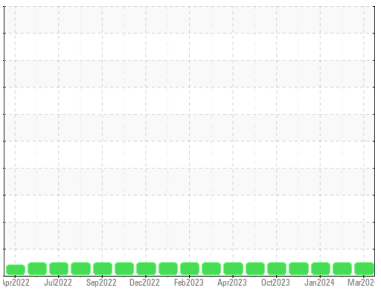
OIL DIAGNOSTICS

# OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL

Area
**Plymouth & Brockton**
Machine Id
**11449**
Component
**Diesel Engine**
Fluid
**PETRO CANADA 15W40 (36 QTS)**

## 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 | | **PCA0104438** | PCA0109872 | PCA0104732 |
| Sample Date | | Client Info | | **27 Mar 2024** | 19 Feb 2024 | 09 Jan 2024 |
| Machine Age | mls | Client Info | | **226763** | 215550 | 203792 |
| Oil Age | mls | Client Info | | **24000** | 12000 | 24000 |
| Oil Changed | | Client Info | | **Changed** | Not Changd | 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 | >90 | **21** | 12 | 16 |
| Chromium | ppm | ASTM D5185m | >20 | **2** | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >2 | **<1** | 0 | 0 |
| Titanium | ppm | ASTM D5185m | >2 | **<1** | 0 | 1 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | **3** | 1 | 2 |
| Lead | ppm | ASTM D5185m | >40 | **2** | 0 | 0 |
| Copper | ppm | ASTM D5185m | >330 | **<1** | <1 | <1 |
| Tin | ppm | ASTM D5185m | >15 | **2** | 0 | <1 |
| Vanadium | ppm | ASTM D5185m | | **<1** | <1 | 0 |
| Cadmium | ppm | ASTM D5185m | | **<1** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | | **4** | 7 | 6 |
| Barium | ppm | ASTM D5185m | | **0** | 0 | <1 |
| Molybdenum | ppm | ASTM D5185m | | **60** | 59 | 58 |
| Manganese | ppm | ASTM D5185m | | **<1** | 0 | <1 |
| Magnesium | ppm | ASTM D5185m | | **998** | 914 | 868 |
| Calcium | ppm | ASTM D5185m | | **1223** | 1085 | 1012 |
| Phosphorus | ppm | ASTM D5185m | | **1107** | 987 | 955 |
| Zinc | ppm | ASTM D5185m | | **1369** | 1142 | 1173 |
| Sulfur | ppm | ASTM D5185m | | **3673** | 3367 | 2690 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **4** | 2 | 4 |
| Sodium | ppm | ASTM D5185m | | **2** | 10 | <1 |
| Potassium | ppm | ASTM D5185m | >20 | **2** | 9 | 0 |

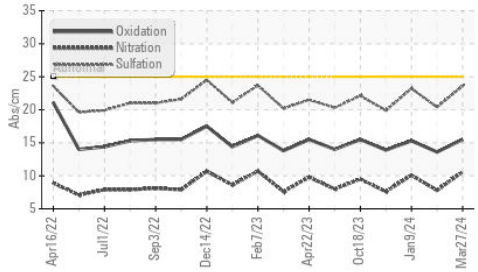
| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >6 | **2.8** | 1.7 | 2.4 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **10.6** | 7.8 | 10.1 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **23.6** | 20.4 | 23.2 |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **15.5** | 13.6 | 15.3 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | | **7.85** | 9.93 | 8.35 |

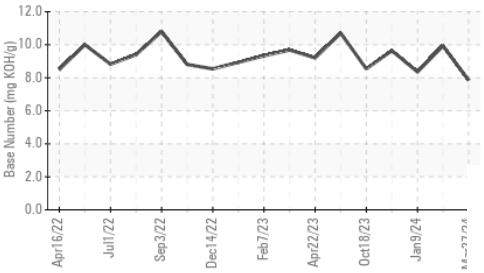
OIL DIAGNOSTICS

# OIL ANALYSIS REPORT

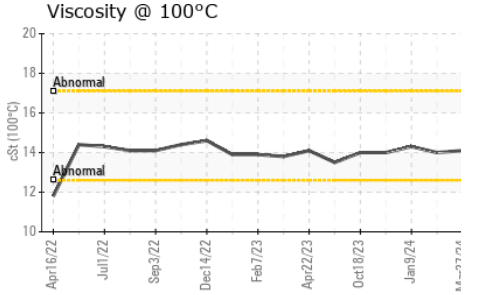
FT-IR (Direct Trend)




Base Number




Viscosity @ 100°C

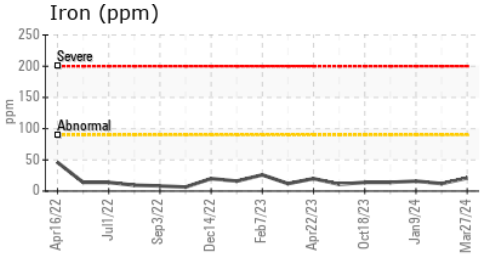



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

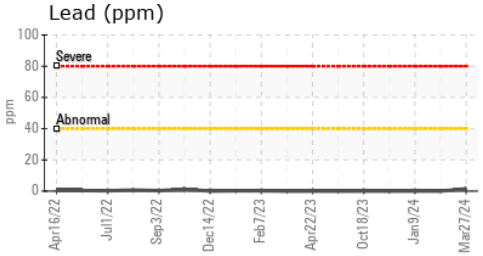
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | | **14.1** | 14.0 | 14.3 |

## GRAPHS

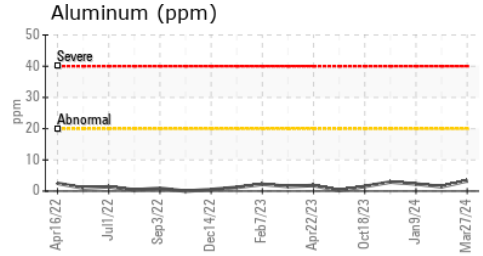
Iron (ppm)



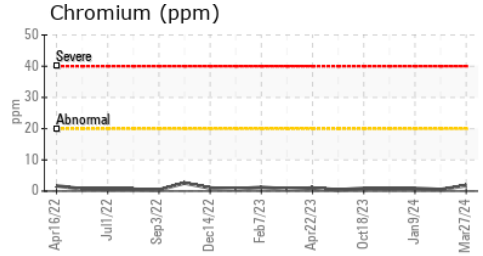

Lead (ppm)



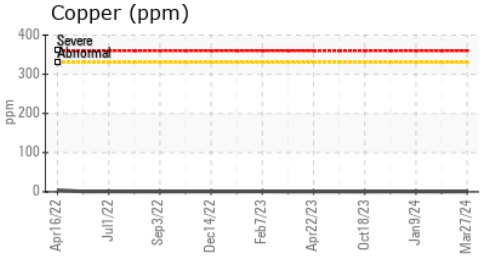

Aluminum (ppm)



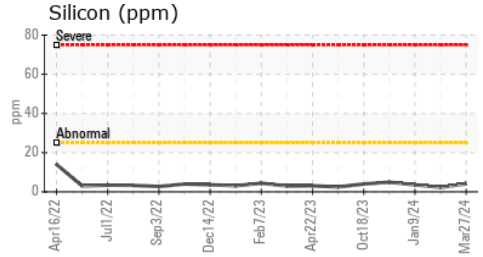

Chromium (ppm)



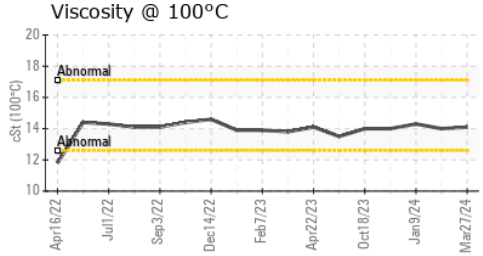

Copper (ppm)



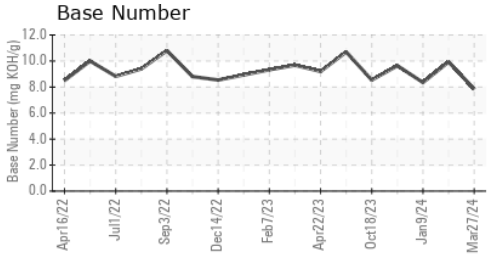

Silicon (ppm)




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.** : PCA0104438
**Lab Number** : 06147554
**Unique Number** : 10977632
**Test Package** : MOB 2

**Received** : 12 Apr 2024
**Tested** : 15 Apr 2024
**Diagnosed** : 15 Apr 2024 - Wes Davis

*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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