m | 0 | **<1** | 0 | 1 |
| Magnesium | ppm | ASTM D5185m | 950 | **582** | 973 | 820 |
| Calcium | ppm | ASTM D5185m | 1050 | **1707** | 1289 | 1315 |
| Phosphorus | ppm | ASTM D5185m | 995 | **1061** | 1101 | 940 |
| Zinc | ppm | ASTM D5185m | 1180 | **1258** | 1326 | 1223 |
| Sulfur | ppm | ASTM D5185m | 2600 | **3869** | 3689 | 3289 |

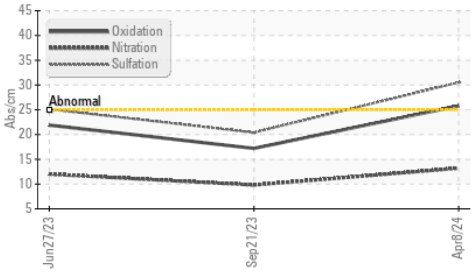
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **11** | 7 | 8 |
| Sodium | ppm | ASTM D5185m | | **4** | 4 | 3 |
| Potassium | ppm | ASTM D5185m | >20 | **19** | 20 | 24 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **0.7** | 0.3 | 0.5 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **13.2** | 9.8 | 12.0 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **30.5** | 20.4 | 25.1 |

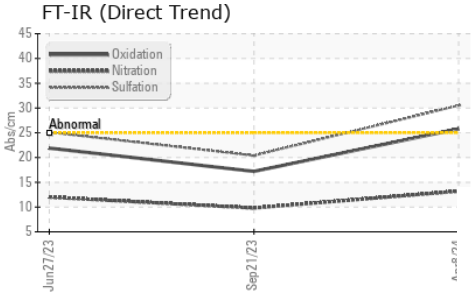
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **25.8** | 17.2 | 21.9 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | | **3.4** | 7.1 | 6.0 |

# OIL ANALYSIS REPORT

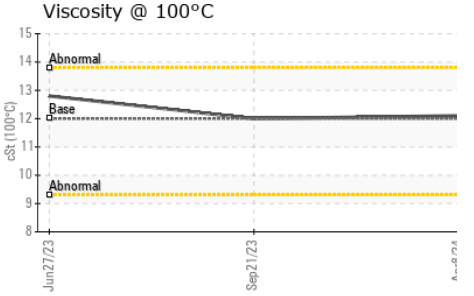
FT-IR (Direct Trend)




FT-IR (Direct Trend)




Viscosity @ 100°C

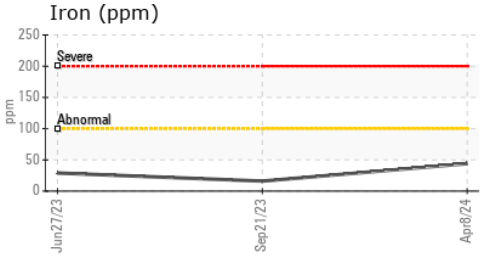



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

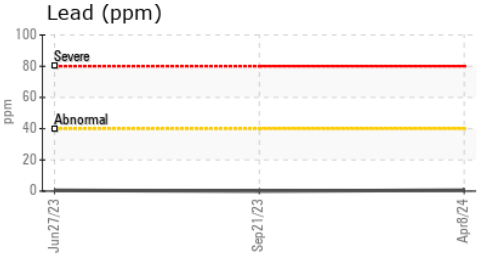
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 12.00 | **12.1** | 12.0 | 12.8 |

## GRAPHS

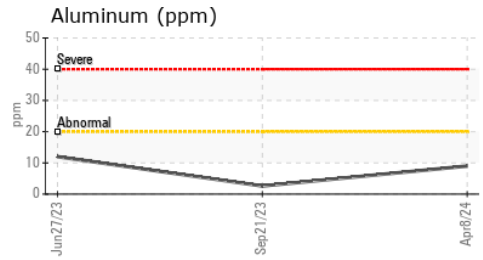
Iron (ppm)



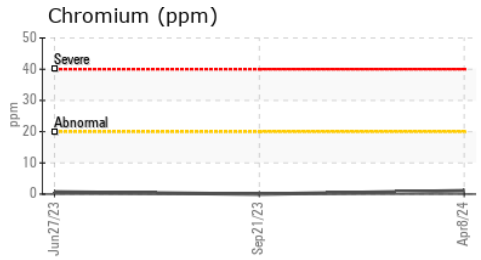

Lead (ppm)



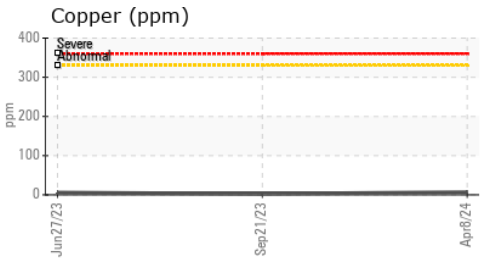

Aluminum (ppm)



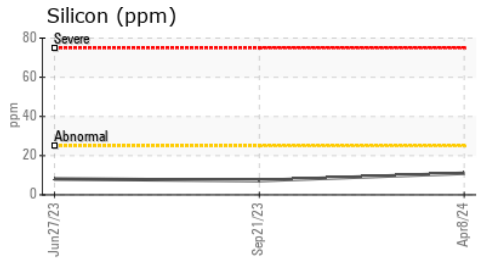

Chromium (ppm)



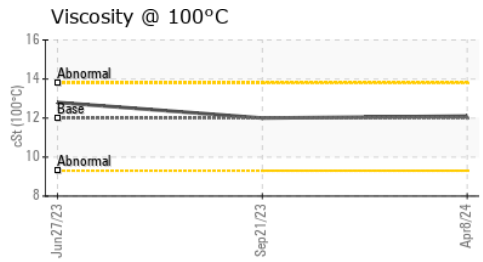

Copper (ppm)



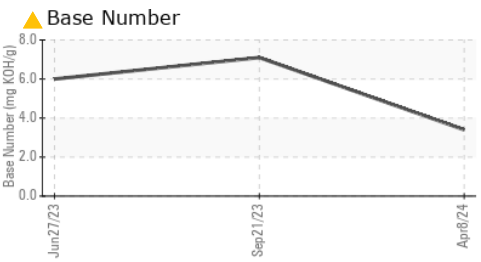

Silicon (ppm)




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : PCA0123235
**Lab Number** : 06153986
**Unique Number** : 10989409
**Test Package** : MOB 1 ( Additional Tests: TBN )

**Received** : 19 Apr 2024
**Tested** : 22 Apr 2024
**Diagnosed** : 23 Apr 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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