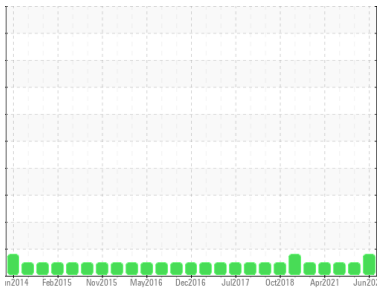
# OIL ANALYSIS REPORT

Sample Rating Trend



**WEAR**

Area
## 52000 series
Machine Id
## Freightliner 52595
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 10W30 (40 LTR)**

## DIAGNOSIS

**Recommendation**
The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

**Wear**
Iron ppm levels are abnormal. Cylinder, crank, or cam shaft wear is indicated.

**Contamination**
Elevated aluminum (Al) and/or lead (Pb) and potassium (K) levels in your metals analysis are likely a result of solder flux release into the lubricant and is common on new equipment/components. There is no indication of any contamination in the oil.

**Fluid Condition**
The oil is no longer serviceable as a result of the abnormal and/or severe wear.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **WC0915048** | WC0828293 | WC0684589 |
| Sample Date | | Client Info | | **22 Jun 2024** | 17 Jun 2023 | 15 May 2022 |
| Machine Age | mls | Client Info | | **607235** | 928265 | 548759 |
| Oil Age | mls | Client Info | | **30319** | 28157 | 23190 |
| Oil Changed | | Client Info | | **Changed** | Changed | Changed |
| Sample Status | | | | **ABNORMAL** | 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 |
|---|---|---|---|---|---|---|
| PQ | | ASTM D8184* | >80 | **0** | --- | --- |
| Iron | ppm | ASTM D5185(m) | >65 | ▲ **66** | 42 | 20 |
| Chromium | ppm | ASTM D5185(m) | >5 | **3** | 2 | <1 |
| Nickel | ppm | ASTM D5185(m) | >3 | **<1** | <1 | <1 |
| Titanium | ppm | ASTM D5185(m) | >5 | **<1** | <1 | 0 |
| Silver | ppm | ASTM D5185(m) | >2 | **<1** | <1 | <1 |
| Aluminum | ppm | ASTM D5185(m) | >35 | **58** | 29 | 8 |
| Lead | ppm | ASTM D5185(m) | >10 | **0** | 0 | <1 |
| Copper | ppm | ASTM D5185(m) | >180 | **8** | 6 | 3 |
| Tin | ppm | ASTM D5185(m) | >8 | **<1** | <1 | <1 |
| Antimony | ppm | ASTM D5185(m) | >35 | **0** | 0 | <1 |
| Vanadium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Beryllium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Cadmium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185(m) | 2 | **1** | 2 | 28 |
| Barium | ppm | ASTM D5185(m) | 0 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185(m) | 50 | **64** | 63 | 6 |
| Manganese | ppm | ASTM D5185(m) | 0 | **<1** | <1 | <1 |
| Magnesium | ppm | ASTM D5185(m) | 950 | **1026** | 1025 | 97 |
| Calcium | ppm | ASTM D5185(m) | 1050 | **1129** | 1120 | 2192 |
| Phosphorus | ppm | ASTM D5185(m) | 995 | **1039** | 1103 | 985 |
| Zinc | ppm | ASTM D5185(m) | 1180 | **1270** | 1240 | 1139 |
| Sulfur | ppm | ASTM D5185(m) | 2600 | **2155** | 2341 | 2962 |
| Lithium | ppm | ASTM D5185(m) | | **<1** | <1 | <1 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185(m) | >15 | **5** | 6 | 6 |
| Sodium | ppm | ASTM D5185(m) | | **4** | 3 | 10 |
| Potassium | ppm | ASTM D5185(m) | >20 | **75** | 37 | 9 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | ASTM D7844* | >3 | **1.1** | 0.7 | 0.4 |
| Nitration | Abs/cm | ASTM D7624* | >20 | **14.7** | 11.1 | 9.3 |
| Sulfation | Abs/.1mm | ASTM D7415* | >30 | **27.5** | 24.0 | 26.2 |

# OIL ANALYSIS REPORT

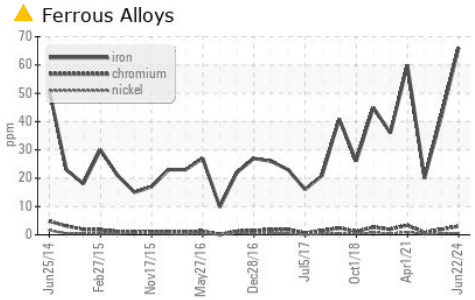
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | ASTM D7414* | >25 | **27.0** | 20.5 | 17.5 |

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Emulsified Water | scalar | Visual* | >0.2 | **NEG** | NEG | NEG |
| Free Water | scalar | Visual* | | **NEG** | NEG | NEG |

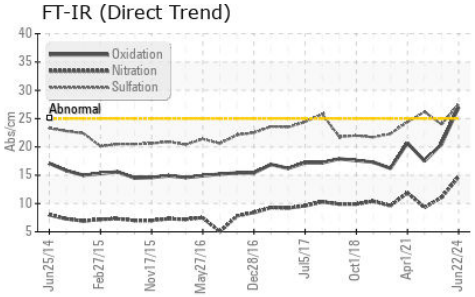
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D7279(m) | 12.00 | **12.8** | 12.0 | 12.3 |

## GRAPHS

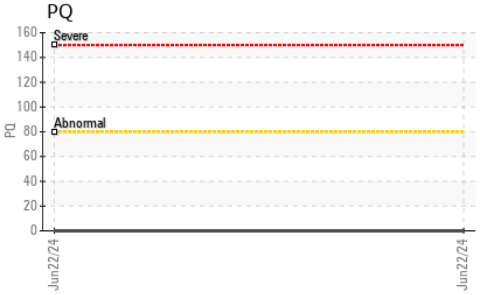
Ferrous Alloys



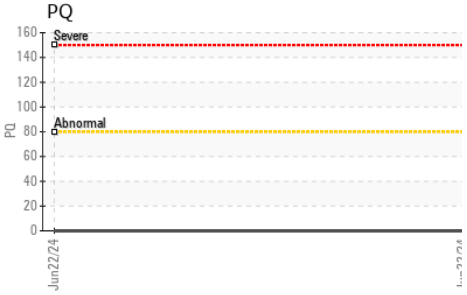

FT-IR (Direct Trend)



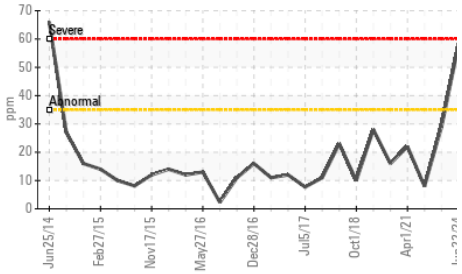

PQ



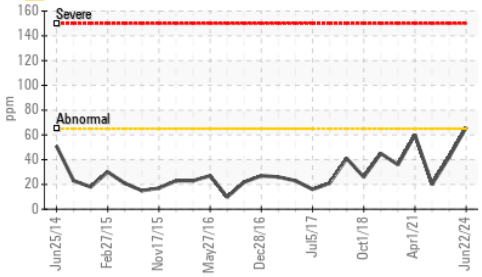

PQ



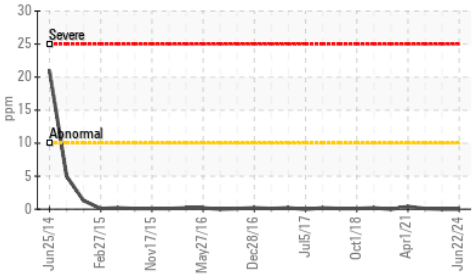

Aluminum (ppm)



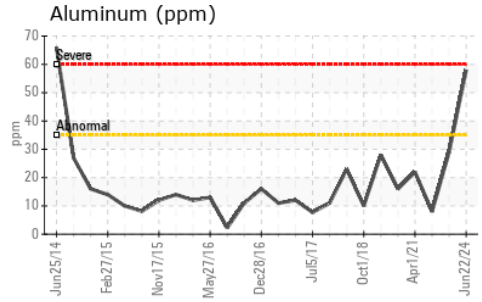

Iron (ppm)



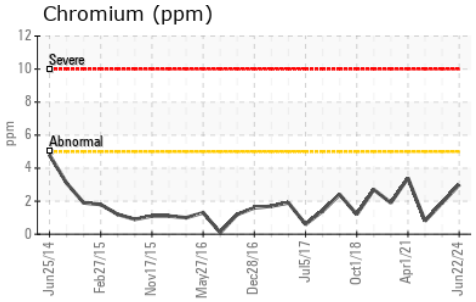

Lead (ppm)



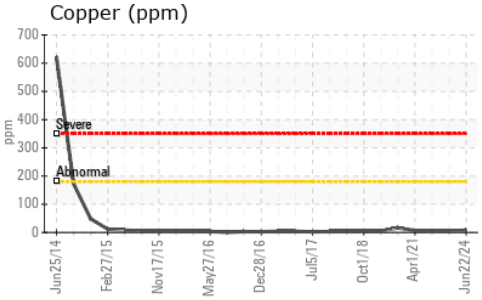

Aluminum (ppm)



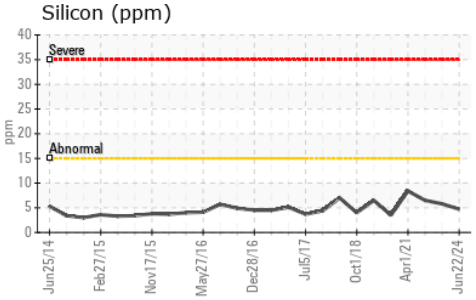

Chromium (ppm)



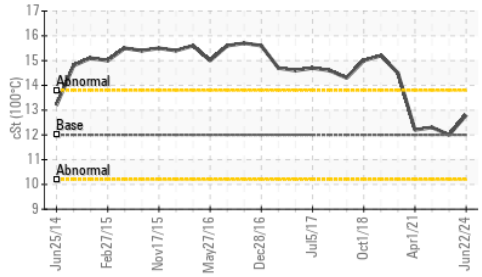

Copper (ppm)



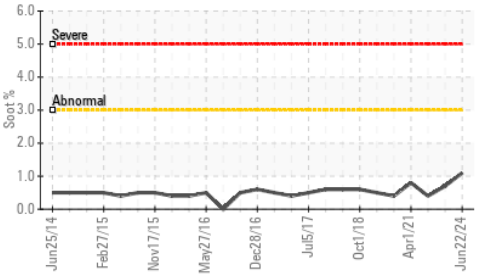

Silicon (ppm)




Viscosity @ 100°C




Soot %




ISO 17025:2017 Accredited Laboratory

**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
**Sample No.** : WC0915048
**Lab Number** : 02646536
**Unique Number** : 5812088
**Test Package** : MOB 1 ( Additional Tests: PQ )

**Received** : 09 Jul 2024
**Tested** : 09 Jul 2024
**Diagnosed** : 09 Jul 2024 - Kevin Marson

*To discuss this sample report, contact Customer Service at 1-800-268-2131.*
*Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.*
*Validity of results and interpretation are based on the sample and information as supplied.*

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