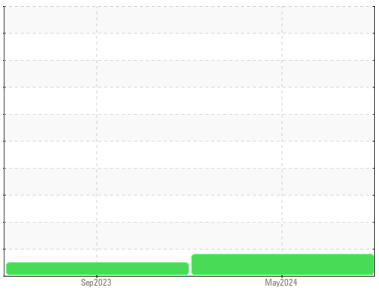
OIL DIAGNOSTICS

# OIL ANALYSIS REPORT

Sample Rating Trend




**FUEL**

Machine Id
## FREIGHTLINER 8
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (13 LTR)**

## DIAGNOSIS

**Recommendation**
The oil change at the time of sampling has been noted. Resample at the next service interval to monitor. No other corrective action is recommended at this time.

**Wear**
All component wear rates are normal.

**Contamination**
Light fuel dilution occurring. No other contaminants were detected 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 | | **PCA0104977** | PCA0102615 | --- |
| Sample Date | | Client Info | | **08 May 2024** | 28 Sep 2023 | --- |
| Machine Age | mls | Client Info | | **600229** | 449849 | --- |
| Oil Age | mls | Client Info | | **27000** | 27553 | --- |
| Oil Changed | | Client Info | | **Changed** | Changed | --- |
| Sample Status | | | | **MARGINAL** | NORMAL | --- |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Water | | WC Method | >0.2 | **NEG** | NEG | --- |
| Glycol | | WC Method | | **NEG** | NEG | --- |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >80 | **34** | 50 | --- |
| Chromium | ppm | ASTM D5185m | >5 | **2** | 2 | --- |
| Nickel | ppm | ASTM D5185m | >2 | **<1** | <1 | --- |
| Titanium | ppm | ASTM D5185m | | **<1** | <1 | --- |
| Silver | ppm | ASTM D5185m | >3 | **<1** | <1 | --- |
| Aluminum | ppm | ASTM D5185m | >30 | **2** | 1 | --- |
| Lead | ppm | ASTM D5185m | >30 | **8** | 22 | --- |
| Copper | ppm | ASTM D5185m | >150 | **1** | 2 | --- |
| Tin | ppm | ASTM D5185m | >5 | **2** | 3 | --- |
| Vanadium | ppm | ASTM D5185m | | **0** | 0 | --- |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | --- |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **33** | 1 | --- |
| Barium | ppm | ASTM D5185m | 0 | **0** | 0 | --- |
| Molybdenum | ppm | ASTM D5185m | 60 | **64** | 63 | --- |
| Manganese | ppm | ASTM D5185m | 0 | **<1** | <1 | --- |
| Magnesium | ppm | ASTM D5185m | 1010 | **829** | 936 | --- |
| Calcium | ppm | ASTM D5185m | 1070 | **1192** | 1153 | --- |
| Phosphorus | ppm | ASTM D5185m | 1150 | **979** | 954 | --- |
| Zinc | ppm | ASTM D5185m | 1270 | **1280** | 1260 | --- |
| Sulfur | ppm | ASTM D5185m | 2060 | **3227** | 3192 | --- |

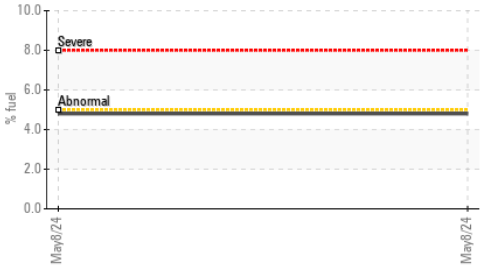
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >20 | **5** | 6 | --- |
| Sodium | ppm | ASTM D5185m | | **1** | 1 | --- |
| Potassium | ppm | ASTM D5185m | >20 | **3** | 3 | --- |
| Fuel | % | ASTM D3524 | >5 | **4.8** | <1.0 | --- |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **1.2** | 1.8 | --- |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **11.7** | 13.4 | --- |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **26.3** | 28.3 | --- |

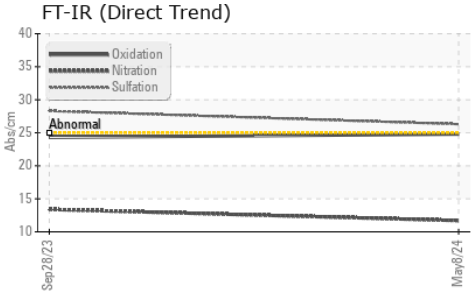
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **24.8** | 24.3 | --- |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **4.7** | 4.2 | --- |

# OIL ANALYSIS REPORT

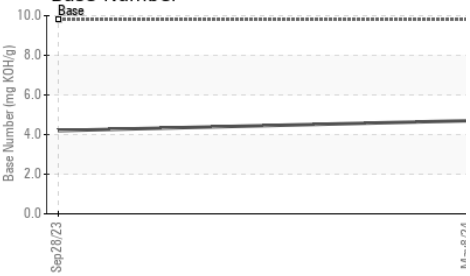
Fuel Dilution



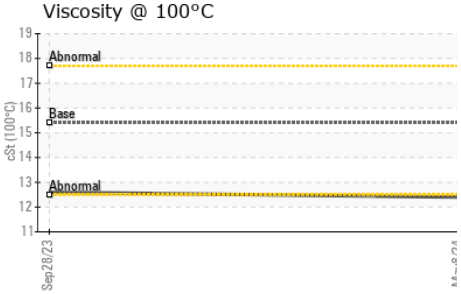

FT-IR (Direct Trend)




Base Number




Viscosity @ 100°C

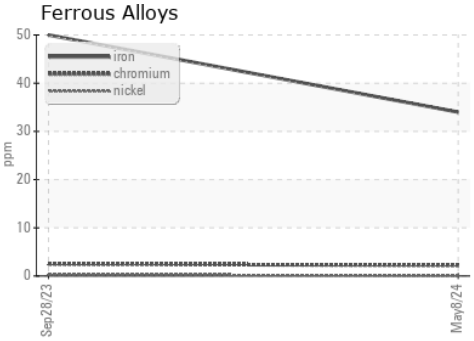



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | --- |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | --- |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | --- |
| Silt | scalar | *Visual | NONE | **NONE** | NONE | --- |
| Debris | scalar | *Visual | NONE | **NONE** | NONE | --- |
| Sand/Dirt | scalar | *Visual | NONE | **NONE** | NONE | --- |
| Appearance | scalar | *Visual | NORML | **NORML** | NORML | --- |
| Odor | scalar | *Visual | NORML | **NORML** | NORML | --- |
| Emulsified Water | scalar | *Visual | >0.2 | **NEG** | NEG | --- |
| Free Water | scalar | *Visual | | **NEG** | NEG | --- |

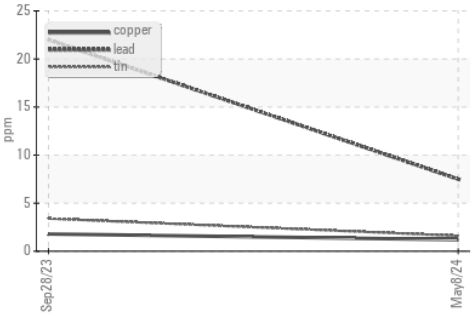
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | **12.4** | 12.6 | --- |

## GRAPHS

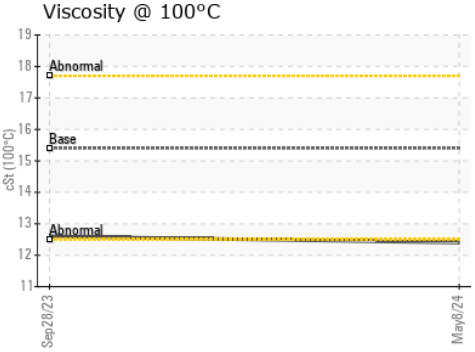
Ferrous Alloys



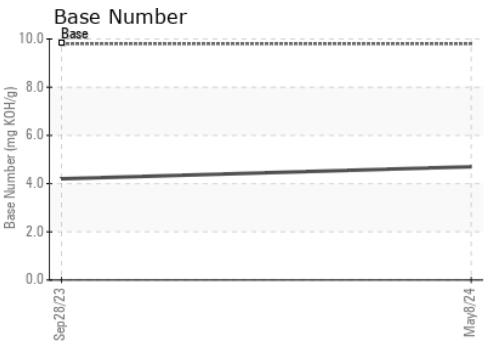

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : PCA0104977 **Received** : 23 May 2024
**Lab Number** : 06188648 **Tested** : 28 May 2024
**Unique Number** : 11045400 **Diagnosed** : 28 May 2024 - Wes Davis
**Test Package** : FLEET ( Additional Tests: FuelDilution, 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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Report Id: ATRPIN [WUSCAR] 06188648 (Generated: 05/28/2024 14:53:06) Rev: 1

Submitted By: Vlad Melnichuk